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 # 03-2023 R1

Project Name:
MileOne Fort Washington, LLC

Address: 500-512 Pennsylvania Ave.
Ft. Washington, PA 19034

Date: 11/4/24

Status: UNDER REVIEW

Updates:

- Revised Waiver Request Application- 12.5.24
- Zoning Ordinance Compliance Review Letter- 12.20.24
- Revised Plans for Shade Tree Commission- 12.17.24
- Township Arborist Review Memo- 12.21.24
- Montgomery County Planning Commission Review- 1.8.25
- Shade Tree Commission Meeting Memo- 1.9.25
- Township Engineer Review Letter- 1.9.25
- Emergency Operations & Egress Plan- dated 12.6.24, received 1.9.25
- Fire Marshal Review Letter- 1.9.25
- Emergency Operations & Egress Plan Review- 1.10.25
- Revised Waiver Request Letter- 1.13.25

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

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

Acreage: _____ **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:

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: 10/24/24 **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.

Per Charlie: One (1) copy of the signed application, One (1) copy of the Landscape Tree Questionnaire, three (3) copies of plans and supporting documents. Electronic Copies of everything - NO CD, flash drive or via email.

Applicant Initials	Required Items of Submission		Township Receipt
_____	Whitemarsh Township Checklist		_____
_____	Whitemarsh Township Application (Signature MUST Be Original)	One (1) copy of the Application	_____
_____	Whitemarsh Township Request for Modification (Signature MUST Be Original)		_____
_____	Whitemarsh Time Waiver Form (Signature MUST Be Original)		_____
_____	Whitemarsh Township Escrow (Payable to Whitemarsh Township; credit card payment accepted in person)		_____
_____	Montgomery County Planning Commission Municipal Request for Review (County will request fee directly from applicant)		_____
_____	Shade Tree Commission Checklist for Compliance with Chapter 55 (attached)		_____
_____	Transportation Impact Study [§105-21.B.(9)(c)] (if applicable)		_____
_____	Stormwater Management Plan & Supporting Calculations (if applicable)		_____
_____	Supplemental Documents Applicable to a Specific Application		_____
_____	List of Encumbrances (Book & Page Numbers) (if applicable)		_____
_____	Three (3) Complete Sets of All Application Materials		_____
_____	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: ***10/30/2024***

PROJECT COVER SHEET – *Approved at June 6, 2023 Shade Tree Commission Meeting*

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.

WHITEMARSH TOWNSHIP
REQUEST FOR MODIFICATION (WAIVER) OF
SUBDIVISION and/or LAND DEVELOPMENT ORDINANCE REQUIREMENTS

Pursuant to § 512.1.(b) of the Pennsylvania Municipalities Planning Code, all requests for a modification shall be in writing and shall accompany and be a part of the application for development. The request shall state in full the grounds and facts of unreasonableness or hardship on which the request is based, the provision or provisions of the ordinance involved and the minimum modification necessary.

Check the appropriate line:

☐ No modification (or waiver) of the Whitemarsh Township Subdivision and Land Development Ordinance is requested

☒ I/we hereby request the following modification[s] (or waiver[s]) of the Whitemarsh Township Subdivision and Land Development Ordinance. (The request must identify the applicable Section[s] of the Ordinance, modification[s] requested, and facts of unreasonableness or hardship upon which the request is made; attach additional sheets if necessary).

Please refer to enclosed Waiver Request Letter

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

Date: 10/24/24

Signature: _____
(Original Signature must be submitted)

74 W. Broad Street, Suite 500
Bethlehem, PA 18018
610.709.9971

October 30, 2024
Revised 12/5/2024
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:

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 §105-21.(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 for parking spaces located within the parking structure.

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 the proposed parking deck building, 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.

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 fourteen (14) parking spaces located near the service drive lane and 26 parking spaces around the car wash to remain.

14. 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.

15. 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.

16. 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.

17. 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.

18. 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

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are more stringent, to permit stormwater pipe sizes under 18-inches and to permit HDPE pipe in lieu of the required reinforced concrete pipe.

19. 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.

20. From SALDO §55-4.(C).(3) and 55-4.(D).(6) from the requirement that replacement trees be provided in accordance with the Ordinance in order to permit fewer than the required number of replacement trees due to insufficient planting area.

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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WHITEMARSH TOWNSHIP
SUBDIVISION and/or LAND DEVELOPMENT
TIME WAIVER FORM

Date: _____

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: 10/24/24

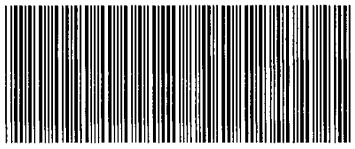
Signature: _____
(Original Signature must be submitted)

Printed Name: Craig Colton

Firm Name: MileOne Fort Washington LLC
(if applicable)

Title: Authorized Person
(if applicable)

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

AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

MILEONE FORT WASHINGTON, LLC

PROPOSED

BMW AUTOMOTIVE DEALERSHIP EXPANSION

LOCATION OF SITE

500 PENNSYLVANIA AVENUE,
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY
COMMONWEALTH OF PENNSYLVANIA

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
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 *
LANDSCAPE PLAN	C-701
LANDSCAPE NOTES AND DETAILS	C-702
LIGHTING PLAN	C-703
PROFILES	C-801, C-802
DETAILS SHEET	C-901, C-902, C-903
DRAINAGE AREA PLANS	C-1001, C-1002, C-1003
LOT CONSOLIDATION PLAN	LC-01 *

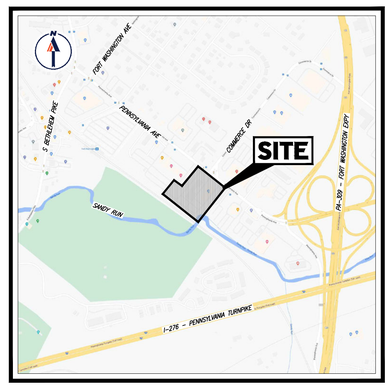
* DENOTES PLAN SHEETS TO BE RECORDED

USGS MAP

AMBLER QUAD

SCALE: 1"=2,000'

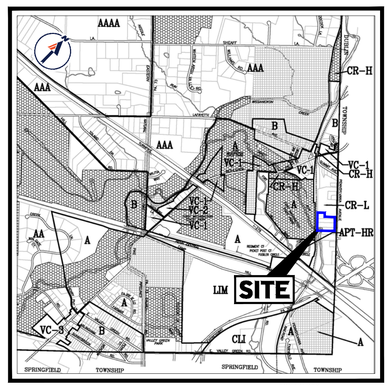
1000' 0 2000'



LOCATION MAP

SCALE: 1"=800'

400' 0 800'



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

PREPARED BY

BOHLER

(Rev. 1/2020)

THE FOLLOWING WAIVERS ARE REQUESTED FROM THE WHITEMARSH TOWNSHIP BOARD OF SUPERVISORS:

1. FROM SALDO §105-21.(B).(1)(h) - 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 LOCATED WITHIN THE PARKING STRUCTURE.
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 PERMIT THE PROPOSED PARKING DECK BUILDING, 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 IN ACCORDANCE WITH PARAGRAPH 8, ABOVE
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

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 , 65-00-08770-00-6 , 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) 879-4062
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 650008770003
5.b. EXISTING LOT 2: APN 650008767006
5.c. EXISTING LOT 3: APN 650008773009
5.d. EXISTING LOT 4: APN 650008776006
5.e. EXISTING LOT 5: APN 650008767105
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: 168.06'>.
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 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

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
ECOLOGICAL SERVICES
PERMITTING SERVICES
TRANSPORTATION SERVICES

THE INFORMATION, DESIGN AND CONTENT OF THIS PLAN ARE COPYRIGHT BY AND SHALL NOT BE DISCLOSED OR USED FOR ANY PURPOSE, WITHOUT THE WRITTEN AUTHORIZATION FROM BOHLER. ONLY APPROVED, SEALED PLANS SHALL BE UTILIZED FOR CONSTRUCTION PURPOSES.

REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY

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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-0A

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
JEFFREY A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No: PE082005
NEW JERSEY LICENSE No: 24GE05033500

SHEET TITLE:

COVER SHEET

SHEET NUMBER:

C-101

ORG. DATE - 10/24/2024

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-CNDS-0A-----LAYOUT: C-101 COVER
RS

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 THESE 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 PERMITS AND APPROVALS AND HAS BEEN APPROVED 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, ORDINANCES, 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 AND PLUMBING PLANS (INCLUDING, BUT NOT LIMITED TO, 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 PAID 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 DUE TO POTENTIAL INACCURACIES. ALL DIMENSIONS AND MEASUREMENTS 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 CONTRACTOR'S OWN MEASUREMENTS IN THE FIELD AS NECESSARY.

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 EXPENSIVE REQUIREMENT SHALL APPLY. THE GEOTECHNICAL ENGINEER OF RECORD SHALL BE CHECKED AND CONFIRMED BY THE 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 THE 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 SUBSTANCES OR WASTE FOUND 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 ANY AND ALL 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 IN ACCORDANCE WITH THE APPROVED PLANS, AND CURRENT CODES, 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 THEREOF.

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 AND FOR TWO YEARS AFTER THE COMPLETION OF CONSTRUCTION AND 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 OWNERS, 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 CLAIMS, STATUTORY 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. THE 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 OF 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 LATEST EDITION OF THE FEDERAL HIGHWAY ADMINISTRATION "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD), AND THE FEDERAL, STATE, AND LOCAL REGULATIONS.

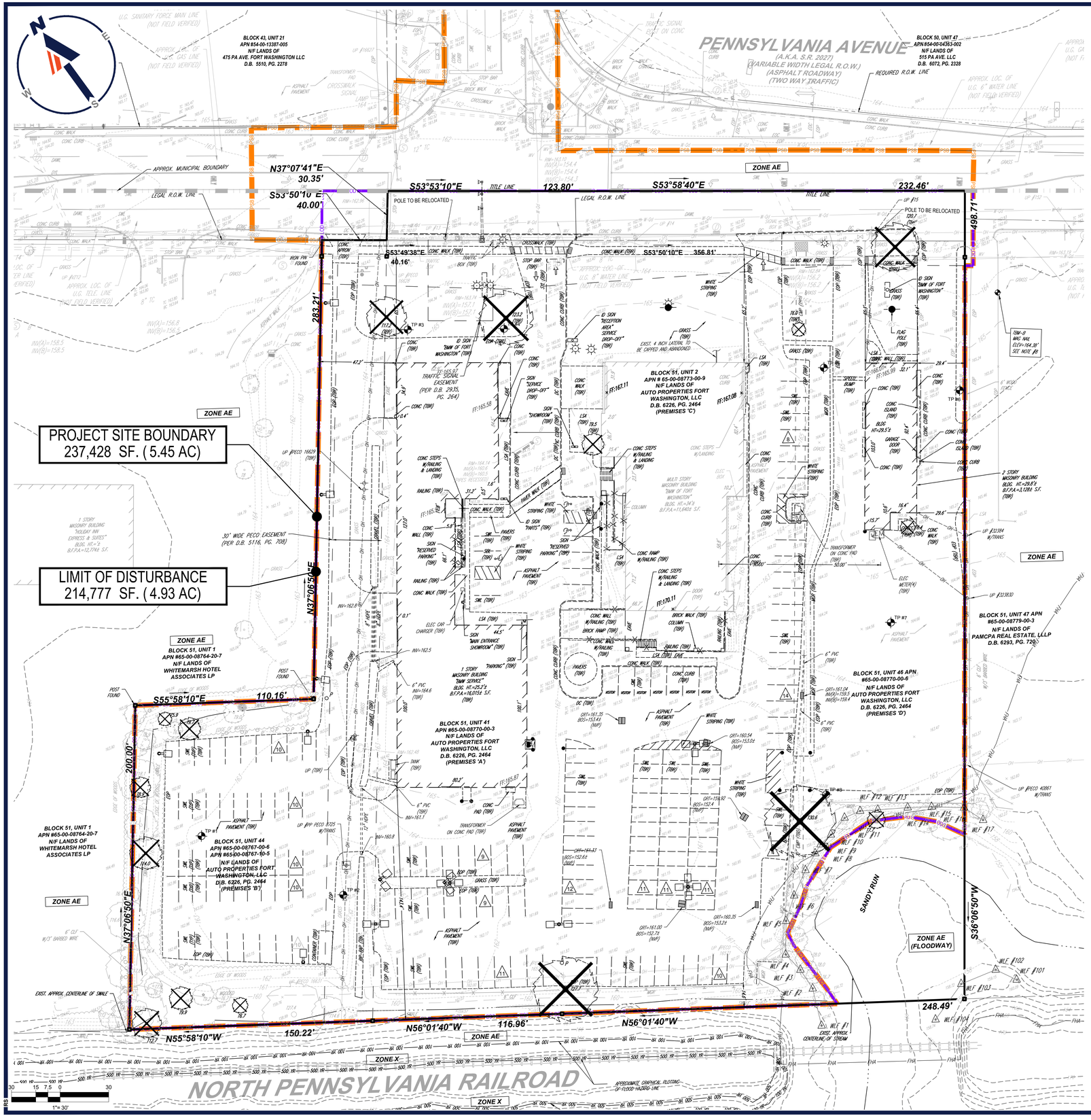
4. THE DEMOLITION (AND/OR REMOVALS) PLAN IS INTENDED TO PROVIDE GENERAL INFORMATION AND TO IDENTIFY ONLY CONDITIONS REGARDING ITEMS TO BE DEMOLISHED, REMOVED, AND/OR TO REMAIN.
   A. THE CONTRACTOR MUST ALSO REVIEW ALL CONSTRUCTION DOCUMENTS AND INCLUDE WITHIN THE DEMOLITION ACTIVITIES ALL INCIDENTAL WORK NECESSARY FOR THE CONSTRUCTION OF THE NEW SITE IMPROVEMENTS.
   B. THIS PLAN IS NOT INTENDED TO AND DOES NOT PROVIDE DIRECTION REGARDING THE MEANS, METHODS, SEQUENCING, TECHNIQUES AND PROCEDURES TO BE EMPLOYED TO ACCOMPLISH THE WORK. ALL MEANS, METHODS, SEQUENCING, TECHNIQUES AND PROCEDURES TO BE USED MUST 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 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 CONSTRUCTION ACTIVITIES. THE CONTRACTOR MUST PERFORM ALL WORK NECESSARY TO PREPARE 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 STANDARD



SURVEY NOTES:

1. 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 MAPS OF WHITEMARSH TOWNSHIP, COMMONWEALTH OF PENNSYLVANIA.
2. TOTAL SITE AREA = 223,558 S.F. OR 5.132 AC.
3. LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE. LOCATIONS AND SIZES ARE BASED ON UTILITY MARK-OUTS, ABOVE GROUND STRUCTURES THAT WERE VISIBLE & ACCESSIBLE IN THE FIELD, AND THE MAPS AS LISTED IN THE REFERENCES AVAILABLE AT THE TIME OF THE SURVEY. AVAILABLE AS-BUILT PLANS AND UTILITY MARKOUT DOES NOT ENSURE MAPPING OF ALL UNDERGROUND UTILITIES AND STRUCTURES. BEFORE ANY EXCAVATION IS TO BEGIN, ALL UNDERGROUND UTILITIES SHOULD BE VERIFIED AS TO THEIR LOCATION, SIZE AND TYPE BY THE PROPER UTILITY COMPANIES. CONTROL POINT ASSOCIATES, INC. DOES NOT GUARANTEE THE UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA EITHER IN SERVICE OR ABANDONED.
4. THIS PLAN IS BASED ON INFORMATION PROVIDED BY CLIENT. A SURVEY PREPARED IN THE FIELD BY CONTROL POINT ASSOCIATES, LLC. AND OTHER REFERENCE MATERIAL AS LISTED HEREON.
5. THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT AND IS SUBJECT TO THE RESTRICTIONS, COVENANTS AND/OR EASEMENTS THAT MAY BE CONTAINED THEREIN. IT IS STRONGLY RECOMMENDED THAT A COMPLETE TITLE SEARCH BE PROVIDED TO THE SURVEYOR FOR REVIEW PRIOR TO THE PLACEMENT OF OR ALTERATION TO IMPROVEMENTS ON THE PROPERTY.
6. BY GRAPHIC PLOTTING ONLY PROPERTY IS LOCATED IN FLOOD HAZARD ZONE AE (BASE FLOOD ELEVATIONS DETERMINED), PER REF #2.
7. THE EXISTENCE OF UNDERGROUND STORAGE TANKS, IF ANY, WAS NOT KNOWN AT THE TIME OF THE FIELD SURVEY.
8. ELEVATIONS REFER TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88); BASED ON GPS OBSERVATIONS UTILIZING THE KEYSTONE VRS NETWORK (KEYNETGPS).
   TEMPORARY MARKS SET:
   TBM-A: MAG NAIL SET IN, ELEVATION = 166.06'
   TBM-B: MAG NAIL SET IN, ELEVATION = 164.38'
9. THE OFFSETS SHOWN ARE NOT TO BE USED FOR THE CONSTRUCTION OF ANY STRUCTURE, FENCE, PERMANENT ADDITION, ETC.
10. THERE ARE A TOTAL OF (167) DESIGNATED PARKING SPACES, INCLUDING (3) HC ACCESSIBLE SAPCES.

SURVEY REFRENCES:

1. THE OFFICIAL TAX ASSESSOR'S MAP OF WHITEMARSH TOWNSHIP, COMMONWEALTH OF PENNSYLVANIA, SHEET #51.
2. MAP ENTITLED "NATIONAL FLOOD INSURANCE PROGRAM, FIRM, FLOOD INSURANCE RATE MAP, MONTGOMERY COUNTY, PENNSYLVANIA, (ALL JURISDICTIONS), PANEL 289 OF 451", MAP NUMBER 42091C0289G, EFFECTIVE DATE: 03-02-2016.
3. MAPS SHOWING PIPELINES PREPARED BY AQUA PENNSYLVANIA.
4. MAP ENTITLED "DELAWARE VALLEY INDUSTRIAL SEWAGE INC. SANITARY SEWER SYSTEM, SHEET 3 OF 9" , PREPARED BY GEORGE A. GREEBY & ASSOC ENGINEERS, DATED: FEBRUARY 23, 1956.
5. MAP ENTITLED "WATER DISTRIBUTION PLAN FOR THE PENNSYLVANIA ONE CALL SYSTEM, PENNSYLVANIA AVE. UPPER DUBLIN TOWNSHIP, MONTGOMERY COUNTY, PA. SHEET 1 OF 1". PREPARED BY NORTH WALES WATER AUTHORITY, DATED: JANUARY 17, 2023.
6. MAPS SHOWING COMMUNICATION LINES PREPARED BY VERIZON.

LEGEND
TO BE REMOVED

R.O.W LINE	
EASEMENT LINE	
SETBACK LINE	
LEASE LINE	
BUILDING	
RETAINING WALL	
CONCRETE CURB	
FLUSH CURB	
FENCE	
GUIDE RAIL	
TREELINE	
ACCESSIBLE SYMBOL	
CONCRETE MONUMENT/ IRON PIN	
SIGN	
PARKING COUNT	
AREA LIGHT	
TREE	
DRAINAGE INLET	
STORM/SANITARY MANHOLE	
WATER/GAS VALVES	
ROOF DRAIN/CLEANOUT	
FIRE HYDRANT	
UTILITY POLE W/ LIGHT	
UTILITY POLE	
OVERHEAD UTILITY WIRES	
ELECTRIC LINE	
TELEPHONE LINE	
GAS LINE	
WATER LINE	
SANITARY SEWER	
STORM PIPE	

LEGEND
EXISTING

PROPERTY LINE	
R.O.W. LINE	
APPROX. MUNICIPAL BOUNDARY	
ADJACENT PROPERTY LINE	
LIMIT OF DISTURBANCE	LOD LOD
PROJECT SITE BOUNDARY	PSB PSB
EASEMENT LINE	
SETBACK LINE	
LEASE LINE	
BUILDING	
RETAINING WALL	
CONCRETE CURB	
FLUSH CURB	
EDGE OF PAVEMENT	
FENCE	
GUIDE RAIL	
TREELINE	
ACCESSIBLE SYMBOL	
CONCRETE MONUMENT/ IRON PIN	
SIGN	
PARKING COUNT	
AREA LIGHT	
TREE	
DRAINAGE INLET	
STORM/SANITARY MANHOLE	
WATER/GAS VALVES	
ROOF DRAIN/CLEANOUT	
FIRE HYDRANT	
UTILITY POLE W/ LIGHT	
UTILITY POLE	
OVERHEAD UTILITY WIRES	
ELECTRIC LINE	
TELEPHONE LINE	
GAS LINE	
WATER LINE	
SANITARY SEWER	
STORM PIPE	
ASSUMED FLOOD WAY	
CENTERLINE OF WATER FEATURE	
TOP OF BANK / OHWM	

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.	215-918-3137
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
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
LAND DEVELOPMENT
PERMITTING SERVICES
TRANSPORTATION SERVICES

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REVISIONS

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PROJECT No.:	PAB220113.01
DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-LDVP-0A

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

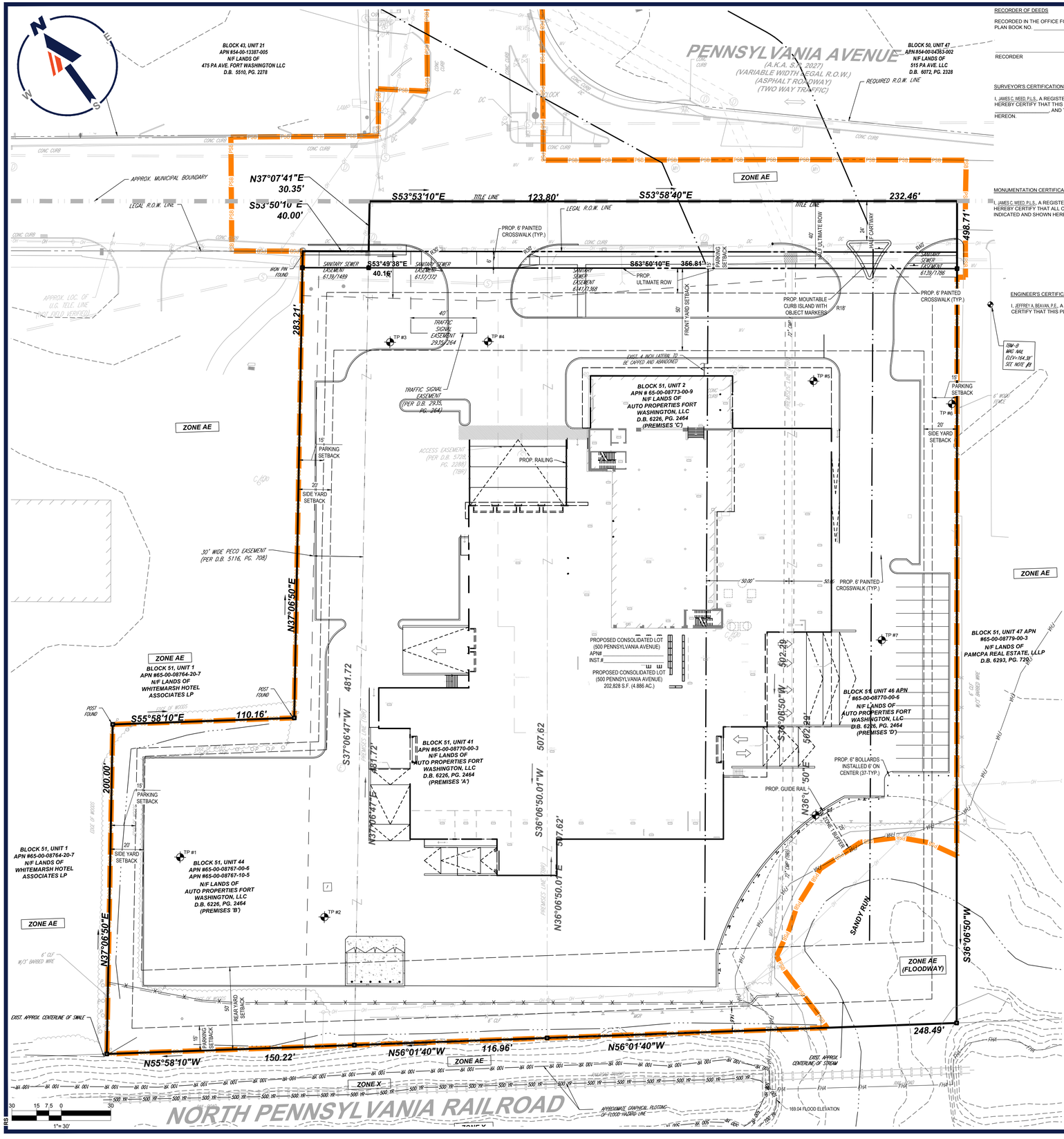
COMMONWEALTH OF PENNSYLVANIA
J.A. BEAVAN
PROFESSIONAL
ENGINEER
JEFFREY A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE082008
NEW JERSEY LICENSE No. GE49036600

SHEET TITLE:
EXISTING CONDITIONS/ DEMOLITION PLAN

SHEET NUMBER:
C-201

ORG. DATE - 10/24/2024

I:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-LDVP-0A-----LAYOUT: C-201 EXIST



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___.

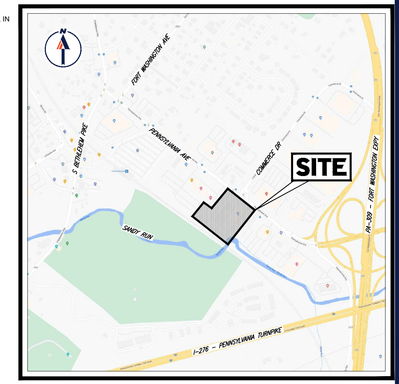
_____ _____
CHAIRMAN SECRETARY

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



LOCATION MAP

SCALE: 1" = 800'

800 400 200 0 800
1"=800'

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)**
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)	72.9% (152,069 SF.)**(V)**
MAXIMUM BUILDING HEIGHT: [3]	35 FT., 65 FT. MAX.	31 FT	35.0 FT
MINIMUM GREEN SPACE AREA:	35%		(27.1%) 56,579 SF. **(V)**
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.

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
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
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PROJECT No.: PAB220113.01
DRAWN BY: RMS
CHECKED BY: JAB
DATE: 10/24/2024
CAD I.D.: PAB220113.01-LDVP-0A

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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J. A. BEAVAN
PROFESSIONAL
JEFFREY A. BEAVAN
PROFESSIONAL ENGINEER
PENDING
PENNSYLVANIA LICENSE No. PE082005
NEW YORK LICENSE No. 095453
NEW JERSEY LICENSE No. 24GE05436600

SHEET TITLE:

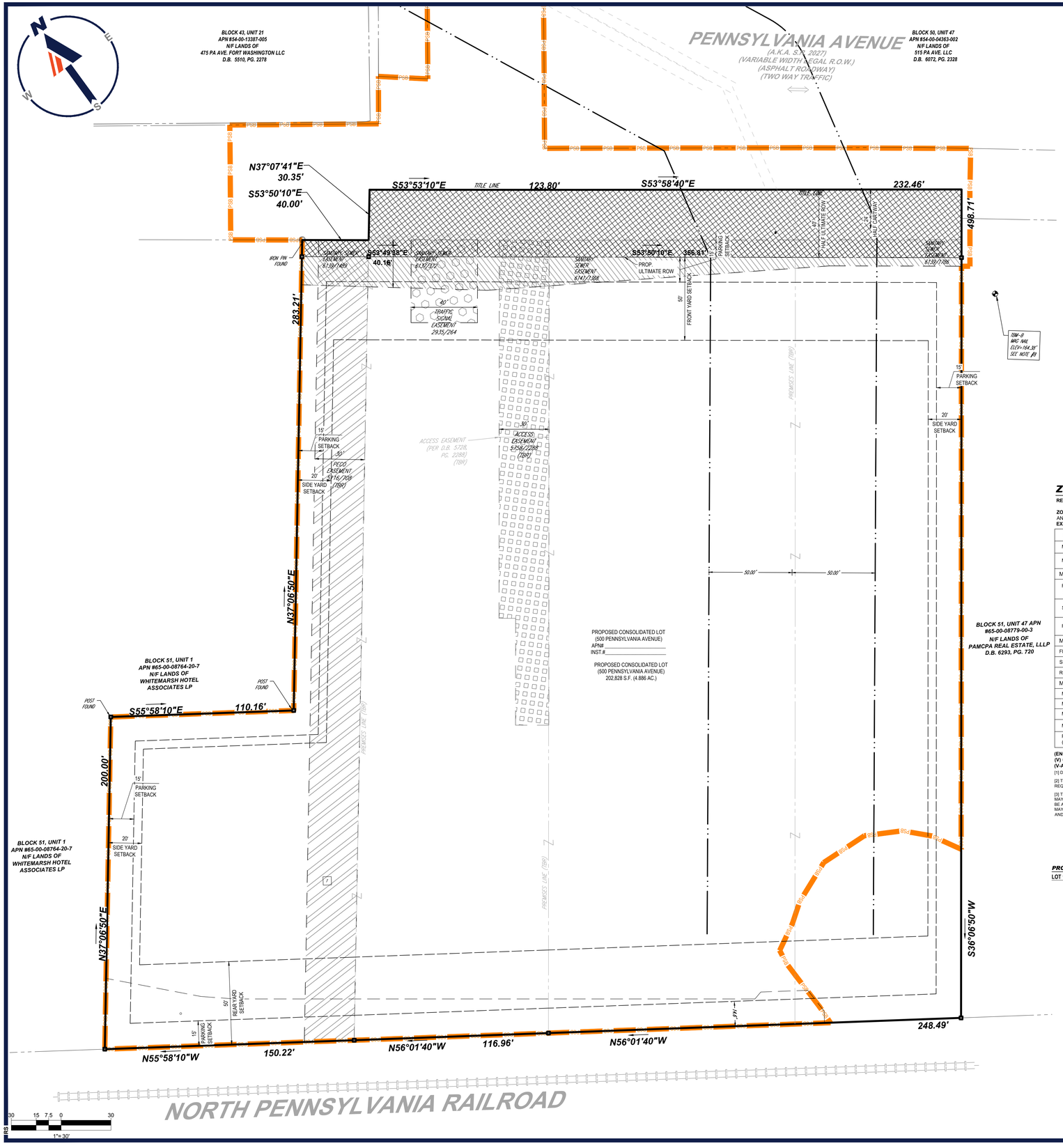
RECORD PLAN

SHEET NUMBER:

C-301

ORG. DATE - 10/24/2024

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-LDVP-0A_---1-LAYOUT C-301 RECORD



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	29.956	S55° 52' 51.08"E	

PROPOSED PECO ELECTRIC EASEMENT

Parcel Table			
Line #/Curve #	Length	Direction/Delta	Radius

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	

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	

EXISTING 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	356.797	S53° 50' 09.99"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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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

LOT 1 PARKING REQUIREMENTS (PER SECTION 116-184):

DESCRIPTION	UNIT	REQUIRED
RETAIL (11,370 SF SHOWROOM + 6,900 SF SERVICE RECEPTION)	1 SPACE/200 SF	92
OFFICE (5,915 SF - EXIST. BLDG 2ND FLR)	1 SPACE/200 SF	30
SERVICE BAYS (39)	1 SPACE PER BAY	39
OTHER COMMERCIAL (50,900 SF SRVC/PARTS/TECH)	1 SPACE/1000 SF	51
TOTAL SPACE REQUIRED:		212
TOTAL OFF-STREET PARKING SPACES PROPOSED (607 GARAGE + 171 OUTSIDE):		222
EV PARKING SPACES PROPOSED (8 REQUIRED PER §116-188.3):		10
TOTAL INVENTORY SPACES PROPOSED:		546
TOTAL SPACES PROPOSED:		778

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 SHEET C-601 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

LEGEND

EASEMENT

- PROPERTY BOUNDARY
- PREMISES LINE
- BUILDING SETBACK LINE
- EXISTING EASEMENT
- PROP. UTILITY EASEMENT
- PROP. BUILDING SETBACK
- PROP. PARKING SETBACK
- PROP. CONCRETE MONUMENT
- ROW EASEMENT
- SANITARY EASEMENT
- ACCESS EASEMENT
- TRAFFIC SIGNAL EASEMENT
- EXISTING PECO EASEMENT
- PROPOSED PECO EASEMENT

RECORD PLAN 4 OF 10

BOHLER
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
LIGHTING AND DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

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PROJECT No.:	PAB220113.01
DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-LDVP-0A

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 — PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE082008
NEW JERSEY LICENSE No. GE49036266600

SHEET TITLE:

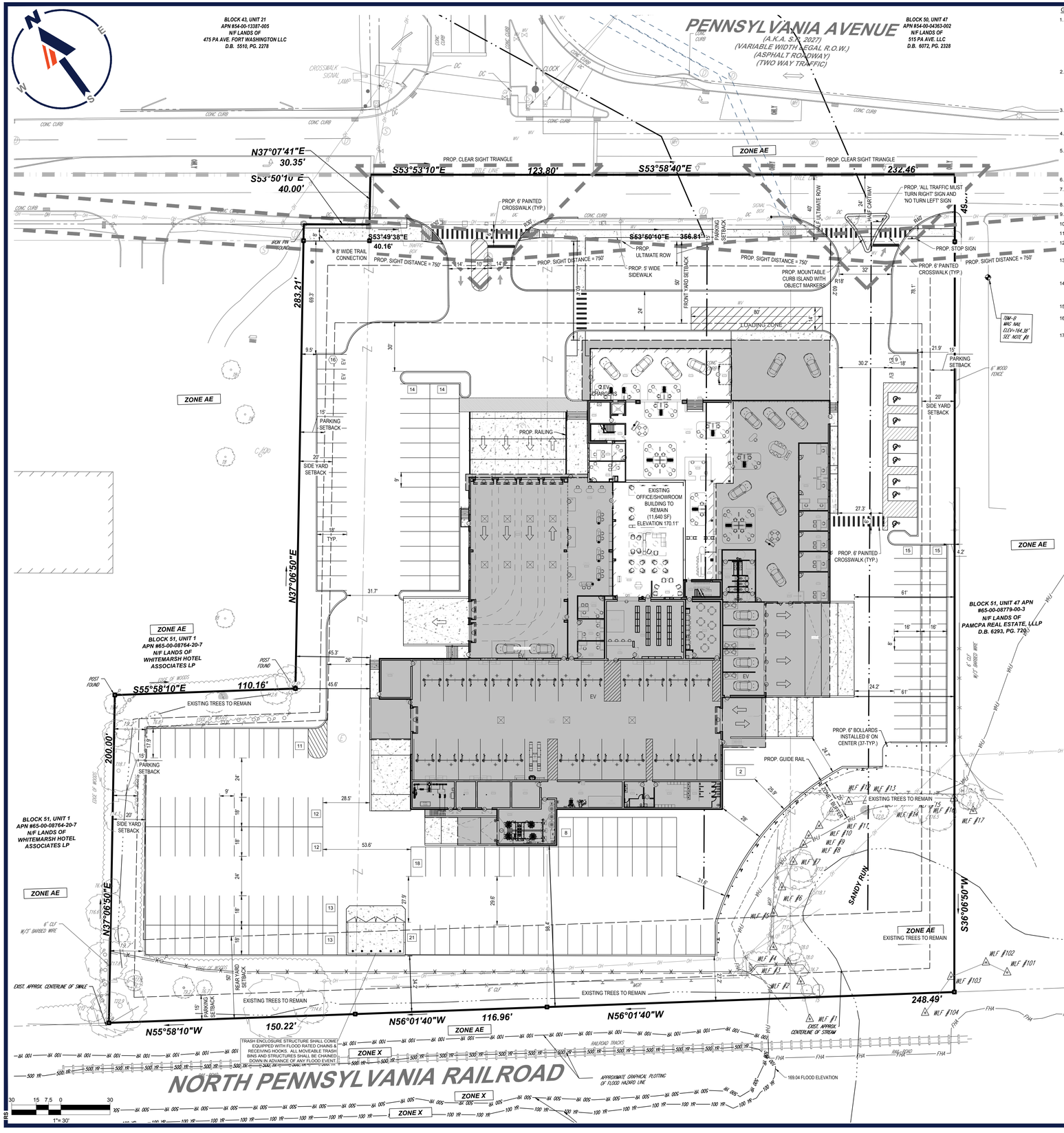
DEDICATION & EASEMENT PLAN

SHEET NUMBER:

C-302

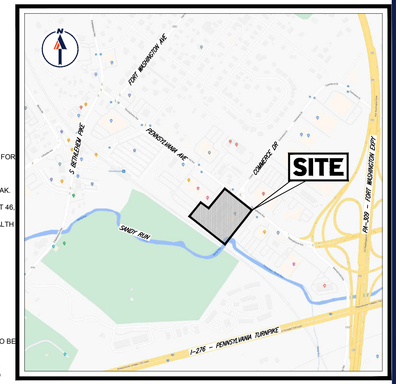
ORG. DATE - 10/24/2024

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-LDVP-0A——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



LOCATION MAP

SCALE: 1" = 800'

800 400 200 0 800

1"=800'

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)**
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)	72.9% (152,069 SF.)**(V)**
MAXIMUM BUILDING HEIGHT: [3]	35 FT., 65 FT. MAX.	31 FT	35.0 FT
MINIMUM GREEN SPACE AREA:	35%		(27.1%) 56,579 SF. **(V)**
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 + 12,201 SF SERVICE RECEPTION)	1 SPACE/200 SF	118
OFFICE (5,915 SF - EXIST. BLDG 2ND FLR)	1 SPACE/250 SF	24
SERVICE BAYS (24)	1 SPACE PER BAY	24
OTHER COMMERCIAL (14,800 SF SRV/CPARTS/TECH)	1 SPACE/1000 SF	15
TOTAL SPACES REQUIRED:		181
TOTAL ADA SPACES REQUIRED		7 CAR AND VAN (2 VAN)
TOTAL OFF-STREET PARKING SPACES PROPOSED:		179
EV PARKING SPACES PROPOSED (8 REQUIRED PER §116-188.3):		8
TOTAL ADA SPACES PROPOSED		7 CAR AND VAN (2 VAN)
TOTAL SPACES PROPOSED:		**193**

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 SHEET C-601 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.

LEGEND

PROPOSED	
PROPERTY LINE	
EASEMENT LINE	
SETBACK LINE	
BUILDING	
RETAINING WALL	
CONCRETE CURB	
FLUSH CURB	
FENCE	
GUIDE RAIL	
TREELINE	
SIDEWALK	
RAMP	
SIGN	
BOLLARD	
INVENTORY PARKING COUNT	10
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	100 YR
500 YEAR FLOOD PLAIN	500 YR
FLOOD WAY	FDWY
ASSUMED FLOOD WAY	
ASSUMED STREAM CROSSING FLOOD WAY	
TOP OF BANK / OHWM	

RECORD PLAN 5 OF 10

BOHLER
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PROGRAM MANAGEMENT
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PROJECT No.:	PAB220113.01
DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-LDVP-0A

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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J.A. BEAVAN — COMMONWEALTH OF PENNSYLVANIA — PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE082005
NEW YORK LICENSE No. 095904
NEW JERSEY LICENSE No. 24GE05339500

SHEET TITLE:

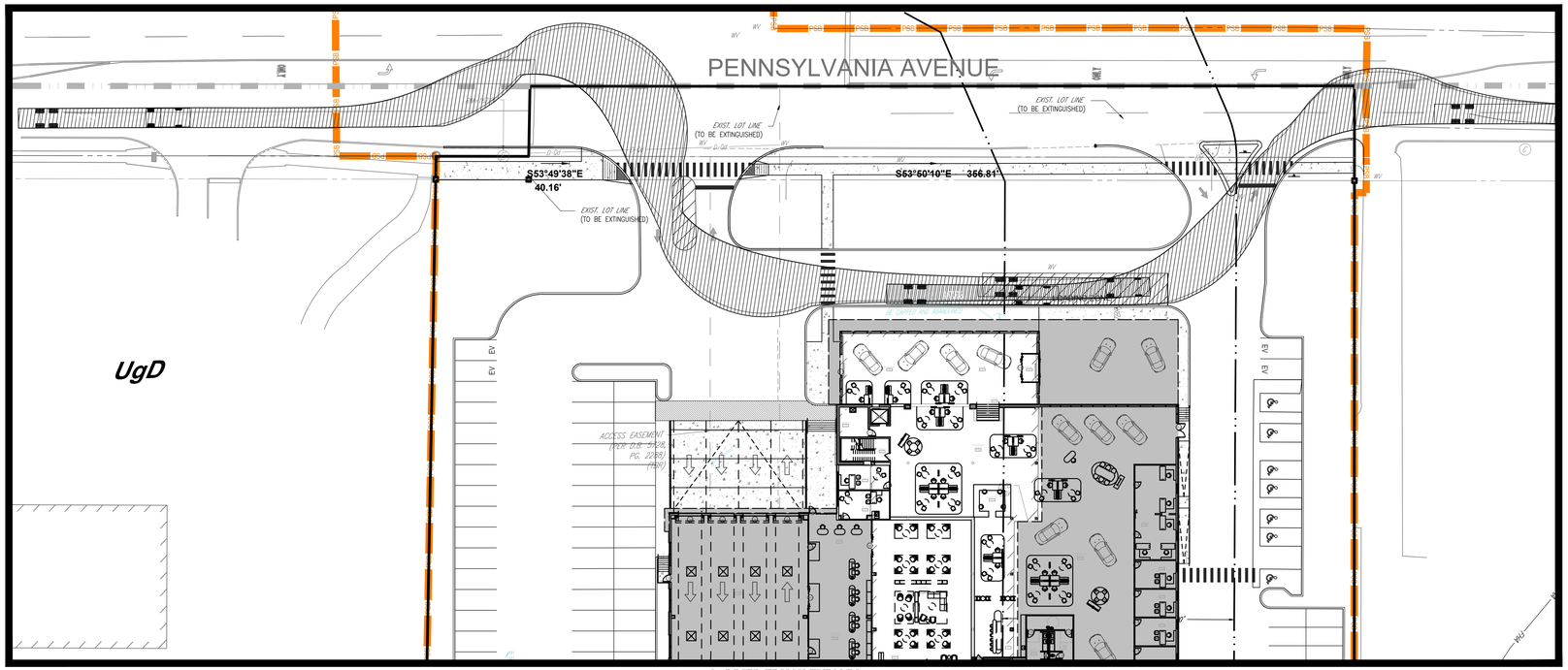
SITE PLAN

SHEET NUMBER:

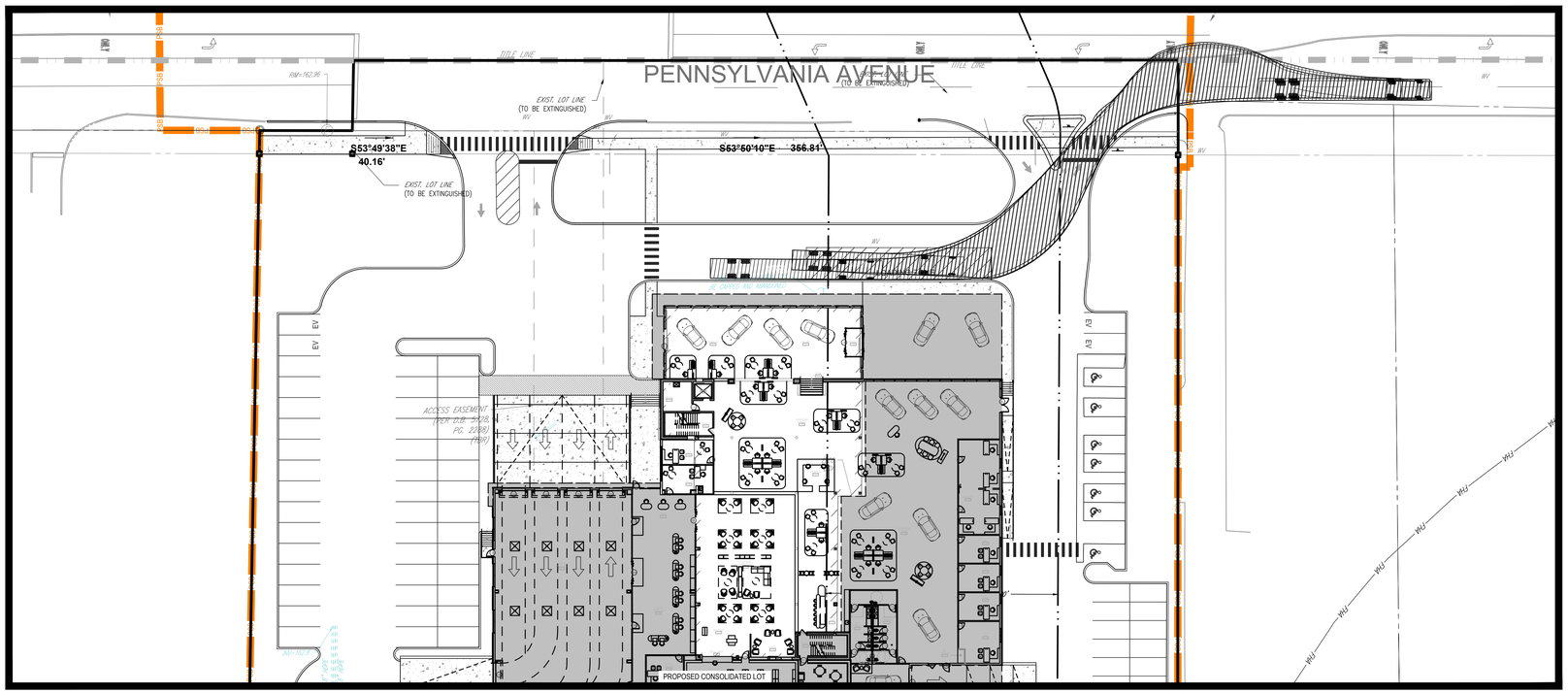
C-303

ORG. DATE - 10/24/2024

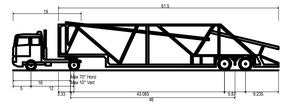
R:\2022\PAB220113.01\CAD\DWG\WINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-LDVP-0A-----LAYOUT: C-303 SITE



CARRIER TRUCK TURN IN



CARRIER TRUCK TURN OUT



AUTO CARRIER

Overall Length	74.170ft
Overall Width	8.500ft
Overall Body Height	13.904ft
Min Body Ground Clearance	1.021ft
Max Track Width	8.330ft
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	16.50°

30 15 7.5 0 30

1"= 30'

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-TRCK-0A---LAYOUT: C-304 TRUCK TURNING

BOHLER

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
HOSPITALITY ARCHITECTURE
LANDSCAPE ARCHITECTURE
SUSTAINABILITY DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

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PROJECT No.:	PAB220113.01
DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-TRCK-0A

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
COMMONWEALTH OF PENNSYLVANIA
PROFESSIONAL
ENGINEER
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE082005
NEVADA LICENSE No. 24026
NEW JERSEY LICENSE No. 24GE05339500

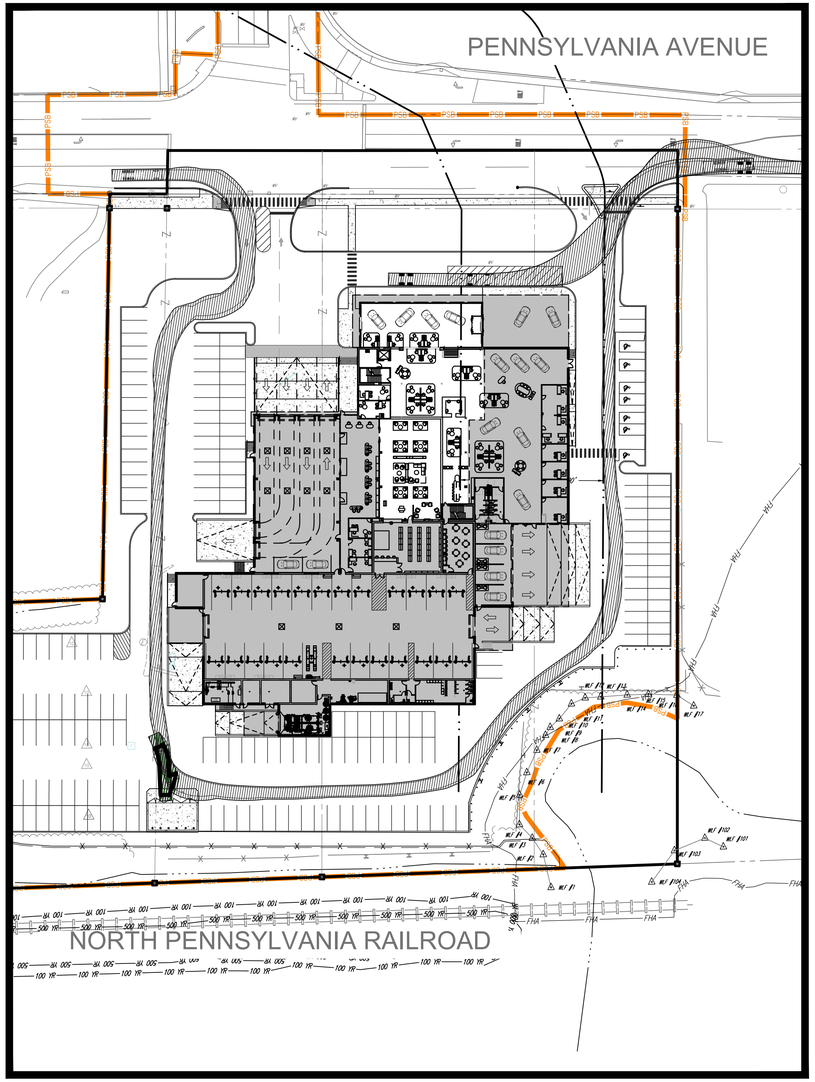
SHEET TITLE:

TRUCK TURNING PLAN - AUTO CARRIER

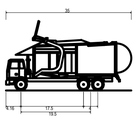
SHEET NUMBER:

C-304

ORG. DATE - 10/24/2024

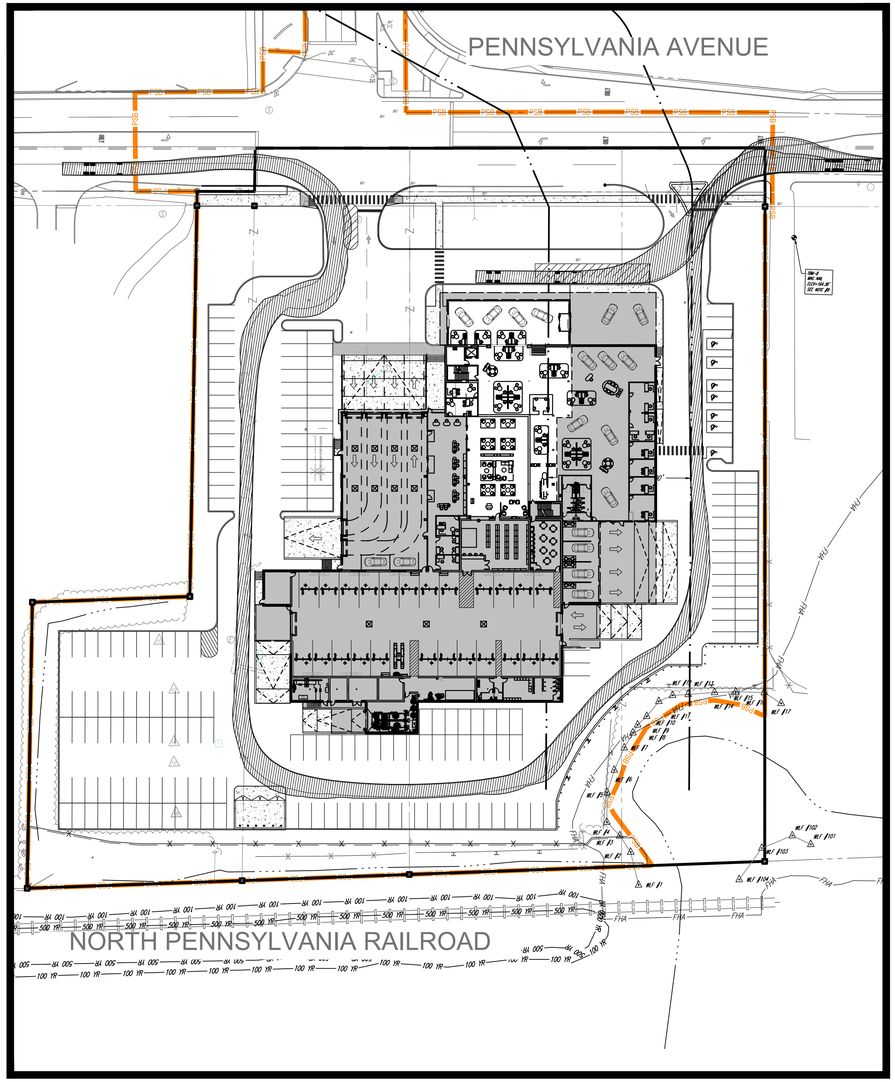


REFUSE TRUCK TURN

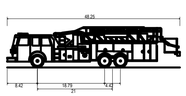


35' FRONT LOAD GARBAGE TRUCK

Overall Length	35.000ft
Overall Width	8.080ft
Overall Body Height	10.388ft
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



WHITEMARSH TOWNSHIP FIRE TRUCK

Overall Length	48.250ft
Overall Width	8.930ft
Overall Body Height	11.246ft
Min Body Ground Clearance	1.646ft
Track Width	8.000ft
Lock-to-lock time	5.00s
Max Wheel Angle	48.00°

50 25 12.5 0 50

1"= 50'

