Planning and Zoning Department
616 Germantown Pike, Lafayette Hill, PA 19444-1821
484-594-2625
www.whitemarshtwp.org

Subdivision and Land Development Cover Page for SLD # 03-23 R2
Project Name: MileOne Fort Washington LLC
Address: 500-512 Pennsylvania Avenue
Date: July 25, 2025
Status: Under Review

Updates:

- Montgomery County Planning Commission Review- 8.8.25
- Zoning Ordinance Compliance Review Letter – 8.19.25
- Recorded Easement for Montco Trail- 8.25.25
- Fire Marshal Review- 8.27.25
- Township Engineer Review Letter- 8.29.25
- Revised Waiver Request Letter- 9.3.25

WHITEMARSH TOWNSHIP
SUBDIVISION and/or LAND DEVELOPMENT APPLICATION

The applicant, or applicant's authorized agent, for the Township to accept submission of the application, must complete each Application item and each Application Submission Checklist item.

Application Type: (check one)
☒ Minor Subdivision ☐ Minor Land Development
☐ Major Subdivision ☒ Major Land Development
☐ Land Development Waiver

Plan Type: New Amended
☐ Sketch ☒ Preliminary ☒ Final

INSERT "N/A" FOR NOT APPLICABLE WHERE APPROPRIATE

Name of Subdivision/Land Development: Proposed BMW Automotive Dealership Expansion

Location of Subdivision/Land Development: 500,506, 510, & 512 Pennsylvania Avenue
(~~Primary Access Roadway Name~~)

Between: Commerce Drive (Roadway Name) **and** Indiana Avenue (Roadway Name)

Number of Parcels: 4 (512 Pennsylvania Ave, 510 Pennsylvania Ave, 500 Pennsylvania Ave, 506 Pennsylvania Ave) **Block Number(s):** 51 **Unit Number(s):** 44, 2, 41, 46

Parcel Number(s): 65-00-08776-006, 65-00-08773-00-9, 65-00-08770-00-3, 65-00-08767-00-6

Acreage: 5.45 AC **Total Lots Proposed:** 1 **Zoning District:** CR-L (Commercial Retail - Low District)

Water Service Proposed: ☒ Public ☐ Private Sewer Service Proposed: ☒ Public ☐ Private

Applicant Name: MileOne Fort Washington, LLC **Contact Name:** Craig Colton

Phone #: 410-427-6706 **Fax #:** **Email:** ccolton@mileoneholdings.com

Address: 3301 Briggs Chaney Road, Silver Spring, MD 20904

Owner of Record Name (If Different): Auto Properties Fort Washington, LLC

Phone #: 443-872-0738 **Fax #:** **Email:** lolivieri@mileone.com

Address: 1 Olympic Place, Suite 1200, Towson, MD 21204

Engineer Name: Jeffrey Beavan, PE **Firm Name:** Bohler Engineering PA, LLC

Phone #: 610-709-9971 **Fax #:** 610-709-9976 **Email:** jbeavan@bohlereng.com

Address: 74 West Broad Street, Suite 500, Bethlehem, PA 18018

Fees and plans showing all public improvements are submitted with this application. Any additional plan information required by the Township Engineer will be submitted to the Director of Planning and Zoning for distribution. The undersigned applicant agrees to comply with all the provisions of Chapter 105 of the Code of the Township of Whitemarsh, as amended, and agrees to obtain all necessary permits in connection with the proposed subdivision and/or land development.

Whitemarsh Township employees, or township-authorized agents, are hereby granted permission to enter upon the land, if necessary, for site inspections.

Original preliminary and/or original final subdivision and/or land development applications submitted by 4:00pm on the last business day of the month will be reviewed by the Whitemarsh Township Planning Commission at a regular meeting two (2) months following the date of submission or other appropriate meeting date depending upon the results of Township reviews.

I hereby certify, as the undersigned applicant, that I am familiar with the provisions of: [1] Chapter 105, "Subdivision and Land Development", [2] Chapter 58, "Grading, Erosion Control, Stormwater Management and Best Management Practices", and [3] Chapter 55, "Tree Protection Standards" of the Code of the Township of Whitemarsh, as amended, and, to the best of my knowledge and belief, this application and the submitted plans conform to those provisions.

Date of Submission: 07/25/2025

Signature: _____

(Original Signature must be submitted)

Printed Name: Craig Colton

I, (name) Craig Colton **(title)** Authorized Person of

(entity submitting application) MileOne Fort Washington, LLC do hereby affirm

that I am authorized by the applicant to affix my signature to this application.

Date: 07/25/2025 **Signature:** _____

(Original Signature must be submitted)

This Checklist and the following items MUST be submitted to the Township, completed in their entirety, at the time of submission for the Township to accept a subdivision/land development application.

This checklist page must be filled out after printing the completed form starting on page 2 where applicable.

Same as prior Submission: One (1) copy of the Landscape Tree Questionnaire, three (3) copies of plans, & supporting documents.
Electronic copies of everything - via email

Applicant Initials	Required Items of Submission	Township Receipt
MRB	Whitemarsh Township Checklist	
MRB	Whitemarsh Township Application (Signature MUST Be Original)	
MRB	Whitemarsh Township Request for Modification (Signature MUST Be Original)	
MRB	Whitemarsh Time Waiver Form (Signature MUST Be Original)	
MRB Arriving under separate cover	Whitemarsh Township Escrow (Payable to Whitemarsh Township; credit card payment accepted in person)	
MRB	Montgomery County Planning Commission Municipal Request for Review (County will request fee directly from applicant)	
MRB	Shade Tree Commission Checklist for Compliance with Chapter 55 (attached)	
	Transportation Impact Study [§105-21.B.(9)(c)] (if applicable)	
MRB	Stormwater Management Plan & Supporting Calculations (if applicable)	
MRB	Supplemental Documents Applicable to a Specific Application	
MRB	List of Encumbrances (Book & Page Numbers) (if applicable)	
MRB ~~FEES ARRIVING~~ UNDER SEPARATE COVER	Three (3) Complete Sets of All Application Materials	
MRB	PDF or Link to Digital File of Each Component of the Application	

Applicant Name: ***MileOne Fort Washington, LLC***

Development Name: ***Proposed BMW Automotive Dealership Expansion***

Location of Property: ***500, 506, 510 & 512 Pennsylvania Avenue***

Date: 07/25/2025

PROJECT COVER SHEET –

To verify fulfillment of Chapter 55 Ordinance requirements for:

1. *Maximum Tree Removal – 55-4B*
2. *Tree Replacement – 55-4D(6)(a)*
3. *Substitutions for Replacements – 55-4F*
4. *Replacement Tree Species – 55-4E*
5. *Tree and Shrub requirements for Chapters other than Chapter 55*

Complete the following tables, filling in data for each lettered item, and resolving each Compliance Test. In accordance with 55-4C(4)(e), provide this completed Cover Sheet together with the Landscape Plan.

Citations to Sections of Chapter 55 are provided for the convenience of the Applicant. Other Chapters of the Whitemarsh Township Code and other sections of Chapter 55, such as 55-2 Definitions, may be relevant. In the event of an inconsistency between this Cover Sheet and any provision of the Code, the language of the Code shall be controlling.

1) Calculation of Requirement for Maximum Tree Removal – 55-4B:

A.	***Total of all existing Trees on the lot with DBH of 6" or greater****, per 55-4C(3)(a).*	*45*
B.	*33% of line (A) =* ***maximum existing Trees which may be Removed.***	*15*
C.	*Provide* ***number of existing Trees proposed to be Removed by the Applicant,*** *per 55-4C(3)(a).*	*16 (Including 8 ash trees and 1 invasive pear tree)*
	COMPLIANCE TEST: *If Line (C) is greater than Line (B), the Applicant's proposal is not in compliance with the requirement that no more than 33% of trees having a DBH of six inches or greater may be removed.*	*Not in compliance*

2) <u>Calculation of Replacement Requirement for Removed Trees having a DBH of Six Inches or Greater 55-4D(6)(a):</u>

D.	***Total DBH of all existing Living and Healthy Trees*** *(as determined per 55-4A) having a DBH of 6" or greater* ***that are proposed to be Removed****, per 55-4C(3)(a).*	*135"*
E.	***Total DBH of all Living and Healthy Trees*** *(as determined per 55-4A) having a DBH of 6" or greater,* ***removed within five years prior to the submission of application****, per 55-4C(3)(b).*	*0"*
F.	*Sum of line (D) and line (E) =* ***Total DBH that must be replaced for all Removed Living and Healthy Trees.***	*135"*
G.	***Total Caliper inches of <u>Canopy</u> Replacement Trees proposed to be planted*** *by the Applicant (as shown on the Landscape Plan) per 55-4D(6)(a). Each Canopy Replacement Tree shall have a minimum Caliper of three inches.*	*69"*
	COMPLIANCE TEST: *If Line (G) is less than Line (F), the Applicant's proposal is not in compliance with the minimum Canopy Tree Replacement Requirement.* *To comply with this requirement, the Applicant may request a waiver from the Shade Tree Commission to permit limited substitutions per 55-4F. If so, proceed to Substitution calculation (3) below.*	*Not compliant. See below for proposed alternate fulfillment.*

3) <u>Calculation of maximum Proposed Substitutions for Replacement Canopy Trees – 554F</u>, subject to certain limitations and approval by the Shade Tree Commission.

H.	*40% of line (F) (round fractions <u>down</u> to a whole number) =* ***maximum Caliper of required Replacement Canopy Trees that may be substituted*** *with Understory Trees and/or FIL, upon STC approval, per 55-4F.*	*54"*
I.	*Line (F) less Line (G) =* ***Shortfall in <u>DBH</u> compliance with the minimum Canopy Tree Replacement Requirement,*** *per 55-4D(6)(a).*	*66"*
	COMPLIANCE TEST: *If line (H) is less than line (I), the deficit of minimum Canopy Tree Replacement requirement, per 55-4D(6) cannot be fully compensated with Substitutions, per 55-4F.*	*Not compliant*

J.	*Line (I) divided by 3" (round fractions <u>up</u> to a whole number) =* ***Shortfall in the <u>number</u> of required 3" Canopy Replacement Trees.***	*22*
K.	*Provide the* ***total number of substitution Understory Trees proposed to be planted*** *by the Applicant, per 55-4F(1).*	*2*
L.	*Line (K) divided by two =* ***Number of required 3"-cal. Replacement Canopy Trees being substituted with Understory Trees*** *per 55-4F(1).*	*1*
M.	*Line (J) less Line (L) =* ***Number of required 3"-cal. Replacement Canopy Trees proposed by the Applicant to be substituted with payment of in-lieu fees****, per 55-4F(2).* ***NOTE:*** *Review proposed Landscape Plan to ensure that the use of Replacement Understory Tree substitutes has been maximized prior to calculating the number of substitutes via in-lieu fees, per 55-4F(4).*	*21*
N.	*Sum of Line (L) and Line (M) =* ***Total proposed number of Replacement Canopy Trees being substituted per 55-4F.***	*22*
O.	*Line (N) multiplied by 3" =* ***Total shortfall of DBH to be fulfilled with substitutions*** *as proposed by this Landscape Plan.*	*66*
	COMPLIANCE TEST: *If (O) is greater than (H), the Applicant's proposal has exceeded the 40% maximum eligible for consideration for Replacement substitutions, per 55-4F, and is not in compliance.*	*Not compliant*
P.	*Sum of Line (O) and (G) =* ***Total Caliper compensation for Removed Trees*** *as provided by this proposed Landscape Plan.*	*135"*
	COMPLIANCE TEST: *If (P) is less than (F), the Applicant's proposal is not in compliance with the Tree Replacement Requirement.*	*In compliance*

4) <u>Compliance with Species Requirement of Replacement Trees – 55-4E</u>:

Q.	***Total number of proposed Canopy Replacement Trees,*** *per 55-4C(4)(c).*	*23*

R.	*75% of line (Q) (round fractions up to the next whole number) =* ***Minimum required number of Native Species Replacement Canopy Trees****, per 55-4E.*	*18*
S.	*Provide the* ***number of proposed Native Species Canopy Replacement Trees,*** *per 55-4C(4)(c).*	*23*
	COMPLIANCE TEST: *If Line (S) is less than Line (R), the Applicant's proposal is not in compliance with the 75% Native Species requirement for Replacement Canopy Trees, per 55-4E.*	*In compliance*
T.	*Provide the* ***number of proposed Native Species Understory Trees****.*	*2*
	COMPLIANCE TEST: *If Line (T) is less than line (K), he Applicant's proposal is not in compliance with the 100% Native Species requirement for Replacement Understory Trees.*	*In compliance*

5) <u>Compliance with Landscaping Requirements of Other Code Chapters</u>. Complete the following Tables for each applicable requirement.

<u>REQUIRED TREES</u>:

A	B	C	D*	E	F**
Full Code Citation: Chapter; sub-chapter, etc.	Subject matter as indicated in Code caption	Required # of Trees	Credits for Preserved Trees per 55-4D(5)	Proposed # of Trees	Column (C) less Columns (D) and (E)

NOTE: Column (D) Credits are strictly limited to calculating Chapter 105-52 Buffer yards, in accordance with 55-4D(5).
****NOTE: When the result in Column (F) is greater than zero, the Applicant's proposal is not in compliance with the applicable Code requirement.***

<u>REQUIRED SHRUBS</u>:

A	B	C	D	E*
Full Code Citation: Chapter; sub-chapter, etc.	Subject matter as indicated in Code caption	Required # of Shrubs	Proposed # of Shrubs	Column (C) less Column (D)

NOTE: When the result in Column (E) is greater than zero, the Applicant's proposal is not in compliance with the applicable Code requirement.





DEED BK 6226 PG 02464 to 02470
INSTRUMENT # : 2021060714
RECORDED DATE: 05/26/2021 08:29:13 AM



5956243-0012U

RECORDER OF DEEDS
MONTGOMERY COUNTY
Jeanne Sorg

One Montgomery Plaza
Swede and Airy Streets ~ Suite 303
P.O. Box 311 ~ Norristown, PA 19404
Office: (610) 278-3289 ~ Fax: (610) 278-3869

MONTGOMERY COUNTY ROD

OFFICIAL RECORDING COVER PAGE

Document Type:	Deed	**Transaction #:**	6344284 - 2 Doc(s)
Document Date:	05/14/2021	**Document Page Count:**	6
Reference Info:		**Operator Id:**	ncostello

RETURN TO: (Mail)
FIDELITY NATIONAL
1700 Market St Ste 2100
Philadelphia, PA 19103-3919

PAID BY:
CHICAGO TITLE INSURANCE COMPANY PA

*** PROPERTY DATA:**

Parcel ID #:	65-00-08770-00-3	65-00-08767-00-6	65-00-08773-00-9
Address:	500 PENNSYLVANIA AVE FT WASHINGTON PA 19034	506 PENNSYLVANIA AVE PA	510 PENNSYLVANIA AVE PA
Municipality:	Whitemarsh Township (100%)	Whitemarsh Township (0%)	Whitemarsh Township (0%)
School District:	Colonial	Colonial	Colonial

*** ASSOCIATED DOCUMENT(S):**

CONSIDERATION/SECURED AMT:
$14,054,016.00

FEES / TAXES:
Recording Fee:Deed
Additional Pages Fee
Additional Parcels Fee
Affordable Housing Pages
Affordable Housing Parcels
State RTT

Whitemarsh Township RTT
Colonial School District RTT

Total:

[redacted]

DEED BK 6226 PG 02464 to 02470
Recorded Date: 05/26/2021 08:29:13 AM
I hereby CERTIFY that this document is recorded in the Recorder of Deeds Office in Montgomery County, Pennsylvania.

Jeanne Sorg
Recorder of Deeds

Rev1a 2016-01-29

PLEASE DO NOT DETACH

THIS PAGE IS NOW PART OF THIS LEGAL DOCUMENT

NOTE: If document data differs from cover sheet, document data always supersedes.

Montgomery County

MAY 2 1 2021

Recorder of Deeds

PREPARED BY: McNEES WALLACE & NURICK LLC
RETURN TO: McNEES WALLACE & NURICK LLC
570 LAUSCH LANE, SUITE 200
LANCASTER, PA 17601

PARCEL ID NOs: 65-00-08770-00-3; 65-00-08767-00-6; 65-00-08773-00-9; & 65-00-08776-00-6

65-00-08767-10-5

THIS DEED

MADE this 14th day of May 2021 and effective as of the 17th day of May in the year Two Thousand Twenty One (2021).

BETWEEN CLEO-MAR, L.P., a Pennsylvania limited partnership (hereinafter called the "Grantor")

and

AUTO PROPERTIES FORT WASHINGTON, LLC, a Pennsylvania limited liability company (hereinafter called the "Grantee").

WITNESSETH, that in consideration of [redacted], in hand paid, the receipt whereof is hereby acknowledged, the Grantor hereby grants and conveys to the Grantee, its successors and assigns:

(Premises-A)

All those two certain pieces or parcels of ground, situate in Whitemarsh Township, Montgomery County, Pennsylvania, described according to a certain survey made for Delpost, Inc., Fort Washington Industrial Park, made by Frank A. Tebo, Registered Professional Engineer, dated September 12, 1966, as one parcel as follows to wit:

Beginning at a point formed by the intersection of the center line of Pennsylvania Avenue (60 feet wide) with the extended center line of Commerce Drive, thence extending said point of beginning, South 52 degrees 03 minutes 48 seconds East, along the center line of Pennsylvania Avenue, 43.00 feet to a point, a corner of lands now or late of Bankbill Corp., thence extending South 37 degrees 56 minutes 12 seconds West, along the aforesaid lands of Bankbill Corp., crossing the Southwesterly side of Pennsylvania Avenue, also crossing the bed of the Philadelphia Electric Co., Easement (30 feet wide), 507.62 feet to a point on the Northeasterly right of way line of the Reading Railroad, thence extending North 54 degrees 12 minutes 18 seconds West, along the Northeasterly right of way line of the Reading Railroad, 116.96 feet to a point, a corner of lands now or late of the Philadelphia Electric Co., thence extending North 38 degrees 56 minutes 12 seconds East along the aforesaid lands of the Philadelphia Electric Company, recrossing the aforesaid bed of the Philadelphia Electric Co., easement, also recrossing the Southeasterly side of Pennsylvania Avenue 512.07 feet to a point in the center line of Pennsylvania Avenue, thence extending South 52 degrees 03 minutes 48 seconds East, along the center line of

Pennsylvania Avenue, 65.00 feet to the first mentioned point of intersection and place of beginning.

(Premises-B)

All that certain irregular lot or parcel of ground, situate in the Township of Whitemarsh, County of Montgomery and Commonwealth of Pennsylvania, bounded and described in accordance with a survey and plan thereof made by C. Raymond Weir, Registered Professional Engineer, Ambler, Pennsylvania, dated March 31, 1958, as follows:

Beginning at a stone on the Southwesterly side of Pennsylvania Avenue (60 feet wide) a corner common to ground of Fort Washington Realty Corp., herein described, and ground now or late of Del-post, inc., thence extending from said point of beginning, along said ground now or late of Del-post Inc., South thirty-five degrees seventeen minutes West four hundred eighty-one feet and seventy-two one hundredths of a foot (481. 72 feet) to a stone set on the Northeasterly right of way line of the North Pennsylvania Railroad (Bethlehem Branch of the Reading Railroad) at a corner common ground herein described and ground now or late of Del-Post Inc., said point also being at the distance of thirty-three feet (33 feet) measured Northeastwardly from and at right angles to the center line on the aforementioned Railroad Company's right of way, thence on a line parallel with and thirty-three (33 feet) distant measured Northeastwardly from and at right angles to the center line of said right of way, North fifty-seven degrees forty-eight minutes West, one hundred fifty feet and twenty-two one-hundredths of a foot (150.22 feet) to a stone, thence through ground of Fort Washington Realty Corp., of which this is a part, the three (3) following courses and distances, (1) on a line parallel with the first course and distance above described North thirty-five degrees seventeen minutes East two hundred feet (200 feet), to a stone, (2) on a line parallel with the second course and distance above described, South fifty-seven degrees forty-eight minutes East, one hundred ten feet and sixteen one-hundredths of a foot (110.16 feet) to a stone, and (3) on a line parallel with the first course and distance above described, North thirty-five degrees seventeen minutes East, two hundred eighty-three feet and twenty-one one hundredths of a foot (283.21 feet) to a stone on the said southwesterly side of Pennsylvania Avenue, thence along the southwesterly side of Pennsylvania Avenue South fifty-five degrees forty minutes East forty feet (40 feet) to the first mentioned point and place of beginning.

(Premises-C)

ALL THAT CERTAIN lot or piece of ground with the buildings and improvements thereon erected, Situate in Whitemarsh Township, Montgomery County, Pennsylvania, bounded and described according to an As Built Survey Plot Plan made by Phillip C. Kretschman, P.E. made for Seltzer Development Corporation, dated July 1, 1986 as follows, to wit:

BEGINNING at a point on the title line in the bed of Pennsylvania Avenue (no width given), said point being South 52 degrees 03 minutes 48 seconds East the distance of 43.00 feet along the title line in the bed of Pennsylvania Avenue from its point of intersection with the center line of Commerce Drive (no width given); thence extending from said point of beginning along the title line in the bed of Pennsylvania Avenue the two following courses and distances: (1) South 52 degrees 03 minutes 48 seconds East 15.86 feet to a point, and

(2) South 52 degrees 09 minutes 18 seconds East and crossing a certain storm sewer easement 132.46 feet to a point; thence extending from said point South 37 degrees 56 minutes 12 seconds West and crossing the Southwesterly side of Pennsylvania Avenue and along a 5 foot wide parking easement and passing through a certain 20 foot storm drainage easement and passing through a certain Electric Company easement line and a certain Electric Company easement and another certain Electric Company easement line the distance of 502.65 feet to a point; thence extending from said point North 54 degrees 12 minutes 18 seconds West 148.42 feet to a point: thence extending from said point North 37 degrees 56 minutes 12 seconds East and recrossing the aforementioned Electric Company Easement line and the aforementioned Electric Company Easement line and recrossing the Southwesterly side of Pennsylvania Avenue the distance of 508.19 feet to a point on the title line in the bed of Pennsylvania Avenue, said point being the first mentioned point and place of beginning.

(Premises-D)

ALL THAT CERTAIN tract of land, situate in Whitemarsh Township, County of Montgomery and State of Pennsylvania, bounded and described as follows, to wit:

FROM a point on the intersection of the center lines of Commerce Drive and Pennsylvania Avenue and following the center line of Pennsylvania Avenue, South 52 degrees 3 minutes 48 seconds East, a distance of 58.86 feet to an angle point; thence continuing to follow the center line of Pennsylvania Avenue, South 52 degrees 9 minutes 18 seconds East, a distance of 132.46 feet to the point and place of beginning; from this point and following the center line of Pennsylvania Avenue, South 52 degrees 9 minutes 18 seconds East, a distance of 100 feet to a point; thence South 37 degrees 56 minutes 12 seconds West, a distance of 498.91 feet to a point on the right of way line of the Reading Railroad (Bethlehem Branch); thence following the right of way line of the Reading Railroad, North 54 degrees 12 minutes 18 seconds West, a distance of 100.07 feet to a point; thence North 37 degrees 56 minutes 12 seconds East, a distance of 502.65 feet to the point and place of beginning.

(As to Premises-A and B)

BEING THE SAME PREMISES which Rosalind T. Spodek by Deed dated November 17, 1999 and recorded December 9, 1999 in the Office of the Recorder of Deeds in and for Montgomery County, Pennsylvania, in Deed Book 5299, Page 1890, granted and conveyed unto CLEO-MAR, L.P., a Pennsylvania limited partnership, the Grantor herein.

(As to Premises-C)

BEING THE SAME PREMISES which PR Group III, LP, a Pennsylvania limited partnership, by Deed dated July 1, 2008 and recorded July 9, 2008 in the Office of the Recorder of Deeds in and for Montgomery County, Pennsylvania, in Deed Book 5699, Page 1401, granted and conveyed unto CLEO-MAR, L.P., a Pennsylvania limited partnership, the Grantor herein.

(As to Premises-D)

BEING THE SAME PREMISES which Geraldine Joan McCarron, Executrix of the Estate of Thomas F. McCarron, deceased, by Deed dated February 9, 2011 and recorded February 11, 2011 in the Office of the Recorder of Deeds in and for Montgomery County, Pennsylvania, in Deed Book 5793, Page 148, granted and conveyed unto CLEO-MAR, L.P., a Pennsylvania limited partnership, the Grantor herein.

UNDER AND SUBJECT to all exceptions, reservations, restrictions, limitations, conditions, covenants, agreements, rights-of-way and easements contained in, and/or conveyed and/or granted by, prior instruments of writing of record, insofar as they may still be in force and effect.

TOGETHER with all and singular the tenements, hereditaments, and appurtenances to the same belonging, or in anywise appertaining, and the reversion and reversions, remainder and remainders, rents, issues and profits thereof; **AND ALSO** all the estate, right, title, interest, property, claim and demand whatsoever, both in law and equity, of the said Grantor, of, in, to or out of the said premises and every part and parcel thereof.

TO HAVE AND TO HOLD the said hereditaments and premises, with all and singular the appurtenances unto the said Grantee, its successors and assigns, to and for the only proper use and behoof of said Grantee, its successors and assigns, forever.

AND the said Grantor, for itself and its successors and assigns, does by these presents, covenant, grant and agree to and with said Grantee, its successors and assigns, that it, the said Grantor, for itself and its successors and assigns, all and singular the hereditaments and premises hereinabove described and granted, or mentioned and intended so to be, with the appurtenances unto the said Grantee, its successors and assigns, against the said Grantor and its successors and assigns, and against all and every other person or persons, whomsoever, lawfully claiming or to claim the same or any part thereof, shall and will by these presents SPECIALLY WARRANT AND FOREVER DEFEND.

[Signatures on Following Page]

IN WITNESS WHEREOF, the Grantor has executed this deed on the date first above written.

CLEO-MAR, L.P., a Pennsylvania limited partnership

By and through its General Partner, BUNCHY, LLC, a Pennsylvania limited liability company

Witness: _____ By: _____
Name: MARIO P CESARINI
Title:

COMMONWEALTH OF PENNSYLVANIA :
: SS:
COUNTY OF MONTGOMERY :

On this, the 14 day of May, 2021, before me, a notary public, the undersigned officer, personally appeared Mario P. Cesarini, who acknowledged himself/herself to be the Sole Member of BUNCHY, LLC, a Pennsylvania limited liability company, the General Partner of **CLEO-MAR, L.P.**, a Pennsylvania limited partnership, and that he/she, as such officer, being authorized to do so, executed the foregoing instrument for the purposes therein contained by signing the name of the limited partnership by himself/herself as Sole Member of BUNCHY, LLC, its General Partner.

IN WITNESS WHEREOF, I have set my hand and official seal.

_____
Notary Public

My commission expires:

Commonwealth of Pennsylvania - Notary Seal
EVA M. GILETTE, Notary Public
Montgomery County
My Commission Expires April 14, 2022
Commission Number 1058588

CERTIFICATE OF ADDRESS

I hereby certify that the precise address of the Grantee herein is as follows:

1 Olympic Place, Suite 1000

Towson, Maryland 21204

On behalf of the Grantee

MONTGOMERY COUNTY COMMISSIONERS REGISTRY
65-00-08770-00-3 WHITEMARSH
500 PENNSYLVANIA AVE
CLEO-MAR LP
B 051 U 041 L 4238 DATE: 05/25/2021 [redacted] JU

MONTGOMERY COUNTY COMMISSIONERS REGISTRY
65-00-08767-00-6 WHITEMARSH
506 PENNSYLVANIA AVE
CLEO-MAR LP
B 051 U 044 L 2900 DATE: 05/25/2021 [redacted] JU

MONTGOMERY COUNTY COMMISSIONERS REGISTRY
65-00-08773-00-9 WHITEMARSH
510 PENNSYLVANIA AVE
CLEO-MAR LP
B 051 U 002 L 4237 DATE: 05/25/2021 [redacted] JU

MONTGOMERY COUNTY COMMISSIONERS REGISTRY
65-00-08776-00-6 WHITEMARSH
512 PENNSYLVANIA AVE
CLEO-MAR LP
B 051 U 046 L 4000 DATE: 05/25/2021 [redacted] JU

MONTGOMERY COUNTY COMMISSIONERS REGISTRY
65-00-08767-10-5 WHITEMARSH
506 PENNSYLVANIA AVE
CLEO-MAR LP
B 051 U 044 L 121 2205 DATE: 05/25/2021 [redacted] JU

WHITEMARSH TOWNSHIP
SUBDIVISION and/or LAND DEVELOPMENT
TIME WAIVER FORM

Date: 07/25/2025

Granted to: Whitemarsh Township Board of Supervisors

Name of Subdivision and/or Land Development: Proposed BMW Automotive Dealership Expansion

On or about, _____ , I/we submitted for official filing the above-reference application.

Notwithstanding any contrary provision of the Pennsylvania Municipalities Planning Code or the Code of the Township of Whitemarsh, this letter will serve as notice to Whitemarsh Township that the requirement that action be taken on this application within ninety (90) days is hereby waived, without limitation as to time. This waiver is granted to permit us to make revisions to the application during the application review process.

Further, with the understanding that this waiver is voluntarily given and will be relied upon by Whitemarsh Township, I/we will give Whitemarsh Township written notice (by certified mail or recognized overnight carrier) should we determine that limiting the time of the review process becomes necessary. Whitemarsh Township shall then have ninety (90) days from receipt of such written notice in which to act upon the application.

This waver is not transferable or assignable by the Applicants and shall apply to any and all revised submissions made in relation to the above-referenced application.

I/we represent that I/we have been duly authorized to execute this waiver on behalf of the Applicant.

Date: 07/25/2025

Signature: _____
(Original Signature must be submitted)

Printed Name: Craig Colton

Firm Name: MileOne Fort Washington LLC
(if applicable)

Title: Authorized Person
(if applicable)

Federal Emergency Management Agency

Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION
COMMENT DOCUMENT

COMMUNITY INFORMATION		PROPOSED PROJECT DESCRIPTION	BASIS OF CONDITIONAL REQUEST
COMMUNITY	Township of Whitemarsh Montgomery County Pennslyvania	GRADING	FLOODWAY 1D HYDRAULIC ANALYSIS UPDATED TOPOGRAPHIC DATA
	COMMUNITY NO.: 420712		
IDENTIFIER	BMW of Fort Washington	APPROXIMATE LATITUDE AND LONGITUDE: 40.133, -75.206 SOURCE: OTHER DATUM: NAD 83	

AFFECTED MAP PANEL	
TYPE: FIRM* NO.: 42091C0289G DATE: March 2, 2016	* FIRM - Flood Insurance Rate Map

FLOODING SOURCE AND REACH DESCRIPTION

Sandy Run – From approximately 130 feet downstream of Railroad to approximately 140 feet upstream of Pennsylvania Turnpike.

PROPOSED PROJECT DESCRIPTION

Flooding Source	Proposed Project	Location of Proposed Project
Sandy Run	Grading	From approximately 20 feet upstream of Railroad to approximately 200 feet upstream of Railroad.

SUMMARY OF IMPACTS TO FLOOD HAZARD DATA

Flooding Source	Effective Flooding	Proposed Flooding	Increases	Decreases
Sandy Run	BFEs*	BFEs	Yes	Yes
	Floodway	Floodway	None	Yes
	Zone AE	Zone AE	Yes	Yes

* BFEs - Base (1-percent-annual-chance) Flood Elevations

COMMENT

This document provides the Federal Emergency Management Agency's (FEMA's) comment regarding a request for a CLOMR for the project described above. This document is not a final determination; it only provides our comment on the proposed project in relation to the flood hazard information shown on the effective National Flood Insurance Program (NFIP) map. We reviewed the submitted data and the data used to prepare the effective flood hazard information for your community and determined that the proposed project meets the minimum floodplain management criteria of the NFIP. Your community is responsible for approving all floodplain development and for ensuring that all permits required by Federal or State/Commonwealth law have been received. State/Commonwealth, county, and community officials, based on their knowledge of local conditions and in the interest of safety, may set higher standards for construction in the Special Flood Hazard Area (SFHA), the area subject to inundation by the base flood). If the State/Commonwealth, county, or community has adopted more restrictive or comprehensive floodplain management criteria, these criteria take precedence over the minimum NFIP criteria.

This comment is based on the flood data presently available. If you have any questions about this document, please contact the FEMA Mapping and Insurance eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on the FEMA website at https://www.fema.gov/flood-insurance.

David N. Bascom

David N. Bascom, Acting Director
Engineering and Modeling Division
Risk Analysis, Planning and Information Directorate

Federal Emergency Management Agency

Washington, D.C. 20472

CONDITIONAL LETTER OF MAP REVISION
COMMENT DOCUMENT (CONTINUED)

OTHER COMMUNITIES AFFECTED BY THIS CONDITIONAL REQUEST

CID Number: 420708 **Name:** Township of Upper Dublin, PA

AFFECTED MAP PANELS

TYPE: FIRM NO.: 42091C0289G DATE: March 2, 2016

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CONDITIONAL LETTER OF MAP REVISION
COMMENT DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

To determine the changes in flood hazards that will be caused by the proposed project, we compared the hydraulic modeling reflecting the proposed project (referred to as the proposed conditions model) to the hydraulic modeling used to prepare the Flood Insurance Study (FIS) (referred to as the effective model). If the effective model does not provide enough detail to evaluate the effects of the proposed project, an existing conditions model must be developed to provide this detail. This existing conditions model is then compared to the effective model and the proposed conditions model to differentiate the increases or decreases in flood hazards caused by more detailed modeling from the increases or decreases in flood hazards that will be caused by the proposed project.

The table below shows the changes in the BFEs:

BFE Comparison Table

Flooding Source: Sandy Run		BFE Change (feet)	Location of maximum change
Existing vs. Effective	Maximum increase	0.5	Approximately 210 feet upstream of Railroad
	Maximum decrease	0.3	Approximately 40 feet upstream of Railroad
Proposed vs. Existing	Maximum increase	None	N/A
	Maximum decrease	0.3	Approximately 230 feet upstream of Railroad
Proposed vs. Effective	Maximum increase	0.2	Approximately 210 feet upstream of Railroad
	Maximum decrease	0.4	Approximately 40 feet upstream of Railroad

NFIP regulations Subparagraph 60.3(b)(7) requires communities to ensure that the flood-carrying capacity within the altered or relocated portion of any watercourse is maintained. This provision is incorporated into your community's existing floodplain management ordinances; therefore, responsibility for maintenance of the altered or relocated watercourse, including any related appurtenances such as bridges, culverts, and other drainage structures, rests with your community. We may request that your community submit a description and schedule of maintenance activities necessary to ensure this requirement.

This comment is based on the flood data presently available. If you have any questions about this document, please contact the FEMA Mapping and Insurance eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on the FEMA website at https://www.fema.gov/flood-insurance.

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CONDITIONAL LETTER OF MAP REVISION COMMENT DOCUMENT (CONTINUED)

COMMUNITY INFORMATION (CONTINUED)

DATA REQUIRED FOR FOLLOW-UP LOMR

Upon completion of the project, your community must submit the data listed below and request that we make a final determination on revising the effective FIRM and FIS report. If the project is built as proposed and the data below are received, a revision to the FIRM and FIS report would be warranted.

• Detailed application and certification forms must be used for requesting final revisions to the maps. Therefore, when the map revision request for the area covered by this letter is submitted, Form 1, entitled "Overview and Concurrence Form," must be included. A copy of this form may be accessed at https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms/mt-2.

• The detailed application and certification forms listed below may be required if as-built conditions differ from the proposed plans. If required, please submit new forms, which may be accessed at https://www.fema.gov/flood-maps/change-your-flood-zone/paper-application-forms/mt-2, or annotated copies of the previously submitted forms showing the revised information.

Form 2, entitled "Riverine Hydrology and Hydraulics Form." Hydraulic analyses for as-built conditions of the base flood, the 10-percent, 2-percent, and 0.2 percent annual chance floods, and the regulatory floodway, must be submitted with Form 2.

Form 3, entitled "Riverine Structures Form."

• A certified topographic work map showing the revised and effective base and 0.2 percent annual chance floodplain and floodway boundaries. Please ensure that the revised information ties in with the current effective information at the downstream and upstream ends of the revised reach and any tributaries.

• An annotated copy of the FIRM, at the scale of the effective FIRM, that shows the revised base and 0.2 percent annual chance floodplain and floodway boundary delineations shown on the submitted work map and how they tie into the base and 0.2 percent annual chance floodplain and floodway boundary delineations shown on the current effective FIRM at the downstream and upstream ends of the revised reach, as well as any tributaries.

• As-built plans, certified by a registered Professional Engineer, of all proposed project elements.

• A copy of the public notice distributed by your community stating its intent to revise the regulatory floodway, or a signed statement by your community that it has notified all affected property owners and affected adjacent jurisdictions.

• Documentation of the individual legal notices sent to property owners who will be affected by any widening or shifting of the base floodplain and/or any BFE increases along Sandy Run.

This comment is based on the flood data presently available. If you have any questions about this document, please contact the FEMA Mapping and Insurance eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on the FEMA website at https://www.fema.gov/flood-insurance.

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CONDITIONAL LETTER OF MAP REVISION
COMMENT DOCUMENT (CONTINUED)

COMMUNITY INFORMATION (CONTINUED)

DATA REQUIRED FOR FOLLOW-UP LOMR (continued)

• FEMA's fee schedule for reviewing and processing requests for conditional and final modifications to published flood information and maps may be accessed at https://www.fema.gov/flood-maps/change-your-flood-zone/status/flood-map-related-fees. The fee at the time of the map revision submittal must be received before we can begin processing the request. Payment of this fee can be made through a check or money order, made payable in U.S. funds to the National Flood Insurance Program, or by credit card (Visa or MasterCard only). Please either forward the payment, along with the revision application, to the following address:

LOMC Clearinghouse
Attention: LOMR Manager
3601 Eisenhower Avenue, Suite 500
Alexandria, Virginia 22304-6426

or submit the LOMR and fee using the Online LOMC portal at: https://hazards.fema.gov/femaportal/onlinelomc/signin

After receiving appropriate documentation to show that the project has been completed, FEMA will initiate a revision to the FIRM and FIS report. Because the flood hazard information (i.e., base flood elevations, base flood depths, SFHAs, zone designations, and/or regulatory floodways) will change as a result of the project, a 90-day appeal period will be initiated for the revision, during which community officials and interested persons may appeal the revised flood hazard information based on scientific or technical data.

This comment is based on the flood data presently available. If you have any questions about this document, please contact the FEMA Mapping and Insurance eXchange (FMIX) toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 3601 Eisenhower Avenue, Suite 500, Alexandria, VA 22304-6426. Additional Information about the NFIP is available on the FEMA website at https://www.fema.gov/flood-insurance.

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CONDITIONAL LETTER OF MAP REVISION
COMMENT DOCUMENT (CONTINUED)

COMMUNITY INFORMATION (CONTINUED)

COMMUNITY REMINDERS

We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

April Cummings
Director, Mitigation Division
Federal Emergency Management Agency, Region III
One Independence Mall, Sixth Floor
615 Chestnut Street
Philadelphia, PA 19106-4404
(215) 931-5635

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David N. Bascom, Acting Director
Engineering and Modeling Division
Risk Analysis, Planning and Information Directorate

Post Construction
Stormwater Management Calculations

Project: BMW Automotive Dealership Expansion
500 Pennsylvania Avenue
Whitemarsh Township
Montgomery County, PA

Project Number: PAB220113.01

Client: MileOne Fort Washington, LLC
3301 Briggs Chaney Road
Silver Spring, MD 20904

Date: 4/23/2025

Revised: 7/24/2025

Design Professional: Jeff A. Beavan
PA License #PE082005



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General Project Description/Stormwater Management

GENERAL PROJECT DESCRIPTION

BMW of Fort Washington proposes to consolidate and subdivide four existing lots totaling 5.133 acres along Pennsylvania Avenue into one proposed lot. The proposed lot will contain a proposed automobile dealership. Pertinent data characterizing the existing and future site conditions are shown on the accompanying Final Land Development & Major Subdivision Plans.

The site drains to two points of interest, both of which ultimately drain to Sandy Run, which is tributary to the Wissahickon Creek, with a Chapter 93 designation of TSF, MF, or trout-stocking fishes, migratory fishes.

Waters of the US are present on the project site and have been delineated by survey. Detailed report and scope of the floodplain impacts and encroachments are contained in the DEP joint 105 permit package and is outside the scope of this report.

STORMWATER MANAGEMENT

The pre-development condition of the site consists two Points of Interest (POI #001 and POI #002) which is indicated on the attached Pre-Development Drainage Area Plan. POI #002 ultimately drains to POI#001. POI #001, taking the south and western portions of the site in the pre-development condition, drains through two distinct areas of cover to an open channel running along the south of the property; one area being predominately wooded area and the other area being predominately parking area. The flow through the wooded area takes place via sheet flow and channeled flow to an existing open channel located along the southwestern portion of the site. Flow then discharges out of the existing open channel and runs via channel flow (off-site) to the point of interest located at Sandy Run, which is tributary to Wissahickon Creek. The flow through the parking area drains via sheet flow and shallow concentrated flow to an existing inlet and 18-inch pipe located in the southeast corner of the site. Flow then discharges out of the existing 18-inch pipe and runs via channel flow in an existing open channel to the point of interest. POI #002 takes flow from the north and eastern portions of the site and drains to an existing 72-inch culvert containing mapped waters. Flow then discharges out of the existing 72-inch culvert directly to POI #001.

The on and off-site area tributary to these points of interest have been delineated and hydrographs have been generated for the 1-, 2-, 5-, 10-, 25-, 50-, and 100-year storms. The pre-development conditions were analyzed based on existing conditions for all areas tributary to the points of interest.

The post-development condition of the site maintains the same Points of Interest and relative drainage patterns as the existing condition. Overall, there is a decrease in impervious surface on the site. The drainage areas to POI#001 have been analyzed, and stormwater BMPs are proposed to control rate and runoff to required levels. The areas tributary to each basin have been delineated and hydrographs have been generated for the 1-, 2-, 5-, 10-, 25-, 50-, and 100-year storms. For POI #001, two underground basins (UG1 and UG2) have been designed to manage the runoff to required discharge rates. Basin UG1 outfall pipe connects in a manhole to discharge directly to the creek. The UG2 outfall pipe combines with some roof leader bypass, and the combined flow discharges directly to the Sandy Run Creek. Volume reduction will be managed on the site through managed release, and landscape restoration. The drainage area and impervious cover to POI #002 has been significantly reduced in the post development condition, decreasing rate and volume runoff to this drainage area for each storm event analyzed.

In accordance with the Whitemarsh Township Stormwater Management Chapter 58, stormwater peak flow rates have been designed to reduce the post development peak rate for each sub drainage area individually and the ultimate POI as a whole to the required predevelopment peak rates. In addition, the stormwater peak flow rates have been further designed to comply with the Wissahickon Creek Watershed Act 167 Plan, District B requirements.

Calculation Methodology

The SCS Method was utilized for calculating the peak runoff rates and generating hydrographs for the pre- and post-development conditions as defined in the computer watershed software HydroCAD. The hydrographs were generated based on the precipitation amounts dictated by the NOAA Precipitation Frequency Data Server for Fort Washington, PA. Runoff curve numbers were obtained from the USDA NRCS TR-55 manual, and are contained at the end of this report. The Whitemarsh Township Stormwater Management Chapter 58 was adopted on February 26, 2004. The Wissahickon Creek Watershed Act 167 Plan was last revised and approved November 2014.

Times of concentration (TOC) were calculated using the methodology indicated in the Whitemarsh Township Stormwater Management Ordinance, with a minimum TOC of 5 minutes. Detailed TOC calculations are included within this report. All drainage areas that do not have detailed TOC calculations included in the report are assumed to have a minimum TOC of 5 minutes.

Wissahickon Creek Watershed Act 167 Plan, District B requires the reduction of the stormwater post development peak rates to the predevelopment peak rates as follows:

POST		PRE
2-yr	reduced to	1-yr
5-yr	reduced to	2-yr
10-yr	reduced to	5-yr
25-yr	reduced to	10-yr
50-yr	reduced to	25-yr
100-yr	reduced to	50-yr

Allowable release rate calculations are contained later in this report for the point of interest.

Volume Control

The volume increase resulting from development will be controlled through the combination of underground dry detention basins, managed release basins and landscape restoration. The 2-yr volume increase for POI#1 is 9,412 CF due to an increase in impervious drainage area.

Structural BMP's include 2 underground Detention facilities (UG1 and UG2) which have been designed to capture and treat the entire tributary flow from the 2-year storm. Overflow for the 5, 10, 25, 50, and 100-year storm events will flow through the outlet control structure. Underground Detention Facility UG1 has been designed using Managed Release Concept, to achieve release rates of 0.01 cfs per one acre of impervious area tributary to the facility and reduce the 2-yr post-development peak flow to the 1-yr pre-development peak flow in accordance with the Managed Release Concept (MRC) requirements. The maximum ponding from the 2yr/24hr storm event will drawdown in less than 7 days after the duration of the design storm in accordance with the MRC requirements. MRC calculations are included within this report.

The total managed volume credit for UG1 is 19,988 CF via volume control via managed release control.

The proposed site landscaping was designed to revegetate the site with native species. A volume credit of 10 CF is provided for evergreen trees and 6 CF for deciduous trees. The site landscaping will provide an additional volume reduction of 574 CF.

Total volume reduction is 20,696 CF of the 7,864 CF requirement, which complies with the volume reduction requirements per CG-1 and the Whitemarsh Township Stormwater Management Ordinance.

Water Quality

Multiple BMPs are proposed for their water quality benefits in order to treat the stormwater runoff prior to it leaving the site. These BMPs are as follows:

Underground detention basins UG1 and UG2 will take runoff from impervious areas of the site for treatment prior to discharge. UG1 is designed for managed release to meet volume and rate requirements. Native landscaping is proposed across the site to decrease runoff and increase water quality. Lastly, total disturbed area has been minimized to preserve a portion of wooded area on the southeast and southwest sides of the site.

Hydrodynamic devices in the form of sumps and snouts are provided for the downstream inlets leading to the underground basins, and inlet filters are proposed for all inlets and roof drains leading to the MRC basins to provide pre-treatment for the runoff events.

Storm Sewer Conveyance Calculations

The storm drainage system has been designed to intercept runoff at topographic low points and areas of significant runoff quantities and convey stormwater to the stormwater management basins. Hydraflow Storm Sewers 2022 has been utilized for designing the storm conveyance system. Conveyance design flows are based on the Rational Method for the 100-year, utilizing runoff coefficients and the IDF information from NOAA Precipitation Frequency Data Server for Upper Dublin Twp, PA. Additional calculations are provided for the 25-year storm with flood tailwater conditions (50-year flood elevation from HEC-RAS), as well as the 100-year storm with flood tailwater conditions (100-year flood elevation from HEC-RAS), which shows that the flood water will not cause backups in other portions of the system.

Conclusion

The proposed stormwater management program described above has been designed to comply with the Whitemarsh Township Stormwater Management Requirements of the Whitemarsh Township Chapter 58, the Wissahickon Creek Watershed Act 167 Plan, District B and NPDES Phase II (where applicable) and the Stormwater Management Act of 1978.

PCSM PLANNING & DESIGN NOTES

The following measures were taken to preserve the integrity of stream channels and maintain and protect the physical, biological, and chemical qualities of the receiving stream:

- Direct runoff from impervious surfaces including roadways to BMPs.
- The use of native species requires less fertilization and chemical application than nonnative species.
- The use of sump and snout pre-treatment for water quality to PCSM BMPs.
- The use of inlet filter pre-treatment for water quality to MRC PCSM BMPs

The following measures were taken to prevent an increase in the rate of storm water runoff:

- Direct runoff to an underground storm water basin to control runoff rates.
- Minimize impervious areas where practical.

The following measures were taken to minimize any increase in storm water runoff volume:

- Provide an underground Managed Release Concept basin to reduce runoff volume.
- Provide revegetate-reforest with native spaces throughout the site to help reduce runoff volume.
- Minimize impervious areas where practical.

The following measures were taken to minimize impervious areas:

- Maintain existing impervious extents were feasible to reduce required surface parking and impervious footprint.
- Configure as efficiently as possible through vertical design to reduce surface parking and consolidate impervious coverage.

The following measures are taken to maximize protection of existing drainage features and vegetation:

- Access the site thru designated construction entrance.
- Protect woodlands with tree protection fencing.

The following measures were taken to minimize land clearing and grading:

- Protect woodlands with tree protection fencing.
- Adjust road slope and site grading to reduce extent of cuts or fills to existing grades.

The following measures are taken to minimize soil compaction:

- Access the site thru designated construction entrance.
- Use of treaded machinery where practical during earthmoving operations.
- Grade site to minimize extent of cuts/fills.

The following measures were taken to utilize other structural or nonstructural BMPs that prevent or minimize changes in storm water runoff:

- Provide underground detention/Managed Release Concept basin to help reduce runoff volume and rates.

POST-CONSTRUCTION STORMWATER MANAGEMENT BMPs

The storm drainage system has been designed to intercept runoff at topographic low points and areas of significant runoff quantities and convey stormwater to the stormwater management facilities. The proposed stormwater management program described above has been designed to comply with the Whitemarsh Township Stormwater Management Requirements of the Whitemarsh Township Chapter 58, the Wissahickon Creek Watershed Act 167 Plan, District B, NPDES Phase II and the Stormwater Management Act of 1978.

The PCSWM and BMP approach of this development is meant to prevent adverse stormwater impacts and provide the necessary treatment of runoff close to the origin of the impact. The primary goal of this development's stormwater management program was to mimic, as best as possible, the pre-development site hydrology by using both structural and non-structural BMP's to prevent or minimize changes in stormwater runoff.

Generally, the proposed BMPs were selected to:

- Preserve the integrity of Sandy Run and the Wissahickon Creek and maintain and protect the physical, biological and chemical qualities of the waters through mitigating any increases in stormwater runoff volume due to the proposed development and treating runoff for water quality purposes prior to being discharged from the site.
- Prevent an increase in rate of stormwater runoff. The proposed stormwater management design has reduced the post-development peak rate from the pre-development conditions, as required by Whitemarsh Township Stormwater Management Ordinance due to the reduction in stormwater runoff volume.
- To the greatest extent feasible, minimize any increase in stormwater runoff volume by incorporating one (1) underground Managed Release Concept basin and one (1) underground detention basin. Resultantly, stormwater runoff volume has been reduced below pre-development levels.
- Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces. Runoff from impervious areas is directed to water quality and infiltration BMP's in order to pre-treat runoff prior to being discharged from the site. the site conveys runoff through a series of water quality and infiltration BMP's in order to maximize pre-treatment of runoff and further mitigate any impact to peak rate and volume in the post development conditions.
- Maximize the protection of existing drainage features and existing vegetation. The proposed development has been designed to maintain the general drainage patterns of the site.
- Minimize land clearing and grading. The current 5.12 Ac. tract has been designed to only impact approximately 4.63 Ac. of Earth Disturbance within the tract boundary (4.63 total Ac. Of earth disturbance for the project).
- Minimize soil compaction. The sequence of construction has been designed to limit the extent and duration of disturbance activities and to limit the extent of heavy traffic over sensitive areas necessary for the PCSM design.
- Utilizes other measures or controls that prevent or minimize generation of increased stormwater runoff.

5.6.3 - Re-vegetate and Re-forest Disturbed Areas, Using Native Species - sites that require landscaping and re-vegetation should select and use vegetation (i.e., native species) that does not require significant chemical maintenance by fertilizers, herbicides, and pesticides. The introduction of these chemicals results in a negative impact on the water quality. The existing site consists of a grassed, vacant field for a future development. The proposal includes the implementation of meadow mix seed mixture along the rear of the property. Additionally, native species plantings (trees and shrubs) are being proposed throughout the development.

6.6.3 - Subsurface Detention Basin - subsurface detention facilities provide temporary storage of stormwater runoff by placing storage media of varying types beneath the proposed surface grade. Stormwater runoff from nearby impervious areas are conveyed to the subsurface storage media where it then reduces the post development runoff rate at or below the pre-development condition. This is a subsurface stormwater structure that provides for the temporary storage of stormwater runoff to prevent downstream flooding impacts. Water quality benefits are achieved with extended detention (dewatering between 24 hrs and 168 hrs) of the runoff volume from the water quality design storm.

6.6.4 - Water Quality Filters & Hydrodynamic Devices - These structural BMPs vary in size and function, but utilize some form of settling and filtration to remove particulate pollutants from stormwater runoff. Commercially available water quality filters, catch basin inserts, and hydrodynamic devices are generally configured to remove particulate contaminants, including coarse sediment, oil and grease, and debris. Water quality inlets are commonly used as pretreatment BMPs and can provide "hotspot" control by reducing sediment loads to infiltration devices. Hydrodynamic devices are not truly inserts, but separate flow through devices designed to serve in concert with inlets and storm sewer. Ideally, the flow through the device should remove liter, oil, sediment, heavy metals, dissolved, solids, and nutrients. Clays and fine silts do not easily settle out unless they are coagulated with some kind of chemical addition or polymer.

GENERAL SEQUENCING NOTES FOR PCSM BMPs

1. A site inspection by the county conservation district is required prior to removal of sediment traps and basins.
2. Bohler Engineering, LLC shall be notified of pre-construction meeting date and BMP construction schedule.
3. The contractor shall take all necessary precautions to limit the compaction in the proposed BMP bottoms.
4. Refer to the BMP construction details for construction guidelines of all proposed stormwater management BMPs.
5. A Notice of Termination (NOT) will be required to be submitted following acceptance of the proposed BMPs by the licensed professional responsible for BMP installation oversight. Prior to accepting the NOT, the Department and/or Conservation District Staff will perform a final inspection to ensure site stabilization and verify installation and function of stormwater BMPs.
6. The PCSM BMP's shall be constructed in the following order:
    - Install Tree Protection Fence
    - Install Underground Detention #2
    - Install Underground Detention #1
    - Install Proposed Trees (Revegetate/Reforest Native Plantings BMP)

Note: Refer to PCSM Plan and Details for individual construction sequencing and specifications.

PCSM BMP INSPECTIONS AND MAINTENANCE

Until the site is stabilized and during construction activities, all BMPs must be maintained properly by the contractor. All permanent maintenance procedures shall be performed by the owner. Maintenance must include inspections of all BMPs after each runoff event and on a weekly basis. All preventative and remedial maintenance work, including clean-out, repair, replacement, regrading, reseeding, remulching and renetting must be performed immediately and in accordance with these procedures, plans, and details. Any areas disturbed during maintenance must be stabilized immediately in accordance with the general conservation notes and specifications. All site inspections must be documented in an inspection log kept for this purpose indicating the compliance actions and the date, time and name of the person conducting the inspection. The inspection log must be kept on site at all times and made available to the district upon request.

Storm Drainage Systems – The stormwater management facilities including the inlets, stormwater piping, and detention basins on this site shall be maintained in proper working order in accordance with these plans and per the recommendation of the structure(s) manufacturer(s). Maintenance of these stormwater management facilities, as noted below, shall be the responsibility of the property owner(s) upon whose property the facilities are located.

All onsite inlets, manholes, and stormwater piping shall be cleared of debris every three (3) months or when accumulation hinders operation of the facility. Systems shall be flushed every five (5) years.

All sediment/debris/oil removed from the stormwater management system shall be disposed per local, state, and federal standards.

Should onsite erosion occur from the landscaped areas, source of erosion shall be immediately stabilized and the inlets, manholes, and stormwater piping shall be checked for accumulation and cleared if accumulation of sediment exists.

5.6.3 Re-Vegetate and Re-Forest Disturbed Areas, Using Native Species - Woodland areas planted with a proper cover crop can be expected to require annual mowing in order to control invasive species. Application of a carefully selected herbicide around the protective tree shelters/tubes may be necessary, reinforced by selective cutting/manual removal, if necessary. This initial maintenance routine is necessary for the first 2 to 3 years of growth and may be necessary for up to 5 years until tree growth and tree canopy begins to form, naturally inhibiting weed growth. A seasonal moving may be required, although care must be taken to make sure that any management is coordinated with essential reseeding and other important aspects of meadow re-establishment.

6.6.3 Underground Extended Detention Basins – basins shall be inspected for litter and sediment accumulation on an annual basis or as directed by the township engineer. Needed maintenance should be initiated immediately after the inspection. The litter and sediment must be removed to restore design capacities. The litter and sediment shall be disposed of in an approved manner and in accordance with applicable state regulations. Any areas disturbed during maintenance must be stabilized immediately in accordance with the general conservation notes and specifications.

At a minimum, the long-term operation and maintenance schedule must meet 25 PA. Code § 102.8(f)(10) and include the following:

1. Upgradient catch basins and inlets should be inspected and cleaned annually, or more often if historical maintenance records suggest a more frequent cleaning.
2. The vegetation (for the contributing drainage area) should be maintained in good condition, and any bare spots revegetated.

3. Care should be taken to avoid excessive compaction by mowers. Mow only as appropriate for vegetative species.
4. Inspect at least two times per year after runoff events greater than 0.8 inch and make sure that runoff drains down within the design parameters. Water level should be drawn down to 0.7 inches above IWS level (UG1: 13 inches from bottom of structure).
5. At least two times per year, or more if historical maintenance indicate it is necessary, inspect for accumulation of sediment, damage to outlet control structures, erosion, signs of water contamination/spills, and instability. Leaf litter needs to be removed annually.
6. As needed, remove accumulated sediment as required to maintain infiltration through the MRCs soil media and to maintain water quality functionality. Restore original cross section. Properly dispose of sediment.
7. If porous pavement is included in the design, vacuum at least twice per year. Vacuum should have sufficient suction power and be designed for use with porous pavements.
8. All MRC bmp components should be maintained as indicated in the stormwater bmp manual.

6.6.4 - Water Quality Filters & Hydrodynamic Devices - Maintenance is crucial to the effectiveness of this BMP and should be conducted in accordance with manufacturer recommendations. More frequent cleaning is desired and some sites benefit from keeping a log of removed sediment amount to determine a cleaning schedule. Disposal of removed material will depend on the nature of the drainage area and the intent and function of the water quality insert.

MRC# Narrative – Multiple Facilities

This Narrative applies to the following facilities:

- **Underground Basin UG1**
- **Underground Basin UG2**

This appendix contains the following items:

- Summary of the 13 MRC design standards as utilized for the above-referenced basins
- MRC BMP Alternative Analysis
- MRC Design Summary Sheet
- MRC 1 inch Storm Summary and Hydrographs

Construction details of the facility and outlet control structure are located on the corresponding PCSM detail sheet. The pre and post construction drainage area maps are contained within appendix D of this report. CN calculations, Time of Concentration, Hydrographs and Summary Sheets for the 1, 2, 10, 50 & 100-yr Storm Events can be found within the main body of this report.

MRC BMP DESIGN STANDARDS

The above-referenced facilities incorporate the Managed Release Concept (MRC) to treat the entire tributary flow from the 2-year storm. The underground facility will be constructed from manufactured chambers outfitted with inspection ports for ease of maintenance. Maintenance will be performed per the chamber manufacture's guidelines. The underground facility is also proposed to be lined will an impermeable liner to prevent the infiltration of runoff into native soils.

1. **Runoff Capture** – The basins are designed to capture and treat the first one inch of runoff from all new impervious surfaces tributary to it. One inch storm event has been modeled and routed through the facility as well as the 2-yr, 10-yr, 50-yr and 100-yr storm events. The areas tributary to the facility has been delineated and hydrographs have been generated using the SCS Method and HydroCAD software. The corresponding hydrographs are located within this appendix.

2. **Release Rate** - The outlet control structure will achieve a release rate of 0.01 cfs per acre of impervious area tributary to the facility. The release rate summary and corresponding hydrographs are located within this appendix.

3. **Internal Water Storage (IWS)** -There is no IWS as these facilities are designed as Non-vegetated MRC basins for the purpose of vegetation credit. No infiltration is proposed due to poor infiltration rates.

4. **Peak Flow Attenuation** - The outlet control structure will reduce the 2-yr post development peak flow to the 1-yr pre-development peak flow, and will also control peak flows from the 10, 50 & 100-yr storm events via a secondary orifice and weir in the OCS. Quarterly inspections and inspections following 10, 50 1nd 100-yr storm events of basin and OCS are specified in this PCSM Report and on the PCSM plans. The release rate summary and corresponding hydrographs are located within this appendix.

5. **Stormwater BMP Manual** – All facilities use the MRC BMP - Non-vegetated MRC: Underground Storage Chambers standards due to poor infiltration rates and high groundwater.

6. **MRC BMP Selection** – Due to high groundwater and poor infiltration rates, all facilities use a standard MRC BMP - Non-vegetated MRC: Underground Storage Chambers standards, even the

above-ground facility (which is not able to achieve required soil media depth for Vegetated WQ benefit). Vegetated MRC and/or Non-vegetated MRC: porous pavement were not used as they contain an infiltration component that is not feasible for this site. The proposed design utilizes pre-treatment via water quality insert filters and sump & snout to treat surface runoff prior to it entering the MRC facility and ultimate discharge to the surface water. PCSM Spreadsheets for Rate and Water Quality demonstrating 85% removal of TSS for the contributing tributary are included within this appendix.

7. **Pre-Development Site Characterization and Assessment of Soil and Geology** – Infiltration testing was performed and resulted in poor rates making infiltration infeasible on the project site. Geotechnical testing (See report appendix) revealed several limiting factors including water, mottling, weathered rock, and bedrock.

8. **Separation Distance** – Due to poor infiltration rates, the proposed non-infiltrating MRC detention facilities will be lined (impermeable) and will not utilize soil media. Soil media and limiting zones are not applicable to the proposed impermeable detention facilities.

9. **Ponding Depth and Drawdown Time** - The maximum ponding for the 2-yr/24 hr storm will drawdown in less than three days for above-ground systems and less than seven days as required for subsurface MRC systems. Supporting drawdown calculations are contained within this appendix.

10. **Soil Media** - is not utilized as part of the facility due to poor infiltration rates.

11. **Underdrain Design** - is not utilized as there is no infiltration component or IWS in the facility due to poor infiltration rates.

12. **Discharge Flow Path** – A winged endwall with rip rap apron is utilized at each discharge outfall for outlet protection to the receiving water. Level Spreaders are not utilized to minimize disturbance to the stream bank and reduce the potential for re-channelization on the stream banks. Project outfalls are directly into the receiving waters.

13. **Antidegradation Requirements** – are not required as the Neshaminy Creek is not a HQ or EV water.

MRC BMP ALTERNATIVE ANALYSIS

Due to the restrictions of the aforementioned limiting zones and infiltration rates, BMPs utilizing infiltration to meet the regulatory requirements under § 102.8(g)(2) are technically infeasible. BMPs utilizing methods other than infiltration have been incorporated into the PCSM design, where appropriate, and used on site to the maximum extent feasible to treat the water quality volume (WQv) resulting from the post-development condition. To meet the shortfall associated with the volume that would normally be treated with an infiltration BMP, the Managed Release Concept (MRC) is proposed utilizing the standard "**Non-vegetated MRC: Underground Storage Chambers**" design criteria. To justify the use of an alternative PCSM BMP, the following is a summary of BMPs used on site for volume reduction and those determined to be not practical, demonstrating the applicant's intent to utilize traditional BMPs to the maximum extent feasible prior to considering an alternate PCSM design (i.e. MRC).

BMP 5.4.1 Protect Sensitive and Special Value Features – Protect sensitive/natural features has been proposed by way of a LOD reduction standpoint, including certain trees and the streambank to the extent feasible. Protection of all sensitive/natural features is not feasible due to the operational needs of the proposed facilities.

BMP 5.4.2 Protect/Conserve/Enhance Riparian Areas – Proposed to maximum extent possible by limiting and minimizing disturbance along the stream banks and wooded areas.

BMP 5.4.3 Protect/Utilize Natural Flow Pathways in Overall Stormwater Planning and Design - Proposed to maximum extent possible by limiting and minimizing disturbance along the stream banks and wooded areas and maintaining the same relative drainage patters.

BMP 5.5.1 Cluster Uses at Each Site; Build on the Smallest Area Possible - This BMP is not feasible due to floodplain constraints, as the entire site is within the 100 year floodplain.

BMP 5.5.2 Concentrate Uses Areawide through Smart Growth Practices - This BMP is not feasible due to floodplain constraints, as the entire site is within the 100 year floodplain.

BMP 5.6.1 Minimize Total Disturbed Area – Proposed by minimizing disturbance and grading along the stream banks, slopes and wooded areas with Tree protection fencing and demarcation of LOD.

BMP 5.6.2 Minimize Soil Compaction in Disturbed Areas - Proposed to the maximum extent possible by minimizing disturbance and grading along the stream banks, slopes and wooded areas with Tree protection fencing and demarcation of LOD.

BMP 5.6.3 Re-Vegetate and Re-Forest Disturbed Areas, Using Native Species – The majority of existing on-site trees and plant material are proposed to be protected during construction with tree protection fence. Moreover, planting of native species is proposed as part of the Landscape Plan.

BMP 5.7.1 Reduce Street Imperviousness – no streets are proposed with this project

BMP 5.7.2 Reduce Parking Imperviousness - A reduction in parking spaces is not proposed due to ordinance requirements.

BMP 5.8.1 Rooftop Disconnection – is not proposed. In POI#001, Managed Release Concept (MRC) is utilized to treat the entire tributary flow from the 2-year storm.

BMP 5.8.2 Disconnection from Storm Sewers - is not proposed. In POI#001, Managed Release Concept (MRC) is utilized to treat the entire tributary flow from the 2-year storm.

BMP 5.9.1 Streetsweeping - is not utilized due to the access limitations to the site and type of use.

BMP 6.4.1 Pervious Pavement with Infiltration Bed - is not proposed, as it has been determined to be infeasible due to both maintenance costs and the operational needs of the proposed facilities.

BMP 6.4.2 Infiltration Basin – is not proposed due to poor infiltration rates. In POI#001, Managed Release Concept (MRC) will be utilized to treat the entire tributary flow from the 2-year storm.

BMP 6.4.3 Subsurface Infiltration Bed - is not proposed due to poor infiltration rates. In POI#001, Managed Release Concept (MRC) will be utilized to treat the entire tributary flow from the 2-year storm.

BMP 6.4.4 Infiltration Trench - is not proposed due to poor infiltration rates. In POI#001, Managed Release Concept (MRC) will be utilized to treat the entire tributary flow from the 2-year storm.

BMP 6.4.5 Rain Garden/Bioretention - is not proposed for water quality as water quality is provided through a series of other BMPs.

BMP 6.4.6 Dry Well / Seepage Pit - are not proposed for recharge due to several limiting factors (See Appendix D). In POI#001, Managed Release Concept (MRC) will be utilized to treat the entire tributary flow from the 2-year storm.

BMP 6.4.7 Constructed Filter - is not proposed for water quality as water quality is provided through a series of other BMPs.

BMP 6.4.8 Vegetated Swale - are not proposed due to limited opportunity based on the site layout, as all proposed discharges are point source directly into surface waters.

BMP 6.4.9 Vegetated Filter Strip - is not utilized as all proposed discharges are point source directly into surface waters.

BMP 6.4.10 Infiltration Berm & Retentive Grading – is not proposed due to limited opportunity based on the site layout and on poor infiltration rates. Several existing wetland areas on the site naturally provide retentive grading.

BMP 6.5.1 Vegetated Roof - is not proposed for volume reduction, as it has been determined to be infeasible due to the design and maintenance costs; additionally, this entire 2-year volume will flow through a water quality inlet.

BMP 6.5.2 Runoff Capture & Reuse – Not feasible due to the lack of ability to spray during the winter. Additional water quality will be achieved through pretreatment of Managed Release Concept (MRC) basins UG1, and UG2; and through the planting of native vegetation as part of this project, which will decrease runoff and promote soil infiltration.

BMP 6.6.1 Constructed Wetland - Is not proposed, as disturbance and grading along the stream banks, slopes and wooded areas will be minimized with Tree protection fencing and demarcation of LOD.

BMP 6.6.2 Wet Pond/Retention Basin - is not proposed for peak rate control as this is provided through capture and reuse/spray irrigation and MRC.

BMP 6.6.3 Dry Extended Detention Basin - is utilized in UG1, UG2, and UG3 to control peak rate and volume of runoff through MRC method.

BMP 6.6.4 Water Quality Filters & Hydrodynamic Devices - are utilized as water quality pre-treatment of rooftop and parking surface runoff prior to entering the underground detention facilities and ultimate discharge to surface waters.

BMP 6.7.1 Riparian Buffer Restoration - is not utilized, disturbance to the existing riparian area is minimized.

BMP 6.7.2 Landscape Restoration - is utilized to the maximum extent possible by protection of existing trees and planting of proposed native species.

BMP 6.7.3 Soil Amendment & Restoration – Soil amendments are not proposed as there is limited topsoil areas on the site to amend due to extensive on-site impervious, as well as the fact that most soil areas are outside the LOD (see protect sensitive/natural features), and therefore provision of extensive soil amendments would result in extensive additional disturbance to provide limited volume benefit.

BMP 6.7.4 Floodplain Restoration – Is not proposed, as this BMP is only considered where there is minimal interaction between groundwater, stream base flow, and root systems; furthermore, the

disturbance associated with the improvements that affects the floodplain is covered under a separate permit.

BMP 6.8.1 Level Spreader – are not utilized to minimize disturbance and the potential for re-channelization on the stream banks. Project outfalls are directly into the receiving waters.

BMP 6.8.2 Special Detention Areas - Parking Lot, Rooftop – are not utilized as there is no need or requirement for them on the project.

MRC - 13 Design Standards (August 25, 2020 Version 1.2)

NPDES Permit application number: PAC460822Page **1** of **11**
Municipality: Whitemarsh Township
County: Montgomery
MRC Identification: UG1

1. **Runoff Capture** – The runoff from the 1.2-inch/2-hour storm from the contributing watershed that the MRC is intended to treat should be captured and managed by the MRC BMP, without overflow. The runoff is filtered through vegetated media or treated and filtered to the extent practicable through the on-site undisturbed soils or other acceptable treatment systems, and released through the underdrain as indicated in MRC Standard 2. The MRC BMP may be designed for offsetting when contributing non-regulated earth disturbance (either impervious area or compacted pervious areas) is present in the contributing drainage area. Uncompacted pervious surfaces outside the disturbed area should be bypassed to the maximum extent practical.

   NOTE 1 – Runoff from existing similar impervious and compacted pervious areas can be used to offset undetained areas. The runoff volume for the 1.2 inch/2-hour storm from the two areas must be equivalent (See Figure 2). In addition, the pollutant contribution as determined through land use of the two areas should be similar.

   NOTE 2 – A composite Curve Number is not adequate for the modeling of the 1.2 inch/2-hour storm due to the large error associated with averaging of initial abstractions for storms less than or equal to the 2-year/24hour storm event. Curve numbers must be separate for this analysis.

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

UG1#1 will capture and treat the first 1.2 of runoff from all new impervious surfaces tributary to it. One inch storm event has been modeled and routed through the facility as well as the 1-yr, 2-yr, 10-yr, 50-yr and 100-yr storm events. The areas tributary to the facility have been delineated and hydrographs have been generated using the SCS Method and HydroCAD software.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

Drainage area shown on Plan Sheet C-1002. Drainage area calculations for the WQ storm are included on pages 295-304 of the Post-Construction Stormwater Management Narrative Report. Drainage area calculations and the corresponding hydrographs for the 1-yr, 2-yr, 10-yr, 50-yr and 100-yr storm events are located on pages 103-112 (1-yr), 123-132 (2-yr), 163-172 (10-yr), 203-212 (50-yr) and 223-232 (100-yr) of the Post-Construction Stormwater Management Narrative Report. The corresponding hydrographs for the 1.2-inch/2 hour storm event are located on pages 268-289 of the Post-Construction Stormwater Management Narrative Report.

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2. **Release Rate for the 1.2-inch/2-hour Storm** – The stormwater release rate from the MRC BMP for the 1.2inch/2-hour storm should not exceed 0.01 cubic feet per second (cfs) from the equivalent impervious area. To obtain the equivalent impervious area being managed by a MRC BMP, determine the total volume of runoff generated during the 1.2-inch/2-hour event from all

pervious and impervious areas contributing to the MRC and divide by 0.0833 feet. This release rate is rounded to the nearest hundredth of a cfs (e.g., 1.576 ac. is 0.01576 cfs, rounded to 0.02 cfs). Routing is necessary to demonstrate compliance with the standard for release rate.

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

The outlet control structure for UG1 will feature a 1.00 inch diameter MRC orifice in a weir plate to achieve a release rate of 0.01 cfs per acre of impervious area tributary to the facility. The release rate summary and corresponding hydrographs are located within this appendix. The release rate calculation: 6,655 cf / 0.0833 = 79,891.957 cubic inches: 79,891.957 / 43,560 = 1.83 acres (equivalent impervious area): 1.86 x 0.01 = 0.0186 cfs or 0.02 cfs rounded.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

MRC Release rate calculations for the WQ storm are included in the corresponding hydrographs for the 1.2-inch/2-hour storm event. The MRC Design Summary is located on pages 362-363 of the Post-Construction Stormwater Management Narrative Report. The Equivalent impervious Area Calculations are located on page 364 of the Post-Construction Stormwater Management Narrative Report. The hydrographs are located on pages 268-289 of the Post-Construction Stormwater Management Narrative Report.

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3. **Internal Water Storage (IWS)** – A volume for IWS should be provided that is at least one foot deep below the lowest structural outlet (i.e., the outlet for the underdrain) in the MRC BMP to encourage ET, infiltration and denitrification. To encourage ET, the overall soil media depth of a facility including the IWS can be no deeper than four (4) feet, and up to 50% of the IWS void volume can be included (only for vegetated MRC BMPs) as available storage during hydrologic routings to demonstrate compliance with the standards for the release rate (No. 2 above) and peak flow attenuation (No. 4 below). For soil media, a void space of 30% can be used to describe the soil volume storage and recovery. If a void space of 30% is to be used, the void space in the soil media in the IWS should be modeled at 15% (0.5 x 0.3 void space = 0.15 or 15%). If an alternate void space is used for soil media, specific data demonstrating the void space should be submitted. For non-vegetated MRC designs, the IWS must be above the underdrain, but below the outlet, to promote a change of the stormwater stored during rain events.

   Use of Liners and Infiltration – The MRC BMP should not have an impervious liner installed unless environmental or geological conditions necessitate use of a liner, or if an existing structure would be damaged as a result of not lining the facility. Although MRC BMPs are for areas with infiltration limitations, whatever infiltration that can be achieved is encouraged. Measured saturated hydraulic conductivity rates are encouraged to be used in design and modeling.

NOTE 3 – The presence of a project site in an area of known karst conditions does not, in itself, serve as evidence of the applicability of MRC to a project site or to the use of a liner to avoid infiltration. DEP and delegated CCDs reserve the right to request a detailed subsurface investigation where considered warranted to evaluate the likelihood of sinkhole formation as a result of post-construction stormwater management.

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

Basin UG1 provides 1 foot of Internal water storage, providing 1 foot of media depth within the basin, with 64.5% space available for routing purposes. The proposed basin bottom elevation for Basin UG1 is 156.53 as shown on Plan Sheet C-609. The limiting zone elevation for Basin UG1 is 159.00 (Seasonal High Water Table) per test pit INF-1 on page 22 of the Stormwater Infiltration Report report and page 29 of the Post-Construction Stormwater Management Narrative Report. The Groundwater separation for UG1 is -2.47 feet to the underdrain invert elevation and must be lined.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

The limiting zone elevations are found on page 22 of the Stormwater Infiltration Report report and page 29 of the Post-Construction Stormwater Management Narrative Report.

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4. **Geomorphologic Peak Flow Management for the 2-year/24-hour Event** – The peak flow from the postconstruction 2-year/24-hour storm should be managed back to the pre-construction 1-year/24-hour storm peak flow, unless an approved and current Act 167 Plan or another requirement (such as limited capacity of a downstream channel) is more restrictive. In general, this rate is determined at the project point of interest. In the event the MRC drainage area is part of a larger overall site with non-MRC BMPs, only the MRC drainage peak flows should be managed back to the 1-year/24-hour level and overflows can be combined with flows from the non-MRC BMPs.

   In situations where the pre-construction drainage area to the MRC BMP varies significantly compared to the post-construction drainage area, the post-construction drainage area boundary to the MRC BMP (using existing land uses) can be used to calculate the target pre-construction 1-year/24-hour rate, as long as all areas in question are in close proximity to the MRC BMP and drain to the same surface water. In cases where the BMP is managing additional volume to offset adjacent areas that could not be captured in the MRC BMP, the targeted pre-construction 1-year/24-hour release rate should be calculated based on the combined flow rates from the BMP drainage area and adjacent area.

   NOTE 4 – This standard is used to ensure that MRC does not contribute to channel-eroding flows in receiving surface waters.

NOTE 5 – This release rate (0.01 cfs / equivalent impervious acre) is approximately the expected rate of interflow (lateral movement of stormwater to a stream) after a 2-year/24-hour storm event for a Pennsylvania non-karst watershed based on the NRCS curvilinear unit hydrograph. Releasing at this rate will produce a condition where baseflow contributions will be similar to that of an undeveloped area during and after storm events. As the level of outflow would be similar to what would be expected during and after the storm, it would not be expected to impact the storm event's effects on flooding and erosion. This rate should also be used for karst watersheds unless it can be demonstrated that interflow on a particular project site differs from this standard (such a demonstration would be considered an alternative to the MRC Design Standard).

Flows Greater Than 2-Year/24-Hour Storm – The recommended design for MRC BMPs is to bypass storm events larger than the 2-year/24-hour storm to a rate control BMP; however, DEP understands that site and cost limitations may not allow for this bypass. When it is demonstrated by the licensed professional engineer that larger storm events cannot reasonably be bypassed, the MRC BMP surface component should be designed to manage the post-construction 10-, 50- and 100-year/24-hour storm event peak flows to their corresponding pre-construction rates and the MRC BMP should have an increased (i.e., more frequent) inspection and maintenance schedule that includes inspection and repair after extreme events (10-, 50- and 100-year/24-hour storm events).

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

The outlet control structure for UG1 will feature a 1.00 inch diameter MRC orifice in a weir plate to reduce the 2-yr post development peak flow to the 1-yr pre-development peak flow. UG1 also controls peak flows from the 10, 50 & 100-yr storm events via a secondary orifice and weir in the OCS. Quarterly inspections and inspections following 0.8 inch storm events, 2, 10, 50 and 100-yr storm events of basin and OCS are specified in this PCSM Report and on the PCSM plans. The release rate summary and corresponding hydrographs are located within this appendix.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

Outlet control structure details shown on C-609. MRC release rate calculations for the 1.2 inch/2-hour WQ storm are included on pages 268-289, and release rate calculations for the 2-yr WQ storm are included on pages 295-304 of the Post-Construction Stormwater Management Narrative Report. Release rates for 1-100 year storms are included on pages 103-112 (1-yr), 123-132 (2-yr), 163-172 (10-yr), 203-212 (50-yr) and 223-232 (100-yr) of the Post-Construction Stormwater Management Narrative Report.

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5. **Stormwater BMP Manual** – Follow the design considerations for BMPs as presented in the Pennsylvania Stormwater Best Management Practices Manual (Stormwater BMP Manual) (363-

0300-002), as revised. MRC may be incorporated into the design of any BMP by a licensed professional engineer.

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

UG1 uses a standard MRC BMP – Underground MRC guidelines, and was originally based on the Managed Release Concept Basin guidance per the PA DEP BMP Manual, latest edition (MRC Design Guide August 2020).

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

Description of how the basin meets MRC guidance included on pages 9-13 of the Post-Construction Stormwater Management Narrative Report.

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6. **MRC BMP Selection** – Standard MRC BMPs include the following system types:

   a. **Vegetated MRC** – Vegetation must be provided for 75% of the surface of the MRC BMP. Native vegetation should be selected by the licensed professional engineer in consultation with a professional that is knowledgeable in native plant ecology. Vegetation should be selected based on the plants' ability to grow within the anticipated conditions considering the depth and duration of stormwater stored in the MRC BMP.

   b. **Non-vegetated MRC: Porous Pavement** – Porous pavements with a storage bed require a vacuum street sweeping maintenance regime adequate for the drainage area characteristics; the vacuum street sweeping equipment must provide adequate suction capacity to remove particles on the pavement's surface to provide a sufficient water quality demonstration and to maintain flow pathways.

   c. **Non-vegetated MRC: Underground Storage Chambers** – Underground storage chambers must be accessible for maintenance, and for this reason underground storage is not recommended to be rock beds. The water quality demonstration is then made through the Quality Worksheet on the DEP Spreadsheet. DEP highly recommends that designers consider adequate pretreatment as necessary for system longevity.

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

UG1 uses a standard MRC BMP – Non-vegetated MRC design. Vegetated MRC and/or Non-vegetated MRC: Porous Pavement were not used as the site does provide for a suitable location. The proposed design utilizes water quality pre-treatment via hydrodynamic devices and soil amendments prior to it entering the MRC facility.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

Description of how the basin meets MRC guidance included on pages 9-13 of the Post-Construction Stormwater Management Narrative Report. Basin design and details are contained on Plan Sheets C-609.

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7. **Pre-Development Site Characterization and Assessment of Soil and Geology** – Adequate and appropriate soils and geologic testing and evaluation must be performed to demonstrate the infiltration capacity of the entire project site to the satisfaction of DEP. At a minimum, one infiltration test for every 40,000 square feet of disturbed acreage should be performed with a minimum of four tests, equally distributed across a site. The infiltration tests must be done in the most accommodating soil horizon for infiltration as demonstrated by a deep hole test within 100 feet of the infiltration test. All other sections of Appendix C Protocol 1, Site Evaluation and Soil Infiltration Testing and Appendix C Protocol 2, Infiltration Systems Guidelines per the Stormwater BMP Manual (as revised) should be followed to clearly demonstrate the infiltration capability of on-site undisturbed soils at applicable elevations and for a variety of locations. Soil probes and infiltration test locations should be identified on the PCSM Plan drawing(s). The use of soil borings as a substitute for test pits can be used as a planning tool but will not generally be accepted for final design of infiltration MRC BMPs.

   NOTE 6 – The above recommended number of infiltration tests per disturbed area is to be based upon the disturbed area that is not considered a restoration activity or road maintenance activity. For example, a large sewer main installation project disturbs 30 acres in total, with 29 acres of disturbance for the sewer line installation (that will be covered by a restoration plan) and 1 acre of disturbance for a pumping station that requires a PCSM plan. The recommended number of infiltration tests would be based on the 1 acre, not 30 acres.

   NOTE 7 – The minimum number of tests can be reduced, if it can be demonstrated that the subsurface conditions are uniform; however, this is considered a deviation from MRC Design Standards, requiring an individual permit.

   NOTE 8 – Infiltration tests resulting in saturated hydraulic conductivities (as identified in the field) of less than or equal to 0.2 inch per hour (prior to application of a safety factor) classify as extremely limited. This is a saturated hydraulic conductivity representative of the lower part of the range of HSG C soils and HSG D soils.

   NOTE 9 – Research has shown that limited infiltration rates (i.e., less than or equal to 0.2 inch per hour) over time with an IWS can result in measurable losses from a BMP. Therefore, a designer can use results from the infiltration testing to describe infiltration losses for unlined MRC BMPs or utilize an infiltration rate of 0. Testing for infiltration rates should be performed as per Protocol 1 of Appendix C of the Stormwater BMP Manual (as revised). The recommendation

in Protocol 2 of Appendix C that "soils underlying infiltration devices should have infiltration rates between 0.1 and 10 inches per hour" does not apply to MRC BMPs.

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

Infiltration test results were not favorable in multiple locations on the projects site, yielding a 0.00 in/hr geometric mean rate. As such, the Managed Release Concept released has been utilized for volume control. The managed release is utilized underground detention facility UG1 in accordance with the Managed Release Concept (MRC) technical paper released by PADEP on December 13, 2018, latest revision August 2020. The proposed development will also introduce structural and non-structural stormwater best management practices (BMP's) in order to control the rate and volume of stormwater runoff. A combination of traditional volume controls and managed release will be implemented to control volume and rate to required levels per CG-1, as well as comply with water quality requirements per PADEP requirements.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

Description of site geotechnical investigation is included in the Stormwater Infiltration Report, pages 2-7.

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8. **Separation Distance** – At least one foot of separation distance should be maintained between groundwater or the seasonally high-water table and the bottom footprint of the MRC BMP's soil media; however, a two-foot separation is preferred. There is no minimum separation required between bedrock or hardpan and the MRC BMP's soil media.

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

Basin UG1 is within the groundwater elevation and lined per MRC guidelines.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

The proposed basin bottom elevation for Basin UG1 is 156.53 as shown on Plan Sheet C-609. The limiting zone elevation for Basin UG1 is 159.00 (Seasonal High Water Table) per test pit INF-1 on page 22 of the Stormwater Infiltration Report report and page 29 of the Post-Construction Stormwater Management Narrative Report. The Groundwater separation for UG1 is -2.47 feet to the basin bottom elevation and must be lined.

---

9. **Ponding Depth and Drawdown time** – The maximum ponding time (i.e., the time after the end of the storm event for stored surface water to lower to soil surface) should not exceed 72 hours for any storm event. In general, a maximum ponding depth (i.e., storage depth above BMP

surface) of preferably one foot with a maximum of two feet at the peak of the 2-year/24-hour storm event should not be exceeded for the design of surface BMPs. In accordance with MRC Design Standard 4, the MRC could incorporate a multi-stage detention facility with the upper portions of the facility providing flow attenuation for storm events greater than a 2-year/24hour storm, to meet 25 Pa. Code § 102.8(g)(3). An engineered overflow structure or reinforced spillway / berm should be installed to provide safe conveyance for storm events greater than a 2-year/24-hour storm. Ponding depth for storms larger than the 2-year/24-hour storm should not exceed four feet, and drawdown to the MRC BMP surface should not exceed 72 hours for all design storms. For underground storage chambers and porous pavement MRC systems, drawdown to the IWS storage level should not exceed 7 days.

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

The maximum ponding for the 2-yr/24 hr storm will drawdown in less than seven days as required for subsurface MRC systems. Drawdown time for the storms are 117.50 hours (2-yr), 118.00 hours (10, yr), 118.00 hours (50-yr), and 118.00 hours (100-yr) Supporting drawdown calculations are contained within the narrative report on the hydrograph tables.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

The corresponding hydrographs showing drawdown time for the 2-yr, 10-yr, 50-yr and 100-yr storm events are located on pages 123-132 (2-yr), 163-172 (10-yr), 203-212 (50-yr) and 223-232 (100-yr) of the Post-Construction Stormwater Management Narrative Report.

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10. **Soil Media** – The selection of soil media should be done by considering anticipated pollutants to be treated and the vegetation that will be used. On-site soils should be evaluated for desired characteristics and infiltration capabilities as listed below. The depth of the soil media above the invert elevation of the underdrain pipe should be a minimum of 2 feet (24 inches) to provide pollutant removal. If on-site undisturbed soils are unsuitable for the purpose of providing IWS, an additional one to two feet of suitable soil media should be provided below the underdrain.

    Soil Media Drainage – The designer will need to exercise caution when selecting a soil media, as there is a delicate balance between infiltration rate and residence time. To maximize water quality treatment, the residence time within the soil media used in MRC BMPs should be selected to be close to the parameters established for infiltration into native soils. The designer will need to select a soil media that provide the proper infiltration rate and ponding time to achieve water quality for the anticipated life cycle of the BMP.

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

No Planting soil media is proposed as the basins are subsurface basins.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

N/A

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11. **Underdrain Design** – The licensed professional engineer can refer to PennDOT Publication 408 Section 610 for specifications of underdrains. However, underdrains should have a minimum flow rate of 10 gallons (1.34 cubic feet) per minute per linear foot of pipe not considering the flow control orifice or upturned elbow. For non-vegetated MRC BMPs, the underdrain should be located at the bottom of the IWS to promote movement of water from previous storms. There may need to be multiple underdrains, or longer underdrains, to provide adequate design capacity for drainage. Section 6.4.7 (Constructed Filter) of the Stormwater BMP Manual (as revised) has recommended design standards for lateral spacing of multiple underdrains.

    IWS Outflow with Capped / Orifice Underdrain – It is highly recommended that an upturned elbow or an elevated weir be designed at the outlet of the underdrain (see Figure 1). The upturned elbow or elevated weir will create a zone within the soil media, referred to as the IWS. Research has shown that IWS can reduce runoff volume and improve water quality treatment. The upturned elbow or elevated weir can also help if site conditions present daylighting issues for the underdrain's discharge elevation. Underdrains should be capped within an outlet structure when used to allow access for maintenance. The cap should be drilled to provide an appropriately sized orifice. Figure 7 below provides an example of an underdrain detail. Note that all cleanouts and angles within the underdrain should not exceed 45 degrees. For lined, nonvegetated MRCs the underdrain leading to the upturned elbow should be located at the bottom of the IWS.

    Underdrain Aggregate Envelope – A 6-inch stone envelope of AASHTO #57 should be placed around the underdrain. A geotextile (or pea gravel diaphragm) is needed around the aggregate envelope. Note that the stone should not be placed throughout the bottom of the BMP, but just in the envelope of the underdrain.

    Cleanout for Underdrain – The underdrain(s) should be equipped with a clean-out for maintenance. The design of any clean-out should ensure that surface water does not enter the underdrain system through the top of the cleanout. Consideration must be given for cleaning and inspecting underdrains and access to the upturned elbow or elevated weir.

    Orifices – An appropriately sized orifice is necessary on the outlet of the underdrain to control flow to the required release rate (see Figure 8). The orifice should be clean, smooth and sanded so that no burs or irregularities are present. The orifice should be on a plate or cap of sufficient

thickness, and the edges of the orifice should be ground so that flow through the orifice is smooth. Orifices should be vertical. The orifice plate and other connections should be water-tight and accessible for maintenance. Control valves cannot be substituted for an orifice.

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

IWS Outflow with capped underdrain and orifice plate mounted inside the structure is utilized for rate control. Underdrain is proposed to be 4" diameter and calculations are provided to show adequate flow rate into the underdrain pipe to drain the facility. Given the very low flow leaving the facility in the water quality storm (0.01 cfs), adequate capacity is provided in the 4" perforated underdrain.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

Underdrain capacity noted on page 365 of of the Post-Construction Stormwater Management Narrative Report.

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12. **Discharge Flow Path** – The MRC BMP should be directed to a suitably vegetated flow path, which can safely convey the releases without erosion or loss of stability. The discharge should be dispersed through the use of a level spreader. A licensed professional engineer can provide an analysis, with calculations, which identifies that a level spreader is not necessary, or that discharge to a channel will not cause increased erosion.

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

An endwall is proposed for the basin outfall, which drains to the existing swale conveyance to the stream onsite. Release rate is decreased for all storms, and the flow path follows the existing drainage route.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

An offsite discharge analysis is not required for this outfall.

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13. **Antidegradation Requirements** – Where the stormwater from the project site discharges to a special protection surface water, an MRC BMP can be used to satisfy the Antidegradation Best Available Combination of Technologies (ABACT) regulatory requirements from Chapters 93 and 102 (assuming that non-discharge alternatives do not exist).

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

MRC - 13 Design Standards (August 25, 2020 Version 1.2)

NPDES Permit application number: PAC460822Page **11** of **11**

Municipality: Whitemarsh Township

County: Montgomery

MRC Identification: UG1

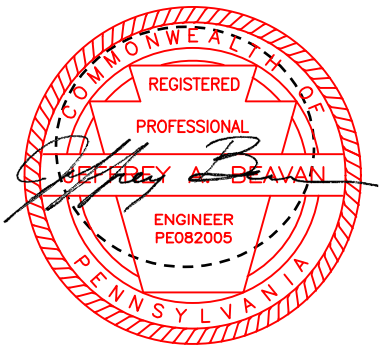
Not required as the runoff does not discharge to a HQ or EV water.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

n/a

SEAL AND CERTIFICATION BY LICENSED PROFESSIONAL

I, Jeffrey Beavan , do hereby certify pursuant to the penalties of 18 Pa.C.S.A. 4904 to the best of my knowledge, information and belief, that the accompanying report and drawings are in conformance with Chapter 102 of the rules and regulations of the Department of Environmental Protection.





USGS MAP

SCALE: 1" = 2,000'
AMBLER QUAD

Stormwater Management Calculation Summary

GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Project: 500-512 Pennsylvania Avenue - BMW Dealership Expansion
Project Number: 31230523
Project Location: Whitemarsh Township, Montgomery County, Pennsylvania
Client: Bohler Engineering PA, LLC

Legend
N/E = Not Encountered
N/A = Not Applicable
EGS = Existing Ground Surface Elevation
SHWT = Seasonal High Water Table

Test Boring Location	Approximate Existing Ground Surface Elevation (ft)	Proposed Cut Depth (ft)	Proposed Bottom of Bed Elevation (ft)	Soil Features Type / Encountered	Limiting Zone Depth (ft)	Limiting Zone Elevation (ft)	GTA Infiltration Test Depth (ft)	GTA Infiltration Test Elevation (ft)	Final Raw Infiltration Rate (in/hr)	Stormwater Facility Location
INF-1	163	-5	158	SHWT	4	159	4	159	0	Southwestern Basin
INF-1	163	-5	158	SHWT	4	159	5	158	0	
INF-2	163	-5	158	SHWT	8	155	4	159	0	
INF-3	165	-6	159	SHWT	6	159	4	161	0	Northwestern Basin
INF-3	165	-6	159	SHWT	6	159	6	159	0	
INF-4	165	-6	159	SHWT	8	157	5	160	0	
INF-4	165	-6	159	SHWT	8	157	6	159	0	
INF-5	165	-5.5	159.5	SHWT	4	161	6	159	0	Northeastern Basin
INF-6	165	-5.5	159.5	SHWT	8	157	5	160	0	
INF-7	164	-4	160	SHWT	8	156	4.5	159.5	0	Southeastern Basin
INF-8	163	-4	159	SHWT	4	159	4	159	0	
INF-8	163	-4	159	SHWT	4	159	5	158	0	

ALLOWABLE RELEASE RATE WORKSHEET

PROJECT: ***BMW Fort Washington***
500, 506, 510 & 512 Pennsylvania Avenue
Whitemarsh Township
Montgomery County, PA

DATE: ***7/24/2025***
BY: ***RS***
CHECKED BY: ***MRB***
SHEET NO.: ***Summary***
REVISION: ***4***

Release Rate Summary

Stormwater Peak Rate & Volume Summary - POI#1

	Storm Event (years)													
Hydrograph	**1**		**2**		**5**		**10**		**25**		**50**		**100**	
	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)
Pre-Development (cfs)	5.996	18,729	8.041	25,070	11.294	35,342	14.015	44,087	18.041	57,257	21.445	68,573	25.063	80,802
Post Development Total (cfs)	2.629	24,645	3.979	31,185	6.280	41,697	7.853	50,636	10.004	64,132	12.116	75,778	13.690	88,419
Required Release Rate Percentage														
Required Release Rate (cfs)	N/A	N/A	5.996	18,729	8.041	25,070	11.294	35,342	14.015	44,087	18.041	57,257	21.445	68,573
Pre to Post Change (cfs)	-3.367	5,916	-4.062	6,115	-5.014	6,355	-6.162	6,549	-8.037	6,875	-9.329	7,205	-11.373	7,617

Stormwater Peak Rate & Volume Summary - POI#2

	Storm Event (years)													
Hydrograph	**1**		**2**		**5**		**10**		**25**		**50**		**100**	
	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)
Pre-Development (cfs)	1.769	3,491	2.579	5,034	3.930	7,662	5.101	9,985	6.879	13,584	8.410	16,743	10.063	20,209
Post Development Total (cfs)	0.714	1,523	1.172	2,369	1.977	3,882	2.701	5,268	3.834	7,476	4.834	9,458	5.932	11,664
Required Release Rate Percentage														
Required Release Rate (cfs)	N/A	N/A	1.769	3,491	2.579	5,034	3.930	7,662	5.101	9,985	6.879	13,584	8.410	16,743
Pre to Post Change (cfs)	-1.055	-1,968	-1.407	-2,665	-1.953	-3,780	-2.400	-4,717	-3.045	-6,108	-3.576	-7,285	-4.131	-8,545

Stormwater Peak Rate & Volume Summary - TOTAL POI#1

	Storm Event (years)													
Hydrograph	**1**		**2**		**5**		**10**		**25**		**50**		**100**	
	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)
Pre-Development (cfs)	6.392	22,220	8.617	30,104	12.182	43,004	15.210	54,070	19.791	70,841	23.724	85,316	27.952	101,011
Post Development Total (cfs)	3.342	26,168	5.124	33,554	8.233	45,579	10.531	55,904	13.799	71,608	16.521	85,235	19.438	100,083
Required Release Rate Percentage														
Required Release Rate (cfs)	N/A	N/A	6.392	22,220	8.617	30,104	12.182	43,004	15.210	54,070	19.791	70,841	23.724	85,316
Pre to Post Change (cfs)	-3.050	3,948	-3.493	3,450	-3.949	2,575	-4.679	1,834	-5.992	767	-7.203	-81	-8.514	-928

Pre-Development to Post-Development Analysis

COMPUTATION SHEET : COMPOSITE CURVE NUMBER (CN)

PROJECT: ***BMW Fort Washington***
500 Pennsylvania Ave
Whitemarsh Township, Montgomery County

DATE: ***7/22/2025***
BY: ***RMS***
CHECKED BY: ***MRB***
REVISION: ***4***

Cover Type Description	Soil HSG	CN	Pre-Development DA#1 (Acres)	Pre-Development DA#2 (Acres)	Pre-Development POI#1 (Acres)	BYPASS DA#1 TO POI#1
Meadow	A	39	0.466	0.390	0.856	
Wooded	A	30	0.282	0.000	0.282	
Meadow	B	61	0.024	0.051	0.075	
Wooded	B	55	0.000	0.000	0.000	
Meadow	C	74	0.000	0.000	0.000	
Wooded	C	70	0.000	0.000	0.000	
Meadow	D	80	0.000	0.000	0.000	
Wooded	D	77	0.000	0.000	0.000	
Impervious	ALL	98	3.010	0.707	3.717	
		Total Area	3.782	1.148	4.930	
		Composite CN	**85.4**	**76.3**	**83.3**	
		Time of Concentration (Tc)	18.50	9.10	9.10	

COMPUTATION SHEET : COMPOSITE CURVE NUMBER (CN)

PROJECT: ***BMW Fort Washington***
500 Pennsylvania Ave
Whitemarsh Township, Montgomery County

DATE: ***7/22/2025***
BY: ***RMS***
CHECKED BY: ***MRB***
REVISION: ***4***

Cover Type Description	Soil HSG	CN	UG1 TO POI#001 (DP#001) (Acres)	UG2 TO POI#001 (DP#003) (Acres)	BYPASS DA#001 TO POI#001 (DP#002) (Acres)	ROOF BYPASS TO POI#001 (DP#001) (Acres)	DP#001 TOTAL (Acres)	BYPASS POI#002 TO POI#001 (DP#004) (Acres)	Post-Development POI#001 (Acres)
Open Space	A	39	0.057	0.097	0.389	0.000	0.543	0.318	0.861
Wooded	A	30	0.000	0.000	0.285	0.000	0.285	0.000	0.285
Open Space	B	61	0.000	0.000	0.000	0.000	0.000	0.107	0.107
Wooded	B	55	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Open Space	C	74	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wooded	C	70	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Open Space	D	80	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wooded	D	77	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Impervious	ALL	98	1.871	0.396	0.402	0.592	3.261	0.366	3.627
		Total Area	1.928	0.493	1.076	0.592	4.089	0.791	4.880
		Composite CN	**96.3**	**86.4**	**58.7**	**98.0**	**85.4**	**69.3**	**82.8**
		Time of Concentration (Tc)	5.00	5.00	18.50	5.00	5.00	5.00	5.00

Time of Concentration (Tc) or (Tt) Calculations

Project: **Proposed Automotive Dealership Expansion**
BMW of Fort Washington

Description: **Bypass - DP002 (to POI1)**

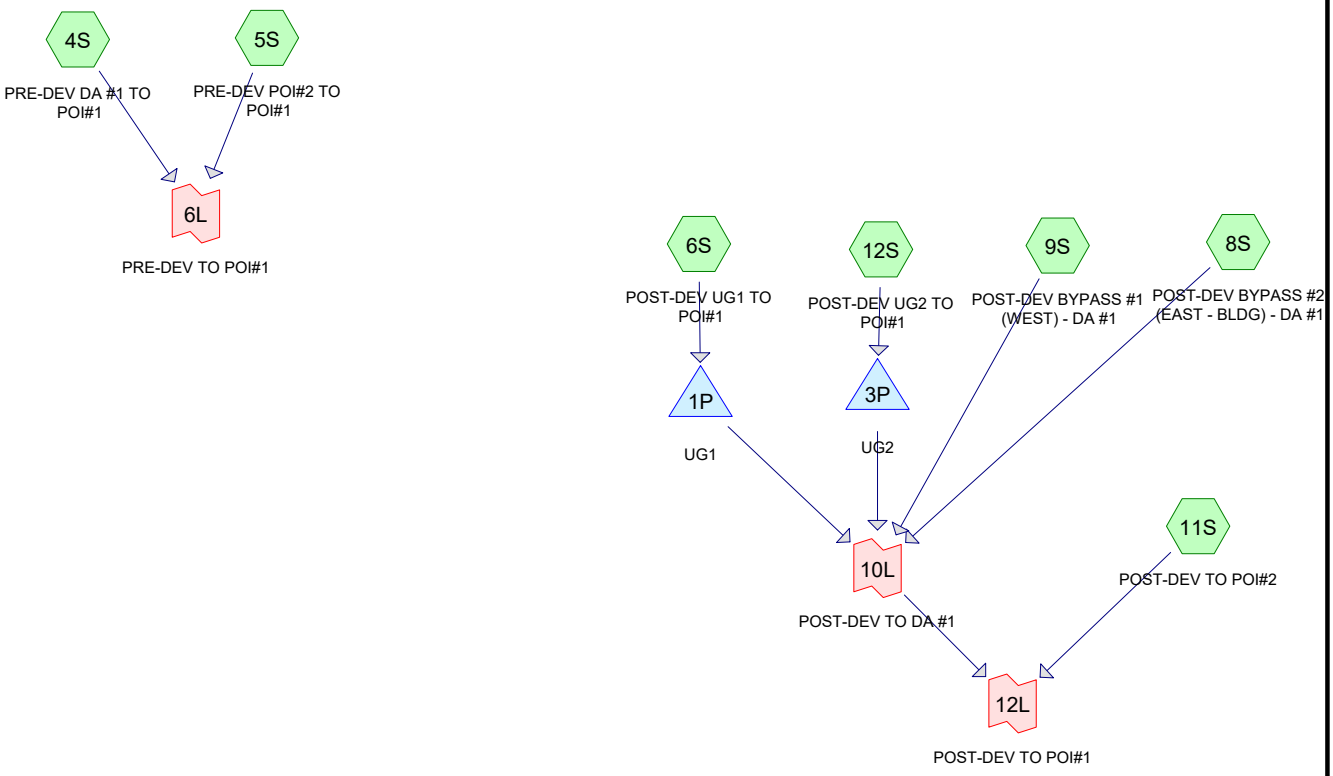
Note: Space for as many as three segments per flow type can be used for each worksheet.

Sheet Flow *(Applicable to Tc only)*		**Segment ID**	**AB**					
1. Surface Description *(table 3-1)*			Woods (light underbrush)					
2. Manning's roughness coeff., n *(table 3-1)*			0.400					
3. Flow length, L *(total L ≤ 150 ft)*		ft	43					
4. Two-yr 24-hr rainfall, P_2		in	3.23					
5. Land slope, s*		ft/ft	0.0080					
6. Tt =0.007(nL)$^{0.8}$ / $P_2^{0.5}$s$^{0.4}$		**Compute Tt**	**hr**	**0.2623**	+		+		=	**0.2623**
**S is averaged*										

Shallow Concentrated Flow		**Segment ID**						
7. Surface Description (paved or unpaved)								
8. Flow length, L		ft						
9. Watercourse slope, s*		ft/ft						
10. Average velocity, V		ft/sec						
11. Tt = L / 3600V				+		+		=	

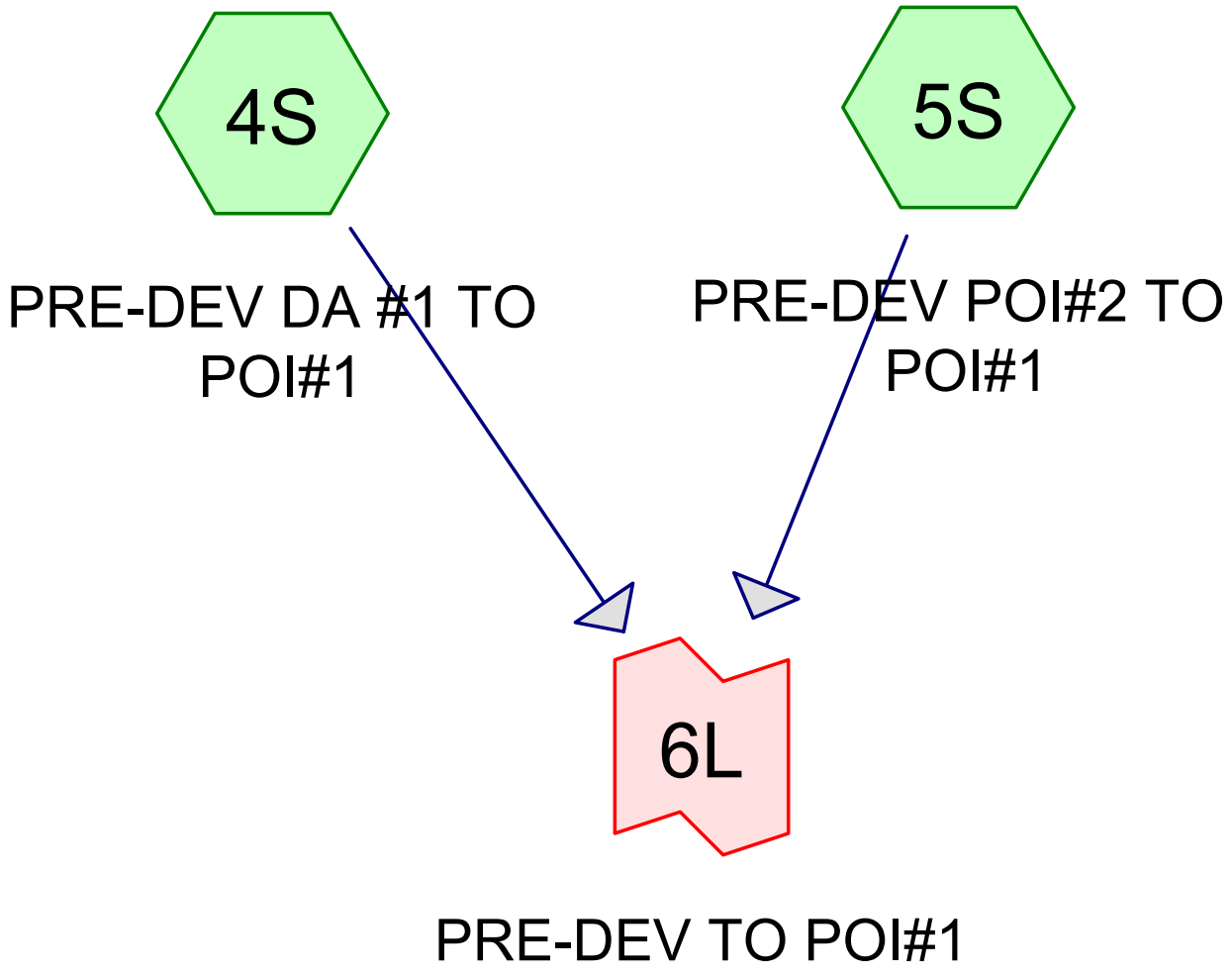
Channel Flow		**Segment ID**	**BC**	**CD**			
12. Cross sectional flow area, a		ft^2	11.50	11.50			
13. Wetted perimeter, p		ft	17.67	17.67			
14. Hydraulic radius, r = a/wp		ft	0.6510	0.6510			
15. Channel Slope, s		ft/ft	0.0110	0.0140			
16. Manning's roughness coeff., n			0.040	0.024			
17. V=1.49r$^{2/3}$s$^{1/2}$ / n			2.9345	5.5176			
18. Flow length, L		ft	325	303			
19. Tt = L / 3600V			**0.0308**	**0.0153**	+		=	**0.0460**
20. Watershed or subarea T_c or T_t (add T_t in steps 6,11, and 19)								**0.3083**

Tc = **18.50** **minutes**



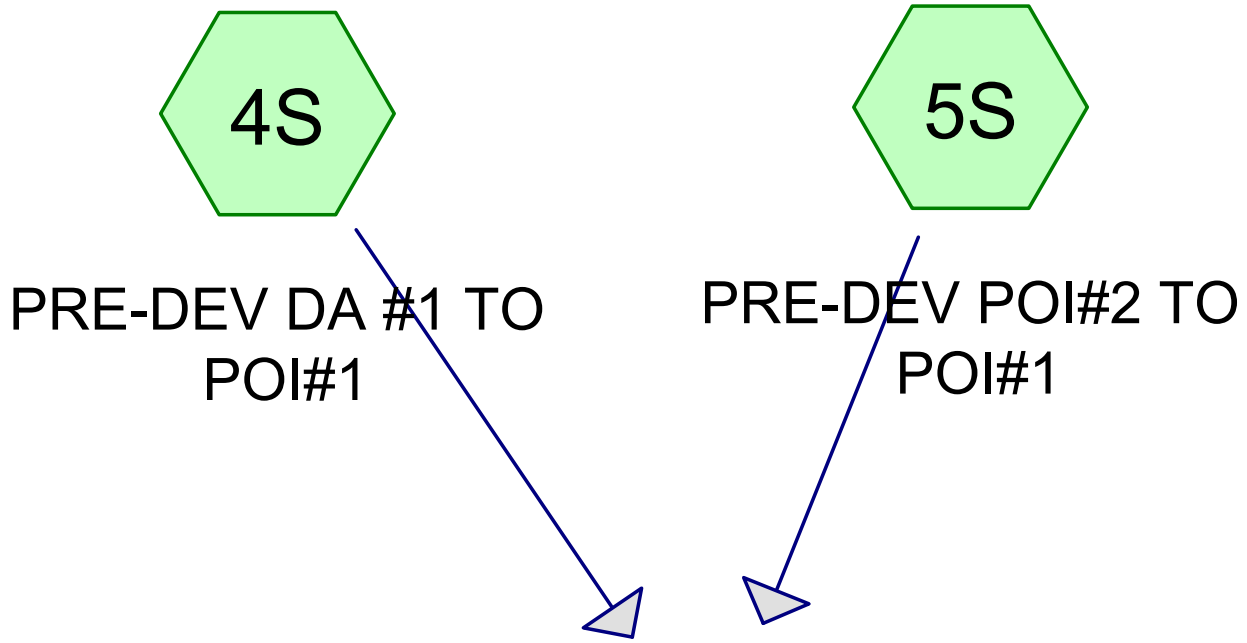
Subcat Reach Pond Link

Routing Diagram for BMW_2025-1-3
Prepared by Bohler, Printed 1/2/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC



Subcat Reach Pond Link

Routing Diagram for BMW_2025-1-3
Prepared by Bohler, Printed 1/2/2025
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Subcat Reach Pond Link

Routing Diagram for BMW_2025-7-24_2
Prepared by Bohler, Printed 7/24/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Summary for Subcatchment 4S: PRE-DEV DA #1 TO POI#1

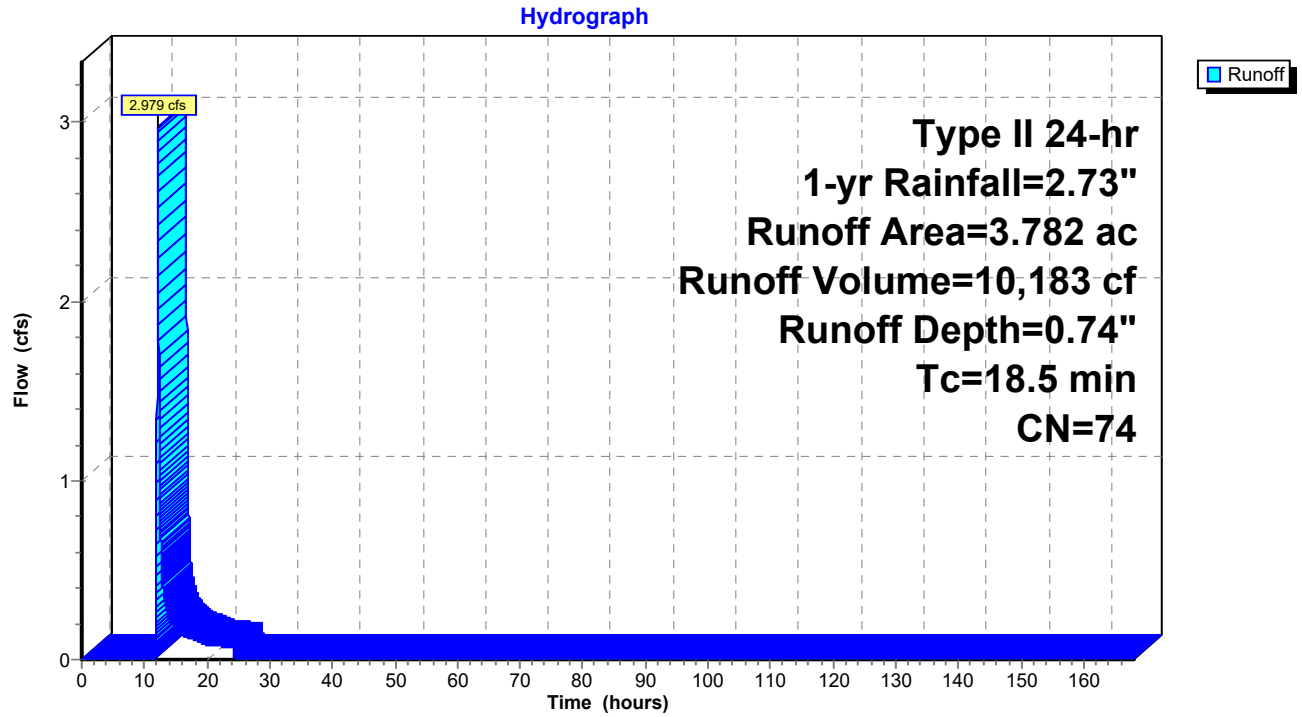
Runoff = 2.979 cfs @ 12.13 hrs, Volume= 10,183 cf, Depth= 0.74"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-yr Rainfall=2.73"

	Area (ac)	CN	Description
*	0.466	30	Meadow A
*	0.282	30	Wooded A
*	0.024	58	Meadow B
*	2.410	98	Impervious
*	0.590	30	Impervious As Meadow (A)
*	0.010	58	Impervious as Meadow (B)
	3.782	74	Weighted Average
	1.372		36.28% Pervious Area
	2.410		63.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 4S: PRE-DEV DA #1 TO POI#1



Summary for Subcatchment 5S: PRE-DEV POI#2 TO POI#1

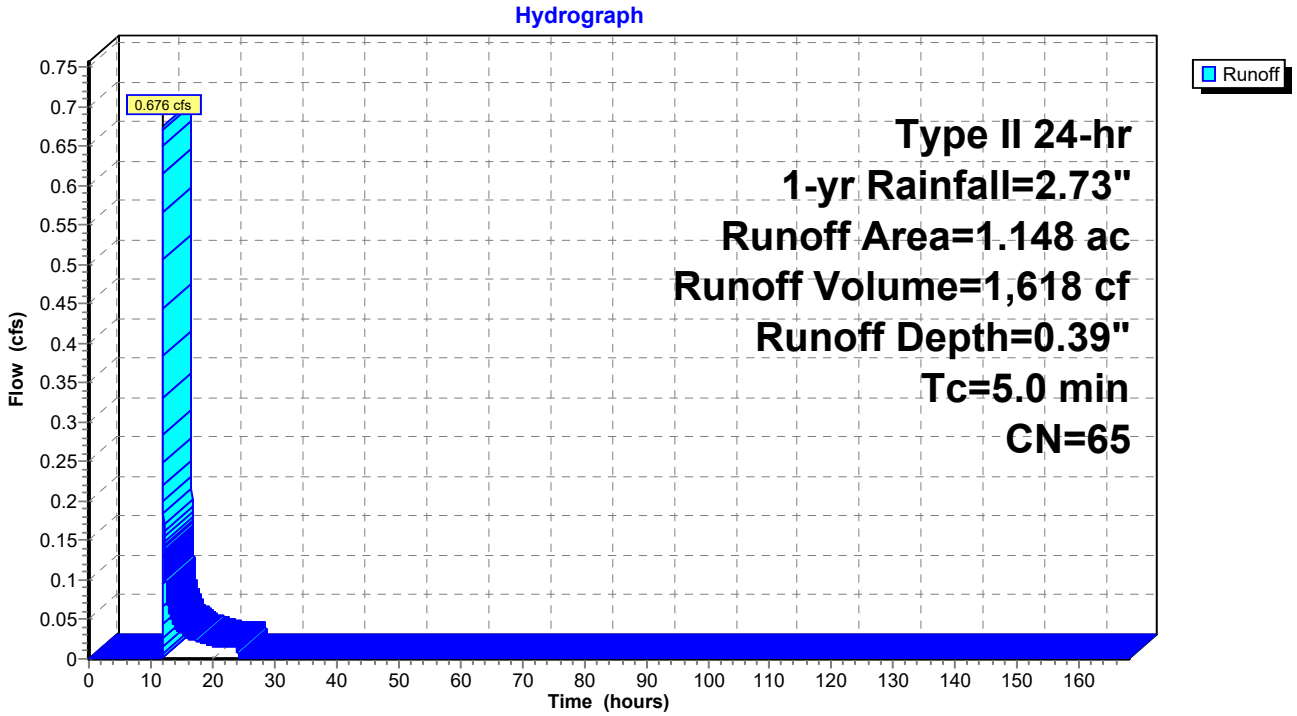
Runoff = 0.676 cfs @ 11.98 hrs, Volume= 1,618 cf, Depth= 0.39"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-yr Rainfall=2.73"

	Area (ac)	CN	Description
*	0.390	30	Meadow A
*	0.051	58	Meadow B
*	0.565	98	Impervious
*	0.125	30	Impervious as Meadow (A)
*	0.017	58	Impervious as Meadow (B)
	1.148	65	Weighted Average
	0.583		50.78% Pervious Area
	0.565		49.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Pre-Dev DA #2 Tc**

Subcatchment 5S: PRE-DEV POI#2 TO POI#1



Summary for Subcatchment 4S: PRE-DEV DA #1 TO POI#1

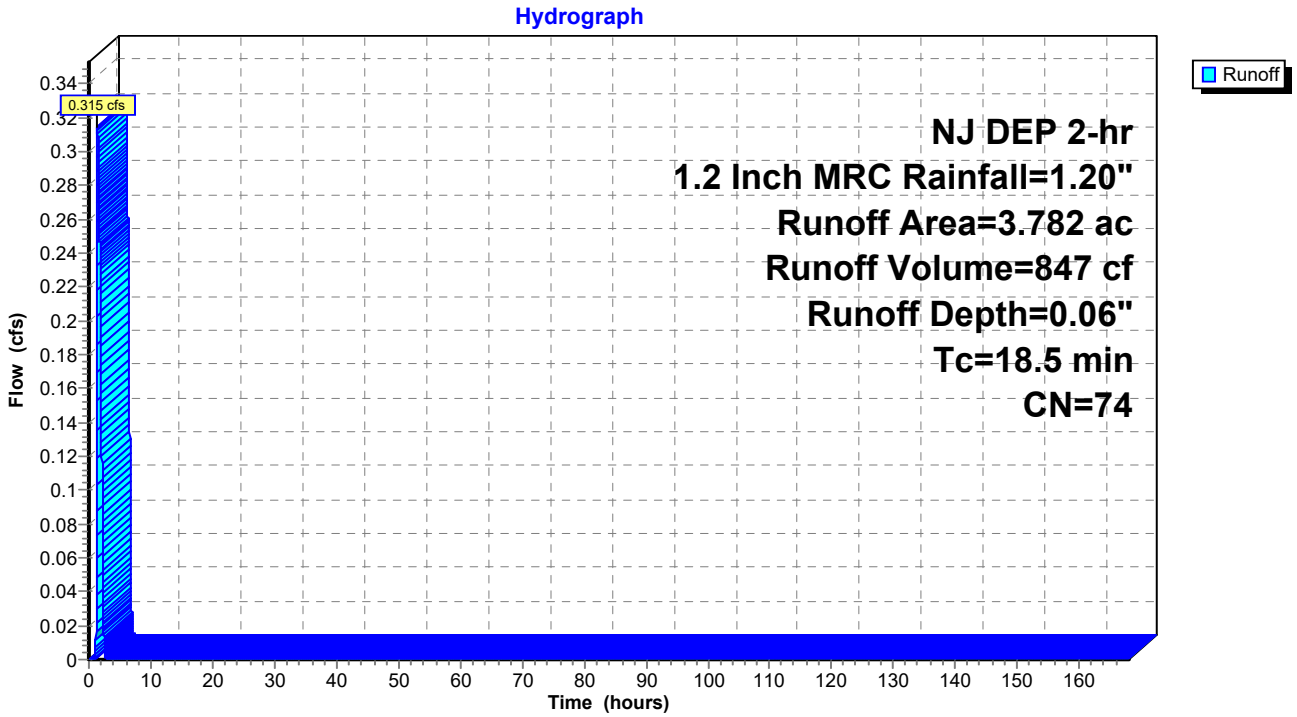
Runoff = 0.315 cfs @ 1.42 hrs, Volume= 847 cf, Depth= 0.06"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
NJ DEP 2-hr 1.2 Inch MRC Rainfall=1.20"

	Area (ac)	CN	Description
*	0.466	30	Meadow A
*	0.282	30	Wooded A
*	0.024	58	Meadow B
*	2.410	98	Impervious
*	0.590	30	Impervious As Meadow (A)
*	0.010	58	Impervious as Meadow (B)
	3.782	74	Weighted Average
	1.372		36.28% Pervious Area
	2.410		63.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 4S: PRE-DEV DA #1 TO POI#1



Summary for Subcatchment 5S: PRE-DEV POI#2 TO POI#1

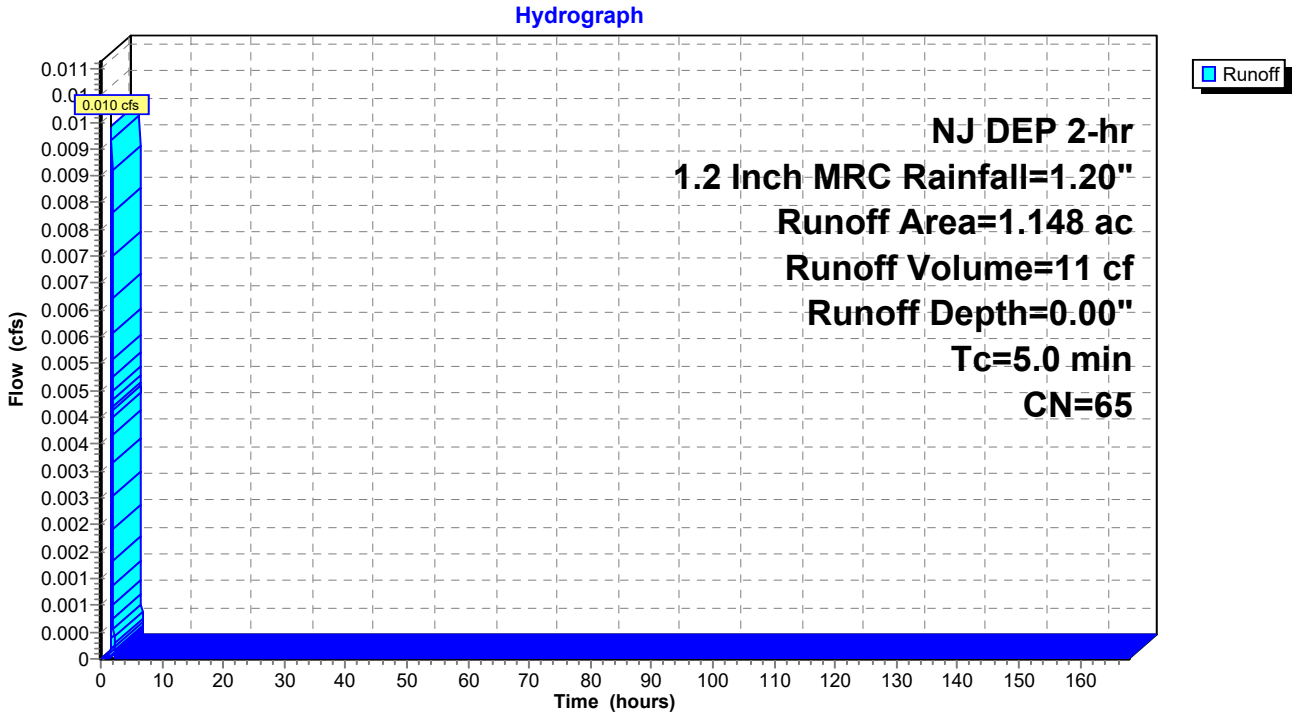
Runoff = 0.010 cfs @ 1.78 hrs, Volume= 11 cf, Depth= 0.00"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
NJ DEP 2-hr 1.2 Inch MRC Rainfall=1.20"

	Area (ac)	CN	Description
*	0.390	30	Meadow A
*	0.051	58	Meadow B
*	0.565	98	Impervious
*	0.125	30	Impervious as Meadow (A)
*	0.017	58	Impervious as Meadow (B)
	1.148	65	Weighted Average
	0.583		50.78% Pervious Area
	0.565		49.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Pre-Dev DA #2 Tc**

Subcatchment 5S: PRE-DEV POI#2 TO POI#1



Summary for Subcatchment 4S: PRE-DEV DA #1 TO POI#1

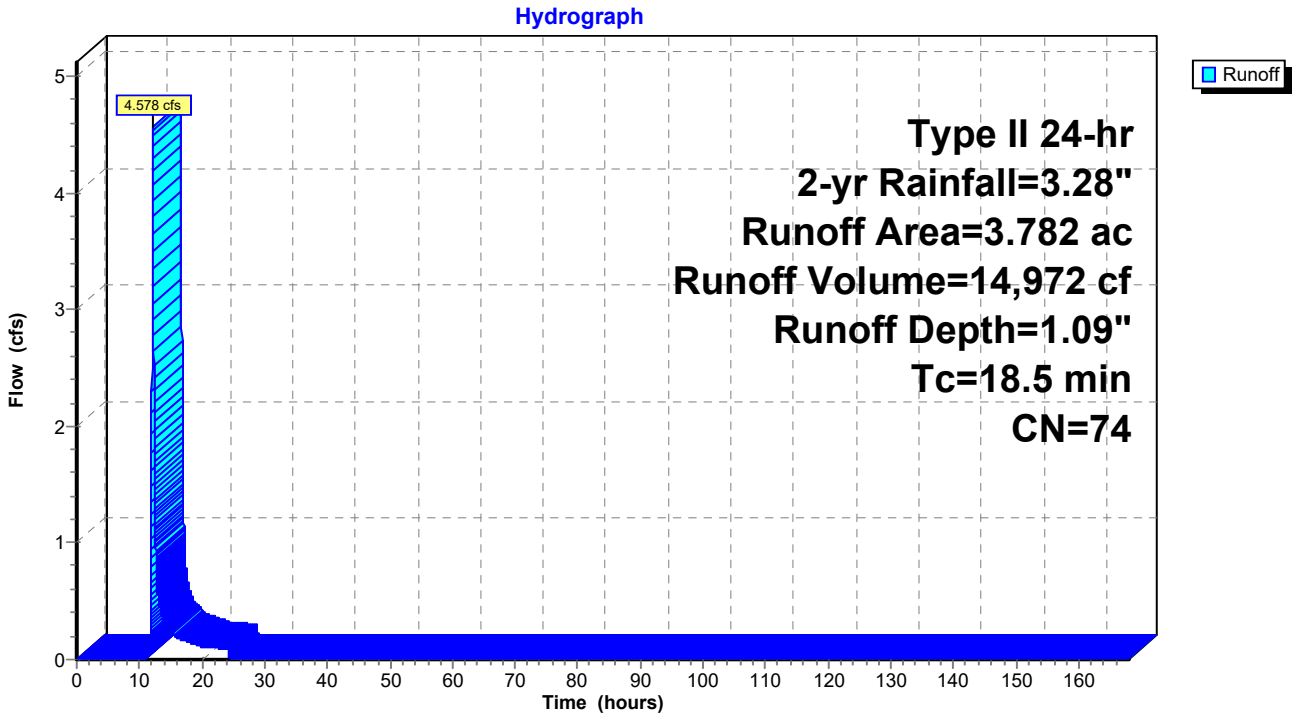
Runoff = 4.578 cfs @ 12.12 hrs, Volume= 14,972 cf, Depth= 1.09"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.466	30	Meadow A
*	0.282	30	Wooded A
*	0.024	58	Meadow B
*	2.410	98	Impervious
*	0.590	30	Impervious As Meadow (A)
*	0.010	58	Impervious as Meadow (B)
	3.782	74	Weighted Average
	1.372		36.28% Pervious Area
	2.410		63.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 4S: PRE-DEV DA #1 TO POI#1



Summary for Subcatchment 5S: PRE-DEV POI#2 TO POI#1

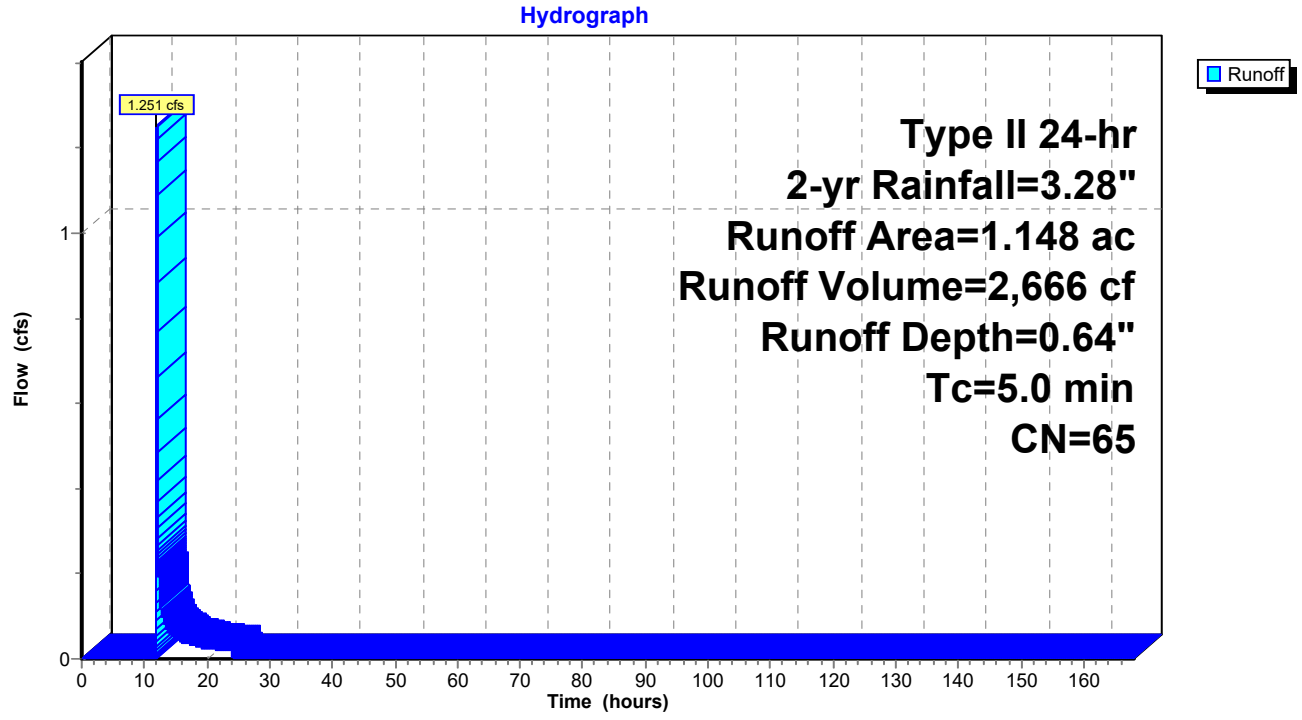
Runoff = 1.251 cfs @ 11.98 hrs, Volume= 2,666 cf, Depth= 0.64"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.390	30	Meadow A
*	0.051	58	Meadow B
*	0.565	98	Impervious
*	0.125	30	Impervious as Meadow (A)
*	0.017	58	Impervious as Meadow (B)
	1.148	65	Weighted Average
	0.583		50.78% Pervious Area
	0.565		49.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Pre-Dev DA #2 Tc**

Subcatchment 5S: PRE-DEV POI#2 TO POI#1



Summary for Subcatchment 4S: PRE-DEV DA #1 TO POI#1

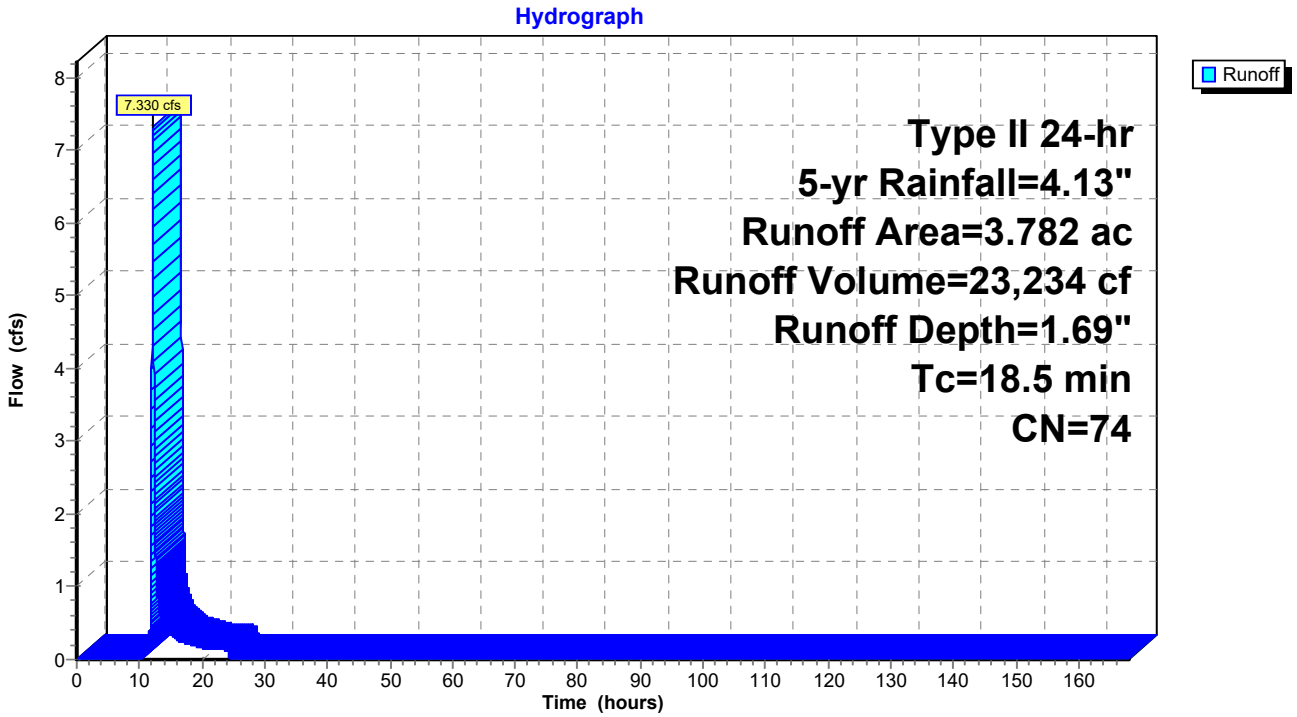
Runoff = 7.330 cfs @ 12.11 hrs, Volume= 23,234 cf, Depth= 1.69"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 5-yr Rainfall=4.13"

	Area (ac)	CN	Description
*	0.466	30	Meadow A
*	0.282	30	Wooded A
*	0.024	58	Meadow B
*	2.410	98	Impervious
*	0.590	30	Impervious As Meadow (A)
*	0.010	58	Impervious as Meadow (B)
	3.782	74	Weighted Average
	1.372		36.28% Pervious Area
	2.410		63.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 4S: PRE-DEV DA #1 TO POI#1



Summary for Subcatchment 5S: PRE-DEV POI#2 TO POI#1

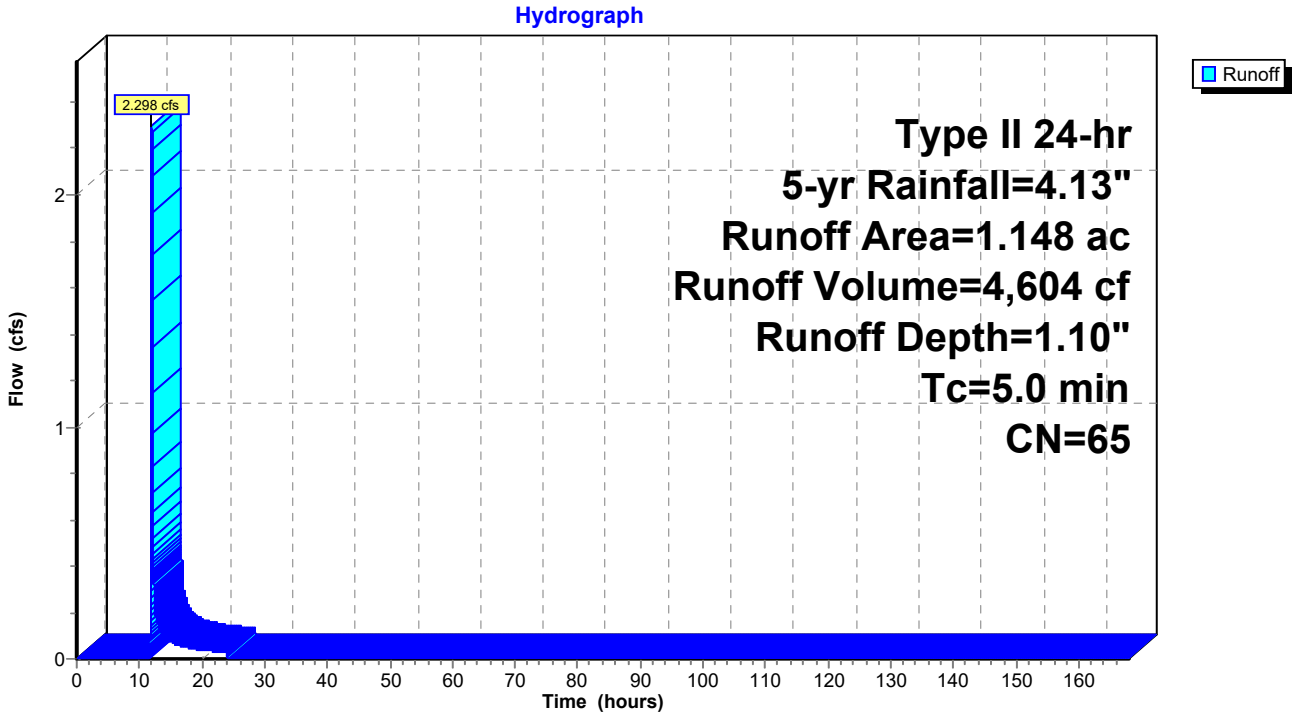
Runoff = 2.298 cfs @ 11.97 hrs, Volume= 4,604 cf, Depth= 1.10"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 5-yr Rainfall=4.13"

	Area (ac)	CN	Description
*	0.390	30	Meadow A
*	0.051	58	Meadow B
*	0.565	98	Impervious
*	0.125	30	Impervious as Meadow (A)
*	0.017	58	Impervious as Meadow (B)
	1.148	65	Weighted Average
	0.583		50.78% Pervious Area
	0.565		49.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Pre-Dev DA #2 Tc**

Subcatchment 5S: PRE-DEV POI#2 TO POI#1



Summary for Subcatchment 4S: PRE-DEV DA #1 TO POI#1

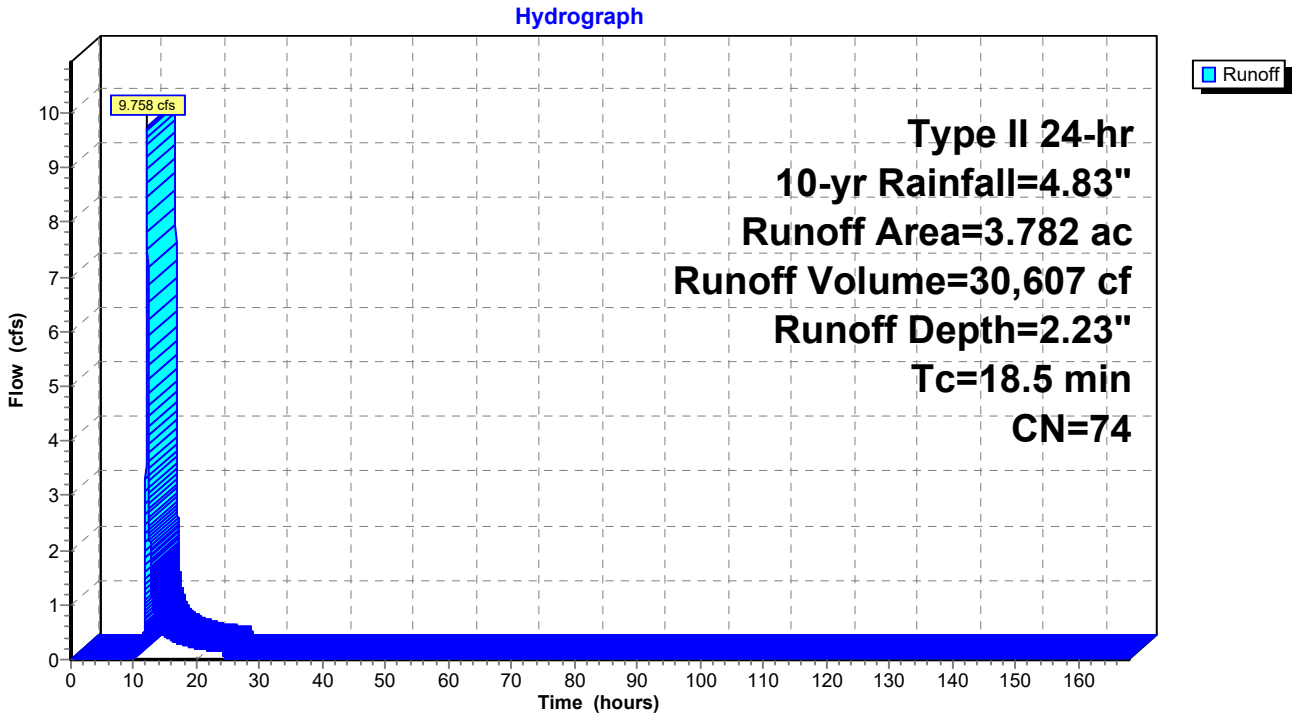
Runoff = 9.758 cfs @ 12.11 hrs, Volume= 30,607 cf, Depth= 2.23"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.466	30	Meadow A
*	0.282	30	Wooded A
*	0.024	58	Meadow B
*	2.410	98	Impervious
*	0.590	30	Impervious As Meadow (A)
*	0.010	58	Impervious as Meadow (B)
	3.782	74	Weighted Average
	1.372		36.28% Pervious Area
	2.410		63.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 4S: PRE-DEV DA #1 TO POI#1



Summary for Subcatchment 5S: PRE-DEV POI#2 TO POI#1

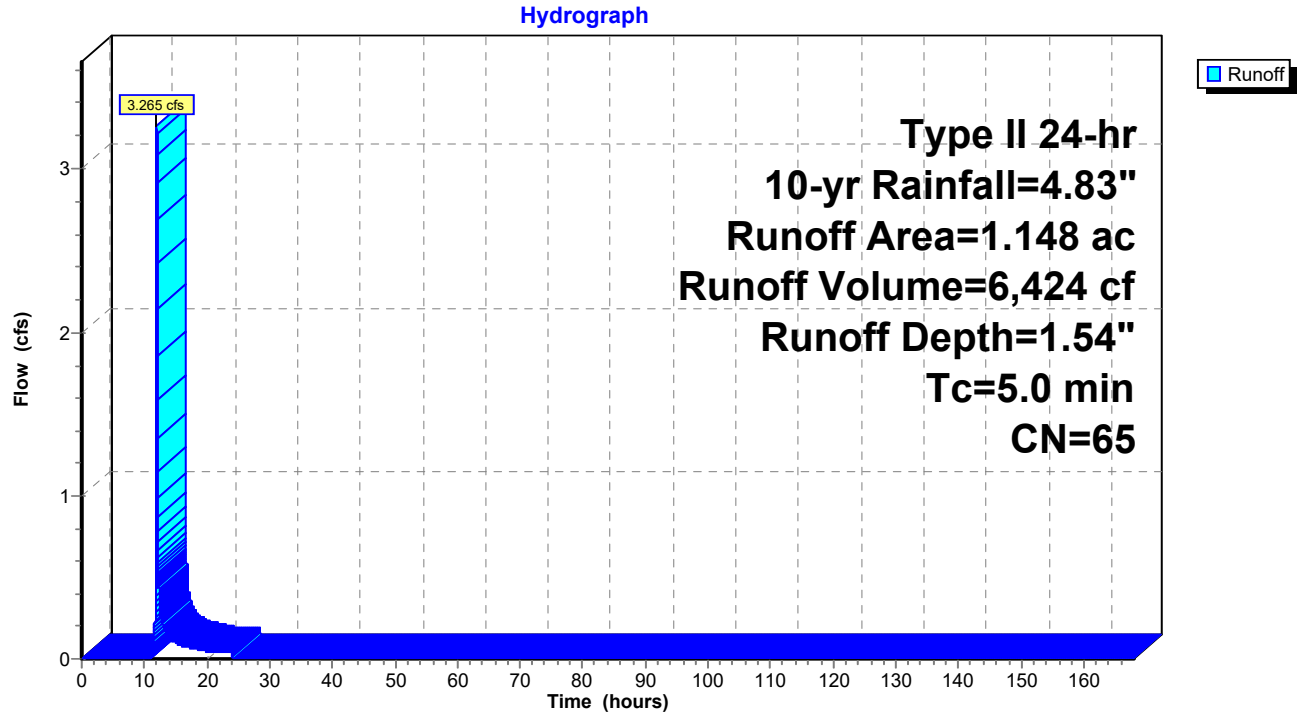
Runoff = 3.265 cfs @ 11.97 hrs, Volume= 6,424 cf, Depth= 1.54"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.390	30	Meadow A
*	0.051	58	Meadow B
*	0.565	98	Impervious
*	0.125	30	Impervious as Meadow (A)
*	0.017	58	Impervious as Meadow (B)
	1.148	65	Weighted Average
	0.583		50.78% Pervious Area
	0.565		49.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Pre-Dev DA #2 Tc**

Subcatchment 5S: PRE-DEV POI#2 TO POI#1



Summary for Subcatchment 4S: PRE-DEV DA #1 TO POI#1

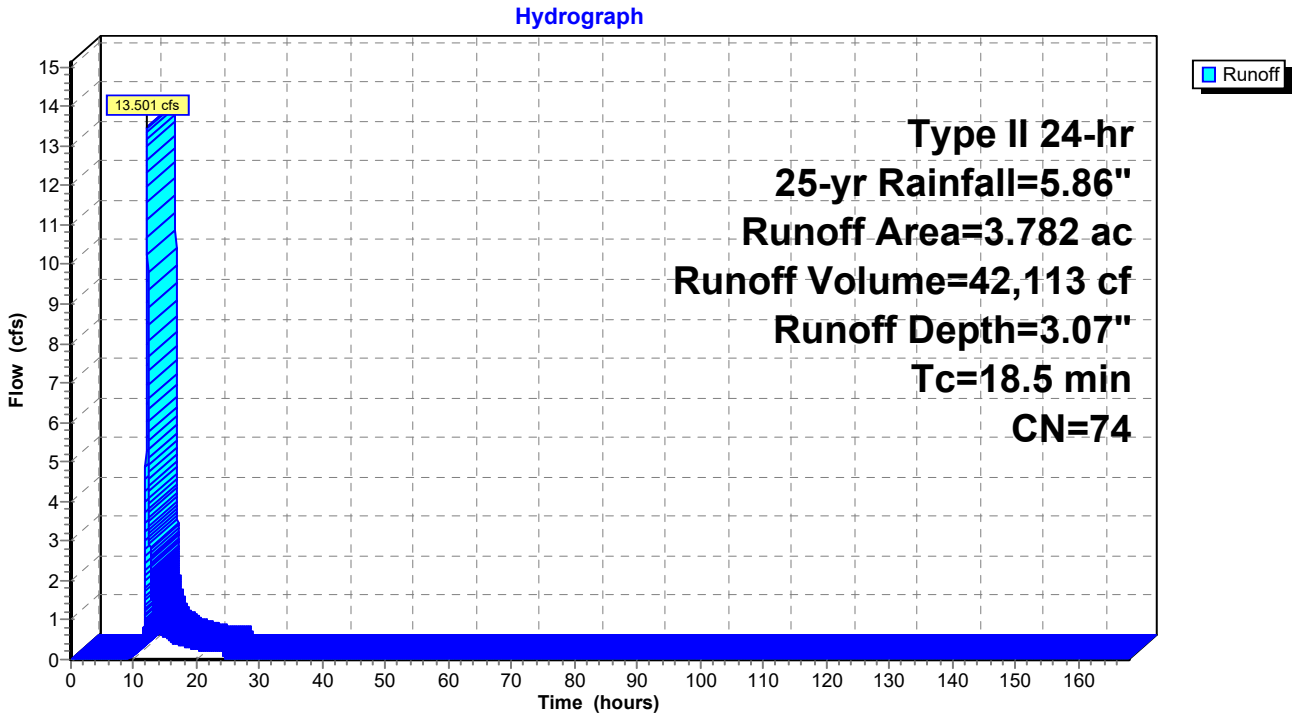
Runoff = 13.501 cfs @ 12.11 hrs, Volume= 42,113 cf, Depth= 3.07"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=5.86"

	Area (ac)	CN	Description
*	0.466	30	Meadow A
*	0.282	30	Wooded A
*	0.024	58	Meadow B
*	2.410	98	Impervious
*	0.590	30	Impervious As Meadow (A)
*	0.010	58	Impervious as Meadow (B)
	3.782	74	Weighted Average
	1.372		36.28% Pervious Area
	2.410		63.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 4S: PRE-DEV DA #1 TO POI#1



Summary for Subcatchment 5S: PRE-DEV POI#2 TO POI#1

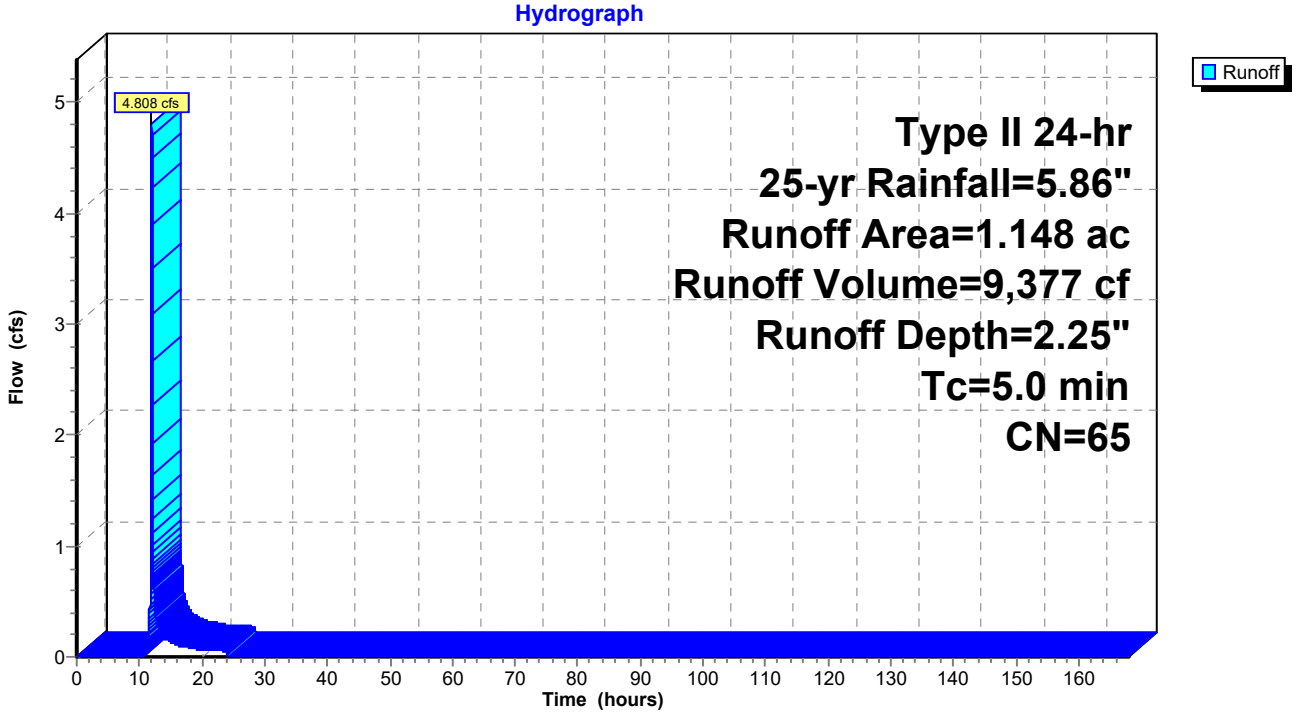
Runoff = 4.808 cfs @ 11.97 hrs, Volume= 9,377 cf, Depth= 2.25"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=5.86"

	Area (ac)	CN	Description
*	0.390	30	Meadow A
*	0.051	58	Meadow B
*	0.565	98	Impervious
*	0.125	30	Impervious as Meadow (A)
*	0.017	58	Impervious as Meadow (B)
	1.148	65	Weighted Average
	0.583		50.78% Pervious Area
	0.565		49.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Pre-Dev DA #2 Tc**

Subcatchment 5S: PRE-DEV POI#2 TO POI#1



Summary for Subcatchment 4S: PRE-DEV DA #1 TO POI#1

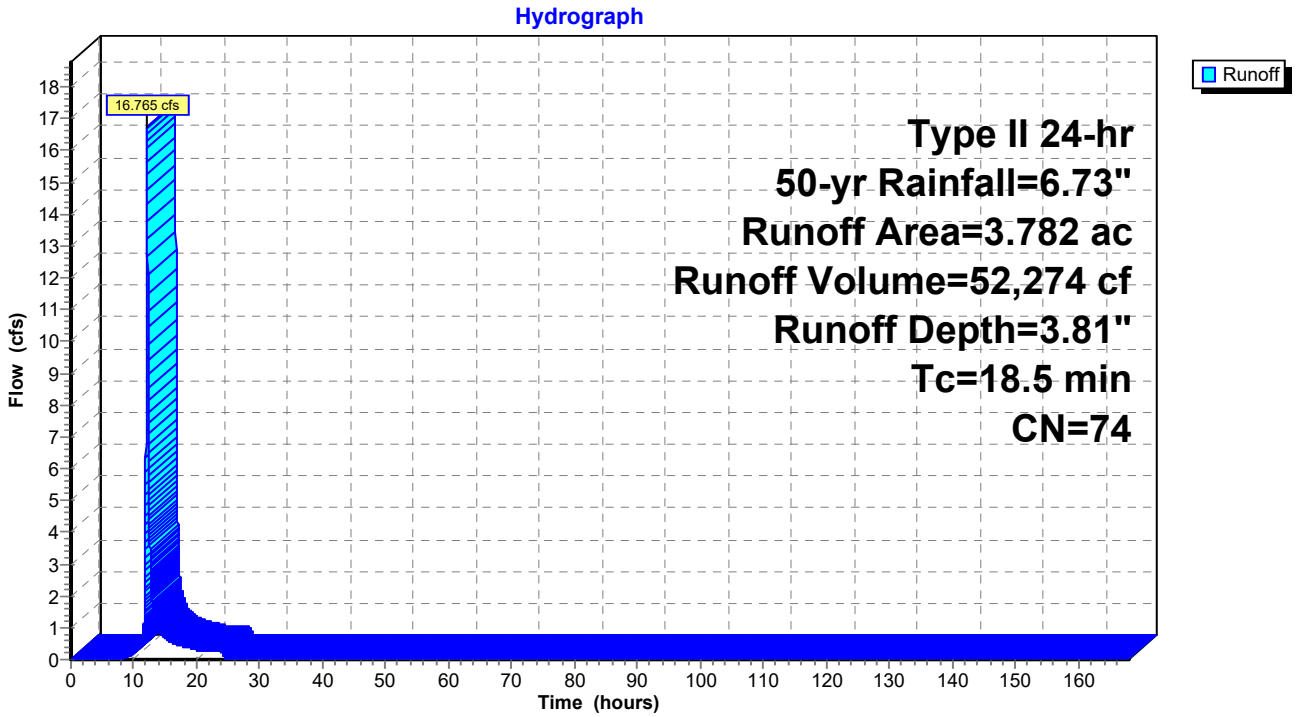
Runoff = 16.765 cfs @ 12.11 hrs, Volume= 52,274 cf, Depth= 3.81"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.466	30	Meadow A
*	0.282	30	Wooded A
*	0.024	58	Meadow B
*	2.410	98	Impervious
*	0.590	30	Impervious As Meadow (A)
*	0.010	58	Impervious as Meadow (B)
	3.782	74	Weighted Average
	1.372		36.28% Pervious Area
	2.410		63.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 4S: PRE-DEV DA #1 TO POI#1



Summary for Subcatchment 5S: PRE-DEV POI#2 TO POI#1

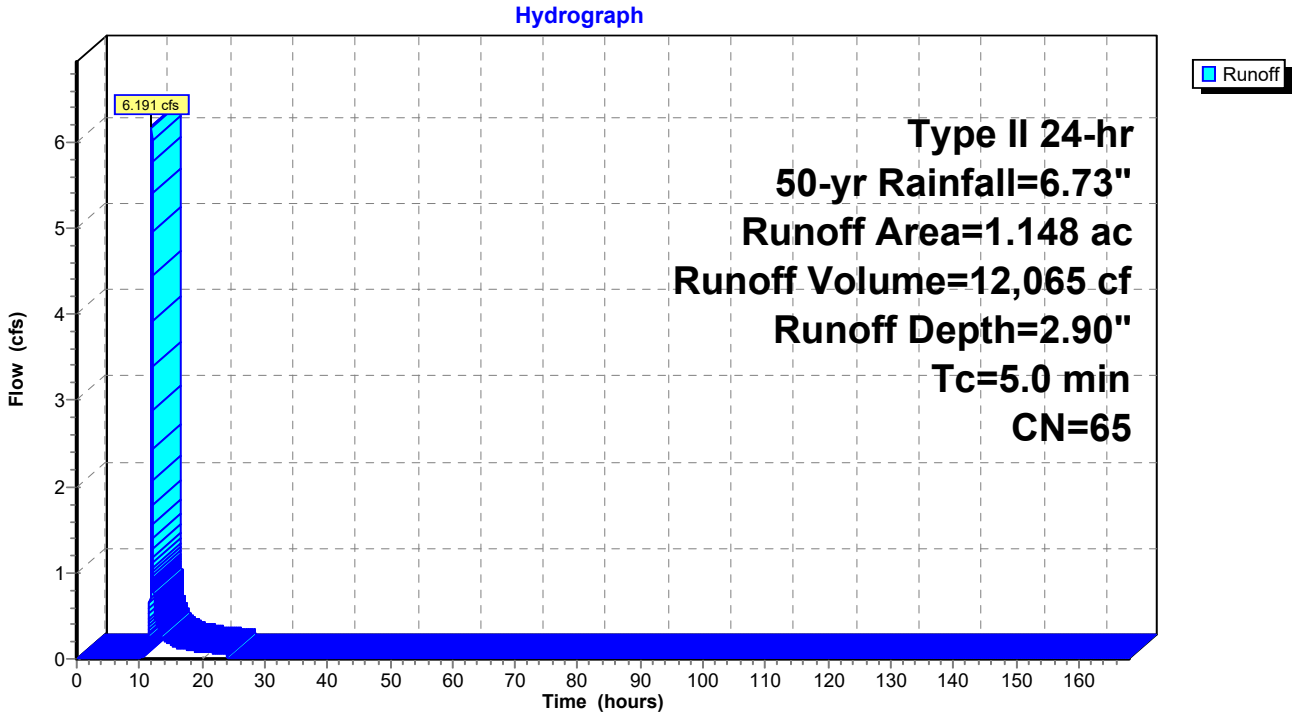
Runoff = 6.191 cfs @ 11.96 hrs, Volume= 12,065 cf, Depth= 2.90"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.390	30	Meadow A
*	0.051	58	Meadow B
*	0.565	98	Impervious
*	0.125	30	Impervious as Meadow (A)
*	0.017	58	Impervious as Meadow (B)
	1.148	65	Weighted Average
	0.583		50.78% Pervious Area
	0.565		49.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Pre-Dev DA #2 Tc**

Subcatchment 5S: PRE-DEV POI#2 TO POI#1



Summary for Subcatchment 4S: PRE-DEV DA #1 TO POI#1

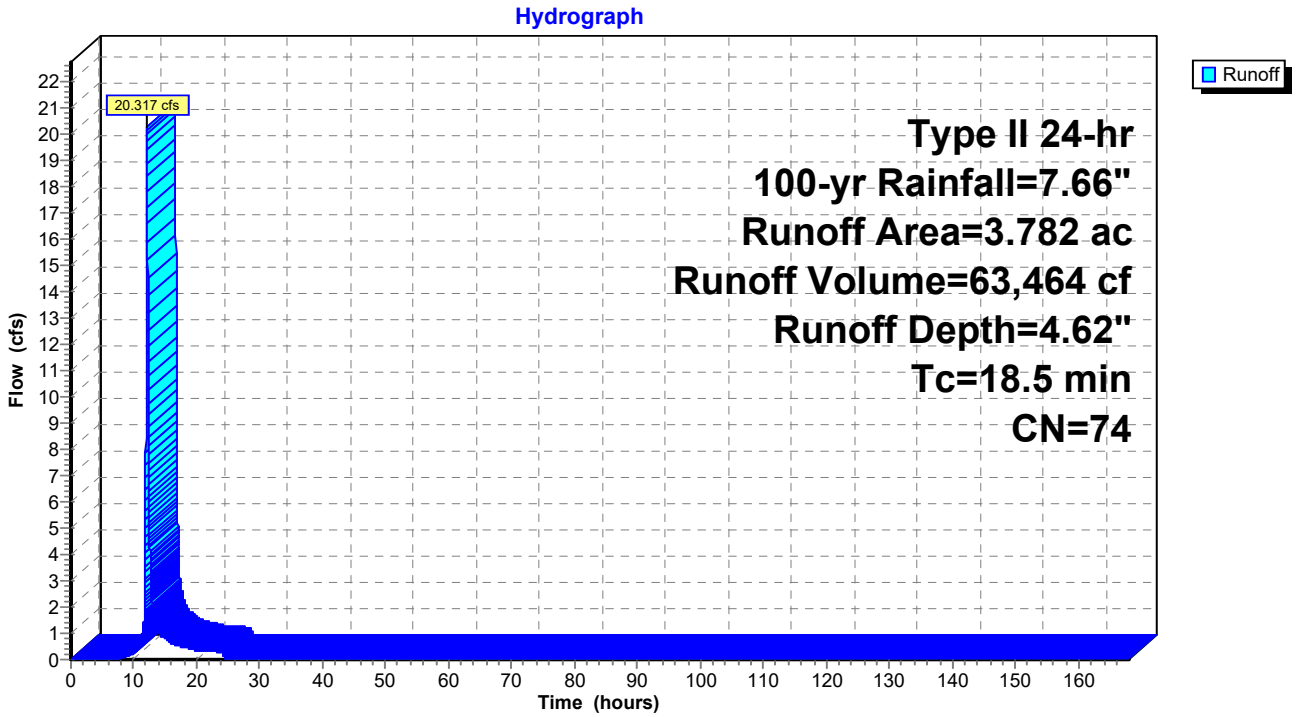
Runoff = 20.317 cfs @ 12.11 hrs, Volume= 63,464 cf, Depth= 4.62"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.466	30	Meadow A
*	0.282	30	Wooded A
*	0.024	58	Meadow B
*	2.410	98	Impervious
*	0.590	30	Impervious As Meadow (A)
*	0.010	58	Impervious as Meadow (B)
	3.782	74	Weighted Average
	1.372		36.28% Pervious Area
	2.410		63.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 4S: PRE-DEV DA #1 TO POI#1



Summary for Subcatchment 5S: PRE-DEV POI#2 TO POI#1

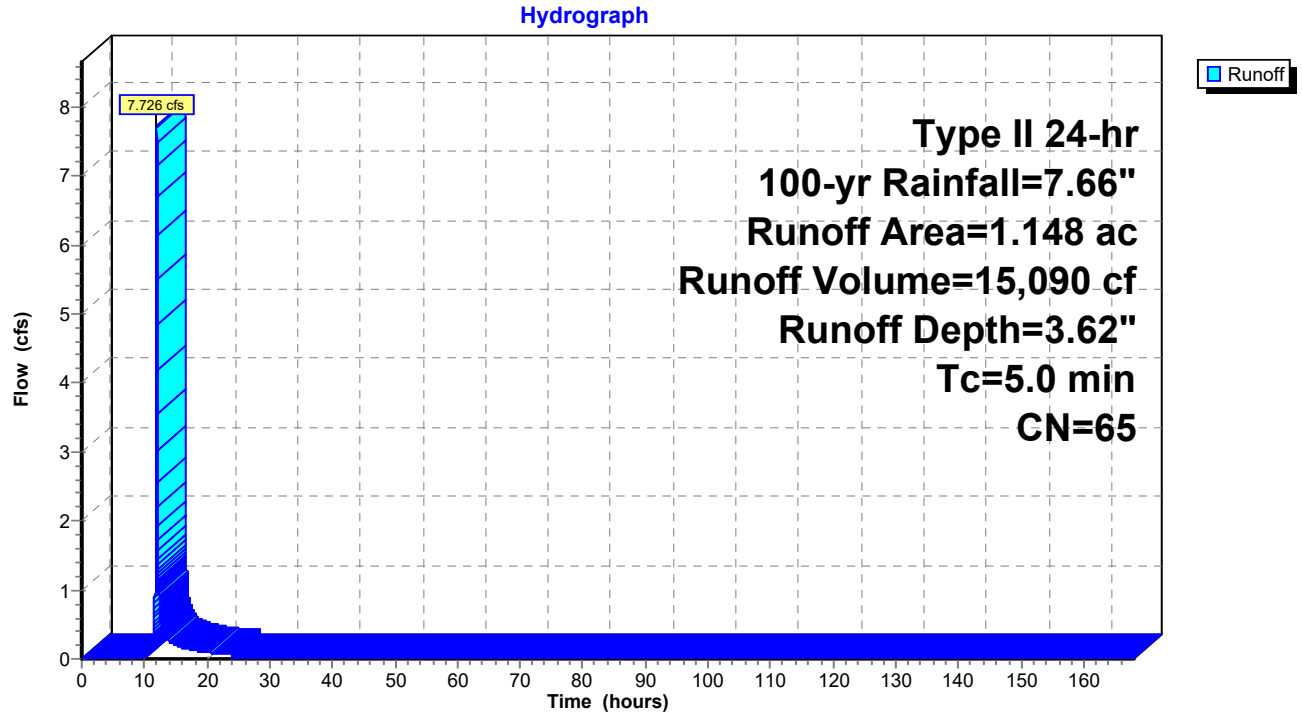
Runoff = 7.726 cfs @ 11.96 hrs, Volume= 15,090 cf, Depth= 3.62"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.390	30	Meadow A
*	0.051	58	Meadow B
*	0.565	98	Impervious
*	0.125	30	Impervious as Meadow (A)
*	0.017	58	Impervious as Meadow (B)
	1.148	65	Weighted Average
	0.583		50.78% Pervious Area
	0.565		49.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Pre-Dev DA #2 Tc**

Subcatchment 5S: PRE-DEV POI#2 TO POI#1





PRE-DEV TO POI#1

Subcat Reach Pond Link

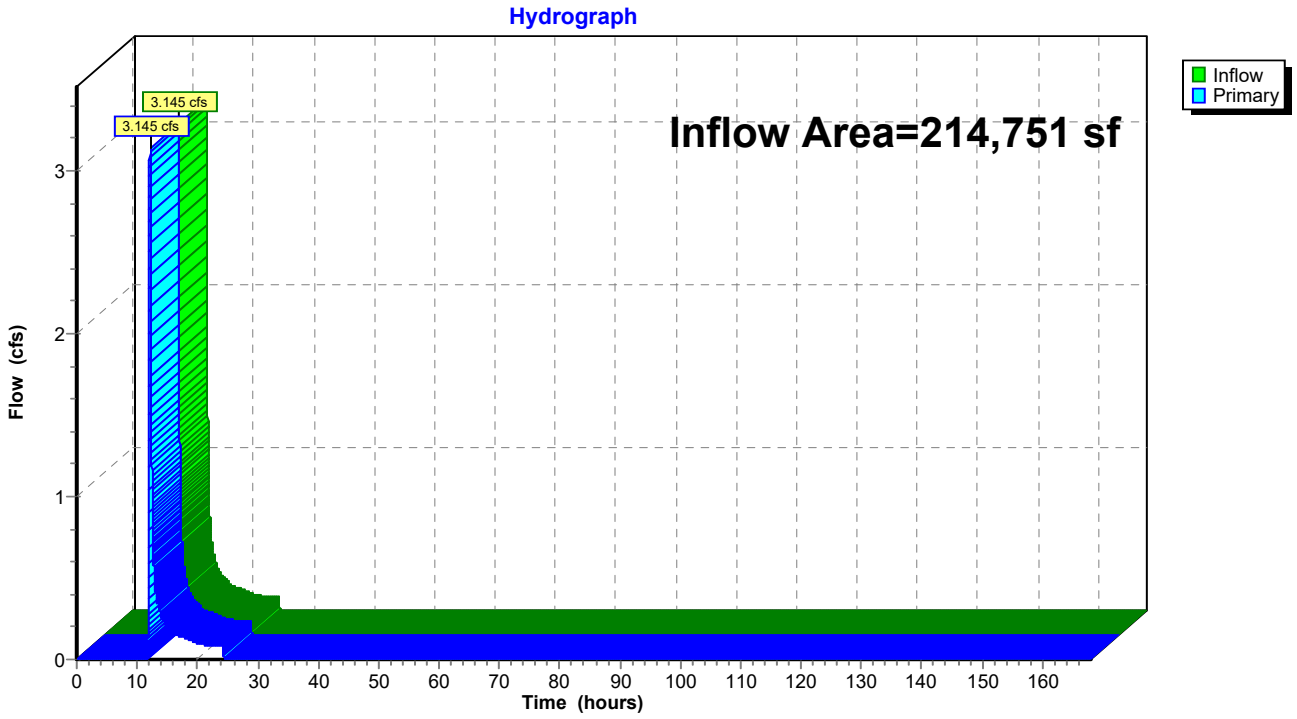
Routing Diagram for BMW_2025-7-24_2
Prepared by Bohler, Printed 7/24/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Summary for Link 6L: PRE-DEV TO POI#1

Inflow Area = 214,751 sf, 60.34% Impervious, Inflow Depth = 0.66" for 1-yr event
Inflow = 3.145 cfs @ 12.12 hrs, Volume= 11,801 cf
Primary = 3.145 cfs @ 12.12 hrs, Volume= 11,801 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 6L: PRE-DEV TO POI#1

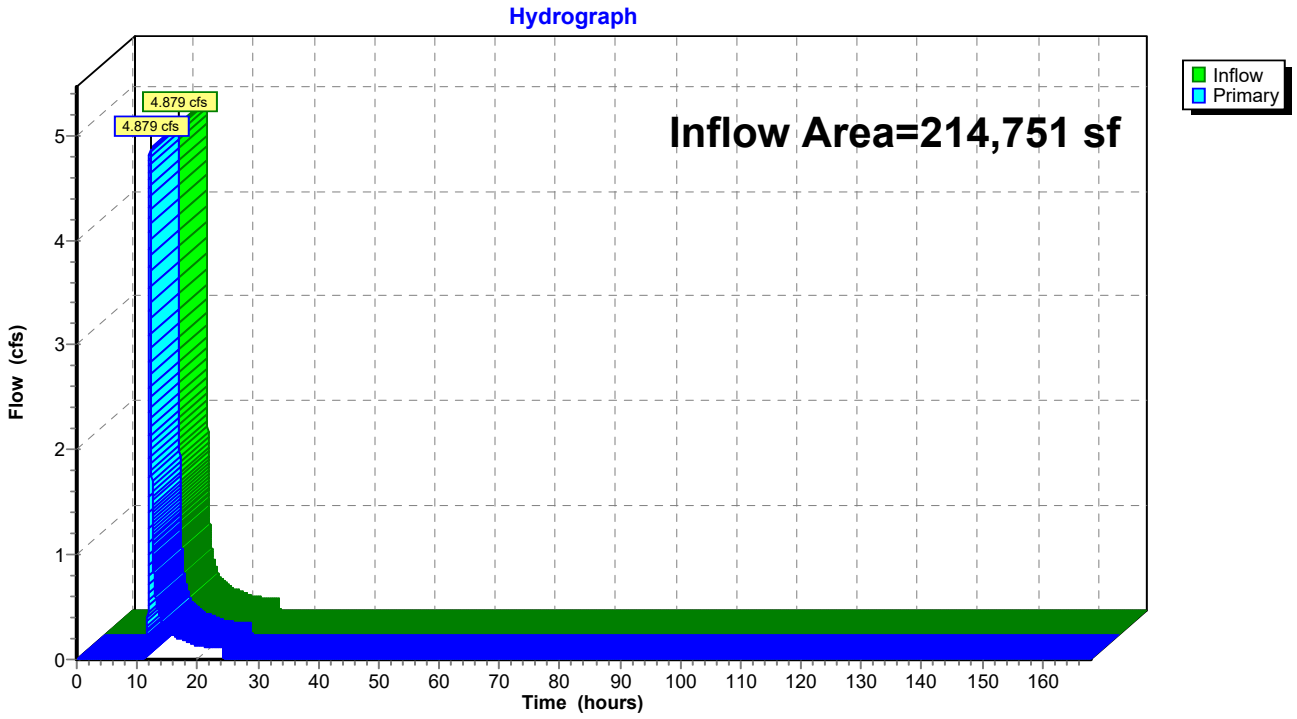


Summary for Link 6L: PRE-DEV TO POI#1

Inflow Area = 214,751 sf, 60.34% Impervious, Inflow Depth = 0.99" for 2-yr event
Inflow = 4.879 cfs @ 12.11 hrs, Volume= 17,638 cf
Primary = 4.879 cfs @ 12.11 hrs, Volume= 17,638 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 6L: PRE-DEV TO POI#1

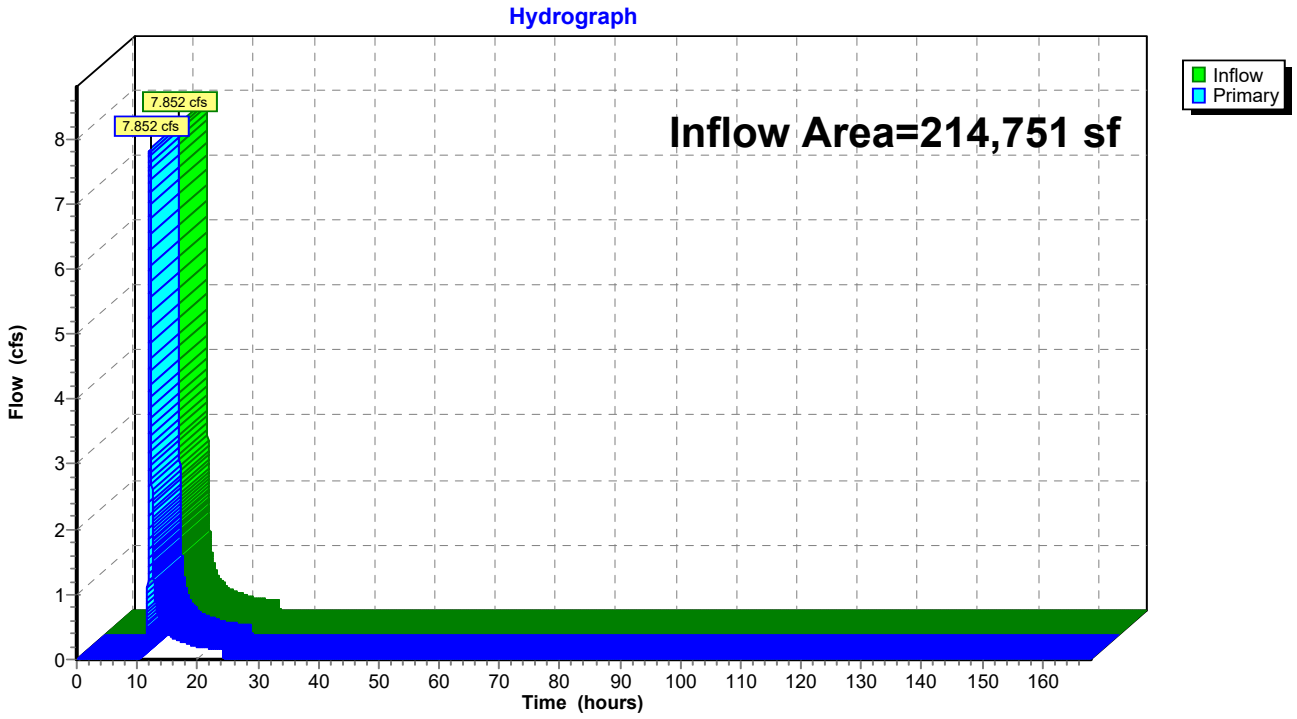


Summary for Link 6L: PRE-DEV TO POI#1

Inflow Area = 214,751 sf, 60.34% Impervious, Inflow Depth = 1.56" for 5-yr event
Inflow = 7.852 cfs @ 12.11 hrs, Volume= 27,837 cf
Primary = 7.852 cfs @ 12.11 hrs, Volume= 27,837 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 6L: PRE-DEV TO POI#1

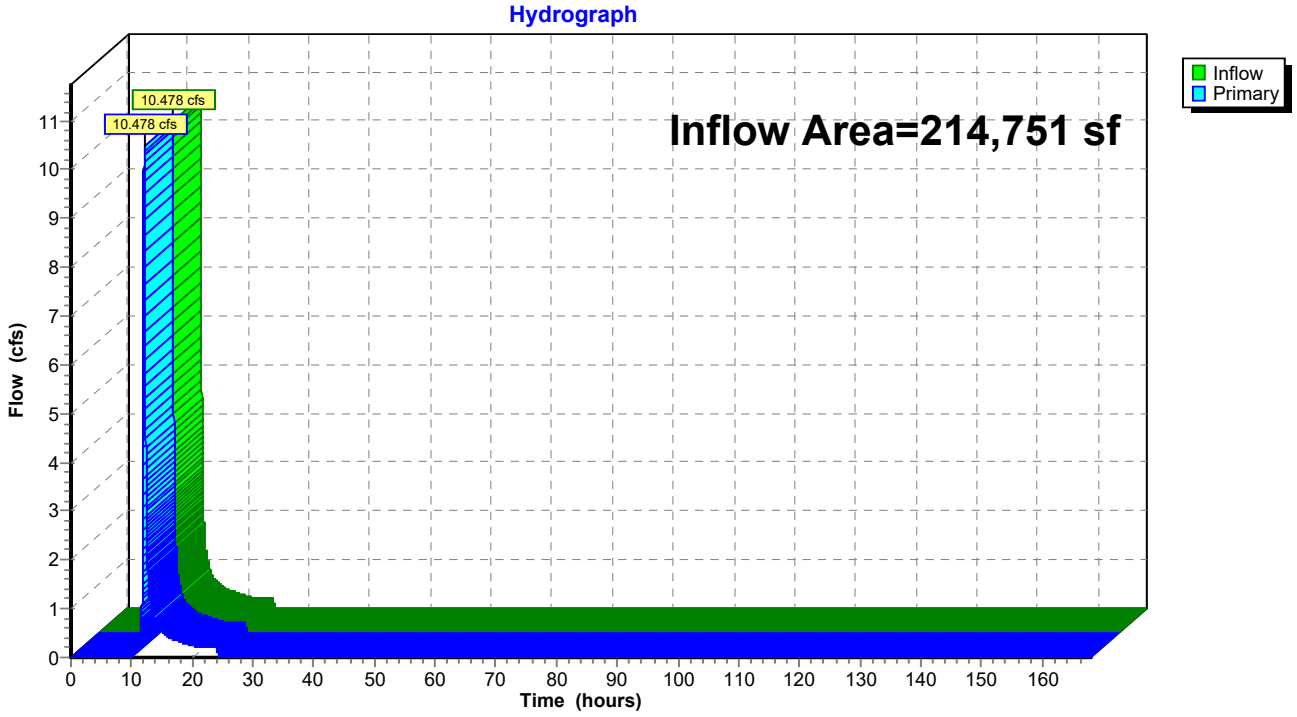


Summary for Link 6L: PRE-DEV TO POI#1

Inflow Area = 214,751 sf, 60.34% Impervious, Inflow Depth = 2.07" for 10-yr event
Inflow = 10.478 cfs @ 12.10 hrs, Volume= 37,031 cf
Primary = 10.478 cfs @ 12.10 hrs, Volume= 37,031 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 6L: PRE-DEV TO POI#1

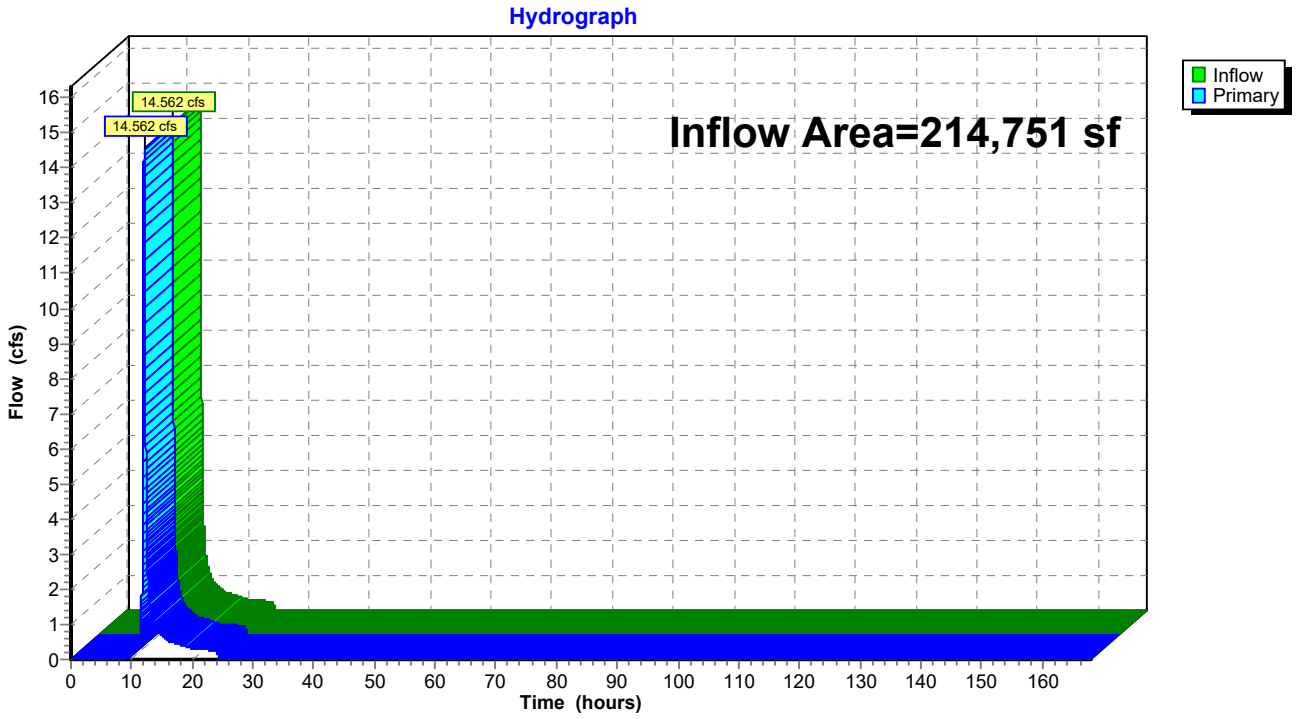


Summary for Link 6L: PRE-DEV TO POI#1

Inflow Area = 214,751 sf, 60.34% Impervious, Inflow Depth = 2.88" for 25-yr event
Inflow = 14.562 cfs @ 12.09 hrs, Volume= 51,489 cf
Primary = 14.562 cfs @ 12.09 hrs, Volume= 51,489 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 6L: PRE-DEV TO POI#1

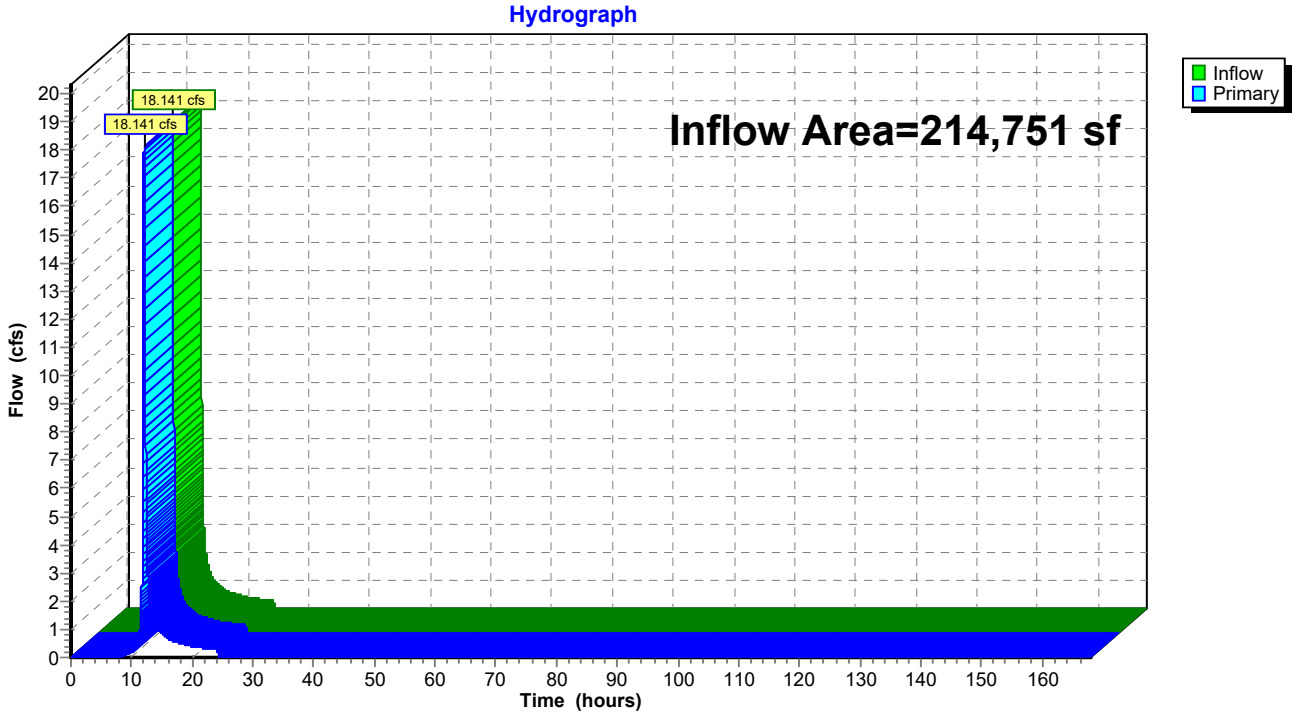


Summary for Link 6L: PRE-DEV TO POI#1

Inflow Area = 214,751 sf, 60.34% Impervious, Inflow Depth = 3.60" for 50-yr event
Inflow = 18.141 cfs @ 12.09 hrs, Volume= 64,340 cf
Primary = 18.141 cfs @ 12.09 hrs, Volume= 64,340 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 6L: PRE-DEV TO POI#1

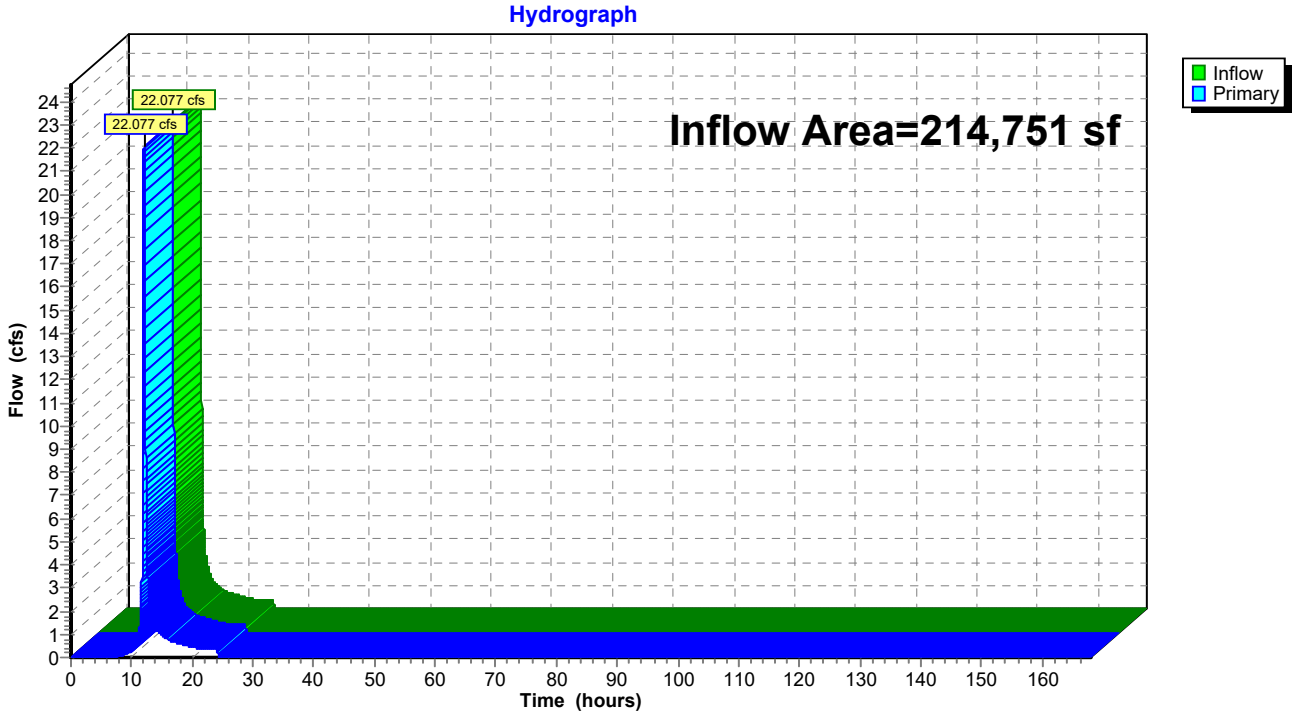


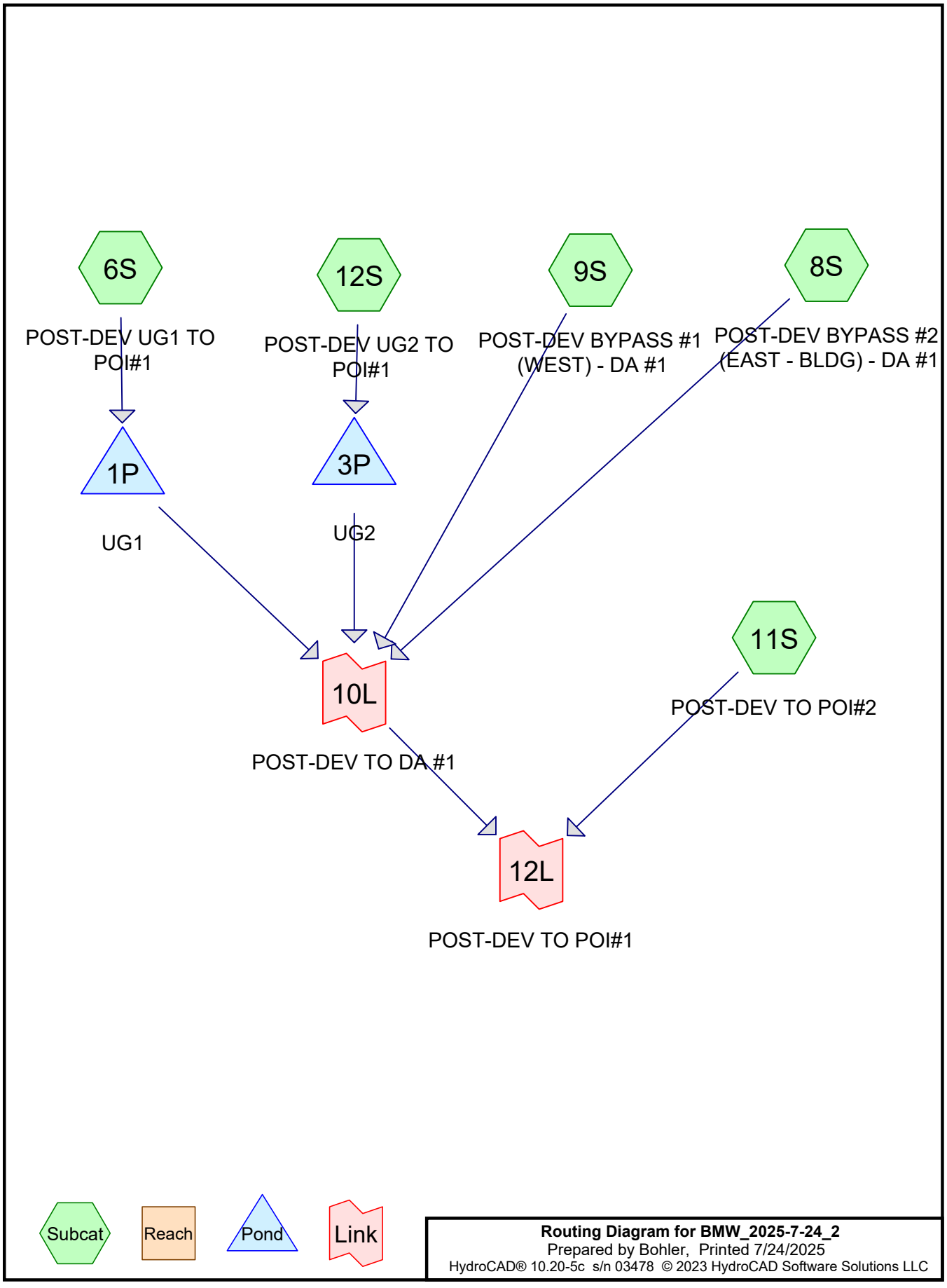
Summary for Link 6L: PRE-DEV TO POI#1

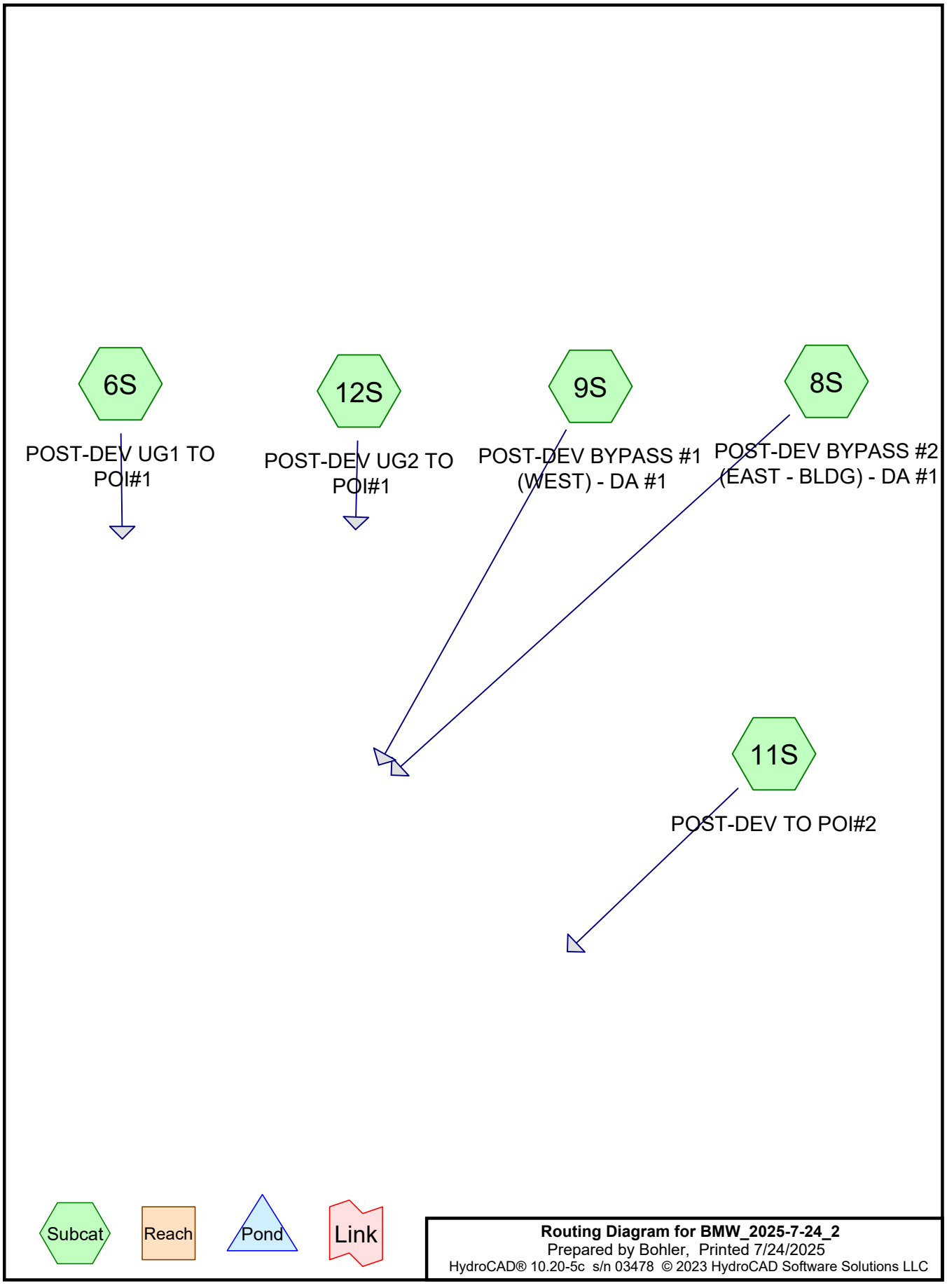
Inflow Area = 214,751 sf, 60.34% Impervious, Inflow Depth = 4.39" for 100-yr event
Inflow = 22.077 cfs @ 12.07 hrs, Volume= 78,554 cf
Primary = 22.077 cfs @ 12.07 hrs, Volume= 78,554 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 6L: PRE-DEV TO POI#1




6S
POST-DEV UG1 TO POI#1
12S
POST-DEV UG2 TO POI#1
9S
POST-DEV BYPASS #1 (WEST) - DA #1
8S
POST-DEV BYPASS #2 (EAST - BLDG) - DA #1
1P
UG1
3P
UG2
10L
POST-DEV TO DA #1
11S
POST-DEV TO POI#2
12L
POST-DEV TO POI#1
Subcat
Reach
Pond
Link
Routing Diagram for BMW_2025-7-24_2
Prepared by Bohler, Printed 7/24/2025
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6S
POST-DEV UG1 TO POI#1
12S
POST-DEV UG2 TO POI#1
9S
POST-DEV BYPASS #1 (WEST) - DA #1
8S
POST-DEV BYPASS #2 (EAST - BLDG) - DA #1
11S
POST-DEV TO POI#2
Subcat
Reach
Pond
Link
Routing Diagram for BMW_2025-7-24_2
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Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
157,992	98	Impervious (6S, 8S, 9S, 11S, 12S)
37,505	39	Lawn A (6S, 9S, 11S, 12S)
4,661	61	Lawn B (11S)
12,415	30	Wooded A (9S)
212,573	**83**	**TOTAL AREA**

Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

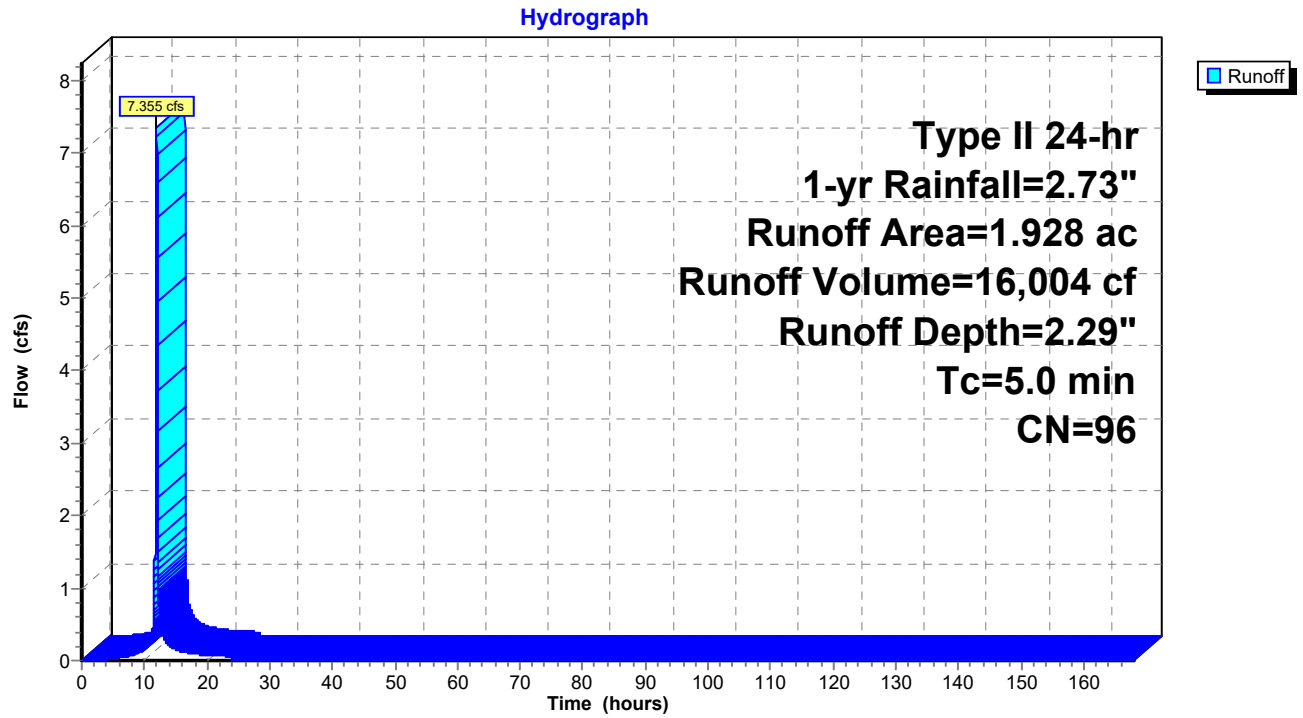
Runoff = 7.355 cfs @ 11.96 hrs, Volume= 16,004 cf, Depth= 2.29"
Routed to Pond 1P : UG1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-yr Rainfall=2.73"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928	96	Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: POST-DEV UG1 TO POI#1



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Summary for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

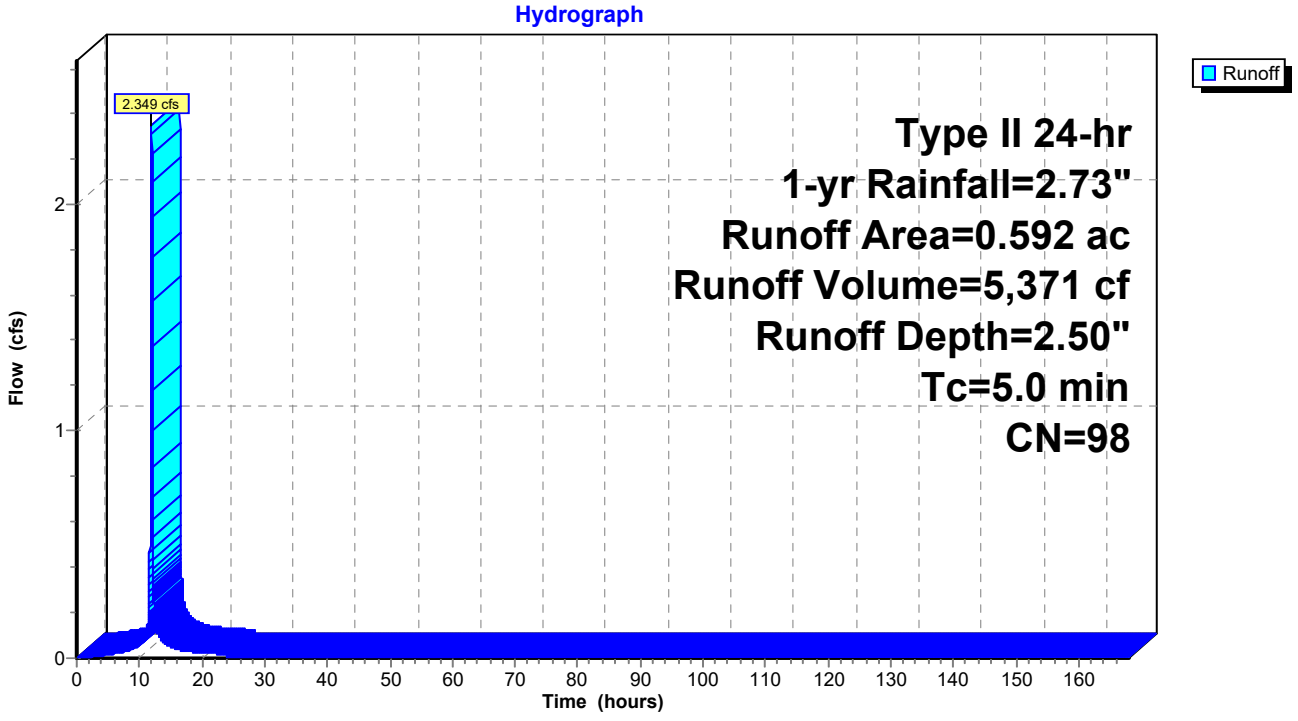
Runoff = 2.349 cfs @ 11.96 hrs, Volume= 5,371 cf, Depth= 2.50"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-yr Rainfall=2.73"

	Area (ac)	CN	Description
*	0.000	39	Lawn A
*	0.592	98	Impervious
	0.592	98	Weighted Average
	0.592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1



Summary for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

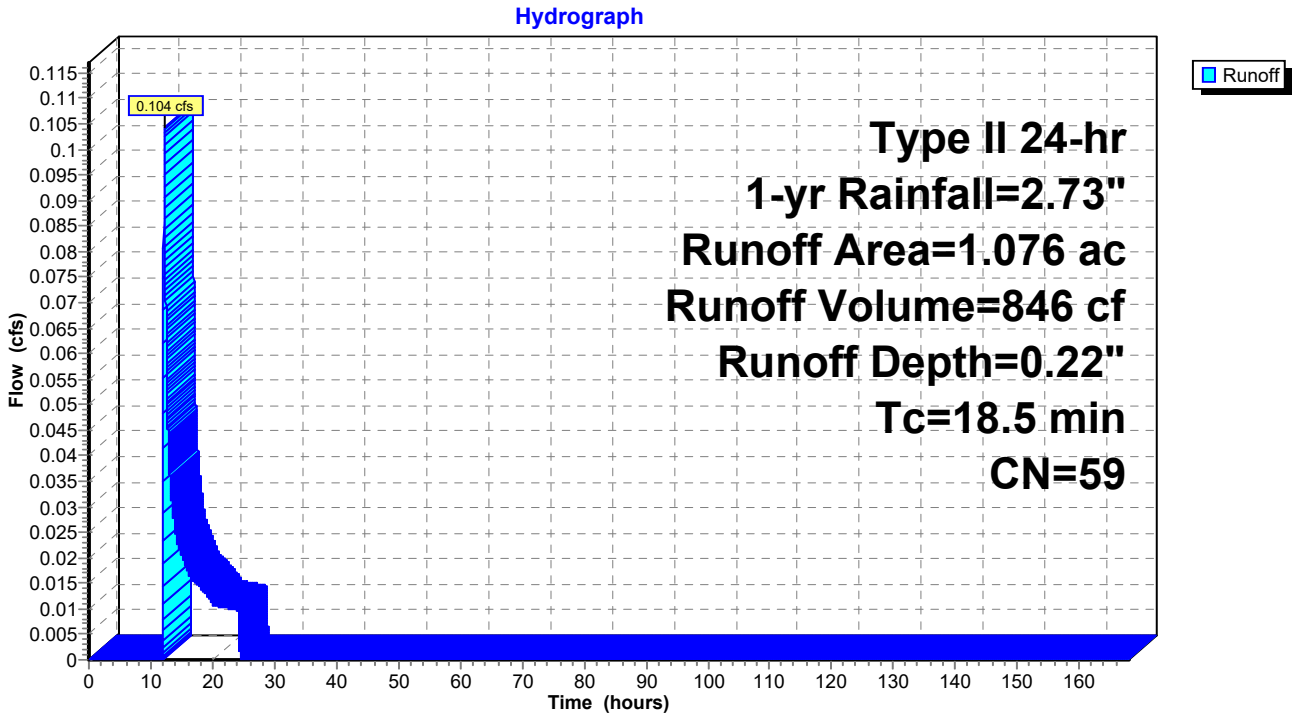
Runoff = 0.104 cfs @ 12.19 hrs, Volume= 846 cf, Depth= 0.22"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-yr Rainfall=2.73"

	Area (ac)	CN	Description
*	0.389	39	Lawn A
*	0.285	30	Wooded A
*	0.402	98	Impervious
	1.076	59	Weighted Average
	0.674		62.64% Pervious Area
	0.402		37.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1



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Summary for Subcatchment 11S: POST-DEV TO POI#2

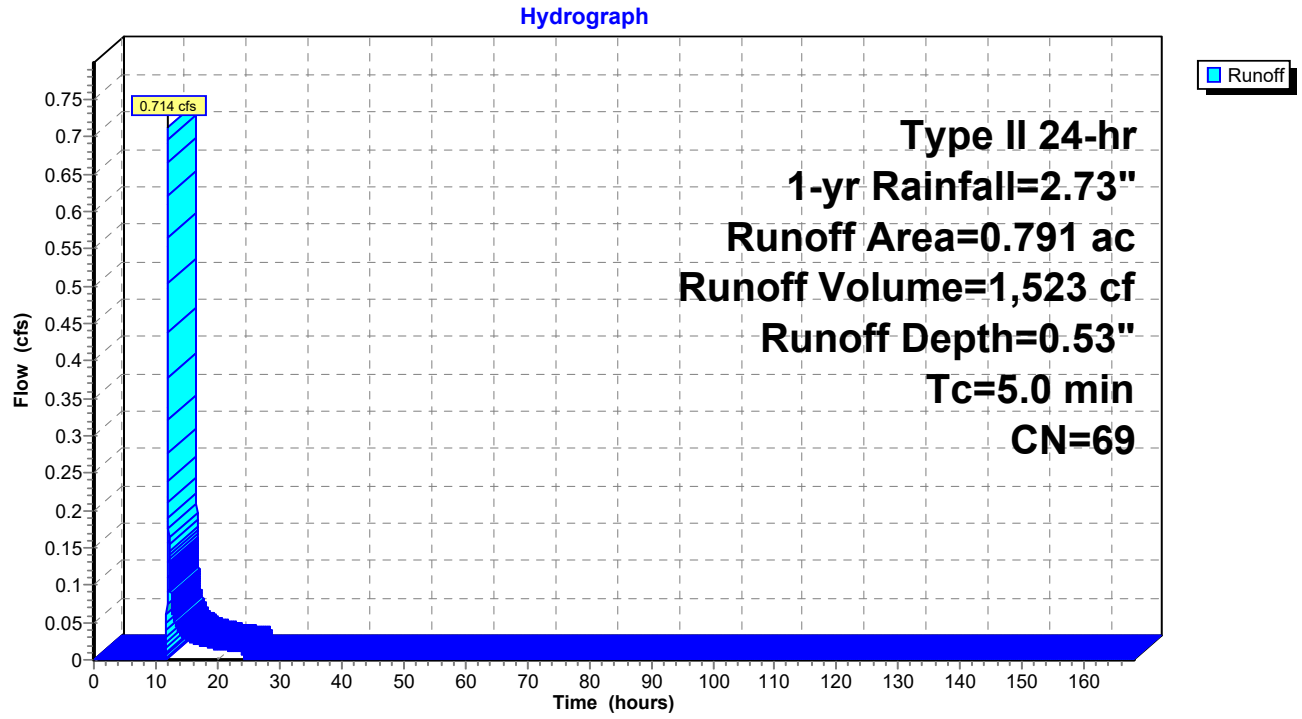
Runoff = 0.714 cfs @ 11.98 hrs, Volume= 1,523 cf, Depth= 0.53"
Routed to Link 12L : POST-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-yr Rainfall=2.73"

	Area (ac)	CN	Description
*	0.318	39	Lawn A
*	0.107	61	Lawn B
*	0.366	98	Impervious
	0.791	69	Weighted Average
	0.425		53.73% Pervious Area
	0.366		46.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 11S: POST-DEV TO POI#2



Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

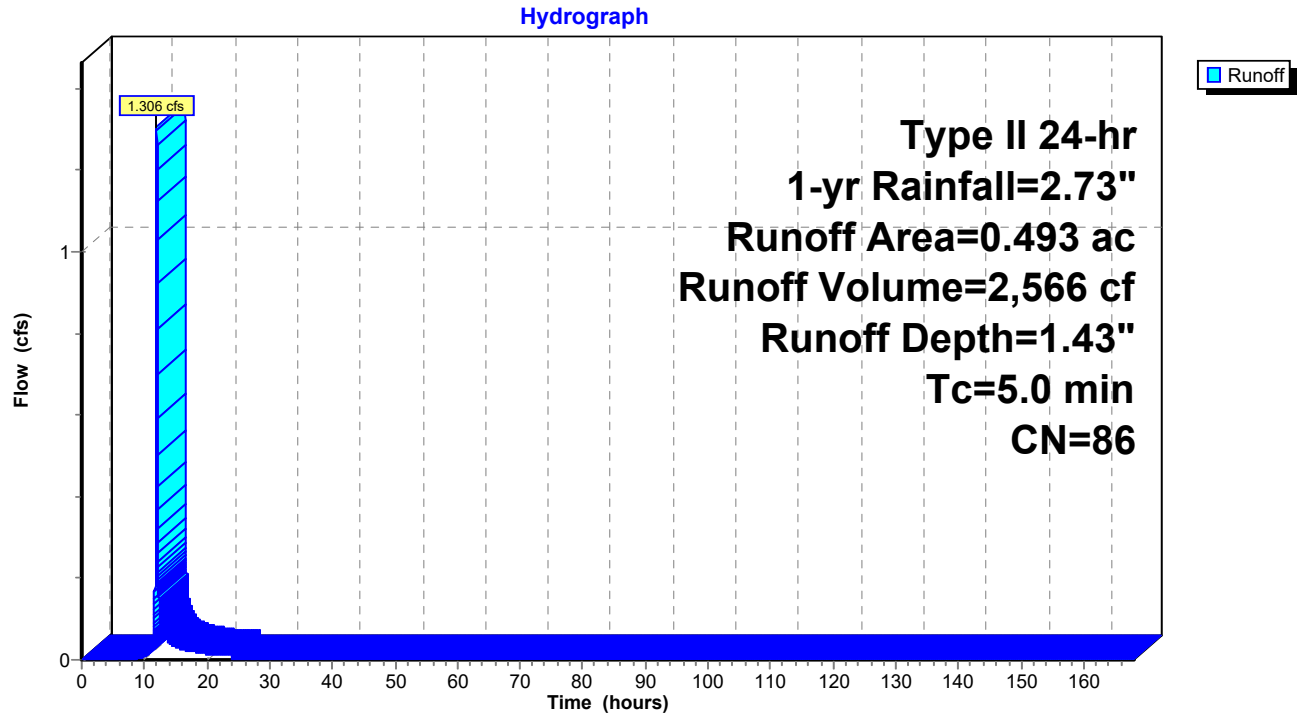
Runoff = 1.306 cfs @ 11.96 hrs, Volume= 2,566 cf, Depth= 1.43"
Routed to Pond 3P : UG2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-yr Rainfall=2.73"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493	86	Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 12S: POST-DEV UG2 TO POI#1



Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

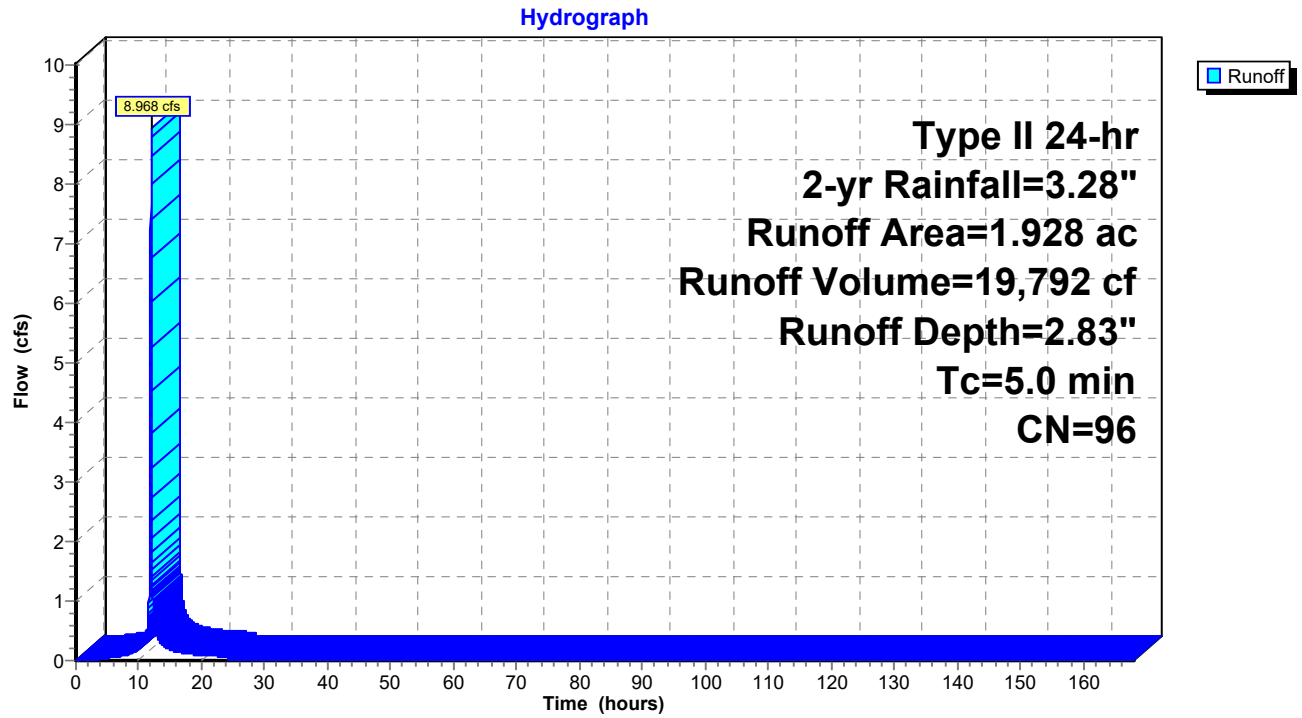
Runoff = 8.968 cfs @ 11.96 hrs, Volume= 19,792 cf, Depth= 2.83"
Routed to Pond 1P : UG1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928	96	Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: POST-DEV UG1 TO POI#1



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Summary for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

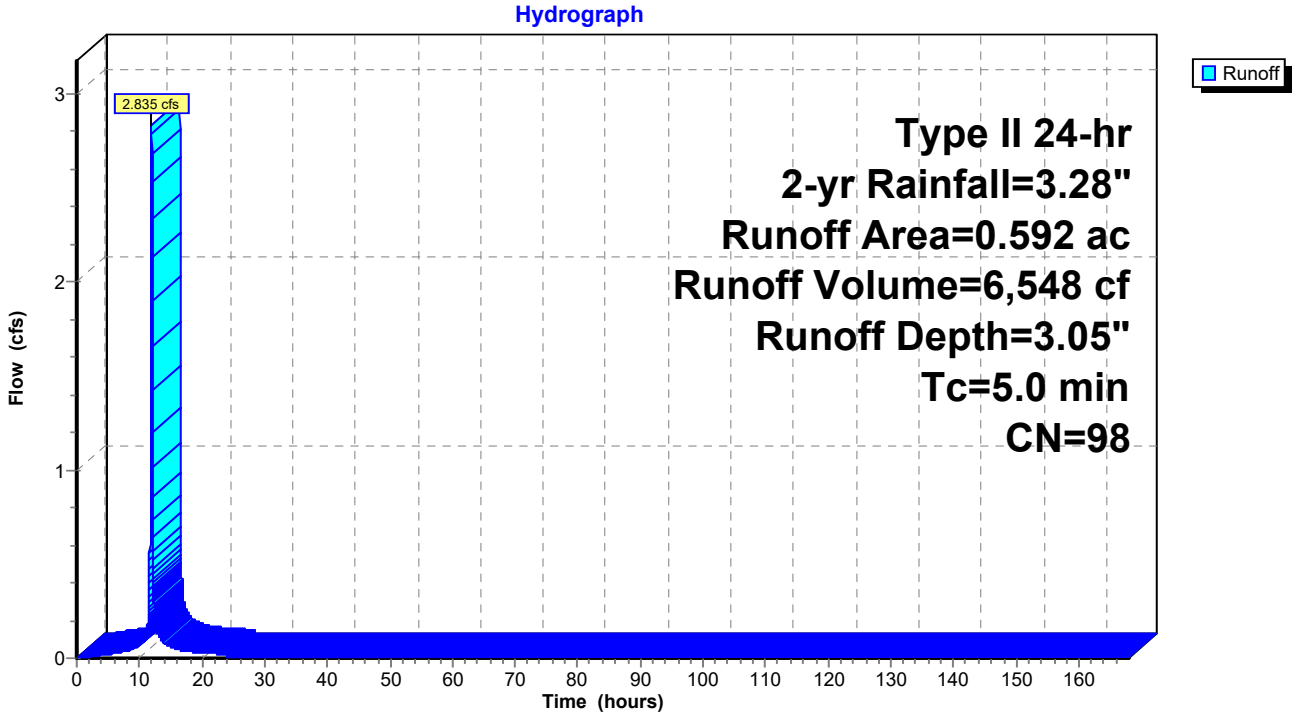
Runoff = 2.835 cfs @ 11.96 hrs, Volume= 6,548 cf, Depth= 3.05"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.000	39	Lawn A
*	0.592	98	Impervious
	0.592	98	Weighted Average
	0.592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1



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Summary for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

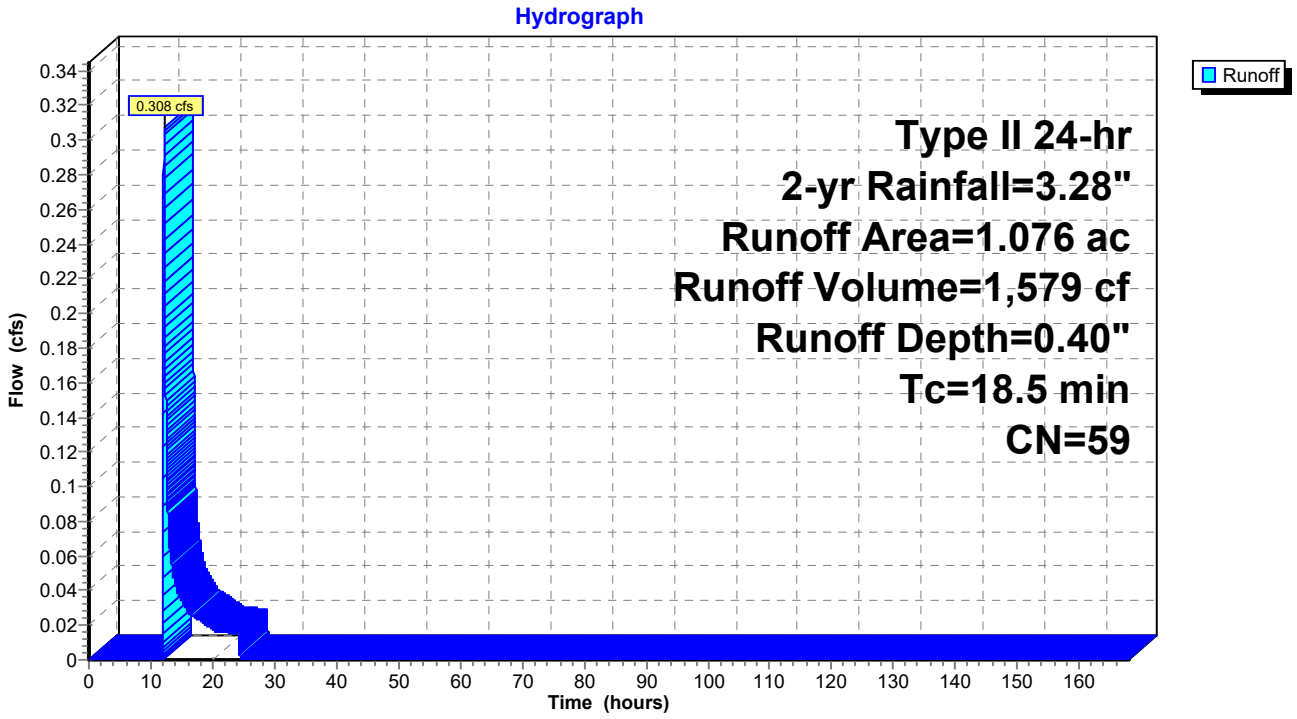
Runoff = 0.308 cfs @ 12.16 hrs, Volume= 1,579 cf, Depth= 0.40"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.389	39	Lawn A
*	0.285	30	Wooded A
*	0.402	98	Impervious
	1.076	59	Weighted Average
	0.674		62.64% Pervious Area
	0.402		37.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1



Summary for Subcatchment 11S: POST-DEV TO POI#2

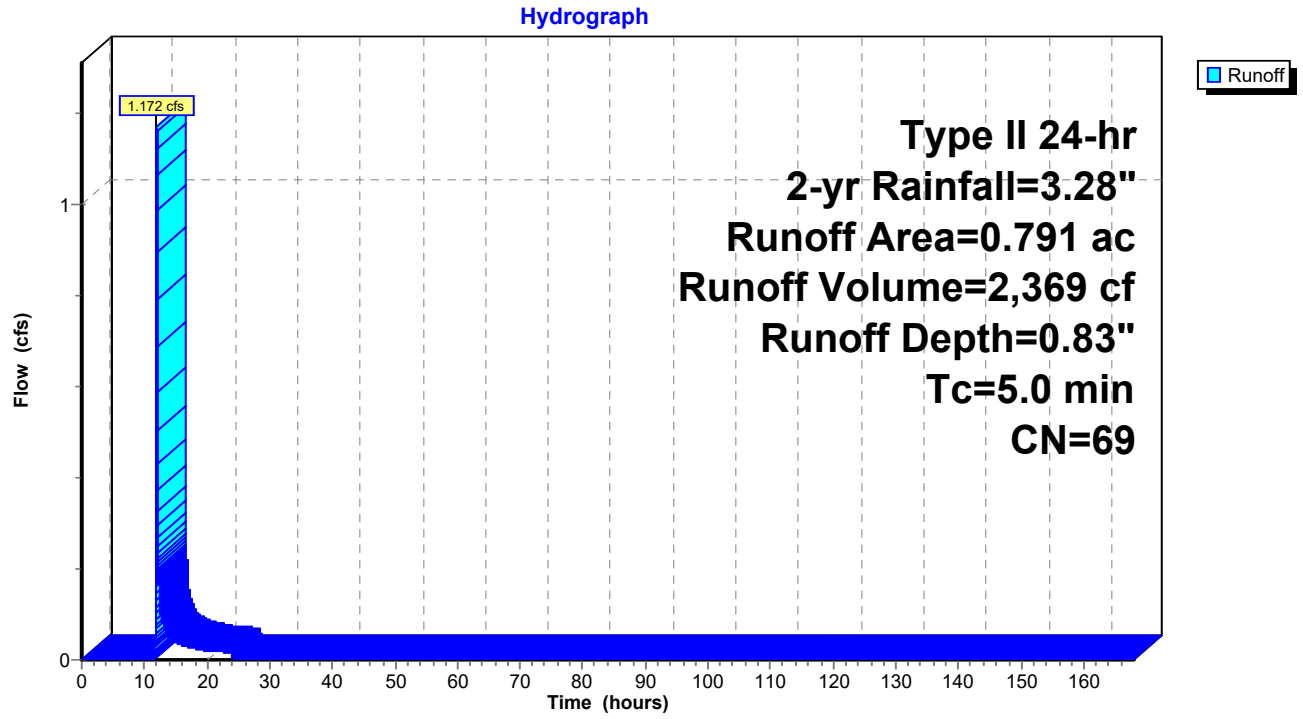
Runoff = 1.172 cfs @ 11.97 hrs, Volume= 2,369 cf, Depth= 0.83"
Routed to Link 12L : POST-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.318	39	Lawn A
*	0.107	61	Lawn B
*	0.366	98	Impervious
	0.791	69	Weighted Average
	0.425		53.73% Pervious Area
	0.366		46.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 11S: POST-DEV TO POI#2



Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

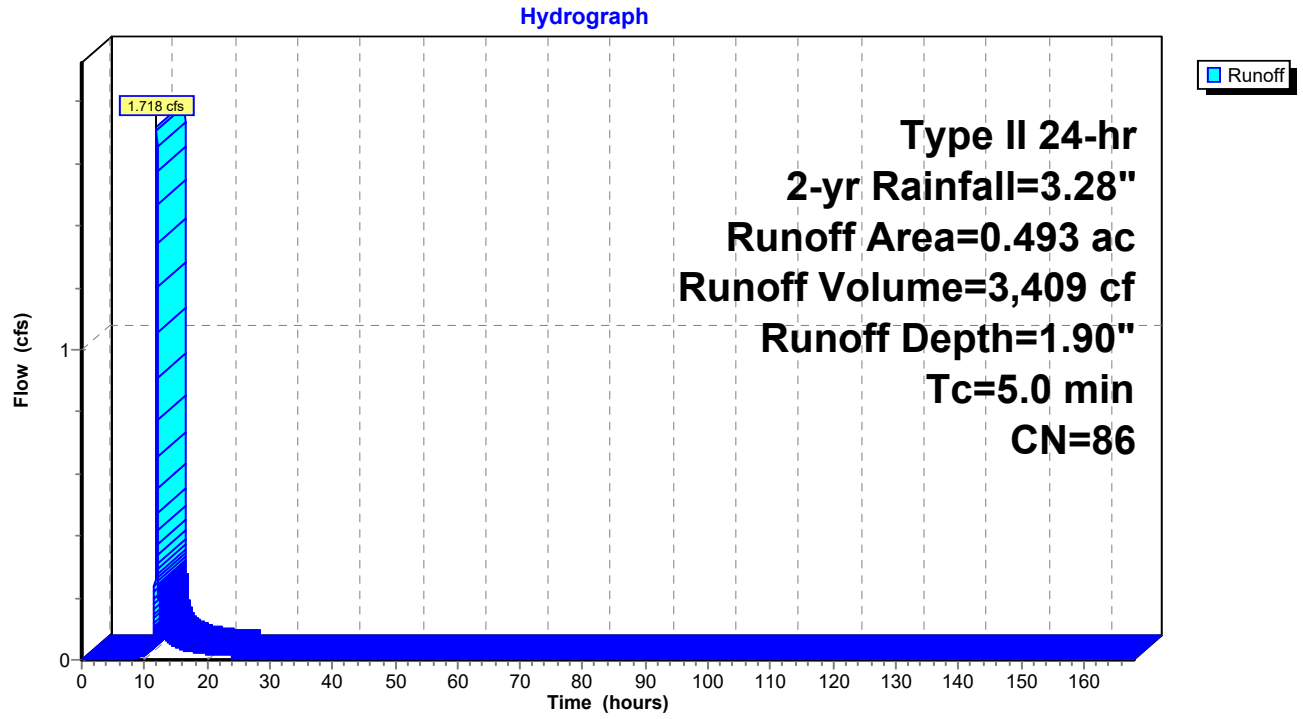
Runoff = 1.718 cfs @ 11.96 hrs, Volume= 3,409 cf, Depth= 1.90"
Routed to Pond 3P : UG2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493	86	Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 12S: POST-DEV UG2 TO POI#1



Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

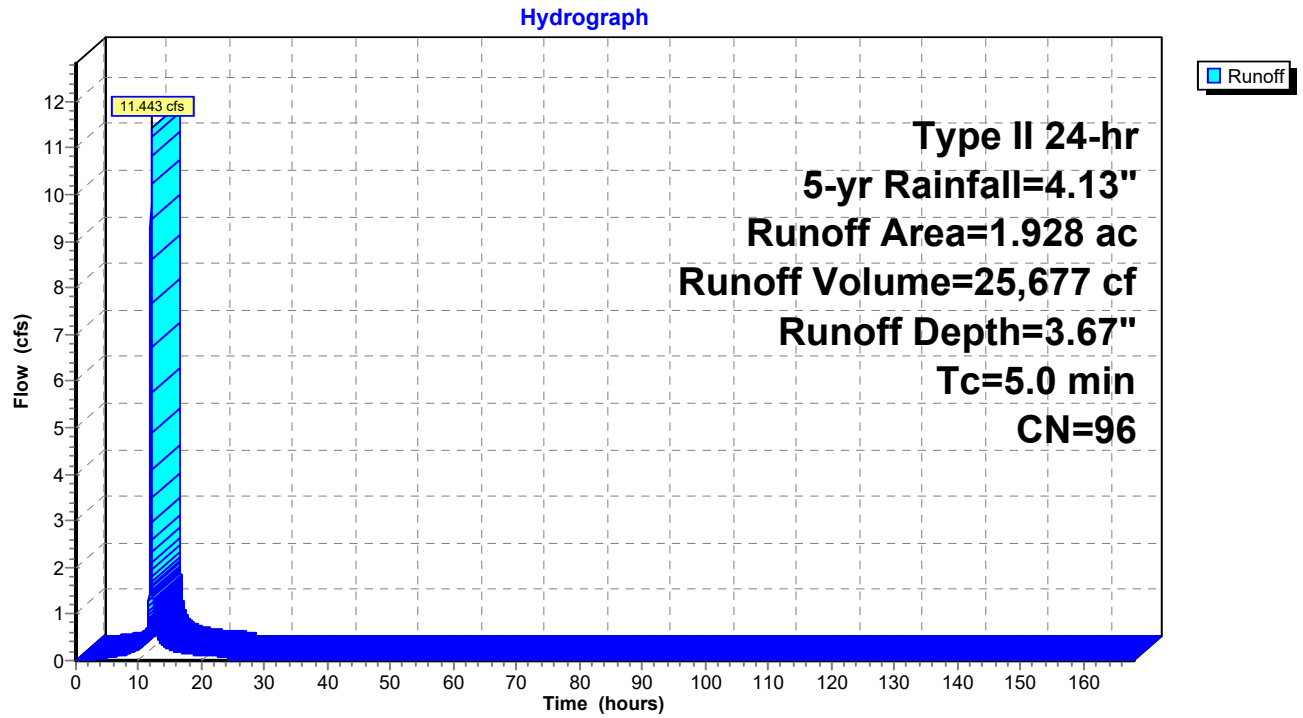
Runoff = 11.443 cfs @ 11.96 hrs, Volume= 25,677 cf, Depth= 3.67"
Routed to Pond 1P : UG1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 5-yr Rainfall=4.13"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928	96	Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: POST-DEV UG1 TO POI#1



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Summary for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

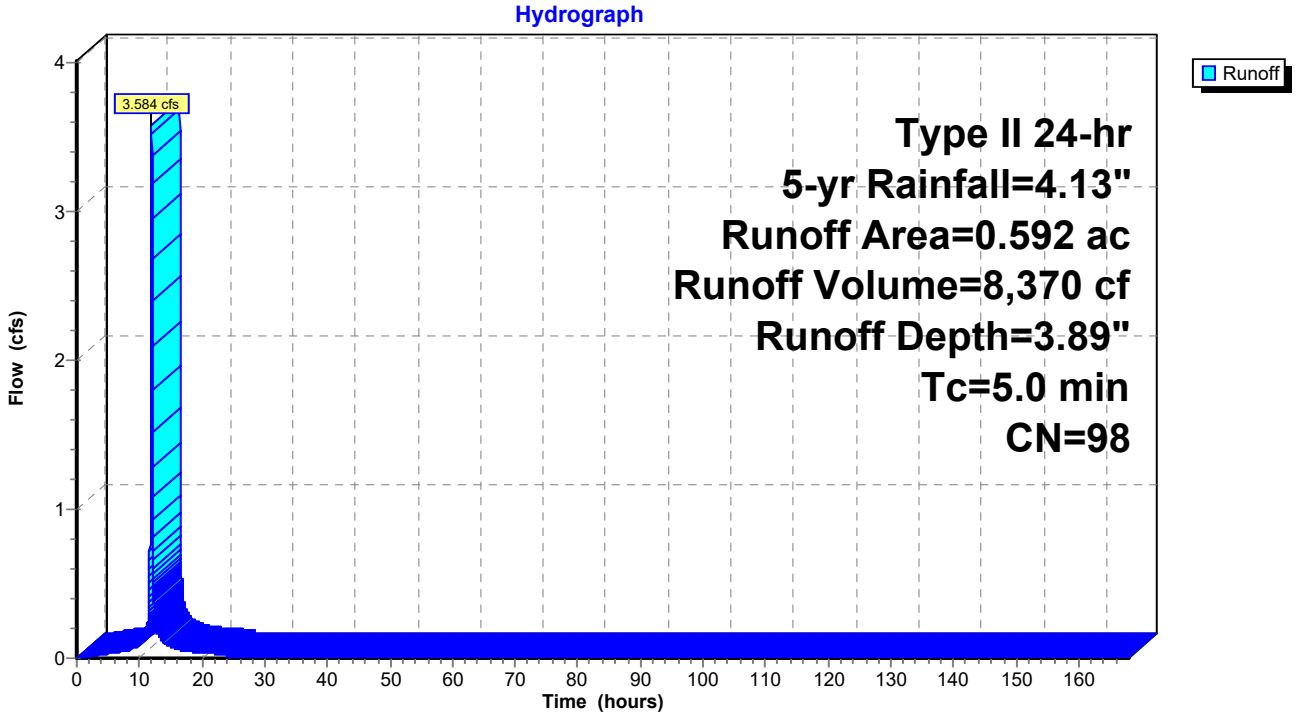
Runoff = 3.584 cfs @ 11.96 hrs, Volume= 8,370 cf, Depth= 3.89"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 5-yr Rainfall=4.13"

	Area (ac)	CN	Description
*	0.000	39	Lawn A
*	0.592	98	Impervious
	0.592	98	Weighted Average
	0.592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1



Summary for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

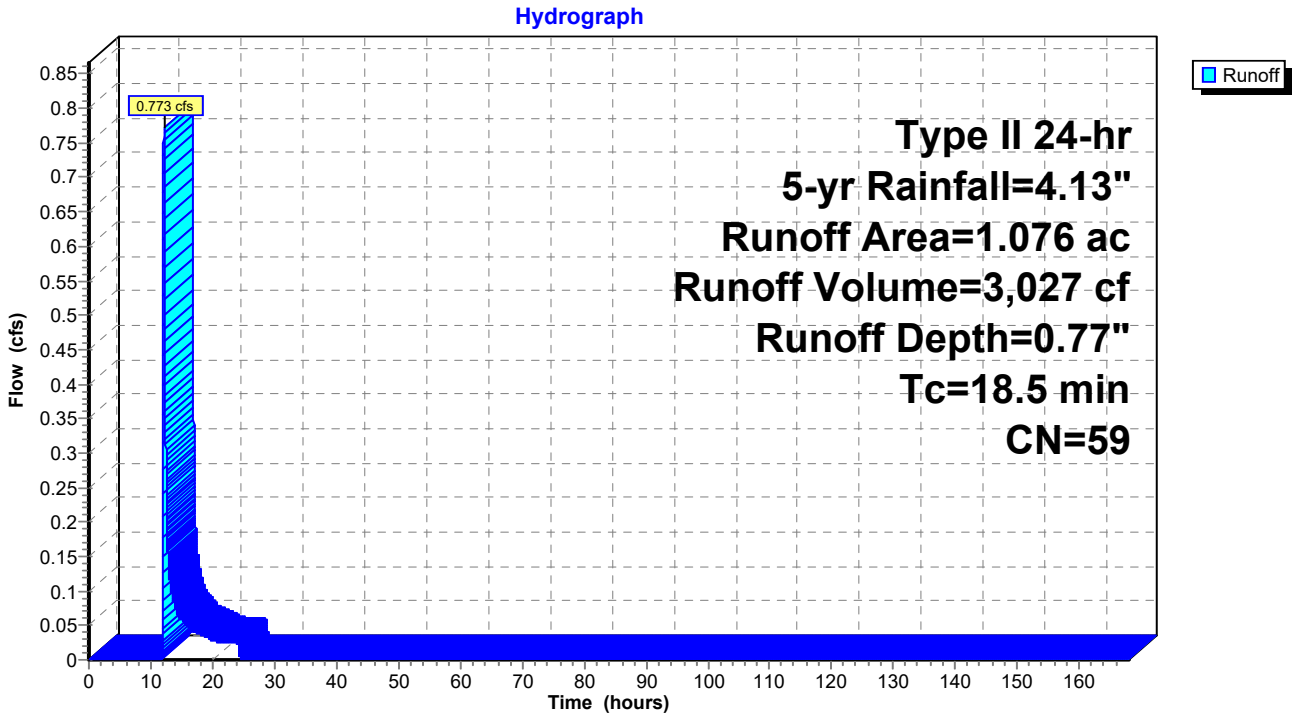
Runoff = 0.773 cfs @ 12.15 hrs, Volume= 3,027 cf, Depth= 0.77"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 5-yr Rainfall=4.13"

	Area (ac)	CN	Description
*	0.389	39	Lawn A
*	0.285	30	Wooded A
*	0.402	98	Impervious
	1.076	59	Weighted Average
	0.674		62.64% Pervious Area
	0.402		37.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1



Summary for Subcatchment 11S: POST-DEV TO POI#2

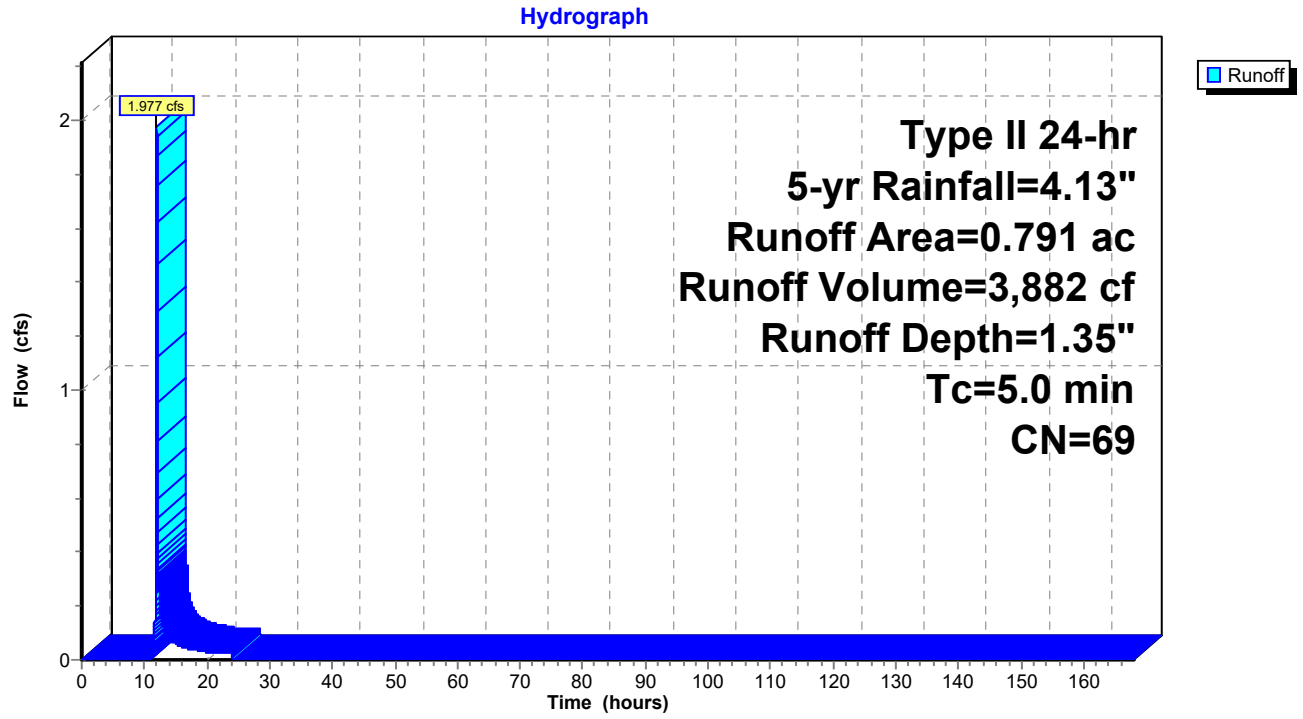
Runoff = 1.977 cfs @ 11.97 hrs, Volume= 3,882 cf, Depth= 1.35"
Routed to Link 12L : POST-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 5-yr Rainfall=4.13"

	Area (ac)	CN	Description
*	0.318	39	Lawn A
*	0.107	61	Lawn B
*	0.366	98	Impervious
	0.791	69	Weighted Average
	0.425		53.73% Pervious Area
	0.366		46.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 11S: POST-DEV TO POI#2



Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

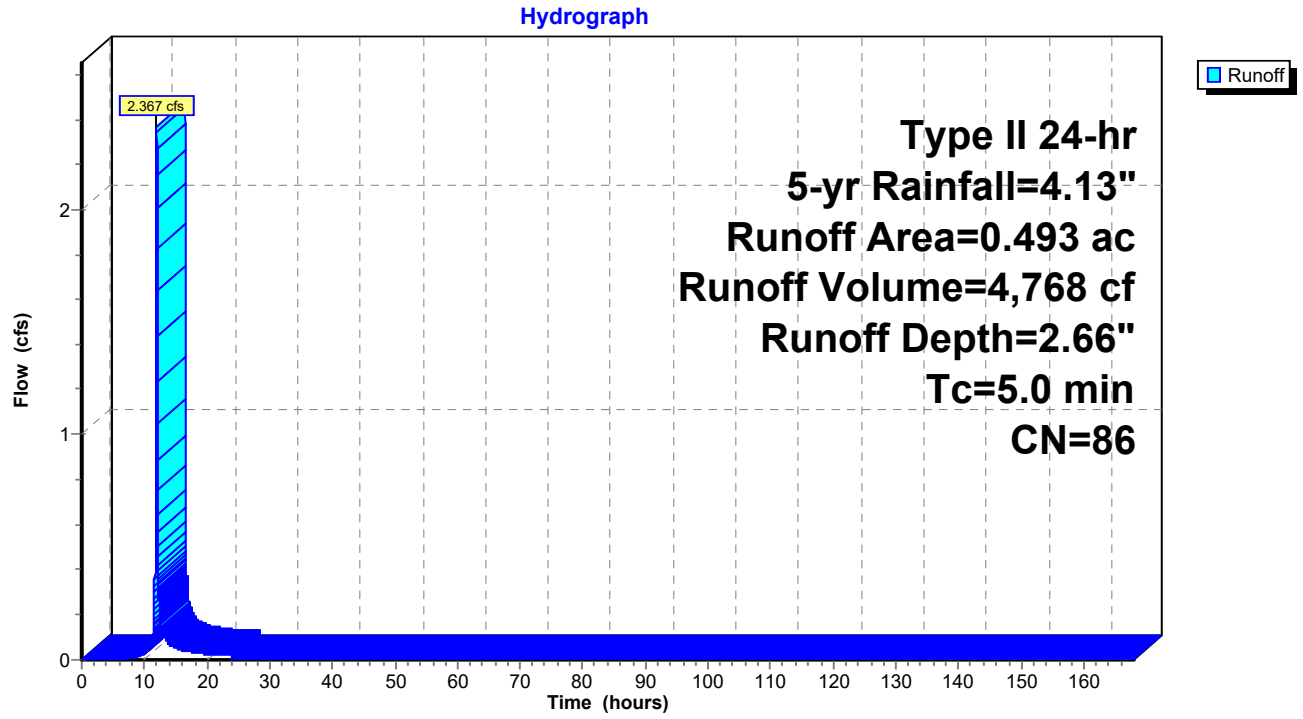
Runoff = 2.367 cfs @ 11.96 hrs, Volume= 4,768 cf, Depth= 2.66"
Routed to Pond 3P : UG2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 5-yr Rainfall=4.13"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493	86	Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 12S: POST-DEV UG2 TO POI#1



Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

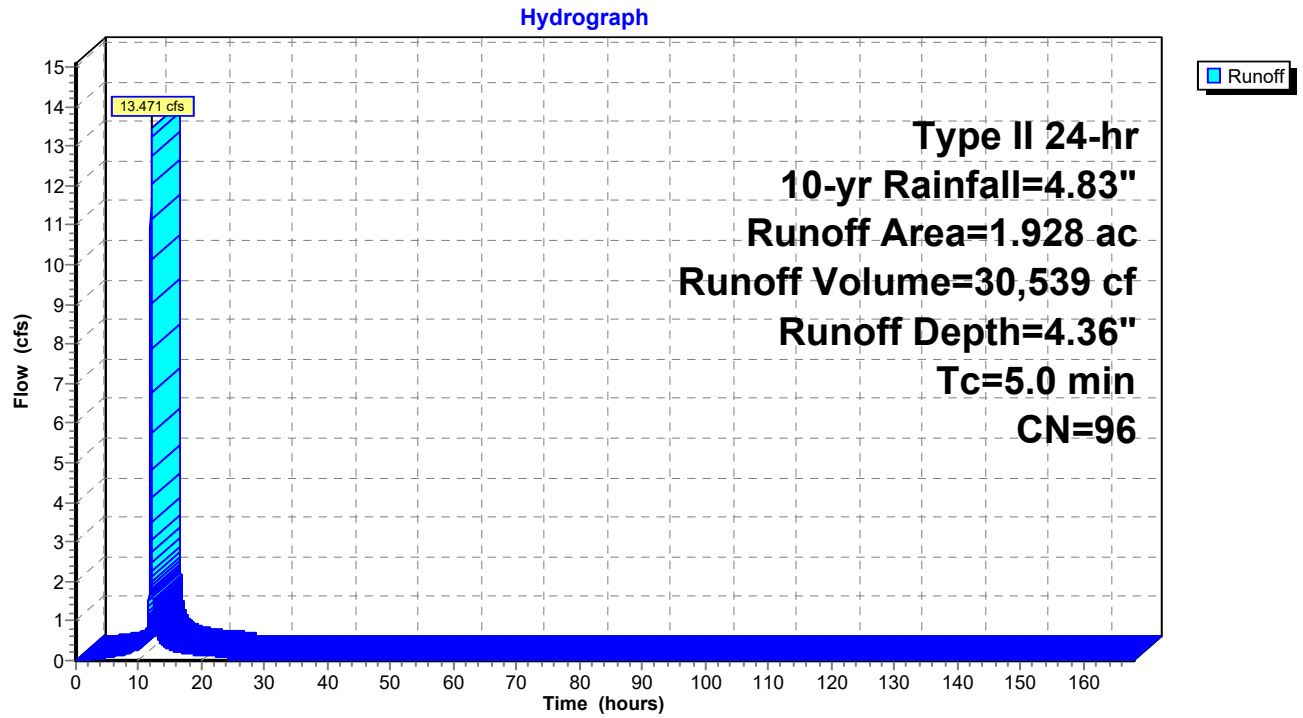
Runoff = 13.471 cfs @ 11.96 hrs, Volume= 30,539 cf, Depth= 4.36"
Routed to Pond 1P : UG1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928	96	Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: POST-DEV UG1 TO POI#1



Summary for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

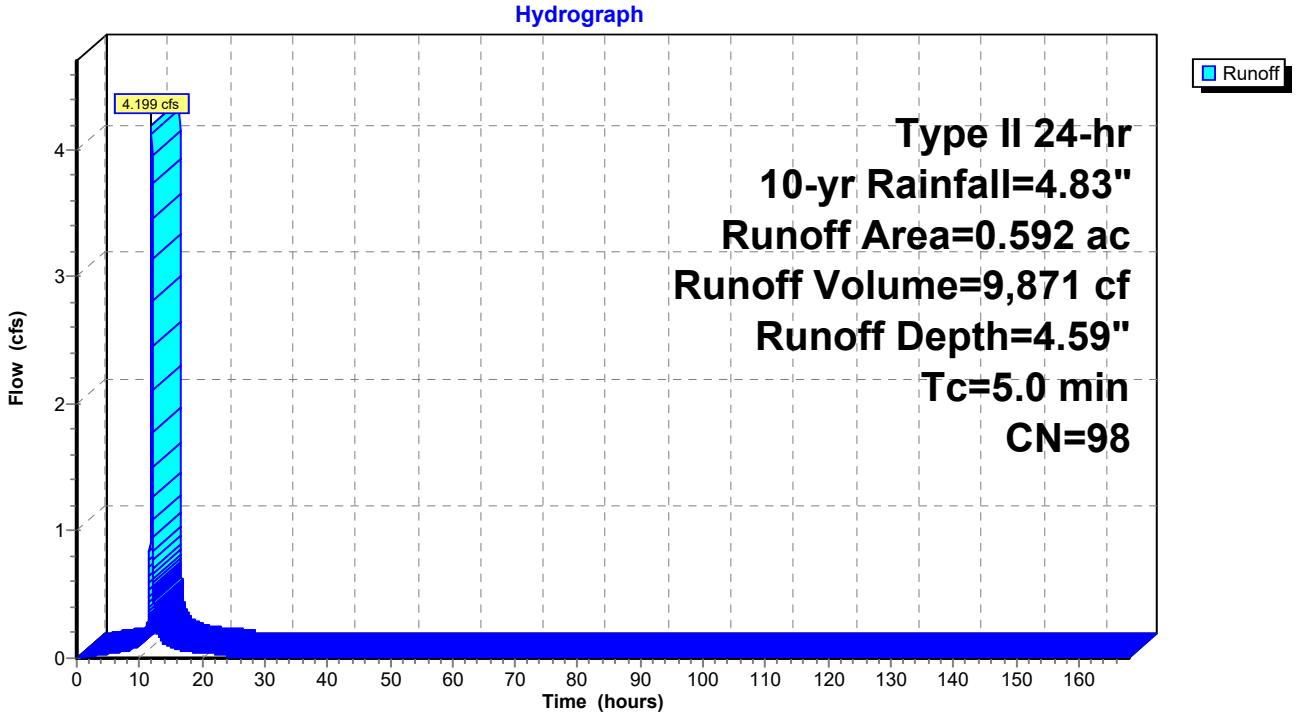
Runoff = 4.199 cfs @ 11.96 hrs, Volume= 9,871 cf, Depth= 4.59"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.000	39	Lawn A
*	0.592	98	Impervious
	0.592	98	Weighted Average
	0.592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1



Summary for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

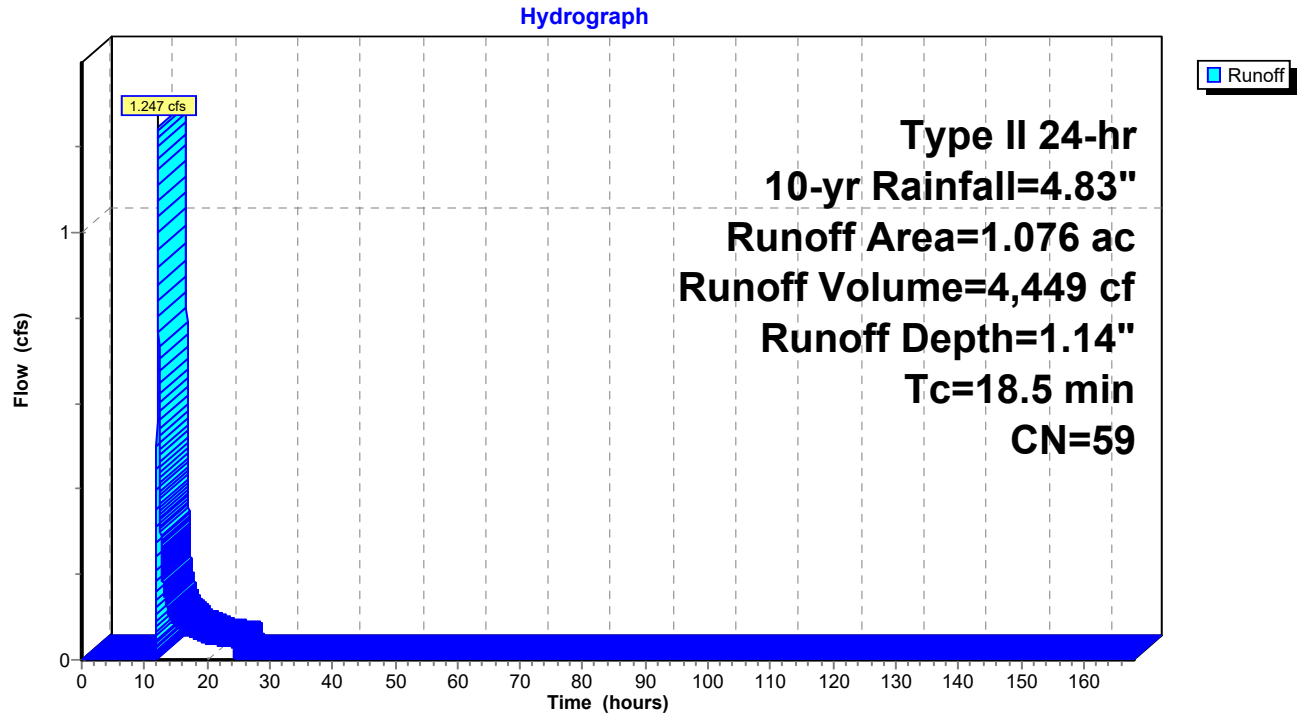
Runoff = 1.247 cfs @ 12.13 hrs, Volume= 4,449 cf, Depth= 1.14"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.389	39	Lawn A
*	0.285	30	Wooded A
*	0.402	98	Impervious
	1.076	59	Weighted Average
	0.674		62.64% Pervious Area
	0.402		37.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1



Summary for Subcatchment 11S: POST-DEV TO POI#2

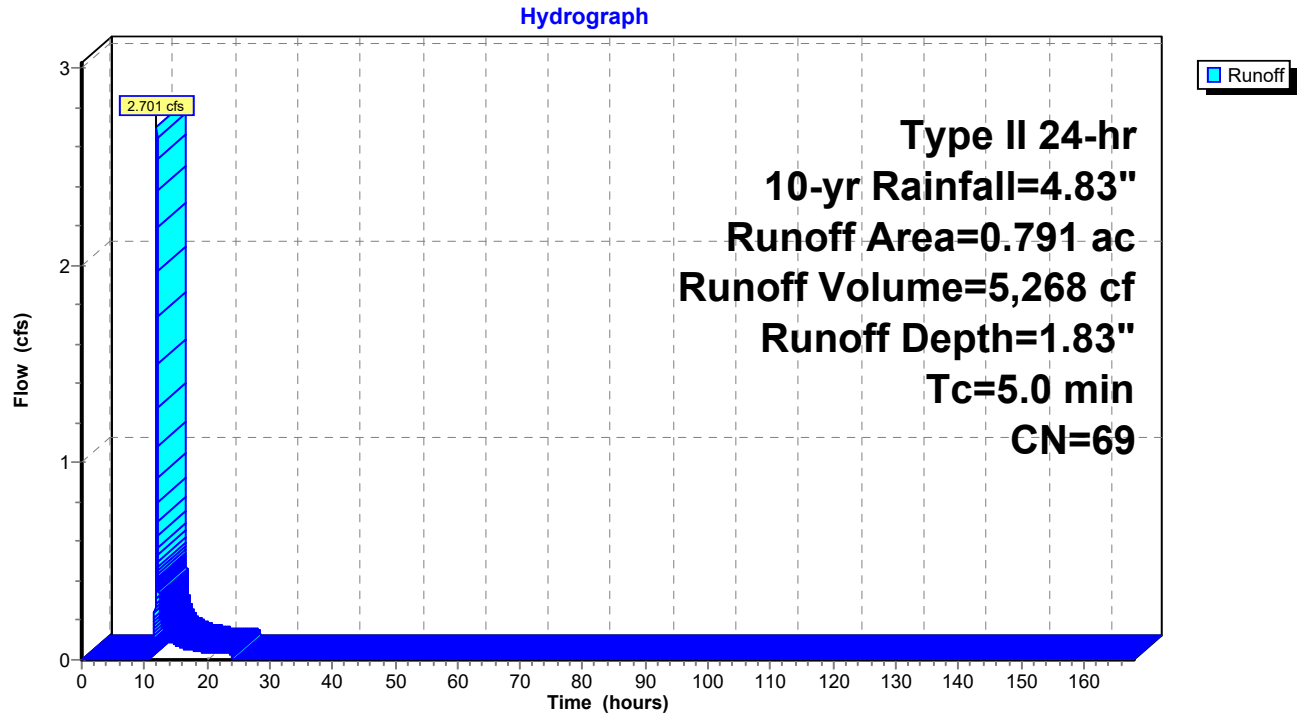
Runoff = 2.701 cfs @ 11.97 hrs, Volume= 5,268 cf, Depth= 1.83"
Routed to Link 12L : POST-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.318	39	Lawn A
*	0.107	61	Lawn B
*	0.366	98	Impervious
	0.791	69	Weighted Average
	0.425		53.73% Pervious Area
	0.366		46.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 11S: POST-DEV TO POI#2



Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

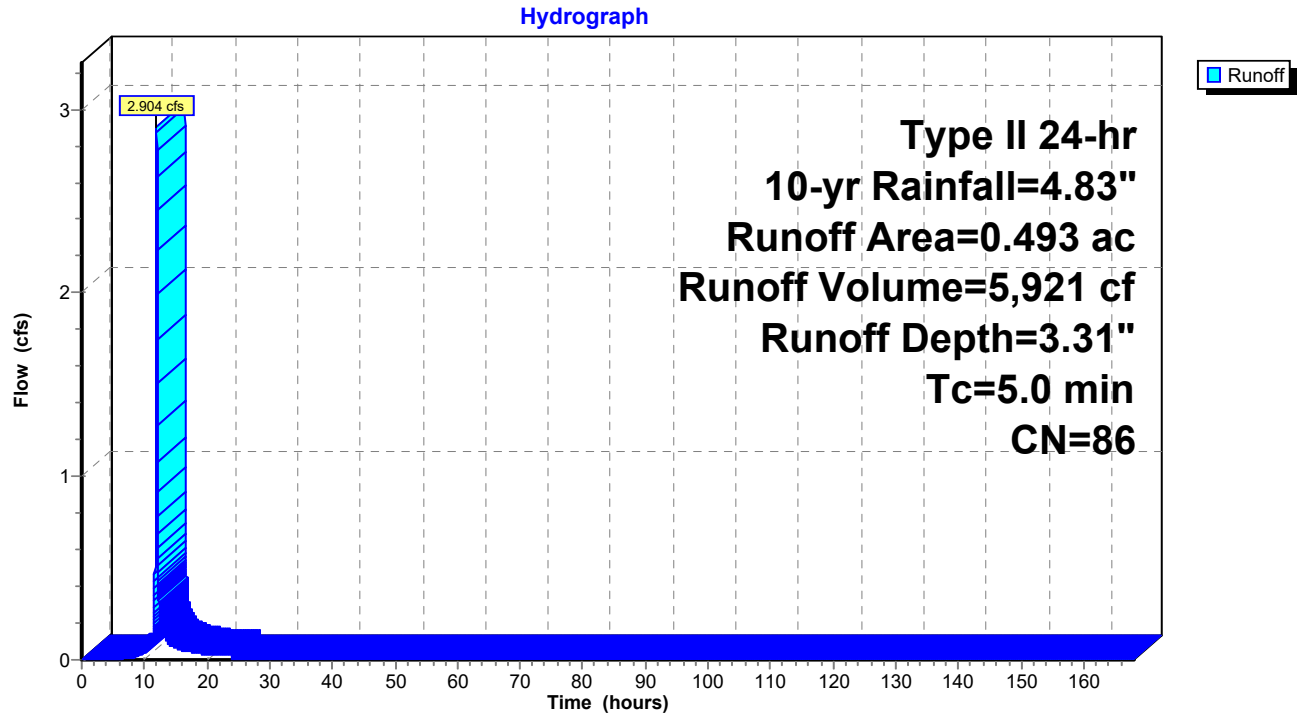
Runoff = 2.904 cfs @ 11.96 hrs, Volume= 5,921 cf, Depth= 3.31"
Routed to Pond 3P : UG2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493	86	Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 12S: POST-DEV UG2 TO POI#1



Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

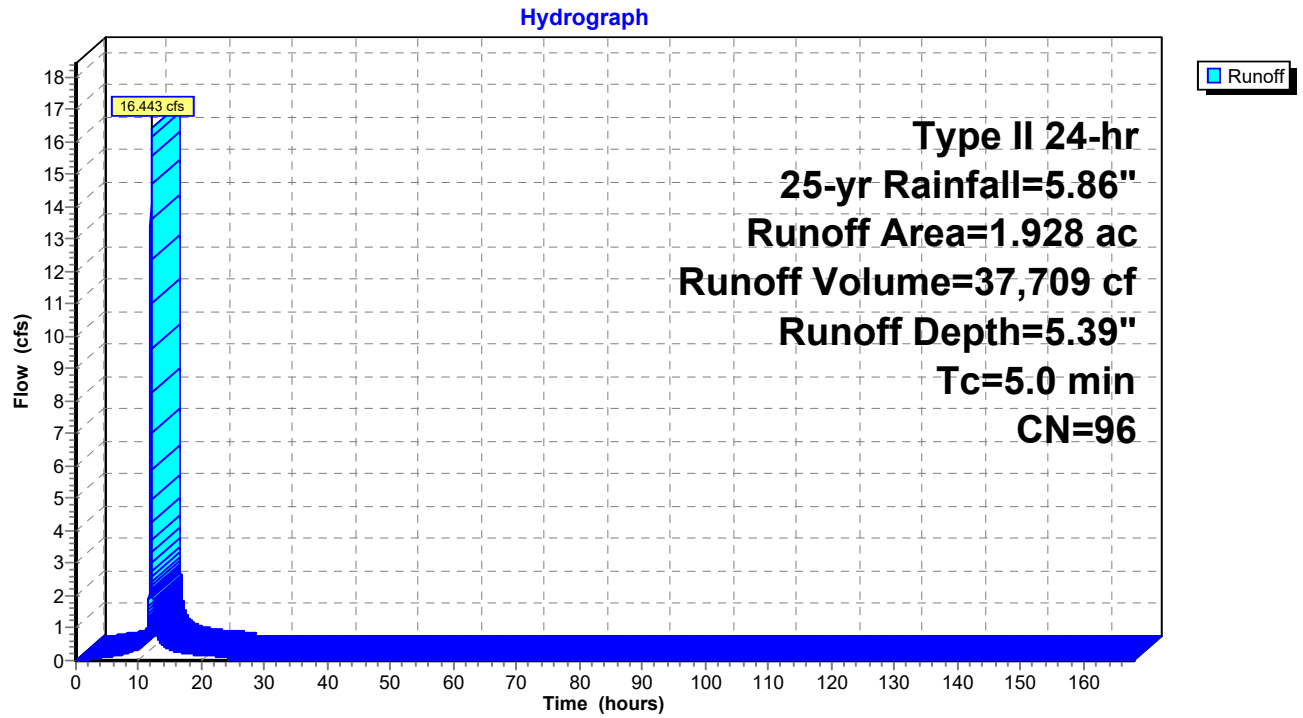
Runoff = 16.443 cfs @ 11.96 hrs, Volume= 37,709 cf, Depth= 5.39"
Routed to Pond 1P : UG1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=5.86"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928	96	Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: POST-DEV UG1 TO POI#1



Summary for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

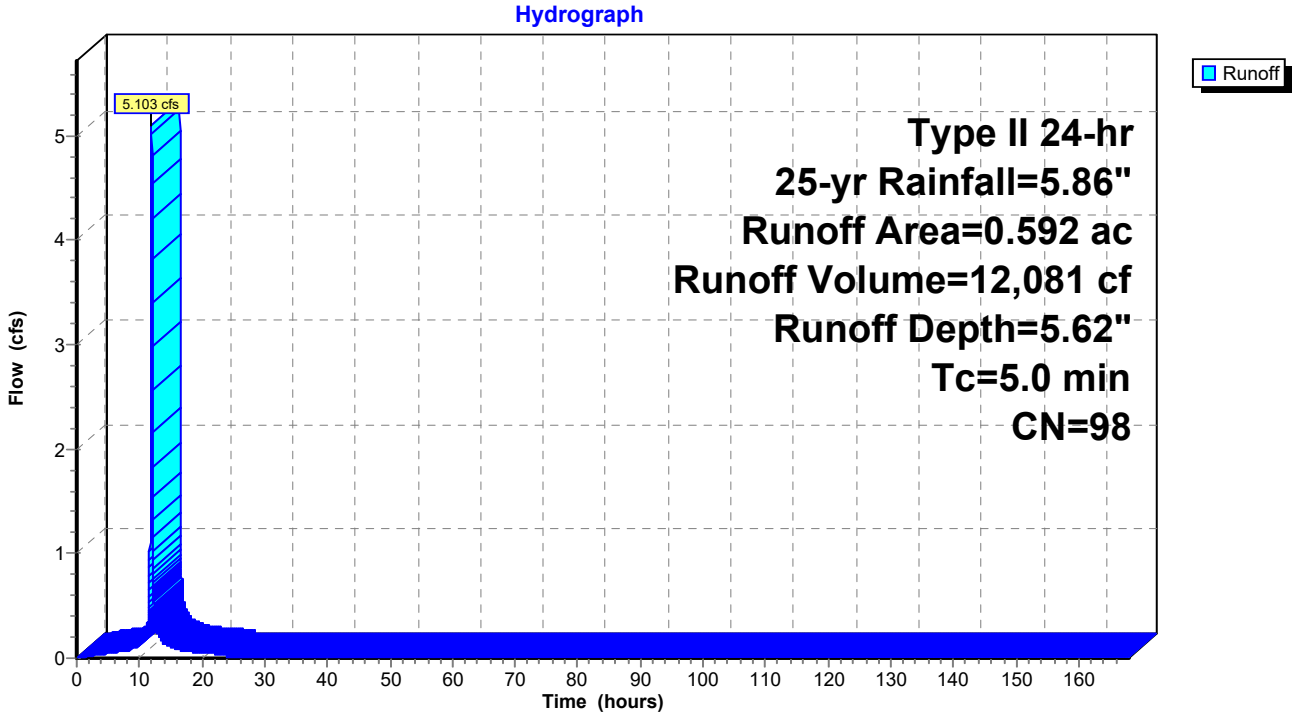
Runoff = 5.103 cfs @ 11.96 hrs, Volume= 12,081 cf, Depth= 5.62"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=5.86"

	Area (ac)	CN	Description
*	0.000	39	Lawn A
*	0.592	98	Impervious
	0.592	98	Weighted Average
	0.592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1



Summary for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

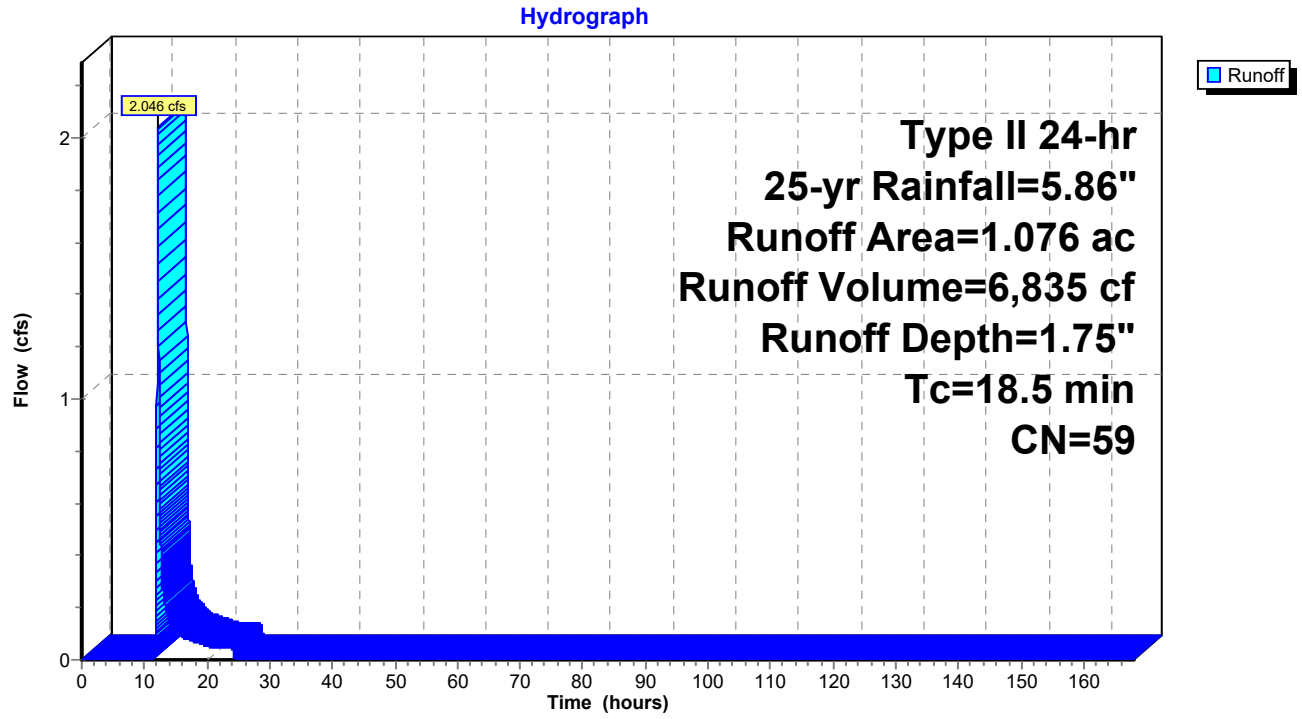
Runoff = 2.046 cfs @ 12.13 hrs, Volume= 6,835 cf, Depth= 1.75"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=5.86"

	Area (ac)	CN	Description
*	0.389	39	Lawn A
*	0.285	30	Wooded A
*	0.402	98	Impervious
	1.076	59	Weighted Average
	0.674		62.64% Pervious Area
	0.402		37.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1



Summary for Subcatchment 11S: POST-DEV TO POI#2

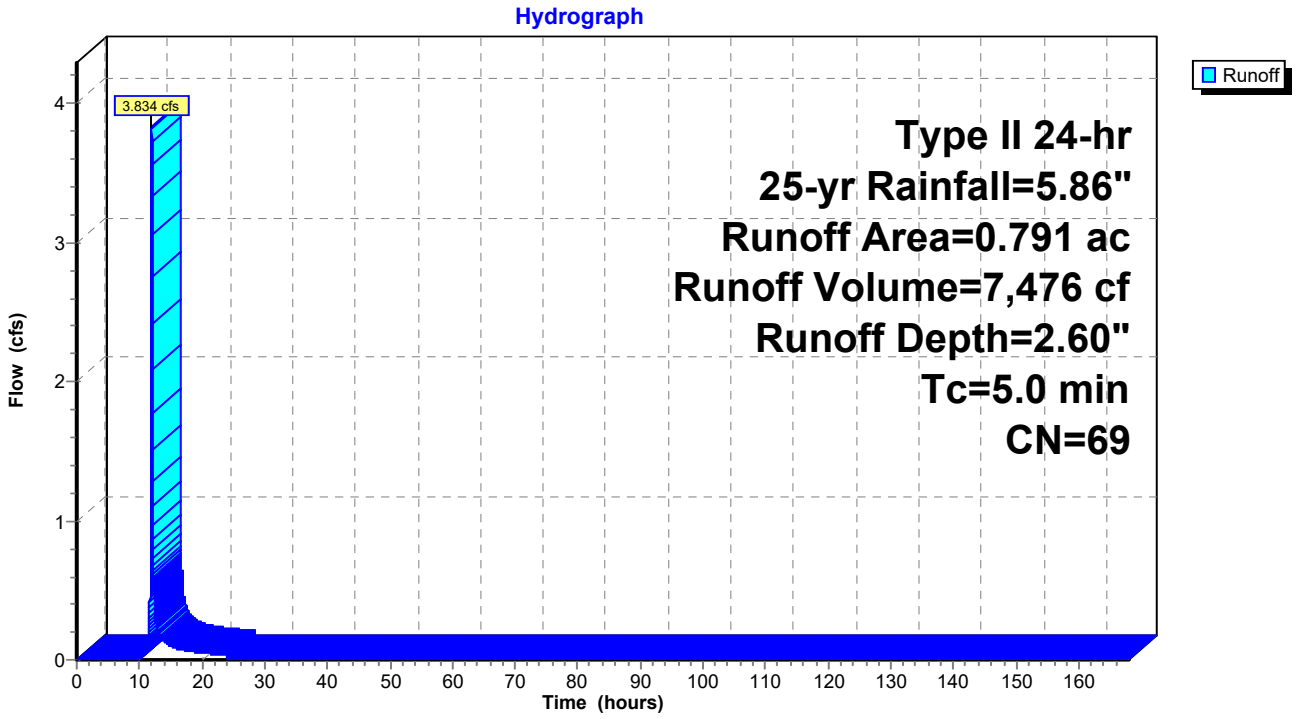
Runoff = 3.834 cfs @ 11.96 hrs, Volume= 7,476 cf, Depth= 2.60"
Routed to Link 12L : POST-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=5.86"

	Area (ac)	CN	Description
*	0.318	39	Lawn A
*	0.107	61	Lawn B
*	0.366	98	Impervious
	0.791	69	Weighted Average
	0.425		53.73% Pervious Area
	0.366		46.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 11S: POST-DEV TO POI#2



Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

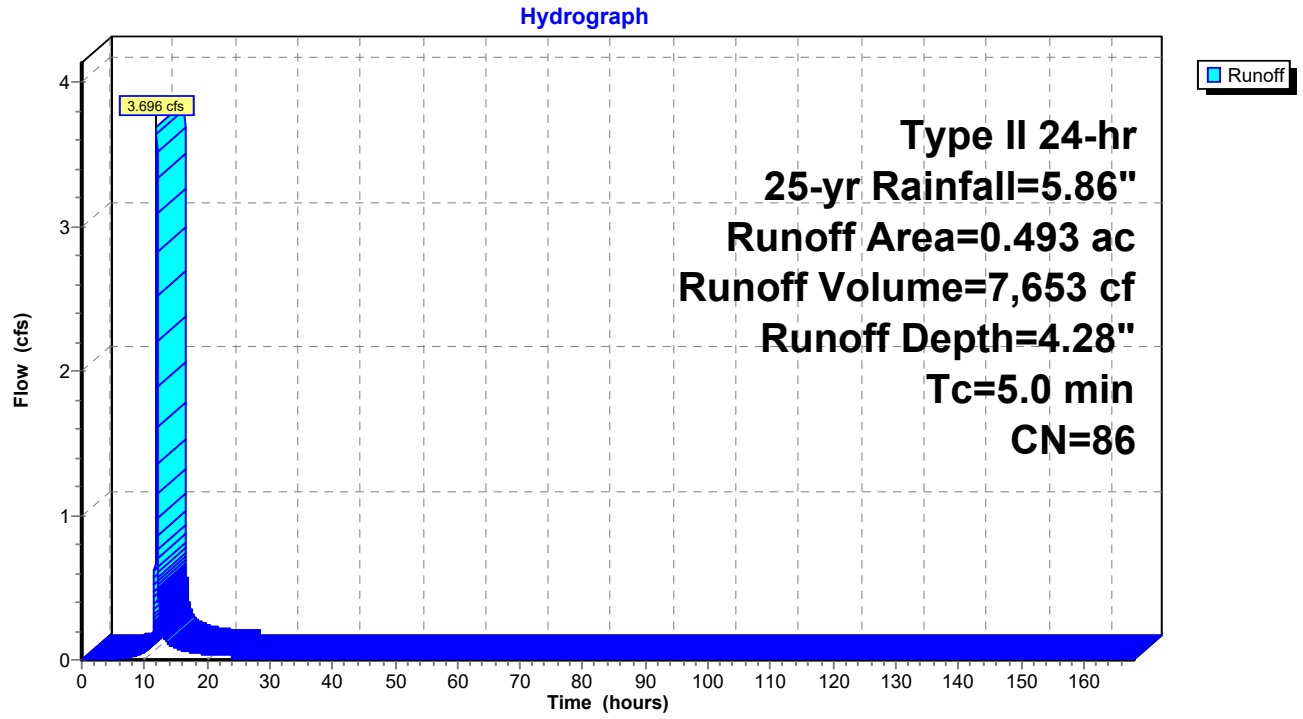
Runoff = 3.696 cfs @ 11.96 hrs, Volume= 7,653 cf, Depth= 4.28"
Routed to Pond 3P : UG2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=5.86"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493	86	Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 12S: POST-DEV UG2 TO POI#1



Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

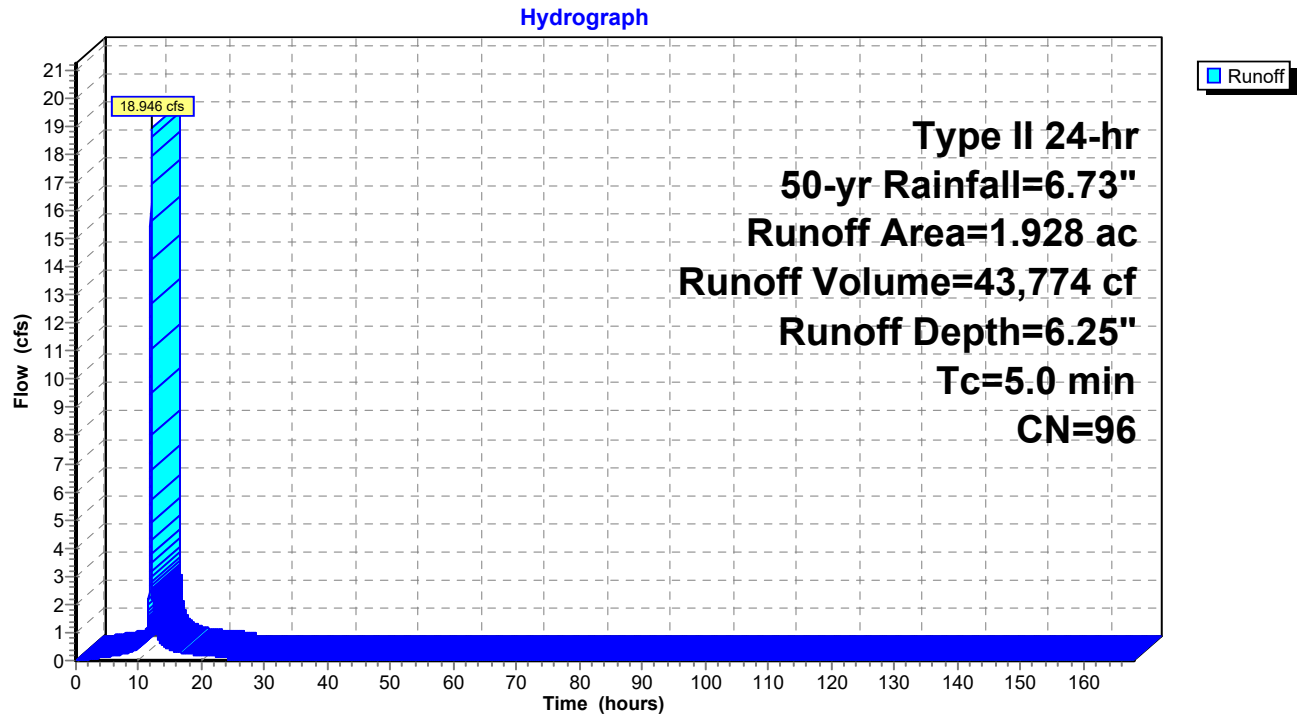
Runoff = 18.946 cfs @ 11.96 hrs, Volume= 43,774 cf, Depth= 6.25"
Routed to Pond 1P : UG1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928	96	Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: POST-DEV UG1 TO POI#1



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Summary for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

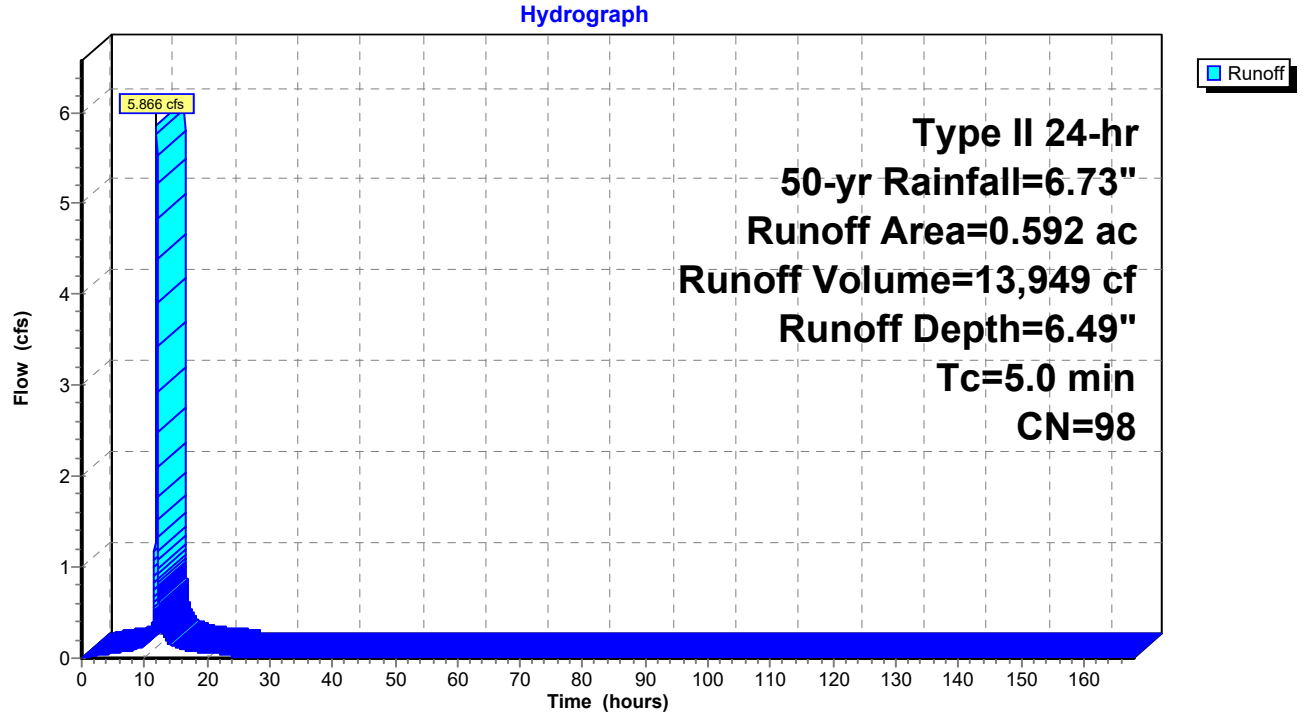
Runoff = 5.866 cfs @ 11.96 hrs, Volume= 13,949 cf, Depth= 6.49"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.000	39	Lawn A
*	0.592	98	Impervious
	0.592	98	Weighted Average
	0.592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1



Summary for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

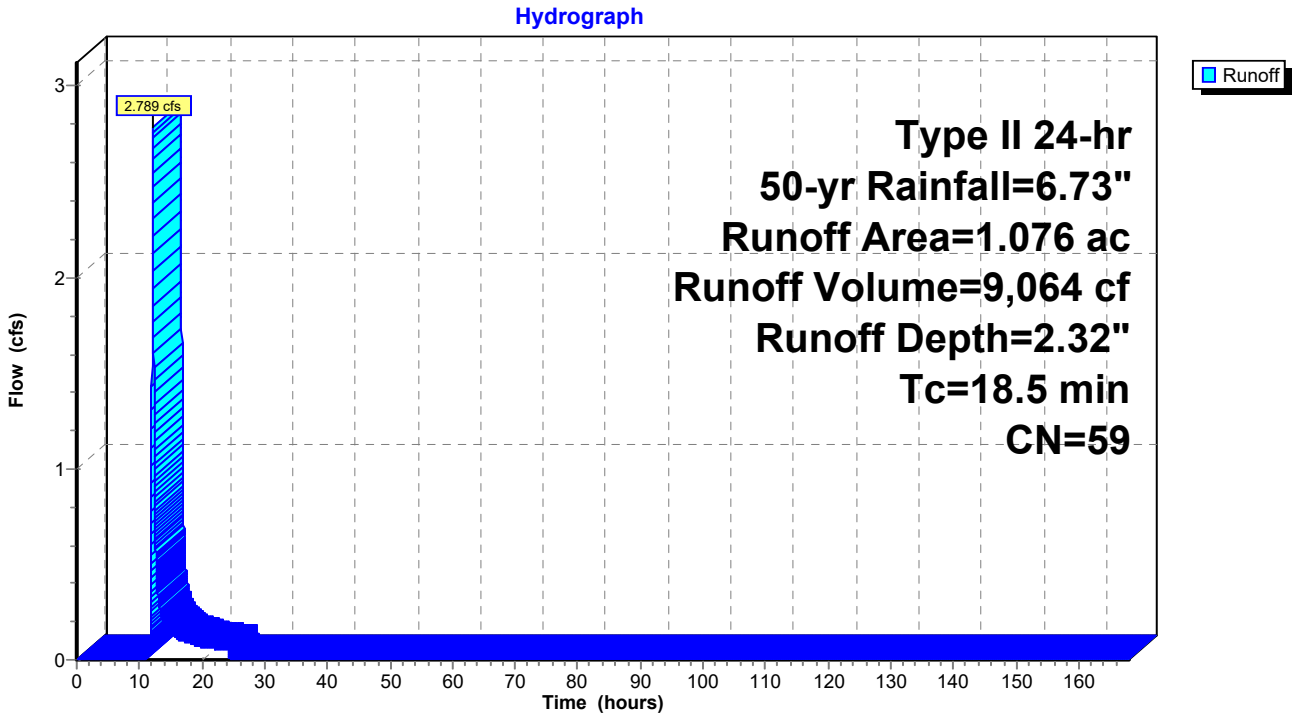
Runoff = 2.789 cfs @ 12.12 hrs, Volume= 9,064 cf, Depth= 2.32"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.389	39	Lawn A
*	0.285	30	Wooded A
*	0.402	98	Impervious
	1.076	59	Weighted Average
	0.674		62.64% Pervious Area
	0.402		37.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1



Summary for Subcatchment 11S: POST-DEV TO POI#2

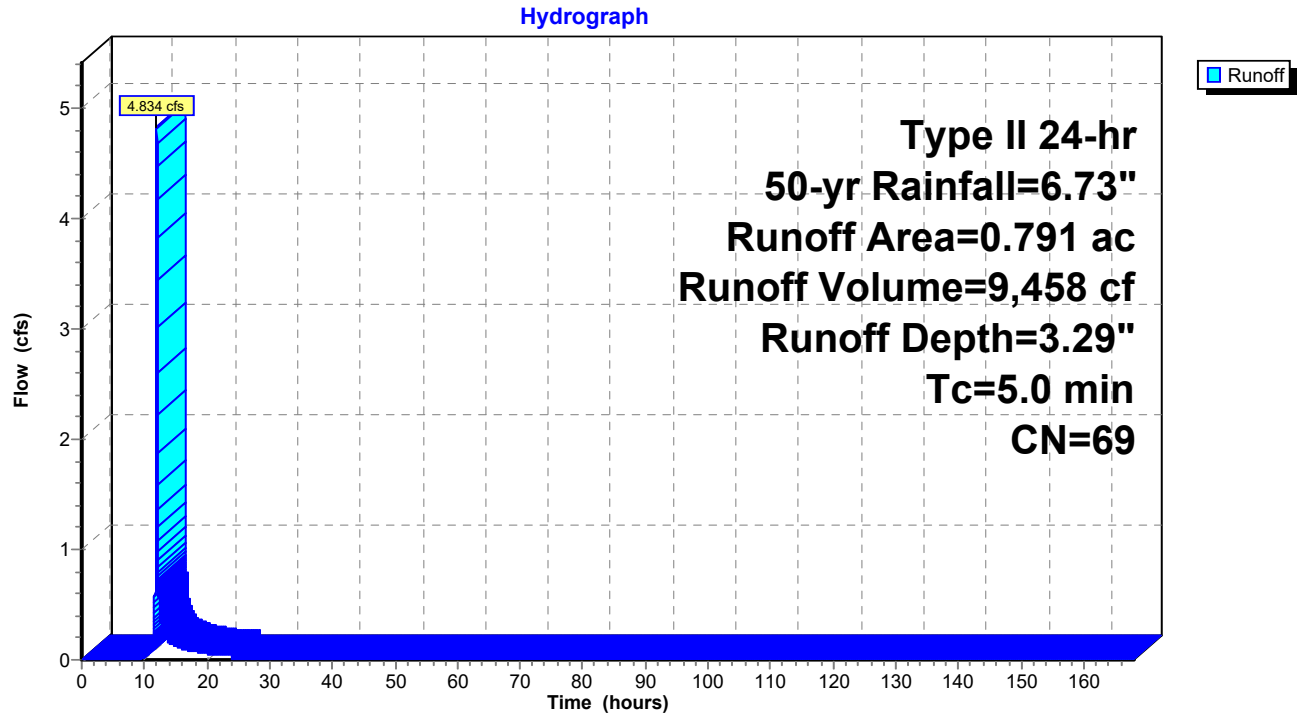
Runoff = 4.834 cfs @ 11.96 hrs, Volume= 9,458 cf, Depth= 3.29"
Routed to Link 12L : POST-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.318	39	Lawn A
*	0.107	61	Lawn B
*	0.366	98	Impervious
	0.791	69	Weighted Average
	0.425		53.73% Pervious Area
	0.366		46.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 11S: POST-DEV TO POI#2



Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

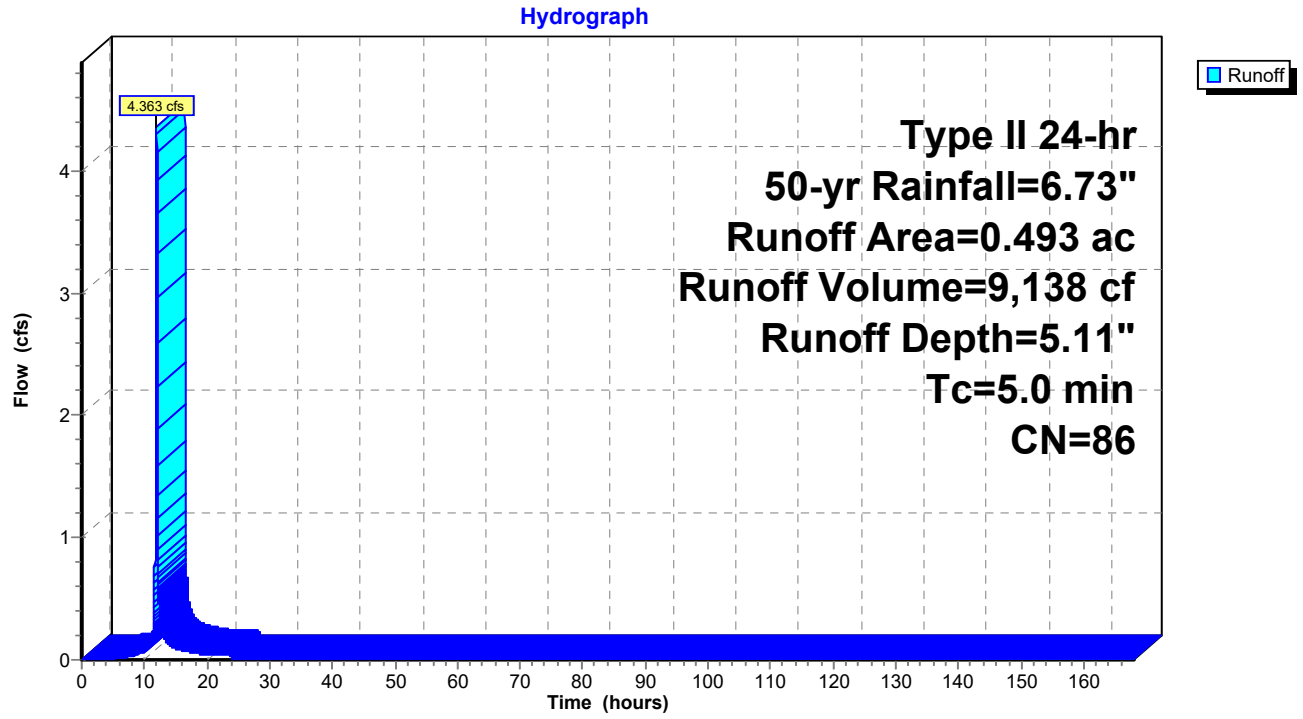
Runoff = 4.363 cfs @ 11.96 hrs, Volume= 9,138 cf, Depth= 5.11"
Routed to Pond 3P : UG2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493	86	Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 12S: POST-DEV UG2 TO POI#1



Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

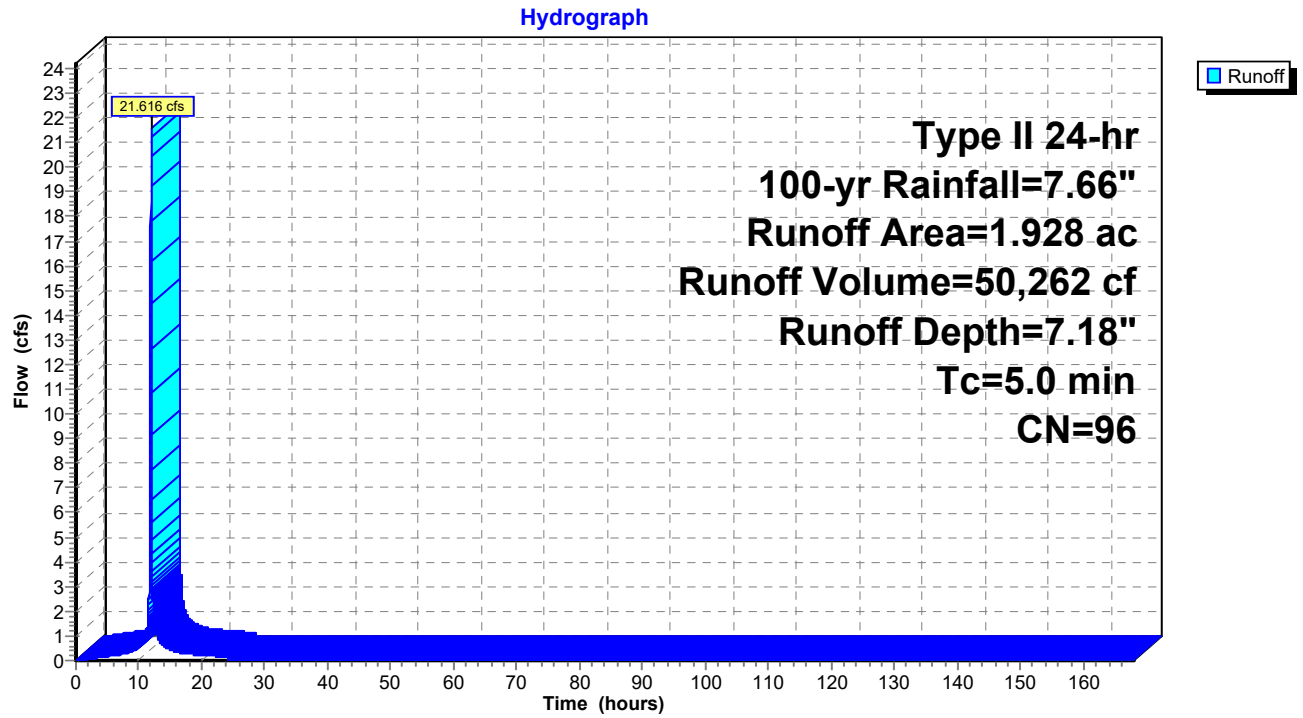
Runoff = 21.616 cfs @ 11.96 hrs, Volume= 50,262 cf, Depth= 7.18"
Routed to Pond 1P : UG1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928	96	Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: POST-DEV UG1 TO POI#1



Summary for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

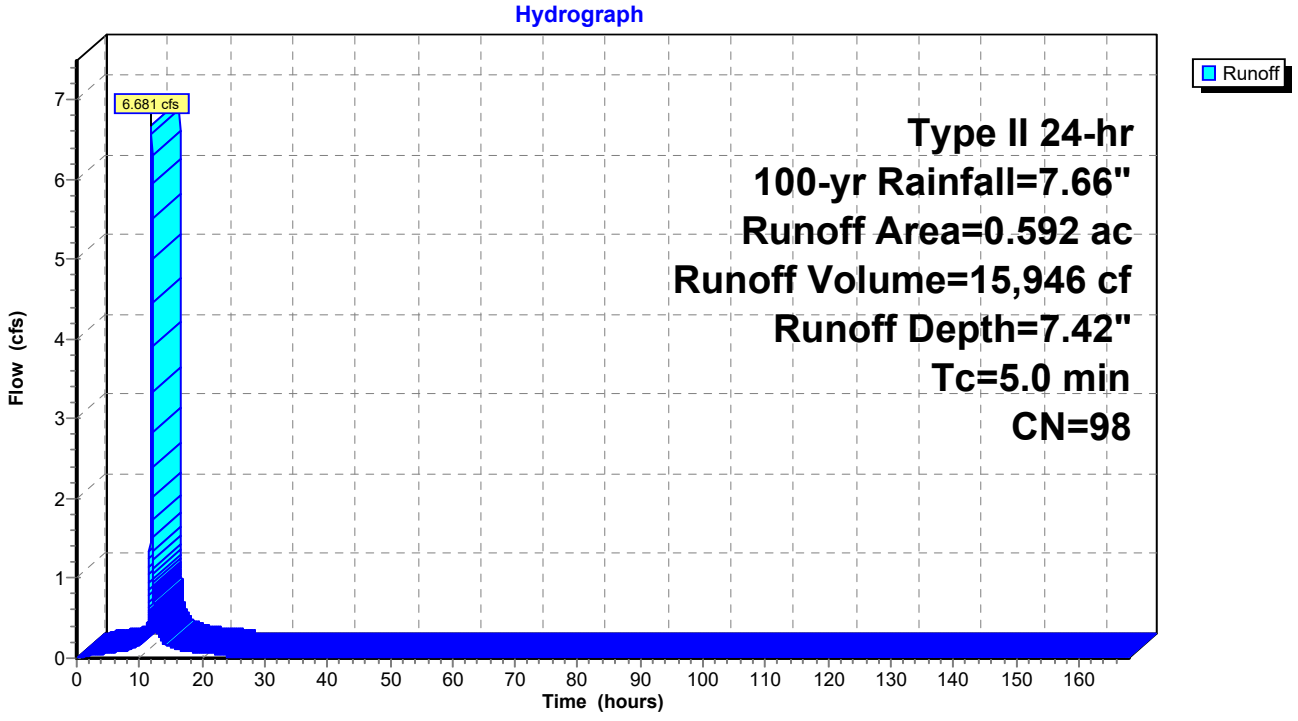
Runoff = 6.681 cfs @ 11.96 hrs, Volume= 15,946 cf, Depth= 7.42"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.000	39	Lawn A
*	0.592	98	Impervious
	0.592	98	Weighted Average
	0.592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1



Summary for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

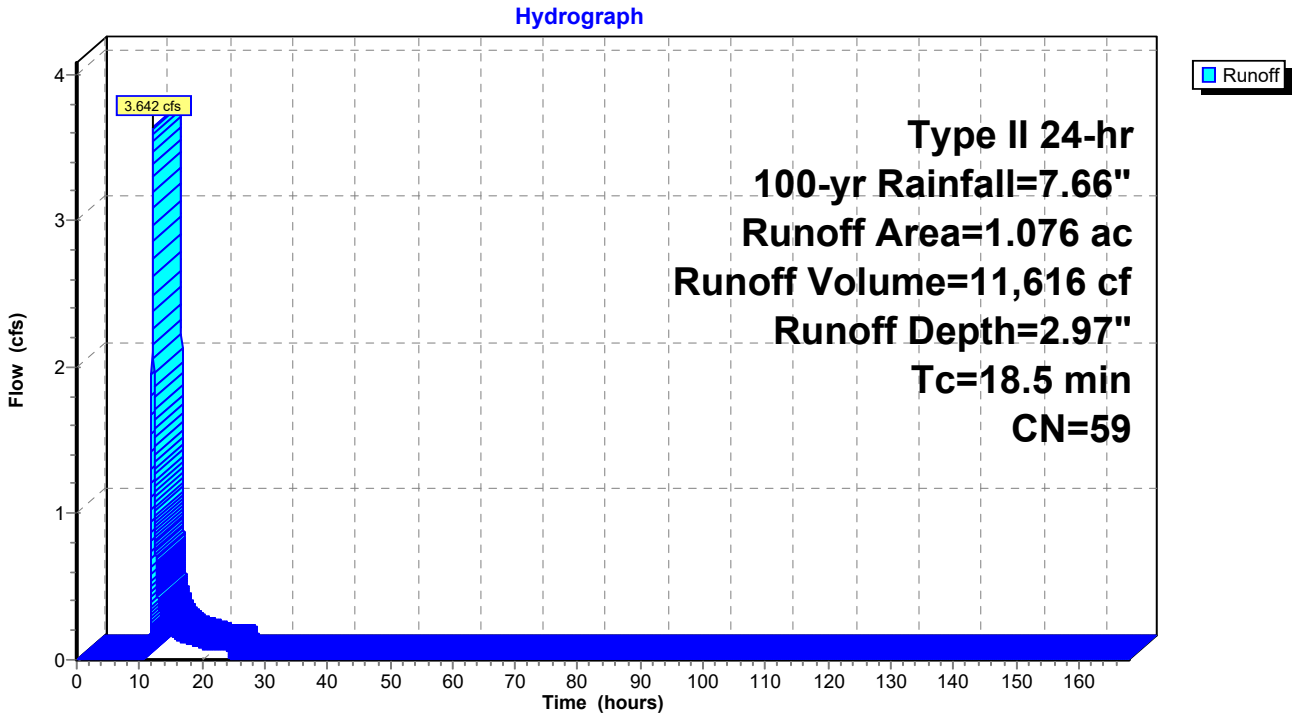
Runoff = 3.642 cfs @ 12.11 hrs, Volume= 11,616 cf, Depth= 2.97"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.389	39	Lawn A
*	0.285	30	Wooded A
*	0.402	98	Impervious
	1.076	59	Weighted Average
	0.674		62.64% Pervious Area
	0.402		37.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1



Summary for Subcatchment 11S: POST-DEV TO POI#2

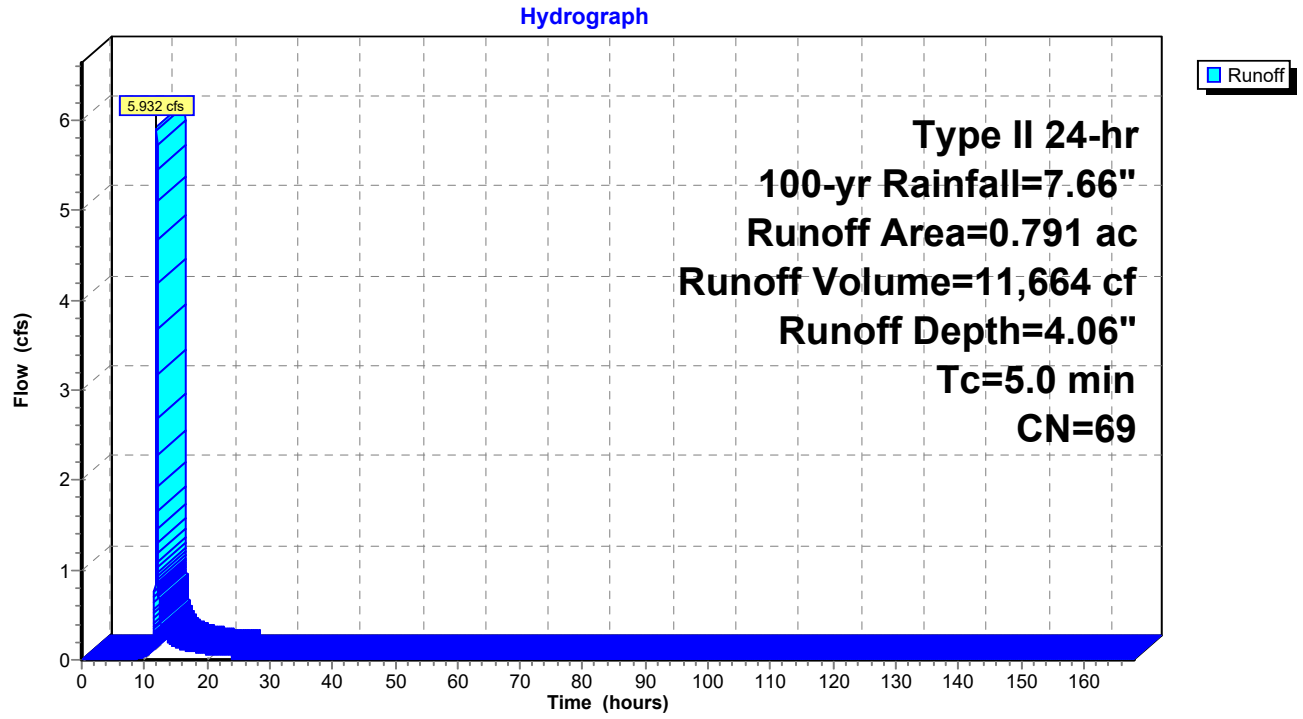
Runoff = 5.932 cfs @ 11.96 hrs, Volume= 11,664 cf, Depth= 4.06"
Routed to Link 12L : POST-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.318	39	Lawn A
*	0.107	61	Lawn B
*	0.366	98	Impervious
	0.791	69	Weighted Average
	0.425		53.73% Pervious Area
	0.366		46.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 11S: POST-DEV TO POI#2



Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

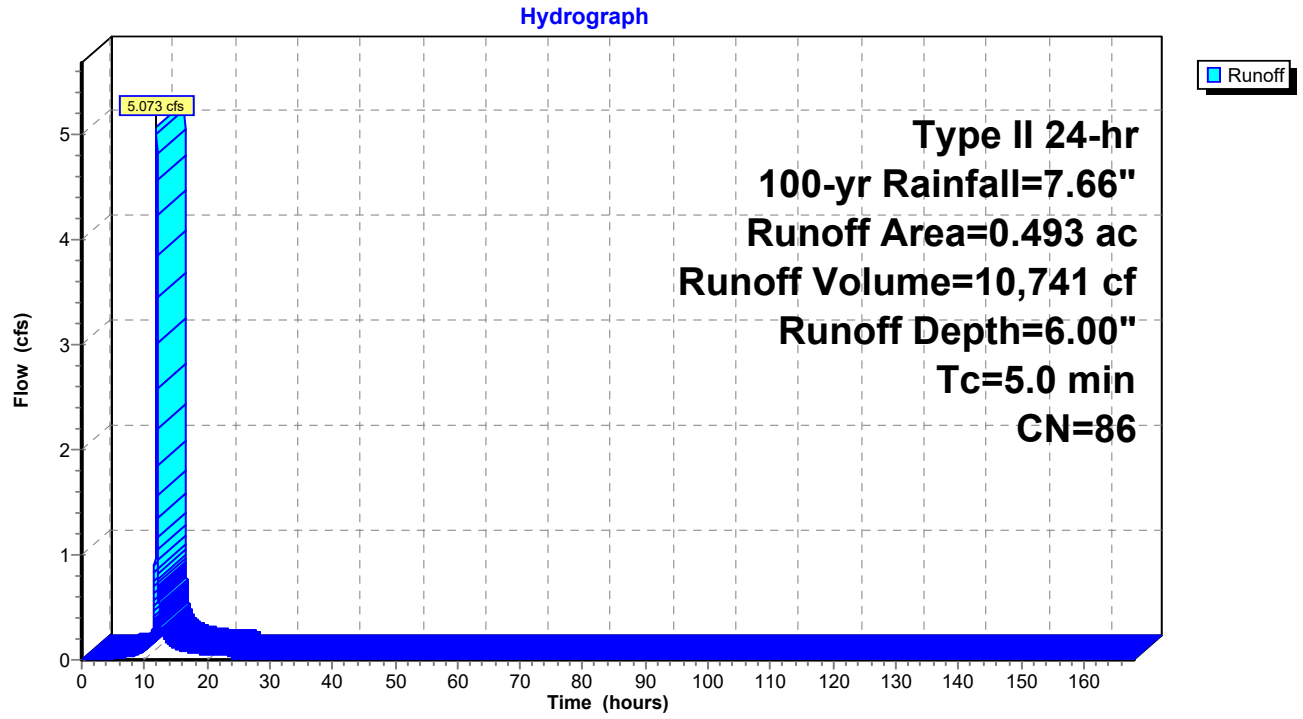
Runoff = 5.073 cfs @ 11.96 hrs, Volume= 10,741 cf, Depth= 6.00"
Routed to Pond 3P : UG2

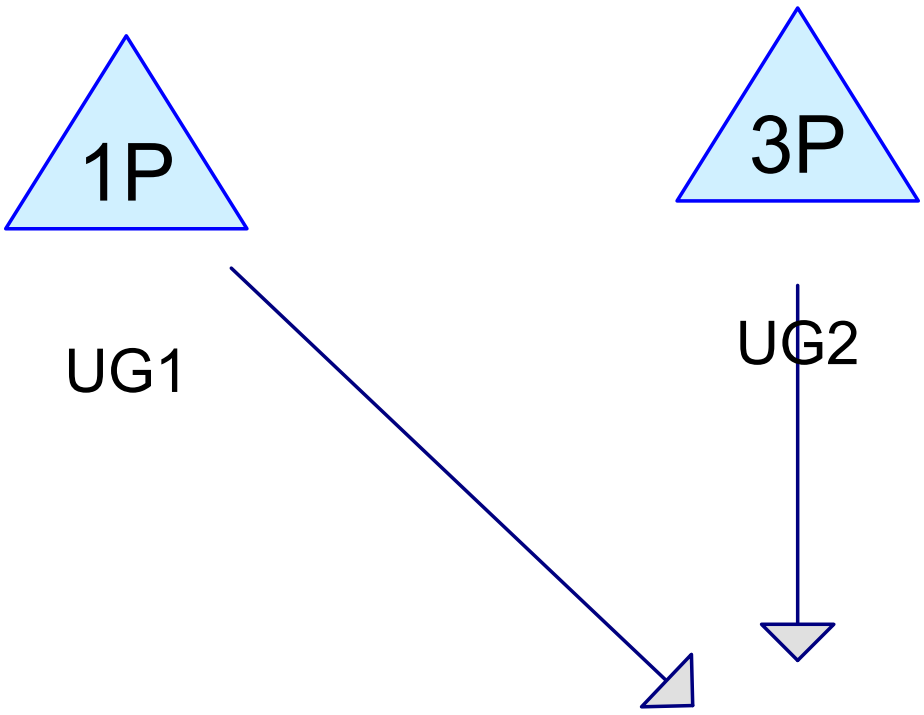
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493	86	Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 12S: POST-DEV UG2 TO POI#1





Subcat Reach Pond Link

Routing Diagram for BMW_2025-7-24_2
Prepared by Bohler, Printed 7/24/2025
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BMW_2025-7-24_2

Prepared by Bohler

Printed 7/24/2025

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-yr	Type II 24-hr		Default	24.00	1	2.73	2
2	2-yr	Type II 24-hr		Default	24.00	1	3.28	2
3	5-yr	Type II 24-hr		Default	24.00	1	4.13	2
4	10-yr	Type II 24-hr		Default	24.00	1	4.83	2
5	25-yr	Type II 24-hr		Default	24.00	1	5.86	2
6	50-yr	Type II 24-hr		Default	24.00	1	6.73	2
7	100-yr	Type II 24-hr		Default	24.00	1	7.66	2

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 2.29" for 1-yr event
Inflow = 7.355 cfs @ 11.96 hrs, Volume= 16,004 cf
Outflow = 0.831 cfs @ 12.25 hrs, Volume= 15,861 cf, Atten= 89%, Lag= 17.5 min
Primary = 0.831 cfs @ 12.25 hrs, Volume= 15,861 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 158.62' @ 12.25 hrs Surf.Area= 13,041 sf Storage= 9,389 cf

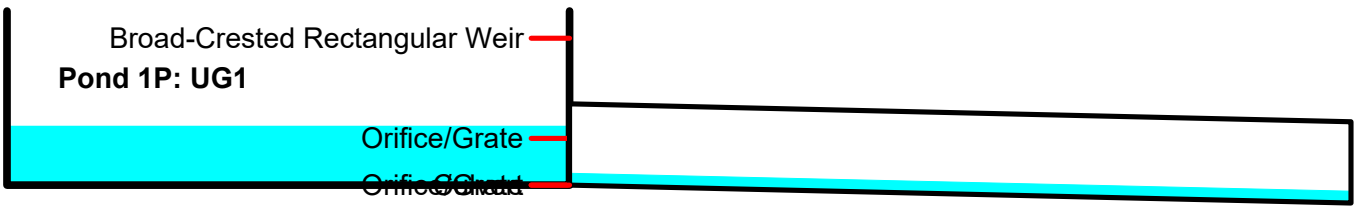
Plug-Flow detention time= 1,637.7 min calculated for 15,861 cf (99% of inflow)
Center-of-Mass det. time= 1,631.9 min (2,406.2 - 774.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.831 cfs @ 12.25 hrs HW=158.62' (Free Discharge)
└**4=Culvert** (Passes 0.831 cfs of 3.177 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.027 cfs @ 4.920 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.804 cfs @ 1.525 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 1P: UG1 - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger®280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 27 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

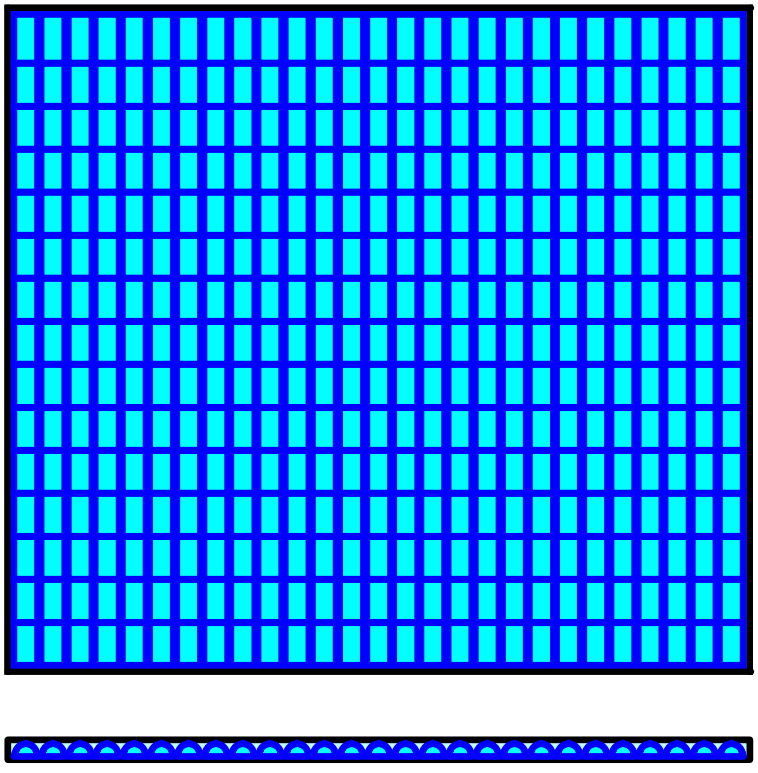
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

405 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 27 Rows = 17,377.3 cf Chamber Storage

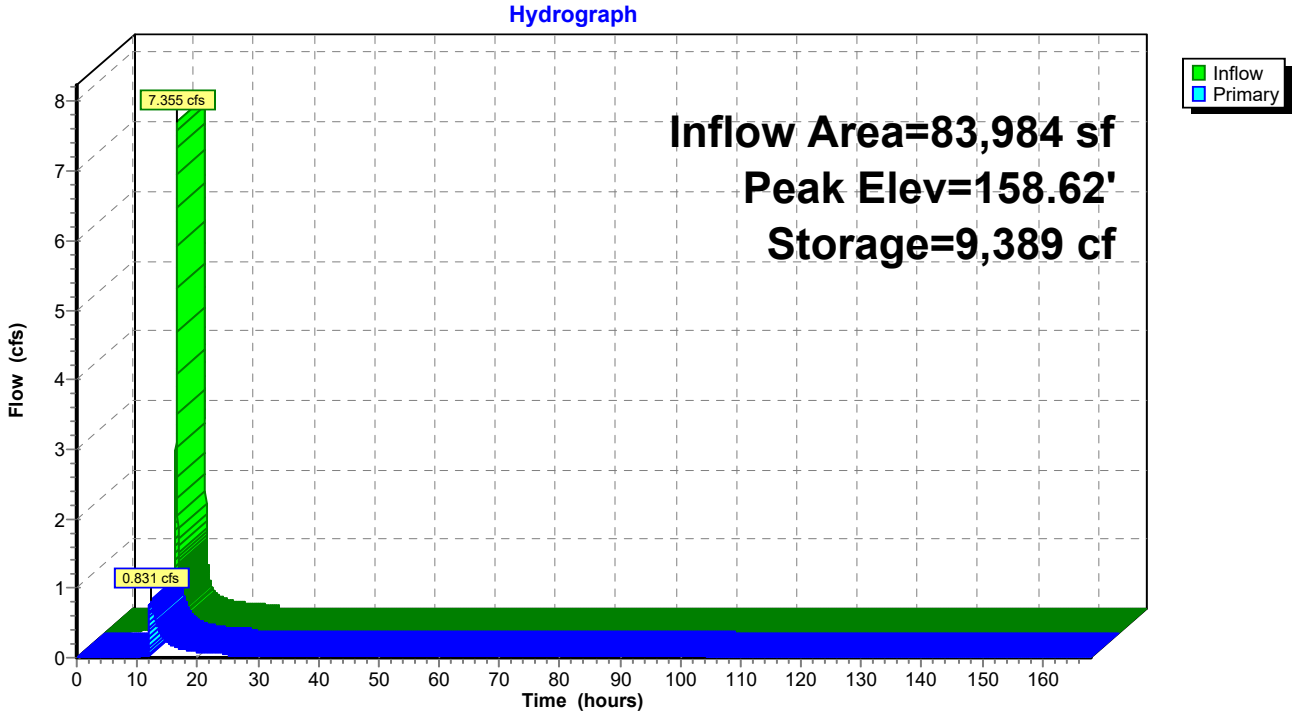
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

Chamber Storage + Stone Storage = 27,162.4 cf = 0.624 af
Overall Storage Efficiency = 64.9%
Overall System Size = 108.00' x 120.75' x 3.21'

405 Chambers
1,549.6 cy Field
906.0 cy Stone



Pond 1P: UG1


Hydrograph
Inflow Area=83,984 sf
Peak Elev=158.62'
Storage=9,389 cf
7.355 cfs
0.831 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.000	0	157.53	0.000
2.00	0.000	0	157.53	0.000
2.50	0.000	0	157.53	0.000
3.00	0.003	1	157.53	0.000
3.50	0.008	11	157.53	0.000
4.00	0.014	30	157.54	0.000
4.50	0.020	59	157.54	0.000
5.00	0.026	100	157.55	0.001
5.50	0.033	151	157.56	0.001
6.00	0.040	214	157.57	0.002
6.50	0.047	288	157.59	0.003
7.00	0.054	373	157.60	0.004
7.50	0.062	468	157.62	0.006
8.00	0.069	575	157.64	0.007
8.50	0.088	701	157.66	0.008
9.00	0.111	865	157.70	0.009
9.50	0.120	1,058	157.73	0.011
10.00	0.152	1,280	157.78	0.012
10.50	0.206	1,578	157.83	0.013
11.00	0.297	2,000	157.91	0.015
11.50	**0.509**	2,678	158.04	0.018
12.00	**6.110**	**8,279**	**158.52**	**0.369**
12.50	0.537	**9,273**	**158.61**	**0.777**
13.00	0.335	8,803	158.56	0.571
13.50	0.254	8,438	158.53	0.426
14.00	0.199	8,167	158.51	0.331
14.50	0.176	7,969	158.49	0.265
15.00	0.158	7,831	158.48	0.225
15.50	0.140	7,723	158.47	0.194
16.00	0.122	7,634	158.46	0.168
16.50	0.114	7,560	158.46	0.149
17.00	0.107	7,503	158.45	0.135
17.50	0.101	7,457	158.45	0.124
18.00	0.094	7,417	158.44	0.116
18.50	0.088	7,380	158.44	0.108
19.00	0.082	7,346	158.44	0.100
19.50	0.075	7,312	158.43	0.093
20.00	0.069	7,280	158.43	0.086
20.50	0.067	7,251	158.43	0.080
21.00	0.065	7,228	158.43	0.077
21.50	0.064	7,208	158.42	0.074
22.00	0.063	7,191	158.42	0.072
22.50	0.061	7,176	158.42	0.070
23.00	0.060	7,162	158.42	0.068
23.50	0.059	7,149	158.42	0.066
24.00	0.057	7,137	158.42	0.064
24.50	0.000	7,048	158.41	0.051
25.00	0.000	6,967	158.40	0.040

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	6,904	158.40	0.031
26.00	0.000	6,854	158.39	0.026
26.50	0.000	6,809	158.39	0.024
27.00	0.000	6,767	158.39	0.024
27.50	0.000	6,724	158.38	0.024
28.00	0.000	6,681	158.38	0.024
28.50	0.000	6,639	158.38	0.024
29.00	0.000	6,597	158.37	0.023
29.50	0.000	6,554	158.37	0.023
30.00	0.000	6,512	158.36	0.023
30.50	0.000	6,470	158.36	0.023
31.00	0.000	6,428	158.36	0.023
31.50	0.000	6,387	158.35	0.023
32.00	0.000	6,345	158.35	0.023
32.50	0.000	6,303	158.35	0.023
33.00	0.000	6,262	158.34	0.023
33.50	0.000	6,220	158.34	0.023
34.00	0.000	6,179	158.34	0.023
34.50	0.000	6,138	158.33	0.023
35.00	0.000	6,096	158.33	0.023
35.50	0.000	6,055	158.32	0.023
36.00	0.000	6,014	158.32	0.023
36.50	0.000	5,973	158.32	0.023
37.00	0.000	5,933	158.31	0.023
37.50	0.000	5,892	158.31	0.023
38.00	0.000	5,851	158.31	0.023
38.50	0.000	5,811	158.30	0.022
39.00	0.000	5,771	158.30	0.022
39.50	0.000	5,730	158.30	0.022
40.00	0.000	5,690	158.29	0.022
40.50	0.000	5,650	158.29	0.022
41.00	0.000	5,610	158.29	0.022
41.50	0.000	5,570	158.28	0.022
42.00	0.000	5,530	158.28	0.022
42.50	0.000	5,491	158.28	0.022
43.00	0.000	5,451	158.27	0.022
43.50	0.000	5,411	158.27	0.022
44.00	0.000	5,372	158.27	0.022
44.50	0.000	5,333	158.26	0.022
45.00	0.000	5,293	158.26	0.022
45.50	0.000	5,254	158.26	0.022
46.00	0.000	5,215	158.25	0.022
46.50	0.000	5,176	158.25	0.022
47.00	0.000	5,137	158.25	0.022
47.50	0.000	5,099	158.24	0.022
48.00	0.000	5,060	158.24	0.021
48.50	0.000	5,022	158.24	0.021
49.00	0.000	4,983	158.23	0.021
49.50	0.000	4,945	158.23	0.021
50.00	0.000	4,906	158.23	0.021
50.50	0.000	4,868	158.22	0.021

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,830	158.22	0.021
51.50	0.000	4,792	158.22	0.021
52.00	0.000	4,754	158.21	0.021
52.50	0.000	4,717	158.21	0.021
53.00	0.000	4,679	158.21	0.021
53.50	0.000	4,641	158.20	0.021
54.00	0.000	4,604	158.20	0.021
54.50	0.000	4,566	158.20	0.021
55.00	0.000	4,529	158.19	0.021
55.50	0.000	4,492	158.19	0.021
56.00	0.000	4,455	158.19	0.021
56.50	0.000	4,418	158.18	0.021
57.00	0.000	4,381	158.18	0.020
57.50	0.000	4,344	158.18	0.020
58.00	0.000	4,307	158.17	0.020
58.50	0.000	4,271	158.17	0.020
59.00	0.000	4,234	158.17	0.020
59.50	0.000	4,198	158.16	0.020
60.00	0.000	4,161	158.16	0.020
60.50	0.000	4,125	158.16	0.020
61.00	0.000	4,089	158.16	0.020
61.50	0.000	4,053	158.15	0.020
62.00	0.000	4,017	158.15	0.020
62.50	0.000	3,981	158.15	0.020
63.00	0.000	3,945	158.14	0.020
63.50	0.000	3,910	158.14	0.020
64.00	0.000	3,874	158.14	0.020
64.50	0.000	3,838	158.13	0.020
65.00	0.000	3,803	158.13	0.020
65.50	0.000	3,768	158.13	0.020
66.00	0.000	3,733	158.12	0.020
66.50	0.000	3,697	158.12	0.019
67.00	0.000	3,662	158.12	0.019
67.50	0.000	3,627	158.12	0.019
68.00	0.000	3,593	158.11	0.019
68.50	0.000	3,558	158.11	0.019
69.00	0.000	3,523	158.11	0.019
69.50	0.000	3,489	158.10	0.019
70.00	0.000	3,454	158.10	0.019
70.50	0.000	3,420	158.10	0.019
71.00	0.000	3,386	158.10	0.019
71.50	0.000	3,352	158.09	0.019
72.00	0.000	3,317	158.09	0.019
72.50	0.000	3,283	158.09	0.019
73.00	0.000	3,250	158.08	0.019
73.50	0.000	3,216	158.08	0.019
74.00	0.000	3,182	158.08	0.019
74.50	0.000	3,149	158.08	0.019
75.00	0.000	3,115	158.07	0.019
75.50	0.000	3,082	158.07	0.019
76.00	0.000	3,048	158.07	0.018

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	3,015	158.06	0.018
77.00	0.000	2,982	158.06	0.018
77.50	0.000	2,949	158.06	0.018
78.00	0.000	2,916	158.06	0.018
78.50	0.000	2,883	158.05	0.018
79.00	0.000	2,850	158.05	0.018
79.50	0.000	2,818	158.05	0.018
80.00	0.000	2,785	158.04	0.018
80.50	0.000	2,753	158.04	0.018
81.00	0.000	2,720	158.04	0.018
81.50	0.000	2,688	158.04	0.018
82.00	0.000	2,656	158.03	0.018
82.50	0.000	2,624	158.03	0.018
83.00	0.000	2,592	158.03	0.018
83.50	0.000	2,560	158.02	0.018
84.00	0.000	2,528	158.01	0.017
84.50	0.000	2,497	158.01	0.017
85.00	0.000	2,466	158.00	0.017
85.50	0.000	2,435	158.00	0.017
86.00	0.000	2,404	157.99	0.017
86.50	0.000	2,374	157.99	0.017
87.00	0.000	2,344	157.98	0.017
87.50	0.000	2,313	157.97	0.017
88.00	0.000	2,284	157.97	0.017
88.50	0.000	2,254	157.96	0.016
89.00	0.000	2,225	157.96	0.016
89.50	0.000	2,195	157.95	0.016
90.00	0.000	2,166	157.95	0.016
90.50	0.000	2,138	157.94	0.016
91.00	0.000	2,109	157.93	0.016
91.50	0.000	2,081	157.93	0.016
92.00	0.000	2,053	157.92	0.016
92.50	0.000	2,025	157.92	0.015
93.00	0.000	1,997	157.91	0.015
93.50	0.000	1,969	157.91	0.015
94.00	0.000	1,942	157.90	0.015
94.50	0.000	1,915	157.90	0.015
95.00	0.000	1,888	157.89	0.015
95.50	0.000	1,862	157.89	0.015
96.00	0.000	1,835	157.88	0.015
96.50	0.000	1,809	157.88	0.015
97.00	0.000	1,783	157.87	0.014
97.50	0.000	1,757	157.87	0.014
98.00	0.000	1,732	157.86	0.014
98.50	0.000	1,706	157.86	0.014
99.00	0.000	1,681	157.85	0.014
99.50	0.000	1,656	157.85	0.014
100.00	0.000	1,631	157.84	0.014
100.50	0.000	1,607	157.84	0.014
101.00	0.000	1,583	157.83	0.013
101.50	0.000	1,559	157.83	0.013

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	1,535	157.82	0.013
102.50	0.000	1,511	157.82	0.013
103.00	0.000	1,488	157.82	0.013
103.50	0.000	1,464	157.81	0.013
104.00	0.000	1,441	157.81	0.013
104.50	0.000	1,419	157.80	0.013
105.00	0.000	1,396	157.80	0.012
105.50	0.000	1,374	157.79	0.012
106.00	0.000	1,352	157.79	0.012
106.50	0.000	1,330	157.78	0.012
107.00	0.000	1,308	157.78	0.012
107.50	0.000	1,286	157.78	0.012
108.00	0.000	1,265	157.77	0.012
108.50	0.000	1,244	157.77	0.012
109.00	0.000	1,223	157.76	0.012
109.50	0.000	1,203	157.76	0.011
110.00	0.000	1,182	157.76	0.011
110.50	0.000	1,162	157.75	0.011
111.00	0.000	1,142	157.75	0.011
111.50	0.000	1,122	157.75	0.011
112.00	0.000	1,103	157.74	0.011
112.50	0.000	1,083	157.74	0.011
113.00	0.000	1,064	157.73	0.011
113.50	0.000	1,045	157.73	0.010
114.00	0.000	1,027	157.73	0.010
114.50	0.000	1,008	157.72	0.010
115.00	0.000	990	157.72	0.010
115.50	0.000	972	157.72	0.010
116.00	0.000	954	157.71	0.010
116.50	0.000	936	157.71	0.010
117.00	0.000	919	157.71	0.010
117.50	0.000	902	157.70	0.009
118.00	0.000	885	157.70	0.009
118.50	0.000	868	157.70	0.009
119.00	0.000	851	157.69	0.009
119.50	0.000	835	157.69	0.009
120.00	0.000	819	157.69	0.009
120.50	0.000	803	157.68	0.009
121.00	0.000	787	157.68	0.009
121.50	0.000	772	157.68	0.009
122.00	0.000	756	157.67	0.008
122.50	0.000	741	157.67	0.008
123.00	0.000	727	157.67	0.008
123.50	0.000	712	157.67	0.008
124.00	0.000	697	157.66	0.008
124.50	0.000	683	157.66	0.008
125.00	0.000	669	157.66	0.008
125.50	0.000	655	157.66	0.008
126.00	0.000	642	157.65	0.007
126.50	0.000	629	157.65	0.007
127.00	0.000	615	157.65	0.007

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	603	157.65	0.007
128.00	0.000	590	157.64	0.007
128.50	0.000	577	157.64	0.007
129.00	0.000	565	157.64	0.007
129.50	0.000	553	157.64	0.007
130.00	0.000	541	157.63	0.007
130.50	0.000	530	157.63	0.006
131.00	0.000	518	157.63	0.006
131.50	0.000	507	157.63	0.006
132.00	0.000	496	157.63	0.006
132.50	0.000	485	157.62	0.006
133.00	0.000	475	157.62	0.006
133.50	0.000	465	157.62	0.006
134.00	0.000	455	157.62	0.005
134.50	0.000	445	157.62	0.005
135.00	0.000	435	157.61	0.005
135.50	0.000	426	157.61	0.005
136.00	0.000	417	157.61	0.005
136.50	0.000	408	157.61	0.005
137.00	0.000	399	157.61	0.005
137.50	0.000	391	157.60	0.005
138.00	0.000	383	157.60	0.005
138.50	0.000	375	157.60	0.004
139.00	0.000	367	157.60	0.004
139.50	0.000	359	157.60	0.004
140.00	0.000	351	157.60	0.004
140.50	0.000	344	157.60	0.004
141.00	0.000	337	157.59	0.004
141.50	0.000	330	157.59	0.004
142.00	0.000	323	157.59	0.004
142.50	0.000	317	157.59	0.004
143.00	0.000	310	157.59	0.003
143.50	0.000	304	157.59	0.003
144.00	0.000	298	157.59	0.003
144.50	0.000	292	157.59	0.003
145.00	0.000	287	157.58	0.003
145.50	0.000	281	157.58	0.003
146.00	0.000	276	157.58	0.003
146.50	0.000	271	157.58	0.003
147.00	0.000	266	157.58	0.003
147.50	0.000	261	157.58	0.003
148.00	0.000	256	157.58	0.003
148.50	0.000	251	157.58	0.003
149.00	0.000	247	157.58	0.002
149.50	0.000	242	157.58	0.002
150.00	0.000	238	157.58	0.002
150.50	0.000	234	157.57	0.002
151.00	0.000	230	157.57	0.002
151.50	0.000	226	157.57	0.002
152.00	0.000	222	157.57	0.002
152.50	0.000	219	157.57	0.002

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	215	157.57	0.002
153.50	0.000	212	157.57	0.002
154.00	0.000	208	157.57	0.002
154.50	0.000	205	157.57	0.002
155.00	0.000	202	157.57	0.002
155.50	0.000	199	157.57	0.002
156.00	0.000	196	157.57	0.002
156.50	0.000	193	157.57	0.002
157.00	0.000	190	157.57	0.002
157.50	0.000	187	157.57	0.002
158.00	0.000	185	157.57	0.001
158.50	0.000	182	157.56	0.001
159.00	0.000	179	157.56	0.001
159.50	0.000	177	157.56	0.001
160.00	0.000	175	157.56	0.001
160.50	0.000	172	157.56	0.001
161.00	0.000	170	157.56	0.001
161.50	0.000	168	157.56	0.001
162.00	0.000	166	157.56	0.001
162.50	0.000	164	157.56	0.001
163.00	0.000	162	157.56	0.001
163.50	0.000	160	157.56	0.001
164.00	0.000	158	157.56	0.001
164.50	0.000	156	157.56	0.001
165.00	0.000	154	157.56	0.001
165.50	0.000	152	157.56	0.001
166.00	0.000	150	157.56	0.001
166.50	0.000	148	157.56	0.001
167.00	0.000	146	157.56	0.001
167.50	0.000	144	157.56	0.001
168.00	0.000	142	157.56	0.001

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 1.43" for 1-yr event
Inflow = 1.306 cfs @ 11.96 hrs, Volume= 2,566 cf
Outflow = 0.200 cfs @ 12.16 hrs, Volume= 2,566 cf, Atten= 85%, Lag= 11.6 min
Primary = 0.200 cfs @ 12.16 hrs, Volume= 2,566 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 160.02' @ 12.16 hrs Surf.Area= 2,542 sf Storage= 1,022 cf

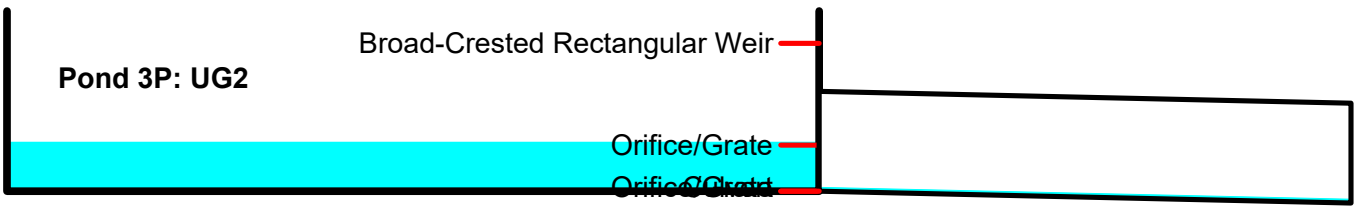
Plug-Flow detention time= 78.4 min calculated for 2,566 cf (100% of inflow)
Center-of-Mass det. time= 78.2 min (903.8 - 825.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.200 cfs @ 12.16 hrs HW=160.02' (Free Discharge)
└**4=Culvert** (Passes 0.200 cfs of 1.719 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.185 cfs @ 3.761 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.015 cfs @ 0.681 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 3P: UG2 - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Discontinued, not for new designs)
Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf
Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 3.44 sf x 8 rows

36.0" Wide + 3.0" Spacing = 39.0" C-C Row Spacing

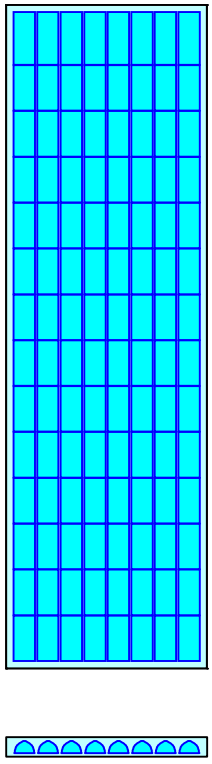
14 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 89.62' Row Length +12.0" End Stone x 2 = 91.62' Base Length
8 Rows x 36.0" Wide + 3.0" Spacing x 7 + 12.0" Side Stone x 2 = 27.75' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

112 Chambers x 21.8 cf +1.00' Row Adjustment x 3.44 sf x 8 Rows = 2,466.0 cf Chamber Storage

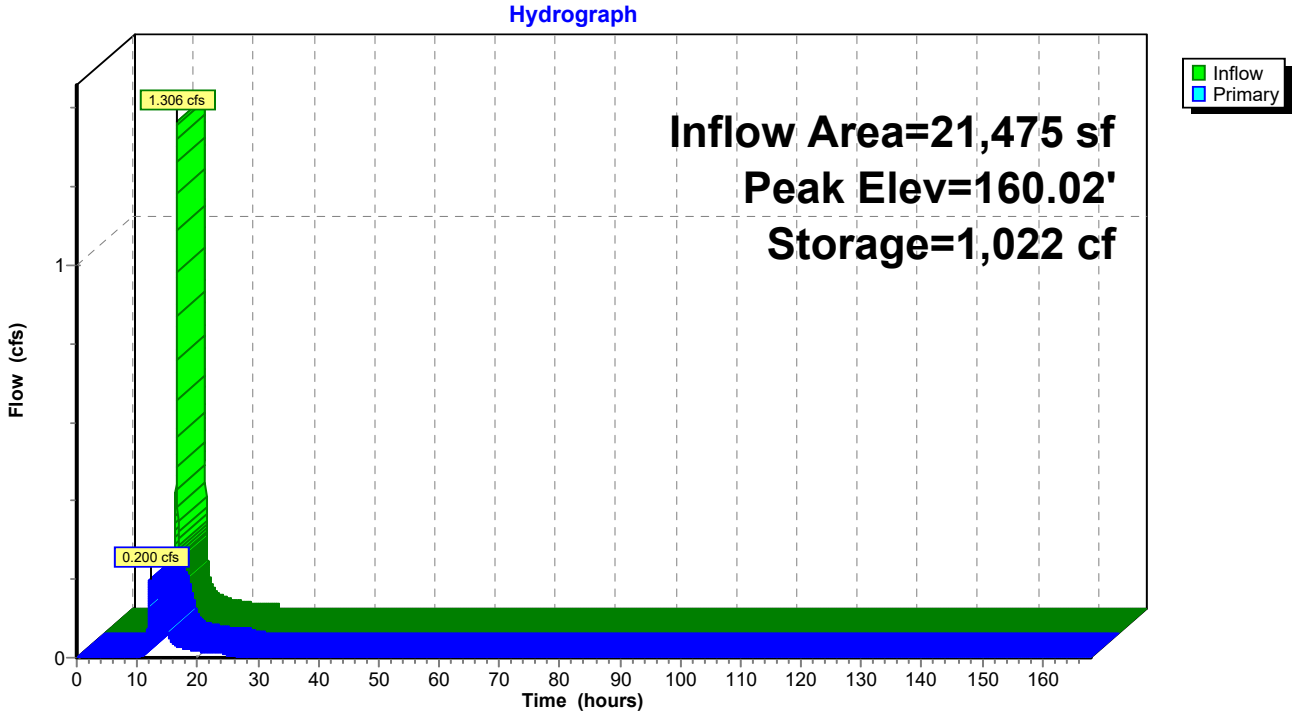
6,885.8 cf Field - 2,466.0 cf Chambers = 4,419.8 cf Stone x 40.0% Voids = 1,767.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,233.9 cf = 0.097 af
Overall Storage Efficiency = 61.5%
Overall System Size = 91.62' x 27.75' x 2.71'

112 Chambers
255.0 cy Field
163.7 cy Stone



Pond 3P: UG2


Hydrograph
Inflow Area=21,475 sf
Peak Elev=160.02'
Storage=1,022 cf
1.306 cfs
0.200 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.000	0	159.28	0.000
4.50	0.000	0	159.28	0.000
5.00	0.000	0	159.28	0.000
5.50	0.000	0	159.28	0.000
6.00	0.000	0	159.28	0.000
6.50	0.000	0	159.28	0.000
7.00	0.000	0	159.28	0.000
7.50	0.000	0	159.28	0.000
8.00	0.000	0	159.28	0.000
8.50	0.001	1	159.28	0.000
9.00	0.003	5	159.28	0.000
9.50	0.005	12	159.29	0.001
10.00	0.009	23	159.30	0.001
10.50	0.015	40	159.32	0.004
11.00	0.027	66	159.35	0.009
11.50	**0.057**	111	159.39	0.023
12.00	**1.123**	**852**	**159.94**	**0.172**
12.50	0.107	**963**	**159.99**	**0.185**
13.00	0.068	796	159.91	0.168
13.50	0.052	613	159.83	0.154
14.00	0.041	437	159.71	0.130
14.50	0.037	301	159.58	0.098
15.00	0.033	214	159.49	0.069
15.50	0.029	168	159.45	0.048
16.00	0.026	143	159.42	0.036
16.50	0.024	128	159.41	0.030
17.00	0.023	120	159.40	0.027
17.50	0.022	114	159.39	0.024
18.00	0.020	109	159.39	0.023
18.50	0.019	105	159.38	0.021
19.00	0.018	101	159.38	0.020
19.50	0.016	97	159.38	0.018
20.00	0.015	93	159.37	0.017
20.50	0.014	90	159.37	0.016
21.00	0.014	88	159.37	0.015
21.50	0.014	86	159.36	0.015
22.00	0.014	85	159.36	0.014
22.50	0.013	84	159.36	0.014
23.00	0.013	83	159.36	0.014
23.50	0.013	82	159.36	0.013
24.00	0.013	81	159.36	0.013
24.50	0.000	65	159.34	0.009
25.00	0.000	52	159.33	0.006

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	43	159.32	0.004
26.00	0.000	37	159.32	0.003
26.50	0.000	32	159.31	0.002
27.00	0.000	28	159.31	0.002
27.50	0.000	25	159.30	0.001
28.00	0.000	23	159.30	0.001
28.50	0.000	21	159.30	0.001
29.00	0.000	18	159.30	0.001
29.50	0.000	17	159.30	0.001
30.00	0.000	15	159.29	0.001
30.50	0.000	13	159.29	0.001
31.00	0.000	12	159.29	0.001
31.50	0.000	11	159.29	0.001
32.00	0.000	10	159.29	0.001
32.50	0.000	9	159.29	0.001
33.00	0.000	8	159.29	0.000
33.50	0.000	7	159.29	0.000
34.00	0.000	6	159.29	0.000
34.50	0.000	6	159.29	0.000
35.00	0.000	5	159.29	0.000
35.50	0.000	5	159.28	0.000
36.00	0.000	4	159.28	0.000
36.50	0.000	4	159.28	0.000
37.00	0.000	3	159.28	0.000
37.50	0.000	3	159.28	0.000
38.00	0.000	3	159.28	0.000
38.50	0.000	3	159.28	0.000
39.00	0.000	2	159.28	0.000
39.50	0.000	2	159.28	0.000
40.00	0.000	2	159.28	0.000
40.50	0.000	2	159.28	0.000
41.00	0.000	1	159.28	0.000
41.50	0.000	1	159.28	0.000
42.00	0.000	1	159.28	0.000
42.50	0.000	1	159.28	0.000
43.00	0.000	1	159.28	0.000
43.50	0.000	1	159.28	0.000
44.00	0.000	1	159.28	0.000
44.50	0.000	1	159.28	0.000
45.00	0.000	1	159.28	0.000
45.50	0.000	1	159.28	0.000
46.00	0.000	1	159.28	0.000
46.50	0.000	0	159.28	0.000
47.00	0.000	0	159.28	0.000
47.50	0.000	0	159.28	0.000
48.00	0.000	0	159.28	0.000
48.50	0.000	0	159.28	0.000
49.00	0.000	0	159.28	0.000
49.50	0.000	0	159.28	0.000
50.00	0.000	0	159.28	0.000
50.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	0	159.28	0.000
51.50	0.000	0	159.28	0.000
52.00	0.000	0	159.28	0.000
52.50	0.000	0	159.28	0.000
53.00	0.000	0	159.28	0.000
53.50	0.000	0	159.28	0.000
54.00	0.000	0	159.28	0.000
54.50	0.000	0	159.28	0.000
55.00	0.000	0	159.28	0.000
55.50	0.000	0	159.28	0.000
56.00	0.000	0	159.28	0.000
56.50	0.000	0	159.28	0.000
57.00	0.000	0	159.28	0.000
57.50	0.000	0	159.28	0.000
58.00	0.000	0	159.28	0.000
58.50	0.000	0	159.28	0.000
59.00	0.000	0	159.28	0.000
59.50	0.000	0	159.28	0.000
60.00	0.000	0	159.28	0.000
60.50	0.000	0	159.28	0.000
61.00	0.000	0	159.28	0.000
61.50	0.000	0	159.28	0.000
62.00	0.000	0	159.28	0.000
62.50	0.000	0	159.28	0.000
63.00	0.000	0	159.28	0.000
63.50	0.000	0	159.28	0.000
64.00	0.000	0	159.28	0.000
64.50	0.000	0	159.28	0.000
65.00	0.000	0	159.28	0.000
65.50	0.000	0	159.28	0.000
66.00	0.000	0	159.28	0.000
66.50	0.000	0	159.28	0.000
67.00	0.000	0	159.28	0.000
67.50	0.000	0	159.28	0.000
68.00	0.000	0	159.28	0.000
68.50	0.000	0	159.28	0.000
69.00	0.000	0	159.28	0.000
69.50	0.000	0	159.28	0.000
70.00	0.000	0	159.28	0.000
70.50	0.000	0	159.28	0.000
71.00	0.000	0	159.28	0.000
71.50	0.000	0	159.28	0.000
72.00	0.000	0	159.28	0.000
72.50	0.000	0	159.28	0.000
73.00	0.000	0	159.28	0.000
73.50	0.000	0	159.28	0.000
74.00	0.000	0	159.28	0.000
74.50	0.000	0	159.28	0.000
75.00	0.000	0	159.28	0.000
75.50	0.000	0	159.28	0.000
76.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	0	159.28	0.000
77.00	0.000	0	159.28	0.000
77.50	0.000	0	159.28	0.000
78.00	0.000	0	159.28	0.000
78.50	0.000	0	159.28	0.000
79.00	0.000	0	159.28	0.000
79.50	0.000	0	159.28	0.000
80.00	0.000	0	159.28	0.000
80.50	0.000	0	159.28	0.000
81.00	0.000	0	159.28	0.000
81.50	0.000	0	159.28	0.000
82.00	0.000	0	159.28	0.000
82.50	0.000	0	159.28	0.000
83.00	0.000	0	159.28	0.000
83.50	0.000	0	159.28	0.000
84.00	0.000	0	159.28	0.000
84.50	0.000	0	159.28	0.000
85.00	0.000	0	159.28	0.000
85.50	0.000	0	159.28	0.000
86.00	0.000	0	159.28	0.000
86.50	0.000	0	159.28	0.000
87.00	0.000	0	159.28	0.000
87.50	0.000	0	159.28	0.000
88.00	0.000	0	159.28	0.000
88.50	0.000	0	159.28	0.000
89.00	0.000	0	159.28	0.000
89.50	0.000	0	159.28	0.000
90.00	0.000	0	159.28	0.000
90.50	0.000	0	159.28	0.000
91.00	0.000	0	159.28	0.000
91.50	0.000	0	159.28	0.000
92.00	0.000	0	159.28	0.000
92.50	0.000	0	159.28	0.000
93.00	0.000	0	159.28	0.000
93.50	0.000	0	159.28	0.000
94.00	0.000	0	159.28	0.000
94.50	0.000	0	159.28	0.000
95.00	0.000	0	159.28	0.000
95.50	0.000	0	159.28	0.000
96.00	0.000	0	159.28	0.000
96.50	0.000	0	159.28	0.000
97.00	0.000	0	159.28	0.000
97.50	0.000	0	159.28	0.000
98.00	0.000	0	159.28	0.000
98.50	0.000	0	159.28	0.000
99.00	0.000	0	159.28	0.000
99.50	0.000	0	159.28	0.000
100.00	0.000	0	159.28	0.000
100.50	0.000	0	159.28	0.000
101.00	0.000	0	159.28	0.000
101.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	0	159.28	0.000
102.50	0.000	0	159.28	0.000
103.00	0.000	0	159.28	0.000
103.50	0.000	0	159.28	0.000
104.00	0.000	0	159.28	0.000
104.50	0.000	0	159.28	0.000
105.00	0.000	0	159.28	0.000
105.50	0.000	0	159.28	0.000
106.00	0.000	0	159.28	0.000
106.50	0.000	0	159.28	0.000
107.00	0.000	0	159.28	0.000
107.50	0.000	0	159.28	0.000
108.00	0.000	0	159.28	0.000
108.50	0.000	0	159.28	0.000
109.00	0.000	0	159.28	0.000
109.50	0.000	0	159.28	0.000
110.00	0.000	0	159.28	0.000
110.50	0.000	0	159.28	0.000
111.00	0.000	0	159.28	0.000
111.50	0.000	0	159.28	0.000
112.00	0.000	0	159.28	0.000
112.50	0.000	0	159.28	0.000
113.00	0.000	0	159.28	0.000
113.50	0.000	0	159.28	0.000
114.00	0.000	0	159.28	0.000
114.50	0.000	0	159.28	0.000
115.00	0.000	0	159.28	0.000
115.50	0.000	0	159.28	0.000
116.00	0.000	0	159.28	0.000
116.50	0.000	0	159.28	0.000
117.00	0.000	0	159.28	0.000
117.50	0.000	0	159.28	0.000
118.00	0.000	0	159.28	0.000
118.50	0.000	0	159.28	0.000
119.00	0.000	0	159.28	0.000
119.50	0.000	0	159.28	0.000
120.00	0.000	0	159.28	0.000
120.50	0.000	0	159.28	0.000
121.00	0.000	0	159.28	0.000
121.50	0.000	0	159.28	0.000
122.00	0.000	0	159.28	0.000
122.50	0.000	0	159.28	0.000
123.00	0.000	0	159.28	0.000
123.50	0.000	0	159.28	0.000
124.00	0.000	0	159.28	0.000
124.50	0.000	0	159.28	0.000
125.00	0.000	0	159.28	0.000
125.50	0.000	0	159.28	0.000
126.00	0.000	0	159.28	0.000
126.50	0.000	0	159.28	0.000
127.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	0	159.28	0.000
128.00	0.000	0	159.28	0.000
128.50	0.000	0	159.28	0.000
129.00	0.000	0	159.28	0.000
129.50	0.000	0	159.28	0.000
130.00	0.000	0	159.28	0.000
130.50	0.000	0	159.28	0.000
131.00	0.000	0	159.28	0.000
131.50	0.000	0	159.28	0.000
132.00	0.000	0	159.28	0.000
132.50	0.000	0	159.28	0.000
133.00	0.000	0	159.28	0.000
133.50	0.000	0	159.28	0.000
134.00	0.000	0	159.28	0.000
134.50	0.000	0	159.28	0.000
135.00	0.000	0	159.28	0.000
135.50	0.000	0	159.28	0.000
136.00	0.000	0	159.28	0.000
136.50	0.000	0	159.28	0.000
137.00	0.000	0	159.28	0.000
137.50	0.000	0	159.28	0.000
138.00	0.000	0	159.28	0.000
138.50	0.000	0	159.28	0.000
139.00	0.000	0	159.28	0.000
139.50	0.000	0	159.28	0.000
140.00	0.000	0	159.28	0.000
140.50	0.000	0	159.28	0.000
141.00	0.000	0	159.28	0.000
141.50	0.000	0	159.28	0.000
142.00	0.000	0	159.28	0.000
142.50	0.000	0	159.28	0.000
143.00	0.000	0	159.28	0.000
143.50	0.000	0	159.28	0.000
144.00	0.000	0	159.28	0.000
144.50	0.000	0	159.28	0.000
145.00	0.000	0	159.28	0.000
145.50	0.000	0	159.28	0.000
146.00	0.000	0	159.28	0.000
146.50	0.000	0	159.28	0.000
147.00	0.000	0	159.28	0.000
147.50	0.000	0	159.28	0.000
148.00	0.000	0	159.28	0.000
148.50	0.000	0	159.28	0.000
149.00	0.000	0	159.28	0.000
149.50	0.000	0	159.28	0.000
150.00	0.000	0	159.28	0.000
150.50	0.000	0	159.28	0.000
151.00	0.000	0	159.28	0.000
151.50	0.000	0	159.28	0.000
152.00	0.000	0	159.28	0.000
152.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	0	159.28	0.000
153.50	0.000	0	159.28	0.000
154.00	0.000	0	159.28	0.000
154.50	0.000	0	159.28	0.000
155.00	0.000	0	159.28	0.000
155.50	0.000	0	159.28	0.000
156.00	0.000	0	159.28	0.000
156.50	0.000	0	159.28	0.000
157.00	0.000	0	159.28	0.000
157.50	0.000	0	159.28	0.000
158.00	0.000	0	159.28	0.000
158.50	0.000	0	159.28	0.000
159.00	0.000	0	159.28	0.000
159.50	0.000	0	159.28	0.000
160.00	0.000	0	159.28	0.000
160.50	0.000	0	159.28	0.000
161.00	0.000	0	159.28	0.000
161.50	0.000	0	159.28	0.000
162.00	0.000	0	159.28	0.000
162.50	0.000	0	159.28	0.000
163.00	0.000	0	159.28	0.000
163.50	0.000	0	159.28	0.000
164.00	0.000	0	159.28	0.000
164.50	0.000	0	159.28	0.000
165.00	0.000	0	159.28	0.000
165.50	0.000	0	159.28	0.000
166.00	0.000	0	159.28	0.000
166.50	0.000	0	159.28	0.000
167.00	0.000	0	159.28	0.000
167.50	0.000	0	159.28	0.000
168.00	0.000	0	159.28	0.000

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 2.83" for 2-yr event
Inflow = 8.968 cfs @ 11.96 hrs, Volume= 19,792 cf
Outflow = 1.724 cfs @ 12.11 hrs, Volume= 19,649 cf, Atten= 81%, Lag= 9.0 min
Primary = 1.724 cfs @ 12.11 hrs, Volume= 19,649 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 158.77' @ 12.11 hrs Surf.Area= 13,041 sf Storage= 11,156 cf

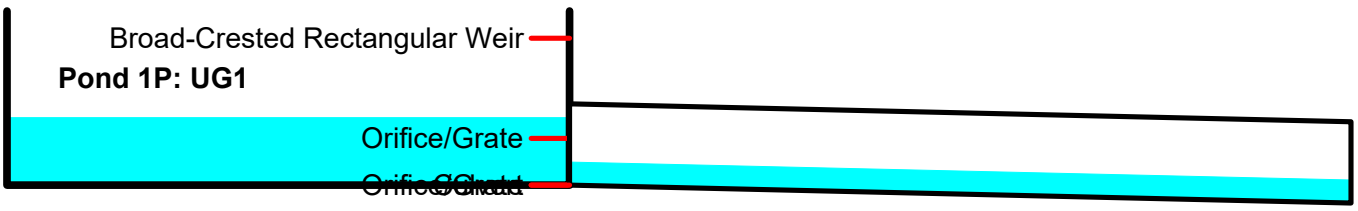
Plug-Flow detention time= 1,344.7 min calculated for 19,648 cf (99% of inflow)
Center-of-Mass det. time= 1,340.3 min (2,109.2 - 768.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.725 cfs @ 12.11 hrs HW=158.77' (Free Discharge)
└**4=Culvert** (Passes 1.725 cfs of 3.976 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.029 cfs @ 5.279 fps)
  ├**2=Orifice/Grate** (Orifice Controls 1.697 cfs @ 2.181 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 1P: UG1 - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger®280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 27 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

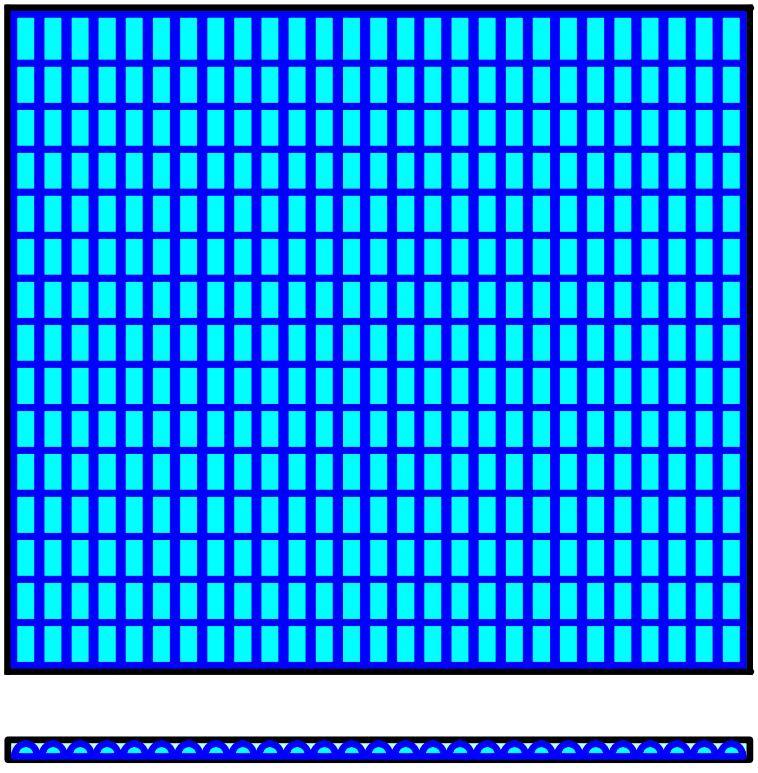
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

405 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 27 Rows = 17,377.3 cf Chamber Storage

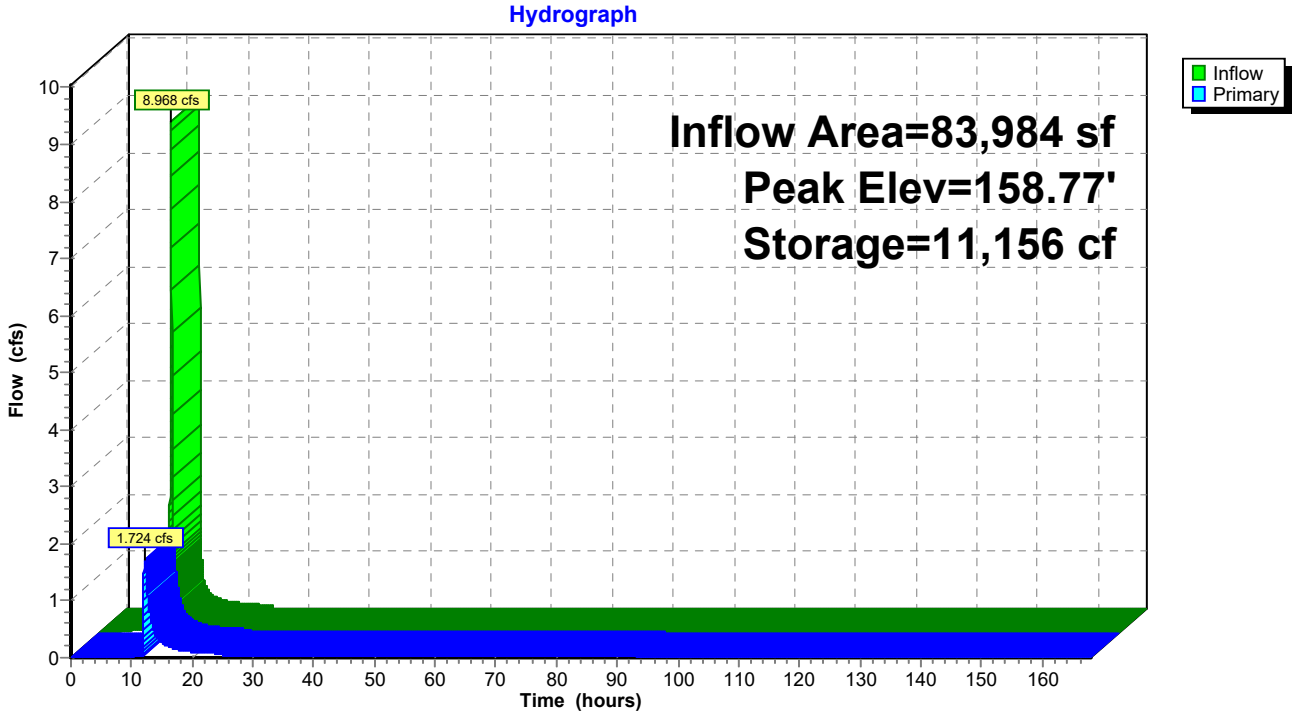
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

Chamber Storage + Stone Storage = 27,162.4 cf = 0.624 af
Overall Storage Efficiency = 64.9%
Overall System Size = 108.00' x 120.75' x 3.21'

405 Chambers
1,549.6 cy Field
906.0 cy Stone



Pond 1P: UG1


Hydrograph
Inflow Area=83,984 sf
Peak Elev=158.77'
Storage=11,156 cf
8.968 cfs
1.724 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.000	0	157.53	0.000
2.00	0.000	0	157.53	0.000
2.50	0.002	1	157.53	0.000
3.00	0.010	11	157.53	0.000
3.50	0.017	35	157.54	0.000
4.00	0.024	71	157.54	0.000
4.50	0.032	119	157.55	0.001
5.00	0.040	182	157.56	0.001
5.50	0.049	258	157.58	0.003
6.00	0.057	347	157.60	0.004
6.50	0.066	449	157.62	0.005
7.00	0.075	565	157.64	0.007
7.50	0.084	695	157.66	0.008
8.00	0.093	839	157.69	0.009
8.50	0.117	1,008	157.72	0.010
9.00	0.146	1,225	157.76	0.012
9.50	0.156	1,478	157.81	0.013
10.00	0.196	1,766	157.87	0.014
10.50	0.263	2,149	157.94	0.016
11.00	0.375	2,687	158.04	0.018
11.50	**0.636**	3,542	158.11	0.019
12.00	**7.436**	**10,239**	**158.69**	**1.269**
12.50	0.651	**10,329**	**158.70**	**1.319**
13.00	0.406	9,354	158.61	0.814
13.50	0.307	8,775	158.56	0.559
14.00	0.241	8,402	158.53	0.412
14.50	0.213	8,149	158.51	0.325
15.00	0.191	7,982	158.49	0.269
15.50	0.169	7,857	158.48	0.233
16.00	0.148	7,751	158.47	0.202
16.50	0.138	7,666	158.46	0.177
17.00	0.130	7,604	158.46	0.160
17.50	0.122	7,553	158.45	0.148
18.00	0.114	7,510	158.45	0.137
18.50	0.106	7,471	158.45	0.127
19.00	0.099	7,433	158.44	0.119
19.50	0.091	7,396	158.44	0.111
20.00	0.083	7,359	158.44	0.103
20.50	0.080	7,326	158.43	0.096
21.00	0.079	7,301	158.43	0.091
21.50	0.077	7,282	158.43	0.087
22.00	0.076	7,266	158.43	0.084
22.50	0.074	7,253	158.43	0.081
23.00	0.073	7,242	158.43	0.079
23.50	0.071	7,230	158.43	0.077
24.00	0.069	7,219	158.43	0.076
24.50	0.000	7,114	158.42	0.061
25.00	0.000	7,018	158.41	0.047

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	6,943	158.40	0.036
26.00	0.000	6,886	158.40	0.028
26.50	0.000	6,838	158.39	0.025
27.00	0.000	6,795	158.39	0.024
27.50	0.000	6,752	158.38	0.024
28.00	0.000	6,709	158.38	0.024
28.50	0.000	6,667	158.38	0.024
29.00	0.000	6,625	158.37	0.024
29.50	0.000	6,582	158.37	0.023
30.00	0.000	6,540	158.37	0.023
30.50	0.000	6,498	158.36	0.023
31.00	0.000	6,456	158.36	0.023
31.50	0.000	6,414	158.36	0.023
32.00	0.000	6,372	158.35	0.023
32.50	0.000	6,331	158.35	0.023
33.00	0.000	6,289	158.34	0.023
33.50	0.000	6,247	158.34	0.023
34.00	0.000	6,206	158.34	0.023
34.50	0.000	6,165	158.33	0.023
35.00	0.000	6,123	158.33	0.023
35.50	0.000	6,082	158.33	0.023
36.00	0.000	6,041	158.32	0.023
36.50	0.000	6,000	158.32	0.023
37.00	0.000	5,960	158.32	0.023
37.50	0.000	5,919	158.31	0.023
38.00	0.000	5,878	158.31	0.023
38.50	0.000	5,838	158.31	0.023
39.00	0.000	5,797	158.30	0.022
39.50	0.000	5,757	158.30	0.022
40.00	0.000	5,717	158.30	0.022
40.50	0.000	5,676	158.29	0.022
41.00	0.000	5,636	158.29	0.022
41.50	0.000	5,596	158.28	0.022
42.00	0.000	5,556	158.28	0.022
42.50	0.000	5,517	158.28	0.022
43.00	0.000	5,477	158.27	0.022
43.50	0.000	5,437	158.27	0.022
44.00	0.000	5,398	158.27	0.022
44.50	0.000	5,359	158.26	0.022
45.00	0.000	5,319	158.26	0.022
45.50	0.000	5,280	158.26	0.022
46.00	0.000	5,241	158.25	0.022
46.50	0.000	5,202	158.25	0.022
47.00	0.000	5,163	158.25	0.022
47.50	0.000	5,124	158.24	0.022
48.00	0.000	5,086	158.24	0.021
48.50	0.000	5,047	158.24	0.021
49.00	0.000	5,008	158.23	0.021
49.50	0.000	4,970	158.23	0.021
50.00	0.000	4,932	158.23	0.021
50.50	0.000	4,893	158.22	0.021

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,855	158.22	0.021
51.50	0.000	4,817	158.22	0.021
52.00	0.000	4,779	158.21	0.021
52.50	0.000	4,741	158.21	0.021
53.00	0.000	4,704	158.21	0.021
53.50	0.000	4,666	158.20	0.021
54.00	0.000	4,628	158.20	0.021
54.50	0.000	4,591	158.20	0.021
55.00	0.000	4,554	158.20	0.021
55.50	0.000	4,516	158.19	0.021
56.00	0.000	4,479	158.19	0.021
56.50	0.000	4,442	158.19	0.021
57.00	0.000	4,405	158.18	0.021
57.50	0.000	4,368	158.18	0.020
58.00	0.000	4,331	158.18	0.020
58.50	0.000	4,295	158.17	0.020
59.00	0.000	4,258	158.17	0.020
59.50	0.000	4,222	158.17	0.020
60.00	0.000	4,185	158.16	0.020
60.50	0.000	4,149	158.16	0.020
61.00	0.000	4,113	158.16	0.020
61.50	0.000	4,077	158.15	0.020
62.00	0.000	4,040	158.15	0.020
62.50	0.000	4,005	158.15	0.020
63.00	0.000	3,969	158.14	0.020
63.50	0.000	3,933	158.14	0.020
64.00	0.000	3,897	158.14	0.020
64.50	0.000	3,862	158.14	0.020
65.00	0.000	3,826	158.13	0.020
65.50	0.000	3,791	158.13	0.020
66.00	0.000	3,756	158.13	0.020
66.50	0.000	3,721	158.12	0.020
67.00	0.000	3,685	158.12	0.019
67.50	0.000	3,650	158.12	0.019
68.00	0.000	3,616	158.11	0.019
68.50	0.000	3,581	158.11	0.019
69.00	0.000	3,546	158.11	0.019
69.50	0.000	3,511	158.11	0.019
70.00	0.000	3,477	158.10	0.019
70.50	0.000	3,443	158.10	0.019
71.00	0.000	3,408	158.10	0.019
71.50	0.000	3,374	158.09	0.019
72.00	0.000	3,340	158.09	0.019
72.50	0.000	3,306	158.09	0.019
73.00	0.000	3,272	158.09	0.019
73.50	0.000	3,238	158.08	0.019
74.00	0.000	3,204	158.08	0.019
74.50	0.000	3,171	158.08	0.019
75.00	0.000	3,137	158.07	0.019
75.50	0.000	3,104	158.07	0.019
76.00	0.000	3,070	158.07	0.019

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	3,037	158.07	0.018
77.00	0.000	3,004	158.06	0.018
77.50	0.000	2,971	158.06	0.018
78.00	0.000	2,938	158.06	0.018
78.50	0.000	2,905	158.05	0.018
79.00	0.000	2,872	158.05	0.018
79.50	0.000	2,839	158.05	0.018
80.00	0.000	2,807	158.05	0.018
80.50	0.000	2,774	158.04	0.018
81.00	0.000	2,742	158.04	0.018
81.50	0.000	2,709	158.04	0.018
82.00	0.000	2,677	158.04	0.018
82.50	0.000	2,645	158.03	0.018
83.00	0.000	2,613	158.03	0.018
83.50	0.000	2,581	158.02	0.018
84.00	0.000	2,549	158.02	0.018
84.50	0.000	2,518	158.01	0.017
85.00	0.000	2,486	158.01	0.017
85.50	0.000	2,455	158.00	0.017
86.00	0.000	2,425	157.99	0.017
86.50	0.000	2,394	157.99	0.017
87.00	0.000	2,363	157.98	0.017
87.50	0.000	2,333	157.98	0.017
88.00	0.000	2,303	157.97	0.017
88.50	0.000	2,273	157.97	0.016
89.00	0.000	2,244	157.96	0.016
89.50	0.000	2,215	157.95	0.016
90.00	0.000	2,185	157.95	0.016
90.50	0.000	2,156	157.94	0.016
91.00	0.000	2,128	157.94	0.016
91.50	0.000	2,099	157.93	0.016
92.00	0.000	2,071	157.93	0.016
92.50	0.000	2,043	157.92	0.016
93.00	0.000	2,015	157.92	0.015
93.50	0.000	1,987	157.91	0.015
94.00	0.000	1,960	157.91	0.015
94.50	0.000	1,933	157.90	0.015
95.00	0.000	1,906	157.90	0.015
95.50	0.000	1,879	157.89	0.015
96.00	0.000	1,852	157.89	0.015
96.50	0.000	1,826	157.88	0.015
97.00	0.000	1,800	157.88	0.014
97.50	0.000	1,774	157.87	0.014
98.00	0.000	1,748	157.87	0.014
98.50	0.000	1,723	157.86	0.014
99.00	0.000	1,698	157.86	0.014
99.50	0.000	1,672	157.85	0.014
100.00	0.000	1,648	157.85	0.014
100.50	0.000	1,623	157.84	0.014
101.00	0.000	1,599	157.84	0.014
101.50	0.000	1,574	157.83	0.013

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	1,550	157.83	0.013
102.50	0.000	1,527	157.82	0.013
103.00	0.000	1,503	157.82	0.013
103.50	0.000	1,480	157.81	0.013
104.00	0.000	1,457	157.81	0.013
104.50	0.000	1,434	157.80	0.013
105.00	0.000	1,411	157.80	0.013
105.50	0.000	1,388	157.80	0.012
106.00	0.000	1,366	157.79	0.012
106.50	0.000	1,344	157.79	0.012
107.00	0.000	1,322	157.78	0.012
107.50	0.000	1,301	157.78	0.012
108.00	0.000	1,279	157.78	0.012
108.50	0.000	1,258	157.77	0.012
109.00	0.000	1,237	157.77	0.012
109.50	0.000	1,216	157.76	0.011
110.00	0.000	1,196	157.76	0.011
110.50	0.000	1,175	157.76	0.011
111.00	0.000	1,155	157.75	0.011
111.50	0.000	1,135	157.75	0.011
112.00	0.000	1,115	157.74	0.011
112.50	0.000	1,096	157.74	0.011
113.00	0.000	1,077	157.74	0.011
113.50	0.000	1,058	157.73	0.011
114.00	0.000	1,039	157.73	0.010
114.50	0.000	1,020	157.73	0.010
115.00	0.000	1,002	157.72	0.010
115.50	0.000	984	157.72	0.010
116.00	0.000	966	157.72	0.010
116.50	0.000	948	157.71	0.010
117.00	0.000	930	157.71	0.010
117.50	0.000	913	157.70	0.010
118.00	0.000	896	157.70	0.009
118.50	0.000	879	157.70	0.009
119.00	0.000	862	157.70	0.009
119.50	0.000	846	157.69	0.009
120.00	0.000	829	157.69	0.009
120.50	0.000	813	157.69	0.009
121.00	0.000	797	157.68	0.009
121.50	0.000	782	157.68	0.009
122.00	0.000	766	157.68	0.008
122.50	0.000	751	157.67	0.008
123.00	0.000	736	157.67	0.008
123.50	0.000	721	157.67	0.008
124.00	0.000	707	157.67	0.008
124.50	0.000	693	157.66	0.008
125.00	0.000	678	157.66	0.008
125.50	0.000	665	157.66	0.008
126.00	0.000	651	157.65	0.008
126.50	0.000	637	157.65	0.007
127.00	0.000	624	157.65	0.007

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	611	157.65	0.007
128.00	0.000	598	157.64	0.007
128.50	0.000	586	157.64	0.007
129.00	0.000	573	157.64	0.007
129.50	0.000	561	157.64	0.007
130.00	0.000	549	157.64	0.007
130.50	0.000	537	157.63	0.006
131.00	0.000	526	157.63	0.006
131.50	0.000	514	157.63	0.006
132.00	0.000	503	157.63	0.006
132.50	0.000	492	157.62	0.006
133.00	0.000	482	157.62	0.006
133.50	0.000	471	157.62	0.006
134.00	0.000	461	157.62	0.006
134.50	0.000	451	157.62	0.005
135.00	0.000	441	157.61	0.005
135.50	0.000	432	157.61	0.005
136.00	0.000	423	157.61	0.005
136.50	0.000	414	157.61	0.005
137.00	0.000	405	157.61	0.005
137.50	0.000	396	157.61	0.005
138.00	0.000	388	157.60	0.005
138.50	0.000	380	157.60	0.004
139.00	0.000	372	157.60	0.004
139.50	0.000	364	157.60	0.004
140.00	0.000	356	157.60	0.004
140.50	0.000	349	157.60	0.004
141.00	0.000	342	157.60	0.004
141.50	0.000	335	157.59	0.004
142.00	0.000	328	157.59	0.004
142.50	0.000	321	157.59	0.004
143.00	0.000	315	157.59	0.004
143.50	0.000	308	157.59	0.003
144.00	0.000	302	157.59	0.003
144.50	0.000	296	157.59	0.003
145.00	0.000	290	157.59	0.003
145.50	0.000	285	157.58	0.003
146.00	0.000	279	157.58	0.003
146.50	0.000	274	157.58	0.003
147.00	0.000	269	157.58	0.003
147.50	0.000	264	157.58	0.003
148.00	0.000	259	157.58	0.003
148.50	0.000	254	157.58	0.003
149.00	0.000	250	157.58	0.003
149.50	0.000	245	157.58	0.002
150.00	0.000	241	157.58	0.002
150.50	0.000	237	157.58	0.002
151.00	0.000	233	157.57	0.002
151.50	0.000	229	157.57	0.002
152.00	0.000	225	157.57	0.002
152.50	0.000	221	157.57	0.002

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	217	157.57	0.002
153.50	0.000	214	157.57	0.002
154.00	0.000	210	157.57	0.002
154.50	0.000	207	157.57	0.002
155.00	0.000	204	157.57	0.002
155.50	0.000	201	157.57	0.002
156.00	0.000	198	157.57	0.002
156.50	0.000	195	157.57	0.002
157.00	0.000	192	157.57	0.002
157.50	0.000	189	157.57	0.002
158.00	0.000	186	157.57	0.001
158.50	0.000	184	157.57	0.001
159.00	0.000	181	157.56	0.001
159.50	0.000	179	157.56	0.001
160.00	0.000	176	157.56	0.001
160.50	0.000	174	157.56	0.001
161.00	0.000	172	157.56	0.001
161.50	0.000	169	157.56	0.001
162.00	0.000	167	157.56	0.001
162.50	0.000	165	157.56	0.001
163.00	0.000	163	157.56	0.001
163.50	0.000	161	157.56	0.001
164.00	0.000	159	157.56	0.001
164.50	0.000	157	157.56	0.001
165.00	0.000	155	157.56	0.001
165.50	0.000	153	157.56	0.001
166.00	0.000	151	157.56	0.001
166.50	0.000	149	157.56	0.001
167.00	0.000	147	157.56	0.001
167.50	0.000	145	157.56	0.001
168.00	0.000	144	157.56	0.001

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 1.90" for 2-yr event
Inflow = 1.718 cfs @ 11.96 hrs, Volume= 3,409 cf
Outflow = 0.347 cfs @ 12.11 hrs, Volume= 3,409 cf, Atten= 80%, Lag= 8.8 min
Primary = 0.347 cfs @ 12.11 hrs, Volume= 3,409 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 160.17' @ 12.11 hrs Surf.Area= 2,542 sf Storage= 1,349 cf

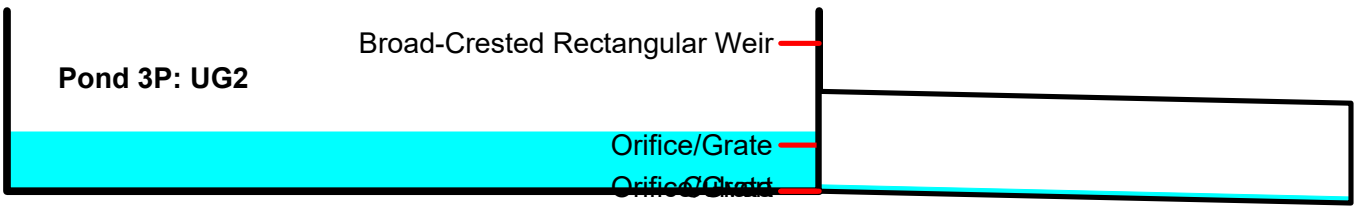
Plug-Flow detention time= 74.8 min calculated for 3,409 cf (100% of inflow)
Center-of-Mass det. time= 74.9 min (892.3 - 817.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.347 cfs @ 12.11 hrs HW=160.17' (Free Discharge)
└**4=Culvert** (Passes 0.347 cfs of 2.415 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.206 cfs @ 4.203 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.140 cfs @ 1.425 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 3P: UG2 - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Discontinued, not for new designs)
Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf
Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 3.44 sf x 8 rows

36.0" Wide + 3.0" Spacing = 39.0" C-C Row Spacing

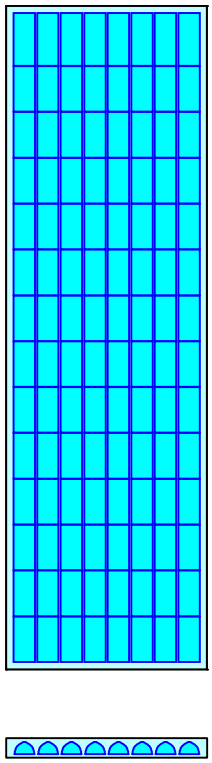
14 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 89.62' Row Length +12.0" End Stone x 2 = 91.62' Base Length
8 Rows x 36.0" Wide + 3.0" Spacing x 7 + 12.0" Side Stone x 2 = 27.75' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

112 Chambers x 21.8 cf +1.00' Row Adjustment x 3.44 sf x 8 Rows = 2,466.0 cf Chamber Storage

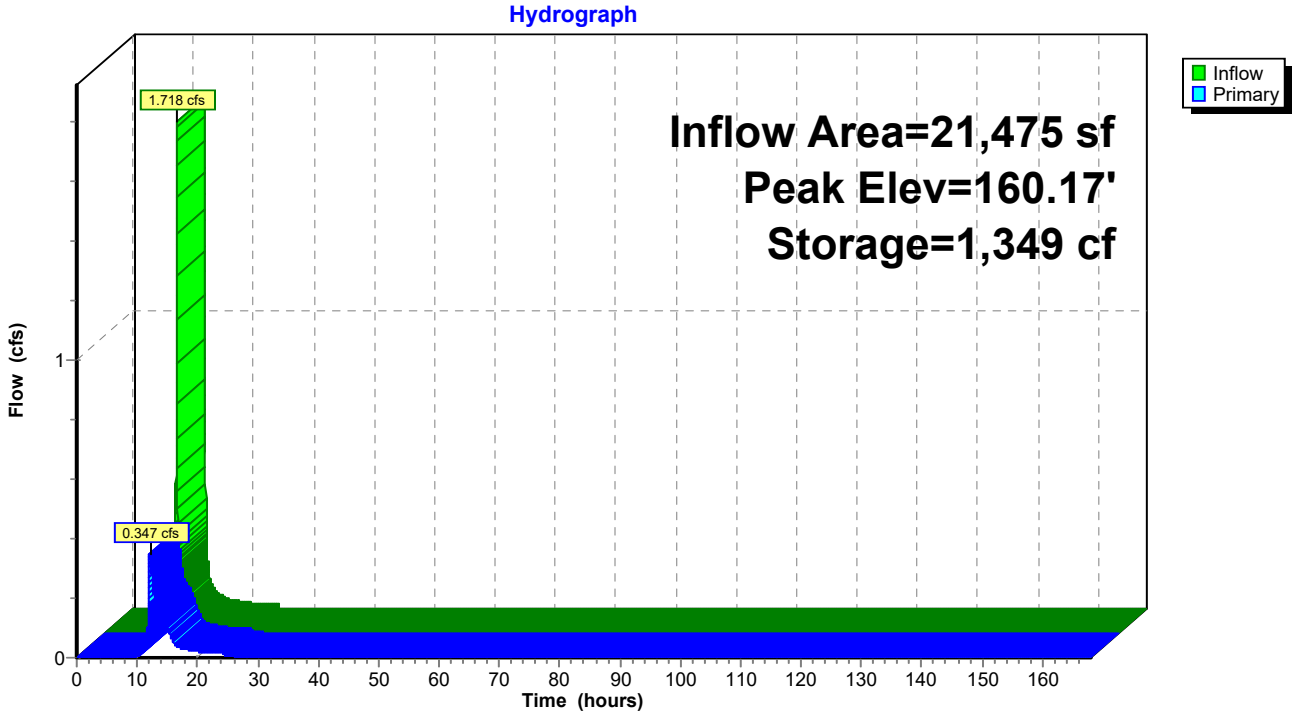
6,885.8 cf Field - 2,466.0 cf Chambers = 4,419.8 cf Stone x 40.0% Voids = 1,767.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,233.9 cf = 0.097 af
Overall Storage Efficiency = 61.5%
Overall System Size = 91.62' x 27.75' x 2.71'

112 Chambers
255.0 cy Field
163.7 cy Stone



Pond 3P: UG2


Hydrograph
Inflow Area=21,475 sf
Peak Elev=160.17'
Storage=1,349 cf
1.718 cfs
0.347 cfs
Inflow
Primary
Flow (cfs)
0
1
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160
Time (hours)

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.000	0	159.28	0.000
4.50	0.000	0	159.28	0.000
5.00	0.000	0	159.28	0.000
5.50	0.000	0	159.28	0.000
6.00	0.000	0	159.28	0.000
6.50	0.000	0	159.28	0.000
7.00	0.000	0	159.28	0.000
7.50	0.001	1	159.28	0.000
8.00	0.003	4	159.28	0.000
8.50	0.005	10	159.29	0.001
9.00	0.008	20	159.30	0.001
9.50	0.011	34	159.31	0.003
10.00	0.016	51	159.33	0.005
10.50	0.025	73	159.35	0.011
11.00	0.042	105	159.38	0.021
11.50	**0.083**	158	159.44	0.043
12.00	**1.467**	**1,165**	**160.08**	**0.254**
12.50	0.137	**1,195**	**160.10**	**0.268**
13.00	0.087	983	160.00	0.190
13.50	0.066	801	159.91	0.169
14.00	0.052	617	159.83	0.154
14.50	0.046	444	159.72	0.132
15.00	0.042	314	159.59	0.101
15.50	0.037	228	159.50	0.074
16.00	0.033	178	159.46	0.052
16.50	0.030	152	159.43	0.041
17.00	0.029	139	159.42	0.034
17.50	0.027	130	159.41	0.031
18.00	0.025	124	159.40	0.029
18.50	0.024	119	159.40	0.026
19.00	0.022	114	159.39	0.025
19.50	0.020	110	159.39	0.023
20.00	0.019	105	159.38	0.021
20.50	0.018	101	159.38	0.020
21.00	0.018	99	159.38	0.019
21.50	0.017	97	159.38	0.018
22.00	0.017	95	159.37	0.018
22.50	0.017	94	159.37	0.017
23.00	0.016	93	159.37	0.017
23.50	0.016	92	159.37	0.017
24.00	0.016	91	159.37	0.016
24.50	0.000	71	159.35	0.010
25.00	0.000	56	159.34	0.007

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	46	159.33	0.005
26.00	0.000	39	159.32	0.004
26.50	0.000	33	159.31	0.003
27.00	0.000	29	159.31	0.002
27.50	0.000	26	159.31	0.002
28.00	0.000	24	159.30	0.001
28.50	0.000	21	159.30	0.001
29.00	0.000	19	159.30	0.001
29.50	0.000	17	159.30	0.001
30.00	0.000	16	159.30	0.001
30.50	0.000	14	159.29	0.001
31.00	0.000	13	159.29	0.001
31.50	0.000	11	159.29	0.001
32.00	0.000	10	159.29	0.001
32.50	0.000	9	159.29	0.001
33.00	0.000	8	159.29	0.000
33.50	0.000	7	159.29	0.000
34.00	0.000	7	159.29	0.000
34.50	0.000	6	159.29	0.000
35.00	0.000	5	159.29	0.000
35.50	0.000	5	159.28	0.000
36.00	0.000	4	159.28	0.000
36.50	0.000	4	159.28	0.000
37.00	0.000	4	159.28	0.000
37.50	0.000	3	159.28	0.000
38.00	0.000	3	159.28	0.000
38.50	0.000	3	159.28	0.000
39.00	0.000	2	159.28	0.000
39.50	0.000	2	159.28	0.000
40.00	0.000	2	159.28	0.000
40.50	0.000	2	159.28	0.000
41.00	0.000	2	159.28	0.000
41.50	0.000	1	159.28	0.000
42.00	0.000	1	159.28	0.000
42.50	0.000	1	159.28	0.000
43.00	0.000	1	159.28	0.000
43.50	0.000	1	159.28	0.000
44.00	0.000	1	159.28	0.000
44.50	0.000	1	159.28	0.000
45.00	0.000	1	159.28	0.000
45.50	0.000	1	159.28	0.000
46.00	0.000	1	159.28	0.000
46.50	0.000	0	159.28	0.000
47.00	0.000	0	159.28	0.000
47.50	0.000	0	159.28	0.000
48.00	0.000	0	159.28	0.000
48.50	0.000	0	159.28	0.000
49.00	0.000	0	159.28	0.000
49.50	0.000	0	159.28	0.000
50.00	0.000	0	159.28	0.000
50.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	0	159.28	0.000
51.50	0.000	0	159.28	0.000
52.00	0.000	0	159.28	0.000
52.50	0.000	0	159.28	0.000
53.00	0.000	0	159.28	0.000
53.50	0.000	0	159.28	0.000
54.00	0.000	0	159.28	0.000
54.50	0.000	0	159.28	0.000
55.00	0.000	0	159.28	0.000
55.50	0.000	0	159.28	0.000
56.00	0.000	0	159.28	0.000
56.50	0.000	0	159.28	0.000
57.00	0.000	0	159.28	0.000
57.50	0.000	0	159.28	0.000
58.00	0.000	0	159.28	0.000
58.50	0.000	0	159.28	0.000
59.00	0.000	0	159.28	0.000
59.50	0.000	0	159.28	0.000
60.00	0.000	0	159.28	0.000
60.50	0.000	0	159.28	0.000
61.00	0.000	0	159.28	0.000
61.50	0.000	0	159.28	0.000
62.00	0.000	0	159.28	0.000
62.50	0.000	0	159.28	0.000
63.00	0.000	0	159.28	0.000
63.50	0.000	0	159.28	0.000
64.00	0.000	0	159.28	0.000
64.50	0.000	0	159.28	0.000
65.00	0.000	0	159.28	0.000
65.50	0.000	0	159.28	0.000
66.00	0.000	0	159.28	0.000
66.50	0.000	0	159.28	0.000
67.00	0.000	0	159.28	0.000
67.50	0.000	0	159.28	0.000
68.00	0.000	0	159.28	0.000
68.50	0.000	0	159.28	0.000
69.00	0.000	0	159.28	0.000
69.50	0.000	0	159.28	0.000
70.00	0.000	0	159.28	0.000
70.50	0.000	0	159.28	0.000
71.00	0.000	0	159.28	0.000
71.50	0.000	0	159.28	0.000
72.00	0.000	0	159.28	0.000
72.50	0.000	0	159.28	0.000
73.00	0.000	0	159.28	0.000
73.50	0.000	0	159.28	0.000
74.00	0.000	0	159.28	0.000
74.50	0.000	0	159.28	0.000
75.00	0.000	0	159.28	0.000
75.50	0.000	0	159.28	0.000
76.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	0	159.28	0.000
77.00	0.000	0	159.28	0.000
77.50	0.000	0	159.28	0.000
78.00	0.000	0	159.28	0.000
78.50	0.000	0	159.28	0.000
79.00	0.000	0	159.28	0.000
79.50	0.000	0	159.28	0.000
80.00	0.000	0	159.28	0.000
80.50	0.000	0	159.28	0.000
81.00	0.000	0	159.28	0.000
81.50	0.000	0	159.28	0.000
82.00	0.000	0	159.28	0.000
82.50	0.000	0	159.28	0.000
83.00	0.000	0	159.28	0.000
83.50	0.000	0	159.28	0.000
84.00	0.000	0	159.28	0.000
84.50	0.000	0	159.28	0.000
85.00	0.000	0	159.28	0.000
85.50	0.000	0	159.28	0.000
86.00	0.000	0	159.28	0.000
86.50	0.000	0	159.28	0.000
87.00	0.000	0	159.28	0.000
87.50	0.000	0	159.28	0.000
88.00	0.000	0	159.28	0.000
88.50	0.000	0	159.28	0.000
89.00	0.000	0	159.28	0.000
89.50	0.000	0	159.28	0.000
90.00	0.000	0	159.28	0.000
90.50	0.000	0	159.28	0.000
91.00	0.000	0	159.28	0.000
91.50	0.000	0	159.28	0.000
92.00	0.000	0	159.28	0.000
92.50	0.000	0	159.28	0.000
93.00	0.000	0	159.28	0.000
93.50	0.000	0	159.28	0.000
94.00	0.000	0	159.28	0.000
94.50	0.000	0	159.28	0.000
95.00	0.000	0	159.28	0.000
95.50	0.000	0	159.28	0.000
96.00	0.000	0	159.28	0.000
96.50	0.000	0	159.28	0.000
97.00	0.000	0	159.28	0.000
97.50	0.000	0	159.28	0.000
98.00	0.000	0	159.28	0.000
98.50	0.000	0	159.28	0.000
99.00	0.000	0	159.28	0.000
99.50	0.000	0	159.28	0.000
100.00	0.000	0	159.28	0.000
100.50	0.000	0	159.28	0.000
101.00	0.000	0	159.28	0.000
101.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	0	159.28	0.000
102.50	0.000	0	159.28	0.000
103.00	0.000	0	159.28	0.000
103.50	0.000	0	159.28	0.000
104.00	0.000	0	159.28	0.000
104.50	0.000	0	159.28	0.000
105.00	0.000	0	159.28	0.000
105.50	0.000	0	159.28	0.000
106.00	0.000	0	159.28	0.000
106.50	0.000	0	159.28	0.000
107.00	0.000	0	159.28	0.000
107.50	0.000	0	159.28	0.000
108.00	0.000	0	159.28	0.000
108.50	0.000	0	159.28	0.000
109.00	0.000	0	159.28	0.000
109.50	0.000	0	159.28	0.000
110.00	0.000	0	159.28	0.000
110.50	0.000	0	159.28	0.000
111.00	0.000	0	159.28	0.000
111.50	0.000	0	159.28	0.000
112.00	0.000	0	159.28	0.000
112.50	0.000	0	159.28	0.000
113.00	0.000	0	159.28	0.000
113.50	0.000	0	159.28	0.000
114.00	0.000	0	159.28	0.000
114.50	0.000	0	159.28	0.000
115.00	0.000	0	159.28	0.000
115.50	0.000	0	159.28	0.000
116.00	0.000	0	159.28	0.000
116.50	0.000	0	159.28	0.000
117.00	0.000	0	159.28	0.000
117.50	0.000	0	159.28	0.000
118.00	0.000	0	159.28	0.000
118.50	0.000	0	159.28	0.000
119.00	0.000	0	159.28	0.000
119.50	0.000	0	159.28	0.000
120.00	0.000	0	159.28	0.000
120.50	0.000	0	159.28	0.000
121.00	0.000	0	159.28	0.000
121.50	0.000	0	159.28	0.000
122.00	0.000	0	159.28	0.000
122.50	0.000	0	159.28	0.000
123.00	0.000	0	159.28	0.000
123.50	0.000	0	159.28	0.000
124.00	0.000	0	159.28	0.000
124.50	0.000	0	159.28	0.000
125.00	0.000	0	159.28	0.000
125.50	0.000	0	159.28	0.000
126.00	0.000	0	159.28	0.000
126.50	0.000	0	159.28	0.000
127.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	0	159.28	0.000
128.00	0.000	0	159.28	0.000
128.50	0.000	0	159.28	0.000
129.00	0.000	0	159.28	0.000
129.50	0.000	0	159.28	0.000
130.00	0.000	0	159.28	0.000
130.50	0.000	0	159.28	0.000
131.00	0.000	0	159.28	0.000
131.50	0.000	0	159.28	0.000
132.00	0.000	0	159.28	0.000
132.50	0.000	0	159.28	0.000
133.00	0.000	0	159.28	0.000
133.50	0.000	0	159.28	0.000
134.00	0.000	0	159.28	0.000
134.50	0.000	0	159.28	0.000
135.00	0.000	0	159.28	0.000
135.50	0.000	0	159.28	0.000
136.00	0.000	0	159.28	0.000
136.50	0.000	0	159.28	0.000
137.00	0.000	0	159.28	0.000
137.50	0.000	0	159.28	0.000
138.00	0.000	0	159.28	0.000
138.50	0.000	0	159.28	0.000
139.00	0.000	0	159.28	0.000
139.50	0.000	0	159.28	0.000
140.00	0.000	0	159.28	0.000
140.50	0.000	0	159.28	0.000
141.00	0.000	0	159.28	0.000
141.50	0.000	0	159.28	0.000
142.00	0.000	0	159.28	0.000
142.50	0.000	0	159.28	0.000
143.00	0.000	0	159.28	0.000
143.50	0.000	0	159.28	0.000
144.00	0.000	0	159.28	0.000
144.50	0.000	0	159.28	0.000
145.00	0.000	0	159.28	0.000
145.50	0.000	0	159.28	0.000
146.00	0.000	0	159.28	0.000
146.50	0.000	0	159.28	0.000
147.00	0.000	0	159.28	0.000
147.50	0.000	0	159.28	0.000
148.00	0.000	0	159.28	0.000
148.50	0.000	0	159.28	0.000
149.00	0.000	0	159.28	0.000
149.50	0.000	0	159.28	0.000
150.00	0.000	0	159.28	0.000
150.50	0.000	0	159.28	0.000
151.00	0.000	0	159.28	0.000
151.50	0.000	0	159.28	0.000
152.00	0.000	0	159.28	0.000
152.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	0	159.28	0.000
153.50	0.000	0	159.28	0.000
154.00	0.000	0	159.28	0.000
154.50	0.000	0	159.28	0.000
155.00	0.000	0	159.28	0.000
155.50	0.000	0	159.28	0.000
156.00	0.000	0	159.28	0.000
156.50	0.000	0	159.28	0.000
157.00	0.000	0	159.28	0.000
157.50	0.000	0	159.28	0.000
158.00	0.000	0	159.28	0.000
158.50	0.000	0	159.28	0.000
159.00	0.000	0	159.28	0.000
159.50	0.000	0	159.28	0.000
160.00	0.000	0	159.28	0.000
160.50	0.000	0	159.28	0.000
161.00	0.000	0	159.28	0.000
161.50	0.000	0	159.28	0.000
162.00	0.000	0	159.28	0.000
162.50	0.000	0	159.28	0.000
163.00	0.000	0	159.28	0.000
163.50	0.000	0	159.28	0.000
164.00	0.000	0	159.28	0.000
164.50	0.000	0	159.28	0.000
165.00	0.000	0	159.28	0.000
165.50	0.000	0	159.28	0.000
166.00	0.000	0	159.28	0.000
166.50	0.000	0	159.28	0.000
167.00	0.000	0	159.28	0.000
167.50	0.000	0	159.28	0.000
168.00	0.000	0	159.28	0.000

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 3.67" for 5-yr event
Inflow = 11.443 cfs @ 11.96 hrs, Volume= 25,677 cf
Outflow = 2.613 cfs @ 12.09 hrs, Volume= 25,533 cf, Atten= 77%, Lag= 8.0 min
Primary = 2.613 cfs @ 12.09 hrs, Volume= 25,533 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 159.04' @ 12.09 hrs Surf.Area= 13,041 sf Storage= 14,016 cf

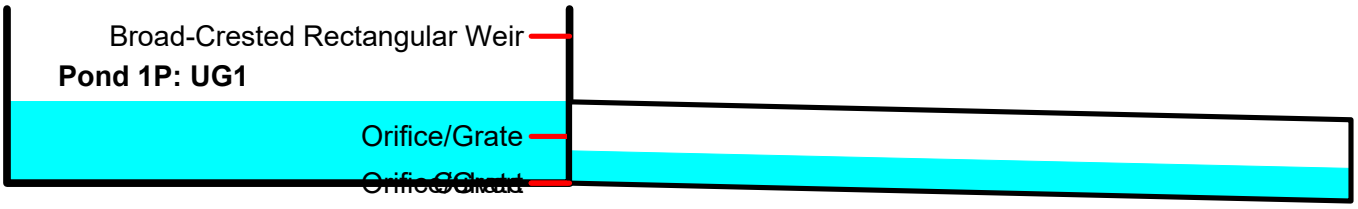
Plug-Flow detention time= 1,060.4 min calculated for 25,531 cf (99% of inflow)
Center-of-Mass det. time= 1,057.1 min (1,819.6 - 762.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=2.613 cfs @ 12.09 hrs HW=159.04' (Free Discharge)
└**4=Culvert** (Passes 2.613 cfs of 5.289 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.032 cfs @ 5.828 fps)
  ├**2=Orifice/Grate** (Orifice Controls 2.581 cfs @ 3.319 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 1P: UG1 - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger®280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 27 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

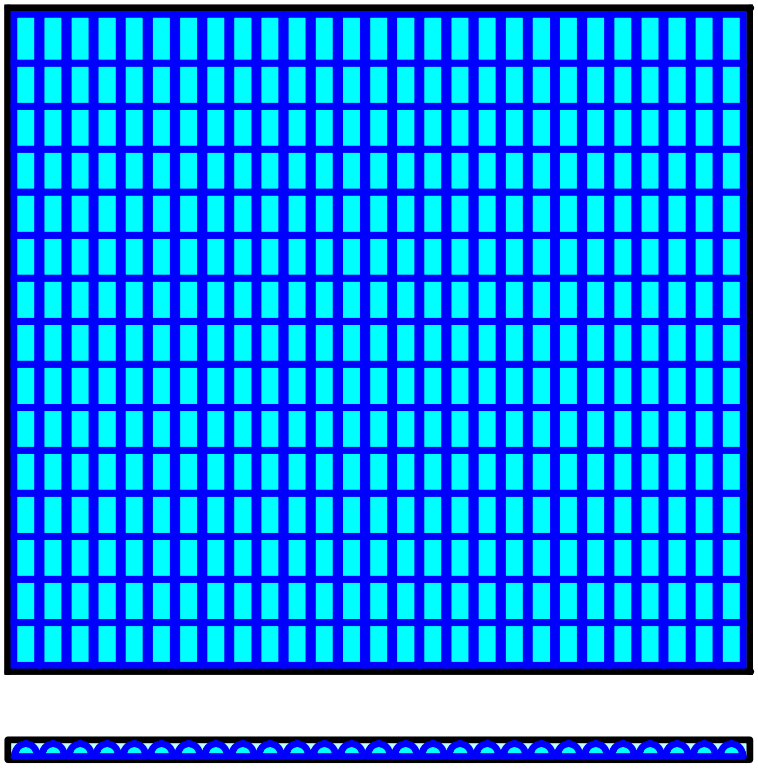
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

405 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 27 Rows = 17,377.3 cf Chamber Storage

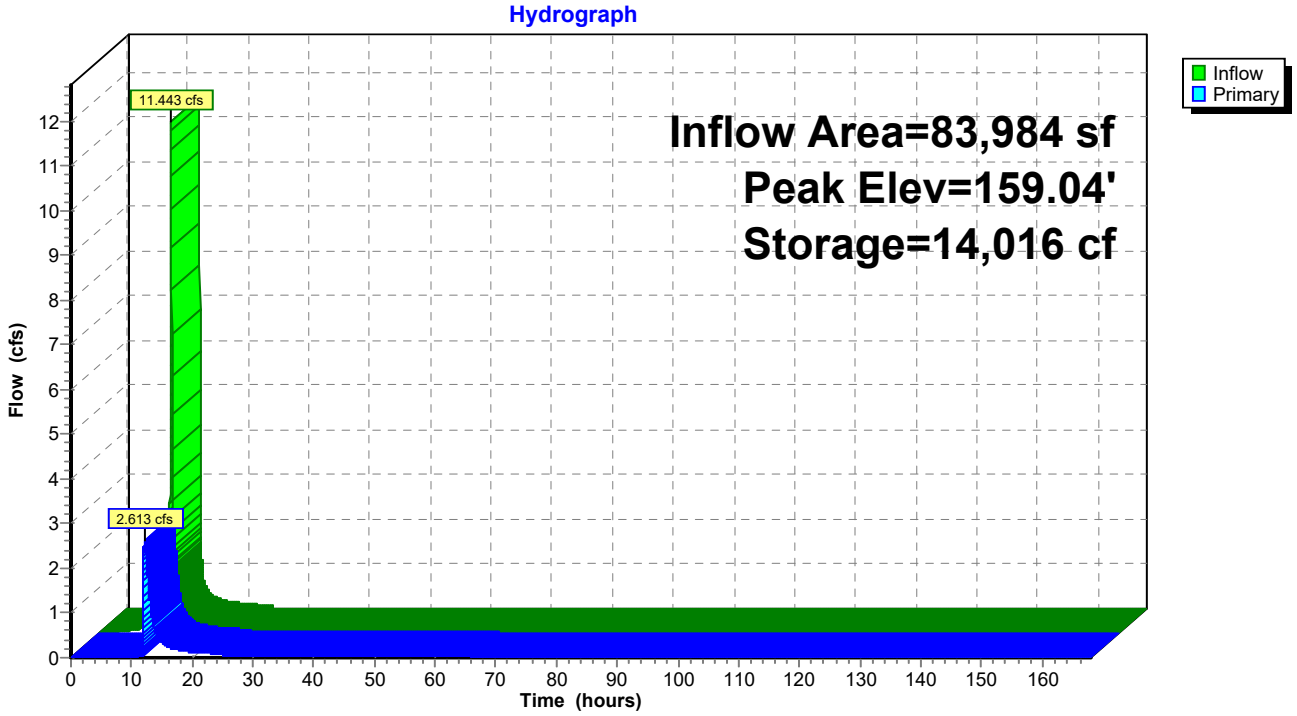
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

Chamber Storage + Stone Storage = 27,162.4 cf = 0.624 af
Overall Storage Efficiency = 64.9%
Overall System Size = 108.00' x 120.75' x 3.21'

405 Chambers
1,549.6 cy Field
906.0 cy Stone



Pond 1P: UG1


Hydrograph
Inflow
Primary
11.443 cfs
2.613 cfs
Inflow Area=83,984 sf
Peak Elev=159.04'
Storage=14,016 cf
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
11
12
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.000	0	157.53	0.000
2.00	0.002	0	157.53	0.000
2.50	0.012	13	157.53	0.000
3.00	0.023	45	157.54	0.000
3.50	0.033	94	157.55	0.001
4.00	0.042	159	157.56	0.001
4.50	0.052	241	157.58	0.002
5.00	0.063	339	157.60	0.004
5.50	0.075	455	157.62	0.006
6.00	0.086	588	157.64	0.007
6.50	0.097	739	157.67	0.008
7.00	0.108	908	157.70	0.010
7.50	0.119	1,094	157.74	0.011
8.00	0.130	1,299	157.78	0.012
8.50	0.162	1,537	157.82	0.013
9.00	0.200	1,838	157.88	0.015
9.50	0.212	2,185	157.95	0.016
10.00	0.264	2,577	158.02	0.018
10.50	0.351	3,093	158.07	0.019
11.00	0.495	3,812	158.13	0.020
11.50	**0.831**	4,943	158.23	0.021
12.00	**9.472**	**13,028**	**158.95**	**2.346**
12.50	0.827	**12,348**	**158.88**	**2.143**
13.00	0.515	10,339	158.70	1.324
13.50	0.389	9,307	158.61	0.793
14.00	0.306	8,747	158.56	0.547
14.50	0.270	8,406	158.53	0.414
15.00	0.242	8,194	158.51	0.340
15.50	0.215	8,041	158.50	0.289
16.00	0.187	7,919	158.49	0.251
16.50	0.174	7,819	158.48	0.222
17.00	0.164	7,745	158.47	0.200
17.50	0.154	7,687	158.47	0.184
18.00	0.145	7,639	158.46	0.170
18.50	0.135	7,595	158.46	0.158
19.00	0.125	7,553	158.45	0.148
19.50	0.115	7,512	158.45	0.138
20.00	0.105	7,471	158.45	0.128
20.50	0.102	7,435	158.44	0.119
21.00	0.100	7,407	158.44	0.113
21.50	0.098	7,385	158.44	0.109
22.00	0.096	7,367	158.44	0.105
22.50	0.094	7,351	158.44	0.102
23.00	0.092	7,338	158.44	0.099
23.50	0.090	7,326	158.43	0.096
24.00	0.088	7,315	158.43	0.094
24.50	0.000	7,190	158.42	0.072
25.00	0.000	7,077	158.41	0.055

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	6,989	158.41	0.043
26.00	0.000	6,921	158.40	0.033
26.50	0.000	6,868	158.39	0.027
27.00	0.000	6,822	158.39	0.024
27.50	0.000	6,779	158.39	0.024
28.00	0.000	6,737	158.38	0.024
28.50	0.000	6,694	158.38	0.024
29.00	0.000	6,652	158.38	0.024
29.50	0.000	6,609	158.37	0.024
30.00	0.000	6,567	158.37	0.023
30.50	0.000	6,525	158.37	0.023
31.00	0.000	6,483	158.36	0.023
31.50	0.000	6,441	158.36	0.023
32.00	0.000	6,399	158.35	0.023
32.50	0.000	6,357	158.35	0.023
33.00	0.000	6,316	158.35	0.023
33.50	0.000	6,274	158.34	0.023
34.00	0.000	6,233	158.34	0.023
34.50	0.000	6,191	158.34	0.023
35.00	0.000	6,150	158.33	0.023
35.50	0.000	6,109	158.33	0.023
36.00	0.000	6,068	158.33	0.023
36.50	0.000	6,027	158.32	0.023
37.00	0.000	5,986	158.32	0.023
37.50	0.000	5,945	158.32	0.023
38.00	0.000	5,904	158.31	0.023
38.50	0.000	5,864	158.31	0.023
39.00	0.000	5,823	158.30	0.022
39.50	0.000	5,783	158.30	0.022
40.00	0.000	5,742	158.30	0.022
40.50	0.000	5,702	158.29	0.022
41.00	0.000	5,662	158.29	0.022
41.50	0.000	5,622	158.29	0.022
42.00	0.000	5,582	158.28	0.022
42.50	0.000	5,542	158.28	0.022
43.00	0.000	5,502	158.28	0.022
43.50	0.000	5,463	158.27	0.022
44.00	0.000	5,423	158.27	0.022
44.50	0.000	5,384	158.27	0.022
45.00	0.000	5,344	158.26	0.022
45.50	0.000	5,305	158.26	0.022
46.00	0.000	5,266	158.26	0.022
46.50	0.000	5,227	158.25	0.022
47.00	0.000	5,188	158.25	0.022
47.50	0.000	5,149	158.25	0.022
48.00	0.000	5,110	158.24	0.022
48.50	0.000	5,072	158.24	0.021
49.00	0.000	5,033	158.24	0.021
49.50	0.000	4,995	158.23	0.021
50.00	0.000	4,956	158.23	0.021
50.50	0.000	4,918	158.23	0.021

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,880	158.22	0.021
51.50	0.000	4,842	158.22	0.021
52.00	0.000	4,804	158.22	0.021
52.50	0.000	4,766	158.21	0.021
53.00	0.000	4,728	158.21	0.021
53.50	0.000	4,690	158.21	0.021
54.00	0.000	4,652	158.20	0.021
54.50	0.000	4,615	158.20	0.021
55.00	0.000	4,578	158.20	0.021
55.50	0.000	4,540	158.19	0.021
56.00	0.000	4,503	158.19	0.021
56.50	0.000	4,466	158.19	0.021
57.00	0.000	4,429	158.18	0.021
57.50	0.000	4,392	158.18	0.021
58.00	0.000	4,355	158.18	0.020
58.50	0.000	4,318	158.17	0.020
59.00	0.000	4,282	158.17	0.020
59.50	0.000	4,245	158.17	0.020
60.00	0.000	4,208	158.17	0.020
60.50	0.000	4,172	158.16	0.020
61.00	0.000	4,136	158.16	0.020
61.50	0.000	4,100	158.16	0.020
62.00	0.000	4,064	158.15	0.020
62.50	0.000	4,028	158.15	0.020
63.00	0.000	3,992	158.15	0.020
63.50	0.000	3,956	158.14	0.020
64.00	0.000	3,920	158.14	0.020
64.50	0.000	3,885	158.14	0.020
65.00	0.000	3,849	158.13	0.020
65.50	0.000	3,814	158.13	0.020
66.00	0.000	3,778	158.13	0.020
66.50	0.000	3,743	158.13	0.020
67.00	0.000	3,708	158.12	0.019
67.50	0.000	3,673	158.12	0.019
68.00	0.000	3,638	158.12	0.019
68.50	0.000	3,603	158.11	0.019
69.00	0.000	3,568	158.11	0.019
69.50	0.000	3,534	158.11	0.019
70.00	0.000	3,499	158.11	0.019
70.50	0.000	3,465	158.10	0.019
71.00	0.000	3,430	158.10	0.019
71.50	0.000	3,396	158.10	0.019
72.00	0.000	3,362	158.09	0.019
72.50	0.000	3,328	158.09	0.019
73.00	0.000	3,294	158.09	0.019
73.50	0.000	3,260	158.08	0.019
74.00	0.000	3,226	158.08	0.019
74.50	0.000	3,192	158.08	0.019
75.00	0.000	3,159	158.08	0.019
75.50	0.000	3,125	158.07	0.019
76.00	0.000	3,092	158.07	0.019

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	3,058	158.07	0.018
77.00	0.000	3,025	158.07	0.018
77.50	0.000	2,992	158.06	0.018
78.00	0.000	2,959	158.06	0.018
78.50	0.000	2,926	158.06	0.018
79.00	0.000	2,893	158.05	0.018
79.50	0.000	2,860	158.05	0.018
80.00	0.000	2,827	158.05	0.018
80.50	0.000	2,795	158.05	0.018
81.00	0.000	2,762	158.04	0.018
81.50	0.000	2,730	158.04	0.018
82.00	0.000	2,698	158.04	0.018
82.50	0.000	2,665	158.03	0.018
83.00	0.000	2,633	158.03	0.018
83.50	0.000	2,601	158.03	0.018
84.00	0.000	2,569	158.02	0.018
84.50	0.000	2,538	158.02	0.018
85.00	0.000	2,506	158.01	0.017
85.50	0.000	2,475	158.00	0.017
86.00	0.000	2,444	158.00	0.017
86.50	0.000	2,413	157.99	0.017
87.00	0.000	2,383	157.99	0.017
87.50	0.000	2,353	157.98	0.017
88.00	0.000	2,322	157.98	0.017
88.50	0.000	2,292	157.97	0.017
89.00	0.000	2,263	157.96	0.016
89.50	0.000	2,233	157.96	0.016
90.00	0.000	2,204	157.95	0.016
90.50	0.000	2,175	157.95	0.016
91.00	0.000	2,146	157.94	0.016
91.50	0.000	2,117	157.94	0.016
92.00	0.000	2,089	157.93	0.016
92.50	0.000	2,061	157.93	0.016
93.00	0.000	2,033	157.92	0.015
93.50	0.000	2,005	157.91	0.015
94.00	0.000	1,978	157.91	0.015
94.50	0.000	1,950	157.90	0.015
95.00	0.000	1,923	157.90	0.015
95.50	0.000	1,896	157.89	0.015
96.00	0.000	1,869	157.89	0.015
96.50	0.000	1,843	157.88	0.015
97.00	0.000	1,817	157.88	0.015
97.50	0.000	1,791	157.87	0.014
98.00	0.000	1,765	157.87	0.014
98.50	0.000	1,739	157.86	0.014
99.00	0.000	1,714	157.86	0.014
99.50	0.000	1,689	157.85	0.014
100.00	0.000	1,664	157.85	0.014
100.50	0.000	1,639	157.84	0.014
101.00	0.000	1,614	157.84	0.014
101.50	0.000	1,590	157.83	0.013

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	1,566	157.83	0.013
102.50	0.000	1,542	157.83	0.013
103.00	0.000	1,518	157.82	0.013
103.50	0.000	1,495	157.82	0.013
104.00	0.000	1,471	157.81	0.013
104.50	0.000	1,448	157.81	0.013
105.00	0.000	1,425	157.80	0.013
105.50	0.000	1,403	157.80	0.013
106.00	0.000	1,380	157.79	0.012
106.50	0.000	1,358	157.79	0.012
107.00	0.000	1,336	157.79	0.012
107.50	0.000	1,314	157.78	0.012
108.00	0.000	1,293	157.78	0.012
108.50	0.000	1,271	157.77	0.012
109.00	0.000	1,250	157.77	0.012
109.50	0.000	1,229	157.77	0.012
110.00	0.000	1,209	157.76	0.011
110.50	0.000	1,188	157.76	0.011
111.00	0.000	1,168	157.75	0.011
111.50	0.000	1,148	157.75	0.011
112.00	0.000	1,128	157.75	0.011
112.50	0.000	1,108	157.74	0.011
113.00	0.000	1,089	157.74	0.011
113.50	0.000	1,070	157.74	0.011
114.00	0.000	1,051	157.73	0.010
114.50	0.000	1,032	157.73	0.010
115.00	0.000	1,014	157.72	0.010
115.50	0.000	995	157.72	0.010
116.00	0.000	977	157.72	0.010
116.50	0.000	959	157.71	0.010
117.00	0.000	941	157.71	0.010
117.50	0.000	924	157.71	0.010
118.00	0.000	907	157.70	0.010
118.50	0.000	890	157.70	0.009
119.00	0.000	873	157.70	0.009
119.50	0.000	856	157.69	0.009
120.00	0.000	840	157.69	0.009
120.50	0.000	824	157.69	0.009
121.00	0.000	808	157.68	0.009
121.50	0.000	792	157.68	0.009
122.00	0.000	776	157.68	0.009
122.50	0.000	761	157.68	0.008
123.00	0.000	746	157.67	0.008
123.50	0.000	731	157.67	0.008
124.00	0.000	716	157.67	0.008
124.50	0.000	702	157.66	0.008
125.00	0.000	687	157.66	0.008
125.50	0.000	673	157.66	0.008
126.00	0.000	660	157.66	0.008
126.50	0.000	646	157.65	0.008
127.00	0.000	633	157.65	0.007

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	619	157.65	0.007
128.00	0.000	606	157.65	0.007
128.50	0.000	594	157.64	0.007
129.00	0.000	581	157.64	0.007
129.50	0.000	569	157.64	0.007
130.00	0.000	557	157.64	0.007
130.50	0.000	545	157.63	0.007
131.00	0.000	533	157.63	0.006
131.50	0.000	522	157.63	0.006
132.00	0.000	510	157.63	0.006
132.50	0.000	499	157.63	0.006
133.00	0.000	489	157.62	0.006
133.50	0.000	478	157.62	0.006
134.00	0.000	468	157.62	0.006
134.50	0.000	458	157.62	0.006
135.00	0.000	448	157.62	0.005
135.50	0.000	438	157.61	0.005
136.00	0.000	429	157.61	0.005
136.50	0.000	420	157.61	0.005
137.00	0.000	411	157.61	0.005
137.50	0.000	402	157.61	0.005
138.00	0.000	393	157.61	0.005
138.50	0.000	385	157.60	0.005
139.00	0.000	377	157.60	0.004
139.50	0.000	369	157.60	0.004
140.00	0.000	361	157.60	0.004
140.50	0.000	354	157.60	0.004
141.00	0.000	346	157.60	0.004
141.50	0.000	339	157.60	0.004
142.00	0.000	332	157.59	0.004
142.50	0.000	325	157.59	0.004
143.00	0.000	319	157.59	0.004
143.50	0.000	312	157.59	0.004
144.00	0.000	306	157.59	0.003
144.50	0.000	300	157.59	0.003
145.00	0.000	294	157.59	0.003
145.50	0.000	288	157.59	0.003
146.00	0.000	283	157.58	0.003
146.50	0.000	277	157.58	0.003
147.00	0.000	272	157.58	0.003
147.50	0.000	267	157.58	0.003
148.00	0.000	262	157.58	0.003
148.50	0.000	257	157.58	0.003
149.00	0.000	253	157.58	0.003
149.50	0.000	248	157.58	0.002
150.00	0.000	244	157.58	0.002
150.50	0.000	239	157.58	0.002
151.00	0.000	235	157.58	0.002
151.50	0.000	231	157.57	0.002
152.00	0.000	227	157.57	0.002
152.50	0.000	223	157.57	0.002

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	220	157.57	0.002
153.50	0.000	216	157.57	0.002
154.00	0.000	213	157.57	0.002
154.50	0.000	209	157.57	0.002
155.00	0.000	206	157.57	0.002
155.50	0.000	203	157.57	0.002
156.00	0.000	200	157.57	0.002
156.50	0.000	197	157.57	0.002
157.00	0.000	194	157.57	0.002
157.50	0.000	191	157.57	0.002
158.00	0.000	188	157.57	0.002
158.50	0.000	185	157.57	0.001
159.00	0.000	183	157.57	0.001
159.50	0.000	180	157.56	0.001
160.00	0.000	178	157.56	0.001
160.50	0.000	175	157.56	0.001
161.00	0.000	173	157.56	0.001
161.50	0.000	171	157.56	0.001
162.00	0.000	169	157.56	0.001
162.50	0.000	166	157.56	0.001
163.00	0.000	164	157.56	0.001
163.50	0.000	162	157.56	0.001
164.00	0.000	160	157.56	0.001
164.50	0.000	158	157.56	0.001
165.00	0.000	156	157.56	0.001
165.50	0.000	154	157.56	0.001
166.00	0.000	152	157.56	0.001
166.50	0.000	150	157.56	0.001
167.00	0.000	148	157.56	0.001
167.50	0.000	147	157.56	0.001
168.00	0.000	145	157.56	0.001

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 2.66" for 5-yr event
Inflow = 2.367 cfs @ 11.96 hrs, Volume= 4,768 cf
Outflow = 0.568 cfs @ 12.09 hrs, Volume= 4,768 cf, Atten= 76%, Lag= 7.8 min
Primary = 0.568 cfs @ 12.09 hrs, Volume= 4,768 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 160.40' @ 12.09 hrs Surf.Area= 2,542 sf Storage= 1,849 cf

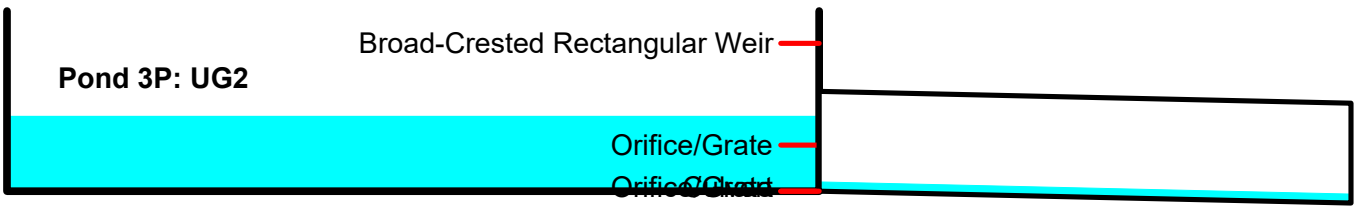
Plug-Flow detention time= 68.7 min calculated for 4,768 cf (100% of inflow)
Center-of-Mass det. time= 68.8 min (876.7 - 807.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.568 cfs @ 12.09 hrs HW=160.40' (Free Discharge)
└**4=Culvert** (Passes 0.568 cfs of 3.631 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.236 cfs @ 4.811 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.332 cfs @ 2.655 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 3P: UG2 - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Discontinued, not for new designs)
Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf
Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 3.44 sf x 8 rows

36.0" Wide + 3.0" Spacing = 39.0" C-C Row Spacing

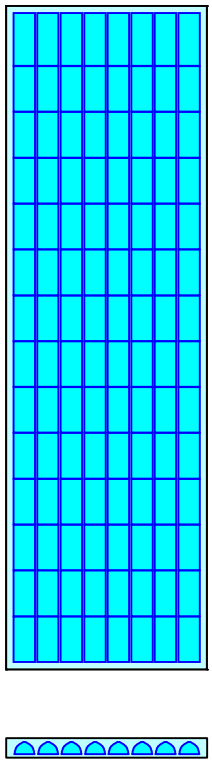
14 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 89.62' Row Length +12.0" End Stone x 2 = 91.62' Base Length
8 Rows x 36.0" Wide + 3.0" Spacing x 7 + 12.0" Side Stone x 2 = 27.75' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

112 Chambers x 21.8 cf +1.00' Row Adjustment x 3.44 sf x 8 Rows = 2,466.0 cf Chamber Storage

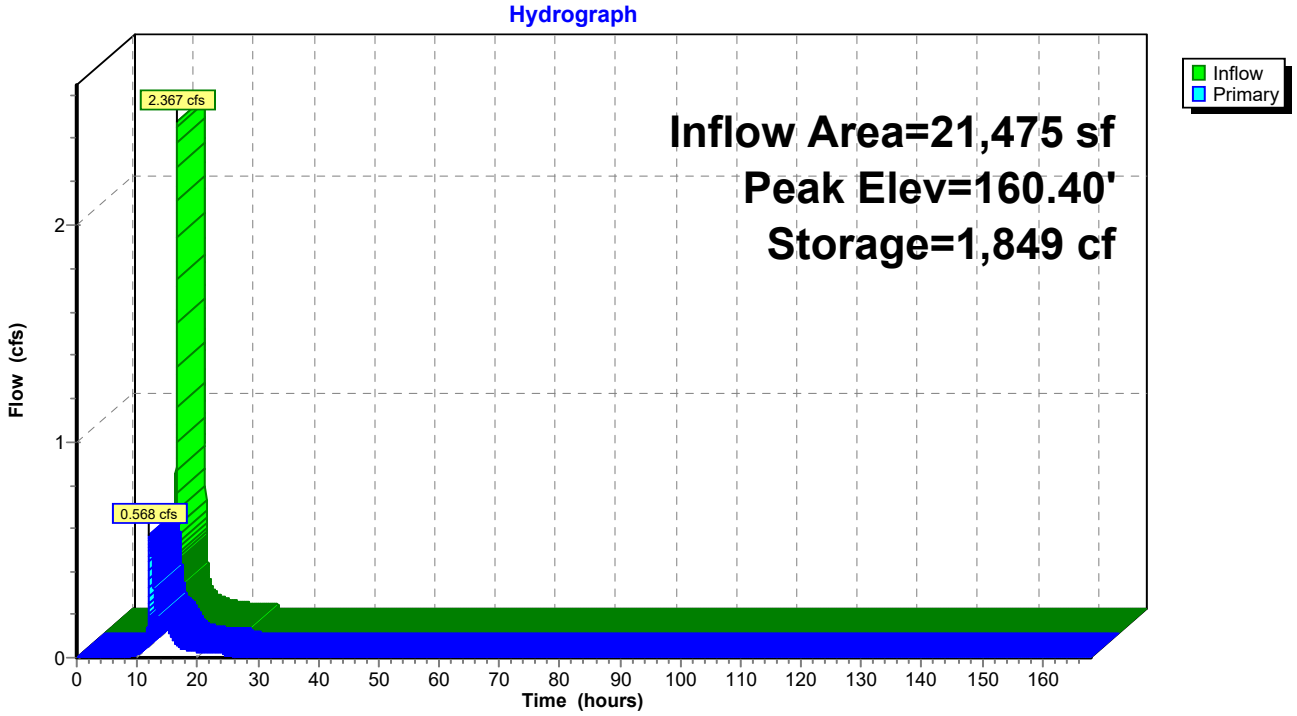
6,885.8 cf Field - 2,466.0 cf Chambers = 4,419.8 cf Stone x 40.0% Voids = 1,767.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,233.9 cf = 0.097 af
Overall Storage Efficiency = 61.5%
Overall System Size = 91.62' x 27.75' x 2.71'

112 Chambers
255.0 cy Field
163.7 cy Stone



Pond 3P: UG2


Hydrograph
Inflow Area=21,475 sf
Peak Elev=160.40'
Storage=1,849 cf
2.367 cfs
0.568 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.000	0	159.28	0.000
4.50	0.000	0	159.28	0.000
5.00	0.000	0	159.28	0.000
5.50	0.000	0	159.28	0.000
6.00	0.000	0	159.28	0.000
6.50	0.002	1	159.28	0.000
7.00	0.004	6	159.29	0.000
7.50	0.006	13	159.29	0.001
8.00	0.008	23	159.30	0.001
8.50	0.012	37	159.32	0.003
9.00	0.017	54	159.33	0.006
9.50	0.021	73	159.35	0.011
10.00	0.029	92	159.37	0.017
10.50	0.043	118	159.40	0.026
11.00	0.067	156	159.43	0.042
11.50	**0.128**	225	159.50	0.073
12.00	**2.004**	**1,639**	**160.30**	**0.494**
12.50	0.184	**1,508**	**160.24**	**0.437**
13.00	0.116	1,164	160.08	0.254
13.50	0.088	961	159.99	0.184
14.00	0.070	789	159.91	0.168
14.50	0.062	616	159.83	0.154
15.00	0.056	459	159.73	0.135
15.50	0.049	336	159.61	0.107
16.00	0.043	249	159.53	0.082
16.50	0.040	196	159.47	0.061
17.00	0.038	170	159.45	0.048
17.50	0.036	155	159.43	0.042
18.00	0.034	146	159.42	0.038
18.50	0.031	139	159.42	0.035
19.00	0.029	133	159.41	0.032
19.50	0.027	128	159.41	0.030
20.00	0.024	122	159.40	0.028
20.50	0.024	117	159.40	0.026
21.00	0.023	114	159.39	0.025
21.50	0.023	112	159.39	0.024
22.00	0.022	111	159.39	0.023
22.50	0.022	110	159.39	0.023
23.00	0.022	108	159.39	0.022
23.50	0.021	107	159.39	0.022
24.00	0.021	106	159.38	0.021
24.50	0.000	80	159.36	0.013
25.00	0.000	62	159.34	0.008

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	50	159.33	0.005
26.00	0.000	42	159.32	0.004
26.50	0.000	36	159.32	0.003
27.00	0.000	31	159.31	0.002
27.50	0.000	28	159.31	0.002
28.00	0.000	25	159.30	0.001
28.50	0.000	22	159.30	0.001
29.00	0.000	20	159.30	0.001
29.50	0.000	18	159.30	0.001
30.00	0.000	16	159.30	0.001
30.50	0.000	15	159.29	0.001
31.00	0.000	13	159.29	0.001
31.50	0.000	12	159.29	0.001
32.00	0.000	11	159.29	0.001
32.50	0.000	10	159.29	0.001
33.00	0.000	9	159.29	0.001
33.50	0.000	8	159.29	0.000
34.00	0.000	7	159.29	0.000
34.50	0.000	6	159.29	0.000
35.00	0.000	6	159.29	0.000
35.50	0.000	5	159.29	0.000
36.00	0.000	5	159.28	0.000
36.50	0.000	4	159.28	0.000
37.00	0.000	4	159.28	0.000
37.50	0.000	3	159.28	0.000
38.00	0.000	3	159.28	0.000
38.50	0.000	3	159.28	0.000
39.00	0.000	2	159.28	0.000
39.50	0.000	2	159.28	0.000
40.00	0.000	2	159.28	0.000
40.50	0.000	2	159.28	0.000
41.00	0.000	2	159.28	0.000
41.50	0.000	1	159.28	0.000
42.00	0.000	1	159.28	0.000
42.50	0.000	1	159.28	0.000
43.00	0.000	1	159.28	0.000
43.50	0.000	1	159.28	0.000
44.00	0.000	1	159.28	0.000
44.50	0.000	1	159.28	0.000
45.00	0.000	1	159.28	0.000
45.50	0.000	1	159.28	0.000
46.00	0.000	1	159.28	0.000
46.50	0.000	1	159.28	0.000
47.00	0.000	0	159.28	0.000
47.50	0.000	0	159.28	0.000
48.00	0.000	0	159.28	0.000
48.50	0.000	0	159.28	0.000
49.00	0.000	0	159.28	0.000
49.50	0.000	0	159.28	0.000
50.00	0.000	0	159.28	0.000
50.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	0	159.28	0.000
51.50	0.000	0	159.28	0.000
52.00	0.000	0	159.28	0.000
52.50	0.000	0	159.28	0.000
53.00	0.000	0	159.28	0.000
53.50	0.000	0	159.28	0.000
54.00	0.000	0	159.28	0.000
54.50	0.000	0	159.28	0.000
55.00	0.000	0	159.28	0.000
55.50	0.000	0	159.28	0.000
56.00	0.000	0	159.28	0.000
56.50	0.000	0	159.28	0.000
57.00	0.000	0	159.28	0.000
57.50	0.000	0	159.28	0.000
58.00	0.000	0	159.28	0.000
58.50	0.000	0	159.28	0.000
59.00	0.000	0	159.28	0.000
59.50	0.000	0	159.28	0.000
60.00	0.000	0	159.28	0.000
60.50	0.000	0	159.28	0.000
61.00	0.000	0	159.28	0.000
61.50	0.000	0	159.28	0.000
62.00	0.000	0	159.28	0.000
62.50	0.000	0	159.28	0.000
63.00	0.000	0	159.28	0.000
63.50	0.000	0	159.28	0.000
64.00	0.000	0	159.28	0.000
64.50	0.000	0	159.28	0.000
65.00	0.000	0	159.28	0.000
65.50	0.000	0	159.28	0.000
66.00	0.000	0	159.28	0.000
66.50	0.000	0	159.28	0.000
67.00	0.000	0	159.28	0.000
67.50	0.000	0	159.28	0.000
68.00	0.000	0	159.28	0.000
68.50	0.000	0	159.28	0.000
69.00	0.000	0	159.28	0.000
69.50	0.000	0	159.28	0.000
70.00	0.000	0	159.28	0.000
70.50	0.000	0	159.28	0.000
71.00	0.000	0	159.28	0.000
71.50	0.000	0	159.28	0.000
72.00	0.000	0	159.28	0.000
72.50	0.000	0	159.28	0.000
73.00	0.000	0	159.28	0.000
73.50	0.000	0	159.28	0.000
74.00	0.000	0	159.28	0.000
74.50	0.000	0	159.28	0.000
75.00	0.000	0	159.28	0.000
75.50	0.000	0	159.28	0.000
76.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	0	159.28	0.000
77.00	0.000	0	159.28	0.000
77.50	0.000	0	159.28	0.000
78.00	0.000	0	159.28	0.000
78.50	0.000	0	159.28	0.000
79.00	0.000	0	159.28	0.000
79.50	0.000	0	159.28	0.000
80.00	0.000	0	159.28	0.000
80.50	0.000	0	159.28	0.000
81.00	0.000	0	159.28	0.000
81.50	0.000	0	159.28	0.000
82.00	0.000	0	159.28	0.000
82.50	0.000	0	159.28	0.000
83.00	0.000	0	159.28	0.000
83.50	0.000	0	159.28	0.000
84.00	0.000	0	159.28	0.000
84.50	0.000	0	159.28	0.000
85.00	0.000	0	159.28	0.000
85.50	0.000	0	159.28	0.000
86.00	0.000	0	159.28	0.000
86.50	0.000	0	159.28	0.000
87.00	0.000	0	159.28	0.000
87.50	0.000	0	159.28	0.000
88.00	0.000	0	159.28	0.000
88.50	0.000	0	159.28	0.000
89.00	0.000	0	159.28	0.000
89.50	0.000	0	159.28	0.000
90.00	0.000	0	159.28	0.000
90.50	0.000	0	159.28	0.000
91.00	0.000	0	159.28	0.000
91.50	0.000	0	159.28	0.000
92.00	0.000	0	159.28	0.000
92.50	0.000	0	159.28	0.000
93.00	0.000	0	159.28	0.000
93.50	0.000	0	159.28	0.000
94.00	0.000	0	159.28	0.000
94.50	0.000	0	159.28	0.000
95.00	0.000	0	159.28	0.000
95.50	0.000	0	159.28	0.000
96.00	0.000	0	159.28	0.000
96.50	0.000	0	159.28	0.000
97.00	0.000	0	159.28	0.000
97.50	0.000	0	159.28	0.000
98.00	0.000	0	159.28	0.000
98.50	0.000	0	159.28	0.000
99.00	0.000	0	159.28	0.000
99.50	0.000	0	159.28	0.000
100.00	0.000	0	159.28	0.000
100.50	0.000	0	159.28	0.000
101.00	0.000	0	159.28	0.000
101.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	0	159.28	0.000
102.50	0.000	0	159.28	0.000
103.00	0.000	0	159.28	0.000
103.50	0.000	0	159.28	0.000
104.00	0.000	0	159.28	0.000
104.50	0.000	0	159.28	0.000
105.00	0.000	0	159.28	0.000
105.50	0.000	0	159.28	0.000
106.00	0.000	0	159.28	0.000
106.50	0.000	0	159.28	0.000
107.00	0.000	0	159.28	0.000
107.50	0.000	0	159.28	0.000
108.00	0.000	0	159.28	0.000
108.50	0.000	0	159.28	0.000
109.00	0.000	0	159.28	0.000
109.50	0.000	0	159.28	0.000
110.00	0.000	0	159.28	0.000
110.50	0.000	0	159.28	0.000
111.00	0.000	0	159.28	0.000
111.50	0.000	0	159.28	0.000
112.00	0.000	0	159.28	0.000
112.50	0.000	0	159.28	0.000
113.00	0.000	0	159.28	0.000
113.50	0.000	0	159.28	0.000
114.00	0.000	0	159.28	0.000
114.50	0.000	0	159.28	0.000
115.00	0.000	0	159.28	0.000
115.50	0.000	0	159.28	0.000
116.00	0.000	0	159.28	0.000
116.50	0.000	0	159.28	0.000
117.00	0.000	0	159.28	0.000
117.50	0.000	0	159.28	0.000
118.00	0.000	0	159.28	0.000
118.50	0.000	0	159.28	0.000
119.00	0.000	0	159.28	0.000
119.50	0.000	0	159.28	0.000
120.00	0.000	0	159.28	0.000
120.50	0.000	0	159.28	0.000
121.00	0.000	0	159.28	0.000
121.50	0.000	0	159.28	0.000
122.00	0.000	0	159.28	0.000
122.50	0.000	0	159.28	0.000
123.00	0.000	0	159.28	0.000
123.50	0.000	0	159.28	0.000
124.00	0.000	0	159.28	0.000
124.50	0.000	0	159.28	0.000
125.00	0.000	0	159.28	0.000
125.50	0.000	0	159.28	0.000
126.00	0.000	0	159.28	0.000
126.50	0.000	0	159.28	0.000
127.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	0	159.28	0.000
128.00	0.000	0	159.28	0.000
128.50	0.000	0	159.28	0.000
129.00	0.000	0	159.28	0.000
129.50	0.000	0	159.28	0.000
130.00	0.000	0	159.28	0.000
130.50	0.000	0	159.28	0.000
131.00	0.000	0	159.28	0.000
131.50	0.000	0	159.28	0.000
132.00	0.000	0	159.28	0.000
132.50	0.000	0	159.28	0.000
133.00	0.000	0	159.28	0.000
133.50	0.000	0	159.28	0.000
134.00	0.000	0	159.28	0.000
134.50	0.000	0	159.28	0.000
135.00	0.000	0	159.28	0.000
135.50	0.000	0	159.28	0.000
136.00	0.000	0	159.28	0.000
136.50	0.000	0	159.28	0.000
137.00	0.000	0	159.28	0.000
137.50	0.000	0	159.28	0.000
138.00	0.000	0	159.28	0.000
138.50	0.000	0	159.28	0.000
139.00	0.000	0	159.28	0.000
139.50	0.000	0	159.28	0.000
140.00	0.000	0	159.28	0.000
140.50	0.000	0	159.28	0.000
141.00	0.000	0	159.28	0.000
141.50	0.000	0	159.28	0.000
142.00	0.000	0	159.28	0.000
142.50	0.000	0	159.28	0.000
143.00	0.000	0	159.28	0.000
143.50	0.000	0	159.28	0.000
144.00	0.000	0	159.28	0.000
144.50	0.000	0	159.28	0.000
145.00	0.000	0	159.28	0.000
145.50	0.000	0	159.28	0.000
146.00	0.000	0	159.28	0.000
146.50	0.000	0	159.28	0.000
147.00	0.000	0	159.28	0.000
147.50	0.000	0	159.28	0.000
148.00	0.000	0	159.28	0.000
148.50	0.000	0	159.28	0.000
149.00	0.000	0	159.28	0.000
149.50	0.000	0	159.28	0.000
150.00	0.000	0	159.28	0.000
150.50	0.000	0	159.28	0.000
151.00	0.000	0	159.28	0.000
151.50	0.000	0	159.28	0.000
152.00	0.000	0	159.28	0.000
152.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	0	159.28	0.000
153.50	0.000	0	159.28	0.000
154.00	0.000	0	159.28	0.000
154.50	0.000	0	159.28	0.000
155.00	0.000	0	159.28	0.000
155.50	0.000	0	159.28	0.000
156.00	0.000	0	159.28	0.000
156.50	0.000	0	159.28	0.000
157.00	0.000	0	159.28	0.000
157.50	0.000	0	159.28	0.000
158.00	0.000	0	159.28	0.000
158.50	0.000	0	159.28	0.000
159.00	0.000	0	159.28	0.000
159.50	0.000	0	159.28	0.000
160.00	0.000	0	159.28	0.000
160.50	0.000	0	159.28	0.000
161.00	0.000	0	159.28	0.000
161.50	0.000	0	159.28	0.000
162.00	0.000	0	159.28	0.000
162.50	0.000	0	159.28	0.000
163.00	0.000	0	159.28	0.000
163.50	0.000	0	159.28	0.000
164.00	0.000	0	159.28	0.000
164.50	0.000	0	159.28	0.000
165.00	0.000	0	159.28	0.000
165.50	0.000	0	159.28	0.000
166.00	0.000	0	159.28	0.000
166.50	0.000	0	159.28	0.000
167.00	0.000	0	159.28	0.000
167.50	0.000	0	159.28	0.000
168.00	0.000	0	159.28	0.000

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 4.36" for 10-yr event
Inflow = 13.471 cfs @ 11.96 hrs, Volume= 30,539 cf
Outflow = 3.160 cfs @ 12.09 hrs, Volume= 30,394 cf, Atten= 77%, Lag= 7.9 min
Primary = 3.160 cfs @ 12.09 hrs, Volume= 30,394 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 159.26' @ 12.09 hrs Surf.Area= 13,041 sf Storage= 16,346 cf

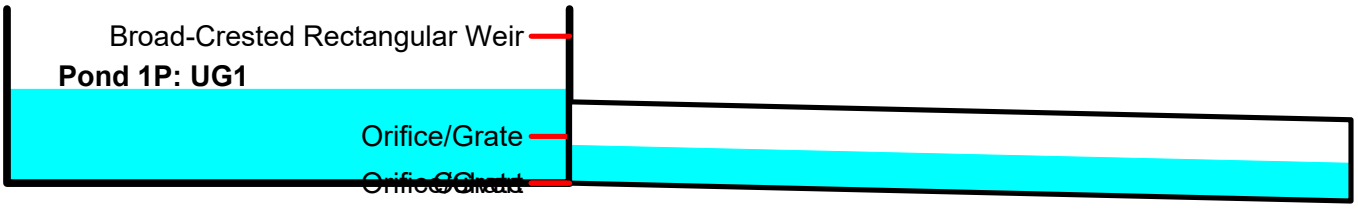
Plug-Flow detention time= 908.7 min calculated for 30,392 cf (100% of inflow)
Center-of-Mass det. time= 906.0 min (1,664.5 - 758.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=3.160 cfs @ 12.09 hrs HW=159.26' (Free Discharge)
└**4=Culvert** (Passes 3.160 cfs of 6.240 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.034 cfs @ 6.250 fps)
  ├**2=Orifice/Grate** (Orifice Controls 3.126 cfs @ 4.019 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 1P: UG1 - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger®280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 27 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

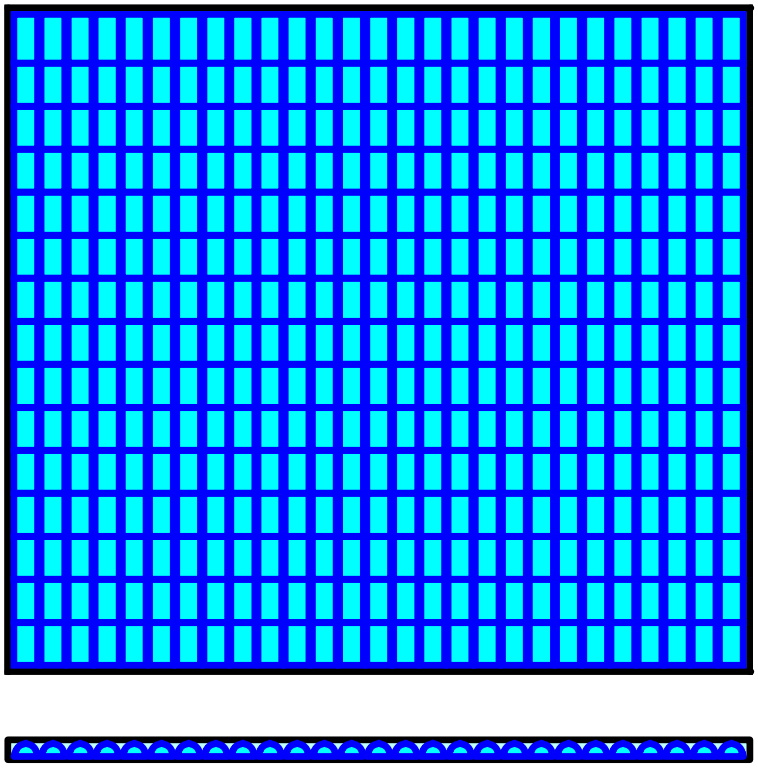
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

405 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 27 Rows = 17,377.3 cf Chamber Storage

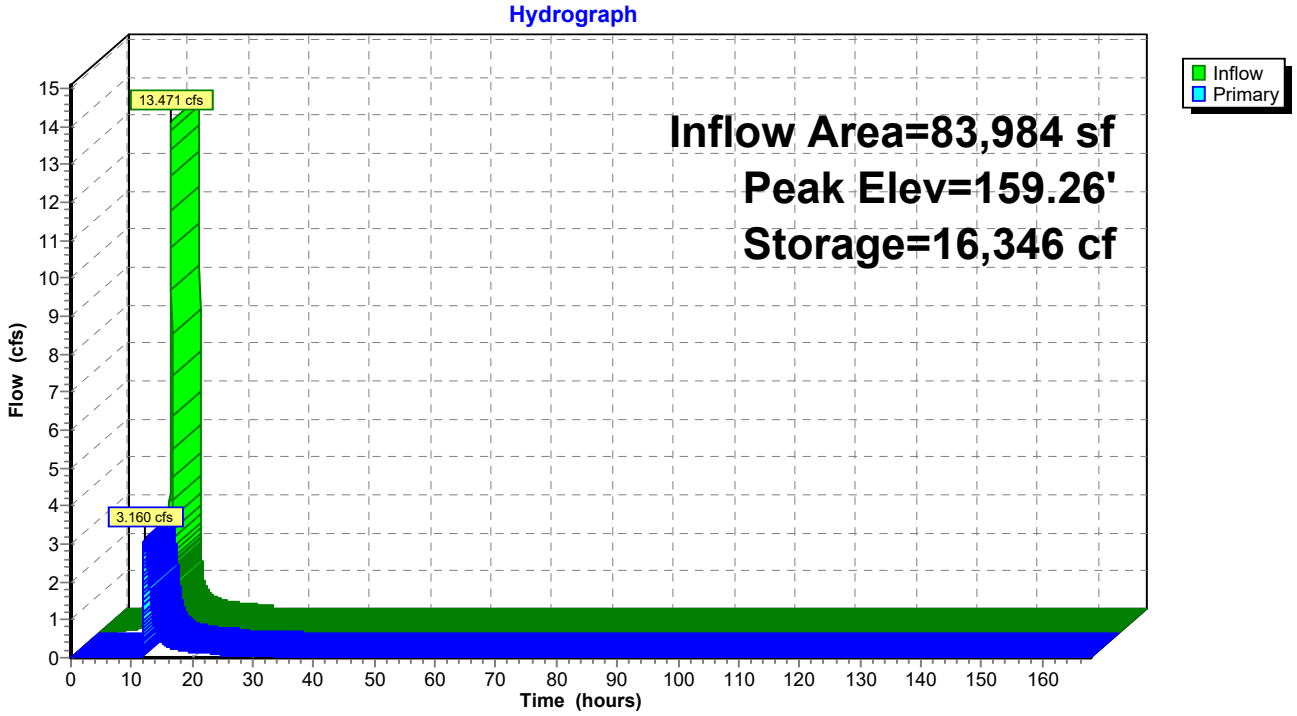
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

Chamber Storage + Stone Storage = 27,162.4 cf = 0.624 af
Overall Storage Efficiency = 64.9%
Overall System Size = 108.00' x 120.75' x 3.21'

405 Chambers
1,549.6 cy Field
906.0 cy Stone



Pond 1P: UG1


Hydrograph
Inflow Area=83,984 sf
Peak Elev=159.26'
Storage=16,346 cf
13.471 cfs
3.160 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.000	0	157.53	0.000
2.00	0.009	6	157.53	0.000
2.50	0.023	34	157.54	0.000
3.00	0.035	86	157.55	0.001
3.50	0.047	159	157.56	0.001
4.00	0.058	251	157.58	0.003
4.50	0.071	361	157.60	0.004
5.00	0.084	491	157.62	0.006
5.50	0.097	642	157.65	0.007
6.00	0.110	814	157.69	0.009
6.50	0.123	1,008	157.72	0.010
7.00	0.136	1,222	157.76	0.012
7.50	0.149	1,457	157.81	0.013
8.00	0.162	1,712	157.86	0.014
8.50	0.200	2,008	157.91	0.015
9.00	0.245	2,379	157.99	0.017
9.50	0.258	2,805	158.05	0.018
10.00	0.320	3,284	158.09	0.019
10.50	0.422	3,913	158.14	0.020
11.00	0.593	4,781	158.21	0.021
11.50	**0.990**	6,137	158.33	0.023
12.00	**11.141**	**15,217**	**159.15**	**2.905**
12.50	0.971	**14,219**	**159.06**	**2.664**
13.00	0.604	11,478	158.80	1.848
13.50	0.457	9,846	158.66	1.058
14.00	0.358	9,057	158.59	0.679
14.50	0.317	8,620	158.55	0.496
15.00	0.284	8,363	158.53	0.398
15.50	0.252	8,186	158.51	0.338
16.00	0.219	8,046	158.50	0.290
16.50	0.204	7,937	158.49	0.256
17.00	0.193	7,856	158.48	0.232
17.50	0.181	7,791	158.48	0.214
18.00	0.170	7,737	158.47	0.198
18.50	0.158	7,688	158.47	0.184
19.00	0.146	7,643	158.46	0.171
19.50	0.135	7,599	158.46	0.159
20.00	0.123	7,554	158.45	0.148
20.50	0.119	7,514	158.45	0.138
21.00	0.117	7,485	158.45	0.131
21.50	0.115	7,463	158.45	0.125
22.00	0.112	7,445	158.45	0.122
22.50	0.110	7,429	158.44	0.118
23.00	0.108	7,415	158.44	0.115
23.50	0.105	7,402	158.44	0.112
24.00	0.103	7,389	158.44	0.110
24.50	0.000	7,245	158.43	0.080
25.00	0.000	7,119	158.42	0.061

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	7,022	158.41	0.047
26.00	0.000	6,946	158.40	0.037
26.50	0.000	6,888	158.40	0.028
27.00	0.000	6,840	158.39	0.025
27.50	0.000	6,797	158.39	0.024
28.00	0.000	6,754	158.39	0.024
28.50	0.000	6,711	158.38	0.024
29.00	0.000	6,669	158.38	0.024
29.50	0.000	6,627	158.37	0.024
30.00	0.000	6,584	158.37	0.023
30.50	0.000	6,542	158.37	0.023
31.00	0.000	6,500	158.36	0.023
31.50	0.000	6,458	158.36	0.023
32.00	0.000	6,416	158.36	0.023
32.50	0.000	6,374	158.35	0.023
33.00	0.000	6,333	158.35	0.023
33.50	0.000	6,291	158.34	0.023
34.00	0.000	6,249	158.34	0.023
34.50	0.000	6,208	158.34	0.023
35.00	0.000	6,167	158.33	0.023
35.50	0.000	6,125	158.33	0.023
36.00	0.000	6,084	158.33	0.023
36.50	0.000	6,043	158.32	0.023
37.00	0.000	6,002	158.32	0.023
37.50	0.000	5,961	158.32	0.023
38.00	0.000	5,921	158.31	0.023
38.50	0.000	5,880	158.31	0.023
39.00	0.000	5,840	158.31	0.023
39.50	0.000	5,799	158.30	0.022
40.00	0.000	5,759	158.30	0.022
40.50	0.000	5,718	158.30	0.022
41.00	0.000	5,678	158.29	0.022
41.50	0.000	5,638	158.29	0.022
42.00	0.000	5,598	158.29	0.022
42.50	0.000	5,558	158.28	0.022
43.00	0.000	5,519	158.28	0.022
43.50	0.000	5,479	158.27	0.022
44.00	0.000	5,439	158.27	0.022
44.50	0.000	5,400	158.27	0.022
45.00	0.000	5,360	158.26	0.022
45.50	0.000	5,321	158.26	0.022
46.00	0.000	5,282	158.26	0.022
46.50	0.000	5,243	158.25	0.022
47.00	0.000	5,204	158.25	0.022
47.50	0.000	5,165	158.25	0.022
48.00	0.000	5,126	158.24	0.022
48.50	0.000	5,087	158.24	0.021
49.00	0.000	5,049	158.24	0.021
49.50	0.000	5,010	158.23	0.021
50.00	0.000	4,972	158.23	0.021
50.50	0.000	4,933	158.23	0.021

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,895	158.22	0.021
51.50	0.000	4,857	158.22	0.021
52.00	0.000	4,819	158.22	0.021
52.50	0.000	4,781	158.21	0.021
53.00	0.000	4,743	158.21	0.021
53.50	0.000	4,705	158.21	0.021
54.00	0.000	4,668	158.20	0.021
54.50	0.000	4,630	158.20	0.021
55.00	0.000	4,593	158.20	0.021
55.50	0.000	4,555	158.20	0.021
56.00	0.000	4,518	158.19	0.021
56.50	0.000	4,481	158.19	0.021
57.00	0.000	4,444	158.19	0.021
57.50	0.000	4,407	158.18	0.021
58.00	0.000	4,370	158.18	0.020
58.50	0.000	4,333	158.18	0.020
59.00	0.000	4,296	158.17	0.020
59.50	0.000	4,260	158.17	0.020
60.00	0.000	4,223	158.17	0.020
60.50	0.000	4,187	158.16	0.020
61.00	0.000	4,151	158.16	0.020
61.50	0.000	4,114	158.16	0.020
62.00	0.000	4,078	158.15	0.020
62.50	0.000	4,042	158.15	0.020
63.00	0.000	4,006	158.15	0.020
63.50	0.000	3,970	158.15	0.020
64.00	0.000	3,935	158.14	0.020
64.50	0.000	3,899	158.14	0.020
65.00	0.000	3,863	158.14	0.020
65.50	0.000	3,828	158.13	0.020
66.00	0.000	3,793	158.13	0.020
66.50	0.000	3,757	158.13	0.020
67.00	0.000	3,722	158.12	0.020
67.50	0.000	3,687	158.12	0.019
68.00	0.000	3,652	158.12	0.019
68.50	0.000	3,617	158.12	0.019
69.00	0.000	3,582	158.11	0.019
69.50	0.000	3,548	158.11	0.019
70.00	0.000	3,513	158.11	0.019
70.50	0.000	3,479	158.10	0.019
71.00	0.000	3,444	158.10	0.019
71.50	0.000	3,410	158.10	0.019
72.00	0.000	3,376	158.09	0.019
72.50	0.000	3,341	158.09	0.019
73.00	0.000	3,307	158.09	0.019
73.50	0.000	3,273	158.09	0.019
74.00	0.000	3,240	158.08	0.019
74.50	0.000	3,206	158.08	0.019
75.00	0.000	3,172	158.08	0.019
75.50	0.000	3,139	158.07	0.019
76.00	0.000	3,105	158.07	0.019

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	3,072	158.07	0.019
77.00	0.000	3,039	158.07	0.018
77.50	0.000	3,005	158.06	0.018
78.00	0.000	2,972	158.06	0.018
78.50	0.000	2,939	158.06	0.018
79.00	0.000	2,906	158.06	0.018
79.50	0.000	2,873	158.05	0.018
80.00	0.000	2,841	158.05	0.018
80.50	0.000	2,808	158.05	0.018
81.00	0.000	2,776	158.04	0.018
81.50	0.000	2,743	158.04	0.018
82.00	0.000	2,711	158.04	0.018
82.50	0.000	2,679	158.04	0.018
83.00	0.000	2,646	158.03	0.018
83.50	0.000	2,614	158.03	0.018
84.00	0.000	2,582	158.03	0.018
84.50	0.000	2,551	158.02	0.018
85.00	0.000	2,519	158.01	0.017
85.50	0.000	2,488	158.01	0.017
86.00	0.000	2,457	158.00	0.017
86.50	0.000	2,426	158.00	0.017
87.00	0.000	2,395	157.99	0.017
87.50	0.000	2,365	157.98	0.017
88.00	0.000	2,335	157.98	0.017
88.50	0.000	2,305	157.97	0.017
89.00	0.000	2,275	157.97	0.016
89.50	0.000	2,245	157.96	0.016
90.00	0.000	2,216	157.95	0.016
90.50	0.000	2,187	157.95	0.016
91.00	0.000	2,158	157.94	0.016
91.50	0.000	2,129	157.94	0.016
92.00	0.000	2,101	157.93	0.016
92.50	0.000	2,072	157.93	0.016
93.00	0.000	2,044	157.92	0.016
93.50	0.000	2,016	157.92	0.015
94.00	0.000	1,989	157.91	0.015
94.50	0.000	1,961	157.91	0.015
95.00	0.000	1,934	157.90	0.015
95.50	0.000	1,907	157.90	0.015
96.00	0.000	1,880	157.89	0.015
96.50	0.000	1,854	157.89	0.015
97.00	0.000	1,827	157.88	0.015
97.50	0.000	1,801	157.88	0.014
98.00	0.000	1,775	157.87	0.014
98.50	0.000	1,750	157.87	0.014
99.00	0.000	1,724	157.86	0.014
99.50	0.000	1,699	157.86	0.014
100.00	0.000	1,674	157.85	0.014
100.50	0.000	1,649	157.85	0.014
101.00	0.000	1,624	157.84	0.014
101.50	0.000	1,600	157.84	0.014

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	1,575	157.83	0.013
102.50	0.000	1,551	157.83	0.013
103.00	0.000	1,528	157.82	0.013
103.50	0.000	1,504	157.82	0.013
104.00	0.000	1,481	157.81	0.013
104.50	0.000	1,458	157.81	0.013
105.00	0.000	1,435	157.81	0.013
105.50	0.000	1,412	157.80	0.013
106.00	0.000	1,389	157.80	0.012
106.50	0.000	1,367	157.79	0.012
107.00	0.000	1,345	157.79	0.012
107.50	0.000	1,323	157.78	0.012
108.00	0.000	1,302	157.78	0.012
108.50	0.000	1,280	157.78	0.012
109.00	0.000	1,259	157.77	0.012
109.50	0.000	1,238	157.77	0.012
110.00	0.000	1,217	157.76	0.011
110.50	0.000	1,197	157.76	0.011
111.00	0.000	1,176	157.76	0.011
111.50	0.000	1,156	157.75	0.011
112.00	0.000	1,136	157.75	0.011
112.50	0.000	1,116	157.74	0.011
113.00	0.000	1,097	157.74	0.011
113.50	0.000	1,078	157.74	0.011
114.00	0.000	1,059	157.73	0.011
114.50	0.000	1,040	157.73	0.010
115.00	0.000	1,021	157.73	0.010
115.50	0.000	1,003	157.72	0.010
116.00	0.000	984	157.72	0.010
116.50	0.000	966	157.72	0.010
117.00	0.000	949	157.71	0.010
117.50	0.000	931	157.71	0.010
118.00	0.000	914	157.71	0.010
118.50	0.000	897	157.70	0.009
119.00	0.000	880	157.70	0.009
119.50	0.000	863	157.70	0.009
120.00	0.000	846	157.69	0.009
120.50	0.000	830	157.69	0.009
121.00	0.000	814	157.69	0.009
121.50	0.000	798	157.68	0.009
122.00	0.000	783	157.68	0.009
122.50	0.000	767	157.68	0.009
123.00	0.000	752	157.67	0.008
123.50	0.000	737	157.67	0.008
124.00	0.000	722	157.67	0.008
124.50	0.000	708	157.67	0.008
125.00	0.000	693	157.66	0.008
125.50	0.000	679	157.66	0.008
126.00	0.000	665	157.66	0.008
126.50	0.000	651	157.65	0.008
127.00	0.000	638	157.65	0.007

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	625	157.65	0.007
128.00	0.000	612	157.65	0.007
128.50	0.000	599	157.64	0.007
129.00	0.000	586	157.64	0.007
129.50	0.000	574	157.64	0.007
130.00	0.000	562	157.64	0.007
130.50	0.000	550	157.64	0.007
131.00	0.000	538	157.63	0.006
131.50	0.000	526	157.63	0.006
132.00	0.000	515	157.63	0.006
132.50	0.000	504	157.63	0.006
133.00	0.000	493	157.62	0.006
133.50	0.000	482	157.62	0.006
134.00	0.000	472	157.62	0.006
134.50	0.000	462	157.62	0.006
135.00	0.000	452	157.62	0.005
135.50	0.000	442	157.61	0.005
136.00	0.000	432	157.61	0.005
136.50	0.000	423	157.61	0.005
137.00	0.000	414	157.61	0.005
137.50	0.000	405	157.61	0.005
138.00	0.000	397	157.61	0.005
138.50	0.000	388	157.60	0.005
139.00	0.000	380	157.60	0.004
139.50	0.000	372	157.60	0.004
140.00	0.000	364	157.60	0.004
140.50	0.000	357	157.60	0.004
141.00	0.000	349	157.60	0.004
141.50	0.000	342	157.60	0.004
142.00	0.000	335	157.59	0.004
142.50	0.000	328	157.59	0.004
143.00	0.000	321	157.59	0.004
143.50	0.000	315	157.59	0.004
144.00	0.000	309	157.59	0.003
144.50	0.000	302	157.59	0.003
145.00	0.000	296	157.59	0.003
145.50	0.000	291	157.59	0.003
146.00	0.000	285	157.58	0.003
146.50	0.000	280	157.58	0.003
147.00	0.000	274	157.58	0.003
147.50	0.000	269	157.58	0.003
148.00	0.000	264	157.58	0.003
148.50	0.000	259	157.58	0.003
149.00	0.000	254	157.58	0.003
149.50	0.000	250	157.58	0.003
150.00	0.000	245	157.58	0.002
150.50	0.000	241	157.58	0.002
151.00	0.000	237	157.58	0.002
151.50	0.000	233	157.57	0.002
152.00	0.000	229	157.57	0.002
152.50	0.000	225	157.57	0.002

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	221	157.57	0.002
153.50	0.000	218	157.57	0.002
154.00	0.000	214	157.57	0.002
154.50	0.000	211	157.57	0.002
155.00	0.000	207	157.57	0.002
155.50	0.000	204	157.57	0.002
156.00	0.000	201	157.57	0.002
156.50	0.000	198	157.57	0.002
157.00	0.000	195	157.57	0.002
157.50	0.000	192	157.57	0.002
158.00	0.000	189	157.57	0.002
158.50	0.000	186	157.57	0.001
159.00	0.000	184	157.57	0.001
159.50	0.000	181	157.56	0.001
160.00	0.000	179	157.56	0.001
160.50	0.000	176	157.56	0.001
161.00	0.000	174	157.56	0.001
161.50	0.000	172	157.56	0.001
162.00	0.000	169	157.56	0.001
162.50	0.000	167	157.56	0.001
163.00	0.000	165	157.56	0.001
163.50	0.000	163	157.56	0.001
164.00	0.000	161	157.56	0.001
164.50	0.000	159	157.56	0.001
165.00	0.000	157	157.56	0.001
165.50	0.000	155	157.56	0.001
166.00	0.000	153	157.56	0.001
166.50	0.000	151	157.56	0.001
167.00	0.000	149	157.56	0.001
167.50	0.000	147	157.56	0.001
168.00	0.000	146	157.56	0.001

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 3.31" for 10-yr event
Inflow = 2.904 cfs @ 11.96 hrs, Volume= 5,921 cf
Outflow = 0.694 cfs @ 12.09 hrs, Volume= 5,921 cf, Atten= 76%, Lag= 7.8 min
Primary = 0.694 cfs @ 12.09 hrs, Volume= 5,921 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 160.62' @ 12.09 hrs Surf.Area= 2,542 sf Storage= 2,286 cf

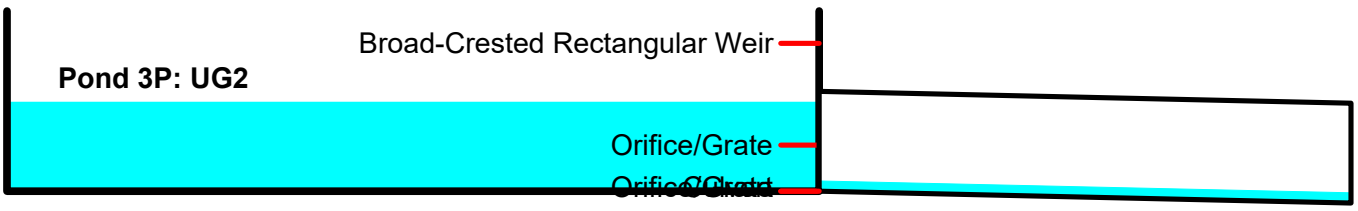
Plug-Flow detention time= 65.8 min calculated for 5,921 cf (100% of inflow)
Center-of-Mass det. time= 65.9 min (867.7 - 801.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.694 cfs @ 12.09 hrs HW=160.62' (Free Discharge)
└**4=Culvert** (Passes 0.694 cfs of 4.800 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.260 cfs @ 5.300 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.434 cfs @ 3.468 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 3P: UG2 - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Discontinued, not for new designs)
Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf
Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 3.44 sf x 8 rows

36.0" Wide + 3.0" Spacing = 39.0" C-C Row Spacing

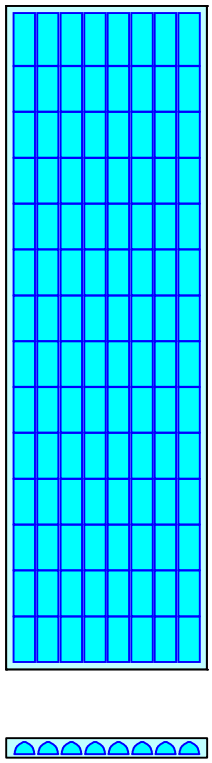
14 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 89.62' Row Length +12.0" End Stone x 2 = 91.62' Base Length
8 Rows x 36.0" Wide + 3.0" Spacing x 7 + 12.0" Side Stone x 2 = 27.75' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

112 Chambers x 21.8 cf +1.00' Row Adjustment x 3.44 sf x 8 Rows = 2,466.0 cf Chamber Storage

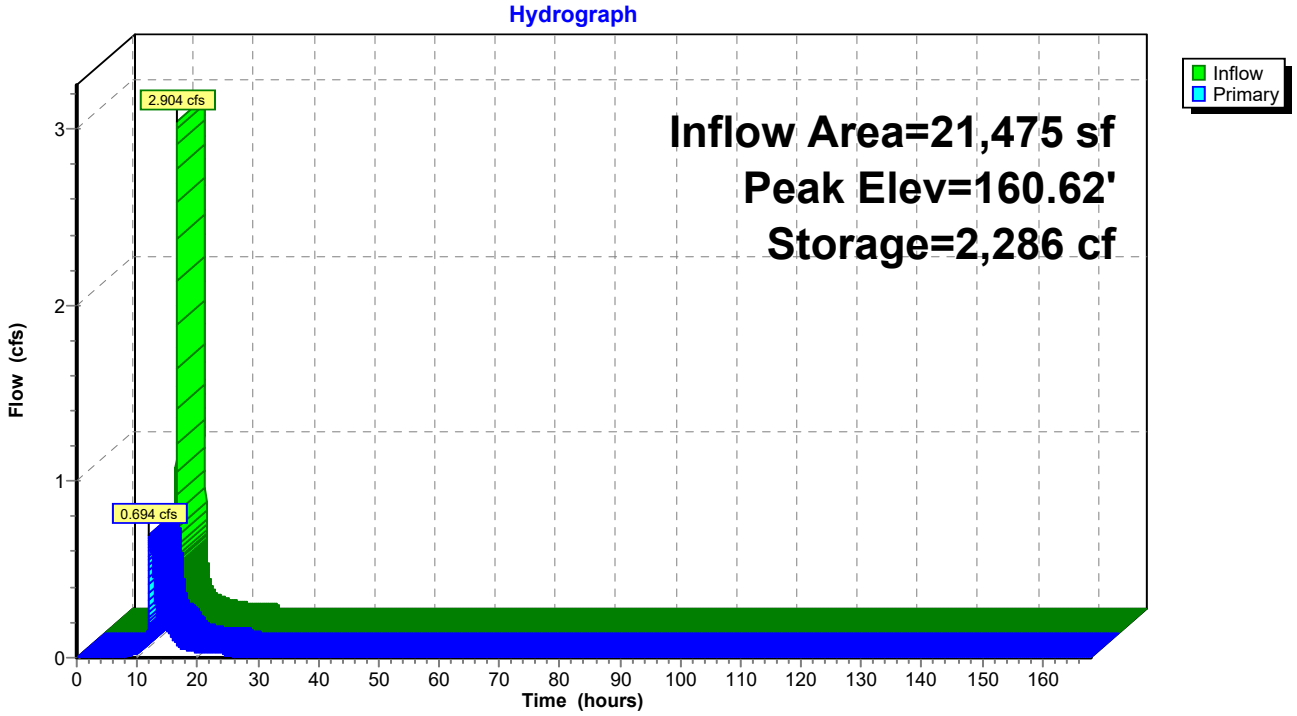
6,885.8 cf Field - 2,466.0 cf Chambers = 4,419.8 cf Stone x 40.0% Voids = 1,767.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,233.9 cf = 0.097 af
Overall Storage Efficiency = 61.5%
Overall System Size = 91.62' x 27.75' x 2.71'