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PERMITTING SERVICES
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PROJECT No.:	PAB220113.01
DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-TRCK-0A

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. PE083005
NEW YORK LICENSE No. 095453/96500
NEW JERSEY LICENSE No. 24GE05453600

SHEET TITLE:

TRUCK TURNING PLAN - FIRE & REFUSE

SHEET NUMBER:

C-305

ORG. DATE - 10/24/2024

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-TRCK-0A.----LAYOUT: C-305 FIRE - REFUSE

RS

PROJECT SITE BOUNDARY
237,428 SF. (5.45 AC)

LIMIT OF DISTURBANCE
214,777 SF. (4.93 AC)

PENNSYLVANIA AVENUE
(A.K.A. S.R. 2027)
(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

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'

S53°49'38"E 40.16'

S53°50'10"E 366.81'

PROP. ULTIMATE ROW

83.21'

ZONE AE

ZONE X

TRAFFIC SIGNAL EASEMENT (PER D.B. 2935, PG. 264)

30' WIDE PECO EASEMENT (PER D.B. 5116, PG. 708)

N37°06'50"E

S55°58'10"E 110.16'

200.00'

S37°06'50"W

N55°58'10"W 150.22'

N56°01'40"W 116.96'

N56°01'40"W

248.49'

S36°06'50"W

EXISTING BUILDING TO REMAIN (11,370 SF)
FFE = 170.11'

SERVICE DRIVE LANES
FFE = 170.11'

SERVICE DEPT.
FFE = 170.11'

PROP. UNDERGROUND BASIN (UG2)

PROP. UNDERGROUND BASIN (UG1)

PROP. AERIAL RAMP STRUCTURE

PROP. RAILING

PROP. GUIDE RAIL

PROP. 6" DUCTILE IRON WATER LINE INSTALLED BY AQUA PA

BLOCK 51, UNIT 1
APN #65-00-08764-20-7
N/F LANDS OF
WHITEMARSH HOTEL ASSOCIATES LP

BLOCK 51, UNIT 47 APN #65-00-08779-00-3
N/F LANDS OF
PAMCPA REAL ESTATE, LLLP
D.B. 6293, PG. 729

SANDY RUN

NORTH PENNSYLVANIA RAILROAD

APPROXIMATE GRAPHICAL PLOTTING OF FLOOD HAZARD LINE

169.04 FLOOD ELEVATION

EXIST. APPROX. CENTERLINE OF STREAM

TRASH ENCLOSURE STRUCTURE SHALL COME EQUIPPED WITH FLOOD RATED CHAINS & RECEIVING HOOKS. ALL MOVEABLE TRASH BINS AND STRUCTURES SHALL BE CHAINED DOWN IN ADVANCE OF ANY FLOOD EVENT

30 15 7.5 0 30
1"= 30'

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	
GAS LINE	
WATER LINE	
STORM PIPE	
CONTOUR ELEVATION	
CENTERLINE OF WATER FEATURE	
100 YEAR FLOOD PLAIN	100 YR 100 YR
500 YEAR FLOOD PLAIN	500 YR 500 YR
FLOOD WAY	FEMA FEMA
EDGE OF STREAM DELINEATION FLAGS	WLF #1 WLF #1

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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FOR

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BMW AUTOMOTIVE DEALERSHIP EXPANSION

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PROFESSIONAL
JEFFREY A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE084005
NEW JERSEY LICENSE No. GE49503/36600

SHEET TITLE:

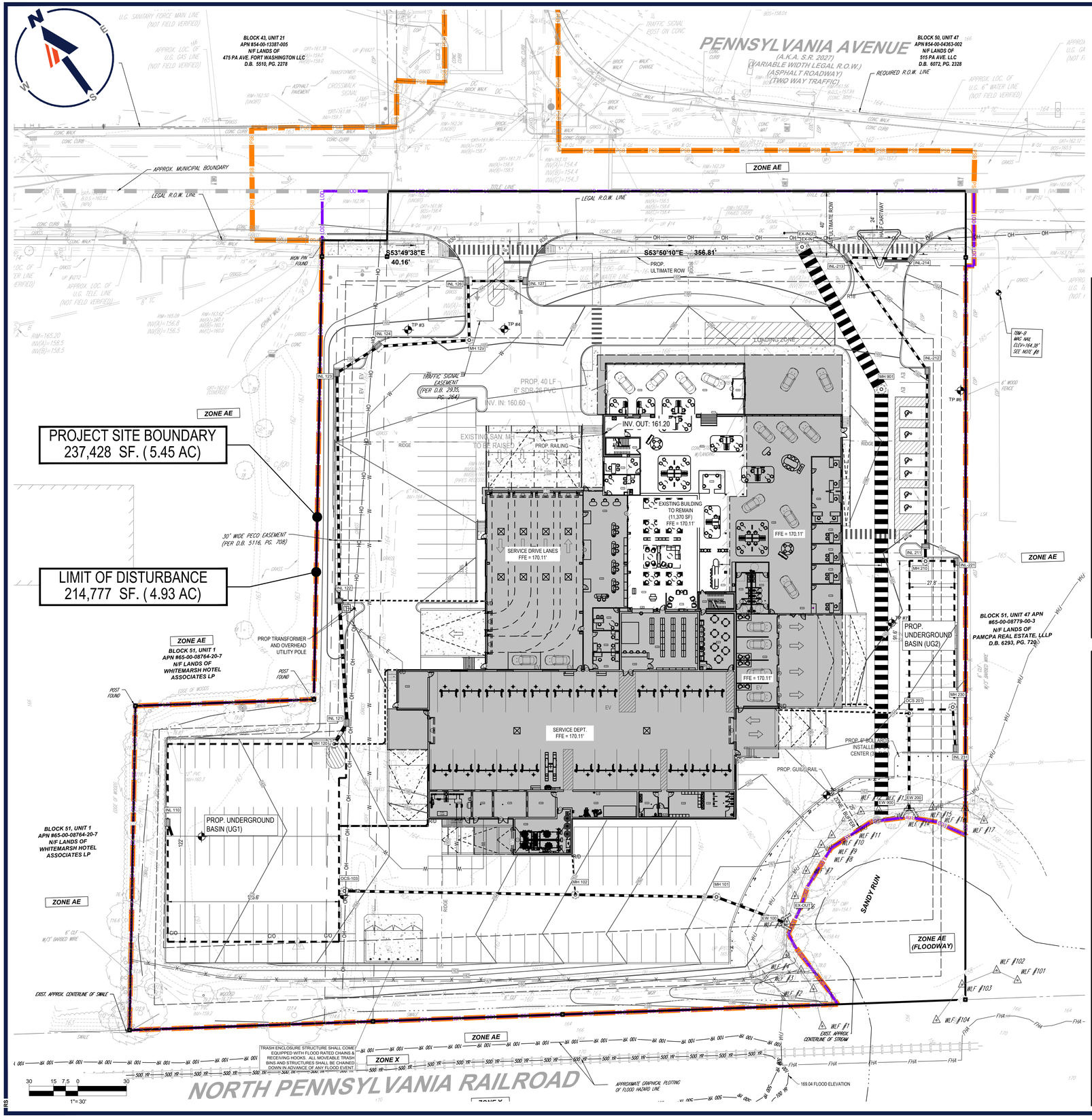
GRADING PLAN

SHEET NUMBER:

C-401

ORG. DATE - 10/24/2024

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-GDUL-0A—LAYOUT C-401 GRADING



USGS MAP

AMBLER QUAD

SCALE: 1"=2,000'

1000' 0 2000'

STORM SEWER PIPE SCHEDULE

FROM	TO	SIZE (IN.)	TYPE	LENGTH (FT.)	SLOPE(%)
EW 100	MH 101	18"	HDPE	44	0.52%
EW 200	OCS 201	18"	HDPE	60	0.50%
EW 900	MH 901	98"	RCP	263	0.14%
EX-IN	EX-OUT	98"	RCP	411	0.31%
INL-212	INL-213	15"	HDPE	85	0.50%
INL-213	INL-214	15"	HDPE	39	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	INL 124	18"	HDPE	30	0.50%
INL 124	MH 125	18"	HDPE	56	0.50%
INL 126	INL 127	15"	HDPE	35	0.50%
INL 211	INL-212	15"	HDPE	108	0.50%
MH 101	MH 102	18"	HDPE	87	0.51%
MH 102	RD4	12"	HDPE	25	0.52%
MH 102	OCS-103	18"	HDPE	142	0.50%
MH 120	UG1_	24"	HDPE	4	0.50%
MH 120	RD2(2)	12"	HDPE	31	0.54%
MH 120	INL 121	24"	HDPE	15	1.64%
MH 125	INL 126	18"	HDPE	36	0.50%
MH 210	INL 211	18"	HDPE	9	0.53%
MH 230	INL 231	15"	HDPE	26	2.82%
MH 901	EX-IN(2)	98"	RCP	100	0.15%
OCS 201	RD5	12"	HDPE	80	0.51%
RD2(1)	RD2	12"	HDPE	7	0.55%
RD2(2)	RD2(1)	12"	HDPE	46	0.53%
RD3(1)	RD3	12"	HDPE	4	0.68%
UG1	INL 110	18"	HDPE	9	13.27%
UG1.	RD3(1)	12"	HDPE	54	0.50%
UG2	INL-221	15"	HDPE	4	0.55%

STORM STRUCTURE SCHEDULE

NAME	TYPE	GRT/RIM ELEV. (FT.)	INVERTS
EW 100	ENDWALL	158.32'	INV IN = 156.15' (18" HDPE)
EW 200	ENDWALL	160.07'	INV IN = 157.83' (18" HDPE)
EW 900	ENDWALL	160.91'	INV IN = 154.85' (98" RCP)
EX-IN	MANHOLE	163.46'	INV OUT = 155.38' (98" RCP)
EX-IN(2)	TYPE 12 MANHOLE	163.43'	INV OUT = 155.38' (98" RCP)
EX-OUT	ENDWALL	154.82'	INV IN = 154.10' (98" RCP)
INL-212	TYPE C INLET	164.93'	INV IN = 159.47' (15" HDPE) INV OUT = 159.47' (15" HDPE)
INL-213	TYPE C INLET	163.42'	INV IN = 159.90' (15" HDPE) INV OUT = 159.90' (15" HDPE)
INL-214	TYPE C INLET	163.46'	INV OUT = 160.09' (15" HDPE)
INL-221	TYPE C INLET	164.29'	INV OUT = 160.15' (15" HDPE)
INL 110	TYPE C INLET	162.50'	INV OUT = 159.25' (18" HDPE)
INL 121	TYPE C INLET	164.19'	INV IN = 158.28' (24" HDPE) INV OUT = 158.28' (24" HDPE)
INL 122	TYPE C INLET	164.99'	INV IN = 158.66' (18" HDPE) INV IN = 158.66' (12" HDPE) INV OUT = 158.66' (24" HDPE)
INL 123	TYPE C INLET	165.11'	INV IN = 159.37' (18" HDPE) INV OUT = 159.37' (18" HDPE)
INL 124	TYPE C INLET	165.05'	INV IN = 159.52' (18" HDPE) INV OUT = 159.52' (18" HDPE)
INL 126	TYPE C INLET	163.79'	INV IN = 160.08' (15" HDPE) INV OUT = 160.08' (18" HDPE)
INL 127	TYPE C INLET	163.64'	INV OUT = 160.26' (15" HDPE)
INL 211	TYPE C INLET	164.75'	INV IN = 158.93' (15" HDPE) INV OUT = 158.68' (18" HDPE)
INL 231	TYPE C INLET	163.15'	INV OUT = 159.85' (15" HDPE)
MH 101	MANHOLE	160.87'	INV IN = 156.38' (18" HDPE) INV OUT = 156.36' (18" HDPE)
MH 102	MANHOLE	162.83'	INV IN = 156.82' (18" HDPE) INV IN = 156.82' (12" HDPE) INV OUT = 156.82' (18" HDPE)
MH 120	MANHOLE	163.93'	INV IN = 158.03' (24" HDPE) INV IN = 158.03' (12" HDPE) INV OUT = 158.03' (24" HDPE)
MH 125	MANHOLE	164.85'	INV IN = 159.90' (18" HDPE) INV OUT = 159.80' (18" HDPE)
MH 210	MANHOLE	164.62'	INV IN = 158.63' (18" HDPE)
MH 230	MANHOLE	163.52'	INV IN = 159.13' (15" HDPE)
MH 901	MANHOLE	165.57'	INV IN = 155.23' (98" RCP) INV OUT = 155.23' (98" RCP)
OCS-103	MANHOLE	163.82'	INV OUT = 157.53' (18" HDPE)
OCS 201	MANHOLE	163.96'	INV IN = 161.11' (12" HDPE) INV OUT = 158.13' (18" HDPE)

SANITARY PIPE SCHEDULE

FROM	TO	SIZE IN.	TYPE	n MANNING'S COEF.	So SLOPE %	L LENGTH FT.
Exist. Building	Exist. San. Manhole	6	PVC	0.000	1.48%	40.53

LEGEND

PROPOSED	
RIDGE	
STORM PIPE	
ELECTRIC	UGE T&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	
WATER LINE	
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	WLF #A WLF #A
FLOOD WAY	FDWY

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.	215-918-3137
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

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DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-GDUL-0A

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
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE036008
NEW YORK LICENSE No. 090104
NEW JERSEY LICENSE No. 24GE05039500

SHEET TITLE:

UTILITY PLAN

SHEET NUMBER:

C-501

ORG. DATE - 10/24/2024

P:\2022\PAB220113.01\CAD\DRAWING\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-GDUL-0A-----LAYOUT C-501 UTILITY
RS

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

UgD
ZONE AE
PROJECT SITE BOUNDARY
237,428 SF. (5.45 AC)

LIMIT OF DISTURBANCE
214,777 SF. (4.93 AC)

BLOCK 51, UNIT 1
APN #65-00-08764-20-7
N/F LANDS OF
WHITEMARSH HOTEL
ASSOCIATES LP

UusB
ZONE AE
ZONE X
ZONE AE (FLOODWAY)

CFS#9
CFS#10
CFS#11
CFS#12
CFS#13
CFS#14
CFS#15
CFS#17
CFS#18
CFS#19
CFS#20
CFS#21
CFS#22
CFS#23
CFS#24
CFS#25

PROP. RCE #2-0
PROP. STOCKPILE #2-0
PROP. CONCRETE WASHOUT
PROP. RCE #1-0
PROP. STOCKPILE #1-0
PROP. BARRICADE (TYP.)
FILTER SOCK SEDIMENT TRAP #2
FILTER SOCK SEDIMENT TRAP #1
TEM-B MAG NAIL ELEV= 164.38' SEE NOTE #8

DP003
DP002
P.O.I.#1

BLOCK 51, UNIT 47 APN
#65-00-08779-00-3
N/F LANDS OF
PAMCPA REAL ESTATE, LLLP
D.B. 6293, PG. 720

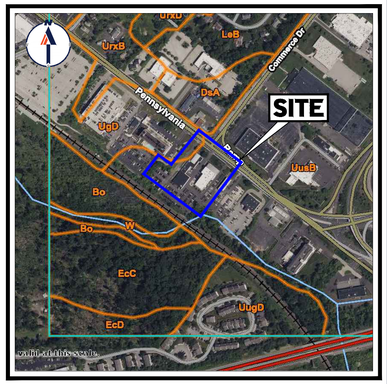
SANDY RUN
EXIST. APPROX. CENTERLINE OF STREAM
APPROXIMATE GRAPHICAL PLOTTING OF FLOOD HAZARD LINE
169.04 FLOOD ELEVATION

NORTH PENNSYLVANIA RAILROAD

30 15 7.5 0 30
1"= 30'

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-SESC-0A-----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	
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
SANITARY SEWER	S 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 #5 WLF #8

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	CWO
TEMPORARY STOCKPILE	SP
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.

THIS PLAN IS FOR SOIL EROSION & SEDIMENT POLLUTION CONTROL PURPOSES ONLY

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CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-SESC-0A

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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ENGINEER
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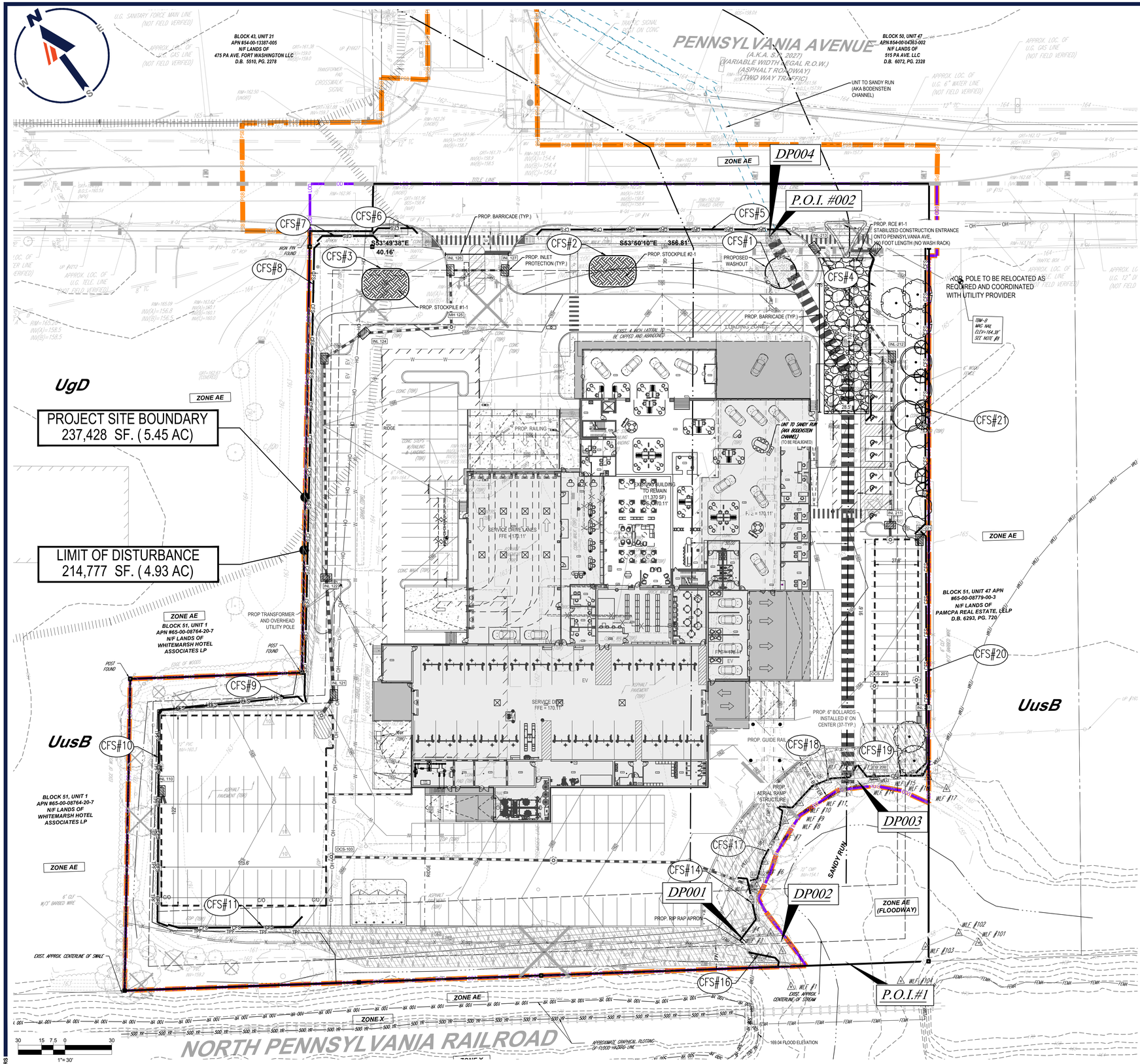
PENNSYLVANIA LICENSE No. PE082005
NEW JERSEY LICENSE No. GE49503436500

SHEET TITLE:
SOIL EROSION & SEDIMENT POLLUTION CONTROL PLAN STAGE - 0

SHEET NUMBER:
C-601

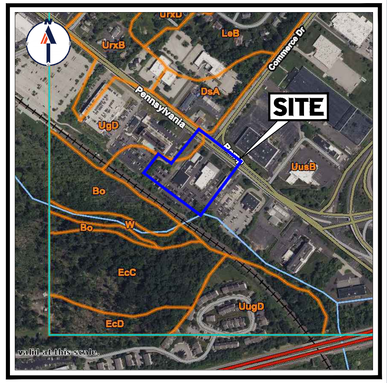
ORG. DATE - 10/24/2024



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 #5

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	
CONCRETE WASHOUT	CWO
TEMPORARY STOCKPILE	SS
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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NEW JERSEY LICENSE No. GE45535600

SHEET TITLE:

SOIL EROSION & SEDIMENT POLLUTION CONTROL PLAN STAGE - 1

SHEET NUMBER:

C-602

ORG. DATE - 10/24/2024

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-SESC-0A---LAYOUT C-602 ESS STAGE 1
RS

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 SHALL RECEIVE APPROVAL OF THE REVISIONS FROM THE 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 OR LEAVING THE SITE. IF NECESSARY, THE MAINTENANCE PROCEDURES AND THE 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, AS SPECIFIED IN THE GENERAL CONSERVATION NOTES AND SPECIFICATIONS. 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 MUST 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 IN A FORMAT PROVIDED BY THE DEPARTMENT, AND CONDUCTED BY QUALIFIED PERSONNEL TRAINED AND EXPERIENCED IN EROSION AND SEDIMENT CONTROL, TO 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 REPORTING 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 AND/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 FACILITY BED. SUCH FACILITY, STORMWATER BMPs INCLUDED BELOW, WERE DESIGNED TO REDUCE POST-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 BMPs 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 BMPS 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 DESIGNATED 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 RISER
- 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 #2-0, 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 PRIVATE WELL 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 BMPS 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, THE E&S PLAN PREPARER, THE PCSM PLAN PREPARER, THE OWNER AND/OR OPERATOR'S PRIMARY 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 CONSERVATION DISTRICT TO AN ON-SITE PRECONSTRUCTION MEETING.

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 AND MAINTAINED. 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 THESE BMPS SHALL BE 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. BUILDING CONSTRUCTION OF THE PARKING STRUCTURE (PART-A) 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. AREAS UNDER THE INITIAL PARKING GARAGE AREA SHALL BE STABILIZED IMMEDIATELY WITH R-3 RIPRAP UPON ACHIEVING FINAL GRADE, WITH COMPOST FILTER SOCK SEDIMENT TRAP #1 REMOVED AFTER STABILIZATION WITH ROCK AND PRIOR TO THE INSTALLATION OF THE SOUTHERN FOUNDATION WALL.
7. UPON COMPLETION OF PARKING STRUCTURE PART-A AND COORDINATION WITH SITE OWNER, 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.
11. **CRITICAL STAGE** - UNDERGROUND DETENTION BASIN 2 - UPON REMOVAL OF EXISTING BUILDING 2 COMMENCE INSTALLATION OF UNDERGROUND DETENTION BASIN UG2. INITIATE STORM SEWER AND SUBSURFACE BASIN INSTALLATION FOR THE FEATURES SHOWN ON THE PLANS STARTING AT THE FURTHEST DOWNSTREAM STRUCTURE. **THE PERMITTEE SHALL PROVIDE ENGINEERING OVERSIGHT FOR THE CONSTRUCTION OF SUBSURFACE DETENTION BASIN, INCLUDING PREPARATION OF THE SUBGRADE AND INSTALLATION OF THE OUTLET CONTROL STRUCTURE (OCS-201). A LICENSED PROFESSIONAL OR DESIGNEE KNOWLEDGEABLE IN THE DESIGN AND CONSTRUCTION OF SUBSURFACE DETENTION BASINS, PREFERABLY THE DESIGN ENGINEER, SHALL CONDUCT THE OVERSIGHT.** GC TO INSTALL E&S BMPS (INLET PROTECTION) AS NECESSARY TO INLETS DISCHARGING TO SUBSURFACE DETENTION BASINS IMMEDIATELY AFTER INSTALLATION. 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.]
12. UPON COMPLETION OF SUBSURFACE DETENTION BASIN UG2, 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.
13. UPON COMPLETION OF PARKING STRUCTURE (PART-A) AND SITE STABILIZATION FOR TRIBUTARY AREA OF FILTER SOCK SEDIMENT TRAP 1 (UNIFORM COVERAGE OR DENSITY OF 70% ACROSS ALL DISTURBED AREAS AND RIPRAP (R-3) STABILIZATION WITHIN FLOOD STORAGE ENVELOPE BENEATH FIRST FLOOR PARKING LEVEL) AND NOTIFICATION OF THE MONTGOMERY COUNTY CONSERVATION DISTRICT, REMOVE EROSION AND SEDIMENT CONTROL FACILITY (COMPOST FILTER SOCK TRAP #1). ANY AREA DISTRIBUTED DURING THE REMOVAL OF EROSION AND SEDIMENT CONTROL FACILITIES SHALL BE STABILIZED IMMEDIATELY.
14. 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 CONVERSION 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

15. INSTALL 100 FOOT ROCK CONSTRUCTION ENTRANCE AND STAGING AREAS AS DESIGNATED ON THE PLANS.
16. 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 THESE BMPS SHALL BE PERMITTED.
17. 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.
18. **CRITICAL STAGE** - FINTATE 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 BASINS, INCLUDING PREPARATION OF THE SUBGRADE AND OUTLET CONTROL STRUCTURE (OCS-101). A LICENSED PROFESSIONAL OR DESIGNEE KNOWLEDGEABLE IN THE DESIGN AND CONSTRUCTION OF SUBSURFACE MANAGED RELEASE CONCEPT BASINS, PREFERABLY THE DESIGN ENGINEER, SHALL CONDUCT THE OVERSIGHT.** GC TO INSTALL E&S BMPS (INLET PROTECTION) AS NECESSARY TO INLETS DISCHARGING TO SUBSURFACE DETENTION BASINS IMMEDIATELY AFTER INSTALLATION. 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.] **INSTALL CULVERT REALIGNMENT FROM DOWNSTREAM TO UPSTREAM. PROVIDE BYPASS PUMPING DURING FINAL CONNECTION IF NECESSARY**
19. CONTINUE WITH THE BALANCE

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 GEOTETILE 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 OR WALKED 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".

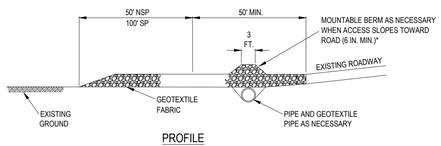
3.) ANY PERSON PLACING CLEAN FILL THAT HAS BEEN AFFECTED BY A SPILL OR RELEASE OF A REGULATED SUBSTANCE MUST USE FORM FP-001 TO CERTIFY THE ORIGIN OF THE FILL MATERIAL AND THE RESULTS OF THE ANALYTICAL TESTING TO QUALIFY THE MATERIAL AS CLEAN FILL. FORM FP-001 MUST BE RETAINED BY THE OWNER OF THE PROPERTY 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".

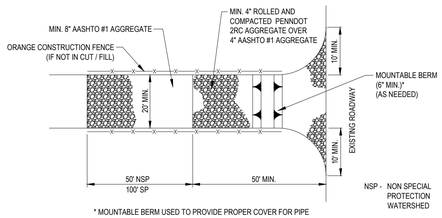
FILL MATERIAL THAT DOES NOT QUALIFY AS CLEAN FILL IS REGULATED FILL. REGULATED FILL IS WASTE AND MUST BE MANAGED IN ACCORDANCE WITH THE DEPARTMENT'S MUNICIPAL OR RESIDUAL WASTE REGULATIONS BASED ON 25 PA. CODE CHAPTERS 287 RESIDUAL WASTE MANAGEMENT OR 271 MUNICIPAL WASTE MANAGEMENT, WHICHEVER IS APPLICABLE. 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 OWNER 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 CONTACT THE L



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.

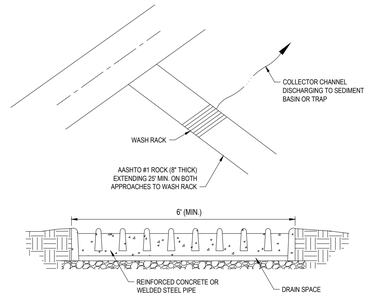
RUNOFF SHALL BE DIVERTED FROM ROADWAY TO A SUITABLE SEDIMENT REMOVAL BMP PRIOR TO ENTERING ROCK CONSTRUCTION ENTRANCE.

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.

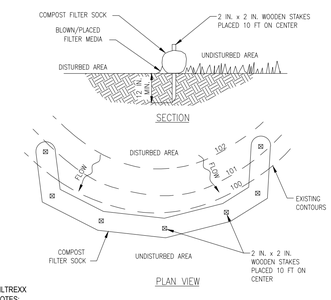
WASH RACK SHALL BE DESIGNED AND CONSTRUCTED TO ACCOMMODATE ANTICIPATED CONSTRUCTION VEHICULAR TRAFFIC.

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



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.

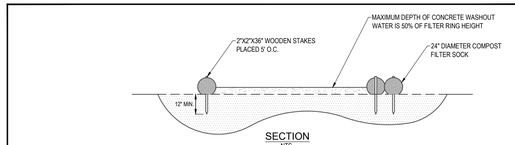
#4-1 ***STANDARD CONSTRUCTION DETAIL #4-1 COMPOST FILTER SOCK***

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
16	Swale Disturbance	24	2.1	400
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

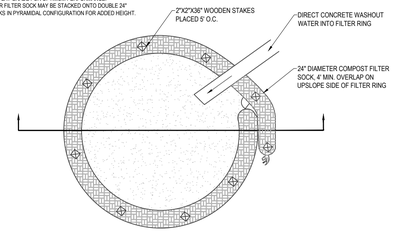
NOTE: WHERE COMPOST FILTER SOCKS ARE PLACED ON PAVED SURFACES, CONCRETE BLOCKS SHOULD BE USED IMMEDIATELY DOWNSLOPE OF THE SOCKS (AT THE SAME INTERVALS RECOMMENDED FOR THE STAKES) TO HELP HOLD THE SOCK IN PLACE.

** 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.



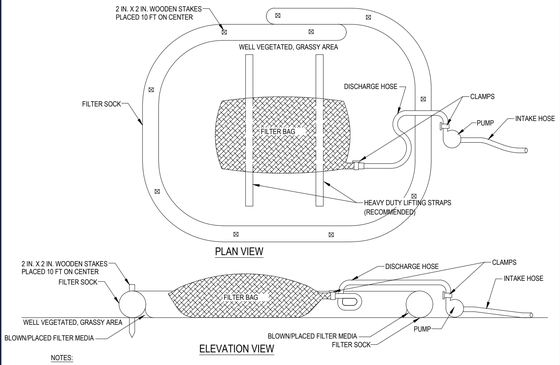
A SUITABLE IMPERVIOUS GEOMEMBRANE SHALL BE PLACED AT THE LOCATION OF THE WASHOUT PRIOR TO INSTALLING THE SOCKS.

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



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.

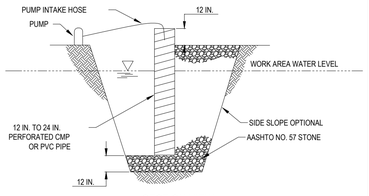
THE PUMP DISCHARGE HOSE SHALL BE INSERTED INTO THE BAGS IN THE MANNER SPECIFIED BY THE MANUFACTURER AND SECURELY CLAMPED. A PIECE OF PVC PIPE IS RECOMMENDED FOR THIS PURPOSE.

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



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.

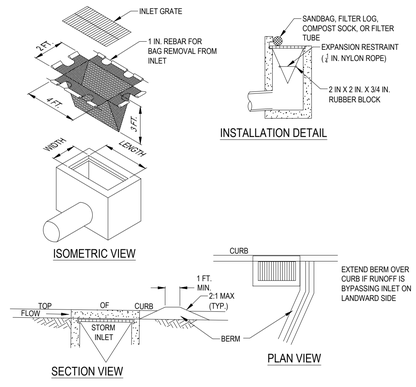
SET PUMP INTAKE INSIDE STANDPIPE.

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-110	0.37 AC.
INL-120	0.10 AC.
INL-211	0.09 AC.
INL-221	0.18 AC.
INL-223	0.09 AC.
INL-224	0.34 AC.
INL-230	0.08 AC.
INL-310.1	0.10 AC.
INL-311	0.11 AC.
INL-312	0.07 AC.
INL-321	0.14 AC.
INL-330	0.10 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	5.5-8.5
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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CAD I.D.:	PAB220113.01-SESC-0A

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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74 W BROAD STREET, SUITE 500
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PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE082008
NEW YORK LICENSE No. 095104
NEW JERSEY LICENSE No. 24GE05039500

SHEET TITLE:

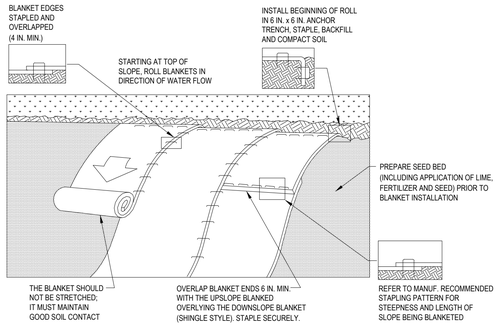
SOIL EROSION & SEDIMENT POLLUTION CONTROL DETAILS

SHEET NUMBER:

C-605

ORG. DATE - 10/24/2024

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-SESC-0A-----3A-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.

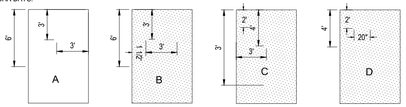
PROVIDE ANCHOR TRENCH AT TOE OF SLOPE IN SIMILAR FASHION AS AT TOP OF SLOPE.

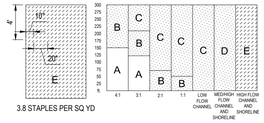
SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS, AND GRASS.

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.



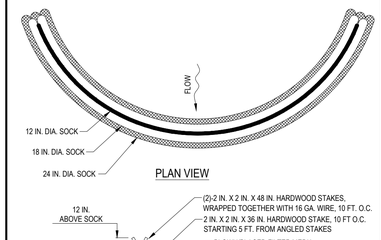


NOTE:
STAPLE PATTERNS APPLY TO ALL NORTH AMERICAN GREEN EROSION CONTROL BLANKETS. STAPLE PATTERNS WILL VARY DEPENDING UPON APPLICATION TYPE, SLOPE LENGTH, SLOPE GRADE, SOIL TYPE AND ANNUAL RAINFALL. THE FOLLOWING ARE GENERAL STAPLE RECOMMENDATIONS BASED ON SLOPE LENGTH, SLOPE GRADE, AND ESTIMATED RUNOFF. 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.

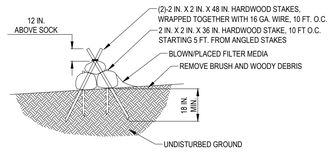
EROSION CONTROL BLANKET STAPLE PATTERN GUIDE

#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.

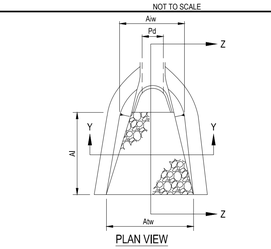
COMPOST SOCK SEDIMENT TRAPS SHALL BE INSPECTED WEEKLY AND AFTER EACH RUNOFF EVENT. SEDIMENT SHALL BE REMOVED WHEN IT REACHES 1/3 THE HEIGHT OF THE SOCKS.

PHOTODEGRADABLE AND BIODEGRADABLE SOCKS SHALL NOT BE USED FOR MORE THAN 1 YEAR.

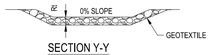
NOTE: WHERE COMPOST FILTER SOCKS ARE PLACED ON PAVED SURFACES, CONCRETE BLOCKS SHOULD BE USED IMMEDIATELY DOWNSLOPE OF THE SOCKS (AT THE SAME INTERVALS RECOMMENDED FOR THE STAKES) TO HELP HOLD THE SOCK IN PLACE.

#3-11 ***STANDARD CONSTRUCTION DETAIL #3-11 COMPOST SOCK SEDIMENT TRAP***

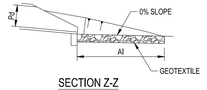
NOT TO SCALE



PLAN VIEW



SECTION Y-Y



SECTION Z-Z

OUTLET NO.	PIPE DIA Pd (IN)	RIPRAP SIZE R-_	RIPRAP THICK. Rt (IN)	APRON LENGTH Al (FT)	APRON INITIAL WIDTH A/w (FT)	APRON TERMINAL WIDTH Atw (FT)
EW-100	18	R-3	9.0	9.0	4.5	13.5

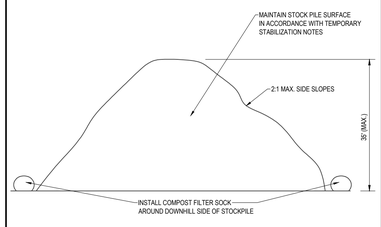
NOTES:

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.

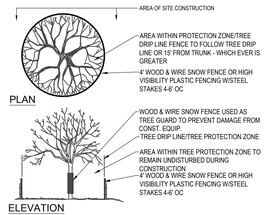
#9-1 ***STANDARD CONSTRUCTION DETAIL #9-1 RIPRAP APRON AT PIPE OUTLET WITH FLARED END SECTION OR ENDWALL***

NOT TO SCALE



X-8 ***TEMPORARY SOIL STOCKPILE DETAIL***

NOT TO SCALE



X-11 ***TREE PROTECTION DURING SITE CONSTRUCTION***

NOT TO SCALE

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SHEET TITLE:

SOIL EROSION & SEDIMENT POLLUTION CONTROL DETAILS

SHEET NUMBER:

C-606

ORG. DATE - 10/24/2024

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-SESC-0A.....LAYOUT: C-606 ESS DETAILS

PENNSYLVANIA AVENUE
(A.K.A. S.R. 2027)
(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 366.81'

UgD

ZONE AE

PROJECT SITE BOUNDARY
237,428 SF. (5.45 AC)

LIMIT OF DISTURBANCE
214,777 SF. (4.93 AC)

EXIST. 4 INCH LATERAL TO BE CAPPED AND ABANDONED

EXIST. BUILDING TO REMAIN (11,370 SF) FFE = 170.11'

SERVICE DRIVE LANES FFE = 170.11'

SERVICE DRIVE FFE = 170.11'

PROP. UNDERGROUND BASIN (UG2)

PROP. UNDERGROUND BASIN (UG1)

LIGHTING ZONE 1

POB. POLE TO BE RELOCATED AS (1) COORD AND COORDINATED WITH UTILITY PROVIDER

BMP 004
PROP. UNDERGROUND EXTENDED DETENTION UG2 (NO SUBSURFACE INFILTRATION) (BMP #6.6.3)

BMP 002
PROP. UNDERGROUND MRC UG1
(BMP #6.6.3)

BLOCK 51, UNIT 47 APN #65-00-08779-00-3
N/F LANDS OF
PAMCPA REAL ESTATE, LELP
D.B. 6293, PG. 720

BLOCK 51, UNIT 1
APN #65-00-08764-20-7
N/F LANDS OF
WHITEMARSH HOTEL ASSOCIATES LP

PROP TRANSFORMER AND OVERHEAD UTILITY POLE

PROP. 6" BOLLARDS INSTALLED 6' ON CENTER (37-TYP.)

PROP. GUIDE RAIL

UusB

DP003

DP001

DP002

SANDY RUN

ZONE AE (FLOODWAY)

P.O.I.#1

EXIST. APPROX. CENTERLINE OF STREAM

EXIST. APPROX. CENTERLINE OF SWALE

TRASH ENCLOSURE STRUCTURE SHALL COMPLY WITH FLOOD PROOFING REQUIREMENTS INCLUDING HOOKS, ARE MOVEABLE FLOOD BARRIERS, STRUCTURE SHALL BE DESIGNED TO WITHSTAND ABSENCE OF ANY FLOOD VENTS

ZONE X

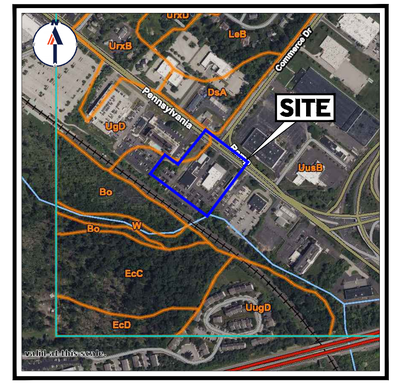
NORTH PENNSYLVANIA RAILROAD

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	-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	FEM
ASSUMED FLOOD WAY	
TOP OF BANK / OHWM	WLF #5

LEGEND
PROPOSED

LIMIT OF DISTURBANCE	LOD
PROJECT SITE BOUNDARY	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	
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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500 PENNSYLVANIA AVENUE
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY, PA

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SHEET TITLE:
POST CONSTRUCTION STORMWATER MANAGEMENT PLAN

SHEET NUMBER:
C-607

ORG. DATE - 10/24/2024

P:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-SESC-0A—LAYOUT C-607 PCSM
RS

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.: 02-221055-00
   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 UTILITIES 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 = 169.00. 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 SCHEDULE.

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, DRAINAGE FACILITIES, 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 AND SEALED 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 DETAILS 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". 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. VEHICLES SHOULD NOT BE PARKED OR DRIVEN ON THE SPRAY AREA, AND CARE SHOULD BE TAKEN TO AVOID EXCESSIVE COMPACTION BY MOWERS.
4. INSPECT THE UNDERGROUND BASINS AFTER RUNOFF EVENTS AND MAKE SURE THAT RUNOFF DRAINS DOWN WITHIN 72 HOURS. MOSQUITOS SHOULD NOT BE A PROBLEM IF THE WATER DRAINS IN 72 HOURS. MOSQUITOES REQUIRE A CONSIDERABLY LONG BREEDING PERIOD WITH RELATIVELY STATIC WATER LEVELS.
5. INSPECT FOR ACCUMULATION OF SEDIMENT, DAMAGE TO OUTLET CONTROL STRUCTURES, EROSION CONTROL MEASURES, AND SIGNS OF WATER CONTAMINATION/SPILLS.
6. MOW ONLY AS APPROPRIATE FOR VEGETATIVE COVER SPECIES.
7. 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 TO 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 PCSM REQUIREMENTS), 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 DEPARTMENT PERMIT NUMBER AND ACTIVITY.
(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, AND 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 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 WRITTEN 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 DISCLOSURE OF THE PCSM BMP AND THE RELATED OBLIGATIONS IN THE ORDINARY COURSE OF A TITLE SEARCH OF THE SUBJECT PROPERTY. 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 M

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 (MRC 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.

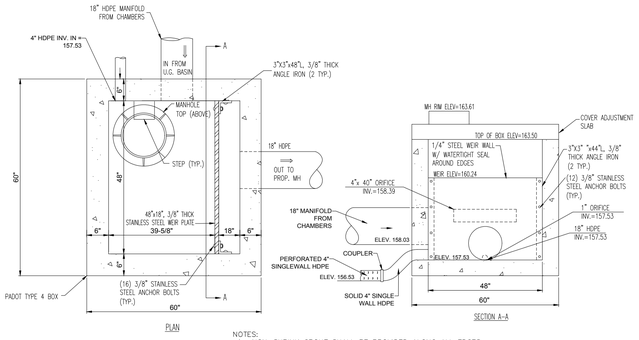
4.) MRC BASIN UG1, MRC BASIN UG2 AND DETENTION BASIN UG3 ARE TO BE LINED WITH AN IMPERMEABLE LINER DUE TO THE PRESENCE OF PERCHED WATER.

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%

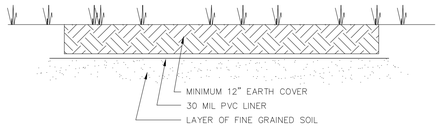
1. A CERTIFICATION FROM THE MANUFACTURER DOCUMENTING THE FULL GRADATION AND VOID RATIO SHALL BE OBTAINED.
2. WHEN IN THE OPINION OF THE TOWNSHIP INSPECTOR OR THE GEOTECHNICAL ENGINEER THE STONE IS NOT CONSISTENT WITH THE APPROVED SAMPLE, IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THE STONE 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)

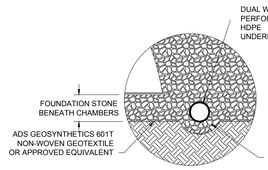
N.T.S.



DETENTION BASIN LINER DETAIL

NO SCALE

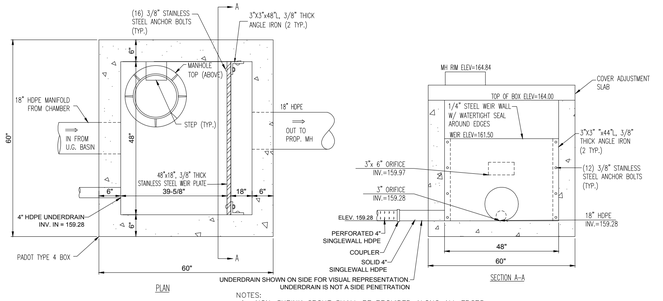
NOTES:
1. PROVIDE A 30 MIL PVC LINER. SPECIFICATIONS ARE TO BE PROVIDED BY THE MANUFACTURER FOR THE BASIN.
2. THE LINER MUST BE PLACED ON A LAYER OF FINE GRAINED SOIL THAT HAS BEEN ROLLED WITH A SMOOTH DRUM ROLLER IN BOTH DIRECTIONS TO PRODUCE A SMOOTH LEVEL BASE FOR THE LINER.
3. THE SOIL MAY NOT CONTAIN 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 MANUFAACTURER'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.

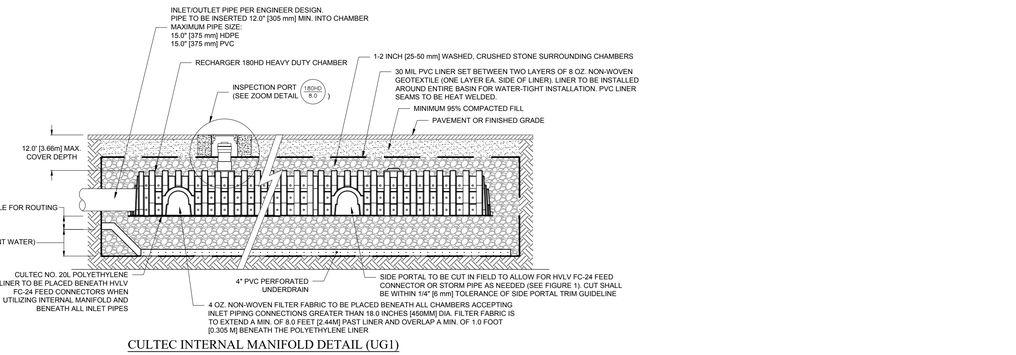


UNDERDRAIN SHOWN ON SIDE FOR VISUAL REPRESENTATION - UNDERDRAIN IS NOT A SIDE PENETRATION

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)

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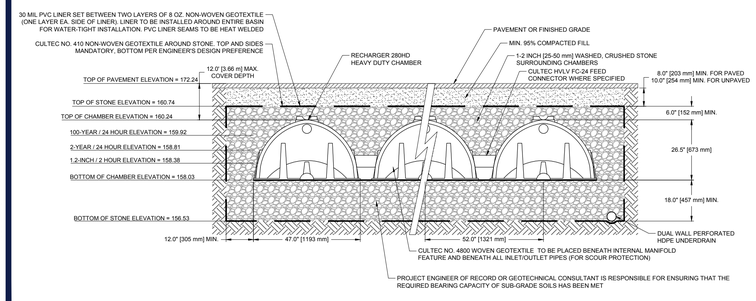
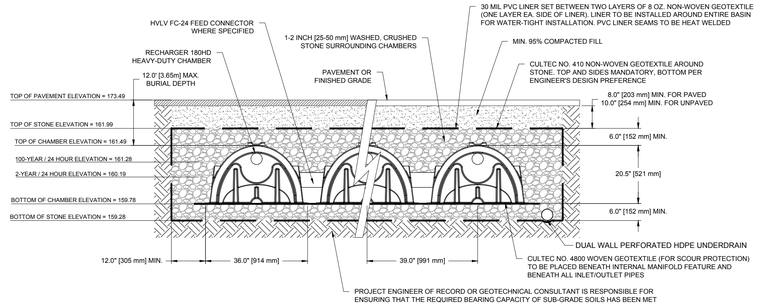


CULTEC RECHARGER 280HD HEAVY DUTY TYPICAL CROSS SECTION (UG1)

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-0A-----LAYOUT: C-609 PCSM DETAILS

RMS

BOHLER
SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
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PERMITTING SERVICES
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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY

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PROJECT No.:	PAB220113.01
DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-SESC-0A

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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PENNSYLVANIA LICENSE No. PE082005
VIRGINIA LICENSE No. 0402049204
NEW JERSEY LICENSE No. 24GE05339500

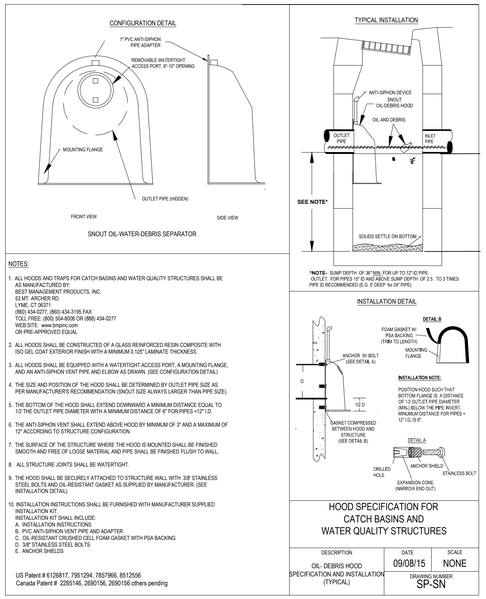
SHEET TITLE:

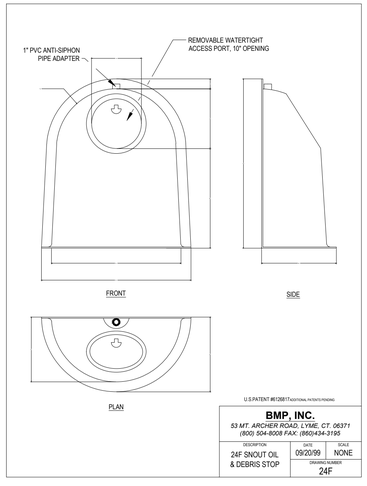
POST CONSTRUCTION STORMWATER MANAGEMENT DETAILS

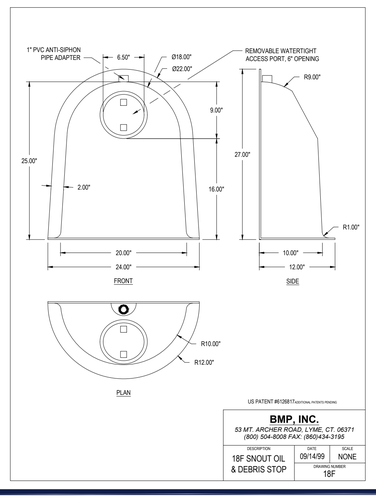
SHEET NUMBER:

C-609

ORG. DATE - 10/24/2024







STORM STRUCTURE SCHEDULE

NAME	TYPE	GRT/RIM ELEV. (FT.)	INVERTS
EW 100	ENDWALL	158.32'	INV IN = 156.15' (18" HDPE)
EW 200	ENDWALL	160.07'	INV IN = 157.83' (18" HDPE)
EW 900	ENDWALL	160.91'	INV IN = 154.85' (98" RCP)
EX-IN	MANHOLE	163.46'	INV OUT = 155.38' (98" RCP)
EX-IN(2)	TYPE 12 MANHOLE	163.43'	INV OUT = 155.38' (98" RCP)
EX-OUT	ENDWALL	154.82'	INV IN = 154.10' (98" RCP)
INL-212	TYPE C INLET	164.93'	INV IN = 159.47' (15" HDPE) INV OUT = 159.47' (15" HDPE)
INL-213	TYPE C INLET	163.42'	INV IN = 159.90' (15" HDPE) INV OUT = 159.90' (15" HDPE)
INL-214	TYPE C INLET	163.46'	INV OUT = 160.09' (15" HDPE)
INL-221	TYPE C INLET	164.29'	INV OUT = 160.15' (15" HDPE)
INL 110	TYPE C INLET	162.50'	INV OUT = 159.25' (18" HDPE)
INL 121	TYPE C INLET	164.19'	INV IN = 158.28' (24" HDPE) INV OUT = 158.28' (24" HDPE)
INL 122	TYPE C INLET	164.99'	INV IN = 158.66' (18" HDPE) INV IN = 158.66' (12" HDPE) INV OUT = 158.66' (24" HDPE)
INL 123	TYPE C INLET	165.11'	INV IN = 159.37' (18" HDPE) INV OUT = 159.37' (18" HDPE)
INL 124	TYPE C INLET	165.05'	INV IN = 159.52' (18" HDPE) INV OUT = 159.52' (18" HDPE)
INL 126	TYPE C INLET	163.79'	INV IN = 160.08' (15" HDPE) INV OUT = 160.08' (18" HDPE)
INL 127	TYPE C INLET	163.64'	INV OUT = 160.26' (15" HDPE)
INL 211	TYPE C INLET	164.75'	INV IN = 158.93' (15" HDPE) INV OUT = 158.68' (18" HDPE)

STORM STRUCTURE SCHEDULE

NAME	TYPE	GRT/RIM ELEV. (FT.)	INVERTS
INL 231	TYPE C INLET	163.15'	INV OUT = 159.85' (15" HDPE)
MH 101	MANHOLE	160.87'	INV IN = 156.38' (18" HDPE) INV OUT = 156.38' (18" HDPE)
MH 102	MANHOLE	162.83'	INV IN = 156.82' (18" HDPE) INV IN = 156.82' (12" HDPE) INV OUT = 156.82' (18" HDPE)
MH 120	MANHOLE	163.93'	INV IN = 158.03' (24" HDPE) INV IN = 158.03' (12" HDPE) INV OUT = 158.03' (24" HDPE)
MH 125	MANHOLE	164.85'	INV IN = 159.90' (18" HDPE) INV OUT = 159.80' (18" HDPE)
MH 210	MANHOLE	164.62'	INV IN = 158.63' (18" HDPE)
MH 230	MANHOLE	163.52'	INV IN = 159.13' (15" HDPE)
MH 901	MANHOLE	165.57'	INV IN = 155.23' (98" RCP) INV OUT = 155.23' (98" RCP)
OCS-103	MANHOLE	163.82'	INV OUT = 157.53' (18" HDPE)
OCS 201	MANHOLE	163.96'	INV IN = 161.11' (12" HDPE) INV OUT = 158.13' (18" HDPE)
RD1	CLEANOUT	166.88'	INV OUT = 159.11' (12" HDPE)
RD2	CLEANOUT	165.30'	INV OUT = 159.48' (12" HDPE)
RD2(1)	CLEANOUT	165.23'	INV IN = 158.44' (12" HDPE) INV OUT = 158.44' (12" HDPE)
RD2(2)	CLEANOUT	164.63'	INV IN = 158.20' (12" HDPE) INV OUT = 158.20' (12" HDPE)
RD3	CLEANOUT	164.60'	INV OUT = 158.33' (12" HDPE)
RD3(1)	CLEANOUT	164.48'	INV IN = 158.30' (12" HDPE) INV OUT = 158.30' (12" HDPE)
RD4	CLEANOUT	165.47'	INV OUT = 156.95' (12" HDPE)
RD5	CLEANOUT	168.64'	INV OUT = 161.52' (12" HDPE)

STORM SEWER PIPE SCHEDULE

FROM	TO	SIZE (IN.)	TYPE	LENGTH (FT.)	SLOPE(%)
EW 100	MH 101	18"	HDPE	44	0.52%
EW 200	OCS 201	18"	HDPE	60	0.50%
EW 900	MH 901	98"	RCP	263	0.14%
EX-IN	EX-OUT	98"	RCP	411	0.31%
INL-212	INL-213	15"	HDPE	85	0.50%
INL-213	INL-214	15"	HDPE	39	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	INL 124	18"	HDPE	30	0.50%
INL 124	MH 125	18"	HDPE	56	0.50%
INL 126	INL 127	15"	HDPE	35	0.50%
INL 211	INL-212	15"	HDPE	108	0.50%
MH 101	MH 102	18"	HDPE	87	0.51%
MH 102	RD4	12"	HDPE	25	0.52%
MH 102	OCS-103	18"	HDPE	142	0.50%
MH 120	UG1_	24"	HDPE	4	0.50%
MH 120	RD2(2)	12"	HDPE	31	0.54%
MH 120	INL 121	24"	HDPE	15	1.64%
MH 125	INL 126	18"	HDPE	36	0.50%

Outflow Calculations from Perforated Pipe

Project Name: BMW Automotive Dealership Expansion
Date Prepared: 7/22/2024
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
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	59.58	A-proflo 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	

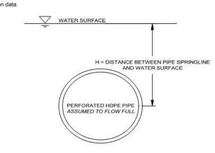
Pipe Diam (in)	Perforation Type	Inlet Area/Foot (ACTUAL Min., in²/ft)	Flow/Perf ft³/sec	Flow/Perf gal/min	Flow/FT ft³/sec	Flow/FT gal/min	
4	slotted	1.6	0.0008	0.36	0.0587	26.34	H-profile Pipe
6	slotted	1.3	0.0008	0.37	0.0517	23.22	
8	slotted	2.2	0.0009	0.38	0.0852	38.25	
10	slotted	1.6	0.0009	0.39	0.0666	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 patterns
3 - Refer to Internal Product Note 1.01 - *Perforation Patterns* for perforation data

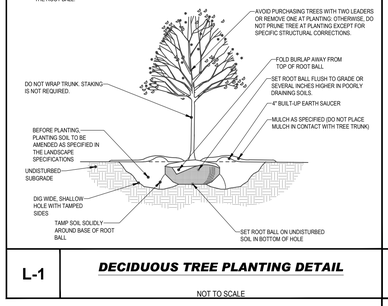
$$Q_p = C_d A \sqrt{2gH}$$

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)



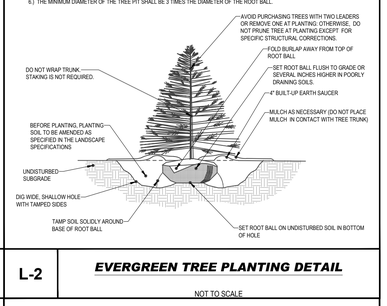
UNDERDRAIN PERFORATION FLOW RATES

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.) THOUROUGHLY 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

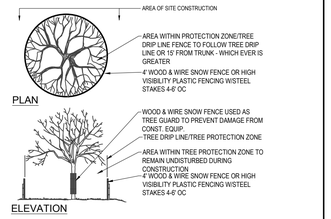
NOTES:
1.) NO SOIL OR MULCH SHALL BE PLACED AGAINST ROOT COLLAR OF PLANT.
2.) REMOVE ALL NON-BIODEGRADABLE MATERIAL AND ROPE FROM TRUNK & TOP OF ROOT BALL. FOLD BURLAP BACK 1/3 FROM ROOT BALL.
3.) PLANTING DEPTH SHALL BE THE SAME AS GROWN IN NURSERY.
4.) THOUROUGHLY SOAK THE TREE ROOT BALL AND ADJACENT 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.