112 Chambers
255.0 cy Field
163.7 cy Stone



Pond 3P: UG2


Hydrograph
Inflow Area=21,475 sf
Peak Elev=160.62'
Storage=2,286 cf
2.904 cfs
0.694 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.000	0	159.28	0.000
4.50	0.000	0	159.28	0.000
5.00	0.000	0	159.28	0.000
5.50	0.001	0	159.28	0.000
6.00	0.003	3	159.28	0.000
6.50	0.005	9	159.29	0.001
7.00	0.007	19	159.30	0.001
7.50	0.010	32	159.31	0.002
8.00	0.013	46	159.33	0.005
8.50	0.018	63	159.34	0.008
9.00	0.025	82	159.36	0.013
9.50	0.030	102	159.38	0.020
10.00	0.040	122	159.40	0.028
10.50	0.058	150	159.43	0.040
11.00	0.090	194	159.47	0.060
11.50	**0.166**	283	159.56	0.092
12.00	**2.449**	**2,033**	**160.49**	**0.624**
12.50	0.222	**1,847**	**160.40**	**0.567**
13.00	0.140	1,333	160.16	0.338
13.50	0.106	1,071	160.04	0.216
14.00	0.084	897	159.96	0.176
14.50	0.074	732	159.88	0.163
15.00	0.067	577	159.81	0.151
15.50	0.059	434	159.71	0.130
16.00	0.052	324	159.60	0.104
16.50	0.048	247	159.52	0.082
17.00	0.046	202	159.48	0.063
17.50	0.043	178	159.46	0.052
18.00	0.040	165	159.44	0.046
18.50	0.037	156	159.43	0.042
19.00	0.035	148	159.43	0.039
19.50	0.032	141	159.42	0.036
20.00	0.029	135	159.41	0.033
20.50	0.028	129	159.41	0.031
21.00	0.028	126	159.40	0.029
21.50	0.027	124	159.40	0.028
22.00	0.027	122	159.40	0.028
22.50	0.026	121	159.40	0.027
23.00	0.026	119	159.40	0.026
23.50	0.025	118	159.40	0.026
24.00	0.025	116	159.39	0.025
24.50	0.000	87	159.37	0.015
25.00	0.000	66	159.34	0.009

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	53	159.33	0.006
26.00	0.000	44	159.32	0.004
26.50	0.000	37	159.32	0.003
27.00	0.000	32	159.31	0.002
27.50	0.000	28	159.31	0.002
28.00	0.000	26	159.31	0.001
28.50	0.000	23	159.30	0.001
29.00	0.000	21	159.30	0.001
29.50	0.000	19	159.30	0.001
30.00	0.000	17	159.30	0.001
30.50	0.000	15	159.29	0.001
31.00	0.000	14	159.29	0.001
31.50	0.000	12	159.29	0.001
32.00	0.000	11	159.29	0.001
32.50	0.000	10	159.29	0.001
33.00	0.000	9	159.29	0.001
33.50	0.000	8	159.29	0.000
34.00	0.000	7	159.29	0.000
34.50	0.000	7	159.29	0.000
35.00	0.000	6	159.29	0.000
35.50	0.000	5	159.29	0.000
36.00	0.000	5	159.28	0.000
36.50	0.000	4	159.28	0.000
37.00	0.000	4	159.28	0.000
37.50	0.000	3	159.28	0.000
38.00	0.000	3	159.28	0.000
38.50	0.000	3	159.28	0.000
39.00	0.000	3	159.28	0.000
39.50	0.000	2	159.28	0.000
40.00	0.000	2	159.28	0.000
40.50	0.000	2	159.28	0.000
41.00	0.000	2	159.28	0.000
41.50	0.000	1	159.28	0.000
42.00	0.000	1	159.28	0.000
42.50	0.000	1	159.28	0.000
43.00	0.000	1	159.28	0.000
43.50	0.000	1	159.28	0.000
44.00	0.000	1	159.28	0.000
44.50	0.000	1	159.28	0.000
45.00	0.000	1	159.28	0.000
45.50	0.000	1	159.28	0.000
46.00	0.000	1	159.28	0.000
46.50	0.000	1	159.28	0.000
47.00	0.000	0	159.28	0.000
47.50	0.000	0	159.28	0.000
48.00	0.000	0	159.28	0.000
48.50	0.000	0	159.28	0.000
49.00	0.000	0	159.28	0.000
49.50	0.000	0	159.28	0.000
50.00	0.000	0	159.28	0.000
50.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	0	159.28	0.000
51.50	0.000	0	159.28	0.000
52.00	0.000	0	159.28	0.000
52.50	0.000	0	159.28	0.000
53.00	0.000	0	159.28	0.000
53.50	0.000	0	159.28	0.000
54.00	0.000	0	159.28	0.000
54.50	0.000	0	159.28	0.000
55.00	0.000	0	159.28	0.000
55.50	0.000	0	159.28	0.000
56.00	0.000	0	159.28	0.000
56.50	0.000	0	159.28	0.000
57.00	0.000	0	159.28	0.000
57.50	0.000	0	159.28	0.000
58.00	0.000	0	159.28	0.000
58.50	0.000	0	159.28	0.000
59.00	0.000	0	159.28	0.000
59.50	0.000	0	159.28	0.000
60.00	0.000	0	159.28	0.000
60.50	0.000	0	159.28	0.000
61.00	0.000	0	159.28	0.000
61.50	0.000	0	159.28	0.000
62.00	0.000	0	159.28	0.000
62.50	0.000	0	159.28	0.000
63.00	0.000	0	159.28	0.000
63.50	0.000	0	159.28	0.000
64.00	0.000	0	159.28	0.000
64.50	0.000	0	159.28	0.000
65.00	0.000	0	159.28	0.000
65.50	0.000	0	159.28	0.000
66.00	0.000	0	159.28	0.000
66.50	0.000	0	159.28	0.000
67.00	0.000	0	159.28	0.000
67.50	0.000	0	159.28	0.000
68.00	0.000	0	159.28	0.000
68.50	0.000	0	159.28	0.000
69.00	0.000	0	159.28	0.000
69.50	0.000	0	159.28	0.000
70.00	0.000	0	159.28	0.000
70.50	0.000	0	159.28	0.000
71.00	0.000	0	159.28	0.000
71.50	0.000	0	159.28	0.000
72.00	0.000	0	159.28	0.000
72.50	0.000	0	159.28	0.000
73.00	0.000	0	159.28	0.000
73.50	0.000	0	159.28	0.000
74.00	0.000	0	159.28	0.000
74.50	0.000	0	159.28	0.000
75.00	0.000	0	159.28	0.000
75.50	0.000	0	159.28	0.000
76.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	0	159.28	0.000
77.00	0.000	0	159.28	0.000
77.50	0.000	0	159.28	0.000
78.00	0.000	0	159.28	0.000
78.50	0.000	0	159.28	0.000
79.00	0.000	0	159.28	0.000
79.50	0.000	0	159.28	0.000
80.00	0.000	0	159.28	0.000
80.50	0.000	0	159.28	0.000
81.00	0.000	0	159.28	0.000
81.50	0.000	0	159.28	0.000
82.00	0.000	0	159.28	0.000
82.50	0.000	0	159.28	0.000
83.00	0.000	0	159.28	0.000
83.50	0.000	0	159.28	0.000
84.00	0.000	0	159.28	0.000
84.50	0.000	0	159.28	0.000
85.00	0.000	0	159.28	0.000
85.50	0.000	0	159.28	0.000
86.00	0.000	0	159.28	0.000
86.50	0.000	0	159.28	0.000
87.00	0.000	0	159.28	0.000
87.50	0.000	0	159.28	0.000
88.00	0.000	0	159.28	0.000
88.50	0.000	0	159.28	0.000
89.00	0.000	0	159.28	0.000
89.50	0.000	0	159.28	0.000
90.00	0.000	0	159.28	0.000
90.50	0.000	0	159.28	0.000
91.00	0.000	0	159.28	0.000
91.50	0.000	0	159.28	0.000
92.00	0.000	0	159.28	0.000
92.50	0.000	0	159.28	0.000
93.00	0.000	0	159.28	0.000
93.50	0.000	0	159.28	0.000
94.00	0.000	0	159.28	0.000
94.50	0.000	0	159.28	0.000
95.00	0.000	0	159.28	0.000
95.50	0.000	0	159.28	0.000
96.00	0.000	0	159.28	0.000
96.50	0.000	0	159.28	0.000
97.00	0.000	0	159.28	0.000
97.50	0.000	0	159.28	0.000
98.00	0.000	0	159.28	0.000
98.50	0.000	0	159.28	0.000
99.00	0.000	0	159.28	0.000
99.50	0.000	0	159.28	0.000
100.00	0.000	0	159.28	0.000
100.50	0.000	0	159.28	0.000
101.00	0.000	0	159.28	0.000
101.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	0	159.28	0.000
102.50	0.000	0	159.28	0.000
103.00	0.000	0	159.28	0.000
103.50	0.000	0	159.28	0.000
104.00	0.000	0	159.28	0.000
104.50	0.000	0	159.28	0.000
105.00	0.000	0	159.28	0.000
105.50	0.000	0	159.28	0.000
106.00	0.000	0	159.28	0.000
106.50	0.000	0	159.28	0.000
107.00	0.000	0	159.28	0.000
107.50	0.000	0	159.28	0.000
108.00	0.000	0	159.28	0.000
108.50	0.000	0	159.28	0.000
109.00	0.000	0	159.28	0.000
109.50	0.000	0	159.28	0.000
110.00	0.000	0	159.28	0.000
110.50	0.000	0	159.28	0.000
111.00	0.000	0	159.28	0.000
111.50	0.000	0	159.28	0.000
112.00	0.000	0	159.28	0.000
112.50	0.000	0	159.28	0.000
113.00	0.000	0	159.28	0.000
113.50	0.000	0	159.28	0.000
114.00	0.000	0	159.28	0.000
114.50	0.000	0	159.28	0.000
115.00	0.000	0	159.28	0.000
115.50	0.000	0	159.28	0.000
116.00	0.000	0	159.28	0.000
116.50	0.000	0	159.28	0.000
117.00	0.000	0	159.28	0.000
117.50	0.000	0	159.28	0.000
118.00	0.000	0	159.28	0.000
118.50	0.000	0	159.28	0.000
119.00	0.000	0	159.28	0.000
119.50	0.000	0	159.28	0.000
120.00	0.000	0	159.28	0.000
120.50	0.000	0	159.28	0.000
121.00	0.000	0	159.28	0.000
121.50	0.000	0	159.28	0.000
122.00	0.000	0	159.28	0.000
122.50	0.000	0	159.28	0.000
123.00	0.000	0	159.28	0.000
123.50	0.000	0	159.28	0.000
124.00	0.000	0	159.28	0.000
124.50	0.000	0	159.28	0.000
125.00	0.000	0	159.28	0.000
125.50	0.000	0	159.28	0.000
126.00	0.000	0	159.28	0.000
126.50	0.000	0	159.28	0.000
127.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	0	159.28	0.000
128.00	0.000	0	159.28	0.000
128.50	0.000	0	159.28	0.000
129.00	0.000	0	159.28	0.000
129.50	0.000	0	159.28	0.000
130.00	0.000	0	159.28	0.000
130.50	0.000	0	159.28	0.000
131.00	0.000	0	159.28	0.000
131.50	0.000	0	159.28	0.000
132.00	0.000	0	159.28	0.000
132.50	0.000	0	159.28	0.000
133.00	0.000	0	159.28	0.000
133.50	0.000	0	159.28	0.000
134.00	0.000	0	159.28	0.000
134.50	0.000	0	159.28	0.000
135.00	0.000	0	159.28	0.000
135.50	0.000	0	159.28	0.000
136.00	0.000	0	159.28	0.000
136.50	0.000	0	159.28	0.000
137.00	0.000	0	159.28	0.000
137.50	0.000	0	159.28	0.000
138.00	0.000	0	159.28	0.000
138.50	0.000	0	159.28	0.000
139.00	0.000	0	159.28	0.000
139.50	0.000	0	159.28	0.000
140.00	0.000	0	159.28	0.000
140.50	0.000	0	159.28	0.000
141.00	0.000	0	159.28	0.000
141.50	0.000	0	159.28	0.000
142.00	0.000	0	159.28	0.000
142.50	0.000	0	159.28	0.000
143.00	0.000	0	159.28	0.000
143.50	0.000	0	159.28	0.000
144.00	0.000	0	159.28	0.000
144.50	0.000	0	159.28	0.000
145.00	0.000	0	159.28	0.000
145.50	0.000	0	159.28	0.000
146.00	0.000	0	159.28	0.000
146.50	0.000	0	159.28	0.000
147.00	0.000	0	159.28	0.000
147.50	0.000	0	159.28	0.000
148.00	0.000	0	159.28	0.000
148.50	0.000	0	159.28	0.000
149.00	0.000	0	159.28	0.000
149.50	0.000	0	159.28	0.000
150.00	0.000	0	159.28	0.000
150.50	0.000	0	159.28	0.000
151.00	0.000	0	159.28	0.000
151.50	0.000	0	159.28	0.000
152.00	0.000	0	159.28	0.000
152.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	0	159.28	0.000
153.50	0.000	0	159.28	0.000
154.00	0.000	0	159.28	0.000
154.50	0.000	0	159.28	0.000
155.00	0.000	0	159.28	0.000
155.50	0.000	0	159.28	0.000
156.00	0.000	0	159.28	0.000
156.50	0.000	0	159.28	0.000
157.00	0.000	0	159.28	0.000
157.50	0.000	0	159.28	0.000
158.00	0.000	0	159.28	0.000
158.50	0.000	0	159.28	0.000
159.00	0.000	0	159.28	0.000
159.50	0.000	0	159.28	0.000
160.00	0.000	0	159.28	0.000
160.50	0.000	0	159.28	0.000
161.00	0.000	0	159.28	0.000
161.50	0.000	0	159.28	0.000
162.00	0.000	0	159.28	0.000
162.50	0.000	0	159.28	0.000
163.00	0.000	0	159.28	0.000
163.50	0.000	0	159.28	0.000
164.00	0.000	0	159.28	0.000
164.50	0.000	0	159.28	0.000
165.00	0.000	0	159.28	0.000
165.50	0.000	0	159.28	0.000
166.00	0.000	0	159.28	0.000
166.50	0.000	0	159.28	0.000
167.00	0.000	0	159.28	0.000
167.50	0.000	0	159.28	0.000
168.00	0.000	0	159.28	0.000

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 5.39" for 25-yr event
Inflow = 16.443 cfs @ 11.96 hrs, Volume= 37,709 cf
Outflow = 3.829 cfs @ 12.09 hrs, Volume= 37,563 cf, Atten= 77%, Lag= 8.0 min
Primary = 3.829 cfs @ 12.09 hrs, Volume= 37,563 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 159.58' @ 12.09 hrs Surf.Area= 13,041 sf Storage= 19,594 cf

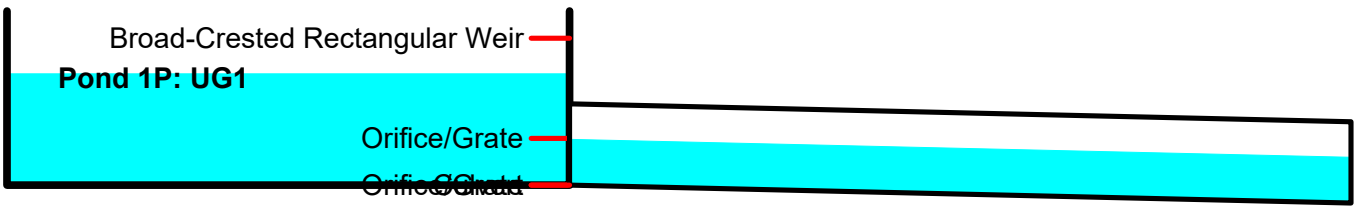
Plug-Flow detention time= 756.6 min calculated for 37,560 cf (100% of inflow)
Center-of-Mass det. time= 754.4 min (1,508.4 - 754.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=3.828 cfs @ 12.09 hrs HW=159.58' (Free Discharge)
└**4=Culvert** (Passes 3.828 cfs of 6.806 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.037 cfs @ 6.830 fps)
  ├**2=Orifice/Grate** (Orifice Controls 3.791 cfs @ 4.874 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 1P: UG1 - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger®280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 27 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

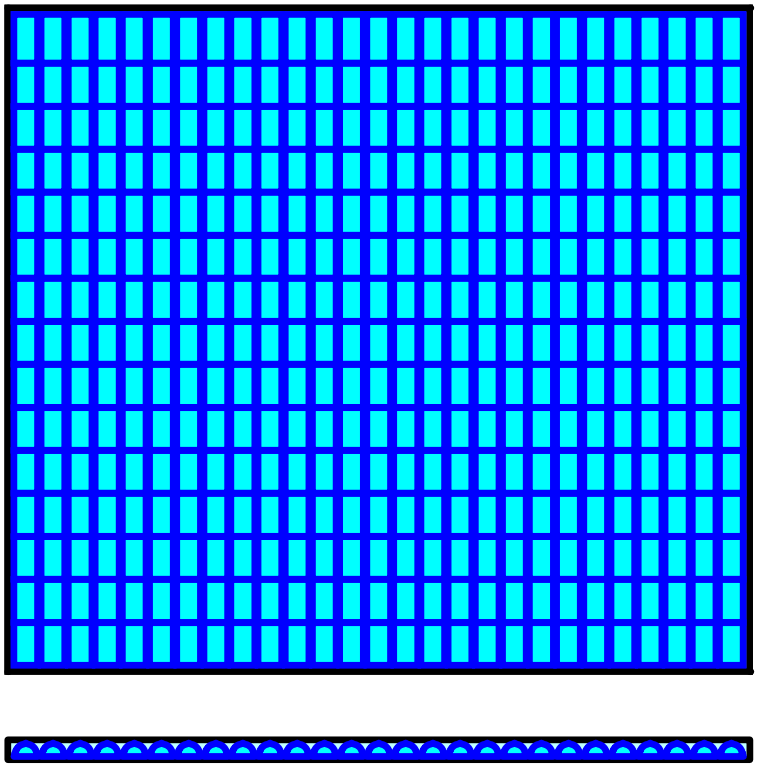
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

405 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 27 Rows = 17,377.3 cf Chamber Storage

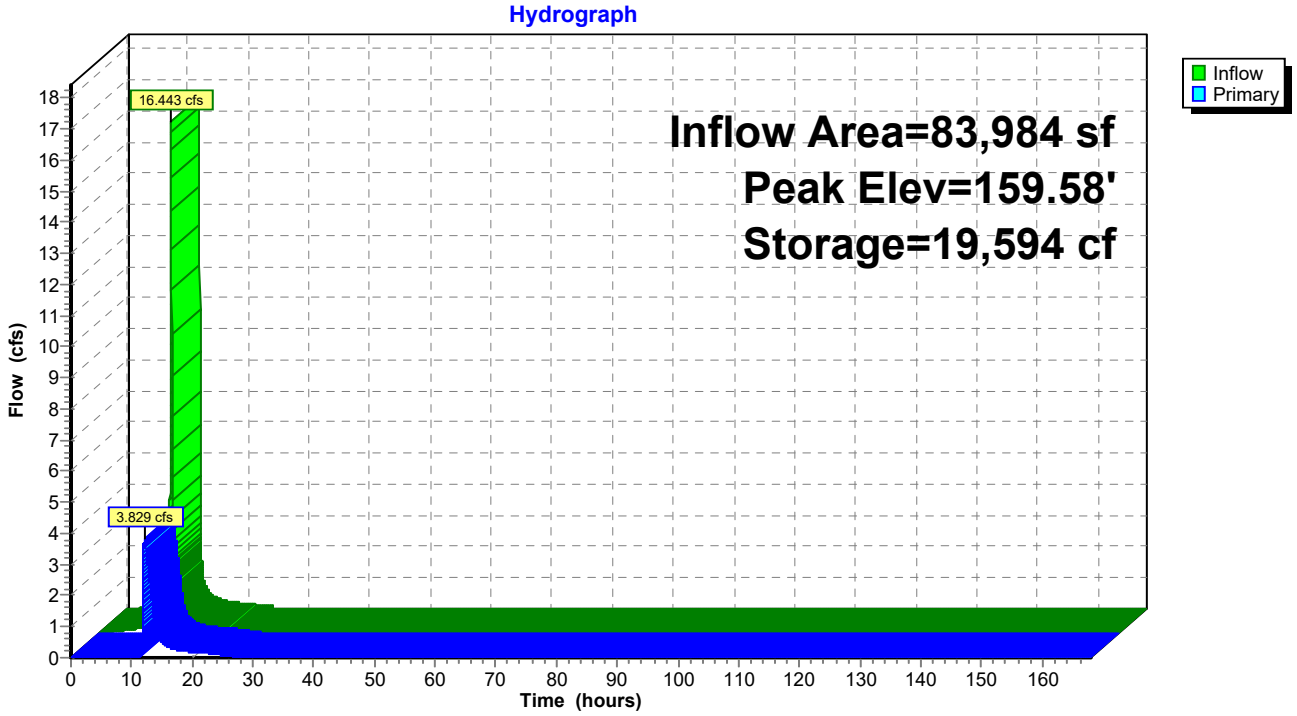
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

Chamber Storage + Stone Storage = 27,162.4 cf = 0.624 af
Overall Storage Efficiency = 64.9%
Overall System Size = 108.00' x 120.75' x 3.21'

405 Chambers
1,549.6 cy Field
906.0 cy Stone



Pond 1P: UG1


Hydrograph
Inflow
Primary
Inflow Area=83,984 sf
Peak Elev=159.58'
Storage=19,594 cf
16.443 cfs
3.829 cfs
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.004	1	157.53	0.000
2.00	0.023	25	157.53	0.000
2.50	0.040	81	157.55	0.001
3.00	0.056	166	157.56	0.001
3.50	0.071	277	157.58	0.003
4.00	0.084	409	157.61	0.005
4.50	0.100	564	157.64	0.007
5.00	0.116	744	157.67	0.008
5.50	0.132	951	157.71	0.010
6.00	0.147	1,183	157.76	0.011
6.50	0.163	1,440	157.81	0.013
7.00	0.178	1,723	157.86	0.014
7.50	0.193	2,030	157.92	0.015
8.00	0.208	2,362	157.98	0.017
8.50	0.256	2,743	158.04	0.018
9.00	0.311	3,220	158.08	0.019
9.50	0.326	3,765	158.13	0.020
10.00	0.401	4,373	158.18	0.020
10.50	0.527	5,166	158.25	0.022
11.00	0.737	6,253	158.34	0.023
11.50	**1.223**	7,850	158.48	0.231
12.00	**13.588**	**18,214**	**159.44**	**3.553**
12.50	1.182	**16,987**	**159.32**	**3.299**
13.00	0.735	13,421	158.98	2.456
13.50	0.556	10,904	158.75	1.619
14.00	0.436	9,584	158.63	0.926
14.50	0.385	8,949	158.58	0.633
15.00	0.346	8,609	158.55	0.492
15.50	0.306	8,390	158.53	0.408
16.00	0.267	8,225	158.51	0.351
16.50	0.249	8,096	158.50	0.307
17.00	0.234	8,007	158.49	0.277
17.50	0.220	7,938	158.49	0.256
18.00	0.206	7,877	158.48	0.238
18.50	0.192	7,821	158.48	0.222
19.00	0.178	7,768	158.47	0.207
19.50	0.164	7,716	158.47	0.192
20.00	0.150	7,666	158.46	0.177
20.50	0.145	7,622	158.46	0.165
21.00	0.142	7,591	158.46	0.157
21.50	0.139	7,567	158.46	0.151
22.00	0.136	7,548	158.45	0.146
22.50	0.134	7,531	158.45	0.142
23.00	0.131	7,516	158.45	0.139
23.50	0.128	7,503	158.45	0.135
24.00	0.125	7,490	158.45	0.132
24.50	0.000	7,318	158.43	0.095
25.00	0.000	7,174	158.42	0.069

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	7,064	158.41	0.054
26.00	0.000	6,979	158.40	0.041
26.50	0.000	6,914	158.40	0.032
27.00	0.000	6,862	158.39	0.026
27.50	0.000	6,817	158.39	0.024
28.00	0.000	6,774	158.39	0.024
28.50	0.000	6,731	158.38	0.024
29.00	0.000	6,689	158.38	0.024
29.50	0.000	6,646	158.38	0.024
30.00	0.000	6,604	158.37	0.023
30.50	0.000	6,562	158.37	0.023
31.00	0.000	6,520	158.36	0.023
31.50	0.000	6,478	158.36	0.023
32.00	0.000	6,436	158.36	0.023
32.50	0.000	6,394	158.35	0.023
33.00	0.000	6,352	158.35	0.023
33.50	0.000	6,310	158.35	0.023
34.00	0.000	6,269	158.34	0.023
34.50	0.000	6,227	158.34	0.023
35.00	0.000	6,186	158.34	0.023
35.50	0.000	6,145	158.33	0.023
36.00	0.000	6,103	158.33	0.023
36.50	0.000	6,062	158.33	0.023
37.00	0.000	6,021	158.32	0.023
37.50	0.000	5,981	158.32	0.023
38.00	0.000	5,940	158.31	0.023
38.50	0.000	5,899	158.31	0.023
39.00	0.000	5,858	158.31	0.023
39.50	0.000	5,818	158.30	0.022
40.00	0.000	5,778	158.30	0.022
40.50	0.000	5,737	158.30	0.022
41.00	0.000	5,697	158.29	0.022
41.50	0.000	5,657	158.29	0.022
42.00	0.000	5,617	158.29	0.022
42.50	0.000	5,577	158.28	0.022
43.00	0.000	5,537	158.28	0.022
43.50	0.000	5,497	158.28	0.022
44.00	0.000	5,458	158.27	0.022
44.50	0.000	5,418	158.27	0.022
45.00	0.000	5,379	158.27	0.022
45.50	0.000	5,339	158.26	0.022
46.00	0.000	5,300	158.26	0.022
46.50	0.000	5,261	158.26	0.022
47.00	0.000	5,222	158.25	0.022
47.50	0.000	5,183	158.25	0.022
48.00	0.000	5,144	158.25	0.022
48.50	0.000	5,105	158.24	0.022
49.00	0.000	5,067	158.24	0.021
49.50	0.000	5,028	158.24	0.021
50.00	0.000	4,990	158.23	0.021
50.50	0.000	4,951	158.23	0.021

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,913	158.23	0.021
51.50	0.000	4,875	158.22	0.021
52.00	0.000	4,837	158.22	0.021
52.50	0.000	4,799	158.22	0.021
53.00	0.000	4,761	158.21	0.021
53.50	0.000	4,723	158.21	0.021
54.00	0.000	4,685	158.21	0.021
54.50	0.000	4,648	158.20	0.021
55.00	0.000	4,610	158.20	0.021
55.50	0.000	4,573	158.20	0.021
56.00	0.000	4,535	158.19	0.021
56.50	0.000	4,498	158.19	0.021
57.00	0.000	4,461	158.19	0.021
57.50	0.000	4,424	158.18	0.021
58.00	0.000	4,387	158.18	0.020
58.50	0.000	4,350	158.18	0.020
59.00	0.000	4,314	158.17	0.020
59.50	0.000	4,277	158.17	0.020
60.00	0.000	4,240	158.17	0.020
60.50	0.000	4,204	158.17	0.020
61.00	0.000	4,168	158.16	0.020
61.50	0.000	4,131	158.16	0.020
62.00	0.000	4,095	158.16	0.020
62.50	0.000	4,059	158.15	0.020
63.00	0.000	4,023	158.15	0.020
63.50	0.000	3,987	158.15	0.020
64.00	0.000	3,951	158.14	0.020
64.50	0.000	3,916	158.14	0.020
65.00	0.000	3,880	158.14	0.020
65.50	0.000	3,845	158.13	0.020
66.00	0.000	3,809	158.13	0.020
66.50	0.000	3,774	158.13	0.020
67.00	0.000	3,739	158.13	0.020
67.50	0.000	3,703	158.12	0.019
68.00	0.000	3,668	158.12	0.019
68.50	0.000	3,633	158.12	0.019
69.00	0.000	3,599	158.11	0.019
69.50	0.000	3,564	158.11	0.019
70.00	0.000	3,529	158.11	0.019
70.50	0.000	3,495	158.10	0.019
71.00	0.000	3,460	158.10	0.019
71.50	0.000	3,426	158.10	0.019
72.00	0.000	3,392	158.10	0.019
72.50	0.000	3,357	158.09	0.019
73.00	0.000	3,323	158.09	0.019
73.50	0.000	3,289	158.09	0.019
74.00	0.000	3,255	158.08	0.019
74.50	0.000	3,222	158.08	0.019
75.00	0.000	3,188	158.08	0.019
75.50	0.000	3,154	158.08	0.019
76.00	0.000	3,121	158.07	0.019

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	3,087	158.07	0.019
77.00	0.000	3,054	158.07	0.018
77.50	0.000	3,021	158.06	0.018
78.00	0.000	2,988	158.06	0.018
78.50	0.000	2,955	158.06	0.018
79.00	0.000	2,922	158.06	0.018
79.50	0.000	2,889	158.05	0.018
80.00	0.000	2,856	158.05	0.018
80.50	0.000	2,823	158.05	0.018
81.00	0.000	2,791	158.05	0.018
81.50	0.000	2,758	158.04	0.018
82.00	0.000	2,726	158.04	0.018
82.50	0.000	2,694	158.04	0.018
83.00	0.000	2,661	158.03	0.018
83.50	0.000	2,629	158.03	0.018
84.00	0.000	2,597	158.03	0.018
84.50	0.000	2,565	158.02	0.018
85.00	0.000	2,534	158.02	0.017
85.50	0.000	2,502	158.01	0.017
86.00	0.000	2,471	158.00	0.017
86.50	0.000	2,440	158.00	0.017
87.00	0.000	2,410	157.99	0.017
87.50	0.000	2,379	157.99	0.017
88.00	0.000	2,349	157.98	0.017
88.50	0.000	2,319	157.97	0.017
89.00	0.000	2,289	157.97	0.017
89.50	0.000	2,259	157.96	0.016
90.00	0.000	2,230	157.96	0.016
90.50	0.000	2,200	157.95	0.016
91.00	0.000	2,171	157.95	0.016
91.50	0.000	2,142	157.94	0.016
92.00	0.000	2,114	157.94	0.016
92.50	0.000	2,086	157.93	0.016
93.00	0.000	2,057	157.92	0.016
93.50	0.000	2,029	157.92	0.015
94.00	0.000	2,002	157.91	0.015
94.50	0.000	1,974	157.91	0.015
95.00	0.000	1,947	157.90	0.015
95.50	0.000	1,920	157.90	0.015
96.00	0.000	1,893	157.89	0.015
96.50	0.000	1,866	157.89	0.015
97.00	0.000	1,840	157.88	0.015
97.50	0.000	1,813	157.88	0.015
98.00	0.000	1,787	157.87	0.014
98.50	0.000	1,762	157.87	0.014
99.00	0.000	1,736	157.86	0.014
99.50	0.000	1,711	157.86	0.014
100.00	0.000	1,685	157.85	0.014
100.50	0.000	1,660	157.85	0.014
101.00	0.000	1,636	157.84	0.014
101.50	0.000	1,611	157.84	0.014

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	1,587	157.83	0.013
102.50	0.000	1,563	157.83	0.013
103.00	0.000	1,539	157.82	0.013
103.50	0.000	1,515	157.82	0.013
104.00	0.000	1,492	157.82	0.013
104.50	0.000	1,468	157.81	0.013
105.00	0.000	1,445	157.81	0.013
105.50	0.000	1,423	157.80	0.013
106.00	0.000	1,400	157.80	0.012
106.50	0.000	1,378	157.79	0.012
107.00	0.000	1,355	157.79	0.012
107.50	0.000	1,333	157.79	0.012
108.00	0.000	1,312	157.78	0.012
108.50	0.000	1,290	157.78	0.012
109.00	0.000	1,269	157.77	0.012
109.50	0.000	1,248	157.77	0.012
110.00	0.000	1,227	157.77	0.012
110.50	0.000	1,206	157.76	0.011
111.00	0.000	1,186	157.76	0.011
111.50	0.000	1,165	157.75	0.011
112.00	0.000	1,145	157.75	0.011
112.50	0.000	1,126	157.75	0.011
113.00	0.000	1,106	157.74	0.011
113.50	0.000	1,087	157.74	0.011
114.00	0.000	1,067	157.73	0.011
114.50	0.000	1,048	157.73	0.010
115.00	0.000	1,030	157.73	0.010
115.50	0.000	1,011	157.72	0.010
116.00	0.000	993	157.72	0.010
116.50	0.000	975	157.72	0.010
117.00	0.000	957	157.71	0.010
117.50	0.000	939	157.71	0.010
118.00	0.000	922	157.71	0.010
118.50	0.000	905	157.70	0.010
119.00	0.000	887	157.70	0.009
119.50	0.000	871	157.70	0.009
120.00	0.000	854	157.69	0.009
120.50	0.000	838	157.69	0.009
121.00	0.000	821	157.69	0.009
121.50	0.000	806	157.68	0.009
122.00	0.000	790	157.68	0.009
122.50	0.000	774	157.68	0.009
123.00	0.000	759	157.68	0.008
123.50	0.000	744	157.67	0.008
124.00	0.000	729	157.67	0.008
124.50	0.000	714	157.67	0.008
125.00	0.000	700	157.66	0.008
125.50	0.000	686	157.66	0.008
126.00	0.000	672	157.66	0.008
126.50	0.000	658	157.66	0.008
127.00	0.000	644	157.65	0.007

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	631	157.65	0.007
128.00	0.000	618	157.65	0.007
128.50	0.000	605	157.65	0.007
129.00	0.000	592	157.64	0.007
129.50	0.000	580	157.64	0.007
130.00	0.000	567	157.64	0.007
130.50	0.000	555	157.64	0.007
131.00	0.000	543	157.63	0.007
131.50	0.000	532	157.63	0.006
132.00	0.000	520	157.63	0.006
132.50	0.000	509	157.63	0.006
133.00	0.000	498	157.63	0.006
133.50	0.000	487	157.62	0.006
134.00	0.000	477	157.62	0.006
134.50	0.000	466	157.62	0.006
135.00	0.000	456	157.62	0.006
135.50	0.000	446	157.62	0.005
136.00	0.000	437	157.61	0.005
136.50	0.000	428	157.61	0.005
137.00	0.000	418	157.61	0.005
137.50	0.000	409	157.61	0.005
138.00	0.000	401	157.61	0.005
138.50	0.000	392	157.61	0.005
139.00	0.000	384	157.60	0.005
139.50	0.000	376	157.60	0.004
140.00	0.000	368	157.60	0.004
140.50	0.000	360	157.60	0.004
141.00	0.000	353	157.60	0.004
141.50	0.000	345	157.60	0.004
142.00	0.000	338	157.59	0.004
142.50	0.000	331	157.59	0.004
143.00	0.000	324	157.59	0.004
143.50	0.000	318	157.59	0.004
144.00	0.000	311	157.59	0.004
144.50	0.000	305	157.59	0.003
145.00	0.000	299	157.59	0.003
145.50	0.000	293	157.59	0.003
146.00	0.000	288	157.59	0.003
146.50	0.000	282	157.58	0.003
147.00	0.000	277	157.58	0.003
147.50	0.000	271	157.58	0.003
148.00	0.000	266	157.58	0.003
148.50	0.000	261	157.58	0.003
149.00	0.000	257	157.58	0.003
149.50	0.000	252	157.58	0.003
150.00	0.000	247	157.58	0.002
150.50	0.000	243	157.58	0.002
151.00	0.000	239	157.58	0.002
151.50	0.000	235	157.57	0.002
152.00	0.000	231	157.57	0.002
152.50	0.000	227	157.57	0.002

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	223	157.57	0.002
153.50	0.000	219	157.57	0.002
154.00	0.000	216	157.57	0.002
154.50	0.000	212	157.57	0.002
155.00	0.000	209	157.57	0.002
155.50	0.000	206	157.57	0.002
156.00	0.000	202	157.57	0.002
156.50	0.000	199	157.57	0.002
157.00	0.000	196	157.57	0.002
157.50	0.000	193	157.57	0.002
158.00	0.000	190	157.57	0.002
158.50	0.000	188	157.57	0.002
159.00	0.000	185	157.57	0.001
159.50	0.000	182	157.56	0.001
160.00	0.000	180	157.56	0.001
160.50	0.000	177	157.56	0.001
161.00	0.000	175	157.56	0.001
161.50	0.000	173	157.56	0.001
162.00	0.000	170	157.56	0.001
162.50	0.000	168	157.56	0.001
163.00	0.000	166	157.56	0.001
163.50	0.000	164	157.56	0.001
164.00	0.000	162	157.56	0.001
164.50	0.000	160	157.56	0.001
165.00	0.000	158	157.56	0.001
165.50	0.000	156	157.56	0.001
166.00	0.000	154	157.56	0.001
166.50	0.000	152	157.56	0.001
167.00	0.000	150	157.56	0.001
167.50	0.000	148	157.56	0.001
168.00	0.000	146	157.56	0.001

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 4.28" for 25-yr event
Inflow = 3.696 cfs @ 11.96 hrs, Volume= 7,653 cf
Outflow = 0.856 cfs @ 12.09 hrs, Volume= 7,653 cf, Atten= 77%, Lag= 8.0 min
Primary = 0.856 cfs @ 12.09 hrs, Volume= 7,653 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 160.96' @ 12.09 hrs Surf.Area= 2,542 sf Storage= 2,955 cf

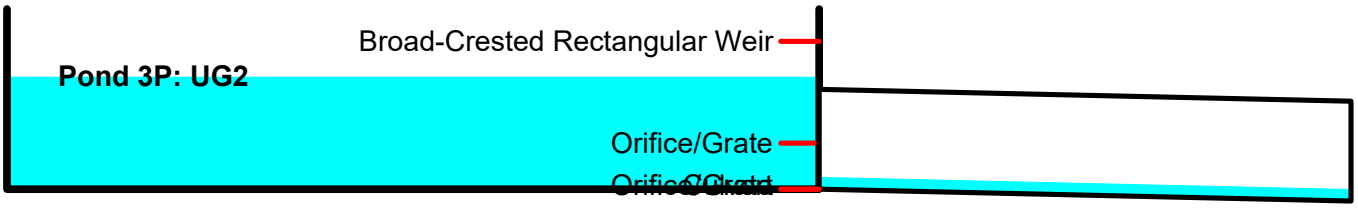
Plug-Flow detention time= 63.7 min calculated for 7,653 cf (100% of inflow)
Center-of-Mass det. time= 63.8 min (858.3 - 794.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.856 cfs @ 12.09 hrs HW=160.96' (Free Discharge)
└**4=Culvert** (Passes 0.856 cfs of 6.631 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.295 cfs @ 6.013 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.561 cfs @ 4.486 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 3P: UG2 - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Discontinued, not for new designs)
Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf
Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 3.44 sf x 8 rows

36.0" Wide + 3.0" Spacing = 39.0" C-C Row Spacing

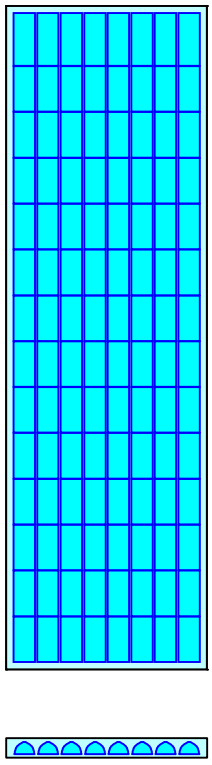
14 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 89.62' Row Length +12.0" End Stone x 2 = 91.62' Base Length
8 Rows x 36.0" Wide + 3.0" Spacing x 7 + 12.0" Side Stone x 2 = 27.75' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

112 Chambers x 21.8 cf +1.00' Row Adjustment x 3.44 sf x 8 Rows = 2,466.0 cf Chamber Storage

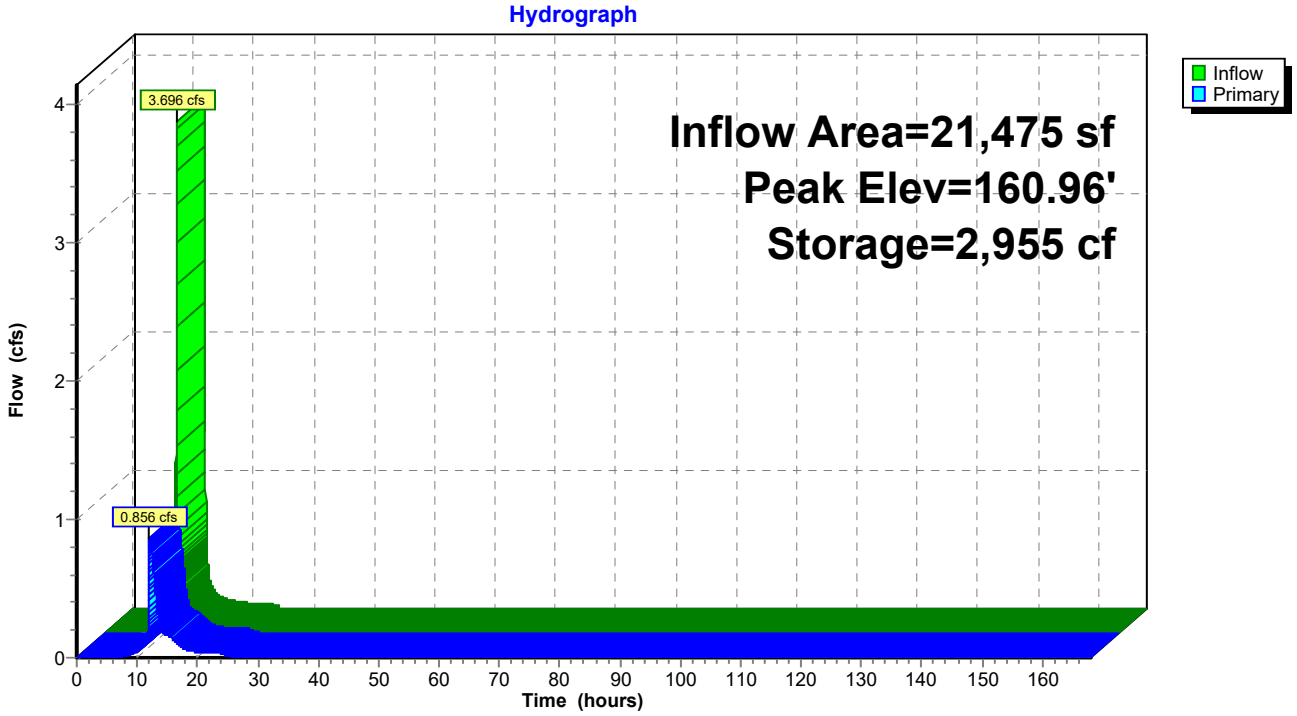
6,885.8 cf Field - 2,466.0 cf Chambers = 4,419.8 cf Stone x 40.0% Voids = 1,767.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,233.9 cf = 0.097 af
Overall Storage Efficiency = 61.5%
Overall System Size = 91.62' x 27.75' x 2.71'

112 Chambers
255.0 cy Field
163.7 cy Stone



Pond 3P: UG2


Hydrograph
Inflow Area=21,475 sf
Peak Elev=160.96'
Storage=2,955 cf
3.696 cfs
0.856 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.000	0	159.28	0.000
4.50	0.000	0	159.28	0.000
5.00	0.002	1	159.28	0.000
5.50	0.005	7	159.29	0.000
6.00	0.008	17	159.30	0.001
6.50	0.011	31	159.31	0.002
7.00	0.014	47	159.33	0.005
7.50	0.018	64	159.34	0.009
8.00	0.021	80	159.36	0.013
8.50	0.029	97	159.38	0.018
9.00	0.039	118	159.40	0.026
9.50	0.044	139	159.42	0.034
10.00	0.059	160	159.44	0.044
10.50	0.083	194	159.47	0.060
11.00	0.125	251	159.53	0.083
11.50	**0.225**	380	159.65	0.118
12.00	**3.101**	**2,629**	**160.79**	**0.779**
12.50	0.279	**2,408**	**160.68**	**0.725**
13.00	0.174	1,677	160.32	0.509
13.50	0.133	1,244	160.12	0.291
14.00	0.104	1,026	160.02	0.201
14.50	0.092	870	159.95	0.174
15.00	0.083	725	159.88	0.163
15.50	0.074	584	159.81	0.151
16.00	0.064	449	159.72	0.133
16.50	0.060	343	159.62	0.109
17.00	0.057	271	159.55	0.089
17.50	0.053	224	159.50	0.073
18.00	0.050	197	159.47	0.061
18.50	0.046	181	159.46	0.054
19.00	0.043	170	159.45	0.048
19.50	0.040	161	159.44	0.044
20.00	0.036	153	159.43	0.041
20.50	0.035	146	159.42	0.038
21.00	0.035	143	159.42	0.036
21.50	0.034	140	159.42	0.035
22.00	0.033	138	159.42	0.034
22.50	0.033	136	159.41	0.033
23.00	0.032	135	159.41	0.033
23.50	0.031	133	159.41	0.032
24.00	0.030	131	159.41	0.031
24.50	0.000	95	159.37	0.018
25.00	0.000	71	159.35	0.010

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	56	159.34	0.006
26.00	0.000	46	159.33	0.005
26.50	0.000	39	159.32	0.003
27.00	0.000	33	159.31	0.003
27.50	0.000	29	159.31	0.002
28.00	0.000	26	159.31	0.002
28.50	0.000	24	159.30	0.001
29.00	0.000	21	159.30	0.001
29.50	0.000	19	159.30	0.001
30.00	0.000	17	159.30	0.001
30.50	0.000	16	159.30	0.001
31.00	0.000	14	159.29	0.001
31.50	0.000	13	159.29	0.001
32.00	0.000	11	159.29	0.001
32.50	0.000	10	159.29	0.001
33.00	0.000	9	159.29	0.001
33.50	0.000	8	159.29	0.000
34.00	0.000	7	159.29	0.000
34.50	0.000	7	159.29	0.000
35.00	0.000	6	159.29	0.000
35.50	0.000	5	159.29	0.000
36.00	0.000	5	159.28	0.000
36.50	0.000	4	159.28	0.000
37.00	0.000	4	159.28	0.000
37.50	0.000	4	159.28	0.000
38.00	0.000	3	159.28	0.000
38.50	0.000	3	159.28	0.000
39.00	0.000	3	159.28	0.000
39.50	0.000	2	159.28	0.000
40.00	0.000	2	159.28	0.000
40.50	0.000	2	159.28	0.000
41.00	0.000	2	159.28	0.000
41.50	0.000	2	159.28	0.000
42.00	0.000	1	159.28	0.000
42.50	0.000	1	159.28	0.000
43.00	0.000	1	159.28	0.000
43.50	0.000	1	159.28	0.000
44.00	0.000	1	159.28	0.000
44.50	0.000	1	159.28	0.000
45.00	0.000	1	159.28	0.000
45.50	0.000	1	159.28	0.000
46.00	0.000	1	159.28	0.000
46.50	0.000	1	159.28	0.000
47.00	0.000	0	159.28	0.000
47.50	0.000	0	159.28	0.000
48.00	0.000	0	159.28	0.000
48.50	0.000	0	159.28	0.000
49.00	0.000	0	159.28	0.000
49.50	0.000	0	159.28	0.000
50.00	0.000	0	159.28	0.000
50.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	0	159.28	0.000
51.50	0.000	0	159.28	0.000
52.00	0.000	0	159.28	0.000
52.50	0.000	0	159.28	0.000
53.00	0.000	0	159.28	0.000
53.50	0.000	0	159.28	0.000
54.00	0.000	0	159.28	0.000
54.50	0.000	0	159.28	0.000
55.00	0.000	0	159.28	0.000
55.50	0.000	0	159.28	0.000
56.00	0.000	0	159.28	0.000
56.50	0.000	0	159.28	0.000
57.00	0.000	0	159.28	0.000
57.50	0.000	0	159.28	0.000
58.00	0.000	0	159.28	0.000
58.50	0.000	0	159.28	0.000
59.00	0.000	0	159.28	0.000
59.50	0.000	0	159.28	0.000
60.00	0.000	0	159.28	0.000
60.50	0.000	0	159.28	0.000
61.00	0.000	0	159.28	0.000
61.50	0.000	0	159.28	0.000
62.00	0.000	0	159.28	0.000
62.50	0.000	0	159.28	0.000
63.00	0.000	0	159.28	0.000
63.50	0.000	0	159.28	0.000
64.00	0.000	0	159.28	0.000
64.50	0.000	0	159.28	0.000
65.00	0.000	0	159.28	0.000
65.50	0.000	0	159.28	0.000
66.00	0.000	0	159.28	0.000
66.50	0.000	0	159.28	0.000
67.00	0.000	0	159.28	0.000
67.50	0.000	0	159.28	0.000
68.00	0.000	0	159.28	0.000
68.50	0.000	0	159.28	0.000
69.00	0.000	0	159.28	0.000
69.50	0.000	0	159.28	0.000
70.00	0.000	0	159.28	0.000
70.50	0.000	0	159.28	0.000
71.00	0.000	0	159.28	0.000
71.50	0.000	0	159.28	0.000
72.00	0.000	0	159.28	0.000
72.50	0.000	0	159.28	0.000
73.00	0.000	0	159.28	0.000
73.50	0.000	0	159.28	0.000
74.00	0.000	0	159.28	0.000
74.50	0.000	0	159.28	0.000
75.00	0.000	0	159.28	0.000
75.50	0.000	0	159.28	0.000
76.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	0	159.28	0.000
77.00	0.000	0	159.28	0.000
77.50	0.000	0	159.28	0.000
78.00	0.000	0	159.28	0.000
78.50	0.000	0	159.28	0.000
79.00	0.000	0	159.28	0.000
79.50	0.000	0	159.28	0.000
80.00	0.000	0	159.28	0.000
80.50	0.000	0	159.28	0.000
81.00	0.000	0	159.28	0.000
81.50	0.000	0	159.28	0.000
82.00	0.000	0	159.28	0.000
82.50	0.000	0	159.28	0.000
83.00	0.000	0	159.28	0.000
83.50	0.000	0	159.28	0.000
84.00	0.000	0	159.28	0.000
84.50	0.000	0	159.28	0.000
85.00	0.000	0	159.28	0.000
85.50	0.000	0	159.28	0.000
86.00	0.000	0	159.28	0.000
86.50	0.000	0	159.28	0.000
87.00	0.000	0	159.28	0.000
87.50	0.000	0	159.28	0.000
88.00	0.000	0	159.28	0.000
88.50	0.000	0	159.28	0.000
89.00	0.000	0	159.28	0.000
89.50	0.000	0	159.28	0.000
90.00	0.000	0	159.28	0.000
90.50	0.000	0	159.28	0.000
91.00	0.000	0	159.28	0.000
91.50	0.000	0	159.28	0.000
92.00	0.000	0	159.28	0.000
92.50	0.000	0	159.28	0.000
93.00	0.000	0	159.28	0.000
93.50	0.000	0	159.28	0.000
94.00	0.000	0	159.28	0.000
94.50	0.000	0	159.28	0.000
95.00	0.000	0	159.28	0.000
95.50	0.000	0	159.28	0.000
96.00	0.000	0	159.28	0.000
96.50	0.000	0	159.28	0.000
97.00	0.000	0	159.28	0.000
97.50	0.000	0	159.28	0.000
98.00	0.000	0	159.28	0.000
98.50	0.000	0	159.28	0.000
99.00	0.000	0	159.28	0.000
99.50	0.000	0	159.28	0.000
100.00	0.000	0	159.28	0.000
100.50	0.000	0	159.28	0.000
101.00	0.000	0	159.28	0.000
101.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	0	159.28	0.000
102.50	0.000	0	159.28	0.000
103.00	0.000	0	159.28	0.000
103.50	0.000	0	159.28	0.000
104.00	0.000	0	159.28	0.000
104.50	0.000	0	159.28	0.000
105.00	0.000	0	159.28	0.000
105.50	0.000	0	159.28	0.000
106.00	0.000	0	159.28	0.000
106.50	0.000	0	159.28	0.000
107.00	0.000	0	159.28	0.000
107.50	0.000	0	159.28	0.000
108.00	0.000	0	159.28	0.000
108.50	0.000	0	159.28	0.000
109.00	0.000	0	159.28	0.000
109.50	0.000	0	159.28	0.000
110.00	0.000	0	159.28	0.000
110.50	0.000	0	159.28	0.000
111.00	0.000	0	159.28	0.000
111.50	0.000	0	159.28	0.000
112.00	0.000	0	159.28	0.000
112.50	0.000	0	159.28	0.000
113.00	0.000	0	159.28	0.000
113.50	0.000	0	159.28	0.000
114.00	0.000	0	159.28	0.000
114.50	0.000	0	159.28	0.000
115.00	0.000	0	159.28	0.000
115.50	0.000	0	159.28	0.000
116.00	0.000	0	159.28	0.000
116.50	0.000	0	159.28	0.000
117.00	0.000	0	159.28	0.000
117.50	0.000	0	159.28	0.000
118.00	0.000	0	159.28	0.000
118.50	0.000	0	159.28	0.000
119.00	0.000	0	159.28	0.000
119.50	0.000	0	159.28	0.000
120.00	0.000	0	159.28	0.000
120.50	0.000	0	159.28	0.000
121.00	0.000	0	159.28	0.000
121.50	0.000	0	159.28	0.000
122.00	0.000	0	159.28	0.000
122.50	0.000	0	159.28	0.000
123.00	0.000	0	159.28	0.000
123.50	0.000	0	159.28	0.000
124.00	0.000	0	159.28	0.000
124.50	0.000	0	159.28	0.000
125.00	0.000	0	159.28	0.000
125.50	0.000	0	159.28	0.000
126.00	0.000	0	159.28	0.000
126.50	0.000	0	159.28	0.000
127.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	0	159.28	0.000
128.00	0.000	0	159.28	0.000
128.50	0.000	0	159.28	0.000
129.00	0.000	0	159.28	0.000
129.50	0.000	0	159.28	0.000
130.00	0.000	0	159.28	0.000
130.50	0.000	0	159.28	0.000
131.00	0.000	0	159.28	0.000
131.50	0.000	0	159.28	0.000
132.00	0.000	0	159.28	0.000
132.50	0.000	0	159.28	0.000
133.00	0.000	0	159.28	0.000
133.50	0.000	0	159.28	0.000
134.00	0.000	0	159.28	0.000
134.50	0.000	0	159.28	0.000
135.00	0.000	0	159.28	0.000
135.50	0.000	0	159.28	0.000
136.00	0.000	0	159.28	0.000
136.50	0.000	0	159.28	0.000
137.00	0.000	0	159.28	0.000
137.50	0.000	0	159.28	0.000
138.00	0.000	0	159.28	0.000
138.50	0.000	0	159.28	0.000
139.00	0.000	0	159.28	0.000
139.50	0.000	0	159.28	0.000
140.00	0.000	0	159.28	0.000
140.50	0.000	0	159.28	0.000
141.00	0.000	0	159.28	0.000
141.50	0.000	0	159.28	0.000
142.00	0.000	0	159.28	0.000
142.50	0.000	0	159.28	0.000
143.00	0.000	0	159.28	0.000
143.50	0.000	0	159.28	0.000
144.00	0.000	0	159.28	0.000
144.50	0.000	0	159.28	0.000
145.00	0.000	0	159.28	0.000
145.50	0.000	0	159.28	0.000
146.00	0.000	0	159.28	0.000
146.50	0.000	0	159.28	0.000
147.00	0.000	0	159.28	0.000
147.50	0.000	0	159.28	0.000
148.00	0.000	0	159.28	0.000
148.50	0.000	0	159.28	0.000
149.00	0.000	0	159.28	0.000
149.50	0.000	0	159.28	0.000
150.00	0.000	0	159.28	0.000
150.50	0.000	0	159.28	0.000
151.00	0.000	0	159.28	0.000
151.50	0.000	0	159.28	0.000
152.00	0.000	0	159.28	0.000
152.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	0	159.28	0.000
153.50	0.000	0	159.28	0.000
154.00	0.000	0	159.28	0.000
154.50	0.000	0	159.28	0.000
155.00	0.000	0	159.28	0.000
155.50	0.000	0	159.28	0.000
156.00	0.000	0	159.28	0.000
156.50	0.000	0	159.28	0.000
157.00	0.000	0	159.28	0.000
157.50	0.000	0	159.28	0.000
158.00	0.000	0	159.28	0.000
158.50	0.000	0	159.28	0.000
159.00	0.000	0	159.28	0.000
159.50	0.000	0	159.28	0.000
160.00	0.000	0	159.28	0.000
160.50	0.000	0	159.28	0.000
161.00	0.000	0	159.28	0.000
161.50	0.000	0	159.28	0.000
162.00	0.000	0	159.28	0.000
162.50	0.000	0	159.28	0.000
163.00	0.000	0	159.28	0.000
163.50	0.000	0	159.28	0.000
164.00	0.000	0	159.28	0.000
164.50	0.000	0	159.28	0.000
165.00	0.000	0	159.28	0.000
165.50	0.000	0	159.28	0.000
166.00	0.000	0	159.28	0.000
166.50	0.000	0	159.28	0.000
167.00	0.000	0	159.28	0.000
167.50	0.000	0	159.28	0.000
168.00	0.000	0	159.28	0.000

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 6.25" for 50-yr event
Inflow = 18.946 cfs @ 11.96 hrs, Volume= 43,774 cf
Outflow = 4.318 cfs @ 12.09 hrs, Volume= 43,627 cf, Atten= 77%, Lag= 8.1 min
Primary = 4.318 cfs @ 12.09 hrs, Volume= 43,627 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 159.86' @ 12.09 hrs Surf.Area= 13,041 sf Storage= 22,089 cf

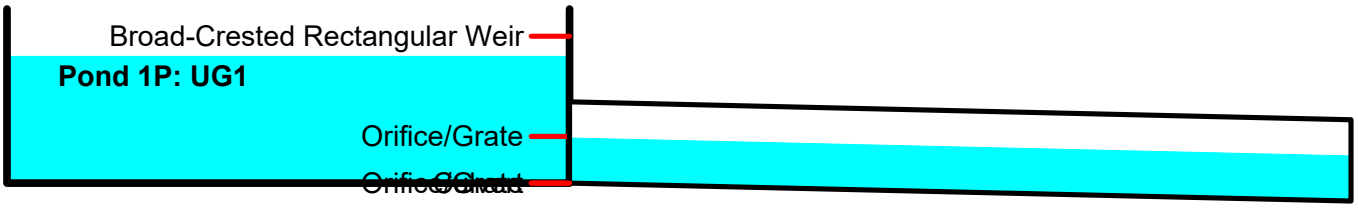
Plug-Flow detention time= 666.4 min calculated for 43,624 cf (100% of inflow)
Center-of-Mass det. time= 664.6 min (1,415.5 - 750.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=4.318 cfs @ 12.09 hrs HW=159.86' (Free Discharge)
└**4=Culvert** (Passes 4.318 cfs of 7.809 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.040 cfs @ 7.289 fps)
  ├**2=Orifice/Grate** (Orifice Controls 4.278 cfs @ 5.501 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 1P: UG1 - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger®280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 27 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

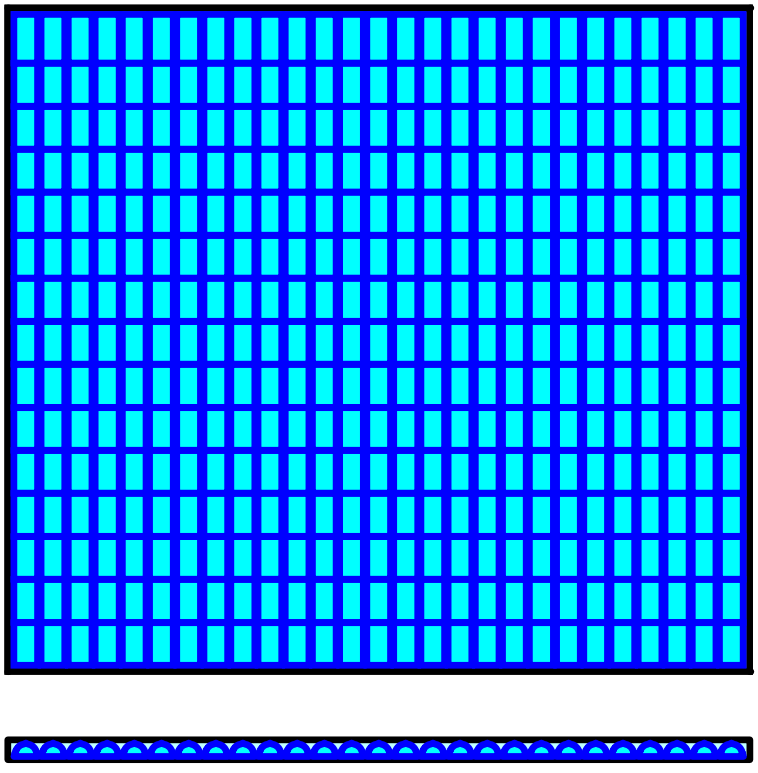
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

405 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 27 Rows = 17,377.3 cf Chamber Storage

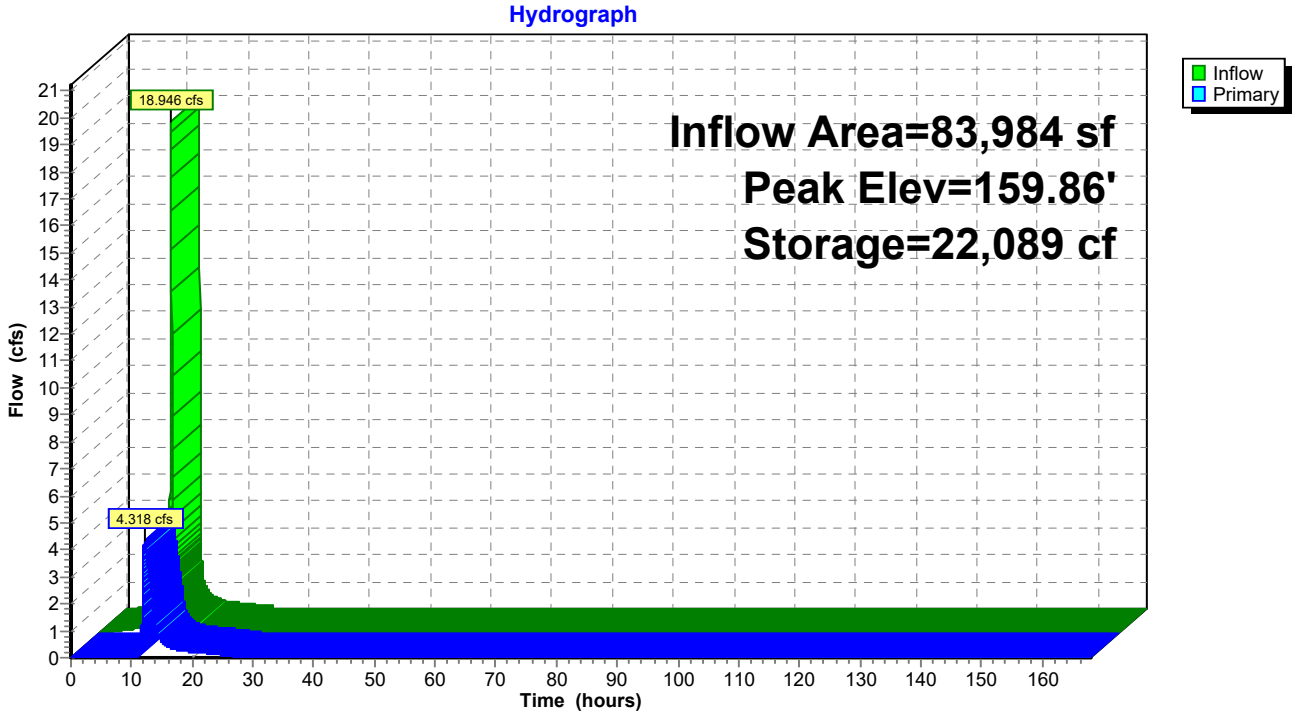
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

Chamber Storage + Stone Storage = 27,162.4 cf = 0.624 af
Overall Storage Efficiency = 64.9%
Overall System Size = 108.00' x 120.75' x 3.21'

405 Chambers
1,549.6 cy Field
906.0 cy Stone



Pond 1P: UG1


Hydrograph
Inflow
Primary
18.946 cfs
4.318 cfs
Inflow Area=83,984 sf
Peak Elev=159.86'
Storage=22,089 cf
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.013	6	157.53	0.000
2.00	0.036	50	157.54	0.000
2.50	0.057	133	157.56	0.001
3.00	0.075	249	157.58	0.002
3.50	0.092	393	157.61	0.005
4.00	0.107	562	157.64	0.007
4.50	0.125	756	157.67	0.008
5.00	0.143	981	157.72	0.010
5.50	0.161	1,235	157.77	0.012
6.00	0.179	1,519	157.82	0.013
6.50	0.196	1,832	157.88	0.015
7.00	0.214	2,174	157.95	0.016
7.50	0.230	2,543	158.02	0.018
8.00	0.247	2,941	158.06	0.018
8.50	0.302	3,396	158.10	0.019
9.00	0.367	3,963	158.14	0.020
9.50	0.382	4,608	158.20	0.021
10.00	0.470	5,325	158.26	0.022
10.50	0.616	6,255	158.34	0.023
11.00	0.857	7,485	158.45	0.131
11.50	**1.419**	8,880	158.57	0.603
12.00	**15.649**	**20,470**	**159.68**	**4.000**
12.50	1.360	**19,194**	**159.54**	**3.750**
13.00	0.846	15,091	159.14	2.876
13.50	0.640	11,999	158.85	2.031
14.00	0.502	10,119	158.68	1.203
14.50	0.443	9,249	158.60	0.766
15.00	0.398	8,817	158.57	0.577
15.50	0.352	8,557	158.54	0.472
16.00	0.307	8,368	158.53	0.400
16.50	0.286	8,225	158.51	0.351
17.00	0.270	8,125	158.50	0.317
17.50	0.253	8,049	158.50	0.291
18.00	0.237	7,986	158.49	0.270
18.50	0.221	7,928	158.49	0.253
19.00	0.204	7,870	158.48	0.236
19.50	0.188	7,813	158.48	0.220
20.00	0.172	7,756	158.47	0.203
20.50	0.167	7,707	158.47	0.189
21.00	0.163	7,672	158.46	0.179
21.50	0.160	7,648	158.46	0.172
22.00	0.157	7,628	158.46	0.167
22.50	0.154	7,612	158.46	0.162
23.00	0.150	7,597	158.46	0.159
23.50	0.147	7,583	158.46	0.155
24.00	0.144	7,569	158.46	0.152
24.50	0.000	7,374	158.44	0.106
25.00	0.000	7,214	158.43	0.075

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	7,095	158.41	0.058
26.00	0.000	7,003	158.41	0.045
26.50	0.000	6,932	158.40	0.035
27.00	0.000	6,877	158.40	0.027
27.50	0.000	6,830	158.39	0.025
28.00	0.000	6,787	158.39	0.024
28.50	0.000	6,744	158.38	0.024
29.00	0.000	6,702	158.38	0.024
29.50	0.000	6,659	158.38	0.024
30.00	0.000	6,617	158.37	0.024
30.50	0.000	6,575	158.37	0.023
31.00	0.000	6,533	158.37	0.023
31.50	0.000	6,491	158.36	0.023
32.00	0.000	6,449	158.36	0.023
32.50	0.000	6,407	158.35	0.023
33.00	0.000	6,365	158.35	0.023
33.50	0.000	6,323	158.35	0.023
34.00	0.000	6,282	158.34	0.023
34.50	0.000	6,240	158.34	0.023
35.00	0.000	6,199	158.34	0.023
35.50	0.000	6,157	158.33	0.023
36.00	0.000	6,116	158.33	0.023
36.50	0.000	6,075	158.33	0.023
37.00	0.000	6,034	158.32	0.023
37.50	0.000	5,993	158.32	0.023
38.00	0.000	5,952	158.32	0.023
38.50	0.000	5,912	158.31	0.023
39.00	0.000	5,871	158.31	0.023
39.50	0.000	5,830	158.31	0.022
40.00	0.000	5,790	158.30	0.022
40.50	0.000	5,750	158.30	0.022
41.00	0.000	5,709	158.29	0.022
41.50	0.000	5,669	158.29	0.022
42.00	0.000	5,629	158.29	0.022
42.50	0.000	5,589	158.28	0.022
43.00	0.000	5,549	158.28	0.022
43.50	0.000	5,510	158.28	0.022
44.00	0.000	5,470	158.27	0.022
44.50	0.000	5,430	158.27	0.022
45.00	0.000	5,391	158.27	0.022
45.50	0.000	5,352	158.26	0.022
46.00	0.000	5,312	158.26	0.022
46.50	0.000	5,273	158.26	0.022
47.00	0.000	5,234	158.25	0.022
47.50	0.000	5,195	158.25	0.022
48.00	0.000	5,156	158.25	0.022
48.50	0.000	5,117	158.24	0.022
49.00	0.000	5,079	158.24	0.021
49.50	0.000	5,040	158.24	0.021
50.00	0.000	5,002	158.23	0.021
50.50	0.000	4,963	158.23	0.021

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,925	158.23	0.021
51.50	0.000	4,887	158.22	0.021
52.00	0.000	4,848	158.22	0.021
52.50	0.000	4,810	158.22	0.021
53.00	0.000	4,773	158.21	0.021
53.50	0.000	4,735	158.21	0.021
54.00	0.000	4,697	158.21	0.021
54.50	0.000	4,659	158.20	0.021
55.00	0.000	4,622	158.20	0.021
55.50	0.000	4,584	158.20	0.021
56.00	0.000	4,547	158.19	0.021
56.50	0.000	4,510	158.19	0.021
57.00	0.000	4,473	158.19	0.021
57.50	0.000	4,435	158.18	0.021
58.00	0.000	4,399	158.18	0.021
58.50	0.000	4,362	158.18	0.020
59.00	0.000	4,325	158.18	0.020
59.50	0.000	4,288	158.17	0.020
60.00	0.000	4,252	158.17	0.020
60.50	0.000	4,215	158.17	0.020
61.00	0.000	4,179	158.16	0.020
61.50	0.000	4,142	158.16	0.020
62.00	0.000	4,106	158.16	0.020
62.50	0.000	4,070	158.15	0.020
63.00	0.000	4,034	158.15	0.020
63.50	0.000	3,998	158.15	0.020
64.00	0.000	3,962	158.14	0.020
64.50	0.000	3,927	158.14	0.020
65.00	0.000	3,891	158.14	0.020
65.50	0.000	3,855	158.14	0.020
66.00	0.000	3,820	158.13	0.020
66.50	0.000	3,785	158.13	0.020
67.00	0.000	3,749	158.13	0.020
67.50	0.000	3,714	158.12	0.020
68.00	0.000	3,679	158.12	0.019
68.50	0.000	3,644	158.12	0.019
69.00	0.000	3,609	158.11	0.019
69.50	0.000	3,575	158.11	0.019
70.00	0.000	3,540	158.11	0.019
70.50	0.000	3,505	158.11	0.019
71.00	0.000	3,471	158.10	0.019
71.50	0.000	3,436	158.10	0.019
72.00	0.000	3,402	158.10	0.019
72.50	0.000	3,368	158.09	0.019
73.00	0.000	3,334	158.09	0.019
73.50	0.000	3,300	158.09	0.019
74.00	0.000	3,266	158.09	0.019
74.50	0.000	3,232	158.08	0.019
75.00	0.000	3,198	158.08	0.019
75.50	0.000	3,165	158.08	0.019
76.00	0.000	3,131	158.07	0.019

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	3,098	158.07	0.019
77.00	0.000	3,064	158.07	0.019
77.50	0.000	3,031	158.07	0.018
78.00	0.000	2,998	158.06	0.018
78.50	0.000	2,965	158.06	0.018
79.00	0.000	2,932	158.06	0.018
79.50	0.000	2,899	158.05	0.018
80.00	0.000	2,866	158.05	0.018
80.50	0.000	2,833	158.05	0.018
81.00	0.000	2,801	158.05	0.018
81.50	0.000	2,768	158.04	0.018
82.00	0.000	2,736	158.04	0.018
82.50	0.000	2,704	158.04	0.018
83.00	0.000	2,671	158.04	0.018
83.50	0.000	2,639	158.03	0.018
84.00	0.000	2,607	158.03	0.018
84.50	0.000	2,575	158.02	0.018
85.00	0.000	2,544	158.02	0.018
85.50	0.000	2,512	158.01	0.017
86.00	0.000	2,481	158.01	0.017
86.50	0.000	2,450	158.00	0.017
87.00	0.000	2,419	157.99	0.017
87.50	0.000	2,388	157.99	0.017
88.00	0.000	2,358	157.98	0.017
88.50	0.000	2,328	157.98	0.017
89.00	0.000	2,298	157.97	0.017
89.50	0.000	2,268	157.96	0.016
90.00	0.000	2,239	157.96	0.016
90.50	0.000	2,209	157.95	0.016
91.00	0.000	2,180	157.95	0.016
91.50	0.000	2,151	157.94	0.016
92.00	0.000	2,123	157.94	0.016
92.50	0.000	2,094	157.93	0.016
93.00	0.000	2,066	157.93	0.016
93.50	0.000	2,038	157.92	0.016
94.00	0.000	2,010	157.92	0.015
94.50	0.000	1,983	157.91	0.015
95.00	0.000	1,955	157.90	0.015
95.50	0.000	1,928	157.90	0.015
96.00	0.000	1,901	157.89	0.015
96.50	0.000	1,874	157.89	0.015
97.00	0.000	1,848	157.88	0.015
97.50	0.000	1,821	157.88	0.015
98.00	0.000	1,795	157.87	0.014
98.50	0.000	1,769	157.87	0.014
99.00	0.000	1,744	157.86	0.014
99.50	0.000	1,718	157.86	0.014
100.00	0.000	1,693	157.85	0.014
100.50	0.000	1,668	157.85	0.014
101.00	0.000	1,643	157.85	0.014
101.50	0.000	1,619	157.84	0.014

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	1,594	157.84	0.013
102.50	0.000	1,570	157.83	0.013
103.00	0.000	1,546	157.83	0.013
103.50	0.000	1,522	157.82	0.013
104.00	0.000	1,499	157.82	0.013
104.50	0.000	1,476	157.81	0.013
105.00	0.000	1,452	157.81	0.013
105.50	0.000	1,430	157.80	0.013
106.00	0.000	1,407	157.80	0.013
106.50	0.000	1,384	157.80	0.012
107.00	0.000	1,362	157.79	0.012
107.50	0.000	1,340	157.79	0.012
108.00	0.000	1,318	157.78	0.012
108.50	0.000	1,297	157.78	0.012
109.00	0.000	1,275	157.77	0.012
109.50	0.000	1,254	157.77	0.012
110.00	0.000	1,233	157.77	0.012
110.50	0.000	1,213	157.76	0.011
111.00	0.000	1,192	157.76	0.011
111.50	0.000	1,172	157.75	0.011
112.00	0.000	1,152	157.75	0.011
112.50	0.000	1,132	157.75	0.011
113.00	0.000	1,112	157.74	0.011
113.50	0.000	1,093	157.74	0.011
114.00	0.000	1,073	157.74	0.011
114.50	0.000	1,054	157.73	0.011
115.00	0.000	1,035	157.73	0.010
115.50	0.000	1,017	157.72	0.010
116.00	0.000	998	157.72	0.010
116.50	0.000	980	157.72	0.010
117.00	0.000	962	157.71	0.010
117.50	0.000	945	157.71	0.010
118.00	0.000	927	157.71	0.010
118.50	0.000	910	157.70	0.010
119.00	0.000	893	157.70	0.009
119.50	0.000	876	157.70	0.009
120.00	0.000	859	157.69	0.009
120.50	0.000	843	157.69	0.009
121.00	0.000	826	157.69	0.009
121.50	0.000	810	157.69	0.009
122.00	0.000	795	157.68	0.009
122.50	0.000	779	157.68	0.009
123.00	0.000	764	157.68	0.008
123.50	0.000	749	157.67	0.008
124.00	0.000	734	157.67	0.008
124.50	0.000	719	157.67	0.008
125.00	0.000	704	157.67	0.008
125.50	0.000	690	157.66	0.008
126.00	0.000	676	157.66	0.008
126.50	0.000	662	157.66	0.008
127.00	0.000	648	157.65	0.008

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	635	157.65	0.007
128.00	0.000	622	157.65	0.007
128.50	0.000	609	157.65	0.007
129.00	0.000	596	157.64	0.007
129.50	0.000	583	157.64	0.007
130.00	0.000	571	157.64	0.007
130.50	0.000	559	157.64	0.007
131.00	0.000	547	157.63	0.007
131.50	0.000	535	157.63	0.006
132.00	0.000	524	157.63	0.006
132.50	0.000	513	157.63	0.006
133.00	0.000	501	157.63	0.006
133.50	0.000	490	157.62	0.006
134.00	0.000	480	157.62	0.006
134.50	0.000	469	157.62	0.006
135.00	0.000	459	157.62	0.006
135.50	0.000	449	157.62	0.005
136.00	0.000	440	157.61	0.005
136.50	0.000	430	157.61	0.005
137.00	0.000	421	157.61	0.005
137.50	0.000	412	157.61	0.005
138.00	0.000	403	157.61	0.005
138.50	0.000	395	157.61	0.005
139.00	0.000	387	157.60	0.005
139.50	0.000	378	157.60	0.004
140.00	0.000	370	157.60	0.004
140.50	0.000	363	157.60	0.004
141.00	0.000	355	157.60	0.004
141.50	0.000	348	157.60	0.004
142.00	0.000	340	157.60	0.004
142.50	0.000	333	157.59	0.004
143.00	0.000	327	157.59	0.004
143.50	0.000	320	157.59	0.004
144.00	0.000	313	157.59	0.004
144.50	0.000	307	157.59	0.003
145.00	0.000	301	157.59	0.003
145.50	0.000	295	157.59	0.003
146.00	0.000	289	157.59	0.003
146.50	0.000	284	157.58	0.003
147.00	0.000	278	157.58	0.003
147.50	0.000	273	157.58	0.003
148.00	0.000	268	157.58	0.003
148.50	0.000	263	157.58	0.003
149.00	0.000	258	157.58	0.003
149.50	0.000	253	157.58	0.003
150.00	0.000	249	157.58	0.002
150.50	0.000	244	157.58	0.002
151.00	0.000	240	157.58	0.002
151.50	0.000	236	157.58	0.002
152.00	0.000	232	157.57	0.002
152.50	0.000	228	157.57	0.002

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	224	157.57	0.002
153.50	0.000	220	157.57	0.002
154.00	0.000	217	157.57	0.002
154.50	0.000	213	157.57	0.002
155.00	0.000	210	157.57	0.002
155.50	0.000	207	157.57	0.002
156.00	0.000	203	157.57	0.002
156.50	0.000	200	157.57	0.002
157.00	0.000	197	157.57	0.002
157.50	0.000	194	157.57	0.002
158.00	0.000	191	157.57	0.002
158.50	0.000	189	157.57	0.002
159.00	0.000	186	157.57	0.001
159.50	0.000	183	157.57	0.001
160.00	0.000	181	157.56	0.001
160.50	0.000	178	157.56	0.001
161.00	0.000	176	157.56	0.001
161.50	0.000	173	157.56	0.001
162.00	0.000	171	157.56	0.001
162.50	0.000	169	157.56	0.001
163.00	0.000	167	157.56	0.001
163.50	0.000	165	157.56	0.001
164.00	0.000	163	157.56	0.001
164.50	0.000	161	157.56	0.001
165.00	0.000	159	157.56	0.001
165.50	0.000	157	157.56	0.001
166.00	0.000	155	157.56	0.001
166.50	0.000	153	157.56	0.001
167.00	0.000	151	157.56	0.001
167.50	0.000	149	157.56	0.001
168.00	0.000	147	157.56	0.001

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 5.11" for 50-yr event
Inflow = 4.363 cfs @ 11.96 hrs, Volume= 9,138 cf
Outflow = 0.995 cfs @ 12.09 hrs, Volume= 9,138 cf, Atten= 77%, Lag= 8.1 min
Primary = 0.995 cfs @ 12.09 hrs, Volume= 9,138 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 161.32' @ 12.09 hrs Surf.Area= 2,542 sf Storage= 3,532 cf

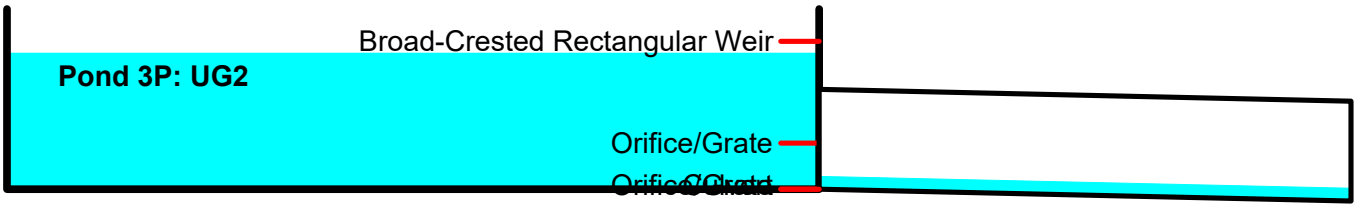
Plug-Flow detention time= 63.1 min calculated for 9,138 cf (100% of inflow)
Center-of-Mass det. time= 63.0 min (852.5 - 789.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.995 cfs @ 12.09 hrs HW=161.32' (Free Discharge)
└**4=Culvert** (Passes 0.995 cfs of 7.736 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.327 cfs @ 6.671 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.667 cfs @ 5.337 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 3P: UG2 - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Discontinued, not for new designs)
Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf
Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 3.44 sf x 8 rows

36.0" Wide + 3.0" Spacing = 39.0" C-C Row Spacing

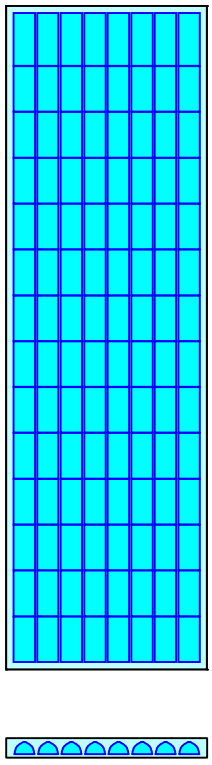
14 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 89.62' Row Length +12.0" End Stone x 2 = 91.62' Base Length
8 Rows x 36.0" Wide + 3.0" Spacing x 7 + 12.0" Side Stone x 2 = 27.75' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

112 Chambers x 21.8 cf +1.00' Row Adjustment x 3.44 sf x 8 Rows = 2,466.0 cf Chamber Storage

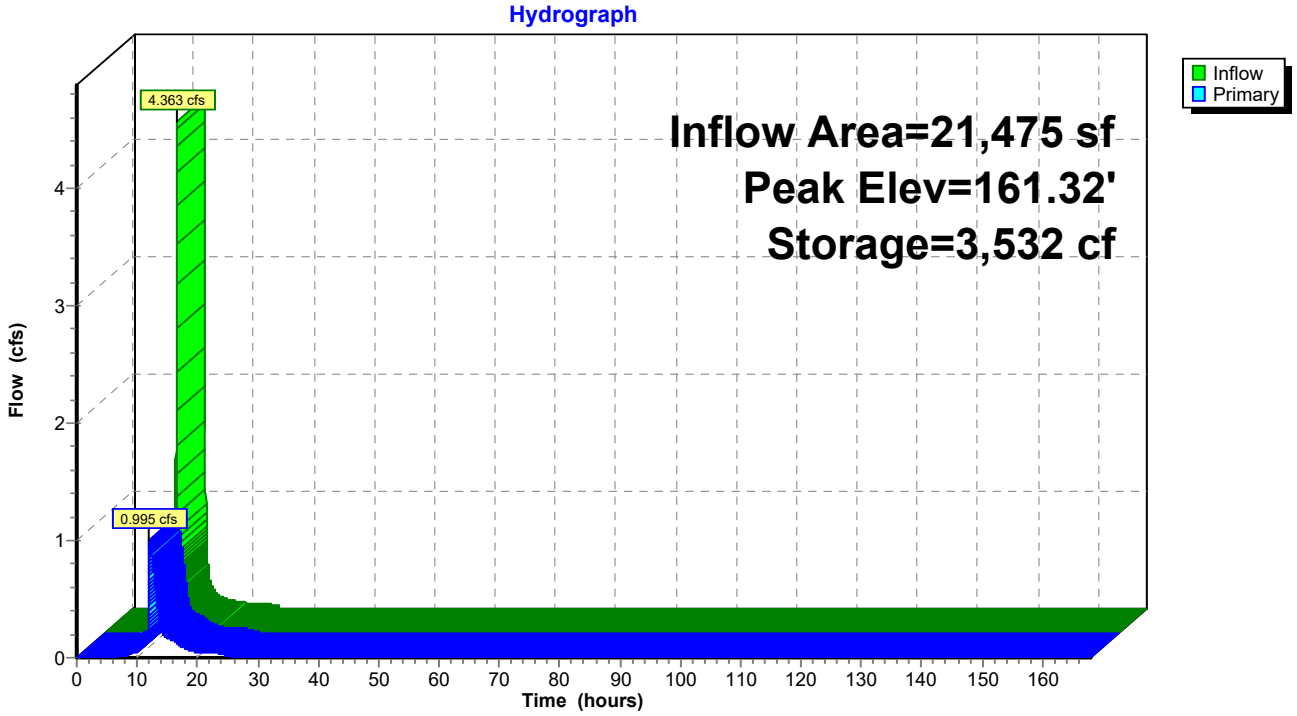
6,885.8 cf Field - 2,466.0 cf Chambers = 4,419.8 cf Stone x 40.0% Voids = 1,767.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,233.9 cf = 0.097 af
Overall Storage Efficiency = 61.5%
Overall System Size = 91.62' x 27.75' x 2.71'

112 Chambers
255.0 cy Field
163.7 cy Stone



Pond 3P: UG2


Hydrograph
Inflow Area=21,475 sf
Peak Elev=161.32'
Storage=3,532 cf
4.363 cfs
0.995 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.000	0	159.28	0.000
4.50	0.002	2	159.28	0.000
5.00	0.005	8	159.29	0.000
5.50	0.009	19	159.30	0.001
6.00	0.013	35	159.31	0.003
6.50	0.016	53	159.33	0.006
7.00	0.021	72	159.35	0.011
7.50	0.025	89	159.37	0.016
8.00	0.029	105	159.38	0.021
8.50	0.039	122	159.40	0.028
9.00	0.051	145	159.42	0.037
9.50	0.057	167	159.44	0.047
10.00	0.075	190	159.47	0.058
10.50	0.104	231	159.51	0.075
11.00	0.155	305	159.58	0.099
11.50	**0.276**	473	159.75	0.138
12.00	**3.650**	**3,144**	**161.07**	**0.900**
12.50	0.326	**2,904**	**160.94**	**0.844**
13.00	0.204	2,030	160.49	0.623
13.50	0.155	1,428	160.20	0.393
14.00	0.122	1,131	160.07	0.240
14.50	0.108	961	159.99	0.184
15.00	0.097	829	159.93	0.171
15.50	0.086	695	159.86	0.160
16.00	0.075	561	159.80	0.149
16.50	0.070	436	159.71	0.130
17.00	0.066	343	159.62	0.109
17.50	0.062	279	159.55	0.091
18.00	0.058	235	159.51	0.077
18.50	0.054	208	159.48	0.066
19.00	0.050	190	159.47	0.058
19.50	0.046	178	159.45	0.052
20.00	0.042	168	159.44	0.047
20.50	0.041	160	159.44	0.044
21.00	0.040	156	159.43	0.042
21.50	0.039	153	159.43	0.041
22.00	0.039	150	159.43	0.040
22.50	0.038	148	159.43	0.039
23.00	0.037	147	159.42	0.038
23.50	0.036	145	159.42	0.037
24.00	0.035	143	159.42	0.036
24.50	0.000	102	159.38	0.020
25.00	0.000	75	159.35	0.011

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	58	159.34	0.007
26.00	0.000	48	159.33	0.005
26.50	0.000	40	159.32	0.004
27.00	0.000	34	159.31	0.003
27.50	0.000	30	159.31	0.002
28.00	0.000	27	159.31	0.002
28.50	0.000	24	159.30	0.001
29.00	0.000	22	159.30	0.001
29.50	0.000	20	159.30	0.001
30.00	0.000	18	159.30	0.001
30.50	0.000	16	159.30	0.001
31.00	0.000	14	159.29	0.001
31.50	0.000	13	159.29	0.001
32.00	0.000	12	159.29	0.001
32.50	0.000	10	159.29	0.001
33.00	0.000	9	159.29	0.001
33.50	0.000	8	159.29	0.000
34.00	0.000	8	159.29	0.000
34.50	0.000	7	159.29	0.000
35.00	0.000	6	159.29	0.000
35.50	0.000	6	159.29	0.000
36.00	0.000	5	159.28	0.000
36.50	0.000	4	159.28	0.000
37.00	0.000	4	159.28	0.000
37.50	0.000	4	159.28	0.000
38.00	0.000	3	159.28	0.000
38.50	0.000	3	159.28	0.000
39.00	0.000	3	159.28	0.000
39.50	0.000	2	159.28	0.000
40.00	0.000	2	159.28	0.000
40.50	0.000	2	159.28	0.000
41.00	0.000	2	159.28	0.000
41.50	0.000	2	159.28	0.000
42.00	0.000	1	159.28	0.000
42.50	0.000	1	159.28	0.000
43.00	0.000	1	159.28	0.000
43.50	0.000	1	159.28	0.000
44.00	0.000	1	159.28	0.000
44.50	0.000	1	159.28	0.000
45.00	0.000	1	159.28	0.000
45.50	0.000	1	159.28	0.000
46.00	0.000	1	159.28	0.000
46.50	0.000	1	159.28	0.000
47.00	0.000	0	159.28	0.000
47.50	0.000	0	159.28	0.000
48.00	0.000	0	159.28	0.000
48.50	0.000	0	159.28	0.000
49.00	0.000	0	159.28	0.000
49.50	0.000	0	159.28	0.000
50.00	0.000	0	159.28	0.000
50.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	0	159.28	0.000
51.50	0.000	0	159.28	0.000
52.00	0.000	0	159.28	0.000
52.50	0.000	0	159.28	0.000
53.00	0.000	0	159.28	0.000
53.50	0.000	0	159.28	0.000
54.00	0.000	0	159.28	0.000
54.50	0.000	0	159.28	0.000
55.00	0.000	0	159.28	0.000
55.50	0.000	0	159.28	0.000
56.00	0.000	0	159.28	0.000
56.50	0.000	0	159.28	0.000
57.00	0.000	0	159.28	0.000
57.50	0.000	0	159.28	0.000
58.00	0.000	0	159.28	0.000
58.50	0.000	0	159.28	0.000
59.00	0.000	0	159.28	0.000
59.50	0.000	0	159.28	0.000
60.00	0.000	0	159.28	0.000
60.50	0.000	0	159.28	0.000
61.00	0.000	0	159.28	0.000
61.50	0.000	0	159.28	0.000
62.00	0.000	0	159.28	0.000
62.50	0.000	0	159.28	0.000
63.00	0.000	0	159.28	0.000
63.50	0.000	0	159.28	0.000
64.00	0.000	0	159.28	0.000
64.50	0.000	0	159.28	0.000
65.00	0.000	0	159.28	0.000
65.50	0.000	0	159.28	0.000
66.00	0.000	0	159.28	0.000
66.50	0.000	0	159.28	0.000
67.00	0.000	0	159.28	0.000
67.50	0.000	0	159.28	0.000
68.00	0.000	0	159.28	0.000
68.50	0.000	0	159.28	0.000
69.00	0.000	0	159.28	0.000
69.50	0.000	0	159.28	0.000
70.00	0.000	0	159.28	0.000
70.50	0.000	0	159.28	0.000
71.00	0.000	0	159.28	0.000
71.50	0.000	0	159.28	0.000
72.00	0.000	0	159.28	0.000
72.50	0.000	0	159.28	0.000
73.00	0.000	0	159.28	0.000
73.50	0.000	0	159.28	0.000
74.00	0.000	0	159.28	0.000
74.50	0.000	0	159.28	0.000
75.00	0.000	0	159.28	0.000
75.50	0.000	0	159.28	0.000
76.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	0	159.28	0.000
77.00	0.000	0	159.28	0.000
77.50	0.000	0	159.28	0.000
78.00	0.000	0	159.28	0.000
78.50	0.000	0	159.28	0.000
79.00	0.000	0	159.28	0.000
79.50	0.000	0	159.28	0.000
80.00	0.000	0	159.28	0.000
80.50	0.000	0	159.28	0.000
81.00	0.000	0	159.28	0.000
81.50	0.000	0	159.28	0.000
82.00	0.000	0	159.28	0.000
82.50	0.000	0	159.28	0.000
83.00	0.000	0	159.28	0.000
83.50	0.000	0	159.28	0.000
84.00	0.000	0	159.28	0.000
84.50	0.000	0	159.28	0.000
85.00	0.000	0	159.28	0.000
85.50	0.000	0	159.28	0.000
86.00	0.000	0	159.28	0.000
86.50	0.000	0	159.28	0.000
87.00	0.000	0	159.28	0.000
87.50	0.000	0	159.28	0.000
88.00	0.000	0	159.28	0.000
88.50	0.000	0	159.28	0.000
89.00	0.000	0	159.28	0.000
89.50	0.000	0	159.28	0.000
90.00	0.000	0	159.28	0.000
90.50	0.000	0	159.28	0.000
91.00	0.000	0	159.28	0.000
91.50	0.000	0	159.28	0.000
92.00	0.000	0	159.28	0.000
92.50	0.000	0	159.28	0.000
93.00	0.000	0	159.28	0.000
93.50	0.000	0	159.28	0.000
94.00	0.000	0	159.28	0.000
94.50	0.000	0	159.28	0.000
95.00	0.000	0	159.28	0.000
95.50	0.000	0	159.28	0.000
96.00	0.000	0	159.28	0.000
96.50	0.000	0	159.28	0.000
97.00	0.000	0	159.28	0.000
97.50	0.000	0	159.28	0.000
98.00	0.000	0	159.28	0.000
98.50	0.000	0	159.28	0.000
99.00	0.000	0	159.28	0.000
99.50	0.000	0	159.28	0.000
100.00	0.000	0	159.28	0.000
100.50	0.000	0	159.28	0.000
101.00	0.000	0	159.28	0.000
101.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	0	159.28	0.000
102.50	0.000	0	159.28	0.000
103.00	0.000	0	159.28	0.000
103.50	0.000	0	159.28	0.000
104.00	0.000	0	159.28	0.000
104.50	0.000	0	159.28	0.000
105.00	0.000	0	159.28	0.000
105.50	0.000	0	159.28	0.000
106.00	0.000	0	159.28	0.000
106.50	0.000	0	159.28	0.000
107.00	0.000	0	159.28	0.000
107.50	0.000	0	159.28	0.000
108.00	0.000	0	159.28	0.000
108.50	0.000	0	159.28	0.000
109.00	0.000	0	159.28	0.000
109.50	0.000	0	159.28	0.000
110.00	0.000	0	159.28	0.000
110.50	0.000	0	159.28	0.000
111.00	0.000	0	159.28	0.000
111.50	0.000	0	159.28	0.000
112.00	0.000	0	159.28	0.000
112.50	0.000	0	159.28	0.000
113.00	0.000	0	159.28	0.000
113.50	0.000	0	159.28	0.000
114.00	0.000	0	159.28	0.000
114.50	0.000	0	159.28	0.000
115.00	0.000	0	159.28	0.000
115.50	0.000	0	159.28	0.000
116.00	0.000	0	159.28	0.000
116.50	0.000	0	159.28	0.000
117.00	0.000	0	159.28	0.000
117.50	0.000	0	159.28	0.000
118.00	0.000	0	159.28	0.000
118.50	0.000	0	159.28	0.000
119.00	0.000	0	159.28	0.000
119.50	0.000	0	159.28	0.000
120.00	0.000	0	159.28	0.000
120.50	0.000	0	159.28	0.000
121.00	0.000	0	159.28	0.000
121.50	0.000	0	159.28	0.000
122.00	0.000	0	159.28	0.000
122.50	0.000	0	159.28	0.000
123.00	0.000	0	159.28	0.000
123.50	0.000	0	159.28	0.000
124.00	0.000	0	159.28	0.000
124.50	0.000	0	159.28	0.000
125.00	0.000	0	159.28	0.000
125.50	0.000	0	159.28	0.000
126.00	0.000	0	159.28	0.000
126.50	0.000	0	159.28	0.000
127.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	0	159.28	0.000
128.00	0.000	0	159.28	0.000
128.50	0.000	0	159.28	0.000
129.00	0.000	0	159.28	0.000
129.50	0.000	0	159.28	0.000
130.00	0.000	0	159.28	0.000
130.50	0.000	0	159.28	0.000
131.00	0.000	0	159.28	0.000
131.50	0.000	0	159.28	0.000
132.00	0.000	0	159.28	0.000
132.50	0.000	0	159.28	0.000
133.00	0.000	0	159.28	0.000
133.50	0.000	0	159.28	0.000
134.00	0.000	0	159.28	0.000
134.50	0.000	0	159.28	0.000
135.00	0.000	0	159.28	0.000
135.50	0.000	0	159.28	0.000
136.00	0.000	0	159.28	0.000
136.50	0.000	0	159.28	0.000
137.00	0.000	0	159.28	0.000
137.50	0.000	0	159.28	0.000
138.00	0.000	0	159.28	0.000
138.50	0.000	0	159.28	0.000
139.00	0.000	0	159.28	0.000
139.50	0.000	0	159.28	0.000
140.00	0.000	0	159.28	0.000
140.50	0.000	0	159.28	0.000
141.00	0.000	0	159.28	0.000
141.50	0.000	0	159.28	0.000
142.00	0.000	0	159.28	0.000
142.50	0.000	0	159.28	0.000
143.00	0.000	0	159.28	0.000
143.50	0.000	0	159.28	0.000
144.00	0.000	0	159.28	0.000
144.50	0.000	0	159.28	0.000
145.00	0.000	0	159.28	0.000
145.50	0.000	0	159.28	0.000
146.00	0.000	0	159.28	0.000
146.50	0.000	0	159.28	0.000
147.00	0.000	0	159.28	0.000
147.50	0.000	0	159.28	0.000
148.00	0.000	0	159.28	0.000
148.50	0.000	0	159.28	0.000
149.00	0.000	0	159.28	0.000
149.50	0.000	0	159.28	0.000
150.00	0.000	0	159.28	0.000
150.50	0.000	0	159.28	0.000
151.00	0.000	0	159.28	0.000
151.50	0.000	0	159.28	0.000
152.00	0.000	0	159.28	0.000
152.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	0	159.28	0.000
153.50	0.000	0	159.28	0.000
154.00	0.000	0	159.28	0.000
154.50	0.000	0	159.28	0.000
155.00	0.000	0	159.28	0.000
155.50	0.000	0	159.28	0.000
156.00	0.000	0	159.28	0.000
156.50	0.000	0	159.28	0.000
157.00	0.000	0	159.28	0.000
157.50	0.000	0	159.28	0.000
158.00	0.000	0	159.28	0.000
158.50	0.000	0	159.28	0.000
159.00	0.000	0	159.28	0.000
159.50	0.000	0	159.28	0.000
160.00	0.000	0	159.28	0.000
160.50	0.000	0	159.28	0.000
161.00	0.000	0	159.28	0.000
161.50	0.000	0	159.28	0.000
162.00	0.000	0	159.28	0.000
162.50	0.000	0	159.28	0.000
163.00	0.000	0	159.28	0.000
163.50	0.000	0	159.28	0.000
164.00	0.000	0	159.28	0.000
164.50	0.000	0	159.28	0.000
165.00	0.000	0	159.28	0.000
165.50	0.000	0	159.28	0.000
166.00	0.000	0	159.28	0.000
166.50	0.000	0	159.28	0.000
167.00	0.000	0	159.28	0.000
167.50	0.000	0	159.28	0.000
168.00	0.000	0	159.28	0.000

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 7.18" for 100-yr event
Inflow = 21.616 cfs @ 11.96 hrs, Volume= 50,262 cf
Outflow = 4.898 cfs @ 12.09 hrs, Volume= 50,115 cf, Atten= 77%, Lag= 8.1 min
Primary = 4.898 cfs @ 12.09 hrs, Volume= 50,115 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 160.24' @ 12.09 hrs Surf.Area= 13,041 sf Storage= 24,557 cf

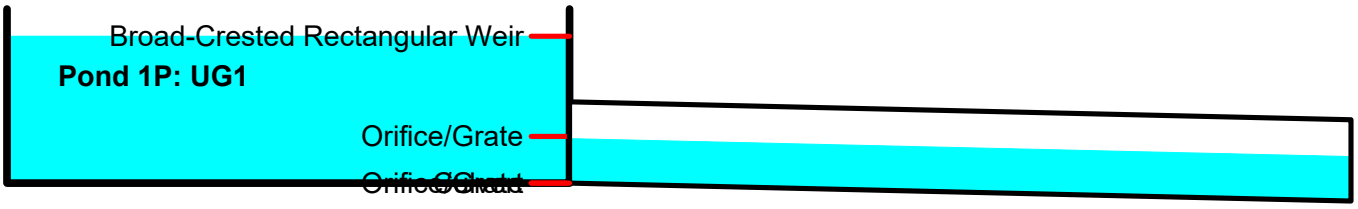
Plug-Flow detention time= 593.4 min calculated for 50,112 cf (100% of inflow)
Center-of-Mass det. time= 591.8 min (1,340.1 - 748.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=4.898 cfs @ 12.09 hrs HW=160.24' (Free Discharge)
└**4=Culvert** (Passes 4.898 cfs of 8.980 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.043 cfs @ 7.863 fps)
  ├**2=Orifice/Grate** (Orifice Controls 4.855 cfs @ 6.242 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 1P: UG1 - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger®280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 27 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

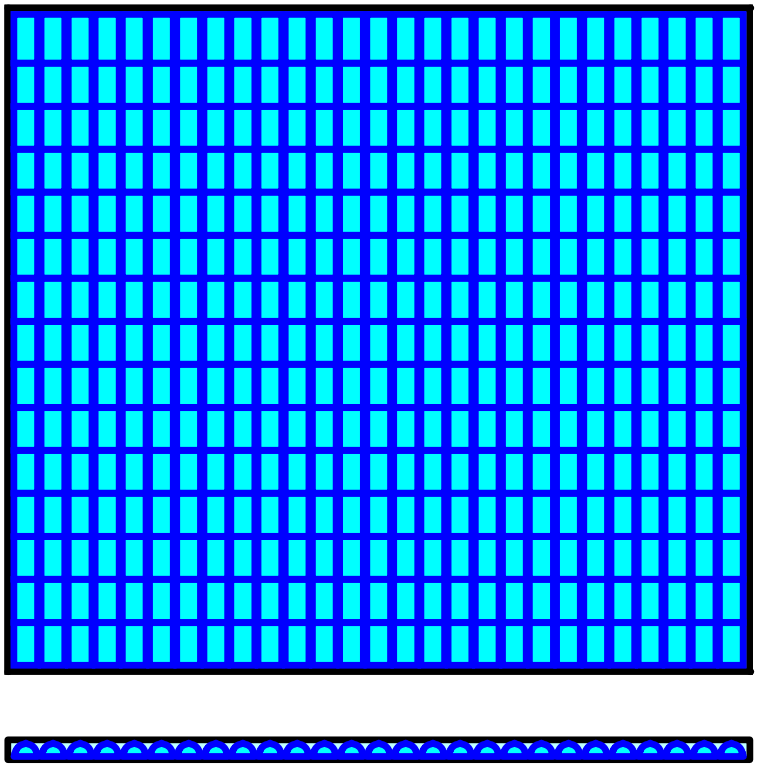
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

405 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 27 Rows = 17,377.3 cf Chamber Storage

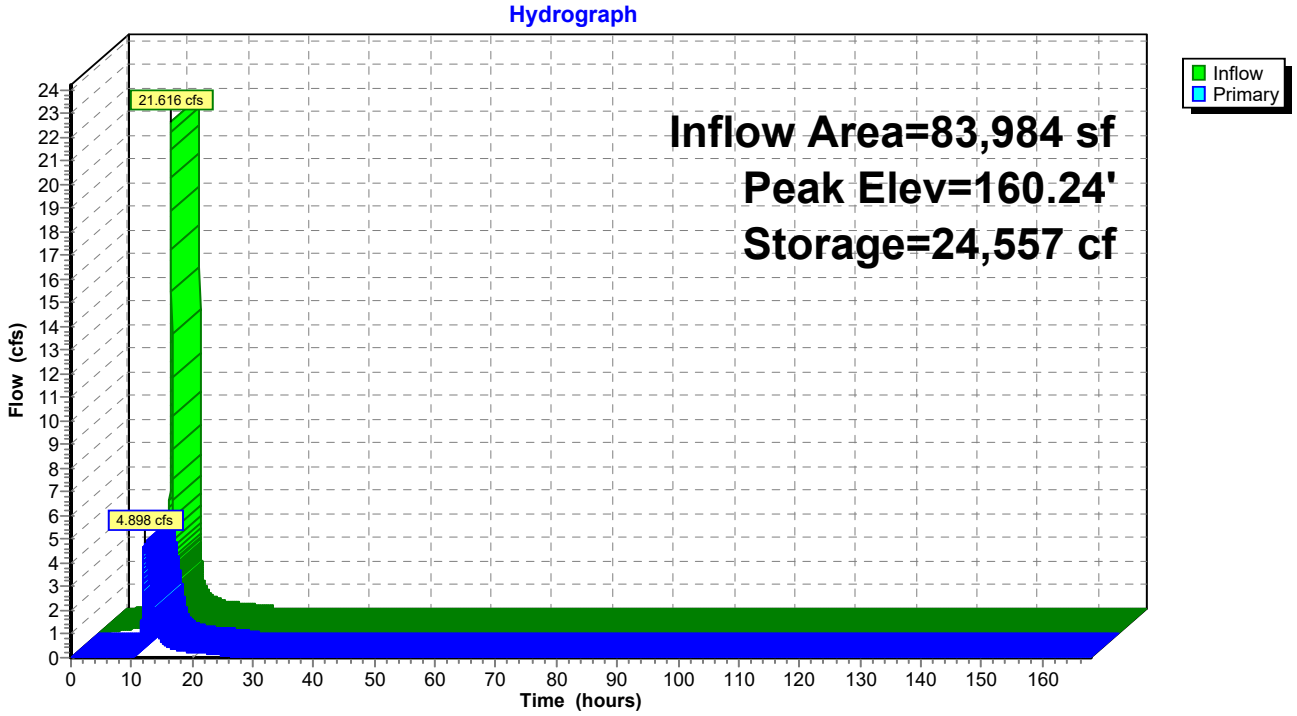
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

Chamber Storage + Stone Storage = 27,162.4 cf = 0.624 af
Overall Storage Efficiency = 64.9%
Overall System Size = 108.00' x 120.75' x 3.21'

405 Chambers
1,549.6 cy Field
906.0 cy Stone



Pond 1P: UG1


Hydrograph
Inflow
Primary
Inflow Area=83,984 sf
Peak Elev=160.24'
Storage=24,557 cf
21.616 cfs
4.898 cfs
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.024	17	157.53	0.000
2.00	0.052	86	157.55	0.001
2.50	0.075	199	157.57	0.002
3.00	0.096	349	157.60	0.004
3.50	0.115	530	157.63	0.006
4.00	0.132	740	157.67	0.008
4.50	0.152	979	157.72	0.010
5.00	0.173	1,252	157.77	0.012
5.50	0.193	1,560	157.83	0.013
6.00	0.213	1,900	157.89	0.015
6.50	0.232	2,273	157.97	0.016
7.00	0.252	2,677	158.04	0.018
7.50	0.270	3,114	158.07	0.019
8.00	0.289	3,583	158.11	0.019
8.50	0.352	4,118	158.16	0.020
9.00	0.426	4,781	158.21	0.021
9.50	0.443	5,532	158.28	0.022
10.00	0.542	6,365	158.35	0.023
10.50	0.709	7,405	158.44	0.113
11.00	0.985	8,448	158.53	0.430
11.50	**1.627**	9,576	158.63	0.923
12.00	**17.848**	**22,690**	**159.94**	**4.441**
12.50	1.550	**21,376**	**159.78**	**4.177**
13.00	0.964	16,809	159.30	3.260
13.50	0.729	13,224	158.96	2.401
14.00	0.572	10,811	158.74	1.574
14.50	0.505	9,599	158.63	0.934
15.00	0.453	9,045	158.59	0.674
15.50	0.401	8,731	158.56	0.540
16.00	0.349	8,514	158.54	0.456
16.50	0.326	8,357	158.52	0.396
17.00	0.307	8,249	158.52	0.359
17.50	0.289	8,165	158.51	0.331
18.00	0.270	8,095	158.50	0.307
18.50	0.251	8,032	158.50	0.285
19.00	0.233	7,972	158.49	0.266
19.50	0.214	7,912	158.49	0.249
20.00	0.196	7,850	158.48	0.231
20.50	0.190	7,795	158.48	0.215
21.00	0.186	7,757	158.47	0.204
21.50	0.182	7,730	158.47	0.196
22.00	0.179	7,708	158.47	0.190
22.50	0.175	7,690	158.47	0.184
23.00	0.171	7,674	158.46	0.180
23.50	0.168	7,659	158.46	0.176
24.00	0.164	7,645	158.46	0.172
24.50	0.000	7,428	158.44	0.118
25.00	0.000	7,251	158.43	0.080

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	7,124	158.42	0.062
26.00	0.000	7,025	158.41	0.048
26.50	0.000	6,949	158.40	0.037
27.00	0.000	6,890	158.40	0.029
27.50	0.000	6,842	158.39	0.025
28.00	0.000	6,798	158.39	0.024
28.50	0.000	6,756	158.39	0.024
29.00	0.000	6,713	158.38	0.024
29.50	0.000	6,671	158.38	0.024
30.00	0.000	6,628	158.37	0.024
30.50	0.000	6,586	158.37	0.023
31.00	0.000	6,544	158.37	0.023
31.50	0.000	6,502	158.36	0.023
32.00	0.000	6,460	158.36	0.023
32.50	0.000	6,418	158.36	0.023
33.00	0.000	6,376	158.35	0.023
33.50	0.000	6,334	158.35	0.023
34.00	0.000	6,293	158.35	0.023
34.50	0.000	6,251	158.34	0.023
35.00	0.000	6,210	158.34	0.023
35.50	0.000	6,168	158.33	0.023
36.00	0.000	6,127	158.33	0.023
36.50	0.000	6,086	158.33	0.023
37.00	0.000	6,045	158.32	0.023
37.50	0.000	6,004	158.32	0.023
38.00	0.000	5,963	158.32	0.023
38.50	0.000	5,922	158.31	0.023
39.00	0.000	5,882	158.31	0.023
39.50	0.000	5,841	158.31	0.023
40.00	0.000	5,801	158.30	0.022
40.50	0.000	5,760	158.30	0.022
41.00	0.000	5,720	158.30	0.022
41.50	0.000	5,680	158.29	0.022
42.00	0.000	5,640	158.29	0.022
42.50	0.000	5,600	158.29	0.022
43.00	0.000	5,560	158.28	0.022
43.50	0.000	5,520	158.28	0.022
44.00	0.000	5,481	158.27	0.022
44.50	0.000	5,441	158.27	0.022
45.00	0.000	5,401	158.27	0.022
45.50	0.000	5,362	158.26	0.022
46.00	0.000	5,323	158.26	0.022
46.50	0.000	5,284	158.26	0.022
47.00	0.000	5,244	158.25	0.022
47.50	0.000	5,205	158.25	0.022
48.00	0.000	5,166	158.25	0.022
48.50	0.000	5,128	158.24	0.022
49.00	0.000	5,089	158.24	0.021
49.50	0.000	5,050	158.24	0.021
50.00	0.000	5,012	158.23	0.021
50.50	0.000	4,973	158.23	0.021

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,935	158.23	0.021
51.50	0.000	4,897	158.22	0.021
52.00	0.000	4,859	158.22	0.021
52.50	0.000	4,821	158.22	0.021
53.00	0.000	4,783	158.21	0.021
53.50	0.000	4,745	158.21	0.021
54.00	0.000	4,707	158.21	0.021
54.50	0.000	4,669	158.21	0.021
55.00	0.000	4,632	158.20	0.021
55.50	0.000	4,594	158.20	0.021
56.00	0.000	4,557	158.20	0.021
56.50	0.000	4,520	158.19	0.021
57.00	0.000	4,482	158.19	0.021
57.50	0.000	4,445	158.19	0.021
58.00	0.000	4,408	158.18	0.021
58.50	0.000	4,371	158.18	0.020
59.00	0.000	4,335	158.18	0.020
59.50	0.000	4,298	158.17	0.020
60.00	0.000	4,261	158.17	0.020
60.50	0.000	4,225	158.17	0.020
61.00	0.000	4,188	158.16	0.020
61.50	0.000	4,152	158.16	0.020
62.00	0.000	4,116	158.16	0.020
62.50	0.000	4,080	158.15	0.020
63.00	0.000	4,044	158.15	0.020
63.50	0.000	4,008	158.15	0.020
64.00	0.000	3,972	158.15	0.020
64.50	0.000	3,936	158.14	0.020
65.00	0.000	3,900	158.14	0.020
65.50	0.000	3,865	158.14	0.020
66.00	0.000	3,829	158.13	0.020
66.50	0.000	3,794	158.13	0.020
67.00	0.000	3,759	158.13	0.020
67.50	0.000	3,724	158.12	0.020
68.00	0.000	3,689	158.12	0.019
68.50	0.000	3,654	158.12	0.019
69.00	0.000	3,619	158.12	0.019
69.50	0.000	3,584	158.11	0.019
70.00	0.000	3,549	158.11	0.019
70.50	0.000	3,515	158.11	0.019
71.00	0.000	3,480	158.10	0.019
71.50	0.000	3,446	158.10	0.019
72.00	0.000	3,411	158.10	0.019
72.50	0.000	3,377	158.09	0.019
73.00	0.000	3,343	158.09	0.019
73.50	0.000	3,309	158.09	0.019
74.00	0.000	3,275	158.09	0.019
74.50	0.000	3,241	158.08	0.019
75.00	0.000	3,207	158.08	0.019
75.50	0.000	3,174	158.08	0.019
76.00	0.000	3,140	158.07	0.019

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	3,107	158.07	0.019
77.00	0.000	3,073	158.07	0.019
77.50	0.000	3,040	158.07	0.018
78.00	0.000	3,007	158.06	0.018
78.50	0.000	2,974	158.06	0.018
79.00	0.000	2,941	158.06	0.018
79.50	0.000	2,908	158.06	0.018
80.00	0.000	2,875	158.05	0.018
80.50	0.000	2,842	158.05	0.018
81.00	0.000	2,809	158.05	0.018
81.50	0.000	2,777	158.04	0.018
82.00	0.000	2,745	158.04	0.018
82.50	0.000	2,712	158.04	0.018
83.00	0.000	2,680	158.04	0.018
83.50	0.000	2,648	158.03	0.018
84.00	0.000	2,616	158.03	0.018
84.50	0.000	2,584	158.03	0.018
85.00	0.000	2,552	158.02	0.018
85.50	0.000	2,520	158.01	0.017
86.00	0.000	2,489	158.01	0.017
86.50	0.000	2,458	158.00	0.017
87.00	0.000	2,427	158.00	0.017
87.50	0.000	2,397	157.99	0.017
88.00	0.000	2,366	157.98	0.017
88.50	0.000	2,336	157.98	0.017
89.00	0.000	2,306	157.97	0.017
89.50	0.000	2,276	157.97	0.016
90.00	0.000	2,246	157.96	0.016
90.50	0.000	2,217	157.96	0.016
91.00	0.000	2,188	157.95	0.016
91.50	0.000	2,159	157.94	0.016
92.00	0.000	2,130	157.94	0.016
92.50	0.000	2,102	157.93	0.016
93.00	0.000	2,073	157.93	0.016
93.50	0.000	2,045	157.92	0.016
94.00	0.000	2,018	157.92	0.015
94.50	0.000	1,990	157.91	0.015
95.00	0.000	1,962	157.91	0.015
95.50	0.000	1,935	157.90	0.015
96.00	0.000	1,908	157.90	0.015
96.50	0.000	1,881	157.89	0.015
97.00	0.000	1,855	157.89	0.015
97.50	0.000	1,828	157.88	0.015
98.00	0.000	1,802	157.88	0.014
98.50	0.000	1,776	157.87	0.014
99.00	0.000	1,751	157.87	0.014
99.50	0.000	1,725	157.86	0.014
100.00	0.000	1,700	157.86	0.014
100.50	0.000	1,675	157.85	0.014
101.00	0.000	1,650	157.85	0.014
101.50	0.000	1,625	157.84	0.014

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	1,601	157.84	0.014
102.50	0.000	1,576	157.83	0.013
103.00	0.000	1,552	157.83	0.013
103.50	0.000	1,529	157.82	0.013
104.00	0.000	1,505	157.82	0.013
104.50	0.000	1,482	157.81	0.013
105.00	0.000	1,459	157.81	0.013
105.50	0.000	1,436	157.81	0.013
106.00	0.000	1,413	157.80	0.013
106.50	0.000	1,390	157.80	0.012
107.00	0.000	1,368	157.79	0.012
107.50	0.000	1,346	157.79	0.012
108.00	0.000	1,324	157.78	0.012
108.50	0.000	1,302	157.78	0.012
109.00	0.000	1,281	157.78	0.012
109.50	0.000	1,260	157.77	0.012
110.00	0.000	1,239	157.77	0.012
110.50	0.000	1,218	157.76	0.011
111.00	0.000	1,197	157.76	0.011
111.50	0.000	1,177	157.76	0.011
112.00	0.000	1,157	157.75	0.011
112.50	0.000	1,137	157.75	0.011
113.00	0.000	1,117	157.74	0.011
113.50	0.000	1,098	157.74	0.011
114.00	0.000	1,078	157.74	0.011
114.50	0.000	1,059	157.73	0.011
115.00	0.000	1,040	157.73	0.010
115.50	0.000	1,022	157.73	0.010
116.00	0.000	1,003	157.72	0.010
116.50	0.000	985	157.72	0.010
117.00	0.000	967	157.72	0.010
117.50	0.000	949	157.71	0.010
118.00	0.000	932	157.71	0.010
118.50	0.000	914	157.71	0.010
119.00	0.000	897	157.70	0.009
119.50	0.000	880	157.70	0.009
120.00	0.000	864	157.70	0.009
120.50	0.000	847	157.69	0.009
121.00	0.000	831	157.69	0.009
121.50	0.000	815	157.69	0.009
122.00	0.000	799	157.68	0.009
122.50	0.000	783	157.68	0.009
123.00	0.000	768	157.68	0.009
123.50	0.000	753	157.67	0.008
124.00	0.000	738	157.67	0.008
124.50	0.000	723	157.67	0.008
125.00	0.000	708	157.67	0.008
125.50	0.000	694	157.66	0.008
126.00	0.000	680	157.66	0.008
126.50	0.000	666	157.66	0.008
127.00	0.000	652	157.65	0.008

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	638	157.65	0.007
128.00	0.000	625	157.65	0.007
128.50	0.000	612	157.65	0.007
129.00	0.000	599	157.64	0.007
129.50	0.000	587	157.64	0.007
130.00	0.000	574	157.64	0.007
130.50	0.000	562	157.64	0.007
131.00	0.000	550	157.64	0.007
131.50	0.000	538	157.63	0.006
132.00	0.000	527	157.63	0.006
132.50	0.000	515	157.63	0.006
133.00	0.000	504	157.63	0.006
133.50	0.000	493	157.62	0.006
134.00	0.000	483	157.62	0.006
134.50	0.000	472	157.62	0.006
135.00	0.000	462	157.62	0.006
135.50	0.000	452	157.62	0.005
136.00	0.000	442	157.61	0.005
136.50	0.000	433	157.61	0.005
137.00	0.000	424	157.61	0.005
137.50	0.000	415	157.61	0.005
138.00	0.000	406	157.61	0.005
138.50	0.000	397	157.61	0.005
139.00	0.000	389	157.60	0.005
139.50	0.000	381	157.60	0.005
140.00	0.000	373	157.60	0.004
140.50	0.000	365	157.60	0.004
141.00	0.000	357	157.60	0.004
141.50	0.000	350	157.60	0.004
142.00	0.000	342	157.60	0.004
142.50	0.000	335	157.59	0.004
143.00	0.000	328	157.59	0.004
143.50	0.000	322	157.59	0.004
144.00	0.000	315	157.59	0.004
144.50	0.000	309	157.59	0.003
145.00	0.000	303	157.59	0.003
145.50	0.000	297	157.59	0.003
146.00	0.000	291	157.59	0.003
146.50	0.000	285	157.58	0.003
147.00	0.000	280	157.58	0.003
147.50	0.000	274	157.58	0.003
148.00	0.000	269	157.58	0.003
148.50	0.000	264	157.58	0.003
149.00	0.000	259	157.58	0.003
149.50	0.000	255	157.58	0.003
150.00	0.000	250	157.58	0.003
150.50	0.000	246	157.58	0.002
151.00	0.000	241	157.58	0.002
151.50	0.000	237	157.58	0.002
152.00	0.000	233	157.57	0.002
152.50	0.000	229	157.57	0.002

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	225	157.57	0.002
153.50	0.000	221	157.57	0.002
154.00	0.000	218	157.57	0.002
154.50	0.000	214	157.57	0.002
155.00	0.000	211	157.57	0.002
155.50	0.000	207	157.57	0.002
156.00	0.000	204	157.57	0.002
156.50	0.000	201	157.57	0.002
157.00	0.000	198	157.57	0.002
157.50	0.000	195	157.57	0.002
158.00	0.000	192	157.57	0.002
158.50	0.000	189	157.57	0.002
159.00	0.000	187	157.57	0.001
159.50	0.000	184	157.57	0.001
160.00	0.000	181	157.56	0.001
160.50	0.000	179	157.56	0.001
161.00	0.000	176	157.56	0.001
161.50	0.000	174	157.56	0.001
162.00	0.000	172	157.56	0.001
162.50	0.000	170	157.56	0.001
163.00	0.000	167	157.56	0.001
163.50	0.000	165	157.56	0.001
164.00	0.000	163	157.56	0.001
164.50	0.000	161	157.56	0.001
165.00	0.000	159	157.56	0.001
165.50	0.000	157	157.56	0.001
166.00	0.000	155	157.56	0.001
166.50	0.000	153	157.56	0.001
167.00	0.000	151	157.56	0.001
167.50	0.000	149	157.56	0.001
168.00	0.000	147	157.56	0.001

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 6.00" for 100-yr event
Inflow = 5.073 cfs @ 11.96 hrs, Volume= 10,741 cf
Outflow = 2.374 cfs @ 12.05 hrs, Volume= 10,741 cf, Atten= 53%, Lag= 5.3 min
Primary = 2.374 cfs @ 12.05 hrs, Volume= 10,741 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 161.71' @ 12.05 hrs Surf.Area= 2,542 sf Storage= 3,947 cf

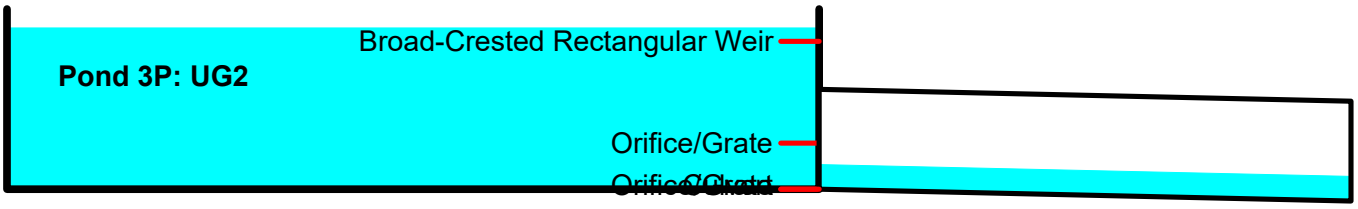
Plug-Flow detention time= 60.3 min calculated for 10,741 cf (100% of inflow)
Center-of-Mass det. time= 60.4 min (845.5 - 785.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=2.359 cfs @ 12.05 hrs HW=161.71' (Free Discharge)
└**4=Culvert** (Passes 2.359 cfs of 9.554 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.358 cfs @ 7.302 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.764 cfs @ 6.108 fps)
  └**3=Broad-Crested Rectangular Weir** (Weir Controls 1.237 cfs @ 1.508 fps)



Pond 3P: UG2 - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Discontinued, not for new designs)
Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf
Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 3.44 sf x 8 rows

36.0" Wide + 3.0" Spacing = 39.0" C-C Row Spacing

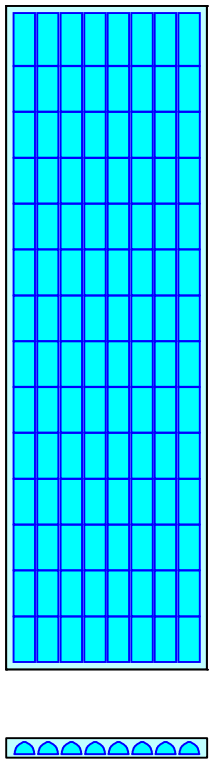
14 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 89.62' Row Length +12.0" End Stone x 2 = 91.62' Base Length
8 Rows x 36.0" Wide + 3.0" Spacing x 7 + 12.0" Side Stone x 2 = 27.75' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

112 Chambers x 21.8 cf +1.00' Row Adjustment x 3.44 sf x 8 Rows = 2,466.0 cf Chamber Storage

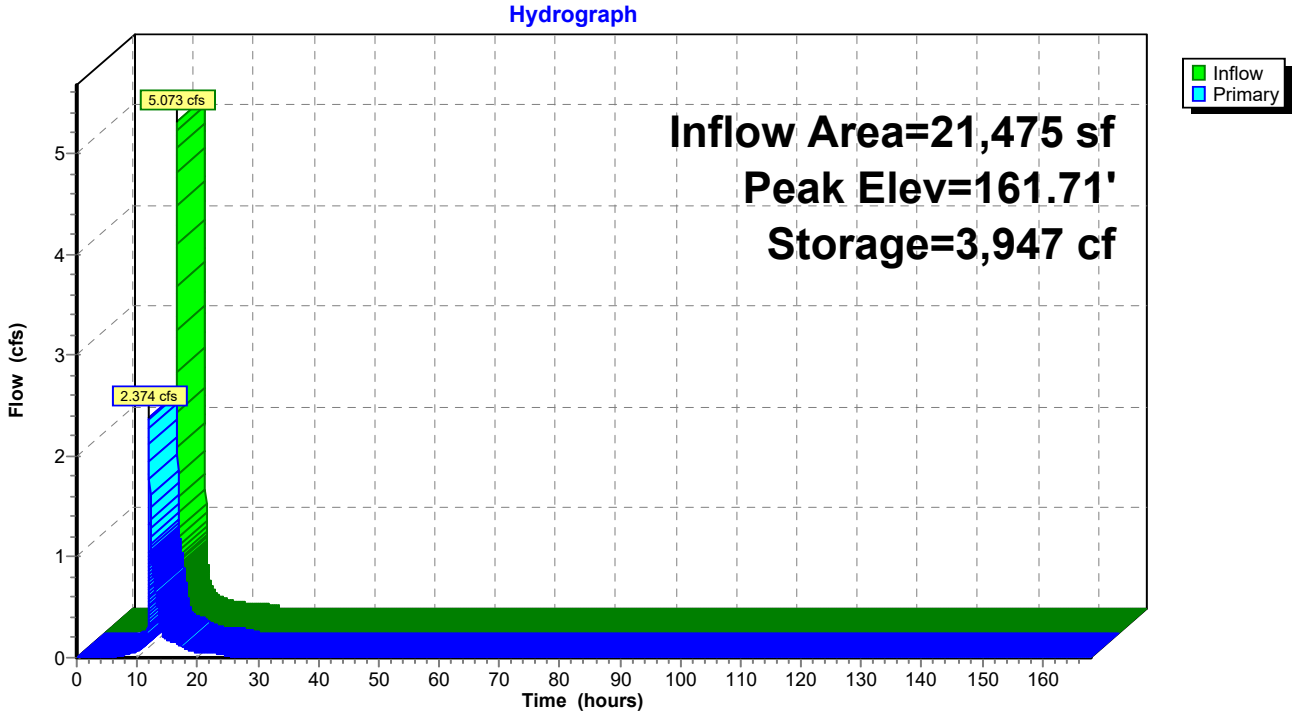
6,885.8 cf Field - 2,466.0 cf Chambers = 4,419.8 cf Stone x 40.0% Voids = 1,767.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,233.9 cf = 0.097 af
Overall Storage Efficiency = 61.5%
Overall System Size = 91.62' x 27.75' x 2.71'

112 Chambers
255.0 cy Field
163.7 cy Stone



Pond 3P: UG2


Hydrograph
Inflow Area=21,475 sf
Peak Elev=161.71'
Storage=3,947 cf
5.073 cfs
2.374 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.002	1	159.28	0.000
4.50	0.006	8	159.29	0.000
5.00	0.010	20	159.30	0.001
5.50	0.014	38	159.32	0.003
6.00	0.018	58	159.34	0.007
6.50	0.023	78	159.36	0.012
7.00	0.028	96	159.37	0.018
7.50	0.033	113	159.39	0.024
8.00	0.038	128	159.41	0.030
8.50	0.050	146	159.42	0.038
9.00	0.065	171	159.45	0.049
9.50	0.071	196	159.47	0.060
10.00	0.093	222	159.50	0.072
10.50	0.128	274	159.55	0.090
11.00	0.188	372	159.65	0.116
11.50	**0.331**	585	159.81	0.151
12.00	**4.234**	**3,704**	**161.47**	**1.044**
12.50	0.376	**3,183**	**161.10**	**0.909**
13.00	0.235	2,263	160.61	0.688
13.50	0.178	1,585	160.28	0.472
14.00	0.140	1,216	160.11	0.278
14.50	0.124	1,030	160.02	0.203
15.00	0.111	906	159.96	0.176
15.50	0.099	785	159.91	0.167
16.00	0.086	659	159.85	0.157
16.50	0.080	534	159.79	0.147
17.00	0.076	425	159.70	0.128
17.50	0.071	344	159.62	0.109
18.00	0.067	286	159.56	0.093
18.50	0.062	246	159.52	0.081
19.00	0.058	217	159.49	0.070
19.50	0.053	199	159.48	0.062
20.00	0.048	185	159.46	0.055
20.50	0.047	175	159.45	0.051
21.00	0.046	170	159.45	0.048
21.50	0.045	166	159.44	0.047
22.00	0.044	164	159.44	0.046
22.50	0.043	161	159.44	0.045
23.00	0.042	159	159.44	0.044
23.50	0.042	157	159.43	0.043
24.00	0.041	155	159.43	0.042
24.50	0.000	108	159.39	0.022
25.00	0.000	78	159.36	0.012

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	61	159.34	0.008
26.00	0.000	49	159.33	0.005
26.50	0.000	41	159.32	0.004
27.00	0.000	35	159.31	0.003
27.50	0.000	31	159.31	0.002
28.00	0.000	27	159.31	0.002
28.50	0.000	25	159.30	0.001
29.00	0.000	22	159.30	0.001
29.50	0.000	20	159.30	0.001
30.00	0.000	18	159.30	0.001
30.50	0.000	16	159.30	0.001
31.00	0.000	15	159.29	0.001
31.50	0.000	13	159.29	0.001
32.00	0.000	12	159.29	0.001
32.50	0.000	11	159.29	0.001
33.00	0.000	10	159.29	0.001
33.50	0.000	9	159.29	0.001
34.00	0.000	8	159.29	0.000
34.50	0.000	7	159.29	0.000
35.00	0.000	6	159.29	0.000
35.50	0.000	6	159.29	0.000
36.00	0.000	5	159.29	0.000
36.50	0.000	5	159.28	0.000
37.00	0.000	4	159.28	0.000
37.50	0.000	4	159.28	0.000
38.00	0.000	3	159.28	0.000
38.50	0.000	3	159.28	0.000
39.00	0.000	3	159.28	0.000
39.50	0.000	2	159.28	0.000
40.00	0.000	2	159.28	0.000
40.50	0.000	2	159.28	0.000
41.00	0.000	2	159.28	0.000
41.50	0.000	2	159.28	0.000
42.00	0.000	1	159.28	0.000
42.50	0.000	1	159.28	0.000
43.00	0.000	1	159.28	0.000
43.50	0.000	1	159.28	0.000
44.00	0.000	1	159.28	0.000
44.50	0.000	1	159.28	0.000
45.00	0.000	1	159.28	0.000
45.50	0.000	1	159.28	0.000
46.00	0.000	1	159.28	0.000
46.50	0.000	1	159.28	0.000
47.00	0.000	1	159.28	0.000
47.50	0.000	0	159.28	0.000
48.00	0.000	0	159.28	0.000
48.50	0.000	0	159.28	0.000
49.00	0.000	0	159.28	0.000
49.50	0.000	0	159.28	0.000
50.00	0.000	0	159.28	0.000
50.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	0	159.28	0.000
51.50	0.000	0	159.28	0.000
52.00	0.000	0	159.28	0.000
52.50	0.000	0	159.28	0.000
53.00	0.000	0	159.28	0.000
53.50	0.000	0	159.28	0.000
54.00	0.000	0	159.28	0.000
54.50	0.000	0	159.28	0.000
55.00	0.000	0	159.28	0.000
55.50	0.000	0	159.28	0.000
56.00	0.000	0	159.28	0.000
56.50	0.000	0	159.28	0.000
57.00	0.000	0	159.28	0.000
57.50	0.000	0	159.28	0.000
58.00	0.000	0	159.28	0.000
58.50	0.000	0	159.28	0.000
59.00	0.000	0	159.28	0.000
59.50	0.000	0	159.28	0.000
60.00	0.000	0	159.28	0.000
60.50	0.000	0	159.28	0.000
61.00	0.000	0	159.28	0.000
61.50	0.000	0	159.28	0.000
62.00	0.000	0	159.28	0.000
62.50	0.000	0	159.28	0.000
63.00	0.000	0	159.28	0.000
63.50	0.000	0	159.28	0.000
64.00	0.000	0	159.28	0.000
64.50	0.000	0	159.28	0.000
65.00	0.000	0	159.28	0.000
65.50	0.000	0	159.28	0.000
66.00	0.000	0	159.28	0.000
66.50	0.000	0	159.28	0.000
67.00	0.000	0	159.28	0.000
67.50	0.000	0	159.28	0.000
68.00	0.000	0	159.28	0.000
68.50	0.000	0	159.28	0.000
69.00	0.000	0	159.28	0.000
69.50	0.000	0	159.28	0.000
70.00	0.000	0	159.28	0.000
70.50	0.000	0	159.28	0.000
71.00	0.000	0	159.28	0.000
71.50	0.000	0	159.28	0.000
72.00	0.000	0	159.28	0.000
72.50	0.000	0	159.28	0.000
73.00	0.000	0	159.28	0.000
73.50	0.000	0	159.28	0.000
74.00	0.000	0	159.28	0.000
74.50	0.000	0	159.28	0.000
75.00	0.000	0	159.28	0.000
75.50	0.000	0	159.28	0.000
76.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	0	159.28	0.000
77.00	0.000	0	159.28	0.000
77.50	0.000	0	159.28	0.000
78.00	0.000	0	159.28	0.000
78.50	0.000	0	159.28	0.000
79.00	0.000	0	159.28	0.000
79.50	0.000	0	159.28	0.000
80.00	0.000	0	159.28	0.000
80.50	0.000	0	159.28	0.000
81.00	0.000	0	159.28	0.000
81.50	0.000	0	159.28	0.000
82.00	0.000	0	159.28	0.000
82.50	0.000	0	159.28	0.000
83.00	0.000	0	159.28	0.000
83.50	0.000	0	159.28	0.000
84.00	0.000	0	159.28	0.000
84.50	0.000	0	159.28	0.000
85.00	0.000	0	159.28	0.000
85.50	0.000	0	159.28	0.000
86.00	0.000	0	159.28	0.000
86.50	0.000	0	159.28	0.000
87.00	0.000	0	159.28	0.000
87.50	0.000	0	159.28	0.000
88.00	0.000	0	159.28	0.000
88.50	0.000	0	159.28	0.000
89.00	0.000	0	159.28	0.000
89.50	0.000	0	159.28	0.000
90.00	0.000	0	159.28	0.000
90.50	0.000	0	159.28	0.000
91.00	0.000	0	159.28	0.000
91.50	0.000	0	159.28	0.000
92.00	0.000	0	159.28	0.000
92.50	0.000	0	159.28	0.000
93.00	0.000	0	159.28	0.000
93.50	0.000	0	159.28	0.000
94.00	0.000	0	159.28	0.000
94.50	0.000	0	159.28	0.000
95.00	0.000	0	159.28	0.000
95.50	0.000	0	159.28	0.000
96.00	0.000	0	159.28	0.000
96.50	0.000	0	159.28	0.000
97.00	0.000	0	159.28	0.000
97.50	0.000	0	159.28	0.000
98.00	0.000	0	159.28	0.000
98.50	0.000	0	159.28	0.000
99.00	0.000	0	159.28	0.000
99.50	0.000	0	159.28	0.000
100.00	0.000	0	159.28	0.000
100.50	0.000	0	159.28	0.000
101.00	0.000	0	159.28	0.000
101.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

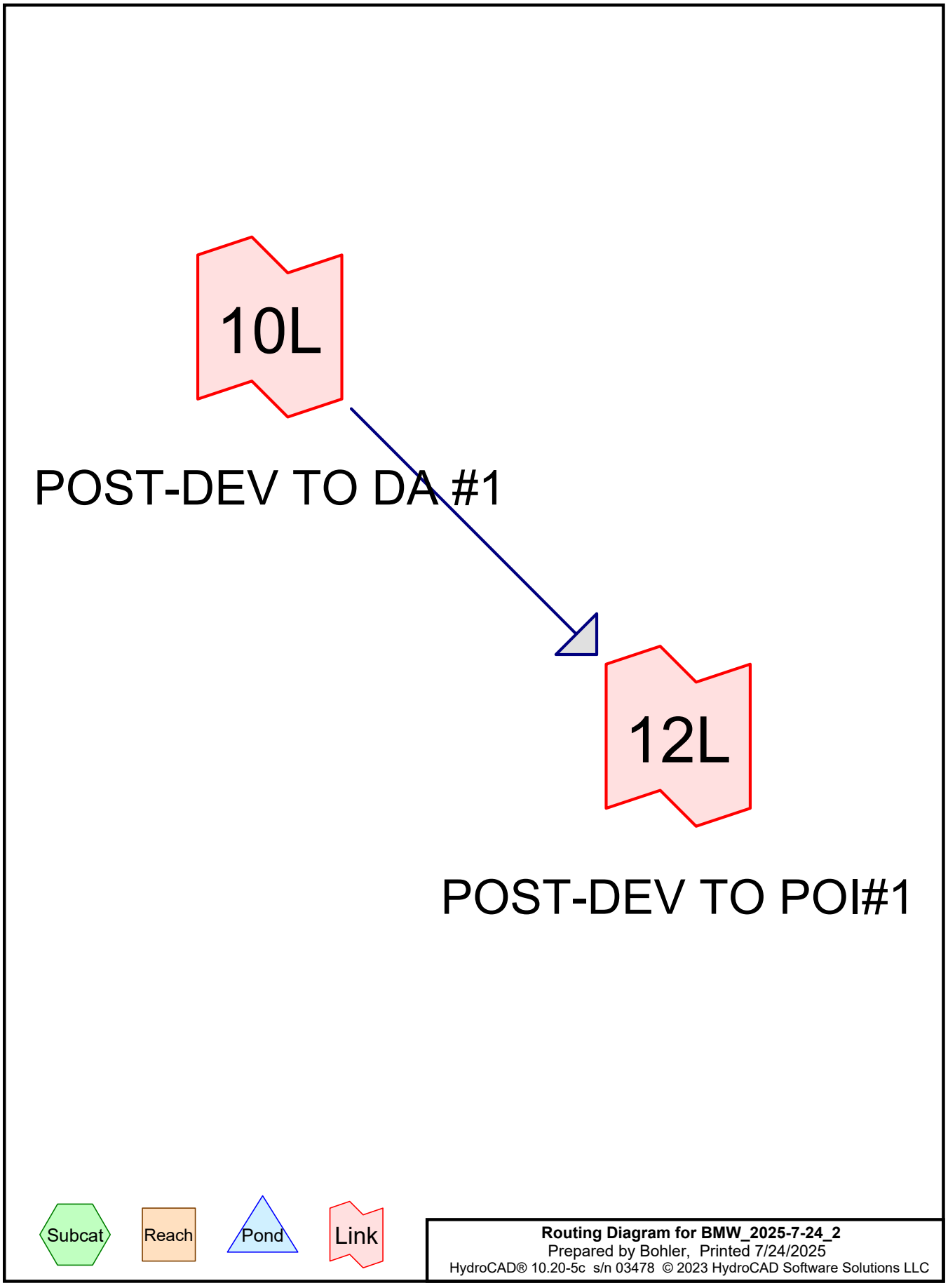
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	0	159.28	0.000
102.50	0.000	0	159.28	0.000
103.00	0.000	0	159.28	0.000
103.50	0.000	0	159.28	0.000
104.00	0.000	0	159.28	0.000
104.50	0.000	0	159.28	0.000
105.00	0.000	0	159.28	0.000
105.50	0.000	0	159.28	0.000
106.00	0.000	0	159.28	0.000
106.50	0.000	0	159.28	0.000
107.00	0.000	0	159.28	0.000
107.50	0.000	0	159.28	0.000
108.00	0.000	0	159.28	0.000
108.50	0.000	0	159.28	0.000
109.00	0.000	0	159.28	0.000
109.50	0.000	0	159.28	0.000
110.00	0.000	0	159.28	0.000
110.50	0.000	0	159.28	0.000
111.00	0.000	0	159.28	0.000
111.50	0.000	0	159.28	0.000
112.00	0.000	0	159.28	0.000
112.50	0.000	0	159.28	0.000
113.00	0.000	0	159.28	0.000
113.50	0.000	0	159.28	0.000
114.00	0.000	0	159.28	0.000
114.50	0.000	0	159.28	0.000
115.00	0.000	0	159.28	0.000
115.50	0.000	0	159.28	0.000
116.00	0.000	0	159.28	0.000
116.50	0.000	0	159.28	0.000
117.00	0.000	0	159.28	0.000
117.50	0.000	0	159.28	0.000
118.00	0.000	0	159.28	0.000
118.50	0.000	0	159.28	0.000
119.00	0.000	0	159.28	0.000
119.50	0.000	0	159.28	0.000
120.00	0.000	0	159.28	0.000
120.50	0.000	0	159.28	0.000
121.00	0.000	0	159.28	0.000
121.50	0.000	0	159.28	0.000
122.00	0.000	0	159.28	0.000
122.50	0.000	0	159.28	0.000
123.00	0.000	0	159.28	0.000
123.50	0.000	0	159.28	0.000
124.00	0.000	0	159.28	0.000
124.50	0.000	0	159.28	0.000
125.00	0.000	0	159.28	0.000
125.50	0.000	0	159.28	0.000
126.00	0.000	0	159.28	0.000
126.50	0.000	0	159.28	0.000
127.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	0	159.28	0.000
128.00	0.000	0	159.28	0.000
128.50	0.000	0	159.28	0.000
129.00	0.000	0	159.28	0.000
129.50	0.000	0	159.28	0.000
130.00	0.000	0	159.28	0.000
130.50	0.000	0	159.28	0.000
131.00	0.000	0	159.28	0.000
131.50	0.000	0	159.28	0.000
132.00	0.000	0	159.28	0.000
132.50	0.000	0	159.28	0.000
133.00	0.000	0	159.28	0.000
133.50	0.000	0	159.28	0.000
134.00	0.000	0	159.28	0.000
134.50	0.000	0	159.28	0.000
135.00	0.000	0	159.28	0.000
135.50	0.000	0	159.28	0.000
136.00	0.000	0	159.28	0.000
136.50	0.000	0	159.28	0.000
137.00	0.000	0	159.28	0.000
137.50	0.000	0	159.28	0.000
138.00	0.000	0	159.28	0.000
138.50	0.000	0	159.28	0.000
139.00	0.000	0	159.28	0.000
139.50	0.000	0	159.28	0.000
140.00	0.000	0	159.28	0.000
140.50	0.000	0	159.28	0.000
141.00	0.000	0	159.28	0.000
141.50	0.000	0	159.28	0.000
142.00	0.000	0	159.28	0.000
142.50	0.000	0	159.28	0.000
143.00	0.000	0	159.28	0.000
143.50	0.000	0	159.28	0.000
144.00	0.000	0	159.28	0.000
144.50	0.000	0	159.28	0.000
145.00	0.000	0	159.28	0.000
145.50	0.000	0	159.28	0.000
146.00	0.000	0	159.28	0.000
146.50	0.000	0	159.28	0.000
147.00	0.000	0	159.28	0.000
147.50	0.000	0	159.28	0.000
148.00	0.000	0	159.28	0.000
148.50	0.000	0	159.28	0.000
149.00	0.000	0	159.28	0.000
149.50	0.000	0	159.28	0.000
150.00	0.000	0	159.28	0.000
150.50	0.000	0	159.28	0.000
151.00	0.000	0	159.28	0.000
151.50	0.000	0	159.28	0.000
152.00	0.000	0	159.28	0.000
152.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	0	159.28	0.000
153.50	0.000	0	159.28	0.000
154.00	0.000	0	159.28	0.000
154.50	0.000	0	159.28	0.000
155.00	0.000	0	159.28	0.000
155.50	0.000	0	159.28	0.000
156.00	0.000	0	159.28	0.000
156.50	0.000	0	159.28	0.000
157.00	0.000	0	159.28	0.000
157.50	0.000	0	159.28	0.000
158.00	0.000	0	159.28	0.000
158.50	0.000	0	159.28	0.000
159.00	0.000	0	159.28	0.000
159.50	0.000	0	159.28	0.000
160.00	0.000	0	159.28	0.000
160.50	0.000	0	159.28	0.000
161.00	0.000	0	159.28	0.000
161.50	0.000	0	159.28	0.000
162.00	0.000	0	159.28	0.000
162.50	0.000	0	159.28	0.000
163.00	0.000	0	159.28	0.000
163.50	0.000	0	159.28	0.000
164.00	0.000	0	159.28	0.000
164.50	0.000	0	159.28	0.000
165.00	0.000	0	159.28	0.000
165.50	0.000	0	159.28	0.000
166.00	0.000	0	159.28	0.000
166.50	0.000	0	159.28	0.000
167.00	0.000	0	159.28	0.000
167.50	0.000	0	159.28	0.000
168.00	0.000	0	159.28	0.000



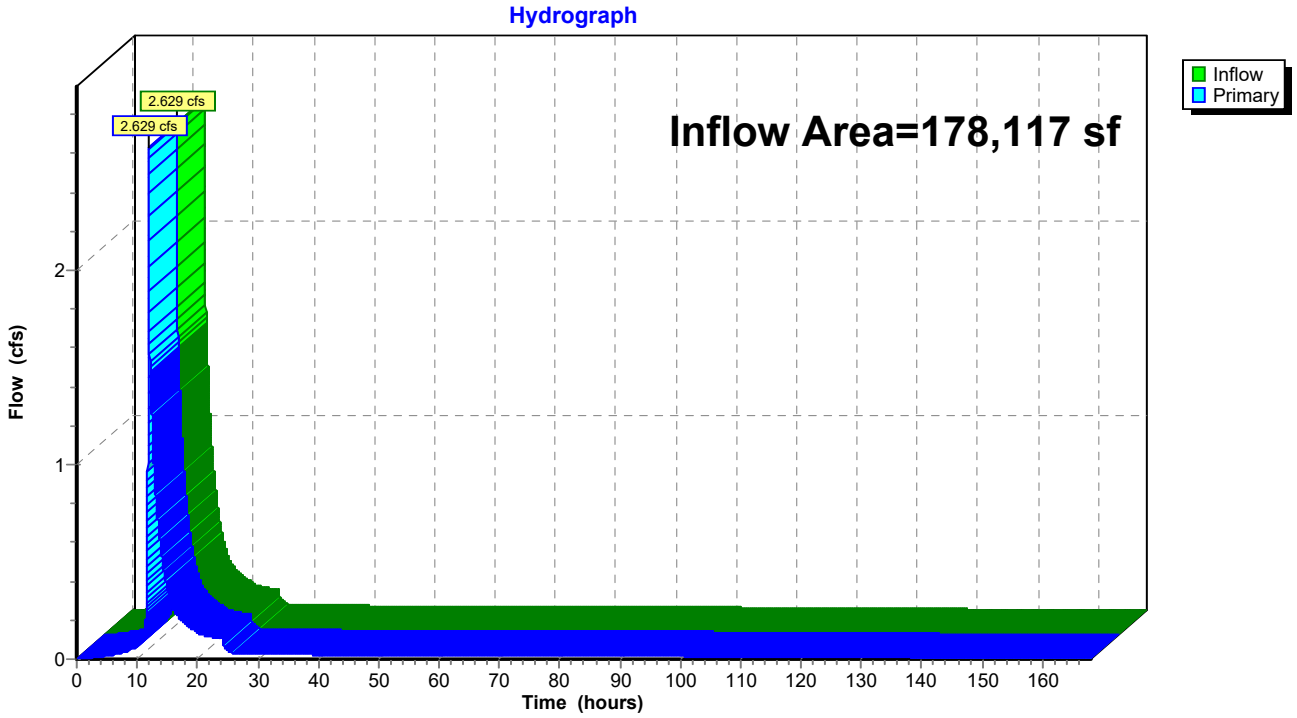
Routing Diagram for BMW_2025-7-24_2
Prepared by Bohler, Printed 7/24/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 178,117 sf, 79.75% Impervious, Inflow Depth > 1.66" for 1-yr event
Inflow = 2.629 cfs @ 11.97 hrs, Volume= 24,645 cf
Primary = 2.629 cfs @ 11.97 hrs, Volume= 24,645 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : POST-DEV TO POI#1

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 10L: POST-DEV TO DA #1

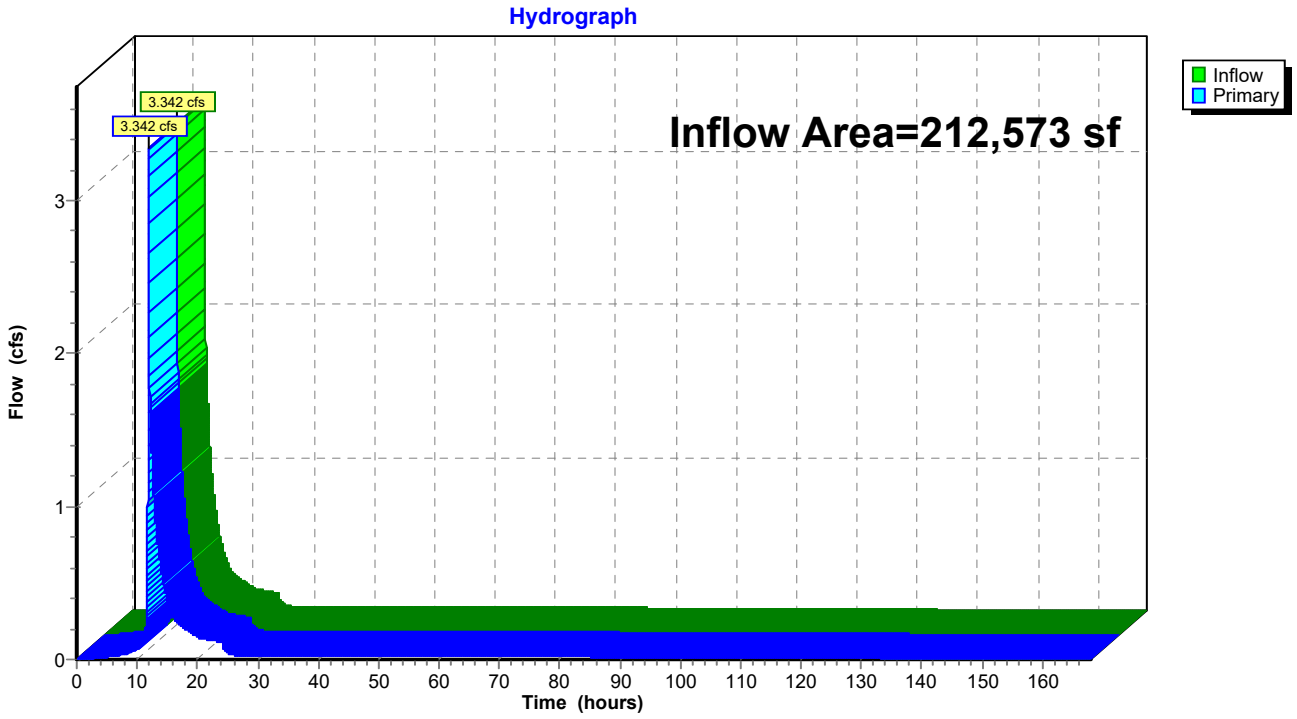


Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 212,573 sf, 74.32% Impervious, Inflow Depth > 1.48" for 1-yr event
Inflow = 3.342 cfs @ 11.97 hrs, Volume= 26,168 cf
Primary = 3.342 cfs @ 11.97 hrs, Volume= 26,168 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 12L: POST-DEV TO POI#1

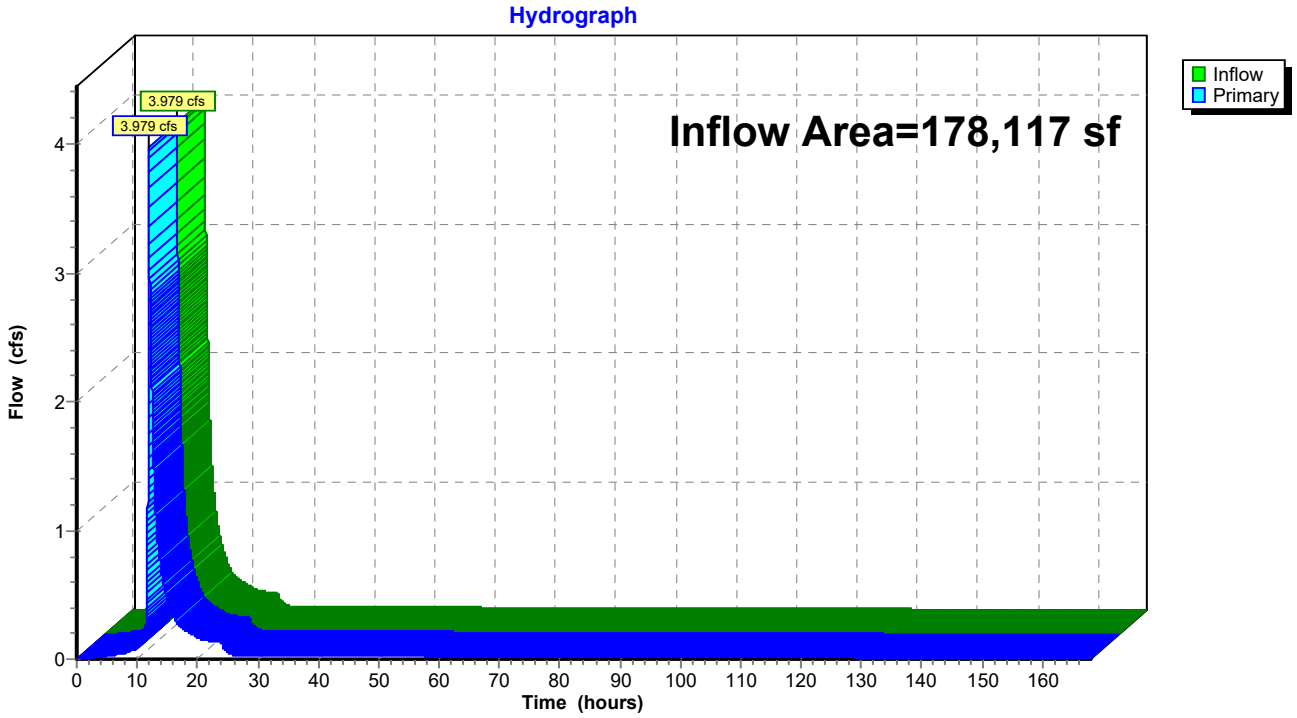


Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 178,117 sf, 79.75% Impervious, Inflow Depth > 2.10" for 2-yr event
Inflow = 3.979 cfs @ 11.99 hrs, Volume= 31,185 cf
Primary = 3.979 cfs @ 11.99 hrs, Volume= 31,185 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : POST-DEV TO POI#1

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 10L: POST-DEV TO DA #1

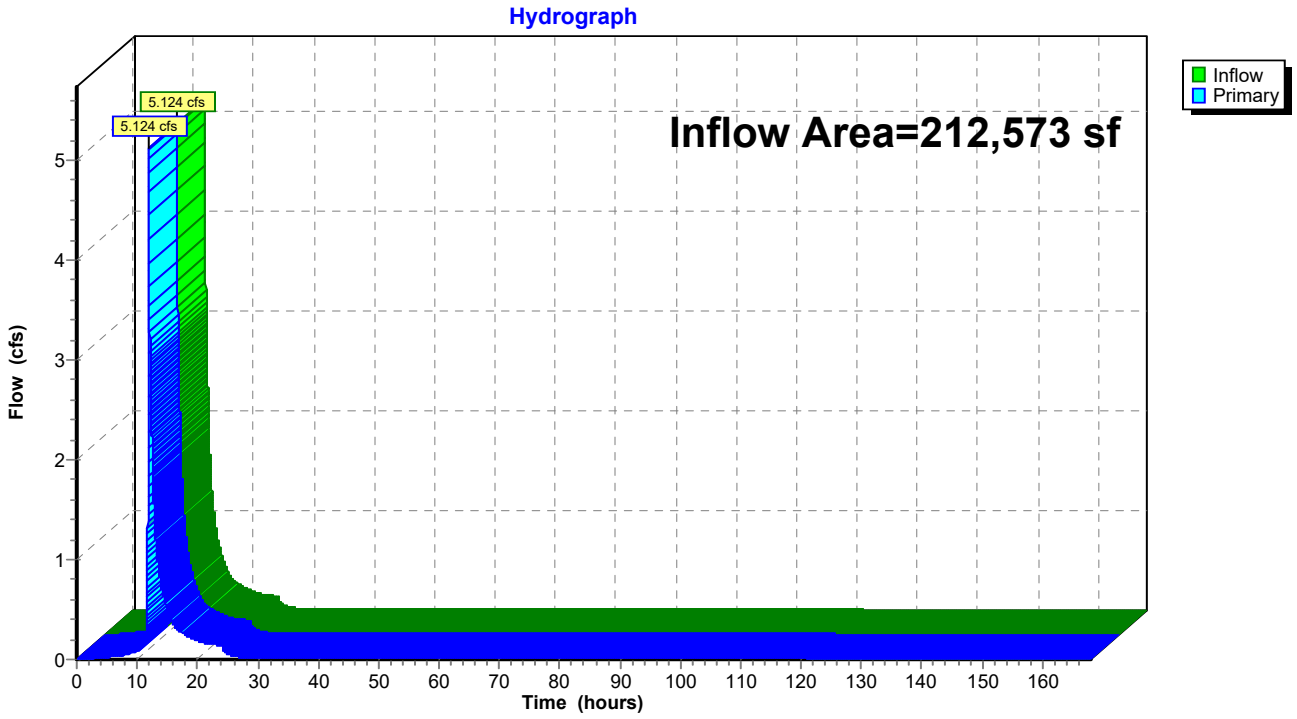


Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 212,573 sf, 74.32% Impervious, Inflow Depth > 1.89" for 2-yr event
Inflow = 5.124 cfs @ 11.98 hrs, Volume= 33,554 cf
Primary = 5.124 cfs @ 11.98 hrs, Volume= 33,554 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 12L: POST-DEV TO POI#1

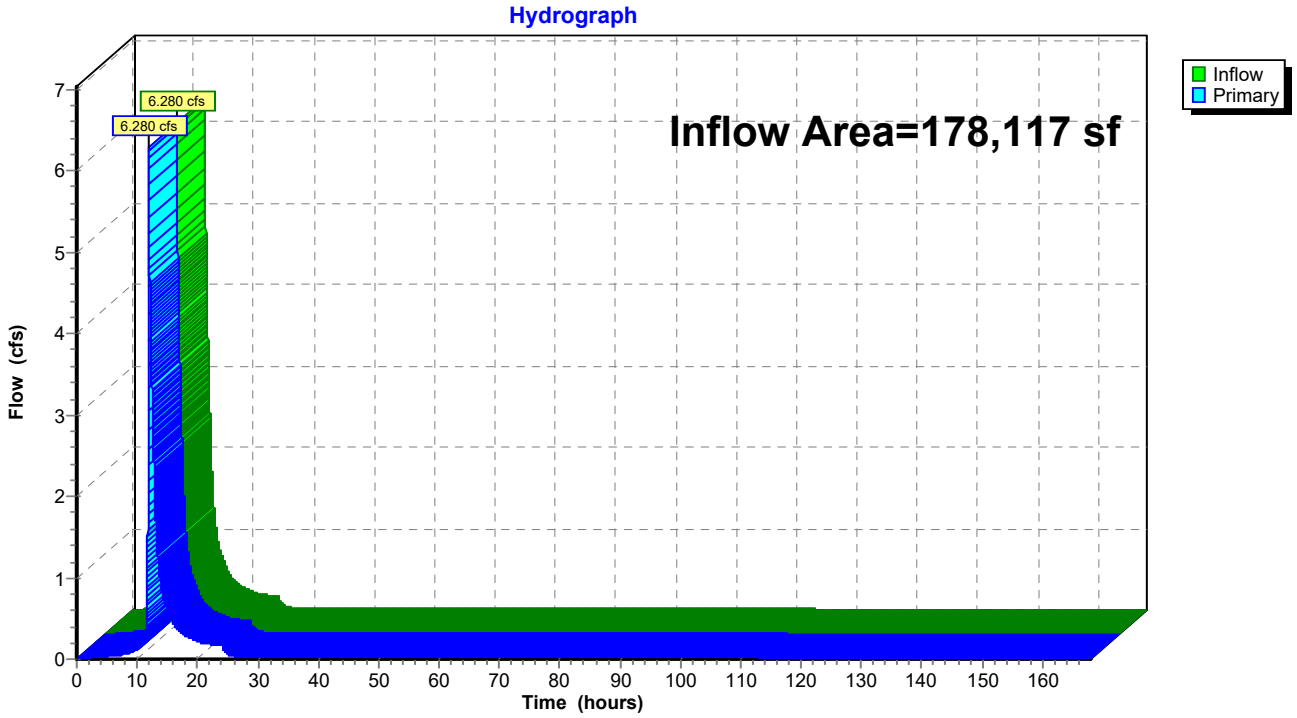


Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 178,117 sf, 79.75% Impervious, Inflow Depth > 2.81" for 5-yr event
Inflow = 6.280 cfs @ 11.98 hrs, Volume= 41,697 cf
Primary = 6.280 cfs @ 11.98 hrs, Volume= 41,697 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : POST-DEV TO POI#1

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 10L: POST-DEV TO DA #1

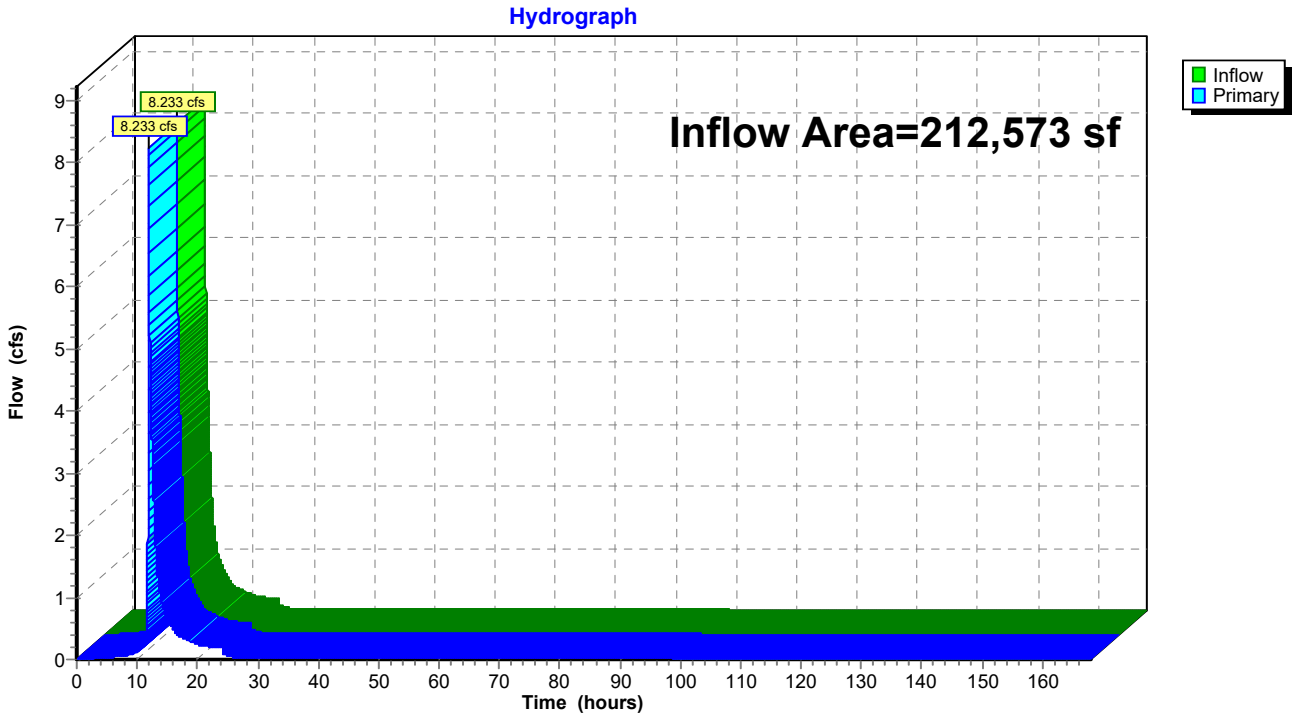


Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 212,573 sf, 74.32% Impervious, Inflow Depth > 2.57" for 5-yr event
Inflow = 8.233 cfs @ 11.98 hrs, Volume= 45,579 cf
Primary = 8.233 cfs @ 11.98 hrs, Volume= 45,579 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 12L: POST-DEV TO POI#1

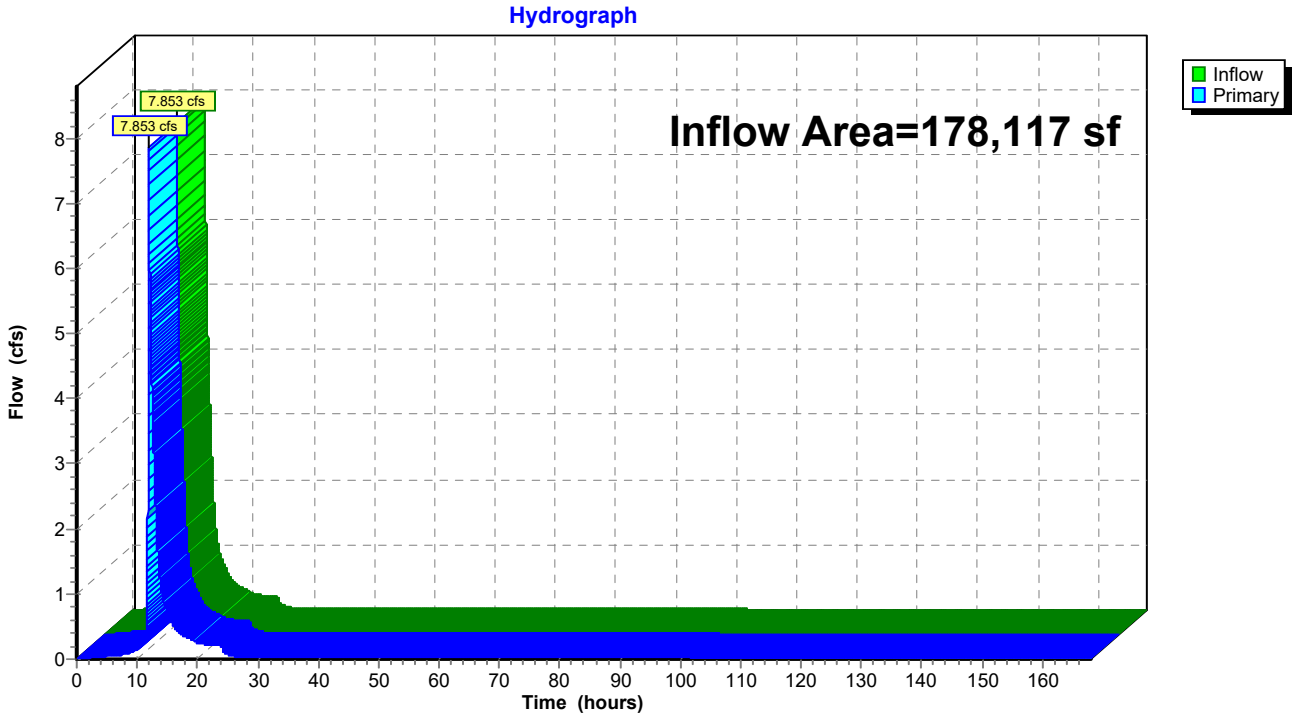


Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 178,117 sf, 79.75% Impervious, Inflow Depth > 3.41" for 10-yr event
Inflow = 7.853 cfs @ 11.98 hrs, Volume= 50,636 cf
Primary = 7.853 cfs @ 11.98 hrs, Volume= 50,636 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : POST-DEV TO POI#1

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 10L: POST-DEV TO DA #1

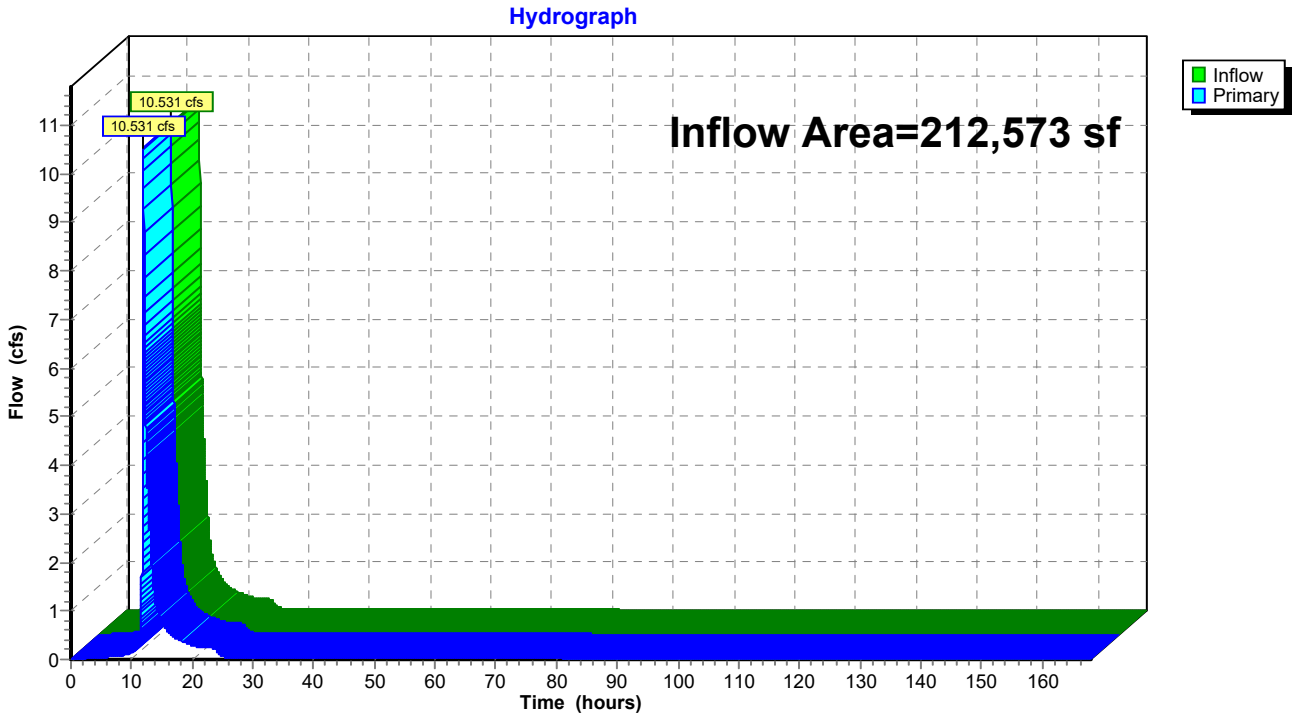


Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 212,573 sf, 74.32% Impervious, Inflow Depth = 3.16" for 10-yr event
Inflow = 10.531 cfs @ 11.97 hrs, Volume= 55,904 cf
Primary = 10.531 cfs @ 11.97 hrs, Volume= 55,904 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 12L: POST-DEV TO POI#1

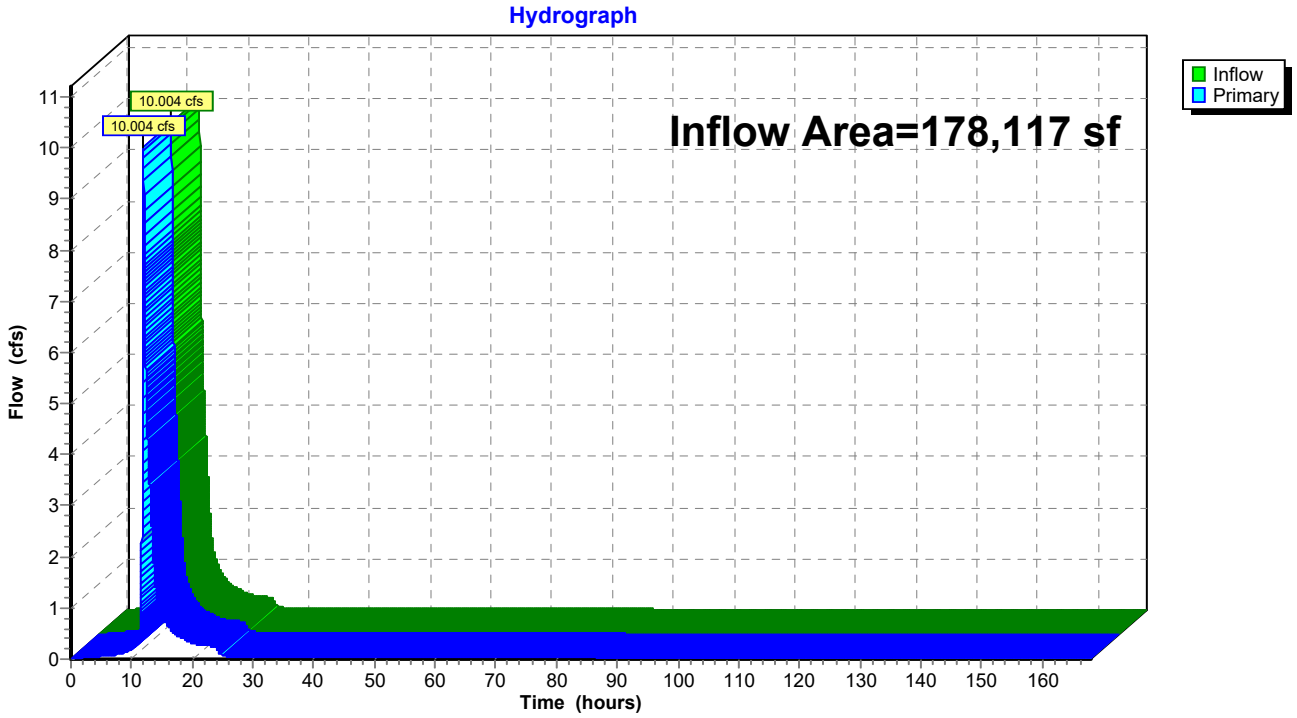


Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 178,117 sf, 79.75% Impervious, Inflow Depth > 4.32" for 25-yr event
Inflow = 10.004 cfs @ 11.98 hrs, Volume= 64,132 cf
Primary = 10.004 cfs @ 11.98 hrs, Volume= 64,132 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : POST-DEV TO POI#1

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 10L: POST-DEV TO DA #1

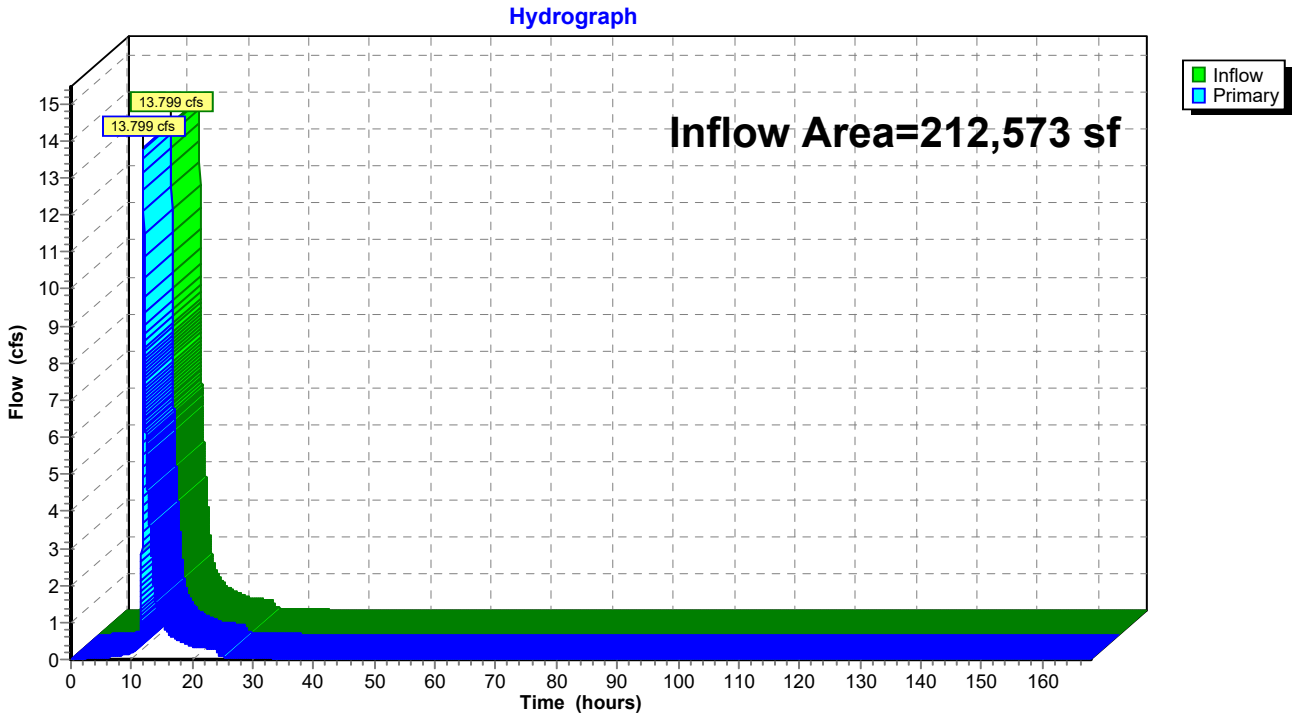


Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 212,573 sf, 74.32% Impervious, Inflow Depth = 4.04" for 25-yr event
Inflow = 13.799 cfs @ 11.97 hrs, Volume= 71,608 cf
Primary = 13.799 cfs @ 11.97 hrs, Volume= 71,608 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 12L: POST-DEV TO POI#1

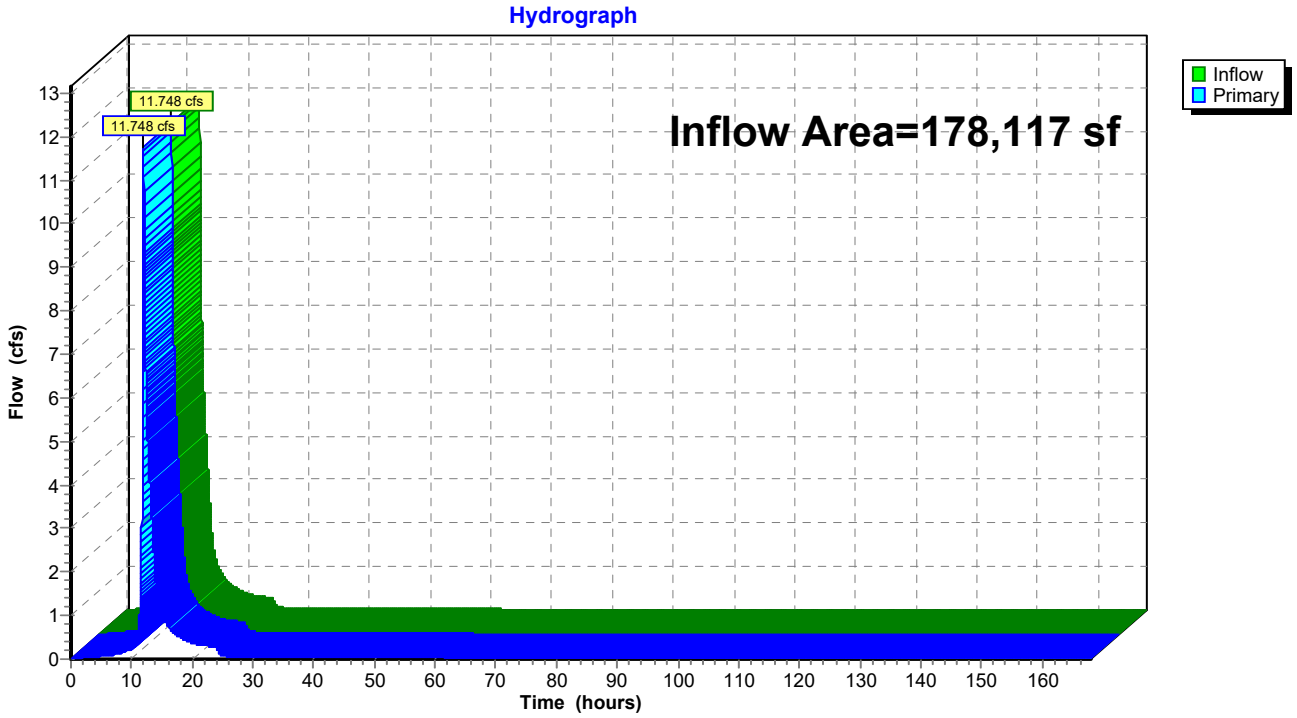


Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 178,117 sf, 79.75% Impervious, Inflow Depth = 5.11" for 50-yr event
Inflow = 11.748 cfs @ 11.98 hrs, Volume= 75,778 cf
Primary = 11.748 cfs @ 11.98 hrs, Volume= 75,778 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : POST-DEV TO POI#1

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 10L: POST-DEV TO DA #1

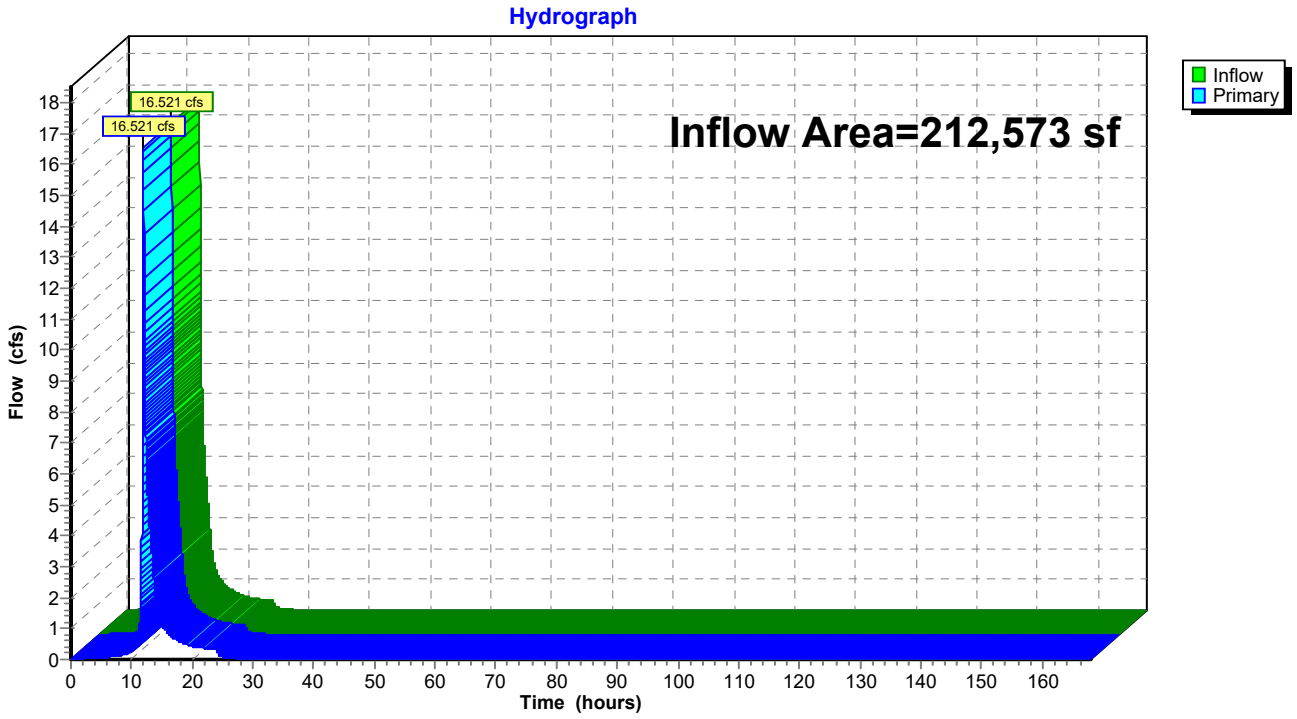


Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 212,573 sf, 74.32% Impervious, Inflow Depth = 4.81" for 50-yr event
Inflow = 16.521 cfs @ 11.97 hrs, Volume= 85,235 cf
Primary = 16.521 cfs @ 11.97 hrs, Volume= 85,235 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 12L: POST-DEV TO POI#1

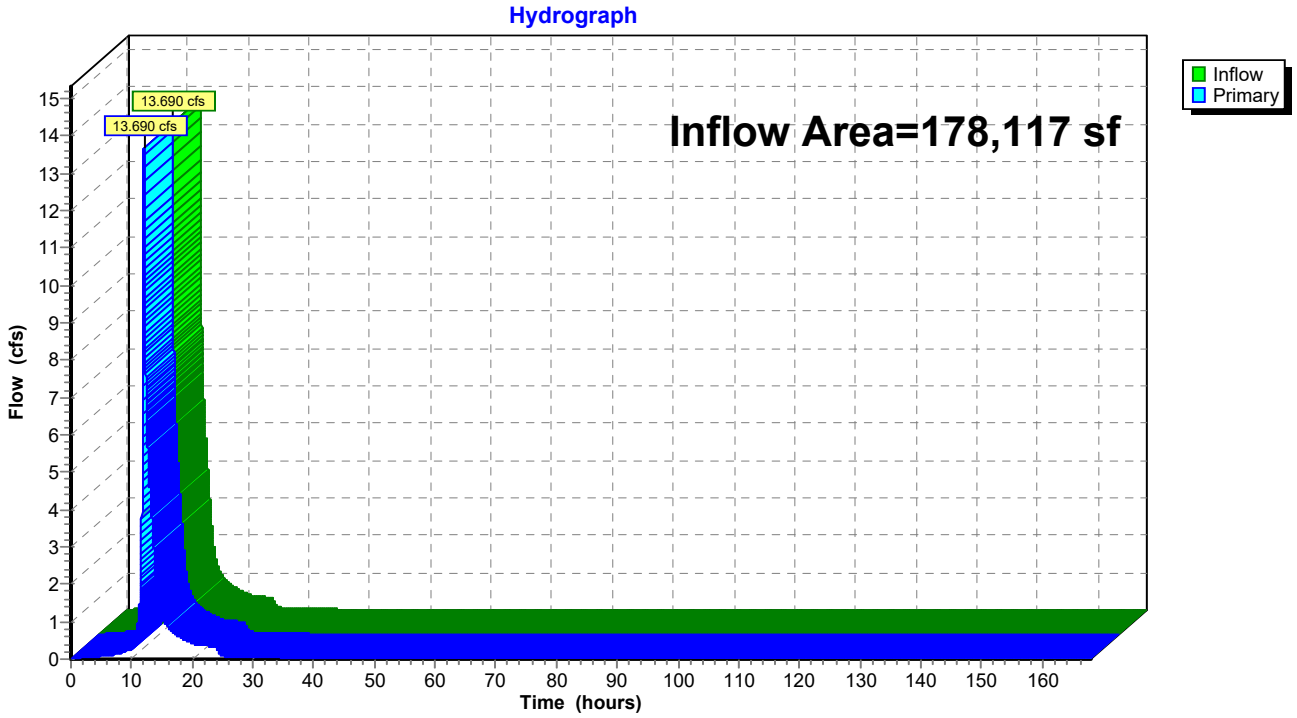


Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 178,117 sf, 79.75% Impervious, Inflow Depth = 5.96" for 100-yr event
Inflow = 13.690 cfs @ 12.03 hrs, Volume= 88,419 cf
Primary = 13.690 cfs @ 12.03 hrs, Volume= 88,419 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : POST-DEV TO POI#1

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 10L: POST-DEV TO DA #1

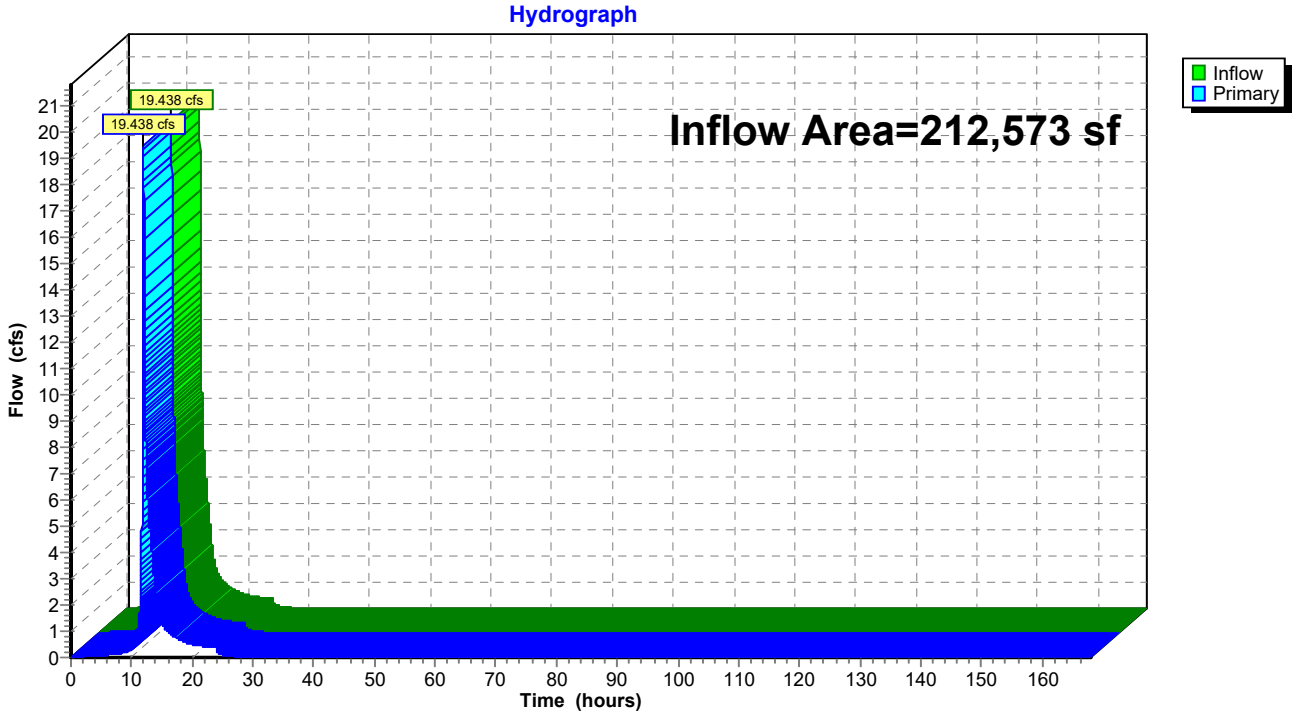


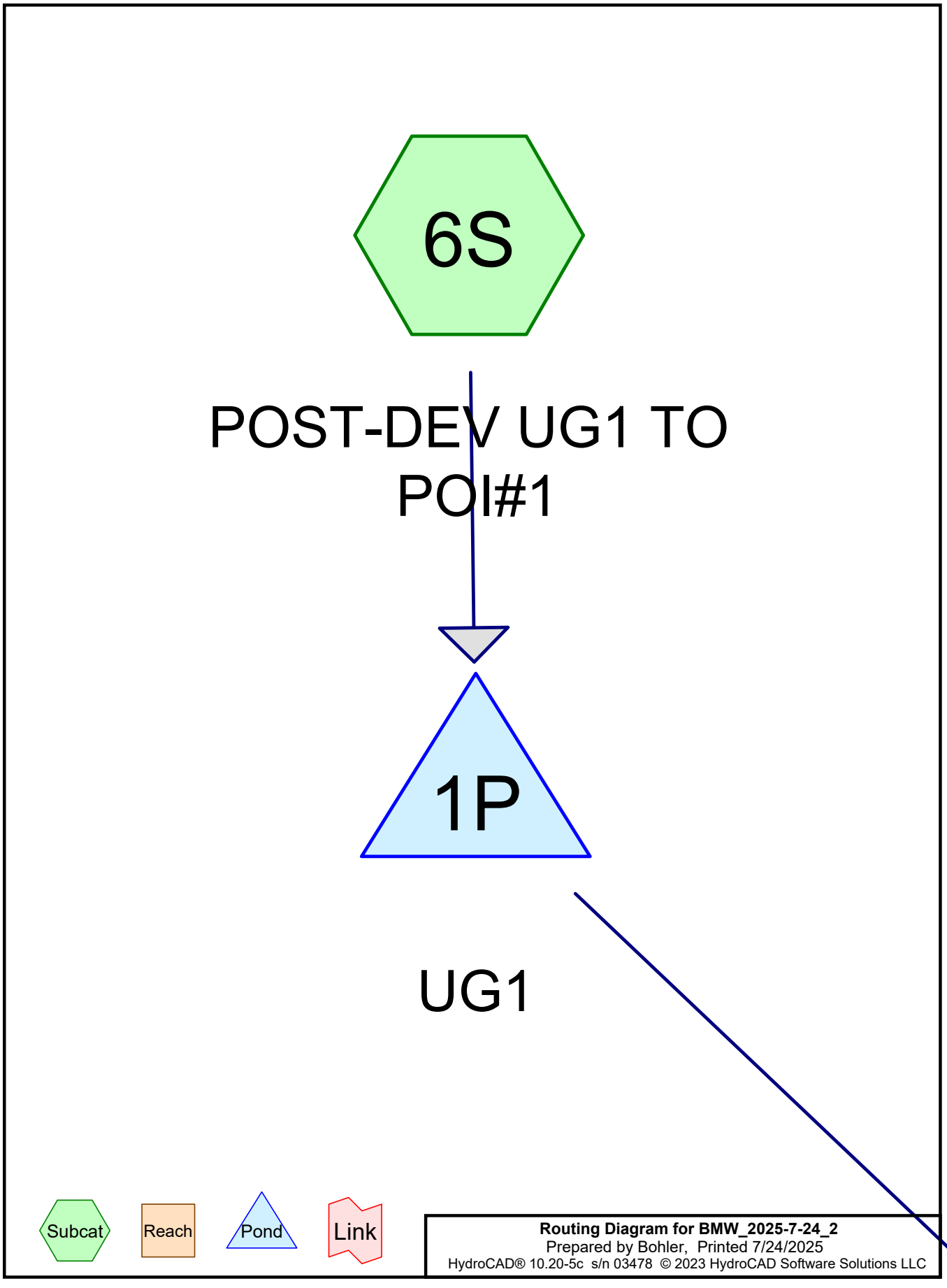
Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 212,573 sf, 74.32% Impervious, Inflow Depth = 5.65" for 100-yr event
Inflow = 19.438 cfs @ 11.97 hrs, Volume= 100,083 cf
Primary = 19.438 cfs @ 11.97 hrs, Volume= 100,083 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 12L: POST-DEV TO POI#1




6S
POST-DEV UG1 TO POI#1
1P
UG1
Subcat
Reach
Pond
Link
Routing Diagram for BMW_2025-7-24_2
Prepared by Bohler, Printed 7/24/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1.2 Inch MRC	NJ DEP 2-hr		Default	2.00	1	1.20	2

Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

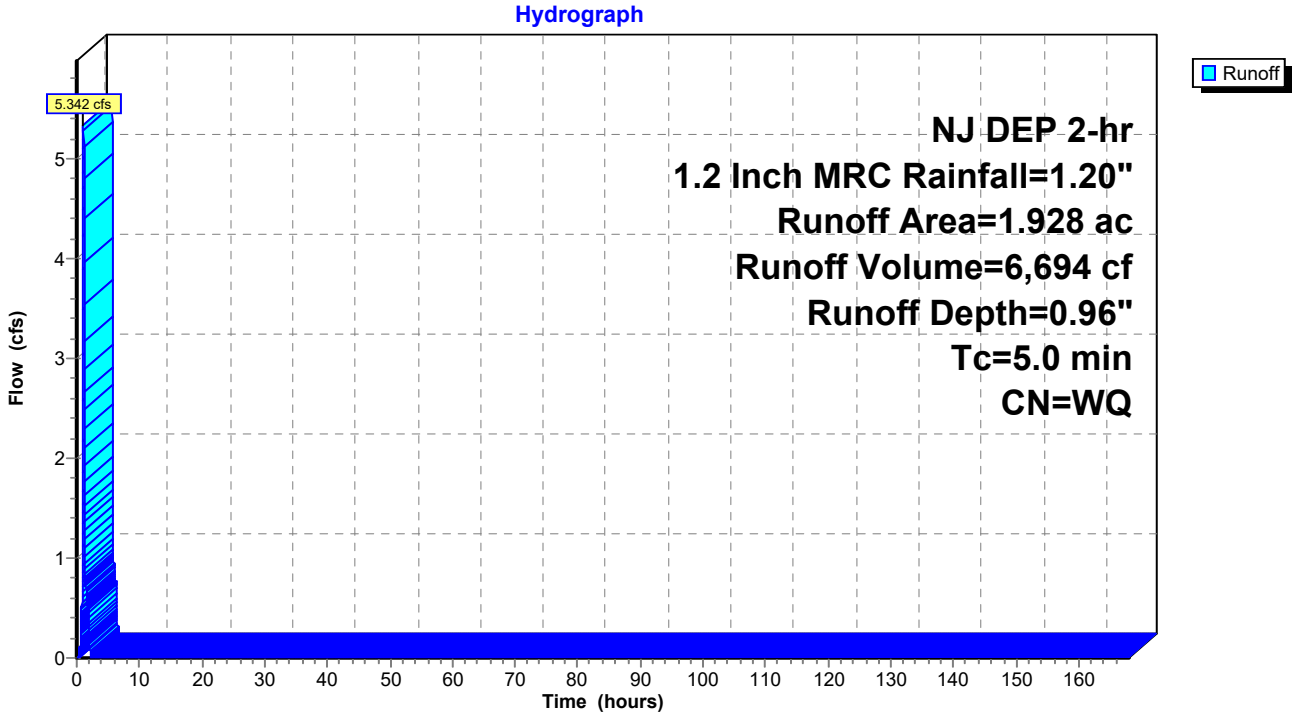
Runoff = 5.342 cfs @ 1.10 hrs, Volume= 6,694 cf, Depth= 0.96"
Routed to Pond 1P : UG1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
NJ DEP 2-hr 1.2 Inch MRC Rainfall=1.20"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928		Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: POST-DEV UG1 TO POI#1



Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.000	10.20	1.20	0.81	0.000
0.20	0.02	0.00	0.000	10.40	1.20	0.81	0.000
0.40	0.07	0.00	0.033	10.60	1.20	0.81	0.000
0.60	0.13	0.01	0.288	10.80	1.20	0.81	0.000
0.80	0.23	0.04	0.562	11.00	1.20	0.81	0.000
1.00	0.60	0.29	**3.892**	11.20	1.20	0.81	0.000
1.20	0.97	0.61	**2.485**	11.40	1.20	0.81	0.000
1.40	1.07	0.69	0.735	11.60	1.20	0.81	0.000
1.60	1.13	0.75	0.565	11.80	1.20	0.81	0.000
1.80	1.18	0.80	0.449	12.00	1.20	0.81	0.000
2.00	**1.20**	**0.81**	0.177	12.20	1.20	0.81	0.000
2.20	1.20	0.81	0.002	12.40	1.20	0.81	0.000
2.40	1.20	0.81	0.000	12.60	1.20	0.81	0.000
2.60	1.20	0.81	0.000	12.80	1.20	0.81	0.000
2.80	1.20	0.81	0.000	13.00	1.20	0.81	0.000
3.00	1.20	0.81	0.000	13.20	1.20	0.81	0.000
3.20	1.20	0.81	0.000	13.40	1.20	0.81	0.000
3.40	1.20	0.81	0.000	13.60	1.20	0.81	0.000
3.60	1.20	0.81	0.000	13.80	1.20	0.81	0.000
3.80	1.20	0.81	0.000	14.00	1.20	0.81	0.000
4.00	1.20	0.81	0.000	14.20	1.20	0.81	0.000
4.20	1.20	0.81	0.000	14.40	1.20	0.81	0.000
4.40	1.20	0.81	0.000	14.60	1.20	0.81	0.000
4.60	1.20	0.81	0.000	14.80	1.20	0.81	0.000
4.80	1.20	0.81	0.000	15.00	1.20	0.81	0.000
5.00	1.20	0.81	0.000	15.20	1.20	0.81	0.000
5.20	1.20	0.81	0.000	15.40	1.20	0.81	0.000
5.40	1.20	0.81	0.000	15.60	1.20	0.81	0.000
5.60	1.20	0.81	0.000	15.80	1.20	0.81	0.000
5.80	1.20	0.81	0.000	16.00	1.20	0.81	0.000
6.00	1.20	0.81	0.000	16.20	1.20	0.81	0.000
6.20	1.20	0.81	0.000	16.40	1.20	0.81	0.000
6.40	1.20	0.81	0.000	16.60	1.20	0.81	0.000
6.60	1.20	0.81	0.000	16.80	1.20	0.81	0.000
6.80	1.20	0.81	0.000	17.00	1.20	0.81	0.000
7.00	1.20	0.81	0.000	17.20	1.20	0.81	0.000
7.20	1.20	0.81	0.000	17.40	1.20	0.81	0.000
7.40	1.20	0.81	0.000	17.60	1.20	0.81	0.000
7.60	1.20	0.81	0.000	17.80	1.20	0.81	0.000
7.80	1.20	0.81	0.000	18.00	1.20	0.81	0.000
8.00	1.20	0.81	0.000	18.20	1.20	0.81	0.000
8.20	1.20	0.81	0.000	18.40	1.20	0.81	0.000
8.40	1.20	0.81	0.000	18.60	1.20	0.81	0.000
8.60	1.20	0.81	0.000	18.80	1.20	0.81	0.000
8.80	1.20	0.81	0.000	19.00	1.20	0.81	0.000
9.00	1.20	0.81	0.000	19.20	1.20	0.81	0.000
9.20	1.20	0.81	0.000	19.40	1.20	0.81	0.000
9.40	1.20	0.81	0.000	19.60	1.20	0.81	0.000
9.60	1.20	0.81	0.000	19.80	1.20	0.81	0.000
9.80	1.20	0.81	0.000	20.00	1.20	0.81	0.000
10.00	1.20	0.81	0.000	20.20	1.20	0.81	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
20.40	1.20	0.81	0.000	30.60	1.20	0.81	0.000
20.60	1.20	0.81	0.000	30.80	1.20	0.81	0.000
20.80	1.20	0.81	0.000	31.00	1.20	0.81	0.000
21.00	1.20	0.81	0.000	31.20	1.20	0.81	0.000
21.20	1.20	0.81	0.000	31.40	1.20	0.81	0.000
21.40	1.20	0.81	0.000	31.60	1.20	0.81	0.000
21.60	1.20	0.81	0.000	31.80	1.20	0.81	0.000
21.80	1.20	0.81	0.000	32.00	1.20	0.81	0.000
22.00	1.20	0.81	0.000	32.20	1.20	0.81	0.000
22.20	1.20	0.81	0.000	32.40	1.20	0.81	0.000
22.40	1.20	0.81	0.000	32.60	1.20	0.81	0.000
22.60	1.20	0.81	0.000	32.80	1.20	0.81	0.000
22.80	1.20	0.81	0.000	33.00	1.20	0.81	0.000
23.00	1.20	0.81	0.000	33.20	1.20	0.81	0.000
23.20	1.20	0.81	0.000	33.40	1.20	0.81	0.000
23.40	1.20	0.81	0.000	33.60	1.20	0.81	0.000
23.60	1.20	0.81	0.000	33.80	1.20	0.81	0.000
23.80	1.20	0.81	0.000	34.00	1.20	0.81	0.000
24.00	1.20	0.81	0.000	34.20	1.20	0.81	0.000
24.20	1.20	0.81	0.000	34.40	1.20	0.81	0.000
24.40	1.20	0.81	0.000	34.60	1.20	0.81	0.000
24.60	1.20	0.81	0.000	34.80	1.20	0.81	0.000
24.80	1.20	0.81	0.000	35.00	1.20	0.81	0.000
25.00	1.20	0.81	0.000	35.20	1.20	0.81	0.000
25.20	1.20	0.81	0.000	35.40	1.20	0.81	0.000
25.40	1.20	0.81	0.000	35.60	1.20	0.81	0.000
25.60	1.20	0.81	0.000	35.80	1.20	0.81	0.000
25.80	1.20	0.81	0.000	36.00	1.20	0.81	0.000
26.00	1.20	0.81	0.000	36.20	1.20	0.81	0.000
26.20	1.20	0.81	0.000	36.40	1.20	0.81	0.000
26.40	1.20	0.81	0.000	36.60	1.20	0.81	0.000
26.60	1.20	0.81	0.000	36.80	1.20	0.81	0.000
26.80	1.20	0.81	0.000	37.00	1.20	0.81	0.000
27.00	1.20	0.81	0.000	37.20	1.20	0.81	0.000
27.20	1.20	0.81	0.000	37.40	1.20	0.81	0.000
27.40	1.20	0.81	0.000	37.60	1.20	0.81	0.000
27.60	1.20	0.81	0.000	37.80	1.20	0.81	0.000
27.80	1.20	0.81	0.000	38.00	1.20	0.81	0.000
28.00	1.20	0.81	0.000	38.20	1.20	0.81	0.000
28.20	1.20	0.81	0.000	38.40	1.20	0.81	0.000
28.40	1.20	0.81	0.000	38.60	1.20	0.81	0.000
28.60	1.20	0.81	0.000	38.80	1.20	0.81	0.000
28.80	1.20	0.81	0.000	39.00	1.20	0.81	0.000
29.00	1.20	0.81	0.000	39.20	1.20	0.81	0.000
29.20	1.20	0.81	0.000	39.40	1.20	0.81	0.000
29.40	1.20	0.81	0.000	39.60	1.20	0.81	0.000
29.60	1.20	0.81	0.000	39.80	1.20	0.81	0.000
29.80	1.20	0.81	0.000	40.00	1.20	0.81	0.000
30.00	1.20	0.81	0.000	40.20	1.20	0.81	0.000
30.20	1.20	0.81	0.000	40.40	1.20	0.81	0.000
30.40	1.20	0.81	0.000	40.60	1.20	0.81	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
40.80	1.20	0.81	0.000	51.00	1.20	0.81	0.000
41.00	1.20	0.81	0.000	51.20	1.20	0.81	0.000
41.20	1.20	0.81	0.000	51.40	1.20	0.81	0.000
41.40	1.20	0.81	0.000	51.60	1.20	0.81	0.000
41.60	1.20	0.81	0.000	51.80	1.20	0.81	0.000
41.80	1.20	0.81	0.000	52.00	1.20	0.81	0.000
42.00	1.20	0.81	0.000	52.20	1.20	0.81	0.000
42.20	1.20	0.81	0.000	52.40	1.20	0.81	0.000
42.40	1.20	0.81	0.000	52.60	1.20	0.81	0.000
42.60	1.20	0.81	0.000	52.80	1.20	0.81	0.000
42.80	1.20	0.81	0.000	53.00	1.20	0.81	0.000
43.00	1.20	0.81	0.000	53.20	1.20	0.81	0.000
43.20	1.20	0.81	0.000	53.40	1.20	0.81	0.000
43.40	1.20	0.81	0.000	53.60	1.20	0.81	0.000
43.60	1.20	0.81	0.000	53.80	1.20	0.81	0.000
43.80	1.20	0.81	0.000	54.00	1.20	0.81	0.000
44.00	1.20	0.81	0.000	54.20	1.20	0.81	0.000
44.20	1.20	0.81	0.000	54.40	1.20	0.81	0.000
44.40	1.20	0.81	0.000	54.60	1.20	0.81	0.000
44.60	1.20	0.81	0.000	54.80	1.20	0.81	0.000
44.80	1.20	0.81	0.000	55.00	1.20	0.81	0.000
45.00	1.20	0.81	0.000	55.20	1.20	0.81	0.000
45.20	1.20	0.81	0.000	55.40	1.20	0.81	0.000
45.40	1.20	0.81	0.000	55.60	1.20	0.81	0.000
45.60	1.20	0.81	0.000	55.80	1.20	0.81	0.000
45.80	1.20	0.81	0.000	56.00	1.20	0.81	0.000
46.00	1.20	0.81	0.000	56.20	1.20	0.81	0.000
46.20	1.20	0.81	0.000	56.40	1.20	0.81	0.000
46.40	1.20	0.81	0.000	56.60	1.20	0.81	0.000
46.60	1.20	0.81	0.000	56.80	1.20	0.81	0.000
46.80	1.20	0.81	0.000	57.00	1.20	0.81	0.000
47.00	1.20	0.81	0.000	57.20	1.20	0.81	0.000
47.20	1.20	0.81	0.000	57.40	1.20	0.81	0.000
47.40	1.20	0.81	0.000	57.60	1.20	0.81	0.000
47.60	1.20	0.81	0.000	57.80	1.20	0.81	0.000
47.80	1.20	0.81	0.000	58.00	1.20	0.81	0.000
48.00	1.20	0.81	0.000	58.20	1.20	0.81	0.000
48.20	1.20	0.81	0.000	58.40	1.20	0.81	0.000
48.40	1.20	0.81	0.000	58.60	1.20	0.81	0.000
48.60	1.20	0.81	0.000	58.80	1.20	0.81	0.000
48.80	1.20	0.81	0.000	59.00	1.20	0.81	0.000
49.00	1.20	0.81	0.000	59.20	1.20	0.81	0.000
49.20	1.20	0.81	0.000	59.40	1.20	0.81	0.000
49.40	1.20	0.81	0.000	59.60	1.20	0.81	0.000
49.60	1.20	0.81	0.000	59.80	1.20	0.81	0.000
49.80	1.20	0.81	0.000	60.00	1.20	0.81	0.000
50.00	1.20	0.81	0.000	60.20	1.20	0.81	0.000
50.20	1.20	0.81	0.000	60.40	1.20	0.81	0.000
50.40	1.20	0.81	0.000	60.60	1.20	0.81	0.000
50.60	1.20	0.81	0.000	60.80	1.20	0.81	0.000
50.80	1.20	0.81	0.000	61.00	1.20	0.81	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
61.20	1.20	0.81	0.000	71.40	1.20	0.81	0.000
61.40	1.20	0.81	0.000	71.60	1.20	0.81	0.000
61.60	1.20	0.81	0.000	71.80	1.20	0.81	0.000
61.80	1.20	0.81	0.000	72.00	1.20	0.81	0.000
62.00	1.20	0.81	0.000	72.20	1.20	0.81	0.000
62.20	1.20	0.81	0.000	72.40	1.20	0.81	0.000
62.40	1.20	0.81	0.000	72.60	1.20	0.81	0.000
62.60	1.20	0.81	0.000	72.80	1.20	0.81	0.000
62.80	1.20	0.81	0.000	73.00	1.20	0.81	0.000
63.00	1.20	0.81	0.000	73.20	1.20	0.81	0.000
63.20	1.20	0.81	0.000	73.40	1.20	0.81	0.000
63.40	1.20	0.81	0.000	73.60	1.20	0.81	0.000
63.60	1.20	0.81	0.000	73.80	1.20	0.81	0.000
63.80	1.20	0.81	0.000	74.00	1.20	0.81	0.000
64.00	1.20	0.81	0.000	74.20	1.20	0.81	0.000
64.20	1.20	0.81	0.000	74.40	1.20	0.81	0.000
64.40	1.20	0.81	0.000	74.60	1.20	0.81	0.000
64.60	1.20	0.81	0.000	74.80	1.20	0.81	0.000
64.80	1.20	0.81	0.000	75.00	1.20	0.81	0.000
65.00	1.20	0.81	0.000	75.20	1.20	0.81	0.000
65.20	1.20	0.81	0.000	75.40	1.20	0.81	0.000
65.40	1.20	0.81	0.000	75.60	1.20	0.81	0.000
65.60	1.20	0.81	0.000	75.80	1.20	0.81	0.000
65.80	1.20	0.81	0.000	76.00	1.20	0.81	0.000
66.00	1.20	0.81	0.000	76.20	1.20	0.81	0.000
66.20	1.20	0.81	0.000	76.40	1.20	0.81	0.000
66.40	1.20	0.81	0.000	76.60	1.20	0.81	0.000
66.60	1.20	0.81	0.000	76.80	1.20	0.81	0.000
66.80	1.20	0.81	0.000	77.00	1.20	0.81	0.000
67.00	1.20	0.81	0.000	77.20	1.20	0.81	0.000
67.20	1.20	0.81	0.000	77.40	1.20	0.81	0.000
67.40	1.20	0.81	0.000	77.60	1.20	0.81	0.000
67.60	1.20	0.81	0.000	77.80	1.20	0.81	0.000
67.80	1.20	0.81	0.000	78.00	1.20	0.81	0.000
68.00	1.20	0.81	0.000	78.20	1.20	0.81	0.000
68.20	1.20	0.81	0.000	78.40	1.20	0.81	0.000
68.40	1.20	0.81	0.000	78.60	1.20	0.81	0.000
68.60	1.20	0.81	0.000	78.80	1.20	0.81	0.000
68.80	1.20	0.81	0.000	79.00	1.20	0.81	0.000
69.00	1.20	0.81	0.000	79.20	1.20	0.81	0.000
69.20	1.20	0.81	0.000	79.40	1.20	0.81	0.000
69.40	1.20	0.81	0.000	79.60	1.20	0.81	0.000
69.60	1.20	0.81	0.000	79.80	1.20	0.81	0.000
69.80	1.20	0.81	0.000	80.00	1.20	0.81	0.000
70.00	1.20	0.81	0.000	80.20	1.20	0.81	0.000
70.20	1.20	0.81	0.000	80.40	1.20	0.81	0.000
70.40	1.20	0.81	0.000	80.60	1.20	0.81	0.000
70.60	1.20	0.81	0.000	80.80	1.20	0.81	0.000
70.80	1.20	0.81	0.000	81.00	1.20	0.81	0.000
71.00	1.20	0.81	0.000	81.20	1.20	0.81	0.000
71.20	1.20	0.81	0.000	81.40	1.20	0.81	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
81.60	1.20	0.81	0.000	91.80	1.20	0.81	0.000
81.80	1.20	0.81	0.000	92.00	1.20	0.81	0.000
82.00	1.20	0.81	0.000	92.20	1.20	0.81	0.000
82.20	1.20	0.81	0.000	92.40	1.20	0.81	0.000
82.40	1.20	0.81	0.000	92.60	1.20	0.81	0.000
82.60	1.20	0.81	0.000	92.80	1.20	0.81	0.000
82.80	1.20	0.81	0.000	93.00	1.20	0.81	0.000
83.00	1.20	0.81	0.000	93.20	1.20	0.81	0.000
83.20	1.20	0.81	0.000	93.40	1.20	0.81	0.000
83.40	1.20	0.81	0.000	93.60	1.20	0.81	0.000
83.60	1.20	0.81	0.000	93.80	1.20	0.81	0.000
83.80	1.20	0.81	0.000	94.00	1.20	0.81	0.000
84.00	1.20	0.81	0.000	94.20	1.20	0.81	0.000
84.20	1.20	0.81	0.000	94.40	1.20	0.81	0.000
84.40	1.20	0.81	0.000	94.60	1.20	0.81	0.000
84.60	1.20	0.81	0.000	94.80	1.20	0.81	0.000
84.80	1.20	0.81	0.000	95.00	1.20	0.81	0.000
85.00	1.20	0.81	0.000	95.20	1.20	0.81	0.000
85.20	1.20	0.81	0.000	95.40	1.20	0.81	0.000
85.40	1.20	0.81	0.000	95.60	1.20	0.81	0.000
85.60	1.20	0.81	0.000	95.80	1.20	0.81	0.000
85.80	1.20	0.81	0.000	96.00	1.20	0.81	0.000
86.00	1.20	0.81	0.000	96.20	1.20	0.81	0.000
86.20	1.20	0.81	0.000	96.40	1.20	0.81	0.000
86.40	1.20	0.81	0.000	96.60	1.20	0.81	0.000
86.60	1.20	0.81	0.000	96.80	1.20	0.81	0.000
86.80	1.20	0.81	0.000	97.00	1.20	0.81	0.000
87.00	1.20	0.81	0.000	97.20	1.20	0.81	0.000
87.20	1.20	0.81	0.000	97.40	1.20	0.81	0.000
87.40	1.20	0.81	0.000	97.60	1.20	0.81	0.000
87.60	1.20	0.81	0.000	97.80	1.20	0.81	0.000
87.80	1.20	0.81	0.000	98.00	1.20	0.81	0.000
88.00	1.20	0.81	0.000	98.20	1.20	0.81	0.000
88.20	1.20	0.81	0.000	98.40	1.20	0.81	0.000
88.40	1.20	0.81	0.000	98.60	1.20	0.81	0.000
88.60	1.20	0.81	0.000	98.80	1.20	0.81	0.000
88.80	1.20	0.81	0.000	99.00	1.20	0.81	0.000
89.00	1.20	0.81	0.000	99.20	1.20	0.81	0.000
89.20	1.20	0.81	0.000	99.40	1.20	0.81	0.000
89.40	1.20	0.81	0.000	99.60	1.20	0.81	0.000
89.60	1.20	0.81	0.000	99.80	1.20	0.81	0.000
89.80	1.20	0.81	0.000	100.00	1.20	0.81	0.000
90.00	1.20	0.81	0.000	100.20	1.20	0.81	0.000
90.20	1.20	0.81	0.000	100.40	1.20	0.81	0.000
90.40	1.20	0.81	0.000	100.60	1.20	0.81	0.000
90.60	1.20	0.81	0.000	100.80	1.20	0.81	0.000
90.80	1.20	0.81	0.000	101.00	1.20	0.81	0.000
91.00	1.20	0.81	0.000	101.20	1.20	0.81	0.000
91.20	1.20	0.81	0.000	101.40	1.20	0.81	0.000
91.40	1.20	0.81	0.000	101.60	1.20	0.81	0.000
91.60	1.20	0.81	0.000	101.80	1.20	0.81	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
102.00	1.20	0.81	0.000	112.20	1.20	0.81	0.000
102.20	1.20	0.81	0.000	112.40	1.20	0.81	0.000
102.40	1.20	0.81	0.000	112.60	1.20	0.81	0.000
102.60	1.20	0.81	0.000	112.80	1.20	0.81	0.000
102.80	1.20	0.81	0.000	113.00	1.20	0.81	0.000
103.00	1.20	0.81	0.000	113.20	1.20	0.81	0.000
103.20	1.20	0.81	0.000	113.40	1.20	0.81	0.000
103.40	1.20	0.81	0.000	113.60	1.20	0.81	0.000
103.60	1.20	0.81	0.000	113.80	1.20	0.81	0.000
103.80	1.20	0.81	0.000	114.00	1.20	0.81	0.000
104.00	1.20	0.81	0.000	114.20	1.20	0.81	0.000
104.20	1.20	0.81	0.000	114.40	1.20	0.81	0.000
104.40	1.20	0.81	0.000	114.60	1.20	0.81	0.000
104.60	1.20	0.81	0.000	114.80	1.20	0.81	0.000
104.80	1.20	0.81	0.000	115.00	1.20	0.81	0.000
105.00	1.20	0.81	0.000	115.20	1.20	0.81	0.000
105.20	1.20	0.81	0.000	115.40	1.20	0.81	0.000
105.40	1.20	0.81	0.000	115.60	1.20	0.81	0.000
105.60	1.20	0.81	0.000	115.80	1.20	0.81	0.000
105.80	1.20	0.81	0.000	116.00	1.20	0.81	0.000
106.00	1.20	0.81	0.000	116.20	1.20	0.81	0.000
106.20	1.20	0.81	0.000	116.40	1.20	0.81	0.000
106.40	1.20	0.81	0.000	116.60	1.20	0.81	0.000
106.60	1.20	0.81	0.000	116.80	1.20	0.81	0.000
106.80	1.20	0.81	0.000	117.00	1.20	0.81	0.000
107.00	1.20	0.81	0.000	117.20	1.20	0.81	0.000
107.20	1.20	0.81	0.000	117.40	1.20	0.81	0.000
107.40	1.20	0.81	0.000	117.60	1.20	0.81	0.000
107.60	1.20	0.81	0.000	117.80	1.20	0.81	0.000
107.80	1.20	0.81	0.000	118.00	1.20	0.81	0.000
108.00	1.20	0.81	0.000	118.20	1.20	0.81	0.000
108.20	1.20	0.81	0.000	118.40	1.20	0.81	0.000
108.40	1.20	0.81	0.000	118.60	1.20	0.81	0.000
108.60	1.20	0.81	0.000	118.80	1.20	0.81	0.000
108.80	1.20	0.81	0.000	119.00	1.20	0.81	0.000
109.00	1.20	0.81	0.000	119.20	1.20	0.81	0.000
109.20	1.20	0.81	0.000	119.40	1.20	0.81	0.000
109.40	1.20	0.81	0.000	119.60	1.20	0.81	0.000
109.60	1.20	0.81	0.000	119.80	1.20	0.81	0.000
109.80	1.20	0.81	0.000	120.00	1.20	0.81	0.000
110.00	1.20	0.81	0.000	120.20	1.20	0.81	0.000
110.20	1.20	0.81	0.000	120.40	1.20	0.81	0.000
110.40	1.20	0.81	0.000	120.60	1.20	0.81	0.000
110.60	1.20	0.81	0.000	120.80	1.20	0.81	0.000
110.80	1.20	0.81	0.000	121.00	1.20	0.81	0.000
111.00	1.20	0.81	0.000	121.20	1.20	0.81	0.000
111.20	1.20	0.81	0.000	121.40	1.20	0.81	0.000
111.40	1.20	0.81	0.000	121.60	1.20	0.81	0.000
111.60	1.20	0.81	0.000	121.80	1.20	0.81	0.000
111.80	1.20	0.81	0.000	122.00	1.20	0.81	0.000
112.00	1.20	0.81	0.000	122.20	1.20	0.81	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
122.40	1.20	0.81	0.000	132.60	1.20	0.81	0.000
122.60	1.20	0.81	0.000	132.80	1.20	0.81	0.000
122.80	1.20	0.81	0.000	133.00	1.20	0.81	0.000
123.00	1.20	0.81	0.000	133.20	1.20	0.81	0.000
123.20	1.20	0.81	0.000	133.40	1.20	0.81	0.000
123.40	1.20	0.81	0.000	133.60	1.20	0.81	0.000
123.60	1.20	0.81	0.000	133.80	1.20	0.81	0.000
123.80	1.20	0.81	0.000	134.00	1.20	0.81	0.000
124.00	1.20	0.81	0.000	134.20	1.20	0.81	0.000
124.20	1.20	0.81	0.000	134.40	1.20	0.81	0.000
124.40	1.20	0.81	0.000	134.60	1.20	0.81	0.000
124.60	1.20	0.81	0.000	134.80	1.20	0.81	0.000
124.80	1.20	0.81	0.000	135.00	1.20	0.81	0.000
125.00	1.20	0.81	0.000	135.20	1.20	0.81	0.000
125.20	1.20	0.81	0.000	135.40	1.20	0.81	0.000
125.40	1.20	0.81	0.000	135.60	1.20	0.81	0.000
125.60	1.20	0.81	0.000	135.80	1.20	0.81	0.000
125.80	1.20	0.81	0.000	136.00	1.20	0.81	0.000
126.00	1.20	0.81	0.000	136.20	1.20	0.81	0.000
126.20	1.20	0.81	0.000	136.40	1.20	0.81	0.000
126.40	1.20	0.81	0.000	136.60	1.20	0.81	0.000
126.60	1.20	0.81	0.000	136.80	1.20	0.81	0.000
126.80	1.20	0.81	0.000	137.00	1.20	0.81	0.000
127.00	1.20	0.81	0.000	137.20	1.20	0.81	0.000
127.20	1.20	0.81	0.000	137.40	1.20	0.81	0.000
127.40	1.20	0.81	0.000	137.60	1.20	0.81	0.000
127.60	1.20	0.81	0.000	137.80	1.20	0.81	0.000
127.80	1.20	0.81	0.000	138.00	1.20	0.81	0.000
128.00	1.20	0.81	0.000	138.20	1.20	0.81	0.000
128.20	1.20	0.81	0.000	138.40	1.20	0.81	0.000
128.40	1.20	0.81	0.000	138.60	1.20	0.81	0.000
128.60	1.20	0.81	0.000	138.80	1.20	0.81	0.000
128.80	1.20	0.81	0.000	139.00	1.20	0.81	0.000
129.00	1.20	0.81	0.000	139.20	1.20	0.81	0.000
129.20	1.20	0.81	0.000	139.40	1.20	0.81	0.000
129.40	1.20	0.81	0.000	139.60	1.20	0.81	0.000
129.60	1.20	0.81	0.000	139.80	1.20	0.81	0.000
129.80	1.20	0.81	0.000	140.00	1.20	0.81	0.000
130.00	1.20	0.81	0.000	140.20	1.20	0.81	0.000
130.20	1.20	0.81	0.000	140.40	1.20	0.81	0.000
130.40	1.20	0.81	0.000	140.60	1.20	0.81	0.000
130.60	1.20	0.81	0.000	140.80	1.20	0.81	0.000
130.80	1.20	0.81	0.000	141.00	1.20	0.81	0.000
131.00	1.20	0.81	0.000	141.20	1.20	0.81	0.000
131.20	1.20	0.81	0.000	141.40	1.20	0.81	0.000
131.40	1.20	0.81	0.000	141.60	1.20	0.81	0.000
131.60	1.20	0.81	0.000	141.80	1.20	0.81	0.000
131.80	1.20	0.81	0.000	142.00	1.20	0.81	0.000
132.00	1.20	0.81	0.000	142.20	1.20	0.81	0.000
132.20	1.20	0.81	0.000	142.40	1.20	0.81	0.000
132.40	1.20	0.81	0.000	142.60	1.20	0.81	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
142.80	1.20	0.81	0.000	153.00	1.20	0.81	0.000
143.00	1.20	0.81	0.000	153.20	1.20	0.81	0.000
143.20	1.20	0.81	0.000	153.40	1.20	0.81	0.000
143.40	1.20	0.81	0.000	153.60	1.20	0.81	0.000
143.60	1.20	0.81	0.000	153.80	1.20	0.81	0.000
143.80	1.20	0.81	0.000	154.00	1.20	0.81	0.000
144.00	1.20	0.81	0.000	154.20	1.20	0.81	0.000
144.20	1.20	0.81	0.000	154.40	1.20	0.81	0.000
144.40	1.20	0.81	0.000	154.60	1.20	0.81	0.000
144.60	1.20	0.81	0.000	154.80	1.20	0.81	0.000
144.80	1.20	0.81	0.000	155.00	1.20	0.81	0.000
145.00	1.20	0.81	0.000	155.20	1.20	0.81	0.000
145.20	1.20	0.81	0.000	155.40	1.20	0.81	0.000
145.40	1.20	0.81	0.000	155.60	1.20	0.81	0.000
145.60	1.20	0.81	0.000	155.80	1.20	0.81	0.000
145.80	1.20	0.81	0.000	156.00	1.20	0.81	0.000
146.00	1.20	0.81	0.000	156.20	1.20	0.81	0.000
146.20	1.20	0.81	0.000	156.40	1.20	0.81	0.000
146.40	1.20	0.81	0.000	156.60	1.20	0.81	0.000
146.60	1.20	0.81	0.000	156.80	1.20	0.81	0.000
146.80	1.20	0.81	0.000	157.00	1.20	0.81	0.000
147.00	1.20	0.81	0.000	157.20	1.20	0.81	0.000
147.20	1.20	0.81	0.000	157.40	1.20	0.81	0.000
147.40	1.20	0.81	0.000	157.60	1.20	0.81	0.000
147.60	1.20	0.81	0.000	157.80	1.20	0.81	0.000
147.80	1.20	0.81	0.000	158.00	1.20	0.81	0.000
148.00	1.20	0.81	0.000	158.20	1.20	0.81	0.000
148.20	1.20	0.81	0.000	158.40	1.20	0.81	0.000
148.40	1.20	0.81	0.000	158.60	1.20	0.81	0.000
148.60	1.20	0.81	0.000	158.80	1.20	0.81	0.000
148.80	1.20	0.81	0.000	159.00	1.20	0.81	0.000
149.00	1.20	0.81	0.000	159.20	1.20	0.81	0.000
149.20	1.20	0.81	0.000	159.40	1.20	0.81	0.000
149.40	1.20	0.81	0.000	159.60	1.20	0.81	0.000
149.60	1.20	0.81	0.000	159.80	1.20	0.81	0.000
149.80	1.20	0.81	0.000	160.00	1.20	0.81	0.000
150.00	1.20	0.81	0.000	160.20	1.20	0.81	0.000
150.20	1.20	0.81	0.000	160.40	1.20	0.81	0.000
150.40	1.20	0.81	0.000	160.60	1.20	0.81	0.000
150.60	1.20	0.81	0.000	160.80	1.20	0.81	0.000
150.80	1.20	0.81	0.000	161.00	1.20	0.81	0.000
151.00	1.20	0.81	0.000	161.20	1.20	0.81	0.000
151.20	1.20	0.81	0.000	161.40	1.20	0.81	0.000
151.40	1.20	0.81	0.000	161.60	1.20	0.81	0.000
151.60	1.20	0.81	0.000	161.80	1.20	0.81	0.000
151.80	1.20	0.81	0.000	162.00	1.20	0.81	0.000
152.00	1.20	0.81	0.000	162.20	1.20	0.81	0.000
152.20	1.20	0.81	0.000	162.40	1.20	0.81	0.000
152.40	1.20	0.81	0.000	162.60	1.20	0.81	0.000
152.60	1.20	0.81	0.000	162.80	1.20	0.81	0.000
152.80	1.20	0.81	0.000	163.00	1.20	0.81	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
163.20	1.20	0.81	0.000
163.40	1.20	0.81	0.000
163.60	1.20	0.81	0.000
163.80	1.20	0.81	0.000
164.00	1.20	0.81	0.000
164.20	1.20	0.81	0.000
164.40	1.20	0.81	0.000
164.60	1.20	0.81	0.000
164.80	1.20	0.81	0.000
165.00	1.20	0.81	0.000
165.20	1.20	0.81	0.000
165.40	1.20	0.81	0.000
165.60	1.20	0.81	0.000
165.80	1.20	0.81	0.000
166.00	1.20	0.81	0.000
166.20	1.20	0.81	0.000
166.40	1.20	0.81	0.000
166.60	1.20	0.81	0.000
166.80	1.20	0.81	0.000
167.00	1.20	0.81	0.000
167.20	1.20	0.81	0.000
167.40	1.20	0.81	0.000
167.60	1.20	0.81	0.000
167.80	1.20	0.81	0.000
168.00	1.20	0.81	0.000

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 0.96" for 1.2 Inch MRC event
Inflow = 5.342 cfs @ 1.10 hrs, Volume= 6,694 cf
Outflow = 0.023 cfs @ 2.12 hrs, Volume= 6,622 cf, Atten= 100%, Lag= 61.1 min
Primary = 0.023 cfs @ 2.12 hrs, Volume= 6,622 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 158.37' @ 2.12 hrs Surf.Area= 13,041 sf Storage= 6,596 cf

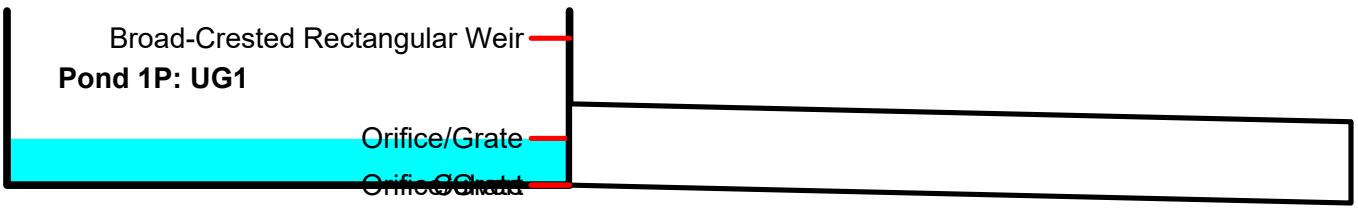
Plug-Flow detention time= 2,873.7 min calculated for 6,622 cf (99% of inflow)
Center-of-Mass det. time= 2,873.1 min (2,942.6 - 69.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.023 cfs @ 2.12 hrs HW=158.37' (Free Discharge)
└**4=Culvert** (Passes 0.023 cfs of 2.024 cfs potential flow)
  └**1=Orifice/Grate** (Orifice Controls 0.023 cfs @ 4.306 fps)
  └**2=Orifice/Grate** (Controls 0.000 cfs)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 1P: UG1 - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger®280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 27 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

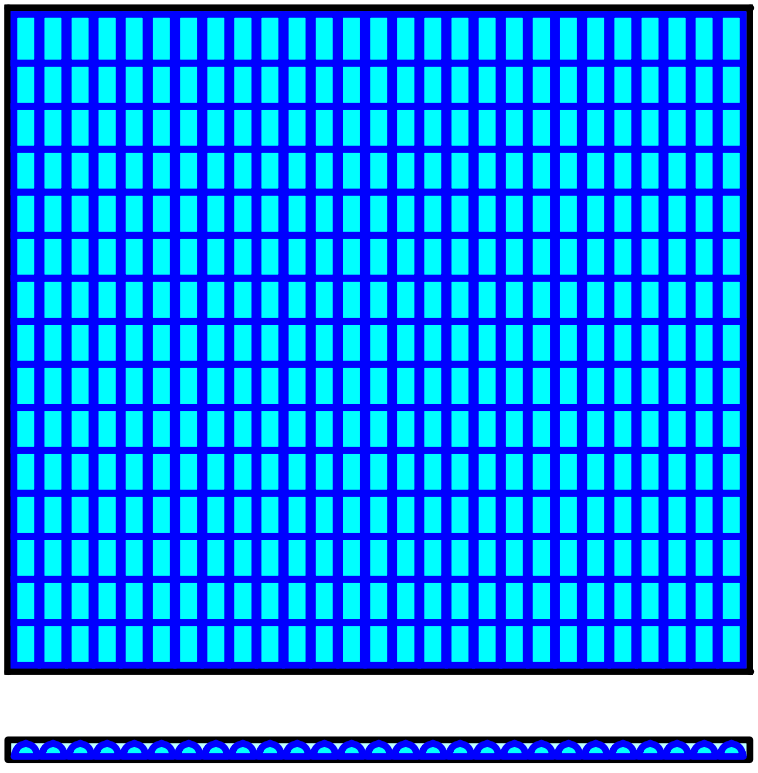
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

405 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 27 Rows = 17,377.3 cf Chamber Storage

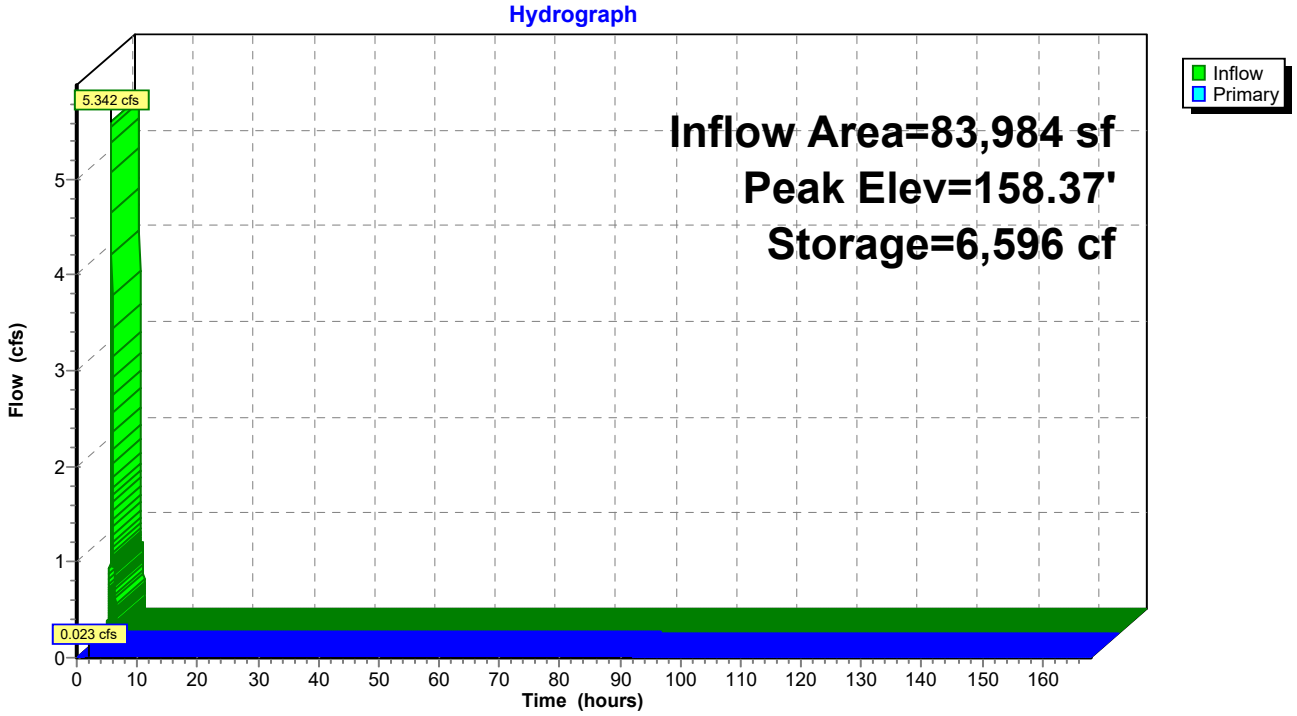
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

Chamber Storage + Stone Storage = 27,162.4 cf = 0.624 af
Overall Storage Efficiency = 64.9%
Overall System Size = 108.00' x 120.75' x 3.21'

405 Chambers
1,549.6 cy Field
906.0 cy Stone



Pond 1P: UG1


Hydrograph
Inflow Area=83,984 sf
Peak Elev=158.37'
Storage=6,596 cf
5.342 cfs
0.023 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.138	34	157.54	0.000
1.00	**3.892**	1,474	157.81	0.013
1.50	**0.699**	5,819	158.30	0.022
2.00	0.177	**6,559**	**158.37**	**0.023**
2.50	0.000	**6,566**	**158.37**	**0.023**
3.00	0.000	6,524	158.37	0.023
3.50	0.000	6,482	158.36	0.023
4.00	0.000	6,440	158.36	0.023
4.50	0.000	6,398	158.35	0.023
5.00	0.000	6,356	158.35	0.023
5.50	0.000	6,315	158.35	0.023
6.00	0.000	6,273	158.34	0.023
6.50	0.000	6,232	158.34	0.023
7.00	0.000	6,190	158.34	0.023
7.50	0.000	6,149	158.33	0.023
8.00	0.000	6,108	158.33	0.023
8.50	0.000	6,067	158.33	0.023
9.00	0.000	6,026	158.32	0.023
9.50	0.000	5,985	158.32	0.023
10.00	0.000	5,944	158.31	0.023
10.50	0.000	5,903	158.31	0.023
11.00	0.000	5,863	158.31	0.023
11.50	0.000	5,822	158.30	0.022
12.00	0.000	5,782	158.30	0.022
12.50	0.000	5,741	158.30	0.022
13.00	0.000	5,701	158.29	0.022
13.50	0.000	5,661	158.29	0.022
14.00	0.000	5,621	158.29	0.022
14.50	0.000	5,581	158.28	0.022
15.00	0.000	5,541	158.28	0.022
15.50	0.000	5,501	158.28	0.022
16.00	0.000	5,462	158.27	0.022
16.50	0.000	5,422	158.27	0.022
17.00	0.000	5,383	158.27	0.022
17.50	0.000	5,343	158.26	0.022
18.00	0.000	5,304	158.26	0.022
18.50	0.000	5,265	158.26	0.022
19.00	0.000	5,226	158.25	0.022
19.50	0.000	5,187	158.25	0.022
20.00	0.000	5,148	158.25	0.022
20.50	0.000	5,109	158.24	0.022
21.00	0.000	5,071	158.24	0.021
21.50	0.000	5,032	158.24	0.021
22.00	0.000	4,994	158.23	0.021
22.50	0.000	4,955	158.23	0.021
23.00	0.000	4,917	158.23	0.021
23.50	0.000	4,879	158.22	0.021
24.00	0.000	4,841	158.22	0.021
24.50	0.000	4,803	158.22	0.021
25.00	0.000	4,765	158.21	0.021

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	4,727	158.21	0.021
26.00	0.000	4,689	158.21	0.021
26.50	0.000	4,652	158.20	0.021
27.00	0.000	4,614	158.20	0.021
27.50	0.000	4,577	158.20	0.021
28.00	0.000	4,539	158.19	0.021
28.50	0.000	4,502	158.19	0.021
29.00	0.000	4,465	158.19	0.021
29.50	0.000	4,428	158.18	0.021
30.00	0.000	4,391	158.18	0.021
30.50	0.000	4,354	158.18	0.020
31.00	0.000	4,317	158.17	0.020
31.50	0.000	4,281	158.17	0.020
32.00	0.000	4,244	158.17	0.020
32.50	0.000	4,208	158.17	0.020
33.00	0.000	4,171	158.16	0.020
33.50	0.000	4,135	158.16	0.020
34.00	0.000	4,099	158.16	0.020
34.50	0.000	4,063	158.15	0.020
35.00	0.000	4,027	158.15	0.020
35.50	0.000	3,991	158.15	0.020
36.00	0.000	3,955	158.14	0.020
36.50	0.000	3,919	158.14	0.020
37.00	0.000	3,884	158.14	0.020
37.50	0.000	3,848	158.13	0.020
38.00	0.000	3,813	158.13	0.020
38.50	0.000	3,777	158.13	0.020
39.00	0.000	3,742	158.13	0.020
39.50	0.000	3,707	158.12	0.019
40.00	0.000	3,672	158.12	0.019
40.50	0.000	3,637	158.12	0.019
41.00	0.000	3,602	158.11	0.019
41.50	0.000	3,567	158.11	0.019
42.00	0.000	3,533	158.11	0.019
42.50	0.000	3,498	158.10	0.019
43.00	0.000	3,464	158.10	0.019
43.50	0.000	3,429	158.10	0.019
44.00	0.000	3,395	158.10	0.019
44.50	0.000	3,361	158.09	0.019
45.00	0.000	3,327	158.09	0.019
45.50	0.000	3,293	158.09	0.019
46.00	0.000	3,259	158.08	0.019
46.50	0.000	3,225	158.08	0.019
47.00	0.000	3,191	158.08	0.019
47.50	0.000	3,158	158.08	0.019
48.00	0.000	3,124	158.07	0.019
48.50	0.000	3,091	158.07	0.019
49.00	0.000	3,057	158.07	0.018
49.50	0.000	3,024	158.06	0.018
50.00	0.000	2,991	158.06	0.018
50.50	0.000	2,958	158.06	0.018

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	2,925	158.06	0.018
51.50	0.000	2,892	158.05	0.018
52.00	0.000	2,859	158.05	0.018
52.50	0.000	2,827	158.05	0.018
53.00	0.000	2,794	158.05	0.018
53.50	0.000	2,762	158.04	0.018
54.00	0.000	2,729	158.04	0.018
54.50	0.000	2,697	158.04	0.018
55.00	0.000	2,665	158.03	0.018
55.50	0.000	2,633	158.03	0.018
56.00	0.000	2,601	158.03	0.018
56.50	0.000	2,569	158.02	0.018
57.00	0.000	2,537	158.02	0.018
57.50	0.000	2,506	158.01	0.017
58.00	0.000	2,474	158.00	0.017
58.50	0.000	2,443	158.00	0.017
59.00	0.000	2,413	157.99	0.017
59.50	0.000	2,382	157.99	0.017
60.00	0.000	2,352	157.98	0.017
60.50	0.000	2,322	157.98	0.017
61.00	0.000	2,292	157.97	0.017
61.50	0.000	2,262	157.96	0.016
62.00	0.000	2,233	157.96	0.016
62.50	0.000	2,203	157.95	0.016
63.00	0.000	2,174	157.95	0.016
63.50	0.000	2,145	157.94	0.016
64.00	0.000	2,117	157.94	0.016
64.50	0.000	2,088	157.93	0.016
65.00	0.000	2,060	157.92	0.016
65.50	0.000	2,032	157.92	0.015
66.00	0.000	2,004	157.91	0.015
66.50	0.000	1,977	157.91	0.015
67.00	0.000	1,950	157.90	0.015
67.50	0.000	1,922	157.90	0.015
68.00	0.000	1,895	157.89	0.015
68.50	0.000	1,869	157.89	0.015
69.00	0.000	1,842	157.88	0.015
69.50	0.000	1,816	157.88	0.015
70.00	0.000	1,790	157.87	0.014
70.50	0.000	1,764	157.87	0.014
71.00	0.000	1,739	157.86	0.014
71.50	0.000	1,713	157.86	0.014
72.00	0.000	1,688	157.85	0.014
72.50	0.000	1,663	157.85	0.014
73.00	0.000	1,638	157.84	0.014
73.50	0.000	1,614	157.84	0.014
74.00	0.000	1,589	157.83	0.013
74.50	0.000	1,565	157.83	0.013
75.00	0.000	1,541	157.83	0.013
75.50	0.000	1,518	157.82	0.013
76.00	0.000	1,494	157.82	0.013

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	1,471	157.81	0.013
77.00	0.000	1,448	157.81	0.013
77.50	0.000	1,425	157.80	0.013
78.00	0.000	1,402	157.80	0.013
78.50	0.000	1,380	157.79	0.012
79.00	0.000	1,358	157.79	0.012
79.50	0.000	1,336	157.79	0.012
80.00	0.000	1,314	157.78	0.012
80.50	0.000	1,292	157.78	0.012
81.00	0.000	1,271	157.77	0.012
81.50	0.000	1,250	157.77	0.012
82.00	0.000	1,229	157.77	0.012
82.50	0.000	1,208	157.76	0.011
83.00	0.000	1,188	157.76	0.011
83.50	0.000	1,167	157.75	0.011
84.00	0.000	1,147	157.75	0.011
84.50	0.000	1,128	157.75	0.011
85.00	0.000	1,108	157.74	0.011
85.50	0.000	1,089	157.74	0.011
86.00	0.000	1,069	157.73	0.011
86.50	0.000	1,050	157.73	0.010
87.00	0.000	1,032	157.73	0.010
87.50	0.000	1,013	157.72	0.010
88.00	0.000	995	157.72	0.010
88.50	0.000	977	157.72	0.010
89.00	0.000	959	157.71	0.010
89.50	0.000	941	157.71	0.010
90.00	0.000	924	157.71	0.010
90.50	0.000	906	157.70	0.010
91.00	0.000	889	157.70	0.009
91.50	0.000	872	157.70	0.009
92.00	0.000	856	157.69	0.009
92.50	0.000	839	157.69	0.009
93.00	0.000	823	157.69	0.009
93.50	0.000	807	157.68	0.009
94.00	0.000	791	157.68	0.009
94.50	0.000	776	157.68	0.009
95.00	0.000	761	157.68	0.008
95.50	0.000	745	157.67	0.008
96.00	0.000	731	157.67	0.008
96.50	0.000	716	157.67	0.008
97.00	0.000	701	157.66	0.008
97.50	0.000	687	157.66	0.008
98.00	0.000	673	157.66	0.008
98.50	0.000	659	157.66	0.008
99.00	0.000	646	157.65	0.008
99.50	0.000	632	157.65	0.007
100.00	0.000	619	157.65	0.007
100.50	0.000	606	157.65	0.007
101.00	0.000	593	157.64	0.007
101.50	0.000	581	157.64	0.007

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	569	157.64	0.007
102.50	0.000	556	157.64	0.007
103.00	0.000	545	157.63	0.007
103.50	0.000	533	157.63	0.006
104.00	0.000	521	157.63	0.006
104.50	0.000	510	157.63	0.006
105.00	0.000	499	157.63	0.006
105.50	0.000	488	157.62	0.006
106.00	0.000	478	157.62	0.006
106.50	0.000	467	157.62	0.006
107.00	0.000	457	157.62	0.006
107.50	0.000	447	157.62	0.005
108.00	0.000	438	157.61	0.005
108.50	0.000	428	157.61	0.005
109.00	0.000	419	157.61	0.005
109.50	0.000	410	157.61	0.005
110.00	0.000	402	157.61	0.005
110.50	0.000	393	157.61	0.005
111.00	0.000	385	157.60	0.005
111.50	0.000	377	157.60	0.004
112.00	0.000	369	157.60	0.004
112.50	0.000	361	157.60	0.004
113.00	0.000	354	157.60	0.004
113.50	0.000	346	157.60	0.004
114.00	0.000	339	157.59	0.004
114.50	0.000	332	157.59	0.004
115.00	0.000	325	157.59	0.004
115.50	0.000	319	157.59	0.004
116.00	0.000	312	157.59	0.004
116.50	0.000	306	157.59	0.003
117.00	0.000	300	157.59	0.003
117.50	0.000	294	157.59	0.003
118.00	0.000	288	157.59	0.003
118.50	0.000	283	157.58	0.003
119.00	0.000	277	157.58	0.003
119.50	0.000	272	157.58	0.003
120.00	0.000	267	157.58	0.003
120.50	0.000	262	157.58	0.003
121.00	0.000	257	157.58	0.003
121.50	0.000	252	157.58	0.003
122.00	0.000	248	157.58	0.002
122.50	0.000	244	157.58	0.002
123.00	0.000	239	157.58	0.002
123.50	0.000	235	157.58	0.002
124.00	0.000	231	157.57	0.002
124.50	0.000	227	157.57	0.002
125.00	0.000	223	157.57	0.002
125.50	0.000	220	157.57	0.002
126.00	0.000	216	157.57	0.002
126.50	0.000	213	157.57	0.002
127.00	0.000	209	157.57	0.002

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	206	157.57	0.002
128.00	0.000	203	157.57	0.002
128.50	0.000	200	157.57	0.002
129.00	0.000	197	157.57	0.002
129.50	0.000	194	157.57	0.002
130.00	0.000	191	157.57	0.002
130.50	0.000	188	157.57	0.002
131.00	0.000	185	157.57	0.001
131.50	0.000	183	157.57	0.001
132.00	0.000	180	157.56	0.001
132.50	0.000	178	157.56	0.001
133.00	0.000	175	157.56	0.001
133.50	0.000	173	157.56	0.001
134.00	0.000	171	157.56	0.001
134.50	0.000	169	157.56	0.001
135.00	0.000	166	157.56	0.001
135.50	0.000	164	157.56	0.001
136.00	0.000	162	157.56	0.001
136.50	0.000	160	157.56	0.001
137.00	0.000	158	157.56	0.001
137.50	0.000	156	157.56	0.001
138.00	0.000	154	157.56	0.001
138.50	0.000	152	157.56	0.001
139.00	0.000	150	157.56	0.001
139.50	0.000	148	157.56	0.001
140.00	0.000	147	157.56	0.001
140.50	0.000	145	157.56	0.001
141.00	0.000	143	157.56	0.001
141.50	0.000	141	157.56	0.001
142.00	0.000	139	157.56	0.001
142.50	0.000	138	157.56	0.001
143.00	0.000	136	157.56	0.001
143.50	0.000	134	157.56	0.001
144.00	0.000	132	157.56	0.001
144.50	0.000	131	157.56	0.001
145.00	0.000	129	157.55	0.001
145.50	0.000	127	157.55	0.001
146.00	0.000	126	157.55	0.001
146.50	0.000	124	157.55	0.001
147.00	0.000	123	157.55	0.001
147.50	0.000	121	157.55	0.001
148.00	0.000	120	157.55	0.001
148.50	0.000	118	157.55	0.001
149.00	0.000	117	157.55	0.001
149.50	0.000	115	157.55	0.001
150.00	0.000	114	157.55	0.001
150.50	0.000	112	157.55	0.001
151.00	0.000	111	157.55	0.001
151.50	0.000	109	157.55	0.001
152.00	0.000	108	157.55	0.001
152.50	0.000	107	157.55	0.001

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	105	157.55	0.001
153.50	0.000	104	157.55	0.001
154.00	0.000	103	157.55	0.001
154.50	0.000	101	157.55	0.001
155.00	0.000	100	157.55	0.001
155.50	0.000	99	157.55	0.001
156.00	0.000	98	157.55	0.001
156.50	0.000	96	157.55	0.001
157.00	0.000	95	157.55	0.001
157.50	0.000	94	157.55	0.001
158.00	0.000	93	157.55	0.001
158.50	0.000	92	157.55	0.001
159.00	0.000	90	157.55	0.001
159.50	0.000	89	157.55	0.001
160.00	0.000	88	157.55	0.001
160.50	0.000	87	157.55	0.001
161.00	0.000	86	157.55	0.001
161.50	0.000	85	157.55	0.001
162.00	0.000	84	157.55	0.001
162.50	0.000	83	157.55	0.001
163.00	0.000	82	157.55	0.001
163.50	0.000	81	157.55	0.001
164.00	0.000	80	157.55	0.001
164.50	0.000	79	157.55	0.001
165.00	0.000	78	157.54	0.001
165.50	0.000	77	157.54	0.001
166.00	0.000	76	157.54	0.001
166.50	0.000	75	157.54	0.001
167.00	0.000	74	157.54	0.001
167.50	0.000	73	157.54	0.001
168.00	0.000	72	157.54	0.001

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-yr	Type II 24-hr		Default	24.00	1	2.73	2
2	2-yr	Type II 24-hr		Default	24.00	1	3.28	2
3	5-yr	Type II 24-hr		Default	24.00	1	4.13	2
4	10-yr	Type II 24-hr		Default	24.00	1	4.83	2
5	25-yr	Type II 24-hr		Default	24.00	1	5.86	2
6	50-yr	Type II 24-hr		Default	24.00	1	6.73	2
7	100-yr	Type II 24-hr		Default	24.00	1	7.66	2

Stage-Area-Storage for Pond 1P: UG1

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
157.53	0	158.04	2,727	158.55	8,645
157.54	52	158.05	2,847	158.56	8,759
157.55	104	158.06	2,965	158.57	8,872
157.56	156	158.07	3,084	158.58	8,985
157.57	209	158.08	3,203	158.59	9,098
157.58	261	158.09	3,321	158.60	9,211
157.59	313	158.10	3,439	158.61	9,324
157.60	365	158.11	3,557	158.62	9,436
157.61	417	158.12	3,675	158.63	9,549
157.62	469	158.13	3,793	158.64	9,661
157.63	522	158.14	3,910	158.65	9,773
157.64	574	158.15	4,028	158.66	9,885
157.65	626	158.16	4,145	158.67	9,997
157.66	678	158.17	4,262	158.68	10,109
157.67	730	158.18	4,378	158.69	10,221
157.68	782	158.19	4,495	158.70	10,333
157.69	835	158.20	4,611	158.71	10,445
157.70	887	158.21	4,727	158.72	10,556
157.71	939	158.22	4,843	158.73	10,668
157.72	991	158.23	4,960	158.74	10,779
157.73	1,043	158.24	5,076	158.75	10,890
157.74	1,095	158.25	5,192	158.76	11,001
157.75	1,148	158.26	5,308	158.77	11,112
157.76	1,200	158.27	5,423	158.78	11,222
157.77	1,252	158.28	5,539	158.79	11,333
157.78	1,304	158.29	5,655	158.80	11,443
157.79	1,356	158.30	5,771	158.81	11,553
157.80	1,408	158.31	5,887	158.82	11,663
157.81	1,461	158.32	6,002	158.83	11,773
157.82	1,513	158.33	6,118	158.84	11,882
157.83	1,565	158.34	6,233	158.85	11,992
157.84	1,617	158.35	6,349	158.86	12,101
157.85	1,669	158.36	6,464	158.87	12,211
157.86	1,721	158.37	6,580	158.88	12,320
157.87	1,774	158.38	6,695	158.89	12,429
157.88	1,826	158.39	6,811	158.90	12,538
157.89	1,878	158.40	6,926	158.91	12,646
157.90	1,930	158.41	7,041	158.92	12,755
157.91	1,982	158.42	7,156	158.93	12,864
157.92	2,034	158.43	7,272	158.94	12,972
157.93	2,087	158.44	7,387	158.95	13,081
157.94	2,139	158.45	7,502	158.96	13,189
157.95	2,191	158.46	7,617	158.97	13,297
157.96	2,243	158.47	7,732	158.98	13,405
157.97	2,295	158.48	7,846	158.99	13,514
157.98	2,347	158.49	7,961	159.00	13,621
157.99	2,400	158.50	8,075	159.01	13,729
158.00	2,452	158.51	8,190	159.02	13,837
158.01	2,504	158.52	8,304	159.03	13,945
158.02	2,556	158.53	8,418	159.04	14,052
158.03	2,608	158.54	8,531	159.05	14,160

Stage-Area-Storage for Pond 1P: UG1 (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
159.06	14,267	159.57	19,462	160.08	23,669
159.07	14,374	159.58	19,557	160.09	23,731
159.08	14,481	159.59	19,652	160.10	23,792
159.09	14,588	159.60	19,746	160.11	23,852
159.10	14,695	159.61	19,840	160.12	23,910
159.11	14,802	159.62	19,934	160.13	23,968
159.12	14,909	159.63	20,027	160.14	24,026
159.13	15,016	159.64	20,120	160.15	24,082
159.14	15,122	159.65	20,213	160.16	24,138
159.15	15,228	159.66	20,305	160.17	24,193
159.16	15,334	159.67	20,397	160.18	24,248
159.17	15,439	159.68	20,489	160.19	24,301
159.18	15,545	159.69	20,580	160.20	24,354
159.19	15,650	159.70	20,671	160.21	24,406
159.20	15,755	159.71	20,761	160.22	24,459
159.21	15,860	159.72	20,851	160.23	24,511
159.22	15,964	159.73	20,940	160.24	24,563
159.23	16,068	159.74	21,029	160.25	24,615
159.24	16,172	159.75	21,118	160.26	24,667
159.25	16,276	159.76	21,206	160.27	24,719
159.26	16,379	159.77	21,293	160.28	24,772
159.27	16,482	159.78	21,381	160.29	24,824
159.28	16,585	159.79	21,467	160.30	24,876
159.29	16,687	159.80	21,554	160.31	24,928
159.30	16,790	159.81	21,639	160.32	24,980
159.31	16,892	159.82	21,724	160.33	25,032
159.32	16,994	159.83	21,809	160.34	25,084
159.33	17,095	159.84	21,893	160.35	25,137
159.34	17,197	159.85	21,976	160.36	25,189
159.35	17,298	159.86	22,059	160.37	25,241
159.36	17,399	159.87	22,141	160.38	25,293
159.37	17,500	159.88	22,223	160.39	25,345
159.38	17,601	159.89	22,303	160.40	25,397
159.39	17,701	159.90	22,383	160.41	25,450
159.40	17,801	159.91	22,463	160.42	25,502
159.41	17,901	159.92	22,541	160.43	25,554
159.42	18,001	159.93	22,619	160.44	25,606
159.43	18,100	159.94	22,696	160.45	25,658
159.44	18,199	159.95	22,773	160.46	25,710
159.45	18,298	159.96	22,848	160.47	25,763
159.46	18,397	159.97	22,922	160.48	25,815
159.47	18,495	159.98	22,995	160.49	25,867
159.48	18,593	159.99	23,068	160.50	25,919
159.49	18,691	160.00	23,139	160.51	25,971
159.50	18,788	160.01	23,209	160.52	26,023
159.51	18,885	160.02	23,278	160.53	26,076
159.52	18,982	160.03	23,345	160.54	26,128
159.53	19,079	160.04	23,412	160.55	26,180
159.54	19,175	160.05	23,478	160.56	26,232
159.55	19,271	160.06	23,543	160.57	26,284
159.56	19,367	160.07	23,607	160.58	26,336

Stage-Area-Storage for Pond 1P: UG1 (continued)

Elevation (feet)	Storage (cubic-feet)
160.59	26,389
160.60	26,441
160.61	26,493
160.62	26,545
160.63	26,597
160.64	26,649
160.65	26,702
160.66	26,754
160.67	26,806
160.68	26,858
160.69	26,910
160.70	26,962
160.71	27,015
160.72	27,067
160.73	27,119
160.74	**27,162**

Stage-Area-Storage for Pond 3P: UG2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
159.28	0	159.79	531	160.30	1,632
159.29	10	159.80	553	160.31	1,653
159.30	20	159.81	575	160.32	1,674
159.31	31	159.82	597	160.33	1,695
159.32	41	159.83	619	160.34	1,716
159.33	51	159.84	641	160.35	1,737
159.34	61	159.85	663	160.36	1,758
159.35	71	159.86	685	160.37	1,779
159.36	81	159.87	707	160.38	1,800
159.37	92	159.88	729	160.39	1,821
159.38	102	159.89	751	160.40	1,842
159.39	112	159.90	772	160.41	1,862
159.40	122	159.91	794	160.42	1,883
159.41	132	159.92	816	160.43	1,904
159.42	142	159.93	838	160.44	1,925
159.43	153	159.94	859	160.45	1,945
159.44	163	159.95	881	160.46	1,966
159.45	173	159.96	903	160.47	1,987
159.46	183	159.97	924	160.48	2,007
159.47	193	159.98	946	160.49	2,028
159.48	203	159.99	967	160.50	2,048
159.49	214	160.00	989	160.51	2,069
159.50	224	160.01	1,011	160.52	2,090
159.51	234	160.02	1,032	160.53	2,110
159.52	244	160.03	1,054	160.54	2,131
159.53	254	160.04	1,075	160.55	2,151
159.54	264	160.05	1,097	160.56	2,171
159.55	275	160.06	1,119	160.57	2,192
159.56	285	160.07	1,140	160.58	2,212
159.57	295	160.08	1,162	160.59	2,233
159.58	305	160.09	1,183	160.60	2,253
159.59	315	160.10	1,205	160.61	2,273
159.60	325	160.11	1,226	160.62	2,293
159.61	336	160.12	1,248	160.63	2,314
159.62	346	160.13	1,270	160.64	2,334
159.63	356	160.14	1,291	160.65	2,354
159.64	366	160.15	1,313	160.66	2,374
159.65	376	160.16	1,334	160.67	2,394
159.66	386	160.17	1,356	160.68	2,414
159.67	397	160.18	1,377	160.69	2,434
159.68	407	160.19	1,398	160.70	2,454
159.69	417	160.20	1,420	160.71	2,473
159.70	427	160.21	1,441	160.72	2,493
159.71	437	160.22	1,463	160.73	2,513
159.72	447	160.23	1,484	160.74	2,532
159.73	458	160.24	1,505	160.75	2,552
159.74	468	160.25	1,527	160.76	2,571
159.75	478	160.26	1,548	160.77	2,590
159.76	488	160.27	1,569	160.78	2,610
159.77	498	160.28	1,590	160.79	2,629
159.78	508	160.29	1,611	160.80	2,648

Stage-Area-Storage for Pond 3P: UG2 (continued)

Elevation (feet)	Storage (cubic-feet)
160.81	2,667
160.82	2,686
160.83	2,705
160.84	2,724
160.85	2,743
160.86	2,762
160.87	2,781
160.88	2,799
160.89	2,818
160.90	2,836
160.91	2,855
160.92	2,873
160.93	2,892
160.94	2,910
160.95	2,928
160.96	2,946
160.97	2,964
160.98	2,982
160.99	3,000
161.00	3,018
161.01	3,036
161.02	3,053
161.03	3,071
161.04	3,088
161.05	3,106
161.06	3,123
161.07	3,140
161.08	3,157
161.09	3,174
161.10	3,191
161.11	3,208
161.12	3,224
161.13	3,241
161.14	3,257
161.15	3,273
161.16	3,290
161.17	3,306
161.18	3,321
161.19	3,337
161.20	3,353
161.21	3,368
161.22	3,383
161.23	3,398
161.24	3,413
161.25	3,428
161.26	3,442
161.27	3,456
161.28	3,471
161.29	3,484
161.30	3,498
161.31	3,512
161.32	3,525
161.33	3,539
161.34	3,552
161.35	3,565
161.36	3,578
161.37	3,590
161.38	3,603
161.39	3,615
161.40	3,628
161.41	3,640
161.42	3,652
161.43	3,664
161.44	3,675
161.45	3,686
161.46	3,697
161.47	3,707
161.48	3,717
161.49	3,727
161.50	3,737
161.51	3,747
161.52	3,758
161.53	3,768
161.54	3,778
161.55	3,788
161.56	3,798
161.57	3,808
161.58	3,819
161.59	3,829
161.60	3,839
161.61	3,849
161.62	3,859
161.63	3,869
161.64	3,880
161.65	3,890
161.66	3,900
161.67	3,910
161.68	3,920
161.69	3,931
161.70	3,941
161.71	3,951
161.72	3,961
161.73	3,971
161.74	3,981
161.75	3,992
161.76	4,002
161.77	4,012
161.78	4,022
161.79	4,032
161.80	4,042
161.81	4,053
161.82	4,063
161.83	4,073
161.84	4,083
161.85	4,093
161.86	4,103
161.87	4,114
161.88	4,124
161.89	4,134
161.90	4,144
161.91	4,154
161.92	4,164
161.93	4,175
161.94	4,185
161.95	4,195
161.96	4,205
161.97	4,215
161.98	4,225
161.99	**4,234**

Stage-Discharge for Pond 1P: UG1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
157.53	0.000	158.04	0.018	158.55	0.505	159.06	2.677
157.54	0.000	158.05	0.018	158.56	0.551	159.07	2.703
157.55	0.000	158.06	0.018	158.57	0.598	159.08	2.730
157.56	0.001	158.07	0.019	158.58	0.647	159.09	2.756
157.57	0.002	158.08	0.019	158.59	0.696	159.10	2.782
157.58	0.003	158.09	0.019	158.60	0.747	159.11	2.808
157.59	0.004	158.10	0.019	158.61	0.800	159.12	2.833
157.60	0.004	158.11	0.019	158.62	0.853	159.13	2.858
157.61	0.005	158.12	0.019	158.63	0.908	159.14	2.883
157.62	0.006	158.13	0.020	158.64	0.963	159.15	2.908
157.63	0.006	158.14	0.020	158.65	1.020	159.16	2.933
157.64	0.007	158.15	0.020	158.66	1.078	159.17	2.957
157.65	0.007	158.16	0.020	158.67	1.137	159.18	2.981
157.66	0.008	158.17	0.020	158.68	1.197	159.19	3.005
157.67	0.008	158.18	0.020	158.69	1.258	159.20	3.029
157.68	0.009	158.19	0.021	158.70	1.321	159.21	3.052
157.69	0.009	158.20	0.021	158.71	1.384	159.22	3.076
157.70	0.009	158.21	0.021	158.72	1.448	159.23	3.099
157.71	0.010	158.22	0.021	158.73	1.509	159.24	3.122
157.72	0.010	158.23	0.021	158.74	1.563	159.25	3.145
157.73	0.010	158.24	0.021	158.75	1.614	159.26	3.167
157.74	0.011	158.25	0.022	158.76	1.662	159.27	3.190
157.75	0.011	158.26	0.022	158.77	1.708	159.28	3.212
157.76	0.011	158.27	0.022	158.78	1.752	159.29	3.234
157.77	0.012	158.28	0.022	158.79	1.795	159.30	3.256
157.78	0.012	158.29	0.022	158.80	1.836	159.31	3.278
157.79	0.012	158.30	0.022	158.81	1.877	159.32	3.300
157.80	0.013	158.31	0.023	158.82	1.916	159.33	3.322
157.81	0.013	158.32	0.023	158.83	1.955	159.34	3.343
157.82	0.013	158.33	0.023	158.84	1.992	159.35	3.364
157.83	0.013	158.34	0.023	158.85	2.029	159.36	3.386
157.84	0.014	158.35	0.023	158.86	2.065	159.37	3.407
157.85	0.014	158.36	0.023	158.87	2.100	159.38	3.428
157.86	0.014	158.37	0.023	158.88	2.135	159.39	3.448
157.87	0.014	158.38	0.024	158.89	2.169	159.40	3.469
157.88	0.015	158.39	0.024	158.90	2.202	159.41	3.490
157.89	0.015	158.40	0.031	158.91	2.235	159.42	3.510
157.90	0.015	158.41	0.045	158.92	2.267	159.43	3.530
157.91	0.015	158.42	0.063	158.93	2.299	159.44	3.550
157.92	0.015	158.43	0.084	158.94	2.330	159.45	3.570
157.93	0.016	158.44	0.108	158.95	2.361	159.46	3.590
157.94	0.016	158.45	0.135	158.96	2.392	159.47	3.610
157.95	0.016	158.46	0.163	158.97	2.422	159.48	3.630
157.96	0.016	158.47	0.194	158.98	2.452	159.49	3.650
157.97	0.017	158.48	0.227	158.99	2.481	159.50	3.669
157.98	0.017	158.49	0.262	159.00	2.510	159.51	3.688
157.99	0.017	158.50	0.299	159.01	2.538	159.52	3.708
158.00	0.017	158.51	0.337	159.02	2.567	159.53	3.727
158.01	0.017	158.52	0.377	159.03	2.595	159.54	3.746
158.02	0.018	158.53	0.418	159.04	2.622	159.55	3.765
158.03	0.018	158.54	0.461	159.05	2.650	159.56	3.784

Stage-Discharge for Pond 1P: UG1 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
159.57	3.803	160.08	4.661	160.59	8.142
159.58	3.821	160.09	4.677	160.60	8.275
159.59	3.840	160.10	4.692	160.61	8.408
159.60	3.859	160.11	4.707	160.62	8.544
159.61	3.877	160.12	4.722	160.63	8.681
159.62	3.895	160.13	4.737	160.64	8.820
159.63	3.914	160.14	4.752	160.65	8.960
159.64	3.932	160.15	4.767	160.66	9.102
159.65	3.950	160.16	4.782	160.67	9.245
159.66	3.968	160.17	4.797	160.68	9.390
159.67	3.986	160.18	4.812	160.69	9.536
159.68	4.004	160.19	4.827	160.70	9.683
159.69	4.021	160.20	4.841	160.71	9.833
159.70	4.039	160.21	4.856	160.72	9.983
159.71	4.057	160.22	4.871	160.73	10.135
159.72	4.074	160.23	4.885	160.74	**10.288**
159.73	4.092	160.24	4.900		
159.74	4.109	160.25	4.928		
159.75	4.126	160.26	4.966		
159.76	4.144	160.27	5.012		
159.77	4.161	160.28	5.064		
159.78	4.178	160.29	5.121		
159.79	4.195	160.30	5.182		
159.80	4.212	160.31	5.247		
159.81	4.229	160.32	5.316		
159.82	4.246	160.33	5.388		
159.83	4.262	160.34	5.464		
159.84	4.279	160.35	5.543		
159.85	4.296	160.36	5.625		
159.86	4.312	160.37	5.709		
159.87	4.329	160.38	5.797		
159.88	4.345	160.39	5.887		
159.89	4.361	160.40	5.979		
159.90	4.378	160.41	6.074		
159.91	4.394	160.42	6.172		
159.92	4.410	160.43	6.272		
159.93	4.426	160.44	6.374		
159.94	4.442	160.45	6.478		
159.95	4.458	160.46	6.584		
159.96	4.474	160.47	6.693		
159.97	4.490	160.48	6.803		
159.98	4.506	160.49	6.915		
159.99	4.522	160.50	7.030		
160.00	4.538	160.51	7.146		
160.01	4.553	160.52	7.264		
160.02	4.569	160.53	7.385		
160.03	4.584	160.54	7.506		
160.04	4.600	160.55	7.630		
160.05	4.615	160.56	7.756		
160.06	4.631	160.57	7.883		
160.07	4.646	160.58	8.012		

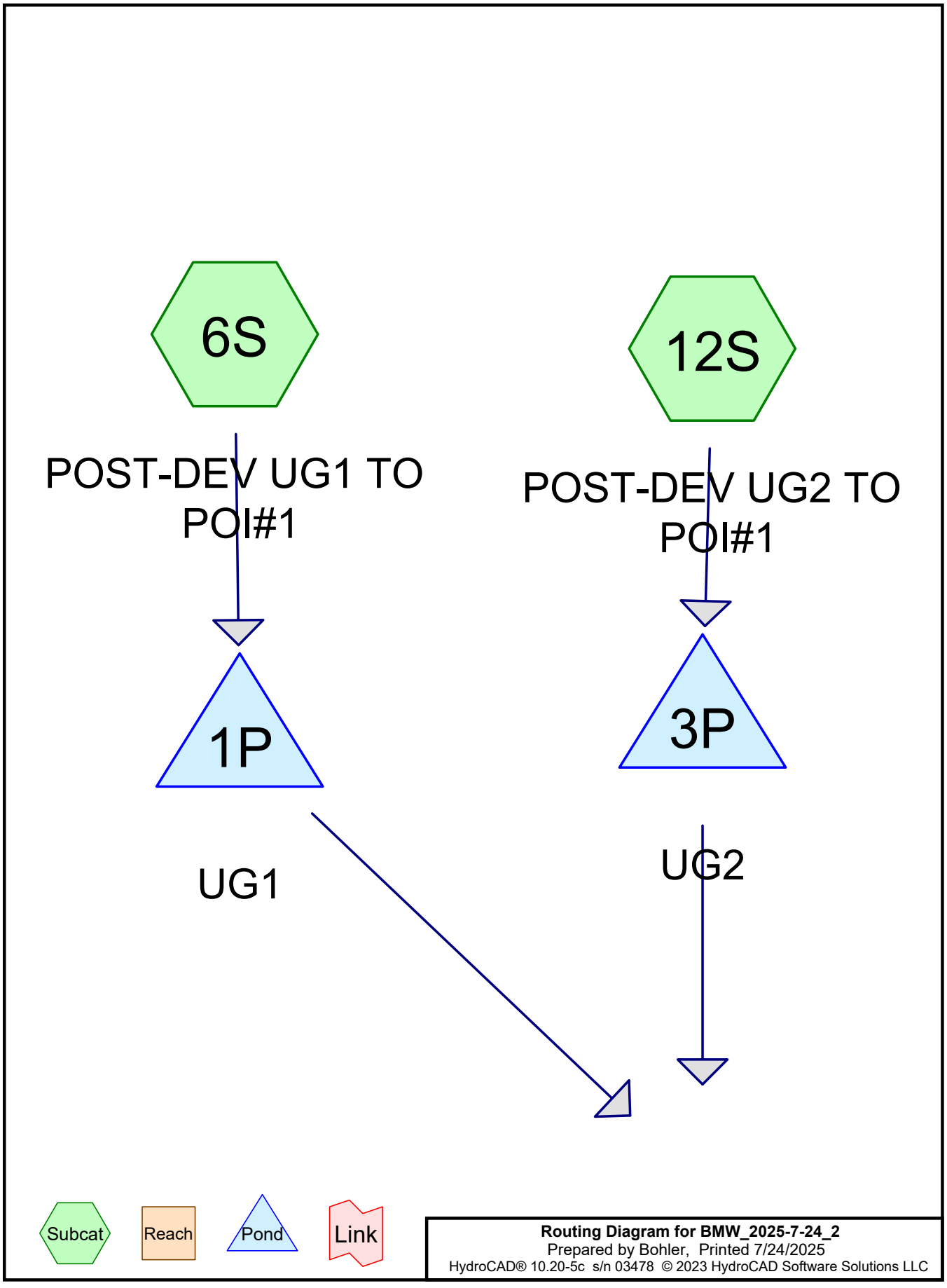
Stage-Discharge for Pond 3P: UG2

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
159.28	0.000	159.79	0.147	160.30	0.492	160.81	0.788
159.29	0.000	159.80	0.149	160.31	0.500	160.82	0.793
159.30	0.001	159.81	0.150	160.32	0.508	160.83	0.798
159.31	0.002	159.82	0.152	160.33	0.515	160.84	0.802
159.32	0.003	159.83	0.154	160.34	0.523	160.85	0.806
159.33	0.005	159.84	0.156	160.35	0.530	160.86	0.811
159.34	0.008	159.85	0.158	160.36	0.538	160.87	0.815
159.35	0.010	159.86	0.159	160.37	0.545	160.88	0.820
159.36	0.013	159.87	0.161	160.38	0.552	160.89	0.824
159.37	0.016	159.88	0.163	160.39	0.559	160.90	0.828
159.38	0.020	159.89	0.165	160.40	0.566	160.91	0.833
159.39	0.023	159.90	0.166	160.41	0.572	160.92	0.837
159.40	0.027	159.91	0.168	160.42	0.579	160.93	0.841
159.41	0.032	159.92	0.170	160.43	0.586	160.94	0.846
159.42	0.036	159.93	0.171	160.44	0.592	160.95	0.850
159.43	0.041	159.94	0.173	160.45	0.598	160.96	0.854
159.44	0.045	159.95	0.174	160.46	0.605	160.97	0.858
159.45	0.050	159.96	0.176	160.47	0.611	160.98	0.862
159.46	0.055	159.97	0.178	160.48	0.617	160.99	0.866
159.47	0.059	159.98	0.181	160.49	0.623	161.00	0.871
159.48	0.064	159.99	0.185	160.50	0.629	161.01	0.875
159.49	0.069	160.00	0.191	160.51	0.635	161.02	0.879
159.50	0.073	160.01	0.197	160.52	0.641	161.03	0.883
159.51	0.077	160.02	0.203	160.53	0.646	161.04	0.887
159.52	0.081	160.03	0.210	160.54	0.652	161.05	0.891
159.53	0.084	160.04	0.218	160.55	0.658	161.06	0.895
159.54	0.087	160.05	0.226	160.56	0.663	161.07	0.899
159.55	0.090	160.06	0.235	160.57	0.669	161.08	0.903
159.56	0.093	160.07	0.243	160.58	0.674	161.09	0.907
159.57	0.096	160.08	0.253	160.59	0.680	161.10	0.911
159.58	0.099	160.09	0.262	160.60	0.685	161.11	0.915
159.59	0.102	160.10	0.272	160.61	0.690	161.12	0.918
159.60	0.104	160.11	0.283	160.62	0.696	161.13	0.922
159.61	0.107	160.12	0.293	160.63	0.701	161.14	0.926
159.62	0.110	160.13	0.304	160.64	0.706	161.15	0.930
159.63	0.112	160.14	0.315	160.65	0.711	161.16	0.934
159.64	0.115	160.15	0.327	160.66	0.716	161.17	0.938
159.65	0.117	160.16	0.338	160.67	0.721	161.18	0.941
159.66	0.119	160.17	0.350	160.68	0.726	161.19	0.945
159.67	0.122	160.18	0.363	160.69	0.731	161.20	0.949
159.68	0.124	160.19	0.375	160.70	0.736	161.21	0.953
159.69	0.126	160.20	0.388	160.71	0.741	161.22	0.956
159.70	0.128	160.21	0.401	160.72	0.746	161.23	0.960
159.71	0.131	160.22	0.414	160.73	0.751	161.24	0.964
159.72	0.133	160.23	0.426	160.74	0.756	161.25	0.968
159.73	0.135	160.24	0.437	160.75	0.760	161.26	0.971
159.74	0.137	160.25	0.447	160.76	0.765	161.27	0.975
159.75	0.139	160.26	0.456	160.77	0.770	161.28	0.979
159.76	0.141	160.27	0.466	160.78	0.775	161.29	0.982
159.77	0.143	160.28	0.475	160.79	0.779	161.30	0.986
159.78	0.145	160.29	0.483	160.80	0.784	161.31	0.989

Stage-Discharge for Pond 3P: UG2 (continued)

Elevation (feet)	Primary (cfs)
161.32	0.993
161.33	0.997
161.34	1.000
161.35	1.004
161.36	1.007
161.37	1.011
161.38	1.014
161.39	1.018
161.40	1.021
161.41	1.025
161.42	1.028
161.43	1.032
161.44	1.035
161.45	1.038
161.46	1.042
161.47	1.045
161.48	1.049
161.49	1.052
161.50	1.055
161.51	1.072
161.52	1.100
161.53	1.135
161.54	1.175
161.55	1.221
161.56	1.271
161.57	1.325
161.58	1.383
161.59	1.445
161.60	1.510
161.61	1.578
161.62	1.649
161.63	1.722
161.64	1.799
161.65	1.878
161.66	1.960
161.67	2.044
161.68	2.131
161.69	2.220
161.70	2.312
161.71	2.405
161.72	2.501
161.73	2.599
161.74	2.699
161.75	2.801
161.76	2.905
161.77	3.011
161.78	3.119
161.79	3.229
161.80	3.340
161.81	3.454
161.82	3.569
161.83	3.686
161.84	3.804
161.85	3.925
161.86	4.047
161.87	4.171
161.88	4.296
161.89	4.423
161.90	4.552
161.91	4.682
161.92	4.813
161.93	4.947
161.94	5.081
161.95	5.218
161.96	5.355
161.97	5.494
161.98	5.635
161.99	**5.777**

Volume Calculations


6S
12S
POST-DEV UG1 TO POI#1
POST-DEV UG2 TO POI#1
1P
3P
UG1
UG2
Subcat
Reach
Pond
Link
Routing Diagram for BMW_2025-7-24_2
Prepared by Bohler, Printed 7/24/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

BMW_2025-7-24_2
Prepared by Bohler
Printed 7/24/2025
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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	Type II 24-hr		Default	24.00	1	3.28	2

Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

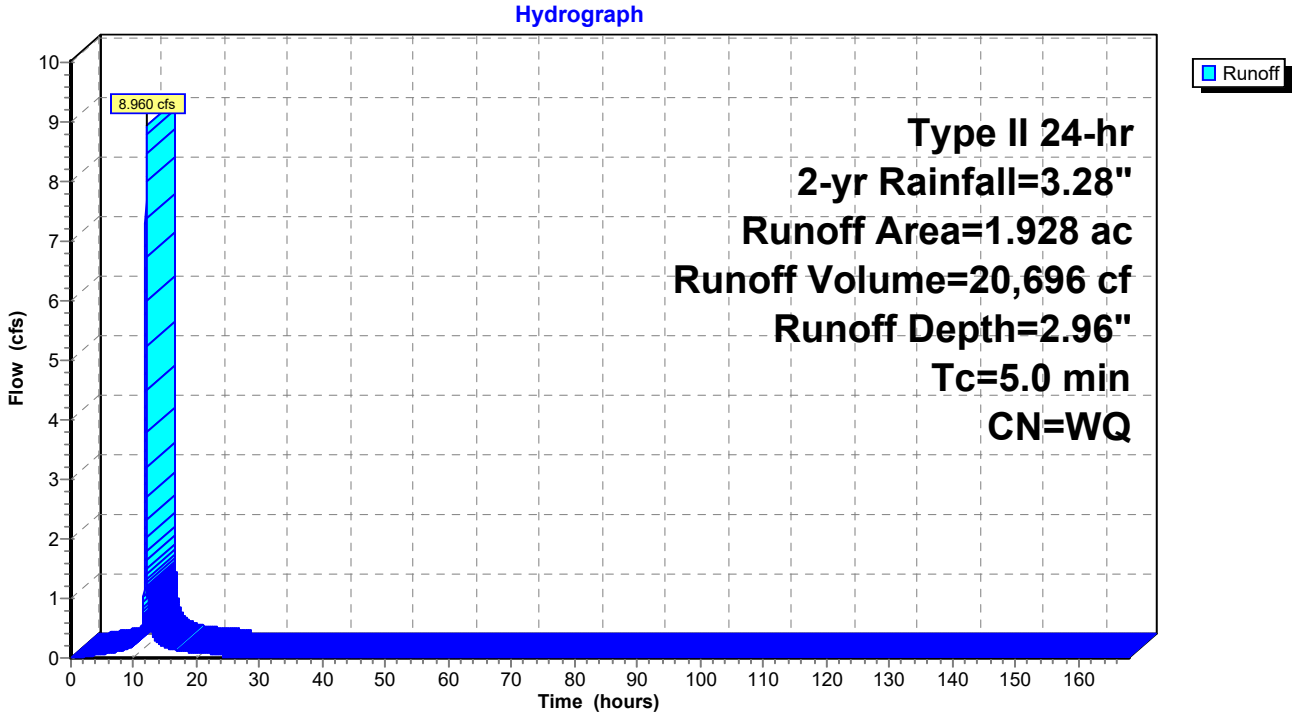
Runoff = 8.960 cfs @ 11.96 hrs, Volume= 20,696 cf, Depth= 2.96"
Routed to Pond 1P : UG1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928		Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: POST-DEV UG1 TO POI#1



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Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.000	10.20	0.62	0.30	0.247
0.20	0.01	0.00	0.000	10.40	0.65	0.33	0.276
0.40	0.01	0.00	0.000	10.60	0.69	0.36	0.309
0.60	0.02	0.00	0.000	10.80	0.73	0.39	0.356
0.80	0.03	0.00	0.000	11.00	0.77	0.43	0.405
1.00	0.03	0.00	0.000	11.20	0.82	0.47	0.495
1.20	0.04	0.00	0.000	11.40	0.89	0.53	0.612
1.40	0.05	0.00	0.004	11.60	1.01	0.64	1.135
1.60	0.06	0.00	0.008	11.80	1.41	1.01	**3.990**
1.80	0.06	0.00	0.013	12.00	2.17	1.74	**7.401**
2.00	0.07	0.00	0.017	12.20	2.29	1.86	1.086
2.20	0.08	0.00	0.021	12.40	2.38	1.94	0.783
2.40	0.09	0.00	0.025	12.60	2.44	2.00	0.535
2.60	0.10	0.00	0.028	12.80	2.49	2.05	0.464
2.80	0.10	0.00	0.032	13.00	2.53	2.09	0.400
3.00	0.11	0.00	0.035	13.20	2.57	2.13	0.354
3.20	0.12	0.00	0.039	13.40	2.60	2.16	0.320
3.40	0.13	0.00	0.042	13.60	2.64	2.19	0.287
3.60	0.14	0.01	0.045	13.80	2.66	2.22	0.262
3.80	0.15	0.01	0.048	14.00	2.69	2.25	0.237
4.00	0.16	0.01	0.050	14.20	2.71	2.27	0.223
4.20	0.17	0.01	0.054	14.40	2.74	2.29	0.214
4.40	0.18	0.02	0.057	14.60	2.76	2.31	0.205
4.60	0.19	0.02	0.061	14.80	2.78	2.34	0.197
4.80	0.20	0.02	0.064	15.00	2.80	2.35	0.188
5.00	0.21	0.03	0.068	15.20	2.82	2.37	0.179
5.20	0.22	0.03	0.071	15.40	2.84	2.39	0.171
5.40	0.23	0.04	0.074	15.60	2.85	2.41	0.162
5.60	0.24	0.04	0.078	15.80	2.87	2.43	0.154
5.80	0.25	0.05	0.081	16.00	2.89	2.44	0.145
6.00	0.26	0.05	0.084	16.20	2.90	2.45	0.140
6.20	0.27	0.06	0.088	16.40	2.92	2.47	0.137
6.40	0.29	0.07	0.091	16.60	2.93	2.48	0.134
6.60	0.30	0.07	0.094	16.80	2.94	2.50	0.131
6.80	0.31	0.08	0.098	17.00	2.96	2.51	0.127
7.00	0.32	0.09	0.101	17.20	2.97	2.52	0.124
7.20	0.34	0.10	0.104	17.40	2.98	2.54	0.121
7.40	0.35	0.10	0.107	17.60	3.00	2.55	0.118
7.60	0.37	0.11	0.110	17.80	3.01	2.56	0.115
7.80	0.38	0.12	0.114	18.00	3.02	2.57	0.112
8.00	0.39	0.13	0.117	18.20	3.03	2.58	0.109
8.20	0.41	0.14	0.125	18.40	3.04	2.60	0.106
8.40	0.43	0.15	0.137	18.60	3.05	2.61	0.103
8.60	0.44	0.17	0.149	18.80	3.07	2.62	0.100
8.80	0.46	0.18	0.161	19.00	3.08	2.63	0.097
9.00	0.48	0.20	0.173	19.20	3.09	2.64	0.094
9.20	0.50	0.21	0.179	19.40	3.10	2.65	0.091
9.40	0.52	0.23	0.180	19.60	3.10	2.66	0.087
9.60	0.55	0.24	0.184	19.80	3.11	2.66	0.084
9.80	0.57	0.26	0.203	20.00	3.12	2.67	0.081
10.00	0.59	0.28	0.222	20.20	3.13	2.68	0.080

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
20.40	3.14	2.69	0.079	30.60	3.28	2.83	0.000
20.60	3.15	2.70	0.079	30.80	3.28	2.83	0.000
20.80	3.16	2.71	0.078	31.00	3.28	2.83	0.000
21.00	3.16	2.71	0.077	31.20	3.28	2.83	0.000
21.20	3.17	2.72	0.077	31.40	3.28	2.83	0.000
21.40	3.18	2.73	0.076	31.60	3.28	2.83	0.000
21.60	3.19	2.74	0.075	31.80	3.28	2.83	0.000
21.80	3.20	2.75	0.075	32.00	3.28	2.83	0.000
22.00	3.20	2.75	0.074	32.20	3.28	2.83	0.000
22.20	3.21	2.76	0.074	32.40	3.28	2.83	0.000
22.40	3.22	2.77	0.073	32.60	3.28	2.83	0.000
22.60	3.23	2.78	0.072	32.80	3.28	2.83	0.000
22.80	3.24	2.78	0.072	33.00	3.28	2.83	0.000
23.00	3.24	2.79	0.071	33.20	3.28	2.83	0.000
23.20	3.25	2.80	0.071	33.40	3.28	2.83	0.000
23.40	3.26	2.81	0.070	33.60	3.28	2.83	0.000
23.60	3.27	2.81	0.069	33.80	3.28	2.83	0.000
23.80	3.27	2.82	0.069	34.00	3.28	2.83	0.000
24.00	**3.28**	**2.83**	0.068	34.20	3.28	2.83	0.000
24.20	3.28	2.83	0.001	34.40	3.28	2.83	0.000
24.40	3.28	2.83	0.000	34.60	3.28	2.83	0.000
24.60	3.28	2.83	0.000	34.80	3.28	2.83	0.000
24.80	3.28	2.83	0.000	35.00	3.28	2.83	0.000
25.00	3.28	2.83	0.000	35.20	3.28	2.83	0.000
25.20	3.28	2.83	0.000	35.40	3.28	2.83	0.000
25.40	3.28	2.83	0.000	35.60	3.28	2.83	0.000
25.60	3.28	2.83	0.000	35.80	3.28	2.83	0.000
25.80	3.28	2.83	0.000	36.00	3.28	2.83	0.000
26.00	3.28	2.83	0.000	36.20	3.28	2.83	0.000
26.20	3.28	2.83	0.000	36.40	3.28	2.83	0.000
26.40	3.28	2.83	0.000	36.60	3.28	2.83	0.000
26.60	3.28	2.83	0.000	36.80	3.28	2.83	0.000
26.80	3.28	2.83	0.000	37.00	3.28	2.83	0.000
27.00	3.28	2.83	0.000	37.20	3.28	2.83	0.000
27.20	3.28	2.83	0.000	37.40	3.28	2.83	0.000
27.40	3.28	2.83	0.000	37.60	3.28	2.83	0.000
27.60	3.28	2.83	0.000	37.80	3.28	2.83	0.000
27.80	3.28	2.83	0.000	38.00	3.28	2.83	0.000
28.00	3.28	2.83	0.000	38.20	3.28	2.83	0.000
28.20	3.28	2.83	0.000	38.40	3.28	2.83	0.000
28.40	3.28	2.83	0.000	38.60	3.28	2.83	0.000
28.60	3.28	2.83	0.000	38.80	3.28	2.83	0.000
28.80	3.28	2.83	0.000	39.00	3.28	2.83	0.000
29.00	3.28	2.83	0.000	39.20	3.28	2.83	0.000
29.20	3.28	2.83	0.000	39.40	3.28	2.83	0.000
29.40	3.28	2.83	0.000	39.60	3.28	2.83	0.000
29.60	3.28	2.83	0.000	39.80	3.28	2.83	0.000
29.80	3.28	2.83	0.000	40.00	3.28	2.83	0.000
30.00	3.28	2.83	0.000	40.20	3.28	2.83	0.000
30.20	3.28	2.83	0.000	40.40	3.28	2.83	0.000
30.40	3.28	2.83	0.000	40.60	3.28	2.83	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
40.80	3.28	2.83	0.000	51.00	3.28	2.83	0.000
41.00	3.28	2.83	0.000	51.20	3.28	2.83	0.000
41.20	3.28	2.83	0.000	51.40	3.28	2.83	0.000
41.40	3.28	2.83	0.000	51.60	3.28	2.83	0.000
41.60	3.28	2.83	0.000	51.80	3.28	2.83	0.000
41.80	3.28	2.83	0.000	52.00	3.28	2.83	0.000
42.00	3.28	2.83	0.000	52.20	3.28	2.83	0.000
42.20	3.28	2.83	0.000	52.40	3.28	2.83	0.000
42.40	3.28	2.83	0.000	52.60	3.28	2.83	0.000
42.60	3.28	2.83	0.000	52.80	3.28	2.83	0.000
42.80	3.28	2.83	0.000	53.00	3.28	2.83	0.000
43.00	3.28	2.83	0.000	53.20	3.28	2.83	0.000
43.20	3.28	2.83	0.000	53.40	3.28	2.83	0.000
43.40	3.28	2.83	0.000	53.60	3.28	2.83	0.000
43.60	3.28	2.83	0.000	53.80	3.28	2.83	0.000
43.80	3.28	2.83	0.000	54.00	3.28	2.83	0.000
44.00	3.28	2.83	0.000	54.20	3.28	2.83	0.000
44.20	3.28	2.83	0.000	54.40	3.28	2.83	0.000
44.40	3.28	2.83	0.000	54.60	3.28	2.83	0.000
44.60	3.28	2.83	0.000	54.80	3.28	2.83	0.000
44.80	3.28	2.83	0.000	55.00	3.28	2.83	0.000
45.00	3.28	2.83	0.000	55.20	3.28	2.83	0.000
45.20	3.28	2.83	0.000	55.40	3.28	2.83	0.000
45.40	3.28	2.83	0.000	55.60	3.28	2.83	0.000
45.60	3.28	2.83	0.000	55.80	3.28	2.83	0.000
45.80	3.28	2.83	0.000	56.00	3.28	2.83	0.000
46.00	3.28	2.83	0.000	56.20	3.28	2.83	0.000
46.20	3.28	2.83	0.000	56.40	3.28	2.83	0.000
46.40	3.28	2.83	0.000	56.60	3.28	2.83	0.000
46.60	3.28	2.83	0.000	56.80	3.28	2.83	0.000
46.80	3.28	2.83	0.000	57.00	3.28	2.83	0.000
47.00	3.28	2.83	0.000	57.20	3.28	2.83	0.000
47.20	3.28	2.83	0.000	57.40	3.28	2.83	0.000
47.40	3.28	2.83	0.000	57.60	3.28	2.83	0.000
47.60	3.28	2.83	0.000	57.80	3.28	2.83	0.000
47.80	3.28	2.83	0.000	58.00	3.28	2.83	0.000
48.00	3.28	2.83	0.000	58.20	3.28	2.83	0.000
48.20	3.28	2.83	0.000	58.40	3.28	2.83	0.000
48.40	3.28	2.83	0.000	58.60	3.28	2.83	0.000
48.60	3.28	2.83	0.000	58.80	3.28	2.83	0.000
48.80	3.28	2.83	0.000	59.00	3.28	2.83	0.000
49.00	3.28	2.83	0.000	59.20	3.28	2.83	0.000
49.20	3.28	2.83	0.000	59.40	3.28	2.83	0.000
49.40	3.28	2.83	0.000	59.60	3.28	2.83	0.000
49.60	3.28	2.83	0.000	59.80	3.28	2.83	0.000
49.80	3.28	2.83	0.000	60.00	3.28	2.83	0.000
50.00	3.28	2.83	0.000	60.20	3.28	2.83	0.000
50.20	3.28	2.83	0.000	60.40	3.28	2.83	0.000
50.40	3.28	2.83	0.000	60.60	3.28	2.83	0.000
50.60	3.28	2.83	0.000	60.80	3.28	2.83	0.000
50.80	3.28	2.83	0.000	61.00	3.28	2.83	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
61.20	3.28	2.83	0.000	71.40	3.28	2.83	0.000
61.40	3.28	2.83	0.000	71.60	3.28	2.83	0.000
61.60	3.28	2.83	0.000	71.80	3.28	2.83	0.000
61.80	3.28	2.83	0.000	72.00	3.28	2.83	0.000
62.00	3.28	2.83	0.000	72.20	3.28	2.83	0.000
62.20	3.28	2.83	0.000	72.40	3.28	2.83	0.000
62.40	3.28	2.83	0.000	72.60	3.28	2.83	0.000
62.60	3.28	2.83	0.000	72.80	3.28	2.83	0.000
62.80	3.28	2.83	0.000	73.00	3.28	2.83	0.000
63.00	3.28	2.83	0.000	73.20	3.28	2.83	0.000
63.20	3.28	2.83	0.000	73.40	3.28	2.83	0.000
63.40	3.28	2.83	0.000	73.60	3.28	2.83	0.000
63.60	3.28	2.83	0.000	73.80	3.28	2.83	0.000
63.80	3.28	2.83	0.000	74.00	3.28	2.83	0.000
64.00	3.28	2.83	0.000	74.20	3.28	2.83	0.000
64.20	3.28	2.83	0.000	74.40	3.28	2.83	0.000
64.40	3.28	2.83	0.000	74.60	3.28	2.83	0.000
64.60	3.28	2.83	0.000	74.80	3.28	2.83	0.000
64.80	3.28	2.83	0.000	75.00	3.28	2.83	0.000
65.00	3.28	2.83	0.000	75.20	3.28	2.83	0.000
65.20	3.28	2.83	0.000	75.40	3.28	2.83	0.000
65.40	3.28	2.83	0.000	75.60	3.28	2.83	0.000
65.60	3.28	2.83	0.000	75.80	3.28	2.83	0.000
65.80	3.28	2.83	0.000	76.00	3.28	2.83	0.000
66.00	3.28	2.83	0.000	76.20	3.28	2.83	0.000
66.20	3.28	2.83	0.000	76.40	3.28	2.83	0.000
66.40	3.28	2.83	0.000	76.60	3.28	2.83	0.000
66.60	3.28	2.83	0.000	76.80	3.28	2.83	0.000
66.80	3.28	2.83	0.000	77.00	3.28	2.83	0.000
67.00	3.28	2.83	0.000	77.20	3.28	2.83	0.000
67.20	3.28	2.83	0.000	77.40	3.28	2.83	0.000
67.40	3.28	2.83	0.000	77.60	3.28	2.83	0.000
67.60	3.28	2.83	0.000	77.80	3.28	2.83	0.000
67.80	3.28	2.83	0.000	78.00	3.28	2.83	0.000
68.00	3.28	2.83	0.000	78.20	3.28	2.83	0.000
68.20	3.28	2.83	0.000	78.40	3.28	2.83	0.000
68.40	3.28	2.83	0.000	78.60	3.28	2.83	0.000
68.60	3.28	2.83	0.000	78.80	3.28	2.83	0.000
68.80	3.28	2.83	0.000	79.00	3.28	2.83	0.000
69.00	3.28	2.83	0.000	79.20	3.28	2.83	0.000
69.20	3.28	2.83	0.000	79.40	3.28	2.83	0.000
69.40	3.28	2.83	0.000	79.60	3.28	2.83	0.000
69.60	3.28	2.83	0.000	79.80	3.28	2.83	0.000
69.80	3.28	2.83	0.000	80.00	3.28	2.83	0.000
70.00	3.28	2.83	0.000	80.20	3.28	2.83	0.000
70.20	3.28	2.83	0.000	80.40	3.28	2.83	0.000
70.40	3.28	2.83	0.000	80.60	3.28	2.83	0.000
70.60	3.28	2.83	0.000	80.80	3.28	2.83	0.000
70.80	3.28	2.83	0.000	81.00	3.28	2.83	0.000
71.00	3.28	2.83	0.000	81.20	3.28	2.83	0.000
71.20	3.28	2.83	0.000	81.40	3.28	2.83	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
81.60	3.28	2.83	0.000	91.80	3.28	2.83	0.000
81.80	3.28	2.83	0.000	92.00	3.28	2.83	0.000
82.00	3.28	2.83	0.000	92.20	3.28	2.83	0.000
82.20	3.28	2.83	0.000	92.40	3.28	2.83	0.000
82.40	3.28	2.83	0.000	92.60	3.28	2.83	0.000
82.60	3.28	2.83	0.000	92.80	3.28	2.83	0.000
82.80	3.28	2.83	0.000	93.00	3.28	2.83	0.000
83.00	3.28	2.83	0.000	93.20	3.28	2.83	0.000
83.20	3.28	2.83	0.000	93.40	3.28	2.83	0.000
83.40	3.28	2.83	0.000	93.60	3.28	2.83	0.000
83.60	3.28	2.83	0.000	93.80	3.28	2.83	0.000
83.80	3.28	2.83	0.000	94.00	3.28	2.83	0.000
84.00	3.28	2.83	0.000	94.20	3.28	2.83	0.000
84.20	3.28	2.83	0.000	94.40	3.28	2.83	0.000
84.40	3.28	2.83	0.000	94.60	3.28	2.83	0.000
84.60	3.28	2.83	0.000	94.80	3.28	2.83	0.000
84.80	3.28	2.83	0.000	95.00	3.28	2.83	0.000
85.00	3.28	2.83	0.000	95.20	3.28	2.83	0.000
85.20	3.28	2.83	0.000	95.40	3.28	2.83	0.000
85.40	3.28	2.83	0.000	95.60	3.28	2.83	0.000
85.60	3.28	2.83	0.000	95.80	3.28	2.83	0.000
85.80	3.28	2.83	0.000	96.00	3.28	2.83	0.000
86.00	3.28	2.83	0.000	96.20	3.28	2.83	0.000
86.20	3.28	2.83	0.000	96.40	3.28	2.83	0.000
86.40	3.28	2.83	0.000	96.60	3.28	2.83	0.000
86.60	3.28	2.83	0.000	96.80	3.28	2.83	0.000
86.80	3.28	2.83	0.000	97.00	3.28	2.83	0.000
87.00	3.28	2.83	0.000	97.20	3.28	2.83	0.000
87.20	3.28	2.83	0.000	97.40	3.28	2.83	0.000
87.40	3.28	2.83	0.000	97.60	3.28	2.83	0.000
87.60	3.28	2.83	0.000	97.80	3.28	2.83	0.000
87.80	3.28	2.83	0.000	98.00	3.28	2.83	0.000
88.00	3.28	2.83	0.000	98.20	3.28	2.83	0.000
88.20	3.28	2.83	0.000	98.40	3.28	2.83	0.000
88.40	3.28	2.83	0.000	98.60	3.28	2.83	0.000
88.60	3.28	2.83	0.000	98.80	3.28	2.83	0.000
88.80	3.28	2.83	0.000	99.00	3.28	2.83	0.000
89.00	3.28	2.83	0.000	99.20	3.28	2.83	0.000
89.20	3.28	2.83	0.000	99.40	3.28	2.83	0.000
89.40	3.28	2.83	0.000	99.60	3.28	2.83	0.000
89.60	3.28	2.83	0.000	99.80	3.28	2.83	0.000
89.80	3.28	2.83	0.000	100.00	3.28	2.83	0.000
90.00	3.28	2.83	0.000	100.20	3.28	2.83	0.000
90.20	3.28	2.83	0.000	100.40	3.28	2.83	0.000
90.40	3.28	2.83	0.000	100.60	3.28	2.83	0.000
90.60	3.28	2.83	0.000	100.80	3.28	2.83	0.000
90.80	3.28	2.83	0.000	101.00	3.28	2.83	0.000
91.00	3.28	2.83	0.000	101.20	3.28	2.83	0.000
91.20	3.28	2.83	0.000	101.40	3.28	2.83	0.000
91.40	3.28	2.83	0.000	101.60	3.28	2.83	0.000
91.60	3.28	2.83	0.000	101.80	3.28	2.83	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
102.00	3.28	2.83	0.000	112.20	3.28	2.83	0.000
102.20	3.28	2.83	0.000	112.40	3.28	2.83	0.000
102.40	3.28	2.83	0.000	112.60	3.28	2.83	0.000
102.60	3.28	2.83	0.000	112.80	3.28	2.83	0.000
102.80	3.28	2.83	0.000	113.00	3.28	2.83	0.000
103.00	3.28	2.83	0.000	113.20	3.28	2.83	0.000
103.20	3.28	2.83	0.000	113.40	3.28	2.83	0.000
103.40	3.28	2.83	0.000	113.60	3.28	2.83	0.000
103.60	3.28	2.83	0.000	113.80	3.28	2.83	0.000
103.80	3.28	2.83	0.000	114.00	3.28	2.83	0.000
104.00	3.28	2.83	0.000	114.20	3.28	2.83	0.000
104.20	3.28	2.83	0.000	114.40	3.28	2.83	0.000
104.40	3.28	2.83	0.000	114.60	3.28	2.83	0.000
104.60	3.28	2.83	0.000	114.80	3.28	2.83	0.000
104.80	3.28	2.83	0.000	115.00	3.28	2.83	0.000
105.00	3.28	2.83	0.000	115.20	3.28	2.83	0.000
105.20	3.28	2.83	0.000	115.40	3.28	2.83	0.000
105.40	3.28	2.83	0.000	115.60	3.28	2.83	0.000
105.60	3.28	2.83	0.000	115.80	3.28	2.83	0.000
105.80	3.28	2.83	0.000	116.00	3.28	2.83	0.000
106.00	3.28	2.83	0.000	116.20	3.28	2.83	0.000
106.20	3.28	2.83	0.000	116.40	3.28	2.83	0.000
106.40	3.28	2.83	0.000	116.60	3.28	2.83	0.000
106.60	3.28	2.83	0.000	116.80	3.28	2.83	0.000
106.80	3.28	2.83	0.000	117.00	3.28	2.83	0.000
107.00	3.28	2.83	0.000	117.20	3.28	2.83	0.000
107.20	3.28	2.83	0.000	117.40	3.28	2.83	0.000
107.40	3.28	2.83	0.000	117.60	3.28	2.83	0.000
107.60	3.28	2.83	0.000	117.80	3.28	2.83	0.000
107.80	3.28	2.83	0.000	118.00	3.28	2.83	0.000
108.00	3.28	2.83	0.000	118.20	3.28	2.83	0.000
108.20	3.28	2.83	0.000	118.40	3.28	2.83	0.000
108.40	3.28	2.83	0.000	118.60	3.28	2.83	0.000
108.60	3.28	2.83	0.000	118.80	3.28	2.83	0.000
108.80	3.28	2.83	0.000	119.00	3.28	2.83	0.000
109.00	3.28	2.83	0.000	119.20	3.28	2.83	0.000
109.20	3.28	2.83	0.000	119.40	3.28	2.83	0.000
109.40	3.28	2.83	0.000	119.60	3.28	2.83	0.000
109.60	3.28	2.83	0.000	119.80	3.28	2.83	0.000
109.80	3.28	2.83	0.000	120.00	3.28	2.83	0.000
110.00	3.28	2.83	0.000	120.20	3.28	2.83	0.000
110.20	3.28	2.83	0.000	120.40	3.28	2.83	0.000
110.40	3.28	2.83	0.000	120.60	3.28	2.83	0.000
110.60	3.28	2.83	0.000	120.80	3.28	2.83	0.000
110.80	3.28	2.83	0.000	121.00	3.28	2.83	0.000
111.00	3.28	2.83	0.000	121.20	3.28	2.83	0.000
111.20	3.28	2.83	0.000	121.40	3.28	2.83	0.000
111.40	3.28	2.83	0.000	121.60	3.28	2.83	0.000
111.60	3.28	2.83	0.000	121.80	3.28	2.83	0.000
111.80	3.28	2.83	0.000	122.00	3.28	2.83	0.000
112.00	3.28	2.83	0.000	122.20	3.28	2.83	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
122.40	3.28	2.83	0.000	132.60	3.28	2.83	0.000
122.60	3.28	2.83	0.000	132.80	3.28	2.83	0.000
122.80	3.28	2.83	0.000	133.00	3.28	2.83	0.000
123.00	3.28	2.83	0.000	133.20	3.28	2.83	0.000
123.20	3.28	2.83	0.000	133.40	3.28	2.83	0.000
123.40	3.28	2.83	0.000	133.60	3.28	2.83	0.000
123.60	3.28	2.83	0.000	133.80	3.28	2.83	0.000
123.80	3.28	2.83	0.000	134.00	3.28	2.83	0.000
124.00	3.28	2.83	0.000	134.20	3.28	2.83	0.000
124.20	3.28	2.83	0.000	134.40	3.28	2.83	0.000
124.40	3.28	2.83	0.000	134.60	3.28	2.83	0.000
124.60	3.28	2.83	0.000	134.80	3.28	2.83	0.000
124.80	3.28	2.83	0.000	135.00	3.28	2.83	0.000
125.00	3.28	2.83	0.000	135.20	3.28	2.83	0.000
125.20	3.28	2.83	0.000	135.40	3.28	2.83	0.000
125.40	3.28	2.83	0.000	135.60	3.28	2.83	0.000
125.60	3.28	2.83	0.000	135.80	3.28	2.83	0.000
125.80	3.28	2.83	0.000	136.00	3.28	2.83	0.000
126.00	3.28	2.83	0.000	136.20	3.28	2.83	0.000
126.20	3.28	2.83	0.000	136.40	3.28	2.83	0.000
126.40	3.28	2.83	0.000	136.60	3.28	2.83	0.000
126.60	3.28	2.83	0.000	136.80	3.28	2.83	0.000
126.80	3.28	2.83	0.000	137.00	3.28	2.83	0.000
127.00	3.28	2.83	0.000	137.20	3.28	2.83	0.000
127.20	3.28	2.83	0.000	137.40	3.28	2.83	0.000
127.40	3.28	2.83	0.000	137.60	3.28	2.83	0.000
127.60	3.28	2.83	0.000	137.80	3.28	2.83	0.000
127.80	3.28	2.83	0.000	138.00	3.28	2.83	0.000
128.00	3.28	2.83	0.000	138.20	3.28	2.83	0.000
128.20	3.28	2.83	0.000	138.40	3.28	2.83	0.000
128.40	3.28	2.83	0.000	138.60	3.28	2.83	0.000
128.60	3.28	2.83	0.000	138.80	3.28	2.83	0.000
128.80	3.28	2.83	0.000	139.00	3.28	2.83	0.000
129.00	3.28	2.83	0.000	139.20	3.28	2.83	0.000
129.20	3.28	2.83	0.000	139.40	3.28	2.83	0.000
129.40	3.28	2.83	0.000	139.60	3.28	2.83	0.000
129.60	3.28	2.83	0.000	139.80	3.28	2.83	0.000
129.80	3.28	2.83	0.000	140.00	3.28	2.83	0.000
130.00	3.28	2.83	0.000	140.20	3.28	2.83	0.000
130.20	3.28	2.83	0.000	140.40	3.28	2.83	0.000
130.40	3.28	2.83	0.000	140.60	3.28	2.83	0.000
130.60	3.28	2.83	0.000	140.80	3.28	2.83	0.000
130.80	3.28	2.83	0.000	141.00	3.28	2.83	0.000
131.00	3.28	2.83	0.000	141.20	3.28	2.83	0.000
131.20	3.28	2.83	0.000	141.40	3.28	2.83	0.000
131.40	3.28	2.83	0.000	141.60	3.28	2.83	0.000
131.60	3.28	2.83	0.000	141.80	3.28	2.83	0.000
131.80	3.28	2.83	0.000	142.00	3.28	2.83	0.000
132.00	3.28	2.83	0.000	142.20	3.28	2.83	0.000
132.20	3.28	2.83	0.000	142.40	3.28	2.83	0.000
132.40	3.28	2.83	0.000	142.60	3.28	2.83	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
142.80	3.28	2.83	0.000	153.00	3.28	2.83	0.000
143.00	3.28	2.83	0.000	153.20	3.28	2.83	0.000
143.20	3.28	2.83	0.000	153.40	3.28	2.83	0.000
143.40	3.28	2.83	0.000	153.60	3.28	2.83	0.000
143.60	3.28	2.83	0.000	153.80	3.28	2.83	0.000
143.80	3.28	2.83	0.000	154.00	3.28	2.83	0.000
144.00	3.28	2.83	0.000	154.20	3.28	2.83	0.000
144.20	3.28	2.83	0.000	154.40	3.28	2.83	0.000
144.40	3.28	2.83	0.000	154.60	3.28	2.83	0.000
144.60	3.28	2.83	0.000	154.80	3.28	2.83	0.000
144.80	3.28	2.83	0.000	155.00	3.28	2.83	0.000
145.00	3.28	2.83	0.000	155.20	3.28	2.83	0.000
145.20	3.28	2.83	0.000	155.40	3.28	2.83	0.000
145.40	3.28	2.83	0.000	155.60	3.28	2.83	0.000
145.60	3.28	2.83	0.000	155.80	3.28	2.83	0.000
145.80	3.28	2.83	0.000	156.00	3.28	2.83	0.000
146.00	3.28	2.83	0.000	156.20	3.28	2.83	0.000
146.20	3.28	2.83	0.000	156.40	3.28	2.83	0.000
146.40	3.28	2.83	0.000	156.60	3.28	2.83	0.000
146.60	3.28	2.83	0.000	156.80	3.28	2.83	0.000
146.80	3.28	2.83	0.000	157.00	3.28	2.83	0.000
147.00	3.28	2.83	0.000	157.20	3.28	2.83	0.000
147.20	3.28	2.83	0.000	157.40	3.28	2.83	0.000
147.40	3.28	2.83	0.000	157.60	3.28	2.83	0.000
147.60	3.28	2.83	0.000	157.80	3.28	2.83	0.000
147.80	3.28	2.83	0.000	158.00	3.28	2.83	0.000
148.00	3.28	2.83	0.000	158.20	3.28	2.83	0.000
148.20	3.28	2.83	0.000	158.40	3.28	2.83	0.000
148.40	3.28	2.83	0.000	158.60	3.28	2.83	0.000
148.60	3.28	2.83	0.000	158.80	3.28	2.83	0.000
148.80	3.28	2.83	0.000	159.00	3.28	2.83	0.000
149.00	3.28	2.83	0.000	159.20	3.28	2.83	0.000
149.20	3.28	2.83	0.000	159.40	3.28	2.83	0.000
149.40	3.28	2.83	0.000	159.60	3.28	2.83	0.000
149.60	3.28	2.83	0.000	159.80	3.28	2.83	0.000
149.80	3.28	2.83	0.000	160.00	3.28	2.83	0.000
150.00	3.28	2.83	0.000	160.20	3.28	2.83	0.000
150.20	3.28	2.83	0.000	160.40	3.28	2.83	0.000
150.40	3.28	2.83	0.000	160.60	3.28	2.83	0.000
150.60	3.28	2.83	0.000	160.80	3.28	2.83	0.000
150.80	3.28	2.83	0.000	161.00	3.28	2.83	0.000
151.00	3.28	2.83	0.000	161.20	3.28	2.83	0.000
151.20	3.28	2.83	0.000	161.40	3.28	2.83	0.000
151.40	3.28	2.83	0.000	161.60	3.28	2.83	0.000
151.60	3.28	2.83	0.000	161.80	3.28	2.83	0.000
151.80	3.28	2.83	0.000	162.00	3.28	2.83	0.000
152.00	3.28	2.83	0.000	162.20	3.28	2.83	0.000
152.20	3.28	2.83	0.000	162.40	3.28	2.83	0.000
152.40	3.28	2.83	0.000	162.60	3.28	2.83	0.000
152.60	3.28	2.83	0.000	162.80	3.28	2.83	0.000
152.80	3.28	2.83	0.000	163.00	3.28	2.83	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
163.20	3.28	2.83	0.000
163.40	3.28	2.83	0.000
163.60	3.28	2.83	0.000
163.80	3.28	2.83	0.000
164.00	3.28	2.83	0.000
164.20	3.28	2.83	0.000
164.40	3.28	2.83	0.000
164.60	3.28	2.83	0.000
164.80	3.28	2.83	0.000
165.00	3.28	2.83	0.000
165.20	3.28	2.83	0.000
165.40	3.28	2.83	0.000
165.60	3.28	2.83	0.000
165.80	3.28	2.83	0.000
166.00	3.28	2.83	0.000
166.20	3.28	2.83	0.000
166.40	3.28	2.83	0.000
166.60	3.28	2.83	0.000
166.80	3.28	2.83	0.000
167.00	3.28	2.83	0.000
167.20	3.28	2.83	0.000
167.40	3.28	2.83	0.000
167.60	3.28	2.83	0.000
167.80	3.28	2.83	0.000
168.00	3.28	2.83	0.000

BMW_2025-7-24_2
Prepared by Bohler
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Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

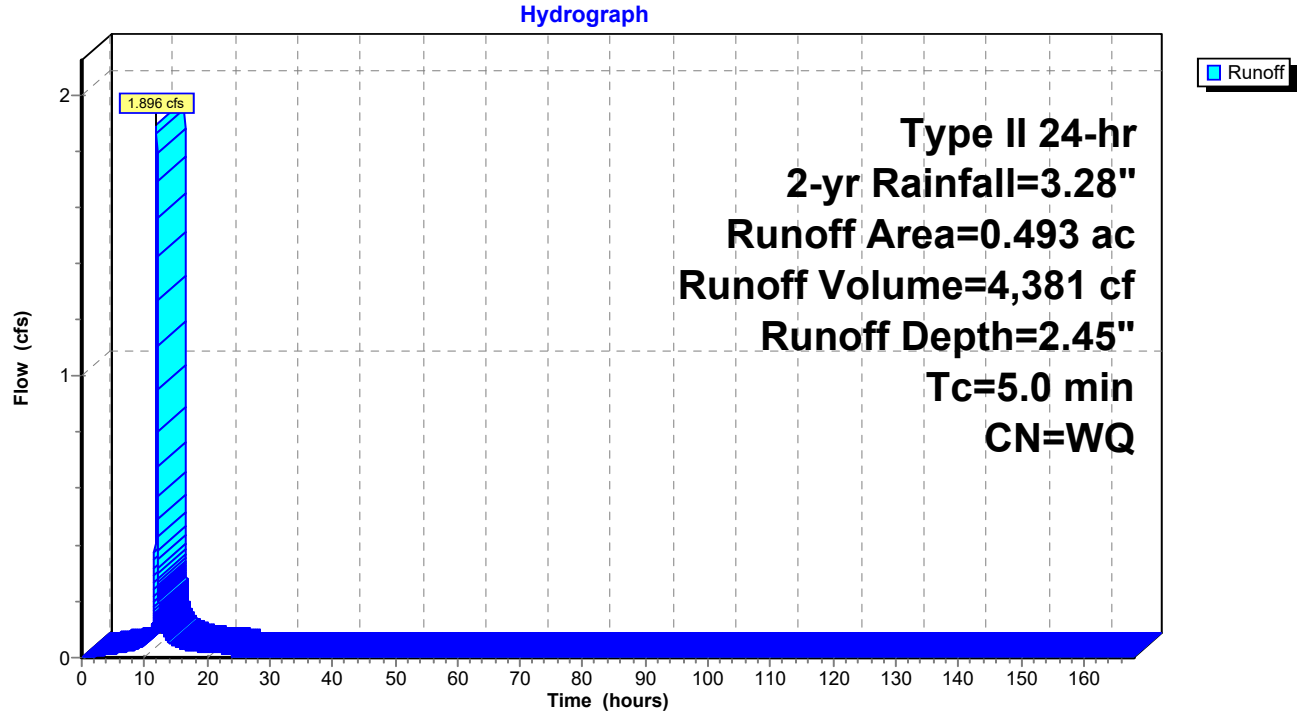
Runoff = 1.896 cfs @ 11.96 hrs, Volume= 4,381 cf, Depth= 2.45"
Routed to Pond 3P : UG2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493		Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 12S: POST-DEV UG2 TO POI#1



Hydrograph for Subcatchment 12S: POST-DEV UG2 TO POI#1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.000	10.20	0.62	0.05	0.052
0.20	0.01	0.00	0.000	10.40	0.65	0.05	0.058
0.40	0.01	0.00	0.000	10.60	0.69	0.07	0.065
0.60	0.02	0.00	0.000	10.80	0.73	0.08	0.075
0.80	0.03	0.00	0.000	11.00	0.77	0.10	0.086
1.00	0.03	0.00	0.000	11.20	0.82	0.12	0.105
1.20	0.04	0.00	0.000	11.40	0.89	0.15	0.130
1.40	0.05	0.00	0.001	11.60	1.01	0.20	0.240
1.60	0.06	0.00	0.002	11.80	1.41	0.44	**0.844**
1.80	0.06	0.00	0.003	12.00	2.17	0.98	**1.566**
2.00	0.07	0.00	0.004	12.20	2.29	1.08	0.230
2.20	0.08	0.00	0.004	12.40	2.38	1.15	0.166
2.40	0.09	0.00	0.005	12.60	2.44	1.19	0.113
2.60	0.10	0.00	0.006	12.80	2.49	1.23	0.098
2.80	0.10	0.00	0.007	13.00	2.53	1.27	0.085
3.00	0.11	0.00	0.007	13.20	2.57	1.30	0.075
3.20	0.12	0.00	0.008	13.40	2.60	1.33	0.068
3.40	0.13	0.00	0.009	13.60	2.64	1.36	0.061
3.60	0.14	0.00	0.009	13.80	2.66	1.38	0.055
3.80	0.15	0.00	0.010	14.00	2.69	1.40	0.050
4.00	0.16	0.00	0.011	14.20	2.71	1.42	0.047
4.20	0.17	0.00	0.011	14.40	2.74	1.44	0.045
4.40	0.18	0.00	0.012	14.60	2.76	1.46	0.043
4.60	0.19	0.00	0.013	14.80	2.78	1.48	0.042
4.80	0.20	0.00	0.014	15.00	2.80	1.49	0.040
5.00	0.21	0.00	0.014	15.20	2.82	1.51	0.038
5.20	0.22	0.00	0.015	15.40	2.84	1.52	0.036
5.40	0.23	0.00	0.016	15.60	2.85	1.54	0.034
5.60	0.24	0.00	0.016	15.80	2.87	1.55	0.033
5.80	0.25	0.00	0.017	16.00	2.89	1.57	0.031
6.00	0.26	0.00	0.018	16.20	2.90	1.58	0.030
6.20	0.27	0.00	0.019	16.40	2.92	1.59	0.029
6.40	0.29	0.00	0.019	16.60	2.93	1.60	0.028
6.60	0.30	0.00	0.020	16.80	2.94	1.61	0.028
6.80	0.31	0.00	0.021	17.00	2.96	1.63	0.027
7.00	0.32	0.00	0.021	17.20	2.97	1.64	0.026
7.20	0.34	0.00	0.022	17.40	2.98	1.65	0.026
7.40	0.35	0.00	0.023	17.60	3.00	1.66	0.025
7.60	0.37	0.00	0.023	17.80	3.01	1.67	0.024
7.80	0.38	0.00	0.024	18.00	3.02	1.68	0.024
8.00	0.39	0.00	0.025	18.20	3.03	1.69	0.023
8.20	0.41	0.00	0.026	18.40	3.04	1.70	0.022
8.40	0.43	0.01	0.029	18.60	3.05	1.71	0.022
8.60	0.44	0.01	0.032	18.80	3.07	1.72	0.021
8.80	0.46	0.01	0.034	19.00	3.08	1.73	0.020
9.00	0.48	0.01	0.037	19.20	3.09	1.74	0.020
9.20	0.50	0.02	0.038	19.40	3.10	1.74	0.019
9.40	0.52	0.02	0.038	19.60	3.10	1.75	0.019
9.60	0.55	0.03	0.039	19.80	3.11	1.76	0.018
9.80	0.57	0.03	0.043	20.00	3.12	1.77	0.017
10.00	0.59	0.04	0.047	20.20	3.13	1.78	0.017

Hydrograph for Subcatchment 12S: POST-DEV UG2 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
20.40	3.14	1.78	0.017	30.60	3.28	1.90	0.000
20.60	3.15	1.79	0.017	30.80	3.28	1.90	0.000
20.80	3.16	1.80	0.017	31.00	3.28	1.90	0.000
21.00	3.16	1.80	0.016	31.20	3.28	1.90	0.000
21.20	3.17	1.81	0.016	31.40	3.28	1.90	0.000
21.40	3.18	1.82	0.016	31.60	3.28	1.90	0.000
21.60	3.19	1.83	0.016	31.80	3.28	1.90	0.000
21.80	3.20	1.83	0.016	32.00	3.28	1.90	0.000
22.00	3.20	1.84	0.016	32.20	3.28	1.90	0.000
22.20	3.21	1.85	0.016	32.40	3.28	1.90	0.000
22.40	3.22	1.85	0.015	32.60	3.28	1.90	0.000
22.60	3.23	1.86	0.015	32.80	3.28	1.90	0.000
22.80	3.24	1.87	0.015	33.00	3.28	1.90	0.000
23.00	3.24	1.87	0.015	33.20	3.28	1.90	0.000
23.20	3.25	1.88	0.015	33.40	3.28	1.90	0.000
23.40	3.26	1.89	0.015	33.60	3.28	1.90	0.000
23.60	3.27	1.89	0.015	33.80	3.28	1.90	0.000
23.80	3.27	1.90	0.015	34.00	3.28	1.90	0.000
24.00	**3.28**	**1.90**	0.014	34.20	3.28	1.90	0.000
24.20	3.28	1.90	0.000	34.40	3.28	1.90	0.000
24.40	3.28	1.90	0.000	34.60	3.28	1.90	0.000
24.60	3.28	1.90	0.000	34.80	3.28	1.90	0.000
24.80	3.28	1.90	0.000	35.00	3.28	1.90	0.000
25.00	3.28	1.90	0.000	35.20	3.28	1.90	0.000
25.20	3.28	1.90	0.000	35.40	3.28	1.90	0.000
25.40	3.28	1.90	0.000	35.60	3.28	1.90	0.000
25.60	3.28	1.90	0.000	35.80	3.28	1.90	0.000
25.80	3.28	1.90	0.000	36.00	3.28	1.90	0.000
26.00	3.28	1.90	0.000	36.20	3.28	1.90	0.000
26.20	3.28	1.90	0.000	36.40	3.28	1.90	0.000
26.40	3.28	1.90	0.000	36.60	3.28	1.90	0.000
26.60	3.28	1.90	0.000	36.80	3.28	1.90	0.000
26.80	3.28	1.90	0.000	37.00	3.28	1.90	0.000
27.00	3.28	1.90	0.000	37.20	3.28	1.90	0.000
27.20	3.28	1.90	0.000	37.40	3.28	1.90	0.000
27.40	3.28	1.90	0.000	37.60	3.28	1.90	0.000
27.60	3.28	1.90	0.000	37.80	3.28	1.90	0.000
27.80	3.28	1.90	0.000	38.00	3.28	1.90	0.000
28.00	3.28	1.90	0.000	38.20	3.28	1.90	0.000
28.20	3.28	1.90	0.000	38.40	3.28	1.90	0.000
28.40	3.28	1.90	0.000	38.60	3.28	1.90	0.000
28.60	3.28	1.90	0.000	38.80	3.28	1.90	0.000
28.80	3.28	1.90	0.000	39.00	3.28	1.90	0.000
29.00	3.28	1.90	0.000	39.20	3.28	1.90	0.000
29.20	3.28	1.90	0.000	39.40	3.28	1.90	0.000
29.40	3.28	1.90	0.000	39.60	3.28	1.90	0.000
29.60	3.28	1.90	0.000	39.80	3.28	1.90	0.000
29.80	3.28	1.90	0.000	40.00	3.28	1.90	0.000
30.00	3.28	1.90	0.000	40.20	3.28	1.90	0.000
30.20	3.28	1.90	0.000	40.40	3.28	1.90	0.000
30.40	3.28	1.90	0.000	40.60	3.28	1.90	0.000

Hydrograph for Subcatchment 12S: POST-DEV UG2 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
40.80	3.28	1.90	0.000	51.00	3.28	1.90	0.000
41.00	3.28	1.90	0.000	51.20	3.28	1.90	0.000
41.20	3.28	1.90	0.000	51.40	3.28	1.90	0.000
41.40	3.28	1.90	0.000	51.60	3.28	1.90	0.000
41.60	3.28	1.90	0.000	51.80	3.28	1.90	0.000
41.80	3.28	1.90	0.000	52.00	3.28	1.90	0.000
42.00	3.28	1.90	0.000	52.20	3.28	1.90	0.000
42.20	3.28	1.90	0.000	52.40	3.28	1.90	0.000
42.40	3.28	1.90	0.000	52.60	3.28	1.90	0.000
42.60	3.28	1.90	0.000	52.80	3.28	1.90	0.000
42.80	3.28	1.90	0.000	53.00	3.28	1.90	0.000
43.00	3.28	1.90	0.000	53.20	3.28	1.90	0.000
43.20	3.28	1.90	0.000	53.40	3.28	1.90	0.000
43.40	3.28	1.90	0.000	53.60	3.28	1.90	0.000
43.60	3.28	1.90	0.000	53.80	3.28	1.90	0.000
43.80	3.28	1.90	0.000	54.00	3.28	1.90	0.000
44.00	3.28	1.90	0.000	54.20	3.28	1.90	0.000
44.20	3.28	1.90	0.000	54.40	3.28	1.90	0.000
44.40	3.28	1.90	0.000	54.60	3.28	1.90	0.000
44.60	3.28	1.90	0.000	54.80	3.28	1.90	0.000
44.80	3.28	1.90	0.000	55.00	3.28	1.90	0.000
45.00	3.28	1.90	0.000	55.20	3.28	1.90	0.000
45.20	3.28	1.90	0.000	55.40	3.28	1.90	0.000
45.40	3.28	1.90	0.000	55.60	3.28	1.90	0.000
45.60	3.28	1.90	0.000	55.80	3.28	1.90	0.000
45.80	3.28	1.90	0.000	56.00	3.28	1.90	0.000
46.00	3.28	1.90	0.000	56.20	3.28	1.90	0.000
46.20	3.28	1.90	0.000	56.40	3.28	1.90	0.000
46.40	3.28	1.90	0.000	56.60	3.28	1.90	0.000
46.60	3.28	1.90	0.000	56.80	3.28	1.90	0.000
46.80	3.28	1.90	0.000	57.00	3.28	1.90	0.000
47.00	3.28	1.90	0.000	57.20	3.28	1.90	0.000
47.20	3.28	1.90	0.000	57.40	3.28	1.90	0.000
47.40	3.28	1.90	0.000	57.60	3.28	1.90	0.000
47.60	3.28	1.90	0.000	57.80	3.28	1.90	0.000
47.80	3.28	1.90	0.000	58.00	3.28	1.90	0.000
48.00	3.28	1.90	0.000	58.20	3.28	1.90	0.000
48.20	3.28	1.90	0.000	58.40	3.28	1.90	0.000
48.40	3.28	1.90	0.000	58.60	3.28	1.90	0.000
48.60	3.28	1.90	0.000	58.80	3.28	1.90	0.000
48.80	3.28	1.90	0.000	59.00	3.28	1.90	0.000
49.00	3.28	1.90	0.000	59.20	3.28	1.90	0.000
49.20	3.28	1.90	0.000	59.40	3.28	1.90	0.000
49.40	3.28	1.90	0.000	59.60	3.28	1.90	0.000
49.60	3.28	1.90	0.000	59.80	3.28	1.90	0.000
49.80	3.28	1.90	0.000	60.00	3.28	1.90	0.000
50.00	3.28	1.90	0.000	60.20	3.28	1.90	0.000
50.20	3.28	1.90	0.000	60.40	3.28	1.90	0.000
50.40	3.28	1.90	0.000	60.60	3.28	1.90	0.000
50.60	3.28	1.90	0.000	60.80	3.28	1.90	0.000
50.80	3.28	1.90	0.000	61.00	3.28	1.90	0.000

Hydrograph for Subcatchment 12S: POST-DEV UG2 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
61.20	3.28	1.90	0.000	71.40	3.28	1.90	0.000
61.40	3.28	1.90	0.000	71.60	3.28	1.90	0.000
61.60	3.28	1.90	0.000	71.80	3.28	1.90	0.000
61.80	3.28	1.90	0.000	72.00	3.28	1.90	0.000
62.00	3.28	1.90	0.000	72.20	3.28	1.90	0.000
62.20	3.28	1.90	0.000	72.40	3.28	1.90	0.000
62.40	3.28	1.90	0.000	72.60	3.28	1.90	0.000
62.60	3.28	1.90	0.000	72.80	3.28	1.90	0.000
62.80	3.28	1.90	0.000	73.00	3.28	1.90	0.000
63.00	3.28	1.90	0.000	73.20	3.28	1.90	0.000
63.20	3.28	1.90	0.000	73.40	3.28	1.90	0.000
63.40	3.28	1.90	0.000	73.60	3.28	1.90	0.000
63.60	3.28	1.90	0.000	73.80	3.28	1.90	0.000
63.80	3.28	1.90	0.000	74.00	3.28	1.90	0.000
64.00	3.28	1.90	0.000	74.20	3.28	1.90	0.000
64.20	3.28	1.90	0.000	74.40	3.28	1.90	0.000
64.40	3.28	1.90	0.000	74.60	3.28	1.90	0.000
64.60	3.28	1.90	0.000	74.80	3.28	1.90	0.000
64.80	3.28	1.90	0.000	75.00	3.28	1.90	0.000
65.00	3.28	1.90	0.000	75.20	3.28	1.90	0.000
65.20	3.28	1.90	0.000	75.40	3.28	1.90	0.000
65.40	3.28	1.90	0.000	75.60	3.28	1.90	0.000
65.60	3.28	1.90	0.000	75.80	3.28	1.90	0.000
65.80	3.28	1.90	0.000	76.00	3.28	1.90	0.000
66.00	3.28	1.90	0.000	76.20	3.28	1.90	0.000
66.20	3.28	1.90	0.000	76.40	3.28	1.90	0.000
66.40	3.28	1.90	0.000	76.60	3.28	1.90	0.000
66.60	3.28	1.90	0.000	76.80	3.28	1.90	0.000
66.80	3.28	1.90	0.000	77.00	3.28	1.90	0.000
67.00	3.28	1.90	0.000	77.20	3.28	1.90	0.000
67.20	3.28	1.90	0.000	77.40	3.28	1.90	0.000
67.40	3.28	1.90	0.000	77.60	3.28	1.90	0.000
67.60	3.28	1.90	0.000	77.80	3.28	1.90	0.000
67.80	3.28	1.90	0.000	78.00	3.28	1.90	0.000
68.00	3.28	1.90	0.000	78.20	3.28	1.90	0.000
68.20	3.28	1.90	0.000	78.40	3.28	1.90	0.000
68.40	3.28	1.90	0.000	78.60	3.28	1.90	0.000
68.60	3.28	1.90	0.000	78.80	3.28	1.90	0.000
68.80	3.28	1.90	0.000	79.00	3.28	1.90	0.000
69.00	3.28	1.90	0.000	79.20	3.28	1.90	0.000
69.20	3.28	1.90	0.000	79.40	3.28	1.90	0.000
69.40	3.28	1.90	0.000	79.60	3.28	1.90	0.000
69.60	3.28	1.90	0.000	79.80	3.28	1.90	0.000
69.80	3.28	1.90	0.000	80.00	3.28	1.90	0.000
70.00	3.28	1.90	0.000	80.20	3.28	1.90	0.000
70.20	3.28	1.90	0.000	80.40	3.28	1.90	0.000
70.40	3.28	1.90	0.000	80.60	3.28	1.90	0.000
70.60	3.28	1.90	0.000	80.80	3.28	1.90	0.000
70.80	3.28	1.90	0.000	81.00	3.28	1.90	0.000
71.00	3.28	1.90	0.000	81.20	3.28	1.90	0.000
71.20	3.28	1.90	0.000	81.40	3.28	1.90	0.000

Hydrograph for Subcatchment 12S: POST-DEV UG2 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
81.60	3.28	1.90	0.000	91.80	3.28	1.90	0.000
81.80	3.28	1.90	0.000	92.00	3.28	1.90	0.000
82.00	3.28	1.90	0.000	92.20	3.28	1.90	0.000
82.20	3.28	1.90	0.000	92.40	3.28	1.90	0.000
82.40	3.28	1.90	0.000	92.60	3.28	1.90	0.000
82.60	3.28	1.90	0.000	92.80	3.28	1.90	0.000
82.80	3.28	1.90	0.000	93.00	3.28	1.90	0.000
83.00	3.28	1.90	0.000	93.20	3.28	1.90	0.000
83.20	3.28	1.90	0.000	93.40	3.28	1.90	0.000
83.40	3.28	1.90	0.000	93.60	3.28	1.90	0.000
83.60	3.28	1.90	0.000	93.80	3.28	1.90	0.000
83.80	3.28	1.90	0.000	94.00	3.28	1.90	0.000
84.00	3.28	1.90	0.000	94.20	3.28	1.90	0.000
84.20	3.28	1.90	0.000	94.40	3.28	1.90	0.000
84.40	3.28	1.90	0.000	94.60	3.28	1.90	0.000
84.60	3.28	1.90	0.000	94.80	3.28	1.90	0.000
84.80	3.28	1.90	0.000	95.00	3.28	1.90	0.000
85.00	3.28	1.90	0.000	95.20	3.28	1.90	0.000
85.20	3.28	1.90	0.000	95.40	3.28	1.90	0.000
85.40	3.28	1.90	0.000	95.60	3.28	1.90	0.000
85.60	3.28	1.90	0.000	95.80	3.28	1.90	0.000
85.80	3.28	1.90	0.000	96.00	3.28	1.90	0.000
86.00	3.28	1.90	0.000	96.20	3.28	1.90	0.000
86.20	3.28	1.90	0.000	96.40	3.28	1.90	0.000
86.40	3.28	1.90	0.000	96.60	3.28	1.90	0.000
86.60	3.28	1.90	0.000	96.80	3.28	1.90	0.000
86.80	3.28	1.90	0.000	97.00	3.28	1.90	0.000
87.00	3.28	1.90	0.000	97.20	3.28	1.90	0.000
87.20	3.28	1.90	0.000	97.40	3.28	1.90	0.000
87.40	3.28	1.90	0.000	97.60	3.28	1.90	0.000
87.60	3.28	1.90	0.000	97.80	3.28	1.90	0.000
87.80	3.28	1.90	0.000	98.00	3.28	1.90	0.000
88.00	3.28	1.90	0.000	98.20	3.28	1.90	0.000
88.20	3.28	1.90	0.000	98.40	3.28	1.90	0.000
88.40	3.28	1.90	0.000	98.60	3.28	1.90	0.000
88.60	3.28	1.90	0.000	98.80	3.28	1.90	0.000
88.80	3.28	1.90	0.000	99.00	3.28	1.90	0.000
89.00	3.28	1.90	0.000	99.20	3.28	1.90	0.000
89.20	3.28	1.90	0.000	99.40	3.28	1.90	0.000
89.40	3.28	1.90	0.000	99.60	3.28	1.90	0.000
89.60	3.28	1.90	0.000	99.80	3.28	1.90	0.000
89.80	3.28	1.90	0.000	100.00	3.28	1.90	0.000
90.00	3.28	1.90	0.000	100.20	3.28	1.90	0.000
90.20	3.28	1.90	0.000	100.40	3.28	1.90	0.000
90.40	3.28	1.90	0.000	100.60	3.28	1.90	0.000
90.60	3.28	1.90	0.000	100.80	3.28	1.90	0.000
90.80	3.28	1.90	0.000	101.00	3.28	1.90	0.000
91.00	3.28	1.90	0.000	101.20	3.28	1.90	0.000
91.20	3.28	1.90	0.000	101.40	3.28	1.90	0.000
91.40	3.28	1.90	0.000	101.60	3.28	1.90	0.000
91.60	3.28	1.90	0.000	101.80	3.28	1.90	0.000

Hydrograph for Subcatchment 12S: POST-DEV UG2 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
102.00	3.28	1.90	0.000	112.20	3.28	1.90	0.000
102.20	3.28	1.90	0.000	112.40	3.28	1.90	0.000
102.40	3.28	1.90	0.000	112.60	3.28	1.90	0.000
102.60	3.28	1.90	0.000	112.80	3.28	1.90	0.000
102.80	3.28	1.90	0.000	113.00	3.28	1.90	0.000
103.00	3.28	1.90	0.000	113.20	3.28	1.90	0.000
103.20	3.28	1.90	0.000	113.40	3.28	1.90	0.000
103.40	3.28	1.90	0.000	113.60	3.28	1.90	0.000
103.60	3.28	1.90	0.000	113.80	3.28	1.90	0.000
103.80	3.28	1.90	0.000	114.00	3.28	1.90	0.000
104.00	3.28	1.90	0.000	114.20	3.28	1.90	0.000
104.20	3.28	1.90	0.000	114.40	3.28	1.90	0.000
104.40	3.28	1.90	0.000	114.60	3.28	1.90	0.000
104.60	3.28	1.90	0.000	114.80	3.28	1.90	0.000
104.80	3.28	1.90	0.000	115.00	3.28	1.90	0.000
105.00	3.28	1.90	0.000	115.20	3.28	1.90	0.000
105.20	3.28	1.90	0.000	115.40	3.28	1.90	0.000
105.40	3.28	1.90	0.000	115.60	3.28	1.90	0.000
105.60	3.28	1.90	0.000	115.80	3.28	1.90	0.000
105.80	3.28	1.90	0.000	116.00	3.28	1.90	0.000
106.00	3.28	1.90	0.000	116.20	3.28	1.90	0.000
106.20	3.28	1.90	0.000	116.40	3.28	1.90	0.000
106.40	3.28	1.90	0.000	116.60	3.28	1.90	0.000
106.60	3.28	1.90	0.000	116.80	3.28	1.90	0.000
106.80	3.28	1.90	0.000	117.00	3.28	1.90	0.000
107.00	3.28	1.90	0.000	117.20	3.28	1.90	0.000
107.20	3.28	1.90	0.000	117.40	3.28	1.90	0.000
107.40	3.28	1.90	0.000	117.60	3.28	1.90	0.000
107.60	3.28	1.90	0.000	117.80	3.28	1.90	0.000
107.80	3.28	1.90	0.000	118.00	3.28	1.90	0.000
108.00	3.28	1.90	0.000	118.20	3.28	1.90	0.000
108.20	3.28	1.90	0.000	118.40	3.28	1.90	0.000
108.40	3.28	1.90	0.000	118.60	3.28	1.90	0.000
108.60	3.28	1.90	0.000	118.80	3.28	1.90	0.000
108.80	3.28	1.90	0.000	119.00	3.28	1.90	0.000
109.00	3.28	1.90	0.000	119.20	3.28	1.90	0.000
109.20	3.28	1.90	0.000	119.40	3.28	1.90	0.000
109.40	3.28	1.90	0.000	119.60	3.28	1.90	0.000
109.60	3.28	1.90	0.000	119.80	3.28	1.90	0.000
109.80	3.28	1.90	0.000	120.00	3.28	1.90	0.000
110.00	3.28	1.90	0.000	120.20	3.28	1.90	0.000
110.20	3.28	1.90	0.000	120.40	3.28	1.90	0.000
110.40	3.28	1.90	0.000	120.60	3.28	1.90	0.000
110.60	3.28	1.90	0.000	120.80	3.28	1.90	0.000
110.80	3.28	1.90	0.000	121.00	3.28	1.90	0.000
111.00	3.28	1.90	0.000	121.20	3.28	1.90	0.000
111.20	3.28	1.90	0.000	121.40	3.28	1.90	0.000
111.40	3.28	1.90	0.000	121.60	3.28	1.90	0.000
111.60	3.28	1.90	0.000	121.80	3.28	1.90	0.000
111.80	3.28	1.90	0.000	122.00	3.28	1.90	0.000
112.00	3.28	1.90	0.000	122.20	3.28	1.90	0.000

Hydrograph for Subcatchment 12S: POST-DEV UG2 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
122.40	3.28	1.90	0.000	132.60	3.28	1.90	0.000
122.60	3.28	1.90	0.000	132.80	3.28	1.90	0.000
122.80	3.28	1.90	0.000	133.00	3.28	1.90	0.000
123.00	3.28	1.90	0.000	133.20	3.28	1.90	0.000
123.20	3.28	1.90	0.000	133.40	3.28	1.90	0.000
123.40	3.28	1.90	0.000	133.60	3.28	1.90	0.000
123.60	3.28	1.90	0.000	133.80	3.28	1.90	0.000
123.80	3.28	1.90	0.000	134.00	3.28	1.90	0.000
124.00	3.28	1.90	0.000	134.20	3.28	1.90	0.000
124.20	3.28	1.90	0.000	134.40	3.28	1.90	0.000
124.40	3.28	1.90	0.000	134.60	3.28	1.90	0.000
124.60	3.28	1.90	0.000	134.80	3.28	1.90	0.000
124.80	3.28	1.90	0.000	135.00	3.28	1.90	0.000
125.00	3.28	1.90	0.000	135.20	3.28	1.90	0.000
125.20	3.28	1.90	0.000	135.40	3.28	1.90	0.000
125.40	3.28	1.90	0.000	135.60	3.28	1.90	0.000
125.60	3.28	1.90	0.000	135.80	3.28	1.90	0.000
125.80	3.28	1.90	0.000	136.00	3.28	1.90	0.000
126.00	3.28	1.90	0.000	136.20	3.28	1.90	0.000
126.20	3.28	1.90	0.000	136.40	3.28	1.90	0.000
126.40	3.28	1.90	0.000	136.60	3.28	1.90	0.000
126.60	3.28	1.90	0.000	136.80	3.28	1.90	0.000
126.80	3.28	1.90	0.000	137.00	3.28	1.90	0.000
127.00	3.28	1.90	0.000	137.20	3.28	1.90	0.000
127.20	3.28	1.90	0.000	137.40	3.28	1.90	0.000
127.40	3.28	1.90	0.000	137.60	3.28	1.90	0.000
127.60	3.28	1.90	0.000	137.80	3.28	1.90	0.000
127.80	3.28	1.90	0.000	138.00	3.28	1.90	0.000
128.00	3.28	1.90	0.000	138.20	3.28	1.90	0.000
128.20	3.28	1.90	0.000	138.40	3.28	1.90	0.000
128.40	3.28	1.90	0.000	138.60	3.28	1.90	0.000
128.60	3.28	1.90	0.000	138.80	3.28	1.90	0.000
128.80	3.28	1.90	0.000	139.00	3.28	1.90	0.000
129.00	3.28	1.90	0.000	139.20	3.28	1.90	0.000
129.20	3.28	1.90	0.000	139.40	3.28	1.90	0.000
129.40	3.28	1.90	0.000	139.60	3.28	1.90	0.000
129.60	3.28	1.90	0.000	139.80	3.28	1.90	0.000
129.80	3.28	1.90	0.000	140.00	3.28	1.90	0.000
130.00	3.28	1.90	0.000	140.20	3.28	1.90	0.000
130.20	3.28	1.90	0.000	140.40	3.28	1.90	0.000
130.40	3.28	1.90	0.000	140.60	3.28	1.90	0.000
130.60	3.28	1.90	0.000	140.80	3.28	1.90	0.000
130.80	3.28	1.90	0.000	141.00	3.28	1.90	0.000
131.00	3.28	1.90	0.000	141.20	3.28	1.90	0.000
131.20	3.28	1.90	0.000	141.40	3.28	1.90	0.000
131.40	3.28	1.90	0.000	141.60	3.28	1.90	0.000
131.60	3.28	1.90	0.000	141.80	3.28	1.90	0.000
131.80	3.28	1.90	0.000	142.00	3.28	1.90	0.000
132.00	3.28	1.90	0.000	142.20	3.28	1.90	0.000
132.20	3.28	1.90	0.000	142.40	3.28	1.90	0.000
132.40	3.28	1.90	0.000	142.60	3.28	1.90	0.000

Hydrograph for Subcatchment 12S: POST-DEV UG2 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
142.80	3.28	1.90	0.000	153.00	3.28	1.90	0.000
143.00	3.28	1.90	0.000	153.20	3.28	1.90	0.000
143.20	3.28	1.90	0.000	153.40	3.28	1.90	0.000
143.40	3.28	1.90	0.000	153.60	3.28	1.90	0.000
143.60	3.28	1.90	0.000	153.80	3.28	1.90	0.000
143.80	3.28	1.90	0.000	154.00	3.28	1.90	0.000
144.00	3.28	1.90	0.000	154.20	3.28	1.90	0.000
144.20	3.28	1.90	0.000	154.40	3.28	1.90	0.000
144.40	3.28	1.90	0.000	154.60	3.28	1.90	0.000
144.60	3.28	1.90	0.000	154.80	3.28	1.90	0.000
144.80	3.28	1.90	0.000	155.00	3.28	1.90	0.000
145.00	3.28	1.90	0.000	155.20	3.28	1.90	0.000
145.20	3.28	1.90	0.000	155.40	3.28	1.90	0.000
145.40	3.28	1.90	0.000	155.60	3.28	1.90	0.000
145.60	3.28	1.90	0.000	155.80	3.28	1.90	0.000
145.80	3.28	1.90	0.000	156.00	3.28	1.90	0.000
146.00	3.28	1.90	0.000	156.20	3.28	1.90	0.000
146.20	3.28	1.90	0.000	156.40	3.28	1.90	0.000
146.40	3.28	1.90	0.000	156.60	3.28	1.90	0.000
146.60	3.28	1.90	0.000	156.80	3.28	1.90	0.000
146.80	3.28	1.90	0.000	157.00	3.28	1.90	0.000
147.00	3.28	1.90	0.000	157.20	3.28	1.90	0.000
147.20	3.28	1.90	0.000	157.40	3.28	1.90	0.000
147.40	3.28	1.90	0.000	157.60	3.28	1.90	0.000
147.60	3.28	1.90	0.000	157.80	3.28	1.90	0.000
147.80	3.28	1.90	0.000	158.00	3.28	1.90	0.000
148.00	3.28	1.90	0.000	158.20	3.28	1.90	0.000
148.20	3.28	1.90	0.000	158.40	3.28	1.90	0.000
148.40	3.28	1.90	0.000	158.60	3.28	1.90	0.000
148.60	3.28	1.90	0.000	158.80	3.28	1.90	0.000
148.80	3.28	1.90	0.000	159.00	3.28	1.90	0.000
149.00	3.28	1.90	0.000	159.20	3.28	1.90	0.000
149.20	3.28	1.90	0.000	159.40	3.28	1.90	0.000
149.40	3.28	1.90	0.000	159.60	3.28	1.90	0.000
149.60	3.28	1.90	0.000	159.80	3.28	1.90	0.000
149.80	3.28	1.90	0.000	160.00	3.28	1.90	0.000
150.00	3.28	1.90	0.000	160.20	3.28	1.90	0.000
150.20	3.28	1.90	0.000	160.40	3.28	1.90	0.000
150.40	3.28	1.90	0.000	160.60	3.28	1.90	0.000
150.60	3.28	1.90	0.000	160.80	3.28	1.90	0.000
150.80	3.28	1.90	0.000	161.00	3.28	1.90	0.000
151.00	3.28	1.90	0.000	161.20	3.28	1.90	0.000
151.20	3.28	1.90	0.000	161.40	3.28	1.90	0.000
151.40	3.28	1.90	0.000	161.60	3.28	1.90	0.000
151.60	3.28	1.90	0.000	161.80	3.28	1.90	0.000
151.80	3.28	1.90	0.000	162.00	3.28	1.90	0.000
152.00	3.28	1.90	0.000	162.20	3.28	1.90	0.000
152.20	3.28	1.90	0.000	162.40	3.28	1.90	0.000
152.40	3.28	1.90	0.000	162.60	3.28	1.90	0.000
152.60	3.28	1.90	0.000	162.80	3.28	1.90	0.000
152.80	3.28	1.90	0.000	163.00	3.28	1.90	0.000

Hydrograph for Subcatchment 12S: POST-DEV UG2 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
163.20	3.28	1.90	0.000
163.40	3.28	1.90	0.000
163.60	3.28	1.90	0.000
163.80	3.28	1.90	0.000
164.00	3.28	1.90	0.000
164.20	3.28	1.90	0.000
164.40	3.28	1.90	0.000
164.60	3.28	1.90	0.000
164.80	3.28	1.90	0.000
165.00	3.28	1.90	0.000
165.20	3.28	1.90	0.000
165.40	3.28	1.90	0.000
165.60	3.28	1.90	0.000
165.80	3.28	1.90	0.000
166.00	3.28	1.90	0.000
166.20	3.28	1.90	0.000
166.40	3.28	1.90	0.000
166.60	3.28	1.90	0.000
166.80	3.28	1.90	0.000
167.00	3.28	1.90	0.000
167.20	3.28	1.90	0.000
167.40	3.28	1.90	0.000
167.60	3.28	1.90	0.000
167.80	3.28	1.90	0.000
168.00	3.28	1.90	0.000

BMW_2025-7-24_2
Prepared by Bohler
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Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 2.96" for 2-yr event
Inflow = 8.960 cfs @ 11.96 hrs, Volume= 20,696 cf
Outflow = 1.967 cfs @ 12.09 hrs, Volume= 20,553 cf, Atten= 78%, Lag= 8.2 min
Primary = 1.967 cfs @ 12.09 hrs, Volume= 20,553 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 158.83' @ 12.09 hrs Surf.Area= 13,041 sf Storage= 11,812 cf

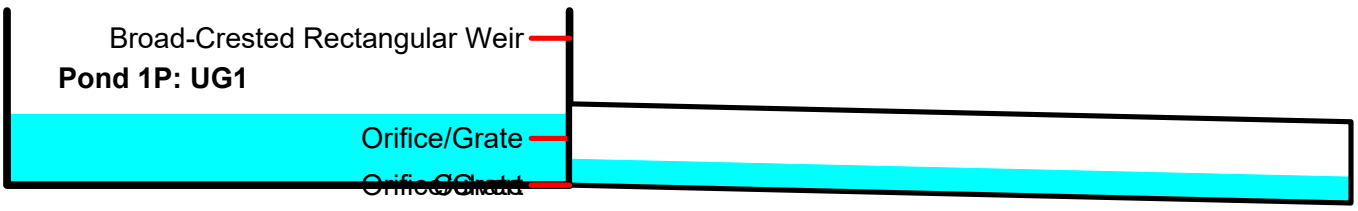
Plug-Flow detention time= 1,299.4 min calculated for 20,553 cf (99% of inflow)
Center-of-Mass det. time= 1,294.7 min (2,045.8 - 751.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.968 cfs @ 12.09 hrs HW=158.83' (Free Discharge)
└**4=Culvert** (Passes 1.968 cfs of 4.279 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.030 cfs @ 5.409 fps)
  ├**2=Orifice/Grate** (Orifice Controls 1.938 cfs @ 2.492 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 1P: UG1 - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger®280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 27 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

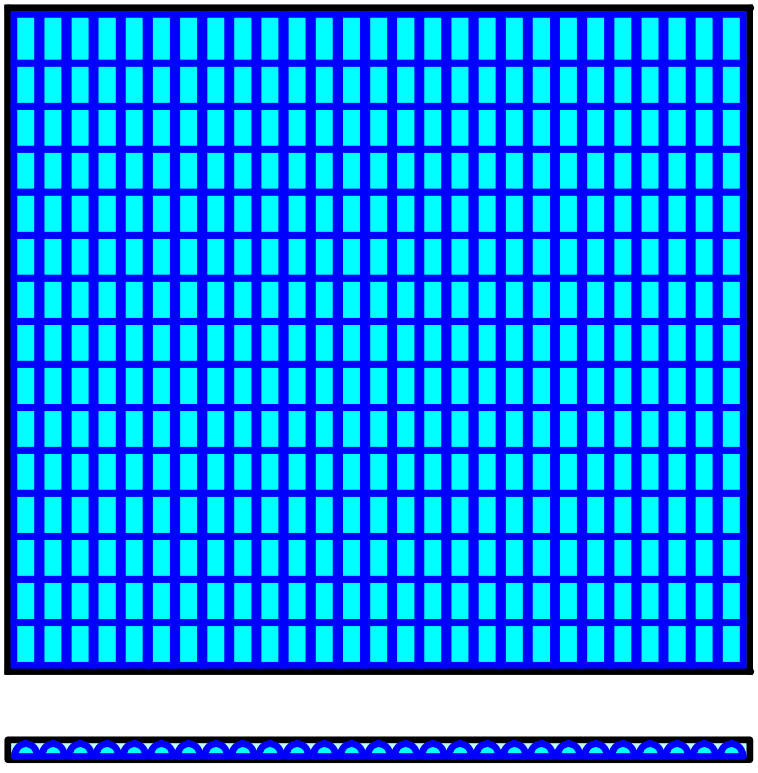
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

405 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 27 Rows = 17,377.3 cf Chamber Storage

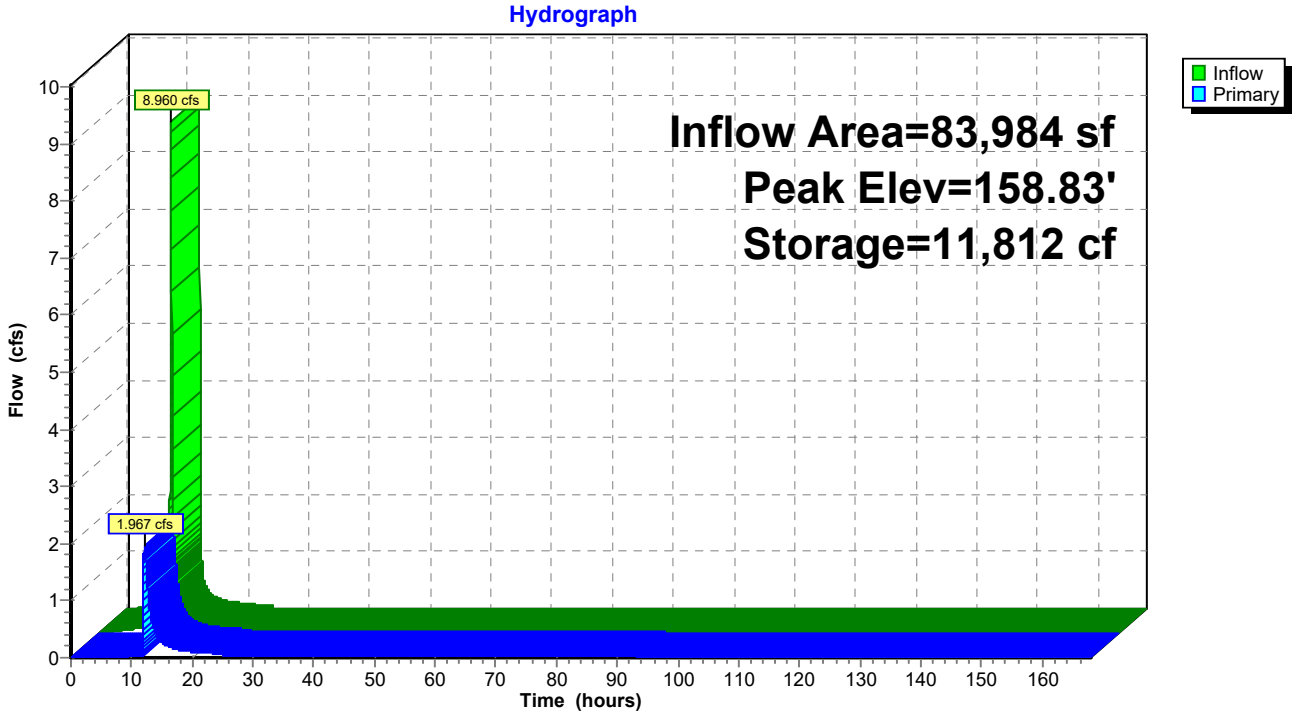
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

Chamber Storage + Stone Storage = 27,162.4 cf = 0.624 af
Overall Storage Efficiency = 64.9%
Overall System Size = 108.00' x 120.75' x 3.21'

405 Chambers
1,549.6 cy Field
906.0 cy Stone



Pond 1P: UG1


Hydrograph
Inflow
Primary
Inflow Area=83,984 sf
Peak Elev=158.83'
Storage=11,812 cf
8.960 cfs
1.967 cfs
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.006	3	157.53	0.000
2.00	0.017	23	157.53	0.000
2.50	0.027	62	157.54	0.000
3.00	0.035	117	157.55	0.001
3.50	0.043	186	157.57	0.001
4.00	0.050	266	157.58	0.003
4.50	0.059	358	157.60	0.004
5.00	0.068	463	157.62	0.006
5.50	0.076	581	157.64	0.007
6.00	0.084	712	157.67	0.008
6.50	0.093	856	157.69	0.009
7.00	0.101	1,013	157.72	0.010
7.50	0.109	1,182	157.76	0.011
8.00	0.117	1,364	157.79	0.012
8.50	0.143	1,572	157.83	0.013
9.00	0.173	1,832	157.88	0.015
9.50	0.181	2,126	157.94	0.016
10.00	0.222	2,453	158.00	0.017
10.50	0.291	2,880	158.05	0.018
11.00	0.405	3,468	158.10	0.019
11.50	**0.671**	4,381	158.18	0.020
12.00	**7.401**	**11,008**	**158.76**	**1.663**
12.50	0.643	**10,667**	**158.73**	**1.502**
13.00	0.400	9,478	158.62	0.874
13.50	0.303	8,825	158.57	0.580
14.00	0.237	8,421	158.53	0.419
14.50	0.210	8,154	158.51	0.327
15.00	0.188	7,980	158.49	0.268
15.50	0.167	7,851	158.48	0.231
16.00	0.145	7,744	158.47	0.200
16.50	0.135	7,658	158.46	0.175
17.00	0.127	7,596	158.46	0.158
17.50	0.120	7,545	158.45	0.146
18.00	0.112	7,501	158.45	0.135
18.50	0.104	7,462	158.45	0.125
19.00	0.097	7,425	158.44	0.117
19.50	0.089	7,388	158.44	0.109
20.00	0.081	7,351	158.44	0.102
20.50	0.079	7,318	158.43	0.095
21.00	0.077	7,294	158.43	0.089
21.50	0.076	7,274	158.43	0.085
22.00	0.074	7,259	158.43	0.082
22.50	0.073	7,246	158.43	0.080
23.00	0.071	7,234	158.43	0.078
23.50	0.070	7,222	158.43	0.076
24.00	0.068	7,210	158.42	0.075
24.50	0.000	7,107	158.42	0.060
25.00	0.000	7,012	158.41	0.046

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	6,939	158.40	0.036
26.00	0.000	6,883	158.40	0.028
26.50	0.000	6,835	158.39	0.025
27.00	0.000	6,792	158.39	0.024
27.50	0.000	6,749	158.38	0.024
28.00	0.000	6,707	158.38	0.024
28.50	0.000	6,664	158.38	0.024
29.00	0.000	6,622	158.37	0.024
29.50	0.000	6,580	158.37	0.023
30.00	0.000	6,537	158.37	0.023
30.50	0.000	6,495	158.36	0.023
31.00	0.000	6,453	158.36	0.023
31.50	0.000	6,411	158.36	0.023
32.00	0.000	6,370	158.35	0.023
32.50	0.000	6,328	158.35	0.023
33.00	0.000	6,286	158.34	0.023
33.50	0.000	6,245	158.34	0.023
34.00	0.000	6,203	158.34	0.023
34.50	0.000	6,162	158.33	0.023
35.00	0.000	6,121	158.33	0.023
35.50	0.000	6,080	158.33	0.023
36.00	0.000	6,039	158.32	0.023
36.50	0.000	5,998	158.32	0.023
37.00	0.000	5,957	158.32	0.023
37.50	0.000	5,916	158.31	0.023
38.00	0.000	5,876	158.31	0.023
38.50	0.000	5,835	158.31	0.022
39.00	0.000	5,795	158.30	0.022
39.50	0.000	5,754	158.30	0.022
40.00	0.000	5,714	158.30	0.022
40.50	0.000	5,674	158.29	0.022
41.00	0.000	5,634	158.29	0.022
41.50	0.000	5,594	158.28	0.022
42.00	0.000	5,554	158.28	0.022
42.50	0.000	5,514	158.28	0.022
43.00	0.000	5,474	158.27	0.022
43.50	0.000	5,435	158.27	0.022
44.00	0.000	5,395	158.27	0.022
44.50	0.000	5,356	158.26	0.022
45.00	0.000	5,317	158.26	0.022
45.50	0.000	5,278	158.26	0.022
46.00	0.000	5,238	158.25	0.022
46.50	0.000	5,199	158.25	0.022
47.00	0.000	5,161	158.25	0.022
47.50	0.000	5,122	158.24	0.022
48.00	0.000	5,083	158.24	0.021
48.50	0.000	5,044	158.24	0.021
49.00	0.000	5,006	158.23	0.021
49.50	0.000	4,968	158.23	0.021
50.00	0.000	4,929	158.23	0.021
50.50	0.000	4,891	158.22	0.021

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,853	158.22	0.021
51.50	0.000	4,815	158.22	0.021
52.00	0.000	4,777	158.21	0.021
52.50	0.000	4,739	158.21	0.021
53.00	0.000	4,701	158.21	0.021
53.50	0.000	4,664	158.20	0.021
54.00	0.000	4,626	158.20	0.021
54.50	0.000	4,589	158.20	0.021
55.00	0.000	4,551	158.19	0.021
55.50	0.000	4,514	158.19	0.021
56.00	0.000	4,477	158.19	0.021
56.50	0.000	4,440	158.19	0.021
57.00	0.000	4,403	158.18	0.021
57.50	0.000	4,366	158.18	0.020
58.00	0.000	4,329	158.18	0.020
58.50	0.000	4,292	158.17	0.020
59.00	0.000	4,256	158.17	0.020
59.50	0.000	4,219	158.17	0.020
60.00	0.000	4,183	158.16	0.020
60.50	0.000	4,147	158.16	0.020
61.00	0.000	4,110	158.16	0.020
61.50	0.000	4,074	158.15	0.020
62.00	0.000	4,038	158.15	0.020
62.50	0.000	4,002	158.15	0.020
63.00	0.000	3,966	158.14	0.020
63.50	0.000	3,931	158.14	0.020
64.00	0.000	3,895	158.14	0.020
64.50	0.000	3,860	158.14	0.020
65.00	0.000	3,824	158.13	0.020
65.50	0.000	3,789	158.13	0.020
66.00	0.000	3,753	158.13	0.020
66.50	0.000	3,718	158.12	0.020
67.00	0.000	3,683	158.12	0.019
67.50	0.000	3,648	158.12	0.019
68.00	0.000	3,613	158.11	0.019
68.50	0.000	3,579	158.11	0.019
69.00	0.000	3,544	158.11	0.019
69.50	0.000	3,509	158.11	0.019
70.00	0.000	3,475	158.10	0.019
70.50	0.000	3,440	158.10	0.019
71.00	0.000	3,406	158.10	0.019
71.50	0.000	3,372	158.09	0.019
72.00	0.000	3,338	158.09	0.019
72.50	0.000	3,304	158.09	0.019
73.00	0.000	3,270	158.09	0.019
73.50	0.000	3,236	158.08	0.019
74.00	0.000	3,202	158.08	0.019
74.50	0.000	3,169	158.08	0.019
75.00	0.000	3,135	158.07	0.019
75.50	0.000	3,101	158.07	0.019
76.00	0.000	3,068	158.07	0.019

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	3,035	158.07	0.018
77.00	0.000	3,002	158.06	0.018
77.50	0.000	2,969	158.06	0.018
78.00	0.000	2,936	158.06	0.018
78.50	0.000	2,903	158.05	0.018
79.00	0.000	2,870	158.05	0.018
79.50	0.000	2,837	158.05	0.018
80.00	0.000	2,805	158.05	0.018
80.50	0.000	2,772	158.04	0.018
81.00	0.000	2,740	158.04	0.018
81.50	0.000	2,707	158.04	0.018
82.00	0.000	2,675	158.04	0.018
82.50	0.000	2,643	158.03	0.018
83.00	0.000	2,611	158.03	0.018
83.50	0.000	2,579	158.02	0.018
84.00	0.000	2,547	158.02	0.018
84.50	0.000	2,516	158.01	0.017
85.00	0.000	2,484	158.01	0.017
85.50	0.000	2,453	158.00	0.017
86.00	0.000	2,423	157.99	0.017
86.50	0.000	2,392	157.99	0.017
87.00	0.000	2,362	157.98	0.017
87.50	0.000	2,331	157.98	0.017
88.00	0.000	2,301	157.97	0.017
88.50	0.000	2,272	157.97	0.016
89.00	0.000	2,242	157.96	0.016
89.50	0.000	2,213	157.95	0.016
90.00	0.000	2,184	157.95	0.016
90.50	0.000	2,155	157.94	0.016
91.00	0.000	2,126	157.94	0.016
91.50	0.000	2,097	157.93	0.016
92.00	0.000	2,069	157.93	0.016
92.50	0.000	2,041	157.92	0.016
93.00	0.000	2,013	157.92	0.015
93.50	0.000	1,986	157.91	0.015
94.00	0.000	1,958	157.91	0.015
94.50	0.000	1,931	157.90	0.015
95.00	0.000	1,904	157.90	0.015
95.50	0.000	1,877	157.89	0.015
96.00	0.000	1,851	157.88	0.015
96.50	0.000	1,824	157.88	0.015
97.00	0.000	1,798	157.87	0.014
97.50	0.000	1,772	157.87	0.014
98.00	0.000	1,747	157.86	0.014
98.50	0.000	1,721	157.86	0.014
99.00	0.000	1,696	157.86	0.014
99.50	0.000	1,671	157.85	0.014
100.00	0.000	1,646	157.85	0.014
100.50	0.000	1,621	157.84	0.014
101.00	0.000	1,597	157.84	0.013
101.50	0.000	1,573	157.83	0.013

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	1,549	157.83	0.013
102.50	0.000	1,525	157.82	0.013
103.00	0.000	1,502	157.82	0.013
103.50	0.000	1,478	157.81	0.013
104.00	0.000	1,455	157.81	0.013
104.50	0.000	1,432	157.80	0.013
105.00	0.000	1,409	157.80	0.013
105.50	0.000	1,387	157.80	0.012
106.00	0.000	1,365	157.79	0.012
106.50	0.000	1,343	157.79	0.012
107.00	0.000	1,321	157.78	0.012
107.50	0.000	1,299	157.78	0.012
108.00	0.000	1,278	157.77	0.012
108.50	0.000	1,257	157.77	0.012
109.00	0.000	1,236	157.77	0.012
109.50	0.000	1,215	157.76	0.011
110.00	0.000	1,194	157.76	0.011
110.50	0.000	1,174	157.76	0.011
111.00	0.000	1,154	157.75	0.011
111.50	0.000	1,134	157.75	0.011
112.00	0.000	1,114	157.74	0.011
112.50	0.000	1,095	157.74	0.011
113.00	0.000	1,075	157.74	0.011
113.50	0.000	1,056	157.73	0.011
114.00	0.000	1,038	157.73	0.010
114.50	0.000	1,019	157.73	0.010
115.00	0.000	1,001	157.72	0.010
115.50	0.000	982	157.72	0.010
116.00	0.000	964	157.71	0.010
116.50	0.000	947	157.71	0.010
117.00	0.000	929	157.71	0.010
117.50	0.000	912	157.70	0.010
118.00	0.000	895	157.70	0.009
118.50	0.000	878	157.70	0.009
119.00	0.000	861	157.70	0.009
119.50	0.000	845	157.69	0.009
120.00	0.000	828	157.69	0.009
120.50	0.000	812	157.69	0.009
121.00	0.000	796	157.68	0.009
121.50	0.000	781	157.68	0.009
122.00	0.000	765	157.68	0.008
122.50	0.000	750	157.67	0.008
123.00	0.000	735	157.67	0.008
123.50	0.000	721	157.67	0.008
124.00	0.000	706	157.67	0.008
124.50	0.000	692	157.66	0.008
125.00	0.000	678	157.66	0.008
125.50	0.000	664	157.66	0.008
126.00	0.000	650	157.65	0.008
126.50	0.000	636	157.65	0.007
127.00	0.000	623	157.65	0.007

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	610	157.65	0.007
128.00	0.000	597	157.64	0.007
128.50	0.000	585	157.64	0.007
129.00	0.000	572	157.64	0.007
129.50	0.000	560	157.64	0.007
130.00	0.000	548	157.64	0.007
130.50	0.000	537	157.63	0.006
131.00	0.000	525	157.63	0.006
131.50	0.000	514	157.63	0.006
132.00	0.000	503	157.63	0.006
132.50	0.000	492	157.62	0.006
133.00	0.000	481	157.62	0.006
133.50	0.000	471	157.62	0.006
134.00	0.000	460	157.62	0.006
134.50	0.000	451	157.62	0.005
135.00	0.000	441	157.61	0.005
135.50	0.000	431	157.61	0.005
136.00	0.000	422	157.61	0.005
136.50	0.000	413	157.61	0.005
137.00	0.000	404	157.61	0.005
137.50	0.000	396	157.61	0.005
138.00	0.000	387	157.60	0.005
138.50	0.000	379	157.60	0.004
139.00	0.000	371	157.60	0.004
139.50	0.000	364	157.60	0.004
140.00	0.000	356	157.60	0.004
140.50	0.000	349	157.60	0.004
141.00	0.000	341	157.60	0.004
141.50	0.000	334	157.59	0.004
142.00	0.000	327	157.59	0.004
142.50	0.000	321	157.59	0.004
143.00	0.000	314	157.59	0.004
143.50	0.000	308	157.59	0.003
144.00	0.000	302	157.59	0.003
144.50	0.000	296	157.59	0.003
145.00	0.000	290	157.59	0.003
145.50	0.000	284	157.58	0.003
146.00	0.000	279	157.58	0.003
146.50	0.000	274	157.58	0.003
147.00	0.000	268	157.58	0.003
147.50	0.000	263	157.58	0.003
148.00	0.000	259	157.58	0.003
148.50	0.000	254	157.58	0.003
149.00	0.000	249	157.58	0.003
149.50	0.000	245	157.58	0.002
150.00	0.000	241	157.58	0.002
150.50	0.000	236	157.58	0.002
151.00	0.000	232	157.57	0.002
151.50	0.000	228	157.57	0.002
152.00	0.000	225	157.57	0.002
152.50	0.000	221	157.57	0.002

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	217	157.57	0.002
153.50	0.000	214	157.57	0.002
154.00	0.000	210	157.57	0.002
154.50	0.000	207	157.57	0.002
155.00	0.000	204	157.57	0.002
155.50	0.000	201	157.57	0.002
156.00	0.000	197	157.57	0.002
156.50	0.000	195	157.57	0.002
157.00	0.000	192	157.57	0.002
157.50	0.000	189	157.57	0.002
158.00	0.000	186	157.57	0.001
158.50	0.000	184	157.57	0.001
159.00	0.000	181	157.56	0.001
159.50	0.000	178	157.56	0.001
160.00	0.000	176	157.56	0.001
160.50	0.000	174	157.56	0.001
161.00	0.000	171	157.56	0.001
161.50	0.000	169	157.56	0.001
162.00	0.000	167	157.56	0.001
162.50	0.000	165	157.56	0.001
163.00	0.000	163	157.56	0.001
163.50	0.000	161	157.56	0.001
164.00	0.000	159	157.56	0.001
164.50	0.000	157	157.56	0.001
165.00	0.000	155	157.56	0.001
165.50	0.000	153	157.56	0.001
166.00	0.000	151	157.56	0.001
166.50	0.000	149	157.56	0.001
167.00	0.000	147	157.56	0.001
167.50	0.000	145	157.56	0.001
168.00	0.000	143	157.56	0.001

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 2.45" for 2-yr event
Inflow = 1.896 cfs @ 11.96 hrs, Volume= 4,381 cf
Outflow = 0.489 cfs @ 12.08 hrs, Volume= 4,381 cf, Atten= 74%, Lag= 7.5 min
Primary = 0.489 cfs @ 12.08 hrs, Volume= 4,381 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 160.30' @ 12.08 hrs Surf.Area= 2,542 sf Storage= 1,626 cf

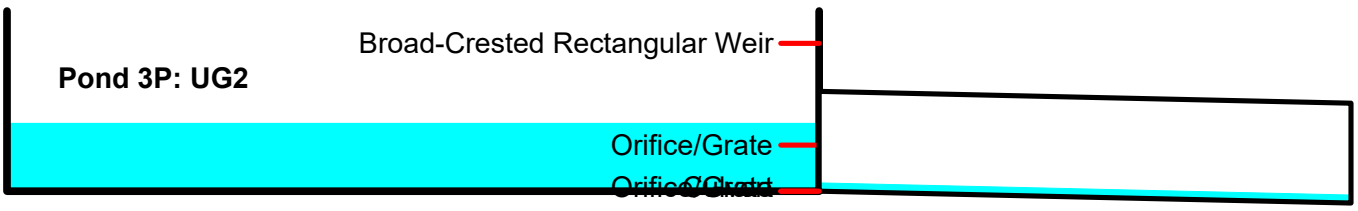
Plug-Flow detention time= 71.9 min calculated for 4,381 cf (100% of inflow)
Center-of-Mass det. time= 72.0 min (823.1 - 751.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.489 cfs @ 12.08 hrs HW=160.30' (Free Discharge)
└**4=Culvert** (Passes 0.489 cfs of 3.067 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.223 cfs @ 4.547 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.266 cfs @ 2.126 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 3P: UG2 - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Discontinued, not for new designs)
Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf
Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 3.44 sf x 8 rows

36.0" Wide + 3.0" Spacing = 39.0" C-C Row Spacing

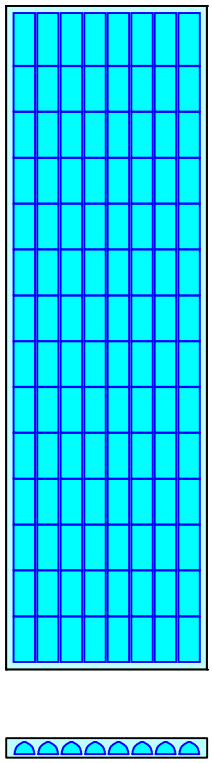
14 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 89.62' Row Length +12.0" End Stone x 2 = 91.62' Base Length
8 Rows x 36.0" Wide + 3.0" Spacing x 7 + 12.0" Side Stone x 2 = 27.75' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

112 Chambers x 21.8 cf +1.00' Row Adjustment x 3.44 sf x 8 Rows = 2,466.0 cf Chamber Storage

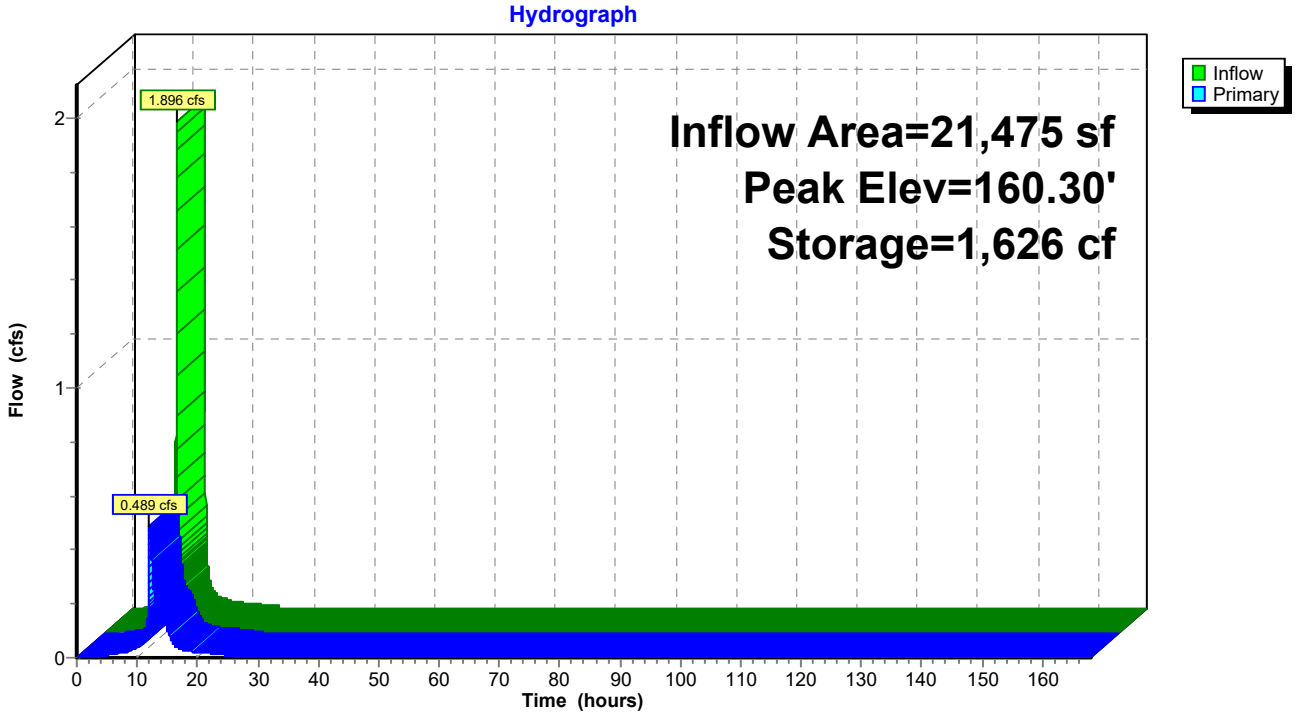
6,885.8 cf Field - 2,466.0 cf Chambers = 4,419.8 cf Stone x 40.0% Voids = 1,767.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,233.9 cf = 0.097 af
Overall Storage Efficiency = 61.5%
Overall System Size = 91.62' x 27.75' x 2.71'

112 Chambers
255.0 cy Field
163.7 cy Stone



Pond 3P: UG2


Hydrograph
Inflow
Primary
Inflow Area=21,475 sf
Peak Elev=160.30'
Storage=1,626 cf
1.896 cfs
0.489 cfs
Flow (cfs)
Time (hours)
0
1
2
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.001	1	159.28	0.000
2.00	0.004	5	159.28	0.000
2.50	0.006	12	159.29	0.001
3.00	0.007	22	159.30	0.001
3.50	0.009	34	159.31	0.003
4.00	0.011	45	159.32	0.005
4.50	0.012	56	159.34	0.006
5.00	0.014	66	159.35	0.009
5.50	0.016	75	159.35	0.011
6.00	0.018	83	159.36	0.014
6.50	0.020	90	159.37	0.016
7.00	0.021	96	159.37	0.018
7.50	0.023	102	159.38	0.020
8.00	0.025	107	159.39	0.022
8.50	0.030	115	159.39	0.025
9.00	0.037	126	159.40	0.029
9.50	0.038	137	159.41	0.034
10.00	0.047	148	159.43	0.039
10.50	0.062	168	159.45	0.048
11.00	0.086	201	159.48	0.063
11.50	**0.142**	268	159.54	0.088
12.00	**1.566**	**1,479**	**160.23**	**0.423**
12.50	0.136	**1,321**	**160.15**	**0.331**
13.00	0.085	1,041	160.02	0.206
13.50	0.064	843	159.93	0.172
14.00	0.050	650	159.84	0.157
14.50	0.044	467	159.74	0.137
15.00	0.040	326	159.60	0.105
15.50	0.035	232	159.51	0.076
16.00	0.031	178	159.45	0.052
16.50	0.029	150	159.43	0.039
17.00	0.027	135	159.41	0.033
17.50	0.025	126	159.40	0.029
18.00	0.024	120	159.40	0.027
18.50	0.022	115	159.39	0.025
19.00	0.020	110	159.39	0.023
19.50	0.019	106	159.38	0.021
20.00	0.017	101	159.38	0.020
20.50	0.017	97	159.38	0.018
21.00	0.016	95	159.37	0.018
21.50	0.016	93	159.37	0.017
22.00	0.016	91	159.37	0.016
22.50	0.015	90	159.37	0.016
23.00	0.015	89	159.37	0.016
23.50	0.015	88	159.37	0.015
24.00	0.014	87	159.37	0.015
24.50	0.000	69	159.35	0.010
25.00	0.000	55	159.33	0.006

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	45	159.32	0.005
26.00	0.000	38	159.32	0.003
26.50	0.000	33	159.31	0.002
27.00	0.000	29	159.31	0.002
27.50	0.000	26	159.31	0.002
28.00	0.000	23	159.30	0.001
28.50	0.000	21	159.30	0.001
29.00	0.000	19	159.30	0.001
29.50	0.000	17	159.30	0.001
30.00	0.000	15	159.30	0.001
30.50	0.000	14	159.29	0.001
31.00	0.000	12	159.29	0.001
31.50	0.000	11	159.29	0.001
32.00	0.000	10	159.29	0.001
32.50	0.000	9	159.29	0.001
33.00	0.000	8	159.29	0.000
33.50	0.000	7	159.29	0.000
34.00	0.000	7	159.29	0.000
34.50	0.000	6	159.29	0.000
35.00	0.000	5	159.29	0.000
35.50	0.000	5	159.28	0.000
36.00	0.000	4	159.28	0.000
36.50	0.000	4	159.28	0.000
37.00	0.000	4	159.28	0.000
37.50	0.000	3	159.28	0.000
38.00	0.000	3	159.28	0.000
38.50	0.000	3	159.28	0.000
39.00	0.000	2	159.28	0.000
39.50	0.000	2	159.28	0.000
40.00	0.000	2	159.28	0.000
40.50	0.000	2	159.28	0.000
41.00	0.000	2	159.28	0.000
41.50	0.000	1	159.28	0.000
42.00	0.000	1	159.28	0.000
42.50	0.000	1	159.28	0.000
43.00	0.000	1	159.28	0.000
43.50	0.000	1	159.28	0.000
44.00	0.000	1	159.28	0.000
44.50	0.000	1	159.28	0.000
45.00	0.000	1	159.28	0.000
45.50	0.000	1	159.28	0.000
46.00	0.000	1	159.28	0.000
46.50	0.000	0	159.28	0.000
47.00	0.000	0	159.28	0.000
47.50	0.000	0	159.28	0.000
48.00	0.000	0	159.28	0.000
48.50	0.000	0	159.28	0.000
49.00	0.000	0	159.28	0.000
49.50	0.000	0	159.28	0.000
50.00	0.000	0	159.28	0.000
50.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	0	159.28	0.000
51.50	0.000	0	159.28	0.000
52.00	0.000	0	159.28	0.000
52.50	0.000	0	159.28	0.000
53.00	0.000	0	159.28	0.000
53.50	0.000	0	159.28	0.000
54.00	0.000	0	159.28	0.000
54.50	0.000	0	159.28	0.000
55.00	0.000	0	159.28	0.000
55.50	0.000	0	159.28	0.000
56.00	0.000	0	159.28	0.000
56.50	0.000	0	159.28	0.000
57.00	0.000	0	159.28	0.000
57.50	0.000	0	159.28	0.000
58.00	0.000	0	159.28	0.000
58.50	0.000	0	159.28	0.000
59.00	0.000	0	159.28	0.000
59.50	0.000	0	159.28	0.000
60.00	0.000	0	159.28	0.000
60.50	0.000	0	159.28	0.000
61.00	0.000	0	159.28	0.000
61.50	0.000	0	159.28	0.000
62.00	0.000	0	159.28	0.000
62.50	0.000	0	159.28	0.000
63.00	0.000	0	159.28	0.000
63.50	0.000	0	159.28	0.000
64.00	0.000	0	159.28	0.000
64.50	0.000	0	159.28	0.000
65.00	0.000	0	159.28	0.000
65.50	0.000	0	159.28	0.000
66.00	0.000	0	159.28	0.000
66.50	0.000	0	159.28	0.000
67.00	0.000	0	159.28	0.000
67.50	0.000	0	159.28	0.000
68.00	0.000	0	159.28	0.000
68.50	0.000	0	159.28	0.000
69.00	0.000	0	159.28	0.000
69.50	0.000	0	159.28	0.000
70.00	0.000	0	159.28	0.000
70.50	0.000	0	159.28	0.000
71.00	0.000	0	159.28	0.000
71.50	0.000	0	159.28	0.000
72.00	0.000	0	159.28	0.000
72.50	0.000	0	159.28	0.000
73.00	0.000	0	159.28	0.000
73.50	0.000	0	159.28	0.000
74.00	0.000	0	159.28	0.000
74.50	0.000	0	159.28	0.000
75.00	0.000	0	159.28	0.000
75.50	0.000	0	159.28	0.000
76.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	0	159.28	0.000
77.00	0.000	0	159.28	0.000
77.50	0.000	0	159.28	0.000
78.00	0.000	0	159.28	0.000
78.50	0.000	0	159.28	0.000
79.00	0.000	0	159.28	0.000
79.50	0.000	0	159.28	0.000
80.00	0.000	0	159.28	0.000
80.50	0.000	0	159.28	0.000
81.00	0.000	0	159.28	0.000
81.50	0.000	0	159.28	0.000
82.00	0.000	0	159.28	0.000
82.50	0.000	0	159.28	0.000
83.00	0.000	0	159.28	0.000
83.50	0.000	0	159.28	0.000
84.00	0.000	0	159.28	0.000
84.50	0.000	0	159.28	0.000
85.00	0.000	0	159.28	0.000
85.50	0.000	0	159.28	0.000
86.00	0.000	0	159.28	0.000
86.50	0.000	0	159.28	0.000
87.00	0.000	0	159.28	0.000
87.50	0.000	0	159.28	0.000
88.00	0.000	0	159.28	0.000
88.50	0.000	0	159.28	0.000
89.00	0.000	0	159.28	0.000
89.50	0.000	0	159.28	0.000
90.00	0.000	0	159.28	0.000
90.50	0.000	0	159.28	0.000
91.00	0.000	0	159.28	0.000
91.50	0.000	0	159.28	0.000
92.00	0.000	0	159.28	0.000
92.50	0.000	0	159.28	0.000
93.00	0.000	0	159.28	0.000
93.50	0.000	0	159.28	0.000
94.00	0.000	0	159.28	0.000
94.50	0.000	0	159.28	0.000
95.00	0.000	0	159.28	0.000
95.50	0.000	0	159.28	0.000
96.00	0.000	0	159.28	0.000
96.50	0.000	0	159.28	0.000
97.00	0.000	0	159.28	0.000
97.50	0.000	0	159.28	0.000
98.00	0.000	0	159.28	0.000
98.50	0.000	0	159.28	0.000
99.00	0.000	0	159.28	0.000
99.50	0.000	0	159.28	0.000
100.00	0.000	0	159.28	0.000
100.50	0.000	0	159.28	0.000
101.00	0.000	0	159.28	0.000
101.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	0	159.28	0.000
102.50	0.000	0	159.28	0.000
103.00	0.000	0	159.28	0.000
103.50	0.000	0	159.28	0.000
104.00	0.000	0	159.28	0.000
104.50	0.000	0	159.28	0.000
105.00	0.000	0	159.28	0.000
105.50	0.000	0	159.28	0.000
106.00	0.000	0	159.28	0.000
106.50	0.000	0	159.28	0.000
107.00	0.000	0	159.28	0.000
107.50	0.000	0	159.28	0.000
108.00	0.000	0	159.28	0.000
108.50	0.000	0	159.28	0.000
109.00	0.000	0	159.28	0.000
109.50	0.000	0	159.28	0.000
110.00	0.000	0	159.28	0.000
110.50	0.000	0	159.28	0.000
111.00	0.000	0	159.28	0.000
111.50	0.000	0	159.28	0.000
112.00	0.000	0	159.28	0.000
112.50	0.000	0	159.28	0.000
113.00	0.000	0	159.28	0.000
113.50	0.000	0	159.28	0.000
114.00	0.000	0	159.28	0.000
114.50	0.000	0	159.28	0.000
115.00	0.000	0	159.28	0.000
115.50	0.000	0	159.28	0.000
116.00	0.000	0	159.28	0.000
116.50	0.000	0	159.28	0.000
117.00	0.000	0	159.28	0.000
117.50	0.000	0	159.28	0.000
118.00	0.000	0	159.28	0.000
118.50	0.000	0	159.28	0.000
119.00	0.000	0	159.28	0.000
119.50	0.000	0	159.28	0.000
120.00	0.000	0	159.28	0.000
120.50	0.000	0	159.28	0.000
121.00	0.000	0	159.28	0.000
121.50	0.000	0	159.28	0.000
122.00	0.000	0	159.28	0.000
122.50	0.000	0	159.28	0.000
123.00	0.000	0	159.28	0.000
123.50	0.000	0	159.28	0.000
124.00	0.000	0	159.28	0.000
124.50	0.000	0	159.28	0.000
125.00	0.000	0	159.28	0.000
125.50	0.000	0	159.28	0.000
126.00	0.000	0	159.28	0.000
126.50	0.000	0	159.28	0.000
127.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	0	159.28	0.000
128.00	0.000	0	159.28	0.000
128.50	0.000	0	159.28	0.000
129.00	0.000	0	159.28	0.000
129.50	0.000	0	159.28	0.000
130.00	0.000	0	159.28	0.000
130.50	0.000	0	159.28	0.000
131.00	0.000	0	159.28	0.000
131.50	0.000	0	159.28	0.000
132.00	0.000	0	159.28	0.000
132.50	0.000	0	159.28	0.000
133.00	0.000	0	159.28	0.000
133.50	0.000	0	159.28	0.000
134.00	0.000	0	159.28	0.000
134.50	0.000	0	159.28	0.000
135.00	0.000	0	159.28	0.000
135.50	0.000	0	159.28	0.000
136.00	0.000	0	159.28	0.000
136.50	0.000	0	159.28	0.000
137.00	0.000	0	159.28	0.000
137.50	0.000	0	159.28	0.000
138.00	0.000	0	159.28	0.000
138.50	0.000	0	159.28	0.000
139.00	0.000	0	159.28	0.000
139.50	0.000	0	159.28	0.000
140.00	0.000	0	159.28	0.000
140.50	0.000	0	159.28	0.000
141.00	0.000	0	159.28	0.000
141.50	0.000	0	159.28	0.000
142.00	0.000	0	159.28	0.000
142.50	0.000	0	159.28	0.000
143.00	0.000	0	159.28	0.000
143.50	0.000	0	159.28	0.000
144.00	0.000	0	159.28	0.000
144.50	0.000	0	159.28	0.000
145.00	0.000	0	159.28	0.000
145.50	0.000	0	159.28	0.000
146.00	0.000	0	159.28	0.000
146.50	0.000	0	159.28	0.000
147.00	0.000	0	159.28	0.000
147.50	0.000	0	159.28	0.000
148.00	0.000	0	159.28	0.000
148.50	0.000	0	159.28	0.000
149.00	0.000	0	159.28	0.000
149.50	0.000	0	159.28	0.000
150.00	0.000	0	159.28	0.000
150.50	0.000	0	159.28	0.000
151.00	0.000	0	159.28	0.000
151.50	0.000	0	159.28	0.000
152.00	0.000	0	159.28	0.000
152.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	0	159.28	0.000
153.50	0.000	0	159.28	0.000
154.00	0.000	0	159.28	0.000
154.50	0.000	0	159.28	0.000
155.00	0.000	0	159.28	0.000
155.50	0.000	0	159.28	0.000
156.00	0.000	0	159.28	0.000
156.50	0.000	0	159.28	0.000
157.00	0.000	0	159.28	0.000
157.50	0.000	0	159.28	0.000
158.00	0.000	0	159.28	0.000
158.50	0.000	0	159.28	0.000
159.00	0.000	0	159.28	0.000
159.50	0.000	0	159.28	0.000
160.00	0.000	0	159.28	0.000
160.50	0.000	0	159.28	0.000
161.00	0.000	0	159.28	0.000
161.50	0.000	0	159.28	0.000
162.00	0.000	0	159.28	0.000
162.50	0.000	0	159.28	0.000
163.00	0.000	0	159.28	0.000
163.50	0.000	0	159.28	0.000
164.00	0.000	0	159.28	0.000
164.50	0.000	0	159.28	0.000
165.00	0.000	0	159.28	0.000
165.50	0.000	0	159.28	0.000
166.00	0.000	0	159.28	0.000
166.50	0.000	0	159.28	0.000
167.00	0.000	0	159.28	0.000
167.50	0.000	0	159.28	0.000
168.00	0.000	0	159.28	0.000

General Information

Instructions | *General* | Volume | Rate | Quality

Project Name: **Prop. Automotive Dealership Expansion**

Application Type: **PAG-02 NOI**

County: **Montgomery**

Municipality: **Whitemarsh Township**

Project Type: **Commercial Building**

(●) New Project ( ) Minor / Major Amendment

Total Project Site Area: **5.45** acres
(In Watershed)

Total Earth Disturbance: **4.93** acres
(In Watershed)

No. of Post-Construction Discharge Points: **4**

Start DP Numbering at: **001**

Discharge Point (DP) No.	Drainage Area (DA) (acres)	Earth Disturbance in DA (acres)	Existing Impervious in DA (acres)	Proposed Impervious in DA (acres)	Receiving Waters	Ch. 93 Class	Structural BMP(s)
001	0.87	1.87	1.75	1.81	Sandy Run	TSF, MF	Yes
002					Sandy Run	TSF, MF	No
003	0.51	0.51	0.21	0.40	Sandy Run	TSF, MF	Yes
004					Dis. to MS4 - Bodenstein Channel (UNT to Sandy Run)	TSF, MF	No
Undetained Areas	2.55	2.55	1.77	1.82	Sandy Run, UNT to Sandy Run/Bodenstein Channel	TSF, MF	
Totals:	**3.93**	**4.93**	**3.73**	**4.03**			

Volume Management

Project: Prop. Automotive Dealership Expansion

Instructions | General | *Volume* | Rate | Quality

2-Year / 24-Hour Storm Event (NOAA Atlas 14): **3.28** inches

Alternative 2-Year / 24-Hour Storm Event _____ inches

Alternative Source: _____

Pre-Construction Conditions: *No. Rows:* **6** ☐ *Exempt from Meadow in Good Condition* ☑ *Automatically Calculate CN, Ia, Runoff and Volume*

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Pervious as Meadow	0.86	A	30	4.667	0.00	0
Forested (Good Condition)	0.28	A	30	4.667	0.00	0
Pervious as Meadow	0.08	B	58	1.448	0.37	101
Impervious as Meadow	0.72	A	30	4.667	0.00	0
Impervious as Meadow	0.03	B	58	1.448	0.37	34
Impervious Areas: Commercial	2.97	N/A	98	0.041	3.05	32,885
TOTAL (ACRES):	**4.93**				**TOTAL (CF):**	**33,020**

Post-Construction Conditions: *No. Rows:* **4**

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	0.86	A	39	3.128	0.00	5

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Woods (Good Condition)	0.29	A	30	4.667	0.00	0
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	0.10	B	61	1.279	0.48	177
Impervious Areas: Commercial	3.63	N/A	98	0.041	3.05	40,153
TOTAL (ACRES):	**4.87**				**TOTAL (CF):**	**40,334**

NET CHANGE IN VOLUME TO MANAGE (CF): **7,314**

Non-Structural BMP Volume Credits:

☑ Tree Planting Credit

Number of new deciduous trees that will be planted within disturbed area: 69 — **CREDIT (CF):** **414**

Number of new evergreen trees that will be planted within disturbed area: 16 — **CREDIT (CF):** **160**

☐ Other (attach calculations):

Structural BMP Volume Credits: *No. Structural BMPs:* **2** *Start BMP Numbering at:* **2**

DP No.	BMP No.	BMP Name	MRC?	Discharge	Incremental BMP DA (acres)	Volume Routed to BMP (CF)	Infiltration / Vegetated Area (SF)	Infiltration Rate (in/hr)	Infiltration Period (hrs)	Vegeta-ted?	Media Depth (ft)	Storage Volume (CF)	Infiltration Credit (CF)	ET Credit (CF)
001	2	Dry Extended Detention Basin	Y	Off-Site	1.87	20,696	0	0.00	12	No	1.0	20,696	**0**	
003	3	Dry Extended Detention Basin	-	Off-Site	0.51	4,712	0	0.00	12	No	1.0	4,712	**0**	
												Totals:		

INFILTRATION & ET CREDITS (CF):

MANAGED RELEASE CREDIT (CF): **20,696**

NET CHANGE IN VOLUME TO MANAGE (CF): **7,314**

TOTAL CREDITS (CF): **21,270**

VOLUME REQUIREMENT SATISFIED

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Rate Control

Project: Prop. Automotive Dealership Expansion

Instructions | General | Volume | *Rate* | Quality

Precipitation Amounts:

NOAA 2-Year 24-Hour Storm Event (in):	**3.28**	Alternative 2-Year 24-Hour Storm Event (in):	
NOAA 10-Year 24-Hour Storm Event (in):	**4.83**	Alternative 10-Year 24-Hour Storm Event (in):	
NOAA 50-Year 24-Hour Storm Event (in):	**6.73**	Alternative 50-Year 24-Hour Storm Event (in):	
NOAA 100-Year 24-Hour Storm Event (in):	**7.66**	Alternative 100-Year 24-Hour Storm Event (in):	

☑ **Report Summary of Peak Rates Only**

Attach model input and output data or other calculations to support the rates reported below.

	Peak Discharge Rates (cfs)			
	Pre-Construction	**Post-Construction**	**Net Change**	
2-Year Storm:	**8.62**	**5.12**	**-3.50**	***Rate Control Satisfied***
10-Year Storm:	**15.21**	**10.53**	**-4.68**	***Rate Control Satisfied***
50-Year Storm:	**23.72**	**16.52**	**-7.20**	***Rate Control Satisfied***
100-Year Storm:	**27.95**	**19.44**	**-8.51**	***Rate Control Satisfied***

Water Quality

Project: Prop. Automotive Dealership Expansion

PRINT

Instructions | General | Volume | Rate | *Quality*

Pre-Construction Pollutant Loads:

Land Cover (from Volume Worksheet)	Land Cover for Water Quality	Area (acres)	Soil Group	Runoff Volume (cf)	Pollutant Conc. (mg/L)			Pollutant Loads (lbs)		
					TSS	TP	TN	TSS	TP	TN
Pervious as Meadow	Grassland/Herbaceous	0.86	A	0	48.8	0.22	2.30	0.00	0.00	0.00
Forested (Good Condition)	Deciduous Forest/Evergreen Forest/Mixed Forest	0.28	A	0	45.0	0.13	1.05	0.00	0.00	0.00
Pervious as Meadow	Grassland/Herbaceous	0.08	B	101	48.8	0.22	2.30	0.31	0.00	0.01
Impervious as Meadow	Grassland/Herbaceous	0.72	A	0	48.8	0.22	2.30	0.00	0.00	0.00
Impervious as Meadow	Grassland/Herbaceous	0.03	B	34	48.8	0.22	2.30	0.10	0.00	0.00
Impervious Areas: Commercial	Commercial	2.97	N/A	32,885	61.7	0.22	2.02	126.74	0.45	4.15
	TOTAL (ACRES):	**4.93**					**TOTALS:**	**127.15**	**0.45**	**4.17**

Post-Construction Pollutant Loads (without BMPs):

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Land Cover (from Volume Worksheet)	Land Cover for Water Quality	Area (acres)	Soil Group	Runoff Volume (cf)	Pollutant Conc. (mg/L)			Pollutant Loads (lbs)		
					TSS	TP	TN	TSS	TP	TN
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	Open Space	0.86	A	5	78.0	0.25	1.25	0.02	0.00	0.00
Woods (Good Condition)	Deciduous Forest/Evergreen Forest/Mixed Forest	0.29	A	0	45.0	0.13	1.05	0.00	0.00	0.00
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	Open Space	0.10	B	177	78.0	0.25	1.25	0.86	0.00	0.01
Impervious Areas: Commercial	Commercial	3.63	N/A	40,153	61.7	0.22	2.02	154.75	0.55	5.06
	TOTAL (ACRES):	**4.87**					**TOTALS:**	**155.63**	**0.55**	**5.08**

POLLUTANT LOAD REDUCTION REQUIREMENTS (LBS):	28.48	0.10	0.91

☑ **Characterize Undetained Areas (for Untreated Stormwater)** *No. Rows:* 4

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	**0.728**	**A**	**39**	**3.128**	**0.00**	**4**
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	**0.102**	**B**	**61**	**1.279**	**0.48**	**177**
Woods (Good Condition)	**0.285**	**A**	**30**	**4.667**	**0.00**	**0**
Impervious Areas: Commercial	**0.791**	**N/A**	**98**	**0.041**	**3.05**	**8,750**

Non-Structural BMP Water Quality Credits:

☑ Pervious Undetained Area Credit

TSS	TP	TN
0.14	0.00	0.00

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☐ Other (attach calculations)

Structural BMP Water Quality Credits:

☑ *Use default BMP Outflows and Median BMP Outflow Concentrations*

DP No.	BMP No.	BMP Name	MRC?	BMP DA (acres)	Vol. Routed to BMP (CF)	Inf. & ET Credits (CF)	Capture & Buffer Credits (CF)	Outflow (CF)	Outflow Conc. (mg/L)			Pollutant Loads (lbs)		
									TSS	TP	TN	TSS	TP	TN
001	2	Dry Extended Detention Basin	Y	1.87	20,696	0		20,696	-	-	-	-	-	-
003	3	Dry Extended Detention Basin	-	0.51	4,712	0		4,712	22.00	0.19	1.22	6.47	0.06	0.36

	TSS	TP	TN
POLLUTANT LOADS FROM STRUCTURAL BMP (TREATED) OUTFLOWS (LBS):	**6.47**	**0.06**	**0.36**
POLLUTANT LOADS FROM UNTREATED STORMWATER (LBS):	**34.60**	**0.12**	**1.12**
NON-STRUCTURAL BMP WATER QUALITY CREDITS (LBS):	**0.14**	**0.00**	**0.00**
NET POLLUTANT LOADS FROM SITE, POST-CONSTRUCTION (LBS):	**40.93**	**0.18**	**1.47**
POLLUTANT LOADS FROM SITE, PRE-CONSTRUCTION (LBS):	**127.15**	**0.45**	**4.17**

WATER QUALITY REQUIREMENT SATISFIED

CERTIFICATION

I certify under penalty of law and subject to the penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities) that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I further certify that the structure, function, and calculations contained in this spreadsheet have not been modified in comparison to the spreadsheet DEP has posted to its website or, if modifications were made, an explanation of the modifications made is attached to this spreadsheet.

Robert Swahl	7/24/2025
Spreadsheet User Name	Date

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General Information

Instructions | *General* | Volume | Rate | Quality

Project Name: **Prop. Automotive Dealership Expansion**

Application Type: **PAG-02 NOI**

County: **Montgomery**

Municipality: **Whitemarsh Township**

Project Type: **Commercial Building**

(●) New Project ( ) Minor / Major Amendment

Total Project Site Area: **5.45** acres
(In Watershed)

Total Earth Disturbance: **4.14** acres
(In Watershed)

No. of Post-Construction Discharge Points: **4**

Start DP Numbering at: **001**

Discharge Point (DP) No.	Drainage Area (DA) (acres)	Earth Disturbance in DA (acres)	Existing Impervious in DA (acres)	Proposed Impervious in DA (acres)	Receiving Waters	Ch. 93 Class	Structural BMP(s)
001	1.87	1.87	1.75	1.81	Sandy Run	TSF, MF	Yes
002					Sandy Run	TSF, MF	No
003	0.51	0.51	0.21	0.40	Sandy Run	TSF, MF	Yes
004					Dis. to MS4 - Bodenstein Channel (UNT to Sandy Run)	TSF, MF	No
Undetained Areas	1.76	1.76	1.05	1.45	Sandy Run, UNT to Sandy Run/Bodenstein Channel	TSF, MF	
Totals:	**4.14**	**4.14**	**3.01**	**3.66**			

Volume Management

Project: Prop. Automotive Dealership Expansion

Instructions | General | *Volume* | Rate | Quality

2-Year / 24-Hour Storm Event (NOAA Atlas 14): **3.28** inches

Alternative 2-Year / 24-Hour Storm Event _____ inches

Alternative Source: _____

Pre-Construction Conditions: *No. Rows:* **6** ☐ *Exempt from Meadow in Good Condition* ☑ *Automatically Calculate CN, Ia, Runoff and Volume*

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Pervious as Meadow	0.47	A	30	4.667	0.00	0
Forested (Good Condition)	0.29	A	30	4.667	0.00	0
Pervious as Meadow	0.02	B	58	1.448	0.37	32
Impervious as Meadow	0.59	A	30	4.667	0.00	0
Impervious as Meadow	0.01	B	58	1.448	0.37	11
Impervious Areas: Commercial	2.41	N/A	98	0.041	3.05	26,636
TOTAL (ACRES):	**3.79**				**TOTAL (CF):**	**26,679**

Post-Construction Conditions: *No. Rows:* **4**

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	0.54	A	39	3.128	0.00	3

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Woods (Good Condition)	0.29	A	30	4.667	0.00	0
Impervious Areas: Commercial	3.26	N/A	98	0.041	3.05	36,060
TOTAL (ACRES):	**4.09**				**TOTAL (CF):**	**36,063**

NET CHANGE IN VOLUME TO MANAGE (CF): **9,384**

Non-Structural BMP Volume Credits:

☑ Tree Planting Credit

Number of new deciduous trees that will be planted within disturbed area: 42 — **CREDIT (CF):** **252**

Number of new evergreen trees that will be planted within disturbed area: 4 — **CREDIT (CF):** **40**

☐ Other (attach calculations):

Structural BMP Volume Credits: *No. Structural BMPs:* **2** *Start BMP Numbering at:* **2**

DP No.	BMP No.	BMP Name	MRC?	Discharge	Incremental BMP DA (acres)	Volume Routed to BMP (CF)	Infiltration / Vegetated Area (SF)	Infiltration Rate (in/hr)	Infiltration Period (hrs)	Vegeta-ted?	Media Depth (ft)	Storage Volume (CF)	Infiltration Credit (CF)	ET Credit (CF)
001	2	Dry Extended Detention Basin	Y	Off-Site	1.87	20,696	0	0.00	12	No	1.0	20,696	**0**	
003	3	Dry Extended Detention Basin	-	Off-Site	0.51	4,712	0	0.00	12	No	1.0	4,712	**0**	
												Totals:		

INFILTRATION & ET CREDITS (CF):

MANAGED RELEASE CREDIT (CF): **20,696**

NET CHANGE IN VOLUME TO MANAGE (CF): **9,384**

TOTAL CREDITS (CF): **20,988**

VOLUME REQUIREMENT SATISFIED

Rate Control

Project: Prop. Automotive Dealership Expansion

Instructions | General | Volume | *Rate* | Quality

Precipitation Amounts:

NOAA 2-Year 24-Hour Storm Event (in):	**3.28**	Alternative 2-Year 24-Hour Storm Event (in):	
NOAA 10-Year 24-Hour Storm Event (in):	**4.83**	Alternative 10-Year 24-Hour Storm Event (in):	
NOAA 50-Year 24-Hour Storm Event (in):	**6.73**	Alternative 50-Year 24-Hour Storm Event (in):	
NOAA 100-Year 24-Hour Storm Event (in):	**7.66**	Alternative 100-Year 24-Hour Storm Event (in):	

☑ **Report Summary of Peak Rates Only**

Attach model input and output data or other calculations to support the rates reported below.

	Peak Discharge Rates (cfs)			
	Pre-Construction	**Post-Construction**	**Net Change**	
2-Year Storm:	**8.04**	**3.98**	**-4.06**	***Rate Control Satisfied***
10-Year Storm:	**14.02**	**7.85**	**-6.17**	***Rate Control Satisfied***
50-Year Storm:	**21.45**	**11.75**	**-9.70**	***Rate Control Satisfied***
100-Year Storm:	**25.06**	**13.69**	**-11.37**	***Rate Control Satisfied***

Water Quality

Project: Prop. Automotive Dealership Expansion

PRINT

Instructions | General | Volume | Rate | *Quality*

Pre-Construction Pollutant Loads:

Land Cover (from Volume Worksheet)	Land Cover for Water Quality	Area (acres)	Soil Group	Runoff Volume (cf)	Pollutant Conc. (mg/L)			Pollutant Loads (lbs)		
					TSS	TP	TN	TSS	TP	TN
Pervious as Meadow	Grassland/Herbaceous	0.47	A	0	48.8	0.22	2.30	0.00	0.00	0.00
Forested (Good Condition)	Deciduous Forest/Evergreen Forest/Mixed Forest	0.29	A	0	45.0	0.13	1.05	0.00	0.00	0.00
Pervious as Meadow	Grassland/Herbaceous	0.02	B	32	48.8	0.22	2.30	0.10	0.00	0.00
Impervious as Meadow	Grassland/Herbaceous	0.59	A	0	48.8	0.22	2.30	0.00	0.00	0.00
Impervious as Meadow	Grassland/Herbaceous	0.01	B	11	48.8	0.22	2.30	0.03	0.00	0.00
Impervious Areas: Commercial	Commercial	2.41	N/A	26,636	61.7	0.22	2.02	102.65	0.37	3.36
	TOTAL (ACRES):	**3.79**					**TOTALS:**	**102.78**	**0.37**	**3.37**

Post-Construction Pollutant Loads (without BMPs):

Land Cover (from Volume Worksheet)	Land Cover for Water Quality	Area (acres)	Soil Group	Runoff Volume (cf)	Pollutant Conc. (mg/L)			Pollutant Loads (lbs)		
					TSS	TP	TN	TSS	TP	TN
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	Open Space	0.54	A	3	78.0	0.25	1.25	0.01	0.00	0.00
Woods (Good Condition)	Deciduous Forest/Evergreen Forest/Mixed Forest	0.29	A	0	45.0	0.13	1.05	0.00	0.00	0.00
Impervious Areas: Commercial	Commercial	3.26	N/A	36,060	61.7	0.22	2.02	138.97	0.50	4.55
	TOTAL (ACRES):	**4.09**					**TOTALS:**	**138.99**	**0.50**	**4.55**

POLLUTANT LOAD REDUCTION REQUIREMENTS (LBS):	**36.20**	**0.13**	**1.18**

☑ **Characterize Undetained Areas (for Untreated Stormwater)** *No. Rows:* **4**

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	**0.396**	**A**	**39**	**3.128**	**0.00**	**2**
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)		**B**				
Woods (Good Condition)	**0.285**	**A**	**30**	**4.667**	**0.00**	**0**
Impervious Areas: Commercial	**0.402**	**N/A**	**98**	**0.041**	**3.05**	**4,447**

Non-Structural BMP Water Quality Credits:

☑ Pervious Undetained Area Credit

TSS	TP	TN
0.00	**0.00**	**0.00**

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☐ Other (attach calculations)

Structural BMP Water Quality Credits:

☑ *Use default BMP Outflows and Median BMP Outflow Concentrations*

DP No.	BMP No.	BMP Name	MRC?	BMP DA (acres)	Vol. Routed to BMP (CF)	Inf. & ET Credits (CF)	Capture & Buffer Credits (CF)	Outflow (CF)	Outflow Conc. (mg/L)			Pollutant Loads (lbs)		
									TSS	TP	TN	TSS	TP	TN
001	2	Dry Extended Detention Basin	Y	1.87	20,696	0		20,696	-	-	-	-	-	-
003	3	Dry Extended Detention Basin	-	0.51	4,712	0		4,712	22.00	0.19	1.22	6.47	0.06	0.36

	TSS	TP	TN
POLLUTANT LOADS FROM STRUCTURAL BMP (TREATED) OUTFLOWS (LBS):	**6.47**	**0.06**	**0.36**
POLLUTANT LOADS FROM UNTREATED STORMWATER (LBS):	**17.15**	**0.06**	**0.56**
NON-STRUCTURAL BMP WATER QUALITY CREDITS (LBS):	**0.00**	**0.00**	**0.00**
NET POLLUTANT LOADS FROM SITE, POST-CONSTRUCTION (LBS):	**23.62**	**0.12**	**0.92**
POLLUTANT LOADS FROM SITE, PRE-CONSTRUCTION (LBS):	**102.78**	**0.37**	**3.37**

WATER QUALITY REQUIREMENT SATISFIED

CERTIFICATION

I certify under penalty of law and subject to the penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities) that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I further certify that the structure, function, and calculations contained in this spreadsheet have not been modified in comparison to the spreadsheet DEP has posted to its website or, if modifications were made, an explanation of the modifications made is attached to this spreadsheet.

Robert Swahl	7/24/2025
Spreadsheet User Name	Date

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General Information

Instructions | *General* | Volume | Rate | Quality

Project Name: **Prop. Automotive Dealership Expansion**

Application Type: **PAG-02 NOI**

County: **Montgomery**

Municipality: **Whitemarsh Township**

Project Type: **Commercial Building**

(●) New Project ( ) Minor / Major Amendment

Total Project Site Area: **5.45** acres
(In Watershed)

Total Earth Disturbance: **1.15** acres
(In Watershed)

No. of Post-Construction Discharge Points: **4**

Start DP Numbering at: **001**

Discharge Point (DP) No.	Drainage Area (DA) (acres)	Earth Disturbance in DA (acres)	Existing Impervious in DA (acres)	Proposed Impervious in DA (acres)	Receiving Waters	Ch. 93 Class	Structural BMP(s)
001					Sandy Run	TSF, MF	Yes
002					Sandy Run	TSF, MF	No
003					Sandy Run	TSF, MF	Yes
004					Dis. to MS4 - Bodenstein Channel (UNT to Sandy Run)	TSF, MF	No
Undetained Areas	1.15	1.15	0.71	0.37	Sandy Run, UNT to Sandy Run/Bodenstein Channel	TSF, MF	
Totals:	**1.15**	**1.15**	**0.71**	**0.37**			

PROJECT SITE MEETS SMALL SITE EXCEPTION - RATE WORKSHEET NOT REQUIRED

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Volume Management

Project: Prop. Automotive Dealership Expansion

Instructions | General | *Volume* | Rate | Quality

2-Year / 24-Hour Storm Event (NOAA Atlas 14): **3.28** inches

Alternative 2-Year / 24-Hour Storm Event _____ inches

Alternative Source: _____

Pre-Construction Conditions: *No. Rows:* **6**

☐ *Exempt from Meadow in Good Condition* ☑ *Automatically Calculate CN, Ia, Runoff and Volume*

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Pervious as Meadow	0.39	A	30	4.667	0.00	0
Pervious as Meadow	0.05	B	58	1.448	0.37	68
Impervious as Meadow	0.13	A	30	4.667	0.00	0
Impervious as Meadow	0.02	B	58	1.448	0.37	23
Impervious Areas: Commercial	0.57	N/A	98	0.041	3.05	6,250
TOTAL (ACRES):	**1.15**				**TOTAL (CF):**	**6,341**

Post-Construction Conditions: *No. Rows:* **4**

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	0.32	A	39	3.128	0.00	2

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Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	0.10	B	61	1.279	0.48	177
Impervious Areas: Commercial	0.37	N/A	98	0.041	3.05	4,093
TOTAL (ACRES):	**0.80**				**TOTAL (CF):**	**4,271**

NET CHANGE IN VOLUME TO MANAGE (CF): **-2,070**

Non-Structural BMP Volume Credits:

☑ Tree Planting Credit

Number of new deciduous trees that will be planted within disturbed area: 27 — **CREDIT (CF):** **162**

Number of new evergreen trees that will be planted within disturbed area: 12 — **CREDIT (CF):** **120**

☐ Other (attach calculations):

Structural BMP Volume Credits: *No. Structural BMPs:* **1** *Start BMP Numbering at:* **1**

DP No.	BMP No.	BMP Name	MRC?	Discharge	Incremental BMP DA (acres)	Volume Routed to BMP (CF)	Infiltration / Vegetated Area (SF)	Infiltration Rate (in/hr)	Infiltration Period (hrs)	Vegeta-ted?	Media Depth (ft)	Storage Volume (CF)	Infiltration Credit (CF)	ET Credit (CF)
	1													
												Totals:		

INFILTRATION & ET CREDITS (CF):

NET CHANGE IN VOLUME TO MANAGE (CF): **-2,070**

TOTAL CREDITS (CF): **282**

VOLUME REQUIREMENT SATISFIED

Rate Control

Project: Prop. Automotive Dealership Expansion

Instructions | General | Volume | *Rate* | Quality

SMALL SITE EXCEPTION SATISFIED: RATE CONTROL NOT REQUIRED

Precipitation Amounts:

NOAA 2-Year 24-Hour Storm Event (in):	**3.28**	Alternative 2-Year 24-Hour Storm Event (in):	
NOAA 10-Year 24-Hour Storm Event (in):	**4.83**	Alternative 10-Year 24-Hour Storm Event (in):	
NOAA 50-Year 24-Hour Storm Event (in):	**6.73**	Alternative 50-Year 24-Hour Storm Event (in):	
NOAA 100-Year 24-Hour Storm Event (in):	**7.66**	Alternative 100-Year 24-Hour Storm Event (in):	

☑ **Report Summary of Peak Rates Only**

Attach model input and output data or other calculations to support the rates reported below.

	Peak Discharge Rates (cfs)			
	Pre-Construction	**Post-Construction**	**Net Change**	
2-Year Storm:	**2.56**	**1.17**	**-1.39**	***Rate Control Satisfied***
10-Year Storm:	**5.10**	**2.70**	**-2.40**	***Rate Control Satisfied***
50-Year Storm:	**8.41**	**4.83**	**-3.58**	***Rate Control Satisfied***
100-Year Storm:	**10.06**	**5.93**	**-4.13**	***Rate Control Satisfied***

Water Quality

Project: Prop. Automotive Dealership Expansion

PRINT

Instructions | General | Volume | Rate | *Quality*

Pre-Construction Pollutant Loads:

Land Cover (from Volume Worksheet)	Land Cover for Water Quality	Area (acres)	Soil Group	Runoff Volume (cf)	Pollutant Conc. (mg/L)			Pollutant Loads (lbs)		
					TSS	TP	TN	TSS	TP	TN
Pervious as Meadow	Grassland/Herbaceous	0.39	A	0	48.8	0.22	2.30	0.00	0.00	0.00
Pervious as Meadow	Grassland/Herbaceous	0.05	B	68	48.8	0.22	2.30	0.21	0.00	0.01
Impervious as Meadow	Grassland/Herbaceous	0.13	A	0	48.8	0.22	2.30	0.00	0.00	0.00
Impervious as Meadow	Grassland/Herbaceous	0.02	B	23	48.8	0.22	2.30	0.07	0.00	0.00
Impervious Areas: Commercial	Commercial	0.57	N/A	6,250	61.7	0.22	2.02	24.09	0.09	0.79
	TOTAL (ACRES):	**1.15**					**TOTALS:**	**24.36**	**0.09**	**0.80**

Post-Construction Pollutant Loads (without BMPs):

Land Cover (from Volume Worksheet)	Land Cover for Water Quality	Area (acres)	Soil Group	Runoff Volume (cf)	Pollutant Conc. (mg/L)			Pollutant Loads (lbs)		
					TSS	TP	TN	TSS	TP	TN
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	Open Space	0.32	A	2	78.0	0.25	1.25	0.01	0.00	0.00
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	Open Space	0.10	B	177	78.0	0.25	1.25	0.86	0.00	0.01
Impervious Areas: Commercial	Commercial	0.37	N/A	4,093	61.7	0.22	2.02	15.77	0.06	0.52
	TOTAL (ACRES):	**0.80**					**TOTALS:**	**16.64**	**0.06**	**0.53**

POLLUTANT LOAD REDUCTION REQUIREMENTS (LBS):	**0.00**	**0.00**	**0.00**

☑ **Characterize Undetained Areas (for Untreated Stormwater)** *No. Rows:* **4**

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	**0.318**	**A**	**39**	**3.128**	**0.00**	**2**
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	**0.107**	**B**	**61**	**1.279**	**0.48**	**185**
Impervious Areas: Commercial	**0.366**	**N/A**	**98**	**0.041**	**3.05**	**4,048**

Non-Structural BMP Water Quality Credits:

☑ Pervious Undetained Area Credit

TSS	TP	TN
0.14	**0.00**	**0.00**

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☐ Other (attach calculations)

Structural BMP Water Quality Credits:

☑ *Use default BMP Outflows and Median BMP Outflow Concentrations*

DP No.	BMP No.	BMP Name	MRC?	BMP DA (acres)	Vol. Routed to BMP (CF)	Inf. & ET Credits (CF)	Capture & Buffer Credits (CF)	Outflow (CF)	Outflow Conc. (mg/L)			Pollutant Loads (lbs)		
									TSS	TP	TN	TSS	TP	TN
	1													

	TSS	TP	TN
POLLUTANT LOADS FROM STRUCTURAL BMP (TREATED) OUTFLOWS (LBS):	0.00	0.00	0.00
POLLUTANT LOADS FROM UNTREATED STORMWATER (LBS):	16.51	0.06	0.53
NON-STRUCTURAL BMP WATER QUALITY CREDITS (LBS):	0.14	0.00	0.00
NET POLLUTANT LOADS FROM SITE, POST-CONSTRUCTION (LBS):	16.37	0.06	0.52
POLLUTANT LOADS FROM SITE, PRE-CONSTRUCTION (LBS):	24.36	0.09	0.80

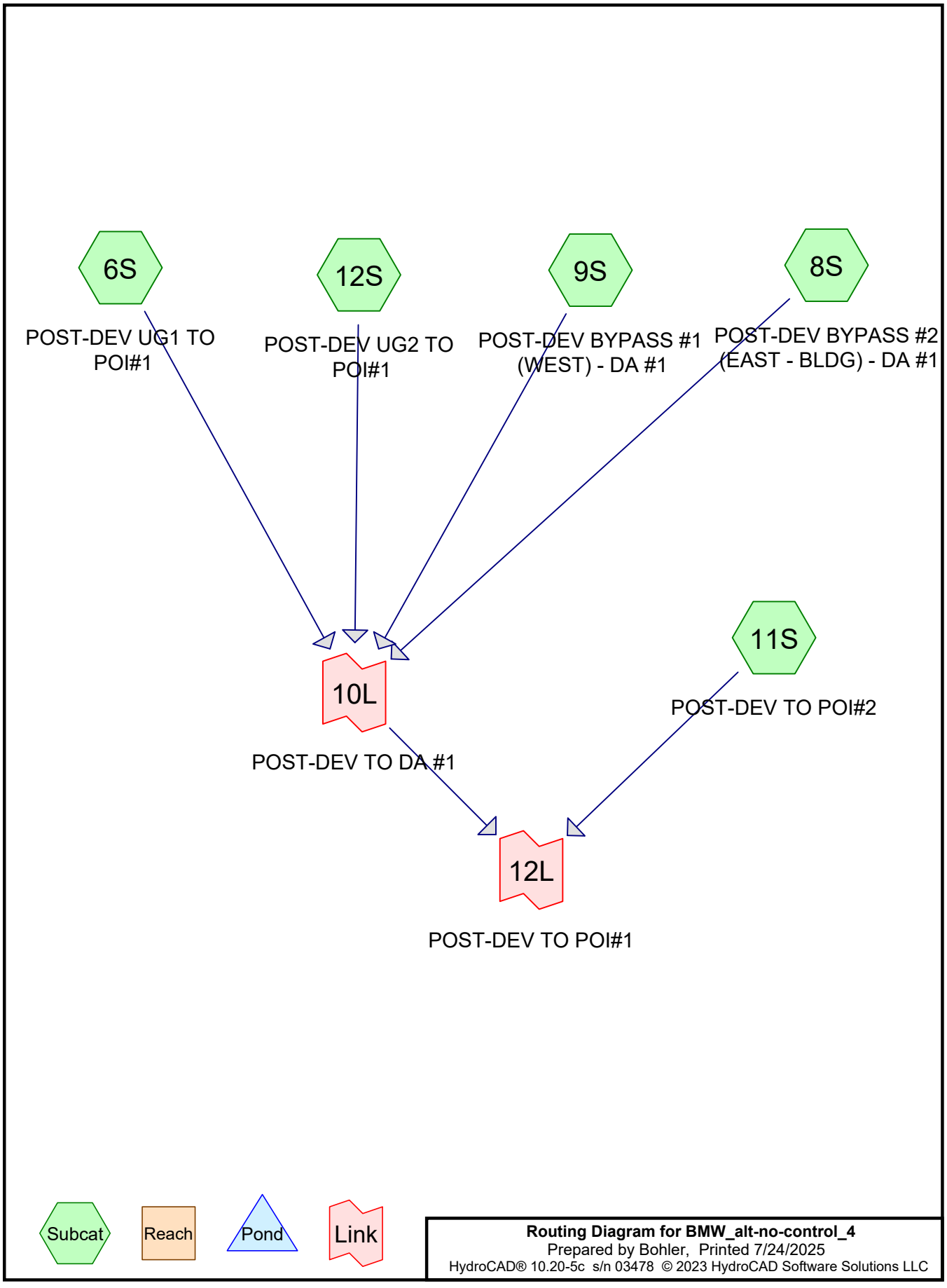
WATER QUALITY REQUIREMENT SATISFIED

CERTIFICATION

I certify under penalty of law and subject to the penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities) that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I further certify that the structure, function, and calculations contained in this spreadsheet have not been modified in comparison to the spreadsheet DEP has posted to its website or, if modifications were made, an explanation of the modifications made is attached to this spreadsheet.

Robert Swahl	7/24/2025
Spreadsheet User Name	Date

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6S
POST-DEV UG1 TO POI#1
12S
POST-DEV UG2 TO POI#1
9S
POST-DEV BYPASS #1 (WEST) - DA #1
8S
POST-DEV BYPASS #2 (EAST - BLDG) - DA #1
11S
POST-DEV TO POI#2
10L
POST-DEV TO DA #1
12L
POST-DEV TO POI#1
Subcat
Reach
Pond
Link
Routing Diagram for BMW_alt-no-control_4
Prepared by Bohler, Printed 7/24/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

Runoff = 8.968 cfs @ 11.96 hrs, Volume= 19,792 cf, Depth= 2.83"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928	96	Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

Runoff = 2.835 cfs @ 11.96 hrs, Volume= 6,548 cf, Depth= 3.05"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.000	39	Lawn A
*	0.592	98	Impervious
	0.592	98	Weighted Average
	0.592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

Runoff = 0.308 cfs @ 12.16 hrs, Volume= 1,579 cf, Depth= 0.40"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.389	39	Lawn A
*	0.285	30	Wooded A
*	0.402	98	Impervious
	1.076	59	Weighted Average
	0.674		62.64% Pervious Area
	0.402		37.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Summary for Subcatchment 11S: POST-DEV TO POI#2

Runoff = 1.172 cfs @ 11.97 hrs, Volume= 2,369 cf, Depth= 0.83"
Routed to Link 12L : POST-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.318	39	Lawn A
*	0.107	61	Lawn B
*	0.366	98	Impervious
	0.791	69	Weighted Average
	0.425		53.73% Pervious Area
	0.366		46.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

Runoff = 1.718 cfs @ 11.96 hrs, Volume= 3,409 cf, Depth= 1.90"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493	86	Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 178,117 sf, 79.75% Impervious, Inflow Depth = 2.11" for 2-yr event
Inflow = 13.552 cfs @ 11.96 hrs, Volume= 31,328 cf
Primary = 13.552 cfs @ 11.96 hrs, Volume= 31,328 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : POST-DEV TO POI#1

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 212,573 sf, 74.32% Impervious, Inflow Depth = 1.90" for 2-yr event
Inflow = 14.701 cfs @ 11.96 hrs, Volume= 33,697 cf
Primary = 14.701 cfs @ 11.96 hrs, Volume= 33,697 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

Runoff = 13.471 cfs @ 11.96 hrs, Volume= 30,539 cf, Depth= 4.36"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928	96	Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

Runoff = 4.199 cfs @ 11.96 hrs, Volume= 9,871 cf, Depth= 4.59"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.000	39	Lawn A
*	0.592	98	Impervious
	0.592	98	Weighted Average
	0.592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

Runoff = 1.247 cfs @ 12.13 hrs, Volume= 4,449 cf, Depth= 1.14"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.389	39	Lawn A
*	0.285	30	Wooded A
*	0.402	98	Impervious
	1.076	59	Weighted Average
	0.674		62.64% Pervious Area
	0.402		37.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Summary for Subcatchment 11S: POST-DEV TO POI#2

Runoff = 2.701 cfs @ 11.97 hrs, Volume= 5,268 cf, Depth= 1.83"
Routed to Link 12L : POST-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.318	39	Lawn A
*	0.107	61	Lawn B
*	0.366	98	Impervious
	0.791	69	Weighted Average
	0.425		53.73% Pervious Area
	0.366		46.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

Runoff = 2.904 cfs @ 11.96 hrs, Volume= 5,921 cf, Depth= 3.31"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493	86	Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 178,117 sf, 79.75% Impervious, Inflow Depth = 3.42" for 10-yr event
Inflow = 21.007 cfs @ 11.96 hrs, Volume= 50,781 cf
Primary = 21.007 cfs @ 11.96 hrs, Volume= 50,781 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : POST-DEV TO POI#1

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 212,573 sf, 74.32% Impervious, Inflow Depth = 3.16" for 10-yr event
Inflow = 23.691 cfs @ 11.96 hrs, Volume= 56,049 cf
Primary = 23.691 cfs @ 11.96 hrs, Volume= 56,049 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

Runoff = 18.946 cfs @ 11.96 hrs, Volume= 43,774 cf, Depth= 6.25"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928	96	Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

Runoff = 5.866 cfs @ 11.96 hrs, Volume= 13,949 cf, Depth= 6.49"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.000	39	Lawn A
*	0.592	98	Impervious
	0.592	98	Weighted Average
	0.592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

Runoff = 2.789 cfs @ 12.12 hrs, Volume= 9,064 cf, Depth= 2.32"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.389	39	Lawn A
*	0.285	30	Wooded A
*	0.402	98	Impervious
	1.076	59	Weighted Average
	0.674		62.64% Pervious Area
	0.402		37.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Summary for Subcatchment 11S: POST-DEV TO POI#2

Runoff = 4.834 cfs @ 11.96 hrs, Volume= 9,458 cf, Depth= 3.29"
Routed to Link 12L : POST-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.318	39	Lawn A
*	0.107	61	Lawn B
*	0.366	98	Impervious
	0.791	69	Weighted Average
	0.425		53.73% Pervious Area
	0.366		46.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

Runoff = 4.363 cfs @ 11.96 hrs, Volume= 9,138 cf, Depth= 5.11"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493	86	Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 178,117 sf, 79.75% Impervious, Inflow Depth = 5.12" for 50-yr event
Inflow = 30.456 cfs @ 11.96 hrs, Volume= 75,925 cf
Primary = 30.456 cfs @ 11.96 hrs, Volume= 75,925 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : POST-DEV TO POI#1

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 212,573 sf, 74.32% Impervious, Inflow Depth = 4.82" for 50-yr event
Inflow = 35.281 cfs @ 11.96 hrs, Volume= 85,382 cf
Primary = 35.281 cfs @ 11.96 hrs, Volume= 85,382 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

Runoff = 21.616 cfs @ 11.96 hrs, Volume= 50,262 cf, Depth= 7.18"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928	96	Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

Runoff = 6.681 cfs @ 11.96 hrs, Volume= 15,946 cf, Depth= 7.42"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.000	39	Lawn A
*	0.592	98	Impervious
	0.592	98	Weighted Average
	0.592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

Runoff = 3.642 cfs @ 12.11 hrs, Volume= 11,616 cf, Depth= 2.97"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.389	39	Lawn A
*	0.285	30	Wooded A
*	0.402	98	Impervious
	1.076	59	Weighted Average
	0.674		62.64% Pervious Area
	0.402		37.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Summary for Subcatchment 11S: POST-DEV TO POI#2

Runoff = 5.932 cfs @ 11.96 hrs, Volume= 11,664 cf, Depth= 4.06"
Routed to Link 12L : POST-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.318	39	Lawn A
*	0.107	61	Lawn B
*	0.366	98	Impervious
	0.791	69	Weighted Average
	0.425		53.73% Pervious Area
	0.366		46.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

Runoff = 5.073 cfs @ 11.96 hrs, Volume= 10,741 cf, Depth= 6.00"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493	86	Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 178,117 sf, 79.75% Impervious, Inflow Depth = 5.97" for 100-yr event
Inflow = 35.135 cfs @ 11.96 hrs, Volume= 88,566 cf
Primary = 35.135 cfs @ 11.96 hrs, Volume= 88,566 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : POST-DEV TO POI#1

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 212,573 sf, 74.32% Impervious, Inflow Depth = 5.66" for 100-yr event
Inflow = 41.060 cfs @ 11.96 hrs, Volume= 100,230 cf
Primary = 41.060 cfs @ 11.96 hrs, Volume= 100,230 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

BMW_alt-no-control_4
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Events for Subcatchment 6S: POST-DEV UG1 TO POI#1

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-yr	3.28	8.968	19,792	2.83
10-yr	4.83	13.471	30,539	4.36
50-yr	6.73	18.946	43,774	6.25
100-yr	**7.66**	**21.616**	**50,262**	**7.18**

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Events for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-yr	3.28	2.835	6,548	3.05
10-yr	4.83	4.199	9,871	4.59
50-yr	6.73	5.866	13,949	6.49
100-yr	**7.66**	**6.681**	**15,946**	**7.42**

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Events for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-yr	3.28	0.308	1,579	0.40
10-yr	4.83	1.247	4,449	1.14
50-yr	6.73	2.789	9,064	2.32
100-yr	**7.66**	**3.642**	**11,616**	**2.97**

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Events for Subcatchment 11S: POST-DEV TO POI#2

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-yr	3.28	1.172	2,369	0.83
10-yr	4.83	2.701	5,268	1.83
50-yr	6.73	4.834	9,458	3.29
100-yr	**7.66**	**5.932**	**11,664**	**4.06**

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Events for Subcatchment 12S: POST-DEV UG2 TO POI#1

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-yr	3.28	1.718	3,409	1.90
10-yr	4.83	2.904	5,921	3.31
50-yr	6.73	4.363	9,138	5.11
100-yr	**7.66**	**5.073**	**10,741**	**6.00**

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Events for Link 10L: POST-DEV TO DA #1

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)
2-yr	13.552	13.552	**0.00**
10-yr	21.007	21.007	0.00
50-yr	30.456	30.456	0.00
100-yr	**35.135**	**35.135**	0.00

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Events for Link 12L: POST-DEV TO POI#1

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)
2-yr	14.701	14.701	**0.00**
10-yr	23.691	23.691	0.00
50-yr	35.281	35.281	0.00
100-yr	**41.060**	**41.060**	0.00

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

MANAGED RELEASE CONCEPT (MRC) DESIGN SUMMARY

Complete One Design Summary Sheet for Each BMP Designed for MRC

GENERAL INFORMATION

Applicant Name:	**MileOne Fort Washington, LLC**	Project Name:	**BMW Automotive Dealership Expansion**
Applicant Address:	**3301 Briggs Chaney Road**	Municipality:	**Whitemarsh Township**
City, State, Zip:	Silver Spring, MD 20904	County:	**Montgomery County**

Permit Type: ☒ NPDES PAG-02 ☐ NPDES IP ☐ ESCGP ☐ ESP

	Pre-Development	Post-Development	Change
Impervious Area (acres):	3.715	3.627	0.088

MRC BMP INFORMATION

MRC BMP Type: **Dry Extended Detention Basin UG1** Stormwater BMP Manual Section: **6.6.3**

Will the BMP Include Vegetation? ☐ Yes ☒ No

If Yes, Identify Proposed Vegetation:

For Non-Vegetated BMPs Will There Be Pre- or Post-Treatment? ☒ Yes (Pre-) ☐ Yes (Post-) ☐ No

If Yes, Identify Proposed Pre- or Post-Treatment: **Water Quality Filters / Hydrodynamic Devices**

Name of Surface Water to Receive MRC BMP Discharges: **Sandy Run**

Designated Use of Surface Water: **TSF, MF** Existing Use of Surface Water (if different):

Is the Surface Water Impaired? ☒ Yes ☐ No

If Yes, Identify Cause(s): **Municipal Point Source Discharges – Nutrients, Biochemical Oxygen Demand (BOD) ; Urban Runoff/Storm Sewers - Nutrients**

Will the BMP have an impermeable liner? ☒ Yes ☐ No

If Yes, explain why a liner is proposed: **Proximity to Seasonal High Water Table**

BMP Media Description: **Coarse Aggregate with 40% Voids**

Are Any Deviations from MRC Design Standards Proposed? ☐ Yes ☒ No

If Yes, Identify Deviations:

MRC BMP DESIGN VALUES AND STANDARDS

Parameter	Design Value	Design Standard
Actual Contributing Impervious Area to BMP (acres)	**1.87**	
Equivalent Contributing Impervious Area to BMP (acres)	**1.84**	
Total Drainage Area to BMP (acres)	**1.87**	
MRC BMP Release Rate (cfs)	**0.02**	*No greater than 0.01 cfs / acre of equivalent contributing impervious*
Underdrain Outflow Rate During 1.2-Inch/2-Hour Storm (cfs)	**0.02**	*<= MRC BMP Release Rate (cfs)*
Maximum Storm Event Routed to MRC BMP	**100-Yr**	

MRC BMP Design Summary
Revised, August 25, 2020

Parameter	Design Value	Design Standard
BMP Footprint Area (ft^2)	**13,041**	
Bottom BMP Elevation (Native Soils) (ft)	**156.53**	
2-Yr/24-Hr Storm Ponding Depth (ft)	**1.30**	*1 ft (recommended) (2 ft max)*
Maximum Ponding Depth (ft)	**2.30**	*4 ft (max)*
Overflow Bypass Elevation (ft)	**158.39**	
Media Depth (ft)	**4.21**	*2 ft (min) – 4 ft (max)*
Media Void Space (%)	**40**	
Internal Water Storage (IWS) Depth (ft)	**1**	*1 ft recommended*
Top of IWS Elevation (ft)	**157.53**	
Underdrain Pipe Diameter (in)	**4**	
Underdrain Orifice Diameter (in)	**1.0**	
Underdrain Outlet Elevation (ft)	**157.53**	
IWS Available for Routing (%)	**0**	*50% max*
Separation Distance (Groundwater) (ft)	**-2.47**	*1 ft (min) (2 ft recommended)*
Infiltration Rate (in/hr)	**0**	
Volume of Overflow During 1.2-Inch/2-Hour Storm (cf)	**0**	*0 (No overflow allowed)*
1-Yr/24-Hr **Pre**-Development Peak Rate (cfs)	**6.39***	
2-Yr/24-Hr **Post**-Development Peak Rate (cfs)	**5.12***	*1-Yr/24-Hr Pre-Development Peak Rate (or per approved Act 167 Plan)*
10-Yr/24-Hr **Post**-Development Peak Rate (cfs)	**10.53***	*10-Yr/24-Hr Pre-Development Peak Rate*
50-Yr/24-Hr **Post**-Development Peak Rate (cfs)	**16.52***	*50-Yr/24-Hr Pre-Development Peak Rate*
100-Yr/24-Hr **Post**-Development Peak Rate (cfs)	**19.43***	*100-Yr/24-Hr Pre-Development Peak Rate*
Total 2-Yr/24-Hr Runoff Volume Managed by BMP (cf)	**20,696**	
Ponding Time @ 2-Yr/24-Hr Storm (hrs)	**117.50**	*72 hrs (surface), 7 days (underground)*
Ponding Time @ 10-Yr/24-Hr Storm (hrs)	**118.00**	*72 hrs (surface), 7 days (underground)*
Ponding Time @ 50-Yr/24-Hr Storm (hrs)	**118.00**	*72 hrs (surface), 7 days (underground)*
Ponding Time @ 100-Yr/24-Hr Storm (hrs)	**118.00**	*72 hrs (surface), 7 days (underground)*

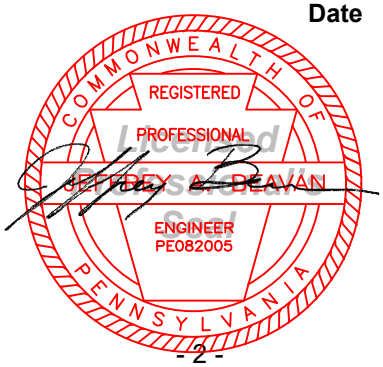
* PER MRC GUIDANCE DOCUMENTS, A CONSISTENT METHOD IS REQUIRED TO COMPARE PRE- AND POST-DEVELOPMENT RATES. RATES SHOWN ARE THE PEAK RATES AT DP-001 FOR BOTH PRE- AND POST-DEVELOPMENT CONDITIONS. ACTUAL BMP OUTFLOW RATES ARE LOWER.

Jeffrey A. Beavan
Licensed P.E. Name

Licensed P.E. Signature

PE082055
License No.

01/03/2025
Date



MRC Contributing Impervious Area Calculations

	Total Inflow Volume (1.2-inch/2-hour) (cf)	Divide by 0.0833 ft. (cubic inches) (sf.)	Divide by 43,560 sf per acre Equivalent Impervious Area (acre)	Maximum Release Rate Divide by 100 (cfs)
MRC1	6694	80360.14406	1.84	0.02

Outflow Calculations from Perforated Pipe

Project Name: BMW Automotive Dealership Expansion

Date Prepared: 1/6/2025

Prepared By: RMS/JAB

Prepared For: MileOne Fort Washington

UG1

183 LF * 0.1327 = 24.28 cfs capacity

Height of Water[1] (top of pipe to water surface)	15.36	in
Orifice Coefficient, Cd	0.56	

Based on 2-year WSE

Pipe Diam (in)	**Perforation Type**	**Inlet Area/Foot** (ACTUAL Min., in^2/ft)	**Flow/Perf** ft^3/sec	**Flow/Perf** gal/min	**Flow/FT** ft^3/sec	**Flow/FT** gal/min	
4	slotted	3.5	0.0024	1.09	0.1327	59.55	A-profile Pipe
6	slotted	3.1	0.0026	1.15	0.1198	53.79	
8	slotted	3.4	0.0036	1.60	0.1338	60.05	
10	slotted	2.5	0.0035	1.59	0.1014	45.51	
12	drilled	2.5	0.0029	1.32	0.1060	47.55	
15	drilled	2.0	0.0030	1.37	0.0846	37.99	
18	drilled	2.0	0.0031	1.41	0.0877	39.37	
24	drilled	2.2	0.0033	1.50	0.1015	45.56	
30	drilled	3.5	0.0037	1.68	0.1746	78.37	
36	drilled	2.9	0.0042	1.88	0.1530	68.69	
42	drilled	2.6	0.0038	1.72	0.1421	63.76	
48	drilled	2.9	0.0045	2.04	0.1662	74.61	
60	drilled	2.6	0.0049	2.19	0.1562	70.09	

Pipe Diam (in)	**Perforation Type**	**Inlet Area/Foot** (ACTUAL Min., in^2/ft)	**Flow/Perf** ft^3/sec	**Flow/Perf** gal/min	**Flow/FT** ft^3/sec	**Flow/FT** gal/min	
4	slotted	1.6	0.0008	0.36	0.0587	26.34	H-profile Pipe
6	slotted	1.3	0.0008	0.37	0.0517	23.22	
8	slotted	2.2	0.0009	0.38	0.0852	38.25	
10	slotted	1.6	0.0009	0.39	0.0666	29.89	
12	drilled	2.5	0.0020	0.92	0.1022	45.87	
15	drilled	2.9	0.0033	1.49	0.1228	55.14	
18	drilled	2.8	0.0034	1.54	0.1226	55.01	
24	drilled	3.4	0.0052	2.34	0.1586	71.19	
30	drilled	2.6	0.0055	2.46	0.1277	57.34	
36*	drilled	2.2	0.0057	2.58	0.1157	51.91	
42*	drilled	2.2	0.0060	2.69	0.1206	54.13	
48*	drilled	2.2	0.0062	2.80	0.1253	56.22	
60*	drilled	2.0	0.0067	3.01	0.1216	54.59	

** Based on H-profile pipe*

Notes

1 - Calculations assume the pipe is flowing full. User input is measured from top of pipe to water surface. The height of water, H, is then calculated to be 1/2*Pipe ID plus the distance between top of pipe and water surface (user-entered value). Enter 0 if the water surface is not above the top of pipe. Calculations represent free-flow conditions and do not account for any backfill material.

2 - Based on Class 2 perforation pattern

3 - Refer to Internal Product Note 1.01 - *Perforation Patterns* for perforation data

$$Q_p = C_d A \sqrt{2gH}$$

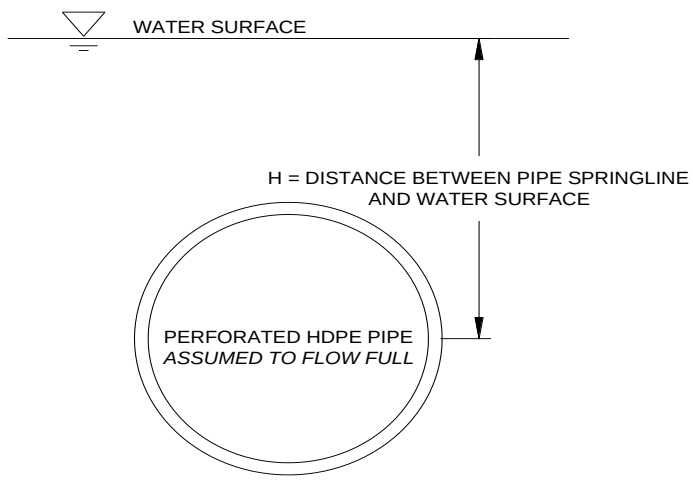
Qp = Free outfall flow rate (ft^3/sec)

C_d = Coefficient of discharge, 0.56 recommended

A = Cross-sectional area of perforations per foot (ft^2/ft)

g = Gravimetric constant, 32.2 ft/sec^2

H = Height of water above pipe springline, head (ft)



Technical Note

TN 1.01 Dual Wall HDPE Perforation Patterns

Overview

Perforated pipe plays an integral role in many applications of HDPE pipe. Generally, perforated pipe is used to accelerate the removal of subsurface water in soils or to allow storm water to percolate into the soil. Currently, two classifications of perforations are specified in the AASHTO material specifications for HDPE pipe: Class I, and Class II. The Class II perforation pattern comes standard when perforated pipe is ordered. Class One perforated pipe has limited availability. Please check with a local representative to determine availability. Both classes are explained in more detail in the AASHTO materials specifications (M294 and M252). AASHTO M252 covers pipe diameters 3- through 10-inch (75 - 250 mm) while M294 covers 12-inch through 60-inch (300 - 1500 mm).

Standard Perforation Patterns

AASHTO Class II Perforation

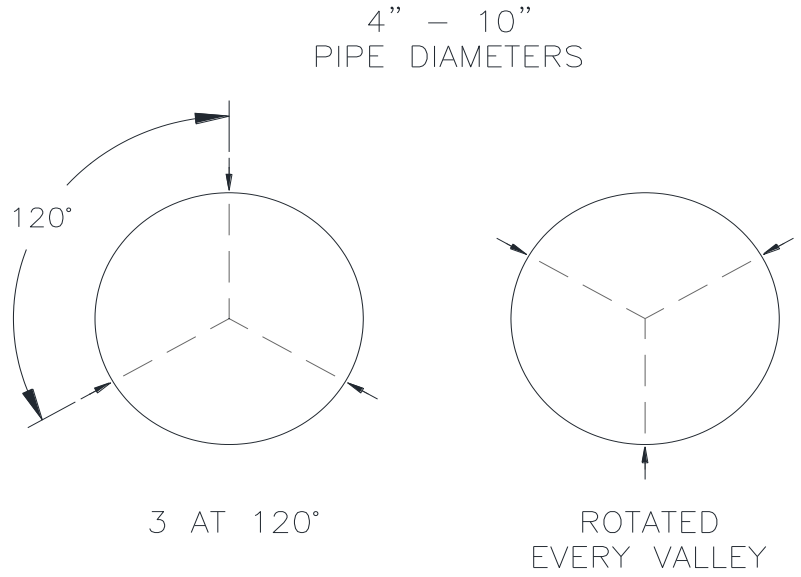
The following terminology for perforations is derived from the applicable AASHTO specification. Differences between the specifications are covered in the table below. Class II perforations shall be located in the outside valleys of the corrugations, be circular and/or slotted and evenly spaced around the circumference and length of the pipe. The perforations shall be located in the outside valleys of the corrugations. The water inlet area shall be no less than 0.945 in^2/ft (20 cm^2/m) for pipe diameters 4- through 10-inch (100 - 250mm), 1.42 in^2/ft (30 cm^2/m) for pipe diameters 12- through 18-inch (300 - 450 mm) and 1.89 in^2/ft (40 cm^2/m) for pipe diameters larger than and equal to 24 inches (600 mm). Table 1 below represents ADS standard perforation patterns for AASHTO Class II.

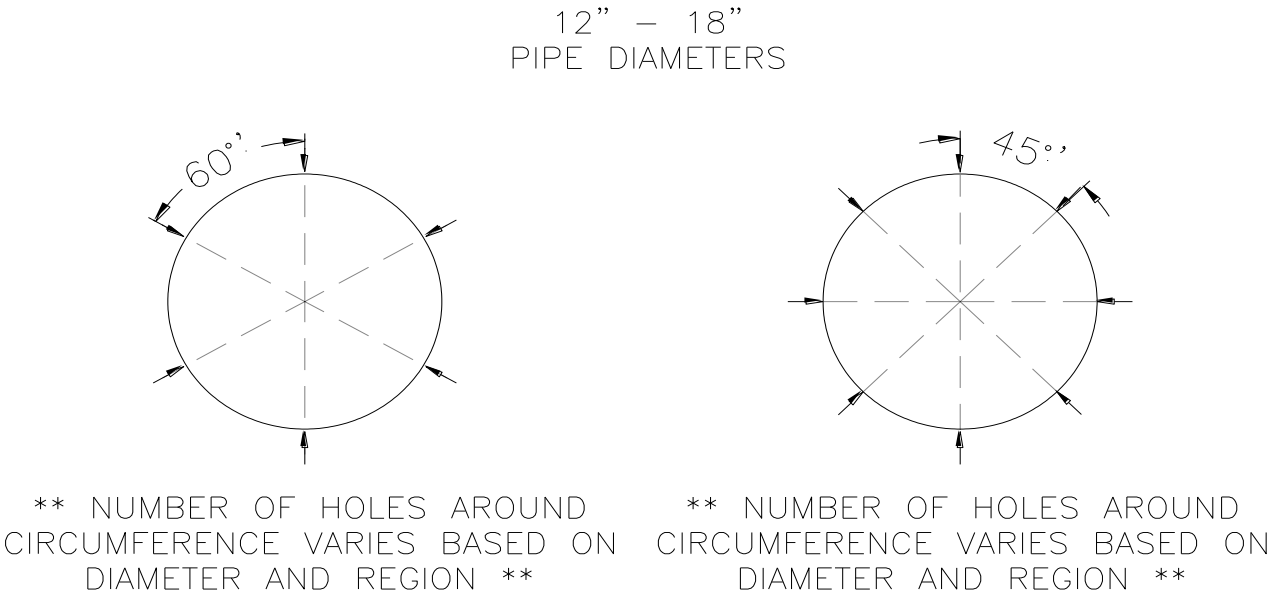
Nominal I.D.	Perforation Type	Maximum Slot Length or Diameter	Maximum Slot Width	Minimum Inlet Area
4” (100 mm)	Slot	0.875” (22 mm)	0.125” (3 mm)	1.0 in^2/ft (21 cm^2/m)
6” (150 mm)	Slot	0.875” (22 mm)	0.125” (3 mm)	1.0 in^2/ft (21 cm^2/m)
8” (200 mm)	Slot	1.18” (30 mm)	0.125” (3 mm)	1.0 in^2/ft (21 cm^2/m)
10” (250 mm)	Slot	1.18” (30 mm)	0.125” (3 mm)	1.0 in^2/ft (21 cm^2/m)
12” (300 mm)	Circular	0.313” (8 mm)	-	1.5 in^2/ft (32 cm^2/m)
15” (375 mm)	Circular	0.313” (8 mm)	-	1.5 in^2/ft (32 cm^2/m)
18” (450 mm)	Circular	0.313” (8 mm)	-	1.5 in^2/ft (32 cm^2/m)
24” (600 mm)	Circular	0.313” (8 mm)	-	2.0 in^2/ft (42 cm^2/m)
30” (750 mm)	Circular	0.375” (9.5 mm)	-	2.0 in^2/ft (42 cm^2/m)
36” (900 mm)	Circular	0.375” (9.5 mm)	-	2.0 in^2/ft (42 cm^2/m)
42” (1050 mm)	Circular	0.375” (9.5 mm)	-	2.0 in^2/ft (42 cm^2/m)
48” (1200 mm)	Circular	0.375” (9.5 mm)	-	2.0 in^2/ft (42 cm^2/m)
54” (1350 mm)	Circular	0.375” (9.5 mm)	-	2.0 in^2/ft (42 cm^2/m)
60” (1500 mm)	Circular	0.375” (9.5 mm)	-	2.0 in^2/ft (42 cm^2/m)

Figure 1

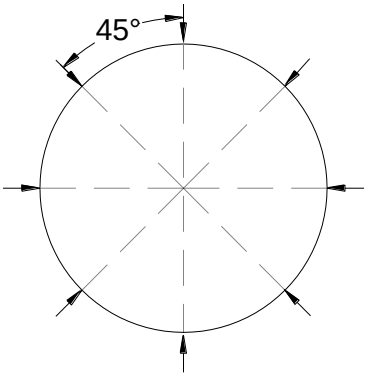
AASHTO Class II Perforation Patterns

Note: Actual pattern may vary by region, however all patterns meet the AASHTO and ASTM minimum requirements for the open inlet area.