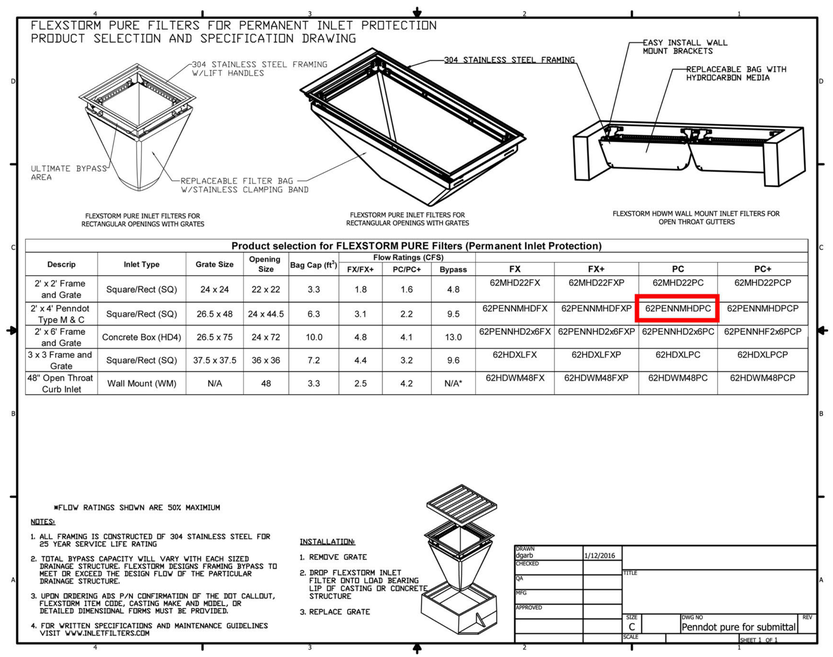
L-2 EVERGREEN TREE PLANTING DETAIL
NOT TO SCALE

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	6	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	26	CLETHRA ALNIFOLIA `HUMMINGBIRD`	HUMMINGBIRD SUMMERSWEET (DWARF)	24-30"	CONTAINER
CSK	80	CORNUS SERICEA `KELSEYI`	KELSEYI DOGWOOD	15-18"	CONTAINER
DGN	27	DEUTZIA GRACILIS `NIKKO`	SLENDER DEUTZIA	18-24"	CONTAINER
IGS	45	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	4	ILEX AQUIPERNYI `MESCHICK`	DRAGON LADY HOLLY	3-4`	CONTAINER
IV	49	ITEA VIRGINICA `HENRY`S GARNET`	HENRY`S GARNET SWEETSPIRE	24-30"	CONTAINER
JHIB	47	JUNIPERUS HORIZONTALIS `MONBER`	ICEE BLUE JUNIPER	15-18" SPRD	CONTAINER
RAG	38	RHUS AROMATICA `GRO-LOW`	GRO-LOW FRAGRANT SUMAC	15-18"	CONTAINER
VR	9	VIBURNUM RHYTIDOPHYLLUM	LEATHERLEAF VIBURNUM	3-4`	B&B
GRASSES					
PVN	36	PANICUM VIRGATUM `NORTH WIND`	NORTHWIND SWITCH GRASS	1 GAL	CONTAINER
SSO	15	SCHIZACHYRIUM SCOPARIUM `STANDING OVATION`	STANDING OVATION LITTLE BLUESTEM GRASS	1 GAL	CONTAINER



X-11 TREE PROTECTION DURING SITE CONSTRUCTION
NOT TO SCALE



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' x4' 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 ASS 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 INTO LOAD BEARING LIP OF CASTING OR CONCRETE STRUCTURE
3. REPLACE GRATE

DRAWN	dgarb	1/12/2016
CHECKED		
QA		
MFG		
APPROVED		

TITLE
SIZE: C
DWG NO: Penndot pure for submittal
REV
SCALE
SHEET 1 OF 1

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

RECORD PLAN 9 OF 11

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PROJECT No.: PAB220113.01
DRAWN BY: RMS
CHECKED BY: JAB
DATE: 10/24/2024
CAD I.D.: PAB220113.01-SESC-0A

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 — PROFESSIONAL ENGINEER — PENDING
PENNSYLVANIA LICENSE No. PE036008
NEW JERSEY LICENSE No. GE45536500

SHEET TITLE:
POST CONSTRUCTION STORMWATER MANAGEMENT DETAILS
SHEET NUMBER:
C-610

ORG. DATE - 10/24/2024

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-SESC-0A-----LAYOUT C-610 PCSM DETAILS

LOCATION MAP

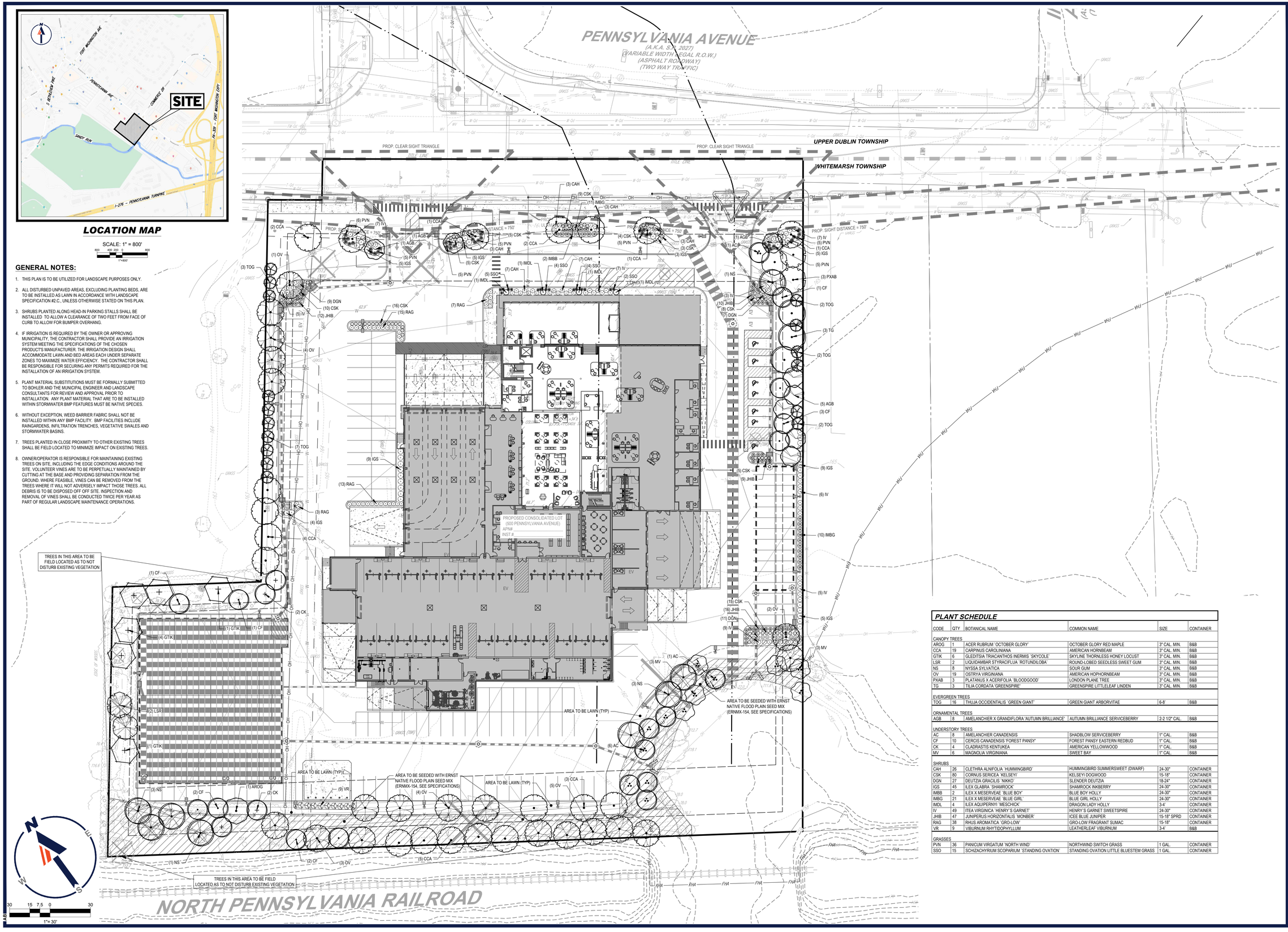
SCALE: 1" = 800'

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.



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
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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
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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					
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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	26	CLETHRA ALNIFOLIA `HUMMINGBIRD`	HUMMINGBIRD SUMMERSWEET (DWARF)	24-30"	CONTAINER
CSK	80	CORNUS SERICEA `KELSEYI`	KELSEYI DOGWOOD	15-18"	CONTAINER
DGN	27	DEUTZIA GRACILIS `NIKKO`	SLENDER DEUTZIA	18-24"	CONTAINER
IGS	45	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	4	ILEX AQUIPERNYI `MESCHICK`	DRAGON LADY HOLLY	3-4'	CONTAINER
IV	49	ITEA VIRGINICA `HENRY'S GARNET`	HENRY'S GARNET SWEETSPIRE	24-30"	CONTAINER
JHIB	47	JUNIPERUS HORIZONTALIS `MONBER`	ICEE BLUE JUNIPER	15-18" SPRD	CONTAINER
RAG	38	RHUS AROMATICA `GRO-LOW`	GRO-LOW FRAGRANT SUMAC	15-18"	CONTAINER
VR	9	VIBURNUM RHYTIDOPHYLLUM	LEATHERLEAF VIBURNUM	3-4'	B&B
GRASSES					
PVN	36	PANICUM VIRGATUM `NORTH WIND`	NORTHWIND SWITCH GRASS	1 GAL.	CONTAINER
SSO	15	SCHIZACHYRIUM SCOPARIUM `STANDING OVATION`	STANDING OVATION LITTLE BLUESTEM GRASS	1 GAL.	CONTAINER

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PROJECT No.: PAB220113.01
DRAWN BY: RMS
CHECKED BY: JAB
DATE: 10/24/2024
CAD I.D.: PAB220113.01-LLGT-0A

PROJECT:

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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D.T. NORTH
REGISTERED LANDSCAPE ARCHITECT
PENNSYLVANIA LICENSE NO. LA002729

SHEET TITLE:

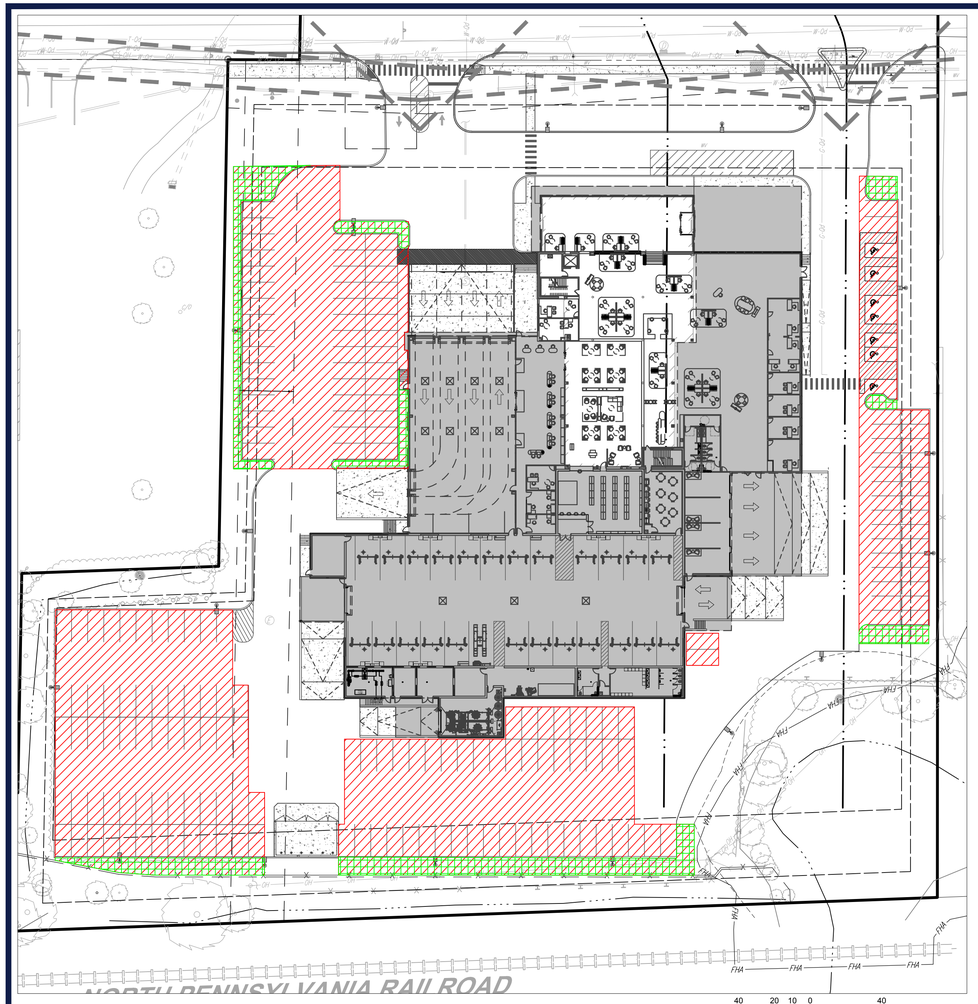
LANDSCAPE PLAN

SHEET NUMBER:

C-701

ORG. DATE - 10/24/2024

R:\2022\PAB220113.01\CAD\DB6\WGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-LLGT-0A-----LAYOUT: C-701 LSCP



PARKING LOT LANDSCAPE REQUIREMENT

TOTAL OPEN AIR PARKING AREA
(54,041± SF)

TOTAL OPEN AIR PARKING AREA
LANDSCAPE AREA
(5,630± SF (10.4%))

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 CLAY CLODS.

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 II 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 'VISI-FENCE' OR APPROVED EQUAL, MOUNTED ON STEEL POSTS SHALL BE PLACED ALONG THE BOUNDARY OF THE TREE PROTECTION ZONE. POSTS SHALL BE ALLOCATED 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 SLOW RELEASE) 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 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 SPECIES 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.

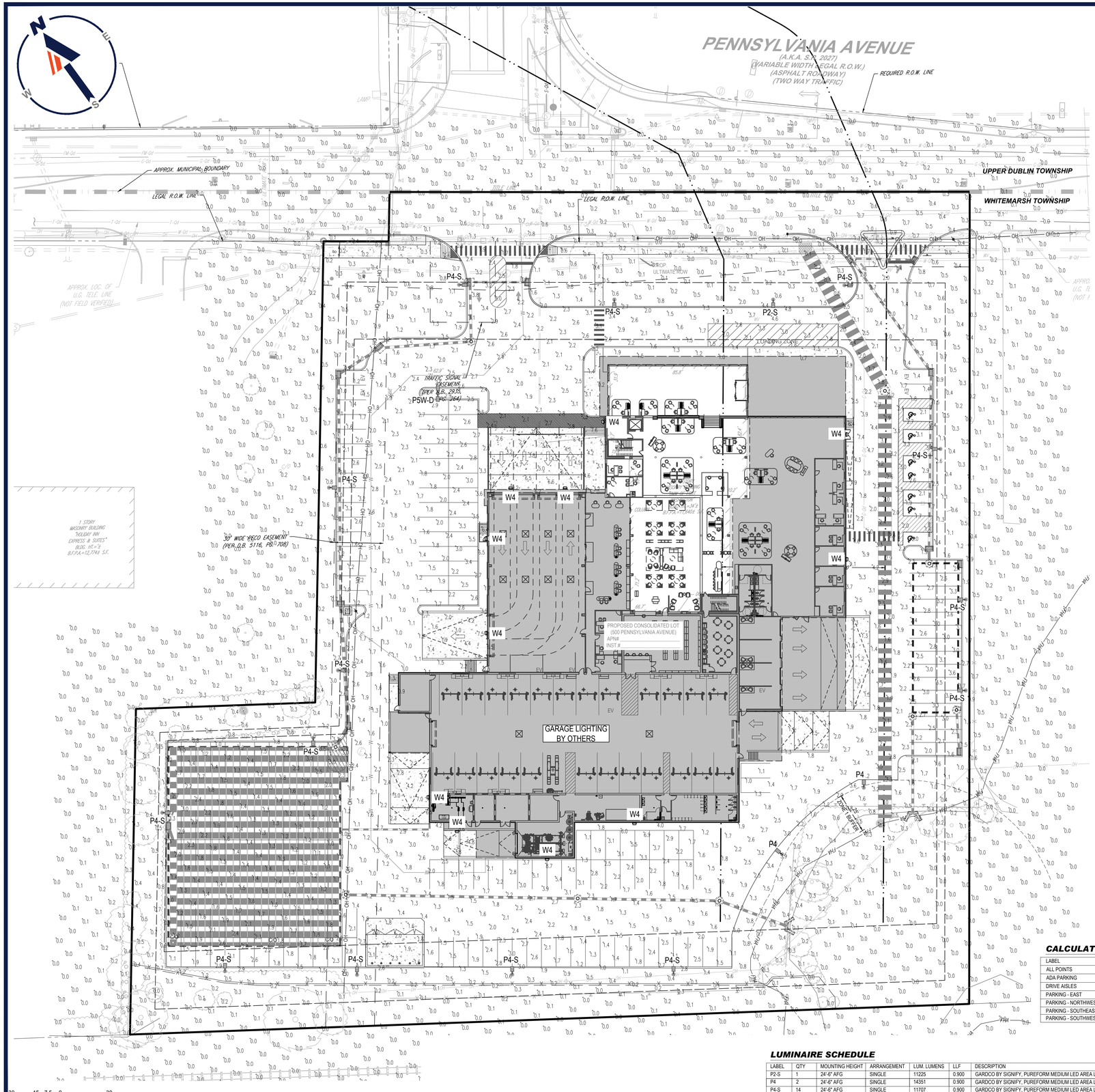
D. LAWNS SHALL BE MAINTAINED BY THE CONTRACTOR DURING CONSTRUCTION AND UNTIL TURNOVER TO THE OWNER/OPERATOR THROUGH WATERING, FERTILIZING, WEEDING, MOWING, TRIMMING AND OTHER OPERATIONS SUCH AS ROLLING, REGARDING AND REPLANTING AS REQUIRED TO ESTABLISH A SMOOTH, ACCEPTABLE LAWN, FREE OF ERODED OR BARE 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.

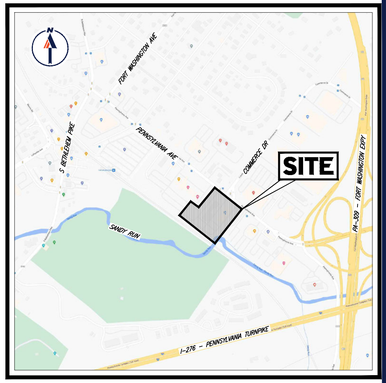
COMPLIANCE CHART

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 OPEN AIR PARKING SPACES = 46 (EXCLUDING GARAGE PARKING AND INVENTORY SPACES) REQUIRED: 46 / 2 = 23 TREES PROVIDED: 1 ARDG, 3 CCA, 6 GTK, 2 LRC, 5 NS, 6 OV (23 TREES)	COMPLIES
	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 = 54,041± SF REQUIRED (10%): 5,404.1 SF LANDSCAPE AREA PROVIDED: 5,630± SF LANDSCAPE AREA (10.4%)	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. THE IMPACT OF THE 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 AND CONSUMER SERVICE: –; UTILITIES + PUBLIC SERVICE: –; NON-RESIDENTIAL PARKING: –; ADJ. STREET MAJOR COLLECTOR: A *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: SEE PLANTING OPTION FROM 105-48 PROVIDED: SEE 105-48 ABOVE	COMPLIES
		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)	COMPLIES
		LENGTH ALONG SOUTHWEST PROPERTY LINE ADJACENT TO RAILROAD (UTILITIES AND PUBLIC SERVICE) = 516± LF REQUIRED: NO BUFFER REQUIRED PROVIDED: NONE	COMPLIES
		LENGTH ALONG NORTHWEST PROPERTY LINES ADJACENT TO HOTEL (RETAIL AND CONSUMER SERVICE) = 584± LF REQUIRED: NO BUFFER REQUIRED PROVIDED: NONE	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 ASH TREES AND INVASIVE TREES) TOTAL DBH INCHES PROPOSED TO BE REMOVED = 135 CALIPER INCHES REPLACEMENT 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



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.



LOCATION MAP

SCALE: 1" = 800'

800 400 200 0 800

1"=800'

LIGHTING COMPLIANCE

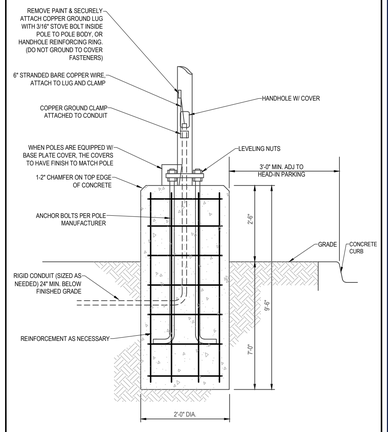
ZONING:

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.

CALCULATION SUMMARY

LABEL	CALCTYPE	UNITS	AVG	MAX	MIN	AVG/MIN	MAX/MIN
ALL POINTS	ILLUMINANCE	Fc	0.85	9.2	0.0	N.A.	N.A.
ADA PARKING	ILLUMINANCE	Fc	2.26	3.4	1.4	1.61	2.43
DRIVE AISLES	ILLUMINANCE	Fc	2.38	9.2	1.0	2.38	9.20
PARKING - EAST	ILLUMINANCE	Fc	2.73	3.8	1.5	1.82	2.53
PARKING - NORTHWEST	ILLUMINANCE	Fc	2.07	5.5	1.0	2.07	5.50
PARKING - SOUTHEAST	ILLUMINANCE	Fc	2.24	8.7	1.0	2.24	8.70
PARKING - SOUTHWEST	ILLUMINANCE	Fc	1.71	3.5	1.0	1.71	3.50

I-3 **LIGHT POLE FOUNDATION DETAIL**

NOT TO SCALE

LUMINAIRE SCHEDULE

LABEL	QTY	MOUNTING HEIGHT	ARRANGEMENT	LUM. LUMENS	LLF	DESCRIPTION	POLE
P2-S	1	24'-6" AFG	SINGLE	11225	0.900	GARDCO BY SIGNIFY, PUREFORM MEDIUM LED AREA LIGHT, TYPE 2 WITH INTERNAL HOUSE SIDE SHIELD, ZERO UP-LIGHT (P26-48L-700-NW-G2-AR-2-x-HIS)	GARDCO BY SIGNIFY, STRAIGHT ROUND STEEL POLE, 22' LENGTH (SRS-CB-4-11-22-01-DT5)
P4	2	24'-6" AFG	SINGLE	14351	0.900	GARDCO BY SIGNIFY, PUREFORM MEDIUM LED AREA LIGHT, TYPE 4, ZERO UP-LIGHT (P26-48L-700-NW-G2-AR-4-x)	GARDCO BY SIGNIFY, STRAIGHT ROUND STEEL POLE, 22' LENGTH (SRS-CB-4-11-22-01-DT5)
P4-S	14	24'-6" AFG	SINGLE	11707	0.900	GARDCO BY SIGNIFY, PUREFORM MEDIUM LED AREA LIGHT, TYPE 4 WITH INTERNAL HOUSE SIDE SHIELD, ZERO UP-LIGHT (P26-48L-700-NW-G2-AR-4-x-HIS)	GARDCO BY SIGNIFY, STRAIGHT ROUND STEEL POLE, 22' LENGTH (SRS-CB-4-11-22-01-DT5)
P5W-D	1	24'-6" AFG	BACK-BACK	14819	0.900	GARDCO BY SIGNIFY, PUREFORM MEDIUM LED AREA LIGHT, TYPE 5W, ZERO UP-LIGHT (P26-48L-700-NW-G2-AR-5W-x)	GARDCO BY SIGNIFY, STRAIGHT ROUND STEEL POLE, 22' LENGTH (SRS-CB-4-11-22-02-DT5)
W4	11	12'-0" AFF	SINGLE	7938	0.900	GARDCO BY SIGNIFY, PUREFORM LED WALL SCONCE, TYPE 4, ZERO UP-LIGHT (PWS-48L-400-NW-G2-4-x)	----------

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PROJECT No.:	PAB220113.01
DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-LLGT-0A

PROJECT:

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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74 W BROAD STREET, SUITE 500
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REGISTERED LANDSCAPE ARCHITECT
PENNSYLVANIA LICENSE NO. LA002739

SHEET TITLE:

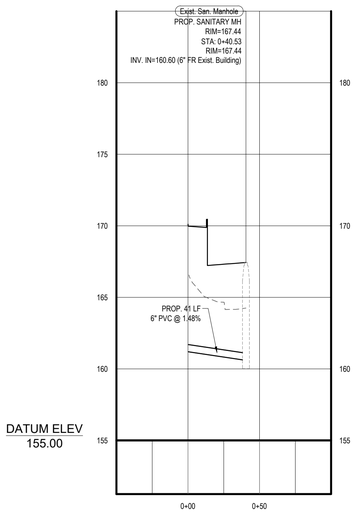
LIGHTING PLAN

SHEET NUMBER:

C-703

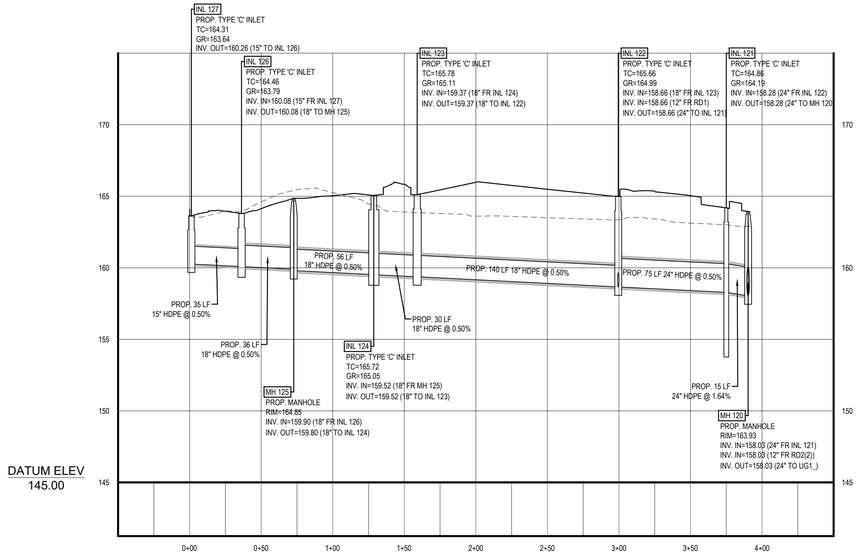
ORG. DATE - 10/24/2024

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-LLGT-0A_-_LAYOUT C-703 LIGHT



SANITARY

SCALE: 1"= 50 ' HORIZONTAL
1"= 5 ' VERTICAL



INL 127 - UG1

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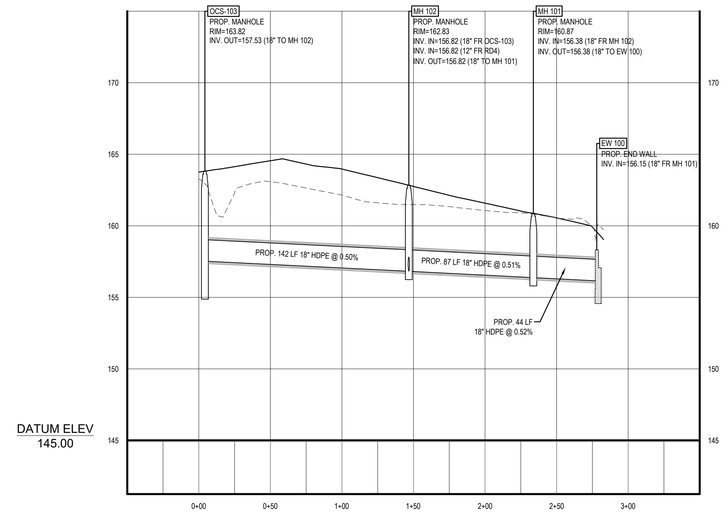

OCS 103 - EW 100

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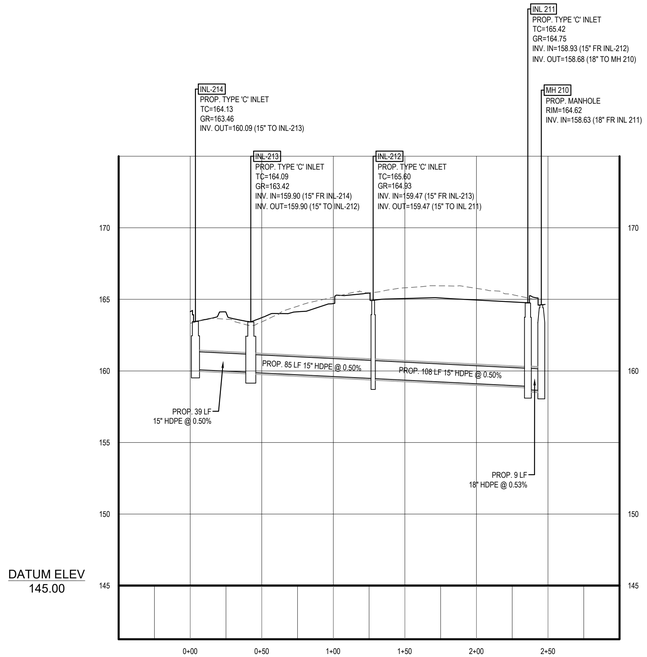

INL 214 - MH 210

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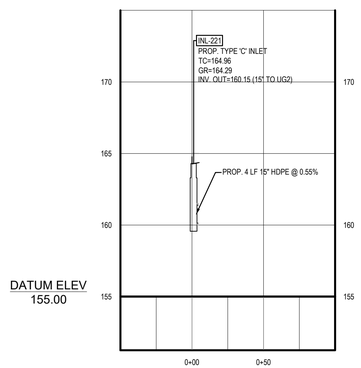

INL 221 - UG2

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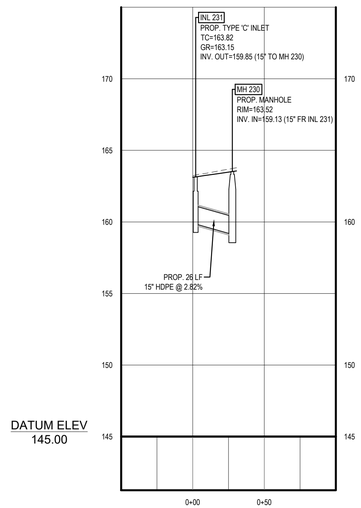

INL 231 - MH 230

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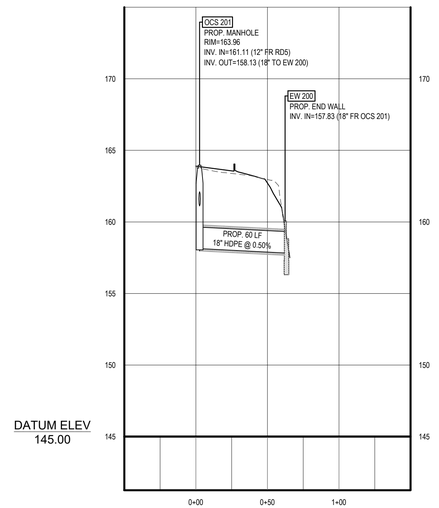

OCS 201 - EW-200

SCALE: 1"= 50 ' HORIZONTAL
1"= 5 ' VERTICAL

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RS3

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PROJECT No.: PAB220113.01
DRAWN BY: RMS
CHECKED BY: JAB
DATE: 10/24/2024
CAD I.D.: PAB220113.01-PROF-0A

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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NEW YORK LICENSE No. 083536
NEW JERSEY LICENSE No. 24GE05039600

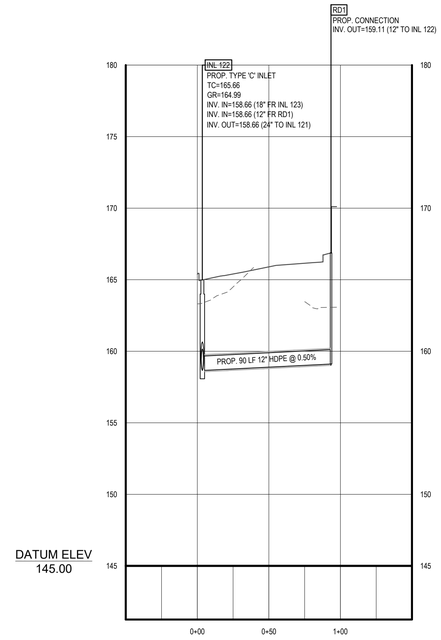
SHEET TITLE:

STORM SEWER PROFILES

SHEET NUMBER:

C-801

ORG. DATE - 10/24/2024



RD1 - INL122 (1)

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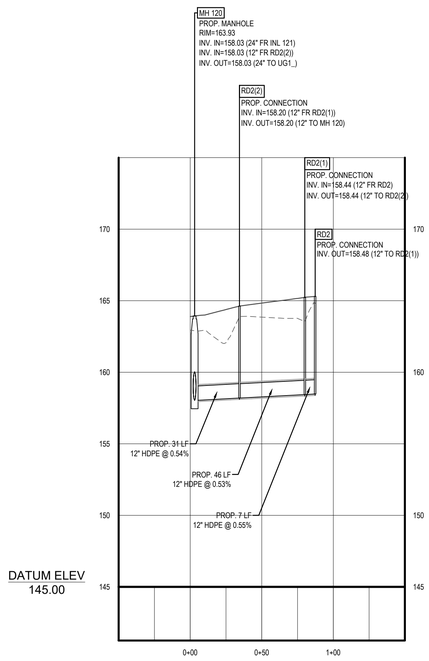

RD2 - MH120

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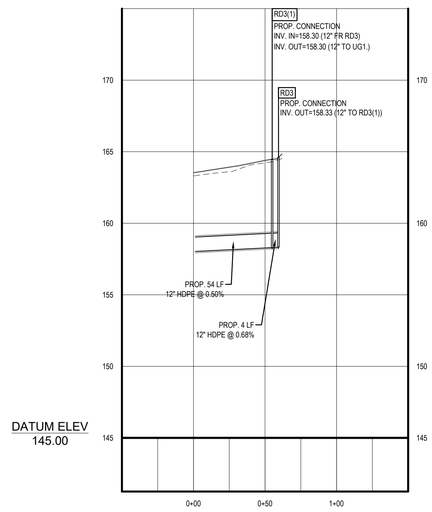

RD3 - UG1

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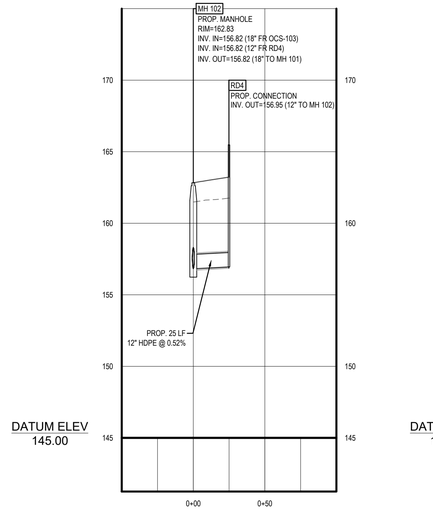

RD4 - MH102

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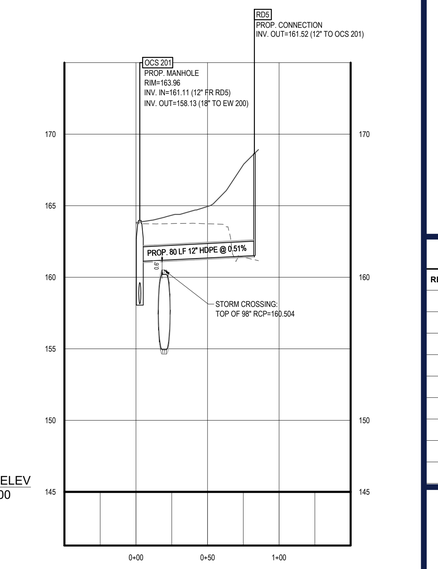

RD5 - OCS201 (BYPASS)

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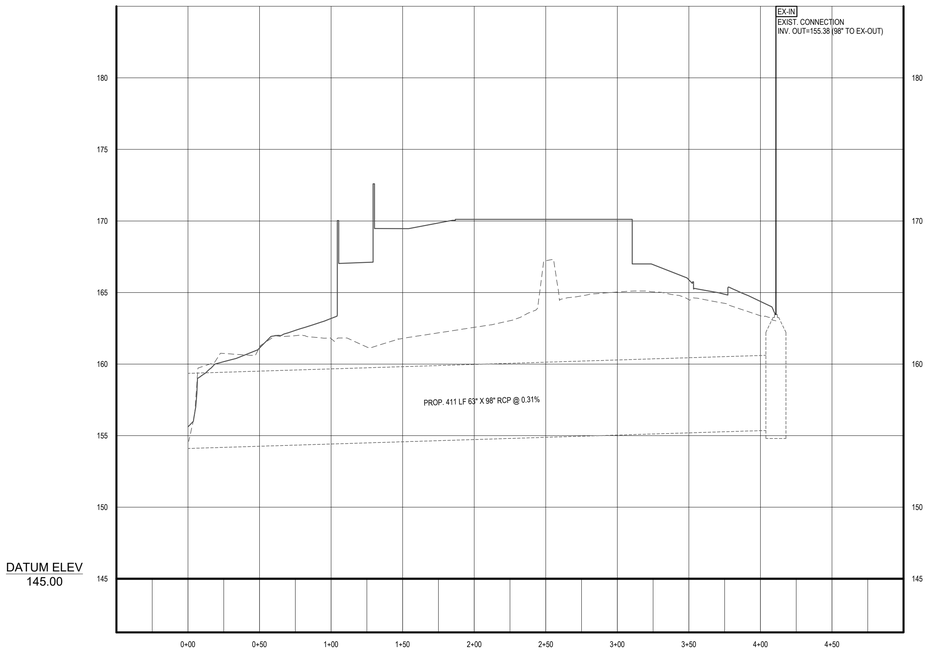
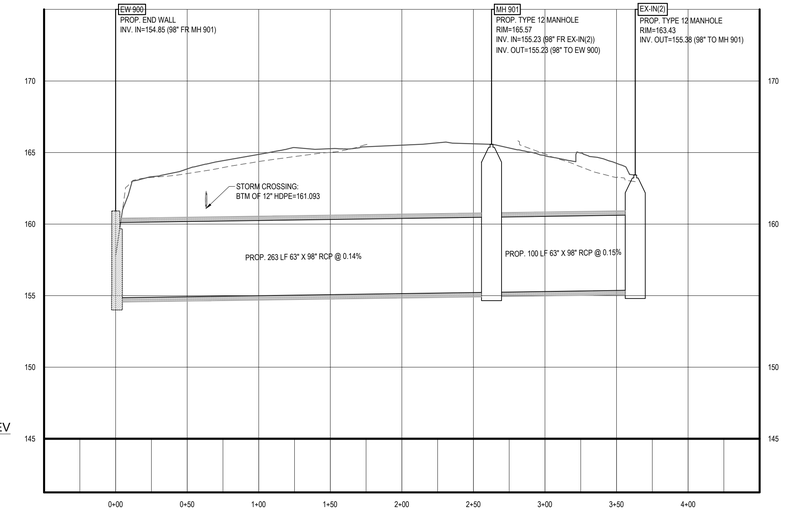


EXISTING CULVERT PIPE

SCALE: 1"= 50 ' HORIZONTAL
1"= 5 ' VERTICAL



EXISTING CULVERT REALIGNMENT

SCALE: 1"= 50 ' HORIZONTAL
1"= 5 ' VERTICAL

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PROJECT:

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NEW YORK LICENSE No. 116-094304
NEW JERSEY LICENSE No. GE045436600

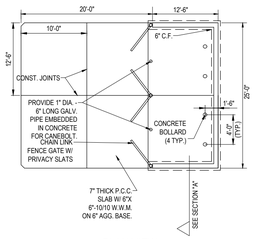
SHEET TITLE:

STORM SEWER PROFILES

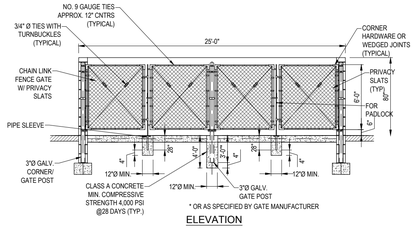
SHEET NUMBER:

C-802

ORG. DATE - 10/24/2024

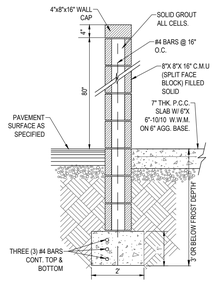


PLAN VIEW



* OR AS SPECIFIED BY GATE MANUFACTURER

ELEVATION

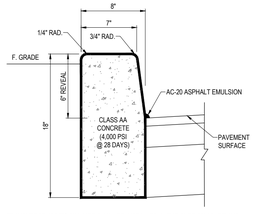


SECTION "A"

NOTE: TRASH ENCLOSURE FINISH TO BE COORDINATED WITH OWNER.

A-10 ***12'-6" x 25'-0" CMU TRASH ENCLOSURE DETAIL***

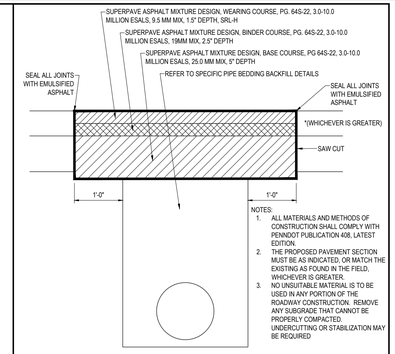
NOT TO SCALE



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***

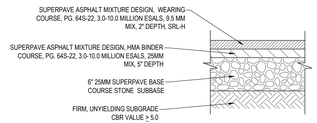
NOT TO SCALE



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***

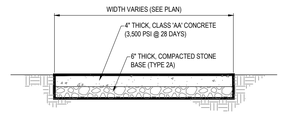
NOT TO SCALE



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

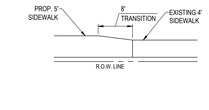


EXPANSION JOINTS 1/2" WIDE PREMOULDED BIT. MATERIAL SHALL BE INSTALLED AT 30' INTERVALS. CONTRACTION JOINTS TO BE SPACED AT EQUAL INTERVALS, 5' MAXIMUM LENGTH.

ALL SIDEWALKS SHALL BE LATERALL PITCHED AT A SLOPE OF NO LESS THAN [INCH PER FOOT.

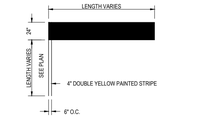
P-21 ***CONCRETE SIDEWALK DETAIL***

NOT TO SCALE



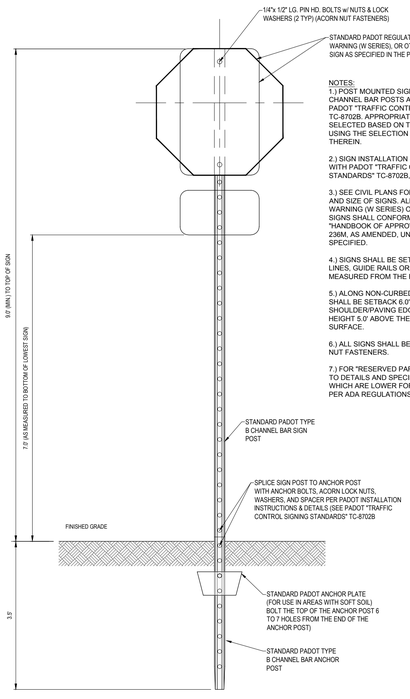
P-22 ***SIDEWALK TIE-IN DETAIL***

NOT TO SCALE



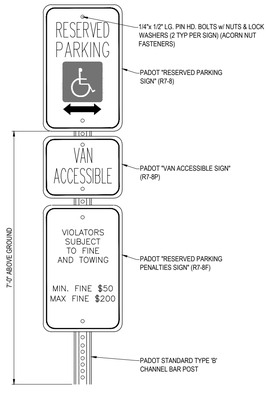
T-6 ***WHITE PAINTED STOP BAR DETAIL***

NOT TO SCALE



T-11 ***STANDARD POLE MOUNTED SIGN INSTALLATION DETAIL***

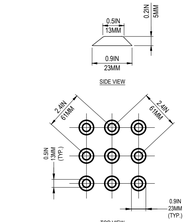
NOT TO SCALE



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***

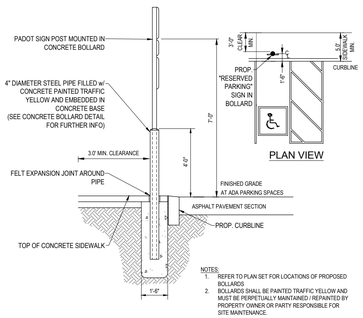
NOT TO SCALE



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)***

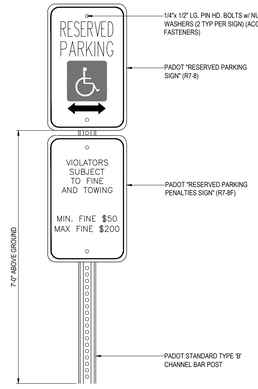
NOT TO SCALE



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.

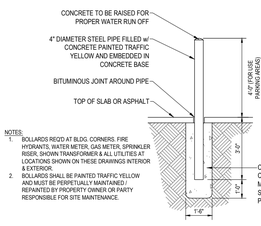
T-18 ***RESERVED PARKING SIGN WITHIN BOLLARD DETAIL***

NOT TO SCALE



T-15 ***RESERVED PARKING SPACE & PENALTIES SIGNS***

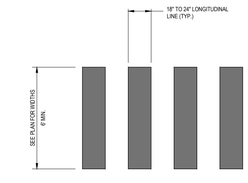
NOT TO SCALE



NOTES:
1. BOLLARDS REQ'D 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)***

NOT TO SCALE

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-CNDS-0A-----LAYOUT: C-901 DETAILS

BOHLER

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
ENVIRONMENTAL SERVICES
PERMITTING SERVICES
TRANSPORTATION SERVICES

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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY

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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-0A

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 YORK LICENSE No. 124090-1
NEW JERSEY LICENSE No. 24GE05339500

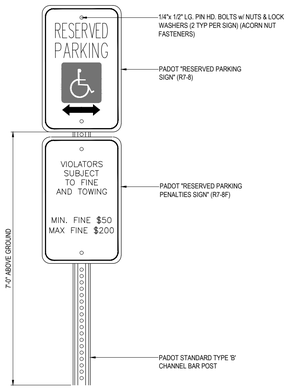
SHEET TITLE:

DETAIL SHEET

SHEET NUMBER:

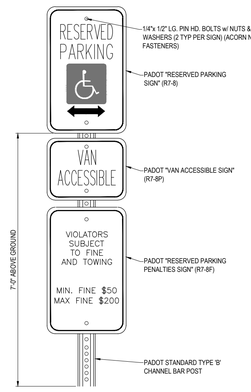
C-901

ORG. DATE - 10/24/2024



T-15 ***RESERVED PARKING SPACE & PENALTIES SIGNS***

NOT TO SCALE



NOTES:
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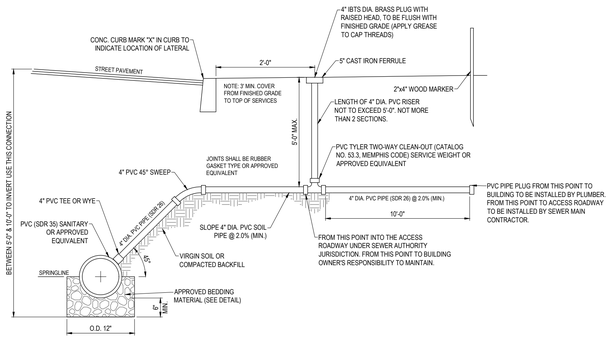
4. SIGNS SHALL BE SETBACK 2.0' FROM CURB LINES OR OTHER OBSTRUCTIONS AS MEASURED FROM THE FACE/EDGE OF THE SIGN.
5. RESERVED PARKING SPACE SIGNS SHALL CONFORM TO DEPARTMENT OF JUSTICE "ADA STANDARDS FOR ACCESSIBLE DESIGN" AS AMENDED.
6. ALL SIGNS SHALL BE INSTALLED WITH ACORN NUT FASTENERS.

T-14 ***RESERVED PARKING SPACE WITH PENALTIES & VAN ACCESSIBLE SIGNS***

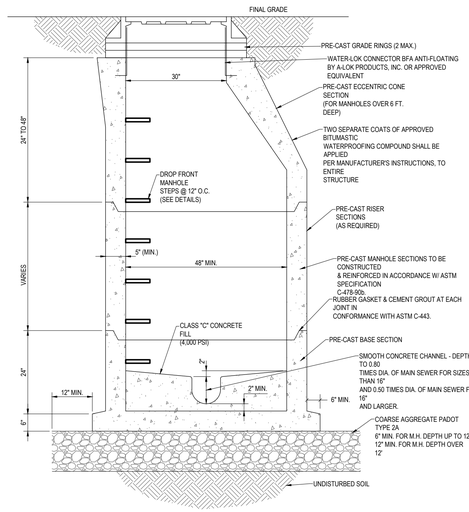
NOT TO SCALE



S-1 ***TYPICAL SANITARY SEWER LATERAL DETAIL***

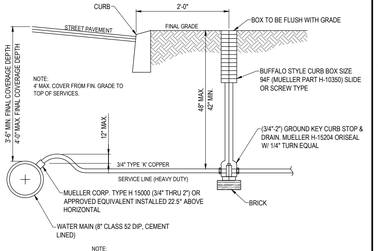
NOT TO SCALE

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***

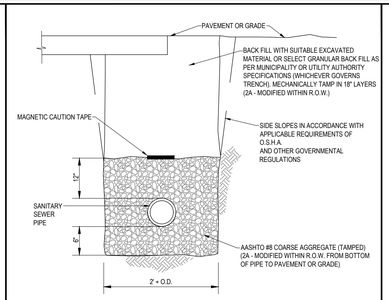
NOT TO SCALE



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

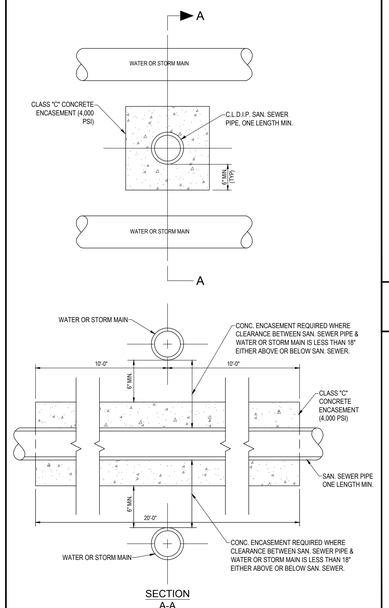


EXCAVATIONS IN EXISTING PAVED ROADWAYS SHALL BE COORDINATED WITH THE LOCAL PERMITTING AGENCY, AND ALL EXCAVATION SHALL BE PAVED WITH TEMPORARY BITUMINOUS PAVEMENT FROM THE DATE OF ORIGINAL EXCAVATION UNTIL PERMANENT PAVEMENT IS INSTALLED. (MINIMUM = 90 DAYS, MAXIMUM = 120 DAYS)

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.

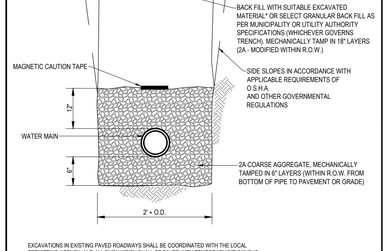
S-8 ***TRENCH BEDDING CLASSIFICATION (SANITARY MAIN)***

NOT TO SCALE



S-11 ***CONCRETE ENCASEMENT DETAIL***

NOT TO SCALE

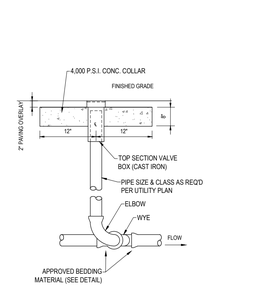


EXCAVATIONS IN EXISTING PAVED ROADWAYS SHALL BE COORDINATED WITH THE LOCAL PERMITTING AGENCY, AND ALL EXCAVATION SHALL BE PAVED WITH TEMPORARY BITUMINOUS PAVEMENT FROM THE DATE OF ORIGINAL EXCAVATION UNTIL PERMANENT PAVEMENT IS INSTALLED. (MINIMUM = 90 DAYS, MAXIMUM = 120 DAYS)

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.

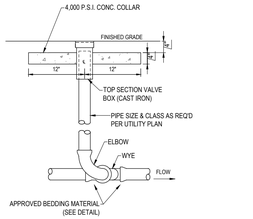
W-4 ***TRENCH BEDDING CLASSIFICATION (WATER MAIN)***

NOT TO SCALE



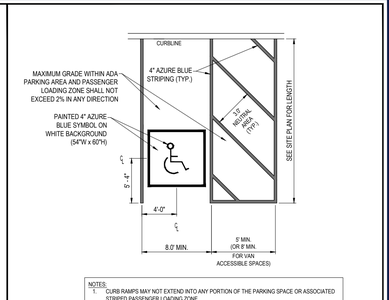
S-12 ***TYPICAL CLEANOUT DETAIL (PAVED AREAS)***

NOT TO SCALE



S-13 ***TYPICAL CLEANOUT DETAIL (LANDSCAPE AREAS)***

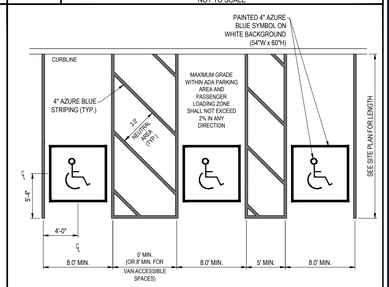
NOT TO SCALE



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)***

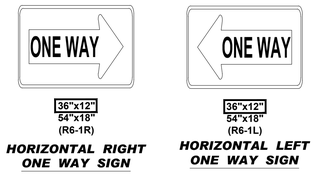
NOT TO SCALE

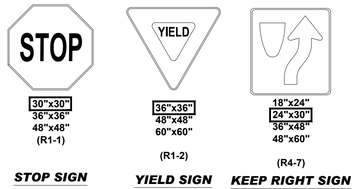


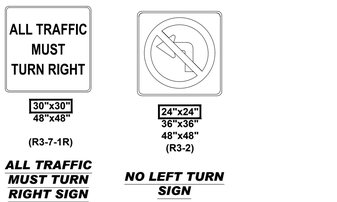
NOTES:
1.) CURB RAMPS MAY NOT EXTEND INTO ANY PORTION OF THE PARKING SPACE OR ASSOCIATED STRIPED PASSENGER LOADING ZONE.
2.) CURB RAMPS, PAVEMENT MARKINGS, AND APPLICABLE SIGNAGE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST A.D.A. ACCESSIBILITY GUIDELINES.

T-12 ***ADA ACCESSIBLE PARKING SPACE STRIPING (3 SPACES)***

NOT TO SCALE







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

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

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REV	DATE	COMMENT	DRAWN BY / CHECKED BY

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PROJECT No.: PAB220113.01
DRAWN BY: RMS
CHECKED BY: JAB
DATE: 10/24/2024
CAD I.D.: PAB220113.01-CNDS-0A

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
JAMES A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE062005
NEW YORK LICENSE No. 076404
NEW JERSEY LICENSE No. 24GE05039500

SHEET TITLE:

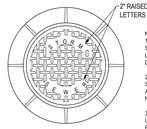
DETAIL SHEET

SHEET NUMBER:

C-902

ORG. DATE - 10/24/2024

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-CNDS-0A-----3A-LAYOUT C-902 DETAILS
RMS

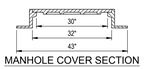


NOTES:
1.) STANDARD MANHOLE FRAMES & COVERS SHALL BE USED ON ALL MANHOLES NOT LOCATED WITHIN EASEMENTS UNLESS DIRECTED OTHERWISE BY THE ENGINEER.

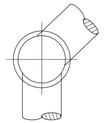
2.) STANDARD MANHOLE FRAME & COVER SHALL BE BRODIESTATE PATTERN #1012B, OR APPROVED EQUIVALENT, WITH NON-PENETRATING PICK HOLES.

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.



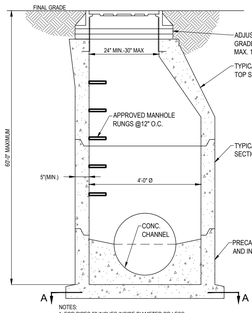
MANHOLE COVER SECTION



PLAN VIEW

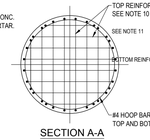
TABLE A
BASE SLAB DIMENSIONS

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"

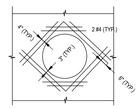


NOTES:
1. FOR PIPES 30 INCHES INSIDE DIAMETER OR LESS
2. FOR BASE SLAB DIMENSIONS SEE TABLE "A"

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 A1060, 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 0.15 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.

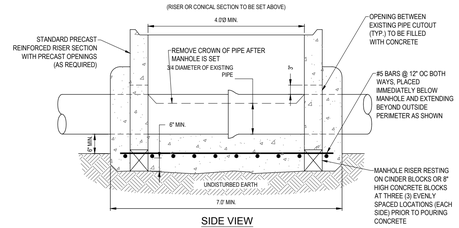
9. MECHANICAL ANCHOR REQUIRED FOR INSTALLATION OF STEPS WITHOUT HOOKS.

10. FOR FOOTING TOP REINFORCEMENT, BOTH DIRECTIONS, USE NO. 19 (6) BARS AT 12" FOR DEPTHS TO 60' OR 0.30 IN/FT WWF FOR DEPTHS TO 30' AND 0.32 IN/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 IN/FT WWF FOR DEPTHS TO 30' AND 0.16 IN/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



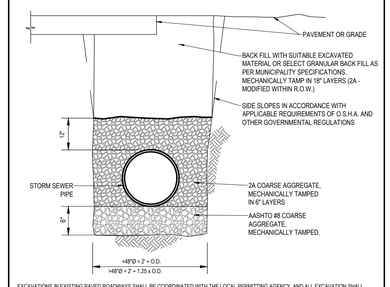
SIDE VIEW

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



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

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-CNDS-0A-----LAYOUT: C-903 DETAILS

RS

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PROJECT NO.:	PAB220113.01
DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-CNDS-0A

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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JEFFREY A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE082005
NEW YORK LICENSE No. 095400
NEW JERSEY LICENSE No. 24GE05036600

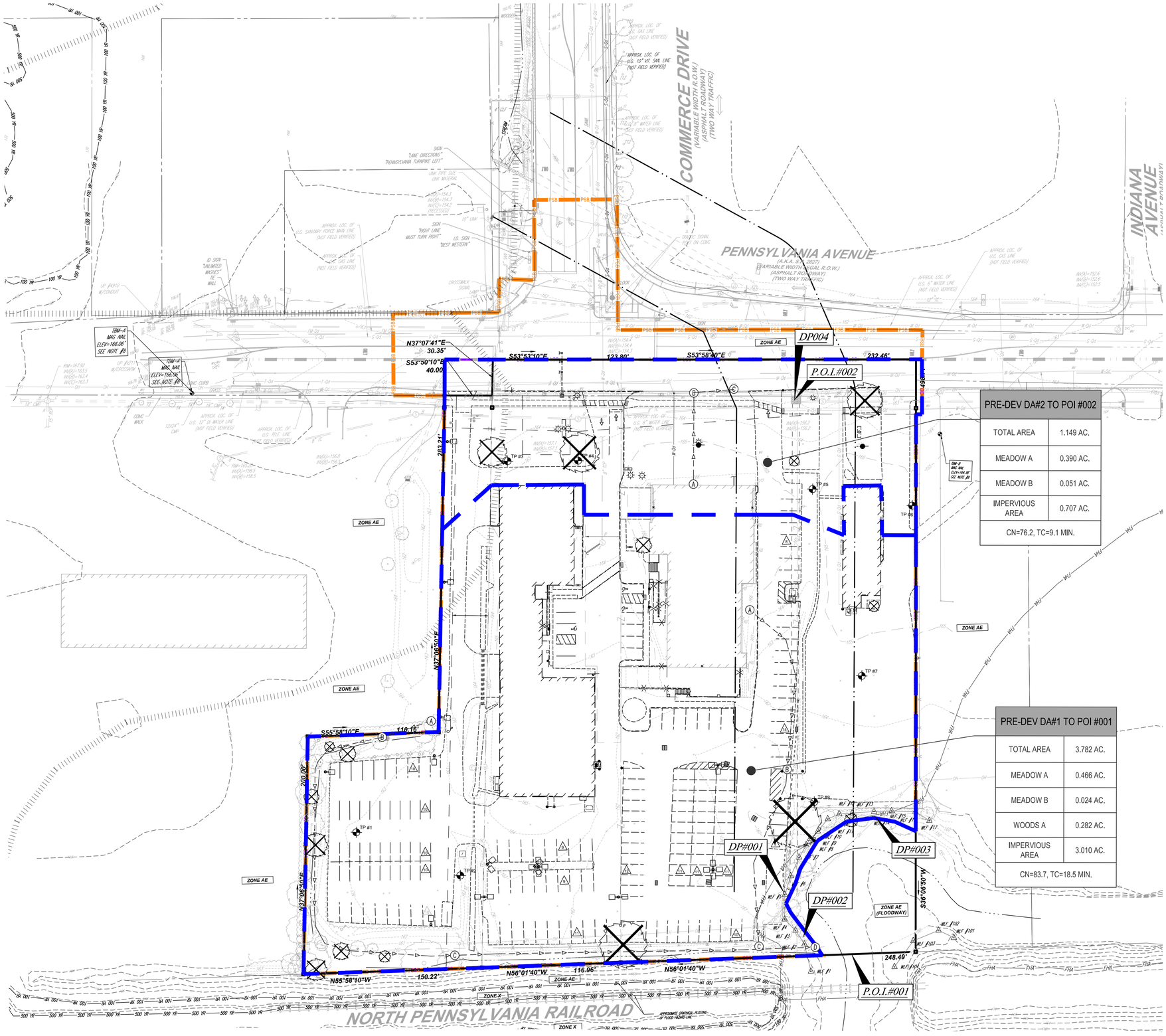
SHEET TITLE:

DETAIL SHEET

SHEET NUMBER:

C-903

ORG. DATE - 10/24/2024


COMMERCE DRIVE
(VARIABLE WIDTH R.O.W.)
(ASPHALT ROADWAY)
(TWO WAY TRAFFIC)
PENNSYLVANIA AVENUE
(A.K.A. S.R. 2027)
(VARIABLE WIDTH LEGAL R.O.W.)
(ASPHALT ROADWAY)
(TWO WAY TRAFFIC)
INDIANA AVENUE
NORTH PENNSYLVANIA RAILROAD
DP004
P.O.I.#002
DP#001
DP#002
DP#003
P.O.I.#001
ZONE AE
ZONE AE (FLOODWAY)
ZONE X
N37°07'41"E 30.35'
S53°53'10"E 123.80'
S53°58'40"E 232.46'
S53°50'10"E 40.00'
283.21'
N37°06'50"E 200.00'
S55°58'10"E 118.16'
N37°06'50"W 200.00'
N55°58'10"W 150.22'
N56°01'40"W 116.96'
N56°01'40"W
S36°06'50"W 496.78'
248.49'
TBM-A MAG NAIL ELEV=166.06' SEE NOTE #8
TBM-A MAG NAIL ELEV=166.06' SEE NOTE #8
TBM-A MAG NAIL ELEV=164.39' SEE NOTE #8
TP #1
TP #2
TP #3
TP #4
TP #5
TP #6
TP #7
TP #8
SIGN "LANE DIRECTIONS" "PENNSYLVANIA TURNPIKE LEFT"
SIGN "RIGHT LANE MUST TURN RIGHT"
I.D. SIGN "UNLIMITED WASHES" TIE WALL
L.D. SIGN "BEST WESTERN"
TRAFFIC SIGNAL ON CONC. PIER ON CORE
CROSSWALK SIGNAL
UP #4910 W/CROSSARM
UP #4910 W/CROSSARM
CONC WALK
PSB
SIDEWALK
APPROX. LOC. OF U.G. GAS LINE (NOT FIELD VERIFIED)
APPROX. LOC. OF U.G. 10" MT. SAN. LINE (NOT FIELD VERIFIED)
APPROX. LOC. OF U.G. 8" WATER LINE (NOT FIELD VERIFIED)
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. 6" WATER LINE (NOT FIELD VERIFIED)
APPROX. LOC. OF U.G. 10" DI WATER LINE (NOT FIELD VERIFIED)
APPROX. LOC. OF U.G. TELE. LINE (NOT FIELD VERIFIED)
APPROX. LOC. OF U.G. 8" WATER LINE (NOT FIELD VERIFIED)
APPROX. LOC. OF U.G. GAS LINE (NOT FIELD VERIFIED)
APPROX. LOC. OF U.G. 6" WATER LINE (NOT FIELD VERIFIED)
APPROX. LOC. OF U.G. GAS LINE (NOT FIELD VERIFIED)
WOODEN
10" UNK
UNK TYPE SIZE UNK MATERIAL
INV(E)=154.3 INV(S)=154.2 INV(E)=154.2 (ASSUMED)
INV(E)=152.6 INV(S)=152.5
INV(E)=156.2 INV(W)=156.2
INV(A)=157.1 INV(S)=157.1
INV(A)=156.8 INV(S)=156.8
INV(A)=158.5 INV(S)=158.5
INV(A)=163.5 INV(S)=163.4 INV(E)=163.1
INV(A)=154.4 INV(S)=154.4 INV(E)=154.4
INV(A)=154.7 INV(S)=154.7 INV(E)=154.7
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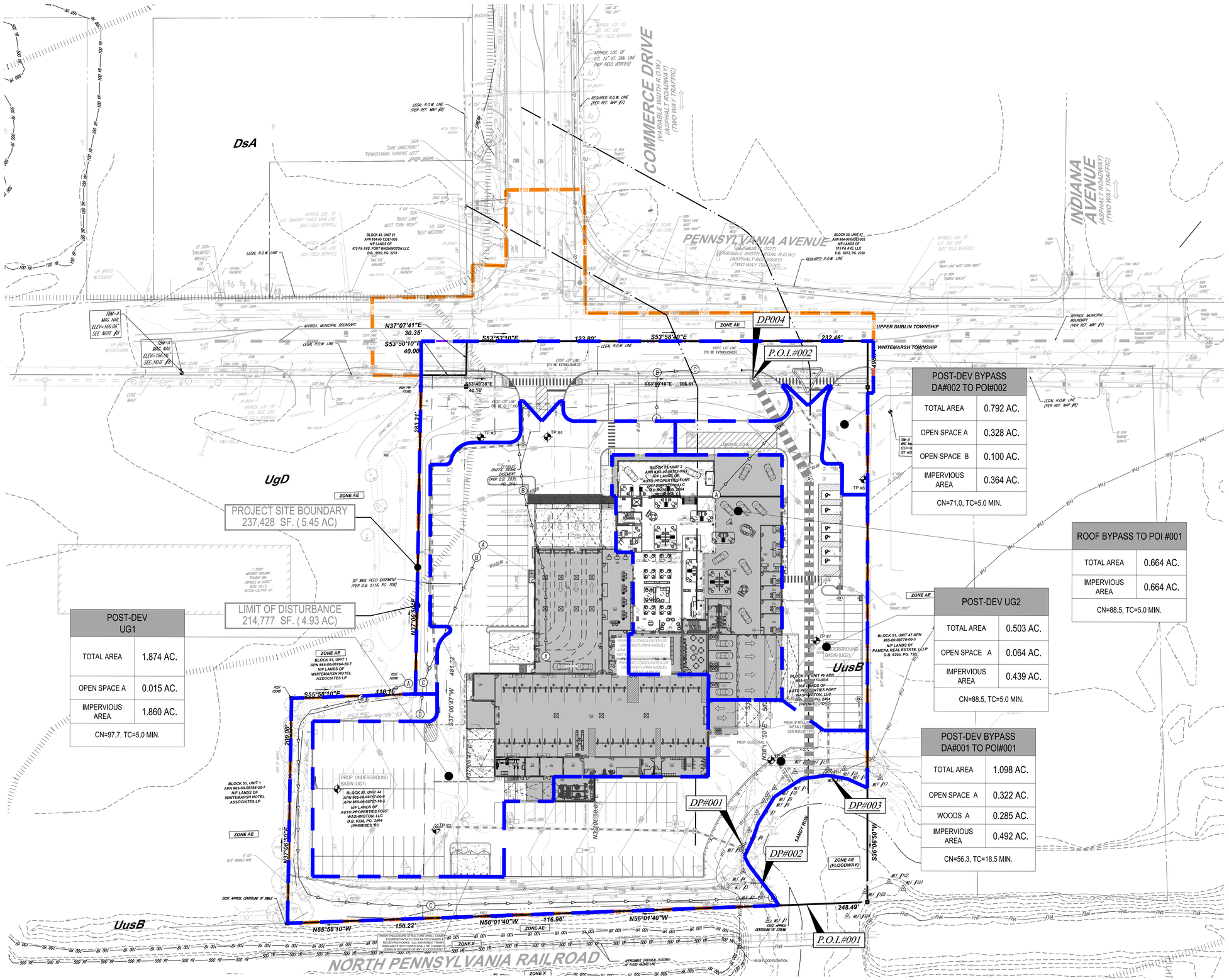

POST-DEV UG1	
TOTAL AREA	1.874 AC.
OPEN SPACE A	0.015 AC.
IMPERVIOUS AREA	1.860 AC.
CN=97.7, TC=5.0 MIN.	

POST-DEV BYPASS DA#002 TO POI#002	
TOTAL AREA	0.792 AC.
OPEN SPACE A	0.328 AC.
OPEN SPACE B	0.100 AC.
IMPERVIOUS AREA	0.364 AC.
CN=71.0, TC=5.0 MIN.	

ROOF BYPASS TO POI #001	
TOTAL AREA	0.664 AC.
IMPERVIOUS AREA	0.664 AC.
CN=88.5, TC=5.0 MIN.	

POST-DEV UG2	
TOTAL AREA	0.503 AC.
OPEN SPACE A	0.064 AC.
IMPERVIOUS AREA	0.439 AC.
CN=88.5, TC=5.0 MIN.	

POST-DEV BYPASS DA#001 TO POI#001	
TOTAL AREA	1.098 AC.
OPEN SPACE A	0.322 AC.
WOODS A	0.285 AC.
IMPERVIOUS AREA	0.492 AC.
CN=56.3, TC=18.5 MIN.	

40 20 10 0 40
1"= 40'

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PROJECT No.: PAB220113.01
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PROJECT:

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J.A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE082005
NEW JERSEY LICENSE No. 24GE04633600

SHEET TITLE:

POST DEVELOPMENT DRAINAGE AREA PLAN

SHEET NUMBER:

C-1002

ORG. DATE - 10/24/2024

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RSS

INL-124	
TOTAL AREA	0.058 AC.
PERVIOUS AREA	0 AC.
IMPERVIOUS AREA	0.058 AC.
C=0.92, TC=5.0 MIN.	

INL-126	
TOTAL AREA	0.102 AC.
PERVIOUS AREA	0.008 AC.
IMPERVIOUS AREA	0.095 AC.
C=0.95, TC=5.0 MIN.	

INL-127	
TOTAL AREA	0.168 AC.
PERVIOUS AREA	0.013 AC.
IMPERVIOUS AREA	0.155 AC.
C=0.93, TC=5.0 MIN.	

INL-213	
TOTAL AREA	0.100 AC.
PERVIOUS AREA	0.007 AC.
IMPERVIOUS AREA	0.093 AC.
C=0.91, TC=5.0 MIN.	

INL-123	
TOTAL AREA	0.033 AC.
IMPERVIOUS AREA	0.033 AC.
C=0.92, TC=5.0 MIN.	

INL-214	
TOTAL AREA	0.035 AC.
PERVIOUS AREA	0.005 AC.
IMPERVIOUS AREA	0.030 AC.
C=0.91, TC=5.0 MIN.	

INL-122	
TOTAL AREA	0.066 AC.
IMPERVIOUS AREA	0.066 AC.
C=0.95, TC=5.0 MIN.	

INL-212	
TOTAL AREA	0.034 AC.
PERVIOUS AREA	0.000 AC.
IMPERVIOUS AREA	0.034 AC.
C=0.95, TC=5.0 MIN.	

INL-121	
TOTAL AREA	0.242 AC.
PERVIOUS AREA	0.008 AC.
IMPERVIOUS AREA	0.234 AC.
C=0.89, TC=5.0 MIN.	

RL1 TO INL 122	
TOTAL AREA	0.220 AC.
IMPERVIOUS AREA	0.220 AC.
C=0.95, TC=5.0 MIN.	

INL-211	
TOTAL AREA	0.070 AC.
PERVIOUS AREA	0.036 AC.
IMPERVIOUS AREA	0.035 AC.
C=0.73, TC=5.0 MIN.	

RL2 TO MH 120	
TOTAL AREA	0.028 AC.
IMPERVIOUS AREA	0.028 AC.
C=0.95, TC=5.0 MIN.	

INL-221	
TOTAL AREA	0.069 AC.
PERVIOUS AREA	0.019 AC.
IMPERVIOUS AREA	0.050 AC.
C=0.93, TC=5.0 MIN.	

RL3 TO UG1	
TOTAL AREA	0.399 AC.
IMPERVIOUS AREA	0.399 AC.
C=0.95, TC=5.0 MIN.	

INL-231	
TOTAL AREA	0.130 AC.
IMPERVIOUS AREA	0.130 AC.
C=0.73, TC=5.0 MIN.	

INL-110	
TOTAL AREA	0.556 AC.
PERVIOUS AREA	0.0000
IMPERVIOUS AREA	0.556 AC.
C=0.95, TC=5.0 MIN.	

RL5 TO OCS 201 (BYPASS)	
TOTAL AREA	0.664 AC.
IMPERVIOUS AREA	0.664 AC.
C=0.95, TC=5.0 MIN.	

RL4 TO UG1	
TOTAL AREA	0.018 AC.
IMPERVIOUS AREA	0.018 AC.
C=0.95, TC=5.0 MIN.	

COMMERCE DRIVE (VARIABLE WIDTH R.O.W.) (ASPHALT ROADWAY) (TWO WAY TRAFFIC)

SYLVANIA AVENUE (A.K.A. SR 2027) (VARIABLE WIDTH PUBLIC R.O.W.) (ASPHALT ROADWAY) (TWO WAY TRAFFIC)

INDIANA AVENUE (ASPHALT ROADWAY) (TWO WAY TRAFFIC)

NORTH PENNSYLVANIA RAILROAD

DP004 · DP#001 · DP#002 · DP#003 · P.O.I.#002 · P.O.I.#001

PROP. UNDERGROUND BASIN (UG1) · PROP. UNDERGROUND BASIN (UG2)

ZONE AE · ZONE AE (FLOODWAY) · ZONE X

N37°06'50"E 491.72' · S37°06'50"W 491.72' · S55°58'10"E 110.16' · N55°58'10"W 150.22' · N56°01'40"W 116.96' · S36°06'50"W 248.49' · N36°06'50"E 468.71' · S53°53'10"E 123.80' · S53°58'40"E 232.46' · N37°37'41"E 30.35' · S53°50'10"E 40.00' · 265.21' · 200.00'

TBM-A MAG NAIL ELEV= 166.06' SEE NOTE #8

TBM-A MAG NAIL ELEV= 166.06' SEE NOTE #8

ELEV=164.8' SEE NOTE #8

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-0A

PROJECT:

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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J.A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No: PE076008
NEW YORK LICENSE No: 24-076004
NEW JERSEY LICENSE No: 24GE05039500

SHEET TITLE:

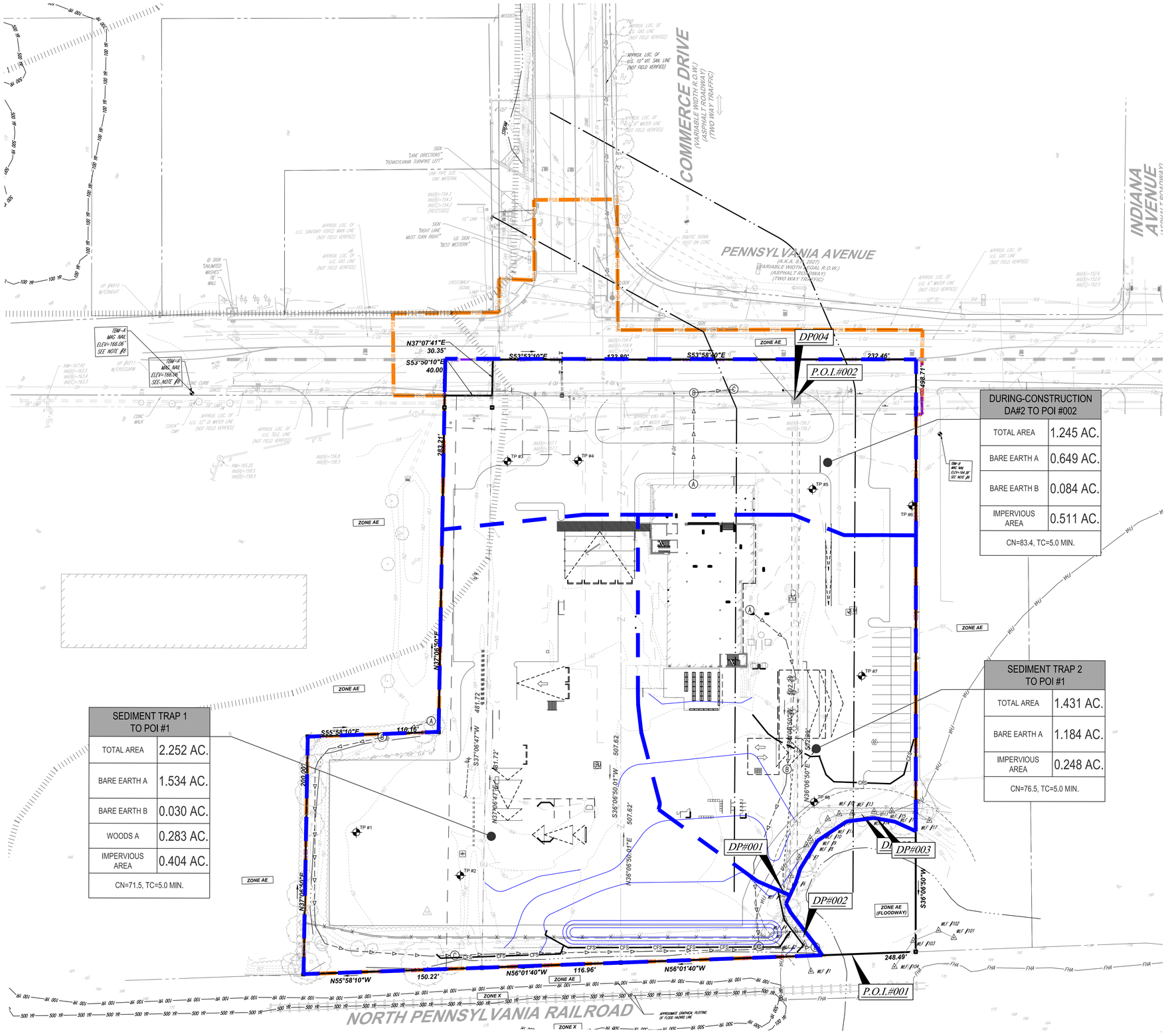
INLET DRAINAGE AREA PLAN

SHEET NUMBER:

C-1003

ORG. DATE - 10/24/2024

R:\2022\PAB220113.01\C-AD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-DRIN-0A-----LAYOUT: C-1003 INL DA'S



SEDIMENT TRAP 1 TO POI #1

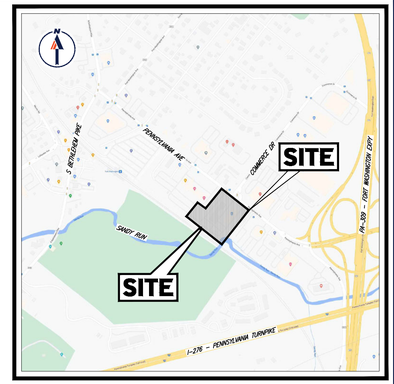
TOTAL AREA	2.252 AC.
BARE EARTH A	1.534 AC.
BARE EARTH B	0.030 AC.
WOODS A	0.283 AC.
IMPERVIOUS AREA	0.404 AC.
CN=71.5, TC=5.0 MIN.	

DURING-CONSTRUCTION DA#2 TO POI #002

TOTAL AREA	1.245 AC.
BARE EARTH A	0.649 AC.
BARE EARTH B	0.084 AC.
IMPERVIOUS AREA	0.511 AC.
CN=83.4, 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'

40 20 10 0 40

1"= 40'

IS P:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-DRIN-0A——LAYOUT: C-1004 MAX

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PROJECT:

PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

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JEFFREY A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE090208
NEW YORK LICENSE No. 095904
NEW JERSEY LICENSE No. GE49036600

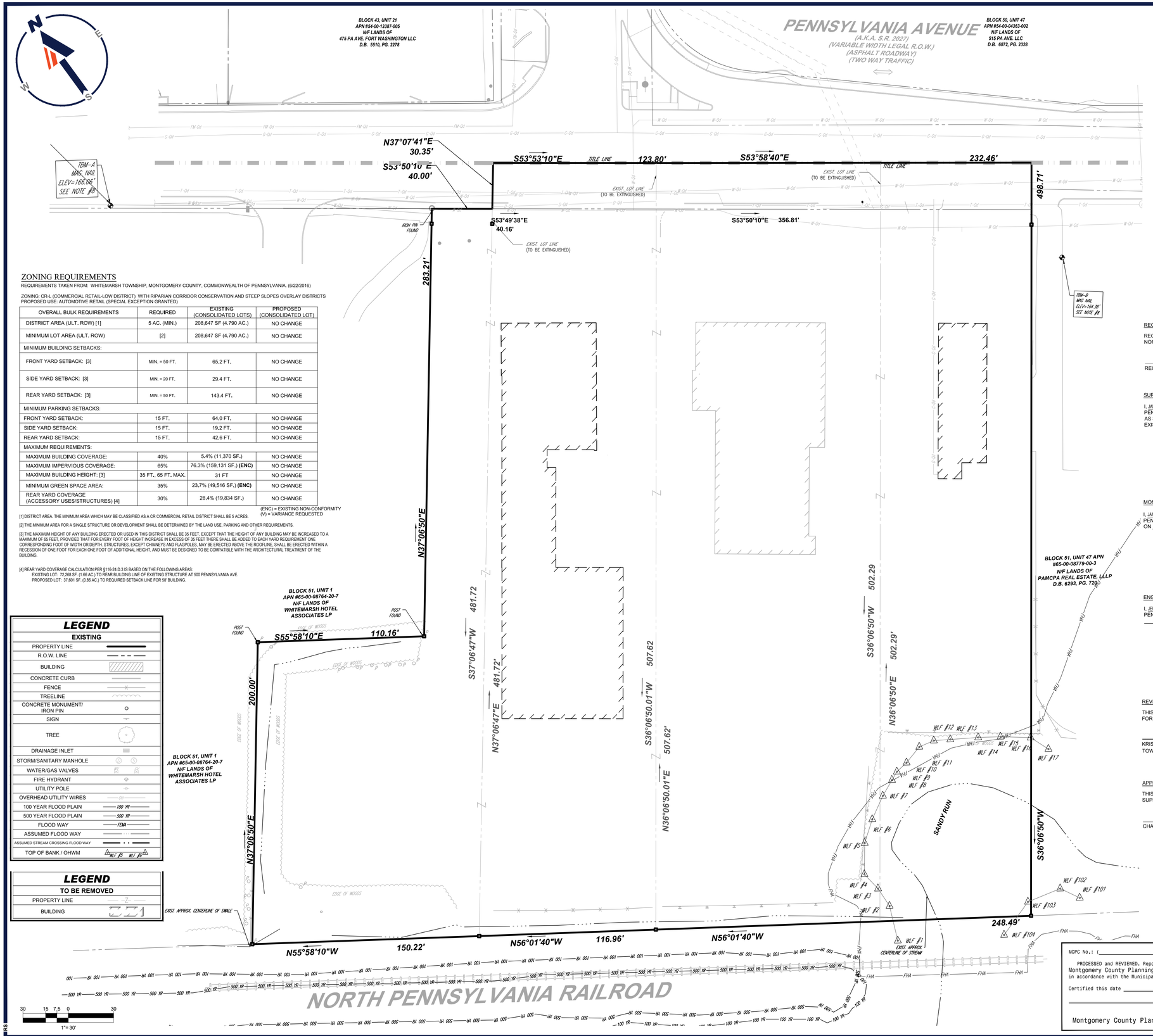
SHEET TITLE:

MAX DURING CONSTRUCTION DRAINAGE AREA PLAN

SHEET NUMBER:

C-1004

ORG. DATE - 10/24/2024



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.

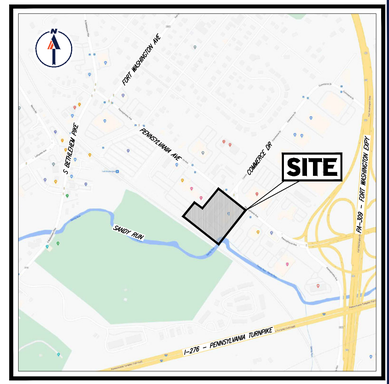
[4] REAR YARD COVERAGE CALCULATION PER §116-24.D.3 IS BASED ON THE FOLLOWING AREAS:
EXISTING LOT: 72,268 SF. (1.66 AC.) TO REAR BUILDING LINE OF EXISTING STRUCTURE AT 500 PENNSYLVANIA AVE.
PROPOSED LOT: 37,601 SF. (0.86 AC.) TO REQUIRED SETBACK LINE FOR 58' BUILDING.

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 —
500 YEAR FLOOD PLAIN — 500 YR —
FLOOD WAY — ITEM —
ASSUMED FLOOD WAY
ASSUMED STREAM CROSSING FLOOD WAY
TOP OF BANK / OHWM — WLF 15 WLF 16 —

LEGEND
TO BE REMOVED

PROPERTY LINE
BUILDING



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

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PROJECT No.: PAB220113.01
DRAWN BY: RMS
CHECKED BY: JAB
DATE: 10/24/2024
CAD I.D.: PAB220113.01-LDVP-0A

PROJECT:

PRELIMINARY/FINAL LOT CONSOLIDATION PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

**500 PENNSYLVANIA AVENUE
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY, PA**

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PROFESSIONAL
JEFFREY A. BEAVAN
PROFESSIONAL ENGINEER
PE082005
PENNSYLVANIA LICENSE No. PE082005
NEW YORK LICENSE No. 096904
NEW JERSEY LICENSE No. 24GE05039500

SHEET TITLE:

LOT CONSOLIDATION PLAN

SHEET NUMBER:

LC-01

ORG. DATE - 10/24/2024

P:\2022\PAB220113.01\CAD\DRAWING\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-LDVP-0A---LAYOUT LC-01 LOT CONSOLIDATION
RS

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: 10/28/2024

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 20,840 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 20,574 CF of the 9,412 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.

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 300-309 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 93-102 (1-yr), 123-132 (2-yr), 153-162 (10-yr), 183-192 (50-yr) and 213-222 (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 277-286 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: 6,741 cf / 0.0833 = 80,924.310 cubic inches: 80,924.310 / 43,560 = 1.86 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 368-369 of the Post-Construction Stormwater Management Narrative Report. The Equivalent impervious Area Calculations are located on page 372 of the Post-Construction Stormwater Management Narrative Report. The hydrographs are located on pages 277-286 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 64.9% 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 38 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.

Internal water storage calculations are included on page 259-261 of the PCSM report. The limiting zone elevations are found on page 22 of the Stormwater Infiltration Report report and page 38 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 in the 277-286 and release rate calculations for the 2-yr WQ storm are included in the 300-309 of the Post-Construction Stormwater Management Narrative Report. Release rates for 1-100 year storms are included on pages 93-102 (1-yr), 123-132 (2-yr), 153-162 (10-yr), 183-192 (50-yr) and 213-222 (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 38 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 114.50 hours (2-yr), 115.00 hours (10, yr), 115.50 hours (50-yr), and 115.50 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), 153-162 (10-yr), 183-192 (50-yr) and 213-222 (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 373 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: ***10/28/2024***
BY: ***RS***
CHECKED BY: ***JAB***
SHEET NO.: ***Summary***
REVISION: ***0***

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)	3.479	27,284	5.499	34,155	8.012	45,136	9.773	54,430	12.153	68,410	14.095	80,443	17.849	93,452
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)	-2.517	8,555	-2.542	9,085	-3.282	9,794	-4.242	10,343	-5.888	11,153	-7.350	11,870	-7.214	12,650

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)	0.813	1,677	1.279	2,546	2.087	4,077	2.805	5,465	3.919	7,657	4.895	9,610	5.960	11,776
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)	-0.956	-1,814	-1.300	-2,488	-1.843	-3,585	-2.296	-4,520	-2.960	-5,927	-3.515	-7,133	-4.103	-8,433

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)	4.276	28,961	6.722	36,702	10.068	49,214	12.541	59,895	16.012	76,066	18.901	90,043	22.713	105,228
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)	-2.116	6,741	-1.895	6,598	-2.114	6,210	-2.669	5,825	-3.779	5,225	-4.823	4,727	-5.239	4,217

Pre-Development to Post-Development Analysis

COMPUTATION SHEET : COMPOSITE CURVE NUMBER (CN)

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

DATE: ***10/28/2024***
BY: ***RMS***
CHECKED BY: ***JAB***
REVISION: ***0***

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: ***10/28/2024***
BY: ***RMS***
CHECKED BY: ***JAB***
REVISION: ***0***

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#002) (Acres)	DP#001 TOTAL (Acres)	BYPASS POI#002 TO POI#001 (DP#004) (Acres)	Post-Development POI#001 (Acres)
Open Space	A	39	0.015	0.064	0.325	0.000	0.404	0.328	0.732
Wooded	A	30	0.000	0.000	0.282	0.000	0.282	0.000	0.282
Open Space	B	61	0.000	0.000	0.000	0.000	0.000	0.100	0.100
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	1.860	0.439	0.492	0.664	3.455	0.364	3.819
		Total Area	1.875	0.503	1.099	0.664	4.141	0.792	4.933
		Composite CN	**97.5**	**90.5**	**63.1**	**98.0**	**87.6**	**68.9**	**84.6**
		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)**

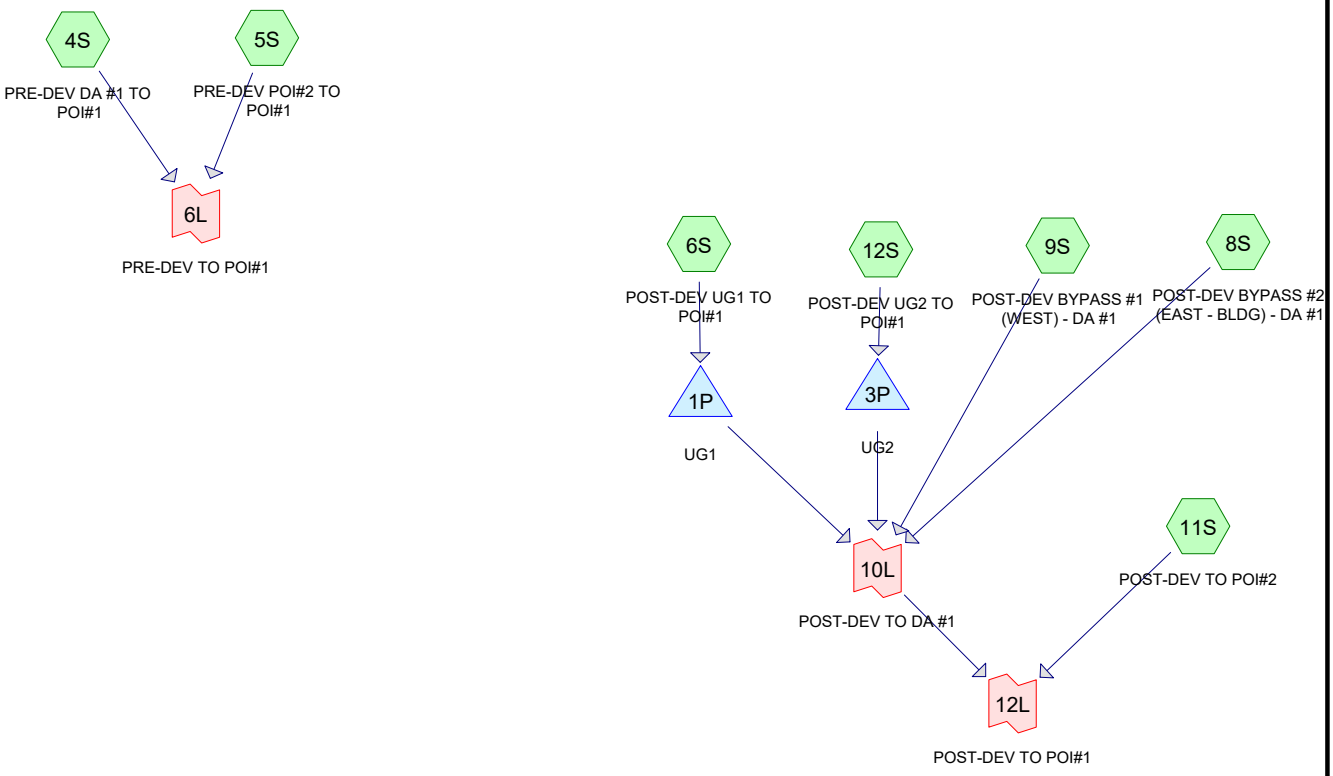
Note: Space for as many as three segments per flow type can be used for each worksheet.