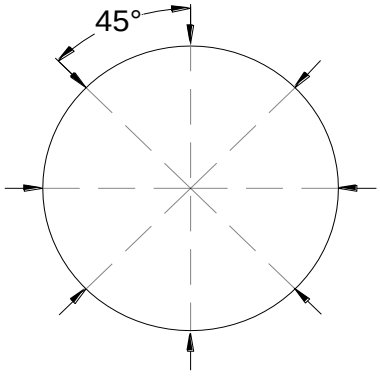


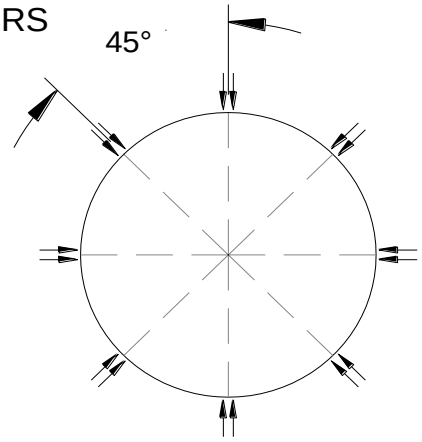


24"
PIPE DIAMETERS



30"
PIPE DIAMETERS

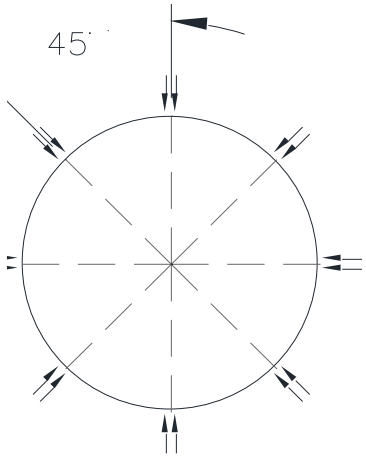




2 AT EVERY 45°

** NUMBER OF HOLES AROUND CIRCUMFERENCE VARIES BASED ON DIAMETER AND REGION**

36" – 60"
PIPE DIAMETERS



2 AT EVERY 45°

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UNDERGROUND BASIN BUOYANCY CALCULATION

PROJECT: ***BMW Fort Washington***
500 Pennsylvania Ave
Whitemarsh Township, Montgomery County

DATE: ***3/20/2024***
BY: ***RMS***
CHECKED BY: ***JAB***
REVISION: ***5***

Underground Basin 1 / BMP #002 Buoyancy Calculation

Buoyant Force	Depth (Ft)	Material Density (lb/ft^3)	lb/SF
System Depth Below SHWT*	2.47	62.4	**154.128**
		Total Buoyant Force to Overcome	**154.128**

** Water depth from SHWT (159.00) to bottom of MRC Basin UG1 liner (156.53)*

Downward Force	Depth (Ft)	Material Density (lb/ft^3)	lb/SF
Clean Stone (Below Chambers Only)**	0.5	90	45.00
Clean Stone (Above Chambers)	0.5	90	45.00
Asphalt Pavement	0.58	150	87.00
Subbase Stone	0.5	145	72.50
Clean Stone	0	90	0.00
Dirt Subgrade (@ Min. Cover)	0.68	80	54.40
		Total Downward Force of Basin & Material Above	**303.90**

***Assumes no water in IWS or in basin*

BUOYANT? **FALSE**

FOS **2**

Storm Drainage Calculations

Runoff Calculations C Worksheet

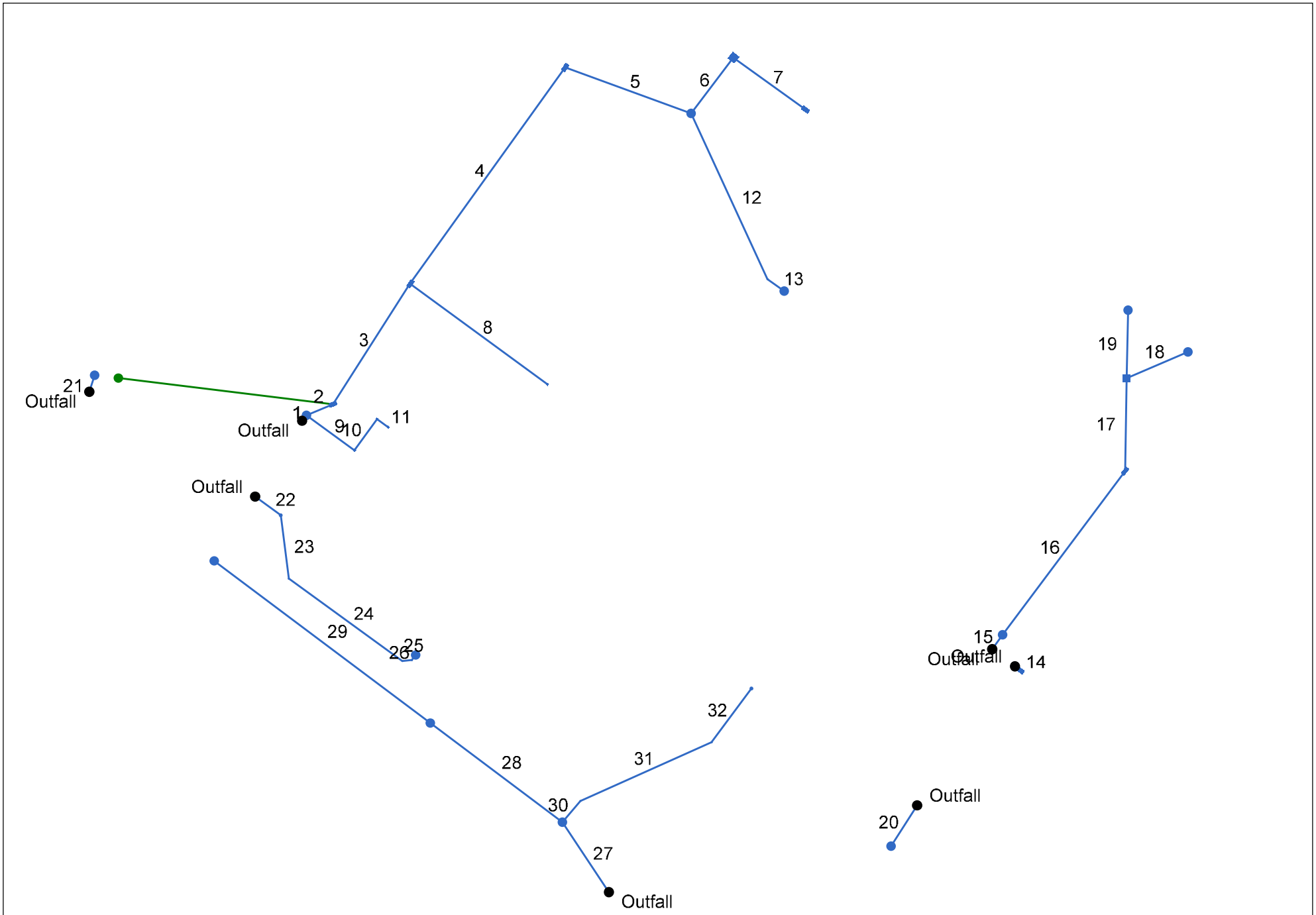
Project: **BMW Fort Washington**

Description: **510 Pennsylvania Ave, Whitemarsh Township, Montgomery County**

Drainage Area	Land Use Description	C	Area (Acres)	Total Area (Acres)	Weighted C
INL-110	Impervious	0.95	0.545	0.55	0.94
	Pervious	0.35	0.005		
INL-121	Impervious	0.95	0.115	0.14	0.86
	Pervious	0.35	0.021		
INL-122	Impervious	0.95	0.171	0.17	0.95
	Pervious	0.35	0.001		
INL-123	Impervious	0.95	0.076	0.08	0.90
	Pervious	0.35	0.007		
INL-126	Impervious	0.95	0.074	0.09	0.87
	Pervious	0.35	0.011		
INL-127	Impervious	0.95	0.116	0.13	0.89
	Pervious	0.35	0.012		

INL-211	Impervious	0.95	0.060	**0.10**	**0.71**
	Pervious	0.35	0.040		
INL-212	Impervious	0.95	0.038	**0.05**	**0.82**
	Pervious	0.35	0.011		
INL-214	Impervious	0.95	0.096	**0.10**	**0.92**
	Pervious	0.35	0.005		
INL-213.1	Impervious	0.95	0.035	**0.04**	**0.95**
INL-221	Impervious	0.95	0.058	**0.09**	**0.76**
	Pervious	0.35	0.03		
INL-231	Impervious	0.95	0.130	**0.13**	**0.95**
RD1	Impervious	0.95	0.285	**0.29**	**0.95**
RD2	Impervious	0.95	0.028	**0.03**	**0.95**
RD3	Impervious	0.95	0.439	**0.44**	**0.95**
RD4	Impervious	0.95	0.029	**0.03**	**0.95**
RD5	Impervious	0.95	0.592	**0.59**	**0.95**

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: PAB220113.01-Storm_Rev3a_2-yr.stm	Number of lines: 32	Date: 7/24/2025

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
1	MH 120	Manhole	163.93	Cir	4.00	4.00	24	Cir	158.03	24 12	Cir Cir	158.03 158.03
2	INL 121	Combination	164.19	Rect	4.00	2.00	24	Cir	158.13	24	Cir	158.13
3	INL 122	Combination	164.99	Rect	4.00	2.00	24	Cir	158.51	18 12	Cir Cir	158.51 158.66
4	INL 123	Combination	165.11	Rect	4.00	2.00	18	Cir	159.22	18	Cir	159.37
5	MH 125	Manhole	164.85	Cir	4.00	4.00	18	Cir	159.58	14 6	Cir Cir	159.58 162.29
6	INL 126	Combination	163.79	Rect	4.00	4.00	14	Cir	159.77	12	Cir	159.77
7	INL 127	Combination	163.64	Rect	4.00	2.00	12	Cir	160.00			
8	RD1	Generic	166.88	Rect	1.00	1.00	12	Cir	159.11			
9	RD2(2)	Manhole	164.63	Rect	1.00	1.00	12	Cir	158.20	12	Cir	158.22
10	RD2(1)	Manhole	165.23	Rect	1.00	1.00	12	Cir	158.32	12	Cir	158.32
11	RD2	Combination	165.30	Rect	1.00	1.00	12	Cir	158.36			
12		None	0.00	n/a	n/a	n/a	6	Cir	164.71	6	Cir	164.71
13	RD4	Generic	0.00	Cir	4.00	4.00	6	Cir	164.87			
14	INL-221	Combination	164.29	Rect	4.00	2.00	15	Cir	160.15			
15	INL 211	Combination	164.75	Cir	4.00	2.00	18	Cir	158.68	15	Cir	158.93
16	INL-212	Combination	164.93	Rect	4.00	2.00	15	Cir	159.47	15	Cir	159.47
17	MH-213	Manhole	163.42	Rect	4.00	4.00	15	Cir	159.72	15 12	Cir Cir	159.90 159.72
18	INL213.1	Combination	163.46	Cir	4.00	2.00	15	Cir	160.09			
19	INL-214	Combination	0.00	Cir	4.00	2.00	12	Cir	159.90			
20	INL 231	Combination	163.15	Cir	4.00	4.00	15	Cir	160.00			
21	INL 110	Combination	162.50	Cir	4.00	2.00	18	Cir	159.25			

Project File: PAB220113.01-Storm_Rev3a_2-yr.stm | Number of Structures: 32 | Run Date: 7/24/2025

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
22	RD3(1)	Manhole	164.48	Cir	1.00	1.00	8	Cir	158.45	8	Cir	158.45
23		None	0.00	n/a	n/a	n/a	8	Cir	158.62	8	Cir	158.62
24		None	0.00	n/a	n/a	n/a	8	Cir	158.99	8	Cir	158.99
25		None	0.00	n/a	n/a	n/a	8	Cir	159.01	8	Cir	159.01
26	RD3	Generic	0.00	Cir	4.00	4.00	8	Cir	159.06			
27	MH 101	Manhole	160.87	Cir	4.00	4.00	18	Cir	156.38	18 8	Cir Cir	156.38 158.75
28	MH 102	Manhole	162.83	Cir	4.00	4.00	18	Cir	156.82	18	Cir	156.82
29	OCS-103	Manhole	163.82	Cir	4.00	4.00	18	Cir	157.53			
30		None	0.00	n/a	n/a	n/a	8	Cir	158.83	8	Cir	158.83
31		None	0.00	n/a	n/a	n/a	8	Cir	162.17	8	Cir	162.17
32	RD5	Generic	168.64	Cir	1.00	1.00	8	Cir	162.87			

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	Pipe - (85)	3.09	24	Cir	3.640	158.01	158.03	0.550	158.64	158.64	0.22	158.64	End	Manhole
2	Pipe - (63)	3.01	24	Cir	15.229	158.03	158.13	0.657	158.64	158.74	n/a	158.74 j	1	Combination
3	Pipe - (64)	2.70	24	Cir	75.492	158.13	158.51	0.503	158.74	159.08	n/a	159.08 j	2	Combination
4	Pipe - (65)	1.23	18	Cir	140.496	158.51	159.22	0.505	159.08	159.63	n/a	159.63 j	3	Combination
5	Pipe - (67)	1.01	18	Cir	70.504	159.37	159.58	0.298	159.78	159.99	0.10	160.09	4	Manhole
6	Pipe - (68)	0.95	14	Cir	36.961	159.58	159.77	0.514	160.09	160.16	0.21	160.16	5	Combination
7	Pipe - (69)	0.57	12	Cir	46.842	159.77	160.00	0.491	160.16	160.31	0.11	160.31	6	Combination
8	Pipe - (77)	1.36	12	Cir	89.896	158.66	159.11	0.501	159.16	159.61	n/a	159.80 j	3	Generic
9	Pipe - (78)	0.12	12	Cir	31.389	158.03	158.20	0.542	158.64	158.34	n/a	158.34	1	Manhole
10	Pipe - (79)	0.14	12	Cir	20.349	158.22	158.32	0.491	158.37	158.47	n/a	158.52 j	9	Manhole
11	Pipe - (80)	0.14	12	Cir	7.210	158.32	158.36	0.555	158.52	158.51	0.05	158.51	10	Combination
12	Pipe - (108)	0.14	6	Cir	96.463	162.29	164.71	2.509	162.42	164.89	0.04	164.89	5	None
13	Pipe - (107)	0.14	6	Cir	10.810	164.71	164.87	1.480	164.89	165.06	0.07	165.06	12	Generic
14	Pipe - (56)	0.34	15	Cir	3.658	160.13	160.15	0.546	160.35	160.37	0.08	160.37	End	Combination
15	Pipe - (52)	0.86	18	Cir	9.379	158.63	158.68	0.533	160.35*	160.35*	0.00	160.35	End	Combination
16	Pipe - (53)	0.67	15	Cir	108.000	158.93	159.47	0.500	160.35	160.36	0.01	160.37	15	Combination
17	Pipe - (54)	0.54	15	Cir	49.000	159.47	159.72	0.510	160.37	160.01	0.09	160.01	16	Manhole
18	Pipe - (55)	0.19	15	Cir	35.041	159.90	160.09	0.542	160.06	160.26	0.06	160.26	17	Combination
19	Pipe - (54) (1)	0.45	12	Cir	36.000	159.72	159.90	0.500	160.01	160.18	0.10	160.18	17	Combination
20	Pipe - (57)	0.61	15	Cir	25.570	159.28	160.00	2.816	160.01	160.30	n/a	160.30 j	End	Combination
21	Pipe - (62)	2.54	18	Cir	9.207	158.03	159.25	13.251	159.58	159.85	n/a	159.85	End	Combination
22	Pipe - (82)	2.02	8	Cir	16.733	158.36	158.45	0.538	158.99*	159.39*	0.40	159.79	End	Manhole
23	Pipe - (119)	2.03	8	Cir	33.811	158.45	158.62	0.503	159.79*	160.60*	0.41	161.01	22	None
24	Pipe - (118)	2.05	8	Cir	73.925	158.62	158.99	0.501	161.01*	162.83*	0.38	163.21	23	None

Project File: PAB220113.01-Storm_Rev3a_2-yr.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Return period = 2 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
25	Pipe - (117)	2.06	8	Cir	4.964	158.99	159.01	0.403	163.21*	163.34*	0.42	163.76	24	None
26	Pipe - (116)	2.06	8	Cir	3.314	159.01	159.06	1.509	163.76*	163.84*	0.54	164.38	25	Generic
27	Pipe - (59)	4.57	18	Cir	44.321	156.15	156.38	0.519	157.34	157.20	0.32	157.20	End	Manhole
28	Pipe - (60)	1.85	18	Cir	87.044	156.38	156.82	0.505	157.20	157.33	n/a	157.33 j	27	Manhole
29	Pipe - (61)	1.85	18	Cir	142.460	156.82	157.53	0.498	157.33	158.04	0.19	158.04	28	Manhole
30	Pipe - (111)	2.73	8	Cir	14.582	158.75	158.83	0.549	159.42*	160.05*	0.47	160.52	27	None
31	Pipe - (110)	2.75	8	Cir	75.774	158.83	162.17	4.408	160.52*	163.87*	0.53	164.40	30	None
32	Pipe - (71)	2.76	8	Cir	35.213	162.17	162.87	1.988	164.40*	165.96*	0.97	166.93	31	Generic

Project File: PAB220113.01-Storm_Rev3a_2-yr.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Return period = 2 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	MH 120	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
2	INL 121	0.59	0.00	0.59	0.00	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.11	2.71	0.02	0.34	0.0	21
3	INL 122	0.79	0.00	0.79	0.00	Comb	4.0	0.06	0.12	0.06	2.00	Sag	2.00	0.050	0.020	0.013	0.22	7.92	0.22	7.92	0.0	Off
4	INL 123	0.35	0.00	0.35	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.11	2.57	0.11	2.57	0.0	Off
5	MH 125	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
6	INL 126	0.43	0.00	0.43	0.00	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.10	2.06	0.00	0.00	0.0	Off
7	INL 127	0.57	0.00	0.57	0.00	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.11	2.62	0.02	0.33	0.0	Off
8	RD1	1.36	0.00	1.03	0.33	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off
9	RD2(2)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
10	RD2(1)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
11	RD2	0.14	0.00	0.14	0.00	Comb	4.0	0.03	0.05	0.03	2.00	Sag	2.00	0.050	0.020	0.013	0.10	2.22	0.10	2.22	0.0	Off
12		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	5
13	RD4	0.14	0.00	0.14	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	12
14	INL-221	0.34	0.00	0.34	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.11	2.47	0.11	2.47	0.0	Off
15	INL 211	0.35	0.00	0.35	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.11	2.54	0.11	2.54	0.0	Off
16	INL-212	0.20	0.00	0.20	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.10	2.00	0.10	2.00	0.0	Off
17	MH-213	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	Off
18	INL213.1	0.19	0.00	0.19	0.00	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.07	1.48	0.00	0.00	0.0	Off
19	INL-214	0.45	0.00	0.44	0.01	Comb	4.0	1.00	0.00	1.00	2.00	0.020	2.00	0.050	0.020	0.013	0.12	3.10	0.03	0.61	0.0	Off
20	INL 231	0.61	0.00	0.61	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.14	3.90	0.14	3.90	0.0	Off
21	INL 110	2.54	0.00	2.55	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.28	10.93	0.28	10.93	0.0	Off
22	RD3(1)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
23		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	22

Project File: PAB220113.01-Storm_Rev3a_2-yr.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Inlet N-Values = 0.016; Intensity = 62.26 / (Inlet time + 12.90) ^ 0.88; Return period = 2 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

400

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
24		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	23
25		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	24
26	RD3	2.06	0.00	2.06	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off
27	MH 101	0.00	0.00	0.00	0.00	MH	0.0	2.00	0.00	2.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
28	MH 102	0.00	0.00	0.00	0.00	MH	0.0	2.00	0.00	2.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
29	OCS-103	1.85*	0.00	0.00	1.85	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
30		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	27
31		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	30
32	RD5	2.76	0.00	2.76	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off

Project File: PAB220113.01-Storm_Rev3a_2-yr.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Inlet N-Values = 0.016; Intensity = 62.26 / (Inlet time + 12.90) ^ 0.88; Return period = 2 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q	Inlet elev	Elev of HGL			Rise	HGL	ADD		Date: 7/24/2025
					C1 = 0.2 C2 = 0.5 C3 = 0.9							Total Flow		Elev of Crown			Span	Pipe	Full Flow		Frequency: 2 yrs
														Elev of Invert							Proj: PAB220113.01-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
1	End	MH	0.012	3.640	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	13.69	0.05	3.47	0.89	0.00 3.09	163.93	158.64 160.03 158.03	158.64 160.01 158.01	0.00 0.02	24 24 Cir	0.08 0.55	3.71 5.78	3.09 18.16	Pipe - (85)
2	1	Comb	0.012	15.229	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	13.48	0.21	3.50	0.86	0.00 3.01	164.19	158.74 160.13 158.13	158.64 160.03 158.03	0.09 0.10	24 24 Cir	0.61 0.66	3.72 6.32	3.01 19.86	Pipe - (63)
3	2	Comb	0.012	75.492	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	12.30	1.18	3.64	0.74	0.00 2.70	164.99	159.08 160.51 158.51	158.74 160.13 158.13	0.35 0.38	24 24 Cir	0.46 0.50	3.50 5.53	2.70 17.38	Pipe - (64)
4	3	Comb	0.012	140.496	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	9.39	2.91	4.06	0.30	0.00 1.23	165.11	159.63 160.72 159.22	159.08 160.01 158.51	0.55 0.71	18 18 Cir	0.39 0.51	2.54 4.58	1.23 8.09	Pipe - (65)
5	4	MH	0.012	70.504	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.51	1.88	4.38	0.23	0.00 1.01	164.85	159.99 161.08 159.58	159.78 160.87 159.37	0.21 0.21	18 18 Cir	0.30 0.30	2.60 3.51	1.01 6.21	Pipe - (67)
6	5	Comb	0.012	36.961	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	6.08	0.67	4.67	0.20	0.00 0.95	163.79	160.16 160.94 159.77	160.09 160.75 159.58	0.07 0.19	14 14 Cir	0.19 0.51	2.57 3.90	0.95 4.17	Pipe - (68)
7	6	Comb	0.012	46.842	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	1.08	4.92	0.12	0.00 0.57	163.64	160.31 161.00 160.00	160.16 160.77 159.77	0.15 0.23	12 12 Cir	0.33 0.49	2.36 3.44	0.57 2.70	Pipe - (69)
8	3	Genr	0.012	89.896	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.87	4.92	0.28	0.00 1.36	166.88	159.61 160.11 159.11	159.16 159.66 158.66	0.45 0.45	12 12 Cir	0.50 0.50	3.47 3.48	1.36 2.73	Pipe - (77)
9	1	MH	0.012	31.389	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.58	2.95	4.37	0.03	0.00 0.12	164.63	158.34 159.20 158.20	158.64 159.03 158.03	-0.30 0.17	12 12 Cir	-0.95 0.54	1.02 3.61	0.12 2.84	Pipe - (78)
10	9	MH	0.012	20.349	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.67	1.90	4.76	0.03	0.00 0.14	165.23	158.47 159.32 158.32	158.37 159.22 158.22	0.10 0.10	12 12 Cir	0.49 0.49	1.80 3.44	0.14 2.70	Pipe - (79)

NOTES: Intensity = 62.26 / (Inlet time + 12.90) ^ 0.88 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.01-Storm_Rev3a_2-yr.stm

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q	Inlet elev	Elev of HGL			Rise	HGL	ADD		Date: 7/24/2025
					C1 = 0.2 C2 = 0.5 C3 = 0.9							Total Flow		Elev of Crown			Span	Pipe	Full Flow		Frequency: 2 yrs
														Elev of Invert							Proj: PAB220113.01-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
11	10	Comb	0.012	7.210	0.00	0.00	0.00	5.00	0.67	4.92	0.03	0.00	165.30	158.51	158.52	-0.01	12	-0.13	1.54	0.14	Pipe - (80)
					0.00	0.00	0.00					0.14		159.36	159.32		12	0.55	3.66	2.87	
					0.00	0.00	0.00							158.36	158.32	0.04	Cir				
12	5	None	0.012	96.463	0.00	0.00	0.00	5.25	2.26	4.86	0.03	0.00	0.00	164.89	162.42	2.48	6	2.57	2.79	0.14	Pipe - (108)
					0.00	0.00	0.00					0.14		165.21	162.79		6	2.51	4.90	0.96	
					0.00	0.00	0.00							164.71	162.29	2.42	Cir				
13	12	Genr	0.012	10.810	0.00	0.00	0.00	5.00	0.25	4.92	0.03	0.00	0.00	165.06	164.89	0.16	6	1.49	2.12	0.14	Pipe - (107)
					0.00	0.00	0.00					0.14		165.37	165.21		6	1.48	3.76	0.74	
					0.00	0.00	0.00							164.87	164.71	0.16	Cir				
14	End	Comb	0.012	3.658	0.00	0.00	0.00	5.00	0.22	4.92	0.07	0.00	164.29	160.37	160.35	0.02	15	0.67	2.28	0.34	Pipe - (56)
					0.00	0.00	0.00					0.34		161.40	161.38		15	0.55	4.21	5.17	
					0.00	0.00	0.00							160.15	160.13	0.02	Cir				
15	End	Comb	0.012	9.379	0.00	0.00	0.00	13.10	0.24	3.54	0.24	0.00	164.75	160.35	160.35	0.00	18	0.01	0.49	0.86	Pipe - (52)
					0.00	0.00	0.00					0.86		160.18	160.13		18	0.53	4.70	8.31	
					0.00	0.00	0.00							158.68	158.63	0.05	Cir				
16	15	Comb	0.012	108.000	0.00	0.00	0.00	10.42	2.69	3.90	0.17	0.00	164.93	160.36	160.35	0.01	15	0.01	0.63	0.67	Pipe - (53)
					0.00	0.00	0.00					0.67		160.72	160.18		15	0.50	4.03	4.95	
					0.00	0.00	0.00							159.47	158.93	0.54	Cir				
17	16	MH	0.012	49.000	0.00	0.00	0.00	8.83	1.58	4.15	0.13	0.00	163.42	160.01	160.37	-0.36	15	-0.74	1.56	0.54	Pipe - (54)
					0.00	0.00	0.00					0.54		160.97	160.72		15	0.51	4.07	5.00	
					0.00	0.00	0.00							159.72	159.47	0.25	Cir				
18	17	Comb	0.012	35.041	0.00	0.00	0.00	5.00	3.83	4.92	0.04	0.00	163.46	160.26	160.06	0.19	15	0.55	1.95	0.19	Pipe - (55)
					0.00	0.00	0.00					0.19		161.34	161.15		15	0.54	4.20	5.15	
					0.00	0.00	0.00							160.09	159.90	0.19	Cir				
19	17	Comb	0.012	36.000	0.00	0.00	0.00	5.00	1.04	4.92	0.09	0.00	0.00	160.18	160.01	0.17	12	0.48	2.49	0.45	Pipe - (54) (1)
					0.00	0.00	0.00					0.45		160.90	160.72		12	0.50	3.47	2.73	
					0.00	0.00	0.00							159.90	159.72	0.18	Cir				
20	End	Comb	0.012	25.570	0.00	0.00	0.00	5.00	0.86	4.92	0.12	0.00	163.15	160.30	160.01	0.29	15	1.15	1.73	0.61	Pipe - (57)
					0.00	0.00	0.00					0.61		161.25	160.53		15	2.82	9.57	11.74	
					0.00	0.00	0.00							160.00	159.28	0.72	Cir				

NOTES: Intensity = 62.26 / (Inlet time + 12.90) ^ 0.88 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.01-Storm_Rev3a_2-yr.stm

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area C1 = 0.2 C2 = 0.5 C3 = 0.9			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q / Total Flow	Inlet elev	Elev of HGL / Elev of Crown / Elev of Invert			Rise / Span	HGL / Pipe	ADD / Full Flow		Date: 7/24/2025 / Frequency: 2 yrs / Proj: PAB220113.01-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
21	End	Comb	0.012	9.207	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.11	4.92	0.52	0.00 2.54	162.50	159.85 160.75 159.25	159.58 159.53 158.03	0.27 1.22	18 18 Cir	2.97 13.25	2.63 23.43	2.54 41.41	Pipe - (62)
22	End	MH	0.012	16.733	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.34	0.05	4.84	0.42	0.00 2.02	164.48	159.39 159.12 158.45	158.99 159.03 158.36	0.40 0.09	8 8 Cir	2.37 0.54	5.86 2.75	2.02 0.96	Pipe - (82)
23	22	None	0.012	33.811	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.24	0.10	4.86	0.42	0.00 2.03	0.00	160.60 159.29 158.62	159.79 159.12 158.45	0.82 0.17	8 8 Cir	2.41 0.50	5.82 2.66	2.03 0.93	Pipe - (119)
24	23	None	0.012	73.925	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.03	0.21	4.91	0.42	0.00 2.05	0.00	162.83 159.66 158.99	161.01 159.29 158.62	1.82 0.37	8 8 Cir	2.46 0.50	5.88 2.65	2.05 0.93	Pipe - (118)
25	24	None	0.012	4.964	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.01	0.02	4.92	0.42	0.00 2.06	0.00	163.34 159.68 159.01	163.21 159.66 158.99	0.12 0.02	8 12 Cir	2.47 0.40	5.89 1.59	2.06 0.83	Pipe - (117)
26	25	Genr	0.012	3.314	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.01	4.92	0.42	0.00 2.06	0.00	163.84 159.73 159.06	163.76 159.68 159.01	0.08 0.05	8 8 Cir	2.48 1.51	5.89 4.60	2.06 1.61	Pipe - (116)
27	End	MH	0.012	44.321	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.27	0.29	4.86	0.56	0.00 4.57	160.87	157.20 157.88 156.38	157.34 157.65 156.15	-0.14 0.23	18 18 Cir	-0.32 0.52	3.83 4.64	4.57 8.20	Pipe - (59)
28	27	MH	0.012	87.044	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	2.27	1.39	0.00	0.00	0.00 1.85	162.83	157.33 158.32 156.82	157.20 157.88 156.38	0.13 0.44	18 18 Cir	0.15 0.51	2.67 4.58	1.85 8.09	Pipe - (60)
29	28	MH	0.012	142.460	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00	2.27	0.00	0.00	1.85 1.85	163.82	158.04 159.03 157.53	157.33 158.32 156.82	0.71 0.71	18 18 Cir	0.50 0.50	3.48 4.54	1.85 8.03	Pipe - (61)
30	27	None	0.012	14.582	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.24	0.03	4.86	0.56	0.00 2.73	0.00	160.05 159.50 158.83	159.42 159.42 158.75	0.63 0.08	8 8 Cir	4.34 0.55	7.81 2.78	2.73 0.97	Pipe - (111)

NOTES: Intensity = 62.26 / (Inlet time + 12.90) ^ 0.88 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.01-Storm_Rev3a_2-yr.stm

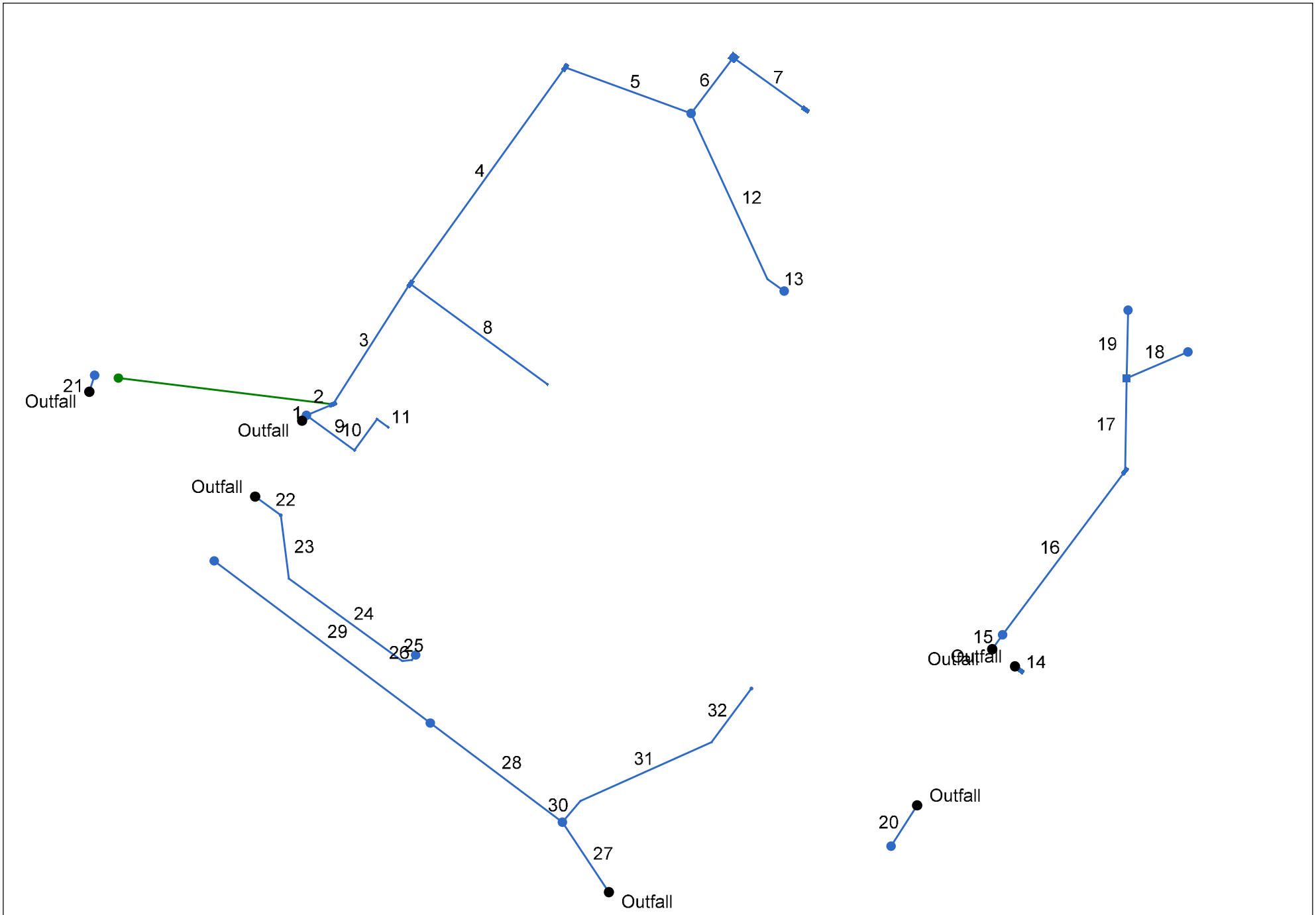
FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q	Inlet elev	Elev of HGL			Rise	HGL	ADD		Date: 7/24/2025
					C1 = 0.2 C2 = 0.5 C3 = 0.9							Total Flow		Elev of Crown			Span	Pipe	Full Flow		Frequency: 2 yrs
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Elev of Invert Up	Down	Fall	Size	Slope	Vel	Cap	Proj: PAB220113.01-Storm Line description
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	
31	30	None	0.012	75.774	0.00	0.00	0.00	5.07	0.16	4.90	0.56	0.00	0.00	163.87	160.52	3.34	8	4.41	7.87	2.75	Pipe - (110)
					0.00	0.00	0.00					2.75		162.84	159.50		8	4.41	7.87	2.75	
					0.00	0.00	0.00							162.17	158.83	3.34	Cir				
32	31	Genr	0.012	35.213	0.00	0.00	0.00	5.00	0.07	4.92	0.56	0.00	168.64	165.96	164.40	1.56	8	4.44	7.90	2.76	Pipe - (71)
					0.00	0.00	0.00					2.76		163.54	162.84		8	1.99	5.28	1.84	
					0.00	0.00	0.00							162.87	162.17	0.70	Cir				

NOTES: Intensity = 62.26 / (Inlet time + 12.90) ^ 0.88 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.01-Storm_Rev3a_2-yr.stm

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: PAB220113.01-Storm_Rev4a_25-yr.stm	Number of lines: 32	Date: 7/24/2025

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
1	MH 120	Manhole	163.93	Cir	4.00	4.00	24	Cir	158.03	24 12	Cir Cir	158.03 158.03
2	INL 121	Combination	164.19	Rect	4.00	2.00	24	Cir	158.13	24	Cir	158.13
3	INL 122	Combination	164.99	Rect	4.00	2.00	24	Cir	158.51	18 12	Cir Cir	158.51 158.66
4	INL 123	Combination	165.11	Rect	4.00	2.00	18	Cir	159.22	18	Cir	159.37
5	MH 125	Manhole	164.85	Cir	4.00	4.00	18	Cir	159.58	14 6	Cir Cir	159.58 162.29
6	INL 126	Combination	163.79	Rect	4.00	4.00	14	Cir	159.77	12	Cir	159.77
7	INL 127	Combination	163.64	Rect	4.00	2.00	12	Cir	160.00			
8	RD1	Generic	166.88	Rect	1.00	1.00	12	Cir	159.11			
9	RD2(2)	Manhole	164.63	Rect	1.00	1.00	12	Cir	158.20	12	Cir	158.22
10	RD2(1)	Manhole	165.23	Rect	1.00	1.00	12	Cir	158.32	12	Cir	158.32
11	RD2	Combination	165.30	Rect	1.00	1.00	12	Cir	158.36			
12		None	0.00	n/a	n/a	n/a	6	Cir	164.71	6	Cir	164.71
13	RD4	Generic	0.00	Cir	4.00	4.00	6	Cir	164.87			
14	INL-221	Combination	164.29	Rect	4.00	2.00	15	Cir	160.15			
15	INL 211	Combination	164.75	Cir	4.00	2.00	18	Cir	158.68	15	Cir	158.93
16	INL-212	Combination	164.93	Rect	4.00	2.00	15	Cir	159.47	15	Cir	159.47
17	MH-213	Manhole	163.42	Rect	4.00	4.00	15	Cir	159.72	15 12	Cir Cir	159.90 159.72
18	INL213.1	Combination	163.46	Cir	4.00	2.00	15	Cir	160.09			
19	INL-214	Combination	0.00	Cir	4.00	2.00	12	Cir	159.90			
20	INL 231	Combination	163.15	Cir	4.00	4.00	15	Cir	160.00			
21	INL 110	Combination	162.50	Cir	4.00	2.00	18	Cir	159.25			

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
22	RD3(1)	Manhole	164.48	Cir	1.00	1.00	8	Cir	158.45	8	Cir	158.45
23		None	0.00	n/a	n/a	n/a	8	Cir	158.62	8	Cir	158.62
24		None	0.00	n/a	n/a	n/a	8	Cir	158.99	8	Cir	158.99
25		None	0.00	n/a	n/a	n/a	8	Cir	159.01	8	Cir	159.01
26	RD3	Generic	0.00	Cir	4.00	4.00	8	Cir	159.06			
27	MH 101	Manhole	160.87	Cir	4.00	4.00	18	Cir	156.38	18 8	Cir Cir	156.38 158.75
28	MH 102	Manhole	162.83	Cir	4.00	4.00	18	Cir	156.82	18	Cir	156.82
29	OCS-103	Manhole	163.82	Cir	4.00	4.00	18	Cir	157.53			
30		None	0.00	n/a	n/a	n/a	8	Cir	158.83	8	Cir	158.83
31		None	0.00	n/a	n/a	n/a	8	Cir	162.17	8	Cir	162.17
32	RD5	Generic	168.64	Cir	1.00	1.00	8	Cir	162.87			

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	Pipe - (85)	5.03	24	Cir	3.640	158.01	158.03	0.550	158.73	158.82	0.30	158.82	End	Manhole
2	Pipe - (63)	4.90	24	Cir	15.229	158.03	158.13	0.657	158.82	158.91	n/a	158.91 j	1	Combination
3	Pipe - (64)	4.33	24	Cir	75.492	158.13	158.51	0.503	158.91	159.24	n/a	159.24	2	Combination
4	Pipe - (65)	1.91	18	Cir	140.496	158.51	159.22	0.505	159.24	159.74	n/a	159.74 j	3	Combination
5	Pipe - (67)	1.53	18	Cir	70.504	159.37	159.58	0.298	159.88	160.09	0.13	160.21	4	Manhole
6	Pipe - (68)	1.40	14	Cir	36.961	159.58	159.77	0.514	160.21	160.25	n/a	160.25 j	5	Combination
7	Pipe - (69)	0.83	12	Cir	46.842	159.77	160.00	0.491	160.25	160.38	n/a	160.38 j	6	Combination
8	Pipe - (77)	1.97	12	Cir	89.896	158.66	159.11	0.501	159.29	159.74	0.22	159.96	3	Generic
9	Pipe - (78)	0.19	12	Cir	31.389	158.03	158.20	0.542	158.82	158.38	n/a	158.38	1	Manhole
10	Pipe - (79)	0.20	12	Cir	20.349	158.22	158.32	0.491	158.40	158.50	0.06	158.57	9	Manhole
11	Pipe - (80)	0.20	12	Cir	7.210	158.32	158.36	0.555	158.57	158.55	n/a	158.55	10	Combination
12	Pipe - (108)	0.20	6	Cir	96.463	162.29	164.71	2.509	162.45	164.94	n/a	164.94	5	None
13	Pipe - (107)	0.20	6	Cir	10.810	164.71	164.87	1.480	164.94	165.10	n/a	165.10	12	Generic
14	Pipe - (56)	0.49	15	Cir	3.658	160.13	160.15	0.546	160.39	160.42	0.10	160.42	End	Combination
15	Pipe - (52)	1.39	18	Cir	9.379	158.63	158.68	0.533	159.05	159.12	n/a	159.12	End	Combination
16	Pipe - (53)	1.05	15	Cir	108.000	158.93	159.47	0.500	159.32	159.87	n/a	159.87	15	Combination
17	Pipe - (54)	0.83	15	Cir	49.000	159.47	159.72	0.510	159.87	160.08	0.12	160.08	16	Manhole
18	Pipe - (55)	0.27	15	Cir	35.041	159.90	160.09	0.542	160.10	160.29	0.07	160.29	17	Combination
19	Pipe - (54) (1)	0.66	12	Cir	36.000	159.72	159.90	0.500	160.08	160.24	n/a	160.24	17	Combination
20	Pipe - (57)	0.88	15	Cir	25.570	159.28	160.00	2.816	159.58	160.37	n/a	160.37	End	Combination
21	Pipe - (62)	3.70	18	Cir	9.207	158.03	159.25	13.251	158.63	159.98	n/a	159.98	End	Combination
22	Pipe - (82)	2.96	8	Cir	16.733	158.36	158.45	0.538	159.02*	159.84*	0.86	160.70	End	Manhole
23	Pipe - (119)	2.97	8	Cir	33.811	158.45	158.62	0.503	160.70*	162.44*	0.86	163.30	22	None
24	Pipe - (118)	2.99	8	Cir	73.925	158.62	158.99	0.501	163.30*	167.16*	0.81	167.97	23	None

Project File: PAB220113.01-Storm_Rev4a_25-yr.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Return period = 25 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

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Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
25	Pipe - (117)	2.99	8	Cir	4.964	158.99	159.01	0.403	167.97*	168.23*	0.89	169.11	24	None
26	Pipe - (116)	2.99	8	Cir	3.314	159.01	159.06	1.509	169.11*	169.29*	1.14	170.43	25	Generic
27	Pipe - (59)	5.83	18	Cir	44.321	156.15	156.38	0.519	157.08	157.32	0.37	157.69	End	Manhole
28	Pipe - (60)	1.85	18	Cir	87.044	156.38	156.82	0.505	157.69	157.33	0.03	157.33	27	Manhole
29	Pipe - (61)	1.85	18	Cir	142.460	156.82	157.53	0.498	157.33	158.04	0.19	158.04	28	Manhole
30	Pipe - (111)	3.98	8	Cir	14.582	158.75	158.83	0.549	159.42*	160.77*	1.01	161.78	27	None
31	Pipe - (110)	4.00	8	Cir	75.774	158.83	162.17	4.408	161.78*	168.86*	1.12	169.98	30	None
32	Pipe - (71)	4.01	8	Cir	35.213	162.17	162.87	1.988	169.98*	173.29*	2.05	175.34	31	Generic

Project File: PAB220113.01-Storm_Rev4a_25-yr.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Return period = 25 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

410

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	MH 120	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
2	INL 121	0.86	0.00	0.83	0.03	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.13	3.51	0.04	0.79	0.0	21
3	INL 122	1.16	0.00	1.16	0.00	Comb	4.0	0.06	0.12	0.06	2.00	Sag	2.00	0.050	0.020	0.013	0.28	10.83	0.28	10.83	0.0	Off
4	INL 123	0.51	0.00	0.51	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.13	3.44	0.13	3.44	0.0	Off
5	MH 125	0.00	0.06	0.00	0.06	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
6	INL 126	0.62	0.00	0.62	0.01	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.12	2.81	0.02	0.42	0.0	Off
7	INL 127	0.83	0.00	0.80	0.03	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.13	3.42	0.04	0.75	0.0	Off
8	RD1	1.97	0.00	1.03	0.94	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off
9	RD2(2)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
10	RD2(1)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
11	RD2	0.20	0.00	0.20	0.00	Comb	4.0	0.03	0.05	0.03	2.00	Sag	2.00	0.050	0.020	0.013	0.12	3.14	0.12	3.14	0.0	Off
12		0.00	0.06	0.00	0.06	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	5
13	RD4	0.20	0.00	0.14	0.06	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	12
14	INL-221	0.49	0.00	0.49	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.13	3.31	0.13	3.31	0.0	Off
15	INL 211	0.51	0.00	0.51	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.13	3.40	0.13	3.40	0.0	Off
16	INL-212	0.29	0.00	0.29	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.10	2.21	0.10	2.21	0.0	Off
17	MH-213	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	Off
18	INL213.1	0.27	0.00	0.27	0.00	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.09	1.71	0.00	0.00	0.0	Off
19	INL-214	0.66	0.00	0.61	0.05	Comb	4.0	1.00	0.00	1.00	2.00	0.020	2.00	0.050	0.020	0.013	0.14	3.94	0.05	1.07	0.0	Off
20	INL 231	0.88	0.00	0.88	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.16	5.15	0.16	5.15	0.0	Off
21	INL 110	3.70	0.03	3.73	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.34	14.24	0.34	14.24	0.0	Off
22	RD3(1)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
23		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	22

Project File: PAB220113.01-Storm_Rev4a_25-yr.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Inlet N-Values = 0.016; Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74; Return period = 25 Yrs. ; * Indicates Known Q added.All curb inlets are throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
24		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	23
25		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	24
26	RD3	2.99	0.00	2.06	0.93	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off
27	MH 101	0.00	0.00	0.00	0.00	MH	0.0	2.00	0.00	2.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
28	MH 102	0.00	0.00	0.00	0.00	MH	0.0	2.00	0.00	2.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
29	OCS-103	1.85*	0.00	0.00	1.85	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
30		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	27
31		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	30
32	RD5	4.01	0.00	2.76	1.25	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off

Project File: PAB220113.01-Storm_Rev4a_25-yr.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Inlet N-Values = 0.016; Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74; Return period = 25 Yrs. ; * Indicates Known Q added.All curb inlets are throat.

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q	Inlet elev	Elev of HGL			Rise	HGL	ADD		Date: 7/24/2025
					C1 = 0.2 C2 = 0.5 C3 = 0.9							Total Flow		Elev of Crown			Span	Pipe	Full Flow		Frequency: 25 yrs
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Elev of Invert Up	Down	Fall	Size	Slope	Vel	Cap	Proj: PAB220113.01-Storm
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
1	End	MH	0.012	3.640	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.96	0.03	5.66	0.89	0.00 5.03	163.93	158.82 160.03 158.03	158.73 160.01 158.01	0.09 0.02	24 24 Cir	2.47 0.55	4.65 5.78	5.03 18.16	Pipe - (85)
2	1	Comb	0.012	15.229	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.82	0.14	5.69	0.86	0.00 4.90	164.19	158.91 160.13 158.13	158.82 160.03 158.03	0.09 0.10	24 24 Cir	0.58 0.66	4.29 6.32	4.90 19.86	Pipe - (63)
3	2	Comb	0.012	75.492	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.01	0.81	5.85	0.74	0.00 4.33	164.99	159.24 160.51 158.51	158.91 160.13 158.13	0.33 0.38	24 24 Cir	0.44 0.50	4.00 5.53	4.33 17.38	Pipe - (64)
4	3	Comb	0.012	140.496	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	8.02	1.99	6.30	0.30	0.00 1.91	165.11	159.74 160.72 159.22	159.24 160.01 158.51	0.50 0.71	18 18 Cir	0.36 0.51	2.87 4.58	1.91 8.09	Pipe - (65)
5	4	MH	0.012	70.504	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	6.73	1.29	6.63	0.23	0.00 1.53	164.85	160.09 161.08 159.58	159.88 160.87 159.37	0.21 0.21	18 18 Cir	0.30 0.30	2.91 3.51	1.53 6.21	Pipe - (67)
6	5	Comb	0.012	36.961	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.74	0.46	6.92	0.20	0.00 1.40	163.79	160.25 160.94 159.77	160.21 160.75 159.58	0.03 0.19	14 14 Cir	0.09 0.51	2.88 3.90	1.40 4.17	Pipe - (68)
7	6	Comb	0.012	46.842	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.74	7.15	0.12	0.00 0.83	163.64	160.38 161.00 160.00	160.25 160.77 159.77	0.13 0.23	12 12 Cir	0.28 0.49	2.63 3.44	0.83 2.70	Pipe - (69)
8	3	Genr	0.012	89.896	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.60	7.15	0.28	0.00 1.97	166.88	159.74 160.11 159.11	159.29 159.66 158.66	0.45 0.45	12 12 Cir	0.50 0.50	3.78 3.48	1.97 2.73	Pipe - (77)
9	1	MH	0.012	31.389	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	6.77	2.03	6.62	0.03	0.00 0.19	164.63	158.38 159.20 158.20	158.82 159.03 158.03	-0.44 0.17	12 12 Cir	-1.41 0.54	1.14 3.61	0.19 2.84	Pipe - (78)
10	9	MH	0.012	20.349	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.46	1.31	7.00	0.03	0.00 0.20	165.23	158.50 159.32 158.32	158.40 159.22 158.22	0.10 0.10	12 12 Cir	0.50 0.49	2.00 3.44	0.20 2.70	Pipe - (79)

NOTES: Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.01-Storm_Rev4a_25-yr.stm

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q / Total Flow	Inlet elev	Elev of HGL / Elev of Crown / Elev of Invert			Rise / Span	HGL / Pipe	ADD / Full Flow		Date: 7/24/2025 / Frequency: 25 yrs / Proj: PAB220113.01-Storm
					C1 = 0.2 C2 = 0.5 C3 = 0.9																
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
11	10	Comb	0.012	7.210	0.00	0.00	0.00	5.00	0.46	7.15	0.03	0.00	165.30	158.55	158.57	-0.02	12	-0.30	1.69	0.20	Pipe - (80)
					0.00	0.00	0.00					0.20		159.36	159.32		12	0.55	3.66	2.87	
					0.00	0.00	0.00							158.36	158.32	0.04	Cir				
12	5	None	0.012	96.463	0.00	0.00	0.00	5.17	1.55	7.10	0.03	0.00	0.00	164.94	162.45	2.49	6	2.58	3.12	0.20	Pipe - (108)
					0.00	0.00	0.00					0.20		165.21	162.79		6	2.51	4.90	0.96	
					0.00	0.00	0.00							164.71	162.29	2.42	Cir				
13	12	Genr	0.012	10.810	0.00	0.00	0.00	5.00	0.17	7.15	0.03	0.00	0.00	165.10	164.94	0.16	6	1.49	2.37	0.20	Pipe - (107)
					0.00	0.00	0.00					0.20		165.37	165.21		6	1.48	3.76	0.74	
					0.00	0.00	0.00							164.87	164.71	0.16	Cir				
14	End	Comb	0.012	3.658	0.00	0.00	0.00	5.00	0.15	7.15	0.07	0.00	164.29	160.42	160.39	0.03	15	0.87	2.57	0.49	Pipe - (56)
					0.00	0.00	0.00					0.49		161.40	161.38		15	0.55	4.21	5.17	
					0.00	0.00	0.00							160.15	160.13	0.02	Cir				
15	End	Comb	0.012	9.379	0.00	0.00	0.00	10.57	0.17	5.74	0.24	0.00	164.75	159.12	159.05	0.08	18	0.81	3.34	1.39	Pipe - (52)
					0.00	0.00	0.00					1.39		160.18	160.13		18	0.53	4.70	8.31	
					0.00	0.00	0.00							158.68	158.63	0.05	Cir				
16	15	Comb	0.012	108.000	0.00	0.00	0.00	8.72	1.85	6.13	0.17	0.00	164.93	159.87	159.32	0.55	15	0.51	3.13	1.05	Pipe - (53)
					0.00	0.00	0.00					1.05		160.72	160.18		15	0.50	4.03	4.95	
					0.00	0.00	0.00							159.47	158.93	0.54	Cir				
17	16	MH	0.012	49.000	0.00	0.00	0.00	7.64	1.09	6.39	0.13	0.00	163.42	160.08	159.87	0.20	15	0.42	2.65	0.83	Pipe - (54)
					0.00	0.00	0.00					0.83		160.97	160.72		15	0.51	4.07	5.00	
					0.00	0.00	0.00							159.72	159.47	0.25	Cir				
18	17	Comb	0.012	35.041	0.00	0.00	0.00	5.00	2.64	7.15	0.04	0.00	163.46	160.29	160.10	0.20	15	0.56	2.17	0.27	Pipe - (55)
					0.00	0.00	0.00					0.27		161.34	161.15		15	0.54	4.20	5.15	
					0.00	0.00	0.00							160.09	159.90	0.19	Cir				
19	17	Comb	0.012	36.000	0.00	0.00	0.00	5.00	0.72	7.15	0.09	0.00	0.00	160.24	160.08	0.16	12	0.45	2.72	0.66	Pipe - (54) (1)
					0.00	0.00	0.00					0.66		160.90	160.72		12	0.50	3.47	2.73	
					0.00	0.00	0.00							159.90	159.72	0.18	Cir				
20	End	Comb	0.012	25.570	0.00	0.00	0.00	5.00	0.59	7.15	0.12	0.00	163.15	160.37	159.58	0.79	15	3.08	3.41	0.88	Pipe - (57)
					0.00	0.00	0.00					0.88		161.25	160.53		15	2.82	9.57	11.74	
					0.00	0.00	0.00							160.00	159.28	0.72	Cir				

NOTES: Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.01-Storm_Rev4a_25-yr.stm

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q	Inlet elev	Elev of HGL			Rise	HGL	ADD		Date: 7/24/2025
					C1 = 0.2 C2 = 0.5 C3 = 0.9							Total Flow		Elev of Crown			Span	Pipe	Full Flow		Frequency: 25 yrs
														Elev of Invert							Proj: PAB220113.01-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
21	End	Comb	0.012	9.207	0.00	0.00	0.00	5.00	0.07	7.15	0.52	0.00	162.50	159.98	158.63	1.35	18	14.71	4.95	3.70	Pipe - (62)
					0.00	0.00	0.00					3.70		160.75	159.53		18	13.25	23.43	41.41	
					0.00	0.00	0.00							159.25	158.03	1.22	Cir				
22	End	MH	0.012	16.733	0.00	0.00	0.00	5.23	0.03	7.08	0.42	0.00	164.48	159.84	159.02	0.82	8	4.92	8.49	2.96	Pipe - (82)
					0.00	0.00	0.00					2.96		159.12	159.03		8	0.54	2.75	0.96	
					0.00	0.00	0.00							158.45	158.36	0.09	Cir				
23	22	None	0.012	33.811	0.00	0.00	0.00	5.17	0.07	7.10	0.42	0.00	0.00	162.44	160.70	1.74	8	5.14	8.50	2.97	Pipe - (119)
					0.00	0.00	0.00					2.97		159.29	159.12		8	0.50	2.66	0.93	
					0.00	0.00	0.00							158.62	158.45	0.17	Cir				
24	23	None	0.012	73.925	0.00	0.00	0.00	5.02	0.14	7.15	0.42	0.00	0.00	167.16	163.30	3.85	8	5.21	8.56	2.99	Pipe - (118)
					0.00	0.00	0.00					2.99		159.66	159.29		8	0.50	2.65	0.93	
					0.00	0.00	0.00							158.99	158.62	0.37	Cir				
25	24	None	0.012	4.964	0.00	0.00	0.00	5.01	0.01	7.15	0.42	0.00	0.00	168.23	167.97	0.26	8	5.23	8.56	2.99	Pipe - (117)
					0.00	0.00	0.00					2.99		159.68	159.66		12	0.40	1.59	0.83	
					0.00	0.00	0.00							159.01	158.99	0.02	Cir				
26	25	Genr	0.012	3.314	0.00	0.00	0.00	5.00	0.01	7.15	0.42	0.00	0.00	169.29	169.11	0.17	8	5.24	8.57	2.99	Pipe - (116)
					0.00	0.00	0.00					2.99		159.73	159.68		8	1.51	4.60	1.61	
					0.00	0.00	0.00							159.06	159.01	0.05	Cir				
27	End	MH	0.012	44.321	0.00	0.00	0.00	5.18	0.23	7.09	0.56	0.00	160.87	157.32	157.08	0.24	18	0.54	5.03	5.83	Pipe - (59)
					0.00	0.00	0.00					5.83		157.88	157.65		18	0.52	4.64	8.20	
					0.00	0.00	0.00							156.38	156.15	0.23	Cir				
28	27	MH	0.012	87.044	0.00	0.00	0.00	2.27	1.39	0.00	0.00	0.00	162.83	157.33	157.69	-0.36	18	-0.41	2.30	1.85	Pipe - (60)
					0.00	0.00	0.00					1.85		158.32	157.88		18	0.51	4.58	8.09	
					0.00	0.00	0.00							156.82	156.38	0.44	Cir				
29	28	MH	0.012	142.460	0.00	0.00	0.00	0.00	2.27	0.00	0.00	1.85	163.82	158.04	157.33	0.71	18	0.50	3.48	1.85	Pipe - (61)
					0.00	0.00	0.00					1.85		159.03	158.32		18	0.50	4.54	8.03	
					0.00	0.00	0.00							157.53	156.82	0.71	Cir				
30	27	None	0.012	14.582	0.00	0.00	0.00	5.16	0.02	7.10	0.56	0.00	0.00	160.77	159.42	1.35	8	9.26	11.40	3.98	Pipe - (111)
					0.00	0.00	0.00					3.98		159.50	159.42		8	0.55	2.78	0.97	
					0.00	0.00	0.00							158.83	158.75	0.08	Cir				

NOTES: Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.01-Storm_Rev4a_25-yr.stm

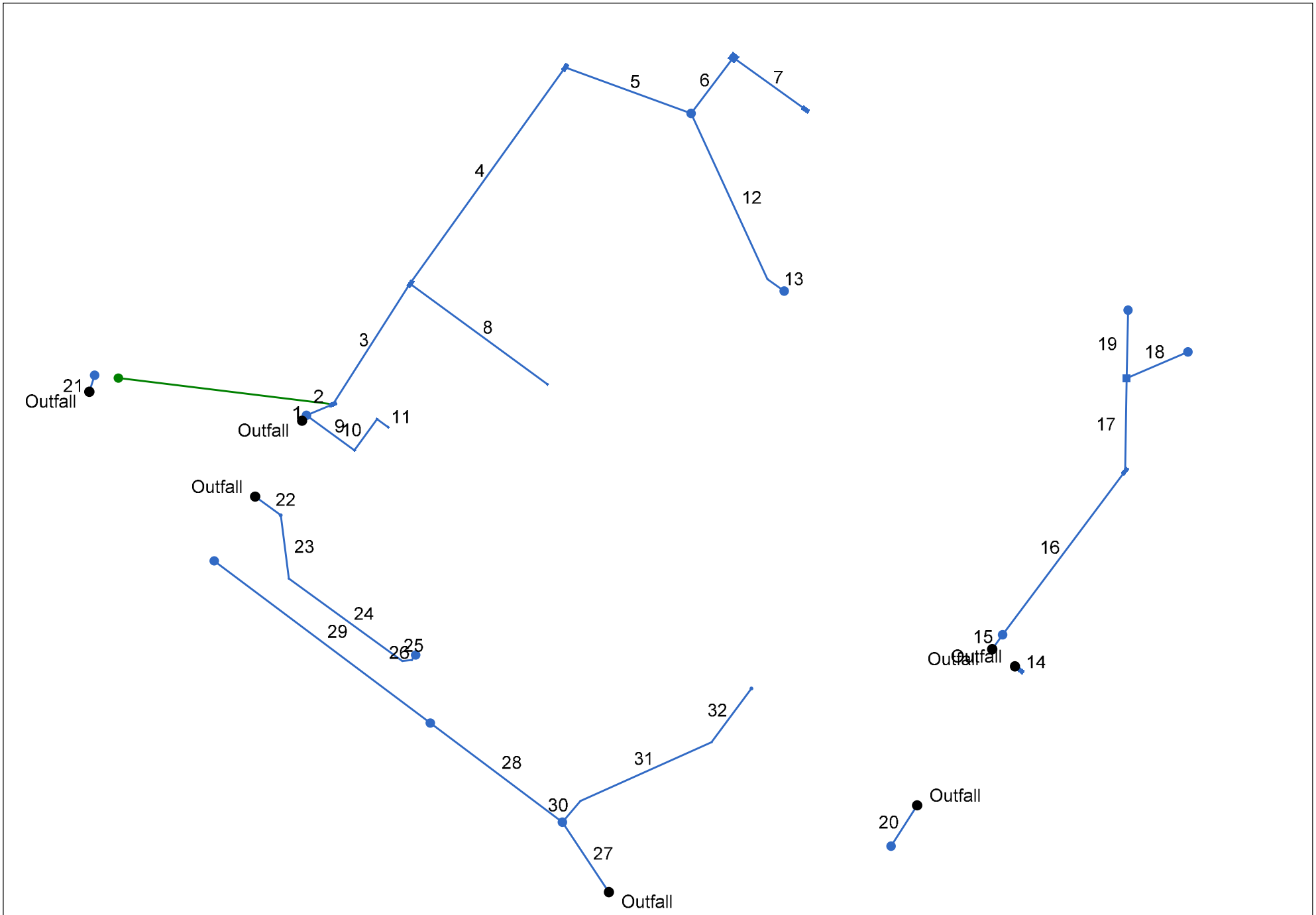
FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area C1 = 0.2 C2 = 0.5 C3 = 0.9			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q / Total Flow	Inlet elev	Elev of HGL / Elev of Crown / Elev of Invert			Rise / Span	HGL / Pipe	ADD / Full Flow		Date: 7/24/2025 / Frequency: 25 yrs / Proj: PAB220113.01-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA							Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		Q (cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
31	30	None	0.012	75.774	0.00	0.00	0.00	5.05	0.11	7.14	0.56	0.00	0.00	168.86	161.78	7.08	8	9.35	11.46	4.00	Pipe - (110)
					0.00	0.00	0.00					4.00		162.84	159.50		8	4.41	7.87	2.75	
					0.00	0.00	0.00							162.17	158.83	3.34	Cir				
32	31	Genr	0.012	35.213	0.00	0.00	0.00	5.00	0.05	7.15	0.56	0.00	168.64	173.29	169.98	3.31	8	9.39	11.49	4.01	Pipe - (71)
					0.00	0.00	0.00					4.01		163.54	162.84		8	1.99	5.28	1.84	
					0.00	0.00	0.00							162.87	162.17	0.70	Cir				

NOTES: Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.01-Storm_Rev4a_25-yr.stm

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev4.stm	Number of lines: 32	Date: 7/24/2025

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
1	MH 120	Manhole	163.93	Cir	4.00	4.00	24	Cir	158.03	24 12	Cir Cir	158.03 158.03
2	INL 121	Combination	164.19	Rect	4.00	2.00	24	Cir	158.13	24	Cir	158.13
3	INL 122	Combination	164.99	Rect	4.00	2.00	24	Cir	158.51	18 12	Cir Cir	158.51 158.66
4	INL 123	Combination	165.11	Rect	4.00	2.00	18	Cir	159.22	18	Cir	159.37
5	MH 125	Manhole	164.85	Cir	4.00	4.00	18	Cir	159.58	14 6	Cir Cir	159.58 162.29
6	INL 126	Combination	163.79	Rect	4.00	4.00	14	Cir	159.77	12	Cir	159.77
7	INL 127	Combination	163.64	Rect	4.00	2.00	12	Cir	160.00			
8	RD1	Generic	166.88	Rect	1.00	1.00	12	Cir	159.11			
9	RD2(2)	Manhole	164.63	Rect	1.00	1.00	12	Cir	158.20	12	Cir	158.22
10	RD2(1)	Manhole	165.23	Rect	1.00	1.00	12	Cir	158.32	12	Cir	158.32
11	RD2	Combination	165.30	Rect	1.00	1.00	12	Cir	158.36			
12		None	0.00	n/a	n/a	n/a	6	Cir	164.71	6	Cir	164.71
13	RD4	Generic	0.00	Cir	4.00	4.00	6	Cir	164.87			
14	INL-221	Combination	164.29	Rect	4.00	2.00	15	Cir	160.15			
15	INL 211	Combination	164.75	Cir	4.00	2.00	18	Cir	158.68	15	Cir	158.93
16	INL-212	Combination	164.93	Rect	4.00	2.00	15	Cir	159.47	15	Cir	159.47
17	MH-213	Manhole	163.42	Rect	4.00	4.00	15	Cir	159.72	15 12	Cir Cir	159.90 159.72
18	INL213.1	Combination	163.46	Cir	4.00	2.00	15	Cir	160.09			
19	INL-214	Combination	0.00	Cir	4.00	2.00	12	Cir	159.90			
20	INL 231	Combination	163.15	Cir	4.00	4.00	15	Cir	160.00			
21	INL 110	Combination	162.50	Cir	4.00	2.00	18	Cir	159.25			

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
22	RD3(1)	Manhole	164.48	Cir	1.00	1.00	8	Cir	158.45	8	Cir	158.45
23		None	0.00	n/a	n/a	n/a	8	Cir	158.62	8	Cir	158.62
24		None	0.00	n/a	n/a	n/a	8	Cir	158.99	8	Cir	158.99
25		None	0.00	n/a	n/a	n/a	8	Cir	159.01	8	Cir	159.01
26	RD3	Generic	0.00	Cir	4.00	4.00	8	Cir	159.06			
27	MH 101	Manhole	160.87	Cir	4.00	4.00	18	Cir	156.38	18 8	Cir Cir	156.38 158.75
28	MH 102	Manhole	162.83	Cir	4.00	4.00	18	Cir	156.82	18	Cir	156.82
29	OCS-103	Manhole	163.82	Cir	4.00	4.00	18	Cir	157.53			
30		None	0.00	n/a	n/a	n/a	8	Cir	158.83	8	Cir	158.83
31		None	0.00	n/a	n/a	n/a	8	Cir	162.17	8	Cir	162.17
32	RD5	Generic	168.64	Cir	1.00	1.00	8	Cir	162.87			

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	Pipe - (85)	5.03	24	Cir	3.640	158.01	158.03	0.550	167.66*	167.66*	0.04	167.70	End	Manhole
2	Pipe - (63)	4.90	24	Cir	15.229	158.03	158.13	0.657	167.70*	167.71*	0.04	167.74	1	Combination
3	Pipe - (64)	4.33	24	Cir	75.492	158.13	158.51	0.503	167.74*	167.77*	0.04	167.81	2	Combination
4	Pipe - (65)	1.91	18	Cir	140.496	158.51	159.22	0.505	167.81*	167.85*	0.03	167.88	3	Combination
5	Pipe - (67)	1.53	18	Cir	70.504	159.37	159.58	0.298	167.88*	167.89*	0.01	167.90	4	Manhole
6	Pipe - (68)	1.40	14	Cir	36.961	159.58	159.77	0.514	167.90*	167.92*	0.04	167.96	5	Combination
7	Pipe - (69)	0.83	12	Cir	46.842	159.77	160.00	0.491	167.96*	167.98*	0.02	168.00	6	Combination
8	Pipe - (77)	1.97	12	Cir	89.896	158.66	159.11	0.501	167.81*	168.05*	0.10	168.14	3	Generic
9	Pipe - (78)	0.19	12	Cir	31.389	158.03	158.20	0.542	167.70*	167.70*	0.00	167.70	1	Manhole
10	Pipe - (79)	0.20	12	Cir	20.349	158.22	158.32	0.491	167.70*	167.70*	0.00	167.70	9	Manhole
11	Pipe - (80)	0.20	12	Cir	7.210	158.32	158.36	0.555	167.70*	167.70*	0.00	167.71	10	Combination
12	Pipe - (108)	0.20	6	Cir	96.463	162.29	164.71	2.509	167.90*	168.01*	0.01	168.02	5	None
13	Pipe - (107)	0.20	6	Cir	10.810	164.71	164.87	1.480	168.02*	168.03*	0.02	168.05	12	Generic
14	Pipe - (56)	0.49	15	Cir	3.658	160.13	160.15	0.546	167.66*	167.66*	0.00	167.66	End	Combination
15	Pipe - (52)	1.39	18	Cir	9.379	158.63	158.68	0.533	167.66*	167.66*	0.00	167.67	End	Combination
16	Pipe - (53)	1.05	15	Cir	108.000	158.93	159.47	0.500	167.67*	167.69*	0.01	167.70	15	Combination
17	Pipe - (54)	0.83	15	Cir	49.000	159.47	159.72	0.510	167.70*	167.71*	0.01	167.71	16	Manhole
18	Pipe - (55)	0.27	15	Cir	35.041	159.90	160.09	0.542	167.71*	167.72*	0.00	167.72	17	Combination
19	Pipe - (54) (1)	0.66	12	Cir	36.000	159.72	159.90	0.500	167.71*	167.73*	0.01	167.74	17	Combination
20	Pipe - (57)	0.88	15	Cir	25.570	159.28	160.00	2.816	167.66*	167.66*	0.01	167.67	End	Combination
21	Pipe - (62)	3.70	18	Cir	9.207	158.03	159.25	13.251	167.66*	167.67*	0.07	167.74	End	Combination
22	Pipe - (82)	2.96	8	Cir	16.733	158.36	158.45	0.538	167.66*	168.52*	0.86	169.38	End	Manhole
23	Pipe - (119)	2.97	8	Cir	33.811	158.45	158.62	0.503	169.38*	171.12*	0.86	171.98	22	None
24	Pipe - (118)	2.99	8	Cir	73.925	158.62	158.99	0.501	171.98*	175.83*	0.81	176.64	23	None

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev4.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Return period = 25 Yrs. ; *Surcharged (HGL above crown).

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
25	Pipe - (117)	2.99	8	Cir	4.964	158.99	159.01	0.403	176.64*	176.90*	0.89	177.79	24	None
26	Pipe - (116)	2.99	8	Cir	3.314	159.01	159.06	1.509	177.79*	177.96*	1.14	179.10	25	Generic
27	Pipe - (59)	5.83	18	Cir	44.321	156.15	156.38	0.519	167.66*	167.78*	0.16	167.94	End	Manhole
28	Pipe - (60)	1.85	18	Cir	87.044	156.38	156.82	0.505	167.94*	167.96*	0.00	167.96	27	Manhole
29	Pipe - (61)	1.85	18	Cir	142.460	156.82	157.53	0.498	167.96*	168.00*	0.02	168.02	28	Manhole
30	Pipe - (111)	3.98	8	Cir	14.582	158.75	158.83	0.549	167.94*	169.29*	1.01	170.30	27	None
31	Pipe - (110)	4.00	8	Cir	75.774	158.83	162.17	4.408	170.30*	177.38*	1.12	178.50	30	None
32	Pipe - (71)	4.01	8	Cir	35.213	162.17	162.87	1.988	178.50*	181.81*	2.05	183.86	31	Generic

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev4.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Return period = 25 Yrs. ; *Surcharged (HGL above crown).

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	MH 120	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
2	INL 121	0.86	0.00	0.83	0.03	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.13	3.51	0.04	0.79	0.0	21
3	INL 122	1.16	0.00	1.16	0.00	Comb	4.0	0.06	0.12	0.06	2.00	Sag	2.00	0.050	0.020	0.013	0.28	10.83	0.28	10.83	0.0	Off
4	INL 123	0.51	0.00	0.51	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.13	3.44	0.13	3.44	0.0	Off
5	MH 125	0.00	0.06	0.00	0.06	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
6	INL 126	0.62	0.00	0.62	0.01	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.12	2.81	0.02	0.42	0.0	Off
7	INL 127	0.83	0.00	0.80	0.03	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.13	3.42	0.04	0.75	0.0	Off
8	RD1	1.97	0.00	1.03	0.94	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off
9	RD2(2)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
10	RD2(1)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
11	RD2	0.20	0.00	0.20	0.00	Comb	4.0	0.03	0.05	0.03	2.00	Sag	2.00	0.050	0.020	0.013	0.12	3.14	0.12	3.14	0.0	Off
12		0.00	0.06	0.00	0.06	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	5
13	RD4	0.20	0.00	0.14	0.06	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	12
14	INL-221	0.49	0.00	0.49	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.13	3.31	0.13	3.31	0.0	Off
15	INL 211	0.51	0.00	0.51	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.13	3.40	0.13	3.40	0.0	Off
16	INL-212	0.29	0.00	0.29	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.10	2.21	0.10	2.21	0.0	Off
17	MH-213	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	Off
18	INL213.1	0.27	0.00	0.27	0.00	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.09	1.71	0.00	0.00	0.0	Off
19	INL-214	0.66	0.00	0.61	0.05	Comb	4.0	1.00	0.00	1.00	2.00	0.020	2.00	0.050	0.020	0.013	0.14	3.94	0.05	1.07	0.0	Off
20	INL 231	0.88	0.00	0.88	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.16	5.15	0.16	5.15	0.0	Off
21	INL 110	3.70	0.03	3.73	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.34	14.24	0.34	14.24	0.0	Off
22	RD3(1)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
23		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	22

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev4.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Inlet N-Values = 0.016; Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74; Return period = 25 Yrs. ; * Indicates Known Q added.All curb inlets are throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
24		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	23
25		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	24
26	RD3	2.99	0.00	2.06	0.93	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off
27	MH 101	0.00	0.00	0.00	0.00	MH	0.0	2.00	0.00	2.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
28	MH 102	0.00	0.00	0.00	0.00	MH	0.0	2.00	0.00	2.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
29	OCS-103	1.85*	0.00	0.00	1.85	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
30		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	27
31		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	30
32	RD5	4.01	0.00	2.76	1.25	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev4.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Inlet N-Values = 0.016; Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74; Return period = 25 Yrs. ; * Indicates Known Q added.All curb inlets are throat.

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area C1 = 0.2 C2 = 0.5 C3 = 0.9			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q / Total Flow	Inlet elev	Elev of HGL / Elev of Crown / Elev of Invert			Rise / Span	HGL / Pipe	ADD / Full Flow		Date: 7/24/2025 / Frequency: 25 yrs / Proj: PAB220113.00-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
1	End	MH	0.012	3.640	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.96	0.03	5.66	0.89	0.00 5.03	163.93	167.66 160.03 158.03	167.66 160.01 158.01	0.00 0.02	24 24 Cir	0.04 0.55	1.60 5.78	5.03 18.16	Pipe - (85)
2	1	Comb	0.012	15.229	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.82	0.14	5.69	0.86	0.00 4.90	164.19	167.71 160.13 158.13	167.70 160.03 158.03	0.01 0.10	24 24 Cir	0.04 0.66	1.56 6.32	4.90 19.86	Pipe - (63)
3	2	Comb	0.012	75.492	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.01	0.81	5.85	0.74	0.00 4.33	164.99	167.77 160.51 158.51	167.74 160.13 158.13	0.02 0.38	24 24 Cir	0.03 0.50	1.38 5.53	4.33 17.38	Pipe - (64)
4	3	Comb	0.012	140.496	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	8.02	1.99	6.30	0.30	0.00 1.91	165.11	167.85 160.72 159.22	167.81 160.01 158.51	0.04 0.71	18 18 Cir	0.03 0.51	1.08 4.58	1.91 8.09	Pipe - (65)
5	4	MH	0.012	70.504	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	6.73	1.29	6.63	0.23	0.00 1.53	164.85	167.89 161.08 159.58	167.88 160.87 159.37	0.01 0.21	18 18 Cir	0.02 0.30	0.87 3.51	1.53 6.21	Pipe - (67)
6	5	Comb	0.012	36.961	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.74	0.46	6.92	0.20	0.00 1.40	163.79	167.92 160.94 159.77	167.90 160.75 159.58	0.02 0.19	14 14 Cir	0.06 0.51	1.31 3.90	1.40 4.17	Pipe - (68)
7	6	Comb	0.012	46.842	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.74	7.15	0.12	0.00 0.83	163.64	167.98 161.00 160.00	167.96 160.77 159.77	0.02 0.23	12 12 Cir	0.05 0.49	1.05 3.44	0.83 2.70	Pipe - (69)
8	3	Genr	0.012	89.896	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.60	7.15	0.28	0.00 1.97	166.88	168.05 160.11 159.11	167.81 159.66 158.66	0.23 0.45	12 12 Cir	0.26 0.50	2.51 3.48	1.97 2.73	Pipe - (77)
9	1	MH	0.012	31.389	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	6.77	2.03	6.62	0.03	0.00 0.19	164.63	167.70 159.20 158.20	167.70 159.03 158.03	0.00 0.17	12 12 Cir	0.00 0.54	0.24 3.61	0.19 2.84	Pipe - (78)
10	9	MH	0.012	20.349	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.46	1.31	7.00	0.03	0.00 0.20	165.23	167.70 159.32 158.32	167.70 159.22 158.22	0.00 0.10	12 12 Cir	0.00 0.49	0.25 3.44	0.20 2.70	Pipe - (79)

NOTES: Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev4.stm

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area C1 = 0.2 C2 = 0.5 C3 = 0.9			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q / Total Flow	Inlet elev	Elev of HGL / Elev of Crown / Elev of Invert			Rise / Span	HGL / Pipe	ADD / Full Flow		Date: 7/24/2025 / Frequency: 25 yrs / Proj: PAB220113.00-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
11	10	Comb	0.012	7.210	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.46	7.15	0.03	0.00 0.20	165.30	167.70 159.36 158.36	167.70 159.32 158.32	0.00 0.04	12 12 Cir	0.00 0.55	0.26 3.66	0.20 2.87	Pipe - (80)
12	5	None	0.012	96.463	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.17	1.55	7.10	0.03	0.00 0.20	0.00	168.01 165.21 164.71	167.90 162.79 162.29	0.11 2.42	6 6 Cir	0.11 2.51	1.03 4.90	0.20 0.96	Pipe - (108)
13	12	Genr	0.012	10.810	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.17	7.15	0.03	0.00 0.20	0.00	168.03 165.37 164.87	168.02 165.21 164.71	0.01 0.16	6 6 Cir	0.11 1.48	1.04 3.76	0.20 0.74	Pipe - (107)
14	End	Comb	0.012	3.658	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.15	7.15	0.07	0.00 0.49	164.29	167.66 161.40 160.15	167.66 161.38 160.13	0.00 0.02	15 15 Cir	0.01 0.55	0.40 4.21	0.49 5.17	Pipe - (56)
15	End	Comb	0.012	9.379	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.57	0.17	5.74	0.24	0.00 1.39	164.75	167.66 160.18 158.68	167.66 160.13 158.63	0.00 0.05	18 18 Cir	0.01 0.53	0.79 4.70	1.39 8.31	Pipe - (52)
16	15	Comb	0.012	108.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	8.72	1.85	6.13	0.17	0.00 1.05	164.93	167.69 160.72 159.47	167.67 160.18 158.93	0.02 0.54	15 15 Cir	0.02 0.50	0.85 4.03	1.05 4.95	Pipe - (53)
17	16	MH	0.012	49.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.64	1.09	6.39	0.13	0.00 0.83	163.42	167.71 160.97 159.72	167.70 160.72 159.47	0.01 0.25	15 15 Cir	0.01 0.51	0.68 4.07	0.83 5.00	Pipe - (54)
18	17	Comb	0.012	35.041	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	2.64	7.15	0.04	0.00 0.27	163.46	167.72 161.34 160.09	167.71 161.15 159.90	0.00 0.19	15 15 Cir	0.00 0.54	0.22 4.20	0.27 5.15	Pipe - (55)
19	17	Comb	0.012	36.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.72	7.15	0.09	0.00 0.66	0.00	167.73 160.90 159.90	167.71 160.72 159.72	0.01 0.18	12 12 Cir	0.03 0.50	0.84 3.47	0.66 2.73	Pipe - (54) (1)
20	End	Comb	0.012	25.570	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.59	7.15	0.12	0.00 0.88	163.15	167.66 161.25 160.00	167.66 160.53 159.28	0.00 0.72	15 15 Cir	0.02 2.82	0.72 9.57	0.88 11.74	Pipe - (57)

NOTES: Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev4.stm

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area C1 = 0.2 C2 = 0.5 C3 = 0.9			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q / Total Flow	Inlet elev	Elev of HGL / Elev of Crown / Elev of Invert			Rise / Span	HGL / Pipe	ADD / Full Flow		Date: 7/24/2025 / Frequency: 25 yrs / Proj: PAB220113.00-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
21	End	Comb	0.012	9.207	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.07	7.15	0.52	0.00 3.70	162.50	167.67 160.75 159.25	167.66 159.53 158.03	0.01 1.22	18 18 Cir	0.11 13.25	2.09 23.43	3.70 41.41	Pipe - (62)
22	End	MH	0.012	16.733	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.23	0.03	7.08	0.42	0.00 2.96	164.48	168.52 159.12 158.45	167.66 159.03 158.36	0.86 0.09	8 8 Cir	5.11 0.54	8.47 2.75	2.96 0.96	Pipe - (82)
23	22	None	0.012	33.811	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.17	0.07	7.10	0.42	0.00 2.97	0.00	171.12 159.29 158.62	169.38 159.12 158.45	1.74 0.17	8 8 Cir	5.14 0.50	8.50 2.66	2.97 0.93	Pipe - (119)
24	23	None	0.012	73.925	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.02	0.14	7.15	0.42	0.00 2.99	0.00	175.83 159.66 158.99	171.98 159.29 158.62	3.85 0.37	8 8 Cir	5.21 0.50	8.56 2.65	2.99 0.93	Pipe - (118)
25	24	None	0.012	4.964	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.01	0.01	7.15	0.42	0.00 2.99	0.00	176.90 159.68 159.01	176.64 159.66 158.99	0.26 0.02	8 12 Cir	5.23 0.40	8.56 1.59	2.99 0.83	Pipe - (117)
26	25	Genr	0.012	3.314	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.01	7.15	0.42	0.00 2.99	0.00	177.96 159.73 159.06	177.79 159.68 159.01	0.17 0.05	8 8 Cir	5.24 1.51	8.57 4.60	2.99 1.61	Pipe - (116)
27	End	MH	0.012	44.321	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.18	0.23	7.09	0.56	0.00 5.83	160.87	167.78 157.88 156.38	167.66 157.65 156.15	0.12 0.23	18 18 Cir	0.26 0.52	3.30 4.64	5.83 8.20	Pipe - (59)
28	27	MH	0.012	87.044	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	2.27	1.39	0.00	0.00	0.00 1.85	162.83	167.96 158.32 156.82	167.94 157.88 156.38	0.02 0.44	18 18 Cir	0.03 0.51	1.05 4.58	1.85 8.09	Pipe - (60)
29	28	MH	0.012	142.460	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00	2.27	0.00	0.00	1.85 1.85	163.82	168.00 159.03 157.53	167.96 158.32 156.82	0.04 0.71	18 18 Cir	0.03 0.50	1.05 4.54	1.85 8.03	Pipe - (61)
30	27	None	0.012	14.582	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.16	0.02	7.10	0.56	0.00 3.98	0.00	169.29 159.50 158.83	167.94 159.42 158.75	1.35 0.08	8 8 Cir	9.26 0.55	11.40 2.78	3.98 0.97	Pipe - (111)

NOTES: Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev4.stm

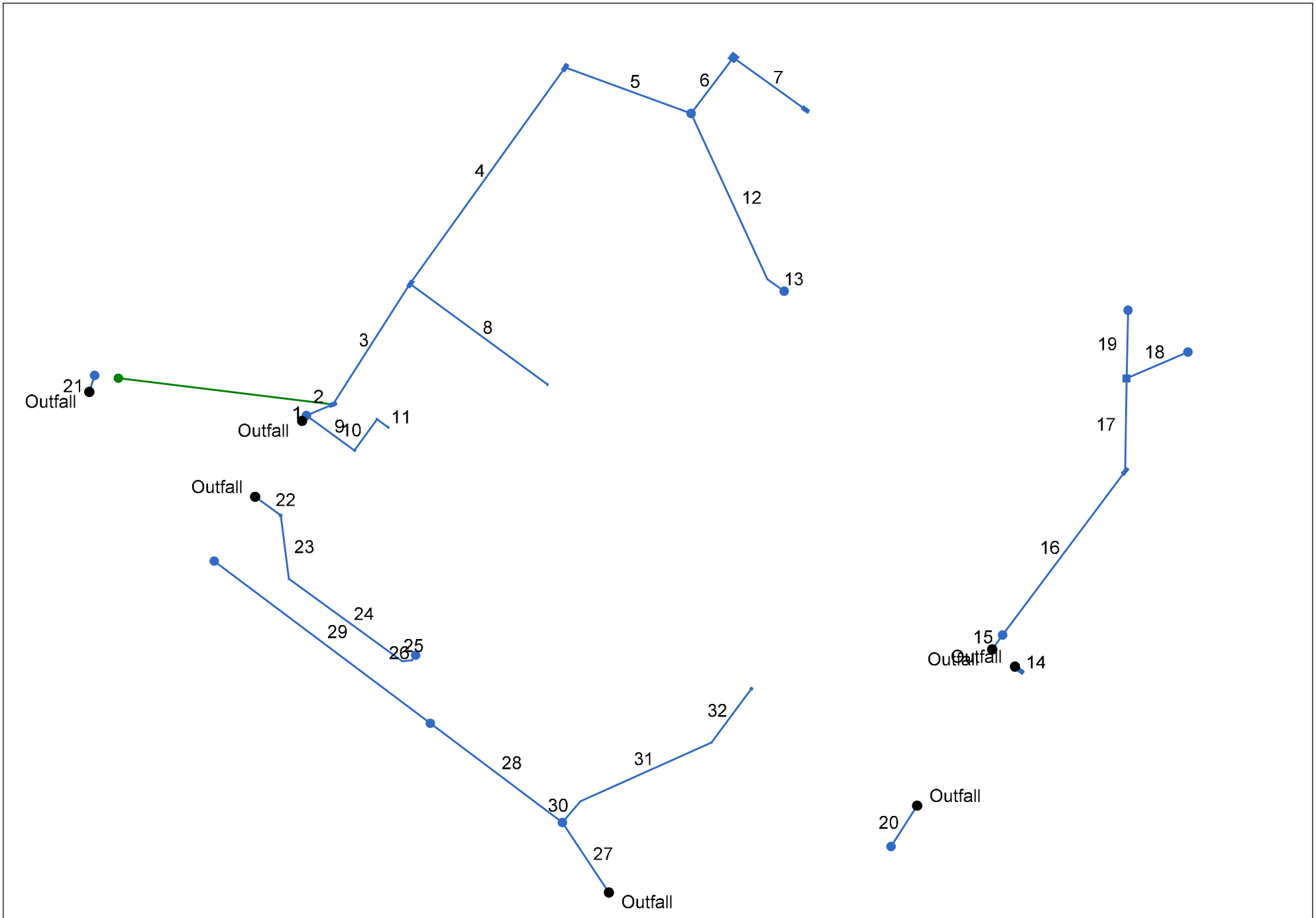
FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area C1 = 0.2 C2 = 0.5 C3 = 0.9			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q / Total Flow	Inlet elev	Elev of HGL / Elev of Crown / Elev of Invert			Rise / Span	HGL / Pipe	ADD / Full Flow		Date: 7/24/2025 / Frequency: 25 yrs / Proj: PAB220113.00-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA							Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
31	30	None	0.012	75.774	0.00	0.00	0.00	5.05	0.11	7.14	0.56	0.00	0.00	177.38	170.30	7.08	8	9.35	11.46	4.00	Pipe - (110)
					0.00	0.00	0.00					4.00		162.84	159.50		8	4.41	7.87	2.75	
					0.00	0.00	0.00							162.17	158.83	3.34	Cir				
32	31	Genr	0.012	35.213	0.00	0.00	0.00	5.00	0.05	7.15	0.56	0.00	168.64	181.81	178.50	3.31	8	9.39	11.49	4.01	Pipe - (71)
					0.00	0.00	0.00					4.01		163.54	162.84		8	1.99	5.28	1.84	
					0.00	0.00	0.00							162.87	162.17	0.70	Cir				

NOTES: Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev4.stm

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev4.stm	Number of lines: 32	Date: 7/24/2025

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
1	MH 120	Manhole	163.93	Cir	4.00	4.00	24	Cir	158.03	24 12	Cir Cir	158.03 158.03
2	INL 121	Combination	164.19	Rect	4.00	2.00	24	Cir	158.13	24	Cir	158.13
3	INL 122	Combination	164.99	Rect	4.00	2.00	24	Cir	158.51	18 12	Cir Cir	158.51 158.66
4	INL 123	Combination	165.11	Rect	4.00	2.00	18	Cir	159.22	18	Cir	159.37
5	MH 125	Manhole	164.85	Cir	4.00	4.00	18	Cir	159.58	14 6	Cir Cir	159.58 162.29
6	INL 126	Combination	163.79	Rect	4.00	4.00	14	Cir	159.77	12	Cir	159.77
7	INL 127	Combination	163.64	Rect	4.00	2.00	12	Cir	160.00			
8	RD1	Generic	166.88	Rect	1.00	1.00	12	Cir	159.11			
9	RD2(2)	Manhole	164.63	Rect	1.00	1.00	12	Cir	158.20	12	Cir	158.22
10	RD2(1)	Manhole	165.23	Rect	1.00	1.00	12	Cir	158.32	12	Cir	158.32
11	RD2	Combination	165.30	Rect	1.00	1.00	12	Cir	158.36			
12		None	0.00	n/a	n/a	n/a	6	Cir	164.71	6	Cir	164.71
13	RD4	Generic	0.00	Cir	4.00	4.00	6	Cir	164.87			
14	INL-221	Combination	164.29	Rect	4.00	2.00	15	Cir	160.15			
15	INL 211	Combination	164.75	Cir	4.00	2.00	18	Cir	158.68	15	Cir	158.93
16	INL-212	Combination	164.93	Rect	4.00	2.00	15	Cir	159.47	15	Cir	159.47
17	MH-213	Manhole	163.42	Rect	4.00	4.00	15	Cir	159.72	15 12	Cir Cir	159.90 159.72
18	INL213.1	Combination	163.46	Cir	4.00	2.00	15	Cir	160.09			
19	INL-214	Combination	0.00	Cir	4.00	2.00	12	Cir	159.90			
20	INL 231	Combination	163.15	Cir	4.00	4.00	15	Cir	160.00			
21	INL 110	Combination	162.50	Cir	4.00	2.00	18	Cir	159.25			

Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev4.stm | Number of Structures: 32 | Run Date: 7/24/2025

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
22	RD3(1)	Manhole	164.48	Cir	1.00	1.00	8	Cir	158.45	8	Cir	158.45
23		None	0.00	n/a	n/a	n/a	8	Cir	158.62	8	Cir	158.62
24		None	0.00	n/a	n/a	n/a	8	Cir	158.99	8	Cir	158.99
25		None	0.00	n/a	n/a	n/a	8	Cir	159.01	8	Cir	159.01
26	RD3	Generic	0.00	Cir	4.00	4.00	8	Cir	159.06			
27	MH 101	Manhole	160.87	Cir	4.00	4.00	18	Cir	156.38	18 8	Cir Cir	156.38 158.75
28	MH 102	Manhole	162.83	Cir	4.00	4.00	18	Cir	156.82	18	Cir	156.82
29	OCS-103	Manhole	163.82	Cir	4.00	4.00	18	Cir	157.53			
30		None	0.00	n/a	n/a	n/a	8	Cir	158.83	8	Cir	158.83
31		None	0.00	n/a	n/a	n/a	8	Cir	162.17	8	Cir	162.17
32	RD5	Generic	168.64	Cir	1.00	1.00	8	Cir	162.87			

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	Pipe - (85)	5.93	24	Cir	3.640	158.01	158.03	0.550	168.67*	168.67*	0.06	168.73	End	Manhole
2	Pipe - (63)	5.76	24	Cir	15.229	158.03	158.13	0.657	168.73*	168.74*	0.05	168.79	1	Combination
3	Pipe - (64)	5.08	24	Cir	75.492	158.13	158.51	0.503	168.79*	168.82*	0.06	168.88	2	Combination
4	Pipe - (65)	2.22	18	Cir	140.496	158.51	159.22	0.505	168.88*	168.93*	0.04	168.97	3	Combination
5	Pipe - (67)	1.77	18	Cir	70.504	159.37	159.58	0.298	168.97*	168.99*	0.02	169.00	4	Manhole
6	Pipe - (68)	1.61	14	Cir	36.961	159.58	159.77	0.514	169.00*	169.03*	0.05	169.08	5	Combination
7	Pipe - (69)	0.95	12	Cir	46.842	159.77	160.00	0.491	169.08*	169.11*	0.02	169.13	6	Combination
8	Pipe - (77)	2.26	12	Cir	89.896	158.66	159.11	0.501	168.88*	169.19*	0.13	169.31	3	Generic
9	Pipe - (78)	0.22	12	Cir	31.389	158.03	158.20	0.542	168.73*	168.73*	0.00	168.73	1	Manhole
10	Pipe - (79)	0.23	12	Cir	20.349	158.22	158.32	0.491	168.73*	168.73*	0.00	168.73	9	Manhole
11	Pipe - (80)	0.23	12	Cir	7.210	158.32	158.36	0.555	168.73*	168.73*	0.00	168.73	10	Combination
12	Pipe - (108)	0.23	6	Cir	96.463	162.29	164.71	2.509	169.00*	169.14*	0.01	169.15	5	None
13	Pipe - (107)	0.23	6	Cir	10.810	164.71	164.87	1.480	169.15*	169.17*	0.02	169.19	12	Generic
14	Pipe - (56)	0.56	15	Cir	3.658	160.13	160.15	0.546	168.67*	168.67*	0.00	168.67	End	Combination
15	Pipe - (52)	1.63	18	Cir	9.379	158.63	158.68	0.533	168.67*	168.67*	0.01	168.68	End	Combination
16	Pipe - (53)	1.22	15	Cir	108.000	158.93	159.47	0.500	168.68*	168.71*	0.01	168.73	15	Combination
17	Pipe - (54)	0.96	15	Cir	49.000	159.47	159.72	0.510	168.73*	168.74*	0.01	168.74	16	Manhole
18	Pipe - (55)	0.31	15	Cir	35.041	159.90	160.09	0.542	168.74*	168.75*	0.00	168.75	17	Combination
19	Pipe - (54) (1)	0.75	12	Cir	36.000	159.72	159.90	0.500	168.74*	168.76*	0.01	168.77	17	Combination
20	Pipe - (57)	1.01	15	Cir	25.570	159.28	160.00	2.816	168.67*	168.68*	0.01	168.69	End	Combination
21	Pipe - (62)	4.23	18	Cir	9.207	158.03	159.25	13.251	168.67*	168.68*	0.09	168.77	End	Combination
22	Pipe - (82)	3.39	8	Cir	16.733	158.36	158.45	0.538	168.67*	169.80*	1.13	170.93	End	Manhole
23	Pipe - (119)	3.40	8	Cir	33.811	158.45	158.62	0.503	170.93*	173.21*	1.14	174.35	22	None
24	Pipe - (118)	3.42	8	Cir	73.925	158.62	158.99	0.501	174.35*	179.40*	1.06	180.46	23	None

Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev4.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Return period = 100 Yrs. ; *Surcharged (HGL above crown).

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
25	Pipe - (117)	3.42	8	Cir	4.964	158.99	159.01	0.403	180.46*	180.80*	1.17	181.97	24	None
26	Pipe - (116)	3.42	8	Cir	3.314	159.01	159.06	1.509	181.97*	182.20*	1.50	183.69	25	Generic
27	Pipe - (59)	6.41	18	Cir	44.321	156.15	156.38	0.519	168.67*	168.81*	0.20	169.01	End	Manhole
28	Pipe - (60)	1.85	18	Cir	87.044	156.38	156.82	0.505	169.01*	169.03*	0.00	169.03	27	Manhole
29	Pipe - (61)	1.85	18	Cir	142.460	156.82	157.53	0.498	169.03*	169.07*	0.02	169.09	28	Manhole
30	Pipe - (111)	4.56	8	Cir	14.582	158.75	158.83	0.549	169.01*	170.78*	1.33	172.11	27	None
31	Pipe - (110)	4.58	8	Cir	75.774	158.83	162.17	4.408	172.11*	181.40*	1.47	182.88	30	None
32	Pipe - (71)	4.59	8	Cir	35.213	162.17	162.87	1.988	182.88*	187.21*	2.69	189.90	31	Generic

Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev4.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Return period = 100 Yrs. ; *Surcharged (HGL above crown).

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	MH 120	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
2	INL 121	0.99	0.00	0.93	0.06	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.14	3.81	0.05	0.96	0.0	21
3	INL 122	1.32	0.00	1.32	0.00	Comb	4.0	0.06	0.12	0.06	2.00	Sag	2.00	0.050	0.020	0.013	0.30	12.08	0.30	12.08	0.0	Off
4	INL 123	0.59	0.00	0.59	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.14	3.81	0.14	3.81	0.0	Off
5	MH 125	0.00	0.09	0.00	0.09	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
6	INL 126	0.71	0.00	0.70	0.01	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.12	3.09	0.03	0.57	0.0	Off
7	INL 127	0.95	0.00	0.90	0.05	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.13	3.72	0.05	0.91	0.0	Off
8	RD1	2.26	0.00	1.03	1.23	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off
9	RD2(2)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
10	RD2(1)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
11	RD2	0.23	0.00	0.23	0.00	Comb	4.0	0.03	0.05	0.03	2.00	Sag	2.00	0.050	0.020	0.013	0.13	3.54	0.13	3.54	0.0	Off
12		0.00	0.09	0.00	0.09	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	5
13	RD4	0.23	0.00	0.14	0.09	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	12
14	INL-221	0.56	0.00	0.56	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.13	3.67	0.13	3.67	0.0	Off
15	INL 211	0.58	0.00	0.58	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.14	3.77	0.14	3.77	0.0	Off
16	INL-212	0.34	0.00	0.34	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.11	2.47	0.11	2.47	0.0	Off
17	MH-213	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	Off
18	INL213.1	0.31	0.00	0.31	0.00	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.09	1.80	0.00	0.00	0.0	Off
19	INL-214	0.75	0.00	0.68	0.08	Comb	4.0	1.00	0.00	1.00	2.00	0.020	2.00	0.050	0.020	0.013	0.15	4.25	0.06	1.26	0.0	Off
20	INL 231	1.01	0.00	1.01	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.17	5.68	0.17	5.68	0.0	Off
21	INL 110	4.23	0.06	4.29	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.37	15.68	0.37	15.68	0.0	Off
22	RD3(1)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
23		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	22

Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev4.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Inlet N-Values = 0.016; Intensity = 46.91 / (Inlet time + 9.20) ^ 0.66; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
24		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	23
25		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	24
26	RD3	3.42	0.00	2.06	1.37	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off
27	MH 101	0.00	0.00	0.00	0.00	MH	0.0	2.00	0.00	2.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
28	MH 102	0.00	0.00	0.00	0.00	MH	0.0	2.00	0.00	2.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
29	OCS-103	1.85*	0.00	0.00	1.85	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
30		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	27
31		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	30
32	RD5	4.59	0.00	2.76	1.83	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off

Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev4.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Inlet N-Values = 0.016; Intensity = 46.91 / (Inlet time + 9.20) ^ 0.66; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q	Inlet elev	Elev of HGL			Rise	HGL	ADD		Date: 7/24/2025
					C1 = 0.2 C2 = 0.5 C3 = 0.9							Total Flow		Elev of Crown			Span	Pipe	Full Flow		Frequency: 100 yrs
														Elev of Invert							Proj: PAB220113.00-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
1	End	MH	0.012	3.640	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.20	0.03	6.67	0.89	0.00 5.93	163.93	168.67 160.03 158.03	168.67 160.01 158.01	0.00 0.02	24 24 Cir	0.06 0.55	1.89 5.78	5.93 18.16	Pipe - (85)
2	1	Comb	0.012	15.229	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.08	0.12	6.70	0.86	0.00 5.76	164.19	168.74 160.13 158.13	168.73 160.03 158.03	0.01 0.10	24 24 Cir	0.06 0.66	1.84 6.32	5.76 19.86	Pipe - (63)
3	2	Comb	0.012	75.492	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	9.38	0.70	6.86	0.74	0.00 5.08	164.99	168.82 160.51 158.51	168.79 160.13 158.13	0.03 0.38	24 24 Cir	0.04 0.50	1.62 5.53	5.08 17.38	Pipe - (64)
4	3	Comb	0.012	140.496	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.63	1.74	7.32	0.30	0.00 2.22	165.11	168.93 160.72 159.22	168.88 160.01 158.51	0.05 0.71	18 18 Cir	0.04 0.51	1.26 4.58	2.22 8.09	Pipe - (65)
5	4	MH	0.012	70.504	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	6.51	1.13	7.66	0.23	0.00 1.77	164.85	168.99 161.08 159.58	168.97 160.87 159.37	0.02 0.21	18 18 Cir	0.02 0.30	1.00 3.51	1.77 6.21	Pipe - (67)
6	5	Comb	0.012	36.961	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.65	0.40	7.95	0.20	0.00 1.61	163.79	169.03 160.94 159.77	169.00 160.75 159.58	0.03 0.19	14 14 Cir	0.08 0.51	1.51 3.90	1.61 4.17	Pipe - (68)
7	6	Comb	0.012	46.842	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.65	8.19	0.12	0.00 0.95	163.64	169.11 161.00 160.00	169.08 160.77 159.77	0.03 0.23	12 12 Cir	0.06 0.49	1.21 3.44	0.95 2.70	Pipe - (69)
8	3	Genr	0.012	89.896	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.52	8.19	0.28	0.00 2.26	166.88	169.19 160.11 159.11	168.88 159.66 158.66	0.31 0.45	12 12 Cir	0.34 0.50	2.87 3.48	2.26 2.73	Pipe - (77)
9	1	MH	0.012	31.389	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	6.55	1.77	7.65	0.03	0.00 0.22	164.63	168.73 159.20 158.20	168.73 159.03 158.03	0.00 0.17	12 12 Cir	0.00 0.54	0.28 3.61	0.22 2.84	Pipe - (78)
10	9	MH	0.012	20.349	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.40	1.14	8.04	0.03	0.00 0.23	165.23	168.73 159.32 158.32	168.73 159.22 158.22	0.00 0.10	12 12 Cir	0.00 0.49	0.29 3.44	0.23 2.70	Pipe - (79)

NOTES: Intensity = 46.91 / (Inlet time + 9.20) ^ 0.66 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev4.stm

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q	Inlet elev	Elev of HGL			Rise	HGL	ADD		Date: 7/24/2025
					C1 = 0.2 C2 = 0.5 C3 = 0.9							Total Flow		Elev of Crown			Span	Pipe	Full Flow		Frequency: 100 yrs
														Elev of Invert							Proj: PAB220113.00-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
11	10	Comb	0.012	7.210	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.40	8.19	0.03	0.00 0.23	165.30	168.73 159.36 158.36	168.73 159.32 158.32	0.00 0.04	12 12 Cir	0.00 0.55	0.30 3.66	0.23 2.87	Pipe - (80)
12	5	None	0.012	96.463	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.15	1.36	8.13	0.03	0.00 0.23	0.00	169.14 165.21 164.71	169.00 162.79 162.29	0.14 2.42	6 6 Cir	0.15 2.51	1.18 4.90	0.23 0.96	Pipe - (108)
13	12	Genr	0.012	10.810	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.15	8.19	0.03	0.00 0.23	0.00	169.17 165.37 164.87	169.15 165.21 164.71	0.02 0.16	6 6 Cir	0.15 1.48	1.19 3.76	0.23 0.74	Pipe - (107)
14	End	Comb	0.012	3.658	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.13	8.19	0.07	0.00 0.56	164.29	168.67 161.40 160.15	168.67 161.38 160.13	0.00 0.02	15 15 Cir	0.01 0.55	0.46 4.21	0.56 5.17	Pipe - (56)
15	End	Comb	0.012	9.379	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	9.86	0.15	6.75	0.24	0.00 1.63	164.75	168.67 160.18 158.68	168.67 160.13 158.63	0.00 0.05	18 18 Cir	0.02 0.53	0.92 4.70	1.63 8.31	Pipe - (52)
16	15	Comb	0.012	108.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	8.25	1.61	7.15	0.17	0.00 1.22	164.93	168.71 160.72 159.47	168.68 160.18 158.93	0.03 0.54	15 15 Cir	0.03 0.50	1.00 4.03	1.22 4.95	Pipe - (53)
17	16	MH	0.012	49.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.30	0.95	7.42	0.13	0.00 0.96	163.42	168.74 160.97 159.72	168.73 160.72 159.47	0.01 0.25	15 15 Cir	0.02 0.51	0.79 4.07	0.96 5.00	Pipe - (54)
18	17	Comb	0.012	35.041	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	2.30	8.19	0.04	0.00 0.31	163.46	168.75 161.34 160.09	168.74 161.15 159.90	0.00 0.19	15 15 Cir	0.00 0.54	0.25 4.20	0.31 5.15	Pipe - (55)
19	17	Comb	0.012	36.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.63	8.19	0.09	0.00 0.75	0.00	168.76 160.90 159.90	168.74 160.72 159.72	0.01 0.18	12 12 Cir	0.04 0.50	0.96 3.47	0.75 2.73	Pipe - (54) (1)
20	End	Comb	0.012	25.570	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.52	8.19	0.12	0.00 1.01	163.15	168.68 161.25 160.00	168.67 160.53 159.28	0.01 0.72	15 15 Cir	0.02 2.82	0.82 9.57	1.01 11.74	Pipe - (57)

NOTES: Intensity = 46.91 / (Inlet time + 9.20) ^ 0.66 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev4.stm

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area C1 = 0.2 C2 = 0.5 C3 = 0.9			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q / Total Flow	Inlet elev	Elev of HGL / Elev of Crown / Elev of Invert			Rise / Span	HGL / Pipe	ADD / Full Flow		Date: 7/24/2025 / Frequency: 100 yrs / Proj: PAB220113.00-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
21	End	Comb	0.012	9.207	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.06	8.19	0.52	0.00 4.23	162.50	168.68 160.75 159.25	168.67 159.53 158.03	0.01 1.22	18 18 Cir	0.14 13.25	2.40 23.43	4.23 41.41	Pipe - (62)
22	End	MH	0.012	16.733	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.20	0.03	8.11	0.42	0.00 3.39	164.48	169.80 159.12 158.45	168.67 159.03 158.36	1.13 0.09	8 8 Cir	6.73 0.54	9.72 2.75	3.39 0.96	Pipe - (82)
23	22	None	0.012	33.811	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.14	0.06	8.14	0.42	0.00 3.40	0.00	173.21 159.29 158.62	170.93 159.12 158.45	2.29 0.17	8 8 Cir	6.76 0.50	9.74 2.66	3.40 0.93	Pipe - (119)
24	23	None	0.012	73.925	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.02	0.13	8.18	0.42	0.00 3.42	0.00	179.40 159.66 158.99	174.35 159.29 158.62	5.06 0.37	8 8 Cir	6.84 0.50	9.80 2.65	3.42 0.93	Pipe - (118)
25	24	None	0.012	4.964	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.01	0.01	8.19	0.42	0.00 3.42	0.00	180.80 159.68 159.01	180.46 159.66 158.99	0.34 0.02	8 12 Cir	6.86 0.40	9.81 1.59	3.42 0.83	Pipe - (117)
26	25	Genr	0.012	3.314	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.01	8.19	0.42	0.00 3.42	0.00	182.20 159.73 159.06	181.97 159.68 159.01	0.23 0.05	8 8 Cir	6.87 1.51	9.81 4.60	3.42 1.61	Pipe - (116)
27	End	MH	0.012	44.321	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.16	0.21	8.13	0.56	0.00 6.41	160.87	168.81 157.88 156.38	168.67 157.65 156.15	0.14 0.23	18 18 Cir	0.32 0.52	3.63 4.64	6.41 8.20	Pipe - (59)
28	27	MH	0.012	87.044	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	2.27	1.39	0.00	0.00	0.00 1.85	162.83	169.03 158.32 156.82	169.01 157.88 156.38	0.02 0.44	18 18 Cir	0.03 0.51	1.05 4.58	1.85 8.09	Pipe - (60)
29	28	MH	0.012	142.460	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00	2.27	0.00	0.00	1.85 1.85	163.82	169.07 159.03 157.53	169.03 158.32 156.82	0.04 0.71	18 18 Cir	0.03 0.50	1.05 4.54	1.85 8.03	Pipe - (61)
30	27	None	0.012	14.582	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.14	0.02	8.14	0.56	0.00 4.56	0.00	170.78 159.50 158.83	169.01 159.42 158.75	1.77 0.08	8 8 Cir	12.16 0.55	13.07 2.78	4.56 0.97	Pipe - (111)

NOTES: Intensity = 46.91 / (Inlet time + 9.20) ^ 0.66 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev4.stm

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q	Inlet elev	Elev of HGL			Rise	HGL	ADD		Date: 7/24/2025
					C1 = 0.2 C2 = 0.5 C3 = 0.9							Total Flow		Elev of Crown			Span	Pipe	Full Flow		Frequency: 100 yrs
														Elev of Invert							Proj: PAB220113.00-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
31	30	None	0.012	75.774	0.00	0.00	0.00	5.04	0.10	8.17	0.56	0.00	0.00	181.40	172.11	9.29	8	12.27	13.13	4.58	Pipe - (110)
					0.00	0.00	0.00					4.58		162.84	159.50		8	4.41	7.87	2.75	
					0.00	0.00	0.00							162.17	158.83	3.34	Cir				
32	31	Genr	0.012	35.213	0.00	0.00	0.00	5.00	0.04	8.19	0.56	0.00	168.64	187.21	182.88	4.34	8	12.32	13.15	4.59	Pipe - (71)
					0.00	0.00	0.00					4.59		163.54	162.84		8	1.99	5.28	1.84	
					0.00	0.00	0.00							162.87	162.17	0.70	Cir				

NOTES: Intensity = 46.91 / (Inlet time + 9.20) ^ 0.66 (in/hr) ; Time of flow in section is based on full flow.

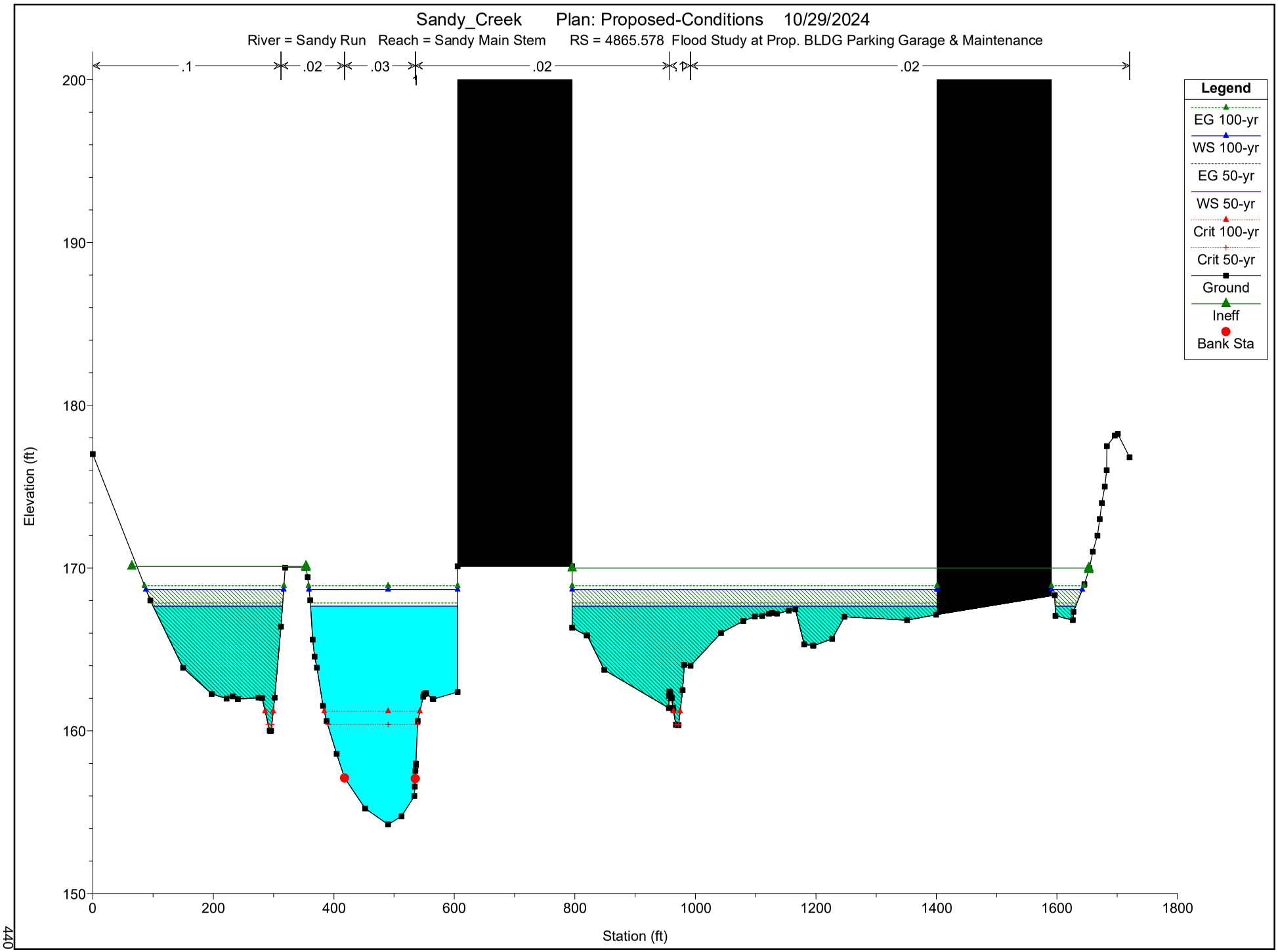
Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev4.stm

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 4865.578 Profile: 50-yr

E.G. Elev (ft)	167.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.020	0.030	0.020
W.S. Elev (ft)	167.66	Reach Len. (ft)	54.72	75.61	94.12
Crit W.S. (ft)	160.38	Flow Area (sq ft)	380.20	1454.88	406.06
E.G. Slope (ft/ft)	0.000180	Area (sq ft)	1341.90	1454.88	1782.89
Q Total (cfs)	7709.00	Flow (cfs)	1325.80	5161.43	1221.78
Top Width (ft)	1098.68	Top Width (ft)	271.49	117.19	710.00
Vel Total (ft/s)	3.44	Avg. Vel. (ft/s)	3.49	3.55	3.01
Max Chl Dpth (ft)	13.41	Hydr. Depth (ft)	6.71	12.41	5.79
Conv. Total (cfs)	575353.1	Conv. (cfs)	98949.4	385217.8	91185.9
Length Wtd. (ft)	77.86	Wetted Per. (ft)	57.99	117.71	76.97
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.07	0.14	0.06
Alpha	1.01	Stream Power (lb/ft s)	1720.50	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	95.82	41.52	198.76
C & E Loss (ft)	0.02	Cum SA (acres)	26.90	4.23	43.46

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 4865.578 Profile: 100-yr

E.G. Elev (ft)	168.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.	0.020	0.030	0.020
W.S. Elev (ft)	168.67	Reach Len. (ft)	54.72	75.61	94.12
Crit W.S. (ft)	161.20	Flow Area (sq ft)	438.74	1573.57	477.09
E.G. Slope (ft/ft)	0.000206	Area (sq ft)	1625.23	1573.57	2509.82
Q Total (cfs)	9741.00	Flow (cfs)	1746.54	6297.71	1696.76
Top Width (ft)	1131.84	Top Width (ft)	287.73	117.19	726.92
Vel Total (ft/s)	3.91	Avg. Vel. (ft/s)	3.98	4.00	3.56
Max Chl Dpth (ft)	14.42	Hydr. Depth (ft)	7.41	13.43	6.80
Conv. Total (cfs)	679032.7	Conv. (cfs)	121748.7	439005.2	118278.7
Length Wtd. (ft)	78.08	Wetted Per. (ft)	60.78	117.71	78.01
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.09	0.17	0.08
Alpha	1.01	Stream Power (lb/ft s)	1720.50	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	111.10	44.36	226.93
C & E Loss (ft)	0.03	Cum SA (acres)	27.95	4.23	44.18


Sandy_Creek Plan: Proposed-Conditions 10/29/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4865.578 Flood Study at Prop. BLDG Parking Garage & Maintenance
.1
.02
.03
.02
.02
Legend
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 100-yr
Crit 50-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
200
190
180
170
160
150
0
200
400
600
800
1000
1200
1400
1600
1800

Supporting Documentation

Permanent Channel Design Data

Project: **BMW Automotive Dealership Expansion**
Description: **500 Pennsylvania Avenue**
Whitemarsh Township, Montgomery County

Slope Condition (Minimum, Maximum, Entire)	Minimum	Maximum	Minimum	Maximum
Channel or Channel Section	**Existing Swale-1**	**Existing Swale-1**	**Permanent Swale**	**Permanent Swale**
Channel Condition (Temporary or Permanent)	**Permanent**	**Temporary**	**Permanent**	**Permanent**
Design Storm (2-Year or 10-Year)	2-Year	2-Year	10-Year	10-Year
Acres (Ac)	3.78	3.78	0.50	0.50
Multiplier (1.6 for temporary or 2.75 for permanent)	2.75	2.75	2.75	2.75
Q_r (Required Capacity, cfs)	10.40	10.40	1.38	1.38
Q (At Flow Depth d, cfs)	10.40	10.40	1.38	1.38
Protective Lining **	Grass (6")	Grass (6")	Grass (6")	Grass (6")
n (Manning's Coefficient) **	0.095	0.095	0.093	0.093
V_a (Allowable Velocity, fps)	4.00	4.00	4.00	4.00
V (At Flow Depth d, fps)	0.83	0.83	0.96	0.96
τ_a (Max. Allowable Shear Stress, lb/ft2)	1.00	1.00	1.00	1.00
τ_d (Shear Stress at Flow Depth d, lb/ft2)	0.25	0.25	0.44	0.44
Channel Bottom Width (ft)	6.00	6.00	3.00	3.00
Z1 Channel Side Slope (H:V)	2.00	2.00	3.00	3.00
Z2 Channel Side Slope (H:V)	3.00	3.00	3.00	3.00
D (Design Depth in ft)	1.00	1.00	1.00	1.00
Channel Top Width (ft) @D	11.00	11.00	9.00	9.00
d (Flow Depth in ft)	1.34	1.34	0.35	0.35
Channel Top Width (ft) @d	12.71	12.71	5.12	5.12
Bottom Width: Depth Ratio (12:1 max)	4.47	4.47	8.47	8.47
d_{50} Stone Size (in)	N/A	N/A	N/A	N/A
A (Area in s.f. at flow depth, d)	12.55	12.55	1.44	1.44
P (Wetted Perimeter in ft)	13.24	13.24	5.24	5.24
R (Hydraulic Radius (A/P))	0.95	0.95	0.27	0.27
S (Bed Slope, ft/ft) *	0.003	0.003	0.020	0.020
S_c (Critical Slope)	0.139	0.139	0.198	0.198
$0.7S_c$	0.097	0.097	0.138	0.138
$1.3S_c$	0.180	0.180	0.257	0.257
Stable Flow? (Y/N)	Y	Y	Y	Y
Freeboard Based on Unstable Flow, ft	N/A	N/A	N/A	N/A
Freeboard Based On Stable Flow, ft	0.34	0.34	0.09	0.09
Minimum Required Freeboard, ft ***	0.50	0.50	0.50	0.50
Minimum Required Depth, ft	1.84	1.84	0.85	0.85
Design Method for Protective Lining**** Permissible Velocity (V) or Shear Stress (S)	S	S	S	S
Vegetative Lining Retardance	C	C	C	C
Include Bend Analysis (Approx. Horizontal Radius, ft)				
Additional Depth Adjustment for Horizontal Bend	0.00	0.00	0.00	0.00

** Slopes may not be averaged.*

*** For vegetated channels, provide data for temporary linings and vegetated conditions in separate columns.*

****Minimum Freeboard, F, is 0.50 ft.*

*****Permissible velocity lining design method is not acceptable for channels with a bed slope of 10% or greater.*

*****Shear stress lining design method is recommended for channels with a bed slope of 10% or greater.*

*****Shear stress lining design method may be used for any channel bed slope.*

Swale Calculations

Project: **BMW Automotive Dealership Expansion**

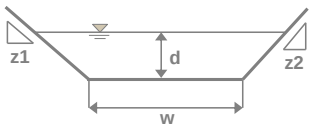
Description: **500 Pennsylvania Avenue**
Whitemarsh Township, Montgomery County

Swale Name: **Existing Swale-1**

Input Channel Parameters

Channel Dimensions

z1	2.00	ft. (horiz to 1' vert.)
z2	3.00	ft. (horiz to 1' vert.)
w	6.00	ft. (bottom width)
d	1.00	ft. (design depth)



Slope Condition

Minimum	0.0030	ft/ft (capacity)
Maximum	0.0030	ft/ft (stability)
Entire	0.0030	ft/ft

Evaluate Temporary & Permanent Conditions

Design Method: **Shear Stress**

☐ **Temporary**

Calculate Design Flow (Q)

2-yr storm cfs

OR

Area acres

x cfs/acre

cfs (design Q)

Select Lining Material

	Lining	Retardance (A, B, C, D)	d_{50} Stone Size (in.)	Initial n-value	Allowable Velocity	Allowable τ_d (lb/ft^2)
z1						
z2						
w						

Results

	n-value	d	v (fps)	τ_d (lb/ft^2)
Min. slope				
Max. slope				
Entire slope				

☑ **Permanent**

Calculate Design Flow (Q)

10-yr storm cfs

OR

Area 3.78 acres

x 2.75 cfs/acre

10.40 cfs (design Q)

Select Lining Material

	Lining	Retardance (A, B, C, D)	d_{50} Stone Size (in.)	Initial n-value	Allowable Velocity	Allowable τ_d (lb/ft^2)
z1	**Grass (6")**	**C**	N/A	0.034	4.000	**1.000**
z2	**Grass (6")**	**C**	N/A	0.034	4.000	**1.000**
w	**Grass (6")**	**C**	N/A	0.034	4.000	**1.000**

Results

	n-value	d	v (fps)	τ_d (lb/ft^2)
Min. slope	0.095	1.34	0.83	**0.25**
Max. slope	0.095	1.34	0.83	**0.25**
Entire slope	0.095	1.34	0.83	**0.25**

Swale Calculations

Project: **BMW Automotive Dealership Expansion**

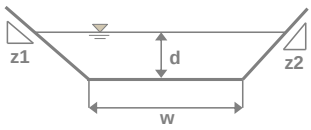
Description: **500 Pennsylvania Avenue**
Whitemarsh Township, Montgomery County

Swale Name: **Permanent Swale**

Input Channel Parameters

Channel Dimensions

z1	3.00	ft. (horiz to 1' vert.)
z2	3.00	ft. (horiz to 1' vert.)
w	3.00	ft. (bottom width)
d	1.00	ft. (design depth)



Slope Condition

Minimum	0.0200	ft/ft (capacity)
Maximum	0.0200	ft/ft (stability)
Entire	0.0200	ft/ft

Evaluate Temporary & Permanent Conditions

Design Method: **Shear Stress**

☐ **Temporary**

Calculate Design Flow (Q)

2-yr storm cfs

OR

Area acres

x cfs/acre

cfs (design Q)

Select Lining Material

	Lining	Retardance (A, B, C, D)	d_{50} Stone Size (in.)	Initial n-value	Allowable Velocity	Allowable τ_d (lb/ft^2)
z1						
z2						
w						

Results

	n-value	d	v (fps)	τ_d (lb/ft^2)
Min. slope				
Max. slope				
Entire slope				

☑ **Permanent**

Calculate Design Flow (Q)

10-yr storm cfs

OR

Area 0.50 acres

x 2.75 cfs/acre

1.38 cfs (design Q)

Select Lining Material

	Lining	Retardance (A, B, C, D)	d_{50} Stone Size (in.)	Initial n-value	Allowable Velocity	Allowable τ_d (lb/ft^2)
z1	**Grass (6")**	**C**	N/A	0.034	4.000	**1.000**
z2	**Grass (6")**	**C**	N/A	0.034	4.000	**1.000**
w	**Grass (6")**	**C**	N/A	0.034	4.000	**1.000**

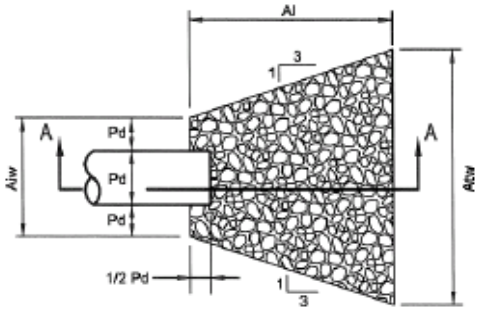
Results

	n-value	d	v (fps)	τ_d (lb/ft^2)
Min. slope	0.093	0.35	0.96	**0.44**
Max. slope	0.093	0.35	0.96	**0.44**
Entire slope	0.093	0.35	0.96	**0.44**

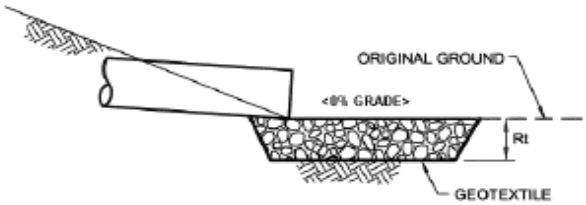
Rip-rap Apron Summary Sheet

Project: **BMW Automotive Dealership Expansion**

Description: **510 Pennsylvania Ave, Whitemarsh Township, Montgomery County**



PLAN VIEW



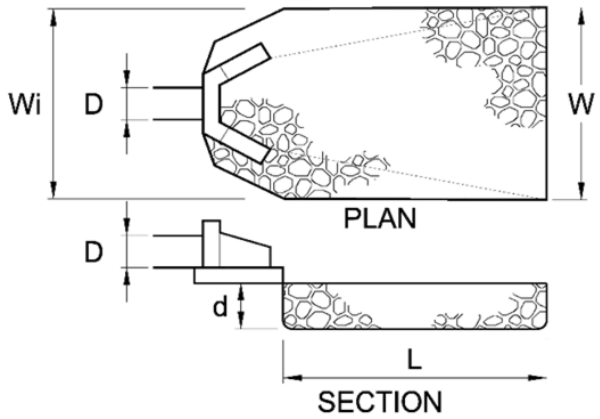
SECTION A - A

Outlet Name	Pipe						Apron					
	Dia. In.	Tail Water Condition Min or Max	Manning's "n" For Pipe	Slope	Q cfs	V[1] fps	d_{50} R-	in.	Rt in.	Al ft.	Aiw ft.	Atw ft
EW-100	18	MIN	0.013	0.0052	1.93	3.53	3	6	9.0	8.00	4.5	12.5
EW-300	18	MIN	0.013	0.0050	3.05	4.06	3	6	9.0	8.00	4.5	12.5

Rip-Rap Apron Worksheet

Project: **BMW Automotive Dealership Expansion**

Description: **EW-100**
510 Pennsylvania Ave, Whitemarsh Township, Montgomery County



Rip-Rap Dimensions:

L=	8.0	ft
W =	12.5	ft
Wi =	4.5	ft
Rip-rap Size =	R-3	
d50 =	6.0	in
d=	9.0	in

Design Values:

n =	*Manning's n*	0.013	
D =	*Diameter of Pipe*	18	in.
S =	*Slope of Pipe*	0.0052	ft/ft
Q_d =	*Design Discharge*	1.93	cfs***
V_d =	*Velocity*	3.53	fps***
T_w =	*Tailwater Condition*	MIN	either MIN or MAX
A =	*Full Flow Area of Pipe*	1.77	sf

Rise (in.)		Span (in.)		Barrels
18	x	18		1

1.93	
3.53	

*** *Formulas based on full-flow capacity.*

Full Flow Pipe Discharge:

Q_f = *0.464/n * D* $^{8/3}$ ** S* $^{1/2}$ = 7.59 cfs

Ratio of Part-Full to Full Flow Discharge:

d/D = Q_d/Q_f = 0.25

Figure 20 Ratios:

Area of Flow =	0.31
Depth of Flow =	0.35

Calculate Equivalent Flow:

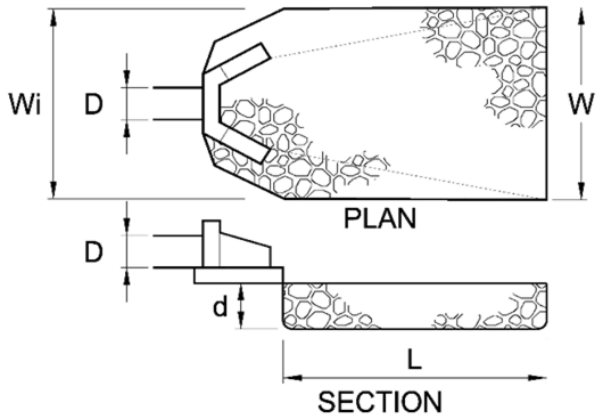
*A * Ratio* =	0.55	sf
Equivalent Pipe Size full-flow =	12	in (smaller size = larger rip-rap (factor of safety))

Rip-Rap Apron Worksheet

Project: **BMW Automotive Dealership Expansion**

Description: **EW-300**

510 Pennsylvania Ave, Whitemarsh Township, Montgomery County



Rip-Rap Dimensions:

L=	8.0	ft
W =	12.5	ft
Wi =	4.5	ft
Rip-rap Size =	R-3	
d50 =	6.0	in
d=	9.0	in

Design Values:

n =	*Manning's n*	0.013		
D =	*Diameter of Pipe*	18	in.	Rise (in.) 18 x Span (in.) 18, Barrels 1
S =	*Slope of Pipe*	0.0050	ft/ft	
Q_d =	*Design Discharge*	3.05	cfs***	3.05
V_d =	*Velocity*	4.06	fps***	4.06
T_w =	*Tailwater Condition*	MIN	either MIN or MAX	
A =	*Full Flow Area of Pipe*	1.77	sf	

*** Formulas based on full-flow capacity.

Full Flow Pipe Discharge:

Q_f = *0.464/n * D $^{8/3}$ * S $^{1/2}$ =* 7.44 cfs

Ratio of Part-Full to Full Flow Discharge:

d/D = Q_d/Q_f = 0.41

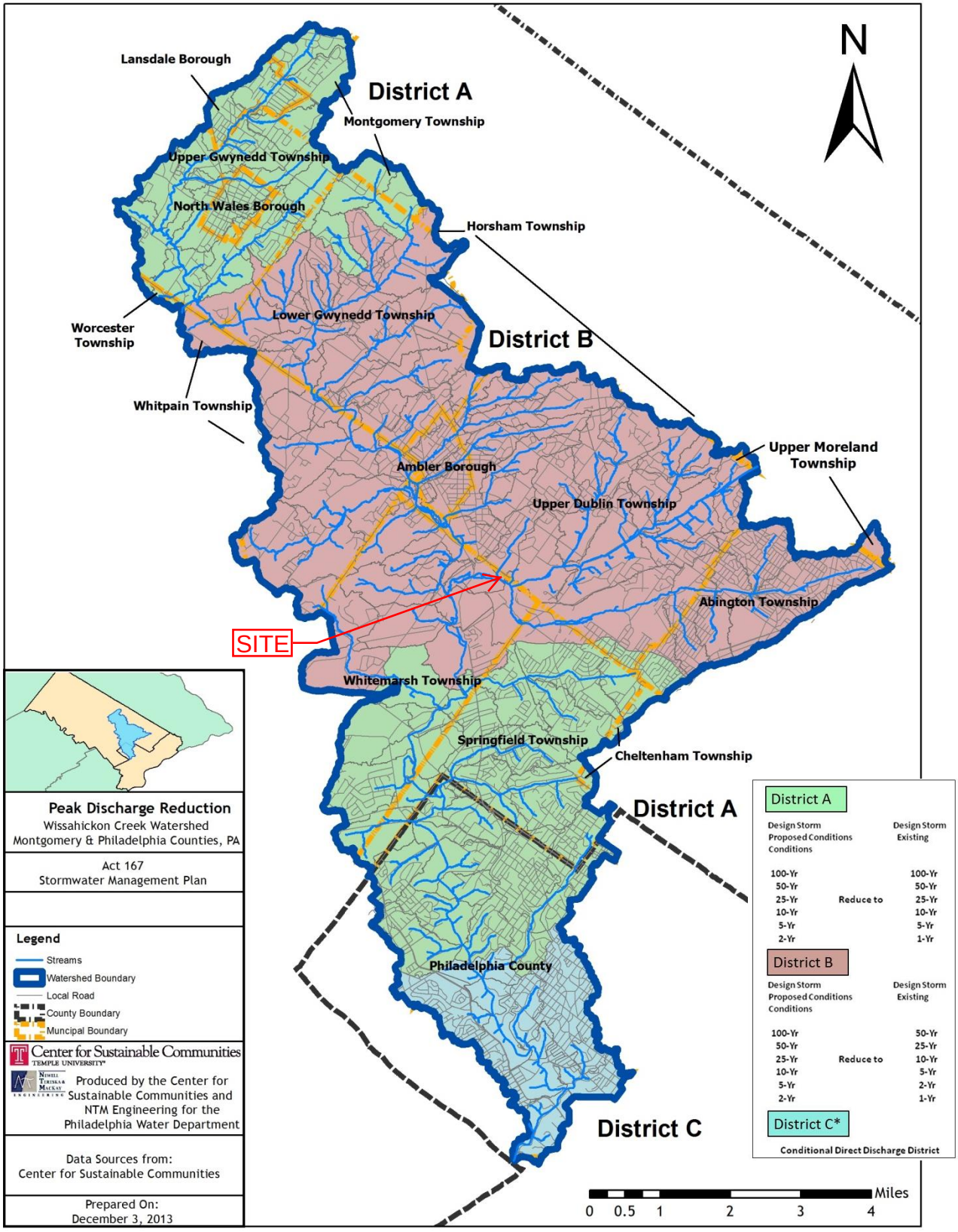
Figure 20 Ratios:

Area of Flow =	0.44
Depth of Flow =	0.44

Calculate Equivalent Flow:

*A * Ratio* =	0.77	sf
Equivalent Pipe Size full-flow =	12	in (smaller size = larger rip-rap (factor of safety))

Figure 4.4.E Peak Rate Management District Map for the Wissahickon Watershed



NOAA Atlas 14, Volume 2, Version 3
Location name: Fort Washington, Pennsylvania, USA*
Latitude: 40.134°, Longitude: -75.207°
Elevation: m/ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**4.13** (3.78-4.52)	**4.92** (4.50-5.39)	**5.80** (5.28-6.32)	**6.41** (5.84-7.01)	**7.16** (6.49-7.82)	**7.68** (6.92-8.40)	**8.20** (7.36-8.98)	**8.65** (7.72-9.50)	**9.19** (8.12-10.1)	**9.59** (8.42-10.6)
10-min	**3.29** (3.02-3.61)	**3.94** (3.60-4.30)	**4.64** (4.23-5.07)	**5.13** (4.67-5.60)	**5.71** (5.17-6.23)	**6.12** (5.51-6.69)	**6.51** (5.84-7.13)	**6.85** (6.12-7.53)	**7.27** (6.43-8.02)	**7.55** (6.63-8.37)
15-min	**2.75** (2.52-3.01)	**3.30** (3.02-3.61)	**3.91** (3.57-4.27)	**4.32** (3.94-4.73)	**4.82** (4.37-5.27)	**5.16** (4.66-5.65)	**5.48** (4.92-6.01)	**5.76** (5.15-6.34)	**6.10** (5.40-6.73)	**6.32** (5.55-7.00)
30-min	**1.88** (1.72-2.06)	**2.28** (2.08-2.49)	**2.78** (2.54-3.04)	**3.13** (2.86-3.43)	**3.57** (3.24-3.90)	**3.89** (3.51-4.25)	**4.20** (3.77-4.60)	**4.49** (4.01-4.93)	**4.85** (4.29-5.36)	**5.12** (4.49-5.67)
60-min	**1.17** (1.08-1.29)	**1.43** (1.31-1.56)	**1.78** (1.63-1.95)	**2.04** (1.86-2.23)	**2.38** (2.15-2.60)	**2.64** (2.38-2.88)	**2.89** (2.60-3.17)	**3.15** (2.81-3.46)	**3.48** (3.08-3.84)	**3.73** (3.28-4.14)
2-hr	**0.703** (0.640-0.772)	**0.854** (0.779-0.938)	**1.07** (0.972-1.17)	**1.23** (1.12-1.35)	**1.46** (1.31-1.59)	**1.63** (1.46-1.79)	**1.81** (1.61-1.98)	**1.98** (1.75-2.18)	**2.23** (1.94-2.46)	**2.41** (2.09-2.67)
3-hr	**0.512** (0.466-0.565)	**0.622** (0.566-0.685)	**0.781** (0.709-0.860)	**0.903** (0.818-0.994)	**1.07** (0.962-1.18)	**1.20** (1.07-1.32)	**1.34** (1.19-1.47)	**1.47** (1.30-1.62)	**1.66** (1.44-1.84)	**1.81** (1.55-2.01)
6-hr	**0.322** (0.294-0.355)	**0.390** (0.356-0.431)	**0.487** (0.444-0.537)	**0.567** (0.514-0.623)	**0.678** (0.610-0.745)	**0.769** (0.687-0.845)	**0.866** (0.766-0.952)	**0.968** (0.847-1.07)	**1.11** (0.955-1.23)	**1.23** (1.04-1.37)
12-hr	**0.195** (0.178-0.216)	**0.235** (0.215-0.261)	**0.296** (0.270-0.327)	**0.347** (0.315-0.383)	**0.422** (0.379-0.464)	**0.485** (0.432-0.533)	**0.554** (0.487-0.610)	**0.629** (0.544-0.695)	**0.738** (0.626-0.821)	**0.831** (0.692-0.927)
24-hr	**0.114** (0.105-0.124)	**0.137** (0.126-0.149)	**0.172** (0.158-0.187)	**0.201** (0.185-0.219)	**0.244** (0.223-0.265)	**0.280** (0.254-0.304)	**0.319** (0.288-0.346)	**0.362** (0.324-0.392)	**0.424** (0.374-0.459)	**0.475** (0.415-0.515)
2-day	**0.065** (0.060-0.072)	**0.079** (0.072-0.086)	**0.100** (0.091-0.109)	**0.116** (0.106-0.127)	**0.140** (0.128-0.153)	**0.160** (0.145-0.174)	**0.181** (0.163-0.197)	**0.204** (0.182-0.222)	**0.236** (0.209-0.258)	**0.263** (0.231-0.287)
3-day	**0.046** (0.042-0.050)	**0.056** (0.051-0.061)	**0.070** (0.064-0.076)	**0.081** (0.075-0.088)	**0.098** (0.089-0.106)	**0.111** (0.101-0.121)	**0.126** (0.114-0.136)	**0.141** (0.127-0.153)	**0.163** (0.145-0.177)	**0.181** (0.160-0.197)
4-day	**0.036** (0.034-0.040)	**0.044** (0.041-0.048)	**0.055** (0.051-0.060)	**0.064** (0.059-0.069)	**0.076** (0.070-0.083)	**0.087** (0.079-0.094)	**0.098** (0.089-0.106)	**0.109** (0.099-0.119)	**0.126** (0.113-0.137)	**0.140** (0.124-0.152)
7-day	**0.024** (0.023-0.026)	**0.029** (0.027-0.032)	**0.036** (0.033-0.039)	**0.042** (0.039-0.045)	**0.050** (0.046-0.054)	**0.056** (0.052-0.061)	**0.064** (0.058-0.069)	**0.071** (0.065-0.077)	**0.082** (0.074-0.088)	**0.091** (0.081-0.098)
10-day	**0.019** (0.018-0.021)	**0.023** (0.022-0.025)	**0.028** (0.026-0.030)	**0.032** (0.030-0.035)	**0.038** (0.035-0.041)	**0.043** (0.039-0.046)	**0.047** (0.044-0.051)	**0.052** (0.048-0.056)	**0.059** (0.054-0.064)	**0.065** (0.058-0.070)
20-day	**0.013** (0.012-0.014)	**0.016** (0.015-0.017)	**0.019** (0.017-0.020)	**0.021** (0.020-0.022)	**0.024** (0.023-0.026)	**0.027** (0.025-0.028)	**0.029** (0.027-0.031)	**0.032** (0.029-0.034)	**0.035** (0.032-0.037)	**0.038** (0.034-0.040)
30-day	**0.011** (0.010-0.011)	**0.013** (0.012-0.014)	**0.015** (0.014-0.016)	**0.017** (0.016-0.017)	**0.019** (0.018-0.020)	**0.020** (0.019-0.022)	**0.022** (0.021-0.023)	**0.024** (0.022-0.025)	**0.026** (0.024-0.027)	**0.027** (0.025-0.029)
45-day	**0.009** (0.009-0.010)	**0.011** (0.010-0.011)	**0.012** (0.012-0.013)	**0.014** (0.013-0.014)	**0.015** (0.014-0.016)	**0.016** (0.016-0.017)	**0.017** (0.016-0.018)	**0.018** (0.017-0.019)	**0.020** (0.019-0.021)	**0.021** (0.019-0.022)
60-day	**0.008** (0.008-0.009)	**0.010** (0.009-0.010)	**0.011** (0.011-0.012)	**0.012** (0.012-0.013)	**0.013** (0.013-0.014)	**0.014** (0.014-0.015)	**0.015** (0.014-0.016)	**0.016** (0.015-0.017)	**0.017** (0.016-0.018)	**0.018** (0.017-0.019)

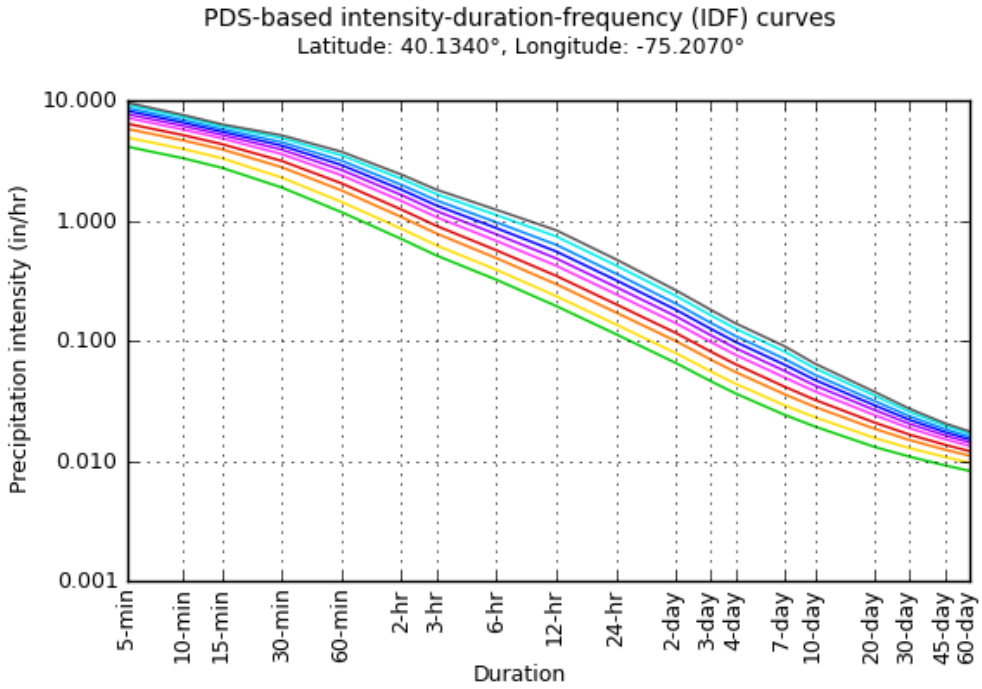
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

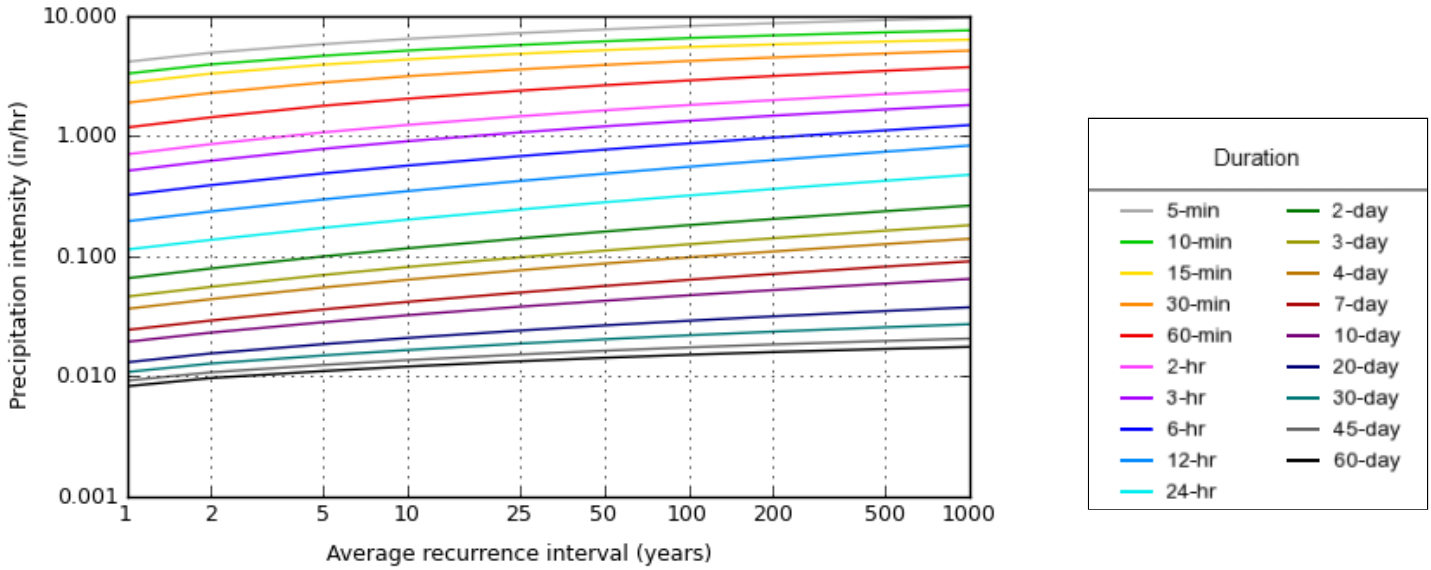
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical





NOAA Atlas 14, Volume 2, Version 3 Created (GMT): Mon Mar 6 18:23:54 2023

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Maps & aerials

Small scale terrain

NOAA Atlas 14, Volume 2, Version 3
Location name: Fort Washington, Pennsylvania, USA*
Latitude: 40.134°, Longitude: -75.207°
Elevation: m/ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.344** (0.315-0.377)	**0.410** (0.375-0.449)	**0.483** (0.440-0.527)	**0.534** (0.487-0.584)	**0.597** (0.541-0.652)	**0.640** (0.577-0.700)	**0.683** (0.613-0.748)	**0.721** (0.643-0.792)	**0.766** (0.677-0.845)	**0.799** (0.702-0.886)
10-min	**0.549** (0.503-0.601)	**0.656** (0.600-0.717)	**0.773** (0.705-0.845)	**0.855** (0.779-0.934)	**0.951** (0.862-1.04)	**1.02** (0.919-1.12)	**1.09** (0.974-1.19)	**1.14** (1.02-1.25)	**1.21** (1.07-1.34)	**1.26** (1.11-1.40)
15-min	**0.687** (0.629-0.752)	**0.825** (0.754-0.902)	**0.978** (0.892-1.07)	**1.08** (0.985-1.18)	**1.21** (1.09-1.32)	**1.29** (1.16-1.41)	**1.37** (1.23-1.50)	**1.44** (1.29-1.58)	**1.52** (1.35-1.68)	**1.58** (1.39-1.75)
30-min	**0.942** (0.862-1.03)	**1.14** (1.04-1.25)	**1.39** (1.27-1.52)	**1.57** (1.43-1.71)	**1.79** (1.62-1.95)	**1.95** (1.75-2.13)	**2.10** (1.89-2.30)	**2.24** (2.00-2.47)	**2.43** (2.15-2.68)	**2.56** (2.25-2.84)
60-min	**1.17** (1.08-1.29)	**1.43** (1.31-1.56)	**1.78** (1.63-1.95)	**2.04** (1.86-2.23)	**2.38** (2.15-2.60)	**2.64** (2.38-2.88)	**2.89** (2.60-3.17)	**3.15** (2.81-3.46)	**3.48** (3.08-3.84)	**3.73** (3.28-4.14)
2-hr	**1.41** (1.28-1.54)	**1.71** (1.56-1.88)	**2.14** (1.95-2.35)	**2.47** (2.24-2.70)	**2.91** (2.62-3.19)	**3.26** (2.92-3.57)	**3.61** (3.22-3.96)	**3.97** (3.51-4.36)	**4.45** (3.89-4.91)	**4.82** (4.17-5.34)
3-hr	**1.54** (1.40-1.70)	**1.87** (1.70-2.06)	**2.35** (2.13-2.58)	**2.71** (2.46-2.98)	**3.21** (2.89-3.53)	**3.60** (3.23-3.96)	**4.01** (3.56-4.42)	**4.42** (3.89-4.88)	**4.98** (4.33-5.53)	**5.43** (4.66-6.04)
6-hr	**1.93** (1.76-2.13)	**2.33** (2.13-2.58)	**2.92** (2.66-3.22)	**3.39** (3.08-3.73)	**4.06** (3.65-4.46)	**4.61** (4.11-5.06)	**5.19** (4.58-5.70)	**5.80** (5.07-6.38)	**6.66** (5.72-7.38)	**7.36** (6.23-8.19)
12-hr	**2.35** (2.15-2.60)	**2.84** (2.60-3.14)	**3.57** (3.26-3.94)	**4.18** (3.80-4.62)	**5.08** (4.57-5.59)	**5.84** (5.20-6.43)	**6.67** (5.86-7.35)	**7.57** (6.56-8.37)	**8.90** (7.54-9.89)	**10.0** (8.33-11.2)
24-hr	**2.73** (2.51-2.97)	**3.28** (3.03-3.58)	**4.13** (3.80-4.49)	**4.83** (4.43-5.26)	**5.86** (5.35-6.36)	**6.73** (6.10-7.29)	**7.66** (6.91-8.30)	**8.68** (7.76-9.40)	**10.2** (8.98-11.0)	**11.4** (9.97-12.4)
2-day	**3.14** (2.88-3.43)	**3.79** (3.48-4.14)	**4.78** (4.38-5.22)	**5.58** (5.10-6.09)	**6.73** (6.12-7.32)	**7.68** (6.96-8.36)	**8.70** (7.83-9.46)	**9.79** (8.74-10.7)	**11.4** (10.0-12.4)	**12.6** (11.1-13.8)
3-day	**3.32** (3.06-3.62)	**4.00** (3.69-4.37)	**5.02** (4.62-5.47)	**5.85** (5.37-6.37)	**7.03** (6.42-7.64)	**8.01** (7.29-8.70)	**9.04** (8.18-9.82)	**10.1** (9.12-11.0)	**11.7** (10.4-12.8)	**13.0** (11.5-14.2)
4-day	**3.50** (3.24-3.81)	**4.22** (3.90-4.59)	**5.27** (4.86-5.73)	**6.12** (5.64-6.65)	**7.33** (6.72-7.96)	**8.33** (7.61-9.04)	**9.39** (8.54-10.2)	**10.5** (9.50-11.4)	**12.1** (10.8-13.2)	**13.4** (11.9-14.6)
7-day	**4.09** (3.80-4.43)	**4.90** (4.56-5.32)	**6.06** (5.63-6.57)	**7.01** (6.49-7.60)	**8.37** (7.72-9.06)	**9.49** (8.72-10.3)	**10.7** (9.76-11.5)	**11.9** (10.9-12.9)	**13.7** (12.4-14.9)	**15.2** (13.6-16.5)
10-day	**4.65** (4.34-5.01)	**5.56** (5.19-5.98)	**6.78** (6.31-7.29)	**7.75** (7.21-8.34)	**9.12** (8.45-9.80)	**10.2** (9.44-11.0)	**11.4** (10.4-12.2)	**12.5** (11.5-13.5)	**14.2** (12.9-15.3)	**15.5** (14.0-16.7)
20-day	**6.29** (5.91-6.70)	**7.46** (7.01-7.95)	**8.90** (8.36-9.49)	**10.0** (9.40-10.7)	**11.6** (10.8-12.3)	**12.7** (11.9-13.6)	**13.9** (13.0-14.9)	**15.2** (14.1-16.2)	**16.8** (15.5-17.9)	**18.0** (16.5-19.3)
30-day	**7.83** (7.41-8.27)	**9.23** (8.74-9.74)	**10.8** (10.2-11.4)	**11.9** (11.3-12.6)	**13.5** (12.7-14.2)	**14.7** (13.8-15.5)	**15.8** (14.9-16.7)	**17.0** (15.9-18.0)	**18.5** (17.2-19.6)	**19.6** (18.2-20.8)
45-day	**9.96** (9.47-10.5)	**11.7** (11.1-12.3)	**13.4** (12.8-14.1)	**14.8** (14.0-15.5)	**16.4** (15.6-17.3)	**17.7** (16.7-18.6)	**18.8** (17.8-19.8)	**19.9** (18.8-21.0)	**21.3** (20.1-22.4)	**22.3** (20.9-23.5)
60-day	**11.9** (11.4-12.5)	**14.0** (13.3-14.7)	**15.9** (15.2-16.7)	**17.4** (16.6-18.3)	**19.2** (18.3-20.2)	**20.6** (19.6-21.6)	**21.8** (20.7-22.9)	**23.0** (21.8-24.1)	**24.4** (23.1-25.7)	**25.4** (24.0-26.7)

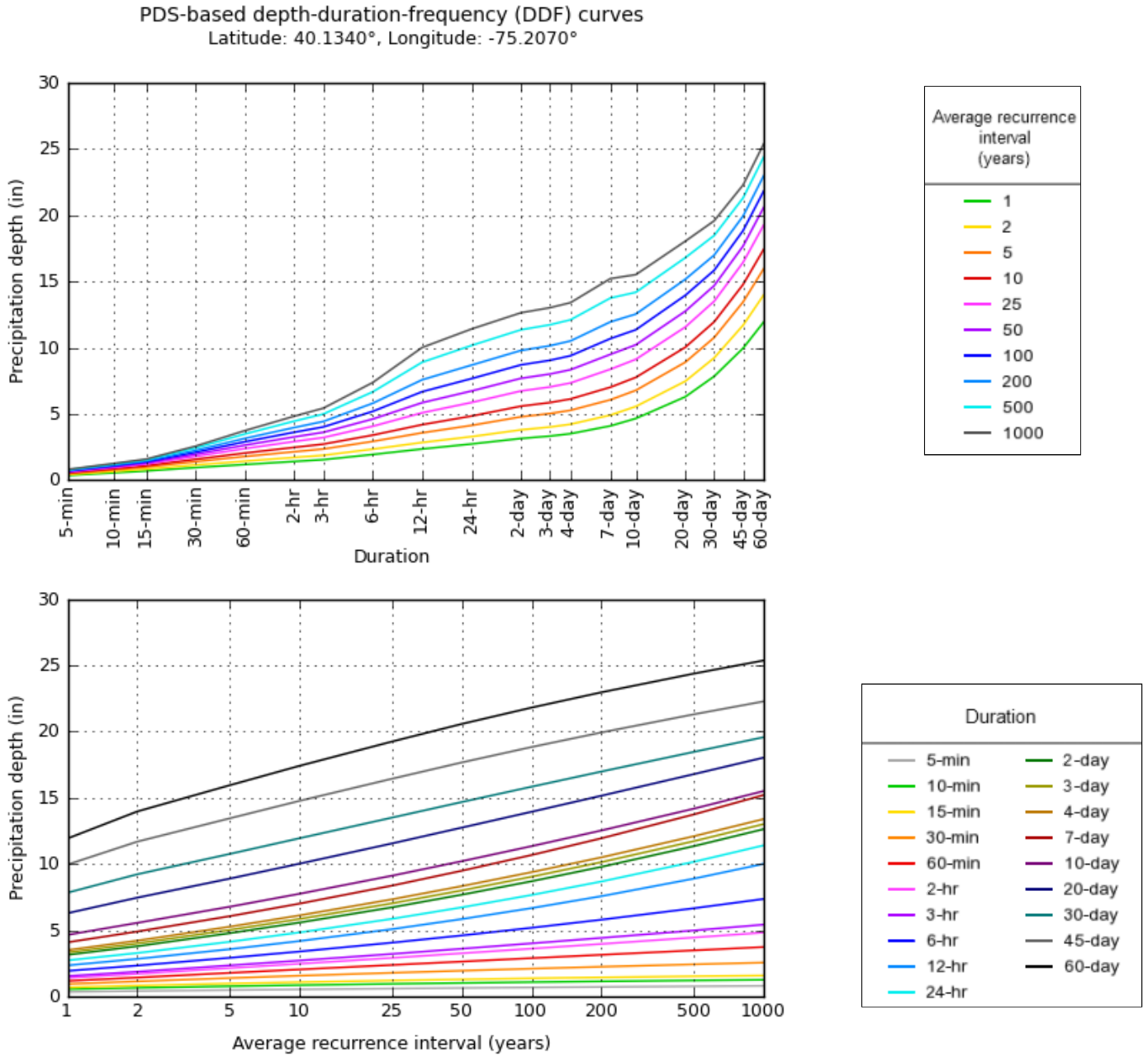
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical



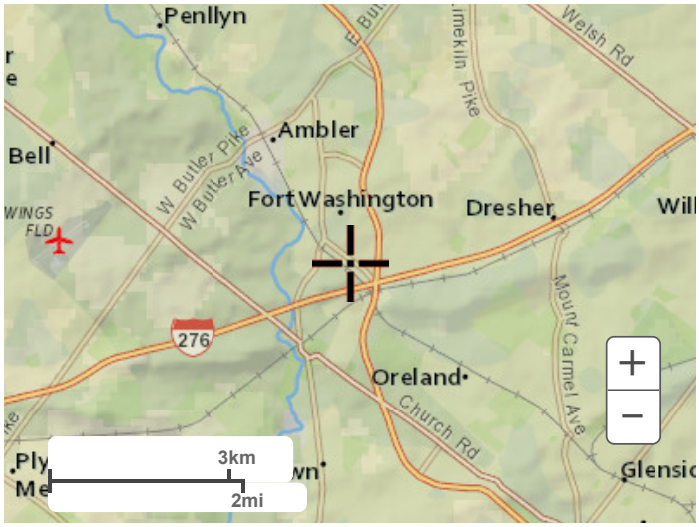
NOAA Atlas 14, Volume 2, Version 3

Created (GMT): Mon Mar 6 18:25:10 2023

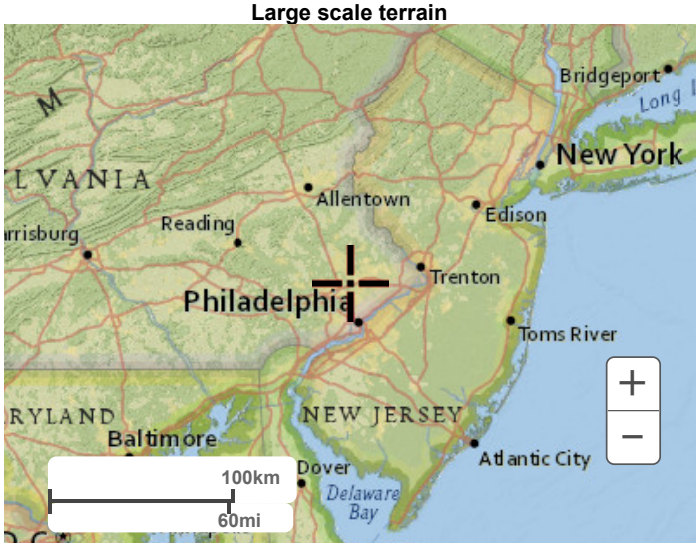
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Maps & aerials

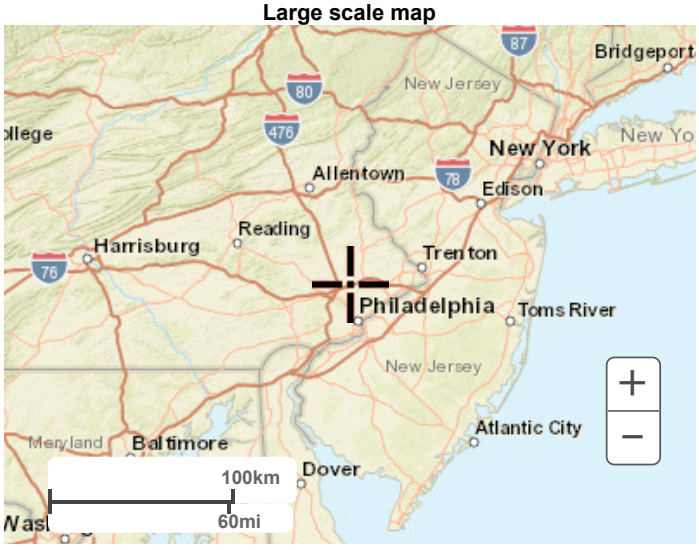
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



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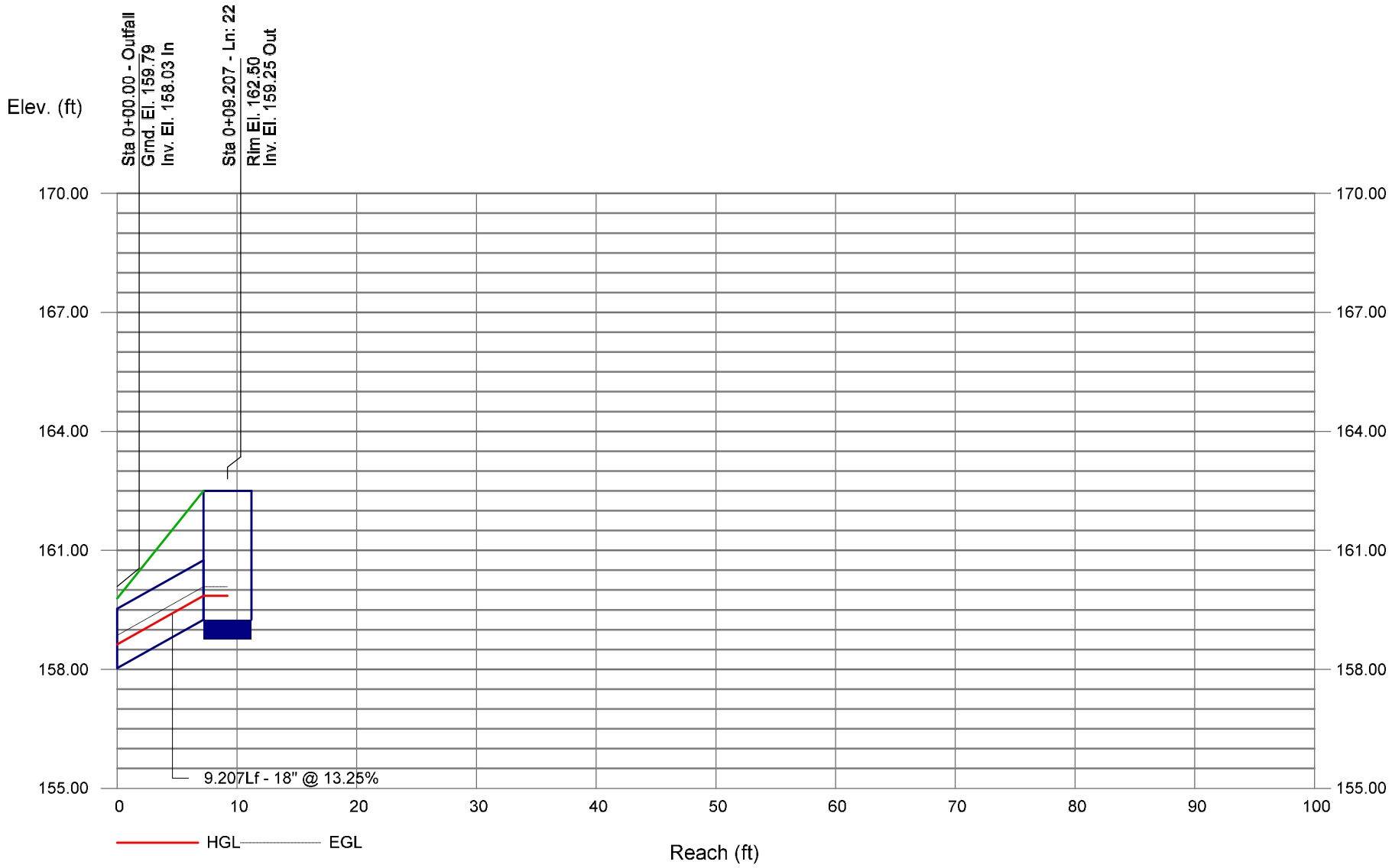
US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Appendix A – Supplemental Stormwater Calculations

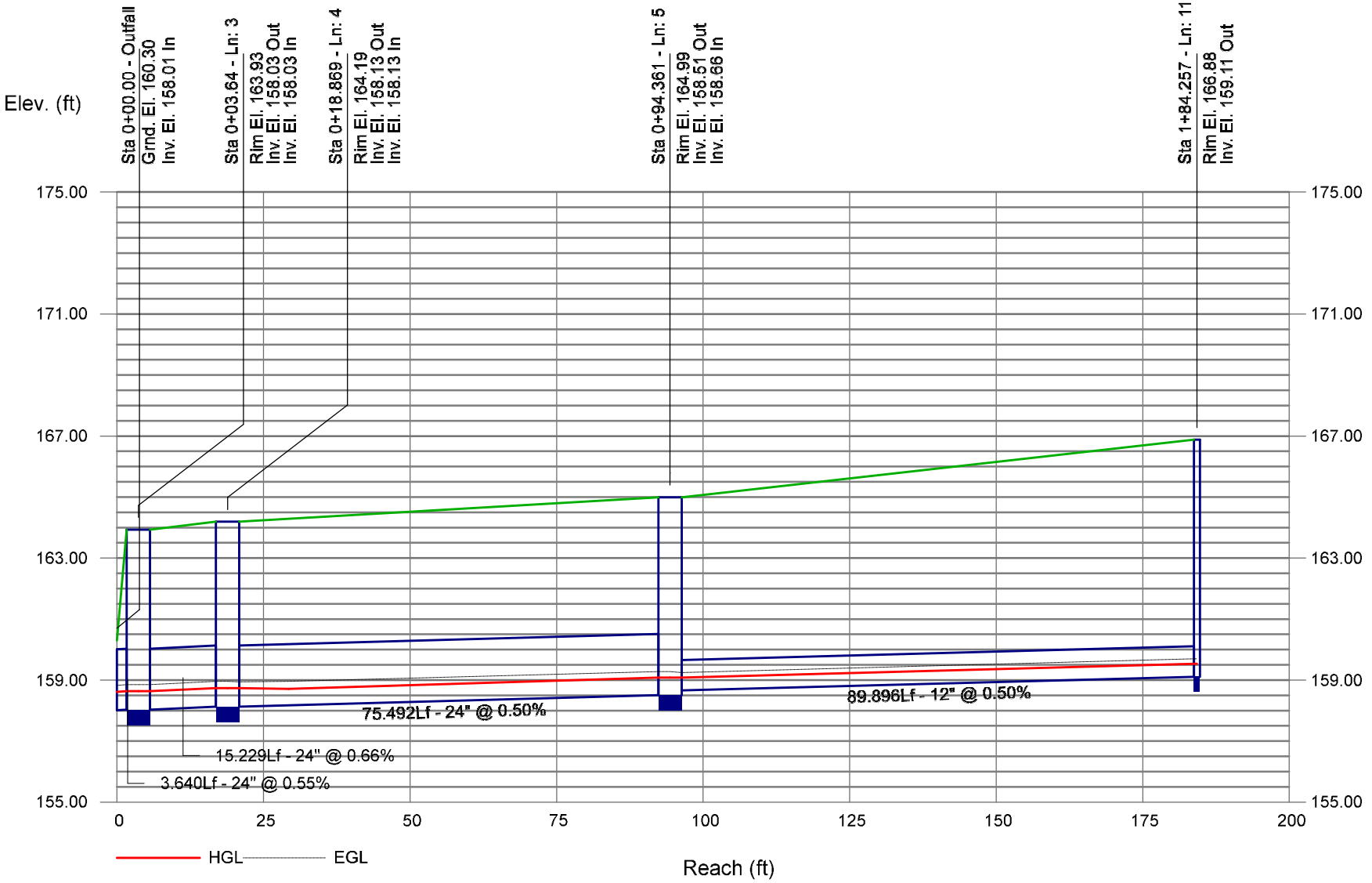
Storm Sewer Profile

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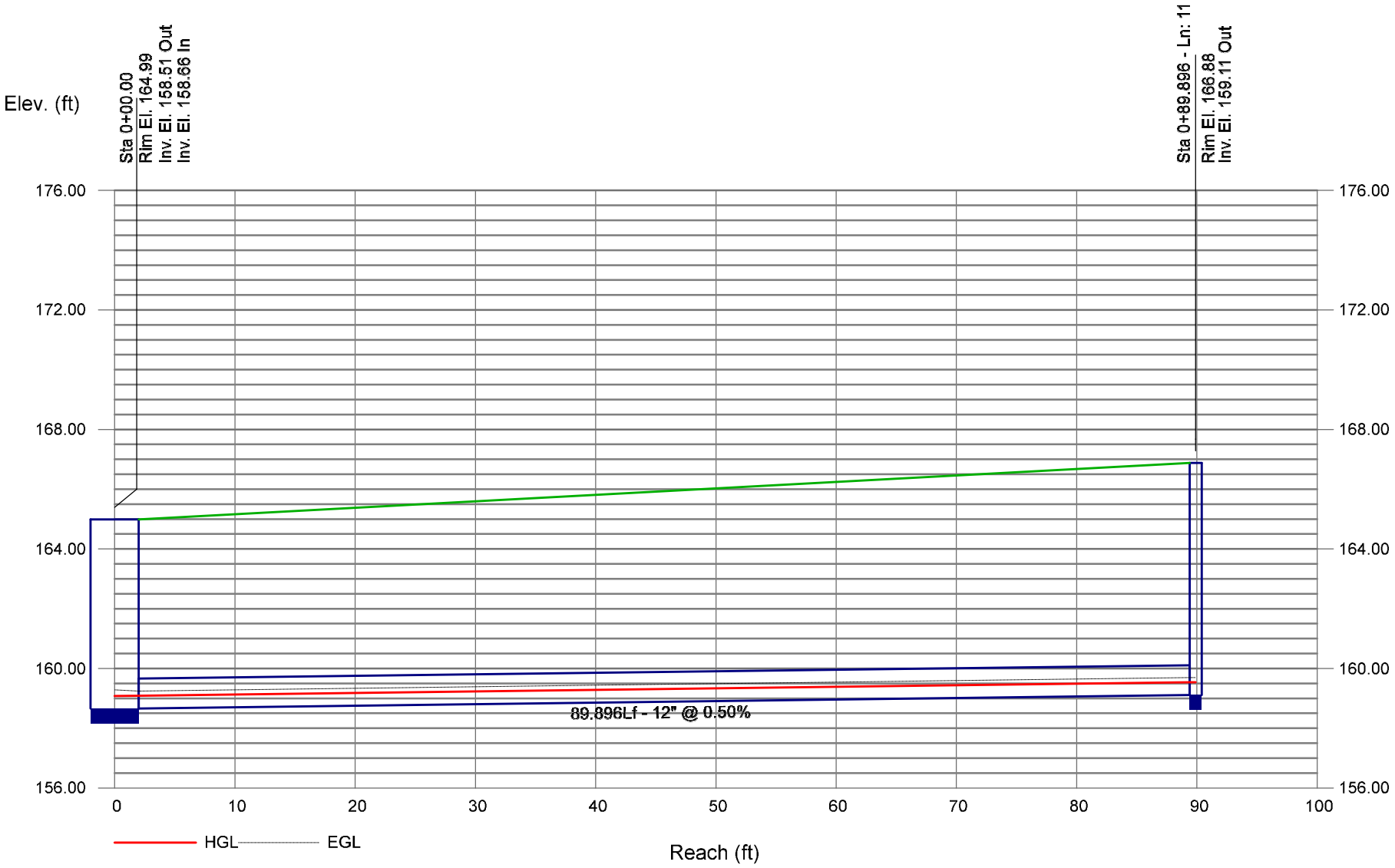
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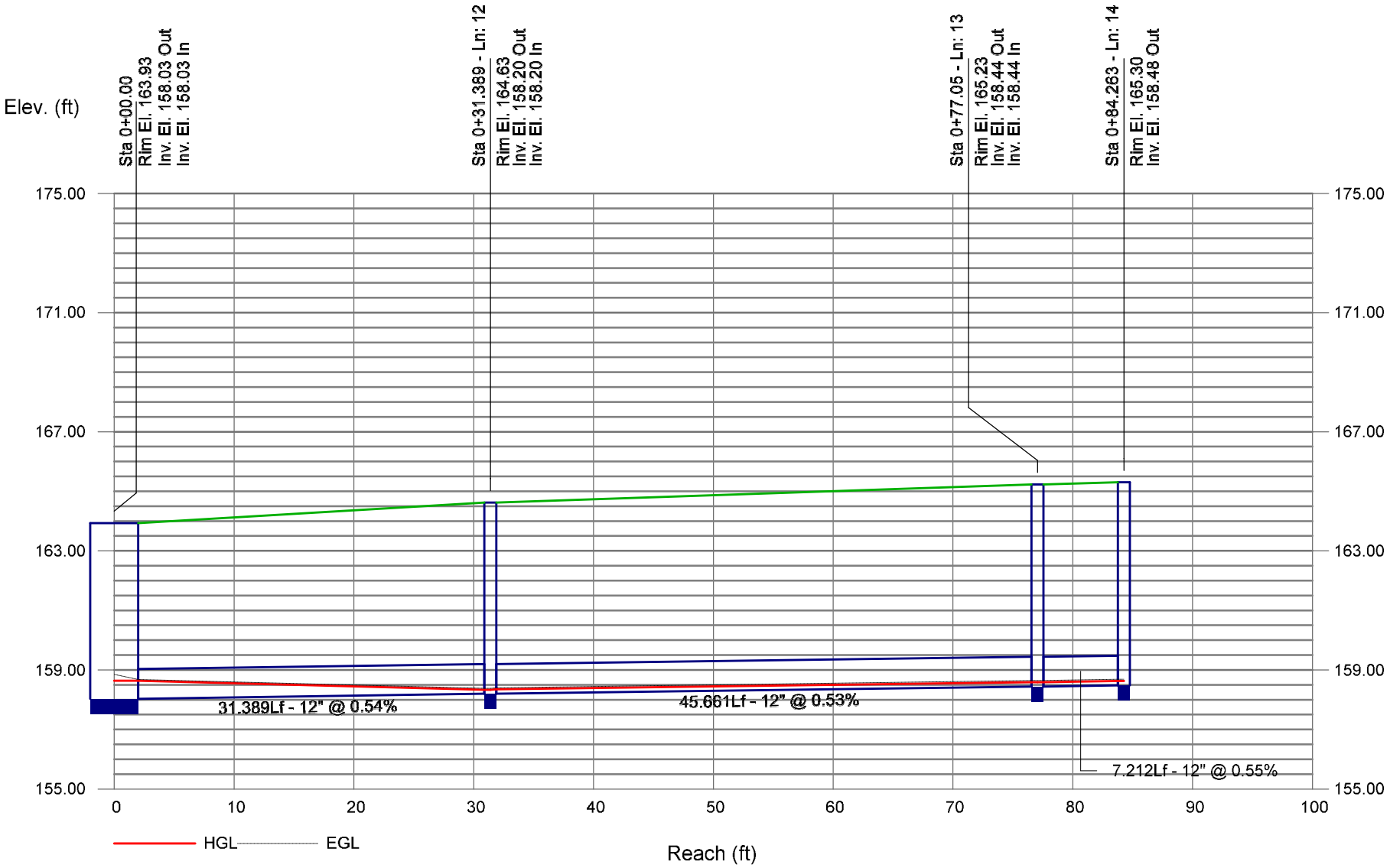
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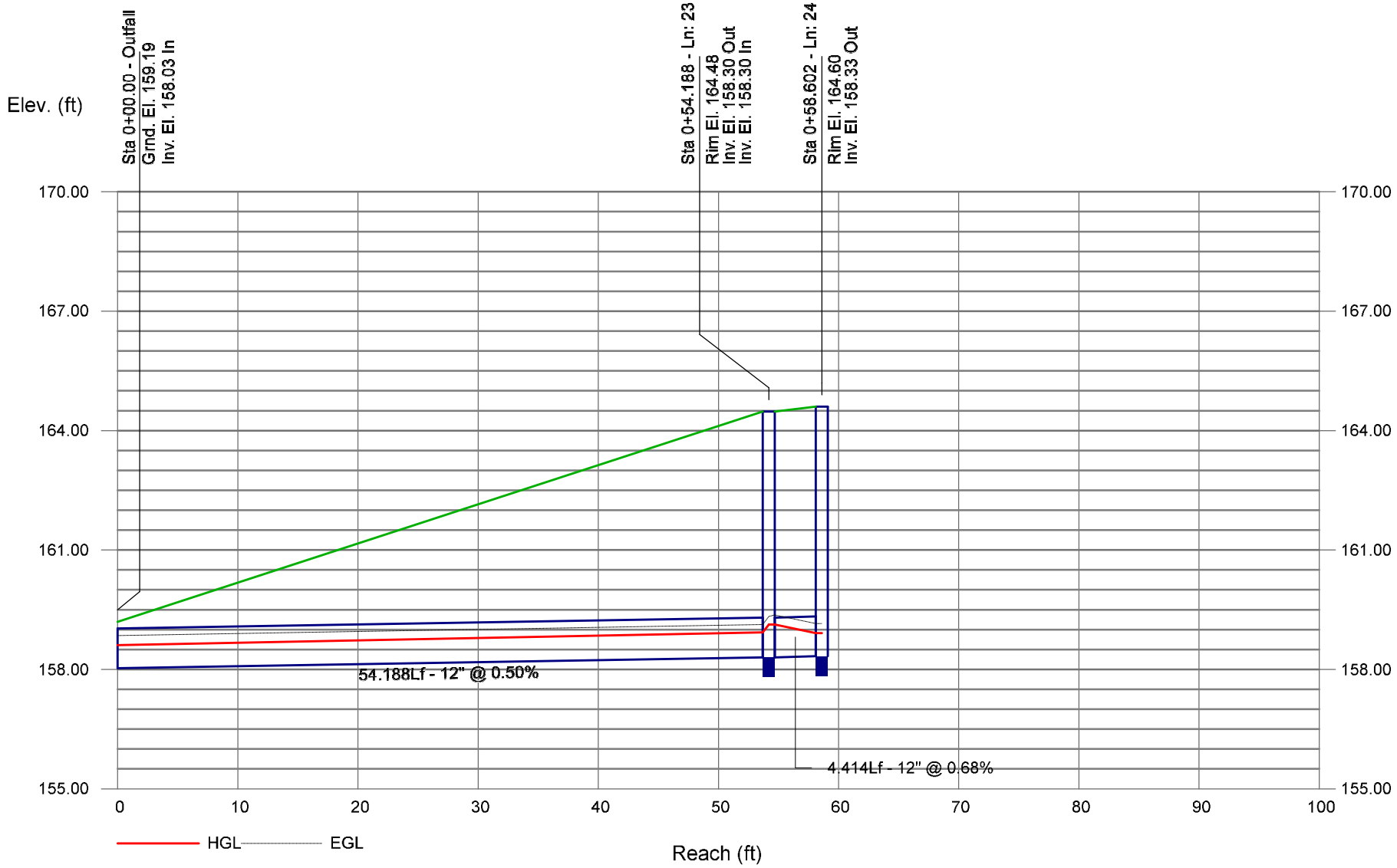
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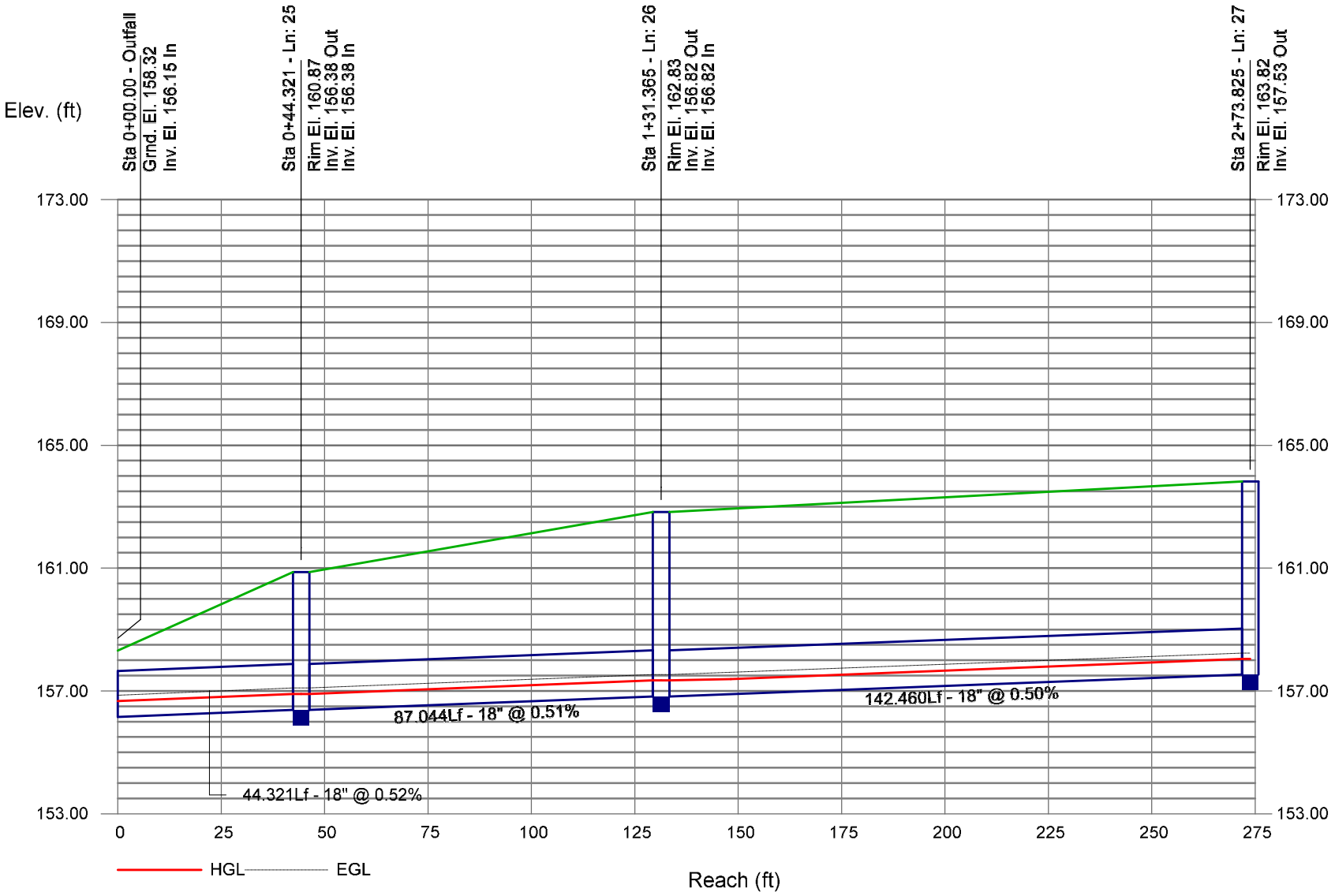
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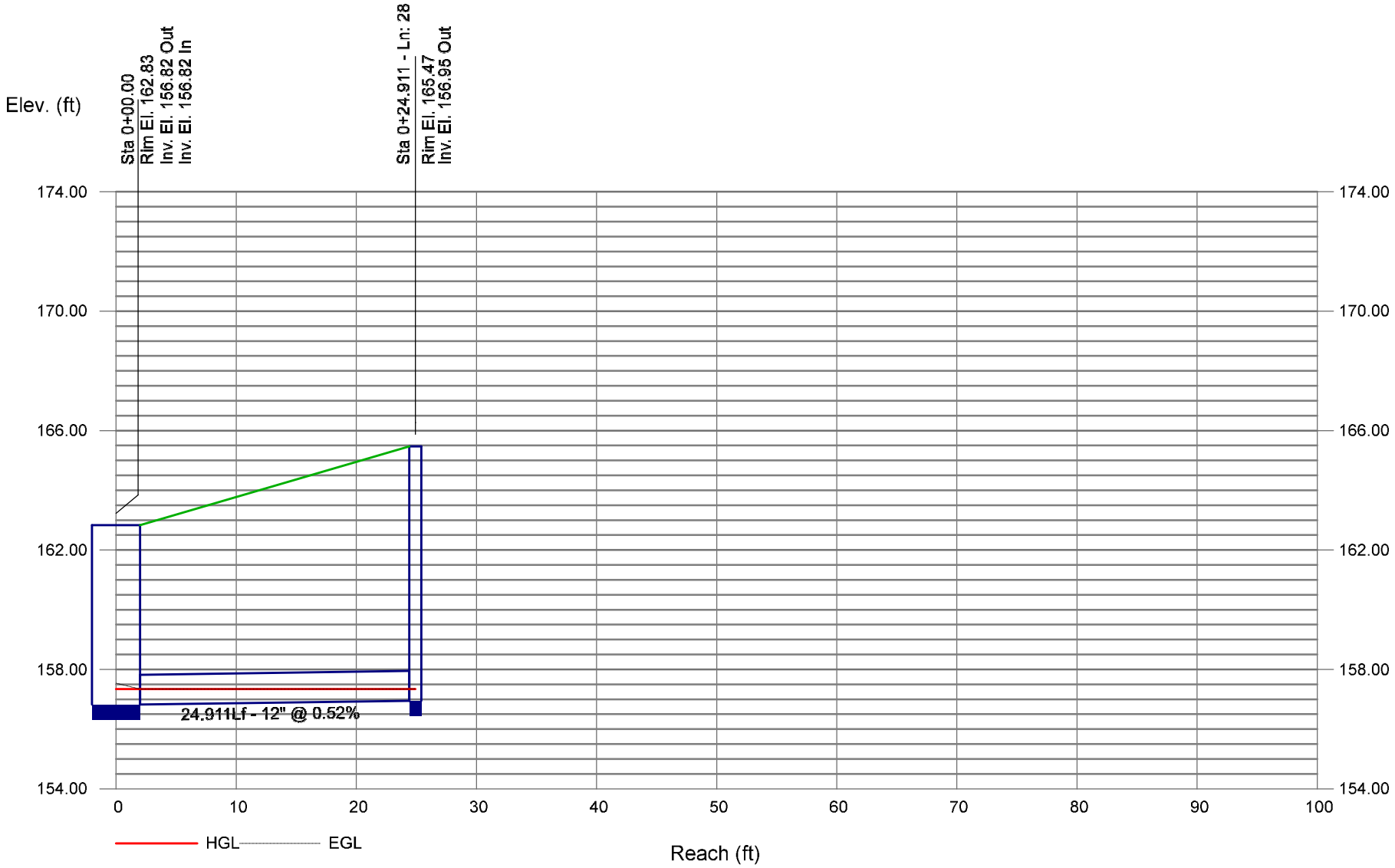
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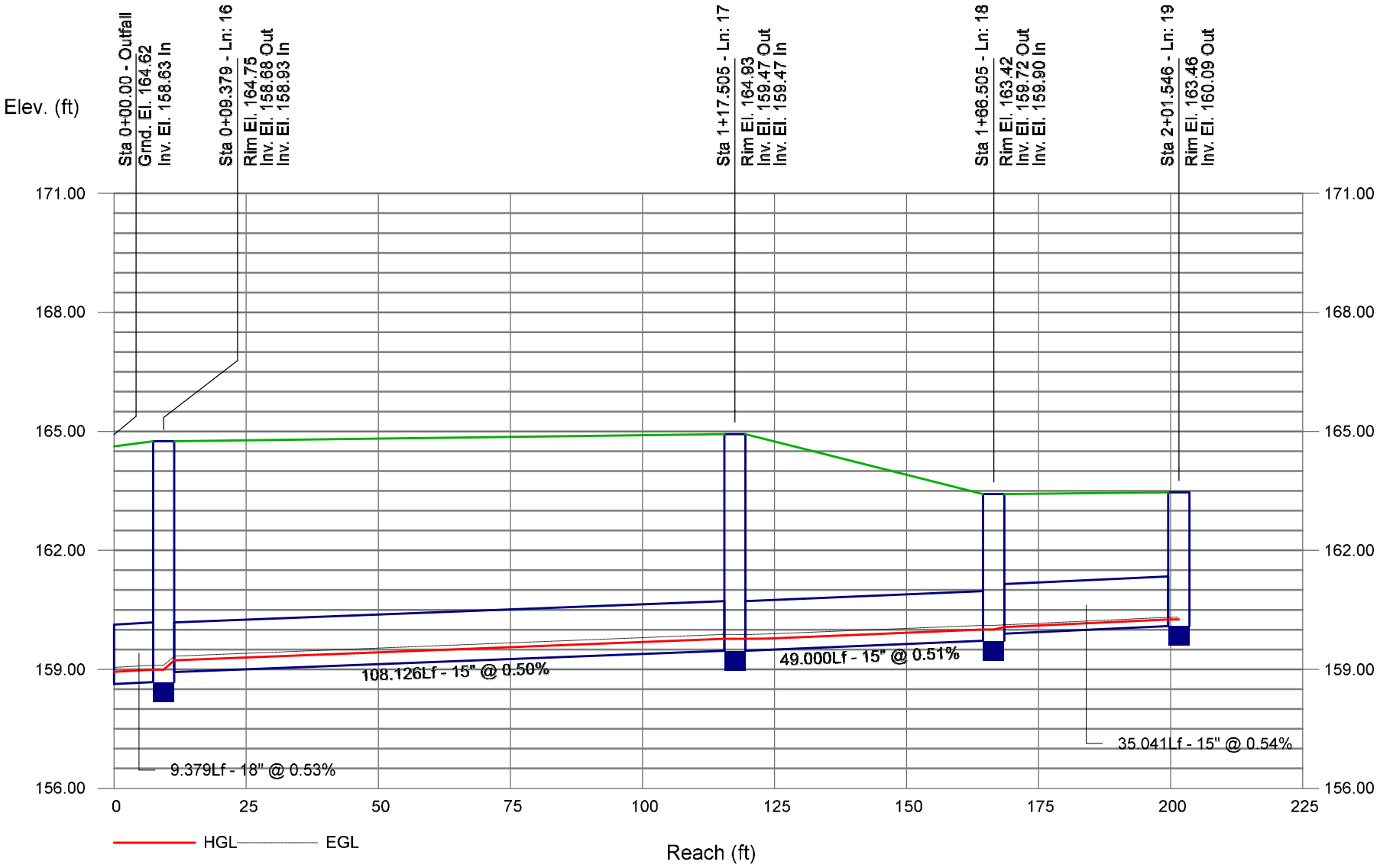
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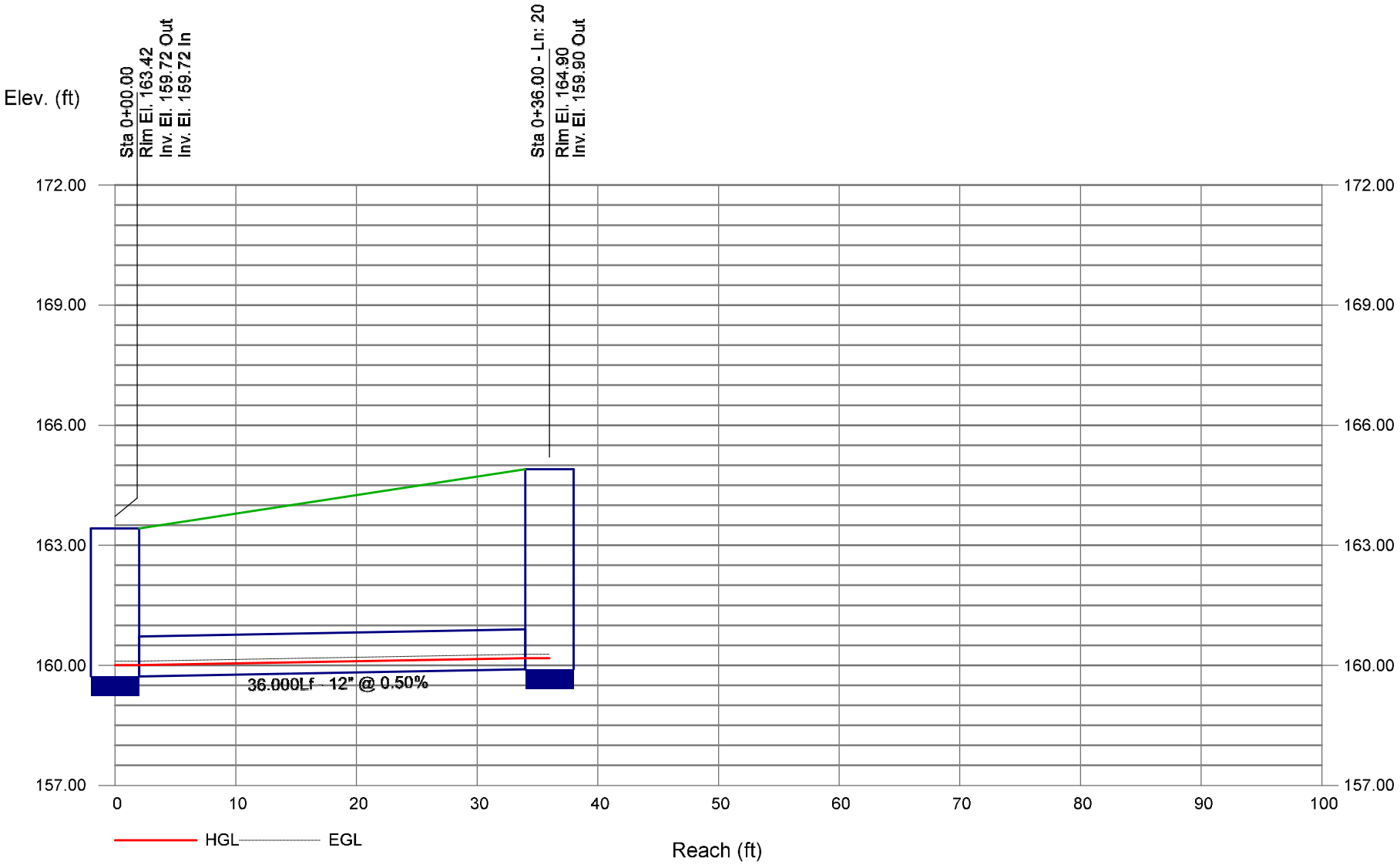
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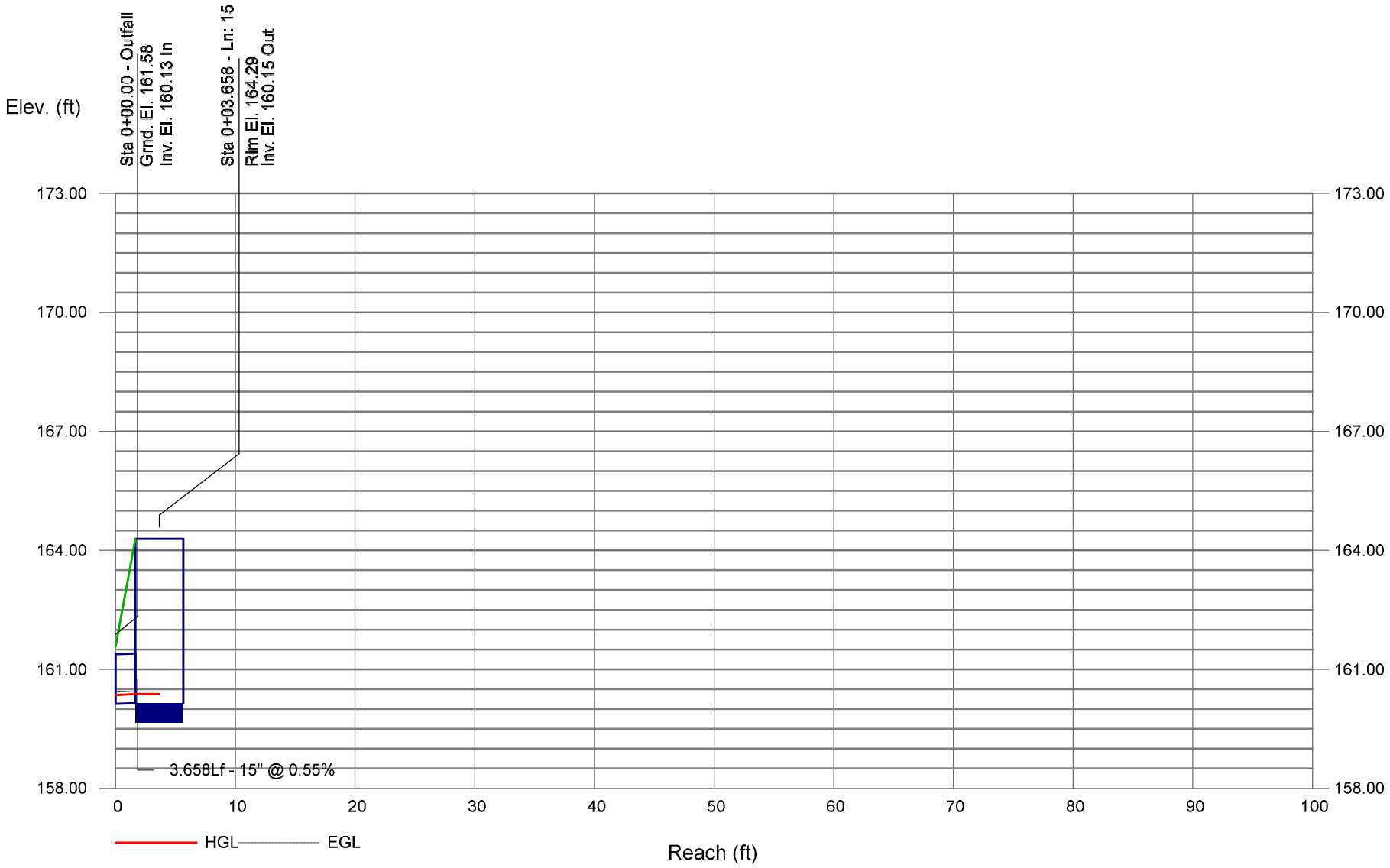
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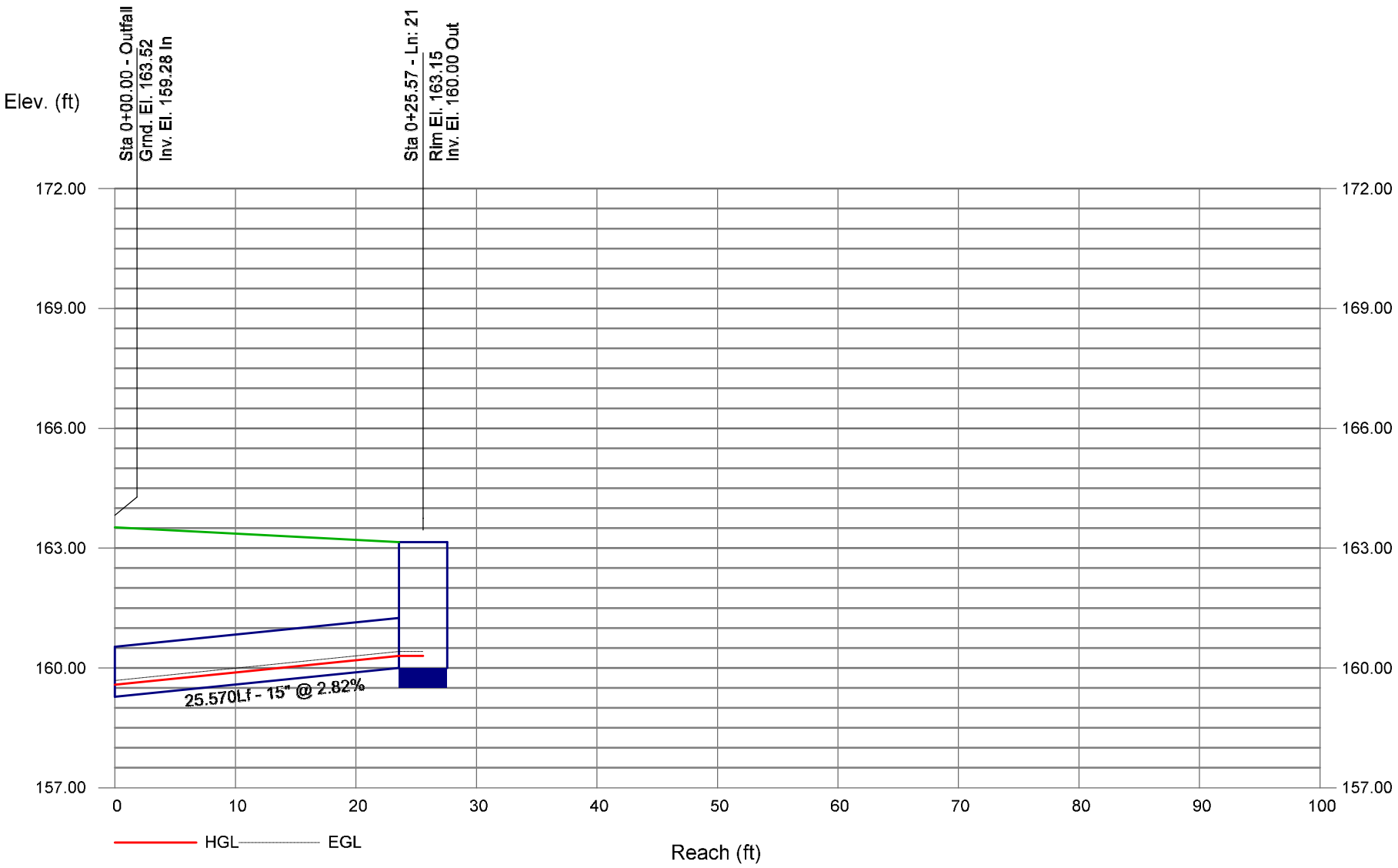
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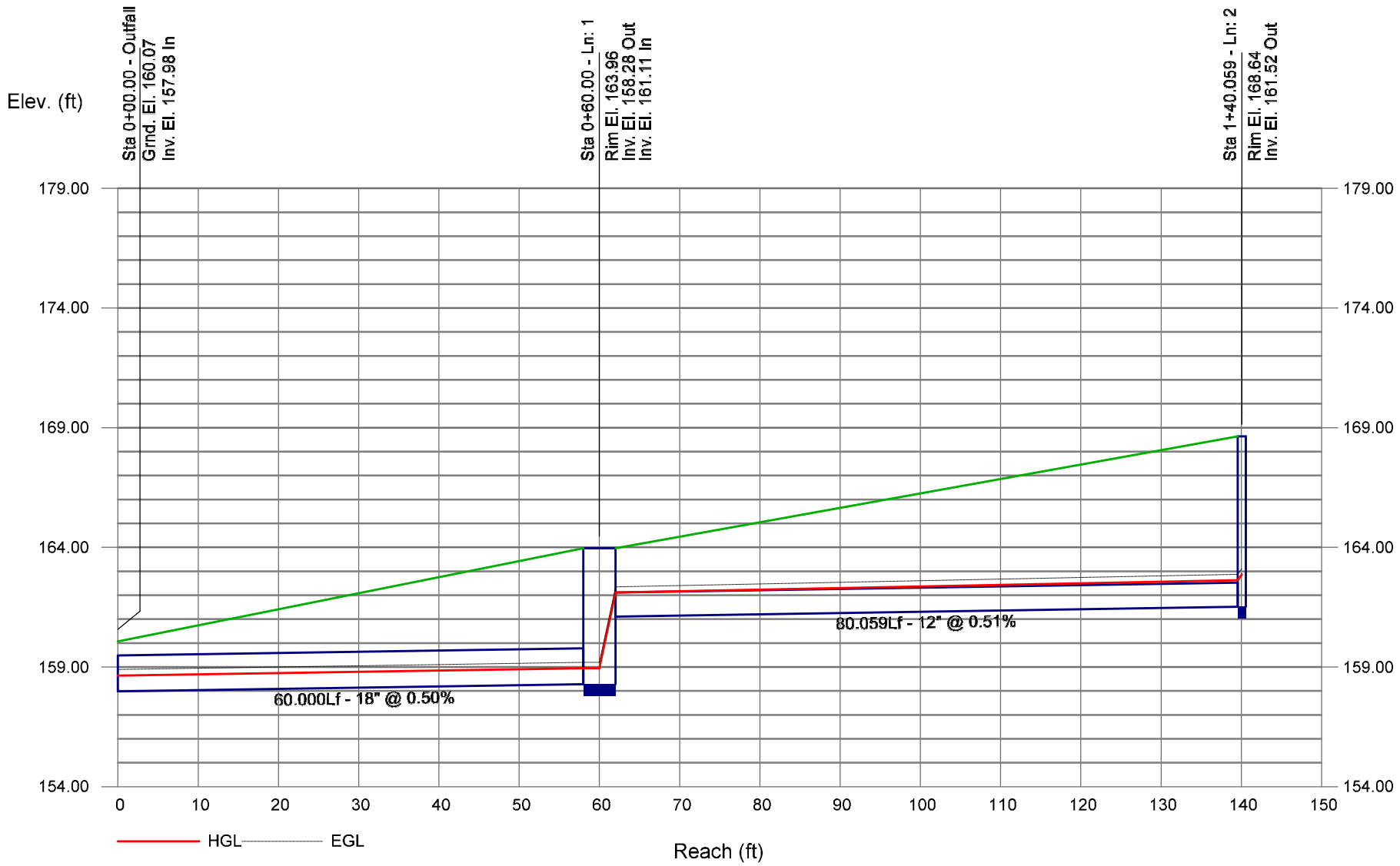
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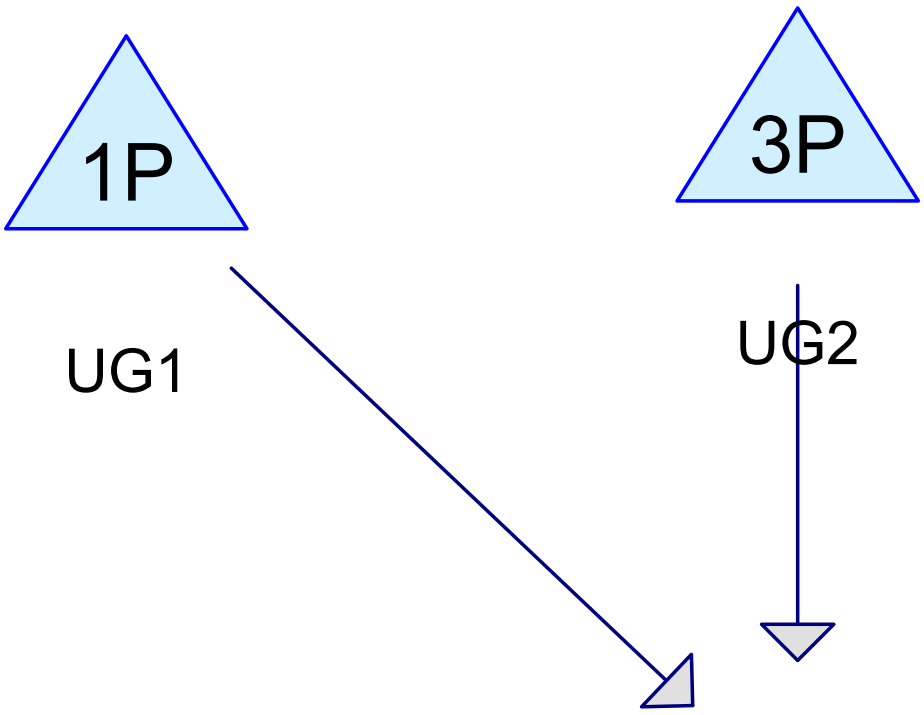
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Storm Sewer Profile

Proj. file: PAB220113.01-Storm_Rev3_2-yr.stm





Subcat Reach Pond Link

Routing Diagram for BMW_2025-4-23
Prepared by Bohler, Printed 4/23/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	Type II 24-hr		Default	24.00	1	3.28	2

Summary for Pond 1P: UG1

Inflow Area = 81,327 sf, 96.79% Impervious, Inflow Depth = 2.95" for 2-yr event
Inflow = 8.653 cfs @ 11.96 hrs, Volume= 19,988 cf
Outflow = 1.779 cfs @ 12.10 hrs, Volume= 10,777 cf, Atten= 79%, Lag= 8.6 min
Primary = 1.779 cfs @ 12.10 hrs, Volume= 10,777 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 158.85' @ 12.10 hrs Surf.Area= 13,041 sf Storage= 11,959 cf

Plug-Flow detention time= 246.9 min calculated for 10,777 cf (54% of inflow)
Center-of-Mass det. time= 128.9 min (879.9 - 751.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.779 cfs @ 12.10 hrs HW=158.85' TW=158.60' (Fixed TW Elev= 158.60')
└─**4=Culvert** (Passes 1.779 cfs of 2.661 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.013 cfs @ 2.393 fps)
  ├─**2=Orifice/Grate** (Orifice Controls 1.766 cfs @ 2.271 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.006	3	157.53	0.000
2.00	0.016	23	157.53	0.000
2.50	0.026	61	157.54	0.000
3.00	0.034	115	157.55	0.000
3.50	0.042	183	157.57	0.000
4.00	0.049	265	157.58	0.000
4.50	0.057	359	157.60	0.000
5.00	0.065	469	157.62	0.000
5.50	0.073	594	157.64	0.000
6.00	0.082	734	157.67	0.000
6.50	0.090	888	157.70	0.000
7.00	0.097	1,056	157.73	0.000
7.50	0.105	1,239	157.77	0.000
8.00	0.113	1,435	157.81	0.000
8.50	0.138	1,658	157.85	0.000
9.00	0.167	1,932	157.90	0.000
9.50	0.174	2,243	157.96	0.000
10.00	0.214	2,588	158.03	0.000
10.50	0.281	3,031	158.07	0.000
11.00	0.391	3,631	158.12	0.000
11.50	**0.648**	4,548	158.19	0.000
12.00	**7.148**	**11,136**	**158.77**	**1.442**
12.50	0.621	**11,000**	**158.76**	**1.378**
13.00	0.386	9,975	158.67	0.753
13.50	0.292	9,541	158.63	0.439
14.00	0.229	9,364	158.61	0.290
14.50	0.202	9,321	158.61	0.211
15.00	0.182	9,309	158.61	0.188
15.50	0.161	9,298	158.61	0.167
16.00	0.140	9,287	158.61	0.146
16.50	0.131	9,280	158.61	0.133
17.00	0.123	9,276	158.61	0.125
17.50	0.116	9,273	158.61	0.118
18.00	0.108	9,269	158.61	0.110
18.50	0.101	9,265	158.60	0.103
19.00	0.093	9,261	158.60	0.096
19.50	0.086	9,257	158.60	0.088
20.00	0.079	9,253	158.60	0.081
20.50	0.076	9,251	158.60	0.077
21.00	0.075	9,250	158.60	0.075
21.50	0.073	9,249	158.60	0.074
22.00	0.072	9,249	158.60	0.072
22.50	0.070	9,248	158.60	0.071
23.00	0.069	9,247	158.60	0.069
23.50	0.067	9,246	158.60	0.068
24.00	0.066	9,246	158.60	0.066
24.50	0.000	9,213	158.60	0.004
25.00	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	9,211	158.60	0.000
26.00	0.000	9,211	158.60	0.000
26.50	0.000	9,211	158.60	0.000
27.00	0.000	9,211	158.60	0.000
27.50	0.000	9,211	158.60	0.000
28.00	0.000	9,211	158.60	0.000
28.50	0.000	9,211	158.60	0.000
29.00	0.000	9,211	158.60	0.000
29.50	0.000	9,211	158.60	0.000
30.00	0.000	9,211	158.60	0.000
30.50	0.000	9,211	158.60	0.000
31.00	0.000	9,211	158.60	0.000
31.50	0.000	9,211	158.60	0.000
32.00	0.000	9,211	158.60	0.000
32.50	0.000	9,211	158.60	0.000
33.00	0.000	9,211	158.60	0.000
33.50	0.000	9,211	158.60	0.000
34.00	0.000	9,211	158.60	0.000
34.50	0.000	9,211	158.60	0.000
35.00	0.000	9,211	158.60	0.000
35.50	0.000	9,211	158.60	0.000
36.00	0.000	9,211	158.60	0.000
36.50	0.000	9,211	158.60	0.000
37.00	0.000	9,211	158.60	0.000
37.50	0.000	9,211	158.60	0.000
38.00	0.000	9,211	158.60	0.000
38.50	0.000	9,211	158.60	0.000
39.00	0.000	9,211	158.60	0.000
39.50	0.000	9,211	158.60	0.000
40.00	0.000	9,211	158.60	0.000
40.50	0.000	9,211	158.60	0.000
41.00	0.000	9,211	158.60	0.000
41.50	0.000	9,211	158.60	0.000
42.00	0.000	9,211	158.60	0.000
42.50	0.000	9,211	158.60	0.000
43.00	0.000	9,211	158.60	0.000
43.50	0.000	9,211	158.60	0.000
44.00	0.000	9,211	158.60	0.000
44.50	0.000	9,211	158.60	0.000
45.00	0.000	9,211	158.60	0.000
45.50	0.000	9,211	158.60	0.000
46.00	0.000	9,211	158.60	0.000
46.50	0.000	9,211	158.60	0.000
47.00	0.000	9,211	158.60	0.000
47.50	0.000	9,211	158.60	0.000
48.00	0.000	9,211	158.60	0.000
48.50	0.000	9,211	158.60	0.000
49.00	0.000	9,211	158.60	0.000
49.50	0.000	9,211	158.60	0.000
50.00	0.000	9,211	158.60	0.000
50.50	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	9,211	158.60	0.000
51.50	0.000	9,211	158.60	0.000
52.00	0.000	9,211	158.60	0.000
52.50	0.000	9,211	158.60	0.000
53.00	0.000	9,211	158.60	0.000
53.50	0.000	9,211	158.60	0.000
54.00	0.000	9,211	158.60	0.000
54.50	0.000	9,211	158.60	0.000
55.00	0.000	9,211	158.60	0.000
55.50	0.000	9,211	158.60	0.000
56.00	0.000	9,211	158.60	0.000
56.50	0.000	9,211	158.60	0.000
57.00	0.000	9,211	158.60	0.000
57.50	0.000	9,211	158.60	0.000
58.00	0.000	9,211	158.60	0.000
58.50	0.000	9,211	158.60	0.000
59.00	0.000	9,211	158.60	0.000
59.50	0.000	9,211	158.60	0.000
60.00	0.000	9,211	158.60	0.000
60.50	0.000	9,211	158.60	0.000
61.00	0.000	9,211	158.60	0.000
61.50	0.000	9,211	158.60	0.000
62.00	0.000	9,211	158.60	0.000
62.50	0.000	9,211	158.60	0.000
63.00	0.000	9,211	158.60	0.000
63.50	0.000	9,211	158.60	0.000
64.00	0.000	9,211	158.60	0.000
64.50	0.000	9,211	158.60	0.000
65.00	0.000	9,211	158.60	0.000
65.50	0.000	9,211	158.60	0.000
66.00	0.000	9,211	158.60	0.000
66.50	0.000	9,211	158.60	0.000
67.00	0.000	9,211	158.60	0.000
67.50	0.000	9,211	158.60	0.000
68.00	0.000	9,211	158.60	0.000
68.50	0.000	9,211	158.60	0.000
69.00	0.000	9,211	158.60	0.000
69.50	0.000	9,211	158.60	0.000
70.00	0.000	9,211	158.60	0.000
70.50	0.000	9,211	158.60	0.000
71.00	0.000	9,211	158.60	0.000
71.50	0.000	9,211	158.60	0.000
72.00	0.000	9,211	158.60	0.000
72.50	0.000	9,211	158.60	0.000
73.00	0.000	9,211	158.60	0.000
73.50	0.000	9,211	158.60	0.000
74.00	0.000	9,211	158.60	0.000
74.50	0.000	9,211	158.60	0.000
75.00	0.000	9,211	158.60	0.000
75.50	0.000	9,211	158.60	0.000
76.00	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	9,211	158.60	0.000
77.00	0.000	9,211	158.60	0.000
77.50	0.000	9,211	158.60	0.000
78.00	0.000	9,211	158.60	0.000
78.50	0.000	9,211	158.60	0.000
79.00	0.000	9,211	158.60	0.000
79.50	0.000	9,211	158.60	0.000
80.00	0.000	9,211	158.60	0.000
80.50	0.000	9,211	158.60	0.000
81.00	0.000	9,211	158.60	0.000
81.50	0.000	9,211	158.60	0.000
82.00	0.000	9,211	158.60	0.000
82.50	0.000	9,211	158.60	0.000
83.00	0.000	9,211	158.60	0.000
83.50	0.000	9,211	158.60	0.000
84.00	0.000	9,211	158.60	0.000
84.50	0.000	9,211	158.60	0.000
85.00	0.000	9,211	158.60	0.000
85.50	0.000	9,211	158.60	0.000
86.00	0.000	9,211	158.60	0.000
86.50	0.000	9,211	158.60	0.000
87.00	0.000	9,211	158.60	0.000
87.50	0.000	9,211	158.60	0.000
88.00	0.000	9,211	158.60	0.000
88.50	0.000	9,211	158.60	0.000
89.00	0.000	9,211	158.60	0.000
89.50	0.000	9,211	158.60	0.000
90.00	0.000	9,211	158.60	0.000
90.50	0.000	9,211	158.60	0.000
91.00	0.000	9,211	158.60	0.000
91.50	0.000	9,211	158.60	0.000
92.00	0.000	9,211	158.60	0.000
92.50	0.000	9,211	158.60	0.000
93.00	0.000	9,211	158.60	0.000
93.50	0.000	9,211	158.60	0.000
94.00	0.000	9,211	158.60	0.000
94.50	0.000	9,211	158.60	0.000
95.00	0.000	9,211	158.60	0.000
95.50	0.000	9,211	158.60	0.000
96.00	0.000	9,211	158.60	0.000
96.50	0.000	9,211	158.60	0.000
97.00	0.000	9,211	158.60	0.000
97.50	0.000	9,211	158.60	0.000
98.00	0.000	9,211	158.60	0.000
98.50	0.000	9,211	158.60	0.000
99.00	0.000	9,211	158.60	0.000
99.50	0.000	9,211	158.60	0.000
100.00	0.000	9,211	158.60	0.000
100.50	0.000	9,211	158.60	0.000
101.00	0.000	9,211	158.60	0.000
101.50	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	9,211	158.60	0.000
102.50	0.000	9,211	158.60	0.000
103.00	0.000	9,211	158.60	0.000
103.50	0.000	9,211	158.60	0.000
104.00	0.000	9,211	158.60	0.000
104.50	0.000	9,211	158.60	0.000
105.00	0.000	9,211	158.60	0.000
105.50	0.000	9,211	158.60	0.000
106.00	0.000	9,211	158.60	0.000
106.50	0.000	9,211	158.60	0.000
107.00	0.000	9,211	158.60	0.000
107.50	0.000	9,211	158.60	0.000
108.00	0.000	9,211	158.60	0.000
108.50	0.000	9,211	158.60	0.000
109.00	0.000	9,211	158.60	0.000
109.50	0.000	9,211	158.60	0.000
110.00	0.000	9,211	158.60	0.000
110.50	0.000	9,211	158.60	0.000
111.00	0.000	9,211	158.60	0.000
111.50	0.000	9,211	158.60	0.000
112.00	0.000	9,211	158.60	0.000
112.50	0.000	9,211	158.60	0.000
113.00	0.000	9,211	158.60	0.000
113.50	0.000	9,211	158.60	0.000
114.00	0.000	9,211	158.60	0.000
114.50	0.000	9,211	158.60	0.000
115.00	0.000	9,211	158.60	0.000
115.50	0.000	9,211	158.60	0.000
116.00	0.000	9,211	158.60	0.000
116.50	0.000	9,211	158.60	0.000
117.00	0.000	9,211	158.60	0.000
117.50	0.000	9,211	158.60	0.000
118.00	0.000	9,211	158.60	0.000
118.50	0.000	9,211	158.60	0.000
119.00	0.000	9,211	158.60	0.000
119.50	0.000	9,211	158.60	0.000
120.00	0.000	9,211	158.60	0.000
120.50	0.000	9,211	158.60	0.000
121.00	0.000	9,211	158.60	0.000
121.50	0.000	9,211	158.60	0.000
122.00	0.000	9,211	158.60	0.000
122.50	0.000	9,211	158.60	0.000
123.00	0.000	9,211	158.60	0.000
123.50	0.000	9,211	158.60	0.000
124.00	0.000	9,211	158.60	0.000
124.50	0.000	9,211	158.60	0.000
125.00	0.000	9,211	158.60	0.000
125.50	0.000	9,211	158.60	0.000
126.00	0.000	9,211	158.60	0.000
126.50	0.000	9,211	158.60	0.000
127.00	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	9,211	158.60	0.000
128.00	0.000	9,211	158.60	0.000
128.50	0.000	9,211	158.60	0.000
129.00	0.000	9,211	158.60	0.000
129.50	0.000	9,211	158.60	0.000
130.00	0.000	9,211	158.60	0.000
130.50	0.000	9,211	158.60	0.000
131.00	0.000	9,211	158.60	0.000
131.50	0.000	9,211	158.60	0.000
132.00	0.000	9,211	158.60	0.000
132.50	0.000	9,211	158.60	0.000
133.00	0.000	9,211	158.60	0.000
133.50	0.000	9,211	158.60	0.000
134.00	0.000	9,211	158.60	0.000
134.50	0.000	9,211	158.60	0.000
135.00	0.000	9,211	158.60	0.000
135.50	0.000	9,211	158.60	0.000
136.00	0.000	9,211	158.60	0.000
136.50	0.000	9,211	158.60	0.000
137.00	0.000	9,211	158.60	0.000
137.50	0.000	9,211	158.60	0.000
138.00	0.000	9,211	158.60	0.000
138.50	0.000	9,211	158.60	0.000
139.00	0.000	9,211	158.60	0.000
139.50	0.000	9,211	158.60	0.000
140.00	0.000	9,211	158.60	0.000
140.50	0.000	9,211	158.60	0.000
141.00	0.000	9,211	158.60	0.000
141.50	0.000	9,211	158.60	0.000
142.00	0.000	9,211	158.60	0.000
142.50	0.000	9,211	158.60	0.000
143.00	0.000	9,211	158.60	0.000
143.50	0.000	9,211	158.60	0.000
144.00	0.000	9,211	158.60	0.000
144.50	0.000	9,211	158.60	0.000
145.00	0.000	9,211	158.60	0.000
145.50	0.000	9,211	158.60	0.000
146.00	0.000	9,211	158.60	0.000
146.50	0.000	9,211	158.60	0.000
147.00	0.000	9,211	158.60	0.000
147.50	0.000	9,211	158.60	0.000
148.00	0.000	9,211	158.60	0.000
148.50	0.000	9,211	158.60	0.000
149.00	0.000	9,211	158.60	0.000
149.50	0.000	9,211	158.60	0.000
150.00	0.000	9,211	158.60	0.000
150.50	0.000	9,211	158.60	0.000
151.00	0.000	9,211	158.60	0.000
151.50	0.000	9,211	158.60	0.000
152.00	0.000	9,211	158.60	0.000
152.50	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	9,211	158.60	0.000
153.50	0.000	9,211	158.60	0.000
154.00	0.000	9,211	158.60	0.000
154.50	0.000	9,211	158.60	0.000
155.00	0.000	9,211	158.60	0.000
155.50	0.000	9,211	158.60	0.000
156.00	0.000	9,211	158.60	0.000
156.50	0.000	9,211	158.60	0.000
157.00	0.000	9,211	158.60	0.000
157.50	0.000	9,211	158.60	0.000
158.00	0.000	9,211	158.60	0.000
158.50	0.000	9,211	158.60	0.000
159.00	0.000	9,211	158.60	0.000
159.50	0.000	9,211	158.60	0.000
160.00	0.000	9,211	158.60	0.000
160.50	0.000	9,211	158.60	0.000
161.00	0.000	9,211	158.60	0.000
161.50	0.000	9,211	158.60	0.000
162.00	0.000	9,211	158.60	0.000
162.50	0.000	9,211	158.60	0.000
163.00	0.000	9,211	158.60	0.000
163.50	0.000	9,211	158.60	0.000
164.00	0.000	9,211	158.60	0.000
164.50	0.000	9,211	158.60	0.000
165.00	0.000	9,211	158.60	0.000
165.50	0.000	9,211	158.60	0.000
166.00	0.000	9,211	158.60	0.000
166.50	0.000	9,211	158.60	0.000
167.00	0.000	9,211	158.60	0.000
167.50	0.000	9,211	158.60	0.000
168.00	0.000	9,211	158.60	0.000

Summary for Pond 3P: UG2

Inflow Area = 21,562 sf, 86.06% Impervious, Inflow Depth = 2.62" for 2-yr event
Inflow = 2.040 cfs @ 11.96 hrs, Volume= 4,712 cf
Outflow = 0.532 cfs @ 12.08 hrs, Volume= 4,712 cf, Atten= 74%, Lag= 7.5 min
Primary = 0.532 cfs @ 12.08 hrs, Volume= 4,712 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 160.35' @ 12.08 hrs Surf.Area= 2,542 sf Storage= 1,741 cf

Plug-Flow detention time= 70.5 min calculated for 4,712 cf (100% of inflow)
Center-of-Mass det. time= 70.6 min (821.7 - 751.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.532 cfs @ 12.08 hrs HW=160.35' TW=158.60' (Fixed TW Elev= 158.60')
└─**4=Culvert** (Passes 0.532 cfs of 3.355 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.230 cfs @ 4.685 fps)
  ├─**2=Orifice/Grate** (Orifice Controls 0.302 cfs @ 2.415 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.001	1	159.28	0.000
2.00	0.004	5	159.28	0.000
2.50	0.006	13	159.29	0.001
3.00	0.008	24	159.30	0.001
3.50	0.010	36	159.32	0.003
4.00	0.011	48	159.33	0.005
4.50	0.013	60	159.34	0.007
5.00	0.015	70	159.35	0.010
5.50	0.017	79	159.36	0.012
6.00	0.019	87	159.37	0.015
6.50	0.021	94	159.37	0.017
7.00	0.023	101	159.38	0.020
7.50	0.025	107	159.38	0.022
8.00	0.027	112	159.39	0.024
8.50	0.033	120	159.40	0.027
9.00	0.039	132	159.41	0.032
9.50	0.041	144	159.42	0.037
10.00	0.051	155	159.43	0.042
10.50	0.066	176	159.45	0.052
11.00	0.092	212	159.49	0.068
11.50	**0.153**	285	159.56	0.093
12.00	**1.685**	**1,586**	**160.28**	**0.473**
12.50	0.146	**1,393**	**160.19**	**0.372**
13.00	0.091	1,082	160.04	0.221
13.50	0.069	881	159.95	0.174
14.00	0.054	690	159.86	0.160
14.50	0.048	506	159.78	0.144
15.00	0.043	357	159.63	0.112
15.50	0.038	254	159.53	0.084
16.00	0.033	191	159.47	0.058
16.50	0.031	158	159.44	0.043
17.00	0.029	142	159.42	0.036
17.50	0.027	132	159.41	0.032
18.00	0.026	125	159.40	0.029
18.50	0.024	120	159.40	0.027
19.00	0.022	115	159.39	0.025
19.50	0.020	110	159.39	0.023
20.00	0.019	105	159.38	0.021
20.50	0.018	101	159.38	0.020
21.00	0.018	98	159.38	0.019
21.50	0.017	97	159.37	0.018
22.00	0.017	95	159.37	0.018
22.50	0.017	94	159.37	0.017
23.00	0.016	93	159.37	0.017
23.50	0.016	92	159.37	0.016
24.00	0.016	91	159.37	0.016
24.50	0.000	71	159.35	0.010
25.00	0.000	56	159.34	0.006

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	46	159.33	0.005
26.00	0.000	39	159.32	0.003
26.50	0.000	33	159.31	0.003
27.00	0.000	29	159.31	0.002
27.50	0.000	26	159.31	0.002
28.00	0.000	24	159.30	0.001
28.50	0.000	21	159.30	0.001
29.00	0.000	19	159.30	0.001
29.50	0.000	17	159.30	0.001
30.00	0.000	16	159.30	0.001
30.50	0.000	14	159.29	0.001
31.00	0.000	13	159.29	0.001
31.50	0.000	11	159.29	0.001
32.00	0.000	10	159.29	0.001
32.50	0.000	9	159.29	0.001
33.00	0.000	8	159.29	0.000
33.50	0.000	7	159.29	0.000
34.00	0.000	7	159.29	0.000
34.50	0.000	6	159.29	0.000
35.00	0.000	5	159.29	0.000
35.50	0.000	5	159.28	0.000
36.00	0.000	4	159.28	0.000
36.50	0.000	4	159.28	0.000
37.00	0.000	4	159.28	0.000
37.50	0.000	3	159.28	0.000
38.00	0.000	3	159.28	0.000
38.50	0.000	3	159.28	0.000
39.00	0.000	2	159.28	0.000
39.50	0.000	2	159.28	0.000
40.00	0.000	2	159.28	0.000
40.50	0.000	2	159.28	0.000
41.00	0.000	2	159.28	0.000
41.50	0.000	1	159.28	0.000
42.00	0.000	1	159.28	0.000
42.50	0.000	1	159.28	0.000
43.00	0.000	1	159.28	0.000
43.50	0.000	1	159.28	0.000
44.00	0.000	1	159.28	0.000
44.50	0.000	1	159.28	0.000
45.00	0.000	1	159.28	0.000
45.50	0.000	1	159.28	0.000
46.00	0.000	1	159.28	0.000
46.50	0.000	0	159.28	0.000
47.00	0.000	0	159.28	0.000
47.50	0.000	0	159.28	0.000
48.00	0.000	0	159.28	0.000
48.50	0.000	0	159.28	0.000
49.00	0.000	0	159.28	0.000
49.50	0.000	0	159.28	0.000
50.00	0.000	0	159.28	0.000
50.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	0	159.28	0.000
51.50	0.000	0	159.28	0.000
52.00	0.000	0	159.28	0.000
52.50	0.000	0	159.28	0.000
53.00	0.000	0	159.28	0.000
53.50	0.000	0	159.28	0.000
54.00	0.000	0	159.28	0.000
54.50	0.000	0	159.28	0.000
55.00	0.000	0	159.28	0.000
55.50	0.000	0	159.28	0.000
56.00	0.000	0	159.28	0.000
56.50	0.000	0	159.28	0.000
57.00	0.000	0	159.28	0.000
57.50	0.000	0	159.28	0.000
58.00	0.000	0	159.28	0.000
58.50	0.000	0	159.28	0.000
59.00	0.000	0	159.28	0.000
59.50	0.000	0	159.28	0.000
60.00	0.000	0	159.28	0.000
60.50	0.000	0	159.28	0.000
61.00	0.000	0	159.28	0.000
61.50	0.000	0	159.28	0.000
62.00	0.000	0	159.28	0.000
62.50	0.000	0	159.28	0.000
63.00	0.000	0	159.28	0.000
63.50	0.000	0	159.28	0.000
64.00	0.000	0	159.28	0.000
64.50	0.000	0	159.28	0.000
65.00	0.000	0	159.28	0.000
65.50	0.000	0	159.28	0.000
66.00	0.000	0	159.28	0.000
66.50	0.000	0	159.28	0.000
67.00	0.000	0	159.28	0.000
67.50	0.000	0	159.28	0.000
68.00	0.000	0	159.28	0.000
68.50	0.000	0	159.28	0.000
69.00	0.000	0	159.28	0.000
69.50	0.000	0	159.28	0.000
70.00	0.000	0	159.28	0.000
70.50	0.000	0	159.28	0.000
71.00	0.000	0	159.28	0.000
71.50	0.000	0	159.28	0.000
72.00	0.000	0	159.28	0.000
72.50	0.000	0	159.28	0.000
73.00	0.000	0	159.28	0.000
73.50	0.000	0	159.28	0.000
74.00	0.000	0	159.28	0.000
74.50	0.000	0	159.28	0.000
75.00	0.000	0	159.28	0.000
75.50	0.000	0	159.28	0.000
76.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	0	159.28	0.000
77.00	0.000	0	159.28	0.000
77.50	0.000	0	159.28	0.000
78.00	0.000	0	159.28	0.000
78.50	0.000	0	159.28	0.000
79.00	0.000	0	159.28	0.000
79.50	0.000	0	159.28	0.000
80.00	0.000	0	159.28	0.000
80.50	0.000	0	159.28	0.000
81.00	0.000	0	159.28	0.000
81.50	0.000	0	159.28	0.000
82.00	0.000	0	159.28	0.000
82.50	0.000	0	159.28	0.000
83.00	0.000	0	159.28	0.000
83.50	0.000	0	159.28	0.000
84.00	0.000	0	159.28	0.000
84.50	0.000	0	159.28	0.000
85.00	0.000	0	159.28	0.000
85.50	0.000	0	159.28	0.000
86.00	0.000	0	159.28	0.000
86.50	0.000	0	159.28	0.000
87.00	0.000	0	159.28	0.000
87.50	0.000	0	159.28	0.000
88.00	0.000	0	159.28	0.000
88.50	0.000	0	159.28	0.000
89.00	0.000	0	159.28	0.000
89.50	0.000	0	159.28	0.000
90.00	0.000	0	159.28	0.000
90.50	0.000	0	159.28	0.000
91.00	0.000	0	159.28	0.000
91.50	0.000	0	159.28	0.000
92.00	0.000	0	159.28	0.000
92.50	0.000	0	159.28	0.000
93.00	0.000	0	159.28	0.000
93.50	0.000	0	159.28	0.000
94.00	0.000	0	159.28	0.000
94.50	0.000	0	159.28	0.000
95.00	0.000	0	159.28	0.000
95.50	0.000	0	159.28	0.000
96.00	0.000	0	159.28	0.000
96.50	0.000	0	159.28	0.000
97.00	0.000	0	159.28	0.000
97.50	0.000	0	159.28	0.000
98.00	0.000	0	159.28	0.000
98.50	0.000	0	159.28	0.000
99.00	0.000	0	159.28	0.000
99.50	0.000	0	159.28	0.000
100.00	0.000	0	159.28	0.000
100.50	0.000	0	159.28	0.000
101.00	0.000	0	159.28	0.000
101.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

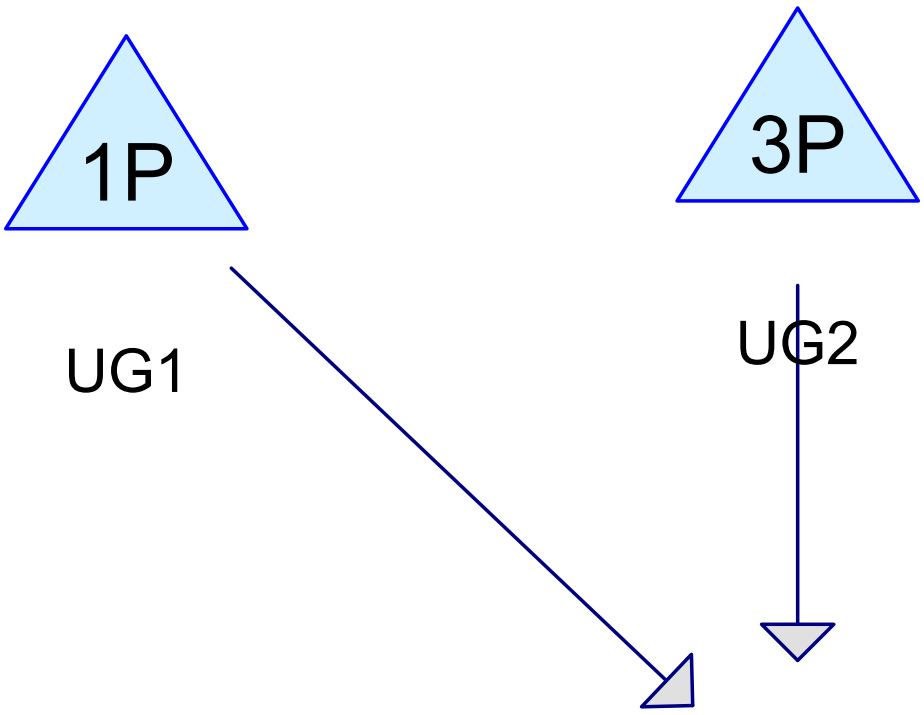
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	0	159.28	0.000
102.50	0.000	0	159.28	0.000
103.00	0.000	0	159.28	0.000
103.50	0.000	0	159.28	0.000
104.00	0.000	0	159.28	0.000
104.50	0.000	0	159.28	0.000
105.00	0.000	0	159.28	0.000
105.50	0.000	0	159.28	0.000
106.00	0.000	0	159.28	0.000
106.50	0.000	0	159.28	0.000
107.00	0.000	0	159.28	0.000
107.50	0.000	0	159.28	0.000
108.00	0.000	0	159.28	0.000
108.50	0.000	0	159.28	0.000
109.00	0.000	0	159.28	0.000
109.50	0.000	0	159.28	0.000
110.00	0.000	0	159.28	0.000
110.50	0.000	0	159.28	0.000
111.00	0.000	0	159.28	0.000
111.50	0.000	0	159.28	0.000
112.00	0.000	0	159.28	0.000
112.50	0.000	0	159.28	0.000
113.00	0.000	0	159.28	0.000
113.50	0.000	0	159.28	0.000
114.00	0.000	0	159.28	0.000
114.50	0.000	0	159.28	0.000
115.00	0.000	0	159.28	0.000
115.50	0.000	0	159.28	0.000
116.00	0.000	0	159.28	0.000
116.50	0.000	0	159.28	0.000
117.00	0.000	0	159.28	0.000
117.50	0.000	0	159.28	0.000
118.00	0.000	0	159.28	0.000
118.50	0.000	0	159.28	0.000
119.00	0.000	0	159.28	0.000
119.50	0.000	0	159.28	0.000
120.00	0.000	0	159.28	0.000
120.50	0.000	0	159.28	0.000
121.00	0.000	0	159.28	0.000
121.50	0.000	0	159.28	0.000
122.00	0.000	0	159.28	0.000
122.50	0.000	0	159.28	0.000
123.00	0.000	0	159.28	0.000
123.50	0.000	0	159.28	0.000
124.00	0.000	0	159.28	0.000
124.50	0.000	0	159.28	0.000
125.00	0.000	0	159.28	0.000
125.50	0.000	0	159.28	0.000
126.00	0.000	0	159.28	0.000
126.50	0.000	0	159.28	0.000
127.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	0	159.28	0.000
128.00	0.000	0	159.28	0.000
128.50	0.000	0	159.28	0.000
129.00	0.000	0	159.28	0.000
129.50	0.000	0	159.28	0.000
130.00	0.000	0	159.28	0.000
130.50	0.000	0	159.28	0.000
131.00	0.000	0	159.28	0.000
131.50	0.000	0	159.28	0.000
132.00	0.000	0	159.28	0.000
132.50	0.000	0	159.28	0.000
133.00	0.000	0	159.28	0.000
133.50	0.000	0	159.28	0.000
134.00	0.000	0	159.28	0.000
134.50	0.000	0	159.28	0.000
135.00	0.000	0	159.28	0.000
135.50	0.000	0	159.28	0.000
136.00	0.000	0	159.28	0.000
136.50	0.000	0	159.28	0.000
137.00	0.000	0	159.28	0.000
137.50	0.000	0	159.28	0.000
138.00	0.000	0	159.28	0.000
138.50	0.000	0	159.28	0.000
139.00	0.000	0	159.28	0.000
139.50	0.000	0	159.28	0.000
140.00	0.000	0	159.28	0.000
140.50	0.000	0	159.28	0.000
141.00	0.000	0	159.28	0.000
141.50	0.000	0	159.28	0.000
142.00	0.000	0	159.28	0.000
142.50	0.000	0	159.28	0.000
143.00	0.000	0	159.28	0.000
143.50	0.000	0	159.28	0.000
144.00	0.000	0	159.28	0.000
144.50	0.000	0	159.28	0.000
145.00	0.000	0	159.28	0.000
145.50	0.000	0	159.28	0.000
146.00	0.000	0	159.28	0.000
146.50	0.000	0	159.28	0.000
147.00	0.000	0	159.28	0.000
147.50	0.000	0	159.28	0.000
148.00	0.000	0	159.28	0.000
148.50	0.000	0	159.28	0.000
149.00	0.000	0	159.28	0.000
149.50	0.000	0	159.28	0.000
150.00	0.000	0	159.28	0.000
150.50	0.000	0	159.28	0.000
151.00	0.000	0	159.28	0.000
151.50	0.000	0	159.28	0.000
152.00	0.000	0	159.28	0.000
152.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	0	159.28	0.000
153.50	0.000	0	159.28	0.000
154.00	0.000	0	159.28	0.000
154.50	0.000	0	159.28	0.000
155.00	0.000	0	159.28	0.000
155.50	0.000	0	159.28	0.000
156.00	0.000	0	159.28	0.000
156.50	0.000	0	159.28	0.000
157.00	0.000	0	159.28	0.000
157.50	0.000	0	159.28	0.000
158.00	0.000	0	159.28	0.000
158.50	0.000	0	159.28	0.000
159.00	0.000	0	159.28	0.000
159.50	0.000	0	159.28	0.000
160.00	0.000	0	159.28	0.000
160.50	0.000	0	159.28	0.000
161.00	0.000	0	159.28	0.000
161.50	0.000	0	159.28	0.000
162.00	0.000	0	159.28	0.000
162.50	0.000	0	159.28	0.000
163.00	0.000	0	159.28	0.000
163.50	0.000	0	159.28	0.000
164.00	0.000	0	159.28	0.000
164.50	0.000	0	159.28	0.000
165.00	0.000	0	159.28	0.000
165.50	0.000	0	159.28	0.000
166.00	0.000	0	159.28	0.000
166.50	0.000	0	159.28	0.000
167.00	0.000	0	159.28	0.000
167.50	0.000	0	159.28	0.000
168.00	0.000	0	159.28	0.000



Subcat Reach Pond Link

Routing Diagram for BMW_2025-4-23
Prepared by Bohler, Printed 4/23/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	5-yr	Type II 24-hr		Default	24.00	1	4.13	2

Summary for Pond 1P: UG1

Inflow Area = 81,327 sf, 96.79% Impervious, Inflow Depth = 3.77" for 5-yr event
Inflow = 10.939 cfs @ 11.96 hrs, Volume= 25,561 cf
Outflow = 0.355 cfs @ 13.57 hrs, Volume= 5,814 cf, Atten= 97%, Lag= 96.7 min
Primary = 0.355 cfs @ 13.57 hrs, Volume= 5,814 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 159.61' @ 13.57 hrs Surf.Area= 13,041 sf Storage= 19,849 cf

Plug-Flow detention time= 532.0 min calculated for 5,814 cf (23% of inflow)
Center-of-Mass det. time= 297.8 min (1,044.4 - 746.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.393 cfs @ 13.57 hrs HW=159.61' TW=159.60' (Fixed TW Elev= 159.60')
└─**4=Culvert** (Passes 0.393 cfs of 0.755 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.003 cfs @ 0.502 fps)
  ├─**2=Orifice/Grate** (Orifice Controls 0.391 cfs @ 0.502 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.016	14	157.53	0.000
2.00	0.030	56	157.54	0.000
2.50	0.042	121	157.55	0.000
3.00	0.053	207	157.57	0.000
3.50	0.062	310	157.59	0.000
4.00	0.071	430	157.61	0.000
4.50	0.081	566	157.64	0.000
5.00	0.091	720	157.67	0.000
5.50	0.101	893	157.70	0.000
6.00	0.111	1,083	157.74	0.000
6.50	0.120	1,291	157.78	0.000
7.00	0.130	1,517	157.82	0.000
7.50	0.139	1,759	157.87	0.000
8.00	0.148	2,018	157.92	0.000
8.50	0.181	2,311	157.97	0.000
9.00	0.218	2,669	158.04	0.000
9.50	0.226	3,073	158.07	0.000
10.00	0.277	3,519	158.11	0.000
10.50	0.361	4,090	158.16	0.000
11.00	0.501	4,859	158.22	0.000
11.50	**0.826**	6,030	158.32	0.000
12.00	**9.030**	14,672	159.10	0.000
12.50	0.784	18,186	159.44	0.000
13.00	0.487	19,257	159.55	0.000
13.50	0.369	**19,846**	**159.61**	**0.348**
14.00	0.289	**19,833**	**159.61**	**0.301**
14.50	0.256	19,821	159.61	0.260
15.00	0.229	19,814	159.61	0.234
15.50	0.203	19,806	159.61	0.207
16.00	0.177	19,798	159.61	0.181
16.50	0.165	19,794	159.61	0.167
17.00	0.156	19,792	159.60	0.157
17.50	0.146	19,789	159.60	0.148
18.00	0.137	19,786	159.60	0.138
18.50	0.128	19,783	159.60	0.129
19.00	0.118	19,781	159.60	0.120
19.50	0.109	19,778	159.60	0.110
20.00	0.099	19,775	159.60	0.101
20.50	0.096	19,774	159.60	0.097
21.00	0.094	19,774	159.60	0.095
21.50	0.093	19,773	159.60	0.093
22.00	0.091	19,772	159.60	0.091
22.50	0.089	19,772	159.60	0.089
23.00	0.087	19,771	159.60	0.087
23.50	0.085	19,771	159.60	0.085
24.00	0.083	19,770	159.60	0.083
24.50	0.000	19,746	159.60	0.000
25.00	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	19,746	159.60	0.000
26.00	0.000	19,746	159.60	0.000
26.50	0.000	19,746	159.60	0.000
27.00	0.000	19,746	159.60	0.000
27.50	0.000	19,746	159.60	0.000
28.00	0.000	19,746	159.60	0.000
28.50	0.000	19,746	159.60	0.000
29.00	0.000	19,746	159.60	0.000
29.50	0.000	19,746	159.60	0.000
30.00	0.000	19,746	159.60	0.000
30.50	0.000	19,746	159.60	0.000
31.00	0.000	19,746	159.60	0.000
31.50	0.000	19,746	159.60	0.000
32.00	0.000	19,746	159.60	0.000
32.50	0.000	19,746	159.60	0.000
33.00	0.000	19,746	159.60	0.000
33.50	0.000	19,746	159.60	0.000
34.00	0.000	19,746	159.60	0.000
34.50	0.000	19,746	159.60	0.000
35.00	0.000	19,746	159.60	0.000
35.50	0.000	19,746	159.60	0.000
36.00	0.000	19,746	159.60	0.000
36.50	0.000	19,746	159.60	0.000
37.00	0.000	19,746	159.60	0.000
37.50	0.000	19,746	159.60	0.000
38.00	0.000	19,746	159.60	0.000
38.50	0.000	19,746	159.60	0.000
39.00	0.000	19,746	159.60	0.000
39.50	0.000	19,746	159.60	0.000
40.00	0.000	19,746	159.60	0.000
40.50	0.000	19,746	159.60	0.000
41.00	0.000	19,746	159.60	0.000
41.50	0.000	19,746	159.60	0.000
42.00	0.000	19,746	159.60	0.000
42.50	0.000	19,746	159.60	0.000
43.00	0.000	19,746	159.60	0.000
43.50	0.000	19,746	159.60	0.000
44.00	0.000	19,746	159.60	0.000
44.50	0.000	19,746	159.60	0.000
45.00	0.000	19,746	159.60	0.000
45.50	0.000	19,746	159.60	0.000
46.00	0.000	19,746	159.60	0.000
46.50	0.000	19,746	159.60	0.000
47.00	0.000	19,746	159.60	0.000
47.50	0.000	19,746	159.60	0.000
48.00	0.000	19,746	159.60	0.000
48.50	0.000	19,746	159.60	0.000
49.00	0.000	19,746	159.60	0.000
49.50	0.000	19,746	159.60	0.000
50.00	0.000	19,746	159.60	0.000
50.50	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	19,746	159.60	0.000
51.50	0.000	19,746	159.60	0.000
52.00	0.000	19,746	159.60	0.000
52.50	0.000	19,746	159.60	0.000
53.00	0.000	19,746	159.60	0.000
53.50	0.000	19,746	159.60	0.000
54.00	0.000	19,746	159.60	0.000
54.50	0.000	19,746	159.60	0.000
55.00	0.000	19,746	159.60	0.000
55.50	0.000	19,746	159.60	0.000
56.00	0.000	19,746	159.60	0.000
56.50	0.000	19,746	159.60	0.000
57.00	0.000	19,746	159.60	0.000
57.50	0.000	19,746	159.60	0.000
58.00	0.000	19,746	159.60	0.000
58.50	0.000	19,746	159.60	0.000
59.00	0.000	19,746	159.60	0.000
59.50	0.000	19,746	159.60	0.000
60.00	0.000	19,746	159.60	0.000
60.50	0.000	19,746	159.60	0.000
61.00	0.000	19,746	159.60	0.000
61.50	0.000	19,746	159.60	0.000
62.00	0.000	19,746	159.60	0.000
62.50	0.000	19,746	159.60	0.000
63.00	0.000	19,746	159.60	0.000
63.50	0.000	19,746	159.60	0.000
64.00	0.000	19,746	159.60	0.000
64.50	0.000	19,746	159.60	0.000
65.00	0.000	19,746	159.60	0.000
65.50	0.000	19,746	159.60	0.000
66.00	0.000	19,746	159.60	0.000
66.50	0.000	19,746	159.60	0.000
67.00	0.000	19,746	159.60	0.000
67.50	0.000	19,746	159.60	0.000
68.00	0.000	19,746	159.60	0.000
68.50	0.000	19,746	159.60	0.000
69.00	0.000	19,746	159.60	0.000
69.50	0.000	19,746	159.60	0.000
70.00	0.000	19,746	159.60	0.000
70.50	0.000	19,746	159.60	0.000
71.00	0.000	19,746	159.60	0.000
71.50	0.000	19,746	159.60	0.000
72.00	0.000	19,746	159.60	0.000
72.50	0.000	19,746	159.60	0.000
73.00	0.000	19,746	159.60	0.000
73.50	0.000	19,746	159.60	0.000
74.00	0.000	19,746	159.60	0.000
74.50	0.000	19,746	159.60	0.000
75.00	0.000	19,746	159.60	0.000
75.50	0.000	19,746	159.60	0.000
76.00	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	19,746	159.60	0.000
77.00	0.000	19,746	159.60	0.000
77.50	0.000	19,746	159.60	0.000
78.00	0.000	19,746	159.60	0.000
78.50	0.000	19,746	159.60	0.000
79.00	0.000	19,746	159.60	0.000
79.50	0.000	19,746	159.60	0.000
80.00	0.000	19,746	159.60	0.000
80.50	0.000	19,746	159.60	0.000
81.00	0.000	19,746	159.60	0.000
81.50	0.000	19,746	159.60	0.000
82.00	0.000	19,746	159.60	0.000
82.50	0.000	19,746	159.60	0.000
83.00	0.000	19,746	159.60	0.000
83.50	0.000	19,746	159.60	0.000
84.00	0.000	19,746	159.60	0.000
84.50	0.000	19,746	159.60	0.000
85.00	0.000	19,746	159.60	0.000
85.50	0.000	19,746	159.60	0.000
86.00	0.000	19,746	159.60	0.000
86.50	0.000	19,746	159.60	0.000
87.00	0.000	19,746	159.60	0.000
87.50	0.000	19,746	159.60	0.000
88.00	0.000	19,746	159.60	0.000
88.50	0.000	19,746	159.60	0.000
89.00	0.000	19,746	159.60	0.000
89.50	0.000	19,746	159.60	0.000
90.00	0.000	19,746	159.60	0.000
90.50	0.000	19,746	159.60	0.000
91.00	0.000	19,746	159.60	0.000
91.50	0.000	19,746	159.60	0.000
92.00	0.000	19,746	159.60	0.000
92.50	0.000	19,746	159.60	0.000
93.00	0.000	19,746	159.60	0.000
93.50	0.000	19,746	159.60	0.000
94.00	0.000	19,746	159.60	0.000
94.50	0.000	19,746	159.60	0.000
95.00	0.000	19,746	159.60	0.000
95.50	0.000	19,746	159.60	0.000
96.00	0.000	19,746	159.60	0.000
96.50	0.000	19,746	159.60	0.000
97.00	0.000	19,746	159.60	0.000
97.50	0.000	19,746	159.60	0.000
98.00	0.000	19,746	159.60	0.000
98.50	0.000	19,746	159.60	0.000
99.00	0.000	19,746	159.60	0.000
99.50	0.000	19,746	159.60	0.000
100.00	0.000	19,746	159.60	0.000
100.50	0.000	19,746	159.60	0.000
101.00	0.000	19,746	159.60	0.000
101.50	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	19,746	159.60	0.000
102.50	0.000	19,746	159.60	0.000
103.00	0.000	19,746	159.60	0.000
103.50	0.000	19,746	159.60	0.000
104.00	0.000	19,746	159.60	0.000
104.50	0.000	19,746	159.60	0.000
105.00	0.000	19,746	159.60	0.000
105.50	0.000	19,746	159.60	0.000
106.00	0.000	19,746	159.60	0.000
106.50	0.000	19,746	159.60	0.000
107.00	0.000	19,746	159.60	0.000
107.50	0.000	19,746	159.60	0.000
108.00	0.000	19,746	159.60	0.000
108.50	0.000	19,746	159.60	0.000
109.00	0.000	19,746	159.60	0.000
109.50	0.000	19,746	159.60	0.000
110.00	0.000	19,746	159.60	0.000
110.50	0.000	19,746	159.60	0.000
111.00	0.000	19,746	159.60	0.000
111.50	0.000	19,746	159.60	0.000
112.00	0.000	19,746	159.60	0.000
112.50	0.000	19,746	159.60	0.000
113.00	0.000	19,746	159.60	0.000
113.50	0.000	19,746	159.60	0.000
114.00	0.000	19,746	159.60	0.000
114.50	0.000	19,746	159.60	0.000
115.00	0.000	19,746	159.60	0.000
115.50	0.000	19,746	159.60	0.000
116.00	0.000	19,746	159.60	0.000
116.50	0.000	19,746	159.60	0.000
117.00	0.000	19,746	159.60	0.000
117.50	0.000	19,746	159.60	0.000
118.00	0.000	19,746	159.60	0.000
118.50	0.000	19,746	159.60	0.000
119.00	0.000	19,746	159.60	0.000
119.50	0.000	19,746	159.60	0.000
120.00	0.000	19,746	159.60	0.000
120.50	0.000	19,746	159.60	0.000
121.00	0.000	19,746	159.60	0.000
121.50	0.000	19,746	159.60	0.000
122.00	0.000	19,746	159.60	0.000
122.50	0.000	19,746	159.60	0.000
123.00	0.000	19,746	159.60	0.000
123.50	0.000	19,746	159.60	0.000
124.00	0.000	19,746	159.60	0.000
124.50	0.000	19,746	159.60	0.000
125.00	0.000	19,746	159.60	0.000
125.50	0.000	19,746	159.60	0.000
126.00	0.000	19,746	159.60	0.000
126.50	0.000	19,746	159.60	0.000
127.00	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	19,746	159.60	0.000
128.00	0.000	19,746	159.60	0.000
128.50	0.000	19,746	159.60	0.000
129.00	0.000	19,746	159.60	0.000
129.50	0.000	19,746	159.60	0.000
130.00	0.000	19,746	159.60	0.000
130.50	0.000	19,746	159.60	0.000
131.00	0.000	19,746	159.60	0.000
131.50	0.000	19,746	159.60	0.000
132.00	0.000	19,746	159.60	0.000
132.50	0.000	19,746	159.60	0.000
133.00	0.000	19,746	159.60	0.000
133.50	0.000	19,746	159.60	0.000
134.00	0.000	19,746	159.60	0.000
134.50	0.000	19,746	159.60	0.000
135.00	0.000	19,746	159.60	0.000
135.50	0.000	19,746	159.60	0.000
136.00	0.000	19,746	159.60	0.000
136.50	0.000	19,746	159.60	0.000
137.00	0.000	19,746	159.60	0.000
137.50	0.000	19,746	159.60	0.000
138.00	0.000	19,746	159.60	0.000
138.50	0.000	19,746	159.60	0.000
139.00	0.000	19,746	159.60	0.000
139.50	0.000	19,746	159.60	0.000
140.00	0.000	19,746	159.60	0.000
140.50	0.000	19,746	159.60	0.000
141.00	0.000	19,746	159.60	0.000
141.50	0.000	19,746	159.60	0.000
142.00	0.000	19,746	159.60	0.000
142.50	0.000	19,746	159.60	0.000
143.00	0.000	19,746	159.60	0.000
143.50	0.000	19,746	159.60	0.000
144.00	0.000	19,746	159.60	0.000
144.50	0.000	19,746	159.60	0.000
145.00	0.000	19,746	159.60	0.000
145.50	0.000	19,746	159.60	0.000
146.00	0.000	19,746	159.60	0.000
146.50	0.000	19,746	159.60	0.000
147.00	0.000	19,746	159.60	0.000
147.50	0.000	19,746	159.60	0.000
148.00	0.000	19,746	159.60	0.000
148.50	0.000	19,746	159.60	0.000
149.00	0.000	19,746	159.60	0.000
149.50	0.000	19,746	159.60	0.000
150.00	0.000	19,746	159.60	0.000
150.50	0.000	19,746	159.60	0.000
151.00	0.000	19,746	159.60	0.000
151.50	0.000	19,746	159.60	0.000
152.00	0.000	19,746	159.60	0.000
152.50	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	19,746	159.60	0.000
153.50	0.000	19,746	159.60	0.000
154.00	0.000	19,746	159.60	0.000
154.50	0.000	19,746	159.60	0.000
155.00	0.000	19,746	159.60	0.000
155.50	0.000	19,746	159.60	0.000
156.00	0.000	19,746	159.60	0.000
156.50	0.000	19,746	159.60	0.000
157.00	0.000	19,746	159.60	0.000
157.50	0.000	19,746	159.60	0.000
158.00	0.000	19,746	159.60	0.000
158.50	0.000	19,746	159.60	0.000
159.00	0.000	19,746	159.60	0.000
159.50	0.000	19,746	159.60	0.000
160.00	0.000	19,746	159.60	0.000
160.50	0.000	19,746	159.60	0.000
161.00	0.000	19,746	159.60	0.000
161.50	0.000	19,746	159.60	0.000
162.00	0.000	19,746	159.60	0.000
162.50	0.000	19,746	159.60	0.000
163.00	0.000	19,746	159.60	0.000
163.50	0.000	19,746	159.60	0.000
164.00	0.000	19,746	159.60	0.000
164.50	0.000	19,746	159.60	0.000
165.00	0.000	19,746	159.60	0.000
165.50	0.000	19,746	159.60	0.000
166.00	0.000	19,746	159.60	0.000
166.50	0.000	19,746	159.60	0.000
167.00	0.000	19,746	159.60	0.000
167.50	0.000	19,746	159.60	0.000
168.00	0.000	19,746	159.60	0.000

Summary for Pond 3P: UG2

Inflow Area = 21,562 sf, 86.06% Impervious, Inflow Depth = 3.36" for 5-yr event
Inflow = 2.579 cfs @ 11.96 hrs, Volume= 6,038 cf
Outflow = 0.692 cfs @ 12.08 hrs, Volume= 5,713 cf, Atten= 73%, Lag= 7.3 min
Primary = 0.692 cfs @ 12.08 hrs, Volume= 5,713 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 160.65' @ 12.08 hrs Surf.Area= 2,542 sf Storage= 2,363 cf

Plug-Flow detention time= 99.3 min calculated for 5,713 cf (95% of inflow)
Center-of-Mass det. time= 66.9 min (814.3 - 747.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.692 cfs @ 12.08 hrs HW=160.65' TW=159.60' (Fixed TW Elev= 159.60')
└─**4=Culvert** (Passes 0.692 cfs of 5.009 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.243 cfs @ 4.944 fps)
  ├─**2=Orifice/Grate** (Orifice Controls 0.449 cfs @ 3.593 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.004	3	159.28	0.000
2.00	0.007	13	159.29	0.000
2.50	0.010	29	159.31	0.000
3.00	0.012	49	159.33	0.000
3.50	0.015	73	159.35	0.000
4.00	0.017	101	159.38	0.000
4.50	0.019	133	159.41	0.000
5.00	0.021	170	159.45	0.000
5.50	0.024	210	159.49	0.000
6.00	0.026	255	159.53	0.000
6.50	0.028	304	159.58	0.000
7.00	0.031	338	159.61	0.024
7.50	0.033	345	159.62	0.030
8.00	0.035	349	159.62	0.033
8.50	0.043	354	159.63	0.038
9.00	0.051	363	159.64	0.045
9.50	0.053	372	159.65	0.050
10.00	0.065	383	159.66	0.056
10.50	0.085	408	159.68	0.067
11.00	0.118	454	159.73	0.084
11.50	**0.195**	558	159.80	0.106
12.00	**2.129**	**2,174**	**160.56**	**0.641**
12.50	0.185	**1,859**	**160.41**	**0.547**
13.00	0.115	1,336	160.16	0.311
13.50	0.087	1,084	160.04	0.190
14.00	0.068	929	159.97	0.145
14.50	0.061	796	159.91	0.132
15.00	0.054	673	159.85	0.119
15.50	0.048	562	159.80	0.107
16.00	0.042	465	159.74	0.088
16.50	0.039	402	159.68	0.065
17.00	0.037	370	159.64	0.049
17.50	0.035	355	159.63	0.040
18.00	0.033	350	159.62	0.035
18.50	0.030	347	159.62	0.032
19.00	0.028	344	159.62	0.030
19.50	0.026	342	159.62	0.027
20.00	0.024	339	159.61	0.025
20.50	0.023	338	159.61	0.024
21.00	0.023	337	159.61	0.023
21.50	0.022	337	159.61	0.022
22.00	0.022	336	159.61	0.022
22.50	0.021	336	159.61	0.021
23.00	0.021	335	159.61	0.021
23.50	0.020	335	159.61	0.021
24.00	0.020	334	159.61	0.020
24.50	0.000	326	159.60	0.000
25.00	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	325	159.60	0.000
26.00	0.000	325	159.60	0.000
26.50	0.000	325	159.60	0.000
27.00	0.000	325	159.60	0.000
27.50	0.000	325	159.60	0.000
28.00	0.000	325	159.60	0.000
28.50	0.000	325	159.60	0.000
29.00	0.000	325	159.60	0.000
29.50	0.000	325	159.60	0.000
30.00	0.000	325	159.60	0.000
30.50	0.000	325	159.60	0.000
31.00	0.000	325	159.60	0.000
31.50	0.000	325	159.60	0.000
32.00	0.000	325	159.60	0.000
32.50	0.000	325	159.60	0.000
33.00	0.000	325	159.60	0.000
33.50	0.000	325	159.60	0.000
34.00	0.000	325	159.60	0.000
34.50	0.000	325	159.60	0.000
35.00	0.000	325	159.60	0.000
35.50	0.000	325	159.60	0.000
36.00	0.000	325	159.60	0.000
36.50	0.000	325	159.60	0.000
37.00	0.000	325	159.60	0.000
37.50	0.000	325	159.60	0.000
38.00	0.000	325	159.60	0.000
38.50	0.000	325	159.60	0.000
39.00	0.000	325	159.60	0.000
39.50	0.000	325	159.60	0.000
40.00	0.000	325	159.60	0.000
40.50	0.000	325	159.60	0.000
41.00	0.000	325	159.60	0.000
41.50	0.000	325	159.60	0.000
42.00	0.000	325	159.60	0.000
42.50	0.000	325	159.60	0.000
43.00	0.000	325	159.60	0.000
43.50	0.000	325	159.60	0.000
44.00	0.000	325	159.60	0.000
44.50	0.000	325	159.60	0.000
45.00	0.000	325	159.60	0.000
45.50	0.000	325	159.60	0.000
46.00	0.000	325	159.60	0.000
46.50	0.000	325	159.60	0.000
47.00	0.000	325	159.60	0.000
47.50	0.000	325	159.60	0.000
48.00	0.000	325	159.60	0.000
48.50	0.000	325	159.60	0.000
49.00	0.000	325	159.60	0.000
49.50	0.000	325	159.60	0.000
50.00	0.000	325	159.60	0.000
50.50	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	325	159.60	0.000
51.50	0.000	325	159.60	0.000
52.00	0.000	325	159.60	0.000
52.50	0.000	325	159.60	0.000
53.00	0.000	325	159.60	0.000
53.50	0.000	325	159.60	0.000
54.00	0.000	325	159.60	0.000
54.50	0.000	325	159.60	0.000
55.00	0.000	325	159.60	0.000
55.50	0.000	325	159.60	0.000
56.00	0.000	325	159.60	0.000
56.50	0.000	325	159.60	0.000
57.00	0.000	325	159.60	0.000
57.50	0.000	325	159.60	0.000
58.00	0.000	325	159.60	0.000
58.50	0.000	325	159.60	0.000
59.00	0.000	325	159.60	0.000
59.50	0.000	325	159.60	0.000
60.00	0.000	325	159.60	0.000
60.50	0.000	325	159.60	0.000
61.00	0.000	325	159.60	0.000
61.50	0.000	325	159.60	0.000
62.00	0.000	325	159.60	0.000
62.50	0.000	325	159.60	0.000
63.00	0.000	325	159.60	0.000
63.50	0.000	325	159.60	0.000
64.00	0.000	325	159.60	0.000
64.50	0.000	325	159.60	0.000
65.00	0.000	325	159.60	0.000
65.50	0.000	325	159.60	0.000
66.00	0.000	325	159.60	0.000
66.50	0.000	325	159.60	0.000
67.00	0.000	325	159.60	0.000
67.50	0.000	325	159.60	0.000
68.00	0.000	325	159.60	0.000
68.50	0.000	325	159.60	0.000
69.00	0.000	325	159.60	0.000
69.50	0.000	325	159.60	0.000
70.00	0.000	325	159.60	0.000
70.50	0.000	325	159.60	0.000
71.00	0.000	325	159.60	0.000
71.50	0.000	325	159.60	0.000
72.00	0.000	325	159.60	0.000
72.50	0.000	325	159.60	0.000
73.00	0.000	325	159.60	0.000
73.50	0.000	325	159.60	0.000
74.00	0.000	325	159.60	0.000
74.50	0.000	325	159.60	0.000
75.00	0.000	325	159.60	0.000
75.50	0.000	325	159.60	0.000
76.00	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	325	159.60	0.000
77.00	0.000	325	159.60	0.000
77.50	0.000	325	159.60	0.000
78.00	0.000	325	159.60	0.000
78.50	0.000	325	159.60	0.000
79.00	0.000	325	159.60	0.000
79.50	0.000	325	159.60	0.000
80.00	0.000	325	159.60	0.000
80.50	0.000	325	159.60	0.000
81.00	0.000	325	159.60	0.000
81.50	0.000	325	159.60	0.000
82.00	0.000	325	159.60	0.000
82.50	0.000	325	159.60	0.000
83.00	0.000	325	159.60	0.000
83.50	0.000	325	159.60	0.000
84.00	0.000	325	159.60	0.000
84.50	0.000	325	159.60	0.000
85.00	0.000	325	159.60	0.000
85.50	0.000	325	159.60	0.000
86.00	0.000	325	159.60	0.000
86.50	0.000	325	159.60	0.000
87.00	0.000	325	159.60	0.000
87.50	0.000	325	159.60	0.000
88.00	0.000	325	159.60	0.000
88.50	0.000	325	159.60	0.000
89.00	0.000	325	159.60	0.000
89.50	0.000	325	159.60	0.000
90.00	0.000	325	159.60	0.000
90.50	0.000	325	159.60	0.000
91.00	0.000	325	159.60	0.000
91.50	0.000	325	159.60	0.000
92.00	0.000	325	159.60	0.000
92.50	0.000	325	159.60	0.000
93.00	0.000	325	159.60	0.000
93.50	0.000	325	159.60	0.000
94.00	0.000	325	159.60	0.000
94.50	0.000	325	159.60	0.000
95.00	0.000	325	159.60	0.000
95.50	0.000	325	159.60	0.000
96.00	0.000	325	159.60	0.000
96.50	0.000	325	159.60	0.000
97.00	0.000	325	159.60	0.000
97.50	0.000	325	159.60	0.000
98.00	0.000	325	159.60	0.000
98.50	0.000	325	159.60	0.000
99.00	0.000	325	159.60	0.000
99.50	0.000	325	159.60	0.000
100.00	0.000	325	159.60	0.000
100.50	0.000	325	159.60	0.000
101.00	0.000	325	159.60	0.000
101.50	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

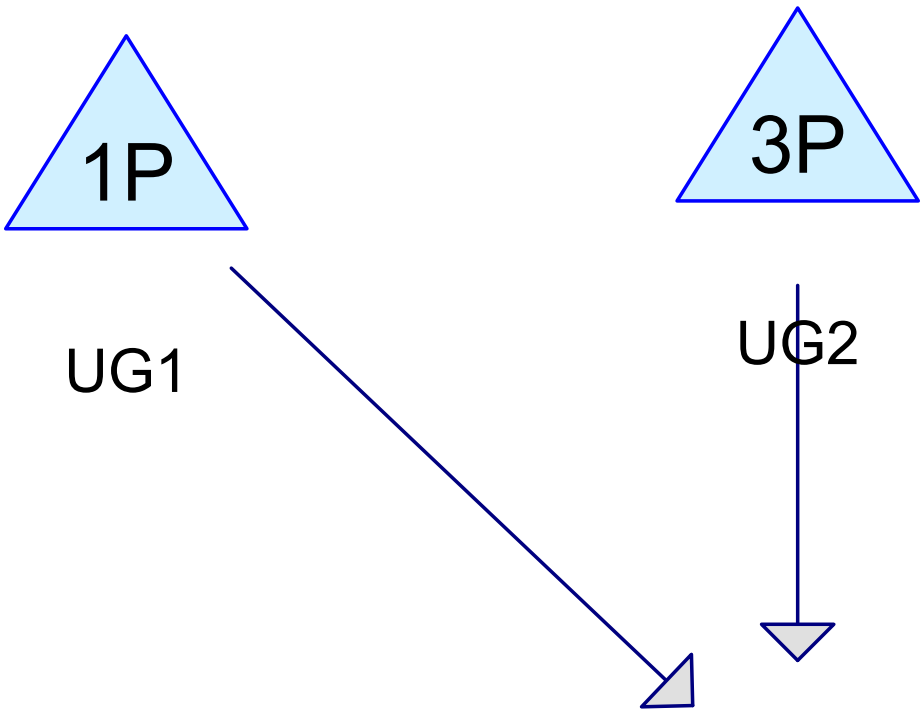
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	325	159.60	0.000
102.50	0.000	325	159.60	0.000
103.00	0.000	325	159.60	0.000
103.50	0.000	325	159.60	0.000
104.00	0.000	325	159.60	0.000
104.50	0.000	325	159.60	0.000
105.00	0.000	325	159.60	0.000
105.50	0.000	325	159.60	0.000
106.00	0.000	325	159.60	0.000
106.50	0.000	325	159.60	0.000
107.00	0.000	325	159.60	0.000
107.50	0.000	325	159.60	0.000
108.00	0.000	325	159.60	0.000
108.50	0.000	325	159.60	0.000
109.00	0.000	325	159.60	0.000
109.50	0.000	325	159.60	0.000
110.00	0.000	325	159.60	0.000
110.50	0.000	325	159.60	0.000
111.00	0.000	325	159.60	0.000
111.50	0.000	325	159.60	0.000
112.00	0.000	325	159.60	0.000
112.50	0.000	325	159.60	0.000
113.00	0.000	325	159.60	0.000
113.50	0.000	325	159.60	0.000
114.00	0.000	325	159.60	0.000
114.50	0.000	325	159.60	0.000
115.00	0.000	325	159.60	0.000
115.50	0.000	325	159.60	0.000
116.00	0.000	325	159.60	0.000
116.50	0.000	325	159.60	0.000
117.00	0.000	325	159.60	0.000
117.50	0.000	325	159.60	0.000
118.00	0.000	325	159.60	0.000
118.50	0.000	325	159.60	0.000
119.00	0.000	325	159.60	0.000
119.50	0.000	325	159.60	0.000
120.00	0.000	325	159.60	0.000
120.50	0.000	325	159.60	0.000
121.00	0.000	325	159.60	0.000
121.50	0.000	325	159.60	0.000
122.00	0.000	325	159.60	0.000
122.50	0.000	325	159.60	0.000
123.00	0.000	325	159.60	0.000
123.50	0.000	325	159.60	0.000
124.00	0.000	325	159.60	0.000
124.50	0.000	325	159.60	0.000
125.00	0.000	325	159.60	0.000
125.50	0.000	325	159.60	0.000
126.00	0.000	325	159.60	0.000
126.50	0.000	325	159.60	0.000
127.00	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	325	159.60	0.000
128.00	0.000	325	159.60	0.000
128.50	0.000	325	159.60	0.000
129.00	0.000	325	159.60	0.000
129.50	0.000	325	159.60	0.000
130.00	0.000	325	159.60	0.000
130.50	0.000	325	159.60	0.000
131.00	0.000	325	159.60	0.000
131.50	0.000	325	159.60	0.000
132.00	0.000	325	159.60	0.000
132.50	0.000	325	159.60	0.000
133.00	0.000	325	159.60	0.000
133.50	0.000	325	159.60	0.000
134.00	0.000	325	159.60	0.000
134.50	0.000	325	159.60	0.000
135.00	0.000	325	159.60	0.000
135.50	0.000	325	159.60	0.000
136.00	0.000	325	159.60	0.000
136.50	0.000	325	159.60	0.000
137.00	0.000	325	159.60	0.000
137.50	0.000	325	159.60	0.000
138.00	0.000	325	159.60	0.000
138.50	0.000	325	159.60	0.000
139.00	0.000	325	159.60	0.000
139.50	0.000	325	159.60	0.000
140.00	0.000	325	159.60	0.000
140.50	0.000	325	159.60	0.000
141.00	0.000	325	159.60	0.000
141.50	0.000	325	159.60	0.000
142.00	0.000	325	159.60	0.000
142.50	0.000	325	159.60	0.000
143.00	0.000	325	159.60	0.000
143.50	0.000	325	159.60	0.000
144.00	0.000	325	159.60	0.000
144.50	0.000	325	159.60	0.000
145.00	0.000	325	159.60	0.000
145.50	0.000	325	159.60	0.000
146.00	0.000	325	159.60	0.000
146.50	0.000	325	159.60	0.000
147.00	0.000	325	159.60	0.000
147.50	0.000	325	159.60	0.000
148.00	0.000	325	159.60	0.000
148.50	0.000	325	159.60	0.000
149.00	0.000	325	159.60	0.000
149.50	0.000	325	159.60	0.000
150.00	0.000	325	159.60	0.000
150.50	0.000	325	159.60	0.000
151.00	0.000	325	159.60	0.000
151.50	0.000	325	159.60	0.000
152.00	0.000	325	159.60	0.000
152.50	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	325	159.60	0.000
153.50	0.000	325	159.60	0.000
154.00	0.000	325	159.60	0.000
154.50	0.000	325	159.60	0.000
155.00	0.000	325	159.60	0.000
155.50	0.000	325	159.60	0.000
156.00	0.000	325	159.60	0.000
156.50	0.000	325	159.60	0.000
157.00	0.000	325	159.60	0.000
157.50	0.000	325	159.60	0.000
158.00	0.000	325	159.60	0.000
158.50	0.000	325	159.60	0.000
159.00	0.000	325	159.60	0.000
159.50	0.000	325	159.60	0.000
160.00	0.000	325	159.60	0.000
160.50	0.000	325	159.60	0.000
161.00	0.000	325	159.60	0.000
161.50	0.000	325	159.60	0.000
162.00	0.000	325	159.60	0.000
162.50	0.000	325	159.60	0.000
163.00	0.000	325	159.60	0.000
163.50	0.000	325	159.60	0.000
164.00	0.000	325	159.60	0.000
164.50	0.000	325	159.60	0.000
165.00	0.000	325	159.60	0.000
165.50	0.000	325	159.60	0.000
166.00	0.000	325	159.60	0.000
166.50	0.000	325	159.60	0.000
167.00	0.000	325	159.60	0.000
167.50	0.000	325	159.60	0.000
168.00	0.000	325	159.60	0.000



Subcat Reach Pond Link

Routing Diagram for BMW_2025-4-23
Prepared by Bohler, Printed 4/23/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10-yr	Type II 24-hr		Default	24.00	1	4.83	2

Summary for Pond 1P: UG1

[93] Warning: Storage range exceeded by 3.08'
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=345)

Inflow Area = 81,327 sf, 96.79% Impervious, Inflow Depth = 4.45" for 10-yr event
Inflow = 12.817 cfs @ 11.96 hrs, Volume= 30,167 cf
Outflow = 0.241 cfs @ 17.27 hrs, Volume= 3,005 cf, Atten= 98%, Lag= 318.8 min
Primary = 0.241 cfs @ 17.27 hrs, Volume= 3,005 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 163.82' @ 17.27 hrs Surf.Area= 13,041 sf Storage= 27,162 cf

Plug-Flow detention time= 864.2 min calculated for 3,005 cf (10% of inflow)
Center-of-Mass det. time= 475.6 min (1,219.6 - 743.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.661 cfs @ 17.27 hrs HW=163.82' TW=163.81' (Fixed TW Elev= 163.81')
└─**4=Culvert** (Outlet Controls 0.661 cfs @ 0.374 fps)
  ├─**1=Orifice/Grate** (Passes < 0.002 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 0.342 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 10.209 cfs potential flow)

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.005	1	157.53	0.000
1.50	0.026	30	157.54	0.000
2.00	0.043	92	157.55	0.000
2.50	0.057	182	157.56	0.000
3.00	0.069	295	157.59	0.000
3.50	0.079	429	157.61	0.000
4.00	0.089	581	157.64	0.000
4.50	0.100	751	157.67	0.000
5.00	0.112	942	157.71	0.000
5.50	0.124	1,155	157.75	0.000
6.00	0.135	1,387	157.80	0.000
6.50	0.146	1,640	157.84	0.000
7.00	0.157	1,912	157.90	0.000
7.50	0.167	2,204	157.95	0.000
8.00	0.177	2,514	158.01	0.000
8.50	0.215	2,864	158.05	0.000
9.00	0.259	3,291	158.09	0.000
9.50	0.268	3,770	158.13	0.000
10.00	0.328	4,299	158.17	0.000
10.50	0.427	4,974	158.23	0.000
11.00	0.591	5,882	158.31	0.000
11.50	**0.972**	7,261	158.43	0.000
12.00	**10.578**	17,399	159.36	0.000
12.50	0.919	21,517	159.80	0.000
13.00	0.572	22,772	159.95	0.000
13.50	0.433	23,664	160.08	0.000
14.00	0.339	24,355	160.20	0.000
14.50	0.300	24,924	160.31	0.000
15.00	0.269	25,436	160.41	0.000
15.50	0.238	25,893	160.50	0.000
16.00	0.208	26,295	160.57	0.000
16.50	0.194	26,654	160.64	0.000
17.00	0.183	**26,992**	**160.71**	**0.000**
17.50	0.172	**27,162**	**163.81**	**0.108**
18.00	0.161	27,162	163.81	0.097
18.50	0.150	27,162	163.81	0.086
19.00	0.139	27,162	163.81	0.075
19.50	0.128	27,162	163.81	0.064
20.00	0.117	27,162	163.81	0.053
20.50	0.113	27,162	163.81	0.049
21.00	0.111	27,162	163.81	0.047
21.50	0.109	27,162	163.81	0.045
22.00	0.106	27,162	163.81	0.042
22.50	0.104	27,162	163.81	0.040
23.00	0.102	27,162	163.81	0.038
23.50	0.100	27,162	163.81	0.036
24.00	0.098	27,162	163.81	0.034
24.50	0.000	27,162	163.75	0.000
25.00	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	27,162	163.75	0.000
26.00	0.000	27,162	163.75	0.000
26.50	0.000	27,162	163.75	0.000
27.00	0.000	27,162	163.75	0.000
27.50	0.000	27,162	163.75	0.000
28.00	0.000	27,162	163.75	0.000
28.50	0.000	27,162	163.75	0.000
29.00	0.000	27,162	163.75	0.000
29.50	0.000	27,162	163.75	0.000
30.00	0.000	27,162	163.75	0.000
30.50	0.000	27,162	163.75	0.000
31.00	0.000	27,162	163.75	0.000
31.50	0.000	27,162	163.75	0.000
32.00	0.000	27,162	163.75	0.000
32.50	0.000	27,162	163.75	0.000
33.00	0.000	27,162	163.75	0.000
33.50	0.000	27,162	163.75	0.000
34.00	0.000	27,162	163.75	0.000
34.50	0.000	27,162	163.75	0.000
35.00	0.000	27,162	163.75	0.000
35.50	0.000	27,162	163.75	0.000
36.00	0.000	27,162	163.75	0.000
36.50	0.000	27,162	163.75	0.000
37.00	0.000	27,162	163.75	0.000
37.50	0.000	27,162	163.75	0.000
38.00	0.000	27,162	163.75	0.000
38.50	0.000	27,162	163.75	0.000
39.00	0.000	27,162	163.75	0.000
39.50	0.000	27,162	163.75	0.000
40.00	0.000	27,162	163.75	0.000
40.50	0.000	27,162	163.75	0.000
41.00	0.000	27,162	163.75	0.000
41.50	0.000	27,162	163.75	0.000
42.00	0.000	27,162	163.75	0.000
42.50	0.000	27,162	163.75	0.000
43.00	0.000	27,162	163.75	0.000
43.50	0.000	27,162	163.75	0.000
44.00	0.000	27,162	163.75	0.000
44.50	0.000	27,162	163.75	0.000
45.00	0.000	27,162	163.75	0.000
45.50	0.000	27,162	163.75	0.000
46.00	0.000	27,162	163.75	0.000
46.50	0.000	27,162	163.75	0.000
47.00	0.000	27,162	163.75	0.000
47.50	0.000	27,162	163.75	0.000
48.00	0.000	27,162	163.75	0.000
48.50	0.000	27,162	163.75	0.000
49.00	0.000	27,162	163.75	0.000
49.50	0.000	27,162	163.75	0.000
50.00	0.000	27,162	163.75	0.000
50.50	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	27,162	163.75	0.000
51.50	0.000	27,162	163.75	0.000
52.00	0.000	27,162	163.75	0.000
52.50	0.000	27,162	163.75	0.000
53.00	0.000	27,162	163.75	0.000
53.50	0.000	27,162	163.75	0.000
54.00	0.000	27,162	163.75	0.000
54.50	0.000	27,162	163.75	0.000
55.00	0.000	27,162	163.75	0.000
55.50	0.000	27,162	163.75	0.000
56.00	0.000	27,162	163.75	0.000
56.50	0.000	27,162	163.75	0.000
57.00	0.000	27,162	163.75	0.000
57.50	0.000	27,162	163.75	0.000
58.00	0.000	27,162	163.75	0.000
58.50	0.000	27,162	163.75	0.000
59.00	0.000	27,162	163.75	0.000
59.50	0.000	27,162	163.75	0.000
60.00	0.000	27,162	163.75	0.000
60.50	0.000	27,162	163.75	0.000
61.00	0.000	27,162	163.75	0.000
61.50	0.000	27,162	163.75	0.000
62.00	0.000	27,162	163.75	0.000
62.50	0.000	27,162	163.75	0.000
63.00	0.000	27,162	163.75	0.000
63.50	0.000	27,162	163.75	0.000
64.00	0.000	27,162	163.75	0.000
64.50	0.000	27,162	163.75	0.000
65.00	0.000	27,162	163.75	0.000
65.50	0.000	27,162	163.75	0.000
66.00	0.000	27,162	163.75	0.000
66.50	0.000	27,162	163.75	0.000
67.00	0.000	27,162	163.75	0.000
67.50	0.000	27,162	163.75	0.000
68.00	0.000	27,162	163.75	0.000
68.50	0.000	27,162	163.75	0.000
69.00	0.000	27,162	163.75	0.000
69.50	0.000	27,162	163.75	0.000
70.00	0.000	27,162	163.75	0.000
70.50	0.000	27,162	163.75	0.000
71.00	0.000	27,162	163.75	0.000
71.50	0.000	27,162	163.75	0.000
72.00	0.000	27,162	163.75	0.000
72.50	0.000	27,162	163.75	0.000
73.00	0.000	27,162	163.75	0.000
73.50	0.000	27,162	163.75	0.000
74.00	0.000	27,162	163.75	0.000
74.50	0.000	27,162	163.75	0.000
75.00	0.000	27,162	163.75	0.000
75.50	0.000	27,162	163.75	0.000
76.00	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	27,162	163.75	0.000
77.00	0.000	27,162	163.75	0.000
77.50	0.000	27,162	163.75	0.000
78.00	0.000	27,162	163.75	0.000
78.50	0.000	27,162	163.75	0.000
79.00	0.000	27,162	163.75	0.000
79.50	0.000	27,162	163.75	0.000
80.00	0.000	27,162	163.75	0.000
80.50	0.000	27,162	163.75	0.000
81.00	0.000	27,162	163.75	0.000
81.50	0.000	27,162	163.75	0.000
82.00	0.000	27,162	163.75	0.000
82.50	0.000	27,162	163.75	0.000
83.00	0.000	27,162	163.75	0.000
83.50	0.000	27,162	163.75	0.000
84.00	0.000	27,162	163.75	0.000
84.50	0.000	27,162	163.75	0.000
85.00	0.000	27,162	163.75	0.000
85.50	0.000	27,162	163.75	0.000
86.00	0.000	27,162	163.75	0.000
86.50	0.000	27,162	163.75	0.000
87.00	0.000	27,162	163.75	0.000
87.50	0.000	27,162	163.75	0.000
88.00	0.000	27,162	163.75	0.000
88.50	0.000	27,162	163.75	0.000
89.00	0.000	27,162	163.75	0.000
89.50	0.000	27,162	163.75	0.000
90.00	0.000	27,162	163.75	0.000
90.50	0.000	27,162	163.75	0.000
91.00	0.000	27,162	163.75	0.000
91.50	0.000	27,162	163.75	0.000
92.00	0.000	27,162	163.75	0.000
92.50	0.000	27,162	163.75	0.000
93.00	0.000	27,162	163.75	0.000
93.50	0.000	27,162	163.75	0.000
94.00	0.000	27,162	163.75	0.000
94.50	0.000	27,162	163.75	0.000
95.00	0.000	27,162	163.75	0.000
95.50	0.000	27,162	163.75	0.000
96.00	0.000	27,162	163.75	0.000
96.50	0.000	27,162	163.75	0.000
97.00	0.000	27,162	163.75	0.000
97.50	0.000	27,162	163.75	0.000
98.00	0.000	27,162	163.75	0.000
98.50	0.000	27,162	163.75	0.000
99.00	0.000	27,162	163.75	0.000
99.50	0.000	27,162	163.75	0.000
100.00	0.000	27,162	163.75	0.000
100.50	0.000	27,162	163.75	0.000
101.00	0.000	27,162	163.75	0.000
101.50	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	27,162	163.75	0.000
102.50	0.000	27,162	163.75	0.000
103.00	0.000	27,162	163.75	0.000
103.50	0.000	27,162	163.75	0.000
104.00	0.000	27,162	163.75	0.000
104.50	0.000	27,162	163.75	0.000
105.00	0.000	27,162	163.75	0.000
105.50	0.000	27,162	163.75	0.000
106.00	0.000	27,162	163.75	0.000
106.50	0.000	27,162	163.75	0.000
107.00	0.000	27,162	163.75	0.000
107.50	0.000	27,162	163.75	0.000
108.00	0.000	27,162	163.75	0.000
108.50	0.000	27,162	163.75	0.000
109.00	0.000	27,162	163.75	0.000
109.50	0.000	27,162	163.75	0.000
110.00	0.000	27,162	163.75	0.000
110.50	0.000	27,162	163.75	0.000
111.00	0.000	27,162	163.75	0.000
111.50	0.000	27,162	163.75	0.000
112.00	0.000	27,162	163.75	0.000
112.50	0.000	27,162	163.75	0.000
113.00	0.000	27,162	163.75	0.000
113.50	0.000	27,162	163.75	0.000
114.00	0.000	27,162	163.75	0.000
114.50	0.000	27,162	163.75	0.000
115.00	0.000	27,162	163.75	0.000
115.50	0.000	27,162	163.75	0.000
116.00	0.000	27,162	163.75	0.000
116.50	0.000	27,162	163.75	0.000
117.00	0.000	27,162	163.75	0.000
117.50	0.000	27,162	163.75	0.000
118.00	0.000	27,162	163.75	0.000
118.50	0.000	27,162	163.75	0.000
119.00	0.000	27,162	163.75	0.000
119.50	0.000	27,162	163.75	0.000
120.00	0.000	27,162	163.75	0.000
120.50	0.000	27,162	163.75	0.000
121.00	0.000	27,162	163.75	0.000
121.50	0.000	27,162	163.75	0.000
122.00	0.000	27,162	163.75	0.000
122.50	0.000	27,162	163.75	0.000
123.00	0.000	27,162	163.75	0.000
123.50	0.000	27,162	163.75	0.000
124.00	0.000	27,162	163.75	0.000
124.50	0.000	27,162	163.75	0.000
125.00	0.000	27,162	163.75	0.000
125.50	0.000	27,162	163.75	0.000
126.00	0.000	27,162	163.75	0.000
126.50	0.000	27,162	163.75	0.000
127.00	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	27,162	163.75	0.000
128.00	0.000	27,162	163.75	0.000
128.50	0.000	27,162	163.75	0.000
129.00	0.000	27,162	163.75	0.000
129.50	0.000	27,162	163.75	0.000
130.00	0.000	27,162	163.75	0.000
130.50	0.000	27,162	163.75	0.000
131.00	0.000	27,162	163.75	0.000
131.50	0.000	27,162	163.75	0.000
132.00	0.000	27,162	163.75	0.000
132.50	0.000	27,162	163.75	0.000
133.00	0.000	27,162	163.75	0.000
133.50	0.000	27,162	163.75	0.000
134.00	0.000	27,162	163.75	0.000
134.50	0.000	27,162	163.75	0.000
135.00	0.000	27,162	163.75	0.000
135.50	0.000	27,162	163.75	0.000
136.00	0.000	27,162	163.75	0.000
136.50	0.000	27,162	163.75	0.000
137.00	0.000	27,162	163.75	0.000
137.50	0.000	27,162	163.75	0.000
138.00	0.000	27,162	163.75	0.000
138.50	0.000	27,162	163.75	0.000
139.00	0.000	27,162	163.75	0.000
139.50	0.000	27,162	163.75	0.000
140.00	0.000	27,162	163.75	0.000
140.50	0.000	27,162	163.75	0.000
141.00	0.000	27,162	163.75	0.000
141.50	0.000	27,162	163.75	0.000
142.00	0.000	27,162	163.75	0.000
142.50	0.000	27,162	163.75	0.000
143.00	0.000	27,162	163.75	0.000
143.50	0.000	27,162	163.75	0.000
144.00	0.000	27,162	163.75	0.000
144.50	0.000	27,162	163.75	0.000
145.00	0.000	27,162	163.75	0.000
145.50	0.000	27,162	163.75	0.000
146.00	0.000	27,162	163.75	0.000
146.50	0.000	27,162	163.75	0.000
147.00	0.000	27,162	163.75	0.000
147.50	0.000	27,162	163.75	0.000
148.00	0.000	27,162	163.75	0.000
148.50	0.000	27,162	163.75	0.000
149.00	0.000	27,162	163.75	0.000
149.50	0.000	27,162	163.75	0.000
150.00	0.000	27,162	163.75	0.000
150.50	0.000	27,162	163.75	0.000
151.00	0.000	27,162	163.75	0.000
151.50	0.000	27,162	163.75	0.000
152.00	0.000	27,162	163.75	0.000
152.50	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	27,162	163.75	0.000
153.50	0.000	27,162	163.75	0.000
154.00	0.000	27,162	163.75	0.000
154.50	0.000	27,162	163.75	0.000
155.00	0.000	27,162	163.75	0.000
155.50	0.000	27,162	163.75	0.000
156.00	0.000	27,162	163.75	0.000
156.50	0.000	27,162	163.75	0.000
157.00	0.000	27,162	163.75	0.000
157.50	0.000	27,162	163.75	0.000
158.00	0.000	27,162	163.75	0.000
158.50	0.000	27,162	163.75	0.000
159.00	0.000	27,162	163.75	0.000
159.50	0.000	27,162	163.75	0.000
160.00	0.000	27,162	163.75	0.000
160.50	0.000	27,162	163.75	0.000
161.00	0.000	27,162	163.75	0.000
161.50	0.000	27,162	163.75	0.000
162.00	0.000	27,162	163.75	0.000
162.50	0.000	27,162	163.75	0.000
163.00	0.000	27,162	163.75	0.000
163.50	0.000	27,162	163.75	0.000
164.00	0.000	27,162	163.75	0.000
164.50	0.000	27,162	163.75	0.000
165.00	0.000	27,162	163.75	0.000
165.50	0.000	27,162	163.75	0.000
166.00	0.000	27,162	163.75	0.000
166.50	0.000	27,162	163.75	0.000
167.00	0.000	27,162	163.75	0.000
167.50	0.000	27,162	163.75	0.000
168.00	0.000	27,162	163.75	0.000

Summary for Pond 3P: UG2

[93] Warning: Storage range exceeded by 1.88'
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=601)

Inflow Area = 21,562 sf, 86.06% Impervious, Inflow Depth = 3.98" for 10-yr event
Inflow = 3.022 cfs @ 11.96 hrs, Volume= 7,145 cf
Outflow = 2.098 cfs @ 12.03 hrs, Volume= 2,917 cf, Atten= 31%, Lag= 4.3 min
Primary = 2.098 cfs @ 12.03 hrs, Volume= 2,917 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 163.87' @ 12.03 hrs Surf.Area= 2,542 sf Storage= 4,234 cf

Plug-Flow detention time= 317.8 min calculated for 2,917 cf (41% of inflow)
Center-of-Mass det. time= 165.4 min (910.7 - 745.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=2.037 cfs @ 12.03 hrs HW=163.87' TW=163.81' (Fixed TW Elev= 163.81')
└─**4=Culvert** (Inlet Controls 2.037 cfs @ 1.153 fps)
  ├─**1=Orifice/Grate** (Passes < 0.057 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 0.144 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 13.505 cfs potential flow)

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.001	0	159.28	0.000
1.50	0.006	7	159.29	0.000
2.00	0.010	22	159.30	0.000
2.50	0.013	43	159.32	0.000
3.00	0.016	70	159.35	0.000
3.50	0.019	101	159.38	0.000
4.00	0.021	137	159.41	0.000
4.50	0.024	177	159.45	0.000
5.00	0.026	222	159.50	0.000
5.50	0.029	272	159.55	0.000
6.00	0.032	327	159.60	0.000
6.50	0.034	387	159.66	0.000
7.00	0.037	451	159.72	0.000
7.50	0.039	520	159.78	0.000
8.00	0.042	593	159.82	0.000
8.50	0.051	675	159.86	0.000
9.00	0.061	776	159.90	0.000
9.50	0.063	889	159.95	0.000
10.00	0.077	1,014	160.01	0.000
10.50	0.101	1,173	160.09	0.000
11.00	0.139	1,387	160.18	0.000
11.50	**0.229**	1,712	160.34	0.000
12.00	**2.494**	**4,102**	**161.86**	**0.000**
12.50	0.218	**4,234**	**163.76**	**0.000**
13.00	0.136	4,234	163.76	0.000
13.50	0.103	4,234	163.76	0.000
14.00	0.081	4,234	163.76	0.000
14.50	0.072	4,234	163.76	0.000
15.00	0.064	4,234	163.76	0.000
15.50	0.057	4,234	163.76	0.000
16.00	0.050	4,234	163.76	0.000
16.50	0.046	4,234	163.76	0.000
17.00	0.044	4,234	163.76	0.000
17.50	0.041	4,234	163.76	0.000
18.00	0.039	4,234	163.76	0.000
18.50	0.036	4,234	163.76	0.000
19.00	0.033	4,234	163.76	0.000
19.50	0.031	4,234	163.76	0.000
20.00	0.028	4,234	163.76	0.000
20.50	0.027	4,234	163.76	0.000
21.00	0.027	4,234	163.76	0.000
21.50	0.026	4,234	163.76	0.000
22.00	0.026	4,234	163.76	0.000
22.50	0.025	4,234	163.76	0.000
23.00	0.025	4,234	163.76	0.000
23.50	0.024	4,234	163.76	0.000
24.00	0.024	4,234	163.76	0.000
24.50	0.000	4,234	163.76	0.000
25.00	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	4,234	163.76	0.000
26.00	0.000	4,234	163.76	0.000
26.50	0.000	4,234	163.76	0.000
27.00	0.000	4,234	163.76	0.000
27.50	0.000	4,234	163.76	0.000
28.00	0.000	4,234	163.76	0.000
28.50	0.000	4,234	163.76	0.000
29.00	0.000	4,234	163.76	0.000
29.50	0.000	4,234	163.76	0.000
30.00	0.000	4,234	163.76	0.000
30.50	0.000	4,234	163.76	0.000
31.00	0.000	4,234	163.76	0.000
31.50	0.000	4,234	163.76	0.000
32.00	0.000	4,234	163.76	0.000
32.50	0.000	4,234	163.76	0.000
33.00	0.000	4,234	163.76	0.000
33.50	0.000	4,234	163.76	0.000
34.00	0.000	4,234	163.76	0.000
34.50	0.000	4,234	163.76	0.000
35.00	0.000	4,234	163.76	0.000
35.50	0.000	4,234	163.76	0.000
36.00	0.000	4,234	163.76	0.000
36.50	0.000	4,234	163.76	0.000
37.00	0.000	4,234	163.76	0.000
37.50	0.000	4,234	163.76	0.000
38.00	0.000	4,234	163.76	0.000
38.50	0.000	4,234	163.76	0.000
39.00	0.000	4,234	163.76	0.000
39.50	0.000	4,234	163.76	0.000
40.00	0.000	4,234	163.76	0.000
40.50	0.000	4,234	163.76	0.000
41.00	0.000	4,234	163.76	0.000
41.50	0.000	4,234	163.76	0.000
42.00	0.000	4,234	163.76	0.000
42.50	0.000	4,234	163.76	0.000
43.00	0.000	4,234	163.76	0.000
43.50	0.000	4,234	163.76	0.000
44.00	0.000	4,234	163.76	0.000
44.50	0.000	4,234	163.76	0.000
45.00	0.000	4,234	163.76	0.000
45.50	0.000	4,234	163.76	0.000
46.00	0.000	4,234	163.76	0.000
46.50	0.000	4,234	163.76	0.000
47.00	0.000	4,234	163.76	0.000
47.50	0.000	4,234	163.76	0.000
48.00	0.000	4,234	163.76	0.000
48.50	0.000	4,234	163.76	0.000
49.00	0.000	4,234	163.76	0.000
49.50	0.000	4,234	163.76	0.000
50.00	0.000	4,234	163.76	0.000
50.50	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,234	163.76	0.000
51.50	0.000	4,234	163.76	0.000
52.00	0.000	4,234	163.76	0.000
52.50	0.000	4,234	163.76	0.000
53.00	0.000	4,234	163.76	0.000
53.50	0.000	4,234	163.76	0.000
54.00	0.000	4,234	163.76	0.000
54.50	0.000	4,234	163.76	0.000
55.00	0.000	4,234	163.76	0.000
55.50	0.000	4,234	163.76	0.000
56.00	0.000	4,234	163.76	0.000
56.50	0.000	4,234	163.76	0.000
57.00	0.000	4,234	163.76	0.000
57.50	0.000	4,234	163.76	0.000
58.00	0.000	4,234	163.76	0.000
58.50	0.000	4,234	163.76	0.000
59.00	0.000	4,234	163.76	0.000
59.50	0.000	4,234	163.76	0.000
60.00	0.000	4,234	163.76	0.000
60.50	0.000	4,234	163.76	0.000
61.00	0.000	4,234	163.76	0.000
61.50	0.000	4,234	163.76	0.000
62.00	0.000	4,234	163.76	0.000
62.50	0.000	4,234	163.76	0.000
63.00	0.000	4,234	163.76	0.000
63.50	0.000	4,234	163.76	0.000
64.00	0.000	4,234	163.76	0.000
64.50	0.000	4,234	163.76	0.000
65.00	0.000	4,234	163.76	0.000
65.50	0.000	4,234	163.76	0.000
66.00	0.000	4,234	163.76	0.000
66.50	0.000	4,234	163.76	0.000
67.00	0.000	4,234	163.76	0.000
67.50	0.000	4,234	163.76	0.000
68.00	0.000	4,234	163.76	0.000
68.50	0.000	4,234	163.76	0.000
69.00	0.000	4,234	163.76	0.000
69.50	0.000	4,234	163.76	0.000
70.00	0.000	4,234	163.76	0.000
70.50	0.000	4,234	163.76	0.000
71.00	0.000	4,234	163.76	0.000
71.50	0.000	4,234	163.76	0.000
72.00	0.000	4,234	163.76	0.000
72.50	0.000	4,234	163.76	0.000
73.00	0.000	4,234	163.76	0.000
73.50	0.000	4,234	163.76	0.000
74.00	0.000	4,234	163.76	0.000
74.50	0.000	4,234	163.76	0.000
75.00	0.000	4,234	163.76	0.000
75.50	0.000	4,234	163.76	0.000
76.00	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	4,234	163.76	0.000
77.00	0.000	4,234	163.76	0.000
77.50	0.000	4,234	163.76	0.000
78.00	0.000	4,234	163.76	0.000
78.50	0.000	4,234	163.76	0.000
79.00	0.000	4,234	163.76	0.000
79.50	0.000	4,234	163.76	0.000
80.00	0.000	4,234	163.76	0.000
80.50	0.000	4,234	163.76	0.000
81.00	0.000	4,234	163.76	0.000
81.50	0.000	4,234	163.76	0.000
82.00	0.000	4,234	163.76	0.000
82.50	0.000	4,234	163.76	0.000
83.00	0.000	4,234	163.76	0.000
83.50	0.000	4,234	163.76	0.000
84.00	0.000	4,234	163.76	0.000
84.50	0.000	4,234	163.76	0.000
85.00	0.000	4,234	163.76	0.000
85.50	0.000	4,234	163.76	0.000
86.00	0.000	4,234	163.76	0.000
86.50	0.000	4,234	163.76	0.000
87.00	0.000	4,234	163.76	0.000
87.50	0.000	4,234	163.76	0.000
88.00	0.000	4,234	163.76	0.000
88.50	0.000	4,234	163.76	0.000
89.00	0.000	4,234	163.76	0.000
89.50	0.000	4,234	163.76	0.000
90.00	0.000	4,234	163.76	0.000
90.50	0.000	4,234	163.76	0.000
91.00	0.000	4,234	163.76	0.000
91.50	0.000	4,234	163.76	0.000
92.00	0.000	4,234	163.76	0.000
92.50	0.000	4,234	163.76	0.000
93.00	0.000	4,234	163.76	0.000
93.50	0.000	4,234	163.76	0.000
94.00	0.000	4,234	163.76	0.000
94.50	0.000	4,234	163.76	0.000
95.00	0.000	4,234	163.76	0.000
95.50	0.000	4,234	163.76	0.000
96.00	0.000	4,234	163.76	0.000
96.50	0.000	4,234	163.76	0.000
97.00	0.000	4,234	163.76	0.000
97.50	0.000	4,234	163.76	0.000
98.00	0.000	4,234	163.76	0.000
98.50	0.000	4,234	163.76	0.000
99.00	0.000	4,234	163.76	0.000
99.50	0.000	4,234	163.76	0.000
100.00	0.000	4,234	163.76	0.000
100.50	0.000	4,234	163.76	0.000
101.00	0.000	4,234	163.76	0.000
101.50	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

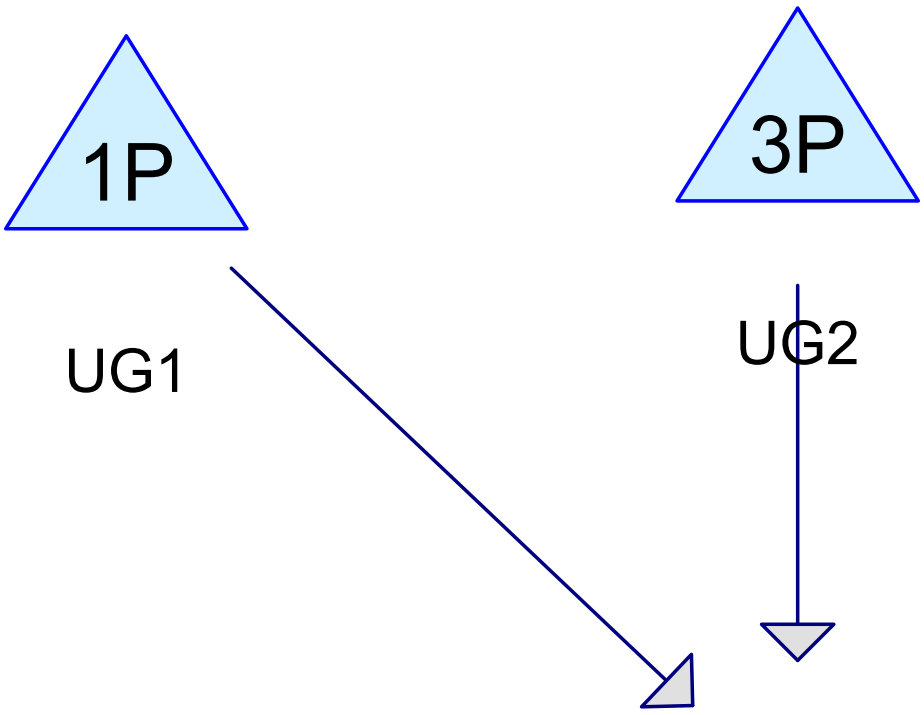
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	4,234	163.76	0.000
102.50	0.000	4,234	163.76	0.000
103.00	0.000	4,234	163.76	0.000
103.50	0.000	4,234	163.76	0.000
104.00	0.000	4,234	163.76	0.000
104.50	0.000	4,234	163.76	0.000
105.00	0.000	4,234	163.76	0.000
105.50	0.000	4,234	163.76	0.000
106.00	0.000	4,234	163.76	0.000
106.50	0.000	4,234	163.76	0.000
107.00	0.000	4,234	163.76	0.000
107.50	0.000	4,234	163.76	0.000
108.00	0.000	4,234	163.76	0.000
108.50	0.000	4,234	163.76	0.000
109.00	0.000	4,234	163.76	0.000
109.50	0.000	4,234	163.76	0.000
110.00	0.000	4,234	163.76	0.000
110.50	0.000	4,234	163.76	0.000
111.00	0.000	4,234	163.76	0.000
111.50	0.000	4,234	163.76	0.000
112.00	0.000	4,234	163.76	0.000
112.50	0.000	4,234	163.76	0.000
113.00	0.000	4,234	163.76	0.000
113.50	0.000	4,234	163.76	0.000
114.00	0.000	4,234	163.76	0.000
114.50	0.000	4,234	163.76	0.000
115.00	0.000	4,234	163.76	0.000
115.50	0.000	4,234	163.76	0.000
116.00	0.000	4,234	163.76	0.000
116.50	0.000	4,234	163.76	0.000
117.00	0.000	4,234	163.76	0.000
117.50	0.000	4,234	163.76	0.000
118.00	0.000	4,234	163.76	0.000
118.50	0.000	4,234	163.76	0.000
119.00	0.000	4,234	163.76	0.000
119.50	0.000	4,234	163.76	0.000
120.00	0.000	4,234	163.76	0.000
120.50	0.000	4,234	163.76	0.000
121.00	0.000	4,234	163.76	0.000
121.50	0.000	4,234	163.76	0.000
122.00	0.000	4,234	163.76	0.000
122.50	0.000	4,234	163.76	0.000
123.00	0.000	4,234	163.76	0.000
123.50	0.000	4,234	163.76	0.000
124.00	0.000	4,234	163.76	0.000
124.50	0.000	4,234	163.76	0.000
125.00	0.000	4,234	163.76	0.000
125.50	0.000	4,234	163.76	0.000
126.00	0.000	4,234	163.76	0.000
126.50	0.000	4,234	163.76	0.000
127.00	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	4,234	163.76	0.000
128.00	0.000	4,234	163.76	0.000
128.50	0.000	4,234	163.76	0.000
129.00	0.000	4,234	163.76	0.000
129.50	0.000	4,234	163.76	0.000
130.00	0.000	4,234	163.76	0.000
130.50	0.000	4,234	163.76	0.000
131.00	0.000	4,234	163.76	0.000
131.50	0.000	4,234	163.76	0.000
132.00	0.000	4,234	163.76	0.000
132.50	0.000	4,234	163.76	0.000
133.00	0.000	4,234	163.76	0.000
133.50	0.000	4,234	163.76	0.000
134.00	0.000	4,234	163.76	0.000
134.50	0.000	4,234	163.76	0.000
135.00	0.000	4,234	163.76	0.000
135.50	0.000	4,234	163.76	0.000
136.00	0.000	4,234	163.76	0.000
136.50	0.000	4,234	163.76	0.000
137.00	0.000	4,234	163.76	0.000
137.50	0.000	4,234	163.76	0.000
138.00	0.000	4,234	163.76	0.000
138.50	0.000	4,234	163.76	0.000
139.00	0.000	4,234	163.76	0.000
139.50	0.000	4,234	163.76	0.000
140.00	0.000	4,234	163.76	0.000
140.50	0.000	4,234	163.76	0.000
141.00	0.000	4,234	163.76	0.000
141.50	0.000	4,234	163.76	0.000
142.00	0.000	4,234	163.76	0.000
142.50	0.000	4,234	163.76	0.000
143.00	0.000	4,234	163.76	0.000
143.50	0.000	4,234	163.76	0.000
144.00	0.000	4,234	163.76	0.000
144.50	0.000	4,234	163.76	0.000
145.00	0.000	4,234	163.76	0.000
145.50	0.000	4,234	163.76	0.000
146.00	0.000	4,234	163.76	0.000
146.50	0.000	4,234	163.76	0.000
147.00	0.000	4,234	163.76	0.000
147.50	0.000	4,234	163.76	0.000
148.00	0.000	4,234	163.76	0.000
148.50	0.000	4,234	163.76	0.000
149.00	0.000	4,234	163.76	0.000
149.50	0.000	4,234	163.76	0.000
150.00	0.000	4,234	163.76	0.000
150.50	0.000	4,234	163.76	0.000
151.00	0.000	4,234	163.76	0.000
151.50	0.000	4,234	163.76	0.000
152.00	0.000	4,234	163.76	0.000
152.50	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	4,234	163.76	0.000
153.50	0.000	4,234	163.76	0.000
154.00	0.000	4,234	163.76	0.000
154.50	0.000	4,234	163.76	0.000
155.00	0.000	4,234	163.76	0.000
155.50	0.000	4,234	163.76	0.000
156.00	0.000	4,234	163.76	0.000
156.50	0.000	4,234	163.76	0.000
157.00	0.000	4,234	163.76	0.000
157.50	0.000	4,234	163.76	0.000
158.00	0.000	4,234	163.76	0.000
158.50	0.000	4,234	163.76	0.000
159.00	0.000	4,234	163.76	0.000
159.50	0.000	4,234	163.76	0.000
160.00	0.000	4,234	163.76	0.000
160.50	0.000	4,234	163.76	0.000
161.00	0.000	4,234	163.76	0.000
161.50	0.000	4,234	163.76	0.000
162.00	0.000	4,234	163.76	0.000
162.50	0.000	4,234	163.76	0.000
163.00	0.000	4,234	163.76	0.000
163.50	0.000	4,234	163.76	0.000
164.00	0.000	4,234	163.76	0.000
164.50	0.000	4,234	163.76	0.000
165.00	0.000	4,234	163.76	0.000
165.50	0.000	4,234	163.76	0.000
166.00	0.000	4,234	163.76	0.000
166.50	0.000	4,234	163.76	0.000
167.00	0.000	4,234	163.76	0.000
167.50	0.000	4,234	163.76	0.000
168.00	0.000	4,234	163.76	0.000



Subcat Reach Pond Link

Routing Diagram for BMW_2025-4-23
Prepared by Bohler, Printed 4/23/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	50-yr	Type II 24-hr		Default	24.00	1	6.73	2

Summary for Pond 1P: UG1

[93] Warning: Storage range exceeded by 8.34'
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=600)

Inflow Area = 81,327 sf, 96.79% Impervious, Inflow Depth = 6.30" for 50-yr event
Inflow = 17.943 cfs @ 11.96 hrs, Volume= 42,725 cf
Outflow = 8.639 cfs @ 12.07 hrs, Volume= 15,620 cf, Atten= 52%, Lag= 6.9 min
Primary = 8.639 cfs @ 12.07 hrs, Volume= 15,620 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 169.08' @ 12.07 hrs Surf.Area= 13,041 sf Storage= 27,162 cf

Plug-Flow detention time= 360.1 min calculated for 15,620 cf (37% of inflow)
Center-of-Mass det. time= 188.5 min (927.6 - 739.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=8.425 cfs @ 12.07 hrs HW=169.01' TW=167.66' (Fixed TW Elev= 167.66')
└─**4=Culvert** (Outlet Controls 8.425 cfs @ 4.768 fps)
  ├─**1=Orifice/Grate** (Passes < 0.031 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 4.359 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 194.076 cfs potential flow)

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.027	17	157.53	0.000
1.50	0.057	94	157.55	0.000
2.00	0.081	220	157.57	0.000
2.50	0.099	382	157.60	0.000
3.00	0.115	575	157.64	0.000
3.50	0.128	794	157.68	0.000
4.00	0.140	1,035	157.73	0.000
4.50	0.155	1,300	157.78	0.000
5.00	0.170	1,592	157.84	0.000
5.50	0.185	1,912	157.90	0.000
6.00	0.200	2,259	157.96	0.000
6.50	0.214	2,631	158.03	0.000
7.00	0.228	3,030	158.07	0.000
7.50	0.242	3,453	158.10	0.000
8.00	0.256	3,901	158.14	0.000
8.50	0.309	4,404	158.18	0.000
9.00	0.371	5,016	158.23	0.000
9.50	0.382	5,700	158.29	0.000
10.00	0.465	6,451	158.36	0.000
10.50	0.604	7,407	158.44	0.000
11.00	0.833	8,688	158.55	0.000
11.50	**1.366**	10,629	158.73	0.000
12.00	**14.820**	**24,828**	**160.29**	**0.000**
12.50	1.289	**27,162**	**167.56**	**0.000**
13.00	0.802	27,162	167.56	0.000
13.50	0.607	27,162	167.56	0.000
14.00	0.476	27,162	167.56	0.000
14.50	0.420	27,162	167.56	0.000
15.00	0.377	27,162	167.56	0.000
15.50	0.334	27,162	167.56	0.000
16.00	0.291	27,162	167.56	0.000
16.50	0.271	27,162	167.56	0.000
17.00	0.256	27,162	167.56	0.000
17.50	0.240	27,162	167.56	0.000
18.00	0.225	27,162	167.56	0.000
18.50	0.210	27,162	167.56	0.000
19.00	0.194	27,162	167.56	0.000
19.50	0.179	27,162	167.56	0.000
20.00	0.163	27,162	167.56	0.000
20.50	0.158	27,162	167.56	0.000
21.00	0.155	27,162	167.56	0.000
21.50	0.152	27,162	167.56	0.000
22.00	0.149	27,162	167.56	0.000
22.50	0.146	27,162	167.56	0.000
23.00	0.143	27,162	167.56	0.000
23.50	0.140	27,162	167.56	0.000
24.00	0.137	27,162	167.56	0.000
24.50	0.000	27,162	167.56	0.000
25.00	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	27,162	167.56	0.000
26.00	0.000	27,162	167.56	0.000
26.50	0.000	27,162	167.56	0.000
27.00	0.000	27,162	167.56	0.000
27.50	0.000	27,162	167.56	0.000
28.00	0.000	27,162	167.56	0.000
28.50	0.000	27,162	167.56	0.000
29.00	0.000	27,162	167.56	0.000
29.50	0.000	27,162	167.56	0.000
30.00	0.000	27,162	167.56	0.000
30.50	0.000	27,162	167.56	0.000
31.00	0.000	27,162	167.56	0.000
31.50	0.000	27,162	167.56	0.000
32.00	0.000	27,162	167.56	0.000
32.50	0.000	27,162	167.56	0.000
33.00	0.000	27,162	167.56	0.000
33.50	0.000	27,162	167.56	0.000
34.00	0.000	27,162	167.56	0.000
34.50	0.000	27,162	167.56	0.000
35.00	0.000	27,162	167.56	0.000
35.50	0.000	27,162	167.56	0.000
36.00	0.000	27,162	167.56	0.000
36.50	0.000	27,162	167.56	0.000
37.00	0.000	27,162	167.56	0.000
37.50	0.000	27,162	167.56	0.000
38.00	0.000	27,162	167.56	0.000
38.50	0.000	27,162	167.56	0.000
39.00	0.000	27,162	167.56	0.000
39.50	0.000	27,162	167.56	0.000
40.00	0.000	27,162	167.56	0.000
40.50	0.000	27,162	167.56	0.000
41.00	0.000	27,162	167.56	0.000
41.50	0.000	27,162	167.56	0.000
42.00	0.000	27,162	167.56	0.000
42.50	0.000	27,162	167.56	0.000
43.00	0.000	27,162	167.56	0.000
43.50	0.000	27,162	167.56	0.000
44.00	0.000	27,162	167.56	0.000
44.50	0.000	27,162	167.56	0.000
45.00	0.000	27,162	167.56	0.000
45.50	0.000	27,162	167.56	0.000
46.00	0.000	27,162	167.56	0.000
46.50	0.000	27,162	167.56	0.000
47.00	0.000	27,162	167.56	0.000
47.50	0.000	27,162	167.56	0.000
48.00	0.000	27,162	167.56	0.000
48.50	0.000	27,162	167.56	0.000
49.00	0.000	27,162	167.56	0.000
49.50	0.000	27,162	167.56	0.000
50.00	0.000	27,162	167.56	0.000
50.50	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	27,162	167.56	0.000
51.50	0.000	27,162	167.56	0.000
52.00	0.000	27,162	167.56	0.000
52.50	0.000	27,162	167.56	0.000
53.00	0.000	27,162	167.56	0.000
53.50	0.000	27,162	167.56	0.000
54.00	0.000	27,162	167.56	0.000
54.50	0.000	27,162	167.56	0.000
55.00	0.000	27,162	167.56	0.000
55.50	0.000	27,162	167.56	0.000
56.00	0.000	27,162	167.56	0.000
56.50	0.000	27,162	167.56	0.000
57.00	0.000	27,162	167.56	0.000
57.50	0.000	27,162	167.56	0.000
58.00	0.000	27,162	167.56	0.000
58.50	0.000	27,162	167.56	0.000
59.00	0.000	27,162	167.56	0.000
59.50	0.000	27,162	167.56	0.000
60.00	0.000	27,162	167.56	0.000
60.50	0.000	27,162	167.56	0.000
61.00	0.000	27,162	167.56	0.000
61.50	0.000	27,162	167.56	0.000
62.00	0.000	27,162	167.56	0.000
62.50	0.000	27,162	167.56	0.000
63.00	0.000	27,162	167.56	0.000
63.50	0.000	27,162	167.56	0.000
64.00	0.000	27,162	167.56	0.000
64.50	0.000	27,162	167.56	0.000
65.00	0.000	27,162	167.56	0.000
65.50	0.000	27,162	167.56	0.000
66.00	0.000	27,162	167.56	0.000
66.50	0.000	27,162	167.56	0.000
67.00	0.000	27,162	167.56	0.000
67.50	0.000	27,162	167.56	0.000
68.00	0.000	27,162	167.56	0.000
68.50	0.000	27,162	167.56	0.000
69.00	0.000	27,162	167.56	0.000
69.50	0.000	27,162	167.56	0.000
70.00	0.000	27,162	167.56	0.000
70.50	0.000	27,162	167.56	0.000
71.00	0.000	27,162	167.56	0.000
71.50	0.000	27,162	167.56	0.000
72.00	0.000	27,162	167.56	0.000
72.50	0.000	27,162	167.56	0.000
73.00	0.000	27,162	167.56	0.000
73.50	0.000	27,162	167.56	0.000
74.00	0.000	27,162	167.56	0.000
74.50	0.000	27,162	167.56	0.000
75.00	0.000	27,162	167.56	0.000
75.50	0.000	27,162	167.56	0.000
76.00	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	27,162	167.56	0.000
77.00	0.000	27,162	167.56	0.000
77.50	0.000	27,162	167.56	0.000
78.00	0.000	27,162	167.56	0.000
78.50	0.000	27,162	167.56	0.000
79.00	0.000	27,162	167.56	0.000
79.50	0.000	27,162	167.56	0.000
80.00	0.000	27,162	167.56	0.000
80.50	0.000	27,162	167.56	0.000
81.00	0.000	27,162	167.56	0.000
81.50	0.000	27,162	167.56	0.000
82.00	0.000	27,162	167.56	0.000
82.50	0.000	27,162	167.56	0.000
83.00	0.000	27,162	167.56	0.000
83.50	0.000	27,162	167.56	0.000
84.00	0.000	27,162	167.56	0.000
84.50	0.000	27,162	167.56	0.000
85.00	0.000	27,162	167.56	0.000
85.50	0.000	27,162	167.56	0.000
86.00	0.000	27,162	167.56	0.000
86.50	0.000	27,162	167.56	0.000
87.00	0.000	27,162	167.56	0.000
87.50	0.000	27,162	167.56	0.000
88.00	0.000	27,162	167.56	0.000
88.50	0.000	27,162	167.56	0.000
89.00	0.000	27,162	167.56	0.000
89.50	0.000	27,162	167.56	0.000
90.00	0.000	27,162	167.56	0.000
90.50	0.000	27,162	167.56	0.000
91.00	0.000	27,162	167.56	0.000
91.50	0.000	27,162	167.56	0.000
92.00	0.000	27,162	167.56	0.000
92.50	0.000	27,162	167.56	0.000
93.00	0.000	27,162	167.56	0.000
93.50	0.000	27,162	167.56	0.000
94.00	0.000	27,162	167.56	0.000
94.50	0.000	27,162	167.56	0.000
95.00	0.000	27,162	167.56	0.000
95.50	0.000	27,162	167.56	0.000
96.00	0.000	27,162	167.56	0.000
96.50	0.000	27,162	167.56	0.000
97.00	0.000	27,162	167.56	0.000
97.50	0.000	27,162	167.56	0.000
98.00	0.000	27,162	167.56	0.000
98.50	0.000	27,162	167.56	0.000
99.00	0.000	27,162	167.56	0.000
99.50	0.000	27,162	167.56	0.000
100.00	0.000	27,162	167.56	0.000
100.50	0.000	27,162	167.56	0.000
101.00	0.000	27,162	167.56	0.000
101.50	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	27,162	167.56	0.000
102.50	0.000	27,162	167.56	0.000
103.00	0.000	27,162	167.56	0.000
103.50	0.000	27,162	167.56	0.000
104.00	0.000	27,162	167.56	0.000
104.50	0.000	27,162	167.56	0.000
105.00	0.000	27,162	167.56	0.000
105.50	0.000	27,162	167.56	0.000
106.00	0.000	27,162	167.56	0.000
106.50	0.000	27,162	167.56	0.000
107.00	0.000	27,162	167.56	0.000
107.50	0.000	27,162	167.56	0.000
108.00	0.000	27,162	167.56	0.000
108.50	0.000	27,162	167.56	0.000
109.00	0.000	27,162	167.56	0.000
109.50	0.000	27,162	167.56	0.000
110.00	0.000	27,162	167.56	0.000
110.50	0.000	27,162	167.56	0.000
111.00	0.000	27,162	167.56	0.000
111.50	0.000	27,162	167.56	0.000
112.00	0.000	27,162	167.56	0.000
112.50	0.000	27,162	167.56	0.000
113.00	0.000	27,162	167.56	0.000
113.50	0.000	27,162	167.56	0.000
114.00	0.000	27,162	167.56	0.000
114.50	0.000	27,162	167.56	0.000
115.00	0.000	27,162	167.56	0.000
115.50	0.000	27,162	167.56	0.000
116.00	0.000	27,162	167.56	0.000
116.50	0.000	27,162	167.56	0.000
117.00	0.000	27,162	167.56	0.000
117.50	0.000	27,162	167.56	0.000
118.00	0.000	27,162	167.56	0.000
118.50	0.000	27,162	167.56	0.000
119.00	0.000	27,162	167.56	0.000
119.50	0.000	27,162	167.56	0.000
120.00	0.000	27,162	167.56	0.000
120.50	0.000	27,162	167.56	0.000
121.00	0.000	27,162	167.56	0.000
121.50	0.000	27,162	167.56	0.000
122.00	0.000	27,162	167.56	0.000
122.50	0.000	27,162	167.56	0.000
123.00	0.000	27,162	167.56	0.000
123.50	0.000	27,162	167.56	0.000
124.00	0.000	27,162	167.56	0.000
124.50	0.000	27,162	167.56	0.000
125.00	0.000	27,162	167.56	0.000
125.50	0.000	27,162	167.56	0.000
126.00	0.000	27,162	167.56	0.000
126.50	0.000	27,162	167.56	0.000
127.00	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	27,162	167.56	0.000
128.00	0.000	27,162	167.56	0.000
128.50	0.000	27,162	167.56	0.000
129.00	0.000	27,162	167.56	0.000
129.50	0.000	27,162	167.56	0.000
130.00	0.000	27,162	167.56	0.000
130.50	0.000	27,162	167.56	0.000
131.00	0.000	27,162	167.56	0.000
131.50	0.000	27,162	167.56	0.000
132.00	0.000	27,162	167.56	0.000
132.50	0.000	27,162	167.56	0.000
133.00	0.000	27,162	167.56	0.000
133.50	0.000	27,162	167.56	0.000
134.00	0.000	27,162	167.56	0.000
134.50	0.000	27,162	167.56	0.000
135.00	0.000	27,162	167.56	0.000
135.50	0.000	27,162	167.56	0.000
136.00	0.000	27,162	167.56	0.000
136.50	0.000	27,162	167.56	0.000
137.00	0.000	27,162	167.56	0.000
137.50	0.000	27,162	167.56	0.000
138.00	0.000	27,162	167.56	0.000
138.50	0.000	27,162	167.56	0.000
139.00	0.000	27,162	167.56	0.000
139.50	0.000	27,162	167.56	0.000
140.00	0.000	27,162	167.56	0.000
140.50	0.000	27,162	167.56	0.000
141.00	0.000	27,162	167.56	0.000
141.50	0.000	27,162	167.56	0.000
142.00	0.000	27,162	167.56	0.000
142.50	0.000	27,162	167.56	0.000
143.00	0.000	27,162	167.56	0.000
143.50	0.000	27,162	167.56	0.000
144.00	0.000	27,162	167.56	0.000
144.50	0.000	27,162	167.56	0.000
145.00	0.000	27,162	167.56	0.000
145.50	0.000	27,162	167.56	0.000
146.00	0.000	27,162	167.56	0.000
146.50	0.000	27,162	167.56	0.000
147.00	0.000	27,162	167.56	0.000
147.50	0.000	27,162	167.56	0.000
148.00	0.000	27,162	167.56	0.000
148.50	0.000	27,162	167.56	0.000
149.00	0.000	27,162	167.56	0.000
149.50	0.000	27,162	167.56	0.000
150.00	0.000	27,162	167.56	0.000
150.50	0.000	27,162	167.56	0.000
151.00	0.000	27,162	167.56	0.000
151.50	0.000	27,162	167.56	0.000
152.00	0.000	27,162	167.56	0.000
152.50	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	27,162	167.56	0.000
153.50	0.000	27,162	167.56	0.000
154.00	0.000	27,162	167.56	0.000
154.50	0.000	27,162	167.56	0.000
155.00	0.000	27,162	167.56	0.000
155.50	0.000	27,162	167.56	0.000
156.00	0.000	27,162	167.56	0.000
156.50	0.000	27,162	167.56	0.000
157.00	0.000	27,162	167.56	0.000
157.50	0.000	27,162	167.56	0.000
158.00	0.000	27,162	167.56	0.000
158.50	0.000	27,162	167.56	0.000
159.00	0.000	27,162	167.56	0.000
159.50	0.000	27,162	167.56	0.000
160.00	0.000	27,162	167.56	0.000
160.50	0.000	27,162	167.56	0.000
161.00	0.000	27,162	167.56	0.000
161.50	0.000	27,162	167.56	0.000
162.00	0.000	27,162	167.56	0.000
162.50	0.000	27,162	167.56	0.000
163.00	0.000	27,162	167.56	0.000
163.50	0.000	27,162	167.56	0.000
164.00	0.000	27,162	167.56	0.000
164.50	0.000	27,162	167.56	0.000
165.00	0.000	27,162	167.56	0.000
165.50	0.000	27,162	167.56	0.000
166.00	0.000	27,162	167.56	0.000
166.50	0.000	27,162	167.56	0.000
167.00	0.000	27,162	167.56	0.000
167.50	0.000	27,162	167.56	0.000
168.00	0.000	27,162	167.56	0.000

Summary for Pond 3P: UG2

[93] Warning: Storage range exceeded by 6.08'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=607)

Inflow Area = 21,562 sf, 86.06% Impervious, Inflow Depth = 5.68" for 50-yr event
Inflow = 4.265 cfs @ 11.96 hrs, Volume= 10,207 cf
Outflow = 5.420 cfs @ 11.95 hrs, Volume= 5,994 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.420 cfs @ 11.95 hrs, Volume= 5,994 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 168.07' @ 11.95 hrs Surf.Area= 2,542 sf Storage= 4,234 cf

Plug-Flow detention time= 227.0 min calculated for 5,993 cf (59% of inflow)
Center-of-Mass det. time= 110.0 min (851.6 - 741.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=5.404 cfs @ 11.95 hrs HW=168.06' TW=167.66' (Fixed TW Elev= 167.66')
└─**4=Culvert** (Inlet Controls 5.404 cfs @ 3.058 fps)
  ├─**1=Orifice/Grate** (Passes < 0.150 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 0.382 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 88.921 cfs potential flow)

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.006	4	159.28	0.000
1.50	0.014	22	159.30	0.000
2.00	0.019	52	159.33	0.000
2.50	0.023	90	159.37	0.000
3.00	0.027	136	159.41	0.000
3.50	0.030	187	159.46	0.000
4.00	0.033	244	159.52	0.000
4.50	0.036	306	159.58	0.000
5.00	0.040	375	159.65	0.000
5.50	0.044	451	159.72	0.000
6.00	0.047	532	159.79	0.000
6.50	0.050	620	159.83	0.000
7.00	0.054	714	159.87	0.000
7.50	0.057	814	159.92	0.000
8.00	0.060	920	159.97	0.000
8.50	0.073	1,038	160.02	0.000
9.00	0.087	1,182	160.09	0.000
9.50	0.090	1,344	160.16	0.000
10.00	0.110	1,521	160.25	0.000
10.50	0.142	1,746	160.35	0.000
11.00	0.196	2,048	160.50	0.000
11.50	**0.322**	**2,506**	**160.73**	**0.000**
12.00	**3.538**	**4,234**	**167.74**	**2.364**
12.50	0.311	4,234	167.58	0.000
13.00	0.194	4,234	167.58	0.000
13.50	0.147	4,234	167.58	0.000
14.00	0.116	4,234	167.58	0.000
14.50	0.102	4,234	167.58	0.000
15.00	0.092	4,234	167.58	0.000
15.50	0.082	4,234	167.58	0.000
16.00	0.071	4,234	167.58	0.000
16.50	0.066	4,234	167.58	0.000
17.00	0.063	4,234	167.58	0.000
17.50	0.059	4,234	167.58	0.000
18.00	0.055	4,234	167.58	0.000
18.50	0.051	4,234	167.58	0.000
19.00	0.048	4,234	167.58	0.000
19.50	0.044	4,234	167.58	0.000
20.00	0.040	4,234	167.58	0.000
20.50	0.039	4,234	167.58	0.000
21.00	0.038	4,234	167.58	0.000
21.50	0.037	4,234	167.58	0.000
22.00	0.037	4,234	167.58	0.000
22.50	0.036	4,234	167.58	0.000
23.00	0.035	4,234	167.58	0.000
23.50	0.034	4,234	167.58	0.000
24.00	0.034	4,234	167.58	0.000
24.50	0.000	4,234	167.58	0.000
25.00	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	4,234	167.58	0.000
26.00	0.000	4,234	167.58	0.000
26.50	0.000	4,234	167.58	0.000
27.00	0.000	4,234	167.58	0.000
27.50	0.000	4,234	167.58	0.000
28.00	0.000	4,234	167.58	0.000
28.50	0.000	4,234	167.58	0.000
29.00	0.000	4,234	167.58	0.000
29.50	0.000	4,234	167.58	0.000
30.00	0.000	4,234	167.58	0.000
30.50	0.000	4,234	167.58	0.000
31.00	0.000	4,234	167.58	0.000
31.50	0.000	4,234	167.58	0.000
32.00	0.000	4,234	167.58	0.000
32.50	0.000	4,234	167.58	0.000
33.00	0.000	4,234	167.58	0.000
33.50	0.000	4,234	167.58	0.000
34.00	0.000	4,234	167.58	0.000
34.50	0.000	4,234	167.58	0.000
35.00	0.000	4,234	167.58	0.000
35.50	0.000	4,234	167.58	0.000
36.00	0.000	4,234	167.58	0.000
36.50	0.000	4,234	167.58	0.000
37.00	0.000	4,234	167.58	0.000
37.50	0.000	4,234	167.58	0.000
38.00	0.000	4,234	167.58	0.000
38.50	0.000	4,234	167.58	0.000
39.00	0.000	4,234	167.58	0.000
39.50	0.000	4,234	167.58	0.000
40.00	0.000	4,234	167.58	0.000
40.50	0.000	4,234	167.58	0.000
41.00	0.000	4,234	167.58	0.000
41.50	0.000	4,234	167.58	0.000
42.00	0.000	4,234	167.58	0.000
42.50	0.000	4,234	167.58	0.000
43.00	0.000	4,234	167.58	0.000
43.50	0.000	4,234	167.58	0.000
44.00	0.000	4,234	167.58	0.000
44.50	0.000	4,234	167.58	0.000
45.00	0.000	4,234	167.58	0.000
45.50	0.000	4,234	167.58	0.000
46.00	0.000	4,234	167.58	0.000
46.50	0.000	4,234	167.58	0.000
47.00	0.000	4,234	167.58	0.000
47.50	0.000	4,234	167.58	0.000
48.00	0.000	4,234	167.58	0.000
48.50	0.000	4,234	167.58	0.000
49.00	0.000	4,234	167.58	0.000
49.50	0.000	4,234	167.58	0.000
50.00	0.000	4,234	167.58	0.000
50.50	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,234	167.58	0.000
51.50	0.000	4,234	167.58	0.000
52.00	0.000	4,234	167.58	0.000
52.50	0.000	4,234	167.58	0.000
53.00	0.000	4,234	167.58	0.000
53.50	0.000	4,234	167.58	0.000
54.00	0.000	4,234	167.58	0.000
54.50	0.000	4,234	167.58	0.000
55.00	0.000	4,234	167.58	0.000
55.50	0.000	4,234	167.58	0.000
56.00	0.000	4,234	167.58	0.000
56.50	0.000	4,234	167.58	0.000
57.00	0.000	4,234	167.58	0.000
57.50	0.000	4,234	167.58	0.000
58.00	0.000	4,234	167.58	0.000
58.50	0.000	4,234	167.58	0.000
59.00	0.000	4,234	167.58	0.000
59.50	0.000	4,234	167.58	0.000
60.00	0.000	4,234	167.58	0.000
60.50	0.000	4,234	167.58	0.000
61.00	0.000	4,234	167.58	0.000
61.50	0.000	4,234	167.58	0.000
62.00	0.000	4,234	167.58	0.000
62.50	0.000	4,234	167.58	0.000
63.00	0.000	4,234	167.58	0.000
63.50	0.000	4,234	167.58	0.000
64.00	0.000	4,234	167.58	0.000
64.50	0.000	4,234	167.58	0.000
65.00	0.000	4,234	167.58	0.000
65.50	0.000	4,234	167.58	0.000
66.00	0.000	4,234	167.58	0.000
66.50	0.000	4,234	167.58	0.000
67.00	0.000	4,234	167.58	0.000
67.50	0.000	4,234	167.58	0.000
68.00	0.000	4,234	167.58	0.000
68.50	0.000	4,234	167.58	0.000
69.00	0.000	4,234	167.58	0.000
69.50	0.000	4,234	167.58	0.000
70.00	0.000	4,234	167.58	0.000
70.50	0.000	4,234	167.58	0.000
71.00	0.000	4,234	167.58	0.000
71.50	0.000	4,234	167.58	0.000
72.00	0.000	4,234	167.58	0.000
72.50	0.000	4,234	167.58	0.000
73.00	0.000	4,234	167.58	0.000
73.50	0.000	4,234	167.58	0.000
74.00	0.000	4,234	167.58	0.000
74.50	0.000	4,234	167.58	0.000
75.00	0.000	4,234	167.58	0.000
75.50	0.000	4,234	167.58	0.000
76.00	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	4,234	167.58	0.000
77.00	0.000	4,234	167.58	0.000
77.50	0.000	4,234	167.58	0.000
78.00	0.000	4,234	167.58	0.000
78.50	0.000	4,234	167.58	0.000
79.00	0.000	4,234	167.58	0.000
79.50	0.000	4,234	167.58	0.000
80.00	0.000	4,234	167.58	0.000
80.50	0.000	4,234	167.58	0.000
81.00	0.000	4,234	167.58	0.000
81.50	0.000	4,234	167.58	0.000
82.00	0.000	4,234	167.58	0.000
82.50	0.000	4,234	167.58	0.000
83.00	0.000	4,234	167.58	0.000
83.50	0.000	4,234	167.58	0.000
84.00	0.000	4,234	167.58	0.000
84.50	0.000	4,234	167.58	0.000
85.00	0.000	4,234	167.58	0.000
85.50	0.000	4,234	167.58	0.000
86.00	0.000	4,234	167.58	0.000
86.50	0.000	4,234	167.58	0.000
87.00	0.000	4,234	167.58	0.000
87.50	0.000	4,234	167.58	0.000
88.00	0.000	4,234	167.58	0.000
88.50	0.000	4,234	167.58	0.000
89.00	0.000	4,234	167.58	0.000
89.50	0.000	4,234	167.58	0.000
90.00	0.000	4,234	167.58	0.000
90.50	0.000	4,234	167.58	0.000
91.00	0.000	4,234	167.58	0.000
91.50	0.000	4,234	167.58	0.000
92.00	0.000	4,234	167.58	0.000
92.50	0.000	4,234	167.58	0.000
93.00	0.000	4,234	167.58	0.000
93.50	0.000	4,234	167.58	0.000
94.00	0.000	4,234	167.58	0.000
94.50	0.000	4,234	167.58	0.000
95.00	0.000	4,234	167.58	0.000
95.50	0.000	4,234	167.58	0.000
96.00	0.000	4,234	167.58	0.000
96.50	0.000	4,234	167.58	0.000
97.00	0.000	4,234	167.58	0.000
97.50	0.000	4,234	167.58	0.000
98.00	0.000	4,234	167.58	0.000
98.50	0.000	4,234	167.58	0.000
99.00	0.000	4,234	167.58	0.000
99.50	0.000	4,234	167.58	0.000
100.00	0.000	4,234	167.58	0.000
100.50	0.000	4,234	167.58	0.000
101.00	0.000	4,234	167.58	0.000
101.50	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

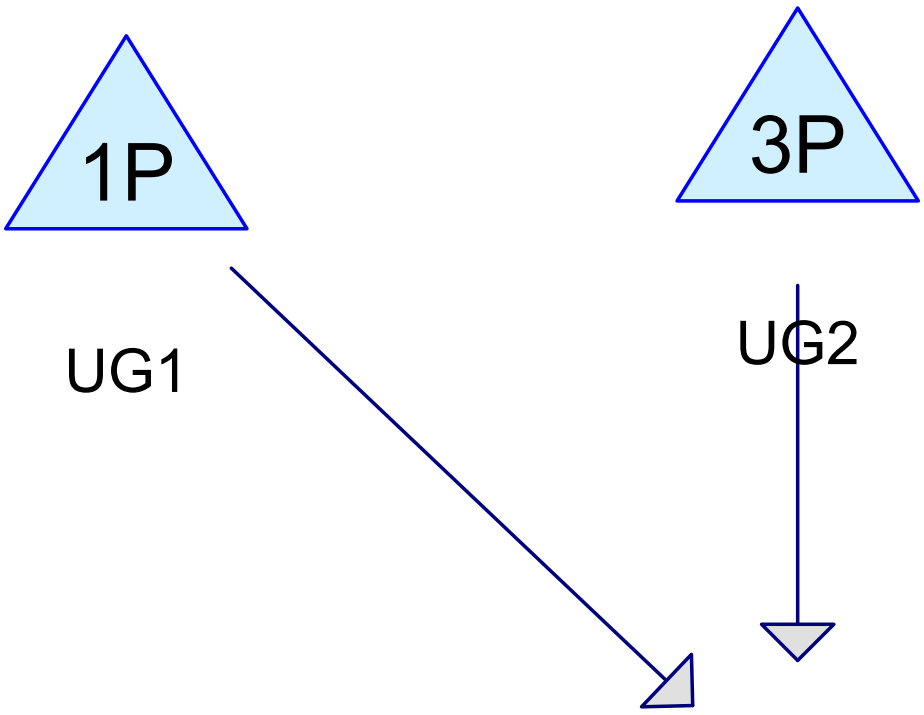
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	4,234	167.58	0.000
102.50	0.000	4,234	167.58	0.000
103.00	0.000	4,234	167.58	0.000
103.50	0.000	4,234	167.58	0.000
104.00	0.000	4,234	167.58	0.000
104.50	0.000	4,234	167.58	0.000
105.00	0.000	4,234	167.58	0.000
105.50	0.000	4,234	167.58	0.000
106.00	0.000	4,234	167.58	0.000
106.50	0.000	4,234	167.58	0.000
107.00	0.000	4,234	167.58	0.000
107.50	0.000	4,234	167.58	0.000
108.00	0.000	4,234	167.58	0.000
108.50	0.000	4,234	167.58	0.000
109.00	0.000	4,234	167.58	0.000
109.50	0.000	4,234	167.58	0.000
110.00	0.000	4,234	167.58	0.000
110.50	0.000	4,234	167.58	0.000
111.00	0.000	4,234	167.58	0.000
111.50	0.000	4,234	167.58	0.000
112.00	0.000	4,234	167.58	0.000
112.50	0.000	4,234	167.58	0.000
113.00	0.000	4,234	167.58	0.000
113.50	0.000	4,234	167.58	0.000
114.00	0.000	4,234	167.58	0.000
114.50	0.000	4,234	167.58	0.000
115.00	0.000	4,234	167.58	0.000
115.50	0.000	4,234	167.58	0.000
116.00	0.000	4,234	167.58	0.000
116.50	0.000	4,234	167.58	0.000
117.00	0.000	4,234	167.58	0.000
117.50	0.000	4,234	167.58	0.000
118.00	0.000	4,234	167.58	0.000
118.50	0.000	4,234	167.58	0.000
119.00	0.000	4,234	167.58	0.000
119.50	0.000	4,234	167.58	0.000
120.00	0.000	4,234	167.58	0.000
120.50	0.000	4,234	167.58	0.000
121.00	0.000	4,234	167.58	0.000
121.50	0.000	4,234	167.58	0.000
122.00	0.000	4,234	167.58	0.000
122.50	0.000	4,234	167.58	0.000
123.00	0.000	4,234	167.58	0.000
123.50	0.000	4,234	167.58	0.000
124.00	0.000	4,234	167.58	0.000
124.50	0.000	4,234	167.58	0.000
125.00	0.000	4,234	167.58	0.000
125.50	0.000	4,234	167.58	0.000
126.00	0.000	4,234	167.58	0.000
126.50	0.000	4,234	167.58	0.000
127.00	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	4,234	167.58	0.000
128.00	0.000	4,234	167.58	0.000
128.50	0.000	4,234	167.58	0.000
129.00	0.000	4,234	167.58	0.000
129.50	0.000	4,234	167.58	0.000
130.00	0.000	4,234	167.58	0.000
130.50	0.000	4,234	167.58	0.000
131.00	0.000	4,234	167.58	0.000
131.50	0.000	4,234	167.58	0.000
132.00	0.000	4,234	167.58	0.000
132.50	0.000	4,234	167.58	0.000
133.00	0.000	4,234	167.58	0.000
133.50	0.000	4,234	167.58	0.000
134.00	0.000	4,234	167.58	0.000
134.50	0.000	4,234	167.58	0.000
135.00	0.000	4,234	167.58	0.000
135.50	0.000	4,234	167.58	0.000
136.00	0.000	4,234	167.58	0.000
136.50	0.000	4,234	167.58	0.000
137.00	0.000	4,234	167.58	0.000
137.50	0.000	4,234	167.58	0.000
138.00	0.000	4,234	167.58	0.000
138.50	0.000	4,234	167.58	0.000
139.00	0.000	4,234	167.58	0.000
139.50	0.000	4,234	167.58	0.000
140.00	0.000	4,234	167.58	0.000
140.50	0.000	4,234	167.58	0.000
141.00	0.000	4,234	167.58	0.000
141.50	0.000	4,234	167.58	0.000
142.00	0.000	4,234	167.58	0.000
142.50	0.000	4,234	167.58	0.000
143.00	0.000	4,234	167.58	0.000
143.50	0.000	4,234	167.58	0.000
144.00	0.000	4,234	167.58	0.000
144.50	0.000	4,234	167.58	0.000
145.00	0.000	4,234	167.58	0.000
145.50	0.000	4,234	167.58	0.000
146.00	0.000	4,234	167.58	0.000
146.50	0.000	4,234	167.58	0.000
147.00	0.000	4,234	167.58	0.000
147.50	0.000	4,234	167.58	0.000
148.00	0.000	4,234	167.58	0.000
148.50	0.000	4,234	167.58	0.000
149.00	0.000	4,234	167.58	0.000
149.50	0.000	4,234	167.58	0.000
150.00	0.000	4,234	167.58	0.000
150.50	0.000	4,234	167.58	0.000
151.00	0.000	4,234	167.58	0.000
151.50	0.000	4,234	167.58	0.000
152.00	0.000	4,234	167.58	0.000
152.50	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	4,234	167.58	0.000
153.50	0.000	4,234	167.58	0.000
154.00	0.000	4,234	167.58	0.000
154.50	0.000	4,234	167.58	0.000
155.00	0.000	4,234	167.58	0.000
155.50	0.000	4,234	167.58	0.000
156.00	0.000	4,234	167.58	0.000
156.50	0.000	4,234	167.58	0.000
157.00	0.000	4,234	167.58	0.000
157.50	0.000	4,234	167.58	0.000
158.00	0.000	4,234	167.58	0.000
158.50	0.000	4,234	167.58	0.000
159.00	0.000	4,234	167.58	0.000
159.50	0.000	4,234	167.58	0.000
160.00	0.000	4,234	167.58	0.000
160.50	0.000	4,234	167.58	0.000
161.00	0.000	4,234	167.58	0.000
161.50	0.000	4,234	167.58	0.000
162.00	0.000	4,234	167.58	0.000
162.50	0.000	4,234	167.58	0.000
163.00	0.000	4,234	167.58	0.000
163.50	0.000	4,234	167.58	0.000
164.00	0.000	4,234	167.58	0.000
164.50	0.000	4,234	167.58	0.000
165.00	0.000	4,234	167.58	0.000
165.50	0.000	4,234	167.58	0.000
166.00	0.000	4,234	167.58	0.000
166.50	0.000	4,234	167.58	0.000
167.00	0.000	4,234	167.58	0.000
167.50	0.000	4,234	167.58	0.000
168.00	0.000	4,234	167.58	0.000



Subcat Reach Pond Link

Routing Diagram for BMW_2025-4-23
Prepared by Bohler, Printed 4/23/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	100-yr	Type II 24-hr		Default	24.00	1	7.66	2

Summary for Pond 1P: UG1

[93] Warning: Storage range exceeded by 34.38'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=601)

Inflow Area = 81,327 sf, 96.79% Impervious, Inflow Depth = 7.21" for 100-yr event
Inflow = 20.473 cfs @ 11.96 hrs, Volume= 48,895 cf
Outflow = 37.232 cfs @ 11.99 hrs, Volume= 22,075 cf, Atten= 0%, Lag= 2.0 min
Primary = 37.232 cfs @ 11.99 hrs, Volume= 22,075 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 195.12' @ 11.99 hrs Surf.Area= 13,041 sf Storage= 27,162 cf

Plug-Flow detention time= 295.8 min calculated for 22,075 cf (45% of inflow)
Center-of-Mass det. time= 150.3 min (887.7 - 737.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=37.187 cfs @ 11.99 hrs HW=195.06' TW=168.67' (Fixed TW Elev= 168.67')
└─**4=Culvert** (Outlet Controls 37.187 cfs @ 21.044 fps)
  ├─**1=Orifice/Grate** (Passes < 0.135 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 19.237 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 2,606.021 cfs potential flow)

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.040	31	157.54	0.000
1.50	0.075	135	157.56	0.000
2.00	0.101	294	157.59	0.000
2.50	0.121	494	157.62	0.000
3.00	0.138	727	157.67	0.000
3.50	0.152	989	157.72	0.000
4.00	0.165	1,274	157.77	0.000
4.50	0.181	1,585	157.83	0.000
5.00	0.198	1,927	157.90	0.000
5.50	0.215	2,299	157.97	0.000
6.00	0.231	2,701	158.04	0.000
6.50	0.247	3,131	158.07	0.000
7.00	0.263	3,591	158.11	0.000
7.50	0.278	4,078	158.15	0.000
8.00	0.294	4,593	158.20	0.000
8.50	0.355	5,171	158.25	0.000
9.00	0.425	5,872	158.31	0.000
9.50	0.437	6,655	158.38	0.000
10.00	0.531	7,515	158.45	0.000
10.50	0.690	8,607	158.55	0.000
11.00	0.951	10,071	158.68	0.000
11.50	**1.558**	**12,286**	**158.88**	**0.000**
12.00	**16.909**	**27,162**	**168.67**	**0.000**
12.50	1.470	27,162	168.67	0.000
13.00	0.915	27,162	168.67	0.000
13.50	0.692	27,162	168.67	0.000
14.00	0.543	27,162	168.67	0.000
14.50	0.480	27,162	168.67	0.000
15.00	0.430	27,162	168.67	0.000
15.50	0.381	27,162	168.67	0.000
16.00	0.332	27,162	168.67	0.000
16.50	0.309	27,162	168.67	0.000
17.00	0.292	27,162	168.67	0.000
17.50	0.274	27,162	168.67	0.000
18.00	0.257	27,162	168.67	0.000
18.50	0.239	27,162	168.67	0.000
19.00	0.222	27,162	168.67	0.000
19.50	0.204	27,162	168.67	0.000
20.00	0.186	27,162	168.67	0.000
20.50	0.181	27,162	168.67	0.000
21.00	0.177	27,162	168.67	0.000
21.50	0.174	27,162	168.67	0.000
22.00	0.170	27,162	168.67	0.000
22.50	0.167	27,162	168.67	0.000
23.00	0.163	27,162	168.67	0.000
23.50	0.160	27,162	168.67	0.000
24.00	0.156	27,162	168.67	0.000
24.50	0.000	27,162	168.67	0.000
25.00	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	27,162	168.67	0.000
26.00	0.000	27,162	168.67	0.000
26.50	0.000	27,162	168.67	0.000
27.00	0.000	27,162	168.67	0.000
27.50	0.000	27,162	168.67	0.000
28.00	0.000	27,162	168.67	0.000
28.50	0.000	27,162	168.67	0.000
29.00	0.000	27,162	168.67	0.000
29.50	0.000	27,162	168.67	0.000
30.00	0.000	27,162	168.67	0.000
30.50	0.000	27,162	168.67	0.000
31.00	0.000	27,162	168.67	0.000
31.50	0.000	27,162	168.67	0.000
32.00	0.000	27,162	168.67	0.000
32.50	0.000	27,162	168.67	0.000
33.00	0.000	27,162	168.67	0.000
33.50	0.000	27,162	168.67	0.000
34.00	0.000	27,162	168.67	0.000
34.50	0.000	27,162	168.67	0.000
35.00	0.000	27,162	168.67	0.000
35.50	0.000	27,162	168.67	0.000
36.00	0.000	27,162	168.67	0.000
36.50	0.000	27,162	168.67	0.000
37.00	0.000	27,162	168.67	0.000
37.50	0.000	27,162	168.67	0.000
38.00	0.000	27,162	168.67	0.000
38.50	0.000	27,162	168.67	0.000
39.00	0.000	27,162	168.67	0.000
39.50	0.000	27,162	168.67	0.000
40.00	0.000	27,162	168.67	0.000
40.50	0.000	27,162	168.67	0.000
41.00	0.000	27,162	168.67	0.000
41.50	0.000	27,162	168.67	0.000
42.00	0.000	27,162	168.67	0.000
42.50	0.000	27,162	168.67	0.000
43.00	0.000	27,162	168.67	0.000
43.50	0.000	27,162	168.67	0.000
44.00	0.000	27,162	168.67	0.000
44.50	0.000	27,162	168.67	0.000
45.00	0.000	27,162	168.67	0.000
45.50	0.000	27,162	168.67	0.000
46.00	0.000	27,162	168.67	0.000
46.50	0.000	27,162	168.67	0.000
47.00	0.000	27,162	168.67	0.000
47.50	0.000	27,162	168.67	0.000
48.00	0.000	27,162	168.67	0.000
48.50	0.000	27,162	168.67	0.000
49.00	0.000	27,162	168.67	0.000
49.50	0.000	27,162	168.67	0.000
50.00	0.000	27,162	168.67	0.000
50.50	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	27,162	168.67	0.000
51.50	0.000	27,162	168.67	0.000
52.00	0.000	27,162	168.67	0.000
52.50	0.000	27,162	168.67	0.000
53.00	0.000	27,162	168.67	0.000
53.50	0.000	27,162	168.67	0.000
54.00	0.000	27,162	168.67	0.000
54.50	0.000	27,162	168.67	0.000
55.00	0.000	27,162	168.67	0.000
55.50	0.000	27,162	168.67	0.000
56.00	0.000	27,162	168.67	0.000
56.50	0.000	27,162	168.67	0.000
57.00	0.000	27,162	168.67	0.000
57.50	0.000	27,162	168.67	0.000
58.00	0.000	27,162	168.67	0.000
58.50	0.000	27,162	168.67	0.000
59.00	0.000	27,162	168.67	0.000
59.50	0.000	27,162	168.67	0.000
60.00	0.000	27,162	168.67	0.000
60.50	0.000	27,162	168.67	0.000
61.00	0.000	27,162	168.67	0.000
61.50	0.000	27,162	168.67	0.000
62.00	0.000	27,162	168.67	0.000
62.50	0.000	27,162	168.67	0.000
63.00	0.000	27,162	168.67	0.000
63.50	0.000	27,162	168.67	0.000
64.00	0.000	27,162	168.67	0.000
64.50	0.000	27,162	168.67	0.000
65.00	0.000	27,162	168.67	0.000
65.50	0.000	27,162	168.67	0.000
66.00	0.000	27,162	168.67	0.000
66.50	0.000	27,162	168.67	0.000
67.00	0.000	27,162	168.67	0.000
67.50	0.000	27,162	168.67	0.000
68.00	0.000	27,162	168.67	0.000
68.50	0.000	27,162	168.67	0.000
69.00	0.000	27,162	168.67	0.000
69.50	0.000	27,162	168.67	0.000
70.00	0.000	27,162	168.67	0.000
70.50	0.000	27,162	168.67	0.000
71.00	0.000	27,162	168.67	0.000
71.50	0.000	27,162	168.67	0.000
72.00	0.000	27,162	168.67	0.000
72.50	0.000	27,162	168.67	0.000
73.00	0.000	27,162	168.67	0.000
73.50	0.000	27,162	168.67	0.000
74.00	0.000	27,162	168.67	0.000
74.50	0.000	27,162	168.67	0.000
75.00	0.000	27,162	168.67	0.000
75.50	0.000	27,162	168.67	0.000
76.00	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	27,162	168.67	0.000
77.00	0.000	27,162	168.67	0.000
77.50	0.000	27,162	168.67	0.000
78.00	0.000	27,162	168.67	0.000
78.50	0.000	27,162	168.67	0.000
79.00	0.000	27,162	168.67	0.000
79.50	0.000	27,162	168.67	0.000
80.00	0.000	27,162	168.67	0.000
80.50	0.000	27,162	168.67	0.000
81.00	0.000	27,162	168.67	0.000
81.50	0.000	27,162	168.67	0.000
82.00	0.000	27,162	168.67	0.000
82.50	0.000	27,162	168.67	0.000
83.00	0.000	27,162	168.67	0.000
83.50	0.000	27,162	168.67	0.000
84.00	0.000	27,162	168.67	0.000
84.50	0.000	27,162	168.67	0.000
85.00	0.000	27,162	168.67	0.000
85.50	0.000	27,162	168.67	0.000
86.00	0.000	27,162	168.67	0.000
86.50	0.000	27,162	168.67	0.000
87.00	0.000	27,162	168.67	0.000
87.50	0.000	27,162	168.67	0.000
88.00	0.000	27,162	168.67	0.000
88.50	0.000	27,162	168.67	0.000
89.00	0.000	27,162	168.67	0.000
89.50	0.000	27,162	168.67	0.000
90.00	0.000	27,162	168.67	0.000
90.50	0.000	27,162	168.67	0.000
91.00	0.000	27,162	168.67	0.000
91.50	0.000	27,162	168.67	0.000
92.00	0.000	27,162	168.67	0.000
92.50	0.000	27,162	168.67	0.000
93.00	0.000	27,162	168.67	0.000
93.50	0.000	27,162	168.67	0.000
94.00	0.000	27,162	168.67	0.000
94.50	0.000	27,162	168.67	0.000
95.00	0.000	27,162	168.67	0.000
95.50	0.000	27,162	168.67	0.000
96.00	0.000	27,162	168.67	0.000
96.50	0.000	27,162	168.67	0.000
97.00	0.000	27,162	168.67	0.000
97.50	0.000	27,162	168.67	0.000
98.00	0.000	27,162	168.67	0.000
98.50	0.000	27,162	168.67	0.000
99.00	0.000	27,162	168.67	0.000
99.50	0.000	27,162	168.67	0.000
100.00	0.000	27,162	168.67	0.000
100.50	0.000	27,162	168.67	0.000
101.00	0.000	27,162	168.67	0.000
101.50	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	27,162	168.67	0.000
102.50	0.000	27,162	168.67	0.000
103.00	0.000	27,162	168.67	0.000
103.50	0.000	27,162	168.67	0.000
104.00	0.000	27,162	168.67	0.000
104.50	0.000	27,162	168.67	0.000
105.00	0.000	27,162	168.67	0.000
105.50	0.000	27,162	168.67	0.000
106.00	0.000	27,162	168.67	0.000
106.50	0.000	27,162	168.67	0.000
107.00	0.000	27,162	168.67	0.000
107.50	0.000	27,162	168.67	0.000
108.00	0.000	27,162	168.67	0.000
108.50	0.000	27,162	168.67	0.000
109.00	0.000	27,162	168.67	0.000
109.50	0.000	27,162	168.67	0.000
110.00	0.000	27,162	168.67	0.000
110.50	0.000	27,162	168.67	0.000
111.00	0.000	27,162	168.67	0.000
111.50	0.000	27,162	168.67	0.000
112.00	0.000	27,162	168.67	0.000
112.50	0.000	27,162	168.67	0.000
113.00	0.000	27,162	168.67	0.000
113.50	0.000	27,162	168.67	0.000
114.00	0.000	27,162	168.67	0.000
114.50	0.000	27,162	168.67	0.000
115.00	0.000	27,162	168.67	0.000
115.50	0.000	27,162	168.67	0.000
116.00	0.000	27,162	168.67	0.000
116.50	0.000	27,162	168.67	0.000
117.00	0.000	27,162	168.67	0.000
117.50	0.000	27,162	168.67	0.000
118.00	0.000	27,162	168.67	0.000
118.50	0.000	27,162	168.67	0.000
119.00	0.000	27,162	168.67	0.000
119.50	0.000	27,162	168.67	0.000
120.00	0.000	27,162	168.67	0.000
120.50	0.000	27,162	168.67	0.000
121.00	0.000	27,162	168.67	0.000
121.50	0.000	27,162	168.67	0.000
122.00	0.000	27,162	168.67	0.000
122.50	0.000	27,162	168.67	0.000
123.00	0.000	27,162	168.67	0.000
123.50	0.000	27,162	168.67	0.000
124.00	0.000	27,162	168.67	0.000
124.50	0.000	27,162	168.67	0.000
125.00	0.000	27,162	168.67	0.000
125.50	0.000	27,162	168.67	0.000
126.00	0.000	27,162	168.67	0.000
126.50	0.000	27,162	168.67	0.000
127.00	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	27,162	168.67	0.000
128.00	0.000	27,162	168.67	0.000
128.50	0.000	27,162	168.67	0.000
129.00	0.000	27,162	168.67	0.000
129.50	0.000	27,162	168.67	0.000
130.00	0.000	27,162	168.67	0.000
130.50	0.000	27,162	168.67	0.000
131.00	0.000	27,162	168.67	0.000
131.50	0.000	27,162	168.67	0.000
132.00	0.000	27,162	168.67	0.000
132.50	0.000	27,162	168.67	0.000
133.00	0.000	27,162	168.67	0.000
133.50	0.000	27,162	168.67	0.000
134.00	0.000	27,162	168.67	0.000
134.50	0.000	27,162	168.67	0.000
135.00	0.000	27,162	168.67	0.000
135.50	0.000	27,162	168.67	0.000
136.00	0.000	27,162	168.67	0.000
136.50	0.000	27,162	168.67	0.000
137.00	0.000	27,162	168.67	0.000
137.50	0.000	27,162	168.67	0.000
138.00	0.000	27,162	168.67	0.000
138.50	0.000	27,162	168.67	0.000
139.00	0.000	27,162	168.67	0.000
139.50	0.000	27,162	168.67	0.000
140.00	0.000	27,162	168.67	0.000
140.50	0.000	27,162	168.67	0.000
141.00	0.000	27,162	168.67	0.000
141.50	0.000	27,162	168.67	0.000
142.00	0.000	27,162	168.67	0.000
142.50	0.000	27,162	168.67	0.000
143.00	0.000	27,162	168.67	0.000
143.50	0.000	27,162	168.67	0.000
144.00	0.000	27,162	168.67	0.000
144.50	0.000	27,162	168.67	0.000
145.00	0.000	27,162	168.67	0.000
145.50	0.000	27,162	168.67	0.000
146.00	0.000	27,162	168.67	0.000
146.50	0.000	27,162	168.67	0.000
147.00	0.000	27,162	168.67	0.000
147.50	0.000	27,162	168.67	0.000
148.00	0.000	27,162	168.67	0.000
148.50	0.000	27,162	168.67	0.000
149.00	0.000	27,162	168.67	0.000
149.50	0.000	27,162	168.67	0.000
150.00	0.000	27,162	168.67	0.000
150.50	0.000	27,162	168.67	0.000
151.00	0.000	27,162	168.67	0.000
151.50	0.000	27,162	168.67	0.000
152.00	0.000	27,162	168.67	0.000
152.50	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	27,162	168.67	0.000
153.50	0.000	27,162	168.67	0.000
154.00	0.000	27,162	168.67	0.000
154.50	0.000	27,162	168.67	0.000
155.00	0.000	27,162	168.67	0.000
155.50	0.000	27,162	168.67	0.000
156.00	0.000	27,162	168.67	0.000
156.50	0.000	27,162	168.67	0.000
157.00	0.000	27,162	168.67	0.000
157.50	0.000	27,162	168.67	0.000
158.00	0.000	27,162	168.67	0.000
158.50	0.000	27,162	168.67	0.000
159.00	0.000	27,162	168.67	0.000
159.50	0.000	27,162	168.67	0.000
160.00	0.000	27,162	168.67	0.000
160.50	0.000	27,162	168.67	0.000
161.00	0.000	27,162	168.67	0.000
161.50	0.000	27,162	168.67	0.000
162.00	0.000	27,162	168.67	0.000
162.50	0.000	27,162	168.67	0.000
163.00	0.000	27,162	168.67	0.000
163.50	0.000	27,162	168.67	0.000
164.00	0.000	27,162	168.67	0.000
164.50	0.000	27,162	168.67	0.000
165.00	0.000	27,162	168.67	0.000
165.50	0.000	27,162	168.67	0.000
166.00	0.000	27,162	168.67	0.000
166.50	0.000	27,162	168.67	0.000
167.00	0.000	27,162	168.67	0.000
167.50	0.000	27,162	168.67	0.000
168.00	0.000	27,162	168.67	0.000

Summary for Pond 3P: UG2

[93] Warning: Storage range exceeded by 7.03'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=604)

Inflow Area = 21,562 sf, 86.06% Impervious, Inflow Depth = 6.53" for 100-yr event
Inflow = 4.899 cfs @ 11.96 hrs, Volume= 11,730 cf
Outflow = 5.004 cfs @ 11.95 hrs, Volume= 7,498 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.004 cfs @ 11.95 hrs, Volume= 7,498 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 169.02' @ 11.95 hrs Surf.Area= 2,542 sf Storage= 4,234 cf

Plug-Flow detention time= 209.3 min calculated for 7,498 cf (64% of inflow)
Center-of-Mass det. time= 99.6 min (840.1 - 740.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=4.988 cfs @ 11.95 hrs HW=169.01' TW=168.67' (Fixed TW Elev= 168.67')
└─**4=Culvert** (Inlet Controls 4.988 cfs @ 2.823 fps)
  ├─**1=Orifice/Grate** (Passes < 0.139 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 0.353 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 97.351 cfs potential flow)

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.009	7	159.29	0.000
1.50	0.018	32	159.31	0.000
2.00	0.024	69	159.35	0.000
2.50	0.029	117	159.39	0.000
3.00	0.032	172	159.45	0.000
3.50	0.036	233	159.51	0.000
4.00	0.039	300	159.58	0.000
4.50	0.043	374	159.65	0.000
5.00	0.047	454	159.73	0.000
5.50	0.051	542	159.80	0.000
6.00	0.055	637	159.84	0.000
6.50	0.058	738	159.88	0.000
7.00	0.062	847	159.93	0.000
7.50	0.066	961	159.99	0.000
8.00	0.069	1,083	160.04	0.000
8.50	0.084	1,219	160.11	0.000
9.00	0.100	1,384	160.18	0.000
9.50	0.103	1,569	160.27	0.000
10.00	0.125	1,772	160.37	0.000
10.50	0.163	2,029	160.49	0.000
11.00	0.224	2,374	160.66	0.000
11.50	**0.367**	**2,896**	**160.93**	**0.000**
12.00	**4.066**	**4,234**	**168.89**	**3.943**
12.50	0.358	4,234	168.68	0.235
13.00	0.223	4,234	168.67	0.100
13.50	0.169	4,234	168.67	0.046
14.00	0.133	4,234	168.67	0.010
14.50	0.118	4,234	168.58	0.000
15.00	0.106	4,234	168.58	0.000
15.50	0.094	4,234	168.58	0.000
16.00	0.082	4,234	168.58	0.000
16.50	0.076	4,234	168.58	0.000
17.00	0.072	4,234	168.58	0.000
17.50	0.068	4,234	168.58	0.000
18.00	0.063	4,234	168.58	0.000
18.50	0.059	4,234	168.58	0.000
19.00	0.055	4,234	168.58	0.000
19.50	0.050	4,234	168.58	0.000
20.00	0.046	4,234	168.58	0.000
20.50	0.045	4,234	168.58	0.000
21.00	0.044	4,234	168.58	0.000
21.50	0.043	4,234	168.58	0.000
22.00	0.042	4,234	168.58	0.000
22.50	0.041	4,234	168.58	0.000
23.00	0.040	4,234	168.58	0.000
23.50	0.039	4,234	168.58	0.000
24.00	0.039	4,234	168.58	0.000
24.50	0.000	4,234	168.58	0.000
25.00	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	4,234	168.58	0.000
26.00	0.000	4,234	168.58	0.000
26.50	0.000	4,234	168.58	0.000
27.00	0.000	4,234	168.58	0.000
27.50	0.000	4,234	168.58	0.000
28.00	0.000	4,234	168.58	0.000
28.50	0.000	4,234	168.58	0.000
29.00	0.000	4,234	168.58	0.000
29.50	0.000	4,234	168.58	0.000
30.00	0.000	4,234	168.58	0.000
30.50	0.000	4,234	168.58	0.000
31.00	0.000	4,234	168.58	0.000
31.50	0.000	4,234	168.58	0.000
32.00	0.000	4,234	168.58	0.000
32.50	0.000	4,234	168.58	0.000
33.00	0.000	4,234	168.58	0.000
33.50	0.000	4,234	168.58	0.000
34.00	0.000	4,234	168.58	0.000
34.50	0.000	4,234	168.58	0.000
35.00	0.000	4,234	168.58	0.000
35.50	0.000	4,234	168.58	0.000
36.00	0.000	4,234	168.58	0.000
36.50	0.000	4,234	168.58	0.000
37.00	0.000	4,234	168.58	0.000
37.50	0.000	4,234	168.58	0.000
38.00	0.000	4,234	168.58	0.000
38.50	0.000	4,234	168.58	0.000
39.00	0.000	4,234	168.58	0.000
39.50	0.000	4,234	168.58	0.000
40.00	0.000	4,234	168.58	0.000
40.50	0.000	4,234	168.58	0.000
41.00	0.000	4,234	168.58	0.000
41.50	0.000	4,234	168.58	0.000
42.00	0.000	4,234	168.58	0.000
42.50	0.000	4,234	168.58	0.000
43.00	0.000	4,234	168.58	0.000
43.50	0.000	4,234	168.58	0.000
44.00	0.000	4,234	168.58	0.000
44.50	0.000	4,234	168.58	0.000
45.00	0.000	4,234	168.58	0.000
45.50	0.000	4,234	168.58	0.000
46.00	0.000	4,234	168.58	0.000
46.50	0.000	4,234	168.58	0.000
47.00	0.000	4,234	168.58	0.000
47.50	0.000	4,234	168.58	0.000
48.00	0.000	4,234	168.58	0.000
48.50	0.000	4,234	168.58	0.000
49.00	0.000	4,234	168.58	0.000
49.50	0.000	4,234	168.58	0.000
50.00	0.000	4,234	168.58	0.000
50.50	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,234	168.58	0.000
51.50	0.000	4,234	168.58	0.000
52.00	0.000	4,234	168.58	0.000
52.50	0.000	4,234	168.58	0.000
53.00	0.000	4,234	168.58	0.000
53.50	0.000	4,234	168.58	0.000
54.00	0.000	4,234	168.58	0.000
54.50	0.000	4,234	168.58	0.000
55.00	0.000	4,234	168.58	0.000
55.50	0.000	4,234	168.58	0.000
56.00	0.000	4,234	168.58	0.000
56.50	0.000	4,234	168.58	0.000
57.00	0.000	4,234	168.58	0.000
57.50	0.000	4,234	168.58	0.000
58.00	0.000	4,234	168.58	0.000
58.50	0.000	4,234	168.58	0.000
59.00	0.000	4,234	168.58	0.000
59.50	0.000	4,234	168.58	0.000
60.00	0.000	4,234	168.58	0.000
60.50	0.000	4,234	168.58	0.000
61.00	0.000	4,234	168.58	0.000
61.50	0.000	4,234	168.58	0.000
62.00	0.000	4,234	168.58	0.000
62.50	0.000	4,234	168.58	0.000
63.00	0.000	4,234	168.58	0.000
63.50	0.000	4,234	168.58	0.000
64.00	0.000	4,234	168.58	0.000
64.50	0.000	4,234	168.58	0.000
65.00	0.000	4,234	168.58	0.000
65.50	0.000	4,234	168.58	0.000
66.00	0.000	4,234	168.58	0.000
66.50	0.000	4,234	168.58	0.000
67.00	0.000	4,234	168.58	0.000
67.50	0.000	4,234	168.58	0.000
68.00	0.000	4,234	168.58	0.000
68.50	0.000	4,234	168.58	0.000
69.00	0.000	4,234	168.58	0.000
69.50	0.000	4,234	168.58	0.000
70.00	0.000	4,234	168.58	0.000
70.50	0.000	4,234	168.58	0.000
71.00	0.000	4,234	168.58	0.000
71.50	0.000	4,234	168.58	0.000
72.00	0.000	4,234	168.58	0.000
72.50	0.000	4,234	168.58	0.000
73.00	0.000	4,234	168.58	0.000
73.50	0.000	4,234	168.58	0.000
74.00	0.000	4,234	168.58	0.000
74.50	0.000	4,234	168.58	0.000
75.00	0.000	4,234	168.58	0.000
75.50	0.000	4,234	168.58	0.000
76.00	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	4,234	168.58	0.000
77.00	0.000	4,234	168.58	0.000
77.50	0.000	4,234	168.58	0.000
78.00	0.000	4,234	168.58	0.000
78.50	0.000	4,234	168.58	0.000
79.00	0.000	4,234	168.58	0.000
79.50	0.000	4,234	168.58	0.000
80.00	0.000	4,234	168.58	0.000
80.50	0.000	4,234	168.58	0.000
81.00	0.000	4,234	168.58	0.000
81.50	0.000	4,234	168.58	0.000
82.00	0.000	4,234	168.58	0.000
82.50	0.000	4,234	168.58	0.000
83.00	0.000	4,234	168.58	0.000
83.50	0.000	4,234	168.58	0.000
84.00	0.000	4,234	168.58	0.000
84.50	0.000	4,234	168.58	0.000
85.00	0.000	4,234	168.58	0.000
85.50	0.000	4,234	168.58	0.000
86.00	0.000	4,234	168.58	0.000
86.50	0.000	4,234	168.58	0.000
87.00	0.000	4,234	168.58	0.000
87.50	0.000	4,234	168.58	0.000
88.00	0.000	4,234	168.58	0.000
88.50	0.000	4,234	168.58	0.000
89.00	0.000	4,234	168.58	0.000
89.50	0.000	4,234	168.58	0.000
90.00	0.000	4,234	168.58	0.000
90.50	0.000	4,234	168.58	0.000
91.00	0.000	4,234	168.58	0.000
91.50	0.000	4,234	168.58	0.000
92.00	0.000	4,234	168.58	0.000
92.50	0.000	4,234	168.58	0.000
93.00	0.000	4,234	168.58	0.000
93.50	0.000	4,234	168.58	0.000
94.00	0.000	4,234	168.58	0.000
94.50	0.000	4,234	168.58	0.000
95.00	0.000	4,234	168.58	0.000
95.50	0.000	4,234	168.58	0.000
96.00	0.000	4,234	168.58	0.000
96.50	0.000	4,234	168.58	0.000
97.00	0.000	4,234	168.58	0.000
97.50	0.000	4,234	168.58	0.000
98.00	0.000	4,234	168.58	0.000
98.50	0.000	4,234	168.58	0.000
99.00	0.000	4,234	168.58	0.000
99.50	0.000	4,234	168.58	0.000
100.00	0.000	4,234	168.58	0.000
100.50	0.000	4,234	168.58	0.000
101.00	0.000	4,234	168.58	0.000
101.50	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	4,234	168.58	0.000
102.50	0.000	4,234	168.58	0.000
103.00	0.000	4,234	168.58	0.000
103.50	0.000	4,234	168.58	0.000
104.00	0.000	4,234	168.58	0.000
104.50	0.000	4,234	168.58	0.000
105.00	0.000	4,234	168.58	0.000
105.50	0.000	4,234	168.58	0.000
106.00	0.000	4,234	168.58	0.000
106.50	0.000	4,234	168.58	0.000
107.00	0.000	4,234	168.58	0.000
107.50	0.000	4,234	168.58	0.000
108.00	0.000	4,234	168.58	0.000
108.50	0.000	4,234	168.58	0.000
109.00	0.000	4,234	168.58	0.000
109.50	0.000	4,234	168.58	0.000
110.00	0.000	4,234	168.58	0.000
110.50	0.000	4,234	168.58	0.000
111.00	0.000	4,234	168.58	0.000
111.50	0.000	4,234	168.58	0.000
112.00	0.000	4,234	168.58	0.000
112.50	0.000	4,234	168.58	0.000
113.00	0.000	4,234	168.58	0.000
113.50	0.000	4,234	168.58	0.000
114.00	0.000	4,234	168.58	0.000
114.50	0.000	4,234	168.58	0.000
115.00	0.000	4,234	168.58	0.000
115.50	0.000	4,234	168.58	0.000
116.00	0.000	4,234	168.58	0.000
116.50	0.000	4,234	168.58	0.000
117.00	0.000	4,234	168.58	0.000
117.50	0.000	4,234	168.58	0.000
118.00	0.000	4,234	168.58	0.000
118.50	0.000	4,234	168.58	0.000
119.00	0.000	4,234	168.58	0.000
119.50	0.000	4,234	168.58	0.000
120.00	0.000	4,234	168.58	0.000
120.50	0.000	4,234	168.58	0.000
121.00	0.000	4,234	168.58	0.000
121.50	0.000	4,234	168.58	0.000
122.00	0.000	4,234	168.58	0.000
122.50	0.000	4,234	168.58	0.000
123.00	0.000	4,234	168.58	0.000
123.50	0.000	4,234	168.58	0.000
124.00	0.000	4,234	168.58	0.000
124.50	0.000	4,234	168.58	0.000
125.00	0.000	4,234	168.58	0.000
125.50	0.000	4,234	168.58	0.000
126.00	0.000	4,234	168.58	0.000
126.50	0.000	4,234	168.58	0.000
127.00	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	4,234	168.58	0.000
128.00	0.000	4,234	168.58	0.000
128.50	0.000	4,234	168.58	0.000
129.00	0.000	4,234	168.58	0.000
129.50	0.000	4,234	168.58	0.000
130.00	0.000	4,234	168.58	0.000
130.50	0.000	4,234	168.58	0.000
131.00	0.000	4,234	168.58	0.000
131.50	0.000	4,234	168.58	0.000
132.00	0.000	4,234	168.58	0.000
132.50	0.000	4,234	168.58	0.000
133.00	0.000	4,234	168.58	0.000
133.50	0.000	4,234	168.58	0.000
134.00	0.000	4,234	168.58	0.000
134.50	0.000	4,234	168.58	0.000
135.00	0.000	4,234	168.58	0.000
135.50	0.000	4,234	168.58	0.000
136.00	0.000	4,234	168.58	0.000
136.50	0.000	4,234	168.58	0.000
137.00	0.000	4,234	168.58	0.000
137.50	0.000	4,234	168.58	0.000
138.00	0.000	4,234	168.58	0.000
138.50	0.000	4,234	168.58	0.000
139.00	0.000	4,234	168.58	0.000
139.50	0.000	4,234	168.58	0.000
140.00	0.000	4,234	168.58	0.000
140.50	0.000	4,234	168.58	0.000
141.00	0.000	4,234	168.58	0.000
141.50	0.000	4,234	168.58	0.000
142.00	0.000	4,234	168.58	0.000
142.50	0.000	4,234	168.58	0.000
143.00	0.000	4,234	168.58	0.000
143.50	0.000	4,234	168.58	0.000
144.00	0.000	4,234	168.58	0.000
144.50	0.000	4,234	168.58	0.000
145.00	0.000	4,234	168.58	0.000
145.50	0.000	4,234	168.58	0.000
146.00	0.000	4,234	168.58	0.000
146.50	0.000	4,234	168.58	0.000
147.00	0.000	4,234	168.58	0.000
147.50	0.000	4,234	168.58	0.000
148.00	0.000	4,234	168.58	0.000
148.50	0.000	4,234	168.58	0.000
149.00	0.000	4,234	168.58	0.000
149.50	0.000	4,234	168.58	0.000
150.00	0.000	4,234	168.58	0.000
150.50	0.000	4,234	168.58	0.000
151.00	0.000	4,234	168.58	0.000
151.50	0.000	4,234	168.58	0.000
152.00	0.000	4,234	168.58	0.000
152.50	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	4,234	168.58	0.000
153.50	0.000	4,234	168.58	0.000
154.00	0.000	4,234	168.58	0.000
154.50	0.000	4,234	168.58	0.000
155.00	0.000	4,234	168.58	0.000
155.50	0.000	4,234	168.58	0.000
156.00	0.000	4,234	168.58	0.000
156.50	0.000	4,234	168.58	0.000
157.00	0.000	4,234	168.58	0.000
157.50	0.000	4,234	168.58	0.000
158.00	0.000	4,234	168.58	0.000
158.50	0.000	4,234	168.58	0.000
159.00	0.000	4,234	168.58	0.000
159.50	0.000	4,234	168.58	0.000
160.00	0.000	4,234	168.58	0.000
160.50	0.000	4,234	168.58	0.000
161.00	0.000	4,234	168.58	0.000
161.50	0.000	4,234	168.58	0.000
162.00	0.000	4,234	168.58	0.000
162.50	0.000	4,234	168.58	0.000
163.00	0.000	4,234	168.58	0.000
163.50	0.000	4,234	168.58	0.000
164.00	0.000	4,234	168.58	0.000
164.50	0.000	4,234	168.58	0.000
165.00	0.000	4,234	168.58	0.000
165.50	0.000	4,234	168.58	0.000
166.00	0.000	4,234	168.58	0.000
166.50	0.000	4,234	168.58	0.000
167.00	0.000	4,234	168.58	0.000
167.50	0.000	4,234	168.58	0.000
168.00	0.000	4,234	168.58	0.000

SEQUENCE OF BMP INSTALLATION AND REMOVAL

§102.4(b)(5)(vii)

ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE. EACH STAGE SHALL BE COMPLETED IN COMPLIANCE WITH CHAPTER 102 REGULATIONS BEFORE ANY FOLLOWING STAGE IS INITIATED. CLEARING AND GRUBBING SHALL BE LIMITED ONLY TO THOSE AREAS DESCRIBED IN EACH STAGE. UPON COMPLETION OR TEMPORARY CESSATION OF THE EARTH DISTURBANCE ACTIVITY THAT WILL EXCEED FOUR (4) DAYS [IMMEDIATELY FOR HQ/EV WATERSHEDS], OR ANY STAGE THEREOF, THE PROJECT SITE SHALL BE IMMEDIATELY STABILIZED WITH THE APPROPRIATE TEMPORARY OR PERMANENT STABILIZATION.

AT LEAST SEVEN (7) DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, THE OPERATOR SHALL INVITE ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES INCLUDING, BUT NOT LIMITED TO: THE LANDOWNER, ALL APPROPRIATE MUNICIPAL OFFICIALS AND A REPRESENTATIVE OF THE MONTGOMERY COUNTY CONSERVATION DISTRICT FOR AN ON-SITE PRE-CONSTRUCTION MEETING. ALSO, AT LEAST THREE (3) DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES SHALL NOTIFY THE PENNSYLVANIA ONE CALL SYSTEM INC. AT 1-800-242-1776 FOR BURIED UTILITIES LOCATION.

BEFORE INITIATING ANY REVISION TO THE APPROVED EROSION AND SEDIMENT CONTROL PLAN OR REVISIONS TO OTHER PLANS WHICH MAY AFFECT THE EFFECTIVENESS OF THE APPROVED E&S CONTROL PLAN, THE OPERATOR MUST RECEIVE APPROVAL OF THE REVISIONS FROM THE MONTGOMERY COUNTY CONSERVATION DISTRICT. THE OPERATOR SHALL ASSURE THAT THE APPROVED EROSION AND SEDIMENT CONTROL PLAN IS PROPERLY AND COMPLETELY IMPLEMENTED. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.

STAGE 0

1. STAKE OUT LIMIT OF DISTURBANCE AND STREAM EXTENTS
2. INSTALL CONSTRUCTION ENTRANCES WITH WASH RACKS AND STAGING AREAS AS DESIGNATED ON THE PLANS.
3. INSTALL ALL PERIMETER COMPOST FILTER SOCKS, TREE PROTECTION FENCING, INLET PROTECTION WITHIN THE DESIGNATED LIMIT OF DISTURBANCE AS INDICATED ON THE PLANS. ONLY LIMITED CLEARING AND GRUBBING NECESSARY TO INSTALL THE PERIMETER EROSION AND SEDIMENT POLLUTION CONTROLS IS PERMITTED.
4. CONSTRUCT FILTER SOCK SEDIMENT TRAP #2. ONLY LIMITED CLEARING AND GRUBBING IS PERMITTED FOR CONSTRUCTION OF THE ACCESS TO THE SEDIMENT TRAP. DURING THE SEDIMENT CONTROL STAGE, THE FACILITY IS NOT TO BE EXCAVATED BELOW THE SEDIMENT TRAP BOTTOM ELEVATION. THE FACILITY IS TO BE STABILIZED AND FUNCTIONING PROPERLY PRIOR TO ANY FURTHER EARTH DISTURBANCE ACTIVITIES.
5. CONSTRUCT FILTER SOCK SEDIMENT TRAP #1. ONLY LIMITED CLEARING AND GRUBBING IS PERMITTED FOR CONSTRUCTION OF THE ACCESS TO THE SEDIMENT TRAP. DURING THE SEDIMENT CONTROL STAGE, THE FACILITY IS NOT TO BE EXCAVATED BELOW THE SEDIMENT TRAP BOTTOM ELEVATION. THE FACILITY IS TO BE STABILIZED AND FUNCTIONING PROPERLY PRIOR TO ANY FURTHER EARTH DISTURBANCE ACTIVITIES. ROCK FILTER IS TO BE REMOVED ONCE FILTER SOCK SEDIMENT TRAPS ARE INSTALLED AND FUNCTIONING.
6. INITIATE THE NECESSARY EARTHWORK TO REACH THE GRADES INDICATED ON THE STAGE-0 PLANS. THE CONCRETE WASHOUT MUST BE INSTALLED BEFORE ANY CONCRETE CAN BE POURED ON-SITE. CONTRACTOR MUST PERFORM BULK OF EARTHWORK TO BALANCE CUTS AND FILLS TO THE GREATEST EXTENT POSSIBLE. ALL AREAS DISTURBED DURING THE EARTHWORK PHASE OF CONSTRUCTION MUST BE TEMPORARILY SEEDED AND STABILIZED IN ACCORDANCE WITH THE GENERAL CONSERVATION NOTES AND SPECIFICATIONS AND SEEDING SPECIFICATIONS IF PERMANENT STABILIZATION CANNOT BE ACHIEVED WITHIN FOUR (4) DAYS.
7. COMMENCE DEMOLITION OF EXISTING BUILDINGS 1 AND 3 (WEST AND EAST) AND ACCESSORY STRUCTURES AND INITIATE REMOVAL OF EXISTING ASPHALT AND CONCRETE FEATURES TO BE REMOVED AS DESIGNATED ON THE PLANS.
8. UPON SITE STABILIZATION FOR TRIBUTARY AREA OF FILTER SOCK SEDIMENT TRAP 2 (UNIFORM COVERAGE OR DENSITY OF 70% ACROSS ALL DISTURBED AREAS) AND NOTIFICATION OF THE MONTGOMERY COUNTY CONSERVATION DISTRICT, REMOVE EROSION AND SEDIMENT CONTROL FACILITY (FILTER SOCK SEDIMENT TRAP #2). ANY AREA DISTURBED DURING THE REMOVAL OF EROSION AND SEDIMENT CONTROL FACILITIES SHALL BE STABILIZED IMMEDIATELY.
9. UPON SITE STABILIZATION FOR TRIBUTARY AREA OF FILTER SOCK SEDIMENT TRAP 1 (UNIFORM COVERAGE OR DENSITY OF 70% ACROSS ALL DISTURBED AREAS) AND NOTIFICATION OF THE MONTGOMERY COUNTY CONSERVATION DISTRICT, REMOVE EROSION AND SEDIMENT CONTROL FACILITY (COMPOST FILTER SOCK TRAP #1). ANY AREA DISTURBED DURING THE REMOVAL OF EROSION AND SEDIMENT CONTROL FACILITIES SHALL BE STABILIZED IMMEDIATELY.
10. A SITE INSPECTION AND APPROVAL BY THE LICENSED DESIGNATED PROFESSIONAL IS REQUIRED PRIOR TO REMOVAL OF SEDIMENT TRAPS. ONCE STONE BASE COURSE HAS BEEN SPREAD IN ALL PAVED AREAS AND ALL LANDSCAPE AREAS HAVE BEEN STABILIZED, BEGIN CONVERTING SEDIMENT TRAPS TO FINAL GRADES IN ACCORDANCE WITH BMP SEQUENCE OF CONSTRUCTION. **THE PERMITTEE SHALL PROVIDE ENGINEERING OVERSIGHT FOR THE REMOVAL OF SEDIMENT TRAPS. A LICENSED PROFESSIONAL OR DESIGNEE KNOWLEDGEABLE IN THE DESIGN AND CONSTRUCTION OF SEDIMENT TRAPS, PREFERABLY THE DESIGN ENGINEER, SHALL CONDUCT THE OVERSIGHT.**

STAGE 1

11. **CRITICAL STAGE - INSTALL CULVERT REALIGNMENT FROM DOWNSTREAM TO UPSTREAM. PROVIDE BYPASS PUMPING DURING FINAL CONNECTION IF NECESSARY**
12. INSTALL 100 FOOT ROCK CONSTRUCTION ENTRANCE AND STAGING AREAS AS DESIGNATED ON THE PLANS.
13. INSTALL ALL PERIMETER COMPOST FILTER SOCKS, TREE PROTECTION FENCING, INLET PROTECTION WITHIN THE DESIGNATED LIMIT OF DISTURBANCE AS INDICATED ON THE PLANS. ONLY LIMITED CLEARING AND GRUBBING NECESSARY TO INSTALL THE PERIMETER EROSION AND SEDIMENT POLLUTION CONTROLS IS PERMITTED.
14. INITIATE THE NECESSARY EARTHWORK TO REACH THE GRADES INDICATED ON THE PLANS. REMAINING BUILDING CONSTRUCTION (INCLUDING PARKING STRUCTURE PART-B, ACCESS RAMPS, ETC.) MAY COMMENCE UPON ACCEPTANCE OF BUILDING PAD BY OWNER. THE CONCRETE WASHOUT MUST BE INSTALLED BEFORE ANY CONCRETE CAN BE POURED ON-SITE. CONTRACTOR MUST PERFORM BULK OF EARTHWORK TO BALANCE CUTS AND FILLS TO THE GREATEST EXTENT POSSIBLE. ALL AREAS DISTURBED DURING THE EARTHWORK PHASE OF CONSTRUCTION MUST BE TEMPORARILY SEEDED AND STABILIZED IN ACCORDANCE WITH THE GENERAL CONSERVATION NOTES AND SPECIFICATIONS AND SEEDING SPECIFICATIONS IF PERMANENT STABILIZATION CANNOT BE ACHIEVED WITHIN FOUR (4) DAYS.
15. **CRITICAL STAGE -** INITIATE STORM SEWER AND SUBSURFACE BASIN INSTALLATIONS FOR THE REMAINING FEATURES SHOWN ON THE PLANS STARTING AT THE FURTHEST DOWNSTREAM STRUCTURE. **THE PERMITTEE SHALL PROVIDE ENGINEERING OVERSIGHT FOR THE CONSTRUCTION OF SUBSURFACE MANAGED RELEASE CONCEPT BASIN AND SUBSURFACE DETENTION BASIN, INCLUDING PREPARATION OF THE SUBGRADE AND OUTLET CONTROL STRUCTURES (OCS-103 AND OCS-201). A LICENSED PROFESSIONAL OR DESIGNEE KNOWLEDGEABLE IN THE DESIGN AND CONSTRUCTION OF SUBSURFACE MANAGED RELEASE CONCEPT BASINS AND DETENTION BASINS, PREFERABLY THE DESIGN ENGINEER, SHALL CONDUCT THE OVERSIGHT.** GC TO INSTALL E&S BMPs (INLET PROTECTION) AND HYDRODYNAMIC DEVICES AS NECESSARY TO INLETS DISCHARGING TO SUBSURFACE DETENTION BASINS IMMEDIATELY AFTER INSTALLATION AND REMAIN INSTALLED UNTIL SITE IS FULLY STABILIZED TO PREVENT SEDIMENT FROM ENTERING THE SUBSURFACE DETENTION BASINS. NO CONSTRUCTION EQUIPMENT, SUCH AS CRANES DURING BUILDING CONSTRUCTION, SHALL BE PARKED ON TOP OF THE SUBSURFACE BASINS TO AVOID DAMAGING THE SUBSURFACE BASINS OR OVER-COMPACTING THE SUBSURFACE SOILS.]
16. CONTINUE WITH THE BALANCE OF EARTHWORK INCLUDING UTILITY INSTALLATION (SANITARY, ELECTRIC, TELEPHONE, CABLE AND GAS) WHERE APPLICABLE.
17. INSTALL ALL CURBING SHOWN IN THIS PHASE AND INSTALL STONE BASE COURSE IN THE DRIVEWAY AND PARKING AREAS.
18. INITIATE FINAL GRADING AND PLACEMENT OF TOPSOIL IN ALL LANDSCAPE AREAS. AS SOON AS SLOPES, CHANNELS, DITCHES AND OTHER DISTURBED AREAS REACH FINAL GRADE, THEY MUST BE STABILIZED. ALL LANDSCAPE AREAS MUST BE STABILIZED AND PERMANENT SEEDING OR PLACEMENT OF SOD MUST BE APPLIED. WHEN FINAL GRADE IS ACHIEVED DURING NON-GERMINATING MONTHS, THE AREA SHOULD BE MULCHED UNTIL THE BEGINNING OF THE NEXT PLANTING SEASON. HOWEVER, THE AREA WILL NOT BE CONSIDERED STABILIZED UNTIL A MINIMUM UNIFORM 70% VEGETATIVE COVER OF EROSION RESISTANT PERENNIAL SPECIES HAS BEEN ACHIEVED. AS DISTURBED AREAS WITHIN A PROJECT APPROACH FINAL GRADE, PREPARATIONS SHOULD BE MADE FOR SEEDING AND MULCHING TO BEGIN (I.E. ANTICIPATE THE COMPLETION DATE AND SCHEDULE THE SEEDER). IN NO CASE SHOULD AN AREA EXCEEDING 15,000 SQUARE FEET, WHICH IS TO BE STABILIZED BY VEGETATION, REACH FINAL GRADE WITHOUT BEING SEEDED AND MULCHED. WAITING UNTIL EARTHMOVING IS COMPLETED BEFORE MAKING PREPARATIONS FOR SEEDING AND MULCHING IS NOT ACCEPTABLE. SEEDING AND MULCHING REQUIREMENTS ARE SPECIFIED IN THE GENERAL CONSERVATION NOTES AND SPECIFICATIONS.
19. INSTALL BITUMINOUS PAVEMENT AND CONCRETE INCLUDING SIDEWALKS.
20. INSTALL FINAL VEGETATION INCLUDING SOD AND LANDSCAPING WHERE SHOWN. FLUSH STORM SEWER PIPES, AND CLEAR SITE OF DEBRIS AND ALL UNWANTED MATERIALS. DISPOSAL SHALL BE IN A SAFE AND LAWFUL MANNER. **A LICENSED PROFESSIONAL SHALL BE ON-SITE TO OVERSEE THE INSTALLATION OF LANDSCAPING FOR RE-VEGETATE/RE-FOREST CREDIT.**
21. UPON SITE STABILIZATION (UNIFORM COVERAGE OR DENSITY OF 70% ACROSS ALL DISTURBED AREAS) AND NOTIFICATION OF THE MONTGOMERY COUNTY CONSERVATION DISTRICT, REMOVE EROSION AND SEDIMENT CONTROL FACILITIES. ANY AREA DISTURBED DURING THE REMOVAL OF EROSION AND SEDIMENT CONTROL FACILITIES SHALL BE STABILIZED IMMEDIATELY.
22. CLEAR SITE OF DEBRIS AND ALL UNWANTED MATERIALS. OPERATOR SHALL REMOVE FROM SITE, RECYCLE OR DISPOSE OF ALL BUILDING MATERIALS AND WASTES IN ACCORDANCE WITH THE DEPARTMENT'S SOLID WASTE MANAGEMENT REGULATIONS AT 25 PA. CODE 260.1 ET SEQ., 271.1 ET SEQ. THE CONTRACTOR SHALL NOT ILLEGALLY BURY, DUMP OR DISCHARGE ANY BUILDING MATERIAL OR WASTE AT THIS SITE.
23. DEMOBILIZE.
24. A NOTICE OF TERMINATION FORM SHOULD BE SUBMITTED TO THE MONTGOMERY COUNTY CONSERVATION DISTRICT UPON STABILIZATION AND FINAL COMPLETION OF THIS PROJECT.

RECYCLING OR DISPOSAL OF POST CONSTRUCTION PCSM MATERIALS

§102.8(f)(11)

THE FOLLOWING IS A LIST THAT INCLUDES, BUT THAT IS NOT LIMITED TO, THE POTENTIAL CONSTRUCTION WASTES THAT MAY EXIST ON-SITE:
- SEDIMENT
- PLANTING SOIL
- DEBRIS & LITTER
- DEAD VEGETATION / PLANT MATERIAL
- MULCH
- RIP-RAP
- PIPING / CLEAN OUTS
- HYDRODYNAMIC DEVICES

ALL BUILDING MATERIALS AND WASTES SHALL BE REMOVED FROM THE SITE AND RECYCLED OR DISPOSED OF IN ACCORDANCE WITH THE DEPARTMENT'S SOLID WASTE MANAGEMENT REGULATIONS AT 25 Pa. CODE 260.1 ET SEQ., 271.1, AND 287.1 ET SEQ. NO BUILDING MATERIALS OR WASTES OR UNUSED BUILDING MATERIALS SHALL BE BURNED, BURIED, DUMPED, OR DISCHARGED AT THE SITE. BELOW IS A LIST OF METHODS FOR THE PROPER RECYCLING/DISPOSAL OF VARIOUS MATERIALS:

PCSM PRODUCED WASTES SHALL BE MAINTAINED IN ACCORDANCE WITH MAINTENANCE DESCRIBED WITHIN THE LONG-TERM OPERATION AND MAINTENANCE SCHEDULE TABLE.

GEOLOGIC FORMATIONS/SOIL CONDITIONS THAT MAY HAVE THE POTENTIAL TO CAUSE POLLUTION

§102.4(b)(5)(xii)

THERE ARE NO GEOLOGIC FORMATIONS OR SOIL CONDITIONS THAT COULD CAUSE CONTAMINANT POLLUTION DURING EARTH DISTURBANCE ACTIVITIES.

E&S THERMAL IMPACT ANALYSIS

THE POTENTIAL FOR THERMAL IMPACTS FROM STORMWATER RUNOFF AS A RESULT OF INCREASED IMPERVIOUS HAVE BEEN AVOIDED OR MINIMIZED THROUGH THE DESIGN OF LANDSCAPING, 1 (1) UNDERGROUND DETENTION FACILITY, AND 2 UNDERGROUND MANAGED RELEASE CONCEPT (MRC) BASINS. THE SHADING EFFECTS OF THE PROPOSED AND EXISTING LANDSCAPING WILL PROVIDE THERMAL WATER QUALITY BENEFITS BY ALLOWING THE STORMWATER THAT HAS RUN ACROSS PAVED AREAS TO DECREASE IN TEMPERATURE PRIOR TO ENTERING THE DOWNSTREAM WATERSHED. THE FACILITIES WILL DETAIN, FILTER AND SHADE THE SURFACE WATER BEFORE MANAGED RELEASE AND WILL HELP COOL DOWN THE SURFACE WATER. THERMAL IMPACTS WILL BE REDUCED DURING CONSTRUCTION BY MEANS OF VARIOUS SOIL EROSION BMP'S THAT WILL REDUCE SEDIMENT LOADING TO SURFACE RUNOFF BEFORE IT LEAVES THE SITE (I.E. COMPOST FILTER SOCKS, INLET FILTER PROTECTION AT EXISTING AND PROPOSED INLETS, EROSION CONTROL MATTING BEING INSTALLED IMMEDIATELY FOLLOWING GRADING). EXISTING TREES AND VEGETATION ON SITE WILL ALSO BE PRESERVED AND PROTECTED WHICH WILL REDUCE THERMAL IMPACTS DURING CONSTRUCTION.

SOIL SUITABILITY AND CHARACTERISTICS

MAP UNIT SYMBOL	SOIL	DEPTH TO SEASONAL HIGH WATER TABLE	DEPTH TO BEDROCK	BRIEF DESCRIPTION OF SOIL	DEPTH FROM SURFACE OF TYPICAL PROFILE	PERMEABILITY	HYDROLOGIC GROUP	SUSECEPTABILITY TO FROST HEAVING	FOR USE AS ROADFILL	FOR USE AS TOPSOIL	FOR USE AS GRAVEL	FOR USE AS SAND	HYDRIC SOILS
UusB	URBAN LAND-UDORTHENTS SHALE AND SANDSTONE COMPLEX, 0-8% SLOPES	>78"	54"		0"-6": VARIABLE 6"-8": CHANNERY SILT LOAM 8"-21": CHANNERY SILT LOAM, CHANNERY SILT CLAY LOAM 21"-34": VERY CHANNERY SILT LOAM 34"-44": BEDROCK	-	A	NONE	NOT RATED	NOT RATED	NOT RATED	NOT RATED	NOT HYDRIC
UgD	URBAN LAND, 8-25% SLOPES	>78"	>78"		VARIABLE	-	B	NONE	NOT RATED	NOT RATED	NOT RATED	NOT RATED	NOT HYDRIC

MRC BMP O&M SCHEDULE

AT A MINIMUM, THE LONG-TERM OPERATION AND MAINTENANCE SCHEDULE MUST MEET 25 PA. CODE § 102.8(F)(10) AND INCLUDE THE FOLLOWING:

1. UPGRADIENT CATCH BASINS AND INLETS SHOULD BE INSPECTED AND CLEANED ANNUALLY, OR MORE OFTEN IF HISTORICAL MAINTENANCE RECORDS SUGGEST A MORE FREQUENT CLEANING.
2. THE VEGETATION (FOR THE CONTRIBUTING DRAINAGE AREA) SHOULD BE MAINTAINED IN GOOD CONDITION, AND ANY BARE SPOTS REVEGETATED.
3. CARE SHOULD BE TAKEN TO AVOID EXCESSIVE COMPACTION BY MOWERS. MOW ONLY AS APPROPRIATE FOR VEGETATIVE SPECIES.
4. INSPECT AT LEAST TWO TIMES PER YEAR AFTER RUNOFF EVENTS GREATER THAN 0.8 INCH AND MAKE SURE THAT RUNOFF DRAINS DOWN WITHIN THE DESIGN PARAMETERS.
5. AT LEAST TWO TIMES PER YEAR, OR MORE IF HISTORICAL MAINTENANCE INDICATE IT IS NECESSARY, INSPECT FOR ACCUMULATION OF SEDIMENT, DAMAGE TO OUTLET CONTROL STRUCTURES, EROSION, SIGNS OF WATER CONTAMINATION/SPILLS, AND INSTABILITY. LEAF LITTER NEEDS TO BE REMOVED ANNUALLY.
   A. TO INSPECT:
      - REMOVE THE INSPECTION PORT LID FROM THE FLOOR BOX FRAME.
      - REMOVE THE RISER PIPE CAP.
      - WITH A FLASHLIGHT AND STADIA ROD, MEASURE THE DEPTH OF SEDIMENT.
      - RECORD RESULTS IN A MAINTENANCE LOG.
      - WHEN DEPTH OF SEDIMENT EXCEEDS 3" (76 MM), REFER TO MANUFACTURER GUIDELINES FOR SEDIMENT REMOVAL PROCEDURE.
6. AS NEEDED, REMOVE ACCUMULATED SEDIMENT AS REQUIRED TO MAINTAIN INFILTRATION THROUGH THE MRCS SOIL MEDIA AND TO MAINTAIN WATER QUALITY FUNCTIONALITY. RESTORE ORIGINAL CROSS SECTION. PROPERLY DISPOSE OF SEDIMENT.
   - IT IS RECOMMENDED TO PERFORM INSPECTION OF THE SEDIMENT SEPARATOR ROW EVERY 6 MONTHS FOR THE FIRST YEAR OF SERVICE.
7. IF ENTRY INTO ANY MANHOLE IS REQUIRED, ALL LOCAL AND OSHA RULES FOR CONFINED SPACE ENTRIES MUST BE STRICTLY FOLLOWED.
8. ALL MRC BMP COMPONENTS SHOULD BE MAINTAINED AS INDICATED IN THE STORMWATER BMP MANUAL.
9. MANUFACTURER INSPECTION AND MAINTENANCE RECORD SHALL BE COMPLETED FOLLOWING EVERY INSPECTION

LONG-TERM PCSM BMP OPERATION AND MAINTENANCE SCHEDULE

§250-68.D.6.e.4.a

BMP NO.	DESCRIPTION	SCHEDULE	INSPECTION TASK	MAINTENANCE	FAILURE INDICATORS
STORM DRAINAGE SYSTEM	INLETS, MANHOLES, AND STORMWATER PIPING.	EVERY 3 MONTHS	• INSPECT INLETS, MANHOLES, AND STORMWATER PIPING	CLEAR SEDIMENT AND DEBRIS FROM ALL ON-SITE INLETS, MANHOLES, AND STORMWATER PIPING.	EXCESSIVE PONDING AROUND THE INLET GRATES COULD INDICATE THAT THERE MAY BE SEDIMENT/DEBRIS BUILDUP.
SWALES	DRAINAGE CHANNELS THAT CONVEY STORMWATER OVER LAND.	ANNUALLY OR AFTER EACH STORM >3"	• INSPECT FOR EROSION AND/OR SEDIMENT ACCUMULATION	AREAS OF EROSION SHALL BE REGRADED AND STABILIZED AND SEDIMENT MUST BE REMOVED TO RESTORE DESIGN CAPACITIES. ANY REMOVED SEDIMENT SHALL BE DISPOSED OF IN AN APPROVED MANNER AND IN ACCORDANCE WITH APPLICABLE STATE REGULATIONS. ALL AREAS DISTURBED DURING MAINTENANCE MUST BE STABILIZED IMMEDIATELY IN ACCORDANCE WITH THE GENERAL CONSERVATION NOTES AND SPECIFICATIONS.	CHANNEL EROSION OR VEGETATION FAILS TO ESTABLISH OR DIES OFF.
BMP 6.6.3 DRY EXTENDED DETENTION BASIN (SUB-SURFACE EXTENDED DETENTION) (UG3)	SUB-SURFACE EXTENDED DETENTION IS A VARIATION OF A DRY EXTENDED DETENTION BASIN AND A IS SYSTEM OF UNDERGROUND PRE-MANUFACTURED VAULTS, PIPES, OR CHAMBERS PLACED IN AGGREGATE FILLED BED IN THE SOIL MANTLE .	4 TIMES PER YEAR & AFTER EVERY STORM > 1 IN. ANNUALLY	• INSPECT BASIN STRUCTURES INCLUDING BASIN BOTTOMS, OUTLET STRUCTURES, RIP-RAP STRUCTURES, AND INLETS FOR CLOGGING AND EXCESS DEBRIS. • INSPECT BASIN STRUCTURES INCLUDING OUTLET STRUCTURES, RIP-RAP STRUCTURES, AND INLETS FOR DAMAGE.	NEEDED MAINTENANCE SHOULD BE CONDUCTED IMMEDIATELY AFTER EACH INSPECTION. THE LITTER AND SEDIMENT SHALL BE REMOVED IN ACCORDANCE WITH THE CHAMBER OR VAULT MANUFACTURER'S INSTRUCTIONS AND SPECIFICATIONS TO RESTORE DESIGN CAPACITIES. REFERENCE INDIVIDUAL MANUFACTURER'S O&M MANUAL FOR DETAILED PROCEDURES. REMOVED LITTER & SEDIMENT SHALL BE DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.	IF THE UNDERGROUND FACILITY DOES NOT DEWATER WITHIN 72 HOURS. UPON OBSERVING A FAILURE INDICATOR A QUALIFIED INDIVIDUAL SUCH AS AN ENGINEER SHALL BE CONSULTED TO DETERMINE THE EXACT CAUSE OF FAILURE. UPON FURTHER INVESTIGATION PERFORMED BY THE QUALIFIED INDIVIDUAL A CORRECTIVE ACTION PLAN SHALL BE IMPLEMENTED TO RESTORE THE FACILITY TO ITS ORIGINAL DESIGN CAPACITIES.
BMP 6.6.4 WATER QUALITY FILTERS & HYDRODYNAMIC DEVICES	WATER QUALITY FILTERS & HYDRODYNAMIC DEVICES REMOVE POLLUTANTS AND NUTRIENTS THROUGH MECHANICAL FILTERS	PER MANUFACTURER'S RECOMMENDATIONS	• INSPECT FILTRATION MEDIA FOR CLOGGING AND EXCESSIVE DEBRIS BUILDUP	CLEAN AND/OR REPLACE FILTER MEDIA AS SPECIFIED BY THE MANUFACTURER	FAILURE INDICATORS INCLUDE EXCESSIVELY SLOW FLOW RATES THROUGH MEDIA. A QUALIFIED INDIVIDUAL SUCH AS A REPRESENTATIVE FROM THE MANUFACTURER SHALL BE CONTACTED. REMEDIATION SHALL BE IN ACCORDANCE WITH THE QUALIFIED INDIVIDUALS RECOMMENDATIONS BASED ON THEIR INVESTIGATION.
BMP 5.6.3 RE-VEGETATE/ RE-FOREST DISTURBED AREAS		ANNUALLY	- INSPECT FOR DYING/DEAD PLANT MATERIAL - INSPECT FOR INVASIVE SPECIES	REMOVE INVASIVE SPECIES AND DISCARD IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS. ANY PLANT THAT IS FOUND TO BE DEAD OR IS DYING AND CANNOT BE SAVED SHALL BE REPLACED IN KIND.	FAILURE INDICATORS INCLUDE AN EXCESSIVE GROWTH OF INVASIVE SPECIES AND VEGETATION THAT FAILS TO ESTABLISH OR DIES OFF. UPON OBSERVING A FAILURE INDICATOR A QUALIFIED INDIVIDUAL SUCH AS A LANDSCAPE ARCHITECT OR SOIL SCIENTIST/ENGINEER SHALL BE CONSULTED TO DETERMINE THE EXACT CAUSE OF THE FAILURE. REMEDIATION SHALL BE IN ACCORDANCE WITH THE QUALIFIED INDIVIDUALS RECOMMENDATIONS BASED ON THEIR INVESTIGATION.
BMP 6.6.3 SUBSURFACE MRC BASIN (UG1 AND UG2)	UNDERGROUND MRC DETENTION BASINS ARE A VARIATION OF A DRY EXTENDED DETENTION BASIN AND A IS SYSTEM OF UNDERGROUND PRE-MANUFACTURED VAULTS, PIPES, OR CHAMBERS PLACED IN AGGREGATE FILLED BED IN THE SOIL MANTLE INTENDED TO CAPTURE AND TREAT RUNOFF THROUGH ENHANCED RESIDENCE TIME WITH THE SOIL MEDIA AND A MANAGED RELEASE RATE OUT THROUGH THE CONTROL STRUCTURE.	4 TIMES PER YEAR & AFTER EVERY STORM > 0.8 IN. ANNUALLY	• INSPECT BASIN STRUCTURES INCLUDING INSPECTION PORTS, BASIN BOTTOMS, OUTLET STRUCTURES, RIP-RAP STRUCTURES, UNDERDRAINS, AND INLETS FOR CLOGGING AND EXCESS DEBRIS. • INSPECT BASIN STRUCTURES INCLUDING THE INSPECTION PORTS, OUTLET STRUCTURES, RIP-RAP STRUCTURES, UNDERDRAINS, AND INLETS FOR DAMAGE.	NEEDED MAINTENANCE SHOULD BE CONDUCTED IMMEDIATELY AFTER EACH INSPECTION. THE LITTER AND SEDIMENT SHALL BE REMOVED IN ACCORDANCE WITH THE CHAMBER OR VAULT MANUFACTURER'S INSTRUCTIONS AND SPECIFICATIONS TO RESTORE DESIGN CAPACITIES. REFERENCE INDIVIDUAL MANUFACTURER'S O&M MANUAL FOR DETAILED PROCEDURES. REMOVED LITTER & SEDIMENT SHALL BE DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.	IF THE UNDERGROUND FACILITY DOES NOT DEWATER WITHIN 168 HOURS (7 DAYS). UPON OBSERVING A FAILURE INDICATOR A QUALIFIED INDIVIDUAL SUCH AS AN ENGINEER SHALL BE CONSULTED TO DETERMINE THE EXACT CAUSE OF FAILURE. UPON FURTHER INVESTIGATION PERFORMED BY THE QUALIFIED INDIVIDUAL A CORRECTIVE ACTION PLAN SHALL BE IMPLEMENTED TO RESTORE THE FACILITY TO ITS ORIGINAL DESIGN CAPACITIES.

TYPES, DEPTH, SLOPE, LOCATIONS, AND LIMITATIONS OF THE SOILS

SOIL DESCRIPTIONS

SOIL	DESCRIPTION	SOIL GROUP	DEPTH TO BEDROCK	DEPTH TO WATER TABLE
UgD	- URBAN LAND, 8 TO 25 PERCENT SLOPES	B	10 TO 99 INCHES TO LITHIC BEDROCK	MORE THAN 80 INCHES
UusB	URBAN LAND, URDOTHENTS, SHALE AND SANDSTONE COMPLEX, 0 TO 8 PERCENT SLOPES	A	10 TO 99 INCHES TO LITHIC BEDROCK	MORE THAN 80 INCHES

SOIL SUITABILITY CHARACTERISTICS & LIMITATIONS

SOIL NAME	CUTBANKS CAVE	CORROSIVE TO CONCRETE/ STEEL	DROUGHTY	EASILY ERODIBLE	FLOODING	DEPTH TO SATURATED ZONE/ SEASONAL HIGH WATER TABLE	HYDRIC/ HYDRIC INCLUSIONS	LOW STRENGTH/ LANDSLIDE PRONE	SLOW PERCOLATION	PIPING	POOR SOURCE OF TOPSOIL	FROST ACTION	SHRINK-SWELL	POTENTIAL SINKHOLE	PONDING	WETNESS
URBAN LAND (UgD)	X	C/S	X	X				X	X		X	X				
UDORTHENTS (UusB)	X	C/S	X	X				X	X		X	X				

SOIL USE LIMITATIONS AND PROVIDED MEASURES TO ADDRESS THOSE LIMITATIONS

SOIL USE RESOLUTIONS

IN ADDITION TO THE LIMITATIONS AND RESOLUTIONS LISTED BELOW, THE CONTRACTOR SHALL CONSULT WITH THE GEOTECHNICAL ENGINEER AND REPORTS TO DETERMINE SOIL LIMITATIONS AND RESOLUTIONS SPECIFIC TO THIS PROJECT.

LIMITATION: CUTBANKS CAVE
RESOLUTION: CONTRACTOR SHALL BE AWARE OF POTENTIAL ISSUES AND FOLLOW OSHA GUIDELINES FOR EXCAVATION BANKS, SLOPES AND TRENCHING.

LIMITATION: CORROSIVE TO CONCRETE / STEEL
RESOLUTION: PIPES, REBAR, CONDUITS, ETC SHALL BE COATED, AS NECESSARY. CONCRETE FOUNDATIONS SHALL BE COATED WITH BITUMINOUS WATER PROOFING MATERIAL, AS NECESSARY.

LIMITATION: DROUGHTY
RESOLUTION: CONTRACTOR TO SELECT APPROPRIATE VEGETATION. EROSION CONTROL BLANKS SHOLD ALSO BE CONSIDERED IN SOIL CONDITIONS THAT MAKE REVEGETATION DIFFICULT. WHEN INSTALLED PROPERLY, EROSION CONTROL BLANKETS CAN HELP HOLD SOIL PARTICLES IN PLACE AND RETAIN SOIL MOISTURE, PROMOTING SEED GERMINATION. SELECTING VEGETATIVE SPECIES TOLERANT TO DRY CONDITIONS, IRRIGATING VEGETATED AREAS AND IMPLEMENTING COMBINATION OF THESE AND/OR OTHER METHODS. SPECIFIC TOLERANCE INFORMATION IS PROVIDED IN TABLE 1 OF THE EROSION CONTROL & CONSERVATION PLANTINGS ON NONCROPLAND PUBLISHED BY PENN STATE

LIMITATION: EASILY ERODIBLE
RESOLUTION: SPECIAL ATTENTION SHALL BE GIVEN TO MAINTAINING EXISTING VEGETATION TO THE EXTENT POSSIBLE. EROSION CONTROL BLANKETS AND IMMEDIATELY STABILIZATION IS REQUIRED FOR EASILY ERODIBLE SOILS. SELECTING VEGETATION WITH GREATER RETARDANCE, SELECTING TEMPORARY / PERMANENT LININGS OTHER THAN GRASSES, AND IMPLEMENTING A COMBINATION OF THESE METHODS WILL DECREASE POTENTIAL FOR EROSION. VEGETATIVE RETARDANCE INFORMATION IS PROVIDED IN TABLES 6 AND 7 OF THE EROSION AND SEDIMENT POLLUTION CONTROL MANUAL PUBLISHED BY PADEP.

LIMITATION: LOW STRENGTH / LANDSLIDE PRONE
RESOLUTION: PRECAUTIONS SHOULD BE TAKEN TO PREVENT SLOPE FAILURES DUE TO IMPROPER CONSTRUCTION PRACTICES, SUCH AS OVER-STEEPENING AND OVERLOADING SLOPES, REMOVAL OF LATERAL SUPPORT, AND FAILURE TO PREVENT SATURATION OF SLOPES. SETBACKS SHOULD COMPLY WITH THE STANDARDS CONTAINED IN CHAPTER 16 OF THE EROSION AND SEDIMENT POLLUTION CONTROL MANUAL, PUBLISHED BY PADEP., UNLESS IT CAN BE SHOWN THAT PROPOSED CUTS AND FILLS DO NOT POSE A HAZARD TO PUBLIC SAFETY AND/OR SURFACE WATERS. WHERE SOILS ARE TO BE UTILIZED AS FILL TO CONSTRUCT A ROADWAY, SOILS MAY BE REQUIRED TO BE IMPORTED SHOULD THEY HAVE LOW STRENGTH.

LIMITATION: SLOW PERCOLATION
RESOLUTION: BMPS SHALL BE INSPECTED AFTER RUNOFF EVENTS TO ENSURE DEWATERING. PROVIDE ADEQUATE AREA FOR PUMPED WATER DISCHARGE IF NECESSARY.

LIMITATION: POOR SOURCE OF TOPSOIL
RESOLUTION: EXCAVATED TOPSOIL WILL BE STOCKPILED AND REUSED. IDENTIFY AND RESOLVE CHARACTERISTICS THAT RENDER THE SOIL TYPES POORLY SUITED AS TOPSOIL. IMPORT TOPSOIL AS NECESSARY.

LIMITATION: FROST ACTION
RESOLUTION: SOILS THAT ARE DIFFICULT TO COMPACT, UNSUITABLE FOR WINTER GRADING, OR SUSCEPTIBLE TO FROST ACTION POSE LIMITATIONS ON PLANNING EMBANKMENTS OF SEDIMENT BASINS, SEDIMENT TRAPS, STORMWATER RETENTION BASINS AND STORMWATER DETENTION BASINS. IMPORT OTHER SOIL FOR EMBANKMENT OF THOSE FACILITES OR LOCATE THOSE FACILITIES ON OTHER SOIL TYPES. DO NOT CONSTRUCT EMBANKMENTS DURING PERIODS PRONE TO FROST.

ADDITIONAL POTENTIAL LIMITATIONS
LIMITATION: DEPTH TO SATURATED ZONE / SEASONAL HIGH WATER TABLE
RESOLUTION: FOLLOW E&S PLAN WITH REGARD TO PUMPING AND DEWATERING AS NECESSARY. DISCHARGE OF SEDIMENT LADEN WATER IS PROHIBITED WITHOUT FIRST PASSING THROUGH A PUMPED WATER FILTER BAG.

LIMITATION: HYDRIC / HYDRIC INCLUSIONS
RESOLUTION: WHEN A SOIL IS LOCATED IN AN AREA THAT HAS HYDROPHYTIC VEGETAION AND WETLAND HYDROLOGY, A WETLAND IS PRESENT. HYDRIC SOILS THAT ARE DELINEATED WETLANDS SHALL BE AVOIDED.

LIMITATION: WETNESS
RESOLUTION: IF HIGH WATER TABLE IS ENCOUNTERED, DEWATERING MAY BE REQUIRED. SELECT VEGEATATIVE SPECIES TOLERANT TO WET CONDITIONS. SPECIFIC TOLERANCE INFORMATION IS PROVIDED IN TABLE 1 OF THE EROSION CONTROL & CONSERVATION PLANTINGS ON NONCROPLAND PUBLISHED BY PENN STATE.

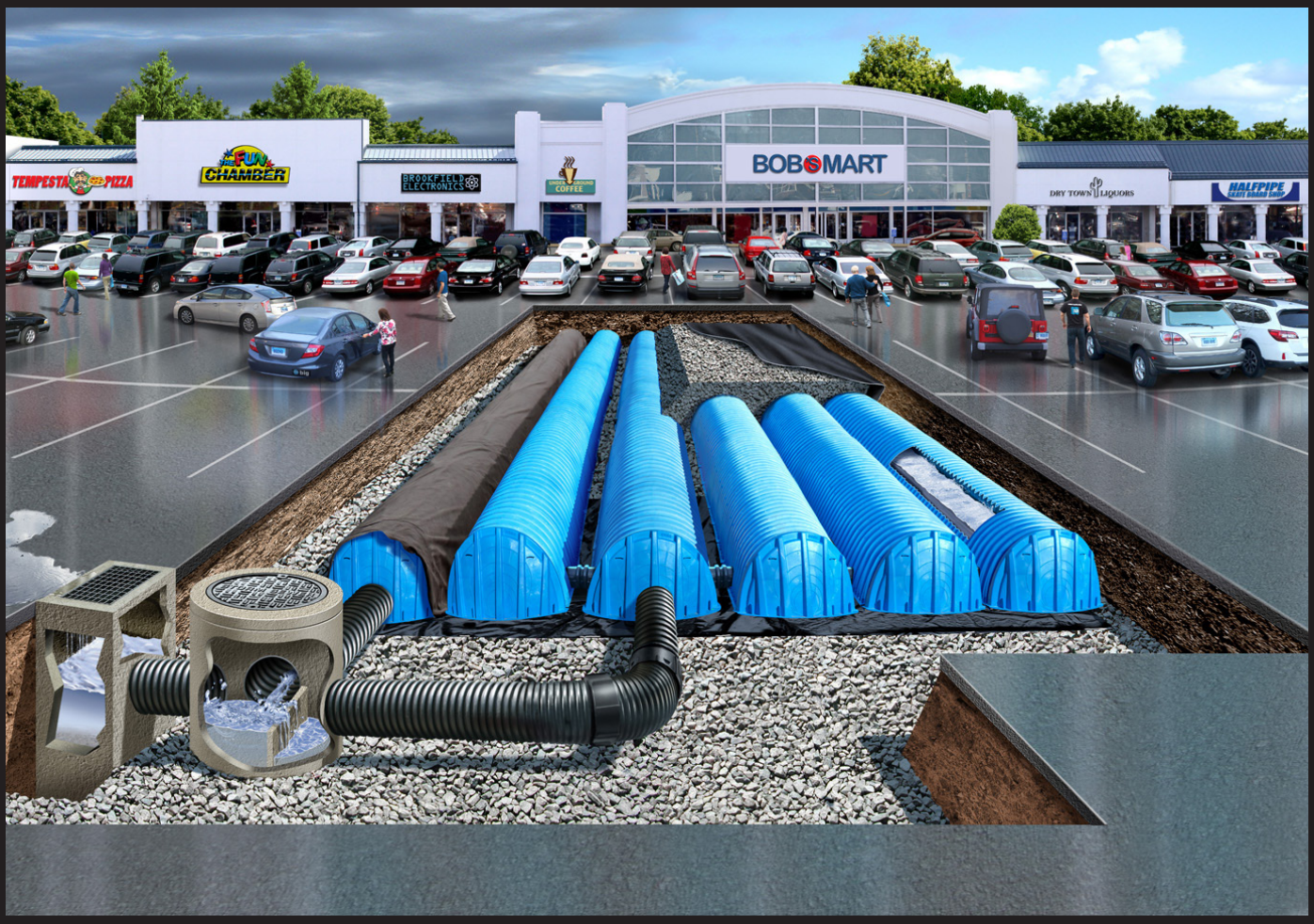
LIMITATION: ACIDIC, pH
RESOLUTIONS: APPLYING LIME CONSISTENT WITH RATES DETERMINED BY SOIL TESTING; SELECTING VEGETATIVE SPECIES TOLERANT TO ACIDIC SOIL CONDITIONS; AND IMPLEMENTING COMBINATIONS OF THESE AND/OR OTHER METHODS. SPECIFIC TOLERANCE INFORMATION IS PROVIDED IN TABLE 1 OF THE EROSION CONTROL & CONSERVATION PLANTINGS ON NONCROPLAND PUBLISHED BY PENN STATE.

LIMITATION: LOW FERTILITY SOIL TYPES LACKING IN SUFFICIENT AMOUNTS OF ESSENTIAL PLANT NUTRIENTS SUCH AS: NITROGEN, PHOSPHOROUS, POTASSIUM, SULFER, MAGNESIUM, CALCIUM, IRON, MANGANESE, BORON, CHLORINE, ZINC, COPPER AND MOLYBDENUM, LIMIT VEGETATION STABILIZATION. SOIL TESTS MIGHT BE NECESSARY TO DETERMINE SITE SPECIFIC SOIL FERTILITY.
RESOLUTIONS: INCORPORATING SOIL NUTRIENTS CONSISTENT WITH RATES DETERMINED BY SOIL TESTING; SELECTIVE VEGETATIVE SPECIES TOLERANT TO LOW FERTILITY SOIL CONDITIONS, AND IMPLEMENTING COMBINATIONS OF THESE AND/OR OTHER METHODS. SPECIFIC TOLERANCE INFORMATION IS PROVIDED IN TABLE 1 OF THE EROSION CONTROL & CONSERVATION PLANTINGS ON NONCROPLAND PUBLISHED BY PENN STATE.

LIMITATION: SIKNHOLE
RESOLUTIONS: IN THE EVENT THAT PRESENCE OF A SINKHOLE IS DETECTED DURING THE COURSE OF WORK, CORRECTIVE MEASURES SHALL BE PERFORMED UNDER THE OBSERVATION AND GUIDANCE OF THE OWNER'S GEOTECHNICAL CONSULTANT. EXCAVATE THE LOOSE, WET SOILS SURROUNDING THE SINKHOLE TO EXPOSE THE SINKHOLE "THROAT" (THE OPENING IN THE ROCK) AND THE ADJACENT STABLE SOILS/ROCK WHERE POSSIBLE, THE EXCAVATION SHALL EXTEND A MINIMUM OF TWO FEET (2') BEYOND THE STABLE SOILS OR TO THE ROCK SURFACE, WHICHEVER IS ENCOUNTERED FIRST.FILL THE EXPOSED SINKHOLE "THROAT" WITH LEAN CONCRETE TO BLOCK THE MIGRATION OF THE UPPER LAYERS OF SOIL THROUGH THE ROCK OPENING.AFTER CONCRETE HAS CURED OVERNIGHT BACKFILL THE REMAINDER OF THE EXCAVATION WITH CLAYEY SOILS TO PROVIDE A LOW PERMEABILITY BARRIER. THE CLAYEY SOILS SHALL BE PLACED IN 8" LIFTS AND EACH LIFT COMPACTED BY REPEATED PASSES OF THE COMPACTION EQUIPMENT UNTIL STABLE. CARE SHALL BE TAKEN TO ASSURE THAT THE SOIL AT THE EDGES OF THE EXCAVATION ARE WELL COMPACTED.

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Visit www.cultec.com/downloads.html for Product Downloads and CAD details.

Doc ID: CLT043 02-22
Feb 2022

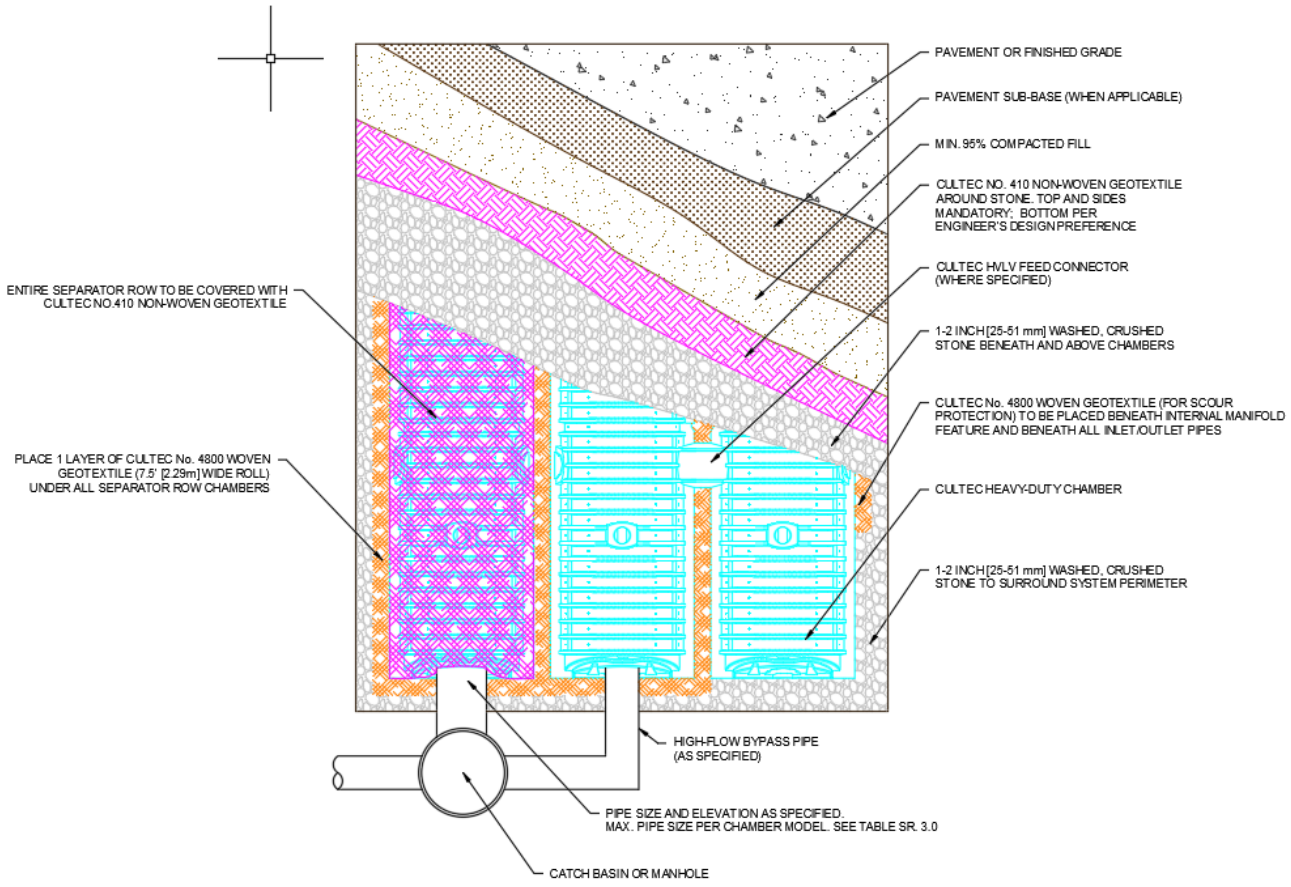
Introduction

CULTEC's Separator™ Row is an inexpensive means of removing Total Suspended Solids from the CULTEC chamber system, as well as providing easier access for inspection and maintenance. The Separator Row is designed to capture the First Flush of a rain event and is typically included as part of the "Treatment Train" for water quality.

The CULTEC Separator Row is a row of CULTEC Contactor or Recharger Chambers that are surrounded on all sides by filter fabric. One layer of CULTEC No. 4800™ Woven Geotextile are placed between the clean foundation stone and the chamber feet. The chambers are then completely wrapped with CULTEC No. 410™ non-woven geotextile. This configuration is designed to trap any sediment and/or debris that may pass through the upstream water-quality structures and into the chamber system.

A manhole is typically located adjacent to the separator row for ease of inspection and maintenance. This manhole is placed upstream of the system and can include a high-flow bypass pipe to pass peak-flows onto adjacent rows of chambers. The upstream manhole is designed with a sump to trap heavier sediment and allow for proper cleaning of the Separator Row. A JetVac process with a high pressure water nozzle is introduced down the Separator Row via the access manhole to clean all sediment and debris from the Separator Row. Captured pollutants are flushed into the sumped access manhole for vacuuming, and the process is repeated until the Separator Row is completely free of sediment and debris.

The Separator Row performance has been tested and verified to the protocols and procedures as defined by Environmental Technology Verification (ETV) Canada to achieve 80% TSS removal.



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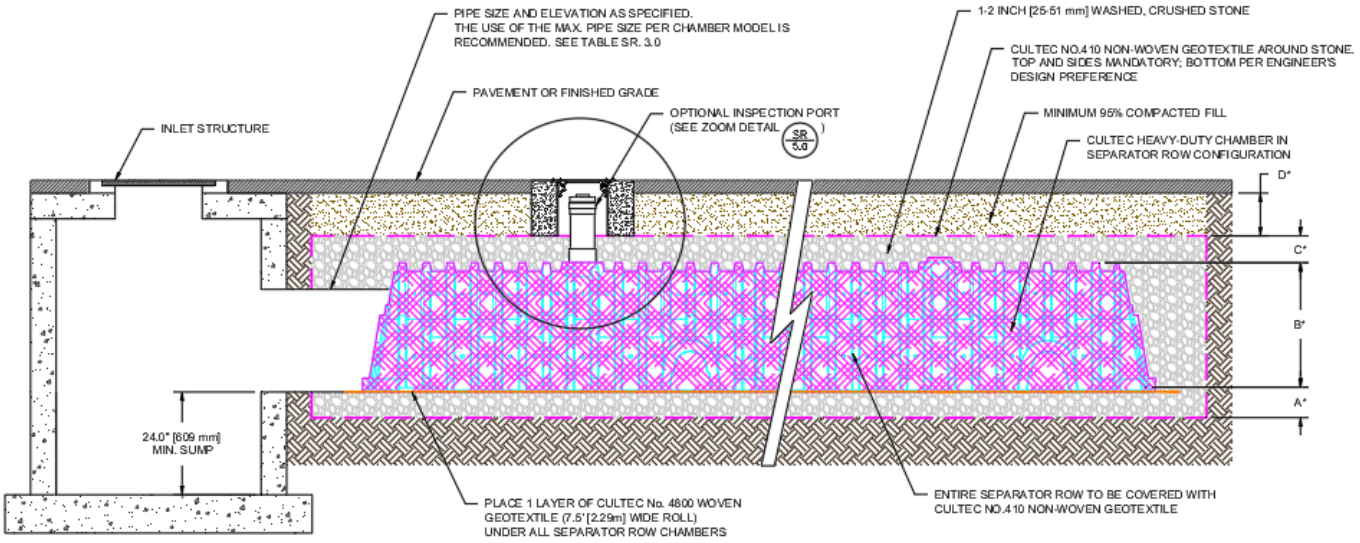
Design

There is no single design to achieve a high level of water quality. The CULTEC Separator Row should be designed as part of an overall best management practices water quality system. Pre-treatment devices such as sump catch basins, inlet baffles and proprietary oil-grit separators and filter systems can all be incorporated upstream of the CULTEC Separator Row. Sumped access/diversion manholes should be installed directly upstream of the Separator Row.

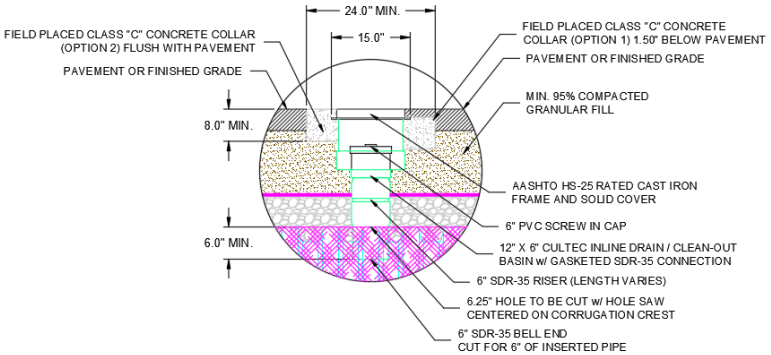
The following is a list of recommended design practices to ensure proper maintenance for the life of the system:

- Install sumped access/diversion manholes, including a minimum 24” (600 mm) sump, directly upstream of the Separator Row.
- Include a high-flow bypass pipe to divert peak flows that exceed the capacity of the Separator Row to adjacent rows.
- Connect the access manhole to the Separator Row with the largest diameter pipe allowable based on the CULTEC chamber model used.
- Maintain a minimum distance between the access manhole and the Separator Row to promote efficient maintenance.
- Include at least one inspection port per Separator Row for periodic inspection.

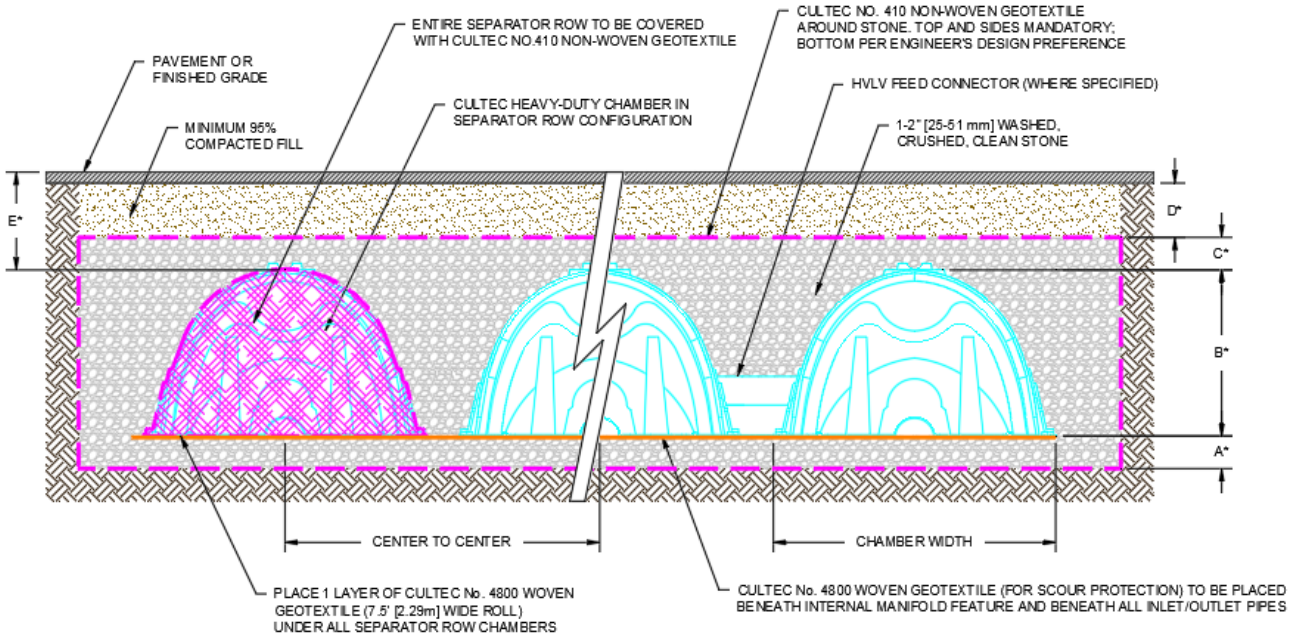
Note: Typical JetVac maintenance reels have a maximum of 400 feet (121.9 m) of available hose. Consider this when designing the length of the CULTEC Separator Rows.



*SEE SR 3.0 - CROSS SECTION TABLE REFERENCE



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*SEE SR 3.0 - CROSS SECTION TABLE REFERENCE

Table SR 3.0

	Description	Contactor 100HD	Recharger 150XLHD	Recharger 280HD	Recharger 330XLHD	Recharger 360HD	Recharger 902HD
A	Min. depth of stone base	6″ 152 mm	6″ 152 mm	6″ 152 mm	6″ 152 mm	6″ 152 mm	9″ 229 m
B	Chamber height	12.5″ 318 mm	18.5″ 470 mm	26.5″ 673 mm	30.5″ 775 mm	36″ 914 mm	48″ 1219 mm
C	Min. depth of stone required above units for traffic applications	6″ 152 mm	6″ 152 mm	6″ 152 mm	6″ 152 mm	6″ 152 mm	12″ 305 mm
D	Min. depth required of 95% compacted fill for paved traffic application	8″ 203 mm	8″ 203 mm	8″ 203 mm	10″ 254 mm	12″ 305 mm	12″ 305 mm
E	Max. depth of cover allowed above crown of chamber	12′ 3.65 m	12′ 3.65 m	12′ 3.65 m	12′ 3.65 m	12′ 3.65 m	8.5′ 2.59 m
	Max. allowable pipe size into chamber end wall/end cap	10″ 250 mm	12″ 300 mm	18″ 450 mm	24″ 600 mm	24″ 600 mm	24″ 600 mm

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Inspection and Maintenance

CULTEC recommends inspection of the Separator Row to be performed every six months for the first year of service. Future inspection frequency can be adjusted based upon previous inspection observations. However annual inspections are recommended. Inspection of the Separator Row can be achieved via an inspection port riser installed during construction. This inspection port riser will connect the top of the Separator Row chambers to finished grade with a removable lid. Alternatively the Separator Row may be inspected via the manhole(s) located at the end(s) of the Separator Row. However this method of inspection requires confined space entry. If entry into the manhole is required, all local and OSHA rules for confined space entries must be strictly followed.

To inspect:

- Remove the inspection port lid from the floor box frame.
- Remove the riser pipe cap.
- With a flashlight and stadia rod, measure the depth of sediment.
- Record results in a maintenance log.
- When depth of sediment exceeds 3” (76 mm), use the JetVac procedure described below.

The JetVac process utilizes a high pressure water nozzle controlled from the surface. The high pressure nozzle is introduced down the Separator Row via the access manhole(s). The high pressure water cleans all sediment and debris from the Separator Row as the nozzle is retrieved. Captured pollutants are flushed into the sumped access manhole for vacuuming. This process is repeated until the Separator Row is completely free of sediment and debris. A small diameter culvert cleaning nozzle is recommended for this procedure.



High pressure water nozzle



Cleaning Separator Row and pipes with high pressure water nozzle



SEPARATOR ROW: Separator Row prior to cleaning



ADJACENT ROW: When the Separator Row is working properly, the adjacent rows will not show signs of sediment.

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Inspection and Maintenance Record

Date	Mode of Access	Frequency	Depth of Sediment	Actions	Expenses	Inspector	Notes
Ex.	Inspection Port	Semi-annually	2”	Measure sediment depth with stadia rod. Visually inspect	$100	DPG	Depth of Sediment was measured via Northeast Inspection Port Adjacent to MH-1. Sediment depth was found to be 2”. No further action required at this time.
Ex.	Access Manhole	Annually					

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Appendix B – Offsite Discharge Analysis

Offsite Discharge Analysis

POI#1 Downstream Analysis

Pre-Development Conditions
POI #001, taking the south and western portions of the site in the pre-development condition, drains through two distinct areas of cover to an open channel running along the south of the property; one area being predominately wooded area and the other area being predominately parking area. The flow through the wooded area takes place via sheet flow and channeled flow to an existing open channel located along the southwestern portion of the site. Flow then discharges out of the existing open channel and runs via channel flow (off-site) to the point of interest located at Sandy Run, which is tributary to Wissahickon Creek. The flow through the parking area drains via sheet flow and shallow concentrated flow to an existing inlet and 18-inch pipe located in the southeast corner of the site. Flow then discharges out of the existing 18-inch pipe and runs via channel flow in an existing open channel to the point of interest. **All discharges from POI#1 discharge directly to a surface water, and therefore an off-site discharge analysis is not required.**

POI#2 Downstream Analysis

Pre-Development Conditions
POI#2 drains in a northerly direction via sheet flow as runoff leaves the subject property. Once flow leaves the property, it collects in a roadside stormwater collection system that drains to an existing 72-inch culvert containing mapped waters. Flow then discharges out of the existing 63-inch by 96-inch culvert directly to POI #001.

During Construction Conditions
POI#2 continues to drain in the same manner as pre-development conditions. The Runoff will be reduced through means of drainage area reduction.

Post-Development Conditions
POI#2 continues to drain in the same manner as pre-development conditions. The existing elliptical culvert pipe is proposed to be realigned and will function in the same manner as the pre-development conditions. There are no structural BMPs within this discharge point and a reduction in overall drainage area.

Downstream Analysis Conclusion
POI#2 has a reduction in overall drainage area in post-development conditions. Runoff is collected and conveyed through an existing collection/conveyance system, but does not pass through any structural stormwater facility prior to discharge to the Sandy Run. Therefore, stormwater will be conveyed in a manner similar to predevelopment conditions, with an overall reduction in rate and volume in each storm event analyzed (2, 10, 50 & 100-year). The downslope property owners are protected by the proposed reduction in stormwater flows from the predevelopment condition in all storm events. All flow is via stormwater conveyance piping at a reduced rate and volume, therefore ensuring that accelerated erosion will not occur downstream of the site due to the proposed development.

ALLOWABLE RELEASE RATE WORKSHEET

PROJECT: ***BMW Fort Washington***
500, 506, 510 & 512 Pennsylvania Avenue
Whitemarsh Township
Montgomery County, PA

DATE: ***7/24/2025***
BY: ***RS***
CHECKED BY: ***MRB***
SHEET NO.: ***Summary***
REVISION: ***4***

Release Rate Summary

Stormwater Peak Rate & Volume Summary - POI#1

	Storm Event (years)													
Hydrograph	**1**		**2**		**5**		**10**		**25**		**50**		**100**	
	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)
Pre-Development (cfs)	5.996	18,729	8.041	25,070	11.294	35,342	14.015	44,087	18.041	57,257	21.445	68,573	25.063	80,802
Post Development Total (cfs)	2.629	24,645	3.979	31,185	6.280	41,697	7.853	50,636	10.004	64,132	12.116	75,778	13.690	88,419
Required Release Rate Percentage														
Required Release Rate (cfs)	N/A	N/A	5.996	18,729	8.041	25,070	11.294	35,342	14.015	44,087	18.041	57,257	21.445	68,573
Pre to Post Change (cfs)	-3.367	5,916	-4.062	6,115	-5.014	6,355	-6.162	6,549	-8.037	6,875	-9.329	7,205	-11.373	7,617

Stormwater Peak Rate & Volume Summary - POI#2

	Storm Event (years)													
Hydrograph	**1**		**2**		**5**		**10**		**25**		**50**		**100**	
	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)
Pre-Development (cfs)	1.769	3,491	2.579	5,034	3.930	7,662	5.101	9,985	6.879	13,584	8.410	16,743	10.063	20,209
Post Development Total (cfs)	0.714	1,523	1.172	2,369	1.977	3,882	2.701	5,268	3.834	7,476	4.834	9,458	5.932	11,664
Required Release Rate Percentage														
Required Release Rate (cfs)	N/A	N/A	1.769	3,491	2.579	5,034	3.930	7,662	5.101	9,985	6.879	13,584	8.410	16,743
Pre to Post Change (cfs)	-1.055	-1,968	-1.407	-2,665	-1.953	-3,780	-2.400	-4,717	-3.045	-6,108	-3.576	-7,285	-4.131	-8,545

Stormwater Peak Rate & Volume Summary - TOTAL POI#1

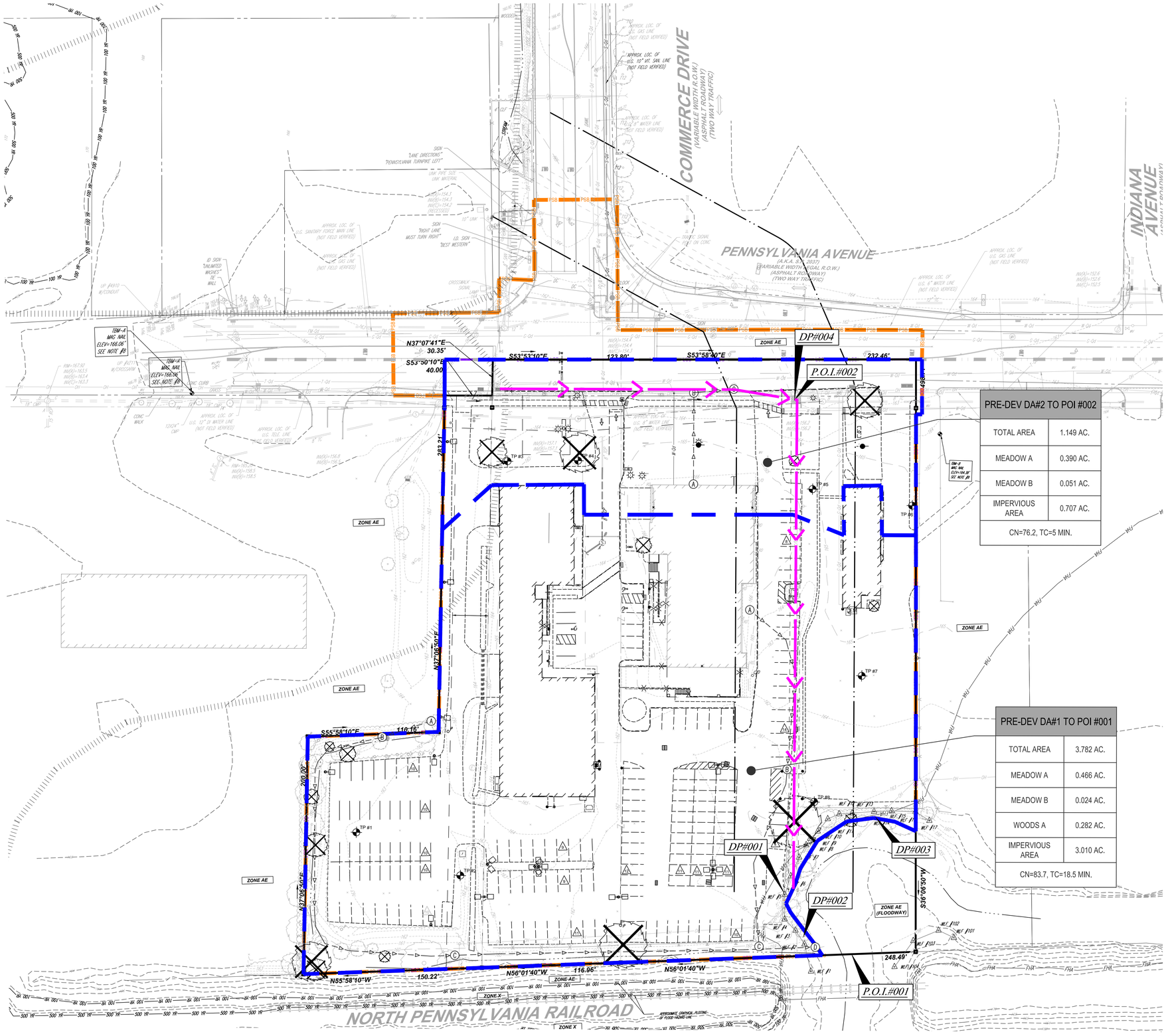
	Storm Event (years)													
Hydrograph	**1**		**2**		**5**		**10**		**25**		**50**		**100**	
	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)
Pre-Development (cfs)	6.392	22,220	8.617	30,104	12.182	43,004	15.210	54,070	19.791	70,841	23.724	85,316	27.952	101,011
Post Development Total (cfs)	3.342	26,168	5.124	33,554	8.233	45,579	10.531	55,904	13.799	71,608	16.521	85,235	19.438	100,083
Required Release Rate Percentage														
Required Release Rate (cfs)	N/A	N/A	6.392	22,220	8.617	30,104	12.182	43,004	15.210	54,070	19.791	70,841	23.724	85,316
Pre to Post Change (cfs)	-3.050	3,948	-3.493	3,450	-3.949	2,575	-4.679	1,834	-5.992	767	-7.203	-81	-8.514	-928

COMPUTATION SHEET : COMPOSITE CURVE NUMBER (CN)

PROJECT: ***BMW Fort Washington***
500 Pennsylvania Ave
Whitemarsh Township, Montgomery County

DATE: ***1/3/2025***
BY: ***RMS***
CHECKED BY: ***JAB***
REVISION: ***1***

Cover Type Description	Soil HSG	CN	Sediment Trap 1 to POI#1 (Acres)	Sediment Trap 2 to POI#1 (Acres)	During-Construction DA#1 Total (Acres)	During-Construction DA#2 to POI#1 (Acres)	During-Construction POI#1 (Acres)
Meadow	A	39	0.000	0.000	0.000	0.000	0.000
Wooded	A	30	0.367	0.000	0.367	0.000	0.367
Bare Earth	A	72	1.544	1.184	2.728	0.649	3.377
Meadow	B	61	0.000	0.000	0.000	0.000	0.000
Wooded	B	55	0.000	0.000	0.000	0.000	0.000
Bare Earth	B	82	0.030	0.000	0.030	0.084	0.114
Meadow	C	74	0.000	0.000	0.000	0.000	0.000
Wooded	C	70	0.000	0.000	0.000	0.000	0.000
Bare Earth	C	87	0.000	0.000	0.000	0.000	0.000
Impervious	ALL	98	0.404	0.248	0.652	0.511	1.163
		Total Area	2.345	1.432	3.777	1.244	5.021
		Composite CN	**70.0**	**76.5**	**72.5**	**83.4**	**75.2**
		Time of Concentration (Tc)	18.50	9.10	9.10	9.10	9.10



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I CERTIFY THAT THE PROPOSED FACILITY IS NOT UNDERLAIN BY LIMESTONE.

MICHAEL W. DERR

REGISTERED No.: #PE080964

DATE

40 20 10 0 40

1"= 40'

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LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/3/2025	NPDES MAJOR MODIFICATION	RMS / JAB
2	3/12/2025	FOR NPDES RESUBMISSION	RMS / JAB
3	04/14/2025	PER TOWNSHIP COMMENT	RMS / JAB
4	5/28/2025	PER NPDES COMMENT	RMS / JAB
5	7/22/2025	PER REVISED ARCH	RMS / MRB

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PROJECT No.:	PAB220113.01
DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-DRIN-5A

PROJECT:

AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

500 PENNSYLVANIA AVENUE
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY, PA

BOHLER

74 W BROAD STREET, SUITE 500
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PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE082006
NEW YORK LICENSE No. 16 093204
NEW JERSEY LICENSE No. 24GE05326500

SHEET TITLE:

PRE DEVELOPMENT DRAINAGE AREA PLAN

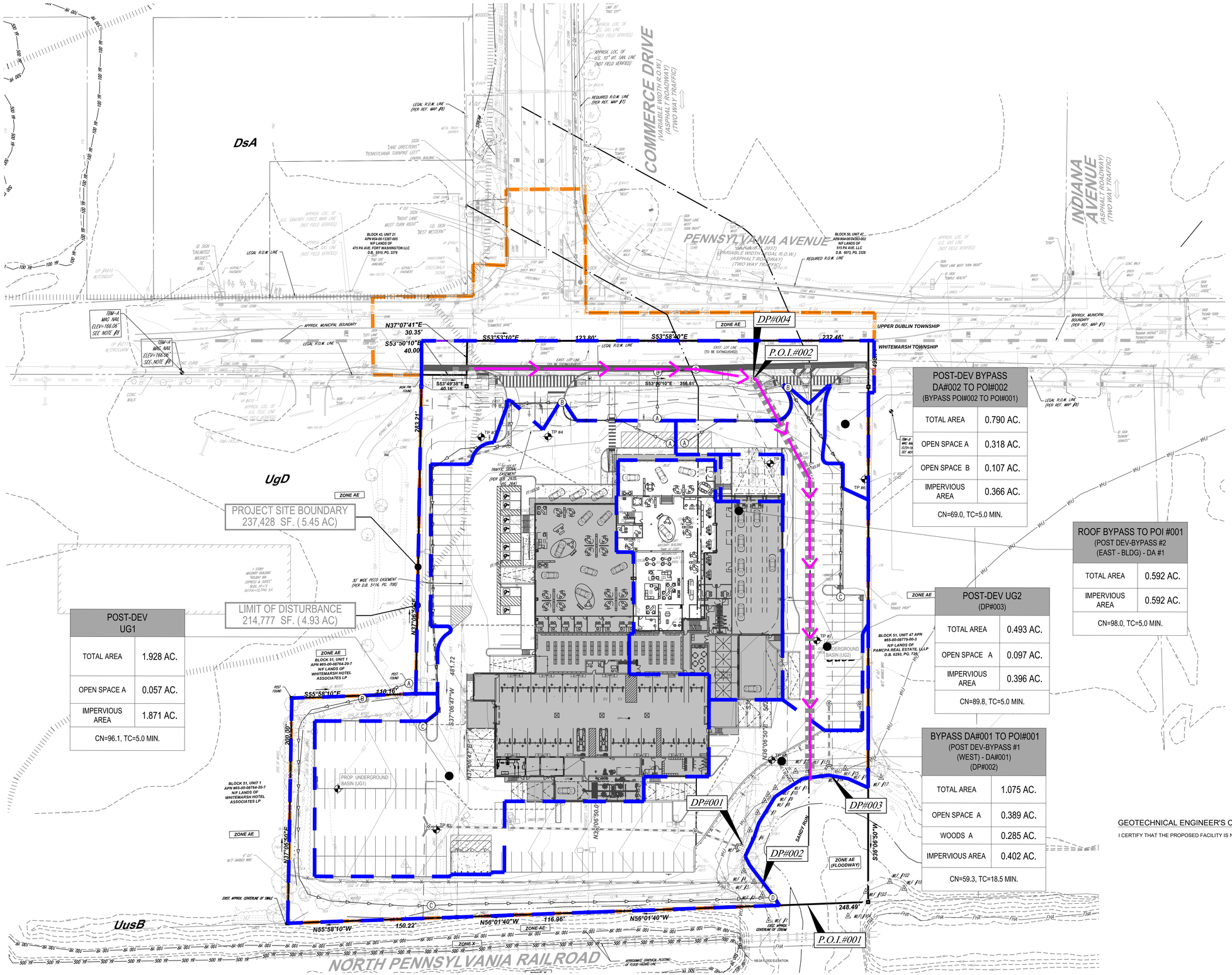
SHEET NUMBER:

C-1001

REVISION 5 - 7/22/2025

RS

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POST-DEV UG1	
TOTAL AREA	1.928 AC.
OPEN SPACE A	0.057 AC.
IMPERVIOUS AREA	1.871 AC.
CN=96.1, TC=5.0 MIN.	

POST-DEV BYPASS DA#002 TO POI#002 (BYPASS POI#002 TO POI#001)	
TOTAL AREA	0.790 AC.
OPEN SPACE A	0.318 AC.
OPEN SPACE B	0.107 AC.
IMPERVIOUS AREA	0.366 AC.
CN=69.0, TC=5.0 MIN.	

POST-DEV UG2 (DP#003)	
TOTAL AREA	0.493 AC.
OPEN SPACE A	0.097 AC.
IMPERVIOUS AREA	0.396 AC.
CN=89.8, TC=5.0 MIN.	

ROOF BYPASS TO POI #001 (POST DEV-BYPASS #2 (EAST - BLDG) - DA #1	
TOTAL AREA	0.592 AC.
IMPERVIOUS AREA	0.592 AC.
CN=98.0, TC=5.0 MIN.	

BYPASS DA#001 TO POI#001 (POST DEV-BYPASS #1 (WEST) - DA#001) (DP#002)	
TOTAL AREA	1.075 AC.
OPEN SPACE A	0.389 AC.
WOODS A	0.285 AC.
IMPERVIOUS AREA	0.402 AC.
CN=59.3, TC=18.5 MIN.	

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MICHAEL W. DERR

REGISTERED No.: #PE080964

DATE

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1"= 40'

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DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-DRIN-SA

PROJECT:

AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

500 PENNSYLVANIA AVENUE
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY, PA

BOHLER

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J.A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE082005
NEW YORK LICENSE No. 16 093204
NEW JERSEY LICENSE No. 24GE05036500

SHEET TITLE:

POST DEVELOPMENT DRAINAGE AREA PLAN

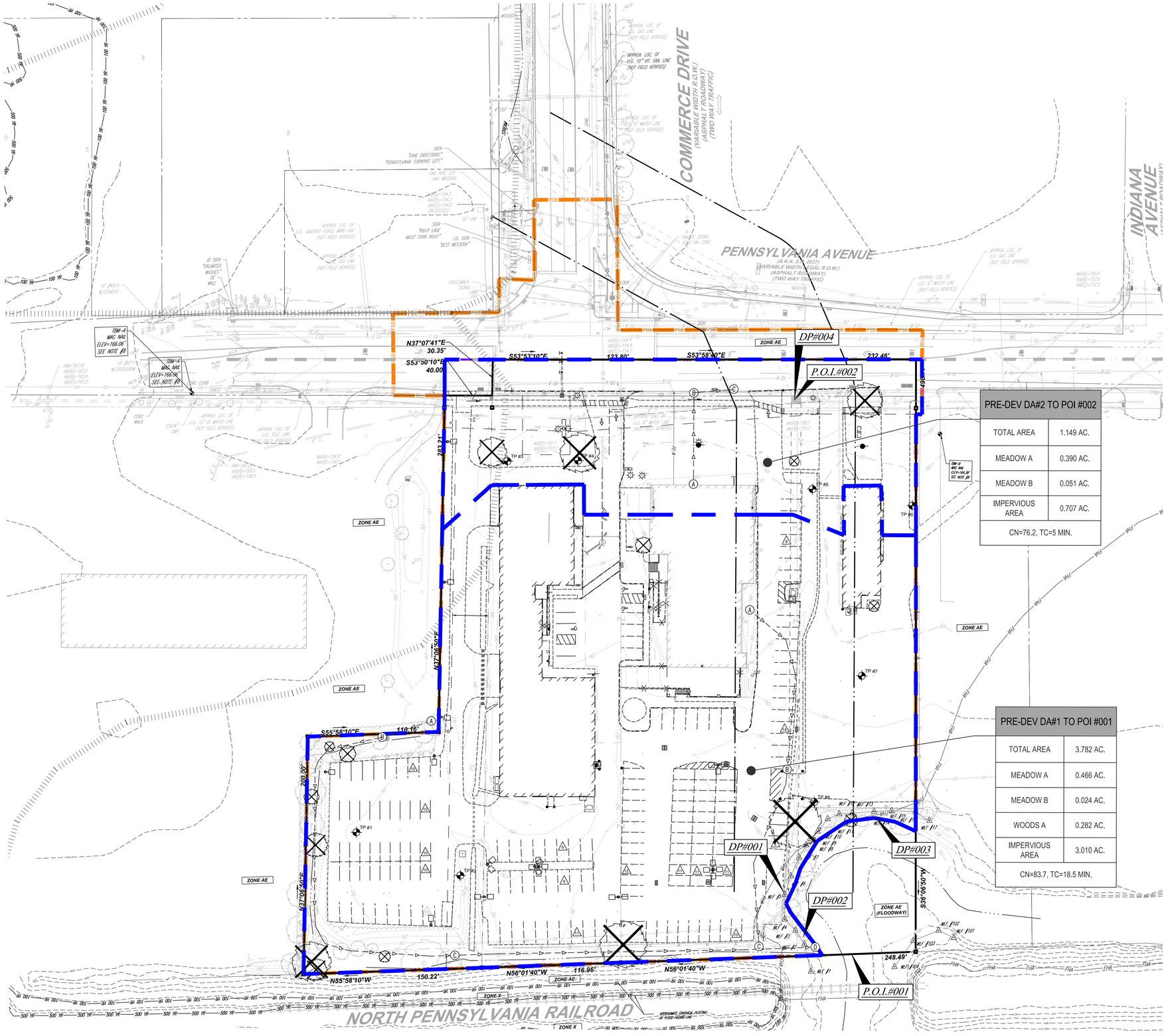
SHEET NUMBER:

C-1002

REVISION 5 - 7/22/2025

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-DRIN-SA---LAYOUT C-1002 POST

Appendix C – Drainage Area Plans



PRE-DEV DA#2 TO POI #002	
TOTAL AREA	1.149 AC.
MEADOW A	0.390 AC.
MEADOW B	0.051 AC.
IMPERVIOUS AREA	0.707 AC.
CN=76.2, TC=5 MIN.	

PRE-DEV DA#1 TO POI #001	
TOTAL AREA	3.782 AC.
MEADOW A	0.466 AC.
MEADOW B	0.024 AC.
WOODS A	0.282 AC.
IMPERVIOUS AREA	3.010 AC.
CN=83.7, TC=18.5 MIN.	

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MICHAEL W. DERR

REGISTERED No.: #PE080964

DATE

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1"= 40'

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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/3/2025	NPDES MAJOR MODIFICATION	RMS / JAB
2	3/12/2025	FOR NPDES RESUBMISSION	RMS / JAB
3	04/14/2025	PER TOWNSHIP COMMENT	RMS / JAB
4	5/28/2025	PER NPDES COMMENT	RMS / JAB
5	7/22/2025	PER REVISED ARCH	RMS / MRB

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PROJECT No.:	PAB220113.01
DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-DRIN-5A

PROJECT:

AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

**500 PENNSYLVANIA AVENUE
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY, PA**

BOHLER
74 W BROAD STREET, SUITE 500
BETHLEHEM, PA 18018
Phone: (610) 709-9971
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J.A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE082006
NEW YORK LICENSE No. 16 093204
NEW JERSEY LICENSE No. 24GE05326500

SHEET TITLE:

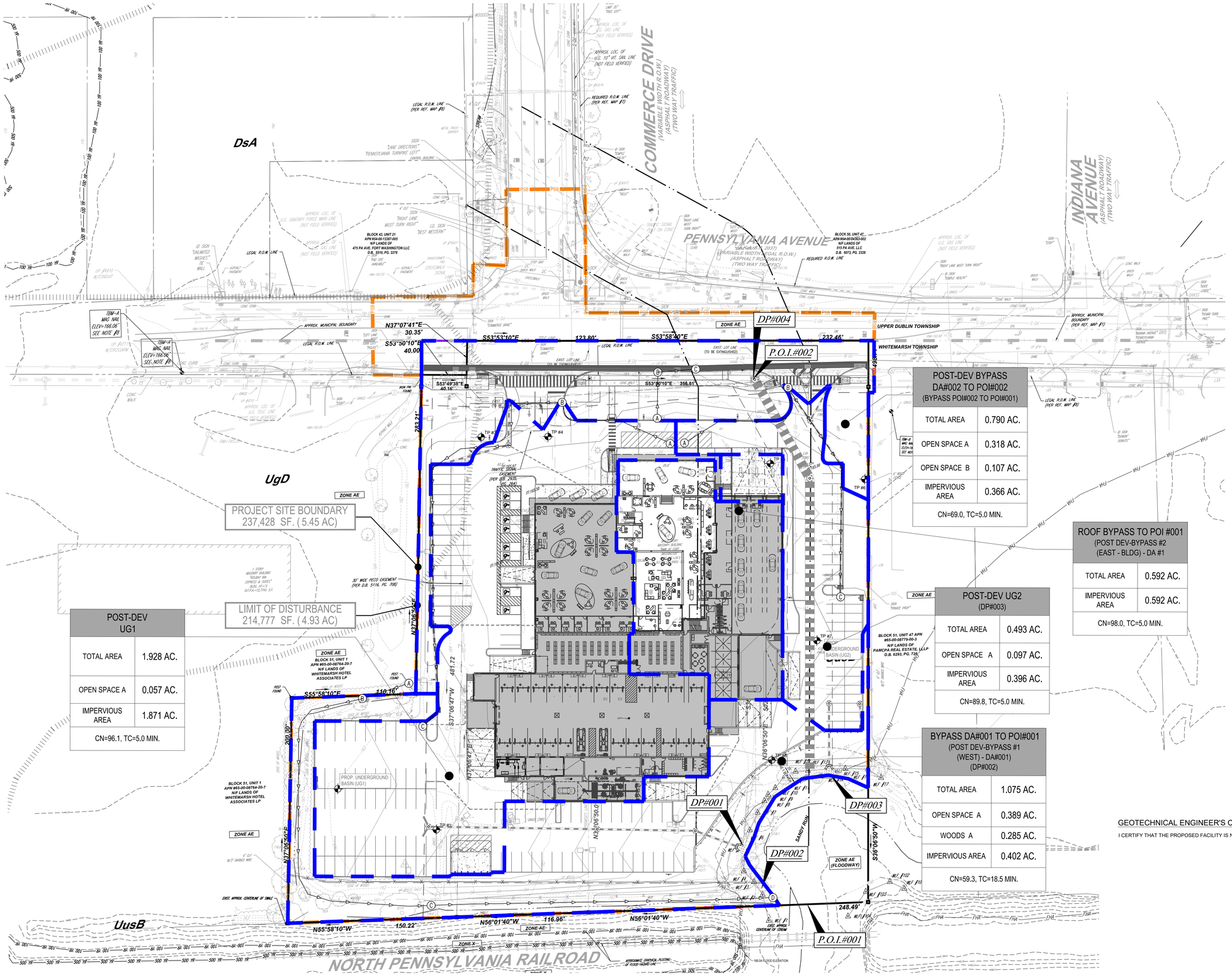
PRE DEVELOPMENT DRAINAGE AREA PLAN

SHEET NUMBER:

C-1001

REVISION 5 - 7/22/2025

RS
P:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-DRIN-5A——LAYOUT: C-1001 PRE



POST-DEV UG1	
TOTAL AREA	1.928 AC.
OPEN SPACE A	0.057 AC.
IMPERVIOUS AREA	1.871 AC.
CN=96.1, TC=5.0 MIN.	

POST-DEV UG2 (DP#003)	
TOTAL AREA	0.493 AC.
OPEN SPACE A	0.097 AC.
IMPERVIOUS AREA	0.396 AC.
CN=89.8, TC=5.0 MIN.	

BYPASS DA#001 TO POI#001 (POST DEV-BYPASS #1 (WEST) - DA#001) (DP#002)	
TOTAL AREA	1.075 AC.
OPEN SPACE A	0.389 AC.
WOODS A	0.285 AC.
IMPERVIOUS AREA	0.402 AC.
CN=59.3, TC=18.5 MIN.	

POST-DEV BYPASS DA#002 TO POI#002 (BYPASS POI#002 TO POI#001)	
TOTAL AREA	0.790 AC.
OPEN SPACE A	0.318 AC.
OPEN SPACE B	0.107 AC.
IMPERVIOUS AREA	0.366 AC.
CN=69.0, TC=5.0 MIN.	

ROOF BYPASS TO POI #001 (POST DEV-BYPASS #2 (EAST - BLDG) - DA #1	
TOTAL AREA	0.592 AC.
IMPERVIOUS AREA	0.592 AC.
CN=98.0, TC=5.0 MIN.	

GEOTECHNICAL ENGINEER'S CERTIFICATION

I CERTIFY THAT THE PROPOSED FACILITY IS NOT UNDERLAIN BY LIMESTONE.

MICHAEL W. DERR

REGISTERED No.: #PE080964

DATE

40 20 10 0 40

1"= 40'

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NEW YORK LICENSE No. 16 093204
NEW JERSEY LICENSE No. 24GE05336500

SHEET TITLE:

POST DEVELOPMENT DRAINAGE AREA PLAN

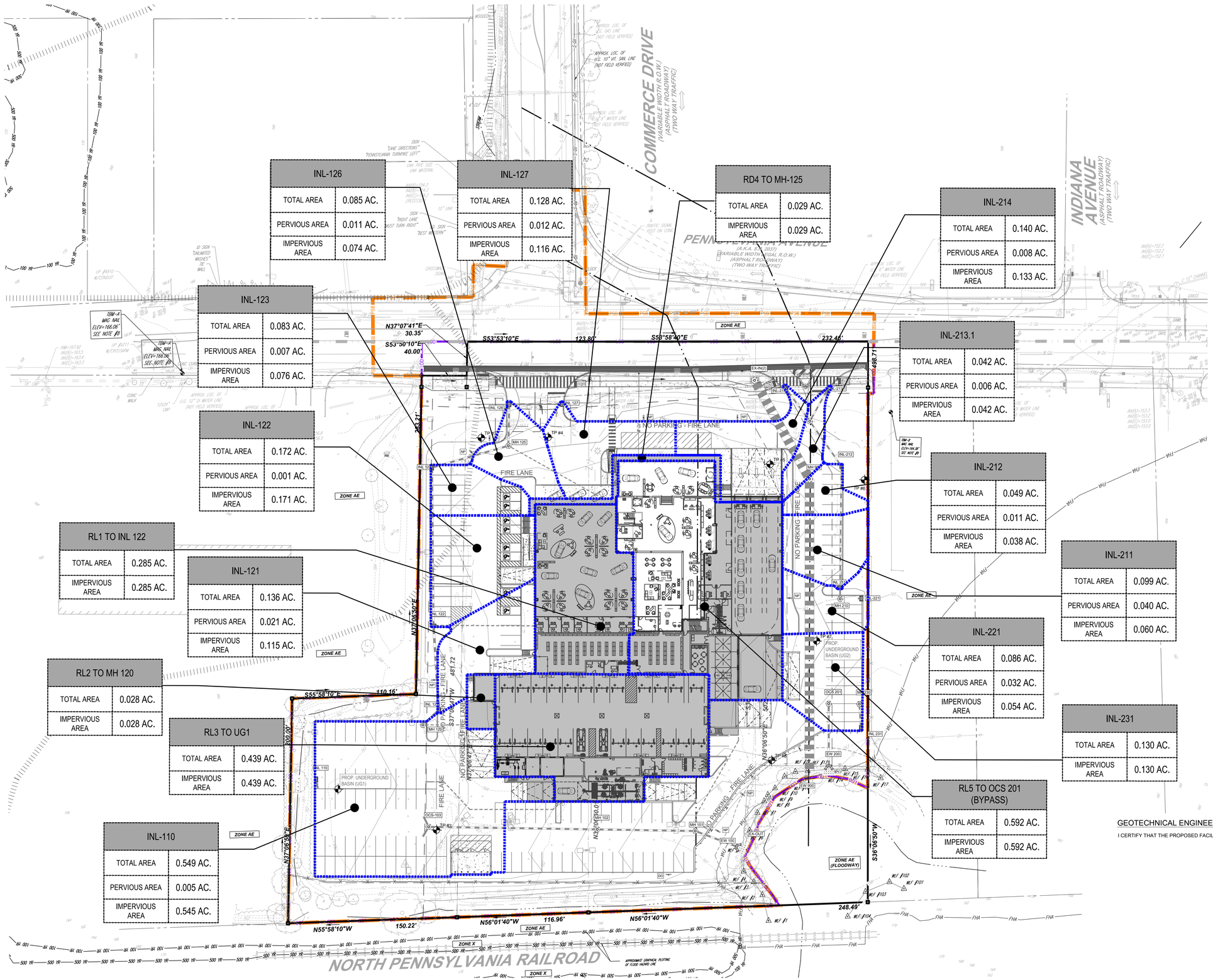
SHEET NUMBER:

C-1002

REVISION 5 - 7/22/2025

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-DRIN-5A-----LAYOUT: C-1002 POST

RS



INL-126	
TOTAL AREA	0.085 AC.
PERVIOUS AREA	0.011 AC.
IMPERVIOUS AREA	0.074 AC.

INL-127	
TOTAL AREA	0.128 AC.
PERVIOUS AREA	0.012 AC.
IMPERVIOUS AREA	0.116 AC.

RD4 TO MH-125	
TOTAL AREA	0.029 AC.
IMPERVIOUS AREA	0.029 AC.

INL-214	
TOTAL AREA	0.140 AC.
PERVIOUS AREA	0.008 AC.
IMPERVIOUS AREA	0.133 AC.

INL-123	
TOTAL AREA	0.083 AC.
PERVIOUS AREA	0.007 AC.
IMPERVIOUS AREA	0.076 AC.

INL-213.1	
TOTAL AREA	0.042 AC.
PERVIOUS AREA	0.006 AC.
IMPERVIOUS AREA	0.042 AC.

INL-122	
TOTAL AREA	0.172 AC.
PERVIOUS AREA	0.001 AC.
IMPERVIOUS AREA	0.171 AC.

INL-212	
TOTAL AREA	0.049 AC.
PERVIOUS AREA	0.011 AC.
IMPERVIOUS AREA	0.038 AC.

RL1 TO INL 122	
TOTAL AREA	0.285 AC.
IMPERVIOUS AREA	0.285 AC.

INL-211	
TOTAL AREA	0.099 AC.
PERVIOUS AREA	0.040 AC.
IMPERVIOUS AREA	0.060 AC.

INL-121	
TOTAL AREA	0.136 AC.
PERVIOUS AREA	0.021 AC.
IMPERVIOUS AREA	0.115 AC.

INL-221	
TOTAL AREA	0.086 AC.
PERVIOUS AREA	0.032 AC.
IMPERVIOUS AREA	0.054 AC.

RL2 TO MH 120	
TOTAL AREA	0.028 AC.
IMPERVIOUS AREA	0.028 AC.

INL-231	
TOTAL AREA	0.130 AC.
IMPERVIOUS AREA	0.130 AC.

RL3 TO UG1	
TOTAL AREA	0.439 AC.
IMPERVIOUS AREA	0.439 AC.

RL5 TO OCS 201 (BYPASS)	
TOTAL AREA	0.592 AC.
IMPERVIOUS AREA	0.592 AC.

INL-110	
TOTAL AREA	0.549 AC.
PERVIOUS AREA	0.005 AC.
IMPERVIOUS AREA	0.545 AC.

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REGISTERED No.: #PE080964

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SHEET TITLE:

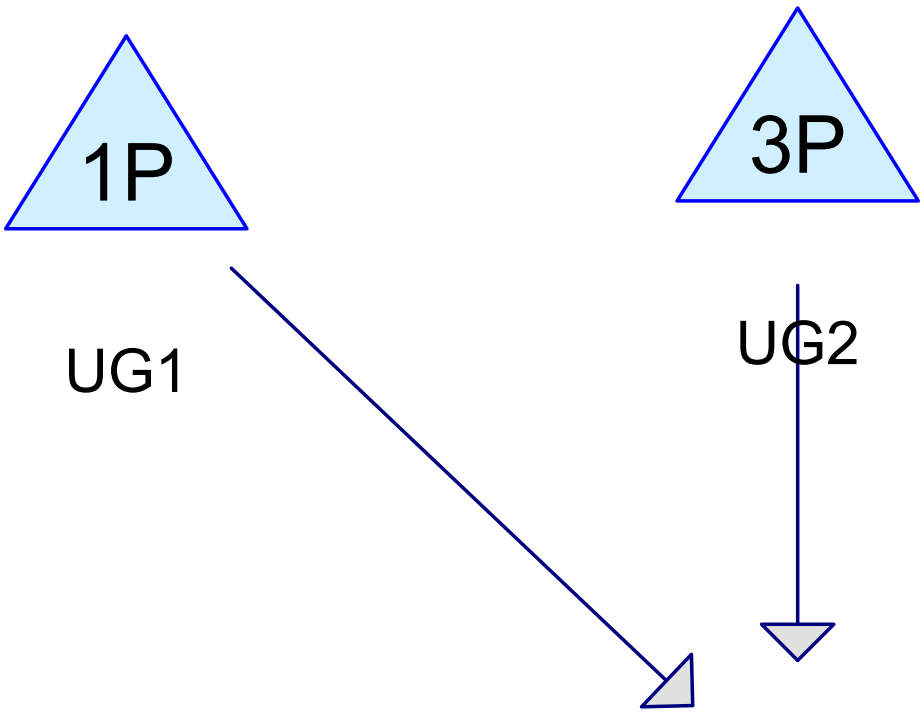
INLET DRAINAGE AREA PLAN

SHEET NUMBER:

C-1003

REVISION 5 - 7/22/2025

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-DRIN-5A_-_LAYOUT: C-1003 INL DA'S



Subcat Reach Pond Link

Routing Diagram for BMW_2025-7-24_2
Prepared by Bohler, Printed 7/24/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	Type II 24-hr		Default	24.00	1	3.28	2

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 2.83" for 2-yr event
Inflow = 8.968 cfs @ 11.96 hrs, Volume= 19,792 cf
Outflow = 1.629 cfs @ 12.11 hrs, Volume= 10,582 cf, Atten= 82%, Lag= 9.3 min
Primary = 1.629 cfs @ 12.11 hrs, Volume= 10,582 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 158.81' @ 12.11 hrs Surf.Area= 13,041 sf Storage= 11,568 cf

Plug-Flow detention time= 233.9 min calculated for 10,581 cf (53% of inflow)
Center-of-Mass det. time= 121.1 min (890.0 - 768.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.629 cfs @ 12.11 hrs HW=158.81' TW=158.60' (Fixed TW Elev= 158.60')
└─**4=Culvert** (Passes 1.629 cfs of 2.375 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.012 cfs @ 2.214 fps)
  ├─**2=Orifice/Grate** (Orifice Controls 1.617 cfs @ 2.079 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.000	0	157.53	0.000
2.00	0.000	0	157.53	0.000
2.50	0.002	1	157.53	0.000
3.00	0.010	11	157.53	0.000
3.50	0.017	35	157.54	0.000
4.00	0.024	72	157.54	0.000
4.50	0.032	121	157.55	0.000
5.00	0.040	186	157.57	0.000
5.50	0.049	265	157.58	0.000
6.00	0.057	361	157.60	0.000
6.50	0.066	472	157.62	0.000
7.00	0.075	599	157.64	0.000
7.50	0.084	742	157.67	0.000
8.00	0.093	901	157.70	0.000
8.50	0.117	1,087	157.74	0.000
9.00	0.146	1,324	157.78	0.000
9.50	0.156	1,599	157.84	0.000
10.00	0.196	1,911	157.90	0.000
10.50	0.263	2,321	157.97	0.000
11.00	0.375	2,889	158.05	0.000
11.50	**0.636**	3,778	158.13	0.000
12.00	**7.436**	**10,612**	**158.73**	**1.167**
12.50	0.651	**10,831**	**158.74**	**1.293**
13.00	0.406	9,944	158.67	0.733
13.50	0.307	9,549	158.63	0.445
14.00	0.241	9,377	158.61	0.302
14.50	0.213	9,327	158.61	0.222
15.00	0.191	9,314	158.61	0.198
15.50	0.169	9,303	158.61	0.176
16.00	0.148	9,291	158.61	0.154
16.50	0.138	9,284	158.61	0.140
17.00	0.130	9,280	158.61	0.132
17.50	0.122	9,276	158.61	0.124
18.00	0.114	9,272	158.61	0.116
18.50	0.106	9,268	158.61	0.109
19.00	0.099	9,264	158.60	0.101
19.50	0.091	9,260	158.60	0.093
20.00	0.083	9,255	158.60	0.085
20.50	0.080	9,253	158.60	0.081
21.00	0.079	9,252	158.60	0.079
21.50	0.077	9,252	158.60	0.078
22.00	0.076	9,251	158.60	0.076
22.50	0.074	9,250	158.60	0.075
23.00	0.073	9,249	158.60	0.073
23.50	0.071	9,248	158.60	0.071
24.00	0.069	9,247	158.60	0.070
24.50	0.000	9,213	158.60	0.004
25.00	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	9,211	158.60	0.000
26.00	0.000	9,211	158.60	0.000
26.50	0.000	9,211	158.60	0.000
27.00	0.000	9,211	158.60	0.000
27.50	0.000	9,211	158.60	0.000
28.00	0.000	9,211	158.60	0.000
28.50	0.000	9,211	158.60	0.000
29.00	0.000	9,211	158.60	0.000
29.50	0.000	9,211	158.60	0.000
30.00	0.000	9,211	158.60	0.000
30.50	0.000	9,211	158.60	0.000
31.00	0.000	9,211	158.60	0.000
31.50	0.000	9,211	158.60	0.000
32.00	0.000	9,211	158.60	0.000
32.50	0.000	9,211	158.60	0.000
33.00	0.000	9,211	158.60	0.000
33.50	0.000	9,211	158.60	0.000
34.00	0.000	9,211	158.60	0.000
34.50	0.000	9,211	158.60	0.000
35.00	0.000	9,211	158.60	0.000
35.50	0.000	9,211	158.60	0.000
36.00	0.000	9,211	158.60	0.000
36.50	0.000	9,211	158.60	0.000
37.00	0.000	9,211	158.60	0.000
37.50	0.000	9,211	158.60	0.000
38.00	0.000	9,211	158.60	0.000
38.50	0.000	9,211	158.60	0.000
39.00	0.000	9,211	158.60	0.000
39.50	0.000	9,211	158.60	0.000
40.00	0.000	9,211	158.60	0.000
40.50	0.000	9,211	158.60	0.000
41.00	0.000	9,211	158.60	0.000
41.50	0.000	9,211	158.60	0.000
42.00	0.000	9,211	158.60	0.000
42.50	0.000	9,211	158.60	0.000
43.00	0.000	9,211	158.60	0.000
43.50	0.000	9,211	158.60	0.000
44.00	0.000	9,211	158.60	0.000
44.50	0.000	9,211	158.60	0.000
45.00	0.000	9,211	158.60	0.000
45.50	0.000	9,211	158.60	0.000
46.00	0.000	9,211	158.60	0.000
46.50	0.000	9,211	158.60	0.000
47.00	0.000	9,211	158.60	0.000
47.50	0.000	9,211	158.60	0.000
48.00	0.000	9,211	158.60	0.000
48.50	0.000	9,211	158.60	0.000
49.00	0.000	9,211	158.60	0.000
49.50	0.000	9,211	158.60	0.000
50.00	0.000	9,211	158.60	0.000
50.50	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	9,211	158.60	0.000
51.50	0.000	9,211	158.60	0.000
52.00	0.000	9,211	158.60	0.000
52.50	0.000	9,211	158.60	0.000
53.00	0.000	9,211	158.60	0.000
53.50	0.000	9,211	158.60	0.000
54.00	0.000	9,211	158.60	0.000
54.50	0.000	9,211	158.60	0.000
55.00	0.000	9,211	158.60	0.000
55.50	0.000	9,211	158.60	0.000
56.00	0.000	9,211	158.60	0.000
56.50	0.000	9,211	158.60	0.000
57.00	0.000	9,211	158.60	0.000
57.50	0.000	9,211	158.60	0.000
58.00	0.000	9,211	158.60	0.000
58.50	0.000	9,211	158.60	0.000
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66.00	0.000	9,211	158.60	0.000
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67.00	0.000	9,211	158.60	0.000
67.50	0.000	9,211	158.60	0.000
68.00	0.000	9,211	158.60	0.000
68.50	0.000	9,211	158.60	0.000
69.00	0.000	9,211	158.60	0.000
69.50	0.000	9,211	158.60	0.000
70.00	0.000	9,211	158.60	0.000
70.50	0.000	9,211	158.60	0.000
71.00	0.000	9,211	158.60	0.000
71.50	0.000	9,211	158.60	0.000
72.00	0.000	9,211	158.60	0.000
72.50	0.000	9,211	158.60	0.000
73.00	0.000	9,211	158.60	0.000
73.50	0.000	9,211	158.60	0.000
74.00	0.000	9,211	158.60	0.000
74.50	0.000	9,211	158.60	0.000
75.00	0.000	9,211	158.60	0.000
75.50	0.000	9,211	158.60	0.000
76.00	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	9,211	158.60	0.000
77.00	0.000	9,211	158.60	0.000
77.50	0.000	9,211	158.60	0.000
78.00	0.000	9,211	158.60	0.000
78.50	0.000	9,211	158.60	0.000
79.00	0.000	9,211	158.60	0.000
79.50	0.000	9,211	158.60	0.000
80.00	0.000	9,211	158.60	0.000
80.50	0.000	9,211	158.60	0.000
81.00	0.000	9,211	158.60	0.000
81.50	0.000	9,211	158.60	0.000
82.00	0.000	9,211	158.60	0.000
82.50	0.000	9,211	158.60	0.000
83.00	0.000	9,211	158.60	0.000
83.50	0.000	9,211	158.60	0.000
84.00	0.000	9,211	158.60	0.000
84.50	0.000	9,211	158.60	0.000
85.00	0.000	9,211	158.60	0.000
85.50	0.000	9,211	158.60	0.000
86.00	0.000	9,211	158.60	0.000
86.50	0.000	9,211	158.60	0.000
87.00	0.000	9,211	158.60	0.000
87.50	0.000	9,211	158.60	0.000
88.00	0.000	9,211	158.60	0.000
88.50	0.000	9,211	158.60	0.000
89.00	0.000	9,211	158.60	0.000
89.50	0.000	9,211	158.60	0.000
90.00	0.000	9,211	158.60	0.000
90.50	0.000	9,211	158.60	0.000
91.00	0.000	9,211	158.60	0.000
91.50	0.000	9,211	158.60	0.000
92.00	0.000	9,211	158.60	0.000
92.50	0.000	9,211	158.60	0.000
93.00	0.000	9,211	158.60	0.000
93.50	0.000	9,211	158.60	0.000
94.00	0.000	9,211	158.60	0.000
94.50	0.000	9,211	158.60	0.000
95.00	0.000	9,211	158.60	0.000
95.50	0.000	9,211	158.60	0.000
96.00	0.000	9,211	158.60	0.000
96.50	0.000	9,211	158.60	0.000
97.00	0.000	9,211	158.60	0.000
97.50	0.000	9,211	158.60	0.000
98.00	0.000	9,211	158.60	0.000
98.50	0.000	9,211	158.60	0.000
99.00	0.000	9,211	158.60	0.000
99.50	0.000	9,211	158.60	0.000
100.00	0.000	9,211	158.60	0.000
100.50	0.000	9,211	158.60	0.000
101.00	0.000	9,211	158.60	0.000
101.50	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	9,211	158.60	0.000
102.50	0.000	9,211	158.60	0.000
103.00	0.000	9,211	158.60	0.000
103.50	0.000	9,211	158.60	0.000
104.00	0.000	9,211	158.60	0.000
104.50	0.000	9,211	158.60	0.000
105.00	0.000	9,211	158.60	0.000
105.50	0.000	9,211	158.60	0.000
106.00	0.000	9,211	158.60	0.000
106.50	0.000	9,211	158.60	0.000
107.00	0.000	9,211	158.60	0.000
107.50	0.000	9,211	158.60	0.000
108.00	0.000	9,211	158.60	0.000
108.50	0.000	9,211	158.60	0.000
109.00	0.000	9,211	158.60	0.000
109.50	0.000	9,211	158.60	0.000
110.00	0.000	9,211	158.60	0.000
110.50	0.000	9,211	158.60	0.000
111.00	0.000	9,211	158.60	0.000
111.50	0.000	9,211	158.60	0.000
112.00	0.000	9,211	158.60	0.000
112.50	0.000	9,211	158.60	0.000
113.00	0.000	9,211	158.60	0.000
113.50	0.000	9,211	158.60	0.000
114.00	0.000	9,211	158.60	0.000
114.50	0.000	9,211	158.60	0.000
115.00	0.000	9,211	158.60	0.000
115.50	0.000	9,211	158.60	0.000
116.00	0.000	9,211	158.60	0.000
116.50	0.000	9,211	158.60	0.000
117.00	0.000	9,211	158.60	0.000
117.50	0.000	9,211	158.60	0.000
118.00	0.000	9,211	158.60	0.000
118.50	0.000	9,211	158.60	0.000
119.00	0.000	9,211	158.60	0.000
119.50	0.000	9,211	158.60	0.000
120.00	0.000	9,211	158.60	0.000
120.50	0.000	9,211	158.60	0.000
121.00	0.000	9,211	158.60	0.000
121.50	0.000	9,211	158.60	0.000
122.00	0.000	9,211	158.60	0.000
122.50	0.000	9,211	158.60	0.000
123.00	0.000	9,211	158.60	0.000
123.50	0.000	9,211	158.60	0.000
124.00	0.000	9,211	158.60	0.000
124.50	0.000	9,211	158.60	0.000
125.00	0.000	9,211	158.60	0.000
125.50	0.000	9,211	158.60	0.000
126.00	0.000	9,211	158.60	0.000
126.50	0.000	9,211	158.60	0.000
127.00	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	9,211	158.60	0.000
128.00	0.000	9,211	158.60	0.000
128.50	0.000	9,211	158.60	0.000
129.00	0.000	9,211	158.60	0.000
129.50	0.000	9,211	158.60	0.000
130.00	0.000	9,211	158.60	0.000
130.50	0.000	9,211	158.60	0.000
131.00	0.000	9,211	158.60	0.000
131.50	0.000	9,211	158.60	0.000
132.00	0.000	9,211	158.60	0.000
132.50	0.000	9,211	158.60	0.000
133.00	0.000	9,211	158.60	0.000
133.50	0.000	9,211	158.60	0.000
134.00	0.000	9,211	158.60	0.000
134.50	0.000	9,211	158.60	0.000
135.00	0.000	9,211	158.60	0.000
135.50	0.000	9,211	158.60	0.000
136.00	0.000	9,211	158.60	0.000
136.50	0.000	9,211	158.60	0.000
137.00	0.000	9,211	158.60	0.000
137.50	0.000	9,211	158.60	0.000
138.00	0.000	9,211	158.60	0.000
138.50	0.000	9,211	158.60	0.000
139.00	0.000	9,211	158.60	0.000
139.50	0.000	9,211	158.60	0.000
140.00	0.000	9,211	158.60	0.000
140.50	0.000	9,211	158.60	0.000
141.00	0.000	9,211	158.60	0.000
141.50	0.000	9,211	158.60	0.000
142.00	0.000	9,211	158.60	0.000
142.50	0.000	9,211	158.60	0.000
143.00	0.000	9,211	158.60	0.000
143.50	0.000	9,211	158.60	0.000
144.00	0.000	9,211	158.60	0.000
144.50	0.000	9,211	158.60	0.000
145.00	0.000	9,211	158.60	0.000
145.50	0.000	9,211	158.60	0.000
146.00	0.000	9,211	158.60	0.000
146.50	0.000	9,211	158.60	0.000
147.00	0.000	9,211	158.60	0.000
147.50	0.000	9,211	158.60	0.000
148.00	0.000	9,211	158.60	0.000
148.50	0.000	9,211	158.60	0.000
149.00	0.000	9,211	158.60	0.000
149.50	0.000	9,211	158.60	0.000
150.00	0.000	9,211	158.60	0.000
150.50	0.000	9,211	158.60	0.000
151.00	0.000	9,211	158.60	0.000
151.50	0.000	9,211	158.60	0.000
152.00	0.000	9,211	158.60	0.000
152.50	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	9,211	158.60	0.000
153.50	0.000	9,211	158.60	0.000
154.00	0.000	9,211	158.60	0.000
154.50	0.000	9,211	158.60	0.000
155.00	0.000	9,211	158.60	0.000
155.50	0.000	9,211	158.60	0.000
156.00	0.000	9,211	158.60	0.000
156.50	0.000	9,211	158.60	0.000
157.00	0.000	9,211	158.60	0.000
157.50	0.000	9,211	158.60	0.000
158.00	0.000	9,211	158.60	0.000
158.50	0.000	9,211	158.60	0.000
159.00	0.000	9,211	158.60	0.000
159.50	0.000	9,211	158.60	0.000
160.00	0.000	9,211	158.60	0.000
160.50	0.000	9,211	158.60	0.000
161.00	0.000	9,211	158.60	0.000
161.50	0.000	9,211	158.60	0.000
162.00	0.000	9,211	158.60	0.000
162.50	0.000	9,211	158.60	0.000
163.00	0.000	9,211	158.60	0.000
163.50	0.000	9,211	158.60	0.000
164.00	0.000	9,211	158.60	0.000
164.50	0.000	9,211	158.60	0.000
165.00	0.000	9,211	158.60	0.000
165.50	0.000	9,211	158.60	0.000
166.00	0.000	9,211	158.60	0.000
166.50	0.000	9,211	158.60	0.000
167.00	0.000	9,211	158.60	0.000
167.50	0.000	9,211	158.60	0.000
168.00	0.000	9,211	158.60	0.000

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 1.90" for 2-yr event
Inflow = 1.718 cfs @ 11.96 hrs, Volume= 3,409 cf
Outflow = 0.347 cfs @ 12.11 hrs, Volume= 3,409 cf, Atten= 80%, Lag= 8.8 min
Primary = 0.347 cfs @ 12.11 hrs, Volume= 3,409 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 160.17' @ 12.11 hrs Surf.Area= 2,542 sf Storage= 1,349 cf

Plug-Flow detention time= 74.8 min calculated for 3,409 cf (100% of inflow)
Center-of-Mass det. time= 74.9 min (892.3 - 817.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.347 cfs @ 12.11 hrs HW=160.17' TW=158.60' (Fixed TW Elev= 158.60')
└─**4=Culvert** (Passes 0.347 cfs of 2.415 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.206 cfs @ 4.203 fps)
  ├─**2=Orifice/Grate** (Orifice Controls 0.140 cfs @ 1.425 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.000	0	159.28	0.000
4.50	0.000	0	159.28	0.000
5.00	0.000	0	159.28	0.000
5.50	0.000	0	159.28	0.000
6.00	0.000	0	159.28	0.000
6.50	0.000	0	159.28	0.000
7.00	0.000	0	159.28	0.000
7.50	0.001	1	159.28	0.000
8.00	0.003	4	159.28	0.000
8.50	0.005	10	159.29	0.001
9.00	0.008	20	159.30	0.001
9.50	0.011	34	159.31	0.003
10.00	0.016	51	159.33	0.005
10.50	0.025	73	159.35	0.011
11.00	0.042	105	159.38	0.021
11.50	**0.083**	158	159.44	0.043
12.00	**1.467**	**1,165**	**160.08**	**0.254**
12.50	0.137	**1,195**	**160.10**	**0.268**
13.00	0.087	983	160.00	0.190
13.50	0.066	801	159.91	0.169
14.00	0.052	617	159.83	0.154
14.50	0.046	444	159.72	0.132
15.00	0.042	314	159.59	0.101
15.50	0.037	228	159.50	0.074
16.00	0.033	178	159.46	0.052
16.50	0.030	152	159.43	0.041
17.00	0.029	139	159.42	0.034
17.50	0.027	130	159.41	0.031
18.00	0.025	124	159.40	0.029
18.50	0.024	119	159.40	0.026
19.00	0.022	114	159.39	0.025
19.50	0.020	110	159.39	0.023
20.00	0.019	105	159.38	0.021
20.50	0.018	101	159.38	0.020
21.00	0.018	99	159.38	0.019
21.50	0.017	97	159.38	0.018
22.00	0.017	95	159.37	0.018
22.50	0.017	94	159.37	0.017
23.00	0.016	93	159.37	0.017
23.50	0.016	92	159.37	0.017
24.00	0.016	91	159.37	0.016
24.50	0.000	71	159.35	0.010
25.00	0.000	56	159.34	0.007

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	46	159.33	0.005
26.00	0.000	39	159.32	0.004
26.50	0.000	33	159.31	0.003
27.00	0.000	29	159.31	0.002
27.50	0.000	26	159.31	0.002
28.00	0.000	24	159.30	0.001
28.50	0.000	21	159.30	0.001
29.00	0.000	19	159.30	0.001
29.50	0.000	17	159.30	0.001
30.00	0.000	16	159.30	0.001
30.50	0.000	14	159.29	0.001
31.00	0.000	13	159.29	0.001
31.50	0.000	11	159.29	0.001
32.00	0.000	10	159.29	0.001
32.50	0.000	9	159.29	0.001
33.00	0.000	8	159.29	0.000
33.50	0.000	7	159.29	0.000
34.00	0.000	7	159.29	0.000
34.50	0.000	6	159.29	0.000
35.00	0.000	5	159.29	0.000
35.50	0.000	5	159.28	0.000
36.00	0.000	4	159.28	0.000
36.50	0.000	4	159.28	0.000
37.00	0.000	4	159.28	0.000
37.50	0.000	3	159.28	0.000
38.00	0.000	3	159.28	0.000
38.50	0.000	3	159.28	0.000
39.00	0.000	2	159.28	0.000
39.50	0.000	2	159.28	0.000
40.00	0.000	2	159.28	0.000
40.50	0.000	2	159.28	0.000
41.00	0.000	2	159.28	0.000
41.50	0.000	1	159.28	0.000
42.00	0.000	1	159.28	0.000
42.50	0.000	1	159.28	0.000
43.00	0.000	1	159.28	0.000
43.50	0.000	1	159.28	0.000
44.00	0.000	1	159.28	0.000
44.50	0.000	1	159.28	0.000
45.00	0.000	1	159.28	0.000
45.50	0.000	1	159.28	0.000
46.00	0.000	1	159.28	0.000
46.50	0.000	0	159.28	0.000
47.00	0.000	0	159.28	0.000
47.50	0.000	0	159.28	0.000
48.00	0.000	0	159.28	0.000
48.50	0.000	0	159.28	0.000
49.00	0.000	0	159.28	0.000
49.50	0.000	0	159.28	0.000
50.00	0.000	0	159.28	0.000
50.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	0	159.28	0.000
51.50	0.000	0	159.28	0.000
52.00	0.000	0	159.28	0.000
52.50	0.000	0	159.28	0.000
53.00	0.000	0	159.28	0.000
53.50	0.000	0	159.28	0.000
54.00	0.000	0	159.28	0.000
54.50	0.000	0	159.28	0.000
55.00	0.000	0	159.28	0.000
55.50	0.000	0	159.28	0.000
56.00	0.000	0	159.28	0.000
56.50	0.000	0	159.28	0.000
57.00	0.000	0	159.28	0.000
57.50	0.000	0	159.28	0.000
58.00	0.000	0	159.28	0.000
58.50	0.000	0	159.28	0.000
59.00	0.000	0	159.28	0.000
59.50	0.000	0	159.28	0.000
60.00	0.000	0	159.28	0.000
60.50	0.000	0	159.28	0.000
61.00	0.000	0	159.28	0.000
61.50	0.000	0	159.28	0.000
62.00	0.000	0	159.28	0.000
62.50	0.000	0	159.28	0.000
63.00	0.000	0	159.28	0.000
63.50	0.000	0	159.28	0.000
64.00	0.000	0	159.28	0.000
64.50	0.000	0	159.28	0.000
65.00	0.000	0	159.28	0.000
65.50	0.000	0	159.28	0.000
66.00	0.000	0	159.28	0.000
66.50	0.000	0	159.28	0.000
67.00	0.000	0	159.28	0.000
67.50	0.000	0	159.28	0.000
68.00	0.000	0	159.28	0.000
68.50	0.000	0	159.28	0.000
69.00	0.000	0	159.28	0.000
69.50	0.000	0	159.28	0.000
70.00	0.000	0	159.28	0.000
70.50	0.000	0	159.28	0.000
71.00	0.000	0	159.28	0.000
71.50	0.000	0	159.28	0.000
72.00	0.000	0	159.28	0.000
72.50	0.000	0	159.28	0.000
73.00	0.000	0	159.28	0.000
73.50	0.000	0	159.28	0.000
74.00	0.000	0	159.28	0.000
74.50	0.000	0	159.28	0.000
75.00	0.000	0	159.28	0.000
75.50	0.000	0	159.28	0.000
76.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	0	159.28	0.000
77.00	0.000	0	159.28	0.000
77.50	0.000	0	159.28	0.000
78.00	0.000	0	159.28	0.000
78.50	0.000	0	159.28	0.000
79.00	0.000	0	159.28	0.000
79.50	0.000	0	159.28	0.000
80.00	0.000	0	159.28	0.000
80.50	0.000	0	159.28	0.000
81.00	0.000	0	159.28	0.000
81.50	0.000	0	159.28	0.000
82.00	0.000	0	159.28	0.000
82.50	0.000	0	159.28	0.000
83.00	0.000	0	159.28	0.000
83.50	0.000	0	159.28	0.000
84.00	0.000	0	159.28	0.000
84.50	0.000	0	159.28	0.000
85.00	0.000	0	159.28	0.000
85.50	0.000	0	159.28	0.000
86.00	0.000	0	159.28	0.000
86.50	0.000	0	159.28	0.000
87.00	0.000	0	159.28	0.000
87.50	0.000	0	159.28	0.000
88.00	0.000	0	159.28	0.000
88.50	0.000	0	159.28	0.000
89.00	0.000	0	159.28	0.000
89.50	0.000	0	159.28	0.000
90.00	0.000	0	159.28	0.000
90.50	0.000	0	159.28	0.000
91.00	0.000	0	159.28	0.000
91.50	0.000	0	159.28	0.000
92.00	0.000	0	159.28	0.000
92.50	0.000	0	159.28	0.000
93.00	0.000	0	159.28	0.000
93.50	0.000	0	159.28	0.000
94.00	0.000	0	159.28	0.000
94.50	0.000	0	159.28	0.000
95.00	0.000	0	159.28	0.000
95.50	0.000	0	159.28	0.000
96.00	0.000	0	159.28	0.000
96.50	0.000	0	159.28	0.000
97.00	0.000	0	159.28	0.000
97.50	0.000	0	159.28	0.000
98.00	0.000	0	159.28	0.000
98.50	0.000	0	159.28	0.000
99.00	0.000	0	159.28	0.000
99.50	0.000	0	159.28	0.000
100.00	0.000	0	159.28	0.000
100.50	0.000	0	159.28	0.000
101.00	0.000	0	159.28	0.000
101.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

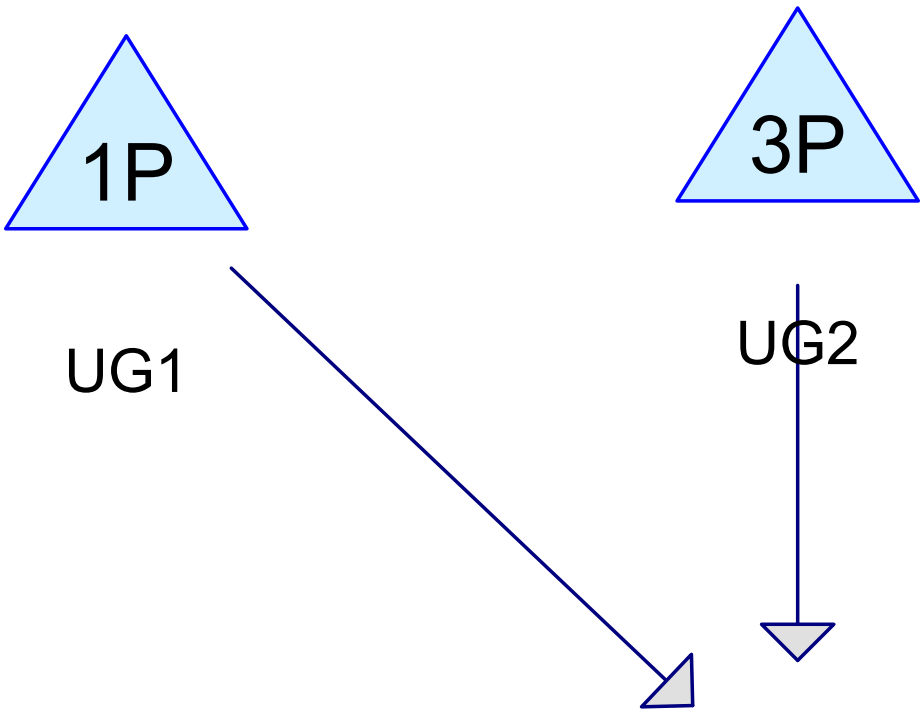
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	0	159.28	0.000
102.50	0.000	0	159.28	0.000
103.00	0.000	0	159.28	0.000
103.50	0.000	0	159.28	0.000
104.00	0.000	0	159.28	0.000
104.50	0.000	0	159.28	0.000
105.00	0.000	0	159.28	0.000
105.50	0.000	0	159.28	0.000
106.00	0.000	0	159.28	0.000
106.50	0.000	0	159.28	0.000
107.00	0.000	0	159.28	0.000
107.50	0.000	0	159.28	0.000
108.00	0.000	0	159.28	0.000
108.50	0.000	0	159.28	0.000
109.00	0.000	0	159.28	0.000
109.50	0.000	0	159.28	0.000
110.00	0.000	0	159.28	0.000
110.50	0.000	0	159.28	0.000
111.00	0.000	0	159.28	0.000
111.50	0.000	0	159.28	0.000
112.00	0.000	0	159.28	0.000
112.50	0.000	0	159.28	0.000
113.00	0.000	0	159.28	0.000
113.50	0.000	0	159.28	0.000
114.00	0.000	0	159.28	0.000
114.50	0.000	0	159.28	0.000
115.00	0.000	0	159.28	0.000
115.50	0.000	0	159.28	0.000
116.00	0.000	0	159.28	0.000
116.50	0.000	0	159.28	0.000
117.00	0.000	0	159.28	0.000
117.50	0.000	0	159.28	0.000
118.00	0.000	0	159.28	0.000
118.50	0.000	0	159.28	0.000
119.00	0.000	0	159.28	0.000
119.50	0.000	0	159.28	0.000
120.00	0.000	0	159.28	0.000
120.50	0.000	0	159.28	0.000
121.00	0.000	0	159.28	0.000
121.50	0.000	0	159.28	0.000
122.00	0.000	0	159.28	0.000
122.50	0.000	0	159.28	0.000
123.00	0.000	0	159.28	0.000
123.50	0.000	0	159.28	0.000
124.00	0.000	0	159.28	0.000
124.50	0.000	0	159.28	0.000
125.00	0.000	0	159.28	0.000
125.50	0.000	0	159.28	0.000
126.00	0.000	0	159.28	0.000
126.50	0.000	0	159.28	0.000
127.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	0	159.28	0.000
128.00	0.000	0	159.28	0.000
128.50	0.000	0	159.28	0.000
129.00	0.000	0	159.28	0.000
129.50	0.000	0	159.28	0.000
130.00	0.000	0	159.28	0.000
130.50	0.000	0	159.28	0.000
131.00	0.000	0	159.28	0.000
131.50	0.000	0	159.28	0.000
132.00	0.000	0	159.28	0.000
132.50	0.000	0	159.28	0.000
133.00	0.000	0	159.28	0.000
133.50	0.000	0	159.28	0.000
134.00	0.000	0	159.28	0.000
134.50	0.000	0	159.28	0.000
135.00	0.000	0	159.28	0.000
135.50	0.000	0	159.28	0.000
136.00	0.000	0	159.28	0.000
136.50	0.000	0	159.28	0.000
137.00	0.000	0	159.28	0.000
137.50	0.000	0	159.28	0.000
138.00	0.000	0	159.28	0.000
138.50	0.000	0	159.28	0.000
139.00	0.000	0	159.28	0.000
139.50	0.000	0	159.28	0.000
140.00	0.000	0	159.28	0.000
140.50	0.000	0	159.28	0.000
141.00	0.000	0	159.28	0.000
141.50	0.000	0	159.28	0.000
142.00	0.000	0	159.28	0.000
142.50	0.000	0	159.28	0.000
143.00	0.000	0	159.28	0.000
143.50	0.000	0	159.28	0.000
144.00	0.000	0	159.28	0.000
144.50	0.000	0	159.28	0.000
145.00	0.000	0	159.28	0.000
145.50	0.000	0	159.28	0.000
146.00	0.000	0	159.28	0.000
146.50	0.000	0	159.28	0.000
147.00	0.000	0	159.28	0.000
147.50	0.000	0	159.28	0.000
148.00	0.000	0	159.28	0.000
148.50	0.000	0	159.28	0.000
149.00	0.000	0	159.28	0.000
149.50	0.000	0	159.28	0.000
150.00	0.000	0	159.28	0.000
150.50	0.000	0	159.28	0.000
151.00	0.000	0	159.28	0.000
151.50	0.000	0	159.28	0.000
152.00	0.000	0	159.28	0.000
152.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	0	159.28	0.000
153.50	0.000	0	159.28	0.000
154.00	0.000	0	159.28	0.000
154.50	0.000	0	159.28	0.000
155.00	0.000	0	159.28	0.000
155.50	0.000	0	159.28	0.000
156.00	0.000	0	159.28	0.000
156.50	0.000	0	159.28	0.000
157.00	0.000	0	159.28	0.000
157.50	0.000	0	159.28	0.000
158.00	0.000	0	159.28	0.000
158.50	0.000	0	159.28	0.000
159.00	0.000	0	159.28	0.000
159.50	0.000	0	159.28	0.000
160.00	0.000	0	159.28	0.000
160.50	0.000	0	159.28	0.000
161.00	0.000	0	159.28	0.000
161.50	0.000	0	159.28	0.000
162.00	0.000	0	159.28	0.000
162.50	0.000	0	159.28	0.000
163.00	0.000	0	159.28	0.000
163.50	0.000	0	159.28	0.000
164.00	0.000	0	159.28	0.000
164.50	0.000	0	159.28	0.000
165.00	0.000	0	159.28	0.000
165.50	0.000	0	159.28	0.000
166.00	0.000	0	159.28	0.000
166.50	0.000	0	159.28	0.000
167.00	0.000	0	159.28	0.000
167.50	0.000	0	159.28	0.000
168.00	0.000	0	159.28	0.000



Subcat Reach Pond Link

Routing Diagram for BMW_2025-7-24_2
Prepared by Bohler, Printed 7/24/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	5-yr	Type II 24-hr		Default	24.00	1	4.13	2

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 3.67" for 5-yr event
Inflow = 11.443 cfs @ 11.96 hrs, Volume= 25,677 cf
Outflow = 0.350 cfs @ 13.72 hrs, Volume= 5,931 cf, Atten= 97%, Lag= 105.8 min
Primary = 0.350 cfs @ 13.72 hrs, Volume= 5,931 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 159.61' @ 13.72 hrs Surf.Area= 13,041 sf Storage= 19,847 cf

Plug-Flow detention time= 489.0 min calculated for 5,931 cf (23% of inflow)
Center-of-Mass det. time= 290.3 min (1,052.8 - 762.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.390 cfs @ 13.72 hrs HW=159.61' TW=159.60' (Fixed TW Elev= 159.60')
└─**4=Culvert** (Passes 0.390 cfs of 0.749 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.003 cfs @ 0.498 fps)
  ├─**2=Orifice/Grate** (Orifice Controls 0.388 cfs @ 0.498 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.000	0	157.53	0.000
2.00	0.002	0	157.53	0.000
2.50	0.012	13	157.53	0.000
3.00	0.023	45	157.54	0.000
3.50	0.033	95	157.55	0.000
4.00	0.042	162	157.56	0.000
4.50	0.052	247	157.58	0.000
5.00	0.063	351	157.60	0.000
5.50	0.075	475	157.62	0.000
6.00	0.086	620	157.65	0.000
6.50	0.097	784	157.68	0.000
7.00	0.108	969	157.72	0.000
7.50	0.119	1,174	157.76	0.000
8.00	0.130	1,399	157.80	0.000
8.50	0.162	1,659	157.85	0.000
9.00	0.200	1,985	157.91	0.000
9.50	0.212	2,360	157.98	0.000
10.00	0.264	2,782	158.04	0.000
10.50	0.351	3,331	158.09	0.000
11.00	0.495	4,085	158.15	0.000
11.50	**0.831**	5,252	158.26	0.000
12.00	**9.472**	14,195	159.05	0.000
12.50	0.827	17,891	159.41	0.000
13.00	0.515	19,020	159.52	0.000
13.50	0.389	**19,802**	**159.61**	**0.194**
14.00	0.306	**19,838**	**159.61**	**0.318**
14.50	0.270	19,825	159.61	0.274
15.00	0.242	19,817	159.61	0.247
15.50	0.215	19,809	159.61	0.219
16.00	0.187	19,801	159.61	0.191
16.50	0.174	19,797	159.61	0.176
17.00	0.164	19,794	159.61	0.166
17.50	0.154	19,791	159.60	0.156
18.00	0.145	19,788	159.60	0.146
18.50	0.135	19,786	159.60	0.136
19.00	0.125	19,783	159.60	0.126
19.50	0.115	19,780	159.60	0.116
20.00	0.105	19,777	159.60	0.107
20.50	0.102	19,776	159.60	0.102
21.00	0.100	19,775	159.60	0.100
21.50	0.098	19,775	159.60	0.098
22.00	0.096	19,774	159.60	0.096
22.50	0.094	19,773	159.60	0.094
23.00	0.092	19,773	159.60	0.092
23.50	0.090	19,772	159.60	0.090
24.00	0.088	19,772	159.60	0.088
24.50	0.000	19,746	159.60	0.001
25.00	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	19,746	159.60	0.000
26.00	0.000	19,746	159.60	0.000
26.50	0.000	19,746	159.60	0.000
27.00	0.000	19,746	159.60	0.000
27.50	0.000	19,746	159.60	0.000
28.00	0.000	19,746	159.60	0.000
28.50	0.000	19,746	159.60	0.000
29.00	0.000	19,746	159.60	0.000
29.50	0.000	19,746	159.60	0.000
30.00	0.000	19,746	159.60	0.000
30.50	0.000	19,746	159.60	0.000
31.00	0.000	19,746	159.60	0.000
31.50	0.000	19,746	159.60	0.000
32.00	0.000	19,746	159.60	0.000
32.50	0.000	19,746	159.60	0.000
33.00	0.000	19,746	159.60	0.000
33.50	0.000	19,746	159.60	0.000
34.00	0.000	19,746	159.60	0.000
34.50	0.000	19,746	159.60	0.000
35.00	0.000	19,746	159.60	0.000
35.50	0.000	19,746	159.60	0.000
36.00	0.000	19,746	159.60	0.000
36.50	0.000	19,746	159.60	0.000
37.00	0.000	19,746	159.60	0.000
37.50	0.000	19,746	159.60	0.000
38.00	0.000	19,746	159.60	0.000
38.50	0.000	19,746	159.60	0.000
39.00	0.000	19,746	159.60	0.000
39.50	0.000	19,746	159.60	0.000
40.00	0.000	19,746	159.60	0.000
40.50	0.000	19,746	159.60	0.000
41.00	0.000	19,746	159.60	0.000
41.50	0.000	19,746	159.60	0.000
42.00	0.000	19,746	159.60	0.000
42.50	0.000	19,746	159.60	0.000
43.00	0.000	19,746	159.60	0.000
43.50	0.000	19,746	159.60	0.000
44.00	0.000	19,746	159.60	0.000
44.50	0.000	19,746	159.60	0.000
45.00	0.000	19,746	159.60	0.000
45.50	0.000	19,746	159.60	0.000
46.00	0.000	19,746	159.60	0.000
46.50	0.000	19,746	159.60	0.000
47.00	0.000	19,746	159.60	0.000
47.50	0.000	19,746	159.60	0.000
48.00	0.000	19,746	159.60	0.000
48.50	0.000	19,746	159.60	0.000
49.00	0.000	19,746	159.60	0.000
49.50	0.000	19,746	159.60	0.000
50.00	0.000	19,746	159.60	0.000
50.50	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	19,746	159.60	0.000
51.50	0.000	19,746	159.60	0.000
52.00	0.000	19,746	159.60	0.000
52.50	0.000	19,746	159.60	0.000
53.00	0.000	19,746	159.60	0.000
53.50	0.000	19,746	159.60	0.000
54.00	0.000	19,746	159.60	0.000
54.50	0.000	19,746	159.60	0.000
55.00	0.000	19,746	159.60	0.000
55.50	0.000	19,746	159.60	0.000
56.00	0.000	19,746	159.60	0.000
56.50	0.000	19,746	159.60	0.000
57.00	0.000	19,746	159.60	0.000
57.50	0.000	19,746	159.60	0.000
58.00	0.000	19,746	159.60	0.000
58.50	0.000	19,746	159.60	0.000
59.00	0.000	19,746	159.60	0.000
59.50	0.000	19,746	159.60	0.000
60.00	0.000	19,746	159.60	0.000
60.50	0.000	19,746	159.60	0.000
61.00	0.000	19,746	159.60	0.000
61.50	0.000	19,746	159.60	0.000
62.00	0.000	19,746	159.60	0.000
62.50	0.000	19,746	159.60	0.000
63.00	0.000	19,746	159.60	0.000
63.50	0.000	19,746	159.60	0.000
64.00	0.000	19,746	159.60	0.000
64.50	0.000	19,746	159.60	0.000
65.00	0.000	19,746	159.60	0.000
65.50	0.000	19,746	159.60	0.000
66.00	0.000	19,746	159.60	0.000
66.50	0.000	19,746	159.60	0.000
67.00	0.000	19,746	159.60	0.000
67.50	0.000	19,746	159.60	0.000
68.00	0.000	19,746	159.60	0.000
68.50	0.000	19,746	159.60	0.000
69.00	0.000	19,746	159.60	0.000
69.50	0.000	19,746	159.60	0.000
70.00	0.000	19,746	159.60	0.000
70.50	0.000	19,746	159.60	0.000
71.00	0.000	19,746	159.60	0.000
71.50	0.000	19,746	159.60	0.000
72.00	0.000	19,746	159.60	0.000
72.50	0.000	19,746	159.60	0.000
73.00	0.000	19,746	159.60	0.000
73.50	0.000	19,746	159.60	0.000
74.00	0.000	19,746	159.60	0.000
74.50	0.000	19,746	159.60	0.000
75.00	0.000	19,746	159.60	0.000
75.50	0.000	19,746	159.60	0.000
76.00	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	19,746	159.60	0.000
77.00	0.000	19,746	159.60	0.000
77.50	0.000	19,746	159.60	0.000
78.00	0.000	19,746	159.60	0.000
78.50	0.000	19,746	159.60	0.000
79.00	0.000	19,746	159.60	0.000
79.50	0.000	19,746	159.60	0.000
80.00	0.000	19,746	159.60	0.000
80.50	0.000	19,746	159.60	0.000
81.00	0.000	19,746	159.60	0.000
81.50	0.000	19,746	159.60	0.000
82.00	0.000	19,746	159.60	0.000
82.50	0.000	19,746	159.60	0.000
83.00	0.000	19,746	159.60	0.000
83.50	0.000	19,746	159.60	0.000
84.00	0.000	19,746	159.60	0.000
84.50	0.000	19,746	159.60	0.000
85.00	0.000	19,746	159.60	0.000
85.50	0.000	19,746	159.60	0.000
86.00	0.000	19,746	159.60	0.000
86.50	0.000	19,746	159.60	0.000
87.00	0.000	19,746	159.60	0.000
87.50	0.000	19,746	159.60	0.000
88.00	0.000	19,746	159.60	0.000
88.50	0.000	19,746	159.60	0.000
89.00	0.000	19,746	159.60	0.000
89.50	0.000	19,746	159.60	0.000
90.00	0.000	19,746	159.60	0.000
90.50	0.000	19,746	159.60	0.000
91.00	0.000	19,746	159.60	0.000
91.50	0.000	19,746	159.60	0.000
92.00	0.000	19,746	159.60	0.000
92.50	0.000	19,746	159.60	0.000
93.00	0.000	19,746	159.60	0.000
93.50	0.000	19,746	159.60	0.000
94.00	0.000	19,746	159.60	0.000
94.50	0.000	19,746	159.60	0.000
95.00	0.000	19,746	159.60	0.000
95.50	0.000	19,746	159.60	0.000
96.00	0.000	19,746	159.60	0.000
96.50	0.000	19,746	159.60	0.000
97.00	0.000	19,746	159.60	0.000
97.50	0.000	19,746	159.60	0.000
98.00	0.000	19,746	159.60	0.000
98.50	0.000	19,746	159.60	0.000
99.00	0.000	19,746	159.60	0.000
99.50	0.000	19,746	159.60	0.000
100.00	0.000	19,746	159.60	0.000
100.50	0.000	19,746	159.60	0.000
101.00	0.000	19,746	159.60	0.000
101.50	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	19,746	159.60	0.000
102.50	0.000	19,746	159.60	0.000
103.00	0.000	19,746	159.60	0.000
103.50	0.000	19,746	159.60	0.000
104.00	0.000	19,746	159.60	0.000
104.50	0.000	19,746	159.60	0.000
105.00	0.000	19,746	159.60	0.000
105.50	0.000	19,746	159.60	0.000
106.00	0.000	19,746	159.60	0.000
106.50	0.000	19,746	159.60	0.000
107.00	0.000	19,746	159.60	0.000
107.50	0.000	19,746	159.60	0.000
108.00	0.000	19,746	159.60	0.000
108.50	0.000	19,746	159.60	0.000
109.00	0.000	19,746	159.60	0.000
109.50	0.000	19,746	159.60	0.000
110.00	0.000	19,746	159.60	0.000
110.50	0.000	19,746	159.60	0.000
111.00	0.000	19,746	159.60	0.000
111.50	0.000	19,746	159.60	0.000
112.00	0.000	19,746	159.60	0.000
112.50	0.000	19,746	159.60	0.000
113.00	0.000	19,746	159.60	0.000
113.50	0.000	19,746	159.60	0.000
114.00	0.000	19,746	159.60	0.000
114.50	0.000	19,746	159.60	0.000
115.00	0.000	19,746	159.60	0.000
115.50	0.000	19,746	159.60	0.000
116.00	0.000	19,746	159.60	0.000
116.50	0.000	19,746	159.60	0.000
117.00	0.000	19,746	159.60	0.000
117.50	0.000	19,746	159.60	0.000
118.00	0.000	19,746	159.60	0.000
118.50	0.000	19,746	159.60	0.000
119.00	0.000	19,746	159.60	0.000
119.50	0.000	19,746	159.60	0.000
120.00	0.000	19,746	159.60	0.000
120.50	0.000	19,746	159.60	0.000
121.00	0.000	19,746	159.60	0.000
121.50	0.000	19,746	159.60	0.000
122.00	0.000	19,746	159.60	0.000
122.50	0.000	19,746	159.60	0.000
123.00	0.000	19,746	159.60	0.000
123.50	0.000	19,746	159.60	0.000
124.00	0.000	19,746	159.60	0.000
124.50	0.000	19,746	159.60	0.000
125.00	0.000	19,746	159.60	0.000
125.50	0.000	19,746	159.60	0.000
126.00	0.000	19,746	159.60	0.000
126.50	0.000	19,746	159.60	0.000
127.00	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	19,746	159.60	0.000
128.00	0.000	19,746	159.60	0.000
128.50	0.000	19,746	159.60	0.000
129.00	0.000	19,746	159.60	0.000
129.50	0.000	19,746	159.60	0.000
130.00	0.000	19,746	159.60	0.000
130.50	0.000	19,746	159.60	0.000
131.00	0.000	19,746	159.60	0.000
131.50	0.000	19,746	159.60	0.000
132.00	0.000	19,746	159.60	0.000
132.50	0.000	19,746	159.60	0.000
133.00	0.000	19,746	159.60	0.000
133.50	0.000	19,746	159.60	0.000
134.00	0.000	19,746	159.60	0.000
134.50	0.000	19,746	159.60	0.000
135.00	0.000	19,746	159.60	0.000
135.50	0.000	19,746	159.60	0.000
136.00	0.000	19,746	159.60	0.000
136.50	0.000	19,746	159.60	0.000
137.00	0.000	19,746	159.60	0.000
137.50	0.000	19,746	159.60	0.000
138.00	0.000	19,746	159.60	0.000
138.50	0.000	19,746	159.60	0.000
139.00	0.000	19,746	159.60	0.000
139.50	0.000	19,746	159.60	0.000
140.00	0.000	19,746	159.60	0.000
140.50	0.000	19,746	159.60	0.000
141.00	0.000	19,746	159.60	0.000
141.50	0.000	19,746	159.60	0.000
142.00	0.000	19,746	159.60	0.000
142.50	0.000	19,746	159.60	0.000
143.00	0.000	19,746	159.60	0.000
143.50	0.000	19,746	159.60	0.000
144.00	0.000	19,746	159.60	0.000
144.50	0.000	19,746	159.60	0.000
145.00	0.000	19,746	159.60	0.000
145.50	0.000	19,746	159.60	0.000
146.00	0.000	19,746	159.60	0.000
146.50	0.000	19,746	159.60	0.000
147.00	0.000	19,746	159.60	0.000
147.50	0.000	19,746	159.60	0.000
148.00	0.000	19,746	159.60	0.000
148.50	0.000	19,746	159.60	0.000
149.00	0.000	19,746	159.60	0.000
149.50	0.000	19,746	159.60	0.000
150.00	0.000	19,746	159.60	0.000
150.50	0.000	19,746	159.60	0.000
151.00	0.000	19,746	159.60	0.000
151.50	0.000	19,746	159.60	0.000
152.00	0.000	19,746	159.60	0.000
152.50	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	19,746	159.60	0.000
153.50	0.000	19,746	159.60	0.000
154.00	0.000	19,746	159.60	0.000
154.50	0.000	19,746	159.60	0.000
155.00	0.000	19,746	159.60	0.000
155.50	0.000	19,746	159.60	0.000
156.00	0.000	19,746	159.60	0.000
156.50	0.000	19,746	159.60	0.000
157.00	0.000	19,746	159.60	0.000
157.50	0.000	19,746	159.60	0.000
158.00	0.000	19,746	159.60	0.000
158.50	0.000	19,746	159.60	0.000
159.00	0.000	19,746	159.60	0.000
159.50	0.000	19,746	159.60	0.000
160.00	0.000	19,746	159.60	0.000
160.50	0.000	19,746	159.60	0.000
161.00	0.000	19,746	159.60	0.000
161.50	0.000	19,746	159.60	0.000
162.00	0.000	19,746	159.60	0.000
162.50	0.000	19,746	159.60	0.000
163.00	0.000	19,746	159.60	0.000
163.50	0.000	19,746	159.60	0.000
164.00	0.000	19,746	159.60	0.000
164.50	0.000	19,746	159.60	0.000
165.00	0.000	19,746	159.60	0.000
165.50	0.000	19,746	159.60	0.000
166.00	0.000	19,746	159.60	0.000
166.50	0.000	19,746	159.60	0.000
167.00	0.000	19,746	159.60	0.000
167.50	0.000	19,746	159.60	0.000
168.00	0.000	19,746	159.60	0.000

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 2.66" for 5-yr event
Inflow = 2.367 cfs @ 11.96 hrs, Volume= 4,768 cf
Outflow = 0.595 cfs @ 12.09 hrs, Volume= 4,443 cf, Atten= 75%, Lag= 7.6 min
Primary = 0.595 cfs @ 12.09 hrs, Volume= 4,443 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 160.48' @ 12.09 hrs Surf.Area= 2,542 sf Storage= 2,014 cf

Plug-Flow detention time= 96.4 min calculated for 4,443 cf (93% of inflow)
Center-of-Mass det. time= 58.9 min (866.8 - 807.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.595 cfs @ 12.09 hrs HW=160.48' TW=159.60' (Fixed TW Elev= 159.60')
└─**4=Culvert** (Passes 0.595 cfs of 4.064 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.222 cfs @ 4.525 fps)
  ├─**2=Orifice/Grate** (Orifice Controls 0.373 cfs @ 2.986 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.000	0	159.28	0.000
4.50	0.000	0	159.28	0.000
5.00	0.000	0	159.28	0.000
5.50	0.000	0	159.28	0.000
6.00	0.000	0	159.28	0.000
6.50	0.002	1	159.28	0.000
7.00	0.004	6	159.29	0.000
7.50	0.006	15	159.29	0.000
8.00	0.008	27	159.31	0.000
8.50	0.012	44	159.32	0.000
9.00	0.017	69	159.35	0.000
9.50	0.021	104	159.38	0.000
10.00	0.029	147	159.42	0.000
10.50	0.043	211	159.49	0.000
11.00	0.067	308	159.58	0.000
11.50	**0.128**	409	159.68	0.068
12.00	**2.004**	**1,814**	**160.39**	**0.532**
12.50	0.184	**1,634**	**160.30**	**0.466**
13.00	0.116	1,245	160.12	0.262
13.50	0.088	1,044	160.03	0.175
14.00	0.070	906	159.96	0.142
14.50	0.062	778	159.90	0.130
15.00	0.056	660	159.85	0.118
15.50	0.049	554	159.80	0.106
16.00	0.043	461	159.73	0.086
16.50	0.040	401	159.67	0.064
17.00	0.038	370	159.64	0.049
17.50	0.036	356	159.63	0.041
18.00	0.034	351	159.62	0.036
18.50	0.031	348	159.62	0.033
19.00	0.029	345	159.62	0.030
19.50	0.027	343	159.62	0.028
20.00	0.024	340	159.61	0.026
20.50	0.024	339	159.61	0.024
21.00	0.023	338	159.61	0.024
21.50	0.023	337	159.61	0.023
22.00	0.022	337	159.61	0.023
22.50	0.022	336	159.61	0.022
23.00	0.022	336	159.61	0.022
23.50	0.021	335	159.61	0.021
24.00	0.021	335	159.61	0.021
24.50	0.000	326	159.60	0.000
25.00	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	325	159.60	0.000
26.00	0.000	325	159.60	0.000
26.50	0.000	325	159.60	0.000
27.00	0.000	325	159.60	0.000
27.50	0.000	325	159.60	0.000
28.00	0.000	325	159.60	0.000
28.50	0.000	325	159.60	0.000
29.00	0.000	325	159.60	0.000
29.50	0.000	325	159.60	0.000
30.00	0.000	325	159.60	0.000
30.50	0.000	325	159.60	0.000
31.00	0.000	325	159.60	0.000
31.50	0.000	325	159.60	0.000
32.00	0.000	325	159.60	0.000
32.50	0.000	325	159.60	0.000
33.00	0.000	325	159.60	0.000
33.50	0.000	325	159.60	0.000
34.00	0.000	325	159.60	0.000
34.50	0.000	325	159.60	0.000
35.00	0.000	325	159.60	0.000
35.50	0.000	325	159.60	0.000
36.00	0.000	325	159.60	0.000
36.50	0.000	325	159.60	0.000
37.00	0.000	325	159.60	0.000
37.50	0.000	325	159.60	0.000
38.00	0.000	325	159.60	0.000
38.50	0.000	325	159.60	0.000
39.00	0.000	325	159.60	0.000
39.50	0.000	325	159.60	0.000
40.00	0.000	325	159.60	0.000
40.50	0.000	325	159.60	0.000
41.00	0.000	325	159.60	0.000
41.50	0.000	325	159.60	0.000
42.00	0.000	325	159.60	0.000
42.50	0.000	325	159.60	0.000
43.00	0.000	325	159.60	0.000
43.50	0.000	325	159.60	0.000
44.00	0.000	325	159.60	0.000
44.50	0.000	325	159.60	0.000
45.00	0.000	325	159.60	0.000
45.50	0.000	325	159.60	0.000
46.00	0.000	325	159.60	0.000
46.50	0.000	325	159.60	0.000
47.00	0.000	325	159.60	0.000
47.50	0.000	325	159.60	0.000
48.00	0.000	325	159.60	0.000
48.50	0.000	325	159.60	0.000
49.00	0.000	325	159.60	0.000
49.50	0.000	325	159.60	0.000
50.00	0.000	325	159.60	0.000
50.50	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	325	159.60	0.000
51.50	0.000	325	159.60	0.000
52.00	0.000	325	159.60	0.000
52.50	0.000	325	159.60	0.000
53.00	0.000	325	159.60	0.000
53.50	0.000	325	159.60	0.000
54.00	0.000	325	159.60	0.000
54.50	0.000	325	159.60	0.000
55.00	0.000	325	159.60	0.000
55.50	0.000	325	159.60	0.000
56.00	0.000	325	159.60	0.000
56.50	0.000	325	159.60	0.000
57.00	0.000	325	159.60	0.000
57.50	0.000	325	159.60	0.000
58.00	0.000	325	159.60	0.000
58.50	0.000	325	159.60	0.000
59.00	0.000	325	159.60	0.000
59.50	0.000	325	159.60	0.000
60.00	0.000	325	159.60	0.000
60.50	0.000	325	159.60	0.000
61.00	0.000	325	159.60	0.000
61.50	0.000	325	159.60	0.000
62.00	0.000	325	159.60	0.000
62.50	0.000	325	159.60	0.000
63.00	0.000	325	159.60	0.000
63.50	0.000	325	159.60	0.000
64.00	0.000	325	159.60	0.000
64.50	0.000	325	159.60	0.000
65.00	0.000	325	159.60	0.000
65.50	0.000	325	159.60	0.000
66.00	0.000	325	159.60	0.000
66.50	0.000	325	159.60	0.000
67.00	0.000	325	159.60	0.000
67.50	0.000	325	159.60	0.000
68.00	0.000	325	159.60	0.000
68.50	0.000	325	159.60	0.000
69.00	0.000	325	159.60	0.000
69.50	0.000	325	159.60	0.000
70.00	0.000	325	159.60	0.000
70.50	0.000	325	159.60	0.000
71.00	0.000	325	159.60	0.000
71.50	0.000	325	159.60	0.000
72.00	0.000	325	159.60	0.000
72.50	0.000	325	159.60	0.000
73.00	0.000	325	159.60	0.000
73.50	0.000	325	159.60	0.000
74.00	0.000	325	159.60	0.000
74.50	0.000	325	159.60	0.000
75.00	0.000	325	159.60	0.000
75.50	0.000	325	159.60	0.000
76.00	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	325	159.60	0.000
77.00	0.000	325	159.60	0.000
77.50	0.000	325	159.60	0.000
78.00	0.000	325	159.60	0.000
78.50	0.000	325	159.60	0.000
79.00	0.000	325	159.60	0.000
79.50	0.000	325	159.60	0.000
80.00	0.000	325	159.60	0.000
80.50	0.000	325	159.60	0.000
81.00	0.000	325	159.60	0.000
81.50	0.000	325	159.60	0.000
82.00	0.000	325	159.60	0.000
82.50	0.000	325	159.60	0.000
83.00	0.000	325	159.60	0.000
83.50	0.000	325	159.60	0.000
84.00	0.000	325	159.60	0.000
84.50	0.000	325	159.60	0.000
85.00	0.000	325	159.60	0.000
85.50	0.000	325	159.60	0.000
86.00	0.000	325	159.60	0.000
86.50	0.000	325	159.60	0.000
87.00	0.000	325	159.60	0.000
87.50	0.000	325	159.60	0.000
88.00	0.000	325	159.60	0.000
88.50	0.000	325	159.60	0.000
89.00	0.000	325	159.60	0.000
89.50	0.000	325	159.60	0.000
90.00	0.000	325	159.60	0.000
90.50	0.000	325	159.60	0.000
91.00	0.000	325	159.60	0.000
91.50	0.000	325	159.60	0.000
92.00	0.000	325	159.60	0.000
92.50	0.000	325	159.60	0.000
93.00	0.000	325	159.60	0.000
93.50	0.000	325	159.60	0.000
94.00	0.000	325	159.60	0.000
94.50	0.000	325	159.60	0.000
95.00	0.000	325	159.60	0.000
95.50	0.000	325	159.60	0.000
96.00	0.000	325	159.60	0.000
96.50	0.000	325	159.60	0.000
97.00	0.000	325	159.60	0.000
97.50	0.000	325	159.60	0.000
98.00	0.000	325	159.60	0.000
98.50	0.000	325	159.60	0.000
99.00	0.000	325	159.60	0.000
99.50	0.000	325	159.60	0.000
100.00	0.000	325	159.60	0.000
100.50	0.000	325	159.60	0.000
101.00	0.000	325	159.60	0.000
101.50	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

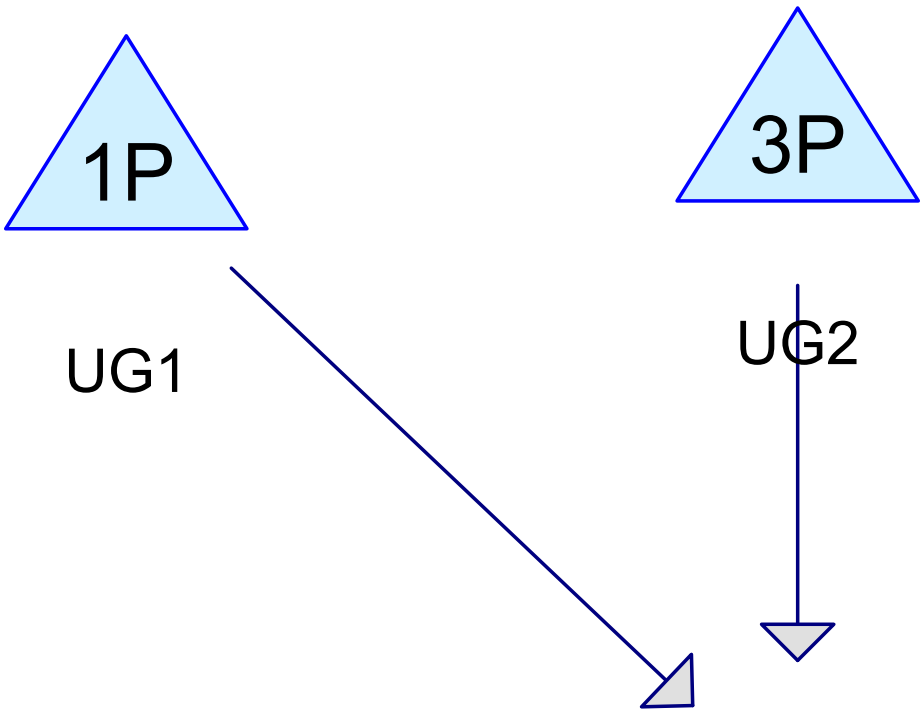
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	325	159.60	0.000
102.50	0.000	325	159.60	0.000
103.00	0.000	325	159.60	0.000
103.50	0.000	325	159.60	0.000
104.00	0.000	325	159.60	0.000
104.50	0.000	325	159.60	0.000
105.00	0.000	325	159.60	0.000
105.50	0.000	325	159.60	0.000
106.00	0.000	325	159.60	0.000
106.50	0.000	325	159.60	0.000
107.00	0.000	325	159.60	0.000
107.50	0.000	325	159.60	0.000
108.00	0.000	325	159.60	0.000
108.50	0.000	325	159.60	0.000
109.00	0.000	325	159.60	0.000
109.50	0.000	325	159.60	0.000
110.00	0.000	325	159.60	0.000
110.50	0.000	325	159.60	0.000
111.00	0.000	325	159.60	0.000
111.50	0.000	325	159.60	0.000
112.00	0.000	325	159.60	0.000
112.50	0.000	325	159.60	0.000
113.00	0.000	325	159.60	0.000
113.50	0.000	325	159.60	0.000
114.00	0.000	325	159.60	0.000
114.50	0.000	325	159.60	0.000
115.00	0.000	325	159.60	0.000
115.50	0.000	325	159.60	0.000
116.00	0.000	325	159.60	0.000
116.50	0.000	325	159.60	0.000
117.00	0.000	325	159.60	0.000
117.50	0.000	325	159.60	0.000
118.00	0.000	325	159.60	0.000
118.50	0.000	325	159.60	0.000
119.00	0.000	325	159.60	0.000
119.50	0.000	325	159.60	0.000
120.00	0.000	325	159.60	0.000
120.50	0.000	325	159.60	0.000
121.00	0.000	325	159.60	0.000
121.50	0.000	325	159.60	0.000
122.00	0.000	325	159.60	0.000
122.50	0.000	325	159.60	0.000
123.00	0.000	325	159.60	0.000
123.50	0.000	325	159.60	0.000
124.00	0.000	325	159.60	0.000
124.50	0.000	325	159.60	0.000
125.00	0.000	325	159.60	0.000
125.50	0.000	325	159.60	0.000
126.00	0.000	325	159.60	0.000
126.50	0.000	325	159.60	0.000
127.00	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	325	159.60	0.000
128.00	0.000	325	159.60	0.000
128.50	0.000	325	159.60	0.000
129.00	0.000	325	159.60	0.000
129.50	0.000	325	159.60	0.000
130.00	0.000	325	159.60	0.000
130.50	0.000	325	159.60	0.000
131.00	0.000	325	159.60	0.000
131.50	0.000	325	159.60	0.000
132.00	0.000	325	159.60	0.000
132.50	0.000	325	159.60	0.000
133.00	0.000	325	159.60	0.000
133.50	0.000	325	159.60	0.000
134.00	0.000	325	159.60	0.000
134.50	0.000	325	159.60	0.000
135.00	0.000	325	159.60	0.000
135.50	0.000	325	159.60	0.000
136.00	0.000	325	159.60	0.000
136.50	0.000	325	159.60	0.000
137.00	0.000	325	159.60	0.000
137.50	0.000	325	159.60	0.000
138.00	0.000	325	159.60	0.000
138.50	0.000	325	159.60	0.000
139.00	0.000	325	159.60	0.000
139.50	0.000	325	159.60	0.000
140.00	0.000	325	159.60	0.000
140.50	0.000	325	159.60	0.000
141.00	0.000	325	159.60	0.000
141.50	0.000	325	159.60	0.000
142.00	0.000	325	159.60	0.000
142.50	0.000	325	159.60	0.000
143.00	0.000	325	159.60	0.000
143.50	0.000	325	159.60	0.000
144.00	0.000	325	159.60	0.000
144.50	0.000	325	159.60	0.000
145.00	0.000	325	159.60	0.000
145.50	0.000	325	159.60	0.000
146.00	0.000	325	159.60	0.000
146.50	0.000	325	159.60	0.000
147.00	0.000	325	159.60	0.000
147.50	0.000	325	159.60	0.000
148.00	0.000	325	159.60	0.000
148.50	0.000	325	159.60	0.000
149.00	0.000	325	159.60	0.000
149.50	0.000	325	159.60	0.000
150.00	0.000	325	159.60	0.000
150.50	0.000	325	159.60	0.000
151.00	0.000	325	159.60	0.000
151.50	0.000	325	159.60	0.000
152.00	0.000	325	159.60	0.000
152.50	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	325	159.60	0.000
153.50	0.000	325	159.60	0.000
154.00	0.000	325	159.60	0.000
154.50	0.000	325	159.60	0.000
155.00	0.000	325	159.60	0.000
155.50	0.000	325	159.60	0.000
156.00	0.000	325	159.60	0.000
156.50	0.000	325	159.60	0.000
157.00	0.000	325	159.60	0.000
157.50	0.000	325	159.60	0.000
158.00	0.000	325	159.60	0.000
158.50	0.000	325	159.60	0.000
159.00	0.000	325	159.60	0.000
159.50	0.000	325	159.60	0.000
160.00	0.000	325	159.60	0.000
160.50	0.000	325	159.60	0.000
161.00	0.000	325	159.60	0.000
161.50	0.000	325	159.60	0.000
162.00	0.000	325	159.60	0.000
162.50	0.000	325	159.60	0.000
163.00	0.000	325	159.60	0.000
163.50	0.000	325	159.60	0.000
164.00	0.000	325	159.60	0.000
164.50	0.000	325	159.60	0.000
165.00	0.000	325	159.60	0.000
165.50	0.000	325	159.60	0.000
166.00	0.000	325	159.60	0.000
166.50	0.000	325	159.60	0.000
167.00	0.000	325	159.60	0.000
167.50	0.000	325	159.60	0.000
168.00	0.000	325	159.60	0.000



Subcat Reach Pond Link

Routing Diagram for BMW_2025-7-24_2
Prepared by Bohler, Printed 7/24/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10-yr	Type II 24-hr		Default	24.00	1	4.83	2

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 4.36" for 10-yr event
Inflow = 13.471 cfs @ 11.96 hrs, Volume= 30,539 cf
Outflow = 0.301 cfs @ 16.97 hrs, Volume= 3,379 cf, Atten= 98%, Lag= 300.8 min
Primary = 0.301 cfs @ 16.97 hrs, Volume= 3,379 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 163.82' @ 16.97 hrs Surf.Area= 13,041 sf Storage= 27,162 cf

Plug-Flow detention time= 769.4 min calculated for 3,379 cf (11% of inflow)
Center-of-Mass det. time= 449.3 min (1,207.9 - 758.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.738 cfs @ 16.97 hrs HW=163.82' TW=163.81' (Fixed TW Elev= 163.81')
└─**4=Culvert** (Outlet Controls 0.738 cfs @ 0.418 fps)
  ├─**1=Orifice/Grate** (Passes < 0.003 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 0.382 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 11.129 cfs potential flow)

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.000	0	157.53	0.000
2.00	0.009	6	157.53	0.000
2.50	0.023	35	157.54	0.000
3.00	0.035	87	157.55	0.000
3.50	0.047	162	157.56	0.000
4.00	0.058	257	157.58	0.000
4.50	0.071	373	157.60	0.000
5.00	0.084	512	157.63	0.000
5.50	0.097	675	157.66	0.000
6.00	0.110	862	157.70	0.000
6.50	0.123	1,073	157.74	0.000
7.00	0.136	1,306	157.78	0.000
7.50	0.149	1,563	157.83	0.000
8.00	0.162	1,843	157.88	0.000
8.50	0.200	2,165	157.94	0.000
9.00	0.245	2,565	158.02	0.000
9.50	0.258	3,023	158.06	0.000
10.00	0.320	3,535	158.11	0.000
10.50	0.422	4,199	158.16	0.000
11.00	0.593	5,104	158.24	0.000
11.50	**0.990**	6,499	158.36	0.000
12.00	**11.141**	17,063	159.33	0.000
12.50	0.971	21,406	159.78	0.000
13.00	0.604	22,732	159.94	0.000
13.50	0.457	23,674	160.08	0.000
14.00	0.358	24,404	160.21	0.000
14.50	0.317	25,005	160.32	0.000
15.00	0.284	25,546	160.43	0.000
15.50	0.252	26,028	160.52	0.000
16.00	0.219	26,452	160.60	0.000
16.50	0.204	**26,831**	**160.67**	**0.000**
17.00	0.193	**27,162**	**163.81**	**0.086**
17.50	0.181	27,162	163.81	0.074
18.00	0.170	27,162	163.81	0.062
18.50	0.158	27,162	163.81	0.051
19.00	0.146	27,162	163.81	0.039
19.50	0.135	27,162	163.81	0.028
20.00	0.123	27,162	163.81	0.016
20.50	0.119	27,162	163.81	0.012
21.00	0.117	27,162	163.81	0.010
21.50	0.115	27,162	163.81	0.007
22.00	0.112	27,162	163.81	0.005
22.50	0.110	27,162	163.81	0.003
23.00	0.108	27,162	163.81	0.001
23.50	0.105	27,162	163.75	0.000
24.00	0.103	27,162	163.75	0.000
24.50	0.000	27,162	163.75	0.000
25.00	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	27,162	163.75	0.000
26.00	0.000	27,162	163.75	0.000
26.50	0.000	27,162	163.75	0.000
27.00	0.000	27,162	163.75	0.000
27.50	0.000	27,162	163.75	0.000
28.00	0.000	27,162	163.75	0.000
28.50	0.000	27,162	163.75	0.000
29.00	0.000	27,162	163.75	0.000
29.50	0.000	27,162	163.75	0.000
30.00	0.000	27,162	163.75	0.000
30.50	0.000	27,162	163.75	0.000
31.00	0.000	27,162	163.75	0.000
31.50	0.000	27,162	163.75	0.000
32.00	0.000	27,162	163.75	0.000
32.50	0.000	27,162	163.75	0.000
33.00	0.000	27,162	163.75	0.000
33.50	0.000	27,162	163.75	0.000
34.00	0.000	27,162	163.75	0.000
34.50	0.000	27,162	163.75	0.000
35.00	0.000	27,162	163.75	0.000
35.50	0.000	27,162	163.75	0.000
36.00	0.000	27,162	163.75	0.000
36.50	0.000	27,162	163.75	0.000
37.00	0.000	27,162	163.75	0.000
37.50	0.000	27,162	163.75	0.000
38.00	0.000	27,162	163.75	0.000
38.50	0.000	27,162	163.75	0.000
39.00	0.000	27,162	163.75	0.000
39.50	0.000	27,162	163.75	0.000
40.00	0.000	27,162	163.75	0.000
40.50	0.000	27,162	163.75	0.000
41.00	0.000	27,162	163.75	0.000
41.50	0.000	27,162	163.75	0.000
42.00	0.000	27,162	163.75	0.000
42.50	0.000	27,162	163.75	0.000
43.00	0.000	27,162	163.75	0.000
43.50	0.000	27,162	163.75	0.000
44.00	0.000	27,162	163.75	0.000
44.50	0.000	27,162	163.75	0.000
45.00	0.000	27,162	163.75	0.000
45.50	0.000	27,162	163.75	0.000
46.00	0.000	27,162	163.75	0.000
46.50	0.000	27,162	163.75	0.000
47.00	0.000	27,162	163.75	0.000
47.50	0.000	27,162	163.75	0.000
48.00	0.000	27,162	163.75	0.000
48.50	0.000	27,162	163.75	0.000
49.00	0.000	27,162	163.75	0.000
49.50	0.000	27,162	163.75	0.000
50.00	0.000	27,162	163.75	0.000
50.50	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	27,162	163.75	0.000
51.50	0.000	27,162	163.75	0.000
52.00	0.000	27,162	163.75	0.000
52.50	0.000	27,162	163.75	0.000
53.00	0.000	27,162	163.75	0.000
53.50	0.000	27,162	163.75	0.000
54.00	0.000	27,162	163.75	0.000
54.50	0.000	27,162	163.75	0.000
55.00	0.000	27,162	163.75	0.000
55.50	0.000	27,162	163.75	0.000
56.00	0.000	27,162	163.75	0.000
56.50	0.000	27,162	163.75	0.000
57.00	0.000	27,162	163.75	0.000
57.50	0.000	27,162	163.75	0.000
58.00	0.000	27,162	163.75	0.000
58.50	0.000	27,162	163.75	0.000
59.00	0.000	27,162	163.75	0.000
59.50	0.000	27,162	163.75	0.000
60.00	0.000	27,162	163.75	0.000
60.50	0.000	27,162	163.75	0.000
61.00	0.000	27,162	163.75	0.000
61.50	0.000	27,162	163.75	0.000
62.00	0.000	27,162	163.75	0.000
62.50	0.000	27,162	163.75	0.000
63.00	0.000	27,162	163.75	0.000
63.50	0.000	27,162	163.75	0.000
64.00	0.000	27,162	163.75	0.000
64.50	0.000	27,162	163.75	0.000
65.00	0.000	27,162	163.75	0.000
65.50	0.000	27,162	163.75	0.000
66.00	0.000	27,162	163.75	0.000
66.50	0.000	27,162	163.75	0.000
67.00	0.000	27,162	163.75	0.000
67.50	0.000	27,162	163.75	0.000
68.00	0.000	27,162	163.75	0.000
68.50	0.000	27,162	163.75	0.000
69.00	0.000	27,162	163.75	0.000
69.50	0.000	27,162	163.75	0.000
70.00	0.000	27,162	163.75	0.000
70.50	0.000	27,162	163.75	0.000
71.00	0.000	27,162	163.75	0.000
71.50	0.000	27,162	163.75	0.000
72.00	0.000	27,162	163.75	0.000
72.50	0.000	27,162	163.75	0.000
73.00	0.000	27,162	163.75	0.000
73.50	0.000	27,162	163.75	0.000
74.00	0.000	27,162	163.75	0.000
74.50	0.000	27,162	163.75	0.000
75.00	0.000	27,162	163.75	0.000
75.50	0.000	27,162	163.75	0.000
76.00	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	27,162	163.75	0.000
77.00	0.000	27,162	163.75	0.000
77.50	0.000	27,162	163.75	0.000
78.00	0.000	27,162	163.75	0.000
78.50	0.000	27,162	163.75	0.000
79.00	0.000	27,162	163.75	0.000
79.50	0.000	27,162	163.75	0.000
80.00	0.000	27,162	163.75	0.000
80.50	0.000	27,162	163.75	0.000
81.00	0.000	27,162	163.75	0.000
81.50	0.000	27,162	163.75	0.000
82.00	0.000	27,162	163.75	0.000
82.50	0.000	27,162	163.75	0.000
83.00	0.000	27,162	163.75	0.000
83.50	0.000	27,162	163.75	0.000
84.00	0.000	27,162	163.75	0.000
84.50	0.000	27,162	163.75	0.000
85.00	0.000	27,162	163.75	0.000
85.50	0.000	27,162	163.75	0.000
86.00	0.000	27,162	163.75	0.000
86.50	0.000	27,162	163.75	0.000
87.00	0.000	27,162	163.75	0.000
87.50	0.000	27,162	163.75	0.000
88.00	0.000	27,162	163.75	0.000
88.50	0.000	27,162	163.75	0.000
89.00	0.000	27,162	163.75	0.000
89.50	0.000	27,162	163.75	0.000
90.00	0.000	27,162	163.75	0.000
90.50	0.000	27,162	163.75	0.000
91.00	0.000	27,162	163.75	0.000
91.50	0.000	27,162	163.75	0.000
92.00	0.000	27,162	163.75	0.000
92.50	0.000	27,162	163.75	0.000
93.00	0.000	27,162	163.75	0.000
93.50	0.000	27,162	163.75	0.000
94.00	0.000	27,162	163.75	0.000
94.50	0.000	27,162	163.75	0.000
95.00	0.000	27,162	163.75	0.000
95.50	0.000	27,162	163.75	0.000
96.00	0.000	27,162	163.75	0.000
96.50	0.000	27,162	163.75	0.000
97.00	0.000	27,162	163.75	0.000
97.50	0.000	27,162	163.75	0.000
98.00	0.000	27,162	163.75	0.000
98.50	0.000	27,162	163.75	0.000
99.00	0.000	27,162	163.75	0.000
99.50	0.000	27,162	163.75	0.000
100.00	0.000	27,162	163.75	0.000
100.50	0.000	27,162	163.75	0.000
101.00	0.000	27,162	163.75	0.000
101.50	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	27,162	163.75	0.000
102.50	0.000	27,162	163.75	0.000
103.00	0.000	27,162	163.75	0.000
103.50	0.000	27,162	163.75	0.000
104.00	0.000	27,162	163.75	0.000
104.50	0.000	27,162	163.75	0.000
105.00	0.000	27,162	163.75	0.000
105.50	0.000	27,162	163.75	0.000
106.00	0.000	27,162	163.75	0.000
106.50	0.000	27,162	163.75	0.000
107.00	0.000	27,162	163.75	0.000
107.50	0.000	27,162	163.75	0.000
108.00	0.000	27,162	163.75	0.000
108.50	0.000	27,162	163.75	0.000
109.00	0.000	27,162	163.75	0.000
109.50	0.000	27,162	163.75	0.000
110.00	0.000	27,162	163.75	0.000
110.50	0.000	27,162	163.75	0.000
111.00	0.000	27,162	163.75	0.000
111.50	0.000	27,162	163.75	0.000
112.00	0.000	27,162	163.75	0.000
112.50	0.000	27,162	163.75	0.000
113.00	0.000	27,162	163.75	0.000
113.50	0.000	27,162	163.75	0.000
114.00	0.000	27,162	163.75	0.000
114.50	0.000	27,162	163.75	0.000
115.00	0.000	27,162	163.75	0.000
115.50	0.000	27,162	163.75	0.000
116.00	0.000	27,162	163.75	0.000
116.50	0.000	27,162	163.75	0.000
117.00	0.000	27,162	163.75	0.000
117.50	0.000	27,162	163.75	0.000
118.00	0.000	27,162	163.75	0.000
118.50	0.000	27,162	163.75	0.000
119.00	0.000	27,162	163.75	0.000
119.50	0.000	27,162	163.75	0.000
120.00	0.000	27,162	163.75	0.000
120.50	0.000	27,162	163.75	0.000
121.00	0.000	27,162	163.75	0.000
121.50	0.000	27,162	163.75	0.000
122.00	0.000	27,162	163.75	0.000
122.50	0.000	27,162	163.75	0.000
123.00	0.000	27,162	163.75	0.000
123.50	0.000	27,162	163.75	0.000
124.00	0.000	27,162	163.75	0.000
124.50	0.000	27,162	163.75	0.000
125.00	0.000	27,162	163.75	0.000
125.50	0.000	27,162	163.75	0.000
126.00	0.000	27,162	163.75	0.000
126.50	0.000	27,162	163.75	0.000
127.00	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	27,162	163.75	0.000
128.00	0.000	27,162	163.75	0.000
128.50	0.000	27,162	163.75	0.000
129.00	0.000	27,162	163.75	0.000
129.50	0.000	27,162	163.75	0.000
130.00	0.000	27,162	163.75	0.000
130.50	0.000	27,162	163.75	0.000
131.00	0.000	27,162	163.75	0.000
131.50	0.000	27,162	163.75	0.000
132.00	0.000	27,162	163.75	0.000
132.50	0.000	27,162	163.75	0.000
133.00	0.000	27,162	163.75	0.000
133.50	0.000	27,162	163.75	0.000
134.00	0.000	27,162	163.75	0.000
134.50	0.000	27,162	163.75	0.000
135.00	0.000	27,162	163.75	0.000
135.50	0.000	27,162	163.75	0.000
136.00	0.000	27,162	163.75	0.000
136.50	0.000	27,162	163.75	0.000
137.00	0.000	27,162	163.75	0.000
137.50	0.000	27,162	163.75	0.000
138.00	0.000	27,162	163.75	0.000
138.50	0.000	27,162	163.75	0.000
139.00	0.000	27,162	163.75	0.000
139.50	0.000	27,162	163.75	0.000
140.00	0.000	27,162	163.75	0.000
140.50	0.000	27,162	163.75	0.000
141.00	0.000	27,162	163.75	0.000
141.50	0.000	27,162	163.75	0.000
142.00	0.000	27,162	163.75	0.000
142.50	0.000	27,162	163.75	0.000
143.00	0.000	27,162	163.75	0.000
143.50	0.000	27,162	163.75	0.000
144.00	0.000	27,162	163.75	0.000
144.50	0.000	27,162	163.75	0.000
145.00	0.000	27,162	163.75	0.000
145.50	0.000	27,162	163.75	0.000
146.00	0.000	27,162	163.75	0.000
146.50	0.000	27,162	163.75	0.000
147.00	0.000	27,162	163.75	0.000
147.50	0.000	27,162	163.75	0.000
148.00	0.000	27,162	163.75	0.000
148.50	0.000	27,162	163.75	0.000
149.00	0.000	27,162	163.75	0.000
149.50	0.000	27,162	163.75	0.000
150.00	0.000	27,162	163.75	0.000
150.50	0.000	27,162	163.75	0.000
151.00	0.000	27,162	163.75	0.000
151.50	0.000	27,162	163.75	0.000
152.00	0.000	27,162	163.75	0.000
152.50	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	27,162	163.75	0.000
153.50	0.000	27,162	163.75	0.000
154.00	0.000	27,162	163.75	0.000
154.50	0.000	27,162	163.75	0.000
155.00	0.000	27,162	163.75	0.000
155.50	0.000	27,162	163.75	0.000
156.00	0.000	27,162	163.75	0.000
156.50	0.000	27,162	163.75	0.000
157.00	0.000	27,162	163.75	0.000
157.50	0.000	27,162	163.75	0.000
158.00	0.000	27,162	163.75	0.000
158.50	0.000	27,162	163.75	0.000
159.00	0.000	27,162	163.75	0.000
159.50	0.000	27,162	163.75	0.000
160.00	0.000	27,162	163.75	0.000
160.50	0.000	27,162	163.75	0.000
161.00	0.000	27,162	163.75	0.000
161.50	0.000	27,162	163.75	0.000
162.00	0.000	27,162	163.75	0.000
162.50	0.000	27,162	163.75	0.000
163.00	0.000	27,162	163.75	0.000
163.50	0.000	27,162	163.75	0.000
164.00	0.000	27,162	163.75	0.000
164.50	0.000	27,162	163.75	0.000
165.00	0.000	27,162	163.75	0.000
165.50	0.000	27,162	163.75	0.000
166.00	0.000	27,162	163.75	0.000
166.50	0.000	27,162	163.75	0.000
167.00	0.000	27,162	163.75	0.000
167.50	0.000	27,162	163.75	0.000
168.00	0.000	27,162	163.75	0.000

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 3.31" for 10-yr event
Inflow = 2.904 cfs @ 11.96 hrs, Volume= 5,921 cf
Outflow = 0.130 cfs @ 13.34 hrs, Volume= 1,687 cf, Atten= 96%, Lag= 82.9 min
Primary = 0.130 cfs @ 13.34 hrs, Volume= 1,687 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 163.81' @ 13.34 hrs Surf.Area= 2,542 sf Storage= 4,234 cf

Plug-Flow detention time= 376.2 min calculated for 1,687 cf (28% of inflow)
Center-of-Mass det. time= 241.2 min (1,042.9 - 801.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.484 cfs @ 13.34 hrs HW=163.81' TW=163.81' (Fixed TW Elev= 163.81')
└─**4=Culvert** (Inlet Controls 0.484 cfs @ 0.274 fps)
  ├─**1=Orifice/Grate** (Passes < 0.013 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 0.034 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 4.364 cfs potential flow)

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.000	0	159.28	0.000
4.50	0.000	0	159.28	0.000
5.00	0.000	0	159.28	0.000
5.50	0.001	0	159.28	0.000
6.00	0.003	3	159.28	0.000
6.50	0.005	10	159.29	0.000
7.00	0.007	21	159.30	0.000
7.50	0.010	37	159.32	0.000
8.00	0.013	58	159.34	0.000
8.50	0.018	85	159.36	0.000
9.00	0.025	124	159.40	0.000
9.50	0.030	174	159.45	0.000
10.00	0.040	236	159.51	0.000
10.50	0.058	324	159.60	0.000
11.00	0.090	455	159.73	0.000
11.50	**0.166**	679	159.86	0.000
12.00	**2.449**	2,802	160.88	0.000
12.50	0.222	3,777	161.54	0.000
13.00	0.140	**4,082**	**161.84**	**0.000**
13.50	0.106	**4,234**	**163.81**	**0.120**
14.00	0.084	4,234	163.81	0.097
14.50	0.074	4,234	163.81	0.088
15.00	0.067	4,234	163.81	0.081
15.50	0.059	4,234	163.81	0.073
16.00	0.052	4,234	163.81	0.065
16.50	0.048	4,234	163.81	0.062
17.00	0.046	4,234	163.81	0.059
17.50	0.043	4,234	163.81	0.057
18.00	0.040	4,234	163.81	0.054
18.50	0.037	4,234	163.81	0.051
19.00	0.035	4,234	163.81	0.049
19.50	0.032	4,234	163.81	0.046
20.00	0.029	4,234	163.81	0.043
20.50	0.028	4,234	163.81	0.042
21.00	0.028	4,234	163.81	0.042
21.50	0.027	4,234	163.81	0.041
22.00	0.027	4,234	163.81	0.041
22.50	0.026	4,234	163.81	0.040
23.00	0.026	4,234	163.81	0.040
23.50	0.025	4,234	163.81	0.039
24.00	0.025	4,234	163.81	0.038
24.50	0.000	4,234	163.76	0.000
25.00	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	4,234	163.76	0.000
26.00	0.000	4,234	163.76	0.000
26.50	0.000	4,234	163.76	0.000
27.00	0.000	4,234	163.76	0.000
27.50	0.000	4,234	163.76	0.000
28.00	0.000	4,234	163.76	0.000
28.50	0.000	4,234	163.76	0.000
29.00	0.000	4,234	163.76	0.000
29.50	0.000	4,234	163.76	0.000
30.00	0.000	4,234	163.76	0.000
30.50	0.000	4,234	163.76	0.000
31.00	0.000	4,234	163.76	0.000
31.50	0.000	4,234	163.76	0.000
32.00	0.000	4,234	163.76	0.000
32.50	0.000	4,234	163.76	0.000
33.00	0.000	4,234	163.76	0.000
33.50	0.000	4,234	163.76	0.000
34.00	0.000	4,234	163.76	0.000
34.50	0.000	4,234	163.76	0.000
35.00	0.000	4,234	163.76	0.000
35.50	0.000	4,234	163.76	0.000
36.00	0.000	4,234	163.76	0.000
36.50	0.000	4,234	163.76	0.000
37.00	0.000	4,234	163.76	0.000
37.50	0.000	4,234	163.76	0.000
38.00	0.000	4,234	163.76	0.000
38.50	0.000	4,234	163.76	0.000
39.00	0.000	4,234	163.76	0.000
39.50	0.000	4,234	163.76	0.000
40.00	0.000	4,234	163.76	0.000
40.50	0.000	4,234	163.76	0.000
41.00	0.000	4,234	163.76	0.000
41.50	0.000	4,234	163.76	0.000
42.00	0.000	4,234	163.76	0.000
42.50	0.000	4,234	163.76	0.000
43.00	0.000	4,234	163.76	0.000
43.50	0.000	4,234	163.76	0.000
44.00	0.000	4,234	163.76	0.000
44.50	0.000	4,234	163.76	0.000
45.00	0.000	4,234	163.76	0.000
45.50	0.000	4,234	163.76	0.000
46.00	0.000	4,234	163.76	0.000
46.50	0.000	4,234	163.76	0.000
47.00	0.000	4,234	163.76	0.000
47.50	0.000	4,234	163.76	0.000
48.00	0.000	4,234	163.76	0.000
48.50	0.000	4,234	163.76	0.000
49.00	0.000	4,234	163.76	0.000
49.50	0.000	4,234	163.76	0.000
50.00	0.000	4,234	163.76	0.000
50.50	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,234	163.76	0.000
51.50	0.000	4,234	163.76	0.000
52.00	0.000	4,234	163.76	0.000
52.50	0.000	4,234	163.76	0.000
53.00	0.000	4,234	163.76	0.000
53.50	0.000	4,234	163.76	0.000
54.00	0.000	4,234	163.76	0.000
54.50	0.000	4,234	163.76	0.000
55.00	0.000	4,234	163.76	0.000
55.50	0.000	4,234	163.76	0.000
56.00	0.000	4,234	163.76	0.000
56.50	0.000	4,234	163.76	0.000
57.00	0.000	4,234	163.76	0.000
57.50	0.000	4,234	163.76	0.000
58.00	0.000	4,234	163.76	0.000
58.50	0.000	4,234	163.76	0.000
59.00	0.000	4,234	163.76	0.000
59.50	0.000	4,234	163.76	0.000
60.00	0.000	4,234	163.76	0.000
60.50	0.000	4,234	163.76	0.000
61.00	0.000	4,234	163.76	0.000
61.50	0.000	4,234	163.76	0.000
62.00	0.000	4,234	163.76	0.000
62.50	0.000	4,234	163.76	0.000
63.00	0.000	4,234	163.76	0.000
63.50	0.000	4,234	163.76	0.000
64.00	0.000	4,234	163.76	0.000
64.50	0.000	4,234	163.76	0.000
65.00	0.000	4,234	163.76	0.000
65.50	0.000	4,234	163.76	0.000
66.00	0.000	4,234	163.76	0.000
66.50	0.000	4,234	163.76	0.000
67.00	0.000	4,234	163.76	0.000
67.50	0.000	4,234	163.76	0.000
68.00	0.000	4,234	163.76	0.000
68.50	0.000	4,234	163.76	0.000
69.00	0.000	4,234	163.76	0.000
69.50	0.000	4,234	163.76	0.000
70.00	0.000	4,234	163.76	0.000
70.50	0.000	4,234	163.76	0.000
71.00	0.000	4,234	163.76	0.000
71.50	0.000	4,234	163.76	0.000
72.00	0.000	4,234	163.76	0.000
72.50	0.000	4,234	163.76	0.000
73.00	0.000	4,234	163.76	0.000
73.50	0.000	4,234	163.76	0.000
74.00	0.000	4,234	163.76	0.000
74.50	0.000	4,234	163.76	0.000
75.00	0.000	4,234	163.76	0.000
75.50	0.000	4,234	163.76	0.000
76.00	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	4,234	163.76	0.000
77.00	0.000	4,234	163.76	0.000
77.50	0.000	4,234	163.76	0.000
78.00	0.000	4,234	163.76	0.000
78.50	0.000	4,234	163.76	0.000
79.00	0.000	4,234	163.76	0.000
79.50	0.000	4,234	163.76	0.000
80.00	0.000	4,234	163.76	0.000
80.50	0.000	4,234	163.76	0.000
81.00	0.000	4,234	163.76	0.000
81.50	0.000	4,234	163.76	0.000
82.00	0.000	4,234	163.76	0.000
82.50	0.000	4,234	163.76	0.000
83.00	0.000	4,234	163.76	0.000
83.50	0.000	4,234	163.76	0.000
84.00	0.000	4,234	163.76	0.000
84.50	0.000	4,234	163.76	0.000
85.00	0.000	4,234	163.76	0.000
85.50	0.000	4,234	163.76	0.000
86.00	0.000	4,234	163.76	0.000
86.50	0.000	4,234	163.76	0.000
87.00	0.000	4,234	163.76	0.000
87.50	0.000	4,234	163.76	0.000
88.00	0.000	4,234	163.76	0.000
88.50	0.000	4,234	163.76	0.000
89.00	0.000	4,234	163.76	0.000
89.50	0.000	4,234	163.76	0.000
90.00	0.000	4,234	163.76	0.000
90.50	0.000	4,234	163.76	0.000
91.00	0.000	4,234	163.76	0.000
91.50	0.000	4,234	163.76	0.000
92.00	0.000	4,234	163.76	0.000
92.50	0.000	4,234	163.76	0.000
93.00	0.000	4,234	163.76	0.000
93.50	0.000	4,234	163.76	0.000
94.00	0.000	4,234	163.76	0.000
94.50	0.000	4,234	163.76	0.000
95.00	0.000	4,234	163.76	0.000
95.50	0.000	4,234	163.76	0.000
96.00	0.000	4,234	163.76	0.000
96.50	0.000	4,234	163.76	0.000
97.00	0.000	4,234	163.76	0.000
97.50	0.000	4,234	163.76	0.000
98.00	0.000	4,234	163.76	0.000
98.50	0.000	4,234	163.76	0.000
99.00	0.000	4,234	163.76	0.000
99.50	0.000	4,234	163.76	0.000
100.00	0.000	4,234	163.76	0.000
100.50	0.000	4,234	163.76	0.000
101.00	0.000	4,234	163.76	0.000
101.50	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

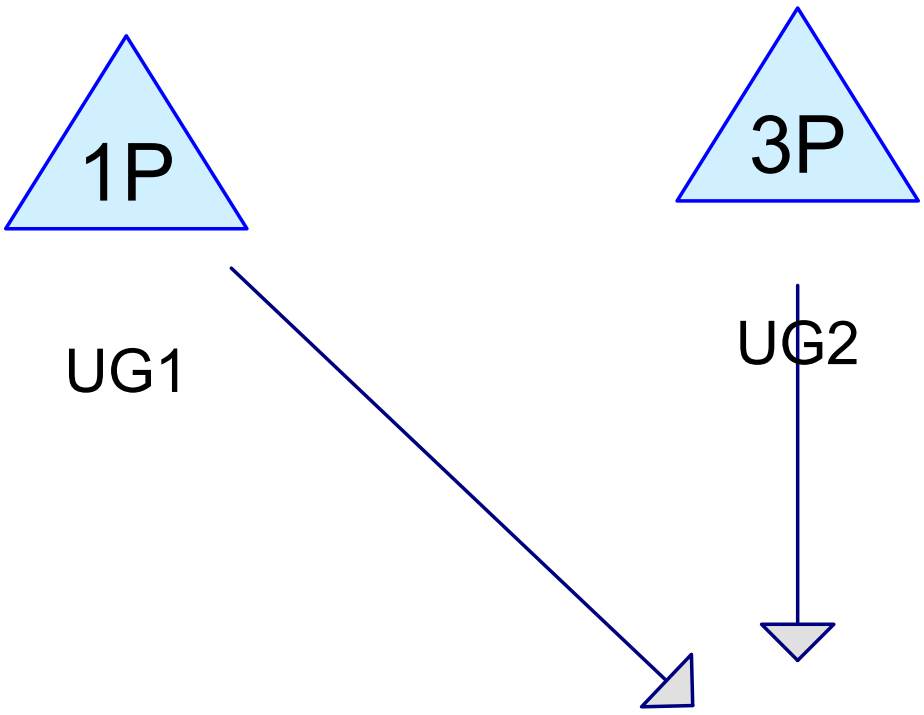
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	4,234	163.76	0.000
102.50	0.000	4,234	163.76	0.000
103.00	0.000	4,234	163.76	0.000
103.50	0.000	4,234	163.76	0.000
104.00	0.000	4,234	163.76	0.000
104.50	0.000	4,234	163.76	0.000
105.00	0.000	4,234	163.76	0.000
105.50	0.000	4,234	163.76	0.000
106.00	0.000	4,234	163.76	0.000
106.50	0.000	4,234	163.76	0.000
107.00	0.000	4,234	163.76	0.000
107.50	0.000	4,234	163.76	0.000
108.00	0.000	4,234	163.76	0.000
108.50	0.000	4,234	163.76	0.000
109.00	0.000	4,234	163.76	0.000
109.50	0.000	4,234	163.76	0.000
110.00	0.000	4,234	163.76	0.000
110.50	0.000	4,234	163.76	0.000
111.00	0.000	4,234	163.76	0.000
111.50	0.000	4,234	163.76	0.000
112.00	0.000	4,234	163.76	0.000
112.50	0.000	4,234	163.76	0.000
113.00	0.000	4,234	163.76	0.000
113.50	0.000	4,234	163.76	0.000
114.00	0.000	4,234	163.76	0.000
114.50	0.000	4,234	163.76	0.000
115.00	0.000	4,234	163.76	0.000
115.50	0.000	4,234	163.76	0.000
116.00	0.000	4,234	163.76	0.000
116.50	0.000	4,234	163.76	0.000
117.00	0.000	4,234	163.76	0.000
117.50	0.000	4,234	163.76	0.000
118.00	0.000	4,234	163.76	0.000
118.50	0.000	4,234	163.76	0.000
119.00	0.000	4,234	163.76	0.000
119.50	0.000	4,234	163.76	0.000
120.00	0.000	4,234	163.76	0.000
120.50	0.000	4,234	163.76	0.000
121.00	0.000	4,234	163.76	0.000
121.50	0.000	4,234	163.76	0.000
122.00	0.000	4,234	163.76	0.000
122.50	0.000	4,234	163.76	0.000
123.00	0.000	4,234	163.76	0.000
123.50	0.000	4,234	163.76	0.000
124.00	0.000	4,234	163.76	0.000
124.50	0.000	4,234	163.76	0.000
125.00	0.000	4,234	163.76	0.000
125.50	0.000	4,234	163.76	0.000
126.00	0.000	4,234	163.76	0.000
126.50	0.000	4,234	163.76	0.000
127.00	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	4,234	163.76	0.000
128.00	0.000	4,234	163.76	0.000
128.50	0.000	4,234	163.76	0.000
129.00	0.000	4,234	163.76	0.000
129.50	0.000	4,234	163.76	0.000
130.00	0.000	4,234	163.76	0.000
130.50	0.000	4,234	163.76	0.000
131.00	0.000	4,234	163.76	0.000
131.50	0.000	4,234	163.76	0.000
132.00	0.000	4,234	163.76	0.000
132.50	0.000	4,234	163.76	0.000
133.00	0.000	4,234	163.76	0.000
133.50	0.000	4,234	163.76	0.000
134.00	0.000	4,234	163.76	0.000
134.50	0.000	4,234	163.76	0.000
135.00	0.000	4,234	163.76	0.000
135.50	0.000	4,234	163.76	0.000
136.00	0.000	4,234	163.76	0.000
136.50	0.000	4,234	163.76	0.000
137.00	0.000	4,234	163.76	0.000
137.50	0.000	4,234	163.76	0.000
138.00	0.000	4,234	163.76	0.000
138.50	0.000	4,234	163.76	0.000
139.00	0.000	4,234	163.76	0.000
139.50	0.000	4,234	163.76	0.000
140.00	0.000	4,234	163.76	0.000
140.50	0.000	4,234	163.76	0.000
141.00	0.000	4,234	163.76	0.000
141.50	0.000	4,234	163.76	0.000
142.00	0.000	4,234	163.76	0.000
142.50	0.000	4,234	163.76	0.000
143.00	0.000	4,234	163.76	0.000
143.50	0.000	4,234	163.76	0.000
144.00	0.000	4,234	163.76	0.000
144.50	0.000	4,234	163.76	0.000
145.00	0.000	4,234	163.76	0.000
145.50	0.000	4,234	163.76	0.000
146.00	0.000	4,234	163.76	0.000
146.50	0.000	4,234	163.76	0.000
147.00	0.000	4,234	163.76	0.000
147.50	0.000	4,234	163.76	0.000
148.00	0.000	4,234	163.76	0.000
148.50	0.000	4,234	163.76	0.000
149.00	0.000	4,234	163.76	0.000
149.50	0.000	4,234	163.76	0.000
150.00	0.000	4,234	163.76	0.000
150.50	0.000	4,234	163.76	0.000
151.00	0.000	4,234	163.76	0.000
151.50	0.000	4,234	163.76	0.000
152.00	0.000	4,234	163.76	0.000
152.50	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	4,234	163.76	0.000
153.50	0.000	4,234	163.76	0.000
154.00	0.000	4,234	163.76	0.000
154.50	0.000	4,234	163.76	0.000
155.00	0.000	4,234	163.76	0.000
155.50	0.000	4,234	163.76	0.000
156.00	0.000	4,234	163.76	0.000
156.50	0.000	4,234	163.76	0.000
157.00	0.000	4,234	163.76	0.000
157.50	0.000	4,234	163.76	0.000
158.00	0.000	4,234	163.76	0.000
158.50	0.000	4,234	163.76	0.000
159.00	0.000	4,234	163.76	0.000
159.50	0.000	4,234	163.76	0.000
160.00	0.000	4,234	163.76	0.000
160.50	0.000	4,234	163.76	0.000
161.00	0.000	4,234	163.76	0.000
161.50	0.000	4,234	163.76	0.000
162.00	0.000	4,234	163.76	0.000
162.50	0.000	4,234	163.76	0.000
163.00	0.000	4,234	163.76	0.000
163.50	0.000	4,234	163.76	0.000
164.00	0.000	4,234	163.76	0.000
164.50	0.000	4,234	163.76	0.000
165.00	0.000	4,234	163.76	0.000
165.50	0.000	4,234	163.76	0.000
166.00	0.000	4,234	163.76	0.000
166.50	0.000	4,234	163.76	0.000
167.00	0.000	4,234	163.76	0.000
167.50	0.000	4,234	163.76	0.000
168.00	0.000	4,234	163.76	0.000



Subcat Reach Pond Link

Routing Diagram for BMW_2025-7-24_2
Prepared by Bohler, Printed 7/24/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	50-yr	Type II 24-hr		Default	24.00	1	6.73	2

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 6.25" for 50-yr event
Inflow = 18.946 cfs @ 11.96 hrs, Volume= 43,774 cf
Outflow = 8.232 cfs @ 12.06 hrs, Volume= 16,633 cf, Atten= 57%, Lag= 6.4 min
Primary = 8.232 cfs @ 12.06 hrs, Volume= 16,633 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 169.63' @ 12.06 hrs Surf.Area= 13,041 sf Storage= 27,162 cf

Plug-Flow detention time= 327.1 min calculated for 16,632 cf (38% of inflow)
Center-of-Mass det. time= 174.4 min (925.3 - 750.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=7.455 cfs @ 12.06 hrs HW=168.72' TW=167.66' (Fixed TW Elev= 167.66')
└─**4=Culvert** (Outlet Controls 7.455 cfs @ 4.219 fps)
  ├─**1=Orifice/Grate** (Passes < 0.027 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 3.857 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 170.562 cfs potential flow)

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.013	6	157.53	0.000
2.00	0.036	51	157.54	0.000
2.50	0.057	134	157.56	0.000
3.00	0.075	253	157.58	0.000
3.50	0.092	403	157.61	0.000
4.00	0.107	583	157.64	0.000
4.50	0.125	791	157.68	0.000
5.00	0.143	1,032	157.73	0.000
5.50	0.161	1,306	157.78	0.000
6.00	0.179	1,612	157.84	0.000
6.50	0.196	1,950	157.90	0.000
7.00	0.214	2,319	157.97	0.000
7.50	0.230	2,719	158.04	0.000
8.00	0.247	3,149	158.08	0.000
8.50	0.302	3,638	158.12	0.000
9.00	0.367	4,240	158.17	0.000
9.50	0.382	4,921	158.23	0.000
10.00	0.470	5,677	158.29	0.000
10.50	0.616	6,648	158.38	0.000
11.00	0.857	7,961	158.49	0.000
11.50	**1.419**	9,968	158.67	0.000
12.00	**15.649**	**24,903**	**160.31**	**0.000**
12.50	1.360	**27,162**	**167.79**	**2.582**
13.00	0.846	27,162	167.73	1.698
13.50	0.640	27,162	167.72	1.283
14.00	0.502	27,162	167.70	1.006
14.50	0.443	27,162	167.70	0.887
15.00	0.398	27,162	167.70	0.796
15.50	0.352	27,162	167.69	0.705
16.00	0.307	27,162	167.69	0.614
16.50	0.286	27,162	167.69	0.572
17.00	0.270	27,162	167.68	0.539
17.50	0.253	27,162	167.68	0.507
18.00	0.237	27,162	167.68	0.474
18.50	0.221	27,162	167.68	0.442
19.00	0.204	27,162	167.68	0.409
19.50	0.188	27,162	167.68	0.377
20.00	0.172	27,162	167.68	0.344
20.50	0.167	27,162	167.67	0.333
21.00	0.163	27,162	167.67	0.327
21.50	0.160	27,162	167.67	0.320
22.00	0.157	27,162	167.67	0.314
22.50	0.154	27,162	167.67	0.307
23.00	0.150	27,162	167.67	0.301
23.50	0.147	27,162	167.67	0.294
24.00	0.144	27,162	167.67	0.288
24.50	0.000	27,162	167.56	0.000
25.00	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	27,162	167.56	0.000
26.00	0.000	27,162	167.56	0.000
26.50	0.000	27,162	167.56	0.000
27.00	0.000	27,162	167.56	0.000
27.50	0.000	27,162	167.56	0.000
28.00	0.000	27,162	167.56	0.000
28.50	0.000	27,162	167.56	0.000
29.00	0.000	27,162	167.56	0.000
29.50	0.000	27,162	167.56	0.000
30.00	0.000	27,162	167.56	0.000
30.50	0.000	27,162	167.56	0.000
31.00	0.000	27,162	167.56	0.000
31.50	0.000	27,162	167.56	0.000
32.00	0.000	27,162	167.56	0.000
32.50	0.000	27,162	167.56	0.000
33.00	0.000	27,162	167.56	0.000
33.50	0.000	27,162	167.56	0.000
34.00	0.000	27,162	167.56	0.000
34.50	0.000	27,162	167.56	0.000
35.00	0.000	27,162	167.56	0.000
35.50	0.000	27,162	167.56	0.000
36.00	0.000	27,162	167.56	0.000
36.50	0.000	27,162	167.56	0.000
37.00	0.000	27,162	167.56	0.000
37.50	0.000	27,162	167.56	0.000
38.00	0.000	27,162	167.56	0.000
38.50	0.000	27,162	167.56	0.000
39.00	0.000	27,162	167.56	0.000
39.50	0.000	27,162	167.56	0.000
40.00	0.000	27,162	167.56	0.000
40.50	0.000	27,162	167.56	0.000
41.00	0.000	27,162	167.56	0.000
41.50	0.000	27,162	167.56	0.000
42.00	0.000	27,162	167.56	0.000
42.50	0.000	27,162	167.56	0.000
43.00	0.000	27,162	167.56	0.000
43.50	0.000	27,162	167.56	0.000
44.00	0.000	27,162	167.56	0.000
44.50	0.000	27,162	167.56	0.000
45.00	0.000	27,162	167.56	0.000
45.50	0.000	27,162	167.56	0.000
46.00	0.000	27,162	167.56	0.000
46.50	0.000	27,162	167.56	0.000
47.00	0.000	27,162	167.56	0.000
47.50	0.000	27,162	167.56	0.000
48.00	0.000	27,162	167.56	0.000
48.50	0.000	27,162	167.56	0.000
49.00	0.000	27,162	167.56	0.000
49.50	0.000	27,162	167.56	0.000
50.00	0.000	27,162	167.56	0.000
50.50	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	27,162	167.56	0.000
51.50	0.000	27,162	167.56	0.000
52.00	0.000	27,162	167.56	0.000
52.50	0.000	27,162	167.56	0.000
53.00	0.000	27,162	167.56	0.000
53.50	0.000	27,162	167.56	0.000
54.00	0.000	27,162	167.56	0.000
54.50	0.000	27,162	167.56	0.000
55.00	0.000	27,162	167.56	0.000
55.50	0.000	27,162	167.56	0.000
56.00	0.000	27,162	167.56	0.000
56.50	0.000	27,162	167.56	0.000
57.00	0.000	27,162	167.56	0.000
57.50	0.000	27,162	167.56	0.000
58.00	0.000	27,162	167.56	0.000
58.50	0.000	27,162	167.56	0.000
59.00	0.000	27,162	167.56	0.000
59.50	0.000	27,162	167.56	0.000
60.00	0.000	27,162	167.56	0.000
60.50	0.000	27,162	167.56	0.000
61.00	0.000	27,162	167.56	0.000
61.50	0.000	27,162	167.56	0.000
62.00	0.000	27,162	167.56	0.000
62.50	0.000	27,162	167.56	0.000
63.00	0.000	27,162	167.56	0.000
63.50	0.000	27,162	167.56	0.000
64.00	0.000	27,162	167.56	0.000
64.50	0.000	27,162	167.56	0.000
65.00	0.000	27,162	167.56	0.000
65.50	0.000	27,162	167.56	0.000
66.00	0.000	27,162	167.56	0.000
66.50	0.000	27,162	167.56	0.000
67.00	0.000	27,162	167.56	0.000
67.50	0.000	27,162	167.56	0.000
68.00	0.000	27,162	167.56	0.000
68.50	0.000	27,162	167.56	0.000
69.00	0.000	27,162	167.56	0.000
69.50	0.000	27,162	167.56	0.000
70.00	0.000	27,162	167.56	0.000
70.50	0.000	27,162	167.56	0.000
71.00	0.000	27,162	167.56	0.000
71.50	0.000	27,162	167.56	0.000
72.00	0.000	27,162	167.56	0.000
72.50	0.000	27,162	167.56	0.000
73.00	0.000	27,162	167.56	0.000
73.50	0.000	27,162	167.56	0.000
74.00	0.000	27,162	167.56	0.000
74.50	0.000	27,162	167.56	0.000
75.00	0.000	27,162	167.56	0.000
75.50	0.000	27,162	167.56	0.000
76.00	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	27,162	167.56	0.000
77.00	0.000	27,162	167.56	0.000
77.50	0.000	27,162	167.56	0.000
78.00	0.000	27,162	167.56	0.000
78.50	0.000	27,162	167.56	0.000
79.00	0.000	27,162	167.56	0.000
79.50	0.000	27,162	167.56	0.000
80.00	0.000	27,162	167.56	0.000
80.50	0.000	27,162	167.56	0.000
81.00	0.000	27,162	167.56	0.000
81.50	0.000	27,162	167.56	0.000
82.00	0.000	27,162	167.56	0.000
82.50	0.000	27,162	167.56	0.000
83.00	0.000	27,162	167.56	0.000
83.50	0.000	27,162	167.56	0.000
84.00	0.000	27,162	167.56	0.000
84.50	0.000	27,162	167.56	0.000
85.00	0.000	27,162	167.56	0.000
85.50	0.000	27,162	167.56	0.000
86.00	0.000	27,162	167.56	0.000
86.50	0.000	27,162	167.56	0.000
87.00	0.000	27,162	167.56	0.000
87.50	0.000	27,162	167.56	0.000
88.00	0.000	27,162	167.56	0.000
88.50	0.000	27,162	167.56	0.000
89.00	0.000	27,162	167.56	0.000
89.50	0.000	27,162	167.56	0.000
90.00	0.000	27,162	167.56	0.000
90.50	0.000	27,162	167.56	0.000
91.00	0.000	27,162	167.56	0.000
91.50	0.000	27,162	167.56	0.000
92.00	0.000	27,162	167.56	0.000
92.50	0.000	27,162	167.56	0.000
93.00	0.000	27,162	167.56	0.000
93.50	0.000	27,162	167.56	0.000
94.00	0.000	27,162	167.56	0.000
94.50	0.000	27,162	167.56	0.000
95.00	0.000	27,162	167.56	0.000
95.50	0.000	27,162	167.56	0.000
96.00	0.000	27,162	167.56	0.000
96.50	0.000	27,162	167.56	0.000
97.00	0.000	27,162	167.56	0.000
97.50	0.000	27,162	167.56	0.000
98.00	0.000	27,162	167.56	0.000
98.50	0.000	27,162	167.56	0.000
99.00	0.000	27,162	167.56	0.000
99.50	0.000	27,162	167.56	0.000
100.00	0.000	27,162	167.56	0.000
100.50	0.000	27,162	167.56	0.000
101.00	0.000	27,162	167.56	0.000
101.50	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	27,162	167.56	0.000
102.50	0.000	27,162	167.56	0.000
103.00	0.000	27,162	167.56	0.000
103.50	0.000	27,162	167.56	0.000
104.00	0.000	27,162	167.56	0.000
104.50	0.000	27,162	167.56	0.000
105.00	0.000	27,162	167.56	0.000
105.50	0.000	27,162	167.56	0.000
106.00	0.000	27,162	167.56	0.000
106.50	0.000	27,162	167.56	0.000
107.00	0.000	27,162	167.56	0.000
107.50	0.000	27,162	167.56	0.000
108.00	0.000	27,162	167.56	0.000
108.50	0.000	27,162	167.56	0.000
109.00	0.000	27,162	167.56	0.000
109.50	0.000	27,162	167.56	0.000
110.00	0.000	27,162	167.56	0.000
110.50	0.000	27,162	167.56	0.000
111.00	0.000	27,162	167.56	0.000
111.50	0.000	27,162	167.56	0.000
112.00	0.000	27,162	167.56	0.000
112.50	0.000	27,162	167.56	0.000
113.00	0.000	27,162	167.56	0.000
113.50	0.000	27,162	167.56	0.000
114.00	0.000	27,162	167.56	0.000
114.50	0.000	27,162	167.56	0.000
115.00	0.000	27,162	167.56	0.000
115.50	0.000	27,162	167.56	0.000
116.00	0.000	27,162	167.56	0.000
116.50	0.000	27,162	167.56	0.000
117.00	0.000	27,162	167.56	0.000
117.50	0.000	27,162	167.56	0.000
118.00	0.000	27,162	167.56	0.000
118.50	0.000	27,162	167.56	0.000
119.00	0.000	27,162	167.56	0.000
119.50	0.000	27,162	167.56	0.000
120.00	0.000	27,162	167.56	0.000
120.50	0.000	27,162	167.56	0.000
121.00	0.000	27,162	167.56	0.000
121.50	0.000	27,162	167.56	0.000
122.00	0.000	27,162	167.56	0.000
122.50	0.000	27,162	167.56	0.000
123.00	0.000	27,162	167.56	0.000
123.50	0.000	27,162	167.56	0.000
124.00	0.000	27,162	167.56	0.000
124.50	0.000	27,162	167.56	0.000
125.00	0.000	27,162	167.56	0.000
125.50	0.000	27,162	167.56	0.000
126.00	0.000	27,162	167.56	0.000
126.50	0.000	27,162	167.56	0.000
127.00	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	27,162	167.56	0.000
128.00	0.000	27,162	167.56	0.000
128.50	0.000	27,162	167.56	0.000
129.00	0.000	27,162	167.56	0.000
129.50	0.000	27,162	167.56	0.000
130.00	0.000	27,162	167.56	0.000
130.50	0.000	27,162	167.56	0.000
131.00	0.000	27,162	167.56	0.000
131.50	0.000	27,162	167.56	0.000
132.00	0.000	27,162	167.56	0.000
132.50	0.000	27,162	167.56	0.000
133.00	0.000	27,162	167.56	0.000
133.50	0.000	27,162	167.56	0.000
134.00	0.000	27,162	167.56	0.000
134.50	0.000	27,162	167.56	0.000
135.00	0.000	27,162	167.56	0.000
135.50	0.000	27,162	167.56	0.000
136.00	0.000	27,162	167.56	0.000
136.50	0.000	27,162	167.56	0.000
137.00	0.000	27,162	167.56	0.000
137.50	0.000	27,162	167.56	0.000
138.00	0.000	27,162	167.56	0.000
138.50	0.000	27,162	167.56	0.000
139.00	0.000	27,162	167.56	0.000
139.50	0.000	27,162	167.56	0.000
140.00	0.000	27,162	167.56	0.000
140.50	0.000	27,162	167.56	0.000
141.00	0.000	27,162	167.56	0.000
141.50	0.000	27,162	167.56	0.000
142.00	0.000	27,162	167.56	0.000
142.50	0.000	27,162	167.56	0.000
143.00	0.000	27,162	167.56	0.000
143.50	0.000	27,162	167.56	0.000
144.00	0.000	27,162	167.56	0.000
144.50	0.000	27,162	167.56	0.000
145.00	0.000	27,162	167.56	0.000
145.50	0.000	27,162	167.56	0.000
146.00	0.000	27,162	167.56	0.000
146.50	0.000	27,162	167.56	0.000
147.00	0.000	27,162	167.56	0.000
147.50	0.000	27,162	167.56	0.000
148.00	0.000	27,162	167.56	0.000
148.50	0.000	27,162	167.56	0.000
149.00	0.000	27,162	167.56	0.000
149.50	0.000	27,162	167.56	0.000
150.00	0.000	27,162	167.56	0.000
150.50	0.000	27,162	167.56	0.000
151.00	0.000	27,162	167.56	0.000
151.50	0.000	27,162	167.56	0.000
152.00	0.000	27,162	167.56	0.000
152.50	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	27,162	167.56	0.000
153.50	0.000	27,162	167.56	0.000
154.00	0.000	27,162	167.56	0.000
154.50	0.000	27,162	167.56	0.000
155.00	0.000	27,162	167.56	0.000
155.50	0.000	27,162	167.56	0.000
156.00	0.000	27,162	167.56	0.000
156.50	0.000	27,162	167.56	0.000
157.00	0.000	27,162	167.56	0.000
157.50	0.000	27,162	167.56	0.000
158.00	0.000	27,162	167.56	0.000
158.50	0.000	27,162	167.56	0.000
159.00	0.000	27,162	167.56	0.000
159.50	0.000	27,162	167.56	0.000
160.00	0.000	27,162	167.56	0.000
160.50	0.000	27,162	167.56	0.000
161.00	0.000	27,162	167.56	0.000
161.50	0.000	27,162	167.56	0.000
162.00	0.000	27,162	167.56	0.000
162.50	0.000	27,162	167.56	0.000
163.00	0.000	27,162	167.56	0.000
163.50	0.000	27,162	167.56	0.000
164.00	0.000	27,162	167.56	0.000
164.50	0.000	27,162	167.56	0.000
165.00	0.000	27,162	167.56	0.000
165.50	0.000	27,162	167.56	0.000
166.00	0.000	27,162	167.56	0.000
166.50	0.000	27,162	167.56	0.000
167.00	0.000	27,162	167.56	0.000
167.50	0.000	27,162	167.56	0.000
168.00	0.000	27,162	167.56	0.000

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 5.11" for 50-yr event
Inflow = 4.363 cfs @ 11.96 hrs, Volume= 9,138 cf
Outflow = 4.582 cfs @ 11.98 hrs, Volume= 4,905 cf, Atten= 0%, Lag= 1.6 min
Primary = 4.582 cfs @ 11.98 hrs, Volume= 4,905 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 167.90' @ 11.98 hrs Surf.Area= 2,542 sf Storage= 4,234 cf

Plug-Flow detention time= 210.6 min calculated for 4,905 cf (54% of inflow)
Center-of-Mass det. time= 100.6 min (890.1 - 789.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=4.063 cfs @ 11.98 hrs HW=167.89' TW=167.66' (Fixed TW Elev= 167.66')
└─**4=Culvert** (Inlet Controls 4.063 cfs @ 2.299 fps)
  ├─**1=Orifice/Grate** (Passes < 0.113 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 0.287 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 69.442 cfs potential flow)

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.000	0	159.28	0.000
4.50	0.002	2	159.28	0.000
5.00	0.005	8	159.29	0.000
5.50	0.009	21	159.30	0.000
6.00	0.013	40	159.32	0.000
6.50	0.016	67	159.35	0.000
7.00	0.021	100	159.38	0.000
7.50	0.025	140	159.42	0.000
8.00	0.029	189	159.47	0.000
8.50	0.039	249	159.52	0.000
9.00	0.051	330	159.60	0.000
9.50	0.057	428	159.70	0.000
10.00	0.075	545	159.80	0.000
10.50	0.104	704	159.87	0.000
11.00	0.155	935	159.97	0.000
11.50	**0.276**	**1,312**	**160.15**	**0.000**
12.00	**3.650**	**4,234**	**167.84**	**3.625**
12.50	0.326	4,234	167.67	0.301
13.00	0.204	4,234	167.67	0.179
13.50	0.155	4,234	167.66	0.130
14.00	0.122	4,234	167.66	0.097
14.50	0.108	4,234	167.66	0.083
15.00	0.097	4,234	167.66	0.072
15.50	0.086	4,234	167.66	0.061
16.00	0.075	4,234	167.66	0.050
16.50	0.070	4,234	167.66	0.045
17.00	0.066	4,234	167.66	0.041
17.50	0.062	4,234	167.66	0.037
18.00	0.058	4,234	167.66	0.034
18.50	0.054	4,234	167.66	0.030
19.00	0.050	4,234	167.66	0.026
19.50	0.046	4,234	167.66	0.022
20.00	0.042	4,234	167.66	0.018
20.50	0.041	4,234	167.66	0.016
21.00	0.040	4,234	167.66	0.016
21.50	0.039	4,234	167.66	0.015
22.00	0.039	4,234	167.66	0.014
22.50	0.038	4,234	167.66	0.013
23.00	0.037	4,234	167.66	0.013
23.50	0.036	4,234	167.66	0.012
24.00	0.035	4,234	167.66	0.011
24.50	0.000	4,234	167.58	0.000
25.00	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	4,234	167.58	0.000
26.00	0.000	4,234	167.58	0.000
26.50	0.000	4,234	167.58	0.000
27.00	0.000	4,234	167.58	0.000
27.50	0.000	4,234	167.58	0.000
28.00	0.000	4,234	167.58	0.000
28.50	0.000	4,234	167.58	0.000
29.00	0.000	4,234	167.58	0.000
29.50	0.000	4,234	167.58	0.000
30.00	0.000	4,234	167.58	0.000
30.50	0.000	4,234	167.58	0.000
31.00	0.000	4,234	167.58	0.000
31.50	0.000	4,234	167.58	0.000
32.00	0.000	4,234	167.58	0.000
32.50	0.000	4,234	167.58	0.000
33.00	0.000	4,234	167.58	0.000
33.50	0.000	4,234	167.58	0.000
34.00	0.000	4,234	167.58	0.000
34.50	0.000	4,234	167.58	0.000
35.00	0.000	4,234	167.58	0.000
35.50	0.000	4,234	167.58	0.000
36.00	0.000	4,234	167.58	0.000
36.50	0.000	4,234	167.58	0.000
37.00	0.000	4,234	167.58	0.000
37.50	0.000	4,234	167.58	0.000
38.00	0.000	4,234	167.58	0.000
38.50	0.000	4,234	167.58	0.000
39.00	0.000	4,234	167.58	0.000
39.50	0.000	4,234	167.58	0.000
40.00	0.000	4,234	167.58	0.000
40.50	0.000	4,234	167.58	0.000
41.00	0.000	4,234	167.58	0.000
41.50	0.000	4,234	167.58	0.000
42.00	0.000	4,234	167.58	0.000
42.50	0.000	4,234	167.58	0.000
43.00	0.000	4,234	167.58	0.000
43.50	0.000	4,234	167.58	0.000
44.00	0.000	4,234	167.58	0.000
44.50	0.000	4,234	167.58	0.000
45.00	0.000	4,234	167.58	0.000
45.50	0.000	4,234	167.58	0.000
46.00	0.000	4,234	167.58	0.000
46.50	0.000	4,234	167.58	0.000
47.00	0.000	4,234	167.58	0.000
47.50	0.000	4,234	167.58	0.000
48.00	0.000	4,234	167.58	0.000
48.50	0.000	4,234	167.58	0.000
49.00	0.000	4,234	167.58	0.000
49.50	0.000	4,234	167.58	0.000
50.00	0.000	4,234	167.58	0.000
50.50	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,234	167.58	0.000
51.50	0.000	4,234	167.58	0.000
52.00	0.000	4,234	167.58	0.000
52.50	0.000	4,234	167.58	0.000
53.00	0.000	4,234	167.58	0.000
53.50	0.000	4,234	167.58	0.000
54.00	0.000	4,234	167.58	0.000
54.50	0.000	4,234	167.58	0.000
55.00	0.000	4,234	167.58	0.000
55.50	0.000	4,234	167.58	0.000
56.00	0.000	4,234	167.58	0.000
56.50	0.000	4,234	167.58	0.000
57.00	0.000	4,234	167.58	0.000
57.50	0.000	4,234	167.58	0.000
58.00	0.000	4,234	167.58	0.000
58.50	0.000	4,234	167.58	0.000
59.00	0.000	4,234	167.58	0.000
59.50	0.000	4,234	167.58	0.000
60.00	0.000	4,234	167.58	0.000
60.50	0.000	4,234	167.58	0.000
61.00	0.000	4,234	167.58	0.000
61.50	0.000	4,234	167.58	0.000
62.00	0.000	4,234	167.58	0.000
62.50	0.000	4,234	167.58	0.000
63.00	0.000	4,234	167.58	0.000
63.50	0.000	4,234	167.58	0.000
64.00	0.000	4,234	167.58	0.000
64.50	0.000	4,234	167.58	0.000
65.00	0.000	4,234	167.58	0.000
65.50	0.000	4,234	167.58	0.000
66.00	0.000	4,234	167.58	0.000
66.50	0.000	4,234	167.58	0.000
67.00	0.000	4,234	167.58	0.000
67.50	0.000	4,234	167.58	0.000
68.00	0.000	4,234	167.58	0.000
68.50	0.000	4,234	167.58	0.000
69.00	0.000	4,234	167.58	0.000
69.50	0.000	4,234	167.58	0.000
70.00	0.000	4,234	167.58	0.000
70.50	0.000	4,234	167.58	0.000
71.00	0.000	4,234	167.58	0.000
71.50	0.000	4,234	167.58	0.000
72.00	0.000	4,234	167.58	0.000
72.50	0.000	4,234	167.58	0.000
73.00	0.000	4,234	167.58	0.000
73.50	0.000	4,234	167.58	0.000
74.00	0.000	4,234	167.58	0.000
74.50	0.000	4,234	167.58	0.000
75.00	0.000	4,234	167.58	0.000
75.50	0.000	4,234	167.58	0.000
76.00	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	4,234	167.58	0.000
77.00	0.000	4,234	167.58	0.000
77.50	0.000	4,234	167.58	0.000
78.00	0.000	4,234	167.58	0.000
78.50	0.000	4,234	167.58	0.000
79.00	0.000	4,234	167.58	0.000
79.50	0.000	4,234	167.58	0.000
80.00	0.000	4,234	167.58	0.000
80.50	0.000	4,234	167.58	0.000
81.00	0.000	4,234	167.58	0.000
81.50	0.000	4,234	167.58	0.000
82.00	0.000	4,234	167.58	0.000
82.50	0.000	4,234	167.58	0.000
83.00	0.000	4,234	167.58	0.000
83.50	0.000	4,234	167.58	0.000
84.00	0.000	4,234	167.58	0.000
84.50	0.000	4,234	167.58	0.000
85.00	0.000	4,234	167.58	0.000
85.50	0.000	4,234	167.58	0.000
86.00	0.000	4,234	167.58	0.000
86.50	0.000	4,234	167.58	0.000
87.00	0.000	4,234	167.58	0.000
87.50	0.000	4,234	167.58	0.000
88.00	0.000	4,234	167.58	0.000
88.50	0.000	4,234	167.58	0.000
89.00	0.000	4,234	167.58	0.000
89.50	0.000	4,234	167.58	0.000
90.00	0.000	4,234	167.58	0.000
90.50	0.000	4,234	167.58	0.000
91.00	0.000	4,234	167.58	0.000
91.50	0.000	4,234	167.58	0.000
92.00	0.000	4,234	167.58	0.000
92.50	0.000	4,234	167.58	0.000
93.00	0.000	4,234	167.58	0.000
93.50	0.000	4,234	167.58	0.000
94.00	0.000	4,234	167.58	0.000
94.50	0.000	4,234	167.58	0.000
95.00	0.000	4,234	167.58	0.000
95.50	0.000	4,234	167.58	0.000
96.00	0.000	4,234	167.58	0.000
96.50	0.000	4,234	167.58	0.000
97.00	0.000	4,234	167.58	0.000
97.50	0.000	4,234	167.58	0.000
98.00	0.000	4,234	167.58	0.000
98.50	0.000	4,234	167.58	0.000
99.00	0.000	4,234	167.58	0.000
99.50	0.000	4,234	167.58	0.000
100.00	0.000	4,234	167.58	0.000
100.50	0.000	4,234	167.58	0.000
101.00	0.000	4,234	167.58	0.000
101.50	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

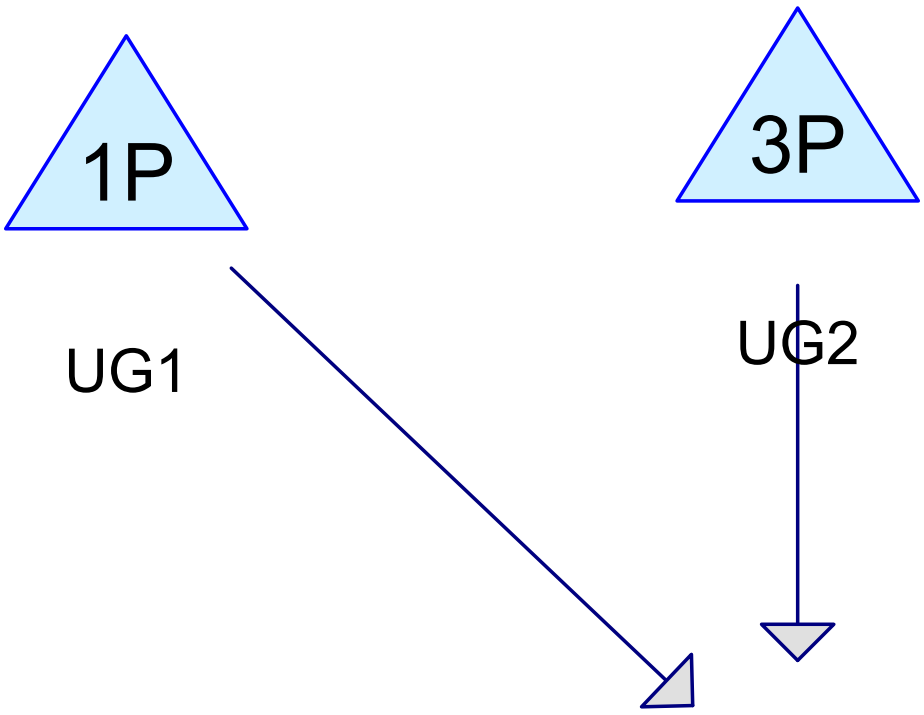
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	4,234	167.58	0.000
102.50	0.000	4,234	167.58	0.000
103.00	0.000	4,234	167.58	0.000
103.50	0.000	4,234	167.58	0.000
104.00	0.000	4,234	167.58	0.000
104.50	0.000	4,234	167.58	0.000
105.00	0.000	4,234	167.58	0.000
105.50	0.000	4,234	167.58	0.000
106.00	0.000	4,234	167.58	0.000
106.50	0.000	4,234	167.58	0.000
107.00	0.000	4,234	167.58	0.000
107.50	0.000	4,234	167.58	0.000
108.00	0.000	4,234	167.58	0.000
108.50	0.000	4,234	167.58	0.000
109.00	0.000	4,234	167.58	0.000
109.50	0.000	4,234	167.58	0.000
110.00	0.000	4,234	167.58	0.000
110.50	0.000	4,234	167.58	0.000
111.00	0.000	4,234	167.58	0.000
111.50	0.000	4,234	167.58	0.000
112.00	0.000	4,234	167.58	0.000
112.50	0.000	4,234	167.58	0.000
113.00	0.000	4,234	167.58	0.000
113.50	0.000	4,234	167.58	0.000
114.00	0.000	4,234	167.58	0.000
114.50	0.000	4,234	167.58	0.000
115.00	0.000	4,234	167.58	0.000
115.50	0.000	4,234	167.58	0.000
116.00	0.000	4,234	167.58	0.000
116.50	0.000	4,234	167.58	0.000
117.00	0.000	4,234	167.58	0.000
117.50	0.000	4,234	167.58	0.000
118.00	0.000	4,234	167.58	0.000
118.50	0.000	4,234	167.58	0.000
119.00	0.000	4,234	167.58	0.000
119.50	0.000	4,234	167.58	0.000
120.00	0.000	4,234	167.58	0.000
120.50	0.000	4,234	167.58	0.000
121.00	0.000	4,234	167.58	0.000
121.50	0.000	4,234	167.58	0.000
122.00	0.000	4,234	167.58	0.000
122.50	0.000	4,234	167.58	0.000
123.00	0.000	4,234	167.58	0.000
123.50	0.000	4,234	167.58	0.000
124.00	0.000	4,234	167.58	0.000
124.50	0.000	4,234	167.58	0.000
125.00	0.000	4,234	167.58	0.000
125.50	0.000	4,234	167.58	0.000
126.00	0.000	4,234	167.58	0.000
126.50	0.000	4,234	167.58	0.000
127.00	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	4,234	167.58	0.000
128.00	0.000	4,234	167.58	0.000
128.50	0.000	4,234	167.58	0.000
129.00	0.000	4,234	167.58	0.000
129.50	0.000	4,234	167.58	0.000
130.00	0.000	4,234	167.58	0.000
130.50	0.000	4,234	167.58	0.000
131.00	0.000	4,234	167.58	0.000
131.50	0.000	4,234	167.58	0.000
132.00	0.000	4,234	167.58	0.000
132.50	0.000	4,234	167.58	0.000
133.00	0.000	4,234	167.58	0.000
133.50	0.000	4,234	167.58	0.000
134.00	0.000	4,234	167.58	0.000
134.50	0.000	4,234	167.58	0.000
135.00	0.000	4,234	167.58	0.000
135.50	0.000	4,234	167.58	0.000
136.00	0.000	4,234	167.58	0.000
136.50	0.000	4,234	167.58	0.000
137.00	0.000	4,234	167.58	0.000
137.50	0.000	4,234	167.58	0.000
138.00	0.000	4,234	167.58	0.000
138.50	0.000	4,234	167.58	0.000
139.00	0.000	4,234	167.58	0.000
139.50	0.000	4,234	167.58	0.000
140.00	0.000	4,234	167.58	0.000
140.50	0.000	4,234	167.58	0.000
141.00	0.000	4,234	167.58	0.000
141.50	0.000	4,234	167.58	0.000
142.00	0.000	4,234	167.58	0.000
142.50	0.000	4,234	167.58	0.000
143.00	0.000	4,234	167.58	0.000
143.50	0.000	4,234	167.58	0.000
144.00	0.000	4,234	167.58	0.000
144.50	0.000	4,234	167.58	0.000
145.00	0.000	4,234	167.58	0.000
145.50	0.000	4,234	167.58	0.000
146.00	0.000	4,234	167.58	0.000
146.50	0.000	4,234	167.58	0.000
147.00	0.000	4,234	167.58	0.000
147.50	0.000	4,234	167.58	0.000
148.00	0.000	4,234	167.58	0.000
148.50	0.000	4,234	167.58	0.000
149.00	0.000	4,234	167.58	0.000
149.50	0.000	4,234	167.58	0.000
150.00	0.000	4,234	167.58	0.000
150.50	0.000	4,234	167.58	0.000
151.00	0.000	4,234	167.58	0.000
151.50	0.000	4,234	167.58	0.000
152.00	0.000	4,234	167.58	0.000
152.50	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	4,234	167.58	0.000
153.50	0.000	4,234	167.58	0.000
154.00	0.000	4,234	167.58	0.000
154.50	0.000	4,234	167.58	0.000
155.00	0.000	4,234	167.58	0.000
155.50	0.000	4,234	167.58	0.000
156.00	0.000	4,234	167.58	0.000
156.50	0.000	4,234	167.58	0.000
157.00	0.000	4,234	167.58	0.000
157.50	0.000	4,234	167.58	0.000
158.00	0.000	4,234	167.58	0.000
158.50	0.000	4,234	167.58	0.000
159.00	0.000	4,234	167.58	0.000
159.50	0.000	4,234	167.58	0.000
160.00	0.000	4,234	167.58	0.000
160.50	0.000	4,234	167.58	0.000
161.00	0.000	4,234	167.58	0.000
161.50	0.000	4,234	167.58	0.000
162.00	0.000	4,234	167.58	0.000
162.50	0.000	4,234	167.58	0.000
163.00	0.000	4,234	167.58	0.000
163.50	0.000	4,234	167.58	0.000
164.00	0.000	4,234	167.58	0.000
164.50	0.000	4,234	167.58	0.000
165.00	0.000	4,234	167.58	0.000
165.50	0.000	4,234	167.58	0.000
166.00	0.000	4,234	167.58	0.000
166.50	0.000	4,234	167.58	0.000
167.00	0.000	4,234	167.58	0.000
167.50	0.000	4,234	167.58	0.000
168.00	0.000	4,234	167.58	0.000



Subcat Reach Pond Link

Routing Diagram for BMW_2025-7-24_2
Prepared by Bohler, Printed 7/24/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

BMW_2025-7-24_2
Prepared by Bohler
Printed 7/24/2025
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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	100-yr	Type II 24-hr		Default	24.00	1	7.66	2

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 7.18" for 100-yr event
Inflow = 21.616 cfs @ 11.96 hrs, Volume= 50,262 cf
Outflow = 27.903 cfs @ 11.99 hrs, Volume= 23,255 cf, Atten= 0%, Lag= 2.0 min
Primary = 27.903 cfs @ 11.99 hrs, Volume= 23,255 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 183.51' @ 11.99 hrs Surf.Area= 13,041 sf Storage= 27,162 cf

Plug-Flow detention time= 273.0 min calculated for 23,255 cf (46% of inflow)
Center-of-Mass det. time= 139.2 min (887.4 - 748.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=27.454 cfs @ 11.99 hrs HW=183.05' TW=168.67' (Fixed TW Elev= 168.67')
└─**4=Culvert** (Outlet Controls 27.454 cfs @ 15.536 fps)
  ├─**1=Orifice/Grate** (Passes < 0.100 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 14.202 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 1,315.845 cfs potential flow)

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.024	17	157.53	0.000
2.00	0.052	86	157.55	0.000
2.50	0.075	201	157.57	0.000
3.00	0.096	356	157.60	0.000
3.50	0.115	547	157.63	0.000
4.00	0.132	770	157.68	0.000
4.50	0.152	1,026	157.73	0.000
5.00	0.173	1,319	157.78	0.000
5.50	0.193	1,648	157.85	0.000
6.00	0.213	2,014	157.92	0.000
6.50	0.232	2,415	157.99	0.000
7.00	0.252	2,851	158.05	0.000
7.50	0.270	3,320	158.09	0.000
8.00	0.289	3,823	158.13	0.000
8.50	0.352	4,394	158.18	0.000
9.00	0.426	5,094	158.24	0.000
9.50	0.443	5,884	158.31	0.000
10.00	0.542	6,758	158.39	0.000
10.50	0.709	7,878	158.48	0.000
11.00	0.985	9,389	158.62	0.000
11.50	**1.627**	**11,694**	**158.82**	**0.000**
12.00	**17.848**	**27,162**	**170.30**	**9.239**
12.50	1.550	27,162	168.67	0.000
13.00	0.964	27,162	168.67	0.000
13.50	0.729	27,162	168.67	0.000
14.00	0.572	27,162	168.67	0.000
14.50	0.505	27,162	168.67	0.000
15.00	0.453	27,162	168.67	0.000
15.50	0.401	27,162	168.67	0.000
16.00	0.349	27,162	168.67	0.000
16.50	0.326	27,162	168.67	0.000
17.00	0.307	27,162	168.67	0.000
17.50	0.289	27,162	168.67	0.000
18.00	0.270	27,162	168.67	0.000
18.50	0.251	27,162	168.67	0.000
19.00	0.233	27,162	168.67	0.000
19.50	0.214	27,162	168.67	0.000
20.00	0.196	27,162	168.67	0.000
20.50	0.190	27,162	168.67	0.000
21.00	0.186	27,162	168.67	0.000
21.50	0.182	27,162	168.67	0.000
22.00	0.179	27,162	168.67	0.000
22.50	0.175	27,162	168.67	0.000
23.00	0.171	27,162	168.67	0.000
23.50	0.168	27,162	168.67	0.000
24.00	0.164	27,162	168.67	0.000
24.50	0.000	27,162	168.67	0.000
25.00	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	27,162	168.67	0.000
26.00	0.000	27,162	168.67	0.000
26.50	0.000	27,162	168.67	0.000
27.00	0.000	27,162	168.67	0.000
27.50	0.000	27,162	168.67	0.000
28.00	0.000	27,162	168.67	0.000
28.50	0.000	27,162	168.67	0.000
29.00	0.000	27,162	168.67	0.000
29.50	0.000	27,162	168.67	0.000
30.00	0.000	27,162	168.67	0.000
30.50	0.000	27,162	168.67	0.000
31.00	0.000	27,162	168.67	0.000
31.50	0.000	27,162	168.67	0.000
32.00	0.000	27,162	168.67	0.000
32.50	0.000	27,162	168.67	0.000
33.00	0.000	27,162	168.67	0.000
33.50	0.000	27,162	168.67	0.000
34.00	0.000	27,162	168.67	0.000
34.50	0.000	27,162	168.67	0.000
35.00	0.000	27,162	168.67	0.000
35.50	0.000	27,162	168.67	0.000
36.00	0.000	27,162	168.67	0.000
36.50	0.000	27,162	168.67	0.000
37.00	0.000	27,162	168.67	0.000
37.50	0.000	27,162	168.67	0.000
38.00	0.000	27,162	168.67	0.000
38.50	0.000	27,162	168.67	0.000
39.00	0.000	27,162	168.67	0.000
39.50	0.000	27,162	168.67	0.000
40.00	0.000	27,162	168.67	0.000
40.50	0.000	27,162	168.67	0.000
41.00	0.000	27,162	168.67	0.000
41.50	0.000	27,162	168.67	0.000
42.00	0.000	27,162	168.67	0.000
42.50	0.000	27,162	168.67	0.000
43.00	0.000	27,162	168.67	0.000
43.50	0.000	27,162	168.67	0.000
44.00	0.000	27,162	168.67	0.000
44.50	0.000	27,162	168.67	0.000
45.00	0.000	27,162	168.67	0.000
45.50	0.000	27,162	168.67	0.000
46.00	0.000	27,162	168.67	0.000
46.50	0.000	27,162	168.67	0.000
47.00	0.000	27,162	168.67	0.000
47.50	0.000	27,162	168.67	0.000
48.00	0.000	27,162	168.67	0.000
48.50	0.000	27,162	168.67	0.000
49.00	0.000	27,162	168.67	0.000
49.50	0.000	27,162	168.67	0.000
50.00	0.000	27,162	168.67	0.000
50.50	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	27,162	168.67	0.000
51.50	0.000	27,162	168.67	0.000
52.00	0.000	27,162	168.67	0.000
52.50	0.000	27,162	168.67	0.000
53.00	0.000	27,162	168.67	0.000
53.50	0.000	27,162	168.67	0.000
54.00	0.000	27,162	168.67	0.000
54.50	0.000	27,162	168.67	0.000
55.00	0.000	27,162	168.67	0.000
55.50	0.000	27,162	168.67	0.000
56.00	0.000	27,162	168.67	0.000
56.50	0.000	27,162	168.67	0.000
57.00	0.000	27,162	168.67	0.000
57.50	0.000	27,162	168.67	0.000
58.00	0.000	27,162	168.67	0.000
58.50	0.000	27,162	168.67	0.000
59.00	0.000	27,162	168.67	0.000
59.50	0.000	27,162	168.67	0.000
60.00	0.000	27,162	168.67	0.000
60.50	0.000	27,162	168.67	0.000
61.00	0.000	27,162	168.67	0.000
61.50	0.000	27,162	168.67	0.000
62.00	0.000	27,162	168.67	0.000
62.50	0.000	27,162	168.67	0.000
63.00	0.000	27,162	168.67	0.000
63.50	0.000	27,162	168.67	0.000
64.00	0.000	27,162	168.67	0.000
64.50	0.000	27,162	168.67	0.000
65.00	0.000	27,162	168.67	0.000
65.50	0.000	27,162	168.67	0.000
66.00	0.000	27,162	168.67	0.000
66.50	0.000	27,162	168.67	0.000
67.00	0.000	27,162	168.67	0.000
67.50	0.000	27,162	168.67	0.000
68.00	0.000	27,162	168.67	0.000
68.50	0.000	27,162	168.67	0.000
69.00	0.000	27,162	168.67	0.000
69.50	0.000	27,162	168.67	0.000
70.00	0.000	27,162	168.67	0.000
70.50	0.000	27,162	168.67	0.000
71.00	0.000	27,162	168.67	0.000
71.50	0.000	27,162	168.67	0.000
72.00	0.000	27,162	168.67	0.000
72.50	0.000	27,162	168.67	0.000
73.00	0.000	27,162	168.67	0.000
73.50	0.000	27,162	168.67	0.000
74.00	0.000	27,162	168.67	0.000
74.50	0.000	27,162	168.67	0.000
75.00	0.000	27,162	168.67	0.000
75.50	0.000	27,162	168.67	0.000
76.00	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	27,162	168.67	0.000
77.00	0.000	27,162	168.67	0.000
77.50	0.000	27,162	168.67	0.000
78.00	0.000	27,162	168.67	0.000
78.50	0.000	27,162	168.67	0.000
79.00	0.000	27,162	168.67	0.000
79.50	0.000	27,162	168.67	0.000
80.00	0.000	27,162	168.67	0.000
80.50	0.000	27,162	168.67	0.000
81.00	0.000	27,162	168.67	0.000
81.50	0.000	27,162	168.67	0.000
82.00	0.000	27,162	168.67	0.000
82.50	0.000	27,162	168.67	0.000
83.00	0.000	27,162	168.67	0.000
83.50	0.000	27,162	168.67	0.000
84.00	0.000	27,162	168.67	0.000
84.50	0.000	27,162	168.67	0.000
85.00	0.000	27,162	168.67	0.000
85.50	0.000	27,162	168.67	0.000
86.00	0.000	27,162	168.67	0.000
86.50	0.000	27,162	168.67	0.000
87.00	0.000	27,162	168.67	0.000
87.50	0.000	27,162	168.67	0.000
88.00	0.000	27,162	168.67	0.000
88.50	0.000	27,162	168.67	0.000
89.00	0.000	27,162	168.67	0.000
89.50	0.000	27,162	168.67	0.000
90.00	0.000	27,162	168.67	0.000
90.50	0.000	27,162	168.67	0.000
91.00	0.000	27,162	168.67	0.000
91.50	0.000	27,162	168.67	0.000
92.00	0.000	27,162	168.67	0.000
92.50	0.000	27,162	168.67	0.000
93.00	0.000	27,162	168.67	0.000
93.50	0.000	27,162	168.67	0.000
94.00	0.000	27,162	168.67	0.000
94.50	0.000	27,162	168.67	0.000
95.00	0.000	27,162	168.67	0.000
95.50	0.000	27,162	168.67	0.000
96.00	0.000	27,162	168.67	0.000
96.50	0.000	27,162	168.67	0.000
97.00	0.000	27,162	168.67	0.000
97.50	0.000	27,162	168.67	0.000
98.00	0.000	27,162	168.67	0.000
98.50	0.000	27,162	168.67	0.000
99.00	0.000	27,162	168.67	0.000
99.50	0.000	27,162	168.67	0.000
100.00	0.000	27,162	168.67	0.000
100.50	0.000	27,162	168.67	0.000
101.00	0.000	27,162	168.67	0.000
101.50	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	27,162	168.67	0.000
102.50	0.000	27,162	168.67	0.000
103.00	0.000	27,162	168.67	0.000
103.50	0.000	27,162	168.67	0.000
104.00	0.000	27,162	168.67	0.000
104.50	0.000	27,162	168.67	0.000
105.00	0.000	27,162	168.67	0.000
105.50	0.000	27,162	168.67	0.000
106.00	0.000	27,162	168.67	0.000
106.50	0.000	27,162	168.67	0.000
107.00	0.000	27,162	168.67	0.000
107.50	0.000	27,162	168.67	0.000
108.00	0.000	27,162	168.67	0.000
108.50	0.000	27,162	168.67	0.000
109.00	0.000	27,162	168.67	0.000
109.50	0.000	27,162	168.67	0.000
110.00	0.000	27,162	168.67	0.000
110.50	0.000	27,162	168.67	0.000
111.00	0.000	27,162	168.67	0.000
111.50	0.000	27,162	168.67	0.000
112.00	0.000	27,162	168.67	0.000
112.50	0.000	27,162	168.67	0.000
113.00	0.000	27,162	168.67	0.000
113.50	0.000	27,162	168.67	0.000
114.00	0.000	27,162	168.67	0.000
114.50	0.000	27,162	168.67	0.000
115.00	0.000	27,162	168.67	0.000
115.50	0.000	27,162	168.67	0.000
116.00	0.000	27,162	168.67	0.000
116.50	0.000	27,162	168.67	0.000
117.00	0.000	27,162	168.67	0.000
117.50	0.000	27,162	168.67	0.000
118.00	0.000	27,162	168.67	0.000
118.50	0.000	27,162	168.67	0.000
119.00	0.000	27,162	168.67	0.000
119.50	0.000	27,162	168.67	0.000
120.00	0.000	27,162	168.67	0.000
120.50	0.000	27,162	168.67	0.000
121.00	0.000	27,162	168.67	0.000
121.50	0.000	27,162	168.67	0.000
122.00	0.000	27,162	168.67	0.000
122.50	0.000	27,162	168.67	0.000
123.00	0.000	27,162	168.67	0.000
123.50	0.000	27,162	168.67	0.000
124.00	0.000	27,162	168.67	0.000
124.50	0.000	27,162	168.67	0.000
125.00	0.000	27,162	168.67	0.000
125.50	0.000	27,162	168.67	0.000
126.00	0.000	27,162	168.67	0.000
126.50	0.000	27,162	168.67	0.000
127.00	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	27,162	168.67	0.000
128.00	0.000	27,162	168.67	0.000
128.50	0.000	27,162	168.67	0.000
129.00	0.000	27,162	168.67	0.000
129.50	0.000	27,162	168.67	0.000
130.00	0.000	27,162	168.67	0.000
130.50	0.000	27,162	168.67	0.000
131.00	0.000	27,162	168.67	0.000
131.50	0.000	27,162	168.67	0.000
132.00	0.000	27,162	168.67	0.000
132.50	0.000	27,162	168.67	0.000
133.00	0.000	27,162	168.67	0.000
133.50	0.000	27,162	168.67	0.000
134.00	0.000	27,162	168.67	0.000
134.50	0.000	27,162	168.67	0.000
135.00	0.000	27,162	168.67	0.000
135.50	0.000	27,162	168.67	0.000
136.00	0.000	27,162	168.67	0.000
136.50	0.000	27,162	168.67	0.000
137.00	0.000	27,162	168.67	0.000
137.50	0.000	27,162	168.67	0.000
138.00	0.000	27,162	168.67	0.000
138.50	0.000	27,162	168.67	0.000
139.00	0.000	27,162	168.67	0.000
139.50	0.000	27,162	168.67	0.000
140.00	0.000	27,162	168.67	0.000
140.50	0.000	27,162	168.67	0.000
141.00	0.000	27,162	168.67	0.000
141.50	0.000	27,162	168.67	0.000
142.00	0.000	27,162	168.67	0.000
142.50	0.000	27,162	168.67	0.000
143.00	0.000	27,162	168.67	0.000
143.50	0.000	27,162	168.67	0.000
144.00	0.000	27,162	168.67	0.000
144.50	0.000	27,162	168.67	0.000
145.00	0.000	27,162	168.67	0.000
145.50	0.000	27,162	168.67	0.000
146.00	0.000	27,162	168.67	0.000
146.50	0.000	27,162	168.67	0.000
147.00	0.000	27,162	168.67	0.000
147.50	0.000	27,162	168.67	0.000
148.00	0.000	27,162	168.67	0.000
148.50	0.000	27,162	168.67	0.000
149.00	0.000	27,162	168.67	0.000
149.50	0.000	27,162	168.67	0.000
150.00	0.000	27,162	168.67	0.000
150.50	0.000	27,162	168.67	0.000
151.00	0.000	27,162	168.67	0.000
151.50	0.000	27,162	168.67	0.000
152.00	0.000	27,162	168.67	0.000
152.50	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	27,162	168.67	0.000
153.50	0.000	27,162	168.67	0.000
154.00	0.000	27,162	168.67	0.000
154.50	0.000	27,162	168.67	0.000
155.00	0.000	27,162	168.67	0.000
155.50	0.000	27,162	168.67	0.000
156.00	0.000	27,162	168.67	0.000
156.50	0.000	27,162	168.67	0.000
157.00	0.000	27,162	168.67	0.000
157.50	0.000	27,162	168.67	0.000
158.00	0.000	27,162	168.67	0.000
158.50	0.000	27,162	168.67	0.000
159.00	0.000	27,162	168.67	0.000
159.50	0.000	27,162	168.67	0.000
160.00	0.000	27,162	168.67	0.000
160.50	0.000	27,162	168.67	0.000
161.00	0.000	27,162	168.67	0.000
161.50	0.000	27,162	168.67	0.000
162.00	0.000	27,162	168.67	0.000
162.50	0.000	27,162	168.67	0.000
163.00	0.000	27,162	168.67	0.000
163.50	0.000	27,162	168.67	0.000
164.00	0.000	27,162	168.67	0.000
164.50	0.000	27,162	168.67	0.000
165.00	0.000	27,162	168.67	0.000
165.50	0.000	27,162	168.67	0.000
166.00	0.000	27,162	168.67	0.000
166.50	0.000	27,162	168.67	0.000
167.00	0.000	27,162	168.67	0.000
167.50	0.000	27,162	168.67	0.000
168.00	0.000	27,162	168.67	0.000

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 6.00" for 100-yr event
Inflow = 5.073 cfs @ 11.96 hrs, Volume= 10,741 cf
Outflow = 7.312 cfs @ 11.96 hrs, Volume= 6,548 cf, Atten= 0%, Lag= 0.1 min
Primary = 7.312 cfs @ 11.96 hrs, Volume= 6,548 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 169.41' @ 11.96 hrs Surf.Area= 2,542 sf Storage= 4,234 cf

Plug-Flow detention time= 185.4 min calculated for 6,548 cf (61% of inflow)
Center-of-Mass det. time= 81.2 min (866.3 - 785.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=7.305 cfs @ 11.96 hrs HW=169.41' TW=168.67' (Fixed TW Elev= 168.67')
└─**4=Culvert** (Inlet Controls 7.305 cfs @ 4.134 fps)
  ├─**1=Orifice/Grate** (Passes < 0.203 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 0.517 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 137.586 cfs potential flow)

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.002	1	159.28	0.000
4.50	0.006	8	159.29	0.000
5.00	0.010	22	159.30	0.000
5.50	0.014	43	159.32	0.000
6.00	0.018	72	159.35	0.000
6.50	0.023	109	159.39	0.000
7.00	0.028	155	159.43	0.000
7.50	0.033	209	159.49	0.000
8.00	0.038	273	159.55	0.000
8.50	0.050	351	159.63	0.000
9.00	0.065	454	159.73	0.000
9.50	0.071	578	159.81	0.000
10.00	0.093	723	159.88	0.000
10.50	0.128	920	159.97	0.000
11.00	0.188	1,201	160.10	0.000
11.50	**0.331**	**1,655**	**160.31**	**0.000**
12.00	**4.234**	**4,234**	**169.25**	**6.476**
12.50	0.376	4,234	168.70	0.760
13.00	0.235	4,234	168.69	0.472
13.50	0.178	4,234	168.68	0.357
14.00	0.140	4,234	168.68	0.281
14.50	0.124	4,234	168.68	0.248
15.00	0.111	4,234	168.68	0.223
15.50	0.099	4,234	168.68	0.198
16.00	0.086	4,234	168.68	0.172
16.50	0.080	4,234	168.68	0.160
17.00	0.076	4,234	168.68	0.151
17.50	0.071	4,234	168.68	0.142
18.00	0.067	4,234	168.67	0.133
18.50	0.062	4,234	168.67	0.124
19.00	0.058	4,234	168.67	0.115
19.50	0.053	4,234	168.67	0.106
20.00	0.048	4,234	168.67	0.097
20.50	0.047	4,234	168.67	0.094
21.00	0.046	4,234	168.67	0.092
21.50	0.045	4,234	168.67	0.090
22.00	0.044	4,234	168.67	0.089
22.50	0.043	4,234	168.67	0.087
23.00	0.042	4,234	168.67	0.085
23.50	0.042	4,234	168.67	0.083
24.00	0.041	4,234	168.67	0.081
24.50	0.000	4,234	168.58	0.000
25.00	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	4,234	168.58	0.000
26.00	0.000	4,234	168.58	0.000
26.50	0.000	4,234	168.58	0.000
27.00	0.000	4,234	168.58	0.000
27.50	0.000	4,234	168.58	0.000
28.00	0.000	4,234	168.58	0.000
28.50	0.000	4,234	168.58	0.000
29.00	0.000	4,234	168.58	0.000
29.50	0.000	4,234	168.58	0.000
30.00	0.000	4,234	168.58	0.000
30.50	0.000	4,234	168.58	0.000
31.00	0.000	4,234	168.58	0.000
31.50	0.000	4,234	168.58	0.000
32.00	0.000	4,234	168.58	0.000
32.50	0.000	4,234	168.58	0.000
33.00	0.000	4,234	168.58	0.000
33.50	0.000	4,234	168.58	0.000
34.00	0.000	4,234	168.58	0.000
34.50	0.000	4,234	168.58	0.000
35.00	0.000	4,234	168.58	0.000
35.50	0.000	4,234	168.58	0.000
36.00	0.000	4,234	168.58	0.000
36.50	0.000	4,234	168.58	0.000
37.00	0.000	4,234	168.58	0.000
37.50	0.000	4,234	168.58	0.000
38.00	0.000	4,234	168.58	0.000
38.50	0.000	4,234	168.58	0.000
39.00	0.000	4,234	168.58	0.000
39.50	0.000	4,234	168.58	0.000
40.00	0.000	4,234	168.58	0.000
40.50	0.000	4,234	168.58	0.000
41.00	0.000	4,234	168.58	0.000
41.50	0.000	4,234	168.58	0.000
42.00	0.000	4,234	168.58	0.000
42.50	0.000	4,234	168.58	0.000
43.00	0.000	4,234	168.58	0.000
43.50	0.000	4,234	168.58	0.000
44.00	0.000	4,234	168.58	0.000
44.50	0.000	4,234	168.58	0.000
45.00	0.000	4,234	168.58	0.000
45.50	0.000	4,234	168.58	0.000
46.00	0.000	4,234	168.58	0.000
46.50	0.000	4,234	168.58	0.000
47.00	0.000	4,234	168.58	0.000
47.50	0.000	4,234	168.58	0.000
48.00	0.000	4,234	168.58	0.000
48.50	0.000	4,234	168.58	0.000
49.00	0.000	4,234	168.58	0.000
49.50	0.000	4,234	168.58	0.000
50.00	0.000	4,234	168.58	0.000
50.50	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,234	168.58	0.000
51.50	0.000	4,234	168.58	0.000
52.00	0.000	4,234	168.58	0.000
52.50	0.000	4,234	168.58	0.000
53.00	0.000	4,234	168.58	0.000
53.50	0.000	4,234	168.58	0.000
54.00	0.000	4,234	168.58	0.000
54.50	0.000	4,234	168.58	0.000
55.00	0.000	4,234	168.58	0.000
55.50	0.000	4,234	168.58	0.000
56.00	0.000	4,234	168.58	0.000
56.50	0.000	4,234	168.58	0.000
57.00	0.000	4,234	168.58	0.000
57.50	0.000	4,234	168.58	0.000
58.00	0.000	4,234	168.58	0.000
58.50	0.000	4,234	168.58	0.000
59.00	0.000	4,234	168.58	0.000
59.50	0.000	4,234	168.58	0.000
60.00	0.000	4,234	168.58	0.000
60.50	0.000	4,234	168.58	0.000
61.00	0.000	4,234	168.58	0.000
61.50	0.000	4,234	168.58	0.000
62.00	0.000	4,234	168.58	0.000
62.50	0.000	4,234	168.58	0.000
63.00	0.000	4,234	168.58	0.000
63.50	0.000	4,234	168.58	0.000
64.00	0.000	4,234	168.58	0.000
64.50	0.000	4,234	168.58	0.000
65.00	0.000	4,234	168.58	0.000
65.50	0.000	4,234	168.58	0.000
66.00	0.000	4,234	168.58	0.000
66.50	0.000	4,234	168.58	0.000
67.00	0.000	4,234	168.58	0.000
67.50	0.000	4,234	168.58	0.000
68.00	0.000	4,234	168.58	0.000
68.50	0.000	4,234	168.58	0.000
69.00	0.000	4,234	168.58	0.000
69.50	0.000	4,234	168.58	0.000
70.00	0.000	4,234	168.58	0.000
70.50	0.000	4,234	168.58	0.000
71.00	0.000	4,234	168.58	0.000
71.50	0.000	4,234	168.58	0.000
72.00	0.000	4,234	168.58	0.000
72.50	0.000	4,234	168.58	0.000
73.00	0.000	4,234	168.58	0.000
73.50	0.000	4,234	168.58	0.000
74.00	0.000	4,234	168.58	0.000
74.50	0.000	4,234	168.58	0.000
75.00	0.000	4,234	168.58	0.000
75.50	0.000	4,234	168.58	0.000
76.00	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	4,234	168.58	0.000
77.00	0.000	4,234	168.58	0.000
77.50	0.000	4,234	168.58	0.000
78.00	0.000	4,234	168.58	0.000
78.50	0.000	4,234	168.58	0.000
79.00	0.000	4,234	168.58	0.000
79.50	0.000	4,234	168.58	0.000
80.00	0.000	4,234	168.58	0.000
80.50	0.000	4,234	168.58	0.000
81.00	0.000	4,234	168.58	0.000
81.50	0.000	4,234	168.58	0.000
82.00	0.000	4,234	168.58	0.000
82.50	0.000	4,234	168.58	0.000
83.00	0.000	4,234	168.58	0.000
83.50	0.000	4,234	168.58	0.000
84.00	0.000	4,234	168.58	0.000
84.50	0.000	4,234	168.58	0.000
85.00	0.000	4,234	168.58	0.000
85.50	0.000	4,234	168.58	0.000
86.00	0.000	4,234	168.58	0.000
86.50	0.000	4,234	168.58	0.000
87.00	0.000	4,234	168.58	0.000
87.50	0.000	4,234	168.58	0.000
88.00	0.000	4,234	168.58	0.000
88.50	0.000	4,234	168.58	0.000
89.00	0.000	4,234	168.58	0.000
89.50	0.000	4,234	168.58	0.000
90.00	0.000	4,234	168.58	0.000
90.50	0.000	4,234	168.58	0.000
91.00	0.000	4,234	168.58	0.000
91.50	0.000	4,234	168.58	0.000
92.00	0.000	4,234	168.58	0.000
92.50	0.000	4,234	168.58	0.000
93.00	0.000	4,234	168.58	0.000
93.50	0.000	4,234	168.58	0.000
94.00	0.000	4,234	168.58	0.000
94.50	0.000	4,234	168.58	0.000
95.00	0.000	4,234	168.58	0.000
95.50	0.000	4,234	168.58	0.000
96.00	0.000	4,234	168.58	0.000
96.50	0.000	4,234	168.58	0.000
97.00	0.000	4,234	168.58	0.000
97.50	0.000	4,234	168.58	0.000
98.00	0.000	4,234	168.58	0.000
98.50	0.000	4,234	168.58	0.000
99.00	0.000	4,234	168.58	0.000
99.50	0.000	4,234	168.58	0.000
100.00	0.000	4,234	168.58	0.000
100.50	0.000	4,234	168.58	0.000
101.00	0.000	4,234	168.58	0.000
101.50	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	4,234	168.58	0.000
102.50	0.000	4,234	168.58	0.000
103.00	0.000	4,234	168.58	0.000
103.50	0.000	4,234	168.58	0.000
104.00	0.000	4,234	168.58	0.000
104.50	0.000	4,234	168.58	0.000
105.00	0.000	4,234	168.58	0.000
105.50	0.000	4,234	168.58	0.000
106.00	0.000	4,234	168.58	0.000
106.50	0.000	4,234	168.58	0.000
107.00	0.000	4,234	168.58	0.000
107.50	0.000	4,234	168.58	0.000
108.00	0.000	4,234	168.58	0.000
108.50	0.000	4,234	168.58	0.000
109.00	0.000	4,234	168.58	0.000
109.50	0.000	4,234	168.58	0.000
110.00	0.000	4,234	168.58	0.000
110.50	0.000	4,234	168.58	0.000
111.00	0.000	4,234	168.58	0.000
111.50	0.000	4,234	168.58	0.000
112.00	0.000	4,234	168.58	0.000
112.50	0.000	4,234	168.58	0.000
113.00	0.000	4,234	168.58	0.000
113.50	0.000	4,234	168.58	0.000
114.00	0.000	4,234	168.58	0.000
114.50	0.000	4,234	168.58	0.000
115.00	0.000	4,234	168.58	0.000
115.50	0.000	4,234	168.58	0.000
116.00	0.000	4,234	168.58	0.000
116.50	0.000	4,234	168.58	0.000
117.00	0.000	4,234	168.58	0.000
117.50	0.000	4,234	168.58	0.000
118.00	0.000	4,234	168.58	0.000
118.50	0.000	4,234	168.58	0.000
119.00	0.000	4,234	168.58	0.000
119.50	0.000	4,234	168.58	0.000
120.00	0.000	4,234	168.58	0.000
120.50	0.000	4,234	168.58	0.000
121.00	0.000	4,234	168.58	0.000
121.50	0.000	4,234	168.58	0.000
122.00	0.000	4,234	168.58	0.000
122.50	0.000	4,234	168.58	0.000
123.00	0.000	4,234	168.58	0.000
123.50	0.000	4,234	168.58	0.000
124.00	0.000	4,234	168.58	0.000
124.50	0.000	4,234	168.58	0.000
125.00	0.000	4,234	168.58	0.000
125.50	0.000	4,234	168.58	0.000
126.00	0.000	4,234	168.58	0.000
126.50	0.000	4,234	168.58	0.000
127.00	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	4,234	168.58	0.000
128.00	0.000	4,234	168.58	0.000
128.50	0.000	4,234	168.58	0.000
129.00	0.000	4,234	168.58	0.000
129.50	0.000	4,234	168.58	0.000
130.00	0.000	4,234	168.58	0.000
130.50	0.000	4,234	168.58	0.000
131.00	0.000	4,234	168.58	0.000
131.50	0.000	4,234	168.58	0.000
132.00	0.000	4,234	168.58	0.000
132.50	0.000	4,234	168.58	0.000
133.00	0.000	4,234	168.58	0.000
133.50	0.000	4,234	168.58	0.000
134.00	0.000	4,234	168.58	0.000
134.50	0.000	4,234	168.58	0.000
135.00	0.000	4,234	168.58	0.000
135.50	0.000	4,234	168.58	0.000
136.00	0.000	4,234	168.58	0.000
136.50	0.000	4,234	168.58	0.000
137.00	0.000	4,234	168.58	0.000
137.50	0.000	4,234	168.58	0.000
138.00	0.000	4,234	168.58	0.000
138.50	0.000	4,234	168.58	0.000
139.00	0.000	4,234	168.58	0.000
139.50	0.000	4,234	168.58	0.000
140.00	0.000	4,234	168.58	0.000
140.50	0.000	4,234	168.58	0.000
141.00	0.000	4,234	168.58	0.000
141.50	0.000	4,234	168.58	0.000
142.00	0.000	4,234	168.58	0.000
142.50	0.000	4,234	168.58	0.000
143.00	0.000	4,234	168.58	0.000
143.50	0.000	4,234	168.58	0.000
144.00	0.000	4,234	168.58	0.000
144.50	0.000	4,234	168.58	0.000
145.00	0.000	4,234	168.58	0.000
145.50	0.000	4,234	168.58	0.000
146.00	0.000	4,234	168.58	0.000
146.50	0.000	4,234	168.58	0.000
147.00	0.000	4,234	168.58	0.000
147.50	0.000	4,234	168.58	0.000
148.00	0.000	4,234	168.58	0.000
148.50	0.000	4,234	168.58	0.000
149.00	0.000	4,234	168.58	0.000
149.50	0.000	4,234	168.58	0.000
150.00	0.000	4,234	168.58	0.000
150.50	0.000	4,234	168.58	0.000
151.00	0.000	4,234	168.58	0.000
151.50	0.000	4,234	168.58	0.000
152.00	0.000	4,234	168.58	0.000
152.50	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	4,234	168.58	0.000
153.50	0.000	4,234	168.58	0.000
154.00	0.000	4,234	168.58	0.000
154.50	0.000	4,234	168.58	0.000
155.00	0.000	4,234	168.58	0.000
155.50	0.000	4,234	168.58	0.000
156.00	0.000	4,234	168.58	0.000
156.50	0.000	4,234	168.58	0.000
157.00	0.000	4,234	168.58	0.000
157.50	0.000	4,234	168.58	0.000
158.00	0.000	4,234	168.58	0.000
158.50	0.000	4,234	168.58	0.000
159.00	0.000	4,234	168.58	0.000
159.50	0.000	4,234	168.58	0.000
160.00	0.000	4,234	168.58	0.000
160.50	0.000	4,234	168.58	0.000
161.00	0.000	4,234	168.58	0.000
161.50	0.000	4,234	168.58	0.000
162.00	0.000	4,234	168.58	0.000
162.50	0.000	4,234	168.58	0.000
163.00	0.000	4,234	168.58	0.000
163.50	0.000	4,234	168.58	0.000
164.00	0.000	4,234	168.58	0.000
164.50	0.000	4,234	168.58	0.000
165.00	0.000	4,234	168.58	0.000
165.50	0.000	4,234	168.58	0.000
166.00	0.000	4,234	168.58	0.000
166.50	0.000	4,234	168.58	0.000
167.00	0.000	4,234	168.58	0.000
167.50	0.000	4,234	168.58	0.000
168.00	0.000	4,234	168.58	0.000

Post Construction
Stormwater Management Calculations

Project: BMW Automotive Dealership Expansion
500 Pennsylvania Avenue
Whitemarsh Township
Montgomery County, PA

Project Number: PAB220113.01

Client: MileOne Fort Washington, LLC
3301 Briggs Chaney Road
Silver Spring, MD 20904

Date: 4/23/2025

Revised: 7/24/2025

Design Professional: Jeff A. Beavan
PA License #PE082005



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General Project Description/Stormwater Management

GENERAL PROJECT DESCRIPTION

BMW of Fort Washington proposes to consolidate and subdivide four existing lots totaling 5.133 acres along Pennsylvania Avenue into one proposed lot. The proposed lot will contain a proposed automobile dealership. Pertinent data characterizing the existing and future site conditions are shown on the accompanying Final Land Development & Major Subdivision Plans.

The site drains to two points of interest, both of which ultimately drain to Sandy Run, which is tributary to the Wissahickon Creek, with a Chapter 93 designation of TSF, MF, or trout-stocking fishes, migratory fishes.

Waters of the US are present on the project site and have been delineated by survey. Detailed report and scope of the floodplain impacts and encroachments are contained in the DEP joint 105 permit package and is outside the scope of this report.

STORMWATER MANAGEMENT

The pre-development condition of the site consists two Points of Interest (POI #001 and POI #002) which is indicated on the attached Pre-Development Drainage Area Plan. POI #002 ultimately drains to POI#001. POI #001, taking the south and western portions of the site in the pre-development condition, drains through two distinct areas of cover to an open channel running along the south of the property; one area being predominately wooded area and the other area being predominately parking area. The flow through the wooded area takes place via sheet flow and channeled flow to an existing open channel located along the southwestern portion of the site. Flow then discharges out of the existing open channel and runs via channel flow (off-site) to the point of interest located at Sandy Run, which is tributary to Wissahickon Creek. The flow through the parking area drains via sheet flow and shallow concentrated flow to an existing inlet and 18-inch pipe located in the southeast corner of the site. Flow then discharges out of the existing 18-inch pipe and runs via channel flow in an existing open channel to the point of interest. POI #002 takes flow from the north and eastern portions of the site and drains to an existing 72-inch culvert containing mapped waters. Flow then discharges out of the existing 72-inch culvert directly to POI #001.

The on and off-site area tributary to these points of interest have been delineated and hydrographs have been generated for the 1-, 2-, 5-, 10-, 25-, 50-, and 100-year storms. The pre-development conditions were analyzed based on existing conditions for all areas tributary to the points of interest.

The post-development condition of the site maintains the same Points of Interest and relative drainage patterns as the existing condition. Overall, there is a decrease in impervious surface on the site. The drainage areas to POI#001 have been analyzed, and stormwater BMPs are proposed to control rate and runoff to required levels. The areas tributary to each basin have been delineated and hydrographs have been generated for the 1-, 2-, 5-, 10-, 25-, 50-, and 100-year storms. For POI #001, two underground basins (UG1 and UG2) have been designed to manage the runoff to required discharge rates. Basin UG1 outfall pipe connects in a manhole to discharge directly to the creek. The UG2 outfall pipe combines with some roof leader bypass, and the combined flow discharges directly to the Sandy Run Creek. Volume reduction will be managed on the site through managed release, and landscape restoration. The drainage area and impervious cover to POI #002 has been significantly reduced in the post development condition, decreasing rate and volume runoff to this drainage area for each storm event analyzed.

In accordance with the Whitemarsh Township Stormwater Management Chapter 58, stormwater peak flow rates have been designed to reduce the post development peak rate for each sub drainage area individually and the ultimate POI as a whole to the required predevelopment peak rates. In addition, the stormwater peak flow rates have been further designed to comply with the Wissahickon Creek Watershed Act 167 Plan, District B requirements.

Calculation Methodology

The SCS Method was utilized for calculating the peak runoff rates and generating hydrographs for the pre- and post-development conditions as defined in the computer watershed software HydroCAD. The hydrographs were generated based on the precipitation amounts dictated by the NOAA Precipitation Frequency Data Server for Fort Washington, PA. Runoff curve numbers were obtained from the USDA NRCS TR-55 manual, and are contained at the end of this report. The Whitemarsh Township Stormwater Management Chapter 58 was adopted on February 26, 2004. The Wissahickon Creek Watershed Act 167 Plan was last revised and approved November 2014.

Times of concentration (TOC) were calculated using the methodology indicated in the Whitemarsh Township Stormwater Management Ordinance, with a minimum TOC of 5 minutes. Detailed TOC calculations are included within this report. All drainage areas that do not have detailed TOC calculations included in the report are assumed to have a minimum TOC of 5 minutes.

Wissahickon Creek Watershed Act 167 Plan, District B requires the reduction of the stormwater post development peak rates to the predevelopment peak rates as follows:

POST		PRE
2-yr	reduced to	1-yr
5-yr	reduced to	2-yr
10-yr	reduced to	5-yr
25-yr	reduced to	10-yr
50-yr	reduced to	25-yr
100-yr	reduced to	50-yr

Allowable release rate calculations are contained later in this report for the point of interest.

Volume Control

The volume increase resulting from development will be controlled through the combination of underground dry detention basins, managed release basins and landscape restoration. The 2-yr volume increase for POI#1 is 9,412 CF due to an increase in impervious drainage area.

Structural BMP's include 2 underground Detention facilities (UG1 and UG2) which have been designed to capture and treat the entire tributary flow from the 2-year storm. Overflow for the 5, 10, 25, 50, and 100-year storm events will flow through the outlet control structure. Underground Detention Facility UG1 has been designed using Managed Release Concept, to achieve release rates of 0.01 cfs per one acre of impervious area tributary to the facility and reduce the 2-yr post-development peak flow to the 1-yr pre-development peak flow in accordance with the Managed Release Concept (MRC) requirements. The maximum ponding from the 2yr/24hr storm event will drawdown in less than 7 days after the duration of the design storm in accordance with the MRC requirements. MRC calculations are included within this report.

The total managed volume credit for UG1 is 19,988 CF via volume control via managed release control.

The proposed site landscaping was designed to revegetate the site with native species. A volume credit of 10 CF is provided for evergreen trees and 6 CF for deciduous trees. The site landscaping will provide an additional volume reduction of 574 CF.

Total volume reduction is 20,696 CF of the 7,864 CF requirement, which complies with the volume reduction requirements per CG-1 and the Whitemarsh Township Stormwater Management Ordinance.

Water Quality

Multiple BMPs are proposed for their water quality benefits in order to treat the stormwater runoff prior to it leaving the site. These BMPs are as follows:

Underground detention basins UG1 and UG2 will take runoff from impervious areas of the site for treatment prior to discharge. UG1 is designed for managed release to meet volume and rate requirements. Native landscaping is proposed across the site to decrease runoff and increase water quality. Lastly, total disturbed area has been minimized to preserve a portion of wooded area on the southeast and southwest sides of the site.

Hydrodynamic devices in the form of sumps and snouts are provided for the downstream inlets leading to the underground basins, and inlet filters are proposed for all inlets and roof drains leading to the MRC basins to provide pre-treatment for the runoff events.

Storm Sewer Conveyance Calculations

The storm drainage system has been designed to intercept runoff at topographic low points and areas of significant runoff quantities and convey stormwater to the stormwater management basins. Hydraflow Storm Sewers 2022 has been utilized for designing the storm conveyance system. Conveyance design flows are based on the Rational Method for the 100-year, utilizing runoff coefficients and the IDF information from NOAA Precipitation Frequency Data Server for Upper Dublin Twp, PA. Additional calculations are provided for the 25-year storm with flood tailwater conditions (50-year flood elevation from HEC-RAS), as well as the 100-year storm with flood tailwater conditions (100-year flood elevation from HEC-RAS), which shows that the flood water will not cause backups in other portions of the system.

Conclusion

The proposed stormwater management program described above has been designed to comply with the Whitemarsh Township Stormwater Management Requirements of the Whitemarsh Township Chapter 58, the Wissahickon Creek Watershed Act 167 Plan, District B and NPDES Phase II (where applicable) and the Stormwater Management Act of 1978.

PCSM PLANNING & DESIGN NOTES

The following measures were taken to preserve the integrity of stream channels and maintain and protect the physical, biological, and chemical qualities of the receiving stream:

- Direct runoff from impervious surfaces including roadways to BMPs.
- The use of native species requires less fertilization and chemical application than nonnative species.
- The use of sump and snout pre-treatment for water quality to PCSM BMPs.
- The use of inlet filter pre-treatment for water quality to MRC PCSM BMPs

The following measures were taken to prevent an increase in the rate of storm water runoff:

- Direct runoff to an underground storm water basin to control runoff rates.
- Minimize impervious areas where practical.

The following measures were taken to minimize any increase in storm water runoff volume:

- Provide an underground Managed Release Concept basin to reduce runoff volume.
- Provide revegetate-reforest with native spaces throughout the site to help reduce runoff volume.
- Minimize impervious areas where practical.

The following measures were taken to minimize impervious areas:

- Maintain existing impervious extents were feasible to reduce required surface parking and impervious footprint.
- Configure as efficiently as possible through vertical design to reduce surface parking and consolidate impervious coverage.

The following measures are taken to maximize protection of existing drainage features and vegetation:

- Access the site thru designated construction entrance.
- Protect woodlands with tree protection fencing.

The following measures were taken to minimize land clearing and grading:

- Protect woodlands with tree protection fencing.
- Adjust road slope and site grading to reduce extent of cuts or fills to existing grades.

The following measures are taken to minimize soil compaction:

- Access the site thru designated construction entrance.
- Use of treaded machinery where practical during earthmoving operations.
- Grade site to minimize extent of cuts/fills.

The following measures were taken to utilize other structural or nonstructural BMPs that prevent or minimize changes in storm water runoff:

- Provide underground detention/Managed Release Concept basin to help reduce runoff volume and rates.

POST-CONSTRUCTION STORMWATER MANAGEMENT BMPs

The storm drainage system has been designed to intercept runoff at topographic low points and areas of significant runoff quantities and convey stormwater to the stormwater management facilities. The proposed stormwater management program described above has been designed to comply with the Whitemarsh Township Stormwater Management Requirements of the Whitemarsh Township Chapter 58, the Wissahickon Creek Watershed Act 167 Plan, District B, NPDES Phase II and the Stormwater Management Act of 1978.

The PCSWM and BMP approach of this development is meant to prevent adverse stormwater impacts and provide the necessary treatment of runoff close to the origin of the impact. The primary goal of this development's stormwater management program was to mimic, as best as possible, the pre-development site hydrology by using both structural and non-structural BMP's to prevent or minimize changes in stormwater runoff.

Generally, the proposed BMPs were selected to:

- Preserve the integrity of Sandy Run and the Wissahickon Creek and maintain and protect the physical, biological and chemical qualities of the waters through mitigating any increases in stormwater runoff volume due to the proposed development and treating runoff for water quality purposes prior to being discharged from the site.
- Prevent an increase in rate of stormwater runoff. The proposed stormwater management design has reduced the post-development peak rate from the pre-development conditions, as required by Whitemarsh Township Stormwater Management Ordinance due to the reduction in stormwater runoff volume.
- To the greatest extent feasible, minimize any increase in stormwater runoff volume by incorporating one (1) underground Managed Release Concept basin and one (1) underground detention basin. Resultantly, stormwater runoff volume has been reduced below pre-development levels.
- Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces. Runoff from impervious areas is directed to water quality and infiltration BMP's in order to pre-treat runoff prior to being discharged from the site. the site conveys runoff through a series of water quality and infiltration BMP's in order to maximize pre-treatment of runoff and further mitigate any impact to peak rate and volume in the post development conditions.
- Maximize the protection of existing drainage features and existing vegetation. The proposed development has been designed to maintain the general drainage patterns of the site.
- Minimize land clearing and grading. The current 5.12 Ac. tract has been designed to only impact approximately 4.63 Ac. of Earth Disturbance within the tract boundary (4.63 total Ac. Of earth disturbance for the project).
- Minimize soil compaction. The sequence of construction has been designed to limit the extent and duration of disturbance activities and to limit the extent of heavy traffic over sensitive areas necessary for the PCSM design.
- Utilizes other measures or controls that prevent or minimize generation of increased stormwater runoff.

5.6.3 - Re-vegetate and Re-forest Disturbed Areas, Using Native Species - sites that require landscaping and re-vegetation should select and use vegetation (i.e., native species) that does not require significant chemical maintenance by fertilizers, herbicides, and pesticides. The introduction of these chemicals results in a negative impact on the water quality. The existing site consists of a grassed, vacant field for a future development. The proposal includes the implementation of meadow mix seed mixture along the rear of the property. Additionally, native species plantings (trees and shrubs) are being proposed throughout the development.

6.6.3 - Subsurface Detention Basin - subsurface detention facilities provide temporary storage of stormwater runoff by placing storage media of varying types beneath the proposed surface grade. Stormwater runoff from nearby impervious areas are conveyed to the subsurface storage media where it then reduces the post development runoff rate at or below the pre-development condition. This is a subsurface stormwater structure that provides for the temporary storage of stormwater runoff to prevent downstream flooding impacts. Water quality benefits are achieved with extended detention (dewatering between 24 hrs and 168 hrs) of the runoff volume from the water quality design storm.

6.6.4 - Water Quality Filters & Hydrodynamic Devices - These structural BMPs vary in size and function, but utilize some form of settling and filtration to remove particulate pollutants from stormwater runoff. Commercially available water quality filters, catch basin inserts, and hydrodynamic devices are generally configured to remove particulate contaminants, including coarse sediment, oil and grease, and debris. Water quality inlets are commonly used as pretreatment BMPs and can provide "hotspot" control by reducing sediment loads to infiltration devices. Hydrodynamic devices are not truly inserts, but separate flow through devices designed to serve in concert with inlets and storm sewer. Ideally, the flow through the device should remove liter, oil, sediment, heavy metals, dissolved, solids, and nutrients. Clays and fine silts do not easily settle out unless they are coagulated with some kind of chemical addition or polymer.

GENERAL SEQUENCING NOTES FOR PCSM BMPs

1. A site inspection by the county conservation district is required prior to removal of sediment traps and basins.
2. Bohler Engineering, LLC shall be notified of pre-construction meeting date and BMP construction schedule.
3. The contractor shall take all necessary precautions to limit the compaction in the proposed BMP bottoms.
4. Refer to the BMP construction details for construction guidelines of all proposed stormwater management BMPs.
5. A Notice of Termination (NOT) will be required to be submitted following acceptance of the proposed BMPs by the licensed professional responsible for BMP installation oversight. Prior to accepting the NOT, the Department and/or Conservation District Staff will perform a final inspection to ensure site stabilization and verify installation and function of stormwater BMPs.
6. The PCSM BMP's shall be constructed in the following order:
    - Install Tree Protection Fence
    - Install Underground Detention #2
    - Install Underground Detention #1
    - Install Proposed Trees (Revegetate/Reforest Native Plantings BMP)

Note: Refer to PCSM Plan and Details for individual construction sequencing and specifications.

PCSM BMP INSPECTIONS AND MAINTENANCE

Until the site is stabilized and during construction activities, all BMPs must be maintained properly by the contractor. All permanent maintenance procedures shall be performed by the owner. Maintenance must include inspections of all BMPs after each runoff event and on a weekly basis. All preventative and remedial maintenance work, including clean-out, repair, replacement, regrading, reseeding, remulching and renetting must be performed immediately and in accordance with these procedures, plans, and details. Any areas disturbed during maintenance must be stabilized immediately in accordance with the general conservation notes and specifications. All site inspections must be documented in an inspection log kept for this purpose indicating the compliance actions and the date, time and name of the person conducting the inspection. The inspection log must be kept on site at all times and made available to the district upon request.

Storm Drainage Systems – The stormwater management facilities including the inlets, stormwater piping, and detention basins on this site shall be maintained in proper working order in accordance with these plans and per the recommendation of the structure(s) manufacturer(s). Maintenance of these stormwater management facilities, as noted below, shall be the responsibility of the property owner(s) upon whose property the facilities are located.

All onsite inlets, manholes, and stormwater piping shall be cleared of debris every three (3) months or when accumulation hinders operation of the facility. Systems shall be flushed every five (5) years.

All sediment/debris/oil removed from the stormwater management system shall be disposed per local, state, and federal standards.

Should onsite erosion occur from the landscaped areas, source of erosion shall be immediately stabilized and the inlets, manholes, and stormwater piping shall be checked for accumulation and cleared if accumulation of sediment exists.

5.6.3 Re-Vegetate and Re-Forest Disturbed Areas, Using Native Species - Woodland areas planted with a proper cover crop can be expected to require annual mowing in order to control invasive species. Application of a carefully selected herbicide around the protective tree shelters/tubes may be necessary, reinforced by selective cutting/manual removal, if necessary. This initial maintenance routine is necessary for the first 2 to 3 years of growth and may be necessary for up to 5 years until tree growth and tree canopy begins to form, naturally inhibiting weed growth. A seasonal moving may be required, although care must be taken to make sure that any management is coordinated with essential reseeding and other important aspects of meadow re-establishment.

6.6.3 Underground Extended Detention Basins – basins shall be inspected for litter and sediment accumulation on an annual basis or as directed by the township engineer. Needed maintenance should be initiated immediately after the inspection. The litter and sediment must be removed to restore design capacities. The litter and sediment shall be disposed of in an approved manner and in accordance with applicable state regulations. Any areas disturbed during maintenance must be stabilized immediately in accordance with the general conservation notes and specifications.

At a minimum, the long-term operation and maintenance schedule must meet 25 PA. Code § 102.8(f)(10) and include the following:

1. Upgradient catch basins and inlets should be inspected and cleaned annually, or more often if historical maintenance records suggest a more frequent cleaning.
2. The vegetation (for the contributing drainage area) should be maintained in good condition, and any bare spots revegetated.

3. Care should be taken to avoid excessive compaction by mowers. Mow only as appropriate for vegetative species.
4. Inspect at least two times per year after runoff events greater than 0.8 inch and make sure that runoff drains down within the design parameters. Water level should be drawn down to 0.7 inches above IWS level (UG1: 13 inches from bottom of structure).
5. At least two times per year, or more if historical maintenance indicate it is necessary, inspect for accumulation of sediment, damage to outlet control structures, erosion, signs of water contamination/spills, and instability. Leaf litter needs to be removed annually.
6. As needed, remove accumulated sediment as required to maintain infiltration through the MRCs soil media and to maintain water quality functionality. Restore original cross section. Properly dispose of sediment.
7. If porous pavement is included in the design, vacuum at least twice per year. Vacuum should have sufficient suction power and be designed for use with porous pavements.
8. All MRC bmp components should be maintained as indicated in the stormwater bmp manual.

6.6.4 - Water Quality Filters & Hydrodynamic Devices - Maintenance is crucial to the effectiveness of this BMP and should be conducted in accordance with manufacturer recommendations. More frequent cleaning is desired and some sites benefit from keeping a log of removed sediment amount to determine a cleaning schedule. Disposal of removed material will depend on the nature of the drainage area and the intent and function of the water quality insert.

MRC# Narrative – Multiple Facilities

This Narrative applies to the following facilities:

- **Underground Basin UG1**
- **Underground Basin UG2**

This appendix contains the following items:

- Summary of the 13 MRC design standards as utilized for the above-referenced basins
- MRC BMP Alternative Analysis
- MRC Design Summary Sheet
- MRC 1 inch Storm Summary and Hydrographs

Construction details of the facility and outlet control structure are located on the corresponding PCSM detail sheet. The pre and post construction drainage area maps are contained within appendix D of this report. CN calculations, Time of Concentration, Hydrographs and Summary Sheets for the 1, 2, 10, 50 & 100-yr Storm Events can be found within the main body of this report.

MRC BMP DESIGN STANDARDS

The above-referenced facilities incorporate the Managed Release Concept (MRC) to treat the entire tributary flow from the 2-year storm. The underground facility will be constructed from manufactured chambers outfitted with inspection ports for ease of maintenance. Maintenance will be performed per the chamber manufacture's guidelines. The underground facility is also proposed to be lined will an impermeable liner to prevent the infiltration of runoff into native soils.

1. **Runoff Capture** – The basins are designed to capture and treat the first one inch of runoff from all new impervious surfaces tributary to it. One inch storm event has been modeled and routed through the facility as well as the 2-yr, 10-yr, 50-yr and 100-yr storm events. The areas tributary to the facility has been delineated and hydrographs have been generated using the SCS Method and HydroCAD software. The corresponding hydrographs are located within this appendix.

2. **Release Rate** - The outlet control structure will achieve a release rate of 0.01 cfs per acre of impervious area tributary to the facility. The release rate summary and corresponding hydrographs are located within this appendix.

3. **Internal Water Storage (IWS)** -There is no IWS as these facilities are designed as Non-vegetated MRC basins for the purpose of vegetation credit. No infiltration is proposed due to poor infiltration rates.

4. **Peak Flow Attenuation** - The outlet control structure will reduce the 2-yr post development peak flow to the 1-yr pre-development peak flow, and will also control peak flows from the 10, 50 & 100-yr storm events via a secondary orifice and weir in the OCS. Quarterly inspections and inspections following 10, 50 1nd 100-yr storm events of basin and OCS are specified in this PCSM Report and on the PCSM plans. The release rate summary and corresponding hydrographs are located within this appendix.

5. **Stormwater BMP Manual** – All facilities use the MRC BMP - Non-vegetated MRC: Underground Storage Chambers standards due to poor infiltration rates and high groundwater.

6. **MRC BMP Selection** – Due to high groundwater and poor infiltration rates, all facilities use a standard MRC BMP - Non-vegetated MRC: Underground Storage Chambers standards, even the

above-ground facility (which is not able to achieve required soil media depth for Vegetated WQ benefit). Vegetated MRC and/or Non-vegetated MRC: porous pavement were not used as they contain an infiltration component that is not feasible for this site. The proposed design utilizes pre-treatment via water quality insert filters and sump & snout to treat surface runoff prior to it entering the MRC facility and ultimate discharge to the surface water. PCSM Spreadsheets for Rate and Water Quality demonstrating 85% removal of TSS for the contributing tributary are included within this appendix.

7. **Pre-Development Site Characterization and Assessment of Soil and Geology** – Infiltration testing was performed and resulted in poor rates making infiltration infeasible on the project site. Geotechnical testing (See report appendix) revealed several limiting factors including water, mottling, weathered rock, and bedrock.

8. **Separation Distance** – Due to poor infiltration rates, the proposed non-infiltrating MRC detention facilities will be lined (impermeable) and will not utilize soil media. Soil media and limiting zones are not applicable to the proposed impermeable detention facilities.

9. **Ponding Depth and Drawdown Time** - The maximum ponding for the 2-yr/24 hr storm will drawdown in less than three days for above-ground systems and less than seven days as required for subsurface MRC systems. Supporting drawdown calculations are contained within this appendix.

10. **Soil Media** - is not utilized as part of the facility due to poor infiltration rates.

11. **Underdrain Design** - is not utilized as there is no infiltration component or IWS in the facility due to poor infiltration rates.

12. **Discharge Flow Path** – A winged endwall with rip rap apron is utilized at each discharge outfall for outlet protection to the receiving water. Level Spreaders are not utilized to minimize disturbance to the stream bank and reduce the potential for re-channelization on the stream banks. Project outfalls are directly into the receiving waters.

13. **Antidegradation Requirements** – are not required as the Neshaminy Creek is not a HQ or EV water.

MRC BMP ALTERNATIVE ANALYSIS

Due to the restrictions of the aforementioned limiting zones and infiltration rates, BMPs utilizing infiltration to meet the regulatory requirements under § 102.8(g)(2) are technically infeasible. BMPs utilizing methods other than infiltration have been incorporated into the PCSM design, where appropriate, and used on site to the maximum extent feasible to treat the water quality volume (WQv) resulting from the post-development condition. To meet the shortfall associated with the volume that would normally be treated with an infiltration BMP, the Managed Release Concept (MRC) is proposed utilizing the standard "**Non-vegetated MRC: Underground Storage Chambers**" design criteria. To justify the use of an alternative PCSM BMP, the following is a summary of BMPs used on site for volume reduction and those determined to be not practical, demonstrating the applicant's intent to utilize traditional BMPs to the maximum extent feasible prior to considering an alternate PCSM design (i.e. MRC).

BMP 5.4.1 Protect Sensitive and Special Value Features – Protect sensitive/natural features has been proposed by way of a LOD reduction standpoint, including certain trees and the streambank to the extent feasible. Protection of all sensitive/natural features is not feasible due to the operational needs of the proposed facilities.

BMP 5.4.2 Protect/Conserve/Enhance Riparian Areas – Proposed to maximum extent possible by limiting and minimizing disturbance along the stream banks and wooded areas.

BMP 5.4.3 Protect/Utilize Natural Flow Pathways in Overall Stormwater Planning and Design - Proposed to maximum extent possible by limiting and minimizing disturbance along the stream banks and wooded areas and maintaining the same relative drainage patters.

BMP 5.5.1 Cluster Uses at Each Site; Build on the Smallest Area Possible - This BMP is not feasible due to floodplain constraints, as the entire site is within the 100 year floodplain.

BMP 5.5.2 Concentrate Uses Areawide through Smart Growth Practices - This BMP is not feasible due to floodplain constraints, as the entire site is within the 100 year floodplain.

BMP 5.6.1 Minimize Total Disturbed Area – Proposed by minimizing disturbance and grading along the stream banks, slopes and wooded areas with Tree protection fencing and demarcation of LOD.

BMP 5.6.2 Minimize Soil Compaction in Disturbed Areas - Proposed to the maximum extent possible by minimizing disturbance and grading along the stream banks, slopes and wooded areas with Tree protection fencing and demarcation of LOD.

BMP 5.6.3 Re-Vegetate and Re-Forest Disturbed Areas, Using Native Species – The majority of existing on-site trees and plant material are proposed to be protected during construction with tree protection fence. Moreover, planting of native species is proposed as part of the Landscape Plan.

BMP 5.7.1 Reduce Street Imperviousness – no streets are proposed with this project

BMP 5.7.2 Reduce Parking Imperviousness - A reduction in parking spaces is not proposed due to ordinance requirements.

BMP 5.8.1 Rooftop Disconnection – is not proposed. In POI#001, Managed Release Concept (MRC) is utilized to treat the entire tributary flow from the 2-year storm.

BMP 5.8.2 Disconnection from Storm Sewers - is not proposed. In POI#001, Managed Release Concept (MRC) is utilized to treat the entire tributary flow from the 2-year storm.

BMP 5.9.1 Streetsweeping - is not utilized due to the access limitations to the site and type of use.

BMP 6.4.1 Pervious Pavement with Infiltration Bed - is not proposed, as it has been determined to be infeasible due to both maintenance costs and the operational needs of the proposed facilities.

BMP 6.4.2 Infiltration Basin – is not proposed due to poor infiltration rates. In POI#001, Managed Release Concept (MRC) will be utilized to treat the entire tributary flow from the 2-year storm.

BMP 6.4.3 Subsurface Infiltration Bed - is not proposed due to poor infiltration rates. In POI#001, Managed Release Concept (MRC) will be utilized to treat the entire tributary flow from the 2-year storm.

BMP 6.4.4 Infiltration Trench - is not proposed due to poor infiltration rates. In POI#001, Managed Release Concept (MRC) will be utilized to treat the entire tributary flow from the 2-year storm.

BMP 6.4.5 Rain Garden/Bioretention - is not proposed for water quality as water quality is provided through a series of other BMPs.

BMP 6.4.6 Dry Well / Seepage Pit - are not proposed for recharge due to several limiting factors (See Appendix D). In POI#001, Managed Release Concept (MRC) will be utilized to treat the entire tributary flow from the 2-year storm.

BMP 6.4.7 Constructed Filter - is not proposed for water quality as water quality is provided through a series of other BMPs.

BMP 6.4.8 Vegetated Swale - are not proposed due to limited opportunity based on the site layout, as all proposed discharges are point source directly into surface waters.

BMP 6.4.9 Vegetated Filter Strip - is not utilized as all proposed discharges are point source directly into surface waters.

BMP 6.4.10 Infiltration Berm & Retentive Grading – is not proposed due to limited opportunity based on the site layout and on poor infiltration rates. Several existing wetland areas on the site naturally provide retentive grading.

BMP 6.5.1 Vegetated Roof - is not proposed for volume reduction, as it has been determined to be infeasible due to the design and maintenance costs; additionally, this entire 2-year volume will flow through a water quality inlet.

BMP 6.5.2 Runoff Capture & Reuse – Not feasible due to the lack of ability to spray during the winter. Additional water quality will be achieved through pretreatment of Managed Release Concept (MRC) basins UG1, and UG2; and through the planting of native vegetation as part of this project, which will decrease runoff and promote soil infiltration.

BMP 6.6.1 Constructed Wetland - Is not proposed, as disturbance and grading along the stream banks, slopes and wooded areas will be minimized with Tree protection fencing and demarcation of LOD.

BMP 6.6.2 Wet Pond/Retention Basin - is not proposed for peak rate control as this is provided through capture and reuse/spray irrigation and MRC.

BMP 6.6.3 Dry Extended Detention Basin - is utilized in UG1, UG2, and UG3 to control peak rate and volume of runoff through MRC method.

BMP 6.6.4 Water Quality Filters & Hydrodynamic Devices - are utilized as water quality pre-treatment of rooftop and parking surface runoff prior to entering the underground detention facilities and ultimate discharge to surface waters.

BMP 6.7.1 Riparian Buffer Restoration - is not utilized, disturbance to the existing riparian area is minimized.

BMP 6.7.2 Landscape Restoration - is utilized to the maximum extent possible by protection of existing trees and planting of proposed native species.

BMP 6.7.3 Soil Amendment & Restoration – Soil amendments are not proposed as there is limited topsoil areas on the site to amend due to extensive on-site impervious, as well as the fact that most soil areas are outside the LOD (see protect sensitive/natural features), and therefore provision of extensive soil amendments would result in extensive additional disturbance to provide limited volume benefit.

BMP 6.7.4 Floodplain Restoration – Is not proposed, as this BMP is only considered where there is minimal interaction between groundwater, stream base flow, and root systems; furthermore, the

disturbance associated with the improvements that affects the floodplain is covered under a separate permit.

BMP 6.8.1 Level Spreader – are not utilized to minimize disturbance and the potential for re-channelization on the stream banks. Project outfalls are directly into the receiving waters.

BMP 6.8.2 Special Detention Areas - Parking Lot, Rooftop – are not utilized as there is no need or requirement for them on the project.

MRC - 13 Design Standards (August 25, 2020 Version 1.2)

NPDES Permit application number: PAC460822Page **1** of **11**
Municipality: Whitemarsh Township
County: Montgomery
MRC Identification: UG1

1. **Runoff Capture** – The runoff from the 1.2-inch/2-hour storm from the contributing watershed that the MRC is intended to treat should be captured and managed by the MRC BMP, without overflow. The runoff is filtered through vegetated media or treated and filtered to the extent practicable through the on-site undisturbed soils or other acceptable treatment systems, and released through the underdrain as indicated in MRC Standard 2. The MRC BMP may be designed for offsetting when contributing non-regulated earth disturbance (either impervious area or compacted pervious areas) is present in the contributing drainage area. Uncompacted pervious surfaces outside the disturbed area should be bypassed to the maximum extent practical.

   NOTE 1 – Runoff from existing similar impervious and compacted pervious areas can be used to offset undetained areas. The runoff volume for the 1.2 inch/2-hour storm from the two areas must be equivalent (See Figure 2). In addition, the pollutant contribution as determined through land use of the two areas should be similar.

   NOTE 2 – A composite Curve Number is not adequate for the modeling of the 1.2 inch/2-hour storm due to the large error associated with averaging of initial abstractions for storms less than or equal to the 2-year/24hour storm event. Curve numbers must be separate for this analysis.

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

UG1#1 will capture and treat the first 1.2 of runoff from all new impervious surfaces tributary to it. One inch storm event has been modeled and routed through the facility as well as the 1-yr, 2-yr, 10-yr, 50-yr and 100-yr storm events. The areas tributary to the facility have been delineated and hydrographs have been generated using the SCS Method and HydroCAD software.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

Drainage area shown on Plan Sheet C-1002. Drainage area calculations for the WQ storm are included on pages 295-304 of the Post-Construction Stormwater Management Narrative Report. Drainage area calculations and the corresponding hydrographs for the 1-yr, 2-yr, 10-yr, 50-yr and 100-yr storm events are located on pages 103-112 (1-yr), 123-132 (2-yr), 163-172 (10-yr), 203-212 (50-yr) and 223-232 (100-yr) of the Post-Construction Stormwater Management Narrative Report. The corresponding hydrographs for the 1.2-inch/2 hour storm event are located on pages 268-289 of the Post-Construction Stormwater Management Narrative Report.

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2. **Release Rate for the 1.2-inch/2-hour Storm** – The stormwater release rate from the MRC BMP for the 1.2inch/2-hour storm should not exceed 0.01 cubic feet per second (cfs) from the equivalent impervious area. To obtain the equivalent impervious area being managed by a MRC BMP, determine the total volume of runoff generated during the 1.2-inch/2-hour event from all

pervious and impervious areas contributing to the MRC and divide by 0.0833 feet. This release rate is rounded to the nearest hundredth of a cfs (e.g., 1.576 ac. is 0.01576 cfs, rounded to 0.02 cfs). Routing is necessary to demonstrate compliance with the standard for release rate.

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

The outlet control structure for UG1 will feature a 1.00 inch diameter MRC orifice in a weir plate to achieve a release rate of 0.01 cfs per acre of impervious area tributary to the facility. The release rate summary and corresponding hydrographs are located within this appendix. The release rate calculation: 6,655 cf / 0.0833 = 79,891.957 cubic inches: 79,891.957 / 43,560 = 1.83 acres (equivalent impervious area): 1.86 x 0.01 = 0.0186 cfs or 0.02 cfs rounded.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

MRC Release rate calculations for the WQ storm are included in the corresponding hydrographs for the 1.2-inch/2-hour storm event. The MRC Design Summary is located on pages 362-363 of the Post-Construction Stormwater Management Narrative Report. The Equivalent impervious Area Calculations are located on page 364 of the Post-Construction Stormwater Management Narrative Report. The hydrographs are located on pages 268-289 of the Post-Construction Stormwater Management Narrative Report.

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3. **Internal Water Storage (IWS)** – A volume for IWS should be provided that is at least one foot deep below the lowest structural outlet (i.e., the outlet for the underdrain) in the MRC BMP to encourage ET, infiltration and denitrification. To encourage ET, the overall soil media depth of a facility including the IWS can be no deeper than four (4) feet, and up to 50% of the IWS void volume can be included (only for vegetated MRC BMPs) as available storage during hydrologic routings to demonstrate compliance with the standards for the release rate (No. 2 above) and peak flow attenuation (No. 4 below). For soil media, a void space of 30% can be used to describe the soil volume storage and recovery. If a void space of 30% is to be used, the void space in the soil media in the IWS should be modeled at 15% (0.5 x 0.3 void space = 0.15 or 15%). If an alternate void space is used for soil media, specific data demonstrating the void space should be submitted. For non-vegetated MRC designs, the IWS must be above the underdrain, but below the outlet, to promote a change of the stormwater stored during rain events.

   Use of Liners and Infiltration – The MRC BMP should not have an impervious liner installed unless environmental or geological conditions necessitate use of a liner, or if an existing structure would be damaged as a result of not lining the facility. Although MRC BMPs are for areas with infiltration limitations, whatever infiltration that can be achieved is encouraged. Measured saturated hydraulic conductivity rates are encouraged to be used in design and modeling.

NOTE 3 – The presence of a project site in an area of known karst conditions does not, in itself, serve as evidence of the applicability of MRC to a project site or to the use of a liner to avoid infiltration. DEP and delegated CCDs reserve the right to request a detailed subsurface investigation where considered warranted to evaluate the likelihood of sinkhole formation as a result of post-construction stormwater management.

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

Basin UG1 provides 1 foot of Internal water storage, providing 1 foot of media depth within the basin, with 64.5% space available for routing purposes. The proposed basin bottom elevation for Basin UG1 is 156.53 as shown on Plan Sheet C-609. The limiting zone elevation for Basin UG1 is 159.00 (Seasonal High Water Table) per test pit INF-1 on page 22 of the Stormwater Infiltration Report report and page 29 of the Post-Construction Stormwater Management Narrative Report. The Groundwater separation for UG1 is -2.47 feet to the underdrain invert elevation and must be lined.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

The limiting zone elevations are found on page 22 of the Stormwater Infiltration Report report and page 29 of the Post-Construction Stormwater Management Narrative Report.

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4. **Geomorphologic Peak Flow Management for the 2-year/24-hour Event** – The peak flow from the postconstruction 2-year/24-hour storm should be managed back to the pre-construction 1-year/24-hour storm peak flow, unless an approved and current Act 167 Plan or another requirement (such as limited capacity of a downstream channel) is more restrictive. In general, this rate is determined at the project point of interest. In the event the MRC drainage area is part of a larger overall site with non-MRC BMPs, only the MRC drainage peak flows should be managed back to the 1-year/24-hour level and overflows can be combined with flows from the non-MRC BMPs.

   In situations where the pre-construction drainage area to the MRC BMP varies significantly compared to the post-construction drainage area, the post-construction drainage area boundary to the MRC BMP (using existing land uses) can be used to calculate the target pre-construction 1-year/24-hour rate, as long as all areas in question are in close proximity to the MRC BMP and drain to the same surface water. In cases where the BMP is managing additional volume to offset adjacent areas that could not be captured in the MRC BMP, the targeted pre-construction 1-year/24-hour release rate should be calculated based on the combined flow rates from the BMP drainage area and adjacent area.

   NOTE 4 – This standard is used to ensure that MRC does not contribute to channel-eroding flows in receiving surface waters.

NOTE 5 – This release rate (0.01 cfs / equivalent impervious acre) is approximately the expected rate of interflow (lateral movement of stormwater to a stream) after a 2-year/24-hour storm event for a Pennsylvania non-karst watershed based on the NRCS curvilinear unit hydrograph. Releasing at this rate will produce a condition where baseflow contributions will be similar to that of an undeveloped area during and after storm events. As the level of outflow would be similar to what would be expected during and after the storm, it would not be expected to impact the storm event's effects on flooding and erosion. This rate should also be used for karst watersheds unless it can be demonstrated that interflow on a particular project site differs from this standard (such a demonstration would be considered an alternative to the MRC Design Standard).

Flows Greater Than 2-Year/24-Hour Storm – The recommended design for MRC BMPs is to bypass storm events larger than the 2-year/24-hour storm to a rate control BMP; however, DEP understands that site and cost limitations may not allow for this bypass. When it is demonstrated by the licensed professional engineer that larger storm events cannot reasonably be bypassed, the MRC BMP surface component should be designed to manage the post-construction 10-, 50- and 100-year/24-hour storm event peak flows to their corresponding pre-construction rates and the MRC BMP should have an increased (i.e., more frequent) inspection and maintenance schedule that includes inspection and repair after extreme events (10-, 50- and 100-year/24-hour storm events).

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

The outlet control structure for UG1 will feature a 1.00 inch diameter MRC orifice in a weir plate to reduce the 2-yr post development peak flow to the 1-yr pre-development peak flow. UG1 also controls peak flows from the 10, 50 & 100-yr storm events via a secondary orifice and weir in the OCS. Quarterly inspections and inspections following 0.8 inch storm events, 2, 10, 50 and 100-yr storm events of basin and OCS are specified in this PCSM Report and on the PCSM plans. The release rate summary and corresponding hydrographs are located within this appendix.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

Outlet control structure details shown on C-609. MRC release rate calculations for the 1.2 inch/2-hour WQ storm are included on pages 268-289, and release rate calculations for the 2-yr WQ storm are included on pages 295-304 of the Post-Construction Stormwater Management Narrative Report. Release rates for 1-100 year storms are included on pages 103-112 (1-yr), 123-132 (2-yr), 163-172 (10-yr), 203-212 (50-yr) and 223-232 (100-yr) of the Post-Construction Stormwater Management Narrative Report.

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5. **Stormwater BMP Manual** – Follow the design considerations for BMPs as presented in the Pennsylvania Stormwater Best Management Practices Manual (Stormwater BMP Manual) (363-

0300-002), as revised. MRC may be incorporated into the design of any BMP by a licensed professional engineer.

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

UG1 uses a standard MRC BMP – Underground MRC guidelines, and was originally based on the Managed Release Concept Basin guidance per the PA DEP BMP Manual, latest edition (MRC Design Guide August 2020).

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

Description of how the basin meets MRC guidance included on pages 9-13 of the Post-Construction Stormwater Management Narrative Report.

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6. **MRC BMP Selection** – Standard MRC BMPs include the following system types:

   a. **Vegetated MRC** – Vegetation must be provided for 75% of the surface of the MRC BMP. Native vegetation should be selected by the licensed professional engineer in consultation with a professional that is knowledgeable in native plant ecology. Vegetation should be selected based on the plants' ability to grow within the anticipated conditions considering the depth and duration of stormwater stored in the MRC BMP.

   b. **Non-vegetated MRC: Porous Pavement** – Porous pavements with a storage bed require a vacuum street sweeping maintenance regime adequate for the drainage area characteristics; the vacuum street sweeping equipment must provide adequate suction capacity to remove particles on the pavement's surface to provide a sufficient water quality demonstration and to maintain flow pathways.

   c. **Non-vegetated MRC: Underground Storage Chambers** – Underground storage chambers must be accessible for maintenance, and for this reason underground storage is not recommended to be rock beds. The water quality demonstration is then made through the Quality Worksheet on the DEP Spreadsheet. DEP highly recommends that designers consider adequate pretreatment as necessary for system longevity.

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

UG1 uses a standard MRC BMP – Non-vegetated MRC design. Vegetated MRC and/or Non-vegetated MRC: Porous Pavement were not used as the site does provide for a suitable location. The proposed design utilizes water quality pre-treatment via hydrodynamic devices and soil amendments prior to it entering the MRC facility.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

Description of how the basin meets MRC guidance included on pages 9-13 of the Post-Construction Stormwater Management Narrative Report. Basin design and details are contained on Plan Sheets C-609.

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7. **Pre-Development Site Characterization and Assessment of Soil and Geology** – Adequate and appropriate soils and geologic testing and evaluation must be performed to demonstrate the infiltration capacity of the entire project site to the satisfaction of DEP. At a minimum, one infiltration test for every 40,000 square feet of disturbed acreage should be performed with a minimum of four tests, equally distributed across a site. The infiltration tests must be done in the most accommodating soil horizon for infiltration as demonstrated by a deep hole test within 100 feet of the infiltration test. All other sections of Appendix C Protocol 1, Site Evaluation and Soil Infiltration Testing and Appendix C Protocol 2, Infiltration Systems Guidelines per the Stormwater BMP Manual (as revised) should be followed to clearly demonstrate the infiltration capability of on-site undisturbed soils at applicable elevations and for a variety of locations. Soil probes and infiltration test locations should be identified on the PCSM Plan drawing(s). The use of soil borings as a substitute for test pits can be used as a planning tool but will not generally be accepted for final design of infiltration MRC BMPs.

   NOTE 6 – The above recommended number of infiltration tests per disturbed area is to be based upon the disturbed area that is not considered a restoration activity or road maintenance activity. For example, a large sewer main installation project disturbs 30 acres in total, with 29 acres of disturbance for the sewer line installation (that will be covered by a restoration plan) and 1 acre of disturbance for a pumping station that requires a PCSM plan. The recommended number of infiltration tests would be based on the 1 acre, not 30 acres.

   NOTE 7 – The minimum number of tests can be reduced, if it can be demonstrated that the subsurface conditions are uniform; however, this is considered a deviation from MRC Design Standards, requiring an individual permit.

   NOTE 8 – Infiltration tests resulting in saturated hydraulic conductivities (as identified in the field) of less than or equal to 0.2 inch per hour (prior to application of a safety factor) classify as extremely limited. This is a saturated hydraulic conductivity representative of the lower part of the range of HSG C soils and HSG D soils.

   NOTE 9 – Research has shown that limited infiltration rates (i.e., less than or equal to 0.2 inch per hour) over time with an IWS can result in measurable losses from a BMP. Therefore, a designer can use results from the infiltration testing to describe infiltration losses for unlined MRC BMPs or utilize an infiltration rate of 0. Testing for infiltration rates should be performed as per Protocol 1 of Appendix C of the Stormwater BMP Manual (as revised). The recommendation

in Protocol 2 of Appendix C that "soils underlying infiltration devices should have infiltration rates between 0.1 and 10 inches per hour" does not apply to MRC BMPs.

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

Infiltration test results were not favorable in multiple locations on the projects site, yielding a 0.00 in/hr geometric mean rate. As such, the Managed Release Concept released has been utilized for volume control. The managed release is utilized underground detention facility UG1 in accordance with the Managed Release Concept (MRC) technical paper released by PADEP on December 13, 2018, latest revision August 2020. The proposed development will also introduce structural and non-structural stormwater best management practices (BMP's) in order to control the rate and volume of stormwater runoff. A combination of traditional volume controls and managed release will be implemented to control volume and rate to required levels per CG-1, as well as comply with water quality requirements per PADEP requirements.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

Description of site geotechnical investigation is included in the Stormwater Infiltration Report, pages 2-7.

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8. **Separation Distance** – At least one foot of separation distance should be maintained between groundwater or the seasonally high-water table and the bottom footprint of the MRC BMP's soil media; however, a two-foot separation is preferred. There is no minimum separation required between bedrock or hardpan and the MRC BMP's soil media.

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

Basin UG1 is within the groundwater elevation and lined per MRC guidelines.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

The proposed basin bottom elevation for Basin UG1 is 156.53 as shown on Plan Sheet C-609. The limiting zone elevation for Basin UG1 is 159.00 (Seasonal High Water Table) per test pit INF-1 on page 22 of the Stormwater Infiltration Report report and page 29 of the Post-Construction Stormwater Management Narrative Report. The Groundwater separation for UG1 is -2.47 feet to the basin bottom elevation and must be lined.

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9. **Ponding Depth and Drawdown time** – The maximum ponding time (i.e., the time after the end of the storm event for stored surface water to lower to soil surface) should not exceed 72 hours for any storm event. In general, a maximum ponding depth (i.e., storage depth above BMP

surface) of preferably one foot with a maximum of two feet at the peak of the 2-year/24-hour storm event should not be exceeded for the design of surface BMPs. In accordance with MRC Design Standard 4, the MRC could incorporate a multi-stage detention facility with the upper portions of the facility providing flow attenuation for storm events greater than a 2-year/24hour storm, to meet 25 Pa. Code § 102.8(g)(3). An engineered overflow structure or reinforced spillway / berm should be installed to provide safe conveyance for storm events greater than a 2-year/24-hour storm. Ponding depth for storms larger than the 2-year/24-hour storm should not exceed four feet, and drawdown to the MRC BMP surface should not exceed 72 hours for all design storms. For underground storage chambers and porous pavement MRC systems, drawdown to the IWS storage level should not exceed 7 days.

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

The maximum ponding for the 2-yr/24 hr storm will drawdown in less than seven days as required for subsurface MRC systems. Drawdown time for the storms are 117.50 hours (2-yr), 118.00 hours (10, yr), 118.00 hours (50-yr), and 118.00 hours (100-yr) Supporting drawdown calculations are contained within the narrative report on the hydrograph tables.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

The corresponding hydrographs showing drawdown time for the 2-yr, 10-yr, 50-yr and 100-yr storm events are located on pages 123-132 (2-yr), 163-172 (10-yr), 203-212 (50-yr) and 223-232 (100-yr) of the Post-Construction Stormwater Management Narrative Report.

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10. **Soil Media** – The selection of soil media should be done by considering anticipated pollutants to be treated and the vegetation that will be used. On-site soils should be evaluated for desired characteristics and infiltration capabilities as listed below. The depth of the soil media above the invert elevation of the underdrain pipe should be a minimum of 2 feet (24 inches) to provide pollutant removal. If on-site undisturbed soils are unsuitable for the purpose of providing IWS, an additional one to two feet of suitable soil media should be provided below the underdrain.

    Soil Media Drainage – The designer will need to exercise caution when selecting a soil media, as there is a delicate balance between infiltration rate and residence time. To maximize water quality treatment, the residence time within the soil media used in MRC BMPs should be selected to be close to the parameters established for infiltration into native soils. The designer will need to select a soil media that provide the proper infiltration rate and ponding time to achieve water quality for the anticipated life cycle of the BMP.

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

No Planting soil media is proposed as the basins are subsurface basins.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

N/A

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11. **Underdrain Design** – The licensed professional engineer can refer to PennDOT Publication 408 Section 610 for specifications of underdrains. However, underdrains should have a minimum flow rate of 10 gallons (1.34 cubic feet) per minute per linear foot of pipe not considering the flow control orifice or upturned elbow. For non-vegetated MRC BMPs, the underdrain should be located at the bottom of the IWS to promote movement of water from previous storms. There may need to be multiple underdrains, or longer underdrains, to provide adequate design capacity for drainage. Section 6.4.7 (Constructed Filter) of the Stormwater BMP Manual (as revised) has recommended design standards for lateral spacing of multiple underdrains.

    IWS Outflow with Capped / Orifice Underdrain – It is highly recommended that an upturned elbow or an elevated weir be designed at the outlet of the underdrain (see Figure 1). The upturned elbow or elevated weir will create a zone within the soil media, referred to as the IWS. Research has shown that IWS can reduce runoff volume and improve water quality treatment. The upturned elbow or elevated weir can also help if site conditions present daylighting issues for the underdrain's discharge elevation. Underdrains should be capped within an outlet structure when used to allow access for maintenance. The cap should be drilled to provide an appropriately sized orifice. Figure 7 below provides an example of an underdrain detail. Note that all cleanouts and angles within the underdrain should not exceed 45 degrees. For lined, nonvegetated MRCs the underdrain leading to the upturned elbow should be located at the bottom of the IWS.

    Underdrain Aggregate Envelope – A 6-inch stone envelope of AASHTO #57 should be placed around the underdrain. A geotextile (or pea gravel diaphragm) is needed around the aggregate envelope. Note that the stone should not be placed throughout the bottom of the BMP, but just in the envelope of the underdrain.

    Cleanout for Underdrain – The underdrain(s) should be equipped with a clean-out for maintenance. The design of any clean-out should ensure that surface water does not enter the underdrain system through the top of the cleanout. Consideration must be given for cleaning and inspecting underdrains and access to the upturned elbow or elevated weir.

    Orifices – An appropriately sized orifice is necessary on the outlet of the underdrain to control flow to the required release rate (see Figure 8). The orifice should be clean, smooth and sanded so that no burs or irregularities are present. The orifice should be on a plate or cap of sufficient

thickness, and the edges of the orifice should be ground so that flow through the orifice is smooth. Orifices should be vertical. The orifice plate and other connections should be water-tight and accessible for maintenance. Control valves cannot be substituted for an orifice.

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

IWS Outflow with capped underdrain and orifice plate mounted inside the structure is utilized for rate control. Underdrain is proposed to be 4" diameter and calculations are provided to show adequate flow rate into the underdrain pipe to drain the facility. Given the very low flow leaving the facility in the water quality storm (0.01 cfs), adequate capacity is provided in the 4" perforated underdrain.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

Underdrain capacity noted on page 365 of of the Post-Construction Stormwater Management Narrative Report.

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12. **Discharge Flow Path** – The MRC BMP should be directed to a suitably vegetated flow path, which can safely convey the releases without erosion or loss of stability. The discharge should be dispersed through the use of a level spreader. A licensed professional engineer can provide an analysis, with calculations, which identifies that a level spreader is not necessary, or that discharge to a channel will not cause increased erosion.

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

An endwall is proposed for the basin outfall, which drains to the existing swale conveyance to the stream onsite. Release rate is decreased for all storms, and the flow path follows the existing drainage route.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

An offsite discharge analysis is not required for this outfall.

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13. **Antidegradation Requirements** – Where the stormwater from the project site discharges to a special protection surface water, an MRC BMP can be used to satisfy the Antidegradation Best Available Combination of Technologies (ABACT) regulatory requirements from Chapters 93 and 102 (assuming that non-discharge alternatives do not exist).

In the space below, the licensed professional should document and demonstrate how this design standard was specifically addressed in the PCSM Report (Narrative, Calculations, H&H Model, etc.).

MRC - 13 Design Standards (August 25, 2020 Version 1.2)

NPDES Permit application number: PAC460822Page **11** of **11**

Municipality: Whitemarsh Township

County: Montgomery

MRC Identification: UG1

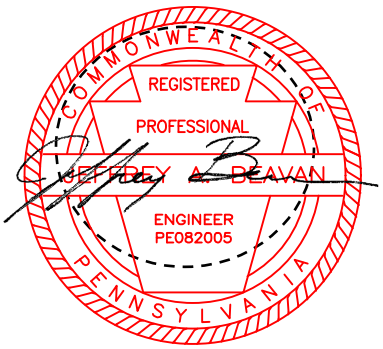
Not required as the runoff does not discharge to a HQ or EV water.

In the space below, the licensed professional should provide the cross reference (i.e. page number) to the specific location in the PCSM Report that addresses this design standard.

n/a

SEAL AND CERTIFICATION BY LICENSED PROFESSIONAL

I, Jeffrey Beavan , do hereby certify pursuant to the penalties of 18 Pa.C.S.A. 4904 to the best of my knowledge, information and belief, that the accompanying report and drawings are in conformance with Chapter 102 of the rules and regulations of the Department of Environmental Protection.





USGS MAP

SCALE: 1" = 2,000'
AMBLER QUAD

Stormwater Management Calculation Summary

GEO-TECHNOLOGY ASSOCIATES, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Project: 500-512 Pennsylvania Avenue - BMW Dealership Expansion
Project Number: 31230523
Project Location: Whitemarsh Township, Montgomery County, Pennsylvania
Client: Bohler Engineering PA, LLC

Legend
N/E = Not Encountered
N/A = Not Applicable
EGS = Existing Ground Surface Elevation
SHWT = Seasonal High Water Table

Test Boring Location	Approximate Existing Ground Surface Elevation (ft)	Proposed Cut Depth (ft)	Proposed Bottom of Bed Elevation (ft)	Soil Features Type / Encountered	Limiting Zone Depth (ft)	Limiting Zone Elevation (ft)	GTA Infiltration Test Depth (ft)	GTA Infiltration Test Elevation (ft)	Final Raw Infiltration Rate (in/hr)	Stormwater Facility Location
INF-1	163	-5	158	SHWT	4	159	4	159	0	Southwestern Basin
INF-1	163	-5	158	SHWT	4	159	5	158	0	
INF-2	163	-5	158	SHWT	8	155	4	159	0	
INF-3	165	-6	159	SHWT	6	159	4	161	0	Northwestern Basin
INF-3	165	-6	159	SHWT	6	159	6	159	0	
INF-4	165	-6	159	SHWT	8	157	5	160	0	
INF-4	165	-6	159	SHWT	8	157	6	159	0	
INF-5	165	-5.5	159.5	SHWT	4	161	6	159	0	Northeastern Basin
INF-6	165	-5.5	159.5	SHWT	8	157	5	160	0	
INF-7	164	-4	160	SHWT	8	156	4.5	159.5	0	Southeastern Basin
INF-8	163	-4	159	SHWT	4	159	4	159	0	
INF-8	163	-4	159	SHWT	4	159	5	158	0	

ALLOWABLE RELEASE RATE WORKSHEET

PROJECT: ***BMW Fort Washington***
500, 506, 510 & 512 Pennsylvania Avenue
Whitemarsh Township
Montgomery County, PA

DATE: ***7/24/2025***
BY: ***RS***
CHECKED BY: ***MRB***
SHEET NO.: ***Summary***
REVISION: ***4***

Release Rate Summary

Stormwater Peak Rate & Volume Summary - POI#1

	Storm Event (years)													
Hydrograph	**1**		**2**		**5**		**10**		**25**		**50**		**100**	
	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)
Pre-Development (cfs)	5.996	18,729	8.041	25,070	11.294	35,342	14.015	44,087	18.041	57,257	21.445	68,573	25.063	80,802
Post Development Total (cfs)	2.629	24,645	3.979	31,185	6.280	41,697	7.853	50,636	10.004	64,132	12.116	75,778	13.690	88,419
Required Release Rate Percentage														
Required Release Rate (cfs)	N/A	N/A	5.996	18,729	8.041	25,070	11.294	35,342	14.015	44,087	18.041	57,257	21.445	68,573
Pre to Post Change (cfs)	-3.367	5,916	-4.062	6,115	-5.014	6,355	-6.162	6,549	-8.037	6,875	-9.329	7,205	-11.373	7,617

Stormwater Peak Rate & Volume Summary - POI#2

	Storm Event (years)													
Hydrograph	**1**		**2**		**5**		**10**		**25**		**50**		**100**	
	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)
Pre-Development (cfs)	1.769	3,491	2.579	5,034	3.930	7,662	5.101	9,985	6.879	13,584	8.410	16,743	10.063	20,209
Post Development Total (cfs)	0.714	1,523	1.172	2,369	1.977	3,882	2.701	5,268	3.834	7,476	4.834	9,458	5.932	11,664
Required Release Rate Percentage														
Required Release Rate (cfs)	N/A	N/A	1.769	3,491	2.579	5,034	3.930	7,662	5.101	9,985	6.879	13,584	8.410	16,743
Pre to Post Change (cfs)	-1.055	-1,968	-1.407	-2,665	-1.953	-3,780	-2.400	-4,717	-3.045	-6,108	-3.576	-7,285	-4.131	-8,545

Stormwater Peak Rate & Volume Summary - TOTAL POI#1

	Storm Event (years)													
Hydrograph	**1**		**2**		**5**		**10**		**25**		**50**		**100**	
	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)
Pre-Development (cfs)	6.392	22,220	8.617	30,104	12.182	43,004	15.210	54,070	19.791	70,841	23.724	85,316	27.952	101,011
Post Development Total (cfs)	3.342	26,168	5.124	33,554	8.233	45,579	10.531	55,904	13.799	71,608	16.521	85,235	19.438	100,083
Required Release Rate Percentage														
Required Release Rate (cfs)	N/A	N/A	6.392	22,220	8.617	30,104	12.182	43,004	15.210	54,070	19.791	70,841	23.724	85,316
Pre to Post Change (cfs)	-3.050	3,948	-3.493	3,450	-3.949	2,575	-4.679	1,834	-5.992	767	-7.203	-81	-8.514	-928

Pre-Development to Post-Development Analysis

COMPUTATION SHEET : COMPOSITE CURVE NUMBER (CN)

PROJECT: ***BMW Fort Washington***
500 Pennsylvania Ave
Whitemarsh Township, Montgomery County

DATE: ***7/22/2025***
BY: ***RMS***
CHECKED BY: ***MRB***
REVISION: ***4***

Cover Type Description	Soil HSG	CN	Pre-Development DA#1 (Acres)	Pre-Development DA#2 (Acres)	Pre-Development POI#1 (Acres)	BYPASS DA#1 TO POI#1
Meadow	A	39	0.466	0.390	0.856	
Wooded	A	30	0.282	0.000	0.282	
Meadow	B	61	0.024	0.051	0.075	
Wooded	B	55	0.000	0.000	0.000	
Meadow	C	74	0.000	0.000	0.000	
Wooded	C	70	0.000	0.000	0.000	
Meadow	D	80	0.000	0.000	0.000	
Wooded	D	77	0.000	0.000	0.000	
Impervious	ALL	98	3.010	0.707	3.717	
		Total Area	3.782	1.148	4.930	
		Composite CN	**85.4**	**76.3**	**83.3**	
		Time of Concentration (Tc)	18.50	9.10	9.10	

COMPUTATION SHEET : COMPOSITE CURVE NUMBER (CN)

PROJECT: ***BMW Fort Washington***
500 Pennsylvania Ave
Whitemarsh Township, Montgomery County

DATE: ***7/22/2025***
BY: ***RMS***
CHECKED BY: ***MRB***
REVISION: ***4***

Cover Type Description	Soil HSG	CN	UG1 TO POI#001 (DP#001) (Acres)	UG2 TO POI#001 (DP#003) (Acres)	BYPASS DA#001 TO POI#001 (DP#002) (Acres)	ROOF BYPASS TO POI#001 (DP#001) (Acres)	DP#001 TOTAL (Acres)	BYPASS POI#002 TO POI#001 (DP#004) (Acres)	Post-Development POI#001 (Acres)
Open Space	A	39	0.057	0.097	0.389	0.000	0.543	0.318	0.861
Wooded	A	30	0.000	0.000	0.285	0.000	0.285	0.000	0.285
Open Space	B	61	0.000	0.000	0.000	0.000	0.000	0.107	0.107
Wooded	B	55	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Open Space	C	74	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wooded	C	70	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Open Space	D	80	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wooded	D	77	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Impervious	ALL	98	1.871	0.396	0.402	0.592	3.261	0.366	3.627
		Total Area	1.928	0.493	1.076	0.592	4.089	0.791	4.880
		Composite CN	**96.3**	**86.4**	**58.7**	**98.0**	**85.4**	**69.3**	**82.8**
		Time of Concentration (Tc)	5.00	5.00	18.50	5.00	5.00	5.00	5.00

Time of Concentration (Tc) or (Tt) Calculations

Project: **Proposed Automotive Dealership Expansion**
BMW of Fort Washington

Description: **Bypass - DP002 (to POI1)**

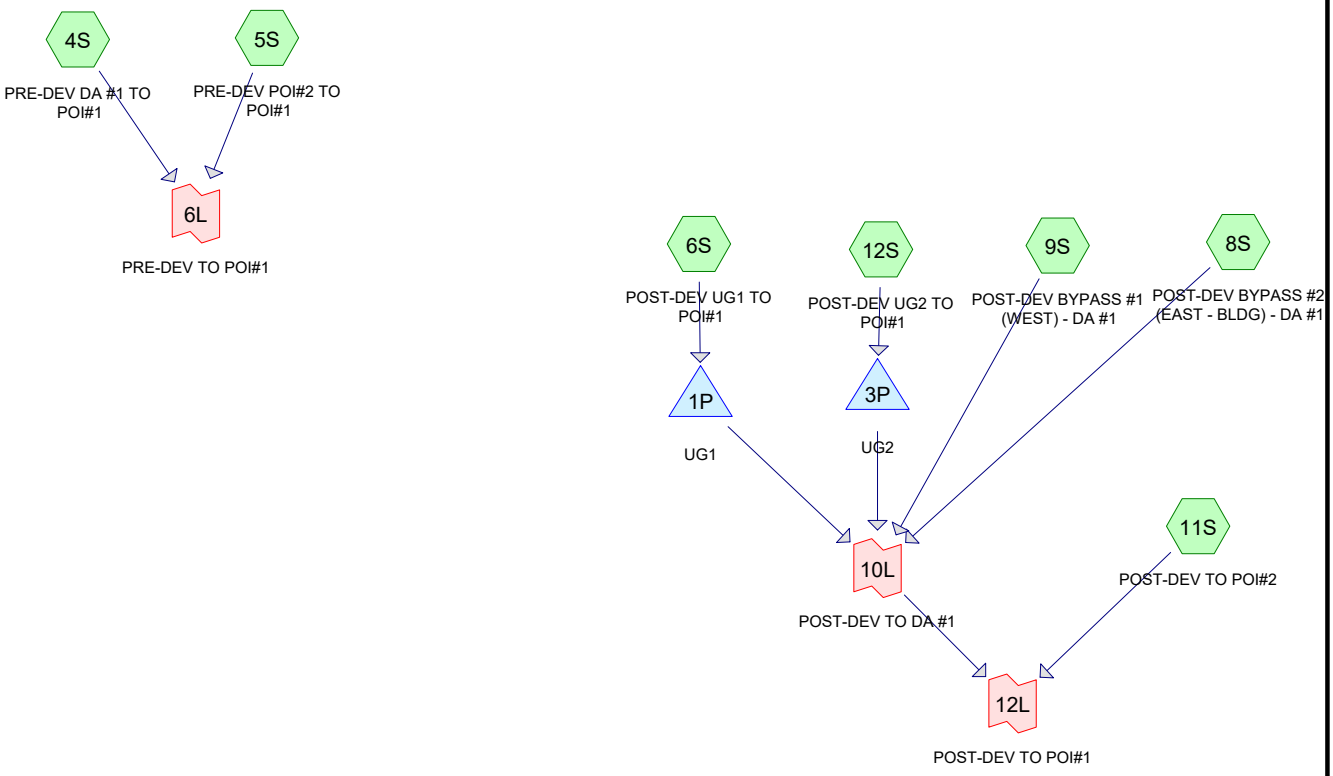
Note: Space for as many as three segments per flow type can be used for each worksheet.

Sheet Flow *(Applicable to Tc only)*		**Segment ID**	**AB**					
1. Surface Description *(table 3-1)*			Woods (light underbrush)					
2. Manning's roughness coeff., n *(table 3-1)*			0.400					
3. Flow length, L *(total L ≤ 150 ft)*		ft	43					
4. Two-yr 24-hr rainfall, P_2		in	3.23					
5. Land slope, s*		ft/ft	0.0080					
6. Tt =0.007(nL)$^{0.8}$ / $P_2^{0.5}$s$^{0.4}$		**Compute Tt**	**hr**	**0.2623**	+		+		=	**0.2623**
**S is averaged*										

Shallow Concentrated Flow		**Segment ID**						
7. Surface Description (paved or unpaved)								
8. Flow length, L		ft						
9. Watercourse slope, s*		ft/ft						
10. Average velocity, V		ft/sec						
11. Tt = L / 3600V				+		+		=	

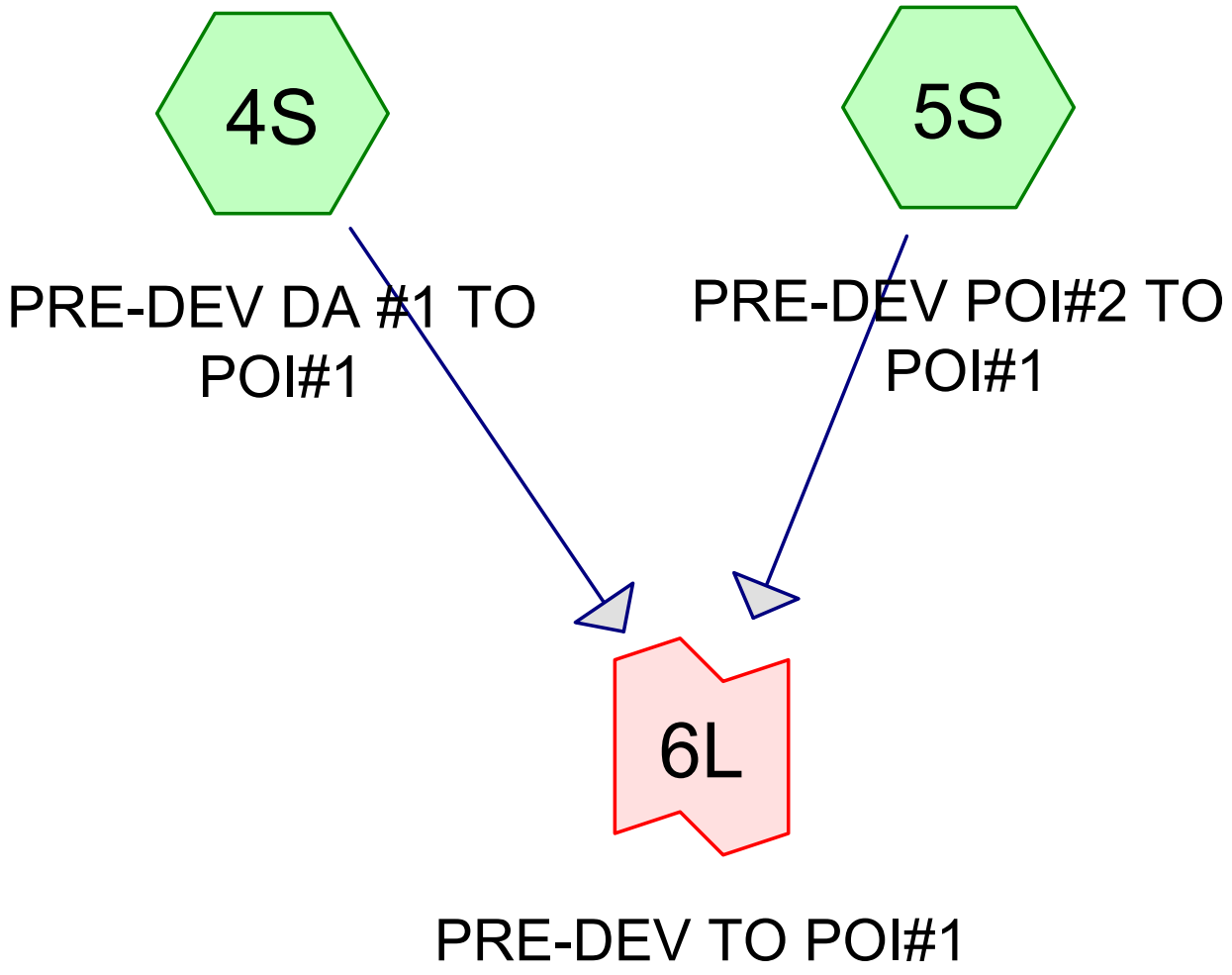
Channel Flow		**Segment ID**	**BC**	**CD**			
12. Cross sectional flow area, a		ft^2	11.50	11.50			
13. Wetted perimeter, p		ft	17.67	17.67			
14. Hydraulic radius, r = a/wp		ft	0.6510	0.6510			
15. Channel Slope, s		ft/ft	0.0110	0.0140			
16. Manning's roughness coeff., n			0.040	0.024			
17. V=1.49r$^{2/3}$s$^{1/2}$ / n			2.9345	5.5176			
18. Flow length, L		ft	325	303			
19. Tt = L / 3600V			**0.0308**	**0.0153**	+		=	**0.0460**
20. Watershed or subarea T_c or T_t (add T_t in steps 6,11, and 19)								**0.3083**

Tc = **18.50** **minutes**



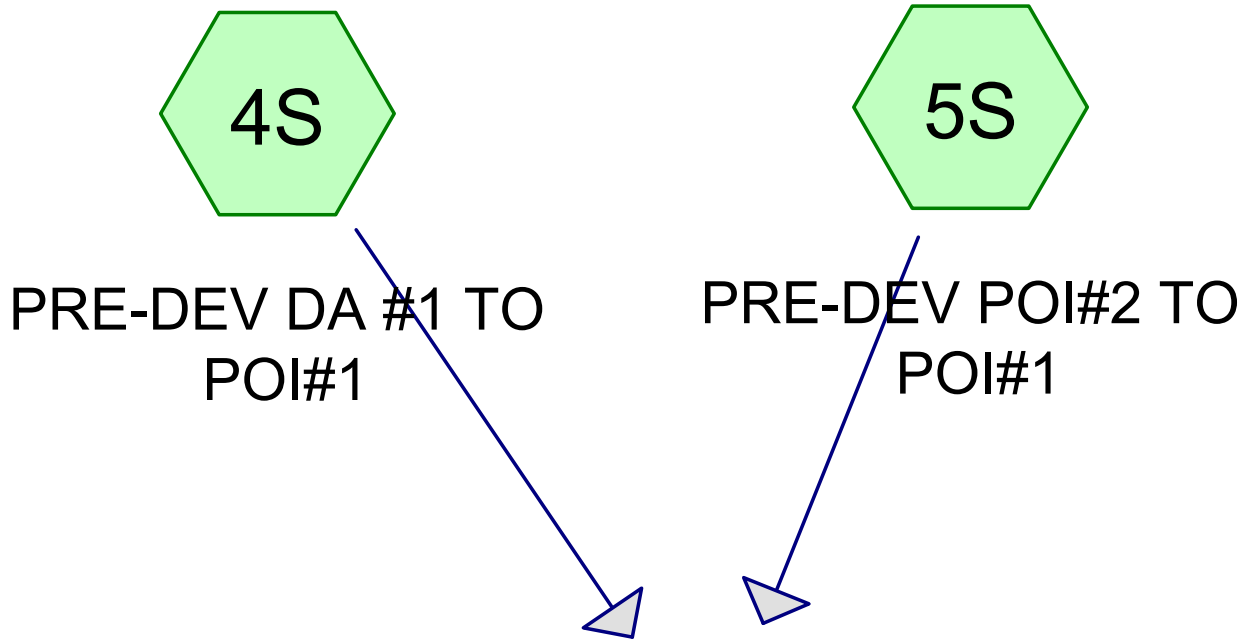
Subcat Reach Pond Link

Routing Diagram for BMW_2025-1-3
Prepared by Bohler, Printed 1/2/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC



Subcat Reach Pond Link

Routing Diagram for BMW_2025-1-3
Prepared by Bohler, Printed 1/2/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC



Subcat Reach Pond Link

Routing Diagram for BMW_2025-7-24_2
Prepared by Bohler, Printed 7/24/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Summary for Subcatchment 4S: PRE-DEV DA #1 TO POI#1

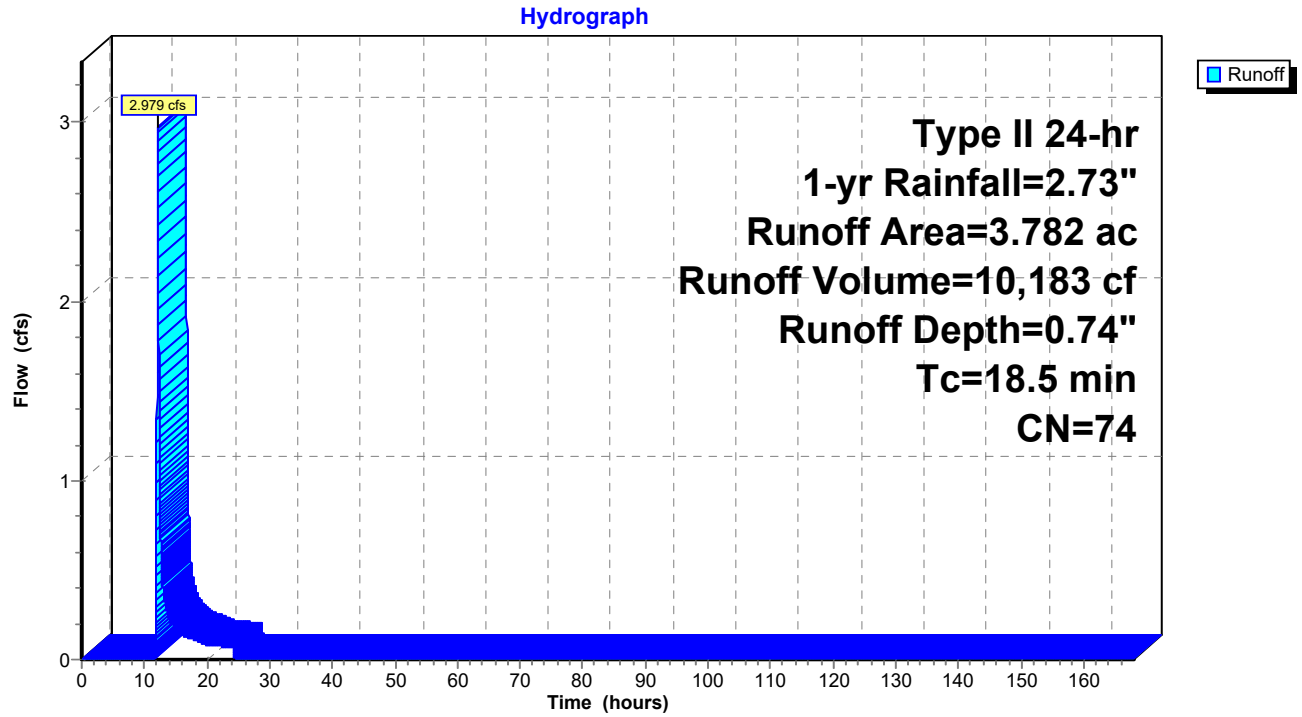
Runoff = 2.979 cfs @ 12.13 hrs, Volume= 10,183 cf, Depth= 0.74"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-yr Rainfall=2.73"

	Area (ac)	CN	Description
*	0.466	30	Meadow A
*	0.282	30	Wooded A
*	0.024	58	Meadow B
*	2.410	98	Impervious
*	0.590	30	Impervious As Meadow (A)
*	0.010	58	Impervious as Meadow (B)
	3.782	74	Weighted Average
	1.372		36.28% Pervious Area
	2.410		63.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 4S: PRE-DEV DA #1 TO POI#1



Summary for Subcatchment 5S: PRE-DEV POI#2 TO POI#1

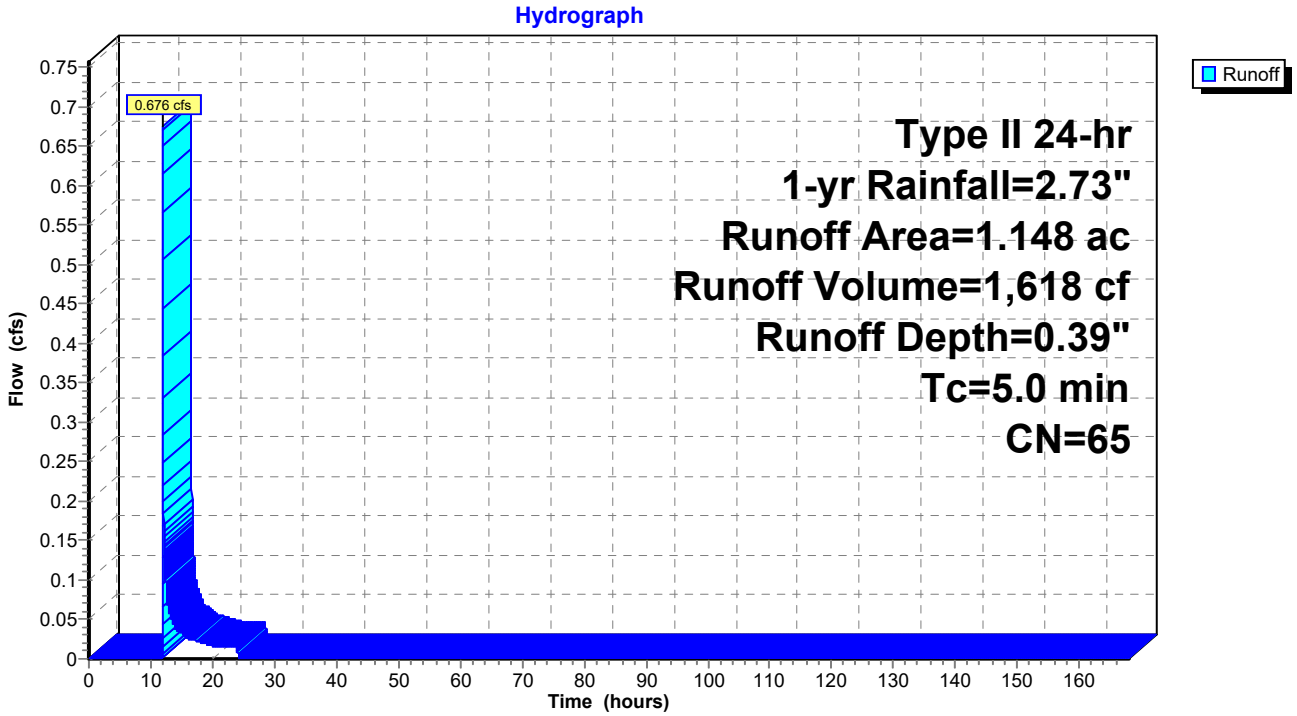
Runoff = 0.676 cfs @ 11.98 hrs, Volume= 1,618 cf, Depth= 0.39"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-yr Rainfall=2.73"

	Area (ac)	CN	Description
*	0.390	30	Meadow A
*	0.051	58	Meadow B
*	0.565	98	Impervious
*	0.125	30	Impervious as Meadow (A)
*	0.017	58	Impervious as Meadow (B)
	1.148	65	Weighted Average
	0.583		50.78% Pervious Area
	0.565		49.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Pre-Dev DA #2 Tc**

Subcatchment 5S: PRE-DEV POI#2 TO POI#1



Summary for Subcatchment 4S: PRE-DEV DA #1 TO POI#1

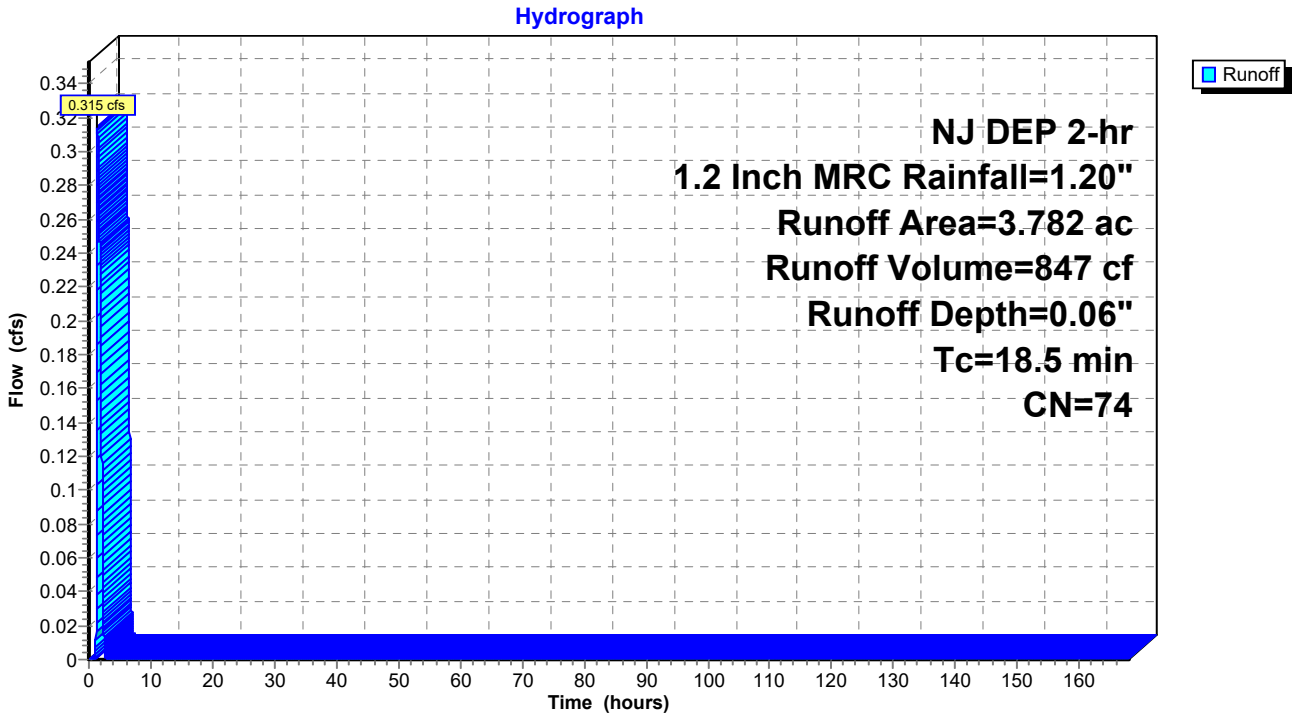
Runoff = 0.315 cfs @ 1.42 hrs, Volume= 847 cf, Depth= 0.06"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
NJ DEP 2-hr 1.2 Inch MRC Rainfall=1.20"

	Area (ac)	CN	Description
*	0.466	30	Meadow A
*	0.282	30	Wooded A
*	0.024	58	Meadow B
*	2.410	98	Impervious
*	0.590	30	Impervious As Meadow (A)
*	0.010	58	Impervious as Meadow (B)
	3.782	74	Weighted Average
	1.372		36.28% Pervious Area
	2.410		63.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 4S: PRE-DEV DA #1 TO POI#1



Summary for Subcatchment 5S: PRE-DEV POI#2 TO POI#1

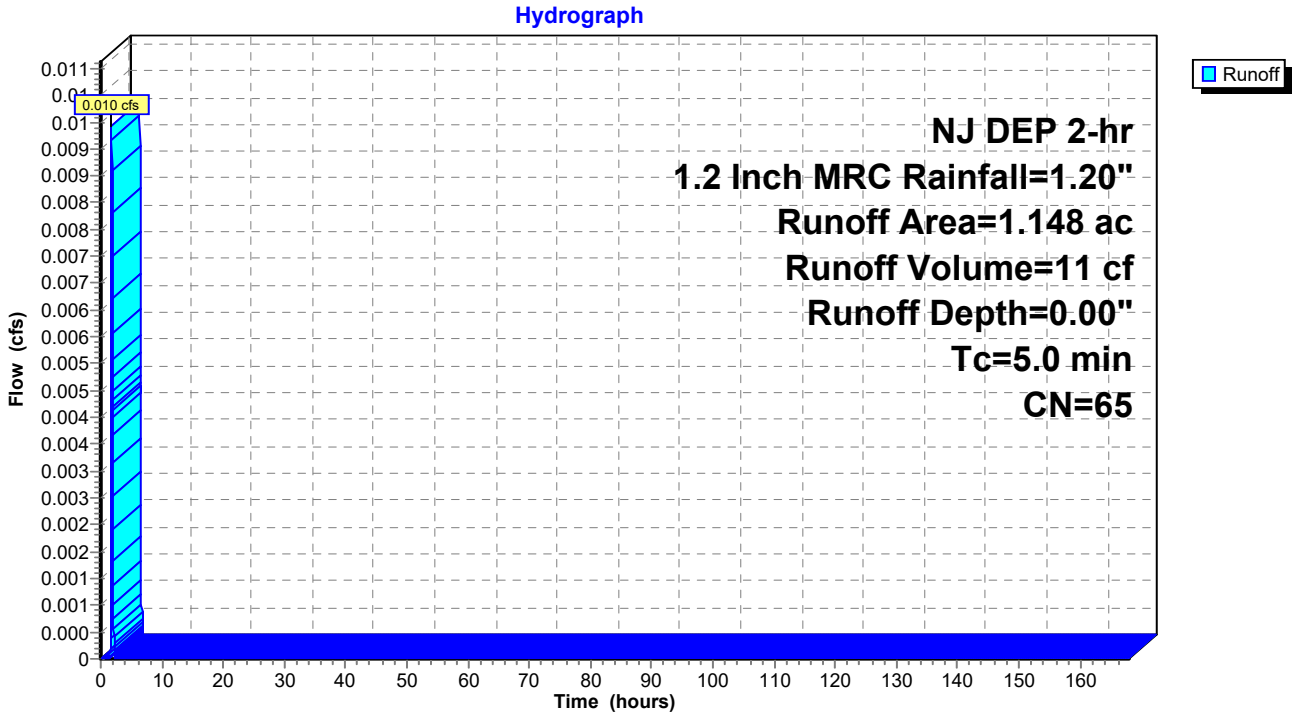
Runoff = 0.010 cfs @ 1.78 hrs, Volume= 11 cf, Depth= 0.00"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
NJ DEP 2-hr 1.2 Inch MRC Rainfall=1.20"

	Area (ac)	CN	Description
*	0.390	30	Meadow A
*	0.051	58	Meadow B
*	0.565	98	Impervious
*	0.125	30	Impervious as Meadow (A)
*	0.017	58	Impervious as Meadow (B)
	1.148	65	Weighted Average
	0.583		50.78% Pervious Area
	0.565		49.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Pre-Dev DA #2 Tc**

Subcatchment 5S: PRE-DEV POI#2 TO POI#1



Summary for Subcatchment 4S: PRE-DEV DA #1 TO POI#1

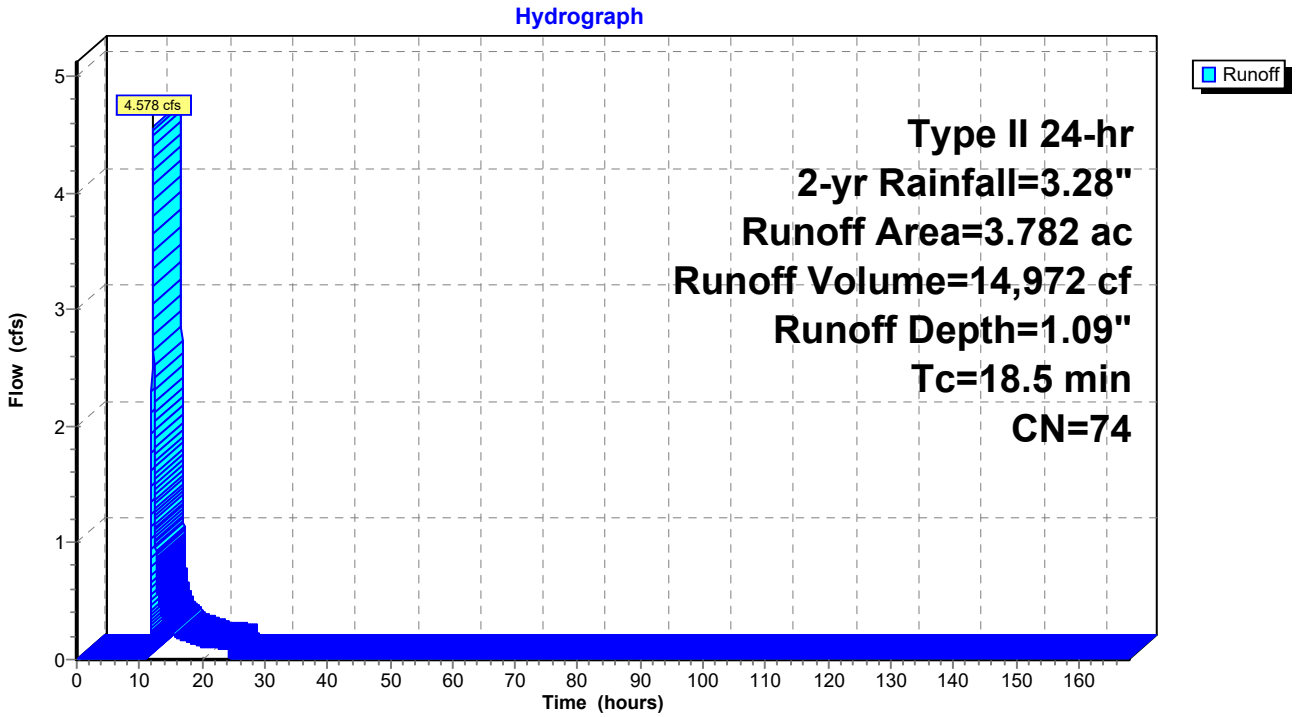
Runoff = 4.578 cfs @ 12.12 hrs, Volume= 14,972 cf, Depth= 1.09"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.466	30	Meadow A
*	0.282	30	Wooded A
*	0.024	58	Meadow B
*	2.410	98	Impervious
*	0.590	30	Impervious As Meadow (A)
*	0.010	58	Impervious as Meadow (B)
	3.782	74	Weighted Average
	1.372		36.28% Pervious Area
	2.410		63.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 4S: PRE-DEV DA #1 TO POI#1



Summary for Subcatchment 5S: PRE-DEV POI#2 TO POI#1

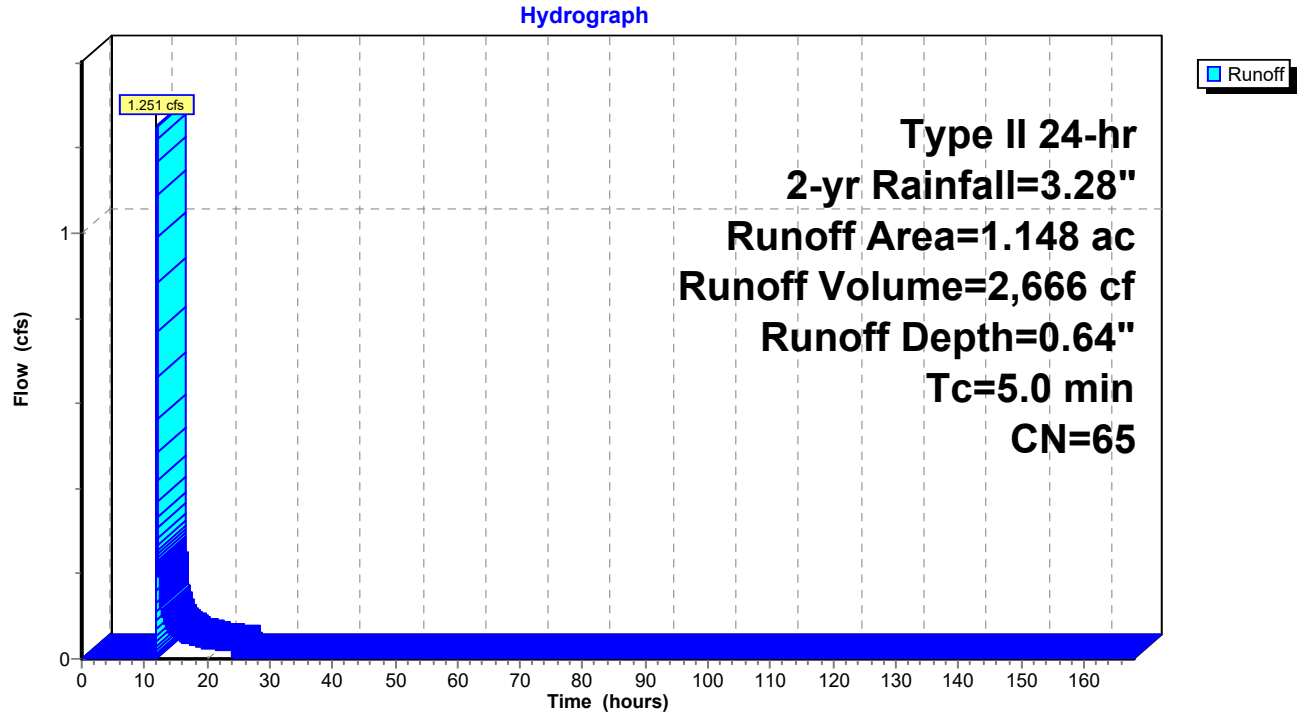
Runoff = 1.251 cfs @ 11.98 hrs, Volume= 2,666 cf, Depth= 0.64"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.390	30	Meadow A
*	0.051	58	Meadow B
*	0.565	98	Impervious
*	0.125	30	Impervious as Meadow (A)
*	0.017	58	Impervious as Meadow (B)
	1.148	65	Weighted Average
	0.583		50.78% Pervious Area
	0.565		49.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Pre-Dev DA #2 Tc**

Subcatchment 5S: PRE-DEV POI#2 TO POI#1



Summary for Subcatchment 4S: PRE-DEV DA #1 TO POI#1

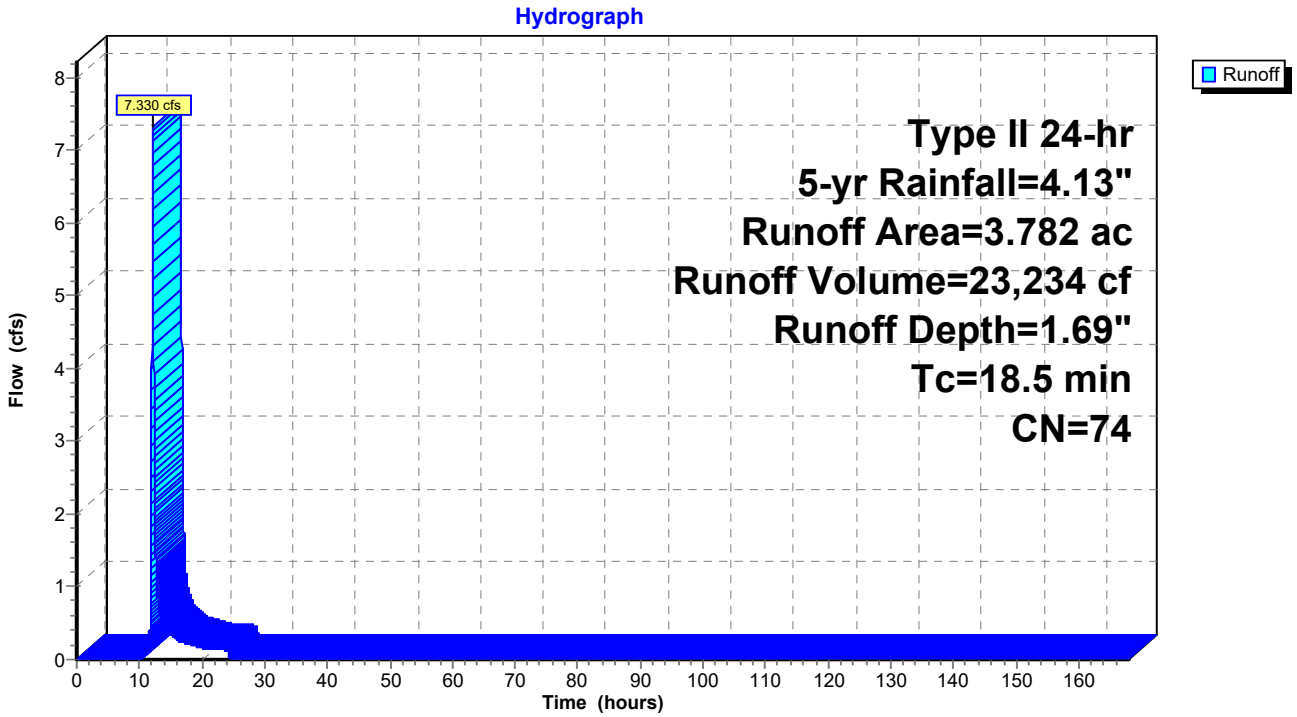
Runoff = 7.330 cfs @ 12.11 hrs, Volume= 23,234 cf, Depth= 1.69"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 5-yr Rainfall=4.13"

	Area (ac)	CN	Description
*	0.466	30	Meadow A
*	0.282	30	Wooded A
*	0.024	58	Meadow B
*	2.410	98	Impervious
*	0.590	30	Impervious As Meadow (A)
*	0.010	58	Impervious as Meadow (B)
	3.782	74	Weighted Average
	1.372		36.28% Pervious Area
	2.410		63.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 4S: PRE-DEV DA #1 TO POI#1



Summary for Subcatchment 5S: PRE-DEV POI#2 TO POI#1

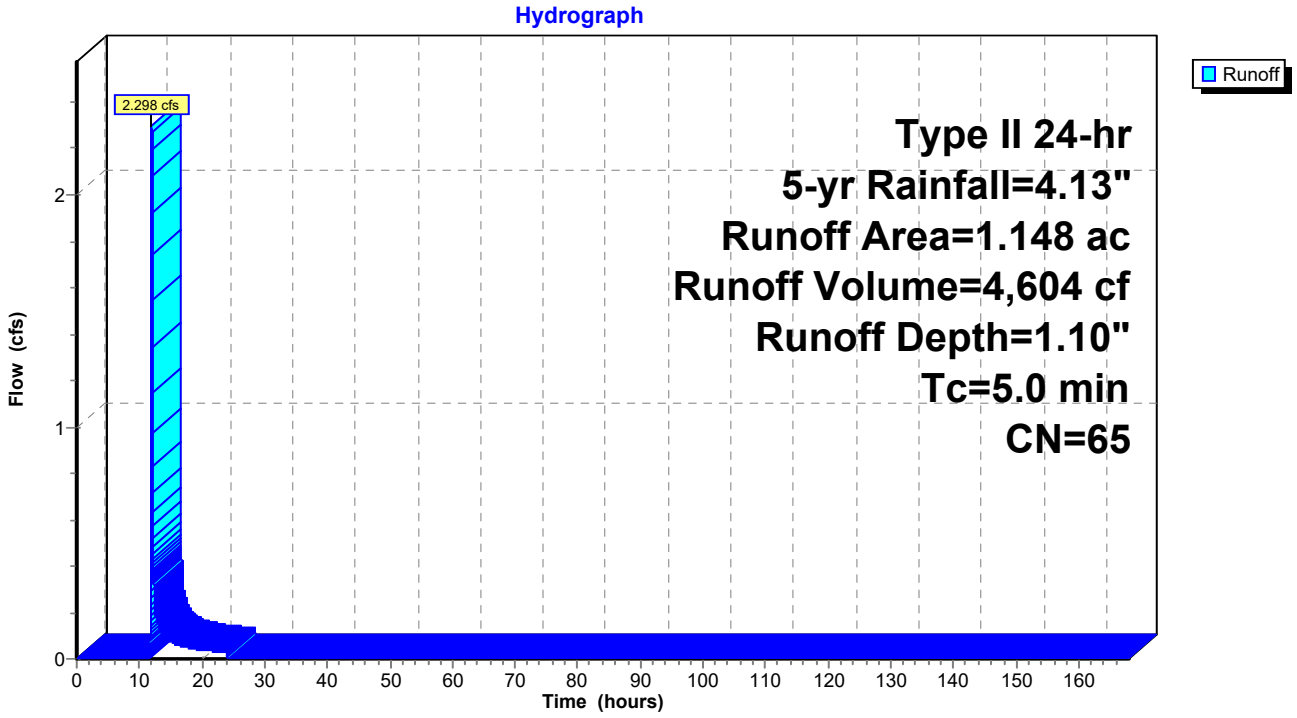
Runoff = 2.298 cfs @ 11.97 hrs, Volume= 4,604 cf, Depth= 1.10"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 5-yr Rainfall=4.13"

	Area (ac)	CN	Description
*	0.390	30	Meadow A
*	0.051	58	Meadow B
*	0.565	98	Impervious
*	0.125	30	Impervious as Meadow (A)
*	0.017	58	Impervious as Meadow (B)
	1.148	65	Weighted Average
	0.583		50.78% Pervious Area
	0.565		49.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Pre-Dev DA #2 Tc**

Subcatchment 5S: PRE-DEV POI#2 TO POI#1



Summary for Subcatchment 4S: PRE-DEV DA #1 TO POI#1

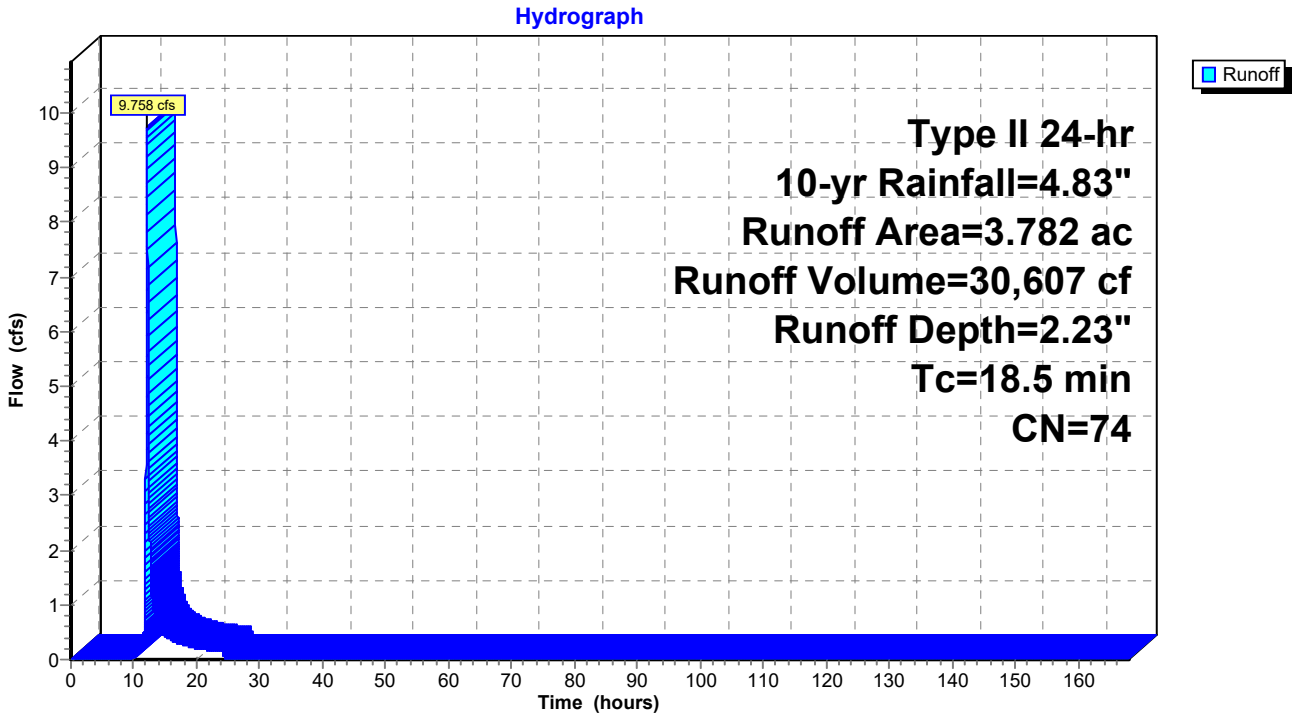
Runoff = 9.758 cfs @ 12.11 hrs, Volume= 30,607 cf, Depth= 2.23"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.466	30	Meadow A
*	0.282	30	Wooded A
*	0.024	58	Meadow B
*	2.410	98	Impervious
*	0.590	30	Impervious As Meadow (A)
*	0.010	58	Impervious as Meadow (B)
	3.782	74	Weighted Average
	1.372		36.28% Pervious Area
	2.410		63.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 4S: PRE-DEV DA #1 TO POI#1



Summary for Subcatchment 5S: PRE-DEV POI#2 TO POI#1

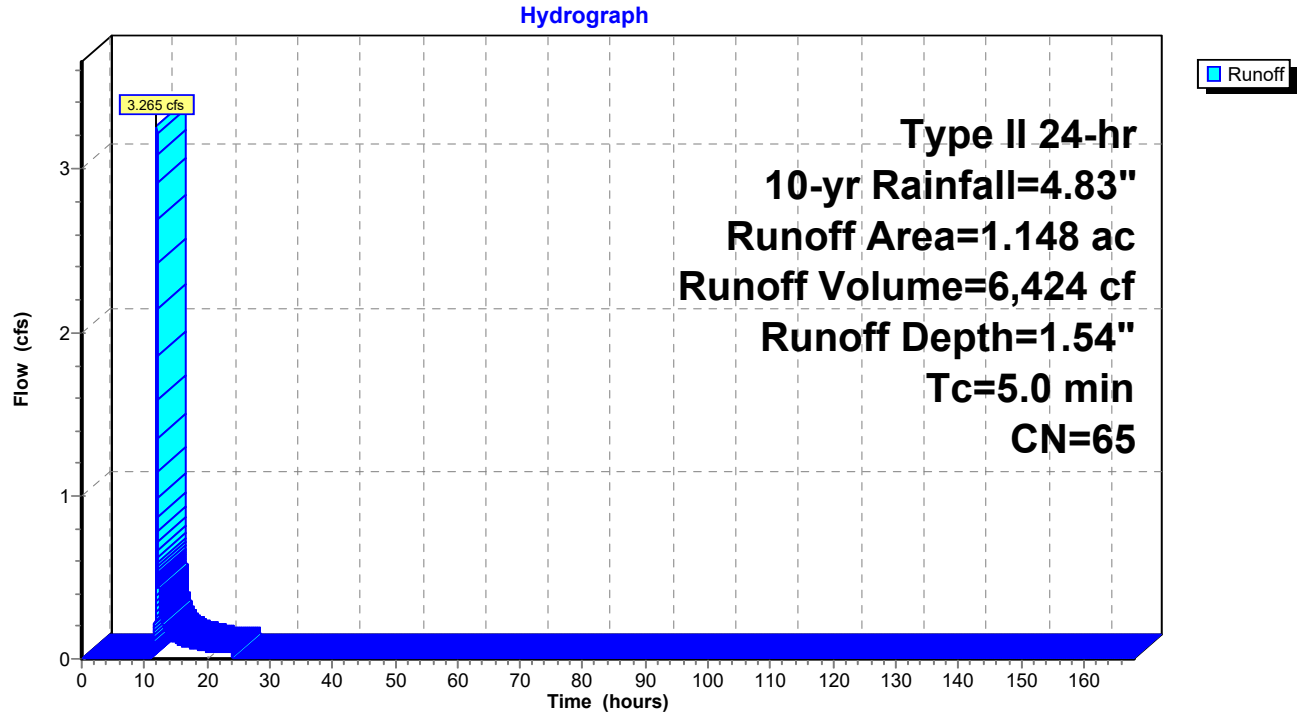
Runoff = 3.265 cfs @ 11.97 hrs, Volume= 6,424 cf, Depth= 1.54"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.390	30	Meadow A
*	0.051	58	Meadow B
*	0.565	98	Impervious
*	0.125	30	Impervious as Meadow (A)
*	0.017	58	Impervious as Meadow (B)
	1.148	65	Weighted Average
	0.583		50.78% Pervious Area
	0.565		49.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Pre-Dev DA #2 Tc**

Subcatchment 5S: PRE-DEV POI#2 TO POI#1



Summary for Subcatchment 4S: PRE-DEV DA #1 TO POI#1

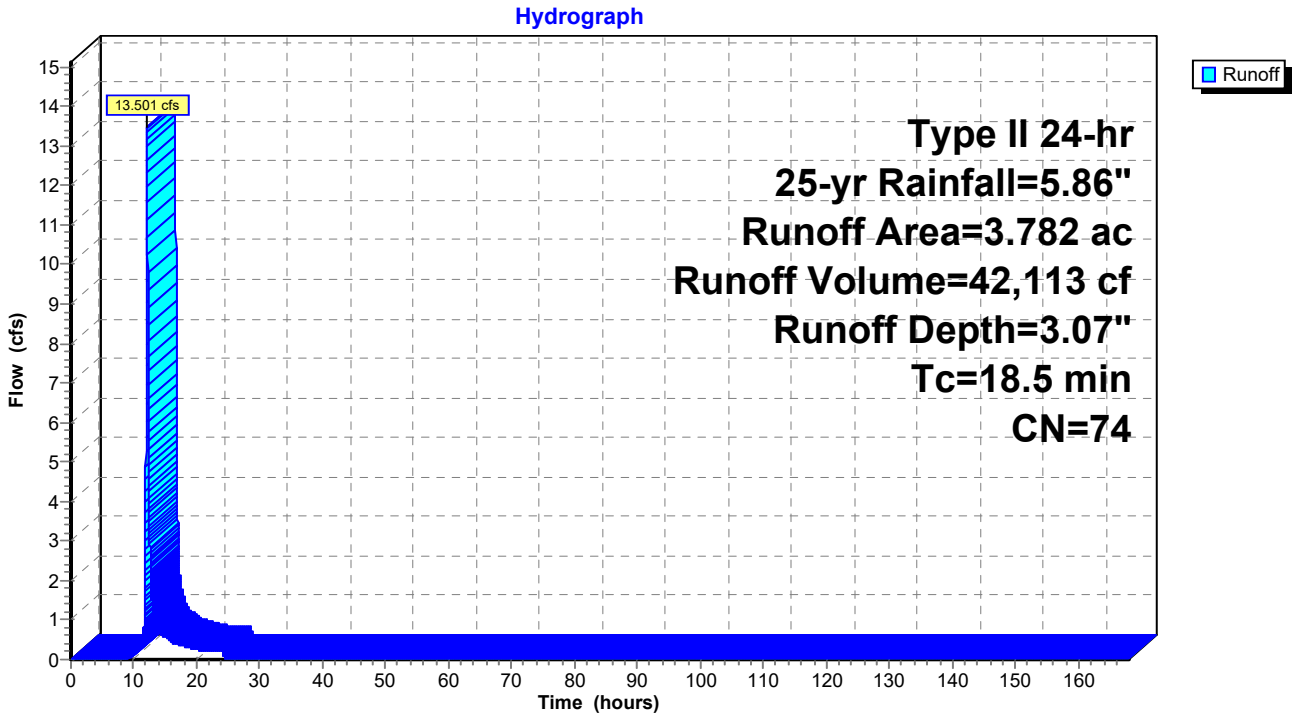
Runoff = 13.501 cfs @ 12.11 hrs, Volume= 42,113 cf, Depth= 3.07"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=5.86"

	Area (ac)	CN	Description
*	0.466	30	Meadow A
*	0.282	30	Wooded A
*	0.024	58	Meadow B
*	2.410	98	Impervious
*	0.590	30	Impervious As Meadow (A)
*	0.010	58	Impervious as Meadow (B)
	3.782	74	Weighted Average
	1.372		36.28% Pervious Area
	2.410		63.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 4S: PRE-DEV DA #1 TO POI#1



Summary for Subcatchment 5S: PRE-DEV POI#2 TO POI#1

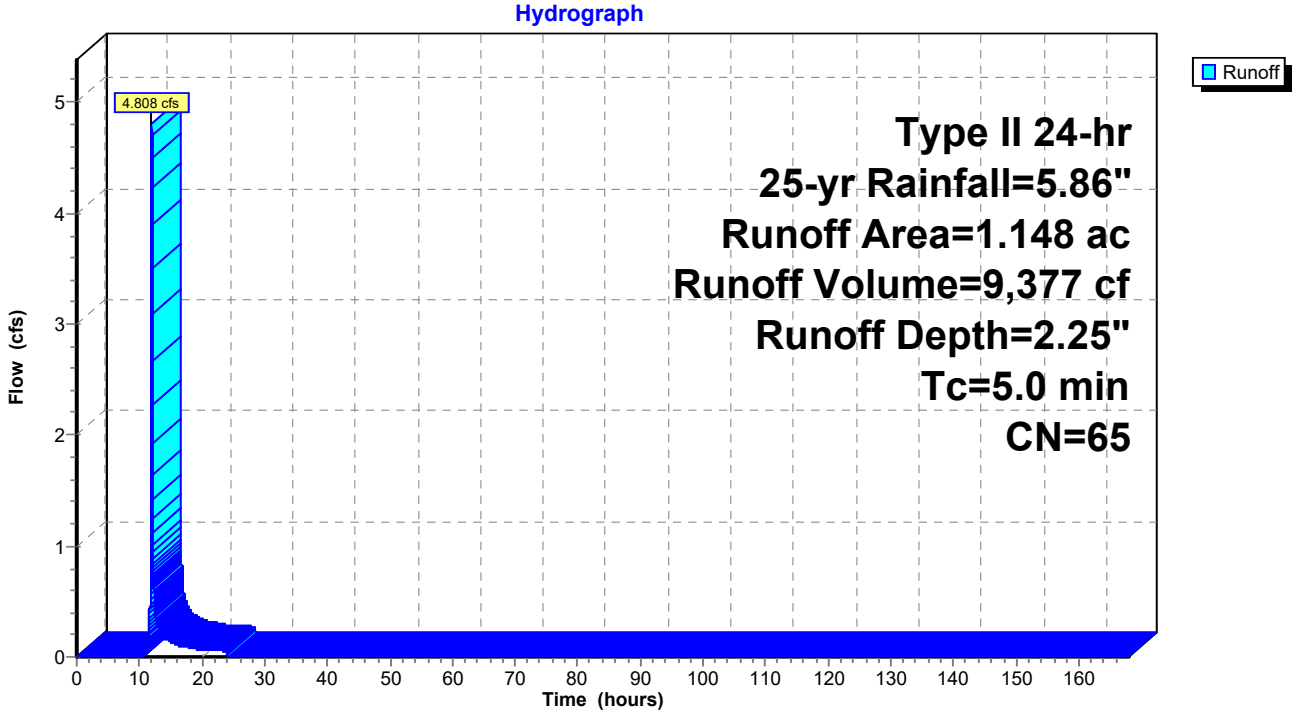
Runoff = 4.808 cfs @ 11.97 hrs, Volume= 9,377 cf, Depth= 2.25"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=5.86"

	Area (ac)	CN	Description
*	0.390	30	Meadow A
*	0.051	58	Meadow B
*	0.565	98	Impervious
*	0.125	30	Impervious as Meadow (A)
*	0.017	58	Impervious as Meadow (B)
	1.148	65	Weighted Average
	0.583		50.78% Pervious Area
	0.565		49.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Pre-Dev DA #2 Tc**

Subcatchment 5S: PRE-DEV POI#2 TO POI#1



Summary for Subcatchment 4S: PRE-DEV DA #1 TO POI#1

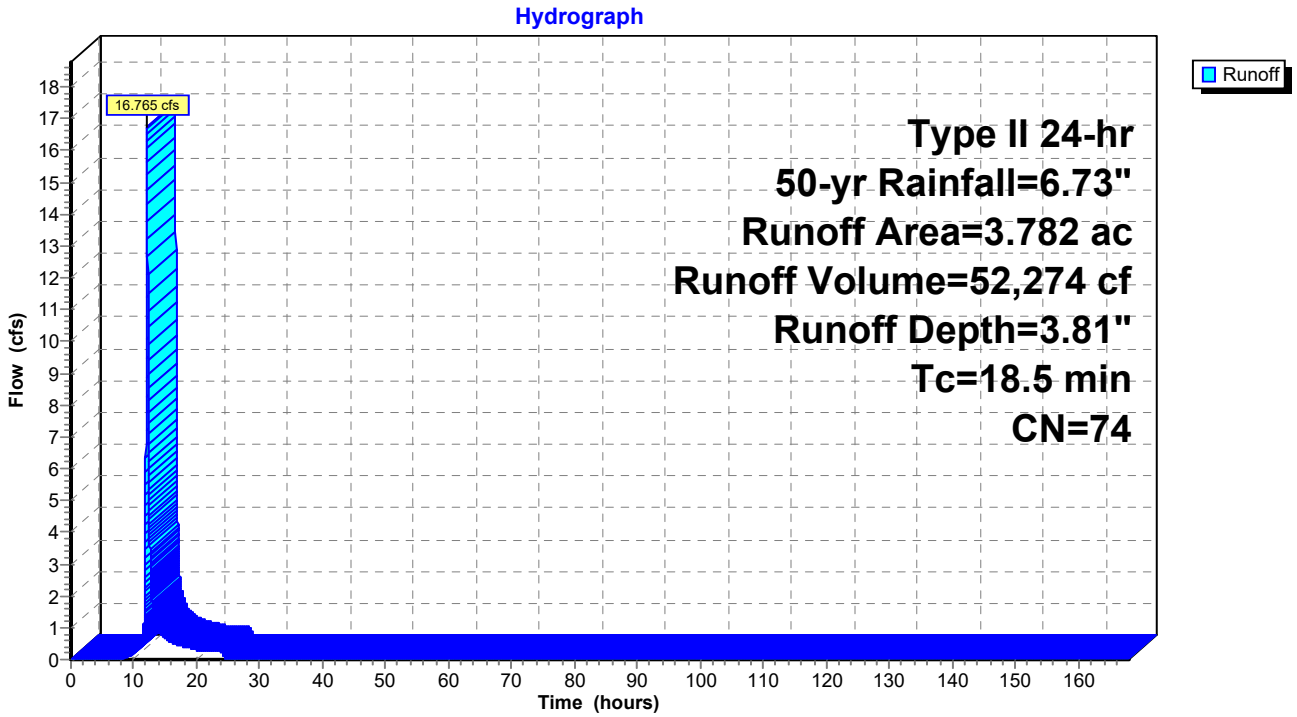
Runoff = 16.765 cfs @ 12.11 hrs, Volume= 52,274 cf, Depth= 3.81"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.466	30	Meadow A
*	0.282	30	Wooded A
*	0.024	58	Meadow B
*	2.410	98	Impervious
*	0.590	30	Impervious As Meadow (A)
*	0.010	58	Impervious as Meadow (B)
	3.782	74	Weighted Average
	1.372		36.28% Pervious Area
	2.410		63.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 4S: PRE-DEV DA #1 TO POI#1



Summary for Subcatchment 5S: PRE-DEV POI#2 TO POI#1

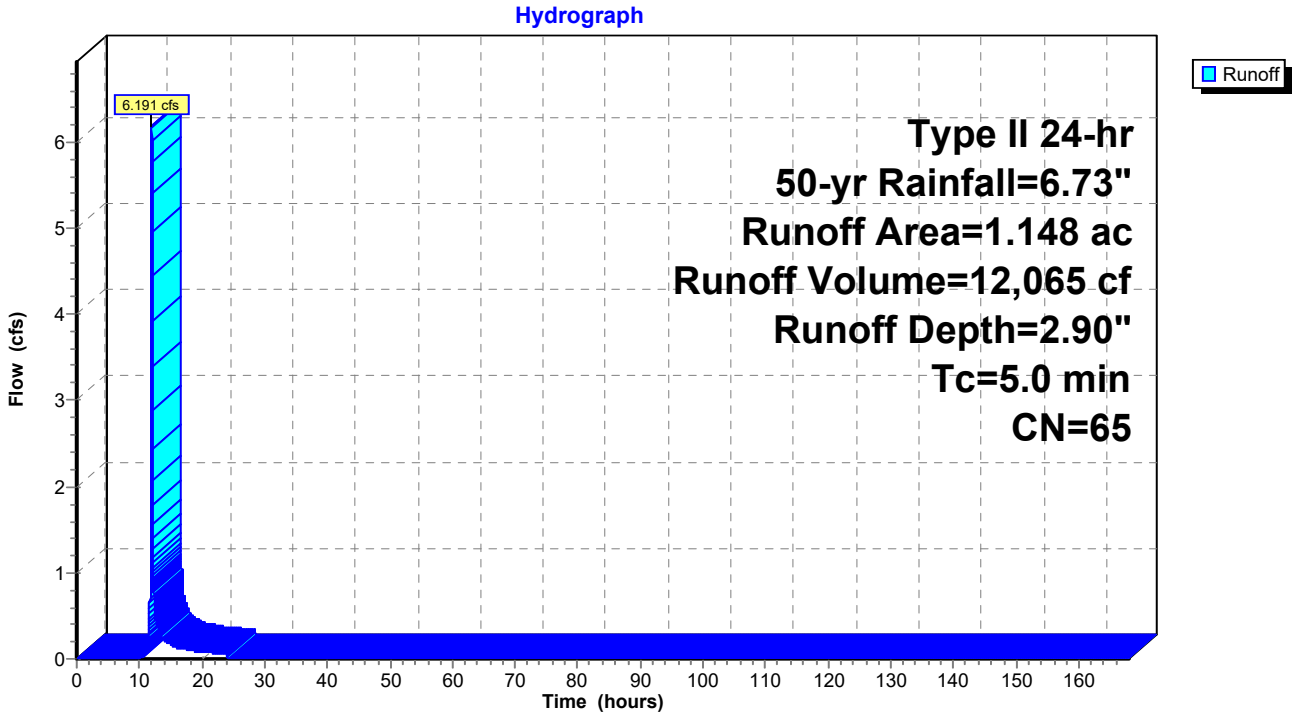
Runoff = 6.191 cfs @ 11.96 hrs, Volume= 12,065 cf, Depth= 2.90"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.390	30	Meadow A
*	0.051	58	Meadow B
*	0.565	98	Impervious
*	0.125	30	Impervious as Meadow (A)
*	0.017	58	Impervious as Meadow (B)
	1.148	65	Weighted Average
	0.583		50.78% Pervious Area
	0.565		49.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Pre-Dev DA #2 Tc**

Subcatchment 5S: PRE-DEV POI#2 TO POI#1



Summary for Subcatchment 4S: PRE-DEV DA #1 TO POI#1

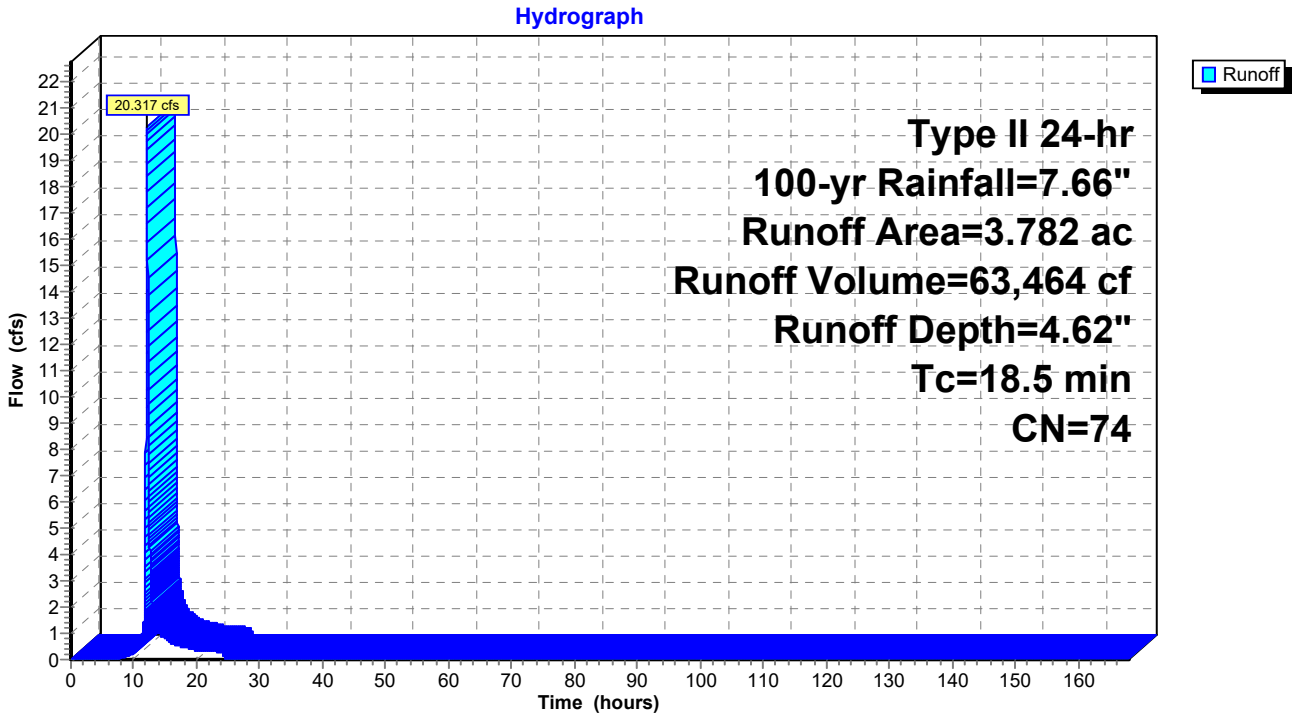
Runoff = 20.317 cfs @ 12.11 hrs, Volume= 63,464 cf, Depth= 4.62"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.466	30	Meadow A
*	0.282	30	Wooded A
*	0.024	58	Meadow B
*	2.410	98	Impervious
*	0.590	30	Impervious As Meadow (A)
*	0.010	58	Impervious as Meadow (B)
	3.782	74	Weighted Average
	1.372		36.28% Pervious Area
	2.410		63.72% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 4S: PRE-DEV DA #1 TO POI#1



Summary for Subcatchment 5S: PRE-DEV POI#2 TO POI#1

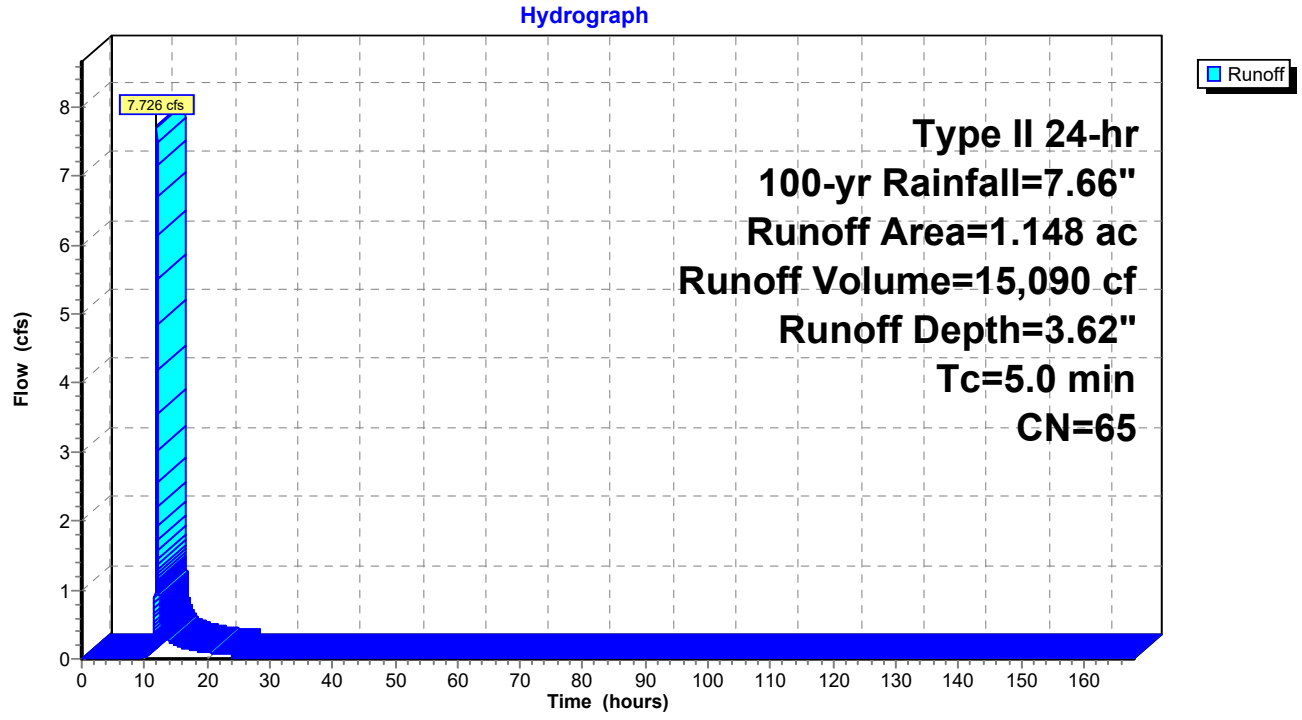
Runoff = 7.726 cfs @ 11.96 hrs, Volume= 15,090 cf, Depth= 3.62"
Routed to Link 6L : PRE-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.390	30	Meadow A
*	0.051	58	Meadow B
*	0.565	98	Impervious
*	0.125	30	Impervious as Meadow (A)
*	0.017	58	Impervious as Meadow (B)
	1.148	65	Weighted Average
	0.583		50.78% Pervious Area
	0.565		49.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry, Pre-Dev DA #2 Tc**

Subcatchment 5S: PRE-DEV POI#2 TO POI#1





PRE-DEV TO POI#1

Subcat Reach Pond Link

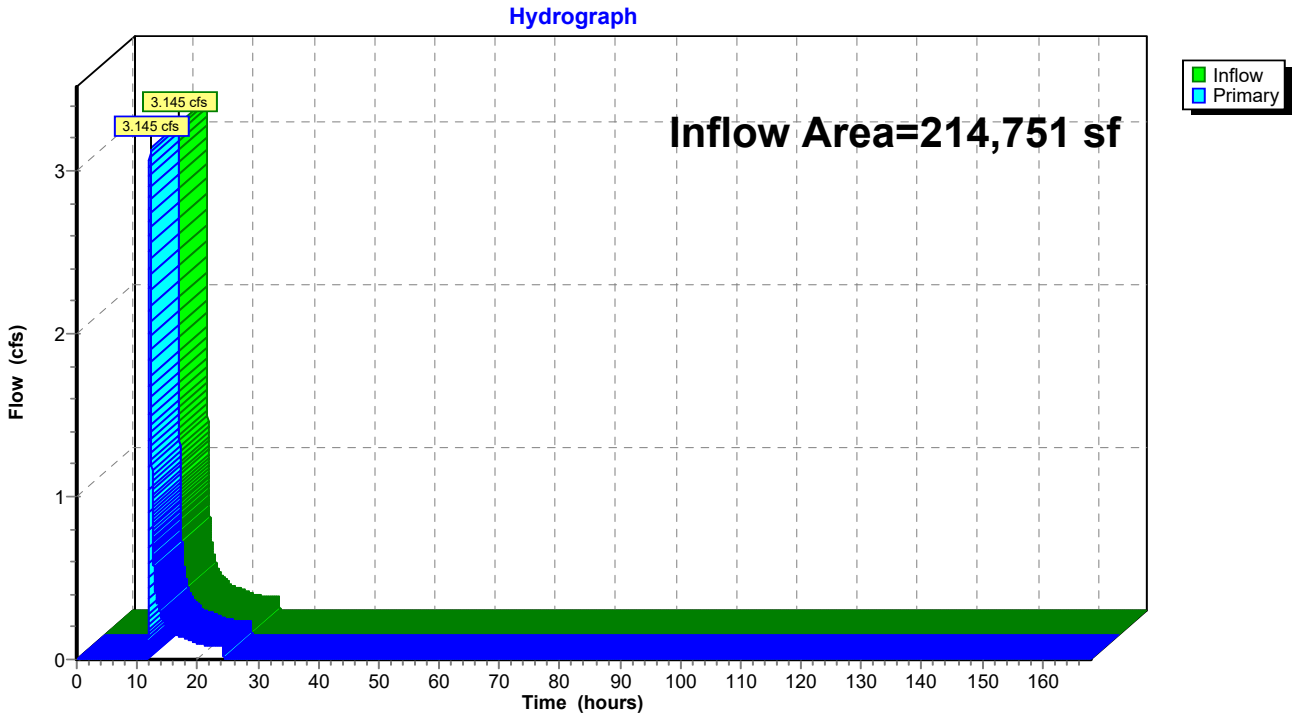
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Prepared by Bohler, Printed 7/24/2025
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Summary for Link 6L: PRE-DEV TO POI#1

Inflow Area = 214,751 sf, 60.34% Impervious, Inflow Depth = 0.66" for 1-yr event
Inflow = 3.145 cfs @ 12.12 hrs, Volume= 11,801 cf
Primary = 3.145 cfs @ 12.12 hrs, Volume= 11,801 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 6L: PRE-DEV TO POI#1

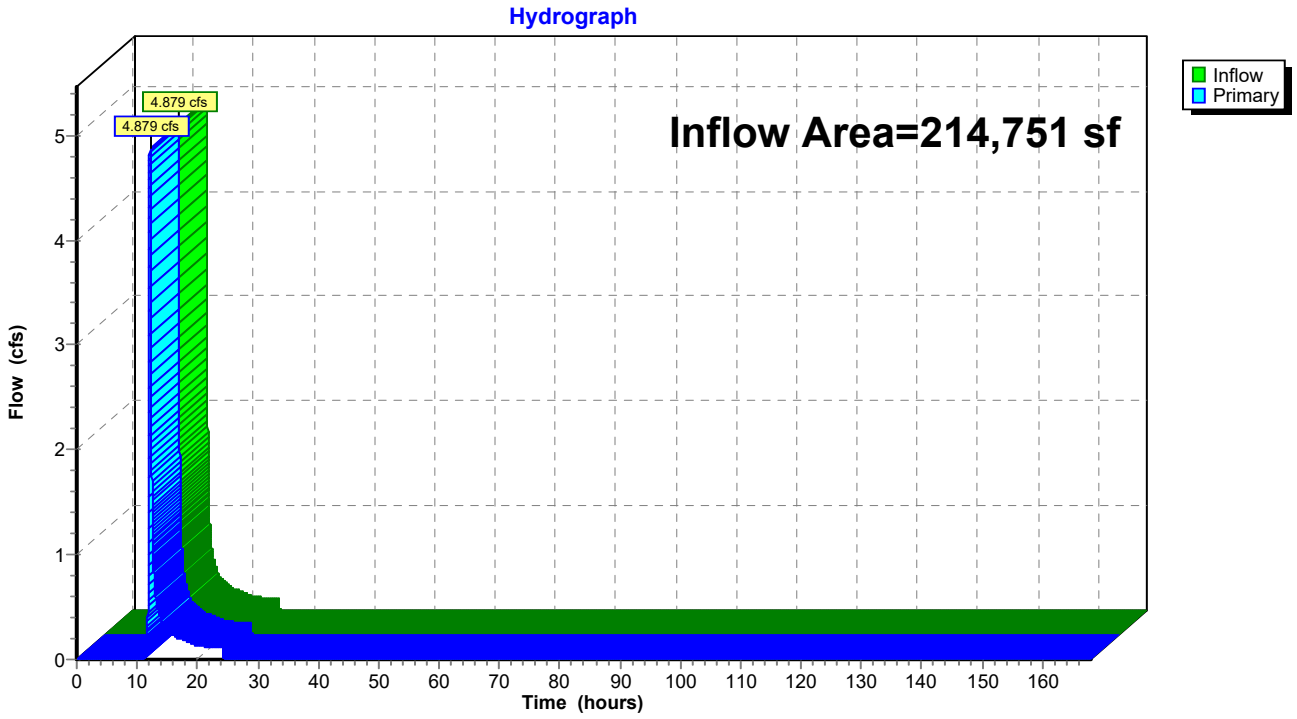


Summary for Link 6L: PRE-DEV TO POI#1

Inflow Area = 214,751 sf, 60.34% Impervious, Inflow Depth = 0.99" for 2-yr event
Inflow = 4.879 cfs @ 12.11 hrs, Volume= 17,638 cf
Primary = 4.879 cfs @ 12.11 hrs, Volume= 17,638 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 6L: PRE-DEV TO POI#1

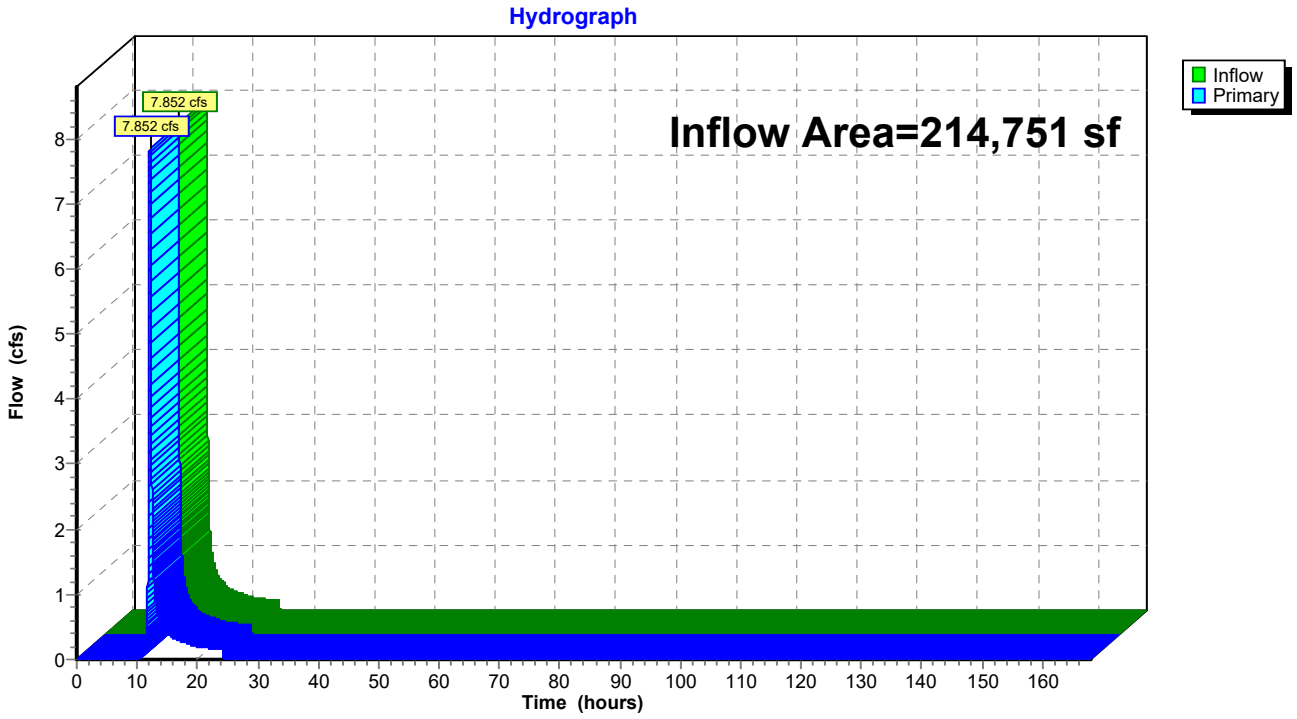


Summary for Link 6L: PRE-DEV TO POI#1

Inflow Area = 214,751 sf, 60.34% Impervious, Inflow Depth = 1.56" for 5-yr event
Inflow = 7.852 cfs @ 12.11 hrs, Volume= 27,837 cf
Primary = 7.852 cfs @ 12.11 hrs, Volume= 27,837 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 6L: PRE-DEV TO POI#1

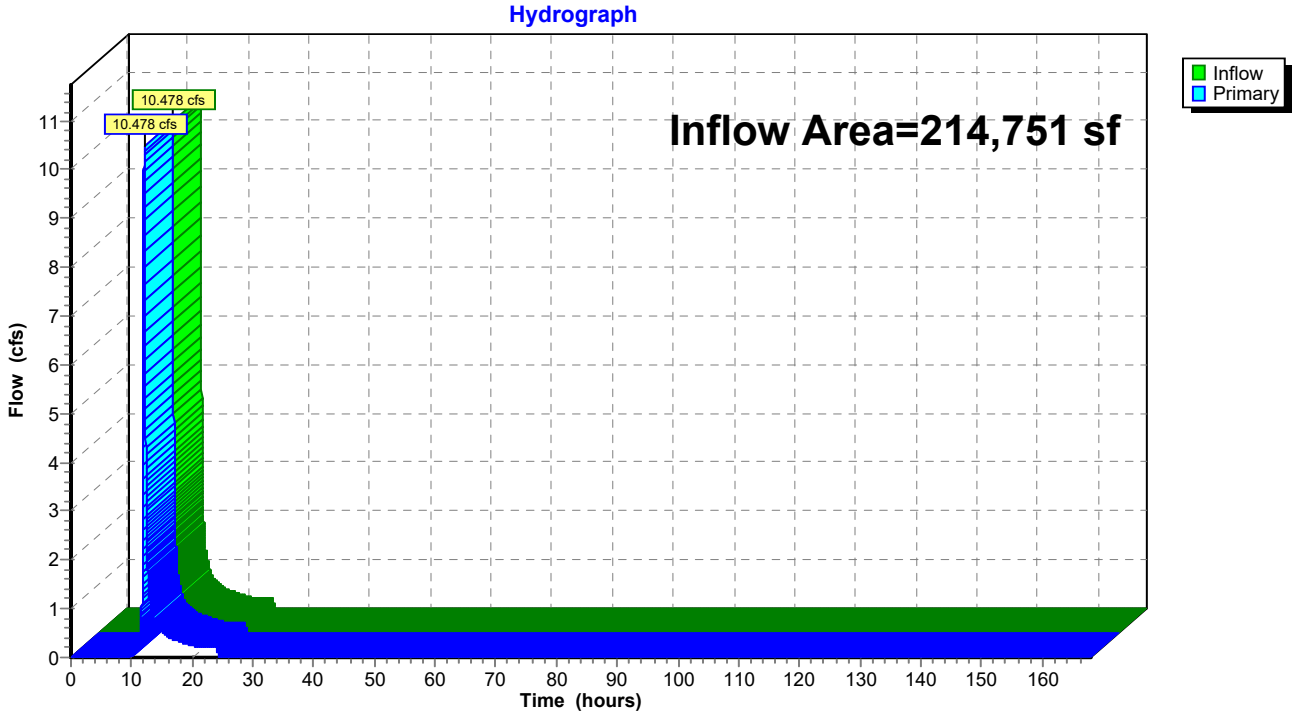


Summary for Link 6L: PRE-DEV TO POI#1

Inflow Area = 214,751 sf, 60.34% Impervious, Inflow Depth = 2.07" for 10-yr event
Inflow = 10.478 cfs @ 12.10 hrs, Volume= 37,031 cf
Primary = 10.478 cfs @ 12.10 hrs, Volume= 37,031 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 6L: PRE-DEV TO POI#1

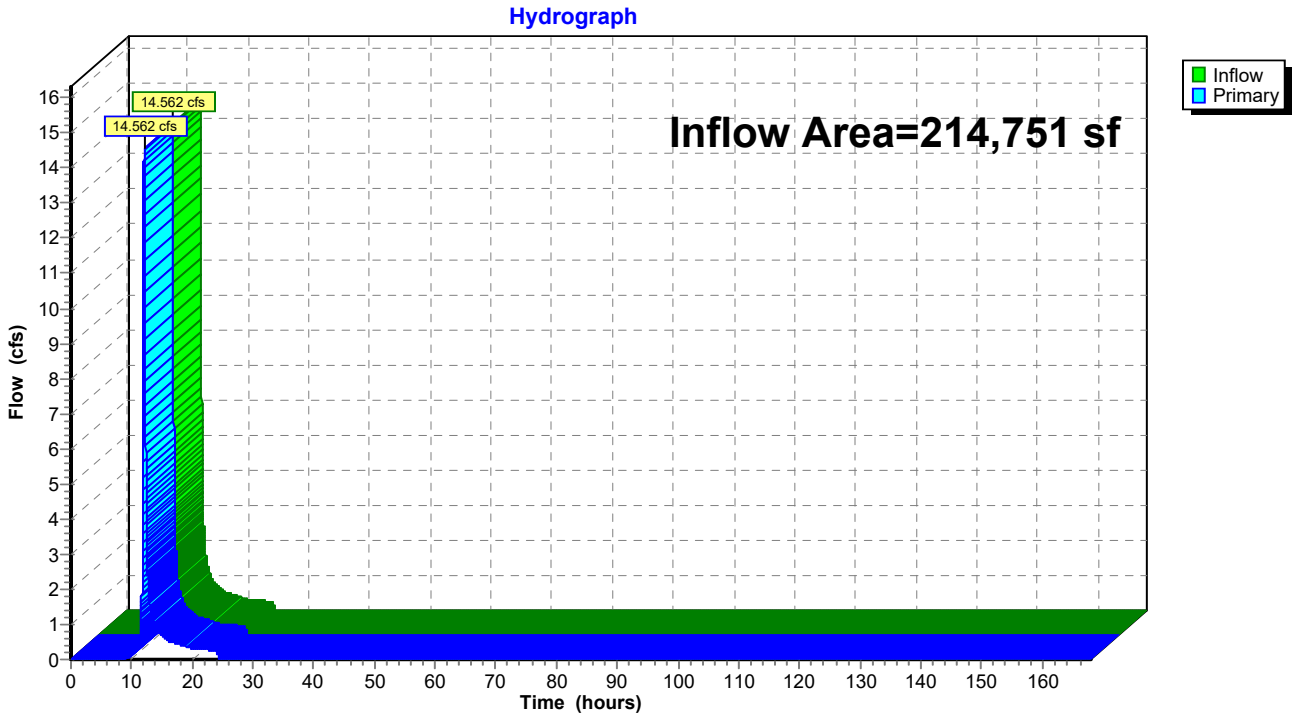


Summary for Link 6L: PRE-DEV TO POI#1

Inflow Area = 214,751 sf, 60.34% Impervious, Inflow Depth = 2.88" for 25-yr event
Inflow = 14.562 cfs @ 12.09 hrs, Volume= 51,489 cf
Primary = 14.562 cfs @ 12.09 hrs, Volume= 51,489 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 6L: PRE-DEV TO POI#1

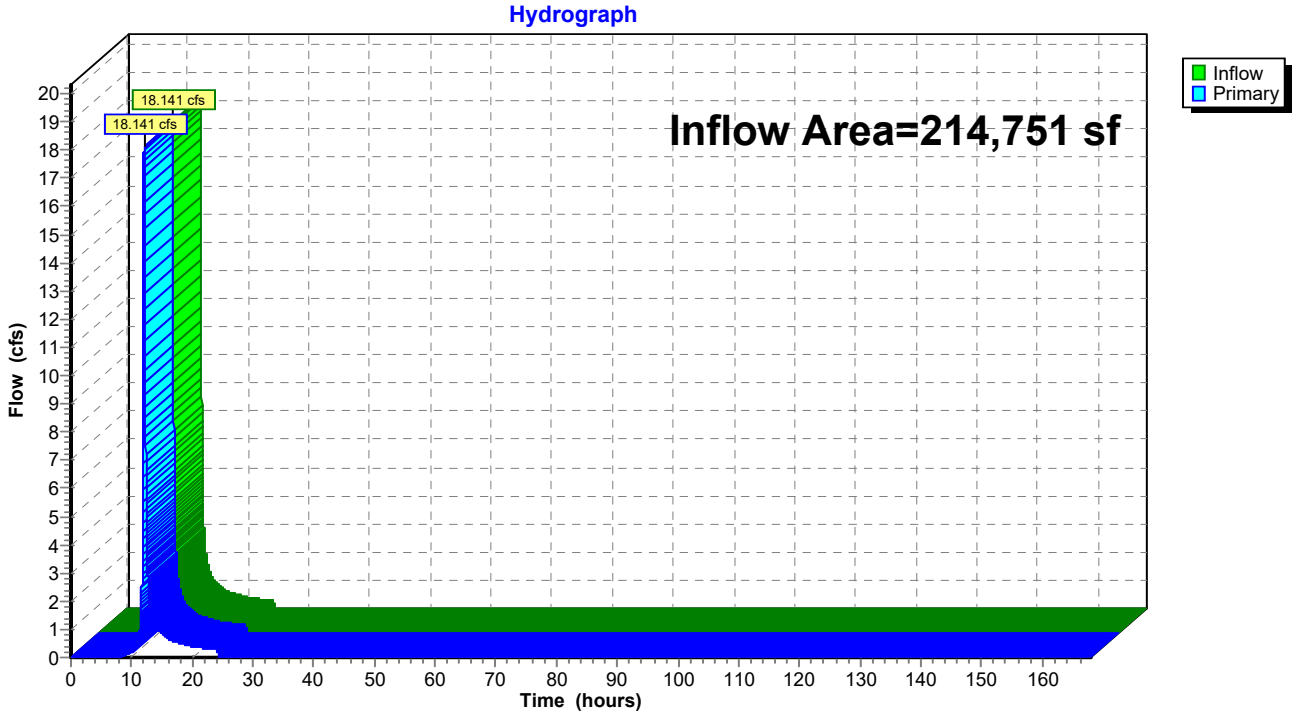


Summary for Link 6L: PRE-DEV TO POI#1

Inflow Area = 214,751 sf, 60.34% Impervious, Inflow Depth = 3.60" for 50-yr event
Inflow = 18.141 cfs @ 12.09 hrs, Volume= 64,340 cf
Primary = 18.141 cfs @ 12.09 hrs, Volume= 64,340 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 6L: PRE-DEV TO POI#1

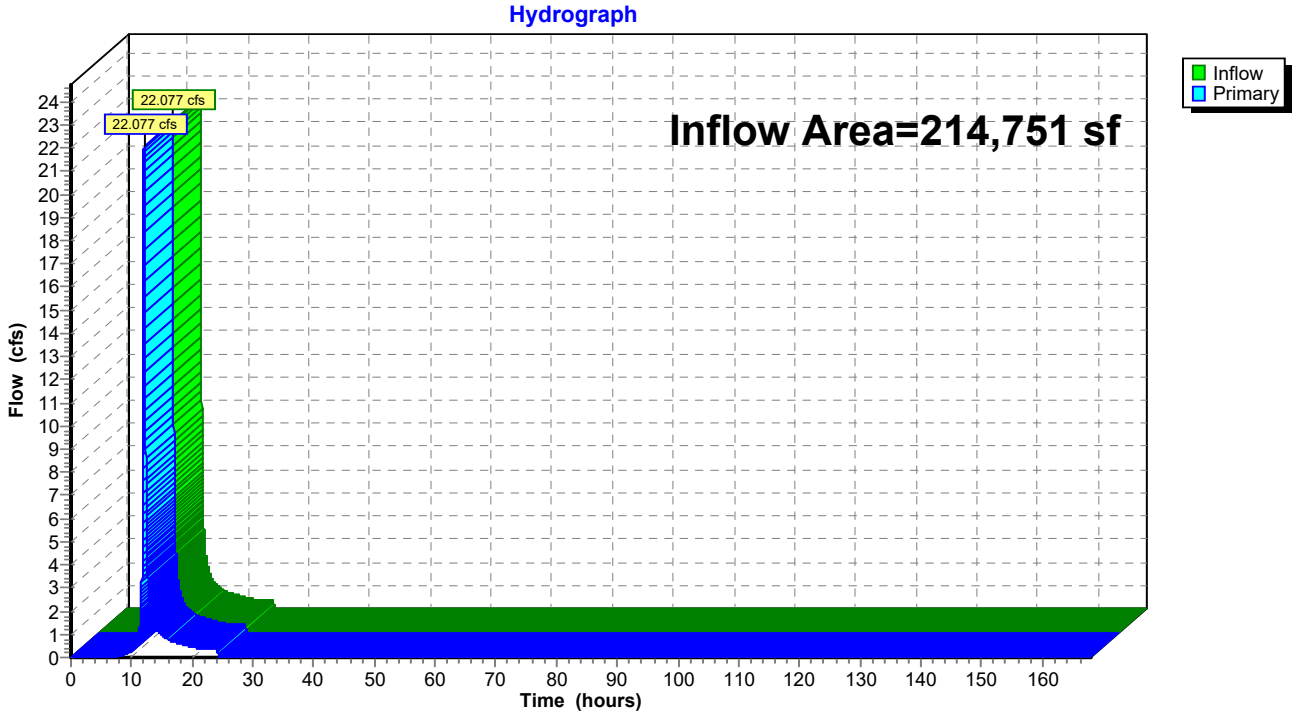


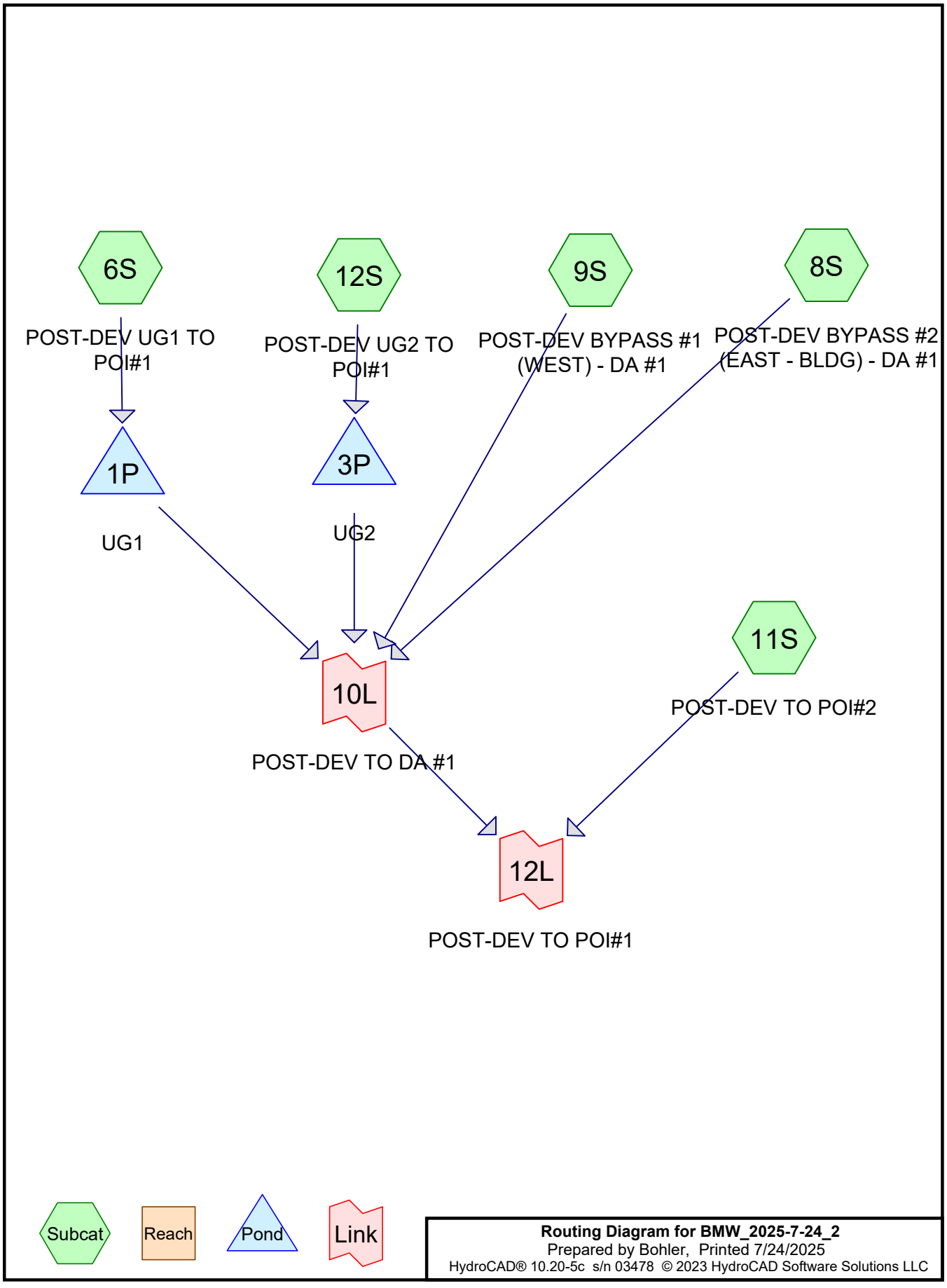
Summary for Link 6L: PRE-DEV TO POI#1

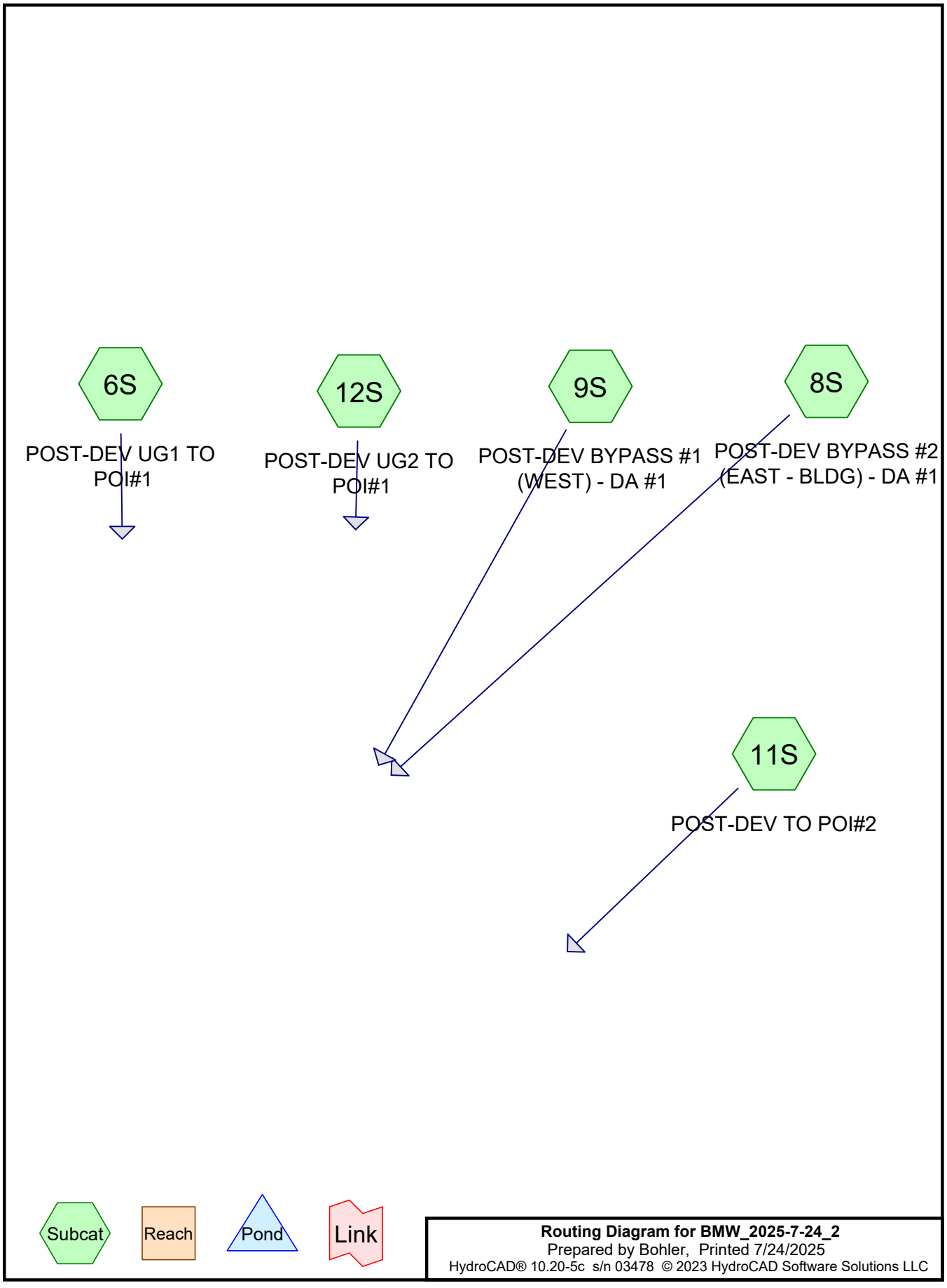
Inflow Area = 214,751 sf, 60.34% Impervious, Inflow Depth = 4.39" for 100-yr event
Inflow = 22.077 cfs @ 12.07 hrs, Volume= 78,554 cf
Primary = 22.077 cfs @ 12.07 hrs, Volume= 78,554 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 6L: PRE-DEV TO POI#1




6S
POST-DEV UG1 TO POI#1
12S
POST-DEV UG2 TO POI#1
9S
POST-DEV BYPASS #1 (WEST) - DA #1
8S
POST-DEV BYPASS #2 (EAST - BLDG) - DA #1
1P
UG1
3P
UG2
10L
POST-DEV TO DA #1
11S
POST-DEV TO POI#2
12L
POST-DEV TO POI#1
Subcat
Reach
Pond
Link
Routing Diagram for BMW_2025-7-24_2
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6S
POST-DEV UG1 TO POI#1
12S
POST-DEV UG2 TO POI#1
9S
POST-DEV BYPASS #1 (WEST) - DA #1
8S
POST-DEV BYPASS #2 (EAST - BLDG) - DA #1
11S
POST-DEV TO POI#2
Subcat
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Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
157,992	98	Impervious (6S, 8S, 9S, 11S, 12S)
37,505	39	Lawn A (6S, 9S, 11S, 12S)
4,661	61	Lawn B (11S)
12,415	30	Wooded A (9S)
212,573	**83**	**TOTAL AREA**

Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

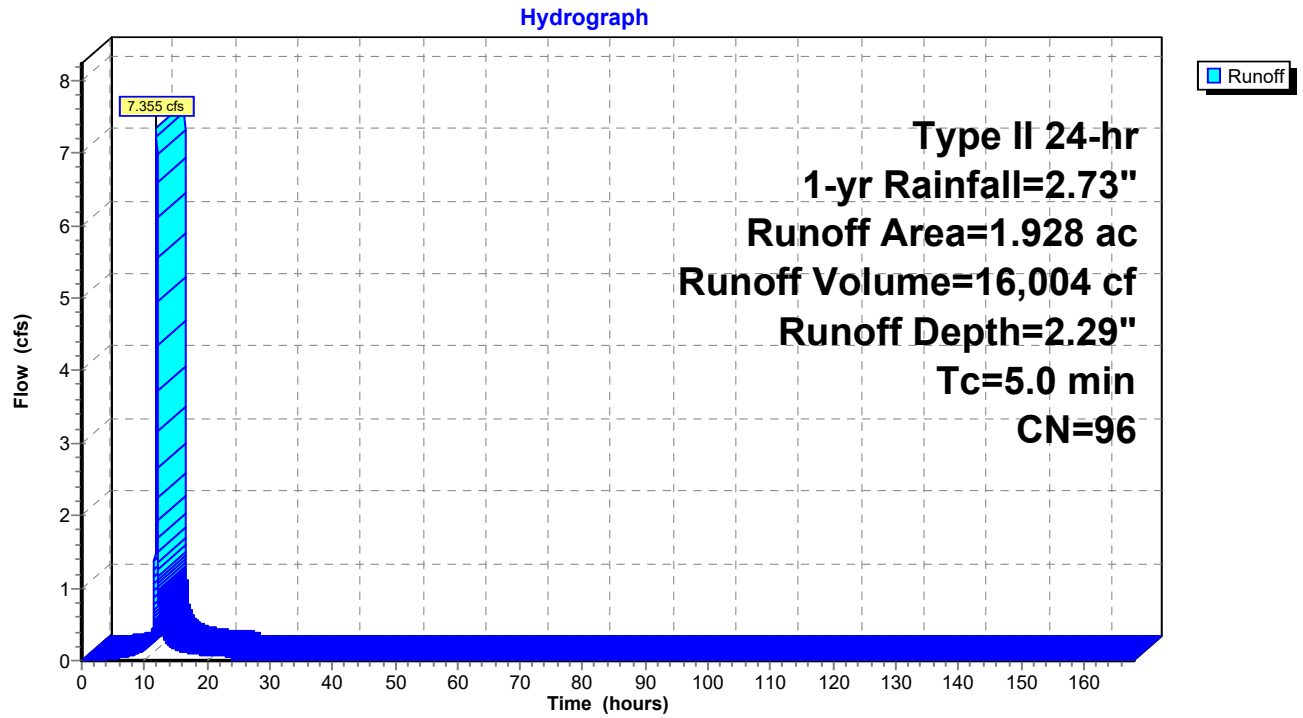
Runoff = 7.355 cfs @ 11.96 hrs, Volume= 16,004 cf, Depth= 2.29"
Routed to Pond 1P : UG1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-yr Rainfall=2.73"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928	96	Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: POST-DEV UG1 TO POI#1



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Summary for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

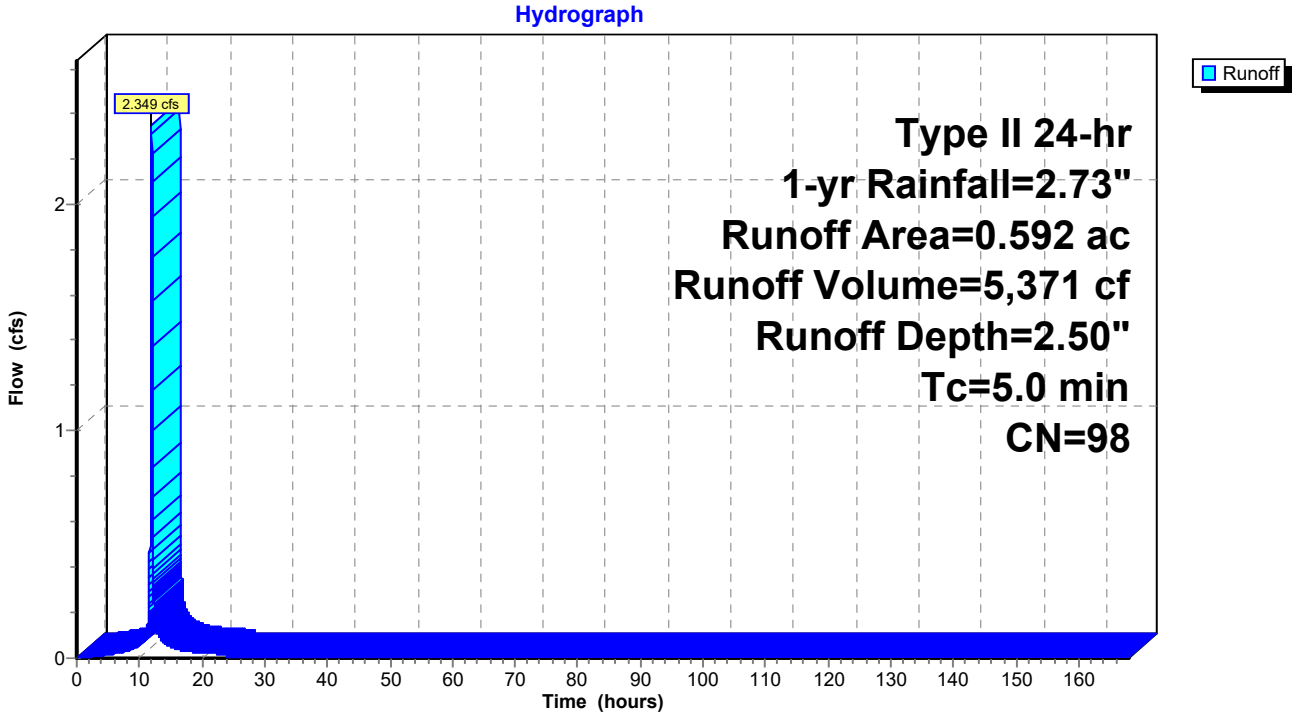
Runoff = 2.349 cfs @ 11.96 hrs, Volume= 5,371 cf, Depth= 2.50"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-yr Rainfall=2.73"

	Area (ac)	CN	Description
*	0.000	39	Lawn A
*	0.592	98	Impervious
	0.592	98	Weighted Average
	0.592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1



Summary for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

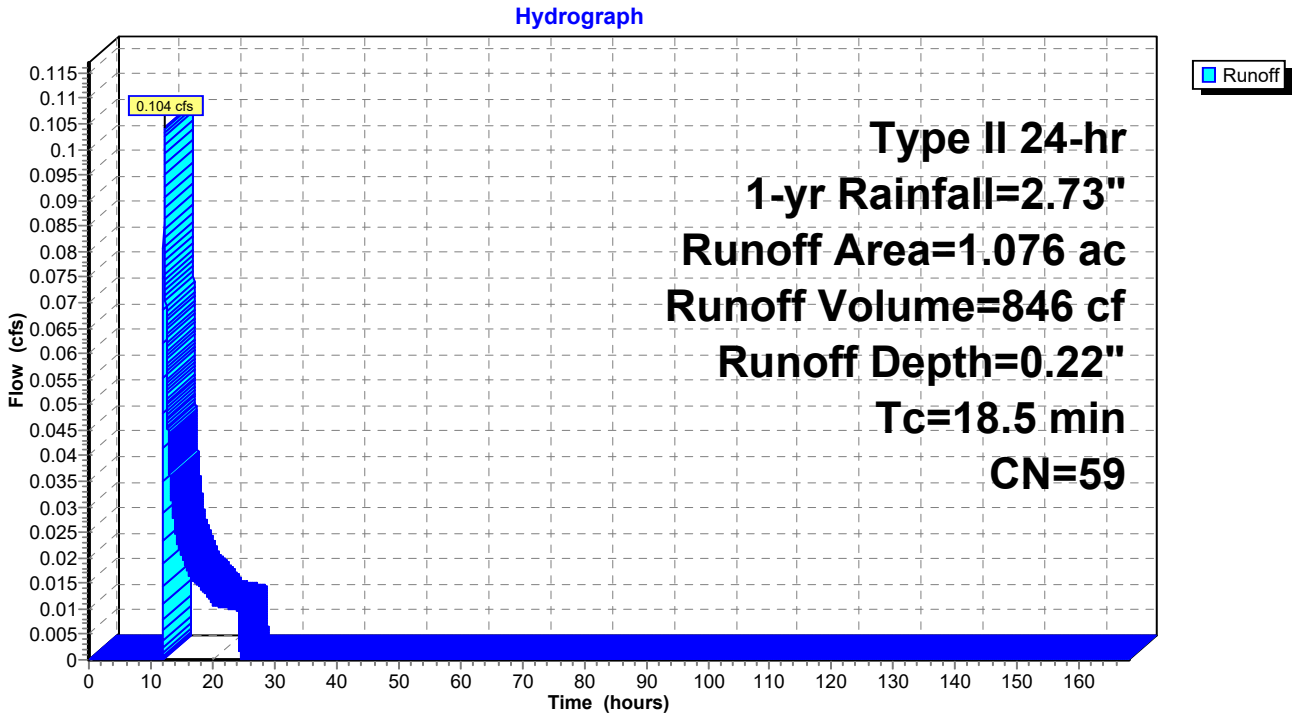
Runoff = 0.104 cfs @ 12.19 hrs, Volume= 846 cf, Depth= 0.22"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-yr Rainfall=2.73"

	Area (ac)	CN	Description
*	0.389	39	Lawn A
*	0.285	30	Wooded A
*	0.402	98	Impervious
	1.076	59	Weighted Average
	0.674		62.64% Pervious Area
	0.402		37.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1



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Summary for Subcatchment 11S: POST-DEV TO POI#2

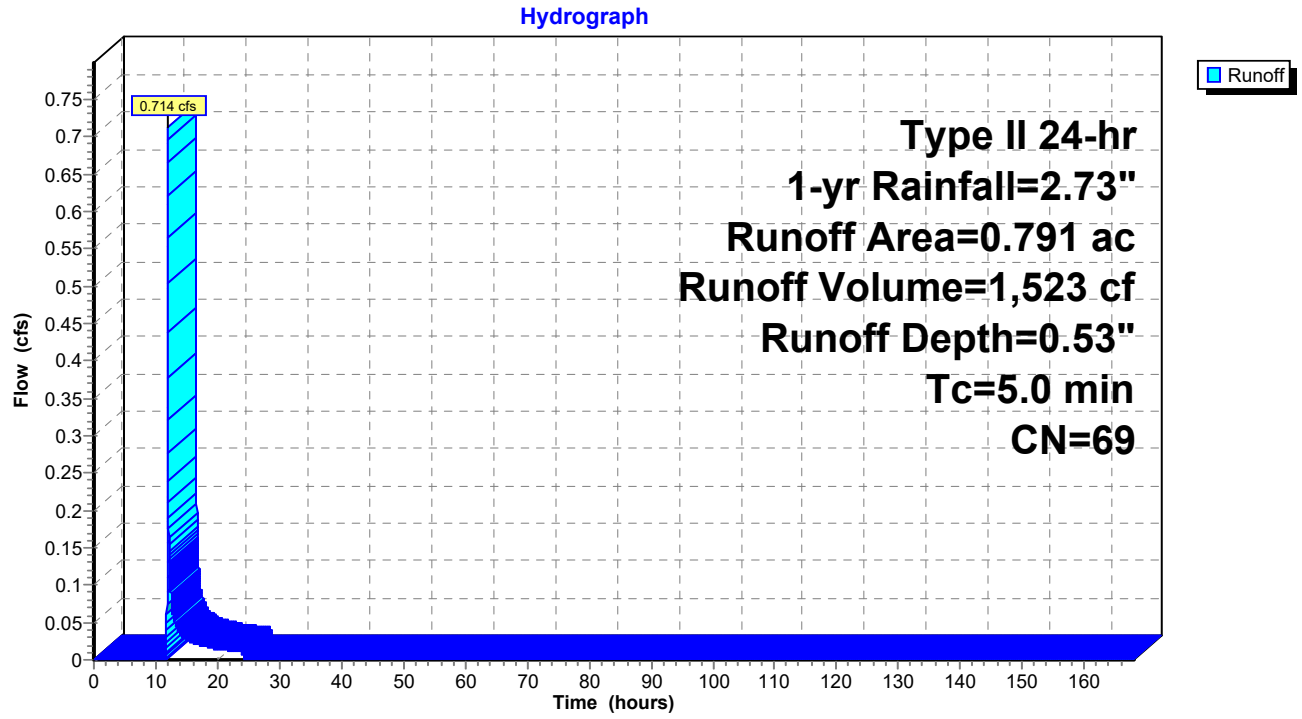
Runoff = 0.714 cfs @ 11.98 hrs, Volume= 1,523 cf, Depth= 0.53"
Routed to Link 12L : POST-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-yr Rainfall=2.73"

	Area (ac)	CN	Description
*	0.318	39	Lawn A
*	0.107	61	Lawn B
*	0.366	98	Impervious
	0.791	69	Weighted Average
	0.425		53.73% Pervious Area
	0.366		46.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 11S: POST-DEV TO POI#2



Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

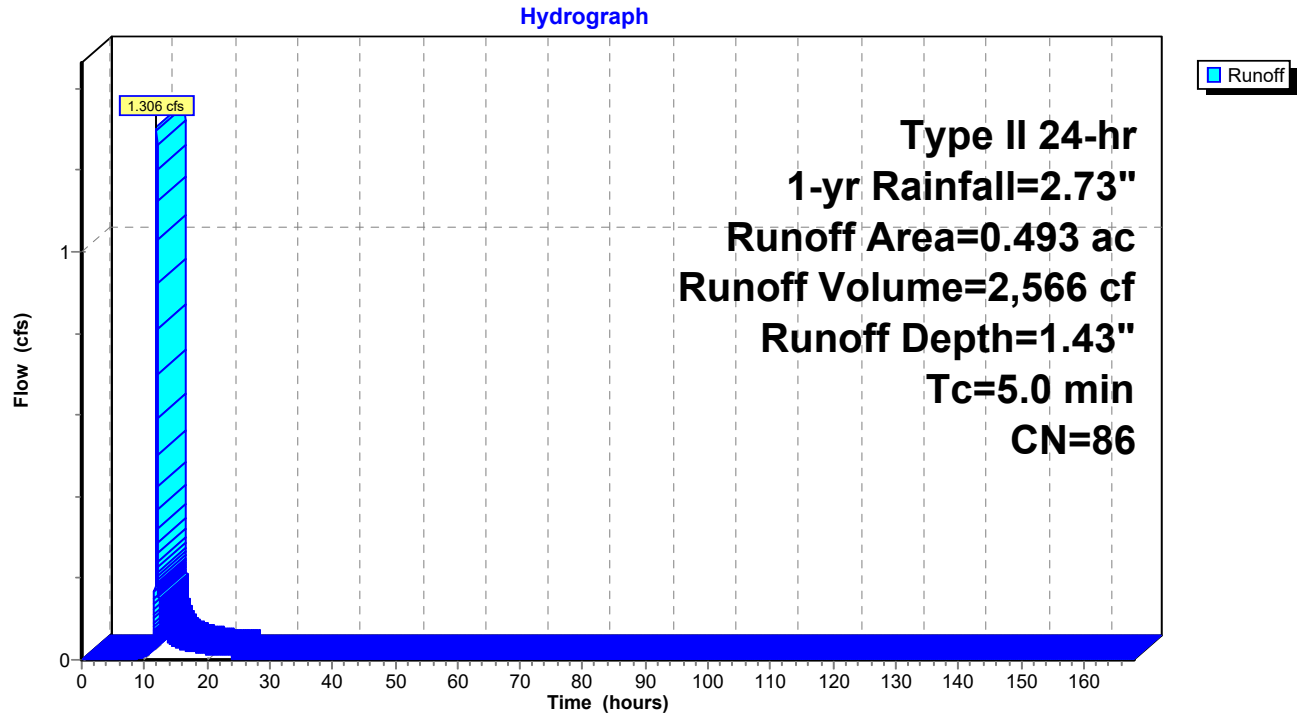
Runoff = 1.306 cfs @ 11.96 hrs, Volume= 2,566 cf, Depth= 1.43"
Routed to Pond 3P : UG2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 1-yr Rainfall=2.73"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493	86	Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 12S: POST-DEV UG2 TO POI#1



Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

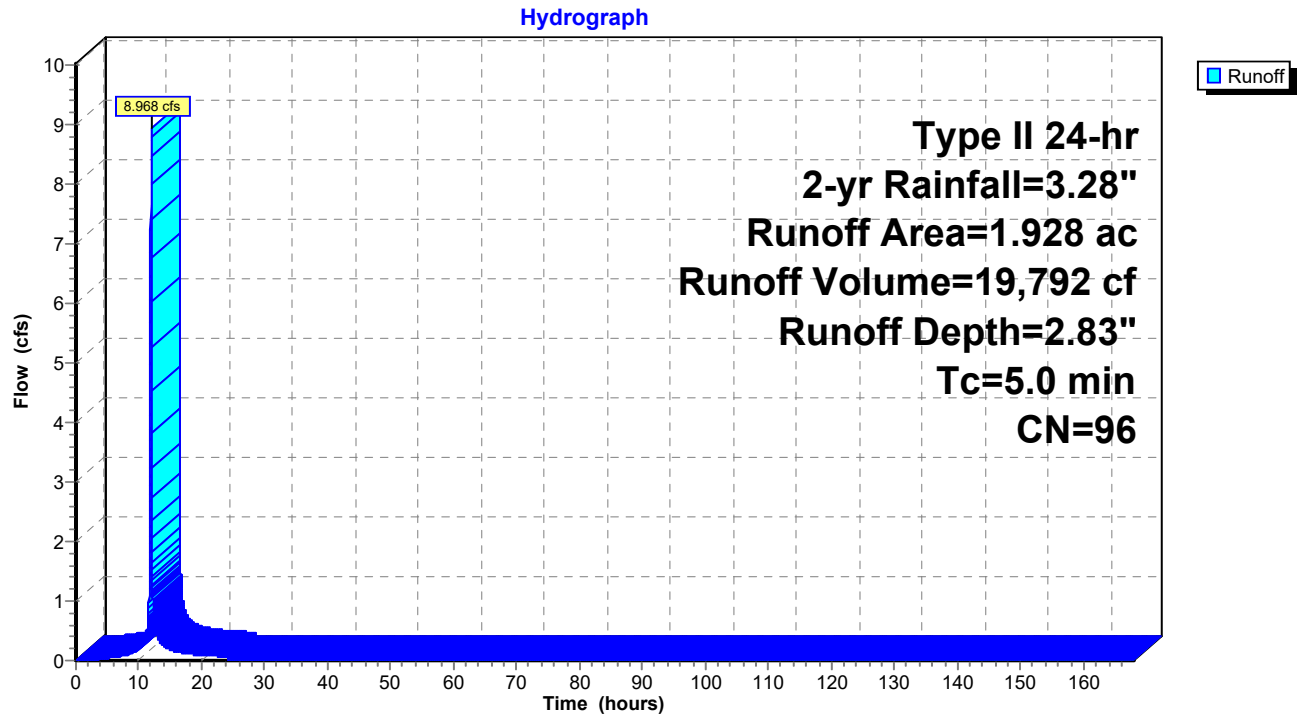
Runoff = 8.968 cfs @ 11.96 hrs, Volume= 19,792 cf, Depth= 2.83"
Routed to Pond 1P : UG1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928	96	Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: POST-DEV UG1 TO POI#1



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Summary for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

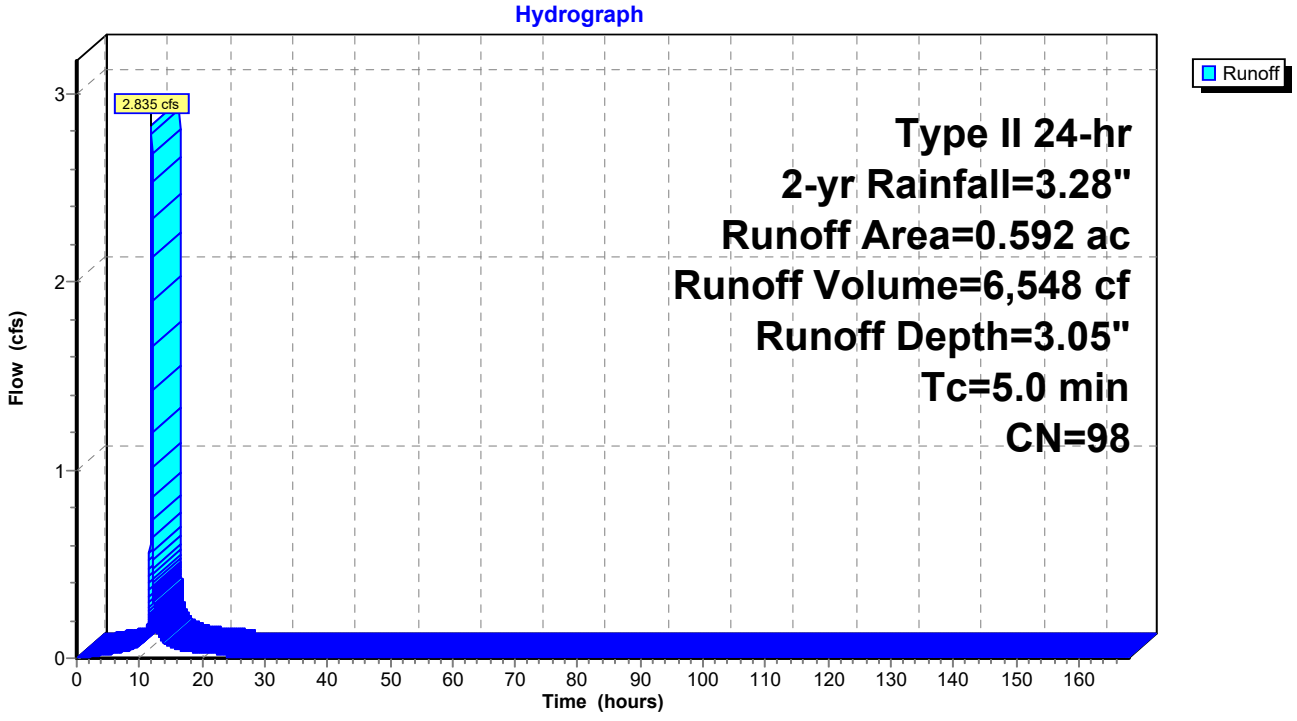
Runoff = 2.835 cfs @ 11.96 hrs, Volume= 6,548 cf, Depth= 3.05"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.000	39	Lawn A
*	0.592	98	Impervious
	0.592	98	Weighted Average
	0.592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1



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Summary for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

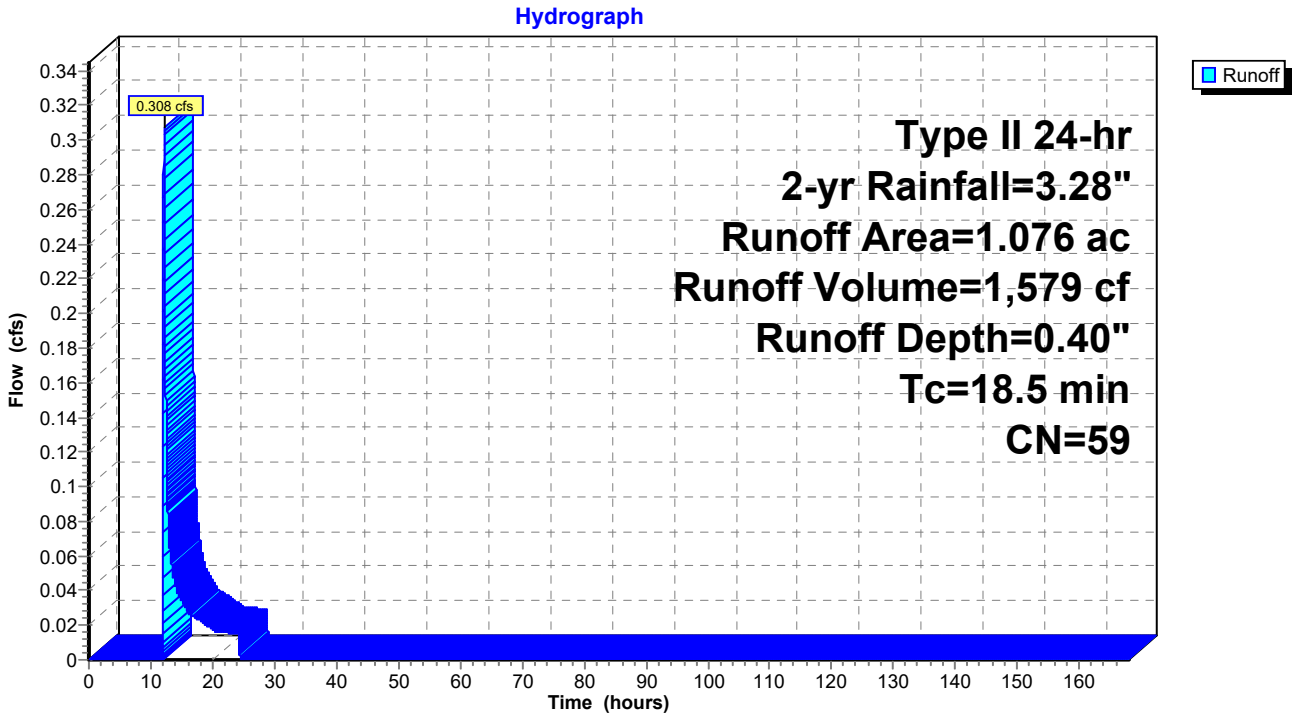
Runoff = 0.308 cfs @ 12.16 hrs, Volume= 1,579 cf, Depth= 0.40"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.389	39	Lawn A
*	0.285	30	Wooded A
*	0.402	98	Impervious
	1.076	59	Weighted Average
	0.674		62.64% Pervious Area
	0.402		37.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1



Summary for Subcatchment 11S: POST-DEV TO POI#2

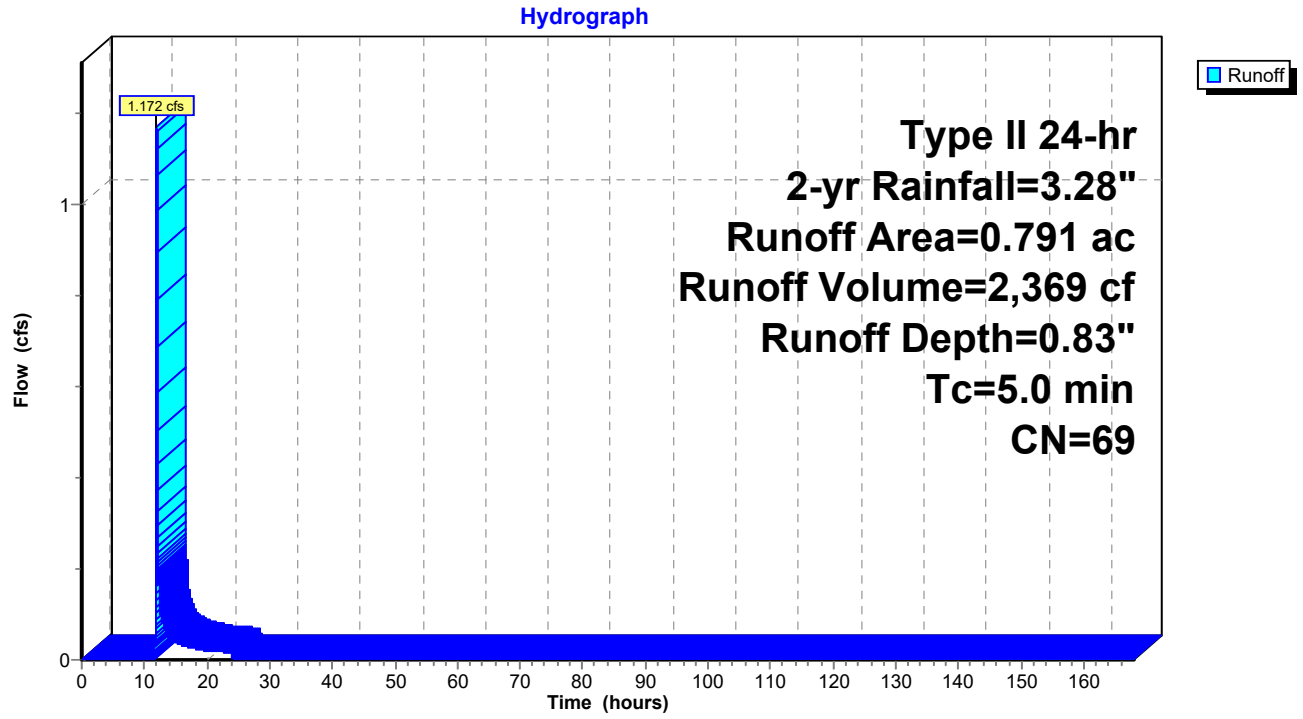
Runoff = 1.172 cfs @ 11.97 hrs, Volume= 2,369 cf, Depth= 0.83"
Routed to Link 12L : POST-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.318	39	Lawn A
*	0.107	61	Lawn B
*	0.366	98	Impervious
	0.791	69	Weighted Average
	0.425		53.73% Pervious Area
	0.366		46.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 11S: POST-DEV TO POI#2



Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

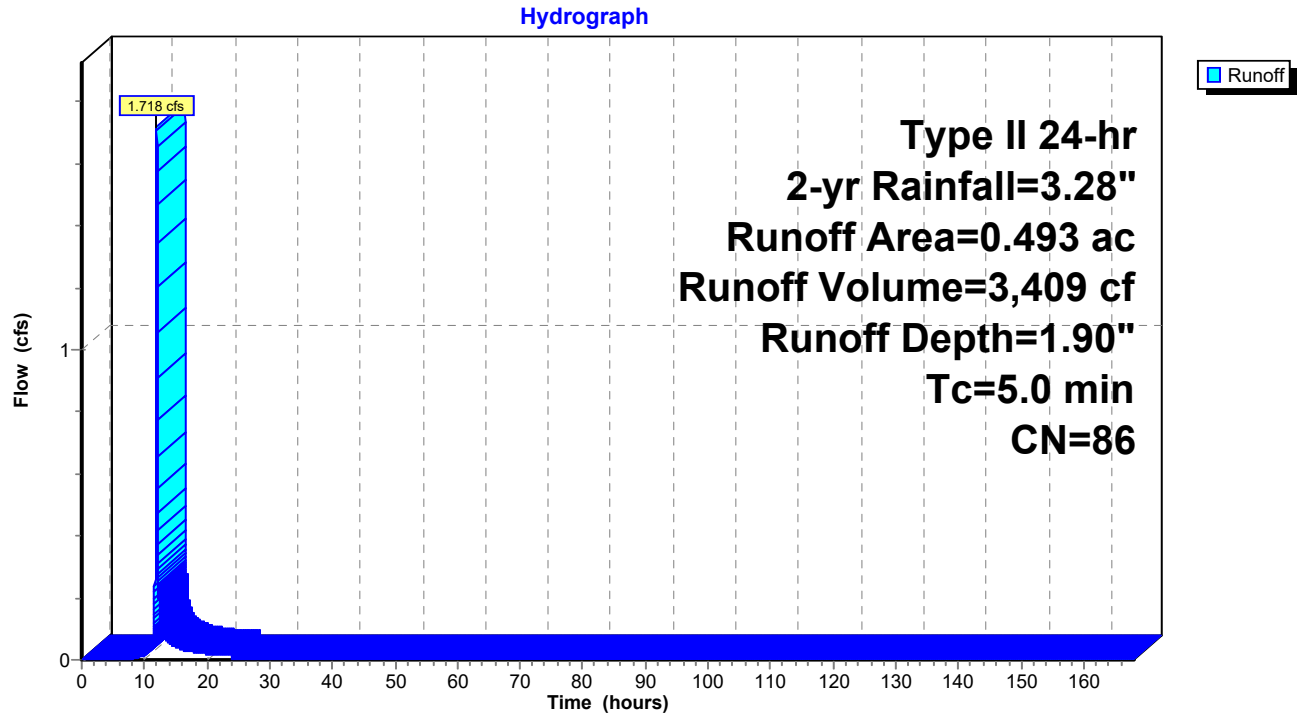
Runoff = 1.718 cfs @ 11.96 hrs, Volume= 3,409 cf, Depth= 1.90"
Routed to Pond 3P : UG2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493	86	Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 12S: POST-DEV UG2 TO POI#1



Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

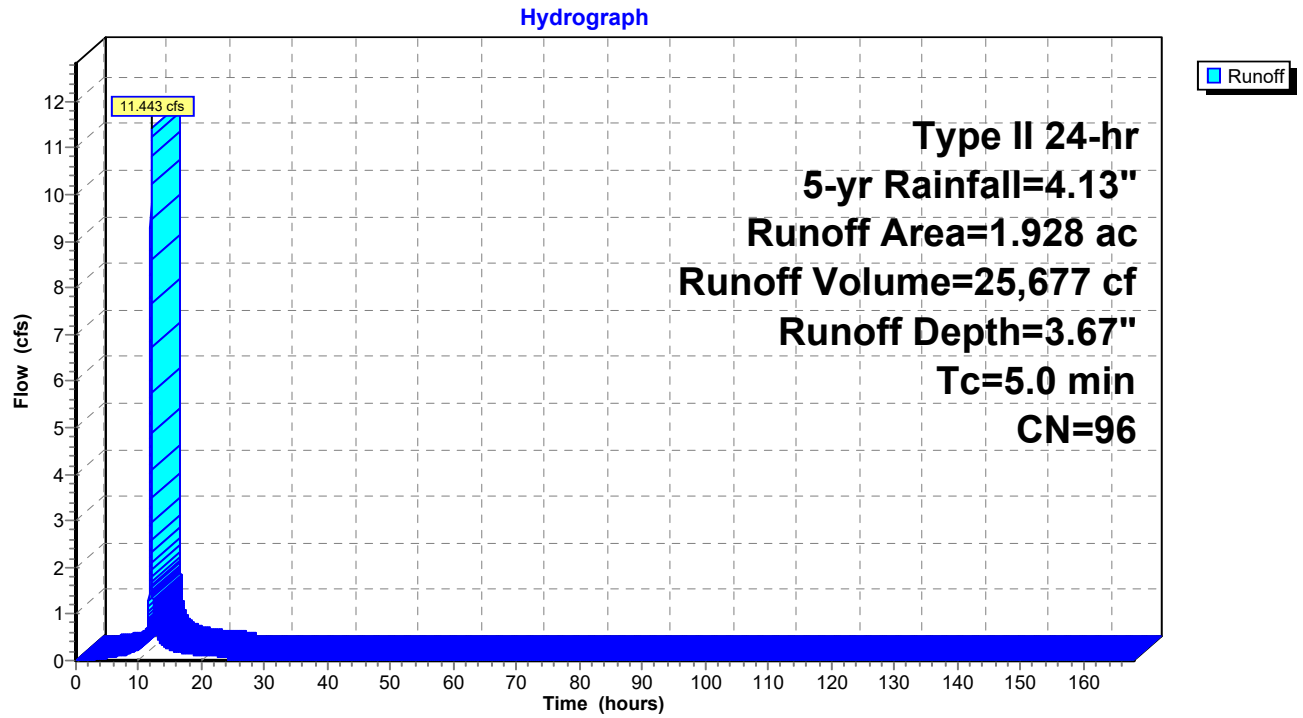
Runoff = 11.443 cfs @ 11.96 hrs, Volume= 25,677 cf, Depth= 3.67"
Routed to Pond 1P : UG1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 5-yr Rainfall=4.13"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928	96	Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: POST-DEV UG1 TO POI#1



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Summary for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

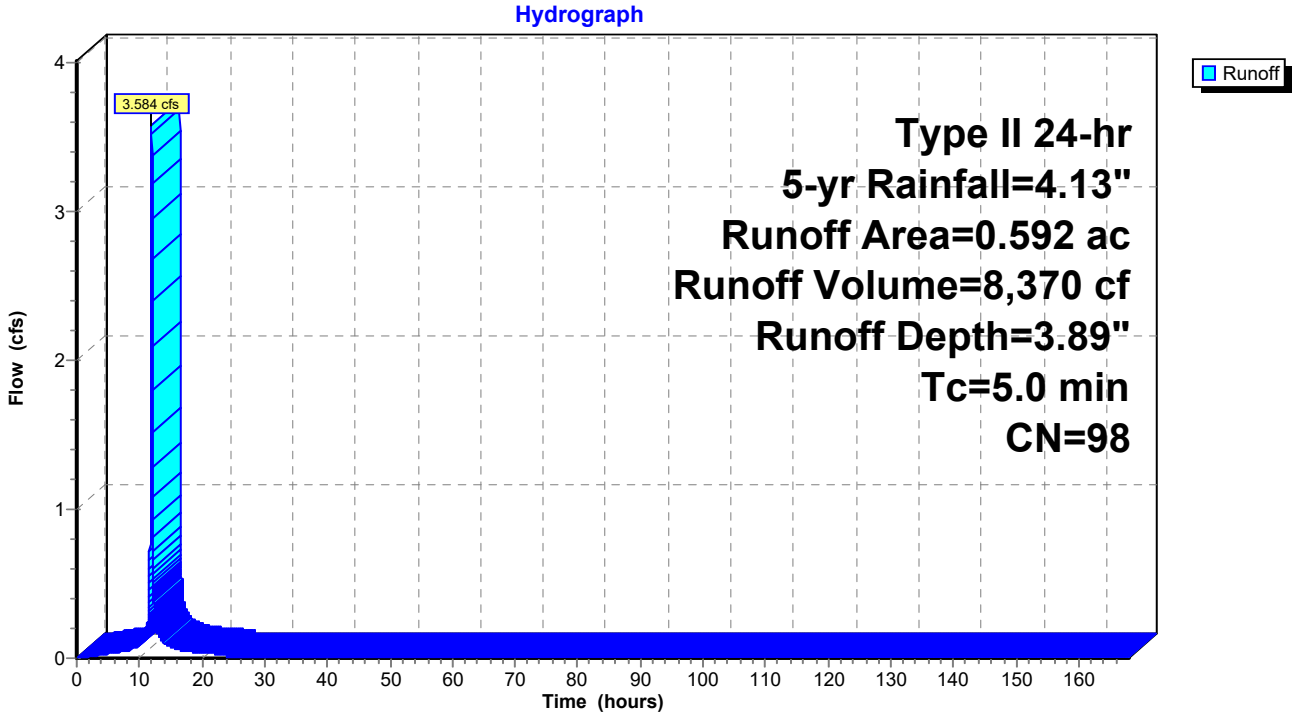
Runoff = 3.584 cfs @ 11.96 hrs, Volume= 8,370 cf, Depth= 3.89"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 5-yr Rainfall=4.13"

	Area (ac)	CN	Description
*	0.000	39	Lawn A
*	0.592	98	Impervious
	0.592	98	Weighted Average
	0.592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1



Summary for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

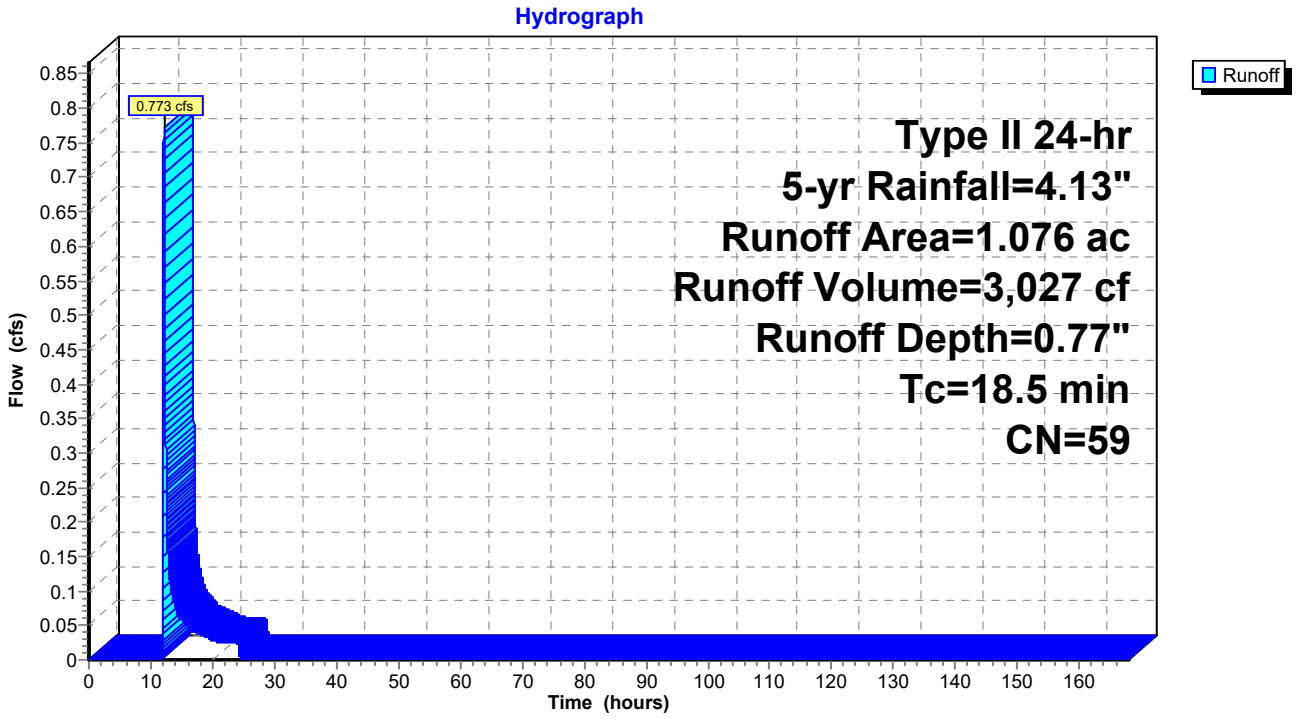
Runoff = 0.773 cfs @ 12.15 hrs, Volume= 3,027 cf, Depth= 0.77"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 5-yr Rainfall=4.13"

	Area (ac)	CN	Description
*	0.389	39	Lawn A
*	0.285	30	Wooded A
*	0.402	98	Impervious
	1.076	59	Weighted Average
	0.674		62.64% Pervious Area
	0.402		37.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1



Summary for Subcatchment 11S: POST-DEV TO POI#2

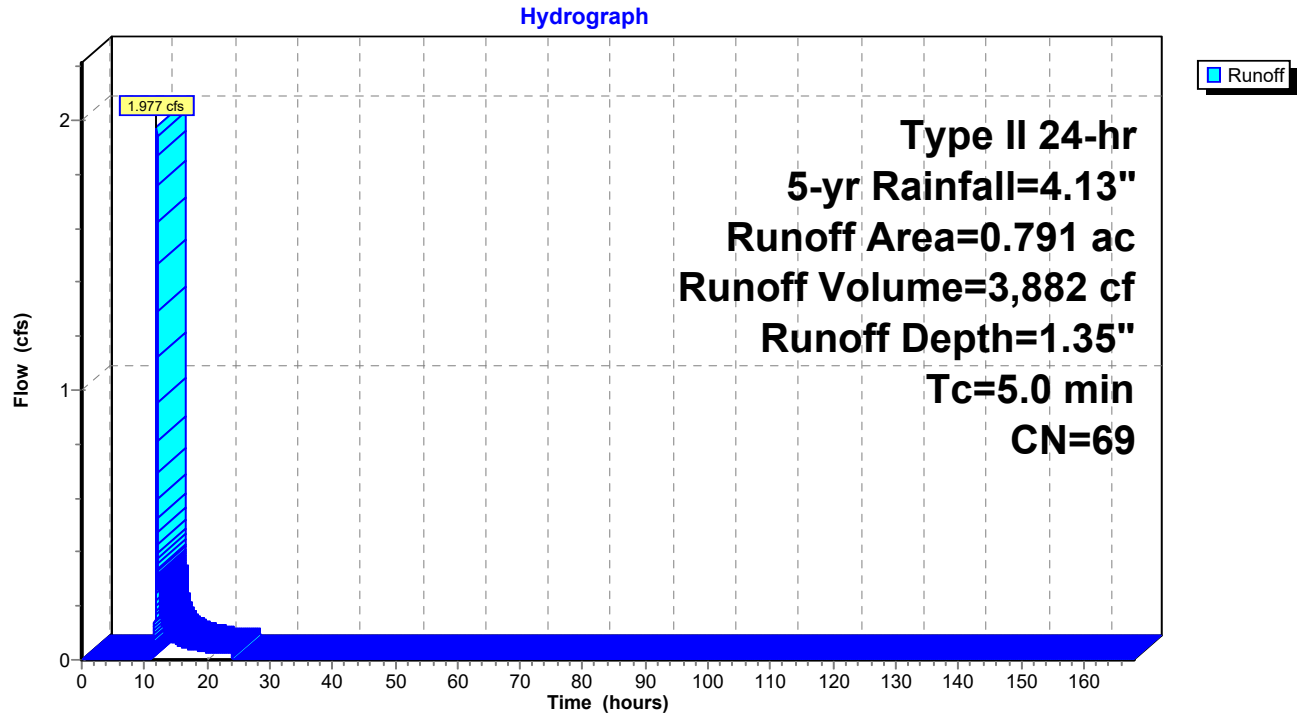
Runoff = 1.977 cfs @ 11.97 hrs, Volume= 3,882 cf, Depth= 1.35"
Routed to Link 12L : POST-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 5-yr Rainfall=4.13"

	Area (ac)	CN	Description
*	0.318	39	Lawn A
*	0.107	61	Lawn B
*	0.366	98	Impervious
	0.791	69	Weighted Average
	0.425		53.73% Pervious Area
	0.366		46.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 11S: POST-DEV TO POI#2



Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

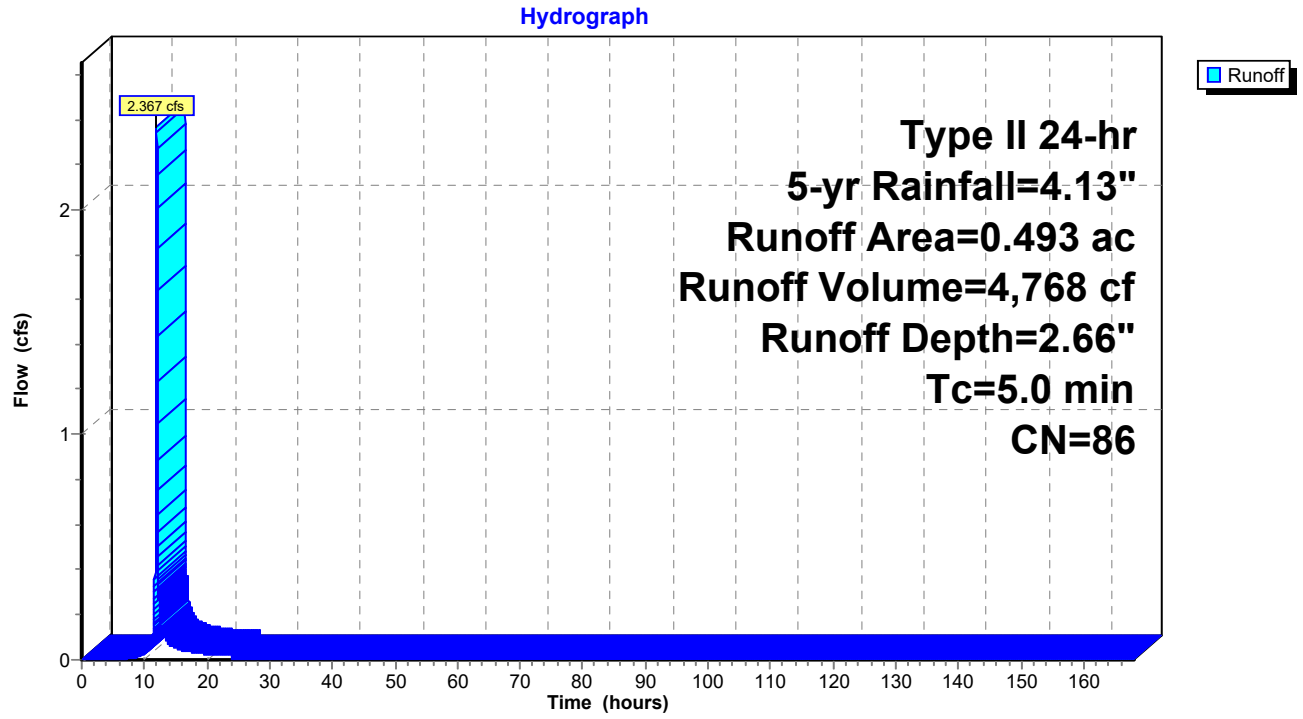
Runoff = 2.367 cfs @ 11.96 hrs, Volume= 4,768 cf, Depth= 2.66"
Routed to Pond 3P : UG2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 5-yr Rainfall=4.13"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493	86	Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 12S: POST-DEV UG2 TO POI#1



Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

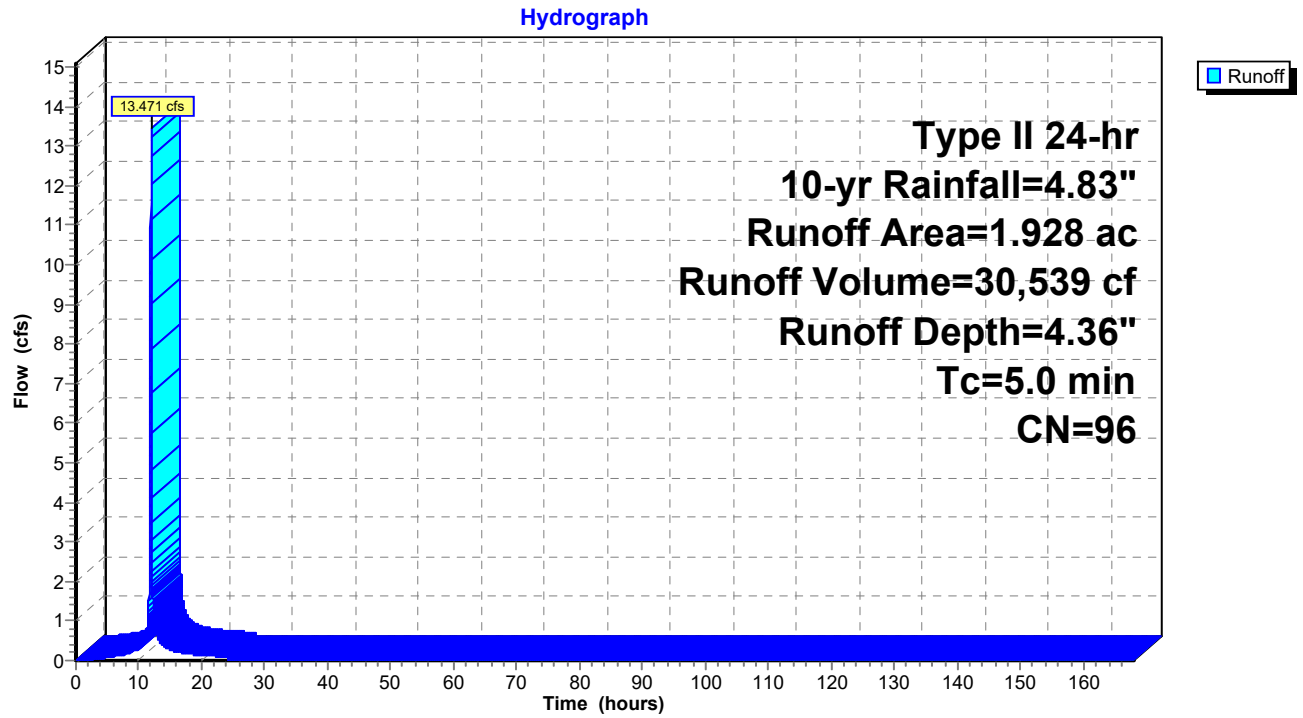
Runoff = 13.471 cfs @ 11.96 hrs, Volume= 30,539 cf, Depth= 4.36"
Routed to Pond 1P : UG1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928	96	Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: POST-DEV UG1 TO POI#1



Summary for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

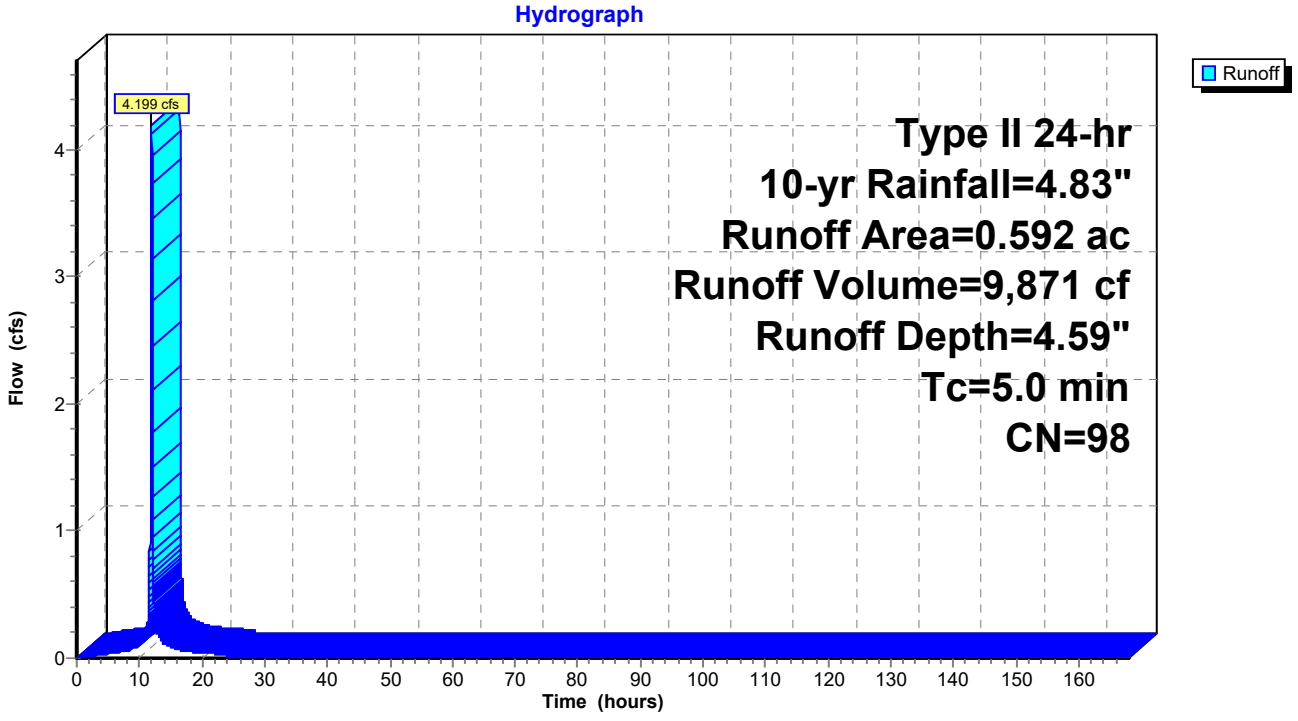
Runoff = 4.199 cfs @ 11.96 hrs, Volume= 9,871 cf, Depth= 4.59"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.000	39	Lawn A
*	0.592	98	Impervious
	0.592	98	Weighted Average
	0.592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1



Summary for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

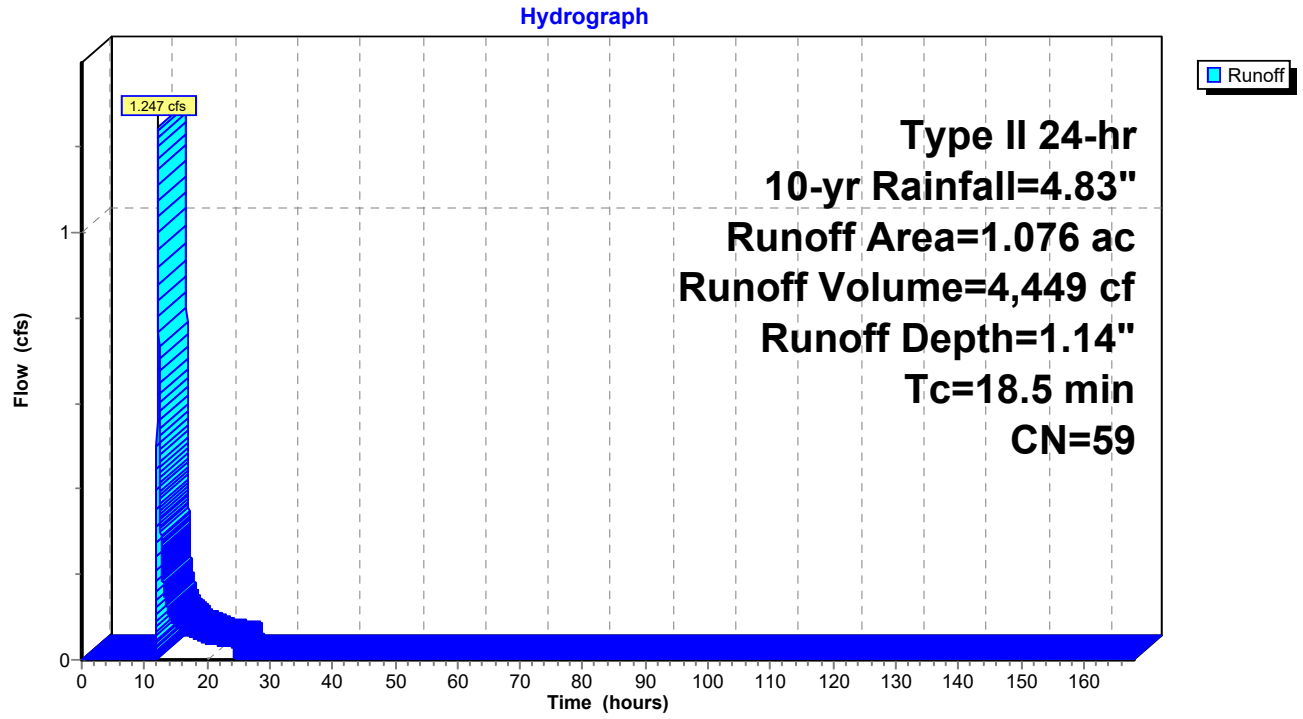
Runoff = 1.247 cfs @ 12.13 hrs, Volume= 4,449 cf, Depth= 1.14"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.389	39	Lawn A
*	0.285	30	Wooded A
*	0.402	98	Impervious
	1.076	59	Weighted Average
	0.674		62.64% Pervious Area
	0.402		37.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1



Summary for Subcatchment 11S: POST-DEV TO POI#2

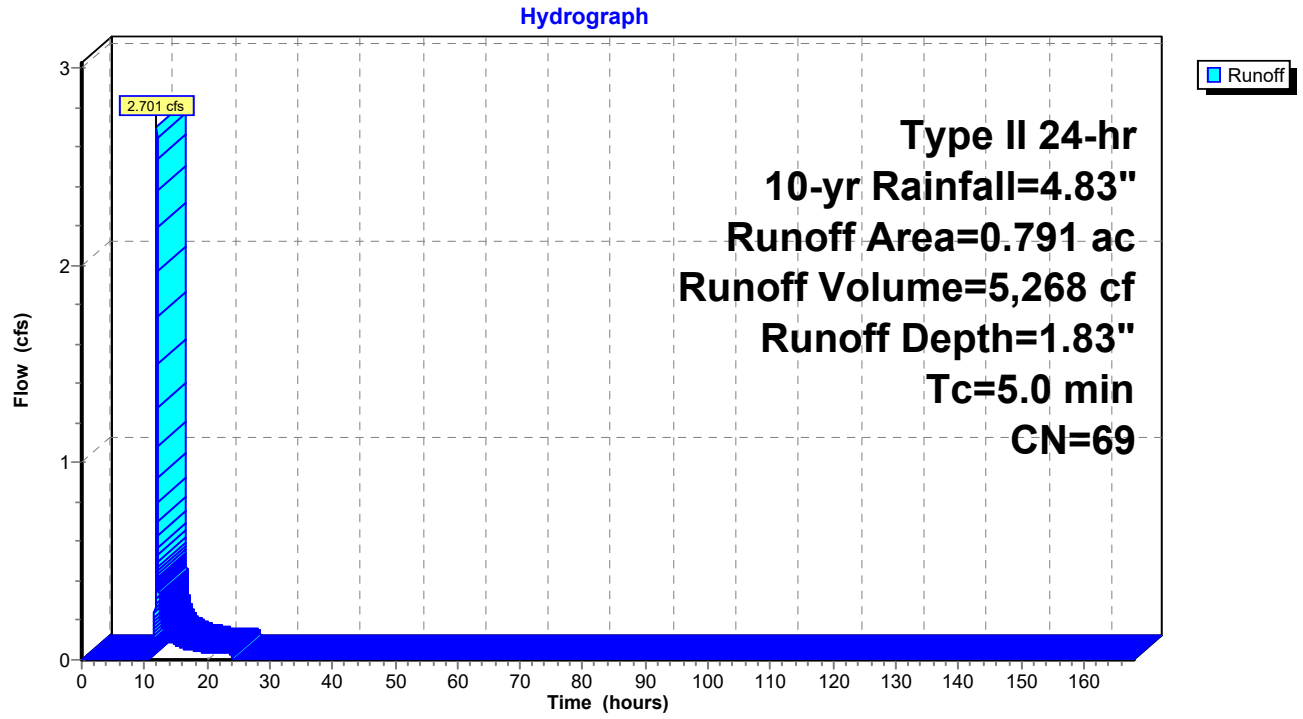
Runoff = 2.701 cfs @ 11.97 hrs, Volume= 5,268 cf, Depth= 1.83"
Routed to Link 12L : POST-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.318	39	Lawn A
*	0.107	61	Lawn B
*	0.366	98	Impervious
	0.791	69	Weighted Average
	0.425		53.73% Pervious Area
	0.366		46.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 11S: POST-DEV TO POI#2



Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

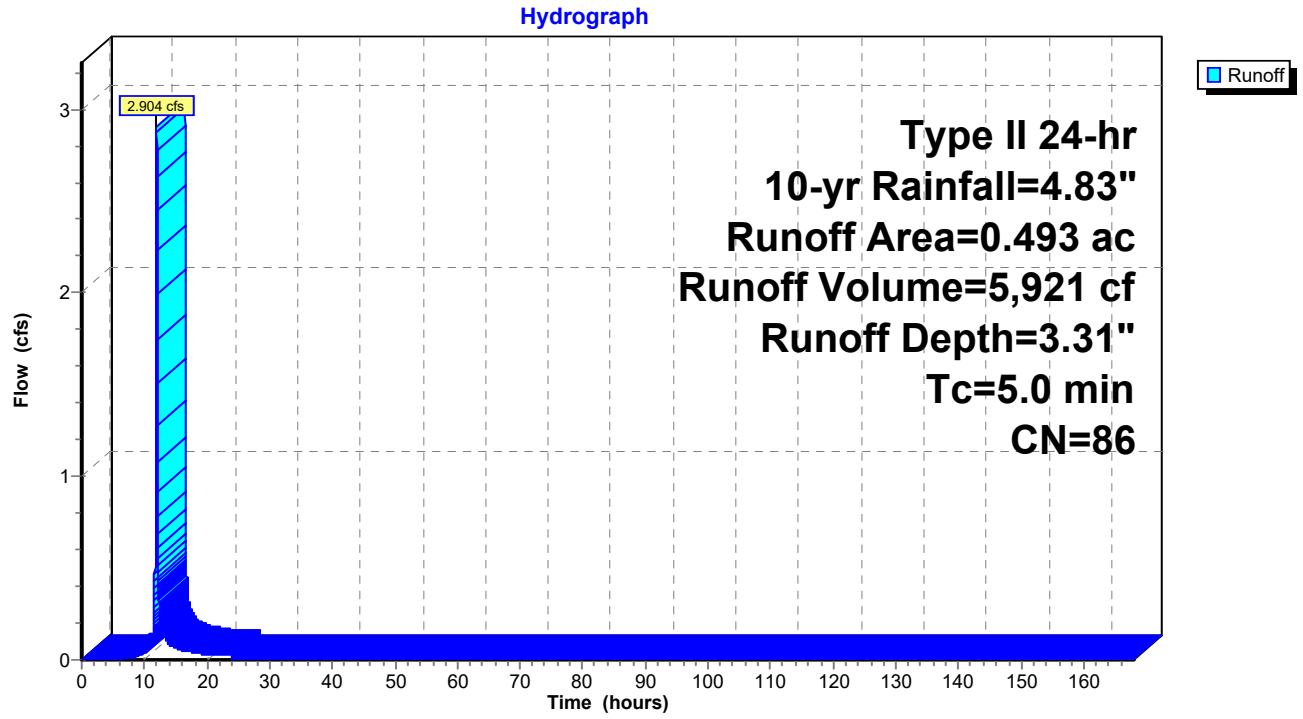
Runoff = 2.904 cfs @ 11.96 hrs, Volume= 5,921 cf, Depth= 3.31"
Routed to Pond 3P : UG2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493	86	Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 12S: POST-DEV UG2 TO POI#1



Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

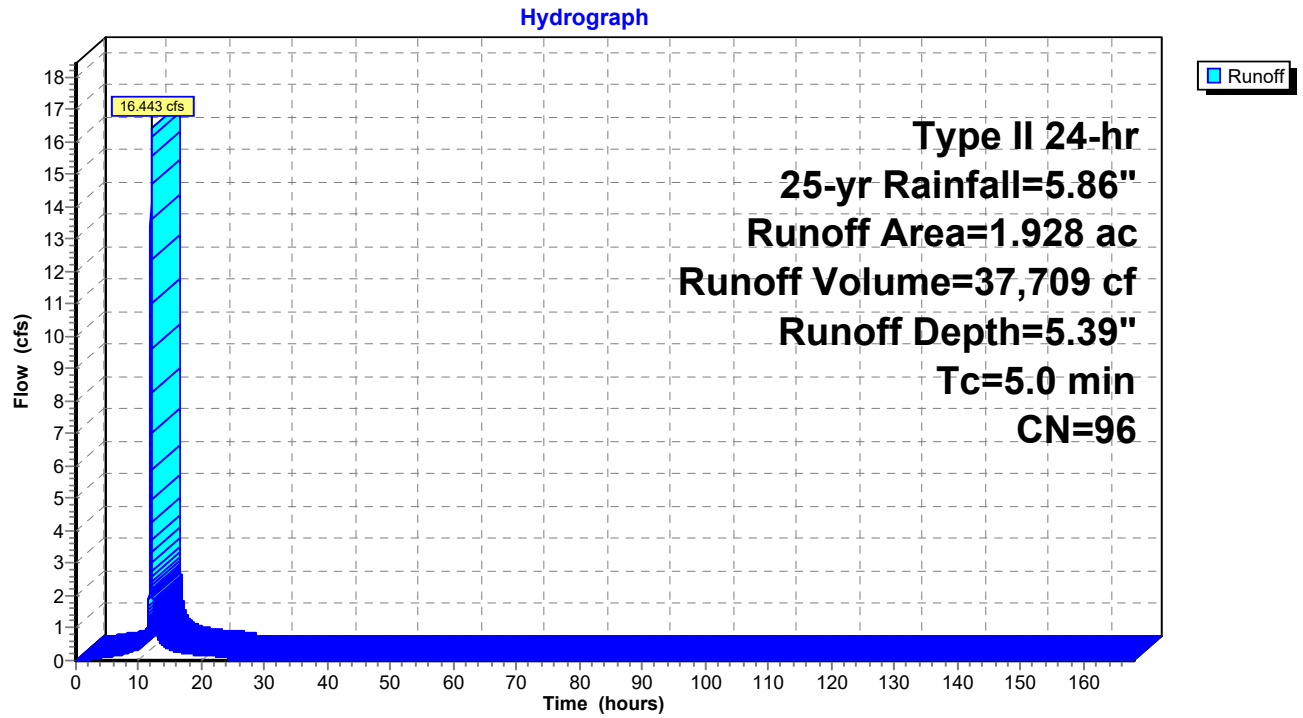
Runoff = 16.443 cfs @ 11.96 hrs, Volume= 37,709 cf, Depth= 5.39"
Routed to Pond 1P : UG1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=5.86"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928	96	Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: POST-DEV UG1 TO POI#1



Summary for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

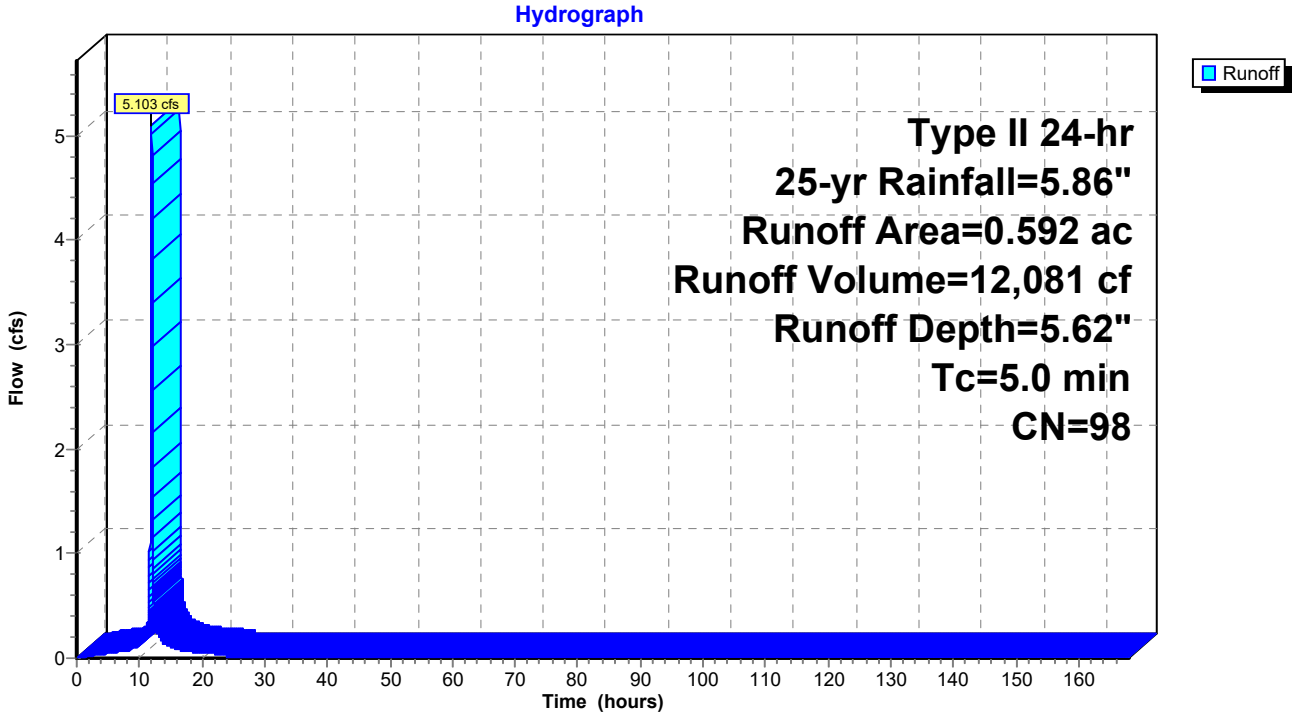
Runoff = 5.103 cfs @ 11.96 hrs, Volume= 12,081 cf, Depth= 5.62"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=5.86"

	Area (ac)	CN	Description
*	0.000	39	Lawn A
*	0.592	98	Impervious
	0.592	98	Weighted Average
	0.592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1



Summary for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

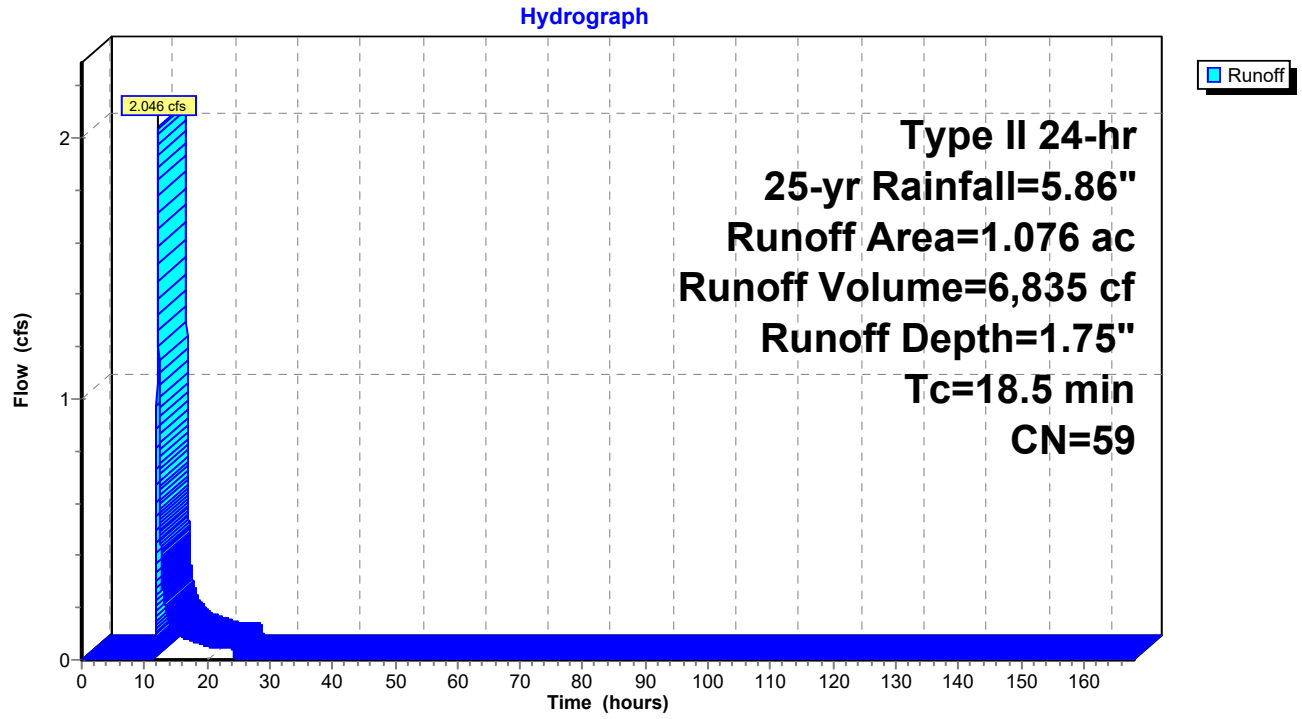
Runoff = 2.046 cfs @ 12.13 hrs, Volume= 6,835 cf, Depth= 1.75"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=5.86"

	Area (ac)	CN	Description
*	0.389	39	Lawn A
*	0.285	30	Wooded A
*	0.402	98	Impervious
	1.076	59	Weighted Average
	0.674		62.64% Pervious Area
	0.402		37.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1



Summary for Subcatchment 11S: POST-DEV TO POI#2

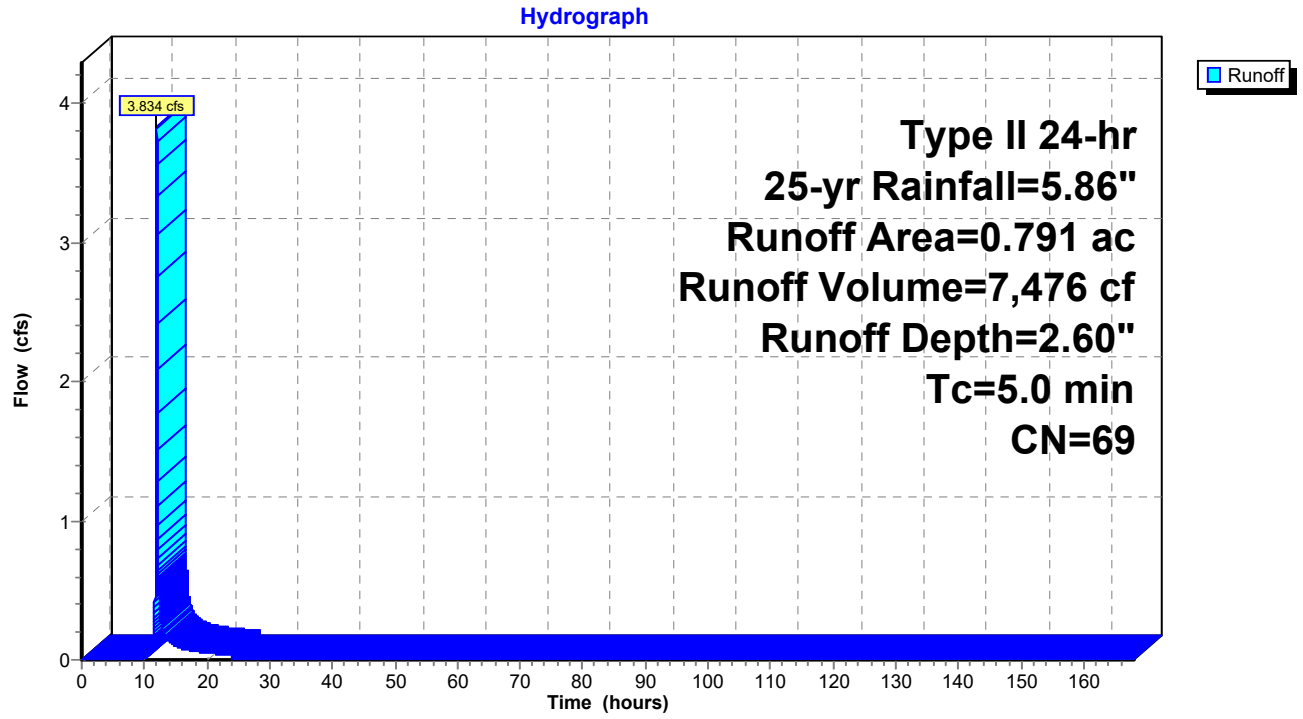
Runoff = 3.834 cfs @ 11.96 hrs, Volume= 7,476 cf, Depth= 2.60"
Routed to Link 12L : POST-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=5.86"

	Area (ac)	CN	Description
*	0.318	39	Lawn A
*	0.107	61	Lawn B
*	0.366	98	Impervious
	0.791	69	Weighted Average
	0.425		53.73% Pervious Area
	0.366		46.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 11S: POST-DEV TO POI#2



Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

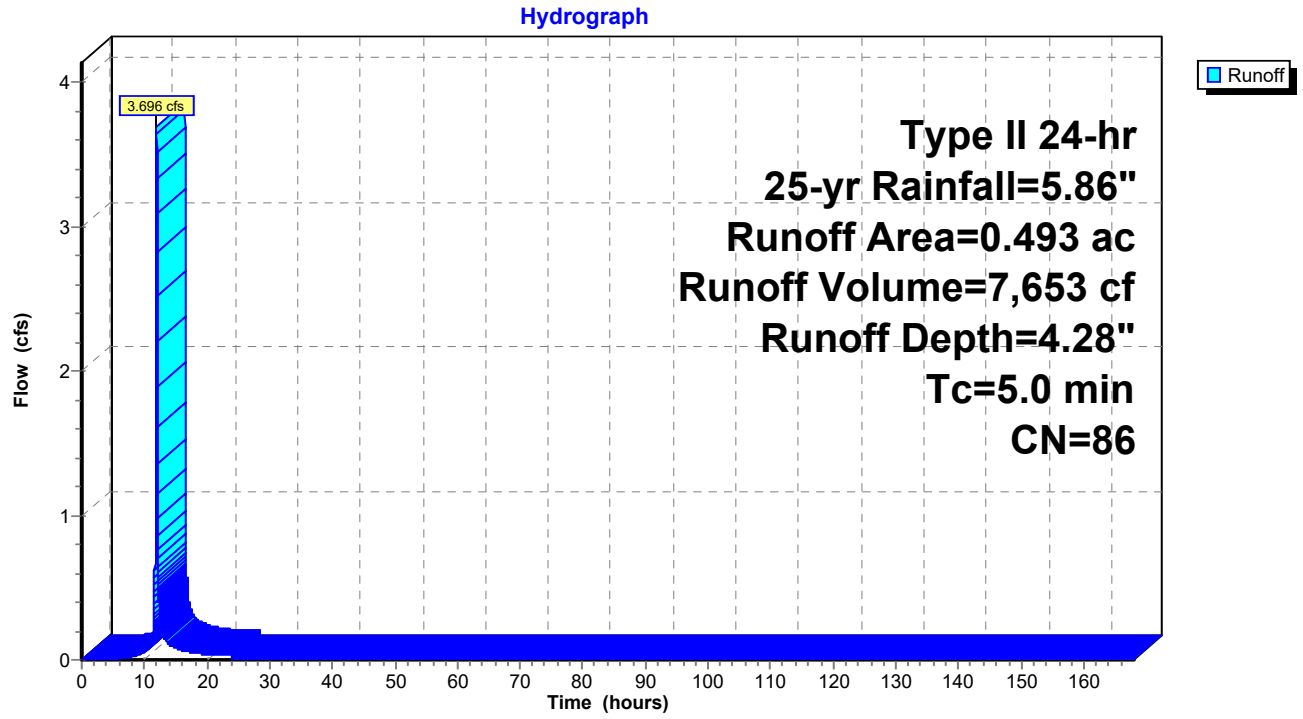
Runoff = 3.696 cfs @ 11.96 hrs, Volume= 7,653 cf, Depth= 4.28"
Routed to Pond 3P : UG2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 25-yr Rainfall=5.86"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493	86	Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 12S: POST-DEV UG2 TO POI#1



Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

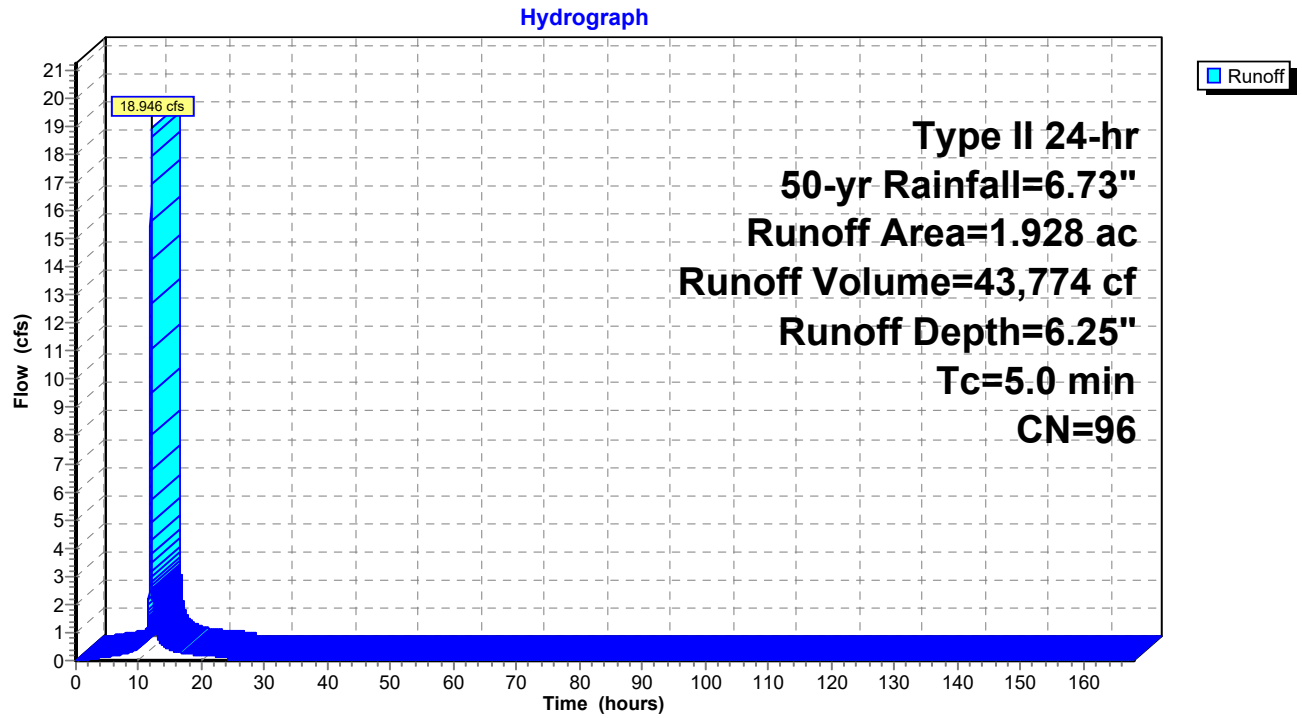
Runoff = 18.946 cfs @ 11.96 hrs, Volume= 43,774 cf, Depth= 6.25"
Routed to Pond 1P : UG1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928	96	Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: POST-DEV UG1 TO POI#1



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Summary for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

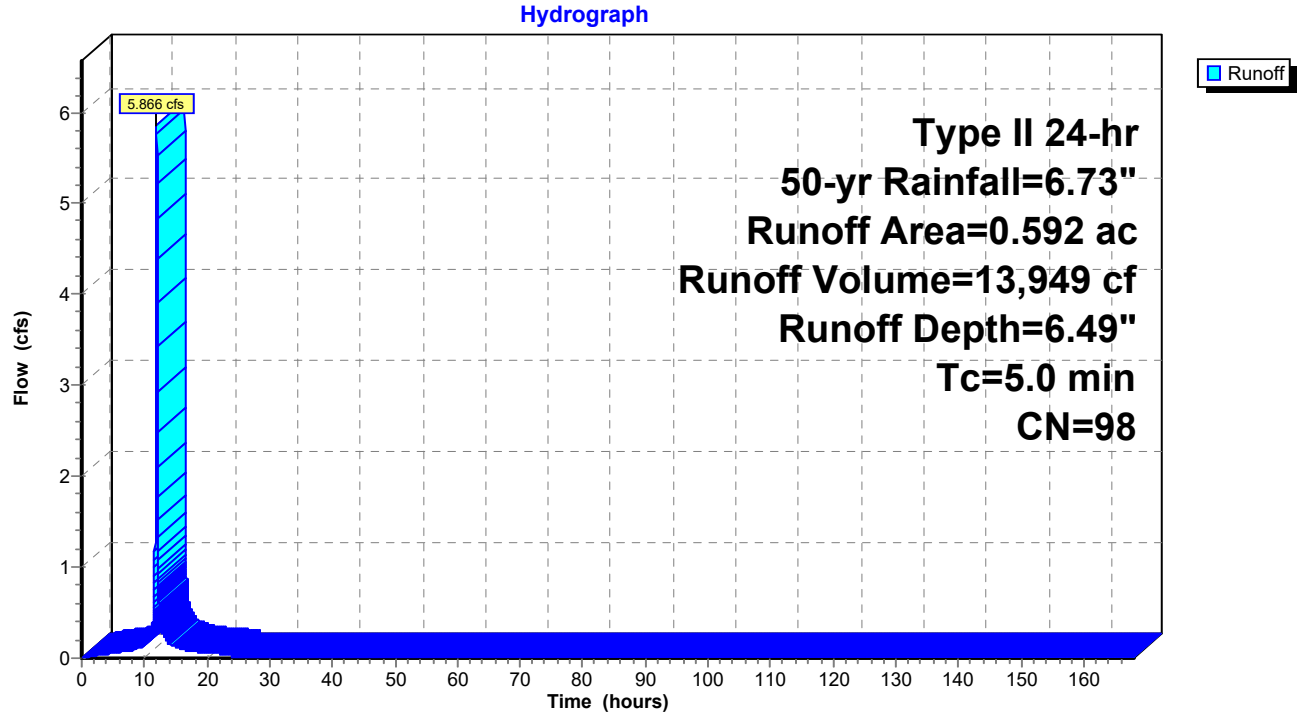
Runoff = 5.866 cfs @ 11.96 hrs, Volume= 13,949 cf, Depth= 6.49"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.000	39	Lawn A
*	0.592	98	Impervious
	0.592	98	Weighted Average
	0.592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1



Summary for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

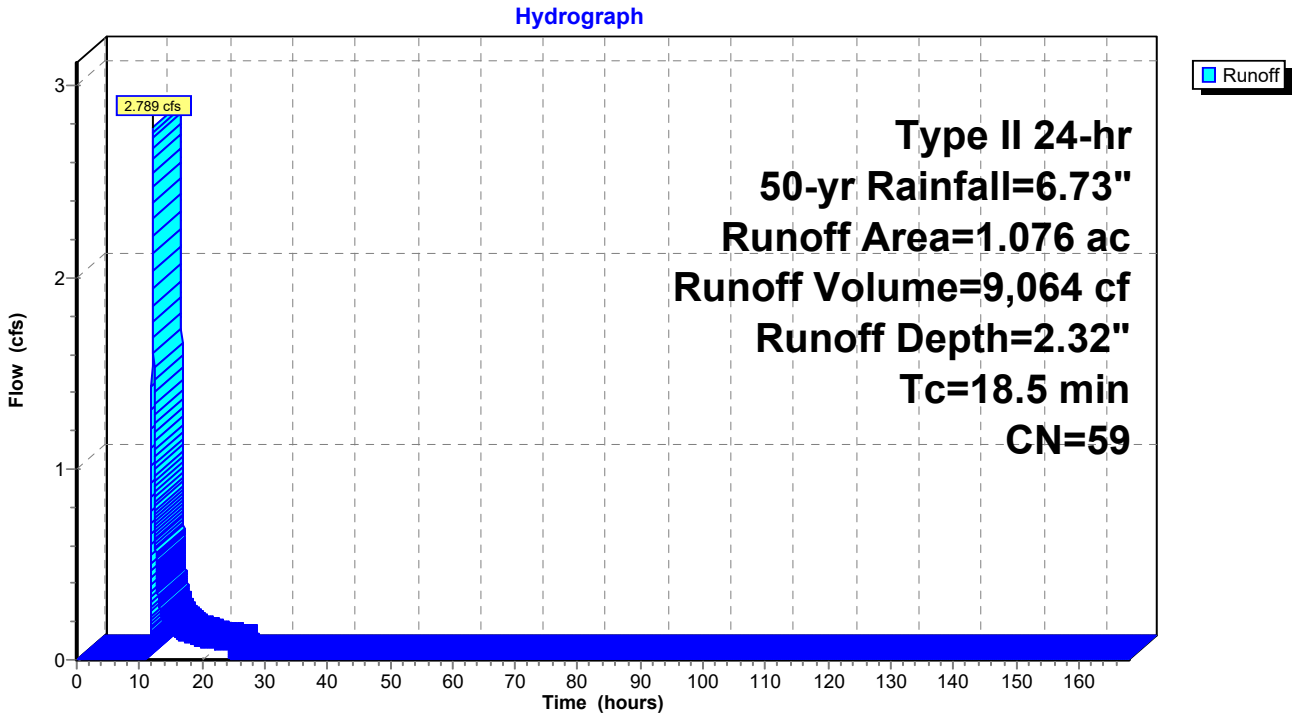
Runoff = 2.789 cfs @ 12.12 hrs, Volume= 9,064 cf, Depth= 2.32"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.389	39	Lawn A
*	0.285	30	Wooded A
*	0.402	98	Impervious
	1.076	59	Weighted Average
	0.674		62.64% Pervious Area
	0.402		37.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1



Summary for Subcatchment 11S: POST-DEV TO POI#2

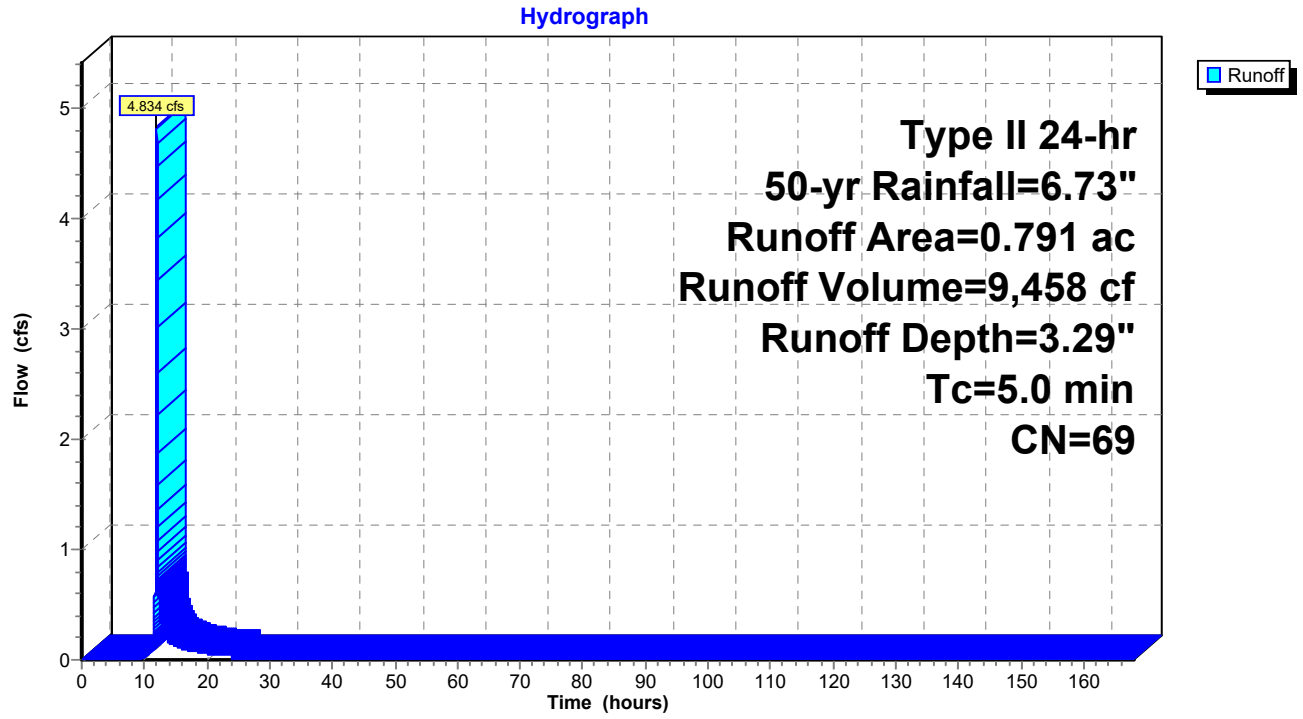
Runoff = 4.834 cfs @ 11.96 hrs, Volume= 9,458 cf, Depth= 3.29"
Routed to Link 12L : POST-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.318	39	Lawn A
*	0.107	61	Lawn B
*	0.366	98	Impervious
	0.791	69	Weighted Average
	0.425		53.73% Pervious Area
	0.366		46.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 11S: POST-DEV TO POI#2



Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

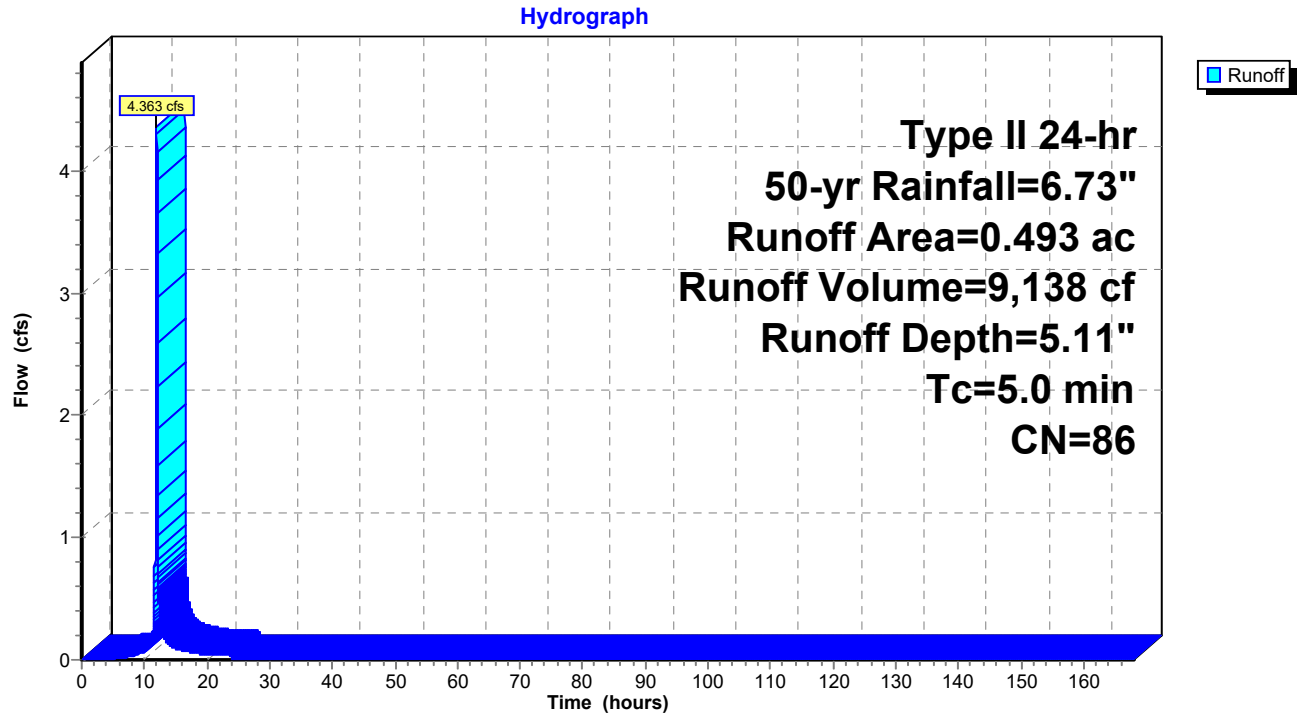
Runoff = 4.363 cfs @ 11.96 hrs, Volume= 9,138 cf, Depth= 5.11"
Routed to Pond 3P : UG2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493	86	Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 12S: POST-DEV UG2 TO POI#1



Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

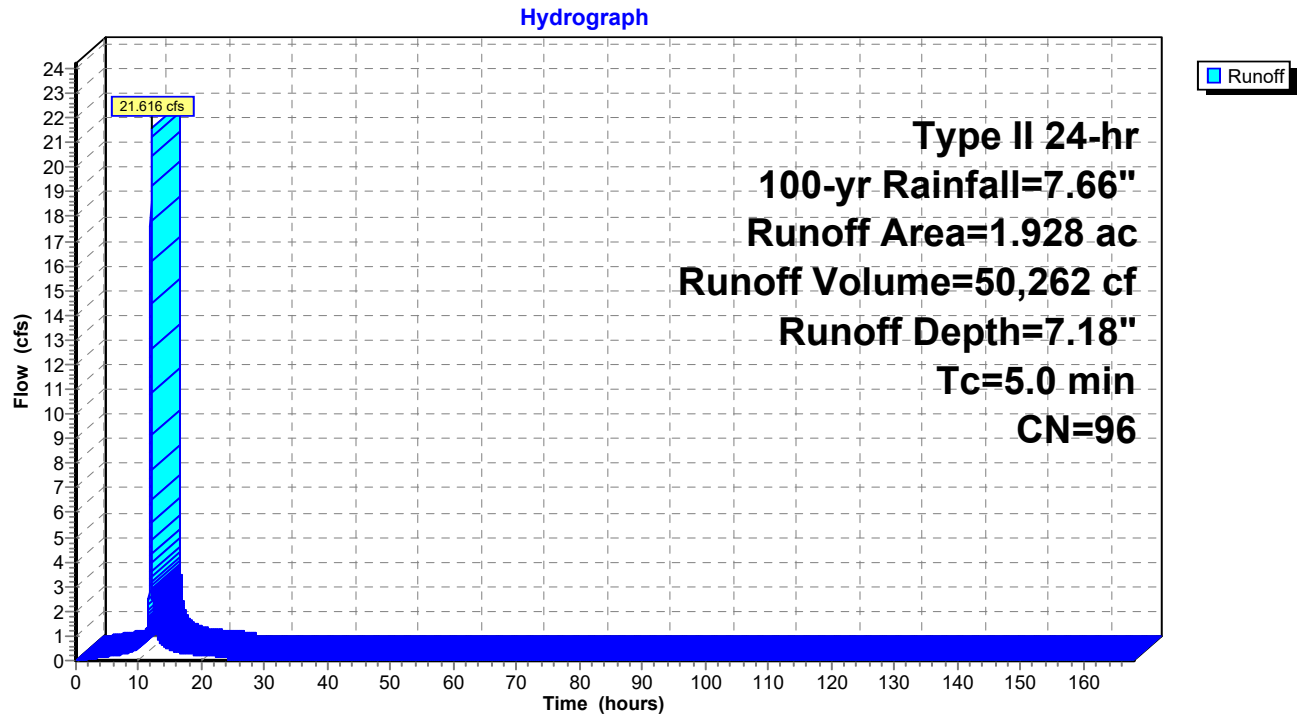
Runoff = 21.616 cfs @ 11.96 hrs, Volume= 50,262 cf, Depth= 7.18"
Routed to Pond 1P : UG1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928	96	Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: POST-DEV UG1 TO POI#1



Summary for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

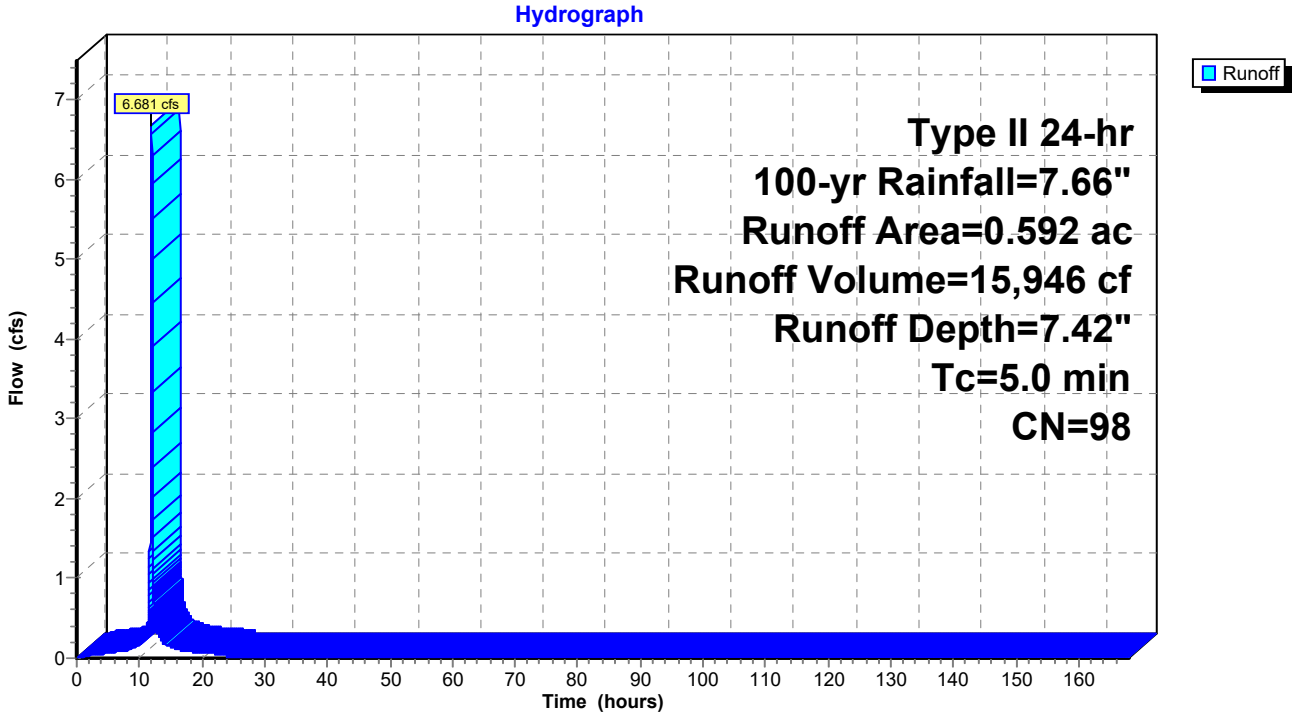
Runoff = 6.681 cfs @ 11.96 hrs, Volume= 15,946 cf, Depth= 7.42"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.000	39	Lawn A
*	0.592	98	Impervious
	0.592	98	Weighted Average
	0.592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1



Summary for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

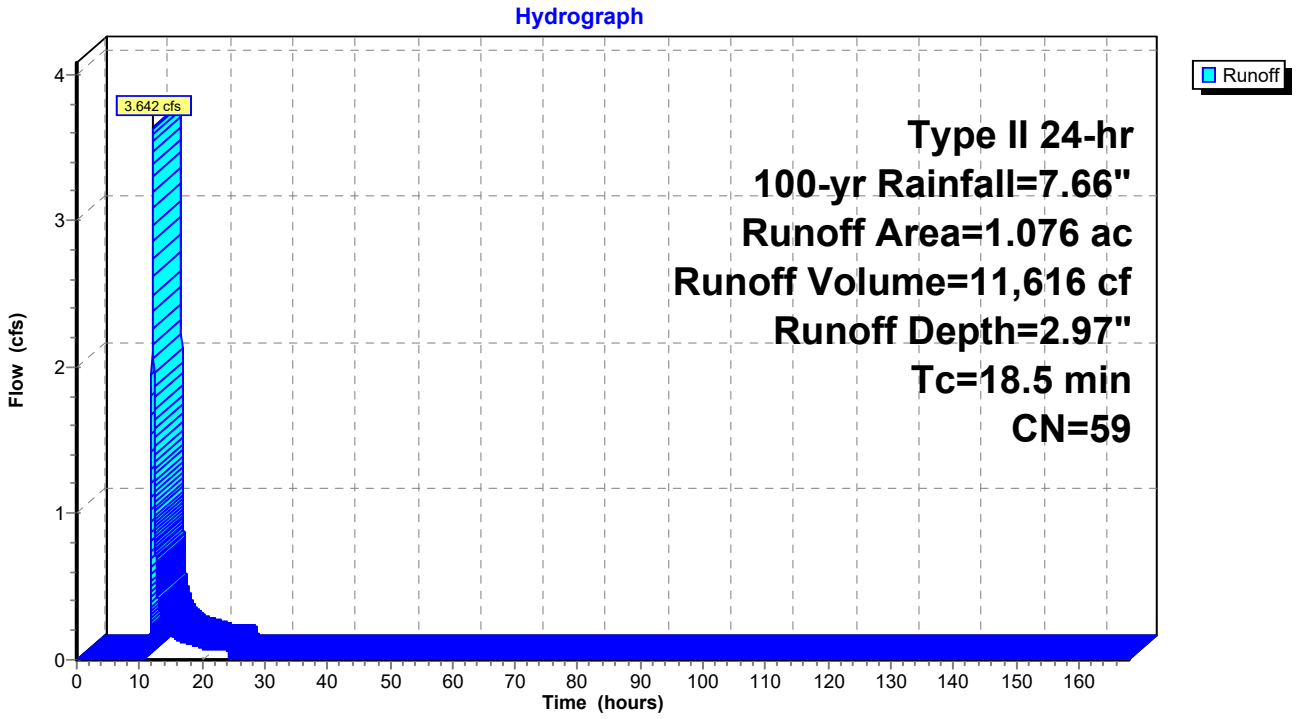
Runoff = 3.642 cfs @ 12.11 hrs, Volume= 11,616 cf, Depth= 2.97"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.389	39	Lawn A
*	0.285	30	Wooded A
*	0.402	98	Impervious
	1.076	59	Weighted Average
	0.674		62.64% Pervious Area
	0.402		37.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1



Summary for Subcatchment 11S: POST-DEV TO POI#2

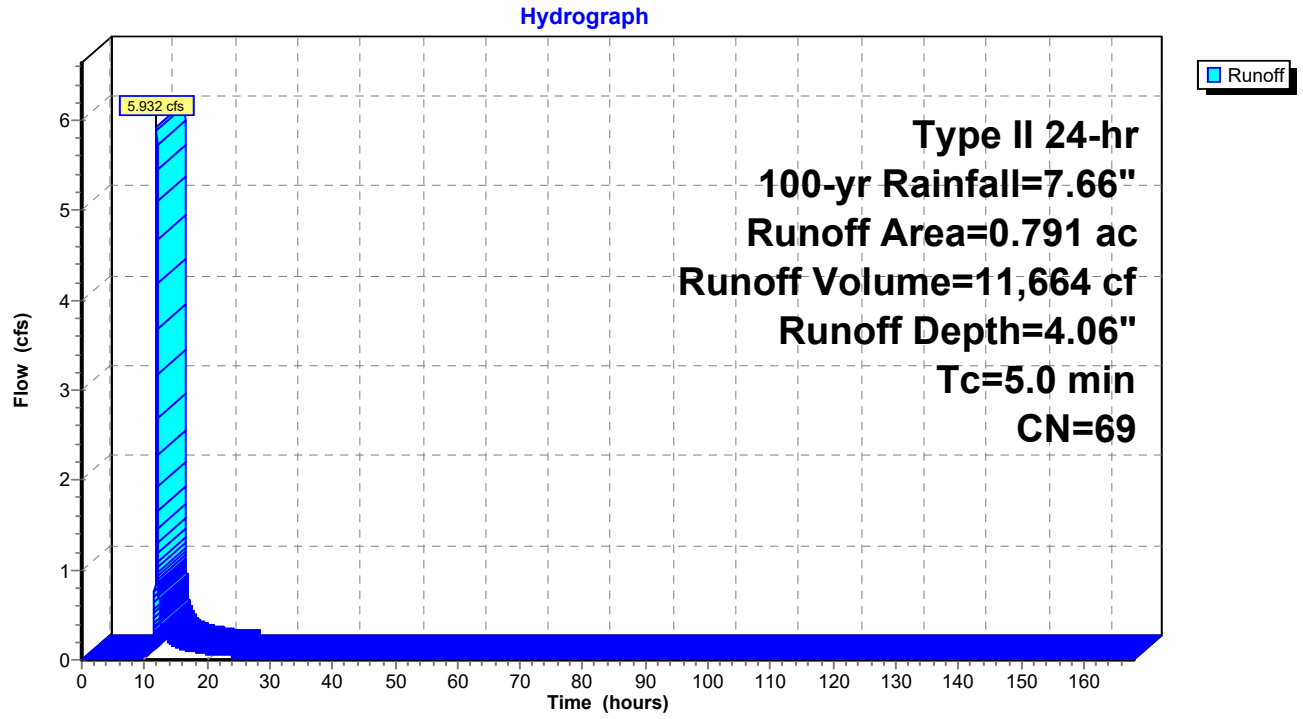
Runoff = 5.932 cfs @ 11.96 hrs, Volume= 11,664 cf, Depth= 4.06"
Routed to Link 12L : POST-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.318	39	Lawn A
*	0.107	61	Lawn B
*	0.366	98	Impervious
	0.791	69	Weighted Average
	0.425		53.73% Pervious Area
	0.366		46.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 11S: POST-DEV TO POI#2



Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

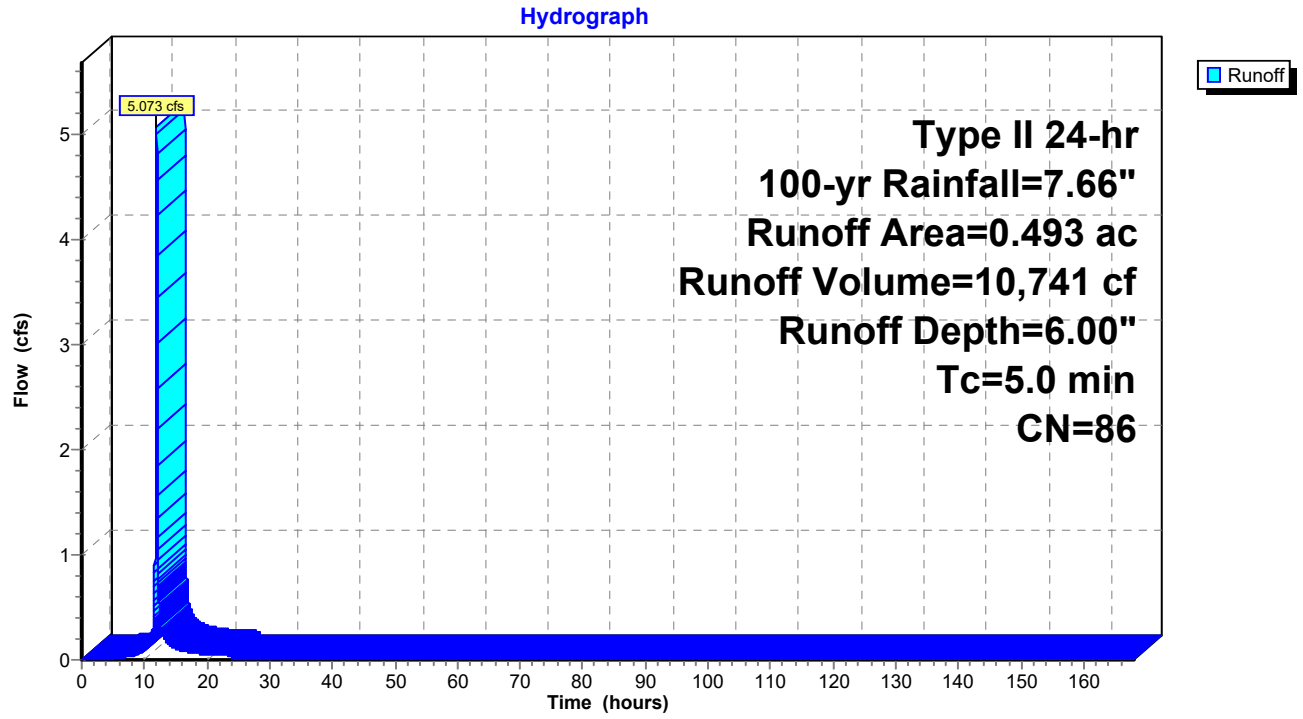
Runoff = 5.073 cfs @ 11.96 hrs, Volume= 10,741 cf, Depth= 6.00"
Routed to Pond 3P : UG2

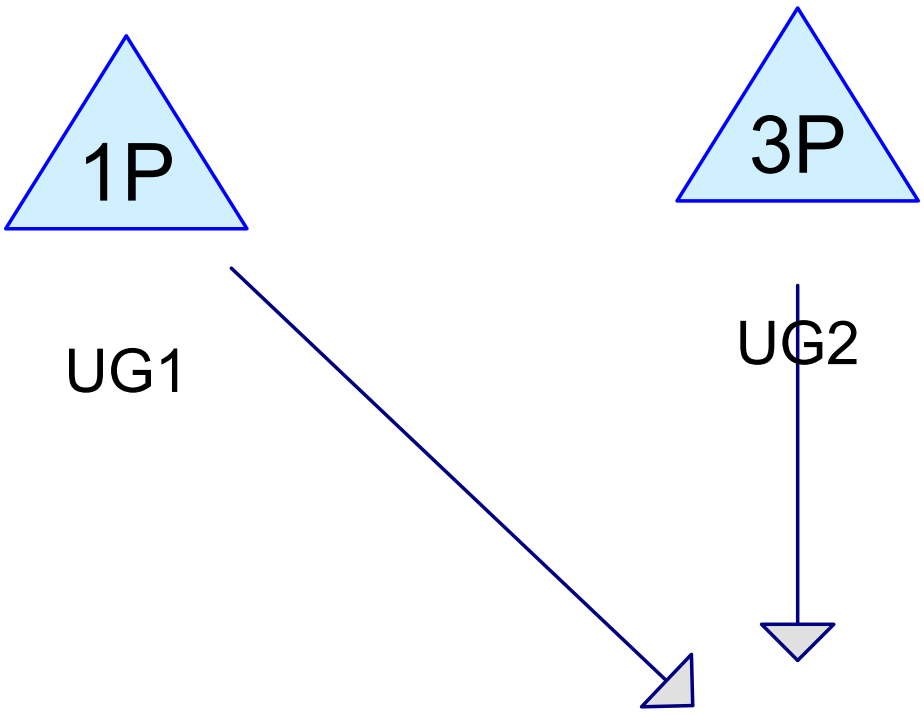
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493	86	Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 12S: POST-DEV UG2 TO POI#1





Subcat Reach Pond Link

Routing Diagram for BMW_2025-7-24_2
Prepared by Bohler, Printed 7/24/2025
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BMW_2025-7-24_2

Prepared by Bohler

Printed 7/24/2025

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-yr	Type II 24-hr		Default	24.00	1	2.73	2
2	2-yr	Type II 24-hr		Default	24.00	1	3.28	2
3	5-yr	Type II 24-hr		Default	24.00	1	4.13	2
4	10-yr	Type II 24-hr		Default	24.00	1	4.83	2
5	25-yr	Type II 24-hr		Default	24.00	1	5.86	2
6	50-yr	Type II 24-hr		Default	24.00	1	6.73	2
7	100-yr	Type II 24-hr		Default	24.00	1	7.66	2

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 2.29" for 1-yr event
Inflow = 7.355 cfs @ 11.96 hrs, Volume= 16,004 cf
Outflow = 0.831 cfs @ 12.25 hrs, Volume= 15,861 cf, Atten= 89%, Lag= 17.5 min
Primary = 0.831 cfs @ 12.25 hrs, Volume= 15,861 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 158.62' @ 12.25 hrs Surf.Area= 13,041 sf Storage= 9,389 cf

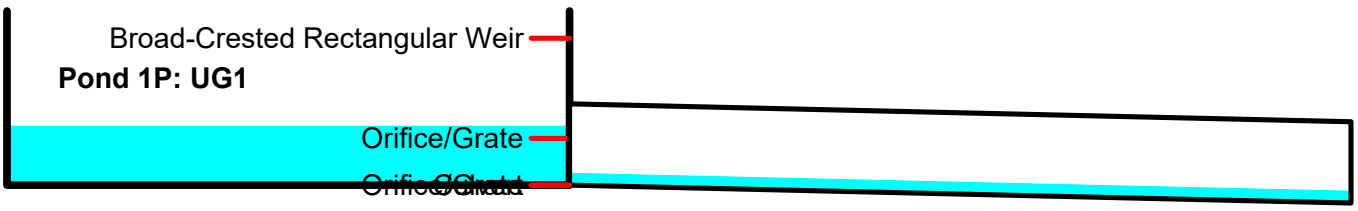
Plug-Flow detention time= 1,637.7 min calculated for 15,861 cf (99% of inflow)
Center-of-Mass det. time= 1,631.9 min (2,406.2 - 774.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.831 cfs @ 12.25 hrs HW=158.62' (Free Discharge)
└**4=Culvert** (Passes 0.831 cfs of 3.177 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.027 cfs @ 4.920 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.804 cfs @ 1.525 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 1P: UG1 - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger®280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 27 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

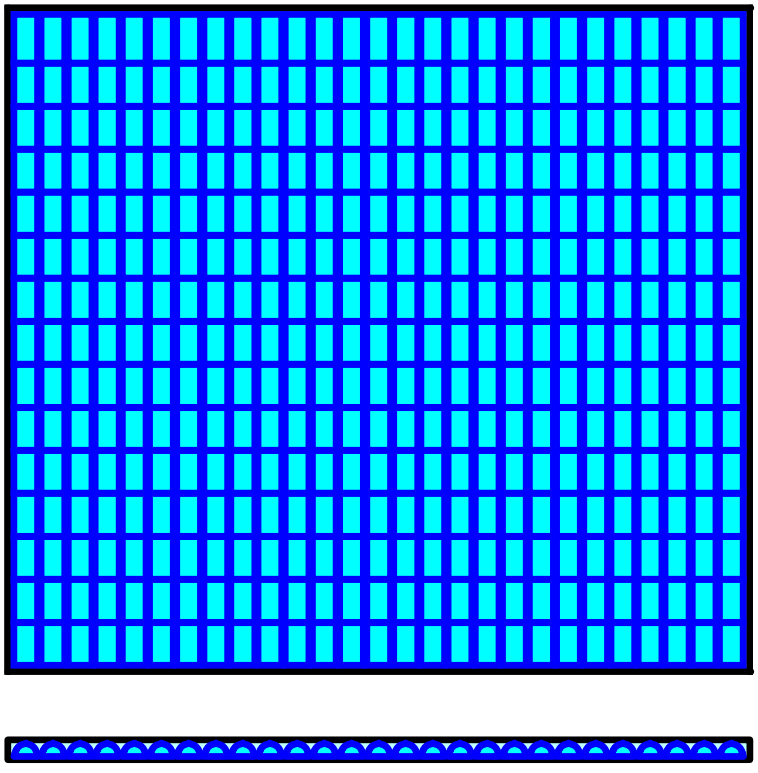
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

405 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 27 Rows = 17,377.3 cf Chamber Storage

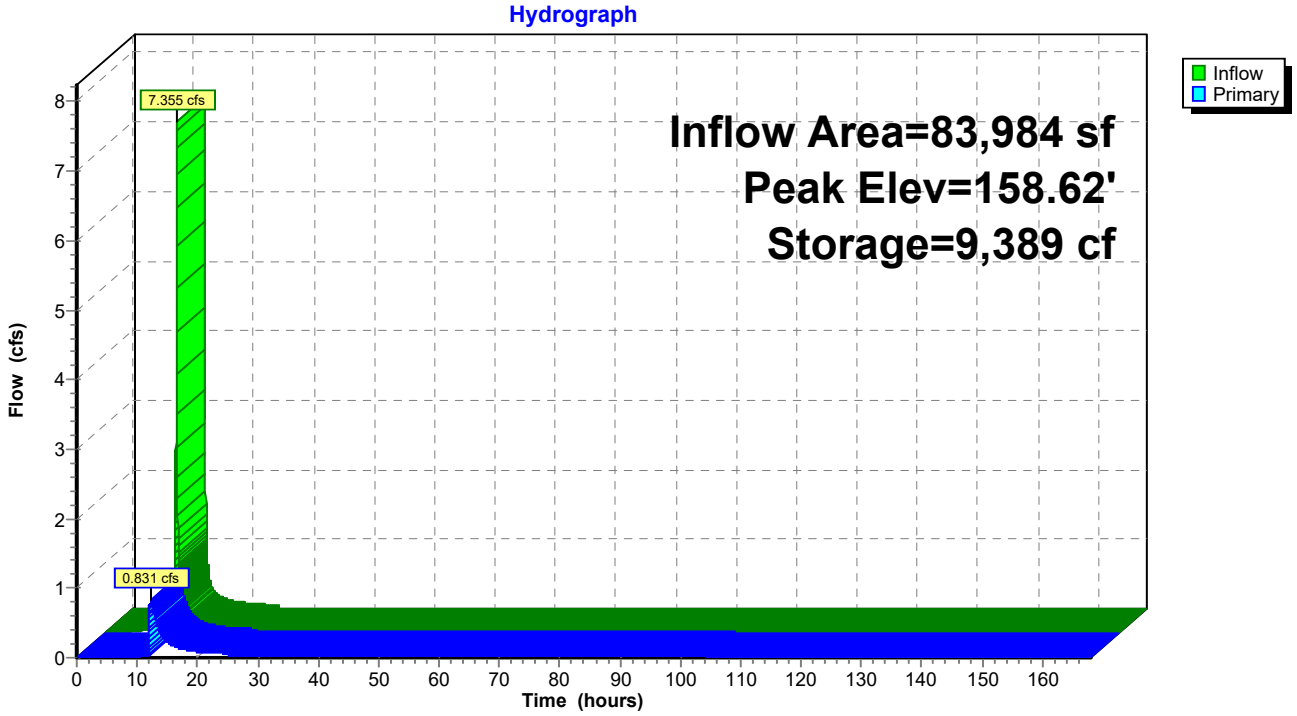
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

Chamber Storage + Stone Storage = 27,162.4 cf = 0.624 af
Overall Storage Efficiency = 64.9%
Overall System Size = 108.00' x 120.75' x 3.21'

405 Chambers
1,549.6 cy Field
906.0 cy Stone



Pond 1P: UG1


Hydrograph
Inflow Area=83,984 sf
Peak Elev=158.62'
Storage=9,389 cf
7.355 cfs
0.831 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.000	0	157.53	0.000
2.00	0.000	0	157.53	0.000
2.50	0.000	0	157.53	0.000
3.00	0.003	1	157.53	0.000
3.50	0.008	11	157.53	0.000
4.00	0.014	30	157.54	0.000
4.50	0.020	59	157.54	0.000
5.00	0.026	100	157.55	0.001
5.50	0.033	151	157.56	0.001
6.00	0.040	214	157.57	0.002
6.50	0.047	288	157.59	0.003
7.00	0.054	373	157.60	0.004
7.50	0.062	468	157.62	0.006
8.00	0.069	575	157.64	0.007
8.50	0.088	701	157.66	0.008
9.00	0.111	865	157.70	0.009
9.50	0.120	1,058	157.73	0.011
10.00	0.152	1,280	157.78	0.012
10.50	0.206	1,578	157.83	0.013
11.00	0.297	2,000	157.91	0.015
11.50	**0.509**	2,678	158.04	0.018
12.00	**6.110**	**8,279**	**158.52**	**0.369**
12.50	0.537	**9,273**	**158.61**	**0.777**
13.00	0.335	8,803	158.56	0.571
13.50	0.254	8,438	158.53	0.426
14.00	0.199	8,167	158.51	0.331
14.50	0.176	7,969	158.49	0.265
15.00	0.158	7,831	158.48	0.225
15.50	0.140	7,723	158.47	0.194
16.00	0.122	7,634	158.46	0.168
16.50	0.114	7,560	158.46	0.149
17.00	0.107	7,503	158.45	0.135
17.50	0.101	7,457	158.45	0.124
18.00	0.094	7,417	158.44	0.116
18.50	0.088	7,380	158.44	0.108
19.00	0.082	7,346	158.44	0.100
19.50	0.075	7,312	158.43	0.093
20.00	0.069	7,280	158.43	0.086
20.50	0.067	7,251	158.43	0.080
21.00	0.065	7,228	158.43	0.077
21.50	0.064	7,208	158.42	0.074
22.00	0.063	7,191	158.42	0.072
22.50	0.061	7,176	158.42	0.070
23.00	0.060	7,162	158.42	0.068
23.50	0.059	7,149	158.42	0.066
24.00	0.057	7,137	158.42	0.064
24.50	0.000	7,048	158.41	0.051
25.00	0.000	6,967	158.40	0.040

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	6,904	158.40	0.031
26.00	0.000	6,854	158.39	0.026
26.50	0.000	6,809	158.39	0.024
27.00	0.000	6,767	158.39	0.024
27.50	0.000	6,724	158.38	0.024
28.00	0.000	6,681	158.38	0.024
28.50	0.000	6,639	158.38	0.024
29.00	0.000	6,597	158.37	0.023
29.50	0.000	6,554	158.37	0.023
30.00	0.000	6,512	158.36	0.023
30.50	0.000	6,470	158.36	0.023
31.00	0.000	6,428	158.36	0.023
31.50	0.000	6,387	158.35	0.023
32.00	0.000	6,345	158.35	0.023
32.50	0.000	6,303	158.35	0.023
33.00	0.000	6,262	158.34	0.023
33.50	0.000	6,220	158.34	0.023
34.00	0.000	6,179	158.34	0.023
34.50	0.000	6,138	158.33	0.023
35.00	0.000	6,096	158.33	0.023
35.50	0.000	6,055	158.32	0.023
36.00	0.000	6,014	158.32	0.023
36.50	0.000	5,973	158.32	0.023
37.00	0.000	5,933	158.31	0.023
37.50	0.000	5,892	158.31	0.023
38.00	0.000	5,851	158.31	0.023
38.50	0.000	5,811	158.30	0.022
39.00	0.000	5,771	158.30	0.022
39.50	0.000	5,730	158.30	0.022
40.00	0.000	5,690	158.29	0.022
40.50	0.000	5,650	158.29	0.022
41.00	0.000	5,610	158.29	0.022
41.50	0.000	5,570	158.28	0.022
42.00	0.000	5,530	158.28	0.022
42.50	0.000	5,491	158.28	0.022
43.00	0.000	5,451	158.27	0.022
43.50	0.000	5,411	158.27	0.022
44.00	0.000	5,372	158.27	0.022
44.50	0.000	5,333	158.26	0.022
45.00	0.000	5,293	158.26	0.022
45.50	0.000	5,254	158.26	0.022
46.00	0.000	5,215	158.25	0.022
46.50	0.000	5,176	158.25	0.022
47.00	0.000	5,137	158.25	0.022
47.50	0.000	5,099	158.24	0.022
48.00	0.000	5,060	158.24	0.021
48.50	0.000	5,022	158.24	0.021
49.00	0.000	4,983	158.23	0.021
49.50	0.000	4,945	158.23	0.021
50.00	0.000	4,906	158.23	0.021
50.50	0.000	4,868	158.22	0.021

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,830	158.22	0.021
51.50	0.000	4,792	158.22	0.021
52.00	0.000	4,754	158.21	0.021
52.50	0.000	4,717	158.21	0.021
53.00	0.000	4,679	158.21	0.021
53.50	0.000	4,641	158.20	0.021
54.00	0.000	4,604	158.20	0.021
54.50	0.000	4,566	158.20	0.021
55.00	0.000	4,529	158.19	0.021
55.50	0.000	4,492	158.19	0.021
56.00	0.000	4,455	158.19	0.021
56.50	0.000	4,418	158.18	0.021
57.00	0.000	4,381	158.18	0.020
57.50	0.000	4,344	158.18	0.020
58.00	0.000	4,307	158.17	0.020
58.50	0.000	4,271	158.17	0.020
59.00	0.000	4,234	158.17	0.020
59.50	0.000	4,198	158.16	0.020
60.00	0.000	4,161	158.16	0.020
60.50	0.000	4,125	158.16	0.020
61.00	0.000	4,089	158.16	0.020
61.50	0.000	4,053	158.15	0.020
62.00	0.000	4,017	158.15	0.020
62.50	0.000	3,981	158.15	0.020
63.00	0.000	3,945	158.14	0.020
63.50	0.000	3,910	158.14	0.020
64.00	0.000	3,874	158.14	0.020
64.50	0.000	3,838	158.13	0.020
65.00	0.000	3,803	158.13	0.020
65.50	0.000	3,768	158.13	0.020
66.00	0.000	3,733	158.12	0.020
66.50	0.000	3,697	158.12	0.019
67.00	0.000	3,662	158.12	0.019
67.50	0.000	3,627	158.12	0.019
68.00	0.000	3,593	158.11	0.019
68.50	0.000	3,558	158.11	0.019
69.00	0.000	3,523	158.11	0.019
69.50	0.000	3,489	158.10	0.019
70.00	0.000	3,454	158.10	0.019
70.50	0.000	3,420	158.10	0.019
71.00	0.000	3,386	158.10	0.019
71.50	0.000	3,352	158.09	0.019
72.00	0.000	3,317	158.09	0.019
72.50	0.000	3,283	158.09	0.019
73.00	0.000	3,250	158.08	0.019
73.50	0.000	3,216	158.08	0.019
74.00	0.000	3,182	158.08	0.019
74.50	0.000	3,149	158.08	0.019
75.00	0.000	3,115	158.07	0.019
75.50	0.000	3,082	158.07	0.019
76.00	0.000	3,048	158.07	0.018

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	3,015	158.06	0.018
77.00	0.000	2,982	158.06	0.018
77.50	0.000	2,949	158.06	0.018
78.00	0.000	2,916	158.06	0.018
78.50	0.000	2,883	158.05	0.018
79.00	0.000	2,850	158.05	0.018
79.50	0.000	2,818	158.05	0.018
80.00	0.000	2,785	158.04	0.018
80.50	0.000	2,753	158.04	0.018
81.00	0.000	2,720	158.04	0.018
81.50	0.000	2,688	158.04	0.018
82.00	0.000	2,656	158.03	0.018
82.50	0.000	2,624	158.03	0.018
83.00	0.000	2,592	158.03	0.018
83.50	0.000	2,560	158.02	0.018
84.00	0.000	2,528	158.01	0.017
84.50	0.000	2,497	158.01	0.017
85.00	0.000	2,466	158.00	0.017
85.50	0.000	2,435	158.00	0.017
86.00	0.000	2,404	157.99	0.017
86.50	0.000	2,374	157.99	0.017
87.00	0.000	2,344	157.98	0.017
87.50	0.000	2,313	157.97	0.017
88.00	0.000	2,284	157.97	0.017
88.50	0.000	2,254	157.96	0.016
89.00	0.000	2,225	157.96	0.016
89.50	0.000	2,195	157.95	0.016
90.00	0.000	2,166	157.95	0.016
90.50	0.000	2,138	157.94	0.016
91.00	0.000	2,109	157.93	0.016
91.50	0.000	2,081	157.93	0.016
92.00	0.000	2,053	157.92	0.016
92.50	0.000	2,025	157.92	0.015
93.00	0.000	1,997	157.91	0.015
93.50	0.000	1,969	157.91	0.015
94.00	0.000	1,942	157.90	0.015
94.50	0.000	1,915	157.90	0.015
95.00	0.000	1,888	157.89	0.015
95.50	0.000	1,862	157.89	0.015
96.00	0.000	1,835	157.88	0.015
96.50	0.000	1,809	157.88	0.015
97.00	0.000	1,783	157.87	0.014
97.50	0.000	1,757	157.87	0.014
98.00	0.000	1,732	157.86	0.014
98.50	0.000	1,706	157.86	0.014
99.00	0.000	1,681	157.85	0.014
99.50	0.000	1,656	157.85	0.014
100.00	0.000	1,631	157.84	0.014
100.50	0.000	1,607	157.84	0.014
101.00	0.000	1,583	157.83	0.013
101.50	0.000	1,559	157.83	0.013

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	1,535	157.82	0.013
102.50	0.000	1,511	157.82	0.013
103.00	0.000	1,488	157.82	0.013
103.50	0.000	1,464	157.81	0.013
104.00	0.000	1,441	157.81	0.013
104.50	0.000	1,419	157.80	0.013
105.00	0.000	1,396	157.80	0.012
105.50	0.000	1,374	157.79	0.012
106.00	0.000	1,352	157.79	0.012
106.50	0.000	1,330	157.78	0.012
107.00	0.000	1,308	157.78	0.012
107.50	0.000	1,286	157.78	0.012
108.00	0.000	1,265	157.77	0.012
108.50	0.000	1,244	157.77	0.012
109.00	0.000	1,223	157.76	0.012
109.50	0.000	1,203	157.76	0.011
110.00	0.000	1,182	157.76	0.011
110.50	0.000	1,162	157.75	0.011
111.00	0.000	1,142	157.75	0.011
111.50	0.000	1,122	157.75	0.011
112.00	0.000	1,103	157.74	0.011
112.50	0.000	1,083	157.74	0.011
113.00	0.000	1,064	157.73	0.011
113.50	0.000	1,045	157.73	0.010
114.00	0.000	1,027	157.73	0.010
114.50	0.000	1,008	157.72	0.010
115.00	0.000	990	157.72	0.010
115.50	0.000	972	157.72	0.010
116.00	0.000	954	157.71	0.010
116.50	0.000	936	157.71	0.010
117.00	0.000	919	157.71	0.010
117.50	0.000	902	157.70	0.009
118.00	0.000	885	157.70	0.009
118.50	0.000	868	157.70	0.009
119.00	0.000	851	157.69	0.009
119.50	0.000	835	157.69	0.009
120.00	0.000	819	157.69	0.009
120.50	0.000	803	157.68	0.009
121.00	0.000	787	157.68	0.009
121.50	0.000	772	157.68	0.009
122.00	0.000	756	157.67	0.008
122.50	0.000	741	157.67	0.008
123.00	0.000	727	157.67	0.008
123.50	0.000	712	157.67	0.008
124.00	0.000	697	157.66	0.008
124.50	0.000	683	157.66	0.008
125.00	0.000	669	157.66	0.008
125.50	0.000	655	157.66	0.008
126.00	0.000	642	157.65	0.007
126.50	0.000	629	157.65	0.007
127.00	0.000	615	157.65	0.007

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	603	157.65	0.007
128.00	0.000	590	157.64	0.007
128.50	0.000	577	157.64	0.007
129.00	0.000	565	157.64	0.007
129.50	0.000	553	157.64	0.007
130.00	0.000	541	157.63	0.007
130.50	0.000	530	157.63	0.006
131.00	0.000	518	157.63	0.006
131.50	0.000	507	157.63	0.006
132.00	0.000	496	157.63	0.006
132.50	0.000	485	157.62	0.006
133.00	0.000	475	157.62	0.006
133.50	0.000	465	157.62	0.006
134.00	0.000	455	157.62	0.005
134.50	0.000	445	157.62	0.005
135.00	0.000	435	157.61	0.005
135.50	0.000	426	157.61	0.005
136.00	0.000	417	157.61	0.005
136.50	0.000	408	157.61	0.005
137.00	0.000	399	157.61	0.005
137.50	0.000	391	157.60	0.005
138.00	0.000	383	157.60	0.005
138.50	0.000	375	157.60	0.004
139.00	0.000	367	157.60	0.004
139.50	0.000	359	157.60	0.004
140.00	0.000	351	157.60	0.004
140.50	0.000	344	157.60	0.004
141.00	0.000	337	157.59	0.004
141.50	0.000	330	157.59	0.004
142.00	0.000	323	157.59	0.004
142.50	0.000	317	157.59	0.004
143.00	0.000	310	157.59	0.003
143.50	0.000	304	157.59	0.003
144.00	0.000	298	157.59	0.003
144.50	0.000	292	157.59	0.003
145.00	0.000	287	157.58	0.003
145.50	0.000	281	157.58	0.003
146.00	0.000	276	157.58	0.003
146.50	0.000	271	157.58	0.003
147.00	0.000	266	157.58	0.003
147.50	0.000	261	157.58	0.003
148.00	0.000	256	157.58	0.003
148.50	0.000	251	157.58	0.003
149.00	0.000	247	157.58	0.002
149.50	0.000	242	157.58	0.002
150.00	0.000	238	157.58	0.002
150.50	0.000	234	157.57	0.002
151.00	0.000	230	157.57	0.002
151.50	0.000	226	157.57	0.002
152.00	0.000	222	157.57	0.002
152.50	0.000	219	157.57	0.002

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	215	157.57	0.002
153.50	0.000	212	157.57	0.002
154.00	0.000	208	157.57	0.002
154.50	0.000	205	157.57	0.002
155.00	0.000	202	157.57	0.002
155.50	0.000	199	157.57	0.002
156.00	0.000	196	157.57	0.002
156.50	0.000	193	157.57	0.002
157.00	0.000	190	157.57	0.002
157.50	0.000	187	157.57	0.002
158.00	0.000	185	157.57	0.001
158.50	0.000	182	157.56	0.001
159.00	0.000	179	157.56	0.001
159.50	0.000	177	157.56	0.001
160.00	0.000	175	157.56	0.001
160.50	0.000	172	157.56	0.001
161.00	0.000	170	157.56	0.001
161.50	0.000	168	157.56	0.001
162.00	0.000	166	157.56	0.001
162.50	0.000	164	157.56	0.001
163.00	0.000	162	157.56	0.001
163.50	0.000	160	157.56	0.001
164.00	0.000	158	157.56	0.001
164.50	0.000	156	157.56	0.001
165.00	0.000	154	157.56	0.001
165.50	0.000	152	157.56	0.001
166.00	0.000	150	157.56	0.001
166.50	0.000	148	157.56	0.001
167.00	0.000	146	157.56	0.001
167.50	0.000	144	157.56	0.001
168.00	0.000	142	157.56	0.001

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 1.43" for 1-yr event
Inflow = 1.306 cfs @ 11.96 hrs, Volume= 2,566 cf
Outflow = 0.200 cfs @ 12.16 hrs, Volume= 2,566 cf, Atten= 85%, Lag= 11.6 min
Primary = 0.200 cfs @ 12.16 hrs, Volume= 2,566 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 160.02' @ 12.16 hrs Surf.Area= 2,542 sf Storage= 1,022 cf

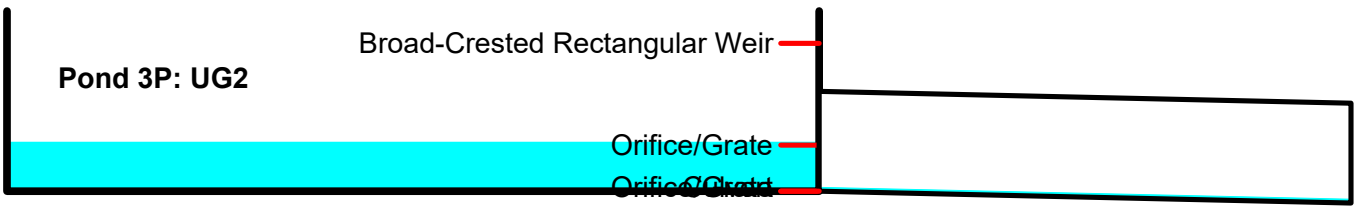
Plug-Flow detention time= 78.4 min calculated for 2,566 cf (100% of inflow)
Center-of-Mass det. time= 78.2 min (903.8 - 825.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.200 cfs @ 12.16 hrs HW=160.02' (Free Discharge)
└**4=Culvert** (Passes 0.200 cfs of 1.719 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.185 cfs @ 3.761 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.015 cfs @ 0.681 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 3P: UG2 - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Discontinued, not for new designs)
Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf
Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 3.44 sf x 8 rows

36.0" Wide + 3.0" Spacing = 39.0" C-C Row Spacing

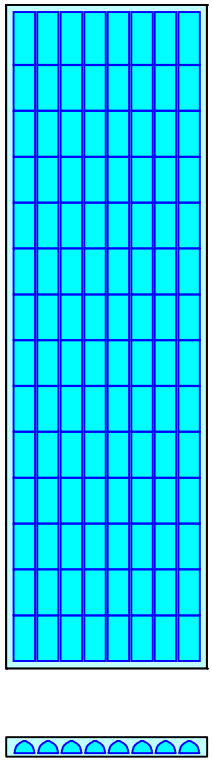
14 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 89.62' Row Length +12.0" End Stone x 2 = 91.62' Base Length
8 Rows x 36.0" Wide + 3.0" Spacing x 7 + 12.0" Side Stone x 2 = 27.75' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

112 Chambers x 21.8 cf +1.00' Row Adjustment x 3.44 sf x 8 Rows = 2,466.0 cf Chamber Storage

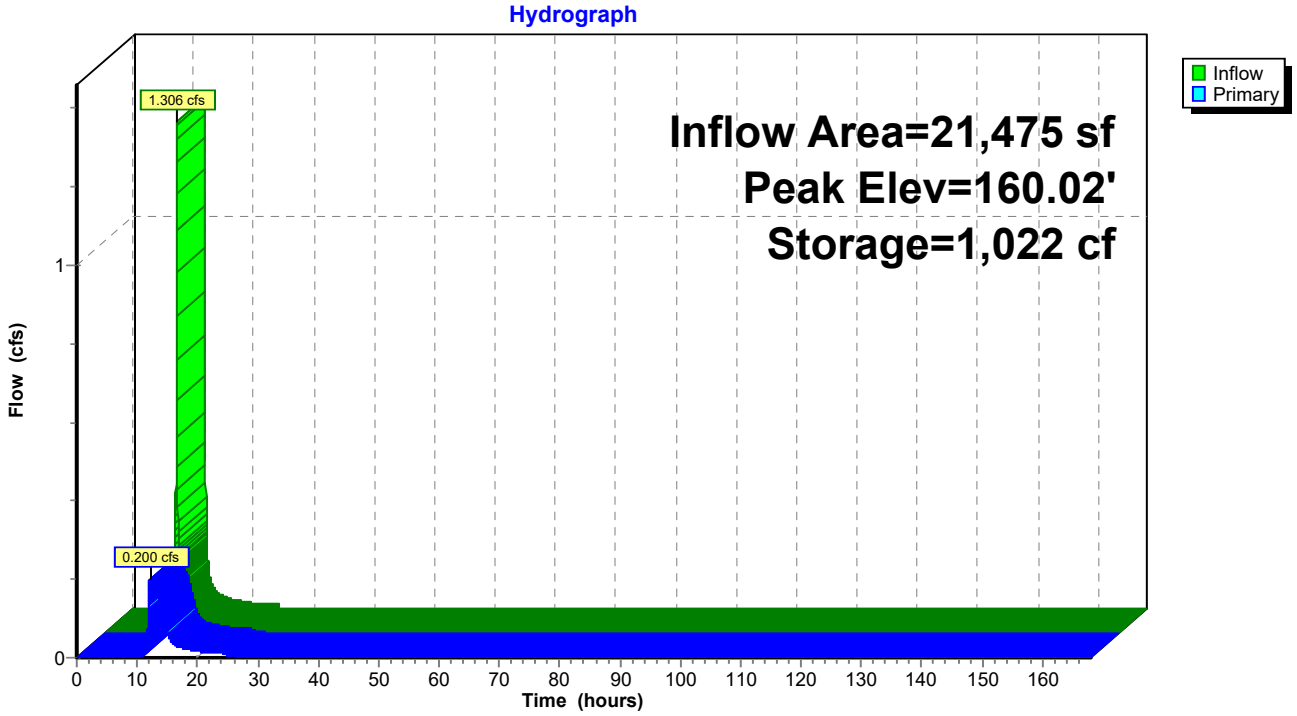
6,885.8 cf Field - 2,466.0 cf Chambers = 4,419.8 cf Stone x 40.0% Voids = 1,767.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,233.9 cf = 0.097 af
Overall Storage Efficiency = 61.5%
Overall System Size = 91.62' x 27.75' x 2.71'

112 Chambers
255.0 cy Field
163.7 cy Stone



Pond 3P: UG2


Hydrograph
Inflow Area=21,475 sf
Peak Elev=160.02'
Storage=1,022 cf
1.306 cfs
0.200 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.000	0	159.28	0.000
4.50	0.000	0	159.28	0.000
5.00	0.000	0	159.28	0.000
5.50	0.000	0	159.28	0.000
6.00	0.000	0	159.28	0.000
6.50	0.000	0	159.28	0.000
7.00	0.000	0	159.28	0.000
7.50	0.000	0	159.28	0.000
8.00	0.000	0	159.28	0.000
8.50	0.001	1	159.28	0.000
9.00	0.003	5	159.28	0.000
9.50	0.005	12	159.29	0.001
10.00	0.009	23	159.30	0.001
10.50	0.015	40	159.32	0.004
11.00	0.027	66	159.35	0.009
11.50	**0.057**	111	159.39	0.023
12.00	**1.123**	**852**	**159.94**	**0.172**
12.50	0.107	**963**	**159.99**	**0.185**
13.00	0.068	796	159.91	0.168
13.50	0.052	613	159.83	0.154
14.00	0.041	437	159.71	0.130
14.50	0.037	301	159.58	0.098
15.00	0.033	214	159.49	0.069
15.50	0.029	168	159.45	0.048
16.00	0.026	143	159.42	0.036
16.50	0.024	128	159.41	0.030
17.00	0.023	120	159.40	0.027
17.50	0.022	114	159.39	0.024
18.00	0.020	109	159.39	0.023
18.50	0.019	105	159.38	0.021
19.00	0.018	101	159.38	0.020
19.50	0.016	97	159.38	0.018
20.00	0.015	93	159.37	0.017
20.50	0.014	90	159.37	0.016
21.00	0.014	88	159.37	0.015
21.50	0.014	86	159.36	0.015
22.00	0.014	85	159.36	0.014
22.50	0.013	84	159.36	0.014
23.00	0.013	83	159.36	0.014
23.50	0.013	82	159.36	0.013
24.00	0.013	81	159.36	0.013
24.50	0.000	65	159.34	0.009
25.00	0.000	52	159.33	0.006