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_2024-07-22
Prepared by Bohler, Printed 10/29/2024
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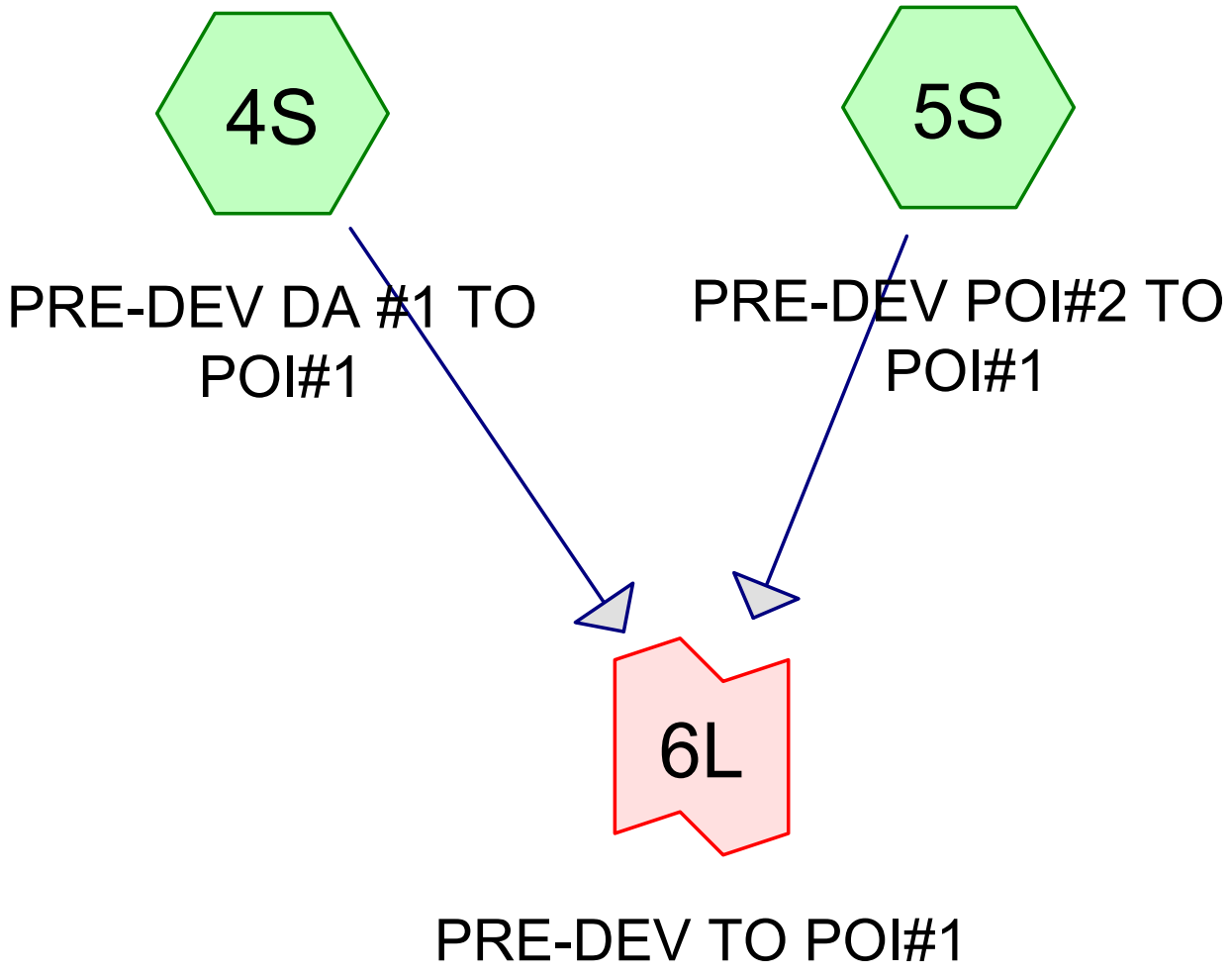

Subcat Reach Pond Link

Routing Diagram for BMW_2024-07-22
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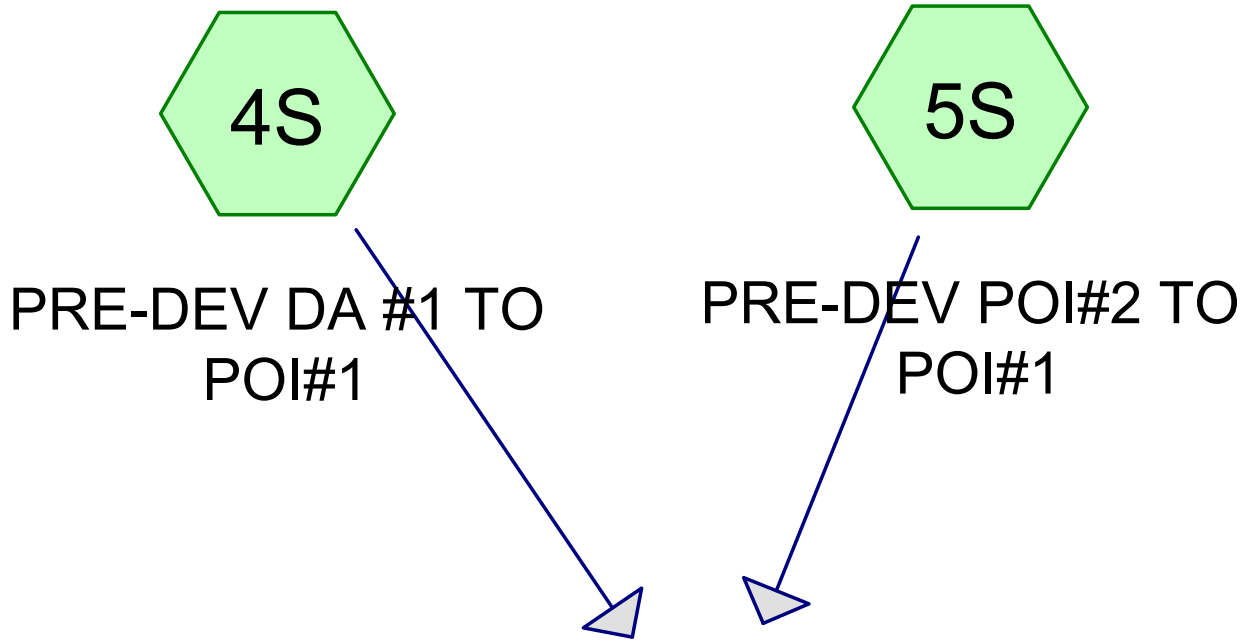

Subcat Reach Pond Link

Routing Diagram for BMW_2024-07-22
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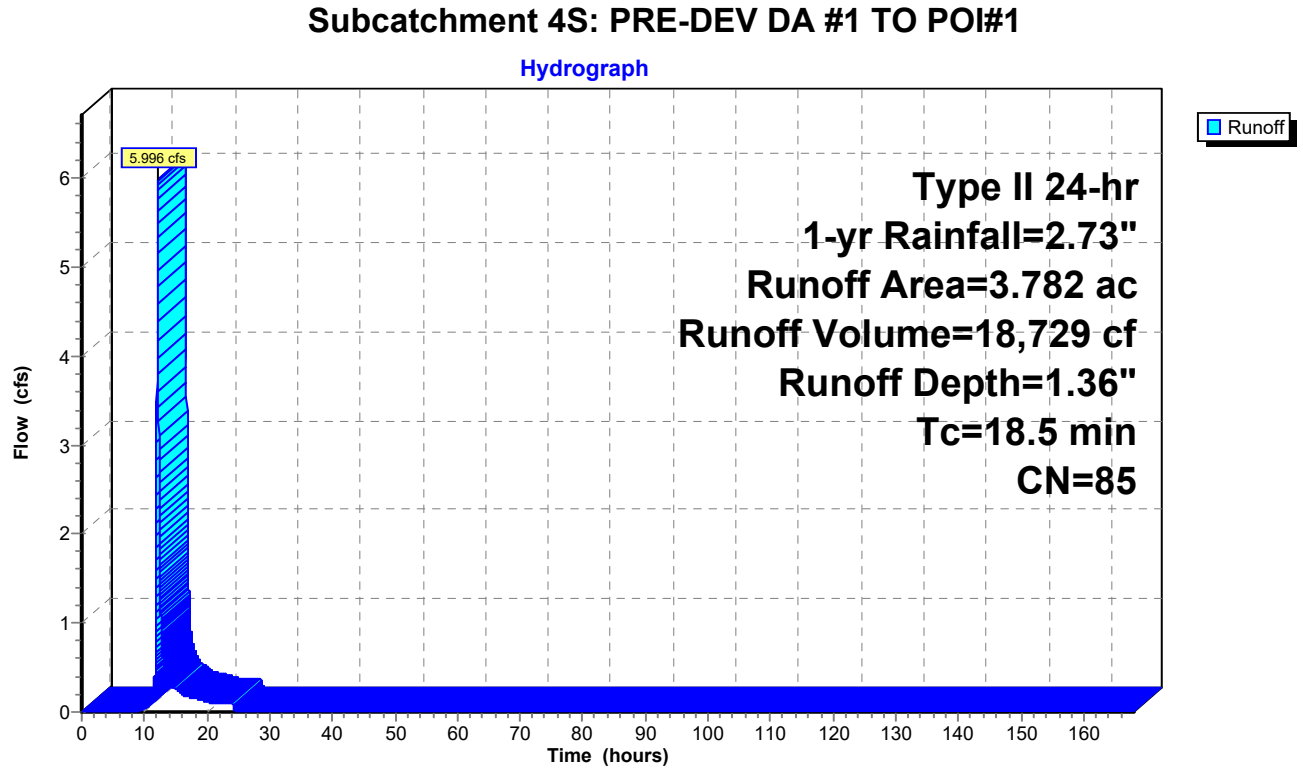
Summary for Subcatchment 4S: PRE-DEV DA #1 TO POI#1

Runoff = 5.996 cfs @ 12.11 hrs, Volume= 18,729 cf, Depth= 1.36"
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	39	Meadow A
*	0.282	30	Wooded A
*	0.024	61	Meadow B
*	3.010	98	Impervious
	3.782	85	Weighted Average
	0.772		20.41% Pervious Area
	3.010		79.59% Impervious Area

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



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

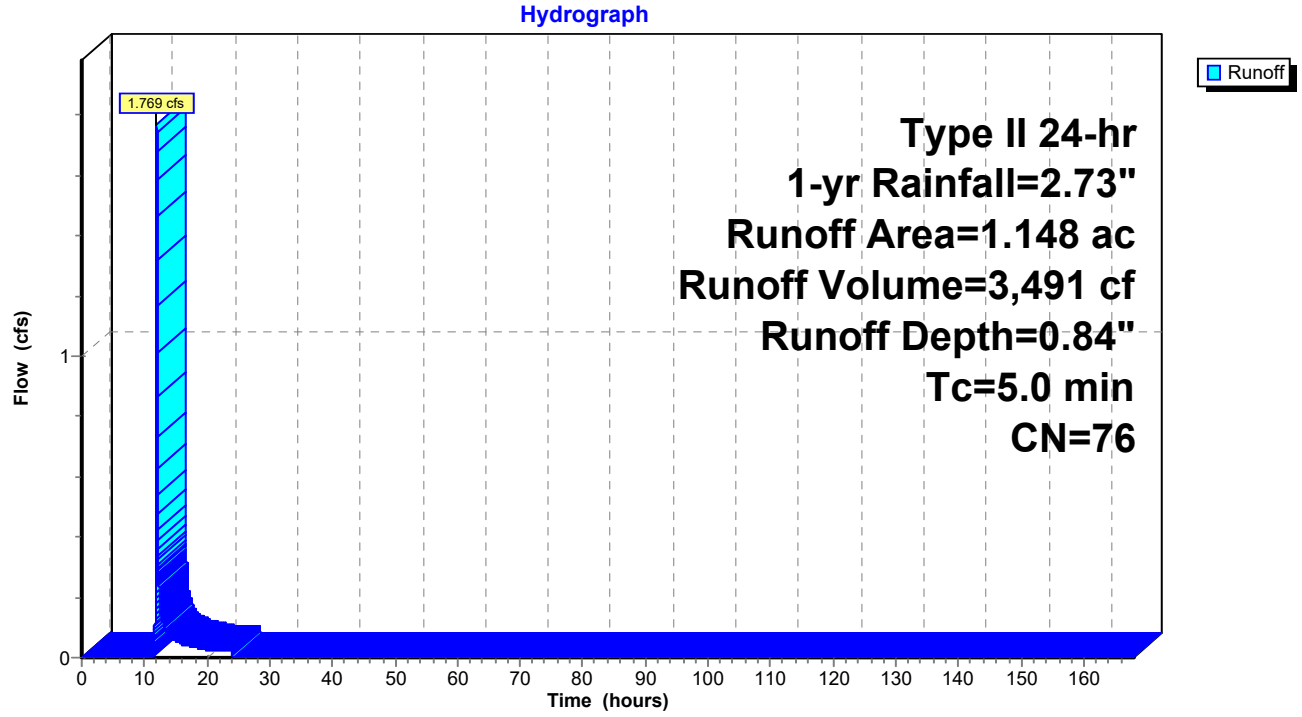
Runoff = 1.769 cfs @ 11.97 hrs, Volume= 3,491 cf, Depth= 0.84"
Routed to Link 6L : PRE-DEV TO POI#1

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	39	Meadow A
*	0.051	61	Meadow B
*	0.707	98	Impervious
	1.148	76	Weighted Average
	0.441		38.41% Pervious Area
	0.707		61.59% 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

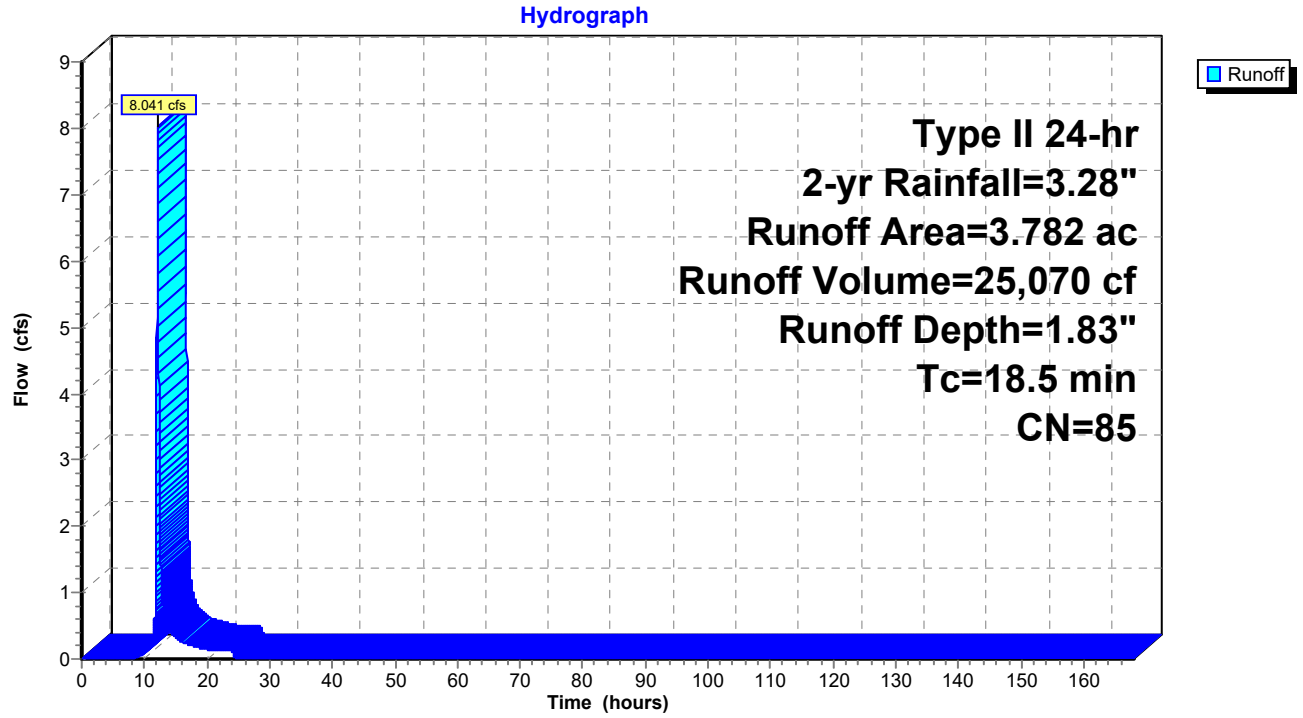
Runoff = 8.041 cfs @ 12.11 hrs, Volume= 25,070 cf, Depth= 1.83"
Routed to Link 6L : PRE-DEV TO POI#1

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	39	Meadow A
*	0.282	30	Wooded A
*	0.024	61	Meadow B
*	3.010	98	Impervious
	3.782	85	Weighted Average
	0.772		20.41% Pervious Area
	3.010		79.59% 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

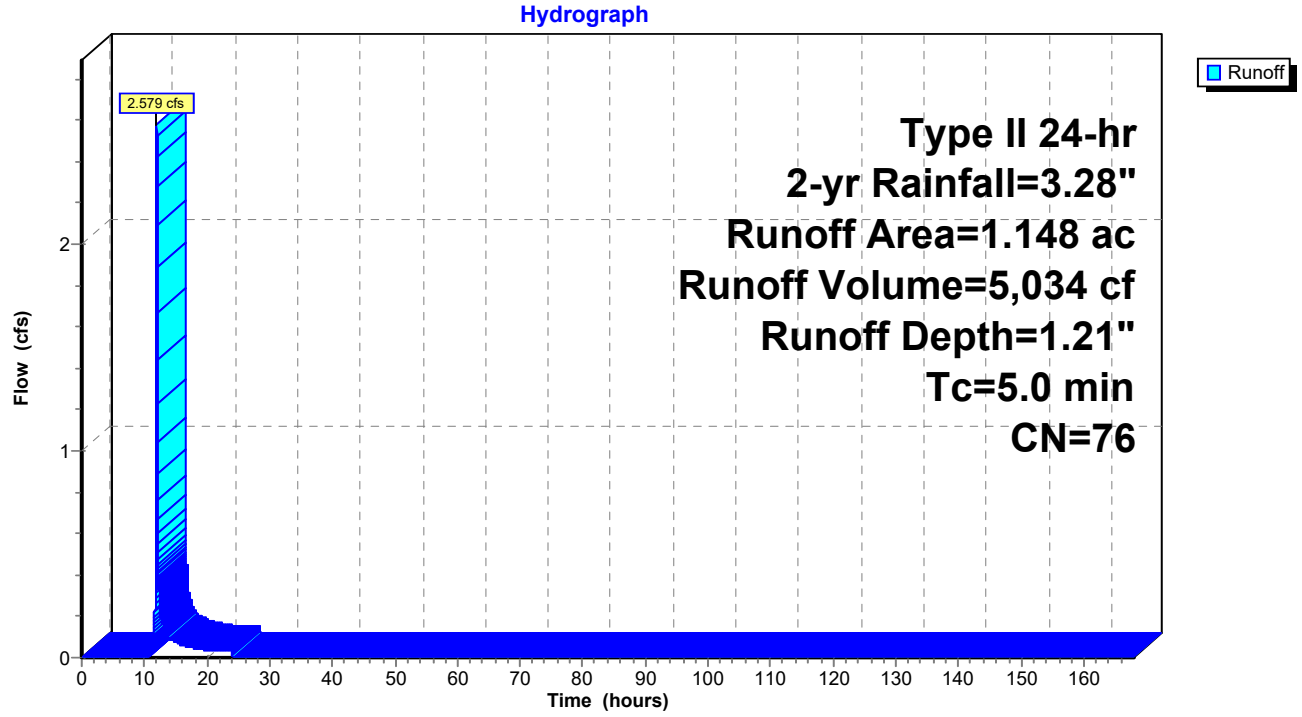
Runoff = 2.579 cfs @ 11.97 hrs, Volume= 5,034 cf, Depth= 1.21"
Routed to Link 6L : PRE-DEV TO POI#1

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	39	Meadow A
*	0.051	61	Meadow B
*	0.707	98	Impervious
	1.148	76	Weighted Average
	0.441		38.41% Pervious Area
	0.707		61.59% 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

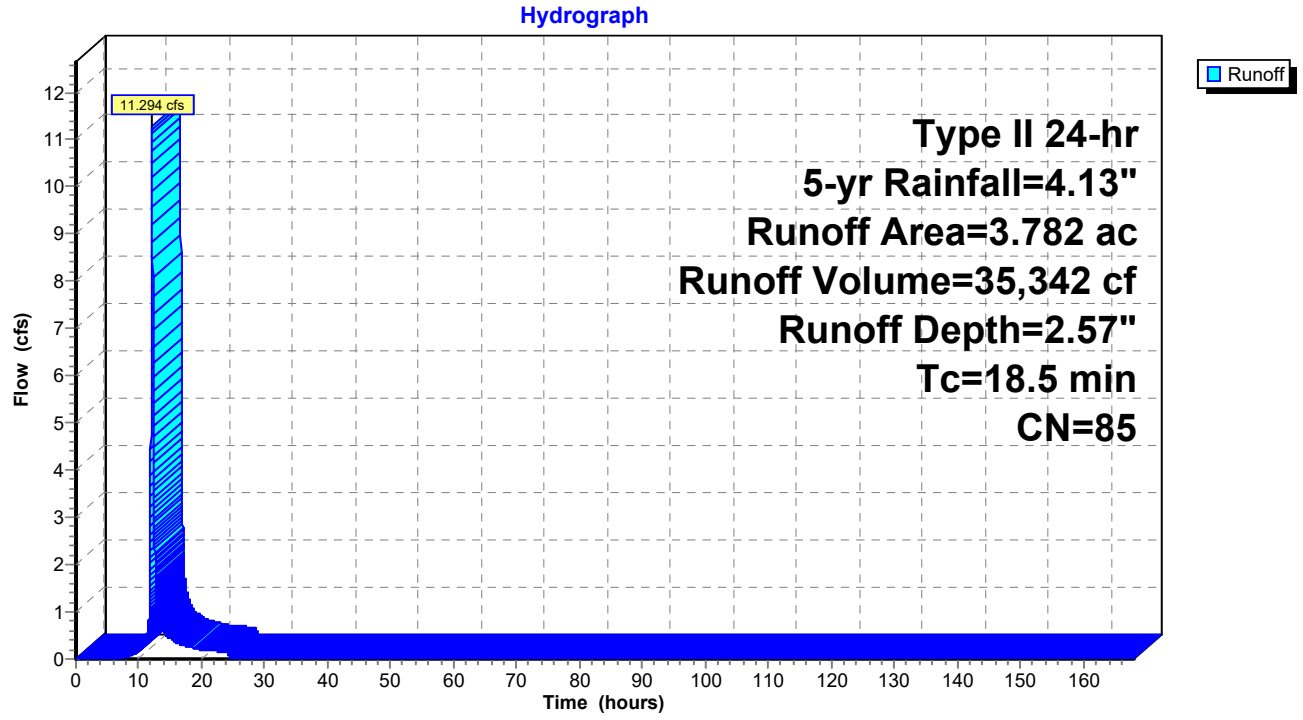
Runoff = 11.294 cfs @ 12.11 hrs, Volume= 35,342 cf, Depth= 2.57"
Routed to Link 6L : PRE-DEV TO POI#1

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	39	Meadow A
*	0.282	30	Wooded A
*	0.024	61	Meadow B
*	3.010	98	Impervious
	3.782	85	Weighted Average
	0.772		20.41% Pervious Area
	3.010		79.59% 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



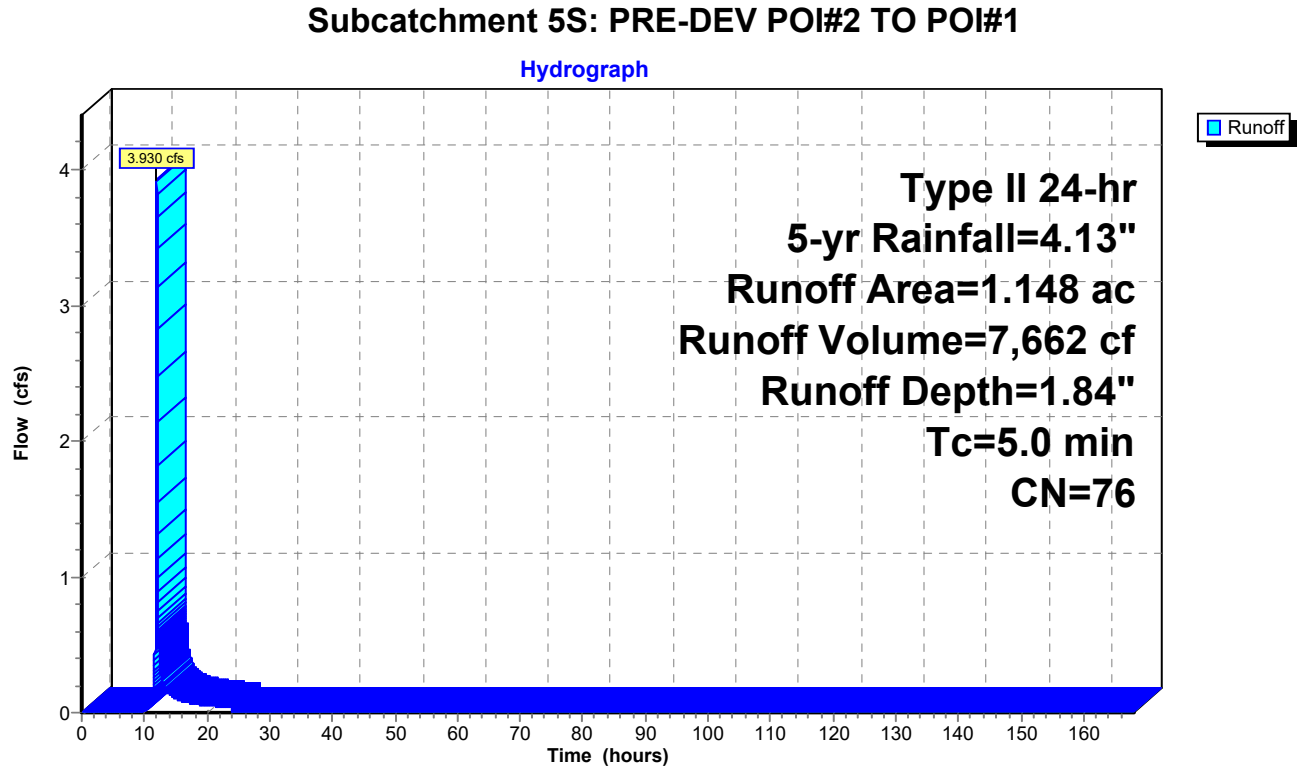
Summary for Subcatchment 5S: PRE-DEV POI#2 TO POI#1

Runoff = 3.930 cfs @ 11.96 hrs, Volume= 7,662 cf, Depth= 1.84"
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	39	Meadow A
*	0.051	61	Meadow B
*	0.707	98	Impervious
	1.148	76	Weighted Average
	0.441		38.41% Pervious Area
	0.707		61.59% Impervious Area

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



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

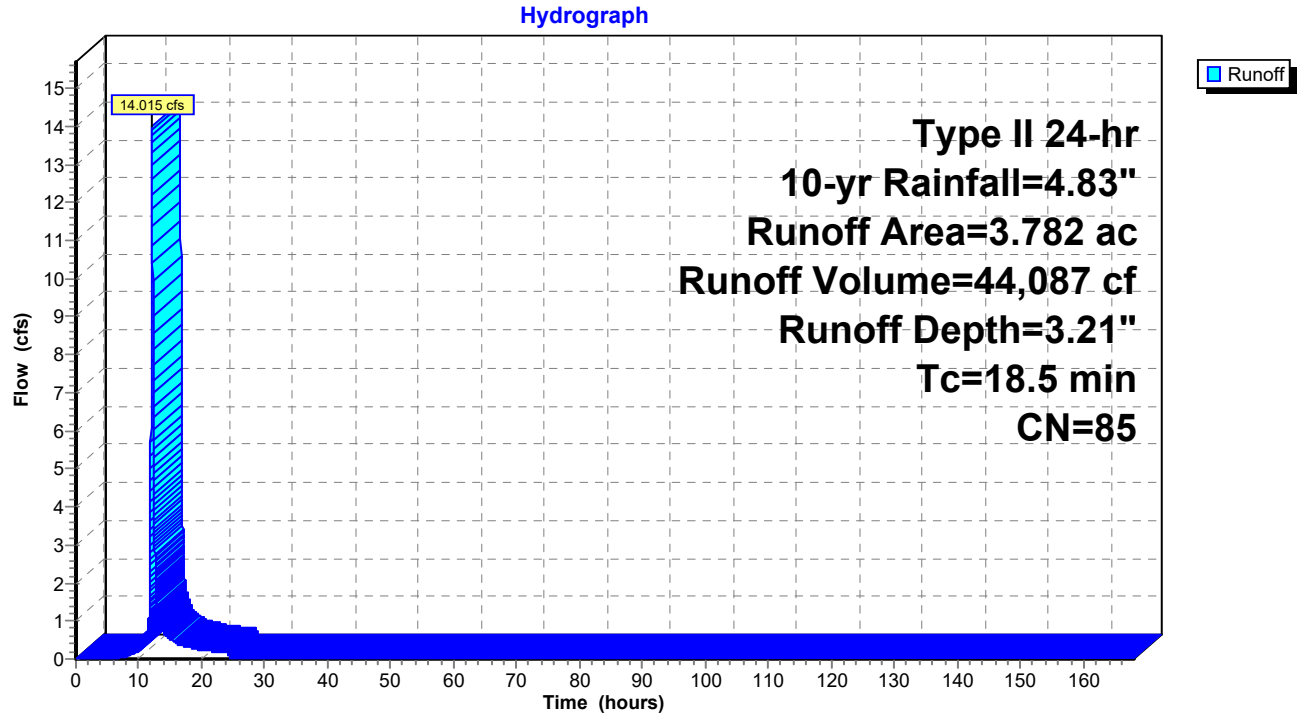
Runoff = 14.015 cfs @ 12.11 hrs, Volume= 44,087 cf, Depth= 3.21"
Routed to Link 6L : PRE-DEV TO POI#1

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	39	Meadow A
*	0.282	30	Wooded A
*	0.024	61	Meadow B
*	3.010	98	Impervious
	3.782	85	Weighted Average
	0.772		20.41% Pervious Area
	3.010		79.59% 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

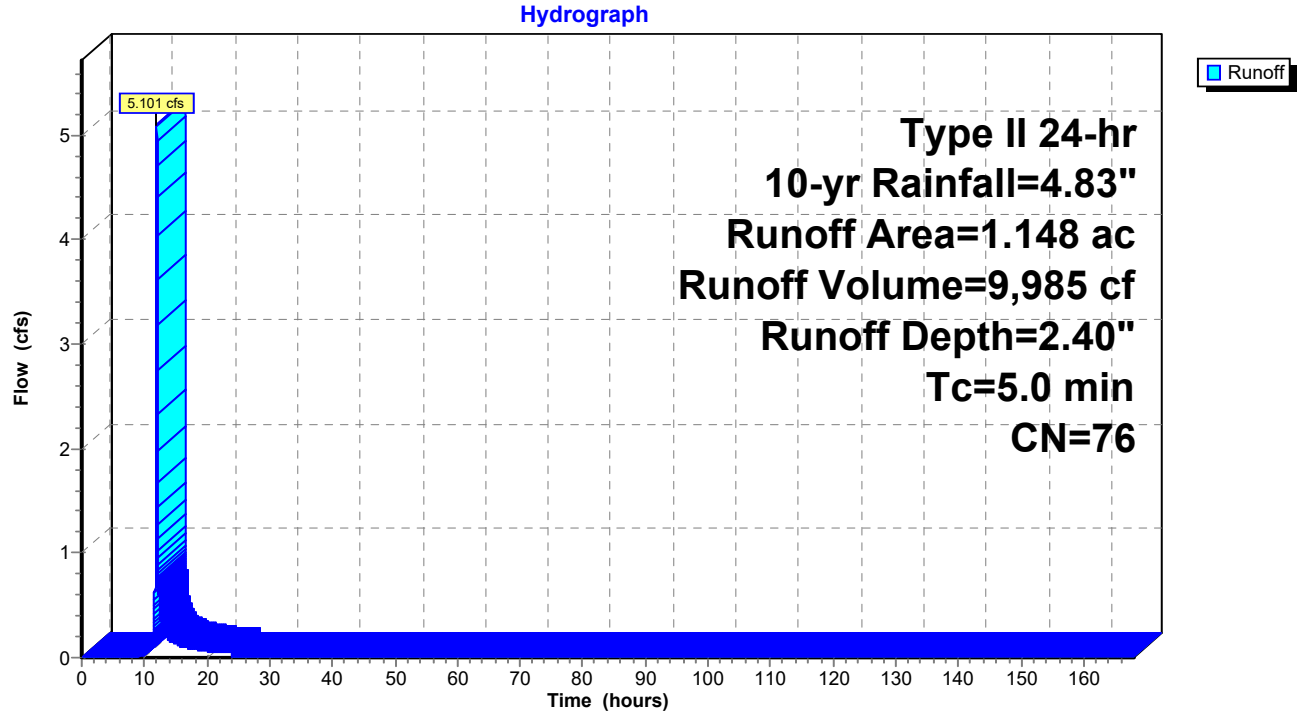
Runoff = 5.101 cfs @ 11.96 hrs, Volume= 9,985 cf, Depth= 2.40"
Routed to Link 6L : PRE-DEV TO POI#1

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	39	Meadow A
*	0.051	61	Meadow B
*	0.707	98	Impervious
	1.148	76	Weighted Average
	0.441		38.41% Pervious Area
	0.707		61.59% 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

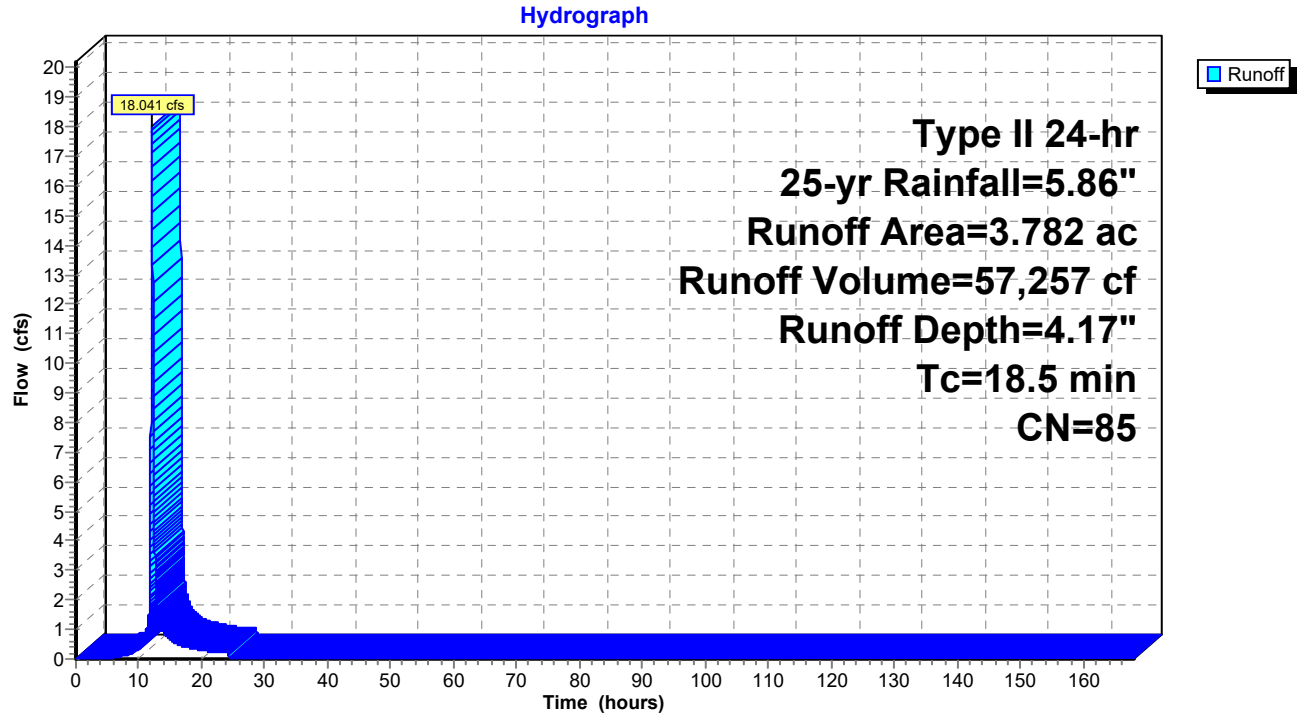
Runoff = 18.041 cfs @ 12.11 hrs, Volume= 57,257 cf, Depth= 4.17"
Routed to Link 6L : PRE-DEV TO POI#1

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	39	Meadow A
*	0.282	30	Wooded A
*	0.024	61	Meadow B
*	3.010	98	Impervious
	3.782	85	Weighted Average
	0.772		20.41% Pervious Area
	3.010		79.59% 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

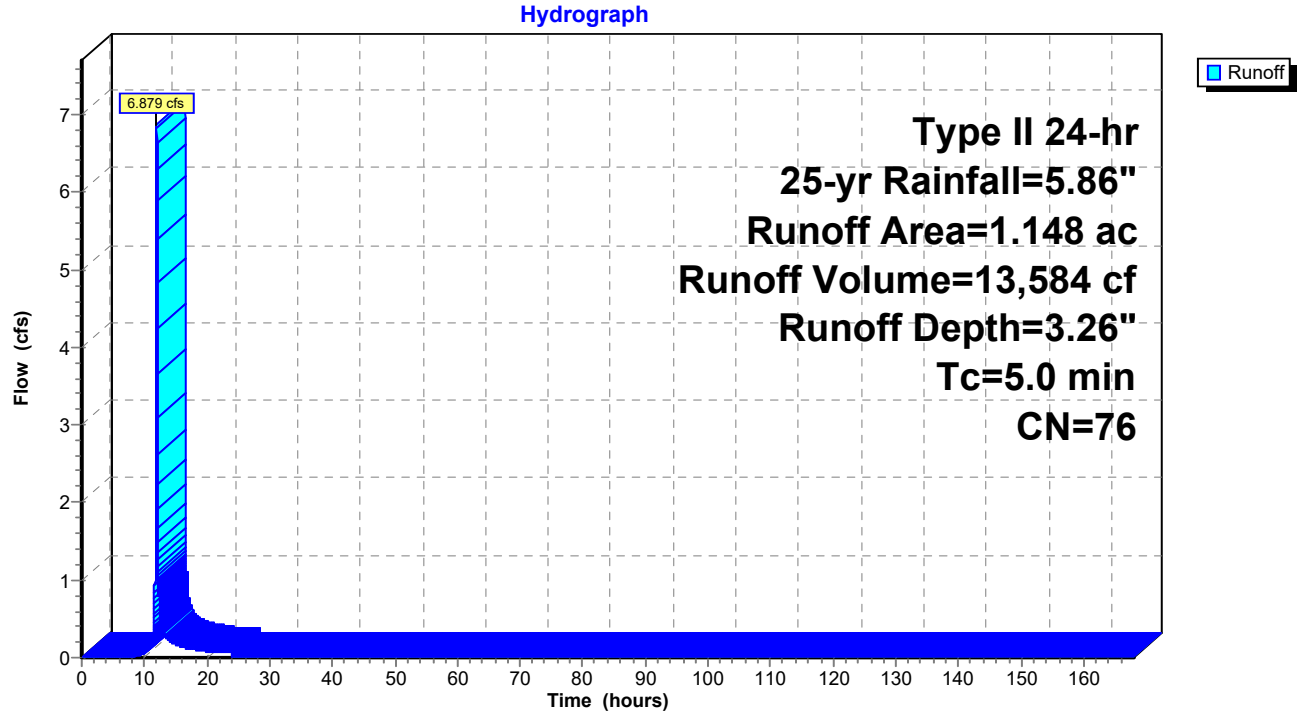
Runoff = 6.879 cfs @ 11.96 hrs, Volume= 13,584 cf, Depth= 3.26"
Routed to Link 6L : PRE-DEV TO POI#1

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	39	Meadow A
*	0.051	61	Meadow B
*	0.707	98	Impervious
	1.148	76	Weighted Average
	0.441		38.41% Pervious Area
	0.707		61.59% 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

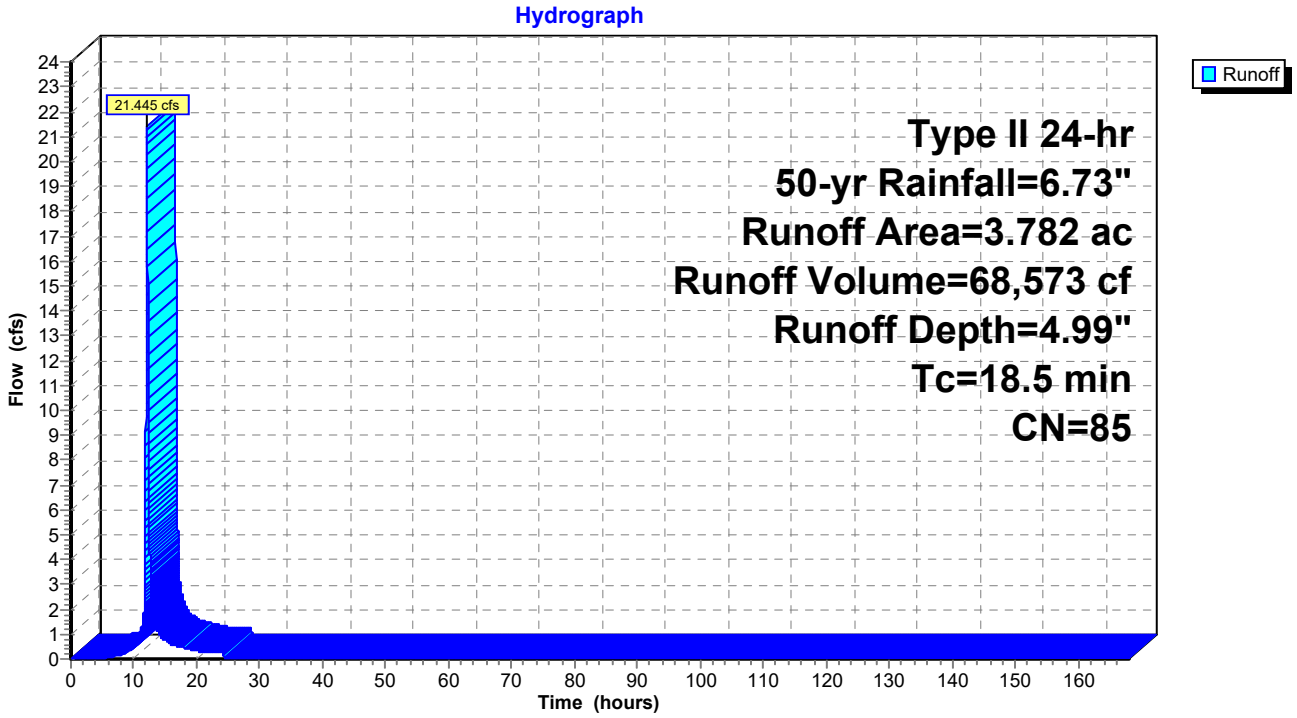
Runoff = 21.445 cfs @ 12.11 hrs, Volume= 68,573 cf, Depth= 4.99"
Routed to Link 6L : PRE-DEV TO POI#1

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	39	Meadow A
*	0.282	30	Wooded A
*	0.024	61	Meadow B
*	3.010	98	Impervious
	3.782	85	Weighted Average
	0.772		20.41% Pervious Area
	3.010		79.59% 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

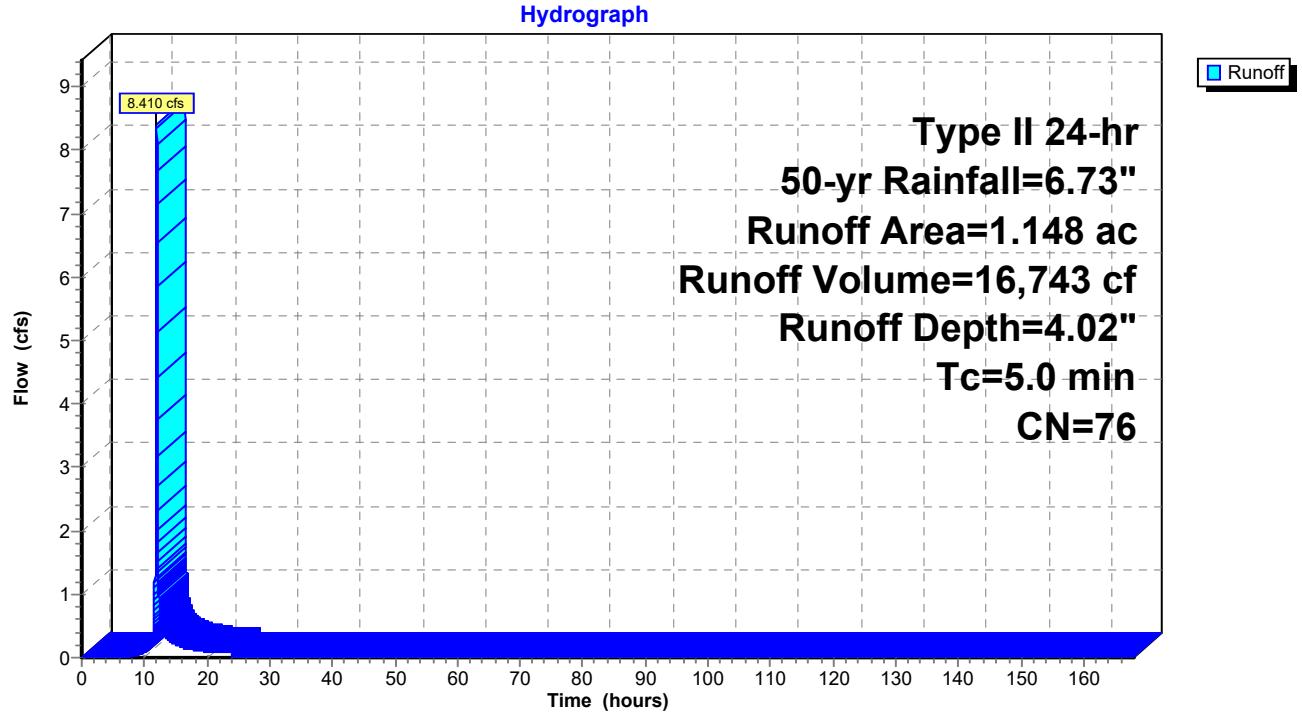
Runoff = 8.410 cfs @ 11.96 hrs, Volume= 16,743 cf, Depth= 4.02"
Routed to Link 6L : PRE-DEV TO POI#1

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	39	Meadow A
*	0.051	61	Meadow B
*	0.707	98	Impervious
	1.148	76	Weighted Average
	0.441		38.41% Pervious Area
	0.707		61.59% 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

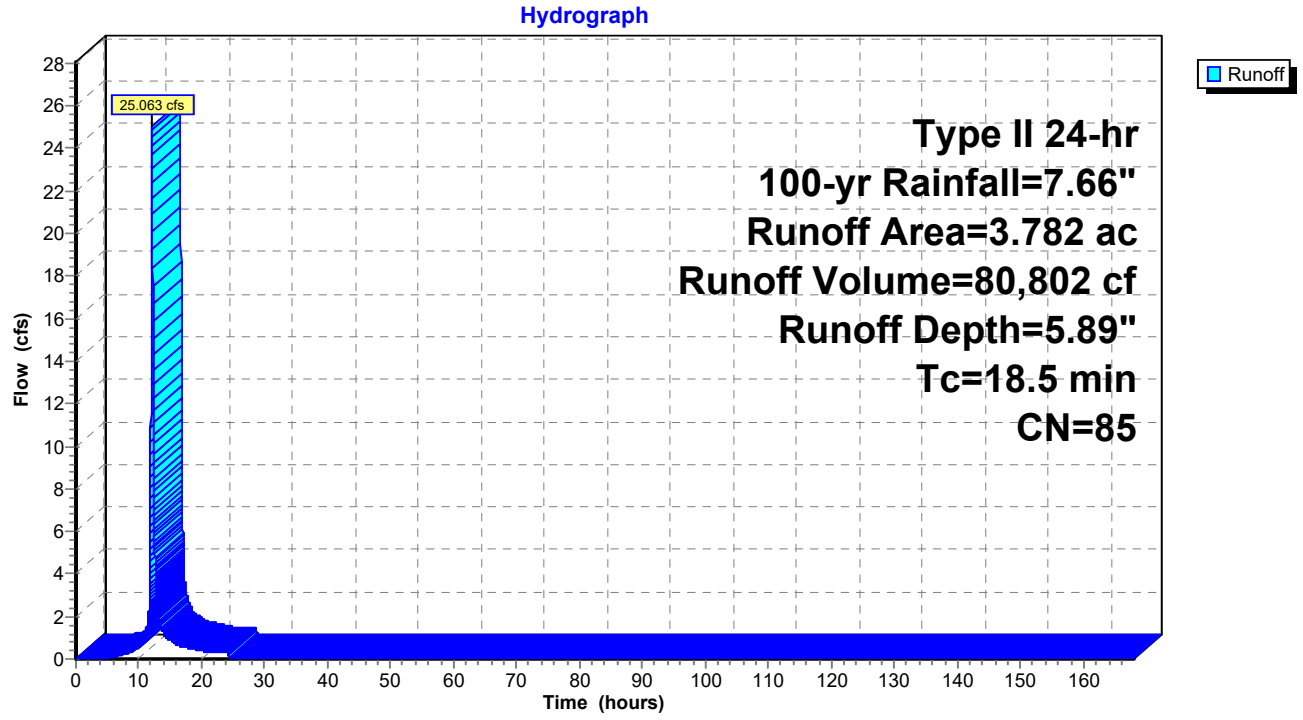
Runoff = 25.063 cfs @ 12.10 hrs, Volume= 80,802 cf, Depth= 5.89"
Routed to Link 6L : PRE-DEV TO POI#1

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	39	Meadow A
*	0.282	30	Wooded A
*	0.024	61	Meadow B
*	3.010	98	Impervious
	3.782	85	Weighted Average
	0.772		20.41% Pervious Area
	3.010		79.59% 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

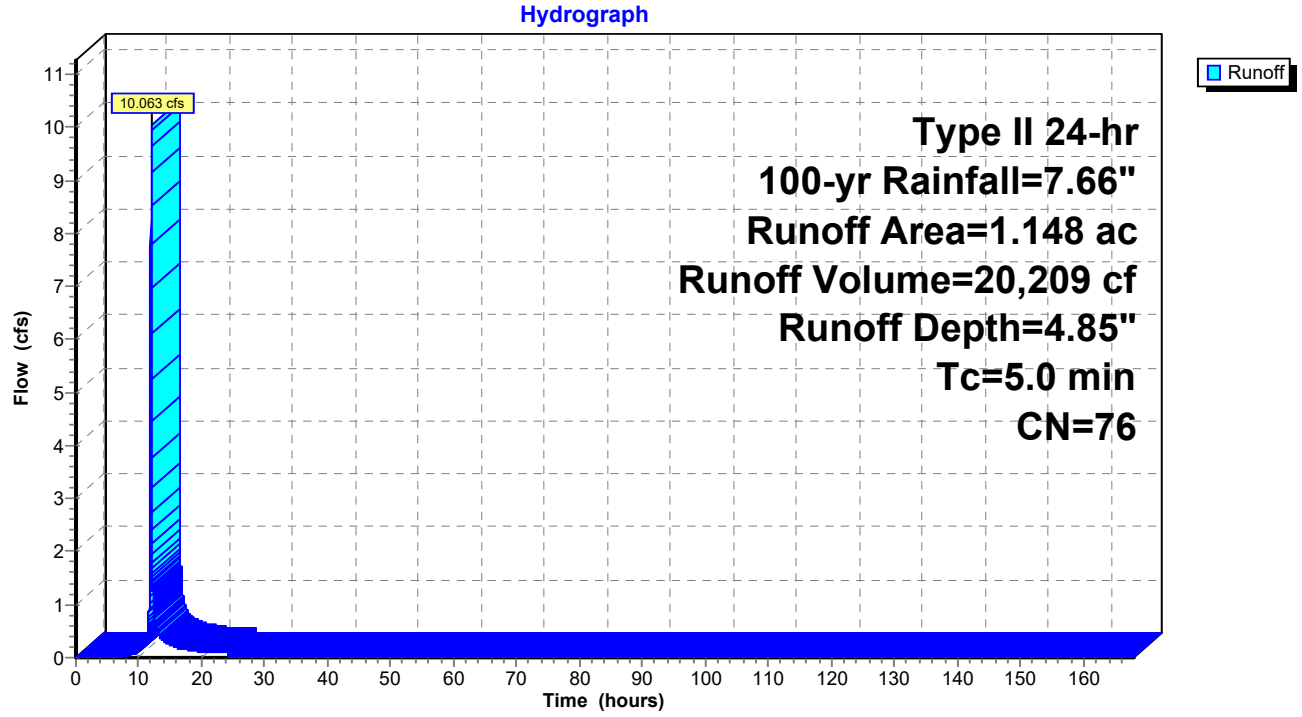
Runoff = 10.063 cfs @ 11.96 hrs, Volume= 20,209 cf, Depth= 4.85"
Routed to Link 6L : PRE-DEV TO POI#1

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	39	Meadow A
*	0.051	61	Meadow B
*	0.707	98	Impervious
	1.148	76	Weighted Average
	0.441		38.41% Pervious Area
	0.707		61.59% 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_2024-07-22
Prepared by Bohler, Printed 10/29/2024
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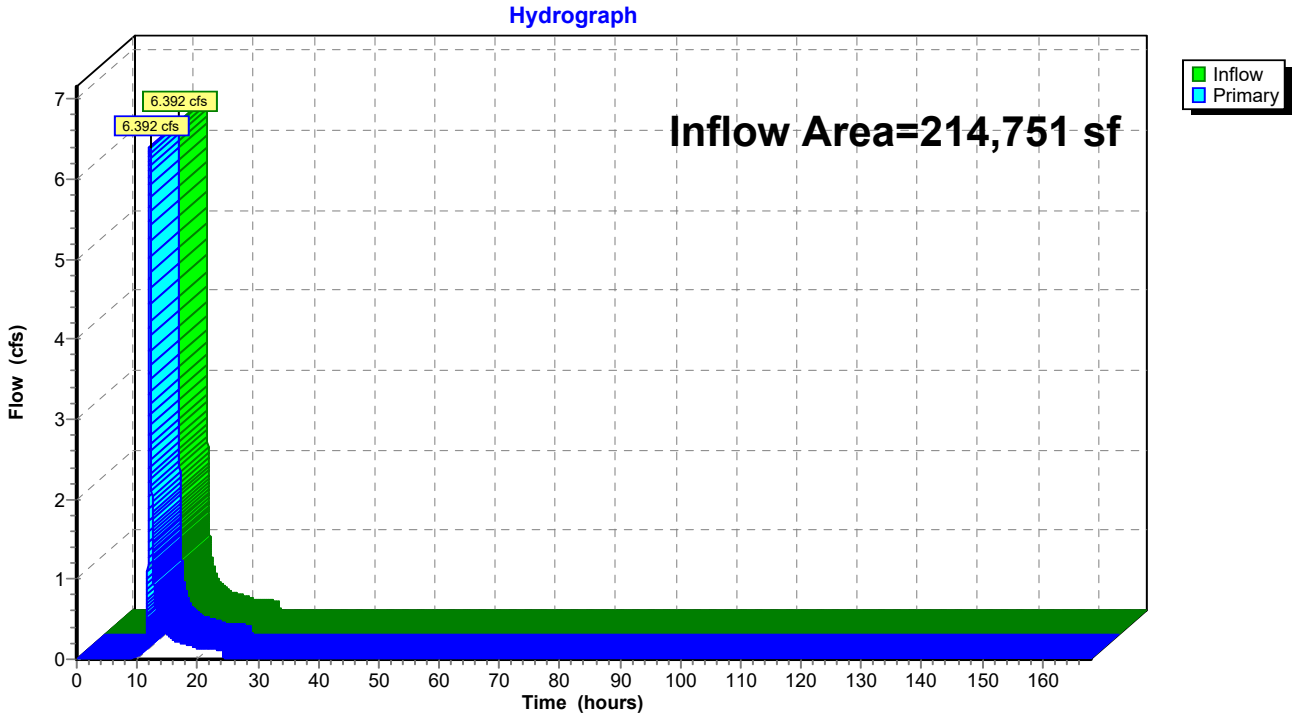
Summary for Link 6L: PRE-DEV TO POI#1

Inflow Area = 214,751 sf, 75.40% Impervious, Inflow Depth = 1.24" for 1-yr event
Inflow = 6.392 cfs @ 12.10 hrs, Volume= 22,220 cf
Primary = 6.392 cfs @ 12.10 hrs, Volume= 22,220 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

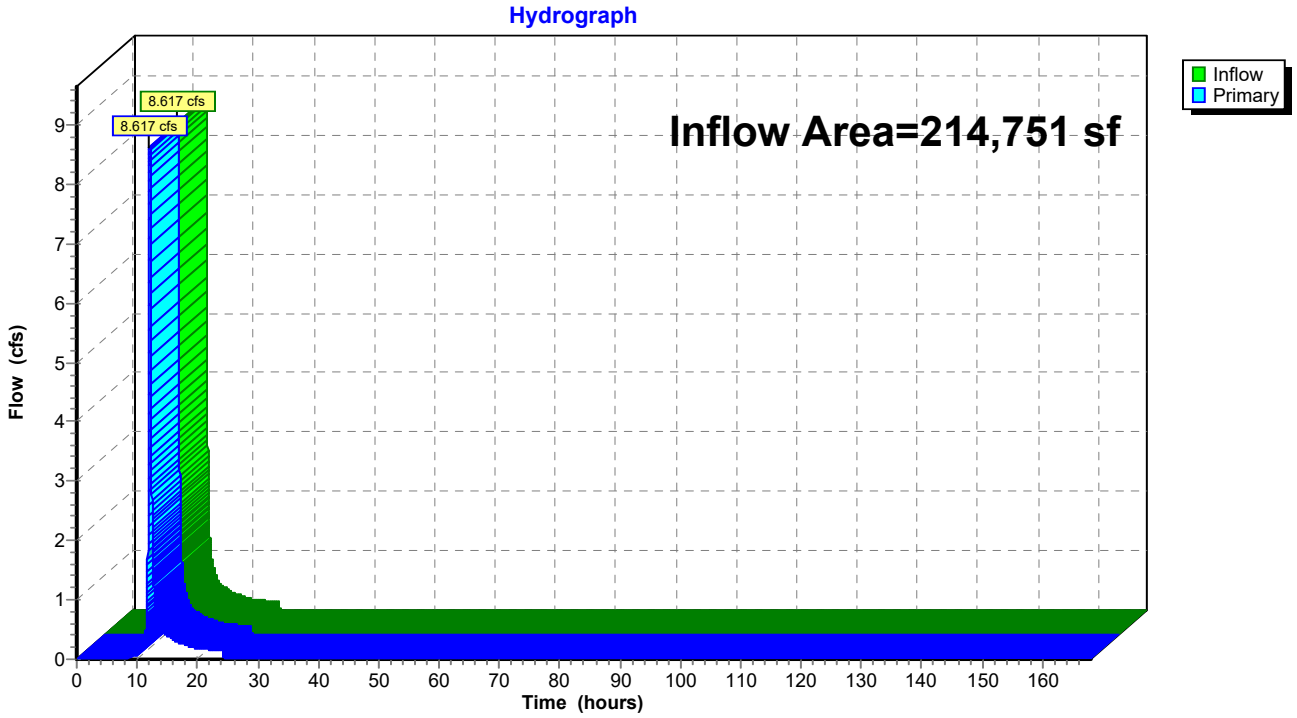


Summary for Link 6L: PRE-DEV TO POI#1

Inflow Area = 214,751 sf, 75.40% Impervious, Inflow Depth = 1.68" for 2-yr event
Inflow = 8.617 cfs @ 12.09 hrs, Volume= 30,104 cf
Primary = 8.617 cfs @ 12.09 hrs, Volume= 30,104 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