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	43	159.32	0.004
26.00	0.000	37	159.32	0.003
26.50	0.000	32	159.31	0.002
27.00	0.000	28	159.31	0.002
27.50	0.000	25	159.30	0.001
28.00	0.000	23	159.30	0.001
28.50	0.000	21	159.30	0.001
29.00	0.000	18	159.30	0.001
29.50	0.000	17	159.30	0.001
30.00	0.000	15	159.29	0.001
30.50	0.000	13	159.29	0.001
31.00	0.000	12	159.29	0.001
31.50	0.000	11	159.29	0.001
32.00	0.000	10	159.29	0.001
32.50	0.000	9	159.29	0.001
33.00	0.000	8	159.29	0.000
33.50	0.000	7	159.29	0.000
34.00	0.000	6	159.29	0.000
34.50	0.000	6	159.29	0.000
35.00	0.000	5	159.29	0.000
35.50	0.000	5	159.28	0.000
36.00	0.000	4	159.28	0.000
36.50	0.000	4	159.28	0.000
37.00	0.000	3	159.28	0.000
37.50	0.000	3	159.28	0.000
38.00	0.000	3	159.28	0.000
38.50	0.000	3	159.28	0.000
39.00	0.000	2	159.28	0.000
39.50	0.000	2	159.28	0.000
40.00	0.000	2	159.28	0.000
40.50	0.000	2	159.28	0.000
41.00	0.000	1	159.28	0.000
41.50	0.000	1	159.28	0.000
42.00	0.000	1	159.28	0.000
42.50	0.000	1	159.28	0.000
43.00	0.000	1	159.28	0.000
43.50	0.000	1	159.28	0.000
44.00	0.000	1	159.28	0.000
44.50	0.000	1	159.28	0.000
45.00	0.000	1	159.28	0.000
45.50	0.000	1	159.28	0.000
46.00	0.000	1	159.28	0.000
46.50	0.000	0	159.28	0.000
47.00	0.000	0	159.28	0.000
47.50	0.000	0	159.28	0.000
48.00	0.000	0	159.28	0.000
48.50	0.000	0	159.28	0.000
49.00	0.000	0	159.28	0.000
49.50	0.000	0	159.28	0.000
50.00	0.000	0	159.28	0.000
50.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	0	159.28	0.000
51.50	0.000	0	159.28	0.000
52.00	0.000	0	159.28	0.000
52.50	0.000	0	159.28	0.000
53.00	0.000	0	159.28	0.000
53.50	0.000	0	159.28	0.000
54.00	0.000	0	159.28	0.000
54.50	0.000	0	159.28	0.000
55.00	0.000	0	159.28	0.000
55.50	0.000	0	159.28	0.000
56.00	0.000	0	159.28	0.000
56.50	0.000	0	159.28	0.000
57.00	0.000	0	159.28	0.000
57.50	0.000	0	159.28	0.000
58.00	0.000	0	159.28	0.000
58.50	0.000	0	159.28	0.000
59.00	0.000	0	159.28	0.000
59.50	0.000	0	159.28	0.000
60.00	0.000	0	159.28	0.000
60.50	0.000	0	159.28	0.000
61.00	0.000	0	159.28	0.000
61.50	0.000	0	159.28	0.000
62.00	0.000	0	159.28	0.000
62.50	0.000	0	159.28	0.000
63.00	0.000	0	159.28	0.000
63.50	0.000	0	159.28	0.000
64.00	0.000	0	159.28	0.000
64.50	0.000	0	159.28	0.000
65.00	0.000	0	159.28	0.000
65.50	0.000	0	159.28	0.000
66.00	0.000	0	159.28	0.000
66.50	0.000	0	159.28	0.000
67.00	0.000	0	159.28	0.000
67.50	0.000	0	159.28	0.000
68.00	0.000	0	159.28	0.000
68.50	0.000	0	159.28	0.000
69.00	0.000	0	159.28	0.000
69.50	0.000	0	159.28	0.000
70.00	0.000	0	159.28	0.000
70.50	0.000	0	159.28	0.000
71.00	0.000	0	159.28	0.000
71.50	0.000	0	159.28	0.000
72.00	0.000	0	159.28	0.000
72.50	0.000	0	159.28	0.000
73.00	0.000	0	159.28	0.000
73.50	0.000	0	159.28	0.000
74.00	0.000	0	159.28	0.000
74.50	0.000	0	159.28	0.000
75.00	0.000	0	159.28	0.000
75.50	0.000	0	159.28	0.000
76.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	0	159.28	0.000
77.00	0.000	0	159.28	0.000
77.50	0.000	0	159.28	0.000
78.00	0.000	0	159.28	0.000
78.50	0.000	0	159.28	0.000
79.00	0.000	0	159.28	0.000
79.50	0.000	0	159.28	0.000
80.00	0.000	0	159.28	0.000
80.50	0.000	0	159.28	0.000
81.00	0.000	0	159.28	0.000
81.50	0.000	0	159.28	0.000
82.00	0.000	0	159.28	0.000
82.50	0.000	0	159.28	0.000
83.00	0.000	0	159.28	0.000
83.50	0.000	0	159.28	0.000
84.00	0.000	0	159.28	0.000
84.50	0.000	0	159.28	0.000
85.00	0.000	0	159.28	0.000
85.50	0.000	0	159.28	0.000
86.00	0.000	0	159.28	0.000
86.50	0.000	0	159.28	0.000
87.00	0.000	0	159.28	0.000
87.50	0.000	0	159.28	0.000
88.00	0.000	0	159.28	0.000
88.50	0.000	0	159.28	0.000
89.00	0.000	0	159.28	0.000
89.50	0.000	0	159.28	0.000
90.00	0.000	0	159.28	0.000
90.50	0.000	0	159.28	0.000
91.00	0.000	0	159.28	0.000
91.50	0.000	0	159.28	0.000
92.00	0.000	0	159.28	0.000
92.50	0.000	0	159.28	0.000
93.00	0.000	0	159.28	0.000
93.50	0.000	0	159.28	0.000
94.00	0.000	0	159.28	0.000
94.50	0.000	0	159.28	0.000
95.00	0.000	0	159.28	0.000
95.50	0.000	0	159.28	0.000
96.00	0.000	0	159.28	0.000
96.50	0.000	0	159.28	0.000
97.00	0.000	0	159.28	0.000
97.50	0.000	0	159.28	0.000
98.00	0.000	0	159.28	0.000
98.50	0.000	0	159.28	0.000
99.00	0.000	0	159.28	0.000
99.50	0.000	0	159.28	0.000
100.00	0.000	0	159.28	0.000
100.50	0.000	0	159.28	0.000
101.00	0.000	0	159.28	0.000
101.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	0	159.28	0.000
102.50	0.000	0	159.28	0.000
103.00	0.000	0	159.28	0.000
103.50	0.000	0	159.28	0.000
104.00	0.000	0	159.28	0.000
104.50	0.000	0	159.28	0.000
105.00	0.000	0	159.28	0.000
105.50	0.000	0	159.28	0.000
106.00	0.000	0	159.28	0.000
106.50	0.000	0	159.28	0.000
107.00	0.000	0	159.28	0.000
107.50	0.000	0	159.28	0.000
108.00	0.000	0	159.28	0.000
108.50	0.000	0	159.28	0.000
109.00	0.000	0	159.28	0.000
109.50	0.000	0	159.28	0.000
110.00	0.000	0	159.28	0.000
110.50	0.000	0	159.28	0.000
111.00	0.000	0	159.28	0.000
111.50	0.000	0	159.28	0.000
112.00	0.000	0	159.28	0.000
112.50	0.000	0	159.28	0.000
113.00	0.000	0	159.28	0.000
113.50	0.000	0	159.28	0.000
114.00	0.000	0	159.28	0.000
114.50	0.000	0	159.28	0.000
115.00	0.000	0	159.28	0.000
115.50	0.000	0	159.28	0.000
116.00	0.000	0	159.28	0.000
116.50	0.000	0	159.28	0.000
117.00	0.000	0	159.28	0.000
117.50	0.000	0	159.28	0.000
118.00	0.000	0	159.28	0.000
118.50	0.000	0	159.28	0.000
119.00	0.000	0	159.28	0.000
119.50	0.000	0	159.28	0.000
120.00	0.000	0	159.28	0.000
120.50	0.000	0	159.28	0.000
121.00	0.000	0	159.28	0.000
121.50	0.000	0	159.28	0.000
122.00	0.000	0	159.28	0.000
122.50	0.000	0	159.28	0.000
123.00	0.000	0	159.28	0.000
123.50	0.000	0	159.28	0.000
124.00	0.000	0	159.28	0.000
124.50	0.000	0	159.28	0.000
125.00	0.000	0	159.28	0.000
125.50	0.000	0	159.28	0.000
126.00	0.000	0	159.28	0.000
126.50	0.000	0	159.28	0.000
127.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	0	159.28	0.000
128.00	0.000	0	159.28	0.000
128.50	0.000	0	159.28	0.000
129.00	0.000	0	159.28	0.000
129.50	0.000	0	159.28	0.000
130.00	0.000	0	159.28	0.000
130.50	0.000	0	159.28	0.000
131.00	0.000	0	159.28	0.000
131.50	0.000	0	159.28	0.000
132.00	0.000	0	159.28	0.000
132.50	0.000	0	159.28	0.000
133.00	0.000	0	159.28	0.000
133.50	0.000	0	159.28	0.000
134.00	0.000	0	159.28	0.000
134.50	0.000	0	159.28	0.000
135.00	0.000	0	159.28	0.000
135.50	0.000	0	159.28	0.000
136.00	0.000	0	159.28	0.000
136.50	0.000	0	159.28	0.000
137.00	0.000	0	159.28	0.000
137.50	0.000	0	159.28	0.000
138.00	0.000	0	159.28	0.000
138.50	0.000	0	159.28	0.000
139.00	0.000	0	159.28	0.000
139.50	0.000	0	159.28	0.000
140.00	0.000	0	159.28	0.000
140.50	0.000	0	159.28	0.000
141.00	0.000	0	159.28	0.000
141.50	0.000	0	159.28	0.000
142.00	0.000	0	159.28	0.000
142.50	0.000	0	159.28	0.000
143.00	0.000	0	159.28	0.000
143.50	0.000	0	159.28	0.000
144.00	0.000	0	159.28	0.000
144.50	0.000	0	159.28	0.000
145.00	0.000	0	159.28	0.000
145.50	0.000	0	159.28	0.000
146.00	0.000	0	159.28	0.000
146.50	0.000	0	159.28	0.000
147.00	0.000	0	159.28	0.000
147.50	0.000	0	159.28	0.000
148.00	0.000	0	159.28	0.000
148.50	0.000	0	159.28	0.000
149.00	0.000	0	159.28	0.000
149.50	0.000	0	159.28	0.000
150.00	0.000	0	159.28	0.000
150.50	0.000	0	159.28	0.000
151.00	0.000	0	159.28	0.000
151.50	0.000	0	159.28	0.000
152.00	0.000	0	159.28	0.000
152.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	0	159.28	0.000
153.50	0.000	0	159.28	0.000
154.00	0.000	0	159.28	0.000
154.50	0.000	0	159.28	0.000
155.00	0.000	0	159.28	0.000
155.50	0.000	0	159.28	0.000
156.00	0.000	0	159.28	0.000
156.50	0.000	0	159.28	0.000
157.00	0.000	0	159.28	0.000
157.50	0.000	0	159.28	0.000
158.00	0.000	0	159.28	0.000
158.50	0.000	0	159.28	0.000
159.00	0.000	0	159.28	0.000
159.50	0.000	0	159.28	0.000
160.00	0.000	0	159.28	0.000
160.50	0.000	0	159.28	0.000
161.00	0.000	0	159.28	0.000
161.50	0.000	0	159.28	0.000
162.00	0.000	0	159.28	0.000
162.50	0.000	0	159.28	0.000
163.00	0.000	0	159.28	0.000
163.50	0.000	0	159.28	0.000
164.00	0.000	0	159.28	0.000
164.50	0.000	0	159.28	0.000
165.00	0.000	0	159.28	0.000
165.50	0.000	0	159.28	0.000
166.00	0.000	0	159.28	0.000
166.50	0.000	0	159.28	0.000
167.00	0.000	0	159.28	0.000
167.50	0.000	0	159.28	0.000
168.00	0.000	0	159.28	0.000

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 2.83" for 2-yr event
Inflow = 8.968 cfs @ 11.96 hrs, Volume= 19,792 cf
Outflow = 1.724 cfs @ 12.11 hrs, Volume= 19,649 cf, Atten= 81%, Lag= 9.0 min
Primary = 1.724 cfs @ 12.11 hrs, Volume= 19,649 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 158.77' @ 12.11 hrs Surf.Area= 13,041 sf Storage= 11,156 cf

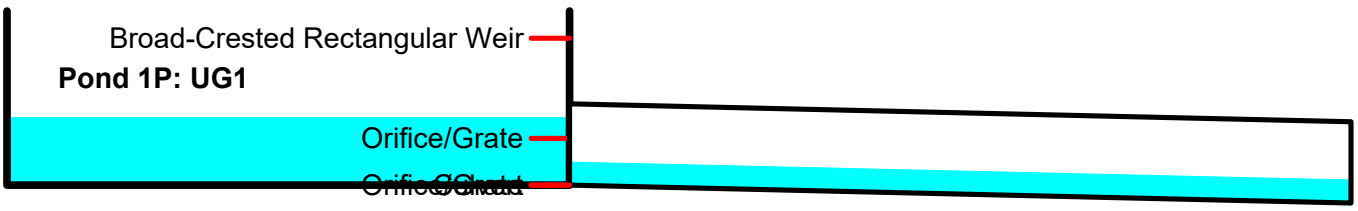
Plug-Flow detention time= 1,344.7 min calculated for 19,648 cf (99% of inflow)
Center-of-Mass det. time= 1,340.3 min (2,109.2 - 768.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.725 cfs @ 12.11 hrs HW=158.77' (Free Discharge)
└**4=Culvert** (Passes 1.725 cfs of 3.976 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.029 cfs @ 5.279 fps)
  ├**2=Orifice/Grate** (Orifice Controls 1.697 cfs @ 2.181 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 1P: UG1 - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger®280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 27 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

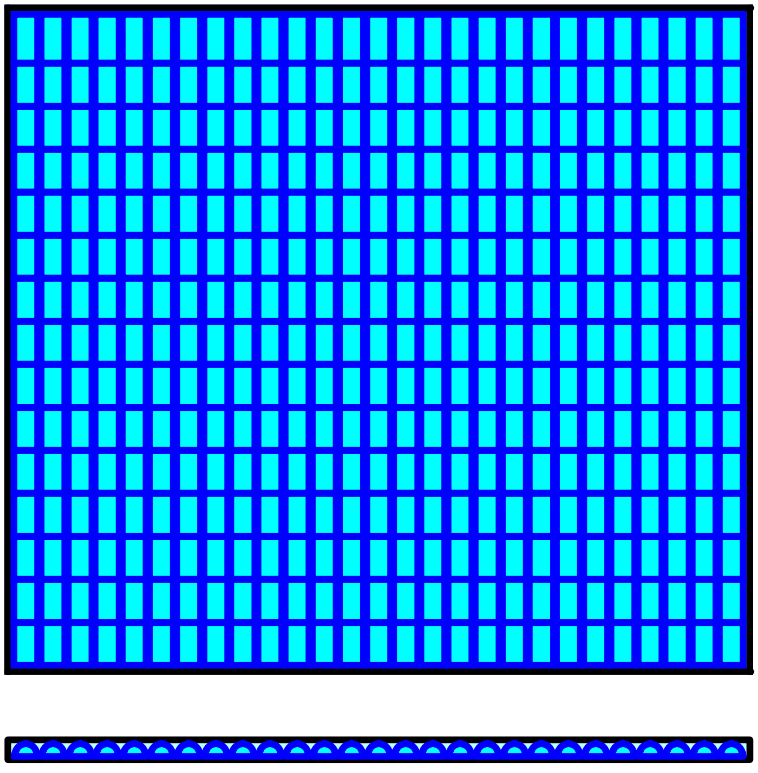
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

405 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 27 Rows = 17,377.3 cf Chamber Storage

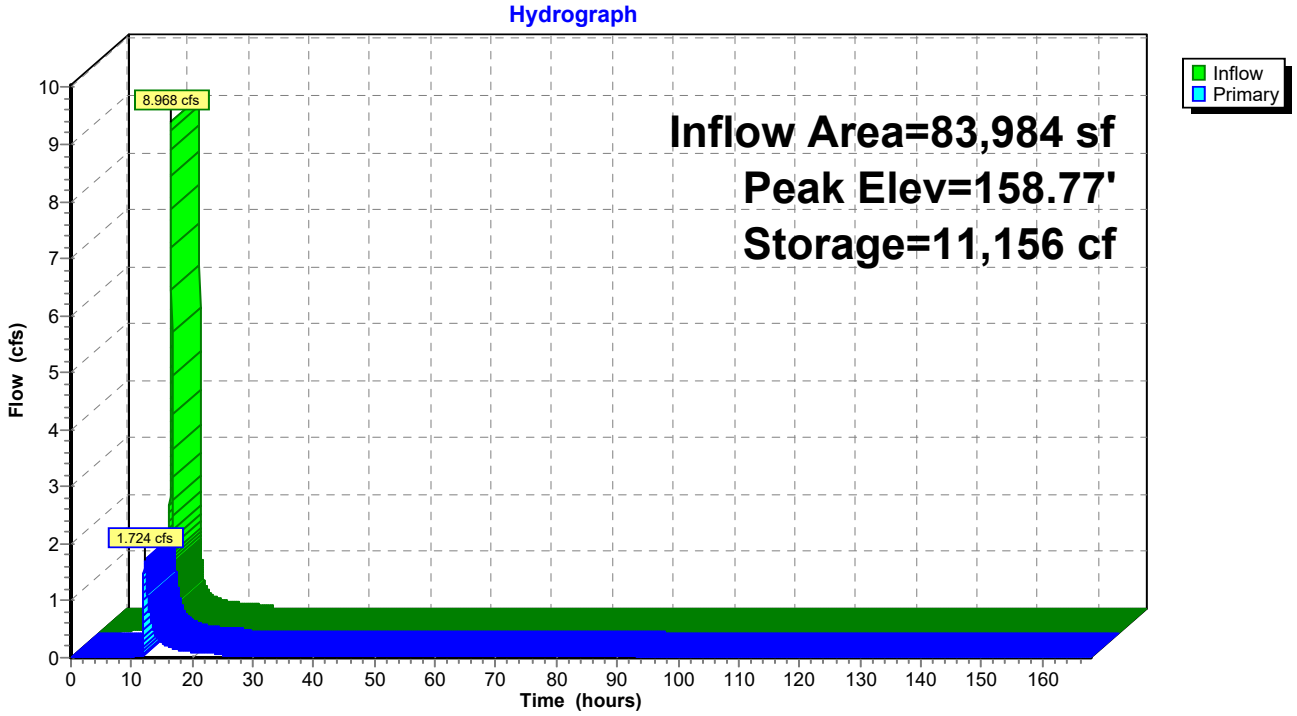
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

Chamber Storage + Stone Storage = 27,162.4 cf = 0.624 af
Overall Storage Efficiency = 64.9%
Overall System Size = 108.00' x 120.75' x 3.21'

405 Chambers
1,549.6 cy Field
906.0 cy Stone



Pond 1P: UG1


Hydrograph
Inflow Area=83,984 sf
Peak Elev=158.77'
Storage=11,156 cf
8.968 cfs
1.724 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.000	0	157.53	0.000
2.00	0.000	0	157.53	0.000
2.50	0.002	1	157.53	0.000
3.00	0.010	11	157.53	0.000
3.50	0.017	35	157.54	0.000
4.00	0.024	71	157.54	0.000
4.50	0.032	119	157.55	0.001
5.00	0.040	182	157.56	0.001
5.50	0.049	258	157.58	0.003
6.00	0.057	347	157.60	0.004
6.50	0.066	449	157.62	0.005
7.00	0.075	565	157.64	0.007
7.50	0.084	695	157.66	0.008
8.00	0.093	839	157.69	0.009
8.50	0.117	1,008	157.72	0.010
9.00	0.146	1,225	157.76	0.012
9.50	0.156	1,478	157.81	0.013
10.00	0.196	1,766	157.87	0.014
10.50	0.263	2,149	157.94	0.016
11.00	0.375	2,687	158.04	0.018
11.50	**0.636**	3,542	158.11	0.019
12.00	**7.436**	**10,239**	**158.69**	**1.269**
12.50	0.651	**10,329**	**158.70**	**1.319**
13.00	0.406	9,354	158.61	0.814
13.50	0.307	8,775	158.56	0.559
14.00	0.241	8,402	158.53	0.412
14.50	0.213	8,149	158.51	0.325
15.00	0.191	7,982	158.49	0.269
15.50	0.169	7,857	158.48	0.233
16.00	0.148	7,751	158.47	0.202
16.50	0.138	7,666	158.46	0.177
17.00	0.130	7,604	158.46	0.160
17.50	0.122	7,553	158.45	0.148
18.00	0.114	7,510	158.45	0.137
18.50	0.106	7,471	158.45	0.127
19.00	0.099	7,433	158.44	0.119
19.50	0.091	7,396	158.44	0.111
20.00	0.083	7,359	158.44	0.103
20.50	0.080	7,326	158.43	0.096
21.00	0.079	7,301	158.43	0.091
21.50	0.077	7,282	158.43	0.087
22.00	0.076	7,266	158.43	0.084
22.50	0.074	7,253	158.43	0.081
23.00	0.073	7,242	158.43	0.079
23.50	0.071	7,230	158.43	0.077
24.00	0.069	7,219	158.43	0.076
24.50	0.000	7,114	158.42	0.061
25.00	0.000	7,018	158.41	0.047

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	6,943	158.40	0.036
26.00	0.000	6,886	158.40	0.028
26.50	0.000	6,838	158.39	0.025
27.00	0.000	6,795	158.39	0.024
27.50	0.000	6,752	158.38	0.024
28.00	0.000	6,709	158.38	0.024
28.50	0.000	6,667	158.38	0.024
29.00	0.000	6,625	158.37	0.024
29.50	0.000	6,582	158.37	0.023
30.00	0.000	6,540	158.37	0.023
30.50	0.000	6,498	158.36	0.023
31.00	0.000	6,456	158.36	0.023
31.50	0.000	6,414	158.36	0.023
32.00	0.000	6,372	158.35	0.023
32.50	0.000	6,331	158.35	0.023
33.00	0.000	6,289	158.34	0.023
33.50	0.000	6,247	158.34	0.023
34.00	0.000	6,206	158.34	0.023
34.50	0.000	6,165	158.33	0.023
35.00	0.000	6,123	158.33	0.023
35.50	0.000	6,082	158.33	0.023
36.00	0.000	6,041	158.32	0.023
36.50	0.000	6,000	158.32	0.023
37.00	0.000	5,960	158.32	0.023
37.50	0.000	5,919	158.31	0.023
38.00	0.000	5,878	158.31	0.023
38.50	0.000	5,838	158.31	0.023
39.00	0.000	5,797	158.30	0.022
39.50	0.000	5,757	158.30	0.022
40.00	0.000	5,717	158.30	0.022
40.50	0.000	5,676	158.29	0.022
41.00	0.000	5,636	158.29	0.022
41.50	0.000	5,596	158.28	0.022
42.00	0.000	5,556	158.28	0.022
42.50	0.000	5,517	158.28	0.022
43.00	0.000	5,477	158.27	0.022
43.50	0.000	5,437	158.27	0.022
44.00	0.000	5,398	158.27	0.022
44.50	0.000	5,359	158.26	0.022
45.00	0.000	5,319	158.26	0.022
45.50	0.000	5,280	158.26	0.022
46.00	0.000	5,241	158.25	0.022
46.50	0.000	5,202	158.25	0.022
47.00	0.000	5,163	158.25	0.022
47.50	0.000	5,124	158.24	0.022
48.00	0.000	5,086	158.24	0.021
48.50	0.000	5,047	158.24	0.021
49.00	0.000	5,008	158.23	0.021
49.50	0.000	4,970	158.23	0.021
50.00	0.000	4,932	158.23	0.021
50.50	0.000	4,893	158.22	0.021

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,855	158.22	0.021
51.50	0.000	4,817	158.22	0.021
52.00	0.000	4,779	158.21	0.021
52.50	0.000	4,741	158.21	0.021
53.00	0.000	4,704	158.21	0.021
53.50	0.000	4,666	158.20	0.021
54.00	0.000	4,628	158.20	0.021
54.50	0.000	4,591	158.20	0.021
55.00	0.000	4,554	158.20	0.021
55.50	0.000	4,516	158.19	0.021
56.00	0.000	4,479	158.19	0.021
56.50	0.000	4,442	158.19	0.021
57.00	0.000	4,405	158.18	0.021
57.50	0.000	4,368	158.18	0.020
58.00	0.000	4,331	158.18	0.020
58.50	0.000	4,295	158.17	0.020
59.00	0.000	4,258	158.17	0.020
59.50	0.000	4,222	158.17	0.020
60.00	0.000	4,185	158.16	0.020
60.50	0.000	4,149	158.16	0.020
61.00	0.000	4,113	158.16	0.020
61.50	0.000	4,077	158.15	0.020
62.00	0.000	4,040	158.15	0.020
62.50	0.000	4,005	158.15	0.020
63.00	0.000	3,969	158.14	0.020
63.50	0.000	3,933	158.14	0.020
64.00	0.000	3,897	158.14	0.020
64.50	0.000	3,862	158.14	0.020
65.00	0.000	3,826	158.13	0.020
65.50	0.000	3,791	158.13	0.020
66.00	0.000	3,756	158.13	0.020
66.50	0.000	3,721	158.12	0.020
67.00	0.000	3,685	158.12	0.019
67.50	0.000	3,650	158.12	0.019
68.00	0.000	3,616	158.11	0.019
68.50	0.000	3,581	158.11	0.019
69.00	0.000	3,546	158.11	0.019
69.50	0.000	3,511	158.11	0.019
70.00	0.000	3,477	158.10	0.019
70.50	0.000	3,443	158.10	0.019
71.00	0.000	3,408	158.10	0.019
71.50	0.000	3,374	158.09	0.019
72.00	0.000	3,340	158.09	0.019
72.50	0.000	3,306	158.09	0.019
73.00	0.000	3,272	158.09	0.019
73.50	0.000	3,238	158.08	0.019
74.00	0.000	3,204	158.08	0.019
74.50	0.000	3,171	158.08	0.019
75.00	0.000	3,137	158.07	0.019
75.50	0.000	3,104	158.07	0.019
76.00	0.000	3,070	158.07	0.019

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	3,037	158.07	0.018
77.00	0.000	3,004	158.06	0.018
77.50	0.000	2,971	158.06	0.018
78.00	0.000	2,938	158.06	0.018
78.50	0.000	2,905	158.05	0.018
79.00	0.000	2,872	158.05	0.018
79.50	0.000	2,839	158.05	0.018
80.00	0.000	2,807	158.05	0.018
80.50	0.000	2,774	158.04	0.018
81.00	0.000	2,742	158.04	0.018
81.50	0.000	2,709	158.04	0.018
82.00	0.000	2,677	158.04	0.018
82.50	0.000	2,645	158.03	0.018
83.00	0.000	2,613	158.03	0.018
83.50	0.000	2,581	158.02	0.018
84.00	0.000	2,549	158.02	0.018
84.50	0.000	2,518	158.01	0.017
85.00	0.000	2,486	158.01	0.017
85.50	0.000	2,455	158.00	0.017
86.00	0.000	2,425	157.99	0.017
86.50	0.000	2,394	157.99	0.017
87.00	0.000	2,363	157.98	0.017
87.50	0.000	2,333	157.98	0.017
88.00	0.000	2,303	157.97	0.017
88.50	0.000	2,273	157.97	0.016
89.00	0.000	2,244	157.96	0.016
89.50	0.000	2,215	157.95	0.016
90.00	0.000	2,185	157.95	0.016
90.50	0.000	2,156	157.94	0.016
91.00	0.000	2,128	157.94	0.016
91.50	0.000	2,099	157.93	0.016
92.00	0.000	2,071	157.93	0.016
92.50	0.000	2,043	157.92	0.016
93.00	0.000	2,015	157.92	0.015
93.50	0.000	1,987	157.91	0.015
94.00	0.000	1,960	157.91	0.015
94.50	0.000	1,933	157.90	0.015
95.00	0.000	1,906	157.90	0.015
95.50	0.000	1,879	157.89	0.015
96.00	0.000	1,852	157.89	0.015
96.50	0.000	1,826	157.88	0.015
97.00	0.000	1,800	157.88	0.014
97.50	0.000	1,774	157.87	0.014
98.00	0.000	1,748	157.87	0.014
98.50	0.000	1,723	157.86	0.014
99.00	0.000	1,698	157.86	0.014
99.50	0.000	1,672	157.85	0.014
100.00	0.000	1,648	157.85	0.014
100.50	0.000	1,623	157.84	0.014
101.00	0.000	1,599	157.84	0.014
101.50	0.000	1,574	157.83	0.013

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	1,550	157.83	0.013
102.50	0.000	1,527	157.82	0.013
103.00	0.000	1,503	157.82	0.013
103.50	0.000	1,480	157.81	0.013
104.00	0.000	1,457	157.81	0.013
104.50	0.000	1,434	157.80	0.013
105.00	0.000	1,411	157.80	0.013
105.50	0.000	1,388	157.80	0.012
106.00	0.000	1,366	157.79	0.012
106.50	0.000	1,344	157.79	0.012
107.00	0.000	1,322	157.78	0.012
107.50	0.000	1,301	157.78	0.012
108.00	0.000	1,279	157.78	0.012
108.50	0.000	1,258	157.77	0.012
109.00	0.000	1,237	157.77	0.012
109.50	0.000	1,216	157.76	0.011
110.00	0.000	1,196	157.76	0.011
110.50	0.000	1,175	157.76	0.011
111.00	0.000	1,155	157.75	0.011
111.50	0.000	1,135	157.75	0.011
112.00	0.000	1,115	157.74	0.011
112.50	0.000	1,096	157.74	0.011
113.00	0.000	1,077	157.74	0.011
113.50	0.000	1,058	157.73	0.011
114.00	0.000	1,039	157.73	0.010
114.50	0.000	1,020	157.73	0.010
115.00	0.000	1,002	157.72	0.010
115.50	0.000	984	157.72	0.010
116.00	0.000	966	157.72	0.010
116.50	0.000	948	157.71	0.010
117.00	0.000	930	157.71	0.010
117.50	0.000	913	157.70	0.010
118.00	0.000	896	157.70	0.009
118.50	0.000	879	157.70	0.009
119.00	0.000	862	157.70	0.009
119.50	0.000	846	157.69	0.009
120.00	0.000	829	157.69	0.009
120.50	0.000	813	157.69	0.009
121.00	0.000	797	157.68	0.009
121.50	0.000	782	157.68	0.009
122.00	0.000	766	157.68	0.008
122.50	0.000	751	157.67	0.008
123.00	0.000	736	157.67	0.008
123.50	0.000	721	157.67	0.008
124.00	0.000	707	157.67	0.008
124.50	0.000	693	157.66	0.008
125.00	0.000	678	157.66	0.008
125.50	0.000	665	157.66	0.008
126.00	0.000	651	157.65	0.008
126.50	0.000	637	157.65	0.007
127.00	0.000	624	157.65	0.007

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	611	157.65	0.007
128.00	0.000	598	157.64	0.007
128.50	0.000	586	157.64	0.007
129.00	0.000	573	157.64	0.007
129.50	0.000	561	157.64	0.007
130.00	0.000	549	157.64	0.007
130.50	0.000	537	157.63	0.006
131.00	0.000	526	157.63	0.006
131.50	0.000	514	157.63	0.006
132.00	0.000	503	157.63	0.006
132.50	0.000	492	157.62	0.006
133.00	0.000	482	157.62	0.006
133.50	0.000	471	157.62	0.006
134.00	0.000	461	157.62	0.006
134.50	0.000	451	157.62	0.005
135.00	0.000	441	157.61	0.005
135.50	0.000	432	157.61	0.005
136.00	0.000	423	157.61	0.005
136.50	0.000	414	157.61	0.005
137.00	0.000	405	157.61	0.005
137.50	0.000	396	157.61	0.005
138.00	0.000	388	157.60	0.005
138.50	0.000	380	157.60	0.004
139.00	0.000	372	157.60	0.004
139.50	0.000	364	157.60	0.004
140.00	0.000	356	157.60	0.004
140.50	0.000	349	157.60	0.004
141.00	0.000	342	157.60	0.004
141.50	0.000	335	157.59	0.004
142.00	0.000	328	157.59	0.004
142.50	0.000	321	157.59	0.004
143.00	0.000	315	157.59	0.004
143.50	0.000	308	157.59	0.003
144.00	0.000	302	157.59	0.003
144.50	0.000	296	157.59	0.003
145.00	0.000	290	157.59	0.003
145.50	0.000	285	157.58	0.003
146.00	0.000	279	157.58	0.003
146.50	0.000	274	157.58	0.003
147.00	0.000	269	157.58	0.003
147.50	0.000	264	157.58	0.003
148.00	0.000	259	157.58	0.003
148.50	0.000	254	157.58	0.003
149.00	0.000	250	157.58	0.003
149.50	0.000	245	157.58	0.002
150.00	0.000	241	157.58	0.002
150.50	0.000	237	157.58	0.002
151.00	0.000	233	157.57	0.002
151.50	0.000	229	157.57	0.002
152.00	0.000	225	157.57	0.002
152.50	0.000	221	157.57	0.002

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	217	157.57	0.002
153.50	0.000	214	157.57	0.002
154.00	0.000	210	157.57	0.002
154.50	0.000	207	157.57	0.002
155.00	0.000	204	157.57	0.002
155.50	0.000	201	157.57	0.002
156.00	0.000	198	157.57	0.002
156.50	0.000	195	157.57	0.002
157.00	0.000	192	157.57	0.002
157.50	0.000	189	157.57	0.002
158.00	0.000	186	157.57	0.001
158.50	0.000	184	157.57	0.001
159.00	0.000	181	157.56	0.001
159.50	0.000	179	157.56	0.001
160.00	0.000	176	157.56	0.001
160.50	0.000	174	157.56	0.001
161.00	0.000	172	157.56	0.001
161.50	0.000	169	157.56	0.001
162.00	0.000	167	157.56	0.001
162.50	0.000	165	157.56	0.001
163.00	0.000	163	157.56	0.001
163.50	0.000	161	157.56	0.001
164.00	0.000	159	157.56	0.001
164.50	0.000	157	157.56	0.001
165.00	0.000	155	157.56	0.001
165.50	0.000	153	157.56	0.001
166.00	0.000	151	157.56	0.001
166.50	0.000	149	157.56	0.001
167.00	0.000	147	157.56	0.001
167.50	0.000	145	157.56	0.001
168.00	0.000	144	157.56	0.001

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 1.90" for 2-yr event
Inflow = 1.718 cfs @ 11.96 hrs, Volume= 3,409 cf
Outflow = 0.347 cfs @ 12.11 hrs, Volume= 3,409 cf, Atten= 80%, Lag= 8.8 min
Primary = 0.347 cfs @ 12.11 hrs, Volume= 3,409 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 160.17' @ 12.11 hrs Surf.Area= 2,542 sf Storage= 1,349 cf

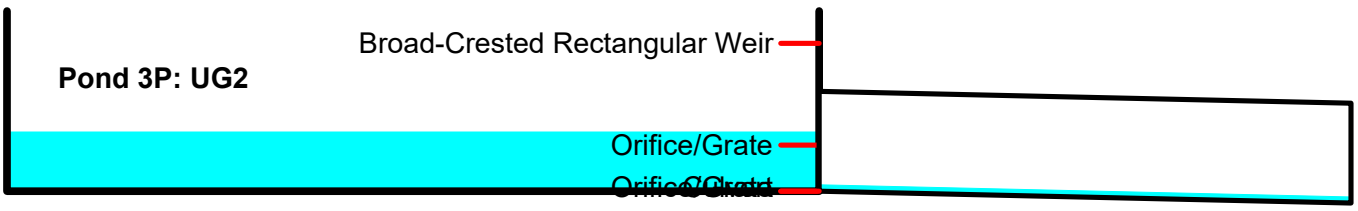
Plug-Flow detention time= 74.8 min calculated for 3,409 cf (100% of inflow)
Center-of-Mass det. time= 74.9 min (892.3 - 817.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.347 cfs @ 12.11 hrs HW=160.17' (Free Discharge)
└**4=Culvert** (Passes 0.347 cfs of 2.415 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.206 cfs @ 4.203 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.140 cfs @ 1.425 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 3P: UG2 - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Discontinued, not for new designs)
Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf
Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 3.44 sf x 8 rows

36.0" Wide + 3.0" Spacing = 39.0" C-C Row Spacing

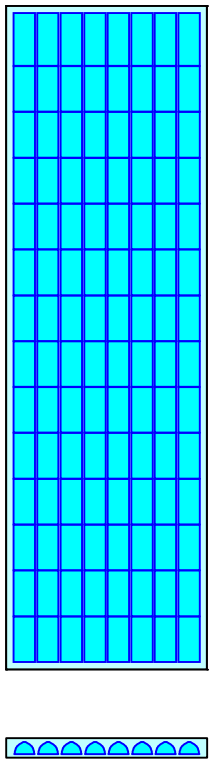
14 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 89.62' Row Length +12.0" End Stone x 2 = 91.62' Base Length
8 Rows x 36.0" Wide + 3.0" Spacing x 7 + 12.0" Side Stone x 2 = 27.75' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

112 Chambers x 21.8 cf +1.00' Row Adjustment x 3.44 sf x 8 Rows = 2,466.0 cf Chamber Storage

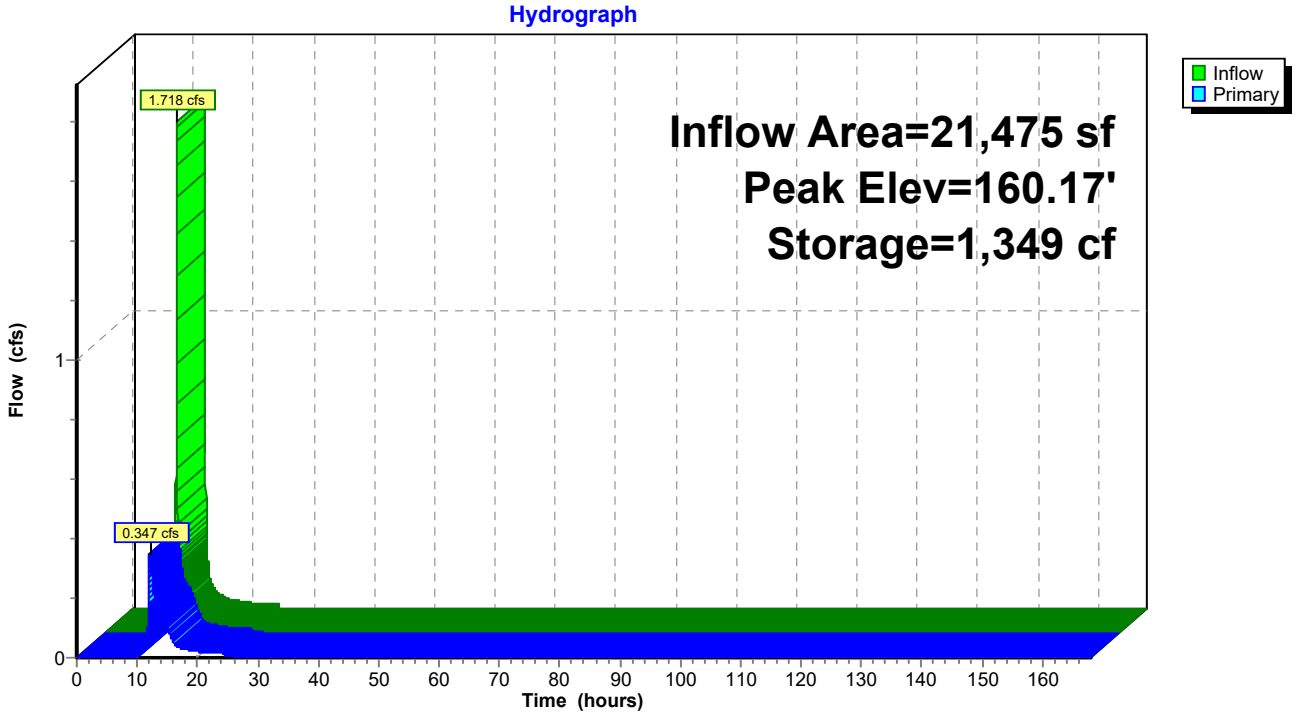
6,885.8 cf Field - 2,466.0 cf Chambers = 4,419.8 cf Stone x 40.0% Voids = 1,767.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,233.9 cf = 0.097 af
Overall Storage Efficiency = 61.5%
Overall System Size = 91.62' x 27.75' x 2.71'

112 Chambers
255.0 cy Field
163.7 cy Stone



Pond 3P: UG2


Hydrograph
Inflow Area=21,475 sf
Peak Elev=160.17'
Storage=1,349 cf
1.718 cfs
0.347 cfs
Inflow
Primary
Flow (cfs)
0
1
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160
Time (hours)

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.000	0	159.28	0.000
4.50	0.000	0	159.28	0.000
5.00	0.000	0	159.28	0.000
5.50	0.000	0	159.28	0.000
6.00	0.000	0	159.28	0.000
6.50	0.000	0	159.28	0.000
7.00	0.000	0	159.28	0.000
7.50	0.001	1	159.28	0.000
8.00	0.003	4	159.28	0.000
8.50	0.005	10	159.29	0.001
9.00	0.008	20	159.30	0.001
9.50	0.011	34	159.31	0.003
10.00	0.016	51	159.33	0.005
10.50	0.025	73	159.35	0.011
11.00	0.042	105	159.38	0.021
11.50	**0.083**	158	159.44	0.043
12.00	**1.467**	**1,165**	**160.08**	**0.254**
12.50	0.137	**1,195**	**160.10**	**0.268**
13.00	0.087	983	160.00	0.190
13.50	0.066	801	159.91	0.169
14.00	0.052	617	159.83	0.154
14.50	0.046	444	159.72	0.132
15.00	0.042	314	159.59	0.101
15.50	0.037	228	159.50	0.074
16.00	0.033	178	159.46	0.052
16.50	0.030	152	159.43	0.041
17.00	0.029	139	159.42	0.034
17.50	0.027	130	159.41	0.031
18.00	0.025	124	159.40	0.029
18.50	0.024	119	159.40	0.026
19.00	0.022	114	159.39	0.025
19.50	0.020	110	159.39	0.023
20.00	0.019	105	159.38	0.021
20.50	0.018	101	159.38	0.020
21.00	0.018	99	159.38	0.019
21.50	0.017	97	159.38	0.018
22.00	0.017	95	159.37	0.018
22.50	0.017	94	159.37	0.017
23.00	0.016	93	159.37	0.017
23.50	0.016	92	159.37	0.017
24.00	0.016	91	159.37	0.016
24.50	0.000	71	159.35	0.010
25.00	0.000	56	159.34	0.007

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	46	159.33	0.005
26.00	0.000	39	159.32	0.004
26.50	0.000	33	159.31	0.003
27.00	0.000	29	159.31	0.002
27.50	0.000	26	159.31	0.002
28.00	0.000	24	159.30	0.001
28.50	0.000	21	159.30	0.001
29.00	0.000	19	159.30	0.001
29.50	0.000	17	159.30	0.001
30.00	0.000	16	159.30	0.001
30.50	0.000	14	159.29	0.001
31.00	0.000	13	159.29	0.001
31.50	0.000	11	159.29	0.001
32.00	0.000	10	159.29	0.001
32.50	0.000	9	159.29	0.001
33.00	0.000	8	159.29	0.000
33.50	0.000	7	159.29	0.000
34.00	0.000	7	159.29	0.000
34.50	0.000	6	159.29	0.000
35.00	0.000	5	159.29	0.000
35.50	0.000	5	159.28	0.000
36.00	0.000	4	159.28	0.000
36.50	0.000	4	159.28	0.000
37.00	0.000	4	159.28	0.000
37.50	0.000	3	159.28	0.000
38.00	0.000	3	159.28	0.000
38.50	0.000	3	159.28	0.000
39.00	0.000	2	159.28	0.000
39.50	0.000	2	159.28	0.000
40.00	0.000	2	159.28	0.000
40.50	0.000	2	159.28	0.000
41.00	0.000	2	159.28	0.000
41.50	0.000	1	159.28	0.000
42.00	0.000	1	159.28	0.000
42.50	0.000	1	159.28	0.000
43.00	0.000	1	159.28	0.000
43.50	0.000	1	159.28	0.000
44.00	0.000	1	159.28	0.000
44.50	0.000	1	159.28	0.000
45.00	0.000	1	159.28	0.000
45.50	0.000	1	159.28	0.000
46.00	0.000	1	159.28	0.000
46.50	0.000	0	159.28	0.000
47.00	0.000	0	159.28	0.000
47.50	0.000	0	159.28	0.000
48.00	0.000	0	159.28	0.000
48.50	0.000	0	159.28	0.000
49.00	0.000	0	159.28	0.000
49.50	0.000	0	159.28	0.000
50.00	0.000	0	159.28	0.000
50.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	0	159.28	0.000
51.50	0.000	0	159.28	0.000
52.00	0.000	0	159.28	0.000
52.50	0.000	0	159.28	0.000
53.00	0.000	0	159.28	0.000
53.50	0.000	0	159.28	0.000
54.00	0.000	0	159.28	0.000
54.50	0.000	0	159.28	0.000
55.00	0.000	0	159.28	0.000
55.50	0.000	0	159.28	0.000
56.00	0.000	0	159.28	0.000
56.50	0.000	0	159.28	0.000
57.00	0.000	0	159.28	0.000
57.50	0.000	0	159.28	0.000
58.00	0.000	0	159.28	0.000
58.50	0.000	0	159.28	0.000
59.00	0.000	0	159.28	0.000
59.50	0.000	0	159.28	0.000
60.00	0.000	0	159.28	0.000
60.50	0.000	0	159.28	0.000
61.00	0.000	0	159.28	0.000
61.50	0.000	0	159.28	0.000
62.00	0.000	0	159.28	0.000
62.50	0.000	0	159.28	0.000
63.00	0.000	0	159.28	0.000
63.50	0.000	0	159.28	0.000
64.00	0.000	0	159.28	0.000
64.50	0.000	0	159.28	0.000
65.00	0.000	0	159.28	0.000
65.50	0.000	0	159.28	0.000
66.00	0.000	0	159.28	0.000
66.50	0.000	0	159.28	0.000
67.00	0.000	0	159.28	0.000
67.50	0.000	0	159.28	0.000
68.00	0.000	0	159.28	0.000
68.50	0.000	0	159.28	0.000
69.00	0.000	0	159.28	0.000
69.50	0.000	0	159.28	0.000
70.00	0.000	0	159.28	0.000
70.50	0.000	0	159.28	0.000
71.00	0.000	0	159.28	0.000
71.50	0.000	0	159.28	0.000
72.00	0.000	0	159.28	0.000
72.50	0.000	0	159.28	0.000
73.00	0.000	0	159.28	0.000
73.50	0.000	0	159.28	0.000
74.00	0.000	0	159.28	0.000
74.50	0.000	0	159.28	0.000
75.00	0.000	0	159.28	0.000
75.50	0.000	0	159.28	0.000
76.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	0	159.28	0.000
77.00	0.000	0	159.28	0.000
77.50	0.000	0	159.28	0.000
78.00	0.000	0	159.28	0.000
78.50	0.000	0	159.28	0.000
79.00	0.000	0	159.28	0.000
79.50	0.000	0	159.28	0.000
80.00	0.000	0	159.28	0.000
80.50	0.000	0	159.28	0.000
81.00	0.000	0	159.28	0.000
81.50	0.000	0	159.28	0.000
82.00	0.000	0	159.28	0.000
82.50	0.000	0	159.28	0.000
83.00	0.000	0	159.28	0.000
83.50	0.000	0	159.28	0.000
84.00	0.000	0	159.28	0.000
84.50	0.000	0	159.28	0.000
85.00	0.000	0	159.28	0.000
85.50	0.000	0	159.28	0.000
86.00	0.000	0	159.28	0.000
86.50	0.000	0	159.28	0.000
87.00	0.000	0	159.28	0.000
87.50	0.000	0	159.28	0.000
88.00	0.000	0	159.28	0.000
88.50	0.000	0	159.28	0.000
89.00	0.000	0	159.28	0.000
89.50	0.000	0	159.28	0.000
90.00	0.000	0	159.28	0.000
90.50	0.000	0	159.28	0.000
91.00	0.000	0	159.28	0.000
91.50	0.000	0	159.28	0.000
92.00	0.000	0	159.28	0.000
92.50	0.000	0	159.28	0.000
93.00	0.000	0	159.28	0.000
93.50	0.000	0	159.28	0.000
94.00	0.000	0	159.28	0.000
94.50	0.000	0	159.28	0.000
95.00	0.000	0	159.28	0.000
95.50	0.000	0	159.28	0.000
96.00	0.000	0	159.28	0.000
96.50	0.000	0	159.28	0.000
97.00	0.000	0	159.28	0.000
97.50	0.000	0	159.28	0.000
98.00	0.000	0	159.28	0.000
98.50	0.000	0	159.28	0.000
99.00	0.000	0	159.28	0.000
99.50	0.000	0	159.28	0.000
100.00	0.000	0	159.28	0.000
100.50	0.000	0	159.28	0.000
101.00	0.000	0	159.28	0.000
101.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	0	159.28	0.000
102.50	0.000	0	159.28	0.000
103.00	0.000	0	159.28	0.000
103.50	0.000	0	159.28	0.000
104.00	0.000	0	159.28	0.000
104.50	0.000	0	159.28	0.000
105.00	0.000	0	159.28	0.000
105.50	0.000	0	159.28	0.000
106.00	0.000	0	159.28	0.000
106.50	0.000	0	159.28	0.000
107.00	0.000	0	159.28	0.000
107.50	0.000	0	159.28	0.000
108.00	0.000	0	159.28	0.000
108.50	0.000	0	159.28	0.000
109.00	0.000	0	159.28	0.000
109.50	0.000	0	159.28	0.000
110.00	0.000	0	159.28	0.000
110.50	0.000	0	159.28	0.000
111.00	0.000	0	159.28	0.000
111.50	0.000	0	159.28	0.000
112.00	0.000	0	159.28	0.000
112.50	0.000	0	159.28	0.000
113.00	0.000	0	159.28	0.000
113.50	0.000	0	159.28	0.000
114.00	0.000	0	159.28	0.000
114.50	0.000	0	159.28	0.000
115.00	0.000	0	159.28	0.000
115.50	0.000	0	159.28	0.000
116.00	0.000	0	159.28	0.000
116.50	0.000	0	159.28	0.000
117.00	0.000	0	159.28	0.000
117.50	0.000	0	159.28	0.000
118.00	0.000	0	159.28	0.000
118.50	0.000	0	159.28	0.000
119.00	0.000	0	159.28	0.000
119.50	0.000	0	159.28	0.000
120.00	0.000	0	159.28	0.000
120.50	0.000	0	159.28	0.000
121.00	0.000	0	159.28	0.000
121.50	0.000	0	159.28	0.000
122.00	0.000	0	159.28	0.000
122.50	0.000	0	159.28	0.000
123.00	0.000	0	159.28	0.000
123.50	0.000	0	159.28	0.000
124.00	0.000	0	159.28	0.000
124.50	0.000	0	159.28	0.000
125.00	0.000	0	159.28	0.000
125.50	0.000	0	159.28	0.000
126.00	0.000	0	159.28	0.000
126.50	0.000	0	159.28	0.000
127.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	0	159.28	0.000
128.00	0.000	0	159.28	0.000
128.50	0.000	0	159.28	0.000
129.00	0.000	0	159.28	0.000
129.50	0.000	0	159.28	0.000
130.00	0.000	0	159.28	0.000
130.50	0.000	0	159.28	0.000
131.00	0.000	0	159.28	0.000
131.50	0.000	0	159.28	0.000
132.00	0.000	0	159.28	0.000
132.50	0.000	0	159.28	0.000
133.00	0.000	0	159.28	0.000
133.50	0.000	0	159.28	0.000
134.00	0.000	0	159.28	0.000
134.50	0.000	0	159.28	0.000
135.00	0.000	0	159.28	0.000
135.50	0.000	0	159.28	0.000
136.00	0.000	0	159.28	0.000
136.50	0.000	0	159.28	0.000
137.00	0.000	0	159.28	0.000
137.50	0.000	0	159.28	0.000
138.00	0.000	0	159.28	0.000
138.50	0.000	0	159.28	0.000
139.00	0.000	0	159.28	0.000
139.50	0.000	0	159.28	0.000
140.00	0.000	0	159.28	0.000
140.50	0.000	0	159.28	0.000
141.00	0.000	0	159.28	0.000
141.50	0.000	0	159.28	0.000
142.00	0.000	0	159.28	0.000
142.50	0.000	0	159.28	0.000
143.00	0.000	0	159.28	0.000
143.50	0.000	0	159.28	0.000
144.00	0.000	0	159.28	0.000
144.50	0.000	0	159.28	0.000
145.00	0.000	0	159.28	0.000
145.50	0.000	0	159.28	0.000
146.00	0.000	0	159.28	0.000
146.50	0.000	0	159.28	0.000
147.00	0.000	0	159.28	0.000
147.50	0.000	0	159.28	0.000
148.00	0.000	0	159.28	0.000
148.50	0.000	0	159.28	0.000
149.00	0.000	0	159.28	0.000
149.50	0.000	0	159.28	0.000
150.00	0.000	0	159.28	0.000
150.50	0.000	0	159.28	0.000
151.00	0.000	0	159.28	0.000
151.50	0.000	0	159.28	0.000
152.00	0.000	0	159.28	0.000
152.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	0	159.28	0.000
153.50	0.000	0	159.28	0.000
154.00	0.000	0	159.28	0.000
154.50	0.000	0	159.28	0.000
155.00	0.000	0	159.28	0.000
155.50	0.000	0	159.28	0.000
156.00	0.000	0	159.28	0.000
156.50	0.000	0	159.28	0.000
157.00	0.000	0	159.28	0.000
157.50	0.000	0	159.28	0.000
158.00	0.000	0	159.28	0.000
158.50	0.000	0	159.28	0.000
159.00	0.000	0	159.28	0.000
159.50	0.000	0	159.28	0.000
160.00	0.000	0	159.28	0.000
160.50	0.000	0	159.28	0.000
161.00	0.000	0	159.28	0.000
161.50	0.000	0	159.28	0.000
162.00	0.000	0	159.28	0.000
162.50	0.000	0	159.28	0.000
163.00	0.000	0	159.28	0.000
163.50	0.000	0	159.28	0.000
164.00	0.000	0	159.28	0.000
164.50	0.000	0	159.28	0.000
165.00	0.000	0	159.28	0.000
165.50	0.000	0	159.28	0.000
166.00	0.000	0	159.28	0.000
166.50	0.000	0	159.28	0.000
167.00	0.000	0	159.28	0.000
167.50	0.000	0	159.28	0.000
168.00	0.000	0	159.28	0.000

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 3.67" for 5-yr event
Inflow = 11.443 cfs @ 11.96 hrs, Volume= 25,677 cf
Outflow = 2.613 cfs @ 12.09 hrs, Volume= 25,533 cf, Atten= 77%, Lag= 8.0 min
Primary = 2.613 cfs @ 12.09 hrs, Volume= 25,533 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 159.04' @ 12.09 hrs Surf.Area= 13,041 sf Storage= 14,016 cf

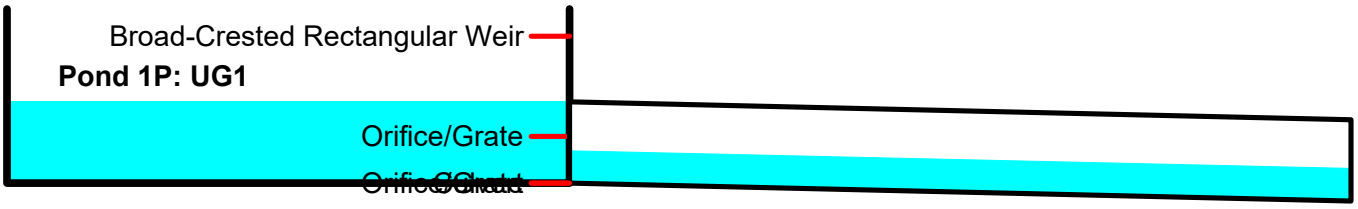
Plug-Flow detention time= 1,060.4 min calculated for 25,531 cf (99% of inflow)
Center-of-Mass det. time= 1,057.1 min (1,819.6 - 762.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=2.613 cfs @ 12.09 hrs HW=159.04' (Free Discharge)
└**4=Culvert** (Passes 2.613 cfs of 5.289 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.032 cfs @ 5.828 fps)
  ├**2=Orifice/Grate** (Orifice Controls 2.581 cfs @ 3.319 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 1P: UG1 - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger®280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 27 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

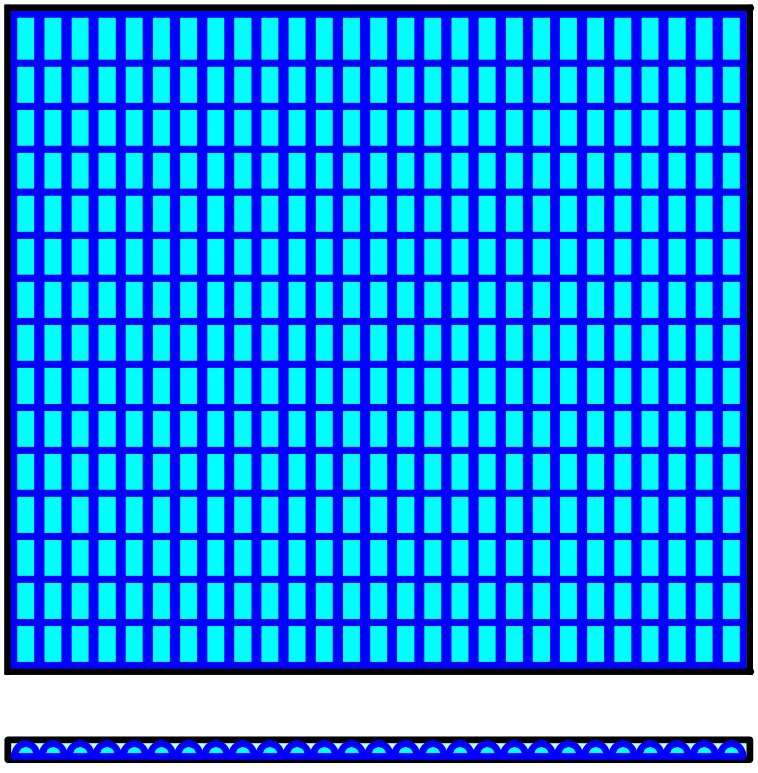
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

405 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 27 Rows = 17,377.3 cf Chamber Storage

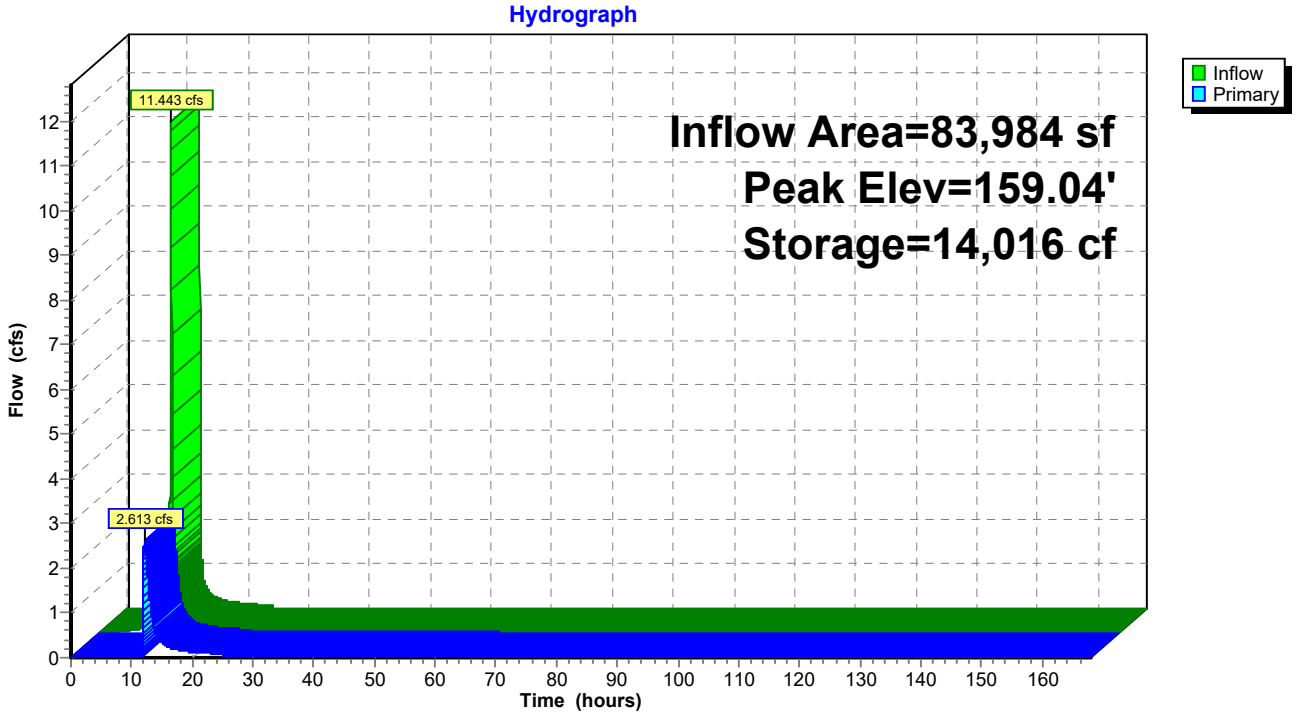
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

Chamber Storage + Stone Storage = 27,162.4 cf = 0.624 af
Overall Storage Efficiency = 64.9%
Overall System Size = 108.00' x 120.75' x 3.21'

405 Chambers
1,549.6 cy Field
906.0 cy Stone



Pond 1P: UG1


Hydrograph
Inflow
Primary
11.443 cfs
2.613 cfs
Inflow Area=83,984 sf
Peak Elev=159.04'
Storage=14,016 cf
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
11
12
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.000	0	157.53	0.000
2.00	0.002	0	157.53	0.000
2.50	0.012	13	157.53	0.000
3.00	0.023	45	157.54	0.000
3.50	0.033	94	157.55	0.001
4.00	0.042	159	157.56	0.001
4.50	0.052	241	157.58	0.002
5.00	0.063	339	157.60	0.004
5.50	0.075	455	157.62	0.006
6.00	0.086	588	157.64	0.007
6.50	0.097	739	157.67	0.008
7.00	0.108	908	157.70	0.010
7.50	0.119	1,094	157.74	0.011
8.00	0.130	1,299	157.78	0.012
8.50	0.162	1,537	157.82	0.013
9.00	0.200	1,838	157.88	0.015
9.50	0.212	2,185	157.95	0.016
10.00	0.264	2,577	158.02	0.018
10.50	0.351	3,093	158.07	0.019
11.00	0.495	3,812	158.13	0.020
11.50	**0.831**	4,943	158.23	0.021
12.00	**9.472**	**13,028**	**158.95**	**2.346**
12.50	0.827	**12,348**	**158.88**	**2.143**
13.00	0.515	10,339	158.70	1.324
13.50	0.389	9,307	158.61	0.793
14.00	0.306	8,747	158.56	0.547
14.50	0.270	8,406	158.53	0.414
15.00	0.242	8,194	158.51	0.340
15.50	0.215	8,041	158.50	0.289
16.00	0.187	7,919	158.49	0.251
16.50	0.174	7,819	158.48	0.222
17.00	0.164	7,745	158.47	0.200
17.50	0.154	7,687	158.47	0.184
18.00	0.145	7,639	158.46	0.170
18.50	0.135	7,595	158.46	0.158
19.00	0.125	7,553	158.45	0.148
19.50	0.115	7,512	158.45	0.138
20.00	0.105	7,471	158.45	0.128
20.50	0.102	7,435	158.44	0.119
21.00	0.100	7,407	158.44	0.113
21.50	0.098	7,385	158.44	0.109
22.00	0.096	7,367	158.44	0.105
22.50	0.094	7,351	158.44	0.102
23.00	0.092	7,338	158.44	0.099
23.50	0.090	7,326	158.43	0.096
24.00	0.088	7,315	158.43	0.094
24.50	0.000	7,190	158.42	0.072
25.00	0.000	7,077	158.41	0.055

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	6,989	158.41	0.043
26.00	0.000	6,921	158.40	0.033
26.50	0.000	6,868	158.39	0.027
27.00	0.000	6,822	158.39	0.024
27.50	0.000	6,779	158.39	0.024
28.00	0.000	6,737	158.38	0.024
28.50	0.000	6,694	158.38	0.024
29.00	0.000	6,652	158.38	0.024
29.50	0.000	6,609	158.37	0.024
30.00	0.000	6,567	158.37	0.023
30.50	0.000	6,525	158.37	0.023
31.00	0.000	6,483	158.36	0.023
31.50	0.000	6,441	158.36	0.023
32.00	0.000	6,399	158.35	0.023
32.50	0.000	6,357	158.35	0.023
33.00	0.000	6,316	158.35	0.023
33.50	0.000	6,274	158.34	0.023
34.00	0.000	6,233	158.34	0.023
34.50	0.000	6,191	158.34	0.023
35.00	0.000	6,150	158.33	0.023
35.50	0.000	6,109	158.33	0.023
36.00	0.000	6,068	158.33	0.023
36.50	0.000	6,027	158.32	0.023
37.00	0.000	5,986	158.32	0.023
37.50	0.000	5,945	158.32	0.023
38.00	0.000	5,904	158.31	0.023
38.50	0.000	5,864	158.31	0.023
39.00	0.000	5,823	158.30	0.022
39.50	0.000	5,783	158.30	0.022
40.00	0.000	5,742	158.30	0.022
40.50	0.000	5,702	158.29	0.022
41.00	0.000	5,662	158.29	0.022
41.50	0.000	5,622	158.29	0.022
42.00	0.000	5,582	158.28	0.022
42.50	0.000	5,542	158.28	0.022
43.00	0.000	5,502	158.28	0.022
43.50	0.000	5,463	158.27	0.022
44.00	0.000	5,423	158.27	0.022
44.50	0.000	5,384	158.27	0.022
45.00	0.000	5,344	158.26	0.022
45.50	0.000	5,305	158.26	0.022
46.00	0.000	5,266	158.26	0.022
46.50	0.000	5,227	158.25	0.022
47.00	0.000	5,188	158.25	0.022
47.50	0.000	5,149	158.25	0.022
48.00	0.000	5,110	158.24	0.022
48.50	0.000	5,072	158.24	0.021
49.00	0.000	5,033	158.24	0.021
49.50	0.000	4,995	158.23	0.021
50.00	0.000	4,956	158.23	0.021
50.50	0.000	4,918	158.23	0.021

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,880	158.22	0.021
51.50	0.000	4,842	158.22	0.021
52.00	0.000	4,804	158.22	0.021
52.50	0.000	4,766	158.21	0.021
53.00	0.000	4,728	158.21	0.021
53.50	0.000	4,690	158.21	0.021
54.00	0.000	4,652	158.20	0.021
54.50	0.000	4,615	158.20	0.021
55.00	0.000	4,578	158.20	0.021
55.50	0.000	4,540	158.19	0.021
56.00	0.000	4,503	158.19	0.021
56.50	0.000	4,466	158.19	0.021
57.00	0.000	4,429	158.18	0.021
57.50	0.000	4,392	158.18	0.021
58.00	0.000	4,355	158.18	0.020
58.50	0.000	4,318	158.17	0.020
59.00	0.000	4,282	158.17	0.020
59.50	0.000	4,245	158.17	0.020
60.00	0.000	4,208	158.17	0.020
60.50	0.000	4,172	158.16	0.020
61.00	0.000	4,136	158.16	0.020
61.50	0.000	4,100	158.16	0.020
62.00	0.000	4,064	158.15	0.020
62.50	0.000	4,028	158.15	0.020
63.00	0.000	3,992	158.15	0.020
63.50	0.000	3,956	158.14	0.020
64.00	0.000	3,920	158.14	0.020
64.50	0.000	3,885	158.14	0.020
65.00	0.000	3,849	158.13	0.020
65.50	0.000	3,814	158.13	0.020
66.00	0.000	3,778	158.13	0.020
66.50	0.000	3,743	158.13	0.020
67.00	0.000	3,708	158.12	0.019
67.50	0.000	3,673	158.12	0.019
68.00	0.000	3,638	158.12	0.019
68.50	0.000	3,603	158.11	0.019
69.00	0.000	3,568	158.11	0.019
69.50	0.000	3,534	158.11	0.019
70.00	0.000	3,499	158.11	0.019
70.50	0.000	3,465	158.10	0.019
71.00	0.000	3,430	158.10	0.019
71.50	0.000	3,396	158.10	0.019
72.00	0.000	3,362	158.09	0.019
72.50	0.000	3,328	158.09	0.019
73.00	0.000	3,294	158.09	0.019
73.50	0.000	3,260	158.08	0.019
74.00	0.000	3,226	158.08	0.019
74.50	0.000	3,192	158.08	0.019
75.00	0.000	3,159	158.08	0.019
75.50	0.000	3,125	158.07	0.019
76.00	0.000	3,092	158.07	0.019

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	3,058	158.07	0.018
77.00	0.000	3,025	158.07	0.018
77.50	0.000	2,992	158.06	0.018
78.00	0.000	2,959	158.06	0.018
78.50	0.000	2,926	158.06	0.018
79.00	0.000	2,893	158.05	0.018
79.50	0.000	2,860	158.05	0.018
80.00	0.000	2,827	158.05	0.018
80.50	0.000	2,795	158.05	0.018
81.00	0.000	2,762	158.04	0.018
81.50	0.000	2,730	158.04	0.018
82.00	0.000	2,698	158.04	0.018
82.50	0.000	2,665	158.03	0.018
83.00	0.000	2,633	158.03	0.018
83.50	0.000	2,601	158.03	0.018
84.00	0.000	2,569	158.02	0.018
84.50	0.000	2,538	158.02	0.018
85.00	0.000	2,506	158.01	0.017
85.50	0.000	2,475	158.00	0.017
86.00	0.000	2,444	158.00	0.017
86.50	0.000	2,413	157.99	0.017
87.00	0.000	2,383	157.99	0.017
87.50	0.000	2,353	157.98	0.017
88.00	0.000	2,322	157.98	0.017
88.50	0.000	2,292	157.97	0.017
89.00	0.000	2,263	157.96	0.016
89.50	0.000	2,233	157.96	0.016
90.00	0.000	2,204	157.95	0.016
90.50	0.000	2,175	157.95	0.016
91.00	0.000	2,146	157.94	0.016
91.50	0.000	2,117	157.94	0.016
92.00	0.000	2,089	157.93	0.016
92.50	0.000	2,061	157.93	0.016
93.00	0.000	2,033	157.92	0.015
93.50	0.000	2,005	157.91	0.015
94.00	0.000	1,978	157.91	0.015
94.50	0.000	1,950	157.90	0.015
95.00	0.000	1,923	157.90	0.015
95.50	0.000	1,896	157.89	0.015
96.00	0.000	1,869	157.89	0.015
96.50	0.000	1,843	157.88	0.015
97.00	0.000	1,817	157.88	0.015
97.50	0.000	1,791	157.87	0.014
98.00	0.000	1,765	157.87	0.014
98.50	0.000	1,739	157.86	0.014
99.00	0.000	1,714	157.86	0.014
99.50	0.000	1,689	157.85	0.014
100.00	0.000	1,664	157.85	0.014
100.50	0.000	1,639	157.84	0.014
101.00	0.000	1,614	157.84	0.014
101.50	0.000	1,590	157.83	0.013

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	1,566	157.83	0.013
102.50	0.000	1,542	157.83	0.013
103.00	0.000	1,518	157.82	0.013
103.50	0.000	1,495	157.82	0.013
104.00	0.000	1,471	157.81	0.013
104.50	0.000	1,448	157.81	0.013
105.00	0.000	1,425	157.80	0.013
105.50	0.000	1,403	157.80	0.013
106.00	0.000	1,380	157.79	0.012
106.50	0.000	1,358	157.79	0.012
107.00	0.000	1,336	157.79	0.012
107.50	0.000	1,314	157.78	0.012
108.00	0.000	1,293	157.78	0.012
108.50	0.000	1,271	157.77	0.012
109.00	0.000	1,250	157.77	0.012
109.50	0.000	1,229	157.77	0.012
110.00	0.000	1,209	157.76	0.011
110.50	0.000	1,188	157.76	0.011
111.00	0.000	1,168	157.75	0.011
111.50	0.000	1,148	157.75	0.011
112.00	0.000	1,128	157.75	0.011
112.50	0.000	1,108	157.74	0.011
113.00	0.000	1,089	157.74	0.011
113.50	0.000	1,070	157.74	0.011
114.00	0.000	1,051	157.73	0.010
114.50	0.000	1,032	157.73	0.010
115.00	0.000	1,014	157.72	0.010
115.50	0.000	995	157.72	0.010
116.00	0.000	977	157.72	0.010
116.50	0.000	959	157.71	0.010
117.00	0.000	941	157.71	0.010
117.50	0.000	924	157.71	0.010
118.00	0.000	907	157.70	0.010
118.50	0.000	890	157.70	0.009
119.00	0.000	873	157.70	0.009
119.50	0.000	856	157.69	0.009
120.00	0.000	840	157.69	0.009
120.50	0.000	824	157.69	0.009
121.00	0.000	808	157.68	0.009
121.50	0.000	792	157.68	0.009
122.00	0.000	776	157.68	0.009
122.50	0.000	761	157.68	0.008
123.00	0.000	746	157.67	0.008
123.50	0.000	731	157.67	0.008
124.00	0.000	716	157.67	0.008
124.50	0.000	702	157.66	0.008
125.00	0.000	687	157.66	0.008
125.50	0.000	673	157.66	0.008
126.00	0.000	660	157.66	0.008
126.50	0.000	646	157.65	0.008
127.00	0.000	633	157.65	0.007

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	619	157.65	0.007
128.00	0.000	606	157.65	0.007
128.50	0.000	594	157.64	0.007
129.00	0.000	581	157.64	0.007
129.50	0.000	569	157.64	0.007
130.00	0.000	557	157.64	0.007
130.50	0.000	545	157.63	0.007
131.00	0.000	533	157.63	0.006
131.50	0.000	522	157.63	0.006
132.00	0.000	510	157.63	0.006
132.50	0.000	499	157.63	0.006
133.00	0.000	489	157.62	0.006
133.50	0.000	478	157.62	0.006
134.00	0.000	468	157.62	0.006
134.50	0.000	458	157.62	0.006
135.00	0.000	448	157.62	0.005
135.50	0.000	438	157.61	0.005
136.00	0.000	429	157.61	0.005
136.50	0.000	420	157.61	0.005
137.00	0.000	411	157.61	0.005
137.50	0.000	402	157.61	0.005
138.00	0.000	393	157.61	0.005
138.50	0.000	385	157.60	0.005
139.00	0.000	377	157.60	0.004
139.50	0.000	369	157.60	0.004
140.00	0.000	361	157.60	0.004
140.50	0.000	354	157.60	0.004
141.00	0.000	346	157.60	0.004
141.50	0.000	339	157.60	0.004
142.00	0.000	332	157.59	0.004
142.50	0.000	325	157.59	0.004
143.00	0.000	319	157.59	0.004
143.50	0.000	312	157.59	0.004
144.00	0.000	306	157.59	0.003
144.50	0.000	300	157.59	0.003
145.00	0.000	294	157.59	0.003
145.50	0.000	288	157.59	0.003
146.00	0.000	283	157.58	0.003
146.50	0.000	277	157.58	0.003
147.00	0.000	272	157.58	0.003
147.50	0.000	267	157.58	0.003
148.00	0.000	262	157.58	0.003
148.50	0.000	257	157.58	0.003
149.00	0.000	253	157.58	0.003
149.50	0.000	248	157.58	0.002
150.00	0.000	244	157.58	0.002
150.50	0.000	239	157.58	0.002
151.00	0.000	235	157.58	0.002
151.50	0.000	231	157.57	0.002
152.00	0.000	227	157.57	0.002
152.50	0.000	223	157.57	0.002

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	220	157.57	0.002
153.50	0.000	216	157.57	0.002
154.00	0.000	213	157.57	0.002
154.50	0.000	209	157.57	0.002
155.00	0.000	206	157.57	0.002
155.50	0.000	203	157.57	0.002
156.00	0.000	200	157.57	0.002
156.50	0.000	197	157.57	0.002
157.00	0.000	194	157.57	0.002
157.50	0.000	191	157.57	0.002
158.00	0.000	188	157.57	0.002
158.50	0.000	185	157.57	0.001
159.00	0.000	183	157.57	0.001
159.50	0.000	180	157.56	0.001
160.00	0.000	178	157.56	0.001
160.50	0.000	175	157.56	0.001
161.00	0.000	173	157.56	0.001
161.50	0.000	171	157.56	0.001
162.00	0.000	169	157.56	0.001
162.50	0.000	166	157.56	0.001
163.00	0.000	164	157.56	0.001
163.50	0.000	162	157.56	0.001
164.00	0.000	160	157.56	0.001
164.50	0.000	158	157.56	0.001
165.00	0.000	156	157.56	0.001
165.50	0.000	154	157.56	0.001
166.00	0.000	152	157.56	0.001
166.50	0.000	150	157.56	0.001
167.00	0.000	148	157.56	0.001
167.50	0.000	147	157.56	0.001
168.00	0.000	145	157.56	0.001

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 2.66" for 5-yr event
Inflow = 2.367 cfs @ 11.96 hrs, Volume= 4,768 cf
Outflow = 0.568 cfs @ 12.09 hrs, Volume= 4,768 cf, Atten= 76%, Lag= 7.8 min
Primary = 0.568 cfs @ 12.09 hrs, Volume= 4,768 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 160.40' @ 12.09 hrs Surf.Area= 2,542 sf Storage= 1,849 cf

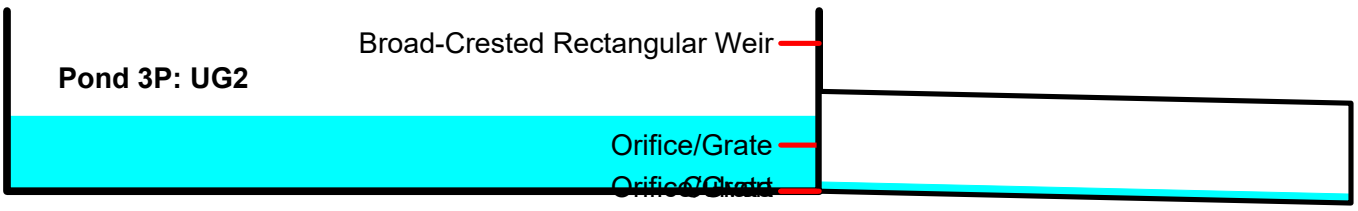
Plug-Flow detention time= 68.7 min calculated for 4,768 cf (100% of inflow)
Center-of-Mass det. time= 68.8 min (876.7 - 807.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.568 cfs @ 12.09 hrs HW=160.40' (Free Discharge)
└**4=Culvert** (Passes 0.568 cfs of 3.631 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.236 cfs @ 4.811 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.332 cfs @ 2.655 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 3P: UG2 - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Discontinued, not for new designs)
Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf
Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 3.44 sf x 8 rows

36.0" Wide + 3.0" Spacing = 39.0" C-C Row Spacing

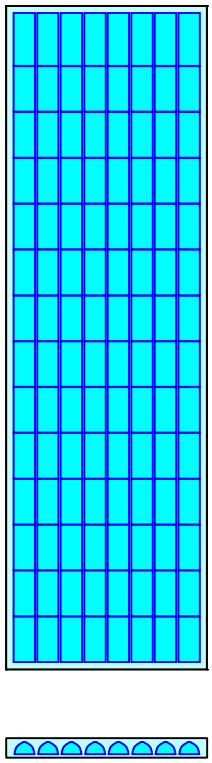
14 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 89.62' Row Length +12.0" End Stone x 2 = 91.62' Base Length
8 Rows x 36.0" Wide + 3.0" Spacing x 7 + 12.0" Side Stone x 2 = 27.75' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

112 Chambers x 21.8 cf +1.00' Row Adjustment x 3.44 sf x 8 Rows = 2,466.0 cf Chamber Storage

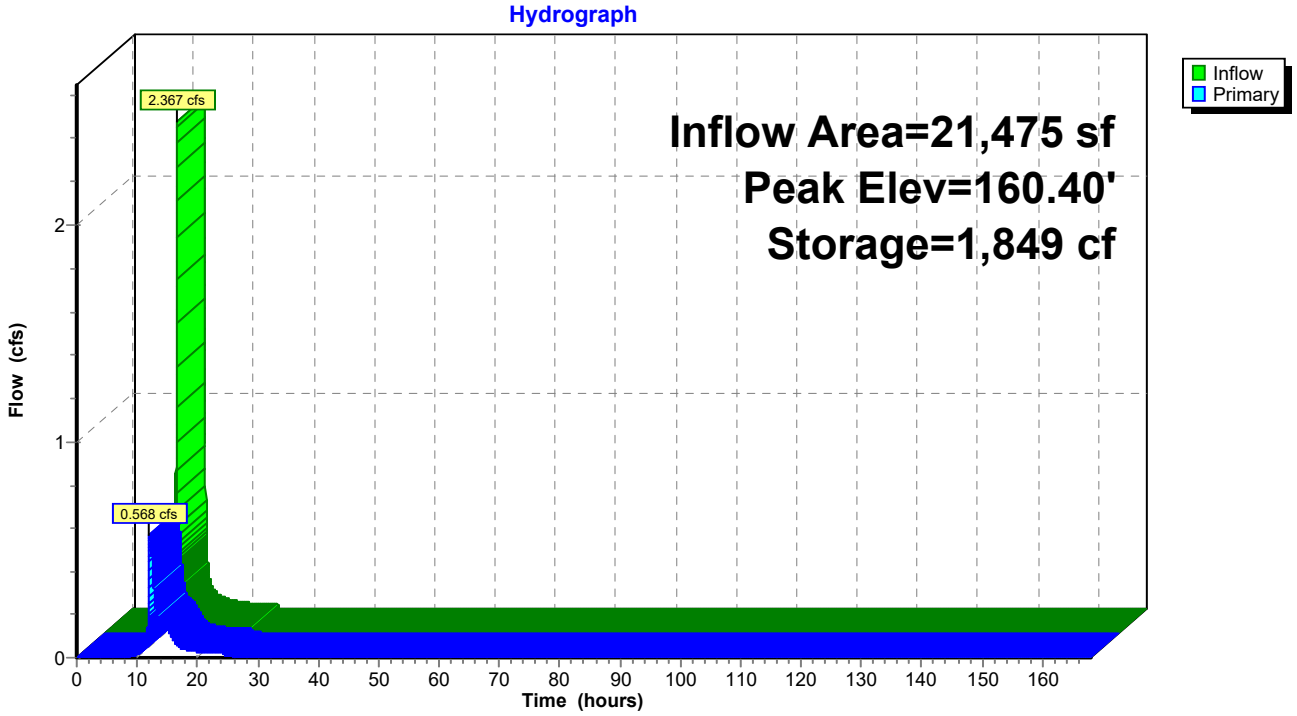
6,885.8 cf Field - 2,466.0 cf Chambers = 4,419.8 cf Stone x 40.0% Voids = 1,767.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,233.9 cf = 0.097 af
Overall Storage Efficiency = 61.5%
Overall System Size = 91.62' x 27.75' x 2.71'

112 Chambers
255.0 cy Field
163.7 cy Stone



Pond 3P: UG2


Hydrograph
Inflow Area=21,475 sf
Peak Elev=160.40'
Storage=1,849 cf
2.367 cfs
0.568 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.000	0	159.28	0.000
4.50	0.000	0	159.28	0.000
5.00	0.000	0	159.28	0.000
5.50	0.000	0	159.28	0.000
6.00	0.000	0	159.28	0.000
6.50	0.002	1	159.28	0.000
7.00	0.004	6	159.29	0.000
7.50	0.006	13	159.29	0.001
8.00	0.008	23	159.30	0.001
8.50	0.012	37	159.32	0.003
9.00	0.017	54	159.33	0.006
9.50	0.021	73	159.35	0.011
10.00	0.029	92	159.37	0.017
10.50	0.043	118	159.40	0.026
11.00	0.067	156	159.43	0.042
11.50	**0.128**	225	159.50	0.073
12.00	**2.004**	**1,639**	**160.30**	**0.494**
12.50	0.184	**1,508**	**160.24**	**0.437**
13.00	0.116	1,164	160.08	0.254
13.50	0.088	961	159.99	0.184
14.00	0.070	789	159.91	0.168
14.50	0.062	616	159.83	0.154
15.00	0.056	459	159.73	0.135
15.50	0.049	336	159.61	0.107
16.00	0.043	249	159.53	0.082
16.50	0.040	196	159.47	0.061
17.00	0.038	170	159.45	0.048
17.50	0.036	155	159.43	0.042
18.00	0.034	146	159.42	0.038
18.50	0.031	139	159.42	0.035
19.00	0.029	133	159.41	0.032
19.50	0.027	128	159.41	0.030
20.00	0.024	122	159.40	0.028
20.50	0.024	117	159.40	0.026
21.00	0.023	114	159.39	0.025
21.50	0.023	112	159.39	0.024
22.00	0.022	111	159.39	0.023
22.50	0.022	110	159.39	0.023
23.00	0.022	108	159.39	0.022
23.50	0.021	107	159.39	0.022
24.00	0.021	106	159.38	0.021
24.50	0.000	80	159.36	0.013
25.00	0.000	62	159.34	0.008

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	50	159.33	0.005
26.00	0.000	42	159.32	0.004
26.50	0.000	36	159.32	0.003
27.00	0.000	31	159.31	0.002
27.50	0.000	28	159.31	0.002
28.00	0.000	25	159.30	0.001
28.50	0.000	22	159.30	0.001
29.00	0.000	20	159.30	0.001
29.50	0.000	18	159.30	0.001
30.00	0.000	16	159.30	0.001
30.50	0.000	15	159.29	0.001
31.00	0.000	13	159.29	0.001
31.50	0.000	12	159.29	0.001
32.00	0.000	11	159.29	0.001
32.50	0.000	10	159.29	0.001
33.00	0.000	9	159.29	0.001
33.50	0.000	8	159.29	0.000
34.00	0.000	7	159.29	0.000
34.50	0.000	6	159.29	0.000
35.00	0.000	6	159.29	0.000
35.50	0.000	5	159.29	0.000
36.00	0.000	5	159.28	0.000
36.50	0.000	4	159.28	0.000
37.00	0.000	4	159.28	0.000
37.50	0.000	3	159.28	0.000
38.00	0.000	3	159.28	0.000
38.50	0.000	3	159.28	0.000
39.00	0.000	2	159.28	0.000
39.50	0.000	2	159.28	0.000
40.00	0.000	2	159.28	0.000
40.50	0.000	2	159.28	0.000
41.00	0.000	2	159.28	0.000
41.50	0.000	1	159.28	0.000
42.00	0.000	1	159.28	0.000
42.50	0.000	1	159.28	0.000
43.00	0.000	1	159.28	0.000
43.50	0.000	1	159.28	0.000
44.00	0.000	1	159.28	0.000
44.50	0.000	1	159.28	0.000
45.00	0.000	1	159.28	0.000
45.50	0.000	1	159.28	0.000
46.00	0.000	1	159.28	0.000
46.50	0.000	1	159.28	0.000
47.00	0.000	0	159.28	0.000
47.50	0.000	0	159.28	0.000
48.00	0.000	0	159.28	0.000
48.50	0.000	0	159.28	0.000
49.00	0.000	0	159.28	0.000
49.50	0.000	0	159.28	0.000
50.00	0.000	0	159.28	0.000
50.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	0	159.28	0.000
51.50	0.000	0	159.28	0.000
52.00	0.000	0	159.28	0.000
52.50	0.000	0	159.28	0.000
53.00	0.000	0	159.28	0.000
53.50	0.000	0	159.28	0.000
54.00	0.000	0	159.28	0.000
54.50	0.000	0	159.28	0.000
55.00	0.000	0	159.28	0.000
55.50	0.000	0	159.28	0.000
56.00	0.000	0	159.28	0.000
56.50	0.000	0	159.28	0.000
57.00	0.000	0	159.28	0.000
57.50	0.000	0	159.28	0.000
58.00	0.000	0	159.28	0.000
58.50	0.000	0	159.28	0.000
59.00	0.000	0	159.28	0.000
59.50	0.000	0	159.28	0.000
60.00	0.000	0	159.28	0.000
60.50	0.000	0	159.28	0.000
61.00	0.000	0	159.28	0.000
61.50	0.000	0	159.28	0.000
62.00	0.000	0	159.28	0.000
62.50	0.000	0	159.28	0.000
63.00	0.000	0	159.28	0.000
63.50	0.000	0	159.28	0.000
64.00	0.000	0	159.28	0.000
64.50	0.000	0	159.28	0.000
65.00	0.000	0	159.28	0.000
65.50	0.000	0	159.28	0.000
66.00	0.000	0	159.28	0.000
66.50	0.000	0	159.28	0.000
67.00	0.000	0	159.28	0.000
67.50	0.000	0	159.28	0.000
68.00	0.000	0	159.28	0.000
68.50	0.000	0	159.28	0.000
69.00	0.000	0	159.28	0.000
69.50	0.000	0	159.28	0.000
70.00	0.000	0	159.28	0.000
70.50	0.000	0	159.28	0.000
71.00	0.000	0	159.28	0.000
71.50	0.000	0	159.28	0.000
72.00	0.000	0	159.28	0.000
72.50	0.000	0	159.28	0.000
73.00	0.000	0	159.28	0.000
73.50	0.000	0	159.28	0.000
74.00	0.000	0	159.28	0.000
74.50	0.000	0	159.28	0.000
75.00	0.000	0	159.28	0.000
75.50	0.000	0	159.28	0.000
76.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	0	159.28	0.000
77.00	0.000	0	159.28	0.000
77.50	0.000	0	159.28	0.000
78.00	0.000	0	159.28	0.000
78.50	0.000	0	159.28	0.000
79.00	0.000	0	159.28	0.000
79.50	0.000	0	159.28	0.000
80.00	0.000	0	159.28	0.000
80.50	0.000	0	159.28	0.000
81.00	0.000	0	159.28	0.000
81.50	0.000	0	159.28	0.000
82.00	0.000	0	159.28	0.000
82.50	0.000	0	159.28	0.000
83.00	0.000	0	159.28	0.000
83.50	0.000	0	159.28	0.000
84.00	0.000	0	159.28	0.000
84.50	0.000	0	159.28	0.000
85.00	0.000	0	159.28	0.000
85.50	0.000	0	159.28	0.000
86.00	0.000	0	159.28	0.000
86.50	0.000	0	159.28	0.000
87.00	0.000	0	159.28	0.000
87.50	0.000	0	159.28	0.000
88.00	0.000	0	159.28	0.000
88.50	0.000	0	159.28	0.000
89.00	0.000	0	159.28	0.000
89.50	0.000	0	159.28	0.000
90.00	0.000	0	159.28	0.000
90.50	0.000	0	159.28	0.000
91.00	0.000	0	159.28	0.000
91.50	0.000	0	159.28	0.000
92.00	0.000	0	159.28	0.000
92.50	0.000	0	159.28	0.000
93.00	0.000	0	159.28	0.000
93.50	0.000	0	159.28	0.000
94.00	0.000	0	159.28	0.000
94.50	0.000	0	159.28	0.000
95.00	0.000	0	159.28	0.000
95.50	0.000	0	159.28	0.000
96.00	0.000	0	159.28	0.000
96.50	0.000	0	159.28	0.000
97.00	0.000	0	159.28	0.000
97.50	0.000	0	159.28	0.000
98.00	0.000	0	159.28	0.000
98.50	0.000	0	159.28	0.000
99.00	0.000	0	159.28	0.000
99.50	0.000	0	159.28	0.000
100.00	0.000	0	159.28	0.000
100.50	0.000	0	159.28	0.000
101.00	0.000	0	159.28	0.000
101.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	0	159.28	0.000
102.50	0.000	0	159.28	0.000
103.00	0.000	0	159.28	0.000
103.50	0.000	0	159.28	0.000
104.00	0.000	0	159.28	0.000
104.50	0.000	0	159.28	0.000
105.00	0.000	0	159.28	0.000
105.50	0.000	0	159.28	0.000
106.00	0.000	0	159.28	0.000
106.50	0.000	0	159.28	0.000
107.00	0.000	0	159.28	0.000
107.50	0.000	0	159.28	0.000
108.00	0.000	0	159.28	0.000
108.50	0.000	0	159.28	0.000
109.00	0.000	0	159.28	0.000
109.50	0.000	0	159.28	0.000
110.00	0.000	0	159.28	0.000
110.50	0.000	0	159.28	0.000
111.00	0.000	0	159.28	0.000
111.50	0.000	0	159.28	0.000
112.00	0.000	0	159.28	0.000
112.50	0.000	0	159.28	0.000
113.00	0.000	0	159.28	0.000
113.50	0.000	0	159.28	0.000
114.00	0.000	0	159.28	0.000
114.50	0.000	0	159.28	0.000
115.00	0.000	0	159.28	0.000
115.50	0.000	0	159.28	0.000
116.00	0.000	0	159.28	0.000
116.50	0.000	0	159.28	0.000
117.00	0.000	0	159.28	0.000
117.50	0.000	0	159.28	0.000
118.00	0.000	0	159.28	0.000
118.50	0.000	0	159.28	0.000
119.00	0.000	0	159.28	0.000
119.50	0.000	0	159.28	0.000
120.00	0.000	0	159.28	0.000
120.50	0.000	0	159.28	0.000
121.00	0.000	0	159.28	0.000
121.50	0.000	0	159.28	0.000
122.00	0.000	0	159.28	0.000
122.50	0.000	0	159.28	0.000
123.00	0.000	0	159.28	0.000
123.50	0.000	0	159.28	0.000
124.00	0.000	0	159.28	0.000
124.50	0.000	0	159.28	0.000
125.00	0.000	0	159.28	0.000
125.50	0.000	0	159.28	0.000
126.00	0.000	0	159.28	0.000
126.50	0.000	0	159.28	0.000
127.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	0	159.28	0.000
128.00	0.000	0	159.28	0.000
128.50	0.000	0	159.28	0.000
129.00	0.000	0	159.28	0.000
129.50	0.000	0	159.28	0.000
130.00	0.000	0	159.28	0.000
130.50	0.000	0	159.28	0.000
131.00	0.000	0	159.28	0.000
131.50	0.000	0	159.28	0.000
132.00	0.000	0	159.28	0.000
132.50	0.000	0	159.28	0.000
133.00	0.000	0	159.28	0.000
133.50	0.000	0	159.28	0.000
134.00	0.000	0	159.28	0.000
134.50	0.000	0	159.28	0.000
135.00	0.000	0	159.28	0.000
135.50	0.000	0	159.28	0.000
136.00	0.000	0	159.28	0.000
136.50	0.000	0	159.28	0.000
137.00	0.000	0	159.28	0.000
137.50	0.000	0	159.28	0.000
138.00	0.000	0	159.28	0.000
138.50	0.000	0	159.28	0.000
139.00	0.000	0	159.28	0.000
139.50	0.000	0	159.28	0.000
140.00	0.000	0	159.28	0.000
140.50	0.000	0	159.28	0.000
141.00	0.000	0	159.28	0.000
141.50	0.000	0	159.28	0.000
142.00	0.000	0	159.28	0.000
142.50	0.000	0	159.28	0.000
143.00	0.000	0	159.28	0.000
143.50	0.000	0	159.28	0.000
144.00	0.000	0	159.28	0.000
144.50	0.000	0	159.28	0.000
145.00	0.000	0	159.28	0.000
145.50	0.000	0	159.28	0.000
146.00	0.000	0	159.28	0.000
146.50	0.000	0	159.28	0.000
147.00	0.000	0	159.28	0.000
147.50	0.000	0	159.28	0.000
148.00	0.000	0	159.28	0.000
148.50	0.000	0	159.28	0.000
149.00	0.000	0	159.28	0.000
149.50	0.000	0	159.28	0.000
150.00	0.000	0	159.28	0.000
150.50	0.000	0	159.28	0.000
151.00	0.000	0	159.28	0.000
151.50	0.000	0	159.28	0.000
152.00	0.000	0	159.28	0.000
152.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	0	159.28	0.000
153.50	0.000	0	159.28	0.000
154.00	0.000	0	159.28	0.000
154.50	0.000	0	159.28	0.000
155.00	0.000	0	159.28	0.000
155.50	0.000	0	159.28	0.000
156.00	0.000	0	159.28	0.000
156.50	0.000	0	159.28	0.000
157.00	0.000	0	159.28	0.000
157.50	0.000	0	159.28	0.000
158.00	0.000	0	159.28	0.000
158.50	0.000	0	159.28	0.000
159.00	0.000	0	159.28	0.000
159.50	0.000	0	159.28	0.000
160.00	0.000	0	159.28	0.000
160.50	0.000	0	159.28	0.000
161.00	0.000	0	159.28	0.000
161.50	0.000	0	159.28	0.000
162.00	0.000	0	159.28	0.000
162.50	0.000	0	159.28	0.000
163.00	0.000	0	159.28	0.000
163.50	0.000	0	159.28	0.000
164.00	0.000	0	159.28	0.000
164.50	0.000	0	159.28	0.000
165.00	0.000	0	159.28	0.000
165.50	0.000	0	159.28	0.000
166.00	0.000	0	159.28	0.000
166.50	0.000	0	159.28	0.000
167.00	0.000	0	159.28	0.000
167.50	0.000	0	159.28	0.000
168.00	0.000	0	159.28	0.000

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 4.36" for 10-yr event
Inflow = 13.471 cfs @ 11.96 hrs, Volume= 30,539 cf
Outflow = 3.160 cfs @ 12.09 hrs, Volume= 30,394 cf, Atten= 77%, Lag= 7.9 min
Primary = 3.160 cfs @ 12.09 hrs, Volume= 30,394 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 159.26' @ 12.09 hrs Surf.Area= 13,041 sf Storage= 16,346 cf

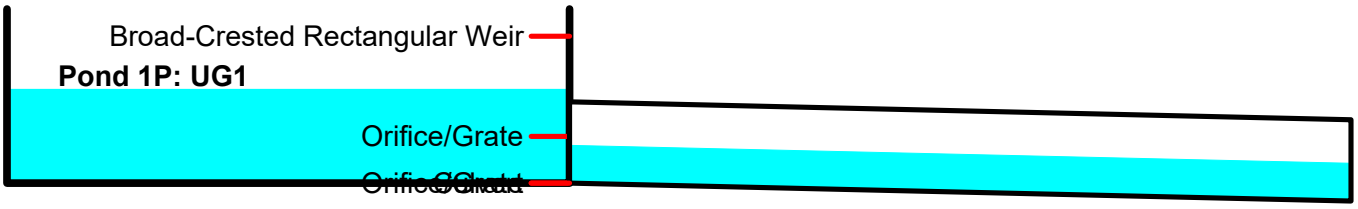
Plug-Flow detention time= 908.7 min calculated for 30,392 cf (100% of inflow)
Center-of-Mass det. time= 906.0 min (1,664.5 - 758.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=3.160 cfs @ 12.09 hrs HW=159.26' (Free Discharge)
└**4=Culvert** (Passes 3.160 cfs of 6.240 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.034 cfs @ 6.250 fps)
  ├**2=Orifice/Grate** (Orifice Controls 3.126 cfs @ 4.019 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 1P: UG1 - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger®280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 27 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

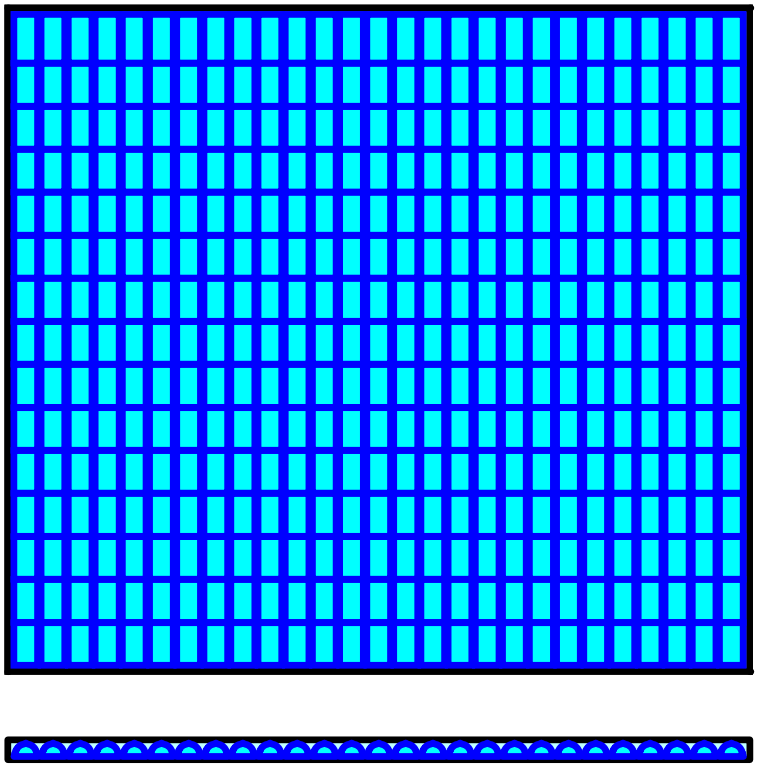
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

405 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 27 Rows = 17,377.3 cf Chamber Storage

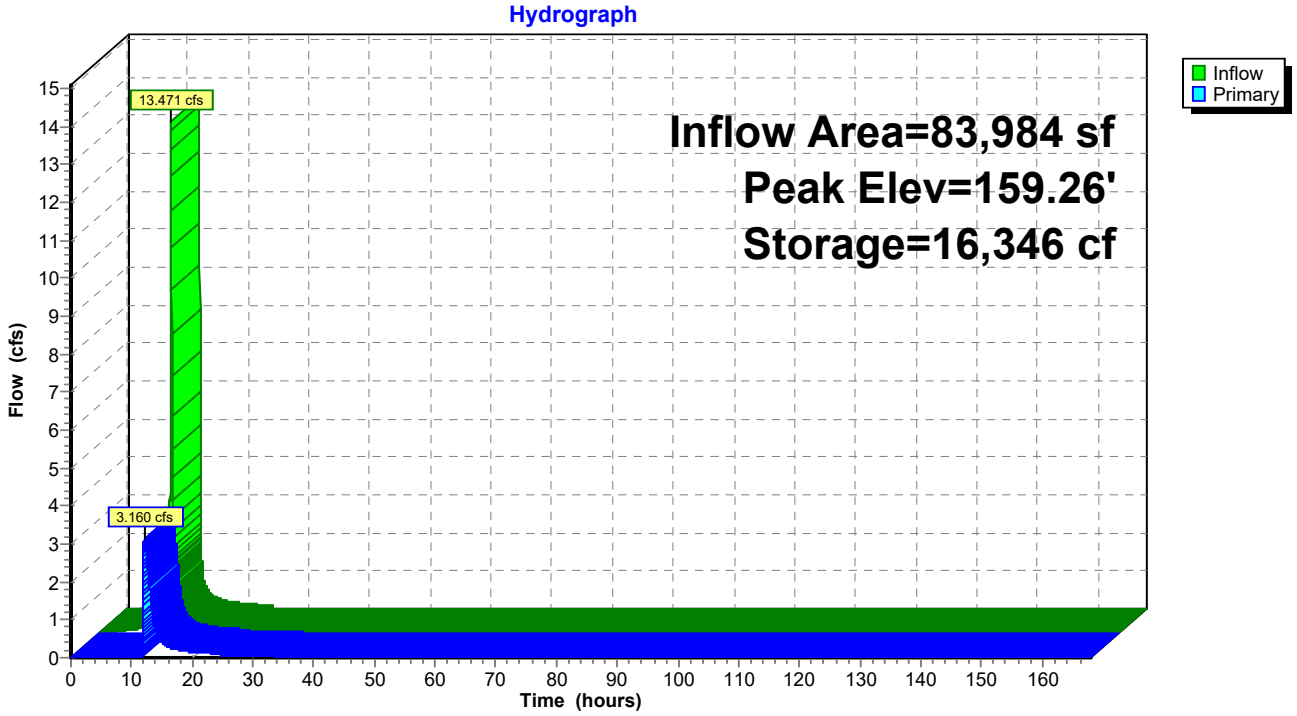
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

Chamber Storage + Stone Storage = 27,162.4 cf = 0.624 af
Overall Storage Efficiency = 64.9%
Overall System Size = 108.00' x 120.75' x 3.21'

405 Chambers
1,549.6 cy Field
906.0 cy Stone



Pond 1P: UG1


Hydrograph
Inflow Area=83,984 sf
Peak Elev=159.26'
Storage=16,346 cf
13.471 cfs
3.160 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.000	0	157.53	0.000
2.00	0.009	6	157.53	0.000
2.50	0.023	34	157.54	0.000
3.00	0.035	86	157.55	0.001
3.50	0.047	159	157.56	0.001
4.00	0.058	251	157.58	0.003
4.50	0.071	361	157.60	0.004
5.00	0.084	491	157.62	0.006
5.50	0.097	642	157.65	0.007
6.00	0.110	814	157.69	0.009
6.50	0.123	1,008	157.72	0.010
7.00	0.136	1,222	157.76	0.012
7.50	0.149	1,457	157.81	0.013
8.00	0.162	1,712	157.86	0.014
8.50	0.200	2,008	157.91	0.015
9.00	0.245	2,379	157.99	0.017
9.50	0.258	2,805	158.05	0.018
10.00	0.320	3,284	158.09	0.019
10.50	0.422	3,913	158.14	0.020
11.00	0.593	4,781	158.21	0.021
11.50	**0.990**	6,137	158.33	0.023
12.00	**11.141**	**15,217**	**159.15**	**2.905**
12.50	0.971	**14,219**	**159.06**	**2.664**
13.00	0.604	11,478	158.80	1.848
13.50	0.457	9,846	158.66	1.058
14.00	0.358	9,057	158.59	0.679
14.50	0.317	8,620	158.55	0.496
15.00	0.284	8,363	158.53	0.398
15.50	0.252	8,186	158.51	0.338
16.00	0.219	8,046	158.50	0.290
16.50	0.204	7,937	158.49	0.256
17.00	0.193	7,856	158.48	0.232
17.50	0.181	7,791	158.48	0.214
18.00	0.170	7,737	158.47	0.198
18.50	0.158	7,688	158.47	0.184
19.00	0.146	7,643	158.46	0.171
19.50	0.135	7,599	158.46	0.159
20.00	0.123	7,554	158.45	0.148
20.50	0.119	7,514	158.45	0.138
21.00	0.117	7,485	158.45	0.131
21.50	0.115	7,463	158.45	0.125
22.00	0.112	7,445	158.45	0.122
22.50	0.110	7,429	158.44	0.118
23.00	0.108	7,415	158.44	0.115
23.50	0.105	7,402	158.44	0.112
24.00	0.103	7,389	158.44	0.110
24.50	0.000	7,245	158.43	0.080
25.00	0.000	7,119	158.42	0.061

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	7,022	158.41	0.047
26.00	0.000	6,946	158.40	0.037
26.50	0.000	6,888	158.40	0.028
27.00	0.000	6,840	158.39	0.025
27.50	0.000	6,797	158.39	0.024
28.00	0.000	6,754	158.39	0.024
28.50	0.000	6,711	158.38	0.024
29.00	0.000	6,669	158.38	0.024
29.50	0.000	6,627	158.37	0.024
30.00	0.000	6,584	158.37	0.023
30.50	0.000	6,542	158.37	0.023
31.00	0.000	6,500	158.36	0.023
31.50	0.000	6,458	158.36	0.023
32.00	0.000	6,416	158.36	0.023
32.50	0.000	6,374	158.35	0.023
33.00	0.000	6,333	158.35	0.023
33.50	0.000	6,291	158.34	0.023
34.00	0.000	6,249	158.34	0.023
34.50	0.000	6,208	158.34	0.023
35.00	0.000	6,167	158.33	0.023
35.50	0.000	6,125	158.33	0.023
36.00	0.000	6,084	158.33	0.023
36.50	0.000	6,043	158.32	0.023
37.00	0.000	6,002	158.32	0.023
37.50	0.000	5,961	158.32	0.023
38.00	0.000	5,921	158.31	0.023
38.50	0.000	5,880	158.31	0.023
39.00	0.000	5,840	158.31	0.023
39.50	0.000	5,799	158.30	0.022
40.00	0.000	5,759	158.30	0.022
40.50	0.000	5,718	158.30	0.022
41.00	0.000	5,678	158.29	0.022
41.50	0.000	5,638	158.29	0.022
42.00	0.000	5,598	158.29	0.022
42.50	0.000	5,558	158.28	0.022
43.00	0.000	5,519	158.28	0.022
43.50	0.000	5,479	158.27	0.022
44.00	0.000	5,439	158.27	0.022
44.50	0.000	5,400	158.27	0.022
45.00	0.000	5,360	158.26	0.022
45.50	0.000	5,321	158.26	0.022
46.00	0.000	5,282	158.26	0.022
46.50	0.000	5,243	158.25	0.022
47.00	0.000	5,204	158.25	0.022
47.50	0.000	5,165	158.25	0.022
48.00	0.000	5,126	158.24	0.022
48.50	0.000	5,087	158.24	0.021
49.00	0.000	5,049	158.24	0.021
49.50	0.000	5,010	158.23	0.021
50.00	0.000	4,972	158.23	0.021
50.50	0.000	4,933	158.23	0.021

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,895	158.22	0.021
51.50	0.000	4,857	158.22	0.021
52.00	0.000	4,819	158.22	0.021
52.50	0.000	4,781	158.21	0.021
53.00	0.000	4,743	158.21	0.021
53.50	0.000	4,705	158.21	0.021
54.00	0.000	4,668	158.20	0.021
54.50	0.000	4,630	158.20	0.021
55.00	0.000	4,593	158.20	0.021
55.50	0.000	4,555	158.20	0.021
56.00	0.000	4,518	158.19	0.021
56.50	0.000	4,481	158.19	0.021
57.00	0.000	4,444	158.19	0.021
57.50	0.000	4,407	158.18	0.021
58.00	0.000	4,370	158.18	0.020
58.50	0.000	4,333	158.18	0.020
59.00	0.000	4,296	158.17	0.020
59.50	0.000	4,260	158.17	0.020
60.00	0.000	4,223	158.17	0.020
60.50	0.000	4,187	158.16	0.020
61.00	0.000	4,151	158.16	0.020
61.50	0.000	4,114	158.16	0.020
62.00	0.000	4,078	158.15	0.020
62.50	0.000	4,042	158.15	0.020
63.00	0.000	4,006	158.15	0.020
63.50	0.000	3,970	158.15	0.020
64.00	0.000	3,935	158.14	0.020
64.50	0.000	3,899	158.14	0.020
65.00	0.000	3,863	158.14	0.020
65.50	0.000	3,828	158.13	0.020
66.00	0.000	3,793	158.13	0.020
66.50	0.000	3,757	158.13	0.020
67.00	0.000	3,722	158.12	0.020
67.50	0.000	3,687	158.12	0.019
68.00	0.000	3,652	158.12	0.019
68.50	0.000	3,617	158.12	0.019
69.00	0.000	3,582	158.11	0.019
69.50	0.000	3,548	158.11	0.019
70.00	0.000	3,513	158.11	0.019
70.50	0.000	3,479	158.10	0.019
71.00	0.000	3,444	158.10	0.019
71.50	0.000	3,410	158.10	0.019
72.00	0.000	3,376	158.09	0.019
72.50	0.000	3,341	158.09	0.019
73.00	0.000	3,307	158.09	0.019
73.50	0.000	3,273	158.09	0.019
74.00	0.000	3,240	158.08	0.019
74.50	0.000	3,206	158.08	0.019
75.00	0.000	3,172	158.08	0.019
75.50	0.000	3,139	158.07	0.019
76.00	0.000	3,105	158.07	0.019

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	3,072	158.07	0.019
77.00	0.000	3,039	158.07	0.018
77.50	0.000	3,005	158.06	0.018
78.00	0.000	2,972	158.06	0.018
78.50	0.000	2,939	158.06	0.018
79.00	0.000	2,906	158.06	0.018
79.50	0.000	2,873	158.05	0.018
80.00	0.000	2,841	158.05	0.018
80.50	0.000	2,808	158.05	0.018
81.00	0.000	2,776	158.04	0.018
81.50	0.000	2,743	158.04	0.018
82.00	0.000	2,711	158.04	0.018
82.50	0.000	2,679	158.04	0.018
83.00	0.000	2,646	158.03	0.018
83.50	0.000	2,614	158.03	0.018
84.00	0.000	2,582	158.03	0.018
84.50	0.000	2,551	158.02	0.018
85.00	0.000	2,519	158.01	0.017
85.50	0.000	2,488	158.01	0.017
86.00	0.000	2,457	158.00	0.017
86.50	0.000	2,426	158.00	0.017
87.00	0.000	2,395	157.99	0.017
87.50	0.000	2,365	157.98	0.017
88.00	0.000	2,335	157.98	0.017
88.50	0.000	2,305	157.97	0.017
89.00	0.000	2,275	157.97	0.016
89.50	0.000	2,245	157.96	0.016
90.00	0.000	2,216	157.95	0.016
90.50	0.000	2,187	157.95	0.016
91.00	0.000	2,158	157.94	0.016
91.50	0.000	2,129	157.94	0.016
92.00	0.000	2,101	157.93	0.016
92.50	0.000	2,072	157.93	0.016
93.00	0.000	2,044	157.92	0.016
93.50	0.000	2,016	157.92	0.015
94.00	0.000	1,989	157.91	0.015
94.50	0.000	1,961	157.91	0.015
95.00	0.000	1,934	157.90	0.015
95.50	0.000	1,907	157.90	0.015
96.00	0.000	1,880	157.89	0.015
96.50	0.000	1,854	157.89	0.015
97.00	0.000	1,827	157.88	0.015
97.50	0.000	1,801	157.88	0.014
98.00	0.000	1,775	157.87	0.014
98.50	0.000	1,750	157.87	0.014
99.00	0.000	1,724	157.86	0.014
99.50	0.000	1,699	157.86	0.014
100.00	0.000	1,674	157.85	0.014
100.50	0.000	1,649	157.85	0.014
101.00	0.000	1,624	157.84	0.014
101.50	0.000	1,600	157.84	0.014

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	1,575	157.83	0.013
102.50	0.000	1,551	157.83	0.013
103.00	0.000	1,528	157.82	0.013
103.50	0.000	1,504	157.82	0.013
104.00	0.000	1,481	157.81	0.013
104.50	0.000	1,458	157.81	0.013
105.00	0.000	1,435	157.81	0.013
105.50	0.000	1,412	157.80	0.013
106.00	0.000	1,389	157.80	0.012
106.50	0.000	1,367	157.79	0.012
107.00	0.000	1,345	157.79	0.012
107.50	0.000	1,323	157.78	0.012
108.00	0.000	1,302	157.78	0.012
108.50	0.000	1,280	157.78	0.012
109.00	0.000	1,259	157.77	0.012
109.50	0.000	1,238	157.77	0.012
110.00	0.000	1,217	157.76	0.011
110.50	0.000	1,197	157.76	0.011
111.00	0.000	1,176	157.76	0.011
111.50	0.000	1,156	157.75	0.011
112.00	0.000	1,136	157.75	0.011
112.50	0.000	1,116	157.74	0.011
113.00	0.000	1,097	157.74	0.011
113.50	0.000	1,078	157.74	0.011
114.00	0.000	1,059	157.73	0.011
114.50	0.000	1,040	157.73	0.010
115.00	0.000	1,021	157.73	0.010
115.50	0.000	1,003	157.72	0.010
116.00	0.000	984	157.72	0.010
116.50	0.000	966	157.72	0.010
117.00	0.000	949	157.71	0.010
117.50	0.000	931	157.71	0.010
118.00	0.000	914	157.71	0.010
118.50	0.000	897	157.70	0.009
119.00	0.000	880	157.70	0.009
119.50	0.000	863	157.70	0.009
120.00	0.000	846	157.69	0.009
120.50	0.000	830	157.69	0.009
121.00	0.000	814	157.69	0.009
121.50	0.000	798	157.68	0.009
122.00	0.000	783	157.68	0.009
122.50	0.000	767	157.68	0.009
123.00	0.000	752	157.67	0.008
123.50	0.000	737	157.67	0.008
124.00	0.000	722	157.67	0.008
124.50	0.000	708	157.67	0.008
125.00	0.000	693	157.66	0.008
125.50	0.000	679	157.66	0.008
126.00	0.000	665	157.66	0.008
126.50	0.000	651	157.65	0.008
127.00	0.000	638	157.65	0.007

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	625	157.65	0.007
128.00	0.000	612	157.65	0.007
128.50	0.000	599	157.64	0.007
129.00	0.000	586	157.64	0.007
129.50	0.000	574	157.64	0.007
130.00	0.000	562	157.64	0.007
130.50	0.000	550	157.64	0.007
131.00	0.000	538	157.63	0.006
131.50	0.000	526	157.63	0.006
132.00	0.000	515	157.63	0.006
132.50	0.000	504	157.63	0.006
133.00	0.000	493	157.62	0.006
133.50	0.000	482	157.62	0.006
134.00	0.000	472	157.62	0.006
134.50	0.000	462	157.62	0.006
135.00	0.000	452	157.62	0.005
135.50	0.000	442	157.61	0.005
136.00	0.000	432	157.61	0.005
136.50	0.000	423	157.61	0.005
137.00	0.000	414	157.61	0.005
137.50	0.000	405	157.61	0.005
138.00	0.000	397	157.61	0.005
138.50	0.000	388	157.60	0.005
139.00	0.000	380	157.60	0.004
139.50	0.000	372	157.60	0.004
140.00	0.000	364	157.60	0.004
140.50	0.000	357	157.60	0.004
141.00	0.000	349	157.60	0.004
141.50	0.000	342	157.60	0.004
142.00	0.000	335	157.59	0.004
142.50	0.000	328	157.59	0.004
143.00	0.000	321	157.59	0.004
143.50	0.000	315	157.59	0.004
144.00	0.000	309	157.59	0.003
144.50	0.000	302	157.59	0.003
145.00	0.000	296	157.59	0.003
145.50	0.000	291	157.59	0.003
146.00	0.000	285	157.58	0.003
146.50	0.000	280	157.58	0.003
147.00	0.000	274	157.58	0.003
147.50	0.000	269	157.58	0.003
148.00	0.000	264	157.58	0.003
148.50	0.000	259	157.58	0.003
149.00	0.000	254	157.58	0.003
149.50	0.000	250	157.58	0.003
150.00	0.000	245	157.58	0.002
150.50	0.000	241	157.58	0.002
151.00	0.000	237	157.58	0.002
151.50	0.000	233	157.57	0.002
152.00	0.000	229	157.57	0.002
152.50	0.000	225	157.57	0.002

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	221	157.57	0.002
153.50	0.000	218	157.57	0.002
154.00	0.000	214	157.57	0.002
154.50	0.000	211	157.57	0.002
155.00	0.000	207	157.57	0.002
155.50	0.000	204	157.57	0.002
156.00	0.000	201	157.57	0.002
156.50	0.000	198	157.57	0.002
157.00	0.000	195	157.57	0.002
157.50	0.000	192	157.57	0.002
158.00	0.000	189	157.57	0.002
158.50	0.000	186	157.57	0.001
159.00	0.000	184	157.57	0.001
159.50	0.000	181	157.56	0.001
160.00	0.000	179	157.56	0.001
160.50	0.000	176	157.56	0.001
161.00	0.000	174	157.56	0.001
161.50	0.000	172	157.56	0.001
162.00	0.000	169	157.56	0.001
162.50	0.000	167	157.56	0.001
163.00	0.000	165	157.56	0.001
163.50	0.000	163	157.56	0.001
164.00	0.000	161	157.56	0.001
164.50	0.000	159	157.56	0.001
165.00	0.000	157	157.56	0.001
165.50	0.000	155	157.56	0.001
166.00	0.000	153	157.56	0.001
166.50	0.000	151	157.56	0.001
167.00	0.000	149	157.56	0.001
167.50	0.000	147	157.56	0.001
168.00	0.000	146	157.56	0.001

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 3.31" for 10-yr event
Inflow = 2.904 cfs @ 11.96 hrs, Volume= 5,921 cf
Outflow = 0.694 cfs @ 12.09 hrs, Volume= 5,921 cf, Atten= 76%, Lag= 7.8 min
Primary = 0.694 cfs @ 12.09 hrs, Volume= 5,921 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 160.62' @ 12.09 hrs Surf.Area= 2,542 sf Storage= 2,286 cf

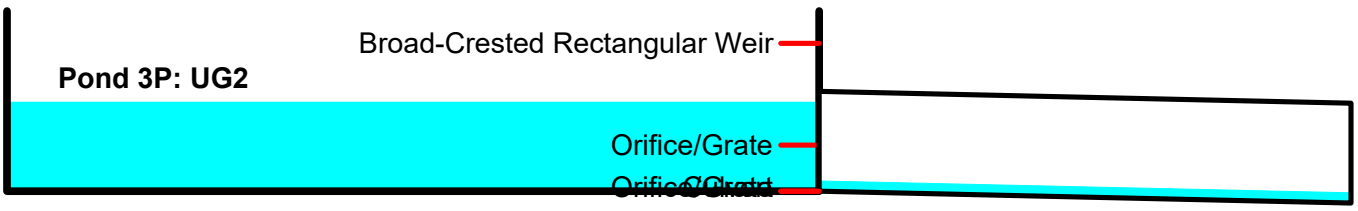
Plug-Flow detention time= 65.8 min calculated for 5,921 cf (100% of inflow)
Center-of-Mass det. time= 65.9 min (867.7 - 801.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.694 cfs @ 12.09 hrs HW=160.62' (Free Discharge)
└**4=Culvert** (Passes 0.694 cfs of 4.800 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.260 cfs @ 5.300 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.434 cfs @ 3.468 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 3P: UG2 - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Discontinued, not for new designs)
Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf
Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 3.44 sf x 8 rows

36.0" Wide + 3.0" Spacing = 39.0" C-C Row Spacing

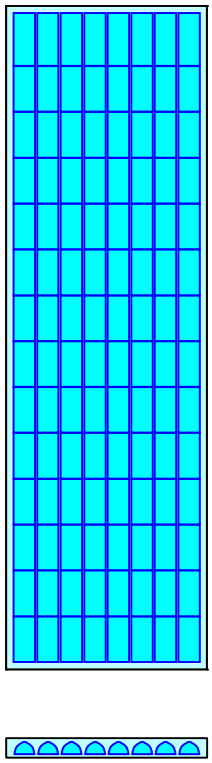
14 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 89.62' Row Length +12.0" End Stone x 2 = 91.62' Base Length
8 Rows x 36.0" Wide + 3.0" Spacing x 7 + 12.0" Side Stone x 2 = 27.75' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

112 Chambers x 21.8 cf +1.00' Row Adjustment x 3.44 sf x 8 Rows = 2,466.0 cf Chamber Storage

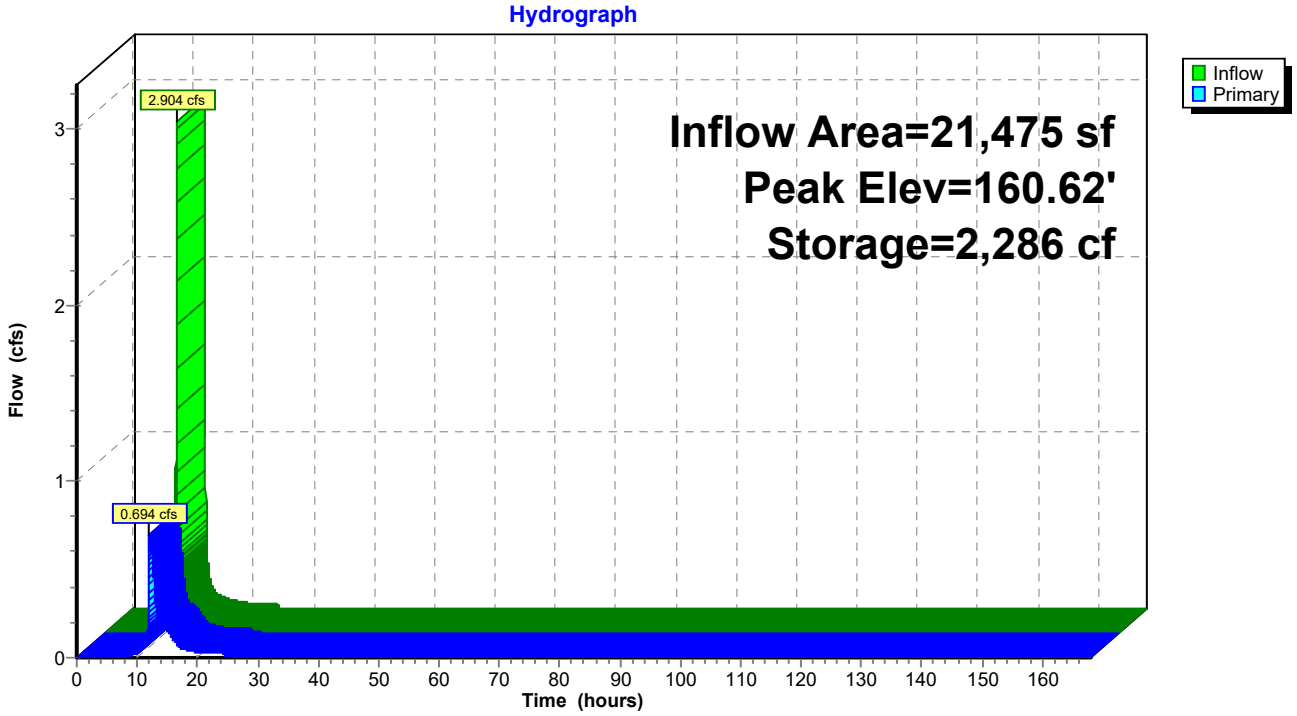
6,885.8 cf Field - 2,466.0 cf Chambers = 4,419.8 cf Stone x 40.0% Voids = 1,767.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,233.9 cf = 0.097 af
Overall Storage Efficiency = 61.5%
Overall System Size = 91.62' x 27.75' x 2.71'

112 Chambers
255.0 cy Field
163.7 cy Stone



Pond 3P: UG2


Hydrograph
Inflow Area=21,475 sf
Peak Elev=160.62'
Storage=2,286 cf
2.904 cfs
0.694 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.000	0	159.28	0.000
4.50	0.000	0	159.28	0.000
5.00	0.000	0	159.28	0.000
5.50	0.001	0	159.28	0.000
6.00	0.003	3	159.28	0.000
6.50	0.005	9	159.29	0.001
7.00	0.007	19	159.30	0.001
7.50	0.010	32	159.31	0.002
8.00	0.013	46	159.33	0.005
8.50	0.018	63	159.34	0.008
9.00	0.025	82	159.36	0.013
9.50	0.030	102	159.38	0.020
10.00	0.040	122	159.40	0.028
10.50	0.058	150	159.43	0.040
11.00	0.090	194	159.47	0.060
11.50	**0.166**	283	159.56	0.092
12.00	**2.449**	**2,033**	**160.49**	**0.624**
12.50	0.222	**1,847**	**160.40**	**0.567**
13.00	0.140	1,333	160.16	0.338
13.50	0.106	1,071	160.04	0.216
14.00	0.084	897	159.96	0.176
14.50	0.074	732	159.88	0.163
15.00	0.067	577	159.81	0.151
15.50	0.059	434	159.71	0.130
16.00	0.052	324	159.60	0.104
16.50	0.048	247	159.52	0.082
17.00	0.046	202	159.48	0.063
17.50	0.043	178	159.46	0.052
18.00	0.040	165	159.44	0.046
18.50	0.037	156	159.43	0.042
19.00	0.035	148	159.43	0.039
19.50	0.032	141	159.42	0.036
20.00	0.029	135	159.41	0.033
20.50	0.028	129	159.41	0.031
21.00	0.028	126	159.40	0.029
21.50	0.027	124	159.40	0.028
22.00	0.027	122	159.40	0.028
22.50	0.026	121	159.40	0.027
23.00	0.026	119	159.40	0.026
23.50	0.025	118	159.40	0.026
24.00	0.025	116	159.39	0.025
24.50	0.000	87	159.37	0.015
25.00	0.000	66	159.34	0.009

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	53	159.33	0.006
26.00	0.000	44	159.32	0.004
26.50	0.000	37	159.32	0.003
27.00	0.000	32	159.31	0.002
27.50	0.000	28	159.31	0.002
28.00	0.000	26	159.31	0.001
28.50	0.000	23	159.30	0.001
29.00	0.000	21	159.30	0.001
29.50	0.000	19	159.30	0.001
30.00	0.000	17	159.30	0.001
30.50	0.000	15	159.29	0.001
31.00	0.000	14	159.29	0.001
31.50	0.000	12	159.29	0.001
32.00	0.000	11	159.29	0.001
32.50	0.000	10	159.29	0.001
33.00	0.000	9	159.29	0.001
33.50	0.000	8	159.29	0.000
34.00	0.000	7	159.29	0.000
34.50	0.000	7	159.29	0.000
35.00	0.000	6	159.29	0.000
35.50	0.000	5	159.29	0.000
36.00	0.000	5	159.28	0.000
36.50	0.000	4	159.28	0.000
37.00	0.000	4	159.28	0.000
37.50	0.000	3	159.28	0.000
38.00	0.000	3	159.28	0.000
38.50	0.000	3	159.28	0.000
39.00	0.000	3	159.28	0.000
39.50	0.000	2	159.28	0.000
40.00	0.000	2	159.28	0.000
40.50	0.000	2	159.28	0.000
41.00	0.000	2	159.28	0.000
41.50	0.000	1	159.28	0.000
42.00	0.000	1	159.28	0.000
42.50	0.000	1	159.28	0.000
43.00	0.000	1	159.28	0.000
43.50	0.000	1	159.28	0.000
44.00	0.000	1	159.28	0.000
44.50	0.000	1	159.28	0.000
45.00	0.000	1	159.28	0.000
45.50	0.000	1	159.28	0.000
46.00	0.000	1	159.28	0.000
46.50	0.000	1	159.28	0.000
47.00	0.000	0	159.28	0.000
47.50	0.000	0	159.28	0.000
48.00	0.000	0	159.28	0.000
48.50	0.000	0	159.28	0.000
49.00	0.000	0	159.28	0.000
49.50	0.000	0	159.28	0.000
50.00	0.000	0	159.28	0.000
50.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	0	159.28	0.000
51.50	0.000	0	159.28	0.000
52.00	0.000	0	159.28	0.000
52.50	0.000	0	159.28	0.000
53.00	0.000	0	159.28	0.000
53.50	0.000	0	159.28	0.000
54.00	0.000	0	159.28	0.000
54.50	0.000	0	159.28	0.000
55.00	0.000	0	159.28	0.000
55.50	0.000	0	159.28	0.000
56.00	0.000	0	159.28	0.000
56.50	0.000	0	159.28	0.000
57.00	0.000	0	159.28	0.000
57.50	0.000	0	159.28	0.000
58.00	0.000	0	159.28	0.000
58.50	0.000	0	159.28	0.000
59.00	0.000	0	159.28	0.000
59.50	0.000	0	159.28	0.000
60.00	0.000	0	159.28	0.000
60.50	0.000	0	159.28	0.000
61.00	0.000	0	159.28	0.000
61.50	0.000	0	159.28	0.000
62.00	0.000	0	159.28	0.000
62.50	0.000	0	159.28	0.000
63.00	0.000	0	159.28	0.000
63.50	0.000	0	159.28	0.000
64.00	0.000	0	159.28	0.000
64.50	0.000	0	159.28	0.000
65.00	0.000	0	159.28	0.000
65.50	0.000	0	159.28	0.000
66.00	0.000	0	159.28	0.000
66.50	0.000	0	159.28	0.000
67.00	0.000	0	159.28	0.000
67.50	0.000	0	159.28	0.000
68.00	0.000	0	159.28	0.000
68.50	0.000	0	159.28	0.000
69.00	0.000	0	159.28	0.000
69.50	0.000	0	159.28	0.000
70.00	0.000	0	159.28	0.000
70.50	0.000	0	159.28	0.000
71.00	0.000	0	159.28	0.000
71.50	0.000	0	159.28	0.000
72.00	0.000	0	159.28	0.000
72.50	0.000	0	159.28	0.000
73.00	0.000	0	159.28	0.000
73.50	0.000	0	159.28	0.000
74.00	0.000	0	159.28	0.000
74.50	0.000	0	159.28	0.000
75.00	0.000	0	159.28	0.000
75.50	0.000	0	159.28	0.000
76.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	0	159.28	0.000
77.00	0.000	0	159.28	0.000
77.50	0.000	0	159.28	0.000
78.00	0.000	0	159.28	0.000
78.50	0.000	0	159.28	0.000
79.00	0.000	0	159.28	0.000
79.50	0.000	0	159.28	0.000
80.00	0.000	0	159.28	0.000
80.50	0.000	0	159.28	0.000
81.00	0.000	0	159.28	0.000
81.50	0.000	0	159.28	0.000
82.00	0.000	0	159.28	0.000
82.50	0.000	0	159.28	0.000
83.00	0.000	0	159.28	0.000
83.50	0.000	0	159.28	0.000
84.00	0.000	0	159.28	0.000
84.50	0.000	0	159.28	0.000
85.00	0.000	0	159.28	0.000
85.50	0.000	0	159.28	0.000
86.00	0.000	0	159.28	0.000
86.50	0.000	0	159.28	0.000
87.00	0.000	0	159.28	0.000
87.50	0.000	0	159.28	0.000
88.00	0.000	0	159.28	0.000
88.50	0.000	0	159.28	0.000
89.00	0.000	0	159.28	0.000
89.50	0.000	0	159.28	0.000
90.00	0.000	0	159.28	0.000
90.50	0.000	0	159.28	0.000
91.00	0.000	0	159.28	0.000
91.50	0.000	0	159.28	0.000
92.00	0.000	0	159.28	0.000
92.50	0.000	0	159.28	0.000
93.00	0.000	0	159.28	0.000
93.50	0.000	0	159.28	0.000
94.00	0.000	0	159.28	0.000
94.50	0.000	0	159.28	0.000
95.00	0.000	0	159.28	0.000
95.50	0.000	0	159.28	0.000
96.00	0.000	0	159.28	0.000
96.50	0.000	0	159.28	0.000
97.00	0.000	0	159.28	0.000
97.50	0.000	0	159.28	0.000
98.00	0.000	0	159.28	0.000
98.50	0.000	0	159.28	0.000
99.00	0.000	0	159.28	0.000
99.50	0.000	0	159.28	0.000
100.00	0.000	0	159.28	0.000
100.50	0.000	0	159.28	0.000
101.00	0.000	0	159.28	0.000
101.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	0	159.28	0.000
102.50	0.000	0	159.28	0.000
103.00	0.000	0	159.28	0.000
103.50	0.000	0	159.28	0.000
104.00	0.000	0	159.28	0.000
104.50	0.000	0	159.28	0.000
105.00	0.000	0	159.28	0.000
105.50	0.000	0	159.28	0.000
106.00	0.000	0	159.28	0.000
106.50	0.000	0	159.28	0.000
107.00	0.000	0	159.28	0.000
107.50	0.000	0	159.28	0.000
108.00	0.000	0	159.28	0.000
108.50	0.000	0	159.28	0.000
109.00	0.000	0	159.28	0.000
109.50	0.000	0	159.28	0.000
110.00	0.000	0	159.28	0.000
110.50	0.000	0	159.28	0.000
111.00	0.000	0	159.28	0.000
111.50	0.000	0	159.28	0.000
112.00	0.000	0	159.28	0.000
112.50	0.000	0	159.28	0.000
113.00	0.000	0	159.28	0.000
113.50	0.000	0	159.28	0.000
114.00	0.000	0	159.28	0.000
114.50	0.000	0	159.28	0.000
115.00	0.000	0	159.28	0.000
115.50	0.000	0	159.28	0.000
116.00	0.000	0	159.28	0.000
116.50	0.000	0	159.28	0.000
117.00	0.000	0	159.28	0.000
117.50	0.000	0	159.28	0.000
118.00	0.000	0	159.28	0.000
118.50	0.000	0	159.28	0.000
119.00	0.000	0	159.28	0.000
119.50	0.000	0	159.28	0.000
120.00	0.000	0	159.28	0.000
120.50	0.000	0	159.28	0.000
121.00	0.000	0	159.28	0.000
121.50	0.000	0	159.28	0.000
122.00	0.000	0	159.28	0.000
122.50	0.000	0	159.28	0.000
123.00	0.000	0	159.28	0.000
123.50	0.000	0	159.28	0.000
124.00	0.000	0	159.28	0.000
124.50	0.000	0	159.28	0.000
125.00	0.000	0	159.28	0.000
125.50	0.000	0	159.28	0.000
126.00	0.000	0	159.28	0.000
126.50	0.000	0	159.28	0.000
127.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	0	159.28	0.000
128.00	0.000	0	159.28	0.000
128.50	0.000	0	159.28	0.000
129.00	0.000	0	159.28	0.000
129.50	0.000	0	159.28	0.000
130.00	0.000	0	159.28	0.000
130.50	0.000	0	159.28	0.000
131.00	0.000	0	159.28	0.000
131.50	0.000	0	159.28	0.000
132.00	0.000	0	159.28	0.000
132.50	0.000	0	159.28	0.000
133.00	0.000	0	159.28	0.000
133.50	0.000	0	159.28	0.000
134.00	0.000	0	159.28	0.000
134.50	0.000	0	159.28	0.000
135.00	0.000	0	159.28	0.000
135.50	0.000	0	159.28	0.000
136.00	0.000	0	159.28	0.000
136.50	0.000	0	159.28	0.000
137.00	0.000	0	159.28	0.000
137.50	0.000	0	159.28	0.000
138.00	0.000	0	159.28	0.000
138.50	0.000	0	159.28	0.000
139.00	0.000	0	159.28	0.000
139.50	0.000	0	159.28	0.000
140.00	0.000	0	159.28	0.000
140.50	0.000	0	159.28	0.000
141.00	0.000	0	159.28	0.000
141.50	0.000	0	159.28	0.000
142.00	0.000	0	159.28	0.000
142.50	0.000	0	159.28	0.000
143.00	0.000	0	159.28	0.000
143.50	0.000	0	159.28	0.000
144.00	0.000	0	159.28	0.000
144.50	0.000	0	159.28	0.000
145.00	0.000	0	159.28	0.000
145.50	0.000	0	159.28	0.000
146.00	0.000	0	159.28	0.000
146.50	0.000	0	159.28	0.000
147.00	0.000	0	159.28	0.000
147.50	0.000	0	159.28	0.000
148.00	0.000	0	159.28	0.000
148.50	0.000	0	159.28	0.000
149.00	0.000	0	159.28	0.000
149.50	0.000	0	159.28	0.000
150.00	0.000	0	159.28	0.000
150.50	0.000	0	159.28	0.000
151.00	0.000	0	159.28	0.000
151.50	0.000	0	159.28	0.000
152.00	0.000	0	159.28	0.000
152.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	0	159.28	0.000
153.50	0.000	0	159.28	0.000
154.00	0.000	0	159.28	0.000
154.50	0.000	0	159.28	0.000
155.00	0.000	0	159.28	0.000
155.50	0.000	0	159.28	0.000
156.00	0.000	0	159.28	0.000
156.50	0.000	0	159.28	0.000
157.00	0.000	0	159.28	0.000
157.50	0.000	0	159.28	0.000
158.00	0.000	0	159.28	0.000
158.50	0.000	0	159.28	0.000
159.00	0.000	0	159.28	0.000
159.50	0.000	0	159.28	0.000
160.00	0.000	0	159.28	0.000
160.50	0.000	0	159.28	0.000
161.00	0.000	0	159.28	0.000
161.50	0.000	0	159.28	0.000
162.00	0.000	0	159.28	0.000
162.50	0.000	0	159.28	0.000
163.00	0.000	0	159.28	0.000
163.50	0.000	0	159.28	0.000
164.00	0.000	0	159.28	0.000
164.50	0.000	0	159.28	0.000
165.00	0.000	0	159.28	0.000
165.50	0.000	0	159.28	0.000
166.00	0.000	0	159.28	0.000
166.50	0.000	0	159.28	0.000
167.00	0.000	0	159.28	0.000
167.50	0.000	0	159.28	0.000
168.00	0.000	0	159.28	0.000

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 5.39" for 25-yr event
Inflow = 16.443 cfs @ 11.96 hrs, Volume= 37,709 cf
Outflow = 3.829 cfs @ 12.09 hrs, Volume= 37,563 cf, Atten= 77%, Lag= 8.0 min
Primary = 3.829 cfs @ 12.09 hrs, Volume= 37,563 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 159.58' @ 12.09 hrs Surf.Area= 13,041 sf Storage= 19,594 cf

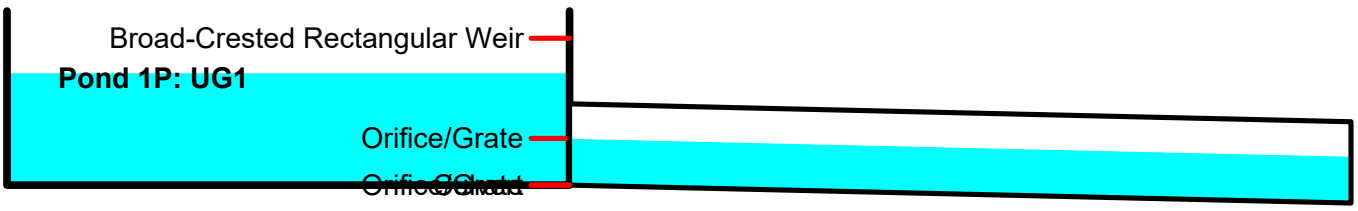
Plug-Flow detention time= 756.6 min calculated for 37,560 cf (100% of inflow)
Center-of-Mass det. time= 754.4 min (1,508.4 - 754.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=3.828 cfs @ 12.09 hrs HW=159.58' (Free Discharge)
└**4=Culvert** (Passes 3.828 cfs of 6.806 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.037 cfs @ 6.830 fps)
  ├**2=Orifice/Grate** (Orifice Controls 3.791 cfs @ 4.874 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 1P: UG1 - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger®280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 27 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

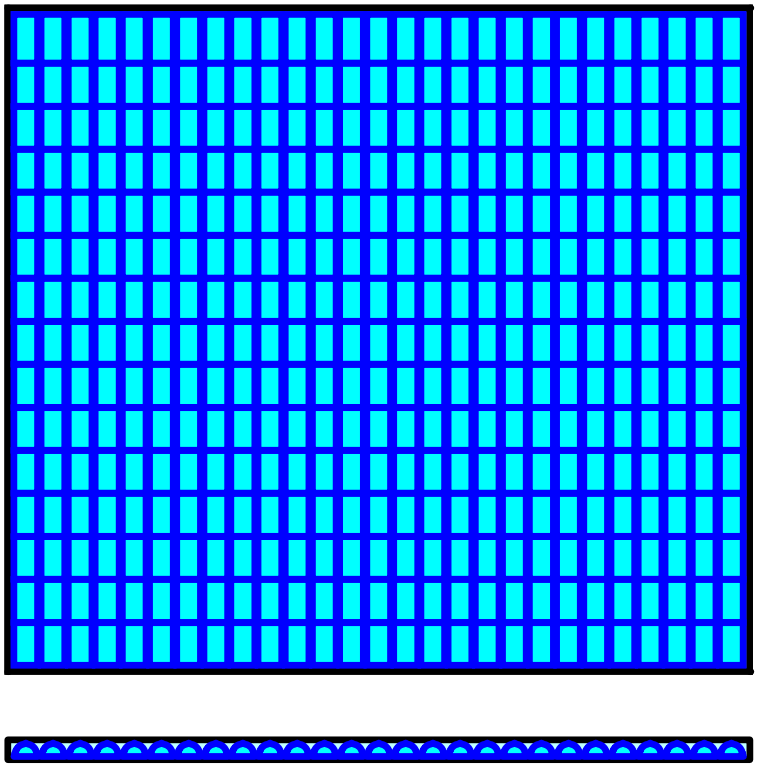
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

405 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 27 Rows = 17,377.3 cf Chamber Storage

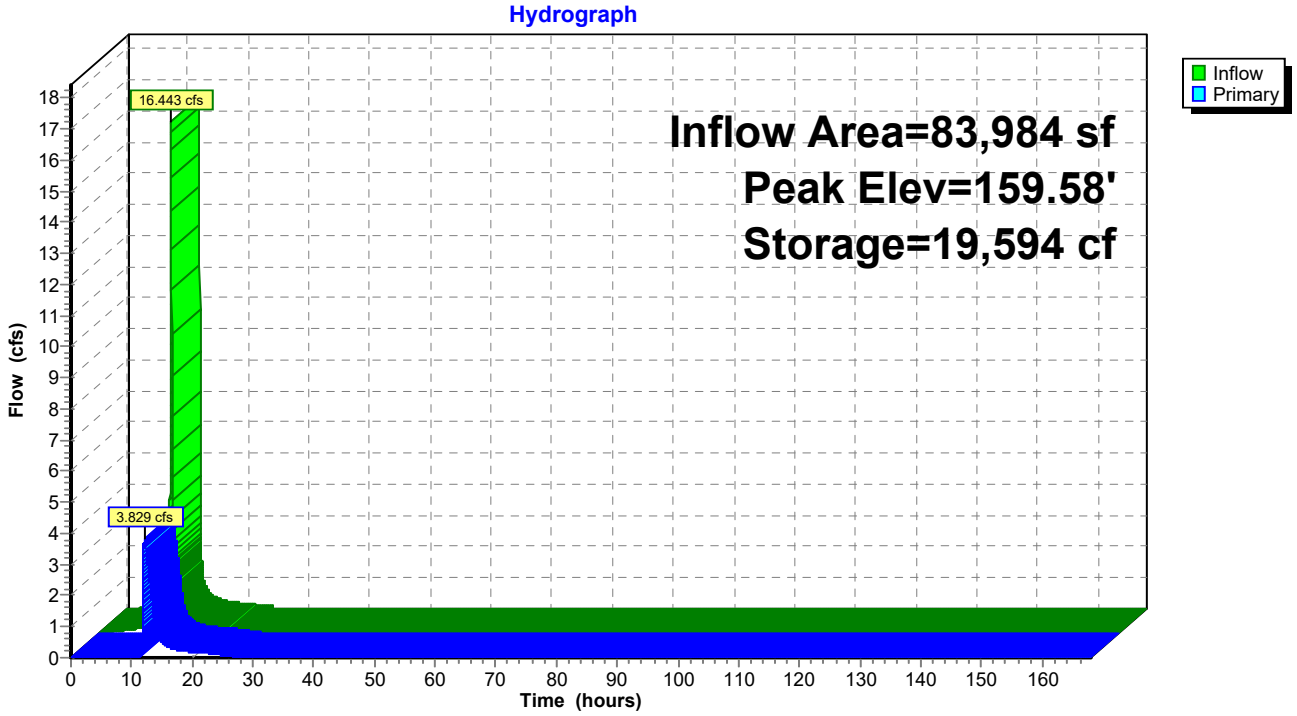
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

Chamber Storage + Stone Storage = 27,162.4 cf = 0.624 af
Overall Storage Efficiency = 64.9%
Overall System Size = 108.00' x 120.75' x 3.21'

405 Chambers
1,549.6 cy Field
906.0 cy Stone



Pond 1P: UG1


Hydrograph
Inflow
Primary
Inflow Area=83,984 sf
Peak Elev=159.58'
Storage=19,594 cf
16.443 cfs
3.829 cfs
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.004	1	157.53	0.000
2.00	0.023	25	157.53	0.000
2.50	0.040	81	157.55	0.001
3.00	0.056	166	157.56	0.001
3.50	0.071	277	157.58	0.003
4.00	0.084	409	157.61	0.005
4.50	0.100	564	157.64	0.007
5.00	0.116	744	157.67	0.008
5.50	0.132	951	157.71	0.010
6.00	0.147	1,183	157.76	0.011
6.50	0.163	1,440	157.81	0.013
7.00	0.178	1,723	157.86	0.014
7.50	0.193	2,030	157.92	0.015
8.00	0.208	2,362	157.98	0.017
8.50	0.256	2,743	158.04	0.018
9.00	0.311	3,220	158.08	0.019
9.50	0.326	3,765	158.13	0.020
10.00	0.401	4,373	158.18	0.020
10.50	0.527	5,166	158.25	0.022
11.00	0.737	6,253	158.34	0.023
11.50	**1.223**	7,850	158.48	0.231
12.00	**13.588**	**18,214**	**159.44**	**3.553**
12.50	1.182	**16,987**	**159.32**	**3.299**
13.00	0.735	13,421	158.98	2.456
13.50	0.556	10,904	158.75	1.619
14.00	0.436	9,584	158.63	0.926
14.50	0.385	8,949	158.58	0.633
15.00	0.346	8,609	158.55	0.492
15.50	0.306	8,390	158.53	0.408
16.00	0.267	8,225	158.51	0.351
16.50	0.249	8,096	158.50	0.307
17.00	0.234	8,007	158.49	0.277
17.50	0.220	7,938	158.49	0.256
18.00	0.206	7,877	158.48	0.238
18.50	0.192	7,821	158.48	0.222
19.00	0.178	7,768	158.47	0.207
19.50	0.164	7,716	158.47	0.192
20.00	0.150	7,666	158.46	0.177
20.50	0.145	7,622	158.46	0.165
21.00	0.142	7,591	158.46	0.157
21.50	0.139	7,567	158.46	0.151
22.00	0.136	7,548	158.45	0.146
22.50	0.134	7,531	158.45	0.142
23.00	0.131	7,516	158.45	0.139
23.50	0.128	7,503	158.45	0.135
24.00	0.125	7,490	158.45	0.132
24.50	0.000	7,318	158.43	0.095
25.00	0.000	7,174	158.42	0.069

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	7,064	158.41	0.054
26.00	0.000	6,979	158.40	0.041
26.50	0.000	6,914	158.40	0.032
27.00	0.000	6,862	158.39	0.026
27.50	0.000	6,817	158.39	0.024
28.00	0.000	6,774	158.39	0.024
28.50	0.000	6,731	158.38	0.024
29.00	0.000	6,689	158.38	0.024
29.50	0.000	6,646	158.38	0.024
30.00	0.000	6,604	158.37	0.023
30.50	0.000	6,562	158.37	0.023
31.00	0.000	6,520	158.36	0.023
31.50	0.000	6,478	158.36	0.023
32.00	0.000	6,436	158.36	0.023
32.50	0.000	6,394	158.35	0.023
33.00	0.000	6,352	158.35	0.023
33.50	0.000	6,310	158.35	0.023
34.00	0.000	6,269	158.34	0.023
34.50	0.000	6,227	158.34	0.023
35.00	0.000	6,186	158.34	0.023
35.50	0.000	6,145	158.33	0.023
36.00	0.000	6,103	158.33	0.023
36.50	0.000	6,062	158.33	0.023
37.00	0.000	6,021	158.32	0.023
37.50	0.000	5,981	158.32	0.023
38.00	0.000	5,940	158.31	0.023
38.50	0.000	5,899	158.31	0.023
39.00	0.000	5,858	158.31	0.023
39.50	0.000	5,818	158.30	0.022
40.00	0.000	5,778	158.30	0.022
40.50	0.000	5,737	158.30	0.022
41.00	0.000	5,697	158.29	0.022
41.50	0.000	5,657	158.29	0.022
42.00	0.000	5,617	158.29	0.022
42.50	0.000	5,577	158.28	0.022
43.00	0.000	5,537	158.28	0.022
43.50	0.000	5,497	158.28	0.022
44.00	0.000	5,458	158.27	0.022
44.50	0.000	5,418	158.27	0.022
45.00	0.000	5,379	158.27	0.022
45.50	0.000	5,339	158.26	0.022
46.00	0.000	5,300	158.26	0.022
46.50	0.000	5,261	158.26	0.022
47.00	0.000	5,222	158.25	0.022
47.50	0.000	5,183	158.25	0.022
48.00	0.000	5,144	158.25	0.022
48.50	0.000	5,105	158.24	0.022
49.00	0.000	5,067	158.24	0.021
49.50	0.000	5,028	158.24	0.021
50.00	0.000	4,990	158.23	0.021
50.50	0.000	4,951	158.23	0.021

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,913	158.23	0.021
51.50	0.000	4,875	158.22	0.021
52.00	0.000	4,837	158.22	0.021
52.50	0.000	4,799	158.22	0.021
53.00	0.000	4,761	158.21	0.021
53.50	0.000	4,723	158.21	0.021
54.00	0.000	4,685	158.21	0.021
54.50	0.000	4,648	158.20	0.021
55.00	0.000	4,610	158.20	0.021
55.50	0.000	4,573	158.20	0.021
56.00	0.000	4,535	158.19	0.021
56.50	0.000	4,498	158.19	0.021
57.00	0.000	4,461	158.19	0.021
57.50	0.000	4,424	158.18	0.021
58.00	0.000	4,387	158.18	0.020
58.50	0.000	4,350	158.18	0.020
59.00	0.000	4,314	158.17	0.020
59.50	0.000	4,277	158.17	0.020
60.00	0.000	4,240	158.17	0.020
60.50	0.000	4,204	158.17	0.020
61.00	0.000	4,168	158.16	0.020
61.50	0.000	4,131	158.16	0.020
62.00	0.000	4,095	158.16	0.020
62.50	0.000	4,059	158.15	0.020
63.00	0.000	4,023	158.15	0.020
63.50	0.000	3,987	158.15	0.020
64.00	0.000	3,951	158.14	0.020
64.50	0.000	3,916	158.14	0.020
65.00	0.000	3,880	158.14	0.020
65.50	0.000	3,845	158.13	0.020
66.00	0.000	3,809	158.13	0.020
66.50	0.000	3,774	158.13	0.020
67.00	0.000	3,739	158.13	0.020
67.50	0.000	3,703	158.12	0.019
68.00	0.000	3,668	158.12	0.019
68.50	0.000	3,633	158.12	0.019
69.00	0.000	3,599	158.11	0.019
69.50	0.000	3,564	158.11	0.019
70.00	0.000	3,529	158.11	0.019
70.50	0.000	3,495	158.10	0.019
71.00	0.000	3,460	158.10	0.019
71.50	0.000	3,426	158.10	0.019
72.00	0.000	3,392	158.10	0.019
72.50	0.000	3,357	158.09	0.019
73.00	0.000	3,323	158.09	0.019
73.50	0.000	3,289	158.09	0.019
74.00	0.000	3,255	158.08	0.019
74.50	0.000	3,222	158.08	0.019
75.00	0.000	3,188	158.08	0.019
75.50	0.000	3,154	158.08	0.019
76.00	0.000	3,121	158.07	0.019

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	3,087	158.07	0.019
77.00	0.000	3,054	158.07	0.018
77.50	0.000	3,021	158.06	0.018
78.00	0.000	2,988	158.06	0.018
78.50	0.000	2,955	158.06	0.018
79.00	0.000	2,922	158.06	0.018
79.50	0.000	2,889	158.05	0.018
80.00	0.000	2,856	158.05	0.018
80.50	0.000	2,823	158.05	0.018
81.00	0.000	2,791	158.05	0.018
81.50	0.000	2,758	158.04	0.018
82.00	0.000	2,726	158.04	0.018
82.50	0.000	2,694	158.04	0.018
83.00	0.000	2,661	158.03	0.018
83.50	0.000	2,629	158.03	0.018
84.00	0.000	2,597	158.03	0.018
84.50	0.000	2,565	158.02	0.018
85.00	0.000	2,534	158.02	0.017
85.50	0.000	2,502	158.01	0.017
86.00	0.000	2,471	158.00	0.017
86.50	0.000	2,440	158.00	0.017
87.00	0.000	2,410	157.99	0.017
87.50	0.000	2,379	157.99	0.017
88.00	0.000	2,349	157.98	0.017
88.50	0.000	2,319	157.97	0.017
89.00	0.000	2,289	157.97	0.017
89.50	0.000	2,259	157.96	0.016
90.00	0.000	2,230	157.96	0.016
90.50	0.000	2,200	157.95	0.016
91.00	0.000	2,171	157.95	0.016
91.50	0.000	2,142	157.94	0.016
92.00	0.000	2,114	157.94	0.016
92.50	0.000	2,086	157.93	0.016
93.00	0.000	2,057	157.92	0.016
93.50	0.000	2,029	157.92	0.015
94.00	0.000	2,002	157.91	0.015
94.50	0.000	1,974	157.91	0.015
95.00	0.000	1,947	157.90	0.015
95.50	0.000	1,920	157.90	0.015
96.00	0.000	1,893	157.89	0.015
96.50	0.000	1,866	157.89	0.015
97.00	0.000	1,840	157.88	0.015
97.50	0.000	1,813	157.88	0.015
98.00	0.000	1,787	157.87	0.014
98.50	0.000	1,762	157.87	0.014
99.00	0.000	1,736	157.86	0.014
99.50	0.000	1,711	157.86	0.014
100.00	0.000	1,685	157.85	0.014
100.50	0.000	1,660	157.85	0.014
101.00	0.000	1,636	157.84	0.014
101.50	0.000	1,611	157.84	0.014

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	1,587	157.83	0.013
102.50	0.000	1,563	157.83	0.013
103.00	0.000	1,539	157.82	0.013
103.50	0.000	1,515	157.82	0.013
104.00	0.000	1,492	157.82	0.013
104.50	0.000	1,468	157.81	0.013
105.00	0.000	1,445	157.81	0.013
105.50	0.000	1,423	157.80	0.013
106.00	0.000	1,400	157.80	0.012
106.50	0.000	1,378	157.79	0.012
107.00	0.000	1,355	157.79	0.012
107.50	0.000	1,333	157.79	0.012
108.00	0.000	1,312	157.78	0.012
108.50	0.000	1,290	157.78	0.012
109.00	0.000	1,269	157.77	0.012
109.50	0.000	1,248	157.77	0.012
110.00	0.000	1,227	157.77	0.012
110.50	0.000	1,206	157.76	0.011
111.00	0.000	1,186	157.76	0.011
111.50	0.000	1,165	157.75	0.011
112.00	0.000	1,145	157.75	0.011
112.50	0.000	1,126	157.75	0.011
113.00	0.000	1,106	157.74	0.011
113.50	0.000	1,087	157.74	0.011
114.00	0.000	1,067	157.73	0.011
114.50	0.000	1,048	157.73	0.010
115.00	0.000	1,030	157.73	0.010
115.50	0.000	1,011	157.72	0.010
116.00	0.000	993	157.72	0.010
116.50	0.000	975	157.72	0.010
117.00	0.000	957	157.71	0.010
117.50	0.000	939	157.71	0.010
118.00	0.000	922	157.71	0.010
118.50	0.000	905	157.70	0.010
119.00	0.000	887	157.70	0.009
119.50	0.000	871	157.70	0.009
120.00	0.000	854	157.69	0.009
120.50	0.000	838	157.69	0.009
121.00	0.000	821	157.69	0.009
121.50	0.000	806	157.68	0.009
122.00	0.000	790	157.68	0.009
122.50	0.000	774	157.68	0.009
123.00	0.000	759	157.68	0.008
123.50	0.000	744	157.67	0.008
124.00	0.000	729	157.67	0.008
124.50	0.000	714	157.67	0.008
125.00	0.000	700	157.66	0.008
125.50	0.000	686	157.66	0.008
126.00	0.000	672	157.66	0.008
126.50	0.000	658	157.66	0.008
127.00	0.000	644	157.65	0.007

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	631	157.65	0.007
128.00	0.000	618	157.65	0.007
128.50	0.000	605	157.65	0.007
129.00	0.000	592	157.64	0.007
129.50	0.000	580	157.64	0.007
130.00	0.000	567	157.64	0.007
130.50	0.000	555	157.64	0.007
131.00	0.000	543	157.63	0.007
131.50	0.000	532	157.63	0.006
132.00	0.000	520	157.63	0.006
132.50	0.000	509	157.63	0.006
133.00	0.000	498	157.63	0.006
133.50	0.000	487	157.62	0.006
134.00	0.000	477	157.62	0.006
134.50	0.000	466	157.62	0.006
135.00	0.000	456	157.62	0.006
135.50	0.000	446	157.62	0.005
136.00	0.000	437	157.61	0.005
136.50	0.000	428	157.61	0.005
137.00	0.000	418	157.61	0.005
137.50	0.000	409	157.61	0.005
138.00	0.000	401	157.61	0.005
138.50	0.000	392	157.61	0.005
139.00	0.000	384	157.60	0.005
139.50	0.000	376	157.60	0.004
140.00	0.000	368	157.60	0.004
140.50	0.000	360	157.60	0.004
141.00	0.000	353	157.60	0.004
141.50	0.000	345	157.60	0.004
142.00	0.000	338	157.59	0.004
142.50	0.000	331	157.59	0.004
143.00	0.000	324	157.59	0.004
143.50	0.000	318	157.59	0.004
144.00	0.000	311	157.59	0.004
144.50	0.000	305	157.59	0.003
145.00	0.000	299	157.59	0.003
145.50	0.000	293	157.59	0.003
146.00	0.000	288	157.59	0.003
146.50	0.000	282	157.58	0.003
147.00	0.000	277	157.58	0.003
147.50	0.000	271	157.58	0.003
148.00	0.000	266	157.58	0.003
148.50	0.000	261	157.58	0.003
149.00	0.000	257	157.58	0.003
149.50	0.000	252	157.58	0.003
150.00	0.000	247	157.58	0.002
150.50	0.000	243	157.58	0.002
151.00	0.000	239	157.58	0.002
151.50	0.000	235	157.57	0.002
152.00	0.000	231	157.57	0.002
152.50	0.000	227	157.57	0.002

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	223	157.57	0.002
153.50	0.000	219	157.57	0.002
154.00	0.000	216	157.57	0.002
154.50	0.000	212	157.57	0.002
155.00	0.000	209	157.57	0.002
155.50	0.000	206	157.57	0.002
156.00	0.000	202	157.57	0.002
156.50	0.000	199	157.57	0.002
157.00	0.000	196	157.57	0.002
157.50	0.000	193	157.57	0.002
158.00	0.000	190	157.57	0.002
158.50	0.000	188	157.57	0.002
159.00	0.000	185	157.57	0.001
159.50	0.000	182	157.56	0.001
160.00	0.000	180	157.56	0.001
160.50	0.000	177	157.56	0.001
161.00	0.000	175	157.56	0.001
161.50	0.000	173	157.56	0.001
162.00	0.000	170	157.56	0.001
162.50	0.000	168	157.56	0.001
163.00	0.000	166	157.56	0.001
163.50	0.000	164	157.56	0.001
164.00	0.000	162	157.56	0.001
164.50	0.000	160	157.56	0.001
165.00	0.000	158	157.56	0.001
165.50	0.000	156	157.56	0.001
166.00	0.000	154	157.56	0.001
166.50	0.000	152	157.56	0.001
167.00	0.000	150	157.56	0.001
167.50	0.000	148	157.56	0.001
168.00	0.000	146	157.56	0.001

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 4.28" for 25-yr event
Inflow = 3.696 cfs @ 11.96 hrs, Volume= 7,653 cf
Outflow = 0.856 cfs @ 12.09 hrs, Volume= 7,653 cf, Atten= 77%, Lag= 8.0 min
Primary = 0.856 cfs @ 12.09 hrs, Volume= 7,653 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 160.96' @ 12.09 hrs Surf.Area= 2,542 sf Storage= 2,955 cf

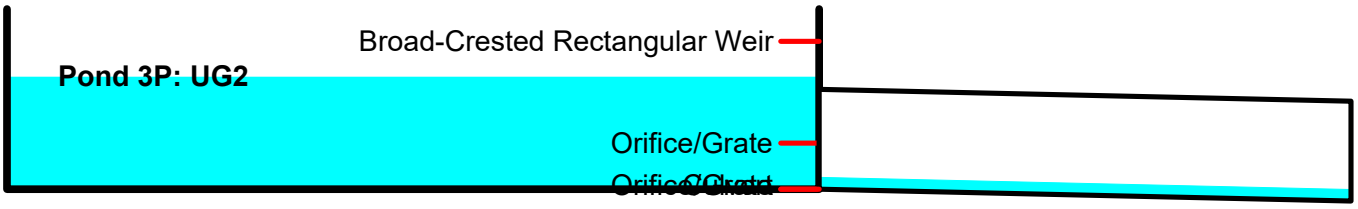
Plug-Flow detention time= 63.7 min calculated for 7,653 cf (100% of inflow)
Center-of-Mass det. time= 63.8 min (858.3 - 794.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.856 cfs @ 12.09 hrs HW=160.96' (Free Discharge)
└**4=Culvert** (Passes 0.856 cfs of 6.631 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.295 cfs @ 6.013 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.561 cfs @ 4.486 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 3P: UG2 - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Discontinued, not for new designs)
Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf
Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 3.44 sf x 8 rows

36.0" Wide + 3.0" Spacing = 39.0" C-C Row Spacing

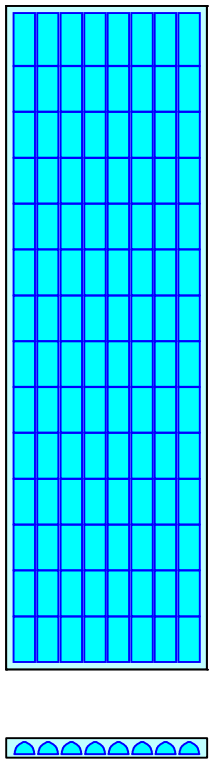
14 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 89.62' Row Length +12.0" End Stone x 2 = 91.62' Base Length
8 Rows x 36.0" Wide + 3.0" Spacing x 7 + 12.0" Side Stone x 2 = 27.75' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

112 Chambers x 21.8 cf +1.00' Row Adjustment x 3.44 sf x 8 Rows = 2,466.0 cf Chamber Storage

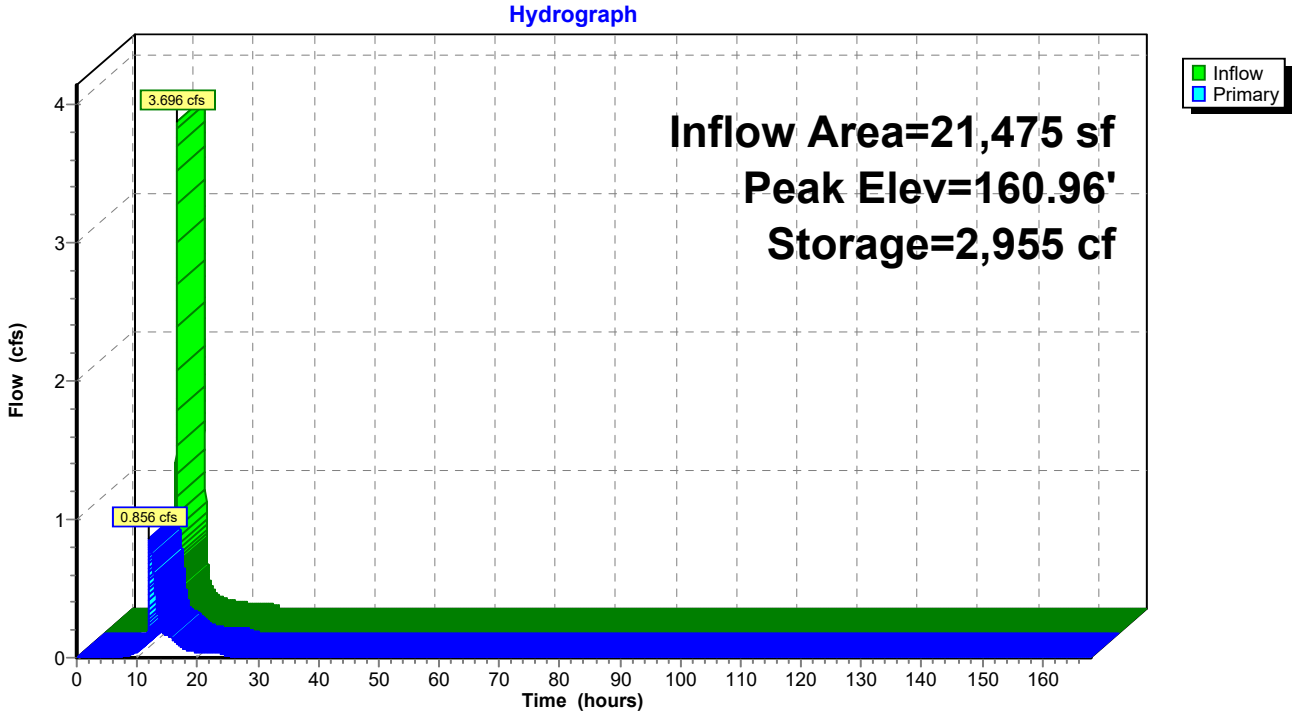
6,885.8 cf Field - 2,466.0 cf Chambers = 4,419.8 cf Stone x 40.0% Voids = 1,767.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,233.9 cf = 0.097 af
Overall Storage Efficiency = 61.5%
Overall System Size = 91.62' x 27.75' x 2.71'

112 Chambers
255.0 cy Field
163.7 cy Stone



Pond 3P: UG2


Hydrograph
Inflow Area=21,475 sf
Peak Elev=160.96'
Storage=2,955 cf
3.696 cfs
0.856 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.000	0	159.28	0.000
4.50	0.000	0	159.28	0.000
5.00	0.002	1	159.28	0.000
5.50	0.005	7	159.29	0.000
6.00	0.008	17	159.30	0.001
6.50	0.011	31	159.31	0.002
7.00	0.014	47	159.33	0.005
7.50	0.018	64	159.34	0.009
8.00	0.021	80	159.36	0.013
8.50	0.029	97	159.38	0.018
9.00	0.039	118	159.40	0.026
9.50	0.044	139	159.42	0.034
10.00	0.059	160	159.44	0.044
10.50	0.083	194	159.47	0.060
11.00	0.125	251	159.53	0.083
11.50	**0.225**	380	159.65	0.118
12.00	**3.101**	**2,629**	**160.79**	**0.779**
12.50	0.279	**2,408**	**160.68**	**0.725**
13.00	0.174	1,677	160.32	0.509
13.50	0.133	1,244	160.12	0.291
14.00	0.104	1,026	160.02	0.201
14.50	0.092	870	159.95	0.174
15.00	0.083	725	159.88	0.163
15.50	0.074	584	159.81	0.151
16.00	0.064	449	159.72	0.133
16.50	0.060	343	159.62	0.109
17.00	0.057	271	159.55	0.089
17.50	0.053	224	159.50	0.073
18.00	0.050	197	159.47	0.061
18.50	0.046	181	159.46	0.054
19.00	0.043	170	159.45	0.048
19.50	0.040	161	159.44	0.044
20.00	0.036	153	159.43	0.041
20.50	0.035	146	159.42	0.038
21.00	0.035	143	159.42	0.036
21.50	0.034	140	159.42	0.035
22.00	0.033	138	159.42	0.034
22.50	0.033	136	159.41	0.033
23.00	0.032	135	159.41	0.033
23.50	0.031	133	159.41	0.032
24.00	0.030	131	159.41	0.031
24.50	0.000	95	159.37	0.018
25.00	0.000	71	159.35	0.010

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	56	159.34	0.006
26.00	0.000	46	159.33	0.005
26.50	0.000	39	159.32	0.003
27.00	0.000	33	159.31	0.003
27.50	0.000	29	159.31	0.002
28.00	0.000	26	159.31	0.002
28.50	0.000	24	159.30	0.001
29.00	0.000	21	159.30	0.001
29.50	0.000	19	159.30	0.001
30.00	0.000	17	159.30	0.001
30.50	0.000	16	159.30	0.001
31.00	0.000	14	159.29	0.001
31.50	0.000	13	159.29	0.001
32.00	0.000	11	159.29	0.001
32.50	0.000	10	159.29	0.001
33.00	0.000	9	159.29	0.001
33.50	0.000	8	159.29	0.000
34.00	0.000	7	159.29	0.000
34.50	0.000	7	159.29	0.000
35.00	0.000	6	159.29	0.000
35.50	0.000	5	159.29	0.000
36.00	0.000	5	159.28	0.000
36.50	0.000	4	159.28	0.000
37.00	0.000	4	159.28	0.000
37.50	0.000	4	159.28	0.000
38.00	0.000	3	159.28	0.000
38.50	0.000	3	159.28	0.000
39.00	0.000	3	159.28	0.000
39.50	0.000	2	159.28	0.000
40.00	0.000	2	159.28	0.000
40.50	0.000	2	159.28	0.000
41.00	0.000	2	159.28	0.000
41.50	0.000	2	159.28	0.000
42.00	0.000	1	159.28	0.000
42.50	0.000	1	159.28	0.000
43.00	0.000	1	159.28	0.000
43.50	0.000	1	159.28	0.000
44.00	0.000	1	159.28	0.000
44.50	0.000	1	159.28	0.000
45.00	0.000	1	159.28	0.000
45.50	0.000	1	159.28	0.000
46.00	0.000	1	159.28	0.000
46.50	0.000	1	159.28	0.000
47.00	0.000	0	159.28	0.000
47.50	0.000	0	159.28	0.000
48.00	0.000	0	159.28	0.000
48.50	0.000	0	159.28	0.000
49.00	0.000	0	159.28	0.000
49.50	0.000	0	159.28	0.000
50.00	0.000	0	159.28	0.000
50.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	0	159.28	0.000
51.50	0.000	0	159.28	0.000
52.00	0.000	0	159.28	0.000
52.50	0.000	0	159.28	0.000
53.00	0.000	0	159.28	0.000
53.50	0.000	0	159.28	0.000
54.00	0.000	0	159.28	0.000
54.50	0.000	0	159.28	0.000
55.00	0.000	0	159.28	0.000
55.50	0.000	0	159.28	0.000
56.00	0.000	0	159.28	0.000
56.50	0.000	0	159.28	0.000
57.00	0.000	0	159.28	0.000
57.50	0.000	0	159.28	0.000
58.00	0.000	0	159.28	0.000
58.50	0.000	0	159.28	0.000
59.00	0.000	0	159.28	0.000
59.50	0.000	0	159.28	0.000
60.00	0.000	0	159.28	0.000
60.50	0.000	0	159.28	0.000
61.00	0.000	0	159.28	0.000
61.50	0.000	0	159.28	0.000
62.00	0.000	0	159.28	0.000
62.50	0.000	0	159.28	0.000
63.00	0.000	0	159.28	0.000
63.50	0.000	0	159.28	0.000
64.00	0.000	0	159.28	0.000
64.50	0.000	0	159.28	0.000
65.00	0.000	0	159.28	0.000
65.50	0.000	0	159.28	0.000
66.00	0.000	0	159.28	0.000
66.50	0.000	0	159.28	0.000
67.00	0.000	0	159.28	0.000
67.50	0.000	0	159.28	0.000
68.00	0.000	0	159.28	0.000
68.50	0.000	0	159.28	0.000
69.00	0.000	0	159.28	0.000
69.50	0.000	0	159.28	0.000
70.00	0.000	0	159.28	0.000
70.50	0.000	0	159.28	0.000
71.00	0.000	0	159.28	0.000
71.50	0.000	0	159.28	0.000
72.00	0.000	0	159.28	0.000
72.50	0.000	0	159.28	0.000
73.00	0.000	0	159.28	0.000
73.50	0.000	0	159.28	0.000
74.00	0.000	0	159.28	0.000
74.50	0.000	0	159.28	0.000
75.00	0.000	0	159.28	0.000
75.50	0.000	0	159.28	0.000
76.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	0	159.28	0.000
77.00	0.000	0	159.28	0.000
77.50	0.000	0	159.28	0.000
78.00	0.000	0	159.28	0.000
78.50	0.000	0	159.28	0.000
79.00	0.000	0	159.28	0.000
79.50	0.000	0	159.28	0.000
80.00	0.000	0	159.28	0.000
80.50	0.000	0	159.28	0.000
81.00	0.000	0	159.28	0.000
81.50	0.000	0	159.28	0.000
82.00	0.000	0	159.28	0.000
82.50	0.000	0	159.28	0.000
83.00	0.000	0	159.28	0.000
83.50	0.000	0	159.28	0.000
84.00	0.000	0	159.28	0.000
84.50	0.000	0	159.28	0.000
85.00	0.000	0	159.28	0.000
85.50	0.000	0	159.28	0.000
86.00	0.000	0	159.28	0.000
86.50	0.000	0	159.28	0.000
87.00	0.000	0	159.28	0.000
87.50	0.000	0	159.28	0.000
88.00	0.000	0	159.28	0.000
88.50	0.000	0	159.28	0.000
89.00	0.000	0	159.28	0.000
89.50	0.000	0	159.28	0.000
90.00	0.000	0	159.28	0.000
90.50	0.000	0	159.28	0.000
91.00	0.000	0	159.28	0.000
91.50	0.000	0	159.28	0.000
92.00	0.000	0	159.28	0.000
92.50	0.000	0	159.28	0.000
93.00	0.000	0	159.28	0.000
93.50	0.000	0	159.28	0.000
94.00	0.000	0	159.28	0.000
94.50	0.000	0	159.28	0.000
95.00	0.000	0	159.28	0.000
95.50	0.000	0	159.28	0.000
96.00	0.000	0	159.28	0.000
96.50	0.000	0	159.28	0.000
97.00	0.000	0	159.28	0.000
97.50	0.000	0	159.28	0.000
98.00	0.000	0	159.28	0.000
98.50	0.000	0	159.28	0.000
99.00	0.000	0	159.28	0.000
99.50	0.000	0	159.28	0.000
100.00	0.000	0	159.28	0.000
100.50	0.000	0	159.28	0.000
101.00	0.000	0	159.28	0.000
101.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	0	159.28	0.000
102.50	0.000	0	159.28	0.000
103.00	0.000	0	159.28	0.000
103.50	0.000	0	159.28	0.000
104.00	0.000	0	159.28	0.000
104.50	0.000	0	159.28	0.000
105.00	0.000	0	159.28	0.000
105.50	0.000	0	159.28	0.000
106.00	0.000	0	159.28	0.000
106.50	0.000	0	159.28	0.000
107.00	0.000	0	159.28	0.000
107.50	0.000	0	159.28	0.000
108.00	0.000	0	159.28	0.000
108.50	0.000	0	159.28	0.000
109.00	0.000	0	159.28	0.000
109.50	0.000	0	159.28	0.000
110.00	0.000	0	159.28	0.000
110.50	0.000	0	159.28	0.000
111.00	0.000	0	159.28	0.000
111.50	0.000	0	159.28	0.000
112.00	0.000	0	159.28	0.000
112.50	0.000	0	159.28	0.000
113.00	0.000	0	159.28	0.000
113.50	0.000	0	159.28	0.000
114.00	0.000	0	159.28	0.000
114.50	0.000	0	159.28	0.000
115.00	0.000	0	159.28	0.000
115.50	0.000	0	159.28	0.000
116.00	0.000	0	159.28	0.000
116.50	0.000	0	159.28	0.000
117.00	0.000	0	159.28	0.000
117.50	0.000	0	159.28	0.000
118.00	0.000	0	159.28	0.000
118.50	0.000	0	159.28	0.000
119.00	0.000	0	159.28	0.000
119.50	0.000	0	159.28	0.000
120.00	0.000	0	159.28	0.000
120.50	0.000	0	159.28	0.000
121.00	0.000	0	159.28	0.000
121.50	0.000	0	159.28	0.000
122.00	0.000	0	159.28	0.000
122.50	0.000	0	159.28	0.000
123.00	0.000	0	159.28	0.000
123.50	0.000	0	159.28	0.000
124.00	0.000	0	159.28	0.000
124.50	0.000	0	159.28	0.000
125.00	0.000	0	159.28	0.000
125.50	0.000	0	159.28	0.000
126.00	0.000	0	159.28	0.000
126.50	0.000	0	159.28	0.000
127.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	0	159.28	0.000
128.00	0.000	0	159.28	0.000
128.50	0.000	0	159.28	0.000
129.00	0.000	0	159.28	0.000
129.50	0.000	0	159.28	0.000
130.00	0.000	0	159.28	0.000
130.50	0.000	0	159.28	0.000
131.00	0.000	0	159.28	0.000
131.50	0.000	0	159.28	0.000
132.00	0.000	0	159.28	0.000
132.50	0.000	0	159.28	0.000
133.00	0.000	0	159.28	0.000
133.50	0.000	0	159.28	0.000
134.00	0.000	0	159.28	0.000
134.50	0.000	0	159.28	0.000
135.00	0.000	0	159.28	0.000
135.50	0.000	0	159.28	0.000
136.00	0.000	0	159.28	0.000
136.50	0.000	0	159.28	0.000
137.00	0.000	0	159.28	0.000
137.50	0.000	0	159.28	0.000
138.00	0.000	0	159.28	0.000
138.50	0.000	0	159.28	0.000
139.00	0.000	0	159.28	0.000
139.50	0.000	0	159.28	0.000
140.00	0.000	0	159.28	0.000
140.50	0.000	0	159.28	0.000
141.00	0.000	0	159.28	0.000
141.50	0.000	0	159.28	0.000
142.00	0.000	0	159.28	0.000
142.50	0.000	0	159.28	0.000
143.00	0.000	0	159.28	0.000
143.50	0.000	0	159.28	0.000
144.00	0.000	0	159.28	0.000
144.50	0.000	0	159.28	0.000
145.00	0.000	0	159.28	0.000
145.50	0.000	0	159.28	0.000
146.00	0.000	0	159.28	0.000
146.50	0.000	0	159.28	0.000
147.00	0.000	0	159.28	0.000
147.50	0.000	0	159.28	0.000
148.00	0.000	0	159.28	0.000
148.50	0.000	0	159.28	0.000
149.00	0.000	0	159.28	0.000
149.50	0.000	0	159.28	0.000
150.00	0.000	0	159.28	0.000
150.50	0.000	0	159.28	0.000
151.00	0.000	0	159.28	0.000
151.50	0.000	0	159.28	0.000
152.00	0.000	0	159.28	0.000
152.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	0	159.28	0.000
153.50	0.000	0	159.28	0.000
154.00	0.000	0	159.28	0.000
154.50	0.000	0	159.28	0.000
155.00	0.000	0	159.28	0.000
155.50	0.000	0	159.28	0.000
156.00	0.000	0	159.28	0.000
156.50	0.000	0	159.28	0.000
157.00	0.000	0	159.28	0.000
157.50	0.000	0	159.28	0.000
158.00	0.000	0	159.28	0.000
158.50	0.000	0	159.28	0.000
159.00	0.000	0	159.28	0.000
159.50	0.000	0	159.28	0.000
160.00	0.000	0	159.28	0.000
160.50	0.000	0	159.28	0.000
161.00	0.000	0	159.28	0.000
161.50	0.000	0	159.28	0.000
162.00	0.000	0	159.28	0.000
162.50	0.000	0	159.28	0.000
163.00	0.000	0	159.28	0.000
163.50	0.000	0	159.28	0.000
164.00	0.000	0	159.28	0.000
164.50	0.000	0	159.28	0.000
165.00	0.000	0	159.28	0.000
165.50	0.000	0	159.28	0.000
166.00	0.000	0	159.28	0.000
166.50	0.000	0	159.28	0.000
167.00	0.000	0	159.28	0.000
167.50	0.000	0	159.28	0.000
168.00	0.000	0	159.28	0.000

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 6.25" for 50-yr event
Inflow = 18.946 cfs @ 11.96 hrs, Volume= 43,774 cf
Outflow = 4.318 cfs @ 12.09 hrs, Volume= 43,627 cf, Atten= 77%, Lag= 8.1 min
Primary = 4.318 cfs @ 12.09 hrs, Volume= 43,627 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 159.86' @ 12.09 hrs Surf.Area= 13,041 sf Storage= 22,089 cf

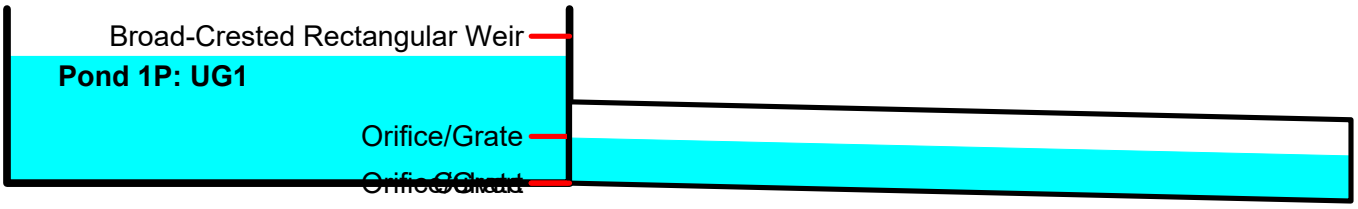
Plug-Flow detention time= 666.4 min calculated for 43,624 cf (100% of inflow)
Center-of-Mass det. time= 664.6 min (1,415.5 - 750.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=4.318 cfs @ 12.09 hrs HW=159.86' (Free Discharge)
└**4=Culvert** (Passes 4.318 cfs of 7.809 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.040 cfs @ 7.289 fps)
  ├**2=Orifice/Grate** (Orifice Controls 4.278 cfs @ 5.501 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 1P: UG1 - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger®280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 27 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

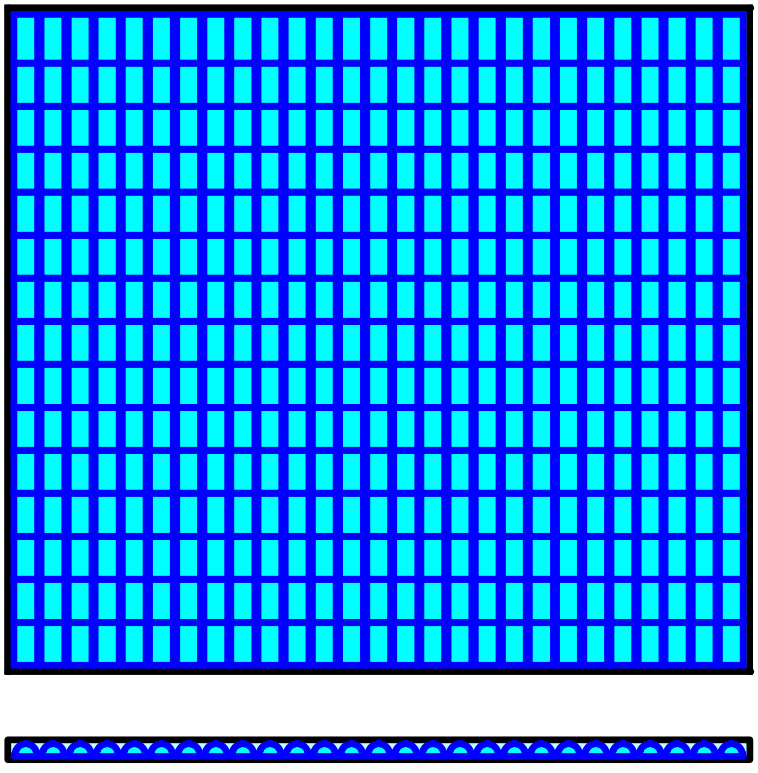
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

405 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 27 Rows = 17,377.3 cf Chamber Storage

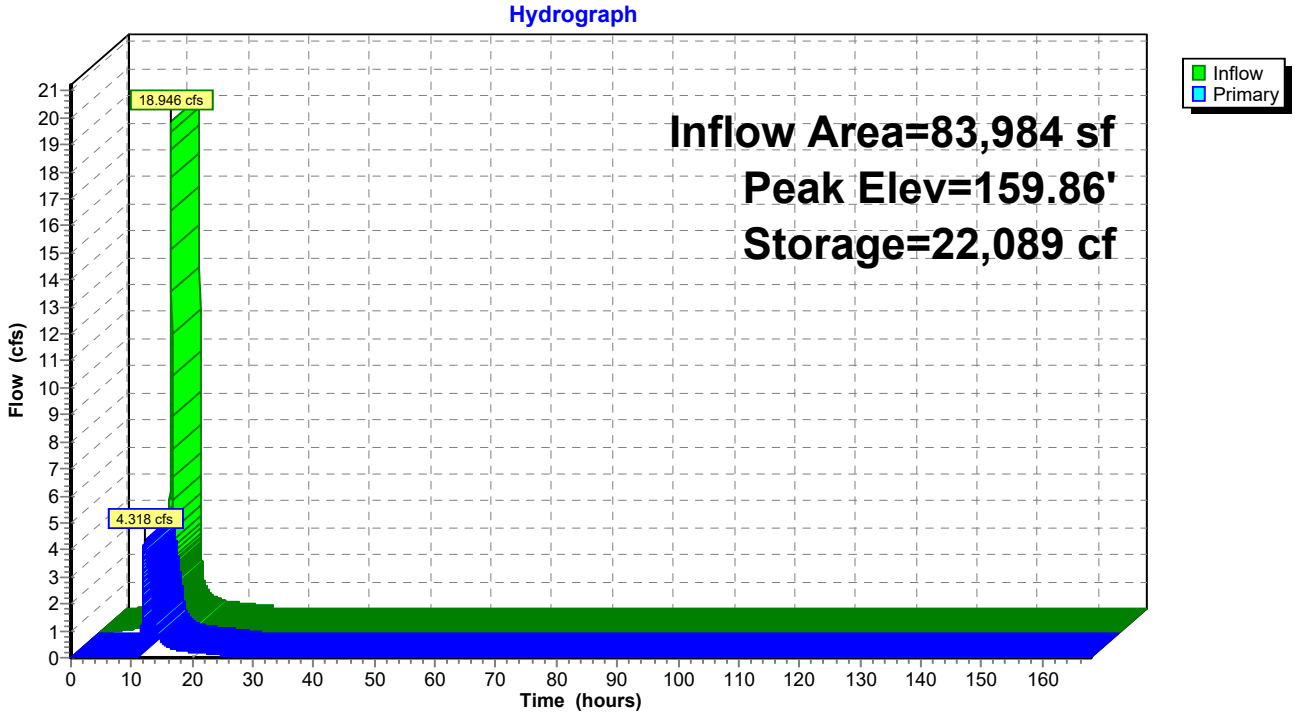
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

Chamber Storage + Stone Storage = 27,162.4 cf = 0.624 af
Overall Storage Efficiency = 64.9%
Overall System Size = 108.00' x 120.75' x 3.21'

405 Chambers
1,549.6 cy Field
906.0 cy Stone



Pond 1P: UG1


Hydrograph
Inflow
Primary
18.946 cfs
4.318 cfs
Inflow Area=83,984 sf
Peak Elev=159.86'
Storage=22,089 cf
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.013	6	157.53	0.000
2.00	0.036	50	157.54	0.000
2.50	0.057	133	157.56	0.001
3.00	0.075	249	157.58	0.002
3.50	0.092	393	157.61	0.005
4.00	0.107	562	157.64	0.007
4.50	0.125	756	157.67	0.008
5.00	0.143	981	157.72	0.010
5.50	0.161	1,235	157.77	0.012
6.00	0.179	1,519	157.82	0.013
6.50	0.196	1,832	157.88	0.015
7.00	0.214	2,174	157.95	0.016
7.50	0.230	2,543	158.02	0.018
8.00	0.247	2,941	158.06	0.018
8.50	0.302	3,396	158.10	0.019
9.00	0.367	3,963	158.14	0.020
9.50	0.382	4,608	158.20	0.021
10.00	0.470	5,325	158.26	0.022
10.50	0.616	6,255	158.34	0.023
11.00	0.857	7,485	158.45	0.131
11.50	**1.419**	8,880	158.57	0.603
12.00	**15.649**	**20,470**	**159.68**	**4.000**
12.50	1.360	**19,194**	**159.54**	**3.750**
13.00	0.846	15,091	159.14	2.876
13.50	0.640	11,999	158.85	2.031
14.00	0.502	10,119	158.68	1.203
14.50	0.443	9,249	158.60	0.766
15.00	0.398	8,817	158.57	0.577
15.50	0.352	8,557	158.54	0.472
16.00	0.307	8,368	158.53	0.400
16.50	0.286	8,225	158.51	0.351
17.00	0.270	8,125	158.50	0.317
17.50	0.253	8,049	158.50	0.291
18.00	0.237	7,986	158.49	0.270
18.50	0.221	7,928	158.49	0.253
19.00	0.204	7,870	158.48	0.236
19.50	0.188	7,813	158.48	0.220
20.00	0.172	7,756	158.47	0.203
20.50	0.167	7,707	158.47	0.189
21.00	0.163	7,672	158.46	0.179
21.50	0.160	7,648	158.46	0.172
22.00	0.157	7,628	158.46	0.167
22.50	0.154	7,612	158.46	0.162
23.00	0.150	7,597	158.46	0.159
23.50	0.147	7,583	158.46	0.155
24.00	0.144	7,569	158.46	0.152
24.50	0.000	7,374	158.44	0.106
25.00	0.000	7,214	158.43	0.075

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	7,095	158.41	0.058
26.00	0.000	7,003	158.41	0.045
26.50	0.000	6,932	158.40	0.035
27.00	0.000	6,877	158.40	0.027
27.50	0.000	6,830	158.39	0.025
28.00	0.000	6,787	158.39	0.024
28.50	0.000	6,744	158.38	0.024
29.00	0.000	6,702	158.38	0.024
29.50	0.000	6,659	158.38	0.024
30.00	0.000	6,617	158.37	0.024
30.50	0.000	6,575	158.37	0.023
31.00	0.000	6,533	158.37	0.023
31.50	0.000	6,491	158.36	0.023
32.00	0.000	6,449	158.36	0.023
32.50	0.000	6,407	158.35	0.023
33.00	0.000	6,365	158.35	0.023
33.50	0.000	6,323	158.35	0.023
34.00	0.000	6,282	158.34	0.023
34.50	0.000	6,240	158.34	0.023
35.00	0.000	6,199	158.34	0.023
35.50	0.000	6,157	158.33	0.023
36.00	0.000	6,116	158.33	0.023
36.50	0.000	6,075	158.33	0.023
37.00	0.000	6,034	158.32	0.023
37.50	0.000	5,993	158.32	0.023
38.00	0.000	5,952	158.32	0.023
38.50	0.000	5,912	158.31	0.023
39.00	0.000	5,871	158.31	0.023
39.50	0.000	5,830	158.31	0.022
40.00	0.000	5,790	158.30	0.022
40.50	0.000	5,750	158.30	0.022
41.00	0.000	5,709	158.29	0.022
41.50	0.000	5,669	158.29	0.022
42.00	0.000	5,629	158.29	0.022
42.50	0.000	5,589	158.28	0.022
43.00	0.000	5,549	158.28	0.022
43.50	0.000	5,510	158.28	0.022
44.00	0.000	5,470	158.27	0.022
44.50	0.000	5,430	158.27	0.022
45.00	0.000	5,391	158.27	0.022
45.50	0.000	5,352	158.26	0.022
46.00	0.000	5,312	158.26	0.022
46.50	0.000	5,273	158.26	0.022
47.00	0.000	5,234	158.25	0.022
47.50	0.000	5,195	158.25	0.022
48.00	0.000	5,156	158.25	0.022
48.50	0.000	5,117	158.24	0.022
49.00	0.000	5,079	158.24	0.021
49.50	0.000	5,040	158.24	0.021
50.00	0.000	5,002	158.23	0.021
50.50	0.000	4,963	158.23	0.021

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,925	158.23	0.021
51.50	0.000	4,887	158.22	0.021
52.00	0.000	4,848	158.22	0.021
52.50	0.000	4,810	158.22	0.021
53.00	0.000	4,773	158.21	0.021
53.50	0.000	4,735	158.21	0.021
54.00	0.000	4,697	158.21	0.021
54.50	0.000	4,659	158.20	0.021
55.00	0.000	4,622	158.20	0.021
55.50	0.000	4,584	158.20	0.021
56.00	0.000	4,547	158.19	0.021
56.50	0.000	4,510	158.19	0.021
57.00	0.000	4,473	158.19	0.021
57.50	0.000	4,435	158.18	0.021
58.00	0.000	4,399	158.18	0.021
58.50	0.000	4,362	158.18	0.020
59.00	0.000	4,325	158.18	0.020
59.50	0.000	4,288	158.17	0.020
60.00	0.000	4,252	158.17	0.020
60.50	0.000	4,215	158.17	0.020
61.00	0.000	4,179	158.16	0.020
61.50	0.000	4,142	158.16	0.020
62.00	0.000	4,106	158.16	0.020
62.50	0.000	4,070	158.15	0.020
63.00	0.000	4,034	158.15	0.020
63.50	0.000	3,998	158.15	0.020
64.00	0.000	3,962	158.14	0.020
64.50	0.000	3,927	158.14	0.020
65.00	0.000	3,891	158.14	0.020
65.50	0.000	3,855	158.14	0.020
66.00	0.000	3,820	158.13	0.020
66.50	0.000	3,785	158.13	0.020
67.00	0.000	3,749	158.13	0.020
67.50	0.000	3,714	158.12	0.020
68.00	0.000	3,679	158.12	0.019
68.50	0.000	3,644	158.12	0.019
69.00	0.000	3,609	158.11	0.019
69.50	0.000	3,575	158.11	0.019
70.00	0.000	3,540	158.11	0.019
70.50	0.000	3,505	158.11	0.019
71.00	0.000	3,471	158.10	0.019
71.50	0.000	3,436	158.10	0.019
72.00	0.000	3,402	158.10	0.019
72.50	0.000	3,368	158.09	0.019
73.00	0.000	3,334	158.09	0.019
73.50	0.000	3,300	158.09	0.019
74.00	0.000	3,266	158.09	0.019
74.50	0.000	3,232	158.08	0.019
75.00	0.000	3,198	158.08	0.019
75.50	0.000	3,165	158.08	0.019
76.00	0.000	3,131	158.07	0.019

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	3,098	158.07	0.019
77.00	0.000	3,064	158.07	0.019
77.50	0.000	3,031	158.07	0.018
78.00	0.000	2,998	158.06	0.018
78.50	0.000	2,965	158.06	0.018
79.00	0.000	2,932	158.06	0.018
79.50	0.000	2,899	158.05	0.018
80.00	0.000	2,866	158.05	0.018
80.50	0.000	2,833	158.05	0.018
81.00	0.000	2,801	158.05	0.018
81.50	0.000	2,768	158.04	0.018
82.00	0.000	2,736	158.04	0.018
82.50	0.000	2,704	158.04	0.018
83.00	0.000	2,671	158.04	0.018
83.50	0.000	2,639	158.03	0.018
84.00	0.000	2,607	158.03	0.018
84.50	0.000	2,575	158.02	0.018
85.00	0.000	2,544	158.02	0.018
85.50	0.000	2,512	158.01	0.017
86.00	0.000	2,481	158.01	0.017
86.50	0.000	2,450	158.00	0.017
87.00	0.000	2,419	157.99	0.017
87.50	0.000	2,388	157.99	0.017
88.00	0.000	2,358	157.98	0.017
88.50	0.000	2,328	157.98	0.017
89.00	0.000	2,298	157.97	0.017
89.50	0.000	2,268	157.96	0.016
90.00	0.000	2,239	157.96	0.016
90.50	0.000	2,209	157.95	0.016
91.00	0.000	2,180	157.95	0.016
91.50	0.000	2,151	157.94	0.016
92.00	0.000	2,123	157.94	0.016
92.50	0.000	2,094	157.93	0.016
93.00	0.000	2,066	157.93	0.016
93.50	0.000	2,038	157.92	0.016
94.00	0.000	2,010	157.92	0.015
94.50	0.000	1,983	157.91	0.015
95.00	0.000	1,955	157.90	0.015
95.50	0.000	1,928	157.90	0.015
96.00	0.000	1,901	157.89	0.015
96.50	0.000	1,874	157.89	0.015
97.00	0.000	1,848	157.88	0.015
97.50	0.000	1,821	157.88	0.015
98.00	0.000	1,795	157.87	0.014
98.50	0.000	1,769	157.87	0.014
99.00	0.000	1,744	157.86	0.014
99.50	0.000	1,718	157.86	0.014
100.00	0.000	1,693	157.85	0.014
100.50	0.000	1,668	157.85	0.014
101.00	0.000	1,643	157.85	0.014
101.50	0.000	1,619	157.84	0.014

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	1,594	157.84	0.013
102.50	0.000	1,570	157.83	0.013
103.00	0.000	1,546	157.83	0.013
103.50	0.000	1,522	157.82	0.013
104.00	0.000	1,499	157.82	0.013
104.50	0.000	1,476	157.81	0.013
105.00	0.000	1,452	157.81	0.013
105.50	0.000	1,430	157.80	0.013
106.00	0.000	1,407	157.80	0.013
106.50	0.000	1,384	157.80	0.012
107.00	0.000	1,362	157.79	0.012
107.50	0.000	1,340	157.79	0.012
108.00	0.000	1,318	157.78	0.012
108.50	0.000	1,297	157.78	0.012
109.00	0.000	1,275	157.77	0.012
109.50	0.000	1,254	157.77	0.012
110.00	0.000	1,233	157.77	0.012
110.50	0.000	1,213	157.76	0.011
111.00	0.000	1,192	157.76	0.011
111.50	0.000	1,172	157.75	0.011
112.00	0.000	1,152	157.75	0.011
112.50	0.000	1,132	157.75	0.011
113.00	0.000	1,112	157.74	0.011
113.50	0.000	1,093	157.74	0.011
114.00	0.000	1,073	157.74	0.011
114.50	0.000	1,054	157.73	0.011
115.00	0.000	1,035	157.73	0.010
115.50	0.000	1,017	157.72	0.010
116.00	0.000	998	157.72	0.010
116.50	0.000	980	157.72	0.010
117.00	0.000	962	157.71	0.010
117.50	0.000	945	157.71	0.010
118.00	0.000	927	157.71	0.010
118.50	0.000	910	157.70	0.010
119.00	0.000	893	157.70	0.009
119.50	0.000	876	157.70	0.009
120.00	0.000	859	157.69	0.009
120.50	0.000	843	157.69	0.009
121.00	0.000	826	157.69	0.009
121.50	0.000	810	157.69	0.009
122.00	0.000	795	157.68	0.009
122.50	0.000	779	157.68	0.009
123.00	0.000	764	157.68	0.008
123.50	0.000	749	157.67	0.008
124.00	0.000	734	157.67	0.008
124.50	0.000	719	157.67	0.008
125.00	0.000	704	157.67	0.008
125.50	0.000	690	157.66	0.008
126.00	0.000	676	157.66	0.008
126.50	0.000	662	157.66	0.008
127.00	0.000	648	157.65	0.008

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	635	157.65	0.007
128.00	0.000	622	157.65	0.007
128.50	0.000	609	157.65	0.007
129.00	0.000	596	157.64	0.007
129.50	0.000	583	157.64	0.007
130.00	0.000	571	157.64	0.007
130.50	0.000	559	157.64	0.007
131.00	0.000	547	157.63	0.007
131.50	0.000	535	157.63	0.006
132.00	0.000	524	157.63	0.006
132.50	0.000	513	157.63	0.006
133.00	0.000	501	157.63	0.006
133.50	0.000	490	157.62	0.006
134.00	0.000	480	157.62	0.006
134.50	0.000	469	157.62	0.006
135.00	0.000	459	157.62	0.006
135.50	0.000	449	157.62	0.005
136.00	0.000	440	157.61	0.005
136.50	0.000	430	157.61	0.005
137.00	0.000	421	157.61	0.005
137.50	0.000	412	157.61	0.005
138.00	0.000	403	157.61	0.005
138.50	0.000	395	157.61	0.005
139.00	0.000	387	157.60	0.005
139.50	0.000	378	157.60	0.004
140.00	0.000	370	157.60	0.004
140.50	0.000	363	157.60	0.004
141.00	0.000	355	157.60	0.004
141.50	0.000	348	157.60	0.004
142.00	0.000	340	157.60	0.004
142.50	0.000	333	157.59	0.004
143.00	0.000	327	157.59	0.004
143.50	0.000	320	157.59	0.004
144.00	0.000	313	157.59	0.004
144.50	0.000	307	157.59	0.003
145.00	0.000	301	157.59	0.003
145.50	0.000	295	157.59	0.003
146.00	0.000	289	157.59	0.003
146.50	0.000	284	157.58	0.003
147.00	0.000	278	157.58	0.003
147.50	0.000	273	157.58	0.003
148.00	0.000	268	157.58	0.003
148.50	0.000	263	157.58	0.003
149.00	0.000	258	157.58	0.003
149.50	0.000	253	157.58	0.003
150.00	0.000	249	157.58	0.002
150.50	0.000	244	157.58	0.002
151.00	0.000	240	157.58	0.002
151.50	0.000	236	157.58	0.002
152.00	0.000	232	157.57	0.002
152.50	0.000	228	157.57	0.002

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	224	157.57	0.002
153.50	0.000	220	157.57	0.002
154.00	0.000	217	157.57	0.002
154.50	0.000	213	157.57	0.002
155.00	0.000	210	157.57	0.002
155.50	0.000	207	157.57	0.002
156.00	0.000	203	157.57	0.002
156.50	0.000	200	157.57	0.002
157.00	0.000	197	157.57	0.002
157.50	0.000	194	157.57	0.002
158.00	0.000	191	157.57	0.002
158.50	0.000	189	157.57	0.002
159.00	0.000	186	157.57	0.001
159.50	0.000	183	157.57	0.001
160.00	0.000	181	157.56	0.001
160.50	0.000	178	157.56	0.001
161.00	0.000	176	157.56	0.001
161.50	0.000	173	157.56	0.001
162.00	0.000	171	157.56	0.001
162.50	0.000	169	157.56	0.001
163.00	0.000	167	157.56	0.001
163.50	0.000	165	157.56	0.001
164.00	0.000	163	157.56	0.001
164.50	0.000	161	157.56	0.001
165.00	0.000	159	157.56	0.001
165.50	0.000	157	157.56	0.001
166.00	0.000	155	157.56	0.001
166.50	0.000	153	157.56	0.001
167.00	0.000	151	157.56	0.001
167.50	0.000	149	157.56	0.001
168.00	0.000	147	157.56	0.001

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 5.11" for 50-yr event
Inflow = 4.363 cfs @ 11.96 hrs, Volume= 9,138 cf
Outflow = 0.995 cfs @ 12.09 hrs, Volume= 9,138 cf, Atten= 77%, Lag= 8.1 min
Primary = 0.995 cfs @ 12.09 hrs, Volume= 9,138 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 161.32' @ 12.09 hrs Surf.Area= 2,542 sf Storage= 3,532 cf

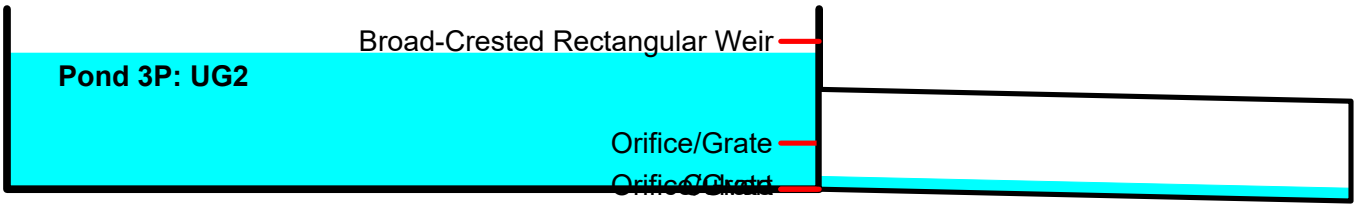
Plug-Flow detention time= 63.1 min calculated for 9,138 cf (100% of inflow)
Center-of-Mass det. time= 63.0 min (852.5 - 789.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.995 cfs @ 12.09 hrs HW=161.32' (Free Discharge)
└**4=Culvert** (Passes 0.995 cfs of 7.736 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.327 cfs @ 6.671 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.667 cfs @ 5.337 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 3P: UG2 - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Discontinued, not for new designs)
Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf
Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 3.44 sf x 8 rows

36.0" Wide + 3.0" Spacing = 39.0" C-C Row Spacing

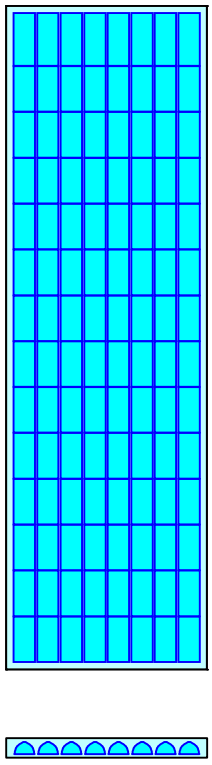
14 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 89.62' Row Length +12.0" End Stone x 2 = 91.62' Base Length
8 Rows x 36.0" Wide + 3.0" Spacing x 7 + 12.0" Side Stone x 2 = 27.75' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

112 Chambers x 21.8 cf +1.00' Row Adjustment x 3.44 sf x 8 Rows = 2,466.0 cf Chamber Storage

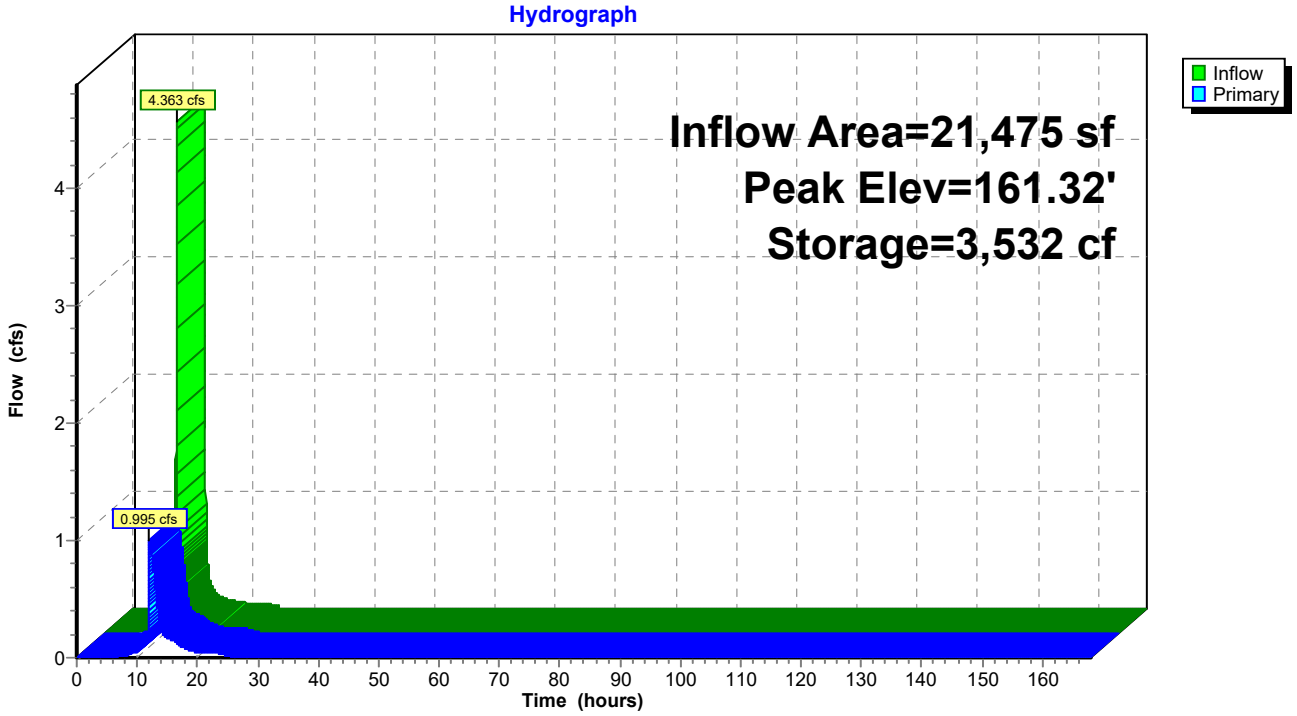
6,885.8 cf Field - 2,466.0 cf Chambers = 4,419.8 cf Stone x 40.0% Voids = 1,767.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,233.9 cf = 0.097 af
Overall Storage Efficiency = 61.5%
Overall System Size = 91.62' x 27.75' x 2.71'

112 Chambers
255.0 cy Field
163.7 cy Stone



Pond 3P: UG2


Hydrograph
Inflow Area=21,475 sf
Peak Elev=161.32'
Storage=3,532 cf
4.363 cfs
0.995 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.000	0	159.28	0.000
4.50	0.002	2	159.28	0.000
5.00	0.005	8	159.29	0.000
5.50	0.009	19	159.30	0.001
6.00	0.013	35	159.31	0.003
6.50	0.016	53	159.33	0.006
7.00	0.021	72	159.35	0.011
7.50	0.025	89	159.37	0.016
8.00	0.029	105	159.38	0.021
8.50	0.039	122	159.40	0.028
9.00	0.051	145	159.42	0.037
9.50	0.057	167	159.44	0.047
10.00	0.075	190	159.47	0.058
10.50	0.104	231	159.51	0.075
11.00	0.155	305	159.58	0.099
11.50	**0.276**	473	159.75	0.138
12.00	**3.650**	**3,144**	**161.07**	**0.900**
12.50	0.326	**2,904**	**160.94**	**0.844**
13.00	0.204	2,030	160.49	0.623
13.50	0.155	1,428	160.20	0.393
14.00	0.122	1,131	160.07	0.240
14.50	0.108	961	159.99	0.184
15.00	0.097	829	159.93	0.171
15.50	0.086	695	159.86	0.160
16.00	0.075	561	159.80	0.149
16.50	0.070	436	159.71	0.130
17.00	0.066	343	159.62	0.109
17.50	0.062	279	159.55	0.091
18.00	0.058	235	159.51	0.077
18.50	0.054	208	159.48	0.066
19.00	0.050	190	159.47	0.058
19.50	0.046	178	159.45	0.052
20.00	0.042	168	159.44	0.047
20.50	0.041	160	159.44	0.044
21.00	0.040	156	159.43	0.042
21.50	0.039	153	159.43	0.041
22.00	0.039	150	159.43	0.040
22.50	0.038	148	159.43	0.039
23.00	0.037	147	159.42	0.038
23.50	0.036	145	159.42	0.037
24.00	0.035	143	159.42	0.036
24.50	0.000	102	159.38	0.020
25.00	0.000	75	159.35	0.011

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	58	159.34	0.007
26.00	0.000	48	159.33	0.005
26.50	0.000	40	159.32	0.004
27.00	0.000	34	159.31	0.003
27.50	0.000	30	159.31	0.002
28.00	0.000	27	159.31	0.002
28.50	0.000	24	159.30	0.001
29.00	0.000	22	159.30	0.001
29.50	0.000	20	159.30	0.001
30.00	0.000	18	159.30	0.001
30.50	0.000	16	159.30	0.001
31.00	0.000	14	159.29	0.001
31.50	0.000	13	159.29	0.001
32.00	0.000	12	159.29	0.001
32.50	0.000	10	159.29	0.001
33.00	0.000	9	159.29	0.001
33.50	0.000	8	159.29	0.000
34.00	0.000	8	159.29	0.000
34.50	0.000	7	159.29	0.000
35.00	0.000	6	159.29	0.000
35.50	0.000	6	159.29	0.000
36.00	0.000	5	159.28	0.000
36.50	0.000	4	159.28	0.000
37.00	0.000	4	159.28	0.000
37.50	0.000	4	159.28	0.000
38.00	0.000	3	159.28	0.000
38.50	0.000	3	159.28	0.000
39.00	0.000	3	159.28	0.000
39.50	0.000	2	159.28	0.000
40.00	0.000	2	159.28	0.000
40.50	0.000	2	159.28	0.000
41.00	0.000	2	159.28	0.000
41.50	0.000	2	159.28	0.000
42.00	0.000	1	159.28	0.000
42.50	0.000	1	159.28	0.000
43.00	0.000	1	159.28	0.000
43.50	0.000	1	159.28	0.000
44.00	0.000	1	159.28	0.000
44.50	0.000	1	159.28	0.000
45.00	0.000	1	159.28	0.000
45.50	0.000	1	159.28	0.000
46.00	0.000	1	159.28	0.000
46.50	0.000	1	159.28	0.000
47.00	0.000	0	159.28	0.000
47.50	0.000	0	159.28	0.000
48.00	0.000	0	159.28	0.000
48.50	0.000	0	159.28	0.000
49.00	0.000	0	159.28	0.000
49.50	0.000	0	159.28	0.000
50.00	0.000	0	159.28	0.000
50.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	0	159.28	0.000
51.50	0.000	0	159.28	0.000
52.00	0.000	0	159.28	0.000
52.50	0.000	0	159.28	0.000
53.00	0.000	0	159.28	0.000
53.50	0.000	0	159.28	0.000
54.00	0.000	0	159.28	0.000
54.50	0.000	0	159.28	0.000
55.00	0.000	0	159.28	0.000
55.50	0.000	0	159.28	0.000
56.00	0.000	0	159.28	0.000
56.50	0.000	0	159.28	0.000
57.00	0.000	0	159.28	0.000
57.50	0.000	0	159.28	0.000
58.00	0.000	0	159.28	0.000
58.50	0.000	0	159.28	0.000
59.00	0.000	0	159.28	0.000
59.50	0.000	0	159.28	0.000
60.00	0.000	0	159.28	0.000
60.50	0.000	0	159.28	0.000
61.00	0.000	0	159.28	0.000
61.50	0.000	0	159.28	0.000
62.00	0.000	0	159.28	0.000
62.50	0.000	0	159.28	0.000
63.00	0.000	0	159.28	0.000
63.50	0.000	0	159.28	0.000
64.00	0.000	0	159.28	0.000
64.50	0.000	0	159.28	0.000
65.00	0.000	0	159.28	0.000
65.50	0.000	0	159.28	0.000
66.00	0.000	0	159.28	0.000
66.50	0.000	0	159.28	0.000
67.00	0.000	0	159.28	0.000
67.50	0.000	0	159.28	0.000
68.00	0.000	0	159.28	0.000
68.50	0.000	0	159.28	0.000
69.00	0.000	0	159.28	0.000
69.50	0.000	0	159.28	0.000
70.00	0.000	0	159.28	0.000
70.50	0.000	0	159.28	0.000
71.00	0.000	0	159.28	0.000
71.50	0.000	0	159.28	0.000
72.00	0.000	0	159.28	0.000
72.50	0.000	0	159.28	0.000
73.00	0.000	0	159.28	0.000
73.50	0.000	0	159.28	0.000
74.00	0.000	0	159.28	0.000
74.50	0.000	0	159.28	0.000
75.00	0.000	0	159.28	0.000
75.50	0.000	0	159.28	0.000
76.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	0	159.28	0.000
77.00	0.000	0	159.28	0.000
77.50	0.000	0	159.28	0.000
78.00	0.000	0	159.28	0.000
78.50	0.000	0	159.28	0.000
79.00	0.000	0	159.28	0.000
79.50	0.000	0	159.28	0.000
80.00	0.000	0	159.28	0.000
80.50	0.000	0	159.28	0.000
81.00	0.000	0	159.28	0.000
81.50	0.000	0	159.28	0.000
82.00	0.000	0	159.28	0.000
82.50	0.000	0	159.28	0.000
83.00	0.000	0	159.28	0.000
83.50	0.000	0	159.28	0.000
84.00	0.000	0	159.28	0.000
84.50	0.000	0	159.28	0.000
85.00	0.000	0	159.28	0.000
85.50	0.000	0	159.28	0.000
86.00	0.000	0	159.28	0.000
86.50	0.000	0	159.28	0.000
87.00	0.000	0	159.28	0.000
87.50	0.000	0	159.28	0.000
88.00	0.000	0	159.28	0.000
88.50	0.000	0	159.28	0.000
89.00	0.000	0	159.28	0.000
89.50	0.000	0	159.28	0.000
90.00	0.000	0	159.28	0.000
90.50	0.000	0	159.28	0.000
91.00	0.000	0	159.28	0.000
91.50	0.000	0	159.28	0.000
92.00	0.000	0	159.28	0.000
92.50	0.000	0	159.28	0.000
93.00	0.000	0	159.28	0.000
93.50	0.000	0	159.28	0.000
94.00	0.000	0	159.28	0.000
94.50	0.000	0	159.28	0.000
95.00	0.000	0	159.28	0.000
95.50	0.000	0	159.28	0.000
96.00	0.000	0	159.28	0.000
96.50	0.000	0	159.28	0.000
97.00	0.000	0	159.28	0.000
97.50	0.000	0	159.28	0.000
98.00	0.000	0	159.28	0.000
98.50	0.000	0	159.28	0.000
99.00	0.000	0	159.28	0.000
99.50	0.000	0	159.28	0.000
100.00	0.000	0	159.28	0.000
100.50	0.000	0	159.28	0.000
101.00	0.000	0	159.28	0.000
101.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	0	159.28	0.000
102.50	0.000	0	159.28	0.000
103.00	0.000	0	159.28	0.000
103.50	0.000	0	159.28	0.000
104.00	0.000	0	159.28	0.000
104.50	0.000	0	159.28	0.000
105.00	0.000	0	159.28	0.000
105.50	0.000	0	159.28	0.000
106.00	0.000	0	159.28	0.000
106.50	0.000	0	159.28	0.000
107.00	0.000	0	159.28	0.000
107.50	0.000	0	159.28	0.000
108.00	0.000	0	159.28	0.000
108.50	0.000	0	159.28	0.000
109.00	0.000	0	159.28	0.000
109.50	0.000	0	159.28	0.000
110.00	0.000	0	159.28	0.000
110.50	0.000	0	159.28	0.000
111.00	0.000	0	159.28	0.000
111.50	0.000	0	159.28	0.000
112.00	0.000	0	159.28	0.000
112.50	0.000	0	159.28	0.000
113.00	0.000	0	159.28	0.000
113.50	0.000	0	159.28	0.000
114.00	0.000	0	159.28	0.000
114.50	0.000	0	159.28	0.000
115.00	0.000	0	159.28	0.000
115.50	0.000	0	159.28	0.000
116.00	0.000	0	159.28	0.000
116.50	0.000	0	159.28	0.000
117.00	0.000	0	159.28	0.000
117.50	0.000	0	159.28	0.000
118.00	0.000	0	159.28	0.000
118.50	0.000	0	159.28	0.000
119.00	0.000	0	159.28	0.000
119.50	0.000	0	159.28	0.000
120.00	0.000	0	159.28	0.000
120.50	0.000	0	159.28	0.000
121.00	0.000	0	159.28	0.000
121.50	0.000	0	159.28	0.000
122.00	0.000	0	159.28	0.000
122.50	0.000	0	159.28	0.000
123.00	0.000	0	159.28	0.000
123.50	0.000	0	159.28	0.000
124.00	0.000	0	159.28	0.000
124.50	0.000	0	159.28	0.000
125.00	0.000	0	159.28	0.000
125.50	0.000	0	159.28	0.000
126.00	0.000	0	159.28	0.000
126.50	0.000	0	159.28	0.000
127.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	0	159.28	0.000
128.00	0.000	0	159.28	0.000
128.50	0.000	0	159.28	0.000
129.00	0.000	0	159.28	0.000
129.50	0.000	0	159.28	0.000
130.00	0.000	0	159.28	0.000
130.50	0.000	0	159.28	0.000
131.00	0.000	0	159.28	0.000
131.50	0.000	0	159.28	0.000
132.00	0.000	0	159.28	0.000
132.50	0.000	0	159.28	0.000
133.00	0.000	0	159.28	0.000
133.50	0.000	0	159.28	0.000
134.00	0.000	0	159.28	0.000
134.50	0.000	0	159.28	0.000
135.00	0.000	0	159.28	0.000
135.50	0.000	0	159.28	0.000
136.00	0.000	0	159.28	0.000
136.50	0.000	0	159.28	0.000
137.00	0.000	0	159.28	0.000
137.50	0.000	0	159.28	0.000
138.00	0.000	0	159.28	0.000
138.50	0.000	0	159.28	0.000
139.00	0.000	0	159.28	0.000
139.50	0.000	0	159.28	0.000
140.00	0.000	0	159.28	0.000
140.50	0.000	0	159.28	0.000
141.00	0.000	0	159.28	0.000
141.50	0.000	0	159.28	0.000
142.00	0.000	0	159.28	0.000
142.50	0.000	0	159.28	0.000
143.00	0.000	0	159.28	0.000
143.50	0.000	0	159.28	0.000
144.00	0.000	0	159.28	0.000
144.50	0.000	0	159.28	0.000
145.00	0.000	0	159.28	0.000
145.50	0.000	0	159.28	0.000
146.00	0.000	0	159.28	0.000
146.50	0.000	0	159.28	0.000
147.00	0.000	0	159.28	0.000
147.50	0.000	0	159.28	0.000
148.00	0.000	0	159.28	0.000
148.50	0.000	0	159.28	0.000
149.00	0.000	0	159.28	0.000
149.50	0.000	0	159.28	0.000
150.00	0.000	0	159.28	0.000
150.50	0.000	0	159.28	0.000
151.00	0.000	0	159.28	0.000
151.50	0.000	0	159.28	0.000
152.00	0.000	0	159.28	0.000
152.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	0	159.28	0.000
153.50	0.000	0	159.28	0.000
154.00	0.000	0	159.28	0.000
154.50	0.000	0	159.28	0.000
155.00	0.000	0	159.28	0.000
155.50	0.000	0	159.28	0.000
156.00	0.000	0	159.28	0.000
156.50	0.000	0	159.28	0.000
157.00	0.000	0	159.28	0.000
157.50	0.000	0	159.28	0.000
158.00	0.000	0	159.28	0.000
158.50	0.000	0	159.28	0.000
159.00	0.000	0	159.28	0.000
159.50	0.000	0	159.28	0.000
160.00	0.000	0	159.28	0.000
160.50	0.000	0	159.28	0.000
161.00	0.000	0	159.28	0.000
161.50	0.000	0	159.28	0.000
162.00	0.000	0	159.28	0.000
162.50	0.000	0	159.28	0.000
163.00	0.000	0	159.28	0.000
163.50	0.000	0	159.28	0.000
164.00	0.000	0	159.28	0.000
164.50	0.000	0	159.28	0.000
165.00	0.000	0	159.28	0.000
165.50	0.000	0	159.28	0.000
166.00	0.000	0	159.28	0.000
166.50	0.000	0	159.28	0.000
167.00	0.000	0	159.28	0.000
167.50	0.000	0	159.28	0.000
168.00	0.000	0	159.28	0.000

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 7.18" for 100-yr event
Inflow = 21.616 cfs @ 11.96 hrs, Volume= 50,262 cf
Outflow = 4.898 cfs @ 12.09 hrs, Volume= 50,115 cf, Atten= 77%, Lag= 8.1 min
Primary = 4.898 cfs @ 12.09 hrs, Volume= 50,115 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 160.24' @ 12.09 hrs Surf.Area= 13,041 sf Storage= 24,557 cf

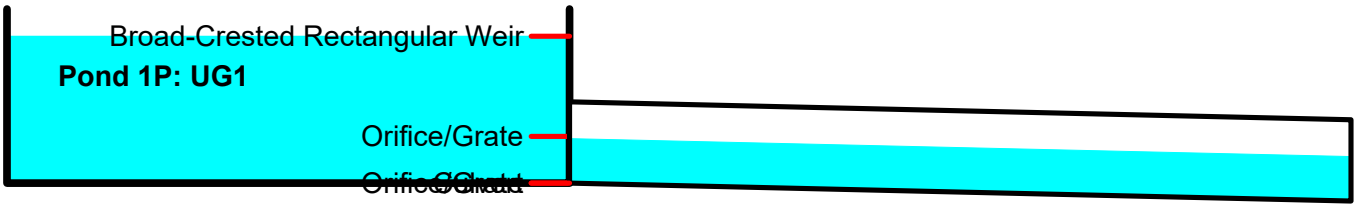
Plug-Flow detention time= 593.4 min calculated for 50,112 cf (100% of inflow)
Center-of-Mass det. time= 591.8 min (1,340.1 - 748.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=4.898 cfs @ 12.09 hrs HW=160.24' (Free Discharge)
└**4=Culvert** (Passes 4.898 cfs of 8.980 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.043 cfs @ 7.863 fps)
  ├**2=Orifice/Grate** (Orifice Controls 4.855 cfs @ 6.242 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 1P: UG1 - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger®280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 27 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

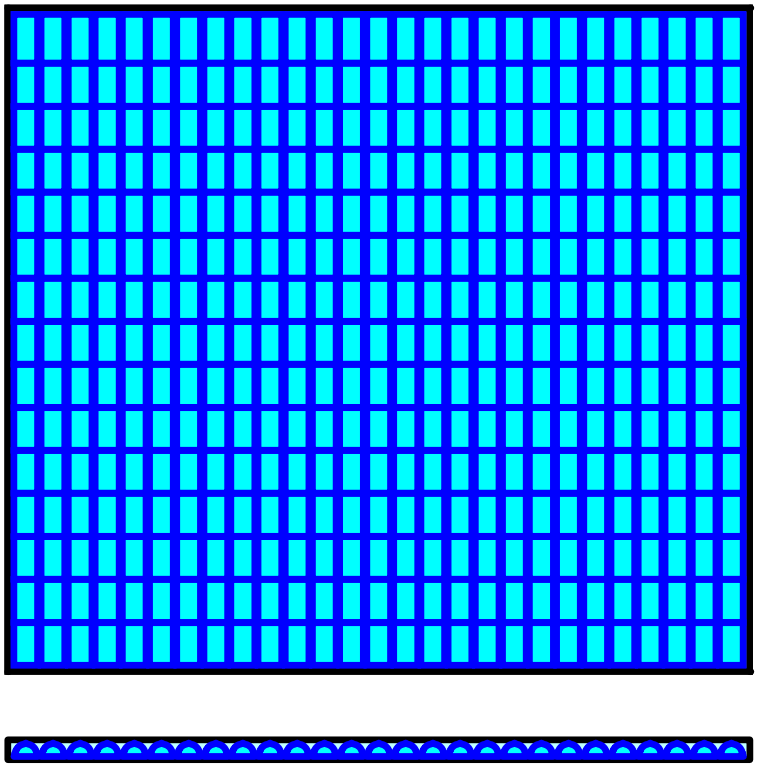
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

405 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 27 Rows = 17,377.3 cf Chamber Storage

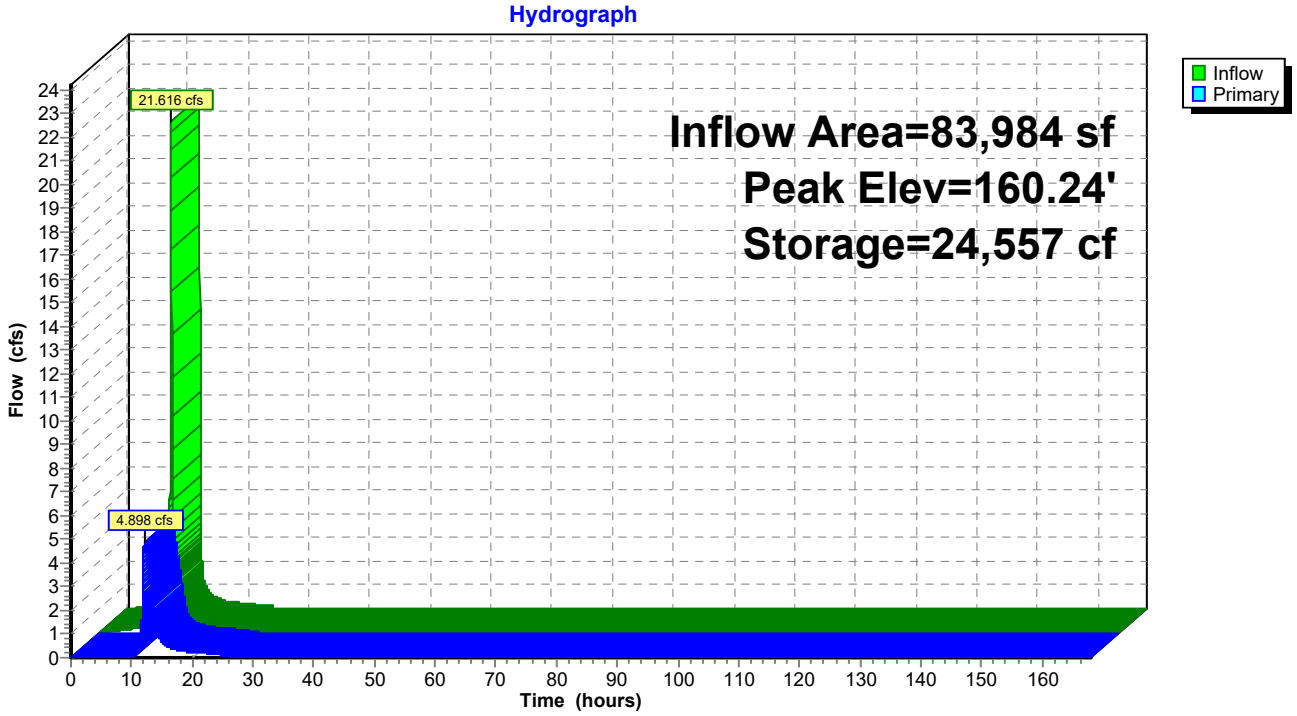
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

Chamber Storage + Stone Storage = 27,162.4 cf = 0.624 af
Overall Storage Efficiency = 64.9%
Overall System Size = 108.00' x 120.75' x 3.21'

405 Chambers
1,549.6 cy Field
906.0 cy Stone



Pond 1P: UG1


Hydrograph
Inflow
Primary
Inflow Area=83,984 sf
Peak Elev=160.24'
Storage=24,557 cf
21.616 cfs
4.898 cfs
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.024	17	157.53	0.000
2.00	0.052	86	157.55	0.001
2.50	0.075	199	157.57	0.002
3.00	0.096	349	157.60	0.004
3.50	0.115	530	157.63	0.006
4.00	0.132	740	157.67	0.008
4.50	0.152	979	157.72	0.010
5.00	0.173	1,252	157.77	0.012
5.50	0.193	1,560	157.83	0.013
6.00	0.213	1,900	157.89	0.015
6.50	0.232	2,273	157.97	0.016
7.00	0.252	2,677	158.04	0.018
7.50	0.270	3,114	158.07	0.019
8.00	0.289	3,583	158.11	0.019
8.50	0.352	4,118	158.16	0.020
9.00	0.426	4,781	158.21	0.021
9.50	0.443	5,532	158.28	0.022
10.00	0.542	6,365	158.35	0.023
10.50	0.709	7,405	158.44	0.113
11.00	0.985	8,448	158.53	0.430
11.50	**1.627**	9,576	158.63	0.923
12.00	**17.848**	**22,690**	**159.94**	**4.441**
12.50	1.550	**21,376**	**159.78**	**4.177**
13.00	0.964	16,809	159.30	3.260
13.50	0.729	13,224	158.96	2.401
14.00	0.572	10,811	158.74	1.574
14.50	0.505	9,599	158.63	0.934
15.00	0.453	9,045	158.59	0.674
15.50	0.401	8,731	158.56	0.540
16.00	0.349	8,514	158.54	0.456
16.50	0.326	8,357	158.52	0.396
17.00	0.307	8,249	158.52	0.359
17.50	0.289	8,165	158.51	0.331
18.00	0.270	8,095	158.50	0.307
18.50	0.251	8,032	158.50	0.285
19.00	0.233	7,972	158.49	0.266
19.50	0.214	7,912	158.49	0.249
20.00	0.196	7,850	158.48	0.231
20.50	0.190	7,795	158.48	0.215
21.00	0.186	7,757	158.47	0.204
21.50	0.182	7,730	158.47	0.196
22.00	0.179	7,708	158.47	0.190
22.50	0.175	7,690	158.47	0.184
23.00	0.171	7,674	158.46	0.180
23.50	0.168	7,659	158.46	0.176
24.00	0.164	7,645	158.46	0.172
24.50	0.000	7,428	158.44	0.118
25.00	0.000	7,251	158.43	0.080

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	7,124	158.42	0.062
26.00	0.000	7,025	158.41	0.048
26.50	0.000	6,949	158.40	0.037
27.00	0.000	6,890	158.40	0.029
27.50	0.000	6,842	158.39	0.025
28.00	0.000	6,798	158.39	0.024
28.50	0.000	6,756	158.39	0.024
29.00	0.000	6,713	158.38	0.024
29.50	0.000	6,671	158.38	0.024
30.00	0.000	6,628	158.37	0.024
30.50	0.000	6,586	158.37	0.023
31.00	0.000	6,544	158.37	0.023
31.50	0.000	6,502	158.36	0.023
32.00	0.000	6,460	158.36	0.023
32.50	0.000	6,418	158.36	0.023
33.00	0.000	6,376	158.35	0.023
33.50	0.000	6,334	158.35	0.023
34.00	0.000	6,293	158.35	0.023
34.50	0.000	6,251	158.34	0.023
35.00	0.000	6,210	158.34	0.023
35.50	0.000	6,168	158.33	0.023
36.00	0.000	6,127	158.33	0.023
36.50	0.000	6,086	158.33	0.023
37.00	0.000	6,045	158.32	0.023
37.50	0.000	6,004	158.32	0.023
38.00	0.000	5,963	158.32	0.023
38.50	0.000	5,922	158.31	0.023
39.00	0.000	5,882	158.31	0.023
39.50	0.000	5,841	158.31	0.023
40.00	0.000	5,801	158.30	0.022
40.50	0.000	5,760	158.30	0.022
41.00	0.000	5,720	158.30	0.022
41.50	0.000	5,680	158.29	0.022
42.00	0.000	5,640	158.29	0.022
42.50	0.000	5,600	158.29	0.022
43.00	0.000	5,560	158.28	0.022
43.50	0.000	5,520	158.28	0.022
44.00	0.000	5,481	158.27	0.022
44.50	0.000	5,441	158.27	0.022
45.00	0.000	5,401	158.27	0.022
45.50	0.000	5,362	158.26	0.022
46.00	0.000	5,323	158.26	0.022
46.50	0.000	5,284	158.26	0.022
47.00	0.000	5,244	158.25	0.022
47.50	0.000	5,205	158.25	0.022
48.00	0.000	5,166	158.25	0.022
48.50	0.000	5,128	158.24	0.022
49.00	0.000	5,089	158.24	0.021
49.50	0.000	5,050	158.24	0.021
50.00	0.000	5,012	158.23	0.021
50.50	0.000	4,973	158.23	0.021

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,935	158.23	0.021
51.50	0.000	4,897	158.22	0.021
52.00	0.000	4,859	158.22	0.021
52.50	0.000	4,821	158.22	0.021
53.00	0.000	4,783	158.21	0.021
53.50	0.000	4,745	158.21	0.021
54.00	0.000	4,707	158.21	0.021
54.50	0.000	4,669	158.21	0.021
55.00	0.000	4,632	158.20	0.021
55.50	0.000	4,594	158.20	0.021
56.00	0.000	4,557	158.20	0.021
56.50	0.000	4,520	158.19	0.021
57.00	0.000	4,482	158.19	0.021
57.50	0.000	4,445	158.19	0.021
58.00	0.000	4,408	158.18	0.021
58.50	0.000	4,371	158.18	0.020
59.00	0.000	4,335	158.18	0.020
59.50	0.000	4,298	158.17	0.020
60.00	0.000	4,261	158.17	0.020
60.50	0.000	4,225	158.17	0.020
61.00	0.000	4,188	158.16	0.020
61.50	0.000	4,152	158.16	0.020
62.00	0.000	4,116	158.16	0.020
62.50	0.000	4,080	158.15	0.020
63.00	0.000	4,044	158.15	0.020
63.50	0.000	4,008	158.15	0.020
64.00	0.000	3,972	158.15	0.020
64.50	0.000	3,936	158.14	0.020
65.00	0.000	3,900	158.14	0.020
65.50	0.000	3,865	158.14	0.020
66.00	0.000	3,829	158.13	0.020
66.50	0.000	3,794	158.13	0.020
67.00	0.000	3,759	158.13	0.020
67.50	0.000	3,724	158.12	0.020
68.00	0.000	3,689	158.12	0.019
68.50	0.000	3,654	158.12	0.019
69.00	0.000	3,619	158.12	0.019
69.50	0.000	3,584	158.11	0.019
70.00	0.000	3,549	158.11	0.019
70.50	0.000	3,515	158.11	0.019
71.00	0.000	3,480	158.10	0.019
71.50	0.000	3,446	158.10	0.019
72.00	0.000	3,411	158.10	0.019
72.50	0.000	3,377	158.09	0.019
73.00	0.000	3,343	158.09	0.019
73.50	0.000	3,309	158.09	0.019
74.00	0.000	3,275	158.09	0.019
74.50	0.000	3,241	158.08	0.019
75.00	0.000	3,207	158.08	0.019
75.50	0.000	3,174	158.08	0.019
76.00	0.000	3,140	158.07	0.019

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	3,107	158.07	0.019
77.00	0.000	3,073	158.07	0.019
77.50	0.000	3,040	158.07	0.018
78.00	0.000	3,007	158.06	0.018
78.50	0.000	2,974	158.06	0.018
79.00	0.000	2,941	158.06	0.018
79.50	0.000	2,908	158.06	0.018
80.00	0.000	2,875	158.05	0.018
80.50	0.000	2,842	158.05	0.018
81.00	0.000	2,809	158.05	0.018
81.50	0.000	2,777	158.04	0.018
82.00	0.000	2,745	158.04	0.018
82.50	0.000	2,712	158.04	0.018
83.00	0.000	2,680	158.04	0.018
83.50	0.000	2,648	158.03	0.018
84.00	0.000	2,616	158.03	0.018
84.50	0.000	2,584	158.03	0.018
85.00	0.000	2,552	158.02	0.018
85.50	0.000	2,520	158.01	0.017
86.00	0.000	2,489	158.01	0.017
86.50	0.000	2,458	158.00	0.017
87.00	0.000	2,427	158.00	0.017
87.50	0.000	2,397	157.99	0.017
88.00	0.000	2,366	157.98	0.017
88.50	0.000	2,336	157.98	0.017
89.00	0.000	2,306	157.97	0.017
89.50	0.000	2,276	157.97	0.016
90.00	0.000	2,246	157.96	0.016
90.50	0.000	2,217	157.96	0.016
91.00	0.000	2,188	157.95	0.016
91.50	0.000	2,159	157.94	0.016
92.00	0.000	2,130	157.94	0.016
92.50	0.000	2,102	157.93	0.016
93.00	0.000	2,073	157.93	0.016
93.50	0.000	2,045	157.92	0.016
94.00	0.000	2,018	157.92	0.015
94.50	0.000	1,990	157.91	0.015
95.00	0.000	1,962	157.91	0.015
95.50	0.000	1,935	157.90	0.015
96.00	0.000	1,908	157.90	0.015
96.50	0.000	1,881	157.89	0.015
97.00	0.000	1,855	157.89	0.015
97.50	0.000	1,828	157.88	0.015
98.00	0.000	1,802	157.88	0.014
98.50	0.000	1,776	157.87	0.014
99.00	0.000	1,751	157.87	0.014
99.50	0.000	1,725	157.86	0.014
100.00	0.000	1,700	157.86	0.014
100.50	0.000	1,675	157.85	0.014
101.00	0.000	1,650	157.85	0.014
101.50	0.000	1,625	157.84	0.014

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	1,601	157.84	0.014
102.50	0.000	1,576	157.83	0.013
103.00	0.000	1,552	157.83	0.013
103.50	0.000	1,529	157.82	0.013
104.00	0.000	1,505	157.82	0.013
104.50	0.000	1,482	157.81	0.013
105.00	0.000	1,459	157.81	0.013
105.50	0.000	1,436	157.81	0.013
106.00	0.000	1,413	157.80	0.013
106.50	0.000	1,390	157.80	0.012
107.00	0.000	1,368	157.79	0.012
107.50	0.000	1,346	157.79	0.012
108.00	0.000	1,324	157.78	0.012
108.50	0.000	1,302	157.78	0.012
109.00	0.000	1,281	157.78	0.012
109.50	0.000	1,260	157.77	0.012
110.00	0.000	1,239	157.77	0.012
110.50	0.000	1,218	157.76	0.011
111.00	0.000	1,197	157.76	0.011
111.50	0.000	1,177	157.76	0.011
112.00	0.000	1,157	157.75	0.011
112.50	0.000	1,137	157.75	0.011
113.00	0.000	1,117	157.74	0.011
113.50	0.000	1,098	157.74	0.011
114.00	0.000	1,078	157.74	0.011
114.50	0.000	1,059	157.73	0.011
115.00	0.000	1,040	157.73	0.010
115.50	0.000	1,022	157.73	0.010
116.00	0.000	1,003	157.72	0.010
116.50	0.000	985	157.72	0.010
117.00	0.000	967	157.72	0.010
117.50	0.000	949	157.71	0.010
118.00	0.000	932	157.71	0.010
118.50	0.000	914	157.71	0.010
119.00	0.000	897	157.70	0.009
119.50	0.000	880	157.70	0.009
120.00	0.000	864	157.70	0.009
120.50	0.000	847	157.69	0.009
121.00	0.000	831	157.69	0.009
121.50	0.000	815	157.69	0.009
122.00	0.000	799	157.68	0.009
122.50	0.000	783	157.68	0.009
123.00	0.000	768	157.68	0.009
123.50	0.000	753	157.67	0.008
124.00	0.000	738	157.67	0.008
124.50	0.000	723	157.67	0.008
125.00	0.000	708	157.67	0.008
125.50	0.000	694	157.66	0.008
126.00	0.000	680	157.66	0.008
126.50	0.000	666	157.66	0.008
127.00	0.000	652	157.65	0.008

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	638	157.65	0.007
128.00	0.000	625	157.65	0.007
128.50	0.000	612	157.65	0.007
129.00	0.000	599	157.64	0.007
129.50	0.000	587	157.64	0.007
130.00	0.000	574	157.64	0.007
130.50	0.000	562	157.64	0.007
131.00	0.000	550	157.64	0.007
131.50	0.000	538	157.63	0.006
132.00	0.000	527	157.63	0.006
132.50	0.000	515	157.63	0.006
133.00	0.000	504	157.63	0.006
133.50	0.000	493	157.62	0.006
134.00	0.000	483	157.62	0.006
134.50	0.000	472	157.62	0.006
135.00	0.000	462	157.62	0.006
135.50	0.000	452	157.62	0.005
136.00	0.000	442	157.61	0.005
136.50	0.000	433	157.61	0.005
137.00	0.000	424	157.61	0.005
137.50	0.000	415	157.61	0.005
138.00	0.000	406	157.61	0.005
138.50	0.000	397	157.61	0.005
139.00	0.000	389	157.60	0.005
139.50	0.000	381	157.60	0.005
140.00	0.000	373	157.60	0.004
140.50	0.000	365	157.60	0.004
141.00	0.000	357	157.60	0.004
141.50	0.000	350	157.60	0.004
142.00	0.000	342	157.60	0.004
142.50	0.000	335	157.59	0.004
143.00	0.000	328	157.59	0.004
143.50	0.000	322	157.59	0.004
144.00	0.000	315	157.59	0.004
144.50	0.000	309	157.59	0.003
145.00	0.000	303	157.59	0.003
145.50	0.000	297	157.59	0.003
146.00	0.000	291	157.59	0.003
146.50	0.000	285	157.58	0.003
147.00	0.000	280	157.58	0.003
147.50	0.000	274	157.58	0.003
148.00	0.000	269	157.58	0.003
148.50	0.000	264	157.58	0.003
149.00	0.000	259	157.58	0.003
149.50	0.000	255	157.58	0.003
150.00	0.000	250	157.58	0.003
150.50	0.000	246	157.58	0.002
151.00	0.000	241	157.58	0.002
151.50	0.000	237	157.58	0.002
152.00	0.000	233	157.57	0.002
152.50	0.000	229	157.57	0.002

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	225	157.57	0.002
153.50	0.000	221	157.57	0.002
154.00	0.000	218	157.57	0.002
154.50	0.000	214	157.57	0.002
155.00	0.000	211	157.57	0.002
155.50	0.000	207	157.57	0.002
156.00	0.000	204	157.57	0.002
156.50	0.000	201	157.57	0.002
157.00	0.000	198	157.57	0.002
157.50	0.000	195	157.57	0.002
158.00	0.000	192	157.57	0.002
158.50	0.000	189	157.57	0.002
159.00	0.000	187	157.57	0.001
159.50	0.000	184	157.57	0.001
160.00	0.000	181	157.56	0.001
160.50	0.000	179	157.56	0.001
161.00	0.000	176	157.56	0.001
161.50	0.000	174	157.56	0.001
162.00	0.000	172	157.56	0.001
162.50	0.000	170	157.56	0.001
163.00	0.000	167	157.56	0.001
163.50	0.000	165	157.56	0.001
164.00	0.000	163	157.56	0.001
164.50	0.000	161	157.56	0.001
165.00	0.000	159	157.56	0.001
165.50	0.000	157	157.56	0.001
166.00	0.000	155	157.56	0.001
166.50	0.000	153	157.56	0.001
167.00	0.000	151	157.56	0.001
167.50	0.000	149	157.56	0.001
168.00	0.000	147	157.56	0.001

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 6.00" for 100-yr event
Inflow = 5.073 cfs @ 11.96 hrs, Volume= 10,741 cf
Outflow = 2.374 cfs @ 12.05 hrs, Volume= 10,741 cf, Atten= 53%, Lag= 5.3 min
Primary = 2.374 cfs @ 12.05 hrs, Volume= 10,741 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 161.71' @ 12.05 hrs Surf.Area= 2,542 sf Storage= 3,947 cf

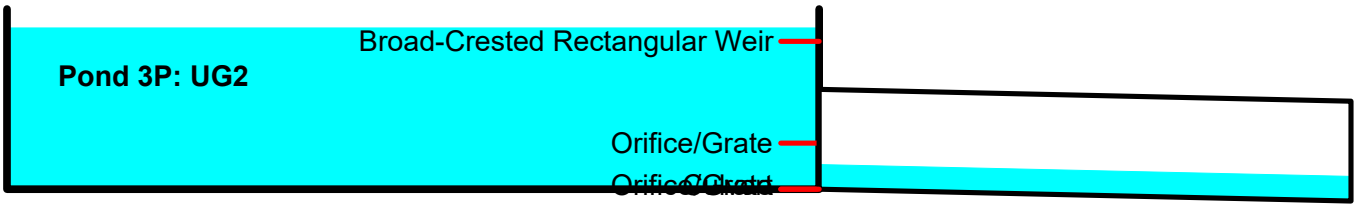
Plug-Flow detention time= 60.3 min calculated for 10,741 cf (100% of inflow)
Center-of-Mass det. time= 60.4 min (845.5 - 785.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=2.359 cfs @ 12.05 hrs HW=161.71' (Free Discharge)
└**4=Culvert** (Passes 2.359 cfs of 9.554 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.358 cfs @ 7.302 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.764 cfs @ 6.108 fps)
  └**3=Broad-Crested Rectangular Weir** (Weir Controls 1.237 cfs @ 1.508 fps)



Pond 3P: UG2 - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Discontinued, not for new designs)
Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf
Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 3.44 sf x 8 rows

36.0" Wide + 3.0" Spacing = 39.0" C-C Row Spacing

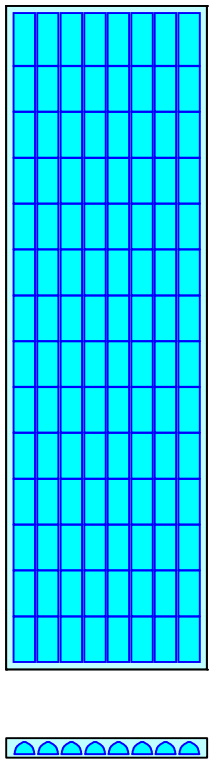
14 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 89.62' Row Length +12.0" End Stone x 2 = 91.62' Base Length
8 Rows x 36.0" Wide + 3.0" Spacing x 7 + 12.0" Side Stone x 2 = 27.75' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

112 Chambers x 21.8 cf +1.00' Row Adjustment x 3.44 sf x 8 Rows = 2,466.0 cf Chamber Storage

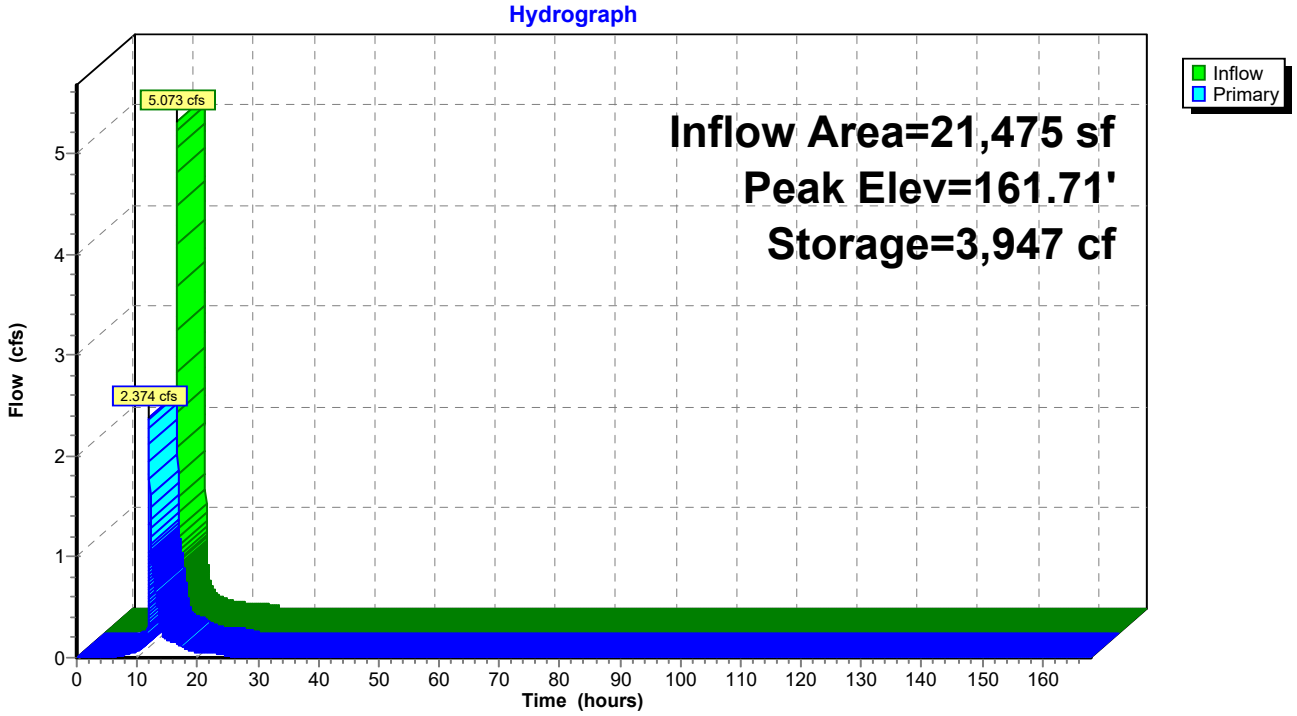
6,885.8 cf Field - 2,466.0 cf Chambers = 4,419.8 cf Stone x 40.0% Voids = 1,767.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,233.9 cf = 0.097 af
Overall Storage Efficiency = 61.5%
Overall System Size = 91.62' x 27.75' x 2.71'

112 Chambers
255.0 cy Field
163.7 cy Stone



Pond 3P: UG2


Hydrograph
Inflow Area=21,475 sf
Peak Elev=161.71'
Storage=3,947 cf
5.073 cfs
2.374 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.002	1	159.28	0.000
4.50	0.006	8	159.29	0.000
5.00	0.010	20	159.30	0.001
5.50	0.014	38	159.32	0.003
6.00	0.018	58	159.34	0.007
6.50	0.023	78	159.36	0.012
7.00	0.028	96	159.37	0.018
7.50	0.033	113	159.39	0.024
8.00	0.038	128	159.41	0.030
8.50	0.050	146	159.42	0.038
9.00	0.065	171	159.45	0.049
9.50	0.071	196	159.47	0.060
10.00	0.093	222	159.50	0.072
10.50	0.128	274	159.55	0.090
11.00	0.188	372	159.65	0.116
11.50	**0.331**	585	159.81	0.151
12.00	**4.234**	**3,704**	**161.47**	**1.044**
12.50	0.376	**3,183**	**161.10**	**0.909**
13.00	0.235	2,263	160.61	0.688
13.50	0.178	1,585	160.28	0.472
14.00	0.140	1,216	160.11	0.278
14.50	0.124	1,030	160.02	0.203
15.00	0.111	906	159.96	0.176
15.50	0.099	785	159.91	0.167
16.00	0.086	659	159.85	0.157
16.50	0.080	534	159.79	0.147
17.00	0.076	425	159.70	0.128
17.50	0.071	344	159.62	0.109
18.00	0.067	286	159.56	0.093
18.50	0.062	246	159.52	0.081
19.00	0.058	217	159.49	0.070
19.50	0.053	199	159.48	0.062
20.00	0.048	185	159.46	0.055
20.50	0.047	175	159.45	0.051
21.00	0.046	170	159.45	0.048
21.50	0.045	166	159.44	0.047
22.00	0.044	164	159.44	0.046
22.50	0.043	161	159.44	0.045
23.00	0.042	159	159.44	0.044
23.50	0.042	157	159.43	0.043
24.00	0.041	155	159.43	0.042
24.50	0.000	108	159.39	0.022
25.00	0.000	78	159.36	0.012

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	61	159.34	0.008
26.00	0.000	49	159.33	0.005
26.50	0.000	41	159.32	0.004
27.00	0.000	35	159.31	0.003
27.50	0.000	31	159.31	0.002
28.00	0.000	27	159.31	0.002
28.50	0.000	25	159.30	0.001
29.00	0.000	22	159.30	0.001
29.50	0.000	20	159.30	0.001
30.00	0.000	18	159.30	0.001
30.50	0.000	16	159.30	0.001
31.00	0.000	15	159.29	0.001
31.50	0.000	13	159.29	0.001
32.00	0.000	12	159.29	0.001
32.50	0.000	11	159.29	0.001
33.00	0.000	10	159.29	0.001
33.50	0.000	9	159.29	0.001
34.00	0.000	8	159.29	0.000
34.50	0.000	7	159.29	0.000
35.00	0.000	6	159.29	0.000
35.50	0.000	6	159.29	0.000
36.00	0.000	5	159.29	0.000
36.50	0.000	5	159.28	0.000
37.00	0.000	4	159.28	0.000
37.50	0.000	4	159.28	0.000
38.00	0.000	3	159.28	0.000
38.50	0.000	3	159.28	0.000
39.00	0.000	3	159.28	0.000
39.50	0.000	2	159.28	0.000
40.00	0.000	2	159.28	0.000
40.50	0.000	2	159.28	0.000
41.00	0.000	2	159.28	0.000
41.50	0.000	2	159.28	0.000
42.00	0.000	1	159.28	0.000
42.50	0.000	1	159.28	0.000
43.00	0.000	1	159.28	0.000
43.50	0.000	1	159.28	0.000
44.00	0.000	1	159.28	0.000
44.50	0.000	1	159.28	0.000
45.00	0.000	1	159.28	0.000
45.50	0.000	1	159.28	0.000
46.00	0.000	1	159.28	0.000
46.50	0.000	1	159.28	0.000
47.00	0.000	1	159.28	0.000
47.50	0.000	0	159.28	0.000
48.00	0.000	0	159.28	0.000
48.50	0.000	0	159.28	0.000
49.00	0.000	0	159.28	0.000
49.50	0.000	0	159.28	0.000
50.00	0.000	0	159.28	0.000
50.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	0	159.28	0.000
51.50	0.000	0	159.28	0.000
52.00	0.000	0	159.28	0.000
52.50	0.000	0	159.28	0.000
53.00	0.000	0	159.28	0.000
53.50	0.000	0	159.28	0.000
54.00	0.000	0	159.28	0.000
54.50	0.000	0	159.28	0.000
55.00	0.000	0	159.28	0.000
55.50	0.000	0	159.28	0.000
56.00	0.000	0	159.28	0.000
56.50	0.000	0	159.28	0.000
57.00	0.000	0	159.28	0.000
57.50	0.000	0	159.28	0.000
58.00	0.000	0	159.28	0.000
58.50	0.000	0	159.28	0.000
59.00	0.000	0	159.28	0.000
59.50	0.000	0	159.28	0.000
60.00	0.000	0	159.28	0.000
60.50	0.000	0	159.28	0.000
61.00	0.000	0	159.28	0.000
61.50	0.000	0	159.28	0.000
62.00	0.000	0	159.28	0.000
62.50	0.000	0	159.28	0.000
63.00	0.000	0	159.28	0.000
63.50	0.000	0	159.28	0.000
64.00	0.000	0	159.28	0.000
64.50	0.000	0	159.28	0.000
65.00	0.000	0	159.28	0.000
65.50	0.000	0	159.28	0.000
66.00	0.000	0	159.28	0.000
66.50	0.000	0	159.28	0.000
67.00	0.000	0	159.28	0.000
67.50	0.000	0	159.28	0.000
68.00	0.000	0	159.28	0.000
68.50	0.000	0	159.28	0.000
69.00	0.000	0	159.28	0.000
69.50	0.000	0	159.28	0.000
70.00	0.000	0	159.28	0.000
70.50	0.000	0	159.28	0.000
71.00	0.000	0	159.28	0.000
71.50	0.000	0	159.28	0.000
72.00	0.000	0	159.28	0.000
72.50	0.000	0	159.28	0.000
73.00	0.000	0	159.28	0.000
73.50	0.000	0	159.28	0.000
74.00	0.000	0	159.28	0.000
74.50	0.000	0	159.28	0.000
75.00	0.000	0	159.28	0.000
75.50	0.000	0	159.28	0.000
76.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	0	159.28	0.000
77.00	0.000	0	159.28	0.000
77.50	0.000	0	159.28	0.000
78.00	0.000	0	159.28	0.000
78.50	0.000	0	159.28	0.000
79.00	0.000	0	159.28	0.000
79.50	0.000	0	159.28	0.000
80.00	0.000	0	159.28	0.000
80.50	0.000	0	159.28	0.000
81.00	0.000	0	159.28	0.000
81.50	0.000	0	159.28	0.000
82.00	0.000	0	159.28	0.000
82.50	0.000	0	159.28	0.000
83.00	0.000	0	159.28	0.000
83.50	0.000	0	159.28	0.000
84.00	0.000	0	159.28	0.000
84.50	0.000	0	159.28	0.000
85.00	0.000	0	159.28	0.000
85.50	0.000	0	159.28	0.000
86.00	0.000	0	159.28	0.000
86.50	0.000	0	159.28	0.000
87.00	0.000	0	159.28	0.000
87.50	0.000	0	159.28	0.000
88.00	0.000	0	159.28	0.000
88.50	0.000	0	159.28	0.000
89.00	0.000	0	159.28	0.000
89.50	0.000	0	159.28	0.000
90.00	0.000	0	159.28	0.000
90.50	0.000	0	159.28	0.000
91.00	0.000	0	159.28	0.000
91.50	0.000	0	159.28	0.000
92.00	0.000	0	159.28	0.000
92.50	0.000	0	159.28	0.000
93.00	0.000	0	159.28	0.000
93.50	0.000	0	159.28	0.000
94.00	0.000	0	159.28	0.000
94.50	0.000	0	159.28	0.000
95.00	0.000	0	159.28	0.000
95.50	0.000	0	159.28	0.000
96.00	0.000	0	159.28	0.000
96.50	0.000	0	159.28	0.000
97.00	0.000	0	159.28	0.000
97.50	0.000	0	159.28	0.000
98.00	0.000	0	159.28	0.000
98.50	0.000	0	159.28	0.000
99.00	0.000	0	159.28	0.000
99.50	0.000	0	159.28	0.000
100.00	0.000	0	159.28	0.000
100.50	0.000	0	159.28	0.000
101.00	0.000	0	159.28	0.000
101.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

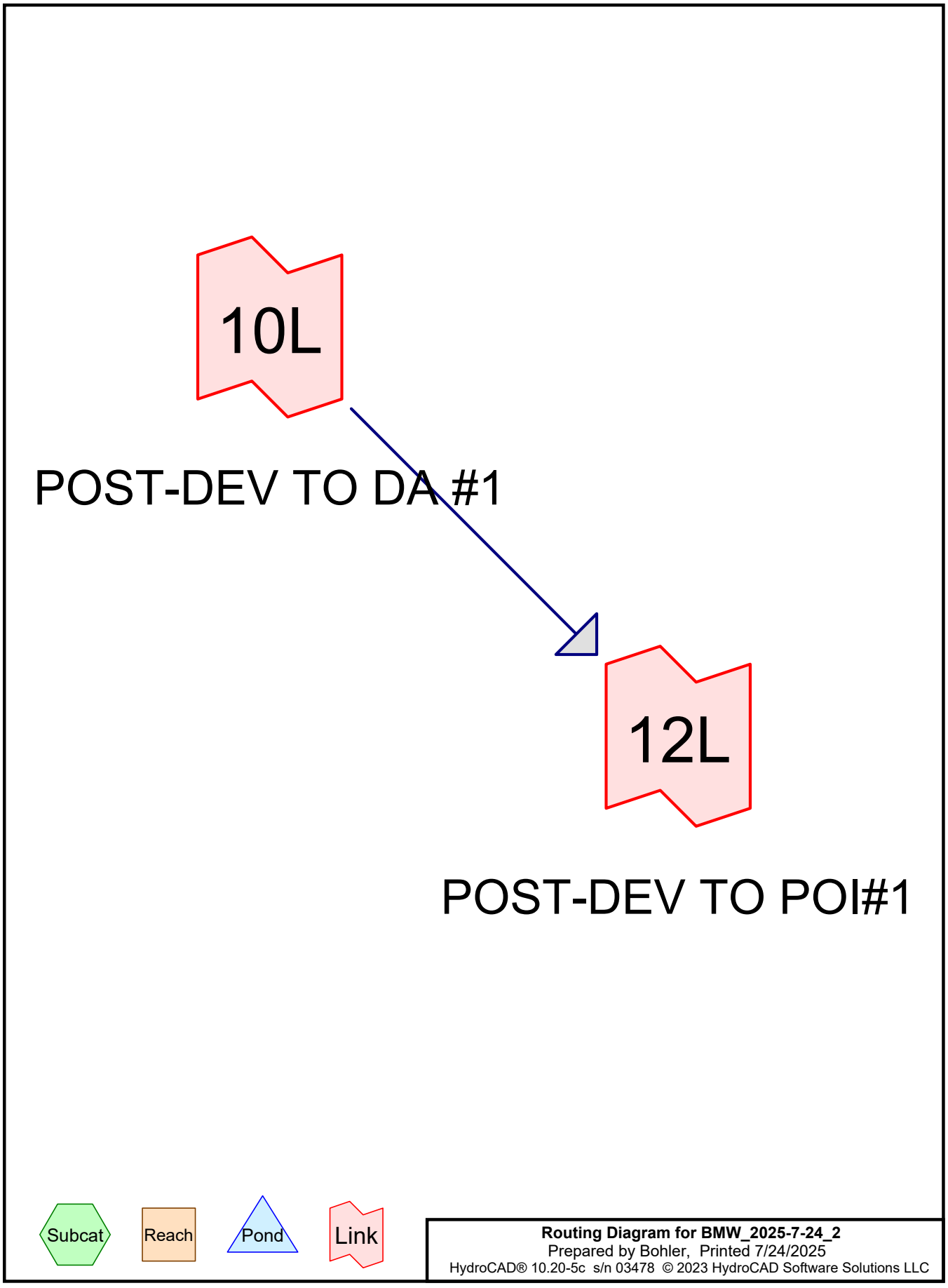
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	0	159.28	0.000
102.50	0.000	0	159.28	0.000
103.00	0.000	0	159.28	0.000
103.50	0.000	0	159.28	0.000
104.00	0.000	0	159.28	0.000
104.50	0.000	0	159.28	0.000
105.00	0.000	0	159.28	0.000
105.50	0.000	0	159.28	0.000
106.00	0.000	0	159.28	0.000
106.50	0.000	0	159.28	0.000
107.00	0.000	0	159.28	0.000
107.50	0.000	0	159.28	0.000
108.00	0.000	0	159.28	0.000
108.50	0.000	0	159.28	0.000
109.00	0.000	0	159.28	0.000
109.50	0.000	0	159.28	0.000
110.00	0.000	0	159.28	0.000
110.50	0.000	0	159.28	0.000
111.00	0.000	0	159.28	0.000
111.50	0.000	0	159.28	0.000
112.00	0.000	0	159.28	0.000
112.50	0.000	0	159.28	0.000
113.00	0.000	0	159.28	0.000
113.50	0.000	0	159.28	0.000
114.00	0.000	0	159.28	0.000
114.50	0.000	0	159.28	0.000
115.00	0.000	0	159.28	0.000
115.50	0.000	0	159.28	0.000
116.00	0.000	0	159.28	0.000
116.50	0.000	0	159.28	0.000
117.00	0.000	0	159.28	0.000
117.50	0.000	0	159.28	0.000
118.00	0.000	0	159.28	0.000
118.50	0.000	0	159.28	0.000
119.00	0.000	0	159.28	0.000
119.50	0.000	0	159.28	0.000
120.00	0.000	0	159.28	0.000
120.50	0.000	0	159.28	0.000
121.00	0.000	0	159.28	0.000
121.50	0.000	0	159.28	0.000
122.00	0.000	0	159.28	0.000
122.50	0.000	0	159.28	0.000
123.00	0.000	0	159.28	0.000
123.50	0.000	0	159.28	0.000
124.00	0.000	0	159.28	0.000
124.50	0.000	0	159.28	0.000
125.00	0.000	0	159.28	0.000
125.50	0.000	0	159.28	0.000
126.00	0.000	0	159.28	0.000
126.50	0.000	0	159.28	0.000
127.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	0	159.28	0.000
128.00	0.000	0	159.28	0.000
128.50	0.000	0	159.28	0.000
129.00	0.000	0	159.28	0.000
129.50	0.000	0	159.28	0.000
130.00	0.000	0	159.28	0.000
130.50	0.000	0	159.28	0.000
131.00	0.000	0	159.28	0.000
131.50	0.000	0	159.28	0.000
132.00	0.000	0	159.28	0.000
132.50	0.000	0	159.28	0.000
133.00	0.000	0	159.28	0.000
133.50	0.000	0	159.28	0.000
134.00	0.000	0	159.28	0.000
134.50	0.000	0	159.28	0.000
135.00	0.000	0	159.28	0.000
135.50	0.000	0	159.28	0.000
136.00	0.000	0	159.28	0.000
136.50	0.000	0	159.28	0.000
137.00	0.000	0	159.28	0.000
137.50	0.000	0	159.28	0.000
138.00	0.000	0	159.28	0.000
138.50	0.000	0	159.28	0.000
139.00	0.000	0	159.28	0.000
139.50	0.000	0	159.28	0.000
140.00	0.000	0	159.28	0.000
140.50	0.000	0	159.28	0.000
141.00	0.000	0	159.28	0.000
141.50	0.000	0	159.28	0.000
142.00	0.000	0	159.28	0.000
142.50	0.000	0	159.28	0.000
143.00	0.000	0	159.28	0.000
143.50	0.000	0	159.28	0.000
144.00	0.000	0	159.28	0.000
144.50	0.000	0	159.28	0.000
145.00	0.000	0	159.28	0.000
145.50	0.000	0	159.28	0.000
146.00	0.000	0	159.28	0.000
146.50	0.000	0	159.28	0.000
147.00	0.000	0	159.28	0.000
147.50	0.000	0	159.28	0.000
148.00	0.000	0	159.28	0.000
148.50	0.000	0	159.28	0.000
149.00	0.000	0	159.28	0.000
149.50	0.000	0	159.28	0.000
150.00	0.000	0	159.28	0.000
150.50	0.000	0	159.28	0.000
151.00	0.000	0	159.28	0.000
151.50	0.000	0	159.28	0.000
152.00	0.000	0	159.28	0.000
152.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	0	159.28	0.000
153.50	0.000	0	159.28	0.000
154.00	0.000	0	159.28	0.000
154.50	0.000	0	159.28	0.000
155.00	0.000	0	159.28	0.000
155.50	0.000	0	159.28	0.000
156.00	0.000	0	159.28	0.000
156.50	0.000	0	159.28	0.000
157.00	0.000	0	159.28	0.000
157.50	0.000	0	159.28	0.000
158.00	0.000	0	159.28	0.000
158.50	0.000	0	159.28	0.000
159.00	0.000	0	159.28	0.000
159.50	0.000	0	159.28	0.000
160.00	0.000	0	159.28	0.000
160.50	0.000	0	159.28	0.000
161.00	0.000	0	159.28	0.000
161.50	0.000	0	159.28	0.000
162.00	0.000	0	159.28	0.000
162.50	0.000	0	159.28	0.000
163.00	0.000	0	159.28	0.000
163.50	0.000	0	159.28	0.000
164.00	0.000	0	159.28	0.000
164.50	0.000	0	159.28	0.000
165.00	0.000	0	159.28	0.000
165.50	0.000	0	159.28	0.000
166.00	0.000	0	159.28	0.000
166.50	0.000	0	159.28	0.000
167.00	0.000	0	159.28	0.000
167.50	0.000	0	159.28	0.000
168.00	0.000	0	159.28	0.000



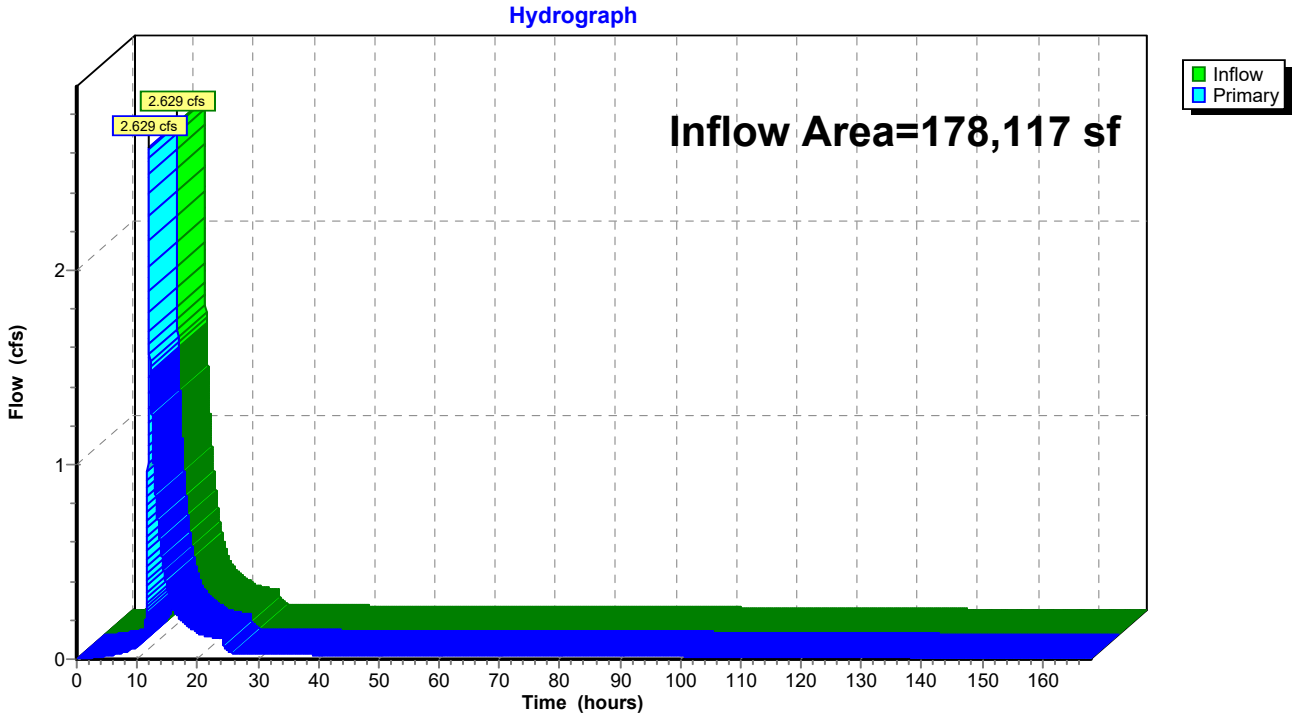
Routing Diagram for BMW_2025-7-24_2
Prepared by Bohler, Printed 7/24/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 178,117 sf, 79.75% Impervious, Inflow Depth > 1.66" for 1-yr event
Inflow = 2.629 cfs @ 11.97 hrs, Volume= 24,645 cf
Primary = 2.629 cfs @ 11.97 hrs, Volume= 24,645 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : POST-DEV TO POI#1

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 10L: POST-DEV TO DA #1

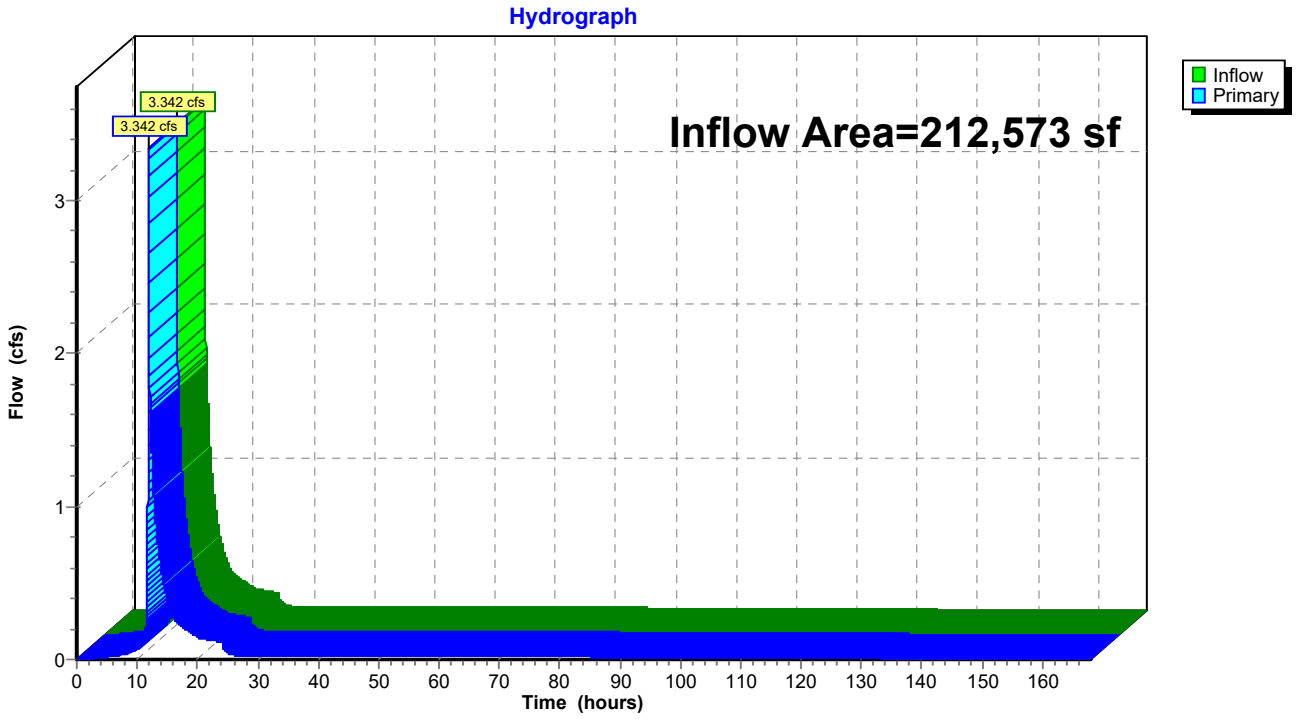


Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 212,573 sf, 74.32% Impervious, Inflow Depth > 1.48" for 1-yr event
Inflow = 3.342 cfs @ 11.97 hrs, Volume= 26,168 cf
Primary = 3.342 cfs @ 11.97 hrs, Volume= 26,168 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 12L: POST-DEV TO POI#1

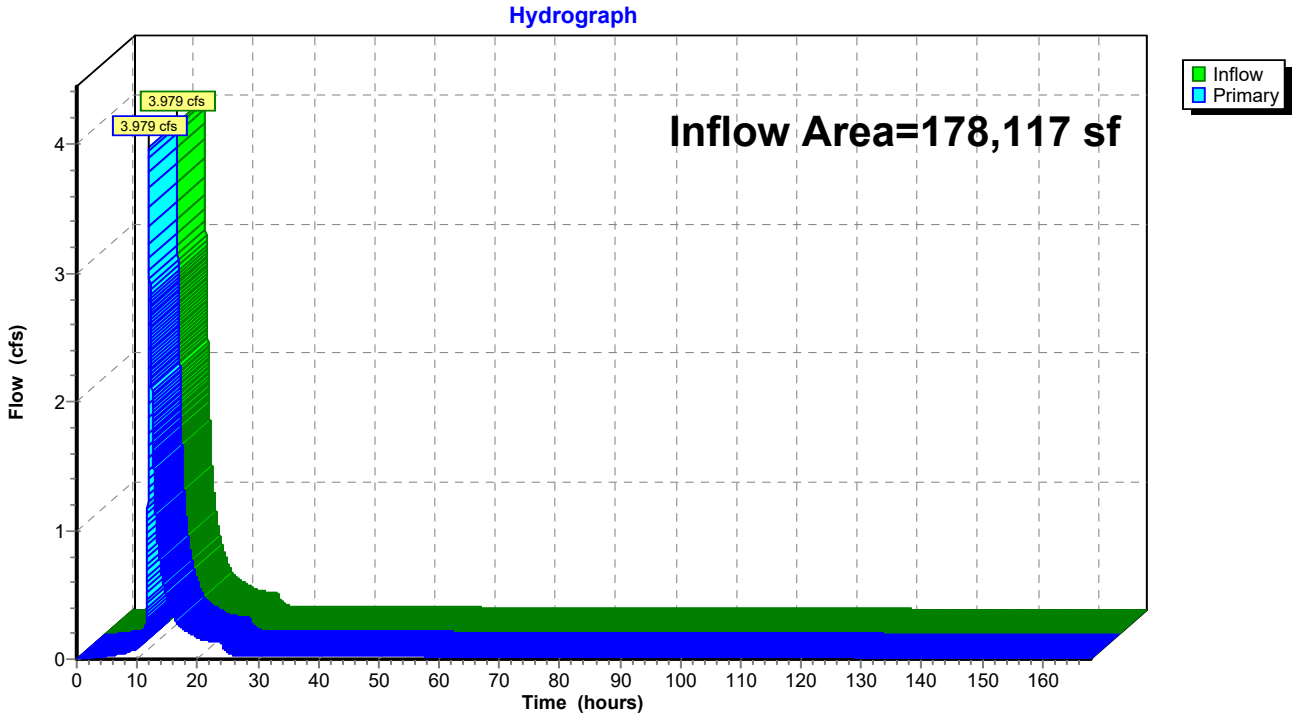


Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 178,117 sf, 79.75% Impervious, Inflow Depth > 2.10" for 2-yr event
Inflow = 3.979 cfs @ 11.99 hrs, Volume= 31,185 cf
Primary = 3.979 cfs @ 11.99 hrs, Volume= 31,185 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : POST-DEV TO POI#1

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 10L: POST-DEV TO DA #1

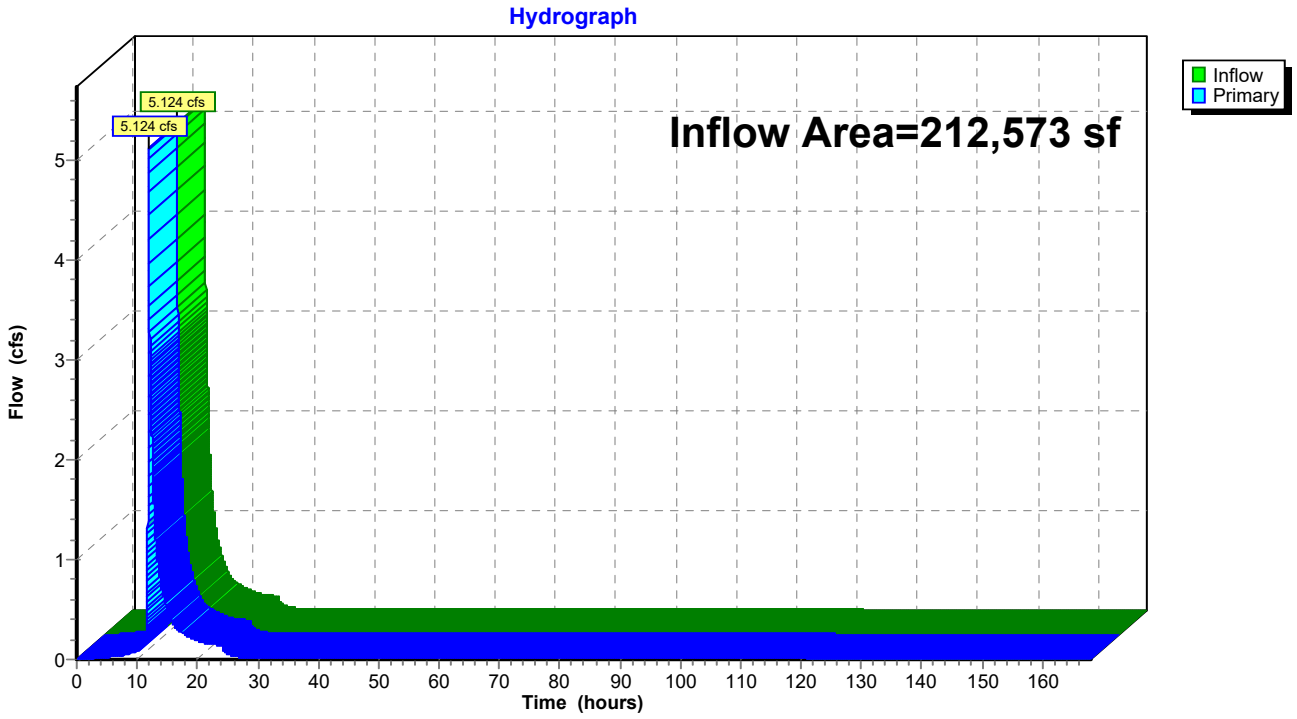


Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 212,573 sf, 74.32% Impervious, Inflow Depth > 1.89" for 2-yr event
Inflow = 5.124 cfs @ 11.98 hrs, Volume= 33,554 cf
Primary = 5.124 cfs @ 11.98 hrs, Volume= 33,554 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 12L: POST-DEV TO POI#1

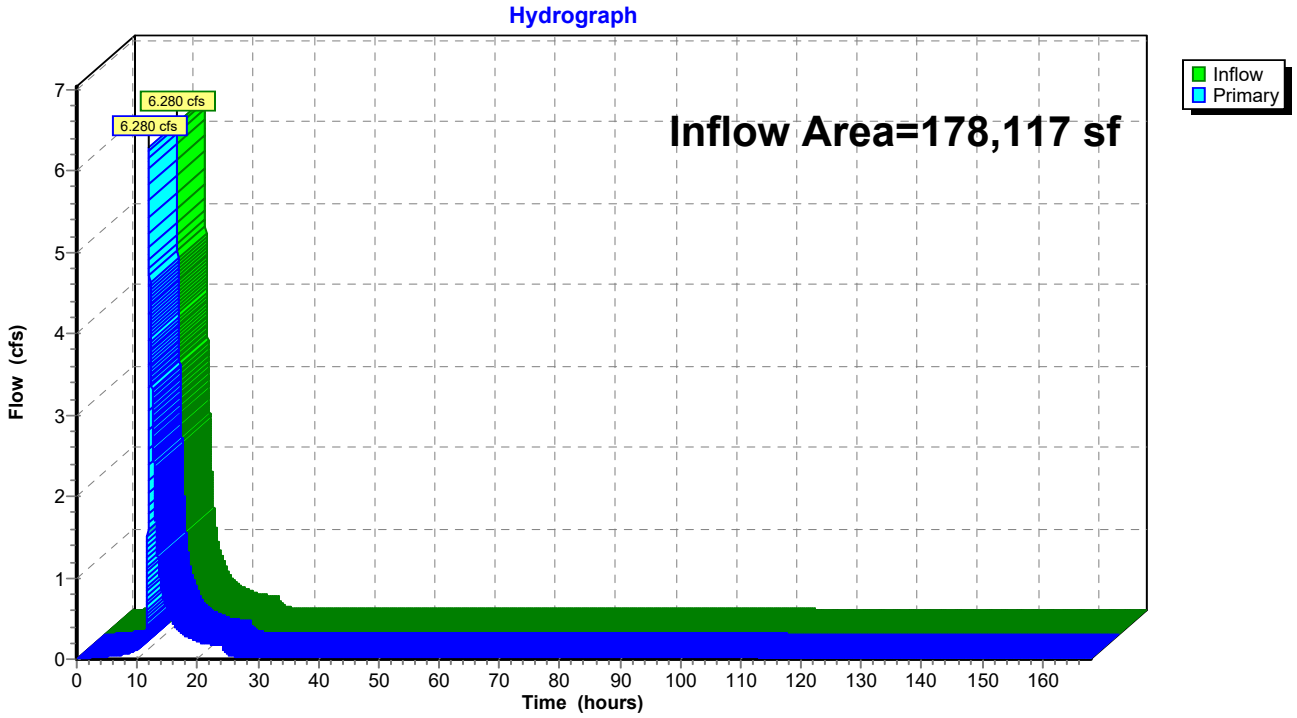


Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 178,117 sf, 79.75% Impervious, Inflow Depth > 2.81" for 5-yr event
Inflow = 6.280 cfs @ 11.98 hrs, Volume= 41,697 cf
Primary = 6.280 cfs @ 11.98 hrs, Volume= 41,697 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : POST-DEV TO POI#1

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 10L: POST-DEV TO DA #1

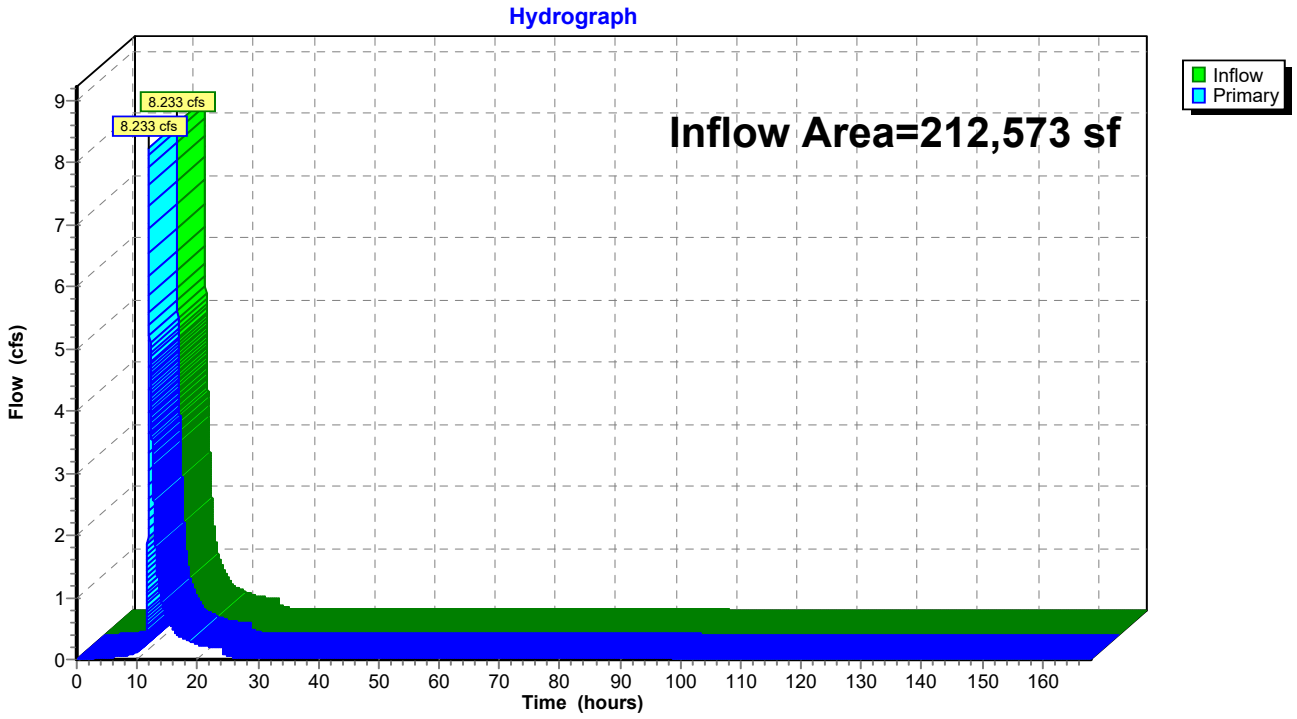


Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 212,573 sf, 74.32% Impervious, Inflow Depth > 2.57" for 5-yr event
Inflow = 8.233 cfs @ 11.98 hrs, Volume= 45,579 cf
Primary = 8.233 cfs @ 11.98 hrs, Volume= 45,579 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 12L: POST-DEV TO POI#1

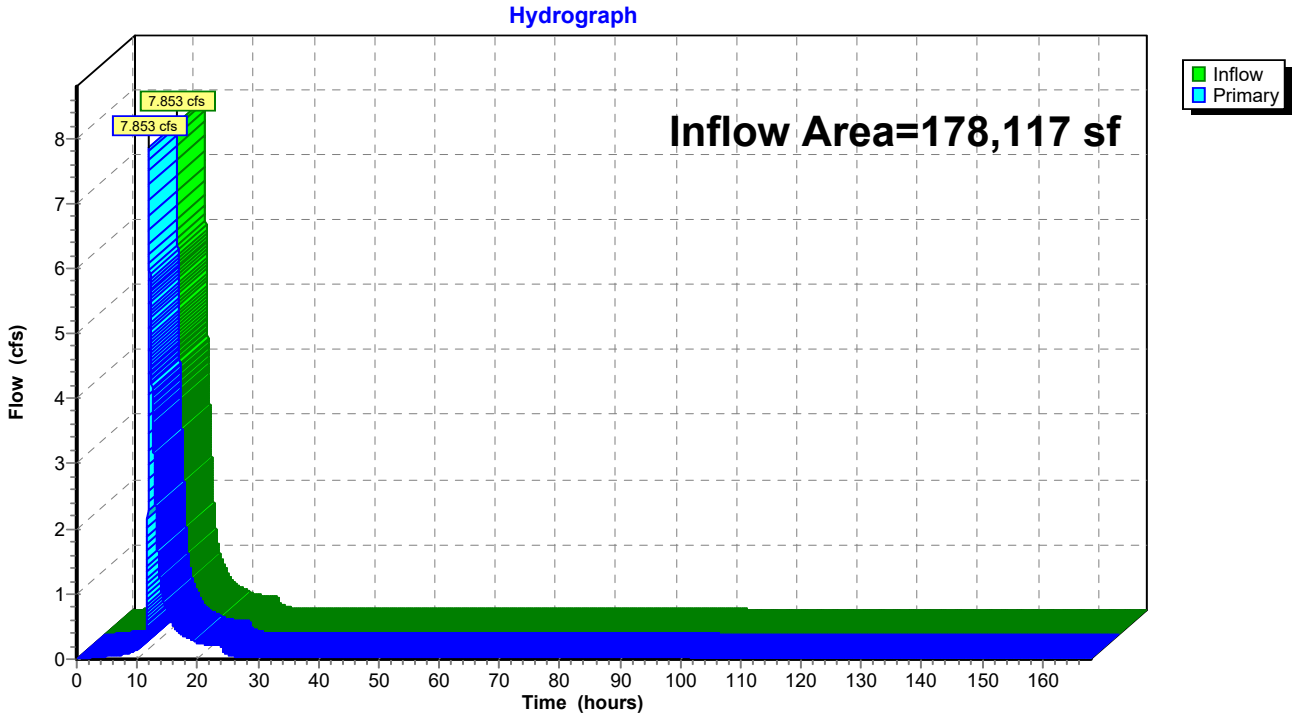


Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 178,117 sf, 79.75% Impervious, Inflow Depth > 3.41" for 10-yr event
Inflow = 7.853 cfs @ 11.98 hrs, Volume= 50,636 cf
Primary = 7.853 cfs @ 11.98 hrs, Volume= 50,636 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : POST-DEV TO POI#1

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 10L: POST-DEV TO DA #1

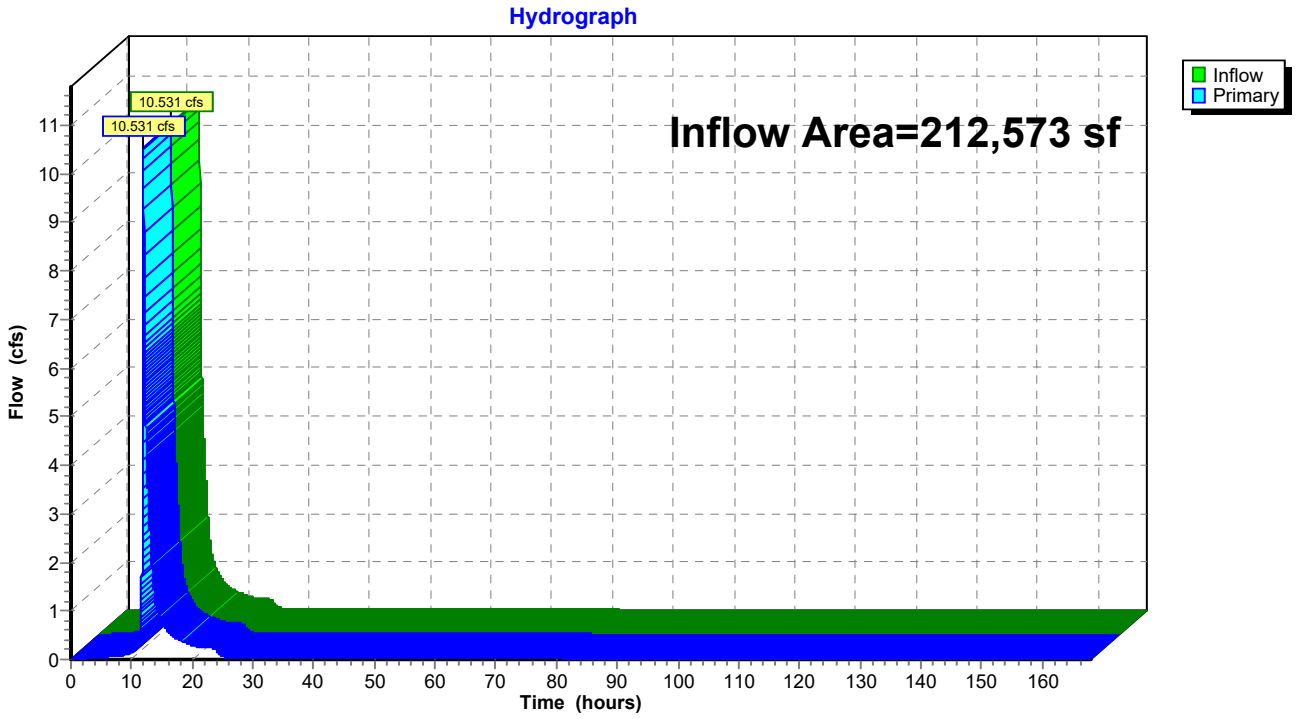


Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 212,573 sf, 74.32% Impervious, Inflow Depth = 3.16" for 10-yr event
Inflow = 10.531 cfs @ 11.97 hrs, Volume= 55,904 cf
Primary = 10.531 cfs @ 11.97 hrs, Volume= 55,904 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 12L: POST-DEV TO POI#1

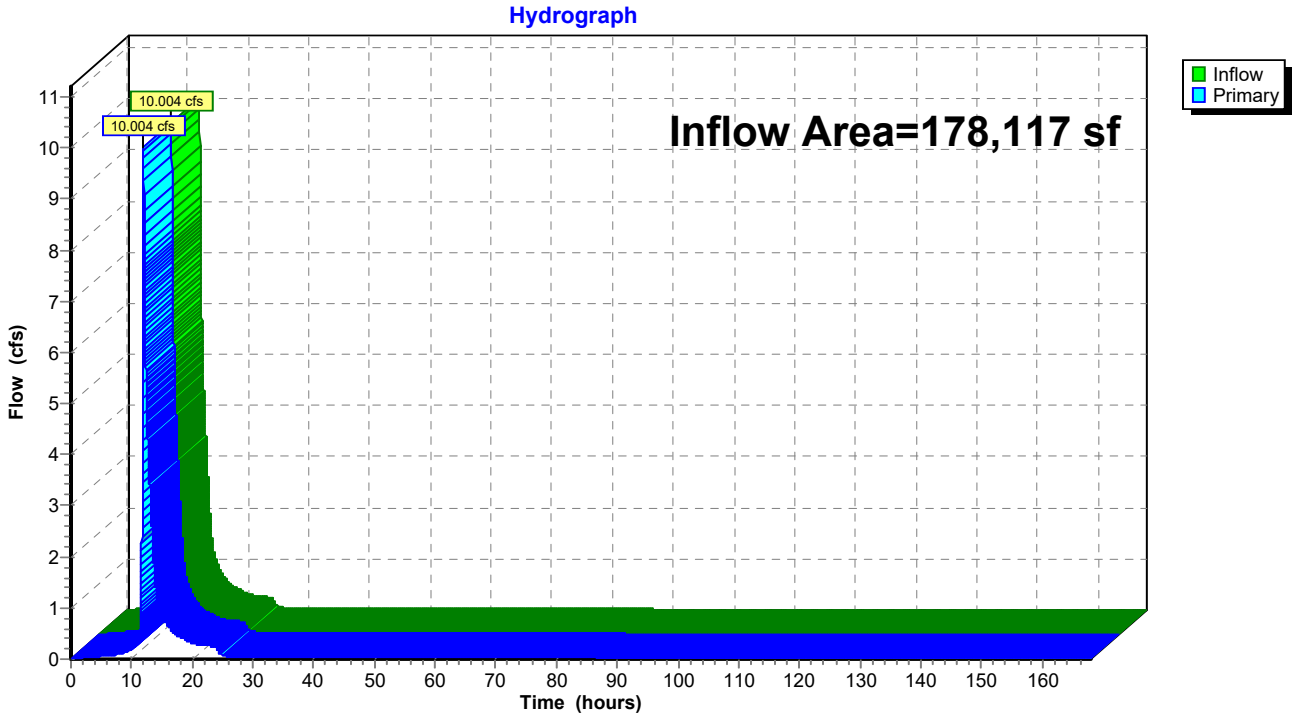


Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 178,117 sf, 79.75% Impervious, Inflow Depth > 4.32" for 25-yr event
Inflow = 10.004 cfs @ 11.98 hrs, Volume= 64,132 cf
Primary = 10.004 cfs @ 11.98 hrs, Volume= 64,132 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : POST-DEV TO POI#1

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 10L: POST-DEV TO DA #1

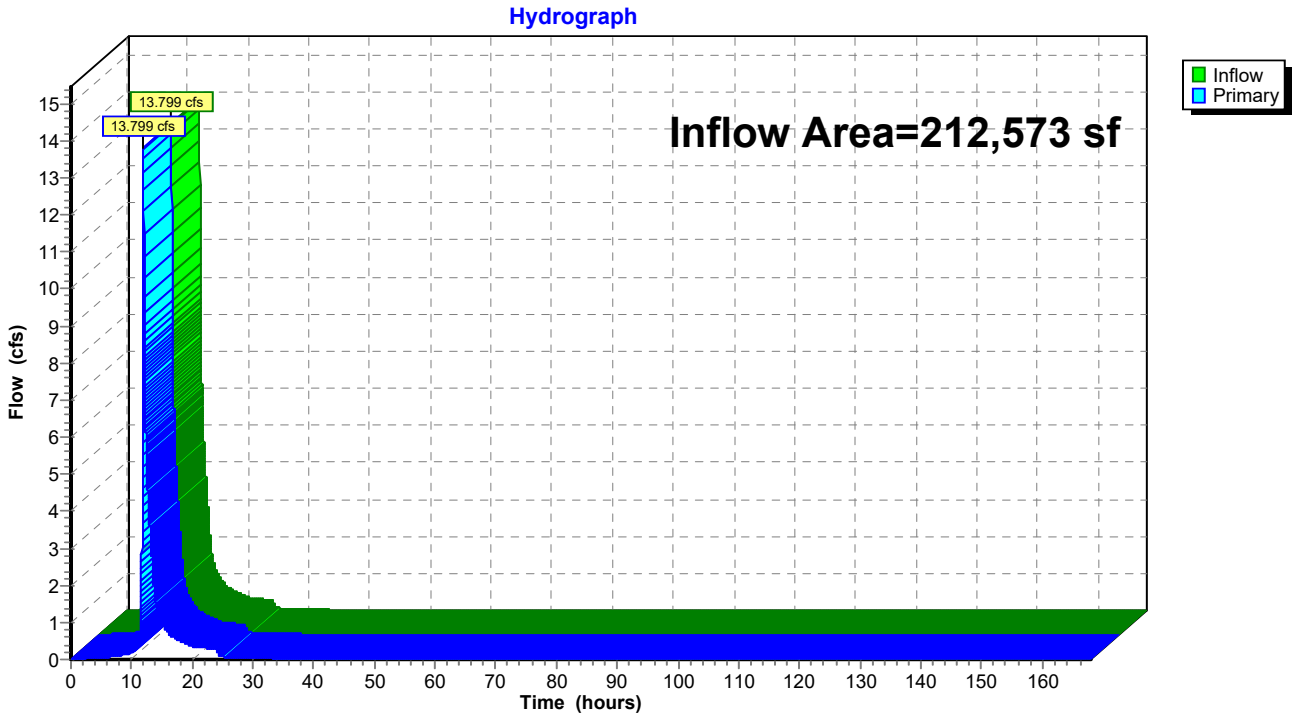


Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 212,573 sf, 74.32% Impervious, Inflow Depth = 4.04" for 25-yr event
Inflow = 13.799 cfs @ 11.97 hrs, Volume= 71,608 cf
Primary = 13.799 cfs @ 11.97 hrs, Volume= 71,608 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 12L: POST-DEV TO POI#1

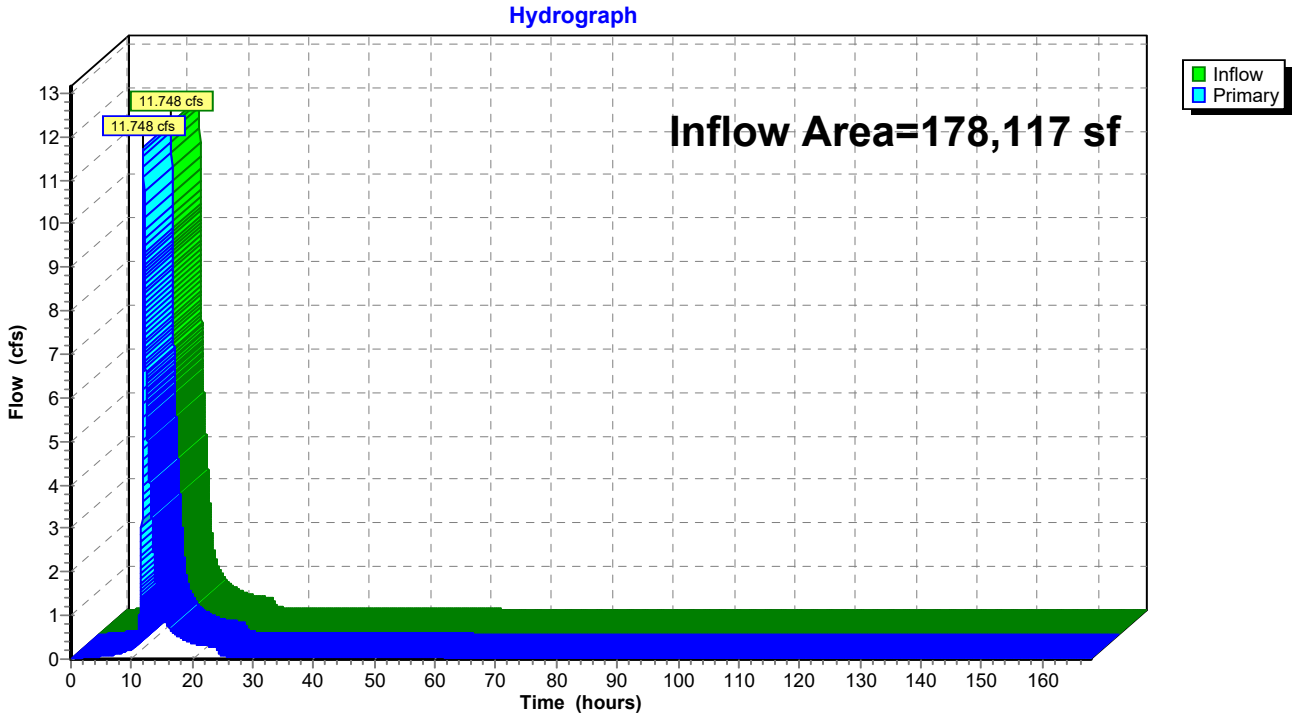


Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 178,117 sf, 79.75% Impervious, Inflow Depth = 5.11" for 50-yr event
Inflow = 11.748 cfs @ 11.98 hrs, Volume= 75,778 cf
Primary = 11.748 cfs @ 11.98 hrs, Volume= 75,778 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : POST-DEV TO POI#1

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 10L: POST-DEV TO DA #1

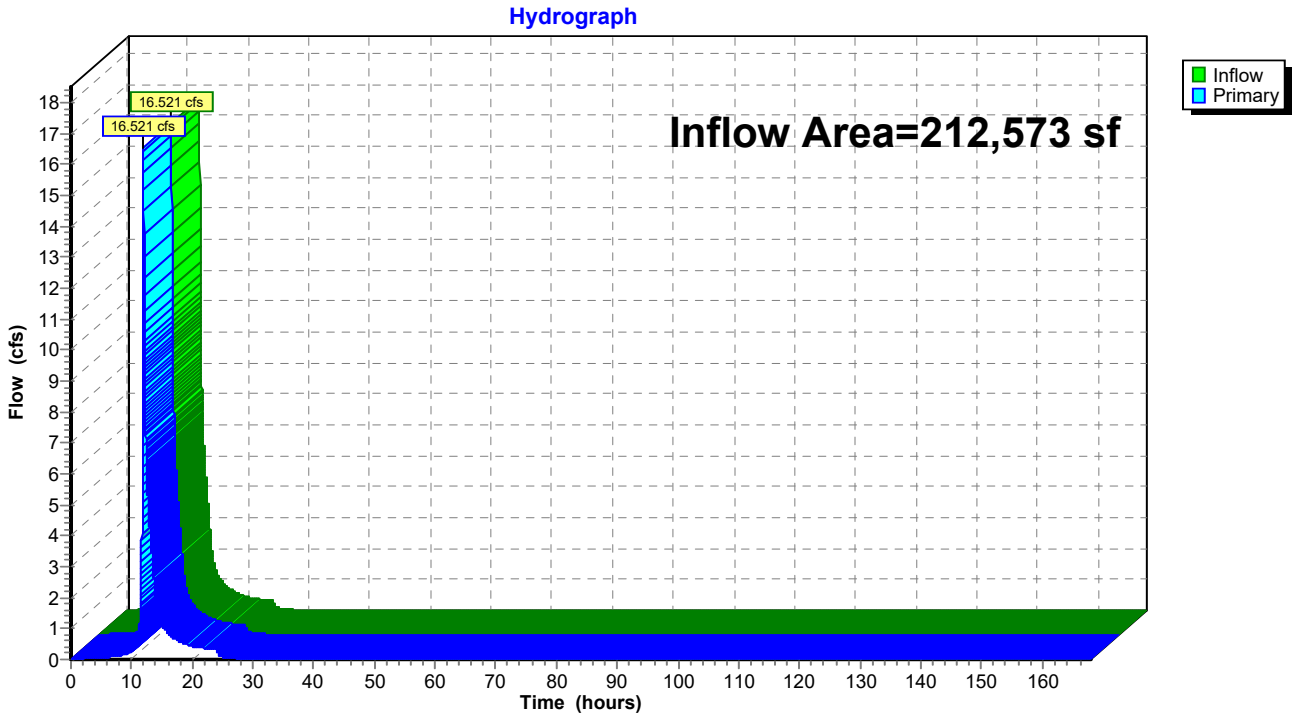


Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 212,573 sf, 74.32% Impervious, Inflow Depth = 4.81" for 50-yr event
Inflow = 16.521 cfs @ 11.97 hrs, Volume= 85,235 cf
Primary = 16.521 cfs @ 11.97 hrs, Volume= 85,235 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 12L: POST-DEV TO POI#1

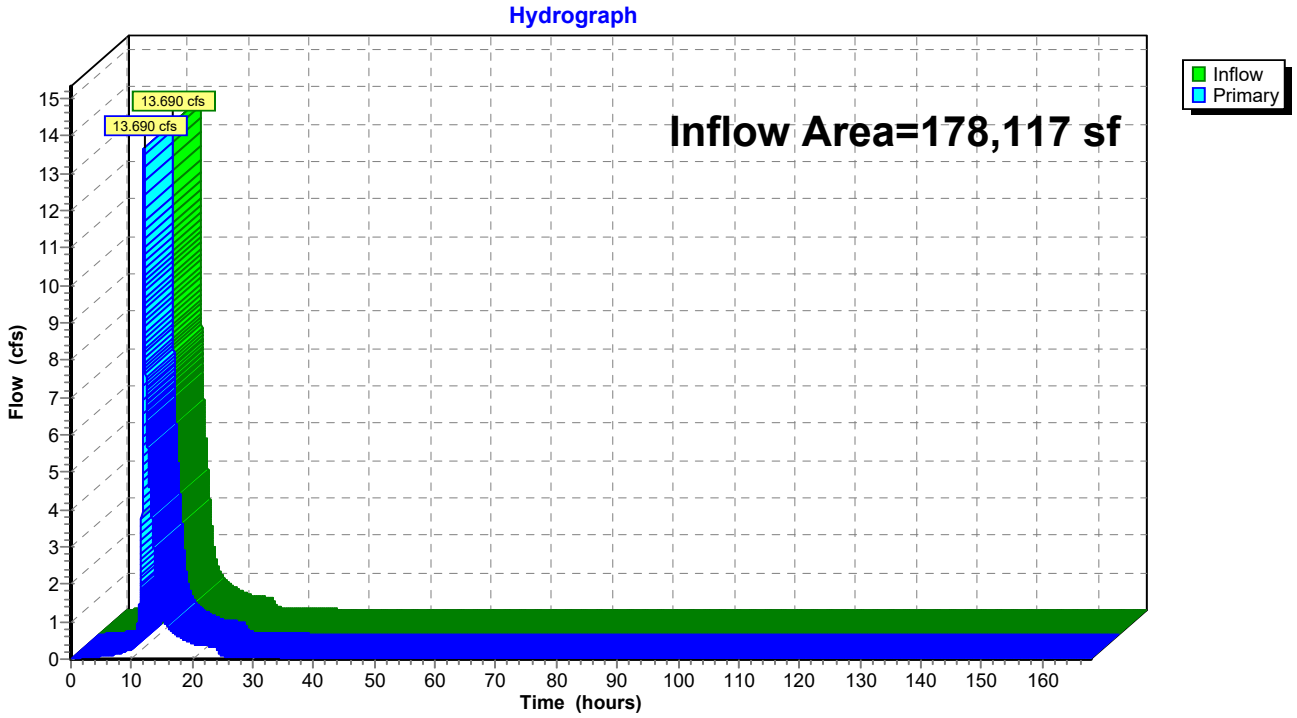


Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 178,117 sf, 79.75% Impervious, Inflow Depth = 5.96" for 100-yr event
Inflow = 13.690 cfs @ 12.03 hrs, Volume= 88,419 cf
Primary = 13.690 cfs @ 12.03 hrs, Volume= 88,419 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : POST-DEV TO POI#1

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 10L: POST-DEV TO DA #1

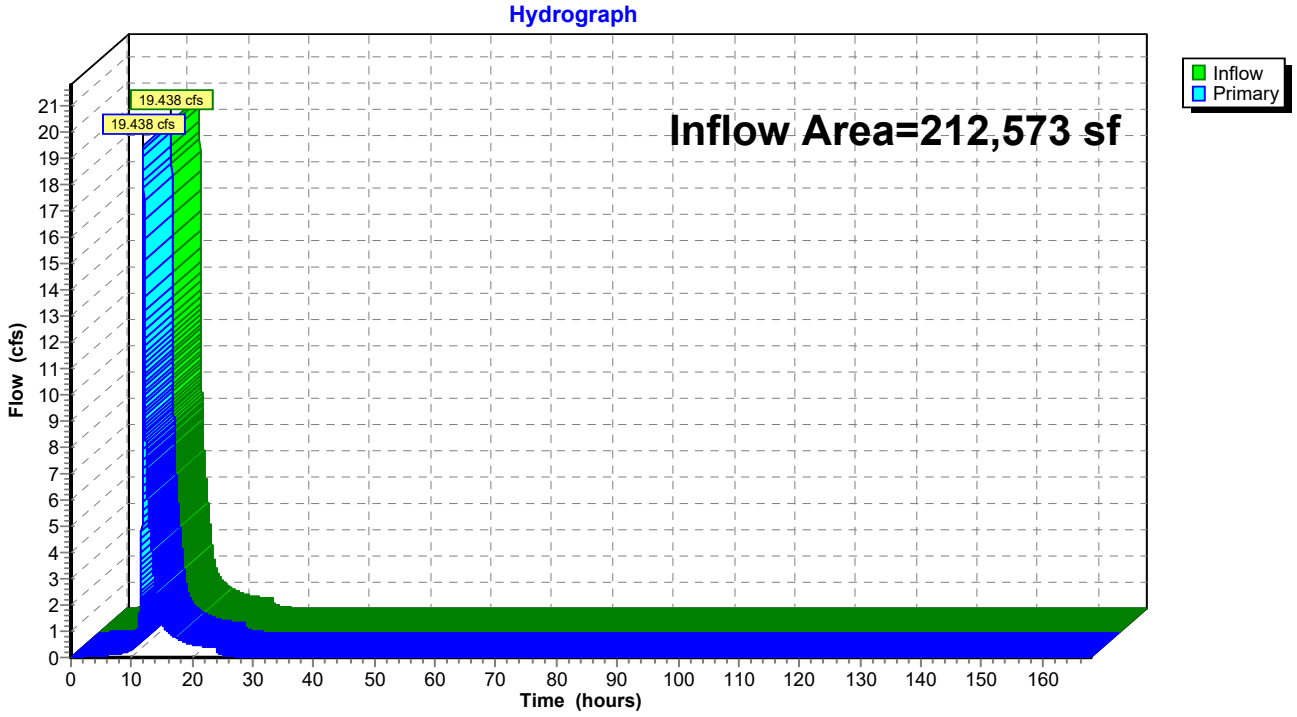


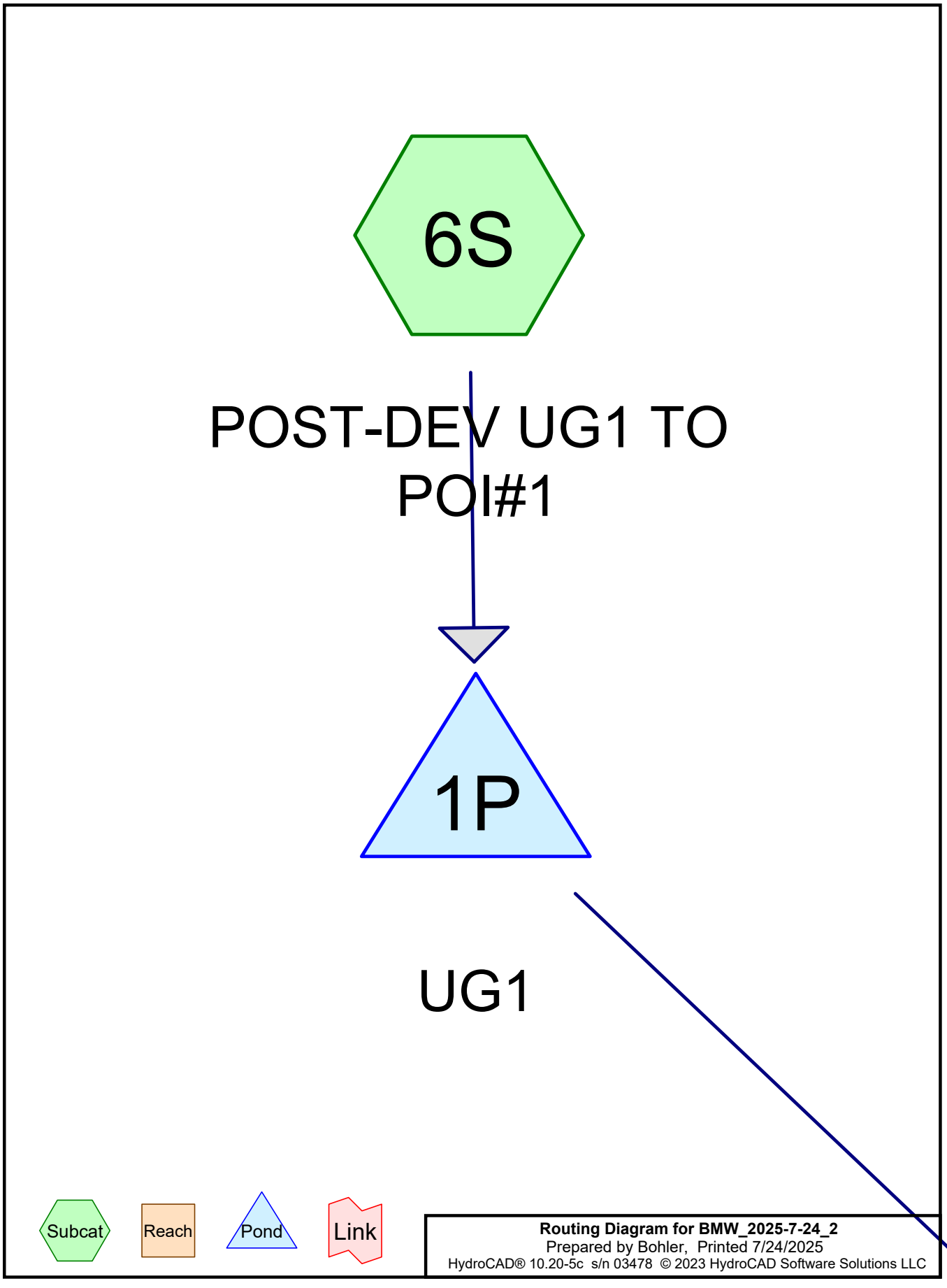
Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 212,573 sf, 74.32% Impervious, Inflow Depth = 5.65" for 100-yr event
Inflow = 19.438 cfs @ 11.97 hrs, Volume= 100,083 cf
Primary = 19.438 cfs @ 11.97 hrs, Volume= 100,083 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Link 12L: POST-DEV TO POI#1




6S
POST-DEV UG1 TO POI#1
1P
UG1
Subcat
Reach
Pond
Link
Routing Diagram for BMW_2025-7-24_2
Prepared by Bohler, Printed 7/24/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1.2 Inch MRC	NJ DEP 2-hr		Default	2.00	1	1.20	2

Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

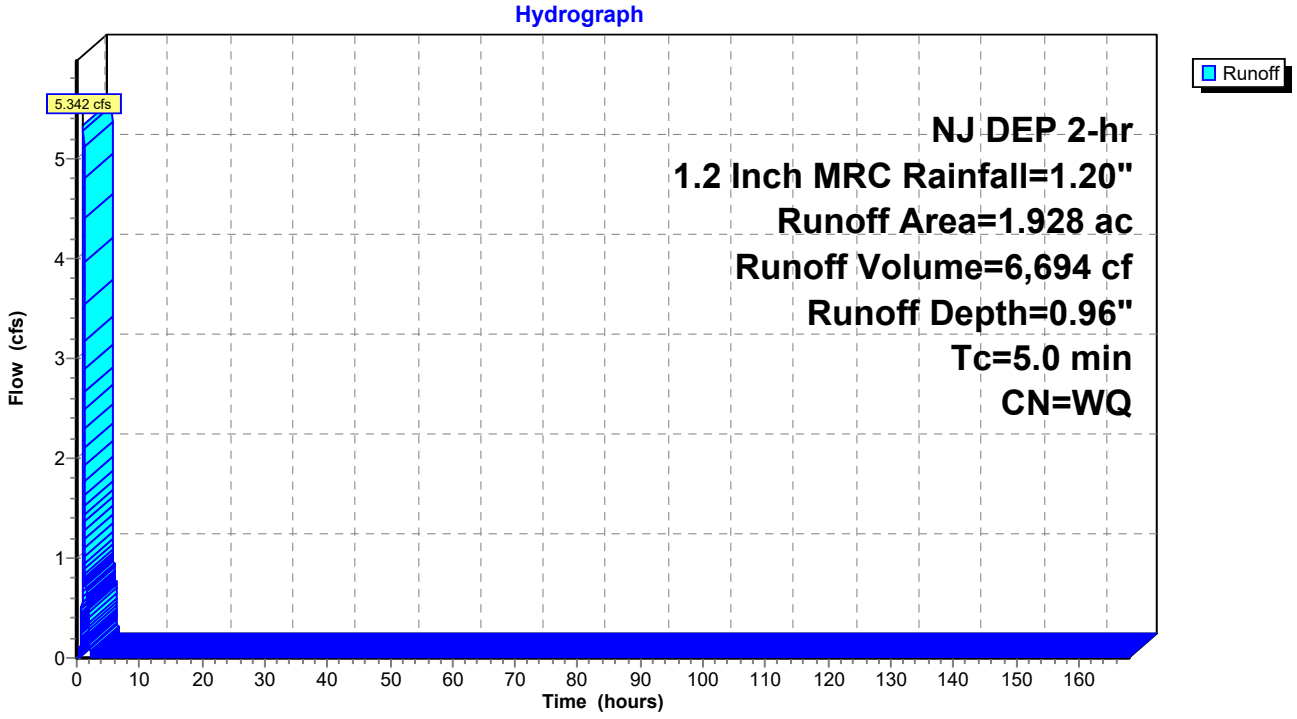
Runoff = 5.342 cfs @ 1.10 hrs, Volume= 6,694 cf, Depth= 0.96"
Routed to Pond 1P : UG1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
NJ DEP 2-hr 1.2 Inch MRC Rainfall=1.20"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928		Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: POST-DEV UG1 TO POI#1



Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.000	10.20	1.20	0.81	0.000
0.20	0.02	0.00	0.000	10.40	1.20	0.81	0.000
0.40	0.07	0.00	0.033	10.60	1.20	0.81	0.000
0.60	0.13	0.01	0.288	10.80	1.20	0.81	0.000
0.80	0.23	0.04	0.562	11.00	1.20	0.81	0.000
1.00	0.60	0.29	**3.892**	11.20	1.20	0.81	0.000
1.20	0.97	0.61	**2.485**	11.40	1.20	0.81	0.000
1.40	1.07	0.69	0.735	11.60	1.20	0.81	0.000
1.60	1.13	0.75	0.565	11.80	1.20	0.81	0.000
1.80	1.18	0.80	0.449	12.00	1.20	0.81	0.000
2.00	**1.20**	**0.81**	0.177	12.20	1.20	0.81	0.000
2.20	1.20	0.81	0.002	12.40	1.20	0.81	0.000
2.40	1.20	0.81	0.000	12.60	1.20	0.81	0.000
2.60	1.20	0.81	0.000	12.80	1.20	0.81	0.000
2.80	1.20	0.81	0.000	13.00	1.20	0.81	0.000
3.00	1.20	0.81	0.000	13.20	1.20	0.81	0.000
3.20	1.20	0.81	0.000	13.40	1.20	0.81	0.000
3.40	1.20	0.81	0.000	13.60	1.20	0.81	0.000
3.60	1.20	0.81	0.000	13.80	1.20	0.81	0.000
3.80	1.20	0.81	0.000	14.00	1.20	0.81	0.000
4.00	1.20	0.81	0.000	14.20	1.20	0.81	0.000
4.20	1.20	0.81	0.000	14.40	1.20	0.81	0.000
4.40	1.20	0.81	0.000	14.60	1.20	0.81	0.000
4.60	1.20	0.81	0.000	14.80	1.20	0.81	0.000
4.80	1.20	0.81	0.000	15.00	1.20	0.81	0.000
5.00	1.20	0.81	0.000	15.20	1.20	0.81	0.000
5.20	1.20	0.81	0.000	15.40	1.20	0.81	0.000
5.40	1.20	0.81	0.000	15.60	1.20	0.81	0.000
5.60	1.20	0.81	0.000	15.80	1.20	0.81	0.000
5.80	1.20	0.81	0.000	16.00	1.20	0.81	0.000
6.00	1.20	0.81	0.000	16.20	1.20	0.81	0.000
6.20	1.20	0.81	0.000	16.40	1.20	0.81	0.000
6.40	1.20	0.81	0.000	16.60	1.20	0.81	0.000
6.60	1.20	0.81	0.000	16.80	1.20	0.81	0.000
6.80	1.20	0.81	0.000	17.00	1.20	0.81	0.000
7.00	1.20	0.81	0.000	17.20	1.20	0.81	0.000
7.20	1.20	0.81	0.000	17.40	1.20	0.81	0.000
7.40	1.20	0.81	0.000	17.60	1.20	0.81	0.000
7.60	1.20	0.81	0.000	17.80	1.20	0.81	0.000
7.80	1.20	0.81	0.000	18.00	1.20	0.81	0.000
8.00	1.20	0.81	0.000	18.20	1.20	0.81	0.000
8.20	1.20	0.81	0.000	18.40	1.20	0.81	0.000
8.40	1.20	0.81	0.000	18.60	1.20	0.81	0.000
8.60	1.20	0.81	0.000	18.80	1.20	0.81	0.000
8.80	1.20	0.81	0.000	19.00	1.20	0.81	0.000
9.00	1.20	0.81	0.000	19.20	1.20	0.81	0.000
9.20	1.20	0.81	0.000	19.40	1.20	0.81	0.000
9.40	1.20	0.81	0.000	19.60	1.20	0.81	0.000
9.60	1.20	0.81	0.000	19.80	1.20	0.81	0.000
9.80	1.20	0.81	0.000	20.00	1.20	0.81	0.000
10.00	1.20	0.81	0.000	20.20	1.20	0.81	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
20.40	1.20	0.81	0.000	30.60	1.20	0.81	0.000
20.60	1.20	0.81	0.000	30.80	1.20	0.81	0.000
20.80	1.20	0.81	0.000	31.00	1.20	0.81	0.000
21.00	1.20	0.81	0.000	31.20	1.20	0.81	0.000
21.20	1.20	0.81	0.000	31.40	1.20	0.81	0.000
21.40	1.20	0.81	0.000	31.60	1.20	0.81	0.000
21.60	1.20	0.81	0.000	31.80	1.20	0.81	0.000
21.80	1.20	0.81	0.000	32.00	1.20	0.81	0.000
22.00	1.20	0.81	0.000	32.20	1.20	0.81	0.000
22.20	1.20	0.81	0.000	32.40	1.20	0.81	0.000
22.40	1.20	0.81	0.000	32.60	1.20	0.81	0.000
22.60	1.20	0.81	0.000	32.80	1.20	0.81	0.000
22.80	1.20	0.81	0.000	33.00	1.20	0.81	0.000
23.00	1.20	0.81	0.000	33.20	1.20	0.81	0.000
23.20	1.20	0.81	0.000	33.40	1.20	0.81	0.000
23.40	1.20	0.81	0.000	33.60	1.20	0.81	0.000
23.60	1.20	0.81	0.000	33.80	1.20	0.81	0.000
23.80	1.20	0.81	0.000	34.00	1.20	0.81	0.000
24.00	1.20	0.81	0.000	34.20	1.20	0.81	0.000
24.20	1.20	0.81	0.000	34.40	1.20	0.81	0.000
24.40	1.20	0.81	0.000	34.60	1.20	0.81	0.000
24.60	1.20	0.81	0.000	34.80	1.20	0.81	0.000
24.80	1.20	0.81	0.000	35.00	1.20	0.81	0.000
25.00	1.20	0.81	0.000	35.20	1.20	0.81	0.000
25.20	1.20	0.81	0.000	35.40	1.20	0.81	0.000
25.40	1.20	0.81	0.000	35.60	1.20	0.81	0.000
25.60	1.20	0.81	0.000	35.80	1.20	0.81	0.000
25.80	1.20	0.81	0.000	36.00	1.20	0.81	0.000
26.00	1.20	0.81	0.000	36.20	1.20	0.81	0.000
26.20	1.20	0.81	0.000	36.40	1.20	0.81	0.000
26.40	1.20	0.81	0.000	36.60	1.20	0.81	0.000
26.60	1.20	0.81	0.000	36.80	1.20	0.81	0.000
26.80	1.20	0.81	0.000	37.00	1.20	0.81	0.000
27.00	1.20	0.81	0.000	37.20	1.20	0.81	0.000
27.20	1.20	0.81	0.000	37.40	1.20	0.81	0.000
27.40	1.20	0.81	0.000	37.60	1.20	0.81	0.000
27.60	1.20	0.81	0.000	37.80	1.20	0.81	0.000
27.80	1.20	0.81	0.000	38.00	1.20	0.81	0.000
28.00	1.20	0.81	0.000	38.20	1.20	0.81	0.000
28.20	1.20	0.81	0.000	38.40	1.20	0.81	0.000
28.40	1.20	0.81	0.000	38.60	1.20	0.81	0.000
28.60	1.20	0.81	0.000	38.80	1.20	0.81	0.000
28.80	1.20	0.81	0.000	39.00	1.20	0.81	0.000
29.00	1.20	0.81	0.000	39.20	1.20	0.81	0.000
29.20	1.20	0.81	0.000	39.40	1.20	0.81	0.000
29.40	1.20	0.81	0.000	39.60	1.20	0.81	0.000
29.60	1.20	0.81	0.000	39.80	1.20	0.81	0.000
29.80	1.20	0.81	0.000	40.00	1.20	0.81	0.000
30.00	1.20	0.81	0.000	40.20	1.20	0.81	0.000
30.20	1.20	0.81	0.000	40.40	1.20	0.81	0.000
30.40	1.20	0.81	0.000	40.60	1.20	0.81	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
40.80	1.20	0.81	0.000	51.00	1.20	0.81	0.000
41.00	1.20	0.81	0.000	51.20	1.20	0.81	0.000
41.20	1.20	0.81	0.000	51.40	1.20	0.81	0.000
41.40	1.20	0.81	0.000	51.60	1.20	0.81	0.000
41.60	1.20	0.81	0.000	51.80	1.20	0.81	0.000
41.80	1.20	0.81	0.000	52.00	1.20	0.81	0.000
42.00	1.20	0.81	0.000	52.20	1.20	0.81	0.000
42.20	1.20	0.81	0.000	52.40	1.20	0.81	0.000
42.40	1.20	0.81	0.000	52.60	1.20	0.81	0.000
42.60	1.20	0.81	0.000	52.80	1.20	0.81	0.000
42.80	1.20	0.81	0.000	53.00	1.20	0.81	0.000
43.00	1.20	0.81	0.000	53.20	1.20	0.81	0.000
43.20	1.20	0.81	0.000	53.40	1.20	0.81	0.000
43.40	1.20	0.81	0.000	53.60	1.20	0.81	0.000
43.60	1.20	0.81	0.000	53.80	1.20	0.81	0.000
43.80	1.20	0.81	0.000	54.00	1.20	0.81	0.000
44.00	1.20	0.81	0.000	54.20	1.20	0.81	0.000
44.20	1.20	0.81	0.000	54.40	1.20	0.81	0.000
44.40	1.20	0.81	0.000	54.60	1.20	0.81	0.000
44.60	1.20	0.81	0.000	54.80	1.20	0.81	0.000
44.80	1.20	0.81	0.000	55.00	1.20	0.81	0.000
45.00	1.20	0.81	0.000	55.20	1.20	0.81	0.000
45.20	1.20	0.81	0.000	55.40	1.20	0.81	0.000
45.40	1.20	0.81	0.000	55.60	1.20	0.81	0.000
45.60	1.20	0.81	0.000	55.80	1.20	0.81	0.000
45.80	1.20	0.81	0.000	56.00	1.20	0.81	0.000
46.00	1.20	0.81	0.000	56.20	1.20	0.81	0.000
46.20	1.20	0.81	0.000	56.40	1.20	0.81	0.000
46.40	1.20	0.81	0.000	56.60	1.20	0.81	0.000
46.60	1.20	0.81	0.000	56.80	1.20	0.81	0.000
46.80	1.20	0.81	0.000	57.00	1.20	0.81	0.000
47.00	1.20	0.81	0.000	57.20	1.20	0.81	0.000
47.20	1.20	0.81	0.000	57.40	1.20	0.81	0.000
47.40	1.20	0.81	0.000	57.60	1.20	0.81	0.000
47.60	1.20	0.81	0.000	57.80	1.20	0.81	0.000
47.80	1.20	0.81	0.000	58.00	1.20	0.81	0.000
48.00	1.20	0.81	0.000	58.20	1.20	0.81	0.000
48.20	1.20	0.81	0.000	58.40	1.20	0.81	0.000
48.40	1.20	0.81	0.000	58.60	1.20	0.81	0.000
48.60	1.20	0.81	0.000	58.80	1.20	0.81	0.000
48.80	1.20	0.81	0.000	59.00	1.20	0.81	0.000
49.00	1.20	0.81	0.000	59.20	1.20	0.81	0.000
49.20	1.20	0.81	0.000	59.40	1.20	0.81	0.000
49.40	1.20	0.81	0.000	59.60	1.20	0.81	0.000
49.60	1.20	0.81	0.000	59.80	1.20	0.81	0.000
49.80	1.20	0.81	0.000	60.00	1.20	0.81	0.000
50.00	1.20	0.81	0.000	60.20	1.20	0.81	0.000
50.20	1.20	0.81	0.000	60.40	1.20	0.81	0.000
50.40	1.20	0.81	0.000	60.60	1.20	0.81	0.000
50.60	1.20	0.81	0.000	60.80	1.20	0.81	0.000
50.80	1.20	0.81	0.000	61.00	1.20	0.81	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
61.20	1.20	0.81	0.000	71.40	1.20	0.81	0.000
61.40	1.20	0.81	0.000	71.60	1.20	0.81	0.000
61.60	1.20	0.81	0.000	71.80	1.20	0.81	0.000
61.80	1.20	0.81	0.000	72.00	1.20	0.81	0.000
62.00	1.20	0.81	0.000	72.20	1.20	0.81	0.000
62.20	1.20	0.81	0.000	72.40	1.20	0.81	0.000
62.40	1.20	0.81	0.000	72.60	1.20	0.81	0.000
62.60	1.20	0.81	0.000	72.80	1.20	0.81	0.000
62.80	1.20	0.81	0.000	73.00	1.20	0.81	0.000
63.00	1.20	0.81	0.000	73.20	1.20	0.81	0.000
63.20	1.20	0.81	0.000	73.40	1.20	0.81	0.000
63.40	1.20	0.81	0.000	73.60	1.20	0.81	0.000
63.60	1.20	0.81	0.000	73.80	1.20	0.81	0.000
63.80	1.20	0.81	0.000	74.00	1.20	0.81	0.000
64.00	1.20	0.81	0.000	74.20	1.20	0.81	0.000
64.20	1.20	0.81	0.000	74.40	1.20	0.81	0.000
64.40	1.20	0.81	0.000	74.60	1.20	0.81	0.000
64.60	1.20	0.81	0.000	74.80	1.20	0.81	0.000
64.80	1.20	0.81	0.000	75.00	1.20	0.81	0.000
65.00	1.20	0.81	0.000	75.20	1.20	0.81	0.000
65.20	1.20	0.81	0.000	75.40	1.20	0.81	0.000
65.40	1.20	0.81	0.000	75.60	1.20	0.81	0.000
65.60	1.20	0.81	0.000	75.80	1.20	0.81	0.000
65.80	1.20	0.81	0.000	76.00	1.20	0.81	0.000
66.00	1.20	0.81	0.000	76.20	1.20	0.81	0.000
66.20	1.20	0.81	0.000	76.40	1.20	0.81	0.000
66.40	1.20	0.81	0.000	76.60	1.20	0.81	0.000
66.60	1.20	0.81	0.000	76.80	1.20	0.81	0.000
66.80	1.20	0.81	0.000	77.00	1.20	0.81	0.000
67.00	1.20	0.81	0.000	77.20	1.20	0.81	0.000
67.20	1.20	0.81	0.000	77.40	1.20	0.81	0.000
67.40	1.20	0.81	0.000	77.60	1.20	0.81	0.000
67.60	1.20	0.81	0.000	77.80	1.20	0.81	0.000
67.80	1.20	0.81	0.000	78.00	1.20	0.81	0.000
68.00	1.20	0.81	0.000	78.20	1.20	0.81	0.000
68.20	1.20	0.81	0.000	78.40	1.20	0.81	0.000
68.40	1.20	0.81	0.000	78.60	1.20	0.81	0.000
68.60	1.20	0.81	0.000	78.80	1.20	0.81	0.000
68.80	1.20	0.81	0.000	79.00	1.20	0.81	0.000
69.00	1.20	0.81	0.000	79.20	1.20	0.81	0.000
69.20	1.20	0.81	0.000	79.40	1.20	0.81	0.000
69.40	1.20	0.81	0.000	79.60	1.20	0.81	0.000
69.60	1.20	0.81	0.000	79.80	1.20	0.81	0.000
69.80	1.20	0.81	0.000	80.00	1.20	0.81	0.000
70.00	1.20	0.81	0.000	80.20	1.20	0.81	0.000
70.20	1.20	0.81	0.000	80.40	1.20	0.81	0.000
70.40	1.20	0.81	0.000	80.60	1.20	0.81	0.000
70.60	1.20	0.81	0.000	80.80	1.20	0.81	0.000
70.80	1.20	0.81	0.000	81.00	1.20	0.81	0.000
71.00	1.20	0.81	0.000	81.20	1.20	0.81	0.000
71.20	1.20	0.81	0.000	81.40	1.20	0.81	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
81.60	1.20	0.81	0.000	91.80	1.20	0.81	0.000
81.80	1.20	0.81	0.000	92.00	1.20	0.81	0.000
82.00	1.20	0.81	0.000	92.20	1.20	0.81	0.000
82.20	1.20	0.81	0.000	92.40	1.20	0.81	0.000
82.40	1.20	0.81	0.000	92.60	1.20	0.81	0.000
82.60	1.20	0.81	0.000	92.80	1.20	0.81	0.000
82.80	1.20	0.81	0.000	93.00	1.20	0.81	0.000
83.00	1.20	0.81	0.000	93.20	1.20	0.81	0.000
83.20	1.20	0.81	0.000	93.40	1.20	0.81	0.000
83.40	1.20	0.81	0.000	93.60	1.20	0.81	0.000
83.60	1.20	0.81	0.000	93.80	1.20	0.81	0.000
83.80	1.20	0.81	0.000	94.00	1.20	0.81	0.000
84.00	1.20	0.81	0.000	94.20	1.20	0.81	0.000
84.20	1.20	0.81	0.000	94.40	1.20	0.81	0.000
84.40	1.20	0.81	0.000	94.60	1.20	0.81	0.000
84.60	1.20	0.81	0.000	94.80	1.20	0.81	0.000
84.80	1.20	0.81	0.000	95.00	1.20	0.81	0.000
85.00	1.20	0.81	0.000	95.20	1.20	0.81	0.000
85.20	1.20	0.81	0.000	95.40	1.20	0.81	0.000
85.40	1.20	0.81	0.000	95.60	1.20	0.81	0.000
85.60	1.20	0.81	0.000	95.80	1.20	0.81	0.000
85.80	1.20	0.81	0.000	96.00	1.20	0.81	0.000
86.00	1.20	0.81	0.000	96.20	1.20	0.81	0.000
86.20	1.20	0.81	0.000	96.40	1.20	0.81	0.000
86.40	1.20	0.81	0.000	96.60	1.20	0.81	0.000
86.60	1.20	0.81	0.000	96.80	1.20	0.81	0.000
86.80	1.20	0.81	0.000	97.00	1.20	0.81	0.000
87.00	1.20	0.81	0.000	97.20	1.20	0.81	0.000
87.20	1.20	0.81	0.000	97.40	1.20	0.81	0.000
87.40	1.20	0.81	0.000	97.60	1.20	0.81	0.000
87.60	1.20	0.81	0.000	97.80	1.20	0.81	0.000
87.80	1.20	0.81	0.000	98.00	1.20	0.81	0.000
88.00	1.20	0.81	0.000	98.20	1.20	0.81	0.000
88.20	1.20	0.81	0.000	98.40	1.20	0.81	0.000
88.40	1.20	0.81	0.000	98.60	1.20	0.81	0.000
88.60	1.20	0.81	0.000	98.80	1.20	0.81	0.000
88.80	1.20	0.81	0.000	99.00	1.20	0.81	0.000
89.00	1.20	0.81	0.000	99.20	1.20	0.81	0.000
89.20	1.20	0.81	0.000	99.40	1.20	0.81	0.000
89.40	1.20	0.81	0.000	99.60	1.20	0.81	0.000
89.60	1.20	0.81	0.000	99.80	1.20	0.81	0.000
89.80	1.20	0.81	0.000	100.00	1.20	0.81	0.000
90.00	1.20	0.81	0.000	100.20	1.20	0.81	0.000
90.20	1.20	0.81	0.000	100.40	1.20	0.81	0.000
90.40	1.20	0.81	0.000	100.60	1.20	0.81	0.000
90.60	1.20	0.81	0.000	100.80	1.20	0.81	0.000
90.80	1.20	0.81	0.000	101.00	1.20	0.81	0.000
91.00	1.20	0.81	0.000	101.20	1.20	0.81	0.000
91.20	1.20	0.81	0.000	101.40	1.20	0.81	0.000
91.40	1.20	0.81	0.000	101.60	1.20	0.81	0.000
91.60	1.20	0.81	0.000	101.80	1.20	0.81	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
102.00	1.20	0.81	0.000	112.20	1.20	0.81	0.000
102.20	1.20	0.81	0.000	112.40	1.20	0.81	0.000
102.40	1.20	0.81	0.000	112.60	1.20	0.81	0.000
102.60	1.20	0.81	0.000	112.80	1.20	0.81	0.000
102.80	1.20	0.81	0.000	113.00	1.20	0.81	0.000
103.00	1.20	0.81	0.000	113.20	1.20	0.81	0.000
103.20	1.20	0.81	0.000	113.40	1.20	0.81	0.000
103.40	1.20	0.81	0.000	113.60	1.20	0.81	0.000
103.60	1.20	0.81	0.000	113.80	1.20	0.81	0.000
103.80	1.20	0.81	0.000	114.00	1.20	0.81	0.000
104.00	1.20	0.81	0.000	114.20	1.20	0.81	0.000
104.20	1.20	0.81	0.000	114.40	1.20	0.81	0.000
104.40	1.20	0.81	0.000	114.60	1.20	0.81	0.000
104.60	1.20	0.81	0.000	114.80	1.20	0.81	0.000
104.80	1.20	0.81	0.000	115.00	1.20	0.81	0.000
105.00	1.20	0.81	0.000	115.20	1.20	0.81	0.000
105.20	1.20	0.81	0.000	115.40	1.20	0.81	0.000
105.40	1.20	0.81	0.000	115.60	1.20	0.81	0.000
105.60	1.20	0.81	0.000	115.80	1.20	0.81	0.000
105.80	1.20	0.81	0.000	116.00	1.20	0.81	0.000
106.00	1.20	0.81	0.000	116.20	1.20	0.81	0.000
106.20	1.20	0.81	0.000	116.40	1.20	0.81	0.000
106.40	1.20	0.81	0.000	116.60	1.20	0.81	0.000
106.60	1.20	0.81	0.000	116.80	1.20	0.81	0.000
106.80	1.20	0.81	0.000	117.00	1.20	0.81	0.000
107.00	1.20	0.81	0.000	117.20	1.20	0.81	0.000
107.20	1.20	0.81	0.000	117.40	1.20	0.81	0.000
107.40	1.20	0.81	0.000	117.60	1.20	0.81	0.000
107.60	1.20	0.81	0.000	117.80	1.20	0.81	0.000
107.80	1.20	0.81	0.000	118.00	1.20	0.81	0.000
108.00	1.20	0.81	0.000	118.20	1.20	0.81	0.000
108.20	1.20	0.81	0.000	118.40	1.20	0.81	0.000
108.40	1.20	0.81	0.000	118.60	1.20	0.81	0.000
108.60	1.20	0.81	0.000	118.80	1.20	0.81	0.000
108.80	1.20	0.81	0.000	119.00	1.20	0.81	0.000
109.00	1.20	0.81	0.000	119.20	1.20	0.81	0.000
109.20	1.20	0.81	0.000	119.40	1.20	0.81	0.000
109.40	1.20	0.81	0.000	119.60	1.20	0.81	0.000
109.60	1.20	0.81	0.000	119.80	1.20	0.81	0.000
109.80	1.20	0.81	0.000	120.00	1.20	0.81	0.000
110.00	1.20	0.81	0.000	120.20	1.20	0.81	0.000
110.20	1.20	0.81	0.000	120.40	1.20	0.81	0.000
110.40	1.20	0.81	0.000	120.60	1.20	0.81	0.000
110.60	1.20	0.81	0.000	120.80	1.20	0.81	0.000
110.80	1.20	0.81	0.000	121.00	1.20	0.81	0.000
111.00	1.20	0.81	0.000	121.20	1.20	0.81	0.000
111.20	1.20	0.81	0.000	121.40	1.20	0.81	0.000
111.40	1.20	0.81	0.000	121.60	1.20	0.81	0.000
111.60	1.20	0.81	0.000	121.80	1.20	0.81	0.000
111.80	1.20	0.81	0.000	122.00	1.20	0.81	0.000
112.00	1.20	0.81	0.000	122.20	1.20	0.81	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
122.40	1.20	0.81	0.000	132.60	1.20	0.81	0.000
122.60	1.20	0.81	0.000	132.80	1.20	0.81	0.000
122.80	1.20	0.81	0.000	133.00	1.20	0.81	0.000
123.00	1.20	0.81	0.000	133.20	1.20	0.81	0.000
123.20	1.20	0.81	0.000	133.40	1.20	0.81	0.000
123.40	1.20	0.81	0.000	133.60	1.20	0.81	0.000
123.60	1.20	0.81	0.000	133.80	1.20	0.81	0.000
123.80	1.20	0.81	0.000	134.00	1.20	0.81	0.000
124.00	1.20	0.81	0.000	134.20	1.20	0.81	0.000
124.20	1.20	0.81	0.000	134.40	1.20	0.81	0.000
124.40	1.20	0.81	0.000	134.60	1.20	0.81	0.000
124.60	1.20	0.81	0.000	134.80	1.20	0.81	0.000
124.80	1.20	0.81	0.000	135.00	1.20	0.81	0.000
125.00	1.20	0.81	0.000	135.20	1.20	0.81	0.000
125.20	1.20	0.81	0.000	135.40	1.20	0.81	0.000
125.40	1.20	0.81	0.000	135.60	1.20	0.81	0.000
125.60	1.20	0.81	0.000	135.80	1.20	0.81	0.000
125.80	1.20	0.81	0.000	136.00	1.20	0.81	0.000
126.00	1.20	0.81	0.000	136.20	1.20	0.81	0.000
126.20	1.20	0.81	0.000	136.40	1.20	0.81	0.000
126.40	1.20	0.81	0.000	136.60	1.20	0.81	0.000
126.60	1.20	0.81	0.000	136.80	1.20	0.81	0.000
126.80	1.20	0.81	0.000	137.00	1.20	0.81	0.000
127.00	1.20	0.81	0.000	137.20	1.20	0.81	0.000
127.20	1.20	0.81	0.000	137.40	1.20	0.81	0.000
127.40	1.20	0.81	0.000	137.60	1.20	0.81	0.000
127.60	1.20	0.81	0.000	137.80	1.20	0.81	0.000
127.80	1.20	0.81	0.000	138.00	1.20	0.81	0.000
128.00	1.20	0.81	0.000	138.20	1.20	0.81	0.000
128.20	1.20	0.81	0.000	138.40	1.20	0.81	0.000
128.40	1.20	0.81	0.000	138.60	1.20	0.81	0.000
128.60	1.20	0.81	0.000	138.80	1.20	0.81	0.000
128.80	1.20	0.81	0.000	139.00	1.20	0.81	0.000
129.00	1.20	0.81	0.000	139.20	1.20	0.81	0.000
129.20	1.20	0.81	0.000	139.40	1.20	0.81	0.000
129.40	1.20	0.81	0.000	139.60	1.20	0.81	0.000
129.60	1.20	0.81	0.000	139.80	1.20	0.81	0.000
129.80	1.20	0.81	0.000	140.00	1.20	0.81	0.000
130.00	1.20	0.81	0.000	140.20	1.20	0.81	0.000
130.20	1.20	0.81	0.000	140.40	1.20	0.81	0.000
130.40	1.20	0.81	0.000	140.60	1.20	0.81	0.000
130.60	1.20	0.81	0.000	140.80	1.20	0.81	0.000
130.80	1.20	0.81	0.000	141.00	1.20	0.81	0.000
131.00	1.20	0.81	0.000	141.20	1.20	0.81	0.000
131.20	1.20	0.81	0.000	141.40	1.20	0.81	0.000
131.40	1.20	0.81	0.000	141.60	1.20	0.81	0.000
131.60	1.20	0.81	0.000	141.80	1.20	0.81	0.000
131.80	1.20	0.81	0.000	142.00	1.20	0.81	0.000
132.00	1.20	0.81	0.000	142.20	1.20	0.81	0.000
132.20	1.20	0.81	0.000	142.40	1.20	0.81	0.000
132.40	1.20	0.81	0.000	142.60	1.20	0.81	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
142.80	1.20	0.81	0.000	153.00	1.20	0.81	0.000
143.00	1.20	0.81	0.000	153.20	1.20	0.81	0.000
143.20	1.20	0.81	0.000	153.40	1.20	0.81	0.000
143.40	1.20	0.81	0.000	153.60	1.20	0.81	0.000
143.60	1.20	0.81	0.000	153.80	1.20	0.81	0.000
143.80	1.20	0.81	0.000	154.00	1.20	0.81	0.000
144.00	1.20	0.81	0.000	154.20	1.20	0.81	0.000
144.20	1.20	0.81	0.000	154.40	1.20	0.81	0.000
144.40	1.20	0.81	0.000	154.60	1.20	0.81	0.000
144.60	1.20	0.81	0.000	154.80	1.20	0.81	0.000
144.80	1.20	0.81	0.000	155.00	1.20	0.81	0.000
145.00	1.20	0.81	0.000	155.20	1.20	0.81	0.000
145.20	1.20	0.81	0.000	155.40	1.20	0.81	0.000
145.40	1.20	0.81	0.000	155.60	1.20	0.81	0.000
145.60	1.20	0.81	0.000	155.80	1.20	0.81	0.000
145.80	1.20	0.81	0.000	156.00	1.20	0.81	0.000
146.00	1.20	0.81	0.000	156.20	1.20	0.81	0.000
146.20	1.20	0.81	0.000	156.40	1.20	0.81	0.000
146.40	1.20	0.81	0.000	156.60	1.20	0.81	0.000
146.60	1.20	0.81	0.000	156.80	1.20	0.81	0.000
146.80	1.20	0.81	0.000	157.00	1.20	0.81	0.000
147.00	1.20	0.81	0.000	157.20	1.20	0.81	0.000
147.20	1.20	0.81	0.000	157.40	1.20	0.81	0.000
147.40	1.20	0.81	0.000	157.60	1.20	0.81	0.000
147.60	1.20	0.81	0.000	157.80	1.20	0.81	0.000
147.80	1.20	0.81	0.000	158.00	1.20	0.81	0.000
148.00	1.20	0.81	0.000	158.20	1.20	0.81	0.000
148.20	1.20	0.81	0.000	158.40	1.20	0.81	0.000
148.40	1.20	0.81	0.000	158.60	1.20	0.81	0.000
148.60	1.20	0.81	0.000	158.80	1.20	0.81	0.000
148.80	1.20	0.81	0.000	159.00	1.20	0.81	0.000
149.00	1.20	0.81	0.000	159.20	1.20	0.81	0.000
149.20	1.20	0.81	0.000	159.40	1.20	0.81	0.000
149.40	1.20	0.81	0.000	159.60	1.20	0.81	0.000
149.60	1.20	0.81	0.000	159.80	1.20	0.81	0.000
149.80	1.20	0.81	0.000	160.00	1.20	0.81	0.000
150.00	1.20	0.81	0.000	160.20	1.20	0.81	0.000
150.20	1.20	0.81	0.000	160.40	1.20	0.81	0.000
150.40	1.20	0.81	0.000	160.60	1.20	0.81	0.000
150.60	1.20	0.81	0.000	160.80	1.20	0.81	0.000
150.80	1.20	0.81	0.000	161.00	1.20	0.81	0.000
151.00	1.20	0.81	0.000	161.20	1.20	0.81	0.000
151.20	1.20	0.81	0.000	161.40	1.20	0.81	0.000
151.40	1.20	0.81	0.000	161.60	1.20	0.81	0.000
151.60	1.20	0.81	0.000	161.80	1.20	0.81	0.000
151.80	1.20	0.81	0.000	162.00	1.20	0.81	0.000
152.00	1.20	0.81	0.000	162.20	1.20	0.81	0.000
152.20	1.20	0.81	0.000	162.40	1.20	0.81	0.000
152.40	1.20	0.81	0.000	162.60	1.20	0.81	0.000
152.60	1.20	0.81	0.000	162.80	1.20	0.81	0.000
152.80	1.20	0.81	0.000	163.00	1.20	0.81	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
163.20	1.20	0.81	0.000
163.40	1.20	0.81	0.000
163.60	1.20	0.81	0.000
163.80	1.20	0.81	0.000
164.00	1.20	0.81	0.000
164.20	1.20	0.81	0.000
164.40	1.20	0.81	0.000
164.60	1.20	0.81	0.000
164.80	1.20	0.81	0.000
165.00	1.20	0.81	0.000
165.20	1.20	0.81	0.000
165.40	1.20	0.81	0.000
165.60	1.20	0.81	0.000
165.80	1.20	0.81	0.000
166.00	1.20	0.81	0.000
166.20	1.20	0.81	0.000
166.40	1.20	0.81	0.000
166.60	1.20	0.81	0.000
166.80	1.20	0.81	0.000
167.00	1.20	0.81	0.000
167.20	1.20	0.81	0.000
167.40	1.20	0.81	0.000
167.60	1.20	0.81	0.000
167.80	1.20	0.81	0.000
168.00	1.20	0.81	0.000

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 0.96" for 1.2 Inch MRC event
Inflow = 5.342 cfs @ 1.10 hrs, Volume= 6,694 cf
Outflow = 0.023 cfs @ 2.12 hrs, Volume= 6,622 cf, Atten= 100%, Lag= 61.1 min
Primary = 0.023 cfs @ 2.12 hrs, Volume= 6,622 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 158.37' @ 2.12 hrs Surf.Area= 13,041 sf Storage= 6,596 cf

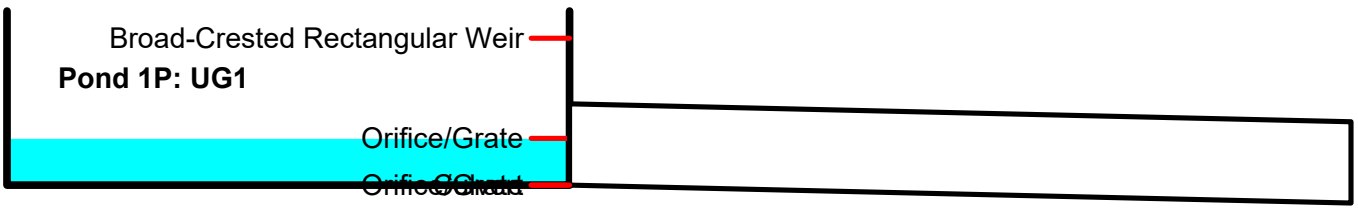
Plug-Flow detention time= 2,873.7 min calculated for 6,622 cf (99% of inflow)
Center-of-Mass det. time= 2,873.1 min (2,942.6 - 69.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.023 cfs @ 2.12 hrs HW=158.37' (Free Discharge)
└**4=Culvert** (Passes 0.023 cfs of 2.024 cfs potential flow)
  └**1=Orifice/Grate** (Orifice Controls 0.023 cfs @ 4.306 fps)
  └**2=Orifice/Grate** (Controls 0.000 cfs)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 1P: UG1 - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger®280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 27 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

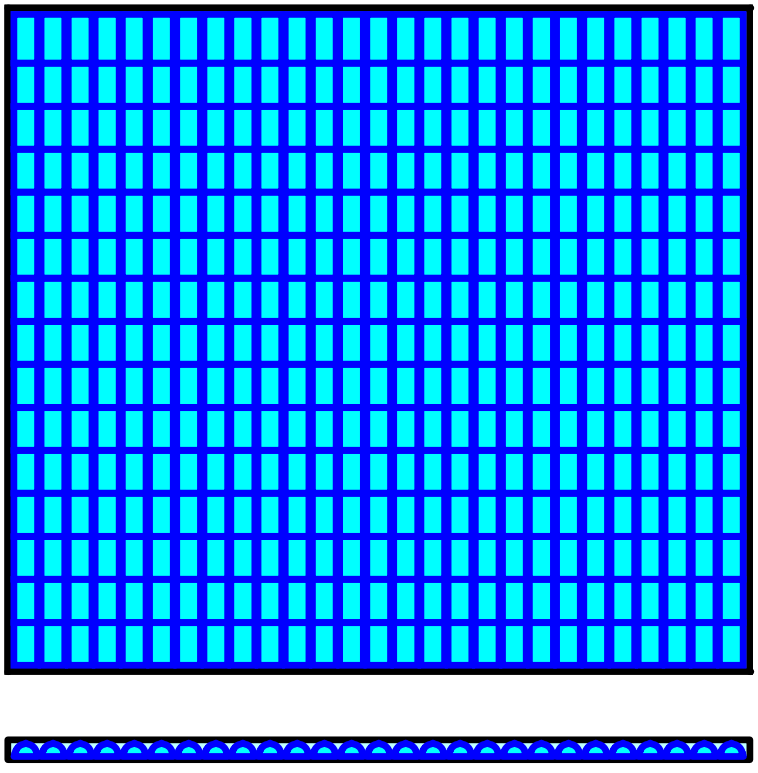
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

405 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 27 Rows = 17,377.3 cf Chamber Storage

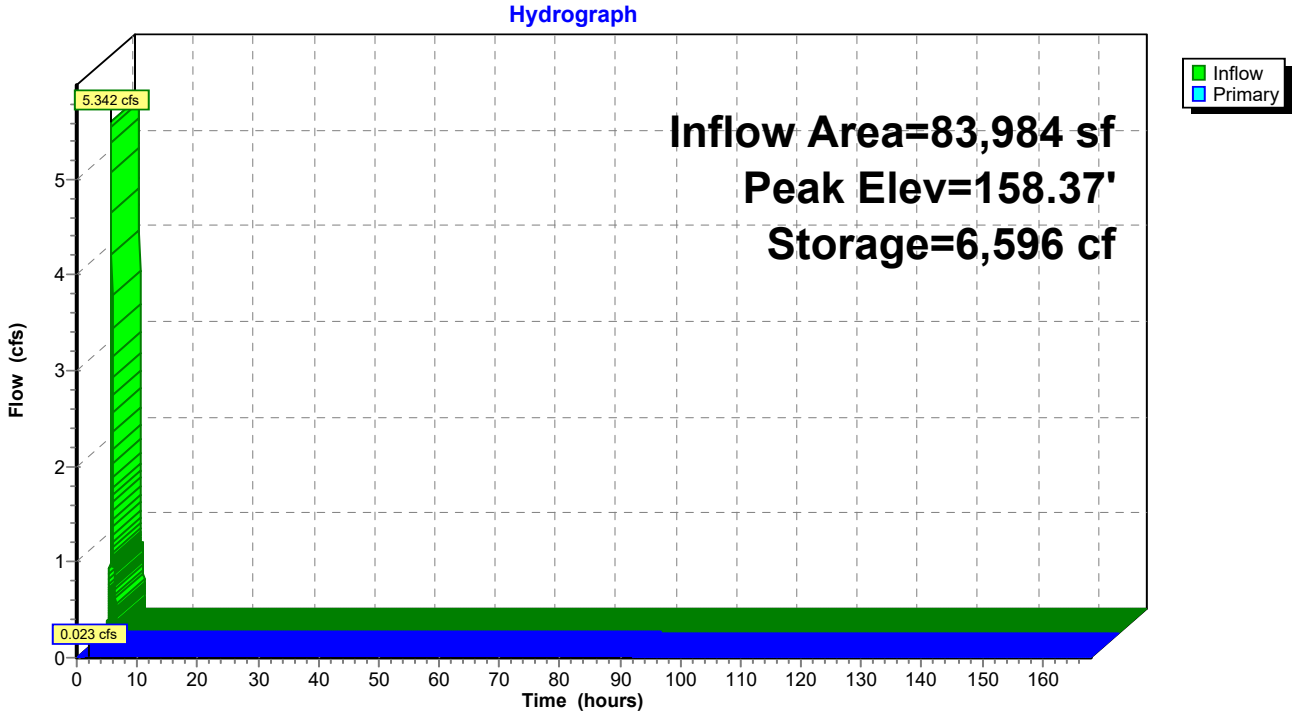
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

Chamber Storage + Stone Storage = 27,162.4 cf = 0.624 af
Overall Storage Efficiency = 64.9%
Overall System Size = 108.00' x 120.75' x 3.21'

405 Chambers
1,549.6 cy Field
906.0 cy Stone



Pond 1P: UG1


Hydrograph
Inflow Area=83,984 sf
Peak Elev=158.37'
Storage=6,596 cf
5.342 cfs
0.023 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.138	34	157.54	0.000
1.00	**3.892**	1,474	157.81	0.013
1.50	**0.699**	5,819	158.30	0.022
2.00	0.177	**6,559**	**158.37**	**0.023**
2.50	0.000	**6,566**	**158.37**	**0.023**
3.00	0.000	6,524	158.37	0.023
3.50	0.000	6,482	158.36	0.023
4.00	0.000	6,440	158.36	0.023
4.50	0.000	6,398	158.35	0.023
5.00	0.000	6,356	158.35	0.023
5.50	0.000	6,315	158.35	0.023
6.00	0.000	6,273	158.34	0.023
6.50	0.000	6,232	158.34	0.023
7.00	0.000	6,190	158.34	0.023
7.50	0.000	6,149	158.33	0.023
8.00	0.000	6,108	158.33	0.023
8.50	0.000	6,067	158.33	0.023
9.00	0.000	6,026	158.32	0.023
9.50	0.000	5,985	158.32	0.023
10.00	0.000	5,944	158.31	0.023
10.50	0.000	5,903	158.31	0.023
11.00	0.000	5,863	158.31	0.023
11.50	0.000	5,822	158.30	0.022
12.00	0.000	5,782	158.30	0.022
12.50	0.000	5,741	158.30	0.022
13.00	0.000	5,701	158.29	0.022
13.50	0.000	5,661	158.29	0.022
14.00	0.000	5,621	158.29	0.022
14.50	0.000	5,581	158.28	0.022
15.00	0.000	5,541	158.28	0.022
15.50	0.000	5,501	158.28	0.022
16.00	0.000	5,462	158.27	0.022
16.50	0.000	5,422	158.27	0.022
17.00	0.000	5,383	158.27	0.022
17.50	0.000	5,343	158.26	0.022
18.00	0.000	5,304	158.26	0.022
18.50	0.000	5,265	158.26	0.022
19.00	0.000	5,226	158.25	0.022
19.50	0.000	5,187	158.25	0.022
20.00	0.000	5,148	158.25	0.022
20.50	0.000	5,109	158.24	0.022
21.00	0.000	5,071	158.24	0.021
21.50	0.000	5,032	158.24	0.021
22.00	0.000	4,994	158.23	0.021
22.50	0.000	4,955	158.23	0.021
23.00	0.000	4,917	158.23	0.021
23.50	0.000	4,879	158.22	0.021
24.00	0.000	4,841	158.22	0.021
24.50	0.000	4,803	158.22	0.021
25.00	0.000	4,765	158.21	0.021

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	4,727	158.21	0.021
26.00	0.000	4,689	158.21	0.021
26.50	0.000	4,652	158.20	0.021
27.00	0.000	4,614	158.20	0.021
27.50	0.000	4,577	158.20	0.021
28.00	0.000	4,539	158.19	0.021
28.50	0.000	4,502	158.19	0.021
29.00	0.000	4,465	158.19	0.021
29.50	0.000	4,428	158.18	0.021
30.00	0.000	4,391	158.18	0.021
30.50	0.000	4,354	158.18	0.020
31.00	0.000	4,317	158.17	0.020
31.50	0.000	4,281	158.17	0.020
32.00	0.000	4,244	158.17	0.020
32.50	0.000	4,208	158.17	0.020
33.00	0.000	4,171	158.16	0.020
33.50	0.000	4,135	158.16	0.020
34.00	0.000	4,099	158.16	0.020
34.50	0.000	4,063	158.15	0.020
35.00	0.000	4,027	158.15	0.020
35.50	0.000	3,991	158.15	0.020
36.00	0.000	3,955	158.14	0.020
36.50	0.000	3,919	158.14	0.020
37.00	0.000	3,884	158.14	0.020
37.50	0.000	3,848	158.13	0.020
38.00	0.000	3,813	158.13	0.020
38.50	0.000	3,777	158.13	0.020
39.00	0.000	3,742	158.13	0.020
39.50	0.000	3,707	158.12	0.019
40.00	0.000	3,672	158.12	0.019
40.50	0.000	3,637	158.12	0.019
41.00	0.000	3,602	158.11	0.019
41.50	0.000	3,567	158.11	0.019
42.00	0.000	3,533	158.11	0.019
42.50	0.000	3,498	158.10	0.019
43.00	0.000	3,464	158.10	0.019
43.50	0.000	3,429	158.10	0.019
44.00	0.000	3,395	158.10	0.019
44.50	0.000	3,361	158.09	0.019
45.00	0.000	3,327	158.09	0.019
45.50	0.000	3,293	158.09	0.019
46.00	0.000	3,259	158.08	0.019
46.50	0.000	3,225	158.08	0.019
47.00	0.000	3,191	158.08	0.019
47.50	0.000	3,158	158.08	0.019
48.00	0.000	3,124	158.07	0.019
48.50	0.000	3,091	158.07	0.019
49.00	0.000	3,057	158.07	0.018
49.50	0.000	3,024	158.06	0.018
50.00	0.000	2,991	158.06	0.018
50.50	0.000	2,958	158.06	0.018

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	2,925	158.06	0.018
51.50	0.000	2,892	158.05	0.018
52.00	0.000	2,859	158.05	0.018
52.50	0.000	2,827	158.05	0.018
53.00	0.000	2,794	158.05	0.018
53.50	0.000	2,762	158.04	0.018
54.00	0.000	2,729	158.04	0.018
54.50	0.000	2,697	158.04	0.018
55.00	0.000	2,665	158.03	0.018
55.50	0.000	2,633	158.03	0.018
56.00	0.000	2,601	158.03	0.018
56.50	0.000	2,569	158.02	0.018
57.00	0.000	2,537	158.02	0.018
57.50	0.000	2,506	158.01	0.017
58.00	0.000	2,474	158.00	0.017
58.50	0.000	2,443	158.00	0.017
59.00	0.000	2,413	157.99	0.017
59.50	0.000	2,382	157.99	0.017
60.00	0.000	2,352	157.98	0.017
60.50	0.000	2,322	157.98	0.017
61.00	0.000	2,292	157.97	0.017
61.50	0.000	2,262	157.96	0.016
62.00	0.000	2,233	157.96	0.016
62.50	0.000	2,203	157.95	0.016
63.00	0.000	2,174	157.95	0.016
63.50	0.000	2,145	157.94	0.016
64.00	0.000	2,117	157.94	0.016
64.50	0.000	2,088	157.93	0.016
65.00	0.000	2,060	157.92	0.016
65.50	0.000	2,032	157.92	0.015
66.00	0.000	2,004	157.91	0.015
66.50	0.000	1,977	157.91	0.015
67.00	0.000	1,950	157.90	0.015
67.50	0.000	1,922	157.90	0.015
68.00	0.000	1,895	157.89	0.015
68.50	0.000	1,869	157.89	0.015
69.00	0.000	1,842	157.88	0.015
69.50	0.000	1,816	157.88	0.015
70.00	0.000	1,790	157.87	0.014
70.50	0.000	1,764	157.87	0.014
71.00	0.000	1,739	157.86	0.014
71.50	0.000	1,713	157.86	0.014
72.00	0.000	1,688	157.85	0.014
72.50	0.000	1,663	157.85	0.014
73.00	0.000	1,638	157.84	0.014
73.50	0.000	1,614	157.84	0.014
74.00	0.000	1,589	157.83	0.013
74.50	0.000	1,565	157.83	0.013
75.00	0.000	1,541	157.83	0.013
75.50	0.000	1,518	157.82	0.013
76.00	0.000	1,494	157.82	0.013

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	1,471	157.81	0.013
77.00	0.000	1,448	157.81	0.013
77.50	0.000	1,425	157.80	0.013
78.00	0.000	1,402	157.80	0.013
78.50	0.000	1,380	157.79	0.012
79.00	0.000	1,358	157.79	0.012
79.50	0.000	1,336	157.79	0.012
80.00	0.000	1,314	157.78	0.012
80.50	0.000	1,292	157.78	0.012
81.00	0.000	1,271	157.77	0.012
81.50	0.000	1,250	157.77	0.012
82.00	0.000	1,229	157.77	0.012
82.50	0.000	1,208	157.76	0.011
83.00	0.000	1,188	157.76	0.011
83.50	0.000	1,167	157.75	0.011
84.00	0.000	1,147	157.75	0.011
84.50	0.000	1,128	157.75	0.011
85.00	0.000	1,108	157.74	0.011
85.50	0.000	1,089	157.74	0.011
86.00	0.000	1,069	157.73	0.011
86.50	0.000	1,050	157.73	0.010
87.00	0.000	1,032	157.73	0.010
87.50	0.000	1,013	157.72	0.010
88.00	0.000	995	157.72	0.010
88.50	0.000	977	157.72	0.010
89.00	0.000	959	157.71	0.010
89.50	0.000	941	157.71	0.010
90.00	0.000	924	157.71	0.010
90.50	0.000	906	157.70	0.010
91.00	0.000	889	157.70	0.009
91.50	0.000	872	157.70	0.009
92.00	0.000	856	157.69	0.009
92.50	0.000	839	157.69	0.009
93.00	0.000	823	157.69	0.009
93.50	0.000	807	157.68	0.009
94.00	0.000	791	157.68	0.009
94.50	0.000	776	157.68	0.009
95.00	0.000	761	157.68	0.008
95.50	0.000	745	157.67	0.008
96.00	0.000	731	157.67	0.008
96.50	0.000	716	157.67	0.008
97.00	0.000	701	157.66	0.008
97.50	0.000	687	157.66	0.008
98.00	0.000	673	157.66	0.008
98.50	0.000	659	157.66	0.008
99.00	0.000	646	157.65	0.008
99.50	0.000	632	157.65	0.007
100.00	0.000	619	157.65	0.007
100.50	0.000	606	157.65	0.007
101.00	0.000	593	157.64	0.007
101.50	0.000	581	157.64	0.007

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	569	157.64	0.007
102.50	0.000	556	157.64	0.007
103.00	0.000	545	157.63	0.007
103.50	0.000	533	157.63	0.006
104.00	0.000	521	157.63	0.006
104.50	0.000	510	157.63	0.006
105.00	0.000	499	157.63	0.006
105.50	0.000	488	157.62	0.006
106.00	0.000	478	157.62	0.006
106.50	0.000	467	157.62	0.006
107.00	0.000	457	157.62	0.006
107.50	0.000	447	157.62	0.005
108.00	0.000	438	157.61	0.005
108.50	0.000	428	157.61	0.005
109.00	0.000	419	157.61	0.005
109.50	0.000	410	157.61	0.005
110.00	0.000	402	157.61	0.005
110.50	0.000	393	157.61	0.005
111.00	0.000	385	157.60	0.005
111.50	0.000	377	157.60	0.004
112.00	0.000	369	157.60	0.004
112.50	0.000	361	157.60	0.004
113.00	0.000	354	157.60	0.004
113.50	0.000	346	157.60	0.004
114.00	0.000	339	157.59	0.004
114.50	0.000	332	157.59	0.004
115.00	0.000	325	157.59	0.004
115.50	0.000	319	157.59	0.004
116.00	0.000	312	157.59	0.004
116.50	0.000	306	157.59	0.003
117.00	0.000	300	157.59	0.003
117.50	0.000	294	157.59	0.003
118.00	0.000	288	157.59	0.003
118.50	0.000	283	157.58	0.003
119.00	0.000	277	157.58	0.003
119.50	0.000	272	157.58	0.003
120.00	0.000	267	157.58	0.003
120.50	0.000	262	157.58	0.003
121.00	0.000	257	157.58	0.003
121.50	0.000	252	157.58	0.003
122.00	0.000	248	157.58	0.002
122.50	0.000	244	157.58	0.002
123.00	0.000	239	157.58	0.002
123.50	0.000	235	157.58	0.002
124.00	0.000	231	157.57	0.002
124.50	0.000	227	157.57	0.002
125.00	0.000	223	157.57	0.002
125.50	0.000	220	157.57	0.002
126.00	0.000	216	157.57	0.002
126.50	0.000	213	157.57	0.002
127.00	0.000	209	157.57	0.002

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	206	157.57	0.002
128.00	0.000	203	157.57	0.002
128.50	0.000	200	157.57	0.002
129.00	0.000	197	157.57	0.002
129.50	0.000	194	157.57	0.002
130.00	0.000	191	157.57	0.002
130.50	0.000	188	157.57	0.002
131.00	0.000	185	157.57	0.001
131.50	0.000	183	157.57	0.001
132.00	0.000	180	157.56	0.001
132.50	0.000	178	157.56	0.001
133.00	0.000	175	157.56	0.001
133.50	0.000	173	157.56	0.001
134.00	0.000	171	157.56	0.001
134.50	0.000	169	157.56	0.001
135.00	0.000	166	157.56	0.001
135.50	0.000	164	157.56	0.001
136.00	0.000	162	157.56	0.001
136.50	0.000	160	157.56	0.001
137.00	0.000	158	157.56	0.001
137.50	0.000	156	157.56	0.001
138.00	0.000	154	157.56	0.001
138.50	0.000	152	157.56	0.001
139.00	0.000	150	157.56	0.001
139.50	0.000	148	157.56	0.001
140.00	0.000	147	157.56	0.001
140.50	0.000	145	157.56	0.001
141.00	0.000	143	157.56	0.001
141.50	0.000	141	157.56	0.001
142.00	0.000	139	157.56	0.001
142.50	0.000	138	157.56	0.001
143.00	0.000	136	157.56	0.001
143.50	0.000	134	157.56	0.001
144.00	0.000	132	157.56	0.001
144.50	0.000	131	157.56	0.001
145.00	0.000	129	157.55	0.001
145.50	0.000	127	157.55	0.001
146.00	0.000	126	157.55	0.001
146.50	0.000	124	157.55	0.001
147.00	0.000	123	157.55	0.001
147.50	0.000	121	157.55	0.001
148.00	0.000	120	157.55	0.001
148.50	0.000	118	157.55	0.001
149.00	0.000	117	157.55	0.001
149.50	0.000	115	157.55	0.001
150.00	0.000	114	157.55	0.001
150.50	0.000	112	157.55	0.001
151.00	0.000	111	157.55	0.001
151.50	0.000	109	157.55	0.001
152.00	0.000	108	157.55	0.001
152.50	0.000	107	157.55	0.001

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	105	157.55	0.001
153.50	0.000	104	157.55	0.001
154.00	0.000	103	157.55	0.001
154.50	0.000	101	157.55	0.001
155.00	0.000	100	157.55	0.001
155.50	0.000	99	157.55	0.001
156.00	0.000	98	157.55	0.001
156.50	0.000	96	157.55	0.001
157.00	0.000	95	157.55	0.001
157.50	0.000	94	157.55	0.001
158.00	0.000	93	157.55	0.001
158.50	0.000	92	157.55	0.001
159.00	0.000	90	157.55	0.001
159.50	0.000	89	157.55	0.001
160.00	0.000	88	157.55	0.001
160.50	0.000	87	157.55	0.001
161.00	0.000	86	157.55	0.001
161.50	0.000	85	157.55	0.001
162.00	0.000	84	157.55	0.001
162.50	0.000	83	157.55	0.001
163.00	0.000	82	157.55	0.001
163.50	0.000	81	157.55	0.001
164.00	0.000	80	157.55	0.001
164.50	0.000	79	157.55	0.001
165.00	0.000	78	157.54	0.001
165.50	0.000	77	157.54	0.001
166.00	0.000	76	157.54	0.001
166.50	0.000	75	157.54	0.001
167.00	0.000	74	157.54	0.001
167.50	0.000	73	157.54	0.001
168.00	0.000	72	157.54	0.001

BMW_2025-7-24_2

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-yr	Type II 24-hr		Default	24.00	1	2.73	2
2	2-yr	Type II 24-hr		Default	24.00	1	3.28	2
3	5-yr	Type II 24-hr		Default	24.00	1	4.13	2
4	10-yr	Type II 24-hr		Default	24.00	1	4.83	2
5	25-yr	Type II 24-hr		Default	24.00	1	5.86	2
6	50-yr	Type II 24-hr		Default	24.00	1	6.73	2
7	100-yr	Type II 24-hr		Default	24.00	1	7.66	2

Stage-Area-Storage for Pond 1P: UG1

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
157.53	0	158.04	2,727	158.55	8,645
157.54	52	158.05	2,847	158.56	8,759
157.55	104	158.06	2,965	158.57	8,872
157.56	156	158.07	3,084	158.58	8,985
157.57	209	158.08	3,203	158.59	9,098
157.58	261	158.09	3,321	158.60	9,211
157.59	313	158.10	3,439	158.61	9,324
157.60	365	158.11	3,557	158.62	9,436
157.61	417	158.12	3,675	158.63	9,549
157.62	469	158.13	3,793	158.64	9,661
157.63	522	158.14	3,910	158.65	9,773
157.64	574	158.15	4,028	158.66	9,885
157.65	626	158.16	4,145	158.67	9,997
157.66	678	158.17	4,262	158.68	10,109
157.67	730	158.18	4,378	158.69	10,221
157.68	782	158.19	4,495	158.70	10,333
157.69	835	158.20	4,611	158.71	10,445
157.70	887	158.21	4,727	158.72	10,556
157.71	939	158.22	4,843	158.73	10,668
157.72	991	158.23	4,960	158.74	10,779
157.73	1,043	158.24	5,076	158.75	10,890
157.74	1,095	158.25	5,192	158.76	11,001
157.75	1,148	158.26	5,308	158.77	11,112
157.76	1,200	158.27	5,423	158.78	11,222
157.77	1,252	158.28	5,539	158.79	11,333
157.78	1,304	158.29	5,655	158.80	11,443
157.79	1,356	158.30	5,771	158.81	11,553
157.80	1,408	158.31	5,887	158.82	11,663
157.81	1,461	158.32	6,002	158.83	11,773
157.82	1,513	158.33	6,118	158.84	11,882
157.83	1,565	158.34	6,233	158.85	11,992
157.84	1,617	158.35	6,349	158.86	12,101
157.85	1,669	158.36	6,464	158.87	12,211
157.86	1,721	158.37	6,580	158.88	12,320
157.87	1,774	158.38	6,695	158.89	12,429
157.88	1,826	158.39	6,811	158.90	12,538
157.89	1,878	158.40	6,926	158.91	12,646
157.90	1,930	158.41	7,041	158.92	12,755
157.91	1,982	158.42	7,156	158.93	12,864
157.92	2,034	158.43	7,272	158.94	12,972
157.93	2,087	158.44	7,387	158.95	13,081
157.94	2,139	158.45	7,502	158.96	13,189
157.95	2,191	158.46	7,617	158.97	13,297
157.96	2,243	158.47	7,732	158.98	13,405
157.97	2,295	158.48	7,846	158.99	13,514
157.98	2,347	158.49	7,961	159.00	13,621
157.99	2,400	158.50	8,075	159.01	13,729
158.00	2,452	158.51	8,190	159.02	13,837
158.01	2,504	158.52	8,304	159.03	13,945
158.02	2,556	158.53	8,418	159.04	14,052
158.03	2,608	158.54	8,531	159.05	14,160

Stage-Area-Storage for Pond 1P: UG1 (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
159.06	14,267	159.57	19,462	160.08	23,669
159.07	14,374	159.58	19,557	160.09	23,731
159.08	14,481	159.59	19,652	160.10	23,792
159.09	14,588	159.60	19,746	160.11	23,852
159.10	14,695	159.61	19,840	160.12	23,910
159.11	14,802	159.62	19,934	160.13	23,968
159.12	14,909	159.63	20,027	160.14	24,026
159.13	15,016	159.64	20,120	160.15	24,082
159.14	15,122	159.65	20,213	160.16	24,138
159.15	15,228	159.66	20,305	160.17	24,193
159.16	15,334	159.67	20,397	160.18	24,248
159.17	15,439	159.68	20,489	160.19	24,301
159.18	15,545	159.69	20,580	160.20	24,354
159.19	15,650	159.70	20,671	160.21	24,406
159.20	15,755	159.71	20,761	160.22	24,459
159.21	15,860	159.72	20,851	160.23	24,511
159.22	15,964	159.73	20,940	160.24	24,563
159.23	16,068	159.74	21,029	160.25	24,615
159.24	16,172	159.75	21,118	160.26	24,667
159.25	16,276	159.76	21,206	160.27	24,719
159.26	16,379	159.77	21,293	160.28	24,772
159.27	16,482	159.78	21,381	160.29	24,824
159.28	16,585	159.79	21,467	160.30	24,876
159.29	16,687	159.80	21,554	160.31	24,928
159.30	16,790	159.81	21,639	160.32	24,980
159.31	16,892	159.82	21,724	160.33	25,032
159.32	16,994	159.83	21,809	160.34	25,084
159.33	17,095	159.84	21,893	160.35	25,137
159.34	17,197	159.85	21,976	160.36	25,189
159.35	17,298	159.86	22,059	160.37	25,241
159.36	17,399	159.87	22,141	160.38	25,293
159.37	17,500	159.88	22,223	160.39	25,345
159.38	17,601	159.89	22,303	160.40	25,397
159.39	17,701	159.90	22,383	160.41	25,450
159.40	17,801	159.91	22,463	160.42	25,502
159.41	17,901	159.92	22,541	160.43	25,554
159.42	18,001	159.93	22,619	160.44	25,606
159.43	18,100	159.94	22,696	160.45	25,658
159.44	18,199	159.95	22,773	160.46	25,710
159.45	18,298	159.96	22,848	160.47	25,763
159.46	18,397	159.97	22,922	160.48	25,815
159.47	18,495	159.98	22,995	160.49	25,867
159.48	18,593	159.99	23,068	160.50	25,919
159.49	18,691	160.00	23,139	160.51	25,971
159.50	18,788	160.01	23,209	160.52	26,023
159.51	18,885	160.02	23,278	160.53	26,076
159.52	18,982	160.03	23,345	160.54	26,128
159.53	19,079	160.04	23,412	160.55	26,180
159.54	19,175	160.05	23,478	160.56	26,232
159.55	19,271	160.06	23,543	160.57	26,284
159.56	19,367	160.07	23,607	160.58	26,336

Stage-Area-Storage for Pond 1P: UG1 (continued)

Elevation (feet)	Storage (cubic-feet)
160.59	26,389
160.60	26,441
160.61	26,493
160.62	26,545
160.63	26,597
160.64	26,649
160.65	26,702
160.66	26,754
160.67	26,806
160.68	26,858
160.69	26,910
160.70	26,962
160.71	27,015
160.72	27,067
160.73	27,119
160.74	**27,162**

Stage-Area-Storage for Pond 3P: UG2

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
159.28	0	159.79	531	160.30	1,632
159.29	10	159.80	553	160.31	1,653
159.30	20	159.81	575	160.32	1,674
159.31	31	159.82	597	160.33	1,695
159.32	41	159.83	619	160.34	1,716
159.33	51	159.84	641	160.35	1,737
159.34	61	159.85	663	160.36	1,758
159.35	71	159.86	685	160.37	1,779
159.36	81	159.87	707	160.38	1,800
159.37	92	159.88	729	160.39	1,821
159.38	102	159.89	751	160.40	1,842
159.39	112	159.90	772	160.41	1,862
159.40	122	159.91	794	160.42	1,883
159.41	132	159.92	816	160.43	1,904
159.42	142	159.93	838	160.44	1,925
159.43	153	159.94	859	160.45	1,945
159.44	163	159.95	881	160.46	1,966
159.45	173	159.96	903	160.47	1,987
159.46	183	159.97	924	160.48	2,007
159.47	193	159.98	946	160.49	2,028
159.48	203	159.99	967	160.50	2,048
159.49	214	160.00	989	160.51	2,069
159.50	224	160.01	1,011	160.52	2,090
159.51	234	160.02	1,032	160.53	2,110
159.52	244	160.03	1,054	160.54	2,131
159.53	254	160.04	1,075	160.55	2,151
159.54	264	160.05	1,097	160.56	2,171
159.55	275	160.06	1,119	160.57	2,192
159.56	285	160.07	1,140	160.58	2,212
159.57	295	160.08	1,162	160.59	2,233
159.58	305	160.09	1,183	160.60	2,253
159.59	315	160.10	1,205	160.61	2,273
159.60	325	160.11	1,226	160.62	2,293
159.61	336	160.12	1,248	160.63	2,314
159.62	346	160.13	1,270	160.64	2,334
159.63	356	160.14	1,291	160.65	2,354
159.64	366	160.15	1,313	160.66	2,374
159.65	376	160.16	1,334	160.67	2,394
159.66	386	160.17	1,356	160.68	2,414
159.67	397	160.18	1,377	160.69	2,434
159.68	407	160.19	1,398	160.70	2,454
159.69	417	160.20	1,420	160.71	2,473
159.70	427	160.21	1,441	160.72	2,493
159.71	437	160.22	1,463	160.73	2,513
159.72	447	160.23	1,484	160.74	2,532
159.73	458	160.24	1,505	160.75	2,552
159.74	468	160.25	1,527	160.76	2,571
159.75	478	160.26	1,548	160.77	2,590
159.76	488	160.27	1,569	160.78	2,610
159.77	498	160.28	1,590	160.79	2,629
159.78	508	160.29	1,611	160.80	2,648

Stage-Area-Storage for Pond 3P: UG2 (continued)

Elevation (feet)	Storage (cubic-feet)
160.81	2,667
160.82	2,686
160.83	2,705
160.84	2,724
160.85	2,743
160.86	2,762
160.87	2,781
160.88	2,799
160.89	2,818
160.90	2,836
160.91	2,855
160.92	2,873
160.93	2,892
160.94	2,910
160.95	2,928
160.96	2,946
160.97	2,964
160.98	2,982
160.99	3,000
161.00	3,018
161.01	3,036
161.02	3,053
161.03	3,071
161.04	3,088
161.05	3,106
161.06	3,123
161.07	3,140
161.08	3,157
161.09	3,174
161.10	3,191
161.11	3,208
161.12	3,224
161.13	3,241
161.14	3,257
161.15	3,273
161.16	3,290
161.17	3,306
161.18	3,321
161.19	3,337
161.20	3,353
161.21	3,368
161.22	3,383
161.23	3,398
161.24	3,413
161.25	3,428
161.26	3,442
161.27	3,456
161.28	3,471
161.29	3,484
161.30	3,498
161.31	3,512
161.32	3,525
161.33	3,539
161.34	3,552
161.35	3,565
161.36	3,578
161.37	3,590
161.38	3,603
161.39	3,615
161.40	3,628
161.41	3,640
161.42	3,652
161.43	3,664
161.44	3,675
161.45	3,686
161.46	3,697
161.47	3,707
161.48	3,717
161.49	3,727
161.50	3,737
161.51	3,747
161.52	3,758
161.53	3,768
161.54	3,778
161.55	3,788
161.56	3,798
161.57	3,808
161.58	3,819
161.59	3,829
161.60	3,839
161.61	3,849
161.62	3,859
161.63	3,869
161.64	3,880
161.65	3,890
161.66	3,900
161.67	3,910
161.68	3,920
161.69	3,931
161.70	3,941
161.71	3,951
161.72	3,961
161.73	3,971
161.74	3,981
161.75	3,992
161.76	4,002
161.77	4,012
161.78	4,022
161.79	4,032
161.80	4,042
161.81	4,053
161.82	4,063
161.83	4,073
161.84	4,083
161.85	4,093
161.86	4,103
161.87	4,114
161.88	4,124
161.89	4,134
161.90	4,144
161.91	4,154
161.92	4,164
161.93	4,175
161.94	4,185
161.95	4,195
161.96	4,205
161.97	4,215
161.98	4,225
161.99	**4,234**

Stage-Discharge for Pond 1P: UG1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
157.53	0.000	158.04	0.018	158.55	0.505	159.06	2.677
157.54	0.000	158.05	0.018	158.56	0.551	159.07	2.703
157.55	0.000	158.06	0.018	158.57	0.598	159.08	2.730
157.56	0.001	158.07	0.019	158.58	0.647	159.09	2.756
157.57	0.002	158.08	0.019	158.59	0.696	159.10	2.782
157.58	0.003	158.09	0.019	158.60	0.747	159.11	2.808
157.59	0.004	158.10	0.019	158.61	0.800	159.12	2.833
157.60	0.004	158.11	0.019	158.62	0.853	159.13	2.858
157.61	0.005	158.12	0.019	158.63	0.908	159.14	2.883
157.62	0.006	158.13	0.020	158.64	0.963	159.15	2.908
157.63	0.006	158.14	0.020	158.65	1.020	159.16	2.933
157.64	0.007	158.15	0.020	158.66	1.078	159.17	2.957
157.65	0.007	158.16	0.020	158.67	1.137	159.18	2.981
157.66	0.008	158.17	0.020	158.68	1.197	159.19	3.005
157.67	0.008	158.18	0.020	158.69	1.258	159.20	3.029
157.68	0.009	158.19	0.021	158.70	1.321	159.21	3.052
157.69	0.009	158.20	0.021	158.71	1.384	159.22	3.076
157.70	0.009	158.21	0.021	158.72	1.448	159.23	3.099
157.71	0.010	158.22	0.021	158.73	1.509	159.24	3.122
157.72	0.010	158.23	0.021	158.74	1.563	159.25	3.145
157.73	0.010	158.24	0.021	158.75	1.614	159.26	3.167
157.74	0.011	158.25	0.022	158.76	1.662	159.27	3.190
157.75	0.011	158.26	0.022	158.77	1.708	159.28	3.212
157.76	0.011	158.27	0.022	158.78	1.752	159.29	3.234
157.77	0.012	158.28	0.022	158.79	1.795	159.30	3.256
157.78	0.012	158.29	0.022	158.80	1.836	159.31	3.278
157.79	0.012	158.30	0.022	158.81	1.877	159.32	3.300
157.80	0.013	158.31	0.023	158.82	1.916	159.33	3.322
157.81	0.013	158.32	0.023	158.83	1.955	159.34	3.343
157.82	0.013	158.33	0.023	158.84	1.992	159.35	3.364
157.83	0.013	158.34	0.023	158.85	2.029	159.36	3.386
157.84	0.014	158.35	0.023	158.86	2.065	159.37	3.407
157.85	0.014	158.36	0.023	158.87	2.100	159.38	3.428
157.86	0.014	158.37	0.023	158.88	2.135	159.39	3.448
157.87	0.014	158.38	0.024	158.89	2.169	159.40	3.469
157.88	0.015	158.39	0.024	158.90	2.202	159.41	3.490
157.89	0.015	158.40	0.031	158.91	2.235	159.42	3.510
157.90	0.015	158.41	0.045	158.92	2.267	159.43	3.530
157.91	0.015	158.42	0.063	158.93	2.299	159.44	3.550
157.92	0.015	158.43	0.084	158.94	2.330	159.45	3.570
157.93	0.016	158.44	0.108	158.95	2.361	159.46	3.590
157.94	0.016	158.45	0.135	158.96	2.392	159.47	3.610
157.95	0.016	158.46	0.163	158.97	2.422	159.48	3.630
157.96	0.016	158.47	0.194	158.98	2.452	159.49	3.650
157.97	0.017	158.48	0.227	158.99	2.481	159.50	3.669
157.98	0.017	158.49	0.262	159.00	2.510	159.51	3.688
157.99	0.017	158.50	0.299	159.01	2.538	159.52	3.708
158.00	0.017	158.51	0.337	159.02	2.567	159.53	3.727
158.01	0.017	158.52	0.377	159.03	2.595	159.54	3.746
158.02	0.018	158.53	0.418	159.04	2.622	159.55	3.765
158.03	0.018	158.54	0.461	159.05	2.650	159.56	3.784

Stage-Discharge for Pond 1P: UG1 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
159.57	3.803	160.08	4.661	160.59	8.142
159.58	3.821	160.09	4.677	160.60	8.275
159.59	3.840	160.10	4.692	160.61	8.408
159.60	3.859	160.11	4.707	160.62	8.544
159.61	3.877	160.12	4.722	160.63	8.681
159.62	3.895	160.13	4.737	160.64	8.820
159.63	3.914	160.14	4.752	160.65	8.960
159.64	3.932	160.15	4.767	160.66	9.102
159.65	3.950	160.16	4.782	160.67	9.245
159.66	3.968	160.17	4.797	160.68	9.390
159.67	3.986	160.18	4.812	160.69	9.536
159.68	4.004	160.19	4.827	160.70	9.683
159.69	4.021	160.20	4.841	160.71	9.833
159.70	4.039	160.21	4.856	160.72	9.983
159.71	4.057	160.22	4.871	160.73	10.135
159.72	4.074	160.23	4.885	160.74	**10.288**
159.73	4.092	160.24	4.900		
159.74	4.109	160.25	4.928		
159.75	4.126	160.26	4.966		
159.76	4.144	160.27	5.012		
159.77	4.161	160.28	5.064		
159.78	4.178	160.29	5.121		
159.79	4.195	160.30	5.182		
159.80	4.212	160.31	5.247		
159.81	4.229	160.32	5.316		
159.82	4.246	160.33	5.388		
159.83	4.262	160.34	5.464		
159.84	4.279	160.35	5.543		
159.85	4.296	160.36	5.625		
159.86	4.312	160.37	5.709		
159.87	4.329	160.38	5.797		
159.88	4.345	160.39	5.887		
159.89	4.361	160.40	5.979		
159.90	4.378	160.41	6.074		
159.91	4.394	160.42	6.172		
159.92	4.410	160.43	6.272		
159.93	4.426	160.44	6.374		
159.94	4.442	160.45	6.478		
159.95	4.458	160.46	6.584		
159.96	4.474	160.47	6.693		
159.97	4.490	160.48	6.803		
159.98	4.506	160.49	6.915		
159.99	4.522	160.50	7.030		
160.00	4.538	160.51	7.146		
160.01	4.553	160.52	7.264		
160.02	4.569	160.53	7.385		
160.03	4.584	160.54	7.506		
160.04	4.600	160.55	7.630		
160.05	4.615	160.56	7.756		
160.06	4.631	160.57	7.883		
160.07	4.646	160.58	8.012		

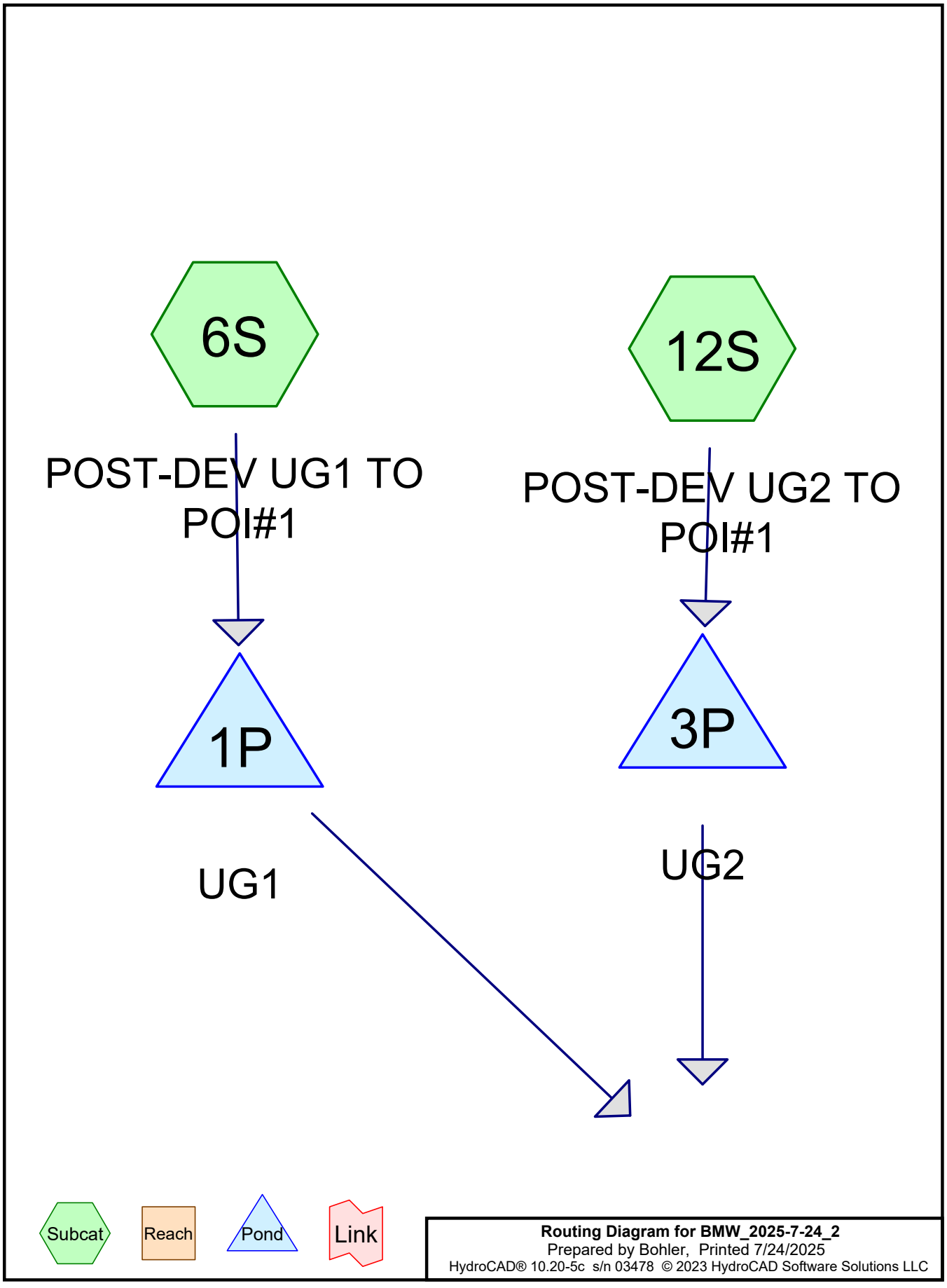
Stage-Discharge for Pond 3P: UG2

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
159.28	0.000	159.79	0.147	160.30	0.492	160.81	0.788
159.29	0.000	159.80	0.149	160.31	0.500	160.82	0.793
159.30	0.001	159.81	0.150	160.32	0.508	160.83	0.798
159.31	0.002	159.82	0.152	160.33	0.515	160.84	0.802
159.32	0.003	159.83	0.154	160.34	0.523	160.85	0.806
159.33	0.005	159.84	0.156	160.35	0.530	160.86	0.811
159.34	0.008	159.85	0.158	160.36	0.538	160.87	0.815
159.35	0.010	159.86	0.159	160.37	0.545	160.88	0.820
159.36	0.013	159.87	0.161	160.38	0.552	160.89	0.824
159.37	0.016	159.88	0.163	160.39	0.559	160.90	0.828
159.38	0.020	159.89	0.165	160.40	0.566	160.91	0.833
159.39	0.023	159.90	0.166	160.41	0.572	160.92	0.837
159.40	0.027	159.91	0.168	160.42	0.579	160.93	0.841
159.41	0.032	159.92	0.170	160.43	0.586	160.94	0.846
159.42	0.036	159.93	0.171	160.44	0.592	160.95	0.850
159.43	0.041	159.94	0.173	160.45	0.598	160.96	0.854
159.44	0.045	159.95	0.174	160.46	0.605	160.97	0.858
159.45	0.050	159.96	0.176	160.47	0.611	160.98	0.862
159.46	0.055	159.97	0.178	160.48	0.617	160.99	0.866
159.47	0.059	159.98	0.181	160.49	0.623	161.00	0.871
159.48	0.064	159.99	0.185	160.50	0.629	161.01	0.875
159.49	0.069	160.00	0.191	160.51	0.635	161.02	0.879
159.50	0.073	160.01	0.197	160.52	0.641	161.03	0.883
159.51	0.077	160.02	0.203	160.53	0.646	161.04	0.887
159.52	0.081	160.03	0.210	160.54	0.652	161.05	0.891
159.53	0.084	160.04	0.218	160.55	0.658	161.06	0.895
159.54	0.087	160.05	0.226	160.56	0.663	161.07	0.899
159.55	0.090	160.06	0.235	160.57	0.669	161.08	0.903
159.56	0.093	160.07	0.243	160.58	0.674	161.09	0.907
159.57	0.096	160.08	0.253	160.59	0.680	161.10	0.911
159.58	0.099	160.09	0.262	160.60	0.685	161.11	0.915
159.59	0.102	160.10	0.272	160.61	0.690	161.12	0.918
159.60	0.104	160.11	0.283	160.62	0.696	161.13	0.922
159.61	0.107	160.12	0.293	160.63	0.701	161.14	0.926
159.62	0.110	160.13	0.304	160.64	0.706	161.15	0.930
159.63	0.112	160.14	0.315	160.65	0.711	161.16	0.934
159.64	0.115	160.15	0.327	160.66	0.716	161.17	0.938
159.65	0.117	160.16	0.338	160.67	0.721	161.18	0.941
159.66	0.119	160.17	0.350	160.68	0.726	161.19	0.945
159.67	0.122	160.18	0.363	160.69	0.731	161.20	0.949
159.68	0.124	160.19	0.375	160.70	0.736	161.21	0.953
159.69	0.126	160.20	0.388	160.71	0.741	161.22	0.956
159.70	0.128	160.21	0.401	160.72	0.746	161.23	0.960
159.71	0.131	160.22	0.414	160.73	0.751	161.24	0.964
159.72	0.133	160.23	0.426	160.74	0.756	161.25	0.968
159.73	0.135	160.24	0.437	160.75	0.760	161.26	0.971
159.74	0.137	160.25	0.447	160.76	0.765	161.27	0.975
159.75	0.139	160.26	0.456	160.77	0.770	161.28	0.979
159.76	0.141	160.27	0.466	160.78	0.775	161.29	0.982
159.77	0.143	160.28	0.475	160.79	0.779	161.30	0.986
159.78	0.145	160.29	0.483	160.80	0.784	161.31	0.989

Stage-Discharge for Pond 3P: UG2 (continued)

Elevation (feet)	Primary (cfs)
161.32	0.993
161.33	0.997
161.34	1.000
161.35	1.004
161.36	1.007
161.37	1.011
161.38	1.014
161.39	1.018
161.40	1.021
161.41	1.025
161.42	1.028
161.43	1.032
161.44	1.035
161.45	1.038
161.46	1.042
161.47	1.045
161.48	1.049
161.49	1.052
161.50	1.055
161.51	1.072
161.52	1.100
161.53	1.135
161.54	1.175
161.55	1.221
161.56	1.271
161.57	1.325
161.58	1.383
161.59	1.445
161.60	1.510
161.61	1.578
161.62	1.649
161.63	1.722
161.64	1.799
161.65	1.878
161.66	1.960
161.67	2.044
161.68	2.131
161.69	2.220
161.70	2.312
161.71	2.405
161.72	2.501
161.73	2.599
161.74	2.699
161.75	2.801
161.76	2.905
161.77	3.011
161.78	3.119
161.79	3.229
161.80	3.340
161.81	3.454
161.82	3.569
161.83	3.686
161.84	3.804
161.85	3.925
161.86	4.047
161.87	4.171
161.88	4.296
161.89	4.423
161.90	4.552
161.91	4.682
161.92	4.813
161.93	4.947
161.94	5.081
161.95	5.218
161.96	5.355
161.97	5.494
161.98	5.635
161.99	**5.777**

Volume Calculations


6S
12S
POST-DEV UG1 TO POI#1
POST-DEV UG2 TO POI#1
1P
3P
UG1
UG2
Subcat
Reach
Pond
Link
Routing Diagram for BMW_2025-7-24_2
Prepared by Bohler, Printed 7/24/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

BMW_2025-7-24_2
Prepared by Bohler
Printed 7/24/2025
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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	Type II 24-hr		Default	24.00	1	3.28	2

Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

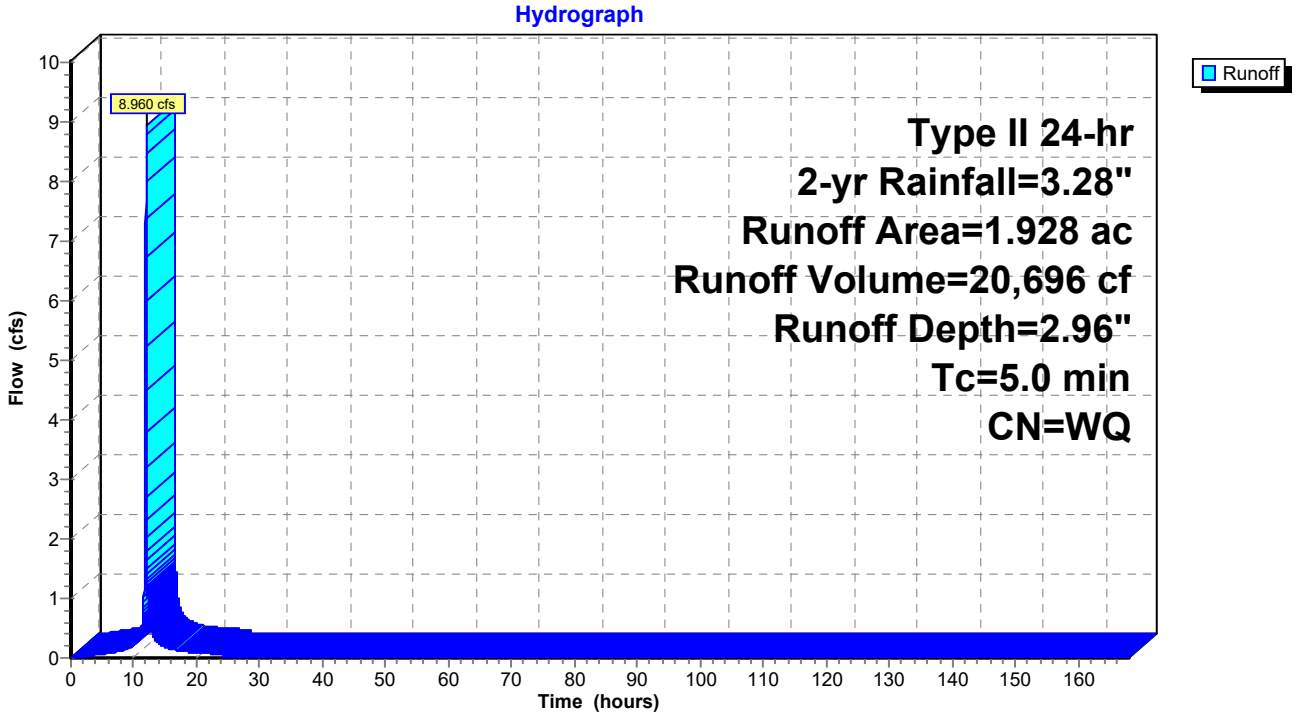
Runoff = 8.960 cfs @ 11.96 hrs, Volume= 20,696 cf, Depth= 2.96"
Routed to Pond 1P : UG1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928		Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 6S: POST-DEV UG1 TO POI#1



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Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.000	10.20	0.62	0.30	0.247
0.20	0.01	0.00	0.000	10.40	0.65	0.33	0.276
0.40	0.01	0.00	0.000	10.60	0.69	0.36	0.309
0.60	0.02	0.00	0.000	10.80	0.73	0.39	0.356
0.80	0.03	0.00	0.000	11.00	0.77	0.43	0.405
1.00	0.03	0.00	0.000	11.20	0.82	0.47	0.495
1.20	0.04	0.00	0.000	11.40	0.89	0.53	0.612
1.40	0.05	0.00	0.004	11.60	1.01	0.64	1.135
1.60	0.06	0.00	0.008	11.80	1.41	1.01	**3.990**
1.80	0.06	0.00	0.013	12.00	2.17	1.74	**7.401**
2.00	0.07	0.00	0.017	12.20	2.29	1.86	1.086
2.20	0.08	0.00	0.021	12.40	2.38	1.94	0.783
2.40	0.09	0.00	0.025	12.60	2.44	2.00	0.535
2.60	0.10	0.00	0.028	12.80	2.49	2.05	0.464
2.80	0.10	0.00	0.032	13.00	2.53	2.09	0.400
3.00	0.11	0.00	0.035	13.20	2.57	2.13	0.354
3.20	0.12	0.00	0.039	13.40	2.60	2.16	0.320
3.40	0.13	0.00	0.042	13.60	2.64	2.19	0.287
3.60	0.14	0.01	0.045	13.80	2.66	2.22	0.262
3.80	0.15	0.01	0.048	14.00	2.69	2.25	0.237
4.00	0.16	0.01	0.050	14.20	2.71	2.27	0.223
4.20	0.17	0.01	0.054	14.40	2.74	2.29	0.214
4.40	0.18	0.02	0.057	14.60	2.76	2.31	0.205
4.60	0.19	0.02	0.061	14.80	2.78	2.34	0.197
4.80	0.20	0.02	0.064	15.00	2.80	2.35	0.188
5.00	0.21	0.03	0.068	15.20	2.82	2.37	0.179
5.20	0.22	0.03	0.071	15.40	2.84	2.39	0.171
5.40	0.23	0.04	0.074	15.60	2.85	2.41	0.162
5.60	0.24	0.04	0.078	15.80	2.87	2.43	0.154
5.80	0.25	0.05	0.081	16.00	2.89	2.44	0.145
6.00	0.26	0.05	0.084	16.20	2.90	2.45	0.140
6.20	0.27	0.06	0.088	16.40	2.92	2.47	0.137
6.40	0.29	0.07	0.091	16.60	2.93	2.48	0.134
6.60	0.30	0.07	0.094	16.80	2.94	2.50	0.131
6.80	0.31	0.08	0.098	17.00	2.96	2.51	0.127
7.00	0.32	0.09	0.101	17.20	2.97	2.52	0.124
7.20	0.34	0.10	0.104	17.40	2.98	2.54	0.121
7.40	0.35	0.10	0.107	17.60	3.00	2.55	0.118
7.60	0.37	0.11	0.110	17.80	3.01	2.56	0.115
7.80	0.38	0.12	0.114	18.00	3.02	2.57	0.112
8.00	0.39	0.13	0.117	18.20	3.03	2.58	0.109
8.20	0.41	0.14	0.125	18.40	3.04	2.60	0.106
8.40	0.43	0.15	0.137	18.60	3.05	2.61	0.103
8.60	0.44	0.17	0.149	18.80	3.07	2.62	0.100
8.80	0.46	0.18	0.161	19.00	3.08	2.63	0.097
9.00	0.48	0.20	0.173	19.20	3.09	2.64	0.094
9.20	0.50	0.21	0.179	19.40	3.10	2.65	0.091
9.40	0.52	0.23	0.180	19.60	3.10	2.66	0.087
9.60	0.55	0.24	0.184	19.80	3.11	2.66	0.084
9.80	0.57	0.26	0.203	20.00	3.12	2.67	0.081
10.00	0.59	0.28	0.222	20.20	3.13	2.68	0.080

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
20.40	3.14	2.69	0.079	30.60	3.28	2.83	0.000
20.60	3.15	2.70	0.079	30.80	3.28	2.83	0.000
20.80	3.16	2.71	0.078	31.00	3.28	2.83	0.000
21.00	3.16	2.71	0.077	31.20	3.28	2.83	0.000
21.20	3.17	2.72	0.077	31.40	3.28	2.83	0.000
21.40	3.18	2.73	0.076	31.60	3.28	2.83	0.000
21.60	3.19	2.74	0.075	31.80	3.28	2.83	0.000
21.80	3.20	2.75	0.075	32.00	3.28	2.83	0.000
22.00	3.20	2.75	0.074	32.20	3.28	2.83	0.000
22.20	3.21	2.76	0.074	32.40	3.28	2.83	0.000
22.40	3.22	2.77	0.073	32.60	3.28	2.83	0.000
22.60	3.23	2.78	0.072	32.80	3.28	2.83	0.000
22.80	3.24	2.78	0.072	33.00	3.28	2.83	0.000
23.00	3.24	2.79	0.071	33.20	3.28	2.83	0.000
23.20	3.25	2.80	0.071	33.40	3.28	2.83	0.000
23.40	3.26	2.81	0.070	33.60	3.28	2.83	0.000
23.60	3.27	2.81	0.069	33.80	3.28	2.83	0.000
23.80	3.27	2.82	0.069	34.00	3.28	2.83	0.000
24.00	**3.28**	**2.83**	0.068	34.20	3.28	2.83	0.000
24.20	3.28	2.83	0.001	34.40	3.28	2.83	0.000
24.40	3.28	2.83	0.000	34.60	3.28	2.83	0.000
24.60	3.28	2.83	0.000	34.80	3.28	2.83	0.000
24.80	3.28	2.83	0.000	35.00	3.28	2.83	0.000
25.00	3.28	2.83	0.000	35.20	3.28	2.83	0.000
25.20	3.28	2.83	0.000	35.40	3.28	2.83	0.000
25.40	3.28	2.83	0.000	35.60	3.28	2.83	0.000
25.60	3.28	2.83	0.000	35.80	3.28	2.83	0.000
25.80	3.28	2.83	0.000	36.00	3.28	2.83	0.000
26.00	3.28	2.83	0.000	36.20	3.28	2.83	0.000
26.20	3.28	2.83	0.000	36.40	3.28	2.83	0.000
26.40	3.28	2.83	0.000	36.60	3.28	2.83	0.000
26.60	3.28	2.83	0.000	36.80	3.28	2.83	0.000
26.80	3.28	2.83	0.000	37.00	3.28	2.83	0.000
27.00	3.28	2.83	0.000	37.20	3.28	2.83	0.000
27.20	3.28	2.83	0.000	37.40	3.28	2.83	0.000
27.40	3.28	2.83	0.000	37.60	3.28	2.83	0.000
27.60	3.28	2.83	0.000	37.80	3.28	2.83	0.000
27.80	3.28	2.83	0.000	38.00	3.28	2.83	0.000
28.00	3.28	2.83	0.000	38.20	3.28	2.83	0.000
28.20	3.28	2.83	0.000	38.40	3.28	2.83	0.000
28.40	3.28	2.83	0.000	38.60	3.28	2.83	0.000
28.60	3.28	2.83	0.000	38.80	3.28	2.83	0.000
28.80	3.28	2.83	0.000	39.00	3.28	2.83	0.000
29.00	3.28	2.83	0.000	39.20	3.28	2.83	0.000
29.20	3.28	2.83	0.000	39.40	3.28	2.83	0.000
29.40	3.28	2.83	0.000	39.60	3.28	2.83	0.000
29.60	3.28	2.83	0.000	39.80	3.28	2.83	0.000
29.80	3.28	2.83	0.000	40.00	3.28	2.83	0.000
30.00	3.28	2.83	0.000	40.20	3.28	2.83	0.000
30.20	3.28	2.83	0.000	40.40	3.28	2.83	0.000
30.40	3.28	2.83	0.000	40.60	3.28	2.83	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
40.80	3.28	2.83	0.000	51.00	3.28	2.83	0.000
41.00	3.28	2.83	0.000	51.20	3.28	2.83	0.000
41.20	3.28	2.83	0.000	51.40	3.28	2.83	0.000
41.40	3.28	2.83	0.000	51.60	3.28	2.83	0.000
41.60	3.28	2.83	0.000	51.80	3.28	2.83	0.000
41.80	3.28	2.83	0.000	52.00	3.28	2.83	0.000
42.00	3.28	2.83	0.000	52.20	3.28	2.83	0.000
42.20	3.28	2.83	0.000	52.40	3.28	2.83	0.000
42.40	3.28	2.83	0.000	52.60	3.28	2.83	0.000
42.60	3.28	2.83	0.000	52.80	3.28	2.83	0.000
42.80	3.28	2.83	0.000	53.00	3.28	2.83	0.000
43.00	3.28	2.83	0.000	53.20	3.28	2.83	0.000
43.20	3.28	2.83	0.000	53.40	3.28	2.83	0.000
43.40	3.28	2.83	0.000	53.60	3.28	2.83	0.000
43.60	3.28	2.83	0.000	53.80	3.28	2.83	0.000
43.80	3.28	2.83	0.000	54.00	3.28	2.83	0.000
44.00	3.28	2.83	0.000	54.20	3.28	2.83	0.000
44.20	3.28	2.83	0.000	54.40	3.28	2.83	0.000
44.40	3.28	2.83	0.000	54.60	3.28	2.83	0.000
44.60	3.28	2.83	0.000	54.80	3.28	2.83	0.000
44.80	3.28	2.83	0.000	55.00	3.28	2.83	0.000
45.00	3.28	2.83	0.000	55.20	3.28	2.83	0.000
45.20	3.28	2.83	0.000	55.40	3.28	2.83	0.000
45.40	3.28	2.83	0.000	55.60	3.28	2.83	0.000
45.60	3.28	2.83	0.000	55.80	3.28	2.83	0.000
45.80	3.28	2.83	0.000	56.00	3.28	2.83	0.000
46.00	3.28	2.83	0.000	56.20	3.28	2.83	0.000
46.20	3.28	2.83	0.000	56.40	3.28	2.83	0.000
46.40	3.28	2.83	0.000	56.60	3.28	2.83	0.000
46.60	3.28	2.83	0.000	56.80	3.28	2.83	0.000
46.80	3.28	2.83	0.000	57.00	3.28	2.83	0.000
47.00	3.28	2.83	0.000	57.20	3.28	2.83	0.000
47.20	3.28	2.83	0.000	57.40	3.28	2.83	0.000
47.40	3.28	2.83	0.000	57.60	3.28	2.83	0.000
47.60	3.28	2.83	0.000	57.80	3.28	2.83	0.000
47.80	3.28	2.83	0.000	58.00	3.28	2.83	0.000
48.00	3.28	2.83	0.000	58.20	3.28	2.83	0.000
48.20	3.28	2.83	0.000	58.40	3.28	2.83	0.000
48.40	3.28	2.83	0.000	58.60	3.28	2.83	0.000
48.60	3.28	2.83	0.000	58.80	3.28	2.83	0.000
48.80	3.28	2.83	0.000	59.00	3.28	2.83	0.000
49.00	3.28	2.83	0.000	59.20	3.28	2.83	0.000
49.20	3.28	2.83	0.000	59.40	3.28	2.83	0.000
49.40	3.28	2.83	0.000	59.60	3.28	2.83	0.000
49.60	3.28	2.83	0.000	59.80	3.28	2.83	0.000
49.80	3.28	2.83	0.000	60.00	3.28	2.83	0.000
50.00	3.28	2.83	0.000	60.20	3.28	2.83	0.000
50.20	3.28	2.83	0.000	60.40	3.28	2.83	0.000
50.40	3.28	2.83	0.000	60.60	3.28	2.83	0.000
50.60	3.28	2.83	0.000	60.80	3.28	2.83	0.000
50.80	3.28	2.83	0.000	61.00	3.28	2.83	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
61.20	3.28	2.83	0.000	71.40	3.28	2.83	0.000
61.40	3.28	2.83	0.000	71.60	3.28	2.83	0.000
61.60	3.28	2.83	0.000	71.80	3.28	2.83	0.000
61.80	3.28	2.83	0.000	72.00	3.28	2.83	0.000
62.00	3.28	2.83	0.000	72.20	3.28	2.83	0.000
62.20	3.28	2.83	0.000	72.40	3.28	2.83	0.000
62.40	3.28	2.83	0.000	72.60	3.28	2.83	0.000
62.60	3.28	2.83	0.000	72.80	3.28	2.83	0.000
62.80	3.28	2.83	0.000	73.00	3.28	2.83	0.000
63.00	3.28	2.83	0.000	73.20	3.28	2.83	0.000
63.20	3.28	2.83	0.000	73.40	3.28	2.83	0.000
63.40	3.28	2.83	0.000	73.60	3.28	2.83	0.000
63.60	3.28	2.83	0.000	73.80	3.28	2.83	0.000
63.80	3.28	2.83	0.000	74.00	3.28	2.83	0.000
64.00	3.28	2.83	0.000	74.20	3.28	2.83	0.000
64.20	3.28	2.83	0.000	74.40	3.28	2.83	0.000
64.40	3.28	2.83	0.000	74.60	3.28	2.83	0.000
64.60	3.28	2.83	0.000	74.80	3.28	2.83	0.000
64.80	3.28	2.83	0.000	75.00	3.28	2.83	0.000
65.00	3.28	2.83	0.000	75.20	3.28	2.83	0.000
65.20	3.28	2.83	0.000	75.40	3.28	2.83	0.000
65.40	3.28	2.83	0.000	75.60	3.28	2.83	0.000
65.60	3.28	2.83	0.000	75.80	3.28	2.83	0.000
65.80	3.28	2.83	0.000	76.00	3.28	2.83	0.000
66.00	3.28	2.83	0.000	76.20	3.28	2.83	0.000
66.20	3.28	2.83	0.000	76.40	3.28	2.83	0.000
66.40	3.28	2.83	0.000	76.60	3.28	2.83	0.000
66.60	3.28	2.83	0.000	76.80	3.28	2.83	0.000
66.80	3.28	2.83	0.000	77.00	3.28	2.83	0.000
67.00	3.28	2.83	0.000	77.20	3.28	2.83	0.000
67.20	3.28	2.83	0.000	77.40	3.28	2.83	0.000
67.40	3.28	2.83	0.000	77.60	3.28	2.83	0.000
67.60	3.28	2.83	0.000	77.80	3.28	2.83	0.000
67.80	3.28	2.83	0.000	78.00	3.28	2.83	0.000
68.00	3.28	2.83	0.000	78.20	3.28	2.83	0.000
68.20	3.28	2.83	0.000	78.40	3.28	2.83	0.000
68.40	3.28	2.83	0.000	78.60	3.28	2.83	0.000
68.60	3.28	2.83	0.000	78.80	3.28	2.83	0.000
68.80	3.28	2.83	0.000	79.00	3.28	2.83	0.000
69.00	3.28	2.83	0.000	79.20	3.28	2.83	0.000
69.20	3.28	2.83	0.000	79.40	3.28	2.83	0.000
69.40	3.28	2.83	0.000	79.60	3.28	2.83	0.000
69.60	3.28	2.83	0.000	79.80	3.28	2.83	0.000
69.80	3.28	2.83	0.000	80.00	3.28	2.83	0.000
70.00	3.28	2.83	0.000	80.20	3.28	2.83	0.000
70.20	3.28	2.83	0.000	80.40	3.28	2.83	0.000
70.40	3.28	2.83	0.000	80.60	3.28	2.83	0.000
70.60	3.28	2.83	0.000	80.80	3.28	2.83	0.000
70.80	3.28	2.83	0.000	81.00	3.28	2.83	0.000
71.00	3.28	2.83	0.000	81.20	3.28	2.83	0.000
71.20	3.28	2.83	0.000	81.40	3.28	2.83	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
81.60	3.28	2.83	0.000	91.80	3.28	2.83	0.000
81.80	3.28	2.83	0.000	92.00	3.28	2.83	0.000
82.00	3.28	2.83	0.000	92.20	3.28	2.83	0.000
82.20	3.28	2.83	0.000	92.40	3.28	2.83	0.000
82.40	3.28	2.83	0.000	92.60	3.28	2.83	0.000
82.60	3.28	2.83	0.000	92.80	3.28	2.83	0.000
82.80	3.28	2.83	0.000	93.00	3.28	2.83	0.000
83.00	3.28	2.83	0.000	93.20	3.28	2.83	0.000
83.20	3.28	2.83	0.000	93.40	3.28	2.83	0.000
83.40	3.28	2.83	0.000	93.60	3.28	2.83	0.000
83.60	3.28	2.83	0.000	93.80	3.28	2.83	0.000
83.80	3.28	2.83	0.000	94.00	3.28	2.83	0.000
84.00	3.28	2.83	0.000	94.20	3.28	2.83	0.000
84.20	3.28	2.83	0.000	94.40	3.28	2.83	0.000
84.40	3.28	2.83	0.000	94.60	3.28	2.83	0.000
84.60	3.28	2.83	0.000	94.80	3.28	2.83	0.000
84.80	3.28	2.83	0.000	95.00	3.28	2.83	0.000
85.00	3.28	2.83	0.000	95.20	3.28	2.83	0.000
85.20	3.28	2.83	0.000	95.40	3.28	2.83	0.000
85.40	3.28	2.83	0.000	95.60	3.28	2.83	0.000
85.60	3.28	2.83	0.000	95.80	3.28	2.83	0.000
85.80	3.28	2.83	0.000	96.00	3.28	2.83	0.000
86.00	3.28	2.83	0.000	96.20	3.28	2.83	0.000
86.20	3.28	2.83	0.000	96.40	3.28	2.83	0.000
86.40	3.28	2.83	0.000	96.60	3.28	2.83	0.000
86.60	3.28	2.83	0.000	96.80	3.28	2.83	0.000
86.80	3.28	2.83	0.000	97.00	3.28	2.83	0.000
87.00	3.28	2.83	0.000	97.20	3.28	2.83	0.000
87.20	3.28	2.83	0.000	97.40	3.28	2.83	0.000
87.40	3.28	2.83	0.000	97.60	3.28	2.83	0.000
87.60	3.28	2.83	0.000	97.80	3.28	2.83	0.000
87.80	3.28	2.83	0.000	98.00	3.28	2.83	0.000
88.00	3.28	2.83	0.000	98.20	3.28	2.83	0.000
88.20	3.28	2.83	0.000	98.40	3.28	2.83	0.000
88.40	3.28	2.83	0.000	98.60	3.28	2.83	0.000
88.60	3.28	2.83	0.000	98.80	3.28	2.83	0.000
88.80	3.28	2.83	0.000	99.00	3.28	2.83	0.000
89.00	3.28	2.83	0.000	99.20	3.28	2.83	0.000
89.20	3.28	2.83	0.000	99.40	3.28	2.83	0.000
89.40	3.28	2.83	0.000	99.60	3.28	2.83	0.000
89.60	3.28	2.83	0.000	99.80	3.28	2.83	0.000
89.80	3.28	2.83	0.000	100.00	3.28	2.83	0.000
90.00	3.28	2.83	0.000	100.20	3.28	2.83	0.000
90.20	3.28	2.83	0.000	100.40	3.28	2.83	0.000
90.40	3.28	2.83	0.000	100.60	3.28	2.83	0.000
90.60	3.28	2.83	0.000	100.80	3.28	2.83	0.000
90.80	3.28	2.83	0.000	101.00	3.28	2.83	0.000
91.00	3.28	2.83	0.000	101.20	3.28	2.83	0.000
91.20	3.28	2.83	0.000	101.40	3.28	2.83	0.000
91.40	3.28	2.83	0.000	101.60	3.28	2.83	0.000
91.60	3.28	2.83	0.000	101.80	3.28	2.83	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
102.00	3.28	2.83	0.000	112.20	3.28	2.83	0.000
102.20	3.28	2.83	0.000	112.40	3.28	2.83	0.000
102.40	3.28	2.83	0.000	112.60	3.28	2.83	0.000
102.60	3.28	2.83	0.000	112.80	3.28	2.83	0.000
102.80	3.28	2.83	0.000	113.00	3.28	2.83	0.000
103.00	3.28	2.83	0.000	113.20	3.28	2.83	0.000
103.20	3.28	2.83	0.000	113.40	3.28	2.83	0.000
103.40	3.28	2.83	0.000	113.60	3.28	2.83	0.000
103.60	3.28	2.83	0.000	113.80	3.28	2.83	0.000
103.80	3.28	2.83	0.000	114.00	3.28	2.83	0.000
104.00	3.28	2.83	0.000	114.20	3.28	2.83	0.000
104.20	3.28	2.83	0.000	114.40	3.28	2.83	0.000
104.40	3.28	2.83	0.000	114.60	3.28	2.83	0.000
104.60	3.28	2.83	0.000	114.80	3.28	2.83	0.000
104.80	3.28	2.83	0.000	115.00	3.28	2.83	0.000
105.00	3.28	2.83	0.000	115.20	3.28	2.83	0.000
105.20	3.28	2.83	0.000	115.40	3.28	2.83	0.000
105.40	3.28	2.83	0.000	115.60	3.28	2.83	0.000
105.60	3.28	2.83	0.000	115.80	3.28	2.83	0.000
105.80	3.28	2.83	0.000	116.00	3.28	2.83	0.000
106.00	3.28	2.83	0.000	116.20	3.28	2.83	0.000
106.20	3.28	2.83	0.000	116.40	3.28	2.83	0.000
106.40	3.28	2.83	0.000	116.60	3.28	2.83	0.000
106.60	3.28	2.83	0.000	116.80	3.28	2.83	0.000
106.80	3.28	2.83	0.000	117.00	3.28	2.83	0.000
107.00	3.28	2.83	0.000	117.20	3.28	2.83	0.000
107.20	3.28	2.83	0.000	117.40	3.28	2.83	0.000
107.40	3.28	2.83	0.000	117.60	3.28	2.83	0.000
107.60	3.28	2.83	0.000	117.80	3.28	2.83	0.000
107.80	3.28	2.83	0.000	118.00	3.28	2.83	0.000
108.00	3.28	2.83	0.000	118.20	3.28	2.83	0.000
108.20	3.28	2.83	0.000	118.40	3.28	2.83	0.000
108.40	3.28	2.83	0.000	118.60	3.28	2.83	0.000
108.60	3.28	2.83	0.000	118.80	3.28	2.83	0.000
108.80	3.28	2.83	0.000	119.00	3.28	2.83	0.000
109.00	3.28	2.83	0.000	119.20	3.28	2.83	0.000
109.20	3.28	2.83	0.000	119.40	3.28	2.83	0.000
109.40	3.28	2.83	0.000	119.60	3.28	2.83	0.000
109.60	3.28	2.83	0.000	119.80	3.28	2.83	0.000
109.80	3.28	2.83	0.000	120.00	3.28	2.83	0.000
110.00	3.28	2.83	0.000	120.20	3.28	2.83	0.000
110.20	3.28	2.83	0.000	120.40	3.28	2.83	0.000
110.40	3.28	2.83	0.000	120.60	3.28	2.83	0.000
110.60	3.28	2.83	0.000	120.80	3.28	2.83	0.000
110.80	3.28	2.83	0.000	121.00	3.28	2.83	0.000
111.00	3.28	2.83	0.000	121.20	3.28	2.83	0.000
111.20	3.28	2.83	0.000	121.40	3.28	2.83	0.000
111.40	3.28	2.83	0.000	121.60	3.28	2.83	0.000
111.60	3.28	2.83	0.000	121.80	3.28	2.83	0.000
111.80	3.28	2.83	0.000	122.00	3.28	2.83	0.000
112.00	3.28	2.83	0.000	122.20	3.28	2.83	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
122.40	3.28	2.83	0.000	132.60	3.28	2.83	0.000
122.60	3.28	2.83	0.000	132.80	3.28	2.83	0.000
122.80	3.28	2.83	0.000	133.00	3.28	2.83	0.000
123.00	3.28	2.83	0.000	133.20	3.28	2.83	0.000
123.20	3.28	2.83	0.000	133.40	3.28	2.83	0.000
123.40	3.28	2.83	0.000	133.60	3.28	2.83	0.000
123.60	3.28	2.83	0.000	133.80	3.28	2.83	0.000
123.80	3.28	2.83	0.000	134.00	3.28	2.83	0.000
124.00	3.28	2.83	0.000	134.20	3.28	2.83	0.000
124.20	3.28	2.83	0.000	134.40	3.28	2.83	0.000
124.40	3.28	2.83	0.000	134.60	3.28	2.83	0.000
124.60	3.28	2.83	0.000	134.80	3.28	2.83	0.000
124.80	3.28	2.83	0.000	135.00	3.28	2.83	0.000
125.00	3.28	2.83	0.000	135.20	3.28	2.83	0.000
125.20	3.28	2.83	0.000	135.40	3.28	2.83	0.000
125.40	3.28	2.83	0.000	135.60	3.28	2.83	0.000
125.60	3.28	2.83	0.000	135.80	3.28	2.83	0.000
125.80	3.28	2.83	0.000	136.00	3.28	2.83	0.000
126.00	3.28	2.83	0.000	136.20	3.28	2.83	0.000
126.20	3.28	2.83	0.000	136.40	3.28	2.83	0.000
126.40	3.28	2.83	0.000	136.60	3.28	2.83	0.000
126.60	3.28	2.83	0.000	136.80	3.28	2.83	0.000
126.80	3.28	2.83	0.000	137.00	3.28	2.83	0.000
127.00	3.28	2.83	0.000	137.20	3.28	2.83	0.000
127.20	3.28	2.83	0.000	137.40	3.28	2.83	0.000
127.40	3.28	2.83	0.000	137.60	3.28	2.83	0.000
127.60	3.28	2.83	0.000	137.80	3.28	2.83	0.000
127.80	3.28	2.83	0.000	138.00	3.28	2.83	0.000
128.00	3.28	2.83	0.000	138.20	3.28	2.83	0.000
128.20	3.28	2.83	0.000	138.40	3.28	2.83	0.000
128.40	3.28	2.83	0.000	138.60	3.28	2.83	0.000
128.60	3.28	2.83	0.000	138.80	3.28	2.83	0.000
128.80	3.28	2.83	0.000	139.00	3.28	2.83	0.000
129.00	3.28	2.83	0.000	139.20	3.28	2.83	0.000
129.20	3.28	2.83	0.000	139.40	3.28	2.83	0.000
129.40	3.28	2.83	0.000	139.60	3.28	2.83	0.000
129.60	3.28	2.83	0.000	139.80	3.28	2.83	0.000
129.80	3.28	2.83	0.000	140.00	3.28	2.83	0.000
130.00	3.28	2.83	0.000	140.20	3.28	2.83	0.000
130.20	3.28	2.83	0.000	140.40	3.28	2.83	0.000
130.40	3.28	2.83	0.000	140.60	3.28	2.83	0.000
130.60	3.28	2.83	0.000	140.80	3.28	2.83	0.000
130.80	3.28	2.83	0.000	141.00	3.28	2.83	0.000
131.00	3.28	2.83	0.000	141.20	3.28	2.83	0.000
131.20	3.28	2.83	0.000	141.40	3.28	2.83	0.000
131.40	3.28	2.83	0.000	141.60	3.28	2.83	0.000
131.60	3.28	2.83	0.000	141.80	3.28	2.83	0.000
131.80	3.28	2.83	0.000	142.00	3.28	2.83	0.000
132.00	3.28	2.83	0.000	142.20	3.28	2.83	0.000
132.20	3.28	2.83	0.000	142.40	3.28	2.83	0.000
132.40	3.28	2.83	0.000	142.60	3.28	2.83	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
142.80	3.28	2.83	0.000	153.00	3.28	2.83	0.000
143.00	3.28	2.83	0.000	153.20	3.28	2.83	0.000
143.20	3.28	2.83	0.000	153.40	3.28	2.83	0.000
143.40	3.28	2.83	0.000	153.60	3.28	2.83	0.000
143.60	3.28	2.83	0.000	153.80	3.28	2.83	0.000
143.80	3.28	2.83	0.000	154.00	3.28	2.83	0.000
144.00	3.28	2.83	0.000	154.20	3.28	2.83	0.000
144.20	3.28	2.83	0.000	154.40	3.28	2.83	0.000
144.40	3.28	2.83	0.000	154.60	3.28	2.83	0.000
144.60	3.28	2.83	0.000	154.80	3.28	2.83	0.000
144.80	3.28	2.83	0.000	155.00	3.28	2.83	0.000
145.00	3.28	2.83	0.000	155.20	3.28	2.83	0.000
145.20	3.28	2.83	0.000	155.40	3.28	2.83	0.000
145.40	3.28	2.83	0.000	155.60	3.28	2.83	0.000
145.60	3.28	2.83	0.000	155.80	3.28	2.83	0.000
145.80	3.28	2.83	0.000	156.00	3.28	2.83	0.000
146.00	3.28	2.83	0.000	156.20	3.28	2.83	0.000
146.20	3.28	2.83	0.000	156.40	3.28	2.83	0.000
146.40	3.28	2.83	0.000	156.60	3.28	2.83	0.000
146.60	3.28	2.83	0.000	156.80	3.28	2.83	0.000
146.80	3.28	2.83	0.000	157.00	3.28	2.83	0.000
147.00	3.28	2.83	0.000	157.20	3.28	2.83	0.000
147.20	3.28	2.83	0.000	157.40	3.28	2.83	0.000
147.40	3.28	2.83	0.000	157.60	3.28	2.83	0.000
147.60	3.28	2.83	0.000	157.80	3.28	2.83	0.000
147.80	3.28	2.83	0.000	158.00	3.28	2.83	0.000
148.00	3.28	2.83	0.000	158.20	3.28	2.83	0.000
148.20	3.28	2.83	0.000	158.40	3.28	2.83	0.000
148.40	3.28	2.83	0.000	158.60	3.28	2.83	0.000
148.60	3.28	2.83	0.000	158.80	3.28	2.83	0.000
148.80	3.28	2.83	0.000	159.00	3.28	2.83	0.000
149.00	3.28	2.83	0.000	159.20	3.28	2.83	0.000
149.20	3.28	2.83	0.000	159.40	3.28	2.83	0.000
149.40	3.28	2.83	0.000	159.60	3.28	2.83	0.000
149.60	3.28	2.83	0.000	159.80	3.28	2.83	0.000
149.80	3.28	2.83	0.000	160.00	3.28	2.83	0.000
150.00	3.28	2.83	0.000	160.20	3.28	2.83	0.000
150.20	3.28	2.83	0.000	160.40	3.28	2.83	0.000
150.40	3.28	2.83	0.000	160.60	3.28	2.83	0.000
150.60	3.28	2.83	0.000	160.80	3.28	2.83	0.000
150.80	3.28	2.83	0.000	161.00	3.28	2.83	0.000
151.00	3.28	2.83	0.000	161.20	3.28	2.83	0.000
151.20	3.28	2.83	0.000	161.40	3.28	2.83	0.000
151.40	3.28	2.83	0.000	161.60	3.28	2.83	0.000
151.60	3.28	2.83	0.000	161.80	3.28	2.83	0.000
151.80	3.28	2.83	0.000	162.00	3.28	2.83	0.000
152.00	3.28	2.83	0.000	162.20	3.28	2.83	0.000
152.20	3.28	2.83	0.000	162.40	3.28	2.83	0.000
152.40	3.28	2.83	0.000	162.60	3.28	2.83	0.000
152.60	3.28	2.83	0.000	162.80	3.28	2.83	0.000
152.80	3.28	2.83	0.000	163.00	3.28	2.83	0.000

Hydrograph for Subcatchment 6S: POST-DEV UG1 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
163.20	3.28	2.83	0.000
163.40	3.28	2.83	0.000
163.60	3.28	2.83	0.000
163.80	3.28	2.83	0.000
164.00	3.28	2.83	0.000
164.20	3.28	2.83	0.000
164.40	3.28	2.83	0.000
164.60	3.28	2.83	0.000
164.80	3.28	2.83	0.000
165.00	3.28	2.83	0.000
165.20	3.28	2.83	0.000
165.40	3.28	2.83	0.000
165.60	3.28	2.83	0.000
165.80	3.28	2.83	0.000
166.00	3.28	2.83	0.000
166.20	3.28	2.83	0.000
166.40	3.28	2.83	0.000
166.60	3.28	2.83	0.000
166.80	3.28	2.83	0.000
167.00	3.28	2.83	0.000
167.20	3.28	2.83	0.000
167.40	3.28	2.83	0.000
167.60	3.28	2.83	0.000
167.80	3.28	2.83	0.000
168.00	3.28	2.83	0.000

BMW_2025-7-24_2
Prepared by Bohler
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Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

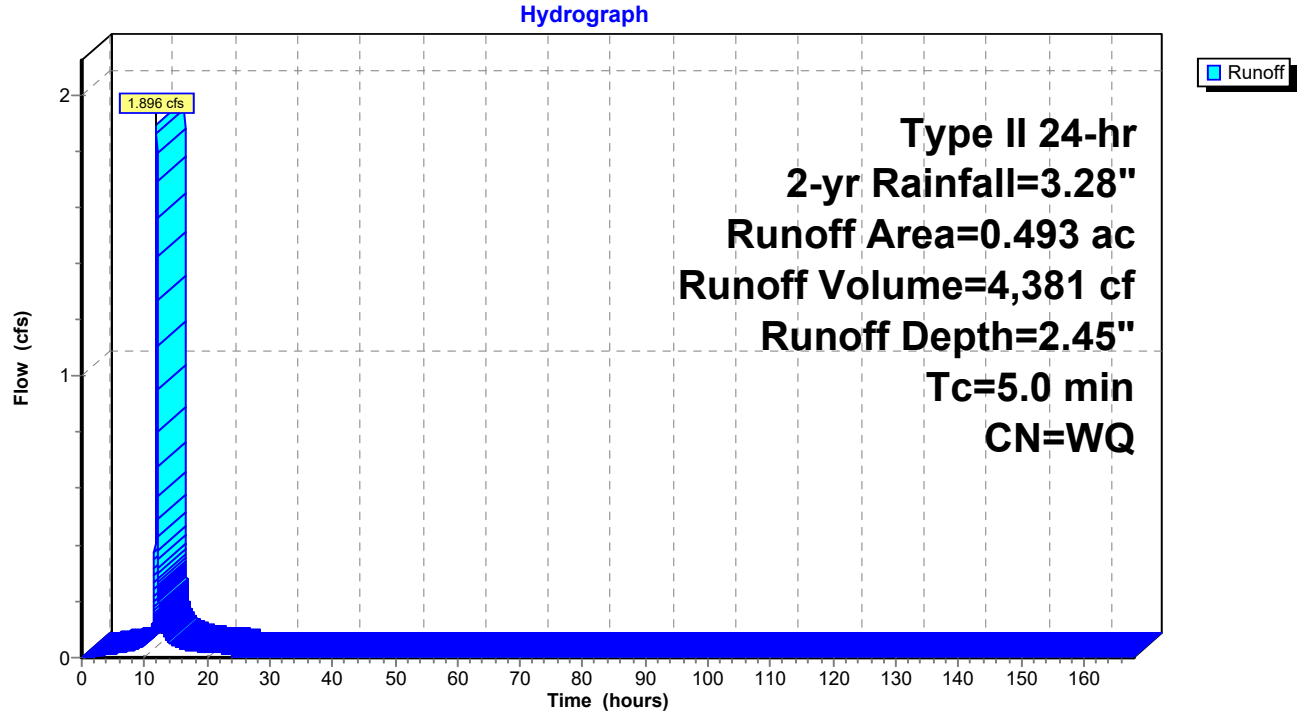
Runoff = 1.896 cfs @ 11.96 hrs, Volume= 4,381 cf, Depth= 2.45"
Routed to Pond 3P : UG2

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493		Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 12S: POST-DEV UG2 TO POI#1



Hydrograph for Subcatchment 12S: POST-DEV UG2 TO POI#1

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.000	10.20	0.62	0.05	0.052
0.20	0.01	0.00	0.000	10.40	0.65	0.05	0.058
0.40	0.01	0.00	0.000	10.60	0.69	0.07	0.065
0.60	0.02	0.00	0.000	10.80	0.73	0.08	0.075
0.80	0.03	0.00	0.000	11.00	0.77	0.10	0.086
1.00	0.03	0.00	0.000	11.20	0.82	0.12	0.105
1.20	0.04	0.00	0.000	11.40	0.89	0.15	0.130
1.40	0.05	0.00	0.001	11.60	1.01	0.20	0.240
1.60	0.06	0.00	0.002	11.80	1.41	0.44	**0.844**
1.80	0.06	0.00	0.003	12.00	2.17	0.98	**1.566**
2.00	0.07	0.00	0.004	12.20	2.29	1.08	0.230
2.20	0.08	0.00	0.004	12.40	2.38	1.15	0.166
2.40	0.09	0.00	0.005	12.60	2.44	1.19	0.113
2.60	0.10	0.00	0.006	12.80	2.49	1.23	0.098
2.80	0.10	0.00	0.007	13.00	2.53	1.27	0.085
3.00	0.11	0.00	0.007	13.20	2.57	1.30	0.075
3.20	0.12	0.00	0.008	13.40	2.60	1.33	0.068
3.40	0.13	0.00	0.009	13.60	2.64	1.36	0.061
3.60	0.14	0.00	0.009	13.80	2.66	1.38	0.055
3.80	0.15	0.00	0.010	14.00	2.69	1.40	0.050
4.00	0.16	0.00	0.011	14.20	2.71	1.42	0.047
4.20	0.17	0.00	0.011	14.40	2.74	1.44	0.045
4.40	0.18	0.00	0.012	14.60	2.76	1.46	0.043
4.60	0.19	0.00	0.013	14.80	2.78	1.48	0.042
4.80	0.20	0.00	0.014	15.00	2.80	1.49	0.040
5.00	0.21	0.00	0.014	15.20	2.82	1.51	0.038
5.20	0.22	0.00	0.015	15.40	2.84	1.52	0.036
5.40	0.23	0.00	0.016	15.60	2.85	1.54	0.034
5.60	0.24	0.00	0.016	15.80	2.87	1.55	0.033
5.80	0.25	0.00	0.017	16.00	2.89	1.57	0.031
6.00	0.26	0.00	0.018	16.20	2.90	1.58	0.030
6.20	0.27	0.00	0.019	16.40	2.92	1.59	0.029
6.40	0.29	0.00	0.019	16.60	2.93	1.60	0.028
6.60	0.30	0.00	0.020	16.80	2.94	1.61	0.028
6.80	0.31	0.00	0.021	17.00	2.96	1.63	0.027
7.00	0.32	0.00	0.021	17.20	2.97	1.64	0.026
7.20	0.34	0.00	0.022	17.40	2.98	1.65	0.026
7.40	0.35	0.00	0.023	17.60	3.00	1.66	0.025
7.60	0.37	0.00	0.023	17.80	3.01	1.67	0.024
7.80	0.38	0.00	0.024	18.00	3.02	1.68	0.024
8.00	0.39	0.00	0.025	18.20	3.03	1.69	0.023
8.20	0.41	0.00	0.026	18.40	3.04	1.70	0.022
8.40	0.43	0.01	0.029	18.60	3.05	1.71	0.022
8.60	0.44	0.01	0.032	18.80	3.07	1.72	0.021
8.80	0.46	0.01	0.034	19.00	3.08	1.73	0.020
9.00	0.48	0.01	0.037	19.20	3.09	1.74	0.020
9.20	0.50	0.02	0.038	19.40	3.10	1.74	0.019
9.40	0.52	0.02	0.038	19.60	3.10	1.75	0.019
9.60	0.55	0.03	0.039	19.80	3.11	1.76	0.018
9.80	0.57	0.03	0.043	20.00	3.12	1.77	0.017
10.00	0.59	0.04	0.047	20.20	3.13	1.78	0.017

Hydrograph for Subcatchment 12S: POST-DEV UG2 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
20.40	3.14	1.78	0.017	30.60	3.28	1.90	0.000
20.60	3.15	1.79	0.017	30.80	3.28	1.90	0.000
20.80	3.16	1.80	0.017	31.00	3.28	1.90	0.000
21.00	3.16	1.80	0.016	31.20	3.28	1.90	0.000
21.20	3.17	1.81	0.016	31.40	3.28	1.90	0.000
21.40	3.18	1.82	0.016	31.60	3.28	1.90	0.000
21.60	3.19	1.83	0.016	31.80	3.28	1.90	0.000
21.80	3.20	1.83	0.016	32.00	3.28	1.90	0.000
22.00	3.20	1.84	0.016	32.20	3.28	1.90	0.000
22.20	3.21	1.85	0.016	32.40	3.28	1.90	0.000
22.40	3.22	1.85	0.015	32.60	3.28	1.90	0.000
22.60	3.23	1.86	0.015	32.80	3.28	1.90	0.000
22.80	3.24	1.87	0.015	33.00	3.28	1.90	0.000
23.00	3.24	1.87	0.015	33.20	3.28	1.90	0.000
23.20	3.25	1.88	0.015	33.40	3.28	1.90	0.000
23.40	3.26	1.89	0.015	33.60	3.28	1.90	0.000
23.60	3.27	1.89	0.015	33.80	3.28	1.90	0.000
23.80	3.27	1.90	0.015	34.00	3.28	1.90	0.000
24.00	**3.28**	**1.90**	0.014	34.20	3.28	1.90	0.000
24.20	3.28	1.90	0.000	34.40	3.28	1.90	0.000
24.40	3.28	1.90	0.000	34.60	3.28	1.90	0.000
24.60	3.28	1.90	0.000	34.80	3.28	1.90	0.000
24.80	3.28	1.90	0.000	35.00	3.28	1.90	0.000
25.00	3.28	1.90	0.000	35.20	3.28	1.90	0.000
25.20	3.28	1.90	0.000	35.40	3.28	1.90	0.000
25.40	3.28	1.90	0.000	35.60	3.28	1.90	0.000
25.60	3.28	1.90	0.000	35.80	3.28	1.90	0.000
25.80	3.28	1.90	0.000	36.00	3.28	1.90	0.000
26.00	3.28	1.90	0.000	36.20	3.28	1.90	0.000
26.20	3.28	1.90	0.000	36.40	3.28	1.90	0.000
26.40	3.28	1.90	0.000	36.60	3.28	1.90	0.000
26.60	3.28	1.90	0.000	36.80	3.28	1.90	0.000
26.80	3.28	1.90	0.000	37.00	3.28	1.90	0.000
27.00	3.28	1.90	0.000	37.20	3.28	1.90	0.000
27.20	3.28	1.90	0.000	37.40	3.28	1.90	0.000
27.40	3.28	1.90	0.000	37.60	3.28	1.90	0.000
27.60	3.28	1.90	0.000	37.80	3.28	1.90	0.000
27.80	3.28	1.90	0.000	38.00	3.28	1.90	0.000
28.00	3.28	1.90	0.000	38.20	3.28	1.90	0.000
28.20	3.28	1.90	0.000	38.40	3.28	1.90	0.000
28.40	3.28	1.90	0.000	38.60	3.28	1.90	0.000
28.60	3.28	1.90	0.000	38.80	3.28	1.90	0.000
28.80	3.28	1.90	0.000	39.00	3.28	1.90	0.000
29.00	3.28	1.90	0.000	39.20	3.28	1.90	0.000
29.20	3.28	1.90	0.000	39.40	3.28	1.90	0.000
29.40	3.28	1.90	0.000	39.60	3.28	1.90	0.000
29.60	3.28	1.90	0.000	39.80	3.28	1.90	0.000
29.80	3.28	1.90	0.000	40.00	3.28	1.90	0.000
30.00	3.28	1.90	0.000	40.20	3.28	1.90	0.000
30.20	3.28	1.90	0.000	40.40	3.28	1.90	0.000
30.40	3.28	1.90	0.000	40.60	3.28	1.90	0.000

Hydrograph for Subcatchment 12S: POST-DEV UG2 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
40.80	3.28	1.90	0.000	51.00	3.28	1.90	0.000
41.00	3.28	1.90	0.000	51.20	3.28	1.90	0.000
41.20	3.28	1.90	0.000	51.40	3.28	1.90	0.000
41.40	3.28	1.90	0.000	51.60	3.28	1.90	0.000
41.60	3.28	1.90	0.000	51.80	3.28	1.90	0.000
41.80	3.28	1.90	0.000	52.00	3.28	1.90	0.000
42.00	3.28	1.90	0.000	52.20	3.28	1.90	0.000
42.20	3.28	1.90	0.000	52.40	3.28	1.90	0.000
42.40	3.28	1.90	0.000	52.60	3.28	1.90	0.000
42.60	3.28	1.90	0.000	52.80	3.28	1.90	0.000
42.80	3.28	1.90	0.000	53.00	3.28	1.90	0.000
43.00	3.28	1.90	0.000	53.20	3.28	1.90	0.000
43.20	3.28	1.90	0.000	53.40	3.28	1.90	0.000
43.40	3.28	1.90	0.000	53.60	3.28	1.90	0.000
43.60	3.28	1.90	0.000	53.80	3.28	1.90	0.000
43.80	3.28	1.90	0.000	54.00	3.28	1.90	0.000
44.00	3.28	1.90	0.000	54.20	3.28	1.90	0.000
44.20	3.28	1.90	0.000	54.40	3.28	1.90	0.000
44.40	3.28	1.90	0.000	54.60	3.28	1.90	0.000
44.60	3.28	1.90	0.000	54.80	3.28	1.90	0.000
44.80	3.28	1.90	0.000	55.00	3.28	1.90	0.000
45.00	3.28	1.90	0.000	55.20	3.28	1.90	0.000
45.20	3.28	1.90	0.000	55.40	3.28	1.90	0.000
45.40	3.28	1.90	0.000	55.60	3.28	1.90	0.000
45.60	3.28	1.90	0.000	55.80	3.28	1.90	0.000
45.80	3.28	1.90	0.000	56.00	3.28	1.90	0.000
46.00	3.28	1.90	0.000	56.20	3.28	1.90	0.000
46.20	3.28	1.90	0.000	56.40	3.28	1.90	0.000
46.40	3.28	1.90	0.000	56.60	3.28	1.90	0.000
46.60	3.28	1.90	0.000	56.80	3.28	1.90	0.000
46.80	3.28	1.90	0.000	57.00	3.28	1.90	0.000
47.00	3.28	1.90	0.000	57.20	3.28	1.90	0.000
47.20	3.28	1.90	0.000	57.40	3.28	1.90	0.000
47.40	3.28	1.90	0.000	57.60	3.28	1.90	0.000
47.60	3.28	1.90	0.000	57.80	3.28	1.90	0.000
47.80	3.28	1.90	0.000	58.00	3.28	1.90	0.000
48.00	3.28	1.90	0.000	58.20	3.28	1.90	0.000
48.20	3.28	1.90	0.000	58.40	3.28	1.90	0.000
48.40	3.28	1.90	0.000	58.60	3.28	1.90	0.000
48.60	3.28	1.90	0.000	58.80	3.28	1.90	0.000
48.80	3.28	1.90	0.000	59.00	3.28	1.90	0.000
49.00	3.28	1.90	0.000	59.20	3.28	1.90	0.000
49.20	3.28	1.90	0.000	59.40	3.28	1.90	0.000
49.40	3.28	1.90	0.000	59.60	3.28	1.90	0.000
49.60	3.28	1.90	0.000	59.80	3.28	1.90	0.000
49.80	3.28	1.90	0.000	60.00	3.28	1.90	0.000
50.00	3.28	1.90	0.000	60.20	3.28	1.90	0.000
50.20	3.28	1.90	0.000	60.40	3.28	1.90	0.000
50.40	3.28	1.90	0.000	60.60	3.28	1.90	0.000
50.60	3.28	1.90	0.000	60.80	3.28	1.90	0.000
50.80	3.28	1.90	0.000	61.00	3.28	1.90	0.000

Hydrograph for Subcatchment 12S: POST-DEV UG2 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
61.20	3.28	1.90	0.000	71.40	3.28	1.90	0.000
61.40	3.28	1.90	0.000	71.60	3.28	1.90	0.000
61.60	3.28	1.90	0.000	71.80	3.28	1.90	0.000
61.80	3.28	1.90	0.000	72.00	3.28	1.90	0.000
62.00	3.28	1.90	0.000	72.20	3.28	1.90	0.000
62.20	3.28	1.90	0.000	72.40	3.28	1.90	0.000
62.40	3.28	1.90	0.000	72.60	3.28	1.90	0.000
62.60	3.28	1.90	0.000	72.80	3.28	1.90	0.000
62.80	3.28	1.90	0.000	73.00	3.28	1.90	0.000
63.00	3.28	1.90	0.000	73.20	3.28	1.90	0.000
63.20	3.28	1.90	0.000	73.40	3.28	1.90	0.000
63.40	3.28	1.90	0.000	73.60	3.28	1.90	0.000
63.60	3.28	1.90	0.000	73.80	3.28	1.90	0.000
63.80	3.28	1.90	0.000	74.00	3.28	1.90	0.000
64.00	3.28	1.90	0.000	74.20	3.28	1.90	0.000
64.20	3.28	1.90	0.000	74.40	3.28	1.90	0.000
64.40	3.28	1.90	0.000	74.60	3.28	1.90	0.000
64.60	3.28	1.90	0.000	74.80	3.28	1.90	0.000
64.80	3.28	1.90	0.000	75.00	3.28	1.90	0.000
65.00	3.28	1.90	0.000	75.20	3.28	1.90	0.000
65.20	3.28	1.90	0.000	75.40	3.28	1.90	0.000
65.40	3.28	1.90	0.000	75.60	3.28	1.90	0.000
65.60	3.28	1.90	0.000	75.80	3.28	1.90	0.000
65.80	3.28	1.90	0.000	76.00	3.28	1.90	0.000
66.00	3.28	1.90	0.000	76.20	3.28	1.90	0.000
66.20	3.28	1.90	0.000	76.40	3.28	1.90	0.000
66.40	3.28	1.90	0.000	76.60	3.28	1.90	0.000
66.60	3.28	1.90	0.000	76.80	3.28	1.90	0.000
66.80	3.28	1.90	0.000	77.00	3.28	1.90	0.000
67.00	3.28	1.90	0.000	77.20	3.28	1.90	0.000
67.20	3.28	1.90	0.000	77.40	3.28	1.90	0.000
67.40	3.28	1.90	0.000	77.60	3.28	1.90	0.000
67.60	3.28	1.90	0.000	77.80	3.28	1.90	0.000
67.80	3.28	1.90	0.000	78.00	3.28	1.90	0.000
68.00	3.28	1.90	0.000	78.20	3.28	1.90	0.000
68.20	3.28	1.90	0.000	78.40	3.28	1.90	0.000
68.40	3.28	1.90	0.000	78.60	3.28	1.90	0.000
68.60	3.28	1.90	0.000	78.80	3.28	1.90	0.000
68.80	3.28	1.90	0.000	79.00	3.28	1.90	0.000
69.00	3.28	1.90	0.000	79.20	3.28	1.90	0.000
69.20	3.28	1.90	0.000	79.40	3.28	1.90	0.000
69.40	3.28	1.90	0.000	79.60	3.28	1.90	0.000
69.60	3.28	1.90	0.000	79.80	3.28	1.90	0.000
69.80	3.28	1.90	0.000	80.00	3.28	1.90	0.000
70.00	3.28	1.90	0.000	80.20	3.28	1.90	0.000
70.20	3.28	1.90	0.000	80.40	3.28	1.90	0.000
70.40	3.28	1.90	0.000	80.60	3.28	1.90	0.000
70.60	3.28	1.90	0.000	80.80	3.28	1.90	0.000
70.80	3.28	1.90	0.000	81.00	3.28	1.90	0.000
71.00	3.28	1.90	0.000	81.20	3.28	1.90	0.000
71.20	3.28	1.90	0.000	81.40	3.28	1.90	0.000

Hydrograph for Subcatchment 12S: POST-DEV UG2 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
81.60	3.28	1.90	0.000	91.80	3.28	1.90	0.000
81.80	3.28	1.90	0.000	92.00	3.28	1.90	0.000
82.00	3.28	1.90	0.000	92.20	3.28	1.90	0.000
82.20	3.28	1.90	0.000	92.40	3.28	1.90	0.000
82.40	3.28	1.90	0.000	92.60	3.28	1.90	0.000
82.60	3.28	1.90	0.000	92.80	3.28	1.90	0.000
82.80	3.28	1.90	0.000	93.00	3.28	1.90	0.000
83.00	3.28	1.90	0.000	93.20	3.28	1.90	0.000
83.20	3.28	1.90	0.000	93.40	3.28	1.90	0.000
83.40	3.28	1.90	0.000	93.60	3.28	1.90	0.000
83.60	3.28	1.90	0.000	93.80	3.28	1.90	0.000
83.80	3.28	1.90	0.000	94.00	3.28	1.90	0.000
84.00	3.28	1.90	0.000	94.20	3.28	1.90	0.000
84.20	3.28	1.90	0.000	94.40	3.28	1.90	0.000
84.40	3.28	1.90	0.000	94.60	3.28	1.90	0.000
84.60	3.28	1.90	0.000	94.80	3.28	1.90	0.000
84.80	3.28	1.90	0.000	95.00	3.28	1.90	0.000
85.00	3.28	1.90	0.000	95.20	3.28	1.90	0.000
85.20	3.28	1.90	0.000	95.40	3.28	1.90	0.000
85.40	3.28	1.90	0.000	95.60	3.28	1.90	0.000
85.60	3.28	1.90	0.000	95.80	3.28	1.90	0.000
85.80	3.28	1.90	0.000	96.00	3.28	1.90	0.000
86.00	3.28	1.90	0.000	96.20	3.28	1.90	0.000
86.20	3.28	1.90	0.000	96.40	3.28	1.90	0.000
86.40	3.28	1.90	0.000	96.60	3.28	1.90	0.000
86.60	3.28	1.90	0.000	96.80	3.28	1.90	0.000
86.80	3.28	1.90	0.000	97.00	3.28	1.90	0.000
87.00	3.28	1.90	0.000	97.20	3.28	1.90	0.000
87.20	3.28	1.90	0.000	97.40	3.28	1.90	0.000
87.40	3.28	1.90	0.000	97.60	3.28	1.90	0.000
87.60	3.28	1.90	0.000	97.80	3.28	1.90	0.000
87.80	3.28	1.90	0.000	98.00	3.28	1.90	0.000
88.00	3.28	1.90	0.000	98.20	3.28	1.90	0.000
88.20	3.28	1.90	0.000	98.40	3.28	1.90	0.000
88.40	3.28	1.90	0.000	98.60	3.28	1.90	0.000
88.60	3.28	1.90	0.000	98.80	3.28	1.90	0.000
88.80	3.28	1.90	0.000	99.00	3.28	1.90	0.000
89.00	3.28	1.90	0.000	99.20	3.28	1.90	0.000
89.20	3.28	1.90	0.000	99.40	3.28	1.90	0.000
89.40	3.28	1.90	0.000	99.60	3.28	1.90	0.000
89.60	3.28	1.90	0.000	99.80	3.28	1.90	0.000
89.80	3.28	1.90	0.000	100.00	3.28	1.90	0.000
90.00	3.28	1.90	0.000	100.20	3.28	1.90	0.000
90.20	3.28	1.90	0.000	100.40	3.28	1.90	0.000
90.40	3.28	1.90	0.000	100.60	3.28	1.90	0.000
90.60	3.28	1.90	0.000	100.80	3.28	1.90	0.000
90.80	3.28	1.90	0.000	101.00	3.28	1.90	0.000
91.00	3.28	1.90	0.000	101.20	3.28	1.90	0.000
91.20	3.28	1.90	0.000	101.40	3.28	1.90	0.000
91.40	3.28	1.90	0.000	101.60	3.28	1.90	0.000
91.60	3.28	1.90	0.000	101.80	3.28	1.90	0.000

Hydrograph for Subcatchment 12S: POST-DEV UG2 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
102.00	3.28	1.90	0.000	112.20	3.28	1.90	0.000
102.20	3.28	1.90	0.000	112.40	3.28	1.90	0.000
102.40	3.28	1.90	0.000	112.60	3.28	1.90	0.000
102.60	3.28	1.90	0.000	112.80	3.28	1.90	0.000
102.80	3.28	1.90	0.000	113.00	3.28	1.90	0.000
103.00	3.28	1.90	0.000	113.20	3.28	1.90	0.000
103.20	3.28	1.90	0.000	113.40	3.28	1.90	0.000
103.40	3.28	1.90	0.000	113.60	3.28	1.90	0.000
103.60	3.28	1.90	0.000	113.80	3.28	1.90	0.000
103.80	3.28	1.90	0.000	114.00	3.28	1.90	0.000
104.00	3.28	1.90	0.000	114.20	3.28	1.90	0.000
104.20	3.28	1.90	0.000	114.40	3.28	1.90	0.000
104.40	3.28	1.90	0.000	114.60	3.28	1.90	0.000
104.60	3.28	1.90	0.000	114.80	3.28	1.90	0.000
104.80	3.28	1.90	0.000	115.00	3.28	1.90	0.000
105.00	3.28	1.90	0.000	115.20	3.28	1.90	0.000
105.20	3.28	1.90	0.000	115.40	3.28	1.90	0.000
105.40	3.28	1.90	0.000	115.60	3.28	1.90	0.000
105.60	3.28	1.90	0.000	115.80	3.28	1.90	0.000
105.80	3.28	1.90	0.000	116.00	3.28	1.90	0.000
106.00	3.28	1.90	0.000	116.20	3.28	1.90	0.000
106.20	3.28	1.90	0.000	116.40	3.28	1.90	0.000
106.40	3.28	1.90	0.000	116.60	3.28	1.90	0.000
106.60	3.28	1.90	0.000	116.80	3.28	1.90	0.000
106.80	3.28	1.90	0.000	117.00	3.28	1.90	0.000
107.00	3.28	1.90	0.000	117.20	3.28	1.90	0.000
107.20	3.28	1.90	0.000	117.40	3.28	1.90	0.000
107.40	3.28	1.90	0.000	117.60	3.28	1.90	0.000
107.60	3.28	1.90	0.000	117.80	3.28	1.90	0.000
107.80	3.28	1.90	0.000	118.00	3.28	1.90	0.000
108.00	3.28	1.90	0.000	118.20	3.28	1.90	0.000
108.20	3.28	1.90	0.000	118.40	3.28	1.90	0.000
108.40	3.28	1.90	0.000	118.60	3.28	1.90	0.000
108.60	3.28	1.90	0.000	118.80	3.28	1.90	0.000
108.80	3.28	1.90	0.000	119.00	3.28	1.90	0.000
109.00	3.28	1.90	0.000	119.20	3.28	1.90	0.000
109.20	3.28	1.90	0.000	119.40	3.28	1.90	0.000
109.40	3.28	1.90	0.000	119.60	3.28	1.90	0.000
109.60	3.28	1.90	0.000	119.80	3.28	1.90	0.000
109.80	3.28	1.90	0.000	120.00	3.28	1.90	0.000
110.00	3.28	1.90	0.000	120.20	3.28	1.90	0.000
110.20	3.28	1.90	0.000	120.40	3.28	1.90	0.000
110.40	3.28	1.90	0.000	120.60	3.28	1.90	0.000
110.60	3.28	1.90	0.000	120.80	3.28	1.90	0.000
110.80	3.28	1.90	0.000	121.00	3.28	1.90	0.000
111.00	3.28	1.90	0.000	121.20	3.28	1.90	0.000
111.20	3.28	1.90	0.000	121.40	3.28	1.90	0.000
111.40	3.28	1.90	0.000	121.60	3.28	1.90	0.000
111.60	3.28	1.90	0.000	121.80	3.28	1.90	0.000
111.80	3.28	1.90	0.000	122.00	3.28	1.90	0.000
112.00	3.28	1.90	0.000	122.20	3.28	1.90	0.000

Hydrograph for Subcatchment 12S: POST-DEV UG2 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
122.40	3.28	1.90	0.000	132.60	3.28	1.90	0.000
122.60	3.28	1.90	0.000	132.80	3.28	1.90	0.000
122.80	3.28	1.90	0.000	133.00	3.28	1.90	0.000
123.00	3.28	1.90	0.000	133.20	3.28	1.90	0.000
123.20	3.28	1.90	0.000	133.40	3.28	1.90	0.000
123.40	3.28	1.90	0.000	133.60	3.28	1.90	0.000
123.60	3.28	1.90	0.000	133.80	3.28	1.90	0.000
123.80	3.28	1.90	0.000	134.00	3.28	1.90	0.000
124.00	3.28	1.90	0.000	134.20	3.28	1.90	0.000
124.20	3.28	1.90	0.000	134.40	3.28	1.90	0.000
124.40	3.28	1.90	0.000	134.60	3.28	1.90	0.000
124.60	3.28	1.90	0.000	134.80	3.28	1.90	0.000
124.80	3.28	1.90	0.000	135.00	3.28	1.90	0.000
125.00	3.28	1.90	0.000	135.20	3.28	1.90	0.000
125.20	3.28	1.90	0.000	135.40	3.28	1.90	0.000
125.40	3.28	1.90	0.000	135.60	3.28	1.90	0.000
125.60	3.28	1.90	0.000	135.80	3.28	1.90	0.000
125.80	3.28	1.90	0.000	136.00	3.28	1.90	0.000
126.00	3.28	1.90	0.000	136.20	3.28	1.90	0.000
126.20	3.28	1.90	0.000	136.40	3.28	1.90	0.000
126.40	3.28	1.90	0.000	136.60	3.28	1.90	0.000
126.60	3.28	1.90	0.000	136.80	3.28	1.90	0.000
126.80	3.28	1.90	0.000	137.00	3.28	1.90	0.000
127.00	3.28	1.90	0.000	137.20	3.28	1.90	0.000
127.20	3.28	1.90	0.000	137.40	3.28	1.90	0.000
127.40	3.28	1.90	0.000	137.60	3.28	1.90	0.000
127.60	3.28	1.90	0.000	137.80	3.28	1.90	0.000
127.80	3.28	1.90	0.000	138.00	3.28	1.90	0.000
128.00	3.28	1.90	0.000	138.20	3.28	1.90	0.000
128.20	3.28	1.90	0.000	138.40	3.28	1.90	0.000
128.40	3.28	1.90	0.000	138.60	3.28	1.90	0.000
128.60	3.28	1.90	0.000	138.80	3.28	1.90	0.000
128.80	3.28	1.90	0.000	139.00	3.28	1.90	0.000
129.00	3.28	1.90	0.000	139.20	3.28	1.90	0.000
129.20	3.28	1.90	0.000	139.40	3.28	1.90	0.000
129.40	3.28	1.90	0.000	139.60	3.28	1.90	0.000
129.60	3.28	1.90	0.000	139.80	3.28	1.90	0.000
129.80	3.28	1.90	0.000	140.00	3.28	1.90	0.000
130.00	3.28	1.90	0.000	140.20	3.28	1.90	0.000
130.20	3.28	1.90	0.000	140.40	3.28	1.90	0.000
130.40	3.28	1.90	0.000	140.60	3.28	1.90	0.000
130.60	3.28	1.90	0.000	140.80	3.28	1.90	0.000
130.80	3.28	1.90	0.000	141.00	3.28	1.90	0.000
131.00	3.28	1.90	0.000	141.20	3.28	1.90	0.000
131.20	3.28	1.90	0.000	141.40	3.28	1.90	0.000
131.40	3.28	1.90	0.000	141.60	3.28	1.90	0.000
131.60	3.28	1.90	0.000	141.80	3.28	1.90	0.000
131.80	3.28	1.90	0.000	142.00	3.28	1.90	0.000
132.00	3.28	1.90	0.000	142.20	3.28	1.90	0.000
132.20	3.28	1.90	0.000	142.40	3.28	1.90	0.000
132.40	3.28	1.90	0.000	142.60	3.28	1.90	0.000

Hydrograph for Subcatchment 12S: POST-DEV UG2 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)	Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
142.80	3.28	1.90	0.000	153.00	3.28	1.90	0.000
143.00	3.28	1.90	0.000	153.20	3.28	1.90	0.000
143.20	3.28	1.90	0.000	153.40	3.28	1.90	0.000
143.40	3.28	1.90	0.000	153.60	3.28	1.90	0.000
143.60	3.28	1.90	0.000	153.80	3.28	1.90	0.000
143.80	3.28	1.90	0.000	154.00	3.28	1.90	0.000
144.00	3.28	1.90	0.000	154.20	3.28	1.90	0.000
144.20	3.28	1.90	0.000	154.40	3.28	1.90	0.000
144.40	3.28	1.90	0.000	154.60	3.28	1.90	0.000
144.60	3.28	1.90	0.000	154.80	3.28	1.90	0.000
144.80	3.28	1.90	0.000	155.00	3.28	1.90	0.000
145.00	3.28	1.90	0.000	155.20	3.28	1.90	0.000
145.20	3.28	1.90	0.000	155.40	3.28	1.90	0.000
145.40	3.28	1.90	0.000	155.60	3.28	1.90	0.000
145.60	3.28	1.90	0.000	155.80	3.28	1.90	0.000
145.80	3.28	1.90	0.000	156.00	3.28	1.90	0.000
146.00	3.28	1.90	0.000	156.20	3.28	1.90	0.000
146.20	3.28	1.90	0.000	156.40	3.28	1.90	0.000
146.40	3.28	1.90	0.000	156.60	3.28	1.90	0.000
146.60	3.28	1.90	0.000	156.80	3.28	1.90	0.000
146.80	3.28	1.90	0.000	157.00	3.28	1.90	0.000
147.00	3.28	1.90	0.000	157.20	3.28	1.90	0.000
147.20	3.28	1.90	0.000	157.40	3.28	1.90	0.000
147.40	3.28	1.90	0.000	157.60	3.28	1.90	0.000
147.60	3.28	1.90	0.000	157.80	3.28	1.90	0.000
147.80	3.28	1.90	0.000	158.00	3.28	1.90	0.000
148.00	3.28	1.90	0.000	158.20	3.28	1.90	0.000
148.20	3.28	1.90	0.000	158.40	3.28	1.90	0.000
148.40	3.28	1.90	0.000	158.60	3.28	1.90	0.000
148.60	3.28	1.90	0.000	158.80	3.28	1.90	0.000
148.80	3.28	1.90	0.000	159.00	3.28	1.90	0.000
149.00	3.28	1.90	0.000	159.20	3.28	1.90	0.000
149.20	3.28	1.90	0.000	159.40	3.28	1.90	0.000
149.40	3.28	1.90	0.000	159.60	3.28	1.90	0.000
149.60	3.28	1.90	0.000	159.80	3.28	1.90	0.000
149.80	3.28	1.90	0.000	160.00	3.28	1.90	0.000
150.00	3.28	1.90	0.000	160.20	3.28	1.90	0.000
150.20	3.28	1.90	0.000	160.40	3.28	1.90	0.000
150.40	3.28	1.90	0.000	160.60	3.28	1.90	0.000
150.60	3.28	1.90	0.000	160.80	3.28	1.90	0.000
150.80	3.28	1.90	0.000	161.00	3.28	1.90	0.000
151.00	3.28	1.90	0.000	161.20	3.28	1.90	0.000
151.20	3.28	1.90	0.000	161.40	3.28	1.90	0.000
151.40	3.28	1.90	0.000	161.60	3.28	1.90	0.000
151.60	3.28	1.90	0.000	161.80	3.28	1.90	0.000
151.80	3.28	1.90	0.000	162.00	3.28	1.90	0.000
152.00	3.28	1.90	0.000	162.20	3.28	1.90	0.000
152.20	3.28	1.90	0.000	162.40	3.28	1.90	0.000
152.40	3.28	1.90	0.000	162.60	3.28	1.90	0.000
152.60	3.28	1.90	0.000	162.80	3.28	1.90	0.000
152.80	3.28	1.90	0.000	163.00	3.28	1.90	0.000

Hydrograph for Subcatchment 12S: POST-DEV UG2 TO POI#1 (continued)

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
163.20	3.28	1.90	0.000
163.40	3.28	1.90	0.000
163.60	3.28	1.90	0.000
163.80	3.28	1.90	0.000
164.00	3.28	1.90	0.000
164.20	3.28	1.90	0.000
164.40	3.28	1.90	0.000
164.60	3.28	1.90	0.000
164.80	3.28	1.90	0.000
165.00	3.28	1.90	0.000
165.20	3.28	1.90	0.000
165.40	3.28	1.90	0.000
165.60	3.28	1.90	0.000
165.80	3.28	1.90	0.000
166.00	3.28	1.90	0.000
166.20	3.28	1.90	0.000
166.40	3.28	1.90	0.000
166.60	3.28	1.90	0.000
166.80	3.28	1.90	0.000
167.00	3.28	1.90	0.000
167.20	3.28	1.90	0.000
167.40	3.28	1.90	0.000
167.60	3.28	1.90	0.000
167.80	3.28	1.90	0.000
168.00	3.28	1.90	0.000

BMW_2025-7-24_2
Prepared by Bohler
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Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 2.96" for 2-yr event
Inflow = 8.960 cfs @ 11.96 hrs, Volume= 20,696 cf
Outflow = 1.967 cfs @ 12.09 hrs, Volume= 20,553 cf, Atten= 78%, Lag= 8.2 min
Primary = 1.967 cfs @ 12.09 hrs, Volume= 20,553 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 158.83' @ 12.09 hrs Surf.Area= 13,041 sf Storage= 11,812 cf

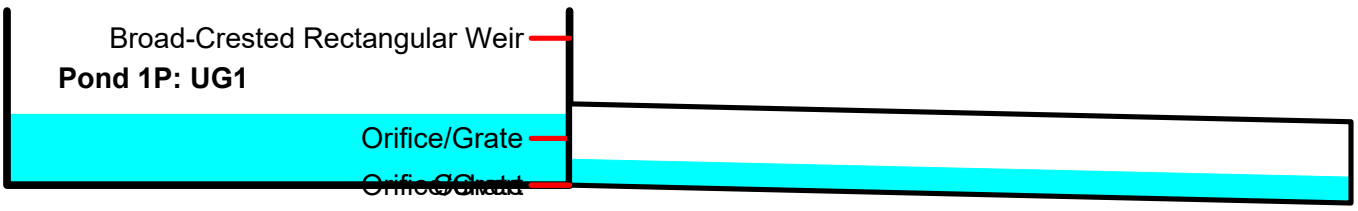
Plug-Flow detention time= 1,299.4 min calculated for 20,553 cf (99% of inflow)
Center-of-Mass det. time= 1,294.7 min (2,045.8 - 751.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.968 cfs @ 12.09 hrs HW=158.83' (Free Discharge)
└**4=Culvert** (Passes 1.968 cfs of 4.279 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.030 cfs @ 5.409 fps)
  ├**2=Orifice/Grate** (Orifice Controls 1.938 cfs @ 2.492 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 1P: UG1 - Chamber Wizard Field A

Chamber Model = Cultec R-280HD (Cultec Recharger®280HD)
Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf
Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 6.07 sf x 27 rows

47.0" Wide + 6.0" Spacing = 53.0" C-C Row Spacing

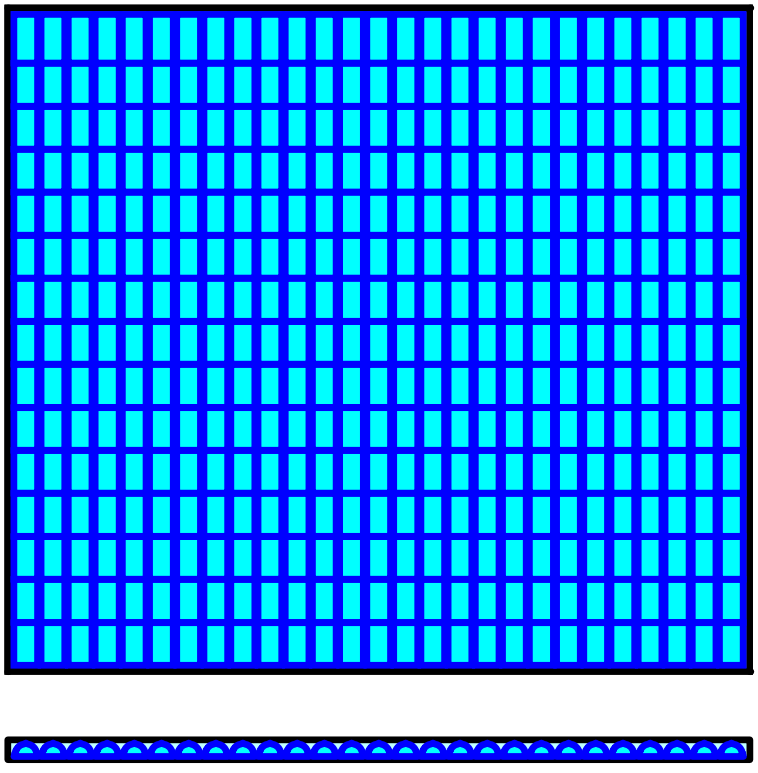
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

405 Chambers x 42.5 cf +1.00' Row Adjustment x 6.07 sf x 27 Rows = 17,377.3 cf Chamber Storage

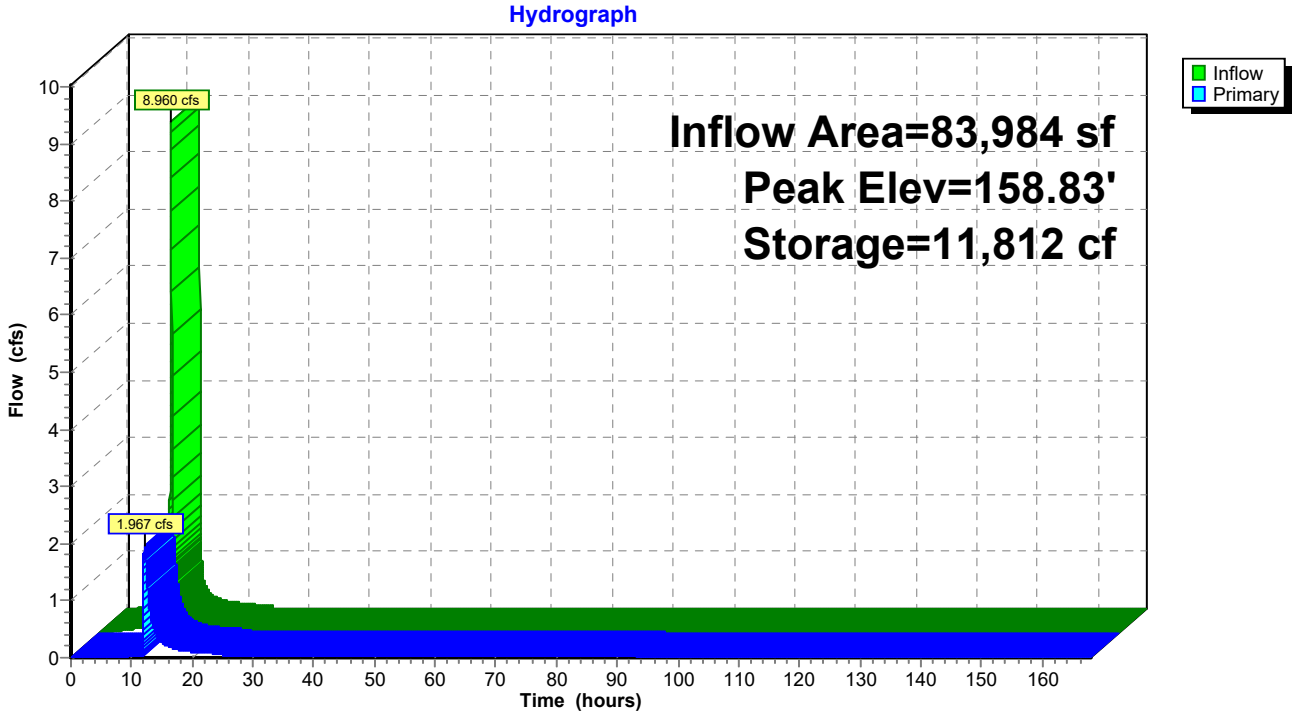
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

Chamber Storage + Stone Storage = 27,162.4 cf = 0.624 af
Overall Storage Efficiency = 64.9%
Overall System Size = 108.00' x 120.75' x 3.21'

405 Chambers
1,549.6 cy Field
906.0 cy Stone



Pond 1P: UG1


Hydrograph
Inflow
Primary
Inflow Area=83,984 sf
Peak Elev=158.83'
Storage=11,812 cf
8.960 cfs
1.967 cfs
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.006	3	157.53	0.000
2.00	0.017	23	157.53	0.000
2.50	0.027	62	157.54	0.000
3.00	0.035	117	157.55	0.001
3.50	0.043	186	157.57	0.001
4.00	0.050	266	157.58	0.003
4.50	0.059	358	157.60	0.004
5.00	0.068	463	157.62	0.006
5.50	0.076	581	157.64	0.007
6.00	0.084	712	157.67	0.008
6.50	0.093	856	157.69	0.009
7.00	0.101	1,013	157.72	0.010
7.50	0.109	1,182	157.76	0.011
8.00	0.117	1,364	157.79	0.012
8.50	0.143	1,572	157.83	0.013
9.00	0.173	1,832	157.88	0.015
9.50	0.181	2,126	157.94	0.016
10.00	0.222	2,453	158.00	0.017
10.50	0.291	2,880	158.05	0.018
11.00	0.405	3,468	158.10	0.019
11.50	**0.671**	4,381	158.18	0.020
12.00	**7.401**	**11,008**	**158.76**	**1.663**
12.50	0.643	**10,667**	**158.73**	**1.502**
13.00	0.400	9,478	158.62	0.874
13.50	0.303	8,825	158.57	0.580
14.00	0.237	8,421	158.53	0.419
14.50	0.210	8,154	158.51	0.327
15.00	0.188	7,980	158.49	0.268
15.50	0.167	7,851	158.48	0.231
16.00	0.145	7,744	158.47	0.200
16.50	0.135	7,658	158.46	0.175
17.00	0.127	7,596	158.46	0.158
17.50	0.120	7,545	158.45	0.146
18.00	0.112	7,501	158.45	0.135
18.50	0.104	7,462	158.45	0.125
19.00	0.097	7,425	158.44	0.117
19.50	0.089	7,388	158.44	0.109
20.00	0.081	7,351	158.44	0.102
20.50	0.079	7,318	158.43	0.095
21.00	0.077	7,294	158.43	0.089
21.50	0.076	7,274	158.43	0.085
22.00	0.074	7,259	158.43	0.082
22.50	0.073	7,246	158.43	0.080
23.00	0.071	7,234	158.43	0.078
23.50	0.070	7,222	158.43	0.076
24.00	0.068	7,210	158.42	0.075
24.50	0.000	7,107	158.42	0.060
25.00	0.000	7,012	158.41	0.046

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	6,939	158.40	0.036
26.00	0.000	6,883	158.40	0.028
26.50	0.000	6,835	158.39	0.025
27.00	0.000	6,792	158.39	0.024
27.50	0.000	6,749	158.38	0.024
28.00	0.000	6,707	158.38	0.024
28.50	0.000	6,664	158.38	0.024
29.00	0.000	6,622	158.37	0.024
29.50	0.000	6,580	158.37	0.023
30.00	0.000	6,537	158.37	0.023
30.50	0.000	6,495	158.36	0.023
31.00	0.000	6,453	158.36	0.023
31.50	0.000	6,411	158.36	0.023
32.00	0.000	6,370	158.35	0.023
32.50	0.000	6,328	158.35	0.023
33.00	0.000	6,286	158.34	0.023
33.50	0.000	6,245	158.34	0.023
34.00	0.000	6,203	158.34	0.023
34.50	0.000	6,162	158.33	0.023
35.00	0.000	6,121	158.33	0.023
35.50	0.000	6,080	158.33	0.023
36.00	0.000	6,039	158.32	0.023
36.50	0.000	5,998	158.32	0.023
37.00	0.000	5,957	158.32	0.023
37.50	0.000	5,916	158.31	0.023
38.00	0.000	5,876	158.31	0.023
38.50	0.000	5,835	158.31	0.022
39.00	0.000	5,795	158.30	0.022
39.50	0.000	5,754	158.30	0.022
40.00	0.000	5,714	158.30	0.022
40.50	0.000	5,674	158.29	0.022
41.00	0.000	5,634	158.29	0.022
41.50	0.000	5,594	158.28	0.022
42.00	0.000	5,554	158.28	0.022
42.50	0.000	5,514	158.28	0.022
43.00	0.000	5,474	158.27	0.022
43.50	0.000	5,435	158.27	0.022
44.00	0.000	5,395	158.27	0.022
44.50	0.000	5,356	158.26	0.022
45.00	0.000	5,317	158.26	0.022
45.50	0.000	5,278	158.26	0.022
46.00	0.000	5,238	158.25	0.022
46.50	0.000	5,199	158.25	0.022
47.00	0.000	5,161	158.25	0.022
47.50	0.000	5,122	158.24	0.022
48.00	0.000	5,083	158.24	0.021
48.50	0.000	5,044	158.24	0.021
49.00	0.000	5,006	158.23	0.021
49.50	0.000	4,968	158.23	0.021
50.00	0.000	4,929	158.23	0.021
50.50	0.000	4,891	158.22	0.021

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,853	158.22	0.021
51.50	0.000	4,815	158.22	0.021
52.00	0.000	4,777	158.21	0.021
52.50	0.000	4,739	158.21	0.021
53.00	0.000	4,701	158.21	0.021
53.50	0.000	4,664	158.20	0.021
54.00	0.000	4,626	158.20	0.021
54.50	0.000	4,589	158.20	0.021
55.00	0.000	4,551	158.19	0.021
55.50	0.000	4,514	158.19	0.021
56.00	0.000	4,477	158.19	0.021
56.50	0.000	4,440	158.19	0.021
57.00	0.000	4,403	158.18	0.021
57.50	0.000	4,366	158.18	0.020
58.00	0.000	4,329	158.18	0.020
58.50	0.000	4,292	158.17	0.020
59.00	0.000	4,256	158.17	0.020
59.50	0.000	4,219	158.17	0.020
60.00	0.000	4,183	158.16	0.020
60.50	0.000	4,147	158.16	0.020
61.00	0.000	4,110	158.16	0.020
61.50	0.000	4,074	158.15	0.020
62.00	0.000	4,038	158.15	0.020
62.50	0.000	4,002	158.15	0.020
63.00	0.000	3,966	158.14	0.020
63.50	0.000	3,931	158.14	0.020
64.00	0.000	3,895	158.14	0.020
64.50	0.000	3,860	158.14	0.020
65.00	0.000	3,824	158.13	0.020
65.50	0.000	3,789	158.13	0.020
66.00	0.000	3,753	158.13	0.020
66.50	0.000	3,718	158.12	0.020
67.00	0.000	3,683	158.12	0.019
67.50	0.000	3,648	158.12	0.019
68.00	0.000	3,613	158.11	0.019
68.50	0.000	3,579	158.11	0.019
69.00	0.000	3,544	158.11	0.019
69.50	0.000	3,509	158.11	0.019
70.00	0.000	3,475	158.10	0.019
70.50	0.000	3,440	158.10	0.019
71.00	0.000	3,406	158.10	0.019
71.50	0.000	3,372	158.09	0.019
72.00	0.000	3,338	158.09	0.019
72.50	0.000	3,304	158.09	0.019
73.00	0.000	3,270	158.09	0.019
73.50	0.000	3,236	158.08	0.019
74.00	0.000	3,202	158.08	0.019
74.50	0.000	3,169	158.08	0.019
75.00	0.000	3,135	158.07	0.019
75.50	0.000	3,101	158.07	0.019
76.00	0.000	3,068	158.07	0.019

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	3,035	158.07	0.018
77.00	0.000	3,002	158.06	0.018
77.50	0.000	2,969	158.06	0.018
78.00	0.000	2,936	158.06	0.018
78.50	0.000	2,903	158.05	0.018
79.00	0.000	2,870	158.05	0.018
79.50	0.000	2,837	158.05	0.018
80.00	0.000	2,805	158.05	0.018
80.50	0.000	2,772	158.04	0.018
81.00	0.000	2,740	158.04	0.018
81.50	0.000	2,707	158.04	0.018
82.00	0.000	2,675	158.04	0.018
82.50	0.000	2,643	158.03	0.018
83.00	0.000	2,611	158.03	0.018
83.50	0.000	2,579	158.02	0.018
84.00	0.000	2,547	158.02	0.018
84.50	0.000	2,516	158.01	0.017
85.00	0.000	2,484	158.01	0.017
85.50	0.000	2,453	158.00	0.017
86.00	0.000	2,423	157.99	0.017
86.50	0.000	2,392	157.99	0.017
87.00	0.000	2,362	157.98	0.017
87.50	0.000	2,331	157.98	0.017
88.00	0.000	2,301	157.97	0.017
88.50	0.000	2,272	157.97	0.016
89.00	0.000	2,242	157.96	0.016
89.50	0.000	2,213	157.95	0.016
90.00	0.000	2,184	157.95	0.016
90.50	0.000	2,155	157.94	0.016
91.00	0.000	2,126	157.94	0.016
91.50	0.000	2,097	157.93	0.016
92.00	0.000	2,069	157.93	0.016
92.50	0.000	2,041	157.92	0.016
93.00	0.000	2,013	157.92	0.015
93.50	0.000	1,986	157.91	0.015
94.00	0.000	1,958	157.91	0.015
94.50	0.000	1,931	157.90	0.015
95.00	0.000	1,904	157.90	0.015
95.50	0.000	1,877	157.89	0.015
96.00	0.000	1,851	157.88	0.015
96.50	0.000	1,824	157.88	0.015
97.00	0.000	1,798	157.87	0.014
97.50	0.000	1,772	157.87	0.014
98.00	0.000	1,747	157.86	0.014
98.50	0.000	1,721	157.86	0.014
99.00	0.000	1,696	157.86	0.014
99.50	0.000	1,671	157.85	0.014
100.00	0.000	1,646	157.85	0.014
100.50	0.000	1,621	157.84	0.014
101.00	0.000	1,597	157.84	0.013
101.50	0.000	1,573	157.83	0.013

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	1,549	157.83	0.013
102.50	0.000	1,525	157.82	0.013
103.00	0.000	1,502	157.82	0.013
103.50	0.000	1,478	157.81	0.013
104.00	0.000	1,455	157.81	0.013
104.50	0.000	1,432	157.80	0.013
105.00	0.000	1,409	157.80	0.013
105.50	0.000	1,387	157.80	0.012
106.00	0.000	1,365	157.79	0.012
106.50	0.000	1,343	157.79	0.012
107.00	0.000	1,321	157.78	0.012
107.50	0.000	1,299	157.78	0.012
108.00	0.000	1,278	157.77	0.012
108.50	0.000	1,257	157.77	0.012
109.00	0.000	1,236	157.77	0.012
109.50	0.000	1,215	157.76	0.011
110.00	0.000	1,194	157.76	0.011
110.50	0.000	1,174	157.76	0.011
111.00	0.000	1,154	157.75	0.011
111.50	0.000	1,134	157.75	0.011
112.00	0.000	1,114	157.74	0.011
112.50	0.000	1,095	157.74	0.011
113.00	0.000	1,075	157.74	0.011
113.50	0.000	1,056	157.73	0.011
114.00	0.000	1,038	157.73	0.010
114.50	0.000	1,019	157.73	0.010
115.00	0.000	1,001	157.72	0.010
115.50	0.000	982	157.72	0.010
116.00	0.000	964	157.71	0.010
116.50	0.000	947	157.71	0.010
117.00	0.000	929	157.71	0.010
117.50	0.000	912	157.70	0.010
118.00	0.000	895	157.70	0.009
118.50	0.000	878	157.70	0.009
119.00	0.000	861	157.70	0.009
119.50	0.000	845	157.69	0.009
120.00	0.000	828	157.69	0.009
120.50	0.000	812	157.69	0.009
121.00	0.000	796	157.68	0.009
121.50	0.000	781	157.68	0.009
122.00	0.000	765	157.68	0.008
122.50	0.000	750	157.67	0.008
123.00	0.000	735	157.67	0.008
123.50	0.000	721	157.67	0.008
124.00	0.000	706	157.67	0.008
124.50	0.000	692	157.66	0.008
125.00	0.000	678	157.66	0.008
125.50	0.000	664	157.66	0.008
126.00	0.000	650	157.65	0.008
126.50	0.000	636	157.65	0.007
127.00	0.000	623	157.65	0.007

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	610	157.65	0.007
128.00	0.000	597	157.64	0.007
128.50	0.000	585	157.64	0.007
129.00	0.000	572	157.64	0.007
129.50	0.000	560	157.64	0.007
130.00	0.000	548	157.64	0.007
130.50	0.000	537	157.63	0.006
131.00	0.000	525	157.63	0.006
131.50	0.000	514	157.63	0.006
132.00	0.000	503	157.63	0.006
132.50	0.000	492	157.62	0.006
133.00	0.000	481	157.62	0.006
133.50	0.000	471	157.62	0.006
134.00	0.000	460	157.62	0.006
134.50	0.000	451	157.62	0.005
135.00	0.000	441	157.61	0.005
135.50	0.000	431	157.61	0.005
136.00	0.000	422	157.61	0.005
136.50	0.000	413	157.61	0.005
137.00	0.000	404	157.61	0.005
137.50	0.000	396	157.61	0.005
138.00	0.000	387	157.60	0.005
138.50	0.000	379	157.60	0.004
139.00	0.000	371	157.60	0.004
139.50	0.000	364	157.60	0.004
140.00	0.000	356	157.60	0.004
140.50	0.000	349	157.60	0.004
141.00	0.000	341	157.60	0.004
141.50	0.000	334	157.59	0.004
142.00	0.000	327	157.59	0.004
142.50	0.000	321	157.59	0.004
143.00	0.000	314	157.59	0.004
143.50	0.000	308	157.59	0.003
144.00	0.000	302	157.59	0.003
144.50	0.000	296	157.59	0.003
145.00	0.000	290	157.59	0.003
145.50	0.000	284	157.58	0.003
146.00	0.000	279	157.58	0.003
146.50	0.000	274	157.58	0.003
147.00	0.000	268	157.58	0.003
147.50	0.000	263	157.58	0.003
148.00	0.000	259	157.58	0.003
148.50	0.000	254	157.58	0.003
149.00	0.000	249	157.58	0.003
149.50	0.000	245	157.58	0.002
150.00	0.000	241	157.58	0.002
150.50	0.000	236	157.58	0.002
151.00	0.000	232	157.57	0.002
151.50	0.000	228	157.57	0.002
152.00	0.000	225	157.57	0.002
152.50	0.000	221	157.57	0.002

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	217	157.57	0.002
153.50	0.000	214	157.57	0.002
154.00	0.000	210	157.57	0.002
154.50	0.000	207	157.57	0.002
155.00	0.000	204	157.57	0.002
155.50	0.000	201	157.57	0.002
156.00	0.000	197	157.57	0.002
156.50	0.000	195	157.57	0.002
157.00	0.000	192	157.57	0.002
157.50	0.000	189	157.57	0.002
158.00	0.000	186	157.57	0.001
158.50	0.000	184	157.57	0.001
159.00	0.000	181	157.56	0.001
159.50	0.000	178	157.56	0.001
160.00	0.000	176	157.56	0.001
160.50	0.000	174	157.56	0.001
161.00	0.000	171	157.56	0.001
161.50	0.000	169	157.56	0.001
162.00	0.000	167	157.56	0.001
162.50	0.000	165	157.56	0.001
163.00	0.000	163	157.56	0.001
163.50	0.000	161	157.56	0.001
164.00	0.000	159	157.56	0.001
164.50	0.000	157	157.56	0.001
165.00	0.000	155	157.56	0.001
165.50	0.000	153	157.56	0.001
166.00	0.000	151	157.56	0.001
166.50	0.000	149	157.56	0.001
167.00	0.000	147	157.56	0.001
167.50	0.000	145	157.56	0.001
168.00	0.000	143	157.56	0.001

BMW_2025-7-24_2
Prepared by Bohler
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Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 2.45" for 2-yr event
Inflow = 1.896 cfs @ 11.96 hrs, Volume= 4,381 cf
Outflow = 0.489 cfs @ 12.08 hrs, Volume= 4,381 cf, Atten= 74%, Lag= 7.5 min
Primary = 0.489 cfs @ 12.08 hrs, Volume= 4,381 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 160.30' @ 12.08 hrs Surf.Area= 2,542 sf Storage= 1,626 cf

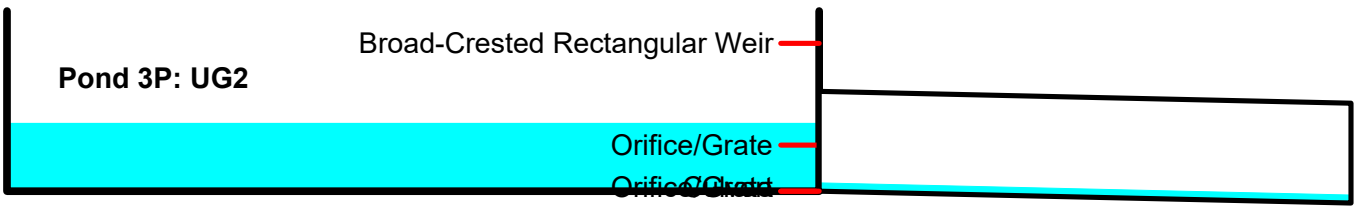
Plug-Flow detention time= 71.9 min calculated for 4,381 cf (100% of inflow)
Center-of-Mass det. time= 72.0 min (823.1 - 751.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.489 cfs @ 12.08 hrs HW=160.30' (Free Discharge)
└**4=Culvert** (Passes 0.489 cfs of 3.067 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.223 cfs @ 4.547 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.266 cfs @ 2.126 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 3P: UG2 - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Discontinued, not for new designs)
Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf
Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap
Row Length Adjustment= +1.00' x 3.44 sf x 8 rows

36.0" Wide + 3.0" Spacing = 39.0" C-C Row Spacing

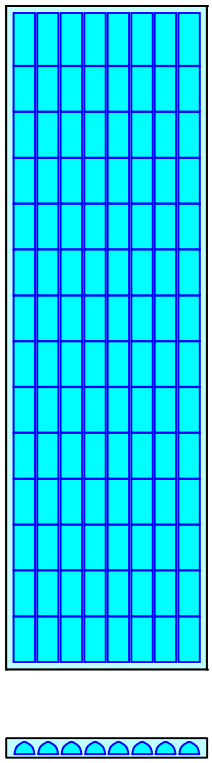
14 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 89.62' Row Length +12.0" End Stone x 2 = 91.62' Base Length
8 Rows x 36.0" Wide + 3.0" Spacing x 7 + 12.0" Side Stone x 2 = 27.75' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

112 Chambers x 21.8 cf +1.00' Row Adjustment x 3.44 sf x 8 Rows = 2,466.0 cf Chamber Storage

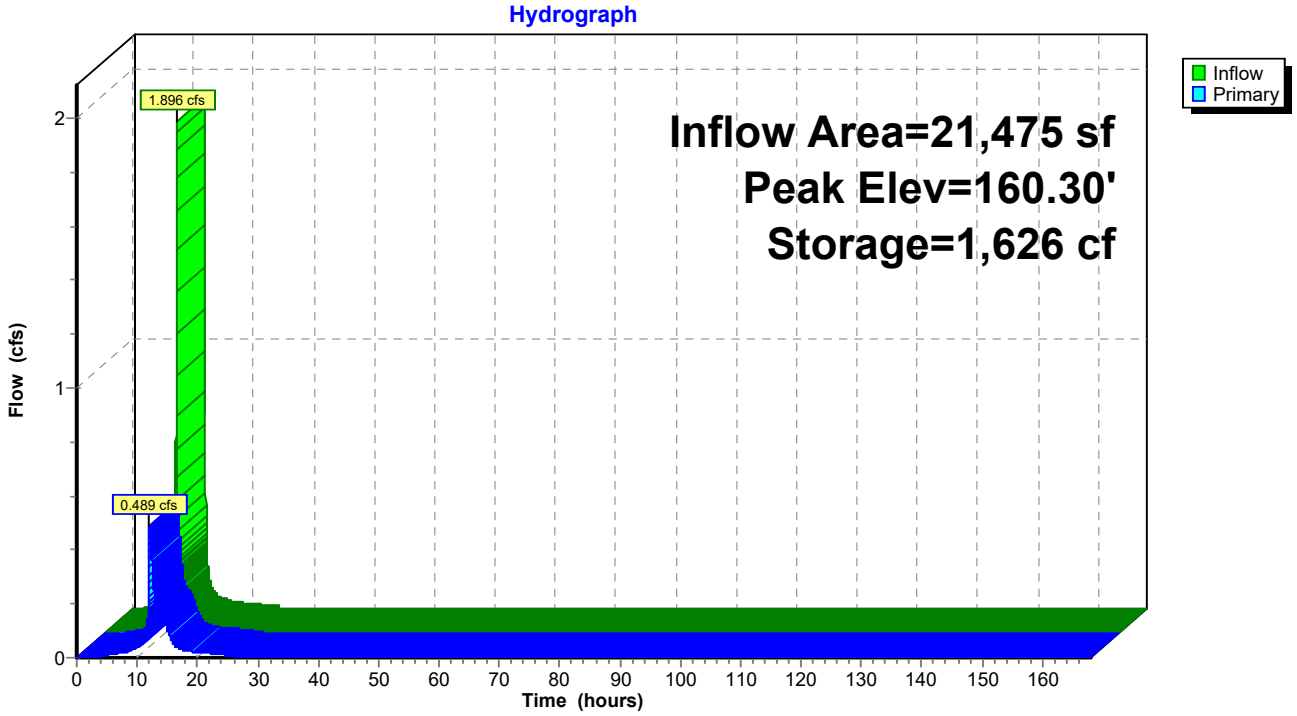
6,885.8 cf Field - 2,466.0 cf Chambers = 4,419.8 cf Stone x 40.0% Voids = 1,767.9 cf Stone Storage

Chamber Storage + Stone Storage = 4,233.9 cf = 0.097 af
Overall Storage Efficiency = 61.5%
Overall System Size = 91.62' x 27.75' x 2.71'

112 Chambers
255.0 cy Field
163.7 cy Stone



Pond 3P: UG2


Hydrograph
Inflow
Primary
Inflow Area=21,475 sf
Peak Elev=160.30'
Storage=1,626 cf
1.896 cfs
0.489 cfs
Flow (cfs)
Time (hours)
0
1
2
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.001	1	159.28	0.000
2.00	0.004	5	159.28	0.000
2.50	0.006	12	159.29	0.001
3.00	0.007	22	159.30	0.001
3.50	0.009	34	159.31	0.003
4.00	0.011	45	159.32	0.005
4.50	0.012	56	159.34	0.006
5.00	0.014	66	159.35	0.009
5.50	0.016	75	159.35	0.011
6.00	0.018	83	159.36	0.014
6.50	0.020	90	159.37	0.016
7.00	0.021	96	159.37	0.018
7.50	0.023	102	159.38	0.020
8.00	0.025	107	159.39	0.022
8.50	0.030	115	159.39	0.025
9.00	0.037	126	159.40	0.029
9.50	0.038	137	159.41	0.034
10.00	0.047	148	159.43	0.039
10.50	0.062	168	159.45	0.048
11.00	0.086	201	159.48	0.063
11.50	**0.142**	268	159.54	0.088
12.00	**1.566**	**1,479**	**160.23**	**0.423**
12.50	0.136	**1,321**	**160.15**	**0.331**
13.00	0.085	1,041	160.02	0.206
13.50	0.064	843	159.93	0.172
14.00	0.050	650	159.84	0.157
14.50	0.044	467	159.74	0.137
15.00	0.040	326	159.60	0.105
15.50	0.035	232	159.51	0.076
16.00	0.031	178	159.45	0.052
16.50	0.029	150	159.43	0.039
17.00	0.027	135	159.41	0.033
17.50	0.025	126	159.40	0.029
18.00	0.024	120	159.40	0.027
18.50	0.022	115	159.39	0.025
19.00	0.020	110	159.39	0.023
19.50	0.019	106	159.38	0.021
20.00	0.017	101	159.38	0.020
20.50	0.017	97	159.38	0.018
21.00	0.016	95	159.37	0.018
21.50	0.016	93	159.37	0.017
22.00	0.016	91	159.37	0.016
22.50	0.015	90	159.37	0.016
23.00	0.015	89	159.37	0.016
23.50	0.015	88	159.37	0.015
24.00	0.014	87	159.37	0.015
24.50	0.000	69	159.35	0.010
25.00	0.000	55	159.33	0.006

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	45	159.32	0.005
26.00	0.000	38	159.32	0.003
26.50	0.000	33	159.31	0.002
27.00	0.000	29	159.31	0.002
27.50	0.000	26	159.31	0.002
28.00	0.000	23	159.30	0.001
28.50	0.000	21	159.30	0.001
29.00	0.000	19	159.30	0.001
29.50	0.000	17	159.30	0.001
30.00	0.000	15	159.30	0.001
30.50	0.000	14	159.29	0.001
31.00	0.000	12	159.29	0.001
31.50	0.000	11	159.29	0.001
32.00	0.000	10	159.29	0.001
32.50	0.000	9	159.29	0.001
33.00	0.000	8	159.29	0.000
33.50	0.000	7	159.29	0.000
34.00	0.000	7	159.29	0.000
34.50	0.000	6	159.29	0.000
35.00	0.000	5	159.29	0.000
35.50	0.000	5	159.28	0.000
36.00	0.000	4	159.28	0.000
36.50	0.000	4	159.28	0.000
37.00	0.000	4	159.28	0.000
37.50	0.000	3	159.28	0.000
38.00	0.000	3	159.28	0.000
38.50	0.000	3	159.28	0.000
39.00	0.000	2	159.28	0.000
39.50	0.000	2	159.28	0.000
40.00	0.000	2	159.28	0.000
40.50	0.000	2	159.28	0.000
41.00	0.000	2	159.28	0.000
41.50	0.000	1	159.28	0.000
42.00	0.000	1	159.28	0.000
42.50	0.000	1	159.28	0.000
43.00	0.000	1	159.28	0.000
43.50	0.000	1	159.28	0.000
44.00	0.000	1	159.28	0.000
44.50	0.000	1	159.28	0.000
45.00	0.000	1	159.28	0.000
45.50	0.000	1	159.28	0.000
46.00	0.000	1	159.28	0.000
46.50	0.000	0	159.28	0.000
47.00	0.000	0	159.28	0.000
47.50	0.000	0	159.28	0.000
48.00	0.000	0	159.28	0.000
48.50	0.000	0	159.28	0.000
49.00	0.000	0	159.28	0.000
49.50	0.000	0	159.28	0.000
50.00	0.000	0	159.28	0.000
50.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	0	159.28	0.000
51.50	0.000	0	159.28	0.000
52.00	0.000	0	159.28	0.000
52.50	0.000	0	159.28	0.000
53.00	0.000	0	159.28	0.000
53.50	0.000	0	159.28	0.000
54.00	0.000	0	159.28	0.000
54.50	0.000	0	159.28	0.000
55.00	0.000	0	159.28	0.000
55.50	0.000	0	159.28	0.000
56.00	0.000	0	159.28	0.000
56.50	0.000	0	159.28	0.000
57.00	0.000	0	159.28	0.000
57.50	0.000	0	159.28	0.000
58.00	0.000	0	159.28	0.000
58.50	0.000	0	159.28	0.000
59.00	0.000	0	159.28	0.000
59.50	0.000	0	159.28	0.000
60.00	0.000	0	159.28	0.000
60.50	0.000	0	159.28	0.000
61.00	0.000	0	159.28	0.000
61.50	0.000	0	159.28	0.000
62.00	0.000	0	159.28	0.000
62.50	0.000	0	159.28	0.000
63.00	0.000	0	159.28	0.000
63.50	0.000	0	159.28	0.000
64.00	0.000	0	159.28	0.000
64.50	0.000	0	159.28	0.000
65.00	0.000	0	159.28	0.000
65.50	0.000	0	159.28	0.000
66.00	0.000	0	159.28	0.000
66.50	0.000	0	159.28	0.000
67.00	0.000	0	159.28	0.000
67.50	0.000	0	159.28	0.000
68.00	0.000	0	159.28	0.000
68.50	0.000	0	159.28	0.000
69.00	0.000	0	159.28	0.000
69.50	0.000	0	159.28	0.000
70.00	0.000	0	159.28	0.000
70.50	0.000	0	159.28	0.000
71.00	0.000	0	159.28	0.000
71.50	0.000	0	159.28	0.000
72.00	0.000	0	159.28	0.000
72.50	0.000	0	159.28	0.000
73.00	0.000	0	159.28	0.000
73.50	0.000	0	159.28	0.000
74.00	0.000	0	159.28	0.000
74.50	0.000	0	159.28	0.000
75.00	0.000	0	159.28	0.000
75.50	0.000	0	159.28	0.000
76.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	0	159.28	0.000
77.00	0.000	0	159.28	0.000
77.50	0.000	0	159.28	0.000
78.00	0.000	0	159.28	0.000
78.50	0.000	0	159.28	0.000
79.00	0.000	0	159.28	0.000
79.50	0.000	0	159.28	0.000
80.00	0.000	0	159.28	0.000
80.50	0.000	0	159.28	0.000
81.00	0.000	0	159.28	0.000
81.50	0.000	0	159.28	0.000
82.00	0.000	0	159.28	0.000
82.50	0.000	0	159.28	0.000
83.00	0.000	0	159.28	0.000
83.50	0.000	0	159.28	0.000
84.00	0.000	0	159.28	0.000
84.50	0.000	0	159.28	0.000
85.00	0.000	0	159.28	0.000
85.50	0.000	0	159.28	0.000
86.00	0.000	0	159.28	0.000
86.50	0.000	0	159.28	0.000
87.00	0.000	0	159.28	0.000
87.50	0.000	0	159.28	0.000
88.00	0.000	0	159.28	0.000
88.50	0.000	0	159.28	0.000
89.00	0.000	0	159.28	0.000
89.50	0.000	0	159.28	0.000
90.00	0.000	0	159.28	0.000
90.50	0.000	0	159.28	0.000
91.00	0.000	0	159.28	0.000
91.50	0.000	0	159.28	0.000
92.00	0.000	0	159.28	0.000
92.50	0.000	0	159.28	0.000
93.00	0.000	0	159.28	0.000
93.50	0.000	0	159.28	0.000
94.00	0.000	0	159.28	0.000
94.50	0.000	0	159.28	0.000
95.00	0.000	0	159.28	0.000
95.50	0.000	0	159.28	0.000
96.00	0.000	0	159.28	0.000
96.50	0.000	0	159.28	0.000
97.00	0.000	0	159.28	0.000
97.50	0.000	0	159.28	0.000
98.00	0.000	0	159.28	0.000
98.50	0.000	0	159.28	0.000
99.00	0.000	0	159.28	0.000
99.50	0.000	0	159.28	0.000
100.00	0.000	0	159.28	0.000
100.50	0.000	0	159.28	0.000
101.00	0.000	0	159.28	0.000
101.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	0	159.28	0.000
102.50	0.000	0	159.28	0.000
103.00	0.000	0	159.28	0.000
103.50	0.000	0	159.28	0.000
104.00	0.000	0	159.28	0.000
104.50	0.000	0	159.28	0.000
105.00	0.000	0	159.28	0.000
105.50	0.000	0	159.28	0.000
106.00	0.000	0	159.28	0.000
106.50	0.000	0	159.28	0.000
107.00	0.000	0	159.28	0.000
107.50	0.000	0	159.28	0.000
108.00	0.000	0	159.28	0.000
108.50	0.000	0	159.28	0.000
109.00	0.000	0	159.28	0.000
109.50	0.000	0	159.28	0.000
110.00	0.000	0	159.28	0.000
110.50	0.000	0	159.28	0.000
111.00	0.000	0	159.28	0.000
111.50	0.000	0	159.28	0.000
112.00	0.000	0	159.28	0.000
112.50	0.000	0	159.28	0.000
113.00	0.000	0	159.28	0.000
113.50	0.000	0	159.28	0.000
114.00	0.000	0	159.28	0.000
114.50	0.000	0	159.28	0.000
115.00	0.000	0	159.28	0.000
115.50	0.000	0	159.28	0.000
116.00	0.000	0	159.28	0.000
116.50	0.000	0	159.28	0.000
117.00	0.000	0	159.28	0.000
117.50	0.000	0	159.28	0.000
118.00	0.000	0	159.28	0.000
118.50	0.000	0	159.28	0.000
119.00	0.000	0	159.28	0.000
119.50	0.000	0	159.28	0.000
120.00	0.000	0	159.28	0.000
120.50	0.000	0	159.28	0.000
121.00	0.000	0	159.28	0.000
121.50	0.000	0	159.28	0.000
122.00	0.000	0	159.28	0.000
122.50	0.000	0	159.28	0.000
123.00	0.000	0	159.28	0.000
123.50	0.000	0	159.28	0.000
124.00	0.000	0	159.28	0.000
124.50	0.000	0	159.28	0.000
125.00	0.000	0	159.28	0.000
125.50	0.000	0	159.28	0.000
126.00	0.000	0	159.28	0.000
126.50	0.000	0	159.28	0.000
127.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	0	159.28	0.000
128.00	0.000	0	159.28	0.000
128.50	0.000	0	159.28	0.000
129.00	0.000	0	159.28	0.000
129.50	0.000	0	159.28	0.000
130.00	0.000	0	159.28	0.000
130.50	0.000	0	159.28	0.000
131.00	0.000	0	159.28	0.000
131.50	0.000	0	159.28	0.000
132.00	0.000	0	159.28	0.000
132.50	0.000	0	159.28	0.000
133.00	0.000	0	159.28	0.000
133.50	0.000	0	159.28	0.000
134.00	0.000	0	159.28	0.000
134.50	0.000	0	159.28	0.000
135.00	0.000	0	159.28	0.000
135.50	0.000	0	159.28	0.000
136.00	0.000	0	159.28	0.000
136.50	0.000	0	159.28	0.000
137.00	0.000	0	159.28	0.000
137.50	0.000	0	159.28	0.000
138.00	0.000	0	159.28	0.000
138.50	0.000	0	159.28	0.000
139.00	0.000	0	159.28	0.000
139.50	0.000	0	159.28	0.000
140.00	0.000	0	159.28	0.000
140.50	0.000	0	159.28	0.000
141.00	0.000	0	159.28	0.000
141.50	0.000	0	159.28	0.000
142.00	0.000	0	159.28	0.000
142.50	0.000	0	159.28	0.000
143.00	0.000	0	159.28	0.000
143.50	0.000	0	159.28	0.000
144.00	0.000	0	159.28	0.000
144.50	0.000	0	159.28	0.000
145.00	0.000	0	159.28	0.000
145.50	0.000	0	159.28	0.000
146.00	0.000	0	159.28	0.000
146.50	0.000	0	159.28	0.000
147.00	0.000	0	159.28	0.000
147.50	0.000	0	159.28	0.000
148.00	0.000	0	159.28	0.000
148.50	0.000	0	159.28	0.000
149.00	0.000	0	159.28	0.000
149.50	0.000	0	159.28	0.000
150.00	0.000	0	159.28	0.000
150.50	0.000	0	159.28	0.000
151.00	0.000	0	159.28	0.000
151.50	0.000	0	159.28	0.000
152.00	0.000	0	159.28	0.000
152.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	0	159.28	0.000
153.50	0.000	0	159.28	0.000
154.00	0.000	0	159.28	0.000
154.50	0.000	0	159.28	0.000
155.00	0.000	0	159.28	0.000
155.50	0.000	0	159.28	0.000
156.00	0.000	0	159.28	0.000
156.50	0.000	0	159.28	0.000
157.00	0.000	0	159.28	0.000
157.50	0.000	0	159.28	0.000
158.00	0.000	0	159.28	0.000
158.50	0.000	0	159.28	0.000
159.00	0.000	0	159.28	0.000
159.50	0.000	0	159.28	0.000
160.00	0.000	0	159.28	0.000
160.50	0.000	0	159.28	0.000
161.00	0.000	0	159.28	0.000
161.50	0.000	0	159.28	0.000
162.00	0.000	0	159.28	0.000
162.50	0.000	0	159.28	0.000
163.00	0.000	0	159.28	0.000
163.50	0.000	0	159.28	0.000
164.00	0.000	0	159.28	0.000
164.50	0.000	0	159.28	0.000
165.00	0.000	0	159.28	0.000
165.50	0.000	0	159.28	0.000
166.00	0.000	0	159.28	0.000
166.50	0.000	0	159.28	0.000
167.00	0.000	0	159.28	0.000
167.50	0.000	0	159.28	0.000
168.00	0.000	0	159.28	0.000

General Information

Instructions | *General* | Volume | Rate | Quality

Project Name: **Prop. Automotive Dealership Expansion**

Application Type: **PAG-02 NOI**

County: **Montgomery**

Municipality: **Whitemarsh Township**

Project Type: **Commercial Building**

(●) New Project ( ) Minor / Major Amendment

Total Project Site Area: **5.45** acres
(In Watershed)

Total Earth Disturbance: **4.93** acres
(In Watershed)

No. of Post-Construction Discharge Points: **4**

Start DP Numbering at: **001**

Discharge Point (DP) No.	Drainage Area (DA) (acres)	Earth Disturbance in DA (acres)	Existing Impervious in DA (acres)	Proposed Impervious in DA (acres)	Receiving Waters	Ch. 93 Class	Structural BMP(s)
001	0.87	1.87	1.75	1.81	Sandy Run	TSF, MF	Yes
002					Sandy Run	TSF, MF	No
003	0.51	0.51	0.21	0.40	Sandy Run	TSF, MF	Yes
004					Dis. to MS4 - Bodenstein Channel (UNT to Sandy Run)	TSF, MF	No
Undetained Areas	2.55	2.55	1.77	1.82	Sandy Run, UNT to Sandy Run/Bodenstein Channel	TSF, MF	
Totals:	**3.93**	**4.93**	**3.73**	**4.03**			

Volume Management

Project: Prop. Automotive Dealership Expansion

Instructions | General | *Volume* | Rate | Quality

2-Year / 24-Hour Storm Event (NOAA Atlas 14): **3.28** inches

Alternative 2-Year / 24-Hour Storm Event _____ inches

Alternative Source: _____

Pre-Construction Conditions: *No. Rows:* **6** ☐ *Exempt from Meadow in Good Condition* ☑ *Automatically Calculate CN, Ia, Runoff and Volume*

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Pervious as Meadow	0.86	A	30	4.667	0.00	0
Forested (Good Condition)	0.28	A	30	4.667	0.00	0
Pervious as Meadow	0.08	B	58	1.448	0.37	101
Impervious as Meadow	0.72	A	30	4.667	0.00	0
Impervious as Meadow	0.03	B	58	1.448	0.37	34
Impervious Areas: Commercial	2.97	N/A	98	0.041	3.05	32,885
TOTAL (ACRES):	**4.93**				**TOTAL (CF):**	**33,020**

Post-Construction Conditions: *No. Rows:* **4**

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	0.86	A	39	3.128	0.00	5

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Woods (Good Condition)	0.29	A	30	4.667	0.00	0
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	0.10	B	61	1.279	0.48	177
Impervious Areas: Commercial	3.63	N/A	98	0.041	3.05	40,153
TOTAL (ACRES):	**4.87**				**TOTAL (CF):**	**40,334**

NET CHANGE IN VOLUME TO MANAGE (CF): **7,314**

Non-Structural BMP Volume Credits:

☑ Tree Planting Credit

Number of new deciduous trees that will be planted within disturbed area: 69 — **CREDIT (CF):** **414**

Number of new evergreen trees that will be planted within disturbed area: 16 — **CREDIT (CF):** **160**

☐ Other (attach calculations):

Structural BMP Volume Credits: *No. Structural BMPs:* **2** *Start BMP Numbering at:* **2**

DP No.	BMP No.	BMP Name	MRC?	Discharge	Incremental BMP DA (acres)	Volume Routed to BMP (CF)	Infiltration / Vegetated Area (SF)	Infiltration Rate (in/hr)	Infiltration Period (hrs)	Vegeta-ted?	Media Depth (ft)	Storage Volume (CF)	Infiltration Credit (CF)	ET Credit (CF)
001	2	Dry Extended Detention Basin	Y	Off-Site	1.87	20,696	0	0.00	12	No	1.0	20,696	**0**	
003	3	Dry Extended Detention Basin	-	Off-Site	0.51	4,712	0	0.00	12	No	1.0	4,712	**0**	
												Totals:		

INFILTRATION & ET CREDITS (CF):

MANAGED RELEASE CREDIT (CF): **20,696**

NET CHANGE IN VOLUME TO MANAGE (CF): **7,314**

TOTAL CREDITS (CF): **21,270**

VOLUME REQUIREMENT SATISFIED

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Rate Control

Project: Prop. Automotive Dealership Expansion

Instructions | General | Volume | *Rate* | Quality

Precipitation Amounts:

NOAA 2-Year 24-Hour Storm Event (in):	**3.28**	Alternative 2-Year 24-Hour Storm Event (in):	
NOAA 10-Year 24-Hour Storm Event (in):	**4.83**	Alternative 10-Year 24-Hour Storm Event (in):	
NOAA 50-Year 24-Hour Storm Event (in):	**6.73**	Alternative 50-Year 24-Hour Storm Event (in):	
NOAA 100-Year 24-Hour Storm Event (in):	**7.66**	Alternative 100-Year 24-Hour Storm Event (in):	

☑ **Report Summary of Peak Rates Only**

Attach model input and output data or other calculations to support the rates reported below.

	Peak Discharge Rates (cfs)			
	Pre-Construction	**Post-Construction**	**Net Change**	
2-Year Storm:	**8.62**	**5.12**	**-3.50**	***Rate Control Satisfied***
10-Year Storm:	**15.21**	**10.53**	**-4.68**	***Rate Control Satisfied***
50-Year Storm:	**23.72**	**16.52**	**-7.20**	***Rate Control Satisfied***
100-Year Storm:	**27.95**	**19.44**	**-8.51**	***Rate Control Satisfied***

Water Quality

Project: Prop. Automotive Dealership Expansion

PRINT

Instructions | General | Volume | Rate | *Quality*

Pre-Construction Pollutant Loads:

Land Cover (from Volume Worksheet)	Land Cover for Water Quality	Area (acres)	Soil Group	Runoff Volume (cf)	Pollutant Conc. (mg/L)			Pollutant Loads (lbs)		
					TSS	TP	TN	TSS	TP	TN
Pervious as Meadow	Grassland/Herbaceous	0.86	A	0	48.8	0.22	2.30	0.00	0.00	0.00
Forested (Good Condition)	Deciduous Forest/Evergreen Forest/Mixed Forest	0.28	A	0	45.0	0.13	1.05	0.00	0.00	0.00
Pervious as Meadow	Grassland/Herbaceous	0.08	B	101	48.8	0.22	2.30	0.31	0.00	0.01
Impervious as Meadow	Grassland/Herbaceous	0.72	A	0	48.8	0.22	2.30	0.00	0.00	0.00
Impervious as Meadow	Grassland/Herbaceous	0.03	B	34	48.8	0.22	2.30	0.10	0.00	0.00
Impervious Areas: Commercial	Commercial	2.97	N/A	32,885	61.7	0.22	2.02	126.74	0.45	4.15
	TOTAL (ACRES):	**4.93**					**TOTALS:**	**127.15**	**0.45**	**4.17**

Post-Construction Pollutant Loads (without BMPs):

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Land Cover (from Volume Worksheet)	Land Cover for Water Quality	Area (acres)	Soil Group	Runoff Volume (cf)	Pollutant Conc. (mg/L)			Pollutant Loads (lbs)		
					TSS	TP	TN	TSS	TP	TN
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	Open Space	0.86	A	5	78.0	0.25	1.25	0.02	0.00	0.00
Woods (Good Condition)	Deciduous Forest/Evergreen Forest/Mixed Forest	0.29	A	0	45.0	0.13	1.05	0.00	0.00	0.00
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	Open Space	0.10	B	177	78.0	0.25	1.25	0.86	0.00	0.01
Impervious Areas: Commercial	Commercial	3.63	N/A	40,153	61.7	0.22	2.02	154.75	0.55	5.06
	TOTAL (ACRES):	**4.87**					**TOTALS:**	**155.63**	**0.55**	**5.08**

POLLUTANT LOAD REDUCTION REQUIREMENTS (LBS):	28.48	0.10	0.91

☑ **Characterize Undetained Areas (for Untreated Stormwater)** *No. Rows:* 4

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	**0.728**	**A**	**39**	**3.128**	**0.00**	**4**
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	**0.102**	**B**	**61**	**1.279**	**0.48**	**177**
Woods (Good Condition)	**0.285**	**A**	**30**	**4.667**	**0.00**	**0**
Impervious Areas: Commercial	**0.791**	**N/A**	**98**	**0.041**	**3.05**	**8,750**

Non-Structural BMP Water Quality Credits:

☑ Pervious Undetained Area Credit

TSS	TP	TN
0.14	0.00	0.00

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☐ Other (attach calculations)

Structural BMP Water Quality Credits:

☑ *Use default BMP Outflows and Median BMP Outflow Concentrations*

DP No.	BMP No.	BMP Name	MRC?	BMP DA (acres)	Vol. Routed to BMP (CF)	Inf. & ET Credits (CF)	Capture & Buffer Credits (CF)	Outflow (CF)	Outflow Conc. (mg/L)			Pollutant Loads (lbs)		
									TSS	TP	TN	TSS	TP	TN
001	2	Dry Extended Detention Basin	Y	1.87	20,696	0		20,696	-	-	-	-	-	-
003	3	Dry Extended Detention Basin	-	0.51	4,712	0		4,712	22.00	0.19	1.22	6.47	0.06	0.36

	TSS	TP	TN
POLLUTANT LOADS FROM STRUCTURAL BMP (TREATED) OUTFLOWS (LBS):	**6.47**	**0.06**	**0.36**
POLLUTANT LOADS FROM UNTREATED STORMWATER (LBS):	**34.60**	**0.12**	**1.12**
NON-STRUCTURAL BMP WATER QUALITY CREDITS (LBS):	**0.14**	**0.00**	**0.00**
NET POLLUTANT LOADS FROM SITE, POST-CONSTRUCTION (LBS):	**40.93**	**0.18**	**1.47**
POLLUTANT LOADS FROM SITE, PRE-CONSTRUCTION (LBS):	**127.15**	**0.45**	**4.17**

WATER QUALITY REQUIREMENT SATISFIED

CERTIFICATION

I certify under penalty of law and subject to the penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities) that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I further certify that the structure, function, and calculations contained in this spreadsheet have not been modified in comparison to the spreadsheet DEP has posted to its website or, if modifications were made, an explanation of the modifications made is attached to this spreadsheet.

Robert Swahl	7/24/2025
Spreadsheet User Name	Date

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General Information

Instructions | *General* | Volume | Rate | Quality

Project Name: **Prop. Automotive Dealership Expansion**

Application Type: **PAG-02 NOI**

County: **Montgomery**

Municipality: **Whitemarsh Township**

Project Type: **Commercial Building**

(●) New Project ( ) Minor / Major Amendment

Total Project Site Area: **5.45** acres
(In Watershed)

Total Earth Disturbance: **4.14** acres
(In Watershed)

No. of Post-Construction Discharge Points: **4**

Start DP Numbering at: **001**

Discharge Point (DP) No.	Drainage Area (DA) (acres)	Earth Disturbance in DA (acres)	Existing Impervious in DA (acres)	Proposed Impervious in DA (acres)	Receiving Waters	Ch. 93 Class	Structural BMP(s)
001	1.87	1.87	1.75	1.81	Sandy Run	TSF, MF	Yes
002					Sandy Run	TSF, MF	No
003	0.51	0.51	0.21	0.40	Sandy Run	TSF, MF	Yes
004					Dis. to MS4 - Bodenstein Channel (UNT to Sandy Run)	TSF, MF	No
Undetained Areas	1.76	1.76	1.05	1.45	Sandy Run, UNT to Sandy Run/Bodenstein Channel	TSF, MF	
Totals:	**4.14**	**4.14**	**3.01**	**3.66**			

Volume Management

Project: Prop. Automotive Dealership Expansion

Instructions | General | *Volume* | Rate | Quality

2-Year / 24-Hour Storm Event (NOAA Atlas 14): **3.28** inches

Alternative 2-Year / 24-Hour Storm Event _____ inches

Alternative Source: _____

Pre-Construction Conditions: *No. Rows:* **6** ☐ *Exempt from Meadow in Good Condition* ☑ *Automatically Calculate CN, Ia, Runoff and Volume*

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Pervious as Meadow	0.47	A	30	4.667	0.00	0
Forested (Good Condition)	0.29	A	30	4.667	0.00	0
Pervious as Meadow	0.02	B	58	1.448	0.37	32
Impervious as Meadow	0.59	A	30	4.667	0.00	0
Impervious as Meadow	0.01	B	58	1.448	0.37	11
Impervious Areas: Commercial	2.41	N/A	98	0.041	3.05	26,636
TOTAL (ACRES):	**3.79**				**TOTAL (CF):**	**26,679**

Post-Construction Conditions: *No. Rows:* **4**

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	0.54	A	39	3.128	0.00	3

346

Woods (Good Condition)	0.29	A	30	4.667	0.00	0
Impervious Areas: Commercial	3.26	N/A	98	0.041	3.05	36,060
TOTAL (ACRES):	**4.09**				**TOTAL (CF):**	**36,063**

NET CHANGE IN VOLUME TO MANAGE (CF): **9,384**

Non-Structural BMP Volume Credits:

☑ Tree Planting Credit

Number of new deciduous trees that will be planted within disturbed area: 42 — **CREDIT (CF):** **252**

Number of new evergreen trees that will be planted within disturbed area: 4 — **CREDIT (CF):** **40**

☐ Other (attach calculations):

Structural BMP Volume Credits: *No. Structural BMPs:* **2** *Start BMP Numbering at:* **2**

DP No.	BMP No.	BMP Name	MRC?	Discharge	Incremental BMP DA (acres)	Volume Routed to BMP (CF)	Infiltration / Vegetated Area (SF)	Infiltration Rate (in/hr)	Infiltration Period (hrs)	Vegeta-ted?	Media Depth (ft)	Storage Volume (CF)	Infiltration Credit (CF)	ET Credit (CF)
001	2	Dry Extended Detention Basin	Y	Off-Site	1.87	20,696	0	0.00	12	No	1.0	20,696	**0**	
003	3	Dry Extended Detention Basin	-	Off-Site	0.51	4,712	0	0.00	12	No	1.0	4,712	**0**	
												Totals:		

INFILTRATION & ET CREDITS (CF):

MANAGED RELEASE CREDIT (CF): **20,696**

NET CHANGE IN VOLUME TO MANAGE (CF): **9,384**

TOTAL CREDITS (CF): **20,988**

VOLUME REQUIREMENT SATISFIED

Rate Control

Project: Prop. Automotive Dealership Expansion

Instructions | General | Volume | *Rate* | Quality

Precipitation Amounts:

NOAA 2-Year 24-Hour Storm Event (in):	**3.28**	Alternative 2-Year 24-Hour Storm Event (in):	
NOAA 10-Year 24-Hour Storm Event (in):	**4.83**	Alternative 10-Year 24-Hour Storm Event (in):	
NOAA 50-Year 24-Hour Storm Event (in):	**6.73**	Alternative 50-Year 24-Hour Storm Event (in):	
NOAA 100-Year 24-Hour Storm Event (in):	**7.66**	Alternative 100-Year 24-Hour Storm Event (in):	

☑ **Report Summary of Peak Rates Only**

Attach model input and output data or other calculations to support the rates reported below.

	Peak Discharge Rates (cfs)			
	Pre-Construction	**Post-Construction**	**Net Change**	
2-Year Storm:	**8.04**	**3.98**	**-4.06**	***Rate Control Satisfied***
10-Year Storm:	**14.02**	**7.85**	**-6.17**	***Rate Control Satisfied***
50-Year Storm:	**21.45**	**11.75**	**-9.70**	***Rate Control Satisfied***
100-Year Storm:	**25.06**	**13.69**	**-11.37**	***Rate Control Satisfied***

Water Quality

Project: Prop. Automotive Dealership Expansion

PRINT

Instructions | General | Volume | Rate | *Quality*

Pre-Construction Pollutant Loads:

Land Cover (from Volume Worksheet)	Land Cover for Water Quality	Area (acres)	Soil Group	Runoff Volume (cf)	Pollutant Conc. (mg/L)			Pollutant Loads (lbs)		
					TSS	TP	TN	TSS	TP	TN
Pervious as Meadow	Grassland/Herbaceous	0.47	A	0	48.8	0.22	2.30	0.00	0.00	0.00
Forested (Good Condition)	Deciduous Forest/Evergreen Forest/Mixed Forest	0.29	A	0	45.0	0.13	1.05	0.00	0.00	0.00
Pervious as Meadow	Grassland/Herbaceous	0.02	B	32	48.8	0.22	2.30	0.10	0.00	0.00
Impervious as Meadow	Grassland/Herbaceous	0.59	A	0	48.8	0.22	2.30	0.00	0.00	0.00
Impervious as Meadow	Grassland/Herbaceous	0.01	B	11	48.8	0.22	2.30	0.03	0.00	0.00
Impervious Areas: Commercial	Commercial	2.41	N/A	26,636	61.7	0.22	2.02	102.65	0.37	3.36
	TOTAL (ACRES):	**3.79**					**TOTALS:**	**102.78**	**0.37**	**3.37**

Post-Construction Pollutant Loads (without BMPs):

Land Cover (from Volume Worksheet)	Land Cover for Water Quality	Area (acres)	Soil Group	Runoff Volume (cf)	Pollutant Conc. (mg/L)			Pollutant Loads (lbs)		
					TSS	TP	TN	TSS	TP	TN
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	Open Space	0.54	A	3	78.0	0.25	1.25	0.01	0.00	0.00
Woods (Good Condition)	Deciduous Forest/Evergreen Forest/Mixed Forest	0.29	A	0	45.0	0.13	1.05	0.00	0.00	0.00
Impervious Areas: Commercial	Commercial	3.26	N/A	36,060	61.7	0.22	2.02	138.97	0.50	4.55
	TOTAL (ACRES):	**4.09**					**TOTALS:**	**138.99**	**0.50**	**4.55**

POLLUTANT LOAD REDUCTION REQUIREMENTS (LBS):	**36.20**	**0.13**	**1.18**

☑ **Characterize Undetained Areas (for Untreated Stormwater)** *No. Rows:* **4**

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	**0.396**	**A**	**39**	**3.128**	**0.00**	**2**
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)		**B**				
Woods (Good Condition)	**0.285**	**A**	**30**	**4.667**	**0.00**	**0**
Impervious Areas: Commercial	**0.402**	**N/A**	**98**	**0.041**	**3.05**	**4,447**

Non-Structural BMP Water Quality Credits:

☑ Pervious Undetained Area Credit

TSS	TP	TN
0.00	**0.00**	**0.00**

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☐ Other (attach calculations)

Structural BMP Water Quality Credits:

☑ *Use default BMP Outflows and Median BMP Outflow Concentrations*

DP No.	BMP No.	BMP Name	MRC?	BMP DA (acres)	Vol. Routed to BMP (CF)	Inf. & ET Credits (CF)	Capture & Buffer Credits (CF)	Outflow (CF)	Outflow Conc. (mg/L)			Pollutant Loads (lbs)		
									TSS	TP	TN	TSS	TP	TN
001	2	Dry Extended Detention Basin	Y	1.87	20,696	0		20,696	-	-	-	-	-	-
003	3	Dry Extended Detention Basin	-	0.51	4,712	0		4,712	22.00	0.19	1.22	6.47	0.06	0.36

	TSS	TP	TN
POLLUTANT LOADS FROM STRUCTURAL BMP (TREATED) OUTFLOWS (LBS):	**6.47**	**0.06**	**0.36**
POLLUTANT LOADS FROM UNTREATED STORMWATER (LBS):	**17.15**	**0.06**	**0.56**
NON-STRUCTURAL BMP WATER QUALITY CREDITS (LBS):	**0.00**	**0.00**	**0.00**
NET POLLUTANT LOADS FROM SITE, POST-CONSTRUCTION (LBS):	**23.62**	**0.12**	**0.92**
POLLUTANT LOADS FROM SITE, PRE-CONSTRUCTION (LBS):	**102.78**	**0.37**	**3.37**

WATER QUALITY REQUIREMENT SATISFIED

CERTIFICATION

I certify under penalty of law and subject to the penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities) that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I further certify that the structure, function, and calculations contained in this spreadsheet have not been modified in comparison to the spreadsheet DEP has posted to its website or, if modifications were made, an explanation of the modifications made is attached to this spreadsheet.

Robert Swahl	7/24/2025
Spreadsheet User Name	Date

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General Information

Instructions | *General* | Volume | Rate | Quality

Project Name: **Prop. Automotive Dealership Expansion**

Application Type: **PAG-02 NOI**

County: **Montgomery**

Municipality: **Whitemarsh Township**

Project Type: **Commercial Building**

(●) New Project ( ) Minor / Major Amendment

Total Project Site Area: **5.45** acres
(In Watershed)

Total Earth Disturbance: **1.15** acres
(In Watershed)

No. of Post-Construction Discharge Points: **4**

Start DP Numbering at: **001**

Discharge Point (DP) No.	Drainage Area (DA) (acres)	Earth Disturbance in DA (acres)	Existing Impervious in DA (acres)	Proposed Impervious in DA (acres)	Receiving Waters	Ch. 93 Class	Structural BMP(s)
001					Sandy Run	TSF, MF	Yes
002					Sandy Run	TSF, MF	No
003					Sandy Run	TSF, MF	Yes
004					Dis. to MS4 - Bodenstein Channel (UNT to Sandy Run)	TSF, MF	No
Undetained Areas	1.15	1.15	0.71	0.37	Sandy Run, UNT to Sandy Run/Bodenstein Channel	TSF, MF	
Totals:	**1.15**	**1.15**	**0.71**	**0.37**			

PROJECT SITE MEETS SMALL SITE EXCEPTION - RATE WORKSHEET NOT REQUIRED

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Volume Management

Project: Prop. Automotive Dealership Expansion

Instructions | General | *Volume* | Rate | Quality

2-Year / 24-Hour Storm Event (NOAA Atlas 14): **3.28** inches

Alternative 2-Year / 24-Hour Storm Event _____ inches

Alternative Source: _____

Pre-Construction Conditions: *No. Rows:* **6**

☐ *Exempt from Meadow in Good Condition* ☑ *Automatically Calculate CN, Ia, Runoff and Volume*

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Pervious as Meadow	0.39	A	30	4.667	0.00	0
Pervious as Meadow	0.05	B	58	1.448	0.37	68
Impervious as Meadow	0.13	A	30	4.667	0.00	0
Impervious as Meadow	0.02	B	58	1.448	0.37	23
Impervious Areas: Commercial	0.57	N/A	98	0.041	3.05	6,250
TOTAL (ACRES):	**1.15**				**TOTAL (CF):**	**6,341**

Post-Construction Conditions: *No. Rows:* **4**

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	0.32	A	39	3.128	0.00	2

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Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	0.10	B	61	1.279	0.48	177
Impervious Areas: Commercial	0.37	N/A	98	0.041	3.05	4,093
TOTAL (ACRES):	**0.80**				**TOTAL (CF):**	**4,271**

NET CHANGE IN VOLUME TO MANAGE (CF): **-2,070**

Non-Structural BMP Volume Credits:

☑ Tree Planting Credit

Number of new deciduous trees that will be planted within disturbed area: 27 — **CREDIT (CF):** **162**

Number of new evergreen trees that will be planted within disturbed area: 12 — **CREDIT (CF):** **120**

☐ Other (attach calculations):

Structural BMP Volume Credits: *No. Structural BMPs:* **1** *Start BMP Numbering at:* **1**

DP No.	BMP No.	BMP Name	MRC?	Discharge	Incremental BMP DA (acres)	Volume Routed to BMP (CF)	Infiltration / Vegetated Area (SF)	Infiltration Rate (in/hr)	Infiltration Period (hrs)	Vegeta-ted?	Media Depth (ft)	Storage Volume (CF)	Infiltration Credit (CF)	ET Credit (CF)
	1													
												Totals:		

INFILTRATION & ET CREDITS (CF):

NET CHANGE IN VOLUME TO MANAGE (CF): **-2,070**

TOTAL CREDITS (CF): **282**

VOLUME REQUIREMENT SATISFIED

Rate Control

Project: Prop. Automotive Dealership Expansion

Instructions | General | Volume | *Rate* | Quality

SMALL SITE EXCEPTION SATISFIED: RATE CONTROL NOT REQUIRED

Precipitation Amounts:

NOAA 2-Year 24-Hour Storm Event (in):	**3.28**	Alternative 2-Year 24-Hour Storm Event (in):	
NOAA 10-Year 24-Hour Storm Event (in):	**4.83**	Alternative 10-Year 24-Hour Storm Event (in):	
NOAA 50-Year 24-Hour Storm Event (in):	**6.73**	Alternative 50-Year 24-Hour Storm Event (in):	
NOAA 100-Year 24-Hour Storm Event (in):	**7.66**	Alternative 100-Year 24-Hour Storm Event (in):	

☑ **Report Summary of Peak Rates Only**

Attach model input and output data or other calculations to support the rates reported below.

	Peak Discharge Rates (cfs)			
	Pre-Construction	**Post-Construction**	**Net Change**	
2-Year Storm:	**2.56**	**1.17**	**-1.39**	***Rate Control Satisfied***
10-Year Storm:	**5.10**	**2.70**	**-2.40**	***Rate Control Satisfied***
50-Year Storm:	**8.41**	**4.83**	**-3.58**	***Rate Control Satisfied***
100-Year Storm:	**10.06**	**5.93**	**-4.13**	***Rate Control Satisfied***

Water Quality

Project: Prop. Automotive Dealership Expansion

PRINT

Instructions | General | Volume | Rate | *Quality*

Pre-Construction Pollutant Loads:

Land Cover (from Volume Worksheet)	Land Cover for Water Quality	Area (acres)	Soil Group	Runoff Volume (cf)	Pollutant Conc. (mg/L)			Pollutant Loads (lbs)		
					TSS	TP	TN	TSS	TP	TN
Pervious as Meadow	Grassland/Herbaceous	0.39	A	0	48.8	0.22	2.30	0.00	0.00	0.00
Pervious as Meadow	Grassland/Herbaceous	0.05	B	68	48.8	0.22	2.30	0.21	0.00	0.01
Impervious as Meadow	Grassland/Herbaceous	0.13	A	0	48.8	0.22	2.30	0.00	0.00	0.00
Impervious as Meadow	Grassland/Herbaceous	0.02	B	23	48.8	0.22	2.30	0.07	0.00	0.00
Impervious Areas: Commercial	Commercial	0.57	N/A	6,250	61.7	0.22	2.02	24.09	0.09	0.79
	TOTAL (ACRES):	**1.15**					**TOTALS:**	**24.36**	**0.09**	**0.80**

Post-Construction Pollutant Loads (without BMPs):

Land Cover (from Volume Worksheet)	Land Cover for Water Quality	Area (acres)	Soil Group	Runoff Volume (cf)	Pollutant Conc. (mg/L)			Pollutant Loads (lbs)		
					TSS	TP	TN	TSS	TP	TN
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	Open Space	0.32	A	2	78.0	0.25	1.25	0.01	0.00	0.00
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	Open Space	0.10	B	177	78.0	0.25	1.25	0.86	0.00	0.01
Impervious Areas: Commercial	Commercial	0.37	N/A	4,093	61.7	0.22	2.02	15.77	0.06	0.52
	TOTAL (ACRES):	**0.80**					**TOTALS:**	**16.64**	**0.06**	**0.53**

POLLUTANT LOAD REDUCTION REQUIREMENTS (LBS):	**0.00**	**0.00**	**0.00**

☑ **Characterize Undetained Areas (for Untreated Stormwater)** *No. Rows:* **4**

Land Cover	Area (acres)	Soil Group	CN	Ia (in)	Q Runoff (in)	Runoff Volume (cf)
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	**0.318**	**A**	**39**	**3.128**	**0.00**	**2**
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	**0.107**	**B**	**61**	**1.279**	**0.48**	**185**
Impervious Areas: Commercial	**0.366**	**N/A**	**98**	**0.041**	**3.05**	**4,048**

Non-Structural BMP Water Quality Credits:

☑ Pervious Undetained Area Credit

TSS	TP	TN
0.14	**0.00**	**0.00**

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☐ Other (attach calculations)

Structural BMP Water Quality Credits:

☑ *Use default BMP Outflows and Median BMP Outflow Concentrations*

DP No.	BMP No.	BMP Name	MRC?	BMP DA (acres)	Vol. Routed to BMP (CF)	Inf. & ET Credits (CF)	Capture & Buffer Credits (CF)	Outflow (CF)	Outflow Conc. (mg/L)			Pollutant Loads (lbs)		
									TSS	TP	TN	TSS	TP	TN
	1													

	TSS	TP	TN
POLLUTANT LOADS FROM STRUCTURAL BMP (TREATED) OUTFLOWS (LBS):	0.00	0.00	0.00
POLLUTANT LOADS FROM UNTREATED STORMWATER (LBS):	16.51	0.06	0.53
NON-STRUCTURAL BMP WATER QUALITY CREDITS (LBS):	0.14	0.00	0.00
NET POLLUTANT LOADS FROM SITE, POST-CONSTRUCTION (LBS):	16.37	0.06	0.52
POLLUTANT LOADS FROM SITE, PRE-CONSTRUCTION (LBS):	24.36	0.09	0.80

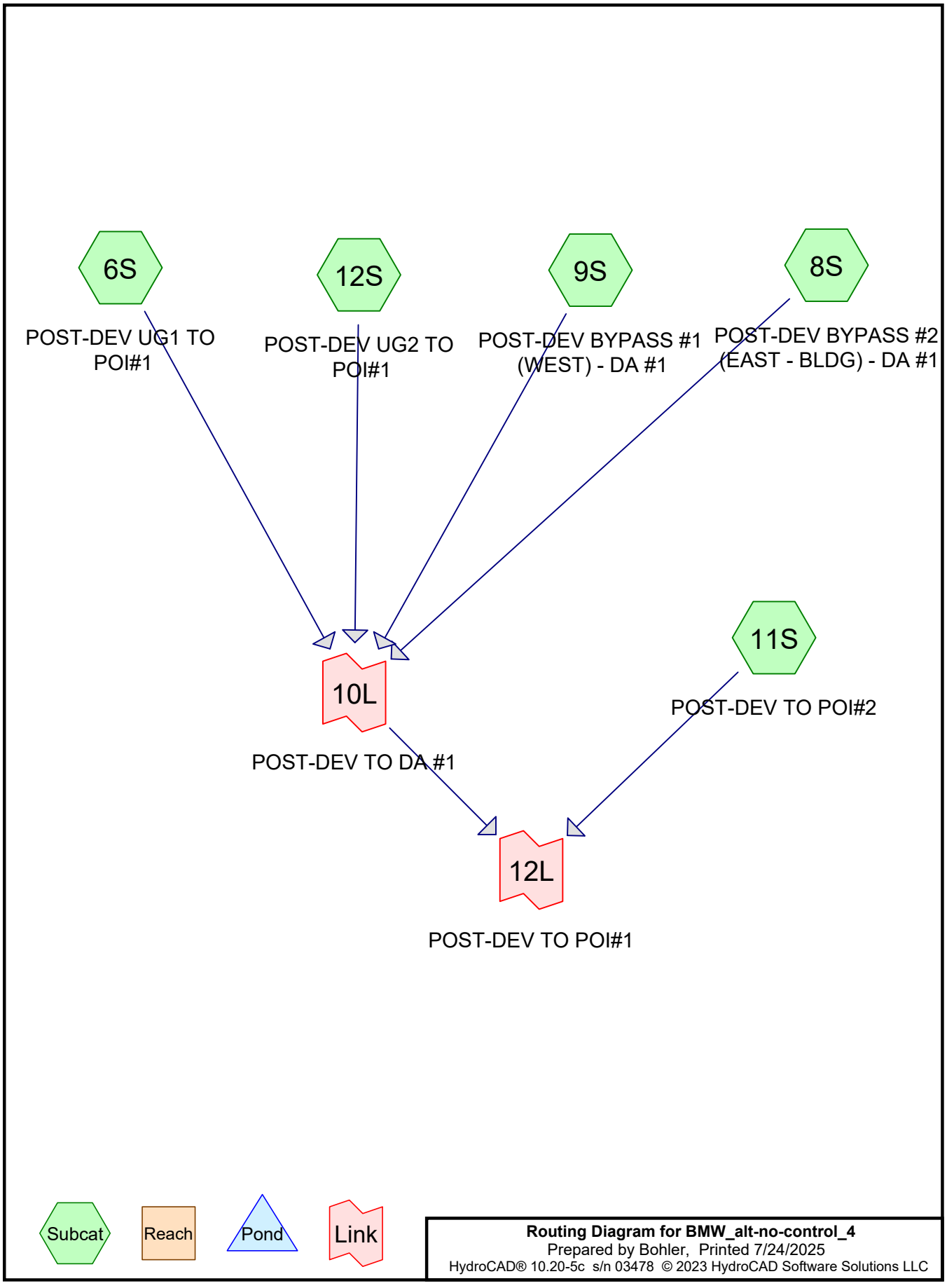
WATER QUALITY REQUIREMENT SATISFIED

CERTIFICATION

I certify under penalty of law and subject to the penalties of 18 Pa.C.S. § 4904 (relating to unsworn falsification to authorities) that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I further certify that the structure, function, and calculations contained in this spreadsheet have not been modified in comparison to the spreadsheet DEP has posted to its website or, if modifications were made, an explanation of the modifications made is attached to this spreadsheet.

Robert Swahl	7/24/2025
Spreadsheet User Name	Date

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6S
POST-DEV UG1 TO POI#1
12S
POST-DEV UG2 TO POI#1
9S
POST-DEV BYPASS #1 (WEST) - DA #1
8S
POST-DEV BYPASS #2 (EAST - BLDG) - DA #1
11S
POST-DEV TO POI#2
10L
POST-DEV TO DA #1
12L
POST-DEV TO POI#1
Subcat
Reach
Pond
Link
Routing Diagram for BMW_alt-no-control_4
Prepared by Bohler, Printed 7/24/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

Runoff = 8.968 cfs @ 11.96 hrs, Volume= 19,792 cf, Depth= 2.83"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928	96	Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

Runoff = 2.835 cfs @ 11.96 hrs, Volume= 6,548 cf, Depth= 3.05"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.000	39	Lawn A
*	0.592	98	Impervious
	0.592	98	Weighted Average
	0.592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

Runoff = 0.308 cfs @ 12.16 hrs, Volume= 1,579 cf, Depth= 0.40"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.389	39	Lawn A
*	0.285	30	Wooded A
*	0.402	98	Impervious
	1.076	59	Weighted Average
	0.674		62.64% Pervious Area
	0.402		37.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Summary for Subcatchment 11S: POST-DEV TO POI#2

Runoff = 1.172 cfs @ 11.97 hrs, Volume= 2,369 cf, Depth= 0.83"
Routed to Link 12L : POST-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.318	39	Lawn A
*	0.107	61	Lawn B
*	0.366	98	Impervious
	0.791	69	Weighted Average
	0.425		53.73% Pervious Area
	0.366		46.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

Runoff = 1.718 cfs @ 11.96 hrs, Volume= 3,409 cf, Depth= 1.90"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 2-yr Rainfall=3.28"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493	86	Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 178,117 sf, 79.75% Impervious, Inflow Depth = 2.11" for 2-yr event
Inflow = 13.552 cfs @ 11.96 hrs, Volume= 31,328 cf
Primary = 13.552 cfs @ 11.96 hrs, Volume= 31,328 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : POST-DEV TO POI#1

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 212,573 sf, 74.32% Impervious, Inflow Depth = 1.90" for 2-yr event
Inflow = 14.701 cfs @ 11.96 hrs, Volume= 33,697 cf
Primary = 14.701 cfs @ 11.96 hrs, Volume= 33,697 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

Runoff = 13.471 cfs @ 11.96 hrs, Volume= 30,539 cf, Depth= 4.36"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928	96	Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

Runoff = 4.199 cfs @ 11.96 hrs, Volume= 9,871 cf, Depth= 4.59"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.000	39	Lawn A
*	0.592	98	Impervious
	0.592	98	Weighted Average
	0.592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

Runoff = 1.247 cfs @ 12.13 hrs, Volume= 4,449 cf, Depth= 1.14"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.389	39	Lawn A
*	0.285	30	Wooded A
*	0.402	98	Impervious
	1.076	59	Weighted Average
	0.674		62.64% Pervious Area
	0.402		37.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Summary for Subcatchment 11S: POST-DEV TO POI#2

Runoff = 2.701 cfs @ 11.97 hrs, Volume= 5,268 cf, Depth= 1.83"
Routed to Link 12L : POST-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.318	39	Lawn A
*	0.107	61	Lawn B
*	0.366	98	Impervious
	0.791	69	Weighted Average
	0.425		53.73% Pervious Area
	0.366		46.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

Runoff = 2.904 cfs @ 11.96 hrs, Volume= 5,921 cf, Depth= 3.31"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493	86	Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 178,117 sf, 79.75% Impervious, Inflow Depth = 3.42" for 10-yr event
Inflow = 21.007 cfs @ 11.96 hrs, Volume= 50,781 cf
Primary = 21.007 cfs @ 11.96 hrs, Volume= 50,781 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : POST-DEV TO POI#1

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 212,573 sf, 74.32% Impervious, Inflow Depth = 3.16" for 10-yr event
Inflow = 23.691 cfs @ 11.96 hrs, Volume= 56,049 cf
Primary = 23.691 cfs @ 11.96 hrs, Volume= 56,049 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

Runoff = 18.946 cfs @ 11.96 hrs, Volume= 43,774 cf, Depth= 6.25"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928	96	Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

Runoff = 5.866 cfs @ 11.96 hrs, Volume= 13,949 cf, Depth= 6.49"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.000	39	Lawn A
*	0.592	98	Impervious
	0.592	98	Weighted Average
	0.592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

Runoff = 2.789 cfs @ 12.12 hrs, Volume= 9,064 cf, Depth= 2.32"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.389	39	Lawn A
*	0.285	30	Wooded A
*	0.402	98	Impervious
	1.076	59	Weighted Average
	0.674		62.64% Pervious Area
	0.402		37.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Summary for Subcatchment 11S: POST-DEV TO POI#2

Runoff = 4.834 cfs @ 11.96 hrs, Volume= 9,458 cf, Depth= 3.29"
Routed to Link 12L : POST-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.318	39	Lawn A
*	0.107	61	Lawn B
*	0.366	98	Impervious
	0.791	69	Weighted Average
	0.425		53.73% Pervious Area
	0.366		46.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

Runoff = 4.363 cfs @ 11.96 hrs, Volume= 9,138 cf, Depth= 5.11"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 50-yr Rainfall=6.73"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493	86	Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 178,117 sf, 79.75% Impervious, Inflow Depth = 5.12" for 50-yr event
Inflow = 30.456 cfs @ 11.96 hrs, Volume= 75,925 cf
Primary = 30.456 cfs @ 11.96 hrs, Volume= 75,925 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : POST-DEV TO POI#1

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 212,573 sf, 74.32% Impervious, Inflow Depth = 4.82" for 50-yr event
Inflow = 35.281 cfs @ 11.96 hrs, Volume= 85,382 cf
Primary = 35.281 cfs @ 11.96 hrs, Volume= 85,382 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

Runoff = 21.616 cfs @ 11.96 hrs, Volume= 50,262 cf, Depth= 7.18"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.057	39	Lawn A
*	1.871	98	Impervious
	1.928	96	Weighted Average
	0.057		2.96% Pervious Area
	1.871		97.04% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

Runoff = 6.681 cfs @ 11.96 hrs, Volume= 15,946 cf, Depth= 7.42"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.000	39	Lawn A
*	0.592	98	Impervious
	0.592	98	Weighted Average
	0.592		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

Runoff = 3.642 cfs @ 12.11 hrs, Volume= 11,616 cf, Depth= 2.97"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.389	39	Lawn A
*	0.285	30	Wooded A
*	0.402	98	Impervious
	1.076	59	Weighted Average
	0.674		62.64% Pervious Area
	0.402		37.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5					**Direct Entry,**

Summary for Subcatchment 11S: POST-DEV TO POI#2

Runoff = 5.932 cfs @ 11.96 hrs, Volume= 11,664 cf, Depth= 4.06"
Routed to Link 12L : POST-DEV TO POI#1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.318	39	Lawn A
*	0.107	61	Lawn B
*	0.366	98	Impervious
	0.791	69	Weighted Average
	0.425		53.73% Pervious Area
	0.366		46.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Subcatchment 12S: POST-DEV UG2 TO POI#1

Runoff = 5.073 cfs @ 11.96 hrs, Volume= 10,741 cf, Depth= 6.00"
Routed to Link 10L : POST-DEV TO DA #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.097	39	Lawn A
*	0.000	30	Wooded A
*	0.396	98	Impervious
	0.493	86	Weighted Average
	0.097		19.68% Pervious Area
	0.396		80.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 178,117 sf, 79.75% Impervious, Inflow Depth = 5.97" for 100-yr event
Inflow = 35.135 cfs @ 11.96 hrs, Volume= 88,566 cf
Primary = 35.135 cfs @ 11.96 hrs, Volume= 88,566 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 12L : POST-DEV TO POI#1

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 212,573 sf, 74.32% Impervious, Inflow Depth = 5.66" for 100-yr event
Inflow = 41.060 cfs @ 11.96 hrs, Volume= 100,230 cf
Primary = 41.060 cfs @ 11.96 hrs, Volume= 100,230 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

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Events for Subcatchment 6S: POST-DEV UG1 TO POI#1

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-yr	3.28	8.968	19,792	2.83
10-yr	4.83	13.471	30,539	4.36
50-yr	6.73	18.946	43,774	6.25
100-yr	**7.66**	**21.616**	**50,262**	**7.18**

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Events for Subcatchment 8S: POST-DEV BYPASS #2 (EAST - BLDG) - DA #1

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-yr	3.28	2.835	6,548	3.05
10-yr	4.83	4.199	9,871	4.59
50-yr	6.73	5.866	13,949	6.49
100-yr	**7.66**	**6.681**	**15,946**	**7.42**

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Events for Subcatchment 9S: POST-DEV BYPASS #1 (WEST) - DA #1

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-yr	3.28	0.308	1,579	0.40
10-yr	4.83	1.247	4,449	1.14
50-yr	6.73	2.789	9,064	2.32
100-yr	**7.66**	**3.642**	**11,616**	**2.97**

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Events for Subcatchment 11S: POST-DEV TO POI#2

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-yr	3.28	1.172	2,369	0.83
10-yr	4.83	2.701	5,268	1.83
50-yr	6.73	4.834	9,458	3.29
100-yr	**7.66**	**5.932**	**11,664**	**4.06**

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Events for Subcatchment 12S: POST-DEV UG2 TO POI#1

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-yr	3.28	1.718	3,409	1.90
10-yr	4.83	2.904	5,921	3.31
50-yr	6.73	4.363	9,138	5.11
100-yr	**7.66**	**5.073**	**10,741**	**6.00**

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Events for Link 10L: POST-DEV TO DA #1

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)
2-yr	13.552	13.552	**0.00**
10-yr	21.007	21.007	0.00
50-yr	30.456	30.456	0.00
100-yr	**35.135**	**35.135**	0.00

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Prepared by Bohler
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Events for Link 12L: POST-DEV TO POI#1

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)
2-yr	14.701	14.701	**0.00**
10-yr	23.691	23.691	0.00
50-yr	35.281	35.281	0.00
100-yr	**41.060**	**41.060**	0.00

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF CLEAN WATER

MANAGED RELEASE CONCEPT (MRC) DESIGN SUMMARY

Complete One Design Summary Sheet for Each BMP Designed for MRC

GENERAL INFORMATION

Applicant Name:	**MileOne Fort Washington, LLC**	Project Name:	**BMW Automotive Dealership Expansion**
Applicant Address:	**3301 Briggs Chaney Road**	Municipality:	**Whitemarsh Township**
City, State, Zip:	Silver Spring, MD 20904	County:	**Montgomery County**

Permit Type: ☒ NPDES PAG-02 ☐ NPDES IP ☐ ESCGP ☐ ESP

	Pre-Development	Post-Development	Change
Impervious Area (acres):	3.715	3.627	0.088

MRC BMP INFORMATION

MRC BMP Type: **Dry Extended Detention Basin UG1** Stormwater BMP Manual Section: **6.6.3**

Will the BMP Include Vegetation? ☐ Yes ☒ No

If Yes, Identify Proposed Vegetation:

For Non-Vegetated BMPs Will There Be Pre- or Post-Treatment? ☒ Yes (Pre-) ☐ Yes (Post-) ☐ No

If Yes, Identify Proposed Pre- or Post-Treatment: **Water Quality Filters / Hydrodynamic Devices**

Name of Surface Water to Receive MRC BMP Discharges: **Sandy Run**

Designated Use of Surface Water: **TSF, MF** Existing Use of Surface Water (if different):

Is the Surface Water Impaired? ☒ Yes ☐ No

If Yes, Identify Cause(s): **Municipal Point Source Discharges – Nutrients, Biochemical Oxygen Demand (BOD) ; Urban Runoff/Storm Sewers - Nutrients**

Will the BMP have an impermeable liner? ☒ Yes ☐ No

If Yes, explain why a liner is proposed: **Proximity to Seasonal High Water Table**

BMP Media Description: **Coarse Aggregate with 40% Voids**

Are Any Deviations from MRC Design Standards Proposed? ☐ Yes ☒ No

If Yes, Identify Deviations:

MRC BMP DESIGN VALUES AND STANDARDS

Parameter	Design Value	Design Standard
Actual Contributing Impervious Area to BMP (acres)	**1.87**	
Equivalent Contributing Impervious Area to BMP (acres)	**1.84**	
Total Drainage Area to BMP (acres)	**1.87**	
MRC BMP Release Rate (cfs)	**0.02**	*No greater than 0.01 cfs / acre of equivalent contributing impervious*
Underdrain Outflow Rate During 1.2-Inch/2-Hour Storm (cfs)	**0.02**	*<= MRC BMP Release Rate (cfs)*
Maximum Storm Event Routed to MRC BMP	**100-Yr**	

MRC BMP Design Summary
Revised, August 25, 2020

Parameter	Design Value	Design Standard
BMP Footprint Area (ft^2)	**13,041**	
Bottom BMP Elevation (Native Soils) (ft)	**156.53**	
2-Yr/24-Hr Storm Ponding Depth (ft)	**1.30**	*1 ft (recommended) (2 ft max)*
Maximum Ponding Depth (ft)	**2.30**	*4 ft (max)*
Overflow Bypass Elevation (ft)	**158.39**	
Media Depth (ft)	**4.21**	*2 ft (min) – 4 ft (max)*
Media Void Space (%)	**40**	
Internal Water Storage (IWS) Depth (ft)	**1**	*1 ft recommended*
Top of IWS Elevation (ft)	**157.53**	
Underdrain Pipe Diameter (in)	**4**	
Underdrain Orifice Diameter (in)	**1.0**	
Underdrain Outlet Elevation (ft)	**157.53**	
IWS Available for Routing (%)	**0**	*50% max*
Separation Distance (Groundwater) (ft)	**-2.47**	*1 ft (min) (2 ft recommended)*
Infiltration Rate (in/hr)	**0**	
Volume of Overflow During 1.2-Inch/2-Hour Storm (cf)	**0**	*0 (No overflow allowed)*
1-Yr/24-Hr **Pre**-Development Peak Rate (cfs)	**6.39***	
2-Yr/24-Hr **Post**-Development Peak Rate (cfs)	**5.12***	*1-Yr/24-Hr Pre-Development Peak Rate (or per approved Act 167 Plan)*
10-Yr/24-Hr **Post**-Development Peak Rate (cfs)	**10.53***	*10-Yr/24-Hr Pre-Development Peak Rate*
50-Yr/24-Hr **Post**-Development Peak Rate (cfs)	**16.52***	*50-Yr/24-Hr Pre-Development Peak Rate*
100-Yr/24-Hr **Post**-Development Peak Rate (cfs)	**19.43***	*100-Yr/24-Hr Pre-Development Peak Rate*
Total 2-Yr/24-Hr Runoff Volume Managed by BMP (cf)	**20,696**	
Ponding Time @ 2-Yr/24-Hr Storm (hrs)	**117.50**	*72 hrs (surface), 7 days (underground)*
Ponding Time @ 10-Yr/24-Hr Storm (hrs)	**118.00**	*72 hrs (surface), 7 days (underground)*
Ponding Time @ 50-Yr/24-Hr Storm (hrs)	**118.00**	*72 hrs (surface), 7 days (underground)*
Ponding Time @ 100-Yr/24-Hr Storm (hrs)	**118.00**	*72 hrs (surface), 7 days (underground)*

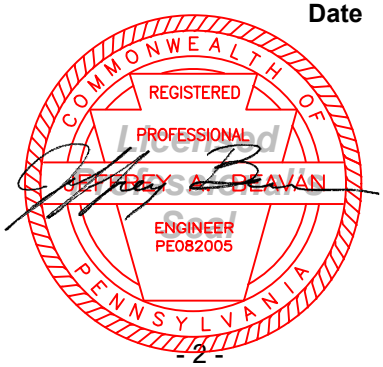
* PER MRC GUIDANCE DOCUMENTS, A CONSISTENT METHOD IS REQUIRED TO COMPARE PRE- AND POST-DEVELOPMENT RATES. RATES SHOWN ARE THE PEAK RATES AT DP-001 FOR BOTH PRE- AND POST-DEVELOPMENT CONDITIONS. ACTUAL BMP OUTFLOW RATES ARE LOWER.

Jeffrey A. Beavan
Licensed P.E. Name

Licensed P.E. Signature

PE082055
License No.

01/03/2025
Date



MRC Contributing Impervious Area Calculations

	Total Inflow Volume (1.2-inch/2-hour) (cf)	Divide by 0.0833 ft. (cubic inches) (sf.)	Divide by 43,560 sf per acre Equivalent Impervious Area (acre)	Maximum Release Rate Divide by 100 (cfs)
MRC1	6694	80360.14406	1.84	0.02

Outflow Calculations from Perforated Pipe

Project Name: BMW Automotive Dealership Expansion

Date Prepared: 1/6/2025

Prepared By: RMS/JAB

Prepared For: MileOne Fort Washington

UG1

183 LF * 0.1327 = 24.28 cfs capacity

Height of Water[1] (top of pipe to water surface)	15.36	in
Orifice Coefficient, Cd	0.56	

Based on 2-year WSE

Pipe Diam (in)	**Perforation Type**	**Inlet Area/Foot** (ACTUAL Min., in^2/ft)	**Flow/Perf** ft^3/sec	**Flow/Perf** gal/min	**Flow/FT** ft^3/sec	**Flow/FT** gal/min	
4	slotted	3.5	0.0024	1.09	0.1327	59.55	A-profile Pipe
6	slotted	3.1	0.0026	1.15	0.1198	53.79	
8	slotted	3.4	0.0036	1.60	0.1338	60.05	
10	slotted	2.5	0.0035	1.59	0.1014	45.51	
12	drilled	2.5	0.0029	1.32	0.1060	47.55	
15	drilled	2.0	0.0030	1.37	0.0846	37.99	
18	drilled	2.0	0.0031	1.41	0.0877	39.37	
24	drilled	2.2	0.0033	1.50	0.1015	45.56	
30	drilled	3.5	0.0037	1.68	0.1746	78.37	
36	drilled	2.9	0.0042	1.88	0.1530	68.69	
42	drilled	2.6	0.0038	1.72	0.1421	63.76	
48	drilled	2.9	0.0045	2.04	0.1662	74.61	
60	drilled	2.6	0.0049	2.19	0.1562	70.09	

Pipe Diam (in)	**Perforation Type**	**Inlet Area/Foot** (ACTUAL Min., in^2/ft)	**Flow/Perf** ft^3/sec	**Flow/Perf** gal/min	**Flow/FT** ft^3/sec	**Flow/FT** gal/min	
4	slotted	1.6	0.0008	0.36	0.0587	26.34	H-profile Pipe
6	slotted	1.3	0.0008	0.37	0.0517	23.22	
8	slotted	2.2	0.0009	0.38	0.0852	38.25	
10	slotted	1.6	0.0009	0.39	0.0666	29.89	
12	drilled	2.5	0.0020	0.92	0.1022	45.87	
15	drilled	2.9	0.0033	1.49	0.1228	55.14	
18	drilled	2.8	0.0034	1.54	0.1226	55.01	
24	drilled	3.4	0.0052	2.34	0.1586	71.19	
30	drilled	2.6	0.0055	2.46	0.1277	57.34	
36*	drilled	2.2	0.0057	2.58	0.1157	51.91	
42*	drilled	2.2	0.0060	2.69	0.1206	54.13	
48*	drilled	2.2	0.0062	2.80	0.1253	56.22	
60*	drilled	2.0	0.0067	3.01	0.1216	54.59	

** Based on H-profile pipe*

Notes

1 - Calculations assume the pipe is flowing full. User input is measured from top of pipe to water surface. The height of water, H, is then calculated to be 1/2*Pipe ID plus the distance between top of pipe and water surface (user-entered value). Enter 0 if the water surface is not above the top of pipe. Calculations represent free-flow conditions and do not account for any backfill material.

2 - Based on Class 2 perforation pattern

3 - Refer to Internal Product Note 1.01 - *Perforation Patterns* for perforation data

$$Q_p = C_d A \sqrt{2gH}$$

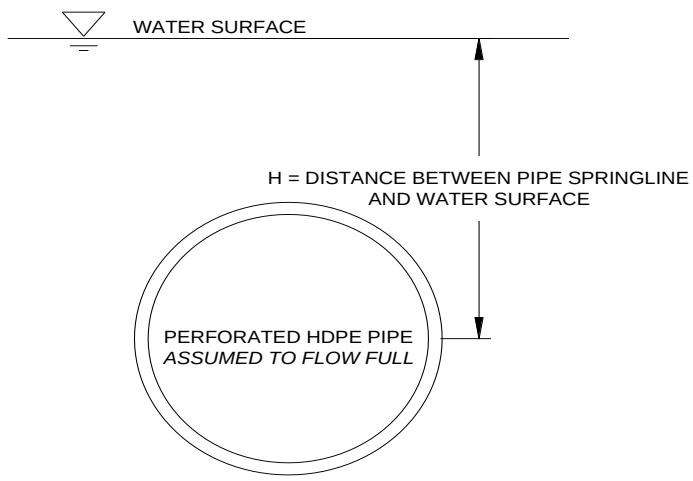
Qp = Free outfall flow rate (ft^3/sec)

C_d = Coefficient of discharge, 0.56 recommended

A = Cross-sectional area of perforations per foot (ft^2/ft)

g = Gravimetric constant, 32.2 ft/sec^2

H = Height of water above pipe springline, head (ft)



Technical Note

TN 1.01 Dual Wall HDPE Perforation Patterns

Overview

Perforated pipe plays an integral role in many applications of HDPE pipe. Generally, perforated pipe is used to accelerate the removal of subsurface water in soils or to allow storm water to percolate into the soil. Currently, two classifications of perforations are specified in the AASHTO material specifications for HDPE pipe: Class I, and Class II. The Class II perforation pattern comes standard when perforated pipe is ordered. Class One perforated pipe has limited availability. Please check with a local representative to determine availability. Both classes are explained in more detail in the AASHTO materials specifications (M294 and M252). AASHTO M252 covers pipe diameters 3- through 10-inch (75 - 250 mm) while M294 covers 12-inch through 60-inch (300 - 1500 mm).

Standard Perforation Patterns

AASHTO Class II Perforation

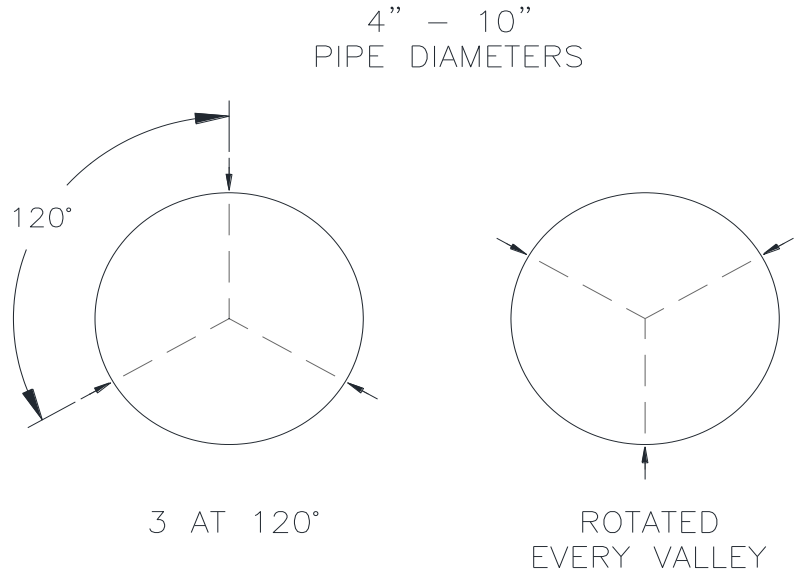
The following terminology for perforations is derived from the applicable AASHTO specification. Differences between the specifications are covered in the table below. Class II perforations shall be located in the outside valleys of the corrugations, be circular and/or slotted and evenly spaced around the circumference and length of the pipe. The perforations shall be located in the outside valleys of the corrugations. The water inlet area shall be no less than 0.945 in^2/ft (20 cm^2/m) for pipe diameters 4- through 10-inch (100 - 250mm), 1.42 in^2/ft (30 cm^2/m) for pipe diameters 12- through 18-inch (300 - 450 mm) and 1.89 in^2/ft (40 cm^2/m) for pipe diameters larger than and equal to 24 inches (600 mm). Table 1 below represents ADS standard perforation patterns for AASHTO Class II.

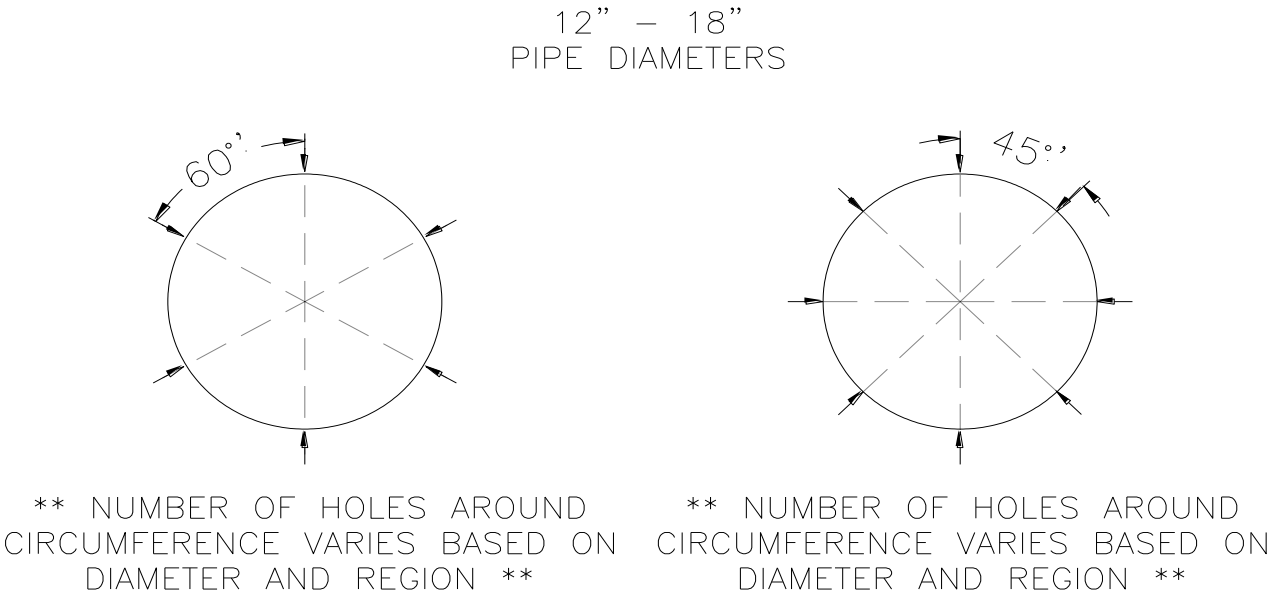
Nominal I.D.	Perforation Type	Maximum Slot Length or Diameter	Maximum Slot Width	Minimum Inlet Area
4” (100 mm)	Slot	0.875” (22 mm)	0.125” (3 mm)	1.0 in^2/ft (21 cm^2/m)
6” (150 mm)	Slot	0.875” (22 mm)	0.125” (3 mm)	1.0 in^2/ft (21 cm^2/m)
8” (200 mm)	Slot	1.18” (30 mm)	0.125” (3 mm)	1.0 in^2/ft (21 cm^2/m)
10” (250 mm)	Slot	1.18” (30 mm)	0.125” (3 mm)	1.0 in^2/ft (21 cm^2/m)
12” (300 mm)	Circular	0.313” (8 mm)	-	1.5 in^2/ft (32 cm^2/m)
15” (375 mm)	Circular	0.313” (8 mm)	-	1.5 in^2/ft (32 cm^2/m)
18” (450 mm)	Circular	0.313” (8 mm)	-	1.5 in^2/ft (32 cm^2/m)
24” (600 mm)	Circular	0.313” (8 mm)	-	2.0 in^2/ft (42 cm^2/m)
30” (750 mm)	Circular	0.375” (9.5 mm)	-	2.0 in^2/ft (42 cm^2/m)
36” (900 mm)	Circular	0.375” (9.5 mm)	-	2.0 in^2/ft (42 cm^2/m)
42” (1050 mm)	Circular	0.375” (9.5 mm)	-	2.0 in^2/ft (42 cm^2/m)
48” (1200 mm)	Circular	0.375” (9.5 mm)	-	2.0 in^2/ft (42 cm^2/m)
54” (1350 mm)	Circular	0.375” (9.5 mm)	-	2.0 in^2/ft (42 cm^2/m)
60” (1500 mm)	Circular	0.375” (9.5 mm)	-	2.0 in^2/ft (42 cm^2/m)

Figure 1

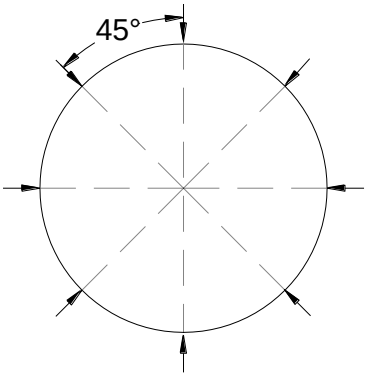
AASHTO Class II Perforation Patterns

Note: Actual pattern may vary by region, however all patterns meet the AASHTO and ASTM minimum requirements for the open inlet area.

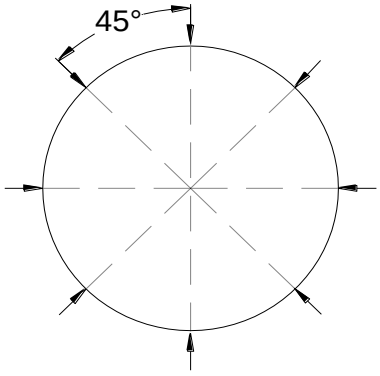


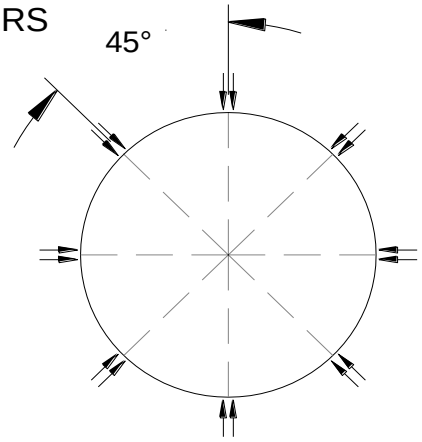


24"
PIPE DIAMETERS



30"
PIPE DIAMETERS

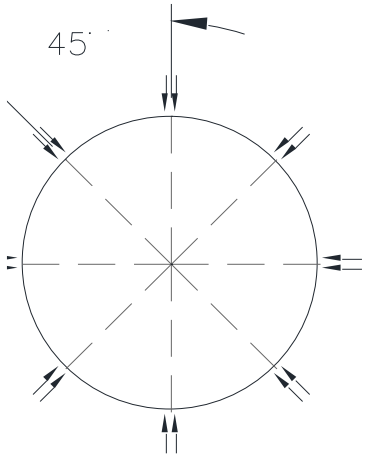




2 AT EVERY 45°

** NUMBER OF HOLES AROUND CIRCUMFERENCE VARIES BASED ON DIAMETER AND REGION**

36" – 60"
PIPE DIAMETERS



2 AT EVERY 45°

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UNDERGROUND BASIN BUOYANCY CALCULATION

PROJECT: ***BMW Fort Washington***
500 Pennsylvania Ave
Whitemarsh Township, Montgomery County

DATE: ***3/20/2024***
BY: ***RMS***
CHECKED BY: ***JAB***
REVISION: ***5***

Underground Basin 1 / BMP #002 Buoyancy Calculation

Buoyant Force	Depth (Ft)	Material Density (lb/ft^3)	lb/SF
System Depth Below SHWT*	2.47	62.4	**154.128**
		Total Buoyant Force to Overcome	**154.128**

** Water depth from SHWT (159.00) to bottom of MRC Basin UG1 liner (156.53)*

Downward Force	Depth (Ft)	Material Density (lb/ft^3)	lb/SF
Clean Stone (Below Chambers Only)**	0.5	90	45.00
Clean Stone (Above Chambers)	0.5	90	45.00
Asphalt Pavement	0.58	150	87.00
Subbase Stone	0.5	145	72.50
Clean Stone	0	90	0.00
Dirt Subgrade (@ Min. Cover)	0.68	80	54.40
		Total Downward Force of Basin & Material Above	**303.90**

***Assumes no water in IWS or in basin*

BUOYANT? **FALSE**

FOS **2**

Storm Drainage Calculations

Runoff Calculations C Worksheet

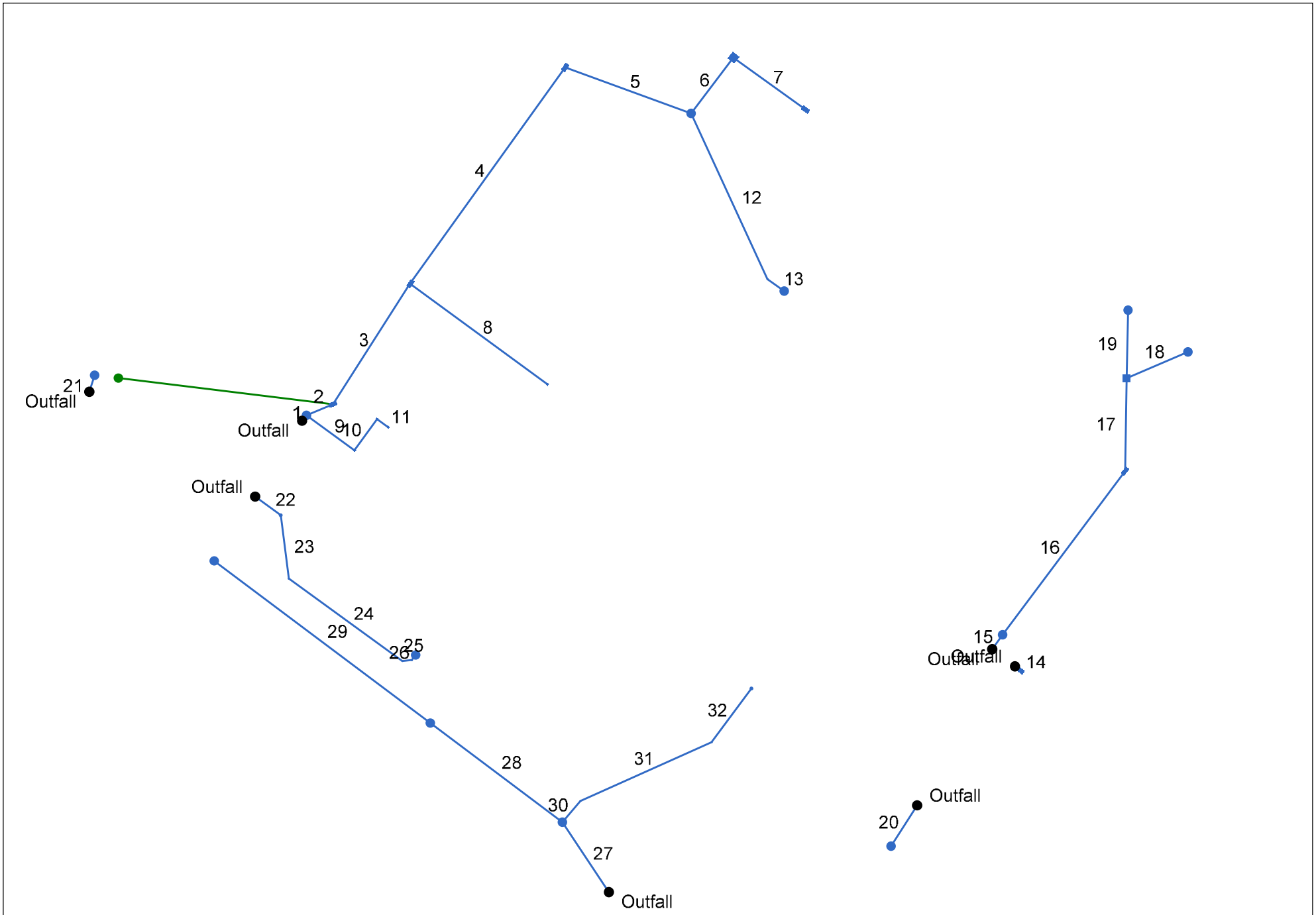
Project: **BMW Fort Washington**

Description: **510 Pennsylvania Ave, Whitemarsh Township, Montgomery County**

Drainage Area	Land Use Description	C	Area (Acres)	Total Area (Acres)	Weighted C
INL-110	Impervious	0.95	0.545	0.55	0.94
	Pervious	0.35	0.005		
INL-121	Impervious	0.95	0.115	0.14	0.86
	Pervious	0.35	0.021		
INL-122	Impervious	0.95	0.171	0.17	0.95
	Pervious	0.35	0.001		
INL-123	Impervious	0.95	0.076	0.08	0.90
	Pervious	0.35	0.007		
INL-126	Impervious	0.95	0.074	0.09	0.87
	Pervious	0.35	0.011		
INL-127	Impervious	0.95	0.116	0.13	0.89
	Pervious	0.35	0.012		

INL-211	Impervious	0.95	0.060	**0.10**	**0.71**
	Pervious	0.35	0.040		
INL-212	Impervious	0.95	0.038	**0.05**	**0.82**
	Pervious	0.35	0.011		
INL-214	Impervious	0.95	0.096	**0.10**	**0.92**
	Pervious	0.35	0.005		
INL-213.1	Impervious	0.95	0.035	**0.04**	**0.95**
INL-221	Impervious	0.95	0.058	**0.09**	**0.76**
	Pervious	0.35	0.03		
INL-231	Impervious	0.95	0.130	**0.13**	**0.95**
RD1	Impervious	0.95	0.285	**0.29**	**0.95**
RD2	Impervious	0.95	0.028	**0.03**	**0.95**
RD3	Impervious	0.95	0.439	**0.44**	**0.95**
RD4	Impervious	0.95	0.029	**0.03**	**0.95**
RD5	Impervious	0.95	0.592	**0.59**	**0.95**

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: PAB220113.01-Storm_Rev3a_2-yr.stm	Number of lines: 32	Date: 7/24/2025

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
1	MH 120	Manhole	163.93	Cir	4.00	4.00	24	Cir	158.03	24 12	Cir Cir	158.03 158.03
2	INL 121	Combination	164.19	Rect	4.00	2.00	24	Cir	158.13	24	Cir	158.13
3	INL 122	Combination	164.99	Rect	4.00	2.00	24	Cir	158.51	18 12	Cir Cir	158.51 158.66
4	INL 123	Combination	165.11	Rect	4.00	2.00	18	Cir	159.22	18	Cir	159.37
5	MH 125	Manhole	164.85	Cir	4.00	4.00	18	Cir	159.58	14 6	Cir Cir	159.58 162.29
6	INL 126	Combination	163.79	Rect	4.00	4.00	14	Cir	159.77	12	Cir	159.77
7	INL 127	Combination	163.64	Rect	4.00	2.00	12	Cir	160.00			
8	RD1	Generic	166.88	Rect	1.00	1.00	12	Cir	159.11			
9	RD2(2)	Manhole	164.63	Rect	1.00	1.00	12	Cir	158.20	12	Cir	158.22
10	RD2(1)	Manhole	165.23	Rect	1.00	1.00	12	Cir	158.32	12	Cir	158.32
11	RD2	Combination	165.30	Rect	1.00	1.00	12	Cir	158.36			
12		None	0.00	n/a	n/a	n/a	6	Cir	164.71	6	Cir	164.71
13	RD4	Generic	0.00	Cir	4.00	4.00	6	Cir	164.87			
14	INL-221	Combination	164.29	Rect	4.00	2.00	15	Cir	160.15			
15	INL 211	Combination	164.75	Cir	4.00	2.00	18	Cir	158.68	15	Cir	158.93
16	INL-212	Combination	164.93	Rect	4.00	2.00	15	Cir	159.47	15	Cir	159.47
17	MH-213	Manhole	163.42	Rect	4.00	4.00	15	Cir	159.72	15 12	Cir Cir	159.90 159.72
18	INL213.1	Combination	163.46	Cir	4.00	2.00	15	Cir	160.09			
19	INL-214	Combination	0.00	Cir	4.00	2.00	12	Cir	159.90			
20	INL 231	Combination	163.15	Cir	4.00	4.00	15	Cir	160.00			
21	INL 110	Combination	162.50	Cir	4.00	2.00	18	Cir	159.25			

Project File: PAB220113.01-Storm_Rev3a_2-yr.stm | Number of Structures: 32 | Run Date: 7/24/2025

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
22	RD3(1)	Manhole	164.48	Cir	1.00	1.00	8	Cir	158.45	8	Cir	158.45
23		None	0.00	n/a	n/a	n/a	8	Cir	158.62	8	Cir	158.62
24		None	0.00	n/a	n/a	n/a	8	Cir	158.99	8	Cir	158.99
25		None	0.00	n/a	n/a	n/a	8	Cir	159.01	8	Cir	159.01
26	RD3	Generic	0.00	Cir	4.00	4.00	8	Cir	159.06			
27	MH 101	Manhole	160.87	Cir	4.00	4.00	18	Cir	156.38	18 8	Cir Cir	156.38 158.75
28	MH 102	Manhole	162.83	Cir	4.00	4.00	18	Cir	156.82	18	Cir	156.82
29	OCS-103	Manhole	163.82	Cir	4.00	4.00	18	Cir	157.53			
30		None	0.00	n/a	n/a	n/a	8	Cir	158.83	8	Cir	158.83
31		None	0.00	n/a	n/a	n/a	8	Cir	162.17	8	Cir	162.17
32	RD5	Generic	168.64	Cir	1.00	1.00	8	Cir	162.87			

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	Pipe - (85)	3.09	24	Cir	3.640	158.01	158.03	0.550	158.64	158.64	0.22	158.64	End	Manhole
2	Pipe - (63)	3.01	24	Cir	15.229	158.03	158.13	0.657	158.64	158.74	n/a	158.74 j	1	Combination
3	Pipe - (64)	2.70	24	Cir	75.492	158.13	158.51	0.503	158.74	159.08	n/a	159.08 j	2	Combination
4	Pipe - (65)	1.23	18	Cir	140.496	158.51	159.22	0.505	159.08	159.63	n/a	159.63 j	3	Combination
5	Pipe - (67)	1.01	18	Cir	70.504	159.37	159.58	0.298	159.78	159.99	0.10	160.09	4	Manhole
6	Pipe - (68)	0.95	14	Cir	36.961	159.58	159.77	0.514	160.09	160.16	0.21	160.16	5	Combination
7	Pipe - (69)	0.57	12	Cir	46.842	159.77	160.00	0.491	160.16	160.31	0.11	160.31	6	Combination
8	Pipe - (77)	1.36	12	Cir	89.896	158.66	159.11	0.501	159.16	159.61	n/a	159.80 j	3	Generic
9	Pipe - (78)	0.12	12	Cir	31.389	158.03	158.20	0.542	158.64	158.34	n/a	158.34	1	Manhole
10	Pipe - (79)	0.14	12	Cir	20.349	158.22	158.32	0.491	158.37	158.47	n/a	158.52 j	9	Manhole
11	Pipe - (80)	0.14	12	Cir	7.210	158.32	158.36	0.555	158.52	158.51	0.05	158.51	10	Combination
12	Pipe - (108)	0.14	6	Cir	96.463	162.29	164.71	2.509	162.42	164.89	0.04	164.89	5	None
13	Pipe - (107)	0.14	6	Cir	10.810	164.71	164.87	1.480	164.89	165.06	0.07	165.06	12	Generic
14	Pipe - (56)	0.34	15	Cir	3.658	160.13	160.15	0.546	160.35	160.37	0.08	160.37	End	Combination
15	Pipe - (52)	0.86	18	Cir	9.379	158.63	158.68	0.533	160.35*	160.35*	0.00	160.35	End	Combination
16	Pipe - (53)	0.67	15	Cir	108.000	158.93	159.47	0.500	160.35	160.36	0.01	160.37	15	Combination
17	Pipe - (54)	0.54	15	Cir	49.000	159.47	159.72	0.510	160.37	160.01	0.09	160.01	16	Manhole
18	Pipe - (55)	0.19	15	Cir	35.041	159.90	160.09	0.542	160.06	160.26	0.06	160.26	17	Combination
19	Pipe - (54) (1)	0.45	12	Cir	36.000	159.72	159.90	0.500	160.01	160.18	0.10	160.18	17	Combination
20	Pipe - (57)	0.61	15	Cir	25.570	159.28	160.00	2.816	160.01	160.30	n/a	160.30 j	End	Combination
21	Pipe - (62)	2.54	18	Cir	9.207	158.03	159.25	13.251	159.58	159.85	n/a	159.85	End	Combination
22	Pipe - (82)	2.02	8	Cir	16.733	158.36	158.45	0.538	158.99*	159.39*	0.40	159.79	End	Manhole
23	Pipe - (119)	2.03	8	Cir	33.811	158.45	158.62	0.503	159.79*	160.60*	0.41	161.01	22	None
24	Pipe - (118)	2.05	8	Cir	73.925	158.62	158.99	0.501	161.01*	162.83*	0.38	163.21	23	None

Project File: PAB220113.01-Storm_Rev3a_2-yr.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Return period = 2 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
25	Pipe - (117)	2.06	8	Cir	4.964	158.99	159.01	0.403	163.21*	163.34*	0.42	163.76	24	None
26	Pipe - (116)	2.06	8	Cir	3.314	159.01	159.06	1.509	163.76*	163.84*	0.54	164.38	25	Generic
27	Pipe - (59)	4.57	18	Cir	44.321	156.15	156.38	0.519	157.34	157.20	0.32	157.20	End	Manhole
28	Pipe - (60)	1.85	18	Cir	87.044	156.38	156.82	0.505	157.20	157.33	n/a	157.33 j	27	Manhole
29	Pipe - (61)	1.85	18	Cir	142.460	156.82	157.53	0.498	157.33	158.04	0.19	158.04	28	Manhole
30	Pipe - (111)	2.73	8	Cir	14.582	158.75	158.83	0.549	159.42*	160.05*	0.47	160.52	27	None
31	Pipe - (110)	2.75	8	Cir	75.774	158.83	162.17	4.408	160.52*	163.87*	0.53	164.40	30	None
32	Pipe - (71)	2.76	8	Cir	35.213	162.17	162.87	1.988	164.40*	165.96*	0.97	166.93	31	Generic

Project File: PAB220113.01-Storm_Rev3a_2-yr.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Return period = 2 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	MH 120	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
2	INL 121	0.59	0.00	0.59	0.00	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.11	2.71	0.02	0.34	0.0	21
3	INL 122	0.79	0.00	0.79	0.00	Comb	4.0	0.06	0.12	0.06	2.00	Sag	2.00	0.050	0.020	0.013	0.22	7.92	0.22	7.92	0.0	Off
4	INL 123	0.35	0.00	0.35	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.11	2.57	0.11	2.57	0.0	Off
5	MH 125	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
6	INL 126	0.43	0.00	0.43	0.00	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.10	2.06	0.00	0.00	0.0	Off
7	INL 127	0.57	0.00	0.57	0.00	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.11	2.62	0.02	0.33	0.0	Off
8	RD1	1.36	0.00	1.03	0.33	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off
9	RD2(2)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
10	RD2(1)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
11	RD2	0.14	0.00	0.14	0.00	Comb	4.0	0.03	0.05	0.03	2.00	Sag	2.00	0.050	0.020	0.013	0.10	2.22	0.10	2.22	0.0	Off
12		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	5
13	RD4	0.14	0.00	0.14	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	12
14	INL-221	0.34	0.00	0.34	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.11	2.47	0.11	2.47	0.0	Off
15	INL 211	0.35	0.00	0.35	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.11	2.54	0.11	2.54	0.0	Off
16	INL-212	0.20	0.00	0.20	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.10	2.00	0.10	2.00	0.0	Off
17	MH-213	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	Off
18	INL213.1	0.19	0.00	0.19	0.00	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.07	1.48	0.00	0.00	0.0	Off
19	INL-214	0.45	0.00	0.44	0.01	Comb	4.0	1.00	0.00	1.00	2.00	0.020	2.00	0.050	0.020	0.013	0.12	3.10	0.03	0.61	0.0	Off
20	INL 231	0.61	0.00	0.61	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.14	3.90	0.14	3.90	0.0	Off
21	INL 110	2.54	0.00	2.55	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.28	10.93	0.28	10.93	0.0	Off
22	RD3(1)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
23		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	22

Project File: PAB220113.01-Storm_Rev3a_2-yr.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Inlet N-Values = 0.016; Intensity = 62.26 / (Inlet time + 12.90) ^ 0.88; Return period = 2 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

400

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
24		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	23
25		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	24
26	RD3	2.06	0.00	2.06	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off
27	MH 101	0.00	0.00	0.00	0.00	MH	0.0	2.00	0.00	2.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
28	MH 102	0.00	0.00	0.00	0.00	MH	0.0	2.00	0.00	2.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
29	OCS-103	1.85*	0.00	0.00	1.85	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
30		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	27
31		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	30
32	RD5	2.76	0.00	2.76	0.00	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off

Project File: PAB220113.01-Storm_Rev3a_2-yr.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Inlet N-Values = 0.016; Intensity = 62.26 / (Inlet time + 12.90) ^ 0.88; Return period = 2 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q	Inlet elev	Elev of HGL			Rise	HGL	ADD		Date: 7/24/2025
					C1 = 0.2 C2 = 0.5 C3 = 0.9							Total Flow		Elev of Crown			Span	Pipe	Full Flow		Frequency: 2 yrs
														Elev of Invert							Proj: PAB220113.01-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
1	End	MH	0.012	3.640	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	13.69	0.05	3.47	0.89	0.00 3.09	163.93	158.64 160.03 158.03	158.64 160.01 158.01	0.00 0.02	24 24 Cir	0.08 0.55	3.71 5.78	3.09 18.16	Pipe - (85)
2	1	Comb	0.012	15.229	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	13.48	0.21	3.50	0.86	0.00 3.01	164.19	158.74 160.13 158.13	158.64 160.03 158.03	0.09 0.10	24 24 Cir	0.61 0.66	3.72 6.32	3.01 19.86	Pipe - (63)
3	2	Comb	0.012	75.492	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	12.30	1.18	3.64	0.74	0.00 2.70	164.99	159.08 160.51 158.51	158.74 160.13 158.13	0.35 0.38	24 24 Cir	0.46 0.50	3.50 5.53	2.70 17.38	Pipe - (64)
4	3	Comb	0.012	140.496	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	9.39	2.91	4.06	0.30	0.00 1.23	165.11	159.63 160.72 159.22	159.08 160.01 158.51	0.55 0.71	18 18 Cir	0.39 0.51	2.54 4.58	1.23 8.09	Pipe - (65)
5	4	MH	0.012	70.504	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.51	1.88	4.38	0.23	0.00 1.01	164.85	159.99 161.08 159.58	159.78 160.87 159.37	0.21 0.21	18 18 Cir	0.30 0.30	2.60 3.51	1.01 6.21	Pipe - (67)
6	5	Comb	0.012	36.961	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	6.08	0.67	4.67	0.20	0.00 0.95	163.79	160.16 160.94 159.77	160.09 160.75 159.58	0.07 0.19	14 14 Cir	0.19 0.51	2.57 3.90	0.95 4.17	Pipe - (68)
7	6	Comb	0.012	46.842	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	1.08	4.92	0.12	0.00 0.57	163.64	160.31 161.00 160.00	160.16 160.77 159.77	0.15 0.23	12 12 Cir	0.33 0.49	2.36 3.44	0.57 2.70	Pipe - (69)
8	3	Genr	0.012	89.896	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.87	4.92	0.28	0.00 1.36	166.88	159.61 160.11 159.11	159.16 159.66 158.66	0.45 0.45	12 12 Cir	0.50 0.50	3.47 3.48	1.36 2.73	Pipe - (77)
9	1	MH	0.012	31.389	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.58	2.95	4.37	0.03	0.00 0.12	164.63	158.34 159.20 158.20	158.64 159.03 158.03	-0.30 0.17	12 12 Cir	-0.95 0.54	1.02 3.61	0.12 2.84	Pipe - (78)
10	9	MH	0.012	20.349	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.67	1.90	4.76	0.03	0.00 0.14	165.23	158.47 159.32 158.32	158.37 159.22 158.22	0.10 0.10	12 12 Cir	0.49 0.49	1.80 3.44	0.14 2.70	Pipe - (79)

NOTES: Intensity = 62.26 / (Inlet time + 12.90) ^ 0.88 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.01-Storm_Rev3a_2-yr.stm

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q	Inlet elev	Elev of HGL			Rise	HGL	ADD		Date: 7/24/2025
					C1 = 0.2 C2 = 0.5 C3 = 0.9							Total Flow		Elev of Crown			Span	Pipe	Full Flow		Frequency: 2 yrs
														Elev of Invert							Proj: PAB220113.01-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
11	10	Comb	0.012	7.210	0.00	0.00	0.00	5.00	0.67	4.92	0.03	0.00	165.30	158.51	158.52	-0.01	12	-0.13	1.54	0.14	Pipe - (80)
					0.00	0.00	0.00					0.14		159.36	159.32		12	0.55	3.66	2.87	
					0.00	0.00	0.00							158.36	158.32	0.04	Cir				
12	5	None	0.012	96.463	0.00	0.00	0.00	5.25	2.26	4.86	0.03	0.00	0.00	164.89	162.42	2.48	6	2.57	2.79	0.14	Pipe - (108)
					0.00	0.00	0.00					0.14		165.21	162.79		6	2.51	4.90	0.96	
					0.00	0.00	0.00							164.71	162.29	2.42	Cir				
13	12	Genr	0.012	10.810	0.00	0.00	0.00	5.00	0.25	4.92	0.03	0.00	0.00	165.06	164.89	0.16	6	1.49	2.12	0.14	Pipe - (107)
					0.00	0.00	0.00					0.14		165.37	165.21		6	1.48	3.76	0.74	
					0.00	0.00	0.00							164.87	164.71	0.16	Cir				
14	End	Comb	0.012	3.658	0.00	0.00	0.00	5.00	0.22	4.92	0.07	0.00	164.29	160.37	160.35	0.02	15	0.67	2.28	0.34	Pipe - (56)
					0.00	0.00	0.00					0.34		161.40	161.38		15	0.55	4.21	5.17	
					0.00	0.00	0.00							160.15	160.13	0.02	Cir				
15	End	Comb	0.012	9.379	0.00	0.00	0.00	13.10	0.24	3.54	0.24	0.00	164.75	160.35	160.35	0.00	18	0.01	0.49	0.86	Pipe - (52)
					0.00	0.00	0.00					0.86		160.18	160.13		18	0.53	4.70	8.31	
					0.00	0.00	0.00							158.68	158.63	0.05	Cir				
16	15	Comb	0.012	108.000	0.00	0.00	0.00	10.42	2.69	3.90	0.17	0.00	164.93	160.36	160.35	0.01	15	0.01	0.63	0.67	Pipe - (53)
					0.00	0.00	0.00					0.67		160.72	160.18		15	0.50	4.03	4.95	
					0.00	0.00	0.00							159.47	158.93	0.54	Cir				
17	16	MH	0.012	49.000	0.00	0.00	0.00	8.83	1.58	4.15	0.13	0.00	163.42	160.01	160.37	-0.36	15	-0.74	1.56	0.54	Pipe - (54)
					0.00	0.00	0.00					0.54		160.97	160.72		15	0.51	4.07	5.00	
					0.00	0.00	0.00							159.72	159.47	0.25	Cir				
18	17	Comb	0.012	35.041	0.00	0.00	0.00	5.00	3.83	4.92	0.04	0.00	163.46	160.26	160.06	0.19	15	0.55	1.95	0.19	Pipe - (55)
					0.00	0.00	0.00					0.19		161.34	161.15		15	0.54	4.20	5.15	
					0.00	0.00	0.00							160.09	159.90	0.19	Cir				
19	17	Comb	0.012	36.000	0.00	0.00	0.00	5.00	1.04	4.92	0.09	0.00	0.00	160.18	160.01	0.17	12	0.48	2.49	0.45	Pipe - (54) (1)
					0.00	0.00	0.00					0.45		160.90	160.72		12	0.50	3.47	2.73	
					0.00	0.00	0.00							159.90	159.72	0.18	Cir				
20	End	Comb	0.012	25.570	0.00	0.00	0.00	5.00	0.86	4.92	0.12	0.00	163.15	160.30	160.01	0.29	15	1.15	1.73	0.61	Pipe - (57)
					0.00	0.00	0.00					0.61		161.25	160.53		15	2.82	9.57	11.74	
					0.00	0.00	0.00							160.00	159.28	0.72	Cir				

NOTES: Intensity = 62.26 / (Inlet time + 12.90) ^ 0.88 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.01-Storm_Rev3a_2-yr.stm

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area C1 = 0.2 C2 = 0.5 C3 = 0.9			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q / Total Flow	Inlet elev	Elev of HGL / Elev of Crown / Elev of Invert			Rise / Span	HGL / Pipe	ADD / Full Flow		Date: 7/24/2025 / Frequency: 2 yrs / Proj: PAB220113.01-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
21	End	Comb	0.012	9.207	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.11	4.92	0.52	0.00 2.54	162.50	159.85 160.75 159.25	159.58 159.53 158.03	0.27 1.22	18 18 Cir	2.97 13.25	2.63 23.43	2.54 41.41	Pipe - (62)
22	End	MH	0.012	16.733	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.34	0.05	4.84	0.42	0.00 2.02	164.48	159.39 159.12 158.45	158.99 159.03 158.36	0.40 0.09	8 8 Cir	2.37 0.54	5.86 2.75	2.02 0.96	Pipe - (82)
23	22	None	0.012	33.811	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.24	0.10	4.86	0.42	0.00 2.03	0.00	160.60 159.29 158.62	159.79 159.12 158.45	0.82 0.17	8 8 Cir	2.41 0.50	5.82 2.66	2.03 0.93	Pipe - (119)
24	23	None	0.012	73.925	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.03	0.21	4.91	0.42	0.00 2.05	0.00	162.83 159.66 158.99	161.01 159.29 158.62	1.82 0.37	8 8 Cir	2.46 0.50	5.88 2.65	2.05 0.93	Pipe - (118)
25	24	None	0.012	4.964	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.01	0.02	4.92	0.42	0.00 2.06	0.00	163.34 159.68 159.01	163.21 159.66 158.99	0.12 0.02	8 12 Cir	2.47 0.40	5.89 1.59	2.06 0.83	Pipe - (117)
26	25	Genr	0.012	3.314	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.01	4.92	0.42	0.00 2.06	0.00	163.84 159.73 159.06	163.76 159.68 159.01	0.08 0.05	8 8 Cir	2.48 1.51	5.89 4.60	2.06 1.61	Pipe - (116)
27	End	MH	0.012	44.321	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.27	0.29	4.86	0.56	0.00 4.57	160.87	157.20 157.88 156.38	157.34 157.65 156.15	-0.14 0.23	18 18 Cir	-0.32 0.52	3.83 4.64	4.57 8.20	Pipe - (59)
28	27	MH	0.012	87.044	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	2.27	1.39	0.00	0.00	0.00 1.85	162.83	157.33 158.32 156.82	157.20 157.88 156.38	0.13 0.44	18 18 Cir	0.15 0.51	2.67 4.58	1.85 8.09	Pipe - (60)
29	28	MH	0.012	142.460	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00	2.27	0.00	0.00	1.85 1.85	163.82	158.04 159.03 157.53	157.33 158.32 156.82	0.71 0.71	18 18 Cir	0.50 0.50	3.48 4.54	1.85 8.03	Pipe - (61)
30	27	None	0.012	14.582	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.24	0.03	4.86	0.56	0.00 2.73	0.00	160.05 159.50 158.83	159.42 159.42 158.75	0.63 0.08	8 8 Cir	4.34 0.55	7.81 2.78	2.73 0.97	Pipe - (111)

NOTES: Intensity = 62.26 / (Inlet time + 12.90) ^ 0.88 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.01-Storm_Rev3a_2-yr.stm

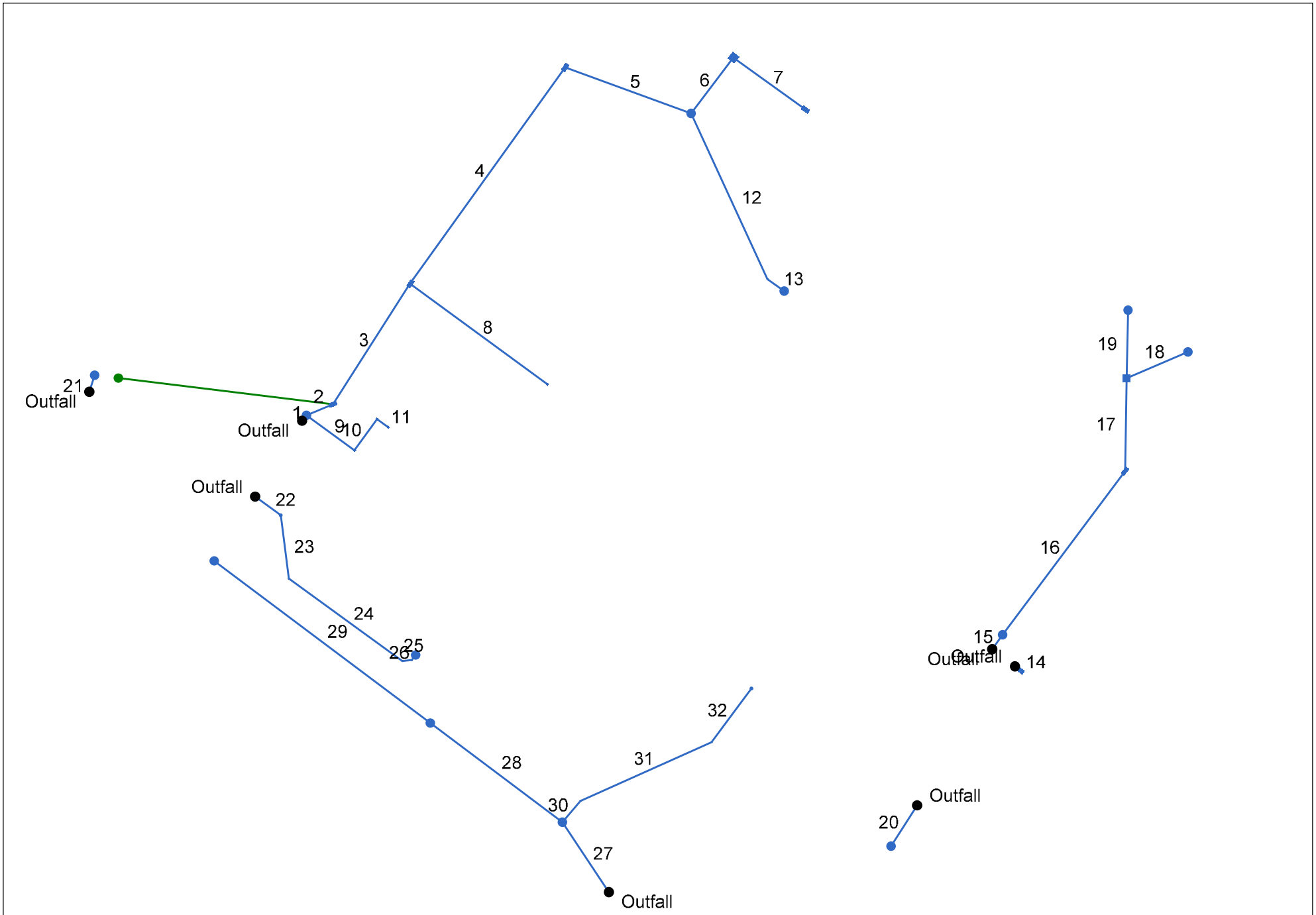
FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q	Inlet elev	Elev of HGL			Rise	HGL	ADD		Date: 7/24/2025
					C1 = 0.2 C2 = 0.5 C3 = 0.9							Total Flow		Elev of Crown			Span	Pipe	Full Flow		Frequency: 2 yrs
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Elev of Invert Up	Down	Fall	Size	Slope	Vel	Cap	Proj: PAB220113.01-Storm Line description
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	
31	30	None	0.012	75.774	0.00	0.00	0.00	5.07	0.16	4.90	0.56	0.00	0.00	163.87	160.52	3.34	8	4.41	7.87	2.75	Pipe - (110)
					0.00	0.00	0.00					2.75		162.84	159.50		8	4.41	7.87	2.75	
					0.00	0.00	0.00							162.17	158.83	3.34	Cir				
32	31	Genr	0.012	35.213	0.00	0.00	0.00	5.00	0.07	4.92	0.56	0.00	168.64	165.96	164.40	1.56	8	4.44	7.90	2.76	Pipe - (71)
					0.00	0.00	0.00					2.76		163.54	162.84		8	1.99	5.28	1.84	
					0.00	0.00	0.00							162.87	162.17	0.70	Cir				

NOTES: Intensity = 62.26 / (Inlet time + 12.90) ^ 0.88 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.01-Storm_Rev3a_2-yr.stm

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: PAB220113.01-Storm_Rev4a_25-yr.stm	Number of lines: 32	Date: 7/24/2025

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
1	MH 120	Manhole	163.93	Cir	4.00	4.00	24	Cir	158.03	24 12	Cir Cir	158.03 158.03
2	INL 121	Combination	164.19	Rect	4.00	2.00	24	Cir	158.13	24	Cir	158.13
3	INL 122	Combination	164.99	Rect	4.00	2.00	24	Cir	158.51	18 12	Cir Cir	158.51 158.66
4	INL 123	Combination	165.11	Rect	4.00	2.00	18	Cir	159.22	18	Cir	159.37
5	MH 125	Manhole	164.85	Cir	4.00	4.00	18	Cir	159.58	14 6	Cir Cir	159.58 162.29
6	INL 126	Combination	163.79	Rect	4.00	4.00	14	Cir	159.77	12	Cir	159.77
7	INL 127	Combination	163.64	Rect	4.00	2.00	12	Cir	160.00			
8	RD1	Generic	166.88	Rect	1.00	1.00	12	Cir	159.11			
9	RD2(2)	Manhole	164.63	Rect	1.00	1.00	12	Cir	158.20	12	Cir	158.22
10	RD2(1)	Manhole	165.23	Rect	1.00	1.00	12	Cir	158.32	12	Cir	158.32
11	RD2	Combination	165.30	Rect	1.00	1.00	12	Cir	158.36			
12		None	0.00	n/a	n/a	n/a	6	Cir	164.71	6	Cir	164.71
13	RD4	Generic	0.00	Cir	4.00	4.00	6	Cir	164.87			
14	INL-221	Combination	164.29	Rect	4.00	2.00	15	Cir	160.15			
15	INL 211	Combination	164.75	Cir	4.00	2.00	18	Cir	158.68	15	Cir	158.93
16	INL-212	Combination	164.93	Rect	4.00	2.00	15	Cir	159.47	15	Cir	159.47
17	MH-213	Manhole	163.42	Rect	4.00	4.00	15	Cir	159.72	15 12	Cir Cir	159.90 159.72
18	INL213.1	Combination	163.46	Cir	4.00	2.00	15	Cir	160.09			
19	INL-214	Combination	0.00	Cir	4.00	2.00	12	Cir	159.90			
20	INL 231	Combination	163.15	Cir	4.00	4.00	15	Cir	160.00			
21	INL 110	Combination	162.50	Cir	4.00	2.00	18	Cir	159.25			

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
22	RD3(1)	Manhole	164.48	Cir	1.00	1.00	8	Cir	158.45	8	Cir	158.45
23		None	0.00	n/a	n/a	n/a	8	Cir	158.62	8	Cir	158.62
24		None	0.00	n/a	n/a	n/a	8	Cir	158.99	8	Cir	158.99
25		None	0.00	n/a	n/a	n/a	8	Cir	159.01	8	Cir	159.01
26	RD3	Generic	0.00	Cir	4.00	4.00	8	Cir	159.06			
27	MH 101	Manhole	160.87	Cir	4.00	4.00	18	Cir	156.38	18 8	Cir Cir	156.38 158.75
28	MH 102	Manhole	162.83	Cir	4.00	4.00	18	Cir	156.82	18	Cir	156.82
29	OCS-103	Manhole	163.82	Cir	4.00	4.00	18	Cir	157.53			
30		None	0.00	n/a	n/a	n/a	8	Cir	158.83	8	Cir	158.83
31		None	0.00	n/a	n/a	n/a	8	Cir	162.17	8	Cir	162.17
32	RD5	Generic	168.64	Cir	1.00	1.00	8	Cir	162.87			

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	Pipe - (85)	5.03	24	Cir	3.640	158.01	158.03	0.550	158.73	158.82	0.30	158.82	End	Manhole
2	Pipe - (63)	4.90	24	Cir	15.229	158.03	158.13	0.657	158.82	158.91	n/a	158.91 j	1	Combination
3	Pipe - (64)	4.33	24	Cir	75.492	158.13	158.51	0.503	158.91	159.24	n/a	159.24	2	Combination
4	Pipe - (65)	1.91	18	Cir	140.496	158.51	159.22	0.505	159.24	159.74	n/a	159.74 j	3	Combination
5	Pipe - (67)	1.53	18	Cir	70.504	159.37	159.58	0.298	159.88	160.09	0.13	160.21	4	Manhole
6	Pipe - (68)	1.40	14	Cir	36.961	159.58	159.77	0.514	160.21	160.25	n/a	160.25 j	5	Combination
7	Pipe - (69)	0.83	12	Cir	46.842	159.77	160.00	0.491	160.25	160.38	n/a	160.38 j	6	Combination
8	Pipe - (77)	1.97	12	Cir	89.896	158.66	159.11	0.501	159.29	159.74	0.22	159.96	3	Generic
9	Pipe - (78)	0.19	12	Cir	31.389	158.03	158.20	0.542	158.82	158.38	n/a	158.38	1	Manhole
10	Pipe - (79)	0.20	12	Cir	20.349	158.22	158.32	0.491	158.40	158.50	0.06	158.57	9	Manhole
11	Pipe - (80)	0.20	12	Cir	7.210	158.32	158.36	0.555	158.57	158.55	n/a	158.55	10	Combination
12	Pipe - (108)	0.20	6	Cir	96.463	162.29	164.71	2.509	162.45	164.94	n/a	164.94	5	None
13	Pipe - (107)	0.20	6	Cir	10.810	164.71	164.87	1.480	164.94	165.10	n/a	165.10	12	Generic
14	Pipe - (56)	0.49	15	Cir	3.658	160.13	160.15	0.546	160.39	160.42	0.10	160.42	End	Combination
15	Pipe - (52)	1.39	18	Cir	9.379	158.63	158.68	0.533	159.05	159.12	n/a	159.12	End	Combination
16	Pipe - (53)	1.05	15	Cir	108.000	158.93	159.47	0.500	159.32	159.87	n/a	159.87	15	Combination
17	Pipe - (54)	0.83	15	Cir	49.000	159.47	159.72	0.510	159.87	160.08	0.12	160.08	16	Manhole
18	Pipe - (55)	0.27	15	Cir	35.041	159.90	160.09	0.542	160.10	160.29	0.07	160.29	17	Combination
19	Pipe - (54) (1)	0.66	12	Cir	36.000	159.72	159.90	0.500	160.08	160.24	n/a	160.24	17	Combination
20	Pipe - (57)	0.88	15	Cir	25.570	159.28	160.00	2.816	159.58	160.37	n/a	160.37	End	Combination
21	Pipe - (62)	3.70	18	Cir	9.207	158.03	159.25	13.251	158.63	159.98	n/a	159.98	End	Combination
22	Pipe - (82)	2.96	8	Cir	16.733	158.36	158.45	0.538	159.02*	159.84*	0.86	160.70	End	Manhole
23	Pipe - (119)	2.97	8	Cir	33.811	158.45	158.62	0.503	160.70*	162.44*	0.86	163.30	22	None
24	Pipe - (118)	2.99	8	Cir	73.925	158.62	158.99	0.501	163.30*	167.16*	0.81	167.97	23	None

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NOTES: Return period = 25 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

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Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
25	Pipe - (117)	2.99	8	Cir	4.964	158.99	159.01	0.403	167.97*	168.23*	0.89	169.11	24	None
26	Pipe - (116)	2.99	8	Cir	3.314	159.01	159.06	1.509	169.11*	169.29*	1.14	170.43	25	Generic
27	Pipe - (59)	5.83	18	Cir	44.321	156.15	156.38	0.519	157.08	157.32	0.37	157.69	End	Manhole
28	Pipe - (60)	1.85	18	Cir	87.044	156.38	156.82	0.505	157.69	157.33	0.03	157.33	27	Manhole
29	Pipe - (61)	1.85	18	Cir	142.460	156.82	157.53	0.498	157.33	158.04	0.19	158.04	28	Manhole
30	Pipe - (111)	3.98	8	Cir	14.582	158.75	158.83	0.549	159.42*	160.77*	1.01	161.78	27	None
31	Pipe - (110)	4.00	8	Cir	75.774	158.83	162.17	4.408	161.78*	168.86*	1.12	169.98	30	None
32	Pipe - (71)	4.01	8	Cir	35.213	162.17	162.87	1.988	169.98*	173.29*	2.05	175.34	31	Generic

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NOTES: Return period = 25 Yrs. ; *Surcharged (HGL above crown). ; j - Line contains hyd. jump.

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Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	MH 120	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
2	INL 121	0.86	0.00	0.83	0.03	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.13	3.51	0.04	0.79	0.0	21
3	INL 122	1.16	0.00	1.16	0.00	Comb	4.0	0.06	0.12	0.06	2.00	Sag	2.00	0.050	0.020	0.013	0.28	10.83	0.28	10.83	0.0	Off
4	INL 123	0.51	0.00	0.51	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.13	3.44	0.13	3.44	0.0	Off
5	MH 125	0.00	0.06	0.00	0.06	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
6	INL 126	0.62	0.00	0.62	0.01	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.12	2.81	0.02	0.42	0.0	Off
7	INL 127	0.83	0.00	0.80	0.03	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.13	3.42	0.04	0.75	0.0	Off
8	RD1	1.97	0.00	1.03	0.94	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off
9	RD2(2)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
10	RD2(1)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
11	RD2	0.20	0.00	0.20	0.00	Comb	4.0	0.03	0.05	0.03	2.00	Sag	2.00	0.050	0.020	0.013	0.12	3.14	0.12	3.14	0.0	Off
12		0.00	0.06	0.00	0.06	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	5
13	RD4	0.20	0.00	0.14	0.06	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	12
14	INL-221	0.49	0.00	0.49	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.13	3.31	0.13	3.31	0.0	Off
15	INL 211	0.51	0.00	0.51	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.13	3.40	0.13	3.40	0.0	Off
16	INL-212	0.29	0.00	0.29	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.10	2.21	0.10	2.21	0.0	Off
17	MH-213	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	Off
18	INL213.1	0.27	0.00	0.27	0.00	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.09	1.71	0.00	0.00	0.0	Off
19	INL-214	0.66	0.00	0.61	0.05	Comb	4.0	1.00	0.00	1.00	2.00	0.020	2.00	0.050	0.020	0.013	0.14	3.94	0.05	1.07	0.0	Off
20	INL 231	0.88	0.00	0.88	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.16	5.15	0.16	5.15	0.0	Off
21	INL 110	3.70	0.03	3.73	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.34	14.24	0.34	14.24	0.0	Off
22	RD3(1)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
23		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	22

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NOTES: Inlet N-Values = 0.016; Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74; Return period = 25 Yrs. ; * Indicates Known Q added.All curb inlets are throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
24		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	23
25		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	24
26	RD3	2.99	0.00	2.06	0.93	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off
27	MH 101	0.00	0.00	0.00	0.00	MH	0.0	2.00	0.00	2.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
28	MH 102	0.00	0.00	0.00	0.00	MH	0.0	2.00	0.00	2.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
29	OCS-103	1.85*	0.00	0.00	1.85	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
30		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	27
31		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	30
32	RD5	4.01	0.00	2.76	1.25	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off

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NOTES: Inlet N-Values = 0.016; Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74; Return period = 25 Yrs. ; * Indicates Known Q added.All curb inlets are throat.

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q	Inlet elev	Elev of HGL			Rise	HGL	ADD		Date: 7/24/2025
					C1 = 0.2 C2 = 0.5 C3 = 0.9							Total Flow		Elev of Crown			Span	Pipe	Full Flow		Frequency: 25 yrs
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Elev of Invert Up	Down	Fall	Size	Slope	Vel	Cap	Proj: PAB220113.01-Storm
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
1	End	MH	0.012	3.640	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.96	0.03	5.66	0.89	0.00 5.03	163.93	158.82 160.03 158.03	158.73 160.01 158.01	0.09 0.02	24 24 Cir	2.47 0.55	4.65 5.78	5.03 18.16	Pipe - (85)
2	1	Comb	0.012	15.229	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.82	0.14	5.69	0.86	0.00 4.90	164.19	158.91 160.13 158.13	158.82 160.03 158.03	0.09 0.10	24 24 Cir	0.58 0.66	4.29 6.32	4.90 19.86	Pipe - (63)
3	2	Comb	0.012	75.492	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.01	0.81	5.85	0.74	0.00 4.33	164.99	159.24 160.51 158.51	158.91 160.13 158.13	0.33 0.38	24 24 Cir	0.44 0.50	4.00 5.53	4.33 17.38	Pipe - (64)
4	3	Comb	0.012	140.496	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	8.02	1.99	6.30	0.30	0.00 1.91	165.11	159.74 160.72 159.22	159.24 160.01 158.51	0.50 0.71	18 18 Cir	0.36 0.51	2.87 4.58	1.91 8.09	Pipe - (65)
5	4	MH	0.012	70.504	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	6.73	1.29	6.63	0.23	0.00 1.53	164.85	160.09 161.08 159.58	159.88 160.87 159.37	0.21 0.21	18 18 Cir	0.30 0.30	2.91 3.51	1.53 6.21	Pipe - (67)
6	5	Comb	0.012	36.961	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.74	0.46	6.92	0.20	0.00 1.40	163.79	160.25 160.94 159.77	160.21 160.75 159.58	0.03 0.19	14 14 Cir	0.09 0.51	2.88 3.90	1.40 4.17	Pipe - (68)
7	6	Comb	0.012	46.842	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.74	7.15	0.12	0.00 0.83	163.64	160.38 161.00 160.00	160.25 160.77 159.77	0.13 0.23	12 12 Cir	0.28 0.49	2.63 3.44	0.83 2.70	Pipe - (69)
8	3	Genr	0.012	89.896	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.60	7.15	0.28	0.00 1.97	166.88	159.74 160.11 159.11	159.29 159.66 158.66	0.45 0.45	12 12 Cir	0.50 0.50	3.78 3.48	1.97 2.73	Pipe - (77)
9	1	MH	0.012	31.389	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	6.77	2.03	6.62	0.03	0.00 0.19	164.63	158.38 159.20 158.20	158.82 159.03 158.03	-0.44 0.17	12 12 Cir	-1.41 0.54	1.14 3.61	0.19 2.84	Pipe - (78)
10	9	MH	0.012	20.349	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.46	1.31	7.00	0.03	0.00 0.20	165.23	158.50 159.32 158.32	158.40 159.22 158.22	0.10 0.10	12 12 Cir	0.50 0.49	2.00 3.44	0.20 2.70	Pipe - (79)

NOTES: Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.01-Storm_Rev4a_25-yr.stm

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q / Total Flow	Inlet elev	Elev of HGL / Elev of Crown / Elev of Invert			Rise / Span	HGL / Pipe	ADD / Full Flow		Date: 7/24/2025 / Frequency: 25 yrs / Proj: PAB220113.01-Storm
					C1 = 0.2 C2 = 0.5 C3 = 0.9																
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
11	10	Comb	0.012	7.210	0.00	0.00	0.00	5.00	0.46	7.15	0.03	0.00	165.30	158.55	158.57	-0.02	12	-0.30	1.69	0.20	Pipe - (80)
					0.00	0.00	0.00					0.20		159.36	159.32		12	0.55	3.66	2.87	
					0.00	0.00	0.00							158.36	158.32	0.04	Cir				
12	5	None	0.012	96.463	0.00	0.00	0.00	5.17	1.55	7.10	0.03	0.00	0.00	164.94	162.45	2.49	6	2.58	3.12	0.20	Pipe - (108)
					0.00	0.00	0.00					0.20		165.21	162.79		6	2.51	4.90	0.96	
					0.00	0.00	0.00							164.71	162.29	2.42	Cir				
13	12	Genr	0.012	10.810	0.00	0.00	0.00	5.00	0.17	7.15	0.03	0.00	0.00	165.10	164.94	0.16	6	1.49	2.37	0.20	Pipe - (107)
					0.00	0.00	0.00					0.20		165.37	165.21		6	1.48	3.76	0.74	
					0.00	0.00	0.00							164.87	164.71	0.16	Cir				
14	End	Comb	0.012	3.658	0.00	0.00	0.00	5.00	0.15	7.15	0.07	0.00	164.29	160.42	160.39	0.03	15	0.87	2.57	0.49	Pipe - (56)
					0.00	0.00	0.00					0.49		161.40	161.38		15	0.55	4.21	5.17	
					0.00	0.00	0.00							160.15	160.13	0.02	Cir				
15	End	Comb	0.012	9.379	0.00	0.00	0.00	10.57	0.17	5.74	0.24	0.00	164.75	159.12	159.05	0.08	18	0.81	3.34	1.39	Pipe - (52)
					0.00	0.00	0.00					1.39		160.18	160.13		18	0.53	4.70	8.31	
					0.00	0.00	0.00							158.68	158.63	0.05	Cir				
16	15	Comb	0.012	108.000	0.00	0.00	0.00	8.72	1.85	6.13	0.17	0.00	164.93	159.87	159.32	0.55	15	0.51	3.13	1.05	Pipe - (53)
					0.00	0.00	0.00					1.05		160.72	160.18		15	0.50	4.03	4.95	
					0.00	0.00	0.00							159.47	158.93	0.54	Cir				
17	16	MH	0.012	49.000	0.00	0.00	0.00	7.64	1.09	6.39	0.13	0.00	163.42	160.08	159.87	0.20	15	0.42	2.65	0.83	Pipe - (54)
					0.00	0.00	0.00					0.83		160.97	160.72		15	0.51	4.07	5.00	
					0.00	0.00	0.00							159.72	159.47	0.25	Cir				
18	17	Comb	0.012	35.041	0.00	0.00	0.00	5.00	2.64	7.15	0.04	0.00	163.46	160.29	160.10	0.20	15	0.56	2.17	0.27	Pipe - (55)
					0.00	0.00	0.00					0.27		161.34	161.15		15	0.54	4.20	5.15	
					0.00	0.00	0.00							160.09	159.90	0.19	Cir				
19	17	Comb	0.012	36.000	0.00	0.00	0.00	5.00	0.72	7.15	0.09	0.00	0.00	160.24	160.08	0.16	12	0.45	2.72	0.66	Pipe - (54) (1)
					0.00	0.00	0.00					0.66		160.90	160.72		12	0.50	3.47	2.73	
					0.00	0.00	0.00							159.90	159.72	0.18	Cir				
20	End	Comb	0.012	25.570	0.00	0.00	0.00	5.00	0.59	7.15	0.12	0.00	163.15	160.37	159.58	0.79	15	3.08	3.41	0.88	Pipe - (57)
					0.00	0.00	0.00					0.88		161.25	160.53		15	2.82	9.57	11.74	
					0.00	0.00	0.00							160.00	159.28	0.72	Cir				

NOTES: Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.01-Storm_Rev4a_25-yr.stm

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q	Inlet elev	Elev of HGL			Rise	HGL	ADD		Date: 7/24/2025
					C1 = 0.2 C2 = 0.5 C3 = 0.9							Total Flow		Elev of Crown			Span	Pipe	Full Flow		Frequency: 25 yrs
														Elev of Invert							Proj: PAB220113.01-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
21	End	Comb	0.012	9.207	0.00	0.00	0.00	5.00	0.07	7.15	0.52	0.00	162.50	159.98	158.63	1.35	18	14.71	4.95	3.70	Pipe - (62)
					0.00	0.00	0.00					3.70		160.75	159.53		18	13.25	23.43	41.41	
					0.00	0.00	0.00							159.25	158.03	1.22	Cir				
22	End	MH	0.012	16.733	0.00	0.00	0.00	5.23	0.03	7.08	0.42	0.00	164.48	159.84	159.02	0.82	8	4.92	8.49	2.96	Pipe - (82)
					0.00	0.00	0.00					2.96		159.12	159.03		8	0.54	2.75	0.96	
					0.00	0.00	0.00							158.45	158.36	0.09	Cir				
23	22	None	0.012	33.811	0.00	0.00	0.00	5.17	0.07	7.10	0.42	0.00	0.00	162.44	160.70	1.74	8	5.14	8.50	2.97	Pipe - (119)
					0.00	0.00	0.00					2.97		159.29	159.12		8	0.50	2.66	0.93	
					0.00	0.00	0.00							158.62	158.45	0.17	Cir				
24	23	None	0.012	73.925	0.00	0.00	0.00	5.02	0.14	7.15	0.42	0.00	0.00	167.16	163.30	3.85	8	5.21	8.56	2.99	Pipe - (118)
					0.00	0.00	0.00					2.99		159.66	159.29		8	0.50	2.65	0.93	
					0.00	0.00	0.00							158.99	158.62	0.37	Cir				
25	24	None	0.012	4.964	0.00	0.00	0.00	5.01	0.01	7.15	0.42	0.00	0.00	168.23	167.97	0.26	8	5.23	8.56	2.99	Pipe - (117)
					0.00	0.00	0.00					2.99		159.68	159.66		12	0.40	1.59	0.83	
					0.00	0.00	0.00							159.01	158.99	0.02	Cir				
26	25	Genr	0.012	3.314	0.00	0.00	0.00	5.00	0.01	7.15	0.42	0.00	0.00	169.29	169.11	0.17	8	5.24	8.57	2.99	Pipe - (116)
					0.00	0.00	0.00					2.99		159.73	159.68		8	1.51	4.60	1.61	
					0.00	0.00	0.00							159.06	159.01	0.05	Cir				
27	End	MH	0.012	44.321	0.00	0.00	0.00	5.18	0.23	7.09	0.56	0.00	160.87	157.32	157.08	0.24	18	0.54	5.03	5.83	Pipe - (59)
					0.00	0.00	0.00					5.83		157.88	157.65		18	0.52	4.64	8.20	
					0.00	0.00	0.00							156.38	156.15	0.23	Cir				
28	27	MH	0.012	87.044	0.00	0.00	0.00	2.27	1.39	0.00	0.00	0.00	162.83	157.33	157.69	-0.36	18	-0.41	2.30	1.85	Pipe - (60)
					0.00	0.00	0.00					1.85		158.32	157.88		18	0.51	4.58	8.09	
					0.00	0.00	0.00							156.82	156.38	0.44	Cir				
29	28	MH	0.012	142.460	0.00	0.00	0.00	0.00	2.27	0.00	0.00	1.85	163.82	158.04	157.33	0.71	18	0.50	3.48	1.85	Pipe - (61)
					0.00	0.00	0.00					1.85		159.03	158.32		18	0.50	4.54	8.03	
					0.00	0.00	0.00							157.53	156.82	0.71	Cir				
30	27	None	0.012	14.582	0.00	0.00	0.00	5.16	0.02	7.10	0.56	0.00	0.00	160.77	159.42	1.35	8	9.26	11.40	3.98	Pipe - (111)
					0.00	0.00	0.00					3.98		159.50	159.42		8	0.55	2.78	0.97	
					0.00	0.00	0.00							158.83	158.75	0.08	Cir				

NOTES: Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.01-Storm_Rev4a_25-yr.stm

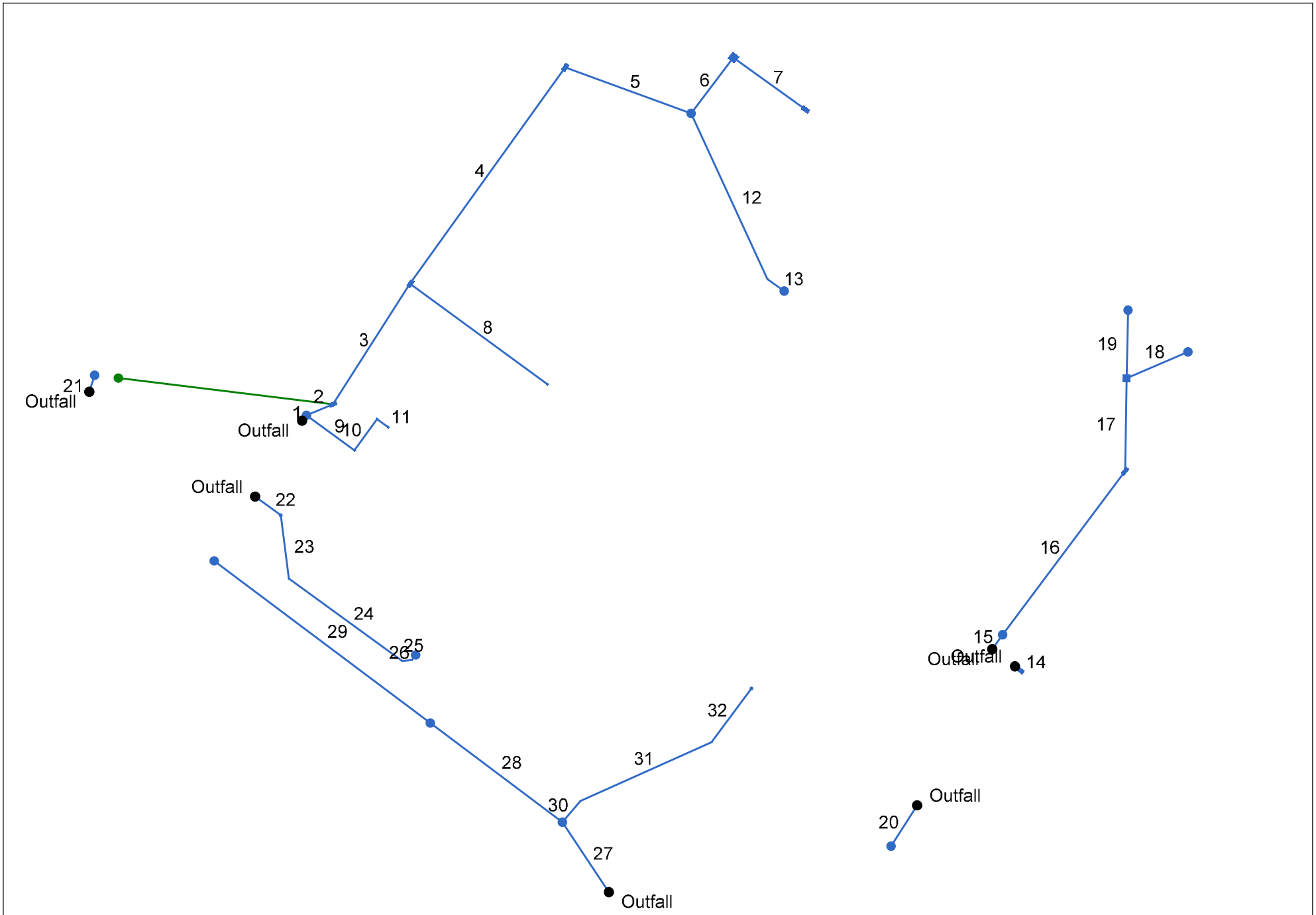
FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area C1 = 0.2 C2 = 0.5 C3 = 0.9			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q / Total Flow	Inlet elev	Elev of HGL / Elev of Crown / Elev of Invert			Rise / Span	HGL / Pipe	ADD / Full Flow		Date: 7/24/2025 / Frequency: 25 yrs / Proj: PAB220113.01-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA							Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		Q (cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
31	30	None	0.012	75.774	0.00	0.00	0.00	5.05	0.11	7.14	0.56	0.00	0.00	168.86	161.78	7.08	8	9.35	11.46	4.00	Pipe - (110)
					0.00	0.00	0.00					4.00		162.84	159.50		8	4.41	7.87	2.75	
					0.00	0.00	0.00							162.17	158.83	3.34	Cir				
32	31	Genr	0.012	35.213	0.00	0.00	0.00	5.00	0.05	7.15	0.56	0.00	168.64	173.29	169.98	3.31	8	9.39	11.49	4.01	Pipe - (71)
					0.00	0.00	0.00					4.01		163.54	162.84		8	1.99	5.28	1.84	
					0.00	0.00	0.00							162.87	162.17	0.70	Cir				

NOTES: Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.01-Storm_Rev4a_25-yr.stm

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev4.stm	Number of lines: 32	Date: 7/24/2025

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
1	MH 120	Manhole	163.93	Cir	4.00	4.00	24	Cir	158.03	24 12	Cir Cir	158.03 158.03
2	INL 121	Combination	164.19	Rect	4.00	2.00	24	Cir	158.13	24	Cir	158.13
3	INL 122	Combination	164.99	Rect	4.00	2.00	24	Cir	158.51	18 12	Cir Cir	158.51 158.66
4	INL 123	Combination	165.11	Rect	4.00	2.00	18	Cir	159.22	18	Cir	159.37
5	MH 125	Manhole	164.85	Cir	4.00	4.00	18	Cir	159.58	14 6	Cir Cir	159.58 162.29
6	INL 126	Combination	163.79	Rect	4.00	4.00	14	Cir	159.77	12	Cir	159.77
7	INL 127	Combination	163.64	Rect	4.00	2.00	12	Cir	160.00			
8	RD1	Generic	166.88	Rect	1.00	1.00	12	Cir	159.11			
9	RD2(2)	Manhole	164.63	Rect	1.00	1.00	12	Cir	158.20	12	Cir	158.22
10	RD2(1)	Manhole	165.23	Rect	1.00	1.00	12	Cir	158.32	12	Cir	158.32
11	RD2	Combination	165.30	Rect	1.00	1.00	12	Cir	158.36			
12		None	0.00	n/a	n/a	n/a	6	Cir	164.71	6	Cir	164.71
13	RD4	Generic	0.00	Cir	4.00	4.00	6	Cir	164.87			
14	INL-221	Combination	164.29	Rect	4.00	2.00	15	Cir	160.15			
15	INL 211	Combination	164.75	Cir	4.00	2.00	18	Cir	158.68	15	Cir	158.93
16	INL-212	Combination	164.93	Rect	4.00	2.00	15	Cir	159.47	15	Cir	159.47
17	MH-213	Manhole	163.42	Rect	4.00	4.00	15	Cir	159.72	15 12	Cir Cir	159.90 159.72
18	INL213.1	Combination	163.46	Cir	4.00	2.00	15	Cir	160.09			
19	INL-214	Combination	0.00	Cir	4.00	2.00	12	Cir	159.90			
20	INL 231	Combination	163.15	Cir	4.00	4.00	15	Cir	160.00			
21	INL 110	Combination	162.50	Cir	4.00	2.00	18	Cir	159.25			

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
22	RD3(1)	Manhole	164.48	Cir	1.00	1.00	8	Cir	158.45	8	Cir	158.45
23		None	0.00	n/a	n/a	n/a	8	Cir	158.62	8	Cir	158.62
24		None	0.00	n/a	n/a	n/a	8	Cir	158.99	8	Cir	158.99
25		None	0.00	n/a	n/a	n/a	8	Cir	159.01	8	Cir	159.01
26	RD3	Generic	0.00	Cir	4.00	4.00	8	Cir	159.06			
27	MH 101	Manhole	160.87	Cir	4.00	4.00	18	Cir	156.38	18 8	Cir Cir	156.38 158.75
28	MH 102	Manhole	162.83	Cir	4.00	4.00	18	Cir	156.82	18	Cir	156.82
29	OCS-103	Manhole	163.82	Cir	4.00	4.00	18	Cir	157.53			
30		None	0.00	n/a	n/a	n/a	8	Cir	158.83	8	Cir	158.83
31		None	0.00	n/a	n/a	n/a	8	Cir	162.17	8	Cir	162.17
32	RD5	Generic	168.64	Cir	1.00	1.00	8	Cir	162.87			

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	Pipe - (85)	5.03	24	Cir	3.640	158.01	158.03	0.550	167.66*	167.66*	0.04	167.70	End	Manhole
2	Pipe - (63)	4.90	24	Cir	15.229	158.03	158.13	0.657	167.70*	167.71*	0.04	167.74	1	Combination
3	Pipe - (64)	4.33	24	Cir	75.492	158.13	158.51	0.503	167.74*	167.77*	0.04	167.81	2	Combination
4	Pipe - (65)	1.91	18	Cir	140.496	158.51	159.22	0.505	167.81*	167.85*	0.03	167.88	3	Combination
5	Pipe - (67)	1.53	18	Cir	70.504	159.37	159.58	0.298	167.88*	167.89*	0.01	167.90	4	Manhole
6	Pipe - (68)	1.40	14	Cir	36.961	159.58	159.77	0.514	167.90*	167.92*	0.04	167.96	5	Combination
7	Pipe - (69)	0.83	12	Cir	46.842	159.77	160.00	0.491	167.96*	167.98*	0.02	168.00	6	Combination
8	Pipe - (77)	1.97	12	Cir	89.896	158.66	159.11	0.501	167.81*	168.05*	0.10	168.14	3	Generic
9	Pipe - (78)	0.19	12	Cir	31.389	158.03	158.20	0.542	167.70*	167.70*	0.00	167.70	1	Manhole
10	Pipe - (79)	0.20	12	Cir	20.349	158.22	158.32	0.491	167.70*	167.70*	0.00	167.70	9	Manhole
11	Pipe - (80)	0.20	12	Cir	7.210	158.32	158.36	0.555	167.70*	167.70*	0.00	167.71	10	Combination
12	Pipe - (108)	0.20	6	Cir	96.463	162.29	164.71	2.509	167.90*	168.01*	0.01	168.02	5	None
13	Pipe - (107)	0.20	6	Cir	10.810	164.71	164.87	1.480	168.02*	168.03*	0.02	168.05	12	Generic
14	Pipe - (56)	0.49	15	Cir	3.658	160.13	160.15	0.546	167.66*	167.66*	0.00	167.66	End	Combination
15	Pipe - (52)	1.39	18	Cir	9.379	158.63	158.68	0.533	167.66*	167.66*	0.00	167.67	End	Combination
16	Pipe - (53)	1.05	15	Cir	108.000	158.93	159.47	0.500	167.67*	167.69*	0.01	167.70	15	Combination
17	Pipe - (54)	0.83	15	Cir	49.000	159.47	159.72	0.510	167.70*	167.71*	0.01	167.71	16	Manhole
18	Pipe - (55)	0.27	15	Cir	35.041	159.90	160.09	0.542	167.71*	167.72*	0.00	167.72	17	Combination
19	Pipe - (54) (1)	0.66	12	Cir	36.000	159.72	159.90	0.500	167.71*	167.73*	0.01	167.74	17	Combination
20	Pipe - (57)	0.88	15	Cir	25.570	159.28	160.00	2.816	167.66*	167.66*	0.01	167.67	End	Combination
21	Pipe - (62)	3.70	18	Cir	9.207	158.03	159.25	13.251	167.66*	167.67*	0.07	167.74	End	Combination
22	Pipe - (82)	2.96	8	Cir	16.733	158.36	158.45	0.538	167.66*	168.52*	0.86	169.38	End	Manhole
23	Pipe - (119)	2.97	8	Cir	33.811	158.45	158.62	0.503	169.38*	171.12*	0.86	171.98	22	None
24	Pipe - (118)	2.99	8	Cir	73.925	158.62	158.99	0.501	171.98*	175.83*	0.81	176.64	23	None

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev4.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Return period = 25 Yrs. ; *Surcharged (HGL above crown).

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
25	Pipe - (117)	2.99	8	Cir	4.964	158.99	159.01	0.403	176.64*	176.90*	0.89	177.79	24	None
26	Pipe - (116)	2.99	8	Cir	3.314	159.01	159.06	1.509	177.79*	177.96*	1.14	179.10	25	Generic
27	Pipe - (59)	5.83	18	Cir	44.321	156.15	156.38	0.519	167.66*	167.78*	0.16	167.94	End	Manhole
28	Pipe - (60)	1.85	18	Cir	87.044	156.38	156.82	0.505	167.94*	167.96*	0.00	167.96	27	Manhole
29	Pipe - (61)	1.85	18	Cir	142.460	156.82	157.53	0.498	167.96*	168.00*	0.02	168.02	28	Manhole
30	Pipe - (111)	3.98	8	Cir	14.582	158.75	158.83	0.549	167.94*	169.29*	1.01	170.30	27	None
31	Pipe - (110)	4.00	8	Cir	75.774	158.83	162.17	4.408	170.30*	177.38*	1.12	178.50	30	None
32	Pipe - (71)	4.01	8	Cir	35.213	162.17	162.87	1.988	178.50*	181.81*	2.05	183.86	31	Generic

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev4.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Return period = 25 Yrs. ; *Surcharged (HGL above crown).

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	MH 120	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
2	INL 121	0.86	0.00	0.83	0.03	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.13	3.51	0.04	0.79	0.0	21
3	INL 122	1.16	0.00	1.16	0.00	Comb	4.0	0.06	0.12	0.06	2.00	Sag	2.00	0.050	0.020	0.013	0.28	10.83	0.28	10.83	0.0	Off
4	INL 123	0.51	0.00	0.51	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.13	3.44	0.13	3.44	0.0	Off
5	MH 125	0.00	0.06	0.00	0.06	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
6	INL 126	0.62	0.00	0.62	0.01	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.12	2.81	0.02	0.42	0.0	Off
7	INL 127	0.83	0.00	0.80	0.03	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.13	3.42	0.04	0.75	0.0	Off
8	RD1	1.97	0.00	1.03	0.94	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off
9	RD2(2)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
10	RD2(1)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
11	RD2	0.20	0.00	0.20	0.00	Comb	4.0	0.03	0.05	0.03	2.00	Sag	2.00	0.050	0.020	0.013	0.12	3.14	0.12	3.14	0.0	Off
12		0.00	0.06	0.00	0.06	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	5
13	RD4	0.20	0.00	0.14	0.06	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	12
14	INL-221	0.49	0.00	0.49	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.13	3.31	0.13	3.31	0.0	Off
15	INL 211	0.51	0.00	0.51	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.13	3.40	0.13	3.40	0.0	Off
16	INL-212	0.29	0.00	0.29	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.10	2.21	0.10	2.21	0.0	Off
17	MH-213	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	Off
18	INL213.1	0.27	0.00	0.27	0.00	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.09	1.71	0.00	0.00	0.0	Off
19	INL-214	0.66	0.00	0.61	0.05	Comb	4.0	1.00	0.00	1.00	2.00	0.020	2.00	0.050	0.020	0.013	0.14	3.94	0.05	1.07	0.0	Off
20	INL 231	0.88	0.00	0.88	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.16	5.15	0.16	5.15	0.0	Off
21	INL 110	3.70	0.03	3.73	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.34	14.24	0.34	14.24	0.0	Off
22	RD3(1)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
23		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	22

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev4.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Inlet N-Values = 0.016; Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74; Return period = 25 Yrs. ; * Indicates Known Q added.All curb inlets are throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
24		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	23
25		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	24
26	RD3	2.99	0.00	2.06	0.93	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off
27	MH 101	0.00	0.00	0.00	0.00	MH	0.0	2.00	0.00	2.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
28	MH 102	0.00	0.00	0.00	0.00	MH	0.0	2.00	0.00	2.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
29	OCS-103	1.85*	0.00	0.00	1.85	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
30		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	27
31		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	30
32	RD5	4.01	0.00	2.76	1.25	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev4.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Inlet N-Values = 0.016; Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74; Return period = 25 Yrs. ; * Indicates Known Q added.All curb inlets are throat.

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area C1 = 0.2 C2 = 0.5 C3 = 0.9			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q / Total Flow	Inlet elev	Elev of HGL / Elev of Crown / Elev of Invert			Rise / Span	HGL / Pipe	ADD / Full Flow		Date: 7/24/2025 / Frequency: 25 yrs / Proj: PAB220113.00-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
1	End	MH	0.012	3.640	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.96	0.03	5.66	0.89	0.00 5.03	163.93	167.66 160.03 158.03	167.66 160.01 158.01	0.00 0.02	24 24 Cir	0.04 0.55	1.60 5.78	5.03 18.16	Pipe - (85)
2	1	Comb	0.012	15.229	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.82	0.14	5.69	0.86	0.00 4.90	164.19	167.71 160.13 158.13	167.70 160.03 158.03	0.01 0.10	24 24 Cir	0.04 0.66	1.56 6.32	4.90 19.86	Pipe - (63)
3	2	Comb	0.012	75.492	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.01	0.81	5.85	0.74	0.00 4.33	164.99	167.77 160.51 158.51	167.74 160.13 158.13	0.02 0.38	24 24 Cir	0.03 0.50	1.38 5.53	4.33 17.38	Pipe - (64)
4	3	Comb	0.012	140.496	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	8.02	1.99	6.30	0.30	0.00 1.91	165.11	167.85 160.72 159.22	167.81 160.01 158.51	0.04 0.71	18 18 Cir	0.03 0.51	1.08 4.58	1.91 8.09	Pipe - (65)
5	4	MH	0.012	70.504	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	6.73	1.29	6.63	0.23	0.00 1.53	164.85	167.89 161.08 159.58	167.88 160.87 159.37	0.01 0.21	18 18 Cir	0.02 0.30	0.87 3.51	1.53 6.21	Pipe - (67)
6	5	Comb	0.012	36.961	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.74	0.46	6.92	0.20	0.00 1.40	163.79	167.92 160.94 159.77	167.90 160.75 159.58	0.02 0.19	14 14 Cir	0.06 0.51	1.31 3.90	1.40 4.17	Pipe - (68)
7	6	Comb	0.012	46.842	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.74	7.15	0.12	0.00 0.83	163.64	167.98 161.00 160.00	167.96 160.77 159.77	0.02 0.23	12 12 Cir	0.05 0.49	1.05 3.44	0.83 2.70	Pipe - (69)
8	3	Genr	0.012	89.896	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.60	7.15	0.28	0.00 1.97	166.88	168.05 160.11 159.11	167.81 159.66 158.66	0.23 0.45	12 12 Cir	0.26 0.50	2.51 3.48	1.97 2.73	Pipe - (77)
9	1	MH	0.012	31.389	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	6.77	2.03	6.62	0.03	0.00 0.19	164.63	167.70 159.20 158.20	167.70 159.03 158.03	0.00 0.17	12 12 Cir	0.00 0.54	0.24 3.61	0.19 2.84	Pipe - (78)
10	9	MH	0.012	20.349	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.46	1.31	7.00	0.03	0.00 0.20	165.23	167.70 159.32 158.32	167.70 159.22 158.22	0.00 0.10	12 12 Cir	0.00 0.49	0.25 3.44	0.20 2.70	Pipe - (79)

NOTES: Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev4.stm

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area C1 = 0.2 C2 = 0.5 C3 = 0.9			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q / Total Flow	Inlet elev	Elev of HGL / Elev of Crown / Elev of Invert			Rise / Span	HGL / Pipe	ADD / Full Flow		Date: 7/24/2025 / Frequency: 25 yrs / Proj: PAB220113.00-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
11	10	Comb	0.012	7.210	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.46	7.15	0.03	0.00 0.20	165.30	167.70 159.36 158.36	167.70 159.32 158.32	0.00 0.04	12 12 Cir	0.00 0.55	0.26 3.66	0.20 2.87	Pipe - (80)
12	5	None	0.012	96.463	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.17	1.55	7.10	0.03	0.00 0.20	0.00	168.01 165.21 164.71	167.90 162.79 162.29	0.11 2.42	6 6 Cir	0.11 2.51	1.03 4.90	0.20 0.96	Pipe - (108)
13	12	Genr	0.012	10.810	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.17	7.15	0.03	0.00 0.20	0.00	168.03 165.37 164.87	168.02 165.21 164.71	0.01 0.16	6 6 Cir	0.11 1.48	1.04 3.76	0.20 0.74	Pipe - (107)
14	End	Comb	0.012	3.658	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.15	7.15	0.07	0.00 0.49	164.29	167.66 161.40 160.15	167.66 161.38 160.13	0.00 0.02	15 15 Cir	0.01 0.55	0.40 4.21	0.49 5.17	Pipe - (56)
15	End	Comb	0.012	9.379	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.57	0.17	5.74	0.24	0.00 1.39	164.75	167.66 160.18 158.68	167.66 160.13 158.63	0.00 0.05	18 18 Cir	0.01 0.53	0.79 4.70	1.39 8.31	Pipe - (52)
16	15	Comb	0.012	108.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	8.72	1.85	6.13	0.17	0.00 1.05	164.93	167.69 160.72 159.47	167.67 160.18 158.93	0.02 0.54	15 15 Cir	0.02 0.50	0.85 4.03	1.05 4.95	Pipe - (53)
17	16	MH	0.012	49.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.64	1.09	6.39	0.13	0.00 0.83	163.42	167.71 160.97 159.72	167.70 160.72 159.47	0.01 0.25	15 15 Cir	0.01 0.51	0.68 4.07	0.83 5.00	Pipe - (54)
18	17	Comb	0.012	35.041	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	2.64	7.15	0.04	0.00 0.27	163.46	167.72 161.34 160.09	167.71 161.15 159.90	0.00 0.19	15 15 Cir	0.00 0.54	0.22 4.20	0.27 5.15	Pipe - (55)
19	17	Comb	0.012	36.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.72	7.15	0.09	0.00 0.66	0.00	167.73 160.90 159.90	167.71 160.72 159.72	0.01 0.18	12 12 Cir	0.03 0.50	0.84 3.47	0.66 2.73	Pipe - (54) (1)
20	End	Comb	0.012	25.570	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.59	7.15	0.12	0.00 0.88	163.15	167.66 161.25 160.00	167.66 160.53 159.28	0.00 0.72	15 15 Cir	0.02 2.82	0.72 9.57	0.88 11.74	Pipe - (57)

NOTES: Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev4.stm

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area C1 = 0.2 C2 = 0.5 C3 = 0.9			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q / Total Flow	Inlet elev	Elev of HGL / Elev of Crown / Elev of Invert			Rise / Span	HGL / Pipe	ADD / Full Flow		Date: 7/24/2025 / Frequency: 25 yrs / Proj: PAB220113.00-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
21	End	Comb	0.012	9.207	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.07	7.15	0.52	0.00 3.70	162.50	167.67 160.75 159.25	167.66 159.53 158.03	0.01 1.22	18 18 Cir	0.11 13.25	2.09 23.43	3.70 41.41	Pipe - (62)
22	End	MH	0.012	16.733	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.23	0.03	7.08	0.42	0.00 2.96	164.48	168.52 159.12 158.45	167.66 159.03 158.36	0.86 0.09	8 8 Cir	5.11 0.54	8.47 2.75	2.96 0.96	Pipe - (82)
23	22	None	0.012	33.811	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.17	0.07	7.10	0.42	0.00 2.97	0.00	171.12 159.29 158.62	169.38 159.12 158.45	1.74 0.17	8 8 Cir	5.14 0.50	8.50 2.66	2.97 0.93	Pipe - (119)
24	23	None	0.012	73.925	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.02	0.14	7.15	0.42	0.00 2.99	0.00	175.83 159.66 158.99	171.98 159.29 158.62	3.85 0.37	8 8 Cir	5.21 0.50	8.56 2.65	2.99 0.93	Pipe - (118)
25	24	None	0.012	4.964	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.01	0.01	7.15	0.42	0.00 2.99	0.00	176.90 159.68 159.01	176.64 159.66 158.99	0.26 0.02	8 12 Cir	5.23 0.40	8.56 1.59	2.99 0.83	Pipe - (117)
26	25	Genr	0.012	3.314	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.01	7.15	0.42	0.00 2.99	0.00	177.96 159.73 159.06	177.79 159.68 159.01	0.17 0.05	8 8 Cir	5.24 1.51	8.57 4.60	2.99 1.61	Pipe - (116)
27	End	MH	0.012	44.321	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.18	0.23	7.09	0.56	0.00 5.83	160.87	167.78 157.88 156.38	167.66 157.65 156.15	0.12 0.23	18 18 Cir	0.26 0.52	3.30 4.64	5.83 8.20	Pipe - (59)
28	27	MH	0.012	87.044	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	2.27	1.39	0.00	0.00	0.00 1.85	162.83	167.96 158.32 156.82	167.94 157.88 156.38	0.02 0.44	18 18 Cir	0.03 0.51	1.05 4.58	1.85 8.09	Pipe - (60)
29	28	MH	0.012	142.460	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00	2.27	0.00	0.00	1.85 1.85	163.82	168.00 159.03 157.53	167.96 158.32 156.82	0.04 0.71	18 18 Cir	0.03 0.50	1.05 4.54	1.85 8.03	Pipe - (61)
30	27	None	0.012	14.582	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.16	0.02	7.10	0.56	0.00 3.98	0.00	169.29 159.50 158.83	167.94 159.42 158.75	1.35 0.08	8 8 Cir	9.26 0.55	11.40 2.78	3.98 0.97	Pipe - (111)

NOTES: Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev4.stm

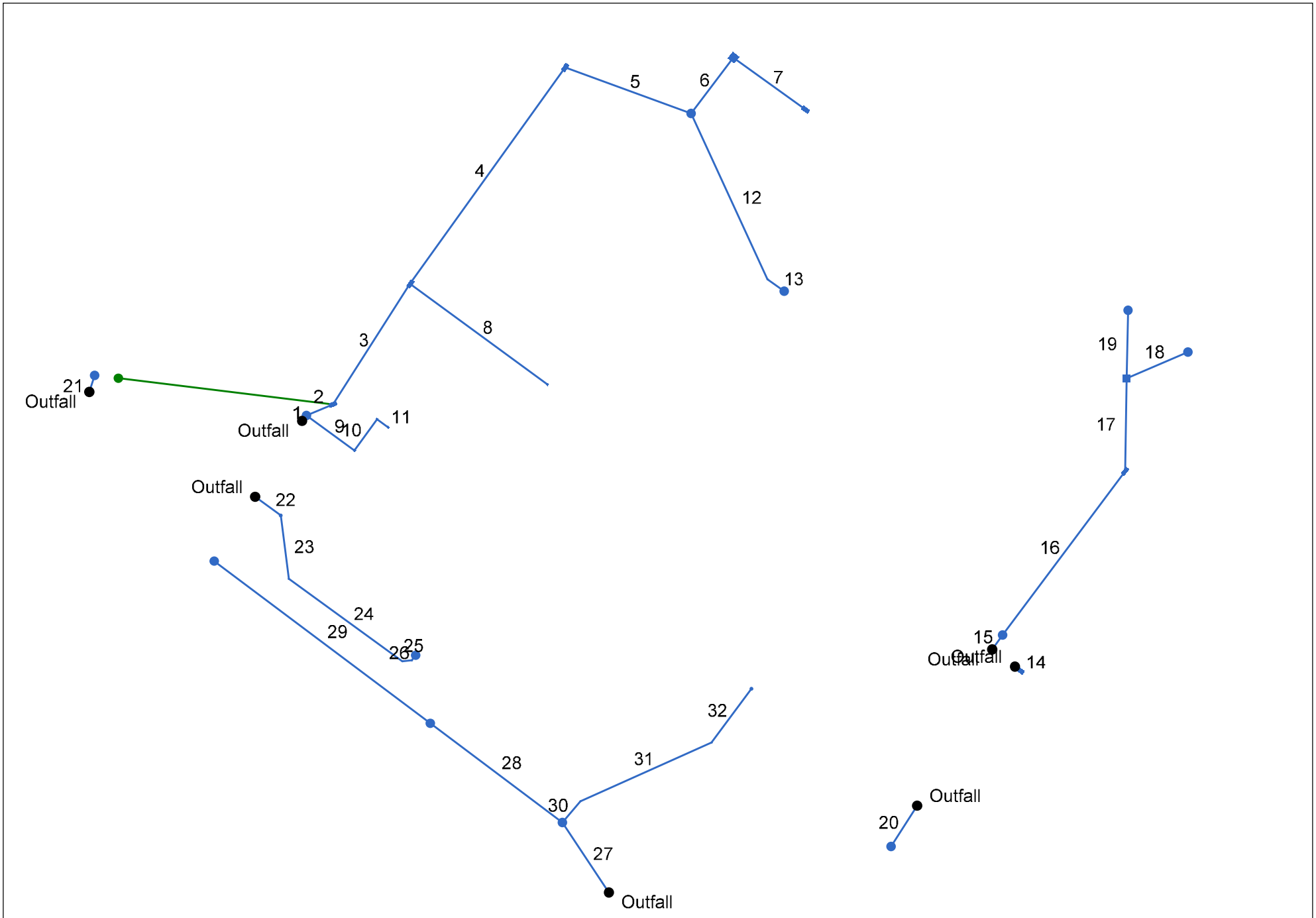
FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area C1 = 0.2 C2 = 0.5 C3 = 0.9			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q / Total Flow	Inlet elev	Elev of HGL / Elev of Crown / Elev of Invert			Rise / Span	HGL / Pipe	ADD / Full Flow		Date: 7/24/2025 / Frequency: 25 yrs / Proj: PAB220113.00-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA							Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
31	30	None	0.012	75.774	0.00	0.00	0.00	5.05	0.11	7.14	0.56	0.00	0.00	177.38	170.30	7.08	8	9.35	11.46	4.00	Pipe - (110)
					0.00	0.00	0.00					4.00		162.84	159.50		8	4.41	7.87	2.75	
					0.00	0.00	0.00							162.17	158.83	3.34	Cir				
32	31	Genr	0.012	35.213	0.00	0.00	0.00	5.00	0.05	7.15	0.56	0.00	168.64	181.81	178.50	3.31	8	9.39	11.49	4.01	Pipe - (71)
					0.00	0.00	0.00					4.01		163.54	162.84		8	1.99	5.28	1.84	
					0.00	0.00	0.00							162.87	162.17	0.70	Cir				

NOTES: Intensity = 55.41 / (Inlet time + 11.00) ^ 0.74 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev4.stm

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev4.stm	Number of lines: 32	Date: 7/24/2025

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
1	MH 120	Manhole	163.93	Cir	4.00	4.00	24	Cir	158.03	24 12	Cir Cir	158.03 158.03
2	INL 121	Combination	164.19	Rect	4.00	2.00	24	Cir	158.13	24	Cir	158.13
3	INL 122	Combination	164.99	Rect	4.00	2.00	24	Cir	158.51	18 12	Cir Cir	158.51 158.66
4	INL 123	Combination	165.11	Rect	4.00	2.00	18	Cir	159.22	18	Cir	159.37
5	MH 125	Manhole	164.85	Cir	4.00	4.00	18	Cir	159.58	14 6	Cir Cir	159.58 162.29
6	INL 126	Combination	163.79	Rect	4.00	4.00	14	Cir	159.77	12	Cir	159.77
7	INL 127	Combination	163.64	Rect	4.00	2.00	12	Cir	160.00			
8	RD1	Generic	166.88	Rect	1.00	1.00	12	Cir	159.11			
9	RD2(2)	Manhole	164.63	Rect	1.00	1.00	12	Cir	158.20	12	Cir	158.22
10	RD2(1)	Manhole	165.23	Rect	1.00	1.00	12	Cir	158.32	12	Cir	158.32
11	RD2	Combination	165.30	Rect	1.00	1.00	12	Cir	158.36			
12		None	0.00	n/a	n/a	n/a	6	Cir	164.71	6	Cir	164.71
13	RD4	Generic	0.00	Cir	4.00	4.00	6	Cir	164.87			
14	INL-221	Combination	164.29	Rect	4.00	2.00	15	Cir	160.15			
15	INL 211	Combination	164.75	Cir	4.00	2.00	18	Cir	158.68	15	Cir	158.93
16	INL-212	Combination	164.93	Rect	4.00	2.00	15	Cir	159.47	15	Cir	159.47
17	MH-213	Manhole	163.42	Rect	4.00	4.00	15	Cir	159.72	15 12	Cir Cir	159.90 159.72
18	INL213.1	Combination	163.46	Cir	4.00	2.00	15	Cir	160.09			
19	INL-214	Combination	0.00	Cir	4.00	2.00	12	Cir	159.90			
20	INL 231	Combination	163.15	Cir	4.00	4.00	15	Cir	160.00			
21	INL 110	Combination	162.50	Cir	4.00	2.00	18	Cir	159.25			

Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev4.stm | Number of Structures: 32 | Run Date: 7/24/2025

Structure Report

Struct No.	Structure ID	Junction Type	Rim Elev (ft)	Structure			Line Out			Line In		
				Shape	Length (ft)	Width (ft)	Size (in)	Shape	Invert (ft)	Size (in)	Shape	Invert (ft)
22	RD3(1)	Manhole	164.48	Cir	1.00	1.00	8	Cir	158.45	8	Cir	158.45
23		None	0.00	n/a	n/a	n/a	8	Cir	158.62	8	Cir	158.62
24		None	0.00	n/a	n/a	n/a	8	Cir	158.99	8	Cir	158.99
25		None	0.00	n/a	n/a	n/a	8	Cir	159.01	8	Cir	159.01
26	RD3	Generic	0.00	Cir	4.00	4.00	8	Cir	159.06			
27	MH 101	Manhole	160.87	Cir	4.00	4.00	18	Cir	156.38	18 8	Cir Cir	156.38 158.75
28	MH 102	Manhole	162.83	Cir	4.00	4.00	18	Cir	156.82	18	Cir	156.82
29	OCS-103	Manhole	163.82	Cir	4.00	4.00	18	Cir	157.53			
30		None	0.00	n/a	n/a	n/a	8	Cir	158.83	8	Cir	158.83
31		None	0.00	n/a	n/a	n/a	8	Cir	162.17	8	Cir	162.17
32	RD5	Generic	168.64	Cir	1.00	1.00	8	Cir	162.87			

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	Pipe - (85)	5.93	24	Cir	3.640	158.01	158.03	0.550	168.67*	168.67*	0.06	168.73	End	Manhole
2	Pipe - (63)	5.76	24	Cir	15.229	158.03	158.13	0.657	168.73*	168.74*	0.05	168.79	1	Combination
3	Pipe - (64)	5.08	24	Cir	75.492	158.13	158.51	0.503	168.79*	168.82*	0.06	168.88	2	Combination
4	Pipe - (65)	2.22	18	Cir	140.496	158.51	159.22	0.505	168.88*	168.93*	0.04	168.97	3	Combination
5	Pipe - (67)	1.77	18	Cir	70.504	159.37	159.58	0.298	168.97*	168.99*	0.02	169.00	4	Manhole
6	Pipe - (68)	1.61	14	Cir	36.961	159.58	159.77	0.514	169.00*	169.03*	0.05	169.08	5	Combination
7	Pipe - (69)	0.95	12	Cir	46.842	159.77	160.00	0.491	169.08*	169.11*	0.02	169.13	6	Combination
8	Pipe - (77)	2.26	12	Cir	89.896	158.66	159.11	0.501	168.88*	169.19*	0.13	169.31	3	Generic
9	Pipe - (78)	0.22	12	Cir	31.389	158.03	158.20	0.542	168.73*	168.73*	0.00	168.73	1	Manhole
10	Pipe - (79)	0.23	12	Cir	20.349	158.22	158.32	0.491	168.73*	168.73*	0.00	168.73	9	Manhole
11	Pipe - (80)	0.23	12	Cir	7.210	158.32	158.36	0.555	168.73*	168.73*	0.00	168.73	10	Combination
12	Pipe - (108)	0.23	6	Cir	96.463	162.29	164.71	2.509	169.00*	169.14*	0.01	169.15	5	None
13	Pipe - (107)	0.23	6	Cir	10.810	164.71	164.87	1.480	169.15*	169.17*	0.02	169.19	12	Generic
14	Pipe - (56)	0.56	15	Cir	3.658	160.13	160.15	0.546	168.67*	168.67*	0.00	168.67	End	Combination
15	Pipe - (52)	1.63	18	Cir	9.379	158.63	158.68	0.533	168.67*	168.67*	0.01	168.68	End	Combination
16	Pipe - (53)	1.22	15	Cir	108.000	158.93	159.47	0.500	168.68*	168.71*	0.01	168.73	15	Combination
17	Pipe - (54)	0.96	15	Cir	49.000	159.47	159.72	0.510	168.73*	168.74*	0.01	168.74	16	Manhole
18	Pipe - (55)	0.31	15	Cir	35.041	159.90	160.09	0.542	168.74*	168.75*	0.00	168.75	17	Combination
19	Pipe - (54) (1)	0.75	12	Cir	36.000	159.72	159.90	0.500	168.74*	168.76*	0.01	168.77	17	Combination
20	Pipe - (57)	1.01	15	Cir	25.570	159.28	160.00	2.816	168.67*	168.68*	0.01	168.69	End	Combination
21	Pipe - (62)	4.23	18	Cir	9.207	158.03	159.25	13.251	168.67*	168.68*	0.09	168.77	End	Combination
22	Pipe - (82)	3.39	8	Cir	16.733	158.36	158.45	0.538	168.67*	169.80*	1.13	170.93	End	Manhole
23	Pipe - (119)	3.40	8	Cir	33.811	158.45	158.62	0.503	170.93*	173.21*	1.14	174.35	22	None
24	Pipe - (118)	3.42	8	Cir	73.925	158.62	158.99	0.501	174.35*	179.40*	1.06	180.46	23	None

Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev4.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Return period = 100 Yrs. ; *Surcharged (HGL above crown).

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
25	Pipe - (117)	3.42	8	Cir	4.964	158.99	159.01	0.403	180.46*	180.80*	1.17	181.97	24	None
26	Pipe - (116)	3.42	8	Cir	3.314	159.01	159.06	1.509	181.97*	182.20*	1.50	183.69	25	Generic
27	Pipe - (59)	6.41	18	Cir	44.321	156.15	156.38	0.519	168.67*	168.81*	0.20	169.01	End	Manhole
28	Pipe - (60)	1.85	18	Cir	87.044	156.38	156.82	0.505	169.01*	169.03*	0.00	169.03	27	Manhole
29	Pipe - (61)	1.85	18	Cir	142.460	156.82	157.53	0.498	169.03*	169.07*	0.02	169.09	28	Manhole
30	Pipe - (111)	4.56	8	Cir	14.582	158.75	158.83	0.549	169.01*	170.78*	1.33	172.11	27	None
31	Pipe - (110)	4.58	8	Cir	75.774	158.83	162.17	4.408	172.11*	181.40*	1.47	182.88	30	None
32	Pipe - (71)	4.59	8	Cir	35.213	162.17	162.87	1.988	182.88*	187.21*	2.69	189.90	31	Generic

Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev4.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Return period = 100 Yrs. ; *Surcharged (HGL above crown).

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
1	MH 120	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
2	INL 121	0.99	0.00	0.93	0.06	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.14	3.81	0.05	0.96	0.0	21
3	INL 122	1.32	0.00	1.32	0.00	Comb	4.0	0.06	0.12	0.06	2.00	Sag	2.00	0.050	0.020	0.013	0.30	12.08	0.30	12.08	0.0	Off
4	INL 123	0.59	0.00	0.59	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.14	3.81	0.14	3.81	0.0	Off
5	MH 125	0.00	0.09	0.00	0.09	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
6	INL 126	0.71	0.00	0.70	0.01	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.12	3.09	0.03	0.57	0.0	Off
7	INL 127	0.95	0.00	0.90	0.05	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.13	3.72	0.05	0.91	0.0	Off
8	RD1	2.26	0.00	1.03	1.23	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off
9	RD2(2)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
10	RD2(1)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
11	RD2	0.23	0.00	0.23	0.00	Comb	4.0	0.03	0.05	0.03	2.00	Sag	2.00	0.050	0.020	0.013	0.13	3.54	0.13	3.54	0.0	Off
12		0.00	0.09	0.00	0.09	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	5
13	RD4	0.23	0.00	0.14	0.09	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	12
14	INL-221	0.56	0.00	0.56	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.13	3.67	0.13	3.67	0.0	Off
15	INL 211	0.58	0.00	0.58	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.14	3.77	0.14	3.77	0.0	Off
16	INL-212	0.34	0.00	0.34	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.11	2.47	0.11	2.47	0.0	Off
17	MH-213	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	Off
18	INL213.1	0.31	0.00	0.31	0.00	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.09	1.80	0.00	0.00	0.0	Off
19	INL-214	0.75	0.00	0.68	0.08	Comb	4.0	1.00	0.00	1.00	2.00	0.020	2.00	0.050	0.020	0.013	0.15	4.25	0.06	1.26	0.0	Off
20	INL 231	1.01	0.00	1.01	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.17	5.68	0.17	5.68	0.0	Off
21	INL 110	4.23	0.06	4.29	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.37	15.68	0.37	15.68	0.0	Off
22	RD3(1)	0.00	0.00	0.00	0.00	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
23		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	22

Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev4.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Inlet N-Values = 0.016; Intensity = 46.91 / (Inlet time + 9.20) ^ 0.66; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

Inlet Report

Line No	Inlet ID	Q = CIA (cfs)	Q carry (cfs)	Q capt (cfs)	Q Byp (cfs)	Junc Type	Curb Inlet		Grate Inlet			Gutter							Inlet			Byp Line No
							Ht (in)	L (ft)	Area (sqft)	L (ft)	W (ft)	So (ft/ft)	W (ft)	Sw (ft/ft)	Sx (ft/ft)	n	Depth (ft)	Spread (ft)	Depth (ft)	Spread (ft)	Depr (in)	
24		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	23
25		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	24
26	RD3	3.42	0.00	2.06	1.37	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off
27	MH 101	0.00	0.00	0.00	0.00	MH	0.0	2.00	0.00	2.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
28	MH 102	0.00	0.00	0.00	0.00	MH	0.0	2.00	0.00	2.00	0.00	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
29	OCS-103	1.85*	0.00	0.00	1.85	MH	0.0	0.00	0.00	0.00	0.00	Sag	0.00	0.000	0.000	0.013	0.00	0.00	0.00	0.00	0.0	Off
30		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	27
31		0.00	0.00	0.00	0.00	None	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.00	0.00	0.00	0.00	0.0	30
32	RD5	4.59	0.00	2.76	1.83	Genr	0.0	0.00	0.00	0.00	0.00	Sag	2.00	0.050	0.020	0.013	0.30	12.00	0.30	12.00	0.0	Off

Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev4.stm | Number of lines: 32 | Run Date: 7/24/2025

NOTES: Inlet N-Values = 0.016; Intensity = 46.91 / (Inlet time + 9.20) ^ 0.66; Return period = 100 Yrs. ; * Indicates Known Q added. All curb inlets are throat.

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q	Inlet elev	Elev of HGL			Rise	HGL	ADD		Date: 7/24/2025
					C1 = 0.2 C2 = 0.5 C3 = 0.9							Total Flow		Elev of Crown			Span	Pipe	Full Flow		Frequency: 100 yrs
														Elev of Invert							Proj: PAB220113.00-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
1	End	MH	0.012	3.640	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.20	0.03	6.67	0.89	0.00 5.93	163.93	168.67 160.03 158.03	168.67 160.01 158.01	0.00 0.02	24 24 Cir	0.06 0.55	1.89 5.78	5.93 18.16	Pipe - (85)
2	1	Comb	0.012	15.229	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.08	0.12	6.70	0.86	0.00 5.76	164.19	168.74 160.13 158.13	168.73 160.03 158.03	0.01 0.10	24 24 Cir	0.06 0.66	1.84 6.32	5.76 19.86	Pipe - (63)
3	2	Comb	0.012	75.492	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	9.38	0.70	6.86	0.74	0.00 5.08	164.99	168.82 160.51 158.51	168.79 160.13 158.13	0.03 0.38	24 24 Cir	0.04 0.50	1.62 5.53	5.08 17.38	Pipe - (64)
4	3	Comb	0.012	140.496	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.63	1.74	7.32	0.30	0.00 2.22	165.11	168.93 160.72 159.22	168.88 160.01 158.51	0.05 0.71	18 18 Cir	0.04 0.51	1.26 4.58	2.22 8.09	Pipe - (65)
5	4	MH	0.012	70.504	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	6.51	1.13	7.66	0.23	0.00 1.77	164.85	168.99 161.08 159.58	168.97 160.87 159.37	0.02 0.21	18 18 Cir	0.02 0.30	1.00 3.51	1.77 6.21	Pipe - (67)
6	5	Comb	0.012	36.961	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.65	0.40	7.95	0.20	0.00 1.61	163.79	169.03 160.94 159.77	169.00 160.75 159.58	0.03 0.19	14 14 Cir	0.08 0.51	1.51 3.90	1.61 4.17	Pipe - (68)
7	6	Comb	0.012	46.842	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.65	8.19	0.12	0.00 0.95	163.64	169.11 161.00 160.00	169.08 160.77 159.77	0.03 0.23	12 12 Cir	0.06 0.49	1.21 3.44	0.95 2.70	Pipe - (69)
8	3	Genr	0.012	89.896	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.52	8.19	0.28	0.00 2.26	166.88	169.19 160.11 159.11	168.88 159.66 158.66	0.31 0.45	12 12 Cir	0.34 0.50	2.87 3.48	2.26 2.73	Pipe - (77)
9	1	MH	0.012	31.389	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	6.55	1.77	7.65	0.03	0.00 0.22	164.63	168.73 159.20 158.20	168.73 159.03 158.03	0.00 0.17	12 12 Cir	0.00 0.54	0.28 3.61	0.22 2.84	Pipe - (78)
10	9	MH	0.012	20.349	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.40	1.14	8.04	0.03	0.00 0.23	165.23	168.73 159.32 158.32	168.73 159.22 158.22	0.00 0.10	12 12 Cir	0.00 0.49	0.29 3.44	0.23 2.70	Pipe - (79)

NOTES: Intensity = 46.91 / (Inlet time + 9.20) ^ 0.66 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev4.stm

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q	Inlet elev	Elev of HGL			Rise	HGL	ADD		Date: 7/24/2025
					C1 = 0.2 C2 = 0.5 C3 = 0.9							Total Flow		Elev of Crown			Span	Pipe	Full Flow		Frequency: 100 yrs
														Elev of Invert							Proj: PAB220113.00-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
11	10	Comb	0.012	7.210	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.40	8.19	0.03	0.00 0.23	165.30	168.73 159.36 158.36	168.73 159.32 158.32	0.00 0.04	12 12 Cir	0.00 0.55	0.30 3.66	0.23 2.87	Pipe - (80)
12	5	None	0.012	96.463	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.15	1.36	8.13	0.03	0.00 0.23	0.00	169.14 165.21 164.71	169.00 162.79 162.29	0.14 2.42	6 6 Cir	0.15 2.51	1.18 4.90	0.23 0.96	Pipe - (108)
13	12	Genr	0.012	10.810	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.15	8.19	0.03	0.00 0.23	0.00	169.17 165.37 164.87	169.15 165.21 164.71	0.02 0.16	6 6 Cir	0.15 1.48	1.19 3.76	0.23 0.74	Pipe - (107)
14	End	Comb	0.012	3.658	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.13	8.19	0.07	0.00 0.56	164.29	168.67 161.40 160.15	168.67 161.38 160.13	0.00 0.02	15 15 Cir	0.01 0.55	0.46 4.21	0.56 5.17	Pipe - (56)
15	End	Comb	0.012	9.379	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	9.86	0.15	6.75	0.24	0.00 1.63	164.75	168.67 160.18 158.68	168.67 160.13 158.63	0.00 0.05	18 18 Cir	0.02 0.53	0.92 4.70	1.63 8.31	Pipe - (52)
16	15	Comb	0.012	108.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	8.25	1.61	7.15	0.17	0.00 1.22	164.93	168.71 160.72 159.47	168.68 160.18 158.93	0.03 0.54	15 15 Cir	0.03 0.50	1.00 4.03	1.22 4.95	Pipe - (53)
17	16	MH	0.012	49.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.30	0.95	7.42	0.13	0.00 0.96	163.42	168.74 160.97 159.72	168.73 160.72 159.47	0.01 0.25	15 15 Cir	0.02 0.51	0.79 4.07	0.96 5.00	Pipe - (54)
18	17	Comb	0.012	35.041	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	2.30	8.19	0.04	0.00 0.31	163.46	168.75 161.34 160.09	168.74 161.15 159.90	0.00 0.19	15 15 Cir	0.00 0.54	0.25 4.20	0.31 5.15	Pipe - (55)
19	17	Comb	0.012	36.000	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.63	8.19	0.09	0.00 0.75	0.00	168.76 160.90 159.90	168.74 160.72 159.72	0.01 0.18	12 12 Cir	0.04 0.50	0.96 3.47	0.75 2.73	Pipe - (54) (1)
20	End	Comb	0.012	25.570	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.52	8.19	0.12	0.00 1.01	163.15	168.68 161.25 160.00	168.67 160.53 159.28	0.01 0.72	15 15 Cir	0.02 2.82	0.82 9.57	1.01 11.74	Pipe - (57)

NOTES: Intensity = 46.91 / (Inlet time + 9.20) ^ 0.66 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev4.stm

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area C1 = 0.2 C2 = 0.5 C3 = 0.9			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q / Total Flow	Inlet elev	Elev of HGL / Elev of Crown / Elev of Invert			Rise / Span	HGL / Pipe	ADD / Full Flow		Date: 7/24/2025 / Frequency: 100 yrs / Proj: PAB220113.00-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
21	End	Comb	0.012	9.207	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.06	8.19	0.52	0.00 4.23	162.50	168.68 160.75 159.25	168.67 159.53 158.03	0.01 1.22	18 18 Cir	0.14 13.25	2.40 23.43	4.23 41.41	Pipe - (62)
22	End	MH	0.012	16.733	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.20	0.03	8.11	0.42	0.00 3.39	164.48	169.80 159.12 158.45	168.67 159.03 158.36	1.13 0.09	8 8 Cir	6.73 0.54	9.72 2.75	3.39 0.96	Pipe - (82)
23	22	None	0.012	33.811	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.14	0.06	8.14	0.42	0.00 3.40	0.00	173.21 159.29 158.62	170.93 159.12 158.45	2.29 0.17	8 8 Cir	6.76 0.50	9.74 2.66	3.40 0.93	Pipe - (119)
24	23	None	0.012	73.925	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.02	0.13	8.18	0.42	0.00 3.42	0.00	179.40 159.66 158.99	174.35 159.29 158.62	5.06 0.37	8 8 Cir	6.84 0.50	9.80 2.65	3.42 0.93	Pipe - (118)
25	24	None	0.012	4.964	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.01	0.01	8.19	0.42	0.00 3.42	0.00	180.80 159.68 159.01	180.46 159.66 158.99	0.34 0.02	8 12 Cir	6.86 0.40	9.81 1.59	3.42 0.83	Pipe - (117)
26	25	Genr	0.012	3.314	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.01	8.19	0.42	0.00 3.42	0.00	182.20 159.73 159.06	181.97 159.68 159.01	0.23 0.05	8 8 Cir	6.87 1.51	9.81 4.60	3.42 1.61	Pipe - (116)
27	End	MH	0.012	44.321	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.16	0.21	8.13	0.56	0.00 6.41	160.87	168.81 157.88 156.38	168.67 157.65 156.15	0.14 0.23	18 18 Cir	0.32 0.52	3.63 4.64	6.41 8.20	Pipe - (59)
28	27	MH	0.012	87.044	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	2.27	1.39	0.00	0.00	0.00 1.85	162.83	169.03 158.32 156.82	169.01 157.88 156.38	0.02 0.44	18 18 Cir	0.03 0.51	1.05 4.58	1.85 8.09	Pipe - (60)
29	28	MH	0.012	142.460	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	0.00	2.27	0.00	0.00	1.85 1.85	163.82	169.07 159.03 157.53	169.03 158.32 156.82	0.04 0.71	18 18 Cir	0.03 0.50	1.05 4.54	1.85 8.03	Pipe - (61)
30	27	None	0.012	14.582	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.14	0.02	8.14	0.56	0.00 4.56	0.00	170.78 159.50 158.83	169.01 159.42 158.75	1.77 0.08	8 8 Cir	12.16 0.55	13.07 2.78	4.56 0.97	Pipe - (111)

NOTES: Intensity = 46.91 / (Inlet time + 9.20) ^ 0.66 (in/hr) ; Time of flow in section is based on full flow.

Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev4.stm

FL-DOT Report

Line No	To Line	Type of struc	n - Value	Len	Drainage Area			Time of conc	Time of Flow in sect	Inten (I)	Total CA	Add Q	Inlet elev	Elev of HGL			Rise	HGL	ADD		Date: 7/24/2025
					C1 = 0.2 C2 = 0.5 C3 = 0.9							Total Flow		Elev of Crown			Span	Pipe	Full Flow		Frequency: 100 yrs
														Elev of Invert							Proj: PAB220113.00-Storm
					Increment (ac)	Sub-Total (ac)	Sum CA					Q		Up	Down	Fall	Size	Slope	Vel	Cap	
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
31	30	None	0.012	75.774	0.00	0.00	0.00	5.04	0.10	8.17	0.56	0.00	0.00	181.40	172.11	9.29	8	12.27	13.13	4.58	Pipe - (110)
					0.00	0.00	0.00					4.58		162.84	159.50		8	4.41	7.87	2.75	
					0.00	0.00	0.00							162.17	158.83	3.34	Cir				
32	31	Genr	0.012	35.213	0.00	0.00	0.00	5.00	0.04	8.19	0.56	0.00	168.64	187.21	182.88	4.34	8	12.32	13.15	4.59	Pipe - (71)
					0.00	0.00	0.00					4.59		163.54	162.84		8	1.99	5.28	1.84	
					0.00	0.00	0.00							162.87	162.17	0.70	Cir				

NOTES: Intensity = 46.91 / (Inlet time + 9.20) ^ 0.66 (in/hr) ; Time of flow in section is based on full flow.

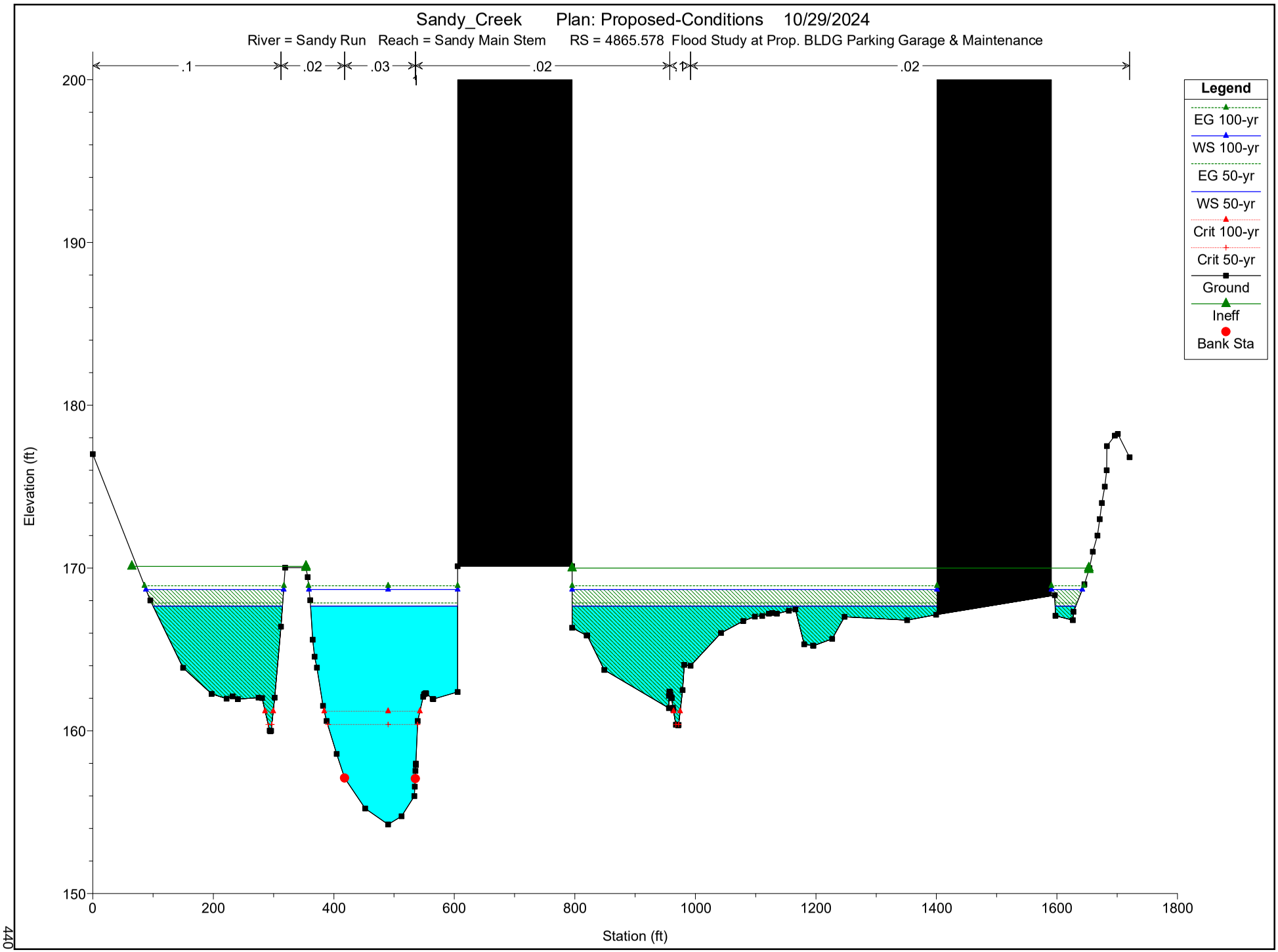
Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev4.stm

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 4865.578 Profile: 50-yr

E.G. Elev (ft)	167.85	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.020	0.030	0.020
W.S. Elev (ft)	167.66	Reach Len. (ft)	54.72	75.61	94.12
Crit W.S. (ft)	160.38	Flow Area (sq ft)	380.20	1454.88	406.06
E.G. Slope (ft/ft)	0.000180	Area (sq ft)	1341.90	1454.88	1782.89
Q Total (cfs)	7709.00	Flow (cfs)	1325.80	5161.43	1221.78
Top Width (ft)	1098.68	Top Width (ft)	271.49	117.19	710.00
Vel Total (ft/s)	3.44	Avg. Vel. (ft/s)	3.49	3.55	3.01
Max Chl Dpth (ft)	13.41	Hydr. Depth (ft)	6.71	12.41	5.79
Conv. Total (cfs)	575353.1	Conv. (cfs)	98949.4	385217.8	91185.9
Length Wtd. (ft)	77.86	Wetted Per. (ft)	57.99	117.71	76.97
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.07	0.14	0.06
Alpha	1.01	Stream Power (lb/ft s)	1720.50	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	95.82	41.52	198.76
C & E Loss (ft)	0.02	Cum SA (acres)	26.90	4.23	43.46

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 4865.578 Profile: 100-yr

E.G. Elev (ft)	168.91	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.	0.020	0.030	0.020
W.S. Elev (ft)	168.67	Reach Len. (ft)	54.72	75.61	94.12
Crit W.S. (ft)	161.20	Flow Area (sq ft)	438.74	1573.57	477.09
E.G. Slope (ft/ft)	0.000206	Area (sq ft)	1625.23	1573.57	2509.82
Q Total (cfs)	9741.00	Flow (cfs)	1746.54	6297.71	1696.76
Top Width (ft)	1131.84	Top Width (ft)	287.73	117.19	726.92
Vel Total (ft/s)	3.91	Avg. Vel. (ft/s)	3.98	4.00	3.56
Max Chl Dpth (ft)	14.42	Hydr. Depth (ft)	7.41	13.43	6.80
Conv. Total (cfs)	679032.7	Conv. (cfs)	121748.7	439005.2	118278.7
Length Wtd. (ft)	78.08	Wetted Per. (ft)	60.78	117.71	78.01
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.09	0.17	0.08
Alpha	1.01	Stream Power (lb/ft s)	1720.50	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	111.10	44.36	226.93
C & E Loss (ft)	0.03	Cum SA (acres)	27.95	4.23	44.18


Sandy_Creek Plan: Proposed-Conditions 10/29/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4865.578 Flood Study at Prop. BLDG Parking Garage & Maintenance
.1
.02
.03
.02
.02
Legend
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 100-yr
Crit 50-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
200
190
180
170
160
150
0
200
400
600
800
1000
1200
1400
1600
1800

Supporting Documentation

Permanent Channel Design Data

Project: **BMW Automotive Dealership Expansion**
Description: **500 Pennsylvania Avenue**
Whitemarsh Township, Montgomery County

Slope Condition (Minimum, Maximum, Entire)	Minimum	Maximum	Minimum	Maximum
Channel or Channel Section	**Existing Swale-1**	**Existing Swale-1**	**Permanent Swale**	**Permanent Swale**
Channel Condition (Temporary or Permanent)	**Permanent**	**Temporary**	**Permanent**	**Permanent**
Design Storm (2-Year or 10-Year)	2-Year	2-Year	10-Year	10-Year
Acres (Ac)	3.78	3.78	0.50	0.50
Multiplier (1.6 for temporary or 2.75 for permanent)	2.75	2.75	2.75	2.75
Q_r (Required Capacity, cfs)	10.40	10.40	1.38	1.38
Q (At Flow Depth d, cfs)	10.40	10.40	1.38	1.38
Protective Lining **	Grass (6")	Grass (6")	Grass (6")	Grass (6")
n (Manning's Coefficient) **	0.095	0.095	0.093	0.093
V_a (Allowable Velocity, fps)	4.00	4.00	4.00	4.00
V (At Flow Depth d, fps)	0.83	0.83	0.96	0.96
τ_a (Max. Allowable Shear Stress, lb/ft2)	1.00	1.00	1.00	1.00
τ_d (Shear Stress at Flow Depth d, lb/ft2)	0.25	0.25	0.44	0.44
Channel Bottom Width (ft)	6.00	6.00	3.00	3.00
Z1 Channel Side Slope (H:V)	2.00	2.00	3.00	3.00
Z2 Channel Side Slope (H:V)	3.00	3.00	3.00	3.00
D (Design Depth in ft)	1.00	1.00	1.00	1.00
Channel Top Width (ft) @D	11.00	11.00	9.00	9.00
d (Flow Depth in ft)	1.34	1.34	0.35	0.35
Channel Top Width (ft) @d	12.71	12.71	5.12	5.12
Bottom Width: Depth Ratio (12:1 max)	4.47	4.47	8.47	8.47
d_{50} Stone Size (in)	N/A	N/A	N/A	N/A
A (Area in s.f. at flow depth, d)	12.55	12.55	1.44	1.44
P (Wetted Perimeter in ft)	13.24	13.24	5.24	5.24
R (Hydraulic Radius (A/P))	0.95	0.95	0.27	0.27
S (Bed Slope, ft/ft) *	0.003	0.003	0.020	0.020
S_c (Critical Slope)	0.139	0.139	0.198	0.198
$0.7S_c$	0.097	0.097	0.138	0.138
$1.3S_c$	0.180	0.180	0.257	0.257
Stable Flow? (Y/N)	Y	Y	Y	Y
Freeboard Based on Unstable Flow, ft	N/A	N/A	N/A	N/A
Freeboard Based On Stable Flow, ft	0.34	0.34	0.09	0.09
Minimum Required Freeboard, ft ***	0.50	0.50	0.50	0.50
Minimum Required Depth, ft	1.84	1.84	0.85	0.85
Design Method for Protective Lining**** Permissible Velocity (V) or Shear Stress (S)	S	S	S	S
Vegetative Lining Retardance	C	C	C	C
Include Bend Analysis (Approx. Horizontal Radius, ft)				
Additional Depth Adjustment for Horizontal Bend	0.00	0.00	0.00	0.00

** Slopes may not be averaged.*

*** For vegetated channels, provide data for temporary linings and vegetated conditions in separate columns.*

****Minimum Freeboard, F, is 0.50 ft.*

*****Permissible velocity lining design method is not acceptable for channels with a bed slope of 10% or greater.*

*****Shear stress lining design method is recommended for channels with a bed slope of 10% or greater.*

*****Shear stress lining design method may be used for any channel bed slope.*

Swale Calculations

Project: **BMW Automotive Dealership Expansion**

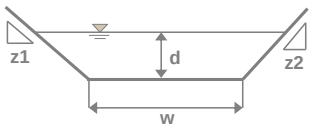
Description: **500 Pennsylvania Avenue**
Whitemarsh Township, Montgomery County

Swale Name: **Existing Swale-1**

Input Channel Parameters

Channel Dimensions

z1	2.00	ft. (horiz to 1' vert.)
z2	3.00	ft. (horiz to 1' vert.)
w	6.00	ft. (bottom width)
d	1.00	ft. (design depth)



Slope Condition

Minimum	0.0030	ft/ft (capacity)
Maximum	0.0030	ft/ft (stability)
Entire	0.0030	ft/ft

Evaluate Temporary & Permanent Conditions

Design Method: **Shear Stress**

☐ **Temporary**

Calculate Design Flow (Q)

2-yr storm cfs

OR

Area acres

x cfs/acre

cfs (design Q)

Select Lining Material

	Lining	Retardance (A, B, C, D)	d_{50} Stone Size (in.)	Initial n-value	Allowable Velocity	Allowable τ_d (lb/ft^2)
z1						
z2						
w						

Results

	n-value	d	v (fps)	τ_d (lb/ft^2)
Min. slope				
Max. slope				
Entire slope				

☑ **Permanent**

Calculate Design Flow (Q)

10-yr storm cfs

OR

Area 3.78 acres

x 2.75 cfs/acre

10.40 cfs (design Q)

Select Lining Material

	Lining	Retardance (A, B, C, D)	d_{50} Stone Size (in.)	Initial n-value	Allowable Velocity	Allowable τ_d (lb/ft^2)
z1	**Grass (6")**	**C**	N/A	0.034	4.000	**1.000**
z2	**Grass (6")**	**C**	N/A	0.034	4.000	**1.000**
w	**Grass (6")**	**C**	N/A	0.034	4.000	**1.000**

Results

	n-value	d	v (fps)	τ_d (lb/ft^2)
Min. slope	0.095	1.34	0.83	**0.25**
Max. slope	0.095	1.34	0.83	**0.25**
Entire slope	0.095	1.34	0.83	**0.25**

Swale Calculations

Project: **BMW Automotive Dealership Expansion**

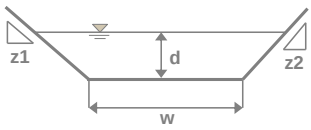
Description: **500 Pennsylvania Avenue**
Whitemarsh Township, Montgomery County

Swale Name: **Permanent Swale**

Input Channel Parameters

Channel Dimensions

z1	3.00	ft. (horiz to 1' vert.)
z2	3.00	ft. (horiz to 1' vert.)
w	3.00	ft. (bottom width)
d	1.00	ft. (design depth)



Slope Condition

Minimum	0.0200	ft/ft (capacity)
Maximum	0.0200	ft/ft (stability)
Entire	0.0200	ft/ft

Evaluate Temporary & Permanent Conditions

Design Method: **Shear Stress**

☐ **Temporary**

Calculate Design Flow (Q)

2-yr storm cfs

OR

Area acres

x cfs/acre

cfs (design Q)

Select Lining Material

	Lining	Retardance (A, B, C, D)	d_{50} Stone Size (in.)	Initial n-value	Allowable Velocity	Allowable τ_d (lb/ft^2)
z1						
z2						
w						

Results

	n-value	d	v (fps)	τ_d (lb/ft^2)
Min. slope				
Max. slope				
Entire slope				

☑ **Permanent**

Calculate Design Flow (Q)

10-yr storm cfs

OR

Area 0.50 acres

x 2.75 cfs/acre

1.38 cfs (design Q)

Select Lining Material

	Lining	Retardance (A, B, C, D)	d_{50} Stone Size (in.)	Initial n-value	Allowable Velocity	Allowable τ_d (lb/ft^2)
z1	**Grass (6")**	**C**	N/A	0.034	4.000	**1.000**
z2	**Grass (6")**	**C**	N/A	0.034	4.000	**1.000**
w	**Grass (6")**	**C**	N/A	0.034	4.000	**1.000**

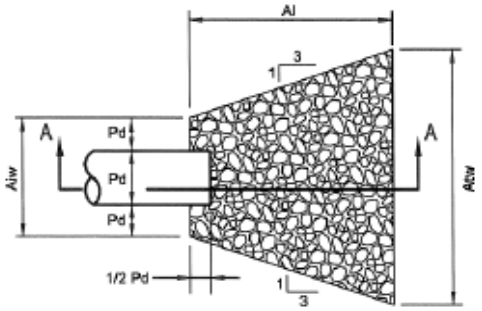
Results

	n-value	d	v (fps)	τ_d (lb/ft^2)
Min. slope	0.093	0.35	0.96	**0.44**
Max. slope	0.093	0.35	0.96	**0.44**
Entire slope	0.093	0.35	0.96	**0.44**

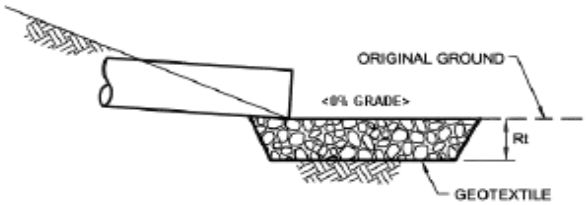
Rip-rap Apron Summary Sheet

Project: **BMW Automotive Dealership Expansion**

Description: **510 Pennsylvania Ave, Whitemarsh Township, Montgomery County**



PLAN VIEW



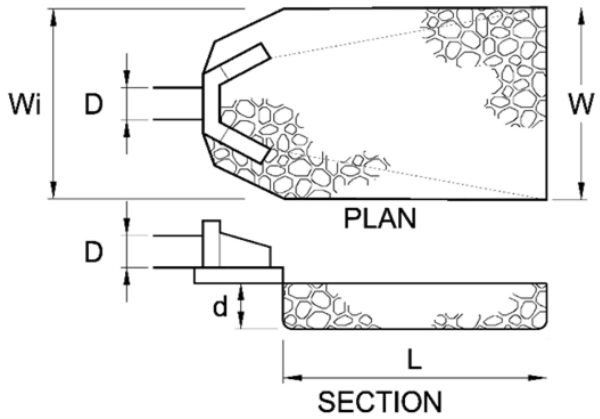
SECTION A - A

Outlet Name	Pipe						Apron					
	Dia. In.	Tail Water Condition Min or Max	Manning's "n" For Pipe	Slope	Q cfs	V[1] fps	d_{50} R-	in.	Rt in.	Al ft.	Aiw ft.	Atw ft
EW-100	18	MIN	0.013	0.0052	1.93	3.53	3	6	9.0	8.00	4.5	12.5
EW-300	18	MIN	0.013	0.0050	3.05	4.06	3	6	9.0	8.00	4.5	12.5

Rip-Rap Apron Worksheet

Project: **BMW Automotive Dealership Expansion**

Description: **EW-100**
510 Pennsylvania Ave, Whitemarsh Township, Montgomery County



Rip-Rap Dimensions:

L=	8.0	ft
W =	12.5	ft
Wi =	4.5	ft
Rip-rap Size =	R-3	
d50 =	6.0	in
d=	9.0	in

Design Values:

n =	*Manning's n*	0.013	
D =	*Diameter of Pipe*	18	in.
S =	*Slope of Pipe*	0.0052	ft/ft
Q_d =	*Design Discharge*	1.93	cfs***
V_d =	*Velocity*	3.53	fps***
T_w =	*Tailwater Condition*	MIN	either MIN or MAX
A =	*Full Flow Area of Pipe*	1.77	sf

Rise (in.)		Span (in.)		Barrels
18	x	18		1

1.93	
3.53	

*** *Formulas based on full-flow capacity.*

Full Flow Pipe Discharge:

Q_f = *0.464/n * D* $^{8/3}$ ** S* $^{1/2}$ = 7.59 cfs

Ratio of Part-Full to Full Flow Discharge:

d/D = Q_d/Q_f = 0.25

Figure 20 Ratios:

Area of Flow =	0.31
Depth of Flow =	0.35

Calculate Equivalent Flow:

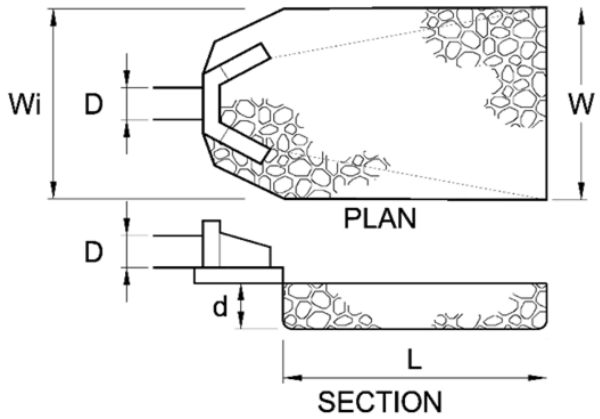
*A * Ratio* =	0.55	sf
Equivalent Pipe Size full-flow =	12	in (smaller size = larger rip-rap (factor of safety))

Rip-Rap Apron Worksheet

Project: **BMW Automotive Dealership Expansion**

Description: **EW-300**

510 Pennsylvania Ave, Whitemarsh Township, Montgomery County



Rip-Rap Dimensions:

L=	8.0	ft
W =	12.5	ft
Wi =	4.5	ft
Rip-rap Size =	R-3	
d50 =	6.0	in
d=	9.0	in

Design Values:

n =	*Manning's n*	0.013		
D =	*Diameter of Pipe*	18	in.	Rise (in.) 18 x Span (in.) 18, Barrels 1
S =	*Slope of Pipe*	0.0050	ft/ft	
Q_d =	*Design Discharge*	3.05	cfs***	3.05
V_d =	*Velocity*	4.06	fps***	4.06
T_w =	*Tailwater Condition*	MIN	either MIN or MAX	
A =	*Full Flow Area of Pipe*	1.77	sf	

*** Formulas based on full-flow capacity.

Full Flow Pipe Discharge:

Q_f = *0.464/n * D $^{8/3}$ * S $^{1/2}$ =* 7.44 cfs

Ratio of Part-Full to Full Flow Discharge:

d/D = Q_d/Q_f = 0.41

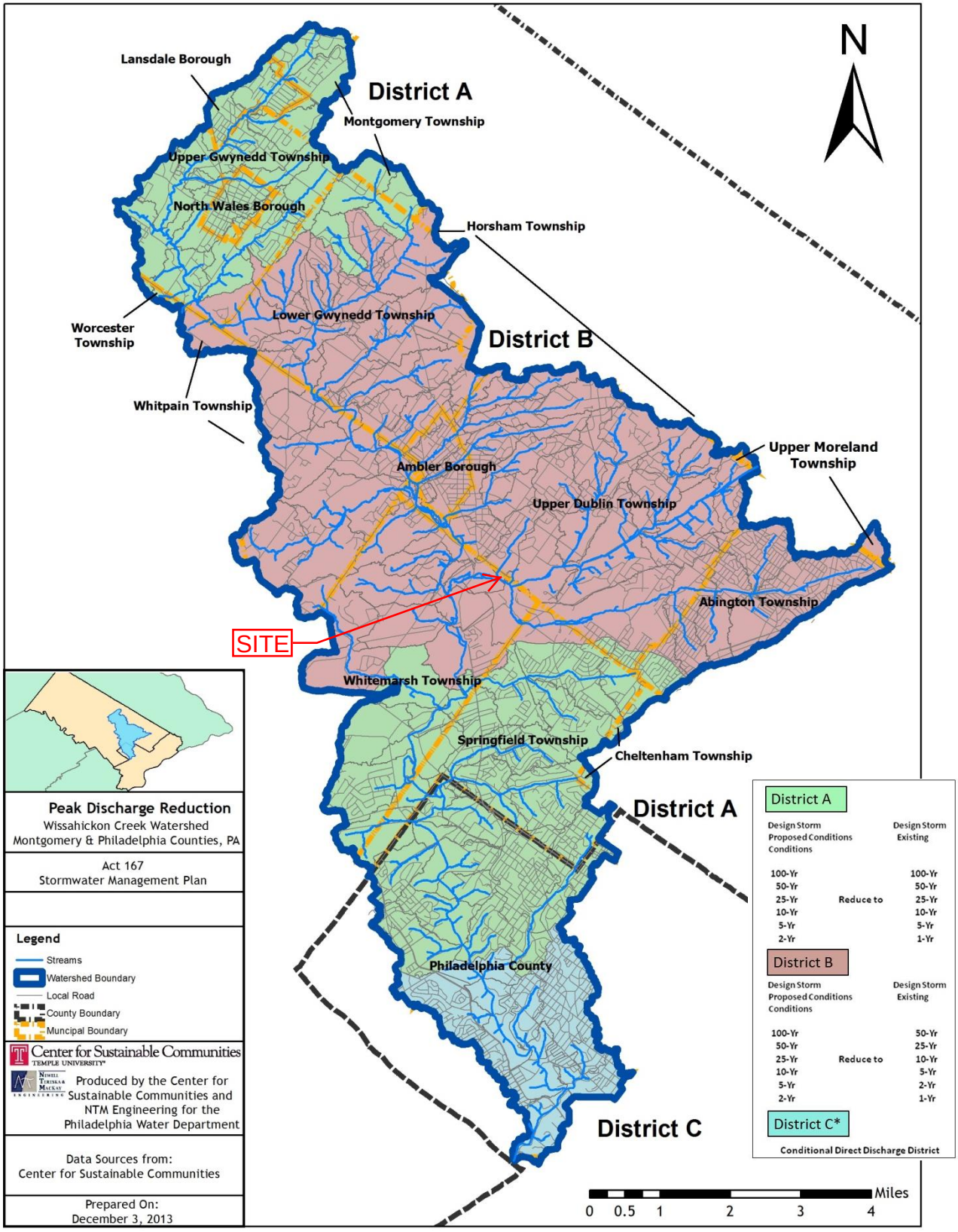
Figure 20 Ratios:

Area of Flow =	0.44
Depth of Flow =	0.44

Calculate Equivalent Flow:

*A * Ratio* =	0.77	sf
Equivalent Pipe Size full-flow =	12	in (smaller size = larger rip-rap (factor of safety))

Figure 4.4.E Peak Rate Management District Map for the Wissahickon Watershed



NOAA Atlas 14, Volume 2, Version 3
Location name: Fort Washington, Pennsylvania, USA*
Latitude: 40.134°, Longitude: -75.207°
Elevation: m/ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**4.13** (3.78-4.52)	**4.92** (4.50-5.39)	**5.80** (5.28-6.32)	**6.41** (5.84-7.01)	**7.16** (6.49-7.82)	**7.68** (6.92-8.40)	**8.20** (7.36-8.98)	**8.65** (7.72-9.50)	**9.19** (8.12-10.1)	**9.59** (8.42-10.6)
10-min	**3.29** (3.02-3.61)	**3.94** (3.60-4.30)	**4.64** (4.23-5.07)	**5.13** (4.67-5.60)	**5.71** (5.17-6.23)	**6.12** (5.51-6.69)	**6.51** (5.84-7.13)	**6.85** (6.12-7.53)	**7.27** (6.43-8.02)	**7.55** (6.63-8.37)
15-min	**2.75** (2.52-3.01)	**3.30** (3.02-3.61)	**3.91** (3.57-4.27)	**4.32** (3.94-4.73)	**4.82** (4.37-5.27)	**5.16** (4.66-5.65)	**5.48** (4.92-6.01)	**5.76** (5.15-6.34)	**6.10** (5.40-6.73)	**6.32** (5.55-7.00)
30-min	**1.88** (1.72-2.06)	**2.28** (2.08-2.49)	**2.78** (2.54-3.04)	**3.13** (2.86-3.43)	**3.57** (3.24-3.90)	**3.89** (3.51-4.25)	**4.20** (3.77-4.60)	**4.49** (4.01-4.93)	**4.85** (4.29-5.36)	**5.12** (4.49-5.67)
60-min	**1.17** (1.08-1.29)	**1.43** (1.31-1.56)	**1.78** (1.63-1.95)	**2.04** (1.86-2.23)	**2.38** (2.15-2.60)	**2.64** (2.38-2.88)	**2.89** (2.60-3.17)	**3.15** (2.81-3.46)	**3.48** (3.08-3.84)	**3.73** (3.28-4.14)
2-hr	**0.703** (0.640-0.772)	**0.854** (0.779-0.938)	**1.07** (0.972-1.17)	**1.23** (1.12-1.35)	**1.46** (1.31-1.59)	**1.63** (1.46-1.79)	**1.81** (1.61-1.98)	**1.98** (1.75-2.18)	**2.23** (1.94-2.46)	**2.41** (2.09-2.67)
3-hr	**0.512** (0.466-0.565)	**0.622** (0.566-0.685)	**0.781** (0.709-0.860)	**0.903** (0.818-0.994)	**1.07** (0.962-1.18)	**1.20** (1.07-1.32)	**1.34** (1.19-1.47)	**1.47** (1.30-1.62)	**1.66** (1.44-1.84)	**1.81** (1.55-2.01)
6-hr	**0.322** (0.294-0.355)	**0.390** (0.356-0.431)	**0.487** (0.444-0.537)	**0.567** (0.514-0.623)	**0.678** (0.610-0.745)	**0.769** (0.687-0.845)	**0.866** (0.766-0.952)	**0.968** (0.847-1.07)	**1.11** (0.955-1.23)	**1.23** (1.04-1.37)
12-hr	**0.195** (0.178-0.216)	**0.235** (0.215-0.261)	**0.296** (0.270-0.327)	**0.347** (0.315-0.383)	**0.422** (0.379-0.464)	**0.485** (0.432-0.533)	**0.554** (0.487-0.610)	**0.629** (0.544-0.695)	**0.738** (0.626-0.821)	**0.831** (0.692-0.927)
24-hr	**0.114** (0.105-0.124)	**0.137** (0.126-0.149)	**0.172** (0.158-0.187)	**0.201** (0.185-0.219)	**0.244** (0.223-0.265)	**0.280** (0.254-0.304)	**0.319** (0.288-0.346)	**0.362** (0.324-0.392)	**0.424** (0.374-0.459)	**0.475** (0.415-0.515)
2-day	**0.065** (0.060-0.072)	**0.079** (0.072-0.086)	**0.100** (0.091-0.109)	**0.116** (0.106-0.127)	**0.140** (0.128-0.153)	**0.160** (0.145-0.174)	**0.181** (0.163-0.197)	**0.204** (0.182-0.222)	**0.236** (0.209-0.258)	**0.263** (0.231-0.287)
3-day	**0.046** (0.042-0.050)	**0.056** (0.051-0.061)	**0.070** (0.064-0.076)	**0.081** (0.075-0.088)	**0.098** (0.089-0.106)	**0.111** (0.101-0.121)	**0.126** (0.114-0.136)	**0.141** (0.127-0.153)	**0.163** (0.145-0.177)	**0.181** (0.160-0.197)
4-day	**0.036** (0.034-0.040)	**0.044** (0.041-0.048)	**0.055** (0.051-0.060)	**0.064** (0.059-0.069)	**0.076** (0.070-0.083)	**0.087** (0.079-0.094)	**0.098** (0.089-0.106)	**0.109** (0.099-0.119)	**0.126** (0.113-0.137)	**0.140** (0.124-0.152)
7-day	**0.024** (0.023-0.026)	**0.029** (0.027-0.032)	**0.036** (0.033-0.039)	**0.042** (0.039-0.045)	**0.050** (0.046-0.054)	**0.056** (0.052-0.061)	**0.064** (0.058-0.069)	**0.071** (0.065-0.077)	**0.082** (0.074-0.088)	**0.091** (0.081-0.098)
10-day	**0.019** (0.018-0.021)	**0.023** (0.022-0.025)	**0.028** (0.026-0.030)	**0.032** (0.030-0.035)	**0.038** (0.035-0.041)	**0.043** (0.039-0.046)	**0.047** (0.044-0.051)	**0.052** (0.048-0.056)	**0.059** (0.054-0.064)	**0.065** (0.058-0.070)
20-day	**0.013** (0.012-0.014)	**0.016** (0.015-0.017)	**0.019** (0.017-0.020)	**0.021** (0.020-0.022)	**0.024** (0.023-0.026)	**0.027** (0.025-0.028)	**0.029** (0.027-0.031)	**0.032** (0.029-0.034)	**0.035** (0.032-0.037)	**0.038** (0.034-0.040)
30-day	**0.011** (0.010-0.011)	**0.013** (0.012-0.014)	**0.015** (0.014-0.016)	**0.017** (0.016-0.017)	**0.019** (0.018-0.020)	**0.020** (0.019-0.022)	**0.022** (0.021-0.023)	**0.024** (0.022-0.025)	**0.026** (0.024-0.027)	**0.027** (0.025-0.029)
45-day	**0.009** (0.009-0.010)	**0.011** (0.010-0.011)	**0.012** (0.012-0.013)	**0.014** (0.013-0.014)	**0.015** (0.014-0.016)	**0.016** (0.016-0.017)	**0.017** (0.016-0.018)	**0.018** (0.017-0.019)	**0.020** (0.019-0.021)	**0.021** (0.019-0.022)
60-day	**0.008** (0.008-0.009)	**0.010** (0.009-0.010)	**0.011** (0.011-0.012)	**0.012** (0.012-0.013)	**0.013** (0.013-0.014)	**0.014** (0.014-0.015)	**0.015** (0.014-0.016)	**0.016** (0.015-0.017)	**0.017** (0.016-0.018)	**0.018** (0.017-0.019)

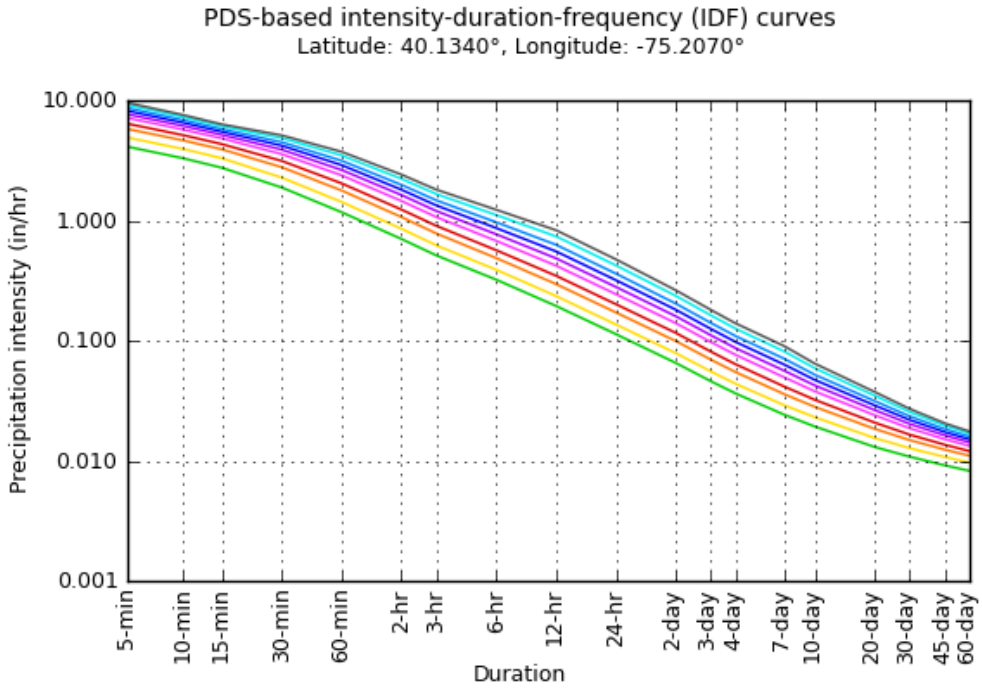
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

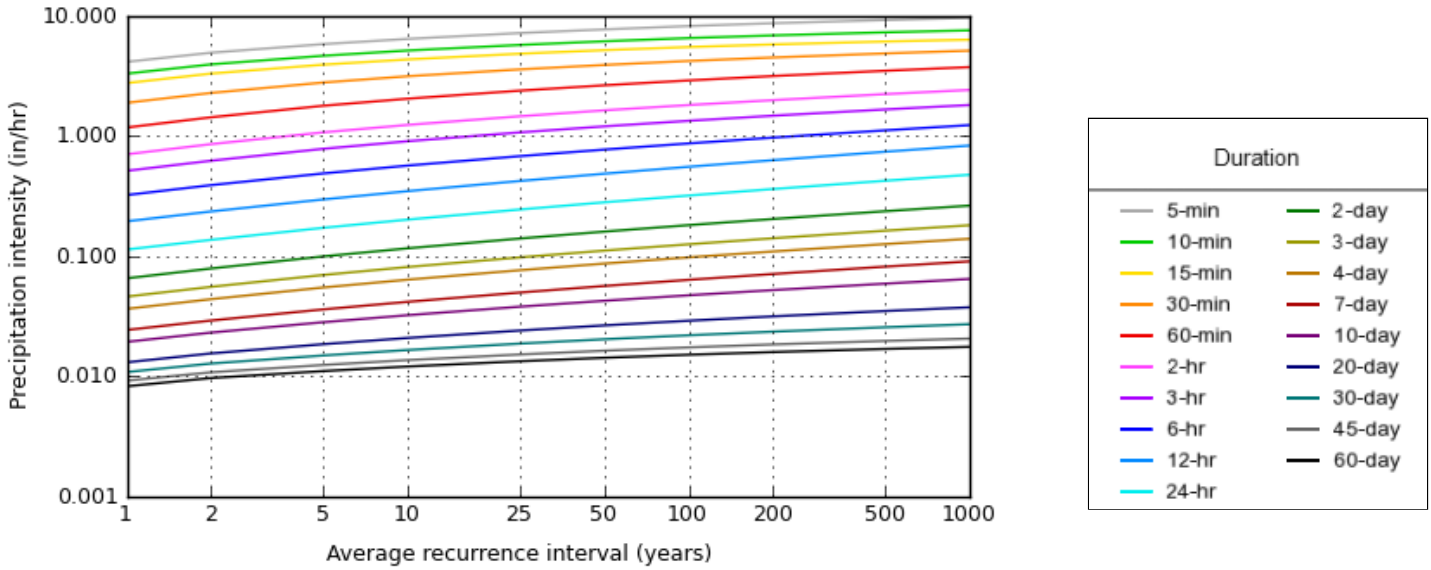
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical





NOAA Atlas 14, Volume 2, Version 3 Created (GMT): Mon Mar 6 18:23:54 2023

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Maps & aerials

Small scale terrain

NOAA Atlas 14, Volume 2, Version 3
Location name: Fort Washington, Pennsylvania, USA*
Latitude: 40.134°, Longitude: -75.207°
Elevation: m/ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

G.M. Bonnin, D. Martin, B. Lin, T. Parzybok, M.Yekta, and D. Riley

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.344** (0.315-0.377)	**0.410** (0.375-0.449)	**0.483** (0.440-0.527)	**0.534** (0.487-0.584)	**0.597** (0.541-0.652)	**0.640** (0.577-0.700)	**0.683** (0.613-0.748)	**0.721** (0.643-0.792)	**0.766** (0.677-0.845)	**0.799** (0.702-0.886)
10-min	**0.549** (0.503-0.601)	**0.656** (0.600-0.717)	**0.773** (0.705-0.845)	**0.855** (0.779-0.934)	**0.951** (0.862-1.04)	**1.02** (0.919-1.12)	**1.09** (0.974-1.19)	**1.14** (1.02-1.25)	**1.21** (1.07-1.34)	**1.26** (1.11-1.40)
15-min	**0.687** (0.629-0.752)	**0.825** (0.754-0.902)	**0.978** (0.892-1.07)	**1.08** (0.985-1.18)	**1.21** (1.09-1.32)	**1.29** (1.16-1.41)	**1.37** (1.23-1.50)	**1.44** (1.29-1.58)	**1.52** (1.35-1.68)	**1.58** (1.39-1.75)
30-min	**0.942** (0.862-1.03)	**1.14** (1.04-1.25)	**1.39** (1.27-1.52)	**1.57** (1.43-1.71)	**1.79** (1.62-1.95)	**1.95** (1.75-2.13)	**2.10** (1.89-2.30)	**2.24** (2.00-2.47)	**2.43** (2.15-2.68)	**2.56** (2.25-2.84)
60-min	**1.17** (1.08-1.29)	**1.43** (1.31-1.56)	**1.78** (1.63-1.95)	**2.04** (1.86-2.23)	**2.38** (2.15-2.60)	**2.64** (2.38-2.88)	**2.89** (2.60-3.17)	**3.15** (2.81-3.46)	**3.48** (3.08-3.84)	**3.73** (3.28-4.14)
2-hr	**1.41** (1.28-1.54)	**1.71** (1.56-1.88)	**2.14** (1.95-2.35)	**2.47** (2.24-2.70)	**2.91** (2.62-3.19)	**3.26** (2.92-3.57)	**3.61** (3.22-3.96)	**3.97** (3.51-4.36)	**4.45** (3.89-4.91)	**4.82** (4.17-5.34)
3-hr	**1.54** (1.40-1.70)	**1.87** (1.70-2.06)	**2.35** (2.13-2.58)	**2.71** (2.46-2.98)	**3.21** (2.89-3.53)	**3.60** (3.23-3.96)	**4.01** (3.56-4.42)	**4.42** (3.89-4.88)	**4.98** (4.33-5.53)	**5.43** (4.66-6.04)
6-hr	**1.93** (1.76-2.13)	**2.33** (2.13-2.58)	**2.92** (2.66-3.22)	**3.39** (3.08-3.73)	**4.06** (3.65-4.46)	**4.61** (4.11-5.06)	**5.19** (4.58-5.70)	**5.80** (5.07-6.38)	**6.66** (5.72-7.38)	**7.36** (6.23-8.19)
12-hr	**2.35** (2.15-2.60)	**2.84** (2.60-3.14)	**3.57** (3.26-3.94)	**4.18** (3.80-4.62)	**5.08** (4.57-5.59)	**5.84** (5.20-6.43)	**6.67** (5.86-7.35)	**7.57** (6.56-8.37)	**8.90** (7.54-9.89)	**10.0** (8.33-11.2)
24-hr	**2.73** (2.51-2.97)	**3.28** (3.03-3.58)	**4.13** (3.80-4.49)	**4.83** (4.43-5.26)	**5.86** (5.35-6.36)	**6.73** (6.10-7.29)	**7.66** (6.91-8.30)	**8.68** (7.76-9.40)	**10.2** (8.98-11.0)	**11.4** (9.97-12.4)
2-day	**3.14** (2.88-3.43)	**3.79** (3.48-4.14)	**4.78** (4.38-5.22)	**5.58** (5.10-6.09)	**6.73** (6.12-7.32)	**7.68** (6.96-8.36)	**8.70** (7.83-9.46)	**9.79** (8.74-10.7)	**11.4** (10.0-12.4)	**12.6** (11.1-13.8)
3-day	**3.32** (3.06-3.62)	**4.00** (3.69-4.37)	**5.02** (4.62-5.47)	**5.85** (5.37-6.37)	**7.03** (6.42-7.64)	**8.01** (7.29-8.70)	**9.04** (8.18-9.82)	**10.1** (9.12-11.0)	**11.7** (10.4-12.8)	**13.0** (11.5-14.2)
4-day	**3.50** (3.24-3.81)	**4.22** (3.90-4.59)	**5.27** (4.86-5.73)	**6.12** (5.64-6.65)	**7.33** (6.72-7.96)	**8.33** (7.61-9.04)	**9.39** (8.54-10.2)	**10.5** (9.50-11.4)	**12.1** (10.8-13.2)	**13.4** (11.9-14.6)
7-day	**4.09** (3.80-4.43)	**4.90** (4.56-5.32)	**6.06** (5.63-6.57)	**7.01** (6.49-7.60)	**8.37** (7.72-9.06)	**9.49** (8.72-10.3)	**10.7** (9.76-11.5)	**11.9** (10.9-12.9)	**13.7** (12.4-14.9)	**15.2** (13.6-16.5)
10-day	**4.65** (4.34-5.01)	**5.56** (5.19-5.98)	**6.78** (6.31-7.29)	**7.75** (7.21-8.34)	**9.12** (8.45-9.80)	**10.2** (9.44-11.0)	**11.4** (10.4-12.2)	**12.5** (11.5-13.5)	**14.2** (12.9-15.3)	**15.5** (14.0-16.7)
20-day	**6.29** (5.91-6.70)	**7.46** (7.01-7.95)	**8.90** (8.36-9.49)	**10.0** (9.40-10.7)	**11.6** (10.8-12.3)	**12.7** (11.9-13.6)	**13.9** (13.0-14.9)	**15.2** (14.1-16.2)	**16.8** (15.5-17.9)	**18.0** (16.5-19.3)
30-day	**7.83** (7.41-8.27)	**9.23** (8.74-9.74)	**10.8** (10.2-11.4)	**11.9** (11.3-12.6)	**13.5** (12.7-14.2)	**14.7** (13.8-15.5)	**15.8** (14.9-16.7)	**17.0** (15.9-18.0)	**18.5** (17.2-19.6)	**19.6** (18.2-20.8)
45-day	**9.96** (9.47-10.5)	**11.7** (11.1-12.3)	**13.4** (12.8-14.1)	**14.8** (14.0-15.5)	**16.4** (15.6-17.3)	**17.7** (16.7-18.6)	**18.8** (17.8-19.8)	**19.9** (18.8-21.0)	**21.3** (20.1-22.4)	**22.3** (20.9-23.5)
60-day	**11.9** (11.4-12.5)	**14.0** (13.3-14.7)	**15.9** (15.2-16.7)	**17.4** (16.6-18.3)	**19.2** (18.3-20.2)	**20.6** (19.6-21.6)	**21.8** (20.7-22.9)	**23.0** (21.8-24.1)	**24.4** (23.1-25.7)	**25.4** (24.0-26.7)

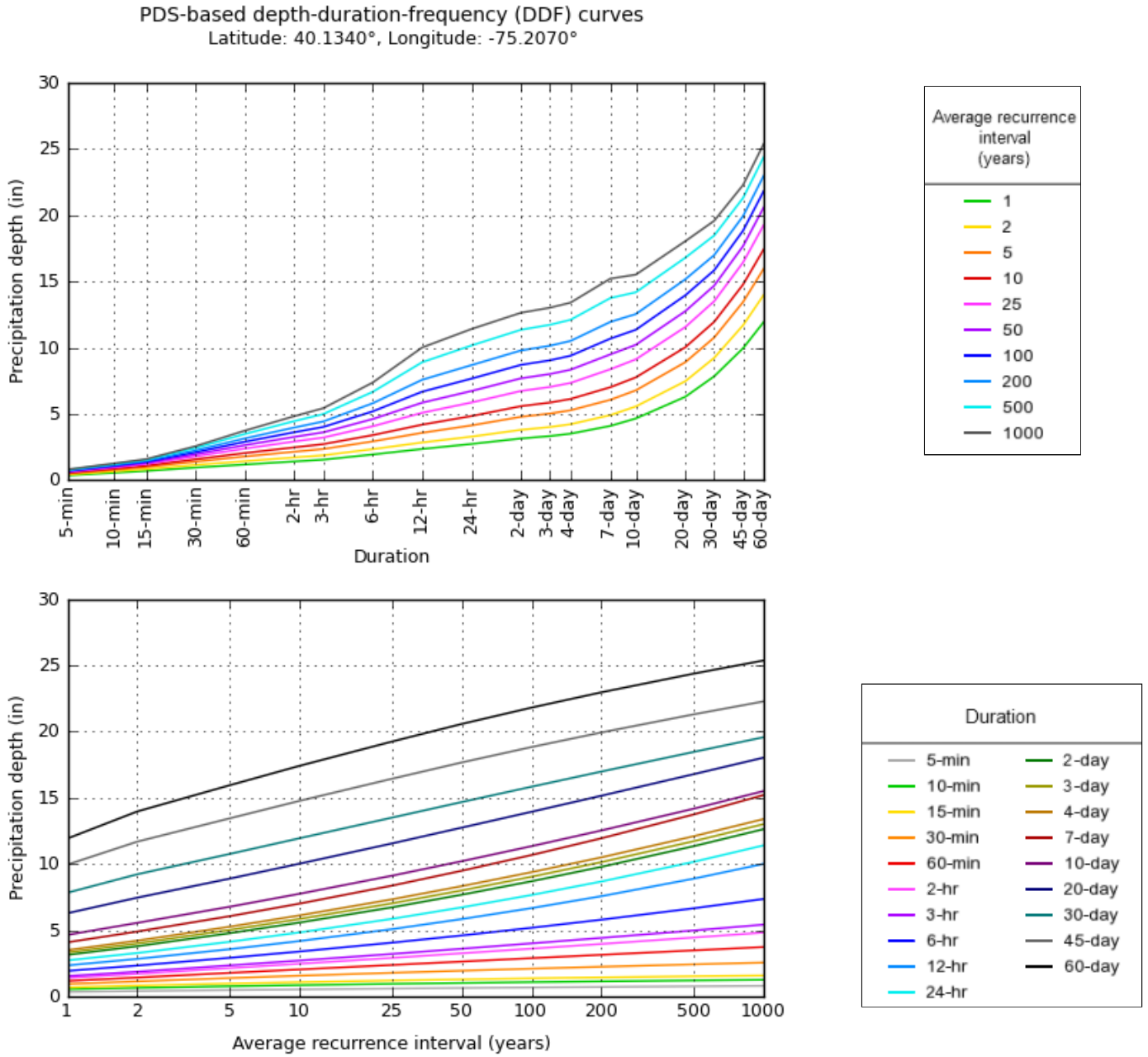
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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PF graphical



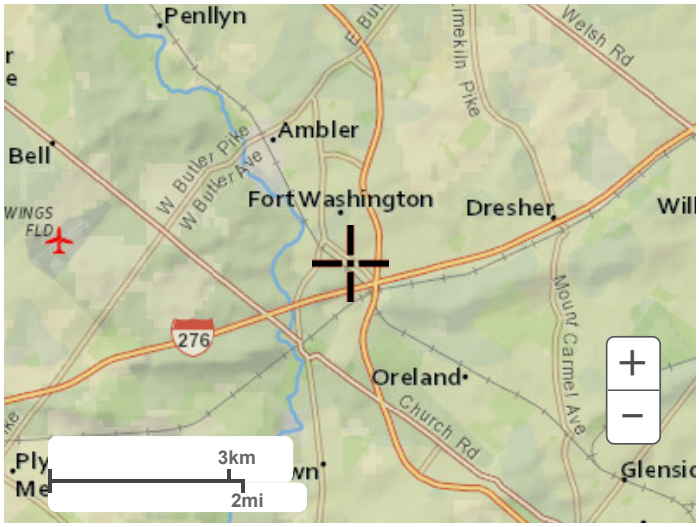
NOAA Atlas 14, Volume 2, Version 3

Created (GMT): Mon Mar 6 18:25:10 2023

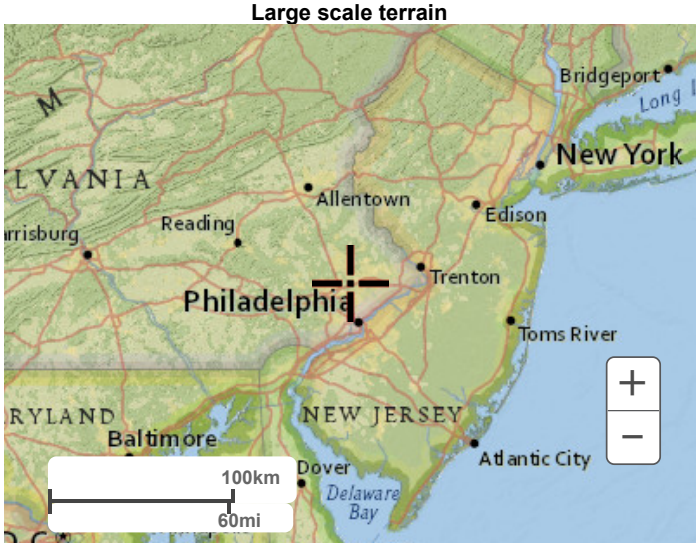
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Maps & aerials

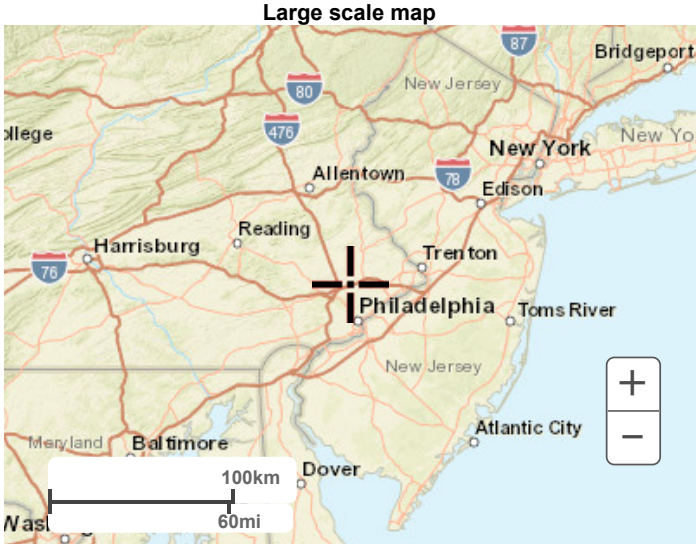
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



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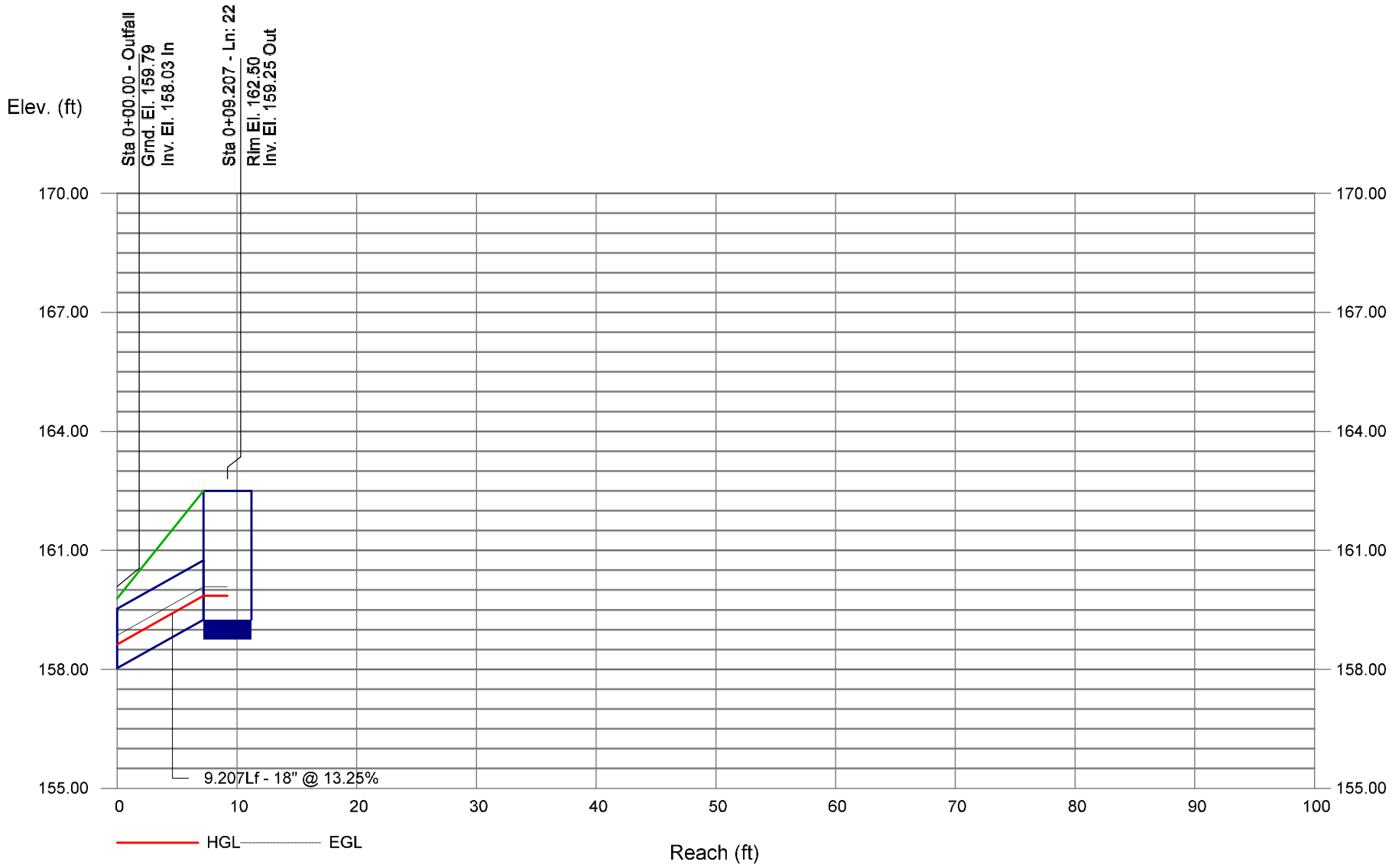
US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Appendix A – Supplemental Stormwater Calculations

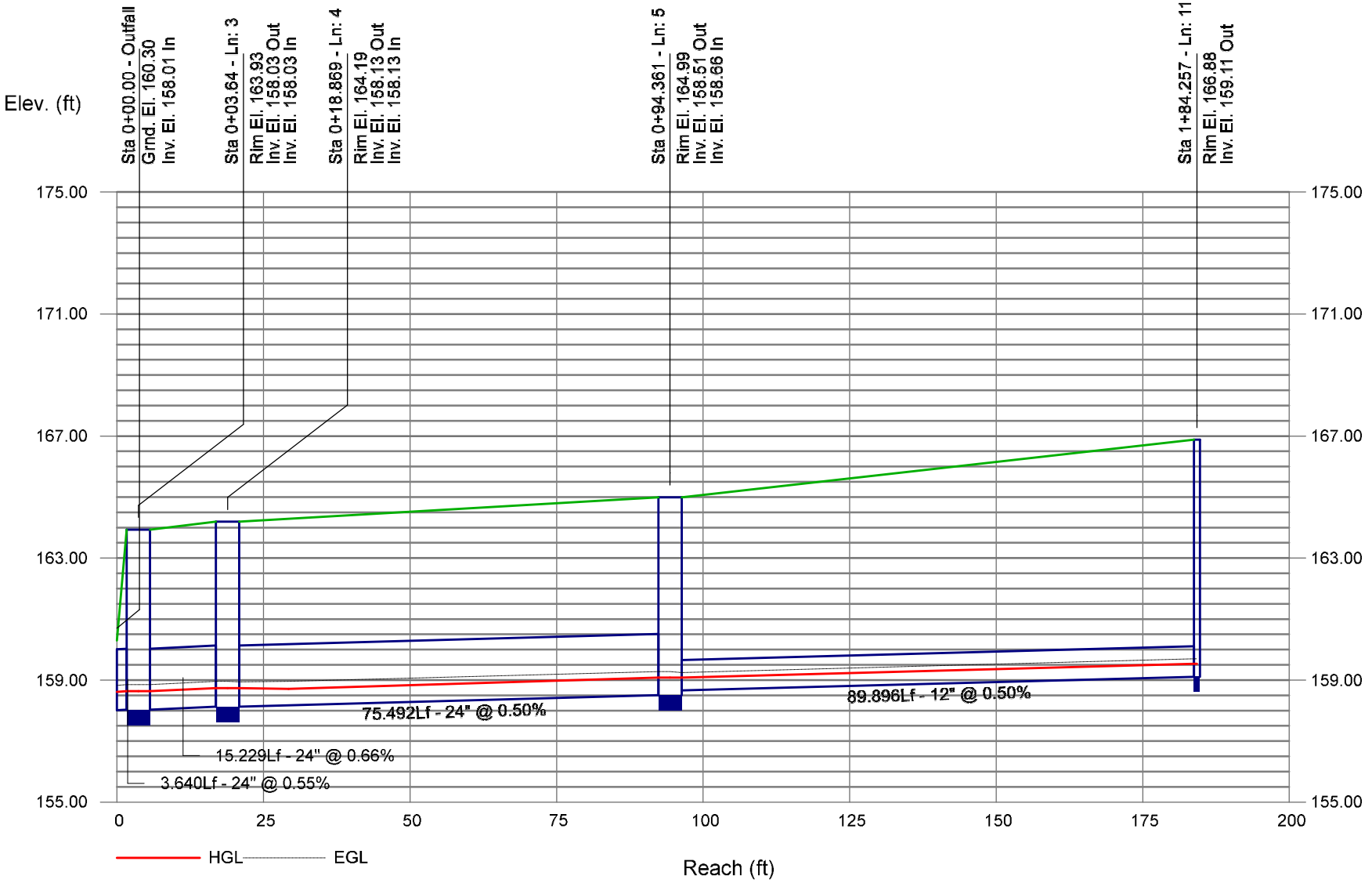
Storm Sewer Profile

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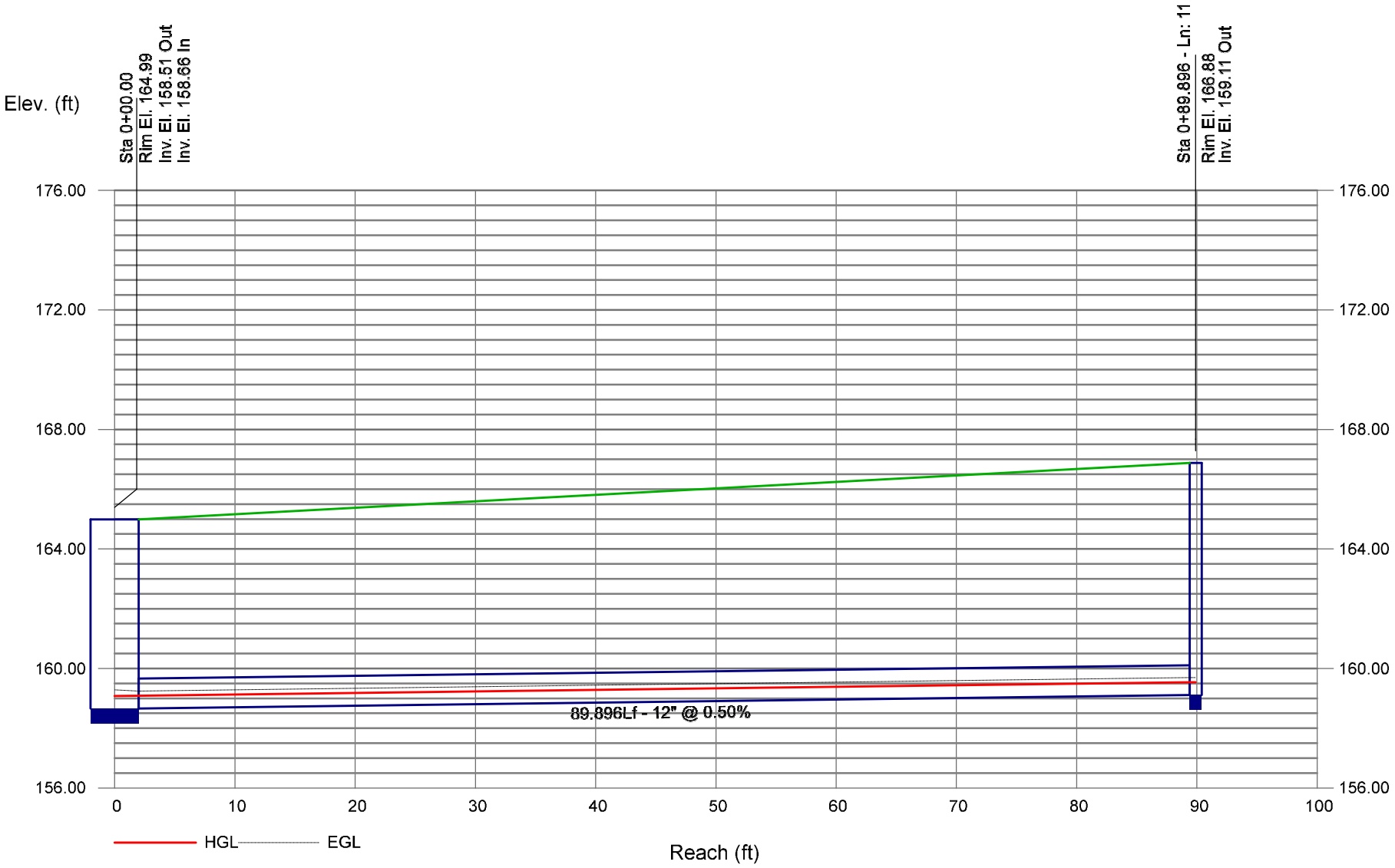
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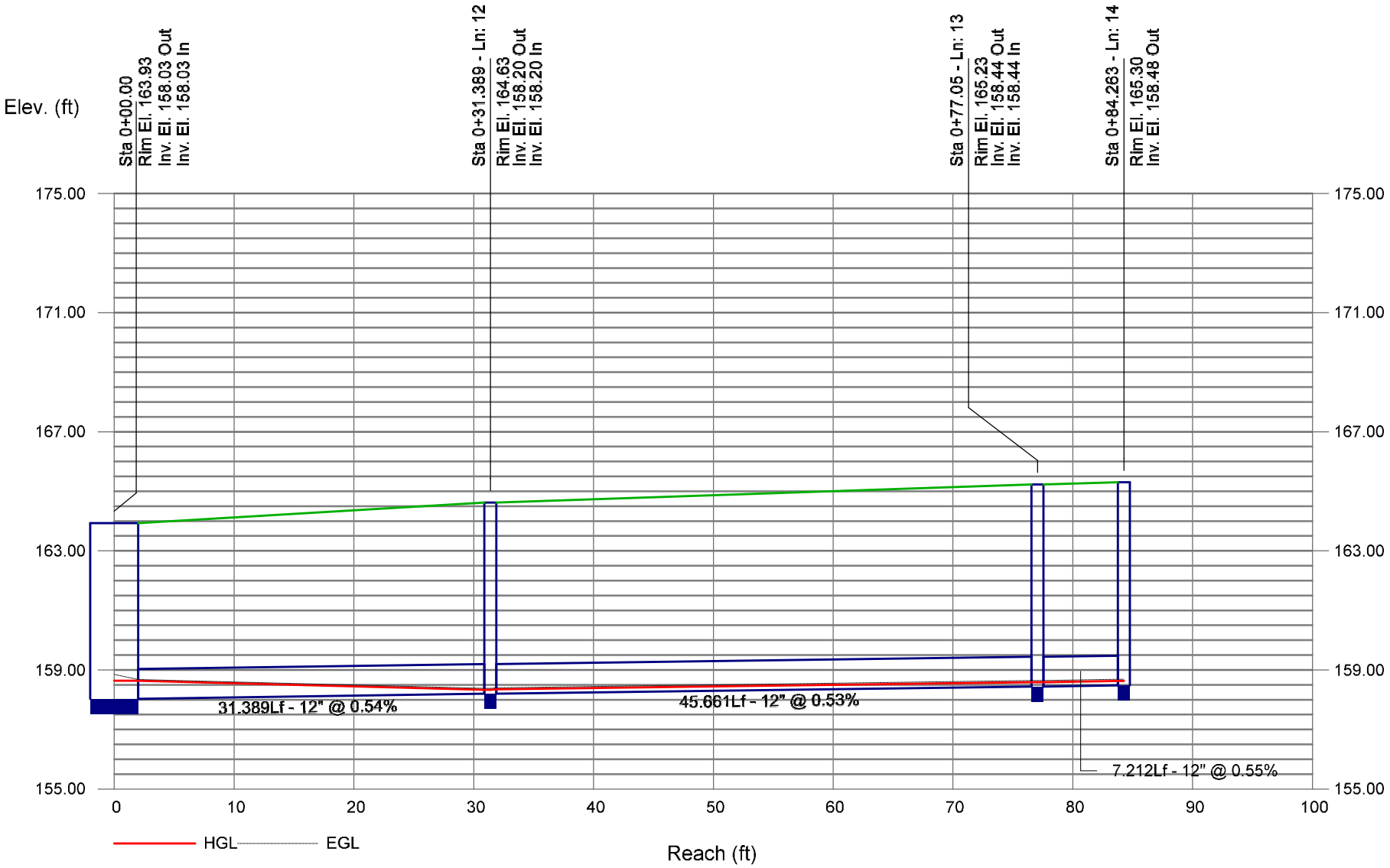
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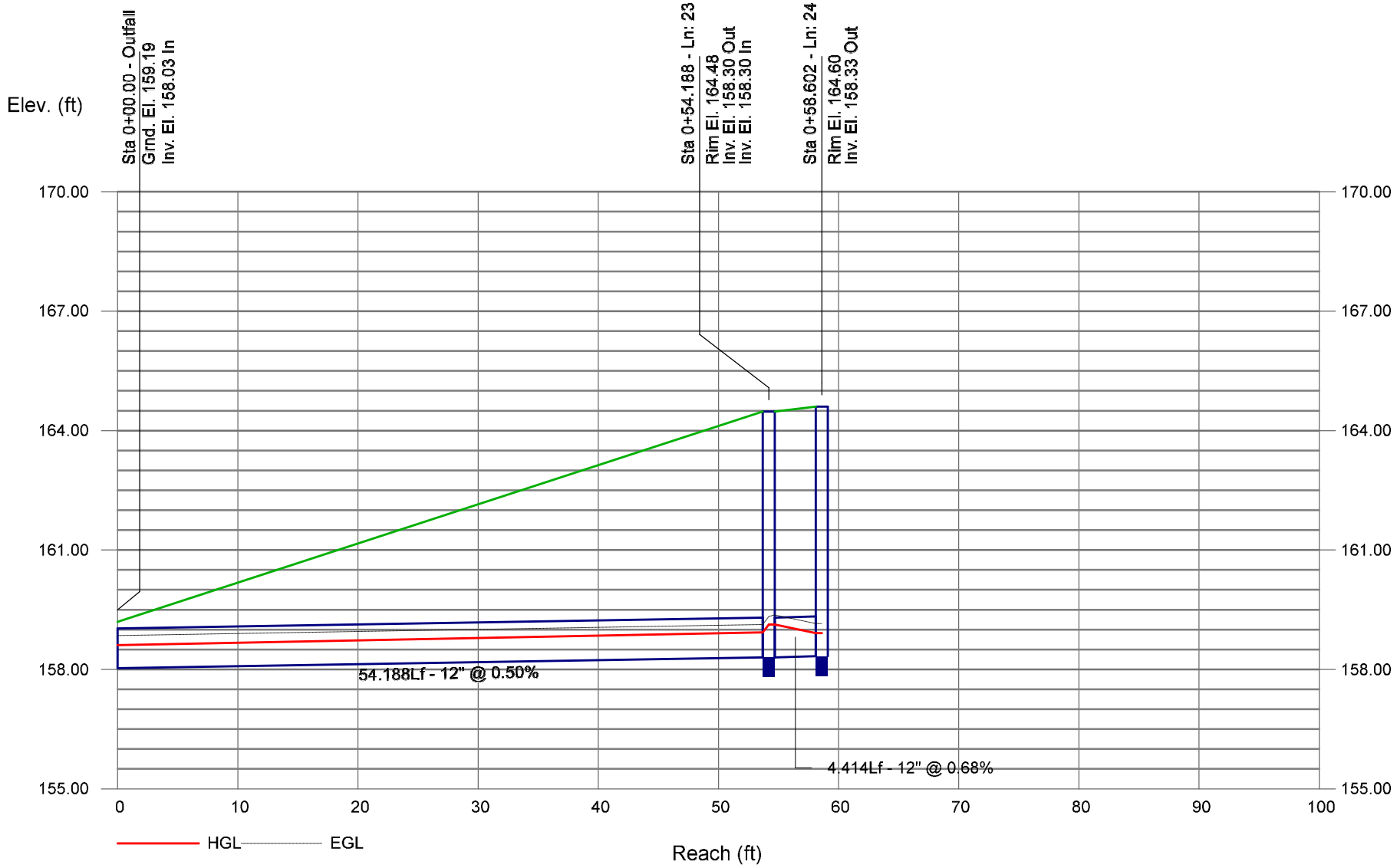
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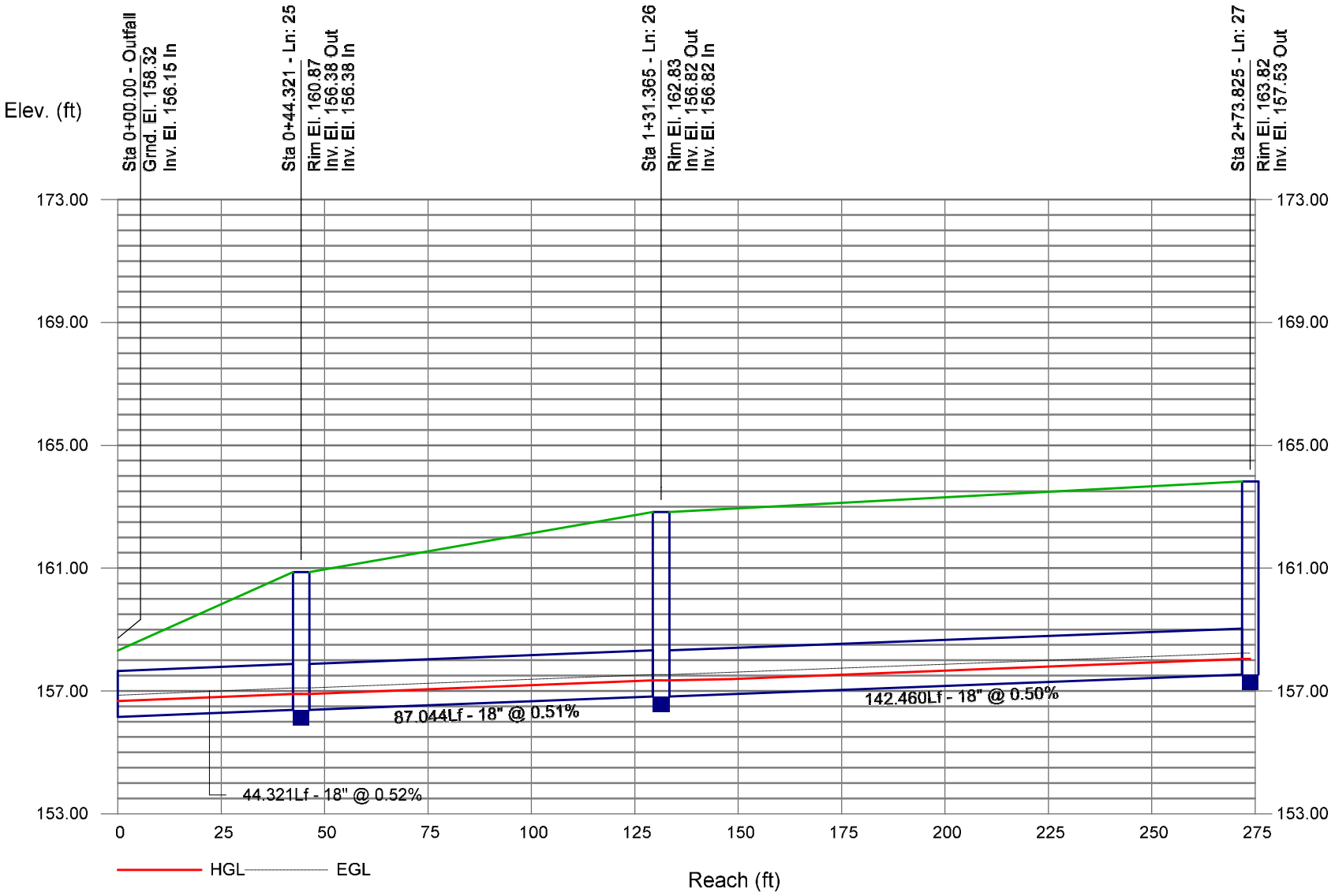
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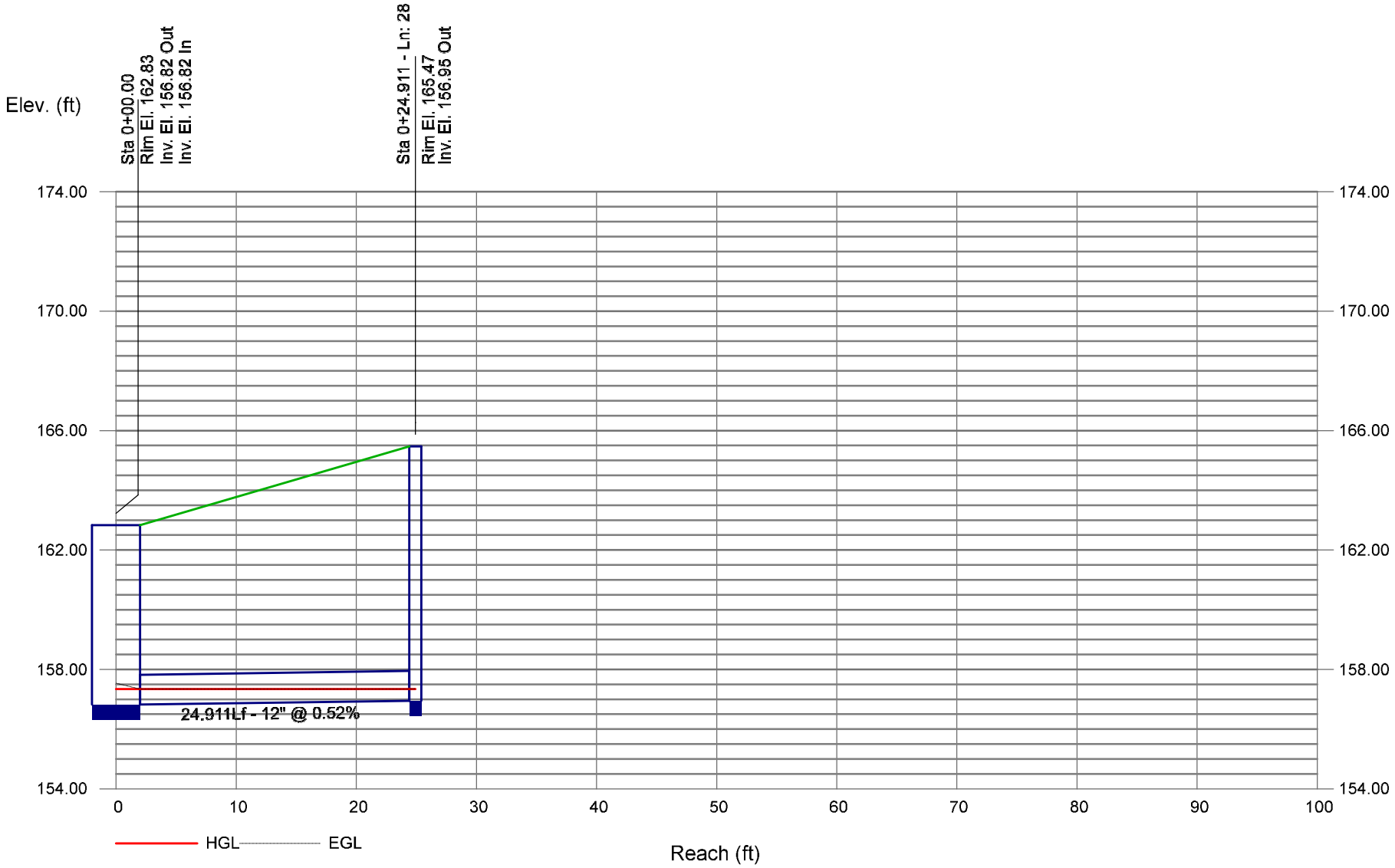
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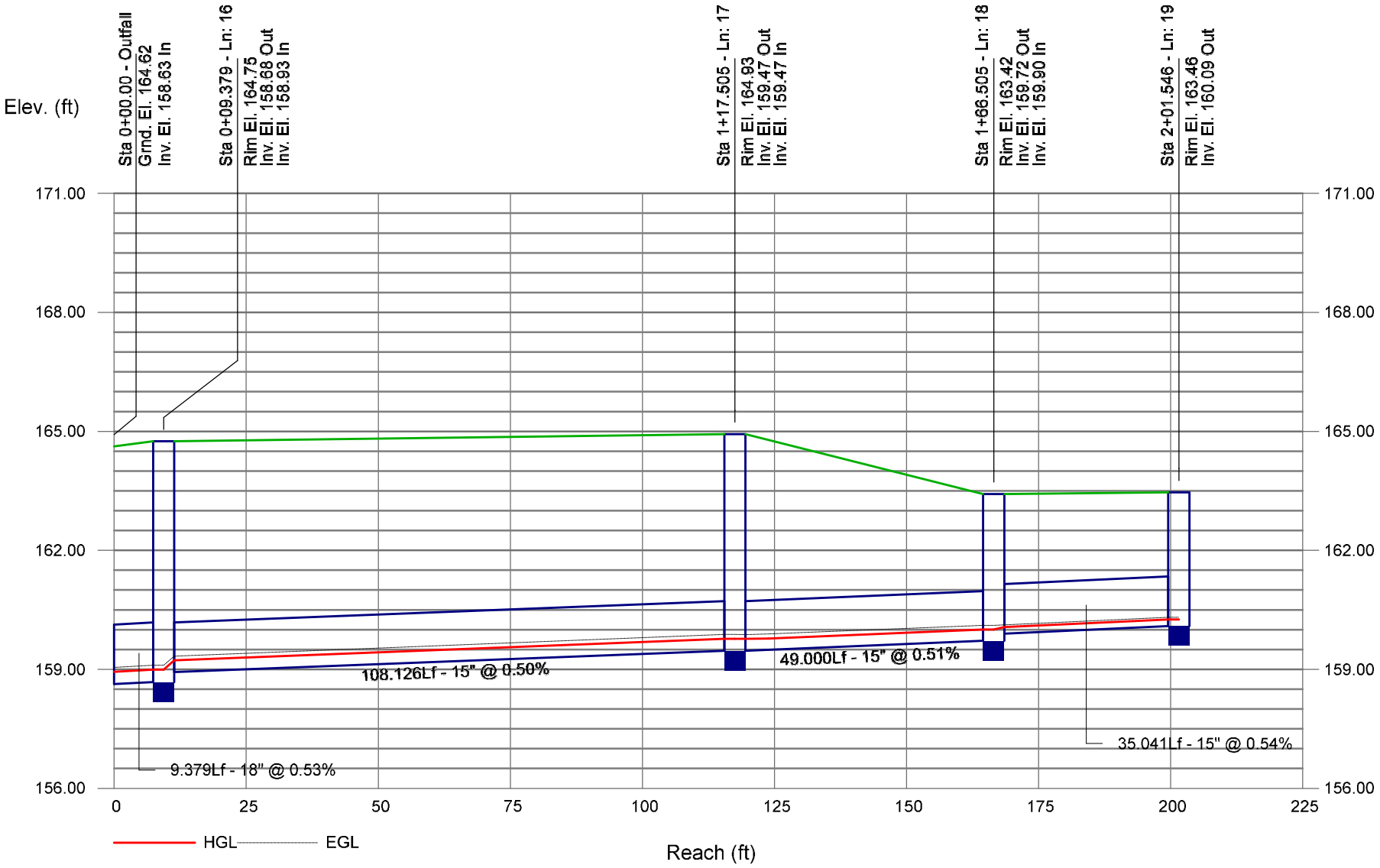
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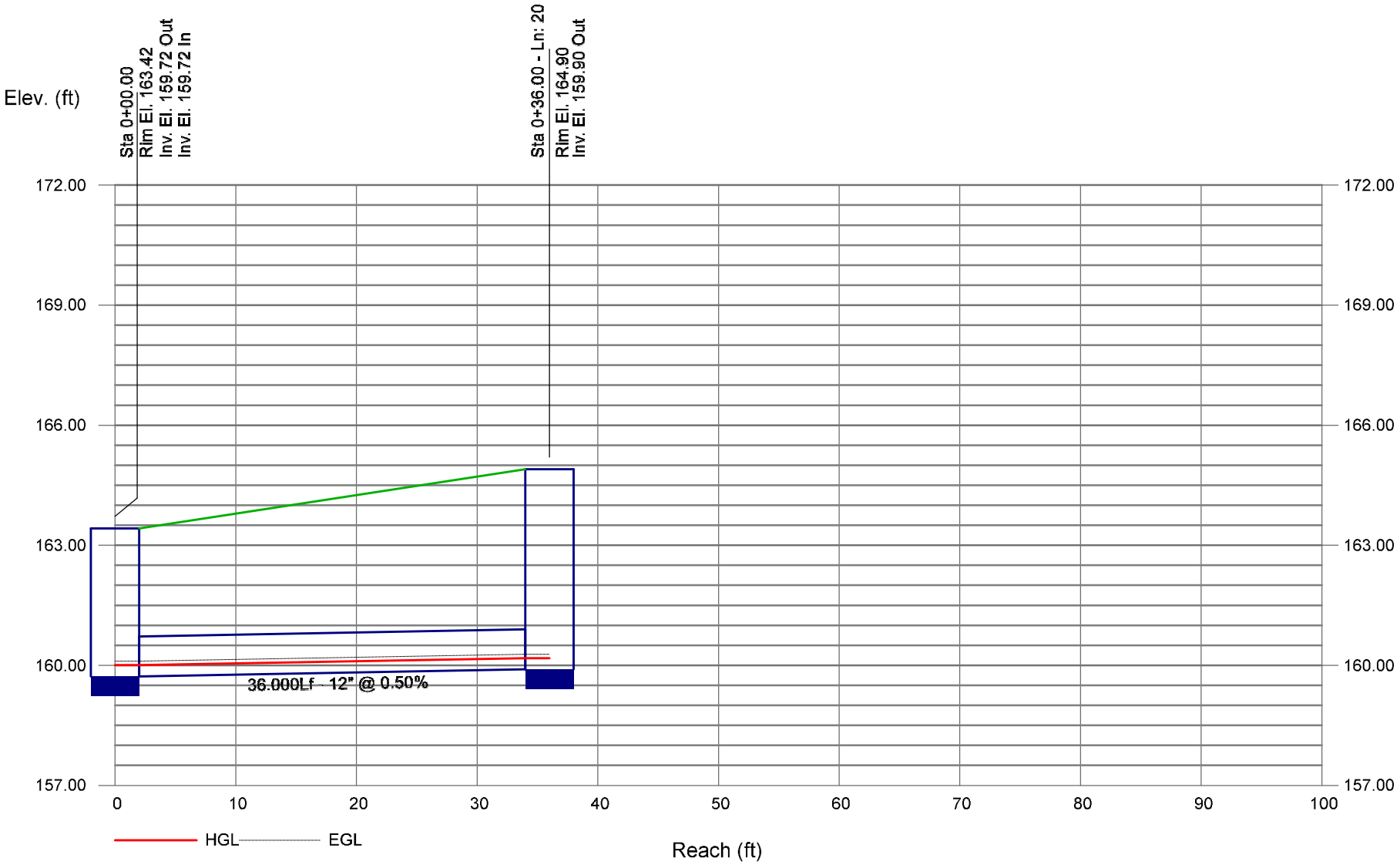
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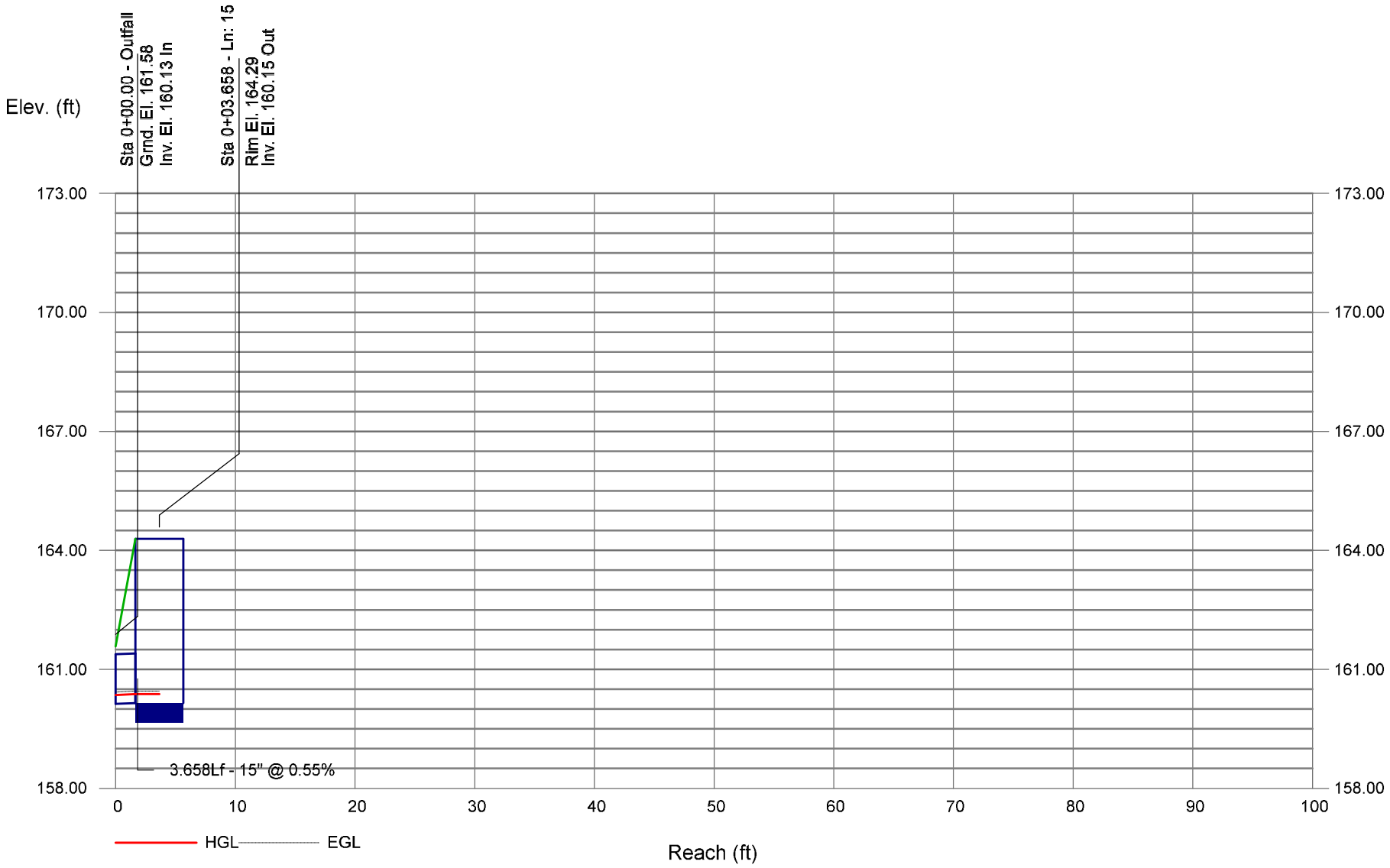
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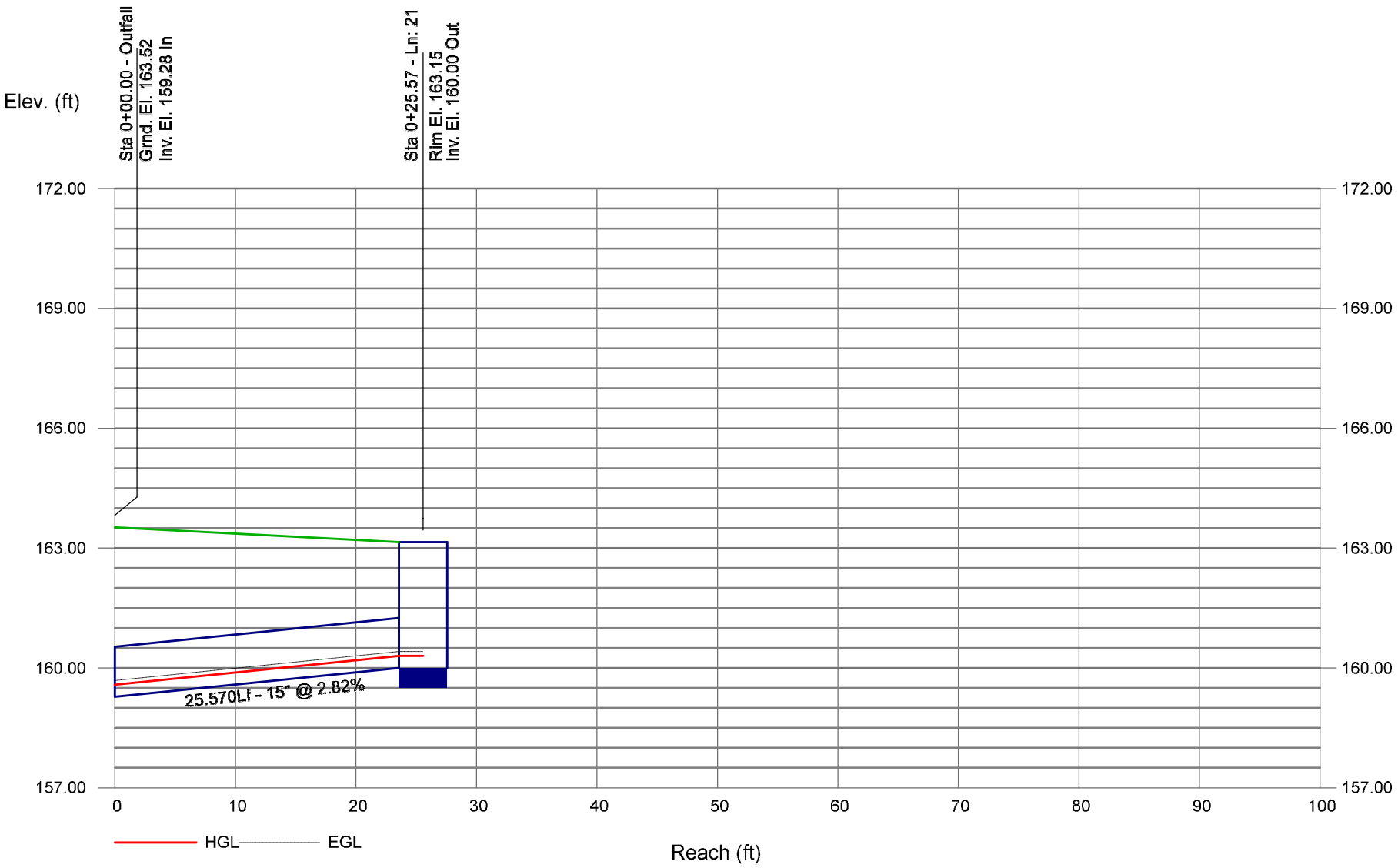
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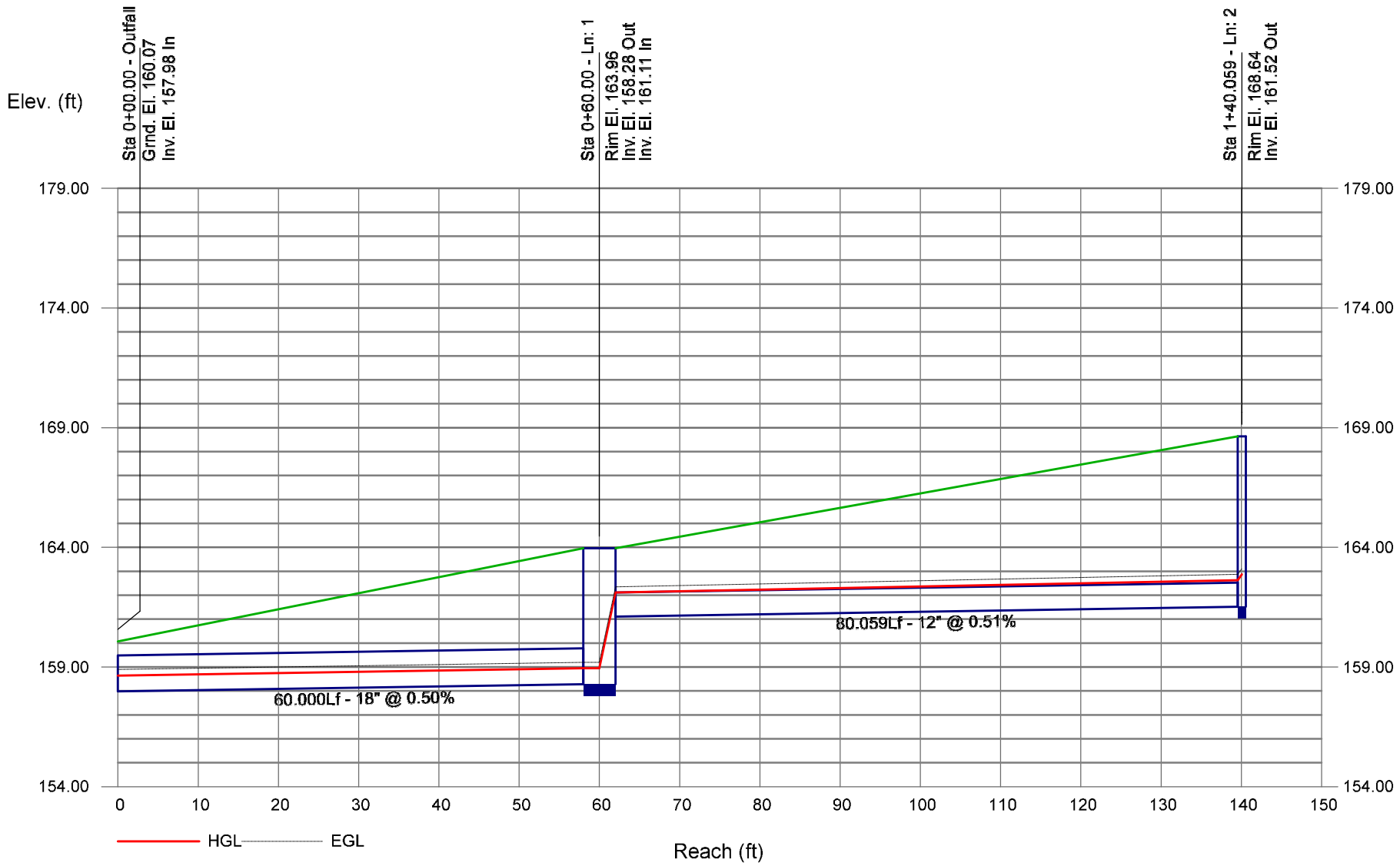
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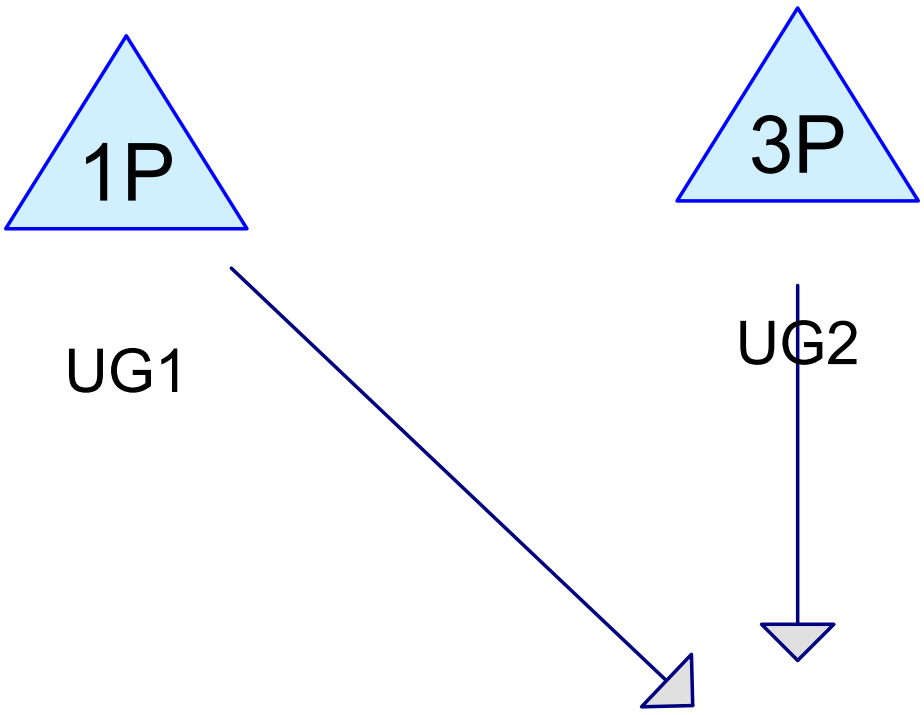
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Storm Sewer Profile

Proj. file: PAB220113.01-Storm_Rev3_2-yr.stm





Subcat Reach Pond Link

Routing Diagram for BMW_2025-4-23
Prepared by Bohler, Printed 4/23/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	Type II 24-hr		Default	24.00	1	3.28	2

Summary for Pond 1P: UG1

Inflow Area = 81,327 sf, 96.79% Impervious, Inflow Depth = 2.95" for 2-yr event
Inflow = 8.653 cfs @ 11.96 hrs, Volume= 19,988 cf
Outflow = 1.779 cfs @ 12.10 hrs, Volume= 10,777 cf, Atten= 79%, Lag= 8.6 min
Primary = 1.779 cfs @ 12.10 hrs, Volume= 10,777 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 158.85' @ 12.10 hrs Surf.Area= 13,041 sf Storage= 11,959 cf

Plug-Flow detention time= 246.9 min calculated for 10,777 cf (54% of inflow)
Center-of-Mass det. time= 128.9 min (879.9 - 751.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.779 cfs @ 12.10 hrs HW=158.85' TW=158.60' (Fixed TW Elev= 158.60')
└─**4=Culvert** (Passes 1.779 cfs of 2.661 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.013 cfs @ 2.393 fps)
  ├─**2=Orifice/Grate** (Orifice Controls 1.766 cfs @ 2.271 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.006	3	157.53	0.000
2.00	0.016	23	157.53	0.000
2.50	0.026	61	157.54	0.000
3.00	0.034	115	157.55	0.000
3.50	0.042	183	157.57	0.000
4.00	0.049	265	157.58	0.000
4.50	0.057	359	157.60	0.000
5.00	0.065	469	157.62	0.000
5.50	0.073	594	157.64	0.000
6.00	0.082	734	157.67	0.000
6.50	0.090	888	157.70	0.000
7.00	0.097	1,056	157.73	0.000
7.50	0.105	1,239	157.77	0.000
8.00	0.113	1,435	157.81	0.000
8.50	0.138	1,658	157.85	0.000
9.00	0.167	1,932	157.90	0.000
9.50	0.174	2,243	157.96	0.000
10.00	0.214	2,588	158.03	0.000
10.50	0.281	3,031	158.07	0.000
11.00	0.391	3,631	158.12	0.000
11.50	**0.648**	4,548	158.19	0.000
12.00	**7.148**	**11,136**	**158.77**	**1.442**
12.50	0.621	**11,000**	**158.76**	**1.378**
13.00	0.386	9,975	158.67	0.753
13.50	0.292	9,541	158.63	0.439
14.00	0.229	9,364	158.61	0.290
14.50	0.202	9,321	158.61	0.211
15.00	0.182	9,309	158.61	0.188
15.50	0.161	9,298	158.61	0.167
16.00	0.140	9,287	158.61	0.146
16.50	0.131	9,280	158.61	0.133
17.00	0.123	9,276	158.61	0.125
17.50	0.116	9,273	158.61	0.118
18.00	0.108	9,269	158.61	0.110
18.50	0.101	9,265	158.60	0.103
19.00	0.093	9,261	158.60	0.096
19.50	0.086	9,257	158.60	0.088
20.00	0.079	9,253	158.60	0.081
20.50	0.076	9,251	158.60	0.077
21.00	0.075	9,250	158.60	0.075
21.50	0.073	9,249	158.60	0.074
22.00	0.072	9,249	158.60	0.072
22.50	0.070	9,248	158.60	0.071
23.00	0.069	9,247	158.60	0.069
23.50	0.067	9,246	158.60	0.068
24.00	0.066	9,246	158.60	0.066
24.50	0.000	9,213	158.60	0.004
25.00	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	9,211	158.60	0.000
26.00	0.000	9,211	158.60	0.000
26.50	0.000	9,211	158.60	0.000
27.00	0.000	9,211	158.60	0.000
27.50	0.000	9,211	158.60	0.000
28.00	0.000	9,211	158.60	0.000
28.50	0.000	9,211	158.60	0.000
29.00	0.000	9,211	158.60	0.000
29.50	0.000	9,211	158.60	0.000
30.00	0.000	9,211	158.60	0.000
30.50	0.000	9,211	158.60	0.000
31.00	0.000	9,211	158.60	0.000
31.50	0.000	9,211	158.60	0.000
32.00	0.000	9,211	158.60	0.000
32.50	0.000	9,211	158.60	0.000
33.00	0.000	9,211	158.60	0.000
33.50	0.000	9,211	158.60	0.000
34.00	0.000	9,211	158.60	0.000
34.50	0.000	9,211	158.60	0.000
35.00	0.000	9,211	158.60	0.000
35.50	0.000	9,211	158.60	0.000
36.00	0.000	9,211	158.60	0.000
36.50	0.000	9,211	158.60	0.000
37.00	0.000	9,211	158.60	0.000
37.50	0.000	9,211	158.60	0.000
38.00	0.000	9,211	158.60	0.000
38.50	0.000	9,211	158.60	0.000
39.00	0.000	9,211	158.60	0.000
39.50	0.000	9,211	158.60	0.000
40.00	0.000	9,211	158.60	0.000
40.50	0.000	9,211	158.60	0.000
41.00	0.000	9,211	158.60	0.000
41.50	0.000	9,211	158.60	0.000
42.00	0.000	9,211	158.60	0.000
42.50	0.000	9,211	158.60	0.000
43.00	0.000	9,211	158.60	0.000
43.50	0.000	9,211	158.60	0.000
44.00	0.000	9,211	158.60	0.000
44.50	0.000	9,211	158.60	0.000
45.00	0.000	9,211	158.60	0.000
45.50	0.000	9,211	158.60	0.000
46.00	0.000	9,211	158.60	0.000
46.50	0.000	9,211	158.60	0.000
47.00	0.000	9,211	158.60	0.000
47.50	0.000	9,211	158.60	0.000
48.00	0.000	9,211	158.60	0.000
48.50	0.000	9,211	158.60	0.000
49.00	0.000	9,211	158.60	0.000
49.50	0.000	9,211	158.60	0.000
50.00	0.000	9,211	158.60	0.000
50.50	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	9,211	158.60	0.000
51.50	0.000	9,211	158.60	0.000
52.00	0.000	9,211	158.60	0.000
52.50	0.000	9,211	158.60	0.000
53.00	0.000	9,211	158.60	0.000
53.50	0.000	9,211	158.60	0.000
54.00	0.000	9,211	158.60	0.000
54.50	0.000	9,211	158.60	0.000
55.00	0.000	9,211	158.60	0.000
55.50	0.000	9,211	158.60	0.000
56.00	0.000	9,211	158.60	0.000
56.50	0.000	9,211	158.60	0.000
57.00	0.000	9,211	158.60	0.000
57.50	0.000	9,211	158.60	0.000
58.00	0.000	9,211	158.60	0.000
58.50	0.000	9,211	158.60	0.000
59.00	0.000	9,211	158.60	0.000
59.50	0.000	9,211	158.60	0.000
60.00	0.000	9,211	158.60	0.000
60.50	0.000	9,211	158.60	0.000
61.00	0.000	9,211	158.60	0.000
61.50	0.000	9,211	158.60	0.000
62.00	0.000	9,211	158.60	0.000
62.50	0.000	9,211	158.60	0.000
63.00	0.000	9,211	158.60	0.000
63.50	0.000	9,211	158.60	0.000
64.00	0.000	9,211	158.60	0.000
64.50	0.000	9,211	158.60	0.000
65.00	0.000	9,211	158.60	0.000
65.50	0.000	9,211	158.60	0.000
66.00	0.000	9,211	158.60	0.000
66.50	0.000	9,211	158.60	0.000
67.00	0.000	9,211	158.60	0.000
67.50	0.000	9,211	158.60	0.000
68.00	0.000	9,211	158.60	0.000
68.50	0.000	9,211	158.60	0.000
69.00	0.000	9,211	158.60	0.000
69.50	0.000	9,211	158.60	0.000
70.00	0.000	9,211	158.60	0.000
70.50	0.000	9,211	158.60	0.000
71.00	0.000	9,211	158.60	0.000
71.50	0.000	9,211	158.60	0.000
72.00	0.000	9,211	158.60	0.000
72.50	0.000	9,211	158.60	0.000
73.00	0.000	9,211	158.60	0.000
73.50	0.000	9,211	158.60	0.000
74.00	0.000	9,211	158.60	0.000
74.50	0.000	9,211	158.60	0.000
75.00	0.000	9,211	158.60	0.000
75.50	0.000	9,211	158.60	0.000
76.00	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	9,211	158.60	0.000
77.00	0.000	9,211	158.60	0.000
77.50	0.000	9,211	158.60	0.000
78.00	0.000	9,211	158.60	0.000
78.50	0.000	9,211	158.60	0.000
79.00	0.000	9,211	158.60	0.000
79.50	0.000	9,211	158.60	0.000
80.00	0.000	9,211	158.60	0.000
80.50	0.000	9,211	158.60	0.000
81.00	0.000	9,211	158.60	0.000
81.50	0.000	9,211	158.60	0.000
82.00	0.000	9,211	158.60	0.000
82.50	0.000	9,211	158.60	0.000
83.00	0.000	9,211	158.60	0.000
83.50	0.000	9,211	158.60	0.000
84.00	0.000	9,211	158.60	0.000
84.50	0.000	9,211	158.60	0.000
85.00	0.000	9,211	158.60	0.000
85.50	0.000	9,211	158.60	0.000
86.00	0.000	9,211	158.60	0.000
86.50	0.000	9,211	158.60	0.000
87.00	0.000	9,211	158.60	0.000
87.50	0.000	9,211	158.60	0.000
88.00	0.000	9,211	158.60	0.000
88.50	0.000	9,211	158.60	0.000
89.00	0.000	9,211	158.60	0.000
89.50	0.000	9,211	158.60	0.000
90.00	0.000	9,211	158.60	0.000
90.50	0.000	9,211	158.60	0.000
91.00	0.000	9,211	158.60	0.000
91.50	0.000	9,211	158.60	0.000
92.00	0.000	9,211	158.60	0.000
92.50	0.000	9,211	158.60	0.000
93.00	0.000	9,211	158.60	0.000
93.50	0.000	9,211	158.60	0.000
94.00	0.000	9,211	158.60	0.000
94.50	0.000	9,211	158.60	0.000
95.00	0.000	9,211	158.60	0.000
95.50	0.000	9,211	158.60	0.000
96.00	0.000	9,211	158.60	0.000
96.50	0.000	9,211	158.60	0.000
97.00	0.000	9,211	158.60	0.000
97.50	0.000	9,211	158.60	0.000
98.00	0.000	9,211	158.60	0.000
98.50	0.000	9,211	158.60	0.000
99.00	0.000	9,211	158.60	0.000
99.50	0.000	9,211	158.60	0.000
100.00	0.000	9,211	158.60	0.000
100.50	0.000	9,211	158.60	0.000
101.00	0.000	9,211	158.60	0.000
101.50	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	9,211	158.60	0.000
102.50	0.000	9,211	158.60	0.000
103.00	0.000	9,211	158.60	0.000
103.50	0.000	9,211	158.60	0.000
104.00	0.000	9,211	158.60	0.000
104.50	0.000	9,211	158.60	0.000
105.00	0.000	9,211	158.60	0.000
105.50	0.000	9,211	158.60	0.000
106.00	0.000	9,211	158.60	0.000
106.50	0.000	9,211	158.60	0.000
107.00	0.000	9,211	158.60	0.000
107.50	0.000	9,211	158.60	0.000
108.00	0.000	9,211	158.60	0.000
108.50	0.000	9,211	158.60	0.000
109.00	0.000	9,211	158.60	0.000
109.50	0.000	9,211	158.60	0.000
110.00	0.000	9,211	158.60	0.000
110.50	0.000	9,211	158.60	0.000
111.00	0.000	9,211	158.60	0.000
111.50	0.000	9,211	158.60	0.000
112.00	0.000	9,211	158.60	0.000
112.50	0.000	9,211	158.60	0.000
113.00	0.000	9,211	158.60	0.000
113.50	0.000	9,211	158.60	0.000
114.00	0.000	9,211	158.60	0.000
114.50	0.000	9,211	158.60	0.000
115.00	0.000	9,211	158.60	0.000
115.50	0.000	9,211	158.60	0.000
116.00	0.000	9,211	158.60	0.000
116.50	0.000	9,211	158.60	0.000
117.00	0.000	9,211	158.60	0.000
117.50	0.000	9,211	158.60	0.000
118.00	0.000	9,211	158.60	0.000
118.50	0.000	9,211	158.60	0.000
119.00	0.000	9,211	158.60	0.000
119.50	0.000	9,211	158.60	0.000
120.00	0.000	9,211	158.60	0.000
120.50	0.000	9,211	158.60	0.000
121.00	0.000	9,211	158.60	0.000
121.50	0.000	9,211	158.60	0.000
122.00	0.000	9,211	158.60	0.000
122.50	0.000	9,211	158.60	0.000
123.00	0.000	9,211	158.60	0.000
123.50	0.000	9,211	158.60	0.000
124.00	0.000	9,211	158.60	0.000
124.50	0.000	9,211	158.60	0.000
125.00	0.000	9,211	158.60	0.000
125.50	0.000	9,211	158.60	0.000
126.00	0.000	9,211	158.60	0.000
126.50	0.000	9,211	158.60	0.000
127.00	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	9,211	158.60	0.000
128.00	0.000	9,211	158.60	0.000
128.50	0.000	9,211	158.60	0.000
129.00	0.000	9,211	158.60	0.000
129.50	0.000	9,211	158.60	0.000
130.00	0.000	9,211	158.60	0.000
130.50	0.000	9,211	158.60	0.000
131.00	0.000	9,211	158.60	0.000
131.50	0.000	9,211	158.60	0.000
132.00	0.000	9,211	158.60	0.000
132.50	0.000	9,211	158.60	0.000
133.00	0.000	9,211	158.60	0.000
133.50	0.000	9,211	158.60	0.000
134.00	0.000	9,211	158.60	0.000
134.50	0.000	9,211	158.60	0.000
135.00	0.000	9,211	158.60	0.000
135.50	0.000	9,211	158.60	0.000
136.00	0.000	9,211	158.60	0.000
136.50	0.000	9,211	158.60	0.000
137.00	0.000	9,211	158.60	0.000
137.50	0.000	9,211	158.60	0.000
138.00	0.000	9,211	158.60	0.000
138.50	0.000	9,211	158.60	0.000
139.00	0.000	9,211	158.60	0.000
139.50	0.000	9,211	158.60	0.000
140.00	0.000	9,211	158.60	0.000
140.50	0.000	9,211	158.60	0.000
141.00	0.000	9,211	158.60	0.000
141.50	0.000	9,211	158.60	0.000
142.00	0.000	9,211	158.60	0.000
142.50	0.000	9,211	158.60	0.000
143.00	0.000	9,211	158.60	0.000
143.50	0.000	9,211	158.60	0.000
144.00	0.000	9,211	158.60	0.000
144.50	0.000	9,211	158.60	0.000
145.00	0.000	9,211	158.60	0.000
145.50	0.000	9,211	158.60	0.000
146.00	0.000	9,211	158.60	0.000
146.50	0.000	9,211	158.60	0.000
147.00	0.000	9,211	158.60	0.000
147.50	0.000	9,211	158.60	0.000
148.00	0.000	9,211	158.60	0.000
148.50	0.000	9,211	158.60	0.000
149.00	0.000	9,211	158.60	0.000
149.50	0.000	9,211	158.60	0.000
150.00	0.000	9,211	158.60	0.000
150.50	0.000	9,211	158.60	0.000
151.00	0.000	9,211	158.60	0.000
151.50	0.000	9,211	158.60	0.000
152.00	0.000	9,211	158.60	0.000
152.50	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	9,211	158.60	0.000
153.50	0.000	9,211	158.60	0.000
154.00	0.000	9,211	158.60	0.000
154.50	0.000	9,211	158.60	0.000
155.00	0.000	9,211	158.60	0.000
155.50	0.000	9,211	158.60	0.000
156.00	0.000	9,211	158.60	0.000
156.50	0.000	9,211	158.60	0.000
157.00	0.000	9,211	158.60	0.000
157.50	0.000	9,211	158.60	0.000
158.00	0.000	9,211	158.60	0.000
158.50	0.000	9,211	158.60	0.000
159.00	0.000	9,211	158.60	0.000
159.50	0.000	9,211	158.60	0.000
160.00	0.000	9,211	158.60	0.000
160.50	0.000	9,211	158.60	0.000
161.00	0.000	9,211	158.60	0.000
161.50	0.000	9,211	158.60	0.000
162.00	0.000	9,211	158.60	0.000
162.50	0.000	9,211	158.60	0.000
163.00	0.000	9,211	158.60	0.000
163.50	0.000	9,211	158.60	0.000
164.00	0.000	9,211	158.60	0.000
164.50	0.000	9,211	158.60	0.000
165.00	0.000	9,211	158.60	0.000
165.50	0.000	9,211	158.60	0.000
166.00	0.000	9,211	158.60	0.000
166.50	0.000	9,211	158.60	0.000
167.00	0.000	9,211	158.60	0.000
167.50	0.000	9,211	158.60	0.000
168.00	0.000	9,211	158.60	0.000

Summary for Pond 3P: UG2

Inflow Area = 21,562 sf, 86.06% Impervious, Inflow Depth = 2.62" for 2-yr event
Inflow = 2.040 cfs @ 11.96 hrs, Volume= 4,712 cf
Outflow = 0.532 cfs @ 12.08 hrs, Volume= 4,712 cf, Atten= 74%, Lag= 7.5 min
Primary = 0.532 cfs @ 12.08 hrs, Volume= 4,712 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 160.35' @ 12.08 hrs Surf.Area= 2,542 sf Storage= 1,741 cf

Plug-Flow detention time= 70.5 min calculated for 4,712 cf (100% of inflow)
Center-of-Mass det. time= 70.6 min (821.7 - 751.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.532 cfs @ 12.08 hrs HW=160.35' TW=158.60' (Fixed TW Elev= 158.60')
└─**4=Culvert** (Passes 0.532 cfs of 3.355 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.230 cfs @ 4.685 fps)
  ├─**2=Orifice/Grate** (Orifice Controls 0.302 cfs @ 2.415 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.001	1	159.28	0.000
2.00	0.004	5	159.28	0.000
2.50	0.006	13	159.29	0.001
3.00	0.008	24	159.30	0.001
3.50	0.010	36	159.32	0.003
4.00	0.011	48	159.33	0.005
4.50	0.013	60	159.34	0.007
5.00	0.015	70	159.35	0.010
5.50	0.017	79	159.36	0.012
6.00	0.019	87	159.37	0.015
6.50	0.021	94	159.37	0.017
7.00	0.023	101	159.38	0.020
7.50	0.025	107	159.38	0.022
8.00	0.027	112	159.39	0.024
8.50	0.033	120	159.40	0.027
9.00	0.039	132	159.41	0.032
9.50	0.041	144	159.42	0.037
10.00	0.051	155	159.43	0.042
10.50	0.066	176	159.45	0.052
11.00	0.092	212	159.49	0.068
11.50	**0.153**	285	159.56	0.093
12.00	**1.685**	**1,586**	**160.28**	**0.473**
12.50	0.146	**1,393**	**160.19**	**0.372**
13.00	0.091	1,082	160.04	0.221
13.50	0.069	881	159.95	0.174
14.00	0.054	690	159.86	0.160
14.50	0.048	506	159.78	0.144
15.00	0.043	357	159.63	0.112
15.50	0.038	254	159.53	0.084
16.00	0.033	191	159.47	0.058
16.50	0.031	158	159.44	0.043
17.00	0.029	142	159.42	0.036
17.50	0.027	132	159.41	0.032
18.00	0.026	125	159.40	0.029
18.50	0.024	120	159.40	0.027
19.00	0.022	115	159.39	0.025
19.50	0.020	110	159.39	0.023
20.00	0.019	105	159.38	0.021
20.50	0.018	101	159.38	0.020
21.00	0.018	98	159.38	0.019
21.50	0.017	97	159.37	0.018
22.00	0.017	95	159.37	0.018
22.50	0.017	94	159.37	0.017
23.00	0.016	93	159.37	0.017
23.50	0.016	92	159.37	0.016
24.00	0.016	91	159.37	0.016
24.50	0.000	71	159.35	0.010
25.00	0.000	56	159.34	0.006

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	46	159.33	0.005
26.00	0.000	39	159.32	0.003
26.50	0.000	33	159.31	0.003
27.00	0.000	29	159.31	0.002
27.50	0.000	26	159.31	0.002
28.00	0.000	24	159.30	0.001
28.50	0.000	21	159.30	0.001
29.00	0.000	19	159.30	0.001
29.50	0.000	17	159.30	0.001
30.00	0.000	16	159.30	0.001
30.50	0.000	14	159.29	0.001
31.00	0.000	13	159.29	0.001
31.50	0.000	11	159.29	0.001
32.00	0.000	10	159.29	0.001
32.50	0.000	9	159.29	0.001
33.00	0.000	8	159.29	0.000
33.50	0.000	7	159.29	0.000
34.00	0.000	7	159.29	0.000
34.50	0.000	6	159.29	0.000
35.00	0.000	5	159.29	0.000
35.50	0.000	5	159.28	0.000
36.00	0.000	4	159.28	0.000
36.50	0.000	4	159.28	0.000
37.00	0.000	4	159.28	0.000
37.50	0.000	3	159.28	0.000
38.00	0.000	3	159.28	0.000
38.50	0.000	3	159.28	0.000
39.00	0.000	2	159.28	0.000
39.50	0.000	2	159.28	0.000
40.00	0.000	2	159.28	0.000
40.50	0.000	2	159.28	0.000
41.00	0.000	2	159.28	0.000
41.50	0.000	1	159.28	0.000
42.00	0.000	1	159.28	0.000
42.50	0.000	1	159.28	0.000
43.00	0.000	1	159.28	0.000
43.50	0.000	1	159.28	0.000
44.00	0.000	1	159.28	0.000
44.50	0.000	1	159.28	0.000
45.00	0.000	1	159.28	0.000
45.50	0.000	1	159.28	0.000
46.00	0.000	1	159.28	0.000
46.50	0.000	0	159.28	0.000
47.00	0.000	0	159.28	0.000
47.50	0.000	0	159.28	0.000
48.00	0.000	0	159.28	0.000
48.50	0.000	0	159.28	0.000
49.00	0.000	0	159.28	0.000
49.50	0.000	0	159.28	0.000
50.00	0.000	0	159.28	0.000
50.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	0	159.28	0.000
51.50	0.000	0	159.28	0.000
52.00	0.000	0	159.28	0.000
52.50	0.000	0	159.28	0.000
53.00	0.000	0	159.28	0.000
53.50	0.000	0	159.28	0.000
54.00	0.000	0	159.28	0.000
54.50	0.000	0	159.28	0.000
55.00	0.000	0	159.28	0.000
55.50	0.000	0	159.28	0.000
56.00	0.000	0	159.28	0.000
56.50	0.000	0	159.28	0.000
57.00	0.000	0	159.28	0.000
57.50	0.000	0	159.28	0.000
58.00	0.000	0	159.28	0.000
58.50	0.000	0	159.28	0.000
59.00	0.000	0	159.28	0.000
59.50	0.000	0	159.28	0.000
60.00	0.000	0	159.28	0.000
60.50	0.000	0	159.28	0.000
61.00	0.000	0	159.28	0.000
61.50	0.000	0	159.28	0.000
62.00	0.000	0	159.28	0.000
62.50	0.000	0	159.28	0.000
63.00	0.000	0	159.28	0.000
63.50	0.000	0	159.28	0.000
64.00	0.000	0	159.28	0.000
64.50	0.000	0	159.28	0.000
65.00	0.000	0	159.28	0.000
65.50	0.000	0	159.28	0.000
66.00	0.000	0	159.28	0.000
66.50	0.000	0	159.28	0.000
67.00	0.000	0	159.28	0.000
67.50	0.000	0	159.28	0.000
68.00	0.000	0	159.28	0.000
68.50	0.000	0	159.28	0.000
69.00	0.000	0	159.28	0.000
69.50	0.000	0	159.28	0.000
70.00	0.000	0	159.28	0.000
70.50	0.000	0	159.28	0.000
71.00	0.000	0	159.28	0.000
71.50	0.000	0	159.28	0.000
72.00	0.000	0	159.28	0.000
72.50	0.000	0	159.28	0.000
73.00	0.000	0	159.28	0.000
73.50	0.000	0	159.28	0.000
74.00	0.000	0	159.28	0.000
74.50	0.000	0	159.28	0.000
75.00	0.000	0	159.28	0.000
75.50	0.000	0	159.28	0.000
76.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	0	159.28	0.000
77.00	0.000	0	159.28	0.000
77.50	0.000	0	159.28	0.000
78.00	0.000	0	159.28	0.000
78.50	0.000	0	159.28	0.000
79.00	0.000	0	159.28	0.000
79.50	0.000	0	159.28	0.000
80.00	0.000	0	159.28	0.000
80.50	0.000	0	159.28	0.000
81.00	0.000	0	159.28	0.000
81.50	0.000	0	159.28	0.000
82.00	0.000	0	159.28	0.000
82.50	0.000	0	159.28	0.000
83.00	0.000	0	159.28	0.000
83.50	0.000	0	159.28	0.000
84.00	0.000	0	159.28	0.000
84.50	0.000	0	159.28	0.000
85.00	0.000	0	159.28	0.000
85.50	0.000	0	159.28	0.000
86.00	0.000	0	159.28	0.000
86.50	0.000	0	159.28	0.000
87.00	0.000	0	159.28	0.000
87.50	0.000	0	159.28	0.000
88.00	0.000	0	159.28	0.000
88.50	0.000	0	159.28	0.000
89.00	0.000	0	159.28	0.000
89.50	0.000	0	159.28	0.000
90.00	0.000	0	159.28	0.000
90.50	0.000	0	159.28	0.000
91.00	0.000	0	159.28	0.000
91.50	0.000	0	159.28	0.000
92.00	0.000	0	159.28	0.000
92.50	0.000	0	159.28	0.000
93.00	0.000	0	159.28	0.000
93.50	0.000	0	159.28	0.000
94.00	0.000	0	159.28	0.000
94.50	0.000	0	159.28	0.000
95.00	0.000	0	159.28	0.000
95.50	0.000	0	159.28	0.000
96.00	0.000	0	159.28	0.000
96.50	0.000	0	159.28	0.000
97.00	0.000	0	159.28	0.000
97.50	0.000	0	159.28	0.000
98.00	0.000	0	159.28	0.000
98.50	0.000	0	159.28	0.000
99.00	0.000	0	159.28	0.000
99.50	0.000	0	159.28	0.000
100.00	0.000	0	159.28	0.000
100.50	0.000	0	159.28	0.000
101.00	0.000	0	159.28	0.000
101.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

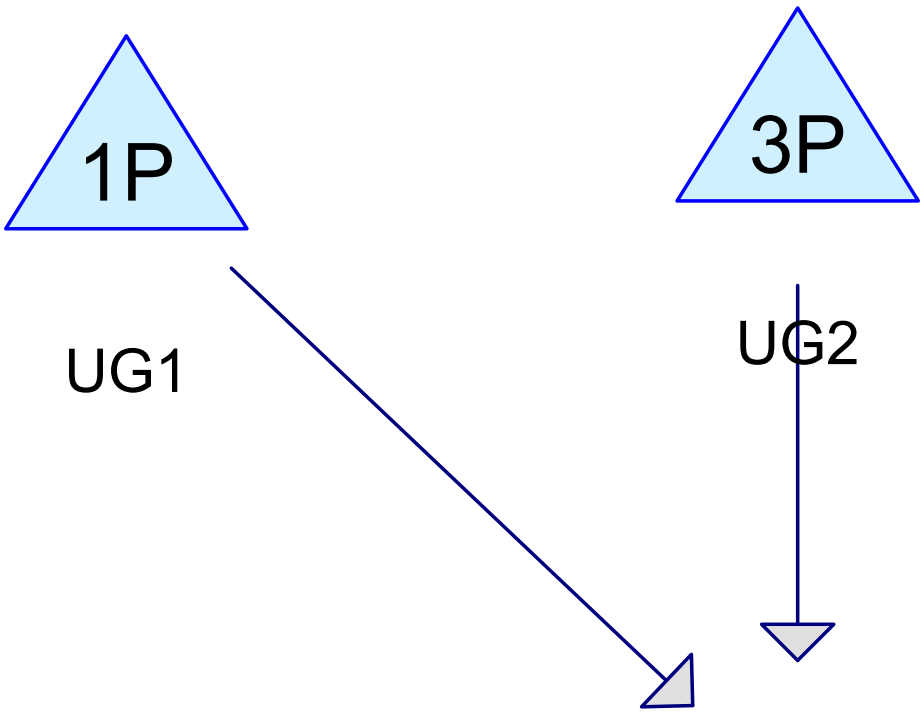
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	0	159.28	0.000
102.50	0.000	0	159.28	0.000
103.00	0.000	0	159.28	0.000
103.50	0.000	0	159.28	0.000
104.00	0.000	0	159.28	0.000
104.50	0.000	0	159.28	0.000
105.00	0.000	0	159.28	0.000
105.50	0.000	0	159.28	0.000
106.00	0.000	0	159.28	0.000
106.50	0.000	0	159.28	0.000
107.00	0.000	0	159.28	0.000
107.50	0.000	0	159.28	0.000
108.00	0.000	0	159.28	0.000
108.50	0.000	0	159.28	0.000
109.00	0.000	0	159.28	0.000
109.50	0.000	0	159.28	0.000
110.00	0.000	0	159.28	0.000
110.50	0.000	0	159.28	0.000
111.00	0.000	0	159.28	0.000
111.50	0.000	0	159.28	0.000
112.00	0.000	0	159.28	0.000
112.50	0.000	0	159.28	0.000
113.00	0.000	0	159.28	0.000
113.50	0.000	0	159.28	0.000
114.00	0.000	0	159.28	0.000
114.50	0.000	0	159.28	0.000
115.00	0.000	0	159.28	0.000
115.50	0.000	0	159.28	0.000
116.00	0.000	0	159.28	0.000
116.50	0.000	0	159.28	0.000
117.00	0.000	0	159.28	0.000
117.50	0.000	0	159.28	0.000
118.00	0.000	0	159.28	0.000
118.50	0.000	0	159.28	0.000
119.00	0.000	0	159.28	0.000
119.50	0.000	0	159.28	0.000
120.00	0.000	0	159.28	0.000
120.50	0.000	0	159.28	0.000
121.00	0.000	0	159.28	0.000
121.50	0.000	0	159.28	0.000
122.00	0.000	0	159.28	0.000
122.50	0.000	0	159.28	0.000
123.00	0.000	0	159.28	0.000
123.50	0.000	0	159.28	0.000
124.00	0.000	0	159.28	0.000
124.50	0.000	0	159.28	0.000
125.00	0.000	0	159.28	0.000
125.50	0.000	0	159.28	0.000
126.00	0.000	0	159.28	0.000
126.50	0.000	0	159.28	0.000
127.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	0	159.28	0.000
128.00	0.000	0	159.28	0.000
128.50	0.000	0	159.28	0.000
129.00	0.000	0	159.28	0.000
129.50	0.000	0	159.28	0.000
130.00	0.000	0	159.28	0.000
130.50	0.000	0	159.28	0.000
131.00	0.000	0	159.28	0.000
131.50	0.000	0	159.28	0.000
132.00	0.000	0	159.28	0.000
132.50	0.000	0	159.28	0.000
133.00	0.000	0	159.28	0.000
133.50	0.000	0	159.28	0.000
134.00	0.000	0	159.28	0.000
134.50	0.000	0	159.28	0.000
135.00	0.000	0	159.28	0.000
135.50	0.000	0	159.28	0.000
136.00	0.000	0	159.28	0.000
136.50	0.000	0	159.28	0.000
137.00	0.000	0	159.28	0.000
137.50	0.000	0	159.28	0.000
138.00	0.000	0	159.28	0.000
138.50	0.000	0	159.28	0.000
139.00	0.000	0	159.28	0.000
139.50	0.000	0	159.28	0.000
140.00	0.000	0	159.28	0.000
140.50	0.000	0	159.28	0.000
141.00	0.000	0	159.28	0.000
141.50	0.000	0	159.28	0.000
142.00	0.000	0	159.28	0.000
142.50	0.000	0	159.28	0.000
143.00	0.000	0	159.28	0.000
143.50	0.000	0	159.28	0.000
144.00	0.000	0	159.28	0.000
144.50	0.000	0	159.28	0.000
145.00	0.000	0	159.28	0.000
145.50	0.000	0	159.28	0.000
146.00	0.000	0	159.28	0.000
146.50	0.000	0	159.28	0.000
147.00	0.000	0	159.28	0.000
147.50	0.000	0	159.28	0.000
148.00	0.000	0	159.28	0.000
148.50	0.000	0	159.28	0.000
149.00	0.000	0	159.28	0.000
149.50	0.000	0	159.28	0.000
150.00	0.000	0	159.28	0.000
150.50	0.000	0	159.28	0.000
151.00	0.000	0	159.28	0.000
151.50	0.000	0	159.28	0.000
152.00	0.000	0	159.28	0.000
152.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	0	159.28	0.000
153.50	0.000	0	159.28	0.000
154.00	0.000	0	159.28	0.000
154.50	0.000	0	159.28	0.000
155.00	0.000	0	159.28	0.000
155.50	0.000	0	159.28	0.000
156.00	0.000	0	159.28	0.000
156.50	0.000	0	159.28	0.000
157.00	0.000	0	159.28	0.000
157.50	0.000	0	159.28	0.000
158.00	0.000	0	159.28	0.000
158.50	0.000	0	159.28	0.000
159.00	0.000	0	159.28	0.000
159.50	0.000	0	159.28	0.000
160.00	0.000	0	159.28	0.000
160.50	0.000	0	159.28	0.000
161.00	0.000	0	159.28	0.000
161.50	0.000	0	159.28	0.000
162.00	0.000	0	159.28	0.000
162.50	0.000	0	159.28	0.000
163.00	0.000	0	159.28	0.000
163.50	0.000	0	159.28	0.000
164.00	0.000	0	159.28	0.000
164.50	0.000	0	159.28	0.000
165.00	0.000	0	159.28	0.000
165.50	0.000	0	159.28	0.000
166.00	0.000	0	159.28	0.000
166.50	0.000	0	159.28	0.000
167.00	0.000	0	159.28	0.000
167.50	0.000	0	159.28	0.000
168.00	0.000	0	159.28	0.000



Subcat Reach Pond Link

Routing Diagram for BMW_2025-4-23
Prepared by Bohler, Printed 4/23/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	5-yr	Type II 24-hr		Default	24.00	1	4.13	2

Summary for Pond 1P: UG1

Inflow Area = 81,327 sf, 96.79% Impervious, Inflow Depth = 3.77" for 5-yr event
Inflow = 10.939 cfs @ 11.96 hrs, Volume= 25,561 cf
Outflow = 0.355 cfs @ 13.57 hrs, Volume= 5,814 cf, Atten= 97%, Lag= 96.7 min
Primary = 0.355 cfs @ 13.57 hrs, Volume= 5,814 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 159.61' @ 13.57 hrs Surf.Area= 13,041 sf Storage= 19,849 cf

Plug-Flow detention time= 532.0 min calculated for 5,814 cf (23% of inflow)
Center-of-Mass det. time= 297.8 min (1,044.4 - 746.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.393 cfs @ 13.57 hrs HW=159.61' TW=159.60' (Fixed TW Elev= 159.60')
└─**4=Culvert** (Passes 0.393 cfs of 0.755 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.003 cfs @ 0.502 fps)
  ├─**2=Orifice/Grate** (Orifice Controls 0.391 cfs @ 0.502 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.016	14	157.53	0.000
2.00	0.030	56	157.54	0.000
2.50	0.042	121	157.55	0.000
3.00	0.053	207	157.57	0.000
3.50	0.062	310	157.59	0.000
4.00	0.071	430	157.61	0.000
4.50	0.081	566	157.64	0.000
5.00	0.091	720	157.67	0.000
5.50	0.101	893	157.70	0.000
6.00	0.111	1,083	157.74	0.000
6.50	0.120	1,291	157.78	0.000
7.00	0.130	1,517	157.82	0.000
7.50	0.139	1,759	157.87	0.000
8.00	0.148	2,018	157.92	0.000
8.50	0.181	2,311	157.97	0.000
9.00	0.218	2,669	158.04	0.000
9.50	0.226	3,073	158.07	0.000
10.00	0.277	3,519	158.11	0.000
10.50	0.361	4,090	158.16	0.000
11.00	0.501	4,859	158.22	0.000
11.50	**0.826**	6,030	158.32	0.000
12.00	**9.030**	14,672	159.10	0.000
12.50	0.784	18,186	159.44	0.000
13.00	0.487	19,257	159.55	0.000
13.50	0.369	**19,846**	**159.61**	**0.348**
14.00	0.289	**19,833**	**159.61**	**0.301**
14.50	0.256	19,821	159.61	0.260
15.00	0.229	19,814	159.61	0.234
15.50	0.203	19,806	159.61	0.207
16.00	0.177	19,798	159.61	0.181
16.50	0.165	19,794	159.61	0.167
17.00	0.156	19,792	159.60	0.157
17.50	0.146	19,789	159.60	0.148
18.00	0.137	19,786	159.60	0.138
18.50	0.128	19,783	159.60	0.129
19.00	0.118	19,781	159.60	0.120
19.50	0.109	19,778	159.60	0.110
20.00	0.099	19,775	159.60	0.101
20.50	0.096	19,774	159.60	0.097
21.00	0.094	19,774	159.60	0.095
21.50	0.093	19,773	159.60	0.093
22.00	0.091	19,772	159.60	0.091
22.50	0.089	19,772	159.60	0.089
23.00	0.087	19,771	159.60	0.087
23.50	0.085	19,771	159.60	0.085
24.00	0.083	19,770	159.60	0.083
24.50	0.000	19,746	159.60	0.000
25.00	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	19,746	159.60	0.000
26.00	0.000	19,746	159.60	0.000
26.50	0.000	19,746	159.60	0.000
27.00	0.000	19,746	159.60	0.000
27.50	0.000	19,746	159.60	0.000
28.00	0.000	19,746	159.60	0.000
28.50	0.000	19,746	159.60	0.000
29.00	0.000	19,746	159.60	0.000
29.50	0.000	19,746	159.60	0.000
30.00	0.000	19,746	159.60	0.000
30.50	0.000	19,746	159.60	0.000
31.00	0.000	19,746	159.60	0.000
31.50	0.000	19,746	159.60	0.000
32.00	0.000	19,746	159.60	0.000
32.50	0.000	19,746	159.60	0.000
33.00	0.000	19,746	159.60	0.000
33.50	0.000	19,746	159.60	0.000
34.00	0.000	19,746	159.60	0.000
34.50	0.000	19,746	159.60	0.000
35.00	0.000	19,746	159.60	0.000
35.50	0.000	19,746	159.60	0.000
36.00	0.000	19,746	159.60	0.000
36.50	0.000	19,746	159.60	0.000
37.00	0.000	19,746	159.60	0.000
37.50	0.000	19,746	159.60	0.000
38.00	0.000	19,746	159.60	0.000
38.50	0.000	19,746	159.60	0.000
39.00	0.000	19,746	159.60	0.000
39.50	0.000	19,746	159.60	0.000
40.00	0.000	19,746	159.60	0.000
40.50	0.000	19,746	159.60	0.000
41.00	0.000	19,746	159.60	0.000
41.50	0.000	19,746	159.60	0.000
42.00	0.000	19,746	159.60	0.000
42.50	0.000	19,746	159.60	0.000
43.00	0.000	19,746	159.60	0.000
43.50	0.000	19,746	159.60	0.000
44.00	0.000	19,746	159.60	0.000
44.50	0.000	19,746	159.60	0.000
45.00	0.000	19,746	159.60	0.000
45.50	0.000	19,746	159.60	0.000
46.00	0.000	19,746	159.60	0.000
46.50	0.000	19,746	159.60	0.000
47.00	0.000	19,746	159.60	0.000
47.50	0.000	19,746	159.60	0.000
48.00	0.000	19,746	159.60	0.000
48.50	0.000	19,746	159.60	0.000
49.00	0.000	19,746	159.60	0.000
49.50	0.000	19,746	159.60	0.000
50.00	0.000	19,746	159.60	0.000
50.50	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	19,746	159.60	0.000
51.50	0.000	19,746	159.60	0.000
52.00	0.000	19,746	159.60	0.000
52.50	0.000	19,746	159.60	0.000
53.00	0.000	19,746	159.60	0.000
53.50	0.000	19,746	159.60	0.000
54.00	0.000	19,746	159.60	0.000
54.50	0.000	19,746	159.60	0.000
55.00	0.000	19,746	159.60	0.000
55.50	0.000	19,746	159.60	0.000
56.00	0.000	19,746	159.60	0.000
56.50	0.000	19,746	159.60	0.000
57.00	0.000	19,746	159.60	0.000
57.50	0.000	19,746	159.60	0.000
58.00	0.000	19,746	159.60	0.000
58.50	0.000	19,746	159.60	0.000
59.00	0.000	19,746	159.60	0.000
59.50	0.000	19,746	159.60	0.000
60.00	0.000	19,746	159.60	0.000
60.50	0.000	19,746	159.60	0.000
61.00	0.000	19,746	159.60	0.000
61.50	0.000	19,746	159.60	0.000
62.00	0.000	19,746	159.60	0.000
62.50	0.000	19,746	159.60	0.000
63.00	0.000	19,746	159.60	0.000
63.50	0.000	19,746	159.60	0.000
64.00	0.000	19,746	159.60	0.000
64.50	0.000	19,746	159.60	0.000
65.00	0.000	19,746	159.60	0.000
65.50	0.000	19,746	159.60	0.000
66.00	0.000	19,746	159.60	0.000
66.50	0.000	19,746	159.60	0.000
67.00	0.000	19,746	159.60	0.000
67.50	0.000	19,746	159.60	0.000
68.00	0.000	19,746	159.60	0.000
68.50	0.000	19,746	159.60	0.000
69.00	0.000	19,746	159.60	0.000
69.50	0.000	19,746	159.60	0.000
70.00	0.000	19,746	159.60	0.000
70.50	0.000	19,746	159.60	0.000
71.00	0.000	19,746	159.60	0.000
71.50	0.000	19,746	159.60	0.000
72.00	0.000	19,746	159.60	0.000
72.50	0.000	19,746	159.60	0.000
73.00	0.000	19,746	159.60	0.000
73.50	0.000	19,746	159.60	0.000
74.00	0.000	19,746	159.60	0.000
74.50	0.000	19,746	159.60	0.000
75.00	0.000	19,746	159.60	0.000
75.50	0.000	19,746	159.60	0.000
76.00	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	19,746	159.60	0.000
77.00	0.000	19,746	159.60	0.000
77.50	0.000	19,746	159.60	0.000
78.00	0.000	19,746	159.60	0.000
78.50	0.000	19,746	159.60	0.000
79.00	0.000	19,746	159.60	0.000
79.50	0.000	19,746	159.60	0.000
80.00	0.000	19,746	159.60	0.000
80.50	0.000	19,746	159.60	0.000
81.00	0.000	19,746	159.60	0.000
81.50	0.000	19,746	159.60	0.000
82.00	0.000	19,746	159.60	0.000
82.50	0.000	19,746	159.60	0.000
83.00	0.000	19,746	159.60	0.000
83.50	0.000	19,746	159.60	0.000
84.00	0.000	19,746	159.60	0.000
84.50	0.000	19,746	159.60	0.000
85.00	0.000	19,746	159.60	0.000
85.50	0.000	19,746	159.60	0.000
86.00	0.000	19,746	159.60	0.000
86.50	0.000	19,746	159.60	0.000
87.00	0.000	19,746	159.60	0.000
87.50	0.000	19,746	159.60	0.000
88.00	0.000	19,746	159.60	0.000
88.50	0.000	19,746	159.60	0.000
89.00	0.000	19,746	159.60	0.000
89.50	0.000	19,746	159.60	0.000
90.00	0.000	19,746	159.60	0.000
90.50	0.000	19,746	159.60	0.000
91.00	0.000	19,746	159.60	0.000
91.50	0.000	19,746	159.60	0.000
92.00	0.000	19,746	159.60	0.000
92.50	0.000	19,746	159.60	0.000
93.00	0.000	19,746	159.60	0.000
93.50	0.000	19,746	159.60	0.000
94.00	0.000	19,746	159.60	0.000
94.50	0.000	19,746	159.60	0.000
95.00	0.000	19,746	159.60	0.000
95.50	0.000	19,746	159.60	0.000
96.00	0.000	19,746	159.60	0.000
96.50	0.000	19,746	159.60	0.000
97.00	0.000	19,746	159.60	0.000
97.50	0.000	19,746	159.60	0.000
98.00	0.000	19,746	159.60	0.000
98.50	0.000	19,746	159.60	0.000
99.00	0.000	19,746	159.60	0.000
99.50	0.000	19,746	159.60	0.000
100.00	0.000	19,746	159.60	0.000
100.50	0.000	19,746	159.60	0.000
101.00	0.000	19,746	159.60	0.000
101.50	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	19,746	159.60	0.000
102.50	0.000	19,746	159.60	0.000
103.00	0.000	19,746	159.60	0.000
103.50	0.000	19,746	159.60	0.000
104.00	0.000	19,746	159.60	0.000
104.50	0.000	19,746	159.60	0.000
105.00	0.000	19,746	159.60	0.000
105.50	0.000	19,746	159.60	0.000
106.00	0.000	19,746	159.60	0.000
106.50	0.000	19,746	159.60	0.000
107.00	0.000	19,746	159.60	0.000
107.50	0.000	19,746	159.60	0.000
108.00	0.000	19,746	159.60	0.000
108.50	0.000	19,746	159.60	0.000
109.00	0.000	19,746	159.60	0.000
109.50	0.000	19,746	159.60	0.000
110.00	0.000	19,746	159.60	0.000
110.50	0.000	19,746	159.60	0.000
111.00	0.000	19,746	159.60	0.000
111.50	0.000	19,746	159.60	0.000
112.00	0.000	19,746	159.60	0.000
112.50	0.000	19,746	159.60	0.000
113.00	0.000	19,746	159.60	0.000
113.50	0.000	19,746	159.60	0.000
114.00	0.000	19,746	159.60	0.000
114.50	0.000	19,746	159.60	0.000
115.00	0.000	19,746	159.60	0.000
115.50	0.000	19,746	159.60	0.000
116.00	0.000	19,746	159.60	0.000
116.50	0.000	19,746	159.60	0.000
117.00	0.000	19,746	159.60	0.000
117.50	0.000	19,746	159.60	0.000
118.00	0.000	19,746	159.60	0.000
118.50	0.000	19,746	159.60	0.000
119.00	0.000	19,746	159.60	0.000
119.50	0.000	19,746	159.60	0.000
120.00	0.000	19,746	159.60	0.000
120.50	0.000	19,746	159.60	0.000
121.00	0.000	19,746	159.60	0.000
121.50	0.000	19,746	159.60	0.000
122.00	0.000	19,746	159.60	0.000
122.50	0.000	19,746	159.60	0.000
123.00	0.000	19,746	159.60	0.000
123.50	0.000	19,746	159.60	0.000
124.00	0.000	19,746	159.60	0.000
124.50	0.000	19,746	159.60	0.000
125.00	0.000	19,746	159.60	0.000
125.50	0.000	19,746	159.60	0.000
126.00	0.000	19,746	159.60	0.000
126.50	0.000	19,746	159.60	0.000
127.00	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	19,746	159.60	0.000
128.00	0.000	19,746	159.60	0.000
128.50	0.000	19,746	159.60	0.000
129.00	0.000	19,746	159.60	0.000
129.50	0.000	19,746	159.60	0.000
130.00	0.000	19,746	159.60	0.000
130.50	0.000	19,746	159.60	0.000
131.00	0.000	19,746	159.60	0.000
131.50	0.000	19,746	159.60	0.000
132.00	0.000	19,746	159.60	0.000
132.50	0.000	19,746	159.60	0.000
133.00	0.000	19,746	159.60	0.000
133.50	0.000	19,746	159.60	0.000
134.00	0.000	19,746	159.60	0.000
134.50	0.000	19,746	159.60	0.000
135.00	0.000	19,746	159.60	0.000
135.50	0.000	19,746	159.60	0.000
136.00	0.000	19,746	159.60	0.000
136.50	0.000	19,746	159.60	0.000
137.00	0.000	19,746	159.60	0.000
137.50	0.000	19,746	159.60	0.000
138.00	0.000	19,746	159.60	0.000
138.50	0.000	19,746	159.60	0.000
139.00	0.000	19,746	159.60	0.000
139.50	0.000	19,746	159.60	0.000
140.00	0.000	19,746	159.60	0.000
140.50	0.000	19,746	159.60	0.000
141.00	0.000	19,746	159.60	0.000
141.50	0.000	19,746	159.60	0.000
142.00	0.000	19,746	159.60	0.000
142.50	0.000	19,746	159.60	0.000
143.00	0.000	19,746	159.60	0.000
143.50	0.000	19,746	159.60	0.000
144.00	0.000	19,746	159.60	0.000
144.50	0.000	19,746	159.60	0.000
145.00	0.000	19,746	159.60	0.000
145.50	0.000	19,746	159.60	0.000
146.00	0.000	19,746	159.60	0.000
146.50	0.000	19,746	159.60	0.000
147.00	0.000	19,746	159.60	0.000
147.50	0.000	19,746	159.60	0.000
148.00	0.000	19,746	159.60	0.000
148.50	0.000	19,746	159.60	0.000
149.00	0.000	19,746	159.60	0.000
149.50	0.000	19,746	159.60	0.000
150.00	0.000	19,746	159.60	0.000
150.50	0.000	19,746	159.60	0.000
151.00	0.000	19,746	159.60	0.000
151.50	0.000	19,746	159.60	0.000
152.00	0.000	19,746	159.60	0.000
152.50	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	19,746	159.60	0.000
153.50	0.000	19,746	159.60	0.000
154.00	0.000	19,746	159.60	0.000
154.50	0.000	19,746	159.60	0.000
155.00	0.000	19,746	159.60	0.000
155.50	0.000	19,746	159.60	0.000
156.00	0.000	19,746	159.60	0.000
156.50	0.000	19,746	159.60	0.000
157.00	0.000	19,746	159.60	0.000
157.50	0.000	19,746	159.60	0.000
158.00	0.000	19,746	159.60	0.000
158.50	0.000	19,746	159.60	0.000
159.00	0.000	19,746	159.60	0.000
159.50	0.000	19,746	159.60	0.000
160.00	0.000	19,746	159.60	0.000
160.50	0.000	19,746	159.60	0.000
161.00	0.000	19,746	159.60	0.000
161.50	0.000	19,746	159.60	0.000
162.00	0.000	19,746	159.60	0.000
162.50	0.000	19,746	159.60	0.000
163.00	0.000	19,746	159.60	0.000
163.50	0.000	19,746	159.60	0.000
164.00	0.000	19,746	159.60	0.000
164.50	0.000	19,746	159.60	0.000
165.00	0.000	19,746	159.60	0.000
165.50	0.000	19,746	159.60	0.000
166.00	0.000	19,746	159.60	0.000
166.50	0.000	19,746	159.60	0.000
167.00	0.000	19,746	159.60	0.000
167.50	0.000	19,746	159.60	0.000
168.00	0.000	19,746	159.60	0.000

Summary for Pond 3P: UG2

Inflow Area = 21,562 sf, 86.06% Impervious, Inflow Depth = 3.36" for 5-yr event
Inflow = 2.579 cfs @ 11.96 hrs, Volume= 6,038 cf
Outflow = 0.692 cfs @ 12.08 hrs, Volume= 5,713 cf, Atten= 73%, Lag= 7.3 min
Primary = 0.692 cfs @ 12.08 hrs, Volume= 5,713 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 160.65' @ 12.08 hrs Surf.Area= 2,542 sf Storage= 2,363 cf

Plug-Flow detention time= 99.3 min calculated for 5,713 cf (95% of inflow)
Center-of-Mass det. time= 66.9 min (814.3 - 747.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.692 cfs @ 12.08 hrs HW=160.65' TW=159.60' (Fixed TW Elev= 159.60')
└─**4=Culvert** (Passes 0.692 cfs of 5.009 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.243 cfs @ 4.944 fps)
  ├─**2=Orifice/Grate** (Orifice Controls 0.449 cfs @ 3.593 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.004	3	159.28	0.000
2.00	0.007	13	159.29	0.000
2.50	0.010	29	159.31	0.000
3.00	0.012	49	159.33	0.000
3.50	0.015	73	159.35	0.000
4.00	0.017	101	159.38	0.000
4.50	0.019	133	159.41	0.000
5.00	0.021	170	159.45	0.000
5.50	0.024	210	159.49	0.000
6.00	0.026	255	159.53	0.000
6.50	0.028	304	159.58	0.000
7.00	0.031	338	159.61	0.024
7.50	0.033	345	159.62	0.030
8.00	0.035	349	159.62	0.033
8.50	0.043	354	159.63	0.038
9.00	0.051	363	159.64	0.045
9.50	0.053	372	159.65	0.050
10.00	0.065	383	159.66	0.056
10.50	0.085	408	159.68	0.067
11.00	0.118	454	159.73	0.084
11.50	**0.195**	558	159.80	0.106
12.00	**2.129**	**2,174**	**160.56**	**0.641**
12.50	0.185	**1,859**	**160.41**	**0.547**
13.00	0.115	1,336	160.16	0.311
13.50	0.087	1,084	160.04	0.190
14.00	0.068	929	159.97	0.145
14.50	0.061	796	159.91	0.132
15.00	0.054	673	159.85	0.119
15.50	0.048	562	159.80	0.107
16.00	0.042	465	159.74	0.088
16.50	0.039	402	159.68	0.065
17.00	0.037	370	159.64	0.049
17.50	0.035	355	159.63	0.040
18.00	0.033	350	159.62	0.035
18.50	0.030	347	159.62	0.032
19.00	0.028	344	159.62	0.030
19.50	0.026	342	159.62	0.027
20.00	0.024	339	159.61	0.025
20.50	0.023	338	159.61	0.024
21.00	0.023	337	159.61	0.023
21.50	0.022	337	159.61	0.022
22.00	0.022	336	159.61	0.022
22.50	0.021	336	159.61	0.021
23.00	0.021	335	159.61	0.021
23.50	0.020	335	159.61	0.021
24.00	0.020	334	159.61	0.020
24.50	0.000	326	159.60	0.000
25.00	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	325	159.60	0.000
26.00	0.000	325	159.60	0.000
26.50	0.000	325	159.60	0.000
27.00	0.000	325	159.60	0.000
27.50	0.000	325	159.60	0.000
28.00	0.000	325	159.60	0.000
28.50	0.000	325	159.60	0.000
29.00	0.000	325	159.60	0.000
29.50	0.000	325	159.60	0.000
30.00	0.000	325	159.60	0.000
30.50	0.000	325	159.60	0.000
31.00	0.000	325	159.60	0.000
31.50	0.000	325	159.60	0.000
32.00	0.000	325	159.60	0.000
32.50	0.000	325	159.60	0.000
33.00	0.000	325	159.60	0.000
33.50	0.000	325	159.60	0.000
34.00	0.000	325	159.60	0.000
34.50	0.000	325	159.60	0.000
35.00	0.000	325	159.60	0.000
35.50	0.000	325	159.60	0.000
36.00	0.000	325	159.60	0.000
36.50	0.000	325	159.60	0.000
37.00	0.000	325	159.60	0.000
37.50	0.000	325	159.60	0.000
38.00	0.000	325	159.60	0.000
38.50	0.000	325	159.60	0.000
39.00	0.000	325	159.60	0.000
39.50	0.000	325	159.60	0.000
40.00	0.000	325	159.60	0.000
40.50	0.000	325	159.60	0.000
41.00	0.000	325	159.60	0.000
41.50	0.000	325	159.60	0.000
42.00	0.000	325	159.60	0.000
42.50	0.000	325	159.60	0.000
43.00	0.000	325	159.60	0.000
43.50	0.000	325	159.60	0.000
44.00	0.000	325	159.60	0.000
44.50	0.000	325	159.60	0.000
45.00	0.000	325	159.60	0.000
45.50	0.000	325	159.60	0.000
46.00	0.000	325	159.60	0.000
46.50	0.000	325	159.60	0.000
47.00	0.000	325	159.60	0.000
47.50	0.000	325	159.60	0.000
48.00	0.000	325	159.60	0.000
48.50	0.000	325	159.60	0.000
49.00	0.000	325	159.60	0.000
49.50	0.000	325	159.60	0.000
50.00	0.000	325	159.60	0.000
50.50	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	325	159.60	0.000
51.50	0.000	325	159.60	0.000
52.00	0.000	325	159.60	0.000
52.50	0.000	325	159.60	0.000
53.00	0.000	325	159.60	0.000
53.50	0.000	325	159.60	0.000
54.00	0.000	325	159.60	0.000
54.50	0.000	325	159.60	0.000
55.00	0.000	325	159.60	0.000
55.50	0.000	325	159.60	0.000
56.00	0.000	325	159.60	0.000
56.50	0.000	325	159.60	0.000
57.00	0.000	325	159.60	0.000
57.50	0.000	325	159.60	0.000
58.00	0.000	325	159.60	0.000
58.50	0.000	325	159.60	0.000
59.00	0.000	325	159.60	0.000
59.50	0.000	325	159.60	0.000
60.00	0.000	325	159.60	0.000
60.50	0.000	325	159.60	0.000
61.00	0.000	325	159.60	0.000
61.50	0.000	325	159.60	0.000
62.00	0.000	325	159.60	0.000
62.50	0.000	325	159.60	0.000
63.00	0.000	325	159.60	0.000
63.50	0.000	325	159.60	0.000
64.00	0.000	325	159.60	0.000
64.50	0.000	325	159.60	0.000
65.00	0.000	325	159.60	0.000
65.50	0.000	325	159.60	0.000
66.00	0.000	325	159.60	0.000
66.50	0.000	325	159.60	0.000
67.00	0.000	325	159.60	0.000
67.50	0.000	325	159.60	0.000
68.00	0.000	325	159.60	0.000
68.50	0.000	325	159.60	0.000
69.00	0.000	325	159.60	0.000
69.50	0.000	325	159.60	0.000
70.00	0.000	325	159.60	0.000
70.50	0.000	325	159.60	0.000
71.00	0.000	325	159.60	0.000
71.50	0.000	325	159.60	0.000
72.00	0.000	325	159.60	0.000
72.50	0.000	325	159.60	0.000
73.00	0.000	325	159.60	0.000
73.50	0.000	325	159.60	0.000
74.00	0.000	325	159.60	0.000
74.50	0.000	325	159.60	0.000
75.00	0.000	325	159.60	0.000
75.50	0.000	325	159.60	0.000
76.00	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	325	159.60	0.000
77.00	0.000	325	159.60	0.000
77.50	0.000	325	159.60	0.000
78.00	0.000	325	159.60	0.000
78.50	0.000	325	159.60	0.000
79.00	0.000	325	159.60	0.000
79.50	0.000	325	159.60	0.000
80.00	0.000	325	159.60	0.000
80.50	0.000	325	159.60	0.000
81.00	0.000	325	159.60	0.000
81.50	0.000	325	159.60	0.000
82.00	0.000	325	159.60	0.000
82.50	0.000	325	159.60	0.000
83.00	0.000	325	159.60	0.000
83.50	0.000	325	159.60	0.000
84.00	0.000	325	159.60	0.000
84.50	0.000	325	159.60	0.000
85.00	0.000	325	159.60	0.000
85.50	0.000	325	159.60	0.000
86.00	0.000	325	159.60	0.000
86.50	0.000	325	159.60	0.000
87.00	0.000	325	159.60	0.000
87.50	0.000	325	159.60	0.000
88.00	0.000	325	159.60	0.000
88.50	0.000	325	159.60	0.000
89.00	0.000	325	159.60	0.000
89.50	0.000	325	159.60	0.000
90.00	0.000	325	159.60	0.000
90.50	0.000	325	159.60	0.000
91.00	0.000	325	159.60	0.000
91.50	0.000	325	159.60	0.000
92.00	0.000	325	159.60	0.000
92.50	0.000	325	159.60	0.000
93.00	0.000	325	159.60	0.000
93.50	0.000	325	159.60	0.000
94.00	0.000	325	159.60	0.000
94.50	0.000	325	159.60	0.000
95.00	0.000	325	159.60	0.000
95.50	0.000	325	159.60	0.000
96.00	0.000	325	159.60	0.000
96.50	0.000	325	159.60	0.000
97.00	0.000	325	159.60	0.000
97.50	0.000	325	159.60	0.000
98.00	0.000	325	159.60	0.000
98.50	0.000	325	159.60	0.000
99.00	0.000	325	159.60	0.000
99.50	0.000	325	159.60	0.000
100.00	0.000	325	159.60	0.000
100.50	0.000	325	159.60	0.000
101.00	0.000	325	159.60	0.000
101.50	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

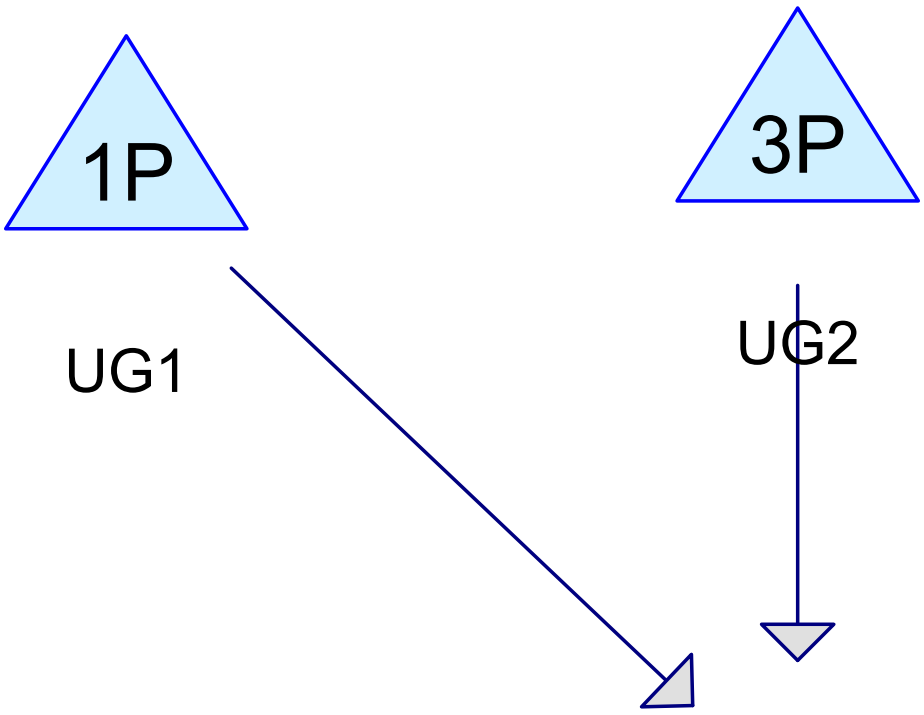
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	325	159.60	0.000
102.50	0.000	325	159.60	0.000
103.00	0.000	325	159.60	0.000
103.50	0.000	325	159.60	0.000
104.00	0.000	325	159.60	0.000
104.50	0.000	325	159.60	0.000
105.00	0.000	325	159.60	0.000
105.50	0.000	325	159.60	0.000
106.00	0.000	325	159.60	0.000
106.50	0.000	325	159.60	0.000
107.00	0.000	325	159.60	0.000
107.50	0.000	325	159.60	0.000
108.00	0.000	325	159.60	0.000
108.50	0.000	325	159.60	0.000
109.00	0.000	325	159.60	0.000
109.50	0.000	325	159.60	0.000
110.00	0.000	325	159.60	0.000
110.50	0.000	325	159.60	0.000
111.00	0.000	325	159.60	0.000
111.50	0.000	325	159.60	0.000
112.00	0.000	325	159.60	0.000
112.50	0.000	325	159.60	0.000
113.00	0.000	325	159.60	0.000
113.50	0.000	325	159.60	0.000
114.00	0.000	325	159.60	0.000
114.50	0.000	325	159.60	0.000
115.00	0.000	325	159.60	0.000
115.50	0.000	325	159.60	0.000
116.00	0.000	325	159.60	0.000
116.50	0.000	325	159.60	0.000
117.00	0.000	325	159.60	0.000
117.50	0.000	325	159.60	0.000
118.00	0.000	325	159.60	0.000
118.50	0.000	325	159.60	0.000
119.00	0.000	325	159.60	0.000
119.50	0.000	325	159.60	0.000
120.00	0.000	325	159.60	0.000
120.50	0.000	325	159.60	0.000
121.00	0.000	325	159.60	0.000
121.50	0.000	325	159.60	0.000
122.00	0.000	325	159.60	0.000
122.50	0.000	325	159.60	0.000
123.00	0.000	325	159.60	0.000
123.50	0.000	325	159.60	0.000
124.00	0.000	325	159.60	0.000
124.50	0.000	325	159.60	0.000
125.00	0.000	325	159.60	0.000
125.50	0.000	325	159.60	0.000
126.00	0.000	325	159.60	0.000
126.50	0.000	325	159.60	0.000
127.00	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	325	159.60	0.000
128.00	0.000	325	159.60	0.000
128.50	0.000	325	159.60	0.000
129.00	0.000	325	159.60	0.000
129.50	0.000	325	159.60	0.000
130.00	0.000	325	159.60	0.000
130.50	0.000	325	159.60	0.000
131.00	0.000	325	159.60	0.000
131.50	0.000	325	159.60	0.000
132.00	0.000	325	159.60	0.000
132.50	0.000	325	159.60	0.000
133.00	0.000	325	159.60	0.000
133.50	0.000	325	159.60	0.000
134.00	0.000	325	159.60	0.000
134.50	0.000	325	159.60	0.000
135.00	0.000	325	159.60	0.000
135.50	0.000	325	159.60	0.000
136.00	0.000	325	159.60	0.000
136.50	0.000	325	159.60	0.000
137.00	0.000	325	159.60	0.000
137.50	0.000	325	159.60	0.000
138.00	0.000	325	159.60	0.000
138.50	0.000	325	159.60	0.000
139.00	0.000	325	159.60	0.000
139.50	0.000	325	159.60	0.000
140.00	0.000	325	159.60	0.000
140.50	0.000	325	159.60	0.000
141.00	0.000	325	159.60	0.000
141.50	0.000	325	159.60	0.000
142.00	0.000	325	159.60	0.000
142.50	0.000	325	159.60	0.000
143.00	0.000	325	159.60	0.000
143.50	0.000	325	159.60	0.000
144.00	0.000	325	159.60	0.000
144.50	0.000	325	159.60	0.000
145.00	0.000	325	159.60	0.000
145.50	0.000	325	159.60	0.000
146.00	0.000	325	159.60	0.000
146.50	0.000	325	159.60	0.000
147.00	0.000	325	159.60	0.000
147.50	0.000	325	159.60	0.000
148.00	0.000	325	159.60	0.000
148.50	0.000	325	159.60	0.000
149.00	0.000	325	159.60	0.000
149.50	0.000	325	159.60	0.000
150.00	0.000	325	159.60	0.000
150.50	0.000	325	159.60	0.000
151.00	0.000	325	159.60	0.000
151.50	0.000	325	159.60	0.000
152.00	0.000	325	159.60	0.000
152.50	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	325	159.60	0.000
153.50	0.000	325	159.60	0.000
154.00	0.000	325	159.60	0.000
154.50	0.000	325	159.60	0.000
155.00	0.000	325	159.60	0.000
155.50	0.000	325	159.60	0.000
156.00	0.000	325	159.60	0.000
156.50	0.000	325	159.60	0.000
157.00	0.000	325	159.60	0.000
157.50	0.000	325	159.60	0.000
158.00	0.000	325	159.60	0.000
158.50	0.000	325	159.60	0.000
159.00	0.000	325	159.60	0.000
159.50	0.000	325	159.60	0.000
160.00	0.000	325	159.60	0.000
160.50	0.000	325	159.60	0.000
161.00	0.000	325	159.60	0.000
161.50	0.000	325	159.60	0.000
162.00	0.000	325	159.60	0.000
162.50	0.000	325	159.60	0.000
163.00	0.000	325	159.60	0.000
163.50	0.000	325	159.60	0.000
164.00	0.000	325	159.60	0.000
164.50	0.000	325	159.60	0.000
165.00	0.000	325	159.60	0.000
165.50	0.000	325	159.60	0.000
166.00	0.000	325	159.60	0.000
166.50	0.000	325	159.60	0.000
167.00	0.000	325	159.60	0.000
167.50	0.000	325	159.60	0.000
168.00	0.000	325	159.60	0.000



Subcat Reach Pond Link

Routing Diagram for BMW_2025-4-23
Prepared by Bohler, Printed 4/23/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10-yr	Type II 24-hr		Default	24.00	1	4.83	2

Summary for Pond 1P: UG1

[93] Warning: Storage range exceeded by 3.08'
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=345)

Inflow Area = 81,327 sf, 96.79% Impervious, Inflow Depth = 4.45" for 10-yr event
Inflow = 12.817 cfs @ 11.96 hrs, Volume= 30,167 cf
Outflow = 0.241 cfs @ 17.27 hrs, Volume= 3,005 cf, Atten= 98%, Lag= 318.8 min
Primary = 0.241 cfs @ 17.27 hrs, Volume= 3,005 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 163.82' @ 17.27 hrs Surf.Area= 13,041 sf Storage= 27,162 cf

Plug-Flow detention time= 864.2 min calculated for 3,005 cf (10% of inflow)
Center-of-Mass det. time= 475.6 min (1,219.6 - 743.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.661 cfs @ 17.27 hrs HW=163.82' TW=163.81' (Fixed TW Elev= 163.81')
└─**4=Culvert** (Outlet Controls 0.661 cfs @ 0.374 fps)
  ├─**1=Orifice/Grate** (Passes < 0.002 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 0.342 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 10.209 cfs potential flow)

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.005	1	157.53	0.000
1.50	0.026	30	157.54	0.000
2.00	0.043	92	157.55	0.000
2.50	0.057	182	157.56	0.000
3.00	0.069	295	157.59	0.000
3.50	0.079	429	157.61	0.000
4.00	0.089	581	157.64	0.000
4.50	0.100	751	157.67	0.000
5.00	0.112	942	157.71	0.000
5.50	0.124	1,155	157.75	0.000
6.00	0.135	1,387	157.80	0.000
6.50	0.146	1,640	157.84	0.000
7.00	0.157	1,912	157.90	0.000
7.50	0.167	2,204	157.95	0.000
8.00	0.177	2,514	158.01	0.000
8.50	0.215	2,864	158.05	0.000
9.00	0.259	3,291	158.09	0.000
9.50	0.268	3,770	158.13	0.000
10.00	0.328	4,299	158.17	0.000
10.50	0.427	4,974	158.23	0.000
11.00	0.591	5,882	158.31	0.000
11.50	**0.972**	7,261	158.43	0.000
12.00	**10.578**	17,399	159.36	0.000
12.50	0.919	21,517	159.80	0.000
13.00	0.572	22,772	159.95	0.000
13.50	0.433	23,664	160.08	0.000
14.00	0.339	24,355	160.20	0.000
14.50	0.300	24,924	160.31	0.000
15.00	0.269	25,436	160.41	0.000
15.50	0.238	25,893	160.50	0.000
16.00	0.208	26,295	160.57	0.000
16.50	0.194	26,654	160.64	0.000
17.00	0.183	**26,992**	**160.71**	**0.000**
17.50	0.172	**27,162**	**163.81**	**0.108**
18.00	0.161	27,162	163.81	0.097
18.50	0.150	27,162	163.81	0.086
19.00	0.139	27,162	163.81	0.075
19.50	0.128	27,162	163.81	0.064
20.00	0.117	27,162	163.81	0.053
20.50	0.113	27,162	163.81	0.049
21.00	0.111	27,162	163.81	0.047
21.50	0.109	27,162	163.81	0.045
22.00	0.106	27,162	163.81	0.042
22.50	0.104	27,162	163.81	0.040
23.00	0.102	27,162	163.81	0.038
23.50	0.100	27,162	163.81	0.036
24.00	0.098	27,162	163.81	0.034
24.50	0.000	27,162	163.75	0.000
25.00	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	27,162	163.75	0.000
26.00	0.000	27,162	163.75	0.000
26.50	0.000	27,162	163.75	0.000
27.00	0.000	27,162	163.75	0.000
27.50	0.000	27,162	163.75	0.000
28.00	0.000	27,162	163.75	0.000
28.50	0.000	27,162	163.75	0.000
29.00	0.000	27,162	163.75	0.000
29.50	0.000	27,162	163.75	0.000
30.00	0.000	27,162	163.75	0.000
30.50	0.000	27,162	163.75	0.000
31.00	0.000	27,162	163.75	0.000
31.50	0.000	27,162	163.75	0.000
32.00	0.000	27,162	163.75	0.000
32.50	0.000	27,162	163.75	0.000
33.00	0.000	27,162	163.75	0.000
33.50	0.000	27,162	163.75	0.000
34.00	0.000	27,162	163.75	0.000
34.50	0.000	27,162	163.75	0.000
35.00	0.000	27,162	163.75	0.000
35.50	0.000	27,162	163.75	0.000
36.00	0.000	27,162	163.75	0.000
36.50	0.000	27,162	163.75	0.000
37.00	0.000	27,162	163.75	0.000
37.50	0.000	27,162	163.75	0.000
38.00	0.000	27,162	163.75	0.000
38.50	0.000	27,162	163.75	0.000
39.00	0.000	27,162	163.75	0.000
39.50	0.000	27,162	163.75	0.000
40.00	0.000	27,162	163.75	0.000
40.50	0.000	27,162	163.75	0.000
41.00	0.000	27,162	163.75	0.000
41.50	0.000	27,162	163.75	0.000
42.00	0.000	27,162	163.75	0.000
42.50	0.000	27,162	163.75	0.000
43.00	0.000	27,162	163.75	0.000
43.50	0.000	27,162	163.75	0.000
44.00	0.000	27,162	163.75	0.000
44.50	0.000	27,162	163.75	0.000
45.00	0.000	27,162	163.75	0.000
45.50	0.000	27,162	163.75	0.000
46.00	0.000	27,162	163.75	0.000
46.50	0.000	27,162	163.75	0.000
47.00	0.000	27,162	163.75	0.000
47.50	0.000	27,162	163.75	0.000
48.00	0.000	27,162	163.75	0.000
48.50	0.000	27,162	163.75	0.000
49.00	0.000	27,162	163.75	0.000
49.50	0.000	27,162	163.75	0.000
50.00	0.000	27,162	163.75	0.000
50.50	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	27,162	163.75	0.000
51.50	0.000	27,162	163.75	0.000
52.00	0.000	27,162	163.75	0.000
52.50	0.000	27,162	163.75	0.000
53.00	0.000	27,162	163.75	0.000
53.50	0.000	27,162	163.75	0.000
54.00	0.000	27,162	163.75	0.000
54.50	0.000	27,162	163.75	0.000
55.00	0.000	27,162	163.75	0.000
55.50	0.000	27,162	163.75	0.000
56.00	0.000	27,162	163.75	0.000
56.50	0.000	27,162	163.75	0.000
57.00	0.000	27,162	163.75	0.000
57.50	0.000	27,162	163.75	0.000
58.00	0.000	27,162	163.75	0.000
58.50	0.000	27,162	163.75	0.000
59.00	0.000	27,162	163.75	0.000
59.50	0.000	27,162	163.75	0.000
60.00	0.000	27,162	163.75	0.000
60.50	0.000	27,162	163.75	0.000
61.00	0.000	27,162	163.75	0.000
61.50	0.000	27,162	163.75	0.000
62.00	0.000	27,162	163.75	0.000
62.50	0.000	27,162	163.75	0.000
63.00	0.000	27,162	163.75	0.000
63.50	0.000	27,162	163.75	0.000
64.00	0.000	27,162	163.75	0.000
64.50	0.000	27,162	163.75	0.000
65.00	0.000	27,162	163.75	0.000
65.50	0.000	27,162	163.75	0.000
66.00	0.000	27,162	163.75	0.000
66.50	0.000	27,162	163.75	0.000
67.00	0.000	27,162	163.75	0.000
67.50	0.000	27,162	163.75	0.000
68.00	0.000	27,162	163.75	0.000
68.50	0.000	27,162	163.75	0.000
69.00	0.000	27,162	163.75	0.000
69.50	0.000	27,162	163.75	0.000
70.00	0.000	27,162	163.75	0.000
70.50	0.000	27,162	163.75	0.000
71.00	0.000	27,162	163.75	0.000
71.50	0.000	27,162	163.75	0.000
72.00	0.000	27,162	163.75	0.000
72.50	0.000	27,162	163.75	0.000
73.00	0.000	27,162	163.75	0.000
73.50	0.000	27,162	163.75	0.000
74.00	0.000	27,162	163.75	0.000
74.50	0.000	27,162	163.75	0.000
75.00	0.000	27,162	163.75	0.000
75.50	0.000	27,162	163.75	0.000
76.00	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	27,162	163.75	0.000
77.00	0.000	27,162	163.75	0.000
77.50	0.000	27,162	163.75	0.000
78.00	0.000	27,162	163.75	0.000
78.50	0.000	27,162	163.75	0.000
79.00	0.000	27,162	163.75	0.000
79.50	0.000	27,162	163.75	0.000
80.00	0.000	27,162	163.75	0.000
80.50	0.000	27,162	163.75	0.000
81.00	0.000	27,162	163.75	0.000
81.50	0.000	27,162	163.75	0.000
82.00	0.000	27,162	163.75	0.000
82.50	0.000	27,162	163.75	0.000
83.00	0.000	27,162	163.75	0.000
83.50	0.000	27,162	163.75	0.000
84.00	0.000	27,162	163.75	0.000
84.50	0.000	27,162	163.75	0.000
85.00	0.000	27,162	163.75	0.000
85.50	0.000	27,162	163.75	0.000
86.00	0.000	27,162	163.75	0.000
86.50	0.000	27,162	163.75	0.000
87.00	0.000	27,162	163.75	0.000
87.50	0.000	27,162	163.75	0.000
88.00	0.000	27,162	163.75	0.000
88.50	0.000	27,162	163.75	0.000
89.00	0.000	27,162	163.75	0.000
89.50	0.000	27,162	163.75	0.000
90.00	0.000	27,162	163.75	0.000
90.50	0.000	27,162	163.75	0.000
91.00	0.000	27,162	163.75	0.000
91.50	0.000	27,162	163.75	0.000
92.00	0.000	27,162	163.75	0.000
92.50	0.000	27,162	163.75	0.000
93.00	0.000	27,162	163.75	0.000
93.50	0.000	27,162	163.75	0.000
94.00	0.000	27,162	163.75	0.000
94.50	0.000	27,162	163.75	0.000
95.00	0.000	27,162	163.75	0.000
95.50	0.000	27,162	163.75	0.000
96.00	0.000	27,162	163.75	0.000
96.50	0.000	27,162	163.75	0.000
97.00	0.000	27,162	163.75	0.000
97.50	0.000	27,162	163.75	0.000
98.00	0.000	27,162	163.75	0.000
98.50	0.000	27,162	163.75	0.000
99.00	0.000	27,162	163.75	0.000
99.50	0.000	27,162	163.75	0.000
100.00	0.000	27,162	163.75	0.000
100.50	0.000	27,162	163.75	0.000
101.00	0.000	27,162	163.75	0.000
101.50	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	27,162	163.75	0.000
102.50	0.000	27,162	163.75	0.000
103.00	0.000	27,162	163.75	0.000
103.50	0.000	27,162	163.75	0.000
104.00	0.000	27,162	163.75	0.000
104.50	0.000	27,162	163.75	0.000
105.00	0.000	27,162	163.75	0.000
105.50	0.000	27,162	163.75	0.000
106.00	0.000	27,162	163.75	0.000
106.50	0.000	27,162	163.75	0.000
107.00	0.000	27,162	163.75	0.000
107.50	0.000	27,162	163.75	0.000
108.00	0.000	27,162	163.75	0.000
108.50	0.000	27,162	163.75	0.000
109.00	0.000	27,162	163.75	0.000
109.50	0.000	27,162	163.75	0.000
110.00	0.000	27,162	163.75	0.000
110.50	0.000	27,162	163.75	0.000
111.00	0.000	27,162	163.75	0.000
111.50	0.000	27,162	163.75	0.000
112.00	0.000	27,162	163.75	0.000
112.50	0.000	27,162	163.75	0.000
113.00	0.000	27,162	163.75	0.000
113.50	0.000	27,162	163.75	0.000
114.00	0.000	27,162	163.75	0.000
114.50	0.000	27,162	163.75	0.000
115.00	0.000	27,162	163.75	0.000
115.50	0.000	27,162	163.75	0.000
116.00	0.000	27,162	163.75	0.000
116.50	0.000	27,162	163.75	0.000
117.00	0.000	27,162	163.75	0.000
117.50	0.000	27,162	163.75	0.000
118.00	0.000	27,162	163.75	0.000
118.50	0.000	27,162	163.75	0.000
119.00	0.000	27,162	163.75	0.000
119.50	0.000	27,162	163.75	0.000
120.00	0.000	27,162	163.75	0.000
120.50	0.000	27,162	163.75	0.000
121.00	0.000	27,162	163.75	0.000
121.50	0.000	27,162	163.75	0.000
122.00	0.000	27,162	163.75	0.000
122.50	0.000	27,162	163.75	0.000
123.00	0.000	27,162	163.75	0.000
123.50	0.000	27,162	163.75	0.000
124.00	0.000	27,162	163.75	0.000
124.50	0.000	27,162	163.75	0.000
125.00	0.000	27,162	163.75	0.000
125.50	0.000	27,162	163.75	0.000
126.00	0.000	27,162	163.75	0.000
126.50	0.000	27,162	163.75	0.000
127.00	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	27,162	163.75	0.000
128.00	0.000	27,162	163.75	0.000
128.50	0.000	27,162	163.75	0.000
129.00	0.000	27,162	163.75	0.000
129.50	0.000	27,162	163.75	0.000
130.00	0.000	27,162	163.75	0.000
130.50	0.000	27,162	163.75	0.000
131.00	0.000	27,162	163.75	0.000
131.50	0.000	27,162	163.75	0.000
132.00	0.000	27,162	163.75	0.000
132.50	0.000	27,162	163.75	0.000
133.00	0.000	27,162	163.75	0.000
133.50	0.000	27,162	163.75	0.000
134.00	0.000	27,162	163.75	0.000
134.50	0.000	27,162	163.75	0.000
135.00	0.000	27,162	163.75	0.000
135.50	0.000	27,162	163.75	0.000
136.00	0.000	27,162	163.75	0.000
136.50	0.000	27,162	163.75	0.000
137.00	0.000	27,162	163.75	0.000
137.50	0.000	27,162	163.75	0.000
138.00	0.000	27,162	163.75	0.000
138.50	0.000	27,162	163.75	0.000
139.00	0.000	27,162	163.75	0.000
139.50	0.000	27,162	163.75	0.000
140.00	0.000	27,162	163.75	0.000
140.50	0.000	27,162	163.75	0.000
141.00	0.000	27,162	163.75	0.000
141.50	0.000	27,162	163.75	0.000
142.00	0.000	27,162	163.75	0.000
142.50	0.000	27,162	163.75	0.000
143.00	0.000	27,162	163.75	0.000
143.50	0.000	27,162	163.75	0.000
144.00	0.000	27,162	163.75	0.000
144.50	0.000	27,162	163.75	0.000
145.00	0.000	27,162	163.75	0.000
145.50	0.000	27,162	163.75	0.000
146.00	0.000	27,162	163.75	0.000
146.50	0.000	27,162	163.75	0.000
147.00	0.000	27,162	163.75	0.000
147.50	0.000	27,162	163.75	0.000
148.00	0.000	27,162	163.75	0.000
148.50	0.000	27,162	163.75	0.000
149.00	0.000	27,162	163.75	0.000
149.50	0.000	27,162	163.75	0.000
150.00	0.000	27,162	163.75	0.000
150.50	0.000	27,162	163.75	0.000
151.00	0.000	27,162	163.75	0.000
151.50	0.000	27,162	163.75	0.000
152.00	0.000	27,162	163.75	0.000
152.50	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	27,162	163.75	0.000
153.50	0.000	27,162	163.75	0.000
154.00	0.000	27,162	163.75	0.000
154.50	0.000	27,162	163.75	0.000
155.00	0.000	27,162	163.75	0.000
155.50	0.000	27,162	163.75	0.000
156.00	0.000	27,162	163.75	0.000
156.50	0.000	27,162	163.75	0.000
157.00	0.000	27,162	163.75	0.000
157.50	0.000	27,162	163.75	0.000
158.00	0.000	27,162	163.75	0.000
158.50	0.000	27,162	163.75	0.000
159.00	0.000	27,162	163.75	0.000
159.50	0.000	27,162	163.75	0.000
160.00	0.000	27,162	163.75	0.000
160.50	0.000	27,162	163.75	0.000
161.00	0.000	27,162	163.75	0.000
161.50	0.000	27,162	163.75	0.000
162.00	0.000	27,162	163.75	0.000
162.50	0.000	27,162	163.75	0.000
163.00	0.000	27,162	163.75	0.000
163.50	0.000	27,162	163.75	0.000
164.00	0.000	27,162	163.75	0.000
164.50	0.000	27,162	163.75	0.000
165.00	0.000	27,162	163.75	0.000
165.50	0.000	27,162	163.75	0.000
166.00	0.000	27,162	163.75	0.000
166.50	0.000	27,162	163.75	0.000
167.00	0.000	27,162	163.75	0.000
167.50	0.000	27,162	163.75	0.000
168.00	0.000	27,162	163.75	0.000

Summary for Pond 3P: UG2

[93] Warning: Storage range exceeded by 1.88'
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=601)

Inflow Area = 21,562 sf, 86.06% Impervious, Inflow Depth = 3.98" for 10-yr event
Inflow = 3.022 cfs @ 11.96 hrs, Volume= 7,145 cf
Outflow = 2.098 cfs @ 12.03 hrs, Volume= 2,917 cf, Atten= 31%, Lag= 4.3 min
Primary = 2.098 cfs @ 12.03 hrs, Volume= 2,917 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 163.87' @ 12.03 hrs Surf.Area= 2,542 sf Storage= 4,234 cf

Plug-Flow detention time= 317.8 min calculated for 2,917 cf (41% of inflow)
Center-of-Mass det. time= 165.4 min (910.7 - 745.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=2.037 cfs @ 12.03 hrs HW=163.87' TW=163.81' (Fixed TW Elev= 163.81')
└─**4=Culvert** (Inlet Controls 2.037 cfs @ 1.153 fps)
  ├─**1=Orifice/Grate** (Passes < 0.057 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 0.144 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 13.505 cfs potential flow)

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.001	0	159.28	0.000
1.50	0.006	7	159.29	0.000
2.00	0.010	22	159.30	0.000
2.50	0.013	43	159.32	0.000
3.00	0.016	70	159.35	0.000
3.50	0.019	101	159.38	0.000
4.00	0.021	137	159.41	0.000
4.50	0.024	177	159.45	0.000
5.00	0.026	222	159.50	0.000
5.50	0.029	272	159.55	0.000
6.00	0.032	327	159.60	0.000
6.50	0.034	387	159.66	0.000
7.00	0.037	451	159.72	0.000
7.50	0.039	520	159.78	0.000
8.00	0.042	593	159.82	0.000
8.50	0.051	675	159.86	0.000
9.00	0.061	776	159.90	0.000
9.50	0.063	889	159.95	0.000
10.00	0.077	1,014	160.01	0.000
10.50	0.101	1,173	160.09	0.000
11.00	0.139	1,387	160.18	0.000
11.50	**0.229**	1,712	160.34	0.000
12.00	**2.494**	**4,102**	**161.86**	**0.000**
12.50	0.218	**4,234**	**163.76**	**0.000**
13.00	0.136	4,234	163.76	0.000
13.50	0.103	4,234	163.76	0.000
14.00	0.081	4,234	163.76	0.000
14.50	0.072	4,234	163.76	0.000
15.00	0.064	4,234	163.76	0.000
15.50	0.057	4,234	163.76	0.000
16.00	0.050	4,234	163.76	0.000
16.50	0.046	4,234	163.76	0.000
17.00	0.044	4,234	163.76	0.000
17.50	0.041	4,234	163.76	0.000
18.00	0.039	4,234	163.76	0.000
18.50	0.036	4,234	163.76	0.000
19.00	0.033	4,234	163.76	0.000
19.50	0.031	4,234	163.76	0.000
20.00	0.028	4,234	163.76	0.000
20.50	0.027	4,234	163.76	0.000
21.00	0.027	4,234	163.76	0.000
21.50	0.026	4,234	163.76	0.000
22.00	0.026	4,234	163.76	0.000
22.50	0.025	4,234	163.76	0.000
23.00	0.025	4,234	163.76	0.000
23.50	0.024	4,234	163.76	0.000
24.00	0.024	4,234	163.76	0.000
24.50	0.000	4,234	163.76	0.000
25.00	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	4,234	163.76	0.000
26.00	0.000	4,234	163.76	0.000
26.50	0.000	4,234	163.76	0.000
27.00	0.000	4,234	163.76	0.000
27.50	0.000	4,234	163.76	0.000
28.00	0.000	4,234	163.76	0.000
28.50	0.000	4,234	163.76	0.000
29.00	0.000	4,234	163.76	0.000
29.50	0.000	4,234	163.76	0.000
30.00	0.000	4,234	163.76	0.000
30.50	0.000	4,234	163.76	0.000
31.00	0.000	4,234	163.76	0.000
31.50	0.000	4,234	163.76	0.000
32.00	0.000	4,234	163.76	0.000
32.50	0.000	4,234	163.76	0.000
33.00	0.000	4,234	163.76	0.000
33.50	0.000	4,234	163.76	0.000
34.00	0.000	4,234	163.76	0.000
34.50	0.000	4,234	163.76	0.000
35.00	0.000	4,234	163.76	0.000
35.50	0.000	4,234	163.76	0.000
36.00	0.000	4,234	163.76	0.000
36.50	0.000	4,234	163.76	0.000
37.00	0.000	4,234	163.76	0.000
37.50	0.000	4,234	163.76	0.000
38.00	0.000	4,234	163.76	0.000
38.50	0.000	4,234	163.76	0.000
39.00	0.000	4,234	163.76	0.000
39.50	0.000	4,234	163.76	0.000
40.00	0.000	4,234	163.76	0.000
40.50	0.000	4,234	163.76	0.000
41.00	0.000	4,234	163.76	0.000
41.50	0.000	4,234	163.76	0.000
42.00	0.000	4,234	163.76	0.000
42.50	0.000	4,234	163.76	0.000
43.00	0.000	4,234	163.76	0.000
43.50	0.000	4,234	163.76	0.000
44.00	0.000	4,234	163.76	0.000
44.50	0.000	4,234	163.76	0.000
45.00	0.000	4,234	163.76	0.000
45.50	0.000	4,234	163.76	0.000
46.00	0.000	4,234	163.76	0.000
46.50	0.000	4,234	163.76	0.000
47.00	0.000	4,234	163.76	0.000
47.50	0.000	4,234	163.76	0.000
48.00	0.000	4,234	163.76	0.000
48.50	0.000	4,234	163.76	0.000
49.00	0.000	4,234	163.76	0.000
49.50	0.000	4,234	163.76	0.000
50.00	0.000	4,234	163.76	0.000
50.50	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,234	163.76	0.000
51.50	0.000	4,234	163.76	0.000
52.00	0.000	4,234	163.76	0.000
52.50	0.000	4,234	163.76	0.000
53.00	0.000	4,234	163.76	0.000
53.50	0.000	4,234	163.76	0.000
54.00	0.000	4,234	163.76	0.000
54.50	0.000	4,234	163.76	0.000
55.00	0.000	4,234	163.76	0.000
55.50	0.000	4,234	163.76	0.000
56.00	0.000	4,234	163.76	0.000
56.50	0.000	4,234	163.76	0.000
57.00	0.000	4,234	163.76	0.000
57.50	0.000	4,234	163.76	0.000
58.00	0.000	4,234	163.76	0.000
58.50	0.000	4,234	163.76	0.000
59.00	0.000	4,234	163.76	0.000
59.50	0.000	4,234	163.76	0.000
60.00	0.000	4,234	163.76	0.000
60.50	0.000	4,234	163.76	0.000
61.00	0.000	4,234	163.76	0.000
61.50	0.000	4,234	163.76	0.000
62.00	0.000	4,234	163.76	0.000
62.50	0.000	4,234	163.76	0.000
63.00	0.000	4,234	163.76	0.000
63.50	0.000	4,234	163.76	0.000
64.00	0.000	4,234	163.76	0.000
64.50	0.000	4,234	163.76	0.000
65.00	0.000	4,234	163.76	0.000
65.50	0.000	4,234	163.76	0.000
66.00	0.000	4,234	163.76	0.000
66.50	0.000	4,234	163.76	0.000
67.00	0.000	4,234	163.76	0.000
67.50	0.000	4,234	163.76	0.000
68.00	0.000	4,234	163.76	0.000
68.50	0.000	4,234	163.76	0.000
69.00	0.000	4,234	163.76	0.000
69.50	0.000	4,234	163.76	0.000
70.00	0.000	4,234	163.76	0.000
70.50	0.000	4,234	163.76	0.000
71.00	0.000	4,234	163.76	0.000
71.50	0.000	4,234	163.76	0.000
72.00	0.000	4,234	163.76	0.000
72.50	0.000	4,234	163.76	0.000
73.00	0.000	4,234	163.76	0.000
73.50	0.000	4,234	163.76	0.000
74.00	0.000	4,234	163.76	0.000
74.50	0.000	4,234	163.76	0.000
75.00	0.000	4,234	163.76	0.000
75.50	0.000	4,234	163.76	0.000
76.00	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	4,234	163.76	0.000
77.00	0.000	4,234	163.76	0.000
77.50	0.000	4,234	163.76	0.000
78.00	0.000	4,234	163.76	0.000
78.50	0.000	4,234	163.76	0.000
79.00	0.000	4,234	163.76	0.000
79.50	0.000	4,234	163.76	0.000
80.00	0.000	4,234	163.76	0.000
80.50	0.000	4,234	163.76	0.000
81.00	0.000	4,234	163.76	0.000
81.50	0.000	4,234	163.76	0.000
82.00	0.000	4,234	163.76	0.000
82.50	0.000	4,234	163.76	0.000
83.00	0.000	4,234	163.76	0.000
83.50	0.000	4,234	163.76	0.000
84.00	0.000	4,234	163.76	0.000
84.50	0.000	4,234	163.76	0.000
85.00	0.000	4,234	163.76	0.000
85.50	0.000	4,234	163.76	0.000
86.00	0.000	4,234	163.76	0.000
86.50	0.000	4,234	163.76	0.000
87.00	0.000	4,234	163.76	0.000
87.50	0.000	4,234	163.76	0.000
88.00	0.000	4,234	163.76	0.000
88.50	0.000	4,234	163.76	0.000
89.00	0.000	4,234	163.76	0.000
89.50	0.000	4,234	163.76	0.000
90.00	0.000	4,234	163.76	0.000
90.50	0.000	4,234	163.76	0.000
91.00	0.000	4,234	163.76	0.000
91.50	0.000	4,234	163.76	0.000
92.00	0.000	4,234	163.76	0.000
92.50	0.000	4,234	163.76	0.000
93.00	0.000	4,234	163.76	0.000
93.50	0.000	4,234	163.76	0.000
94.00	0.000	4,234	163.76	0.000
94.50	0.000	4,234	163.76	0.000
95.00	0.000	4,234	163.76	0.000
95.50	0.000	4,234	163.76	0.000
96.00	0.000	4,234	163.76	0.000
96.50	0.000	4,234	163.76	0.000
97.00	0.000	4,234	163.76	0.000
97.50	0.000	4,234	163.76	0.000
98.00	0.000	4,234	163.76	0.000
98.50	0.000	4,234	163.76	0.000
99.00	0.000	4,234	163.76	0.000
99.50	0.000	4,234	163.76	0.000
100.00	0.000	4,234	163.76	0.000
100.50	0.000	4,234	163.76	0.000
101.00	0.000	4,234	163.76	0.000
101.50	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

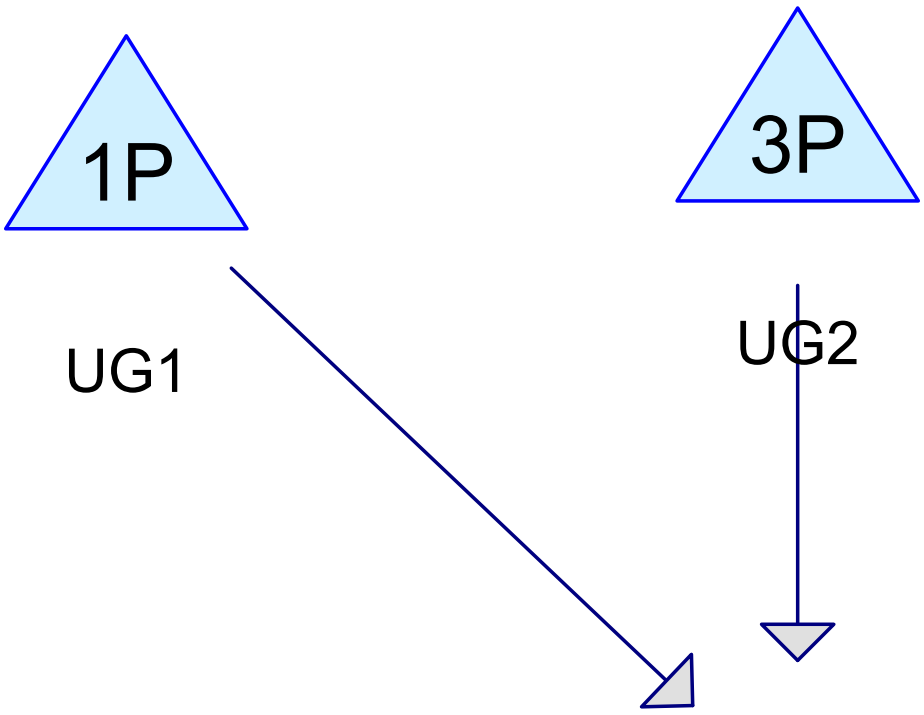
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	4,234	163.76	0.000
102.50	0.000	4,234	163.76	0.000
103.00	0.000	4,234	163.76	0.000
103.50	0.000	4,234	163.76	0.000
104.00	0.000	4,234	163.76	0.000
104.50	0.000	4,234	163.76	0.000
105.00	0.000	4,234	163.76	0.000
105.50	0.000	4,234	163.76	0.000
106.00	0.000	4,234	163.76	0.000
106.50	0.000	4,234	163.76	0.000
107.00	0.000	4,234	163.76	0.000
107.50	0.000	4,234	163.76	0.000
108.00	0.000	4,234	163.76	0.000
108.50	0.000	4,234	163.76	0.000
109.00	0.000	4,234	163.76	0.000
109.50	0.000	4,234	163.76	0.000
110.00	0.000	4,234	163.76	0.000
110.50	0.000	4,234	163.76	0.000
111.00	0.000	4,234	163.76	0.000
111.50	0.000	4,234	163.76	0.000
112.00	0.000	4,234	163.76	0.000
112.50	0.000	4,234	163.76	0.000
113.00	0.000	4,234	163.76	0.000
113.50	0.000	4,234	163.76	0.000
114.00	0.000	4,234	163.76	0.000
114.50	0.000	4,234	163.76	0.000
115.00	0.000	4,234	163.76	0.000
115.50	0.000	4,234	163.76	0.000
116.00	0.000	4,234	163.76	0.000
116.50	0.000	4,234	163.76	0.000
117.00	0.000	4,234	163.76	0.000
117.50	0.000	4,234	163.76	0.000
118.00	0.000	4,234	163.76	0.000
118.50	0.000	4,234	163.76	0.000
119.00	0.000	4,234	163.76	0.000
119.50	0.000	4,234	163.76	0.000
120.00	0.000	4,234	163.76	0.000
120.50	0.000	4,234	163.76	0.000
121.00	0.000	4,234	163.76	0.000
121.50	0.000	4,234	163.76	0.000
122.00	0.000	4,234	163.76	0.000
122.50	0.000	4,234	163.76	0.000
123.00	0.000	4,234	163.76	0.000
123.50	0.000	4,234	163.76	0.000
124.00	0.000	4,234	163.76	0.000
124.50	0.000	4,234	163.76	0.000
125.00	0.000	4,234	163.76	0.000
125.50	0.000	4,234	163.76	0.000
126.00	0.000	4,234	163.76	0.000
126.50	0.000	4,234	163.76	0.000
127.00	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	4,234	163.76	0.000
128.00	0.000	4,234	163.76	0.000
128.50	0.000	4,234	163.76	0.000
129.00	0.000	4,234	163.76	0.000
129.50	0.000	4,234	163.76	0.000
130.00	0.000	4,234	163.76	0.000
130.50	0.000	4,234	163.76	0.000
131.00	0.000	4,234	163.76	0.000
131.50	0.000	4,234	163.76	0.000
132.00	0.000	4,234	163.76	0.000
132.50	0.000	4,234	163.76	0.000
133.00	0.000	4,234	163.76	0.000
133.50	0.000	4,234	163.76	0.000
134.00	0.000	4,234	163.76	0.000
134.50	0.000	4,234	163.76	0.000
135.00	0.000	4,234	163.76	0.000
135.50	0.000	4,234	163.76	0.000
136.00	0.000	4,234	163.76	0.000
136.50	0.000	4,234	163.76	0.000
137.00	0.000	4,234	163.76	0.000
137.50	0.000	4,234	163.76	0.000
138.00	0.000	4,234	163.76	0.000
138.50	0.000	4,234	163.76	0.000
139.00	0.000	4,234	163.76	0.000
139.50	0.000	4,234	163.76	0.000
140.00	0.000	4,234	163.76	0.000
140.50	0.000	4,234	163.76	0.000
141.00	0.000	4,234	163.76	0.000
141.50	0.000	4,234	163.76	0.000
142.00	0.000	4,234	163.76	0.000
142.50	0.000	4,234	163.76	0.000
143.00	0.000	4,234	163.76	0.000
143.50	0.000	4,234	163.76	0.000
144.00	0.000	4,234	163.76	0.000
144.50	0.000	4,234	163.76	0.000
145.00	0.000	4,234	163.76	0.000
145.50	0.000	4,234	163.76	0.000
146.00	0.000	4,234	163.76	0.000
146.50	0.000	4,234	163.76	0.000
147.00	0.000	4,234	163.76	0.000
147.50	0.000	4,234	163.76	0.000
148.00	0.000	4,234	163.76	0.000
148.50	0.000	4,234	163.76	0.000
149.00	0.000	4,234	163.76	0.000
149.50	0.000	4,234	163.76	0.000
150.00	0.000	4,234	163.76	0.000
150.50	0.000	4,234	163.76	0.000
151.00	0.000	4,234	163.76	0.000
151.50	0.000	4,234	163.76	0.000
152.00	0.000	4,234	163.76	0.000
152.50	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	4,234	163.76	0.000
153.50	0.000	4,234	163.76	0.000
154.00	0.000	4,234	163.76	0.000
154.50	0.000	4,234	163.76	0.000
155.00	0.000	4,234	163.76	0.000
155.50	0.000	4,234	163.76	0.000
156.00	0.000	4,234	163.76	0.000
156.50	0.000	4,234	163.76	0.000
157.00	0.000	4,234	163.76	0.000
157.50	0.000	4,234	163.76	0.000
158.00	0.000	4,234	163.76	0.000
158.50	0.000	4,234	163.76	0.000
159.00	0.000	4,234	163.76	0.000
159.50	0.000	4,234	163.76	0.000
160.00	0.000	4,234	163.76	0.000
160.50	0.000	4,234	163.76	0.000
161.00	0.000	4,234	163.76	0.000
161.50	0.000	4,234	163.76	0.000
162.00	0.000	4,234	163.76	0.000
162.50	0.000	4,234	163.76	0.000
163.00	0.000	4,234	163.76	0.000
163.50	0.000	4,234	163.76	0.000
164.00	0.000	4,234	163.76	0.000
164.50	0.000	4,234	163.76	0.000
165.00	0.000	4,234	163.76	0.000
165.50	0.000	4,234	163.76	0.000
166.00	0.000	4,234	163.76	0.000
166.50	0.000	4,234	163.76	0.000
167.00	0.000	4,234	163.76	0.000
167.50	0.000	4,234	163.76	0.000
168.00	0.000	4,234	163.76	0.000



Subcat Reach Pond Link

Routing Diagram for BMW_2025-4-23
Prepared by Bohler, Printed 4/23/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	50-yr	Type II 24-hr		Default	24.00	1	6.73	2

Summary for Pond 1P: UG1

[93] Warning: Storage range exceeded by 8.34'
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=600)

Inflow Area = 81,327 sf, 96.79% Impervious, Inflow Depth = 6.30" for 50-yr event
Inflow = 17.943 cfs @ 11.96 hrs, Volume= 42,725 cf
Outflow = 8.639 cfs @ 12.07 hrs, Volume= 15,620 cf, Atten= 52%, Lag= 6.9 min
Primary = 8.639 cfs @ 12.07 hrs, Volume= 15,620 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 169.08' @ 12.07 hrs Surf.Area= 13,041 sf Storage= 27,162 cf

Plug-Flow detention time= 360.1 min calculated for 15,620 cf (37% of inflow)
Center-of-Mass det. time= 188.5 min (927.6 - 739.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=8.425 cfs @ 12.07 hrs HW=169.01' TW=167.66' (Fixed TW Elev= 167.66')
└─**4=Culvert** (Outlet Controls 8.425 cfs @ 4.768 fps)
  ├─**1=Orifice/Grate** (Passes < 0.031 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 4.359 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 194.076 cfs potential flow)

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.027	17	157.53	0.000
1.50	0.057	94	157.55	0.000
2.00	0.081	220	157.57	0.000
2.50	0.099	382	157.60	0.000
3.00	0.115	575	157.64	0.000
3.50	0.128	794	157.68	0.000
4.00	0.140	1,035	157.73	0.000
4.50	0.155	1,300	157.78	0.000
5.00	0.170	1,592	157.84	0.000
5.50	0.185	1,912	157.90	0.000
6.00	0.200	2,259	157.96	0.000
6.50	0.214	2,631	158.03	0.000
7.00	0.228	3,030	158.07	0.000
7.50	0.242	3,453	158.10	0.000
8.00	0.256	3,901	158.14	0.000
8.50	0.309	4,404	158.18	0.000
9.00	0.371	5,016	158.23	0.000
9.50	0.382	5,700	158.29	0.000
10.00	0.465	6,451	158.36	0.000
10.50	0.604	7,407	158.44	0.000
11.00	0.833	8,688	158.55	0.000
11.50	**1.366**	10,629	158.73	0.000
12.00	**14.820**	**24,828**	**160.29**	**0.000**
12.50	1.289	**27,162**	**167.56**	**0.000**
13.00	0.802	27,162	167.56	0.000
13.50	0.607	27,162	167.56	0.000
14.00	0.476	27,162	167.56	0.000
14.50	0.420	27,162	167.56	0.000
15.00	0.377	27,162	167.56	0.000
15.50	0.334	27,162	167.56	0.000
16.00	0.291	27,162	167.56	0.000
16.50	0.271	27,162	167.56	0.000
17.00	0.256	27,162	167.56	0.000
17.50	0.240	27,162	167.56	0.000
18.00	0.225	27,162	167.56	0.000
18.50	0.210	27,162	167.56	0.000
19.00	0.194	27,162	167.56	0.000
19.50	0.179	27,162	167.56	0.000
20.00	0.163	27,162	167.56	0.000
20.50	0.158	27,162	167.56	0.000
21.00	0.155	27,162	167.56	0.000
21.50	0.152	27,162	167.56	0.000
22.00	0.149	27,162	167.56	0.000
22.50	0.146	27,162	167.56	0.000
23.00	0.143	27,162	167.56	0.000
23.50	0.140	27,162	167.56	0.000
24.00	0.137	27,162	167.56	0.000
24.50	0.000	27,162	167.56	0.000
25.00	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	27,162	167.56	0.000
26.00	0.000	27,162	167.56	0.000
26.50	0.000	27,162	167.56	0.000
27.00	0.000	27,162	167.56	0.000
27.50	0.000	27,162	167.56	0.000
28.00	0.000	27,162	167.56	0.000
28.50	0.000	27,162	167.56	0.000
29.00	0.000	27,162	167.56	0.000
29.50	0.000	27,162	167.56	0.000
30.00	0.000	27,162	167.56	0.000
30.50	0.000	27,162	167.56	0.000
31.00	0.000	27,162	167.56	0.000
31.50	0.000	27,162	167.56	0.000
32.00	0.000	27,162	167.56	0.000
32.50	0.000	27,162	167.56	0.000
33.00	0.000	27,162	167.56	0.000
33.50	0.000	27,162	167.56	0.000
34.00	0.000	27,162	167.56	0.000
34.50	0.000	27,162	167.56	0.000
35.00	0.000	27,162	167.56	0.000
35.50	0.000	27,162	167.56	0.000
36.00	0.000	27,162	167.56	0.000
36.50	0.000	27,162	167.56	0.000
37.00	0.000	27,162	167.56	0.000
37.50	0.000	27,162	167.56	0.000
38.00	0.000	27,162	167.56	0.000
38.50	0.000	27,162	167.56	0.000
39.00	0.000	27,162	167.56	0.000
39.50	0.000	27,162	167.56	0.000
40.00	0.000	27,162	167.56	0.000
40.50	0.000	27,162	167.56	0.000
41.00	0.000	27,162	167.56	0.000
41.50	0.000	27,162	167.56	0.000
42.00	0.000	27,162	167.56	0.000
42.50	0.000	27,162	167.56	0.000
43.00	0.000	27,162	167.56	0.000
43.50	0.000	27,162	167.56	0.000
44.00	0.000	27,162	167.56	0.000
44.50	0.000	27,162	167.56	0.000
45.00	0.000	27,162	167.56	0.000
45.50	0.000	27,162	167.56	0.000
46.00	0.000	27,162	167.56	0.000
46.50	0.000	27,162	167.56	0.000
47.00	0.000	27,162	167.56	0.000
47.50	0.000	27,162	167.56	0.000
48.00	0.000	27,162	167.56	0.000
48.50	0.000	27,162	167.56	0.000
49.00	0.000	27,162	167.56	0.000
49.50	0.000	27,162	167.56	0.000
50.00	0.000	27,162	167.56	0.000
50.50	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	27,162	167.56	0.000
51.50	0.000	27,162	167.56	0.000
52.00	0.000	27,162	167.56	0.000
52.50	0.000	27,162	167.56	0.000
53.00	0.000	27,162	167.56	0.000
53.50	0.000	27,162	167.56	0.000
54.00	0.000	27,162	167.56	0.000
54.50	0.000	27,162	167.56	0.000
55.00	0.000	27,162	167.56	0.000
55.50	0.000	27,162	167.56	0.000
56.00	0.000	27,162	167.56	0.000
56.50	0.000	27,162	167.56	0.000
57.00	0.000	27,162	167.56	0.000
57.50	0.000	27,162	167.56	0.000
58.00	0.000	27,162	167.56	0.000
58.50	0.000	27,162	167.56	0.000
59.00	0.000	27,162	167.56	0.000
59.50	0.000	27,162	167.56	0.000
60.00	0.000	27,162	167.56	0.000
60.50	0.000	27,162	167.56	0.000
61.00	0.000	27,162	167.56	0.000
61.50	0.000	27,162	167.56	0.000
62.00	0.000	27,162	167.56	0.000
62.50	0.000	27,162	167.56	0.000
63.00	0.000	27,162	167.56	0.000
63.50	0.000	27,162	167.56	0.000
64.00	0.000	27,162	167.56	0.000
64.50	0.000	27,162	167.56	0.000
65.00	0.000	27,162	167.56	0.000
65.50	0.000	27,162	167.56	0.000
66.00	0.000	27,162	167.56	0.000
66.50	0.000	27,162	167.56	0.000
67.00	0.000	27,162	167.56	0.000
67.50	0.000	27,162	167.56	0.000
68.00	0.000	27,162	167.56	0.000
68.50	0.000	27,162	167.56	0.000
69.00	0.000	27,162	167.56	0.000
69.50	0.000	27,162	167.56	0.000
70.00	0.000	27,162	167.56	0.000
70.50	0.000	27,162	167.56	0.000
71.00	0.000	27,162	167.56	0.000
71.50	0.000	27,162	167.56	0.000
72.00	0.000	27,162	167.56	0.000
72.50	0.000	27,162	167.56	0.000
73.00	0.000	27,162	167.56	0.000
73.50	0.000	27,162	167.56	0.000
74.00	0.000	27,162	167.56	0.000
74.50	0.000	27,162	167.56	0.000
75.00	0.000	27,162	167.56	0.000
75.50	0.000	27,162	167.56	0.000
76.00	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	27,162	167.56	0.000
77.00	0.000	27,162	167.56	0.000
77.50	0.000	27,162	167.56	0.000
78.00	0.000	27,162	167.56	0.000
78.50	0.000	27,162	167.56	0.000
79.00	0.000	27,162	167.56	0.000
79.50	0.000	27,162	167.56	0.000
80.00	0.000	27,162	167.56	0.000
80.50	0.000	27,162	167.56	0.000
81.00	0.000	27,162	167.56	0.000
81.50	0.000	27,162	167.56	0.000
82.00	0.000	27,162	167.56	0.000
82.50	0.000	27,162	167.56	0.000
83.00	0.000	27,162	167.56	0.000
83.50	0.000	27,162	167.56	0.000
84.00	0.000	27,162	167.56	0.000
84.50	0.000	27,162	167.56	0.000
85.00	0.000	27,162	167.56	0.000
85.50	0.000	27,162	167.56	0.000
86.00	0.000	27,162	167.56	0.000
86.50	0.000	27,162	167.56	0.000
87.00	0.000	27,162	167.56	0.000
87.50	0.000	27,162	167.56	0.000
88.00	0.000	27,162	167.56	0.000
88.50	0.000	27,162	167.56	0.000
89.00	0.000	27,162	167.56	0.000
89.50	0.000	27,162	167.56	0.000
90.00	0.000	27,162	167.56	0.000
90.50	0.000	27,162	167.56	0.000
91.00	0.000	27,162	167.56	0.000
91.50	0.000	27,162	167.56	0.000
92.00	0.000	27,162	167.56	0.000
92.50	0.000	27,162	167.56	0.000
93.00	0.000	27,162	167.56	0.000
93.50	0.000	27,162	167.56	0.000
94.00	0.000	27,162	167.56	0.000
94.50	0.000	27,162	167.56	0.000
95.00	0.000	27,162	167.56	0.000
95.50	0.000	27,162	167.56	0.000
96.00	0.000	27,162	167.56	0.000
96.50	0.000	27,162	167.56	0.000
97.00	0.000	27,162	167.56	0.000
97.50	0.000	27,162	167.56	0.000
98.00	0.000	27,162	167.56	0.000
98.50	0.000	27,162	167.56	0.000
99.00	0.000	27,162	167.56	0.000
99.50	0.000	27,162	167.56	0.000
100.00	0.000	27,162	167.56	0.000
100.50	0.000	27,162	167.56	0.000
101.00	0.000	27,162	167.56	0.000
101.50	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	27,162	167.56	0.000
102.50	0.000	27,162	167.56	0.000
103.00	0.000	27,162	167.56	0.000
103.50	0.000	27,162	167.56	0.000
104.00	0.000	27,162	167.56	0.000
104.50	0.000	27,162	167.56	0.000
105.00	0.000	27,162	167.56	0.000
105.50	0.000	27,162	167.56	0.000
106.00	0.000	27,162	167.56	0.000
106.50	0.000	27,162	167.56	0.000
107.00	0.000	27,162	167.56	0.000
107.50	0.000	27,162	167.56	0.000
108.00	0.000	27,162	167.56	0.000
108.50	0.000	27,162	167.56	0.000
109.00	0.000	27,162	167.56	0.000
109.50	0.000	27,162	167.56	0.000
110.00	0.000	27,162	167.56	0.000
110.50	0.000	27,162	167.56	0.000
111.00	0.000	27,162	167.56	0.000
111.50	0.000	27,162	167.56	0.000
112.00	0.000	27,162	167.56	0.000
112.50	0.000	27,162	167.56	0.000
113.00	0.000	27,162	167.56	0.000
113.50	0.000	27,162	167.56	0.000
114.00	0.000	27,162	167.56	0.000
114.50	0.000	27,162	167.56	0.000
115.00	0.000	27,162	167.56	0.000
115.50	0.000	27,162	167.56	0.000
116.00	0.000	27,162	167.56	0.000
116.50	0.000	27,162	167.56	0.000
117.00	0.000	27,162	167.56	0.000
117.50	0.000	27,162	167.56	0.000
118.00	0.000	27,162	167.56	0.000
118.50	0.000	27,162	167.56	0.000
119.00	0.000	27,162	167.56	0.000
119.50	0.000	27,162	167.56	0.000
120.00	0.000	27,162	167.56	0.000
120.50	0.000	27,162	167.56	0.000
121.00	0.000	27,162	167.56	0.000
121.50	0.000	27,162	167.56	0.000
122.00	0.000	27,162	167.56	0.000
122.50	0.000	27,162	167.56	0.000
123.00	0.000	27,162	167.56	0.000
123.50	0.000	27,162	167.56	0.000
124.00	0.000	27,162	167.56	0.000
124.50	0.000	27,162	167.56	0.000
125.00	0.000	27,162	167.56	0.000
125.50	0.000	27,162	167.56	0.000
126.00	0.000	27,162	167.56	0.000
126.50	0.000	27,162	167.56	0.000
127.00	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	27,162	167.56	0.000
128.00	0.000	27,162	167.56	0.000
128.50	0.000	27,162	167.56	0.000
129.00	0.000	27,162	167.56	0.000
129.50	0.000	27,162	167.56	0.000
130.00	0.000	27,162	167.56	0.000
130.50	0.000	27,162	167.56	0.000
131.00	0.000	27,162	167.56	0.000
131.50	0.000	27,162	167.56	0.000
132.00	0.000	27,162	167.56	0.000
132.50	0.000	27,162	167.56	0.000
133.00	0.000	27,162	167.56	0.000
133.50	0.000	27,162	167.56	0.000
134.00	0.000	27,162	167.56	0.000
134.50	0.000	27,162	167.56	0.000
135.00	0.000	27,162	167.56	0.000
135.50	0.000	27,162	167.56	0.000
136.00	0.000	27,162	167.56	0.000
136.50	0.000	27,162	167.56	0.000
137.00	0.000	27,162	167.56	0.000
137.50	0.000	27,162	167.56	0.000
138.00	0.000	27,162	167.56	0.000
138.50	0.000	27,162	167.56	0.000
139.00	0.000	27,162	167.56	0.000
139.50	0.000	27,162	167.56	0.000
140.00	0.000	27,162	167.56	0.000
140.50	0.000	27,162	167.56	0.000
141.00	0.000	27,162	167.56	0.000
141.50	0.000	27,162	167.56	0.000
142.00	0.000	27,162	167.56	0.000
142.50	0.000	27,162	167.56	0.000
143.00	0.000	27,162	167.56	0.000
143.50	0.000	27,162	167.56	0.000
144.00	0.000	27,162	167.56	0.000
144.50	0.000	27,162	167.56	0.000
145.00	0.000	27,162	167.56	0.000
145.50	0.000	27,162	167.56	0.000
146.00	0.000	27,162	167.56	0.000
146.50	0.000	27,162	167.56	0.000
147.00	0.000	27,162	167.56	0.000
147.50	0.000	27,162	167.56	0.000
148.00	0.000	27,162	167.56	0.000
148.50	0.000	27,162	167.56	0.000
149.00	0.000	27,162	167.56	0.000
149.50	0.000	27,162	167.56	0.000
150.00	0.000	27,162	167.56	0.000
150.50	0.000	27,162	167.56	0.000
151.00	0.000	27,162	167.56	0.000
151.50	0.000	27,162	167.56	0.000
152.00	0.000	27,162	167.56	0.000
152.50	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	27,162	167.56	0.000
153.50	0.000	27,162	167.56	0.000
154.00	0.000	27,162	167.56	0.000
154.50	0.000	27,162	167.56	0.000
155.00	0.000	27,162	167.56	0.000
155.50	0.000	27,162	167.56	0.000
156.00	0.000	27,162	167.56	0.000
156.50	0.000	27,162	167.56	0.000
157.00	0.000	27,162	167.56	0.000
157.50	0.000	27,162	167.56	0.000
158.00	0.000	27,162	167.56	0.000
158.50	0.000	27,162	167.56	0.000
159.00	0.000	27,162	167.56	0.000
159.50	0.000	27,162	167.56	0.000
160.00	0.000	27,162	167.56	0.000
160.50	0.000	27,162	167.56	0.000
161.00	0.000	27,162	167.56	0.000
161.50	0.000	27,162	167.56	0.000
162.00	0.000	27,162	167.56	0.000
162.50	0.000	27,162	167.56	0.000
163.00	0.000	27,162	167.56	0.000
163.50	0.000	27,162	167.56	0.000
164.00	0.000	27,162	167.56	0.000
164.50	0.000	27,162	167.56	0.000
165.00	0.000	27,162	167.56	0.000
165.50	0.000	27,162	167.56	0.000
166.00	0.000	27,162	167.56	0.000
166.50	0.000	27,162	167.56	0.000
167.00	0.000	27,162	167.56	0.000
167.50	0.000	27,162	167.56	0.000
168.00	0.000	27,162	167.56	0.000

Summary for Pond 3P: UG2

[93] Warning: Storage range exceeded by 6.08'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=607)

Inflow Area = 21,562 sf, 86.06% Impervious, Inflow Depth = 5.68" for 50-yr event
Inflow = 4.265 cfs @ 11.96 hrs, Volume= 10,207 cf
Outflow = 5.420 cfs @ 11.95 hrs, Volume= 5,994 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.420 cfs @ 11.95 hrs, Volume= 5,994 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 168.07' @ 11.95 hrs Surf.Area= 2,542 sf Storage= 4,234 cf

Plug-Flow detention time= 227.0 min calculated for 5,993 cf (59% of inflow)
Center-of-Mass det. time= 110.0 min (851.6 - 741.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=5.404 cfs @ 11.95 hrs HW=168.06' TW=167.66' (Fixed TW Elev= 167.66')
└─**4=Culvert** (Inlet Controls 5.404 cfs @ 3.058 fps)
  ├─**1=Orifice/Grate** (Passes < 0.150 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 0.382 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 88.921 cfs potential flow)

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.006	4	159.28	0.000
1.50	0.014	22	159.30	0.000
2.00	0.019	52	159.33	0.000
2.50	0.023	90	159.37	0.000
3.00	0.027	136	159.41	0.000
3.50	0.030	187	159.46	0.000
4.00	0.033	244	159.52	0.000
4.50	0.036	306	159.58	0.000
5.00	0.040	375	159.65	0.000
5.50	0.044	451	159.72	0.000
6.00	0.047	532	159.79	0.000
6.50	0.050	620	159.83	0.000
7.00	0.054	714	159.87	0.000
7.50	0.057	814	159.92	0.000
8.00	0.060	920	159.97	0.000
8.50	0.073	1,038	160.02	0.000
9.00	0.087	1,182	160.09	0.000
9.50	0.090	1,344	160.16	0.000
10.00	0.110	1,521	160.25	0.000
10.50	0.142	1,746	160.35	0.000
11.00	0.196	2,048	160.50	0.000
11.50	**0.322**	**2,506**	**160.73**	**0.000**
12.00	**3.538**	**4,234**	**167.74**	**2.364**
12.50	0.311	4,234	167.58	0.000
13.00	0.194	4,234	167.58	0.000
13.50	0.147	4,234	167.58	0.000
14.00	0.116	4,234	167.58	0.000
14.50	0.102	4,234	167.58	0.000
15.00	0.092	4,234	167.58	0.000
15.50	0.082	4,234	167.58	0.000
16.00	0.071	4,234	167.58	0.000
16.50	0.066	4,234	167.58	0.000
17.00	0.063	4,234	167.58	0.000
17.50	0.059	4,234	167.58	0.000
18.00	0.055	4,234	167.58	0.000
18.50	0.051	4,234	167.58	0.000
19.00	0.048	4,234	167.58	0.000
19.50	0.044	4,234	167.58	0.000
20.00	0.040	4,234	167.58	0.000
20.50	0.039	4,234	167.58	0.000
21.00	0.038	4,234	167.58	0.000
21.50	0.037	4,234	167.58	0.000
22.00	0.037	4,234	167.58	0.000
22.50	0.036	4,234	167.58	0.000
23.00	0.035	4,234	167.58	0.000
23.50	0.034	4,234	167.58	0.000
24.00	0.034	4,234	167.58	0.000
24.50	0.000	4,234	167.58	0.000
25.00	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	4,234	167.58	0.000
26.00	0.000	4,234	167.58	0.000
26.50	0.000	4,234	167.58	0.000
27.00	0.000	4,234	167.58	0.000
27.50	0.000	4,234	167.58	0.000
28.00	0.000	4,234	167.58	0.000
28.50	0.000	4,234	167.58	0.000
29.00	0.000	4,234	167.58	0.000
29.50	0.000	4,234	167.58	0.000
30.00	0.000	4,234	167.58	0.000
30.50	0.000	4,234	167.58	0.000
31.00	0.000	4,234	167.58	0.000
31.50	0.000	4,234	167.58	0.000
32.00	0.000	4,234	167.58	0.000
32.50	0.000	4,234	167.58	0.000
33.00	0.000	4,234	167.58	0.000
33.50	0.000	4,234	167.58	0.000
34.00	0.000	4,234	167.58	0.000
34.50	0.000	4,234	167.58	0.000
35.00	0.000	4,234	167.58	0.000
35.50	0.000	4,234	167.58	0.000
36.00	0.000	4,234	167.58	0.000
36.50	0.000	4,234	167.58	0.000
37.00	0.000	4,234	167.58	0.000
37.50	0.000	4,234	167.58	0.000
38.00	0.000	4,234	167.58	0.000
38.50	0.000	4,234	167.58	0.000
39.00	0.000	4,234	167.58	0.000
39.50	0.000	4,234	167.58	0.000
40.00	0.000	4,234	167.58	0.000
40.50	0.000	4,234	167.58	0.000
41.00	0.000	4,234	167.58	0.000
41.50	0.000	4,234	167.58	0.000
42.00	0.000	4,234	167.58	0.000
42.50	0.000	4,234	167.58	0.000
43.00	0.000	4,234	167.58	0.000
43.50	0.000	4,234	167.58	0.000
44.00	0.000	4,234	167.58	0.000
44.50	0.000	4,234	167.58	0.000
45.00	0.000	4,234	167.58	0.000
45.50	0.000	4,234	167.58	0.000
46.00	0.000	4,234	167.58	0.000
46.50	0.000	4,234	167.58	0.000
47.00	0.000	4,234	167.58	0.000
47.50	0.000	4,234	167.58	0.000
48.00	0.000	4,234	167.58	0.000
48.50	0.000	4,234	167.58	0.000
49.00	0.000	4,234	167.58	0.000
49.50	0.000	4,234	167.58	0.000
50.00	0.000	4,234	167.58	0.000
50.50	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,234	167.58	0.000
51.50	0.000	4,234	167.58	0.000
52.00	0.000	4,234	167.58	0.000
52.50	0.000	4,234	167.58	0.000
53.00	0.000	4,234	167.58	0.000
53.50	0.000	4,234	167.58	0.000
54.00	0.000	4,234	167.58	0.000
54.50	0.000	4,234	167.58	0.000
55.00	0.000	4,234	167.58	0.000
55.50	0.000	4,234	167.58	0.000
56.00	0.000	4,234	167.58	0.000
56.50	0.000	4,234	167.58	0.000
57.00	0.000	4,234	167.58	0.000
57.50	0.000	4,234	167.58	0.000
58.00	0.000	4,234	167.58	0.000
58.50	0.000	4,234	167.58	0.000
59.00	0.000	4,234	167.58	0.000
59.50	0.000	4,234	167.58	0.000
60.00	0.000	4,234	167.58	0.000
60.50	0.000	4,234	167.58	0.000
61.00	0.000	4,234	167.58	0.000
61.50	0.000	4,234	167.58	0.000
62.00	0.000	4,234	167.58	0.000
62.50	0.000	4,234	167.58	0.000
63.00	0.000	4,234	167.58	0.000
63.50	0.000	4,234	167.58	0.000
64.00	0.000	4,234	167.58	0.000
64.50	0.000	4,234	167.58	0.000
65.00	0.000	4,234	167.58	0.000
65.50	0.000	4,234	167.58	0.000
66.00	0.000	4,234	167.58	0.000
66.50	0.000	4,234	167.58	0.000
67.00	0.000	4,234	167.58	0.000
67.50	0.000	4,234	167.58	0.000
68.00	0.000	4,234	167.58	0.000
68.50	0.000	4,234	167.58	0.000
69.00	0.000	4,234	167.58	0.000
69.50	0.000	4,234	167.58	0.000
70.00	0.000	4,234	167.58	0.000
70.50	0.000	4,234	167.58	0.000
71.00	0.000	4,234	167.58	0.000
71.50	0.000	4,234	167.58	0.000
72.00	0.000	4,234	167.58	0.000
72.50	0.000	4,234	167.58	0.000
73.00	0.000	4,234	167.58	0.000
73.50	0.000	4,234	167.58	0.000
74.00	0.000	4,234	167.58	0.000
74.50	0.000	4,234	167.58	0.000
75.00	0.000	4,234	167.58	0.000
75.50	0.000	4,234	167.58	0.000
76.00	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	4,234	167.58	0.000
77.00	0.000	4,234	167.58	0.000
77.50	0.000	4,234	167.58	0.000
78.00	0.000	4,234	167.58	0.000
78.50	0.000	4,234	167.58	0.000
79.00	0.000	4,234	167.58	0.000
79.50	0.000	4,234	167.58	0.000
80.00	0.000	4,234	167.58	0.000
80.50	0.000	4,234	167.58	0.000
81.00	0.000	4,234	167.58	0.000
81.50	0.000	4,234	167.58	0.000
82.00	0.000	4,234	167.58	0.000
82.50	0.000	4,234	167.58	0.000
83.00	0.000	4,234	167.58	0.000
83.50	0.000	4,234	167.58	0.000
84.00	0.000	4,234	167.58	0.000
84.50	0.000	4,234	167.58	0.000
85.00	0.000	4,234	167.58	0.000
85.50	0.000	4,234	167.58	0.000
86.00	0.000	4,234	167.58	0.000
86.50	0.000	4,234	167.58	0.000
87.00	0.000	4,234	167.58	0.000
87.50	0.000	4,234	167.58	0.000
88.00	0.000	4,234	167.58	0.000
88.50	0.000	4,234	167.58	0.000
89.00	0.000	4,234	167.58	0.000
89.50	0.000	4,234	167.58	0.000
90.00	0.000	4,234	167.58	0.000
90.50	0.000	4,234	167.58	0.000
91.00	0.000	4,234	167.58	0.000
91.50	0.000	4,234	167.58	0.000
92.00	0.000	4,234	167.58	0.000
92.50	0.000	4,234	167.58	0.000
93.00	0.000	4,234	167.58	0.000
93.50	0.000	4,234	167.58	0.000
94.00	0.000	4,234	167.58	0.000
94.50	0.000	4,234	167.58	0.000
95.00	0.000	4,234	167.58	0.000
95.50	0.000	4,234	167.58	0.000
96.00	0.000	4,234	167.58	0.000
96.50	0.000	4,234	167.58	0.000
97.00	0.000	4,234	167.58	0.000
97.50	0.000	4,234	167.58	0.000
98.00	0.000	4,234	167.58	0.000
98.50	0.000	4,234	167.58	0.000
99.00	0.000	4,234	167.58	0.000
99.50	0.000	4,234	167.58	0.000
100.00	0.000	4,234	167.58	0.000
100.50	0.000	4,234	167.58	0.000
101.00	0.000	4,234	167.58	0.000
101.50	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

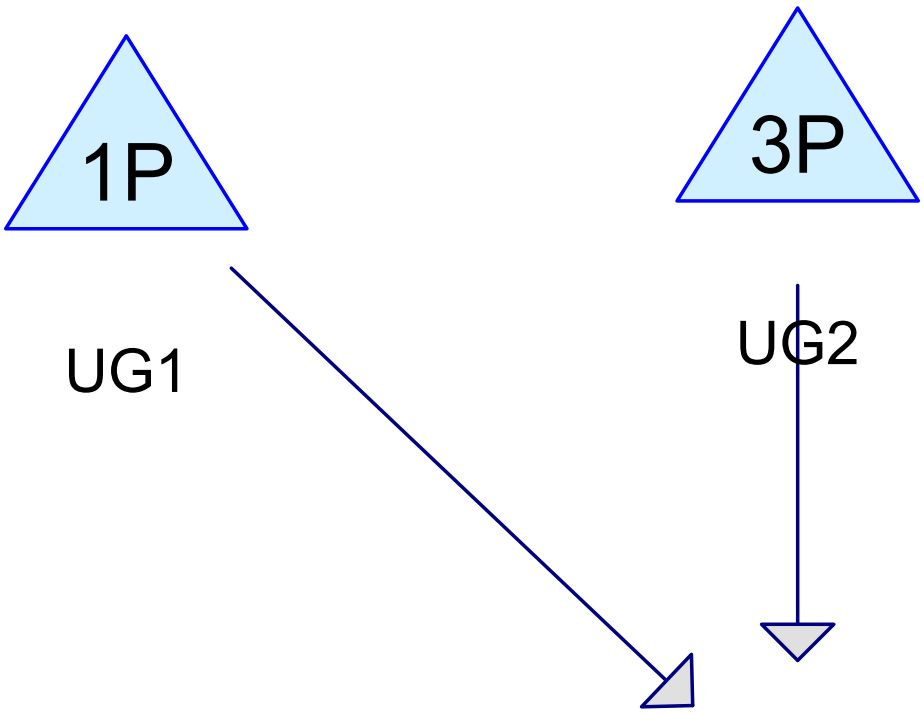
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	4,234	167.58	0.000
102.50	0.000	4,234	167.58	0.000
103.00	0.000	4,234	167.58	0.000
103.50	0.000	4,234	167.58	0.000
104.00	0.000	4,234	167.58	0.000
104.50	0.000	4,234	167.58	0.000
105.00	0.000	4,234	167.58	0.000
105.50	0.000	4,234	167.58	0.000
106.00	0.000	4,234	167.58	0.000
106.50	0.000	4,234	167.58	0.000
107.00	0.000	4,234	167.58	0.000
107.50	0.000	4,234	167.58	0.000
108.00	0.000	4,234	167.58	0.000
108.50	0.000	4,234	167.58	0.000
109.00	0.000	4,234	167.58	0.000
109.50	0.000	4,234	167.58	0.000
110.00	0.000	4,234	167.58	0.000
110.50	0.000	4,234	167.58	0.000
111.00	0.000	4,234	167.58	0.000
111.50	0.000	4,234	167.58	0.000
112.00	0.000	4,234	167.58	0.000
112.50	0.000	4,234	167.58	0.000
113.00	0.000	4,234	167.58	0.000
113.50	0.000	4,234	167.58	0.000
114.00	0.000	4,234	167.58	0.000
114.50	0.000	4,234	167.58	0.000
115.00	0.000	4,234	167.58	0.000
115.50	0.000	4,234	167.58	0.000
116.00	0.000	4,234	167.58	0.000
116.50	0.000	4,234	167.58	0.000
117.00	0.000	4,234	167.58	0.000
117.50	0.000	4,234	167.58	0.000
118.00	0.000	4,234	167.58	0.000
118.50	0.000	4,234	167.58	0.000
119.00	0.000	4,234	167.58	0.000
119.50	0.000	4,234	167.58	0.000
120.00	0.000	4,234	167.58	0.000
120.50	0.000	4,234	167.58	0.000
121.00	0.000	4,234	167.58	0.000
121.50	0.000	4,234	167.58	0.000
122.00	0.000	4,234	167.58	0.000
122.50	0.000	4,234	167.58	0.000
123.00	0.000	4,234	167.58	0.000
123.50	0.000	4,234	167.58	0.000
124.00	0.000	4,234	167.58	0.000
124.50	0.000	4,234	167.58	0.000
125.00	0.000	4,234	167.58	0.000
125.50	0.000	4,234	167.58	0.000
126.00	0.000	4,234	167.58	0.000
126.50	0.000	4,234	167.58	0.000
127.00	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	4,234	167.58	0.000
128.00	0.000	4,234	167.58	0.000
128.50	0.000	4,234	167.58	0.000
129.00	0.000	4,234	167.58	0.000
129.50	0.000	4,234	167.58	0.000
130.00	0.000	4,234	167.58	0.000
130.50	0.000	4,234	167.58	0.000
131.00	0.000	4,234	167.58	0.000
131.50	0.000	4,234	167.58	0.000
132.00	0.000	4,234	167.58	0.000
132.50	0.000	4,234	167.58	0.000
133.00	0.000	4,234	167.58	0.000
133.50	0.000	4,234	167.58	0.000
134.00	0.000	4,234	167.58	0.000
134.50	0.000	4,234	167.58	0.000
135.00	0.000	4,234	167.58	0.000
135.50	0.000	4,234	167.58	0.000
136.00	0.000	4,234	167.58	0.000
136.50	0.000	4,234	167.58	0.000
137.00	0.000	4,234	167.58	0.000
137.50	0.000	4,234	167.58	0.000
138.00	0.000	4,234	167.58	0.000
138.50	0.000	4,234	167.58	0.000
139.00	0.000	4,234	167.58	0.000
139.50	0.000	4,234	167.58	0.000
140.00	0.000	4,234	167.58	0.000
140.50	0.000	4,234	167.58	0.000
141.00	0.000	4,234	167.58	0.000
141.50	0.000	4,234	167.58	0.000
142.00	0.000	4,234	167.58	0.000
142.50	0.000	4,234	167.58	0.000
143.00	0.000	4,234	167.58	0.000
143.50	0.000	4,234	167.58	0.000
144.00	0.000	4,234	167.58	0.000
144.50	0.000	4,234	167.58	0.000
145.00	0.000	4,234	167.58	0.000
145.50	0.000	4,234	167.58	0.000
146.00	0.000	4,234	167.58	0.000
146.50	0.000	4,234	167.58	0.000
147.00	0.000	4,234	167.58	0.000
147.50	0.000	4,234	167.58	0.000
148.00	0.000	4,234	167.58	0.000
148.50	0.000	4,234	167.58	0.000
149.00	0.000	4,234	167.58	0.000
149.50	0.000	4,234	167.58	0.000
150.00	0.000	4,234	167.58	0.000
150.50	0.000	4,234	167.58	0.000
151.00	0.000	4,234	167.58	0.000
151.50	0.000	4,234	167.58	0.000
152.00	0.000	4,234	167.58	0.000
152.50	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	4,234	167.58	0.000
153.50	0.000	4,234	167.58	0.000
154.00	0.000	4,234	167.58	0.000
154.50	0.000	4,234	167.58	0.000
155.00	0.000	4,234	167.58	0.000
155.50	0.000	4,234	167.58	0.000
156.00	0.000	4,234	167.58	0.000
156.50	0.000	4,234	167.58	0.000
157.00	0.000	4,234	167.58	0.000
157.50	0.000	4,234	167.58	0.000
158.00	0.000	4,234	167.58	0.000
158.50	0.000	4,234	167.58	0.000
159.00	0.000	4,234	167.58	0.000
159.50	0.000	4,234	167.58	0.000
160.00	0.000	4,234	167.58	0.000
160.50	0.000	4,234	167.58	0.000
161.00	0.000	4,234	167.58	0.000
161.50	0.000	4,234	167.58	0.000
162.00	0.000	4,234	167.58	0.000
162.50	0.000	4,234	167.58	0.000
163.00	0.000	4,234	167.58	0.000
163.50	0.000	4,234	167.58	0.000
164.00	0.000	4,234	167.58	0.000
164.50	0.000	4,234	167.58	0.000
165.00	0.000	4,234	167.58	0.000
165.50	0.000	4,234	167.58	0.000
166.00	0.000	4,234	167.58	0.000
166.50	0.000	4,234	167.58	0.000
167.00	0.000	4,234	167.58	0.000
167.50	0.000	4,234	167.58	0.000
168.00	0.000	4,234	167.58	0.000



Subcat Reach Pond Link

Routing Diagram for BMW_2025-4-23
Prepared by Bohler, Printed 4/23/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	100-yr	Type II 24-hr		Default	24.00	1	7.66	2

Summary for Pond 1P: UG1

[93] Warning: Storage range exceeded by 34.38'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=601)

Inflow Area = 81,327 sf, 96.79% Impervious, Inflow Depth = 7.21" for 100-yr event
Inflow = 20.473 cfs @ 11.96 hrs, Volume= 48,895 cf
Outflow = 37.232 cfs @ 11.99 hrs, Volume= 22,075 cf, Atten= 0%, Lag= 2.0 min
Primary = 37.232 cfs @ 11.99 hrs, Volume= 22,075 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 195.12' @ 11.99 hrs Surf.Area= 13,041 sf Storage= 27,162 cf

Plug-Flow detention time= 295.8 min calculated for 22,075 cf (45% of inflow)
Center-of-Mass det. time= 150.3 min (887.7 - 737.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=37.187 cfs @ 11.99 hrs HW=195.06' TW=168.67' (Fixed TW Elev= 168.67')
└─**4=Culvert** (Outlet Controls 37.187 cfs @ 21.044 fps)
  ├─**1=Orifice/Grate** (Passes < 0.135 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 19.237 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 2,606.021 cfs potential flow)

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.040	31	157.54	0.000
1.50	0.075	135	157.56	0.000
2.00	0.101	294	157.59	0.000
2.50	0.121	494	157.62	0.000
3.00	0.138	727	157.67	0.000
3.50	0.152	989	157.72	0.000
4.00	0.165	1,274	157.77	0.000
4.50	0.181	1,585	157.83	0.000
5.00	0.198	1,927	157.90	0.000
5.50	0.215	2,299	157.97	0.000
6.00	0.231	2,701	158.04	0.000
6.50	0.247	3,131	158.07	0.000
7.00	0.263	3,591	158.11	0.000
7.50	0.278	4,078	158.15	0.000
8.00	0.294	4,593	158.20	0.000
8.50	0.355	5,171	158.25	0.000
9.00	0.425	5,872	158.31	0.000
9.50	0.437	6,655	158.38	0.000
10.00	0.531	7,515	158.45	0.000
10.50	0.690	8,607	158.55	0.000
11.00	0.951	10,071	158.68	0.000
11.50	**1.558**	**12,286**	**158.88**	**0.000**
12.00	**16.909**	**27,162**	**168.67**	**0.000**
12.50	1.470	27,162	168.67	0.000
13.00	0.915	27,162	168.67	0.000
13.50	0.692	27,162	168.67	0.000
14.00	0.543	27,162	168.67	0.000
14.50	0.480	27,162	168.67	0.000
15.00	0.430	27,162	168.67	0.000
15.50	0.381	27,162	168.67	0.000
16.00	0.332	27,162	168.67	0.000
16.50	0.309	27,162	168.67	0.000
17.00	0.292	27,162	168.67	0.000
17.50	0.274	27,162	168.67	0.000
18.00	0.257	27,162	168.67	0.000
18.50	0.239	27,162	168.67	0.000
19.00	0.222	27,162	168.67	0.000
19.50	0.204	27,162	168.67	0.000
20.00	0.186	27,162	168.67	0.000
20.50	0.181	27,162	168.67	0.000
21.00	0.177	27,162	168.67	0.000
21.50	0.174	27,162	168.67	0.000
22.00	0.170	27,162	168.67	0.000
22.50	0.167	27,162	168.67	0.000
23.00	0.163	27,162	168.67	0.000
23.50	0.160	27,162	168.67	0.000
24.00	0.156	27,162	168.67	0.000
24.50	0.000	27,162	168.67	0.000
25.00	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	27,162	168.67	0.000
26.00	0.000	27,162	168.67	0.000
26.50	0.000	27,162	168.67	0.000
27.00	0.000	27,162	168.67	0.000
27.50	0.000	27,162	168.67	0.000
28.00	0.000	27,162	168.67	0.000
28.50	0.000	27,162	168.67	0.000
29.00	0.000	27,162	168.67	0.000
29.50	0.000	27,162	168.67	0.000
30.00	0.000	27,162	168.67	0.000
30.50	0.000	27,162	168.67	0.000
31.00	0.000	27,162	168.67	0.000
31.50	0.000	27,162	168.67	0.000
32.00	0.000	27,162	168.67	0.000
32.50	0.000	27,162	168.67	0.000
33.00	0.000	27,162	168.67	0.000
33.50	0.000	27,162	168.67	0.000
34.00	0.000	27,162	168.67	0.000
34.50	0.000	27,162	168.67	0.000
35.00	0.000	27,162	168.67	0.000
35.50	0.000	27,162	168.67	0.000
36.00	0.000	27,162	168.67	0.000
36.50	0.000	27,162	168.67	0.000
37.00	0.000	27,162	168.67	0.000
37.50	0.000	27,162	168.67	0.000
38.00	0.000	27,162	168.67	0.000
38.50	0.000	27,162	168.67	0.000
39.00	0.000	27,162	168.67	0.000
39.50	0.000	27,162	168.67	0.000
40.00	0.000	27,162	168.67	0.000
40.50	0.000	27,162	168.67	0.000
41.00	0.000	27,162	168.67	0.000
41.50	0.000	27,162	168.67	0.000
42.00	0.000	27,162	168.67	0.000
42.50	0.000	27,162	168.67	0.000
43.00	0.000	27,162	168.67	0.000
43.50	0.000	27,162	168.67	0.000
44.00	0.000	27,162	168.67	0.000
44.50	0.000	27,162	168.67	0.000
45.00	0.000	27,162	168.67	0.000
45.50	0.000	27,162	168.67	0.000
46.00	0.000	27,162	168.67	0.000
46.50	0.000	27,162	168.67	0.000
47.00	0.000	27,162	168.67	0.000
47.50	0.000	27,162	168.67	0.000
48.00	0.000	27,162	168.67	0.000
48.50	0.000	27,162	168.67	0.000
49.00	0.000	27,162	168.67	0.000
49.50	0.000	27,162	168.67	0.000
50.00	0.000	27,162	168.67	0.000
50.50	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	27,162	168.67	0.000
51.50	0.000	27,162	168.67	0.000
52.00	0.000	27,162	168.67	0.000
52.50	0.000	27,162	168.67	0.000
53.00	0.000	27,162	168.67	0.000
53.50	0.000	27,162	168.67	0.000
54.00	0.000	27,162	168.67	0.000
54.50	0.000	27,162	168.67	0.000
55.00	0.000	27,162	168.67	0.000
55.50	0.000	27,162	168.67	0.000
56.00	0.000	27,162	168.67	0.000
56.50	0.000	27,162	168.67	0.000
57.00	0.000	27,162	168.67	0.000
57.50	0.000	27,162	168.67	0.000
58.00	0.000	27,162	168.67	0.000
58.50	0.000	27,162	168.67	0.000
59.00	0.000	27,162	168.67	0.000
59.50	0.000	27,162	168.67	0.000
60.00	0.000	27,162	168.67	0.000
60.50	0.000	27,162	168.67	0.000
61.00	0.000	27,162	168.67	0.000
61.50	0.000	27,162	168.67	0.000
62.00	0.000	27,162	168.67	0.000
62.50	0.000	27,162	168.67	0.000
63.00	0.000	27,162	168.67	0.000
63.50	0.000	27,162	168.67	0.000
64.00	0.000	27,162	168.67	0.000
64.50	0.000	27,162	168.67	0.000
65.00	0.000	27,162	168.67	0.000
65.50	0.000	27,162	168.67	0.000
66.00	0.000	27,162	168.67	0.000
66.50	0.000	27,162	168.67	0.000
67.00	0.000	27,162	168.67	0.000
67.50	0.000	27,162	168.67	0.000
68.00	0.000	27,162	168.67	0.000
68.50	0.000	27,162	168.67	0.000
69.00	0.000	27,162	168.67	0.000
69.50	0.000	27,162	168.67	0.000
70.00	0.000	27,162	168.67	0.000
70.50	0.000	27,162	168.67	0.000
71.00	0.000	27,162	168.67	0.000
71.50	0.000	27,162	168.67	0.000
72.00	0.000	27,162	168.67	0.000
72.50	0.000	27,162	168.67	0.000
73.00	0.000	27,162	168.67	0.000
73.50	0.000	27,162	168.67	0.000
74.00	0.000	27,162	168.67	0.000
74.50	0.000	27,162	168.67	0.000
75.00	0.000	27,162	168.67	0.000
75.50	0.000	27,162	168.67	0.000
76.00	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	27,162	168.67	0.000
77.00	0.000	27,162	168.67	0.000
77.50	0.000	27,162	168.67	0.000
78.00	0.000	27,162	168.67	0.000
78.50	0.000	27,162	168.67	0.000
79.00	0.000	27,162	168.67	0.000
79.50	0.000	27,162	168.67	0.000
80.00	0.000	27,162	168.67	0.000
80.50	0.000	27,162	168.67	0.000
81.00	0.000	27,162	168.67	0.000
81.50	0.000	27,162	168.67	0.000
82.00	0.000	27,162	168.67	0.000
82.50	0.000	27,162	168.67	0.000
83.00	0.000	27,162	168.67	0.000
83.50	0.000	27,162	168.67	0.000
84.00	0.000	27,162	168.67	0.000
84.50	0.000	27,162	168.67	0.000
85.00	0.000	27,162	168.67	0.000
85.50	0.000	27,162	168.67	0.000
86.00	0.000	27,162	168.67	0.000
86.50	0.000	27,162	168.67	0.000
87.00	0.000	27,162	168.67	0.000
87.50	0.000	27,162	168.67	0.000
88.00	0.000	27,162	168.67	0.000
88.50	0.000	27,162	168.67	0.000
89.00	0.000	27,162	168.67	0.000
89.50	0.000	27,162	168.67	0.000
90.00	0.000	27,162	168.67	0.000
90.50	0.000	27,162	168.67	0.000
91.00	0.000	27,162	168.67	0.000
91.50	0.000	27,162	168.67	0.000
92.00	0.000	27,162	168.67	0.000
92.50	0.000	27,162	168.67	0.000
93.00	0.000	27,162	168.67	0.000
93.50	0.000	27,162	168.67	0.000
94.00	0.000	27,162	168.67	0.000
94.50	0.000	27,162	168.67	0.000
95.00	0.000	27,162	168.67	0.000
95.50	0.000	27,162	168.67	0.000
96.00	0.000	27,162	168.67	0.000
96.50	0.000	27,162	168.67	0.000
97.00	0.000	27,162	168.67	0.000
97.50	0.000	27,162	168.67	0.000
98.00	0.000	27,162	168.67	0.000
98.50	0.000	27,162	168.67	0.000
99.00	0.000	27,162	168.67	0.000
99.50	0.000	27,162	168.67	0.000
100.00	0.000	27,162	168.67	0.000
100.50	0.000	27,162	168.67	0.000
101.00	0.000	27,162	168.67	0.000
101.50	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	27,162	168.67	0.000
102.50	0.000	27,162	168.67	0.000
103.00	0.000	27,162	168.67	0.000
103.50	0.000	27,162	168.67	0.000
104.00	0.000	27,162	168.67	0.000
104.50	0.000	27,162	168.67	0.000
105.00	0.000	27,162	168.67	0.000
105.50	0.000	27,162	168.67	0.000
106.00	0.000	27,162	168.67	0.000
106.50	0.000	27,162	168.67	0.000
107.00	0.000	27,162	168.67	0.000
107.50	0.000	27,162	168.67	0.000
108.00	0.000	27,162	168.67	0.000
108.50	0.000	27,162	168.67	0.000
109.00	0.000	27,162	168.67	0.000
109.50	0.000	27,162	168.67	0.000
110.00	0.000	27,162	168.67	0.000
110.50	0.000	27,162	168.67	0.000
111.00	0.000	27,162	168.67	0.000
111.50	0.000	27,162	168.67	0.000
112.00	0.000	27,162	168.67	0.000
112.50	0.000	27,162	168.67	0.000
113.00	0.000	27,162	168.67	0.000
113.50	0.000	27,162	168.67	0.000
114.00	0.000	27,162	168.67	0.000
114.50	0.000	27,162	168.67	0.000
115.00	0.000	27,162	168.67	0.000
115.50	0.000	27,162	168.67	0.000
116.00	0.000	27,162	168.67	0.000
116.50	0.000	27,162	168.67	0.000
117.00	0.000	27,162	168.67	0.000
117.50	0.000	27,162	168.67	0.000
118.00	0.000	27,162	168.67	0.000
118.50	0.000	27,162	168.67	0.000
119.00	0.000	27,162	168.67	0.000
119.50	0.000	27,162	168.67	0.000
120.00	0.000	27,162	168.67	0.000
120.50	0.000	27,162	168.67	0.000
121.00	0.000	27,162	168.67	0.000
121.50	0.000	27,162	168.67	0.000
122.00	0.000	27,162	168.67	0.000
122.50	0.000	27,162	168.67	0.000
123.00	0.000	27,162	168.67	0.000
123.50	0.000	27,162	168.67	0.000
124.00	0.000	27,162	168.67	0.000
124.50	0.000	27,162	168.67	0.000
125.00	0.000	27,162	168.67	0.000
125.50	0.000	27,162	168.67	0.000
126.00	0.000	27,162	168.67	0.000
126.50	0.000	27,162	168.67	0.000
127.00	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	27,162	168.67	0.000
128.00	0.000	27,162	168.67	0.000
128.50	0.000	27,162	168.67	0.000
129.00	0.000	27,162	168.67	0.000
129.50	0.000	27,162	168.67	0.000
130.00	0.000	27,162	168.67	0.000
130.50	0.000	27,162	168.67	0.000
131.00	0.000	27,162	168.67	0.000
131.50	0.000	27,162	168.67	0.000
132.00	0.000	27,162	168.67	0.000
132.50	0.000	27,162	168.67	0.000
133.00	0.000	27,162	168.67	0.000
133.50	0.000	27,162	168.67	0.000
134.00	0.000	27,162	168.67	0.000
134.50	0.000	27,162	168.67	0.000
135.00	0.000	27,162	168.67	0.000
135.50	0.000	27,162	168.67	0.000
136.00	0.000	27,162	168.67	0.000
136.50	0.000	27,162	168.67	0.000
137.00	0.000	27,162	168.67	0.000
137.50	0.000	27,162	168.67	0.000
138.00	0.000	27,162	168.67	0.000
138.50	0.000	27,162	168.67	0.000
139.00	0.000	27,162	168.67	0.000
139.50	0.000	27,162	168.67	0.000
140.00	0.000	27,162	168.67	0.000
140.50	0.000	27,162	168.67	0.000
141.00	0.000	27,162	168.67	0.000
141.50	0.000	27,162	168.67	0.000
142.00	0.000	27,162	168.67	0.000
142.50	0.000	27,162	168.67	0.000
143.00	0.000	27,162	168.67	0.000
143.50	0.000	27,162	168.67	0.000
144.00	0.000	27,162	168.67	0.000
144.50	0.000	27,162	168.67	0.000
145.00	0.000	27,162	168.67	0.000
145.50	0.000	27,162	168.67	0.000
146.00	0.000	27,162	168.67	0.000
146.50	0.000	27,162	168.67	0.000
147.00	0.000	27,162	168.67	0.000
147.50	0.000	27,162	168.67	0.000
148.00	0.000	27,162	168.67	0.000
148.50	0.000	27,162	168.67	0.000
149.00	0.000	27,162	168.67	0.000
149.50	0.000	27,162	168.67	0.000
150.00	0.000	27,162	168.67	0.000
150.50	0.000	27,162	168.67	0.000
151.00	0.000	27,162	168.67	0.000
151.50	0.000	27,162	168.67	0.000
152.00	0.000	27,162	168.67	0.000
152.50	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	27,162	168.67	0.000
153.50	0.000	27,162	168.67	0.000
154.00	0.000	27,162	168.67	0.000
154.50	0.000	27,162	168.67	0.000
155.00	0.000	27,162	168.67	0.000
155.50	0.000	27,162	168.67	0.000
156.00	0.000	27,162	168.67	0.000
156.50	0.000	27,162	168.67	0.000
157.00	0.000	27,162	168.67	0.000
157.50	0.000	27,162	168.67	0.000
158.00	0.000	27,162	168.67	0.000
158.50	0.000	27,162	168.67	0.000
159.00	0.000	27,162	168.67	0.000
159.50	0.000	27,162	168.67	0.000
160.00	0.000	27,162	168.67	0.000
160.50	0.000	27,162	168.67	0.000
161.00	0.000	27,162	168.67	0.000
161.50	0.000	27,162	168.67	0.000
162.00	0.000	27,162	168.67	0.000
162.50	0.000	27,162	168.67	0.000
163.00	0.000	27,162	168.67	0.000
163.50	0.000	27,162	168.67	0.000
164.00	0.000	27,162	168.67	0.000
164.50	0.000	27,162	168.67	0.000
165.00	0.000	27,162	168.67	0.000
165.50	0.000	27,162	168.67	0.000
166.00	0.000	27,162	168.67	0.000
166.50	0.000	27,162	168.67	0.000
167.00	0.000	27,162	168.67	0.000
167.50	0.000	27,162	168.67	0.000
168.00	0.000	27,162	168.67	0.000

Summary for Pond 3P: UG2

[93] Warning: Storage range exceeded by 7.03'
[88] Warning: Qout>Qin may require smaller dt or Finer Routing
[85] Warning: Oscillations may require smaller dt or Finer Routing (severity=604)

Inflow Area = 21,562 sf, 86.06% Impervious, Inflow Depth = 6.53" for 100-yr event
Inflow = 4.899 cfs @ 11.96 hrs, Volume= 11,730 cf
Outflow = 5.004 cfs @ 11.95 hrs, Volume= 7,498 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.004 cfs @ 11.95 hrs, Volume= 7,498 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 169.02' @ 11.95 hrs Surf.Area= 2,542 sf Storage= 4,234 cf

Plug-Flow detention time= 209.3 min calculated for 7,498 cf (64% of inflow)
Center-of-Mass det. time= 99.6 min (840.1 - 740.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=4.988 cfs @ 11.95 hrs HW=169.01' TW=168.67' (Fixed TW Elev= 168.67')
└─**4=Culvert** (Inlet Controls 4.988 cfs @ 2.823 fps)
  ├─**1=Orifice/Grate** (Passes < 0.139 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 0.353 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 97.351 cfs potential flow)

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.009	7	159.29	0.000
1.50	0.018	32	159.31	0.000
2.00	0.024	69	159.35	0.000
2.50	0.029	117	159.39	0.000
3.00	0.032	172	159.45	0.000
3.50	0.036	233	159.51	0.000
4.00	0.039	300	159.58	0.000
4.50	0.043	374	159.65	0.000
5.00	0.047	454	159.73	0.000
5.50	0.051	542	159.80	0.000
6.00	0.055	637	159.84	0.000
6.50	0.058	738	159.88	0.000
7.00	0.062	847	159.93	0.000
7.50	0.066	961	159.99	0.000
8.00	0.069	1,083	160.04	0.000
8.50	0.084	1,219	160.11	0.000
9.00	0.100	1,384	160.18	0.000
9.50	0.103	1,569	160.27	0.000
10.00	0.125	1,772	160.37	0.000
10.50	0.163	2,029	160.49	0.000
11.00	0.224	2,374	160.66	0.000
11.50	**0.367**	**2,896**	**160.93**	**0.000**
12.00	**4.066**	**4,234**	**168.89**	**3.943**
12.50	0.358	4,234	168.68	0.235
13.00	0.223	4,234	168.67	0.100
13.50	0.169	4,234	168.67	0.046
14.00	0.133	4,234	168.67	0.010
14.50	0.118	4,234	168.58	0.000
15.00	0.106	4,234	168.58	0.000
15.50	0.094	4,234	168.58	0.000
16.00	0.082	4,234	168.58	0.000
16.50	0.076	4,234	168.58	0.000
17.00	0.072	4,234	168.58	0.000
17.50	0.068	4,234	168.58	0.000
18.00	0.063	4,234	168.58	0.000
18.50	0.059	4,234	168.58	0.000
19.00	0.055	4,234	168.58	0.000
19.50	0.050	4,234	168.58	0.000
20.00	0.046	4,234	168.58	0.000
20.50	0.045	4,234	168.58	0.000
21.00	0.044	4,234	168.58	0.000
21.50	0.043	4,234	168.58	0.000
22.00	0.042	4,234	168.58	0.000
22.50	0.041	4,234	168.58	0.000
23.00	0.040	4,234	168.58	0.000
23.50	0.039	4,234	168.58	0.000
24.00	0.039	4,234	168.58	0.000
24.50	0.000	4,234	168.58	0.000
25.00	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	4,234	168.58	0.000
26.00	0.000	4,234	168.58	0.000
26.50	0.000	4,234	168.58	0.000
27.00	0.000	4,234	168.58	0.000
27.50	0.000	4,234	168.58	0.000
28.00	0.000	4,234	168.58	0.000
28.50	0.000	4,234	168.58	0.000
29.00	0.000	4,234	168.58	0.000
29.50	0.000	4,234	168.58	0.000
30.00	0.000	4,234	168.58	0.000
30.50	0.000	4,234	168.58	0.000
31.00	0.000	4,234	168.58	0.000
31.50	0.000	4,234	168.58	0.000
32.00	0.000	4,234	168.58	0.000
32.50	0.000	4,234	168.58	0.000
33.00	0.000	4,234	168.58	0.000
33.50	0.000	4,234	168.58	0.000
34.00	0.000	4,234	168.58	0.000
34.50	0.000	4,234	168.58	0.000
35.00	0.000	4,234	168.58	0.000
35.50	0.000	4,234	168.58	0.000
36.00	0.000	4,234	168.58	0.000
36.50	0.000	4,234	168.58	0.000
37.00	0.000	4,234	168.58	0.000
37.50	0.000	4,234	168.58	0.000
38.00	0.000	4,234	168.58	0.000
38.50	0.000	4,234	168.58	0.000
39.00	0.000	4,234	168.58	0.000
39.50	0.000	4,234	168.58	0.000
40.00	0.000	4,234	168.58	0.000
40.50	0.000	4,234	168.58	0.000
41.00	0.000	4,234	168.58	0.000
41.50	0.000	4,234	168.58	0.000
42.00	0.000	4,234	168.58	0.000
42.50	0.000	4,234	168.58	0.000
43.00	0.000	4,234	168.58	0.000
43.50	0.000	4,234	168.58	0.000
44.00	0.000	4,234	168.58	0.000
44.50	0.000	4,234	168.58	0.000
45.00	0.000	4,234	168.58	0.000
45.50	0.000	4,234	168.58	0.000
46.00	0.000	4,234	168.58	0.000
46.50	0.000	4,234	168.58	0.000
47.00	0.000	4,234	168.58	0.000
47.50	0.000	4,234	168.58	0.000
48.00	0.000	4,234	168.58	0.000
48.50	0.000	4,234	168.58	0.000
49.00	0.000	4,234	168.58	0.000
49.50	0.000	4,234	168.58	0.000
50.00	0.000	4,234	168.58	0.000
50.50	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,234	168.58	0.000
51.50	0.000	4,234	168.58	0.000
52.00	0.000	4,234	168.58	0.000
52.50	0.000	4,234	168.58	0.000
53.00	0.000	4,234	168.58	0.000
53.50	0.000	4,234	168.58	0.000
54.00	0.000	4,234	168.58	0.000
54.50	0.000	4,234	168.58	0.000
55.00	0.000	4,234	168.58	0.000
55.50	0.000	4,234	168.58	0.000
56.00	0.000	4,234	168.58	0.000
56.50	0.000	4,234	168.58	0.000
57.00	0.000	4,234	168.58	0.000
57.50	0.000	4,234	168.58	0.000
58.00	0.000	4,234	168.58	0.000
58.50	0.000	4,234	168.58	0.000
59.00	0.000	4,234	168.58	0.000
59.50	0.000	4,234	168.58	0.000
60.00	0.000	4,234	168.58	0.000
60.50	0.000	4,234	168.58	0.000
61.00	0.000	4,234	168.58	0.000
61.50	0.000	4,234	168.58	0.000
62.00	0.000	4,234	168.58	0.000
62.50	0.000	4,234	168.58	0.000
63.00	0.000	4,234	168.58	0.000
63.50	0.000	4,234	168.58	0.000
64.00	0.000	4,234	168.58	0.000
64.50	0.000	4,234	168.58	0.000
65.00	0.000	4,234	168.58	0.000
65.50	0.000	4,234	168.58	0.000
66.00	0.000	4,234	168.58	0.000
66.50	0.000	4,234	168.58	0.000
67.00	0.000	4,234	168.58	0.000
67.50	0.000	4,234	168.58	0.000
68.00	0.000	4,234	168.58	0.000
68.50	0.000	4,234	168.58	0.000
69.00	0.000	4,234	168.58	0.000
69.50	0.000	4,234	168.58	0.000
70.00	0.000	4,234	168.58	0.000
70.50	0.000	4,234	168.58	0.000
71.00	0.000	4,234	168.58	0.000
71.50	0.000	4,234	168.58	0.000
72.00	0.000	4,234	168.58	0.000
72.50	0.000	4,234	168.58	0.000
73.00	0.000	4,234	168.58	0.000
73.50	0.000	4,234	168.58	0.000
74.00	0.000	4,234	168.58	0.000
74.50	0.000	4,234	168.58	0.000
75.00	0.000	4,234	168.58	0.000
75.50	0.000	4,234	168.58	0.000
76.00	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	4,234	168.58	0.000
77.00	0.000	4,234	168.58	0.000
77.50	0.000	4,234	168.58	0.000
78.00	0.000	4,234	168.58	0.000
78.50	0.000	4,234	168.58	0.000
79.00	0.000	4,234	168.58	0.000
79.50	0.000	4,234	168.58	0.000
80.00	0.000	4,234	168.58	0.000
80.50	0.000	4,234	168.58	0.000
81.00	0.000	4,234	168.58	0.000
81.50	0.000	4,234	168.58	0.000
82.00	0.000	4,234	168.58	0.000
82.50	0.000	4,234	168.58	0.000
83.00	0.000	4,234	168.58	0.000
83.50	0.000	4,234	168.58	0.000
84.00	0.000	4,234	168.58	0.000
84.50	0.000	4,234	168.58	0.000
85.00	0.000	4,234	168.58	0.000
85.50	0.000	4,234	168.58	0.000
86.00	0.000	4,234	168.58	0.000
86.50	0.000	4,234	168.58	0.000
87.00	0.000	4,234	168.58	0.000
87.50	0.000	4,234	168.58	0.000
88.00	0.000	4,234	168.58	0.000
88.50	0.000	4,234	168.58	0.000
89.00	0.000	4,234	168.58	0.000
89.50	0.000	4,234	168.58	0.000
90.00	0.000	4,234	168.58	0.000
90.50	0.000	4,234	168.58	0.000
91.00	0.000	4,234	168.58	0.000
91.50	0.000	4,234	168.58	0.000
92.00	0.000	4,234	168.58	0.000
92.50	0.000	4,234	168.58	0.000
93.00	0.000	4,234	168.58	0.000
93.50	0.000	4,234	168.58	0.000
94.00	0.000	4,234	168.58	0.000
94.50	0.000	4,234	168.58	0.000
95.00	0.000	4,234	168.58	0.000
95.50	0.000	4,234	168.58	0.000
96.00	0.000	4,234	168.58	0.000
96.50	0.000	4,234	168.58	0.000
97.00	0.000	4,234	168.58	0.000
97.50	0.000	4,234	168.58	0.000
98.00	0.000	4,234	168.58	0.000
98.50	0.000	4,234	168.58	0.000
99.00	0.000	4,234	168.58	0.000
99.50	0.000	4,234	168.58	0.000
100.00	0.000	4,234	168.58	0.000
100.50	0.000	4,234	168.58	0.000
101.00	0.000	4,234	168.58	0.000
101.50	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	4,234	168.58	0.000
102.50	0.000	4,234	168.58	0.000
103.00	0.000	4,234	168.58	0.000
103.50	0.000	4,234	168.58	0.000
104.00	0.000	4,234	168.58	0.000
104.50	0.000	4,234	168.58	0.000
105.00	0.000	4,234	168.58	0.000
105.50	0.000	4,234	168.58	0.000
106.00	0.000	4,234	168.58	0.000
106.50	0.000	4,234	168.58	0.000
107.00	0.000	4,234	168.58	0.000
107.50	0.000	4,234	168.58	0.000
108.00	0.000	4,234	168.58	0.000
108.50	0.000	4,234	168.58	0.000
109.00	0.000	4,234	168.58	0.000
109.50	0.000	4,234	168.58	0.000
110.00	0.000	4,234	168.58	0.000
110.50	0.000	4,234	168.58	0.000
111.00	0.000	4,234	168.58	0.000
111.50	0.000	4,234	168.58	0.000
112.00	0.000	4,234	168.58	0.000
112.50	0.000	4,234	168.58	0.000
113.00	0.000	4,234	168.58	0.000
113.50	0.000	4,234	168.58	0.000
114.00	0.000	4,234	168.58	0.000
114.50	0.000	4,234	168.58	0.000
115.00	0.000	4,234	168.58	0.000
115.50	0.000	4,234	168.58	0.000
116.00	0.000	4,234	168.58	0.000
116.50	0.000	4,234	168.58	0.000
117.00	0.000	4,234	168.58	0.000
117.50	0.000	4,234	168.58	0.000
118.00	0.000	4,234	168.58	0.000
118.50	0.000	4,234	168.58	0.000
119.00	0.000	4,234	168.58	0.000
119.50	0.000	4,234	168.58	0.000
120.00	0.000	4,234	168.58	0.000
120.50	0.000	4,234	168.58	0.000
121.00	0.000	4,234	168.58	0.000
121.50	0.000	4,234	168.58	0.000
122.00	0.000	4,234	168.58	0.000
122.50	0.000	4,234	168.58	0.000
123.00	0.000	4,234	168.58	0.000
123.50	0.000	4,234	168.58	0.000
124.00	0.000	4,234	168.58	0.000
124.50	0.000	4,234	168.58	0.000
125.00	0.000	4,234	168.58	0.000
125.50	0.000	4,234	168.58	0.000
126.00	0.000	4,234	168.58	0.000
126.50	0.000	4,234	168.58	0.000
127.00	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	4,234	168.58	0.000
128.00	0.000	4,234	168.58	0.000
128.50	0.000	4,234	168.58	0.000
129.00	0.000	4,234	168.58	0.000
129.50	0.000	4,234	168.58	0.000
130.00	0.000	4,234	168.58	0.000
130.50	0.000	4,234	168.58	0.000
131.00	0.000	4,234	168.58	0.000
131.50	0.000	4,234	168.58	0.000
132.00	0.000	4,234	168.58	0.000
132.50	0.000	4,234	168.58	0.000
133.00	0.000	4,234	168.58	0.000
133.50	0.000	4,234	168.58	0.000
134.00	0.000	4,234	168.58	0.000
134.50	0.000	4,234	168.58	0.000
135.00	0.000	4,234	168.58	0.000
135.50	0.000	4,234	168.58	0.000
136.00	0.000	4,234	168.58	0.000
136.50	0.000	4,234	168.58	0.000
137.00	0.000	4,234	168.58	0.000
137.50	0.000	4,234	168.58	0.000
138.00	0.000	4,234	168.58	0.000
138.50	0.000	4,234	168.58	0.000
139.00	0.000	4,234	168.58	0.000
139.50	0.000	4,234	168.58	0.000
140.00	0.000	4,234	168.58	0.000
140.50	0.000	4,234	168.58	0.000
141.00	0.000	4,234	168.58	0.000
141.50	0.000	4,234	168.58	0.000
142.00	0.000	4,234	168.58	0.000
142.50	0.000	4,234	168.58	0.000
143.00	0.000	4,234	168.58	0.000
143.50	0.000	4,234	168.58	0.000
144.00	0.000	4,234	168.58	0.000
144.50	0.000	4,234	168.58	0.000
145.00	0.000	4,234	168.58	0.000
145.50	0.000	4,234	168.58	0.000
146.00	0.000	4,234	168.58	0.000
146.50	0.000	4,234	168.58	0.000
147.00	0.000	4,234	168.58	0.000
147.50	0.000	4,234	168.58	0.000
148.00	0.000	4,234	168.58	0.000
148.50	0.000	4,234	168.58	0.000
149.00	0.000	4,234	168.58	0.000
149.50	0.000	4,234	168.58	0.000
150.00	0.000	4,234	168.58	0.000
150.50	0.000	4,234	168.58	0.000
151.00	0.000	4,234	168.58	0.000
151.50	0.000	4,234	168.58	0.000
152.00	0.000	4,234	168.58	0.000
152.50	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	4,234	168.58	0.000
153.50	0.000	4,234	168.58	0.000
154.00	0.000	4,234	168.58	0.000
154.50	0.000	4,234	168.58	0.000
155.00	0.000	4,234	168.58	0.000
155.50	0.000	4,234	168.58	0.000
156.00	0.000	4,234	168.58	0.000
156.50	0.000	4,234	168.58	0.000
157.00	0.000	4,234	168.58	0.000
157.50	0.000	4,234	168.58	0.000
158.00	0.000	4,234	168.58	0.000
158.50	0.000	4,234	168.58	0.000
159.00	0.000	4,234	168.58	0.000
159.50	0.000	4,234	168.58	0.000
160.00	0.000	4,234	168.58	0.000
160.50	0.000	4,234	168.58	0.000
161.00	0.000	4,234	168.58	0.000
161.50	0.000	4,234	168.58	0.000
162.00	0.000	4,234	168.58	0.000
162.50	0.000	4,234	168.58	0.000
163.00	0.000	4,234	168.58	0.000
163.50	0.000	4,234	168.58	0.000
164.00	0.000	4,234	168.58	0.000
164.50	0.000	4,234	168.58	0.000
165.00	0.000	4,234	168.58	0.000
165.50	0.000	4,234	168.58	0.000
166.00	0.000	4,234	168.58	0.000
166.50	0.000	4,234	168.58	0.000
167.00	0.000	4,234	168.58	0.000
167.50	0.000	4,234	168.58	0.000
168.00	0.000	4,234	168.58	0.000

SEQUENCE OF BMP INSTALLATION AND REMOVAL

§102.4(b)(5)(vii)

ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE. EACH STAGE SHALL BE COMPLETED IN COMPLIANCE WITH CHAPTER 102 REGULATIONS BEFORE ANY FOLLOWING STAGE IS INITIATED. CLEARING AND GRUBBING SHALL BE LIMITED ONLY TO THOSE AREAS DESCRIBED IN EACH STAGE. UPON COMPLETION OR TEMPORARY CESSATION OF THE EARTH DISTURBANCE ACTIVITY THAT WILL EXCEED FOUR (4) DAYS [IMMEDIATELY FOR HQ/EV WATERSHEDS], OR ANY STAGE THEREOF, THE PROJECT SITE SHALL BE IMMEDIATELY STABILIZED WITH THE APPROPRIATE TEMPORARY OR PERMANENT STABILIZATION.