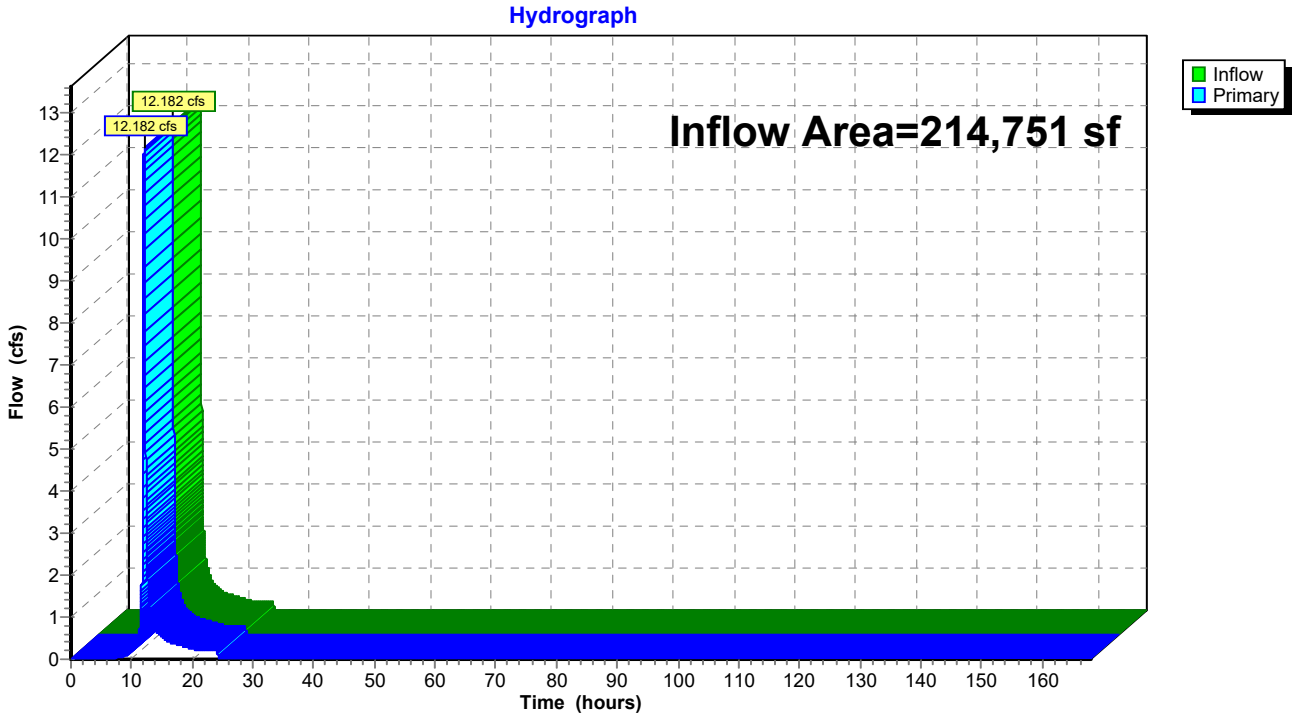


Summary for Link 6L: PRE-DEV TO POI#1

Inflow Area = 214,751 sf, 75.40% Impervious, Inflow Depth = 2.40" for 5-yr event
Inflow = 12.182 cfs @ 12.07 hrs, Volume= 43,004 cf
Primary = 12.182 cfs @ 12.07 hrs, Volume= 43,004 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

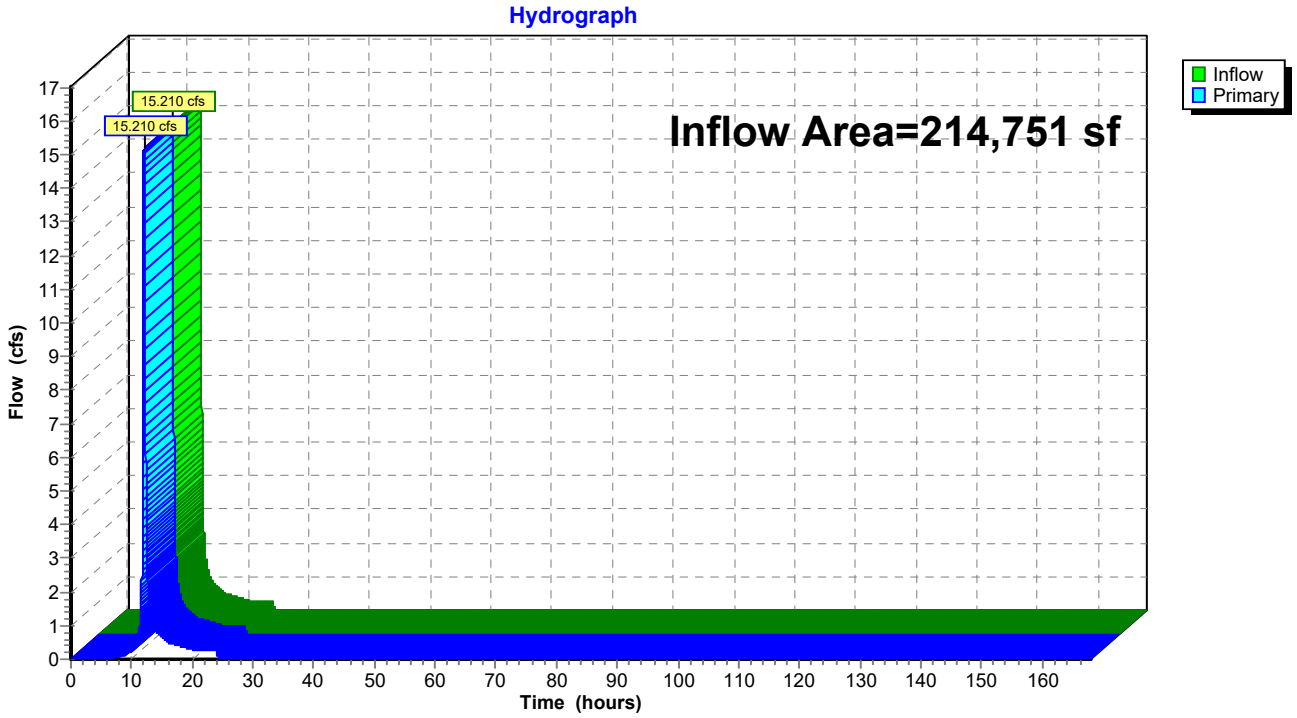


Summary for Link 6L: PRE-DEV TO POI#1

Inflow Area = 214,751 sf, 75.40% Impervious, Inflow Depth = 3.02" for 10-yr event
Inflow = 15.210 cfs @ 12.07 hrs, Volume= 54,072 cf
Primary = 15.210 cfs @ 12.07 hrs, Volume= 54,072 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

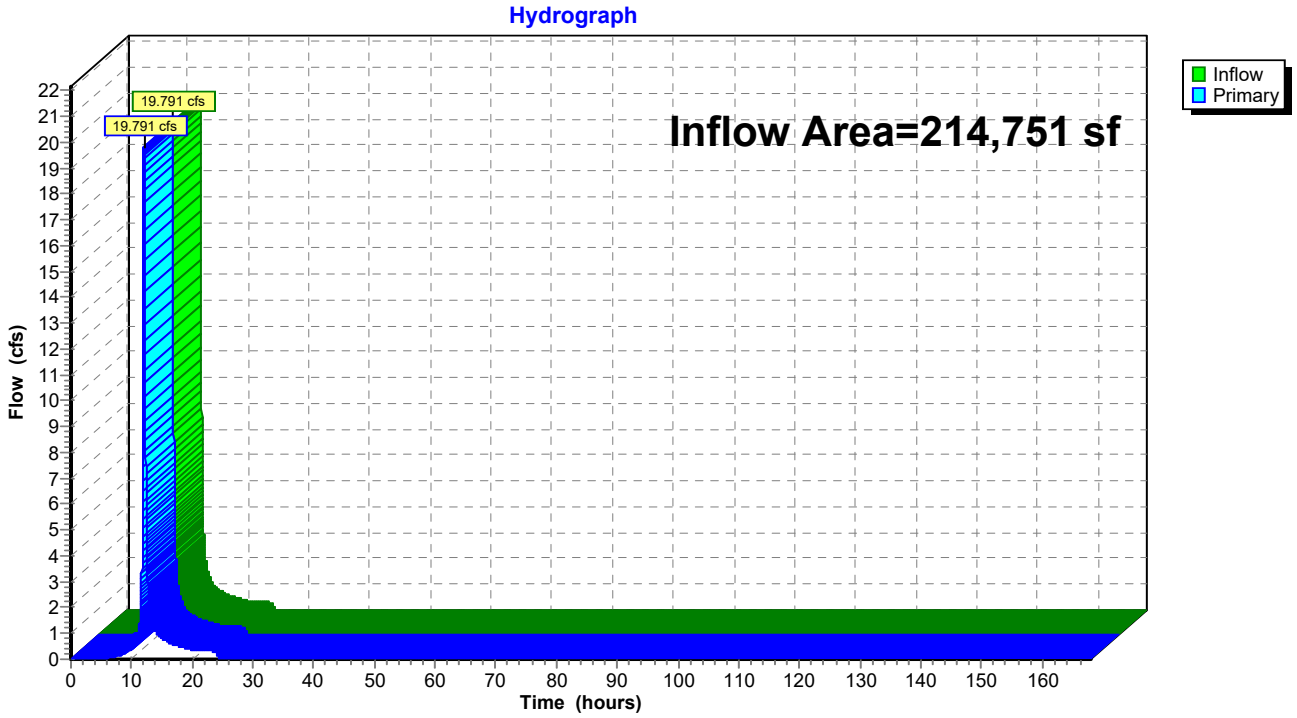


Summary for Link 6L: PRE-DEV TO POI#1

Inflow Area = 214,751 sf, 75.40% Impervious, Inflow Depth = 3.96" for 25-yr event
Inflow = 19.791 cfs @ 12.03 hrs, Volume= 70,841 cf
Primary = 19.791 cfs @ 12.03 hrs, Volume= 70,841 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

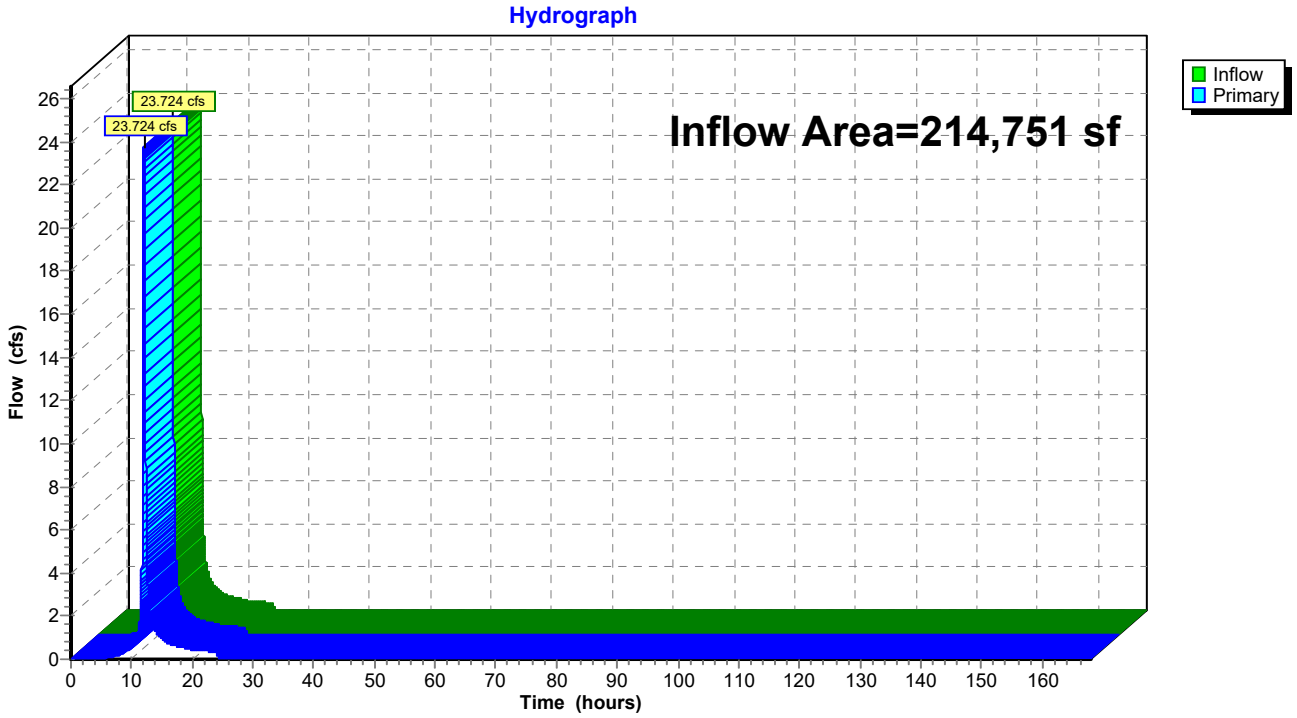


Summary for Link 6L: PRE-DEV TO POI#1

Inflow Area = 214,751 sf, 75.40% Impervious, Inflow Depth = 4.77" for 50-yr event
Inflow = 23.724 cfs @ 12.03 hrs, Volume= 85,316 cf
Primary = 23.724 cfs @ 12.03 hrs, Volume= 85,316 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

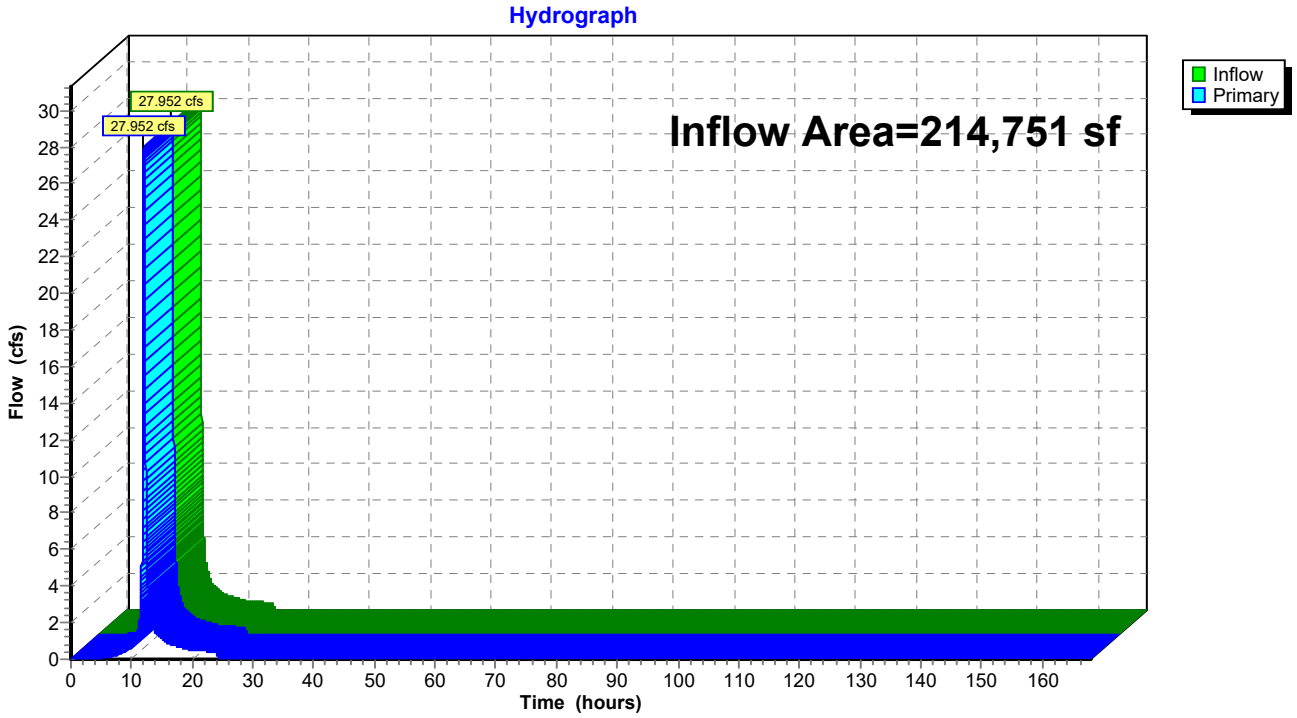


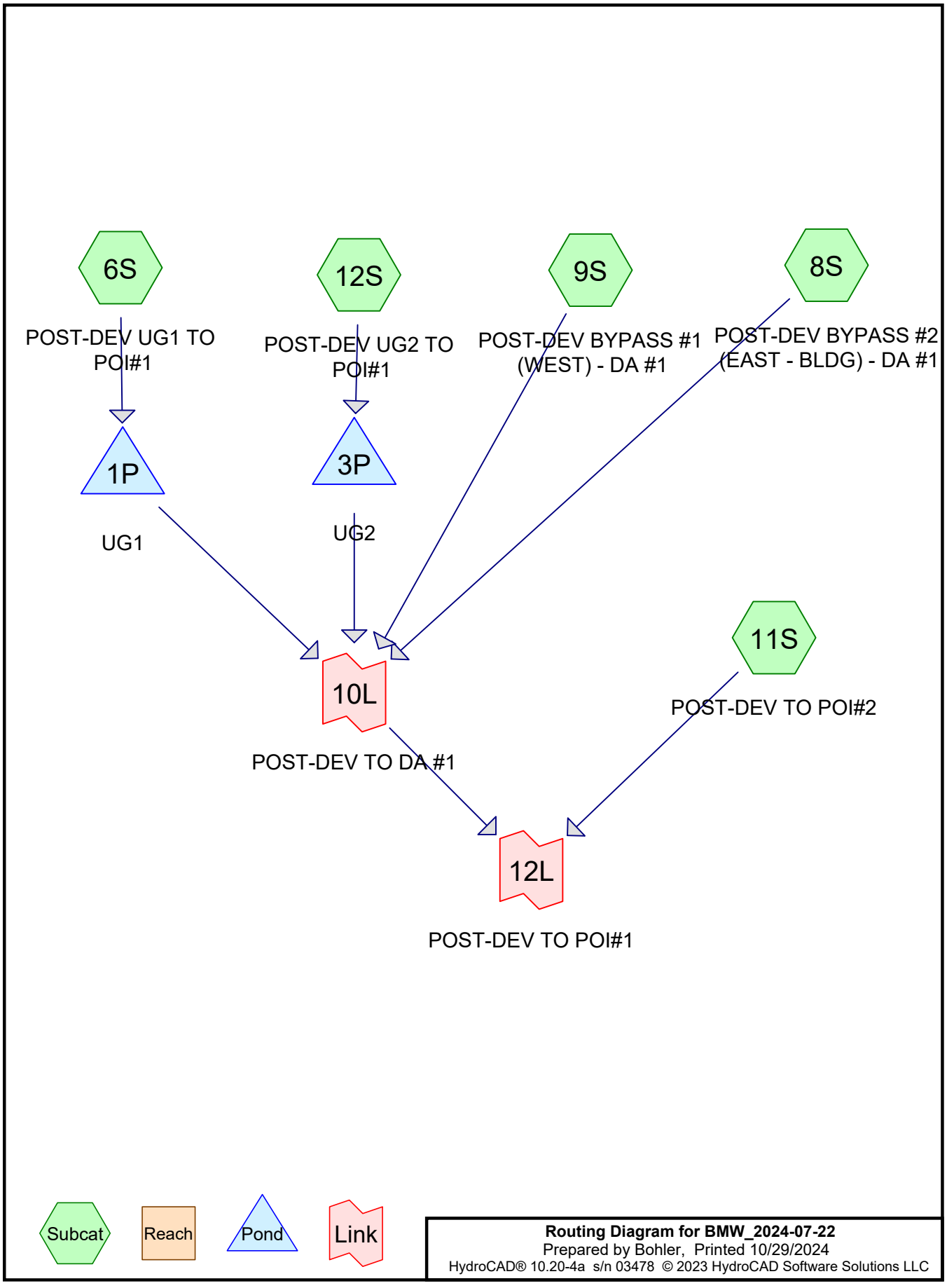
Summary for Link 6L: PRE-DEV TO POI#1

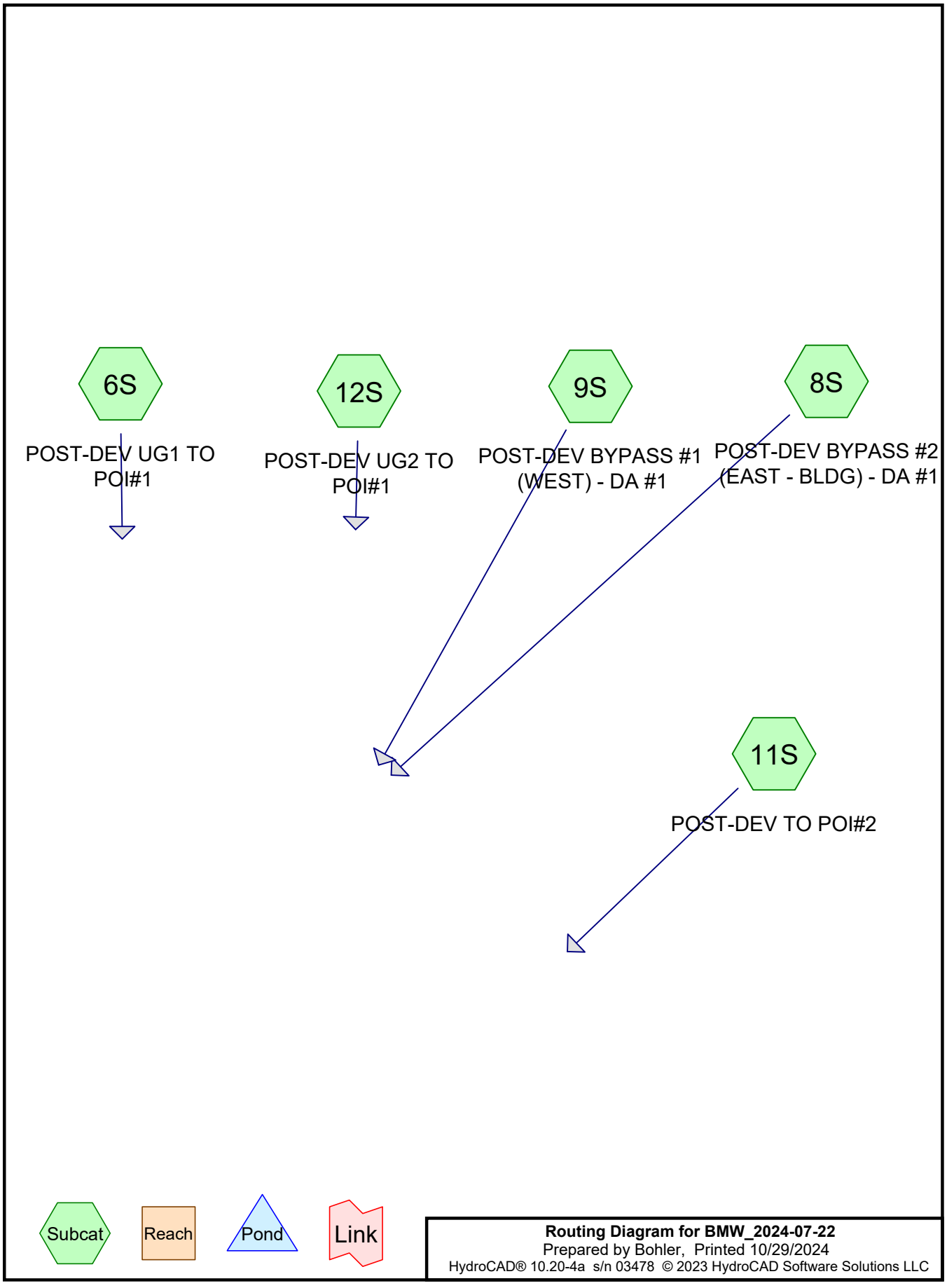
Inflow Area = 214,751 sf, 75.40% Impervious, Inflow Depth = 5.64" for 100-yr event
Inflow = 27.952 cfs @ 12.02 hrs, Volume= 101,011 cf
Primary = 27.952 cfs @ 12.02 hrs, Volume= 101,011 cf, Atten= 0%, Lag= 0.0 min

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_2024-07-22
Prepared by Bohler, Printed 10/29/2024
HydroCAD® 10.20-4a s/n 03478 © 2023 HydroCAD Software Solutions LLC


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_2024-07-22
Prepared by Bohler, Printed 10/29/2024
HydroCAD® 10.20-4a s/n 03478 © 2023 HydroCAD Software Solutions LLC

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
166,181	98	Impervious (6S, 8S, 9S, 11S, 12S)
29,011	39	Lawn A (6S, 9S, 11S, 12S)
5,663	61	Lawn B (11S)
12,415	30	Wooded A (9S)
213,270	**85**	**TOTAL AREA**

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

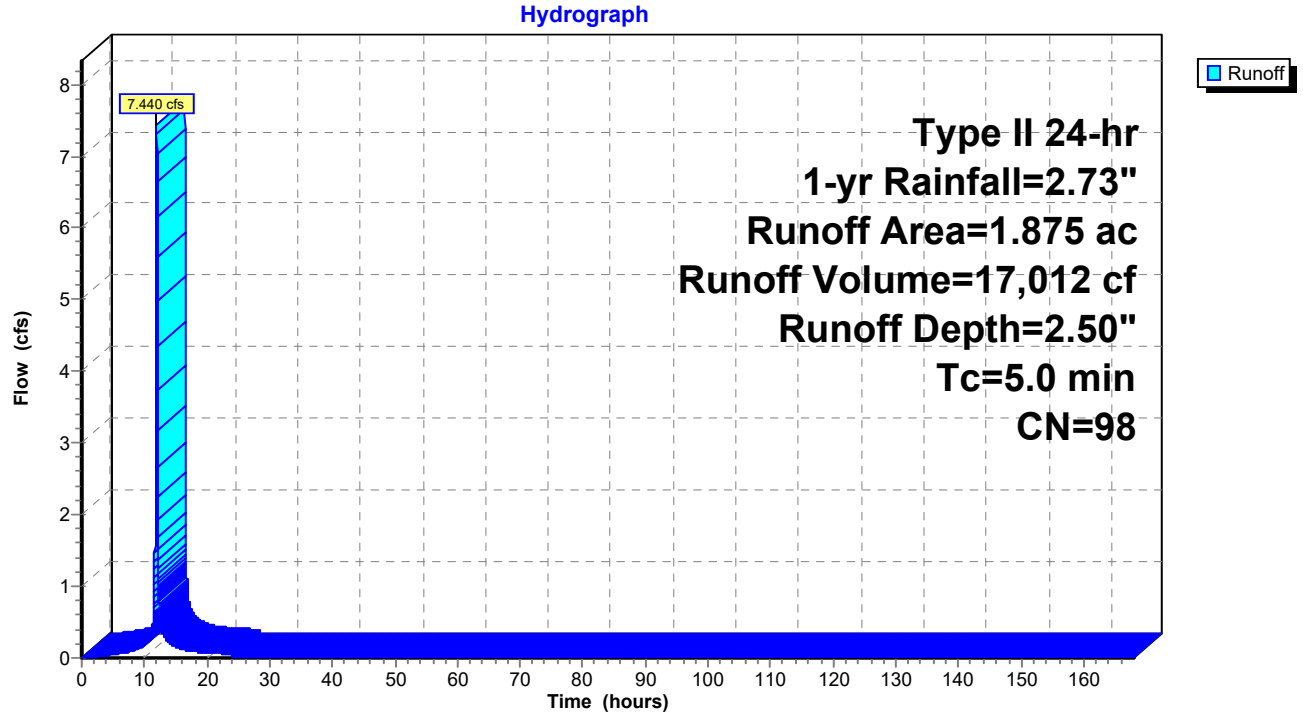
Runoff = 7.440 cfs @ 11.96 hrs, Volume= 17,012 cf, Depth= 2.50"
Routed to Pond 1P : UG1

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
*	0.015	39	Lawn A
*	1.860	98	Impervious
	1.875	98	Weighted Average
	0.015		0.80% Pervious Area
	1.860		99.20% 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

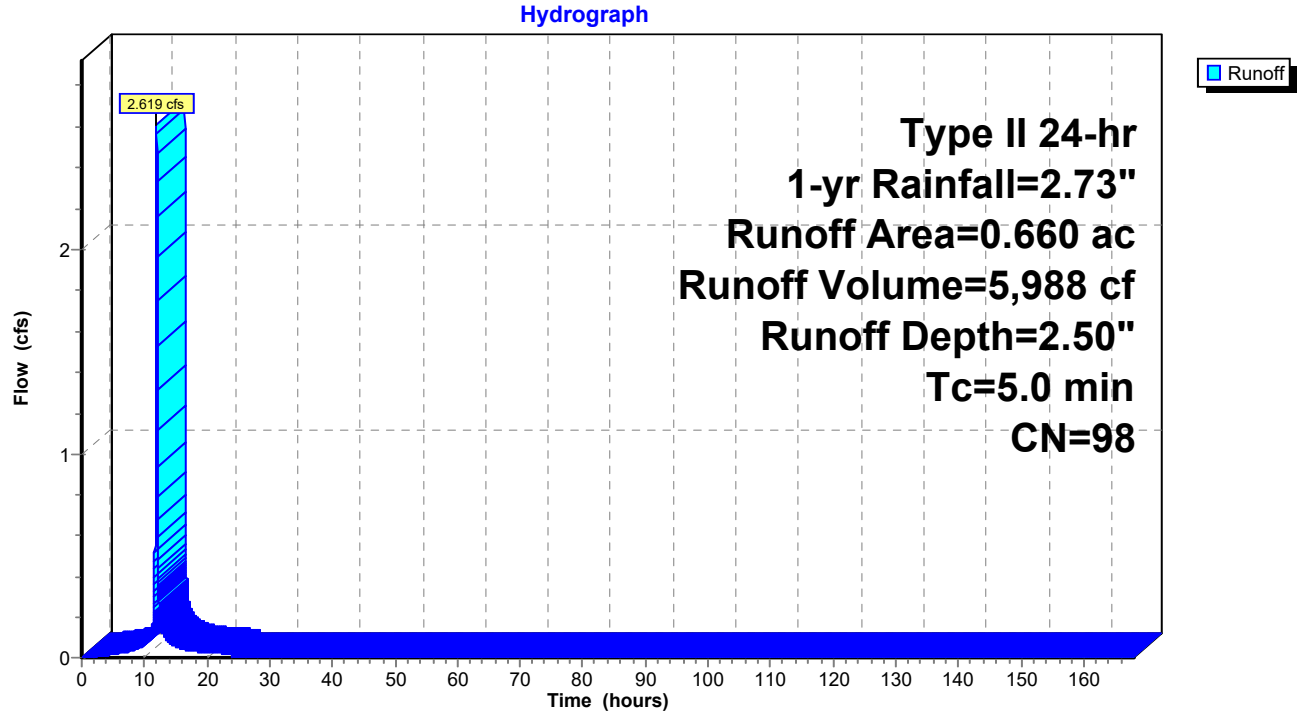
Runoff = 2.619 cfs @ 11.96 hrs, Volume= 5,988 cf, Depth= 2.50"
Routed to Link 10L : POST-DEV TO DA #1

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
*	0.660	98	Impervious
	0.660	98	Weighted Average
	0.660		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

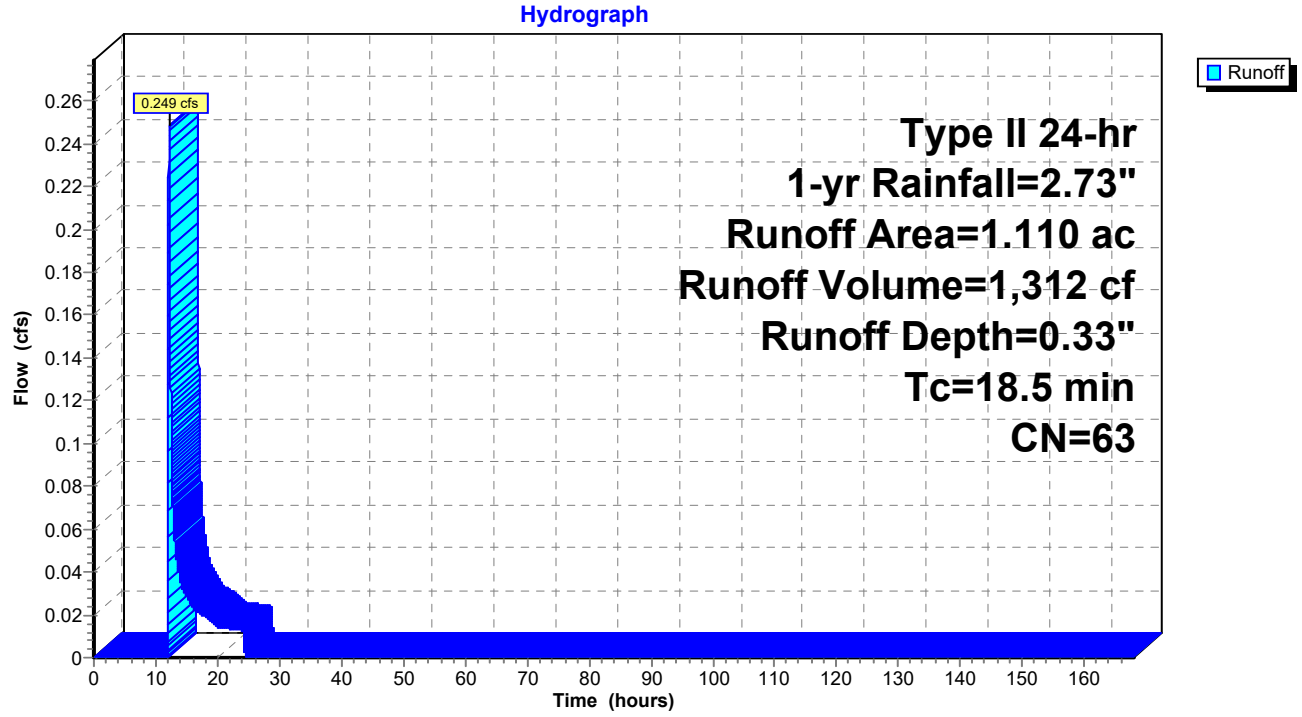
Runoff = 0.249 cfs @ 12.17 hrs, Volume= 1,312 cf, Depth= 0.33"
Routed to Link 10L : POST-DEV TO DA #1

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
*	0.322	39	Lawn A
*	0.285	30	Wooded A
*	0.503	98	Impervious
	1.110	63	Weighted Average
	0.607		54.68% Pervious Area
	0.503		45.32% 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

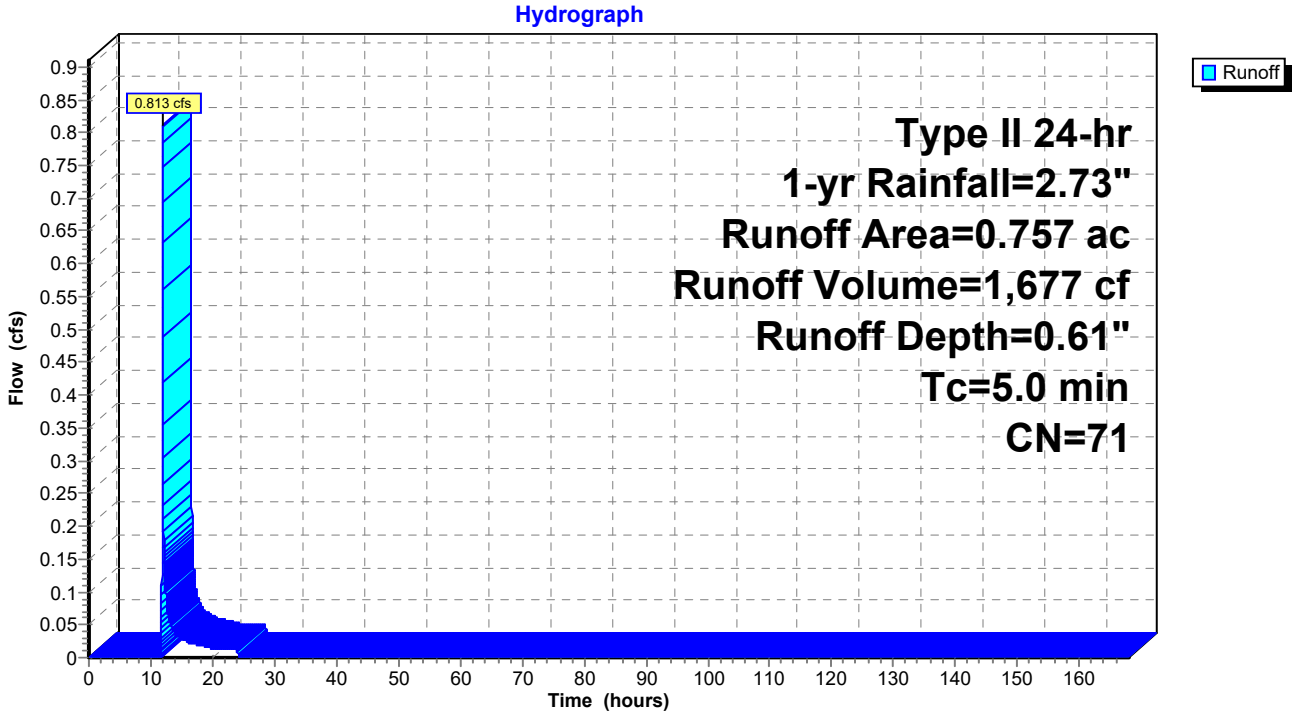
Runoff = 0.813 cfs @ 11.97 hrs, Volume= 1,677 cf, Depth= 0.61"
Routed to Link 12L : POST-DEV TO POI#1

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
*	0.265	39	Lawn A
*	0.130	61	Lawn B
*	0.362	98	Impervious
	0.757	71	Weighted Average
	0.395		52.18% Pervious Area
	0.362		47.82% 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

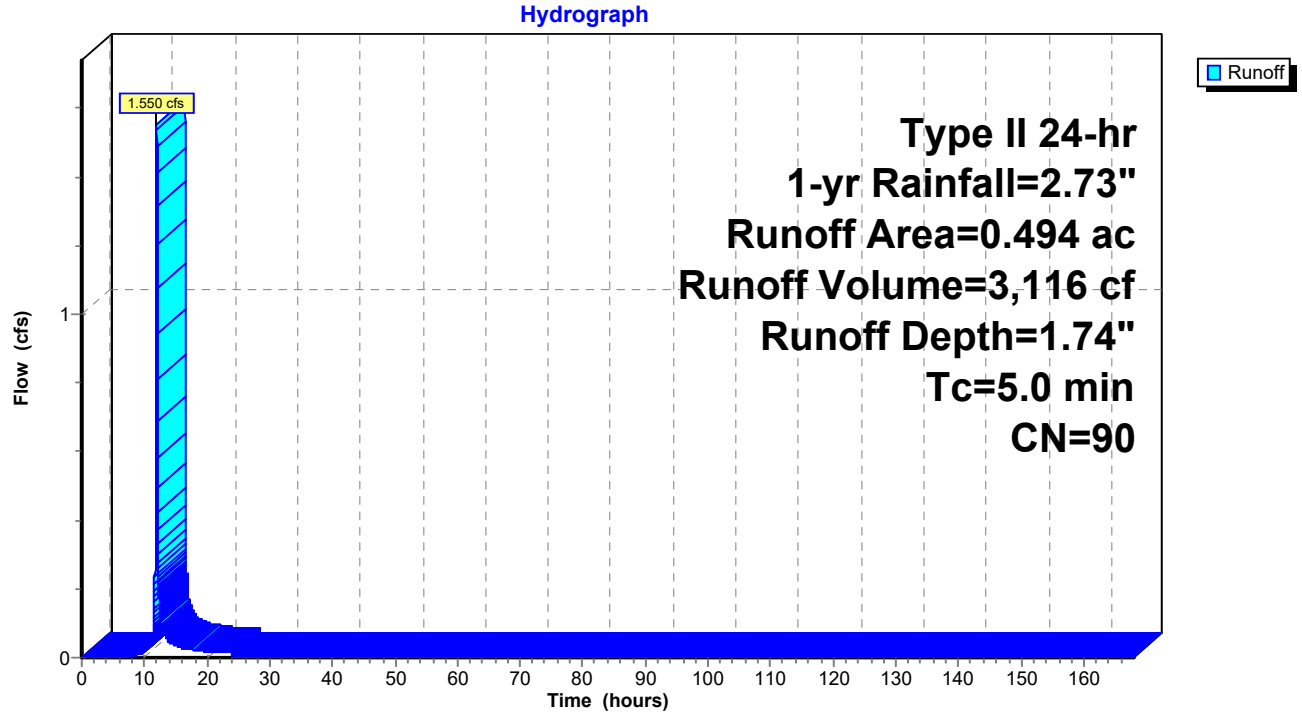
Runoff = 1.550 cfs @ 11.96 hrs, Volume= 3,116 cf, Depth= 1.74"
Routed to Pond 3P : UG2

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
*	0.064	39	Lawn A
*	0.000	30	Wooded A
*	0.430	98	Impervious
	0.494	90	Weighted Average
	0.064		12.96% Pervious Area
	0.430		87.04% 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

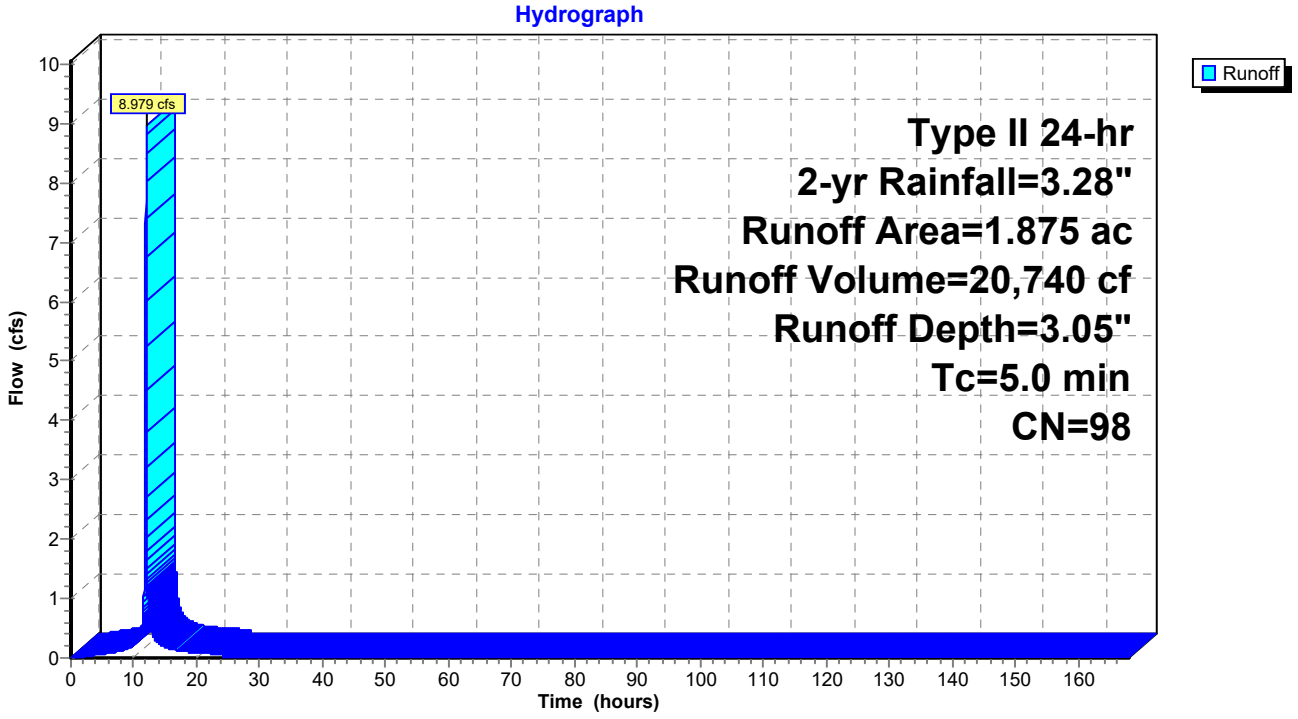
Runoff = 8.979 cfs @ 11.96 hrs, Volume= 20,740 cf, Depth= 3.05"
Routed to Pond 1P : UG1

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
*	0.015	39	Lawn A
*	1.860	98	Impervious
	1.875	98	Weighted Average
	0.015		0.80% Pervious Area
	1.860		99.20% 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

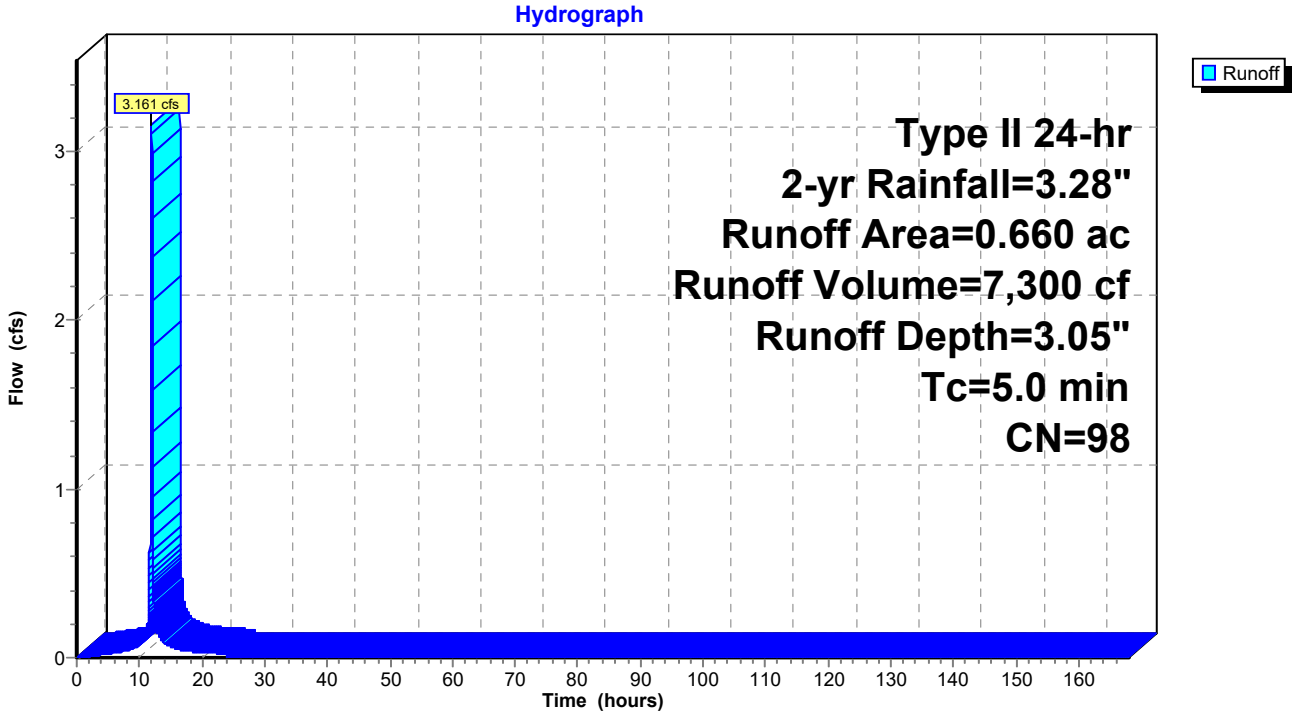
Runoff = 3.161 cfs @ 11.96 hrs, Volume= 7,300 cf, Depth= 3.05"
Routed to Link 10L : POST-DEV TO DA #1

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
*	0.660	98	Impervious
	0.660	98	Weighted Average
	0.660		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

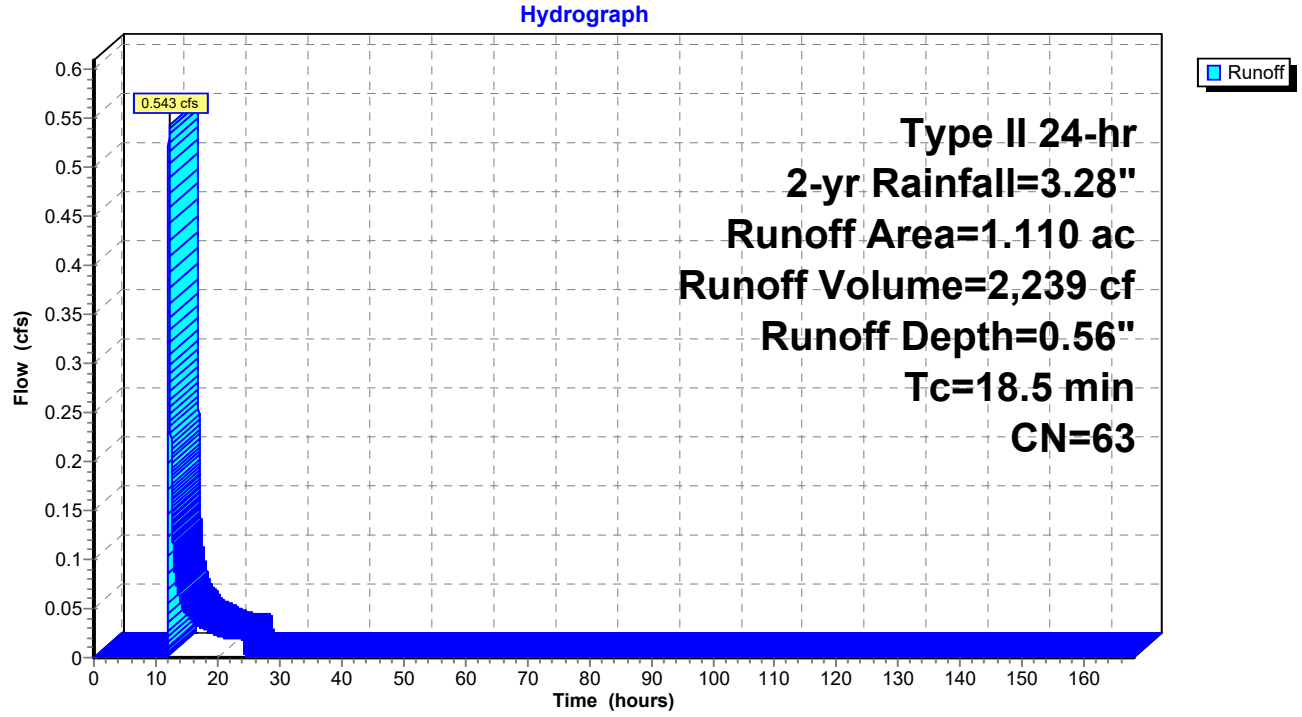
Runoff = 0.543 cfs @ 12.15 hrs, Volume= 2,239 cf, Depth= 0.56"
Routed to Link 10L : POST-DEV TO DA #1

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
*	0.322	39	Lawn A
*	0.285	30	Wooded A
*	0.503	98	Impervious
	1.110	63	Weighted Average
	0.607		54.68% Pervious Area
	0.503		45.32% 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



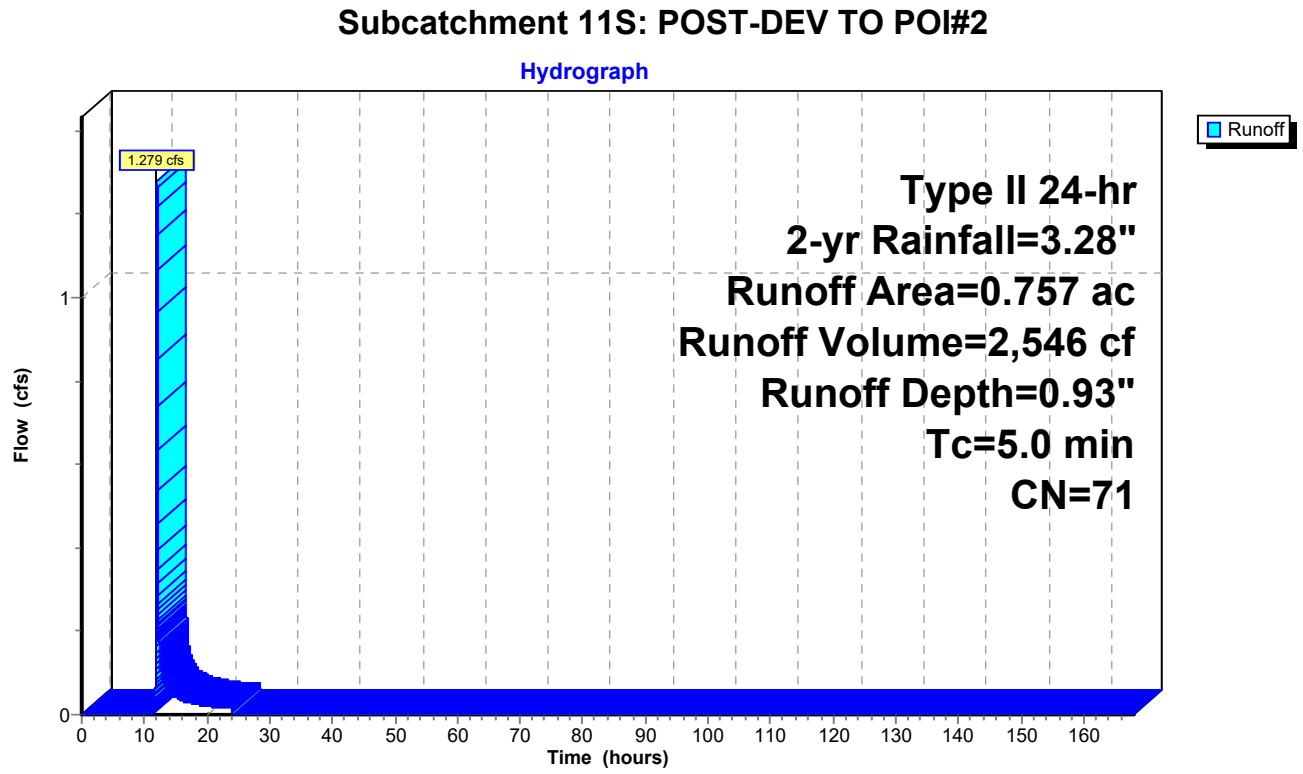
Summary for Subcatchment 11S: POST-DEV TO POI#2

Runoff = 1.279 cfs @ 11.97 hrs, Volume= 2,546 cf, Depth= 0.93"
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
*	0.265	39	Lawn A
*	0.130	61	Lawn B
*	0.362	98	Impervious
	0.757	71	Weighted Average
	0.395		52.18% Pervious Area
	0.362		47.82% 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

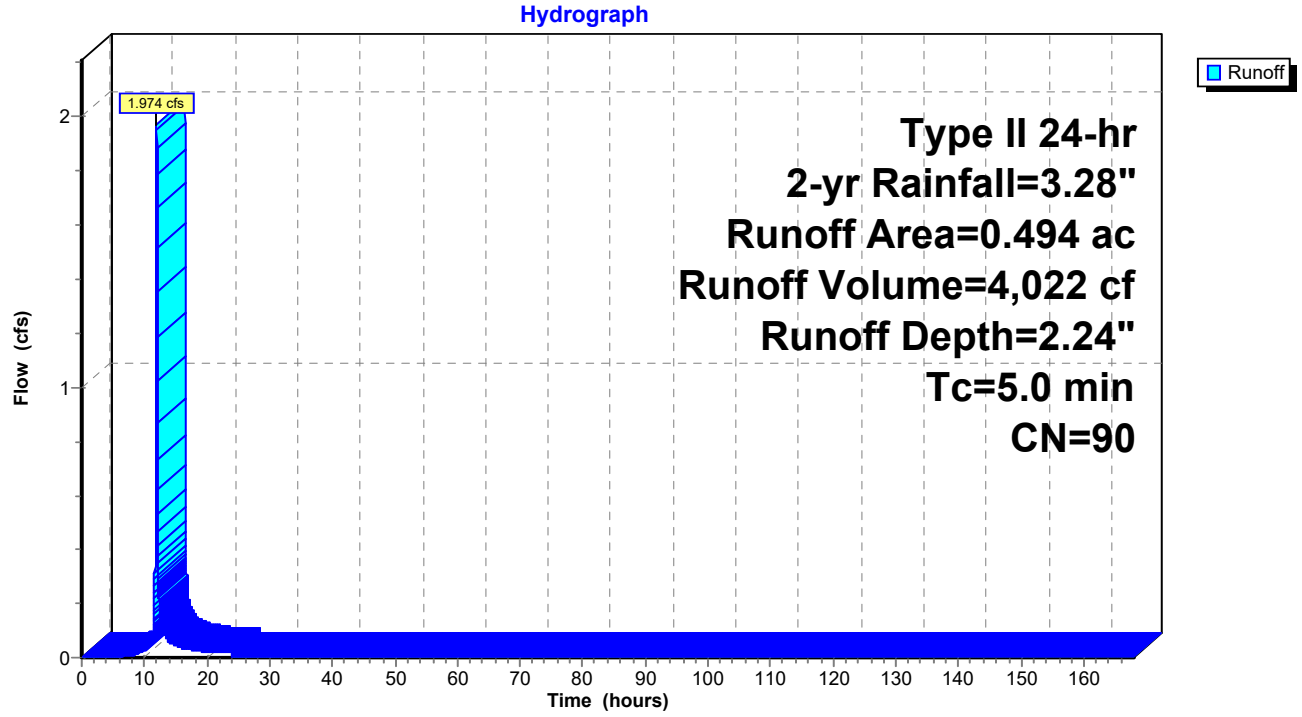
Runoff = 1.974 cfs @ 11.96 hrs, Volume= 4,022 cf, Depth= 2.24"
Routed to Pond 3P : UG2

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
*	0.064	39	Lawn A
*	0.000	30	Wooded A
*	0.430	98	Impervious
	0.494	90	Weighted Average
	0.064		12.96% Pervious Area
	0.430		87.04% 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

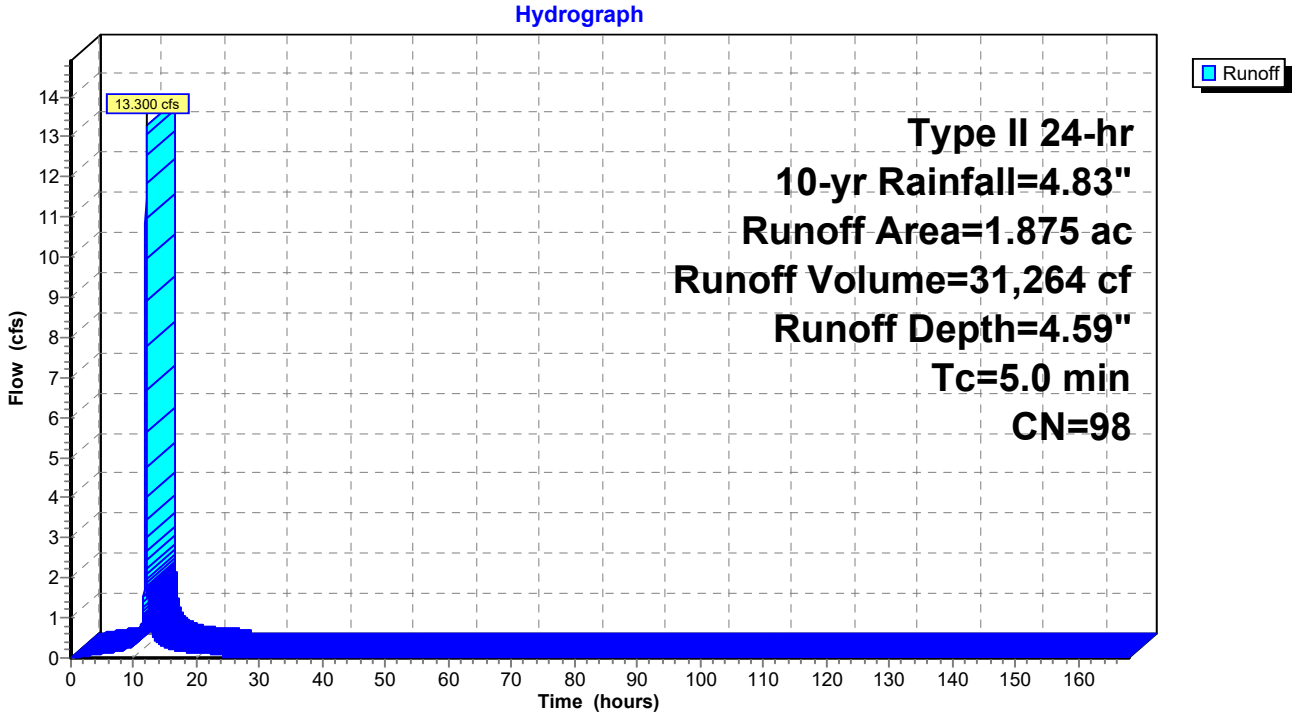
Runoff = 13.300 cfs @ 11.96 hrs, Volume= 31,264 cf, Depth= 4.59"
Routed to Pond 1P : UG1

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
*	0.015	39	Lawn A
*	1.860	98	Impervious
	1.875	98	Weighted Average
	0.015		0.80% Pervious Area
	1.860		99.20% 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

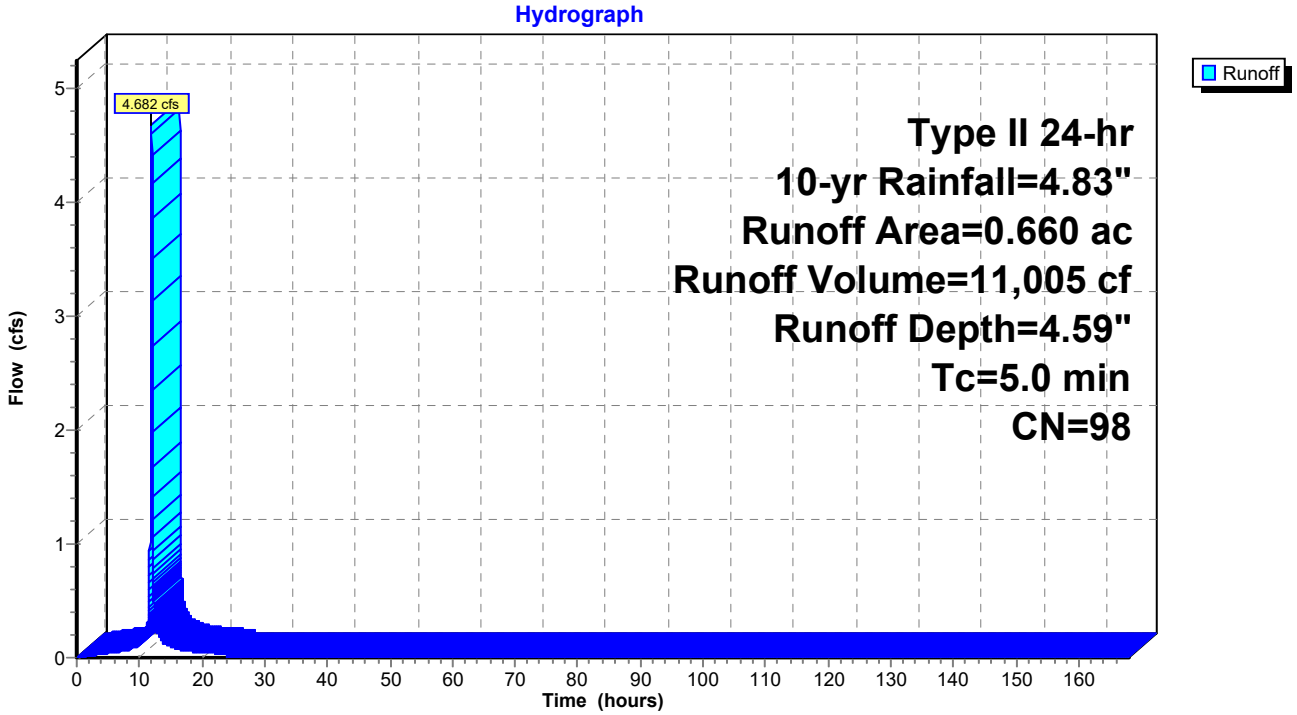
Runoff = 4.682 cfs @ 11.96 hrs, Volume= 11,005 cf, Depth= 4.59"
Routed to Link 10L : POST-DEV TO DA #1

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
*	0.660	98	Impervious
	0.660	98	Weighted Average
	0.660		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

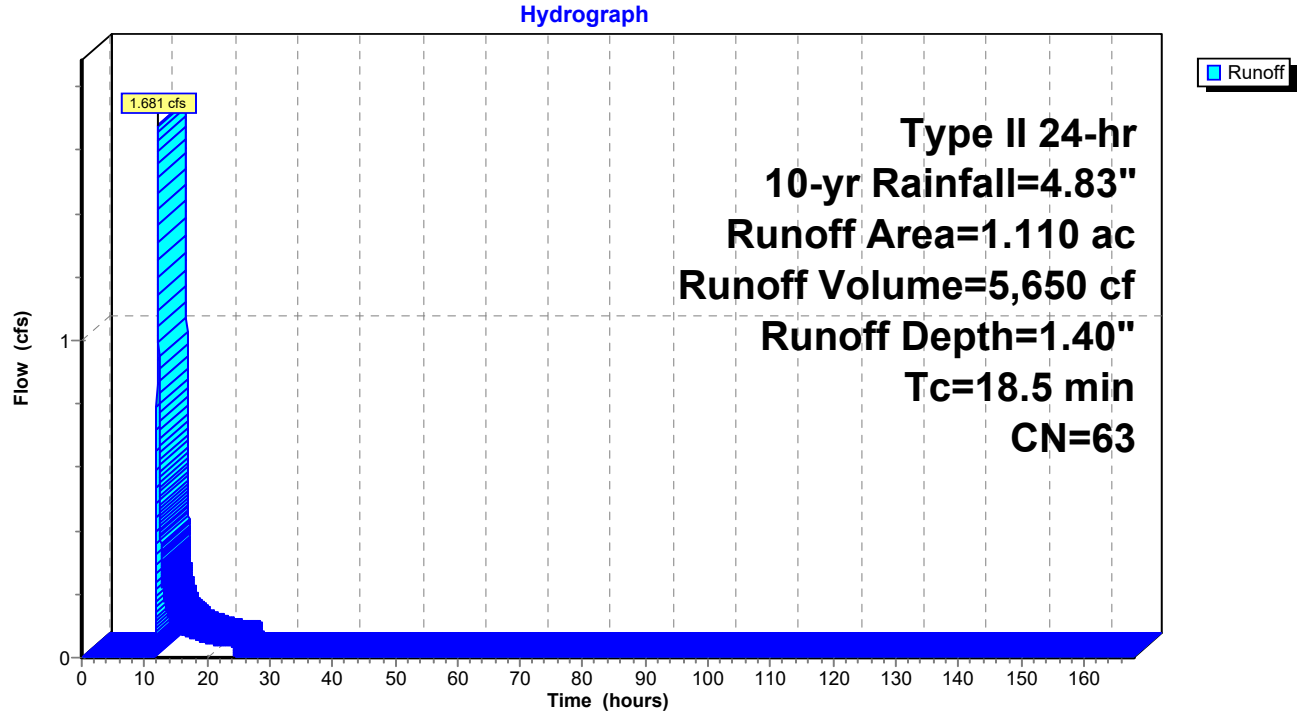
Runoff = 1.681 cfs @ 12.13 hrs, Volume= 5,650 cf, Depth= 1.40"
Routed to Link 10L : POST-DEV TO DA #1

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 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.322	39	Lawn A
*	0.285	30	Wooded A
*	0.503	98	Impervious
	1.110	63	Weighted Average
	0.607		54.68% Pervious Area
	0.503		45.32% 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



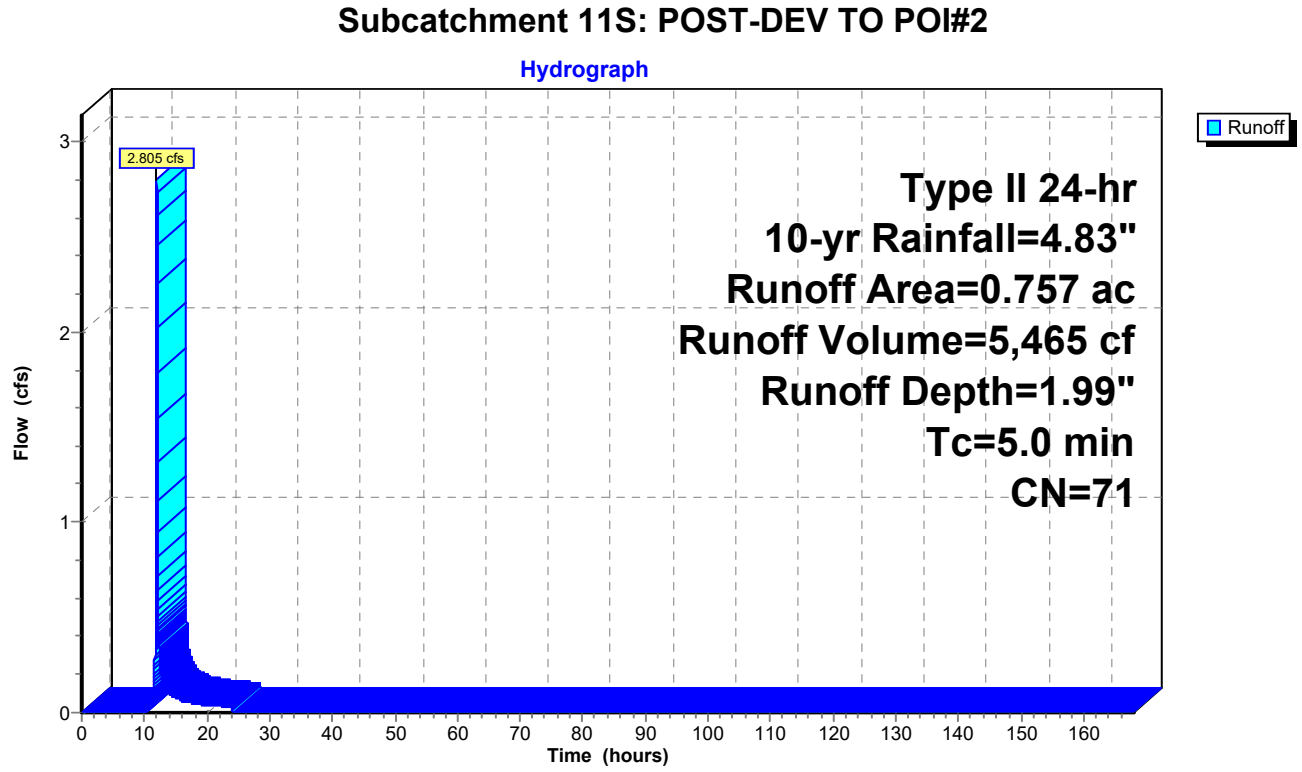
Summary for Subcatchment 11S: POST-DEV TO POI#2

Runoff = 2.805 cfs @ 11.96 hrs, Volume= 5,465 cf, Depth= 1.99"
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
*	0.265	39	Lawn A
*	0.130	61	Lawn B
*	0.362	98	Impervious
	0.757	71	Weighted Average
	0.395		52.18% Pervious Area
	0.362		47.82% 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

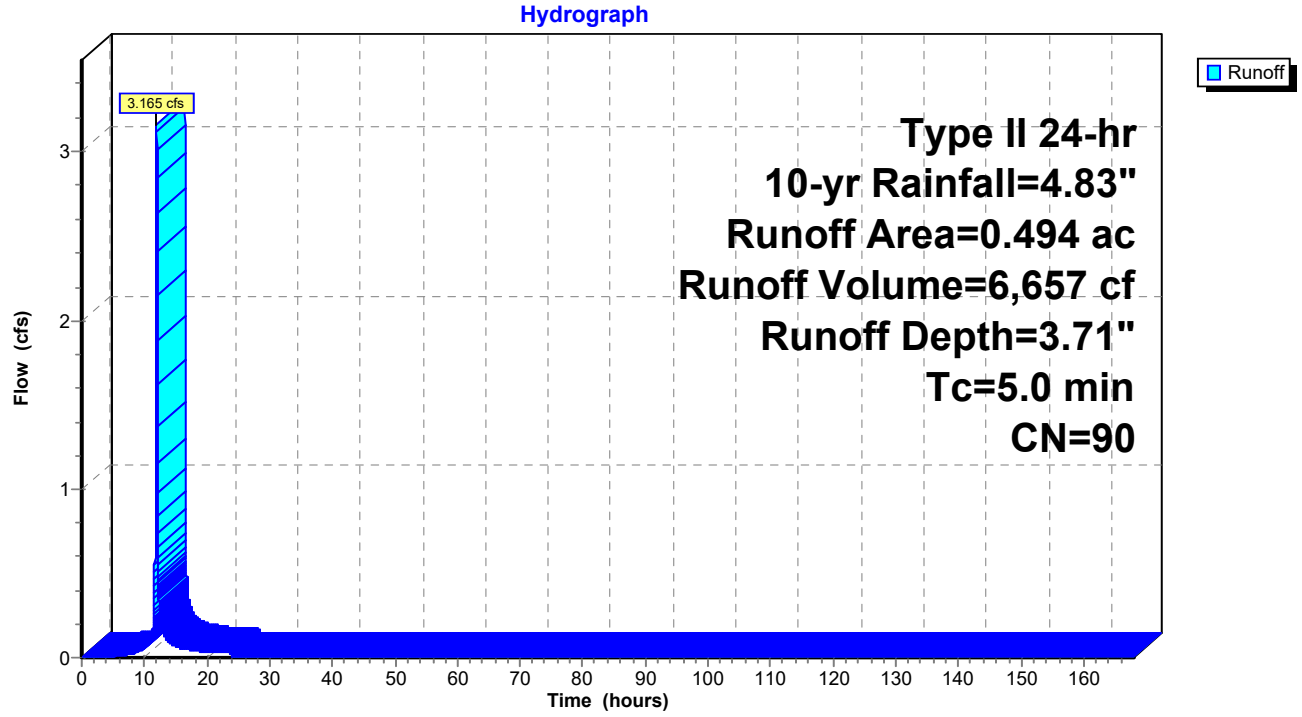
Runoff = 3.165 cfs @ 11.96 hrs, Volume= 6,657 cf, Depth= 3.71"
Routed to Pond 3P : UG2

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
*	0.064	39	Lawn A
*	0.000	30	Wooded A
*	0.430	98	Impervious
	0.494	90	Weighted Average
	0.064		12.96% Pervious Area
	0.430		87.04% 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

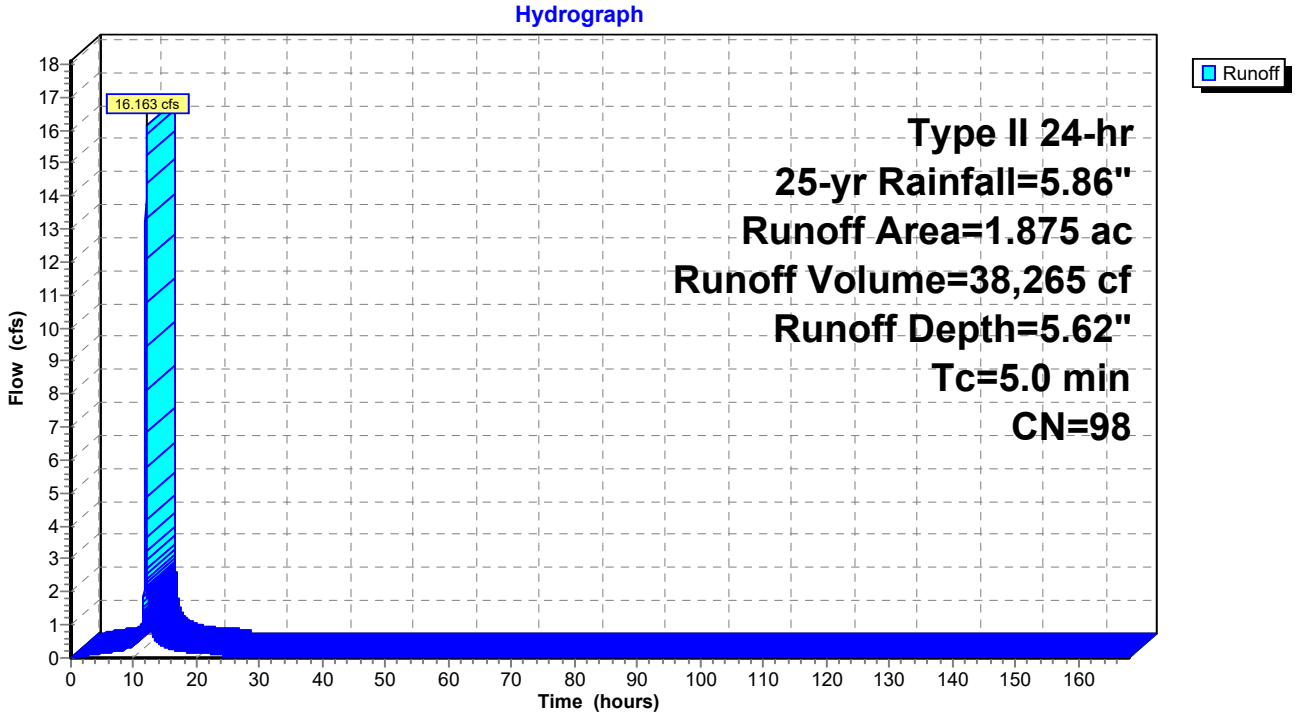
Runoff = 16.163 cfs @ 11.96 hrs, Volume= 38,265 cf, Depth= 5.62"
Routed to Pond 1P : UG1

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
*	0.015	39	Lawn A
*	1.860	98	Impervious
	1.875	98	Weighted Average
	0.015		0.80% Pervious Area
	1.860		99.20% 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

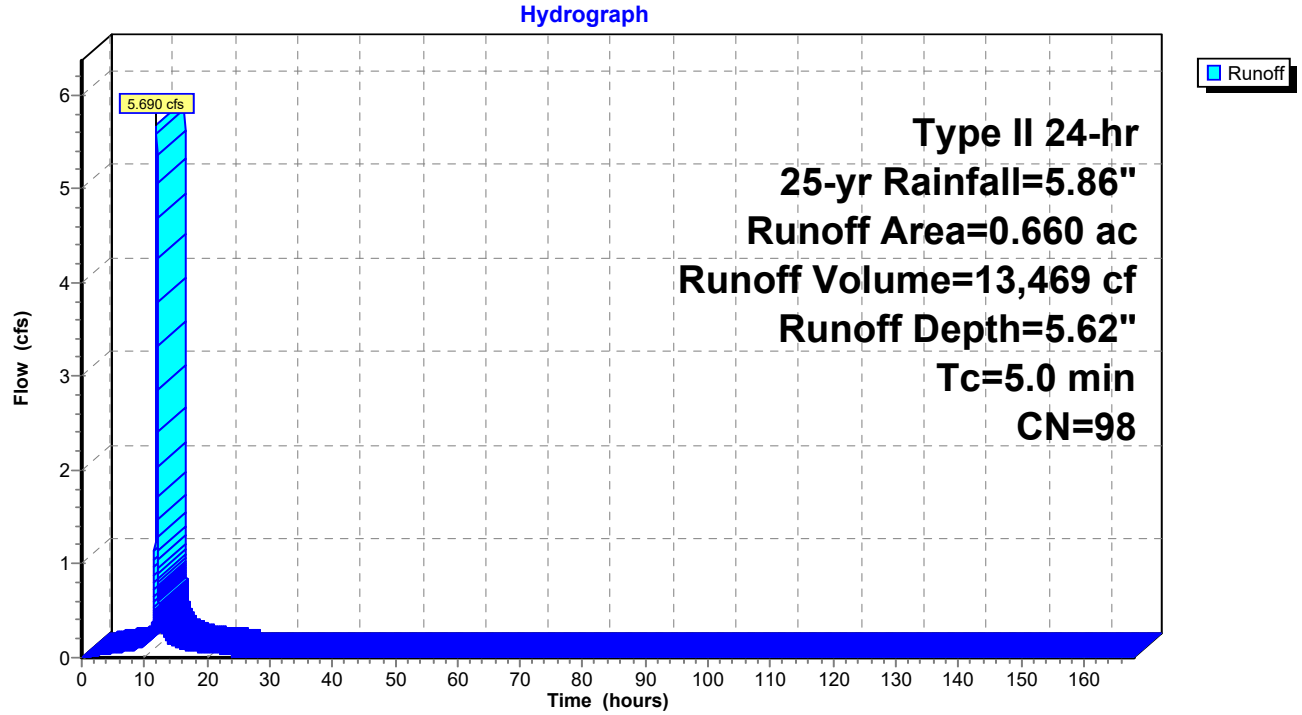
Runoff = 5.690 cfs @ 11.96 hrs, Volume= 13,469 cf, Depth= 5.62"
Routed to Link 10L : POST-DEV TO DA #1

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
*	0.660	98	Impervious
	0.660	98	Weighted Average
	0.660		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

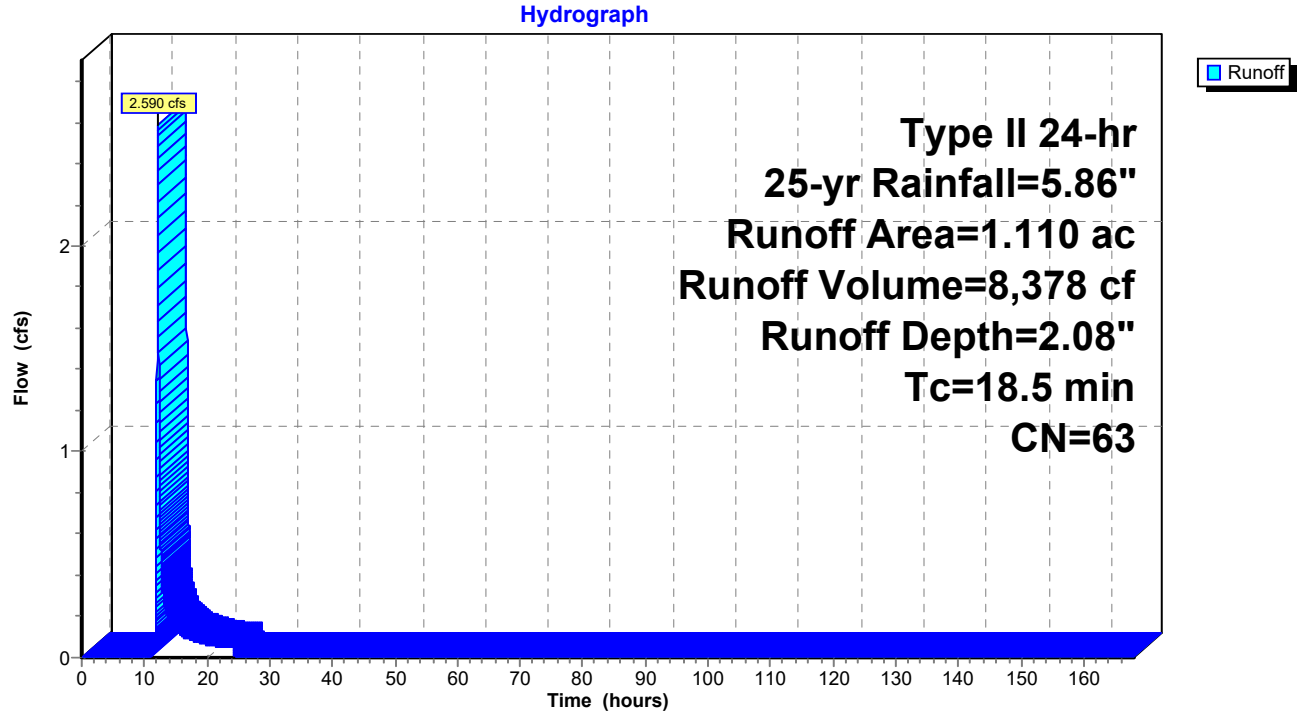
Runoff = 2.590 cfs @ 12.12 hrs, Volume= 8,378 cf, Depth= 2.08"
Routed to Link 10L : POST-DEV TO DA #1

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
*	0.322	39	Lawn A
*	0.285	30	Wooded A
*	0.503	98	Impervious
	1.110	63	Weighted Average
	0.607		54.68% Pervious Area
	0.503		45.32% 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



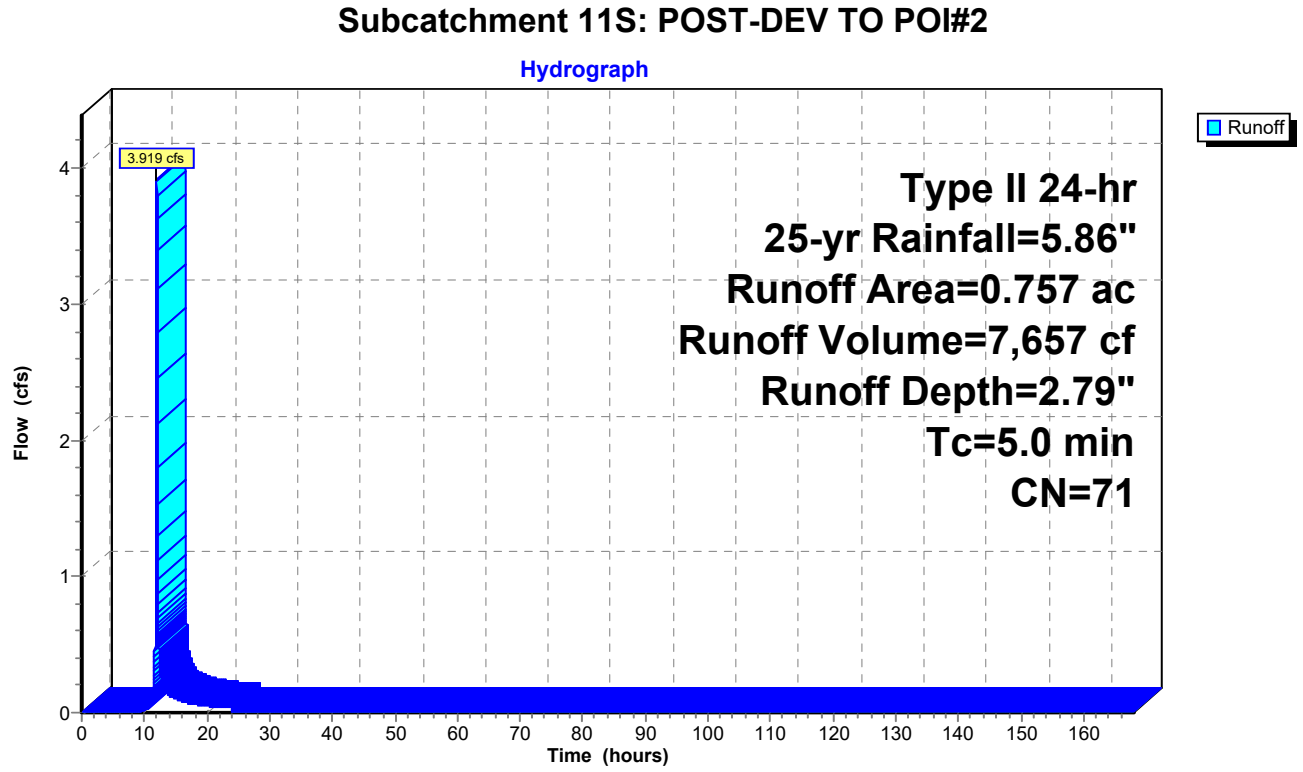
Summary for Subcatchment 11S: POST-DEV TO POI#2

Runoff = 3.919 cfs @ 11.96 hrs, Volume= 7,657 cf, Depth= 2.79"
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
*	0.265	39	Lawn A
*	0.130	61	Lawn B
*	0.362	98	Impervious
	0.757	71	Weighted Average
	0.395		52.18% Pervious Area
	0.362		47.82% 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

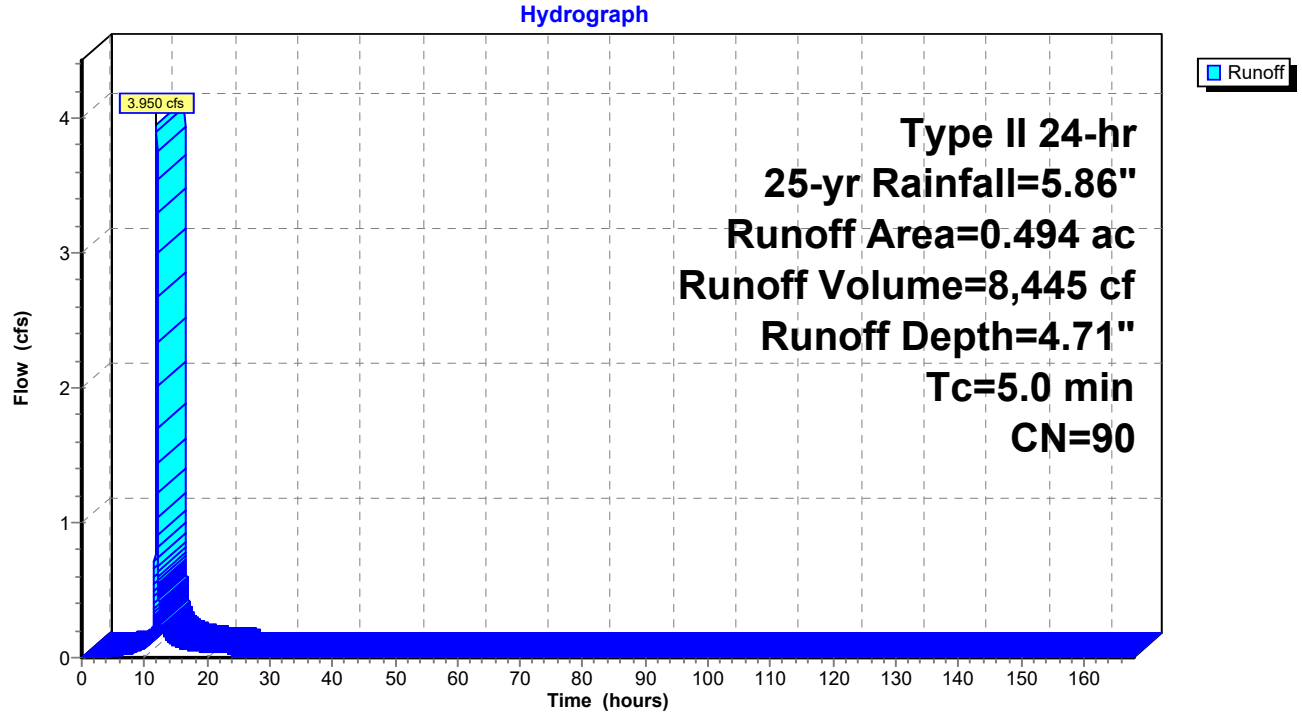
Runoff = 3.950 cfs @ 11.96 hrs, Volume= 8,445 cf, Depth= 4.71"
Routed to Pond 3P : UG2

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
*	0.064	39	Lawn A
*	0.000	30	Wooded A
*	0.430	98	Impervious
	0.494	90	Weighted Average
	0.064		12.96% Pervious Area
	0.430		87.04% 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

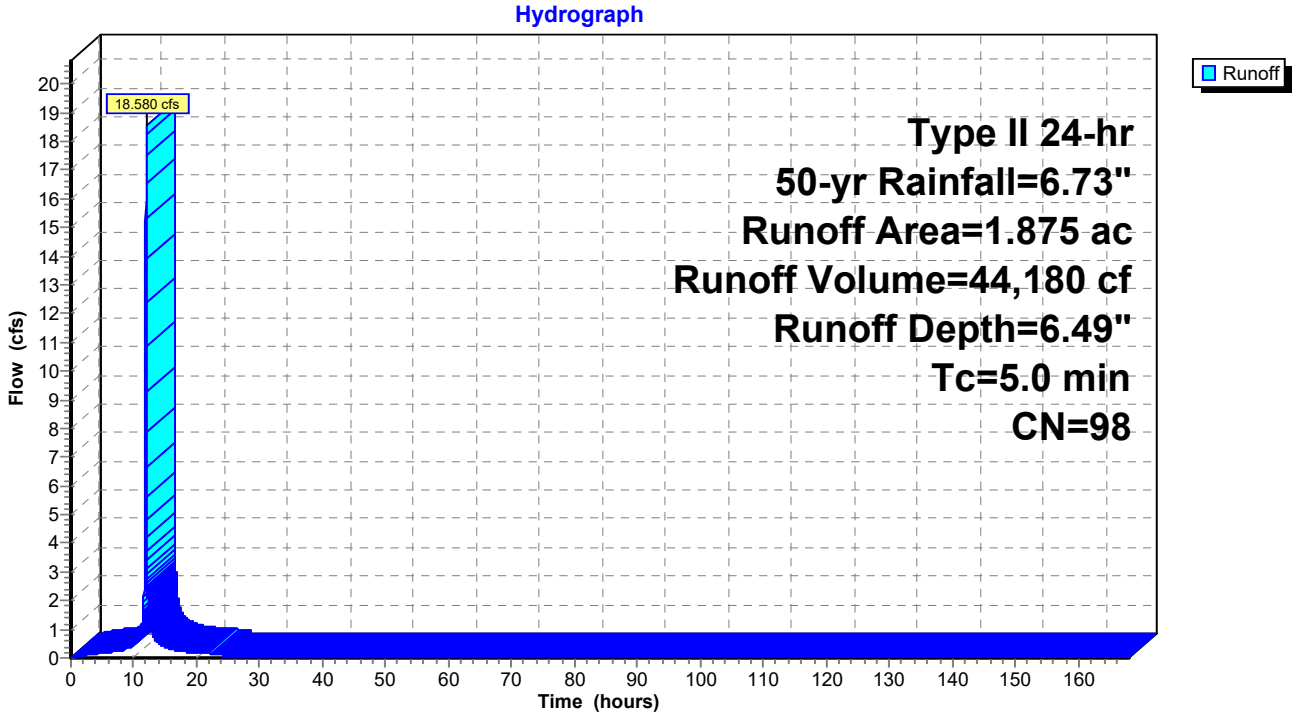
Runoff = 18.580 cfs @ 11.96 hrs, Volume= 44,180 cf, Depth= 6.49"
Routed to Pond 1P : UG1

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
*	0.015	39	Lawn A
*	1.860	98	Impervious
	1.875	98	Weighted Average
	0.015		0.80% Pervious Area
	1.860		99.20% 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

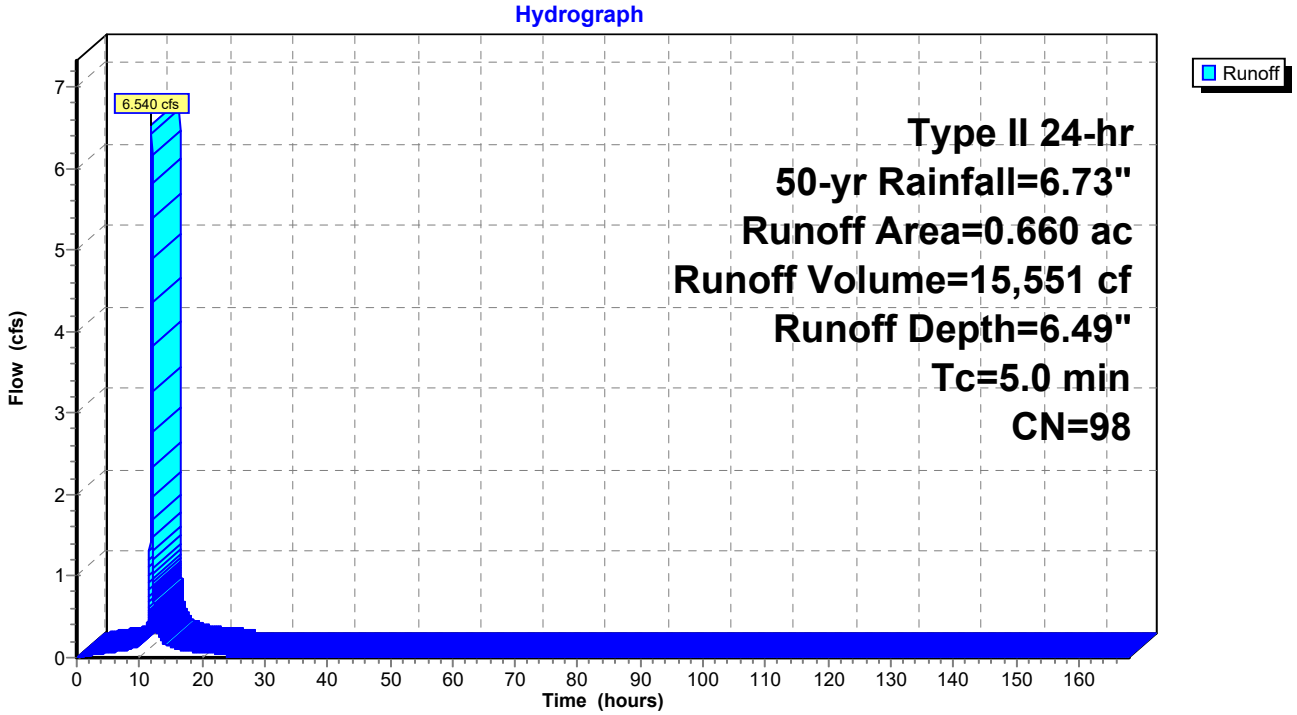
Runoff = 6.540 cfs @ 11.96 hrs, Volume= 15,551 cf, Depth= 6.49"
Routed to Link 10L : POST-DEV TO DA #1

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
*	0.660	98	Impervious
	0.660	98	Weighted Average
	0.660		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

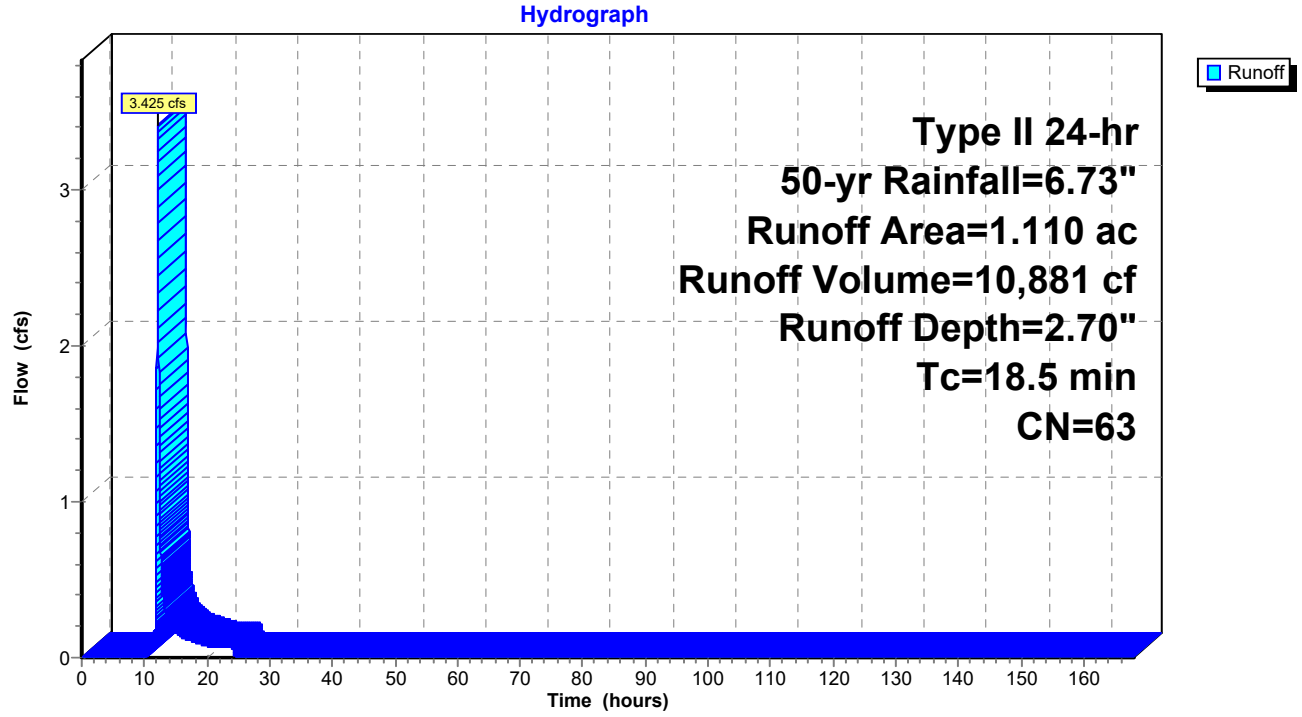
Runoff = 3.425 cfs @ 12.11 hrs, Volume= 10,881 cf, Depth= 2.70"
Routed to Link 10L : POST-DEV TO DA #1

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
*	0.322	39	Lawn A
*	0.285	30	Wooded A
*	0.503	98	Impervious
	1.110	63	Weighted Average
	0.607		54.68% Pervious Area
	0.503		45.32% 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



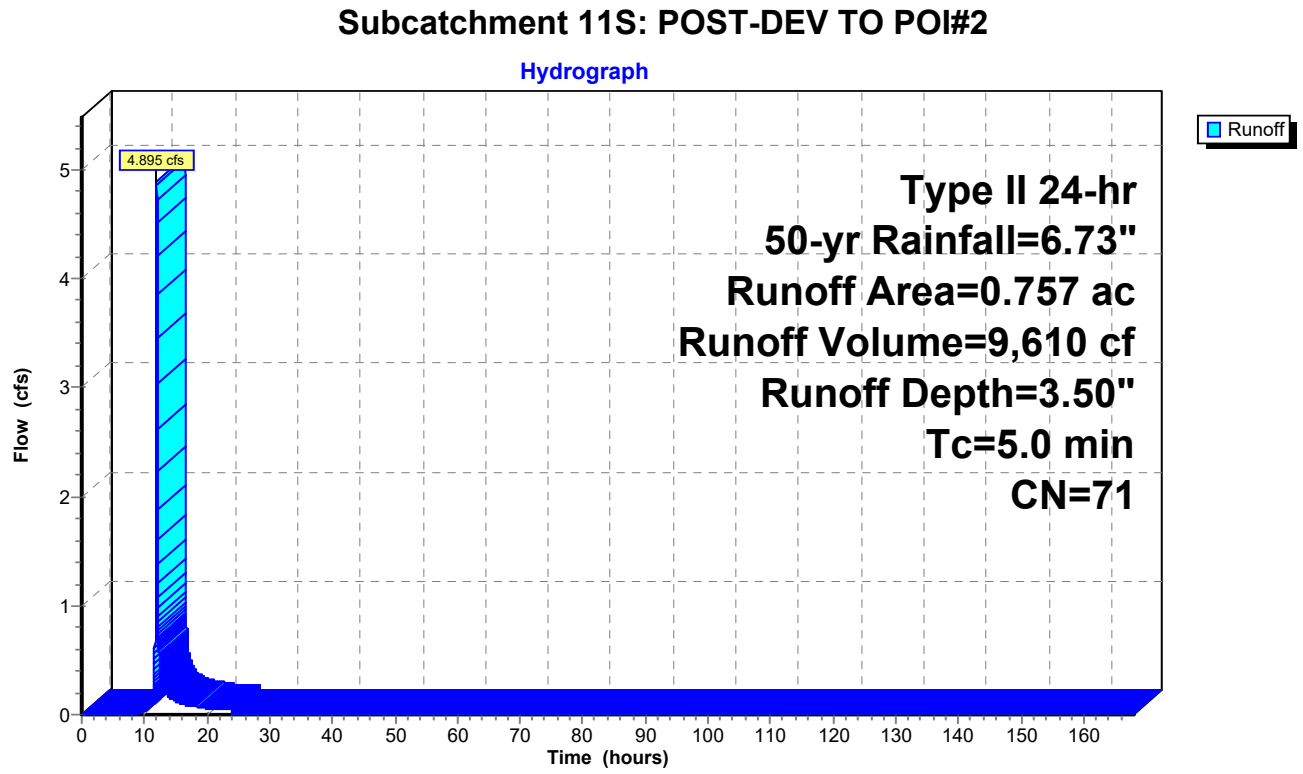
Summary for Subcatchment 11S: POST-DEV TO POI#2

Runoff = 4.895 cfs @ 11.96 hrs, Volume= 9,610 cf, Depth= 3.50"
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
*	0.265	39	Lawn A
*	0.130	61	Lawn B
*	0.362	98	Impervious
	0.757	71	Weighted Average
	0.395		52.18% Pervious Area
	0.362		47.82% 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

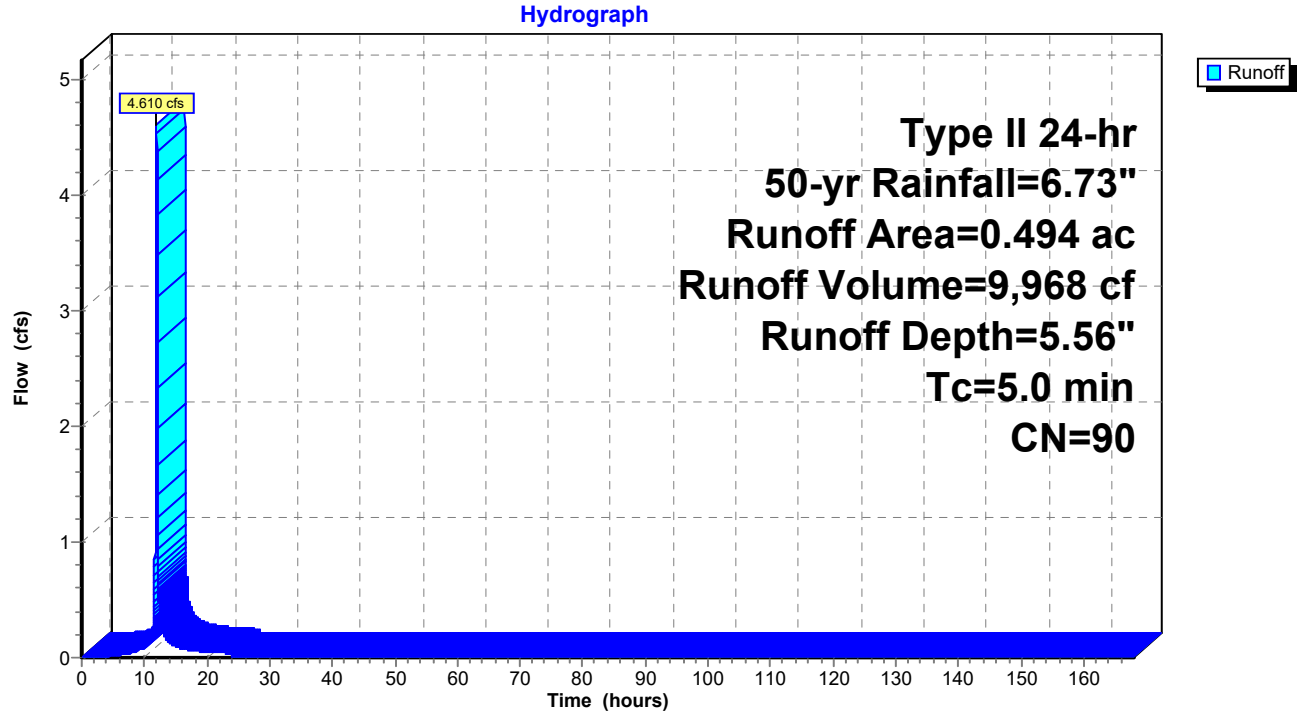
Runoff = 4.610 cfs @ 11.96 hrs, Volume= 9,968 cf, Depth= 5.56"
Routed to Pond 3P : UG2