AT LEAST SEVEN (7) DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, THE OPERATOR SHALL INVITE ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES INCLUDING, BUT NOT LIMITED TO: THE LANDOWNER, ALL APPROPRIATE MUNICIPAL OFFICIALS AND A REPRESENTATIVE OF THE MONTGOMERY COUNTY CONSERVATION DISTRICT FOR AN ON-SITE PRE-CONSTRUCTION MEETING. ALSO, AT LEAST THREE (3) DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES SHALL NOTIFY THE PENNSYLVANIA ONE CALL SYSTEM INC. AT 1-800-242-1776 FOR BURIED UTILITIES LOCATION.

BEFORE INITIATING ANY REVISION TO THE APPROVED EROSION AND SEDIMENT CONTROL PLAN OR REVISIONS TO OTHER PLANS WHICH MAY AFFECT THE EFFECTIVENESS OF THE APPROVED E&S CONTROL PLAN, THE OPERATOR MUST RECEIVE APPROVAL OF THE REVISIONS FROM THE MONTGOMERY COUNTY CONSERVATION DISTRICT. THE OPERATOR SHALL ASSURE THAT THE APPROVED EROSION AND SEDIMENT CONTROL PLAN IS PROPERLY AND COMPLETELY IMPLEMENTED. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.

STAGE 0

1. STAKE OUT LIMIT OF DISTURBANCE AND STREAM EXTENTS
2. INSTALL CONSTRUCTION ENTRANCES WITH WASH RACKS AND STAGING AREAS AS DESIGNATED ON THE PLANS.
3. INSTALL ALL PERIMETER COMPOST FILTER SOCKS, TREE PROTECTION FENCING, INLET PROTECTION WITHIN THE DESIGNATED LIMIT OF DISTURBANCE AS INDICATED ON THE PLANS. ONLY LIMITED CLEARING AND GRUBBING NECESSARY TO INSTALL THE PERIMETER EROSION AND SEDIMENT POLLUTION CONTROLS IS PERMITTED.
4. CONSTRUCT FILTER SOCK SEDIMENT TRAP #2. ONLY LIMITED CLEARING AND GRUBBING IS PERMITTED FOR CONSTRUCTION OF THE ACCESS TO THE SEDIMENT TRAP. DURING THE SEDIMENT CONTROL STAGE, THE FACILITY IS NOT TO BE EXCAVATED BELOW THE SEDIMENT TRAP BOTTOM ELEVATION. THE FACILITY IS TO BE STABILIZED AND FUNCTIONING PROPERLY PRIOR TO ANY FURTHER EARTH DISTURBANCE ACTIVITIES.
5. CONSTRUCT FILTER SOCK SEDIMENT TRAP #1. ONLY LIMITED CLEARING AND GRUBBING IS PERMITTED FOR CONSTRUCTION OF THE ACCESS TO THE SEDIMENT TRAP. DURING THE SEDIMENT CONTROL STAGE, THE FACILITY IS NOT TO BE EXCAVATED BELOW THE SEDIMENT TRAP BOTTOM ELEVATION. THE FACILITY IS TO BE STABILIZED AND FUNCTIONING PROPERLY PRIOR TO ANY FURTHER EARTH DISTURBANCE ACTIVITIES. ROCK FILTER IS TO BE REMOVED ONCE FILTER SOCK SEDIMENT TRAPS ARE INSTALLED AND FUNCTIONING.
6. INITIATE THE NECESSARY EARTHWORK TO REACH THE GRADES INDICATED ON THE STAGE-0 PLANS. THE CONCRETE WASHOUT MUST BE INSTALLED BEFORE ANY CONCRETE CAN BE POURED ON-SITE. CONTRACTOR MUST PERFORM BULK OF EARTHWORK TO BALANCE CUTS AND FILLS TO THE GREATEST EXTENT POSSIBLE. ALL AREAS DISTURBED DURING THE EARTHWORK PHASE OF CONSTRUCTION MUST BE TEMPORARILY SEEDED AND STABILIZED IN ACCORDANCE WITH THE GENERAL CONSERVATION NOTES AND SPECIFICATIONS AND SEEDING SPECIFICATIONS IF PERMANENT STABILIZATION CANNOT BE ACHIEVED WITHIN FOUR (4) DAYS.
7. COMMENCE DEMOLITION OF EXISTING BUILDINGS 1 AND 3 (WEST AND EAST) AND ACCESSORY STRUCTURES AND INITIATE REMOVAL OF EXISTING ASPHALT AND CONCRETE FEATURES TO BE REMOVED AS DESIGNATED ON THE PLANS.
8. UPON SITE STABILIZATION FOR TRIBUTARY AREA OF FILTER SOCK SEDIMENT TRAP 2 (UNIFORM COVERAGE OR DENSITY OF 70% ACROSS ALL DISTURBED AREAS) AND NOTIFICATION OF THE MONTGOMERY COUNTY CONSERVATION DISTRICT, REMOVE EROSION AND SEDIMENT CONTROL FACILITY (FILTER SOCK SEDIMENT TRAP #2). ANY AREA DISTURBED DURING THE REMOVAL OF EROSION AND SEDIMENT CONTROL FACILITIES SHALL BE STABILIZED IMMEDIATELY.
9. UPON SITE STABILIZATION FOR TRIBUTARY AREA OF FILTER SOCK SEDIMENT TRAP 1 (UNIFORM COVERAGE OR DENSITY OF 70% ACROSS ALL DISTURBED AREAS) AND NOTIFICATION OF THE MONTGOMERY COUNTY CONSERVATION DISTRICT, REMOVE EROSION AND SEDIMENT CONTROL FACILITY (COMPOST FILTER SOCK TRAP #1). ANY AREA DISTURBED DURING THE REMOVAL OF EROSION AND SEDIMENT CONTROL FACILITIES SHALL BE STABILIZED IMMEDIATELY.
10. A SITE INSPECTION AND APPROVAL BY THE LICENSED DESIGNATED PROFESSIONAL IS REQUIRED PRIOR TO REMOVAL OF SEDIMENT TRAPS. ONCE STONE BASE COURSE HAS BEEN SPREAD IN ALL PAVED AREAS AND ALL LANDSCAPE AREAS HAVE BEEN STABILIZED, BEGIN CONVERTING SEDIMENT TRAPS TO FINAL GRADES IN ACCORDANCE WITH BMP SEQUENCE OF CONSTRUCTION. **THE PERMITTEE SHALL PROVIDE ENGINEERING OVERSIGHT FOR THE REMOVAL OF SEDIMENT TRAPS. A LICENSED PROFESSIONAL OR DESIGNEE KNOWLEDGEABLE IN THE DESIGN AND CONSTRUCTION OF SEDIMENT TRAPS, PREFERABLY THE DESIGN ENGINEER, SHALL CONDUCT THE OVERSIGHT.**

STAGE 1

11. **CRITICAL STAGE - INSTALL CULVERT REALIGNMENT FROM DOWNSTREAM TO UPSTREAM. PROVIDE BYPASS PUMPING DURING FINAL CONNECTION IF NECESSARY**
12. INSTALL 100 FOOT ROCK CONSTRUCTION ENTRANCE AND STAGING AREAS AS DESIGNATED ON THE PLANS.
13. INSTALL ALL PERIMETER COMPOST FILTER SOCKS, TREE PROTECTION FENCING, INLET PROTECTION WITHIN THE DESIGNATED LIMIT OF DISTURBANCE AS INDICATED ON THE PLANS. ONLY LIMITED CLEARING AND GRUBBING NECESSARY TO INSTALL THE PERIMETER EROSION AND SEDIMENT POLLUTION CONTROLS IS PERMITTED.
14. INITIATE THE NECESSARY EARTHWORK TO REACH THE GRADES INDICATED ON THE PLANS. REMAINING BUILDING CONSTRUCTION (INCLUDING PARKING STRUCTURE PART-B, ACCESS RAMPS, ETC.) MAY COMMENCE UPON ACCEPTANCE OF BUILDING PAD BY OWNER. THE CONCRETE WASHOUT MUST BE INSTALLED BEFORE ANY CONCRETE CAN BE POURED ON-SITE. CONTRACTOR MUST PERFORM BULK OF EARTHWORK TO BALANCE CUTS AND FILLS TO THE GREATEST EXTENT POSSIBLE. ALL AREAS DISTURBED DURING THE EARTHWORK PHASE OF CONSTRUCTION MUST BE TEMPORARILY SEEDED AND STABILIZED IN ACCORDANCE WITH THE GENERAL CONSERVATION NOTES AND SPECIFICATIONS AND SEEDING SPECIFICATIONS IF PERMANENT STABILIZATION CANNOT BE ACHIEVED WITHIN FOUR (4) DAYS.
15. **CRITICAL STAGE -** INITIATE STORM SEWER AND SUBSURFACE BASIN INSTALLATIONS FOR THE REMAINING FEATURES SHOWN ON THE PLANS STARTING AT THE FURTHEST DOWNSTREAM STRUCTURE. **THE PERMITTEE SHALL PROVIDE ENGINEERING OVERSIGHT FOR THE CONSTRUCTION OF SUBSURFACE MANAGED RELEASE CONCEPT BASIN AND SUBSURFACE DETENTION BASIN, INCLUDING PREPARATION OF THE SUBGRADE AND OUTLET CONTROL STRUCTURES (OCS-103 AND OCS-201). A LICENSED PROFESSIONAL OR DESIGNEE KNOWLEDGEABLE IN THE DESIGN AND CONSTRUCTION OF SUBSURFACE MANAGED RELEASE CONCEPT BASINS AND DETENTION BASINS, PREFERABLY THE DESIGN ENGINEER, SHALL CONDUCT THE OVERSIGHT.** GC TO INSTALL E&S BMPs (INLET PROTECTION) AND HYDRODYNAMIC DEVICES AS NECESSARY TO INLETS DISCHARGING TO SUBSURFACE DETENTION BASINS IMMEDIATELY AFTER INSTALLATION AND REMAIN INSTALLED UNTIL SITE IS FULLY STABILIZED TO PREVENT SEDIMENT FROM ENTERING THE SUBSURFACE DETENTION BASINS. NO CONSTRUCTION EQUIPMENT, SUCH AS CRANES DURING BUILDING CONSTRUCTION, SHALL BE PARKED ON TOP OF THE SUBSURFACE BASINS TO AVOID DAMAGING THE SUBSURFACE BASINS OR OVER-COMPACTING THE SUBSURFACE SOILS.]
16. CONTINUE WITH THE BALANCE OF EARTHWORK INCLUDING UTILITY INSTALLATION (SANITARY, ELECTRIC, TELEPHONE, CABLE AND GAS) WHERE APPLICABLE.
17. INSTALL ALL CURBING SHOWN IN THIS PHASE AND INSTALL STONE BASE COURSE IN THE DRIVEWAY AND PARKING AREAS.
18. INITIATE FINAL GRADING AND PLACEMENT OF TOPSOIL IN ALL LANDSCAPE AREAS. AS SOON AS SLOPES, CHANNELS, DITCHES AND OTHER DISTURBED AREAS REACH FINAL GRADE, THEY MUST BE STABILIZED. ALL LANDSCAPE AREAS MUST BE STABILIZED AND PERMANENT SEEDING OR PLACEMENT OF SOD MUST BE APPLIED. WHEN FINAL GRADE IS ACHIEVED DURING NON-GERMINATING MONTHS, THE AREA SHOULD BE MULCHED UNTIL THE BEGINNING OF THE NEXT PLANTING SEASON. HOWEVER, THE AREA WILL NOT BE CONSIDERED STABILIZED UNTIL A MINIMUM UNIFORM 70% VEGETATIVE COVER OF EROSION RESISTANT PERENNIAL SPECIES HAS BEEN ACHIEVED. AS DISTURBED AREAS WITHIN A PROJECT APPROACH FINAL GRADE, PREPARATIONS SHOULD BE MADE FOR SEEDING AND MULCHING TO BEGIN (I.E. ANTICIPATE THE COMPLETION DATE AND SCHEDULE THE SEEDER). IN NO CASE SHOULD AN AREA EXCEEDING 15,000 SQUARE FEET, WHICH IS TO BE STABILIZED BY VEGETATION, REACH FINAL GRADE WITHOUT BEING SEEDED AND MULCHED. WAITING UNTIL EARTHMOVING IS COMPLETED BEFORE MAKING PREPARATIONS FOR SEEDING AND MULCHING IS NOT ACCEPTABLE. SEEDING AND MULCHING REQUIREMENTS ARE SPECIFIED IN THE GENERAL CONSERVATION NOTES AND SPECIFICATIONS.
19. INSTALL BITUMINOUS PAVEMENT AND CONCRETE INCLUDING SIDEWALKS.
20. INSTALL FINAL VEGETATION INCLUDING SOD AND LANDSCAPING WHERE SHOWN. FLUSH STORM SEWER PIPES, AND CLEAR SITE OF DEBRIS AND ALL UNWANTED MATERIALS. DISPOSAL SHALL BE IN A SAFE AND LAWFUL MANNER. **A LICENSED PROFESSIONAL SHALL BE ON-SITE TO OVERSEE THE INSTALLATION OF LANDSCAPING FOR RE-VEGETATE/RE-FOREST CREDIT.**
21. UPON SITE STABILIZATION (UNIFORM COVERAGE OR DENSITY OF 70% ACROSS ALL DISTURBED AREAS) AND NOTIFICATION OF THE MONTGOMERY COUNTY CONSERVATION DISTRICT, REMOVE EROSION AND SEDIMENT CONTROL FACILITIES. ANY AREA DISTURBED DURING THE REMOVAL OF EROSION AND SEDIMENT CONTROL FACILITIES SHALL BE STABILIZED IMMEDIATELY.
22. CLEAR SITE OF DEBRIS AND ALL UNWANTED MATERIALS. OPERATOR SHALL REMOVE FROM SITE, RECYCLE OR DISPOSE OF ALL BUILDING MATERIALS AND WASTES IN ACCORDANCE WITH THE DEPARTMENT'S SOLID WASTE MANAGEMENT REGULATIONS AT 25 PA. CODE 260.1 ET SEQ., 271.1 ET SEQ. THE CONTRACTOR SHALL NOT ILLEGALLY BURY, DUMP OR DISCHARGE ANY BUILDING MATERIAL OR WASTE AT THIS SITE.
23. DEMOBILIZE.
24. A NOTICE OF TERMINATION FORM SHOULD BE SUBMITTED TO THE MONTGOMERY COUNTY CONSERVATION DISTRICT UPON STABILIZATION AND FINAL COMPLETION OF THIS PROJECT.

RECYCLING OR DISPOSAL OF POST CONSTRUCTION PCSM MATERIALS

§102.8(f)(11)

THE FOLLOWING IS A LIST THAT INCLUDES, BUT THAT IS NOT LIMITED TO, THE POTENTIAL CONSTRUCTION WASTES THAT MAY EXIST ON-SITE:
- SEDIMENT
- PLANTING SOIL
- DEBRIS & LITTER
- DEAD VEGETATION / PLANT MATERIAL
- MULCH
- RIP-RAP
- PIPING / CLEAN OUTS
- HYDRODYNAMIC DEVICES

ALL BUILDING MATERIALS AND WASTES SHALL BE REMOVED FROM THE SITE AND RECYCLED OR DISPOSED OF IN ACCORDANCE WITH THE DEPARTMENT'S SOLID WASTE MANAGEMENT REGULATIONS AT 25 Pa. CODE 260.1 ET SEQ., 271.1, AND 287.1 ET SEQ. NO BUILDING MATERIALS OR WASTES OR UNUSED BUILDING MATERIALS SHALL BE BURNED, BURIED, DUMPED, OR DISCHARGED AT THE SITE. BELOW IS A LIST OF METHODS FOR THE PROPER RECYCLING/DISPOSAL OF VARIOUS MATERIALS:

PCSM PRODUCED WASTES SHALL BE MAINTAINED IN ACCORDANCE WITH MAINTENANCE DESCRIBED WITHIN THE LONG-TERM OPERATION AND MAINTENANCE SCHEDULE TABLE.

GEOLOGIC FORMATIONS/SOIL CONDITIONS THAT MAY HAVE THE POTENTIAL TO CAUSE POLLUTION

§102.4(b)(5)(xii)

THERE ARE NO GEOLOGIC FORMATIONS OR SOIL CONDITIONS THAT COULD CAUSE CONTAMINANT POLLUTION DURING EARTH DISTURBANCE ACTIVITIES.

E&S THERMAL IMPACT ANALYSIS

THE POTENTIAL FOR THERMAL IMPACTS FROM STORMWATER RUNOFF AS A RESULT OF INCREASED IMPERVIOUS HAVE BEEN AVOIDED OR MINIMIZED THROUGH THE DESIGN OF LANDSCAPING, 1 (1) UNDERGROUND DETENTION FACILITY, AND 2 UNDERGROUND MANAGED RELEASE CONCEPT (MRC) BASINS. THE SHADING EFFECTS OF THE PROPOSED AND EXISTING LANDSCAPING WILL PROVIDE THERMAL WATER QUALITY BENEFITS BY ALLOWING THE STORMWATER THAT HAS RUN ACROSS PAVED AREAS TO DECREASE IN TEMPERATURE PRIOR TO ENTERING THE DOWNSTREAM WATERSHED. THE FACILITIES WILL DETAIN, FILTER AND SHADE THE SURFACE WATER BEFORE MANAGED RELEASE AND WILL HELP COOL DOWN THE SURFACE WATER. THERMAL IMPACTS WILL BE REDUCED DURING CONSTRUCTION BY MEANS OF VARIOUS SOIL EROSION BMP'S THAT WILL REDUCE SEDIMENT LOADING TO SURFACE RUNOFF BEFORE IT LEAVES THE SITE (I.E. COMPOST FILTER SOCKS, INLET FILTER PROTECTION AT EXISTING AND PROPOSED INLETS, EROSION CONTROL MATTING BEING INSTALLED IMMEDIATELY FOLLOWING GRADING). EXISTING TREES AND VEGETATION ON SITE WILL ALSO BE PRESERVED AND PROTECTED WHICH WILL REDUCE THERMAL IMPACTS DURING CONSTRUCTION.

SOIL SUITABILITY AND CHARACTERISTICS

MAP UNIT SYMBOL	SOIL	DEPTH TO SEASONAL HIGH WATER TABLE	DEPTH TO BEDROCK	BRIEF DESCRIPTION OF SOIL	DEPTH FROM SURFACE OF TYPICAL PROFILE	PERMEABILITY	HYDROLOGIC GROUP	SUSECEPTABILITY TO FROST HEAVING	FOR USE AS ROADFILL	FOR USE AS TOPSOIL	FOR USE AS GRAVEL	FOR USE AS SAND	HYDRIC SOILS
UusB	URBAN LAND-UDORTHENTS SHALE AND SANDSTONE COMPLEX, 0-8% SLOPES	>78"	54"		0"-6": VARIABLE 6"-8": CHANNERY SILT LOAM 8"-21": CHANNERY SILT LOAM, CHANNERY SILT CLAY LOAM 21"-34": VERY CHANNERY SILT LOAM 34"-44": BEDROCK	-	A	NONE	NOT RATED	NOT RATED	NOT RATED	NOT RATED	NOT HYDRIC
UgD	URBAN LAND, 8-25% SLOPES	>78"	>78"		VARIABLE	-	B	NONE	NOT RATED	NOT RATED	NOT RATED	NOT RATED	NOT HYDRIC

MRC BMP O&M SCHEDULE

AT A MINIMUM, THE LONG-TERM OPERATION AND MAINTENANCE SCHEDULE MUST MEET 25 PA. CODE § 102.8(F)(10) AND INCLUDE THE FOLLOWING:

1. UPGRADIENT CATCH BASINS AND INLETS SHOULD BE INSPECTED AND CLEANED ANNUALLY, OR MORE OFTEN IF HISTORICAL MAINTENANCE RECORDS SUGGEST A MORE FREQUENT CLEANING.
2. THE VEGETATION (FOR THE CONTRIBUTING DRAINAGE AREA) SHOULD BE MAINTAINED IN GOOD CONDITION, AND ANY BARE SPOTS REVEGETATED.
3. CARE SHOULD BE TAKEN TO AVOID EXCESSIVE COMPACTION BY MOWERS. MOW ONLY AS APPROPRIATE FOR VEGETATIVE SPECIES.
4. INSPECT AT LEAST TWO TIMES PER YEAR AFTER RUNOFF EVENTS GREATER THAN 0.8 INCH AND MAKE SURE THAT RUNOFF DRAINS DOWN WITHIN THE DESIGN PARAMETERS.
5. AT LEAST TWO TIMES PER YEAR, OR MORE IF HISTORICAL MAINTENANCE INDICATE IT IS NECESSARY, INSPECT FOR ACCUMULATION OF SEDIMENT, DAMAGE TO OUTLET CONTROL STRUCTURES, EROSION, SIGNS OF WATER CONTAMINATION/SPILLS, AND INSTABILITY. LEAF LITTER NEEDS TO BE REMOVED ANNUALLY.
   A. TO INSPECT:
      - REMOVE THE INSPECTION PORT LID FROM THE FLOOR BOX FRAME.
      - REMOVE THE RISER PIPE CAP.
      - WITH A FLASHLIGHT AND STADIA ROD, MEASURE THE DEPTH OF SEDIMENT.
      - RECORD RESULTS IN A MAINTENANCE LOG.
      - WHEN DEPTH OF SEDIMENT EXCEEDS 3" (76 MM), REFER TO MANUFACTURER GUIDELINES FOR SEDIMENT REMOVAL PROCEDURE.
6. AS NEEDED, REMOVE ACCUMULATED SEDIMENT AS REQUIRED TO MAINTAIN INFILTRATION THROUGH THE MRCS SOIL MEDIA AND TO MAINTAIN WATER QUALITY FUNCTIONALITY. RESTORE ORIGINAL CROSS SECTION. PROPERLY DISPOSE OF SEDIMENT.
   - IT IS RECOMMENDED TO PERFORM INSPECTION OF THE SEDIMENT SEPARATOR ROW EVERY 6 MONTHS FOR THE FIRST YEAR OF SERVICE.
7. IF ENTRY INTO ANY MANHOLE IS REQUIRED, ALL LOCAL AND OSHA RULES FOR CONFINED SPACE ENTRIES MUST BE STRICTLY FOLLOWED.
8. ALL MRC BMP COMPONENTS SHOULD BE MAINTAINED AS INDICATED IN THE STORMWATER BMP MANUAL.
9. MANUFACTURER INSPECTION AND MAINTENANCE RECORD SHALL BE COMPLETED FOLLOWING EVERY INSPECTION

LONG-TERM PCSM BMP OPERATION AND MAINTENANCE SCHEDULE

§250-68.D.6.e.4.a

BMP NO.	DESCRIPTION	SCHEDULE	INSPECTION TASK	MAINTENANCE	FAILURE INDICATORS
STORM DRAINAGE SYSTEM	INLETS, MANHOLES, AND STORMWATER PIPING.	EVERY 3 MONTHS	• INSPECT INLETS, MANHOLES, AND STORMWATER PIPING	CLEAR SEDIMENT AND DEBRIS FROM ALL ON-SITE INLETS, MANHOLES, AND STORMWATER PIPING.	EXCESSIVE PONDING AROUND THE INLET GRATES COULD INDICATE THAT THERE MAY BE SEDIMENT/DEBRIS BUILDUP.
SWALES	DRAINAGE CHANNELS THAT CONVEY STORMWATER OVER LAND.	ANNUALLY OR AFTER EACH STORM >3"	• INSPECT FOR EROSION AND/OR SEDIMENT ACCUMULATION	AREAS OF EROSION SHALL BE REGRADED AND STABILIZED AND SEDIMENT MUST BE REMOVED TO RESTORE DESIGN CAPACITIES. ANY REMOVED SEDIMENT SHALL BE DISPOSED OF IN AN APPROVED MANNER AND IN ACCORDANCE WITH APPLICABLE STATE REGULATIONS. ALL AREAS DISTURBED DURING MAINTENANCE MUST BE STABILIZED IMMEDIATELY IN ACCORDANCE WITH THE GENERAL CONSERVATION NOTES AND SPECIFICATIONS.	CHANNEL EROSION OR VEGETATION FAILS TO ESTABLISH OR DIES OFF.
BMP 6.6.3 DRY EXTENDED DETENTION BASIN (SUB-SURFACE EXTENDED DETENTION) (UG3)	SUB-SURFACE EXTENDED DETENTION IS A VARIATION OF A DRY EXTENDED DETENTION BASIN AND A IS SYSTEM OF UNDERGROUND PRE-MANUFACTURED VAULTS, PIPES, OR CHAMBERS PLACED IN AGGREGATE FILLED BED IN THE SOIL MANTLE .	4 TIMES PER YEAR & AFTER EVERY STORM > 1 IN. ANNUALLY	• INSPECT BASIN STRUCTURES INCLUDING BASIN BOTTOMS, OUTLET STRUCTURES, RIP-RAP STRUCTURES, AND INLETS FOR CLOGGING AND EXCESS DEBRIS. • INSPECT BASIN STRUCTURES INCLUDING OUTLET STRUCTURES, RIP-RAP STRUCTURES, AND INLETS FOR DAMAGE.	NEEDED MAINTENANCE SHOULD BE CONDUCTED IMMEDIATELY AFTER EACH INSPECTION. THE LITTER AND SEDIMENT SHALL BE REMOVED IN ACCORDANCE WITH THE CHAMBER OR VAULT MANUFACTURER'S INSTRUCTIONS AND SPECIFICATIONS TO RESTORE DESIGN CAPACITIES. REFERENCE INDIVIDUAL MANUFACTURER'S O&M MANUAL FOR DETAILED PROCEDURES. REMOVED LITTER & SEDIMENT SHALL BE DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.	IF THE UNDERGROUND FACILITY DOES NOT DEWATER WITHIN 72 HOURS. UPON OBSERVING A FAILURE INDICATOR A QUALIFIED INDIVIDUAL SUCH AS AN ENGINEER SHALL BE CONSULTED TO DETERMINE THE EXACT CAUSE OF FAILURE. UPON FURTHER INVESTIGATION PERFORMED BY THE QUALIFIED INDIVIDUAL A CORRECTIVE ACTION PLAN SHALL BE IMPLEMENTED TO RESTORE THE FACILITY TO ITS ORIGINAL DESIGN CAPACITIES.
BMP 6.6.4 WATER QUALITY FILTERS & HYDRODYNAMIC DEVICES	WATER QUALITY FILTERS & HYDRODYNAMIC DEVICES REMOVE POLLUTANTS AND NUTRIENTS THROUGH MECHANICAL FILTERS	PER MANUFACTURER'S RECOMMENDATIONS	• INSPECT FILTRATION MEDIA FOR CLOGGING AND EXCESSIVE DEBRIS BUILDUP	CLEAN AND/OR REPLACE FILTER MEDIA AS SPECIFIED BY THE MANUFACTURER	FAILURE INDICATORS INCLUDE EXCESSIVELY SLOW FLOW RATES THROUGH MEDIA. A QUALIFIED INDIVIDUAL SUCH AS A REPRESENTATIVE FROM THE MANUFACTURER SHALL BE CONTACTED. REMEDIATION SHALL BE IN ACCORDANCE WITH THE QUALIFIED INDIVIDUALS RECOMMENDATIONS BASED ON THEIR INVESTIGATION.
BMP 5.6.3 RE-VEGETATE/ RE-FOREST DISTURBED AREAS		ANNUALLY	- INSPECT FOR DYING/DEAD PLANT MATERIAL - INSPECT FOR INVASIVE SPECIES	REMOVE INVASIVE SPECIES AND DISCARD IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS. ANY PLANT THAT IS FOUND TO BE DEAD OR IS DYING AND CANNOT BE SAVED SHALL BE REPLACED IN KIND.	FAILURE INDICATORS INCLUDE AN EXCESSIVE GROWTH OF INVASIVE SPECIES AND VEGETATION THAT FAILS TO ESTABLISH OR DIES OFF. UPON OBSERVING A FAILURE INDICATOR A QUALIFIED INDIVIDUAL SUCH AS A LANDSCAPE ARCHITECT OR SOIL SCIENTIST/ENGINEER SHALL BE CONSULTED TO DETERMINE THE EXACT CAUSE OF THE FAILURE. REMEDIATION SHALL BE IN ACCORDANCE WITH THE QUALIFIED INDIVIDUALS RECOMMENDATIONS BASED ON THEIR INVESTIGATION.
BMP 6.6.3 SUBSURFACE MRC BASIN (UG1 AND UG2)	UNDERGROUND MRC DETENTION BASINS ARE A VARIATION OF A DRY EXTENDED DETENTION BASIN AND A IS SYSTEM OF UNDERGROUND PRE-MANUFACTURED VAULTS, PIPES, OR CHAMBERS PLACED IN AGGREGATE FILLED BED IN THE SOIL MANTLE INTENDED TO CAPTURE AND TREAT RUNOFF THROUGH ENHANCED RESIDENCE TIME WITH THE SOIL MEDIA AND A MANAGED RELEASE RATE OUT THROUGH THE CONTROL STRUCTURE.	4 TIMES PER YEAR & AFTER EVERY STORM > 0.8 IN. ANNUALLY	• INSPECT BASIN STRUCTURES INCLUDING INSPECTION PORTS, BASIN BOTTOMS, OUTLET STRUCTURES, RIP-RAP STRUCTURES, UNDERDRAINS, AND INLETS FOR CLOGGING AND EXCESS DEBRIS. • INSPECT BASIN STRUCTURES INCLUDING THE INSPECTION PORTS, OUTLET STRUCTURES, RIP-RAP STRUCTURES, UNDERDRAINS, AND INLETS FOR DAMAGE.	NEEDED MAINTENANCE SHOULD BE CONDUCTED IMMEDIATELY AFTER EACH INSPECTION. THE LITTER AND SEDIMENT SHALL BE REMOVED IN ACCORDANCE WITH THE CHAMBER OR VAULT MANUFACTURER'S INSTRUCTIONS AND SPECIFICATIONS TO RESTORE DESIGN CAPACITIES. REFERENCE INDIVIDUAL MANUFACTURER'S O&M MANUAL FOR DETAILED PROCEDURES. REMOVED LITTER & SEDIMENT SHALL BE DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.	IF THE UNDERGROUND FACILITY DOES NOT DEWATER WITHIN 168 HOURS (7 DAYS). UPON OBSERVING A FAILURE INDICATOR A QUALIFIED INDIVIDUAL SUCH AS AN ENGINEER SHALL BE CONSULTED TO DETERMINE THE EXACT CAUSE OF FAILURE. UPON FURTHER INVESTIGATION PERFORMED BY THE QUALIFIED INDIVIDUAL A CORRECTIVE ACTION PLAN SHALL BE IMPLEMENTED TO RESTORE THE FACILITY TO ITS ORIGINAL DESIGN CAPACITIES.

TYPES, DEPTH, SLOPE, LOCATIONS, AND LIMITATIONS OF THE SOILS

SOIL DESCRIPTIONS

SOIL	DESCRIPTION	SOIL GROUP	DEPTH TO BEDROCK	DEPTH TO WATER TABLE
UgD	- URBAN LAND, 8 TO 25 PERCENT SLOPES	B	10 TO 99 INCHES TO LITHIC BEDROCK	MORE THAN 80 INCHES
UusB	URBAN LAND, URDOTHENTS, SHALE AND SANDSTONE COMPLEX, 0 TO 8 PERCENT SLOPES	A	10 TO 99 INCHES TO LITHIC BEDROCK	MORE THAN 80 INCHES

SOIL SUITABILITY CHARACTERISTICS & LIMITATIONS

SOIL NAME	CUTBANKS CAVE	CORROSIVE TO CONCRETE/ STEEL	DROUGHTY	EASILY ERODIBLE	FLOODING	DEPTH TO SATURATED ZONE/ SEASONAL HIGH WATER TABLE	HYDRIC/ HYDRIC INCLUSIONS	LOW STRENGTH/ LANDSLIDE PRONE	SLOW PERCOLATION	PIPING	POOR SOURCE OF TOPSOIL	FROST ACTION	SHRINK-SWELL	POTENTIAL SINKHOLE	PONDING	WETNESS
URBAN LAND (UgD)	X	C/S	X	X				X	X		X	X				
UDORTHENTS (UusB)	X	C/S	X	X				X	X		X	X				

SOIL USE LIMITATIONS AND PROVIDED MEASURES TO ADDRESS THOSE LIMITATIONS

SOIL USE RESOLUTIONS

IN ADDITION TO THE LIMITATIONS AND RESOLUTIONS LISTED BELOW, THE CONTRACTOR SHALL CONSULT WITH THE GEOTECHNICAL ENGINEER AND REPORTS TO DETERMINE SOIL LIMITATIONS AND RESOLUTIONS SPECIFIC TO THIS PROJECT.

LIMITATION: CUTBANKS CAVE
RESOLUTION: CONTRACTOR SHALL BE AWARE OF POTENTIAL ISSUES AND FOLLOW OSHA GUIDELINES FOR EXCAVATION BANKS, SLOPES AND TRENCHING.

LIMITATION: CORROSIVE TO CONCRETE / STEEL
RESOLUTION: PIPES, REBAR, CONDUITS, ETC SHALL BE COATED, AS NECESSARY. CONCRETE FOUNDATIONS SHALL BE COATED WITH BITUMINOUS WATER PROOFING MATERIAL, AS NECESSARY.

LIMITATION: DROUGHTY
RESOLUTION: CONTRACTOR TO SELECT APPROPRIATE VEGETATION. EROSION CONTROL BLANKS SHOLD ALSO BE CONSIDERED IN SOIL CONDITIONS THAT MAKE REVEGETATION DIFFICULT. WHEN INSTALLED PROPERLY, EROSION CONTROL BLANKETS CAN HELP HOLD SOIL PARTICLES IN PLACE AND RETAIN SOIL MOISTURE, PROMOTING SEED GERMINATION. SELECTING VEGETATIVE SPECIES TOLERANT TO DRY CONDITIONS, IRRIGATING VEGETATED AREAS AND IMPLEMENTING COMBINATION OF THESE AND/OR OTHER METHODS. SPECIFIC TOLERANCE INFORMATION IS PROVIDED IN TABLE 1 OF THE EROSION CONTROL & CONSERVATION PLANTINGS ON NONCROPLAND PUBLISHED BY PENN STATE

LIMITATION: EASILY ERODIBLE
RESOLUTION: SPECIAL ATTENTION SHALL BE GIVEN TO MAINTAINING EXISTING VEGETATION TO THE EXTENT POSSIBLE. EROSION CONTROL BLANKETS AND IMMEDIATELY STABILIZATION IS REQUIRED FOR EASILY ERODIBLE SOILS. SELECTING VEGETATION WITH GREATER RETARDANCE, SELECTING TEMPORARY / PERMANENT LININGS OTHER THAN GRASSES, AND IMPLEMENTING A COMBINATION OF THESE METHODS WILL DECREASE POTENTIAL FOR EROSION. VEGETATIVE RETARDANCE INFORMATION IS PROVIDED IN TABLES 6 AND 7 OF THE EROSION AND SEDIMENT POLLUTION CONTROL MANUAL PUBLISHED BY PADEP.

LIMITATION: LOW STRENGTH / LANDSLIDE PRONE
RESOLUTION: PRECAUTIONS SHOULD BE TAKEN TO PREVENT SLOPE FAILURES DUE TO IMPROPER CONSTRUCTION PRACTICES, SUCH AS OVER-STEEPENING AND OVERLOADING SLOPES, REMOVAL OF LATERAL SUPPORT, AND FAILURE TO PREVENT SATURATION OF SLOPES. SETBACKS SHOULD COMPLY WITH THE STANDARDS CONTAINED IN CHAPTER 16 OF THE EROSION AND SEDIMENT POLLUTION CONTROL MANUAL, PUBLISHED BY PADEP., UNLESS IT CAN BE SHOWN THAT PROPOSED CUTS AND FILLS DO NOT POSE A HAZARD TO PUBLIC SAFETY AND/OR SURFACE WATERS. WHERE SOILS ARE TO BE UTILIZED AS FILL TO CONSTRUCT A ROADWAY, SOILS MAY BE REQUIRED TO BE IMPORTED SHOULD THEY HAVE LOW STRENGTH.

LIMITATION: SLOW PERCOLATION
RESOLUTION: BMPS SHALL BE INSPECTED AFTER RUNOFF EVENTS TO ENSURE DEWATERING. PROVIDE ADEQUATE AREA FOR PUMPED WATER DISCHARGE IF NECESSARY.

LIMITATION: POOR SOURCE OF TOPSOIL
RESOLUTION: EXCAVATED TOPSOIL WILL BE STOCKPILED AND REUSED. IDENTIFY AND RESOLVE CHARACTERISTICS THAT RENDER THE SOIL TYPES POORLY SUITED AS TOPSOIL. IMPORT TOPSOIL AS NECESSARY.

LIMITATION: FROST ACTION
RESOLUTION: SOILS THAT ARE DIFFICULT TO COMPACT, UNSUITABLE FOR WINTER GRADING, OR SUSCEPTIBLE TO FROST ACTION POSE LIMITATIONS ON PLANNING EMBANKMENTS OF SEDIMENT BASINS, SEDIMENT TRAPS, STORMWATER RETENTION BASINS AND STORMWATER DETENTION BASINS. IMPORT OTHER SOIL FOR EMBANKMENT OF THOSE FACILITES OR LOCATE THOSE FACILITIES ON OTHER SOIL TYPES. DO NOT CONSTRUCT EMBANKMENTS DURING PERIODS PRONE TO FROST.

ADDITIONAL POTENTIAL LIMITATIONS
LIMITATION: DEPTH TO SATURATED ZONE / SEASONAL HIGH WATER TABLE
RESOLUTION: FOLLOW E&S PLAN WITH REGARD TO PUMPING AND DEWATERING AS NECESSARY. DISCHARGE OF SEDIMENT LADEN WATER IS PROHIBITED WITHOUT FIRST PASSING THROUGH A PUMPED WATER FILTER BAG.

LIMITATION: HYDRIC / HYDRIC INCLUSIONS
RESOLUTION: WHEN A SOIL IS LOCATED IN AN AREA THAT HAS HYDROPHYTIC VEGETAION AND WETLAND HYDROLOGY, A WETLAND IS PRESENT. HYDRIC SOILS THAT ARE DELINEATED WETLANDS SHALL BE AVOIDED.

LIMITATION: WETNESS
RESOLUTION: IF HIGH WATER TABLE IS ENCOUNTERED, DEWATERING MAY BE REQUIRED. SELECT VEGEATATIVE SPECIES TOLERANT TO WET CONDITIONS. SPECIFIC TOLERANCE INFORMATION IS PROVIDED IN TABLE 1 OF THE EROSION CONTROL & CONSERVATION PLANTINGS ON NONCROPLAND PUBLISHED BY PENN STATE.

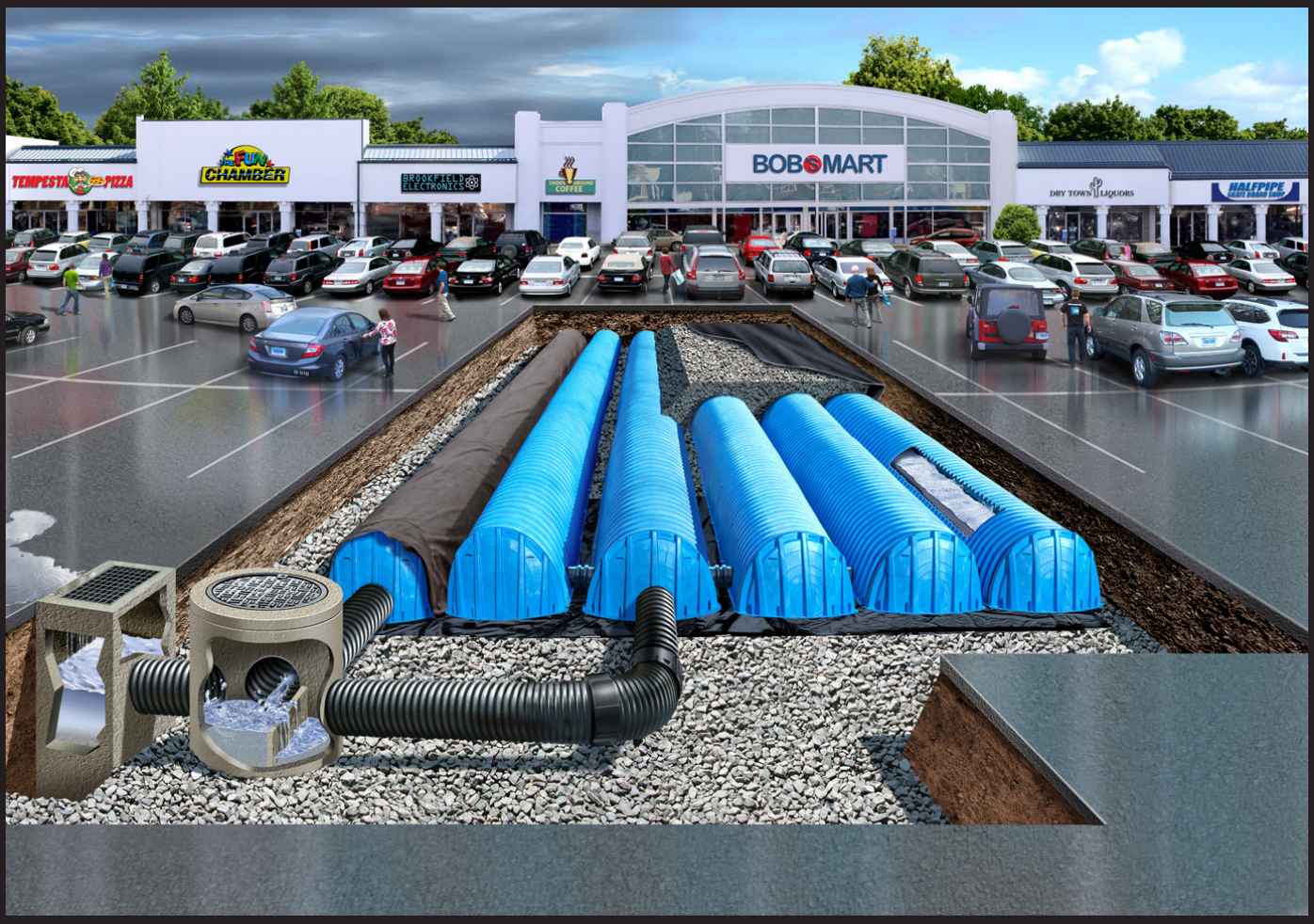
LIMITATION: ACIDIC, pH
RESOLUTIONS: APPLYING LIME CONSISTENT WITH RATES DETERMINED BY SOIL TESTING; SELECTING VEGETATIVE SPECIES TOLERANT TO ACIDIC SOIL CONDITIONS; AND IMPLEMENTING COMBINATIONS OF THESE AND/OR OTHER METHODS. SPECIFIC TOLERANCE INFORMATION IS PROVIDED IN TABLE 1 OF THE EROSION CONTROL & CONSERVATION PLANTINGS ON NONCROPLAND PUBLISHED BY PENN STATE.

LIMITATION: LOW FERTILITY SOIL TYPES LACKING IN SUFFICIENT AMOUNTS OF ESSENTIAL PLANT NUTRIENTS SUCH AS: NITROGEN, PHOSPHOROUS, POTASSIUM, SULFER, MAGNESIUM, CALCIUM, IRON, MANGANESE, BORON, CHLORINE, ZINC, COPPER AND MOLYBDENUM, LIMIT VEGETATION STABILIZATION. SOIL TESTS MIGHT BE NECESSARY TO DETERMINE SITE SPECIFIC SOIL FERTILITY.
RESOLUTIONS: INCORPORATING SOIL NUTRIENTS CONSISTENT WITH RATES DETERMINED BY SOIL TESTING; SELECTIVE VEGETATIVE SPECIES TOLERANT TO LOW FERTILITY SOIL CONDITIONS, AND IMPLEMENTING COMBINATIONS OF THESE AND/OR OTHER METHODS. SPECIFIC TOLERANCE INFORMATION IS PROVIDED IN TABLE 1 OF THE EROSION CONTROL & CONSERVATION PLANTINGS ON NONCROPLAND PUBLISHED BY PENN STATE.

LIMITATION: SIKNHOLE
RESOLUTIONS: IN THE EVENT THAT PRESENCE OF A SINKHOLE IS DETECTED DURING THE COURSE OF WORK, CORRECTIVE MEASURES SHALL BE PERFORMED UNDER THE OBSERVATION AND GUIDANCE OF THE OWNER'S GEOTECHNICAL CONSULTANT. EXCAVATE THE LOOSE, WET SOILS SURROUNDING THE SINKHOLE TO EXPOSE THE SINKHOLE "THROAT" (THE OPENING IN THE ROCK) AND THE ADJACENT STABLE SOILS/ROCK WHERE POSSIBLE, THE EXCAVATION SHALL EXTEND A MINIMUM OF TWO FEET (2') BEYOND THE STABLE SOILS OR TO THE ROCK SURFACE, WHICHEVER IS ENCOUNTERED FIRST.FILL THE EXPOSED SINKHOLE "THROAT" WITH LEAN CONCRETE TO BLOCK THE MIGRATION OF THE UPPER LAYERS OF SOIL THROUGH THE ROCK OPENING.AFTER CONCRETE HAS CURED OVERNIGHT BACKFILL THE REMAINDER OF THE EXCAVATION WITH CLAYEY SOILS TO PROVIDE A LOW PERMEABILITY BARRIER. THE CLAYEY SOILS SHALL BE PLACED IN 8" LIFTS AND EACH LIFT COMPACTED BY REPEATED PASSES OF THE COMPACTION EQUIPMENT UNTIL STABLE. CARE SHALL BE TAKEN TO ASSURE THAT THE SOIL AT THE EDGES OF THE EXCAVATION ARE WELL COMPACTED.

CULTEC SEPARATOR™ ROW

WATER QUALITY SYSTEM



OPERATION & MAINTENANCE GUIDE

FOR CULTEC STORMWATER MANAGEMENT SYSTEMS

GLOBE VERIFIED VÉRIFIÉ

STORMWATER MANAGEMENT SOLUTIONS

CULTEC® 565

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For general information on our other products and services, please contact our offices within the United States at (800)428-5832, (203)775-4416 ext. 202, or e-mail us at custservice@cultec.com.

For technical support, please call (203)775-4416 ext. 203 or e-mail tech@cultec.com.

Visit www.cultec.com/downloads.html for Product Downloads and CAD details.

Doc ID: CLT043 02-22
Feb 2022

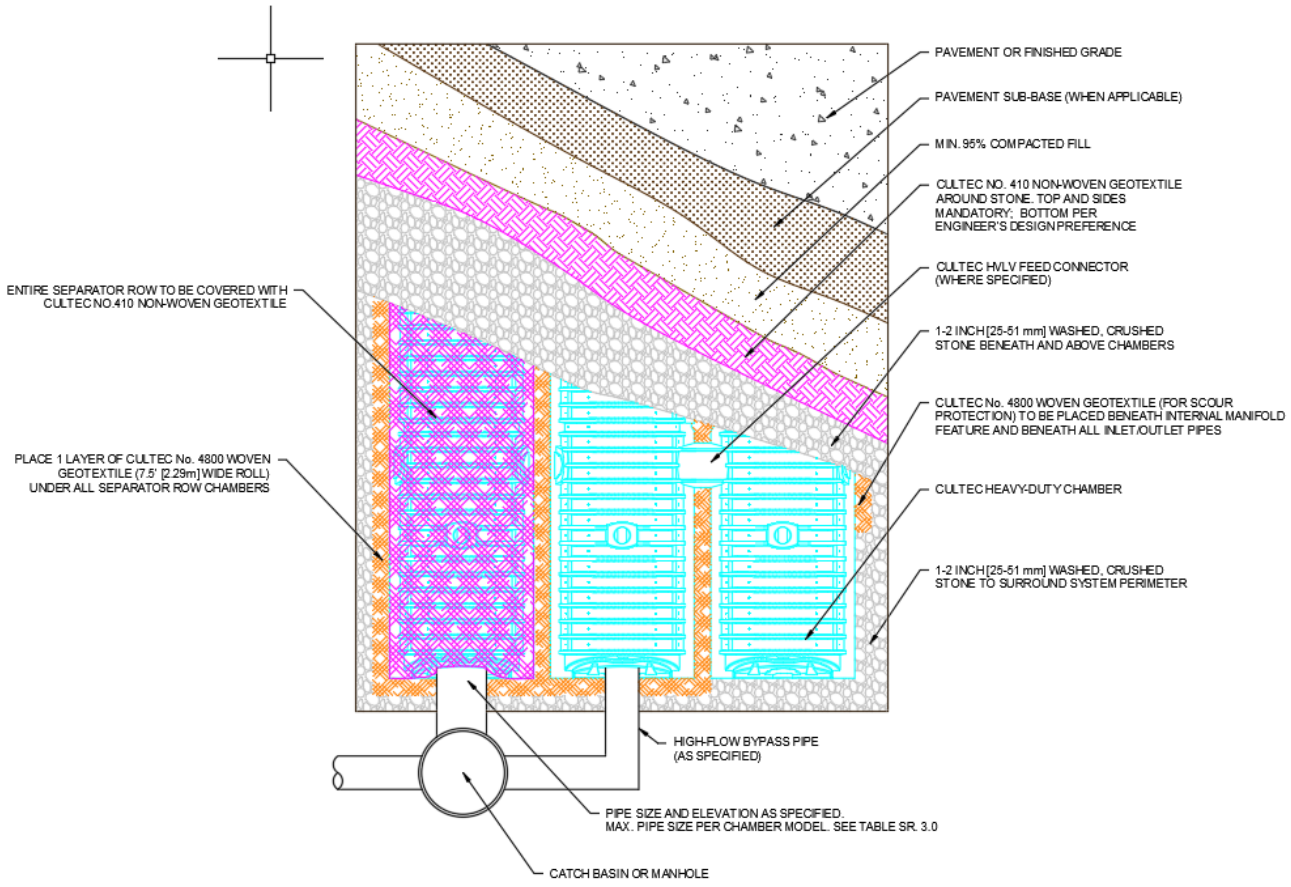
Introduction

CULTEC's Separator™ Row is an inexpensive means of removing Total Suspended Solids from the CULTEC chamber system, as well as providing easier access for inspection and maintenance. The Separator Row is designed to capture the First Flush of a rain event and is typically included as part of the "Treatment Train" for water quality.

The CULTEC Separator Row is a row of CULTEC Contactor or Recharger Chambers that are surrounded on all sides by filter fabric. One layer of CULTEC No. 4800™ Woven Geotextile are placed between the clean foundation stone and the chamber feet. The chambers are then completely wrapped with CULTEC No. 410™ non-woven geotextile. This configuration is designed to trap any sediment and/or debris that may pass through the upstream water-quality structures and into the chamber system.

A manhole is typically located adjacent to the separator row for ease of inspection and maintenance. This manhole is placed upstream of the system and can include a high-flow bypass pipe to pass peak-flows onto adjacent rows of chambers. The upstream manhole is designed with a sump to trap heavier sediment and allow for proper cleaning of the Separator Row. A JetVac process with a high pressure water nozzle is introduced down the Separator Row via the access manhole to clean all sediment and debris from the Separator Row. Captured pollutants are flushed into the sumped access manhole for vacuuming, and the process is repeated until the Separator Row is completely free of sediment and debris.

The Separator Row performance has been tested and verified to the protocols and procedures as defined by Environmental Technology Verification (ETV) Canada to achieve 80% TSS removal.



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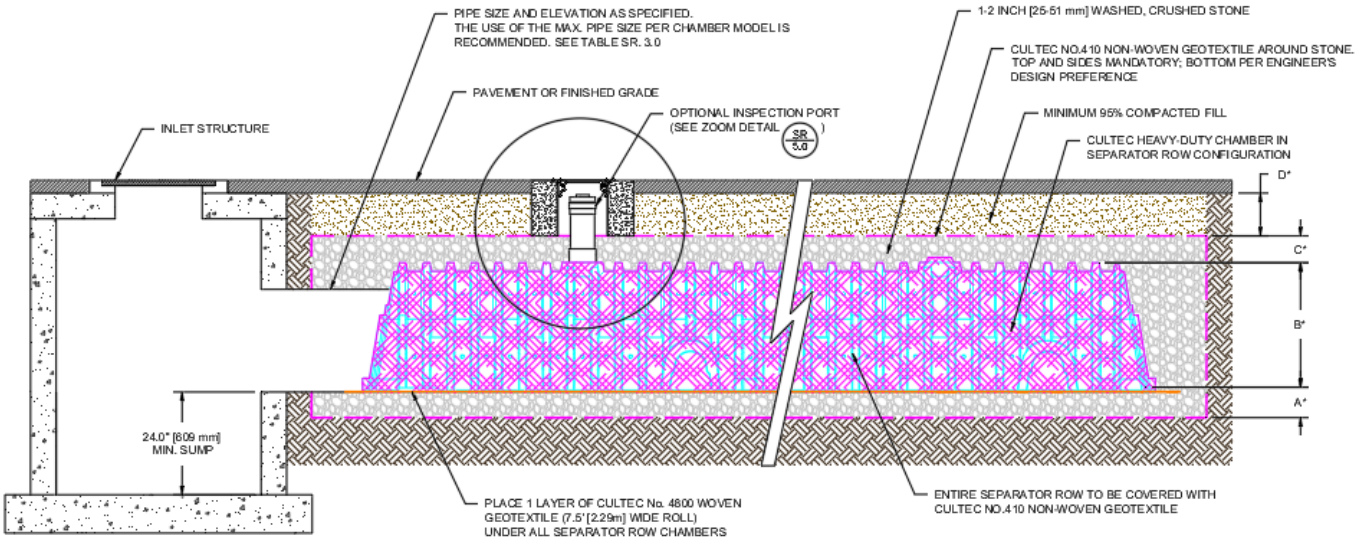
Design

There is no single design to achieve a high level of water quality. The CULTEC Separator Row should be designed as part of an overall best management practices water quality system. Pre-treatment devices such as sump catch basins, inlet baffles and proprietary oil-grit separators and filter systems can all be incorporated upstream of the CULTEC Separator Row. Sumped access/diversion manholes should be installed directly upstream of the Separator Row.

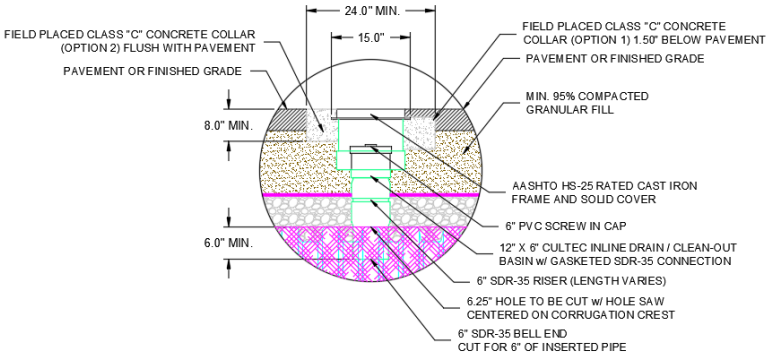
The following is a list of recommended design practices to ensure proper maintenance for the life of the system:

- Install sumped access/diversion manholes, including a minimum 24” (600 mm) sump, directly upstream of the Separator Row.
- Include a high-flow bypass pipe to divert peak flows that exceed the capacity of the Separator Row to adjacent rows.
- Connect the access manhole to the Separator Row with the largest diameter pipe allowable based on the CULTEC chamber model used.
- Maintain a minimum distance between the access manhole and the Separator Row to promote efficient maintenance.
- Include at least one inspection port per Separator Row for periodic inspection.

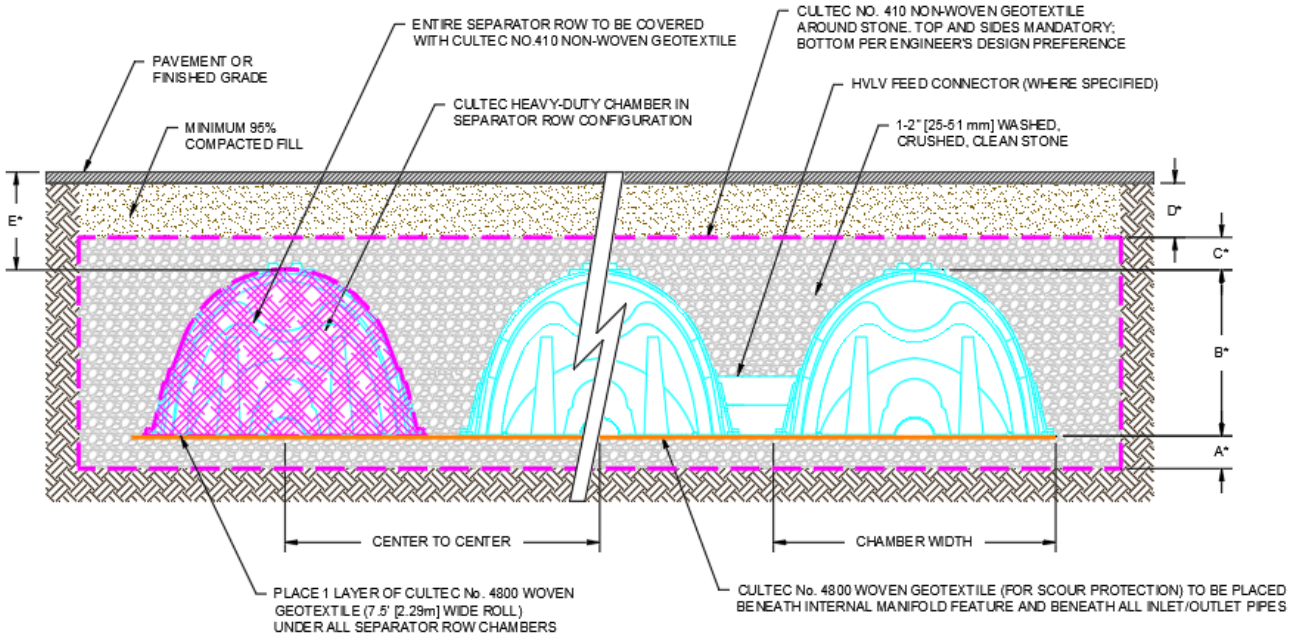
Note: Typical JetVac maintenance reels have a maximum of 400 feet (121.9 m) of available hose. Consider this when designing the length of the CULTEC Separator Rows.



*SEE SR 3.0 - CROSS SECTION TABLE REFERENCE



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*SEE SR 3.0 - CROSS SECTION TABLE REFERENCE

Table SR 3.0

	Description	Contactor 100HD	Recharger 150XLHD	Recharger 280HD	Recharger 330XLHD	Recharger 360HD	Recharger 902HD
A	Min. depth of stone base	6″ 152 mm	6″ 152 mm	6″ 152 mm	6″ 152 mm	6″ 152 mm	9″ 229 m
B	Chamber height	12.5″ 318 mm	18.5″ 470 mm	26.5″ 673 mm	30.5″ 775 mm	36″ 914 mm	48″ 1219 mm
C	Min. depth of stone required above units for traffic applications	6″ 152 mm	6″ 152 mm	6″ 152 mm	6″ 152 mm	6″ 152 mm	12″ 305 mm
D	Min. depth required of 95% compacted fill for paved traffic application	8″ 203 mm	8″ 203 mm	8″ 203 mm	10″ 254 mm	12″ 305 mm	12″ 305 mm
E	Max. depth of cover allowed above crown of chamber	12′ 3.65 m	12′ 3.65 m	12′ 3.65 m	12′ 3.65 m	12′ 3.65 m	8.5′ 2.59 m
	Max. allowable pipe size into chamber end wall/end cap	10″ 250 mm	12″ 300 mm	18″ 450 mm	24″ 600 mm	24″ 600 mm	24″ 600 mm

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Inspection and Maintenance

CULTEC recommends inspection of the Separator Row to be performed every six months for the first year of service. Future inspection frequency can be adjusted based upon previous inspection observations. However annual inspections are recommended. Inspection of the Separator Row can be achieved via an inspection port riser installed during construction. This inspection port riser will connect the top of the Separator Row chambers to finished grade with a removable lid. Alternatively the Separator Row may be inspected via the manhole(s) located at the end(s) of the Separator Row. However this method of inspection requires confined space entry. If entry into the manhole is required, all local and OSHA rules for confined space entries must be strictly followed.

To inspect:

- Remove the inspection port lid from the floor box frame.
- Remove the riser pipe cap.
- With a flashlight and stadia rod, measure the depth of sediment.
- Record results in a maintenance log.
- When depth of sediment exceeds 3” (76 mm), use the JetVac procedure described below.

The JetVac process utilizes a high pressure water nozzle controlled from the surface. The high pressure nozzle is introduced down the Separator Row via the access manhole(s). The high pressure water cleans all sediment and debris from the Separator Row as the nozzle is retrieved. Captured pollutants are flushed into the sumped access manhole for vacuuming. This process is repeated until the Separator Row is completely free of sediment and debris. A small diameter culvert cleaning nozzle is recommended for this procedure.



High pressure water nozzle



Cleaning Separator Row and pipes with high pressure water nozzle



SEPARATOR ROW: Separator Row prior to cleaning



ADJACENT ROW: When the Separator Row is working properly, the adjacent rows will not show signs of sediment.

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Inspection and Maintenance Record

Date	Mode of Access	Frequency	Depth of Sediment	Actions	Expenses	Inspector	Notes
Ex.	Inspection Port	Semi-annually	2”	Measure sediment depth with stadia rod. Visually inspect	$100	DPG	Depth of Sediment was measured via Northeast Inspection Port Adjacent to MH-1. Sediment depth was found to be 2”. No further action required at this time.
Ex.	Access Manhole	Annually					

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Appendix B – Offsite Discharge Analysis

Offsite Discharge Analysis

POI#1 Downstream Analysis

Pre-Development Conditions
POI #001, taking the south and western portions of the site in the pre-development condition, drains through two distinct areas of cover to an open channel running along the south of the property; one area being predominately wooded area and the other area being predominately parking area. The flow through the wooded area takes place via sheet flow and channeled flow to an existing open channel located along the southwestern portion of the site. Flow then discharges out of the existing open channel and runs via channel flow (off-site) to the point of interest located at Sandy Run, which is tributary to Wissahickon Creek. The flow through the parking area drains via sheet flow and shallow concentrated flow to an existing inlet and 18-inch pipe located in the southeast corner of the site. Flow then discharges out of the existing 18-inch pipe and runs via channel flow in an existing open channel to the point of interest. **All discharges from POI#1 discharge directly to a surface water, and therefore an off-site discharge analysis is not required.**

POI#2 Downstream Analysis

Pre-Development Conditions
POI#2 drains in a northerly direction via sheet flow as runoff leaves the subject property. Once flow leaves the property, it collects in a roadside stormwater collection system that drains to an existing 72-inch culvert containing mapped waters. Flow then discharges out of the existing 63-inch by 96-inch culvert directly to POI #001.

During Construction Conditions
POI#2 continues to drain in the same manner as pre-development conditions. The Runoff will be reduced through means of drainage area reduction.

Post-Development Conditions
POI#2 continues to drain in the same manner as pre-development conditions. The existing elliptical culvert pipe is proposed to be realigned and will function in the same manner as the pre-development conditions. There are no structural BMPs within this discharge point and a reduction in overall drainage area.

Downstream Analysis Conclusion
POI#2 has a reduction in overall drainage area in post-development conditions. Runoff is collected and conveyed through an existing collection/conveyance system, but does not pass through any structural stormwater facility prior to discharge to the Sandy Run. Therefore, stormwater will be conveyed in a manner similar to predevelopment conditions, with an overall reduction in rate and volume in each storm event analyzed (2, 10, 50 & 100-year). The downslope property owners are protected by the proposed reduction in stormwater flows from the predevelopment condition in all storm events. All flow is via stormwater conveyance piping at a reduced rate and volume, therefore ensuring that accelerated erosion will not occur downstream of the site due to the proposed development.

ALLOWABLE RELEASE RATE WORKSHEET

PROJECT: ***BMW Fort Washington***
500, 506, 510 & 512 Pennsylvania Avenue
Whitemarsh Township
Montgomery County, PA

DATE: ***7/24/2025***
BY: ***RS***
CHECKED BY: ***MRB***
SHEET NO.: ***Summary***
REVISION: ***4***

Release Rate Summary

Stormwater Peak Rate & Volume Summary - POI#1

	Storm Event (years)													
Hydrograph	**1**		**2**		**5**		**10**		**25**		**50**		**100**	
	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)
Pre-Development (cfs)	5.996	18,729	8.041	25,070	11.294	35,342	14.015	44,087	18.041	57,257	21.445	68,573	25.063	80,802
Post Development Total (cfs)	2.629	24,645	3.979	31,185	6.280	41,697	7.853	50,636	10.004	64,132	12.116	75,778	13.690	88,419
Required Release Rate Percentage														
Required Release Rate (cfs)	N/A	N/A	5.996	18,729	8.041	25,070	11.294	35,342	14.015	44,087	18.041	57,257	21.445	68,573
Pre to Post Change (cfs)	-3.367	5,916	-4.062	6,115	-5.014	6,355	-6.162	6,549	-8.037	6,875	-9.329	7,205	-11.373	7,617

Stormwater Peak Rate & Volume Summary - POI#2

	Storm Event (years)													
Hydrograph	**1**		**2**		**5**		**10**		**25**		**50**		**100**	
	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)
Pre-Development (cfs)	1.769	3,491	2.579	5,034	3.930	7,662	5.101	9,985	6.879	13,584	8.410	16,743	10.063	20,209
Post Development Total (cfs)	0.714	1,523	1.172	2,369	1.977	3,882	2.701	5,268	3.834	7,476	4.834	9,458	5.932	11,664
Required Release Rate Percentage														
Required Release Rate (cfs)	N/A	N/A	1.769	3,491	2.579	5,034	3.930	7,662	5.101	9,985	6.879	13,584	8.410	16,743
Pre to Post Change (cfs)	-1.055	-1,968	-1.407	-2,665	-1.953	-3,780	-2.400	-4,717	-3.045	-6,108	-3.576	-7,285	-4.131	-8,545

Stormwater Peak Rate & Volume Summary - TOTAL POI#1

	Storm Event (years)													
Hydrograph	**1**		**2**		**5**		**10**		**25**		**50**		**100**	
	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)	Rate (cfs)	Volume (cf)
Pre-Development (cfs)	6.392	22,220	8.617	30,104	12.182	43,004	15.210	54,070	19.791	70,841	23.724	85,316	27.952	101,011
Post Development Total (cfs)	3.342	26,168	5.124	33,554	8.233	45,579	10.531	55,904	13.799	71,608	16.521	85,235	19.438	100,083
Required Release Rate Percentage														
Required Release Rate (cfs)	N/A	N/A	6.392	22,220	8.617	30,104	12.182	43,004	15.210	54,070	19.791	70,841	23.724	85,316
Pre to Post Change (cfs)	-3.050	3,948	-3.493	3,450	-3.949	2,575	-4.679	1,834	-5.992	767	-7.203	-81	-8.514	-928

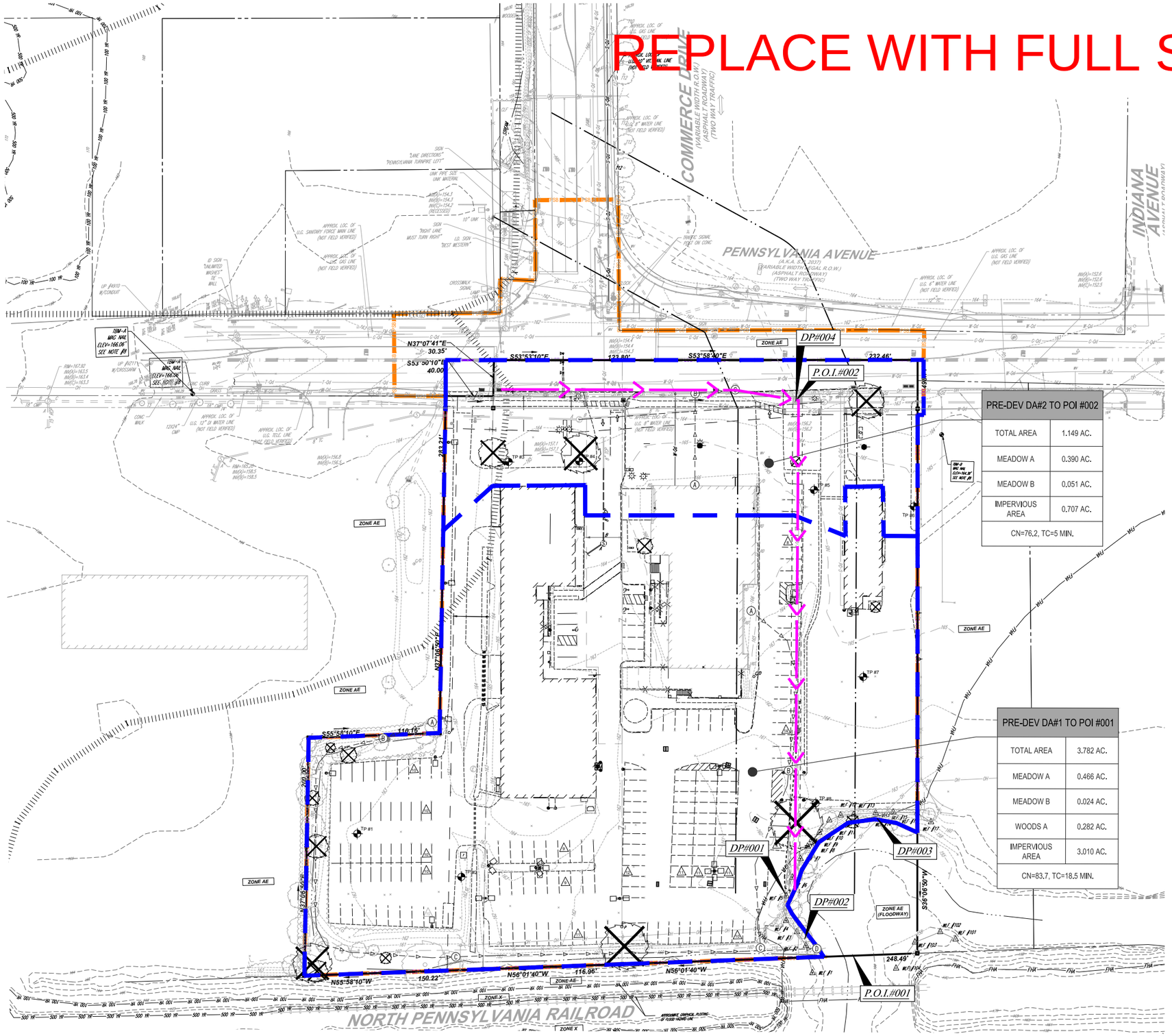
COMPUTATION SHEET : COMPOSITE CURVE NUMBER (CN)

PROJECT: ***BMW Fort Washington***
500 Pennsylvania Ave
Whitemarsh Township, Montgomery County

DATE: ***1/3/2025***
BY: ***RMS***
CHECKED BY: ***JAB***
REVISION: ***1***

Cover Type Description	Soil HSG	CN	Sediment Trap 1 to POI#1 (Acres)	Sediment Trap 2 to POI#1 (Acres)	During-Construction DA#1 Total (Acres)	During-Construction DA#2 to POI#1 (Acres)	During-Construction POI#1 (Acres)
Meadow	A	39	0.000	0.000	0.000	0.000	0.000
Wooded	A	30	0.367	0.000	0.367	0.000	0.367
Bare Earth	A	72	1.544	1.184	2.728	0.649	3.377
Meadow	B	61	0.000	0.000	0.000	0.000	0.000
Wooded	B	55	0.000	0.000	0.000	0.000	0.000
Bare Earth	B	82	0.030	0.000	0.030	0.084	0.114
Meadow	C	74	0.000	0.000	0.000	0.000	0.000
Wooded	C	70	0.000	0.000	0.000	0.000	0.000
Bare Earth	C	87	0.000	0.000	0.000	0.000	0.000
Impervious	ALL	98	0.404	0.248	0.652	0.511	1.163
		Total Area	2.345	1.432	3.777	1.244	5.021
		Composite CN	**70.0**	**76.5**	**72.5**	**83.4**	**75.2**
		Time of Concentration (Tc)	18.50	9.10	9.10	9.10	9.10

REPLACE WITH FULL SIZE PLAN



PRE-DEV DA#2 TO POI #002	
TOTAL AREA	1.149 AC.
MEADOW A	0.390 AC.
MEADOW B	0.051 AC.
IMPERVIOUS AREA	0.707 AC.
CN=76.2, TC=5 MIN.	

PRE-DEV DA#1 TO POI #001	
TOTAL AREA	3.782 AC.
MEADOW A	0.466 AC.
MEADOW B	0.024 AC.
WOODS A	0.282 AC.
IMPERVIOUS AREA	3.010 AC.
CN=83.7, TC=18.5 MIN.	

GEOTECHNICAL ENGINEER'S CERTIFICATION

I CERTIFY THAT THE PROPOSED FACILITY IS NOT UNDERLAIN BY LIMESTONE.

MICHAEL W. DERR

REGISTERED No.: #PE080964

DATE

40 20 10 0 40

1"= 40'

BOHLER

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/3/2025	NPDES MAJOR MODIFICATION	RMS / JAB
2	3/12/2025	FOR NPDES RESUBMISSION	RMS / JAB
3	04/14/2025	PER TOWNSHIP COMMENT	RMS / JAB
4	5/28/2025	PER NPDES COMMENT	RMS / JAB
5	7/22/2025	PER REVISED ARCH	RMS / MRB

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PROJECT No.: PAB220113.01
DRAWN BY: RMS
CHECKED BY: JAB
DATE: 10/24/2024
CAD I.D.: PAB220113.01-DRIN-5A

PROJECT:

AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

**500 PENNSYLVANIA AVENUE
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY, PA**

BOHLER

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BETHLEHEM, PA 18018
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Fax: (610) 709-9976
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J.A. BEAVAN

PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE082006
NEW YORK LICENSE No. 16 093204
NEW JERSEY LICENSE No. 24GE05326500

SHEET TITLE:

PRE DEVELOPMENT DRAINAGE AREA PLAN

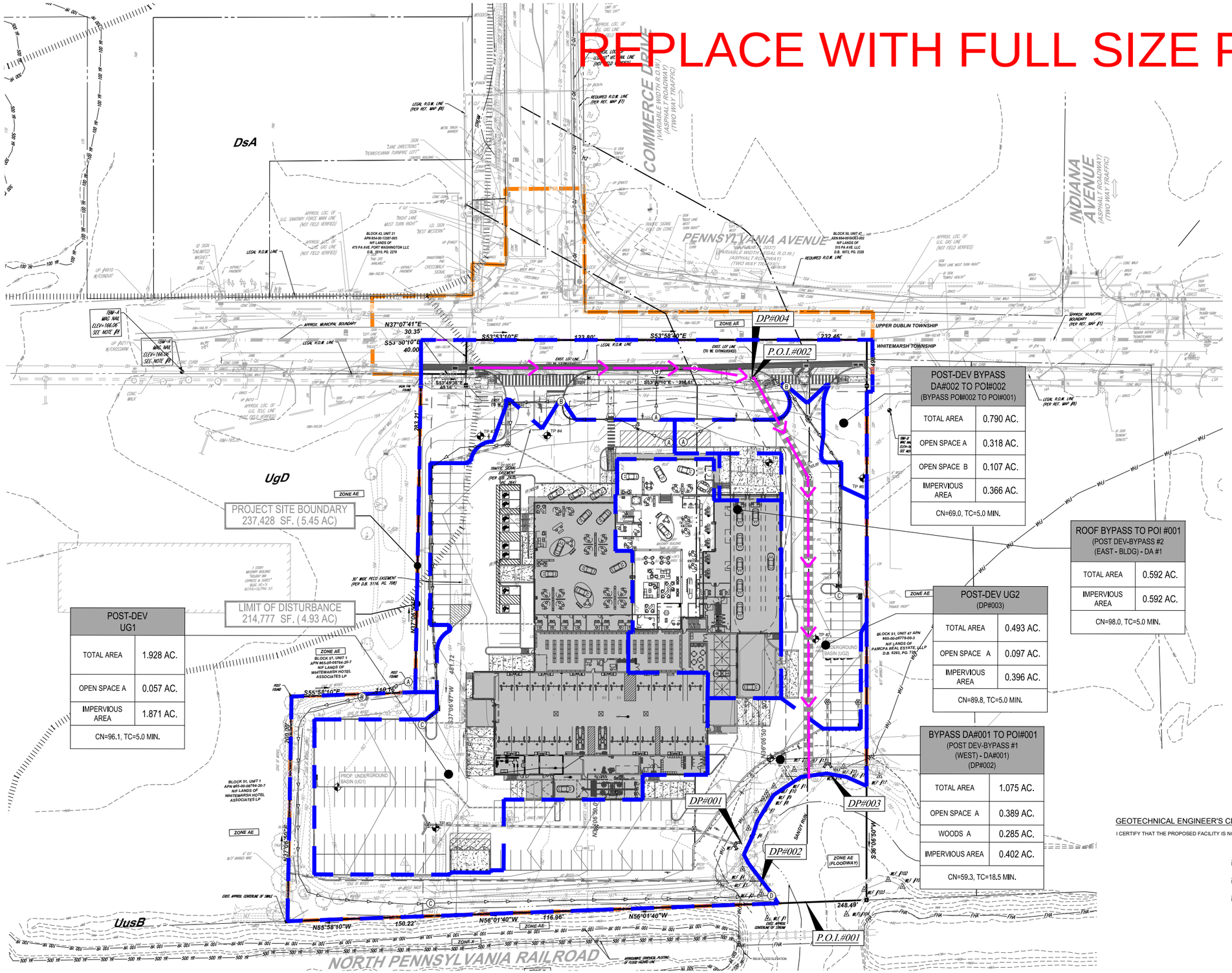
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C-1001

REVISION 5 - 7/22/2025

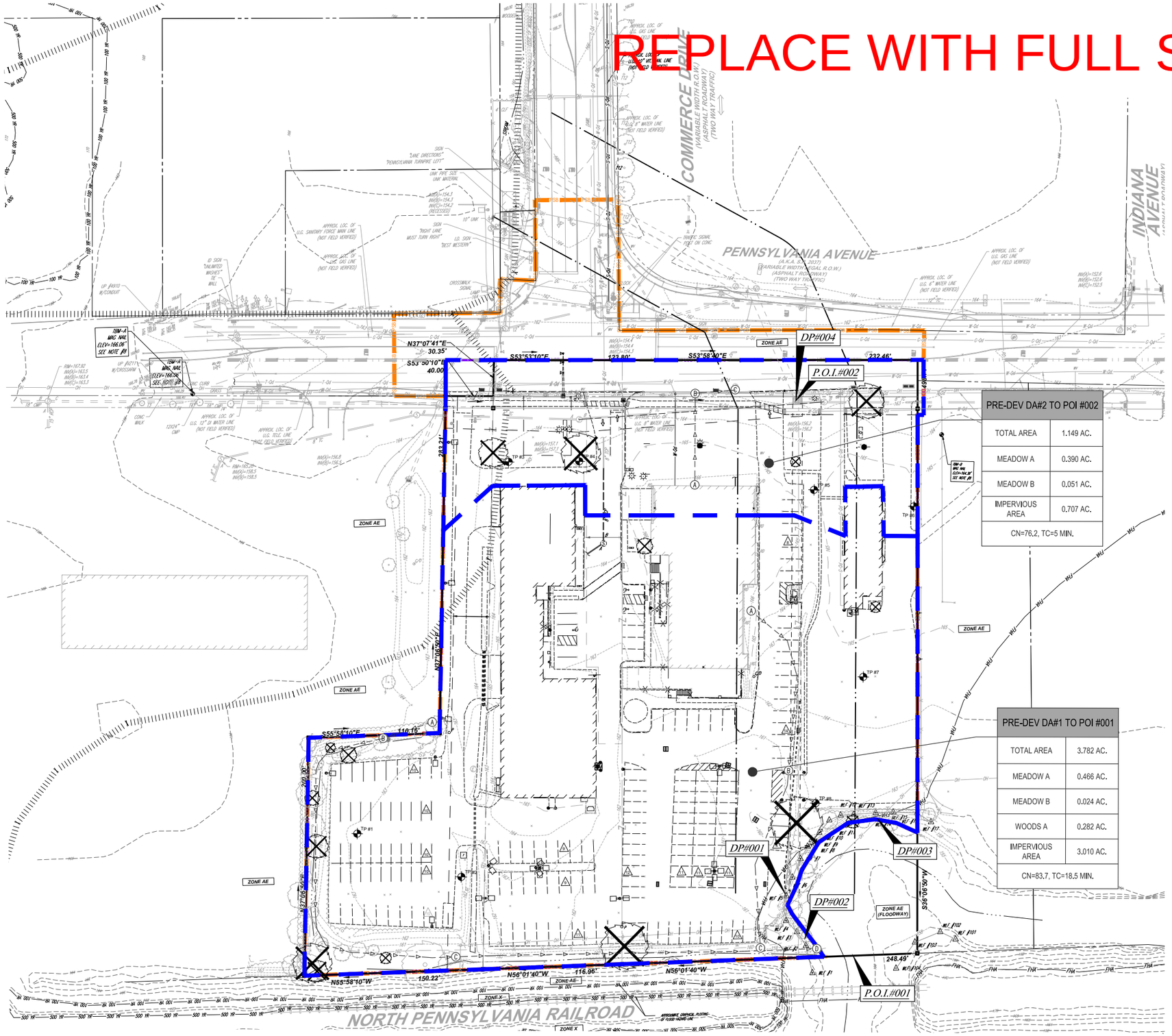
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REPLACE WITH FULL SIZE PLAN


COMMERCE DRIVE
(VARIABLE WIDTH R.O.W.)
(ASPHALT ROADWAY)
(TWO WAY TRAFFIC)
PENNSYLVANIA AVENUE
(VARIABLE WIDTH LEGAL R.O.W.)
(ASPHALT ROADWAY)
(TWO WAY TRAFFIC)
INDIANA AVENUE
(ASPHALT ROADWAY)
(TWO WAY TRAFFIC)
DsA
UgD
UusB
PROJECT SITE BOUNDARY
237,428 SF. (5.45 AC)
LIMIT OF DISTURBANCE
214,777 SF. (4.93 AC)
DP#001
DP#002
DP#003
DP#004
P.O.I.#001
P.O.I.#002
PROP. UNDERGROUND BASIN (UG1)
PROP. UNDERGROUND BASIN (UG2)
SANDY RUN
NORTH PENNSYLVANIA RAILROAD
UPPER DUBLIN TOWNSHIP
WHITEMARSH TOWNSHIP
ZONE AE
ZONE AE (FLOODWAY)
ZONE X
N37°07'41"E 30.35'
S53°50'10"E 40.00'
S53°58'30"E 123.80'
S53°58'30"E 232.46'
S53°58'30"E 398.61'
S53°49'30"E 40.16'
N37°06'49"W 293.21'
N37°06'49"W 481.72'
S55°58'10"E 110.76'
N37°06'49"W 200.00'
N56°01'40"W 116.96'
N56°01'40"W 150.22'
N55°58'10"W
N37°06'49"E
S37°06'49"E
N53°58'30"W 248.49'
N37°06'49"W 496.98'
S37°06'49"E 496.98'
N53°58'30"W 232.46'
N53°58'30"W 123.80'
S53°58'30"E 110.76'
S53°58'30"E 150.22'
S53°58'30"E 116.96'
S53°58'30"E 248.49'
S37°06'49"E 200.00'
N37°06'49"W 200.00'
TBM-A MAG NAIL ELEV.= 166.06' SEE NOTE #8
TBM-A MAG NAIL ELEV.= 166.06' SEE NOTE #8
TBM-2 MAG NAIL ELEV.= 166.06' SET 4/2025
BLOCK 43, UNIT 21 APN #54-00-13397-005 N/F LANDS OF 475 PA AVE. FORT WASHINGTON LLC D.B. 5910, PG. 2278
BLOCK 51, UNIT 1 APN #65-00-08764-20-7 N/F LANDS OF WHITEMARSH HOTEL ASSOCIATES LP
BLOCK 50, UNIT 42 APN #54-00-00383-002 N/F LANDS OF 515 PA AVE LLC D.B. 6072, PG. 2328
BLOCK 51, UNIT 47 APN #65-00-08779-00-3 N/F LANDS OF PAMCPA REAL ESTATE, LLLP D.B. 6293, PG. 726
LEGAL R.O.W. LINE (PER REF. MAP #3)
REQUIRED R.O.W. LINE (PER REF. MAP #7)
REQUIRED R.O.W. LINE
EXIST. LOT LINE (TO BE EXTINGUISHED)
APPROX. MUNICIPAL BOUNDARY
APPROX. MUNICIPAL BOUNDARY (PER REF. MAP #1)
APPROX. LOC. OF U.G. SANITARY FORCE MAIN LINE (NOT FIELD VERIFIED)
APPROX. LOC. OF U.G. GAS LINE (NOT FIELD VERIFIED)
APPROX. LOC. OF U.G. TELE. LINE (NOT FIELD VERIFIED)
30' WIDE PECO EASEMENT (PER D.B. 5116, PG. 708)
10' WIDE TRAFFIC SIGNAL EASEMENT (PER D.B. 2676, PG. 1)
TRAFFIC SIGNAL PAD ON CONC.
TRANSFORMER PAD
CROSSWALK SIGN
CROSSWALK LAMP
SIGN "LANE DIRECTIONS" "PENNSYLVANIA TURNPIKE LEFT"
SIGN "RIGHT LANE MUST TURN RIGHT"
I.D. SIGN "BEST WESTERN"
I.D. SIGN "TEMPLE HEALTH"
I.D. SIGN "TEMPLE HEALTH"
I.D. SIGN "DUNKIN' DONUTS"
SIGN "TRAFFIC FROM"
SIGN "RIGHT LANE MUST TURN RIGHT"
SIGN "STOP"
SIGN "INDIANA AVENUE (RT. 73) PENNSYLVANIA AVENUE"
ID SIGN "UNLIMITED WIDTHS" SEE NOTE #6
1 STORY MASONRY BUILDING "SUBWAY SUB EXPRESS & SUBS" BLDG. #2=1,1 BLD'G.#=3,2,754 S.F.
1 STORY MASONRY BUILDING "HOLIDAY INN EXPRESS & SUITES" BLDG. #1=1,1 BLD'G.#=13,754 S.F.
POST ROAD
MF I #1
MF I #2
MF I #3
MF I #4
MF I #5
MF I #6
MF I #7
MF I #8
MF I #9
MF I #10
MF I #11
MF I #12
MF I #13
MF I

Appendix C – Drainage Area Plans

REPLACE WITH FULL SIZE PLAN



PRE-DEV DA#2 TO POI #002	
TOTAL AREA	1.149 AC.
MEADOW A	0.390 AC.
MEADOW B	0.051 AC.
IMPERVIOUS AREA	0.707 AC.
CN=76.2, TC=5 MIN.	

PRE-DEV DA#1 TO POI #001	
TOTAL AREA	3.782 AC.
MEADOW A	0.466 AC.
MEADOW B	0.024 AC.
WOODS A	0.282 AC.
IMPERVIOUS AREA	3.010 AC.
CN=83.7, TC=18.5 MIN.	

GEOTECHNICAL ENGINEER'S CERTIFICATION

I CERTIFY THAT THE PROPOSED FACILITY IS NOT UNDERLAIN BY LIMESTONE.

MICHAEL W. DERR

REGISTERED No.: #PE080964

DATE

40 20 10 0 40
1"= 40'

R:\2022\PAB220113.01\C-ADD\RAWING\SITE PLAN\PAB220113.01-DRN-5A——LAYOUT: C-1001 PRE

RS

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PROGRAM MANAGEMENT
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SUSTAINABLE DESIGN
PERMITTING SERVICES
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NEW YORK LICENSE No. 16 093204
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SHEET TITLE:

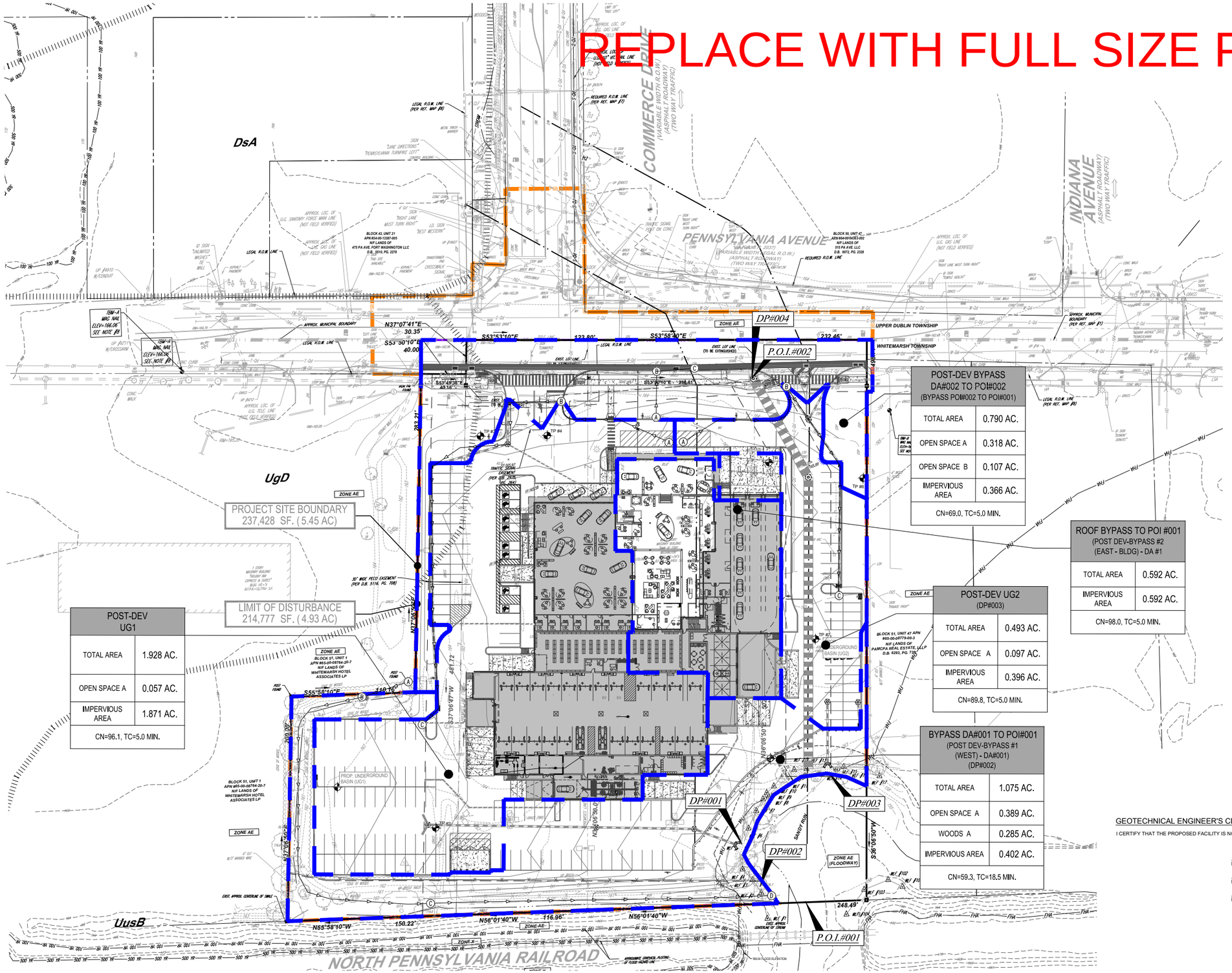
PRE DEVELOPMENT DRAINAGE AREA PLAN

SHEET NUMBER:

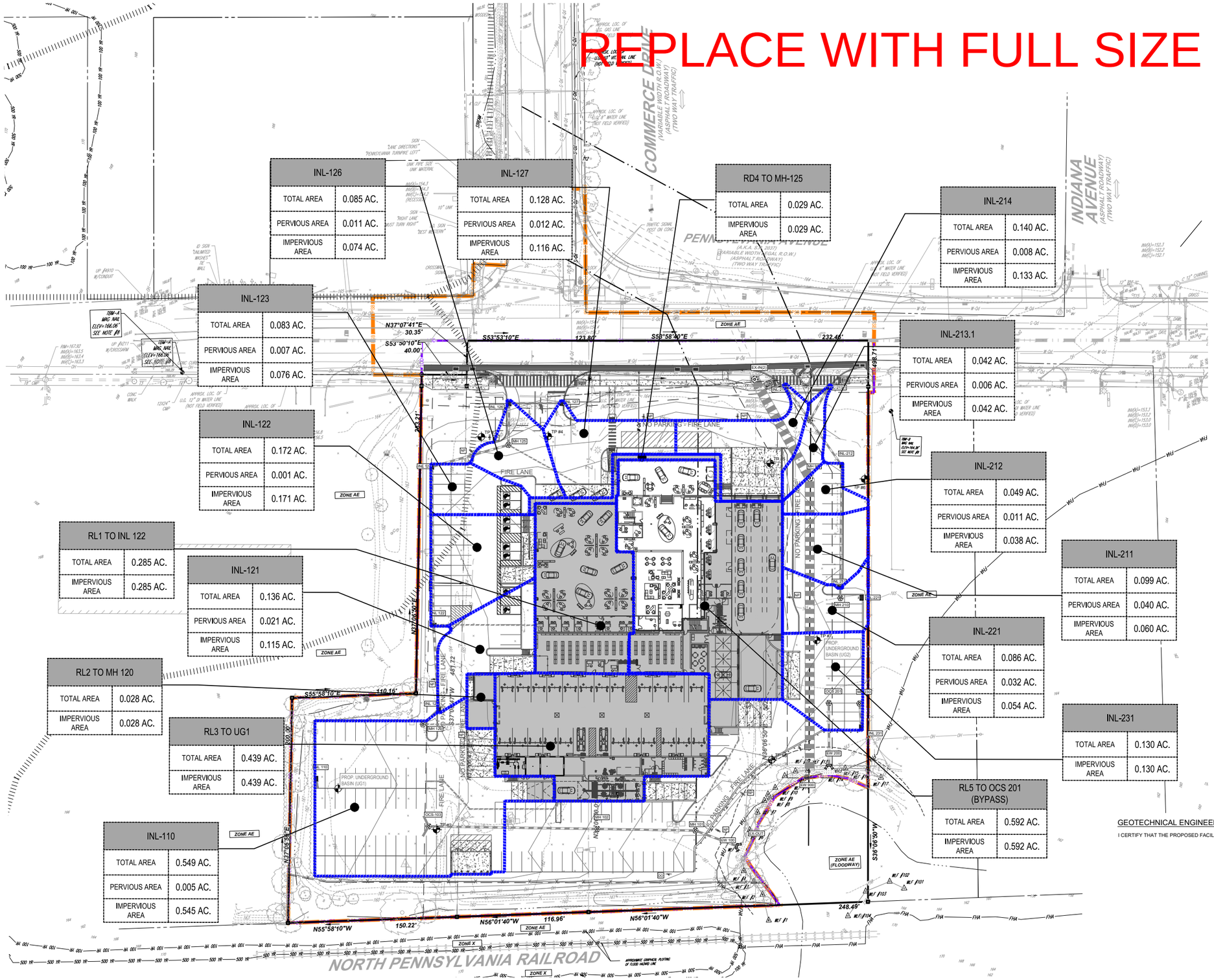
C-1001

REVISION 5 - 7/22/2025

REPLACE WITH FULL SIZE PLAN


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(ASPHALT ROADWAY)
(TWO WAY TRAFFIC)
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(VARIABLE WIDTH LEGAL R.O.W.)
(ASPHALT ROADWAY)
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214,777 SF. (4.93 AC)
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ZONE AE (FLOODWAY)
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TRAFFIC SIGNAL EASEMENT (PER D.B. 2676, PG. 2)
POST ROAD
SANITARY MANHOLE
STORM MANHOLE
INLET
TP #1
TP #2
TP #3
TP #4
TP #5
TP #6
TP #7
TP #8
TP #9
TP #10
TP #11
TP #12
TP #13
TP #14
TP #15
TP #16
TP #17
TP #18
TP #19
TP #20
TP

REPLACE WITH FULL SIZE PLAN



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I CERTIFY THAT THE PROPOSED FACILITY IS NOT UNDERLAIN BY LIMESTONE.

MICHAEL W. DERR

REGISTERED No.: #PE080964

DATE

R:\2022\PAB220113.01\CAD\DRAWING\PLAN SET\CIVIL SITE PLANS\PAB220113.01-DRN-SA——LAYOUT: C-1003 INL DA'S

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DATE: 10/24/2024
CAD I.D.: PAB220113.01-DRN-SA

PROJECT:

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MILEONE FORT WASHINGTON, LLC

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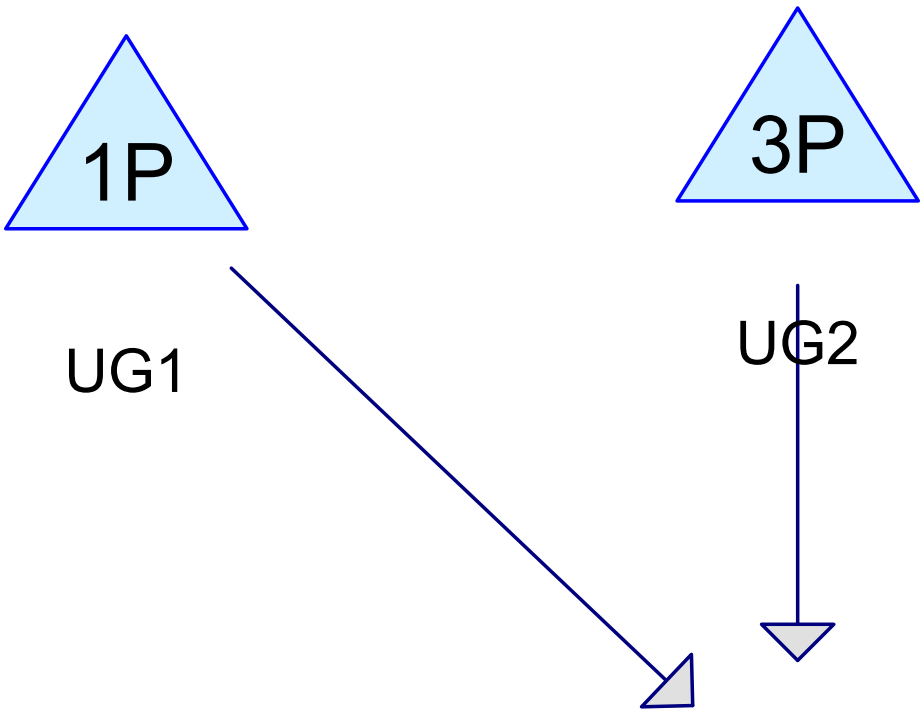
SHEET TITLE:

INLET DRAINAGE AREA PLAN

SHEET NUMBER:

C-1003

REVISION 5 - 7/22/2025



Subcat Reach Pond Link

Routing Diagram for BMW_2025-7-24_2
Prepared by Bohler, Printed 7/24/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2-yr	Type II 24-hr		Default	24.00	1	3.28	2

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 2.83" for 2-yr event
Inflow = 8.968 cfs @ 11.96 hrs, Volume= 19,792 cf
Outflow = 1.629 cfs @ 12.11 hrs, Volume= 10,582 cf, Atten= 82%, Lag= 9.3 min
Primary = 1.629 cfs @ 12.11 hrs, Volume= 10,582 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 158.81' @ 12.11 hrs Surf.Area= 13,041 sf Storage= 11,568 cf

Plug-Flow detention time= 233.9 min calculated for 10,581 cf (53% of inflow)
Center-of-Mass det. time= 121.1 min (890.0 - 768.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.629 cfs @ 12.11 hrs HW=158.81' TW=158.60' (Fixed TW Elev= 158.60')
└─**4=Culvert** (Passes 1.629 cfs of 2.375 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.012 cfs @ 2.214 fps)
  ├─**2=Orifice/Grate** (Orifice Controls 1.617 cfs @ 2.079 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.000	0	157.53	0.000
2.00	0.000	0	157.53	0.000
2.50	0.002	1	157.53	0.000
3.00	0.010	11	157.53	0.000
3.50	0.017	35	157.54	0.000
4.00	0.024	72	157.54	0.000
4.50	0.032	121	157.55	0.000
5.00	0.040	186	157.57	0.000
5.50	0.049	265	157.58	0.000
6.00	0.057	361	157.60	0.000
6.50	0.066	472	157.62	0.000
7.00	0.075	599	157.64	0.000
7.50	0.084	742	157.67	0.000
8.00	0.093	901	157.70	0.000
8.50	0.117	1,087	157.74	0.000
9.00	0.146	1,324	157.78	0.000
9.50	0.156	1,599	157.84	0.000
10.00	0.196	1,911	157.90	0.000
10.50	0.263	2,321	157.97	0.000
11.00	0.375	2,889	158.05	0.000
11.50	**0.636**	3,778	158.13	0.000
12.00	**7.436**	**10,612**	**158.73**	**1.167**
12.50	0.651	**10,831**	**158.74**	**1.293**
13.00	0.406	9,944	158.67	0.733
13.50	0.307	9,549	158.63	0.445
14.00	0.241	9,377	158.61	0.302
14.50	0.213	9,327	158.61	0.222
15.00	0.191	9,314	158.61	0.198
15.50	0.169	9,303	158.61	0.176
16.00	0.148	9,291	158.61	0.154
16.50	0.138	9,284	158.61	0.140
17.00	0.130	9,280	158.61	0.132
17.50	0.122	9,276	158.61	0.124
18.00	0.114	9,272	158.61	0.116
18.50	0.106	9,268	158.61	0.109
19.00	0.099	9,264	158.60	0.101
19.50	0.091	9,260	158.60	0.093
20.00	0.083	9,255	158.60	0.085
20.50	0.080	9,253	158.60	0.081
21.00	0.079	9,252	158.60	0.079
21.50	0.077	9,252	158.60	0.078
22.00	0.076	9,251	158.60	0.076
22.50	0.074	9,250	158.60	0.075
23.00	0.073	9,249	158.60	0.073
23.50	0.071	9,248	158.60	0.071
24.00	0.069	9,247	158.60	0.070
24.50	0.000	9,213	158.60	0.004
25.00	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	9,211	158.60	0.000
26.00	0.000	9,211	158.60	0.000
26.50	0.000	9,211	158.60	0.000
27.00	0.000	9,211	158.60	0.000
27.50	0.000	9,211	158.60	0.000
28.00	0.000	9,211	158.60	0.000
28.50	0.000	9,211	158.60	0.000
29.00	0.000	9,211	158.60	0.000
29.50	0.000	9,211	158.60	0.000
30.00	0.000	9,211	158.60	0.000
30.50	0.000	9,211	158.60	0.000
31.00	0.000	9,211	158.60	0.000
31.50	0.000	9,211	158.60	0.000
32.00	0.000	9,211	158.60	0.000
32.50	0.000	9,211	158.60	0.000
33.00	0.000	9,211	158.60	0.000
33.50	0.000	9,211	158.60	0.000
34.00	0.000	9,211	158.60	0.000
34.50	0.000	9,211	158.60	0.000
35.00	0.000	9,211	158.60	0.000
35.50	0.000	9,211	158.60	0.000
36.00	0.000	9,211	158.60	0.000
36.50	0.000	9,211	158.60	0.000
37.00	0.000	9,211	158.60	0.000
37.50	0.000	9,211	158.60	0.000
38.00	0.000	9,211	158.60	0.000
38.50	0.000	9,211	158.60	0.000
39.00	0.000	9,211	158.60	0.000
39.50	0.000	9,211	158.60	0.000
40.00	0.000	9,211	158.60	0.000
40.50	0.000	9,211	158.60	0.000
41.00	0.000	9,211	158.60	0.000
41.50	0.000	9,211	158.60	0.000
42.00	0.000	9,211	158.60	0.000
42.50	0.000	9,211	158.60	0.000
43.00	0.000	9,211	158.60	0.000
43.50	0.000	9,211	158.60	0.000
44.00	0.000	9,211	158.60	0.000
44.50	0.000	9,211	158.60	0.000
45.00	0.000	9,211	158.60	0.000
45.50	0.000	9,211	158.60	0.000
46.00	0.000	9,211	158.60	0.000
46.50	0.000	9,211	158.60	0.000
47.00	0.000	9,211	158.60	0.000
47.50	0.000	9,211	158.60	0.000
48.00	0.000	9,211	158.60	0.000
48.50	0.000	9,211	158.60	0.000
49.00	0.000	9,211	158.60	0.000
49.50	0.000	9,211	158.60	0.000
50.00	0.000	9,211	158.60	0.000
50.50	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	9,211	158.60	0.000
51.50	0.000	9,211	158.60	0.000
52.00	0.000	9,211	158.60	0.000
52.50	0.000	9,211	158.60	0.000
53.00	0.000	9,211	158.60	0.000
53.50	0.000	9,211	158.60	0.000
54.00	0.000	9,211	158.60	0.000
54.50	0.000	9,211	158.60	0.000
55.00	0.000	9,211	158.60	0.000
55.50	0.000	9,211	158.60	0.000
56.00	0.000	9,211	158.60	0.000
56.50	0.000	9,211	158.60	0.000
57.00	0.000	9,211	158.60	0.000
57.50	0.000	9,211	158.60	0.000
58.00	0.000	9,211	158.60	0.000
58.50	0.000	9,211	158.60	0.000
59.00	0.000	9,211	158.60	0.000
59.50	0.000	9,211	158.60	0.000
60.00	0.000	9,211	158.60	0.000
60.50	0.000	9,211	158.60	0.000
61.00	0.000	9,211	158.60	0.000
61.50	0.000	9,211	158.60	0.000
62.00	0.000	9,211	158.60	0.000
62.50	0.000	9,211	158.60	0.000
63.00	0.000	9,211	158.60	0.000
63.50	0.000	9,211	158.60	0.000
64.00	0.000	9,211	158.60	0.000
64.50	0.000	9,211	158.60	0.000
65.00	0.000	9,211	158.60	0.000
65.50	0.000	9,211	158.60	0.000
66.00	0.000	9,211	158.60	0.000
66.50	0.000	9,211	158.60	0.000
67.00	0.000	9,211	158.60	0.000
67.50	0.000	9,211	158.60	0.000
68.00	0.000	9,211	158.60	0.000
68.50	0.000	9,211	158.60	0.000
69.00	0.000	9,211	158.60	0.000
69.50	0.000	9,211	158.60	0.000
70.00	0.000	9,211	158.60	0.000
70.50	0.000	9,211	158.60	0.000
71.00	0.000	9,211	158.60	0.000
71.50	0.000	9,211	158.60	0.000
72.00	0.000	9,211	158.60	0.000
72.50	0.000	9,211	158.60	0.000
73.00	0.000	9,211	158.60	0.000
73.50	0.000	9,211	158.60	0.000
74.00	0.000	9,211	158.60	0.000
74.50	0.000	9,211	158.60	0.000
75.00	0.000	9,211	158.60	0.000
75.50	0.000	9,211	158.60	0.000
76.00	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	9,211	158.60	0.000
77.00	0.000	9,211	158.60	0.000
77.50	0.000	9,211	158.60	0.000
78.00	0.000	9,211	158.60	0.000
78.50	0.000	9,211	158.60	0.000
79.00	0.000	9,211	158.60	0.000
79.50	0.000	9,211	158.60	0.000
80.00	0.000	9,211	158.60	0.000
80.50	0.000	9,211	158.60	0.000
81.00	0.000	9,211	158.60	0.000
81.50	0.000	9,211	158.60	0.000
82.00	0.000	9,211	158.60	0.000
82.50	0.000	9,211	158.60	0.000
83.00	0.000	9,211	158.60	0.000
83.50	0.000	9,211	158.60	0.000
84.00	0.000	9,211	158.60	0.000
84.50	0.000	9,211	158.60	0.000
85.00	0.000	9,211	158.60	0.000
85.50	0.000	9,211	158.60	0.000
86.00	0.000	9,211	158.60	0.000
86.50	0.000	9,211	158.60	0.000
87.00	0.000	9,211	158.60	0.000
87.50	0.000	9,211	158.60	0.000
88.00	0.000	9,211	158.60	0.000
88.50	0.000	9,211	158.60	0.000
89.00	0.000	9,211	158.60	0.000
89.50	0.000	9,211	158.60	0.000
90.00	0.000	9,211	158.60	0.000
90.50	0.000	9,211	158.60	0.000
91.00	0.000	9,211	158.60	0.000
91.50	0.000	9,211	158.60	0.000
92.00	0.000	9,211	158.60	0.000
92.50	0.000	9,211	158.60	0.000
93.00	0.000	9,211	158.60	0.000
93.50	0.000	9,211	158.60	0.000
94.00	0.000	9,211	158.60	0.000
94.50	0.000	9,211	158.60	0.000
95.00	0.000	9,211	158.60	0.000
95.50	0.000	9,211	158.60	0.000
96.00	0.000	9,211	158.60	0.000
96.50	0.000	9,211	158.60	0.000
97.00	0.000	9,211	158.60	0.000
97.50	0.000	9,211	158.60	0.000
98.00	0.000	9,211	158.60	0.000
98.50	0.000	9,211	158.60	0.000
99.00	0.000	9,211	158.60	0.000
99.50	0.000	9,211	158.60	0.000
100.00	0.000	9,211	158.60	0.000
100.50	0.000	9,211	158.60	0.000
101.00	0.000	9,211	158.60	0.000
101.50	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	9,211	158.60	0.000
102.50	0.000	9,211	158.60	0.000
103.00	0.000	9,211	158.60	0.000
103.50	0.000	9,211	158.60	0.000
104.00	0.000	9,211	158.60	0.000
104.50	0.000	9,211	158.60	0.000
105.00	0.000	9,211	158.60	0.000
105.50	0.000	9,211	158.60	0.000
106.00	0.000	9,211	158.60	0.000
106.50	0.000	9,211	158.60	0.000
107.00	0.000	9,211	158.60	0.000
107.50	0.000	9,211	158.60	0.000
108.00	0.000	9,211	158.60	0.000
108.50	0.000	9,211	158.60	0.000
109.00	0.000	9,211	158.60	0.000
109.50	0.000	9,211	158.60	0.000
110.00	0.000	9,211	158.60	0.000
110.50	0.000	9,211	158.60	0.000
111.00	0.000	9,211	158.60	0.000
111.50	0.000	9,211	158.60	0.000
112.00	0.000	9,211	158.60	0.000
112.50	0.000	9,211	158.60	0.000
113.00	0.000	9,211	158.60	0.000
113.50	0.000	9,211	158.60	0.000
114.00	0.000	9,211	158.60	0.000
114.50	0.000	9,211	158.60	0.000
115.00	0.000	9,211	158.60	0.000
115.50	0.000	9,211	158.60	0.000
116.00	0.000	9,211	158.60	0.000
116.50	0.000	9,211	158.60	0.000
117.00	0.000	9,211	158.60	0.000
117.50	0.000	9,211	158.60	0.000
118.00	0.000	9,211	158.60	0.000
118.50	0.000	9,211	158.60	0.000
119.00	0.000	9,211	158.60	0.000
119.50	0.000	9,211	158.60	0.000
120.00	0.000	9,211	158.60	0.000
120.50	0.000	9,211	158.60	0.000
121.00	0.000	9,211	158.60	0.000
121.50	0.000	9,211	158.60	0.000
122.00	0.000	9,211	158.60	0.000
122.50	0.000	9,211	158.60	0.000
123.00	0.000	9,211	158.60	0.000
123.50	0.000	9,211	158.60	0.000
124.00	0.000	9,211	158.60	0.000
124.50	0.000	9,211	158.60	0.000
125.00	0.000	9,211	158.60	0.000
125.50	0.000	9,211	158.60	0.000
126.00	0.000	9,211	158.60	0.000
126.50	0.000	9,211	158.60	0.000
127.00	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	9,211	158.60	0.000
128.00	0.000	9,211	158.60	0.000
128.50	0.000	9,211	158.60	0.000
129.00	0.000	9,211	158.60	0.000
129.50	0.000	9,211	158.60	0.000
130.00	0.000	9,211	158.60	0.000
130.50	0.000	9,211	158.60	0.000
131.00	0.000	9,211	158.60	0.000
131.50	0.000	9,211	158.60	0.000
132.00	0.000	9,211	158.60	0.000
132.50	0.000	9,211	158.60	0.000
133.00	0.000	9,211	158.60	0.000
133.50	0.000	9,211	158.60	0.000
134.00	0.000	9,211	158.60	0.000
134.50	0.000	9,211	158.60	0.000
135.00	0.000	9,211	158.60	0.000
135.50	0.000	9,211	158.60	0.000
136.00	0.000	9,211	158.60	0.000
136.50	0.000	9,211	158.60	0.000
137.00	0.000	9,211	158.60	0.000
137.50	0.000	9,211	158.60	0.000
138.00	0.000	9,211	158.60	0.000
138.50	0.000	9,211	158.60	0.000
139.00	0.000	9,211	158.60	0.000
139.50	0.000	9,211	158.60	0.000
140.00	0.000	9,211	158.60	0.000
140.50	0.000	9,211	158.60	0.000
141.00	0.000	9,211	158.60	0.000
141.50	0.000	9,211	158.60	0.000
142.00	0.000	9,211	158.60	0.000
142.50	0.000	9,211	158.60	0.000
143.00	0.000	9,211	158.60	0.000
143.50	0.000	9,211	158.60	0.000
144.00	0.000	9,211	158.60	0.000
144.50	0.000	9,211	158.60	0.000
145.00	0.000	9,211	158.60	0.000
145.50	0.000	9,211	158.60	0.000
146.00	0.000	9,211	158.60	0.000
146.50	0.000	9,211	158.60	0.000
147.00	0.000	9,211	158.60	0.000
147.50	0.000	9,211	158.60	0.000
148.00	0.000	9,211	158.60	0.000
148.50	0.000	9,211	158.60	0.000
149.00	0.000	9,211	158.60	0.000
149.50	0.000	9,211	158.60	0.000
150.00	0.000	9,211	158.60	0.000
150.50	0.000	9,211	158.60	0.000
151.00	0.000	9,211	158.60	0.000
151.50	0.000	9,211	158.60	0.000
152.00	0.000	9,211	158.60	0.000
152.50	0.000	9,211	158.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	9,211	158.60	0.000
153.50	0.000	9,211	158.60	0.000
154.00	0.000	9,211	158.60	0.000
154.50	0.000	9,211	158.60	0.000
155.00	0.000	9,211	158.60	0.000
155.50	0.000	9,211	158.60	0.000
156.00	0.000	9,211	158.60	0.000
156.50	0.000	9,211	158.60	0.000
157.00	0.000	9,211	158.60	0.000
157.50	0.000	9,211	158.60	0.000
158.00	0.000	9,211	158.60	0.000
158.50	0.000	9,211	158.60	0.000
159.00	0.000	9,211	158.60	0.000
159.50	0.000	9,211	158.60	0.000
160.00	0.000	9,211	158.60	0.000
160.50	0.000	9,211	158.60	0.000
161.00	0.000	9,211	158.60	0.000
161.50	0.000	9,211	158.60	0.000
162.00	0.000	9,211	158.60	0.000
162.50	0.000	9,211	158.60	0.000
163.00	0.000	9,211	158.60	0.000
163.50	0.000	9,211	158.60	0.000
164.00	0.000	9,211	158.60	0.000
164.50	0.000	9,211	158.60	0.000
165.00	0.000	9,211	158.60	0.000
165.50	0.000	9,211	158.60	0.000
166.00	0.000	9,211	158.60	0.000
166.50	0.000	9,211	158.60	0.000
167.00	0.000	9,211	158.60	0.000
167.50	0.000	9,211	158.60	0.000
168.00	0.000	9,211	158.60	0.000

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 1.90" for 2-yr event
Inflow = 1.718 cfs @ 11.96 hrs, Volume= 3,409 cf
Outflow = 0.347 cfs @ 12.11 hrs, Volume= 3,409 cf, Atten= 80%, Lag= 8.8 min
Primary = 0.347 cfs @ 12.11 hrs, Volume= 3,409 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 160.17' @ 12.11 hrs Surf.Area= 2,542 sf Storage= 1,349 cf

Plug-Flow detention time= 74.8 min calculated for 3,409 cf (100% of inflow)
Center-of-Mass det. time= 74.9 min (892.3 - 817.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.347 cfs @ 12.11 hrs HW=160.17' TW=158.60' (Fixed TW Elev= 158.60')
└─**4=Culvert** (Passes 0.347 cfs of 2.415 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.206 cfs @ 4.203 fps)
  ├─**2=Orifice/Grate** (Orifice Controls 0.140 cfs @ 1.425 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.000	0	159.28	0.000
4.50	0.000	0	159.28	0.000
5.00	0.000	0	159.28	0.000
5.50	0.000	0	159.28	0.000
6.00	0.000	0	159.28	0.000
6.50	0.000	0	159.28	0.000
7.00	0.000	0	159.28	0.000
7.50	0.001	1	159.28	0.000
8.00	0.003	4	159.28	0.000
8.50	0.005	10	159.29	0.001
9.00	0.008	20	159.30	0.001
9.50	0.011	34	159.31	0.003
10.00	0.016	51	159.33	0.005
10.50	0.025	73	159.35	0.011
11.00	0.042	105	159.38	0.021
11.50	**0.083**	158	159.44	0.043
12.00	**1.467**	**1,165**	**160.08**	**0.254**
12.50	0.137	**1,195**	**160.10**	**0.268**
13.00	0.087	983	160.00	0.190
13.50	0.066	801	159.91	0.169
14.00	0.052	617	159.83	0.154
14.50	0.046	444	159.72	0.132
15.00	0.042	314	159.59	0.101
15.50	0.037	228	159.50	0.074
16.00	0.033	178	159.46	0.052
16.50	0.030	152	159.43	0.041
17.00	0.029	139	159.42	0.034
17.50	0.027	130	159.41	0.031
18.00	0.025	124	159.40	0.029
18.50	0.024	119	159.40	0.026
19.00	0.022	114	159.39	0.025
19.50	0.020	110	159.39	0.023
20.00	0.019	105	159.38	0.021
20.50	0.018	101	159.38	0.020
21.00	0.018	99	159.38	0.019
21.50	0.017	97	159.38	0.018
22.00	0.017	95	159.37	0.018
22.50	0.017	94	159.37	0.017
23.00	0.016	93	159.37	0.017
23.50	0.016	92	159.37	0.017
24.00	0.016	91	159.37	0.016
24.50	0.000	71	159.35	0.010
25.00	0.000	56	159.34	0.007

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	46	159.33	0.005
26.00	0.000	39	159.32	0.004
26.50	0.000	33	159.31	0.003
27.00	0.000	29	159.31	0.002
27.50	0.000	26	159.31	0.002
28.00	0.000	24	159.30	0.001
28.50	0.000	21	159.30	0.001
29.00	0.000	19	159.30	0.001
29.50	0.000	17	159.30	0.001
30.00	0.000	16	159.30	0.001
30.50	0.000	14	159.29	0.001
31.00	0.000	13	159.29	0.001
31.50	0.000	11	159.29	0.001
32.00	0.000	10	159.29	0.001
32.50	0.000	9	159.29	0.001
33.00	0.000	8	159.29	0.000
33.50	0.000	7	159.29	0.000
34.00	0.000	7	159.29	0.000
34.50	0.000	6	159.29	0.000
35.00	0.000	5	159.29	0.000
35.50	0.000	5	159.28	0.000
36.00	0.000	4	159.28	0.000
36.50	0.000	4	159.28	0.000
37.00	0.000	4	159.28	0.000
37.50	0.000	3	159.28	0.000
38.00	0.000	3	159.28	0.000
38.50	0.000	3	159.28	0.000
39.00	0.000	2	159.28	0.000
39.50	0.000	2	159.28	0.000
40.00	0.000	2	159.28	0.000
40.50	0.000	2	159.28	0.000
41.00	0.000	2	159.28	0.000
41.50	0.000	1	159.28	0.000
42.00	0.000	1	159.28	0.000
42.50	0.000	1	159.28	0.000
43.00	0.000	1	159.28	0.000
43.50	0.000	1	159.28	0.000
44.00	0.000	1	159.28	0.000
44.50	0.000	1	159.28	0.000
45.00	0.000	1	159.28	0.000
45.50	0.000	1	159.28	0.000
46.00	0.000	1	159.28	0.000
46.50	0.000	0	159.28	0.000
47.00	0.000	0	159.28	0.000
47.50	0.000	0	159.28	0.000
48.00	0.000	0	159.28	0.000
48.50	0.000	0	159.28	0.000
49.00	0.000	0	159.28	0.000
49.50	0.000	0	159.28	0.000
50.00	0.000	0	159.28	0.000
50.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	0	159.28	0.000
51.50	0.000	0	159.28	0.000
52.00	0.000	0	159.28	0.000
52.50	0.000	0	159.28	0.000
53.00	0.000	0	159.28	0.000
53.50	0.000	0	159.28	0.000
54.00	0.000	0	159.28	0.000
54.50	0.000	0	159.28	0.000
55.00	0.000	0	159.28	0.000
55.50	0.000	0	159.28	0.000
56.00	0.000	0	159.28	0.000
56.50	0.000	0	159.28	0.000
57.00	0.000	0	159.28	0.000
57.50	0.000	0	159.28	0.000
58.00	0.000	0	159.28	0.000
58.50	0.000	0	159.28	0.000
59.00	0.000	0	159.28	0.000
59.50	0.000	0	159.28	0.000
60.00	0.000	0	159.28	0.000
60.50	0.000	0	159.28	0.000
61.00	0.000	0	159.28	0.000
61.50	0.000	0	159.28	0.000
62.00	0.000	0	159.28	0.000
62.50	0.000	0	159.28	0.000
63.00	0.000	0	159.28	0.000
63.50	0.000	0	159.28	0.000
64.00	0.000	0	159.28	0.000
64.50	0.000	0	159.28	0.000
65.00	0.000	0	159.28	0.000
65.50	0.000	0	159.28	0.000
66.00	0.000	0	159.28	0.000
66.50	0.000	0	159.28	0.000
67.00	0.000	0	159.28	0.000
67.50	0.000	0	159.28	0.000
68.00	0.000	0	159.28	0.000
68.50	0.000	0	159.28	0.000
69.00	0.000	0	159.28	0.000
69.50	0.000	0	159.28	0.000
70.00	0.000	0	159.28	0.000
70.50	0.000	0	159.28	0.000
71.00	0.000	0	159.28	0.000
71.50	0.000	0	159.28	0.000
72.00	0.000	0	159.28	0.000
72.50	0.000	0	159.28	0.000
73.00	0.000	0	159.28	0.000
73.50	0.000	0	159.28	0.000
74.00	0.000	0	159.28	0.000
74.50	0.000	0	159.28	0.000
75.00	0.000	0	159.28	0.000
75.50	0.000	0	159.28	0.000
76.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	0	159.28	0.000
77.00	0.000	0	159.28	0.000
77.50	0.000	0	159.28	0.000
78.00	0.000	0	159.28	0.000
78.50	0.000	0	159.28	0.000
79.00	0.000	0	159.28	0.000
79.50	0.000	0	159.28	0.000
80.00	0.000	0	159.28	0.000
80.50	0.000	0	159.28	0.000
81.00	0.000	0	159.28	0.000
81.50	0.000	0	159.28	0.000
82.00	0.000	0	159.28	0.000
82.50	0.000	0	159.28	0.000
83.00	0.000	0	159.28	0.000
83.50	0.000	0	159.28	0.000
84.00	0.000	0	159.28	0.000
84.50	0.000	0	159.28	0.000
85.00	0.000	0	159.28	0.000
85.50	0.000	0	159.28	0.000
86.00	0.000	0	159.28	0.000
86.50	0.000	0	159.28	0.000
87.00	0.000	0	159.28	0.000
87.50	0.000	0	159.28	0.000
88.00	0.000	0	159.28	0.000
88.50	0.000	0	159.28	0.000
89.00	0.000	0	159.28	0.000
89.50	0.000	0	159.28	0.000
90.00	0.000	0	159.28	0.000
90.50	0.000	0	159.28	0.000
91.00	0.000	0	159.28	0.000
91.50	0.000	0	159.28	0.000
92.00	0.000	0	159.28	0.000
92.50	0.000	0	159.28	0.000
93.00	0.000	0	159.28	0.000
93.50	0.000	0	159.28	0.000
94.00	0.000	0	159.28	0.000
94.50	0.000	0	159.28	0.000
95.00	0.000	0	159.28	0.000
95.50	0.000	0	159.28	0.000
96.00	0.000	0	159.28	0.000
96.50	0.000	0	159.28	0.000
97.00	0.000	0	159.28	0.000
97.50	0.000	0	159.28	0.000
98.00	0.000	0	159.28	0.000
98.50	0.000	0	159.28	0.000
99.00	0.000	0	159.28	0.000
99.50	0.000	0	159.28	0.000
100.00	0.000	0	159.28	0.000
100.50	0.000	0	159.28	0.000
101.00	0.000	0	159.28	0.000
101.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

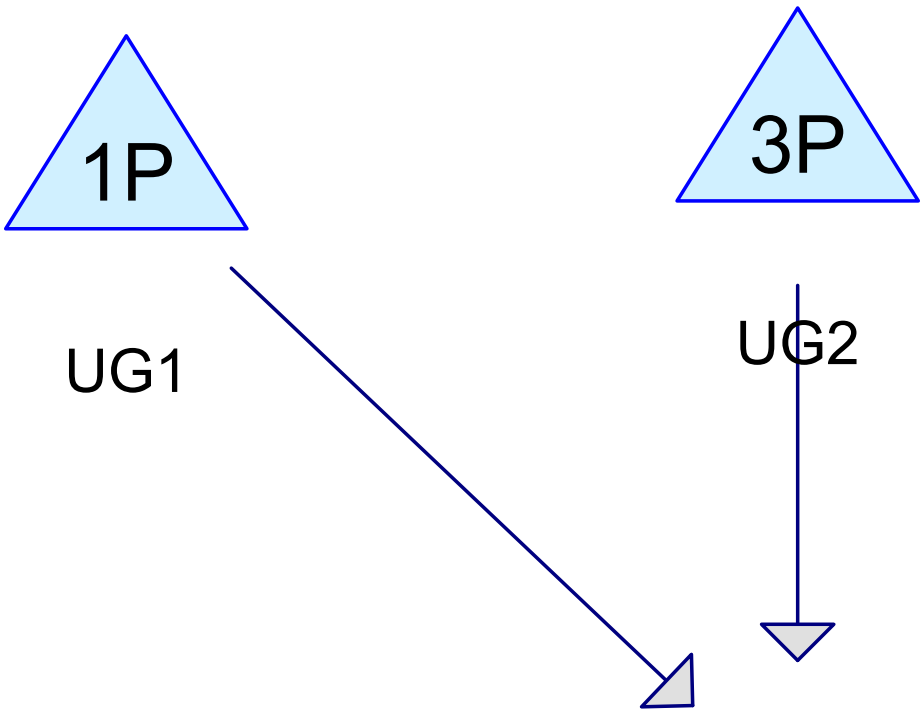
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	0	159.28	0.000
102.50	0.000	0	159.28	0.000
103.00	0.000	0	159.28	0.000
103.50	0.000	0	159.28	0.000
104.00	0.000	0	159.28	0.000
104.50	0.000	0	159.28	0.000
105.00	0.000	0	159.28	0.000
105.50	0.000	0	159.28	0.000
106.00	0.000	0	159.28	0.000
106.50	0.000	0	159.28	0.000
107.00	0.000	0	159.28	0.000
107.50	0.000	0	159.28	0.000
108.00	0.000	0	159.28	0.000
108.50	0.000	0	159.28	0.000
109.00	0.000	0	159.28	0.000
109.50	0.000	0	159.28	0.000
110.00	0.000	0	159.28	0.000
110.50	0.000	0	159.28	0.000
111.00	0.000	0	159.28	0.000
111.50	0.000	0	159.28	0.000
112.00	0.000	0	159.28	0.000
112.50	0.000	0	159.28	0.000
113.00	0.000	0	159.28	0.000
113.50	0.000	0	159.28	0.000
114.00	0.000	0	159.28	0.000
114.50	0.000	0	159.28	0.000
115.00	0.000	0	159.28	0.000
115.50	0.000	0	159.28	0.000
116.00	0.000	0	159.28	0.000
116.50	0.000	0	159.28	0.000
117.00	0.000	0	159.28	0.000
117.50	0.000	0	159.28	0.000
118.00	0.000	0	159.28	0.000
118.50	0.000	0	159.28	0.000
119.00	0.000	0	159.28	0.000
119.50	0.000	0	159.28	0.000
120.00	0.000	0	159.28	0.000
120.50	0.000	0	159.28	0.000
121.00	0.000	0	159.28	0.000
121.50	0.000	0	159.28	0.000
122.00	0.000	0	159.28	0.000
122.50	0.000	0	159.28	0.000
123.00	0.000	0	159.28	0.000
123.50	0.000	0	159.28	0.000
124.00	0.000	0	159.28	0.000
124.50	0.000	0	159.28	0.000
125.00	0.000	0	159.28	0.000
125.50	0.000	0	159.28	0.000
126.00	0.000	0	159.28	0.000
126.50	0.000	0	159.28	0.000
127.00	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	0	159.28	0.000
128.00	0.000	0	159.28	0.000
128.50	0.000	0	159.28	0.000
129.00	0.000	0	159.28	0.000
129.50	0.000	0	159.28	0.000
130.00	0.000	0	159.28	0.000
130.50	0.000	0	159.28	0.000
131.00	0.000	0	159.28	0.000
131.50	0.000	0	159.28	0.000
132.00	0.000	0	159.28	0.000
132.50	0.000	0	159.28	0.000
133.00	0.000	0	159.28	0.000
133.50	0.000	0	159.28	0.000
134.00	0.000	0	159.28	0.000
134.50	0.000	0	159.28	0.000
135.00	0.000	0	159.28	0.000
135.50	0.000	0	159.28	0.000
136.00	0.000	0	159.28	0.000
136.50	0.000	0	159.28	0.000
137.00	0.000	0	159.28	0.000
137.50	0.000	0	159.28	0.000
138.00	0.000	0	159.28	0.000
138.50	0.000	0	159.28	0.000
139.00	0.000	0	159.28	0.000
139.50	0.000	0	159.28	0.000
140.00	0.000	0	159.28	0.000
140.50	0.000	0	159.28	0.000
141.00	0.000	0	159.28	0.000
141.50	0.000	0	159.28	0.000
142.00	0.000	0	159.28	0.000
142.50	0.000	0	159.28	0.000
143.00	0.000	0	159.28	0.000
143.50	0.000	0	159.28	0.000
144.00	0.000	0	159.28	0.000
144.50	0.000	0	159.28	0.000
145.00	0.000	0	159.28	0.000
145.50	0.000	0	159.28	0.000
146.00	0.000	0	159.28	0.000
146.50	0.000	0	159.28	0.000
147.00	0.000	0	159.28	0.000
147.50	0.000	0	159.28	0.000
148.00	0.000	0	159.28	0.000
148.50	0.000	0	159.28	0.000
149.00	0.000	0	159.28	0.000
149.50	0.000	0	159.28	0.000
150.00	0.000	0	159.28	0.000
150.50	0.000	0	159.28	0.000
151.00	0.000	0	159.28	0.000
151.50	0.000	0	159.28	0.000
152.00	0.000	0	159.28	0.000
152.50	0.000	0	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	0	159.28	0.000
153.50	0.000	0	159.28	0.000
154.00	0.000	0	159.28	0.000
154.50	0.000	0	159.28	0.000
155.00	0.000	0	159.28	0.000
155.50	0.000	0	159.28	0.000
156.00	0.000	0	159.28	0.000
156.50	0.000	0	159.28	0.000
157.00	0.000	0	159.28	0.000
157.50	0.000	0	159.28	0.000
158.00	0.000	0	159.28	0.000
158.50	0.000	0	159.28	0.000
159.00	0.000	0	159.28	0.000
159.50	0.000	0	159.28	0.000
160.00	0.000	0	159.28	0.000
160.50	0.000	0	159.28	0.000
161.00	0.000	0	159.28	0.000
161.50	0.000	0	159.28	0.000
162.00	0.000	0	159.28	0.000
162.50	0.000	0	159.28	0.000
163.00	0.000	0	159.28	0.000
163.50	0.000	0	159.28	0.000
164.00	0.000	0	159.28	0.000
164.50	0.000	0	159.28	0.000
165.00	0.000	0	159.28	0.000
165.50	0.000	0	159.28	0.000
166.00	0.000	0	159.28	0.000
166.50	0.000	0	159.28	0.000
167.00	0.000	0	159.28	0.000
167.50	0.000	0	159.28	0.000
168.00	0.000	0	159.28	0.000



Subcat Reach Pond Link

Routing Diagram for BMW_2025-7-24_2
Prepared by Bohler, Printed 7/24/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	5-yr	Type II 24-hr		Default	24.00	1	4.13	2

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 3.67" for 5-yr event
Inflow = 11.443 cfs @ 11.96 hrs, Volume= 25,677 cf
Outflow = 0.350 cfs @ 13.72 hrs, Volume= 5,931 cf, Atten= 97%, Lag= 105.8 min
Primary = 0.350 cfs @ 13.72 hrs, Volume= 5,931 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 159.61' @ 13.72 hrs Surf.Area= 13,041 sf Storage= 19,847 cf

Plug-Flow detention time= 489.0 min calculated for 5,931 cf (23% of inflow)
Center-of-Mass det. time= 290.3 min (1,052.8 - 762.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.390 cfs @ 13.72 hrs HW=159.61' TW=159.60' (Fixed TW Elev= 159.60')
└─**4=Culvert** (Passes 0.390 cfs of 0.749 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.003 cfs @ 0.498 fps)
  ├─**2=Orifice/Grate** (Orifice Controls 0.388 cfs @ 0.498 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.000	0	157.53	0.000
2.00	0.002	0	157.53	0.000
2.50	0.012	13	157.53	0.000
3.00	0.023	45	157.54	0.000
3.50	0.033	95	157.55	0.000
4.00	0.042	162	157.56	0.000
4.50	0.052	247	157.58	0.000
5.00	0.063	351	157.60	0.000
5.50	0.075	475	157.62	0.000
6.00	0.086	620	157.65	0.000
6.50	0.097	784	157.68	0.000
7.00	0.108	969	157.72	0.000
7.50	0.119	1,174	157.76	0.000
8.00	0.130	1,399	157.80	0.000
8.50	0.162	1,659	157.85	0.000
9.00	0.200	1,985	157.91	0.000
9.50	0.212	2,360	157.98	0.000
10.00	0.264	2,782	158.04	0.000
10.50	0.351	3,331	158.09	0.000
11.00	0.495	4,085	158.15	0.000
11.50	**0.831**	5,252	158.26	0.000
12.00	**9.472**	14,195	159.05	0.000
12.50	0.827	17,891	159.41	0.000
13.00	0.515	19,020	159.52	0.000
13.50	0.389	**19,802**	**159.61**	**0.194**
14.00	0.306	**19,838**	**159.61**	**0.318**
14.50	0.270	19,825	159.61	0.274
15.00	0.242	19,817	159.61	0.247
15.50	0.215	19,809	159.61	0.219
16.00	0.187	19,801	159.61	0.191
16.50	0.174	19,797	159.61	0.176
17.00	0.164	19,794	159.61	0.166
17.50	0.154	19,791	159.60	0.156
18.00	0.145	19,788	159.60	0.146
18.50	0.135	19,786	159.60	0.136
19.00	0.125	19,783	159.60	0.126
19.50	0.115	19,780	159.60	0.116
20.00	0.105	19,777	159.60	0.107
20.50	0.102	19,776	159.60	0.102
21.00	0.100	19,775	159.60	0.100
21.50	0.098	19,775	159.60	0.098
22.00	0.096	19,774	159.60	0.096
22.50	0.094	19,773	159.60	0.094
23.00	0.092	19,773	159.60	0.092
23.50	0.090	19,772	159.60	0.090
24.00	0.088	19,772	159.60	0.088
24.50	0.000	19,746	159.60	0.001
25.00	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	19,746	159.60	0.000
26.00	0.000	19,746	159.60	0.000
26.50	0.000	19,746	159.60	0.000
27.00	0.000	19,746	159.60	0.000
27.50	0.000	19,746	159.60	0.000
28.00	0.000	19,746	159.60	0.000
28.50	0.000	19,746	159.60	0.000
29.00	0.000	19,746	159.60	0.000
29.50	0.000	19,746	159.60	0.000
30.00	0.000	19,746	159.60	0.000
30.50	0.000	19,746	159.60	0.000
31.00	0.000	19,746	159.60	0.000
31.50	0.000	19,746	159.60	0.000
32.00	0.000	19,746	159.60	0.000
32.50	0.000	19,746	159.60	0.000
33.00	0.000	19,746	159.60	0.000
33.50	0.000	19,746	159.60	0.000
34.00	0.000	19,746	159.60	0.000
34.50	0.000	19,746	159.60	0.000
35.00	0.000	19,746	159.60	0.000
35.50	0.000	19,746	159.60	0.000
36.00	0.000	19,746	159.60	0.000
36.50	0.000	19,746	159.60	0.000
37.00	0.000	19,746	159.60	0.000
37.50	0.000	19,746	159.60	0.000
38.00	0.000	19,746	159.60	0.000
38.50	0.000	19,746	159.60	0.000
39.00	0.000	19,746	159.60	0.000
39.50	0.000	19,746	159.60	0.000
40.00	0.000	19,746	159.60	0.000
40.50	0.000	19,746	159.60	0.000
41.00	0.000	19,746	159.60	0.000
41.50	0.000	19,746	159.60	0.000
42.00	0.000	19,746	159.60	0.000
42.50	0.000	19,746	159.60	0.000
43.00	0.000	19,746	159.60	0.000
43.50	0.000	19,746	159.60	0.000
44.00	0.000	19,746	159.60	0.000
44.50	0.000	19,746	159.60	0.000
45.00	0.000	19,746	159.60	0.000
45.50	0.000	19,746	159.60	0.000
46.00	0.000	19,746	159.60	0.000
46.50	0.000	19,746	159.60	0.000
47.00	0.000	19,746	159.60	0.000
47.50	0.000	19,746	159.60	0.000
48.00	0.000	19,746	159.60	0.000
48.50	0.000	19,746	159.60	0.000
49.00	0.000	19,746	159.60	0.000
49.50	0.000	19,746	159.60	0.000
50.00	0.000	19,746	159.60	0.000
50.50	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	19,746	159.60	0.000
51.50	0.000	19,746	159.60	0.000
52.00	0.000	19,746	159.60	0.000
52.50	0.000	19,746	159.60	0.000
53.00	0.000	19,746	159.60	0.000
53.50	0.000	19,746	159.60	0.000
54.00	0.000	19,746	159.60	0.000
54.50	0.000	19,746	159.60	0.000
55.00	0.000	19,746	159.60	0.000
55.50	0.000	19,746	159.60	0.000
56.00	0.000	19,746	159.60	0.000
56.50	0.000	19,746	159.60	0.000
57.00	0.000	19,746	159.60	0.000
57.50	0.000	19,746	159.60	0.000
58.00	0.000	19,746	159.60	0.000
58.50	0.000	19,746	159.60	0.000
59.00	0.000	19,746	159.60	0.000
59.50	0.000	19,746	159.60	0.000
60.00	0.000	19,746	159.60	0.000
60.50	0.000	19,746	159.60	0.000
61.00	0.000	19,746	159.60	0.000
61.50	0.000	19,746	159.60	0.000
62.00	0.000	19,746	159.60	0.000
62.50	0.000	19,746	159.60	0.000
63.00	0.000	19,746	159.60	0.000
63.50	0.000	19,746	159.60	0.000
64.00	0.000	19,746	159.60	0.000
64.50	0.000	19,746	159.60	0.000
65.00	0.000	19,746	159.60	0.000
65.50	0.000	19,746	159.60	0.000
66.00	0.000	19,746	159.60	0.000
66.50	0.000	19,746	159.60	0.000
67.00	0.000	19,746	159.60	0.000
67.50	0.000	19,746	159.60	0.000
68.00	0.000	19,746	159.60	0.000
68.50	0.000	19,746	159.60	0.000
69.00	0.000	19,746	159.60	0.000
69.50	0.000	19,746	159.60	0.000
70.00	0.000	19,746	159.60	0.000
70.50	0.000	19,746	159.60	0.000
71.00	0.000	19,746	159.60	0.000
71.50	0.000	19,746	159.60	0.000
72.00	0.000	19,746	159.60	0.000
72.50	0.000	19,746	159.60	0.000
73.00	0.000	19,746	159.60	0.000
73.50	0.000	19,746	159.60	0.000
74.00	0.000	19,746	159.60	0.000
74.50	0.000	19,746	159.60	0.000
75.00	0.000	19,746	159.60	0.000
75.50	0.000	19,746	159.60	0.000
76.00	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	19,746	159.60	0.000
77.00	0.000	19,746	159.60	0.000
77.50	0.000	19,746	159.60	0.000
78.00	0.000	19,746	159.60	0.000
78.50	0.000	19,746	159.60	0.000
79.00	0.000	19,746	159.60	0.000
79.50	0.000	19,746	159.60	0.000
80.00	0.000	19,746	159.60	0.000
80.50	0.000	19,746	159.60	0.000
81.00	0.000	19,746	159.60	0.000
81.50	0.000	19,746	159.60	0.000
82.00	0.000	19,746	159.60	0.000
82.50	0.000	19,746	159.60	0.000
83.00	0.000	19,746	159.60	0.000
83.50	0.000	19,746	159.60	0.000
84.00	0.000	19,746	159.60	0.000
84.50	0.000	19,746	159.60	0.000
85.00	0.000	19,746	159.60	0.000
85.50	0.000	19,746	159.60	0.000
86.00	0.000	19,746	159.60	0.000
86.50	0.000	19,746	159.60	0.000
87.00	0.000	19,746	159.60	0.000
87.50	0.000	19,746	159.60	0.000
88.00	0.000	19,746	159.60	0.000
88.50	0.000	19,746	159.60	0.000
89.00	0.000	19,746	159.60	0.000
89.50	0.000	19,746	159.60	0.000
90.00	0.000	19,746	159.60	0.000
90.50	0.000	19,746	159.60	0.000
91.00	0.000	19,746	159.60	0.000
91.50	0.000	19,746	159.60	0.000
92.00	0.000	19,746	159.60	0.000
92.50	0.000	19,746	159.60	0.000
93.00	0.000	19,746	159.60	0.000
93.50	0.000	19,746	159.60	0.000
94.00	0.000	19,746	159.60	0.000
94.50	0.000	19,746	159.60	0.000
95.00	0.000	19,746	159.60	0.000
95.50	0.000	19,746	159.60	0.000
96.00	0.000	19,746	159.60	0.000
96.50	0.000	19,746	159.60	0.000
97.00	0.000	19,746	159.60	0.000
97.50	0.000	19,746	159.60	0.000
98.00	0.000	19,746	159.60	0.000
98.50	0.000	19,746	159.60	0.000
99.00	0.000	19,746	159.60	0.000
99.50	0.000	19,746	159.60	0.000
100.00	0.000	19,746	159.60	0.000
100.50	0.000	19,746	159.60	0.000
101.00	0.000	19,746	159.60	0.000
101.50	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	19,746	159.60	0.000
102.50	0.000	19,746	159.60	0.000
103.00	0.000	19,746	159.60	0.000
103.50	0.000	19,746	159.60	0.000
104.00	0.000	19,746	159.60	0.000
104.50	0.000	19,746	159.60	0.000
105.00	0.000	19,746	159.60	0.000
105.50	0.000	19,746	159.60	0.000
106.00	0.000	19,746	159.60	0.000
106.50	0.000	19,746	159.60	0.000
107.00	0.000	19,746	159.60	0.000
107.50	0.000	19,746	159.60	0.000
108.00	0.000	19,746	159.60	0.000
108.50	0.000	19,746	159.60	0.000
109.00	0.000	19,746	159.60	0.000
109.50	0.000	19,746	159.60	0.000
110.00	0.000	19,746	159.60	0.000
110.50	0.000	19,746	159.60	0.000
111.00	0.000	19,746	159.60	0.000
111.50	0.000	19,746	159.60	0.000
112.00	0.000	19,746	159.60	0.000
112.50	0.000	19,746	159.60	0.000
113.00	0.000	19,746	159.60	0.000
113.50	0.000	19,746	159.60	0.000
114.00	0.000	19,746	159.60	0.000
114.50	0.000	19,746	159.60	0.000
115.00	0.000	19,746	159.60	0.000
115.50	0.000	19,746	159.60	0.000
116.00	0.000	19,746	159.60	0.000
116.50	0.000	19,746	159.60	0.000
117.00	0.000	19,746	159.60	0.000
117.50	0.000	19,746	159.60	0.000
118.00	0.000	19,746	159.60	0.000
118.50	0.000	19,746	159.60	0.000
119.00	0.000	19,746	159.60	0.000
119.50	0.000	19,746	159.60	0.000
120.00	0.000	19,746	159.60	0.000
120.50	0.000	19,746	159.60	0.000
121.00	0.000	19,746	159.60	0.000
121.50	0.000	19,746	159.60	0.000
122.00	0.000	19,746	159.60	0.000
122.50	0.000	19,746	159.60	0.000
123.00	0.000	19,746	159.60	0.000
123.50	0.000	19,746	159.60	0.000
124.00	0.000	19,746	159.60	0.000
124.50	0.000	19,746	159.60	0.000
125.00	0.000	19,746	159.60	0.000
125.50	0.000	19,746	159.60	0.000
126.00	0.000	19,746	159.60	0.000
126.50	0.000	19,746	159.60	0.000
127.00	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	19,746	159.60	0.000
128.00	0.000	19,746	159.60	0.000
128.50	0.000	19,746	159.60	0.000
129.00	0.000	19,746	159.60	0.000
129.50	0.000	19,746	159.60	0.000
130.00	0.000	19,746	159.60	0.000
130.50	0.000	19,746	159.60	0.000
131.00	0.000	19,746	159.60	0.000
131.50	0.000	19,746	159.60	0.000
132.00	0.000	19,746	159.60	0.000
132.50	0.000	19,746	159.60	0.000
133.00	0.000	19,746	159.60	0.000
133.50	0.000	19,746	159.60	0.000
134.00	0.000	19,746	159.60	0.000
134.50	0.000	19,746	159.60	0.000
135.00	0.000	19,746	159.60	0.000
135.50	0.000	19,746	159.60	0.000
136.00	0.000	19,746	159.60	0.000
136.50	0.000	19,746	159.60	0.000
137.00	0.000	19,746	159.60	0.000
137.50	0.000	19,746	159.60	0.000
138.00	0.000	19,746	159.60	0.000
138.50	0.000	19,746	159.60	0.000
139.00	0.000	19,746	159.60	0.000
139.50	0.000	19,746	159.60	0.000
140.00	0.000	19,746	159.60	0.000
140.50	0.000	19,746	159.60	0.000
141.00	0.000	19,746	159.60	0.000
141.50	0.000	19,746	159.60	0.000
142.00	0.000	19,746	159.60	0.000
142.50	0.000	19,746	159.60	0.000
143.00	0.000	19,746	159.60	0.000
143.50	0.000	19,746	159.60	0.000
144.00	0.000	19,746	159.60	0.000
144.50	0.000	19,746	159.60	0.000
145.00	0.000	19,746	159.60	0.000
145.50	0.000	19,746	159.60	0.000
146.00	0.000	19,746	159.60	0.000
146.50	0.000	19,746	159.60	0.000
147.00	0.000	19,746	159.60	0.000
147.50	0.000	19,746	159.60	0.000
148.00	0.000	19,746	159.60	0.000
148.50	0.000	19,746	159.60	0.000
149.00	0.000	19,746	159.60	0.000
149.50	0.000	19,746	159.60	0.000
150.00	0.000	19,746	159.60	0.000
150.50	0.000	19,746	159.60	0.000
151.00	0.000	19,746	159.60	0.000
151.50	0.000	19,746	159.60	0.000
152.00	0.000	19,746	159.60	0.000
152.50	0.000	19,746	159.60	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	19,746	159.60	0.000
153.50	0.000	19,746	159.60	0.000
154.00	0.000	19,746	159.60	0.000
154.50	0.000	19,746	159.60	0.000
155.00	0.000	19,746	159.60	0.000
155.50	0.000	19,746	159.60	0.000
156.00	0.000	19,746	159.60	0.000
156.50	0.000	19,746	159.60	0.000
157.00	0.000	19,746	159.60	0.000
157.50	0.000	19,746	159.60	0.000
158.00	0.000	19,746	159.60	0.000
158.50	0.000	19,746	159.60	0.000
159.00	0.000	19,746	159.60	0.000
159.50	0.000	19,746	159.60	0.000
160.00	0.000	19,746	159.60	0.000
160.50	0.000	19,746	159.60	0.000
161.00	0.000	19,746	159.60	0.000
161.50	0.000	19,746	159.60	0.000
162.00	0.000	19,746	159.60	0.000
162.50	0.000	19,746	159.60	0.000
163.00	0.000	19,746	159.60	0.000
163.50	0.000	19,746	159.60	0.000
164.00	0.000	19,746	159.60	0.000
164.50	0.000	19,746	159.60	0.000
165.00	0.000	19,746	159.60	0.000
165.50	0.000	19,746	159.60	0.000
166.00	0.000	19,746	159.60	0.000
166.50	0.000	19,746	159.60	0.000
167.00	0.000	19,746	159.60	0.000
167.50	0.000	19,746	159.60	0.000
168.00	0.000	19,746	159.60	0.000

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 2.66" for 5-yr event
Inflow = 2.367 cfs @ 11.96 hrs, Volume= 4,768 cf
Outflow = 0.595 cfs @ 12.09 hrs, Volume= 4,443 cf, Atten= 75%, Lag= 7.6 min
Primary = 0.595 cfs @ 12.09 hrs, Volume= 4,443 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 160.48' @ 12.09 hrs Surf.Area= 2,542 sf Storage= 2,014 cf

Plug-Flow detention time= 96.4 min calculated for 4,443 cf (93% of inflow)
Center-of-Mass det. time= 58.9 min (866.8 - 807.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.595 cfs @ 12.09 hrs HW=160.48' TW=159.60' (Fixed TW Elev= 159.60')
└─**4=Culvert** (Passes 0.595 cfs of 4.064 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.222 cfs @ 4.525 fps)
  ├─**2=Orifice/Grate** (Orifice Controls 0.373 cfs @ 2.986 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.000	0	159.28	0.000
4.50	0.000	0	159.28	0.000
5.00	0.000	0	159.28	0.000
5.50	0.000	0	159.28	0.000
6.00	0.000	0	159.28	0.000
6.50	0.002	1	159.28	0.000
7.00	0.004	6	159.29	0.000
7.50	0.006	15	159.29	0.000
8.00	0.008	27	159.31	0.000
8.50	0.012	44	159.32	0.000
9.00	0.017	69	159.35	0.000
9.50	0.021	104	159.38	0.000
10.00	0.029	147	159.42	0.000
10.50	0.043	211	159.49	0.000
11.00	0.067	308	159.58	0.000
11.50	**0.128**	409	159.68	0.068
12.00	**2.004**	**1,814**	**160.39**	**0.532**
12.50	0.184	**1,634**	**160.30**	**0.466**
13.00	0.116	1,245	160.12	0.262
13.50	0.088	1,044	160.03	0.175
14.00	0.070	906	159.96	0.142
14.50	0.062	778	159.90	0.130
15.00	0.056	660	159.85	0.118
15.50	0.049	554	159.80	0.106
16.00	0.043	461	159.73	0.086
16.50	0.040	401	159.67	0.064
17.00	0.038	370	159.64	0.049
17.50	0.036	356	159.63	0.041
18.00	0.034	351	159.62	0.036
18.50	0.031	348	159.62	0.033
19.00	0.029	345	159.62	0.030
19.50	0.027	343	159.62	0.028
20.00	0.024	340	159.61	0.026
20.50	0.024	339	159.61	0.024
21.00	0.023	338	159.61	0.024
21.50	0.023	337	159.61	0.023
22.00	0.022	337	159.61	0.023
22.50	0.022	336	159.61	0.022
23.00	0.022	336	159.61	0.022
23.50	0.021	335	159.61	0.021
24.00	0.021	335	159.61	0.021
24.50	0.000	326	159.60	0.000
25.00	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	325	159.60	0.000
26.00	0.000	325	159.60	0.000
26.50	0.000	325	159.60	0.000
27.00	0.000	325	159.60	0.000
27.50	0.000	325	159.60	0.000
28.00	0.000	325	159.60	0.000
28.50	0.000	325	159.60	0.000
29.00	0.000	325	159.60	0.000
29.50	0.000	325	159.60	0.000
30.00	0.000	325	159.60	0.000
30.50	0.000	325	159.60	0.000
31.00	0.000	325	159.60	0.000
31.50	0.000	325	159.60	0.000
32.00	0.000	325	159.60	0.000
32.50	0.000	325	159.60	0.000
33.00	0.000	325	159.60	0.000
33.50	0.000	325	159.60	0.000
34.00	0.000	325	159.60	0.000
34.50	0.000	325	159.60	0.000
35.00	0.000	325	159.60	0.000
35.50	0.000	325	159.60	0.000
36.00	0.000	325	159.60	0.000
36.50	0.000	325	159.60	0.000
37.00	0.000	325	159.60	0.000
37.50	0.000	325	159.60	0.000
38.00	0.000	325	159.60	0.000
38.50	0.000	325	159.60	0.000
39.00	0.000	325	159.60	0.000
39.50	0.000	325	159.60	0.000
40.00	0.000	325	159.60	0.000
40.50	0.000	325	159.60	0.000
41.00	0.000	325	159.60	0.000
41.50	0.000	325	159.60	0.000
42.00	0.000	325	159.60	0.000
42.50	0.000	325	159.60	0.000
43.00	0.000	325	159.60	0.000
43.50	0.000	325	159.60	0.000
44.00	0.000	325	159.60	0.000
44.50	0.000	325	159.60	0.000
45.00	0.000	325	159.60	0.000
45.50	0.000	325	159.60	0.000
46.00	0.000	325	159.60	0.000
46.50	0.000	325	159.60	0.000
47.00	0.000	325	159.60	0.000
47.50	0.000	325	159.60	0.000
48.00	0.000	325	159.60	0.000
48.50	0.000	325	159.60	0.000
49.00	0.000	325	159.60	0.000
49.50	0.000	325	159.60	0.000
50.00	0.000	325	159.60	0.000
50.50	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	325	159.60	0.000
51.50	0.000	325	159.60	0.000
52.00	0.000	325	159.60	0.000
52.50	0.000	325	159.60	0.000
53.00	0.000	325	159.60	0.000
53.50	0.000	325	159.60	0.000
54.00	0.000	325	159.60	0.000
54.50	0.000	325	159.60	0.000
55.00	0.000	325	159.60	0.000
55.50	0.000	325	159.60	0.000
56.00	0.000	325	159.60	0.000
56.50	0.000	325	159.60	0.000
57.00	0.000	325	159.60	0.000
57.50	0.000	325	159.60	0.000
58.00	0.000	325	159.60	0.000
58.50	0.000	325	159.60	0.000
59.00	0.000	325	159.60	0.000
59.50	0.000	325	159.60	0.000
60.00	0.000	325	159.60	0.000
60.50	0.000	325	159.60	0.000
61.00	0.000	325	159.60	0.000
61.50	0.000	325	159.60	0.000
62.00	0.000	325	159.60	0.000
62.50	0.000	325	159.60	0.000
63.00	0.000	325	159.60	0.000
63.50	0.000	325	159.60	0.000
64.00	0.000	325	159.60	0.000
64.50	0.000	325	159.60	0.000
65.00	0.000	325	159.60	0.000
65.50	0.000	325	159.60	0.000
66.00	0.000	325	159.60	0.000
66.50	0.000	325	159.60	0.000
67.00	0.000	325	159.60	0.000
67.50	0.000	325	159.60	0.000
68.00	0.000	325	159.60	0.000
68.50	0.000	325	159.60	0.000
69.00	0.000	325	159.60	0.000
69.50	0.000	325	159.60	0.000
70.00	0.000	325	159.60	0.000
70.50	0.000	325	159.60	0.000
71.00	0.000	325	159.60	0.000
71.50	0.000	325	159.60	0.000
72.00	0.000	325	159.60	0.000
72.50	0.000	325	159.60	0.000
73.00	0.000	325	159.60	0.000
73.50	0.000	325	159.60	0.000
74.00	0.000	325	159.60	0.000
74.50	0.000	325	159.60	0.000
75.00	0.000	325	159.60	0.000
75.50	0.000	325	159.60	0.000
76.00	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	325	159.60	0.000
77.00	0.000	325	159.60	0.000
77.50	0.000	325	159.60	0.000
78.00	0.000	325	159.60	0.000
78.50	0.000	325	159.60	0.000
79.00	0.000	325	159.60	0.000
79.50	0.000	325	159.60	0.000
80.00	0.000	325	159.60	0.000
80.50	0.000	325	159.60	0.000
81.00	0.000	325	159.60	0.000
81.50	0.000	325	159.60	0.000
82.00	0.000	325	159.60	0.000
82.50	0.000	325	159.60	0.000
83.00	0.000	325	159.60	0.000
83.50	0.000	325	159.60	0.000
84.00	0.000	325	159.60	0.000
84.50	0.000	325	159.60	0.000
85.00	0.000	325	159.60	0.000
85.50	0.000	325	159.60	0.000
86.00	0.000	325	159.60	0.000
86.50	0.000	325	159.60	0.000
87.00	0.000	325	159.60	0.000
87.50	0.000	325	159.60	0.000
88.00	0.000	325	159.60	0.000
88.50	0.000	325	159.60	0.000
89.00	0.000	325	159.60	0.000
89.50	0.000	325	159.60	0.000
90.00	0.000	325	159.60	0.000
90.50	0.000	325	159.60	0.000
91.00	0.000	325	159.60	0.000
91.50	0.000	325	159.60	0.000
92.00	0.000	325	159.60	0.000
92.50	0.000	325	159.60	0.000
93.00	0.000	325	159.60	0.000
93.50	0.000	325	159.60	0.000
94.00	0.000	325	159.60	0.000
94.50	0.000	325	159.60	0.000
95.00	0.000	325	159.60	0.000
95.50	0.000	325	159.60	0.000
96.00	0.000	325	159.60	0.000
96.50	0.000	325	159.60	0.000
97.00	0.000	325	159.60	0.000
97.50	0.000	325	159.60	0.000
98.00	0.000	325	159.60	0.000
98.50	0.000	325	159.60	0.000
99.00	0.000	325	159.60	0.000
99.50	0.000	325	159.60	0.000
100.00	0.000	325	159.60	0.000
100.50	0.000	325	159.60	0.000
101.00	0.000	325	159.60	0.000
101.50	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

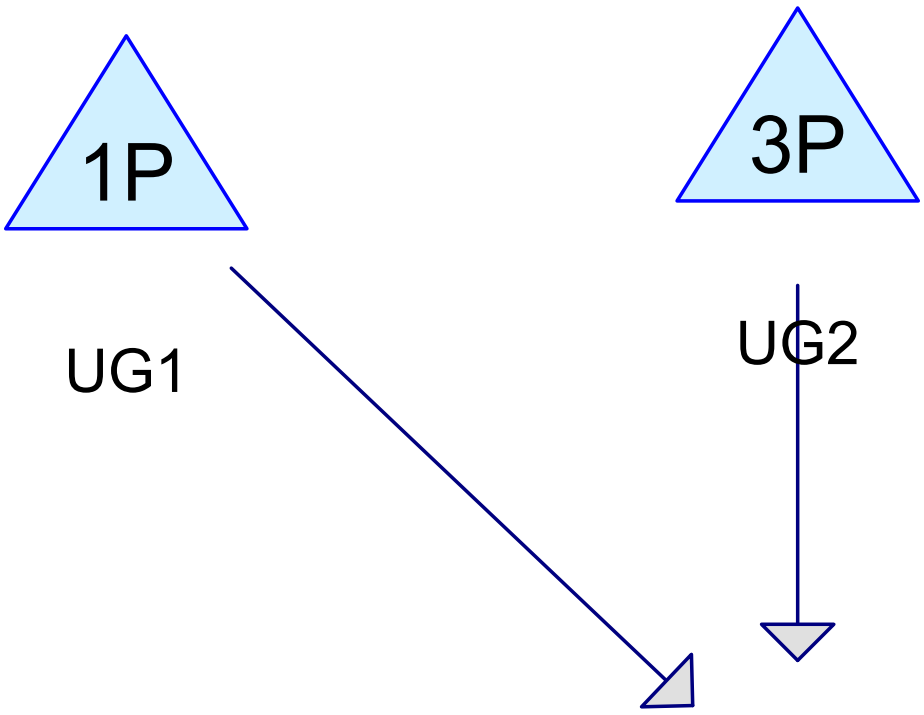
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	325	159.60	0.000
102.50	0.000	325	159.60	0.000
103.00	0.000	325	159.60	0.000
103.50	0.000	325	159.60	0.000
104.00	0.000	325	159.60	0.000
104.50	0.000	325	159.60	0.000
105.00	0.000	325	159.60	0.000
105.50	0.000	325	159.60	0.000
106.00	0.000	325	159.60	0.000
106.50	0.000	325	159.60	0.000
107.00	0.000	325	159.60	0.000
107.50	0.000	325	159.60	0.000
108.00	0.000	325	159.60	0.000
108.50	0.000	325	159.60	0.000
109.00	0.000	325	159.60	0.000
109.50	0.000	325	159.60	0.000
110.00	0.000	325	159.60	0.000
110.50	0.000	325	159.60	0.000
111.00	0.000	325	159.60	0.000
111.50	0.000	325	159.60	0.000
112.00	0.000	325	159.60	0.000
112.50	0.000	325	159.60	0.000
113.00	0.000	325	159.60	0.000
113.50	0.000	325	159.60	0.000
114.00	0.000	325	159.60	0.000
114.50	0.000	325	159.60	0.000
115.00	0.000	325	159.60	0.000
115.50	0.000	325	159.60	0.000
116.00	0.000	325	159.60	0.000
116.50	0.000	325	159.60	0.000
117.00	0.000	325	159.60	0.000
117.50	0.000	325	159.60	0.000
118.00	0.000	325	159.60	0.000
118.50	0.000	325	159.60	0.000
119.00	0.000	325	159.60	0.000
119.50	0.000	325	159.60	0.000
120.00	0.000	325	159.60	0.000
120.50	0.000	325	159.60	0.000
121.00	0.000	325	159.60	0.000
121.50	0.000	325	159.60	0.000
122.00	0.000	325	159.60	0.000
122.50	0.000	325	159.60	0.000
123.00	0.000	325	159.60	0.000
123.50	0.000	325	159.60	0.000
124.00	0.000	325	159.60	0.000
124.50	0.000	325	159.60	0.000
125.00	0.000	325	159.60	0.000
125.50	0.000	325	159.60	0.000
126.00	0.000	325	159.60	0.000
126.50	0.000	325	159.60	0.000
127.00	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	325	159.60	0.000
128.00	0.000	325	159.60	0.000
128.50	0.000	325	159.60	0.000
129.00	0.000	325	159.60	0.000
129.50	0.000	325	159.60	0.000
130.00	0.000	325	159.60	0.000
130.50	0.000	325	159.60	0.000
131.00	0.000	325	159.60	0.000
131.50	0.000	325	159.60	0.000
132.00	0.000	325	159.60	0.000
132.50	0.000	325	159.60	0.000
133.00	0.000	325	159.60	0.000
133.50	0.000	325	159.60	0.000
134.00	0.000	325	159.60	0.000
134.50	0.000	325	159.60	0.000
135.00	0.000	325	159.60	0.000
135.50	0.000	325	159.60	0.000
136.00	0.000	325	159.60	0.000
136.50	0.000	325	159.60	0.000
137.00	0.000	325	159.60	0.000
137.50	0.000	325	159.60	0.000
138.00	0.000	325	159.60	0.000
138.50	0.000	325	159.60	0.000
139.00	0.000	325	159.60	0.000
139.50	0.000	325	159.60	0.000
140.00	0.000	325	159.60	0.000
140.50	0.000	325	159.60	0.000
141.00	0.000	325	159.60	0.000
141.50	0.000	325	159.60	0.000
142.00	0.000	325	159.60	0.000
142.50	0.000	325	159.60	0.000
143.00	0.000	325	159.60	0.000
143.50	0.000	325	159.60	0.000
144.00	0.000	325	159.60	0.000
144.50	0.000	325	159.60	0.000
145.00	0.000	325	159.60	0.000
145.50	0.000	325	159.60	0.000
146.00	0.000	325	159.60	0.000
146.50	0.000	325	159.60	0.000
147.00	0.000	325	159.60	0.000
147.50	0.000	325	159.60	0.000
148.00	0.000	325	159.60	0.000
148.50	0.000	325	159.60	0.000
149.00	0.000	325	159.60	0.000
149.50	0.000	325	159.60	0.000
150.00	0.000	325	159.60	0.000
150.50	0.000	325	159.60	0.000
151.00	0.000	325	159.60	0.000
151.50	0.000	325	159.60	0.000
152.00	0.000	325	159.60	0.000
152.50	0.000	325	159.60	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	325	159.60	0.000
153.50	0.000	325	159.60	0.000
154.00	0.000	325	159.60	0.000
154.50	0.000	325	159.60	0.000
155.00	0.000	325	159.60	0.000
155.50	0.000	325	159.60	0.000
156.00	0.000	325	159.60	0.000
156.50	0.000	325	159.60	0.000
157.00	0.000	325	159.60	0.000
157.50	0.000	325	159.60	0.000
158.00	0.000	325	159.60	0.000
158.50	0.000	325	159.60	0.000
159.00	0.000	325	159.60	0.000
159.50	0.000	325	159.60	0.000
160.00	0.000	325	159.60	0.000
160.50	0.000	325	159.60	0.000
161.00	0.000	325	159.60	0.000
161.50	0.000	325	159.60	0.000
162.00	0.000	325	159.60	0.000
162.50	0.000	325	159.60	0.000
163.00	0.000	325	159.60	0.000
163.50	0.000	325	159.60	0.000
164.00	0.000	325	159.60	0.000
164.50	0.000	325	159.60	0.000
165.00	0.000	325	159.60	0.000
165.50	0.000	325	159.60	0.000
166.00	0.000	325	159.60	0.000
166.50	0.000	325	159.60	0.000
167.00	0.000	325	159.60	0.000
167.50	0.000	325	159.60	0.000
168.00	0.000	325	159.60	0.000



Subcat Reach Pond Link

Routing Diagram for BMW_2025-7-24_2
Prepared by Bohler, Printed 7/24/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	10-yr	Type II 24-hr		Default	24.00	1	4.83	2

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 4.36" for 10-yr event
Inflow = 13.471 cfs @ 11.96 hrs, Volume= 30,539 cf
Outflow = 0.301 cfs @ 16.97 hrs, Volume= 3,379 cf, Atten= 98%, Lag= 300.8 min
Primary = 0.301 cfs @ 16.97 hrs, Volume= 3,379 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 163.82' @ 16.97 hrs Surf.Area= 13,041 sf Storage= 27,162 cf

Plug-Flow detention time= 769.4 min calculated for 3,379 cf (11% of inflow)
Center-of-Mass det. time= 449.3 min (1,207.9 - 758.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.738 cfs @ 16.97 hrs HW=163.82' TW=163.81' (Fixed TW Elev= 163.81')
└─**4=Culvert** (Outlet Controls 0.738 cfs @ 0.418 fps)
  ├─**1=Orifice/Grate** (Passes < 0.003 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 0.382 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 11.129 cfs potential flow)

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.000	0	157.53	0.000
2.00	0.009	6	157.53	0.000
2.50	0.023	35	157.54	0.000
3.00	0.035	87	157.55	0.000
3.50	0.047	162	157.56	0.000
4.00	0.058	257	157.58	0.000
4.50	0.071	373	157.60	0.000
5.00	0.084	512	157.63	0.000
5.50	0.097	675	157.66	0.000
6.00	0.110	862	157.70	0.000
6.50	0.123	1,073	157.74	0.000
7.00	0.136	1,306	157.78	0.000
7.50	0.149	1,563	157.83	0.000
8.00	0.162	1,843	157.88	0.000
8.50	0.200	2,165	157.94	0.000
9.00	0.245	2,565	158.02	0.000
9.50	0.258	3,023	158.06	0.000
10.00	0.320	3,535	158.11	0.000
10.50	0.422	4,199	158.16	0.000
11.00	0.593	5,104	158.24	0.000
11.50	**0.990**	6,499	158.36	0.000
12.00	**11.141**	17,063	159.33	0.000
12.50	0.971	21,406	159.78	0.000
13.00	0.604	22,732	159.94	0.000
13.50	0.457	23,674	160.08	0.000
14.00	0.358	24,404	160.21	0.000
14.50	0.317	25,005	160.32	0.000
15.00	0.284	25,546	160.43	0.000
15.50	0.252	26,028	160.52	0.000
16.00	0.219	26,452	160.60	0.000
16.50	0.204	**26,831**	**160.67**	**0.000**
17.00	0.193	**27,162**	**163.81**	**0.086**
17.50	0.181	27,162	163.81	0.074
18.00	0.170	27,162	163.81	0.062
18.50	0.158	27,162	163.81	0.051
19.00	0.146	27,162	163.81	0.039
19.50	0.135	27,162	163.81	0.028
20.00	0.123	27,162	163.81	0.016
20.50	0.119	27,162	163.81	0.012
21.00	0.117	27,162	163.81	0.010
21.50	0.115	27,162	163.81	0.007
22.00	0.112	27,162	163.81	0.005
22.50	0.110	27,162	163.81	0.003
23.00	0.108	27,162	163.81	0.001
23.50	0.105	27,162	163.75	0.000
24.00	0.103	27,162	163.75	0.000
24.50	0.000	27,162	163.75	0.000
25.00	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	27,162	163.75	0.000
26.00	0.000	27,162	163.75	0.000
26.50	0.000	27,162	163.75	0.000
27.00	0.000	27,162	163.75	0.000
27.50	0.000	27,162	163.75	0.000
28.00	0.000	27,162	163.75	0.000
28.50	0.000	27,162	163.75	0.000
29.00	0.000	27,162	163.75	0.000
29.50	0.000	27,162	163.75	0.000
30.00	0.000	27,162	163.75	0.000
30.50	0.000	27,162	163.75	0.000
31.00	0.000	27,162	163.75	0.000
31.50	0.000	27,162	163.75	0.000
32.00	0.000	27,162	163.75	0.000
32.50	0.000	27,162	163.75	0.000
33.00	0.000	27,162	163.75	0.000
33.50	0.000	27,162	163.75	0.000
34.00	0.000	27,162	163.75	0.000
34.50	0.000	27,162	163.75	0.000
35.00	0.000	27,162	163.75	0.000
35.50	0.000	27,162	163.75	0.000
36.00	0.000	27,162	163.75	0.000
36.50	0.000	27,162	163.75	0.000
37.00	0.000	27,162	163.75	0.000
37.50	0.000	27,162	163.75	0.000
38.00	0.000	27,162	163.75	0.000
38.50	0.000	27,162	163.75	0.000
39.00	0.000	27,162	163.75	0.000
39.50	0.000	27,162	163.75	0.000
40.00	0.000	27,162	163.75	0.000
40.50	0.000	27,162	163.75	0.000
41.00	0.000	27,162	163.75	0.000
41.50	0.000	27,162	163.75	0.000
42.00	0.000	27,162	163.75	0.000
42.50	0.000	27,162	163.75	0.000
43.00	0.000	27,162	163.75	0.000
43.50	0.000	27,162	163.75	0.000
44.00	0.000	27,162	163.75	0.000
44.50	0.000	27,162	163.75	0.000
45.00	0.000	27,162	163.75	0.000
45.50	0.000	27,162	163.75	0.000
46.00	0.000	27,162	163.75	0.000
46.50	0.000	27,162	163.75	0.000
47.00	0.000	27,162	163.75	0.000
47.50	0.000	27,162	163.75	0.000
48.00	0.000	27,162	163.75	0.000
48.50	0.000	27,162	163.75	0.000
49.00	0.000	27,162	163.75	0.000
49.50	0.000	27,162	163.75	0.000
50.00	0.000	27,162	163.75	0.000
50.50	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	27,162	163.75	0.000
51.50	0.000	27,162	163.75	0.000
52.00	0.000	27,162	163.75	0.000
52.50	0.000	27,162	163.75	0.000
53.00	0.000	27,162	163.75	0.000
53.50	0.000	27,162	163.75	0.000
54.00	0.000	27,162	163.75	0.000
54.50	0.000	27,162	163.75	0.000
55.00	0.000	27,162	163.75	0.000
55.50	0.000	27,162	163.75	0.000
56.00	0.000	27,162	163.75	0.000
56.50	0.000	27,162	163.75	0.000
57.00	0.000	27,162	163.75	0.000
57.50	0.000	27,162	163.75	0.000
58.00	0.000	27,162	163.75	0.000
58.50	0.000	27,162	163.75	0.000
59.00	0.000	27,162	163.75	0.000
59.50	0.000	27,162	163.75	0.000
60.00	0.000	27,162	163.75	0.000
60.50	0.000	27,162	163.75	0.000
61.00	0.000	27,162	163.75	0.000
61.50	0.000	27,162	163.75	0.000
62.00	0.000	27,162	163.75	0.000
62.50	0.000	27,162	163.75	0.000
63.00	0.000	27,162	163.75	0.000
63.50	0.000	27,162	163.75	0.000
64.00	0.000	27,162	163.75	0.000
64.50	0.000	27,162	163.75	0.000
65.00	0.000	27,162	163.75	0.000
65.50	0.000	27,162	163.75	0.000
66.00	0.000	27,162	163.75	0.000
66.50	0.000	27,162	163.75	0.000
67.00	0.000	27,162	163.75	0.000
67.50	0.000	27,162	163.75	0.000
68.00	0.000	27,162	163.75	0.000
68.50	0.000	27,162	163.75	0.000
69.00	0.000	27,162	163.75	0.000
69.50	0.000	27,162	163.75	0.000
70.00	0.000	27,162	163.75	0.000
70.50	0.000	27,162	163.75	0.000
71.00	0.000	27,162	163.75	0.000
71.50	0.000	27,162	163.75	0.000
72.00	0.000	27,162	163.75	0.000
72.50	0.000	27,162	163.75	0.000
73.00	0.000	27,162	163.75	0.000
73.50	0.000	27,162	163.75	0.000
74.00	0.000	27,162	163.75	0.000
74.50	0.000	27,162	163.75	0.000
75.00	0.000	27,162	163.75	0.000
75.50	0.000	27,162	163.75	0.000
76.00	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	27,162	163.75	0.000
77.00	0.000	27,162	163.75	0.000
77.50	0.000	27,162	163.75	0.000
78.00	0.000	27,162	163.75	0.000
78.50	0.000	27,162	163.75	0.000
79.00	0.000	27,162	163.75	0.000
79.50	0.000	27,162	163.75	0.000
80.00	0.000	27,162	163.75	0.000
80.50	0.000	27,162	163.75	0.000
81.00	0.000	27,162	163.75	0.000
81.50	0.000	27,162	163.75	0.000
82.00	0.000	27,162	163.75	0.000
82.50	0.000	27,162	163.75	0.000
83.00	0.000	27,162	163.75	0.000
83.50	0.000	27,162	163.75	0.000
84.00	0.000	27,162	163.75	0.000
84.50	0.000	27,162	163.75	0.000
85.00	0.000	27,162	163.75	0.000
85.50	0.000	27,162	163.75	0.000
86.00	0.000	27,162	163.75	0.000
86.50	0.000	27,162	163.75	0.000
87.00	0.000	27,162	163.75	0.000
87.50	0.000	27,162	163.75	0.000
88.00	0.000	27,162	163.75	0.000
88.50	0.000	27,162	163.75	0.000
89.00	0.000	27,162	163.75	0.000
89.50	0.000	27,162	163.75	0.000
90.00	0.000	27,162	163.75	0.000
90.50	0.000	27,162	163.75	0.000
91.00	0.000	27,162	163.75	0.000
91.50	0.000	27,162	163.75	0.000
92.00	0.000	27,162	163.75	0.000
92.50	0.000	27,162	163.75	0.000
93.00	0.000	27,162	163.75	0.000
93.50	0.000	27,162	163.75	0.000
94.00	0.000	27,162	163.75	0.000
94.50	0.000	27,162	163.75	0.000
95.00	0.000	27,162	163.75	0.000
95.50	0.000	27,162	163.75	0.000
96.00	0.000	27,162	163.75	0.000
96.50	0.000	27,162	163.75	0.000
97.00	0.000	27,162	163.75	0.000
97.50	0.000	27,162	163.75	0.000
98.00	0.000	27,162	163.75	0.000
98.50	0.000	27,162	163.75	0.000
99.00	0.000	27,162	163.75	0.000
99.50	0.000	27,162	163.75	0.000
100.00	0.000	27,162	163.75	0.000
100.50	0.000	27,162	163.75	0.000
101.00	0.000	27,162	163.75	0.000
101.50	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	27,162	163.75	0.000
102.50	0.000	27,162	163.75	0.000
103.00	0.000	27,162	163.75	0.000
103.50	0.000	27,162	163.75	0.000
104.00	0.000	27,162	163.75	0.000
104.50	0.000	27,162	163.75	0.000
105.00	0.000	27,162	163.75	0.000
105.50	0.000	27,162	163.75	0.000
106.00	0.000	27,162	163.75	0.000
106.50	0.000	27,162	163.75	0.000
107.00	0.000	27,162	163.75	0.000
107.50	0.000	27,162	163.75	0.000
108.00	0.000	27,162	163.75	0.000
108.50	0.000	27,162	163.75	0.000
109.00	0.000	27,162	163.75	0.000
109.50	0.000	27,162	163.75	0.000
110.00	0.000	27,162	163.75	0.000
110.50	0.000	27,162	163.75	0.000
111.00	0.000	27,162	163.75	0.000
111.50	0.000	27,162	163.75	0.000
112.00	0.000	27,162	163.75	0.000
112.50	0.000	27,162	163.75	0.000
113.00	0.000	27,162	163.75	0.000
113.50	0.000	27,162	163.75	0.000
114.00	0.000	27,162	163.75	0.000
114.50	0.000	27,162	163.75	0.000
115.00	0.000	27,162	163.75	0.000
115.50	0.000	27,162	163.75	0.000
116.00	0.000	27,162	163.75	0.000
116.50	0.000	27,162	163.75	0.000
117.00	0.000	27,162	163.75	0.000
117.50	0.000	27,162	163.75	0.000
118.00	0.000	27,162	163.75	0.000
118.50	0.000	27,162	163.75	0.000
119.00	0.000	27,162	163.75	0.000
119.50	0.000	27,162	163.75	0.000
120.00	0.000	27,162	163.75	0.000
120.50	0.000	27,162	163.75	0.000
121.00	0.000	27,162	163.75	0.000
121.50	0.000	27,162	163.75	0.000
122.00	0.000	27,162	163.75	0.000
122.50	0.000	27,162	163.75	0.000
123.00	0.000	27,162	163.75	0.000
123.50	0.000	27,162	163.75	0.000
124.00	0.000	27,162	163.75	0.000
124.50	0.000	27,162	163.75	0.000
125.00	0.000	27,162	163.75	0.000
125.50	0.000	27,162	163.75	0.000
126.00	0.000	27,162	163.75	0.000
126.50	0.000	27,162	163.75	0.000
127.00	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	27,162	163.75	0.000
128.00	0.000	27,162	163.75	0.000
128.50	0.000	27,162	163.75	0.000
129.00	0.000	27,162	163.75	0.000
129.50	0.000	27,162	163.75	0.000
130.00	0.000	27,162	163.75	0.000
130.50	0.000	27,162	163.75	0.000
131.00	0.000	27,162	163.75	0.000
131.50	0.000	27,162	163.75	0.000
132.00	0.000	27,162	163.75	0.000
132.50	0.000	27,162	163.75	0.000
133.00	0.000	27,162	163.75	0.000
133.50	0.000	27,162	163.75	0.000
134.00	0.000	27,162	163.75	0.000
134.50	0.000	27,162	163.75	0.000
135.00	0.000	27,162	163.75	0.000
135.50	0.000	27,162	163.75	0.000
136.00	0.000	27,162	163.75	0.000
136.50	0.000	27,162	163.75	0.000
137.00	0.000	27,162	163.75	0.000
137.50	0.000	27,162	163.75	0.000
138.00	0.000	27,162	163.75	0.000
138.50	0.000	27,162	163.75	0.000
139.00	0.000	27,162	163.75	0.000
139.50	0.000	27,162	163.75	0.000
140.00	0.000	27,162	163.75	0.000
140.50	0.000	27,162	163.75	0.000
141.00	0.000	27,162	163.75	0.000
141.50	0.000	27,162	163.75	0.000
142.00	0.000	27,162	163.75	0.000
142.50	0.000	27,162	163.75	0.000
143.00	0.000	27,162	163.75	0.000
143.50	0.000	27,162	163.75	0.000
144.00	0.000	27,162	163.75	0.000
144.50	0.000	27,162	163.75	0.000
145.00	0.000	27,162	163.75	0.000
145.50	0.000	27,162	163.75	0.000
146.00	0.000	27,162	163.75	0.000
146.50	0.000	27,162	163.75	0.000
147.00	0.000	27,162	163.75	0.000
147.50	0.000	27,162	163.75	0.000
148.00	0.000	27,162	163.75	0.000
148.50	0.000	27,162	163.75	0.000
149.00	0.000	27,162	163.75	0.000
149.50	0.000	27,162	163.75	0.000
150.00	0.000	27,162	163.75	0.000
150.50	0.000	27,162	163.75	0.000
151.00	0.000	27,162	163.75	0.000
151.50	0.000	27,162	163.75	0.000
152.00	0.000	27,162	163.75	0.000
152.50	0.000	27,162	163.75	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	27,162	163.75	0.000
153.50	0.000	27,162	163.75	0.000
154.00	0.000	27,162	163.75	0.000
154.50	0.000	27,162	163.75	0.000
155.00	0.000	27,162	163.75	0.000
155.50	0.000	27,162	163.75	0.000
156.00	0.000	27,162	163.75	0.000
156.50	0.000	27,162	163.75	0.000
157.00	0.000	27,162	163.75	0.000
157.50	0.000	27,162	163.75	0.000
158.00	0.000	27,162	163.75	0.000
158.50	0.000	27,162	163.75	0.000
159.00	0.000	27,162	163.75	0.000
159.50	0.000	27,162	163.75	0.000
160.00	0.000	27,162	163.75	0.000
160.50	0.000	27,162	163.75	0.000
161.00	0.000	27,162	163.75	0.000
161.50	0.000	27,162	163.75	0.000
162.00	0.000	27,162	163.75	0.000
162.50	0.000	27,162	163.75	0.000
163.00	0.000	27,162	163.75	0.000
163.50	0.000	27,162	163.75	0.000
164.00	0.000	27,162	163.75	0.000
164.50	0.000	27,162	163.75	0.000
165.00	0.000	27,162	163.75	0.000
165.50	0.000	27,162	163.75	0.000
166.00	0.000	27,162	163.75	0.000
166.50	0.000	27,162	163.75	0.000
167.00	0.000	27,162	163.75	0.000
167.50	0.000	27,162	163.75	0.000
168.00	0.000	27,162	163.75	0.000

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 3.31" for 10-yr event
Inflow = 2.904 cfs @ 11.96 hrs, Volume= 5,921 cf
Outflow = 0.130 cfs @ 13.34 hrs, Volume= 1,687 cf, Atten= 96%, Lag= 82.9 min
Primary = 0.130 cfs @ 13.34 hrs, Volume= 1,687 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 163.81' @ 13.34 hrs Surf.Area= 2,542 sf Storage= 4,234 cf

Plug-Flow detention time= 376.2 min calculated for 1,687 cf (28% of inflow)
Center-of-Mass det. time= 241.2 min (1,042.9 - 801.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.484 cfs @ 13.34 hrs HW=163.81' TW=163.81' (Fixed TW Elev= 163.81')
└─**4=Culvert** (Inlet Controls 0.484 cfs @ 0.274 fps)
  ├─**1=Orifice/Grate** (Passes < 0.013 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 0.034 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 4.364 cfs potential flow)

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.000	0	159.28	0.000
4.50	0.000	0	159.28	0.000
5.00	0.000	0	159.28	0.000
5.50	0.001	0	159.28	0.000
6.00	0.003	3	159.28	0.000
6.50	0.005	10	159.29	0.000
7.00	0.007	21	159.30	0.000
7.50	0.010	37	159.32	0.000
8.00	0.013	58	159.34	0.000
8.50	0.018	85	159.36	0.000
9.00	0.025	124	159.40	0.000
9.50	0.030	174	159.45	0.000
10.00	0.040	236	159.51	0.000
10.50	0.058	324	159.60	0.000
11.00	0.090	455	159.73	0.000
11.50	**0.166**	679	159.86	0.000
12.00	**2.449**	2,802	160.88	0.000
12.50	0.222	3,777	161.54	0.000
13.00	0.140	**4,082**	**161.84**	**0.000**
13.50	0.106	**4,234**	**163.81**	**0.120**
14.00	0.084	4,234	163.81	0.097
14.50	0.074	4,234	163.81	0.088
15.00	0.067	4,234	163.81	0.081
15.50	0.059	4,234	163.81	0.073
16.00	0.052	4,234	163.81	0.065
16.50	0.048	4,234	163.81	0.062
17.00	0.046	4,234	163.81	0.059
17.50	0.043	4,234	163.81	0.057
18.00	0.040	4,234	163.81	0.054
18.50	0.037	4,234	163.81	0.051
19.00	0.035	4,234	163.81	0.049
19.50	0.032	4,234	163.81	0.046
20.00	0.029	4,234	163.81	0.043
20.50	0.028	4,234	163.81	0.042
21.00	0.028	4,234	163.81	0.042
21.50	0.027	4,234	163.81	0.041
22.00	0.027	4,234	163.81	0.041
22.50	0.026	4,234	163.81	0.040
23.00	0.026	4,234	163.81	0.040
23.50	0.025	4,234	163.81	0.039
24.00	0.025	4,234	163.81	0.038
24.50	0.000	4,234	163.76	0.000
25.00	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	4,234	163.76	0.000
26.00	0.000	4,234	163.76	0.000
26.50	0.000	4,234	163.76	0.000
27.00	0.000	4,234	163.76	0.000
27.50	0.000	4,234	163.76	0.000
28.00	0.000	4,234	163.76	0.000
28.50	0.000	4,234	163.76	0.000
29.00	0.000	4,234	163.76	0.000
29.50	0.000	4,234	163.76	0.000
30.00	0.000	4,234	163.76	0.000
30.50	0.000	4,234	163.76	0.000
31.00	0.000	4,234	163.76	0.000
31.50	0.000	4,234	163.76	0.000
32.00	0.000	4,234	163.76	0.000
32.50	0.000	4,234	163.76	0.000
33.00	0.000	4,234	163.76	0.000
33.50	0.000	4,234	163.76	0.000
34.00	0.000	4,234	163.76	0.000
34.50	0.000	4,234	163.76	0.000
35.00	0.000	4,234	163.76	0.000
35.50	0.000	4,234	163.76	0.000
36.00	0.000	4,234	163.76	0.000
36.50	0.000	4,234	163.76	0.000
37.00	0.000	4,234	163.76	0.000
37.50	0.000	4,234	163.76	0.000
38.00	0.000	4,234	163.76	0.000
38.50	0.000	4,234	163.76	0.000
39.00	0.000	4,234	163.76	0.000
39.50	0.000	4,234	163.76	0.000
40.00	0.000	4,234	163.76	0.000
40.50	0.000	4,234	163.76	0.000
41.00	0.000	4,234	163.76	0.000
41.50	0.000	4,234	163.76	0.000
42.00	0.000	4,234	163.76	0.000
42.50	0.000	4,234	163.76	0.000
43.00	0.000	4,234	163.76	0.000
43.50	0.000	4,234	163.76	0.000
44.00	0.000	4,234	163.76	0.000
44.50	0.000	4,234	163.76	0.000
45.00	0.000	4,234	163.76	0.000
45.50	0.000	4,234	163.76	0.000
46.00	0.000	4,234	163.76	0.000
46.50	0.000	4,234	163.76	0.000
47.00	0.000	4,234	163.76	0.000
47.50	0.000	4,234	163.76	0.000
48.00	0.000	4,234	163.76	0.000
48.50	0.000	4,234	163.76	0.000
49.00	0.000	4,234	163.76	0.000
49.50	0.000	4,234	163.76	0.000
50.00	0.000	4,234	163.76	0.000
50.50	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,234	163.76	0.000
51.50	0.000	4,234	163.76	0.000
52.00	0.000	4,234	163.76	0.000
52.50	0.000	4,234	163.76	0.000
53.00	0.000	4,234	163.76	0.000
53.50	0.000	4,234	163.76	0.000
54.00	0.000	4,234	163.76	0.000
54.50	0.000	4,234	163.76	0.000
55.00	0.000	4,234	163.76	0.000
55.50	0.000	4,234	163.76	0.000
56.00	0.000	4,234	163.76	0.000
56.50	0.000	4,234	163.76	0.000
57.00	0.000	4,234	163.76	0.000
57.50	0.000	4,234	163.76	0.000
58.00	0.000	4,234	163.76	0.000
58.50	0.000	4,234	163.76	0.000
59.00	0.000	4,234	163.76	0.000
59.50	0.000	4,234	163.76	0.000
60.00	0.000	4,234	163.76	0.000
60.50	0.000	4,234	163.76	0.000
61.00	0.000	4,234	163.76	0.000
61.50	0.000	4,234	163.76	0.000
62.00	0.000	4,234	163.76	0.000
62.50	0.000	4,234	163.76	0.000
63.00	0.000	4,234	163.76	0.000
63.50	0.000	4,234	163.76	0.000
64.00	0.000	4,234	163.76	0.000
64.50	0.000	4,234	163.76	0.000
65.00	0.000	4,234	163.76	0.000
65.50	0.000	4,234	163.76	0.000
66.00	0.000	4,234	163.76	0.000
66.50	0.000	4,234	163.76	0.000
67.00	0.000	4,234	163.76	0.000
67.50	0.000	4,234	163.76	0.000
68.00	0.000	4,234	163.76	0.000
68.50	0.000	4,234	163.76	0.000
69.00	0.000	4,234	163.76	0.000
69.50	0.000	4,234	163.76	0.000
70.00	0.000	4,234	163.76	0.000
70.50	0.000	4,234	163.76	0.000
71.00	0.000	4,234	163.76	0.000
71.50	0.000	4,234	163.76	0.000
72.00	0.000	4,234	163.76	0.000
72.50	0.000	4,234	163.76	0.000
73.00	0.000	4,234	163.76	0.000
73.50	0.000	4,234	163.76	0.000
74.00	0.000	4,234	163.76	0.000
74.50	0.000	4,234	163.76	0.000
75.00	0.000	4,234	163.76	0.000
75.50	0.000	4,234	163.76	0.000
76.00	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	4,234	163.76	0.000
77.00	0.000	4,234	163.76	0.000
77.50	0.000	4,234	163.76	0.000
78.00	0.000	4,234	163.76	0.000
78.50	0.000	4,234	163.76	0.000
79.00	0.000	4,234	163.76	0.000
79.50	0.000	4,234	163.76	0.000
80.00	0.000	4,234	163.76	0.000
80.50	0.000	4,234	163.76	0.000
81.00	0.000	4,234	163.76	0.000
81.50	0.000	4,234	163.76	0.000
82.00	0.000	4,234	163.76	0.000
82.50	0.000	4,234	163.76	0.000
83.00	0.000	4,234	163.76	0.000
83.50	0.000	4,234	163.76	0.000
84.00	0.000	4,234	163.76	0.000
84.50	0.000	4,234	163.76	0.000
85.00	0.000	4,234	163.76	0.000
85.50	0.000	4,234	163.76	0.000
86.00	0.000	4,234	163.76	0.000
86.50	0.000	4,234	163.76	0.000
87.00	0.000	4,234	163.76	0.000
87.50	0.000	4,234	163.76	0.000
88.00	0.000	4,234	163.76	0.000
88.50	0.000	4,234	163.76	0.000
89.00	0.000	4,234	163.76	0.000
89.50	0.000	4,234	163.76	0.000
90.00	0.000	4,234	163.76	0.000
90.50	0.000	4,234	163.76	0.000
91.00	0.000	4,234	163.76	0.000
91.50	0.000	4,234	163.76	0.000
92.00	0.000	4,234	163.76	0.000
92.50	0.000	4,234	163.76	0.000
93.00	0.000	4,234	163.76	0.000
93.50	0.000	4,234	163.76	0.000
94.00	0.000	4,234	163.76	0.000
94.50	0.000	4,234	163.76	0.000
95.00	0.000	4,234	163.76	0.000
95.50	0.000	4,234	163.76	0.000
96.00	0.000	4,234	163.76	0.000
96.50	0.000	4,234	163.76	0.000
97.00	0.000	4,234	163.76	0.000
97.50	0.000	4,234	163.76	0.000
98.00	0.000	4,234	163.76	0.000
98.50	0.000	4,234	163.76	0.000
99.00	0.000	4,234	163.76	0.000
99.50	0.000	4,234	163.76	0.000
100.00	0.000	4,234	163.76	0.000
100.50	0.000	4,234	163.76	0.000
101.00	0.000	4,234	163.76	0.000
101.50	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

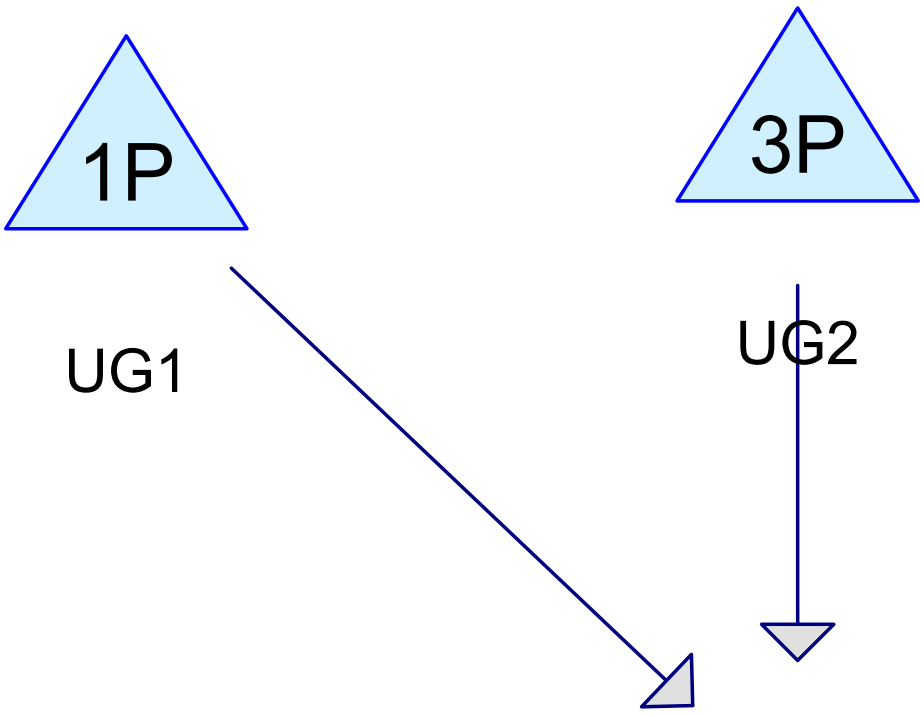
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	4,234	163.76	0.000
102.50	0.000	4,234	163.76	0.000
103.00	0.000	4,234	163.76	0.000
103.50	0.000	4,234	163.76	0.000
104.00	0.000	4,234	163.76	0.000
104.50	0.000	4,234	163.76	0.000
105.00	0.000	4,234	163.76	0.000
105.50	0.000	4,234	163.76	0.000
106.00	0.000	4,234	163.76	0.000
106.50	0.000	4,234	163.76	0.000
107.00	0.000	4,234	163.76	0.000
107.50	0.000	4,234	163.76	0.000
108.00	0.000	4,234	163.76	0.000
108.50	0.000	4,234	163.76	0.000
109.00	0.000	4,234	163.76	0.000
109.50	0.000	4,234	163.76	0.000
110.00	0.000	4,234	163.76	0.000
110.50	0.000	4,234	163.76	0.000
111.00	0.000	4,234	163.76	0.000
111.50	0.000	4,234	163.76	0.000
112.00	0.000	4,234	163.76	0.000
112.50	0.000	4,234	163.76	0.000
113.00	0.000	4,234	163.76	0.000
113.50	0.000	4,234	163.76	0.000
114.00	0.000	4,234	163.76	0.000
114.50	0.000	4,234	163.76	0.000
115.00	0.000	4,234	163.76	0.000
115.50	0.000	4,234	163.76	0.000
116.00	0.000	4,234	163.76	0.000
116.50	0.000	4,234	163.76	0.000
117.00	0.000	4,234	163.76	0.000
117.50	0.000	4,234	163.76	0.000
118.00	0.000	4,234	163.76	0.000
118.50	0.000	4,234	163.76	0.000
119.00	0.000	4,234	163.76	0.000
119.50	0.000	4,234	163.76	0.000
120.00	0.000	4,234	163.76	0.000
120.50	0.000	4,234	163.76	0.000
121.00	0.000	4,234	163.76	0.000
121.50	0.000	4,234	163.76	0.000
122.00	0.000	4,234	163.76	0.000
122.50	0.000	4,234	163.76	0.000
123.00	0.000	4,234	163.76	0.000
123.50	0.000	4,234	163.76	0.000
124.00	0.000	4,234	163.76	0.000
124.50	0.000	4,234	163.76	0.000
125.00	0.000	4,234	163.76	0.000
125.50	0.000	4,234	163.76	0.000
126.00	0.000	4,234	163.76	0.000
126.50	0.000	4,234	163.76	0.000
127.00	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	4,234	163.76	0.000
128.00	0.000	4,234	163.76	0.000
128.50	0.000	4,234	163.76	0.000
129.00	0.000	4,234	163.76	0.000
129.50	0.000	4,234	163.76	0.000
130.00	0.000	4,234	163.76	0.000
130.50	0.000	4,234	163.76	0.000
131.00	0.000	4,234	163.76	0.000
131.50	0.000	4,234	163.76	0.000
132.00	0.000	4,234	163.76	0.000
132.50	0.000	4,234	163.76	0.000
133.00	0.000	4,234	163.76	0.000
133.50	0.000	4,234	163.76	0.000
134.00	0.000	4,234	163.76	0.000
134.50	0.000	4,234	163.76	0.000
135.00	0.000	4,234	163.76	0.000
135.50	0.000	4,234	163.76	0.000
136.00	0.000	4,234	163.76	0.000
136.50	0.000	4,234	163.76	0.000
137.00	0.000	4,234	163.76	0.000
137.50	0.000	4,234	163.76	0.000
138.00	0.000	4,234	163.76	0.000
138.50	0.000	4,234	163.76	0.000
139.00	0.000	4,234	163.76	0.000
139.50	0.000	4,234	163.76	0.000
140.00	0.000	4,234	163.76	0.000
140.50	0.000	4,234	163.76	0.000
141.00	0.000	4,234	163.76	0.000
141.50	0.000	4,234	163.76	0.000
142.00	0.000	4,234	163.76	0.000
142.50	0.000	4,234	163.76	0.000
143.00	0.000	4,234	163.76	0.000
143.50	0.000	4,234	163.76	0.000
144.00	0.000	4,234	163.76	0.000
144.50	0.000	4,234	163.76	0.000
145.00	0.000	4,234	163.76	0.000
145.50	0.000	4,234	163.76	0.000
146.00	0.000	4,234	163.76	0.000
146.50	0.000	4,234	163.76	0.000
147.00	0.000	4,234	163.76	0.000
147.50	0.000	4,234	163.76	0.000
148.00	0.000	4,234	163.76	0.000
148.50	0.000	4,234	163.76	0.000
149.00	0.000	4,234	163.76	0.000
149.50	0.000	4,234	163.76	0.000
150.00	0.000	4,234	163.76	0.000
150.50	0.000	4,234	163.76	0.000
151.00	0.000	4,234	163.76	0.000
151.50	0.000	4,234	163.76	0.000
152.00	0.000	4,234	163.76	0.000
152.50	0.000	4,234	163.76	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	4,234	163.76	0.000
153.50	0.000	4,234	163.76	0.000
154.00	0.000	4,234	163.76	0.000
154.50	0.000	4,234	163.76	0.000
155.00	0.000	4,234	163.76	0.000
155.50	0.000	4,234	163.76	0.000
156.00	0.000	4,234	163.76	0.000
156.50	0.000	4,234	163.76	0.000
157.00	0.000	4,234	163.76	0.000
157.50	0.000	4,234	163.76	0.000
158.00	0.000	4,234	163.76	0.000
158.50	0.000	4,234	163.76	0.000
159.00	0.000	4,234	163.76	0.000
159.50	0.000	4,234	163.76	0.000
160.00	0.000	4,234	163.76	0.000
160.50	0.000	4,234	163.76	0.000
161.00	0.000	4,234	163.76	0.000
161.50	0.000	4,234	163.76	0.000
162.00	0.000	4,234	163.76	0.000
162.50	0.000	4,234	163.76	0.000
163.00	0.000	4,234	163.76	0.000
163.50	0.000	4,234	163.76	0.000
164.00	0.000	4,234	163.76	0.000
164.50	0.000	4,234	163.76	0.000
165.00	0.000	4,234	163.76	0.000
165.50	0.000	4,234	163.76	0.000
166.00	0.000	4,234	163.76	0.000
166.50	0.000	4,234	163.76	0.000
167.00	0.000	4,234	163.76	0.000
167.50	0.000	4,234	163.76	0.000
168.00	0.000	4,234	163.76	0.000



Subcat Reach Pond Link

Routing Diagram for BMW_2025-7-24_2
Prepared by Bohler, Printed 7/24/2025
HydroCAD® 10.20-5c s/n 03478 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	50-yr	Type II 24-hr		Default	24.00	1	6.73	2

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 6.25" for 50-yr event
Inflow = 18.946 cfs @ 11.96 hrs, Volume= 43,774 cf
Outflow = 8.232 cfs @ 12.06 hrs, Volume= 16,633 cf, Atten= 57%, Lag= 6.4 min
Primary = 8.232 cfs @ 12.06 hrs, Volume= 16,633 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 169.63' @ 12.06 hrs Surf.Area= 13,041 sf Storage= 27,162 cf

Plug-Flow detention time= 327.1 min calculated for 16,632 cf (38% of inflow)
Center-of-Mass det. time= 174.4 min (925.3 - 750.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=7.455 cfs @ 12.06 hrs HW=168.72' TW=167.66' (Fixed TW Elev= 167.66')
└─**4=Culvert** (Outlet Controls 7.455 cfs @ 4.219 fps)
  ├─**1=Orifice/Grate** (Passes < 0.027 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 3.857 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 170.562 cfs potential flow)

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.013	6	157.53	0.000
2.00	0.036	51	157.54	0.000
2.50	0.057	134	157.56	0.000
3.00	0.075	253	157.58	0.000
3.50	0.092	403	157.61	0.000
4.00	0.107	583	157.64	0.000
4.50	0.125	791	157.68	0.000
5.00	0.143	1,032	157.73	0.000
5.50	0.161	1,306	157.78	0.000
6.00	0.179	1,612	157.84	0.000
6.50	0.196	1,950	157.90	0.000
7.00	0.214	2,319	157.97	0.000
7.50	0.230	2,719	158.04	0.000
8.00	0.247	3,149	158.08	0.000
8.50	0.302	3,638	158.12	0.000
9.00	0.367	4,240	158.17	0.000
9.50	0.382	4,921	158.23	0.000
10.00	0.470	5,677	158.29	0.000
10.50	0.616	6,648	158.38	0.000
11.00	0.857	7,961	158.49	0.000
11.50	**1.419**	9,968	158.67	0.000
12.00	**15.649**	**24,903**	**160.31**	**0.000**
12.50	1.360	**27,162**	**167.79**	**2.582**
13.00	0.846	27,162	167.73	1.698
13.50	0.640	27,162	167.72	1.283
14.00	0.502	27,162	167.70	1.006
14.50	0.443	27,162	167.70	0.887
15.00	0.398	27,162	167.70	0.796
15.50	0.352	27,162	167.69	0.705
16.00	0.307	27,162	167.69	0.614
16.50	0.286	27,162	167.69	0.572
17.00	0.270	27,162	167.68	0.539
17.50	0.253	27,162	167.68	0.507
18.00	0.237	27,162	167.68	0.474
18.50	0.221	27,162	167.68	0.442
19.00	0.204	27,162	167.68	0.409
19.50	0.188	27,162	167.68	0.377
20.00	0.172	27,162	167.68	0.344
20.50	0.167	27,162	167.67	0.333
21.00	0.163	27,162	167.67	0.327
21.50	0.160	27,162	167.67	0.320
22.00	0.157	27,162	167.67	0.314
22.50	0.154	27,162	167.67	0.307
23.00	0.150	27,162	167.67	0.301
23.50	0.147	27,162	167.67	0.294
24.00	0.144	27,162	167.67	0.288
24.50	0.000	27,162	167.56	0.000
25.00	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	27,162	167.56	0.000
26.00	0.000	27,162	167.56	0.000
26.50	0.000	27,162	167.56	0.000
27.00	0.000	27,162	167.56	0.000
27.50	0.000	27,162	167.56	0.000
28.00	0.000	27,162	167.56	0.000
28.50	0.000	27,162	167.56	0.000
29.00	0.000	27,162	167.56	0.000
29.50	0.000	27,162	167.56	0.000
30.00	0.000	27,162	167.56	0.000
30.50	0.000	27,162	167.56	0.000
31.00	0.000	27,162	167.56	0.000
31.50	0.000	27,162	167.56	0.000
32.00	0.000	27,162	167.56	0.000
32.50	0.000	27,162	167.56	0.000
33.00	0.000	27,162	167.56	0.000
33.50	0.000	27,162	167.56	0.000
34.00	0.000	27,162	167.56	0.000
34.50	0.000	27,162	167.56	0.000
35.00	0.000	27,162	167.56	0.000
35.50	0.000	27,162	167.56	0.000
36.00	0.000	27,162	167.56	0.000
36.50	0.000	27,162	167.56	0.000
37.00	0.000	27,162	167.56	0.000
37.50	0.000	27,162	167.56	0.000
38.00	0.000	27,162	167.56	0.000
38.50	0.000	27,162	167.56	0.000
39.00	0.000	27,162	167.56	0.000
39.50	0.000	27,162	167.56	0.000
40.00	0.000	27,162	167.56	0.000
40.50	0.000	27,162	167.56	0.000
41.00	0.000	27,162	167.56	0.000
41.50	0.000	27,162	167.56	0.000
42.00	0.000	27,162	167.56	0.000
42.50	0.000	27,162	167.56	0.000
43.00	0.000	27,162	167.56	0.000
43.50	0.000	27,162	167.56	0.000
44.00	0.000	27,162	167.56	0.000
44.50	0.000	27,162	167.56	0.000
45.00	0.000	27,162	167.56	0.000
45.50	0.000	27,162	167.56	0.000
46.00	0.000	27,162	167.56	0.000
46.50	0.000	27,162	167.56	0.000
47.00	0.000	27,162	167.56	0.000
47.50	0.000	27,162	167.56	0.000
48.00	0.000	27,162	167.56	0.000
48.50	0.000	27,162	167.56	0.000
49.00	0.000	27,162	167.56	0.000
49.50	0.000	27,162	167.56	0.000
50.00	0.000	27,162	167.56	0.000
50.50	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	27,162	167.56	0.000
51.50	0.000	27,162	167.56	0.000
52.00	0.000	27,162	167.56	0.000
52.50	0.000	27,162	167.56	0.000
53.00	0.000	27,162	167.56	0.000
53.50	0.000	27,162	167.56	0.000
54.00	0.000	27,162	167.56	0.000
54.50	0.000	27,162	167.56	0.000
55.00	0.000	27,162	167.56	0.000
55.50	0.000	27,162	167.56	0.000
56.00	0.000	27,162	167.56	0.000
56.50	0.000	27,162	167.56	0.000
57.00	0.000	27,162	167.56	0.000
57.50	0.000	27,162	167.56	0.000
58.00	0.000	27,162	167.56	0.000
58.50	0.000	27,162	167.56	0.000
59.00	0.000	27,162	167.56	0.000
59.50	0.000	27,162	167.56	0.000
60.00	0.000	27,162	167.56	0.000
60.50	0.000	27,162	167.56	0.000
61.00	0.000	27,162	167.56	0.000
61.50	0.000	27,162	167.56	0.000
62.00	0.000	27,162	167.56	0.000
62.50	0.000	27,162	167.56	0.000
63.00	0.000	27,162	167.56	0.000
63.50	0.000	27,162	167.56	0.000
64.00	0.000	27,162	167.56	0.000
64.50	0.000	27,162	167.56	0.000
65.00	0.000	27,162	167.56	0.000
65.50	0.000	27,162	167.56	0.000
66.00	0.000	27,162	167.56	0.000
66.50	0.000	27,162	167.56	0.000
67.00	0.000	27,162	167.56	0.000
67.50	0.000	27,162	167.56	0.000
68.00	0.000	27,162	167.56	0.000
68.50	0.000	27,162	167.56	0.000
69.00	0.000	27,162	167.56	0.000
69.50	0.000	27,162	167.56	0.000
70.00	0.000	27,162	167.56	0.000
70.50	0.000	27,162	167.56	0.000
71.00	0.000	27,162	167.56	0.000
71.50	0.000	27,162	167.56	0.000
72.00	0.000	27,162	167.56	0.000
72.50	0.000	27,162	167.56	0.000
73.00	0.000	27,162	167.56	0.000
73.50	0.000	27,162	167.56	0.000
74.00	0.000	27,162	167.56	0.000
74.50	0.000	27,162	167.56	0.000
75.00	0.000	27,162	167.56	0.000
75.50	0.000	27,162	167.56	0.000
76.00	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	27,162	167.56	0.000
77.00	0.000	27,162	167.56	0.000
77.50	0.000	27,162	167.56	0.000
78.00	0.000	27,162	167.56	0.000
78.50	0.000	27,162	167.56	0.000
79.00	0.000	27,162	167.56	0.000
79.50	0.000	27,162	167.56	0.000
80.00	0.000	27,162	167.56	0.000
80.50	0.000	27,162	167.56	0.000
81.00	0.000	27,162	167.56	0.000
81.50	0.000	27,162	167.56	0.000
82.00	0.000	27,162	167.56	0.000
82.50	0.000	27,162	167.56	0.000
83.00	0.000	27,162	167.56	0.000
83.50	0.000	27,162	167.56	0.000
84.00	0.000	27,162	167.56	0.000
84.50	0.000	27,162	167.56	0.000
85.00	0.000	27,162	167.56	0.000
85.50	0.000	27,162	167.56	0.000
86.00	0.000	27,162	167.56	0.000
86.50	0.000	27,162	167.56	0.000
87.00	0.000	27,162	167.56	0.000
87.50	0.000	27,162	167.56	0.000
88.00	0.000	27,162	167.56	0.000
88.50	0.000	27,162	167.56	0.000
89.00	0.000	27,162	167.56	0.000
89.50	0.000	27,162	167.56	0.000
90.00	0.000	27,162	167.56	0.000
90.50	0.000	27,162	167.56	0.000
91.00	0.000	27,162	167.56	0.000
91.50	0.000	27,162	167.56	0.000
92.00	0.000	27,162	167.56	0.000
92.50	0.000	27,162	167.56	0.000
93.00	0.000	27,162	167.56	0.000
93.50	0.000	27,162	167.56	0.000
94.00	0.000	27,162	167.56	0.000
94.50	0.000	27,162	167.56	0.000
95.00	0.000	27,162	167.56	0.000
95.50	0.000	27,162	167.56	0.000
96.00	0.000	27,162	167.56	0.000
96.50	0.000	27,162	167.56	0.000
97.00	0.000	27,162	167.56	0.000
97.50	0.000	27,162	167.56	0.000
98.00	0.000	27,162	167.56	0.000
98.50	0.000	27,162	167.56	0.000
99.00	0.000	27,162	167.56	0.000
99.50	0.000	27,162	167.56	0.000
100.00	0.000	27,162	167.56	0.000
100.50	0.000	27,162	167.56	0.000
101.00	0.000	27,162	167.56	0.000
101.50	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	27,162	167.56	0.000
102.50	0.000	27,162	167.56	0.000
103.00	0.000	27,162	167.56	0.000
103.50	0.000	27,162	167.56	0.000
104.00	0.000	27,162	167.56	0.000
104.50	0.000	27,162	167.56	0.000
105.00	0.000	27,162	167.56	0.000
105.50	0.000	27,162	167.56	0.000
106.00	0.000	27,162	167.56	0.000
106.50	0.000	27,162	167.56	0.000
107.00	0.000	27,162	167.56	0.000
107.50	0.000	27,162	167.56	0.000
108.00	0.000	27,162	167.56	0.000
108.50	0.000	27,162	167.56	0.000
109.00	0.000	27,162	167.56	0.000
109.50	0.000	27,162	167.56	0.000
110.00	0.000	27,162	167.56	0.000
110.50	0.000	27,162	167.56	0.000
111.00	0.000	27,162	167.56	0.000
111.50	0.000	27,162	167.56	0.000
112.00	0.000	27,162	167.56	0.000
112.50	0.000	27,162	167.56	0.000
113.00	0.000	27,162	167.56	0.000
113.50	0.000	27,162	167.56	0.000
114.00	0.000	27,162	167.56	0.000
114.50	0.000	27,162	167.56	0.000
115.00	0.000	27,162	167.56	0.000
115.50	0.000	27,162	167.56	0.000
116.00	0.000	27,162	167.56	0.000
116.50	0.000	27,162	167.56	0.000
117.00	0.000	27,162	167.56	0.000
117.50	0.000	27,162	167.56	0.000
118.00	0.000	27,162	167.56	0.000
118.50	0.000	27,162	167.56	0.000
119.00	0.000	27,162	167.56	0.000
119.50	0.000	27,162	167.56	0.000
120.00	0.000	27,162	167.56	0.000
120.50	0.000	27,162	167.56	0.000
121.00	0.000	27,162	167.56	0.000
121.50	0.000	27,162	167.56	0.000
122.00	0.000	27,162	167.56	0.000
122.50	0.000	27,162	167.56	0.000
123.00	0.000	27,162	167.56	0.000
123.50	0.000	27,162	167.56	0.000
124.00	0.000	27,162	167.56	0.000
124.50	0.000	27,162	167.56	0.000
125.00	0.000	27,162	167.56	0.000
125.50	0.000	27,162	167.56	0.000
126.00	0.000	27,162	167.56	0.000
126.50	0.000	27,162	167.56	0.000
127.00	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	27,162	167.56	0.000
128.00	0.000	27,162	167.56	0.000
128.50	0.000	27,162	167.56	0.000
129.00	0.000	27,162	167.56	0.000
129.50	0.000	27,162	167.56	0.000
130.00	0.000	27,162	167.56	0.000
130.50	0.000	27,162	167.56	0.000
131.00	0.000	27,162	167.56	0.000
131.50	0.000	27,162	167.56	0.000
132.00	0.000	27,162	167.56	0.000
132.50	0.000	27,162	167.56	0.000
133.00	0.000	27,162	167.56	0.000
133.50	0.000	27,162	167.56	0.000
134.00	0.000	27,162	167.56	0.000
134.50	0.000	27,162	167.56	0.000
135.00	0.000	27,162	167.56	0.000
135.50	0.000	27,162	167.56	0.000
136.00	0.000	27,162	167.56	0.000
136.50	0.000	27,162	167.56	0.000
137.00	0.000	27,162	167.56	0.000
137.50	0.000	27,162	167.56	0.000
138.00	0.000	27,162	167.56	0.000
138.50	0.000	27,162	167.56	0.000
139.00	0.000	27,162	167.56	0.000
139.50	0.000	27,162	167.56	0.000
140.00	0.000	27,162	167.56	0.000
140.50	0.000	27,162	167.56	0.000
141.00	0.000	27,162	167.56	0.000
141.50	0.000	27,162	167.56	0.000
142.00	0.000	27,162	167.56	0.000
142.50	0.000	27,162	167.56	0.000
143.00	0.000	27,162	167.56	0.000
143.50	0.000	27,162	167.56	0.000
144.00	0.000	27,162	167.56	0.000
144.50	0.000	27,162	167.56	0.000
145.00	0.000	27,162	167.56	0.000
145.50	0.000	27,162	167.56	0.000
146.00	0.000	27,162	167.56	0.000
146.50	0.000	27,162	167.56	0.000
147.00	0.000	27,162	167.56	0.000
147.50	0.000	27,162	167.56	0.000
148.00	0.000	27,162	167.56	0.000
148.50	0.000	27,162	167.56	0.000
149.00	0.000	27,162	167.56	0.000
149.50	0.000	27,162	167.56	0.000
150.00	0.000	27,162	167.56	0.000
150.50	0.000	27,162	167.56	0.000
151.00	0.000	27,162	167.56	0.000
151.50	0.000	27,162	167.56	0.000
152.00	0.000	27,162	167.56	0.000
152.50	0.000	27,162	167.56	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	27,162	167.56	0.000
153.50	0.000	27,162	167.56	0.000
154.00	0.000	27,162	167.56	0.000
154.50	0.000	27,162	167.56	0.000
155.00	0.000	27,162	167.56	0.000
155.50	0.000	27,162	167.56	0.000
156.00	0.000	27,162	167.56	0.000
156.50	0.000	27,162	167.56	0.000
157.00	0.000	27,162	167.56	0.000
157.50	0.000	27,162	167.56	0.000
158.00	0.000	27,162	167.56	0.000
158.50	0.000	27,162	167.56	0.000
159.00	0.000	27,162	167.56	0.000
159.50	0.000	27,162	167.56	0.000
160.00	0.000	27,162	167.56	0.000
160.50	0.000	27,162	167.56	0.000
161.00	0.000	27,162	167.56	0.000
161.50	0.000	27,162	167.56	0.000
162.00	0.000	27,162	167.56	0.000
162.50	0.000	27,162	167.56	0.000
163.00	0.000	27,162	167.56	0.000
163.50	0.000	27,162	167.56	0.000
164.00	0.000	27,162	167.56	0.000
164.50	0.000	27,162	167.56	0.000
165.00	0.000	27,162	167.56	0.000
165.50	0.000	27,162	167.56	0.000
166.00	0.000	27,162	167.56	0.000
166.50	0.000	27,162	167.56	0.000
167.00	0.000	27,162	167.56	0.000
167.50	0.000	27,162	167.56	0.000
168.00	0.000	27,162	167.56	0.000

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 5.11" for 50-yr event
Inflow = 4.363 cfs @ 11.96 hrs, Volume= 9,138 cf
Outflow = 4.582 cfs @ 11.98 hrs, Volume= 4,905 cf, Atten= 0%, Lag= 1.6 min
Primary = 4.582 cfs @ 11.98 hrs, Volume= 4,905 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 167.90' @ 11.98 hrs Surf.Area= 2,542 sf Storage= 4,234 cf

Plug-Flow detention time= 210.6 min calculated for 4,905 cf (54% of inflow)
Center-of-Mass det. time= 100.6 min (890.1 - 789.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=4.063 cfs @ 11.98 hrs HW=167.89' TW=167.66' (Fixed TW Elev= 167.66')
└─**4=Culvert** (Inlet Controls 4.063 cfs @ 2.299 fps)
  ├─**1=Orifice/Grate** (Passes < 0.113 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 0.287 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 69.442 cfs potential flow)

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.000	0	159.28	0.000
4.50	0.002	2	159.28	0.000
5.00	0.005	8	159.29	0.000
5.50	0.009	21	159.30	0.000
6.00	0.013	40	159.32	0.000
6.50	0.016	67	159.35	0.000
7.00	0.021	100	159.38	0.000
7.50	0.025	140	159.42	0.000
8.00	0.029	189	159.47	0.000
8.50	0.039	249	159.52	0.000
9.00	0.051	330	159.60	0.000
9.50	0.057	428	159.70	0.000
10.00	0.075	545	159.80	0.000
10.50	0.104	704	159.87	0.000
11.00	0.155	935	159.97	0.000
11.50	**0.276**	**1,312**	**160.15**	**0.000**
12.00	**3.650**	**4,234**	**167.84**	**3.625**
12.50	0.326	4,234	167.67	0.301
13.00	0.204	4,234	167.67	0.179
13.50	0.155	4,234	167.66	0.130
14.00	0.122	4,234	167.66	0.097
14.50	0.108	4,234	167.66	0.083
15.00	0.097	4,234	167.66	0.072
15.50	0.086	4,234	167.66	0.061
16.00	0.075	4,234	167.66	0.050
16.50	0.070	4,234	167.66	0.045
17.00	0.066	4,234	167.66	0.041
17.50	0.062	4,234	167.66	0.037
18.00	0.058	4,234	167.66	0.034
18.50	0.054	4,234	167.66	0.030
19.00	0.050	4,234	167.66	0.026
19.50	0.046	4,234	167.66	0.022
20.00	0.042	4,234	167.66	0.018
20.50	0.041	4,234	167.66	0.016
21.00	0.040	4,234	167.66	0.016
21.50	0.039	4,234	167.66	0.015
22.00	0.039	4,234	167.66	0.014
22.50	0.038	4,234	167.66	0.013
23.00	0.037	4,234	167.66	0.013
23.50	0.036	4,234	167.66	0.012
24.00	0.035	4,234	167.66	0.011
24.50	0.000	4,234	167.58	0.000
25.00	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	4,234	167.58	0.000
26.00	0.000	4,234	167.58	0.000
26.50	0.000	4,234	167.58	0.000
27.00	0.000	4,234	167.58	0.000
27.50	0.000	4,234	167.58	0.000
28.00	0.000	4,234	167.58	0.000
28.50	0.000	4,234	167.58	0.000
29.00	0.000	4,234	167.58	0.000
29.50	0.000	4,234	167.58	0.000
30.00	0.000	4,234	167.58	0.000
30.50	0.000	4,234	167.58	0.000
31.00	0.000	4,234	167.58	0.000
31.50	0.000	4,234	167.58	0.000
32.00	0.000	4,234	167.58	0.000
32.50	0.000	4,234	167.58	0.000
33.00	0.000	4,234	167.58	0.000
33.50	0.000	4,234	167.58	0.000
34.00	0.000	4,234	167.58	0.000
34.50	0.000	4,234	167.58	0.000
35.00	0.000	4,234	167.58	0.000
35.50	0.000	4,234	167.58	0.000
36.00	0.000	4,234	167.58	0.000
36.50	0.000	4,234	167.58	0.000
37.00	0.000	4,234	167.58	0.000
37.50	0.000	4,234	167.58	0.000
38.00	0.000	4,234	167.58	0.000
38.50	0.000	4,234	167.58	0.000
39.00	0.000	4,234	167.58	0.000
39.50	0.000	4,234	167.58	0.000
40.00	0.000	4,234	167.58	0.000
40.50	0.000	4,234	167.58	0.000
41.00	0.000	4,234	167.58	0.000
41.50	0.000	4,234	167.58	0.000
42.00	0.000	4,234	167.58	0.000
42.50	0.000	4,234	167.58	0.000
43.00	0.000	4,234	167.58	0.000
43.50	0.000	4,234	167.58	0.000
44.00	0.000	4,234	167.58	0.000
44.50	0.000	4,234	167.58	0.000
45.00	0.000	4,234	167.58	0.000
45.50	0.000	4,234	167.58	0.000
46.00	0.000	4,234	167.58	0.000
46.50	0.000	4,234	167.58	0.000
47.00	0.000	4,234	167.58	0.000
47.50	0.000	4,234	167.58	0.000
48.00	0.000	4,234	167.58	0.000
48.50	0.000	4,234	167.58	0.000
49.00	0.000	4,234	167.58	0.000
49.50	0.000	4,234	167.58	0.000
50.00	0.000	4,234	167.58	0.000
50.50	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,234	167.58	0.000
51.50	0.000	4,234	167.58	0.000
52.00	0.000	4,234	167.58	0.000
52.50	0.000	4,234	167.58	0.000
53.00	0.000	4,234	167.58	0.000
53.50	0.000	4,234	167.58	0.000
54.00	0.000	4,234	167.58	0.000
54.50	0.000	4,234	167.58	0.000
55.00	0.000	4,234	167.58	0.000
55.50	0.000	4,234	167.58	0.000
56.00	0.000	4,234	167.58	0.000
56.50	0.000	4,234	167.58	0.000
57.00	0.000	4,234	167.58	0.000
57.50	0.000	4,234	167.58	0.000
58.00	0.000	4,234	167.58	0.000
58.50	0.000	4,234	167.58	0.000
59.00	0.000	4,234	167.58	0.000
59.50	0.000	4,234	167.58	0.000
60.00	0.000	4,234	167.58	0.000
60.50	0.000	4,234	167.58	0.000
61.00	0.000	4,234	167.58	0.000
61.50	0.000	4,234	167.58	0.000
62.00	0.000	4,234	167.58	0.000
62.50	0.000	4,234	167.58	0.000
63.00	0.000	4,234	167.58	0.000
63.50	0.000	4,234	167.58	0.000
64.00	0.000	4,234	167.58	0.000
64.50	0.000	4,234	167.58	0.000
65.00	0.000	4,234	167.58	0.000
65.50	0.000	4,234	167.58	0.000
66.00	0.000	4,234	167.58	0.000
66.50	0.000	4,234	167.58	0.000
67.00	0.000	4,234	167.58	0.000
67.50	0.000	4,234	167.58	0.000
68.00	0.000	4,234	167.58	0.000
68.50	0.000	4,234	167.58	0.000
69.00	0.000	4,234	167.58	0.000
69.50	0.000	4,234	167.58	0.000
70.00	0.000	4,234	167.58	0.000
70.50	0.000	4,234	167.58	0.000
71.00	0.000	4,234	167.58	0.000
71.50	0.000	4,234	167.58	0.000
72.00	0.000	4,234	167.58	0.000
72.50	0.000	4,234	167.58	0.000
73.00	0.000	4,234	167.58	0.000
73.50	0.000	4,234	167.58	0.000
74.00	0.000	4,234	167.58	0.000
74.50	0.000	4,234	167.58	0.000
75.00	0.000	4,234	167.58	0.000
75.50	0.000	4,234	167.58	0.000
76.00	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	4,234	167.58	0.000
77.00	0.000	4,234	167.58	0.000
77.50	0.000	4,234	167.58	0.000
78.00	0.000	4,234	167.58	0.000
78.50	0.000	4,234	167.58	0.000
79.00	0.000	4,234	167.58	0.000
79.50	0.000	4,234	167.58	0.000
80.00	0.000	4,234	167.58	0.000
80.50	0.000	4,234	167.58	0.000
81.00	0.000	4,234	167.58	0.000
81.50	0.000	4,234	167.58	0.000
82.00	0.000	4,234	167.58	0.000
82.50	0.000	4,234	167.58	0.000
83.00	0.000	4,234	167.58	0.000
83.50	0.000	4,234	167.58	0.000
84.00	0.000	4,234	167.58	0.000
84.50	0.000	4,234	167.58	0.000
85.00	0.000	4,234	167.58	0.000
85.50	0.000	4,234	167.58	0.000
86.00	0.000	4,234	167.58	0.000
86.50	0.000	4,234	167.58	0.000
87.00	0.000	4,234	167.58	0.000
87.50	0.000	4,234	167.58	0.000
88.00	0.000	4,234	167.58	0.000
88.50	0.000	4,234	167.58	0.000
89.00	0.000	4,234	167.58	0.000
89.50	0.000	4,234	167.58	0.000
90.00	0.000	4,234	167.58	0.000
90.50	0.000	4,234	167.58	0.000
91.00	0.000	4,234	167.58	0.000
91.50	0.000	4,234	167.58	0.000
92.00	0.000	4,234	167.58	0.000
92.50	0.000	4,234	167.58	0.000
93.00	0.000	4,234	167.58	0.000
93.50	0.000	4,234	167.58	0.000
94.00	0.000	4,234	167.58	0.000
94.50	0.000	4,234	167.58	0.000
95.00	0.000	4,234	167.58	0.000
95.50	0.000	4,234	167.58	0.000
96.00	0.000	4,234	167.58	0.000
96.50	0.000	4,234	167.58	0.000
97.00	0.000	4,234	167.58	0.000
97.50	0.000	4,234	167.58	0.000
98.00	0.000	4,234	167.58	0.000
98.50	0.000	4,234	167.58	0.000
99.00	0.000	4,234	167.58	0.000
99.50	0.000	4,234	167.58	0.000
100.00	0.000	4,234	167.58	0.000
100.50	0.000	4,234	167.58	0.000
101.00	0.000	4,234	167.58	0.000
101.50	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

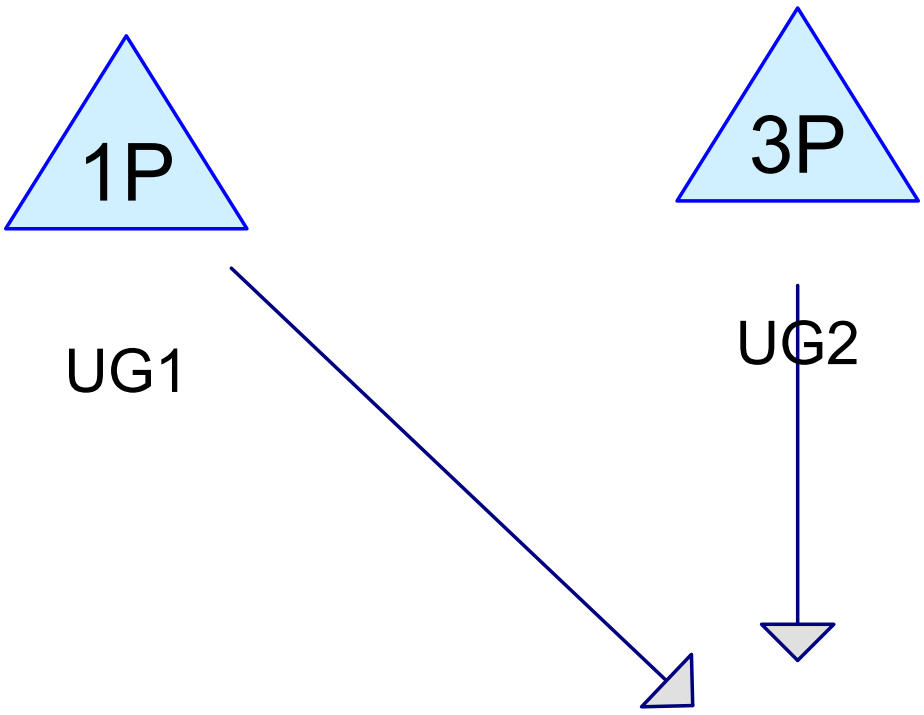
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	4,234	167.58	0.000
102.50	0.000	4,234	167.58	0.000
103.00	0.000	4,234	167.58	0.000
103.50	0.000	4,234	167.58	0.000
104.00	0.000	4,234	167.58	0.000
104.50	0.000	4,234	167.58	0.000
105.00	0.000	4,234	167.58	0.000
105.50	0.000	4,234	167.58	0.000
106.00	0.000	4,234	167.58	0.000
106.50	0.000	4,234	167.58	0.000
107.00	0.000	4,234	167.58	0.000
107.50	0.000	4,234	167.58	0.000
108.00	0.000	4,234	167.58	0.000
108.50	0.000	4,234	167.58	0.000
109.00	0.000	4,234	167.58	0.000
109.50	0.000	4,234	167.58	0.000
110.00	0.000	4,234	167.58	0.000
110.50	0.000	4,234	167.58	0.000
111.00	0.000	4,234	167.58	0.000
111.50	0.000	4,234	167.58	0.000
112.00	0.000	4,234	167.58	0.000
112.50	0.000	4,234	167.58	0.000
113.00	0.000	4,234	167.58	0.000
113.50	0.000	4,234	167.58	0.000
114.00	0.000	4,234	167.58	0.000
114.50	0.000	4,234	167.58	0.000
115.00	0.000	4,234	167.58	0.000
115.50	0.000	4,234	167.58	0.000
116.00	0.000	4,234	167.58	0.000
116.50	0.000	4,234	167.58	0.000
117.00	0.000	4,234	167.58	0.000
117.50	0.000	4,234	167.58	0.000
118.00	0.000	4,234	167.58	0.000
118.50	0.000	4,234	167.58	0.000
119.00	0.000	4,234	167.58	0.000
119.50	0.000	4,234	167.58	0.000
120.00	0.000	4,234	167.58	0.000
120.50	0.000	4,234	167.58	0.000
121.00	0.000	4,234	167.58	0.000
121.50	0.000	4,234	167.58	0.000
122.00	0.000	4,234	167.58	0.000
122.50	0.000	4,234	167.58	0.000
123.00	0.000	4,234	167.58	0.000
123.50	0.000	4,234	167.58	0.000
124.00	0.000	4,234	167.58	0.000
124.50	0.000	4,234	167.58	0.000
125.00	0.000	4,234	167.58	0.000
125.50	0.000	4,234	167.58	0.000
126.00	0.000	4,234	167.58	0.000
126.50	0.000	4,234	167.58	0.000
127.00	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	4,234	167.58	0.000
128.00	0.000	4,234	167.58	0.000
128.50	0.000	4,234	167.58	0.000
129.00	0.000	4,234	167.58	0.000
129.50	0.000	4,234	167.58	0.000
130.00	0.000	4,234	167.58	0.000
130.50	0.000	4,234	167.58	0.000
131.00	0.000	4,234	167.58	0.000
131.50	0.000	4,234	167.58	0.000
132.00	0.000	4,234	167.58	0.000
132.50	0.000	4,234	167.58	0.000
133.00	0.000	4,234	167.58	0.000
133.50	0.000	4,234	167.58	0.000
134.00	0.000	4,234	167.58	0.000
134.50	0.000	4,234	167.58	0.000
135.00	0.000	4,234	167.58	0.000
135.50	0.000	4,234	167.58	0.000
136.00	0.000	4,234	167.58	0.000
136.50	0.000	4,234	167.58	0.000
137.00	0.000	4,234	167.58	0.000
137.50	0.000	4,234	167.58	0.000
138.00	0.000	4,234	167.58	0.000
138.50	0.000	4,234	167.58	0.000
139.00	0.000	4,234	167.58	0.000
139.50	0.000	4,234	167.58	0.000
140.00	0.000	4,234	167.58	0.000
140.50	0.000	4,234	167.58	0.000
141.00	0.000	4,234	167.58	0.000
141.50	0.000	4,234	167.58	0.000
142.00	0.000	4,234	167.58	0.000
142.50	0.000	4,234	167.58	0.000
143.00	0.000	4,234	167.58	0.000
143.50	0.000	4,234	167.58	0.000
144.00	0.000	4,234	167.58	0.000
144.50	0.000	4,234	167.58	0.000
145.00	0.000	4,234	167.58	0.000
145.50	0.000	4,234	167.58	0.000
146.00	0.000	4,234	167.58	0.000
146.50	0.000	4,234	167.58	0.000
147.00	0.000	4,234	167.58	0.000
147.50	0.000	4,234	167.58	0.000
148.00	0.000	4,234	167.58	0.000
148.50	0.000	4,234	167.58	0.000
149.00	0.000	4,234	167.58	0.000
149.50	0.000	4,234	167.58	0.000
150.00	0.000	4,234	167.58	0.000
150.50	0.000	4,234	167.58	0.000
151.00	0.000	4,234	167.58	0.000
151.50	0.000	4,234	167.58	0.000
152.00	0.000	4,234	167.58	0.000
152.50	0.000	4,234	167.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	4,234	167.58	0.000
153.50	0.000	4,234	167.58	0.000
154.00	0.000	4,234	167.58	0.000
154.50	0.000	4,234	167.58	0.000
155.00	0.000	4,234	167.58	0.000
155.50	0.000	4,234	167.58	0.000
156.00	0.000	4,234	167.58	0.000
156.50	0.000	4,234	167.58	0.000
157.00	0.000	4,234	167.58	0.000
157.50	0.000	4,234	167.58	0.000
158.00	0.000	4,234	167.58	0.000
158.50	0.000	4,234	167.58	0.000
159.00	0.000	4,234	167.58	0.000
159.50	0.000	4,234	167.58	0.000
160.00	0.000	4,234	167.58	0.000
160.50	0.000	4,234	167.58	0.000
161.00	0.000	4,234	167.58	0.000
161.50	0.000	4,234	167.58	0.000
162.00	0.000	4,234	167.58	0.000
162.50	0.000	4,234	167.58	0.000
163.00	0.000	4,234	167.58	0.000
163.50	0.000	4,234	167.58	0.000
164.00	0.000	4,234	167.58	0.000
164.50	0.000	4,234	167.58	0.000
165.00	0.000	4,234	167.58	0.000
165.50	0.000	4,234	167.58	0.000
166.00	0.000	4,234	167.58	0.000
166.50	0.000	4,234	167.58	0.000
167.00	0.000	4,234	167.58	0.000
167.50	0.000	4,234	167.58	0.000
168.00	0.000	4,234	167.58	0.000



Subcat Reach Pond Link

Routing Diagram for BMW_2025-7-24_2
Prepared by Bohler, Printed 7/24/2025
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BMW_2025-7-24_2
Prepared by Bohler
Printed 7/24/2025
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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	100-yr	Type II 24-hr		Default	24.00	1	7.66	2

Summary for Pond 1P: UG1

Inflow Area = 83,984 sf, 97.04% Impervious, Inflow Depth = 7.18" for 100-yr event
Inflow = 21.616 cfs @ 11.96 hrs, Volume= 50,262 cf
Outflow = 27.903 cfs @ 11.99 hrs, Volume= 23,255 cf, Atten= 0%, Lag= 2.0 min
Primary = 27.903 cfs @ 11.99 hrs, Volume= 23,255 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 183.51' @ 11.99 hrs Surf.Area= 13,041 sf Storage= 27,162 cf

Plug-Flow detention time= 273.0 min calculated for 23,255 cf (46% of inflow)
Center-of-Mass det. time= 139.2 min (887.4 - 748.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	157.53'	9,785 cf	**120.75'W x 108.00'L x 3.21'H Field A** 41,840 cf Overall - 17,377 cf Embedded = 24,463 cf x 40.0% Voids
#2A	158.03'	17,377 cf	**Cultec R-280HD** x 405 Inside #1 Effective Size= 46.9"W x 26.0"H => 6.07 sf x 7.00'L = 42.5 cf Overall Size= 47.0"W x 26.5"H x 8.00'L with 1.00' Overlap Row Length Adjustment= +1.00' x 6.07 sf x 27 rows
		27,162 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	157.53'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	158.39'	**28.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	160.24'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	157.53'	**18.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0022 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=27.454 cfs @ 11.99 hrs HW=183.05' TW=168.67' (Fixed TW Elev= 168.67')
└─**4=Culvert** (Outlet Controls 27.454 cfs @ 15.536 fps)
  ├─**1=Orifice/Grate** (Passes < 0.100 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 14.202 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 1,315.845 cfs potential flow)

Hydrograph for Pond 1P: UG1

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	157.53	0.000
0.50	0.000	0	157.53	0.000
1.00	0.000	0	157.53	0.000
1.50	0.024	17	157.53	0.000
2.00	0.052	86	157.55	0.000
2.50	0.075	201	157.57	0.000
3.00	0.096	356	157.60	0.000
3.50	0.115	547	157.63	0.000
4.00	0.132	770	157.68	0.000
4.50	0.152	1,026	157.73	0.000
5.00	0.173	1,319	157.78	0.000
5.50	0.193	1,648	157.85	0.000
6.00	0.213	2,014	157.92	0.000
6.50	0.232	2,415	157.99	0.000
7.00	0.252	2,851	158.05	0.000
7.50	0.270	3,320	158.09	0.000
8.00	0.289	3,823	158.13	0.000
8.50	0.352	4,394	158.18	0.000
9.00	0.426	5,094	158.24	0.000
9.50	0.443	5,884	158.31	0.000
10.00	0.542	6,758	158.39	0.000
10.50	0.709	7,878	158.48	0.000
11.00	0.985	9,389	158.62	0.000
11.50	**1.627**	**11,694**	**158.82**	**0.000**
12.00	**17.848**	**27,162**	**170.30**	**9.239**
12.50	1.550	27,162	168.67	0.000
13.00	0.964	27,162	168.67	0.000
13.50	0.729	27,162	168.67	0.000
14.00	0.572	27,162	168.67	0.000
14.50	0.505	27,162	168.67	0.000
15.00	0.453	27,162	168.67	0.000
15.50	0.401	27,162	168.67	0.000
16.00	0.349	27,162	168.67	0.000
16.50	0.326	27,162	168.67	0.000
17.00	0.307	27,162	168.67	0.000
17.50	0.289	27,162	168.67	0.000
18.00	0.270	27,162	168.67	0.000
18.50	0.251	27,162	168.67	0.000
19.00	0.233	27,162	168.67	0.000
19.50	0.214	27,162	168.67	0.000
20.00	0.196	27,162	168.67	0.000
20.50	0.190	27,162	168.67	0.000
21.00	0.186	27,162	168.67	0.000
21.50	0.182	27,162	168.67	0.000
22.00	0.179	27,162	168.67	0.000
22.50	0.175	27,162	168.67	0.000
23.00	0.171	27,162	168.67	0.000
23.50	0.168	27,162	168.67	0.000
24.00	0.164	27,162	168.67	0.000
24.50	0.000	27,162	168.67	0.000
25.00	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	27,162	168.67	0.000
26.00	0.000	27,162	168.67	0.000
26.50	0.000	27,162	168.67	0.000
27.00	0.000	27,162	168.67	0.000
27.50	0.000	27,162	168.67	0.000
28.00	0.000	27,162	168.67	0.000
28.50	0.000	27,162	168.67	0.000
29.00	0.000	27,162	168.67	0.000
29.50	0.000	27,162	168.67	0.000
30.00	0.000	27,162	168.67	0.000
30.50	0.000	27,162	168.67	0.000
31.00	0.000	27,162	168.67	0.000
31.50	0.000	27,162	168.67	0.000
32.00	0.000	27,162	168.67	0.000
32.50	0.000	27,162	168.67	0.000
33.00	0.000	27,162	168.67	0.000
33.50	0.000	27,162	168.67	0.000
34.00	0.000	27,162	168.67	0.000
34.50	0.000	27,162	168.67	0.000
35.00	0.000	27,162	168.67	0.000
35.50	0.000	27,162	168.67	0.000
36.00	0.000	27,162	168.67	0.000
36.50	0.000	27,162	168.67	0.000
37.00	0.000	27,162	168.67	0.000
37.50	0.000	27,162	168.67	0.000
38.00	0.000	27,162	168.67	0.000
38.50	0.000	27,162	168.67	0.000
39.00	0.000	27,162	168.67	0.000
39.50	0.000	27,162	168.67	0.000
40.00	0.000	27,162	168.67	0.000
40.50	0.000	27,162	168.67	0.000
41.00	0.000	27,162	168.67	0.000
41.50	0.000	27,162	168.67	0.000
42.00	0.000	27,162	168.67	0.000
42.50	0.000	27,162	168.67	0.000
43.00	0.000	27,162	168.67	0.000
43.50	0.000	27,162	168.67	0.000
44.00	0.000	27,162	168.67	0.000
44.50	0.000	27,162	168.67	0.000
45.00	0.000	27,162	168.67	0.000
45.50	0.000	27,162	168.67	0.000
46.00	0.000	27,162	168.67	0.000
46.50	0.000	27,162	168.67	0.000
47.00	0.000	27,162	168.67	0.000
47.50	0.000	27,162	168.67	0.000
48.00	0.000	27,162	168.67	0.000
48.50	0.000	27,162	168.67	0.000
49.00	0.000	27,162	168.67	0.000
49.50	0.000	27,162	168.67	0.000
50.00	0.000	27,162	168.67	0.000
50.50	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	27,162	168.67	0.000
51.50	0.000	27,162	168.67	0.000
52.00	0.000	27,162	168.67	0.000
52.50	0.000	27,162	168.67	0.000
53.00	0.000	27,162	168.67	0.000
53.50	0.000	27,162	168.67	0.000
54.00	0.000	27,162	168.67	0.000
54.50	0.000	27,162	168.67	0.000
55.00	0.000	27,162	168.67	0.000
55.50	0.000	27,162	168.67	0.000
56.00	0.000	27,162	168.67	0.000
56.50	0.000	27,162	168.67	0.000
57.00	0.000	27,162	168.67	0.000
57.50	0.000	27,162	168.67	0.000
58.00	0.000	27,162	168.67	0.000
58.50	0.000	27,162	168.67	0.000
59.00	0.000	27,162	168.67	0.000
59.50	0.000	27,162	168.67	0.000
60.00	0.000	27,162	168.67	0.000
60.50	0.000	27,162	168.67	0.000
61.00	0.000	27,162	168.67	0.000
61.50	0.000	27,162	168.67	0.000
62.00	0.000	27,162	168.67	0.000
62.50	0.000	27,162	168.67	0.000
63.00	0.000	27,162	168.67	0.000
63.50	0.000	27,162	168.67	0.000
64.00	0.000	27,162	168.67	0.000
64.50	0.000	27,162	168.67	0.000
65.00	0.000	27,162	168.67	0.000
65.50	0.000	27,162	168.67	0.000
66.00	0.000	27,162	168.67	0.000
66.50	0.000	27,162	168.67	0.000
67.00	0.000	27,162	168.67	0.000
67.50	0.000	27,162	168.67	0.000
68.00	0.000	27,162	168.67	0.000
68.50	0.000	27,162	168.67	0.000
69.00	0.000	27,162	168.67	0.000
69.50	0.000	27,162	168.67	0.000
70.00	0.000	27,162	168.67	0.000
70.50	0.000	27,162	168.67	0.000
71.00	0.000	27,162	168.67	0.000
71.50	0.000	27,162	168.67	0.000
72.00	0.000	27,162	168.67	0.000
72.50	0.000	27,162	168.67	0.000
73.00	0.000	27,162	168.67	0.000
73.50	0.000	27,162	168.67	0.000
74.00	0.000	27,162	168.67	0.000
74.50	0.000	27,162	168.67	0.000
75.00	0.000	27,162	168.67	0.000
75.50	0.000	27,162	168.67	0.000
76.00	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	27,162	168.67	0.000
77.00	0.000	27,162	168.67	0.000
77.50	0.000	27,162	168.67	0.000
78.00	0.000	27,162	168.67	0.000
78.50	0.000	27,162	168.67	0.000
79.00	0.000	27,162	168.67	0.000
79.50	0.000	27,162	168.67	0.000
80.00	0.000	27,162	168.67	0.000
80.50	0.000	27,162	168.67	0.000
81.00	0.000	27,162	168.67	0.000
81.50	0.000	27,162	168.67	0.000
82.00	0.000	27,162	168.67	0.000
82.50	0.000	27,162	168.67	0.000
83.00	0.000	27,162	168.67	0.000
83.50	0.000	27,162	168.67	0.000
84.00	0.000	27,162	168.67	0.000
84.50	0.000	27,162	168.67	0.000
85.00	0.000	27,162	168.67	0.000
85.50	0.000	27,162	168.67	0.000
86.00	0.000	27,162	168.67	0.000
86.50	0.000	27,162	168.67	0.000
87.00	0.000	27,162	168.67	0.000
87.50	0.000	27,162	168.67	0.000
88.00	0.000	27,162	168.67	0.000
88.50	0.000	27,162	168.67	0.000
89.00	0.000	27,162	168.67	0.000
89.50	0.000	27,162	168.67	0.000
90.00	0.000	27,162	168.67	0.000
90.50	0.000	27,162	168.67	0.000
91.00	0.000	27,162	168.67	0.000
91.50	0.000	27,162	168.67	0.000
92.00	0.000	27,162	168.67	0.000
92.50	0.000	27,162	168.67	0.000
93.00	0.000	27,162	168.67	0.000
93.50	0.000	27,162	168.67	0.000
94.00	0.000	27,162	168.67	0.000
94.50	0.000	27,162	168.67	0.000
95.00	0.000	27,162	168.67	0.000
95.50	0.000	27,162	168.67	0.000
96.00	0.000	27,162	168.67	0.000
96.50	0.000	27,162	168.67	0.000
97.00	0.000	27,162	168.67	0.000
97.50	0.000	27,162	168.67	0.000
98.00	0.000	27,162	168.67	0.000
98.50	0.000	27,162	168.67	0.000
99.00	0.000	27,162	168.67	0.000
99.50	0.000	27,162	168.67	0.000
100.00	0.000	27,162	168.67	0.000
100.50	0.000	27,162	168.67	0.000
101.00	0.000	27,162	168.67	0.000
101.50	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	27,162	168.67	0.000
102.50	0.000	27,162	168.67	0.000
103.00	0.000	27,162	168.67	0.000
103.50	0.000	27,162	168.67	0.000
104.00	0.000	27,162	168.67	0.000
104.50	0.000	27,162	168.67	0.000
105.00	0.000	27,162	168.67	0.000
105.50	0.000	27,162	168.67	0.000
106.00	0.000	27,162	168.67	0.000
106.50	0.000	27,162	168.67	0.000
107.00	0.000	27,162	168.67	0.000
107.50	0.000	27,162	168.67	0.000
108.00	0.000	27,162	168.67	0.000
108.50	0.000	27,162	168.67	0.000
109.00	0.000	27,162	168.67	0.000
109.50	0.000	27,162	168.67	0.000
110.00	0.000	27,162	168.67	0.000
110.50	0.000	27,162	168.67	0.000
111.00	0.000	27,162	168.67	0.000
111.50	0.000	27,162	168.67	0.000
112.00	0.000	27,162	168.67	0.000
112.50	0.000	27,162	168.67	0.000
113.00	0.000	27,162	168.67	0.000
113.50	0.000	27,162	168.67	0.000
114.00	0.000	27,162	168.67	0.000
114.50	0.000	27,162	168.67	0.000
115.00	0.000	27,162	168.67	0.000
115.50	0.000	27,162	168.67	0.000
116.00	0.000	27,162	168.67	0.000
116.50	0.000	27,162	168.67	0.000
117.00	0.000	27,162	168.67	0.000
117.50	0.000	27,162	168.67	0.000
118.00	0.000	27,162	168.67	0.000
118.50	0.000	27,162	168.67	0.000
119.00	0.000	27,162	168.67	0.000
119.50	0.000	27,162	168.67	0.000
120.00	0.000	27,162	168.67	0.000
120.50	0.000	27,162	168.67	0.000
121.00	0.000	27,162	168.67	0.000
121.50	0.000	27,162	168.67	0.000
122.00	0.000	27,162	168.67	0.000
122.50	0.000	27,162	168.67	0.000
123.00	0.000	27,162	168.67	0.000
123.50	0.000	27,162	168.67	0.000
124.00	0.000	27,162	168.67	0.000
124.50	0.000	27,162	168.67	0.000
125.00	0.000	27,162	168.67	0.000
125.50	0.000	27,162	168.67	0.000
126.00	0.000	27,162	168.67	0.000
126.50	0.000	27,162	168.67	0.000
127.00	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	27,162	168.67	0.000
128.00	0.000	27,162	168.67	0.000
128.50	0.000	27,162	168.67	0.000
129.00	0.000	27,162	168.67	0.000
129.50	0.000	27,162	168.67	0.000
130.00	0.000	27,162	168.67	0.000
130.50	0.000	27,162	168.67	0.000
131.00	0.000	27,162	168.67	0.000
131.50	0.000	27,162	168.67	0.000
132.00	0.000	27,162	168.67	0.000
132.50	0.000	27,162	168.67	0.000
133.00	0.000	27,162	168.67	0.000
133.50	0.000	27,162	168.67	0.000
134.00	0.000	27,162	168.67	0.000
134.50	0.000	27,162	168.67	0.000
135.00	0.000	27,162	168.67	0.000
135.50	0.000	27,162	168.67	0.000
136.00	0.000	27,162	168.67	0.000
136.50	0.000	27,162	168.67	0.000
137.00	0.000	27,162	168.67	0.000
137.50	0.000	27,162	168.67	0.000
138.00	0.000	27,162	168.67	0.000
138.50	0.000	27,162	168.67	0.000
139.00	0.000	27,162	168.67	0.000
139.50	0.000	27,162	168.67	0.000
140.00	0.000	27,162	168.67	0.000
140.50	0.000	27,162	168.67	0.000
141.00	0.000	27,162	168.67	0.000
141.50	0.000	27,162	168.67	0.000
142.00	0.000	27,162	168.67	0.000
142.50	0.000	27,162	168.67	0.000
143.00	0.000	27,162	168.67	0.000
143.50	0.000	27,162	168.67	0.000
144.00	0.000	27,162	168.67	0.000
144.50	0.000	27,162	168.67	0.000
145.00	0.000	27,162	168.67	0.000
145.50	0.000	27,162	168.67	0.000
146.00	0.000	27,162	168.67	0.000
146.50	0.000	27,162	168.67	0.000
147.00	0.000	27,162	168.67	0.000
147.50	0.000	27,162	168.67	0.000
148.00	0.000	27,162	168.67	0.000
148.50	0.000	27,162	168.67	0.000
149.00	0.000	27,162	168.67	0.000
149.50	0.000	27,162	168.67	0.000
150.00	0.000	27,162	168.67	0.000
150.50	0.000	27,162	168.67	0.000
151.00	0.000	27,162	168.67	0.000
151.50	0.000	27,162	168.67	0.000
152.00	0.000	27,162	168.67	0.000
152.50	0.000	27,162	168.67	0.000

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	27,162	168.67	0.000
153.50	0.000	27,162	168.67	0.000
154.00	0.000	27,162	168.67	0.000
154.50	0.000	27,162	168.67	0.000
155.00	0.000	27,162	168.67	0.000
155.50	0.000	27,162	168.67	0.000
156.00	0.000	27,162	168.67	0.000
156.50	0.000	27,162	168.67	0.000
157.00	0.000	27,162	168.67	0.000
157.50	0.000	27,162	168.67	0.000
158.00	0.000	27,162	168.67	0.000
158.50	0.000	27,162	168.67	0.000
159.00	0.000	27,162	168.67	0.000
159.50	0.000	27,162	168.67	0.000
160.00	0.000	27,162	168.67	0.000
160.50	0.000	27,162	168.67	0.000
161.00	0.000	27,162	168.67	0.000
161.50	0.000	27,162	168.67	0.000
162.00	0.000	27,162	168.67	0.000
162.50	0.000	27,162	168.67	0.000
163.00	0.000	27,162	168.67	0.000
163.50	0.000	27,162	168.67	0.000
164.00	0.000	27,162	168.67	0.000
164.50	0.000	27,162	168.67	0.000
165.00	0.000	27,162	168.67	0.000
165.50	0.000	27,162	168.67	0.000
166.00	0.000	27,162	168.67	0.000
166.50	0.000	27,162	168.67	0.000
167.00	0.000	27,162	168.67	0.000
167.50	0.000	27,162	168.67	0.000
168.00	0.000	27,162	168.67	0.000

Summary for Pond 3P: UG2

Inflow Area = 21,475 sf, 80.32% Impervious, Inflow Depth = 6.00" for 100-yr event
Inflow = 5.073 cfs @ 11.96 hrs, Volume= 10,741 cf
Outflow = 7.312 cfs @ 11.96 hrs, Volume= 6,548 cf, Atten= 0%, Lag= 0.1 min
Primary = 7.312 cfs @ 11.96 hrs, Volume= 6,548 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 169.41' @ 11.96 hrs Surf.Area= 2,542 sf Storage= 4,234 cf

Plug-Flow detention time= 185.4 min calculated for 6,548 cf (61% of inflow)
Center-of-Mass det. time= 81.2 min (866.3 - 785.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	159.28'	1,768 cf	**27.75'W x 91.62'L x 2.71'H Field A** 6,886 cf Overall - 2,466 cf Embedded = 4,420 cf x 40.0% Voids
#2A	159.78'	2,466 cf	**Cultec R-180** x 112 Inside #1 Effective Size= 33.6"W x 20.0"H => 3.44 sf x 6.33'L = 21.8 cf Overall Size= 36.0"W x 20.5"H x 7.33'L with 1.00' Overlap Row Length Adjustment= +1.00' x 3.44 sf x 8 rows
		4,234 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Device 4	159.28'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Device 4	159.97'	**6.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 4	161.50'	**4.0' long Broad-Crested Rectangular Weir** Head (feet) 4.00 Coef. (English) 3.33
#4	Primary	159.28'	**18.0" Round Culvert** L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0030 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=7.305 cfs @ 11.96 hrs HW=169.41' TW=168.67' (Fixed TW Elev= 168.67')
└─**4=Culvert** (Inlet Controls 7.305 cfs @ 4.134 fps)
  ├─**1=Orifice/Grate** (Passes < 0.203 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 0.517 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 137.586 cfs potential flow)

Hydrograph for Pond 3P: UG2

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.000	0	159.28	0.000
0.50	0.000	0	159.28	0.000
1.00	0.000	0	159.28	0.000
1.50	0.000	0	159.28	0.000
2.00	0.000	0	159.28	0.000
2.50	0.000	0	159.28	0.000
3.00	0.000	0	159.28	0.000
3.50	0.000	0	159.28	0.000
4.00	0.002	1	159.28	0.000
4.50	0.006	8	159.29	0.000
5.00	0.010	22	159.30	0.000
5.50	0.014	43	159.32	0.000
6.00	0.018	72	159.35	0.000
6.50	0.023	109	159.39	0.000
7.00	0.028	155	159.43	0.000
7.50	0.033	209	159.49	0.000
8.00	0.038	273	159.55	0.000
8.50	0.050	351	159.63	0.000
9.00	0.065	454	159.73	0.000
9.50	0.071	578	159.81	0.000
10.00	0.093	723	159.88	0.000
10.50	0.128	920	159.97	0.000
11.00	0.188	1,201	160.10	0.000
11.50	**0.331**	**1,655**	**160.31**	**0.000**
12.00	**4.234**	**4,234**	**169.25**	**6.476**
12.50	0.376	4,234	168.70	0.760
13.00	0.235	4,234	168.69	0.472
13.50	0.178	4,234	168.68	0.357
14.00	0.140	4,234	168.68	0.281
14.50	0.124	4,234	168.68	0.248
15.00	0.111	4,234	168.68	0.223
15.50	0.099	4,234	168.68	0.198
16.00	0.086	4,234	168.68	0.172
16.50	0.080	4,234	168.68	0.160
17.00	0.076	4,234	168.68	0.151
17.50	0.071	4,234	168.68	0.142
18.00	0.067	4,234	168.67	0.133
18.50	0.062	4,234	168.67	0.124
19.00	0.058	4,234	168.67	0.115
19.50	0.053	4,234	168.67	0.106
20.00	0.048	4,234	168.67	0.097
20.50	0.047	4,234	168.67	0.094
21.00	0.046	4,234	168.67	0.092
21.50	0.045	4,234	168.67	0.090
22.00	0.044	4,234	168.67	0.089
22.50	0.043	4,234	168.67	0.087
23.00	0.042	4,234	168.67	0.085
23.50	0.042	4,234	168.67	0.083
24.00	0.041	4,234	168.67	0.081
24.50	0.000	4,234	168.58	0.000
25.00	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	4,234	168.58	0.000
26.00	0.000	4,234	168.58	0.000
26.50	0.000	4,234	168.58	0.000
27.00	0.000	4,234	168.58	0.000
27.50	0.000	4,234	168.58	0.000
28.00	0.000	4,234	168.58	0.000
28.50	0.000	4,234	168.58	0.000
29.00	0.000	4,234	168.58	0.000
29.50	0.000	4,234	168.58	0.000
30.00	0.000	4,234	168.58	0.000
30.50	0.000	4,234	168.58	0.000
31.00	0.000	4,234	168.58	0.000
31.50	0.000	4,234	168.58	0.000
32.00	0.000	4,234	168.58	0.000
32.50	0.000	4,234	168.58	0.000
33.00	0.000	4,234	168.58	0.000
33.50	0.000	4,234	168.58	0.000
34.00	0.000	4,234	168.58	0.000
34.50	0.000	4,234	168.58	0.000
35.00	0.000	4,234	168.58	0.000
35.50	0.000	4,234	168.58	0.000
36.00	0.000	4,234	168.58	0.000
36.50	0.000	4,234	168.58	0.000
37.00	0.000	4,234	168.58	0.000
37.50	0.000	4,234	168.58	0.000
38.00	0.000	4,234	168.58	0.000
38.50	0.000	4,234	168.58	0.000
39.00	0.000	4,234	168.58	0.000
39.50	0.000	4,234	168.58	0.000
40.00	0.000	4,234	168.58	0.000
40.50	0.000	4,234	168.58	0.000
41.00	0.000	4,234	168.58	0.000
41.50	0.000	4,234	168.58	0.000
42.00	0.000	4,234	168.58	0.000
42.50	0.000	4,234	168.58	0.000
43.00	0.000	4,234	168.58	0.000
43.50	0.000	4,234	168.58	0.000
44.00	0.000	4,234	168.58	0.000
44.50	0.000	4,234	168.58	0.000
45.00	0.000	4,234	168.58	0.000
45.50	0.000	4,234	168.58	0.000
46.00	0.000	4,234	168.58	0.000
46.50	0.000	4,234	168.58	0.000
47.00	0.000	4,234	168.58	0.000
47.50	0.000	4,234	168.58	0.000
48.00	0.000	4,234	168.58	0.000
48.50	0.000	4,234	168.58	0.000
49.00	0.000	4,234	168.58	0.000
49.50	0.000	4,234	168.58	0.000
50.00	0.000	4,234	168.58	0.000
50.50	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
51.00	0.000	4,234	168.58	0.000
51.50	0.000	4,234	168.58	0.000
52.00	0.000	4,234	168.58	0.000
52.50	0.000	4,234	168.58	0.000
53.00	0.000	4,234	168.58	0.000
53.50	0.000	4,234	168.58	0.000
54.00	0.000	4,234	168.58	0.000
54.50	0.000	4,234	168.58	0.000
55.00	0.000	4,234	168.58	0.000
55.50	0.000	4,234	168.58	0.000
56.00	0.000	4,234	168.58	0.000
56.50	0.000	4,234	168.58	0.000
57.00	0.000	4,234	168.58	0.000
57.50	0.000	4,234	168.58	0.000
58.00	0.000	4,234	168.58	0.000
58.50	0.000	4,234	168.58	0.000
59.00	0.000	4,234	168.58	0.000
59.50	0.000	4,234	168.58	0.000
60.00	0.000	4,234	168.58	0.000
60.50	0.000	4,234	168.58	0.000
61.00	0.000	4,234	168.58	0.000
61.50	0.000	4,234	168.58	0.000
62.00	0.000	4,234	168.58	0.000
62.50	0.000	4,234	168.58	0.000
63.00	0.000	4,234	168.58	0.000
63.50	0.000	4,234	168.58	0.000
64.00	0.000	4,234	168.58	0.000
64.50	0.000	4,234	168.58	0.000
65.00	0.000	4,234	168.58	0.000
65.50	0.000	4,234	168.58	0.000
66.00	0.000	4,234	168.58	0.000
66.50	0.000	4,234	168.58	0.000
67.00	0.000	4,234	168.58	0.000
67.50	0.000	4,234	168.58	0.000
68.00	0.000	4,234	168.58	0.000
68.50	0.000	4,234	168.58	0.000
69.00	0.000	4,234	168.58	0.000
69.50	0.000	4,234	168.58	0.000
70.00	0.000	4,234	168.58	0.000
70.50	0.000	4,234	168.58	0.000
71.00	0.000	4,234	168.58	0.000
71.50	0.000	4,234	168.58	0.000
72.00	0.000	4,234	168.58	0.000
72.50	0.000	4,234	168.58	0.000
73.00	0.000	4,234	168.58	0.000
73.50	0.000	4,234	168.58	0.000
74.00	0.000	4,234	168.58	0.000
74.50	0.000	4,234	168.58	0.000
75.00	0.000	4,234	168.58	0.000
75.50	0.000	4,234	168.58	0.000
76.00	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	4,234	168.58	0.000
77.00	0.000	4,234	168.58	0.000
77.50	0.000	4,234	168.58	0.000
78.00	0.000	4,234	168.58	0.000
78.50	0.000	4,234	168.58	0.000
79.00	0.000	4,234	168.58	0.000
79.50	0.000	4,234	168.58	0.000
80.00	0.000	4,234	168.58	0.000
80.50	0.000	4,234	168.58	0.000
81.00	0.000	4,234	168.58	0.000
81.50	0.000	4,234	168.58	0.000
82.00	0.000	4,234	168.58	0.000
82.50	0.000	4,234	168.58	0.000
83.00	0.000	4,234	168.58	0.000
83.50	0.000	4,234	168.58	0.000
84.00	0.000	4,234	168.58	0.000
84.50	0.000	4,234	168.58	0.000
85.00	0.000	4,234	168.58	0.000
85.50	0.000	4,234	168.58	0.000
86.00	0.000	4,234	168.58	0.000
86.50	0.000	4,234	168.58	0.000
87.00	0.000	4,234	168.58	0.000
87.50	0.000	4,234	168.58	0.000
88.00	0.000	4,234	168.58	0.000
88.50	0.000	4,234	168.58	0.000
89.00	0.000	4,234	168.58	0.000
89.50	0.000	4,234	168.58	0.000
90.00	0.000	4,234	168.58	0.000
90.50	0.000	4,234	168.58	0.000
91.00	0.000	4,234	168.58	0.000
91.50	0.000	4,234	168.58	0.000
92.00	0.000	4,234	168.58	0.000
92.50	0.000	4,234	168.58	0.000
93.00	0.000	4,234	168.58	0.000
93.50	0.000	4,234	168.58	0.000
94.00	0.000	4,234	168.58	0.000
94.50	0.000	4,234	168.58	0.000
95.00	0.000	4,234	168.58	0.000
95.50	0.000	4,234	168.58	0.000
96.00	0.000	4,234	168.58	0.000
96.50	0.000	4,234	168.58	0.000
97.00	0.000	4,234	168.58	0.000
97.50	0.000	4,234	168.58	0.000
98.00	0.000	4,234	168.58	0.000
98.50	0.000	4,234	168.58	0.000
99.00	0.000	4,234	168.58	0.000
99.50	0.000	4,234	168.58	0.000
100.00	0.000	4,234	168.58	0.000
100.50	0.000	4,234	168.58	0.000
101.00	0.000	4,234	168.58	0.000
101.50	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	4,234	168.58	0.000
102.50	0.000	4,234	168.58	0.000
103.00	0.000	4,234	168.58	0.000
103.50	0.000	4,234	168.58	0.000
104.00	0.000	4,234	168.58	0.000
104.50	0.000	4,234	168.58	0.000
105.00	0.000	4,234	168.58	0.000
105.50	0.000	4,234	168.58	0.000
106.00	0.000	4,234	168.58	0.000
106.50	0.000	4,234	168.58	0.000
107.00	0.000	4,234	168.58	0.000
107.50	0.000	4,234	168.58	0.000
108.00	0.000	4,234	168.58	0.000
108.50	0.000	4,234	168.58	0.000
109.00	0.000	4,234	168.58	0.000
109.50	0.000	4,234	168.58	0.000
110.00	0.000	4,234	168.58	0.000
110.50	0.000	4,234	168.58	0.000
111.00	0.000	4,234	168.58	0.000
111.50	0.000	4,234	168.58	0.000
112.00	0.000	4,234	168.58	0.000
112.50	0.000	4,234	168.58	0.000
113.00	0.000	4,234	168.58	0.000
113.50	0.000	4,234	168.58	0.000
114.00	0.000	4,234	168.58	0.000
114.50	0.000	4,234	168.58	0.000
115.00	0.000	4,234	168.58	0.000
115.50	0.000	4,234	168.58	0.000
116.00	0.000	4,234	168.58	0.000
116.50	0.000	4,234	168.58	0.000
117.00	0.000	4,234	168.58	0.000
117.50	0.000	4,234	168.58	0.000
118.00	0.000	4,234	168.58	0.000
118.50	0.000	4,234	168.58	0.000
119.00	0.000	4,234	168.58	0.000
119.50	0.000	4,234	168.58	0.000
120.00	0.000	4,234	168.58	0.000
120.50	0.000	4,234	168.58	0.000
121.00	0.000	4,234	168.58	0.000
121.50	0.000	4,234	168.58	0.000
122.00	0.000	4,234	168.58	0.000
122.50	0.000	4,234	168.58	0.000
123.00	0.000	4,234	168.58	0.000
123.50	0.000	4,234	168.58	0.000
124.00	0.000	4,234	168.58	0.000
124.50	0.000	4,234	168.58	0.000
125.00	0.000	4,234	168.58	0.000
125.50	0.000	4,234	168.58	0.000
126.00	0.000	4,234	168.58	0.000
126.50	0.000	4,234	168.58	0.000
127.00	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	4,234	168.58	0.000
128.00	0.000	4,234	168.58	0.000
128.50	0.000	4,234	168.58	0.000
129.00	0.000	4,234	168.58	0.000
129.50	0.000	4,234	168.58	0.000
130.00	0.000	4,234	168.58	0.000
130.50	0.000	4,234	168.58	0.000
131.00	0.000	4,234	168.58	0.000
131.50	0.000	4,234	168.58	0.000
132.00	0.000	4,234	168.58	0.000
132.50	0.000	4,234	168.58	0.000
133.00	0.000	4,234	168.58	0.000
133.50	0.000	4,234	168.58	0.000
134.00	0.000	4,234	168.58	0.000
134.50	0.000	4,234	168.58	0.000
135.00	0.000	4,234	168.58	0.000
135.50	0.000	4,234	168.58	0.000
136.00	0.000	4,234	168.58	0.000
136.50	0.000	4,234	168.58	0.000
137.00	0.000	4,234	168.58	0.000
137.50	0.000	4,234	168.58	0.000
138.00	0.000	4,234	168.58	0.000
138.50	0.000	4,234	168.58	0.000
139.00	0.000	4,234	168.58	0.000
139.50	0.000	4,234	168.58	0.000
140.00	0.000	4,234	168.58	0.000
140.50	0.000	4,234	168.58	0.000
141.00	0.000	4,234	168.58	0.000
141.50	0.000	4,234	168.58	0.000
142.00	0.000	4,234	168.58	0.000
142.50	0.000	4,234	168.58	0.000
143.00	0.000	4,234	168.58	0.000
143.50	0.000	4,234	168.58	0.000
144.00	0.000	4,234	168.58	0.000
144.50	0.000	4,234	168.58	0.000
145.00	0.000	4,234	168.58	0.000
145.50	0.000	4,234	168.58	0.000
146.00	0.000	4,234	168.58	0.000
146.50	0.000	4,234	168.58	0.000
147.00	0.000	4,234	168.58	0.000
147.50	0.000	4,234	168.58	0.000
148.00	0.000	4,234	168.58	0.000
148.50	0.000	4,234	168.58	0.000
149.00	0.000	4,234	168.58	0.000
149.50	0.000	4,234	168.58	0.000
150.00	0.000	4,234	168.58	0.000
150.50	0.000	4,234	168.58	0.000
151.00	0.000	4,234	168.58	0.000
151.50	0.000	4,234	168.58	0.000
152.00	0.000	4,234	168.58	0.000
152.50	0.000	4,234	168.58	0.000

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
153.00	0.000	4,234	168.58	0.000
153.50	0.000	4,234	168.58	0.000
154.00	0.000	4,234	168.58	0.000
154.50	0.000	4,234	168.58	0.000
155.00	0.000	4,234	168.58	0.000
155.50	0.000	4,234	168.58	0.000
156.00	0.000	4,234	168.58	0.000
156.50	0.000	4,234	168.58	0.000
157.00	0.000	4,234	168.58	0.000
157.50	0.000	4,234	168.58	0.000
158.00	0.000	4,234	168.58	0.000
158.50	0.000	4,234	168.58	0.000
159.00	0.000	4,234	168.58	0.000
159.50	0.000	4,234	168.58	0.000
160.00	0.000	4,234	168.58	0.000
160.50	0.000	4,234	168.58	0.000
161.00	0.000	4,234	168.58	0.000
161.50	0.000	4,234	168.58	0.000
162.00	0.000	4,234	168.58	0.000
162.50	0.000	4,234	168.58	0.000
163.00	0.000	4,234	168.58	0.000
163.50	0.000	4,234	168.58	0.000
164.00	0.000	4,234	168.58	0.000
164.50	0.000	4,234	168.58	0.000
165.00	0.000	4,234	168.58	0.000
165.50	0.000	4,234	168.58	0.000
166.00	0.000	4,234	168.58	0.000
166.50	0.000	4,234	168.58	0.000
167.00	0.000	4,234	168.58	0.000
167.50	0.000	4,234	168.58	0.000
168.00	0.000	4,234	168.58	0.000

AMENDED PRELIMINARY / FINAL LAND DEVELOPMENT PLANS

DRAWING SHEET INDEX

SHEET TITLE	SHEET NUMBER
COVER SHEET	C-101 *
NOTES SHEET	C-102 *
EXISTING CONDITIONS/DEMOLITION PLAN	C-201
RECORD PLAN	C-301 *
EASEMENT PLAN	C-302 *
SITE PLAN	C-303 *
TRUCK TURNING PLAN	C-304, C-305
GRADING PLAN	C-401, C-402
UTILITY PLAN	C-501
SOIL EROSION AND SEDIMENT POLLUTION CONTROL PLAN	C-601, C-602
SOIL EROSION AND SEDIMENT POLLUTION CONTROL NOTES & DETAILS	C-603, C-604, C-605, C-606
POST CONSTRUCTION STORMWATER MANAGEMENT PLAN	C-607 *
POST CONSTRUCTION STORMWATER MANAGEMENT NOTES & DETAILS	C-608 *, C-609 *, C-610 *, C-611 *
LANDSCAPE PLAN	C-701
LANDSCAPE NOTES AND DETAILS	C-702
LIGHTING PLAN	C-703
PROFILES	C-801, C-802, C-803
DETAILS SHEET	C-901, C-902, C-903
DRAINAGE AREA PLANS	C-1001, C-1002, C-1003, C-1004
LOT CONSOLIDATION PLAN	LC-01 *

* DENOTES PLAN SHEETS TO BE RECORDED

FOR

MILEONE FORT WASHINGTON, LLC

PROPOSED

BMW AUTOMOTIVE DEALERSHIP EXPANSION

LOCATION OF SITE

500 PENNSYLVANIA AVENUE,
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY
COMMONWEALTH OF PENNSYLVANIA

THE FOLLOWING WAIVERS GRANTED THROUGH RESOLUTION 2025-06 ON FEBRUARY 13, 2025:

1. FROM SALDO §105-21.(B).(1)(n) - FROM THE REQUIREMENT TO SHOW EXISTING FEATURES WITHIN 500 FEET OF THE SITE TO ALLOW AN AERIAL PLAN SHOWING FEATURES WITHIN 500 FEET OF THE PROJECT TO BE INCLUDED WITH THE PLAN SET.
2. FROM SALDO §105-21.(B).(13) - FROM THE REQUIREMENT THAT AN EXISTING RESOURCES AND SITE ANALYSIS (ERSA) PLAN BE SUBMITTED TO ALLOW THE SITE SURVEY TO SERVE AS SAME.
3. FROM SALDO §105-21.(B).(15) - FROM THE REQUIREMENT TO PROVIDE A PRELIMINARY RESOURCE IMPACT AND CONSERVATION PLAN TO ALLOW THE POST-CONSTRUCTION STORMWATER MANAGEMENT (PCSM) PLANS, DETAILS, AND NOTES TO SERVE AS SAME.
4. FROM SALDO §105-21.A AND 105-48.E - FROM THE REQUIREMENT THAT STREET TREES BE PLANTED WITHIN A TREE PLANTING ZONE OF LAWN AREA OR OTHER MATERIAL APPROVED BY THE SHADE TREE COMMISSION, SITUATED BETWEEN THE SIDEWALK AND CURB AND MEASURING A MINIMUM OF FIVE FEET IN WIDTH FROM THE PLANTING EDGE OF THE CURB TO THE PLANTING EDGE OF THE SIDEWALK, TO ALLOW STREET TREES TO BE PLANTED OUTSIDE OF THE TREE ZONE DUE TO UTILITY CONFLICTS AND AN EXISTING SANITARY SEWER EASEMENT ALONG THE SITE FRONTAGE. THE REQUIRED NUMBER OF STREET TREES SHALL BE PROVIDED ALONG THE SITE FRONTAGE
5. FROM SALDO §105-38.A - FROM THE REQUIREMENT TO PROVIDE 2-WAY AISLES OF A SIZE NOT LESS THAN 24 FEET FOR 90-DEGREE PARKING, HAVING A STALL DIMENSION OF NOT LESS THAN 9' X 18" IN ORDER TO PRESERVE AN EXISTING PARKING AREA IN THE SOUTHWESTERN CORNER OF THE PROPERTY TO BE UTILIZED FOR DEALERSHIP OPERATIONS AND ARE NOT INTENDED FOR CUSTOMER PARKING.
6. FROM SALDO §105-38.B - FROM THE REQUIREMENT THAT THE MAXIMUM WIDTH OF ENTRANCE AND EXIT DRIVES BE 35 FEET AT THE STREET LINE IN ORDER TO PROVIDE ALIGNMENT WITH OPPOSITE TRAVEL AND AUXILIARY LANES AND TO SATISFY PENNDOT DESIGN CRITERIA ALONG A STATE ROUTE.
7. FROM SALDO §105-38.C - FROM THE REQUIREMENT THAT CURVES/TURNS IN ENTRANCE AND EXIT DRIVES AND ALL INTERNAL PARKING LOT AISLES NECESSARY FOR PROVIDING ACCESS FOR FIRE PROTECTION EQUIPMENT SHALL HAVE A MINIMUM INSIDE TURNING RADIUS OF 25 FEET AND A MINIMUM OUTSIDE TURNING RADIUS OF 50 FEET, TO PERMIT CURB RADII OF LESS THAN 25 FEET, CONDITIONED ON THE APPLICANT PROVIDING THE TOWNSHIP WITH TRUCK TURNING TEMPLATES TO THE SATISFACTION OF THE TOWNSHIP FIRE MARSHAL AND THE TOWNSHIP ENGINEER SHOWING CIRCULATION THROUGHOUT THE PROPERTY.
8. FROM SALDO §105-38.D - FROM THE REQUIREMENT THAT PARKING AREAS BE DESIGNED TO PERMIT EACH MOTOR VEHICLE TO PROCEED TO AND FROM THE PARKING SPACE PROVIDED FOR IT WITHOUT REQUIRING THE MOVING OF ANY OTHER MOTOR VEHICLES, TO ALLOW DOUBLE-STACKED INVENTORY AND SERVICE/REPAIR PARKING SPACES WITHOUT A DIRECT ACCESS AISLE, AS THESE ARE INTENDED TO BE UTILIZED FOR DEALERSHIP OPERATIONS AND NOT TO MEET REQUIRED OFF-STREET PARKING REQUIREMENTS.
9. FROM SALDO §105-38.H - FROM THE REQUIREMENT THAT EXCEPT AT ENTRANCE AND EXIT DRIVES, ALL PARKING AREAS SHALL BE SET BACK FROM THE RIGHT-OF-WAY LINE AND ALL PROPERTY LINES AT LEAST 15 FEET, TO ALLOW A 4.2-FOOT SETBACK ALONG THE SOUTHEASTERN PROPERTY LINE FOR UP TO 15 INVENTORY STORAGE AND/OR SERVICE STORAGE SPACES.
10. FROM SALDO §105-38.I - FROM THE REQUIREMENT THAT NO MORE THAN 15 PARKING SPACES BE PERMITTED IN A CONTINUOUS ROW WITHOUT BEING INTERRUPTED BY A LANDSCAPING AREA OF NOT LESS THAN THE WIDTH OF A PARKING SPACE CONSTRUCTED IN ACCORDANCE WITH THE PLAN, TO PERMIT PARKING ROWS OF GREATER THAN 15 SPACES WITHOUT INTERRUPTION FOR PARKING SPACES.
11. FROM SALDO §105-38.J - FROM THE REQUIREMENT THAT NO ONE AREA FOR OFF-STREET PARKING OF MOTOR VEHICLES SHALL EXCEED 30 CARS IN CAPACITY AND THAT SEPARATE AREAS ON A PARCEL SHALL BE PHYSICALLY SEPARATED FROM ONE ANOTHER BY TEN-FOOT-WIDE PLANTING STRIPS, TO ALLOW CERTAIN EXISTING PARKING AREAS (INCLUDING THE SOUTHWESTERN CORNER OF THE PROPERTY) TO REMAIN IN THEIR EXISTING PAVED STATE, AND FOR LIMITED DOUBLE-STACKED INVENTORY/SERVICE STORAGE SPACES ON THE PROPERTY.
12. FROM SALDO §105-38.O - FROM THE REQUIREMENT THAT PARKING AREAS BE LOCATED AT LEAST 10 FEET FROM ANY BUILDING OR STRUCTURE, TO ALLOW THE 14 PARKING SPACES LOCATED NEAR THE SERVICE DRIVE LANE AND 26 PARKING SPACES AROUND THE CAR WASH TO REMAIN.
13. FROM SALDO §105-52.B.(2) - FROM THE REQUIREMENT THAT A MINIMUM 50-FOOT BUFFER YARD BE PROVIDED BETWEEN LAND DEVELOPMENTS, TO ALLOW AN ALTERNATIVE PLANTING OPTION FOR THE BUFFERS ALONG PENNSYLVANIA AVENUE AND THE SOUTHEASTERN PROPERTY LINE DUE TO LIMITED SITE AREA, CONDITIONED ON THE APPLICANT PROVIDING THE REQUIRED QUANTITY OF BUFFER PLANTINGS TO MEET THE SCREENING REQUIREMENTS
14. FROM SALDO §105-53.D - A PARTIAL WAIVER FROM THE REQUIREMENT OF DEDICATION OF LAND SUITABLE FOR PARK AND RECREATIONAL USE TO THE TOWNSHIP OR PAYMENT OF FEES IN LIEU THEREOF TO ALLOW THE APPLICANT TO COORDINATE WITH THE BOARD OF SUPERVISORS IN CONSIDERATION OF THE STREAM BEING PRESERVED AND ANTICIPATED EASEMENT TO THE COUNTY FOR USE IN EXTENDING THE CROSS-COUNTY TRAIL ALONG THE REAR OF THE PROPERTY.
15. FROM SALDO §105-21.1.E - FROM THE REQUIREMENT THAT A TRAFFIC IMPACT FEE BE PAID TO ALLOW FOR THE PAYMENT OF A VOLUNTARY CONTRIBUTION.
16. FROM SALDO §58-30.A (9) - FROM THE REQUIREMENT THAT ALL STORMWATER DETENTION/RETENTION FACILITIES SHALL BE IN PLACE AND FUNCTIONING PRIOR TO THE CREATION OF ANY IMPERVIOUS SURFACE, TO PERMIT CONSTRUCTION OF IMPERVIOUS SURFACES PRIOR TO COMPLETION OF ALL ON-SITE STORMWATER FACILITIES, PROVIDED THAT ADEQUATE EROSION AND SEDIMENT POLLUTION CONTROLS ARE PROVIDED TO PREVENT SEDIMENT- LADEN WATER FROM LEAVING THE PROPERTY AND THAT EROSION AND SEDIMENT ADEQUACY AND AN NPDES PERMIT ARE OBTAINED FROM PADEP AND THE MONTGOMERY COUNTY CONSERVATION DISTRICT PRIOR TO COMMENCING CONSTRUCTION.
17. FROM SALDO §58-34.B.(7)(d) - FROM THE REQUIREMENT THAT THE MINIMUM DIAMETER OF ALL STORM DRAINAGE PIPES SHALL BE 18 INCHES OR EQUIVALENT THERETO AND THAT ALL STORM PIPE SHALL BE REINFORCED CONCRETE PIPE WHICH CONFORMS TO THE PENNSYLVANIA DEPARTMENT OF TRANSPORTATION SPECIFICATIONS, OR WHITEMARSH TOWNSHIP SPECIFICATIONS, WHICHEVER ARE MORE STRINGENT, TO PERMIT STORMWATER PIPE SIZES UNDER 18 INCHES AND TO PERMIT HDPE PIPE IN LIEU OF THE REQUIRED REINFORCED CONCRETE PIPE
18. FROM SALDO §58-34.B.(7)(h) - FROM THE REQUIREMENT THAT STORM PIPES SHALL HAVE A MINIMUM 18-INCH DEPTH OF COVER OVER THE TOP OF PIPE, TO PERMIT ROOF LEADER PIPING TO HAVE A MINIMUM OF 12 INCHES OF COVER OVER THE TOP OF THE PIPE
19. FROM SALDO §55-4.C.(3) AND 55-4.D.(6) - FROM THE REQUIREMENT THAT REPLACEMENT TREES BE PROVIDED IN ACCORDANCE WITH THE ORDINANCE, TO PERMIT FEWER THAN THE REQUIRED NUMBER OF REPLACEMENT TREES DUE TO INSUFFICIENT PLANTING AREA
20. FROM SALDO § 105-12.D - FROM THE REQUIREMENT THAT PRESENTATION OF A PRELIMINARY AND FINAL PLAN SHALL BE CONSIDERED AS SEPARATE SUBMISSIONS AND THE MAXIMUM 90-DAY REVIEW PERIOD MAY BE REQUIRED FOR EACH, TO ALLOW THE PLAN TO BE REVIEWED AND CONSIDERED FOR APPROVAL SIMULTANEOUSLY AS A PRELIMINARY AND FINAL PLAN;
21. FROM SALDO § 105-30.A., 105-2.A., AND 105-48.E - FROM THE REQUIREMENT THAT STREET TREES BE PLANTED WITHIN A TREE PLANTING ZONE OF LAWN AREA OR OTHER MATERIAL APPROVED BY THE SHADE TREE COMMISSION, SITUATED BETWEEN THE SIDEWALK AND CURB, AND MEASURING A MINIMUM OF 5' IN WIDTH FROM THE PLANTING EDGE OF THE CURB TO THE PLANTING EDGE OF THE SIDEWALK, TO ALLOW STREET TREES TO BE PLANTED OUTSIDE OF THE TREE ZONE DUE TO UTILITY CONFLICTS AND AN EXISTING SANITARY SEWER EASEMENT ALONG THE SITE FRONTAGE, CONDITIONED ON THE REQUIRED NUMBER OF STREET TREES BEING PROVIDED ALONG THE SITE FRONTAGE;
22. FROM SALDO § 105-39 .A - FROM THE REQUIREMENT THAT ALL PARKING AREAS HAVE AT LEAST ONE 3-INCH CALIPER TREE FOR EVERY TWO PARKING SPACES PROVIDED TO ALLOW 23 TREES WHERE 97 TREES ARE REQUIRED BASED ON THE QUANTITY OF SURFACE PARKING SPACES DUE TO THE PROPOSED USE AS AN AUTOMOTIVE DEALERSHIP AND THEIR REQUIRED OPERATIONS AND THE EXTENSIVE LANDSCAPING AROUND THE PERIMETER OF THE SITE;
23. FROM SALDO § 58-14.A.(1): TO PERMIT THE UTILIZATION OF MANAGED RELEASE CONCEPT BMP'S ON THE SITE FOR STORMWATER MANAGEMENT AND VOLUME MITIGATION IN ACCORDANCE WITH PADEP DESIGN AND REQUIREMENTS;
24. FROM SALDO § 55-4.B.: FROM THE REQUIREMENT THAT THE REMOVAL OF MORE THAN 33% OF TREES HAVING A DBH OF 6" OR GREATER ON ANY LOT SHALL NOT BE PERMITTED TO ALLOW THE REMOVAL OF A MAXIMUM OF 35.6% OF TREES FROM THE PROPERTY;
25. FROM SALDO § 55-4.C.(4)(B): FROM THE REQUIREMENT TO DELINEATE TREE PROTECTION FENCES TO ALLOW THE TREE PROTECTION FENCING PLACEMENT PROPOSED BY THE APPLICANT;
26. FROM SALDO § 55-4.D. (1)(D): FROM THE REQUIREMENT THAT NO ACTIVITY OF ANY SORT RELATING TO TRANSPLANTING, DEMOLITION, GRADING, CONSTRUCTION, STORAGE, OR ANY OTHER ACTIVITIES SHALL OCCUR BEYOND THE LIMIT OF DISTURBANCE MARKED BY THE PROTECTIVE FENCING, AND THAT NOTHING SHALL BE STORED, STOCKPILED, TEMPORARILY PLACED, OR ALLOWED IN THE ROOT PROTECTION ZONE TO ALLOW THE "PROTECTION FROM GRADE CHANGE" NOTE TO REMAIN ON SHEET C-608 OF THE PLAN IF REQUIRED BY THE COUNTY OR THE COMMONWEALTH.
27. FROM SALDO § 55-4.F.(1): FROM THE REQUIREMENT THAT UNDERSTORY TREES BE PLANTED WITH SINGLE STEM VARIETIES HAVING A MINIMUM OF TWO-INCH CALIPER AND MULTI STEM VARIETIES HAVING NO LESS THAN THREE STEMS WITH A MINIMUM CALIPER OF 0.75 INCH PER STEM TO ALLOW THE APPLICANT TO SUBSTITUTE SHADE TREES WITH A COMBINATION OF UNDERSTORY TREES, CONDITIONED ON THE APPLICANT PAYING A FEE-IN-LIEU OF SEVEN (7) REQUIRED REPLACEMENT TREES IN THE AMOUNT OF $6,580.00 (CALCULATED AS 7 FREES X $940 PER TREE), SAID PAYMENT OCCURRING PRIOR TO THE SIGNING OF FINAL PLANS BY THE TOWNSHIP;

VARIANCES GRANTED BY THE WHITEMARSH TOWNSHIP ZONING HEARING BOARD ON DECEMBER 4, 2024:

1. A VARIANCE FROM §116-93.C, SO AS TO PERMIT AN IMPERVIOUS COVERAGE OF 73.1%
2. SPECIAL EXCEPTIONS UNDER §116-96.A AND §116-104.B.(6), SO AS TO PERMIT THE OUTSIDE DISPLAY AND/OR SALE OF VEHICLES ASSOCIATED WITH THE AUTOMOTIVE DEALERSHIP, AND TO PERMIT RETAIL SALES, WHOLESALE SALES, AND/OR CUSTOMER SERVICE IN THE CR-L DISTRICT.
3. A VARIANCE FROM §116-164.C, SO AS TO PERMIT DEVELOPMENT IN THE FLOODPLAIN WHERE THE EFFECT IS NOT FULLY OFFSET BY IMPROVEMENTS, UNDER CIRCUMSTANCES WHEREBY THE FLOOD HEIGHT WOULD BE INCREASED BY MORE THAN 4" IN HEIGHT
4. A VARIANCE FROM §116-165, SO AS TO PERMIT THE EXPANSION OF AN EXISTING AUTOMOBILE DEALERSHIP WITHIN THE FLOODPLAIN CONSERVATION OVERLAY DISTRICT.
5. A VARIANCE FROM §116-169.B.(2), SO AS TO PERMIT 40% DISTURBANCE TO MAN-MADE STEEP SLOPES (25+%) ON THE SITE.
6. A VARIANCE FROM §116-184.E, SO AS TO PERMIT PARKING SPACES LESS THAN 10 FEET FROM THE BUILDING.
7. A VARIANCE FROM §116-188.3, SO AS TO PERMIT EV CHARGING SPACES PROVIDED ONLY BASED ON THE REQUIRED OFF- STREET PARKING SPACES, AND TO EXCLUDE INVENTORY STORAGE SPACES FROM THE REQUIREMENTS.
8. VARIANCES FROM §116-259.C AND §116-260, SO AS TO PERMIT AN ENCROACHMENT INTO THE RIPARIAN CORRIDOR CONSERVATION DISTRICT ZONE TWO, INCLUDING FOR THE BUILDING AND ASSOCIATED IMPROVEMENTS, TRASH ENCLOSURE, SITE ROADS, DRIVEWAYS, AND STRUCTURES, AS THE ENTIRE SITE IS LOCATED WITHIN THE RIPARIAN CORRIDOR CONSERVATION DISTRICT DUE TO THE 100-YEAR FLOODPLAIN DELINEATION.
VARIANCES FROM §101-21.D. AND §101-24.B, SO AS TO PERMIT CONSTRUCTION WITHIN AN IDENTIFIED FLOODPLAIN AREA CLOSER THAN 50 FEET TO THE TOP-OF-BANK OF A WATERCOURSE, IN ACCORDANCE WITH PADEP AND FEMA REQUIREMENTS.
VARIANCES FROM §116-164.D AND §101-24.A.(12), SO AS TO PERMIT THE PROPOSED USE TO HAVE A SUPPLY OF MORE THAN 550 GALLONS OF PETROLEUM

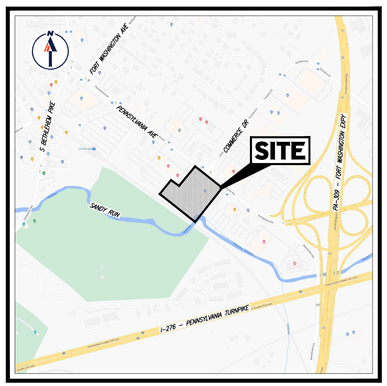


USGS MAP

AMBLER QUAD

SCALE: 1"=2,000'

1000' 0 2000'



LOCATION MAP

SCALE: 1"=800'

400' 0 800'

PREPARED BY

BOHLER

(Rev. 1/2020)

SITE SPECIFIC NOTES

1. PROPERTY OWNER:
AUTO PROPERTIES FORT WASHINGTON
1 OLYMPIC PL, SUITE 1000, TOWSON, MD 21204
2. EXISTING PROPERTY INFORMATION:
65-00-08773-00-3 , 65-00-087670-00-6 , 65-00-08773-00-9 , 65-00-08776-00-6
500-512 PENNSYLVANIA AVE, FORT WASHINGTON, PA 19034
ZONED GC-2 AND R-4
3. APPLICANT/EQUITABLE OWNER:
MILEONE FORT WASHINGTON, LLC
C/O DENNIS TURNBAUGH
3301 BRIGGS CHANEY ROAD, SILVER SPRING, MD 20904
(301) 679-4062
4. SITE AREA:
GROSS AREA = 223,558 S.F. OR 5.132 AC.

PARCEL DATA (PIN AND ADDRESS): PROPERTY KNOWN AS BLOCK 51, UNIT 41, APN #65-00-08770-00-3; BLOCK 51, UNIT 46, APN #65-00-08767-00-6; BLOCK 51, UNIT 2, APN #65-00-08773-00-9 & BLOCK 51, UNIT 44, APN #65-00-08776-00-6 AS IDENTIFIED ON THE OFFICIAL TAX MAP OF WHITEMARSH TOWNSHIP, COMMONWEALTH OF PENNSYLVANIA.

5. EXISTING NUMBER OF LOTS: FIVE (5)
5.a. EXISTING LOT 1: APN 65000877003
5.b. EXISTING LOT 2: APN 65000876706
5.c. EXISTING LOT 3: APN 65000877009
5.d. EXISTING LOT 4: APN 65000877606
5.e. EXISTING LOT 5: APN 65000876705
6. PROPOSED NUMBER OF LOTS: ONE (1)
7. SOURCE OF TITLE: TITLE REPORT PREPARED BY CHICAGO TITLE INSURANCE COMPANY. TITLE NUMBER PHI210770. EFFECTIVE DATE 05/17/2021.
8. HORIZONTAL DATUM <IS BASED ON PENNSYLVANIA STATE PLANE SOUTH COORDINATES, NAD 83. VERTICAL DATUM IS NAVD 1988, BENCHMARK: 166.06'>.
9. BY GRAPHIC PLOTTING ONLY, THE PROPERTY IS LOCATED IN FLOOD HAZARD ZONE AE (BASE FLOOD ELEVATIONS DETERMINED) AS SHOWN ON THE FLOOD INSURANCE RATE MAP (FIRM), MONTGOMERY COUNTY, PENNSYLVANIA, (ALL JURISDICTIONS), PANEL 289 OF 451MAP NUMBER 42091C0289G, EFFECTIVE DATE: 03-02-2016.
10. THE AREA BETWEEN THE ULTIMATE AND LEGAL RIGHT-OF-WAY SHALL BE DEDICATED TO WHITEMARSH TOWNSHIP.
11. ALL CURB AND PAVEMENT RADII ARE 5', UNLESS OTHERWISE NOTED.
12. ALL PROPOSED PINS AND MONUMENTS SHALL BE PLACED AND CERTIFIED BY A LICENSED PENNSYLVANIA PROFESSIONAL SURVEYOR.

STORMWATER MANAGEMENT OWNER CERTIFICATION

I, _____, ACKNOWLEDGE THAT THE STORMWATER BMPS ARE FIXTURES THAT CAN BE ALTERED OR REMOVED ONLY AFTER APPROVAL BY THE TOWNSHIP.

_____
NAME

_____
TITLE

_____
DATE

STORMWATER BLANKET EASEMENT

A BLANKET STORMWATER EASEMENT IN FAVOR OF WHITEMARSH TOWNSHIP IS PROVIDED FOR ACCESS AND MAINTENANCE PURPOSES ON AND OVER THE PROPERTY, EXCEPT FOR THE PORTIONS OF THE PROPERTY ON WHICH BUILDINGS OR OTHER VERTICAL STRUCTURES HAVE BEEN ERECTED. THE TOWNSHIP OF WHITEMARSH SHALL HAVE THE RIGHT TO INSPECT ALL STORMWATER MANAGEMENT FEATURE AND FACILITIES AND TO REQUIRE REPAIRS, BUT NOT THE OBLIGATION TO MAKE SUCH REPAIRS.

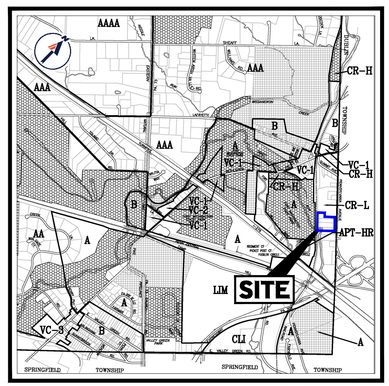
STORMWATER FACILITIES SHALL BE OWNED AND MAINTAINED BY THE PROPERTY OWNER IN PERPETUITY. THE PROPERTY OWNER SHALL PROVIDE A BLANKET STORMWATER ACCESS EASEMENT TO THE TOWNSHIP FOR THE PURPOSE OF ACCESS TO THE STORMWATER FACILITIES. IF, IN THE JUDGEMENT OF THE TOWNSHIP ENGINEER, THE OWNER HAS FAILED TO MAINTAIN THE STORMWATER FACILITIES IN SUCH A MANNER AS TO ENSURE THEIR PROPER FUNCTIONING, THE TOWNSHIP AFTER PROVIDING A WRITTEN NOTICE, SHALL HAVE THE RIGHT TO ENTER UPON THE LANDS OF THE OWNER AND TO MAKE ANY REPAIRS AS MAY BE NECESSARY TO THE STORMWATER FACILITIES TO ENSURE THAT SUCH FACILITIES FUNCTION AND PERFORM IN ACCORDANCE WITH THE DESIGN SPECIFICATIONS. ANY AND ALL COSTS INCURRED BY THE TOWNSHIP FOR SUCH REPAIRS AND/OR MAINTENANCE SHALL BE PAID IN FULL BY THE OWNER. A LIEN OR LIENS MAY BE PLACED AGAINST THE PROPERTY/IES IF THE OWNER FAILS TO REMIT PAYMENT WITHIN SIXTY (60) DAYS.

MCPC No.: (_____)

PROCESSED and REVIEWED. Report prepared by
Montgomery County Planning Commission
in accordance with the Municipalities Planning Code.

Certified this date _____

_____
Montgomery County Planning Commission



ZONING MAP

SCALE: 1"=2,000'

1000' 0 2000'

ZONING KEY

CR-L - COMMERCIAL RETAIL

A - RESIDENTIAL (15,000 SF)

VC-1 - VILLAGE COMMERCIAL 1

: RECREATION OVERLAY

RECORDER OF DEEDS

RECORDED IN THE OFFICE FOR THE RECORDING OF DEEDS IN AND FOR THE COUNTY OF MONTGOMERY, AT NORRISTOWN, PA. IN PLAN BOOK NO. _____ PAGE NO. _____ ON _____, 20___.

_____
RECORDER

OWNER CERTIFICATION AND ACKNOWLEDGEMENT OF PLAN

I, _____, HEREBY CERTIFY THAT _____, IS THE REGISTERED OWNER OF THE LAND HEREIN PROPOSED TO BE DEVELOPED, AND THAT SAID OWNER ADOPTS THIS PLAN AND DESIRES THE SAME TO BE RECORDED. WITNESS MY HAND AND SEAL THIS ____ DAY OF _____, 20___.

AUTO PROPERTIES FORT WASHINGTON, LLC
BY: MILEONE FORT WASHINGTON, LLC
MEMBER

_____ _____
NAME ATTEST

_____
TITLE

COMMONWEALTH OF PENNSYLVANIA,
COUNTY OF MONTGOMERY:

ON THIS, THE _____DAY OF _____, 20____, BEFORE ME, A NOTARY PUBLIC, THE UNDERSIGNED OFFICER, PERSONALLY APPEARED _____, WHO ACKNOWLEDGED HIMSELF TO BE THE _____ OF _____, AND THAT HE AS SUCH, BEING AUTHORIZED TO DO SO, EXECUTED THE FOREGOING INSTRUMENT FOR THE PURPOSES THEREIN CONTAINED.

IN WITNESS WHEREOF, I HAVE HEREUNTO SET MY HAND AND OFFICIAL SEAL.

_____
NOTARY PUBLIC

MY COMMISSION EXPIRES:_____

SURVEYOR'S CERTIFICATION

I, JAMES C. WEED, P.L.S., A REGISTERED PROFESSIONAL LAND SURVEYOR OF THE COMMONWEALTH OF PENNSYLVANIA, DO HEREBY CERTIFY THAT THIS PLAN CORRECTLY REPRESENTS THE METES AND BOUNDS AS SURVEYED BY ME ON _____, 20____, AND THAT THE LOCATION, SIZE AND MATERIAL OF EXISTING MARKERS ARE ACCURATELY SHOWN HEREON.

_____
JAMES C. WEED

_____
REGISTERED No.: #SU075250

_____
DATE

MONUMENTATION CERTIFICATION:

I, JAMES C. WEED, P.L.S., A REGISTERED PROFESSIONAL LAND SURVEYOR OF THE COMMONWEALTH OF PENNSYLVANIA, DO HEREBY CERTIFY THAT ALL CONCRETE MONUMENTS HAVE BEEN SET OR FOUND BY ME ON _____, 20____, AS INDICATED AND SHOWN HEREON.

_____
JAMES C. WEED

_____
REGISTERED No.: #SU075250

_____
DATE

ENGINEER'S CERTIFICATION

I, JEFFREY A. BEAVAN, P.E., A REGISTERED PROFESSIONAL ENGINEER OF THE COMMONWEALTH OF PENNSYLVANIA, DO HEREBY CERTIFY THAT THIS PLAN CORRECT IN ALL DETAILS AS PREPARED BY ME ON _____, 20____.

_____
JEFFREY A. BEAVAN

_____
REGISTERED No.: #PE082005

_____
DATE

STORMWATER MANAGEMENT DESIGN ENGINEER CERTIFICATION

JEFFREY A. BEAVAN, P.E., ON THIS DATE _____ HAS REVIEWED AND HEREBY CERTIFIES THAT THE STORMWATER MANAGEMENT SITE PLAN MEETS ALL DESIGN STANDARDS AND CRITERIA OF CHAPTER 58, "GRADING, EROSION CONTROL, STORMWATER MANAGEMENT AND BEST MANAGEMENT PRACTICE.

_____
JEFFREY A. BEAVAN

_____
REGISTERED No.: #PE082005

REVIEW OF THE TOWNSHIP ENGINEER, WHITEMARSH TOWNSHIP:

THIS SUBDIVISION AND/OR LAND DEVELOPMENT PLAN WAS REVIEWED BY THE APPOINTED TOWNSHIP ENGINEER FOR WHITEMARSH TOWNSHIP ON THIS _____ DAY OF _____, 20____.

_____
KRISTA HEINRICH, P.E.
TOWNSHIP ENGINEER

APPROVAL OF THE WHITEMARSH TOWNSHIP BOARD OF SUPERVISORS:

THIS SUBDIVISION AND/OR LAND DEVELOPMENT PLAN WAS APPROVED BY RESOLUTION OF THE BOARD OF SUPERVISORS OF WHITEMARSH TOWNSHIP ON THIS _____ DAY OF _____, 20____.

_____ CHAIRMAN

_____ SECRETARY

RECORD PLAN 1 OF 10

BOHLER

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE SOLUTIONS
PERMITTING SERVICES
TRANSPORTATION SERVICES

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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/3/2025	NPDES MAJOR MODIFICATION	RMS / JAB
2	3/12/2025	FOR NPDES RESUBMISSION	RMS / JAB
3	04/14/2025	PER TOWNSHIP COMMENT	RMS / JAB
4	5/28/2025	PER NPDES COMMENT	RMS / JAB
5	7/22/2025	PER REVISED ARCH	RMS / MRB

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NOT APPROVED FOR CONSTRUCTION

THIS DRAWING IS INTENDED FOR MUNICIPAL AND/OR AGENCY REVIEW AND APPROVAL. IT IS NOT INTENDED AS A CONSTRUCTION DOCUMENT UNLESS INDICATED OTHERWISE.

PROJECT No.:	PAB220113.01
DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-CNDS-5A

PROJECT:

AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

500 PENNSYLVANIA AVENUE WHITEMARSH TOWNSHIP MONTGOMERY COUNTY, PA

BOHLER
74 W BROAD STREET, SUITE 500
BETHLEHEM, PA 18018
Phone: (610) 709-9971
Fax: (610) 709-9976
www.BohlerEngineering.com

COMMONWEALTH OF PENNSYLVANIA
J. A. BEAVAN
PROFESSIONAL
JEFFREY A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE082005
NEW JERSEY LICENSE No. 24GE05520600

SHEET TITLE:

COVER SHEET

SHEET NUMBER:

C-101

Page 1 of 36

REVISION 5 - 7/22/2025

BSV I:\DOYLENNO-NET\SHARESP\A-PROJECTS\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-CNDS-5A_—LAYOUT C-101 COVER

GENERAL NOTES

(Rev. 2/2021)

1. THESE PLANS ARE SOLELY BASED ON INFORMATION THE OWNER AND OTHERS PROVIDED TO BOHLER ENGINEERING, PENNSYLVANIA, LLC (HEREIN "BOHLER") PRIOR TO THE DATE ON WHICH THE ENGINEER OF RECORD AND BOHLER PREPARED THESE PLANS. THE CONTRACTOR MUST FIELD VERIFY ALL EXISTING CONDITIONS AND IMMEDIATELY NOTIFY BOHLER, IN WRITING, IF ANY ACTUAL SITE CONDITIONS DIFFER FROM THOSE SHOWN ON THESE PLANS, OR IF THE PROPOSED WORK CONFLICTS WITH ANY OTHER SITE FEATURES.

2. THE CONTRACTOR MUST STRICTLY COMPLY WITH THESE NOTES AND ALL SPECIFICATIONS/REPORTS CONTAINED HEREIN. THE CONTRACTOR MUST ENSURE THAT ALL SUBCONTRACTORS FULLY AND COMPLETELY CONFORM TO AND COMPLY WITH THESE REQUIREMENTS, THESE NOTES, AND THE REQUIREMENTS ARTICULATED IN THE NOTES CONTAINED IN ALL THE OTHER DRAWINGS THAT COMPRISE THE PLAN SET OF DRAWINGS. ADDITIONAL NOTES AND SPECIFIC PLAN NOTES MAY BE FOUND ON THE INDIVIDUAL PLANS. THESE GENERAL NOTES APPLY TO THIS ENTIRE DOCUMENT PACKAGE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW ALL CONSTRUCTION CONTRACT DOCUMENTS INCLUDING, BUT NOT LIMITED TO, ALL OF THE DRAWINGS AND SPECIFICATIONS ASSOCIATED WITH THE PROJECT WORK SCOPE, PRIOR TO THE INITIATION AND COMMENCEMENT OF CONSTRUCTION.

3. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR MUST CONFIRM WITH THE ENGINEER OF RECORD AND BOHLER THAT THE LATEST EDITION OF THE DOCUMENTS AND/OR REPORTS REFERENCED WITHIN THE PLAN REFERENCES ARE BEING USED FOR CONSTRUCTION. THIS IS THE CONTRACTOR'S SOLE AND COMPLETE RESPONSIBILITY.

4. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR MUST ENSURE THAT ALL REQUIRED PERMITS AND APPROVALS HAVE BEEN OBTAINED. NO CONSTRUCTION OR FABRICATION IS TO BEGIN UNTIL THE CONTRACTOR HAS RECEIVED AND THOROUGHLY REVIEWED THE CONDITIONS OF APPROVAL TO ALL APPLICABLE PERMITS AND APPROVALS BY THE PERMITTING AUTHORITIES AND HAS ALSO CONFIRMED THAT ALL NECESSARY AND REQUIRED PERMITS HAVE BEEN OBTAINED. THE CONTRACTOR MUST HAVE COPIES OF ALL PERMITS AND APPROVALS ON SITE AT ALL TIMES.

5. THE CONTRACTOR MUST ENSURE THAT ALL WORK IS PERFORMED IN ACCORDANCE WITH THESE PLANS, SPECIFICATIONS/REPORTS AND CONDITIONS OF APPROVAL AND ALL APPLICABLE REQUIREMENTS, RULES, REGULATIONS, STATUTES, REQUIREMENTS, CODES, LAWS AND STANDARDS OF ALL GOVERNMENTAL ENTITIES WITH JURISDICTION OVER THIS PROJECT, AND ALL PROVISIONS IN AND CONDITIONS OF THE CONSTRUCTION CONTRACT WITH THE OWNER/DEVELOPER INCLUDING ALL EXHIBITS, ATTACHMENTS AND ADDENDA TO SAME.

6. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR MUST COORDINATE THE BUILDING LAYOUT BY CAREFULLY REVIEWING THE MOST CURRENT ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND FIRE SUPPRESSION PLANS (WHERE APPLICABLE). THE CONTRACTOR MUST IMMEDIATELY NOTIFY OWNER, ARCHITECT AND ENGINEER OF RECORD AND BOHLER, IN WRITING, OF ANY CONFLICTS, DISCREPANCIES OR AMBIGUITIES WHICH EXIST BETWEEN THESE PLANS AND ANY OTHER PLANS THAT COMPRISE THE CONSTRUCTION DOCUMENTS.

7. CONTRACTOR MUST REFER TO AND ENSURE COMPLIANCE WITH THE APPROVED ARCHITECTURAL/BUILDING PLANS OF RECORD FOR EXACT LOCATIONS AND DIMENSIONS OF ENTRY/EXIT POINTS, ELEVATIONS, PRECISE BUILDING DIMENSIONS, AND EXACT BUILDING UTILITY LOCATIONS.

8. THE CONTRACTOR MUST FIELD VERIFY ALL DIMENSIONS AND MEASUREMENTS SHOWN ON THESE PLANS, PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR MUST IMMEDIATELY NOTIFY ENGINEER OF RECORD AND BOHLER, IN WRITING, IF ANY CONFLICTS, DISCREPANCIES, OR AMBIGUITIES EXIST PRIOR TO PROCEEDING WITH CONSTRUCTION. NO EXTRA COMPENSATION WILL BE ALLOWED TO THE CONTRACTOR FOR WORK WHICH HAS TO BE RE-DONE OR REPAIRED DUE TO DIMENSIONS, MEASUREMENTS OR GRADES SHOWN INCORRECTLY ON THESE PLANS PRIOR TO BOTH (A) THE CONTRACTOR GIVING ENGINEER OF RECORD AND BOHLER WRITTEN NOTIFICATION OF SAME AND (B) ENGINEER OF RECORD AND BOHLER, THEREAFTER, PROVIDING THE CONTRACTOR WITH WRITTEN AUTHORIZATION TO PROCEED WITH SUCH ADDITIONAL WORK.

9. THE CONTRACTOR MUST VERIFY ALL DIMENSIONS AND MEASUREMENTS INCLUDED ON DESIGN DOCUMENTS HEREIN AND MUST NOT SCALE OFF THE DRAWINGS SET TO ANY DIMENSIONS. ALL DIMENSIONS AND MEASUREMENTS ARE TO BE CHECKED AND CONFIRMED BY THE GENERAL CONTRACTOR PRIOR TO PREPARATION OF SHOP DRAWINGS, FABRICATION/ORDERING OF PARTS AND MATERIALS AND COMMENCEMENT OF SITE WORK. SITE PLAN DRAWINGS ARE NOT INTENDED AS SURVEY DOCUMENTS. DIMENSIONS SUPERSEDE GRAPHICAL REPRESENTATIONS. THE CONTRACTOR MUST MAKE CONTRACTORS OWN MEASUREMENTS AS NECESSARY FOR IMPLEMENTATION OF IMPROVEMENTS.

10. THE OWNER AND CONTRACTOR MUST BE FAMILIAR WITH AND RESPONSIBLE FOR THE PROCUREMENT OF ANY AND ALL CERTIFICATIONS REQUIRED FOR THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.

11. WHEN INCLUDED AS ONE OF THE REFERENCED DOCUMENTS, THE GEOTECHNICAL REPORT, SPECIFICATIONS AND RECOMMENDATIONS SET FORTH THEREIN ARE A PART OF THE REQUIRED CONSTRUCTION DOCUMENTS AND, IN CASE OF CONFLICT, DISCREPANCY OR AMBIGUITY, THE MORE RESTRICTIVE OR HIGHER QUALITY REQUIREMENT SHALL GOVERN. THE PLANS AND ALL THE GEOTECHNICAL REPORT AND RECOMMENDATIONS, MUST TAKE PRECEDENCE UNLESS SPECIFICALLY NOTED OTHERWISE ON THE PLANS. THE CONTRACTOR MUST NOTIFY THE ENGINEER OF RECORD AND BOHLER, IN WRITING, OF ANY SUCH CONFLICT, DISCREPANCY OR AMBIGUITY BETWEEN THE GEOTECHNICAL REPORT AND PLANS AND SPECIFICATIONS, PRIOR TO PROCEEDING WITH WORK. IF A GEOTECHNICAL REPORT WAS NOT CREATED, THEN THE CONTRACTOR MUST FOLLOW AND COMPLY WITH ALL OF THE REQUIREMENTS OF ANY AND ALL MUNICIPAL, COUNTY, STATE, AND FEDERAL LAWS AND APPLICABLE SPECIFICATIONS WHICH HAVE JURISDICTION OVER THIS PROJECT.

12. ENGINEER OF RECORD AND BOHLER ARE NEITHER LIABLE NOR RESPONSIBLE FOR ANY SUBSURFACE CONDITIONS AND FURTHER, HAS NO LIABILITY FOR ANY HAZARDOUS MATERIALS, HAZARDOUS WASTE MATERIALS ON, ABOUT OR UNDER THE PROPERTY.

13. THE CONTRACTOR IS RESPONSIBLE FOR IDENTIFYING WHEN AND WHERE SHORING IS REQUIRED AND FOR INSTALLING ALL SHORING REQUIRED DURING EXCAVATION (TO BE PERFORMED IN ACCORDANCE WITH CURRENT OSHA STANDARDS) AND ANY ADDITIONAL PRECAUTIONS TO BE TAKEN TO ASSURE THE STABILITY OF ADJACENT, NEARBY AND CONTIGUOUS STRUCTURES AND PROPERTIES. ALL OF THIS WORK IS TO BE PERFORMED AT CONTRACTOR'S COST AND EXPENSE.

14. THE CONTRACTOR MUST EXERCISE EXTREME CAUTION WHEN PERFORMING ANY WORK ACTIVITIES ADJACENT TO PAVEMENT, STRUCTURES, ETC. WHICH ARE TO REMAIN EITHER FOR AN INITIAL PHASE OF THE PROJECT OR AS PART OF THE FINAL CONDITION. THE CONTRACTOR IS RESPONSIBLE FOR TAKING ALL APPROPRIATE MEASURES REQUIRED TO ENSURE THE STRUCTURAL STABILITY OF SIDEWALKS AND PAVEMENT, UTILITIES, BUILDINGS, AND INFRASTRUCTURE WHICH ARE TO REMAIN, AND TO PROVIDE A SAFE WORK AREA FOR THIRD PARTIES, PEDESTRIANS AND ANYONE INVOLVED WITH THE PROJECT.

15. DEBRIS MUST NOT BE BURIED ON THE SUBJECT SITE. ALL DEMOLITION AND CONSTRUCTION WASTES, UNSUITABLE EXCAVATED MATERIAL, EXCESS SOIL AND DEBRIS (SOLID WASTE) MUST BE DISPOSED OF IN ACCORDANCE WITH THE REQUIREMENTS OF ANY AND ALL MUNICIPAL, COUNTY, STATE, AND FEDERAL LAWS AND APPLICABLE CODES WHICH HAVE JURISDICTION OVER THIS PROJECT OR OVER THE CONTRACTOR.

16. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO MAINTAIN RECORDS TO DEMONSTRATE PROPER AND FULLY COMPLIANT DISPOSAL ACTIVITIES, TO BE PROMPTLY PROVIDED TO THE OWNER UPON REQUEST.

17. THE CONTRACTOR MUST REPAIR, AT CONTRACTOR'S SOLE COST, ALL DAMAGE DONE TO ANY NEW OR EXISTING CONSTRUCTION OR PROPERTY DURING THE COURSE OF CONSTRUCTION, INCLUDING BUT NOT LIMITED TO DRAINAGE, UTILITIES, PAVEMENT, STRIPING, CURB, ETC. AND MUST BEAR ALL COSTS ASSOCIATED WITH SAME TO INCLUDE, BUT NOT BE LIMITED TO, REDESIGN, RE-SURVEY, RE-PERMITTING AND CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR AND MUST REPLACE OR REPAIR AND MUST PROMPTLY REPAIR ANY SIGNAL INTERCONNECTION CABLE, WIRING CONDUITS, AND ANY UNDERGROUND ACCESSORY EQUIPMENT DAMAGED DURING CONSTRUCTION AND MUST BEAR ALL COSTS ASSOCIATED WITH SAME. THE REPAIR OF ANY SUCH NEW OR EXISTING CONSTRUCTION OR PROPERTY MUST RESTORE SUCH CONSTRUCTION OR PROPERTY TO A CONDITION EQUIVALENT TO OR BETTER THAN THE CONDITIONS PRIOR TO COMMENCEMENT OF THE CONSTRUCTION, AND IN CONFORMANCE WITH APPLICABLE CODES, LAWS, RULES, REGULATIONS, STATUTORY REQUIREMENTS AND STATUTES. THE CONTRACTOR MUST BEAR ALL COSTS ASSOCIATED WITH SAME. THE CONTRACTOR MUST, PROMPTLY, DOCUMENT ALL EXISTING DAMAGE AND NOTIFY, IN WRITING, THE OWNER AND THE CONSTRUCTION MANAGER PRIOR TO THE START OF CONSTRUCTION.

18. THE ENGINEER OF RECORD AND BOHLER ARE NOT RESPONSIBLE FOR AND HAVE NO CONTRACTUAL, LEGAL OR OTHER RESPONSIBILITIES FOR JOB SITE SAFETY JOB SITE SUPERVISION, OR ANYTHING RELATED TO SAME. THE ENGINEER OF RECORD AND BOHLER HAVE NOT BEEN RETAINED TO PERFORM OR TO BE RESPONSIBLE FOR JOB SITE SAFETY, SAME BEING WHOLLY OUTSIDE OF ENGINEER OF RECORD'S AND BOHLER SERVICES AS RELATED TO THIS PROJECT. THE ENGINEER OF RECORD AND BOHLER ARE NOT RESPONSIBLE TO IDENTIFY OR REPORT ANY JOB SITE SAFETY ISSUES OR ANY JOB SITE CONDITIONS, AT ANY TIME.

19. THE CONTRACTOR MUST IMMEDIATELY IDENTIFY IN WRITING, TO THE ENGINEER OF RECORD AND BOHLER , ANY DISCREPANCIES THAT MAY OR COULD AFFECT THE PUBLIC SAFETY, HEALTH OR GENERAL WELFARE OR PROJECT COST. IF THE CONTRACTOR PROCEEDS WITH CONSTRUCTION WITHOUT PROVIDING PROPER WRITTEN NOTIFICATION AS DESCRIBED ABOVE, IT WILL BE AT THE CONTRACTOR'S OWN RISK AND, FURTHER, THE CONTRACTOR MUST INDEMNIFY, DEFEND AND HOLD HARMLESS THE ENGINEER OF RECORD AND BOHLER FOR ANY AND ALL DAMAGES, COSTS, INJURIES, ATTORNEY'S FEES AND THE LIKE WHICH RESULT FROM OR ARE IN ANY WAY RELATED TO SAME INCLUDING, BUT NOT LIMITED TO, ANY THIRD PARTY AND FIRST PARTY CLAIMS.

20. THE ENGINEER OF RECORD AND BOHLER ARE NOT RESPONSIBLE FOR ANY INJURY OR DAMAGES RESULTING FROM THE CONTRACTOR'S FAILURE TO BUILD OR CONSTRUCT IN STRICT ACCORDANCE WITH THE APPROVED PLANS, AND CURRENT CODES, RULES, STATUTES AND THE LIKE. IF THE CONTRACTOR AND/OR OWNER FAIL TO BUILD OR CONSTRUCT ANY IMPROVEMENTS IN ACCORDANCE WITH ALL APPLICABLE RULES, STATUTES, CODES AND THE LIKE, THE CONTRACTOR AND/OR OWNER AGREE TO AND MUST JOINTLY, INDEPENDENTLY, SEPARATELY, AND SEVERALLY INDEMNIFY AND HOLD THE ENGINEER OF RECORD AND BOHLER HARMLESS FOR AND FROM ALL INJURIES, CLAIMS AND DAMAGES THAT ENGINEER AND BOHLER SUFFER AND ANY AND ALL COSTS THAT ENGINEER AND BOHLER INCUR AS A RESULT.

21. ALL CONTRACTORS MUST CARRY AT LEAST THE MINIMUM AMOUNT OF THE SPECIFIED AND COMMERCIALLY REASONABLE STATUTORY WORKER'S COMPENSATION INSURANCE, EMPLOYER'S LIABILITY INSURANCE AND COMMERCIAL GENERAL LIABILITY INSURANCE (CGL) INCLUDING ALSO ALL UMBRELLA COVERAGES. ALL CONTRACTORS MUST HAVE THEIR CGL POLICIES ENDORSED TO NAME BOHLER , AND ITS PAST, PRESENT AND FUTURE OWNERS, OFFICERS, DIRECTORS, PARTNERS, SHAREHOLDERS, MEMBERS, PRINCIPALS, COMMISSIONERS, AGENTS, SERVANTS, EMPLOYEES, AFFILIATES, SUBSIDIARIES, AND RELATED ENTITIES, AND ITS SUBCONTRACTORS AND SUBCONSULTANTS AS ADDITIONAL NAMED INSUREDS AND TO PROVIDE CONTRACTUAL LIABILITY COVERAGE SUFFICIENT TO INSURE (DEFEND, IF APPLICABLE) AND HOLD HARMLESS AND INDEMNITY OBLIGATIONS ASSUMED AND AGREED TO BY THE CONTRACTOR HEREIN. ALL CONTRACTORS MUST FURNISH BOHLER WITH CERTIFICATIONS OF INSURANCE OR CERTIFICATES OF INSURANCE AS EVIDENCE OF THE REQUIRED INSURANCE COVERAGES PRIOR TO COMMENCING ANY WORK AND UPON RENEWAL OF EACH POLICY DURING THE ENTIRE PERIOD OF CONSTRUCTION. THE CONTRACTOR'S OBLIGATION TO MAINTAIN SUCH INSURANCE AFTER ALL PERMITS ARE ISSUED, WHICHEVER DATE IS LATER, IN ADDITION, ALL CONTRACTORS AGREE THAT THEY WILL, TO THE FULLEST EXTENT PERMITTED UNDER THE LAW, INDEMNIFY, DEFEND AND HOLD HARMLESS BOHLER , ITS PAST, PRESENT AND FUTURE OFFICERS, DIRECTORS, PARTNERS, SHAREHOLDERS, MEMBERS, PRINCIPALS, COMMISSIONERS, AGENTS, SERVANTS, EMPLOYEES, AFFILIATES, SUBSIDIARIES, AND RELATED ENTITIES, AND ITS SUBCONTRACTORS AND SUBCONSULTANTS AGAINST ANY DAMAGES, INJURIES, CLAIMS, ACTIONS, PENALTIES, EXPENSES, PUNITIVE DAMAGES, STATUTORY CAUSES OF ACTION, LOSSES, CAUSES OF ACTION, LOSSES, CAUSES OF ACTION, LIABILITIES OR COSTS, INCLUDING, BUT NOT LIMITED TO, REASONABLE ATTORNEYS' FEES AND DEFENSE COSTS, ARISING OUT OF OR IN ANY WAY CONNECTED WITH OR TO THE PROJECT, INCLUDING ALL CLAIMS BY EMPLOYEES OF THE CONTRACTOR(S), ALL CLAIMS BY THIRD PARTIES AND ALL CLAIMS RELATED TO THE PROJECT. THE CONTRACTOR MUST NOTIFY ENGINEER, IN WRITING, AT LEAST THIRTY (30) DAYS PRIOR TO ANY TERMINATION, SUSPENSION OR CHANGE OF ITS INSURANCE HEREUNDER.

22. THE ENGINEER OF RECORD AND BOHLER ARE NOT RESPONSIBLE FOR CONSTRUCTION METHODS, MEANS, TECHNIQUES OR PROCEDURES, GENERALLY OR FOR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES OR PROCEDURES FOR COMPLETION OF THE WORK DEPICTED BOTH ON THESE PLANS, AND FOR ANY CONFLICTS IN SCOPE AND REVISIONS THAT RESULT FROM SAME. THE CONTRACTOR IS FULLY AND SOLELY RESPONSIBLE FOR DETERMINING THE MEANS AND METHODS FOR COMPLETION OF THE WORK, PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

23. NEITHER THE PROFESSIONAL ACTIVITIES OF BOHLER, NOR THE PRESENCE OF BOHLER AND/OR ITS PAST, PRESENT AND FUTURE OWNERS, OFFICERS, DIRECTORS, PARTNERS, SHAREHOLDERS, MEMBERS, PRINCIPALS, COMMISSIONERS, AGENTS, SERVANTS, EMPLOYEES, AFFILIATES, SUBSIDIARIES, AND RELATED ENTITIES, AND ITS SUBCONTRACTORS AND SUBCONSULTANTS AT A CONSTRUCTION/PROJECT SITE (HEREIN "BOHLER PARTIES"), RELIEVES OR WILL RELIEVE THE CONTRACTOR OF AND FROM CONSTRUCTION MEANS, METHODS, SEQUENCE, TECHNIQUES OR PROCEDURES NECESSARY FOR PERFORMING, OVERSEEING, SUPERINTENDING AND COORDINATING THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND COMPLIANCE WITH ALL HEALTH AND SAFETY PRECAUTIONS REQUIRED BY ANY REGULATORY AGENCIES WITH JURISDICTION OVER THE PROJECT AND/OR PROPERTY. BOHLER PARTIES HAVE NO AUTHORITY TO EXERCISE ANY CONTROL OVER ANY CONSTRUCTION (OR ANY RESPONSIBILITY FOR) ANY CONSTRUCTION, THE CONTRACTOR OR ITS EMPLOYEES RELATING TO THEIR WORK AND ANY AND ALL HEALTH AND SAFETY PROGRAMS OR PROCEDURES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR JOB SITE SAFETY. THE CONTRACTOR MUST INDEMNIFY, DEFEND, PROTECT AND HOLD HARMLESS BOHLER PARTIES FOR AND FROM ANY LIABILITY TO BOHLER PARTIES RESULTING FROM THE CONTRACTOR'S WORK, SERVICES AND/OR VIOLATIONS OF THIS NOTE, THESE NOTES OR ANY NOTES IN THE PLAN SET AND, FURTHER, THE CONTRACTOR MUST NAME BOHLER AS AN ADDITIONAL INSURED UNDER THE GENERAL CONTRACTOR'S POLICIES OF GENERAL LIABILITY INSURANCE AS DESCRIBED ABOVE.

24. WHEN IT IS CLEARLY AND SPECIFICALLY WITHIN BOHLER'S SCOPE OF SERVICES CONTRACT WITH THE OWNER/DEVELOPER, BOHLER WILL REVIEW OR TAKE OTHER APPROPRIATE ACTION ON THE CONTRACTOR SUBMITTALS, SUCH AS SHOP DRAWINGS, PRODUCT DATA, SAMPLES, AND OTHER DATA, WHICH THE CONTRACTOR IS REQUIRED TO SUBMIT, BUT ONLY FOR THE LIMITED PURPOSE OF EVALUATING CONFORMANCE WITH THE DESIGN INTENT AND THE INFORMATION SHOWN IN THE CONSTRUCTION CONTRACT DOCUMENTS. CONSTRUCTION MEANS AND METHODS AND/OR TECHNIQUES OR PROCEDURES, COORDINATION OF THE WORK WITH OTHER TRADES, AND CONSTRUCTION SAFETY PRECAUTIONS ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND BOHLER HAS NO RESPONSIBILITY OR LIABILITY FOR SAME. BOHLER WILL PERFORM ITS SHOP DRAWING REVIEW WITH REASONABLE PROMPTNESS, AS CONDITIONS PERMIT. ANY DOCUMENT, DOCUMENTING BOHLER'S REVIEW OF A SPECIFIC ITEM OR LIMITED SCOPE, MUST NOT INDICATE THAT BOHLER HAS REVIEWED THE ENTIRE ASSEMBLY OF WHICH THE ITEM IS A COMPONENT. BOHLER IS NOT RESPONSIBLE FOR ANY DEVIATIONS FROM THE CONSTRUCTION DOCUMENTS. THE CONTRACTOR MUST, IN WRITING, PROMPTLY AND IMMEDIATELY BRING ANY DEVIATIONS FROM THE CONSTRUCTION DOCUMENTS TO BOHLER'S ATTENTION. BOHLER IS NOT REQUIRED TO REVIEW PARTIAL SUBMISSIONS OR THOSE FOR WHICH SUBMISSIONS OF CORRELATED ITEMS HAVE NOT BEEN RECEIVED.

25. IF THE CONTRACTOR DEVIATES FROM THESE PLANS AND/OR SPECIFICATIONS, INCLUDING THE NOTES CONTAINED HEREIN, WITHOUT FIRST OBTAINING THE PRIOR WRITTEN AUTHORIZATION OF THE ENGINEER OF RECORD AND BOHLER FOR ALL DEVIATIONS WITHIN ENGINEER'S SCOPE, THE CONTRACTOR IS SOLELY RESPONSIBLE FOR THE PAYMENT OF ALL COSTS INCURRED IN CORRECTING ANY WORK PERFORMED WHICH DEVIATES FROM THE PLANS, ALL FINES AND/OR PENALTIES ASSESSED WITH RESPECT THERETO AND ALL COMPENSATORY OR PUNITIVE DAMAGES RESULTING THEREFROM AND, FURTHER, MUST DEFEND, INDEMNIFY, PROTECT, AND HOLD HARMLESS THE ENGINEER OF RECORD AND BOHLER PARTIES TO THE FULLEST EXTENT PERMITTED UNDER THE LAW, FOR AND FROM ALL FEES, ATTORNEYS' FEES, DAMAGES, COSTS, JUDGMENTS, CLAIMS, INJURIES, PENALTIES AND THE LIKE RELATED TO SAME.

26. THE CONTRACTOR IS RESPONSIBLE FOR A MAINTAINING AND PROTECTING THE TRAFFIC CONTROL PLAN AND ELEMENTS IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REQUIREMENTS, FOR ALL WORK THAT AFFECTS PUBLIC TRAVEL EITHER IN THE RIGHT OF WAY OR ON SITE. THE COST FOR THIS ITEM MUST BE INCLUDED IN THE CONTRACTOR'S PRICE AND IS THE CONTRACTOR'S SOLE RESPONSIBILITY.

27. OWNER MUST MAINTAIN AND PRESERVE ALL PHYSICAL SITE FEATURES AND DESIGN FEATURES DEPICTED ON THE PLANS AND RELATED DOCUMENTS IN STRICT ACCORDANCE WITH THE APPROVED PLAN(S) AND DESIGN; AND, FURTHER, THE ENGINEER OF RECORD AND BOHLER ARE NOT RESPONSIBLE FOR ANY FAILURE TO SO MAINTAIN OR PRESERVE SITE AND/OR DESIGN FEATURES. IF OWNER FAILS TO MAINTAIN AND/OR PRESERVE ALL PHYSICAL SITE FEATURES AND/OR DESIGN FEATURES DEPICTED ON THE PLANS AND RELATED DOCUMENTS, OWNER AGREES TO INDEMNIFY AND HOLD THE ENGINEER OF RECORD AND BOHLER PARTIES, HARMLESS FOR ALL INJURIES, DAMAGES AND COSTS THAT ENGINEER OF RECORD AND BOHLER INCUR AS A RESULT OF SAID FAILURE OR FAILURE TO PRESERVE.

28. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ENSURING THAT ALL CONSTRUCTION ACTIVITIES AND MATERIALS COMPLY WITH AND CONFORM TO APPLICABLE FEDERAL, STATE AND LOCAL RULES AND REGULATIONS, LAWS, ORDINANCES, AND CODES, AND ALL APPLICABLE REQUIREMENTS OF THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970, (29 U.S.C. 651 ET SEQ.) AS AMENDED, AND ANY MODIFICATIONS, AMENDMENTS OR REVISIONS TO SAME.

29. THE CONTRACTOR MUST STRICTLY COMPLY WITH THE LATEST AND CURRENT OSHA STANDARDS AND REGULATIONS, AND/OR ANY OTHER AGENCY WITH JURISDICTION OVER EXCAVATION AND TRENCHING PROCEDURES. ENGINEER OF RECORD AND BOHLER HAS NO RESPONSIBILITY FOR OR AS RELATED TO EXCAVATION AND TRENCHING PROCEDURES AND WORK.

30. THE CONTRACTOR AND THE OWNER MUST INSTALL ALL ELEMENTS AND COMPONENTS IN STRICT COMPLIANCE WITH AND IN ACCORDANCE WITH MANUFACTURER'S STANDARDS AND RECOMMENDED INSTALLATION CRITERIA AND SPECIFICATIONS. IF THE CONTRACTOR AND/OR OWNER FAIL TO DO SO, THEY AGREE TO JOINTLY, INDEPENDENTLY, SEPARATELY, COLLECTIVELY, AND SEVERALLY INDEMNIFY, DEFEND, PROTECT AND HOLD ENGINEER OF RECORD AND BOHLER PARTIES HARMLESS FOR ALL INJURIES AND DAMAGES THAT ENGINEER SUFFERS AND COSTS THAT ENGINEER INCURS AS A RESULT OF SAID FAILURE.

31. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN AN ON-SITE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IN COMPLIANCE WITH THE ENVIRONMENTAL PROTECTION AGENCY (EPA) REQUIREMENTS OR LOCAL GOVERNING AGENCY FOR SITES WHERE ONE (1) ACRE OR MORE IS DISTURBED BY CONSTRUCTION ACTIVITIES, OR LESS THAN ONE (1) ACRE IF LOCAL JURISDICTION REQUIRES A DIFFERENT THRESHOLD. THE CONTRACTOR MUST ENSURE THAT ALL ACTIVITIES, INCLUDING THOSE OF ALL SUBCONTRACTORS, ARE IN COMPLIANCE WITH THE SWPPP, INCLUDING BUT NOT LIMITED TO LOGGING ACTIVITIES (MINIMUM ONCE PER WEEK AND AFTER RAINFALL EVENTS) AND CORRECTIVE MEASURES, AS APPROPRIATE AND FURTHER, THE CONTRACTOR IS SOLELY AND COMPLETELY RESPONSIBLE FOR FAILING TO DO SO.

32. AS CONTAINED IN THESE DRAWINGS AND ASSOCIATED DOCUMENTS PREPARED BY THE ENGINEER OF RECORD AND BOHLER, THE USE OF THE WORDS 'CERTIFY' OR 'CERTIFICATION' CONSTITUTE(S) AN EXPRESSION ONLY OF PROFESSIONAL OPINION REGARDING THE INFORMATION WHICH IS THE SUBJECT OF THE STATEMENT OR RECORD'S AND BOHLER KNOWLEDGE OR BELIEF AND IN ACCORDANCE WITH COMMON AND ACCEPTED PROCEDURE CONSISTENT WITH THE APPLICABLE STANDARDS OF PRACTICE, AND DOES NOT CONSTITUTE A WARRANTY OR GUARANTEE OF ANY NATURE OR TYPE, EITHER EXPRESSED OR IMPLIED, UNDER ANY CIRCUMSTANCES.

33. IT IS THE CONTRACTOR'S RESPONSIBILITY TO HAVE SUBMITTALS PREPARED FOR ANY CONSTRUCTION DETAILED ITEMS AND TO COORDINATE THE SUBMITTALS WITH THE RESPECTIVE GOVERNING AGENCIES OR SERVICE PROVIDERS, WHO SHALL HAVE THE FINAL AUTHORITY IN APPROVING THE SUBMITTALS.

DEMOLITION NOTES

(Rev. 2/2021)

1. THE GENERAL NOTES MUST BE INCLUDED AS PART OF THIS ENTIRE DOCUMENT PACKAGE AND ARE PART OF THE CONTRACT DOCUMENTS. THE GENERAL NOTES ARE REFERENCED HEREIN, AND THE CONTRACTOR MUST REFER TO THEM AND FULLY COMPLY WITH THESE NOTES, IN THEIR ENTIRETY. THE CONTRACTOR MUST BE FAMILIAR WITH AND ACKNOWLEDGE FAMILIARITY WITH ALL OF THE GENERAL NOTES AND ALL OF THE PLANS' SPECIFIC NOTES.

2. THE CONTRACTOR MUST CONDUCT DEMOLITION/REMOVALS ACTIVITIES IN SUCH A MANNER AS TO ENSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, SIDEWALKS, WALKWAYS, AND ALL OTHER ADJACENT FACILITIES. THE CONTRACTOR MUST OBTAIN ALL APPLICABLE PERMITS FROM THE APPROPRIATE GOVERNMENTAL AUTHORITY(IES) PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION ACTIVITIES IN OR ADJACENT TO THE RIGHT-OF-WAY.

3. WHEN DEMOLITION-RELATED ACTIVITIES IMPACT ROADWAYS AND/OR ROADWAY RIGHT-OF-WAY, THE CONTRACTOR MUST PROVIDE TRAFFIC CONTROL AND GENERALLY ACCEPTED PRACTICES IN ACCORDANCE WITH THE MOST RECENT FEDERAL HIGHWAY ADMINISTRATION "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD), AND THE FEDERAL, STATE, AND LOCAL REGULATIONS.

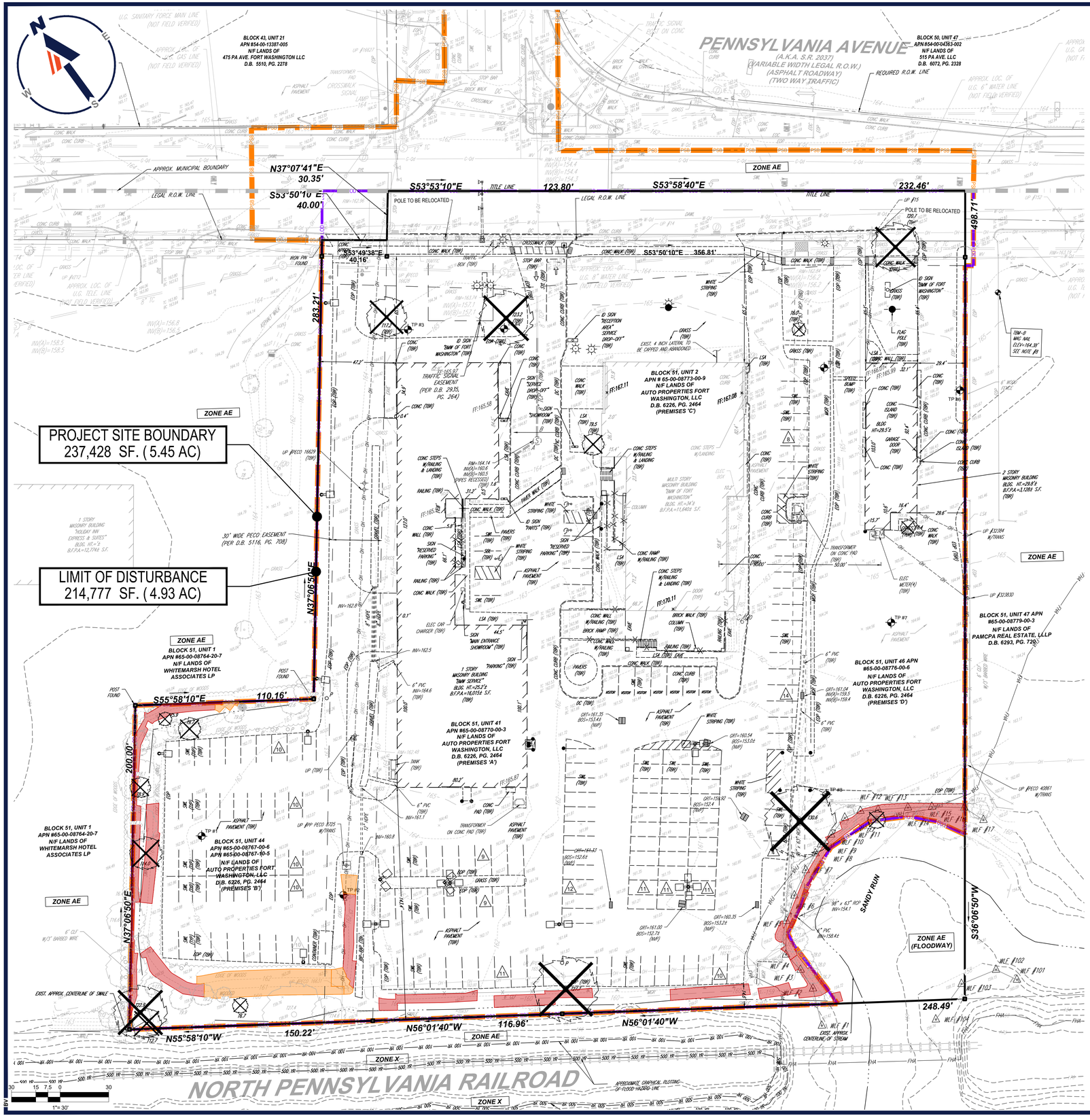
4. THE DEMOLITION (AND/OR REMOVALS) PLAN IS INTENDED TO PROVIDE GENERAL INFORMATION AND TO IDENTIFY ONLY CONDITIONS REGARDING ITEMS TO BE DEMOLISHED, REMOVED, AND/OR TO REMAIN.
   A. THE CONTRACTOR MUST ALSO REVIEW ALL CONSTRUCTION DOCUMENTS AND INCLUDE WITHIN THE DEMOLITION ACTIVITIES ALL INCIDENTAL WORK NECESSARY FOR THE CONSTRUCTION OF THE NEW SITE IMPROVEMENTS.
   B. THIS PLAN IS NOT INTENDED TO AND DOES NOT ADDRESS SUPERVISING OR SUPERINTENDING THE MEANS, METHODS, SEQUENCING, TECHNIQUES AND PROCEDURES TO BE EMPLOYED TO ACCOMPLISH THE WORK. ALL MEANS, METHODS, SEQUENCING, TECHNIQUES AND PROCEDURES TO BE USED SHALL BE IN STRICT ACCORDANCE AND CONFORMANCE WITH ALL STATE, FEDERAL, LOCAL AND JURISDICTIONAL REQUIREMENTS. THE CONTRACTOR MUST COMPLY WITH ALL OSHA AND OTHER SAFETY PRECAUTIONS NECESSARY TO PROVIDE A SAFE WORK SITE FOR THE CONTRACTOR AND THE PUBLIC.

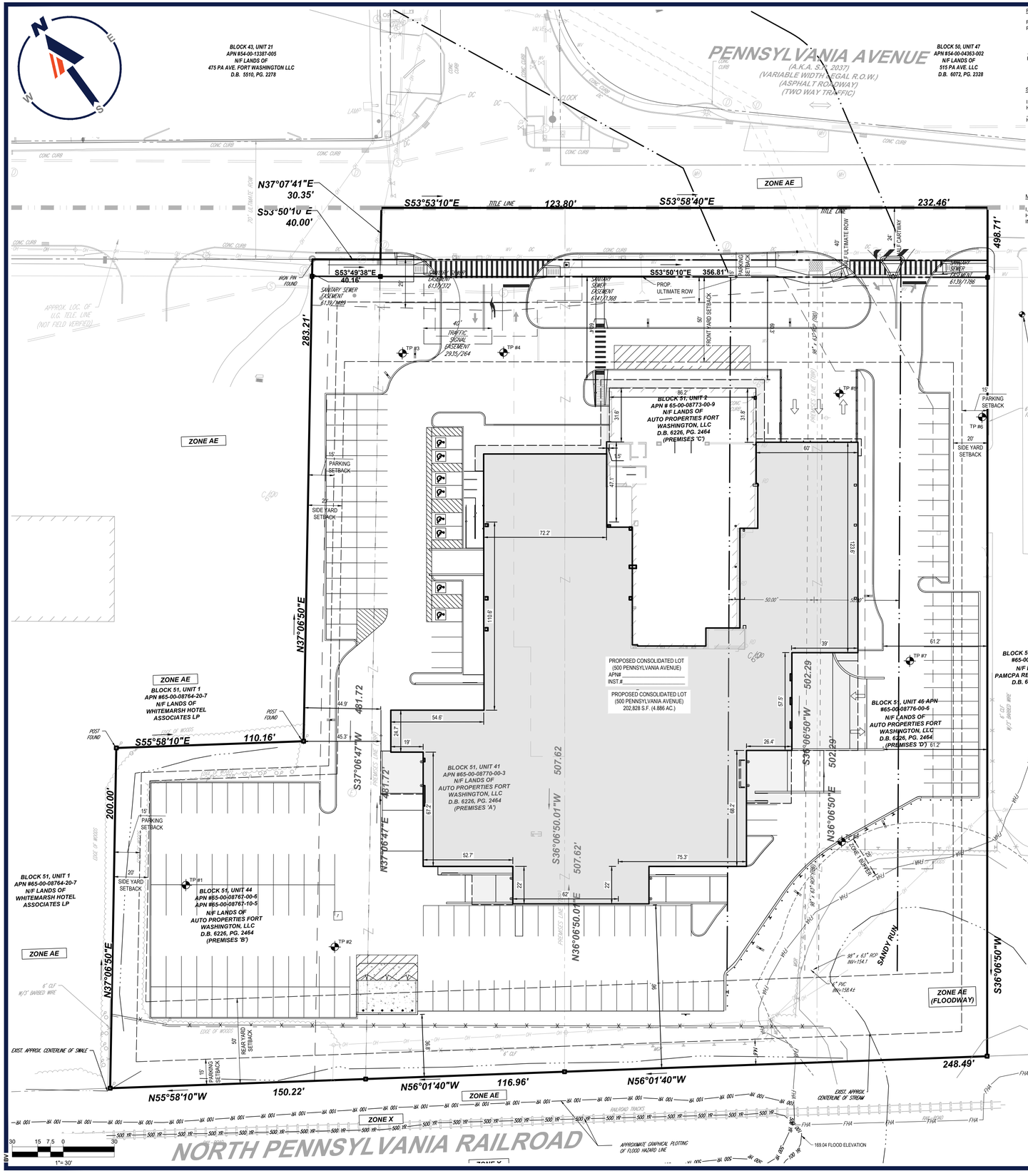
5. THE CONTRACTOR MUST PROVIDE ALL "METHODS AND MEANS" NECESSARY TO PREVENT MOVEMENT, SETTLEMENT, OR COLLAPSE OF EXISTING STRUCTURES AND IMPROVEMENTS THAT ARE REMAINING ON OR OFF SITE. THE CONTRACTOR, AT THE CONTRACTOR'S SOLE COST, MUST REPAIR ALL DAMAGE TO ALL ITEMS AND FEATURES THAT ARE TO REMAIN. CONTRACTOR MUST USE NEW MATERIAL FOR ALL REPAIRS. CONTRACTOR'S REPAIRS MUST INCLUDE THE RESTORATION OF ALL ITEMS AND FEATURES REPAIRED TO THEIR PRE-DEMOLITION CONDITION, OR BETTER. CONTRACTOR MUST PERFORM ALL REPAIRS AT THE CONTRACTOR'S SOLE EXPENSE.

6. ENGINEER OF RECORD AND BOHLER ARE NOT RESPONSIBLE FOR JOB SITE SAFETY OR SUPERVISION. THE CONTRACTOR MUST PROCEED WITH THE DEMOLITION IN A SYSTEMATIC AND SAFE MANNER, COMPLYING WITH ALL OSHA REQUIREMENTS, TO ENSURE PUBLIC AND CONTRACTOR SAFETY AND SAFETY TO ALL PROPERTY ON THE SITE OR ADJACENT OR NEAR TO THE SAME.

7. THE CONTRACTOR IS RESPONSIBLE FOR JOB SITE SAFETY, WHICH MUST INCLUDE, BUT IS NOT LIMITED TO, THE INSTALLATION AND MAINTENANCE OF BARRIERS, FENCING, OTHER APPROPRIATE AND/OR NECESSARY SAFETY FEATURES AND ITEMS NECESSARY TO PROTECT THE PUBLIC FROM AREAS OF CONSTRUCTION AND DEMOLITION ACTIVITIES. THE CONTRACTOR MUST SATISFY ALL OBLIGATIONS NECESSARY TO PERFORM THE DEMOLITION IN SUCH A MANNER AS TO PREVENT THE ENTRY OF ALL UNAUTHORIZED PERSONS AT ANY TIME, TO OR NEAR THE DEMOLITION AREA.

8. PRIOR TO THE COMMENCEMENT OF ANY SITE ACTIVITY AND ANY DEMOLITION ACTIVITY, THE CONTRACTOR MUST, IN WRITING, RAISE ANY QUESTIONS CONCERNING THE ACCURACY OR INTENT OF THESE PLANS AND/OR SPECIFICATIONS, ALL CONCERNS OR QUESTIONS REGARDING THE APPLICABLE SAFETY STANDARDS, AND/OR THE SAFETY OF THE CONTRAC


PENNSYLVANIA AVENUE
(A.K.A. S.R. 2037)
(VARIABLE WIDTH LEGAL R.O.W.)
(ASPHALT ROADWAY)
(TWO WAY TRAFFIC)
BLOCK 43, UNIT 21
APN #54-00-13387-005
N/F LANDS OF
475 PA AVE. FORT WASHINGTON LLC
D.B. 5510, PG. 2278
BLOCK 50, UNIT 47
APN #54-00-04363-002
N/F LANDS OF
515 PA AVE. LLC
D.B. 6072, PG. 2328
REQUIRED R.O.W. LINE
APPROX. MUNICIPAL BOUNDARY
LEGAL R.O.W. LINE
N37°07'41"E
30.35'
S53°50'10"E
40.00'
S53°53'10"E
123.80'
S53°58'40"E
232.46'
498.71'
283.21'
S53°49'38"E
40.16'
S53°50'10"E 356.81'
POLE TO BE RELOCATED
IRON PIN FOUND
PROJECT SITE BOUNDARY
237,428 SF. (5.45 AC)
LIMIT OF DISTURBANCE
214,777 SF. (4.93 AC)
30' WIDE PECO EASEMENT
(PER D.B. 5116, PG. 708)
N37°06'50"E
200.00'
S55°58'10"E
110.16'
N55°58'10"W
150.22'
N56°01'40"W
116.96'
N56°01'40"W
248.49'
S36°06'50"W
EXIST. APPROX. CENTERLINE OF SWALE
BLOCK 51, UNIT 2
APN # 65-00-08773-00-9
N/F LANDS OF
AUTO PROPERTIES FORT
WASHINGTON, LLC
D.B. 6226, PG. 2464
(PREMISES 'C')
BLOCK 51, UNIT 1
APN #65-00-08764-20-7
N/F LANDS OF
WHITEMARSH HOTEL
ASSOCIATES LP
BLOCK 51, UNIT 41
APN #65-00-08770-00-3
N/F LANDS OF
AUTO PROPERTIES FORT
WASHINGTON, LLC
D.B. 6226, PG. 2464
(PREMISES 'A')
BLOCK 51, UNIT 44
APN #65-00-08767-00-6
APN #65-00-08767-10-5
N/F LANDS OF
AUTO PROPERTIES FORT
WASHINGTON, LLC
D.B. 6226, PG. 2464
(PREMISES 'B')
BLOCK 51, UNIT 46 APN
#65-00-08776-00-6
N/F LANDS OF
AUTO PROPERTIES FORT
WASHINGTON, LLC
D.B. 6226, PG. 2464
(PREMISES 'D')
BLOCK 51, UNIT 47 APN
#65-00-08779-00-3
N/F LANDS OF
PAMCPA REAL ESTATE, LLLP
D.B. 6293, PG. 720
ZONE AE
ZONE X
ZONE AE (FLOODWAY)
APPROXIMATE GRAPHICAL PLOTING OF FLOOD HAZARD LINE
NORTH PENNSYLVANIA RAILROAD
SANDY RUN
TP #1
TP #2
TP #3
TP #4
TP #5
TP #6
TP #7
TP #8
TBM-A
MAG NAIL
ELEV= 164.38'
SEE NOTE #8
TBM-B
MAG NAIL
ELEV= 164.58'
SEE NOTE #8
1 STORY MASONRY BUILDING "HOLIDAY INN EXPRESS & SUITES" BLDG. HT.= 3 B.F.P.A.=12,774± S.F.
4 STORY MASONRY BUILDING "TOWN OF FORT WASHINGTON" BLDG. HT.=54'± B.F.P.A.=11,642± S.F.
2 STORY MASONRY BUILDING BLDG. HT.=29.8'± B.F.P.A.=3,128± S.F. (TBR)
1 STORY MASONRY BUILDING "QUICK SERVICE" BLDG. HT.=25.3'± B.F.P.A.=6,875± S.F. (TBR)
1 STORY MASONRY BUILDING "SAW SERVICE" BLDG. HT.=25.3'± B.F.P.A.=6,875± S.F. (TBR)
1 STORY MASONRY BUILDING "PARTS" BLDG. HT.=25.3'± B.F.P.A.=6,875± S.F. (TBR)
1 STORY MASONRY BUILDING "MAIN ENTRANCE SHOWROOM" BLDG. HT.=25.3'± B.F.P.A.=6,875± S.F. (TBR)
1 STORY MASONRY BUILDING "PARKING" BLDG. HT.=25.3'± B.F.P.A.=6,875± S.F. (TBR)
ID SIGN "TOWN OF FORT WASHINGTON" (TBR)
ID SIGN "RECEPTION AREA SERVICE DROP-OFF" (TBR)
ID SIGN "SERVICE DROP-OFF" (TBR)
ID SIGN "SHOWROOM" (TBR)
ID SIGN "PARTS" (TBR)
SIGN "RESERVED PARKING" (TBR)
SIGN "RESERVED PARKING" (TBR)
SIGN "MAIN ENTRANCE SHOWROOM" (TBR)
SIGN "PAVERS" (TBR)
SIGN "TRAFFIC SIGNAL EASEMENT (PER D.B. 29,35, PG. 264)
EXIST. 4 INCH LATERAL TO BE CAPPED AND ABANDONED
EXIST. 6" PVC INV=164.14 INV(E)=160.6 INV(S)=160.5 (PIPES RECESSED)
EXIST. 6" PVC INV=164.6 (TBR)
EXIST. 6" PVC INV=161.1
EXIST. 6" PVC INV=159.4
EXIST. 6" PVC INV=154.1
EXIST. 8" PVC INV=158.4±
EXIST. 12" RCP INV=154.1
EXIST. 24" x 63" RCP INV=154.1
EXIST. 6" PVC INV=158.5
EXIST. 6" PVC INV=159.4
EXIST. 6" PVC INV=154.4
EXIST. 6" PVC INV=153.6
EXIST. 6" PVC INV=153.4
EXIST. 6" PVC INV=152.6
EXIST. 6" PVC INV=152.4
EXIST. 6" PVC INV=152.2
EXIST. 6" PVC INV=152.0
EXIST. 6" PVC INV=151.8
EXIST. 6" PVC INV=151.6
EXIST. 6" PVC INV=151.4
EXIST. 6" PVC INV=151.2
EXIST. 6" PVC INV=151.0
EXIST. 6" PVC INV=150.8
EXIST. 6" PVC



RECORDER OF DEEDS

RECORDED IN THE OFFICE FOR THE RECORDING OF DEEDS IN AND FOR THE COUNTY OF MONTGOMERY, AT NORRISTOWN, PA, IN PLAN BOOK NO. _____ PAGE NO. _____ ON _____, 20___.

_____
RECORDER

SURVEYOR'S CERTIFICATION

I, JAMES C. WEED, P.L.S., A REGISTERED PROFESSIONAL LAND SURVEYOR OF THE COMMONWEALTH OF PENNSYLVANIA, DO HEREBY CERTIFY THAT THIS PLAN CORRECTLY REPRESENTS THE METES AND BOUNDS AS SURVEYED BY ME ON _____, AND THAT THE LOCATION, SIZE AND MATERIAL OF EXISTING MARKERS ARE ACCURATELY SHOWN HEREON.

_____
JAMES C. WEED

_____
REGISTERED No.: #SU075250

_____
DATE

MONUMENTATION CERTIFICATION:

I, JAMES C. WEED, P.L.S., A REGISTERED PROFESSIONAL LAND SURVEYOR OF THE COMMONWEALTH OF PENNSYLVANIA, DO HEREBY CERTIFY THAT ALL CONCRETE MONUMENTS HAVE BEEN SET OR FOUND BY ME ON _____, AS INDICATED AND SHOWN HEREON.

_____
JAMES C. WEED

_____
REGISTERED No.: #SU075250

_____
DATE

ENGINEER'S CERTIFICATION

I, JEFFREY A. BEAVAN, P.E., A REGISTERED PROFESSIONAL ENGINEER OF THE COMMONWEALTH OF PENNSYLVANIA, DO HEREBY CERTIFY THAT THIS PLAN CORRECT IN ALL DETAILS AS PREPARED BY ME ON _____, 20___.

_____
JEFFREY A. BEAVAN

_____
REGISTERED No.: #PE082005

_____
DATE

REVIEW OF THE TOWNSHIP ENGINEER, WHITEMARSH TOWNSHIP:

THIS SUBDIVISION AND/OR LAND DEVELOPMENT PLAN WAS REVIEWED BY THE APPOINTED TOWNSHIP ENGINEER FOR WHITEMARSH TOWNSHIP ON THIS _____ DAY OF _____, 20___.

_____
KRISTA HEINRICH, P.E.
TOWNSHIP ENGINEER

APPROVAL OF THE WHITEMARSH TOWNSHIP BOARD OF SUPERVISORS:

THIS SUBDIVISION AND/OR LAND DEVELOPMENT PLAN WAS APPROVED BY RESOLUTION OF THE BOARD OF SUPERVISORS OF WHITEMARSH TOWNSHIP ON THIS _____ DAY OF _____, 20___.

_____ CHAIRMAN

_____ SECRETARY

ZONING REQUIREMENTS:

REQUIREMENTS TAKEN FROM: WHITEMARSH TOWNSHIP, MONTGOMERY COUNTY, COMMONWEALTH OF PENNSYLVANIA. (6/22/2016)

ZONING: CR-L (COMMERCIAL RETAIL-LOW DISTRICT) WITH RIPARIAN CORRIDOR CONSERVATION, FLOODPLAIN CONSERVATION, AND STEEP SLOPES OVERLAY DISTRICTS
EXISTING USE: AUTOMOTIVE RETAIL. **PROPOSED USE:** AUTOMOTIVE RETAIL

OVERALL BULK REQUIREMENTS	REQUIRED	EXISTING (CONSOLIDATED LOTS)	PROPOSED CONSOLIDATED LOT
MINIMUM LOT AREA (TO ULT. ROW) [1]	5 AC. (MIN.)	208,647 SF (4.790 AC.)	NO CHANGE
MINIMUM LOT AREA (TO ULT. ROW)	[2]	208,647 SF (4.790 AC.)	NO CHANGE
MINIMUM BUILDING SETBACKS:			
FRONT YARD SETBACK: (PENNSYLVANIA AVE)	MIN. = 50 FT.	65.2 FT.	60.2 FT.
SIDE YARD SETBACK: [3]	MIN. = 20 FT.	47.2 FT.	45.3 FT.
REAR YARD SETBACK: [3]	MIN. = 50 FT.	143.4 FT.	98.4 FT.
MINIMUM PARKING SETBACKS:			
FRONT YARD SETBACK:	15 FT.	117.6 FT.	69.3 FT.
SIDE YARD SETBACK:	15 FT.	19.7 FT.	4.2 FT. **(V-A)**
REAR YARD SETBACK:	15 FT.	14.6 FT.	27.2 FT.
MAXIMUM REQUIREMENTS:			
MAXIMUM BUILDING COVERAGE:	40%	15.3% (30,513 SF.)	32.2% (67,080 SF.)
MAXIMUM IMPERVIOUS COVERAGE:	65%	74.8% (159,131 SF)	73.1% (152,425 SF.)**(V-A)**
MAXIMUM BUILDING HEIGHT: [3]	35 FT., 65 FT. MAX.	31 FT	35.0 FT
MINIMUM GREEN SPACE AREA:	35%		(26.9%) 56,222 SF. **(V-A)**
REAR YARD COVERAGE (ACCESSORY USES/STRUCTURES) [4]	30%	28.4% (19,834 SF.)	22.7% (15,884 SF.)

(ENC) = EXISTING NON-CONFORMITY
(V) = VARIANCE REQUESTED
(V-A) = VARIANCE APPROVED

[1] DISTRICT AREA. THE MINIMUM AREA WHICH MAY BE CLASSIFIED AS A CR COMMERCIAL RETAIL DISTRICT SHALL BE 5 ACRES.

[2] THE MINIMUM AREA FOR A SINGLE STRUCTURE OR DEVELOPMENT SHALL BE DETERMINED BY THE LAND USE, PARKING AND OTHER REQUIREMENTS.

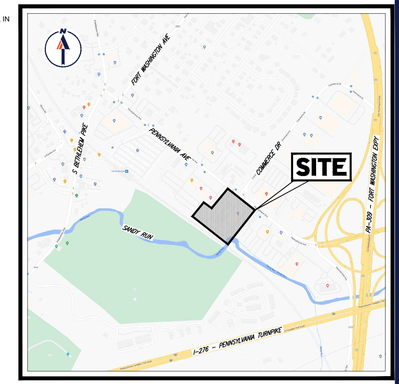
[3] THE MAXIMUM HEIGHT OF ANY BUILDING ERECTED OR USED IN THIS DISTRICT SHALL BE 35 FEET, EXCEPT THAT THE HEIGHT OF ANY BUILDING MAY BE INCREASED TO A MAXIMUM OF 65 FEET, PROVIDED THAT FOR EVERY FOOT OF HEIGHT INCREASE IN EXCESS OF 35 FEET THERE SHALL BE ADDED TO EACH YARD REQUIREMENT ONE CORRESPONDING FOOT OF WIDTH OR DEPTH. STRUCTURES, EXCEPT CHIMNEYS AND FLAGPOLES, MAY BE ERECTED ABOVE THE ROOFLINE, SHALL BE ERECTED WITHIN A RECESSION OF ONE FOOT FOR EACH ONE FOOT OF ADDITIONAL HEIGHT, AND MUST BE DESIGNED TO BE COMPATIBLE WITH THE ARCHITECTURAL TREATMENT OF THE BUILDING.

MCPC No.: (_____)

PROCESSED and REVIEWED. Report prepared by Montgomery County Planning Commission in accordance with the Municipalities Planning Code.

Certified this date _____

_____
Montgomery County Planning Commission



LOCATION MAP

SCALE: 1" = 800'

800 400 200 0 800
1"=800'

LEGEND

PROPOSED

PROPERTY LINE
EASEMENT LINE
SETBACK LINE
BUILDING
RETAINING WALL
CONCRETE CURB
FLUSH CURB
FENCE
GUIDE RAIL
TREELINE
SIDEWALK
RAMP
SIGN
BOLLARD
PARKING COUNT (10)
AREA LIGHT
DRAINAGE INLET
MANHOLE
ENDWALL
TRANSFORMER

LEGEND

EXISTING

PROPERTY LINE
R.O.W. LINE
BUILDING
CONCRETE CURB
FENCE
TREELINE
CONCRETE MONUMENT/ IRON PIN
SIGN
TREE
DRAINAGE INLET
STORM/SANITARY MANHOLE
WATER/GAS VALVES
FIRE HYDRANT
UTILITY POLE
OVERHEAD UTILITY WIRES
100 YEAR FLOOD PLAIN
500 YEAR FLOOD PLAIN
SWALE
CENTERLINE OF STREAM
FLOOD WAY
ASSUMED FLOOD WAY
TOP OF BANK / OHWM

RECORD PLAN 3 OF 10

BOHLER
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
INDUSTRIAL DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

THE INFORMATION, DESIGN AND CONTENT OF THIS PLAN IS PROPRIETARY AND SHALL NOT BE COPIED OR USED FOR ANY PURPOSE WITHOUT PRIOR WRITTEN AUTHORIZATION FROM BOHLER. ONLY APPROVED, SIGNED AND SEALED PLANS SHALL BE UTILIZED OR CONSTRUCTION PURPOSES.

REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/3/2025	NPDES MAJOR MODIFICATION	RMS / JAB
2	3/12/2025	FOR NPDES RESUBMISSION	RMS / JAB
3	04/14/2025	PER TOWNSHIP COMMENT	RMS / JAB
4	5/28/2025	PER NPDES COMMENT	RMS / JAB
5	7/22/2025	PER REVISED ARCH	RMS / MRB

811 Know what's below. Call before you dig.
PENNSYLVANIA
YOU MUST CALL 811 BEFORE ANY EXCAVATION WHETHER IT'S ON PRIVATE OR PUBLIC LAND.
1-800-242-1776
www.pa1call.org

NOT APPROVED FOR CONSTRUCTION

THIS DRAWING IS INTENDED FOR MUNICIPAL AND/OR AGENCY REVIEW AND APPROVAL. IT IS NOT INTENDED AS A CONSTRUCTION DOCUMENT UNLESS INDICATED OTHERWISE.

PROJECT No.: PAB220113.01
DRAWN BY: RMS
CHECKED BY: JAB
DATE: 10/24/2024
CAD I.D.: PAB220113.01-LDVP-5A

PROJECT:

AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

500 PENNSYLVANIA AVENUE
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY, PA

BOHLER
74 W BROAD STREET, SUITE 500
BETHLEHEM, PA 18018
Phone: (610) 709-9971
Fax: (610) 709-9976
www.BohlerEngineering.com

COMMONWEALTH OF PENNSYLVANIA
J.A. BEAVAN
PROFESSIONAL
JEFFREY A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE082005
NEW YORK LICENSE No. 104604
NEW JERSEY LICENSE No. 24GE05305600

SHEET TITLE:

RECORD PLAN

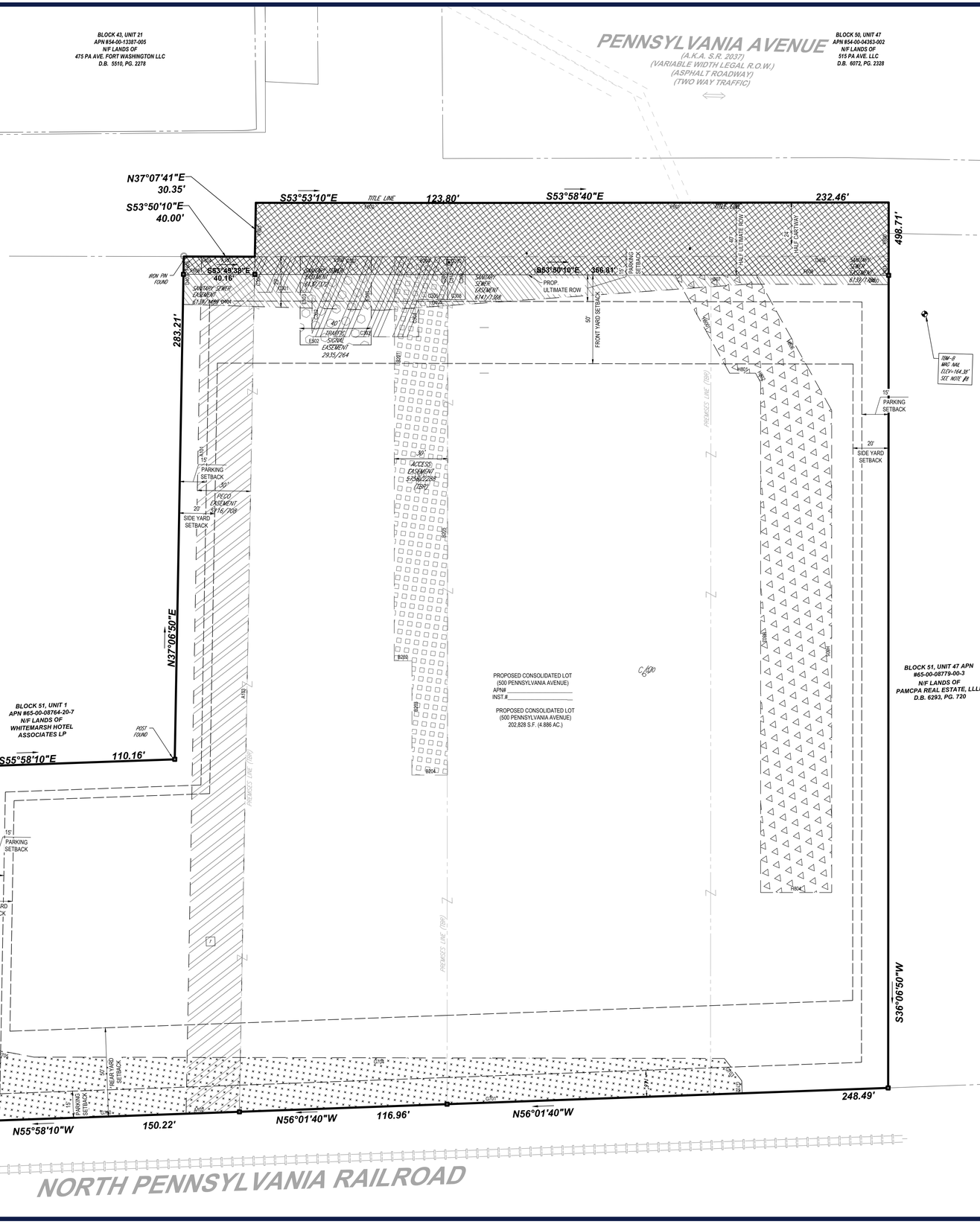
SHEET NUMBER:

C-301

Page 4 of 36

REVISION 5 - 7/22/2025

BY: BOHLERENG-NETSHARE\PA-PROJECTS\2022\PAB220113.01\CAD\DRAWINGS\PLAN SET\CIVIL SITE PLANS\PAB220113.01-LDVP-5A——LAYOUT C-301 RECORD



PROPOSED COUNTY TRAIL EASEMENT

Parcel Table			
Line #/Curve #	Length	Direction/Delta	Radius
G700	150.220	S55° 58' 09.99"E	
G701	283.223	S56° 01' 41.46"E	
G702	7.105	N33° 58' 20.01"E	
G703	15.929	N01° 58' 01.79"W	
G704	388.708	N53° 48' 31.92"W	
G705	34.207	N43° 06' 57.15"W	
G706	42.608	S37° 06' 50.01"W	

PROPOSED DRAINAGE EASEMENT

Parcel Table			
Line #/Curve #	Length	Direction/Delta	Radius
H800	63.272	S06° 57' 35.63"W	
H801	14.618	S53° 55' 23.78"E	
H802	5.873	S06° 57' 35.63"W	
H803	287.363	S36° 04' 41.57"W	
H804	40.000	S53° 55' 18.43"E	
H805	271.507	N36° 04' 41.57"E	
H806	87.215	N06° 57' 35.63"E	
H807	45.825	N53° 50' 09.99"W	

EXISTING PECO EASEMENT

Parcel Table			
Line #/Curve #	Length	Direction/Delta	Radius
A100	29.997	N53° 49' 18.99"W	
A101	482.794	S37° 07' 04.61"W	
A102	29.956	S55° 52' 51.08"E	
A103	481.718	N37° 07' 37.80"E	

EXISTING TRAFFIC SIGNAL EASEMENT

Parcel Table			
Line #/Curve #	Length	Direction/Delta	Radius
E500	40.000	N53° 52' 18.99"W	
E501	50.000	N36° 07' 41.01"E	
E502	40.000	S53° 52' 18.99"E	
E503	50.000	S36° 07' 41.01"W	

PROPOSED PENNDOT TRAFFIC EASEMENT

Parcel Table			
Line #/Curve #	Length	Direction/Delta	Radius
C300	20.003	S37° 06' 46.79"W	
C301	32.575	S53° 50' 09.99"E	
C302	25.000	S36° 09' 50.01"W	
C303	60.000	S53° 50' 09.99"E	
C304	21.000	N36° 09' 50.01"E	
C305	16.256	S53° 50' 10.00"E	
C306	24.000	N36° 06' 50.01"E	
C307	108.479	N53° 50' 09.99"W	
C308	9.979	S53° 50' 09.98"E	
C309	24.000	N36° 09' 50.01"E	
C310	10.000	N53° 50' 09.99"W	
C311	24.000	S36° 06' 50.01"W	

EXISTING ACCESS EASEMENT

Parcel Table			
Line #/Curve #	Length	Direction/Delta	Radius
B200	30.000	N53° 52' 18.99"W	
B201	227.590	S36° 07' 40.01"W	
B202	10.000	S53° 52' 19.98"E	
B203	64.350	S36° 07' 40.01"W	
B204	20.000	S53° 52' 19.99"E	
B205	291.940	N36° 07' 40.01"E	

EXISTING SANITARY SEWER EASEMENT

Parcel Table			
Line #/Curve #	Length	Direction/Delta	Radius
D400	79.530	S53° 45' 48.99"E	
D401	16.010	N36° 07' 36.22"E	
D402	99.997	N53° 57' 48.99"W	
D403	26.934	S37° 08' 02.57"W	
D404	40.000	S52° 12' 47.07"E	
D405	37.379	S57° 59' 36.99"E	

PROPOSED ULTIMATE RIGHT OF WAY

Parcel Table			
Line #/Curve #	Length	Direction/Delta	Radius
F600	40.941	N36° 12' 45.78"E	
F601	232.460	N53° 57' 48.99"W	
F602	65.000	N53° 52' 18.99"W	
F603	30.350	S37° 07' 41.01"W	
F604	40.004	N53° 49' 54.42"W	
F605	9.995	S37° 06' 50.01"W	
F606	40.164	S53° 49' 38.12"E	
F607	356.797	S53° 50' 09.99"E	
F608	356.797	S53° 50' 09.99"E	

ZONING REQUIREMENTS:

REQUIREMENTS TAKEN FROM: WHITEMARSH TOWNSHIP, MONTGOMERY COUNTY, COMMONWEALTH OF PENNSYLVANIA. (6/22/2016)

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EXISTING USE: AUTOMOTIVE RETAIL, **PROPOSED USE:** AUTOMOTIVE RETAIL

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MINIMUM LOT AREA (TO ULT. ROW)	[2]	208,647 SF (4.790 AC.)	NO CHANGE
MINIMUM BUILDING SETBACKS:			
FRONT YARD SETBACK: (PENNSYLVANIA AVE)	MIN. = 50 FT.	65.2 FT.	60.2 FT.
SIDE YARD SETBACK: [3]	MIN. = 20 FT.	47.2 FT.	45.3 FT.
REAR YARD SETBACK: [3]	MIN. = 50 FT.	143.4 FT.	98.4 FT.
MINIMUM PARKING SETBACKS:			
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(V) = VARIANCE REQUESTED
(V-A) = VARIANCE APPROVED

[1] DISTRICT AREA. THE MINIMUM AREA WHICH MAY BE CLASSIFIED AS A CR COMMERCIAL RETAIL DISTRICT SHALL BE 5 ACRES.

[2] THE MINIMUM AREA FOR A SINGLE STRUCTURE OR DEVELOPMENT SHALL BE DETERMINED BY THE LAND USE, PARKING AND OTHER REQUIREMENTS.

[3] THE MAXIMUM HEIGHT OF ANY BUILDING ERECTED OR USED IN THIS DISTRICT SHALL BE 35 FEET, EXCEPT THAT THE HEIGHT OF ANY BUILDING MAY BE INCREASED TO A MAXIMUM OF 65 FEET, PROVIDED THAT FOR EVERY FOOT OF HEIGHT INCREASE IN EXCESS OF 35 FEET THERE SHALL BE ADDED TO EACH YARD REQUIREMENT ONE CORRESPONDING FOOT OF WIDTH OR DEPTH. STRUCTURES, EXCEPT CHIMNEYS AND FLAGPOLES, MAY BE ERECTED ABOVE THE ROOFLINE, SHALL BE ERECTED WITHIN A RECESSION OF ONE FOOT FOR EACH ONE FOOT OF ADDITIONAL HEIGHT, AND MUST BE DESIGNED TO BE COMPATIBLE WITH THE ARCHITECTURAL TREATMENT OF THE BUILDING.

LEGEND

EASEMENT

- PROPERTY BOUNDARY
- PREMISES LINE
- BUILDING SETBACK LINE
- EXISTING EASEMENT
- PROP. UTILITY EASEMENT
- PROP. BUILDING SETBACK
- PROP. PARKING SETBACK
- PROP. CONCRETE MONUMENT
- PROPOSED TOWNSHIP ULTIMATE ROW
- EXISTING SANITARY EASEMENT
- EXISTING ACCESS EASEMENT
- EXISTING PECO EASEMENT
- TRAFFIC SIGNAL EASEMENT
- PROPOSED PENNDOT TRAFFIC SIGNAL EASEMENT
- PROPOSED COUNTY TRAIL EASEMENT
- PROPOSED DRAINAGE EASEMENT

STORMWATER BLANKET EASEMENT

A BLANKET STORMWATER EASEMENT IN FAVOR OF WHITEMARSH TOWNSHIP IS PROVIDED FOR ACCESS AND MAINTENANCE PURPOSES ON AND OVER THE PROPERTY, EXCEPT FOR THE PORTIONS OF THE PROPERTY ON WHICH BUILDINGS OR OTHER VERTICAL STRUCTURES HAVE BEEN ERECTED. THE TOWNSHIP OF WHITEMARSH SHALL HAVE THE RIGHT TO INSPECT ALL STORMWATER MANAGEMENT FEATURE AND FACILITIES AND TO REQUIRE REPAIRS, BUT NOT THE OBLIGATION TO MAKE SUCH REPAIRS.

STORMWATER FACILITIES SHALL BE OWNED AND MAINTAINED BY THE PROPERTY OWNER IN PERPETUITY. THE PROPERTY OWNER SHALL PROVIDE A BLANKET STORMWATER ACCESS EASEMENT TO THE TOWNSHIP FOR THE PURPOSE OF ACCESS TO THE STORMWATER FACILITIES. IF, IN THE JUDGEMENT OF THE TOWNSHIP ENGINEER, THE OWNER HAS FAILED TO MAINTAIN THE STORMWATER FACILITIES IN SUCH A MANNER AS TO ENSURE THEIR PROPER FUNCTIONING, THE TOWNSHIP AFTER PROVIDING A WRITTEN NOTICE, SHALL HAVE THE RIGHT TO ENTER UPON THE LANDS OF THE OWNER AND TO MAKE ANY REPAIRS AS MAY BE NECESSARY TO THE STORMWATER FACILITIES TO ENSURE THAT SUCH FACILITIES FUNCTION AND PERFORM IN ACCORDANCE WITH THE DESIGN SPECIFICATIONS. ANY AND ALL COSTS INCURRED BY THE TOWNSHIP FOR SUCH REPAIRS AND/OR MAINTENANCE SHALL BE PAID IN FULL BY THE OWNER. A LIEN OR LIENS MAY BE PLACED AGAINST THE PROPERTY IF THE OWNER FAILS TO REMIT PAYMENT WITHIN SIXTY (60) DAYS.

GENERAL BLANKET COMMON ACCESS AND UTILITY EASEMENT NOTE:

A BLANKET EASEMENT IS TO BE ESTABLISHED FOR COMMON ACCESS AND UTILITIES WITHIN THE AREA DEFINED AND ILLUSTRATED ON SHEETS C-301 AND C-302 UNLESS OTHERWISE SPECIFIED ON THIS PLAN.

MCPC No.: (14-0121-003)

PROCESSED and REVIEWED. Report prepared by
Montgomery County Planning Commission
in accordance with the Municipalities Planning Code.

Certified this date _____

_____
Montgomery County Planning Commission

RECORD PLAN 4 OF 10

BOHLER
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/3/2025	NPDES MAJOR MODIFICATION	RMS / JAB
2	3/12/2025	FOR NPDES RESUBMISSION	RMS / JAB
3	04/14/2025	PER TOWNSHIP COMMENT	RMS / JAB
4	5/28/2025	PER NPDES COMMENT	RMS / JAB
5	7/22/2025	PER REVISED ARCH	RMS / MRB

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PROJECT No.: PAB220113.01
DRAWN BY: RMS
CHECKED BY: JAB
DATE: 10/24/2024
CAD I.D.: PAB220113.01-LDVP-5A

PROJECT:

AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

500 PENNSYLVANIA AVENUE
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY, PA

BOHLER
74 W BROAD STREET, SUITE 500
BETHLEHEM, PA 18018
Phone: (610) 709-9971
Fax: (610) 709-9976
www.BohlerEngineering.com

J. A. BEAVAN
PROFESSIONAL
COMMONWEALTH OF PENNSYLVANIA
JEFFREY A. BEAVAN
PROFESSIONAL ENGINEER
PRINTED
PENNSYLVANIA LICENSE No. PE082205
AREA CODE
NEW JERSEY LICENSE No. 24GE05336500

SHEET TITLE:

DEDICATION & EASEMENT PLAN

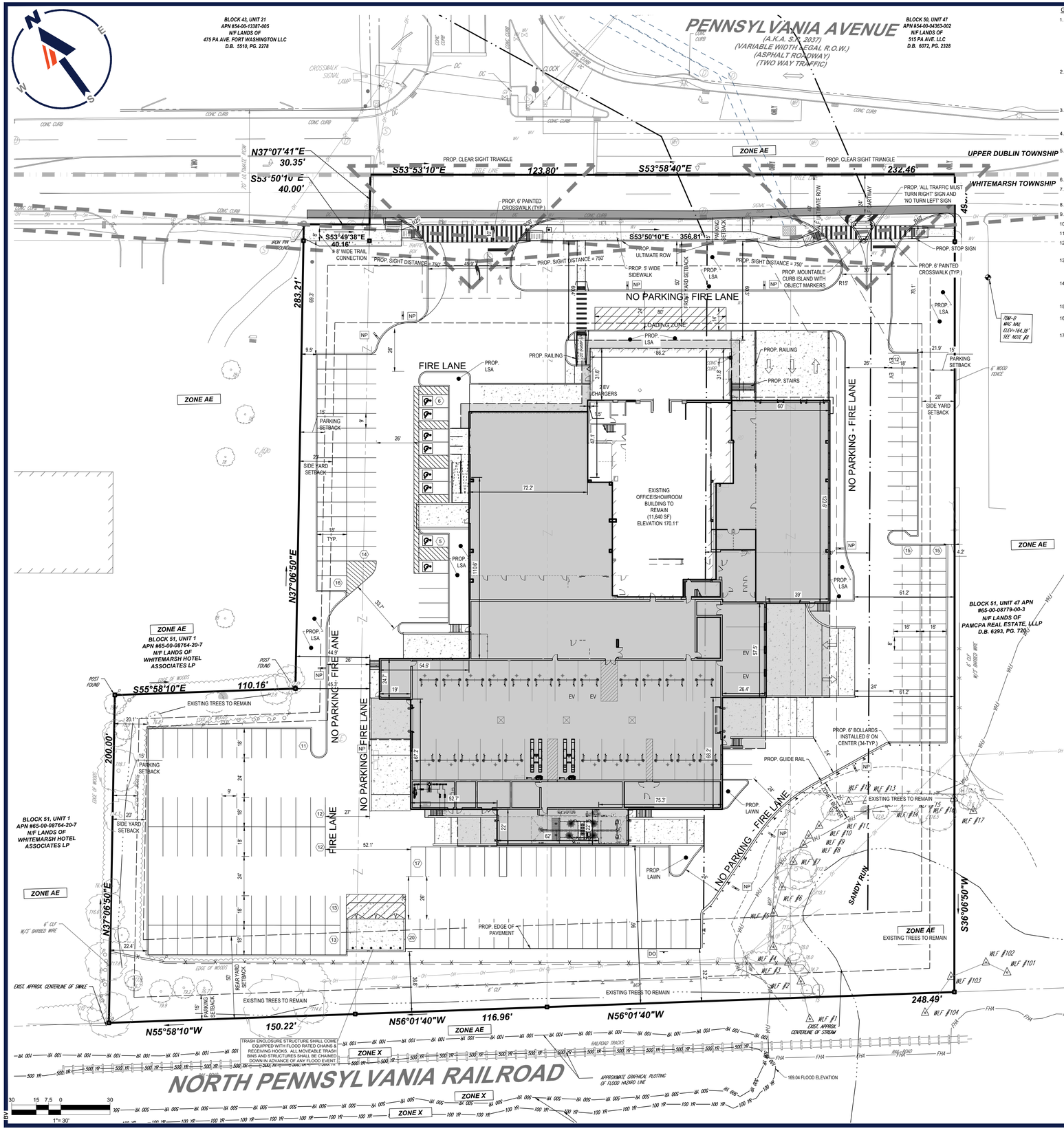
SHEET NUMBER:

C-302

Page 5 of 36

REVISION 5 - 7/22/2025

I:\BOHLER ENG\NETSHARE\PA-PROJECTS\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-LDVP-5A-----LAYOUT: C-302 EASEMENT



GENERAL NOTES

1. THIS PLAN REFERENCES DOCUMENTS AND INFORMATION BY:
   CONTROL POINT ASSOCIATE, LLC.
   1600 MANOR DRIVE, SUITE 210
   CHALFONT, PA 18914
   ENTITLED: "BOUNDARY & TOPOGRAPHIC SURVEY"
   PREPARED FOR: BMW OF FORT WASHINGTON
   FILE NO.: 02-220505-00
   DATED: 02/06/2023
2. APPLICANT/ EQUITABLE OWNER:
   BMW OF FORT WASHINGTON
   3301 BRIGGS CHANEY ROAD
   SILVER SPRING, MD 20904
   ATTENTION: DENNIS TURNBAUGH
   301-679-4062
3. CONTRACTOR IS RESPONSIBLE TO OBTAIN ALL SPECIFIC RESOURCES, TECHNICAL REPORTS, AND DESIGN DOCUMENTS RELATED TO THIS PROJECT AND FAMILIARIZE HIMSELF WITH SAME FOR APPLICATION BOTH PRIOR TO AND DURING CONSTRUCTION.
4. ALL ELEVATIONS SHOWN ARE IN ACCORDANCE WITH THE REFERENCED SURVEYOR'S BENCHMARK AND MUST BE VERIFIED BY THE GENERAL CONTRACTOR PRIOR TO GROUNDBREAK.
5. PARCEL DATA: PROPERTY KNOWN AS BLOCK 51, UNIT 41, APN #65-00-08775-003; BLOCK 51 UNIT 46, APN #65-00-08767-00-6; BLOCK 51, UNIT 2, APN #65-00-08773-00-9 & BLOCK 51, UNIT 44, APN #65-00-08776-00-6 AS IDENTIFIED ON THE TAX MAP OF WHITEMARSH TOWNSHIP, COMMONWEALTH OF PENNSYLVANIA.
6. PARCEL AREA: TOTAL SITE AREA: 5.132 AC.
7. ALL A.D.A. ACCESSIBLE PARKING SPACES, RAMPS, AND ACCESSIBLE ROUTES SHALL BE CONSTRUCTED TO MEET CURRENT A.D.A. REQUIREMENTS, AS AMENDED.
8. ALL FEATURES ARE EXISTING TO REMAIN UNLESS OTHERWISE NOTED.
9. FEATURES TO BE REMOVED ARE NOTED (TBR).
10. MEASUREMENTS ARE TAKEN FROM FACE OF CURB, WHERE APPLICABLE.
11. NO DEBRIS SHALL BE BURIED ON-SITE.
12. ALL PUBLIC UTILITIES, INCLUDING WATER AND SEWER ARE CURRENTLY AVAILABLE. SITE IS TO BE SERVICED BY PUBLIC WATER AND SEWER UTILITIES.
13. LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE. BEFORE ANY EXCAVATION IS TO BEGIN, ALL UNDERGROUND UTILITIES SHOULD BE VERIFIED AS TO THEIR LOCATION, SIZE AND TYPE BY THE PROPER UTILITY COMPANIES.
14. THE ENTIRE SITE IS IN A SPECIAL FLOOD HAZARD AREA, ZONE (AE), WITHIN THE 100-YEAR FLOODPLAIN. BASE FLOOD ELEVATION = 169.04. AS SUCH, THE ENTIRE SITE IS LOCATED WITHIN THE RIPARIAN CORRIDOR CONSERVATION OVERLAY DISTRICT PER WHITEMARSH TOWNSHIP
15. THE EXISTENCE OF UNDERGROUND STORAGE TANKS, IF ANY, IS UNKNOWN.
16. ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, BASED ON GPS OBSERVATIONS UTILIZING THE KEYSTONE VRS NETWORK (KEYNET GPS).
17. STRUCTURES, INCLUDING BUT NOT LIMITED TO MAILBOXES, FENCES AND POLES, SHALL NOT BE ERECTED WITHIN STREET RIGHTS-OF-WAY

ZONING REQUIREMENTS:

REQUIREMENTS TAKEN FROM: WHITEMARSH TOWNSHIP, MONTGOMERY COUNTY, COMMONWEALTH OF PENNSYLVANIA. (6/22/2016)

ZONING: CR-L (COMMERCIAL RETAIL-LOW DISTRICT) WITH RIPARIAN CORRIDOR CONSERVATION, FLOODPLAIN CONSERVATION, AND STEEP SLOPES OVERLAY DISTRICTS
EXISTING USE: AUTOMOTIVE RETAIL, **PROPOSED USE:** AUTOMOTIVE RETAIL

OVERALL BULK REQUIREMENTS	REQUIRED	EXISTING (CONSOLIDATED LOTS)	PROPOSED CONSOLIDATED LOT
MINIMUM LOT AREA (TO ULT. ROW) [1]	5 AC. (MIN.)	208,647 SF (4.790 AC.)	NO CHANGE
MINIMUM LOT AREA (TO ULT. ROW)	[2]	208,647 SF (4.790 AC.)	NO CHANGE
MINIMUM BUILDING SETBACKS:			
FRONT YARD SETBACK: (PENNSYLVANIA AVE)	MIN. = 50 FT.	65.2 FT.	60.2 FT.
SIDE YARD SETBACK: [3]	MIN. = 20 FT.	47.2 FT.	45.3 FT.
REAR YARD SETBACK: [3]	MIN. = 50 FT.	143.4 FT.	98.4 FT.
MINIMUM PARKING SETBACKS:			
FRONT YARD SETBACK:	15 FT.	117.6 FT.	69.3 FT.
SIDE YARD SETBACK:	15 FT.	19.7 FT.	4.2 FT. **(V-A)**
REAR YARD SETBACK:	15 FT.	14.6 FT.	27.2 FT.
MAXIMUM REQUIREMENTS:			
MAXIMUM BUILDING COVERAGE:	40%	15.3% (30,513 SF.)	32.2% (67,080 SF.)
MAXIMUM IMPERVIOUS COVERAGE:	65%	74.8% (159,131 SF)	73.1% (152,425 SF.)**(V-A)**
MAXIMUM BUILDING HEIGHT: [3]	35 FT., 65 FT. MAX.	31 FT	35.0 FT
MINIMUM GREEN SPACE AREA:	35%		(26.9%) 56,222 SF. **(V-A)**
REAR YARD COVERAGE (ACCESSORY USES/STRUCTURES) [4]	30%	28.4% (19,834 SF.)	22.7% (15,884 SF.)

(ENC) = EXISTING NON-CONFORMITY
(V) = VARIANCE REQUESTED
(V-A) = VARIANCE APPROVED

[1] DISTRICT AREA. THE MINIMUM AREA WHICH MAY BE CLASSIFIED AS A CR COMMERCIAL RETAIL DISTRICT SHALL BE 5 ACRES.

[2] THE MINIMUM AREA FOR A SINGLE STRUCTURE OR DEVELOPMENT SHALL BE DETERMINED BY THE LAND USE, PARKING AND OTHER REQUIREMENTS.

[3] THE MAXIMUM HEIGHT OF ANY BUILDING ERECTED OR USED IN THIS DISTRICT SHALL BE 35 FEET, EXCEPT THAT THE HEIGHT OF ANY BUILDING MAY BE INCREASED TO A MAXIMUM OF 65 FEET, PROVIDED THAT FOR EVERY FOOT OF HEIGHT INCREASE IN EXCESS OF 35 FEET THERE SHALL BE ADDED TO EACH YARD REQUIREMENT ONE CORRESPONDING FOOT OF WIDTH OR DEPTH. STRUCTURES, EXCEPT CHIMNEYS AND FLAGPOLES, MAY BE ERECTED ABOVE THE ROOFLINE, SHALL BE ERECTED WITHIN A RECESSION OF ONE FOOT FOR EACH ONE FOOT OF ADDITIONAL HEIGHT, AND MUST BE DESIGNED TO BE COMPATIBLE WITH THE ARCHITECTURAL TREATMENT OF THE BUILDING.

PROPOSED PARKING REQUIREMENTS (PER SECTION 116-184)

DESCRIPTION	UNIT	REQUIRED
RETAIL (11,293 SF SHOWROOM + 12,251 SF SERVICE RECEPTION)	1 SPACE/200 SF	118
OFFICE (5,910 SF - EXIST. BLDG 2ND FLR)	1 SPACE/250 SF	24
SERVICE BAYS (24)	1 SPACE PER BAY	23
OTHER-COMMERCIAL (14,800 SF SRVC/PARTS/TECH)	1 SPACE/1000 SF	15
TOTAL SPACES REQUIRED:		180
TOTAL ADA SPACES REQUIRED		7 CAR AND VAN (2 VAN)
TOTAL OFF-STREET PARKING SPACES PROPOSED:		176
TOTAL ADA SPACES PROPOSED		7 CAR AND VAN (2 VAN)
TOTAL SPACES PROPOSED:		**183**
EV PARKING SPACES PROPOSED (8 REQUIRED PER §116-188.3)		8

ELEVATION CERTIFICATE NOTE:

ELEVATION CERTIFICATE(S) MUST BE SUBMITTED UPON COMPLETION OF THE PROPOSED IMPROVEMENTS.

FLOODPLAIN PERMIT NOTE:

IT SHALL BE UNLAWFUL FOR ANY PERSON, PARTNERSHIP, BUSINESS OR CORPORATION TO UNDERTAKE, OR CAUSE TO BE UNDERTAKEN, ANY CONSTRUCTION OR DEVELOPMENT ANYWHERE WITHIN THE FLOODPLAIN IN TOWNSHIP OF WHITEMARSH UNLESS A PERMIT HAS BEEN OBTAINED FROM THE FLOODPLAIN ADMINISTRATOR.

GENERAL BLANKET COMMON ACCESS AND UTILITY EASEMENT NOTE:

A BLANKET EASEMENT IS TO BE ESTABLISHED FOR COMMON ACCESS AND UTILITIES WITHIN THE AREA DEFINED AND ILLUSTRATED ON SHEETS C-301 AND C-302 UNLESS OTHERWISE SPECIFIED ON THIS PLAN.

NOTE:

1. THE PROPERTY OWNER SHALL HAVE THE RESPONSIBILITY FOR THE PERPETUAL MAINTENANCE OF THE PERMANENT WATER DETENTION BASIN, BASIN OUTLET STRUCTURES AND PIPES WHICH ARE LOCATED ON HIS PROPERTY. NO CHANGES SHALL BE MADE TO THE STRUCTURES, PIPES OR FINISH GRADING WITHOUT PRIOR WRITTEN APPROVAL FROM THE TOWNSHIP. THE TOWNSHIP HAS THE RIGHT TO ENTER THE LOT TO PERFORM ANY REQUIRED MAINTENANCE WHICH HAS NOT BEEN PROPERLY PERFORMED OR CARRIED OUT IN A TIMELY MANNER THE PROPERTY OWNER SHALL BE RESPONSIBLE FOR THE COST OF ANY MAINTENANCE WHICH IS PERFORMED BY THE TOWNSHIP. THE TOWNSHIP SHALL LIEN THE PROPERTY FOR SAID COSTS UNTIL THE TOWNSHIP HAS BEEN REIMBURSED IN FULL.
2. THE DEVELOPER OR PROPERTY OWNER SHALL PAY TO THE TOWNSHIP AND TO THE AUTHORITY WHICH TREATS THE SEWAGE THE CURRENT FEES FOR THE TREATMENT AND COLLECTION OF SEWAGE WHEN SUCH FACILITIES ARE MADE AVAILABLE TO THE APPLICANT'S SITE.

MCPC No.: (14-0121-003)

PROCESSED and REVIEWED. Report prepared by Montgomery County Planning Commission in accordance with the Municipalities Planning Code.

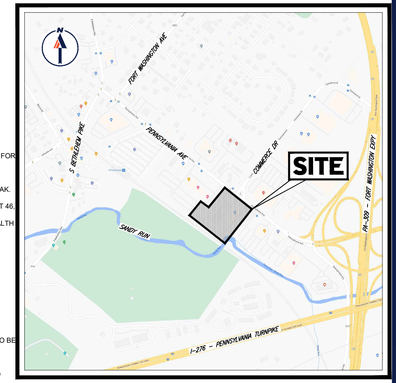
Certified this date _____

Montgomery County Planning Commission

STORMWATER BLANKET EASEMENT

A BLANKET STORMWATER EASEMENT IN FAVOR OF WHITEMARSH TOWNSHIP IS PROVIDED FOR ACCESS AND MAINTENANCE PURPOSES ON AND OVER THE PROPERTY, EXCEPT FOR THE PORTIONS OF THE PROPERTY ON WHICH BUILDINGS OR OTHER VERTICAL STRUCTURES HAVE BEEN ERECTED. THE TOWNSHIP OF WHITEMARSH SHALL HAVE THE RIGHT TO INSPECT ALL STORMWATER MANAGEMENT FEATURE AND FACILITIES AND TO REQUIRE REPAIRS, BUT NOT THE OBLIGATION TO MAKE SUCH REPAIRS.

STORMWATER FACILITIES SHALL BE OWNED AND MAINTAINED BY THE PROPERTY OWNER IN PERPETUITY. THE PROPERTY OWNER SHALL PROVIDE A BLANKET STORMWATER ACCESS EASEMENT TO THE TOWNSHIP FOR THE PURPOSE OF ACCESS TO THE STORMWATER FACILITIES IF, IN THE JUDGEMENT OF THE TOWNSHIP ENGINEER, THE OWNER HAS FAILED TO MAINTAIN THE STORMWATER FACILITIES IN SUCH A MANNER AS TO ENSURE THEIR PROPER FUNCTIONING, THE TOWNSHIP AFTER PROVIDING A WRITTEN NOTICE, SHALL HAVE THE RIGHT TO ENTER UPON THE LANDS OF THE OWNER AND TO MAKE ANY REPAIRS AS MAY BE NECESSARY TO THE STORMWATER FACILITIES TO ENSURE THAT SUCH FACILITIES FUNCTION AND PERFORM IN ACCORDANCE WITH THE DESIGN SPECIFICATIONS. ANY AND ALL COSTS INCURRED BY THE TOWNSHIP FOR SUCH REPAIRS AND/OR MAINTENANCE SHALL BE PAID IN FULL BY THE OWNER. A LIEN OR LIENS MAY BE PLACED AGAINST THE PROPERTY IF THE OWNER FAILS TO REMIT PAYMENT WITHIN SIXTY (60) DAYS.



LOCATION MAP

SCALE: 1" = 800'

800 400 200 0 800
1"=800'

LEGEND

PROPOSED

PROPERTY LINE
EASEMENT LINE
SETBACK LINE
BUILDING
RETAINING WALL
CONCRETE CURB
FLUSH CURB
FENCE
GUIDE RAIL
TREELINE
SIDEWALK
RAMP
SIGN
BOLLARD
"DEALER PARKING ONLY" SIGN (DO)
"NO PARKING - FIRE LANE" SIGN (NP)
PARKING COUNT (10)
AREA LIGHT
DRAINAGE INLET
MANHOLE
ENDWALL
TRANSFORMER

LEGEND

EXISTING

PROPERTY LINE
R.O.W. LINE
BUILDING
CONCRETE CURB
FENCE
TREELINE
CONCRETE MONUMENT/ IRON PIN
SIGN
TREE
DRAINAGE INLET
STORM/SANITARY MANHOLE
WATER/GAS VALVES
FIRE HYDRANT
UTILITY POLE
OVERHEAD UTILITY WIRES
100 YEAR FLOOD PLAIN
500 YEAR FLOOD PLAIN
FLOOD WAY
CENTERLINE OF WATER FEATURE
ASSUMED CULVERT FLOOD WAY
TOP OF BANK / OHWM

RECORD PLAN 5 OF 10

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PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
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PROJECT NO.: PAB220113.01
DRAWN BY: RMS
CHECKED BY: JAB
DATE: 10/24/2024
CAD I.D.: PAB220113.01-LDVP-5A

PROJECT:

AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

500 PENNSYLVANIA AVENUE
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PENNSYLVANIA LICENSE No. PE082005
NEW JERSEY LICENSE No. 24GE04536600

SHEET TITLE:

SITE PLAN

SHEET NUMBER:

C-303
Page 6 of 36

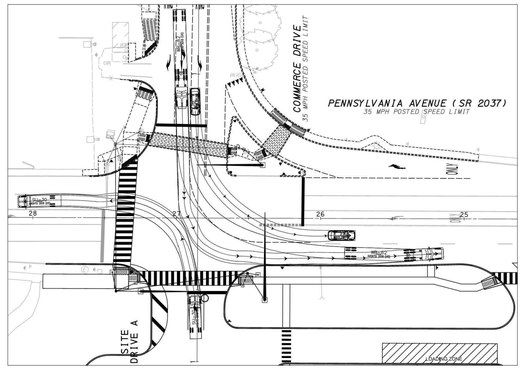
REVISION 5 - 7/22/2025

BV \\BOHLERENG.NET\SHARE\PA-PROJECTS\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-LDVP-5A.dwg——LAYOUT: C-303 SITE

PRELIMINARY
PLANS SUBJECT TO CHANGE

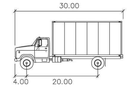
DISTRICT	COUNTY	ROUTE	SECTION	SHEET
6-0	MONTGOMERY	2037	--	2 OF 2
WHITEMARSH TOWNSHIP				

REVISION NUMBER	REVISIONS	DATE	BY
1	REVISED PER PENNDOT REVIEW LETTER DATED 12/20/24	02/21/25	PG
2	REVISED PER PENNDOT REVIEW LETTER DATED 06/19/25	06/20/25	LK



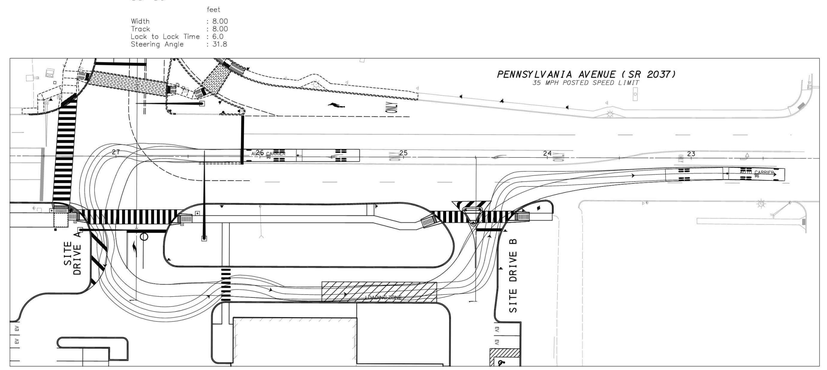
WORK TO BE DONE BY OTHERS UNDER MPMS #105133
PLANS PREPARED BY BOLES, SMYTH ASSOCIATES, INC.

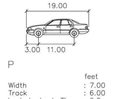
0 25 50 FEET



SU-30

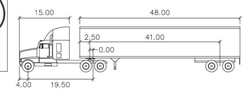
	feet
Width	: 8.00
Track	: 8.00
Lock to Lock Time	: 6.0
Steering Angle	: 31.8





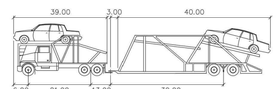
P

	feet
Width	: 7.00
Track	: 6.00
Lock to Lock Time	: 6.0
Steering Angle	: 31.6



WB-62

	feet		
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 70.0
Trailer Track	: 8.50		



AUTO CARRIER

	feet		
Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 40.0
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

Job Number: MBLE.00001
Date: 2023/10/12
Project Designer: NDZ
www.TPDinc.com
1.877.873.9739
info@TPDinc.com

TRUCK TURNING EXHIBIT

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BY:

BOHLER

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABILITY DESIGN
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TRANSPORTATION SERVICES

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CHECKED BY: JAB
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CAD I.D.: PAB220113.01-TRCK-5A

PROJECT:

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FOR

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BMW AUTOMOTIVE DEALERSHIP EXPANSION

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NEW YORK LICENSE No. 24-096504
NEW JERSEY LICENSE No. 24GE05539500

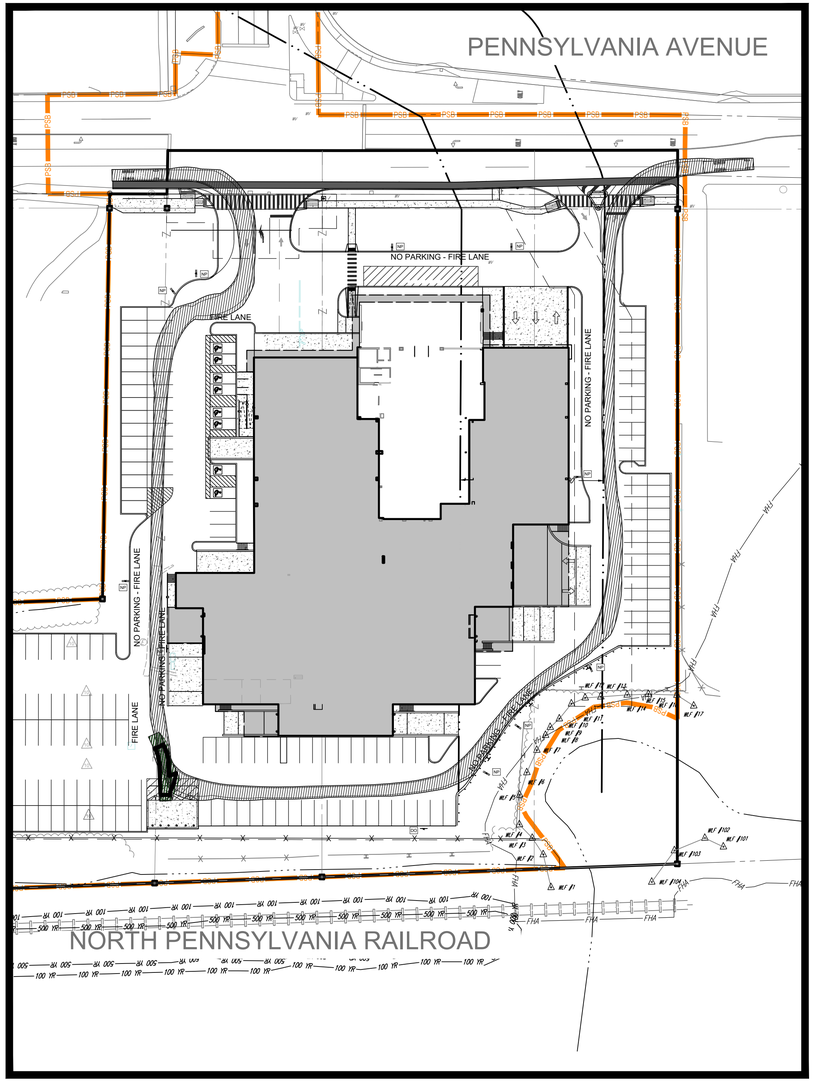
SHEET TITLE:

TRUCK TURNING PLAN - AUTO CARRIER

SHEET NUMBER:

C-304

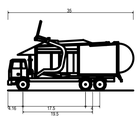
REVISION 5 - 7/22/2025



REFUSE TRUCK TURN

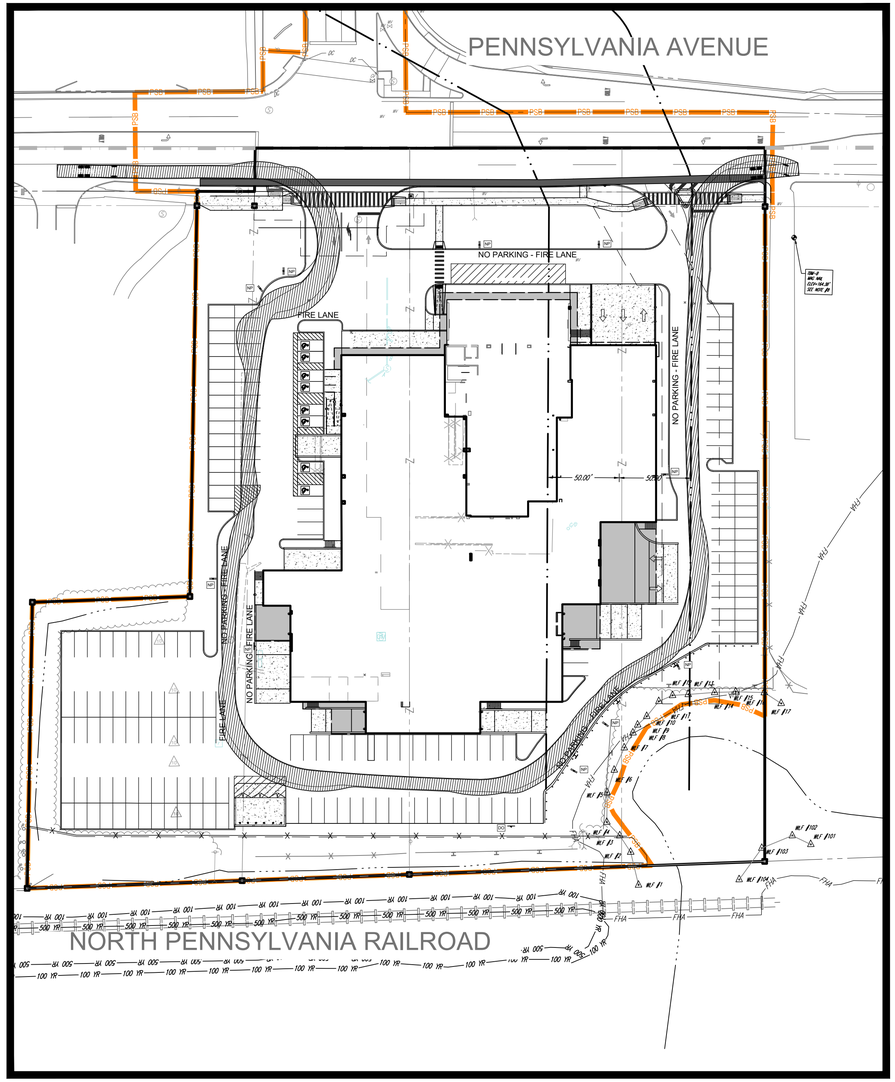
50 25 12.5 0 50

1"= 50'



35' FRONT LOAD GARBAGE TRUCK

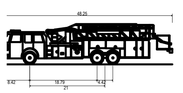
Overall Length	35.000ft
Overall Width	8.080ft
Overall Body Height	19.388ft
Min Body Ground Clearance	1.648ft
Track Width	6.500ft
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	35.00°



FIRE TRUCK TURN

50 25 12.5 0 50

1"= 50'



HITEMARSH TOWNSHIP FIRE TRUCK

verall Length	48.250ft
verall Width	8.830ft
verall Body Height	11.246ft
n Body Ground Clearance	1.648ft
ack Width	8.000ft
ck-to-lock time	5.00s
ax Wheel Angle	48.00°

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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/3/2025	NPDES MAJOR MODIFICATION	RMS / JAB
2	3/12/2025	FOR NPDES RESUBMISSION	RMS / JAB
3	04/14/2025	PER TOWNSHIP COMMENT	RMS / JAB
4	5/28/2025	PER NPDES COMMENT	RMS / JAB
5	7/22/2025	PER REVISED ARCH	RMS / MRB

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PROJECT No.:	PAB220113.01
DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-TRCK-5A

PROJECT:

AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

500 PENNSYLVANIA AVENUE
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY, PA

BOHLER

74 W BROAD STREET, SUITE 500
BETHLEHEM, PA 18018
Phone: (610) 709-9971
Fax: (610) 709-9976
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PROFESSIONAL
JEFFREY A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE084005
NEW JERSEY LICENSE No. GE045436600

SHEET TITLE:

TRUCK TURNING PLAN - FIRE & REFUSE

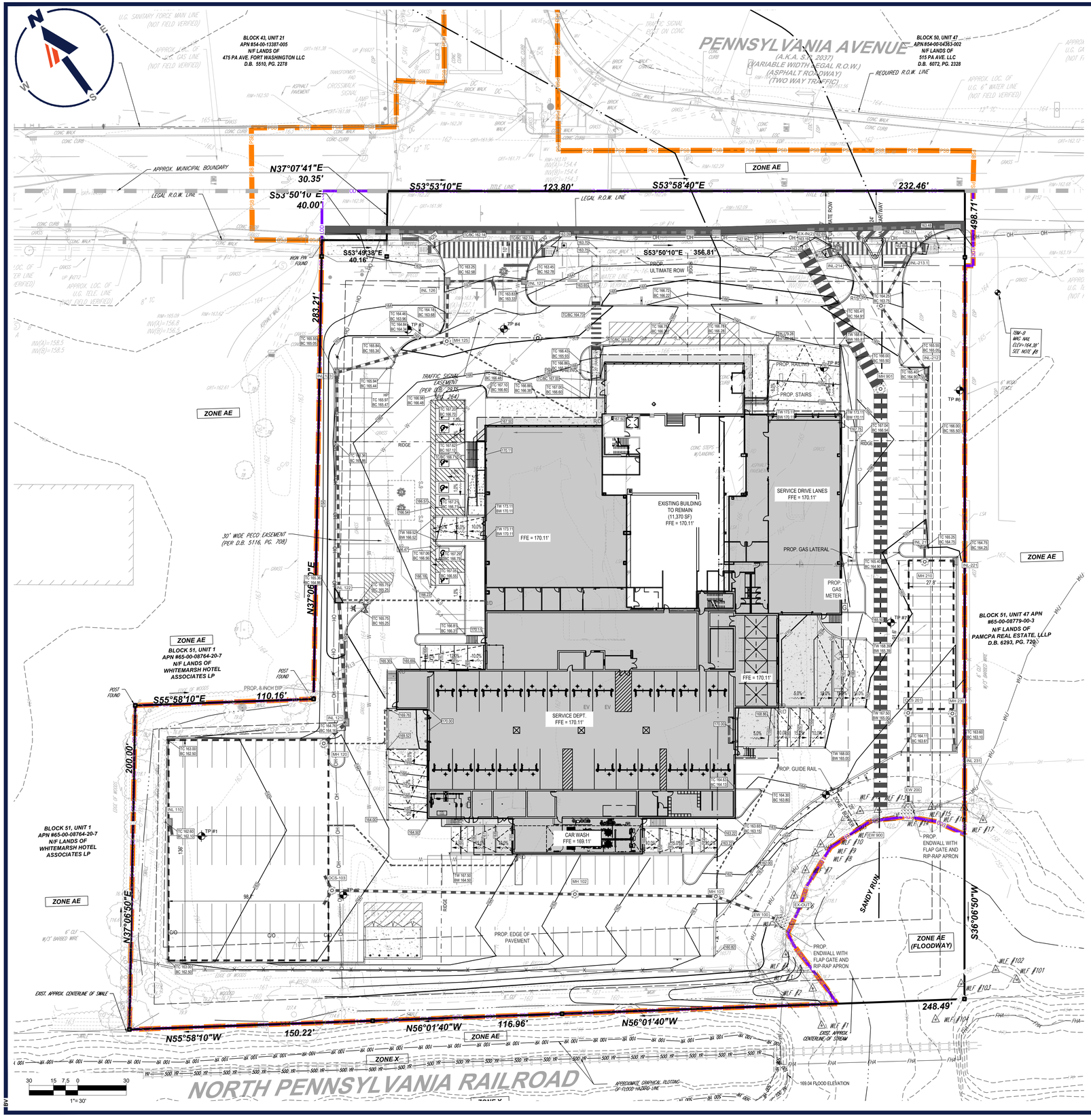
SHEET NUMBER:

C-305

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REVISION 5 - 7/22/2025

I:\BOHLERENG.NET\SHARES\PA PROJECTS\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-TRCK-5A.dwg—LAYOUT: C-305 FIRE - REFUSE
BW





USGS MAP

AMBLER QUAD

SCALE: 1"=2,000'

1000' 0 2000'

LEGEND

EXISTING

PROPERTY LINE	
R.O.W. LINE	
BUILDING	
CONCRETE CURB	
FENCE	
TREELINE	
CONCRETE MONUMENT/ IRON PIN	
SIGN	
TREE	
DRAINAGE INLET	
STORM/SANITARY MANHOLE	
WATER/GAS VALVES	
UTILITY POLE	
OVERHEAD UTILITY WIRES	OH
GAS LINE	G
WATER LINE	W
STORM PIPE	
CONTOUR ELEVATION	400
CENTERLINE OF WATER FEATURE	
FLOOD WAY	FWA
100 YEAR FLOOD PLAIN	100 YR
500 YEAR FLOOD PLAIN	500 YR
ASSUMED CULVERT FLOW WAY	
EDGE OF STREAM DELINEATION FLAGS	WLF #1 WLF #2

LEGEND

PROPOSED

SPOT ELEVATION	123.00 TC 123.50 BC 123.00
CONTOUR ELEVATION	100
RIDGE	
BUILDING	
RETAINING WALL	
CONCRETE CURB	
FLUSH CURB	
RAMP	
AREA LIGHT	
DRAINAGE INLET	
MANHOLE	
ENDWALL	
TRANSFORMER	
STORM PIPE	
ELECTRIC	UGET&C
SANITARY SEWER PIPE	S
WATER PIPE	W
LIMIT OF DISTURBANCE	LOD LOD
PROJECT SITE BOUNDARY	PSB PSB

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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/3/2025	NPDES MAJOR MODIFICATION	RMS / JAB
2	3/12/2025	FOR NPDES RESUBMISSION	RMS / JAB
3	04/14/2025	PER TOWNSHIP COMMENT	RMS / JAB
4	5/28/2025	PER NPDES COMMENT	RMS / JAB
5	7/22/2025	PER REVISED ARCH	RMS / MRB

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PROJECT No.: PAB220113.01
DRAWN BY: RMS
CHECKED BY: JAB
DATE: 10/24/2024
CAD I.D.: PAB220113.01-GDUL-5A

PROJECT:

AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

500 PENNSYLVANIA AVENUE
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY, PA

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PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE036008
NEW YORK LICENSE No. 095043
NEW JERSEY LICENSE No. GE45036600

SHEET TITLE:

GRADING PLAN

SHEET NUMBER:

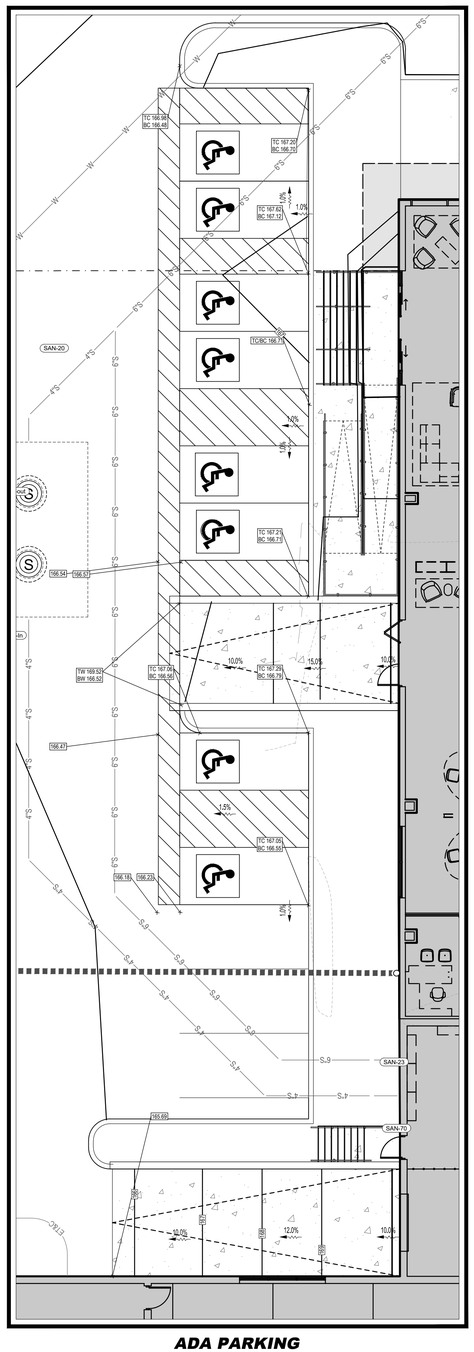
C-401

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I:\BOHLERENG\NETSHARE\5\PA PROJECTS\2023\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-GDUL-5A---LAYOUT: C-401 GRADING
BV

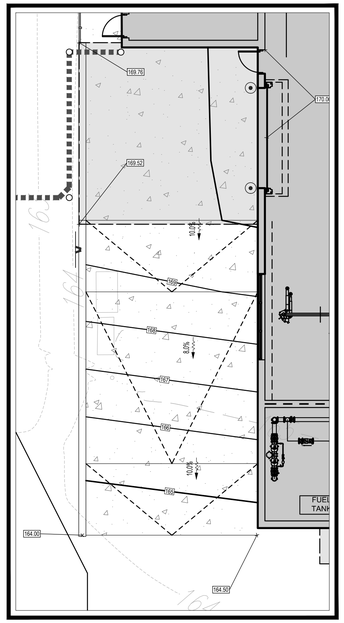




ADA PARKING ENLARGEMENT

10 5 2.5 0 10

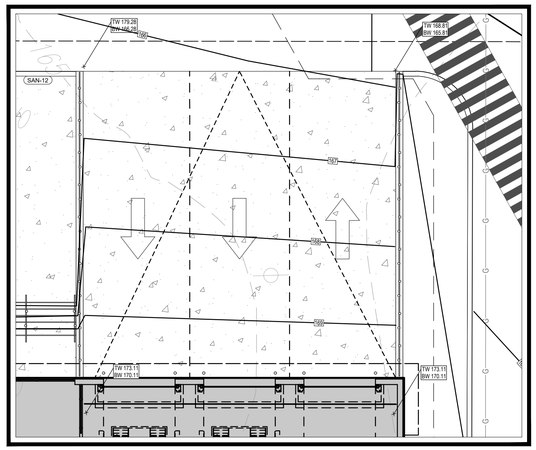
1"= 10'



MAINTENANCE ENTRANCE/EXIT RAMP ENLARGEMENT

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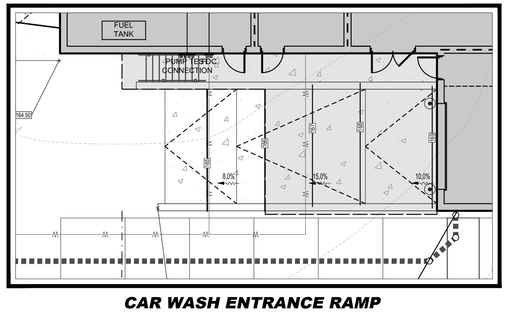
1"= 10'



SERVICE DROP-OFF ENTRANCE RAMP ENLARGEMENT

10 5 2.5 0 10

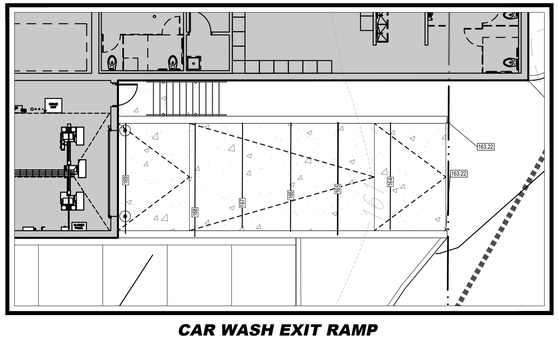
1"= 10'



CAR WASH ENTRANCE RAMP ENLARGEMENT

10 5 2.5 0 10

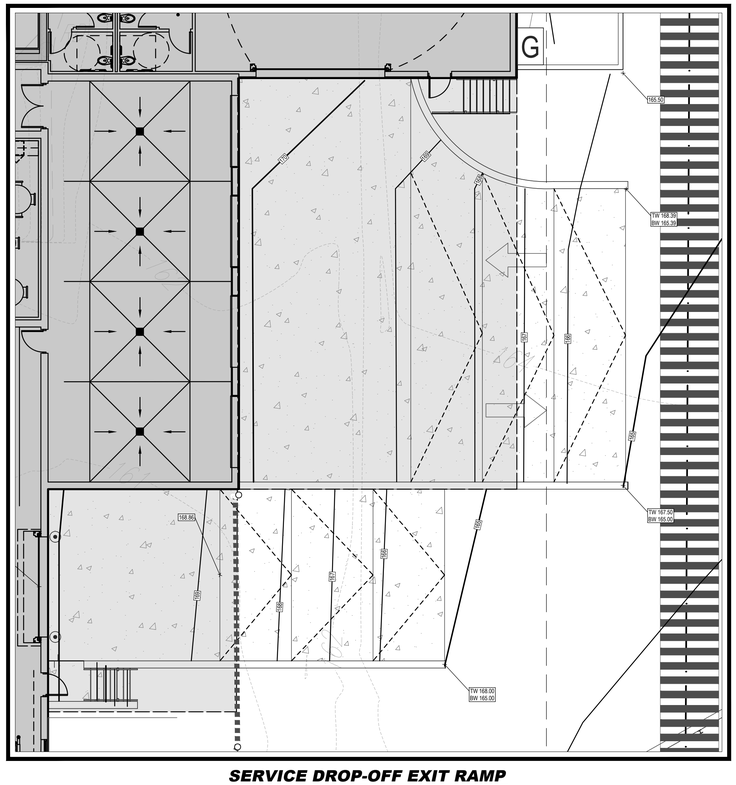
1"= 10'



CAR WASH EXIT RAMP ENLARGEMENT

10 5 2.5 0 10

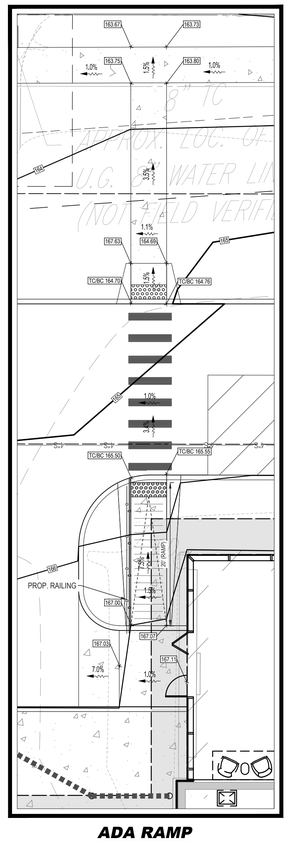
1"= 10'



SERVICE DROP-OFF EXIT RAMP ENLARGEMENT

10 5 2.5 0 10

1"= 10'



ADA RAMP ENLARGEMENT

10 5 2.5 0 10

1"= 10'

LEGEND

EXISTING

PROPERTY LINE	
R.O.W. LINE	
BUILDING	
CONCRETE CURB	
FENCE	X X
TREELINE	
CONCRETE MONUMENT/ IRON PIN	
SIGN	
TREE	
DRAINAGE INLET	
STORM/SANITARY MANHOLE	
WATER/GAS VALVES	
UTILITY POLE	
OVERHEAD UTILITY WIRES	OH OH
GAS LINE	G G
WATER LINE	W W
STORM PIPE	
CONTOUR ELEVATION	400
CENTERLINE OF WATER FEATURE	
FLOOD WAY	FW
100 YEAR FLOOD PLAIN	100 YR
500 YEAR FLOOD PLAIN	500 YR
ASSUMED CULVERT FLOOD WAY	
EDGE OF STREAM DELINEATION FLAGS	WET WET

LEGEND

PROPOSED

SPOT ELEVATION	123.00 TC 123.50 BC 123.00
CONTOUR ELEVATION	100
RIDGE	
BUILDING	
RETAINING WALL	
CONCRETE CURB	
FLUSH CURB	
RAMP	
AREA LIGHT	
DRAINAGE INLET	
MANHOLE	
ENDWALL	
TRANSFORMER	
STORM PIPE	
ELECTRIC	UGET&C
SANITARY SEWER PIPE	S
WATER PIPE	W
LIMIT OF DISTURBANCE	LOD LOD
PROJECT SITE BOUNDARY	PSB PSB

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4	5/28/2025	PER NPDES COMMENT	RMS / JAB
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PROJECT No.:	PAB220113.01
DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-GDUL-5A

PROJECT:

AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

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JEFFREY A. BEAVAN
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PENNSYLVANIA LICENSE No. PE083005
NEW JERSEY LICENSE No. GE49536600

SHEET TITLE:

GRADING PLAN

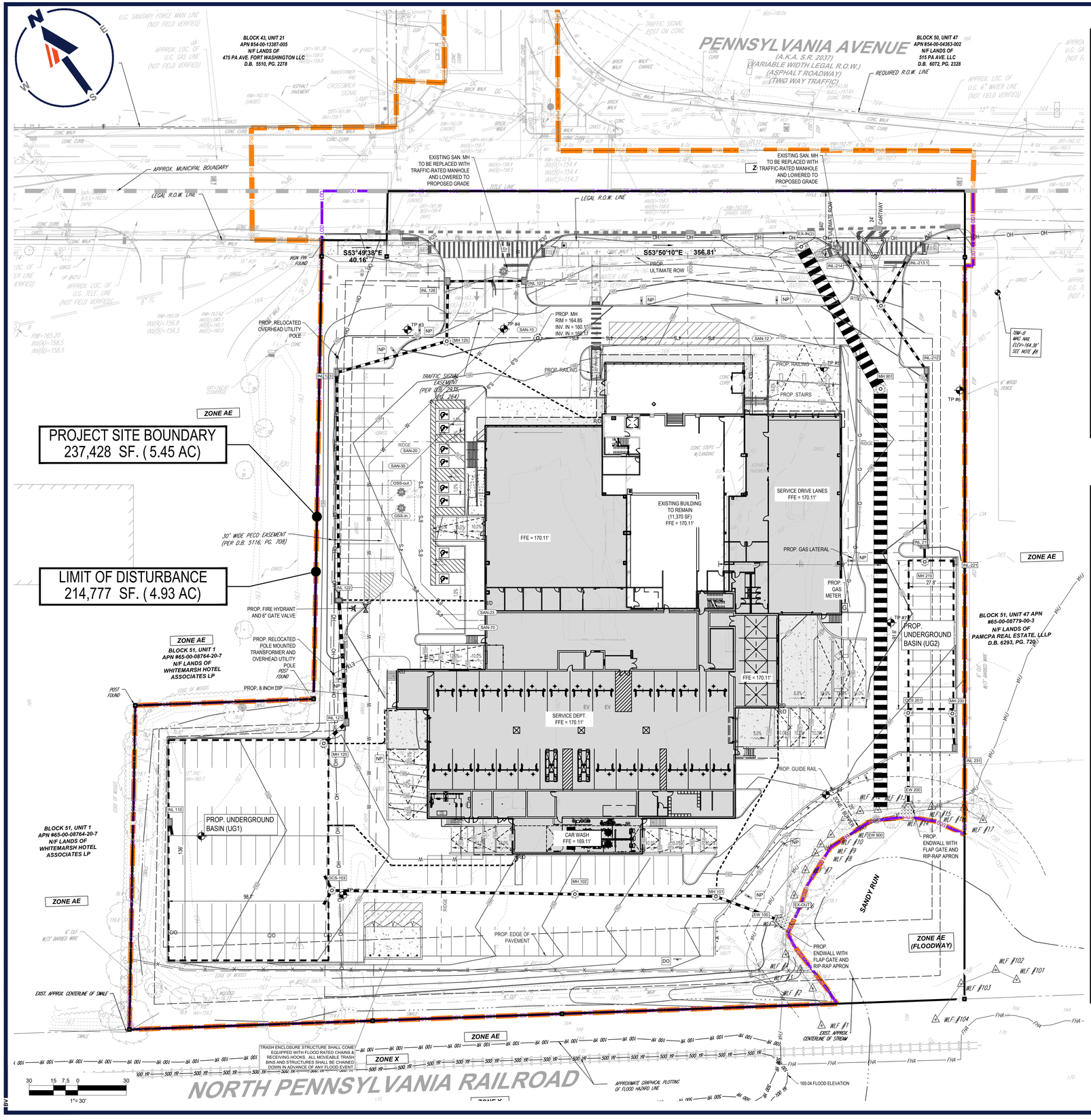
SHEET NUMBER:

C-402

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REVISION 5 - 7/22/2025

I:\BOHLERENG\NETSHARES\PA-PROJECTS\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-GDUL-5A-----LAYOUT: C-402 GRADING ENLARGEMENTS



STORM SEWER PIPE SCHEDULE

FROM	TO	SIZE (IN.)	TYPE	LENGTH (FT.)	SLOPE(%)
EW 100	MH 101	18"	HDPE	39	0.51%
EW 200	OCS 201	18"	HDPE	55	0.51%
EW 900	MH 901	98"	RCP	263	0.14%
EX-IN	EX-OUT	98"	RCP	413	0.31%
IN(119)	RD2	12"	HDPE	7	0.50%
IN(122)	MH 125	6"	HDPE	96	2.51%
IN(123)	IN(124)	8"	HDPE	76	3.66%
IN(124)	MH 101	8"	HDPE	15	0.50%
IN(126)	RD3-CO1	8"	HDPE	34	0.50%
IN(127)	IN(126)	8"	HDPE	74	0.50%
IN(128)	IN(127)	8"	HDPE	5	0.50%
INL-212	MH-213	15"	HDPE	49	0.50%
INL 121	INL 122	24"	HDPE	75	0.50%
INL 122	RD1	12"	HDPE	90	0.50%
INL 122	INL 123	18"	HDPE	140	0.50%
INL 123	MH 125	18"	HDPE	71	0.51%
INL 126	INL 127	15"	HDPE	47	0.51%
INL 211	INL-212	15"	HDPE	108	0.50%
MH-213	INL-214	15"	HDPE	37	0.50%
MH-213	INL-213.1	15"	HDPE	33	0.51%
MH 101	MH 102	18"	HDPE	87	0.51%
MH 102	OCS-103	18"	HDPE	150	0.50%
MH 120	UG1 (120)	24"	HDPE	4	0.00%
MH 120	RD2(2)	12"	HDPE	38	0.50%
MH 120	INL 121	24"	HDPE	19	0.52%
MH 125	INL 126	18"	HDPE	37	0.51%
MH 210	INL 211	15"	HDPE	10	0.50%
MH 230	UG2 (230)	15"	HDPE	3	0.00%
MH 230	INL 231	15"	HDPE	21	3.38%
MH 901	EX-IN(2)	98"	RCP	100	0.15%
OCS-103	UG1 (103b)	18"	HDPE	11	0.00%
OCS-103	UG1 (103a)	18"	HDPE	11	0.00%
OCS 201	UG2 (201)	15"	HDPE	3	0.00%
RD2(2)	IN(119)	12"	HDPE	20	0.50%
RD3	IN(128)	8"	HDPE	3	1.31%
RD4	IN(122)	6"	HDPE	11	1.50%
RD5	IN(123)	8"	HDPE	35	3.62%
UG1 (110)	INL 110	18"	HDPE	9	13.82%
UG1 (RD3)	RD3-CO1	8"	HDPE	17	0.50%
UG2 (210)	MH 210	15"	HDPE	3	0.00%

STORM STRUCTURE SCHEDULE

NAME	TYPE	GRT/RIM ELEV. (FT.)	INVERTS
EW 100	ENDWALL	159.73'	INV IN = 156.14' (18" HDPE)
EW 200	ENDWALL	161.40'	INV IN = 158.00' (18" HDPE)
EW 900	NULL STRUCTURE	160.71'	INV IN = 154.85' (98" RCP)
EX-IN	MANHOLE	163.05'	INV OUT = 155.38' (98" RCP)
EX-IN(2)	TYPE 12 MANHOLE	163.02'	INV OUT = 155.38' (98" RCP)
EX-OUT	NULL STRUCTURE	154.82'	INV IN = 154.10' (98" RCP)
IN(119)	CLEANOUT	164.89'	INV IN = 158.32' (12" HDPE) INV OUT = 158.32' (12" HDPE)
IN(122)	CLEANOUT	167.71'	INV IN = 164.71' (8" HDPE) INV OUT = 164.71' (8" HDPE)
IN(123)	CLEANOUT	164.27'	INV IN = 161.60' (8" HDPE) INV OUT = 161.60' (8" HDPE)
IN(124)	CLEANOUT	162.11'	INV IN = 158.83' (8" HDPE) INV OUT = 158.83' (8" HDPE)
IN(126)	CLEANOUT	164.08'	INV IN = 158.62' (8" HDPE) INV OUT = 158.62' (8" HDPE)
IN(127)	CLEANOUT	164.00'	INV IN = 158.99' (8" HDPE) INV OUT = 158.99' (8" HDPE)
IN(128)	CLEANOUT	163.90'	INV IN = 159.01' (8" HDPE) INV OUT = 159.01' (8" HDPE)
INL-212	TYPE C INLET	164.93'	INV IN = 159.47' (15" HDPE) INV OUT = 159.47' (15" HDPE)
INL-213.1	TYPE C INLET	162.66'	INV OUT = 159.89' (15" HDPE)
INL-214	TYPE C INLET	162.82'	INV OUT = 159.90' (15" HDPE)
INL-221	TYPE C INLET	164.29'	INV OUT = 158.30' (15" HDPE)
INL 110	TYPE C INLET	162.50'	INV OUT = 159.25' (18" HDPE)
INL 121	TYPE C INLET	164.19'	INV IN = 158.13' (24" HDPE) INV OUT = 158.13' (24" HDPE)
INL 122	TYPE C INLET	164.94'	INV IN = 158.51' (18" HDPE) INV IN = 158.51' (12" HDPE) INV OUT = 158.51' (24" HDPE)
INL 123	TYPE C INLET	165.11'	INV IN = 159.23' (18" HDPE) INV OUT = 159.23' (18" HDPE)
INL 126	TYPE C INLET	162.75'	INV IN = 159.77' (15" HDPE) INV OUT = 159.77' (18" HDPE)
INL 127	TYPE C INLET	163.09'	INV OUT = 160.01' (15" HDPE)
INL 211	TYPE C INLET	164.75'	INV IN = 158.83' (15" HDPE) INV OUT = 158.83' (15" HDPE)
INL 231	TYPE C INLET	163.16'	INV OUT = 160.00' (15" HDPE)
MH-213	MANHOLE	164.13'	INV IN = 159.72' (15" HDPE) INV IN = 159.72' (15" HDPE) INV OUT = 159.72' (15" HDPE)
MH 101	MANHOLE TYPE 12 MANHOLE	161.33'	INV IN = 156.34' (18" HDPE) INV IN = 158.75' (8" HDPE) INV OUT = 156.34' (18" HDPE)
MH 102	MANHOLE	162.76'	INV IN = 156.78' (18" HDPE) INV OUT = 156.78' (18" HDPE)
MH 120	MANHOLE	163.83'	INV IN = 158.03' (24" HDPE) INV IN = 158.03' (12" HDPE) INV OUT = 158.03' (24" HDPE)
MH 125	MANHOLE	164.39'	INV IN = 159.58' (18" HDPE) INV IN = 162.29' (8" HDPE) INV OUT = 159.58' (18" HDPE)
MH 210	MANHOLE	164.62'	INV IN = 158.78' (15" HDPE) INV OUT = 158.78' (15" HDPE)
MH 230	MANHOLE	163.52'	INV IN = 159.28' (15" HDPE) INV IN = 158.28' (15" HDPE)
MH 901	MANHOLE	165.59'	INV IN = 155.23' (98" RCP) INV OUT = 155.23' (98" RCP)
OCS-103	TYPE M INLET	163.71'	INV OUT = 157.53' (18" HDPE) INV OUT = 158.03' (18" HDPE) INV OUT = 158.03' (18" HDPE)
OCS 201	TYPE M INLET	163.86'	INV IN = 158.28' (15" HDPE) INV OUT = 158.28' (18" HDPE)



USGS MAP

AMBLER QUAD

SCALE: 1"=2,000'

1000' 0 2000'

SANITARY PIPE SCHEDULE

FROM	TO	SIZE IN.	TYPE	n MANNING'S COEF.	So	SLOPE %	L LENGTH FT.
IN(97)	IN(98)	8	PVC	0.000		0.44%	206.51
IN(139)	SAN-22	6	PVC	0.000		0.50%	12.86
IN(140)	SAN-60	4	PVC	0.000		0.50%	14.93
OSS-out	SAN-30	4	PVC	0.000		0.50%	3.71
SAN-11	SAN-10	4	PVC	0.000		0.50%	128.56
SAN-12	SAN-11	4	PVC	0.000		0.59%	4.10
SAN-13	SAN-12	4	PVC	0.000		0.50%	40.69
SAN-14	SAN-13	4	PVC	0.000		0.50%	3.91
SAN-20	SAN-10	6	PVC	0.000		0.50%	101.92
SAN-21	SAN-20	6	PVC	0.000		0.50%	79.13
SAN-22	SAN-21	6	PVC	0.000		0.50%	32.61
SAN-23	IN(139)	6	PVC	0.000		0.50%	3.76
SAN-30	SAN-20	4	PVC	0.000		0.50%	17.12
SAN-50	OSS-in	4	PVC	0.000		0.42%	33.75
SAN-60	SAN-50	4	PVC	0.000		0.50%	46.65
SAN-70	IN(140)	4	PVC	0.000		0.50%	3.76

LEGEND

PROPOSED

RIDGE	
STORM PIPE	
ELECTRIC	UGET&C
SANITARY SEWER PIPE	S
WATER PIPE	W
AREA LIGHT	
DRAINAGE INLET	
MANHOLE	
ENDWALL	
TRANSFORMER	
CONTOUR ELEVATION	100
BUILDING	
RETAINING WALL	
CONCRETE CURB	
FLUSH CURB	
LIMIT OF DISTURBANCE	LOD LOD
PROJECT SITE BOUNDARY	PSB PSB

LEGEND

EXISTING

PROPERTY LINE	
R.O.W. LINE	
BUILDING	
CONCRETE CURB	
FENCE	X
TREELINE	
CONCRETE MONUMENT/ IRON PIN	
SIGN	
TREE	
DRAINAGE INLET	
STORM/SANITARY MANHOLE	
WATER/GAS VALVES	
UTILITY POLE	
OVERHEAD UTILITY WIRES	OH
WATER LINE	W
STORM PIPE	
CONTOUR ELEVATION	
CENTERLINE OF WATER FEATURE	
100 YEAR FLOOD PLAIN	100 YR
500 YEAR FLOOD PLAIN	500 YR
EDGE OF STREAM DELINEATION FLAGS	WF #
FLOOD WAY	FHA

UTILITY COMPANY	PHONE NUMBER
AMBLER BOROUGH	215-646-1000
AQUA PENNSYLVANIA, INC.	610-525-1400
AT & T	215-233-3474
BUCKS COUNTY WATER & SEWER	215-750-0585
COMCAST CABLE COMMUNICATIONS, INC.	215-018-3137
COMCAST CABLEVISION	215-961-3800
NORTH WALES WATER	215-699-4836
PECO	610-292-8057
SEPTA	215-580-7852
UPPER DUBLIN TWP.	215-643-1600
VERIZON	215-657-9260
WHITEMARSH TOWNSHIP	610-825-3535

BOHLER

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5	7/22/2025	PER REVISED ARCH	RMS / MRB

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THIS DRAWING IS INTENDED FOR MUNICIPAL AND/OR AGENCY REVIEW AND APPROVAL. IT IS NOT INTENDED AS A CONSTRUCTION DOCUMENT UNLESS INDICATED OTHERWISE.

PROJECT No.: PAB220113.01
DRAWN BY: RMS
CHECKED BY: JAB
DATE: 10/24/2024
CAD I.D.: PAB220113.01-GDUL-SA

PROJECT:

AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

500 PENNSYLVANIA AVENUE
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY, PA

BOHLER
74 W BROAD STREET, SUITE 500
BETHLEHEM, PA 18018
Phone: (610) 709-9971
Fax: (610) 709-9976
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J.A. BEAVAN
COMMONWEALTH OF PENNSYLVANIA
PROFESSIONAL
JEFFREY A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE082005
AREA CODE/PHONE No. 610-709-9971
NEW JERSEY LICENSE No. 24GE05036500

SHEET TITLE:

UTILITY PLAN

SHEET NUMBER:

C-501

Page 11 of 36

REVISION 5 - 7/22/2025

I:\BOHLERENG.NET\SHARE\PA-PROJECTS\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-GDUL-SA---LAYOUT C-501 UTILITY PLAN.DWG

PENNSYLVANIA AVENUE
(VARIABLE WIDTH LEGAL R.O.W.)
(ASPHALT ROADWAY)
(TWO WAY TRAFFIC)

BLOCK 43, UNIT 21
APN #54-00-13387-005
N/F LANDS OF
475 PA AVE. FORT WASHINGTON LLC
D.B. 5510, PG. 2278

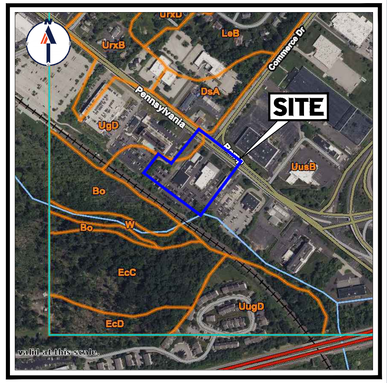
BLOCK 50, UNIT 47
APN #54-00-04383-002
N/F LANDS OF
515 PA AVE. LLC
D.B. 6072, PG. 2328

UNT TO SANDY RUN
(AKA BODENSTEIN
CHANNEL)

DP004
P.O.I. #002
ZONE AE
S53°49'38"E
40.16'
S53°50'10"E 356.81'
IRON PIN FOUND
TSM-B
MAG NAIL
ELEV= 164.38'
SEE NOTE #8
CFS#21
UgD
PROJECT SITE BOUNDARY
237,428 SF. (5.45 AC)
LIMIT OF DISTURBANCE
214,777 SF. (4.93 AC)
PROP. STAGING AREA #1-1
UNT TO SANDY RUN
(AKA BODENSTEIN
CHANNEL)
(TO BE REALIGNED)
PROP. RCE #2-0
PROP. STOCKPILE #2-0
PROP. BARRICADE (TYP.)
PROP. CONCRETE WASHOUT
BLOCK 51, UNIT 47 APN
#65-00-08779-00-3
N/F LANDS OF
PAMCPA REAL ESTATE, LLLP
D.B. 6293, PG. 720
CFS#25
CFS#20
UusB
CFS#15
CFS#18
CFS#19
FILTER SOCK
SEDIMENT TRAP #2
DP003
CFS#17
CFS#14
SANDY RUN
ZONE AE
(FLOODWAY)
DP002
P.O.I.#1
WLF #1
CENTERLINE OF STREAM
ZONE AE
BLOCK 51, UNIT 1
APN #65-00-08764-20-7
N/F LANDS OF
WHITEMARSH HOTEL
ASSOCIATES LP
CFS#9
CFS#10
CFS#22
CFS#24
CFS#23
CFS#11
CFS#13
CFS#12
PROP. RCE #1-0
PROP. STAGING AREA #2-1
PROP. STOCKPILE #1-0
FILTER SOCK
SEDIMENT TRAP #1
EXIST. APPROX. CENTERLINE OF SWALE
ZONE X
NORTH PENNSYLVANIA RAILROAD
APPROXIMATE GRAPHICAL PLOTTING OF FLOOD HAZARD LINE
169.04 FLOOD ELEVATION
30 15 7.5 0 30
1"= 30'



USGS MAP
AMBLER QUAD
SCALE: 1"=2,000'
1000' 0 2000'



SOIL MAP
SCALE: 1"=500'
250' 0 500'

CHAPTER 93 RECEIVING WATERSHED AND STREAM CLASSIFICATION:
POI #1 - SANDY RUN, TRIBUTARY TO WISSAHICKON CREEK - TSF, MF
MUNICIPAL POINT SOURCE DISCHARGES - NUTRIENTS, BIOCHEMICAL OXYGEN DEMAN (BOD);
URBAN RUNOFF/STORM SEWERS - NUTRIENTS

CHAPTER 93 RECEIVING WATERSHED AND STREAM CLASSIFICATION:
POI #2 - UNNAMED TRIBUTARY TO SANDY RUN VIA STORM SEWERS - TSF, MF

LEGEND

EXISTING	
PROPERTY LINE	
R.O.W. LINE	
SOIL BOUNDARY	
SOIL BOUNDARY LABEL	UgD
BUILDING	
CONCRETE CURB	
FENCE	
TREELINE	
CONCRETE MONUMENT/ IRON PIN	
SIGN	
TREE	
DRAINAGE INLET	
STORM/SANITARY MANHOLE	
WATER/GAS VALVES	
UTILITY POLE	
OVERHEAD UTILITY WIRES	
GAS LINE	
WATER LINE	
SANITARY SEWER	
STORM PIPE	
STORM PIPE (UNT TO SANDY RUN AKA BODENSTEIN CHANNEL)	
CONTOUR ELEVATION	
CENTER OF WATER FEATURE	
100 YEAR FLOOD PLAIN	100 YR
500 YEAR FLOOD PLAIN	500 YR
FLOOD WAY	FEMA
ASSUMED FLOOD WAY	
TOP OF BANK / OHWM	WLF #5

LEGEND

PROPOSED	
LIMIT OF DISTURBANCE	LOD LOD
PROJECT SITE BOUNDARY	PSB PSB
PROPOSED CONTOURS	160
COMPOST FILTER SOCK	FS
COMPOST FILTER DIVERSION SOCK	DD
TREE PROTECTION FENCE	TPF
BARRICADE	
INLET PROTECTION	
CONCRETE WASHOUT	
TEMPORARY STOCKPILE	
ROCK CONSTRUCTION ENTRANCE	
NAGSC150	

NOTE:

WHERE COMPOST FILTER SOCKS ARE PLACED ON PAVED SURFACES, CONCRETE BLOCKS SHOULD BE USED IMMEDIATELY DOWNSLOPE OF THE SOCKS (AT THE SAME INTERVALS RECOMMENDED FOR THE STAKES) TO HELP HOLD THE SOCK IN PLACE.

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DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-SESC-5A

PROJECT:
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FOR
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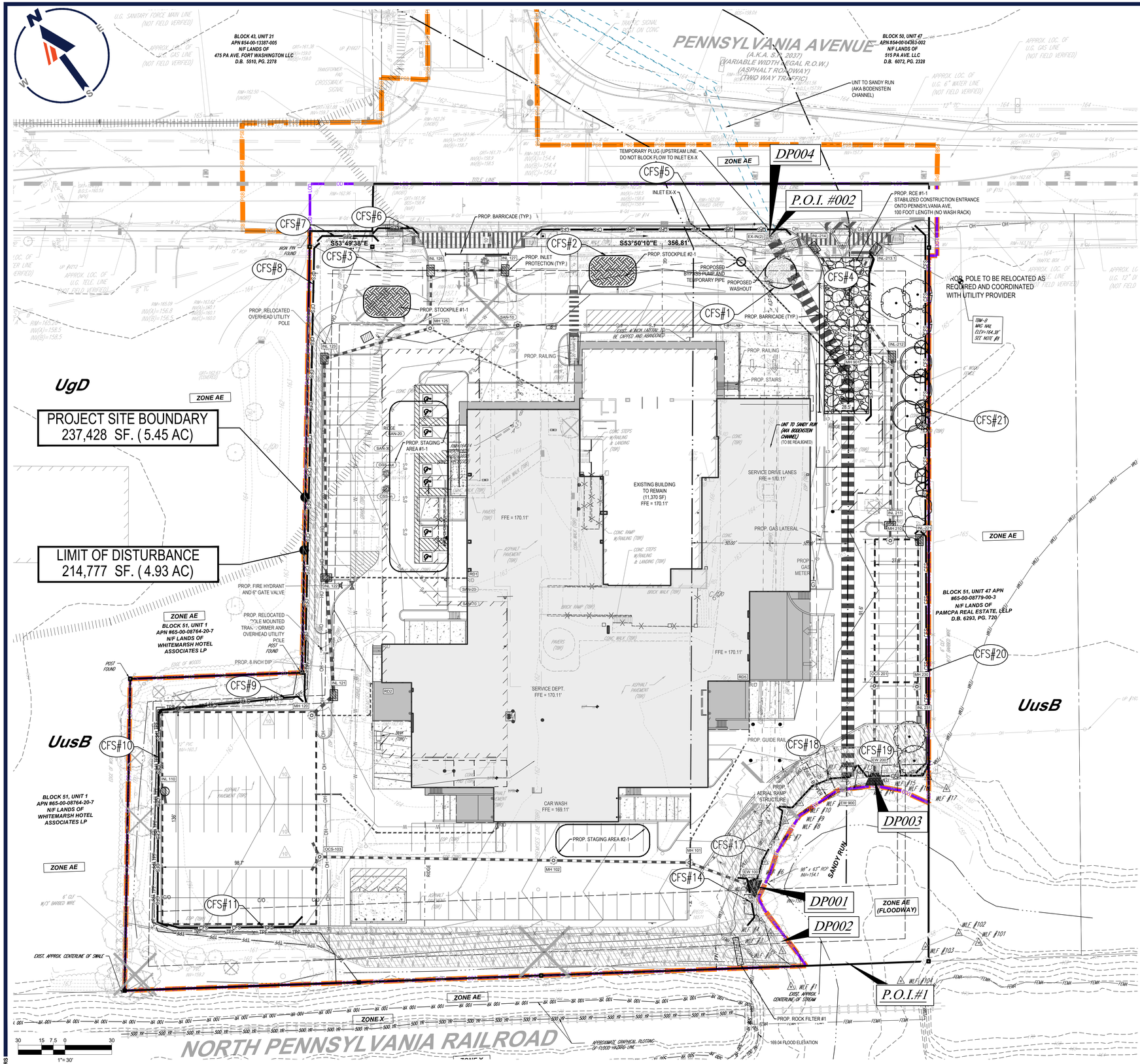
J.A. BEAVAN
JOHN A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE082005
NEW JERSEY LICENSE No. 24GE03339500

SHEET TITLE:
SOIL EROSION & SEDIMENT POLLUTION CONTROL PLAN STAGE - 0

SHEET NUMBER:
C-601
Page 12 of 36

REVISION 5 - 7/22/2025

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-SESC-5A-----LAYOUT: C-601 E&S STAGE 0

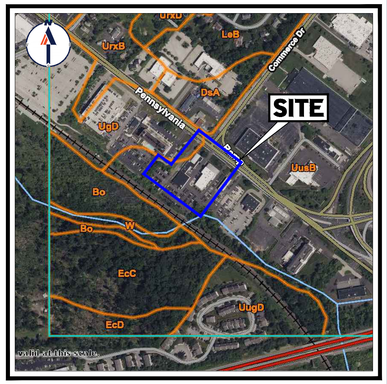




USGS MAP

AMBLER QUAD
SCALE: 1"=2,000'

1000' 0 2000'



SOIL MAP

SCALE: 1"=500'

250' 0 500'

CHAPTER 93 RECEIVING WATERSHED AND STREAM CLASSIFICATION:
POI #1 - SANDY RUN, TRIBUTARY TO WISSAHICKON CREEK - TSF, MF
MUNICIPAL POINT SOURCE DISCHARGES - NUTRIENTS, BIOCHEMICAL OXYGEN DEMAN (BOD);
URBAN RUNOFF/STORM SEWERS - NUTRIENTS

CHAPTER 93 RECEIVING WATERSHED AND STREAM CLASSIFICATION:
POI #2 - UNNAMED TRIBUTARY TO SANDY RUN VIA STORM SEWERS - TSF, MF

LEGEND — EXISTING

PROPERTY LINE	
R.O.W. LINE	
SOIL BOUNDARY	
SOIL BOUNDARY LABEL	UgD
BUILDING	
CONCRETE CURB	
FENCE	-X-
TREELINE	
CONCRETE MONUMENT/ IRON PIN	
SIGN	
TREE	
DRAINAGE INLET	
STORM/SANITARY MANHOLE	
WATER/GAS VALVES	
UTILITY POLE	
OVERHEAD UTILITY WIRES	OH
GAS LINE	G
WATER LINE	W
SANITARY SEWER	S
STORM PIPE	
STORM PIPE (UNT TO SANDY RUN AKA BODENSTEIN CHANNEL)	
CONTOUR ELEVATION	400
CENTER OF WATER FEATURE	
100 YEAR FLOOD PLAIN	100 YR
500 YEAR FLOOD PLAIN	500 YR
FLOOD WAY	FEMA
ASSUMED FLOOD WAY	
TOP OF BANK / OHWM	WLF #1

LEGEND — PROPOSED

LIMIT OF DISTURBANCE	LOD LOD
PROJECT SITE BOUNDARY	PSB PSB
DRAINAGE INLET	
MANHOLE	
ENDWALL	
MINOR CONTOURS BENEATH STRUCTURE	
MAJOR CONTOURS BENEATH STRUCTURE	
OVERHEAD UTILITY WIRES	OH
ELECTRIC LINE	E
WATER LINE	W
SANITARY SEWER	S
STORM PIPE	
COMPOST FILTER SOCK	FS
TREE PROTECTION FENCE	TPF
BARRICADE	
INLET PROTECTION	
STONE AND BLOCK INLET PROTECTION	
ROCK FILTER	
CONCRETE WASHOUT	
TEMPORARY STOCKPILE	
ROCK CONSTRUCTION ENTRANCE	
NAGSC150	

NOTE:

WHERE COMPOST FILTER SOCKS ARE PLACED ON PAVED SURFACES, CONCRETE BLOCKS SHOULD BE USED IMMEDIATELY DOWNSLOPE OF THE SOCKS (AT THE SAME INTERVALS RECOMMENDED FOR THE STAKES) TO HELP HOLD THE SOCK IN PLACE.

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J.A. BEAVAN — PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE082005
NEW YORK LICENSE No. 24-096504
NEW JERSEY LICENSE No. 24GE05339500

SHEET TITLE:

SOIL EROSION & SEDIMENT POLLUTION CONTROL PLAN STAGE - 1

SHEET NUMBER:

C-602

Page 13 of 36

REVISION 5 - 7/22/2025

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-SESC-5A-----LAYOUT: C-602 EAS STAGE 1
RMS

E&S - GENERAL NOTES:

1. THIS PLAN REPRESENTS THE MINIMUM LEVEL OF IMPLEMENTATION OF TEMPORARY EROSION AND SEDIMENTATION CONTROL STRUCTURES. ADDITIONAL FACILITIES OR MEASURES SHALL BE INSTALLED WHERE NECESSARY OR WHERE DIRECTED BY EITHER THE TOWNSHIP OR THE COUNTY CONSERVATION DISTRICT AS CONSTRUCTION PROGRESSES.

2. THE OWNER/CONSTRUCTION MANAGER IS RESPONSIBLE FOR ALL TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROLS AND SITE STABILIZATION. THE OWNER SHALL ASSIGN ONE INDIVIDUAL TO BE RESPONSIBLE FOR PROPER INSTALLATION AND MAINTENANCE OF ALL FACILITIES AND MEASURES.

3. PROTECTION TO THE EXISTING TREES AND SHRUBS SHALL BE TAKEN BY THE CONTRACTOR TO ELIMINATE UNNECESSARY DAMAGE.

4. ANY DRY FILL HAULED OFFSITE MUST BE TAKEN TO A LOCATION WITH AN EROSION AND SEDIMENTATION CONTROL PLAN WHICH HAS BEEN REVIEWED BY THE COUNTY CONSERVATION DISTRICT FOR ADEQUACY.

5. EROSION AND SEDIMENTATION CONTROLS MUST BE CONSTRUCTED, STABILIZED, AND FUNCTIONAL BEFORE SITE DISTURBANCE WITHIN TRIBUTARY AREAS OF THOSE CONTROLS.

6. STOCKPILES MUST BE STABILIZED IMMEDIATELY.

7. NO CHANGES SHALL BE MADE IN THE CONTOUR OF THE LAND. NO GRADING, EXCAVATING, REMOVAL OR DESTRUCTION OF THE TOPSOIL, TREES OR OTHER VEGETATIVE COVER OF THE LAND SHALL BE COMMENCED WITHIN A PROPOSED SUBDIVISION OR LAND DEVELOPMENT TRACT UNTIL SUCH TIME THAT A PLAN FOR SEDIMENTATION CONTROL AND MINIMIZING EROSION HAS BEEN REVIEWED AND FOUND SATISFACTORY BY THE COUNTY CONSERVATION DISTRICT AND REVIEWED AND APPROVED BY THE TOWNSHIP, OR THERE HAS BEEN A DETERMINATION BY THE TOWNSHIP, UPON RECOMMENDATION BY THE COUNTY CONSERVATION DISTRICT, THAT SUCH PLANS ARE NOT NECESSARY.

8. BEFORE INITIATING ANY REVISIONS TO THE APPROVED EROSION AND SEDIMENT CONTROL PLAN OR REVISIONS TO OTHER PLANS WHICH MAY AFFECT THE EFFECTIVENESS OF THE APPROVED E&S CONTROL PLAN, THE OPERATOR MUST RECEIVE APPROVAL OF THE REVISIONS FROM THE COUNTY CONSERVATION DISTRICT.

9. THE OPERATOR SHALL ASSURE THAT AN EROSION AND SEDIMENT CONTROL PLAN HAS BEEN PREPARED, APPROVED BY THE COUNTY CONSERVATION DISTRICT, AND IS BEING IMPLEMENTED AND MAINTAINED FOR ALL SOIL AND/OR ROCK SPOIL AND BORROW AREAS, REGARDLESS OF THEIR LOCATIONS.

10. CONTRACTOR SHALL USE TREADED MACHINERY AND MINIMIZE SOIL COMPACTION WHEREVER POSSIBLE.

MAINTENANCE, MONITORING & INSPECTION PROGRAM

§102.4(b)(5)(x)

UNTIL THE SITE IS STABILIZED AND DURING CONSTRUCTION ACTIVITIES, ALL BMPs MUST BE MAINTAINED PROPERLY BY THE CONTRACTOR. MAINTENANCE MUST INCLUDE INSPECTIONS OF ALL BMPs AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS TO ENSURE THEIR EFFECTIVE AND EFFICIENT OPERATION. SEE EROSION AND SEDIMENT DETAILS FOR ADDITIONAL INSPECTION AND MAINTENANCE REQUIREMENTS. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN-OUT, REPAIR, REPLACEMENT, REGRADING, RESEEDING, REMULCHING, AND RENETTING MUST BE PERFORMED IMMEDIATELY AND IN ACCORDANCE WITH THESE PROCEDURES, PLANS AND DETAILS. ANY AREAS DISTURBED DURING MAINTENANCE MUST BE STABILIZED IMMEDIATELY IN ACCORDANCE WITH THE GENERAL CONSERVATION NOTES AND SPECIFICATIONS. ALL SITE INSPECTIONS MUST BE DOCUMENTED IN AN INSPECTION LOG KEPT FOR THIS PURPOSE INDICATING THE COMPLIANCE ACTIONS AND THE DATE, TIME AND NAME OF THE PERSON CONDUCTING THE INSPECTION. THE INSPECTION LOG MUST BE KEPT ON SITE AT ALL TIMES AND MADE AVAILABLE TO THE DISTRICT UPON REQUEST.

INSPECTIONS SHALL EVALUATE DISTURBED AREAS AND AREAS USED FOR STORING MATERIALS THAT ARE EXPOSED TO RAINFALL FOR EVIDENCE OF, OR THE POTENTIAL FOR, POLLUTANTS ENTERING THE DRAINAGE SYSTEM DISCHARGING FROM THE SITE. IF NECESSARY, THE MATERIALS MUST BE COVERED OR ORIGINAL COVERS MUST BE REPAIRED OR SUPPLEMENTED. ALL AREAS DISTURBED DURING THE EARTHWORK PHASE OF CONSTRUCTION MUST BE TEMPORARILY SEEDED AND STABILIZED IF STABILIZATION CANNOT BE ACHIEVED WITHIN FOUR (4) DAYS. IN ADDITION, ALL DISTURBED AREAS IF NEEDED, IN ORDER TO CONTAIN RUNOFF FROM MATERIAL STOCKPILE AREAS.

GRASSED AREAS SHALL BE INSPECTED TO CONFIRM THAT A HEALTHY STAND OF GRASS IS MAINTAINED. THE SITE HAS ACHIEVED FINAL STABILIZATION ONCE ALL AREAS ARE COVERED WITH BUILDING FOUNDATION OR PAVEMENT, OR HAVE A STAND OF GRASS WITH AT LEAST 70 PERCENT DENSITY OR GREATER IN ACCORDANCE WITH PERMIT REQUIREMENTS. THE VEGETATIVE DENSITY SHALL BE MAINTAINED TO BE CONSIDERED STABILIZED. AREAS MUST BE WATERED, FERTILIZED, AND RESEEDED AS NEEDED TO ACHIEVE THIS REQUIREMENT.

ALL DISCHARGE POINTS MUST BE INSPECTED TO DETERMINE WHETHER EROSION AND SEDIMENT CONTROL MEASURES ARE EFFECTIVE IN PREVENTING DISCHARGE OF SEDIMENT FROM THE SITE OR IMPACTS TO RECEIVING WATERS.

VISUAL INSPECTIONS
THE PERMITTEE AND CO-PERMITTEE(S) MUST ENSURE THAT VISUAL SITE INSPECTIONS ARE CONDUCTED WEEKLY, AND WITHIN 24 HOURS AFTER EACH MEASURABLE RAINFALL EVENT THROUGHOUT THE DURATION OF CONSTRUCTION AND UNTIL THE RECEIPT AND ACKNOWLEDGEMENT OF THE NOT BY THE DEPARTMENT OR AUTHORIZED CONSERVATION DISTRICT. THE VISUAL SITE INSPECTIONS AND REPORTS SHALL BE CONDUCTED BY A PERSON IN A FORMAT PROVIDED BY THE DEPARTMENT, AND CONDUCTED BY QUALIFIED PERSONNEL, TRAINED AND EXPERIENCED IN EROSION AND SEDIMENT CONTROL. A ASCERTAIN THAT E&S BMPs AND PCSM BMPs ARE PROPERLY CONSTRUCTED AND MAINTAINED TO EFFECTIVELY MINIMIZE POLLUTION TO THE WATERS OF THIS COMMONWEALTH. A WRITTEN REPORT OF EACH INSPECTION SHALL BE KEPT AND INCLUDE AT A MINIMUM:

(1) A SUMMARY OF SITE CONDITIONS, E&S BMP AND PCSM BMP, IMPLEMENTATION AND MAINTENANCE AND COMPLIANCE ACTIONS; AND

(2) THE DATE, TIME, NAME AND SIGNATURE OF THE PERSON CONDUCTING THE INSPECTION.

NONCOMPLIANCE REPORTING
WHERE E&S, PCSM OR PPC BMPs ARE FOUND TO BE INOPERATIVE OR INEFFECTIVE DURING AN INSPECTION, OR ANY OTHER TIME, THE PERMITTEE AND CO_PERMITTEE(S) SHALL, WITHIN 24 HOURS, CONTACT THE DEPARTMENT OR AUTHORIZED CONSERVATION DISTRICT, BY PHONE OR PERSONAL CONTACT, FOLLOWED BY THE SUBMISSION OF A WRITTEN REPORT WITHIN 5 DAYS OF THE INITIAL CONTACT. NONCOMPLIANCE REPORTS SHALL INCLUDE THE FOLLOWING INFORMATION:

(1) ANY CONDITION ON THE PROJECT SITE WHICH MAY ENDANGER PUBLIC HEALTH, SAFETY, OR THE ENVIRONMENT, OR INVOLVE INCIDENTS WHICH CAUSE OR THREATEN POLLUTION;

(2) THE PERIOD OF NONCOMPLIANCE, INCLUDING EXACT DATES AND TIMES AND/OR ANTICIPATED TIME WHEN THE ACTIVITY WILL RETURN TO COMPLIANCE;

(3) STEPS BEING TAKEN TO REDUCE, ELIMINATE, AND PREVENT RECURRENCE OF THE NONCOMPLIANCE; AND

(4) THE DATE OR SCHEDULE OF DATES, AND IDENTIFYING REMEDIES FOR CORRECTING NONCOMPLIANCE CONDITIONS.

REDUCTION, LOSS, OR FAILURE OF THE BMPs
UPON REDUCTION, LOSS, OR FAILURE OF THE BMPs, THE PERMITTEE AND CO_PERMITTEE SHALL TAKE IMMEDIATE ACTION TO RESTORE THE BMPs OR PROVIDE AN ALTERNATIVE METHOD OF TREATMENT. SUCH RESTORED BMPs OR ALTERNATIVE TREATMENT SHALL BE AT LEAST AS EFFECTIVE AS THE ORIGINAL BMPs.

TERMINATION OF COVERAGE
NOT. UPON PERMANENT STABILIZATION OF EARTH DISTURBANCE ACTIVITIES ASSOCIATED WITH CONSTRUCTION ACTIVITY THAT ARE AUTHORIZED BY THIS PERMIT AND WHEN BMPs IDENTIFIED IN THE PCSM PLAN HAVE BEEN PROPERLY INSTALLED, THE PERMITTEE OR CO_PERMITTEE OF THE FACILITY MUST SUBMIT A NOT FORM THAT IS SIGNED IN ACCORDANCE WITH PART B, SECTION 1.C, SIGNATORY REQUIREMENTS, OF THIS PERMIT. ALL LETTERS CERTIFYING DISCHARGE TERMINATION ARE TO BE SENT TO THE DEPARTMENT OR AUTHORIZED CONSERVATION DISTRICT. THE NOT MUST CONTAIN THE FOLLOWING INFORMATION: FACILITY NAME, ADDRESS, AND LOCATION, OPERATOR NAME AND ADDRESS, PERMIT NUMBER, IDENTIFICATION AND PROOF OF ACKNOWLEDGMENT FROM THE PERSON(S) WHO WILL BE RESPONSIBLE FOR OPERATION AND MAINTENANCE OF THE PCSM BMPs IN ACCORDANCE WITH THE APPROVED PCSM PLAN, AND THE REASON FOR PERMIT TERMINATION. UNTIL THE PERMITTEE HAS RECEIVED WRITTEN ACKNOWLEDGEMENT OF THE NOT, THE PERMITTEE WILL REMAIN RESPONSIBLE FOR OPERATING AND MAINTAINING ALL E&S BMPs AND PCSM BMPs ON THE PROJECT SITE AND WILL BE RESPONSIBLE FOR VIOLATIONS OCCURRING ON THE PROJECT SITE.

COMPLETION CERTIFICATE AND FINAL PLANS
WITHIN 30 DAYS AFTER THE COMPLETION OF EARTH DISTURBANCE ACTIVITIES AUTHORIZED BY THIS PERMIT, INCLUDING THE PERMANENT STABILIZATION OF THE SITE AND PROPER INSTALLATION OF PCSM BMPs IN ACCORDANCE WITH THE APPROVED PCSM PLAN, OR, UPON SUBMISSION OF THE NOT IF SOONER, THE PERMITTEE SHALL FILE WITH THE DEPARTMENT OR AUTHORIZED CONSERVATION DISTRICT A STATEMENT SIGNED BY A LICENSED PROFESSIONAL AND BY THE PERMITTEE CERTIFYING THAT WORK HAS BEEN PERFORMED IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF THIS PERMIT AND THE APPROVED E&S AND PCSM PLANS.

E&S PLANNING AND DESIGN NOTES

GENERALLY, THE PROPOSED BMPS WERE SELECTED TO:

- PRESERVE THE INTEGRITY OF THE SANDY RUN AND MAINTAIN AND PROTECT THE PHYSICAL, BIOLOGICAL AND CHEMICAL QUALITIES OF THE WATERS THROUGH MITIGATING ANY INCREASES IN STORMWATER RUNOFF VOLUME DUE TO THE PROPOSED DEVELOPMENT AND TREATING RUNOFF FOR WATER QUALITY PURPOSES PRIOR TO BEING DISCHARGED FROM THE SITE.
- PREVENT AN INCREASE IN RATE OF STORMWATER RUNOFF. THE PROPOSED STORMWATER MANAGEMENT DESIGN HAS MATCHED OR REDUCED THE POST-DEVELOPMENT PEAK RATE FROM THE PRE-DEVELOPMENT CONDITIONS, AS REQUIRED BY WHITEMARSH TOWNSHIP STORMWATER MANAGEMENT ORDINANCE DUE TO THE REDUCTION IN STORMWATER RUNOFF VOLUME.
- TO THE GREATEST EXTENT FEASIBLE, MINIMIZE ANY INCREASE IN STORMWATER RUNOFF VOLUME BY INCORPORATING ONE (1) SUBSURFACE MANAGED RELEASE CONCEPT BED, AND ONE (1) UNDERGROUND DETENTION BASIN. RESULTANTLY, STORMWATER RUNOFF VOLUME HAS BEEN REDUCED BELOW PRE-DEVELOPMENT LEVELS.
- MINIMIZE IMPERVIOUS SURFACES AND BREAK UP OR DISCONNECT THE FLOW OF RUNOFF OVER IMPERVIOUS SURFACES. RUNOFF FROM IMPERVIOUS AREAS IS DIRECTED TO WATER QUALITY AND DETENTION BMP'S IN ORDER TO PRE-TREAT RUNOFF PRIOR TO BEING DISCHARGED FROM THE SITE. THE SITE CONVEYS RUNOFF THROUGH A SERIES OF WATER QUALITY AND DETENTION BMP'S IN ORDER TO MAXIMIZE PRE-TREATMENT OF RUNOFF AND FURTHER MITIGATE ANY IMPACT TO PEAK RATE AND VOLUME IN THE POST DEVELOPMENT CONDITIONS.
- MAXIMIZE THE PROTECTION OF EXISTING DRAINAGE FEATURES AND EXISTING VEGETATION. THE PROPOSED DEVELOPMENT HAS BEEN DESIGNED TO MAINTAIN THE GENERAL DRAINAGE PATTERNS OF THE SITE.
- MINIMIZE LAND CLEARING AND GRADING. THE CURRENT 3.64 AC. TRACT HAS BEEN DESIGNED TO ONLY IMPACT APPROXIMATELY 3.37 AC. OF EARTH DISTURBANCE WITHIN THE TRACT BOUNDARY (3.54 AC. TOTAL EARTH DISTURBANCE).
- MINIMIZE SOIL COMPACTION. THE SEQUENCE OF CONSTRUCTION HAS BEEN DESIGNED TO LIMIT THE EXTENT AND DURATION OF DISTURBANCE ACTIVITIES AND TO LIMIT THE EXTENT OF HEAVY TRAFFIC OVER SENSITIVE AREAS NECESSARY FOR THE PCSM DESIGN.
- UTILIZES OTHER MEASURES OR CONTROLS THAT PREVENT OR MINIMIZE GENERATION OF INCREASED STORMWATER RUNOFF.

RECYCLING OR DISPOSAL OF MATERIALS

§102.4(b)(5)(xi)

THE FOLLOWING IS A LIST THAT INCLUDES, BUT THAT IS NOT LIMITED TO, THE POTENTIAL CONSTRUCTION WASTES THAT MAY EXIST ON-SITE:
- CONCRETE CURB AND SIDEWALK
- ASPHALT
- E&S BMP - COMPOST FILTER SOCKS
- E&S BMP - TEMPORARY SEED
- E&S BMP - EROSION CONTROL MATTING
- E&S BMP - INLET PROTECTION

ALL BUILDING MATERIALS AND WASTES SHALL BE REMOVED FROM THE SITE AND RECYCLED OR DISPOSED OF IN ACCORDANCE WITH THE DEPARTMENT'S SOLID WASTE MANAGEMENT REGULATIONS AT 25 Pa. CODE 260.1 ET SEQ., 271.1, AND 287.1 ET SEQ. NO BUILDING MATERIALS OR WASTES OR UNUSED BUILDING MATERIALS SHALL BE BURNED, BURIED, DUMPED, OR DISCHARGED AT THE SITE. BELOW IS A LIST OF METHODS FOR THE PROPER RECYCLING/DISPOSAL OF VARIOUS MATERIALS:

1.) DUST CONTROL - CONSTRUCTION TRAFFIC MUST ENTER AND EXIT THE SITE AT THE STABILIZED CONSTRUCTION ENTRANCE. THE PURPOSE IS TO TRAP DUST AND MUD THAT WOULD OTHERWISE BE CARRIED OFF-SITE BY CONSTRUCTION TRAFFIC. WATER TRUCKS WILL BE USED AS NEEDED DURING CONSTRUCTION TO REDUCE DUST GENERATED ON THE SITE. DUST CONTROL MUST BE PROVIDED BY THE CONTRACTOR TO A DEGREE THAT IS ACCEPTABLE TO THE LOCAL CONSERVATION DISTRICT. AFTER CONSTRUCTION, THE SITE WILL BE STABILIZED, WHICH WILL REDUCE THE POTENTIAL FOR DUST GENERATION.

2.) SOLID WASTE DISPOSAL - NO SOLID MATERIALS, INCLUDING BUILDING MATERIALS, ARE ALLOWED TO BE DISCHARGED FROM THE SITE WITH STORMWATER. ALL SOLID WASTE, INCLUDING DISPOSABLE MATERIALS INCIDENTAL TO THE MAJOR CONSTRUCTION ACTIVITIES, MUST BE COLLECTED AND PLACED IN CONTAINERS. THE CONTAINERS WILL BE EMPTIED AS NECESSARY BY A CONTRACT TRASH DISPOSAL SERVICE AND HAULED AWAY FROM THE SITE.

3.) SANITARY FACILITIES - ALL PERSONNEL INVOLVED WITH CONSTRUCTION ACTIVITIES MUST COMPLY WITH STATE AND LOCAL SANITARY OR SEPTIC SYSTEM REGULATIONS. TEMPORARY SANITARY FACILITIES WILL BE PROVIDED AT THE SITE THROUGHOUT THE CONSTRUCTION PHASE. THEY MUST BE UTILIZED BY ALL CONSTRUCTION PERSONNEL AND WILL BE SERVICED BY A LICENSED COMMERCIAL OPERATOR.

4.) WATER SOURCE - WATER FOR PROPOSED ROCK CONSTRUCTION ENTRANCE WITH WASH RACK, RCE #1-0, TO UTILIZE WATER FROM BUILDING 1 TO DISCHARGE TO FILTER SOCK SEDIMENT TRAP #1. WATER FOR PROPOSED ROCK CONSTRUCTION ENTRANCE WITH WASH RACK, RCE #3-0, TO UTILIZE WATER FROM BUILDING 3 TO DISCHARGE TO FILTER SOCK SEDIMENT TRAP #3. NON-STORMWATER COMPONENTS OF SITE DISCHARGE MUST BE CLEAN WATER. WATER USED FOR CONSTRUCTION WHICH DISCHARGES FROM THE SITE MUST ORIGINATE FROM A PUBLIC WATER SUPPLY OR FACILITIES IF NEEDED, APPROVED BY THE STATE HEALTH DEPARTMENT. WATER USED FOR CONSTRUCTION THAT DOES NOT ORIGINATE FROM AN APPROVED PUBLIC SUPPLY MUST NOT DISCHARGE FROM THE SITE.

5.) CONCRETE WASTE FROM CONCRETE READY-MIX TRUCKS - DISCHARGE OF EXCESS OR WASTE CONCRETE AND/OR WASH WATER FROM CONCRETE TRUCKS WILL BE ALLOWED ON THE CONSTRUCTION SITE, BUT ONLY IN SPECIFICALLY DESIGNATED DIKED AREAS PREPARED TO PREVENT CONTACT BETWEEN THE CONCRETE AND/OR WASH WATER AND STORMWATER THAT WILL BE DISCHARGED FROM THE SITE.

GEOLOGIC FORMATIONS/SOIL CONDITIONS THAT MAY HAVE THE POTENTIAL TO CAUSE POLLUTION

§102.4(b)(5)(xii)

THERE ARE NO GEOLOGIC FORMATIONS OR SOIL CONDITIONS THAT COULD CAUSE CONTAMINANT POLLUTION DURING EARTH DISTURBANCE ACTIVITIES.

E&S THERMAL IMPACT ANALYSIS

THE POTENTIAL FOR THERMAL IMPACTS FROM STORMWATER RUNOFF AS A RESULT OF INCREASED IMPERVIOUS HAVE BEEN AVOIDED OR MINIMIZED THROUGH THE DESIGN OF LANDSCAPING. 1 (1) UNDERGROUND DETENTION FACILITY. AND 1 UNDERGROUND MANAGED RELEASE CONCEPT (MRC) BASIN. THE SHADING EFFECTS OF THE PROPOSED AND EXISTING LANDSCAPING WILL PROVIDE THERMAL WATER QUALITY BENEFITS BY ALLOWING THE STORMWATER THAT HAS RUN ACROSS PAVED AREAS TO DECREASE IN TEMPERATURE PRIOR TO ENTERING THE DOWNSTREAM WATERSHED. THE FACILITIES WILL DETAIN, FILTER AND SHADE THE SURFACE WATER BEFORE MANAGED RELEASE AND WILL HELP COOL DOWN THE SURFACE WATER. THERMAL IMPACTS WILL BE REDUCED DURING CONSTRUCTION BY MEANS OF VARIOUS SOIL EROSION BMP'S THAT WILL REDUCE SEDIMENT LOADING TO SURFACE RUNOFF BEFORE IT LEAVES THE SITE (I.E. COMPOST FILTER SOCKS, INLET FILTER PROTECTION AT EXISTING AND PROPOSED INLETS, EROSION CONTROL MATTING BEING INSTALLED IMMEDIATELY FOLLOWING GRADING). EXISTING TREES AND VEGETATION ON SITE WILL ALSO BE PRESERVED AND PROTECTED WHICH WILL REDUCE THERMAL IMPACTS DURING CONSTRUCTION.

EROSION & SEDIMENT BMP INSPECTION SCHEDULE

- COMPOST FILTER SOCKS - DAILY.
- FILTER SOCK SEDIMENT TRAP - DAILY AND AFTER EACH STORM EVENT.
- ROCK CONSTRUCTION ENTRANCE - DAILY AND AFTER EACH STORM EVENT.
- INLET PROTECTION (FILTER BAGS) - WEEKLY AND AFTER EACH STORM EVENT.

SEQUENCE OF BMP INSTALLATION AND REMOVAL

§102.4(b)(5)(vii)

ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE FOLLOWING SEQUENCE. EACH STAGE SHALL BE COMPLETED IN COMPLIANCE WITH CHAPTER 102 REGULATIONS BEFORE ANY FOLLOWING STAGE IS INITIATED. CLEARING AND GRUBBING SHALL BE LIMITED ONLY TO THOSE AREAS DESCRIBED IN EACH STAGE. UPON COMPLETION OR TEMPORARY CESSATION OF THE EARTH DISTURBANCE ACTIVITY THAT WILL EXCEED FOUR (4) DAYS [IMMEDIATELY FOR HQ/EV WATERSHEDS], OR ANY STAGE THEREOF, THE PROJECT SITE SHALL BE IMMEDIATELY STABILIZED WITH THE APPROPRIATE TEMPORARY OR PERMANENT STABILIZATION.

AT LEAST SEVEN (7) DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, THE OPERATOR SHALL INVITE ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES INCLUDING, BUT NOT LIMITED TO: THE LANDOWNER, ALL APPROPRIATE MUNICIPAL OFFICIALS AND A REPRESENTATIVE OF THE MONTGOMERY COUNTY CONSERVATION DISTRICT FOR AN ONSITE PRECONSTRUCTION MEETING. ALSO, AT LEAST THREE (3) DAYS BEFORE STARTING ANY EARTH DISTURBANCE ACTIVITIES, ALL CONTRACTORS INVOLVED IN THOSE ACTIVITIES SHALL NOTIFY THE PENNSYLVANIA ONE CALL SYSTEM INC. AT 1-800-242-1776 FOR BURIED UTILITIES LOCATION.

BEFORE INITIATING ANY REVISION TO THE APPROVED EROSION AND SEDIMENT CONTROL PLAN OR REVISIONS TO OTHER PLANS WHICH MAY AFFECT THE EFFECTIVENESS OF THE APPROVED E&S CONTROL PLAN, THE OPERATOR MUST RECEIVE APPROVAL OF THE REVISIONS FROM THE MONTGOMERY COUNTY CONSERVATION DISTRICT. THE OPERATOR SHALL ASSURE THAT THE APPROVED EROSION AND SEDIMENT CONTROL PLAN IS REVIEWED BY AND CONSTANTLY IMPLEMENTED BY A QUALIFIED PROFESSIONAL. IN THE EVENT UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO ELIMINATE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION.

A PRE-CONSTRUCTION CONFERENCE SHALL BE HELD WITH THE TOWNSHIP SHADE TREE COMMISSION PRIOR TO START OF CONSTRUCTION.

STAGE 0

1. STAKE OUT LIMIT OF DISTURBANCE AND STREAM EXTENTS
2. INSTALL CONSTRUCTION ENTRANCES WITH WASH RACKS AND STAGING AREAS AS DESIGNATED ON THE PLANS.
3. A PRE-CONSTRUCTION MEETING SHALL BE HELD WITH THE TOWNSHIP ENGINEER PRIOR TO START OF CONSTRUCTION. INSTALL ALL PERIMETER COMPOST FILTER SOCKS, TREE PROTECTION FENCING, INLET PROTECTION WITHIN THE DISTURBANCE LIMIT OF DISTURBANCE AS INDICATED ON THE PLANS. ONLY LIMITED CLEARING AND GRUBBING NECESSARY TO INSTALL THE PERIMETER EROSION AND SEDIMENT POLLUTION CONTROLS IS PERMITTED.
4. CONSTRUCT FILTER SOCK SEDIMENT TRAP #2. ONLY LIMITED CLEARING AND GRUBBING IS PERMITTED FOR CONSTRUCTION OF THE ACCESS TO THE SEDIMENT TRAP. DURING THE SEDIMENT CONTROL STAGE, THE FACILITY IS NOT TO BE EXCAVATED BELOW THE SEDIMENT TRAP BOTTOM ELEVATION. THE FACILITY IS TO BE STABILIZED AND FUNCTIONING PROPERLY PRIOR TO ANY FURTHER EARTH DISTURBANCE ACTIVITIES.
5. CONSTRUCT FILTER SOCK SEDIMENT TRAP #1. ONLY LIMITED CLEARING AND GRUBBING IS PERMITTED FOR CONSTRUCTION OF THE ACCESS TO THE SEDIMENT TRAP. DURING THE SEDIMENT CONTROL STAGE, THE FACILITY IS NOT TO BE EXCAVATED BELOW THE SEDIMENT TRAP BOTTOM ELEVATION. THE FACILITY IS TO BE STABILIZED AND FUNCTIONING PROPERLY PRIOR TO ANY FURTHER EARTH DISTURBANCE ACTIVITIES. INLET FILTER IS TO BE REMOVED ONCE FILTER SOCK SEDIMENT TRAPS ARE INSTALLED AND FUNCTIONING.
6. INITIATE THE NECESSARY EARTHWORK TO REACH THE GRADES INDICATED ON THE STAGE-0 PLANS. THE CONCRETE WASHOUT MUST BE INSTALLED BEFORE ANY CONCRETE CAN BE POURED ON-SITE. CONTRACTOR MUST PERFORM BULK OF EARTHWORK TO BALANCE CUTS AND FILLS TO THE GREATEST EXTENT POSSIBLE. ALL AREAS DISTURBED DURING THE EARTHWORK PHASE OF CONSTRUCTION MUST BE TEMPORARILY SEEDED AND STABILIZED IN ACCORDANCE WITH THE GENERAL CONSERVATION NOTES AND SPECIFICATIONS AND SEEDING SPECIFICATIONS IF PERMANENT STABILIZATION CANNOT BE ACHIEVED WITHIN FOUR (4) DAYS.
7. COMMENCE DEMOLITION OF EXISTING BUILDINGS 1 AND 3 (WEST AND EAST) AND ACCESSORY STRUCTURES AND INITIATE REMOVAL OF EXISTING ASPHALT AND CONCRETE FEATURES TO BE REMOVED AS DESIGNATED ON THE PLANS.
8. UPON SITE STABILIZATION FOR TRIBUTARY AREA OF FILTER SOCK SEDIMENT TRAP 2 (UNIFORM COVERAGE OR DENSITY OF 70% ACROSS ALL DISTURBED AREAS) AND NOTIFICATION OF THE MONTGOMERY COUNTY CONSERVATION DISTRICT, REMOVE EROSION AND SEDIMENT CONTROL FACILITY (FILTER SOCK SEDIMENT TRAP #2). ANY AREA DISTURBED DURING THE REMOVAL OF EROSION AND SEDIMENT CONTROL FACILITIES SHALL BE STABILIZED IMMEDIATELY
9. UPON SITE STABILIZATION FOR TRIBUTARY AREA OF FILTER SOCK SEDIMENT TRAP 1 (UNIFORM COVERAGE OR DENSITY OF 70% ACROSS ALL DISTURBED AREAS) AND NOTIFICATION OF THE MONTGOMERY COUNTY CONSERVATION DISTRICT, REMOVE EROSION AND SEDIMENT CONTROL FACILITY (COMPOST FILTER SOCK TRAP #1). ANY AREA DISTURBED DURING THE REMOVAL OF EROSION AND SEDIMENT CONTROL FACILITIES SHALL BE STABILIZED IMMEDIATELY
10. A SITE INSPECTION AND APPROVAL BY THE LICENSED DESIGNATED PROFESSIONAL IS REQUIRED PRIOR TO REMOVAL OF SEDIMENT TRAPS. ONCE STONE BASE COURSE HAS BEEN SPREAD IN ALL PAVED AREAS AND ALL LANDSCAPE AREAS HAVE BEEN STABILIZED, BEGIN CONVERTING SEDIMENT TRAPS TO FINAL GRADES IN ACCORDANCE WITH BMP SEQUENCE OF CONSTRUCTION. **THE PERMITTEE SHALL PROVIDE ENGINEERING OVERSIGHT FOR THE REMOVAL OF SEDIMENT TRAPS. A LICENSED PROFESSIONAL OR DESIGNEE KNOWLEDGEABLE IN THE DESIGN AND CONSTRUCTION OF SEDIMENT TRAPS, PREFERABLY THE DESIGN ENGINEER, SHALL CONDUCT THE OVERSIGHT.**

STAGE 1

11. **CRITICAL STAGE - INSTALL CULVERT REALIGNMENT FROM DOWNSTREAM TO UPSTREAM. PROVIDE BYPASS PUMPING DURING FINAL CONNECTION IF NECESSARY**
    - **11.1. PRIOR TO THE INSTALLATION OF RCE #1-1, INSTALL NEW CULVERT RUN FROM EW900 TO MH901, AND MH901 TO MH900 WITH 20' OF EX-IN(2).**
    - **11.2. DURING A PERIOD OF NO RAIN (NOTIFY THE CONSTRUCTION MANAGER AT LEAST 24 HOURS IN ADVANCE WHEN IMMINENT TO NO FLOW IN THE LINE), IN ONE COMPLETE STEP: INSTALL BYPASS PUMP AND LINE FROM EX-A TO MH901, PLUG UPSTREAM LINES WITH INFLATABLE PLUGS UPSTREAM OF EX-IN(2). THIS WILL SEND ANY REMAINING WATER IN THE LINE TO EX-X, FOR BYPASS PUMPING.**
    - **11.3. REPLACE INL EX-IN(2), AND CONNECT NEW CULVERT LINE FROM MH901 TO EX-IN(2). BACKFILL, AND ONCE CONNECTED REMOVE BYPASS PUMP.**
12. INSTALL 100 FOOT ROCK CONSTRUCTION ENTRANCE AND STAGING AREAS AS DESIGNATED ON THE PLANS.
13. REMOVE EXISTING CULVERT FROM UPSTREAM TO DOWNSTREAM, OR (OUTSIDE BUILDING AREAS) ABANDON IN PLACE WITH FLOWABLE FILL.
14. INSTALL PIPE RUN FROM INL-212, MH-213, INL-213.1, AND INL-214, AND CAP END UNTIL STAGE 1.
15. INSTALL ALL PERIMETER COMPOST FILTER SOCKS, TREE PROTECTION FENCING, INLET PROTECTION WITHIN THE DESIGNATED LIMIT OF DISTURBANCE AS INDICATED ON THE PLANS. ONLY LIMITED CLEARING AND GRUBBING NECESSARY TO INSTALL THE PERIMETER EROSION AND SEDIMENT POLLUTION CONTROLS IS PERMITTED.
16. INITIATE THE NECESSARY EARTHWORK TO REACH THE GRADES INDICATED ON THE PLANS. REMAINING BUILDING CONSTRUCTION (INCLUDING STRUCTURE, ACCESS RAMPS, ETC.) MAY COMMENCE UPON ACCEPTANCE OF BUILDING PAD BY OWNER. THE CONCRETE WASHOUT MUST BE INSTALLED BEFORE ANY CONCRETE CAN BE POURED ON-SITE. CONTRACTOR MUST PERFORM BULK OF EARTHWORK TO BALANCE CUTS AND FILLS TO THE GREATEST EXTENT POSSIBLE. ALL AREAS DISTURBED DURING THE EARTHWORK PHASE OF CONSTRUCTION MUST BE TEMPORARILY SEEDED AND STABILIZED IN ACCORDANCE WITH THE GENERAL CONSERVATION NOTES AND SPECIFICATIONS AND SEEDING SPECIFICATIONS IF PERMANENT STABILIZATION CANNOT BE ACHIEVED WITHIN FOUR (4) DAYS.
17. **CRITICAL STAGE** - INITIATE STORM SEWER AND SUBSURFACE BASIN INSTALLATIONS FOR THE REMAINING FEATURES SHOWN ON THE PLANS STARTING AT THE FURTHEST DOWNSTREAM STRUCTURE. **THE PERMITTEE SHALL PROVIDE ENGINEERING OVERSIGHT FOR THE CONSTRUCTION OF SUBSURFACE MANAGED RELEASE CONCEPT BASIN, INCLUDING PREPARATION OF THE SUBGRADE AND OUTLET CONTROL STRUCTURES (OCS-103 AND OCS-201). A LICENSED PROFESSIONAL OR DESIGNEE KNOWLEDGEABLE IN THE DESIGN AND CONSTRUCTION OF SUBSURFACE MANAGED RELEASE CONCEPT BASINS AND DETENTION BASINS, PREFERABLY THE DESIGN ENGINEER, SHALL CONDUCT THE OVERSIGHT.** GC TO INSTALL E&S BMPs (INLET PROTECTION) AND HYDRODYNAMIC DEVICES AS NECESSARY TO INLETS DISCHARGING TO SUBSURFACE DETENTION BASINS IMMEDIATELY AFTER INSTALLATION AND REMAIN INSTALLED UNTIL SITE IS FULLY STABILIZED TO PREVENT SEDIMENT FROM ENTERING THE SUBSURFACE DETENTION BASINS. NO CONSTRUCTION EQUIPMENT, SUCH AS CRANES DURING BUILDING CONSTRUCTION, SHALL BE PARKED ON TOP OF THE SUBSURFACE BASINS TO AVOID DAMAGING THE SUBSURFACE BASINS OR OVER-COMPACTING THE SUBSURFACE SOILS.]
18. CONTINUE WITH THE BALANCE OF EARTHWORK INCLUDING UTILITY INSTALLATION (SANITARY, ELECTRIC, TELEPHONE, CABLE AND GAS) WHERE APPLICABLE.
19. INSTALL ALL CURBING SHOWN IN THIS PHASE AND INSTALL STONE BASE COURSE IN THE DRIVEWAY AND PARKING AREAS.
20. INITIATE FINAL GRADING AND INSTALLATION OF TOPSOIL AND PERMANENT SEEDING IN ALL DISTURBED AREAS. AT SOON AS SLOPES, CHANNELS, DITC

UNDERGROUND DETENTION BASIN SEQUENCE OF CONSTRUCTION:

1.) THE EXISTING SUBGRADE UNDER THE BED AREAS SHOULD NOT BE COMPACTED OR SUBJECT TO EXCESSIVE CONSTRUCTION EQUIPMENT TRAFFIC PRIOR TO GEOTEXTILE AND STONE BED PLACEMENT.

2.) WHERE EROSION OF SUBGRADE HAS CAUSED ACCUMULATION OF FINE MATERIAL AND/OR SURFACE PONDING, THIS MATERIAL SHOULD BE REMOVED WITH LIGHT EQUIPMENT AND THE UNDERLYING SOILS SCARIFIED TO A MINIMUM DEPTH OF 6-INCHES. WITH A YORK RAKE (OR EQUIVALENT) AND LIGHT TRACTOR. ALL FINE GRADING SHOULD BE DONE BY HAND.

3.) INSTALL UPSTREAM AND DOWNSTREAM CONTROL STRUCTURES, CLEANOUTS, PERFORATED PIPING, AND ALL OTHER NECESSARY STORMWATER STRUCTURES. REFER TO THE SUBSURFACE DETENTION BASIN PLAN FOR ELEVATIONS.

4.) GEOTEXTILE, IMPERMEABLE LINER (IF APPLICABLE), AND BED AGGREGATE SHOULD BE PLACED IMMEDIATELY AFTER APPROVAL OF SUBGRADE PREPARATION AND INSTALLATION OF STRUCTURES. REFER TO CHAMBER MANUFACTURER INSTALLATION INSTRUCTIONS FOR MINIMUM GEOTEXTILE OVERLAP BETWEEN FABRIC EDGES. GEOTEXTILE SHOULD BE SECURED AT LEAST 4 FEET OUTSIDE OF BED IN ORDER TO PREVENT ANY RUNOFF OR SEDIMENT FROM ENTERING THE STORAGE BED. THIS EDGE STRIP SHOULD REMAIN IN PLACE UNTIL ALL BARE SOILS CONTIGUOUS TO BEDS ARE STABILIZED AND VEGETATED. AS THE SITE IS FULLY STABILIZED, EXCESS GEOTEXTILE ALONG BED EDGES CAN BE CUT BACK TO THE EDGE OF THE BED.

5.) CLEAN-WASHED, UNIFORMLY GRADED AGGREGATE SHOULD BE PLACED IN THE BED AND INSTALLED PER THE CHAMBER MANUFACTURER'S SPECIFICATIONS, WITH CONSTRUCTION EQUIPMENT KEPT OFF OF THE BED BOTTOM AS MUCH AS POSSIBLE.

6.)UPON COMPLETION OF BACKFILLED STONE, COMPLETE PLACEMENT OF GEOTEXTILE FABRIC AND BEGIN PAVEMENT SUBBASE INSTALLATION.

7.)DO NOT REMOVE INLET PROTECTION OR OTHER EROSION AND SEDIMENT CONTROL MEASURES UNTIL SITE IS FULLY STABILIZED.

SUBSURFACE DETENTION BASIN INSTALLATION NOTES

1. ALL SEDIMENT LADEN STORMWATER RUNOFF SHALL BE DIRECTED AROUND THE DETENTION AREA TO THE NEAREST TEMPORARY BMP. WHEN INSPECTION INDICATES THAT SOIL/SEDIMENT HAS ENTERED THE BED, THE AREA SHALL BE FULLY CLEANED AS NECESSARY.
2. THE SUBSURFACE DETENTION BED SHOULD BE COMPRISED OF A 8 INCH MINIMUM SECTION OF AGGREGATE. AGGREGATE IS TO BE UNIFORMLY GRADED, CLEAN-WASHED, AND CONTAIN AT LEAST 40% VOID SPACE.
3. REFERENCE PLANS PREPARED BY CULTEC FOR INSTALLATION PROCEDURES.

SUBSURFACE DETENTION BASIN SPECIFICATIONS

UTILIZE A UNIFORMLY GRADED CRUSHED STONE, PROVIDED THAT THE STONE IS PROPERLY CLEANED AND THAT A MINIMUM VOID RATIO OF 40% IS PROVIDED. HIGHER VOID RATIOS MAY BE SELECTED BY THE DESIGN ENGINEER, AND IF SO, THE DESIGN VOID RATIO SHALL GOVERN. IN ORDER TO INSURE THAT THE STONE USED IS PROPERLY CLEANED, IN ADDITION TO AASHTO DESIGNATION: M43-88 GRADATION, THE PERCENT PASSING THE NO. 200 SIEVE SHALL NOT EXCEED 0.2%

1. A CERTIFICATION FROM THE MANUFACTURER DOCUMENTING THE FULL GRADATION AND VOID RATIO SHALL BE OBTAINED.
2. WHEN IN THE OPINION OF THE TOWNSHIP INSPECTOR OR THE GEOTECHNICAL ENGINEER THE STONE IS NOT CONSISTENT WITH THE APPROVED SAMPLE, IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THE STONE RETESTED AND CERTIFIED BEFORE ANY ADDITIONAL STONE IS INSTALLED OR DELIVERED.
3. ALL STONE SAMPLES AND CERTIFICATIONS SHALL BE SUBMITTED TO THE TOWNSHIP 14 DAYS PRIOR TO THE START OF THE SUBSURFACE DETENTION BED CONSTRUCTION.
4. THE BOTTOM OF THE EXCAVATION SHALL BE SCARIFIED PRIOR TO THE PLACEMENT OF AGGREGATE.
5. ONLY CLEAN AGGREGATE, FREE OF DEBRIS, SHALL BE ALLOWED.
6. THE SIDES AND BOTTOM OF THE BEDS SHALL BE COVERED WITH CONTINUOUS 30 MIL NON-REINFORCED PVC SHEETING BETWEEN 8 OZ. NON-WOVEN GEOTEXTILE OR APPROVED EQUIVALENT.
7. CONSTRUCTION OF THE FACILITY SHALL PREVENT SILT FROM CLOGGING THE AGGREGATE BACKFILL.
8. CONTRACTOR TO REVIEW AND IMPLEMENT CHAMBER BEDDING AND BACKFILL REQUIREMENTS RECOMMENDED BY THE SPECIFIC CHAMBER MANUFACTURER.
9. THE BEDS SHALL BE BACKFILLED WITH CLEAN WASHED AGGREGATE AND SHALL BE KEPT CLEAN OF SOIL/SEDIMENT DURING THE INSTALLATION PROCESS. IF INSPECTION INDICATES THAT SOIL/SEDIMENT HAS CONTAMINATED THESE ITEMS, THE MATERIALS SHALL BE REPLACED AND/OR CLEANED AS NECESSARY.

SEEDING SPECIFICATIONS

1. SEEDING DATES
   A. SEEDING SHALL OCCUR BETWEEN MARCH 1ST AND MAY 15TH OR BETWEEN AUGUST 15TH AND NO LATER THAN OCTOBER 15TH.
   B. IF SEEDING CANNOT BE CONDUCTED DURING THE TIMEFRAMES NOTED ABOVE, THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE LOCAL CONSERVATION DISTRICT AND ALL APPROPRIATE AGENCIES TO DETERMINE AN ACCEPTABLE MEANS IN WHICH TO STABILIZE THE SITE THROUGH THE NEXT GROWING SEASON.
2. SEED MIXTURES: SEED MIXTURE TO BE USED ON THIS SITE SHALL CONSIST OF THE FOLLOWING UNLESS OTHERWISE NOTED ON THE PLANS. RATES ARE IN THE FORM OF POUNDS PER ACRE (LB/A) PER PURE LIVE SEED (POUNDS / ACRE PLS). CONTRACTOR WILL NEED TO ADJUST ACCORDINGLY BASED ON THE SEED GERMINATION AND PURITY RATING (SEE ITEM #3 BELOW).
   A. TEMPORARY SEED MIXTURES: DISTURBED AREAS WHICH ARE NOT AT FINISHED GRADE AND WHICH WILL BE DISTURBED AGAIN WITHIN TWELVE (12) MONTHS MUST BE SEEDED WITH A TEMPORARY SEED MIXTURE AS FOLLOWS:
      ANNUAL RYE (40 POUNDS / ACRE PLS)
      OR SPRING OATS (96 POUNDS / ACRE PLS)
      OR WINTER RYE (168 POUNDS / ACRE PLS)
      (REFERENCE: PENN STATE "EROSION CONTROL & CONSERVATION PLANTINGS ON NONCROPLAND", TABLE 5)
   B. PERMANENT SEEDING SHALL CONSIST OF A NURSE CROP PLUS A PERMANENT SEED MIXTURE, AS FOLLOWS:
      I. NURSE CROP (SELECT ONE):
      ANNUAL RYE (110 POUNDS / ACRE PLS)
      OR SPRING OATS (64 POUNDS / ACRE PLS)
      OR WINTER RYE (56 POUNDS / ACRE PLS)
      (REFERENCE: PA DEP EROSION AND SEDIMENT CONTROL PROGRAM MANUAL, LATEST EDITION, TABLE 11.4, SEED MIX #1)
      II. PERMANENT SEED MIX:
      TALL FESCUES (60 POUNDS / ACRE PLS)
      OR FINE FESCUE (35 POUNDS / ACRE PLS)
      OR KENTUCKY BLUEGRASS (25 POUNDS / ACRE PLS) PLUS REDTOP (3 POUNDS / ACRE PLS)
      OR PERENNIAL RYEGRASS (15 POUNDS / ACRE PLS)
      (REFERENCE: PA DEP EROSION AND SEDIMENT CONTROL PROGRAM MANUAL, LATEST EDITION, TABLE 11.4, SEED MIX #2)
3. PURE LIVE SEED: MINIMUM PLS RATING ACCEPTED SHALL BE 85% PLS. SEED RATE MAY NEED TO BE ADJUSTED BASED ON THE PLS RATING OF THE SEED.
   A. SEED USED FOR THE PURPOSE OF PERMANENT STABILIZATION SHALL BE LABELED WITH GERMINATION AND PURITY PERCENTAGES. UNLABELED SEED WILL BE REJECTED. SEED SHALL NOT BE USED MORE THAN ONE (1) YEAR BEYOND THE LABEL DATE.
   B. DETERMINING THE PERCENT PURE LIVE SEED (PERCENT PLS) OF A LABELED SEED: MULTIPLY BY THE PERCENTAGE OF PURE SEED BY THE PERCENTAGE OF GERMINATION AND DIVIDE THE RESULT BY 100 (%PURE X %GERMINATION / 100)
   C. DETERMINING THE ACTUAL SEED RATE: SIMPLY DIVIDE THE PERCENT PLS RATING OF THE SEED INTO THE PLS REQUIRED, AS NOTED ABOVE. THE RESULT IS THE POUNDS OF SEED REQUIRED. FOR EXAMPLE: IF THE REQUIRED RATE IS 64 POUNDS PLS, AND THE SEED IS RATED AT 35% PLS, DIVIDE 64 BY 0.35 TO GET 182.9 POUNDS, WHICH IS THE AMOUNT OF THAT SEED REQUIRED PER ACRE.
4. APPLICATION OF SEED: SEEDING SHALL BE APPLIED AND ESTABLISHED IN ACCORDANCE WITH THE "EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL" AS PUBLISHED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION BUREAU OF WATER QUALITY PROTECTION (MOST RECENT EDITION).
   A. SEEDING SHALL TAKE PLACE BETWEEN MARCH 15 - OCTOBER 15.
   B. SEED SHALL BE APPLIED IN A NON-COMPACTED, ROUGHENED TOPSOIL.
   C. SEED MAY BE APPLIED THROUGH ANY OF THE FOLLOWING MEANS AND METHODS, OR OTHER ACCEPTED INDUSTRY PRACTICES, UNLESS SPECIFICALLY NOTED OTHERWISE ON THESE PLANS:
      I. DRILL SEEDING
      II. BROADCAST SEEDING (TWO DIRECTIONS)
      III. HYDROSEEDING (TWO DIRECTIONS)
   D. ALL SEED SHALL BE TEMPORARILY OR PERMANENTLY STABILIZED UNTIL A 70% PERENNIAL COVER IS ACHIEVED:
      I. TEMPORARY STABILIZATION WITH STRAW:
         1. STRAW MULCH SHALL BE APPLIED ON TOP OF THE FRESHLY SEEDED AREAS AT A RATE OF 3 TONS PER ACRE (4 TONS PER ACRE BETWEEN NOVEMBER 1ST AND MARCH 1ST).
         2. STRAW SHALL BE STABILIZED WITH A WOOD OR PAPER FIBER MULCH AND TACKIFIER SOLUTION IN ACCORDANCE WITH THE PRODUCT MANUFACTURER'S SPECIFICATIONS.
      II. TEMPORARY/PERMANENT STABILIZATION WITH EROSION CONTROL MATTING/BLANKETS (WHERE SPECIFIED):
         1. MATTING/BLANKETS SHALL BE INSTALLED IN AREAS AS NOTED ON THE EROSION & SEDIMENT CONTROL PLAN OR WITHIN 50 FEET OF PONDS, STREAMS OR WETLANDS. THE PRODUCT SHALL BE INSTALLED AND STAPLED ON TOP OF THE SEEDING IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS.
         2. AREAS WITH MATTING/BLANKETS SHALL NOT BE TRACKED UPON/DISTURBED AFTER INSTALLATION.
         3. MATTING/BLANKETS SHALL BE VISUALLY INSPECTED DAILY TO ENSURE THAT THE PRODUCT IS FUNCTIONING PROPERLY, IS HELD FAST TO THE SOIL SURFACE AND IS IN GOOD CONDITION.
   E. ONCE SEED HAS BEEN SET, VEHICULAR TRAFFIC OR OTHER SOURCES OF COMPACTION SHALL BE AVOIDED.
5. IRRIGATION: NEW SEED APPLICATIONS SHOULD BE SUPPLIED WITH ADEQUATE WATER, A MINIMUM OF ½" TWICE A DAY, UNTIL VEGETATION IS WELL ESTABLISHED (A MINIMUM OF 75% COVER).

MONTGOMERY COUNTY SOIL E&S POLLUTION CONTROL NOTES:

1.) THIS PLAN REPRESENTS THE MINIMUM LEVEL OF IMPLEMENTATION OF TEMPORARY EROSION AND SEDIMENTATION CONTROL STRUCTURES. ADDITIONAL FACILITIES OF MEASURES SHALL BE INSTALLED WHERE NECESSARY OR WHERE DIRECTED BY EITHER THE TOWNSHIP OR THE MONTGOMERY COUNTY CONSERVATION DISTRICT AS CONSTRUCTION PROGRESSES.

2.) THE EQUITABLE OWNER/CONSTRUCTION MANAGER IS RESPONSIBLE FOR ALL TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROLS AND SITE STABILIZATION. THE EQUITABLE OWNER/CONSTRUCTION MANAGER SHALL ASSIGN ONE INDIVIDUAL TO BE RESPONSIBLE FOR PROPER INSTALLATION AND MAINTENANCE OF ALL FACILITIES AND MEASURES.

3.) THE PERMITTEE AND/OR THE CONTRACTOR SHALL NOTIFY THE MONTGOMERY COUNTY CONSERVATION DISTRICT THREE (3) DAYS PRIOR TO THE START OF EARTHMOVING ACTIVITY AND WHEN EARTHMOVING ACTIVITIES CEASE.

4.) AFTER EACH RUNOFF EVENT, ALL TEMPORARY SEDIMENTATION CONTROL FACILITIES SHALL BE INSPECTED, CLEANED AND REPAIRED AS NECESSARY.

5.) SHOULD UNFORSEEN EROSIVE CONDITIONS DEVELOP DURING CONSTRUCTION, THE CONTRACTOR SHALL TAKE ACTION TO REMEDY SUCH CONDITIONS AND TO PREVENT DAMAGE TO ADJACENT PROPERTIES AS A RESULT OF INCREASED RUNOFF AND/OR SEDIMENT DISPLACEMENT. STOCKPILES OF WOOD CHIPS, HAY BALES, CRUSHED STONE AND OTHER MULCHES SHALL BE HELD IN READINESS TO DEAL IMMEDIATELY WITH EMERGENCY PROBLEMS OF EROSION.

6.) THE CONTRACTOR IS ADVISED TO BECOME THOROUGHLY FAMILIAR WITH THE PROVISIONS OF APPENDIX 64. EROSION AND CONTROL RULES AND REGULATIONS, TITLE 25, PART 1, DEPARTMENT OF ENVIRONMENTAL RESOURCES, SUB-PART C, PROTECTION OF NATURAL RESOURCES, ARTICLE III, WATER RESOURCES, CHAPTER 102, EROSION CONTROL.

7.) THE CONTRACTOR SHALL DELINEATE, IN THE FIELD, AREAS OF DISTURBANCE AS SHOWN ON THE PLANS.

8.) DUMP SITES WHERE EXCESS EXCAVATED MATERIAL IS TO BE HAULED MUST BE COVERED UNDER MCCD APPROVED SEDIMENT AND EROSION CONTROL PLANS (FOR THAT SPECIFIC ACTIVITY) PRIOR TO ANY DUMPING / EARTH DISTURBANCE ON SAID SITE.

9.) SEDIMENT REMOVED FROM BMPS SHOULD BE DISPOSED OF IN LANDSCAPED AREAS OUTSIDE OF STEEP SLOPES, WELANDS, FLOODPLAINS OR DRAINAGE SWALES AND IMMEDIATELY STABILIZED, OR PLACED IN TOPSOIL STOCKPILES.

10.) SEVERAL METHODS EXIST TO REDUCE, BUT NOT ELIMINATE, THE INHERENT RISKS OF DEVELOPING WITHIN AN AREA GEOLOGICALLY PRONE TO SINKHOLE DEVELOPMENT. AT A MINIMUM, THE RECOMMENDED METHODS INCLUDE RELATIVELY MINOR SITE PLANNING CONSIDERATIONS AND CONSTRUCTION MEASURES TO MINIMIZE RISKS INHERENT TO THE REGION. DESIGN MEASURES TO REDUCE THE RISK OF TRIGGERING SINKHOLES SHOULD BE INCORPORATED INTO THE SITE PLAN FOR THE REFERENCED PROPERTY. SUCH MEASURES SHOULD INCLUDE USING WATER TIGHT UTILITY CONNECTIONS, AVOIDING THE PLACEMENT OF SUBSURFACE IRRIGATION SYSTEMS ADJACENT TO BUILDINGS OR OTHER STRUCTURES, AND PROPERTY SUBGRADE GRADING TO AVOID CONCENTRATIONS OF SURFACE RUNOFF. REGIONAL DEVELOPMENT ALSO SHOULD BE MONITORED DURING THE LIFE OF THE FACILITY TO IDENTIFY CONDITIONS WHICH MIGHT AFFECT GROUNDWATER LEVELS OR DRAINAGE PATTERNS. IF PRUDENT DESIGN MEASURES AND CONSTRUCTION PHASE CONSIDERATIONS ARE PROPERTY IMPLEMENTED, THE LONG TERM RISK OF POTENTIAL SINKHOLE ACTIVITY MAY BE REDUCED. HOWEVER, SINKHOLES CAN FORM UNDETECTED EVEN IF PRUDENT DESIGN AND CONSTRUCTION PRACTICES ARE IMPLEMENTED. IN THE EVENT THAT A SINKHOLE DEVELOPS ON SITE, SURFACE WATER SHALL BE DIVERTED AWAY FROM THE AREA AND THE SINKHOLE SHALL BE REPAIRED IN ACCORDANCE WITH THE RECOMMENDATIONS OF A PROFESSIONAL ENGINEER WITH EXPERIENCE IN GEOTECHNICAL ENGINEERING.

DEFINITION OF CLEAN FILL AND IMPORT/EXPORT MATERIAL NOTES

IF THE SITE WILL NEED TO IMPORT OR EXPORT MATERIAL FROM THE SITE, THE RESPONSIBILITY FOR PERFORMING ENVIRONMENTAL DUE DILIGENCE AND DETERMINATION OF CLEAN FILL WILL REST WITH THE APPLICANT.

1.) CLEAN FILL IS DEFINED AS: UNCONTAMINATED, NON-WATER SOLUBLE, NON-DECOMPOSABLE, INERT, SOLID MATERIAL. THE TERM INCLUDES SOIL, ROCK, STONE, DREDGED MATERIAL, USED ASPHALT, AND BRICK, BLOCK OR CONCRETE FROM CONSTRUCTION AND DEMOLITION ACTIVITIES THAT IS SEPARATE FROM OTHER WASTE AND IS RECOGNIZABLE AS SUCH. THE TERM DOES NOT INCLUDE MATERIALS PLACED IN OR ON THE WATERS OF THE COMMONWEALTH UNLESS OTHERWISE AUTHORIZED. (THE TERM "USED ASPHALT" DOES NOT INCLUDE MILLED ASPHALT OR ASPHALT THAT HAS BEEN PROCESSED FOR RE-USE)

2.) CLEAN FILL AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE: FILL MATERIALS AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE STILL QUALIFIES AS CLEAN FILL PROVIDED THE TESTING REVEALS THAT THE FILL MATERIAL CONTAINS CONCENTRATIONS OF REGULATED SUBSTANCES THAT ARE BELOW THE RESIDENTIAL LIMITS IN TABLES FP-1A AND FP-1B FOUND IN THE DEPARTMENT'S POLICY "MANAGEMENT OF FILL".

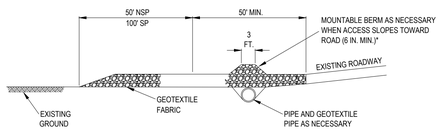
3.) ANY PERSON PLACING CLEAN FILL THAT HAS BEEN AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE MUST USE FORM FP-001 TO CERTIFY THE ORIGIN OF THE FILL MATERIAL AND THE RESULTS OF THE ANALYTICAL TESTING TO QUALIFY THE MATERIAL AS CLEAN FILL. FORM FP-001 MUST BE RETAINED BY THE OWNER OF THE PROPERTY RECEIVING THE FILL. A COPY OF FORM FP-001 CAN BE FOUND AT THE END OF THESE INSTRUCTIONS.

4.) ENVIRONMENTAL DUE DILIGENCE: THE APPLICANT MUST PERFORM ENVIRONMENTAL DUE DILIGENCE TO DETERMINE IF THE FILL MATERIALS ASSOCIATED WITH THE PROJECT QUALIFY AS CLEAN FILL. ENVIRONMENTAL DUE DILIGENCE IS DEFINED AS: INVESTIGATIVE TECHNIQUES, INCLUDING, BUT NOT LIMITED TO, VISUAL PROPERTY INSPECTIONS, ELECTRONIC DATA BASE SEARCHES, REVIEW OF PROPERTY OWNERSHIP, REVIEW OF PROPERTY USE HISTORY, SANBORN MAPS, ENVIRONMENTAL QUESTIONNAIRES, TRANSACTION SCREENS, ANALYTICAL TESTING, ENVIRONMENTAL ASSESSMENTS OR AUDITS. ANALYTICAL TESTING IS NOT A REQUIRED PART OF DUE DILIGENCE UNLESS VISUAL INSPECTION AND/OR REVIEW OF THE PAST LAND USE OF THE PROPERTY INDICATES THAT THE FILL MAY HAVE BEEN SUBJECTED TO A SPILL OR RELEASE OF REGULATED SUBSTANCE. IF THE FILL MAY HAVE BEEN AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE, IT MUST BE TESTED TO DETERMINE IF IT QUALIFIES AS CLEAN FILL. TESTING SHOULD BE PERFORMED IN ACCORDANCE WITH APPENDIX A OF THE DEPARTMENT'S POLICY "MANAGEMENT OF FILL".

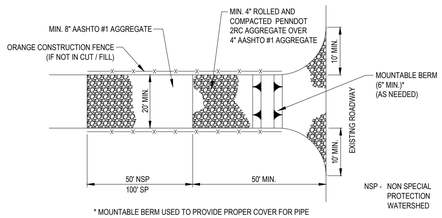
FILL MATERIAL THAT DOES NOT QUALIFY AS CLEAN FILL IS REGULATED FILL. REGULATED FILL IS WASTE AND MUST BE MANAGED IN ACCORDANCE WITH THE DEPARTMENT'S MUNICIPAL OR RESIDUAL WASTE REGULATIONS BASED ON 25 PA. CODE CHAPTERS 287 RESIDUAL WASTE MANAGEMENT OR 271 MUNICIPAL WASTE MANAGEMENT, WHICHEVER IS APPLICABLE. THE REGULATIONS ARE AVAILABLE ON-LINE AT WWW.PACODE.COM.

MONTGOMERY COUNTY SOIL CONSERVATION DISTRICT STANDARD E&S NOTES

1. ALL EARTH DISTURBANCES, INCLUDING CLEARING AND GRUBBING AS WELL AS CUTS AND FILLS SHALL BE DONE IN ACCORDANCE WITH THE APPROVED E&S PLAN. A COPY OF THE APPROVED DRAWINGS (STAMPED, SIGNED AND DATED BY THE REVIEWING AGENCY) MUST BE AVAILABLE AT THE PROJECT SITE AT ALL TIMES. THE REVIEWING AGENCY SHALL BE NOTIFIED OF ANY CHANGES TO THE APPROVED PLAN PRIOR TO IMPLEMENTATION OF THOSE CHANGES. THE REVIEWING AGENCY MAY REQUIRE A WRITTEN SUBMITTAL OF THOSE CHANGES FOR REVIEW AND APPROVAL AT ITS DISCRETION.
2. AT LEAST 7 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, INCLUDING CLEARING AND GRUBBING, THE OWNER AND/OR OPERATOR SHALL INVITE ALL CONTRACTORS, THE LANDOWNER, APPROPRIATE MUNICIPAL OFFICIALS, THE E&S PLAN PREPARER, THE PCSM PLAN PREPARER, THE LICENSED PROFESSIONAL RESPONSIBLE FOR OVERSIGHT OF CRITICAL STAGES OF IMPLEMENTATION OF THE PCSM PLAN, AND A REPRESENTATIVE FROM THE LOCAL CONSERVATION DISTRICT TO AN ON-SITE PRECONSTRUCTION MEETING.
3. AT LEAST 3 DAYS PRIOR TO STARTING ANY EARTH DISTURBANCE ACTIVITIES, OR EXPANDING INTO AN AREA PREVIOUSLY UNMARKED, THE PENNSYLVANIA ONE CALL SYSTEM INC. SHALL BE NOTIFIED AT 1-800-242-1776 FOR THE LOCATION OF EXISTING UNDERGROUND UTILITIES.
4. ALL EARTH DISTURBANCE ACTIVITIES SHALL PROCEED IN ACCORDANCE WITH THE SEQUENCE PROVIDED ON THE PLAN DRAWINGS. DEVIATION FROM THAT SEQUENCE MUST BE APPROVED IN WRITING FROM THE LOCAL CONSERVATION DISTRICT OR BY THE DEPARTMENT PRIOR TO IMPLEMENTATION.
5. AREAS TO BE FILLED ARE TO BE CLEARED, GRUBBED, AND STRIPPED OF TOPSOIL TO REMOVE TREES, VEGETATION, ROOTS AND OTHER OBJECTIONABLE MATERIAL.
6. CLEARING, GRUBBING, AND TOPSOIL STRIPPING SHALL BE LIMITED TO THOSE AREAS DESCRIBED IN EACH STAGE OF THE CONSTRUCTION SEQUENCE. GENERAL SITE CLEARING, GRUBBING AND TOPSOIL STRIPPING MAY NOT COMMENCE IN ANY STAGE OR PHASE OF THE PROJECT UNTIL THE E&S BMPS SPECIFIED BY THE BMP SEQUENCE FOR THAT STAGE OR PHASE HAVE BEEN INSTALLED AND ARE FUNCTIONING AS DESCRIBED IN THIS E&S PLAN.
7. AT NO TIME SHALL CONSTRUCTION VEHICLES BE ALLOWED TO ENTER AREAS OUTSIDE THE LIMIT OF DISTURBANCE BOUNDARIES SHOWN ON THE PLAN MAPS. THESE AREAS MUST BE CLEARLY MARKED AND FENCED OFF BEFORE CLEARING AND GRUBBING OPERATIONS BEGIN.
8. TOPSOIL REQUIRED FOR THE ESTABLISHMENT OF VEGETATION SHALL BE STOCKPILED AT THE LOCATION(S) SHOWN ON THE PLAN MAPS(S) IN THE AMOUNT NECESSARY TO COMPLETE THE FINISH GRADING OF ALL EXPOSED AREAS THAT ARE TO BE STABILIZED BY VEGETATION. EACH STOCKPILE SHALL BE PROTECTED IN THE MANNER SHOWN ON THE PLAN DRAWINGS. STOCKPILE HEIGHTS SHALL NOT EXCEED 35 FEET. STOCKPILE SLOPES SHALL BE 2H:1V OR FLATTER.
9. IMMEDIATELY UPON DISCOVERING UNFORESEEN CIRCUMSTANCES POSING THE POTENTIAL FOR ACCELERATED EROSION AND/OR SEDIMENT POLLUTION, THE OPERATOR SHALL IMPLEMENT APPROPRIATE BEST MANAGEMENT PRACTICES TO MINIMIZE THE POTENTIAL FOR EROSION AND SEDIMENT POLLUTION AND NOTIFY THE LOCAL CONSERVATION DISTRICT AND/OR THE REGIONAL OFFICE OF THE DEPARTMENT.
10. ALL BUILDING MATERIALS AND WASTES SHALL BE REMOVED FROM THE SITE AND RECYCLED OR DISPOSED OF IN ACCORDANCE WITH THE DEPARTMENT'S SOLID WASTE MANAGEMENT REGULATIONS AT 25 PA. CODE 260.1 ET seq 271.1, AND 287.1 ET. SEQ. NO BUILDING MATERIALS OR WASTES OR UNUSED BUILDING MATERIALS SHALL BE BURNED, BURIED, DUMPED, OR DISCHARGED AT THE SITE.
11. ALL OFF-SITE WASTE AND BORROW AREAS MUST HAVE AN E&S PLAN APPROVED BY THE LOCAL CONSERVATION DISTRICT OR THE DEPARTMENT FULLY IMPLEMENTED PRIOR TO BEING ACTIVATED.
12. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ANY MATERIAL BROUGHT ON SITE IS CLEAN FILL. FORM FP-001 MUST BE RETAINED BY THE PROPERTY OWNER FOR ANY FILL MATERIAL AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE BUT QUALIFYING AS CLEAN FILL DUE TO ANALYTICAL TESTING.
13. ALL PUMPING OF WATER FROM ANY WORK AREA SHALL BE DONE ACCORDING TO THE PROCEDURE DESCRIBED IN THIS PLAN, OVER UNDISTURBED VEGETATED AREAS.
14. VEHICLES AND EQUIPMENT MAY NEITHER ENTER DIRECTLY NOR EXIT DIRECTLY FROM SITE EXCEPT THROUGH EXISTING STABILIZED ACCESS POINTS & APPROVED ROCK CONSTRUCTION ENTRANCES SHOWN ON PLAN.
15. UNTIL THE SITE IS STABILIZED, ALL EROSION AND SEDIMENT BMPS SHALL BE MAINTAINED PROPERLY. MAINTENANCE SHALL INCLUDE INSPECTIONS OF ALL EROSION AND SEDIMENT BMPS AFTER EACH RUNOFF EVENT AND ON A WEEKLY BASIS. ALL PREVENTATIVE AND REMEDIAL MAINTENANCE WORK, INCLUDING CLEAN OUT, REPAIR, REPLACEMENT, REGRADING, RESEEDING, REMULCHING AND RENETTING MUST BE PERFORMED IMMEDIATELY. IF THE E&S BMPS FAIL TO PERFORM AS EXPECTED, REPLACEMENT BMPS, OR MODIFICATIONS OF THOSE INSTALLED WILL BE REQUIRED.
16. A LOG SHOWING DATES THAT E&S BMPS WERE INSPECTED AS WELL AS ANY DEFICIENCIES FOUND AND THE DATE THEY WERE CORRECTED SHALL BE MAINTAINED ON THE SITE AND BE MADE AVAILABLE TO REGULATORY AGENCY OFFICIALS AT THE TIME OF INSPECTION.
17. SEDIMENT TRACKED ONTO ANY PUBLIC ROADWAY OR SIDEWALK SHALL BE RETURNED TO THE CONSTRUCTION SITE BY THE END OF EACH WORK DAY AND DISPOSED IN THE MANNER DESCRIBED IN THIS PLAN. IN NO CASE SHALL THE SEDIMENT BE WASHED, SHOVELED, OR SWEPT INTO ANY ROADSIDE DITCH, STORM SEWER, OR SURFACE WATER.
18. ALL SEDIMENT REMOVED FROM BMPS SHALL BE DISPOSED OF IN THE MANNER DESCRIBED ON THE PLAN DRAWINGS.
19. AREAS WHICH ARE TO BE TOPSOILED SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 3 TO 5 INCHES- 6 TO 12 INCHES ON COMPACTED SOILS - PRIOR TO PLACEMENT OF TOPSOIL. AREAS TO BE VEGETATED SHALL HAVE A MINIMUM 4 INCHES OF TOPSOIL IN PLACE PRIOR TO SEEDING AND MULCHING. FILL OUTSLOPES SHALL HAVE A MINIMUM OF 2 INCHES OF TOPSOIL.
20. ALL FILLS SHALL BE COMPACTED AS REQUIRED TO REDUCE EROSION, SLIPPAGE, SETTLEMENT, SUBSIDENCE OR OTHER RELATED PROBLEMS. FILL INTENDED TO SUPPORT BUILDINGS, STRUCTURES AND CONDUITS, ETC. SHALL BE COMPACTED IN ACCORDANCE WITH LOCAL REQUIREMENTS OR CODES.
21. ALL EARTHEN FILLS SHALL BE PLACED IN COMPACTED LAYERS NOT TO EXCEED 9 INCHES IN THICKNESS.
22. FILL MATERIALS SHALL BE FREE OF FROZEN PARTICLES, BRUSH, ROOTS, SOD, OR OTHER FOREIGN OR OBJECTIONABLE MATERIALS THAT WOULD INTERFERE WITH OR PREVENT CONSTRUCTION OF SATISFACTORY FILLS.
23. FROZEN MATERIALS OR SOFT, MUCKY, OR HIGHLY COMPRESSIBLE MATERIALS SHALL NOT BE INCORPORATED INTO FILLS.
24. FILL SHALL NOT BE PLACED ON SATURATED OR FROZEN SURFACES.
25. SEEPS OR SPRINGS ENCOUNTERED DURING CONSTRUCTION SHALL BE HANDLED IN ACCORDANCE WITH THE STANDARD AND SPECIFICATION FOR SUBSURFACE DRAIN OR OTHER APPROVED METHOD.
26. ALL GRADED AREAS SHALL BE PERMANENTLY STABILIZED IMMEDIATELY UPON REACHING FINISHED GRADE. CUT SLOPES IN COMPETENT BEDROCK AND ROCK FILLS NEED NOT BE VEGETATED. SEEDED AREAS WITHIN 50 FEET OF A SURFACE WATER, OR AS OTHERWISE SHOWN ON THE PLAN DRAWINGS, SHALL BE BLANKETED ACCORDING TO THE STANDARDS OF THIS PLAN.
27. IMMEDIATELY AFTER EARTH DISTURBANCE ACTIVITIES CEASE IN ANY AREA OR SUBAREA OF THE PROJECT, THE OPERATOR SHALL STABILIZE ALL DISTURBED AREAS. DURING NON-GERMINATING MONTHS, MULCH OR PROTECTIVE BLANKETING SHALL BE APPLIED AS DESCRIBED IN THE PLAN. AREAS NOT AT FINISHED GRADE, WHICH WILL BE REACTIVATED WITHIN 1 YEAR, MAY BE STABILIZED IN ACCORDANCE WITH THE TEMPORARY STABILIZATION SPECIFICATIONS. THOSE AREAS WHICH WILL NOT BE REACTIVATED WITHIN 1 YEAR SHALL BE STABILIZED IN ACCORDANCE WITH THE PERMANENT STABILIZATION SPECIFICATIONS.
28. PERMANENT STABILIZATION IS DEFINED AS A MINIMUM UNIFORM, PERENNIAL 70% VEGETATIVE COVER OR OTHER PERMANENT NON-VEGETATIVE COVER WITH A DENSITY SUFFICIENT TO RESIST ACCELERATED EROSION. CUT AND FILL SLOPES SHALL BE CAPABLE OF RESISTING FAILURE DUE TO SLUMPING, SLIDING, OR OTHER MOVEMENTS.
29. E&S BMPS SHALL REMAIN FUNCTIONAL AS SUCH UNTIL ALL AREAS TRIBUTARY TO THEM ARE PERMANENTLY STABILIZED OR UNTIL THEY ARE REPLACED BY ANOTHER BMP APPROVED BY THE LOCAL CONSERVATION DISTRICT OR THE DEPARTMENT.
30. UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWINER AND/OR OPERATOR SHALL CONTACT THE LOCAL CONSERVATION DISTRICT FOR AN INSPECTION PRIOR TO REMOVAL/CONVERSION OF THE E&S BMPS.
31. AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED, TEMPORARY EROSION AND SEDIMENT BMPS MUST BE REMOVED OR CONVERTED TO PERMANENT POST CONSTRUCTION STORMWATER MANAGEMENT BMPS. AREAS DISTURBED DURING REMOVAL OR CONVERSION OF THE BMPS SHALL BE STABILIZED IMMEDIATELY. IN ORDER TO ENSURE RAPID REVEGETATION OF DISTURBED AREAS, SUCH REMOVAL/CONVERSIONS ARE TO BE DONE ONLY DURING THE GERMINATING SEASON.
32. UPON COMPLETION OF ALL EARTH DISTURBANCE ACTIVITIES AND PERMANENT STABILIZATION OF ALL DISTURBED AREAS, THE OWNER AND/OR OPERATOR SHALL CONT



PROFILE



* MOUNTABLE BERM USED TO PROVIDE PROPER COVER FOR PIPE

PLAN VIEW

NSP - NON SPECIAL PROTECTION WATERSHED

SP - SPECIAL PROTECTION WATERSHED

NOTES:

REMOVE TOPSOIL PRIOR TO INSTALLATION OF ROCK CONSTRUCTION ENTRANCE. EXTEND ROCK OVER FULL WIDTH OF ENTRANCE.

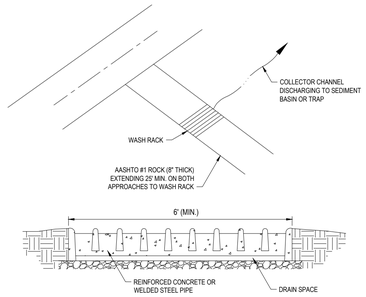
RUNOFF SHALL BE DIVERTED FROM ROADWAY TO A SUITABLE SEDIMENT REMOVAL BMP PRIOR TO ENTERING ROCK CONSTRUCTION ENTRANCE.

MOUNTABLE BERM SHALL BE INSTALLED WHEREVER OPTIONAL CULVERT PIPE IS USED AND PROPER PIPE COVER AS SPECIFIED BY MANUFACTURER IS NOT OTHERWISE PROVIDED. PIPE SHALL BE SIZED APPROPRIATELY FOR SIZE OF DITCH BEING CROSSED.

MAINTENANCE: ROCK CONSTRUCTION ENTRANCE THICKNESS SHALL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. A STOCKPILE SHALL BE MAINTAINED ON SITE FOR THIS PURPOSE. ALL SEDIMENT DEPOSITED ON PAVED ROADWAYS SHALL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE IMMEDIATELY. IF EXCESSIVE AMOUNTS OF SEDIMENT ARE BEING DEPOSITED ON ROADWAY, EXTEND LENGTH OF ROCK CONSTRUCTION ENTRANCE BY 50 FOOT INCREMENTS UNTIL CONDITION IS ALLEVIATED OR INSTALL WASH RACK. WASHING THE ROADWAY OR SWEEPING THE DEPOSITS INTO ROADWAY DITCHES, SEWERS, CULVERTS, OR OTHER DRAINAGE COURSES IS NOT ACCEPTABLE.

#3-1 ***STANDARD CONSTRUCTION DETAIL #3-1 (ABACT) ROCK CONSTRUCTION ENTRANCE***

NOT TO SCALE



MODIFIED FROM SMITH CATTLEGUARD COMPANY

NOTES:
WASH RACK SHALL BE 20 FEET (MIN.) WIDE OR TOTAL WIDTH OF ACCESS.

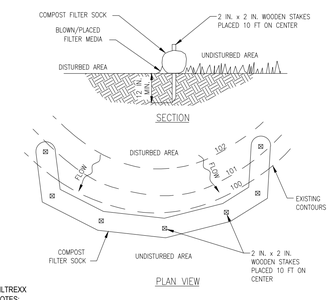
WASH RACK SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE ANTICIPATED CONSTRUCTION VEHICULAR TRAFFIC.

A WATER SUPPLY SHALL BE MADE AVAILABLE TO WASH THE WHEELS OF ALL VEHICLES EXITING THE SITE.

MAINTENANCE: ROCK CONSTRUCTION ENTRANCE THICKNESS SHALL BE CONSTANTLY MAINTAINED TO THE SPECIFIED DIMENSIONS BY ADDING ROCK. A STOCKPILE OF ROCK MATERIAL SHALL BE MAINTAINED ON SITE FOR THIS PURPOSE. DRAIN SPACE UNDER WASH RACK SHALL BE KEPT OPEN AT ALL TIMES. DAMAGE TO THE WASH RACK SHALL BE REPAIRED PRIOR TO FURTHER USE OF THE RACK. ALL SEDIMENT DEPOSITED ON ROADWAYS SHALL BE REMOVED AND RETURNED TO THE CONSTRUCTION SITE IMMEDIATELY. WASHING THE ROADWAY OR SWEEPING THE DEPOSITS INTO ROADWAY DITCHES, SEWERS, CULVERTS, OR OTHER DRAINAGE COURSES IS NOT ACCEPTABLE.

#3-2 ***STANDARD CONSTRUCTION DETAIL #3-2 ROCK CONSTRUCTION ACCESS WITH WASH RACK***

NOT TO SCALE



PLAN VIEW

FILTREXX

NOTES:

- SOCK MATERIAL SHALL MEET THE STANDARDS OF PA DEP EROSION CONTROL MANUAL TABLE 4.1. COMPOST SHALL MEET THE STANDARDS OF PA DEP EROSION CONTROL MANUAL TABLE 4.2
- COMPOST FILTER SOCK SHALL BE PLACED AT EXISTING LEVEL GRADE. BOTH ENDS OF THE SOCK SHALL BE EXTENDED AT LEAST EIGHT (8) FEET UP SLOPE AT 45° TO THE MAIN SOCK ALIGNMENT (PA DEP EROSION CONTROL MANUAL FIGURE 4.1). MAXIMUM SLOPE LENGTH ABOVE ANY SOCK SHALL NOT EXCEED THAT SHOWN ON PA DEP EROSION CONTROL MANUAL FIGURE 4.2. STAKES MAY BE INSTALLED IMMEDIATELY DOWNSLOPE OF THE SOCK IF SO SPECIFIED BY THE MANUFACTURER.
- TRAFFIC SHALL NOT BE PERMITTED TO CROSS FILTER SOCKS.
- ACCUMULATED SEDIMENT SHALL BE REMOVED WHEN IT REACHES HALF THE ABOVE GROUND HEIGHT OF THE SOCK AND DISPOSED IN THE MANNER DESCRIBED ELSEWHERE IN THE PLAN.
- SOCKS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. DAMAGED SOCKS SHALL BE REPAIRED ACCORDING TO MANUFACTURER'S SPECIFICATIONS OR REPLACED WITHIN 24 HOURS OF INSPECTION.
- BIODEGRADABLE FILTER SOCKS SHALL BE REPLACED AFTER SIX (6) MONTHS, PHOTODEGRADABLE SOCKS AFTER ONE (1) YEAR. POLYPROPYLENE SOCKS SHALL BE REPLACED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
- UPON STABILIZATION OF THE AREA TRIBUTARY TO THE SOCK, STAKES SHALL BE REMOVED. THE SOCK MAY BE LEFT IN PLACE AND VEGETATED OR REMOVED. IN THE LATTER CASE, THE MESH SHALL BE CUT OPEN AND THE MULCH SPREAD AS A SOIL SUPPLEMENT.

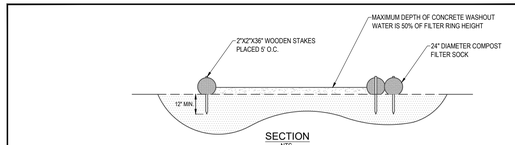
#4-1 ***STANDARD CONSTRUCTION DETAIL #4-1 COMPOST FILTER SOCK***

NOT TO SCALE

Sock #	Location	SiltSoxx Size (inches)	SiltSoxx Size Slope (%)	Provided Slope Length Above Barrier (ft)
1	Along Proposed Washout 1-1	24	1.0	10
2	Along Stockpile 2-1	24	33.0	15
3	Along Stockpile 1-1	24	33.0	15
4	East of RCE #1-1	12	0.5	50
5	Along Pennsylvania Ave	12	3.3	106
6	Along Pennsylvania Ave	12	2.0	101
7	Along Pennsylvania Ave	12	1.8	110
8	Northwest Property Line	12	1.8	85
9	Northwest Property Line	12	1.1	88
10	Northwest Property Line	12	1.1	95
11	Southern Property Line	12	0.7	75
12**	Southern Property Line	12	2.7	168
13**	Sed. Trap 1 Sock	24	1.8	387
14	Sed. Trap 1 Sock	24	2.1	339
15**	Sed. Trap 2 Sock	32	2.1	339
17	Southeast Property Line	12	2.5	21
18	Southeast Property Line	12	2.7	268
19	Southeast Property Line	12	2.9	298
20	Eastern Property Line	18	3.2	317
21	Eastern Property Line	18	3.4	337
22**	North of RCE #1-0	12	3.6	357
23**	South of RCE #1-0	18	3.8	377
24**	East of RCE #2-0	18	4.0	397
25**	Along Proposed Washout 1-0	24	4.2	417
26**	Along Proposed Washout 2-0	24	4.5	437
27**	Along Stockpile 1-0	24	4.7	457
28**	Along Stockpile 2-0	24	4.9	477

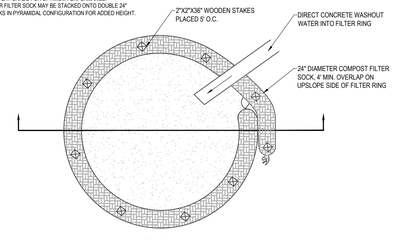
NOTE: WHERE COMPOST FILTER SOCKS ARE PLACED ON PAVED SURFACES, CONCRETE BLOCKS SHOULD BE USED IMMEDIATELY DOWNSLOPE OF THE SOCKS (AT THE SAME INTERVALS RECOMMENDED FOR THE STAKES) TO HELP HOLD THE SOCK IN PLACE.

** SOCKS NOTED ABOVE ARE TO BE INSTALLED AS PART OF STAGE-0 EROSION CONTROLS AND NOT PRESENT DURING STAGE-1 OF CONSTRUCTION



NOTES:

1.) INSTALL ON FLAT GRADE FOR OPTIMUM PERFORMANCE.
2.) 18" DIAMETER FILTER SOCK MAY BE STACKED ONTO DOUBLE 24" DIAMETER SOCKS IN PYRAMIDAL CONFIGURATION FOR ADDED HEIGHT.



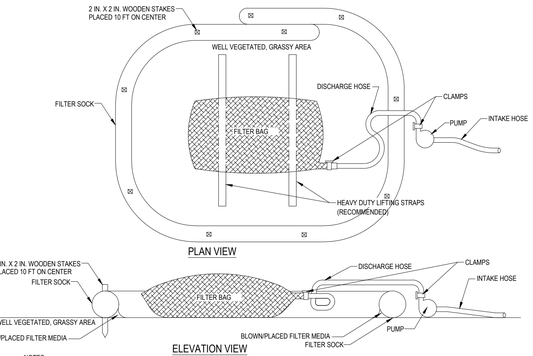
A SUITABLE IMPERVIOUS GEOMEMBRANE SHALL BE PLACED AT THE LOCATION OF THE WASHOUT PRIOR TO INSTALLING THE SOCKS.

CONCRETE WASHOUT NOTES:

-UNDER NO CIRCUMSTANCES MAY WASH WATER FROM THESE VEHICLES BE ALLOWED TO ENTER ANY SURFACE WATERS.
-WASHOUT FACILITIES SHOULD NOT BE PLACED WITHIN 50 FEET OF STORM DRAINS, OPEN DITCHES OR SURFACE WATERS.
-SHOULD BE A MINIMUM OF 10 FEET WIDE AND PROVIDE AT LEAST 12 INCHES OF FREEBOARD ABOVE THE LIQUID AND SOLID WASTE ANTICIPATED BETWEEN CLEANOUT INTERVALS.
-THE PIT SHOULD BE LINED WITH PLASTIC SHEETING OF AT LEAST 10-MIL THICKNESS (WITH NO HOLES OR TEARS) TO PREVENT LEACHING OF LIQUIDS INTO THE GROUND.
-ALL CONCRETE WASHOUT FACILITIES SHOULD BE INSPECTED DAILY. DAMAGED OR LEAKING WASHOUTS SHOULD BE DEACTIVATED AND REPAIRED OR REPLACED IMMEDIATELY.
-ACCUMULATED MATERIALS SHOULD BE REMOVED WHEN THEY REACH 75% CAPACITY.
-PLASTIC LINERS SHOULD BE REPLACED WITH EACH CLEANING OF THE WASHOUT FACILITY.

X-13 ***TYPICAL COMPOST SOCK WASHOUT INSTALLATION***

NOT TO SCALE



PLAN VIEW

ELEVATION VIEW

NOTES:

LOW VOLUME FILTER BAGS SHALL BE MADE FROM NON-WOVEN GEOTEXTILE MATERIAL SEWN WITH HIGH STRENGTH, DOUBLE STITCHED "J" TYPE SEAMS. THEY SHALL BE CAPABLE OF TRAPPING PARTICLES LARGER THAN 150 MICRONS. HIGH VOLUME FILTER BAGS SHALL BE MADE FROM WOVEN GEOTEXTILES THAT MEET THE FOLLOWING STANDARDS:

PROPERTY	TEST METHOD	MINIMUM STANDARD
AVG. WIDE WIDTH STRENGTH	ASTM D-4884	60 LB/IN
GRAB TENSILE	ASTM D-4632	205 LB
PUNCTURE	ASTM D-4833	110 LB
MULLEN BURST	ASTM D-3786	350 PSI
UV RESISTANCE	ASTM D-4355	70%
AOS % RETAINED	ASTM D-4751	80 SIEVE

A SUITABLE MEANS OF ACCESSING THE BAG WITH MACHINERY REQUIRED FOR DISPOSAL PURPOSES SHALL BE PROVIDED. FILTER BAGS SHALL BE REPLACED WHEN THEY BECOME 1/2 FULL OF SEDIMENT. SPARE BAGS SHALL BE KEPT AVAILABLE FOR REPLACEMENT OF THOSE THAT HAVE FAILED OR ARE FILLED. BAGS SHALL BE PLACED ON STRAPS TO FACILITATE REMOVAL UNLESS BAGS COME WITH LIFTING STRAPS ALREADY ATTACHED.

BAGS SHALL BE LOCATED IN WELL-VEGETATED (GRASSY) AREA, AND DISCHARGE ONTO STABLE, EROSION RESISTANT AREAS. WHERE THIS IS NOT POSSIBLE, A GEOTEXTILE UNDERLAYMENT AND FLOW PATH SHALL BE PROVIDED. BAGS MAY BE PLACED ON FILTER STONE TO INCREASE DISCHARGE CAPACITY. BAGS SHALL NOT BE PLACED ON SLOPES GREATER THAN 5%. FOR SLOPES EXCEEDING 5%, CLEAN ROCK OR OTHER NON-ERODIBLE AND NON-POLLUTING MATERIAL MAY BE PLACED UNDER THE BAG TO REDUCE SLOPE STEEPNESS.

AS THE PROPOSED DEVELOPMENT IS WITHIN AN IMPAIRED WATERSHED, ALL FILTER BAGS MUST BE SURROUNDED BY A COMPOST FILTER SOCK RING OR OPERATED IN CONJUNCTION WITH A SUMP PIT.

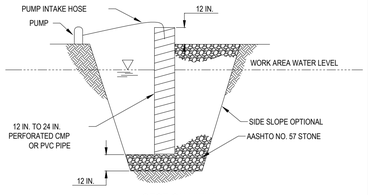
THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED. A PIECE OF PVC PIPE IS RECOMMENDED FOR THIS PURPOSE.

THE PUMPING RATE SHALL BE NO GREATER THAN 750 GPM OR 1/2 THE MAXIMUM SPECIFIED BY THE MANUFACTURER, WHICHEVER IS LESS. PUMP INTAKES SHALL BE FLOATING AND SCREENED.

FILTER BAGS SHALL BE INSPECTED DAILY. IF ANY PROBLEM IS DETECTED, PUMPING SHALL CEASE IMMEDIATELY AND NOT RESUME UNTIL THE PROBLEM IS CORRECTED.

#3-16 ***STANDARD CONSTRUCTION DETAIL #3-16 (ABACT) PUMPED WATER FILTER BAG***

NOT TO SCALE



SECTION VIEW

NOTES:

LOCATE SUMP AT LOW POINT IN WORK AREA AND OUTSIDE OF CONSTRUCTION ACTIVITY. WHEREVER RUNOFF FROM A WORK AREA FLOWS DIRECTLY TO THE SUMP AREA, A FILTER BAG SHALL BE ATTACHED AT THE DISCHARGE POINT UNLESS PUMPING TO A SEDIMENT BASIN OR SEDIMENT TRAP.

MINIMUM DIAMETER OF PIT BOTTOM SHALL BE 24" LARGER THAN PIPE DIAMETER. MINIMUM DEPTH OF PIT SHALL BE 24" BELOW WATER LEVEL IN WORK AREA (INCLUDING THE AASHTO #57 STONE). 12" TO 24" PERFORATED CMP OR PVC PIPE SHALL BE SET ON 12" OF CLEAN AASHTO # 57 STONE.

VOID SPACE AROUND PIPE SHALL BE FILLED WITH AASHTO # 57 STONE. PIPE TO EXTEND 12" MIN. ABOVE TOP OF STONE AND/OR WATER BEING PUMPED FROM WORK AREA.

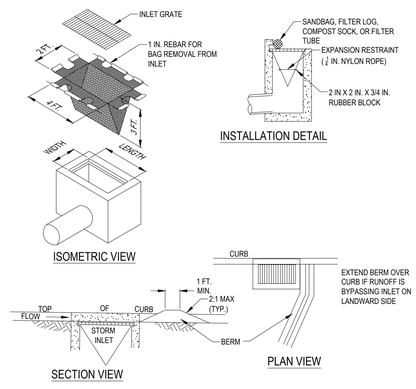
SET PUMP INTAKE INSIDE STANDPIPE.

DISCHARGE FROM PUMP SHALL BE TO A STABLE AREA BELOW DISTURBANCES FROM THE WORK ZONE.

SUMP MAY BE USED IN CONJUNCTION WITH FILTER BAG WHERE ADDITIONAL FILTERING IS NEEDED.

#3-17 ***STANDARD CONSTRUCTION DETAIL #3-17 SUMP PIT***

NOT TO SCALE



NOTES:

MAXIMUM DRAINAGE AREA = 1/2 ACRE.

INLET PROTECTION SHALL NOT BE REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS SHALL BE REQUIRED FOR ALL INSTALLATIONS.

ROLLED EARTHEN BERM SHALL BE MAINTAINED UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED. SIX INCH MINIMUM HEIGHT ASPHALT BERM SHALL BE MAINTAINED UNTIL ROADWAY SURFACE RECEIVES FINAL COAT.
AT A MINIMUM, THE FABRIC SHALL HAVE A MINIMUM GRAB TENSILE STRENGTH OF 120 LBS, A MINIMUM BURST STRENGTH OF 200 PSI, AND A MINIMUM TRAPEZOIDAL TEAR STRENGTH OF 50 LBS. FILTER BAGS SHALL BE CAPABLE OF TRAPPING ALL PARTICLES NOT PASSING A NO. 40 SIEVE.

INLET FILTER BAGS SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER EACH RUNOFF EVENT. BAGS SHALL BE EMPTIED AND RINSED OR REPLACED WHEN HALF FULL OR WHEN FLOW CAPACITY HAS BEEN REDUCED SO AS TO CAUSE FLOODING OR BYPASSING OF THE INLET. DAMAGED OR CLOGGED BAGS SHALL BE REPLACED. A SUPPLY SHALL BE MAINTAINED ON SITE FOR REPLACEMENT OF BAGS. ALL NEEDED REPAIRS SHALL BE INITIATED IMMEDIATELY AFTER THE INSPECTION. DISPOSE OF ACCUMULATED SEDIMENT AS WELL AS ALL USED BAGS ACCORDING TO THE PLAN NOTES.

DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

#4-15 ***STANDARD CONSTRUCTION DETAIL #4-15 FILTER BAG INLET PROTECTION - TYPE C INLET***

NOT TO SCALE

INLET PROTECTION	
INL-121	0.14 AC.
INL-122	0.17 AC.
INL-123	0.08 AC.
INL-126	0.09 AC.
INL-127	0.13 AC.
INL-211	0.10 AC.
INL-212	0.05 AC.
INL-213	0.10 AC.
INL-214	0.04 AC.
INL-221	0.09 AC.
INL-231	0.13 AC.

NOTE: BUILDING RUNOFF FROM THE ROOF LEADERS IS TO BE PRE-TREATED PRIOR TO ENTERING UNDERGROUND BASIN UG1

TABLE 4.2
Compost Standards

ORGANIC MATTER CONTENT	25%-100% (DRY WEIGHT BASE)
ORGANIC PORTION	FIBROUS AND ELONGATED
pH	5.5-9.5
MOISTURE CONTENT	30%-60%
PARTICLE SIZE	30%-50% PASS THROUGH 3/8" SIEVE
SOLUBLE SALT CONCENTRATION	5.0 dS/m (mmhos/cm) MAXIMUM

TABLE 4.1
Compost Sock Fabric Minimum Specifications

MATERIAL TYPE	3 mil HDPE	5 mil HDPE	5 MIL HDPE	Multi-Filament Polypropylene (MFPP)	Heavy Duty Multi-Filament Polypropylene (MFPP)
Material Characteristics	Photo-degradable	Photo-degradable	Bio-degradable	Photo-degradable	Photo-degradable
Sock Diameters	12" 18"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"	12" 18" 24" 32"
Mesh Opening	3/8"	3/8"	3/8"	3/8"	1/8"
Tensile Strength		26 PSI	26 PSI	44 PSI	202 PSI
Ultraviolet Stability % Original Strength (ASTM G-155	23% at 1000 hr.	23% at 1000 hr.		100% at 1000 hr.	100% at 1000 hr.
Minimum Functional Longevity	6 months	9 months	6 months	1 year	2 years
Two-Ply systems					
Inner Containment Netting	HDPE biaxial net				
	Coninuously wound				
	Fusion-welded junctures				
	3/4" X 3/4" Max. aperture size				
Outer Filtration Mesh	Composite Polypropylene Fabric (woven layer and non-woven fleece mechanically fused via needle punch)				
	3/16" Max aperture size				
Sock fabrics composed of burlap may be used on projects lasting 6 months or less.					

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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/3/2025	NPDES MAJOR MODIFICATION	RMS / JAB
2	3/12/2025	FOR NPDES RESUBMISSION	RMS / JAB
3	04/14/2025	PER TOWNSHIP COMMENT	RMS / JAB
4	5/28/2025	PER NPDES COMMENT	RMS / JAB
5	7/22/2025	PER REVISED ARCH	RMS / MRB

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CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-SESC-5A

PROJECT:

AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

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SHEET TITLE:

SOIL EROSION & SEDIMENT POLLUTION CONTROL DETAILS

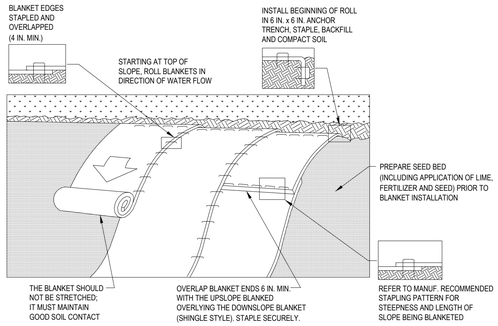
SHEET NUMBER:

C-605

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REVISION 5 - 7/22/2025

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-SESC-5A---LAYOUT C-605 ESS DETAILS



NOTES:

SEED AND SOIL AMENDMENTS SHALL BE APPLIED ACCORDING TO THE RATES IN THE PLAN DRAWINGS PRIOR TO INSTALLING THE BLANKET.

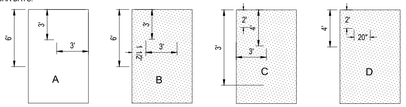
PROVIDE ANCHOR TRENCH AT TOE OF SLOPE IN SIMILAR FASHION AS AT TOP OF SLOPE.

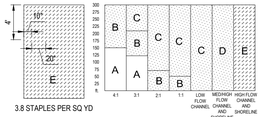
SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS, AND GRASS.

BLANKET SHALL HAVE GOOD CONTINUOUS CONTACT WITH UNDERLYING SOIL THROUGHOUT ENTIRE LENGTH. LAY BLANKET LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH SOIL. DO NOT STRETCH BLANKET.

THE BLANKET SHALL BE STAPLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

BLANKETED AREAS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT UNTIL PERENNIAL VEGETATION IS ESTABLISHED TO A MINIMUM UNIFORM 70% COVERAGE THROUGHOUT THE BLANKETED AREA. DAMAGED OR DISPLACED BLANKETS SHALL BE RESTORED OR REPLACED WITHIN 4 CALENDAR DAYS.



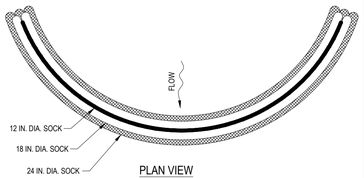


NOTE:
STAPLE PATTERNS APPLY TO ALL NORTH AMERICAN GREEN EROSION CONTROL BLANKETS. STAPLE PATTERNS WILL VARY DEPENDING UPON APPLICATION TYPE, SLOPE LENGTH, SLOPE GRADE, SOIL TYPE AND ANNUAL RAINFALL. THE FOLLOWING ARE GENERAL STAPLE RECOMMENDATIONS BASED ON SLOPE LENGTH, SLOPE GRADE, AND ESTIMATED RUNOFF. SPECIFIC STAPLE PLACEMENT PATTERNS ARE ILLUSTRATED IN DIAGRAMS A,B,C,D, AND E. INCREASED STAPLE RATES MAY BE NECESSARY DEPENDING UPON SITE CONDITIONS. FOR DETAILED SPECIFIC RECOMMENDATIONS, CONTACT YOUR NEAREST AUTHORIZED NORTH AMERICAN GREEN DISTRIBUTOR OF CALL NORTH AMERICAN GREEN TECHNICAL SERVICES.

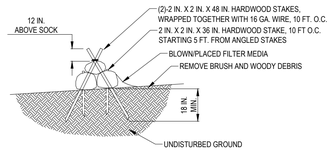
EROSION CONTROL BLANKET STAPLE PATTERN GUIDE

#11-1 ***STANDARD CONSTRUCTION DETAIL #11-1 EROSION CONTROL BLANKET INSTALLATION***

NOT TO SCALE



PLAN VIEW



STAKING DETAIL

DESIGN NOTES:

1. COMPOST SOCK SEDIMENT TRAP SHALL BE SIZED TO PROVIDE 2000 CUBIC FEET OF STORAGE CAPACITY FOR EACH ACRE TRIBUTARY TO THE TRAP.
2. MINIMUM BASE WIDTH IS EQUAL TO THE HEIGHT.
3. SEDIMENT ACCUMULATION SHALL NOT EXCEED 1/3 THE TOTAL HEIGHT OF THE TRAP.
4. SOCKS SHALL BE OF LARGER DIAMETER AT THE BASE OF THE TRAP AND DECREASE IN DIAMETER FOR SUCCESSIVE LAYERS AS SHOWN ON THE PLAN VIEW.
5. ENDS OF THE TRAP SHALL BE A MINIMUM OF 1 FOOT HIGHER IN ELEVATION THAN THE MID-SECTION, WHICH SHALL BE LOCATED AT THE POINT OF DISCHARGE.

NOTES:

SOCK MATERIAL SHALL MEET THE STANDARDS OF TABLE 4.1 OF THE PA DEP EROSION CONTROL MANUAL. COMPOST SHALL MEET THE STANDARDS OF TABLE 4.2 OF THE PA DEP EROSION CONTROL MANUAL.

COMPOST SOCK SEDIMENT TRAPS SHALL NOT EXCEED THREE SOCKS IN HEIGHT AND SHALL BE STACKED IN PYRAMIDAL FORM AS SHOWN ABOVE. MINIMUM TRAP HEIGHT IS ONE 24" DIAMETER SOCK. ADDITIONAL STORAGE MAY BE PROVIDED BY MEANS OF AN EXCAVATED SUMP 12" DEEP EXTENDING 1 TO 3 FEET UPSLOPE OF THE SOCKS ALONG THE LOWER SIDE OF THE TRAP.

COMPOST SOCK SEDIMENT TRAPS SHALL PROVIDE 2,000 CUBIC FEET STORAGE CAPACITY WITH 12" FREEBOARD FOR EACH TRIBUTARY DRAINAGE ACRE. (SEE MANUFACTURER FOR ANTICIPATED SETTLEMENT.)

THE MAXIMUM TRIBUTARY DRAINAGE AREA IS 5.0 ACRES. SINCE COMPOST SOCKS ARE "FLOW-THROUGH," NO SPILLWAY IS REQUIRED.

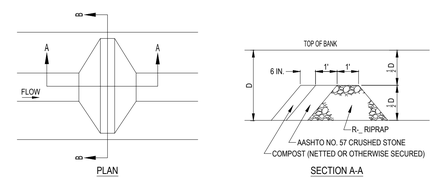
COMPOST SOCK SEDIMENT TRAPS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/3 THE HEIGHT OF THE SOCKS.

PHOTODEGRADABLE AND BIODEGRADABLE SOCKS SHALL NOT BE USED FOR MORE THAN 1 YEAR.

NOTE: WHERE COMPOST FILTER SOCKS ARE PLACED ON PAVED SURFACES, CONCRETE BLOCKS SHOULD BE USED IMMEDIATELY DOWNSLOPE OF THE SOCKS (AT THE SAME INTERVALS RECOMMENDED FOR THE STAKES) TO HELP HOLD THE SOCK IN PLACE.

#3-11 ***STANDARD CONSTRUCTION DETAIL #3-11 COMPOST SOCK SEDIMENT TRAP***

NOT TO SCALE



ROCK FILTER NO.	LOCATION	D (FT)	RIPRAP SIZE (R-_)
#1	SE SWALE (DP2)	2	R-3

FOR D > 3 FT. - USE R-4
FOR D > 2 FT. TO D < 3 FT. - USE R-3
NOT APPLICABLE FOR D < 2 FT.

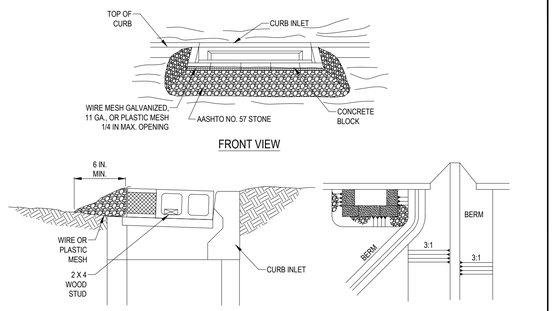
NOTES:

SEDIMENT MUST BE REMOVED WHEN ACCUMULATIONS REACH 1/2 THE HEIGHT OF THE FILTERS.

IMMEDIATELY UPON STABILIZATION OF EACH CHANNEL, REMOVE ACCUMULATED SEDIMENT, REMOVE ROCK FILTER, AND STABILIZE DISTURBED AREAS.

#4-14 ***STANDARD CONSTRUCTION DETAIL #4-14 ROCK FILTER***

NOT TO SCALE



NOTES:

MAXIMUM DRAINAGE AREA = 1 ACRE.

INLET PROTECTION SHALL NOT BE REQUIRED FOR INLET TRIBUTARY TO SEDIMENT BASIN OR TRAP. BERMS SHALL BE REQUIRED FOR ALL INSTALLATIONS.

ROLLED EARTHEN BERM SHALL BE PROVIDED AND MAINTAINED IMMEDIATELY DOWN GRADIENT OF THE PROTECTED INLET UNTIL ROADWAY IS STONED. ROAD SUBBASE BERM SHALL BE MAINTAINED UNTIL ROADWAY IS PAVED. SIX INCH MINIMUM HEIGHT ASPHALT BERM SHALL BE MAINTAINED UNTIL ROADWAY SURFACE RECEIVES FINAL COAT.

SEDIMENT SHALL BE REMOVED WHEN IT REACHES HALF THE HEIGHT OF THE STONE. DAMAGED OR CLOGGED INSTALLATIONS SHALL BE REPAIRED OR REPLACED IMMEDIATELY.

FOR SYSTEMS DISCHARGING TO HQ OR EV SURFACE WATER, A 6 INCH THICK COMPOST LAYER SHALL BE SECURELY ANCHORED ON OUTSIDE AND OVER TOP OF STONE.

DO NOT USE ON MAJOR PAVED ROADWAYS WHERE PONDING MAY CAUSE TRAFFIC HAZARDS.

#4-17 ***STANDARD CONSTRUCTION DETAIL #4-17 STONE AND CONCRETE BLOCK INLET PROTECTION - TYPE C INLET***

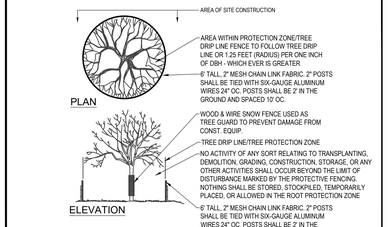
NOT TO SCALE

INLET PROTECTION	
INL-110	0.55 AC.



X-8 ***TEMPORARY SOIL STOCKPILE DETAIL***

NOT TO SCALE

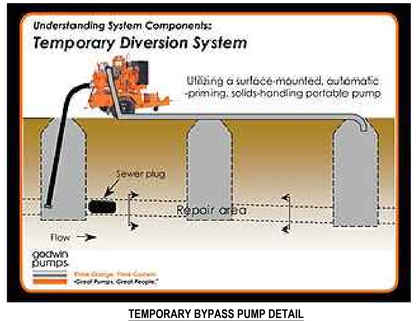


NOTES:

1.) THE PROTECTIVE FENCING SHALL BE INSTALLED WITH CARE TO AVOID ROOTS AND PLACED ENCOMPASSING THE ENTIRE ROOT PROTECTION ZONE OF INDIVIDUAL OR GROUPS OF CONTIGUOUS TREES. FENCING SHALL BE INSTALLED PRIOR TO ANY WORK BEING CONDUCTED, E.G., GRUBBING, EXCAVATION, GRADING, TRENCHING, CLEANING, OR INSTALLATION OF SILT FENCING. THE PROTECTIVE FENCING SHALL BE MAINTAINED THROUGHOUT THE ENTIRE PERIOD OF CONSTRUCTION.
2.) NO FUEL STORAGE, REFUELING OR MAINTENANCE OF EQUIPMENT, OR WASH DOWN OF CEMENT HANDLING EQUIPMENT SHALL BE PERMITTED WITHIN 100 FEET OF ANY TREE TO BE PRESERVED.
3.) ANY DAMAGE TO THE FENCING OR ENCROACHMENT ON THE PROTECTED AREAS SHALL BE REMEDIED IMMEDIATELY. ANY OBSERVED DAMAGE TO THE TREES SHALL BE IMMEDIATELY REPORTED TO THE TOWNSHIP AND REMEDIED AS SOON AS IS PRACTICABLE. AT THE DISCRETION OF THE SHADE TREE COMMISSION, PRESERVED TREES THAT HAVE NOT BEEN ADEQUATELY PROTECTED OR HAVE BEEN DAMAGED MAY BE REQUIRED TO BE REMOVED AND REPLACED AT THE EXPENSE OF THE APPLICANT.

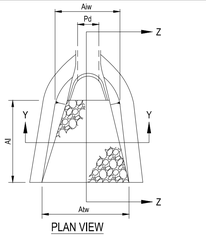
X-11 ***TREE PROTECTION DURING SITE CONSTRUCTION***

NOT TO SCALE



TEMPORARY BYPASS PUMP DETAIL

NOT TO SCALE. FOR DEMONSTRATION PURPOSES ONLY. DIVERSION SYSTEM TO BE SPECIFIED BY CONTRACTOR AND SIZED FOR APPROPRIATE FLOW IN CULVERT LINE. ROUTING SHOWN ON E&S PLAN.



OUTLET NO.	PIPE DIA Pd (IN)	RIPRAP SIZE R-_	RIPRAP THICK. Rt (IN)	APRON LENGTH Al (FT)	APRON INITIAL WIDTH Aiw (FT)	APRON TERMINAL WIDTH Atw (FT)
EW-100	18	R-3	9.0	8.0	4.5	12.5
EW-200	18	R-3	9.0	8.0	4.5	12.5

NOTES:

ALL APRONS SHALL BE CONSTRUCTED TO THE DIMENSIONS SHOWN. TERMINAL WIDTHS SHALL BE ADJUSTED AS NECESSARY TO MATCH RECEIVING CHANNELS.

ALL APRONS SHALL BE INSPECTED AT LEAST WEEKLY AND AFTER EACH RUNOFF EVENT. DISPLACED RIPRAP WITHIN THE APRON SHALL BE REPLACED IMMEDIATELY.

#9-1 ***STANDARD CONSTRUCTION DETAIL #9-1 RIPRAP APRON AT PIPE OUTLET WITH FLARED END SECTION OR ENDWALL***

NOT TO SCALE

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-SESC-5A_-_LAYOUT C-606 E&S DETAILS.dwg

BOHLER

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABILITY DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/3/2025	NPDES MAJOR MODIFICATION	RMS / JAB
2	3/12/2025	FOR NPDES RESUBMISSION	RMS / JAB
3	04/14/2025	PER TOWNSHIP COMMENT	RMS / JAB
4	5/28/2025	PER NPDES COMMENT	RMS / JAB
5	7/22/2025	PER REVISED ARCH	RMS / MRB

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PROJECT No.:	PAB220113.01
DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-SESC-5A

PROJECT:

AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

500 PENNSYLVANIA AVENUE WHITEMARSH TOWNSHIP MONTGOMERY COUNTY, PA

BOHLER
74 W BROAD STREET, SUITE 500
BETHLEHEM, PA 18018
Phone: (610) 709-9971
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J.A. BEAVAN
PROFESSIONAL ENGINEER
JEFFREY A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE082005
NEW YORK LICENSE No. 086043
NEW JERSEY LICENSE No. GE49536600

SHEET TITLE:

SOIL EROSION & SEDIMENT POLLUTION CONTROL DETAILS

SHEET NUMBER:

C-606

REVISION 5 - 7/22/2025

PENNSYLVANIA AVENUE
(A.K.A. S.R. 2037)
(VARIABLE WIDTH LEGAL R.O.W.)
(ASPHALT ROADWAY)
(TWO WAY TRAFFIC)

BLOCK 43, UNIT 21
APN #54-00-13387-005
N/F LANDS OF
475 PA AVE. FORT WASHINGTON LLC
D.B. 5510, PG. 2278

BLOCK 50, UNIT 47
APN:#54-00-04363-002
N/F LANDS OF
515 PA AVE. LLC
D.B. 6072, PG. 2328

UNT TO SANDY RUN
(AKA BODENSTEIN CHANNEL)

ZONE AE

DP004

P.O.I. #002

BMP 001
PROP. RE-VEGETATE /RE-FOREST USING NATIVE SPECIES (TYP.) (BMP # 5.6.3)

S53°49'38"E 40.16'

S53°50'10"E 356.81'

UgD

ZONE AE

PROJECT SITE BOUNDARY
237,428 SF. (5.45 AC)

LIMIT OF DISTURBANCE
214,777 SF. (4.93 AC)

PROP. RELOC (3) TOG OVERHEAD UTILITY POLE

PROP. STAGING AREA #1-1

EXISTING BUILDING TO REMAIN
(11,370 SF)
FFE = 170.11'

SERVICE DRIVE LANES
FFE = 170.11'

PROP. GAS LATERAL

PROP. GAS METER

FFE = 170.11'

SERVICE DEPT.
FFE = 170.11'

CAR WASH
FFE = 169.11'

EXIST. 4 INCH LIATORI TO BE CAPPED AND ABANDONED

PROP. FIRE HYDRANT AND 6" GATE VALVE

PROP. RELOCATED POLE MOUNTED TRANSFORMER AND OVERHEAD UTILITY POLE

PROP. 8 INCH DIP

BMP 002
PROP. UNDERGROUND MRC UG1
(BMP #6.6.3)

ZONE AE
BLOCK 51, UNIT 1
APN #65-00-08764-20-7
N/F LANDS OF
WHITEMARSH HOTEL ASSOCIATES LP

UusB

PROP. UNDERGROUND BASIN (UG1)

BLOCK 51, UNIT 1
APN #65-00-08764-20-7
N/F LANDS OF
WHITEMARSH HOTEL ASSOCIATES LP

ZONE AE

PROP. STAGING AREA #2-1

BMP 004
PROP. UNDERGROUND EXTENDED DETENTION UG2 (NO SUBSURFACE INFILTRATION) (BMP #6.6.3)

PROP. UNDERGROUND BASIN (UG2)

BLOCK 51, UNIT 47 APN #65-00-08779-00-3
N/F LANDS OF
PAMCPA REAL ESTATE, LLLP
D.B. 6293, PG. 720

UusB

(1) AC
(3) MV
(3) NS
(6) AC
(5) CCA
(3) OV
(4) OV

DP003

DP001

DP002

P.O.I.#1

ZONE AE (FLOODWAY)

ZONE X

ZONE AE

SANDY RUN

94" x 63" RCP
INV= 154.1

W.F. #1
EXIST. APPROX. CENTERLINE OF STREAM

169.04 FLOOD ELEVATION

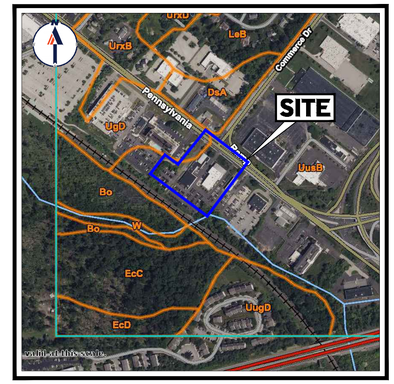
APPROXIMATE GRAPHICAL PLOTTING OF FLOOD HAZARD LINE

NORTH PENNSYLVANIA RAILROAD

30 15 7.5 0 30
1"= 30'



USGS MAP
AMBLER QUAD
SCALE: 1"=2,000'
1000' 0 2000'



SOIL MAP
SCALE: 1"=500'
250' 0 500'

CHAPTER 93 RECEIVING WATERSHED AND STREAM CLASSIFICATION:
POI #1 - SANDY RUN, TRIBUTARY TO WISSAHICKON CREEK - TSF, MF
MUNICIPAL POINT SOURCE DISCHARGES - NUTRIENTS, BIOCHEMICAL OXYGEN DEMAN (BOD); URBAN RUNOFF/STORM SEWERS - NUTRIENTS

CHAPTER 93 RECEIVING WATERSHED AND STREAM CLASSIFICATION:
POI #2 - UNNAMED TRIBUTARY TO SANDY RUN VIA STORM SEWERS - TSF, MF

LEGEND
EXISTING

PROPERTY LINE	
R.O.W. LINE	
SOIL BOUNDARY	
SOIL BOUNDARY LABEL	UgD
BUILDING	
CONCRETE CURB	
FENCE	-X-
TREELINE	
CONCRETE MONUMENT/ IRON PIN	
SIGN	
TREE	
DRAINAGE INLET	
STORM/SANITARY MANHOLE	
WATER/GAS VALVES	
UTILITY POLE	
OVERHEAD UTILITY WIRES	OH
GAS LINE	G
WATER LINE	W
SANITARY LINE	S
STORM PIPE	
STORM PIPE (UNT TO SANDY RUN AKA BODENSTEIN CHANNEL)	
CONTOUR ELEVATION	400
CENTER OF WATER FEATURE	
100 YEAR FLOOD PLAIN	100 YR
500 YEAR FLOOD PLAIN	500 YR
FLOOD WAY	FLW
ASSUMED FLOOD WAY	
TOP OF BANK / OHWM	W.F. #1

LEGEND
PROPOSED

LIMIT OF DISTURBANCE	LOD
PROJECT SITE BOUNDARY	PSB
DRAINAGE INLET	
MANHOLE	
ENDWALL	
OVERHEAD UTILITY WIRES	OH
ELECTRIC LINE	E
WATER LINE	W
SANITARY SEWER	S
STORM PIPE	
INLET CONTAINING WATER QUALITY PRETREATMENT BMP 005 (BMP #6.6.4) & BMP 006	
RE-VEGETATE/RE-FOREST USING NATIVE SPECIES (BMP # 5.6.3)	

RECORD PLAN 6 OF 11

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PROJECT:
AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS
FOR
MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

500 PENNSYLVANIA AVENUE
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY, PA

BOHLER
74 W BROAD STREET, SUITE 500
BETHLEHEM, PA 18018
Phone: (610) 709-9971
Fax: (610) 709-9976
www.BohlerEngineering.com

J.A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No: PE036208
NEW JERSEY LICENSE No: GE49036600

SHEET TITLE:
POST CONSTRUCTION STORMWATER MANAGEMENT PLAN

SHEET NUMBER:
C-607
Page 18 of 36

REVISION 5 - 7/22/2025

I:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-SESC-5A—LAYOUT C-607 PCSM

GENERAL NOTES

1. THIS PLAN REFERENCES DOCUMENTS AND INFORMATION BY:
   CONTROL POINT ASSOCIATES, LLC.
   1600 MANOR DRIVE, SUITE 210
   CHALFONT, PA 18914
   ENTITLED: "BOUNDARY & TOPOGRAPHIC SURVEY"
   PREPARED FOR: BMW OF FORT WASHINGTON
   FILE NO.: 02-22-055-00
   DATED: 02/06/2023
2. APPLICANT/ EQUITABLE OWNER:
   MILEONE FORT WASHINGTON, LLC.
   3301 BRIGGS CHANEY ROAD
   SILVER SPRING, MD 20904
   ATTENTION: DENNIS TURNBAUGH
   301-679-4062
3. CONTRACTOR IS RESPONSIBLE TO OBTAIN ALL SPECIFIC RESOURCES, TECHNICAL REPORTS, AND DESIGN DOCUMENTS RELATED TO THIS PROJECT AND FAMILIARIZE HIMSELF WITH SAME FOR APPLICATION BOTH PRIOR TO AND DURING CONSTRUCTION.
4. ALL ELEVATIONS SHOWN ARE IN ACCORDANCE WITH THE REFERENCED SURVEYOR'S BENCHMARK AND MUST BE VERIFIED BY THE GENERAL CONTRACTOR PRIOR TO GROUNDBREAK.
5. PARCEL DATA: PROPERTY KNOWN AS BLOCK 51, UNIT 41; APN #65-00-08770-00-3; BLOCK 51, UNIT 46; APN #65-00-08767-00-6; BLOCK 51, UNIT 2, APN #65-00-08773-00-9 & BLOCK 51, UNIT 44, APN #65-00-08776-00-6 AS IDENTIFIED ON THE TAX MAP OF WHITEMARSH TOWNSHIP, COMMONWEALTH OF PENNSYLVANIA.
6. PARCEL AREA: TOTAL SITE AREA: 5.132 AC.
7. ALL A.D.A. ACCESSIBLE PARKING SPACES, RAMPS, AND ACCESSIBLE ROUTES SHALL BE CONSTRUCTED TO MEET CURRENT A.D.A. REQUIREMENTS, AS AMENDED.
8. ALL FEATURES ARE EXISTING TO REMAIN UNLESS OTHERWISE NOTED.
9. FEATURES TO BE REMOVED ARE NOTED (TBR).
10. MEASUREMENTS ARE TAKEN FROM FACE OF CURB, WHERE APPLICABLE.
11. NO RETAINING WALLS ARE PROPOSED.
12. ALL PUBLIC UTILITIES, INCLUDING WATER AND SEWER ARE CURRENTLY AVAILABLE. SITE IS TO BE SERVICED BY PUBLIC WATER AND SEWER UTILITIES.
13. LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE. BEFORE ANY EXCAVATION IS TO BEGIN, ALL UNDERGROUND UTILITIES SHOULD BE VERIFIED AS TO THEIR LOCATION, SIZE AND TYPE BY THE PROPER UTILITY COMPANIES.
14. THE ENTIRE SITE IS IN A SPECIAL FLOOD HAZARD AREA, ZONE (AE), WITHIN THE 100-YEAR FLOODPLAIN, BASE FLOOD ELEVATION = 169.00. AS SUCH, THE ENTIRE SITE IS LOCATED WITHIN THE RIPARIAN CORRIDOR CONSERVATION OVERLAY DISTRICT PER WHITEMARSH TOWNSHIP
15. THE EXISTENCE OF UNDERGROUND STORAGE TANKS, IF ANY, IS UNKNOWN.
16. ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88, BASED ON GPS OBSERVATIONS UTILIZING THE KEYSTONE VRS NETWORK (KEYNET GPS).

PCSM - GENERAL BMP NOTES

1. A SITE INSPECTION AND APPROVAL BY THE COUNTY CONSERVATION DISTRICT IS REQUIRED PRIOR TO THE REMOVAL OR CONVERSION OF SEDIMENT BASINS AND TRAPS.
2. BOHLER ENGINEERING SHALL BE NOTIFIED OF PRE-CONSTRUCTION MEETING DATE AND BMP CONSTRUCTION/INSTALLATION.
3. THE PERMIT HOLDER WILL NOTIFY THE TOWNSHIP ENGINEER IN ORDER TO OBTAIN INSPECTIONS AT LEAST 48 HOURS BEFORE THE INSPECTION IS TO BE MADE FOR; INITIAL INSPECTION, ROUGH GRADING, FINANCIAL GUARANTEES, BMPS, SPECIAL STRUCTURES AND FINAL INSPECTION.
4. THE CONTRACTOR SHALL TAKE ALL STEPS NECESSARY TO LIMIT THE COMPACTION IN THE PROPOSED BMP BOTTOMS.
5. REFER TO THE BMP CONSTRUCTION DETAILS FOR THE CONSTRUCTION OF ALL PROPOSED STORMWATER MANAGEMENT BMPs.
6. REFER TO THE PCSWM PLAN AND DETAILS FOR SPECIFIC BMP CONSTRUCTION GUIDELINES.
7. AS-BUILT PLANS OF THE STORMWATER BMPs FOR EACH PROJECT PHASE SHALL BE PROVIDED WITHIN SIX MONTHS FOLLOWING THE COMPLETION OF EACH PHASE. THE AS-BUILT PLANS SHALL BE SIGNED BY A PA REGISTERED PROFESSIONAL SURVEYOR.
8. A NOTICE OF TERMINATION (NOT) WILL BE REQUIRED TO BE SUBMITTED FOLLOWING APPROVAL OF THE FINAL AS-BUILT PLANS. PRIOR TO ACCEPTING THE NOT, THE DEPARTMENT AND/OR CONSERVATION DISTRICT STAFF WILL PERFORM A FINAL INSPECTION TO ENSURE SITE STABILIZATION AND VERIFY ADEQUATE INSTALLATION AND FUNCTION OF STORMWATER BMPs.

PCSM ENVIRONMENTAL DUE DILIGENCE NOTES

1. CLEAN FILL IS DEFINED AS: UNCONTAMINATED, NON-WATER SOLUBLE, NON-DECOMPOSABLE, INERT, SOLID MATERIAL. THE TERM INCLUDES SOIL, ROCK, STONE, DREDGED MATERIAL, USED ASPHALT, AND BRICK, BLOCK OR CONCRETE FROM CONSTRUCTION AND DEMOLITION ACTIVITIES THAT IS SEPARATE FROM OTHER WASTE AND IS RECOGNIZABLE AS SUCH. THE TERM DOES NOT INCLUDE MATERIALS PLACED IN OR ON THE WATERS OF THE COMMONWEALTH UNLESS OTHERWISE AUTHORIZED. (THE TERM "USED ASPHALT" DOES NOT INCLUDE MILLED ASPHALT OR ASPHALT THAT HAS BEEN PROCESSED FOR RE-USE).
2. CLEAN FILL AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE: FILL MATERIALS AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE STILL QUALIFIES AS CLEAN FILL PROVIDED THE TESTING REQUIREMENTS CONTAINED IN THIS DEFINITION DEMONSTRATE THAT THE FILL MATERIAL CONTAINS NO REGULATED SUBSTANCES THAT ARE BELOW THE RESIDENTIAL LIMITS IN TABLES FP-1A AND FP-1B FOUND IN THE DEPARTMENT'S POLICY "MANAGEMENT OF FILL". ANY PERSON PLACING CLEAN FILL THAT HAS BEEN AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE MUST USE FORM FP-001 TO CERTIFY THE ORIGIN OF THE FILL MATERIAL AND THE RESULTS OF THE ANALYTICAL TESTING TO QUALIFY THE MATERIAL AS CLEAN FILL. FORM FP-001 MUST BE RETAINED BY THE OWNER OF THE PROPERTY RECEIVING THE FILL. A COPY OF FORM FP-001 CAN BE FOUND AT THE END OF THESE INSTRUCTIONS.
3. ENVIRONMENTAL DUE DILIGENCE: THE APPLICANT MUST PERFORM ENVIRONMENTAL DUE DILIGENCE TO DETERMINE IF THE FILL MATERIALS ASSOCIATED WITH THE PROJECT QUALIFY AS CLEAN FILL. ENVIRONMENTAL DUE DILIGENCE IS DEFINED AS: INVESTIGATIVE TECHNIQUES, INCLUDING, BUT NOT LIMITED TO, VISUAL PROPERTY INSPECTIONS, ELECTRONIC DATA BASE SEARCHES, REVIEW OF PROPERTY OWNERSHIP, REVIEW OF PROPERTY USE HISTORY, SANBORN MAPS, ENVIRONMENTAL QUESTIONNAIRES, TRANSACTION SCREENS, ANALYTICAL TESTING, ENVIRONMENTAL ASSESSMENTS OR AUDITS. ANALYTICAL TESTING IS NOT A REQUIRED PART OF DUE DILIGENCE UNLESS VISUAL INSPECTION AND/OR REVIEW OF THE PAST LAND USE OF THE PROPERTY INDICATES THAT THE FILL MAY HAVE BEEN SUBJECTED TO A SPILL OR RELEASE OF REGULATED SUBSTANCE. IF THE FILL MAY HAVE BEEN AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE, IT MUST BE TESTED TO DETERMINE IF IT QUALIFIES AS CLEAN FILL. TESTING SHOULD BE PERFORMED IN ACCORDANCE WITH APPENDIX A OF THE DEPARTMENT'S POLICY "MANAGEMENT OF FILL".
4. FILL MATERIAL THAT DOES NOT QUALIFY AS CLEAN FILL IS REGULATED FILL. REGULATED FILL IS WASTE AND MUST BE MANAGED IN ACCORDANCE WITH THE DEPARTMENT'S MUNICIPAL OR RESIDUAL WASTE REGULATIONS BASED ON 25 PA. CODE CHAPTERS 287 RESIDUAL WASTE MANAGEMENT OR 271 MUNICIPAL WASTE MANAGEMENT, WHICHEVER IS APPLICABLE.
5. SEDIMENT REMOVED FROM BMPS SHALL BE DISPOSED OF ON-SITE IN LANDSCAPED AREAS OUTSIDE OF STEEP SLOPES, WETLANDS, FLOODPLAINS OR DRAINAGE SWALES AND IMMEDIATELY STABILIZED OR PLACED IN SOIL STOCKPILES AND STABILIZED.
6. ALL BUILDING MATERIAL AND WASTES MUST BE REMOVED FROM THE SITE AND RECYCLED OR RECYCLED IN ACCORDANCE WITH DEP'S SOLID WASTE REGULATIONS (25 PA CODE 260.1 ET SEQ., 271.1 ET SEQ., AND 287.1 ET SEQ., AND/OR ANY ADDITIONAL LOCAL, STATE OR FEDERAL REGULATIONS. NO BUILDING MATERIALS (USED OR UNUSED) OR WASTE MATERIALS SHALL BE BURNED, BURIED, DUMPED OR DISCHARGED AT THE SITE.

GENERAL MAINTENANCE AND INSPECTION NOTES

1. CATCH BASINS AND INLETS (UPGRADIENT OF DETENTION BASIN) SHOULD BE INSPECTED AND CLEANED AT LEAST TWO TIMES PER YEAR AND AFTER RUNOFF EVENTS.
2. THE VEGETATION SHOULD BE MAINTAINED IN GOOD CONDITION, AND ANY BARE SPOTS REVEGETATED AS SOON AS POSSIBLE.
3. INSPECT THE UNDERGROUND BASINS AFTER RUNOFF EVENTS AND MAKE SURE THAT RUNOFF DRAINS DOWN WITHIN 72 HOURS. MOSQUITO'S SHOULD NOT BE A PROBLEM IF THE WATER DRAINS IN 72 HOURS. MOSQUITOES REQUIRE A CONSIDERABLY LONG BREEDING PERIOD WITH RELATIVELY STATIC WATER LEVELS.
4. INSPECT FOR ACCUMULATION OF SEDIMENT, DAMAGE TO OUTLET CONTROL STRUCTURES, EROSION CONTROL MEASURES, AND SIGNS OF WATER CONTAMINATION/SPILLS.
5. MOW ONLY AS APPROPRIATE FOR VEGETATIVE COVER SPECIES.
6. REMOVE ACCUMULATED SEDIMENT FROM BASIN AS REQUIRED. PROPERLY DISPOSE OF SEDIMENT.

CRITICAL STAGES

THE CONTRACTOR SHALL NOTIFY THE PROFESSIONAL RESPONSIBLE FOR THE PROPER IMPLEMENTATION OF THE STORMWATER BMPS PRIOR TO COMMENCING CONSTRUCTION OF THE FOLLOWING CRITICAL STAGES:

1. INSTALLATION OF UNDERGROUND FACILITY UG1
2. INSTALLATION OF UNDERGROUND FACILITY UG2
3. INSTALLATION OF HYDRODYNAMIC DEVICES
4. INSTALLATION/VERIFICATION OF REGETATE/REFOREST PLANTINGS
5. VERIFICATION OF AS-BUILT GRADING PER PCSM PLAN
6. VERIFICATION OF AS-BUILT POST CONSTRUCTION DRAINAGE AREAS
7. FINAL INSPECTION/ PUNCH LIST

REFERENCE THE SEQUENCE OF CONSTRUCTION AND DETAILS CONTAINED ON THE E&S AND PCSM PLAN SETS FOR PROPER CONSTRUCTION TECHNIQUES.

LOCATION OF ALL SURFACE WATERS AND THEIR CLASSIFICATION UNDER CHAPTER 93

§102.8(f)(5)

1. THE SUBJECT SITE DRAINS TO UNT TO SANDY RUN WHICH HAS NO CHAPTER 93 CLASSIFICATION, AND SANDY RUN WHICH HAS A TSF (TROUT STOCKING) & MF (MIGRATORY FISH(ES) CHAPTER 93 CLASSIFICATION.
2. THE DEVELOPMENT IS IN NEITHER AN HQ NOR AN EV WATERSHED AND THEREFORE NO BOUNDARIES ARE SHOWN.
3. THERE ARE NO WETLANDS LOCATED ON THE PROJECT SITE.

RIPARIAN FOREST BUFFER MANAGEMENT PLAN

§102.8(f)(14)

REGARDING EXISTING OR PROPOSED RIPARIAN FOREST BUFFERS, NOTE THE FOLLOWING:
- THERE ARE NO EXISTING/PROPOSED RIPARIAN FOREST BUFFERS LOCATED WITHIN OR OUTSIDE THE LIMITS OF DISTURBANCE FOR THIS PROJECT.

MRC BMP O&M SCHEDULE

AT A MINIMUM, THE LONG-TERM OPERATION AND MAINTENANCE SCHEDULE MUST MEET 25 PA. CODE § 102.8(F)(10) AND INCLUDE THE FOLLOWING:
1. UPGRADIENT CATCH BASINS AND INLETS SHOULD BE INSPECTED AND CLEANED ANNUALLY, OR MORE OFTEN IF HISTORICAL MAINTENANCE RECORDS SUGGEST A MORE FREQUENT CLEANING.
2. THE VEGETATION (FOR THE CONTRIBUTING DRAINAGE AREA) SHOULD BE MAINTAINED IN GOOD CONDITION, AND ANY BARE SPOTS REVEGETATED.
3. CARE SHOULD BE TAKEN TO AVOID EXCESSIVE COMPACTION BY MOWERS. MOW ONLY AS APPROPRIATE FOR VEGETATIVE SPECIES.
4. INSPECT AT LEAST TWO TIMES PER YEAR AFTER RUNOFF EVENTS GREATER THAN 0.8 INCH AND MAKE SURE THAT RUNOFF DRAINS DOWN WITHIN THE DESIGN PARAMETERS.
5. AT LEAST TWO TIMES PER YEAR, OR MORE IF HISTORICAL MAINTENANCE INDICATE IT IS NECESSARY, INSPECT FOR ACCUMULATION OF SEDIMENT, DAMAGE TO OUTLET CONTROL STRUCTURES, EROSION, SIGNS OF WATER CONTAMINATION/SPILLS, AND INSTABILITY. LEAF LITTER NEEDS TO BE REMOVED ANNUALLY.
   A. TO INSPECT:
      - REMOVE THE INSPECTION PORT LID FROM THE FLOOR BOX FRAME.
      - REMOVE THE RISER PIPE CAP.
      - WITH A FLASHLIGHT AND STADIA ROD, MEASURE THE DEPTH OF SEDIMENT.
      - RECORD RESULTS IN A MAINTENANCE LOG.
      - WHEN DEPTH OF SEDIMENT EXCEEDS 3" (76 MM), REFER TO MANUFACTURER GUIDELINES FOR SEDIMENT REMOVAL PROCEDURE.
6. AS NEEDED. REMOVE ACCUMULATED SEDIMENT AS REQUIRED TO MAINTAIN INFILTRATION THROUGH THE MRCS SOIL MEDIA AND TO MAINTAIN WATER QUALITY FUNCTIONALITY. RESTORE ORIGINAL CROSS SECTION. PROPERLY DISPOSE OF SEDIMENT.
   - IT IS RECOMMENDED TO PERFORM INSPECTION OF THE SEDIMENT SEPARATOR ROW EVERY 6 MONTHS FOR THE FIRST YEAR OF SERVICE.
7. IF ENTRY INTO ANY MANHOLE IS REQUIRED, ALL LOCAL AND OSHA RULES FOR CONFINED SPACE ENTRIES MUST BE STRICTLY FOLLOWED.
8. ALL MRC BMP COMPONENTS SHOULD BE MAINTAINED AS INDICATED IN THE STORMWATER BMP MANUAL.
9. MANUFACTURER INSPECTION AND MAINTENANCE RECORD SHALL BE COMPLETED FOLLOWING EVERY INSPECTION

RECYCLING OR DISPOSAL OF POST CONSTRUCTION PCSM MATERIALS

§102.8(f)(11)

THE FOLLOWING IS A LIST THAT INCLUDES, BUT THAT IS NOT LIMITED TO, THE POTENTIAL CONSTRUCTION WASTES THAT MAY EXIST ON-SITE:
- SEDIMENT
- PLANTING SOIL
- DEBRIS & LITTER
- DEAD VEGETATION / PLANT MATERIAL
- MULCH
- RIP-RAP
- PIPING / CLEAN OUTS
- HYDRODYNAMIC DEVICES

ALL BUILDING MATERIALS AND WASTES SHALL BE REMOVED FROM THE SITE AND RECYCLED OR DISPOSED OF IN ACCORDANCE WITH THE DEPARTMENT'S SOLID WASTE MANAGEMENT REGULATIONS AT 25 PA. CODE 260.1 ET SEQ., 271.1, AND 287.1 ET SEQ. NO BUILDING MATERIALS OR WASTES OR UNUSED BUILDING MATERIALS SHALL BE BURNED, BURIED, DUMPED, OR DISCHARGED AT THE SITE. BELOW IS A LIST OF METHODS FOR THE PROPER RECYCLING/DISPOSAL OF VARIOUS MATERIALS:

PCSM PRODUCED WASTES SHALL BE MAINTAINED IN ACCORDANCE WITH MAINTENANCE DESCRIBED WITHIN THE LONG-TERM OPERATION AND MAINTENANCE SCHEDULE TABLE.

PCSM PLANNING AND DESIGN NOTES

THE FOLLOWING MEASURES WERE TAKEN TO PRESERVE THE INTEGRITY OF STREAM CHANNELS AND MAINTAIN AND PROTECT THE PHYSICAL, BIOLOGICAL, AND CHEMICAL QUALITIES OF THE RECEIVING STREAMS:
- DIRECT RUNOFF FROM IMPERVIOUS SURFACES INCLUDING ROADWAYS TO BMPS.
- THE USE OF NATIVE SPECIES REQUIRES LESS FERTILIZATION AND CHEMICAL APPLICATION THAN NONNATIVE SPECIES.

THE FOLLOWING MEASURES WERE TAKEN TO PREVENT AN INCREASE IN THE RATE OF STORM WATER RUNOFF:
- DIRECT RUNOFF TO AN ABOVE GROUND AND AN UNDERGROUND STORMWATER DETENTION FACILITY TO CONTROL RUNOFF RATES.
- PROVIDE AN UNDERGROUND DETENTION FACILITY FOR RATE REDUCTION
- MINIMIZE IMPERVIOUS AREAS WHERE PRACTICAL.

THE FOLLOWING MEASURES WERE TAKEN TO MINIMIZE ANY INCREASE IN STORM WATER RUNOFF VOLUME:
- PROVIDE AN UNDERGROUND DETENTION FACILITY FOR VOLUME REDUCTION
- REVEGETATE-REFOREST WITH NATIVE SPACES AND MINIMIZE DISTURBANCE OF EXISTING VEGETATION TO HELP REDUCE RUNOFF VOLUME.
- MINIMIZE IMPERVIOUS AREAS WHERE PRACTICAL.

THE FOLLOWING MEASURES WERE TAKEN TO MINIMIZE IMPERVIOUS AREAS:
- CONFIGURE AS EFFICIENTLY AS POSSIBLE AND CONSOLIDATE IMPERVIOUS COVERAGE.
- LIMIT PROJECT DEVELOPMENT AREA BY PROTECTING CREEK, WETLANDS, RIPARIAN BUFFER AND FLOODPLAIN.

THE FOLLOWING MEASURES ARE TAKEN TO MAXIMIZE PROTECTION OF EXISTING DRAINAGE FEATURES AND VEGETATION:
- ACCESS THE SITE THRU DESIGNATED CONSTRUCTION ENTRANCES.
- PROTECT WOODLANDS WITH TREE PROTECTION FENCING.

THE FOLLOWING MEASURES WERE TAKEN TO MINIMIZE LAND CLEARING AND GRADING:
- PROTECT WOODLANDS WITH TREE PROTECTION FENCING.
- ADJUST SITE GRADING TO REDUCE EXTENT OF CUTS OR FILLS TO EXISTING GRADES.

THE FOLLOWING MEASURES ARE TAKEN TO MINIMIZE SOIL COMPACTION:
- ACCESS THE SITE THRU DESIGNATED CONSTRUCTION ENTRANCES.
- USE OF TREADED MACHINERY WHERE PRACTICAL DURING EARTHMOVING OPERATIONS.
- GRADE SITE TO MINIMIZE EXTENT OF CUTS/FILLS.

THE FOLLOWING MEASURES WERE TAKEN TO UTILIZE OTHER STRUCTURAL OR NONSTRUCTURAL BMPS THAT PREVENT OR MINIMIZE CHANGES IN STORM WATER RUNOFF:
- PROVIDE UNDERGROUND DETENTION FACILITIES TO HELP REDUCE RUNOFF VOLUME AND RATES.
- PROVIDE VEGETATED SWALE
- MINIMIZE IMPERVIOUS AREAS WHERE PRACTICAL.

P.C.S.M. STANDARD NOTES

PERMIT TERMINATION

UPON PERMANENT STABILIZATION OF THE EARTH DISTURBANCE ACTIVITY UNDER § 102.22(A)(2) (RELATING TO PERMANENT STABILIZATION), AND INSTALLATION OF BMPS IN ACCORDANCE WITH AN APPROVED PLAN PREPARED AND IMPLEMENTED IN ACCORDANCE WITH §§ 102.4 AND 102.8 (RELATING TO EROSION AND SEDIMENT CONTROL REQUIREMENTS; AND STORMWATER MANAGEMENT), THE PERMITTEE OR CO-PERMITTEE SHALL SUBMIT A NOTICE OF TERMINATION TO THE DEPARTMENT OR CONSERVATION DISTRICT.

THE NOTICE OF TERMINATION MUST INCLUDE:
(1) THE FACILITY NAME, ADDRESS AND LOCATION.
(2) THE PERMIT NUMBER AND ACREAGE.
(3) THE PERMIT NUMBER.
(4) THE BASIS FOR PERMIT TERMINATION.
(5) IDENTIFICATION OF THE PERSONS WHO HAVE AGREED TO AND WILL BE RESPONSIBLE FOR LONG-TERM OPERATION AND MAINTENANCE OF THE PCSM BMPS IN ACCORDANCE WITH § 102.8(M) AND PROOF OF COMPLIANCE WITH § 102.8(M)(2).

PCSM REQUIREMENTS

PCSM RESPONSIBILITY AND RECORDKEEPING. THE PCSM PLAN, INSPECTION REPORTS AND MONITORING RECORDS SHALL BE AVAILABLE FOR REVIEW AND INSPECTION BY THE DEPARTMENT OR THE CONSERVATION DISTRICT.

LICENSED PROFESSIONAL OVERSIGHT OF CRITICAL STAGES. A LICENSED PROFESSIONAL OR A DESIGNEE SHALL BE PRESENT ONSITE AND BE RESPONSIBLE DURING CRITICAL STAGES OF IMPLEMENTATION OF THE APPROVED PCSM PLAN. THE CRITICAL STAGES MAY INCLUDE THE INSTALLATION OF UNDERGROUND TREATMENT OR STORAGE BMPS, STRUCTURALLY ENGINEERED BMPS, OR OTHER BMPS AS DEEMED APPROPRIATE BY THE DEPARTMENT OR THE CONSERVATION DISTRICT.

FINAL CERTIFICATION. THE PERMITTEE SHALL INCLUDE WITH THE NOTICE OF TERMINATION "RECORD DRAWINGS" WITH A FINAL CERTIFICATION STATEMENT FROM A LICENSED PROFESSIONAL, WHICH READS AS FOLLOWS:
"I (NAME) DO HEREBY CERTIFY PURSUANT TO THE PENALTIES OF 18 PA.C.S.A. § 4904 TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF, THAT THE ACCOMPANYING RECORD DRAWINGS ACCURATELY REFLECT THE AS-BUILT CONDITIONS, ARE TRUE AND CORRECT, AND ARE IN CONFORMANCE WITH CHAPTER 102 OF THE RULES AND REGULATIONS OF THE DEPARTMENT OF ENVIRONMENTAL PROTECTION AND THAT THE PROJECT SITE WAS CONSTRUCTED IN ACCORDANCE WITH THE APPROVED PCSM PLAN, ALL APPROVED PLAN CHANGES AND ACCEPTED CONSTRUCTION PRACTICES."

(1) THE PERMITTEE SHALL RETAIN A COPY OF THE RECORD DRAWINGS AS A PART OF THE APPROVED PCSM PLAN.
(2) THE PERMITTEE SHALL PROVIDE A COPY OF THE RECORD DRAWINGS AS A PART OF THE APPROVED PCSM PLAN TO THE PERSON IDENTIFIED IN THIS SECTION AS BEING RESPONSIBLE FOR THE LONG-TERM OPERATION AND MAINTENANCE OF THE PCSM BMPS.

PCSM LONG TERM OPERATIONS AND MAINTENANCE REQUIREMENTS

UNTIL THE PERMITTEE OR CO-PERMITTEE HAS RECEIVED THE NOTICE OF TERMINATION APPROVAL OF A NOTICE OF TERMINATION, THE PERMITTEE OR CO-PERMITTEE WILL REMAIN RESPONSIBLE FOR COMPLIANCE WITH THE PERMIT TERMS AND CONDITIONS INCLUDING LONG-TERM OPERATION AND MAINTENANCE OF ALL PCSM BMPS ON THE PROJECT SITE AND IS RESPONSIBLE FOR VIOLATIONS OCCURRING ON THE PROJECT SITE. THE DEPARTMENT OR CONSERVATION DISTRICT WILL CONDUCT A FINAL INSPECTION AND APPROVE OR DENY THE NOTICE OF TERMINATION WITHIN 30 DAYS.

THE PERMITTEE OR CO-PERMITTEE SHALL BE RESPONSIBLE FOR LONG-TERM OPERATION AND MAINTENANCE OF PCSM BMPS UNLESS A DIFFERENT PERSON IS IDENTIFIED IN THE NOTICE OF TERMINATION AND HAS AGREED TO LONG-TERM OPERATION AND MAINTENANCE OF PCSM BMPS.

FOR ANY PROPERTY CONTAINING A PCSM BMP, THE PERMITTEE OR CO-PERMITTEE SHALL RECORD AN INSTRUMENT WITH THE RECORDER OF DEEDS WHICH WILL ASSURE [illegible] THE PERSON RESPONSIBLE FOR PERFORMING LONG-TERM OPERATION AND MAINTENANCE OF PCSM BMPS MUST HAVE SUFFICIENT ACCESS TO THE PROPERTY TO CONDUCT INSPECTIONS AND MAINTENANCE. THE RECORDED INSTRUMENT MUST IDENTIFY THE PCSM BMP, PROVIDE FOR NECESSARY ACCESS RELATED TO LONG-TERM OPERATION AND MAINTENANCE FOR PCSM BMPS AND PROVIDE NOTICE THAT THE RESPONSIBILITY FOR LONG-TERM OPERATION AND MAINTENANCE OF THE PCSM BMP IS A COVENANT THAT RUNS WITH THE LAND THAT IS BINDING UPON AND ENFORCEABLE BY SUBSEQUENT GRANTEES, AND PROVIDE PROOF OF FILING WITH THE NOTICE OF TERMINATION UNDER § 102.7(B)(5) (RELATING TO PERMIT TERMINATION

THE PERSON RESPONSIBLE FOR PERFORMING LONG-TERM OPERATION AND MAINTENANCE MAY ENTER INTO AN AGREEMENT WITH ANOTHER PERSON INCLUDING A CONSERVATION DISTRICT, NONPROFIT ORGANIZATION, MUNICIPALITY, AUTHORITY, PRIVATE CORPORATION OR OTHER PERSON, TO TRANSFER THE RESPONSIBILITY FOR PCSM BMPS OR TO PERFORM LONG-TERM OPERATION AND MAINTENANCE AND PROVIDE NOTICE THEREOF TO THE DEPARTMENT.

A PERMITTEE OR CO-PERMITTEE THAT FAILS TO TRANSFER LONG-TERM OPERATION AND MAINTENANCE OF THE PCSM BMP OR OTHERWISE FAILS TO COMPLY WITH THIS REQUIREMENT SHALL REMAIN JOINTLY AND SEVERALLY RESPONSIBLE WITH THE LANDOWNER FOR LONG-TERM OPERATION AND MAINTENANCE OF THE PCSM BMPS LOCATED ON THE PROPERTY.

RESPONSIBLE PARTY:
MILEONE FORT WASHINGTON
3301 BRIGGS CHANEY ROAD,
SILVER SPRING, MD 20904
C/O DENNIS TURNBAUGH

LONG-TERM PCSM BMP OPERATION AND MAINTENANCE SCHEDULE

§250-68.D.6.e.4.a

BMP NO.	DESCRIPTION	SCHEDULE	INSPECTION TASK	MAINTENANCE	FAILURE INDICATORS
STORM DRAINAGE SYSTEM	INLETS, MANHOLES, AND STORMWATER PIPING.	EVERY 3 MONTHS	• INSPECT INLETS, MANHOLES, AND STORMWATER PIPING	CLEAR SEDIMENT AND DEBRIS FROM ALL ON-SITE INLETS, MANHOLES, AND STORMWATER PIPING.	EXCESSIVE PONDING AROUND THE INLET GRATES COULD INDICATE THAT THERE MAY BE SEDIMENT/DEBRIS BUILDUP.
SWALES	DRAINAGE CHANNELS THAT CONVEY STORMWATER OVER LAND.	ANNUALLY OR AFTER EACH STORM >3"	• INSPECT FOR EROSION AND/OR SEDIMENT ACCUMULATION	AREAS OF EROSION SHALL BE REGRADED AND STABILIZED AND SEDIMENT MUST BE REMOVED TO RESTORE DESIGN CAPACITIES. ANY REMOVED SEDIMENT SHALL BE DISPOSED OF IN AN APPROVED MANNER AND IN ACCORDANCE WITH APPLICABLE STATE REGULATIONS. ALL AREAS DISTURBED DURING MAINTENANCE MUST BE STABILIZED IMMEDIATELY IN ACCORDANCE WITH THE GENERAL CONSERVATION NOTES AND SPECIFICATIONS.	CHANNEL EROSION OR VEGETATION FAILS TO ESTABLISH OR DIES OFF.
BMP 6.6.3 DRY EXTENDED DETENTION BASIN (SUB-SURFACE EXTENDED DETENTION) (UG2)	SUB-SURFACE EXTENDED DETENTION IS A VARIATION OF A DRY EXTENDED DETENTION BASIN AND A IS SYSTEM OF UNDERGROUND PRE-MANUFACTURED VAULTS, PIPES, OR CHAMBERS PLACED IN AGGREGATE FILLED BED IN THE SOIL MANTLE .	4 TIMES PER YEAR & AFTER EVERY STORM > 1 IN. ANNUALLY	• INSPECT BASIN STRUCTURES INCLUDING BASIN BOTTOMS, OUTLET STRUCTURES, RIP-RAP STRUCTURES, AND INLETS FOR CLOGGING AND EXCESS DEBRIS. • INSPECT BASIN STRUCTURES INCLUDING OUTLET STRUCTURES, RIP-RAP STRUCTURES, AND INLETS FOR DAMAGE.	NEEDED MAINTENANCE SHOULD BE CONDUCTED IMMEDIATELY AFTER EACH INSPECTION. THE LITTER AND SEDIMENT SHALL BE REMOVED IN ACCORDANCE WITH THE CHAMBER OR VAULT MANUFACTURER'S INSTRUCTIONS AND SPECIFICATIONS TO RESTORE DESIGN CAPACITIES. REFERENCE INDIVIDUAL MANUFACTURER'S O&M MANUAL FOR DETAILED PROCEDURES. REMOVED LITTER & SEDIMENT SHALL BE DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.	IF THE UNDERGROUND FACILITY DOES NOT DEWATER WITHIN 72 HOURS. UPON OBSERVING A FAILURE INDICATOR A QUALIFIED INDIVIDUAL SUCH AS AN ENGINEER SHALL BE CONSULTED TO DETERMINE THE EXACT CAUSE OF FAILURE. UPON FURTHER INVESTIGATION PERFORMED BY THE QUALIFIED INDIVIDUAL A CORRECTIVE ACTION PLAN SHALL BE IMPLEMENTED TO RESTORE THE FACILITY TO ITS ORIGINAL DESIGN CAPACITIES.
BMP 6.6.4 WATER QUALITY FILTERS & HYDRODYNAMIC DEVICES	WATER QUALITY FILTERS & HYDRODYNAMIC DEVICES REMOVE POLLUTANTS AND NUTRIENTS THROUGH MECHANICAL FILTERS	PER MANUFACTURER'S RECOMMENDATIONS	• INSPECT FILTRATION MEDIA FOR CLOGGING AND EXCESSIVE DEBRIS BUILDUP	CLEAN AND/OR REPLACE FILTER MEDIA AS SPECIFIED BY THE MANUFACTURER	FAILURE INDICATORS INCLUDE EXCESSIVELY SLOW FLOW RATES THROUGH MEDIA. A QUALIFIED INDIVIDUAL SUCH AS A REPRESENTATIVE FROM THE MANUFACTURER SHALL BE CONTACTED. REMEDIATION SHALL BE IN ACCORDANCE WITH THE QUALIFIED INDIVIDUALS RECOMMENDATIONS BASED ON THEIR INVESTIGATION.
BMP 5.6.3 RE-VEGETATE/ RE-FOREST DISTURBED AREAS		ANNUALLY	- INSPECT FOR DYING/DEAD PLANT MATERIAL - INSPECT FOR INVASIVE SPECIES	REMOVE INVASIVE SPECIES AND DISCARD IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS. ANY PLANT THAT IS FOUND TO BE DEAD OR IS DYING AND CANNOT BE SAVED SHALL BE REPLACED IN KIND.	FAILURE INDICATORS INCLUDE AN EXCESSIVE GROWTH OF INVASIVE SPECIES AND VEGETATION THAT FAILS TO ESTABLISH OR DIES OFF. UPON OBSERVING A FAILURE INDICATOR A QUALIFIED INDIVIDUAL SUCH AS A LANDSCAPE ARCHITECT OR SOIL SCIENTIST/ENGINEER SHALL BE CONSULTED TO DETERMINE THE EXACT CAUSE OF THE FAILURE. REMEDIATION SHALL BE IN ACCORDANCE WITH THE QUALIFIED INDIVIDUALS RECOMMENDATIONS BASED ON THEIR INVESTIGATION.
BMP 6.6.3 SUBSURFACE MRC BASIN (UG1)	UNDERGROUND MRC DETENTION BASINS ARE A VARIATION OF A DRY EXTENDED DETENTION BASIN AND A IS SYSTEM OF UNDERGROUND PRE-MANUFACTURED VAULTS, PIPES, OR CHAMBERS PLACED IN AGGREGATE FILLED BED IN THE SOIL MANTLE INTENDED TO CAPTURE AND TREAT RUNOFF THROUGH ENHANCED RESIDENCE TIME WITH THE SOIL MEDIA AND A MANAGED RELEASE RATE OUT THROUGH THE CONTROL STRUCTURE.	4 TIMES PER YEAR & AFTER EVERY STORM > 0.8 IN. ANNUALLY	• INSPECT BASIN STRUCTURES INCLUDING INSPECTION PORTS, BASIN BOTTOMS, OUTLET STRUCTURES, RIP-RAP STRUCTURES, UNDERDRAINS, AND INLETS FOR CLOGGING AND EXCESS DEBRIS. • INSPECT BASIN STRUCTURES INCLUDING THE INSPECTION PORTS, OUTLET STRUCTURES, RIP-RAP STRUCTURES, UNDERDRAINS, AND INLETS FOR DAMAGE.	NEEDED MAINTENANCE SHOULD BE CONDUCTED IMMEDIATELY AFTER EACH INSPECTION. THE LITTER AND SEDIMENT SHALL BE REMOVED IN ACCORDANCE WITH THE CHAMBER OR VAULT MANUFACTURER'S INSTRUCTIONS AND SPECIFICATIONS T

UNDERGROUND DETENTION BASIN SEQUENCE OF CONSTRUCTION:

1.) THE EXISTING SUBGRADE UNDER THE BED AREAS SHOULD NOT BE COMPACTED OR SUBJECT TO EXCESSIVE CONSTRUCTION EQUIPMENT TRAFFIC PRIOR TO GEOTEXTILE AND STONE BED PLACEMENT.

2.) WHERE EROSION OF SUBGRADE HAS CAUSED ACCUMULATION OF FINE MATERIAL AND/OR SURFACE PONDING, THIS MATERIAL SHOULD BE REMOVED WITH LIGHT EQUIPMENT AND THE UNDERLYING SOILS

3.) INSTALL UPSTREAM AND DOWNSTREAM CONTROL STRUCTURES, CLEANOUTS, PERFORATED PIPING, UNDERDRAINS (NRC BASINS UG1 AND UG2), UPTURNED ELBOWS AND ALL OTHER NECESSARY STORMWATER STRUCTURES. REFER TO THE SUBSURFACE DETENTION BASIN PLANS FOR ELEVATIONS.

4.) GEOTEXTILE, IMPERMEABLE LINER (IF APPLICABLE), AND BED AGGREGATE SHOULD BE PLACED IMMEDIATELY AFTER APPROVAL OF SUBGRADE PREPARATION AND INSTALLATION OF STRUCTURES. STRIPS OF GEOTEXTILE SHOULD OVERLAP A MINIMUM OF 16-INCHES. IT SHOULD BE SECURED AT LEAST 4 FEET OUTSIDE OF BED IN ORDER TO PREVENT ANY RUNOFF OR SEDIMENT FROM ENTERING THE STORAGE BED. THIS EDGE STRIP SHOULD REMAIN IN PLACE UNTIL ALL BARE SOILS CONTIGUOUS TO BEDS ARE STABILIZED AND VEGETATED. AS THE SITE IS FULLY STABILIZED, EXCESS GEOTEXTILE ALONG BED EDGES CAN BE CUT BACK TO THE EDGE OF THE BED.

5.) CLEAN-WASHED, UNIFORMLY GRADED AGGREGATE SHOULD BE PLACED IN THE BED IN MAXIMUM 8-INCH LIFTS. EACH LAYER SHOULD BE LIGHTLY COMPACTED, WITH CONSTRUCTION EQUIPMENT KEPT OFF OF THE BED BOTTOM AS MUCH AS POSSIBLE.

6.)UPON COMPLETION OF BACKFILLED STONE, COMPLETE PLACEMENT OF GEOTEXTILE FABRIC AND BEGIN PAVEMENT SUBBASE INSTALLATION.

7.)DO NOT REMOVE INLET PROTECTION OR OTHER EROSION AND SEDIMENT CONTROL MEASURES UNTIL SITE IS FULLY STABILIZED.

SUBSURFACE DETENTION BASIN INSTALLATION NOTES BMP 6.6.3

2.) ALL SEDIMENT LADEN STORMWATER RUNOFF SHALL BE DIRECTED AROUND THE DETENTION AREA TO THE NEAREST TEMPORARY BMP. WHEN INSPECTION INDICATES THAT SOIL/SEDIMENT HAS ENTERED THE BED, THE AREA SHALL BE FULLY CLEANED AS NECESSARY.

3.) THE SUBSURFACE DETENTION BED SHOULD BE COMPRISED OF A 8 INCH MINIMUM SECTION OF AGGREGATE. AGGREGATE IS TO BE UNIFORMLY GRADED, CLEAN-WASHED, AND CONTAIN AT LEAST 40% VOID SPACE.

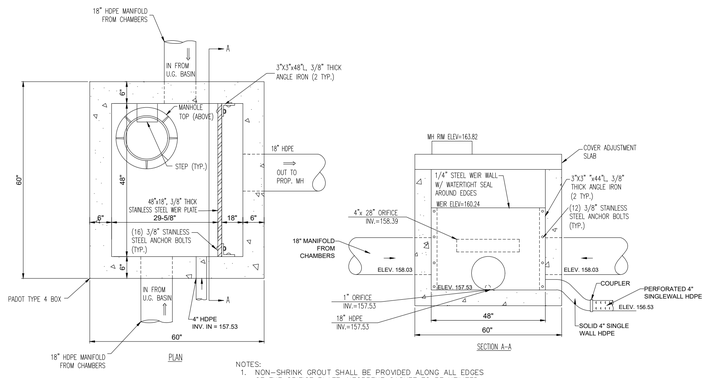
4.) NRC BASIN UG1, NRC BASIN UG2 AND DETENTION BASIN UG3 ARE TO BE LINED WITH AN IMPERMEABLE LINER DUE TO THE PRESENCE OF PERCHED WATER.

5.) FOR BASIN UG3, A 0.50% SLOPE BOTTOM OF STONE IS REQUIRED TO ASSURE NO STANDING WATER, INSTALLED PIPES SHALL BE AT A MINIMUM OF 0.5% TO PROMOTE POSITIVE FLOW.

SUBSURFACE DETENTION BASIN SPECIFICATIONS BMP 6.6.3

UTILIZE A UNIFORMLY GRADED CRUSHED STONE (AASHTO #3), PROVIDED THAT THE STONE IS PROPERLY CLEANED AND THAT A MINIMUM VOID RATIO OF 40% IS PROVIDED. HIGHER VOID RATIOS MAY BE SELECTED BY THE DESIGN ENGINEER, AND IF SO, THE DESIGN VOID RATIO SHALL GOVERN. IN ORDER TO INSURE THAT THE STONE USED IS PROPERLY CLEANED, IN ADDITION TO AASHTO DESIGNATION: M43-88 GRADATION, THE PERCENT PASSING THE NO. 200 SIEVE SHALL NOT EXCEED 0.2%

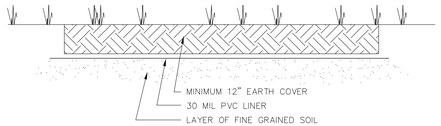
1. A CERTIFICATION FROM THE MANUFACTURER DOCUMENTING THE FULL GRADATION AND VOID RATIO SHALL BE OBTAINED.
2. WHEN IN THE OPINION OF THE TOWNSHIP INSPECTOR OR THE GEOTECHNICAL ENGINEER THE STONE IS NOT CONSISTENT WITH THE APPROVED SAMPLE, IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THE STONE RETESTED AND CERTIFIED BEFORE ANY ADDITIONAL STONE IS INSTALLED OR DELIVERED.
3. ALL STONE SAMPLES AND CERTIFICATIONS SHALL BE SUBMITTED TO THE TOWNSHIP 14 DAYS PRIOR TO THE START OF THE SUBSURFACE DETENTION BED CONSTRUCTION.
4. THE BOTTOM OF THE EXCAVATION SHALL BE SCARIFIED PRIOR TO THE PLACEMENT OF AGGREGATE.
5. ONLY CLEAN AGGREGATE, FREE OF DEBRIS, SHALL BE ALLOWED.
6. THE TOP, SIDES, AND BOTTOM OF THE BEDS SHALL BE COVERED WITH CONTINUOUS 40 MIL NON-REINFORCED PVC SHEETING OR APPROVED EQUIVALENT.
7. CONSTRUCTION OF THE FACILITY SHALL PREVENT SILT FROM CLOGGING THE AGGREGATE BACKFILL.
8. CONTRACTOR TO REVIEW AND IMPLEMENT PIPE BEDDING AND BACKFILL REQUIREMENTS RECOMMENDED BY THE SPECIFIC PIPE MANUFACTURER.
9. THE BEDS SHALL BE BACKFILLED WITH CLEAN WASHED AGGREGATE AND SHALL BE KEPT CLEAN OF SOIL/SEDIMENT DURING THE INSTALLATION PROCESS. IF INSPECTION INDICATES THAT SOIL/SEDIMENT HAS CONTAMINATED THESE ITEMS, THE MATERIALS SHALL BE REPLACED AND/OR CLEANED AS NECESSARY.



NOTES:
1. NON-SHRINK GROUT SHALL BE PROVIDED ALONG ALL EDGES OF THE ORIFICE PLATE. NEOPRENE GASKET TO BE UTILIZED.
2. ALL JOINTS SHALL BE WATERTIGHT.

UNDERGROUND DETENTION BASIN OUTLET STRUCTURE DETAIL UG1 (OCS-103)

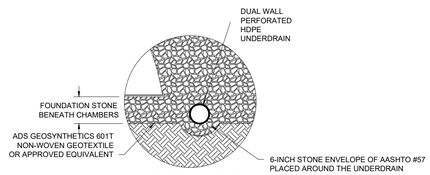
N.T.S.



DETENTION BASIN LINER DETAIL

NO SCALE

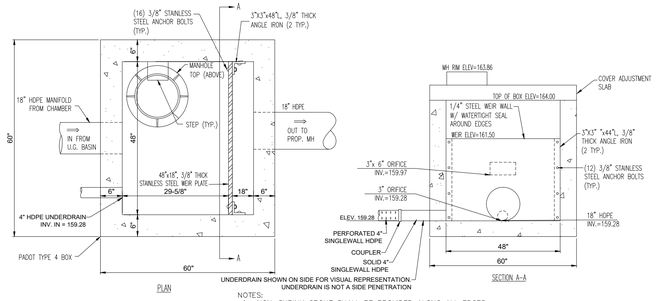
NOTES:
1. PROVIDE A 30 MIL PVC LINER. SPECIFICATIONS ARE TO BE PROVIDED BY THE MANUFACTURER FOR THE BASIN.
2. THE LINER MUST BE PLACED ON A LAYER OF FINE GRAINED SOIL THAT HAS BEEN ROLLED WITH A SMOOTH DRUM ROLLER IN BOTH DIRECTIONS TO PRODUCE A SMOOTH LEVEL BASE FOR THE LINER.
3. THE SOIL MAY NOT CONTAIN SHARP ANGULAR ROCK OR OTHER DEBRIS WHICH COULD PUNCTURE THE LINER, AND MUST MEET ALL MANUFACTURER'S SPECIFICATIONS FOR A LINER BEDDING.
4. ALL VEGETATION, ROOTS AND GRASS MUST BE REMOVED AND ANY CRACKS OR VOIDS SHALL BE FILLED.
5. IF ROCK IS ENCOUNTERED IN THE BEDDING AREA, THIS ROCK MUST BE EXCAVATED TO DEPTH OF 6" BELOW THE LINER AND BACKFILLED WITH A FINE GRAINED SOIL. THIS AREA SHOULD THEN BE COVERED WITH GEOTEXTILE FABRIC EXTENDING 3' BEYOND THE LIMITS OF THE ROCK OUTCROP BEFORE PLACING THE POND LINER.
6. INSTALLATION OF THE LINER MAY ONLY TAKE PLACE WHEN THE AMBIENT TEMPERATURE IS WITHIN THE MANUFACTURER'S RECOMMENDED RANGE.
7. INSTALLATION AND TESTING SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
8. THE NUMBER OF FIELD SEAMS SHALL BE MINIMIZED BY REQUIRING FACTORY FABRICATION OF LARGE PANELS. ANY FIELD SEAMS PERFORMED MUST BE IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
9. ALL STRUCTURES (ie. HEADWALL, PIPES, OUTLET STRUCTURES) WHICH COME IN CONTACT WITH THE LINER MUST HAVE A WATERPROOF SEAL INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
10. A MINIMUM OF 12" OF EARTH COVER SHALL BE PLACED OVER THE LINING.
11. SOIL CONTAINING SHARP JAGGED ROCKS, ROOTS, DEBRIS OR ANY OTHER MATERIAL WHICH MAY PUNCTURE THE LINER SHALL NOT BE USED AS COVER MATERIAL.
12. THE LINER MUST BE INSTALLED TO A MINIMUM HEIGHT OF THE 100 YEAR FLOOD WATER ELEVATION IN THE FACILITY.



UNDERDRAIN DETAIL

NTS

NOTE: UNDERDRAINS SHALL BE EQUIPPED WITH A CLEAN-OUT FOR MAINTENANCE. THE LOCATION AND INSTALLATION OF THE CLEANOUT SHOULD ENSURE THAT SURFACE WATER DOES NOT ENTER THE UNDERDRAIN SYSTEM THROUGH THE TOP OF THE CLEANOUT.

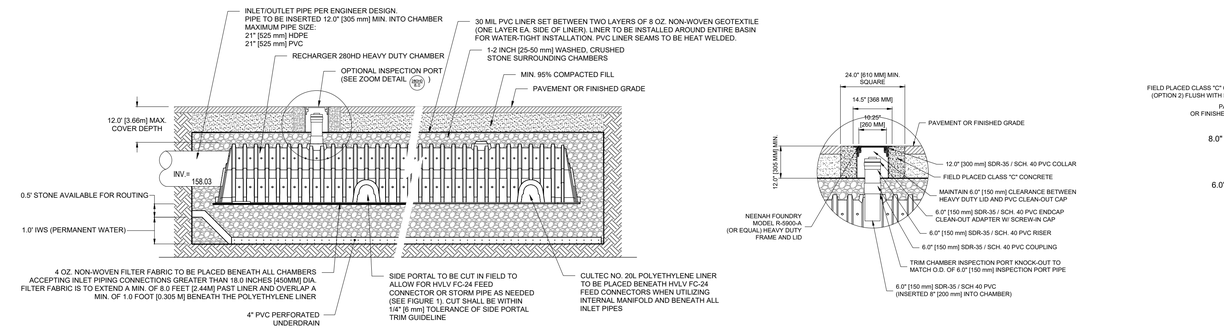


UNDERDRAIN SHOWN ON SIDE FOR VISUAL REPRESENTATION. UNDERDRAIN IS NOT A SIDE PENETRATION

NOTES:
1. NON-SHRINK GROUT SHALL BE PROVIDED ALONG ALL EDGES OF THE ORIFICE PLATE. NEOPRENE GASKET TO BE UTILIZED.
2. ALL JOINTS SHALL BE WATERTIGHT.

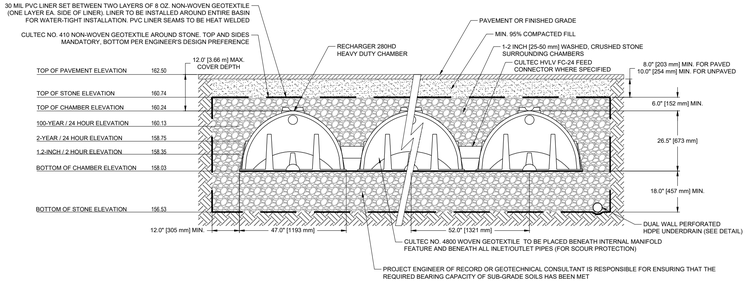
UNDERGROUND DETENTION BASIN OUTLET STRUCTURE DETAIL UG2 (OCS-201)

N.T.S.



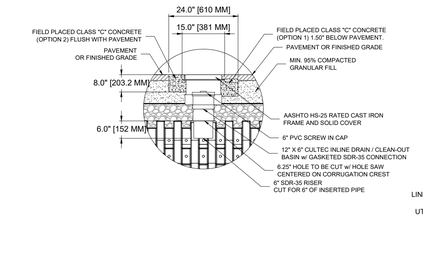
CULTEC INTERNAL MANIFOLD DETAIL (UG1)

N.T.S.



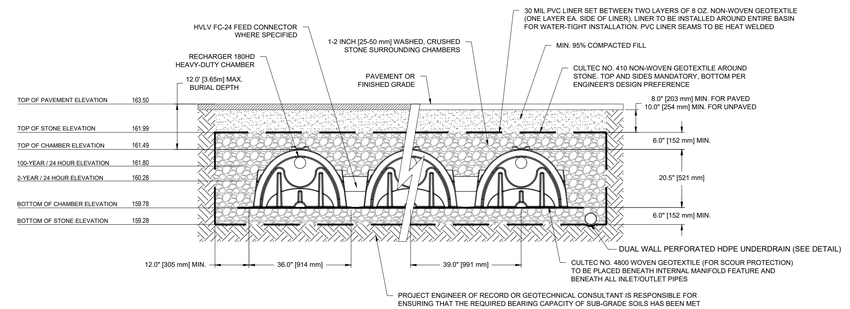
CULTEC RECHARGER 280HD HEAVY DUTY TYPICAL CROSS SECTION (UG1)

N.T.S.



CULTEC INTERNAL MANIFOLD DETAIL (UG2)

N.T.S.



CULTEC RECHARGER 180HD HEAVY DUTY TYPICAL CROSS SECTION (UG2)

N.T.S.

RECORD PLAN 8 OF 11

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-SESC-5A.—LAYOUT: C-609 PCSM DETAILS

RS

BOHLER

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
ARCHITECTURE
LANDSCAPE ARCHITECTURE
PERMITTING SERVICES
TRANSPORTATION SERVICES

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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/3/2025	NPDES MAJOR MODIFICATION	RMS / JAB
2	3/12/2025	FOR NPDES RESUBMISSION	RMS / JAB
3	04/14/2025	PER TOWNSHIP COMMENT	RMS / JAB
4	5/28/2025	PER NPDES COMMENT	RMS / JAB
5	7/22/2025	PER REVISED ARCH	RMS / MRB

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PROJECT No.:	PAB220113.01
DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-SESC-5A

PROJECT:

AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

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SHEET TITLE:

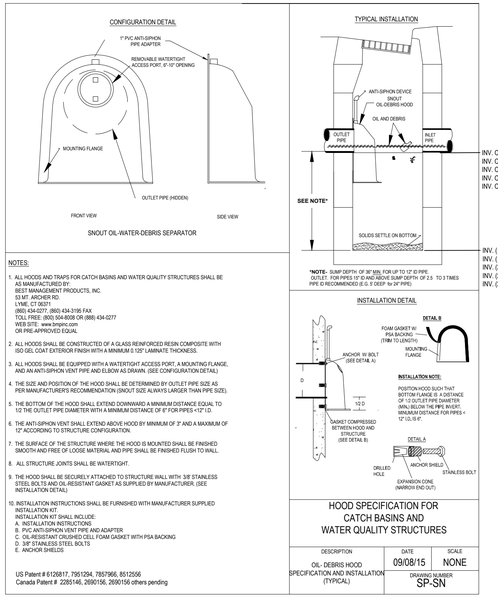
POST CONSTRUCTION STORMWATER MANAGEMENT DETAILS

SHEET NUMBER:

C-609

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REVISION 5 - 7/22/2025



SNOUT OIL-WATER-DEBRIS SEPARATOR

NOTES:

1. ALL HOODS AND TRAPS FOR CATCH BASINS AND WATER QUALITY STRUCTURES SHALL BE AS MANUFACTURED BY:
   BEST MANAGEMENT PRODUCTS, INC.
   53 MT. ARCHER RD.
   LYME, CT 06371
   (860) 434-0277, (860) 434-3196 FAX
   TOLL FREE: (800) 504-8009 OR (888) 434-0277
   WEB SITE: www.bmpinc.com
   OR PRE-APPROVED EQUAL
2. ALL HOODS SHALL BE CONSTRUCTED OF A GLASS REINFORCED RESIN COMPOSITE WITH ISO GEL COAT EXTERIOR FINISH WITH A MINIMUM 0.125" LAMINATE THICKNESS.
3. ALL HOODS SHALL BE EQUIPPED WITH A WATERTIGHT ACCESS PORT, A MOUNTING FLANGE, AND AN ANTI-SIPHON VENT PIPE AND ELBOW AS DRAWN. (SEE CONFIGURATION DETAIL)
4. THE SIZE AND POSITION OF THE HOOD SHALL BE DETERMINED BY OUTLET PIPE SIZE AS PER MANUFACTURER'S RECOMMENDATION (WHICH IS OFTEN ALWAYS LARGER THAN PIPE SIZE).
5. THE BOTTOM OF THE HOOD SHALL EXTEND DOWNWARD A MINIMUM DISTANCE EQUAL TO 1/2 THE OUTLET PIPE DIAMETER WITH A MINIMUM DISTANCE OF 6" FOR PIPES <12" I.D.
6. THE ANTI-SIPHON VENT SHALL EXTEND ABOVE HOOD BY MINIMUM OF 3" AND A MAXIMUM OF 12" ACCORDING TO STRUCTURE CONFIGURATION.
7. THE SURFACE OF THE STRUCTURE WHERE THE HOOD IS MOUNTED SHALL BE FINISHED SMOOTH AND FREE OF LOOSE MATERIAL AND PIPE SHALL BE FINISHED FLUSH TO WALL.
8. ALL STRUCTURE JOINTS SHALL BE WATERTIGHT.
9. THE HOOD SHALL BE SECURELY ATTACHED TO STRUCTURE WALL WITH 3/8" STAINLESS STEEL BOLTS AND OIL-RESISTANT GASKET AS SUPPLIED BY MANUFACTURER. (SEE INSTALLATION DETAIL)
10. INSTALLATION INSTRUCTIONS SHALL BE FURNISHED WITH MANUFACTURER SUPPLIED INSTALLATION KIT.
    INSTALLATION KIT SHALL INCLUDE:
    A. INSTALLATION INSTRUCTIONS
    B. PVC ANTI-SIPHON VENT PIPE AND ADAPTER
    C. OIL-RESISTANT CRUSHED CELL FOAM GASKET WITH PSA BACKING
    D. 3/8" STAINLESS STEEL BOLTS
    E. ANCHOR SHIELDS

US Patent # 6126817, 7951294, 7857966, 8512556
Canada Patent # 2285146, 2690156, 2690156 others pending

HOOD SPECIFICATION FOR CATCH BASINS AND WATER QUALITY STRUCTURES

DESCRIPTION	DATE	SCALE
OIL- DEBRIS HOOD SPECIFICATION AND INSTALLATION (TYPICAL)	09/08/15	NONE
	DRAWING NUMBER	SP-SN

STORM STRUCTURE SCHEDULE

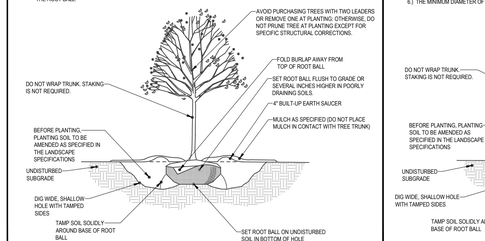
NAME	TYPE	GRT/RIM ELEV. (FT.)	INVERTS
EW 100	ENDWALL	159.73'	INV IN = 156.14' (18" HDPE)
EW 200	ENDWALL	161.40'	INV IN = 158.00' (18" HDPE)
EW 900	NULL STRUCTURE	160.71'	INV IN = 154.85' (98" RCP)
EX-IN	MANHOLE	163.05'	INV OUT = 155.38' (98" RCP)
EX-IN(2)	TYPE 12 MANHOLE	163.02'	INV OUT = 155.38' (98" RCP)
EX-OUT	NULL STRUCTURE	154.82'	INV IN = 154.10' (98" RCP)
IN(119)	CLEANOUT	164.89'	INV IN = 158.32' (12" HDPE) INV OUT = 158.32' (12" HDPE)
IN(122)	CLEANOUT	167.71'	INV IN = 164.71' (8" HDPE) INV OUT = 164.71' (8" HDPE)
IN(123)	CLEANOUT	164.27'	INV IN = 161.60' (8" HDPE) INV OUT = 161.60' (8" HDPE)
IN(124)	CLEANOUT	162.11'	INV IN = 158.83' (8" HDPE) INV OUT = 158.83' (8" HDPE)
IN(126)	CLEANOUT	164.08'	INV IN = 158.62' (8" HDPE) INV OUT = 158.62' (8" HDPE)
IN(127)	CLEANOUT	164.00'	INV IN = 158.99' (8" HDPE) INV OUT = 158.99' (8" HDPE)
IN(128)	CLEANOUT	163.95'	INV IN = 159.01' (8" HDPE) INV OUT = 159.01' (8" HDPE)
INL-212	TYPE C INLET	164.93'	INV IN = 159.47' (15" HDPE) INV OUT = 159.47' (15" HDPE)
INL-213.1	TYPE C INLET	162.66'	INV OUT = 159.89' (15" HDPE)
INL-214	TYPE C INLET	162.82'	INV OUT = 159.90' (15" HDPE)
INL-221	TYPE C INLET	164.29'	INV OUT = 158.30' (15" HDPE)
INL 110	TYPE C INLET	162.50'	INV OUT = 159.25' (18" HDPE)

STORM STRUCTURE SCHEDULE

NAME	TYPE	GRT/RIM ELEV. (FT.)	INVERTS
INL 121	TYPE C INLET	164.19'	INV IN = 158.13' (24" HDPE) INV OUT = 158.13' (24" HDPE)
INL 122	TYPE C INLET	164.94'	INV IN = 158.51' (18" HDPE) INV IN = 158.51' (12" HDPE) INV OUT = 158.51' (24" HDPE)
INL 123	TYPE C INLET	165.11'	INV IN = 159.22' (18" HDPE) INV OUT = 159.22' (18" HDPE)
INL 126	TYPE C INLET	162.75'	INV IN = 159.77' (15" HDPE) INV OUT = 159.77' (18" HDPE)
INL 127	TYPE C INLET	163.09'	INV OUT = 160.01' (15" HDPE)
INL 211	TYPE C INLET	164.75'	INV IN = 158.93' (15" HDPE) INV OUT = 158.83' (15" HDPE)
INL 231	TYPE C INLET	163.16'	INV OUT = 160.00' (15" HDPE)
MH-213	MANHOLE	164.13'	INV IN = 159.72' (15" HDPE) INV IN = 159.72' (15" HDPE) INV OUT = 159.72' (15" HDPE)
MH 101	MANHOLE TYPE 12 MANHOLE	161.33'	INV IN = 156.34' (18" HDPE) INV IN = 158.75' (8" HDPE) INV OUT = 156.34' (18" HDPE)
MH 102	MANHOLE	162.76'	INV IN = 156.78' (18" HDPE) INV OUT = 156.78' (18" HDPE)
MH 120	MANHOLE	163.83'	INV IN = 158.03' (24" HDPE) INV IN = 158.03' (12" HDPE) INV OUT = 158.03' (24" HDPE)
MH 125	MANHOLE	164.39'	INV IN = 159.58' (18" HDPE) INV IN = 162.29' (8" HDPE) INV OUT = 159.58' (18" HDPE)
MH 210	MANHOLE	164.62'	INV IN = 158.78' (15" HDPE) INV OUT = 158.78' (15" HDPE)
MH 230	MANHOLE	163.52'	INV IN = 159.28' (15" HDPE) INV IN = 158.28' (15" HDPE)
MH 901	MANHOLE	165.59'	INV IN = 155.23' (98" RCP) INV OUT = 155.23' (98" RCP)
OCS-103	TYPE M INLET	163.71'	INV OUT = 157.53' (18" HDPE) INV OUT = 158.03' (18" HDPE) INV OUT = 158.03' (18" HDPE)
OCS 201	TYPE M INLET	163.86'	INV IN = 158.28' (15" HDPE) INV OUT = 158.28' (18" HDPE)
RD1	CLEANOUT	168.26'	INV OUT = 158.96' (12" HDPE)

NOTES:

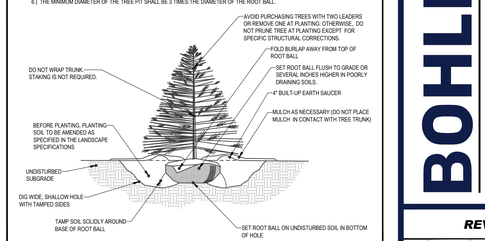
1.) NO SOIL OR MULCH SHALL BE PLACED AGAINST ROOT COLLAR OF PLANT.
2.) REMOVE ALL NON-BIODEGRADABLE MATERIAL AND ROPE FROM TRUNK & TOP OF ROOT BALL. FOLD OR CUT BURLAP BACK FROM TOP 1/3 OF ROOT BALL.
3.) PLANTING DEPTH SHALL BE THE SAME AS GROWN IN NURSERY.
4.) THOROUGHLY SOAK THE TREE ROOT BALL AND ADJACENT PREPARED SOIL SEVERAL TIMES DURING THE FIRST MONTH AFTER PLANTING AND REGULARLY THROUGHOUT THE FOLLOWING TWO SUMMERS.
5.) THE BOTTOM OF PLANTING PIT EXCAVATIONS SHOULD BE SCARIFIED TO AVOID MATTING OF SOIL.
6.) THE MINIMUM DIAMETER OF THE TREE PIT SHALL BE 3 TIMES THE DIAMETER OF THE ROOT BALL.



L-1 ***DECIDUOUS TREE PLANTING DETAIL***
NOT TO SCALE

NOTES:

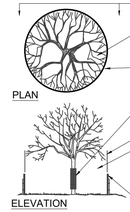
1.) NO SOIL OR MULCH SHALL BE PLACED AGAINST ROOT COLLAR OF PLANT.
2.) REMOVE ALL NON-BIODEGRADABLE MATERIAL AND ROPE FROM TRUNK & TOP OF ROOT BALL. FOLD BURLAP BACK 1/3 FROM ROOT BALL.
3.) PLANTING DEPTH SHALL BE THE SAME AS GROWN IN NURSERY.
4.) THOROUGHLY SOAK THE TREE ROOT BALL AND ADJACENT PREPARED SOIL SEVERAL TIMES DURING THE FIRST MONTH AFTER PLANTING AND REGULARLY THROUGHOUT THE FOLLOWING TWO SUMMERS.
5.) THE BOTTOM OF PLANTING PIT EXCAVATIONS SHOULD BE SCARIFIED TO AVOID MATTING OF SOIL.
6.) THE MINIMUM DIAMETER OF THE TREE PIT SHALL BE 3 TIMES THE DIAMETER OF THE ROOT BALL.



L-2 ***EVERGREEN TREE PLANTING DETAIL***
NOT TO SCALE

PLANT SCHEDULE

CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER
CANOPY TREES					
AROG	1	ACER RUBRUM `OCTOBER GLORY`	OCTOBER GLORY RED MAPLE	3" CAL. MIN.	B&B
CCA	19	CARPINUS CAROLINIANA	AMERICAN HORNBEAM	3" CAL. MIN.	B&B
GTIK	6	GLEDITSIA TRIACANTHOS INERMIS `SKYCOLE`	SKYLINE THORNLESS HONEY LOCUST	3" CAL. MIN.	B&B
LSR	2	LIQUIDAMBAR STYRACIFLUA `ROTUNDILOBA`	ROUND-LOBED SEEDLESS SWEET GUM	3" CAL. MIN.	B&B
NS	8	NYSSA SYLVATICA	SOUR GUM	3" CAL. MIN.	B&B
OV	19	OSTRYA VIRGINIANA	AMERICAN HOPHORNBEAM	3" CAL. MIN.	B&B
PXAB	3	PLATANUS X ACERIFOLIA `BLOODGOOD`	LONDON PLANE TREE	3" CAL. MIN.	B&B
TG	3	TILIA CORDATA `GREENSPIRE`	GREENSPIRE LITTLELEAF LINDEN	3" CAL. MIN.	B&B
EVERGREEN TREES					
TOG	15	THUJA OCCIDENTALIS `GREEN GIANT`	GREEN GIANT ARBORVITAE	6-8`	B&B
ORNAMENTAL TREES					
AGB	8	AMELANCHIER X GRANDIFLORA `AUTUMN BRILLIANCE`	AUTUMN BRILLIANCE SERVICEBERRY	2-2 1/2" CAL.	B&B
UNDERSTORY TREES					
AC	8	AMELANCHIER CANADENSIS	SHADBLOW SERVICEBERRY	1" CAL.	B&B
CF	10	CERCIS CANADENSIS `FOREST PANSY`	FOREST PANSY EASTERN REDBUD	1" CAL.	B&B
CK	4	CLADRASTIS KENTUKEA	AMERICAN YELLOWWOOD	1" CAL.	B&B
MV	6	MAGNOLIA VIRGINIANA	SWEET BAY	1" CAL.	B&B
SHRUBS					
CAH	40	CLETHRA ALNIFOLIA `HUMMINGBIRD`	HUMMINGBIRD SUMMERSWEET (DWARF)	24-30"	CONTAINER
CSK	90	CORNUS SERICEA `KELSEYI`	KELSEYI DOGWOOD	15-18"	CONTAINER
DGN	18	DEUTZIA GRACILIS `NIKKO`	SLENDER DEUTZIA	18-24"	CONTAINER
IGS	50	ILEX GLABRA `SHAMROCK`	SHAMROCK INKBERRY	24-30"	CONTAINER
IMBB	2	ILEX X MESERVEAE `BLUE BOY`	BLUE BOY HOLLY	24-30"	CONTAINER
IMBG	21	ILEX X MESERVEAE `BLUE GIRL`	BLUE GIRL HOLLY	24-30"	CONTAINER
IMDL	7	ILEX AQUIPERNYI `MESCHICK`	DRAGON LADY HOLLY	3-4`	CONTAINER
IV	45	ITEA VIRGINICA `HENRY`S GARNET`	HENRY`S GARNET SWEETSPIRE	24-30"	CONTAINER
JHB	82	JUNIPERUS HORIZONTALIS `MONBER`	ICEE BLUE JUNIPER	15-18" SPRD	CONTAINER
RAG	42	RHUS AROMATICA `GRO-LOW`	GRO-LOW FRAGRANT SUMAC	15-18"	CONTAINER
VR	9	VIBURNUM RHYTIDOPHYLLUM	LEATHERLEAF VIBURNUM	3-4`	B&B
GRASSES					
PVN	56	PANICUM VIRGATUM `NORTH WIND`	NORTHWIND SWITCH GRASS	1 GAL.	CONTAINER
SSO	20	SCHIZACHYRIUM SCOPARIUM `STANDING OVATION`	STANDING OVATION LITTLE BLUESTEM GRASS	1 GAL.	CONTAINER



NOTES:

1.) THE PROTECTIVE FENCING SHALL BE INSTALLED WITH CARE TO AVOID ROOTS AND PLACED ENCOMPASSING THE ENTIRE ROOT PROTECTION ZONE OF INDIVIDUAL OR GROUPS OF CONTIGUOUS TREES. FENCING SHALL BE INSTALLED PRIOR TO ANY WORK BEING CONDUCTED, E.G., GRUBBING, EXCAVATION, GRADING, TRENCHING, CLEANING, OR INSTALLATION OF SILT FENCING. THE PROTECTIVE FENCING SHALL BE MAINTAINED THROUGHOUT THE ENTIRE PERIOD OF CONSTRUCTION.
2.) NO FUEL STORAGE, REFUELING OR MAINTENANCE OF EQUIPMENT, OR WASH-DOWN OF CEMENT HANDLING EQUIPMENT SHALL BE PERMITTED WITHIN 100 FEET OF ANY TREE TO BE PRESERVED.
3.) ANY DAMAGE TO THE FENCING OR ENCROACHMENT ON THE PROTECTED AREAS SHALL BE REMEDIED IMMEDIATELY. ANY OBSERVED DAMAGE TO THE TREES SHALL BE IMMEDIATELY REPORTED TO THE TOWNSHIP AND REMEDIED AS SOON AS IS PRACTICABLE. AT THE DISCRETION OF THE SHADE TREE COMMISSION, PRESERVED TREES THAT HAVE NOT BEEN ADEQUATELY PROTECTED OR HAVE BEEN DAMAGED MAY BE REQUIRED TO BE REMOVED AND REPLACED AT THE EXPENSE OF THE APPLICANT.

X-11 ***TREE PROTECTION DURING SITE CONSTRUCTION***
NOT TO SCALE

STORM SEWER PIPE SCHEDULE

FROM	TO	SIZE (IN.)	TYPE	LENGTH (FT.)	SLOPE(%)
EW 100	MH 101	18"	HDPE	39	0.51%
EW 200	OCS 201	18"	HDPE	55	0.51%
EW 900	MH 901	98"	RCP	263	0.14%
EX-IN	EX-OUT	98"	RCP	413	0.31%
IN(119)	RD2	12"	HDPE	7	0.50%
IN(122)	MH 125	6"	HDPE	96	2.51%
IN(123)	IN(124)	8"	HDPE	76	3.66%
IN(124)	MH 101	8"	HDPE	15	0.50%
IN(126)	RD3-CO1	8"	HDPE	34	0.50%
IN(127)	IN(126)	8"	HDPE	74	0.50%
IN(128)	IN(127)	8"	HDPE	5	0.50%
INL-212	MH-213	15"	HDPE	49	0.50%
INL 121	INL 122	24"	HDPE	75	0.50%
INL 122	RD1	12"	HDPE	90	0.50%
INL 122	INL 123	18"	HDPE	140	0.50%
INL 123	MH 125	18"	HDPE	71	0.51%
INL 126	INL 127	15"	HDPE	47	0.51%
INL 211	INL-212	15"	HDPE	108	0.50%
MH-213	INL-214	15"	HDPE	37	0.50%
MH-213	INL-213.1	15"	HDPE	33	0.51%

STORM SEWER PIPE SCHEDULE

FROM	TO	SIZE (IN.)	TYPE	LENGTH (FT.)	SLOPE(%)
MH 101	MH 102	18"	HDPE	87	0.51%
MH 102	OCS-103	18"	HDPE	150	0.50%
MH 120	UG1 (120)	24"	HDPE	4	0.00%
MH 120	RD2(2)	12"	HDPE	38	0.50%
MH 120	INL 121	24"	HDPE	19	0.52%
MH 125	INL 126	18"	HDPE	37	0.51%
MH 210	INL 211	15"	HDPE	10	0.50%
MH 230	UG2 (230)	15"	HDPE	3	0.00%
MH 230	INL 231	15"	HDPE	21	0.38%
MH 901	EX-IN(2)	98"	RCP	100	0.15%
OCS-103	UG1 (103b)	18"	HDPE	11	0.00%
OCS-103	UG1 (103a)	18"	HDPE	11	0.00%
OCS 201	UG2 (201)	15"	HDPE	3	0.00%
RD2(2)	IN(119)	12"	HDPE	20	0.50%
RD3	IN(128)	8"	HDPE	3	1.31%
RD4	IN(122)	6"	HDPE	11	1.50%
RD5	IN(123)	8"	HDPE	35	3.62%
UG1 (110)	INL 110	18"	HDPE	9	13.82%
UG1 (RD3)	RD3-CO1	8"	HDPE	17	0.50%
UG2 (210)	MH 210	15"	HDPE	3	0.00%

SNOUT STRUCTURE LOCATION & SPECIFICATIONS	
INLET	SNOUT SIZE
110	24F
121	18F
211	18F
221	24F
231	18F

US PATENT #6126817 ADDITIONAL PATENTS PENDING

BMP, INC.
53 MT. ARCHER ROAD, LYME, CT. 06371
(800) 504-8008 FAX: (860)434-3195

DESCRIPTION	DATE	SCALE
24F SNOUT OIL & DEBRIS STOP	09/20/99	NONE
	DRAWING NUMBER	24F

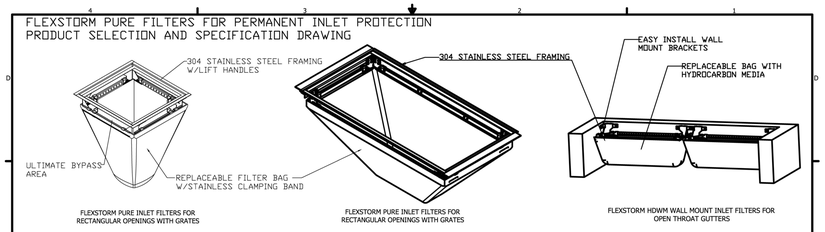
US PATENT #6126817 ADDITIONAL PATENTS PENDING

BMP, INC.
53 MT. ARCHER ROAD, LYME, CT. 06371
(800) 504-8008 FAX: (860)434-3195

DESCRIPTION	DATE	SCALE
18F SNOUT OIL & DEBRIS STOP	09/14/99	NONE
	DRAWING NUMBER	18F

FLEXSTORM WQ INLET INSERT SCHEDULE		
INLET	FLOW RATE TO INLET (CFS)	APPROVED FLOW RATE (CFS
110	1.73	2.2
120	0.44	2.2

FLEXSTORM PURE FILTERS FOR PERMANENT INLET PROTECTION
PRODUCT SELECTION AND SPECIFICATION DRAWING



FLEXSTORM PURE FILTERS FOR RECTANGULAR OPENINGS WITH GRATES

FLEXSTORM PURE INLET FILTERS FOR RECTANGULAR OPENINGS WITH GRATES

FLEXSTORM HDWM WALL MOUNT INLET FILTERS FOR OPEN THROAT GUTTERS

Product selection for FLEXSTORM PURE Filters (Permanent Inlet Protection)

Descrip	Inlet Type	Grate Size	Opening Size	Bag Cap (ft³)	Flow Ratings (CFS) FX/FX+	PC/PC+	Bypass	FX	FX+	PC	PC+
2' x 2' Frame and Grate	Square/Rect (SQ)	24 x 24	22 x 22	3.3	1.8	1.6	4.8	62MHD22FX	62MHD22FXP	62MHD22PC	62MHD22PCP
2' x 4' Penndot Type M & C	Square/Rect (SQ)	26.5 x 48	24 x 44.5	6.3	3.1	2.2	9.5	62PENNMHDFX	62PENNMHDFXP	62PENNMHDPC	62PENNMHDPCP
2' x 6' Frame and Grate	Concrete Box (HD4)	26.5 x 75	24 x 72	10.0	4.8	4.1	13.0	62PENNHD2x6FX	62PENNHD2x6FXP	62PENNHD2x6PC	62PENNHF2x6PCP
3 x 3 Frame and Grate	Square/Rect (SQ)	37.5 x 37.5	36 x 36	7.2	4.4	3.2	9.6	62HDXLFX	62HDXLFXP	62HDXLPC	62HDXLPCP
48" Open Throat Curb Inlet	Wall Mount (WM)	N/A	48	3.3	2.5	4.2	N/A*	62HDWM48FX	62HDWM48FXP	62HDWM48PC	62HDWM48PCP

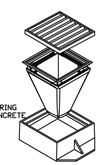
*FLOW RATINGS SHOWN ARE 50% MAXIMUM

NOTES:

1. ALL FRAMING IS CONSTRUCTED OF 304 STAINLESS STEEL FOR 25 YEAR SERVICE LIFE RATING
2. TOTAL BYPASS CAPACITY WILL VARY WITH EACH SIZED DRAINAGE STRUCTURE. FLEXSTORM DESIGNS FRAMING BYPASS TO MEET OR EXCEED THE DESIGN FLOW OF THE PARTICULAR DRAINAGE STRUCTURE.
3. UPON ORDERING ADS P/N CONFIRMATION OF THE DOT CALLOUT, FLEXSTORM ITEM CODE, CASTING MAKE AND MODEL, OR DETAILED DIMENSIONAL FORMS MUST BE PROVIDED.
4. FOR WRITTEN SPECIFICATIONS AND MAINTENANCE GUIDELINES VISIT WWW.INLETFILTERS.COM

INSTALLATION:

1. REMOVE GRATE
2. DROP FLEXSTORM INLET FILTER ONTO LOAD BEARING LIP OF CASTING OR CONCRETE STRUCTURE
3. REPLACE GRATE



DRAWN	cbjar0	1/12/2016	
CHECKED			TITLE
QA			
MFG			
APPROVED			
		SIZE: C	DWG NO: Penndot pure for submittal
		SCALE:	SHEET 1 OF 1

REV

RECORD PLAN 9 OF 11

BOHLER
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
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REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/3/2025	NPDES MAJOR MODIFICATION	RMS / JAB
2	3/12/2025	FOR NPDES RESUBMISSION	RMS / JAB
3	04/14/2025	PER TOWNSHIP COMMENT	RMS / JAB
4	5/28/2025	PER NPDES COMMENT	RMS / JAB
5	7/22/2025	PER REVISED ARCH	RMS / MRB

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PROJECT No.: PAB220113.01
DRAWN BY: RMS
CHECKED BY: JAB
DATE: 10/24/2024
CAD I.D.: PAB220113.01-SESC-5A

PROJECT:
AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS
FOR
MILEONE FORT WASHINGTON, LLC
BMW AUTOMOTIVE DEALERSHIP EXPANSION
500 PENNSYLVANIA AVENUE WHITEMARSH TOWNSHIP MONTGOMERY COUNTY, PA

BOHLER
74 W BROAD STREET, SUITE 500
BETHLEHEM, PA 18018
Phone: (610) 709-9971
Fax: (610) 709-9976
www.BohlerEngineering.com

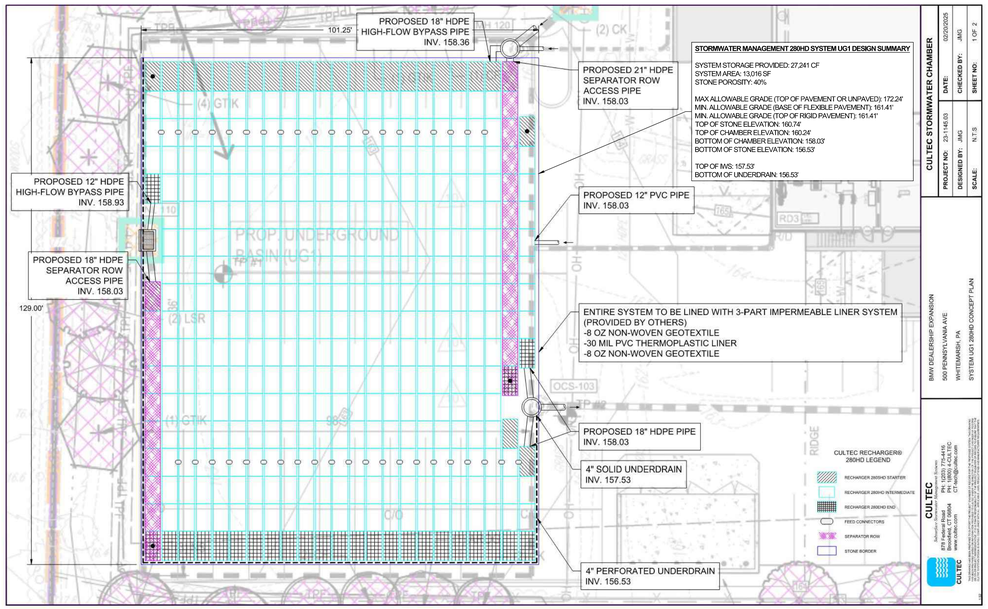
J.A. BEAVAN
COMMONWEALTH OF PENNSYLVANIA
PROFESSIONAL
JEFFREY A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE042008
NJ/DE COA#GA LICENSE No. 24GA28043900

SHEET TITLE:
POST CONSTRUCTION STORMWATER MANAGEMENT DETAILS

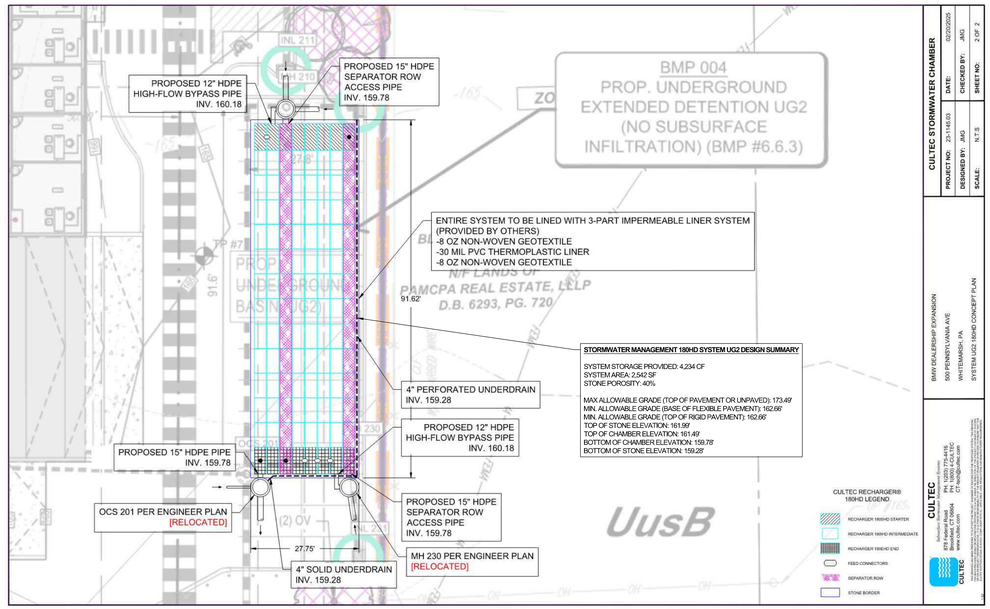
SHEET NUMBER:
C-610
Page 21 of 36

REVISION 5 - 7/22/2025

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-SESC-5A---LAYOUT C-610 PCSM DETAILS
RS



UG BASIN 1 - REFER TO MANUFACTURER DETAILS



UG BASIN 2 - REFER TO MANUFACTURER DETAILS

Outflow Calculations from Perforated Pipe

Project Name: BMW Automotive Dealership Expansion — UG1
Date Prepared: 7/22/2024
Prepared By: RMS/JAB
Prepared For: MileOne Fort Washington

183 LF * 0.1327 = 24.28 cfs capacity

Height of Water[1] (top of pipe to water surface): 15.36 in — Based on 2-year WSE
Orifice Coefficient, Cd: 0.56

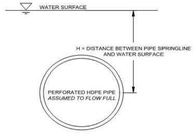
Pipe Diam (in)	Perforation Type	Inlet Area/Foot (ACTUAL Min., in²/ft)	Flow/Perf ft³/sec	Flow/Perf gal/min	Flow/FT ft³/sec	Flow/FT gal/min	
4	slotted	3.5	0.0024	1.09	0.1327	59.55	Acceptable Pipe
6	slotted	3.1	0.0026	1.15	0.1198	53.79	
8	slotted	3.4	0.0036	1.60	0.1338	60.05	
10	slotted	2.5	0.0035	1.59	0.1014	45.51	
12	drilled	2.5	0.0029	1.32	0.1060	47.55	
15	drilled	2.0	0.0030	1.37	0.0846	37.99	
18	drilled	2.0	0.0031	1.41	0.0877	39.37	
24	drilled	2.2	0.0033	1.50	0.1015	45.56	
30	drilled	3.5	0.0037	1.68	0.1746	78.37	
36	drilled	2.9	0.0042	1.88	0.1530	68.69	
42	drilled	2.6	0.0038	1.72	0.1421	63.76	
48	drilled	2.9	0.0045	2.04	0.1662	74.61	
60	drilled	2.6	0.0049	2.19	0.1562	70.09	

Pipe Diam (in)	Perforation Type	Inlet Area/Foot (ACTUAL Min., in²/ft)	Flow/Perf ft³/sec	Flow/Perf gal/min	Flow/FT ft³/sec	Flow/FT gal/min	
4	slotted	1.6	0.0008	0.36	0.0587	26.34	Acceptable Pipe
6	slotted	1.3	0.0008	0.37	0.0517	23.22	
8	slotted	2.2	0.0009	0.38	0.0852	38.25	
10	slotted	1.6	0.0009	0.39	0.0666	29.89	
12	drilled	2.5	0.0020	0.92	0.1022	45.87	
15	drilled	2.9	0.0033	1.49	0.1228	55.14	
18	drilled	2.8	0.0034	1.54	0.1226	55.01	
24	drilled	3.4	0.0052	2.34	0.1586	71.19	
30	drilled	2.6	0.0055	2.46	0.1277	57.34	
36*	drilled	2.2	0.0057	2.58	0.1157	51.91	
42*	drilled	2.2	0.0060	2.69	0.1206	54.13	
48*	drilled	2.2	0.0062	2.80	0.1253	56.22	
60*	drilled	2.0	0.0067	3.01	0.1216	54.59	

* *Based on Hi-profile pipe*

Notes
1 - Calculations assume the pipe is flowing full. User input is measured from top of pipe to water surface. The height of water, H, is then calculated to be 1/2*Pipe ID plus the distance between top of pipe and water surface (user-entered value). Enter 0 if the water surface is not above the top of pipe. Calculations represent free-flow conditions and do not account for any backfill material.
2 - Based on Class 2 perforation patterns
3 - Refer to Internal Product Note 1.01 - *Perforation Patterns* for perforation data

$$Q_p = C_d A \sqrt{2gH}$$



Qp = Free outfall flow rate (ft³/sec)
C_d = Coefficient of discharge, 0.56 recommended
A = Cross-sectional area of perforations per foot (ft²/ft)
g = Gravimetric constant, 32.2 ft/sec²
H = Height of water above pipe springline, head (ft)

UNDERDRAIN PERFORATION FLOW RATES

RECORD PLAN 10 OF 11

BOHLER

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PROJECT:
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FOR
MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

500 PENNSYLVANIA AVENUE
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PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE036005
NEW JERSEY LICENSE No. GE49503/36600

SHEET TITLE:
POST CONSTRUCTION STORMWATER MANAGEMENT DETAILS

SHEET NUMBER:
C-611
Page 22 of 36

REVISION 5 - 7/22/2025

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-SESC-5A-----LAYOUT: C-611 PCSM DETAILS
RS

LOCATION MAP

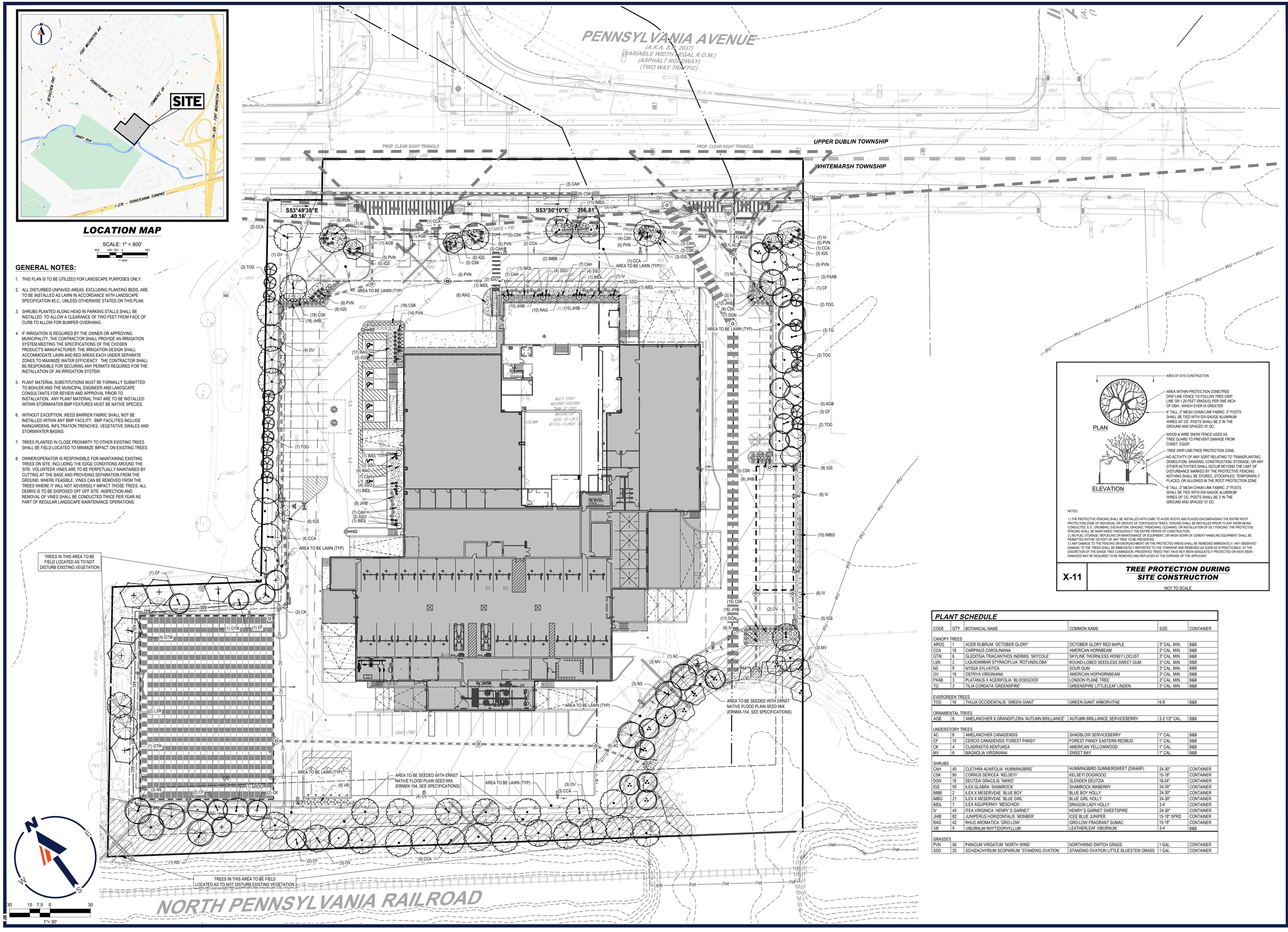
SCALE: 1" = 800'

800 400 200 0 800

1"=800'

GENERAL NOTES:

1. THIS PLAN IS TO BE UTILIZED FOR LANDSCAPE PURPOSES ONLY.
2. ALL DISTURBED UNPAVED AREAS, EXCLUDING PLANTING BEDS, ARE TO BE INSTALLED AS LAWN IN ACCORDANCE WITH LANDSCAPE SPECIFICATION #2.C., UNLESS OTHERWISE STATED ON THIS PLAN.
3. SHRUBS PLANTED ALONG HEAD-IN PARKING STALLS SHALL BE INSTALLED TO ALLOW A CLEARANCE OF TWO FEET FROM FACE OF CURB TO ALLOW FOR BUMPER OVERHANG.
4. IF IRRIGATION IS REQUIRED BY THE OWNER OR APPROVING MUNICIPALITY, THE CONTRACTOR SHALL PROVIDE AN IRRIGATION SYSTEM MEETING THE SPECIFICATIONS OF THE CHOSEN PRODUCT'S MANUFACTURER. THE IRRIGATION DESIGN SHALL ACCOMMODATE LAWN AND BED AREAS EACH UNDER SEPARATE ZONES TO MAXIMIZE WATER EFFICIENCY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING ANY PERMITS REQUIRED FOR THE INSTALLATION OF AN IRRIGATION SYSTEM.
5. PLANT MATERIAL SUBSTITUTIONS MUST BE FORMALLY SUBMITTED TO BOHLER AND THE MUNICIPAL ENGINEER AND LANDSCAPE CONSULTANTS FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION. ANY PLANT MATERIAL THAT ARE TO BE INSTALLED WITHIN STORMWATER BMP FEATURES MUST BE NATIVE SPECIES.
6. WITHOUT EXCEPTION, WEED BARRIER FABRIC SHALL NOT BE INSTALLED WITHIN ANY BMP FACILITY. BMP FACILITIES INCLUDE RAINGARDENS, INFILTRATION TRENCHES, VEGETATIVE SWALES AND STORMWATER BASINS.
7. TREES PLANTED IN CLOSE PROXIMITY TO OTHER EXISTING TREES SHALL BE FIELD LOCATED TO MINIMIZE IMPACT ON EXISTING TREES.
8. OWNER/OPERATOR IS RESPONSIBLE FOR MAINTAINING EXISTING TREES ON SITE, INCLUDING THE EDGE CONDITIONS AROUND THE SITE. VOLUNTEER VINES ARE TO BE PERPETUALLY MAINTAINED BY CUTTING AT THE BASE AND PROVIDING SEPARATION FROM THE GROUND. WHERE FEASIBLE, VINES CAN BE REMOVED FROM THE TREES WHERE IT WILL NOT ADVERSELY IMPACT THOSE TREES. ALL DEBRIS IS TO BE DISPOSED OFF OFF SITE. INSPECTION AND REMOVAL OF VINES SHALL BE CONDUCTED TWICE PER YEAR AS PART OF REGULAR LANDSCAPE MAINTENANCE OPERATIONS.



NOTES:

1.) THE PROTECTIVE FENCING SHALL BE INSTALLED WITH CARE TO AVOID ROOTS AND PLACED ENCOMPASSING THE ENTIRE ROOT PROTECTION ZONE OF INDIVIDUAL OR GROUPS OF CONTIGUOUS TREES. FENCING SHALL BE INSTALLED PRIOR TO ANY WORK BEING CONDUCTED, E.G., GRUBBING, EXCAVATION, GRADING, TRENCHING, CLEARING, OR INSTALLATION OF SILT FENCING. THE PROTECTIVE FENCING SHALL BE MAINTAINED THROUGHOUT THE ENTIRE PERIOD OF CONSTRUCTION.
2.) NO FUEL STORAGE, REFUELING OR MAINTENANCE OF EQUIPMENT, OR WASH DOWN OF CEMENT HANDLING EQUIPMENT SHALL BE PERMITTED WITHIN 100 FEET OF ANY TREE TO BE PRESERVED.
3.) ANY DAMAGE TO THE FENCING OR ENCROACHMENT ON THE PROTECTED AREAS SHALL BE REMEDIED IMMEDIATELY. ANY OBSERVED DAMAGE TO THE TREES SHALL BE IMMEDIATELY REPORTED TO THE TOWNSHIP AND REMEDIED AS SOON AS IS PRACTICABLE. AT THE DISCRETION OF THE SHADE TREE COMMISSION, PRESERVED TREES THAT HAVE NOT BEEN ADEQUATELY PROTECTED OR HAVE BEEN DAMAGED MAY BE REQUIRED TO BE REMOVED AND REPLACED AT THE EXPENSE OF THE APPLICANT.

X-11 — ***TREE PROTECTION DURING SITE CONSTRUCTION***

NOT TO SCALE

PLANT SCHEDULE

CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER
CANOPY TREES					
AROG	1	ACER RUBRUM 'OCTOBER GLORY'	OCTOBER GLORY RED MAPLE	3" CAL. MIN.	B&B
CCA	19	CARPINUS CAROLINIANA	AMERICAN HORNBEAM	3" CAL. MIN.	B&B
GTIK	6	GLEDITSIA TRIACANTHOS INERMIS 'SKYCOLE'	SKYLINE THORNLESS HONEY LOCUST	3" CAL. MIN.	B&B
LSR	2	LIQUIDAMBAR STYRACIFLUA 'ROTUNDILOBA'	ROUND-LOBED SEEDLESS SWEET GUM	3" CAL. MIN.	B&B
NS	8	NYSSA SYLVATICA	SOUR GUM	3" CAL. MIN.	B&B
OV	19	OSTRYA VIRGINIANA	AMERICAN HOPHORNBEAM	3" CAL. MIN.	B&B
PXAB	3	PLATANUS X ACERIFOLIA 'BLOODGOOD'	LONDON PLANE TREE	3" CAL. MIN.	B&B
TG	3	TILIA CORDATA 'GREENSPIRE'	GREENSPIRE LITTLELEAF LINDEN	3" CAL. MIN.	B&B
EVERGREEN TREES					
TOG	16	THUJA OCCIDENTALIS 'GREEN GIANT'	GREEN GIANT ARBORVITAE	6-8'	B&B
ORNAMENTAL TREES					
AGB	8	AMELANCHIER X GRANDIFLORA 'AUTUMN BRILLIANCE'	AUTUMN BRILLIANCE SERVICEBERRY	2-2 1/2" CAL.	B&B
UNDERSTORY TREES					
AC	8	AMELANCHIER CANADENSIS	SHADBLOW SERVICEBERRY	1" CAL.	B&B
CF	10	CERCIS CANADENSIS 'FOREST PANSY'	FOREST PANSY EASTERN REDBUD	1" CAL.	B&B
OK	4	CLADRASTIS KENTUKEA	AMERICAN YELLOWWOOD	1" CAL.	B&B
MV	6	MAGNOLIA VIRGINIANA	SWEET BAY	1" CAL.	B&B
SHRUBS					
CAH	40	CLETHRA ALNIFOLIA 'HUMMINGBIRD'	HUMMINGBIRD SUMMERSWEET (DWARF)	24-30"	CONTAINER
CSK	90	CORNUS SERICEA 'KELSEYI'	KELSEYI DOGWOOD	15-18"	CONTAINER
DGN	18	DEUTZIA GRACILIS 'NIKKO'	SLENDER DEUTZIA	18-24"	CONTAINER
IGS	50	ILEX GLABRA 'SHAMROCK'	SHAMROCK INKBERRY	24-30"	CONTAINER
IMBB	2	ILEX X MESERVEAE 'BLUE BOY'	BLUE BOY HOLLY	24-30"	CONTAINER
IMBG	21	ILEX X MESERVEAE 'BLUE GIRL'	BLUE GIRL HOLLY	24-30"	CONTAINER
IMDL	7	ILEX AQUIPERNYI 'MESCHICK'	DRAGON LADY HOLLY	3-4'	CONTAINER
IV	45	ITEA VIRGINICA 'HENRY`S GARNET'	HENRY`S GARNET SWEETSPIRE	24-30"	CONTAINER
JHIB	82	JUNIPERUS HORIZONTALIS 'MONBER'	ICEE BLUE JUNIPER	15-18" SPRD	CONTAINER
RAG	42	RHUS AROMATICA 'GRO-LOW'	GRO-LOW FRAGRANT SUMAC	15-18"	CONTAINER
VR	9	VIBURNUM RHYTIDOPHYLLUM	LEATHERLEAF VIBURNUM	3-4'	B&B
GRASSES					
PVN	56	PANICUM VIRGATUM 'NORTH WIND'	NORTHWIND SWITCH GRASS	1 GAL.	CONTAINER
SSO	20	SCHIZACHYRIUM SCOPARIUM 'STANDING OVATION'	STANDING OVATION LITTLE BLUESTEM GRASS	1 GAL.	CONTAINER

BOHLER

SITE CIVIL AND CONSULTING ENGINEERING
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PROJECT No.:	PAB220113.01
DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-LLGT-5A

PROJECT:

AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

500 PENNSYLVANIA AVENUE WHITEMARSH TOWNSHIP MONTGOMERY COUNTY, PA

BOHLER

74 W BROAD STREET, SUITE 500
BETHLEHEM, PA 18018
Phone: (610) 709-9971
Fax: (610) 709-9976
www.BohlerEngineering.com

D.T. NORTH — Signature — Registration — Commonwealth of Pennsylvania — Licensed Landscape Architect

REGISTERED LANDSCAPE ARCHITECT
PENNSYLVANIA LICENSE No. LA002729

SHEET TITLE:

LANDSCAPE PLAN

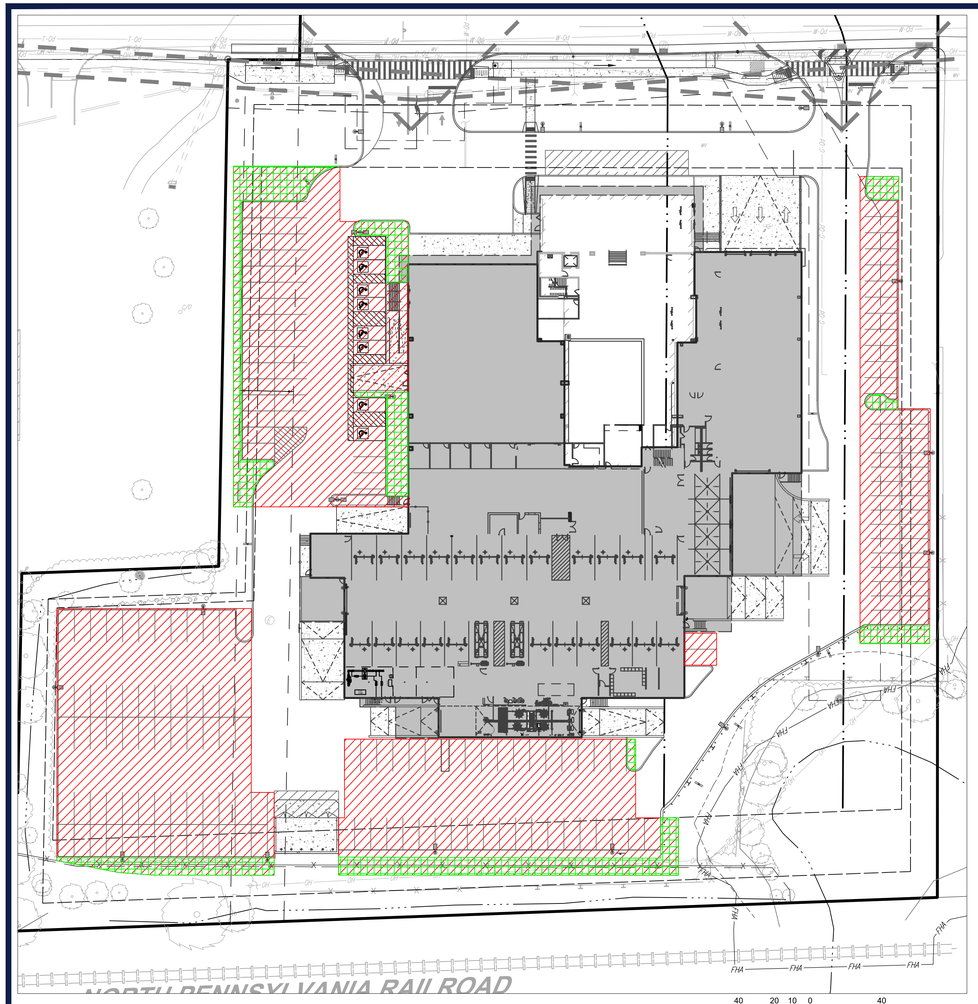
SHEET NUMBER:

C-701

Page 23 of 36

REVISION 5 - 7/22/2025

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-LLGT-5A—LAYOUT C-701 LSCP



PARKING LOT LANDSCAPE REQUIREMENT

TOTAL OPEN AIR PARKING AREA
(55,510± SF)

TOTAL OPEN AIR PARKING AREA
LANDSCAPE AREA
(7,032± SF (12.7%))

LANDSCAPE SPECIFICATIONS:

1. SCOPE OF WORK.
THE CONTRACTOR SHALL BE REQUIRED TO PERFORM ALL CLEARING, FINISHED GRADING, SOIL PREPARATION, PERMANENT SEEDING OR SODDING, PLANTING AND MULCHING INCLUDING ALL LABOR, MATERIALS, TOOLS AND EQUIPMENT NECESSARY FOR THE COMPLETION OF THIS PROJECT, UNLESS OTHERWISE CONTRACTED BY THE GENERAL CONTRACTOR.

2. MATERIALS
A. GENERAL - ALL HARDSCAPE MATERIALS SHALL MEET OR EXCEED SPECIFICATIONS AS OUTLINED IN THE STATE DEPARTMENT OF TRANSPORTATION'S SPECIFICATIONS.

B. TOPSOIL - NATURAL, FRIABLE, LOAMY SILT SOIL HAVING AN ORGANIC CONTENT NOT LESS THAN 5%, A PH RANGE BETWEEN 5.5-7.0. IT SHALL BE FREE OF DEBRIS, ROCKS LARGER THAN ONE INCH (1"), WOOD, ROOTS, VEGETABLE MATTER AND CLAYS.

C. LAWN - LAWN AREAS SHALL BE SEEDED OR SODDED IN ACCORDANCE WITH THE PERMANENT STABILIZATION METHODS INDICATED WITHIN THE SOIL EROSION AND SEDIMENT CONTROL NOTES. FOR SOIL BED PREPARATIONS, REFER TO ITEM B BELOW.
I. LAWN SEED MIXTURE SHALL BE FRESH, CLEAN NEW CROP SEED.
II. SOD SHALL BE STRONGLY ROOTED, WEED AND DISEASE/PEST FREE WITH A UNIFORM THICKNESS. SOD INSTALLED ON SLOPES GREATER THAN 4:1 SHALL BE PEGGED TO HOLD SOD IN PLACE.

D. MULCH - ALL PLANTING BEDS SHALL BE MULCHED WITH A 3" THICK LAYER OF DOUBLE SHREDDED HARDWOOD BARK MULCH, UNLESS OTHERWISE STATED ON THE LANDSCAPE PLAN.

E. FERTILIZER
I. FERTILIZER SHALL BE DELIVERED TO THE SITE MIXED AS SPECIFIED IN THE ORIGINAL UNOPENED STANDARD BAGS SHOWING WEIGHT, ANALYSIS AND NAME OF MANUFACTURER. FERTILIZER SHALL BE STORED IN A WEATHERPROOF PLACE SO THAT IT CAN BE KEPT DRY PRIOR TO USE.
II. FOR THE PURPOSE OF BIDDING, ASSUME THAT FERTILIZER SHALL BE 10% NITROGEN, 6% PHOSPHORUS AND 4% POTASSIUM BY WEIGHT. A FERTILIZER SHOULD NOT BE SELECTED WITHOUT A SOIL TEST PERFORMED BY A CERTIFIED SOIL LABORATORY.

F. PLANT MATERIAL
I. ALL PLANTS SHALL IN ALL CASES CONFORM TO THE REQUIREMENTS OF THE "AMERICAN STANDARD FOR NURSERY STOCK" (ANSI Z60.1), LATEST EDITION, AS PUBLISHED BY AMERICAN HORT (FORMERLY, THE AMERICAN NURSERY AND LANDSCAPE ASSOCIATION).
II. IN ALL CASES, BOTANICAL NAMES SHALL TAKE PRECEDENCE OVER COMMON NAMES FOR ANY AND ALL PLANT MATERIAL.
III. PLANTS SHALL BE LEGIBLY TAGGED WITH THE PROPER NAME AND SIZE. TAGS ARE TO REMAIN ON AT LEAST ONE PLANT OF EACH SPECIES FOR VERIFICATION PURPOSES DURING THE FINAL INSPECTION.
IV. TREES WITH ABRASION OF THE BARK, SUN SCALDS, DISFIGURATION OR FRESH CUTS OF LIMBS OVER 1½" WHICH HAVE NOT BEEN COMPLETELY CALLUSED, SHALL BE REJECTED. PLANTS SHALL NOT BE BOUND WITH WIRE OR ROPE AT ANY TIME SO AS TO DAMAGE THE BARK OR BREAK BRANCHES.
V. ALL PLANTS SHALL BE TYPICAL OF THEIR SPECIES OR VARIETY AND SHALL HAVE A NORMAL HABIT OF GROWTH, WELL DEVELOPED BRANCHES, DENSELY FOLIATED, VIGOROUS ROOT SYSTEMS AND BE FREE OF DISEASE, INSECTS, PESTS, EGGS OR LARVAE.
VI. CALIPER MEASUREMENTS OF NURSERY GROWN TREES SHALL BE TAKEN AT A POINT ON THE TRUNK SIX INCHES (6") ABOVE THE NATURAL GRADE FOR TREES UP TO AND INCLUDING A FOUR INCH (4") CALIPER SIZE. IF THE CALIPER AT SIX INCHES (6") ABOVE THE GROUND EXCEEDS FOUR INCHES (4") IN CALIPER, THE CALIPER SHOULD BE MEASURED AT A POINT "2" ABOVE THE NATURAL GRADE.
VII. SHRUBS SHALL BE MEASURED TO THE AVERAGE HEIGHT OR SPREAD OF THE SHRUB, AND NOT TO THE LONGEST BRANCH.
VIII. TREES AND SHRUBS SHALL BE HANDLED WITH CARE BY THE ROOT BALL.

3. GENERAL WORK PROCEDURES
A. CONTRACTOR TO UTILIZE WORKMANLIKE INDUSTRY STANDARDS IN PERFORMING ALL LANDSCAPE CONSTRUCTION. THE SITE IS TO BE LEFT IN A CLEAN STATE AT THE END OF EACH WORKDAY. ALL DEBRIS, MATERIALS AND TOOLS SHALL BE PROPERLY STORED, STOCKPILED OR DISPOSED OF.

B. WASTE MATERIALS AND DEBRIS SHALL BE COMPLETELY DISPOSED OF AT THE CONTRACTOR'S EXPENSE. DEBRIS SHALL NOT BE BURIED, INCLUDING ORGANIC MATERIALS, BUT SHALL BE REMOVED COMPLETELY FROM THE SITE.

4. SITE PREPARATIONS
A. BEFORE AND DURING PRELIMINARY GRADING AND FINISHED GRADING, ALL WEEDS AND GRASSES SHALL BE DUG OUT BY THE ROOTS AND DISPOSED OF IN ACCORDANCE WITH GENERAL WORK PROCEDURES OUTLINED HEREIN.

B. ALL EXISTING TREES TO REMAIN SHALL BE PRUNED TO REMOVE ANY DAMAGED BRANCHES. THE ENTIRE LIMB OF ANY DAMAGED BRANCH SHALL BE CUT OFF AT THE BRANCH COLLAR. CONTRACTOR SHALL ENSURE THAT CUTS ARE SMOOTH AND STRAIGHT. ANY EXPOSED ROOTS SHALL BE CUT BACK WITH CLEAN, SHARP TOOLS AND TOPSOIL SHALL BE PLACED AROUND THE REMAINDER OF THE ROOTS. EXISTING TREES SHALL BE MONITORED ON A REGULAR BASIS FOR ADDITIONAL ROOT OR BRANCH DAMAGE AS A RESULT OF CONSTRUCTION. ROOTS SHALL NOT BE LEFT EXPOSED FOR MORE THAN ONE (1) DAY. CONTRACTOR SHALL WATER EXISTING TREES AS NEEDED TO PREVENT SHOCK OR DECLINE.

C. CONTRACTOR SHALL ARRANGE TO HAVE A UTILITY STAKE-OUT TO LOCATE ALL UNDERGROUND UTILITIES PRIOR TO INSTALLATION OF ANY LANDSCAPE MATERIAL. UTILITY COMPANIES SHALL BE CONTACTED THREE (3) DAYS PRIOR TO THE BEGINNING OF WORK.

5. TREE PROTECTION
A. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING TREES TO REMAIN. A TREE PROTECTION ZONE SHALL BE ESTABLISHED AT THE DRIP LINE OR 15 FEET FROM THE TRUNK OR AT THE LIMIT OF CONSTRUCTION DISTURBANCE, WHICHEVER IS GREATER. LOCAL STANDARDS THAT MAY REQUIRE A MORE STRICT TREE PROTECTION ZONE SHALL BE HONORED.

B. A FORTY-EIGHT INCH (48") HIGH WOODEN SNOW FENCE OR ORANGE COLORED HIGH-DENSITY 'VIS-FENCE' OR APPROVED EQUAL, MOUNTED ON STEEL POSTS SHALL BE PLACED ALONG THE BOUNDARY OF THE TREE PROTECTION ZONE. POSTS SHALL BE LOCATED AT A MAXIMUM OF EIGHT FEET (8') ON CENTER OR AS INDICATED WITHIN THE TREE PROTECTION DETAIL.

C. WHEN THE TREE PROTECTION FENCING HAS BEEN INSTALLED, IT SHALL BE INSPECTED BY THE APPROVING AGENCY PRIOR TO DEMOLITION, GRADING, TREE CLEARING OR ANY OTHER CONSTRUCTION. THE FENCING ALONG THE TREE PROTECTION ZONE SHALL BE REGULARLY INSPECTED BY THE CONTRACTOR AND MAINTAINED UNTIL ALL CONSTRUCTION ACTIVITY HAS BEEN COMPLETED.

D. AT NO TIME SHALL MACHINERY, DEBRIS, FALLEN TREES OR OTHER MATERIALS BE PLACED, STOCKPILED OR LEFT STANDING IN THE TREE PROTECTION ZONE.

6. SOIL MODIFICATIONS
A. CONTRACTOR SHALL ATTAIN A SOIL TEST FOR ALL AREAS OF THE SITE PRIOR TO CONDUCTING ANY PLANTING. SOIL TESTS SHALL BE PERFORMED BY A CERTIFIED SOIL LABORATORY.

B. CONTRACTOR SHALL REPORT ANY SOIL OR DRAINAGE CONDITIONS CONSIDERED DETRIMENTAL TO THE GROWTH OF PLANT MATERIAL. SOIL MODIFICATIONS, AS SPECIFIED HEREIN, MAY NEED TO BE CONDUCTED BY THE CONTRACTOR DEPENDING ON SITE CONDITIONS.

C. THE FOLLOWING AMENDMENTS AND QUANTITIES ARE APPROXIMATE AND ARE FOR BIDDING PURPOSES ONLY. COMPOSITION OF AMENDMENTS SHOULD BE REVISED DEPENDING ON THE OUTCOME OF A TOPSOIL ANALYSIS PERFORMED BY A CERTIFIED SOIL LABORATORY.
I. TO INCREASE A SANDY SOIL'S ABILITY TO RETAIN WATER AND NUTRIENTS, THOROUGHLY TILL ORGANIC MATTER INTO THE TOP 6-12". USE COMPOSTED BARK, COMPOSTED LEAF MULCH OR PEAT MOSS. ALL PRODUCTS SHOULD BE COMPOSTED TO A DARK COLOR AND BE FREE OF PIECES WITH IDENTIFIABLE LEAF OR WOOD STRUCTURE. AVOID MATERIAL WITH A PH HIGHER THAN 7.5.
II. TO INCREASE DRAINAGE, MODIFY HEAVY CLAY OR SILT (MORE THAN 40% CLAY OR SILT) BY ADDING COMPOSTED PINE BARK (UP TO 30% BY VOLUME) AND/OR AGRICULTURAL GYPSUM. COARSE SAND MAY BE USED IF ENOUGH IS ADDED TO BRING THE SAND CONTENT TO MORE THAN 60% OF THE TOTAL MIX. SUBSURFACE DRAINAGE LINES MAY NEED TO BE ADDED TO INCREASE DRAINAGE.
III. MODIFY EXTREMELY SANDY SOILS (MORE THAN 85%) BY ADDING ORGANIC MATTER AND/OR DRY, SHREDDED CLAY LOAM UP TO 30% OF THE TOTAL MIX.

7. FINISHED GRADING
A. UNLESS OTHERWISE CONTRACTED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION OF TOPSOIL AND THE ESTABLISHMENT OF FINE-GRADING WITHIN THE DISTURBANCE AREA OF THE SITE.

B. CONTRACTOR SHALL VERIFY THAT SUBGRADE FOR INSTALLATION OF TOPSOIL HAS BEEN ESTABLISHED. THE SUBGRADE OF THE SITE MUST MEET THE FINISHED GRADE LESS THE REQUIRED TOPSOIL THICKNESS (1").

C. ALL LAWN AND PLANTING AREAS SHALL BE GRADED TO A SMOOTH, EVEN AND UNIFORM PLANE WITH NO ABRUPT CHANGE OF SURFACE AS DEPICTED WITHIN THIS SET OF CONSTRUCTION PLANS, UNLESS OTHERWISE DIRECTED BY THE PROJECT ENGINEER OR LANDSCAPE ARCHITECT.

D. ALL PLANTING AREAS SHALL BE GRADED AND MAINTAINED TO ALLOW FREE FLOW OF SURFACE WATER IN AND AROUND THE PLANTING BEDS. STANDING WATER SHALL NOT BE PERMITTED IN PLANTING BEDS.

8. TOPSOILING
A. CONTRACTOR SHALL PROVIDE A SIX INCH (6") THICK MINIMUM LAYER OF TOPSOIL, OR AS DIRECTED BY THE LOCAL ORDINANCE OR CLIENT, IN ALL PLANTING AND LAWN AREAS. TOPSOIL SHOULD BE SPREAD OVER A PREPARED SURFACE IN A UNIFORM LAYER TO ACHIEVE THE DESIRED COMPACTED THICKNESS.

B. ON-SITE TOPSOIL MAY BE USED TO SUPPLEMENT THE TOTAL AMOUNT REQUIRED. TOPSOIL FROM THE SITE MAY BE REJECTED IF IT HAS NOT BEEN PROPERLY REMOVED, STORED AND PROTECTED PRIOR TO CONSTRUCTION.

C. CONTRACTOR SHALL FURNISH TO THE APPROVING AGENCY AN ANALYSIS OF BOTH IMPORTED AND ON-SITE TOPSOIL TO BE UTILIZED IN ALL PLANTING AREAS. THE PH AND NUTRIENT LEVELS MAY NEED TO BE ADJUSTED THROUGH SOIL MODIFICATIONS AS NEEDED TO ACHIEVE THE REQUIRED LEVELS AS SPECIFIED IN THE MATERIALS SECTION ABOVE.

D. ALL LAWN AREAS ARE TO BE CULTIVATED TO A DEPTH OF SIX INCHES (6"). ALL DEBRIS EXPOSED FROM EXCAVATION AND CULTIVATION SHALL BE DISPOSED OF IN ACCORDANCE WITH GENERAL WORK PROCEDURES SECTION ABOVE. THE FOLLOWING SHALL BE TILLED INTO THE TOP FOUR INCHES (4") IN TWO DIRECTIONS (QUANTITIES BASED ON A 1,000 SQUARE FOOT AREA - FOR BID PURPOSES ONLY (SEE SPECIFICATION 6.A.3):
I. 20 POUNDS 'GRO-POWER' OR APPROVED EQUAL SOIL CONDITIONER/FERTILIZER
II. 20 POUNDS NITRO-FORM COURSE (36-0-0 BLUE CHIP OR APPROVED NITROGEN FERTILIZER

E. THE SPREADING OF TOPSOIL SHALL NOT BE CONDUCTED UNDER MUDDY OR FROZEN CONDITIONS.

9. PLANTING
A. INSOFAR THAT IT IS FEASIBLE, PLANT MATERIAL SHALL BE PLANTED ON THE DAY OF DELIVERY. IN THE EVENT THAT THIS IS NOT POSSIBLE, CONTRACTOR SHALL PROTECT UNINSTALLED PLANT MATERIAL. PLANTS SHALL NOT REMAIN UNPLANTED FOR LONGER THAN A THREE DAY PERIOD AFTER DELIVERY. PLANTS THAT WILL NOT BE PLANTED FOR A PERIOD OF TIME GREATER THAN THREE DAYS SHALL BE HEALED IN WITH TOPSOIL OR MULCH TO HELP PRESERVE ROOT MOISTURE.

B. PLANTING OPERATIONS SHALL BE PERFORMED DURING PERIODS WITHIN THE PLANTING SEASON WHEN WEATHER AND SOIL CONDITIONS ARE SUITABLE AND IN ACCORDANCE WITH ACCEPTED LOCAL PRACTICE. PLANTS SHALL NOT BE INSTALLED IN TOPSOIL THAT IS IN A MUDDY OR FROZEN CONDITION.

C. ANY INJURED ROOTS OR BRANCHES SHALL BE PRUNED TO MAKE CLEAN-CUT ENDS PRIOR TO PLANTING UTILIZING CLEAN, SHARP TOOLS. ONLY INJURED OR DISEASED BRANCHING SHALL BE REMOVED.

D. ALL PLANTING CONTAINERS, BASKETS AND NON-BIODEGRADABLE MATERIALS SHALL BE REMOVED FROM ROOT BALLS DURING PLANTING. NATURAL FIBER BURLAP MUST BE CUT FROM AROUND THE TRUNK OF THE TREE AND FOLDED DOWN AGAINST THE ROOT BALL PRIOR TO BACKFILLING.

E. POSITION TREES AND SHRUBS AT THEIR INTENDED LOCATIONS AS PER THE PLANS AND SECURE THE APPROVAL OF THE LANDSCAPE ARCHITECT PRIOR TO EXCAVATING PITS, MAKING NECESSARY ADJUSTMENTS AS DIRECTED.

F. PRIOR TO THE ISSUANCE OF ANY CERTIFICATE OF OCCUPANCY, THE PROPOSED LANDSCAPE, AS SHOWN ON THE APPROVED LANDSCAPE PLAN, MUST BE INSTALLED, INSPECTED AND APPROVED BY THE APPROVING AGENCY. THE APPROVING AGENCY SHALL TAKE INTO ACCOUNT SEASONAL CONSIDERATIONS IN THIS REGARD AS FOLLOWS. THE PLANTING OF TREES, SHRUBS, VINES OR GROUND COVER SHALL OCCUR ONLY DURING THE FOLLOWING PLANTING SEASONS:
I. PLANTS: MARCH 15TH TO DECEMBER 15TH
II. LAWN AND MEADOW SEED MIXES: MARCH 1ST TO MAY 15TH OR BETWEEN AUGUST 15TH AND OCTOBER 15TH

PLANTINGS REQUIRED FOR A CERTIFICATE OF OCCUPANCY SHALL BE PROVIDED DURING THE NEXT APPROPRIATE SEASON AT THE MUNICIPALITY'S DISCRETION. CONTRACTOR SHOULD CONTACT APPROVING AGENCY FOR POTENTIAL SUBSTITUTIONS.

G. FURTHERMORE, THE FOLLOWING TREE VARIETIES ARE UNUSUALLY SUSCEPTIBLE TO WINTER DAMAGE. WITH TRANSPLANT SHOCK AND THE SEASONAL LACK OF NITROGEN AVAILABILITY, THE RISK OF PLANT DEATH IS GREATLY INCREASED. IT IS NOT RECOMMENDED THAT THESE SPICIES BE PLANTED DURING THE FALL PLANTING SEASON:

ACER RUBRUM	PLATANUS X ACERIFOLIA
BETULA VARIETIES	POPULUS VARIETIES
CARPINUS VARIETIES	PRUNUS VARIETIES
CRATAEGUS VARIETIES	PYRUS VARIETIES
KOELREUTERIA	QUERCUS VARIETIES
LIQUIDAMBAR STYRACIFLUA	TILIA TOMENTOSA
LIRIODENDRON TULIPIFERA	ZELKOVA VARIETIES

H. PLANTING PITS SHALL BE DUG WITH LEVEL OR CONVEX BOTTOMS, WITH THE WIDTH THREE TIMES THE DIAMETER OF ROOT BALL. THE ROOT BALL SHALL REST ON UNDISTURBED GRADE. EACH PLANT PIT SHALL BE BACKFILLED IN LAYERS WITH THE FOLLOWING PREPARED SOIL MIXED THOROUGHLY:
I. 1 PART PEAT MOSS
II. 1 PART COMPOSTED COW MANURE BY VOLUME
III. 3 PARTS TOPSOIL BY VOLUME
IV. 21 GRAMS 'AGRIFORM' PLANTING TABLETS (OR APPROVED EQUAL) AS FOLLOWS:
A) 2 TABLETS PER 1 GALLON PLANT
B) 3 TABLETS PER 5 GALLON PLANT
C) 4 TABLETS PER 15 GALLON PLANT
D) LARGER PLANTS: 2 TABLETS PER ½" CALIPER OF TRUNK

I. FILL PREPARED SOIL AROUND BALL OF PLANT HALF-WAY AND INSERT PLANT TABLETS. COMPLETE BACKFILL AND WATER THOROUGHLY.

J. ALL PLANTS SHALL BE PLANTED SO THAT THE TOP OF THE ROOT BALL, THE POINT AT WHICH THE ROOT FLARE BEGINS, IS SET AT GROUND LEVEL AND IN THE CENTER OF THE PIT. NO SOIL IS TO BE PLACED DIRECTLY ON TOP OF THE ROOT BALL.

K. ALL PROPOSED TREES DIRECTLY ADJACENT TO WALKWAYS OR DRIVEWAYS SHALL BE PRUNED AND MAINTAINED TO A MINIMUM BRANCHING HEIGHT OF 7' FROM GRADE. NO PRUNING SHALL BE CONDUCTED WITHIN THE FIRST YEAR OF PLANTING.

L. GROUND COVER AREAS SHALL RECEIVE A ¼" LAYER OF HUMUS RAKED INTO THE TOP 1" OF PREPARED SOIL PRIOR TO PLANTING. ALL GROUND COVER AREAS SHALL BE WEEDED AND TREATED WITH A PRE-EMERGENT CHEMICAL AS PER MANUFACTURER'S RECOMMENDATION.

M. NO PLANT, EXCEPT GROUND COVERS, GRASSES OR VINES, SHALL BE PLANTED LESS THAN TWO FEET (2') FROM EXISTING STRUCTURES AND SIDEWALKS.

N. ALL PLANTING AREAS AND PLANTING PITS SHALL BE MULCHED AS SPECIFIED HEREIN TO FILL THE ENTIRE BED AREA OR SAUCER. NO MULCH IS TO TOUCH THE TRUNK OF THE TREE OR SHRUB.

O. ALL PLANTING AREAS SHALL BE WATERED IMMEDIATELY UPON INSTALLATION IN ACCORDANCE WITH THE WATERING SPECIFICATIONS AS LISTED HEREIN.

10. TRANSPLANTING (WHEN REQUIRED)
A. ALL TRANSPLANTS SHALL BE DUG WITH INTACT ROOT BALLS CAPABLE OF SUSTAINING THE PLANT. (SEE SPECIFICATION 2.F. ABOVE)

B. IF PLANTS ARE TO BE STOCKPILED BEFORE REPLANTING, THEY SHALL BE HEALED IN WITH MULCH OR SOIL, ADEQUATELY WATERED AND PROTECTED FROM EXTREME HEAT, SUN AND WIND.

C. PLANTS SHALL NOT BE DUG FOR TRANSPLANTING BETWEEN APRIL 10TH AND JUNE 30TH.

D. UPON REPLANTING, BACKFILL SOIL SHALL BE AMENDED WITH FERTILIZER AND ROOT GROWTH HORMONE.

E. TRANSPLANTS SHALL BE GUARANTEED FOR THE LENGTH OF THE GUARANTEE PERIOD SPECIFIED HEREIN.

F. IF TRANSPLANTS DIE, SHRUBS AND TREES LESS THAN SIX INCHES (6") DBH SHALL BE REPLACED IN KIND. TREES GREATER THAN SIX INCHES (6") DBH MAY BE REQUIRED TO BE REPLACED IN ACCORDANCE WITH THE MUNICIPALITY'S TREE REPLACEMENT GUIDELINES

11. WATERING
A. NEW PLANTINGS OR LAWN AREAS SHALL BE ADEQUATELY IRRIGATED BEGINNING IMMEDIATELY AFTER PLANTING. WATER SHALL BE APPLIED TO EACH TREE AND SHRUB IN SUCH MANNER AS NOT TO DISTURB BACKFILL AND TO THE EXTENT THAT ALL MATERIALS IN THE PLANTING HOLE ARE THOROUGHLY SATURATED. WATERING SHALL CONTINUE AT LEAST UNTIL PLANTS ARE ESTABLISHED.

B. SITE OWNER SHALL PROVIDE WATER IF AVAILABLE ON SITE AT TIME OF PLANTING. IF WATER IS NOT AVAILABLE ON SITE, CONTRACTOR SHALL SUPPLY ALL NECESSARY WATER. THE USE OF WATERING BAGS IS RECOMMENDED FOR ALL NEWLY PLANTED TREES.

C. IF AN IRRIGATION SYSTEM HAS BEEN INSTALLED ON THE SITE, IT SHALL BE USED TO WATER PROPOSED PLANT MATERIAL, BUT ANY FAILURE OF THE SYSTEM DOES NOT ELIMINATE THE CONTRACTOR'S RESPONSIBILITY OF MAINTAINING THE DESIRED MOISTURE LEVEL FOR VIGOROUS, HEALTHY GROWTH.

12. GUARANTEE
A. THE CONTRACTOR SHALL GUARANTEE ALL PLANTS FOR A PERIOD OF EIGHTEEN (18) MONTHS FROM APPROVAL OF LANDSCAPE INSTALLATION BY THE APPROVING AGENCY. CONTRACTOR SHALL SUPPLY THE OWNER WITH A MAINTENANCE BOND FOR TEN PERCENT (10%) OF THE VALUE OF THE LANDSCAPE INSTALLATION WHICH WILL BE RELEASED AT THE CONCLUSION OF THE GUARANTEE PERIOD AND WHEN A FINAL INSPECTION HAS BEEN COMPLETED AND APPROVED BY THE OWNER OR AUTHORIZED REPRESENTATIVE.

B. ANY DEAD OR DYING PLANT MATERIAL SHALL BE REPLACED FOR THE LENGTH OF THE GUARANTEE PERIOD. REPLACEMENT OF PLANT MATERIAL SHALL BE CONDUCTED AT THE FIRST SUCCEEDING PLANTING SEASON. ANY DEBRIS SHALL BE DISPOSED OF OFF-SITE, WITHOUT EXCEPTION. A PLANT SHALL BE CONSIDERED "DEAD OR DYING" IF MORE THAN 30% OF ITS BRANCHES ARE DEAD.

C. TREES AND SHRUBS SHALL BE MAINTAINED BY THE CONTRACTOR DURING CONSTRUCTION AND UNTIL TURNOVER TO THE OWNER/OPERATOR. CULTIVATION, WEEDING, WATERING AND THE PREVENTATIVE TREATMENTS SHALL BE PERFORMED AS NECESSARY TO KEEP PLANT MATERIAL IN GOOD CONDITION AND FREE OF INSECTS AND DISEASE.

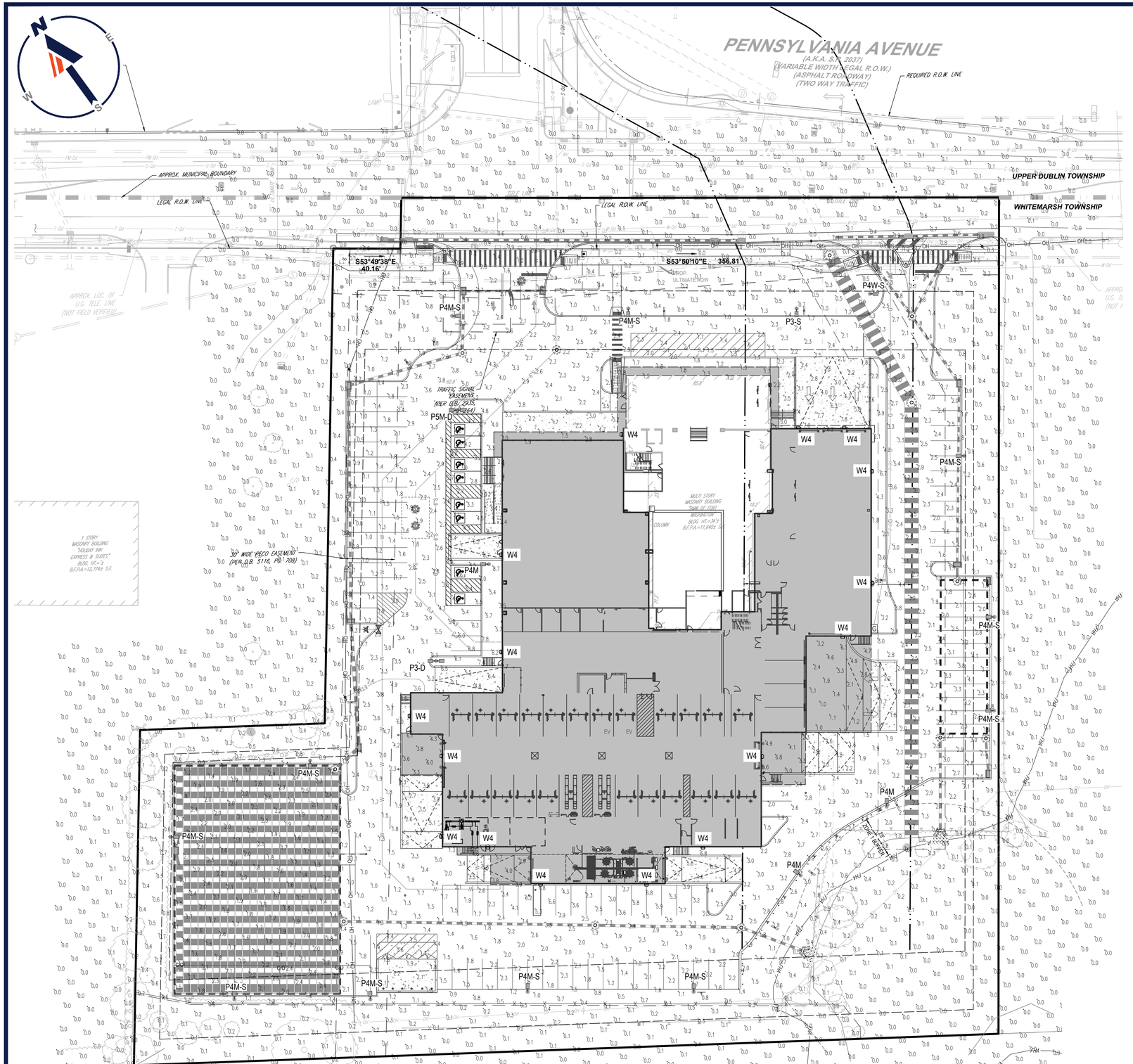
D. LAWNS SHALL BE MAINTAINED BY THE CONTRACTOR DURING CONSTRUCTION AND UNTIL TURNOVER TO THE OWNER/OPERATOR THROUGH WATERING, FERTILIZING, WEEDING, MOWING, TRIMMING AND OTHER OPERATIONS SUCH AS ROLLING, REGRADING AND REPLANTING AS REQUIRED TO ESTABLISH A SMOOTH, ACCEPTABLE LAWN, FREE OF ERODED OR BARE AREAS.

13. CLEANUP
A. UPON THE COMPLETION OF ALL LANDSCAPE INSTALLATION AND BEFORE THE FINAL ACCEPTANCE, THE CONTRACTOR SHALL REMOVE ALL UNUSED MATERIALS, EQUIPMENT AND DEBRIS FROM THE SITE. ALL PAVED AREAS ARE TO BE CLEANED.

B. THE SITE SHALL BE CLEANED AND LEFT IN A NEAT AND ACCEPTABLE CONDITION AS APPROVED BY THE OWNER OR AUTHORIZED REPRESENTATIVE.

COMPLIANCE CHART

SECTION	REQUIREMENT	CALCULATIONS (REQUIRED / PROVIDED)	COMPLIANCE
ZONING: 116-99 LANDSCAPING AND SCREENING	FRONT, REAR AND SIDE YARDS SHALL BE LANDSCAPED AND, WHERE ADJACENT TO RESIDENTIAL DISTRICTS OR WHERE OTHERWISE REQUIRED, SCREENED BY USE OF PLANTINGS AND/OR WALLS, BERMS OR FENCES OF SUITABLE HEIGHT AND COMPOSITION TO EFFECTIVELY PROTECT ADJACENT PROPERTIES. ALL LANDSCAPING AND SCREENING PLANS SHALL BE REVIEWED BY THE SHADE TREE COMMISSION AND SHALL INCLUDE SIZE, LOCATION AND SPECIES OF ALL NEW OR EXISTING PLANT MATERIALS PROPOSED TO BE USED AND SIZE AND LOCATION OF ALL WALLS, BERMS OR FENCES.	LANDSCAPING HAS BEEN PROVIDED THROUGHOUT THE SITE.	COMPLIES
116-264 MANAGEMENT	A. RIPARIAN CORRIDOR PLANTING. REESTABLISHMENT OF FOREST COVER AND WOODLAND HABITAT SHALL BE REQUIRED CONSISTENT WITH THE REQUIREMENTS OF THE LANDSCAPE REGULATION WITHIN THE TOWNSHIP SUBDIVISION AND LAND DEVELOPMENT ORDINANCE.	EXISTING VEGETATION TO REMAIN ALONG SANDY RUN TO MEET THE INTENT OF THIS REQUIREMENT.	COMPLIES
SALDO: 105-39 LANDSCAPING OF PARKING FACILITIES	A. ALL PARKING AREAS SHALL HAVE AT LEAST ONE THREE-INCH-CALIPER TREE FOR EVERY TWO PARKING SPACES PROVIDED.	TOTAL PROVIDED SPACES = 183 REQUIRED: 183 / 2 = 91.5 OR 92 TREES PROVIDED: 1 AROG, 3 CCA, 6 GTIK, 2 LSR, 5 NS, 6 OV (23 TREES)	WAIVER
	B. A MINIMUM OF 10% OF ANY PARKING LOT FACILITY OVER 2,000 SQUARE FEET IN GROSS AREA SHALL BE DEVOTED TO LANDSCAPING, INCLUSIVE OF REQUIRED TREES	OPEN AIR PARKING AREA = 55,510± SF REQUIRED (10%): 5,551 SF LANDSCAPE AREA PROVIDED: 7,032± SF LANDSCAPE AREA (12.7%)	COMPLIES
105-48 STREET TREES	B. SHADE STREET TREES SHALL BE PLANTED AT INTERVALS OF NOT MORE THAN 45 FEET, AND FLOWERING STREET TREES AT INTERVALS OF NOT MORE THAN 30 FEET ALONG BOTH SIDES OF NEW STREETS AND ALONG ONE OR BOTH SIDES OF AN EXISTING STREET WITHIN THE PROPOSED SUBDIVISION OR LAND DEVELOPMENT. AN EQUIVALENT NUMBER MAY BE PLANTED IN AN INFORMAL ARRANGEMENT, SUBJECT TO THE APPROVAL OF THE BOARD OF SUPERVISORS.	LENGTH ALONG PENNSYLVANIA AVE = 304± LF (EXCLUDING DRIVEWAY WIDTHS) REQUIRED: 304 / 45 = 6.8 OR 7 SHADE TREES PROVIDED: 7 CCA (7 SHADE TREES)	COMPLIES
105-52 BUFFER YARDS	A. BUFFER YARDS ARE REQUIRED BETWEEN SUBDIVISIONS AND LAND DEVELOPMENTS AND ALONG EXISTING STREETS TO SOFTEN VISUAL IMPACT, TO SCREEN GLARE, AND TO CREATE A VISUAL BARRIER BETWEEN CONFLICTING LAND USES. THE EXTENT OF BUFFERING REQUIRED SHALL BE DETERMINED BY THE TYPE OF USE PROPOSED AND THE ADJACENT USES OR STREETS SURROUNDING THE PROPOSED DEVELOPMENT SITE. THE TYPE OF PROPOSED USE ON ADJOINING PROPERTIES IS THE BASIS FOR ESTABLISHING BUFFER YARD STANDARDS. THE APPLICANT IS ENCOURAGED TO ENGAGE A LANDSCAPE ARCHITECT IN ORDER TO PROMOTE THE PROPER USE AND ARRANGEMENT OF PLANT MATERIALS.	SEE 105-52.B.(2) BELOW FOR REQUIREMENTS.	COMPLIES
	B.(2) STEP 2: SELECTION OF THE PLANTING OPTION FOR THE BUFFER CLASS. AFTER DETERMINING THE BUFFER CLASS, THE APPLICANT SHALL SELECT A PLANTING OPTION FROM TABLE 2. FOR EACH BUFFER CLASS SEVERAL PLANTING OPTIONS ARE AVAILABLE. ONE OF WHICH THE APPLICANT SHALL SELECT TO MEET THE BUFFER YARD REQUIREMENT FOR EACH BOUNDARY. THE BOARD OF SUPERVISORS MAY PERMIT AN ALTERNATIVE PLANTING OPTION WHICH SHALL HAVE A SCREENING CAPABILITY EQUAL TO OR GREATER THAN ANY OF THE AVAILABLE OPTIONS. ADJACENT USE PROPOSED USE: RETAIL AND CONSUMER SERVICE — RETAIL CONSUMER SERVICE: –; UTILITIES + PUBLIC SERVICE: –; NON-RESIDENTIAL PARKING: –; ADJ. STREET MAJOR COLLECTOR: * *STREET TREES AS REQUIRED BY 105-48. CLASS A — OPTION (1) 1 CANOPY TREE PER 40 FEET ALONG BOUNDARY LINE +1 FLOWERING TREE PER 60 FEET +1 EVERGREEN PER 60 FEET (2) 1 CANOPY TREE PER 40 FEET +1 EVERGREEN PER 30 FEET	LENGTH ALONG PENNSYLVANIA AVE = 304± LF (EXCLUDING DRIVEWAY WIDTHS) REQUIRED: STREET TREES PER 105-48 PROVIDED: SEE 105-48 ABOVE LENGTH ALONG SOUTHEAST PROPERTY LINE ADJACENT NON-RESIDENTIAL PARKING = 337± LF (EXCLUDING EXISTING VEGETATION TO REMAIN) REQUIRED: BUFFER CLASS A (337 / 40) x 1 = 8.4 OR 8 CANOPY TREES (337 / 60) x 1 = 5.6 OR 6 FLOWERING TREES (337 / 60) x 1 = 5.6 OR 6 EVERGREEN TREES PROVIDED: 3 CCA, 5 OV (8 CANOPY TREES); 6 AGB (6 FLOWERING TREES); 6 TOG (6 EVERGREEN TREES) LENGTH ALONG SOUTHWEST PROPERTY LINE ADJACENT TO RAILROAD (UTILITIES AND PUBLIC SERVICE) = 516± LF REQUIRED: NO BUFFER REQUIRED PROVIDED: NONE LENGTH ALONG NORTHWEST PROPERTY LINES ADJACENT TO HOTEL (RETAIL AND CONSUMER SERVICE) = 584± LF REQUIRED: NO BUFFER REQUIRED PROVIDED: NONE	COMPLIES COMPLIES COMPLIES
TREE PROTECTION STANDARDS: 55-4 TREE PRESERVATION, PROTECTION AND REPLACEMENT	B. MAXIMUM TREE REMOVAL. THE REMOVAL OF MORE THAN 33% OF TREES, HAVING A DBH OF SIX INCHES OR GREATER, ON ANY LOT, SHALL NOT BE PERMITTED.	TOTAL EXISTING TREES ON LOT = 45 TREES PERMITTED REMOVAL: LESS THAN 33% REMOVAL (15 TREES) PROPOSED REMOVAL: 16 TREES (INCLUDING 8 ASH TREES AND 1 INVASIVE PEAR TREE)(35.5%)	WAIVER
	D.(6)(a) EVERY LIVING AND HEALTHY TREE WITH A DBH OF SIX INCHES OR GREATER AND WHICH IS DESIGNATED TO BE REMOVED OR WHICH IS DESTROYED, SHALL BE REPLACED WITH ONE OR MORE NEW CANOPY TREES, OF A TYPE AND SPECIES APPROVED BY THE SHADE TREE COMMISSION OR ITS DESIGNEE, WITH A TRUNK DIAMETER OF NOT LESS THAN THREE INCHES IN CALIPER. THE TOTAL CALIPER OF REPLACEMENT TREES, MEASURED AT SIX INCHES ABOVE THE GROUND LINE, SHALL EQUAL OR EXCEED THE DBH OF THE REMOVED TREES.	TOTAL DBH INCHES PROPOSED TO BE REMOVED = 135 (EXCLUDING (8) ASH TREES TOTALING 88.5" DBH AND (1) 6.4" DBH CALLERY PEAR TREE) REQUIRED REPLACEMENT INCHES = 135 / 3 = 45 SHADE TREES PROVIDED: 9 CCA, 11 OV, 3 NS (23 SHADE TREES); 2 AGB (2 ORNAMENTAL TREES AS 1 SHADE TREE); 8 AC, 10 CF, 4 OK, 6 MV (28 UNDERSTORY TREES AS 14 SHADE TREES) (38 SHADE TREES) DEFICIENT: 7 SHADE TREES	WAIVER
	E. SPECIES OF REPLACEMENT TREES. THE SPECIES OF REPLACEMENT



GENERAL LIGHTING NOTES

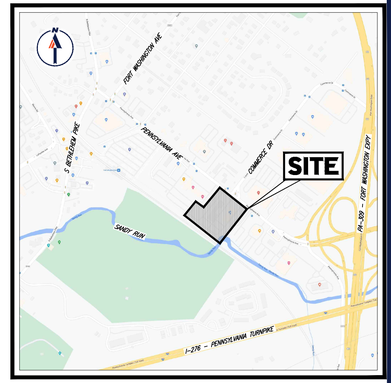
1. THE GENERAL NOTES MUST BE INCLUDED AS PART OF THIS ENTIRE DOCUMENT PACKAGE AND ARE PART OF THE CONTRACT DOCUMENTS. THE GENERAL NOTES ARE REFERENCED HEREIN, AND THE ELECTRICAL CONTRACTOR MUST REFER TO THEM AND FULLY COMPLY WITH THESE NOTES, IN THEIR ENTIRETY. THE ELECTRICAL CONTRACTOR MUST BE FAMILIAR WITH AND ACKNOWLEDGE FAMILIARITY WITH ALL OF THE GENERAL NOTES AND ALL OF THE PLANS' SPECIFIC NOTES.
2. THE ELECTRICAL CONTRACTOR MUST COMPLY WITH ALL APPLICABLE CONTRACTOR REQUIREMENTS INDICATED IN THE PLANS, INCLUDING BUT NOT LIMITED TO GENERAL NOTES, GRADING AND UTILITY NOTES, SITE SAFETY, AND ALL AGENCY AND GOVERNMENTAL REGULATIONS.
3. THE LIGHTING PLAN DEPICTS PROPOSED, SUSTAINED ILLUMINATION LEVELS CALCULATED USING DATA PROVIDED BY THE NOTED MANUFACTURER. ACTUAL SUSTAINED SITE ILLUMINATION LEVELS AND PERFORMANCE OF LUMINAIRES MAY VARY DUE TO VARIATIONS IN WEATHER, ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS, THE SERVICE LIFE OF EQUIPMENT AND LUMINAIRES AND OTHER RELATED VARIABLE FIELD CONDITIONS.
4. THE LIGHTING VALUES AND CALCULATION POINTS DEPICTED ON THIS PLAN ARE ANALYZED ON A HORIZONTAL GEOMETRIC PLANE AT GROUND LEVEL UNLESS OTHERWISE NOTED. ILLUMINATION LEVELS ARE SHOWN IN FOOT-CANDLES (FC).
5. THE LUMINAIRES, LAMPS AND LENSES MUST BE REGULARLY INSPECTED/MAINTAINED TO ENSURE THAT THEY FUNCTION PROPERLY. THIS WORK SHOULD INCLUDE, BUT IS NOT LIMITED TO, VISUAL OBSERVATION, CLEANING OF LENSES, AND RE-LAMPING ACCORDING TO MANUFACTURER RECOMMENDATIONS. FAILURE TO FOLLOW THE ABOVE STEPS COULD RESULT IN IMPROPER LIGHT DISTRIBUTION AND FAILURE TO COMPLY WITH THE APPROVED DESIGN. UPON COMPLETION AND OWNER'S ACCEPTANCE OF THE WORK, THE ABOVE RESPONSIBILITIES BECOMES SOLELY THE OWNER'S.
6. THE LIGHTING PLAN IS INTENDED TO SHOW THE LOCATIONS AND TYPE OF LUMINAIRES. POWER SYSTEM, CONDUITS, WIRING AND OTHER ELECTRICAL COMPONENTS ARE SOLELY THE ARCHITECTS, MECHANICAL ENGINEER'S AND/OR ELECTRICAL CONTRACTOR'S RESPONSIBILITY, AS INDICATED IN THE CONSTRUCTION CONTRACT DOCUMENTS. THE CONTRACTOR MUST COORDINATE WITH THE PROJECT ARCHITECT AND/OR ELECTRICAL ENGINEER REGARDING ANY AND ALL POWER SOURCES AND TIMING DEVICES NECESSARY TO MEET THE DESIGN INTENT. THESE ITEMS MUST BE INSTALLED AS REQUIRED BY STATE AND LOCAL REGULATIONS. CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION OF LIGHTING FIXTURES AND APPURTENANCES IN ACCORDANCE WITH ALL APPLICABLE BUILDING AND ELECTRICAL CODES.
7. THE ELECTRICAL CONTRACTOR MUST BRING IMMEDIATELY, IN WRITING, ANY LIGHT LOCATIONS THAT CONFLICT WITH DRAINAGE, UTILITIES, OR OTHER STRUCTURE(S) TO THE PROFESSIONAL OF RECORD'S ATTENTION, PRIOR TO THE START OF CONSTRUCTION.
8. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE TO ENSURE THAT SHIELDING AND OR ROTATED OPTICS ARE INSTALLED AS INDICATED ON THE PLAN IN ORDER TO ACHIEVE THE LIGHTING LEVELS THE REVIEWING AGENCY APPROVED.
9. UPON OWNER'S ACCEPTANCE OF THE COMPLETED PROJECT, THE OWNER SHALL BE RESPONSIBLE FOR ALL MAINTENANCE, SERVICING, REPAIR AND INSPECTION OF THE LIGHTING SYSTEM AND ALL OF ITS COMPONENTS AND RELATED SYSTEMS, TO ENSURE ADEQUATE LIGHTING LEVELS ARE PRESENT AND FUNCTIONING AT ALL TIMES.
10. THE LIGHT LOSS FACTORS (LLF) DEPICTED IN THE LUMINAIRE SCHEDULE ON THIS PLAN ARE BASED ON DATA PROVIDED BY THE MANUFACTURER FOLLOWING IES LM-80-08 TESTING. THE LIGHT LEVELS DEPICTED ON THIS PLAN WERE CALCULATED BASED ON THE LLF LISTED IN THE LUMINAIRE SCHEDULE.
11. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE SUBMITTALS TO BOHLER FOR REVIEW AND APPROVAL. SUBSTITUTION REQUESTS MUST BE ACCOMPANIED BY A HORIZONTAL PHOTOMETRIC STUDY DEMONSTRATING THAT THE LUMINAIRE(S) IN QUESTION WILL MEET THE DESIGN INTENT OF THIS PLAN. SUBSTITUTION REQUESTS WITHOUT A PHOTOMETRIC STUDY WILL BE REJECTED.
12. LIGHT POLE FOUNDATIONS ARE SHOWN ON THE PLAN IN THE INTENDED LOCATION BASED ON THE LIGHTING CALCULATIONS, UNLESS OTHERWISE NOTED. LIGHT SYMBOLS ARE SHOWN LARGER THAN ACTUAL SIZE, HOWEVER FOUNDATION SIZE IS SHOWN AT ACTUAL SIZE.

CALCULATION SUMMARY

LABEL	CALCTYPE	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
ALL POINTS	ILLUMINANCE	Fc	0.95	8.7	0.0	N.A.	N.A.
DRIVE AISLES	ILLUMINANCE	Fc	2.35	5.2	1.0	2.35	5.20
PARKING - NORTHWEST	ILLUMINANCE	Fc	2.70	7.0	0.7	3.86	10.00
PARKING - SOUTH	ILLUMINANCE	Fc	2.44	6.8	1.2	2.03	5.67
PARKING - SOUTHEAST	ILLUMINANCE	Fc	2.63	5.6	1.3	2.02	4.31
PARKING - SOUTHWEST	ILLUMINANCE	Fc	1.86	2.9	1.0	1.86	2.90

LUMINAIRE SCHEDULE

LABEL	QTY	MOUNTING HEIGHT	ARRANGEMENT	LUM. LUMENS	LLF	DESCRIPTION	POLE
P3-D	1	24'-6" AFG	BACK-BACK	16509	0.900	GARDCO BY SIGNIFY, PUREFORM LED AREA LIGHT, TYPE 3, ZERO UP-LIGHT (P26-A03-840-T3M-AR1-x)	GARDCO BY SIGNIFY, STRAIGHT ROUND STEEL POLE, 22' LENGTH (SRS-CB-4-11-22-D2-DT5)
P3-S	1	24'-6" AFG	SINGLE	12649	0.900	GARDCO BY SIGNIFY, PUREFORM LED AREA LIGHT, TYPE 3 WITH INTERNAL HOUSE SIDE SHIELD, ZERO UP-LIGHT (P26-A03-840-T3M-HIS-AR1-x)	GARDCO BY SIGNIFY, STRAIGHT ROUND STEEL POLE, 22' LENGTH (SRS-CB-4-11-22-D1-DT5)
P4M	3	24'-6" AFG	SINGLE	16357	0.900	GARDCO BY SIGNIFY, PUREFORM LED AREA LIGHT, TYPE 4M, ZERO UP-LIGHT (P26-A03-840-T4M-AR1-x)	GARDCO BY SIGNIFY, STRAIGHT ROUND STEEL POLE, 22' LENGTH (SRS-CB-4-11-22-D1-DT5)
P4M-S	11	24'-6" AFG	SINGLE	11650	0.900	GARDCO BY SIGNIFY, PUREFORM LED AREA LIGHT, TYPE 4M WITH INTERNAL HOUSE SIDE SHIELD, ZERO UP-LIGHT (P26-A03-840-T4M-HIS-AR1-x)	GARDCO BY SIGNIFY, STRAIGHT ROUND STEEL POLE, 22' LENGTH (SRS-CB-4-11-22-D1-DT5)
P4W-S	1	24'-6" AFG	SINGLE	10070	0.900	GARDCO BY SIGNIFY, PUREFORM LED AREA LIGHT, TYPE 4W WITH INTERNAL HOUSE SIDE SHIELD, ZERO UP-LIGHT (P26-A03-840-T4W-HIS-AR1-x)	GARDCO BY SIGNIFY, STRAIGHT ROUND STEEL POLE, 22' LENGTH (SRS-CB-4-11-22-D1-DT5)
P5M-D	1	24'-6" AFG	BACK-BACK	17359	0.900	GARDCO BY SIGNIFY, PUREFORM LED AREA LIGHT, TYPE 5M, ZERO UP-LIGHT (P26-A03-840-T5M-AR1-x)	GARDCO BY SIGNIFY, STRAIGHT ROUND STEEL POLE, 22' LENGTH (SRS-CB-4-11-22-02-DT5)
W4	16	12'-0" AFF	SINGLE	7304	0.900	GARDCO BY SIGNIFY, PUREFORM LED WALL SCONCE, TYPE 4, ZERO UP-LIGHT (PWS-P-A04-840-4-x)	----------



LOCATION MAP

SCALE: 1" = 800'

800 400 200 0 800

1"=800'

LIGHTING COMPLIANCE

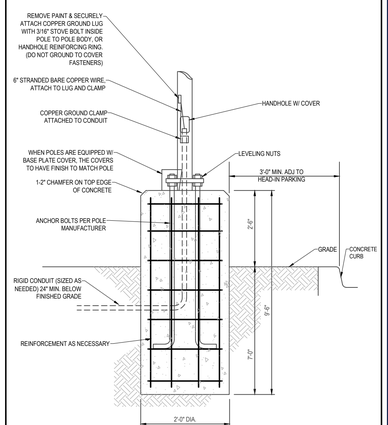
ZONING:

116-98 LIGHTING. LIGHTING SHALL BE ARRANGED IN A MANNER WHICH WILL PROTECT THE HIGHWAY AND NEIGHBORING PROPERTIES FROM DIRECT GLARE OR HAZARDOUS INTERFERENCE OF ANY KIND. [COMPLIES]

SALDO:

105-38.U ALL COMMON PARKING AREAS SHALL BE ADEQUATELY LIGHTED DURING AFTER-DARK OPERATING HOURS. ALL LIGHT STANDARDS SHALL BE LOCATED ON RAISED PARKING ISLANDS AND NOT ON THE PARKING SURFACE. [COMPLIES]

105-38.V. ALL ARTIFICIAL LIGHTING USED TO ILLUMINATE ANY PARKING SPACE OR SPACES SHALL BE SO ARRANGED THAT NO DIRECT RAYS FROM SUCH LIGHTING SHALL FALL UPON ANY NEIGHBORING PROPERTY OR STREETS, NOR SHALL ANY HIGH BRIGHTNESS SURFACE OF THE LUMINARIES BE VISIBLE FROM NEIGHBORING RESIDENTIAL PROPERTIES OR FROM A PUBLIC STREET. [COMPLIES]



NOTES:
1. THIS DETAIL IS FOR BID AND BUDGETARY PURPOSES ONLY. CONTRACTOR SHALL ENSURE DESIGN IS PREPARED BY A QUALIFIED STRUCTURAL ENGINEER CONSIDERING LIGHTING MANUFACTURER REQUIREMENTS, LOCAL WIND LOADS, SITE SPECIFIC SOIL PARAMETERS.
2. ALL REBAR SHALL HAVE A YIELD STRENGTH OF 60ksi, AND MAINTAIN A 3" MIN. CLEARANCE FROM SURFACES.

I-3 **LIGHT POLE FOUNDATION DETAIL**

NOT TO SCALE

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1	1/3/2025	NPDES MAJOR MODIFICATION	RMS / JAB
2	3/12/2025	FOR NPDES RESUBMISSION	RMS / JAB
3	04/14/2025	PER TOWNSHIP COMMENT	RMS / JAB
4	5/28/2025	PER NPDES COMMENT	RMS / JAB
5	7/22/2025	PER REVISED ARCH	RMS / MRB

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PROJECT No.:	PAB220113.01
DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-LLGT-5A

PROJECT:

AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

**500 PENNSYLVANIA AVENUE
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY, PA**

BOHLER
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REGISTERED LANDSCAPE ARCHITECT
PENNSYLVANIA LICENSE No. LA002729

SHEET TITLE:

LIGHTING PLAN

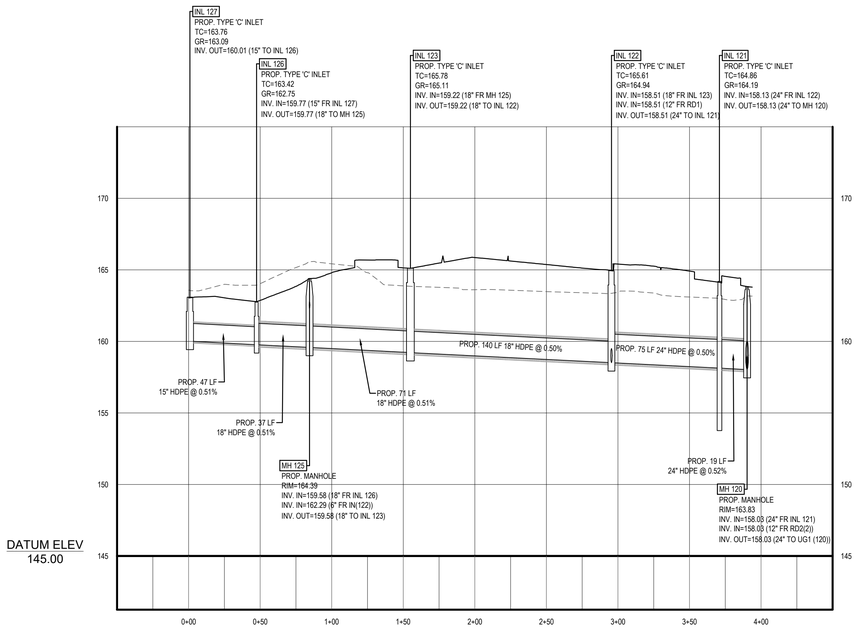
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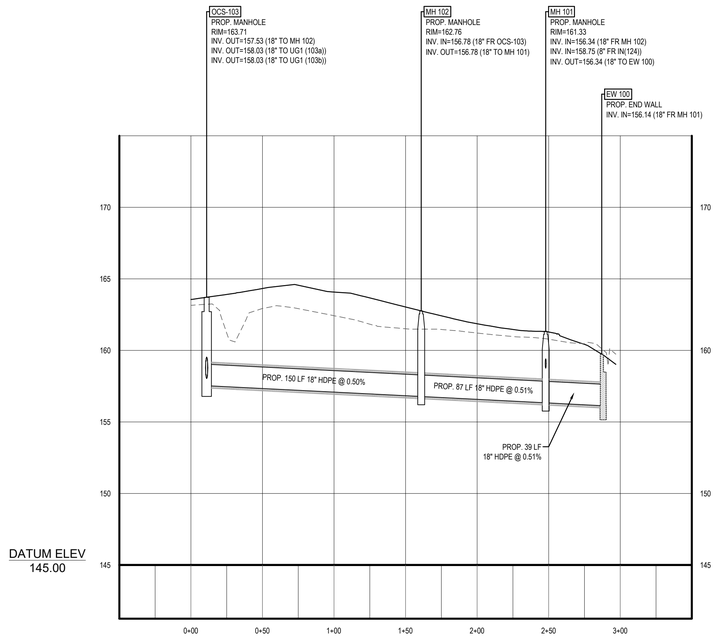
REVISION 5 - 7/22/2025

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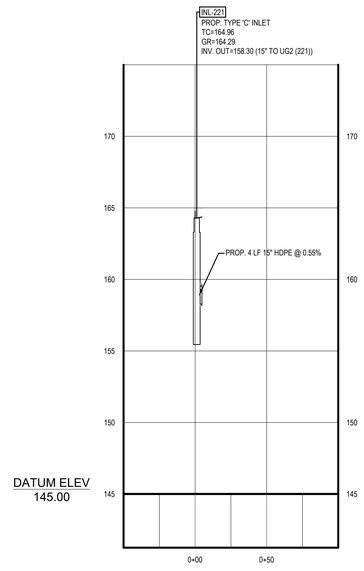
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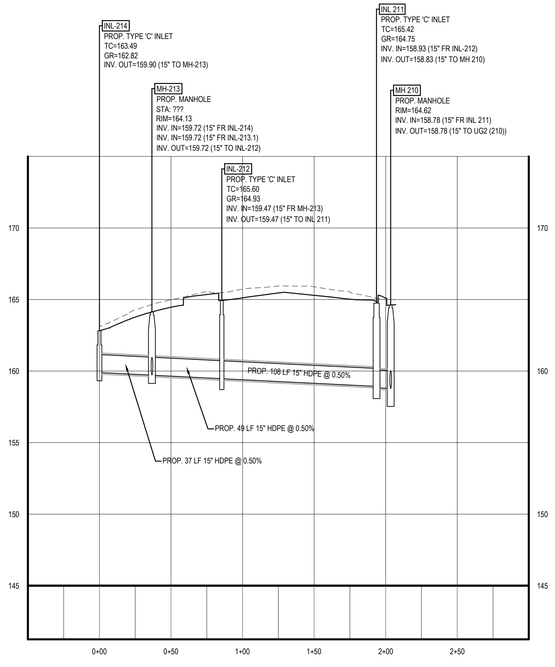
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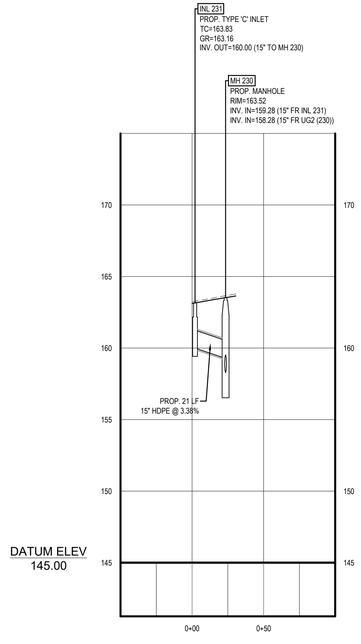
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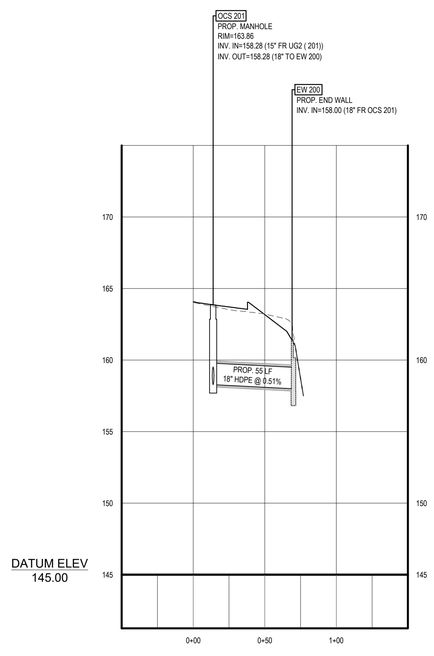
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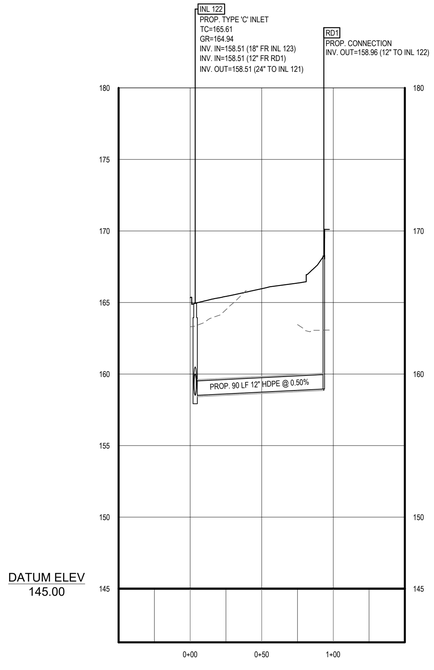
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OCS 201 - EW-200

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1"= 5 ' VERTICAL



RD1 - INL122

SCALE: 1"= 50 ' HORIZONTAL
1"= 5 ' VERTICAL

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RS

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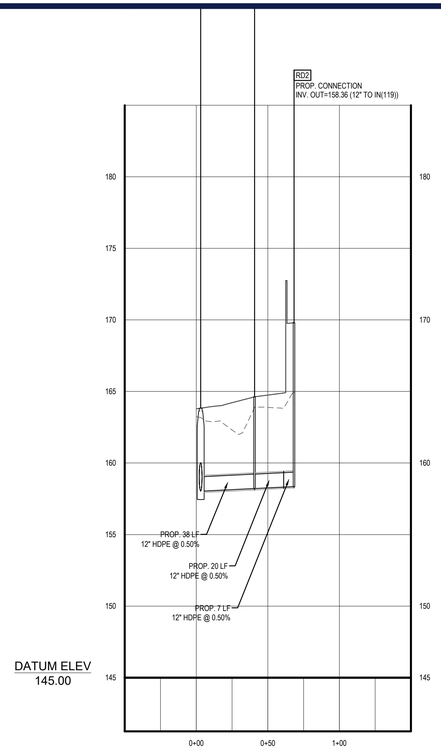
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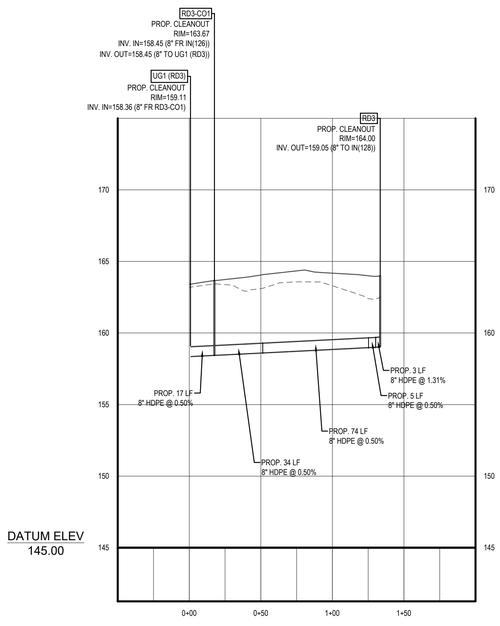
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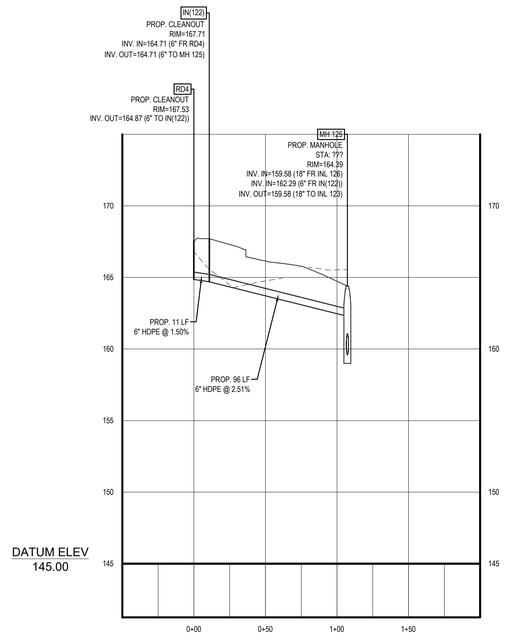
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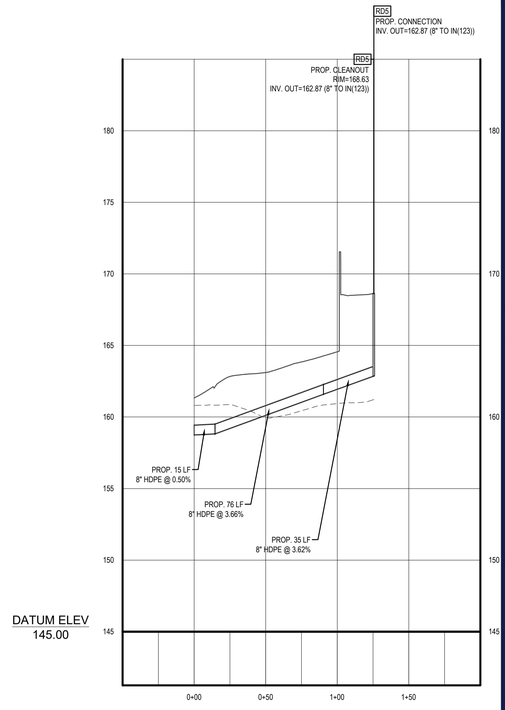
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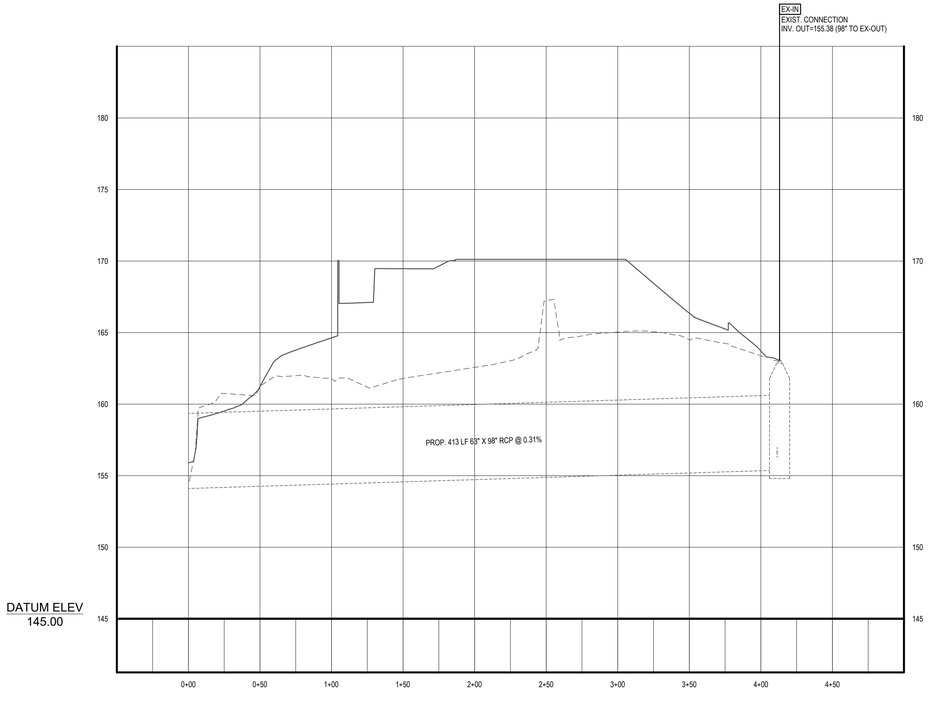
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SCALE: 1"= 50 ' HORIZONTAL
1"= 5 ' VERTICAL



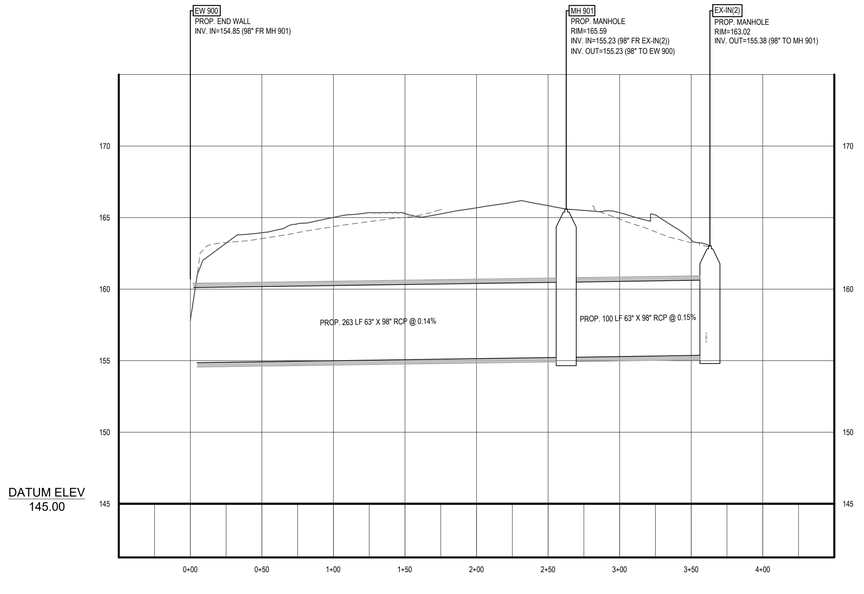
RD5 - OCS101 (BYPASS)

SCALE: 1"= 50 ' HORIZONTAL
1"= 5 ' VERTICAL



EXISTING CULVERT PIPE

SCALE: 1"= 50 ' HORIZONTAL
1"= 5 ' VERTICAL



EXISTING CULVERT REALIGNMENT

SCALE: 1"= 50 ' HORIZONTAL
1"= 5 ' VERTICAL

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PROJECT No.:	PAB220113.01
DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-PROF-5A

PROJECT:

AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

**500 PENNSYLVANIA AVENUE
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY, PA**

BOHLER

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BETHLEHEM, PA 18018
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JEFFREY A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE082005
NEW JERSEY LICENSE No. GE49043/36600

SHEET TITLE:

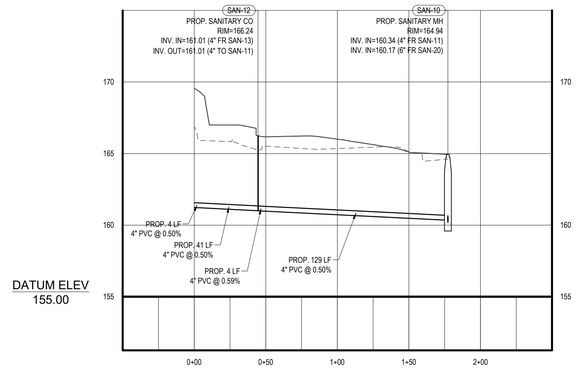
STORM SEWER PROFILES

SHEET NUMBER:

C-802

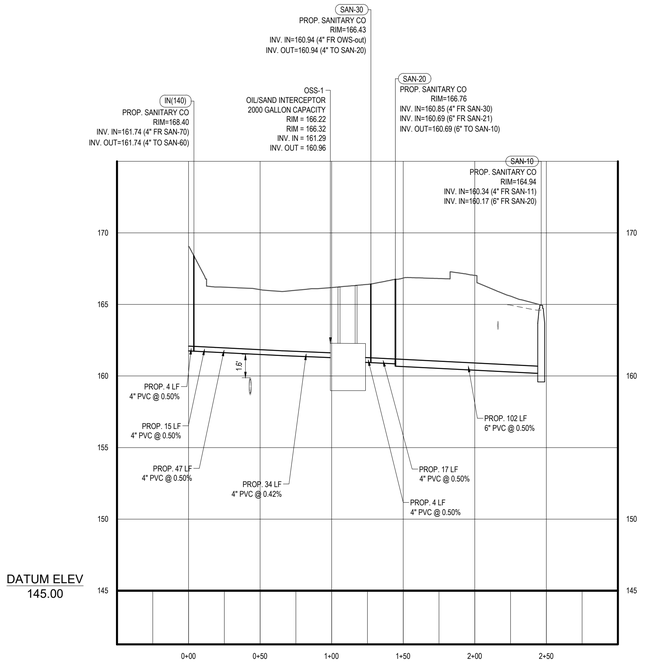
REVISION 5 - 7/22/2025

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RS



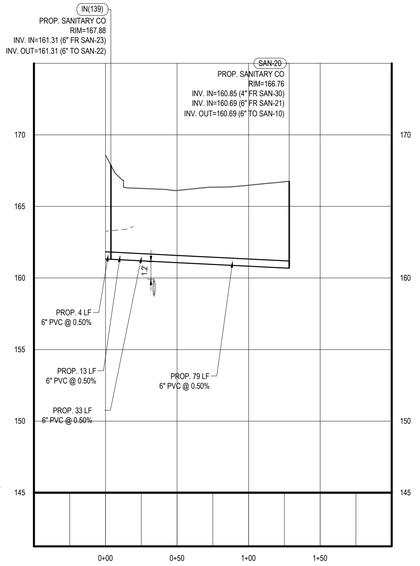
SANITARY SEWER - EXISTING BUILDING EXTENSION

SCALE: 1"= 50 ' HORIZONTAL
1"= 5 ' VERTICAL



SAN-20 - OWS - 4 INCH BLDG CONNECTION

SCALE: 1"= 50 ' HORIZONTAL
1"= 5 ' VERTICAL



SAN-20 - 6 INCH BLDG CONNECTION

SCALE: 1"= 50 ' HORIZONTAL
1"= 5 ' VERTICAL

I:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-PROF-5A_—_LAYOUT C-803 SAN PROFILES
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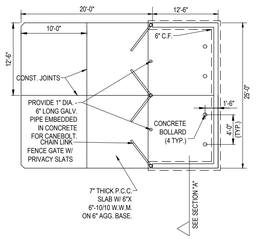
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SANITARY SEWER PROFILES

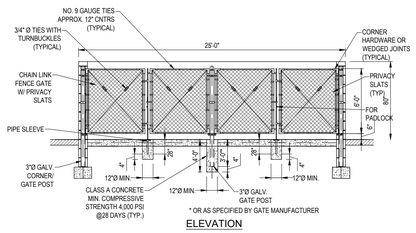
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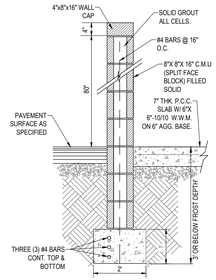
REVISION 5 - 7/22/2025



PLAN VIEW



ELEVATION

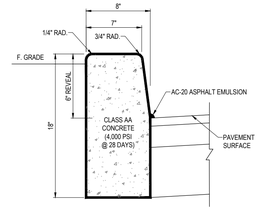


SECTION "A"

NOTE: TRASH ENCLOSURE FINISH TO BE COORDINATED WITH OWNER.

A-10 ***12'-6" x 25'-0" CMU TRASH ENCLOSURE DETAIL***

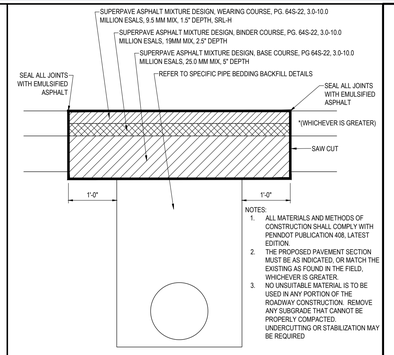
NOT TO SCALE



TRANSVERSE JOINTS 3/4" WIDE SHALL BE INSTALLED IN THE CURB 20' APART AND SHALL BE FILLED WITH CELLULAR COMPRESSION MATERIAL AS SPECIFIED RECESSED 1/4" IN FROM FRONT FACE AND TOP OF CURB.

P-1 ***TYPICAL CONCRETE CURB DETAIL***

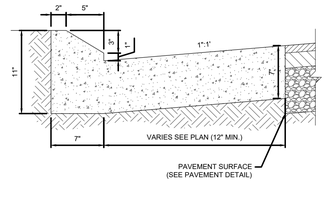
NOT TO SCALE



NOTES:
1. ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL COMPLY WITH PENNDOT PUBLICATION 408, LATEST EDITION.
2. THE PROPOSED PAVEMENT SECTION MUST BE AS INDICATED, OR MATCH THE EXISTING AS FOUND IN THE FIELD, WHICHEVER IS GREATER.
3. NO UNSUITABLE MATERIAL IS TO BE USED IN ANY PORTION OF THE ROADWAY CONSTRUCTION. REMOVE ANY SUBGRADE THAT CANNOT BE PROPERLY COMPACTED. UNDERCUTTING OR STABILIZATION MAY BE REQUIRED

P-14 ***FLEXIBLE PAVEMENT RESTORATION***

NOT TO SCALE



NOTES:
1. EXPANSION JOINTS TO BE INSTALLED AT 20' INTERVALS.
2. THIS ITEM MAY BE PRECAST OR CAST IN PLACE.
3. CONCRETE TO BE CLASS A3 IF CAST IN PLACE OR 4000 P.S.I. IF PRECAST.
4. WHEN THIS STANDARD IS TO BE TIED INTO EXISTING BARRIER CURB, THE TRANSITION IS TO BE MADE WITHIN 10' OR THE CHANGE IN STANDARDS MADE AT REGULAR OPENINGS.

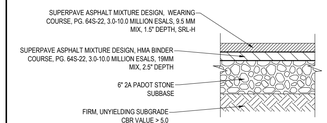
CONCRETE CURB AND GUTTER MOUNTABLE

NOT TO SCALE (BE-S020204 - 08/2023)



NO PARKING - FIRE LANE SIGN

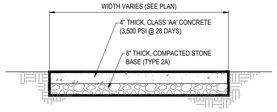
NOT TO SCALE



NOTE:
ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL COMPLY WITH THE LATEST EDITIONS OF PENNDOT PUBLICATION 408 AND 242 (PAVEMENT POLICY MANUAL).

P-17 ***STANDARD ASPHALT PAVEMENT DETAIL***

NOT TO SCALE

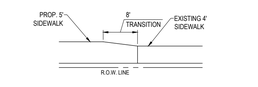


EXPANSION JOINTS 1/2" WIDE PREMOULDED BIT. MATERIAL SHALL BE INSTALLED AT 30' INTERVALS. CONTRACTION JOINTS TO BE SPACED AT EQUAL INTERVALS, 5' MAXIMUM LENGTH.

ALL SIDEWALKS SHALL BE LATERALL PITCHED AT A SLOPE OF NO LESS THAN [INCH PER FOOT.

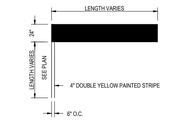
P-21 ***CONCRETE SIDEWALK DETAIL***

NOT TO SCALE



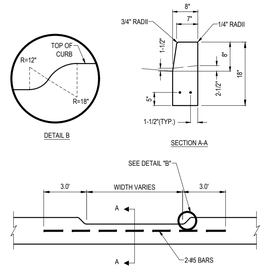
P-22 ***SIDEWALK TIE-IN DETAIL***

NOT TO SCALE



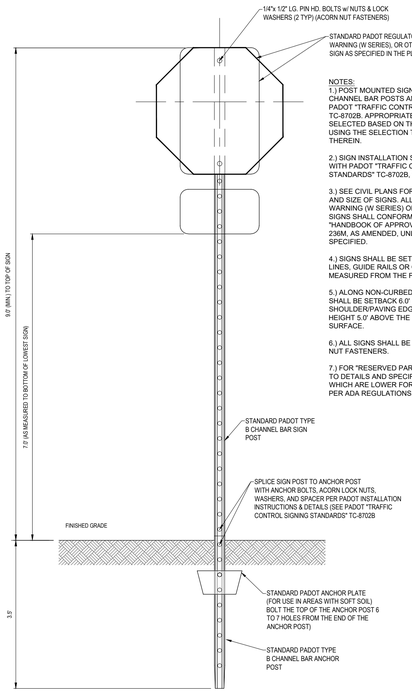
T-6 ***WHITE PAINTED STOP BAR DETAIL***

NOT TO SCALE



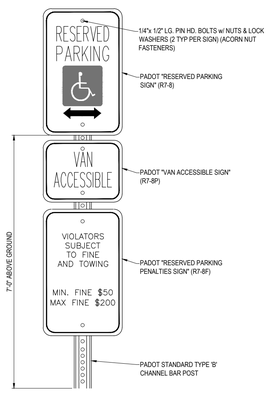
P-6 ***DEPRESSED CURB DETAIL***

NOT TO SCALE



T-11 ***STANDARD POLE MOUNTED SIGN INSTALLATION DETAIL***

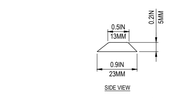
NOT TO SCALE



NOTES:
1. POST MOUNTED SIGNS SHALL BE TYPE B CHANNEL BAR POSTS AND SHALL CONFORM TO PADOT "TRAFFIC CONTROL SIGNING STANDARDS" TC-8702B. APPROPRIATE POSTS SHALL BE SELECTED BASED ON THE SIZE OF THE SIGN USING THE SELECTION TABLES CONTAINED THEREIN.
2. SIGN INSTALLATION SHALL BE IN ACCORDANCE WITH PADOT "TRAFFIC CONTROL SIGNING STANDARDS" TC-8702B, AS AMENDED.
3. SEE CIVIL PLANS FOR EXACT LOCATION, TYPE AND SIZE OF SIGNS. ALL REGULATORY (R SERIES), SIGNS SHALL CONFORM TO THE PADOT "HANDBOOK OF APPROVED SIGNS", PUBLICATION 236M, AS AMENDED, UNLESS OTHERWISE SPECIFIED.
4. SIGNS SHALL BE SETBACK 2.0' FROM CURB LINES OR OTHER OBSTRUCTIONS AS MEASURED FROM THE FACE/EDGE OF THE SIGN.
5. RESERVED PARKING SPACE SIGNS SHALL CONFORM TO DEPARTMENT OF JUSTICE "ADA STANDARDS FOR ACCESSIBLE DESIGN" AS AMENDED.
6. ALL SIGNS SHALL BE INSTALLED WITH ACORN NUT FASTENERS.

T-14 ***RESERVED PARKING SPACE WITH PENALTIES & VAN ACCESSIBLE SIGNS***

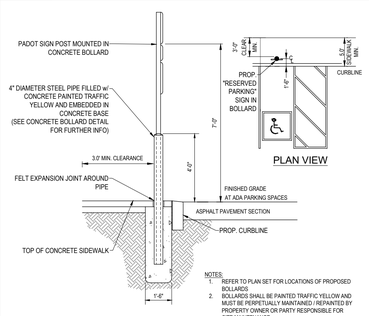
NOT TO SCALE



NOTES:
1. DETECTABLE WARNINGS SHALL BE A PRE-MANUFACTURED ARMOUR-TILE TACTILE SYSTEM OR APPROVED EQUIVALENT.
2. CONTRACTOR TO COORDINATE SPECIFIC SYSTEM AND MATERIALS TO BE UTILIZED WITH THE ENGINEER TO ENSURE LOCAL, STATE AND A.D.A. COMPLIANCE PRIOR TO CONSTRUCTION.

T-16 ***TRUNCATED DOME PATTERN FOR ADA DETECTABLE WARNING SURFACES (FOR USE IN DOT ROADWAYS)***

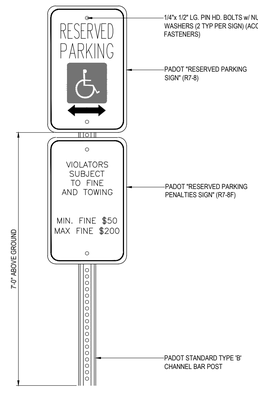
NOT TO SCALE



NOTES:
1. REFER TO PLAN SET FOR LOCATIONS OF PROPOSED BOLLARDS
2. BOLLARDS SHALL BE PAINTED TRAFFIC YELLOW AND MUST BE PERPETUALLY MAINTAINED / REPAINTED BY PROPERTY OWNER OR PARTY RESPONSIBLE FOR SITE MAINTENANCE.

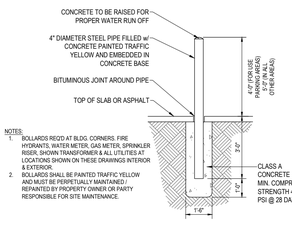
T-18 ***RESERVED PARKING SIGN WITHIN BOLLARD DETAIL***

NOT TO SCALE



T-15 ***RESERVED PARKING SPACE & PENALTIES SIGNS***

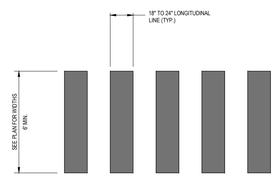
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NOTES:
1. BOLLARDS REQD AT BLDG. CORNERS, FIRE HYDRANTS, WATER METER, GAS METER, SPRINKLER RISER, SHOWN TRANSFORMER & ALL UTILITIES AT LOCATIONS SHOWN ON THESE DRAWINGS INTERIOR & EXTERIOR.
2. BOLLARDS SHALL BE PAINTED TRAFFIC YELLOW AND MUST BE PERPETUALLY MAINTAINED / REPAINTED BY PROPERTY OWNER OR PARTY RESPONSIBLE FOR SITE MAINTENANCE.

T-20 ***BOLLARD DETAIL***

NOT TO SCALE



NOTES:
1. THIS TYPE OF MARKING SHOULD BE USED AT LOCATIONS WHERE SUBSTANTIAL NUMBERS OF PEDESTRIANS CROSS WITHOUT ANY OTHER TRAFFIC CONTROL DEVICE, AT LOCATIONS WHERE PHYSICAL CONDITIONS ARE SUCH THAT ADDED VISIBILITY OF THE CROSSWALK IS NECESSARY, OR AT PLACES WHERE PEDESTRIANS MIGHT NOT BE EXPECTED.
2. ALL CROSSWALKS SHALL COMPLY WITH THE FEDERAL HIGHWAY ADMINISTRATION'S "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD), AS AMENDED.
3. LONGITUDINAL LINES SHALL BE PERPENDICULAR TO TRAVELLED WAY THE EXTEND ACROSS THE FULL WIDTH OF PAVEMENT OR TO THE EDGE OF THE INTERSECTING CROSSWALK TO DISCOURAGE DIAGONAL WALKING BETWEEN CROSSWALKS.
4. ALL CROSSWALK LONGITUDINAL LINES SHALL BE WHITE THERMOPLAST. ALL LINES AND NEUTRAL AREAS SHALL BE OF EQUAL WIDTHS.
5. WARNING SIGNS SHALL BE INSTALLED IN ACCORDANCE WITH MUTCD, AS AMENDED.
6. THE SPACING OF THE LINES SHALL BE SELECTED TO AVOID THE WHEEL PATH.

T-22 ***HIGH VISIBILITY CROSSWALK (PERPENDICULAR TO INTERSECTION)***

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NEW JERSEY LICENSE No. 24GE05339500

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DETAIL SHEET

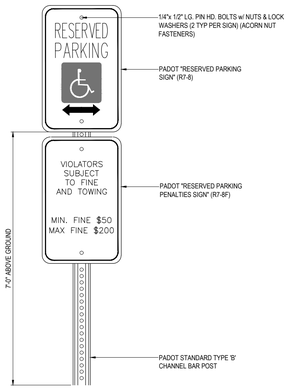
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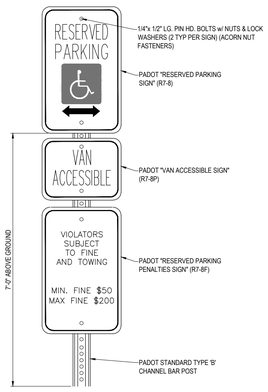
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\\BOHLERENG.NET\SHARES\PA-PROJECTS\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-CNDS-5A-----LAYOUT: C-901 DETAILS
BY:



T-15 ***RESERVED PARKING SPACE & PENALTIES SIGNS***

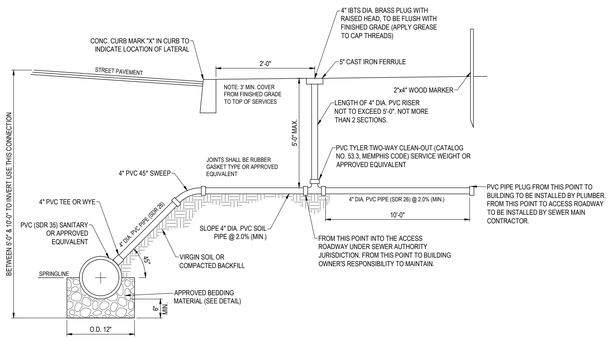
NOT TO SCALE



NOTES:
1. POST MOUNTED SIGNS SHALL BE TYPE B CHANNEL BAR POSTS AND SHALL CONFORM TO PADOT "TRAFFIC CONTROL SIGNING STANDARDS" TC-8702B. APPROPRIATE POSTS SHALL BE SELECTED BASED ON THE SIZE OF THE SIGN USING THE SELECTION TABLES CONTAINED THEREIN.
2. SIGN INSTALLATION SHALL BE IN ACCORDANCE WITH PADOT "TRAFFIC CONTROL SIGNING STANDARDS" TC-8702B, AS AMENDED.
3. SEE CIVIL PLANS FOR EXACT LOCATION, TYPE AND SIZE OF SIGNS. ALL REGULATORY (R SERIES), SIGNS SHALL CONFORM TO THE PADOT "HANDBOOK OF APPROVED SIGNS", PUBLICATION 236M, AS AMENDED, UNLESS OTHERWISE SPECIFIED.
4. SIGNS SHALL BE SETBACK 2.0' FROM CURB LINES OR OTHER OBSTRUCTIONS AS MEASURED FROM THE FACE/EDGE OF THE SIGN.
5. RESERVED PARKING SPACE SIGNS SHALL CONFORM TO DEPARTMENT OF JUSTICE "ADA STANDARDS FOR ACCESSIBLE DESIGN" AS AMENDED.
6. ALL SIGNS SHALL BE INSTALLED WITH ACORN NUT FASTENERS.

T-14 ***RESERVED PARKING SPACE WITH PENALTIES & VAN ACCESSIBLE SIGNS***

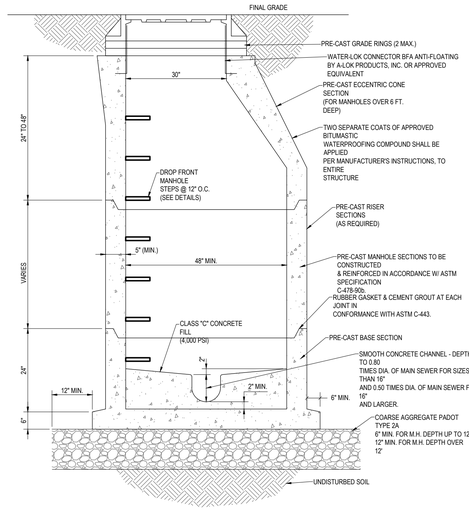
NOT TO SCALE



S-1 ***TYPICAL SANITARY SEWER LATERAL DETAIL***

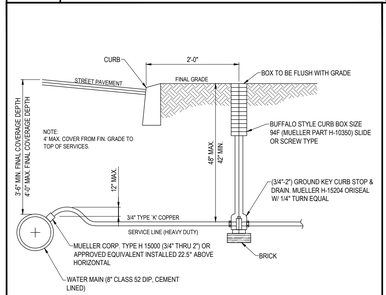
NOT TO SCALE

SANITARY LATERAL PIPE AND MH STRUCTURE WITHIN FLOODPLAIN SHALL BE WATERTIGHT / WATERPROOF AND BE CONSTRUCTED WITH WATERTIGHT / WATERPROOF FITTINGS AND COMPONENTS. MH SHALL HAVE A BOLT DOWN WATERTIGHT / WATERPROOF LID.



S-3 ***PRECAST SANITARY MANHOLE DETAILS***

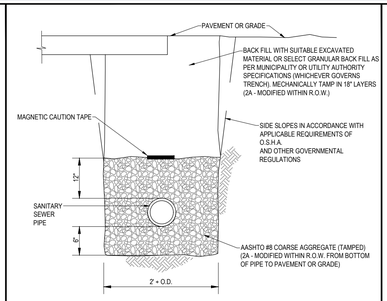
NOT TO SCALE



NOTE:
MODIFIED 2A STONE (8" LIFTS) SHALL BE PLACED WHEN BACKFILLING WATER SERVICE CONNECTION FROM MAIN TO BEHIND CURB.

W-2 ***WATER SERVICES CONNECTION DETAIL***

NOT TO SCALE

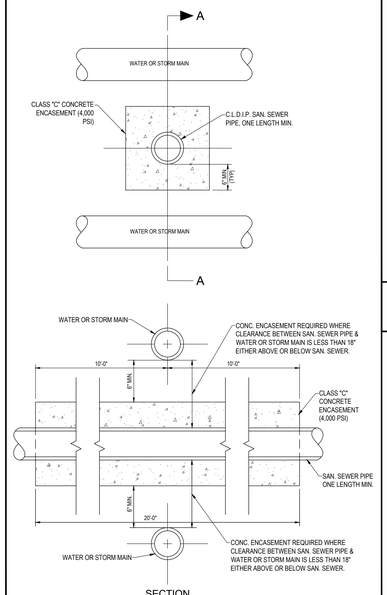


EXCAVATIONS IN EXISTING PAVED ROADWAYS SHALL BE COORDINATED WITH THE LOCAL PERMITTING AGENCY, AND ALL EXCAVATION SHALL BE PAVED WITH TEMPORARY BITUMINOUS PAVEMENT FROM THE DATE OF ORIGINAL EXCAVATION UNTIL PERMANENT PAVEMENT IS INSTALLED. (MINIMUM = 90 DAYS, MAXIMUM = 120 DAYS)

THIS DETAIL IS NOT FOR USE WITHIN A STATE RIGHT-OF-WAY. REFER TO THE LATEST APPROVED DOT SPECIFICATIONS FOR TRENCH BEDDING WITHIN A STATE RIGHT-OF-WAY.

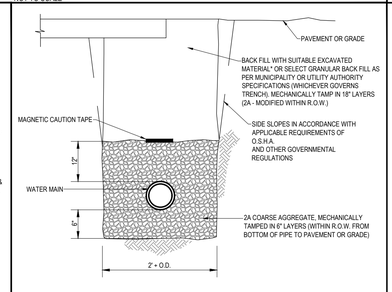
S-8 ***TRENCH BEDDING CLASSIFICATION (SANITARY MAIN)***

NOT TO SCALE



S-11 ***CONCRETE ENCASEMENT DETAIL***

NOT TO SCALE

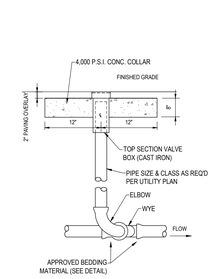


EXCAVATIONS IN EXISTING PAVED ROADWAYS SHALL BE COORDINATED WITH THE LOCAL PERMITTING AGENCY, AND ALL EXCAVATION SHALL BE PAVED WITH TEMPORARY BITUMINOUS PAVEMENT FROM THE DATE OF ORIGINAL EXCAVATION UNTIL PERMANENT PAVEMENT IS INSTALLED. (MINIMUM = 90 DAYS, MAXIMUM = 120 DAYS)

THIS DETAIL IS NOT FOR USE WITHIN A STATE RIGHT-OF-WAY. REFER TO THE LATEST APPROVED DOT SPECIFICATIONS FOR TRENCH BEDDING WITHIN A STATE RIGHT-OF-WAY.

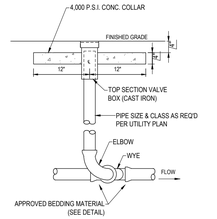
W-4 ***TRENCH BEDDING CLASSIFICATION (WATER MAIN)***

NOT TO SCALE



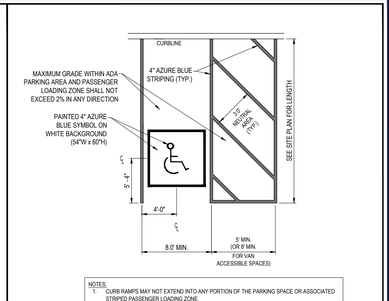
S-12 ***TYPICAL CLEANOUT DETAIL (PAVED AREAS)***

NOT TO SCALE



S-13 ***TYPICAL CLEANOUT DETAIL (LANDSCAPE AREAS)***

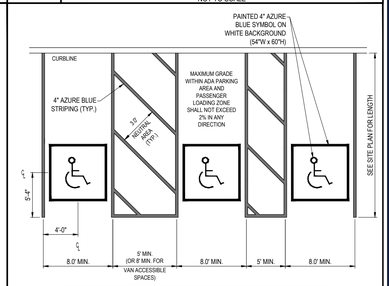
NOT TO SCALE



NOTES:
1. CURB RAMPS MAY NOT EXTEND INTO ANY PORTION OF THE PARKING SPACE OR ASSOCIATED STRIPED PASSENGER LOADING ZONE.
2. CURB RAMPS, PAVEMENT MARKINGS, AND APPLICABLE SIGNAGE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST A.D.A. ACCESSIBILITY GUIDELINES.

T-13 ***ADA ACCESSIBLE PARKING SPACE STRIPING (1 SPACE)***

NOT TO SCALE

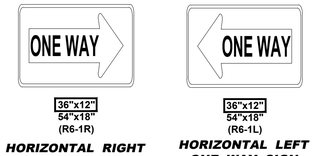


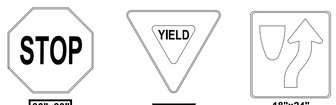
NOTES:
1.) CURB RAMPS MAY NOT EXTEND INTO ANY PORTION OF THE PARKING SPACE OR ASSOCIATED STRIPED PASSENGER LOADING ZONE.

2.) CURB RAMPS, PAVEMENT MARKINGS, AND APPLICABLE SIGNAGE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST A.D.A. ACCESSIBILITY GUIDELINES.

T-12 ***ADA ACCESSIBLE PARKING SPACE STRIPING (3 SPACES)***

NOT TO SCALE







LIST OF APPLICABLE PADOT DETAILS

SIGNAGE: PA.D.O.T. PUBLICATION 236
ADDITIONAL DETAILS ASSOCIATED WITH PADOT ROAD IMPROVEMENTS ARE ON THE FOLLOWING STANDARD DETAILS FROM PennDOT PUBLICATION 72M:
(THE PERMITTEE IS REQUIRED TO PROVIDE THE CONTRACTOR WITH COPIES OF THE MOST CURRENT APPLICABLE RC DRAWINGS FROM THE PennDOT PUBLICATION 72M)

STANDARD DRAWING NUMBER	DRAWING DATE
RC – 28M	FEBRUARY 19, 2021
RC – 39M	FEBRUARY 19, 2021
RC – 45M	FEBRUARY 19, 2021
RC – 46M	FEBRUARY 19, 2021
RC – 64M	FEBRUARY 19, 2021
RC – 67M	FEBRUARY 19, 2021

ALL PAVEMENT MARKINGS SHOULD BE IN ACCORDANCE WITH PennDOT PUBLICATION 111, TC-8600 & TC-8700 STANDARDS, LATEST EDITION.

SIGNAGE: PA.D.O.T. PUBLICATION 236
"STOP" SIGN - R1-1 (24" x 24")
"NO LEFT TURN" SIGN - R3-2 (24" x 24")
"CENTER LANE - LEFT TURN - ONLY" SIGN - R3-9B (24" x 36")
"BEGIN" SIGN - R3-9CP (24" x 12")
"KEEP RIGHT" SIGN - R4-7 (12" x 18")
"DO NOT ENTER" SIGN - R5-1 (30" x 30")
VERTICAL "ONE WAY" LEFT SIGN - R6-2L (18" x 24")
VERTICAL "ONE WAY" RIGHT SIGN - R6-2R (18" x 24")
NO PARKING SYMBOL SIGN - R8-3 (24" x 24")
PEDESTRIAN SIGN - W11-2 (30" x 30" W/ FLUORESCENT YELLOW-GREEN BACKGROUND)
DOWNWARD POINTING ARROW SIGN - W16-7P (24" x 12" W/ FLUORESCENT YELLOW-GREEN BACKGROUND)
OBJECT MARKER - OM1-3 (18" x 18")

ADDITIONAL DETAILS ASSOCIATED WITH PADOT ROAD IMPROVEMENTS ARE ON THE FOLLOWING STANDARD DETAILS FROM THE LATEST EDITION OF PennDOT PUBLICATION 72M:
(THE PERMITTEE IS REQUIRED TO PROVIDE THE CONTRACTOR WITH COPIES OF THE MOST CURRENT APPLICABLE RC DRAWINGS)

LIST OF APPLICABLE PADOT DETAILS & STANDARDS

STANDARD DRAWING NUMBER	DRAWING NAME
RC - 26M	CONCRETE PAVEMENT REHABILITATION
RC - 28M	OVERLAY TRANSITIONS AND PAVING NOTCHES
RC - 30M	SUBSURFACE DRAINS
RC - 33M	END SECTIONS FOR PIPE CULVERTS
RC - 38M	SANITARY SEWER MANHOLES
RC - 39M	STORMWATER MANHOLES
RC - 45M	INLET TOPS, GRATES AND FRAMES
RC - 46M	INLET BOXES
RC - 64M	CURBS AND GUTTERS
RC - 65M	CONCRETE MOUNTABLE CURBS
RC - 67M	CURB RAMPS AND SIDEWALKS

BOHLER
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
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SUSTAINABLE SERVICES
PERMITTING SERVICES
TRANSPORTATION SERVICES

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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/3/2025	NPDES MAJOR MODIFICATION	RMS / JAB
2	3/12/2025	FOR NPDES RESUBMISSION	RMS / JAB
3	04/14/2025	PER TOWNSHIP COMMENT	RMS / JAB
4	5/28/2025	PER NPDES COMMENT	RMS / JAB
5	7/22/2025	PER REVISED ARCH	RMS / MRB

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THIS DRAWING IS INTENDED FOR MUNICIPAL AND/OR AGENCY REVIEW AND APPROVAL. IT IS NOT INTENDED AS A CONSTRUCTION DOCUMENT UNLESS INDICATED OTHERWISE.

PROJECT No.:	PAB220113.01
DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-CNDS-5A

PROJECT:

AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

500 PENNSYLVANIA AVENUE WHITEMARSH TOWNSHIP MONTGOMERY COUNTY, PA

BOHLER
74 W BROAD STREET, SUITE 500
BETHLEHEM, PA 18018
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NEW JERSEY LICENSE No. 24GE05039500

SHEET TITLE:

DETAIL SHEET

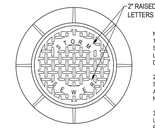
SHEET NUMBER:

C-902

Page 30 of 36

REVISION 5 - 7/22/2025

BY



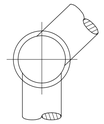
MANHOLE COVER SECTION

NOTES:
1.) STANDARD MANHOLE FRAMES & COVERS SHALL BE USED ON ALL MANHOLES NOT LOCATED WITHIN EASEMENTS UNLESS DIRECTED OTHERWISE BY THE ENGINEER.

2.) STANDARD MANHOLE FRAME & COVER SHALL BE BRODIE/STATE PATTERN #1012B, OR APPROVED EQUIVALENT, WITH NON-PENETRATING PICK HOLES.

3.) "FLOW-SEAL" MANHOLE COVERS SHALL BE USED ON MANHOLES LOCATED WITHIN EASEMENTS, IN UNPAVED AREAS, AND OUTSIDE OF THE CENTERLINE OF PAVED ROADS.

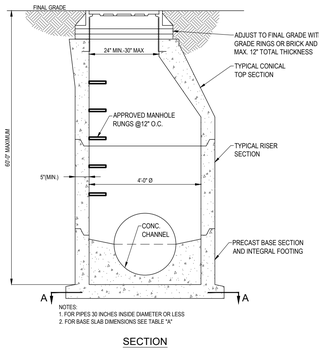
4.) ALL MANHOLE FRAME AND COVERS SHALL BE MADE IN THE USA.



PLAN VIEW

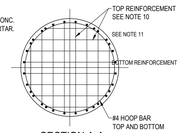
TABLE A
BASE SLAB DIMENSIONS

MAX. DEPTH FROM TOP OF MANHOLE TO TOP OF FOOTING	AS DESIGNED (SEE NOTE 12)	
	FOOTING DIAMETER	FOOTING THICKNESS
10'-0"	6'-9"	1'-0"
20'-0"	6'-9"	1'-0"
30'-0"	6'-9"	1'-3"
40'-0"	7'-3"	1'-3"
50'-0"	8'-0"	1'-3"
60'-0"	8'-6"	1'-3"

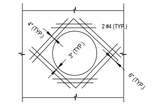


NOTES:
1. FOR PIPES 30 INCHES INSIDE DIAMETER OR LESS
2. FOR BASE SLAB DIMENSIONS SEE TABLE "A"

SECTION



SECTION A-A



NOTE:

FOR WALL THICKNESS 10" THICK OR GREATER PLACE ADDITIONAL REINFORCEMENT AS SHOWN ABOVE AT EACH FACE OF THE WALL INSIDE MAIN REINFORCEMENT.
FOR WALLS 5" THICK KEEP MAIN REINFORCEMENT CENTERED IN WALL, PROVIDE ADDITIONAL REINFORCEMENT AS SHOWN ABOVE, MAINTAINING REQUIRED COVER.

REINFORCEMENT DETAIL AT OPENINGS

NOTES:
1. PRECAST MANHOLES, MEETING THE REQUIREMENTS OF PUBLICATION 408 SPECIFICATIONS, SECTION 714, MAY BE SUBSTITUTED FOR THE STANDARD CAST-IN-PLACE MANHOLE.

2. CONSTRUCTION NOTES:
   A. CONSTRUCT IN ACCORDANCE WITH: PENNDOT PUBLICATION 408 SPECIFICATIONS, SECTIONS 605, 606, 714 AND ASTM C-478-90, STANDARD SPECIFICATIONS FOR PRECAST REINFORCED CONCRETE MANHOLE SECTIONS, AS MODIFIED HERE IN.
   B. MINIMUM CONCRETE CLASS AA.
   C. PROVIDE EPOXY COATED STEEL REINFORCEMENT (IN ACCORDANCE WITH ASTM A185), STEEL WELDED WIRE FABRIC (IN ACCORDANCE WITH ASTM A820 & A675), PLAIN BILLET STEEL BARS (IN ACCORDANCE WITH ASTM A615) OR DEFORMED BILLET STEEL BARS. PROVIDE MINIMUM YIELD STRENGTH OF 60,000 PSI.
   D. CLEAR COVER FOR STEEL: WALLS: 2" FOOTINGS: 2" (TOP BARS), 1 1/2" (BOTTOM BARS) 1 1/2" (SIDE COVER)

3. PROVIDE 12" MINIMUM HORIZONTAL CLEARANCE BETWEEN OPENINGS LOCATED AT THE SAME DEPTH. PIPES NOT LOCATED AT THE SAME DEPTH MUST BE LOCATED VERTICALLY AT LEAST ONE TIMES MAXIMUM OPENING DIAMETER APART.

4. FOR RISERS OR BASE SECTIONS WITH OPENINGS, PROVIDE A MINIMUM HEIGHT OF SECTION EQUAL TO TWO TIMES THE LARGEST OPENING, CENTER OF OPENING TO BE LOCATED AT LEAST ONE TIMES THE OPENING FROM THE CLOSEST JOINT BETWEEN RISERS.

5. FOR PRECAST RISER OR BASE SECTIONS WITH ONE OPENING LOCATED AT DEPTHS TO 60' OR FOR SECTIONS WITH TWO OR MORE OPENINGS, LOCATED AT A DEPTH OF 15 FEET AND LESS, PROVIDE CIRCUMFERENTIAL REINFORCEMENT IN ACCORDANCE WITH REINFORCEMENT DETAIL AT OPENINGS.

   FOR RISERS OR BASE SECTIONS WITH 2 OR MORE OPENINGS, LOCATED AT A DEPTH GREATER THAN 15 FEET, BUT LESS THAN OR EQUAL TO 30 FEET, PROVIDE CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.44 SQ/IN VERTICAL FOOT FOR THE DEPTH OF THE RISER OR BASE SECTION

   FOR RISERS OR BASE SECTIONS WITH 2 OR MORE OPENINGS, LOCATED AT DEPTHS GREATER THAN 30 FEET. USE A 10 INCH THICK WALL RISER OR BASE SECTION WITH CIRCUMFERENTIAL REINFORCEMENT EQUAL TO 0.12 SQ/IN VERTICAL FOOT EACH FACE

   RISERS OR BASE SECTIONS WITH HOLES TO BE CLEARLY MARKED WITH MAXIMUM ALLOWABLE DEPTH.

6. PROVIDE ADDITIONAL REINFORCEMENT BARS AROUND OPENINGS AS SHOWN ON REINFORCEMENT DETAILS AT OPENINGS

7. PROVIDE MANHOLE STEPS MEETING THE REQUIREMENTS OF PUBLICATION 408 SPECIFICATIONS, SECTION 605.2(C), ALTERNATE CONFIGURATIONS AND DIMENSIONS, AS APPROVED BY THE ENGINEER, MAY BE USED.

8. PROVIDE MINIMUM 1" SECTION DIMENSION FOR METAL STEPS. PROVIDE MAXIMUM 3/4" SECTION DIMENSION FOR NON-DETERIORATING MATERIAL STEPS.

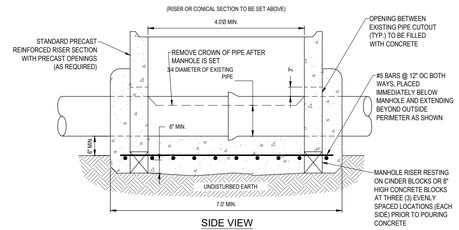
9. MECHANICAL ANCHOR REQUIRED FOR INSTALLATION OF STEPS WITHOUT HOOKS.

10. FOR FOOTING TOP REINFORCEMENT, BOTH DIRECTIONS, USE NO. 19 (6) BARS AT 12" FOR DEPTHS TO 60' OR 0.30 IN²/FT WWF FOR DEPTHS TO 30' AND 0.32 IN²/FT WWF FOR DEPTHS GREATER THAN 30'. 6" MAXIMUM SPACING FOR WWF.

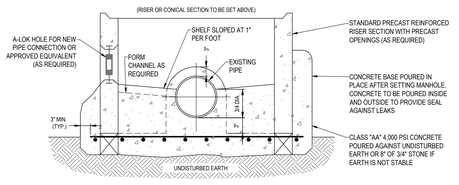
11. FOR FOOTING BOTTOM REINFORCEMENT, BOTH DIRECTIONS, USE NO. 13 (4) BARS AT 18" FOR DEPTHS TO 60' OR 0.15 IN²/FT WWF FOR DEPTHS TO 30' AND 0.16 IN²/FT WWF FOR DEPTHS GREATER THAN 30'. 6" MAXIMUM SPACING FOR WWF.

12. A SAFE BEARING CAPACITY OF (1.5 TONS PER SF) UNDER THE ENTIRE SLAB IS ASSUMED TO DETERMINE THE BASE SIZE. WHEN THE SUBSOIL IS EXTREMELY POOR, PROCEED WITH CONSTRUCTION ONLY AFTER THE ENGINEER SPECIFIES ADEQUATE BASE DESIGN.

R-4	PRECAST STORM MANHOLE DETAILS
	NOT TO SCALE



SIDE VIEW



FRONT VIEW

NOTES:
1.) EXISTING PIPE TO REMAIN UNTIL EXFILTRATION OR VACUUM TEST ON MANHOLE IS ACCEPTABLE TO AUTHORITY.

2.) REMOVE CROWN OF EXISTING PIPE FLUSH WITH CONCRETE SHELF.

R-5	DOGHOUSE MANHOLE DETAIL
	NOT TO SCALE

FRESNO

SERIES 6000 10C FLAP GATE



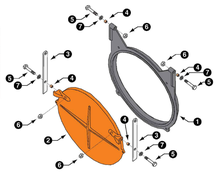
Series 6000 10C Flap Gate

Features

- Economical backflow prevention perfect for low head applications.
- Double pivot hinge action provides positive seating.
- Rugged Cast Iron seat and cover.
- Versatile for mounting to headwalls or corrugated pipe.
- Balanced design ensures maximum responsiveness.
- Precision machined and ground seating surfaces.

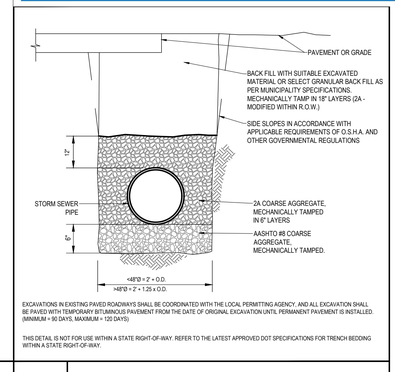
Material Specifications

Item	Description	Material	Specification
1	Seat	Cast Iron	ASTM A126, Class B
2	Cover	Cast Iron	ASTM A126, Class B
3	Link	Steel, Galvanized	ASTM A36, A123
4	Bushing	Bronze	ASTM B505
5	Hinge Bolt	Steel, Plated	ASTM A307, A154
6	Nut	Steel, Plated	ASTM A307, A154
7	Washer	Steel, Plated	ASTM A307, A154



Applications

The Series 6000 Flap Gate is designed to permit the outflow of water from a pipe or a structure to a body of water while preventing backflow of the same. It is frequently used in reservoirs, tidal basins, ponding basins, pump stands and storm drain systems where seating heads are less than ten feet.



EXCAVATIONS IN EXISTING PAVED ROADWAYS SHALL BE COORDINATED WITH THE LOCAL PERMITTING AGENCY, AND ALL EXCAVATION SHALL BE PAVED WITH TEMPORARY BITUMINOUS PAVEMENT FROM THE DATE OF ORIGINAL EXCAVATION UNTIL PERMANENT PAVEMENT IS INSTALLED. (MINIMUM = 90 DAYS, MAXIMUM = 120 DAYS)

THIS DETAIL IS NOT FOR USE WITHIN A STATE RIGHT-OF-WAY. REFER TO THE LATEST APPROVED DOT SPECIFICATIONS FOR TRENCH BEDDING WITHIN A STATE RIGHT-OF-WAY.

R-11	TRENCH BEDDING CLASSIFICATION (STORM)
	NOT TO SCALE

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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	1/3/2025	NPDES MAJOR MODIFICATION	RMS / JAB
2	3/12/2025	FOR NPDES RESUBMISSION	RMS / JAB
3	04/14/2025	PER TOWNSHIP COMMENT	RMS / JAB
4	5/28/2025	PER NPDES COMMENT	RMS / JAB
5	7/22/2025	PER REVISED ARCH	RMS / MRB

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NOT APPROVED FOR CONSTRUCTION

THIS DRAWING IS INTENDED FOR MUNICIPAL AND/OR AGENCY REVIEW AND APPROVAL. IT IS NOT INTENDED AS A CONSTRUCTION DOCUMENT UNLESS INDICATED OTHERWISE.

PROJECT No.:	PAB220113.01
DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-CNDS-5A

PROJECT:

AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

500 PENNSYLVANIA AVENUE WHITEMARSH TOWNSHIP MONTGOMERY COUNTY, PA

BOHLER
74 W BROAD STREET, SUITE 500
BETHLEHEM, PA 18018
Phone: (610) 709-9971
Fax: (610) 709-9976
www.BohlerEngineering.com

COMMONWEALTH OF PENNSYLVANIA
J.A. BEAVAN
PROFESSIONAL
JEFFERY A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE084008
NEW YORK LICENSE No. 095404
NEW JERSEY LICENSE No. 24GE05626500

SHEET TITLE:

DETAIL SHEET

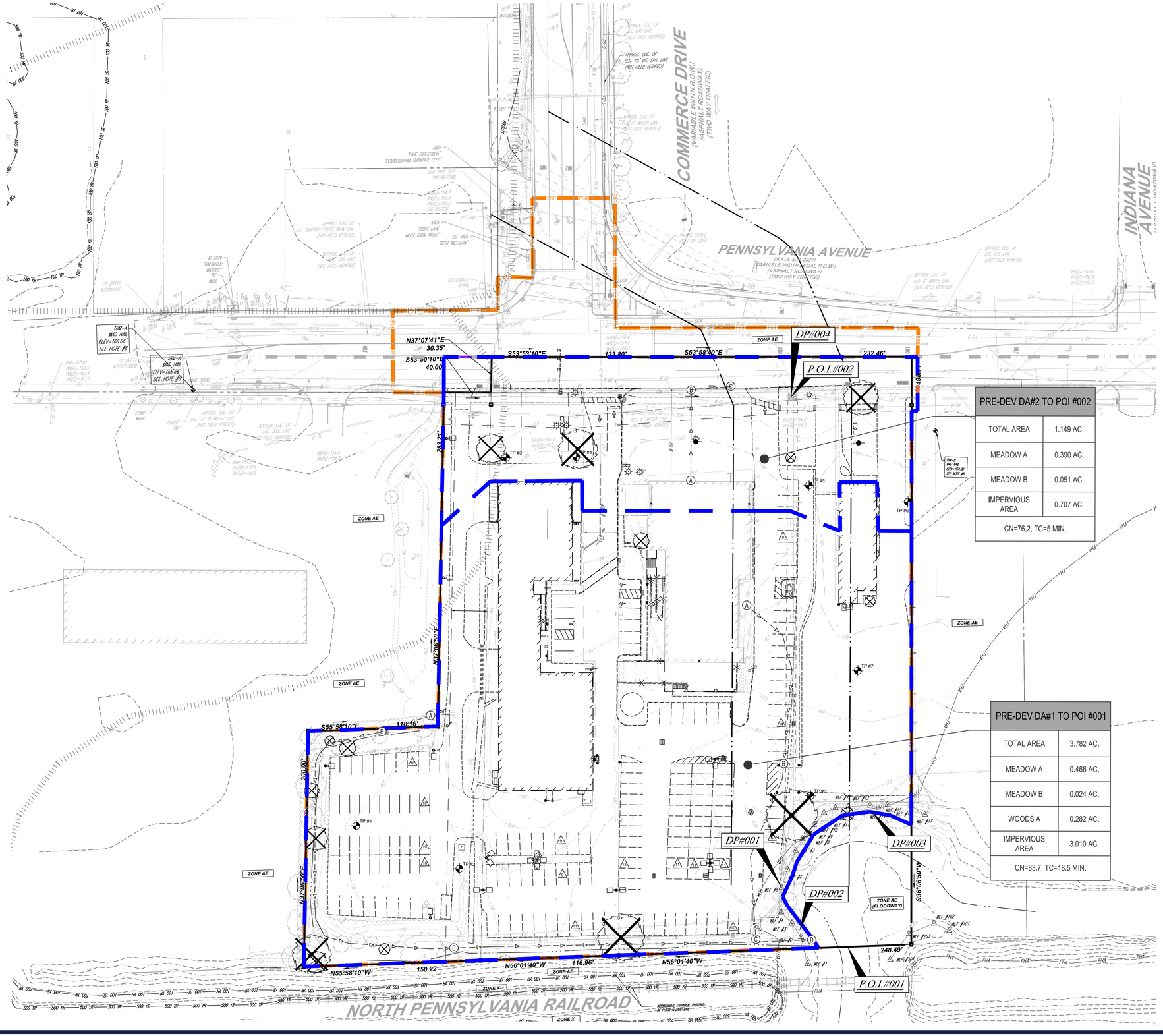
SHEET NUMBER:

C-903

Page 31 of 36

REVISION 5 - 7/22/2025

BV
I:\BOHLER\ENG-NET\BIM\RES\PA-PROJECTS\2022\PAB220113.01\CAD\DRAWINGS\PLAN SET\SHEETS\CIVIL SITE PLANS\PAB220113.01-CNDS-5A_—_LAYOUT: C-903 DETAILS



GEOTECHNICAL ENGINEER'S CERTIFICATION

I CERTIFY THAT THE PROPOSED FACILITY IS NOT UNDERLAIN BY LIMESTONE.

MICHAEL W. DERR

REGISTERED No.: #PE080964

DATE

40 20 10 0 40

1"= 40'

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PROJECT No.:	PAB220113.01
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CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-DRIN-5A

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FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

500 PENNSYLVANIA AVENUE
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY, PA

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Fax: (610) 709-9976
www.BohlerEngineering.com

COMMONWEALTH OF PENNSYLVANIA
J.A. BEAVAN
PROFESSIONAL
JEFFERY A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No: PE081008
NEW YORK LICENSE No: 116.093004
NEW JERSEY LICENSE No: 24GE05206500

SHEET TITLE:

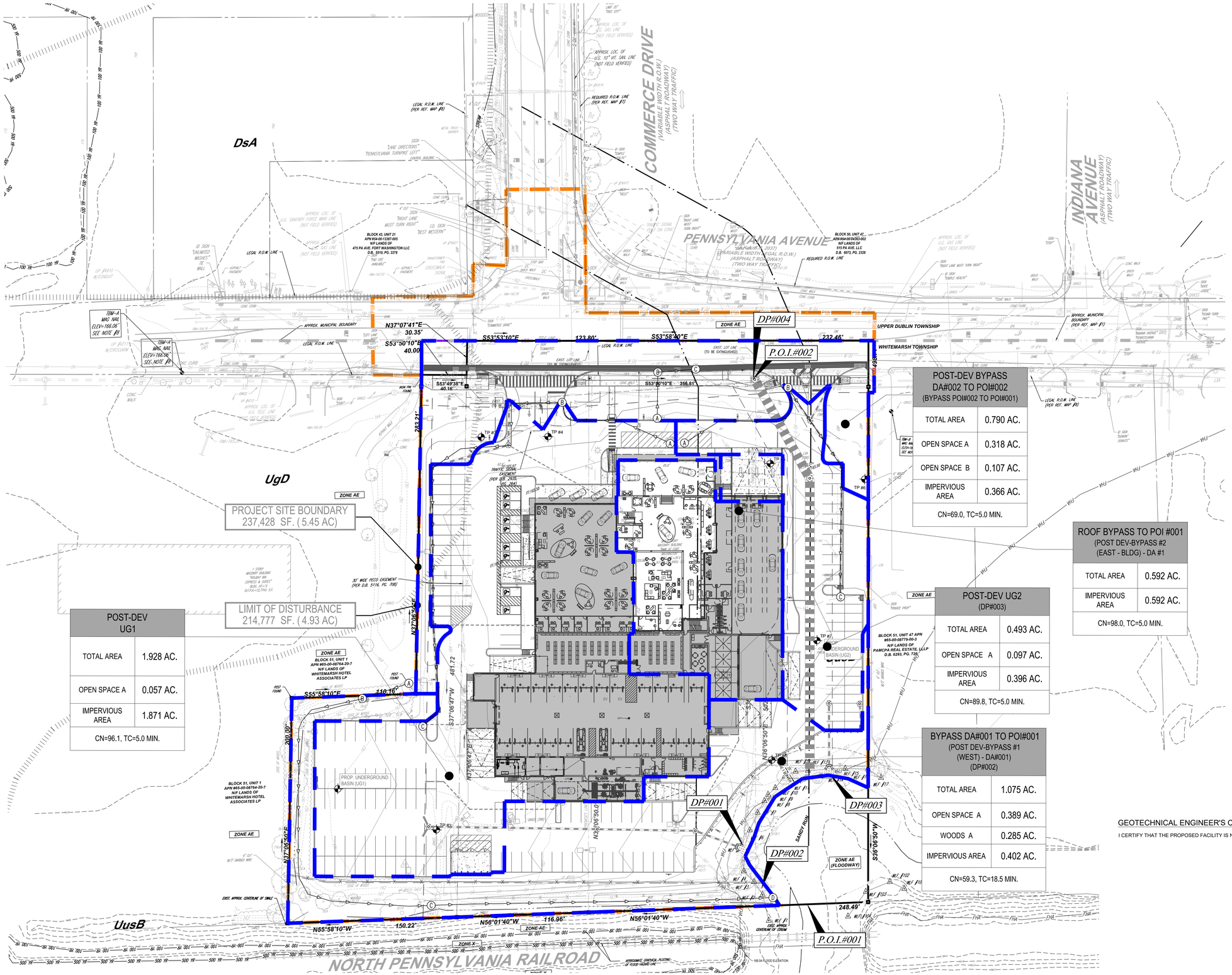
PRE DEVELOPMENT DRAINAGE AREA PLAN

SHEET NUMBER:

C-1001

REVISION 5 - 7/22/2025

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-DRIN-5A——LAYOUT C-1001 PRE



POST-DEV UG1	
TOTAL AREA	1.928 AC.
OPEN SPACE A	0.057 AC.
IMPERVIOUS AREA	1.871 AC.
CN=96.1, TC=5.0 MIN.	

POST-DEV BYPASS DA#002 TO POI#002 (BYPASS POI#002 TO POI#001)	
TOTAL AREA	0.790 AC.
OPEN SPACE A	0.318 AC.
OPEN SPACE B	0.107 AC.
IMPERVIOUS AREA	0.366 AC.
CN=69.0, TC=5.0 MIN.	

POST-DEV UG2 (DP#003)	
TOTAL AREA	0.493 AC.
OPEN SPACE A	0.097 AC.
IMPERVIOUS AREA	0.396 AC.
CN=89.8, TC=5.0 MIN.	

BYPASS DA#001 TO POI#001 (POST DEV-BYPASS #1 (WEST) - DA#001) (DP#002)	
TOTAL AREA	1.075 AC.
OPEN SPACE A	0.389 AC.
WOODS A	0.285 AC.
IMPERVIOUS AREA	0.402 AC.
CN=59.3, TC=18.5 MIN.	

ROOF BYPASS TO POI #001 (POST DEV-BYPASS #2 (EAST - BLDG) - DA #1	
TOTAL AREA	0.592 AC.
IMPERVIOUS AREA	0.592 AC.
CN=98.0, TC=5.0 MIN.	

GEOTECHNICAL ENGINEER'S CERTIFICATION

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MICHAEL W. DERR

REGISTERED No.: #PE080964

DATE

40 20 10 0 40

1"= 40'

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PROFESSIONAL
JEFFREY A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE082005
NEW YORK LICENSE No. 095804
NEW JERSEY LICENSE No. 24GE04039500

SHEET TITLE:

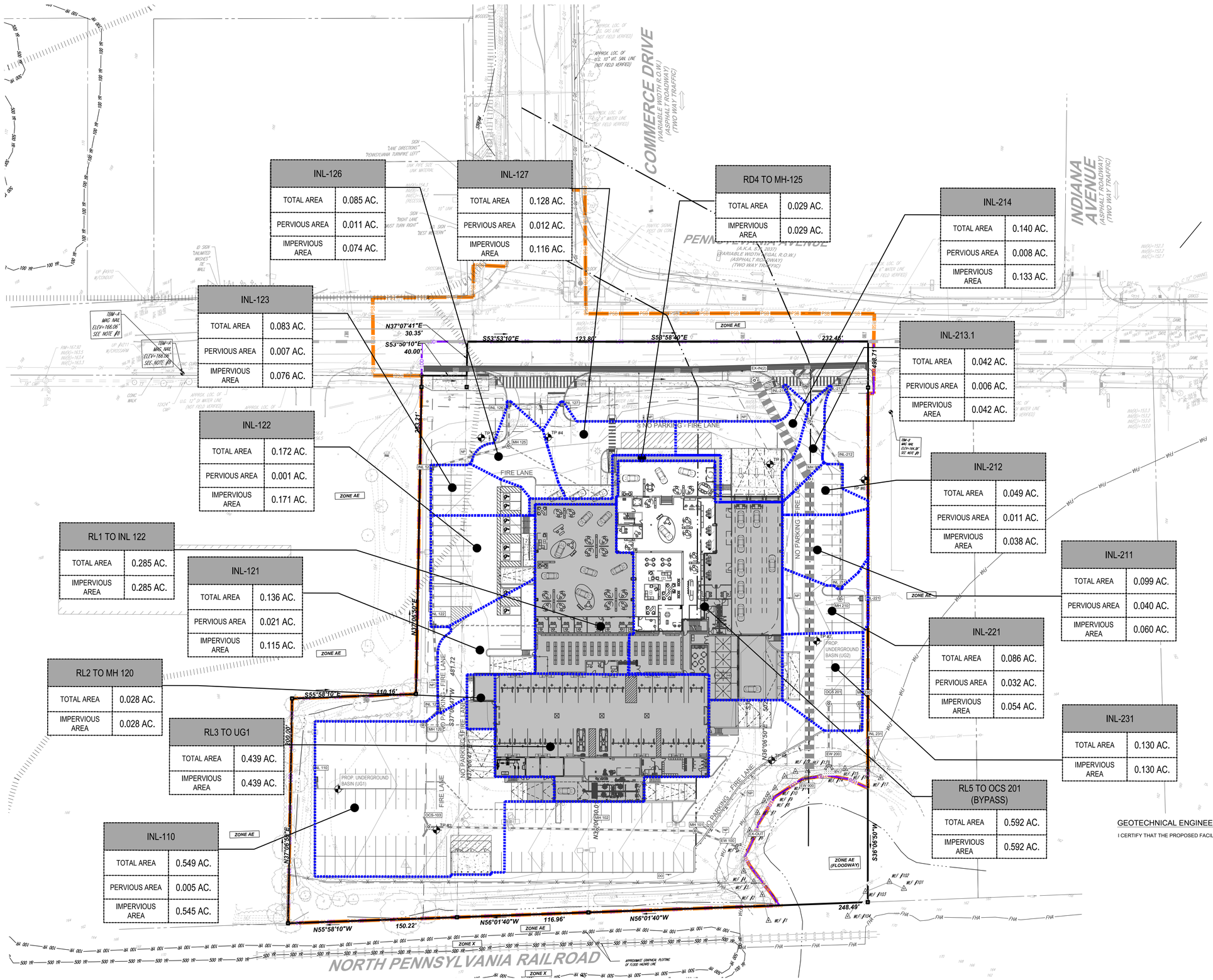
POST DEVELOPMENT DRAINAGE AREA PLAN

SHEET NUMBER:

C-1002

REVISION 5 - 7/22/2025

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REVISIONS

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J.A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE080964
NEW YORK LICENSE No. 095053
NEW JERSEY LICENSE No. 24GE05036600

GEOTECHNICAL ENGINEER'S CERTIFICATION

I CERTIFY THAT THE PROPOSED FACILITY IS NOT UNDERLAIN BY LIMESTONE.

MICHAEL W. DERR

REGISTERED No.: #PE080964

DATE

SHEET TITLE:

INLET DRAINAGE AREA PLAN

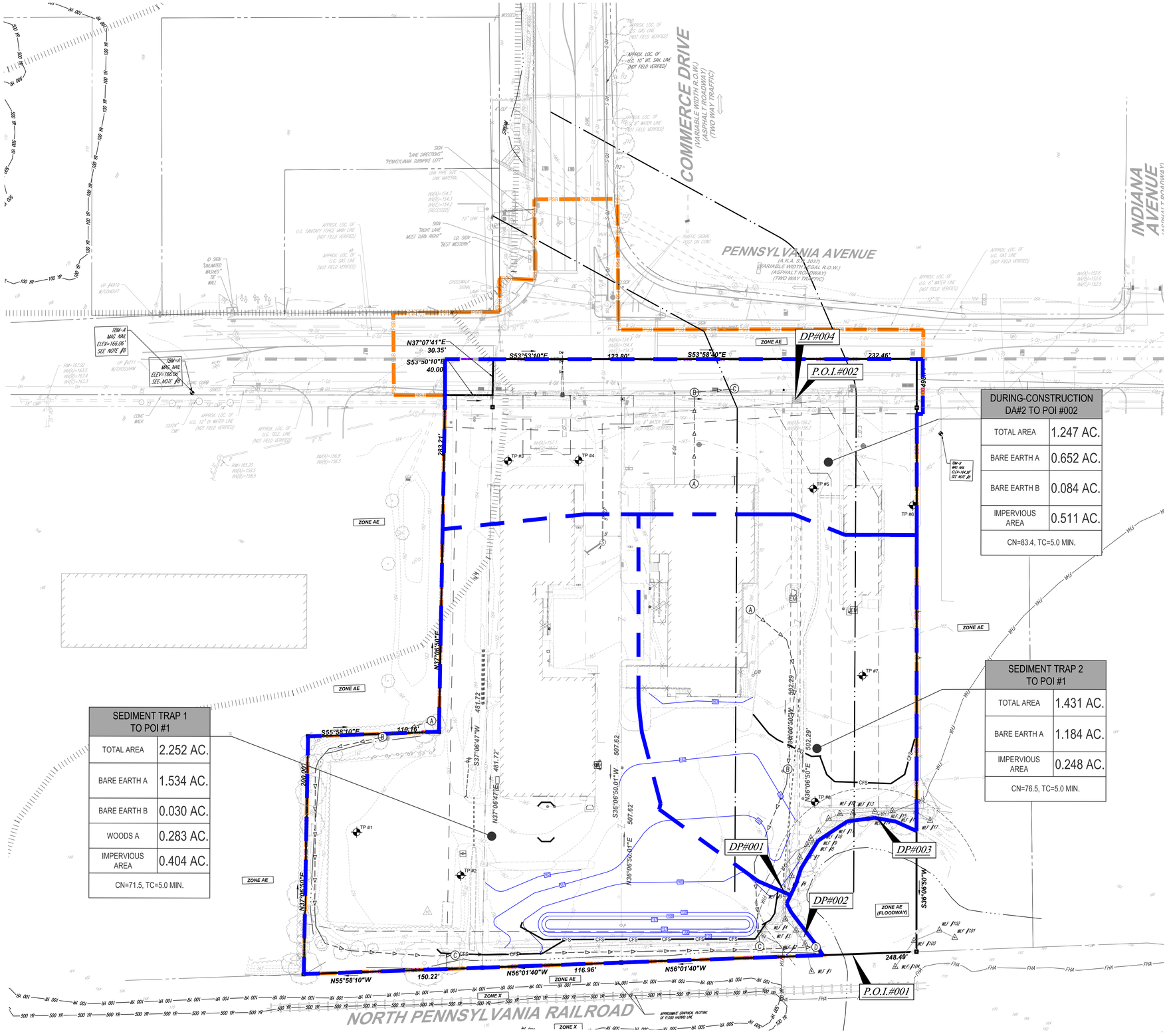
SHEET NUMBER:

C-1003

REVISION 5 - 7/22/2025

1"= 40'

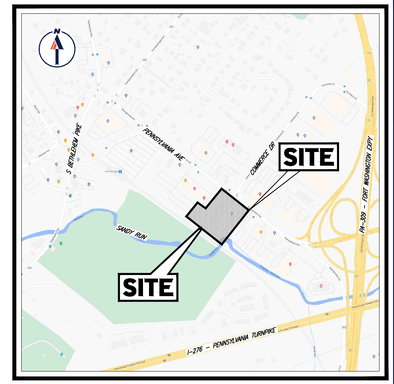
R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-DRIN-5A_-_LAYOUT: C-1003 INL DA'S



DURING-CONSTRUCTION DA#2 TO POI #002	
TOTAL AREA	1.247 AC.
BARE EARTH A	0.652 AC.
BARE EARTH B	0.084 AC.
IMPERVIOUS AREA	0.511 AC.
CN=83.4, TC=5.0 MIN.	

SEDIMENT TRAP 1 TO POI #1	
TOTAL AREA	2.252 AC.
BARE EARTH A	1.534 AC.
BARE EARTH B	0.030 AC.
WOODS A	0.283 AC.
IMPERVIOUS AREA	0.404 AC.
CN=71.5, TC=5.0 MIN.	

SEDIMENT TRAP 2 TO POI #1	
TOTAL AREA	1.431 AC.
BARE EARTH A	1.184 AC.
IMPERVIOUS AREA	0.248 AC.
CN=76.5, TC=5.0 MIN.	



LOCATION MAP

SCALE: 1" = 800'

400' 0 800'

GEOTECHNICAL ENGINEER'S CERTIFICATION

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MICHAEL W. DERR

REGISTERED No.: #PE080964

DATE

40 20 10 0 40

1"= 40'

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J. A. BEAVAN — PROFESSIONAL — JEFFREY A. BEAVAN — PENNSYLVANIA — PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No: PE082005
NEW YORK LICENSE No: 095404
NEW JERSEY LICENSE No: GE49536600

SHEET TITLE:

MAX DURING CONSTRUCTION DRAINAGE AREA PLAN

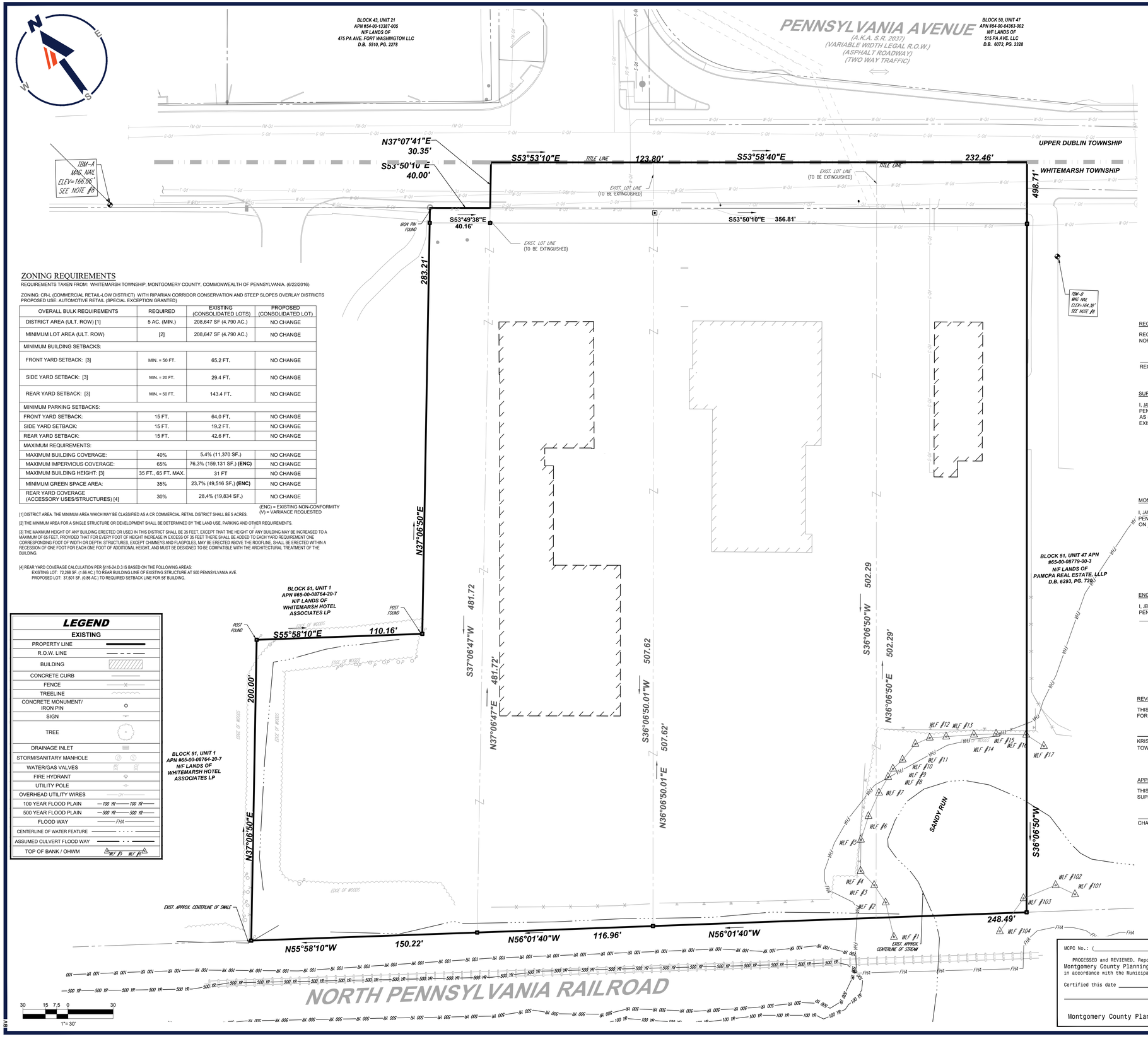
SHEET NUMBER:

C-1004

Page 35 of 36

REVISION 5 - 7/22/2025

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-DRIN-5A-----LAYOUT C-1004 MAX
RS



ZONING REQUIREMENTS

REQUIREMENTS TAKEN FROM: WHITEMARSH TOWNSHIP, MONTGOMERY COUNTY, COMMONWEALTH OF PENNSYLVANIA. (6/22/2016)

ZONING: CR-L (COMMERCIAL RETAIL-LOW DISTRICT) WITH RIPARIAN CORRIDOR CONSERVATION AND STEEP SLOPES OVERLAY DISTRICTS
PROPOSED USE: AUTOMOTIVE RETAIL (SPECIAL EXCEPTION GRANTED)

OVERALL BULK REQUIREMENTS	REQUIRED	EXISTING (CONSOLIDATED LOTS)	PROPOSED (CONSOLIDATED LOT)
DISTRICT AREA (ULT. ROW) [1]	5 AC. (MIN.)	208,647 SF (4.790 AC.)	NO CHANGE
MINIMUM LOT AREA (ULT. ROW)	[2]	208,647 SF (4.790 AC.)	NO CHANGE
MINIMUM BUILDING SETBACKS:			
FRONT YARD SETBACK: [3]	MIN. = 50 FT.	65.2 FT.	NO CHANGE
SIDE YARD SETBACK: [3]	MIN. = 20 FT.	29.4 FT.	NO CHANGE
REAR YARD SETBACK: [3]	MIN. = 50 FT.	143.4 FT.	NO CHANGE
MINIMUM PARKING SETBACKS:			
FRONT YARD SETBACK:	15 FT.	64.0 FT.	NO CHANGE
SIDE YARD SETBACK:	15 FT.	19.2 FT.	NO CHANGE
REAR YARD SETBACK:	15 FT.	42.6 FT.	NO CHANGE
MAXIMUM REQUIREMENTS:			
MAXIMUM BUILDING COVERAGE:	40%	5.4% (11,370 SF.)	NO CHANGE
MAXIMUM IMPERVIOUS COVERAGE:	65%	76.3% (159,131 SF.) **(ENC)**	NO CHANGE
MAXIMUM BUILDING HEIGHT: [3]	35 FT., 65 FT. MAX.	31 FT	NO CHANGE
MINIMUM GREEN SPACE AREA:	35%	23.7% (49,516 SF.) **(ENC)**	NO CHANGE
REAR YARD COVERAGE (ACCESSORY USES/STRUCTURES) [4]	30%	28.4% (19,834 SF.)	NO CHANGE

(ENC) = EXISTING NON-CONFORMITY
(V) = VARIANCE REQUESTED

[1] DISTRICT AREA. THE MINIMUM AREA WHICH MAY BE CLASSIFIED AS A CR COMMERCIAL RETAIL DISTRICT SHALL BE 5 ACRES.

[2] THE MINIMUM AREA FOR A SINGLE STRUCTURE OR DEVELOPMENT SHALL BE DETERMINED BY THE LAND USE, PARKING AND OTHER REQUIREMENTS.

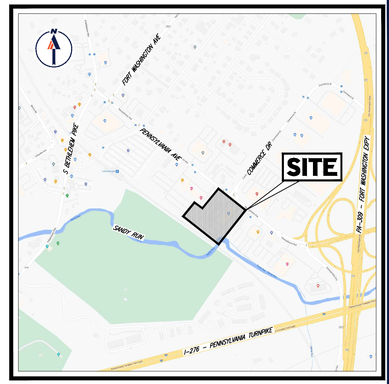
[3] THE MAXIMUM HEIGHT OF ANY BUILDING ERECTED OR USED IN THIS DISTRICT SHALL BE 35 FEET, EXCEPT THAT THE HEIGHT OF ANY BUILDING MAY BE INCREASED TO A MAXIMUM OF 65 FEET, PROVIDED THAT FOR EVERY FOOT OF HEIGHT INCREASE IN EXCESS OF 35 FEET THERE SHALL BE ADDED TO EACH YARD REQUIREMENT ONE CORRESPONDING FOOT OF WIDTH OR DEPTH. STRUCTURES, EXCEPT CHIMNEYS AND FLAGPOLES, MAY BE ERECTED ABOVE THE ROOFLINE, SHALL BE ERECTED WITHIN A RECESSION OF ONE FOOT FOR EACH ONE FOOT OF ADDITIONAL HEIGHT, AND MUST BE DESIGNED TO BE COMPATIBLE WITH THE ARCHITECTURAL TREATMENT OF THE BUILDING.

[4] REAR YARD COVERAGE CALCULATION PER §116-24.D.3 IS BASED ON THE FOLLOWING AREAS:
EXISTING LOT: 72,268 SF. (1.66 AC.) TO REAR BUILDING LINE OF EXISTING STRUCTURE AT 500 PENNSYLVANIA AVE.
PROPOSED LOT: 37,601 SF. (0.86 AC.) TO REQUIRED SETBACK LINE FOR 58' BUILDING.

LEGEND

EXISTING

- PROPERTY LINE
- R.O.W. LINE
- BUILDING
- CONCRETE CURB
- FENCE
- TREELINE
- CONCRETE MONUMENT/ IRON PIN
- SIGN
- TREE
- DRAINAGE INLET
- STORM/SANITARY MANHOLE
- WATER/GAS VALVES
- FIRE HYDRANT
- UTILITY POLE
- OVERHEAD UTILITY WIRES
- 100 YEAR FLOOD PLAIN — 100 YR — 100 YR —
- 500 YEAR FLOOD PLAIN — 500 YR — 500 YR —
- FLOOD WAY — FHA —
- CENTERLINE OF WATER FEATURE
- ASSUMED CULVERT FLOOD WAY
- TOP OF BANK / OHWM — WLF #5 — WLF #6 —



LOCATION MAP

SCALE: 1" = 800'

RECORDER OF DEEDS

RECORDED IN THE OFFICE FOR THE RECORDING OF DEEDS IN AND FOR THE COUNTY OF MONTGOMERY, AT NORRISTOWN, PA, IN PLAN BOOK NO. _____ PAGE NO. _____ ON _____, 20___.

_____
RECORDER

SURVEYOR'S CERTIFICATION

I, JAMES C. WEED, P.L.S., A REGISTERED PROFESSIONAL LAND SURVEYOR OF THE COMMONWEALTH OF PENNSYLVANIA, DO HEREBY CERTIFY THAT THIS PLAN CORRECTLY REPRESENTS THE METES AND BOUNDS AS SURVEYED BY ME ON _____, AND THAT THE LOCATION, SIZE AND MATERIAL OF EXISTING MARKERS ARE ACCURATELY SHOWN HEREON.

_____
JAMES C. WEED

_____
REGISTERED No.: #SU075250

_____
DATE

MONUMENTATION CERTIFICATION:

I, JAMES C. WEED, P.L.S., A REGISTERED PROFESSIONAL LAND SURVEYOR OF THE COMMONWEALTH OF PENNSYLVANIA, DO HEREBY CERTIFY THAT ALL CONCRETE MONUMENTS HAVE BEEN SET OR FOUND BY ME ON _____, AS INDICATED AND SHOWN HEREON.

_____
JAMES C. WEED

_____
REGISTERED No.: #SU075250

_____
DATE

ENGINEER'S CERTIFICATION

I, JEFFREY A. BEAVAN, P.E., A REGISTERED PROFESSIONAL ENGINEER OF THE COMMONWEALTH OF PENNSYLVANIA, DO HEREBY CERTIFY THAT THIS PLAN CORRECT IN ALL DETAILS AS PREPARED BY ME ON _____, 20___.

_____
JEFFREY A. BEAVAN

_____
REGISTERED No.: #PE082005

_____
DATE

REVIEW OF THE TOWNSHIP ENGINEER, WHITEMARSH TOWNSHIP:

THIS SUBDIVISION AND/OR LAND DEVELOPMENT PLAN WAS REVIEWED BY THE APPOINTED TOWNSHIP ENGINEER FOR WHITEMARSH TOWNSHIP ON THIS _____ DAY OF _____, 20___.

_____
KRISTA HEINRICH, P.E.
TOWNSHIP ENGINEER

APPROVAL OF THE WHITEMARSH TOWNSHIP BOARD OF SUPERVISORS:

THIS SUBDIVISION AND/OR LAND DEVELOPMENT PLAN WAS APPROVED BY RESOLUTION OF THE BOARD OF SUPERVISORS OF WHITEMARSH TOWNSHIP ON THIS _____ DAY OF _____, 20___.

_____ _____
CHAIRMAN SECRETARY

MCPC No.: (_____)

PROCESSED and REVIEWED. Report prepared by
Montgomery County Planning Commission
in accordance with the Municipalities Planning Code.

Certified this date _____

_____
Montgomery County Planning Commission

RECORD PLAN 10 OF 10

BOHLER

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PROJECT No.: PAB220113.01
DRAWN BY: RMS
CHECKED BY: JAB
DATE: 10/24/2024
CAD I.D.: PAB220113.01-LDVP-5A

PROJECT:

PRELIMINARY/FINAL LOT CONSOLIDATION PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

**500 PENNSYLVANIA AVENUE
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY, PA**

BOHLER
74 W BROAD STREET, SUITE 500
BETHLEHEM, PA 18018
Phone: (610) 709-9971
Fax: (610) 709-9976
www.BohlerEngineering.com

COMMONWEALTH OF PENNSYLVANIA
J.A. BEAVAN
PROFESSIONAL
JEFFREY A. BEAVAN
PROFESSIONAL ENGINEER
PE082005
PENNSYLVANIA LICENSE NO. PE082005
NEW JERSEY LICENSE NO. GE49503396500

SHEET TITLE:

LOT CONSOLIDATION PLAN

SHEET NUMBER:

LC-01

Page 36 of 36

ORG. DATE - 10/24/2024

I:\BOHLER\NCT\SHARES\PA-PROJECTS\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-LDVP-5A——LAYOUT_LC-01 LOT CONSOLIDATION
BV

3800-CD-BCW0359 12/2018

1. **Development Information**

Name of Development Proposed BMW Automotive Dealership Expansion

Developer Name MileOne Fort Washington, LLC

Address 3301 Briggs Chaney Road

Silver Spring, MD 20904

Telephone # 301-679-4062

Email dtumbaugh@mileone.com

2. **Location of Development**

a. County Montgomery

b. Municipality Whitemarsh Township

c. Address or Coordinates 500-512 Pennsylvania Avenue Fort Washington, PA 19034

d. Tax Parcel # 5-00-08776-006, 65-00-08773-00-9, 65-00-08770-00-3, 65-00-08767-00-6 & 65-00-08767-10-5

e. USGS Quad Name Ambler Quadrangle

inches up 1 over 4.25

from bottom right corner of map.

f. Located in a High Quality/Exceptional Value watershed?

☐ Yes ☒ No

3. **Type of Development Proposed** (check appropriate box)

☐ Residential ☐ Multi-Residential

Describe

☒ Commercial ☐ Institutional

Describe Expansion of the existing BMW Dealership

☐ Brownfield Site Redevelopment

☐ Other (specify)

4. **Size**

a. # of lots 5; Project Proposes Consolidation to 1 Lot
# of EDUs 18

b. # of lots since 5/15/72 5

c. Development Acreage 4.79 ac

d. Remaining Acreage 0 ac

5. **Sewage Flows** 4,500 gpd (2,250 existing, 2,250 proposed)

6. **Proposed Sewage Disposal Method** (check applicable boxes)

a. ☒ Sewerage System

☒ Existing (connection only) ☐ New (extension)

☒ Public ☐ Private

☐ Pump Station(s)/Force Main ☒ Gravity

Name of existing system being extended

N/A

Interceptor Name

Treatment Facility Name Ambler WWTP

NPDES Permit # PA0026000

b. ☐ Construction of Treatment Facility

☐ With Stream Discharge

☐ With Land Application (not including IRSIS)

☐ Other

☐ Repair?

Name of waterbody where point of discharge is proposed (if stream discharge)

c. ☐ Onlot Sewage Disposal Systems
(check appropriate box)

☐ Individual onlot system(s) (including IRSIS)

☐ Community onlot system

☐ Large-Volume onlot system

d. ☐ Retaining tanks

Number of Holding Tanks

Number of Privies

7. ☐ **Request Sewage Facilities Planning Module forms in electronic format**

8. **Request for Planning Exemption**

a. Protection of rare, endangered or threatened species

Check one:

☒ The "PNDI Project Environmental Review Receipt" is attached.

or

☐ A completed "PNDI Project Planning & Environmental Review Form," (PNDI Form) is attached. I request DEP staff to complete the required PNDI search for my project. I realize that my planning exemption will be considered incomplete and that the DEP processing of my planning exemption request will be delayed, until a "PNDI Project Environmental Review Receipt" and all supporting documentation from jurisdictional agencies (when necessary) is/are received by DEP.

Applicant or Consultant Initials

b. ☒ Plot Plan Attached ☐ Site Reports Attached

c. Onlot Disposal Systems

(1) I certify that the Official Plan shows this area as an onlot service area.

(Signature of Municipal Official) / Date

Name (Print) / Title

Municipality (must be same as in 2.b.)

Telephone #

(2) I certify that each lot in this subdivision has been tested and is suitable for both a primary and replacement sewage disposal system.

Signature of SEO) / Date

Name (Print) / Certification #

Telephone #

(3) I certify that each lot in this subdivision is at least 1 acre in size

(Signature of Project Applicant/Agent) / Date

d. Public Sewerage Service (i.e., ownership by municipality or authority)

Based upon written documentation, I certify that the facilities proposed for use have capacity and that no overload exists or is projected within 5 years. (Attach documents.)

Craig T. McAnelly / 4/12/2024

(Signature of Municipal Official) / Date

Craig T. McAnelly / Township Manager

Name (Print) / Title

Whitemarsh Township

Municipality (must be same as in 2.b.)

Telephone # 610 825 3535

FUREY & BALDASSARI, P.C.

ATTORNEYS AT LAW
1043 S. PARK AVENUE
AUDUBON, PA 19403

MICHAEL E. FUREY
mike@fbpclaw.com

JOSEPH J. BALDASSARI*
joe@fbpclaw.com

*also member of NJ bar

(610) 666-7500
fax (610) 666-7200

December 11, 2024

MileOne Fort Washington, LLC
1 Olympic Place, Suite 1100
Towson, MD 21204

RE: Whitemarsh Township Zoning Hearing Board
Application of MileOne Fort Washington, LLC No. 2024-49

Dear Applicant:

Enclosed herewith please find a true and correct copy of the Decision and Order of the Whitemarsh Township Zoning Hearing Board pursuant to the vote at its meeting on December 4, 2024. Please note that your application was granted, subject to conditions as recited in the Decision and Order.

You are also hereby advised that all parties have thirty (30) days from the issuance of the Board's Decision and Order to file an appeal to the Court of Common Pleas of Montgomery County.

Sincerely,

MICHAEL E. FUREY
Solicitor for the Whitemarsh Township
Zoning Hearing Board

MEF/js
Enclosure
cc: Charles Guttenplan, Zoning Officer (w/enclosure)
Sean Kilkenny, Esquire (w/enclosure)
John Iannozzi, Esquire (w/enclosure)

WHITEMARSH TOWNSHIP ZONING HEARING BOARD

DECISION AND ORDER

APPLICATION NO.: 2024-49
APPLICANT: MileOne Fort Washington, LLC

HEARING DATE: 12/04/24
VOTE: 12/04/24
WRITTEN DECISION: 12/10/24
COPY MAILED: 12/11/24

Parcel # 65-00-08776-00-6
Block 051, Unit 046
512 Pennsylvania Avenue
Fort Washington, PA 19034

Parcel # 65-00-08773-00-9
Block 051, Unit 002
510 Pennsylvania Avenue
Fort Washington, PA 19034

Parcel # 65-00-08770-00-3
Block 051, Unit 041
500 Pennsylvania Avenue
Fort Washington, PA 19034

Parcel # 65-00-08767-00-6 and 65-00-08767-10-5
Block 051, Unit 044
506 Pennsylvania Avenue
Fort Washington, PA 19034

CRL – Commercial Retail District - Low
Floodplain Conservation Overlay District
Riparian Corridor Conservation Overlay District

MileOne Fort Washington, LLC ("Applicant") is the lessee of the Properties, proceeding with permission of the Owner. The Applicant received approval from the Zoning Hearing Board at ZHB No. 2023-11 related to a proposed 262,000 square foot building on the Subject Property ("BMW Facility"). The Applicant now proposes to substantially reduce the size of the proposed building. The BMW Facility will be utilized for sales, service, storage, and parking on the Subject Property ("Project").

After completion of a public hearing on the above-referenced Application, pursuant to public notice as required by law, the Zoning Hearing Board of Whitemarsh Township decided and orders that the following relief from, and approvals under, the Whitemarsh Township Zoning Ordinance, and the Floodplain Management Ordinance, are **GRANTED**:

A Variance from §116-93.C, so as to permit an impervious coverage of 73.1%, rather than the 65.0% permitted, and to permit 26.9% green space, rather than the 35% required.

Special Exceptions under §116-96.A and §116-104.B.(6), so as to permit the outside display and/or sale of vehicles associated with the automotive dealership, and to permit retail sales, wholesale sales, and/or customer service in the CR-L District.

A Variance from §116-164.C, so as to permit development in the floodplain where the effect is not fully offset by improvements, under circumstances whereby the flood height would be increased by more than 4" in height.

A Variance from §116-165, so as to permit the expansion of an existing automobile dealership within the Floodplain Conservation Overlay District.

A Variance from §116-169.B.(2), so as to permit 40% disturbance to man-made steep slopes (25+%) on the site, rather than the 15% is permitted.

A Variance from §116-184.E, so as to permit parking spaces less than 10 feet from the building.

A Variance from §116-188.3, so as to permit EV charging spaces provided only based on the required off-street parking spaces, and to exclude inventory storage spaces from the requirements.

Variances from §116-259.C and §116-260, so as to permit an encroachment into the Riparian Corridor Conservation District Zone Two, including for the building and associated improvements, trash enclosure, site roads, driveways, and structures, as the entire site is located within the Riparian Corridor Conservation District due to the 100-year Floodplain delineation.

Variances from §101-21.D. and §101-24.B, so as to permit construction within an identified floodplain area closer than 50 feet to the top-of-bank of a watercourse, in accordance with PADEP and FEMA requirements.

Variances from §116-164.D and §101-24.A.(12), so as to permit the proposed use to have a supply of more than 550 gallons of petroleum products, materials, and other substances associated with an automotive use within the floodplain.

Under the Floodplain Management Ordinance, the Zoning Hearing Board finds that:

The Project does not involve development which may endanger human life, or prohibited activities. The variances granted involve only the least modification necessary to provide relief. Reasonable conditions and safeguards have been imposed in order to protect the public health, safety, and welfare, and to achieve the objectives of the Floodplain Management Ordinance. There is good and sufficient cause for granting relief. The failure to grant the variances would result in exceptional hardship to the Applicant. The granting of the variances will neither result in an unacceptable or prohibited increase in flood heights, additional threats to public safety, or extraordinary public expense, nor create nuisances, cause fraud on, or victimize the public, or conflict with any other applicable state or local ordinances and regulations.

The Applicant is on notice that certain relief from floodplain regulations may result in increased premium rates for flood insurance and/or may increase the risks to life and property. The development of the property in the floodplain is entirely at the risk of the Applicant.

THIS DECISION IS SUBJECT TO THE FOLLOWING CONDITIONS:

1. All use and development permitted by this Decision shall substantially conform to the exhibits and testimony presented by the Applicant, unless inconsistent with any specific conditions imposed by this Board, in which case these specific conditions shall take precedence.

2. The Applicant shall apply for and obtain all permits required by the Township Codes in a timely manner.

3. The Applicant shall comply with all requirements of the Township Engineer as stated in the Township Engineer's Memo dated November 26, 2024, subject to amendment as the Applicant proceeds through the land development approval process. All structures shall be designed and constructed so as to have the capability of resisting the one-percent-annual-chance flood.

4. The Applicant shall comply with all requirements of the Township Board of Supervisors with respect to subdivision and land development approvals.

This Decision and Order of the Board is final and any appeal of it must be filed with the Court of Common Pleas of Montgomery County within thirty (30) days following the copy mailing date set out above.

The Board reserves the right to issue Findings of Fact and Conclusions of Law in the event of an appeal.

Section 116-223 of the Zoning Ordinance provides as follows:

Expiration of granted appeals. Unless otherwise specified by the Board, all approvals granted by the Zoning Hearing Board shall automatically expire 365 days after the date of the decision unless: (1) the applicant has acted upon the approval by obtaining the required permit(s) and paying the prescribed fees for same, or (2) the Zoning Hearing Board decision is on appeal to the courts, at which point, the approval, if upheld on appeal, shall expire 365 days after final determination on appeal.

The Zoning Hearing Board may extend the expiration date of approvals for a 180 day period upon request by the applicant, provided that the applicant is, in the opinion of the Zoning Hearing Board, diligently pursuing governmental and/or regulatory approvals as required. Requests for extensions shall be in writing and submitted to the Zoning Hearing Board at least 30 days before any applicable expiration date. Only one (1) extension may be provided for any application.

No. 2024-49
WHITEMARSH TOWNSHIP ZONING HEARING BOARD:

James Behr, Chair

Robert A. Bacine, Vice Chair

Marc Weinstein

William E. Kramer

Gregory Nester

MONTGOMERY COUNTY
BOARD OF COMMISSIONERS

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PLANNING COMMISSION

MONTGOMERY COUNTY • PO BOX 311
NORRISTOWN, PA 19404-0311

610-278-3722
PLANNING@MONTGOMERYCOUNTYPA.GOV

SCOTT FRANCE, AICP
EXECUTIVE DIRECTOR

August 8, 2025

Mr. Charles L. Guttenplan, AICP, Director of Planning & Zoning
Whitmarsh Township
616 Germantown Pike
Lafayette Hill, Pennsylvania 19444

Re: MCPC #23-0041-003
Plan Name: BMW Automotive Dealership Expansion
(5.45 acres (gross) / 4.886 acres (net)/ building of 72,995 sq. ft.)
Situate: Commerce Drive (west) at Pennsylvania Avenue (south)
Whitemarsh Township

Dear Mr. Guttenplan:

We have reviewed the above-referenced subdivision and land development in accordance with Section 502 of Act 247, "The Pennsylvania Municipalities Planning Code," as you requested on July 28, 2025. We forward this letter as a report of our review.

BACKGROUND

The applicant, MileOne Fort Washington LLC, has submitted a revised land development plan that provides for the redevelopment of an existing automobile dealership located at 500 Pennsylvania Avenue in Whitemarsh Township. This project was previously reviewed by this office on two occasions, with letters dated August 3, 2023 and January 8, 2025 issued to the township.

The development plan provides for substantial redevelopment of an existing automobile dealership for sales, service, storage and parking of vehicles. The total floor area of buildings totals 72,995 square feet, which includes the retention of an existing 11,640-square foot office building. A total of 183 parking spaces, including 7 ADA parking spaces and 8 parking spaces for electric vehicle charging, are proposed. The development tract is located in the CR-L, Commercial-Retail Low District and in the Floodplain Conservation District. The entire site appears to be located within the floodplain and is immediately adjacent to the Sandy Run; however, the applicant has submitted a Conditional Letter of Map Revision issued by the Federal Emergency Management Agency (FEMA) on June 27, 2025. The proposed structure appears to be elevated, and according to the applicant's documentation, various flood-proofing measures will be incorporated into the development.

COMPREHENSIVE PLAN COMPLIANCE

MONTCO 2040: A SHARED VISION (2015; AMENDED 2021)

While Montco 2040 generally supports redevelopment and reinvestment in areas where infrastructure exists and near transit centers such as the Fort Washington Regional Rail Station, the proposed redevelopment of a property located within the floodplain runs contrary to the goals of the plan. A key goal under the 'Sustainable Places' theme recommends that the county "Improve stormwater management and reduce the impact of flooding" and, further, states that this goal will be met by "work[ing] with local municipalities, developers, emergency providers, PennDOT, SEPTA, and emergency management agencies to limit development in the floodplain and limit the impact of flooding" (pg. 41). The applicant and township should cooperate in planning for flood emergencies, as initially recommended in our January 8, 2025 review letter and included below for your reference (under the heading "FLOODPLAIN MANAGEMENT ORDINANCE"), in order to ensure the impacts of flooding are adequately mitigated.

WHITEMARSH TOWNSHIP'S SELECTIVE COMPREHENSIVE PLAN UPDATE (2020)

The proposed redevelopment plan for this site appears to be generally consistent with the Future Land Use Plan included in the township's *Selective Comprehensive Plan Update (2020)*. The future land use map identifies this area of the township as a Mixed-Use Node, which are areas "located along existing commercial corridors, at regional rail stations and nodes where expanded mixed use development is desirable." Suitable uses within a Mixed-Use Node are retail, restaurants, housing, office, services, and public spaces.

RECOMMENDATION

We commend the applicant for addressing some of the recommendations included in our previous review letter dated January 8, 2025. Specifically, we appreciate that the applicant has amended the site plan to include the necessary trail easement to the rear of the property for the future development of the Cross-County Trail. And, furthermore, that the applicant has revised their site plan to provide a wider sidewalk for the section of trail that traverses a portion of the property's frontage on Pennsylvania Avenue.

Although we generally support the redevelopment of this site, in the course of our review we have identified a few issues that were included in our January 8, 2025 review letter that remain relevant. We believe these comments should be addressed in the township's consideration of this plan and, as such, they have been included below for your consideration.

REVIEW COMMENTS

FLOODPLAIN MANAGEMENT ORDINANCE [PER MCPC REVIEW LETTER DATED JANUARY 8, 2025]

The applicant received numerous variances from the Floodplain Management Ordinance and the decision by the Whitemarsh Zoning Hearing Board. We have concerns about the potential negative impacts on the public's health, safety and welfare, as well as the potential environmental impacts of the redevelopment and expansion of automobile use on this site. Given the history of extensive and damaging flooding in this area, the township should ensure that a flood emergency plan is developed that addresses how and where the dealership's vehicles will be stored during flooding events. The applicant should advise the township on how any automobile hazardous materials – such as motor oil, transmission and brake fluids, antifreeze and fuels – will be flood-proofed during these events. The applicant has received relief for the proposed location of the refuse containers. We recommend the township

ensure that a protocol be established with the plan's approval that includes the 'flood-emergency plan,' specifying the details of the enclosure and how the containers will be secured and flood-proofed.

CROSS COUNTY TRAIL CONNECTION - INTERSECTION OF PENNSYLVANIA AVENUE & COMMERCE DRIVE

In our review letters dated August 2023 and January 2025, we raised the issue that inadequate sidewalk width was proposed for the section of sidewalk along the property's frontage that acts as the Cross County Trail. While we commend the applicant for increasing the proposed width of this trail segment to 8 feet, we wish to reiterate that a width of 10 feet is recommended and, further, a minimum width of 10 feet is standard for multi-use regional Circuit Trails such as this. Furthermore, we wish to ensure that the width of the curb ramp for the trail matches that of the newly reconstructed curb cut and crosswalk at Pennsylvania Avenue where the Cross County Trail was recently constructed along the western side of Commerce Drive in Upper Dublin Township. The applicant and township may wish to discuss how the trail connection can be accommodated harmoniously with the proposed automobile dealership.

CONCLUSION

We wish to reiterate that MCPC generally supports the applicant's proposal, but we believe that our suggested revisions will better achieve Whitemarsh Township's planning objectives for commercial corridor redevelopment and pedestrian safety.

Please note that the review comments and recommendations contained in this report are advisory to the municipality and final disposition for the approval of any proposal will be made by the municipality.

Should the governing body approve a final plat of this proposal, the applicant must present the plan to our office for seal and signature prior to recording with the Recorder of Deeds office. A paper copy bearing the municipal seal and signature of approval must be supplied for our files. Please print the assigned MCPC number (*23-0041-003)* on any plans submitted for final recording.

Sincerely,

Timothy Konetchy

Timothy Konetchy, Senior Community Planner
timothy.konetchy@montgomerycountypa.gov – 610-292-4917

c: Craig Colton, Applicant
Jeffrey Beavan, PE, Bohler Engineering
Craig McAnally, Township Manager
Aaron Kostyk, Chair, Township Planning Commission
Krista Heinrich, PE, Township Engineer
David Sander, Esq., Township Solicitor
Jessica Buck, District Manager, MCCD
John Gallagher, PE, PennDOT
Fran Hanney, PE, PennDOT

Attachment A: Aerial Image of Site
Attachment B: Reduced Copy of Applicant's Proposed Site Plan



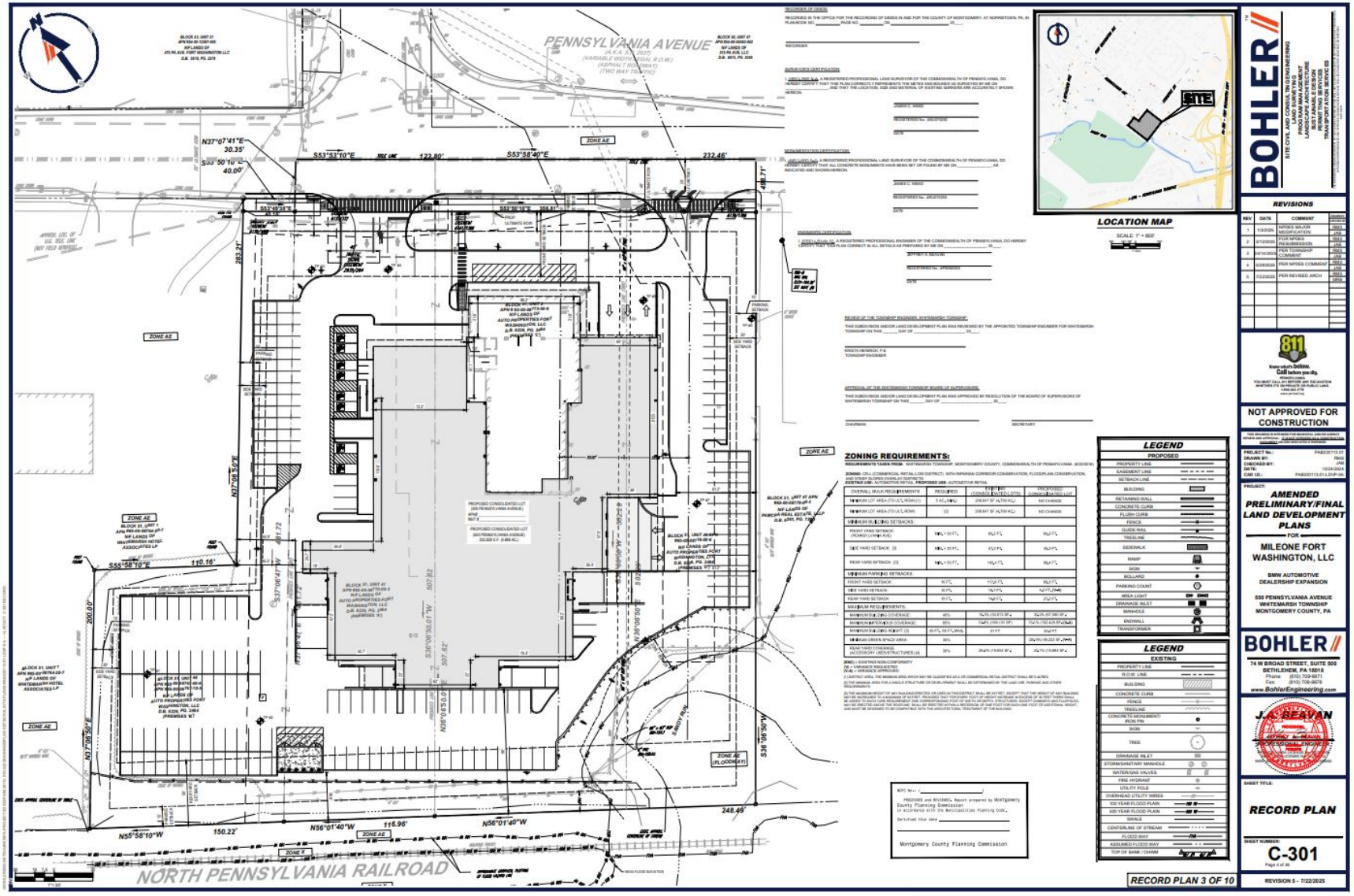
BMW Automotive Dealership Expansion
MCPC#230041003

Montgomery County Planning Commission

0 100 200 400 Feet

N

Montgomery County Courthouse - Planning Commission
PO Box 311 Norristown PA 19404-0311
(p) 610 278-3722 (f) 610 278-3941
www.montcopa.org/plancom
Aerial photography provided by Nearmap


PENNSYLVANIA AVENUE
(A.K.A. S.R. 2037)
(VARIABLE WIDTH LEGAL R.O.W.)
(ASPHALT ROADWAY)
(TWO WAY TRAFFIC)
NORTH PENNSYLVANIA RAILROAD
LOCATION MAP
SITE
SCALE: 1" = 800'
ZONING REQUIREMENTS:
LEGEND
PROPOSED
EXISTING
BOHLER
SITE CIVIL AND STRUCTURAL ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
TRANSPORTATION SERVICES
REVISIONS
NOT APPROVED FOR CONSTRUCTION
AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS
FOR
MILEONE FORT WASHINGTON, LLC
BMW AUTOMOTIVE DEALERSHIP EXPANSION
500 PENNSYLVANIA AVENUE
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY, PA
74 W BROAD STREET, SUITE 500
BETHLEHEM, PA 18018
Phone: (610) 709-9971
Fax: (610) 709-9976
www.BohlerEngineering.com
JAMES C. SERVAN
COMMONWEALTH OF PENNSYLVANIA
PROFESSIONAL ENGINEER
SHEET TITLE:
RECORD PLAN
SHEET NUMBER:
C-301
REVISION 5 - 7/22/2025
RECORD PLAN 3 OF 10

Whitemarsh TOWNSHIP
616 GERMANTOWN PIKE - LAFAYETTE HILL, PA 19444-1821
TEL: 610-825-3535 FAX: 610-825-9416
www.whitemarshtwp.org

BOARD of SUPERVISORS
Jacy Toll – Chair
Fran McCusker– Vice Chair
Vincent Manuele
Elizabeth Moy
Patrice Turenne

Craig T. McAnally
Township Manager

August 19, 2025

Mile One Fort Washington, LLC
c/o Craig Colton
3301 Briggs Chaney Road
Silver Springs, MD 20904

RE: SLD#03-23 Revision 2 (R2)/ 500-512 Pennsylvania Ave. Fort Washington
Preliminary/Final Minor Subdivision/ Major Land Development – Car Dealership Expansion
Zoning Ordinance Compliance Review Letter

Dear Mr. Colton:

Please accept this review of the Zoning Ordinance Compliance issues for your most current amendment to the preliminary minor subdivision/ major land development plan. We reviewed a thirty-six page land development plan set prepared by Bohler Engineering, dated October 4, 2024, with the most recent revision date of July 22, 2025. No architectural plans were included in the current submission. The plan depicts the combination of four lots, demolition of two existing structures, and the construction of an enlarged full-service facility for the BMW dealership at this location. The parcels are located in the Commercial Retail District (CR-L), the Floodplain Conservation District, the Riparian Corridor Conservation District, and a small portion of the lot may have restrictions due to steep slopes.

Please note that this proposed land development is an amendment to a previous land development plan that received final plan approval on February 8, 2024, followed by a scaled back iteration of the plan, that was approved by the Board of Supervisors on February 13, 2025; this plan represents a further refinement of the scaled-back expansion of the BMW dealership at this location.

Relief Granted by the ZHB

In case ZHB #2024-49, the Zoning Hearing Board granted the following relief by vote on December 04, 2024:

1. **A Variance from §116-93.C**, so as to permit an impervious coverage of 73.1%, rather than the 65.0% permitted, and to permit 26.9% green space, rather than the 35% required.

2. **Special Exceptions under §116-96.A and §116-104.B.(6)**, so as to permit the outside display and/or sale of vehicles associated with the automotive dealership, and to permit retail sales, wholesale sales, and/or customer service in the CR-L District.

3. **A Variance from §116-164.C**, so as to permit development in the floodplain where the effect is not fully offset by improvements, under circumstances whereby the flood height would be increased by more than 4" in height.

4. **A Variance from §116-165**, so as to permit the expansion of an existing automobile dealership within the Floodplain Conservation Overlay District.

5. **A Variance from §116-169.B.(2)**, so as to permit 40% disturbance to man-made steep slopes (25+%) on the site, rather than the 15% is permitted.

6. **A Variance from §116-184.E**, so as to permit parking spaces less than 10 feet from the building.

7. **A Variance from §116-188.3**, so as to permit EV charging spaces provided only based on the required off-street parking spaces, and to exclude inventory storage spaces from the requirements.

8. **Variances from §116-259.C and §116-260**, so as to permit an encroachment into the Riparian Corridor Conservation District Zone Two, including for the building and associated improvements, trash enclosure, site roads, driveways, and structures, as the entire site is located within the Riparian Corridor Conservation District due to the 100-year Floodplain delineation.

9. **Variances from §101-21.D. and §101-24.B**, so as to permit construction within an identified floodplain area closer than 50 feet to the top-of-bank of a watercourse, in accordance with PADEP and FEMA requirements.

10. **Variances from §116-164.D and §101-24.A.(12)**, so as to permit the proposed use to have a supply of more than 550 gallons of petroleum products, materials, and other substances associated with an automotive use within the floodplain.

The above relief was granted with certain conditions. One of those conditions is that the Applicant shall comply with all requirements of the Township Engineer as stated in the Township Engineer's Memo dated November 26, 2024, subject to amendment as the Applicant proceeds through the land development approval process. All structures shall be designed and constructed so as to have the capability of resisting the one-percent-annual- chance flood.

Additional Zoning Compliance Comments

The following are the Zoning Ordinance compliance issues noted concerning the proposed Preliminary/Final Plan. If compliance cannot be shown for any of these provisions, a modification to the plan must be made or additional relief from the Zoning Hearing Board would have to be secured.

1.	§ 116-166.C.	This section requires that any new construction, development or substantial improvements granted by special exception must be in full compliance with 44 CFR 60.3(a) through (d) of the National Flood Insurance Program regulations.
2.	§ 116-184.	The applicant should note that there are discrepancies between the parking table on Sheet C-303 and the site plan, specifically regarding the number of ADA spaces. This must be corrected. Additionally, please identify the difference between inventory and public parking spaces.
3.	§ 116-188.3.D.(1)(d)	This section requires one additional EV charging station for every 50 spaces over 100 off-street parking spaces. Only a total of 6 EV spaces have been identified on the plan, whereas the parking table on Sheet C-303 notes 8 proposed spaces. This discrepancy should be resolved and plans shall be updated to show compliance with this section.

4. § 116-188.3.D.(3) — This section requires at least 50% of EV spaces to be ADA accessible. It appears that there are no EV equipped ADA spaces. The plans must be revised to clearly show 4 of these spaces.

5. § 116-188.3.E. — All EV charging stations must have a barrier-free route of travel. It appears that 4 of the required EV spaces are located indoors. Confirmation must be provided to show that this requirement is met for all EV spaces, indoors and outside.

6. § 116-204.B. — This section states that renovations valued at over 50% of the market value of the property in the floodplain must comply with relevant floodplain construction requirements including applicable provisions of Chapter 101, Floodplain Management.

7. § 116-204.C. — This section describes standards for storage of hazardous materials as described in §116-164.D. in the floodplain. Compliance with this section must be demonstrated since such materials will be stored on site.

8. § 116-206 — Proposed dealership sign locations and details should be included unless the applicant intends to request them at a later date, in which case a separate permit will need to be filed along with a request for any necessary zoning relief, if needed.

9. § 116-258 — We acknowledge that the 100-year floodplain is coterminous with RCCD Zone Two; however, the plans must clearly indicate the floodplain boundary as well as boundaries of the Riparian Corridor Conservation District (RCCD) Zones One and Two.

Additional Comment

10. We are aware that there is a trail easement that the applicant is granting to the County for a portion of the Cross County Trail. We understand that there is an agreement drafted and executed with the County and that no specific easement will be shown on the plans because design of the trail has not yet been completed. We understand that this agreement will be recorded simultaneously with the final plan.

Should you have any questions, please do not hesitate to contact me.

Very truly yours,

Charles L. Guttenplan, AICP
Director of Planning and Zoning/Zoning Officer

cc: Craig McAnally, Township Assistant Manager
Robert A. Sztubinski, B.C.O., Director of Building and Codes
Andrew Thomas, Township Fire Marshal
Sean P. Kilkenny, Esq., Township Solicitor
Krista Heinrich, P.E., Township Engineer
Auto Properties Fort Washington, LLC, Owner of Record
Jeffrey Beavan, P.E., Bohler Engineering, Applicant's Engineer
John Iannozzi, Esq. Hamburg Rubin, Applicant's Attorney

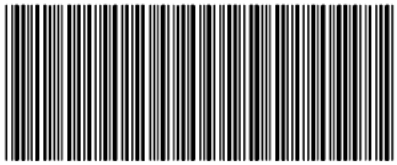




RECORDER OF DEEDS
MONTGOMERY COUNTY
Jeanne Sorg

One Montgomery Plaza
Swede and Airy Streets ~ Suite 303
P.O. Box 311 ~ Norristown, PA 19404
Office: (610) 278-3289 ~ Fax: (610) 278-3869

DEED BK 6408 PG 01044 to 01058.2
INSTRUMENT # : 2025039871
RECORDED DATE: 07/23/2025 02:25:19 PM



6429312-00220

MONTGOMERY COUNTY ROD

OFFICIAL RECORDING COVER PAGE

Document Type:	Easement	**Transaction #:**	7122278 - 1 Doc(s)
Document Date:	05/23/2025	**Document Page Count:**	14
Reference Info:		**Operator Id:**	astokes

RETURN TO: (Simplifile)
HAMBURG RUBIN MULLIN MAXWELL & LUPIN
1684 S Broad St Ste 230
Lansdale, PA 19446-5422
(215) 661-0400

PAID BY:
HAMBURG RUBIN MULLIN MAXWELL & LUPIN

*** PROPERTY DATA:**

Parcel ID #:	65-00-08767-00-6	65-00-08770-00-3	65-00-08773-00-9
Address:	506 PENNSYLVANIA AVE PA	500 PENNSYLVANIA AVE FT WASHINGTON PA 19034	510 PENNSYLVANIA AVE PA
Municipality:	Whitemarsh Township (100%)	Whitemarsh Township (0%)	Whitemarsh Township (0%)
School District:	Colonial	Colonial	Colonial

*** ASSOCIATED DOCUMENT(S):**

CONSIDERATION/SECURED AMT: [redacted]
TAXABLE AMOUNT:

FEES / TAXES:

Recording Fee:Easement	[redacted]
Additional Pages Fee	
Affidavit Fee	
Additional Parcels Fee	
Affordable Housing Pages	
Affordable Housing Parcels	
Total:	

DEED BK 6408 PG 01044 to 01058.2
Recorded Date: 07/23/2025 02:25:19 PM

I hereby CERTIFY that this document is recorded in the Recorder of Deeds Office in Montgomery County, Pennsylvania.



Jeanne Sorg
Recorder of Deeds

Rev1 2016-01-29

PLEASE DO NOT DETACH

THIS PAGE IS NOW PART OF THIS LEGAL DOCUMENT

NOTE: If document data differs from cover sheet, document data always supersedes.
***COVER PAGE DOES NOT INCLUDE ALL DATA, PLEASE SEE INDEX AND DOCUMENT FOR ANY ADDITIONAL INFORMATION**

Prepared By and Return to:

HAMBURG, RUBIN, MULLIN, MAXWELL & LUPIN
1684 S. Broad Street, Suite 230
P.O. Box 1479
Lansdale, PA 19446-5422
215-661-0400

MONTGOMERY COUNTY COMMISSIONERS REGISTRY
65-00-08767-00-6 WHITEMARSH TOWNSHIP
506 PENNSYLVANIA AVE
AUTO PROPERTIES FORT WASHINGTON LLC
B 051 L U 044 2900 07/23/2025 JB

Parcel Nos.: 65-00-08767-00-6
65-00-08770-00-3
65-00-08773-00-9
65-00-08776-00-6

MONTGOMERY COUNTY COMMISSIONERS REGISTRY
65-00-08770-00-3 WHITEMARSH TOWNSHIP
500 PENNSYLVANIA AVE
AUTO PROPERTIES FORT WASHINGTON LLC
B 051 L U 041 4238 07/23/2025 JB

EASEMENT AGREEMENT

THIS EASEMENT AGREEMENT ("Agreement") is made this 23rd day of May, 2025, by and between **AUTO PROPERTIES FORT WASHING TON, LLC**, a Pennsylvania limited liability company ("Grantor"), and **THE COUNTY OF MONTGOMERY**, a body public and politic organized and existing under the laws of the Commonwealth of Pennsylvania ("Grantee") (collectively, the "Parties").

BACKGROUND

A. Grantor is the owner of certain parcels of ground situated at 506 Pennsylvania Avenue, identified as tax parcel number **65-00-08767-00-6**; 500 Pennsylvania Avenue, identified as tax parcel number **65-00-08770-00-3**; 510 Pennsylvania Avenue, identified as tax parcel number **65-00-08773-00-9**; and 512 Pennsylvania Avenue, identified as tax parcel number **65-00-08776-00-6** in Whitemarsh Township, Montgomery County, Pennsylvania (collectively, the "Premises").

B. Grantor intends to construct a new service, storage, and parking structure on the Premises.

C. Grantee is desirous of obtaining an easement over a portion of the Premises for the purpose of constructing a multi-use trail and providing access to the general public between dawn and dusk over such trail ("Easement") pursuant to the Recreational Use of Land and Water Act of February 2, 1966, P.L. 1860 § 1 (1966), 68 P.S. § 477-1, *et seq.*

D. Grantor agrees to grant the Easement upon, across, through and over portions of the Premises to serve Grantee and the general public, subject to the terms, conditions and requirements as set forth in this Agreement.

NOW, THEREFORE, intending to be legally bound hereby and in consideration of the mutual covenants and agreements contained herein, the Parties agree as follows:

MONTGOMERY COUNTY COMMISSIONERS REGISTRY
65-00-08773-00-9 WHITEMARSH TOWNSHIP
510 PENNSYLVANIA AVE
AUTO PROPERTIES FORT WASHINGTON LLC
B 051 L U 002 4237 07/23/2025 JB

MONTGOMERY COUNTY COMMISSIONERS REGISTRY
65-00-08776-00-6 WHITEMARSH TOWNSHIP
512 PENNSYLVANIA AVE
AUTO PROPERTIES FORT WASHINGTON LLC
B 051 L U 046 4000 07/23/2025 JB

1. Grantor, in consideration of the sum of One Dollar ($1.00) of lawful money of the United States unto it well and truly paid by the said Grantee and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, hereby grants unto Grantee, for the mutual benefit of Grantee, its respective agents, employees, invitees, successors, and the general public, a perpetual, non-exclusive easement over the surface of those portions of the Premises as described in the metes and bounds description prepared by Control Point Associates, Inc., dated February 25, 2025, attached hereto and incorporated herein as **Exhibit "A"** ("Legal Descrption"), and further shown on the trail easement exhibit titled "County Trail Exhibit Plan", prepared by Bohler Engineering, dated October 10, 2023 and last revised January 29, 2025, attached hereto and incorporated herein as **Exhibit "B"** ("Plan") (collectively, the "Easement Area"), for the purpose of providing a multi-use trail easement for pedestrian and non-motorized vehicle traffic, except as provided below ("Trail"), including the right of ingress to and egress from, passage on and passage over, and access on and over (by the Grantee for construction, reconstruction, improvement, operation, repair, and maintenance of the Trail and related amenities) the above-described Easement Area.

2. Grantee, and its successors, heirs, and assigns, shall perpetually maintain the non-exclusive right to use and occupy the Easement Area.

3. The Easement is made available pursuant to the Recreational Use of Land and Water Act of February 2, 1966, P.L. (1985) 1860, 68 P.S. 477-1, *et seq.* ("Act"), and this Agreement is intended to comply with the Act (as may be amended from time to time).

4. Grantee, at its cost, shall be responsible for installing, constructing, maintaining, repairing and replacing the Trail and related curbing, landscaping, lighting, signage, and other appurtenances and improvements within the Easement Area; provided, however, any proposed improvements within the Easement Area not depicted and described on the Plan attached as Exhibit "B" shall be subject to the prior written approval of Grantor. As a condition to the exercise of the rights and interests herein granted, Grantee shall, at its cost, restore the Easement Area, and any other portions of the Premises disturbed by Grantee's activities, following any installation or maintenance of the improvements to substantially the same or better condition as existed prior to such installation or maintenance.

5. Grantee covenants that it shall, at its sole cost and expense:

i. Obtain all necessary permits, zoning relief, subdivision and land development ordinance waivers, approvals, and any related permissions imposed by any entity, governmental unit, or individual in any way related to the construction and use of the Trail and shall be solely liable for any expenses and Township fees associated with the removal and/or replacement of trees and landscaping within the Easment Area and Grantee shall ensure that any such permits, zoning relief, subdivision, land development ordinance waivers or approvals do not impact any approvals regarding the Premises, or the operation of automobile dealership and appurtanent facilities located on the Premises. In no event shall Grantor be

responsible to do any work or incur any obligation associatied with the Trail;

ii. Comply with all applicable governmental laws, rules, orders, ordinances and regulations now in force or which may hereafter be in force;

iii. Continuously maintain the Trail and all Trail related facilities in a safe and stable condition free from the accumulation of impediments to the use of the Trail, provided, however, that Grantor and Grantee shall not be required to remove snow or ice which falls or accumulates on the Trail;

iv. Cause to be installed along the Trail a sufficient number of attractive refuse containers approved by Grantor and cause the Trail and Easement Area to be kept clean and free from dirt and rubbish with refuse collection and dirt and rubbish pick up to be performed as needed to maintain a clean, dirt and rubbish free condition; and

v. Cause to be installed along the portion of the Trail which is subject to this Easement signs requiring users of the Trail to remain on the Trail and to not tresspass on Grantor Premises which is not subject to this Easement.

6. Grantee shall have the right to limit the use of the Easement by members of the public by such rules and regulations as Grantee may determine to be reasonably necessary. Grantee will not suffer, permit or commit any waste or nuisance upon or within the Easement Area or the Trail or allow any health, safety or fire hazards to exist thereon. Grantee shall not use, or permit any portion of the Easement Area or the Trail to be used, for any unlawful purpose. Grantee shall not use, or permit any portion of the Easement Area or the Trail to be used, for any activity which might constitute a nuisance or annoyance to trail users or to Grantor or invitees of Grantor, its successors and assigns, upon the Premises or for any activity which is not in keeping with the intended use of the Trail. The following activities shall be specifically prohibited on any portion of the Easement Area or the Trail:

i. Camping, sleeping or lodging;

ii. The conduct of any business, occupation or similar undertaking, including without limitation, the solicitation of business, the distribution of any advertising materials, the distribution of any political materials, the sale and display of any merchandise or the posting of any advertisements or similar signage;

iii. Political or similar demonstrations or picketing or any activity which might tend to create any civil disorder or commotion;

iv. The use of any loudspeakers, sound amplifiers, phonographs, radio or televisions broadcasts in a manner which might constitute a nuisance or

annoyance to other Trail users, to Grantor or the business invitees of Grantor or its successors and assigns;

v. The burning of trash or garbage or the operation of any cooking facilities;

vi. No motorized vehicles shall be permitted on the Trail, except for vehicles specifically authorized by the published policies of the Grantee specifically pertaining to electric bicycles, scooters, and motorized vehicles for disabled inviduals, and vehicles for uses by the Grantee and its agents, including, but not limited to, construction, reconstruction, improvement, operation, repair, maintenance, safety, ranger patrols, and emergency access for all federal, state, and local emergency responders; and

vii. The use of any alcoholic beverages or drugs of any kind.

7. Grantor reserves the right to use and occupy the Easement Area for any and all purposes and to grant such other easements, rights or privileges over and under the Easement Area as Grantor and its successors and assigns may elect, including, without limitation, to conduct any work on the Premises. Grantee understands and acknowledges that work being done by Grantor may impeade access to the Easement Area and/or Trail while Grantor conducts such work. Grantor reserves the right, at any time, to place a fence or other barrier up along the Easement Area or Trail if at any time users of the Trail are interfering in Grantor's sole discretion with Grantor's business or Premises in any way. Neither Grantor nor its successors or assigns shall erect or maintain any improvements on, over or under the Easement Area which would affect access to or use of the Trail, and any other rights and privileges granted herein; provided, however, that Grantor shall be permitted to use the Easement Area in any manner which does not interfere with the safe operation of the Trail and further provided that Grantor completes all work thereon in an expedited manner and restores the Trail to its pre-existing condition following said use. Within the easement area, Grantor shall not (except with prior written approval of the Grantee): 1) Cut or clear trees or shrubs except those which are diseased or dangerous; 2) Deposit or dump solid or liquid refuse, waste, or junk; 3) Quarry, excavate or remove rocks, minerals, gravel, sand, top soil or other materials; 4) Alter the natural or manmade topography; and 5) Construct any buildings, structures, including billboards, or signboards, except as provided in any land development plans of Grantor before Whitemarsh Township.

8. Nothing in this Agreement limits the ability of Grantor and Grantee, and their respective officers, directors, employees and mortgagees, and their successors and assigns, to avail themselves of the protections offered by any applicable law affording immunity to Grantor and Grantee, their successors and assigns, including, the Act.

9. Grantee agrees to indemnify, protect and hold harmless Grantor from all costs, expenses, losses, damages, claims, demands and/or causes of action (including, but not limited to, reasonable attorneys' fees) resulting from any loss of life or property or any injury or damage to any person or property of any person in any manner arising out of, resulting from, or in connection with the use or construction of the Easement Area (including the Trail) by Grantee or its representatives, employees, agents, vendors, licensees, invitees, guests, contractors and/or assigns

(collectively, the "Grantee Parties") or the exercise of any rights granted hereunder by Grantee or Grantee Parties.

10. Upon execution of this Agreement and at all times thereafter, Grantee shall obtain and at all times maintain insurance evidencing that Grantee has (i) a policy of commercial general liability insurance naming Grantor, Auto Properties Fort Washington, LLC, and MileOne Fort Washington, LLC as additional insured parties, insuring the activities of Grantee and Grantee's representatives, employees, agents, vendors, licensees, invitees, guests, contractors, and assigns upon, in or about the Easement Area against claims of bodily injury or death or property damage or loss with a combined single limit of not less than Two Million Dollars ($2,000,000.00) and (ii) workers' compensation insurance that satisfies all statutory requirements in the Commonwealth of Pennsylvania with respect to any party doing any work in the Easement Area. Grantee shall deliver to Grantor, upon execution hereof, and upon written request of Grantor thereafter, certificates evidencing the existence and amounts of such insurance policy.

11. Use of any portion of the Easement Area by members of the general public is at their own risk. Grantor does not have any duty to the general public for defects in the location, design, installation, maintenance or repair of the Trail by entering into this Agreement; for any unsafe conditions within the public Easement Area including, without limitation, the existence of any snow or ice, and Grantor does not assume any duty, obligation, responsibility or liability for the removal thereof; or for the failure to inspect for or warn against possibly unsafe conditions; or to close the Trail to public access when unsafe conditions may be present. For avoidance of doubt, Grantor shall have no responsibility or liability with respect to the Trail, Easement or the Easement Area.

12. Except as otherwise provided in this Agreement, the easement, privileges, and covenants contained in this Agreement run with the land and shall be perpetual and continue in full force and effect forever and shall be for the benefit of and binding upon Grantor and Grantee, their respective grantees, successors, assigns, tenants, employees, agents, and invitees. Every person, partnership, corporation or other entity who owns, occupies or acquires any right, title, estate or interest, in whole or in part, to the Premises does and shall be inclusively deemed to have consented herein, whether or not any reference to this Agreement is contained in the instrument by which each entity acquired an interest in the Premises or any portion thereof.

13. If (i) Grantee is unable to obtain the necessary zoning relief, approvals, and/or subdivision and land development ordinance waivers from the Township necessary to construct the Trail by December 31, 2030, (ii) Grantor elects not to go forward with the Project, as shown on the land development plans prepared by Bohler Engineering dated October 24, 2024, last revised April 14, 2025 (the "Project"), before December 31, 2030, or (iii) construction of the Trail has not begun by December 31, 2030, this Agreement shall become null and void immediately upon the earlier of (i) the date of denial by the Township of such zoning relief and/or waiver, (ii) the date Grantor determines construction on the Premises will not move forward, or (iii) December 31, 2030, without further action required from either of the Parties. Extension of time to begin construction on the Trail shall not be unreasonably withheld by the parties.

14. No provision of this Agreement is intended to create a claim or interest in any person or entity not a party hereto.

15. Each of Grantor and Grantee represents and warrants to the other that it has the authority to enter into this Agreement and to carry out the terms hereof, and that the undersigned is authorized to execute this Agreement on behalf of each of Grantor and Grantee, as applicable.

16. Except as otherwise set forth in this Agreement, this Agreement shall not be changed, amended or terminated, except by written agreement of Grantor and Grantee.

17. This Agreement shall be construed in accordance with the Laws of the Commonwealth of Pennsylvania.

18. This Agreement constitutes the entire agreement between the parties with respect to the subject matter hereof and there are no other understandings written or oral.

19. This Agreement shall be recorded in the Office of the Recorder of Deeds in and for the County of Montgomery, Commonwealth of Pennsylvania, and shall be a covenant running with the land. This Agreement may be executed in one or more counterparts, each of which, when taken together, shall constitute a single instrument.

20. If any provision of this Agreement, or the application thereof to any person, partnership, corporation or other entity, or circumstance shall be held invalid or unenforceable, the remainder of this Agreement shall not be affected thereby and each term and provision of this Agreement shall be valid and enforceable to the fullest extent permitted by law.

21. All notices, requests, and other communications under this Agreement shall be in writing and shall be deemed to have been properly given if personally delivered or sent by registered or certified mail, postage paid, return receipt requested, or by private overnight express carrier, such as Federal Express, next day delivery, charges prepaid, addressed as follows:

Notice to Grantor: ~~Chief Legal and Administrative Officer~~ Lisa Olivieri, Vice President
MileOne Automotive
1 Olympic Place, Suite 1200
Towson, MD 21204

With a copy to: Division President
MileOne Automotive
3301 Briggs Chaney Road
Silver Spring, MD 20904

Notice to Grantee: Yvonne Montgomery, Senior Assistant Solicitor
The County of Montgomery
One Montgomery Plaza – 8th Floor
P.O. Box 311
Norristown, PA 19404

Either party may change its address by notice to the other party, which notice shall be given in accordance with the above.

IN WITNESS WHEREOF, intending to be legally bound hereby, the undersigned have executed this Agreement as of the year and date first written above.

GRANTOR:

AUTO PROPERTIES FORT WASHINGTON, LLC
a Pennsylvania limited liability company

By: _____
Name: Lisa Olivieri
Title: Vice President

GRANTEE:

MONTGOMERY COUNTY

By: _____
Neil K. Makhija, Chair
Board of Commissioners

ATTEST:

Lee A. Soltysiak
Lee Soltysiak, Chief Clerk

Date: May 20, 2025

APPROVED AS TO FORM:

_____
County Solicitor

ACKNOWLEDGMENT

STATE OF MARYLAND :
: ss.
COUNTY OF BALTIMORE :

On this 31st day of July, 2025, before me, the undersigned officer, personally appeared Lisa Olivieri, who acknowledged himself/herself to be the Vice-President of Auto Properties Fort Washington, LLC, a Pennsylvania limited liability company, and that he/she, as such officer, being authorized to do so, executed the foregoing instrument for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

Loretta Wade
Notary Public

LORETTA K WADE
Notary Public - State of Maryland
Baltimore County
My Commission Expires Oct 2, 2028

ACKNOWLEDGMENT

COMMONWEALTH OF PENNSYLVANIA :
: ss.
COUNTY OF MONTGOMERY :

On this 23rd day of May, 2025, before me, the undersigned officer, personally appeared Neil K. Makhija, who acknowledged himself to be the Chair of The Board of Commissioners of The County of Montgomery, and acknowledged that he was authorized to execute this document on behalf of the County and that he executed the same for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and official seal.

Bridget Wosczyna-Briddes
Notary Public

Commonwealth of Pennsylvania - Notary Seal
Bridget Wosczyna-Briddes, Notary Public
Montgomery County
My commission expires October 24, 2025
Commission number 1232014
Member, Pennsylvania Association of Notaries

EXHIBIT "A"

Legal Description

CONTROL POINT ASSOCIATES, INC.
traditional methods | modern approaches

New Britain Corporate Center
1600 Manor Drive, Suite 210
Chalfont, PA 18914
Tel: 215.712.9800
cpasurvey.com

FEBRUARY 25, 2025
02-190406-00

METES AND BOUNDS DESCRIPTION
VARIABLE WIDTH COUNTY TRAIL EASEMENT
PART OF BLOCK 51, UNIT 44, APN #65-00-08767-00-6
PART OF BLOCK 51, UNIT 41, APN #65-00-08770-00-3
PART OF BLOCK 51, UNIT 2, APN #65-00-08773-00-9
PART OF BLOCK 51, UNIT 46, APN #65-00-08776-00-6
LANDS NOW OR FORMERLY
AUTO PROPERTIES FORT WASHINGTON, LLC
WHITEMARSH TOWNSHIP, MONTGOMERY COUNTY
COMMONWEALTH OF PENNSYLVANIA

BEGINNING AT A POINT ON THE DIVIDING LINE BETWEEN BLOCK 51, UNIT 44, LANDS NOW OR FORMERLY AUTO PROPERTIES FORT WASHINGTON, LLC AND BLOCK 51, UNIT 1, LANDS NOW OR FORMERLY WHITEMARSH HOTEL ASSOCIATES LP, SAID POINT BEING DISTANT THE FOLLOWING THREE (3) COURSES AND DISTANCES FROM AN IRON PIN FOUND ON THE TITLE LINE AND SOUTHWESTERLY LEGAL RIGHT-OF-WAY LINE OF PENNSYLVANIA AVENUE (A.K.A. S.R. 2027, VARIABLE WIDTH LEGAL RIGHT-OF-WAY:

THE FOLLOWING THREE (3) COURSES AND DISTANCES ALONG THE DIVIDING LINE BETWEEN BLOCK 51, UNIT 44 AND BLOCK 51, UNIT 1:

A. SOUTH 37 DEGREES - 06 MINUTES - 50 SECONDS WEST, A DISTANCE OF 283.21 FEET TO A POINT, THENCE;

B. NORTH 55 DEGREES - 58 MINUTES - 10 SECONDS WEST, A DISTANCE OF 110.16 FEET TO A POINT, THENCE;

C. SOUTH 37 DEGREES - 06 MINUTES - 50 SECONDS WEST, A DISTANCE OF 157.39 FEET TO THE TRUE POINT AND PLACE OF BEGINNING AND FROM SAID POINT OF BEGINNING RUNNING, THENCE;

1. THROUGH BLOCK 51, UNIT 44, SOUTH 43 DEGREES - 06 MINUTES - 57 SECONDS EAST, A DISTANCE OF 34.21 FEET TO A POINT, THENCE;

2. THROUGH BLOCK 51, UNITS 44, 41, 2 AND 46, SOUTH 53 DEGREES - 48 MINUTES - 32 SECONDS EAST, A DISTANCE OF 388.71 FEET TO A POINT, THENCE;

THE FOLLOWING TWO (2) COURSES AND DISTANCES THROUGH BLOCK 51, UNIT 46:

3. SOUTH 01 DEGREES - 58 MINUTES - 02 SECONDS EAST, A DISTANCE OF 15.93 FEET TO A POINT, THENCE;

4. SOUTH 33 DEGREES - 58 MINUTES - 20 SECONDS WEST, A DISTANCE OF 7.11 FEET TO A POINT, THENCE;

5. ALONG THE DIVIDING LINE BETWEEN BLOCK 51, UNITS 2, 46 & 41 AND LANDS NOW OR FORMERLY NORTH PENNSYLVANIA RAILROAD, NORTH 56 DEGREES - 01 MINUTES - 40 SECONDS WEST, A DISTANCE OF 283.22 FEET TO A POINT, THENCE;

6. ALONG THE DIVIDING LINE BETWEEN BLOCK 51, UNIT 44 AND LANDS NOW OR FORMERLY NORTH PENNSYLVANIA RAILROAD, NORTH 55 DEGREES - 58 MINUTES - 10 SECONDS WEST, A DISTANCE OF 150.22 FEET TO A POINT, THENCE;

7. ALONG THE DIVIDING LINE BETWEEN BLOCK 51, UNIT 44 AND BLOCK 51, UNIT 1, NORTH 37 DEGREES - 06 MINUTES - 50 SECONDS EAST, A DISTANCE OF 42.61 FEET TO THE POINT AND PLACE OF BEGINNING.

CONTAINING 12,145 SQUARE FEET OR 0.279 ACRE

THIS PROPERTY SUBJECT TO RESTRICTIONS, COVENANTS AND/OR EASEMENTS EITHER WRITTEN OR IMPLIED.

THIS DESCRIPTION WAS WRITTEN BASED UPON AN EXHIBIT ENTITLED "TRAIL EASEMENT EXHIBIT FOR MILEONE FORT WASHINGTON, LLC, 500 PENNSYLVANIA AVENUE, WHITEMARSH TOWNSHIP, MONTGOMERY COUNTY, PA, COUNTY TRAIL EXHIBIT PLAN", PREPARED BY BOHLER ENGINEERING, DATED 10/10/2023, REVISION 2, DATED 1/29/2025, PROJECT NO. PAB220113.01, SHEET EX-01.

CONTROL POINT ASSOCIATES, INC.

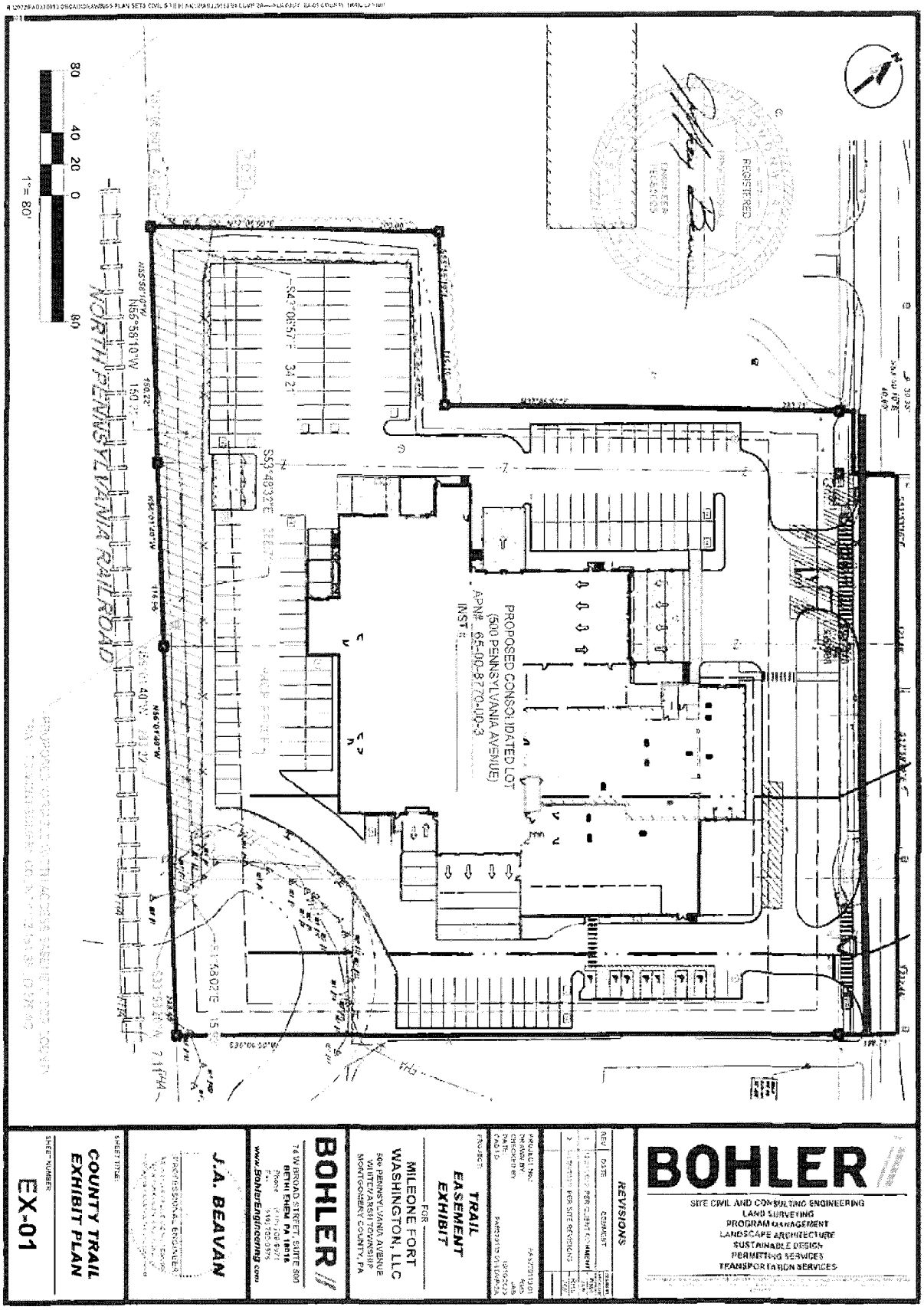
COMMONWEALTH OF PENNSYLVANIA PROFESSIONAL JAMES C. WEED

FEBRUARY 25, 2025
JAMES C. WEED, P.L.S. DATE
COMMONWEALTH OF PENNSYLVANIA
PROFESSIONAL LAND SURVEYOR # SU075250

S:\Surveys\2022\02-220505-00-BEI-500-512PennsylvaniaAve-WhitemarshTwp-PA-JAA\M&B\2025-02-05\M&B_TRAIL EASEMENT.docx
PREPARED BY: JAA REVIEWED BY: BAR

EXHIBIT "B"

Plan


NORTH PENNSYLVANIA RAILROAD
PROPOSED CONSOLIDATED LOT
(500 PENNSYLVANIA AVENUE)
APN# 65-00-8770-00-3
INST. #
1" = 80'
80 40 20 0 80
REGISTERED
PROFESSIONAL
ENGINEER
BOHLER
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES
REVISIONS
TRAIL EASEMENT EXHIBIT
FOR
MILEONE FORT WASHINGTON, LLC
500 PENNSYLVANIA AVENUE
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY, PA
BOHLER
J.A. BEAVAN
COUNTY TRAIL EXHIBIT PLAN
EX-01

pennsylvania DEPARTMENT OF REVENUE (EX) MOD 06-19 (FI)

REV-183

BUREAU OF INDIVIDUAL TAXES
PO BOX 280603
HARRISBURG, PA 17128-0603

18300191O5

REALTY TRANSFER TAX STATEMENT OF VALUE

COMPLETE EACH SECTION

RECORDER'S USE ONLY

State Tax Paid [redacted]
Book: 6408 Page:
Instrument Number: 01044
Date Recorded: 07/23/2025 02:25:19 PM
Addendum (0) of (1)

SECTION I TRANSFER DATA

Date of Acceptance of Document: 05/23/2025					
Grantor(s)/Lessor(s): Auto Properties Fort Washington, LLC	Telephone Number: (443) 872-0738		Grantee(s)/Lessee(s): The County of Montgomery	Telephone Number: (610) 278-3033	
Mailing Address: 1 Olympic Place, Suite 1200			Mailing Address: P.O. Box 311		
City: Towson	State: MD	ZIP Code: 21204	City: Norristown	State: PA	ZIP Code: 19404

SECTION II REAL ESTATE LOCATION

Street Address: See Attached	City, Township, Borough: Whitemarsh	
County: Montgomery	School District: Colonial	Tax Parcel Number: See Attached

SECTION III VALUATION DATA

Was transaction part of an assignment or relocation? ○ YES ● NO

1. Actual Cash Consideration [redacted]	2. Other Consideration + [redacted]	3. Total Consideration = [redacted]
4. County Assessed Value [redacted]	5. Common Level Ratio Factor x [redacted]	6. Computed Value = [redacted]

SECTION IV EXEMPTION DATA - Refer to instructions for exemption status.

1a. Amount of Exemption Claimed $ [redacted]	1b. Percentage of Grantor's Interest in Real Estate [redacted]	1c. Percentage of Grantor's Interest Conveyed [redacted]

2. Fill in the Appropriate Oval Below for Exemption Claimed.

○ Will or intestate succession. _____ (Name of Decedent) _____ (Estate File Number)

○ Transfer to a trust. (Attach complete copy of trust agreement and all amendments.)

○ Transfer from a trust. (Attach complete copy of trust agreement and all amendments.)

○ Transfer between principal and agent/straw party. (Attach complete copy of agency/straw party agreement.)

○ Transfers to the commonwealth, the U.S. and instrumentalities by gift, dedication, condemnation or in lieu of condemnation. (If condemnation or in lieu of condemnation, attach copy of resolution.)

○ Transfer from mortgagor to a holder of a mortgage in default. (Attach copy of mortgage and note/assignment.)

○ Corrective or confirmatory deed. (Attach complete copy of the deed to be corrected or confirmed.)

○ Statutory corporate consolidation, merger or division. (Attach copy of articles.)

● Other (Provide a detailed explanation of exemption claimed. If more space is needed attach additional sheets.)

This trail easement to Montgomery County is for a value less than [redacted] and is therefore tax exempt under section 91.193(b)(21).

SECTION V CORRESPONDENT INFORMATION - All inquiries may be directed to the following person:

Name: J. Braun Taylor, Esq.			Telephone Number: (215) 661-0400
Mailing Address: 1684 S. Broad St., Suite 230, P.O. Box 1479	City: Lansdale	State: PA	ZIP Code: 19446

Under penalties of law, I declare that I have examined this statement, including accompanying information, and to the best of my knowledge and belief, it is true, correct and complete.

Signature of Correspondent or Responsible Party | Date: 07/23/2025

FAILURE TO COMPLETE THIS FORM PROPERLY OR ATTACH REQUESTED DOCUMENTATION MAY RESULT IN THE RECORDER'S REFUSAL TO RECORD THE DEED.

18300191O5

18300191O5

Attachment to Realty Transfer Tax
Statement of Value

Section II: Real Estate Location

Street Address:

Parcel 1: 506 Pennsylvania Avenue
Parcel 2: 500 Pennsylvania Avenue
Parcel 3: 510 Pennsylvania Avenue
Parcel 4: 512 Pennsylvania Avenue

Tax Parcel Numbers:

Parcel 1: 65-00-08767-00-6
Parcel 2: 65-00-08770-00-3
Parcel 3: 65-00-08773-00-9
Parcel 4: 65-00-08776-00-6

Section III: Valuation Data

County Assessed Value:

Parcel 1: [redacted]
Parcel 2:
Parcel 3:
Parcel 4:

TOTAL: [redacted]

Computed Value:

Parcel 1: [redacted]
Parcel 2:
Parcel 3:
Parcel 4:

TOTAL: [redacted]

WHITEMARSH TOWNSHIP

To: Charlie L. Guttenplan, Director of Planning & Zoning/Zoning Officer.

From: **Andrew G. Thomas, Fire Marshal**

Subject: SLD#03-23 R2 MILEONE FORT WASHINGTON LLC
PRELIMINARY/FINAL PLAN REVIEW
500-512 PENNSYLVANIA AVENUE
FORT WASHINGTON, PA 19034

Date: 8/25/2025

The preliminary/ final plan review for revision 2 by the fire marshal's office.

1. The plan shall be in accordance with Appendix C section C101 of the 2018 International Fire Code "Fire Hydrant Locations and Distribution". The submitted plan does not indicate any on-site fire hydrants or the distance from any existing fire hydrants to the new proposed building.

Bohler Response: No onsite fire hydrants are proposed. Fire protection will be provided upon coordination with the fire department.
Fire Marshal Response: Whitemarsh Township reviews all fire plans, please provide the distances from the new proposed building to the nearest fire hydrant for review. This must be completed before any final plans are recorded.
1/9/2025: ***Fire Marshal Response: Whitemarsh Township reviews all fire plans, please provide the distances from the new proposed building to the nearest fire hydrant for review. This must be completed before any final plans are recorded.***

Mile One and Bohler have met all except the above discussed point from the prior plans review.

Andrew G. Thomas
Fire Marshal, Emergency Management Coordinator
616 Germantown Pike
Lafayette Hill, PA 19444
Phone: 610-825-3535 ext. 2614
Email: athomas@whitemarshtwp.org

GILMORE & ASSOCIATES, INC.
ENGINEERING & CONSULTING SERVICES

August 29, 2025

Mr. Craig McAnally - Township Manager
Whitemarsh Township Municipal Building
616 Germantown Pike
Lafayette Hill, PA 19444

RE: Amended Preliminary/Final Plan Review
500-512 Pennsylvania Ave
Whitemarsh Township, Montgomery County, PA
S/LD # 03-23
G&A Project Number 2023-03063

Dear Mr. McAnally:

As requested, we have reviewed plans for the above referenced Preliminary/Final Plan Submission consisting of:

- 36-Sheet Plan Set prepared by Bohler Engineering dated October 24, 2024, last revised July 22, 2025.
- Post Construction Stormwater Management (PCSM) plan narrative prepared by Bohler Engineering dated April 23, 2025, last revised July 24, 2025
- Various supporting documents, forms and correspondence enclosed with the application

The following comments are offered for your consideration:

SUBDIVISION AND LAND DEVELOPMENT ORDINANCE

	Section	Description
1.	105-21(B)(1)(j)	The plans must be revised to include two points along the boundary referencing state plane coordinates.
2.	105-21(B)(9)(d)[2][b]	The Traffic Impact Assessment Report dated September 20, 2023 must be revised to provide a description of the public transportation (i.e. Septa) available in the area.
3.	105-21(B)(9)(d)[3][b]	The Traffic Impact Assessment Report dated September 20, 2023 must be revised to identify roadways and/or intersections experiencing levels of service E or F.
4.	105-21(B)(9)(d)[5][a]	The Traffic Impact Assessment Report dated September 20, 2023 must be revised to provide clarification of the following: • The critical headway values used in the analysis are not consistent with the calculated values in Appendix E. • The timings used for the existing PM peak analysis do not appear to be consistent with the signal plans. • The applicant may consider revising the trip generation table to clearly demonstrate the amount of site traffic that is being added to the roadway network versus the existing building conditions.

	Section	Description
5.	105-21(B)(9)(d)[6][a]	All streets and/or intersections showing a level of service below C shall be considered deficient, and specific recommendations of the elimination of these problems shall be listed. This listing of recommended improvements shall include, but not be limited to the following elements: internal circulation design, site access location and design, external street and intersection design and improvements, traffic signal installation and operation, including signal timing, and transit design improvements. The report indicates various deficiencies. Provide recommendations to eliminate the deficiencies, if feasible.
6.	105-21(B)(9)(d)[6][a]	Signal design plans for the Pennsylvania Avenue/Commerce Drive intersection showing the new alignment and updated timings must be submitted for review.
7.	105-21.1(K)(2), 105-53(D)	The applicant must make a voluntary lump sum contribution in a form acceptable to the Township in the amount of $51,161.00 to enable the Township to use the payment as it sees fit in accordance with Resolution 2025-06.
8.	105-22(A)(3)	The variances granted identified on Sheet C-101 must be expanded to reference Decision #2024-49 and the written decision date December 10, 2024.
9.	105-28(I)	The applicant must obtain a Highway Occupancy Permit from the Pennsylvania Department of Transportation (PennDOT) for the proposed work within the right of way of Pennsylvania Avenue (SR-2037). The most recent Highway Occupancy Permit Application Plans must be included within the Land Development Set. The Township Engineer should be notified of all meetings with PennDOT and must be copied on all correspondence. Additionally, the plans must be revised to indicate the source or plan reference used to determine the right-of-way width for Pennsylvania Avenue.
10.	105-38(V)	The applicant must obtain permission from the adjacent property owners located on TMP #65-00-08764-20-7 and TMP #65-00-08779-00-3 for the proposed light spill onto their property.
11.	105-76(B)	The applicant must obtain a letter of approval from the Township Fire Marshal in order to ensure that adequate fire protection is provided.

CHAPTER 55 - TREE PROTECTION STANDARDS

	Section	Description
12.	55-4(F)(1)	The applicant must make a fee-in-lieu contribution in a form acceptable to the Township in the amount of $6,580.00 for seven (7) required replacement trees in accordance with Resolution 2025-06.

GRADING, EROSION CONTROL, STORMWATER MANAGEMENT AND BEST MANAGEMENT PRACTICES ORDINANCE:

	Section	Description
13.	58-14(A)(2)(b)	The stormwater management report must be revised to demonstrate that the post development total runoff volume will not exceed the pre-development total runoff volumes for the one year and two year storms.
14.	58-15(B)	The stormwater management design must be revised such that the 1-year through 100-year post-development discharge rates do not exceed the required design discharge rates. Additionally, the peak rate summary table on page 31 must be updated to reflect the values shown in the HydroCAD analysis.
15.	58-23(A)	An as-built survey of all stormwater BMPs must be submitted to the Township in paper and digital (dwg) formats. A note must be added to the plans stating an as-built survey will be completed and submitted in both formats to the Township.
16.	58-24(K)(2)(g)	All easements must be documented in the form of an easement agreement, approved by the Township Solicitor and recorded at the Recorder of Deeds for Montgomery County.
17.	58-25	The property owner shall sign an operations and maintenance agreement with the Township addressing stormwater BMPs that are to be privately owned.
18.	58-33(A)(13)	The plans must be revised to provide far bank armoring and/or an energy dissipator at EW-900 unless it can be confirmed the Army Corps of Engineers does not require armoring. Energy dissipating calculations must be submitted to the Township for review.

CHAPTER 101 – FLOODPLAIN MANAGEMENT ORDINANCE:

	Section	Description
19.	101-17(A)(1)	In the Floodplain Conservation District, no development shall be permitted except where the effect of such development on flood heights is fully offset by accompanying improvements which have been approved by all appropriate local, state, and federal authorities as required. The applicant must provide evidence in sufficient detail to demonstrate compliance with the requirements of this section of the ordinance. The Flood Analysis for Sandy Run Report concludes there will be a net cut condition which appears inconsistent with the remaining narrative and must be revised. It does not appear that the stormwater facilities storage volume (1,163 CY) will mitigate the proposed fill (9,650 CY).
20.	101-17(A)(2)	Within any floodway area, no new construction or development shall be allowed, including stormwater outfalls, unless the appropriate approvals are obtained from the Army Corps of Engineers, Federal Emergency Management Agency, Pennsylvania Department of Environmental Protection and approved by the Township. Additionally, the plans indicate an “Assumed Culvert Floodway” which transects the proposed development and must be clarified through proper notes and documentation.

ADDITIONAL COMMENTS

21. The ADA ramp detail along the ADA parking spaces on Sheet C-402 must be revised to provide elevations, slopes, and lengths. Additionally, the plans must be revised to identify the linework shown adjacent to this ramp.

22. The truck turning plans must be expanded to show the auto carrier leaving the site to the west. The "Emergency Operations Plan" dated April 24, 2025 indicates inventory vehicles will be moved off-site to 525 North Bethlehem Pike, which will require a left turn from the signalized intersection.

23. It appears the existing sewer manhole cover conflicts with the accessible route for the right-in/right out driveway and must be revised or a sanitary manhole cover detail must be shown on the plans which is consistent with ADA requirements including slot size, orientation and slip resistance, etc.

24. The Traffic Impact Assessment Report must be updated to include the latest site plan for consistency.

25. The plans must be revised to provide signage to identify the location of parking areas reserved for employees and customers.

26. The plans must be revised to provide a label identifying the structure west of the ADA parking spaces shown on the Grading Plan (Sheet C-401) and Utility Plan (Sheet C-501) which is connected to a 4" and 6" sanitary sewer pipe.

27. The plans must be revised to provide a label identifying the three symbols (x within a square) within the middle of the Service Department.

28. The plans must be revised to provide a dw-endwall construction detail.

Any future submission of the design plans for this project must be accompanied by a letter, prepared by the applicant's engineer, which addresses each of the comments contained in this report. Should you have any questions regarding this matter, please do not hesitate to contact me at this office.

Sincerely,

Krista Heinrich, PE
Township Engineer

c: Craig T. McAnally – Township Manager
Charles L. Guttenplan, AICP – Director of Planning and Zoning
Robert A. Sztubinski, B.C.O. – Director of Building & Codes
Andrew Thomas – Fire Marshal
Sean Kilkenny, Esq.; The Law Offices of Sean Kilkenny, LLC – Township Solicitor *(via email)*
Dennis Turnbaugh – Mile One Fort Washington LLC
Jeffrey A. Beavan, PE – Applicant's Engineer
John Iannozzi, Esq. – Applicant's Attorney

74 W. Broad Street, Suite 500
Bethlehem, PA 18018
610.709.9971

October 30, 2024
Revised September 3, 2025
Via FedEx Priority and Email

Whitemarsh Township
616 Germantown Pike
Lafayette Hill, PA 19444

Attention: Board of Supervisors

RE: BMW Automotive Dealership Expansion
500-512 Pennsylvania Ave.
Whitemarsh Township
Montgomery County, PA
PAB220113.01

Dear Supervisors:

On behalf of MileOne Autogroup, Inc., Bohler Engineering PA, LLC hereby requests the following Waivers from the Whitemarsh Township Board of Supervisors in regards to the above referenced Land Development Application – **note that these same waivers were previously approved by the Board of Supervisors for this project via Resolution 2025-06 during their meeting on February 13, 2025**:

1. From SALDO §105-12.(D) to permit the filing of a combined preliminary/final amended land development plan set, given the nature of the improvements and the fact that the site has been extensively reviewed and discussed as part of the prior land development plan approvals.

2. From SALDO §105-21.(B).(1)(n) from the requirement to show existing features within 500 feet of the site to allow an Aerial Plan showing features within 500 feet of the project to be included with the Plans instead.

3. From SALDO §105-21.(B).(13) from the requirement that an Existing Resources and Site Analysis (ERSA) Plan be submitted to allow the site survey to serve as the same instead.

4. From SALDO §105-21.(B).(15) from the requirement to provide a Preliminary Resource Impact and Conservation Plan to allow the Post-Construction Stormwater Management (PCSM) Plans, Details, and Notes to serve as the same instead.

5. From SALDO §105-30.(A), §105-21.(A) and 105-48.(E) from the requirement that street trees be planted within a tree planting zone of lawn area or other material approved by the Shade Tree Commission, situated between the sidewalk and curb and measuring a minimum of five (5) feet in width from the planting edge of the curb to the planting edge of the sidewalk, to allow street trees to be planted outside of the tree zone due to utility conflicts and an existing sanitary sewer easement along the site frontage. The required number of street trees shall be provided along the site frontage.

6. From SALDO §105-38.(A) from the requirement to provide 2-way aisles of a size not less than 24-feet for 90-degree parking, having a stall dimension of not less than 9’ X 18” in order to preserve an existing parking area in the southwestern corner of the property to be utilized for dealership operations and are not intended for customer parking.

7. From SALDO §105-38.(B) from the requirement that the maximum width of entrance and exit drives shall be 35-feet at the street line, in order to provide alignment with opposite travel and auxiliary lanes and to satisfy PennDOT design criteria along a State Route.

8. From SALDO §105-38.(C) from the requirement that curves/turns in entrance and exit drives and all internal parking lot aisles necessary for providing access for fire protection equipment shall have a minimum inside turning radius of 25-feet and a minimum outside turning radius of 50-feet, to permit curb radii of less than 25-feet, conditioned on the Applicant providing the Township with

truck turning templates to the satisfaction of the Township Fire Marshal and the Township Engineer showing circulation throughout the property.

9. From SALDO §105-38.(D) from the requirement that parking areas be designed to permit each motor vehicle to proceed to and from the parking space provided for it without requiring the moving of any other motor vehicles, to allow double-stacked inventory and service/repair parking spaces without a direct access aisle, as these are intended to be utilized for dealership operations and not to meet required off-street parking requirements.

10. From SALDO §105-38.(H) from the requirement that except at entrance and exit drives, all parking areas shall be set back from the right-of-way line and all property lines at least 15-feet, to allow a 4.2-foot setback along the southeastern property line for up to fifteen (15) inventory storage and/or service storage spaces.

11. From SALDO §105-38.(I) from the requirement that no more than fifteen (15) parking spaces be permitted in a continuous row without being interrupted by a landscaping area of not less than the width of a parking space constructed in accordance with the plan, to permit parking rows of greater than fifteen (15) spaces without interruption.

12. From SALDO §105-38.(J) from the requirement that no one area for off-street parking of motor vehicles shall exceed 30 cars in capacity and that separate areas on a parcel shall be physically separated from each other by ten-foot-wide planting strips, to permit to allow certain existing parking areas (including the southwestern corner of the property) to remain in their existing paved configuration, and for limited double-stacked inventory/service storage spaces on the property.

13. From SALDO §105-38.(O) from the requirement that parking areas be located at least 10-feet from any building or structure, to allow the eleven (11) parking spaces located near the service drive lane and 19 parking spaces around the car wash to remain, and for less than 10.0' from the building or structure for the proposed service lanes. *(Prior approval was for 14 and 26 spaces)*

14. From SALDO §105-39.(A) from the requirement that all parking areas have at least one, three-inch-caliper tree for every two parking spaces provided. Waiver requested to allow 23 trees where 92 trees are required based on the quantity of surface parking spaces, due to the proposed use as an automotive dealership and their required operations, and the extensive landscaping around the perimeter of the site. *(Prior approval was to allow 23 trees where 97 are required)*

15. From SALDO § 105-52.(B).(2) from the requirement that a minimum 50-foot buffer yard be provided between land developments, to allow an alternative planting option for the buffers along Pennsylvania avenue and the southeastern property line due to limited site area, conditioned on the applicant providing the required quantity of buffer plantings to meet the screening requirements.

16. A Partial Waiver from SALDO §105-53.(D) a partial waiver from the requirement of dedication of land suitable for park and recreational use to the Township or payment of fees in lieu thereof to allow the Applicant to coordinate with the Board of Supervisors in consideration of the stream being preserved and anticipated easement to the County for use in extending the cross-County trail along the rear of the property.

17. From SALDO §105-21.1.(E) from the requirement that a Traffic Impact Fee be paid to allow for the payment of a voluntary contribution in accordance with paragraph 8, above.

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18. From SALDO §58-14.(A).(1) to permit the utilization of Managed Release Concept BMP's on the site for stormwater management and volume mitigation, in accordance with PADEP design and requirements.

19. From SALDO §58-30.A.(9) from the requirement that all stormwater detention/retention facilities shall be in place and functioning prior to the creation of any impervious surface, to permit construction of impervious surfaces prior to prevent sediment–laden water from leaving the property, and that Erosion and Sediment adequacy and an NPDES Permit are obtained from PADEP and the Montgomery County Conservation District prior to commencing construction.

20. From SALDO §58-34.B.(7).(d) from the requirement that minimum diameter of all storm drainage pipes shall be 18-inches or equivalent thereto, or Whitemarsh Township specifications, whichever are more stringent, to permit stormwater pipe sizes under 18-inches and to permit HDPE pipe in lieu of the required reinforced concrete pipe.

21. From SALDO §58-34.(B).(7).(h) from the requirement that storm pipes shall have a minimum 18-inch depth of cover over the top of pipe in order to permit roof leader piping to have a minimum of 12-inches of cover over the top of the pipe.

Should you have any questions or require additional information, please do not hesitate to contact me at this office (610) 709-9971.

Sincerely,

BOHLER ENGINEERING PA, LLC



Jeffrey Beavan, P.E.

JB/rs/mb
CC: Craig Colton (email)
John Iannozzi, Esq., Hamburg, Rubin, Mullin, Maxwell & Lupin, P.C. (email)
Jon Penney, Penney Design Group (email)

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