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
*	0.064	39	Lawn A
*	0.000	30	Wooded A
*	0.430	98	Impervious
	0.494	90	Weighted Average
	0.064		12.96% Pervious Area
	0.430		87.04% 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

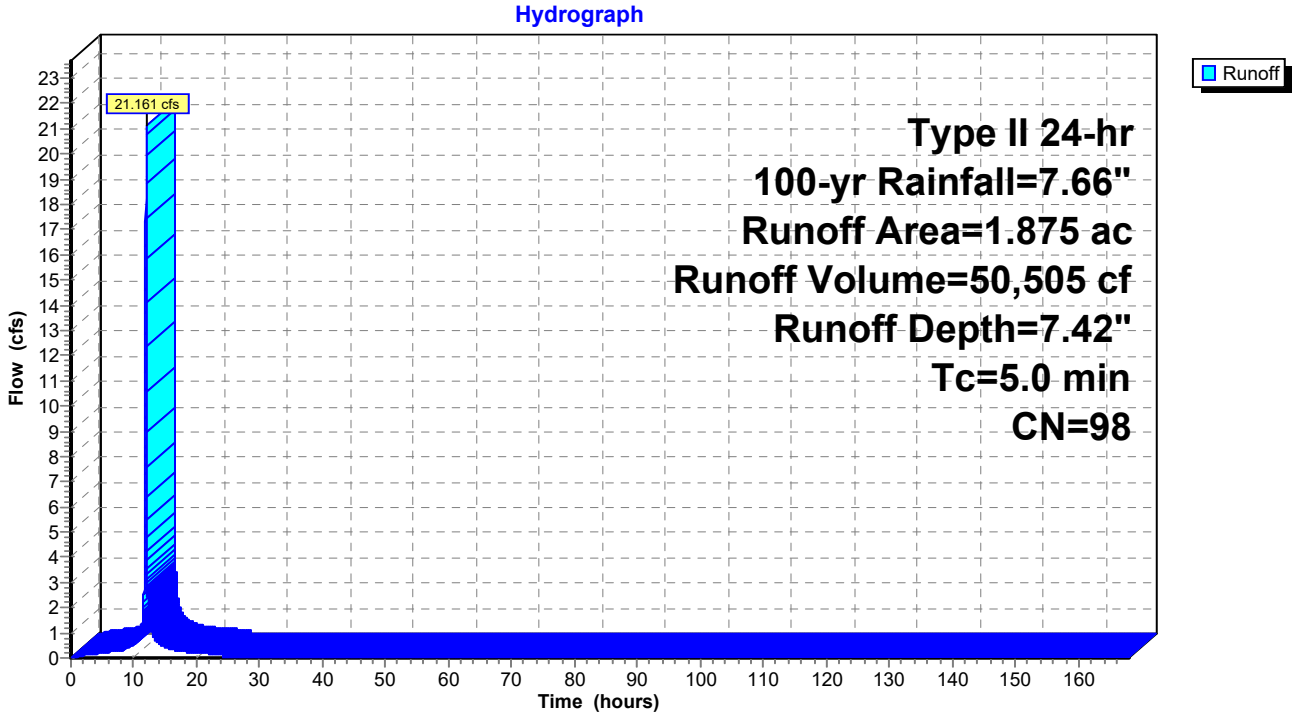
Runoff = 21.161 cfs @ 11.96 hrs, Volume= 50,505 cf, Depth= 7.42"
Routed to Pond 1P : UG1

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
*	0.015	39	Lawn A
*	1.860	98	Impervious
	1.875	98	Weighted Average
	0.015		0.80% Pervious Area
	1.860		99.20% 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

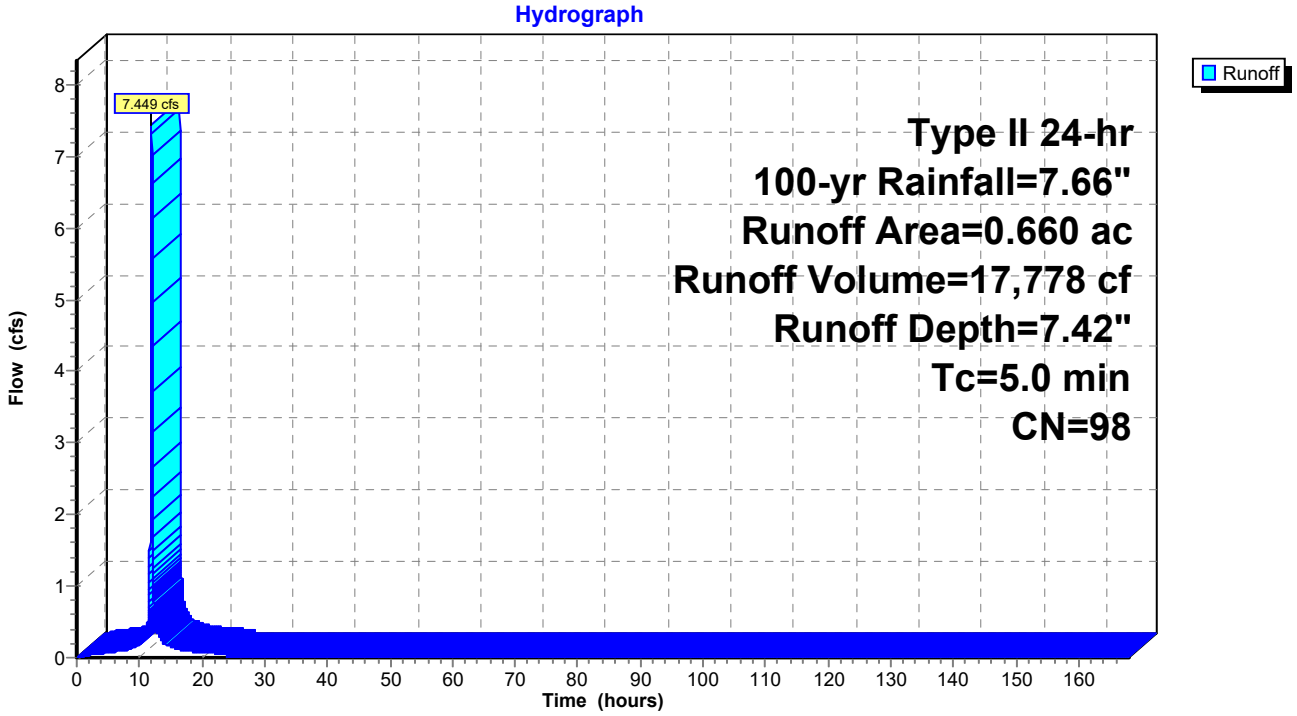
Runoff = 7.449 cfs @ 11.96 hrs, Volume= 17,778 cf, Depth= 7.42"
Routed to Link 10L : POST-DEV TO DA #1

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
*	0.660	98	Impervious
	0.660	98	Weighted Average
	0.660		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

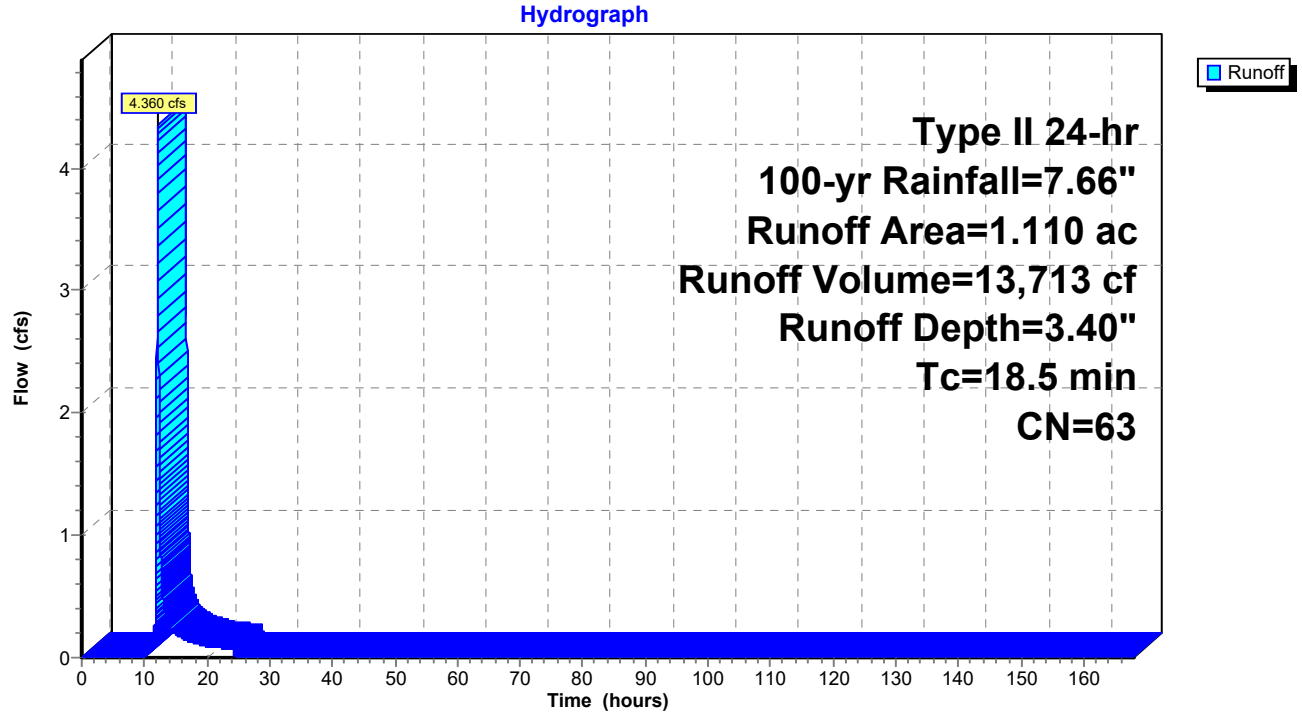
Runoff = 4.360 cfs @ 12.11 hrs, Volume= 13,713 cf, Depth= 3.40"
Routed to Link 10L : POST-DEV TO DA #1

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 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.322	39	Lawn A
*	0.285	30	Wooded A
*	0.503	98	Impervious
	1.110	63	Weighted Average
	0.607		54.68% Pervious Area
	0.503		45.32% 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



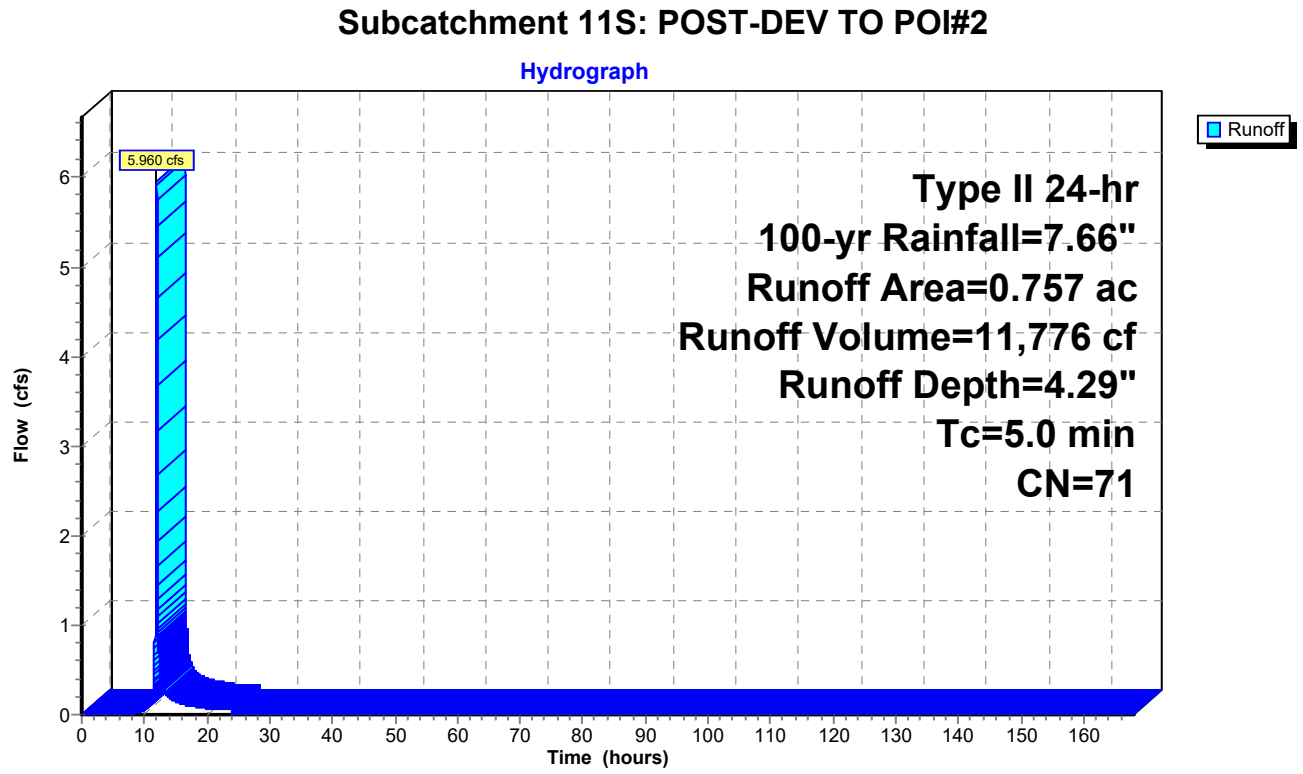
Summary for Subcatchment 11S: POST-DEV TO POI#2

Runoff = 5.960 cfs @ 11.96 hrs, Volume= 11,776 cf, Depth= 4.29"
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 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.265	39	Lawn A
*	0.130	61	Lawn B
*	0.362	98	Impervious
	0.757	71	Weighted Average
	0.395		52.18% Pervious Area
	0.362		47.82% 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

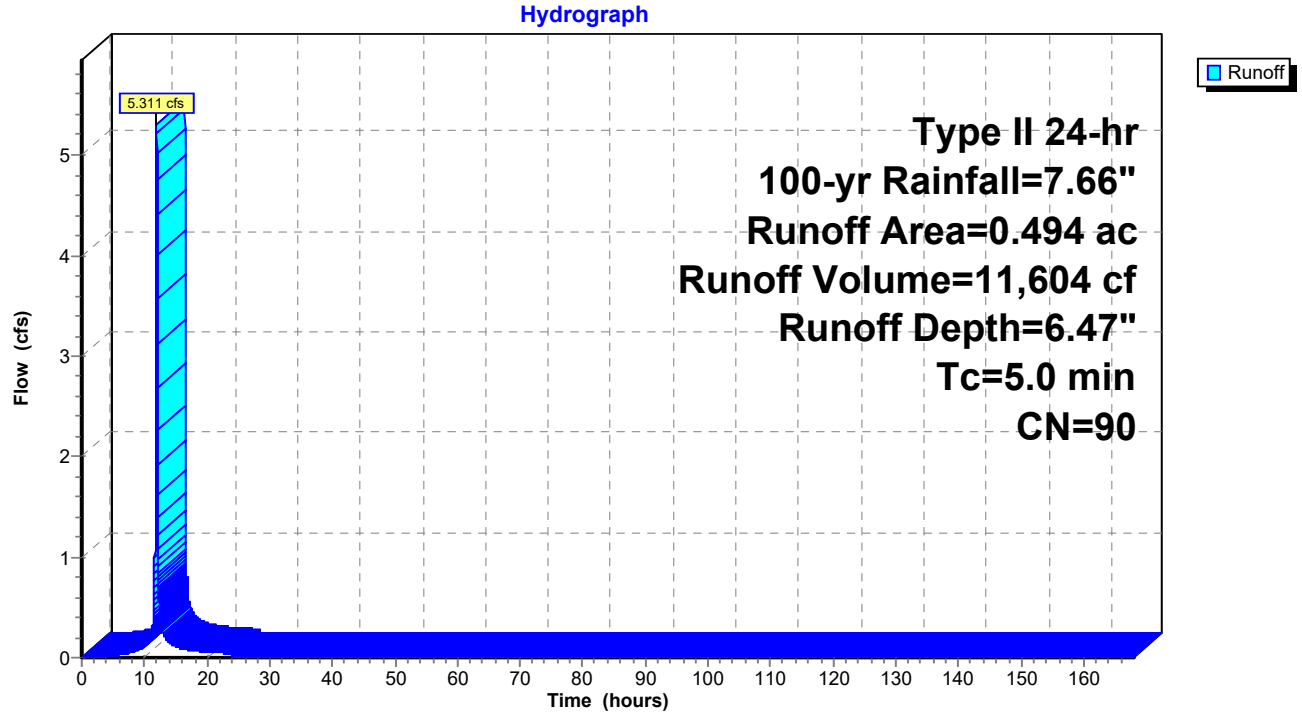
Runoff = 5.311 cfs @ 11.96 hrs, Volume= 11,604 cf, Depth= 6.47"
Routed to Pond 3P : UG2

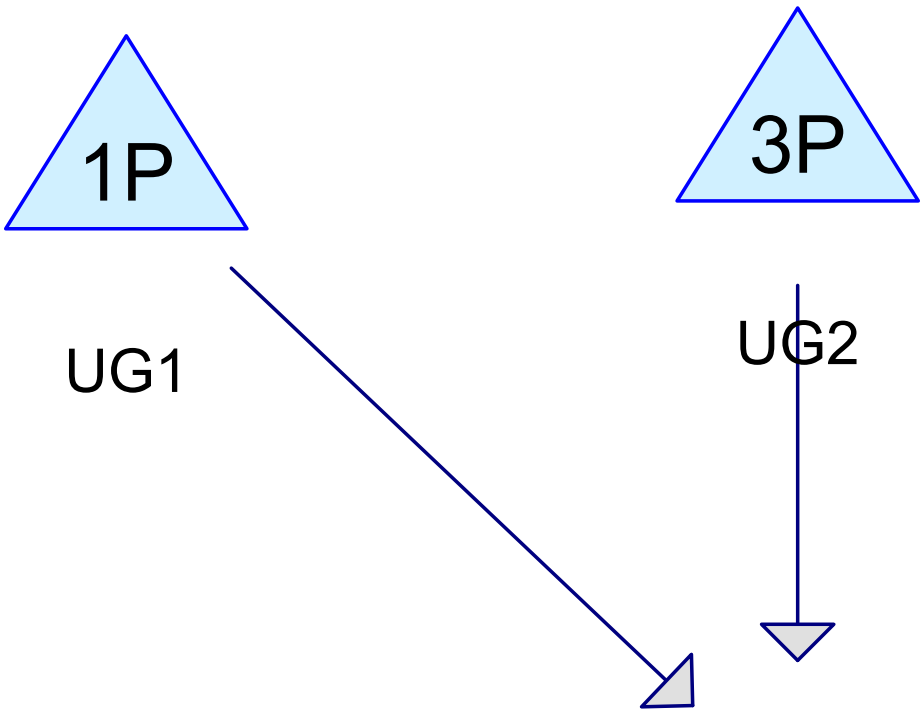
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type II 24-hr 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.064	39	Lawn A
*	0.000	30	Wooded A
*	0.430	98	Impervious
	0.494	90	Weighted Average
	0.064		12.96% Pervious Area
	0.430		87.04% 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_2024-07-22
Prepared by Bohler, Printed 10/29/2024
HydroCAD® 10.20-4a 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-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	10-yr	Type II 24-hr		Default	24.00	1	4.83	2
4	25-yr	Type II 24-hr		Default	24.00	1	5.86	2
5	50-yr	Type II 24-hr		Default	24.00	1	6.73	2
6	100-yr	Type II 24-hr		Default	24.00	1	7.66	2

Summary for Pond 1P: UG1

Inflow Area = 81,675 sf, 99.20% Impervious, Inflow Depth = 2.50" for 1-yr event
Inflow = 7.440 cfs @ 11.96 hrs, Volume= 17,012 cf
Outflow = 1.518 cfs @ 12.10 hrs, Volume= 16,868 cf, Atten= 80%, Lag= 8.6 min
Primary = 1.518 cfs @ 12.10 hrs, Volume= 16,868 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 158.66' @ 12.10 hrs Surf.Area= 13,041 sf Storage= 9,871 cf

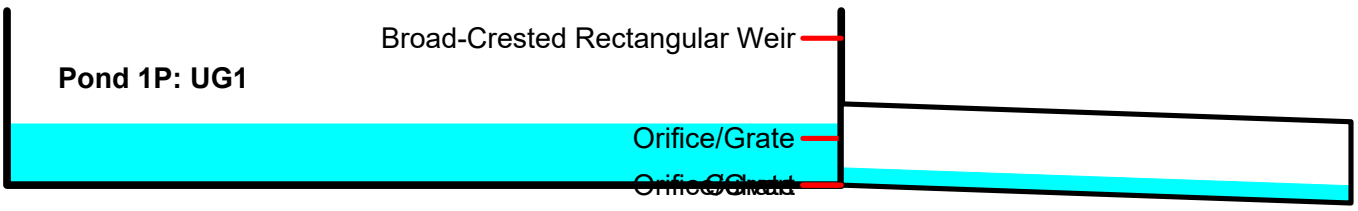
Plug-Flow detention time= 1,537.2 min calculated for 16,868 cf (99% of inflow)
Center-of-Mass det. time= 1,531.5 min (2,286.6 - 755.1)

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'	**40.0" 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= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.517 cfs @ 12.10 hrs HW=158.66' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 1.517 cfs of 4.137 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.027 cfs @ 5.020 fps)
  ├**2=Orifice/Grate** (Orifice Controls 1.490 cfs @ 1.664 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

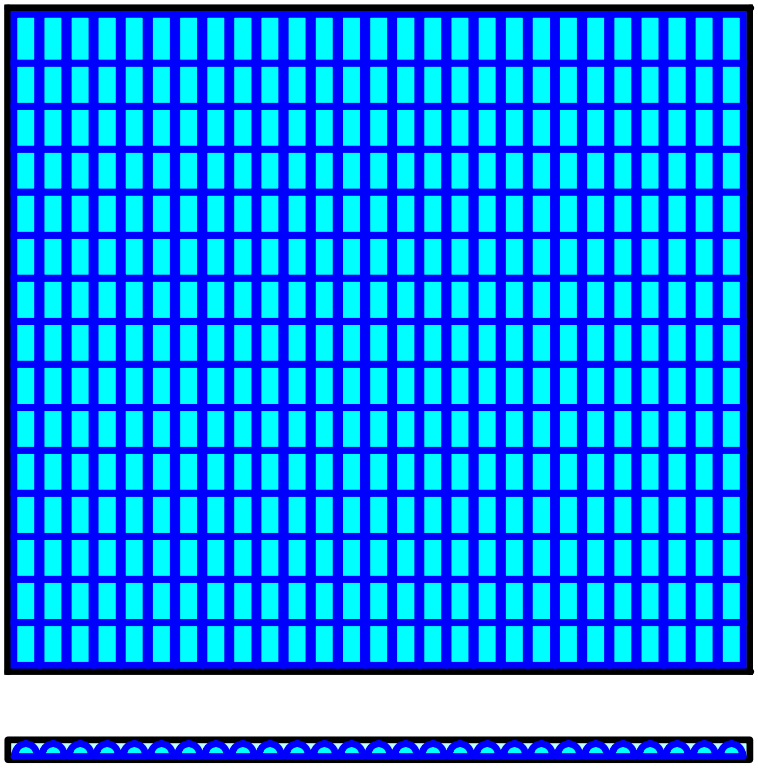
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

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

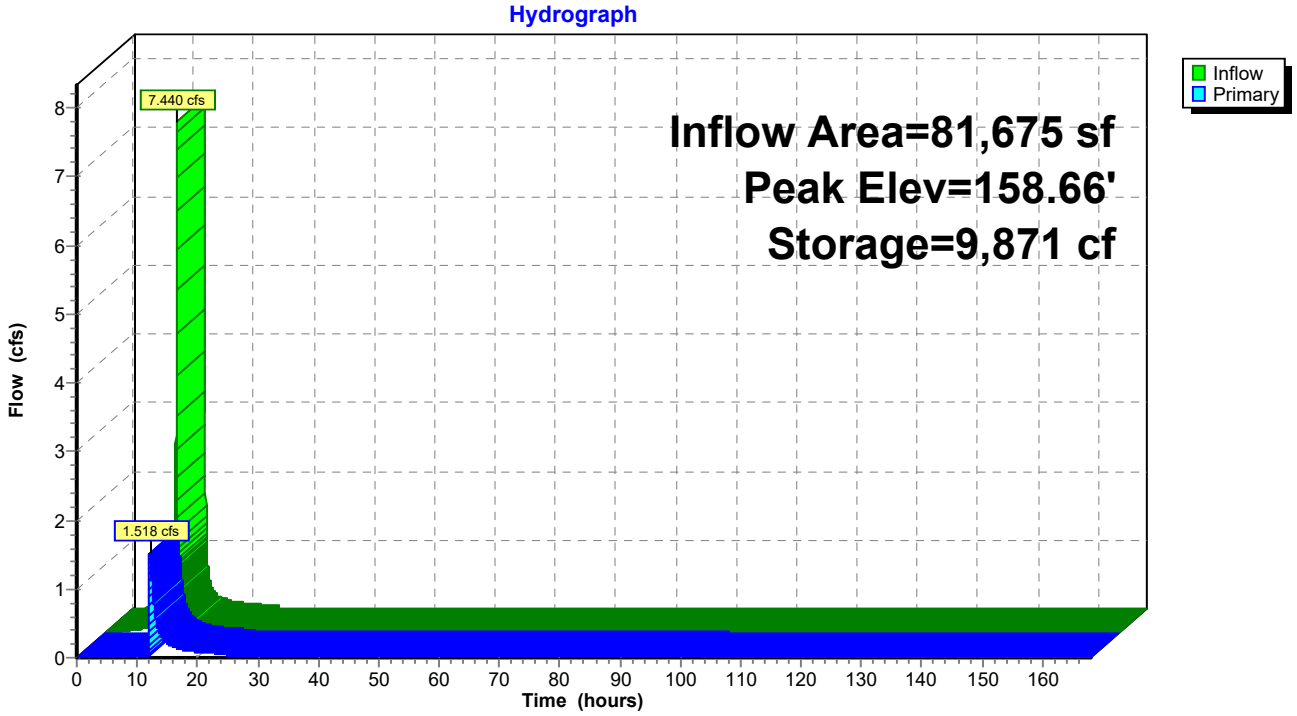
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

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=81,675 sf
Peak Elev=158.66'
Storage=9,871 cf
7.440 cfs
1.518 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	0.001	0	157.53	0.000
2.00	0.009	9	157.53	0.000
2.50	0.017	32	157.54	0.000
3.00	0.024	68	157.54	0.000
3.50	0.030	117	157.55	0.001
4.00	0.037	175	157.56	0.001
4.50	0.044	244	157.58	0.002
5.00	0.051	324	157.59	0.004
5.50	0.058	414	157.61	0.005
6.00	0.065	515	157.63	0.006
6.50	0.072	626	157.65	0.007
7.00	0.079	749	157.67	0.008
7.50	0.086	881	157.70	0.009
8.00	0.093	1,025	157.73	0.010
8.50	0.114	1,190	157.76	0.011
9.00	0.140	1,397	157.80	0.012
9.50	0.146	1,633	157.84	0.014
10.00	0.180	1,897	157.89	0.015
10.50	0.237	2,242	157.96	0.016
11.00	0.332	2,719	158.04	0.018
11.50	**0.552**	3,465	158.10	0.019
12.00	**6.149**	**9,132**	**158.59**	**1.005**
12.50	0.535	**9,182**	**158.60**	**1.038**
13.00	0.333	8,475	158.54	0.617
13.50	0.252	8,083	158.50	0.419
14.00	0.197	7,837	158.48	0.310
14.50	0.174	7,675	158.47	0.245
15.00	0.157	7,570	158.46	0.206
15.50	0.139	7,491	158.45	0.178
16.00	0.121	7,424	158.44	0.156
16.50	0.113	7,369	158.44	0.139
17.00	0.106	7,328	158.43	0.126
17.50	0.100	7,295	158.43	0.117
18.00	0.093	7,267	158.43	0.109
18.50	0.087	7,240	158.43	0.101
19.00	0.081	7,215	158.43	0.094
19.50	0.074	7,190	158.42	0.088
20.00	0.068	7,165	158.42	0.082
20.50	0.066	7,142	158.42	0.076
21.00	0.064	7,125	158.42	0.072
21.50	0.063	7,112	158.42	0.069
22.00	0.062	7,102	158.42	0.067
22.50	0.061	7,093	158.41	0.065
23.00	0.059	7,085	158.41	0.063
23.50	0.058	7,078	158.41	0.062
24.00	0.057	7,071	158.41	0.060
24.50	0.000	6,991	158.41	0.045
25.00	0.000	6,921	158.40	0.034

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	6,866	158.39	0.027
26.00	0.000	6,820	158.39	0.024
26.50	0.000	6,778	158.39	0.024
27.00	0.000	6,735	158.38	0.024
27.50	0.000	6,692	158.38	0.024
28.00	0.000	6,650	158.38	0.024
28.50	0.000	6,608	158.37	0.023
29.00	0.000	6,565	158.37	0.023
29.50	0.000	6,523	158.37	0.023
30.00	0.000	6,481	158.36	0.023
30.50	0.000	6,439	158.36	0.023
31.00	0.000	6,397	158.35	0.023
31.50	0.000	6,356	158.35	0.023
32.00	0.000	6,314	158.35	0.023
32.50	0.000	6,272	158.34	0.023
33.00	0.000	6,231	158.34	0.023
33.50	0.000	6,190	158.34	0.023
34.00	0.000	6,148	158.33	0.023
34.50	0.000	6,107	158.33	0.023
35.00	0.000	6,066	158.33	0.023
35.50	0.000	6,025	158.32	0.023
36.00	0.000	5,984	158.32	0.023
36.50	0.000	5,943	158.31	0.023
37.00	0.000	5,903	158.31	0.023
37.50	0.000	5,862	158.31	0.023
38.00	0.000	5,821	158.30	0.022
38.50	0.000	5,781	158.30	0.022
39.00	0.000	5,741	158.30	0.022
39.50	0.000	5,700	158.29	0.022
40.00	0.000	5,660	158.29	0.022
40.50	0.000	5,620	158.29	0.022
41.00	0.000	5,580	158.28	0.022
41.50	0.000	5,541	158.28	0.022
42.00	0.000	5,501	158.28	0.022
42.50	0.000	5,461	158.27	0.022
43.00	0.000	5,422	158.27	0.022
43.50	0.000	5,382	158.27	0.022
44.00	0.000	5,343	158.26	0.022
44.50	0.000	5,304	158.26	0.022
45.00	0.000	5,264	158.26	0.022
45.50	0.000	5,225	158.25	0.022
46.00	0.000	5,186	158.25	0.022
46.50	0.000	5,147	158.25	0.022
47.00	0.000	5,109	158.24	0.022
47.50	0.000	5,070	158.24	0.021
48.00	0.000	5,031	158.24	0.021
48.50	0.000	4,993	158.23	0.021
49.00	0.000	4,955	158.23	0.021
49.50	0.000	4,916	158.23	0.021
50.00	0.000	4,878	158.22	0.021
50.50	0.000	4,840	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	4,802	158.22	0.021
51.50	0.000	4,764	158.21	0.021
52.00	0.000	4,726	158.21	0.021
52.50	0.000	4,689	158.21	0.021
53.00	0.000	4,651	158.20	0.021
53.50	0.000	4,613	158.20	0.021
54.00	0.000	4,576	158.20	0.021
54.50	0.000	4,539	158.19	0.021
55.00	0.000	4,501	158.19	0.021
55.50	0.000	4,464	158.19	0.021
56.00	0.000	4,427	158.18	0.021
56.50	0.000	4,390	158.18	0.021
57.00	0.000	4,353	158.18	0.020
57.50	0.000	4,317	158.17	0.020
58.00	0.000	4,280	158.17	0.020
58.50	0.000	4,243	158.17	0.020
59.00	0.000	4,207	158.17	0.020
59.50	0.000	4,171	158.16	0.020
60.00	0.000	4,134	158.16	0.020
60.50	0.000	4,098	158.16	0.020
61.00	0.000	4,062	158.15	0.020
61.50	0.000	4,026	158.15	0.020
62.00	0.000	3,990	158.15	0.020
62.50	0.000	3,954	158.14	0.020
63.00	0.000	3,919	158.14	0.020
63.50	0.000	3,883	158.14	0.020
64.00	0.000	3,848	158.13	0.020
64.50	0.000	3,812	158.13	0.020
65.00	0.000	3,777	158.13	0.020
65.50	0.000	3,742	158.13	0.020
66.00	0.000	3,706	158.12	0.019
66.50	0.000	3,671	158.12	0.019
67.00	0.000	3,636	158.12	0.019
67.50	0.000	3,602	158.11	0.019
68.00	0.000	3,567	158.11	0.019
68.50	0.000	3,532	158.11	0.019
69.00	0.000	3,498	158.10	0.019
69.50	0.000	3,463	158.10	0.019
70.00	0.000	3,429	158.10	0.019
70.50	0.000	3,394	158.10	0.019
71.00	0.000	3,360	158.09	0.019
71.50	0.000	3,326	158.09	0.019
72.00	0.000	3,292	158.09	0.019
72.50	0.000	3,258	158.08	0.019
73.00	0.000	3,224	158.08	0.019
73.50	0.000	3,191	158.08	0.019
74.00	0.000	3,157	158.08	0.019
74.50	0.000	3,124	158.07	0.019
75.00	0.000	3,090	158.07	0.019
75.50	0.000	3,057	158.07	0.018
76.00	0.000	3,024	158.06	0.018

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	2,990	158.06	0.018
77.00	0.000	2,957	158.06	0.018
77.50	0.000	2,924	158.06	0.018
78.00	0.000	2,892	158.05	0.018
78.50	0.000	2,859	158.05	0.018
79.00	0.000	2,826	158.05	0.018
79.50	0.000	2,793	158.05	0.018
80.00	0.000	2,761	158.04	0.018
80.50	0.000	2,729	158.04	0.018
81.00	0.000	2,696	158.04	0.018
81.50	0.000	2,664	158.03	0.018
82.00	0.000	2,632	158.03	0.018
82.50	0.000	2,600	158.03	0.018
83.00	0.000	2,568	158.02	0.018
83.50	0.000	2,536	158.02	0.018
84.00	0.000	2,505	158.01	0.017
84.50	0.000	2,474	158.00	0.017
85.00	0.000	2,443	158.00	0.017
85.50	0.000	2,412	157.99	0.017
86.00	0.000	2,382	157.99	0.017
86.50	0.000	2,351	157.98	0.017
87.00	0.000	2,321	157.97	0.017
87.50	0.000	2,291	157.97	0.017
88.00	0.000	2,262	157.96	0.016
88.50	0.000	2,232	157.96	0.016
89.00	0.000	2,203	157.95	0.016
89.50	0.000	2,174	157.95	0.016
90.00	0.000	2,145	157.94	0.016
90.50	0.000	2,116	157.94	0.016
91.00	0.000	2,088	157.93	0.016
91.50	0.000	2,060	157.92	0.016
92.00	0.000	2,032	157.92	0.015
92.50	0.000	2,004	157.91	0.015
93.00	0.000	1,976	157.91	0.015
93.50	0.000	1,949	157.90	0.015
94.00	0.000	1,922	157.90	0.015
94.50	0.000	1,895	157.89	0.015
95.00	0.000	1,868	157.89	0.015
95.50	0.000	1,842	157.88	0.015
96.00	0.000	1,816	157.88	0.015
96.50	0.000	1,789	157.87	0.014
97.00	0.000	1,764	157.87	0.014
97.50	0.000	1,738	157.86	0.014
98.00	0.000	1,713	157.86	0.014
98.50	0.000	1,687	157.85	0.014
99.00	0.000	1,662	157.85	0.014
99.50	0.000	1,638	157.84	0.014
100.00	0.000	1,613	157.84	0.014
100.50	0.000	1,589	157.83	0.013
101.00	0.000	1,565	157.83	0.013
101.50	0.000	1,541	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	1,517	157.82	0.013
102.50	0.000	1,494	157.82	0.013
103.00	0.000	1,470	157.81	0.013
103.50	0.000	1,447	157.81	0.013
104.00	0.000	1,424	157.80	0.013
104.50	0.000	1,402	157.80	0.013
105.00	0.000	1,379	157.79	0.012
105.50	0.000	1,357	157.79	0.012
106.00	0.000	1,335	157.79	0.012
106.50	0.000	1,313	157.78	0.012
107.00	0.000	1,292	157.78	0.012
107.50	0.000	1,271	157.77	0.012
108.00	0.000	1,249	157.77	0.012
108.50	0.000	1,229	157.77	0.012
109.00	0.000	1,208	157.76	0.011
109.50	0.000	1,187	157.76	0.011
110.00	0.000	1,167	157.75	0.011
110.50	0.000	1,147	157.75	0.011
111.00	0.000	1,127	157.75	0.011
111.50	0.000	1,108	157.74	0.011
112.00	0.000	1,088	157.74	0.011
112.50	0.000	1,069	157.73	0.011
113.00	0.000	1,050	157.73	0.010
113.50	0.000	1,031	157.73	0.010
114.00	0.000	1,013	157.72	0.010
114.50	0.000	994	157.72	0.010
115.00	0.000	976	157.72	0.010
115.50	0.000	958	157.71	0.010
116.00	0.000	941	157.71	0.010
116.50	0.000	923	157.71	0.010
117.00	0.000	906	157.70	0.010
117.50	0.000	889	157.70	0.009
118.00	0.000	872	157.70	0.009
118.50	0.000	855	157.69	0.009
119.00	0.000	839	157.69	0.009
119.50	0.000	823	157.69	0.009
120.00	0.000	807	157.68	0.009
120.50	0.000	791	157.68	0.009
121.00	0.000	775	157.68	0.009
121.50	0.000	760	157.68	0.008
122.00	0.000	745	157.67	0.008
122.50	0.000	730	157.67	0.008
123.00	0.000	715	157.67	0.008
123.50	0.000	701	157.66	0.008
124.00	0.000	686	157.66	0.008
124.50	0.000	672	157.66	0.008
125.00	0.000	658	157.66	0.008
125.50	0.000	645	157.65	0.008
126.00	0.000	631	157.65	0.007
126.50	0.000	618	157.65	0.007
127.00	0.000	605	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	592	157.64	0.007
128.00	0.000	580	157.64	0.007
128.50	0.000	567	157.64	0.007
129.00	0.000	555	157.64	0.007
129.50	0.000	543	157.63	0.007
130.00	0.000	532	157.63	0.006
130.50	0.000	520	157.63	0.006
131.00	0.000	509	157.63	0.006
131.50	0.000	498	157.63	0.006
132.00	0.000	487	157.62	0.006
132.50	0.000	476	157.62	0.006
133.00	0.000	466	157.62	0.006
133.50	0.000	456	157.62	0.006
134.00	0.000	446	157.62	0.005
134.50	0.000	436	157.61	0.005
135.00	0.000	426	157.61	0.005
135.50	0.000	417	157.61	0.005
136.00	0.000	408	157.61	0.005
136.50	0.000	399	157.61	0.005
137.00	0.000	390	157.60	0.005
137.50	0.000	381	157.60	0.005
138.00	0.000	373	157.60	0.005
138.50	0.000	365	157.60	0.004
139.00	0.000	357	157.60	0.004
139.50	0.000	350	157.60	0.004
140.00	0.000	342	157.60	0.004
140.50	0.000	335	157.59	0.004
141.00	0.000	328	157.59	0.004
141.50	0.000	322	157.59	0.004
142.00	0.000	315	157.59	0.004
142.50	0.000	309	157.59	0.003
143.00	0.000	303	157.59	0.003
143.50	0.000	297	157.59	0.003
144.00	0.000	291	157.59	0.003
144.50	0.000	286	157.58	0.003
145.00	0.000	280	157.58	0.003
145.50	0.000	275	157.58	0.003
146.00	0.000	270	157.58	0.003
146.50	0.000	265	157.58	0.003
147.00	0.000	260	157.58	0.003
147.50	0.000	256	157.58	0.003
148.00	0.000	251	157.58	0.002
148.50	0.000	247	157.58	0.002
149.00	0.000	243	157.58	0.002
149.50	0.000	239	157.58	0.002
150.00	0.000	235	157.58	0.002
150.50	0.000	231	157.57	0.002
151.00	0.000	227	157.57	0.002
151.50	0.000	224	157.57	0.002
152.00	0.000	220	157.57	0.002
152.50	0.000	217	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	213	157.57	0.002
153.50	0.000	210	157.57	0.002
154.00	0.000	207	157.57	0.002
154.50	0.000	204	157.57	0.002
155.00	0.000	201	157.57	0.002
155.50	0.000	198	157.57	0.002
156.00	0.000	195	157.57	0.002
156.50	0.000	192	157.57	0.002
157.00	0.000	189	157.57	0.001
157.50	0.000	187	157.57	0.001
158.00	0.000	184	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	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	146	157.56	0.001
168.00	0.000	144	157.56	0.001

Summary for Pond 3P: UG2

Inflow Area = 21,519 sf, 87.04% Impervious, Inflow Depth = 1.74" for 1-yr event
Inflow = 1.550 cfs @ 11.96 hrs, Volume= 3,116 cf
Outflow = 0.282 cfs @ 12.12 hrs, Volume= 3,115 cf, Atten= 82%, Lag= 9.5 min
Primary = 0.282 cfs @ 12.12 hrs, Volume= 3,115 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 160.13' @ 12.12 hrs Surf.Area= 2,542 sf Storage= 1,259 cf

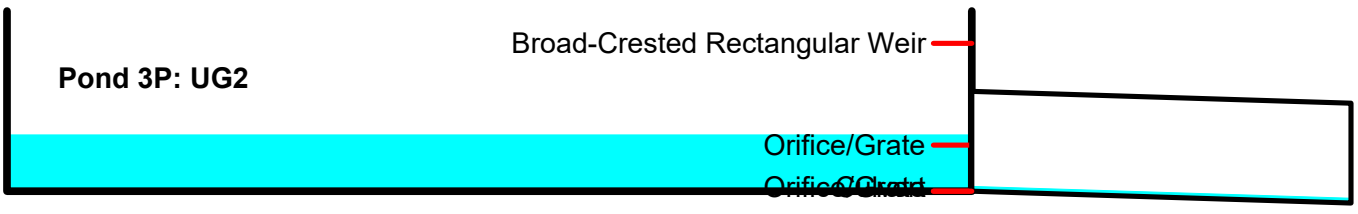
Plug-Flow detention time= 80.8 min calculated for 3,115 cf (100% of inflow)
Center-of-Mass det. time= 81.1 min (890.3 - 809.2)

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'	**5.0" 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= 36.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.282 cfs @ 12.12 hrs HW=160.13' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 0.282 cfs of 2.429 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.201 cfs @ 4.086 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.082 cfs @ 1.264 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 3P: UG2 - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Cultec Recharger®180HD)
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

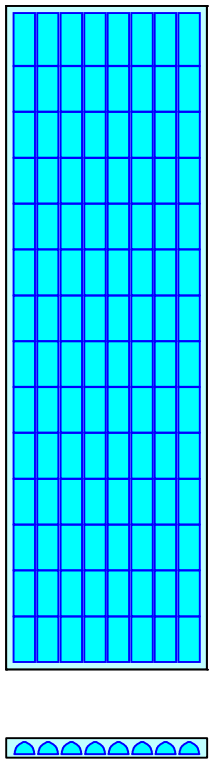
14 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 89.62' Row Length +12.0" End Stone x 2 = 91.62' Base Length
8 Rows x 36.0" Wide + 3.0" Spacing x 7 + 12.0" Side Stone x 2 = 27.75' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

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

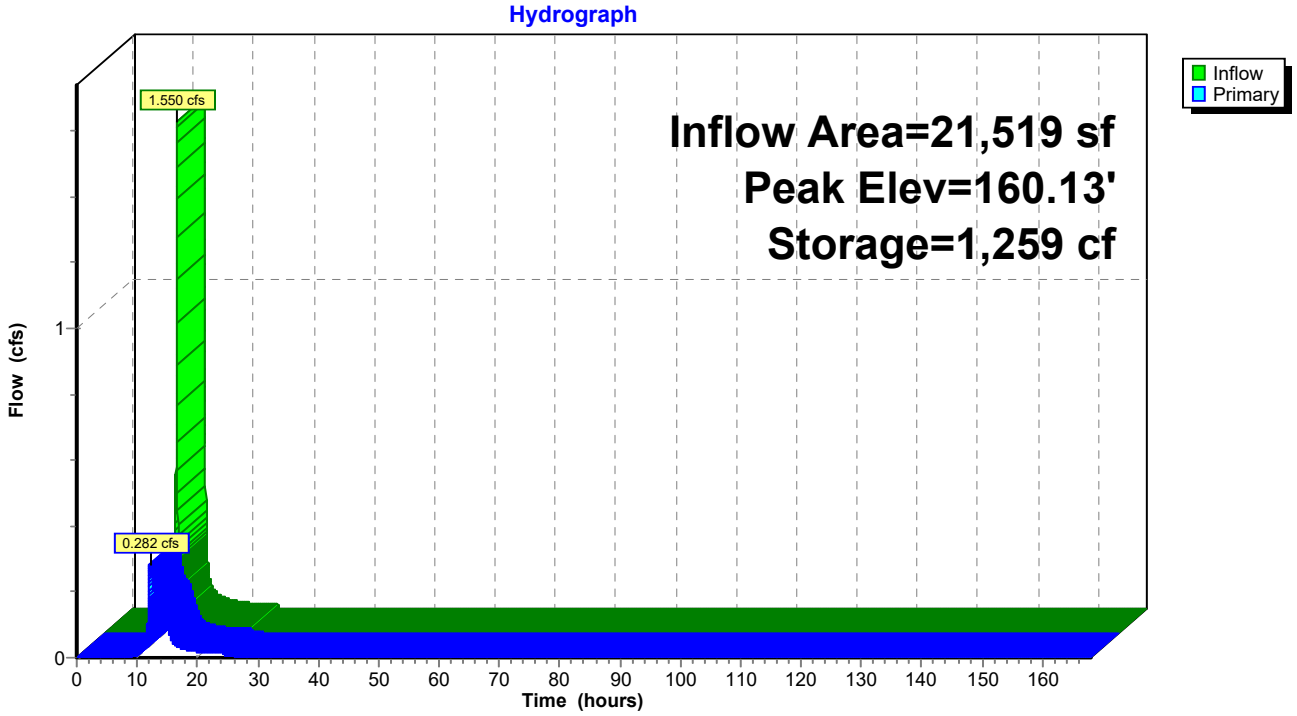
6,885.8 cf Field - 2,466.0 cf Chambers = 4,419.8 cf Stone x 40.0% Voids = 1,767.9 cf Stone Storage

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=21,519 sf
Peak Elev=160.13'
Storage=1,259 cf
1.550 cfs
0.282 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	0.001	0	159.28	0.000
7.00	0.002	3	159.28	0.000
7.50	0.003	8	159.29	0.000
8.00	0.005	14	159.29	0.000
8.50	0.007	24	159.30	0.001
9.00	0.011	36	159.32	0.003
9.50	0.013	51	159.33	0.005
10.00	0.018	66	159.34	0.009
10.50	0.027	86	159.36	0.014
11.00	0.043	114	159.39	0.024
11.50	**0.083**	164	159.44	0.046
12.00	**1.314**	**1,085**	**160.04**	**0.216**
12.50	0.121	**1,140**	**160.07**	**0.235**
13.00	0.076	940	159.98	0.180
13.50	0.058	750	159.89	0.165
14.00	0.046	561	159.80	0.149
14.50	0.041	392	159.67	0.121
15.00	0.037	273	159.55	0.089
15.50	0.032	199	159.48	0.062
16.00	0.028	160	159.44	0.044
16.50	0.026	139	159.42	0.035
17.00	0.025	128	159.41	0.030
17.50	0.024	121	159.40	0.027
18.00	0.022	115	159.39	0.025
18.50	0.021	111	159.39	0.023
19.00	0.019	106	159.38	0.021
19.50	0.018	102	159.38	0.020
20.00	0.016	98	159.38	0.018
20.50	0.016	94	159.37	0.017
21.00	0.015	92	159.37	0.016
21.50	0.015	90	159.37	0.016
22.00	0.015	89	159.37	0.015
22.50	0.014	88	159.37	0.015
23.00	0.014	87	159.37	0.015
23.50	0.014	86	159.36	0.014
24.00	0.014	85	159.36	0.014
24.50	0.000	67	159.35	0.009
25.00	0.000	54	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	0.004
26.00	0.000	39	159.32	0.003
26.50	0.000	34	159.31	0.002
27.00	0.000	30	159.31	0.002
27.50	0.000	27	159.31	0.002
28.00	0.000	24	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	19	159.30	0.001
30.00	0.000	18	159.30	0.001
30.50	0.000	17	159.30	0.001
31.00	0.000	16	159.30	0.001
31.50	0.000	15	159.29	0.000
32.00	0.000	14	159.29	0.000
32.50	0.000	13	159.29	0.000
33.00	0.000	13	159.29	0.000
33.50	0.000	12	159.29	0.000
34.00	0.000	11	159.29	0.000
34.50	0.000	11	159.29	0.000
35.00	0.000	10	159.29	0.000
35.50	0.000	10	159.29	0.000
36.00	0.000	10	159.29	0.000
36.50	0.000	9	159.29	0.000
37.00	0.000	9	159.29	0.000
37.50	0.000	9	159.29	0.000
38.00	0.000	8	159.29	0.000
38.50	0.000	8	159.29	0.000
39.00	0.000	8	159.29	0.000
39.50	0.000	8	159.29	0.000
40.00	0.000	7	159.29	0.000
40.50	0.000	7	159.29	0.000
41.00	0.000	7	159.29	0.000
41.50	0.000	7	159.29	0.000
42.00	0.000	7	159.29	0.000
42.50	0.000	6	159.29	0.000
43.00	0.000	6	159.29	0.000
43.50	0.000	6	159.29	0.000
44.00	0.000	6	159.29	0.000
44.50	0.000	6	159.29	0.000
45.00	0.000	6	159.29	0.000
45.50	0.000	6	159.29	0.000
46.00	0.000	6	159.29	0.000
46.50	0.000	5	159.29	0.000
47.00	0.000	5	159.29	0.000
47.50	0.000	5	159.29	0.000
48.00	0.000	5	159.28	0.000
48.50	0.000	5	159.28	0.000
49.00	0.000	5	159.28	0.000
49.50	0.000	5	159.28	0.000
50.00	0.000	5	159.28	0.000
50.50	0.000	5	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	5	159.28	0.000
51.50	0.000	4	159.28	0.000
52.00	0.000	4	159.28	0.000
52.50	0.000	4	159.28	0.000
53.00	0.000	4	159.28	0.000
53.50	0.000	4	159.28	0.000
54.00	0.000	4	159.28	0.000
54.50	0.000	4	159.28	0.000
55.00	0.000	4	159.28	0.000
55.50	0.000	4	159.28	0.000
56.00	0.000	4	159.28	0.000
56.50	0.000	4	159.28	0.000
57.00	0.000	4	159.28	0.000
57.50	0.000	4	159.28	0.000
58.00	0.000	4	159.28	0.000
58.50	0.000	4	159.28	0.000
59.00	0.000	4	159.28	0.000
59.50	0.000	3	159.28	0.000
60.00	0.000	3	159.28	0.000
60.50	0.000	3	159.28	0.000
61.00	0.000	3	159.28	0.000
61.50	0.000	3	159.28	0.000
62.00	0.000	3	159.28	0.000
62.50	0.000	3	159.28	0.000
63.00	0.000	3	159.28	0.000
63.50	0.000	3	159.28	0.000
64.00	0.000	3	159.28	0.000
64.50	0.000	3	159.28	0.000
65.00	0.000	3	159.28	0.000
65.50	0.000	3	159.28	0.000
66.00	0.000	3	159.28	0.000
66.50	0.000	3	159.28	0.000
67.00	0.000	3	159.28	0.000
67.50	0.000	3	159.28	0.000
68.00	0.000	3	159.28	0.000
68.50	0.000	3	159.28	0.000
69.00	0.000	3	159.28	0.000
69.50	0.000	3	159.28	0.000
70.00	0.000	3	159.28	0.000
70.50	0.000	3	159.28	0.000
71.00	0.000	3	159.28	0.000
71.50	0.000	3	159.28	0.000
72.00	0.000	3	159.28	0.000
72.50	0.000	3	159.28	0.000
73.00	0.000	3	159.28	0.000
73.50	0.000	3	159.28	0.000
74.00	0.000	3	159.28	0.000
74.50	0.000	2	159.28	0.000
75.00	0.000	2	159.28	0.000
75.50	0.000	2	159.28	0.000
76.00	0.000	2	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	2	159.28	0.000
77.00	0.000	2	159.28	0.000
77.50	0.000	2	159.28	0.000
78.00	0.000	2	159.28	0.000
78.50	0.000	2	159.28	0.000
79.00	0.000	2	159.28	0.000
79.50	0.000	2	159.28	0.000
80.00	0.000	2	159.28	0.000
80.50	0.000	2	159.28	0.000
81.00	0.000	2	159.28	0.000
81.50	0.000	2	159.28	0.000
82.00	0.000	2	159.28	0.000
82.50	0.000	2	159.28	0.000
83.00	0.000	2	159.28	0.000
83.50	0.000	2	159.28	0.000
84.00	0.000	2	159.28	0.000
84.50	0.000	2	159.28	0.000
85.00	0.000	2	159.28	0.000
85.50	0.000	2	159.28	0.000
86.00	0.000	2	159.28	0.000
86.50	0.000	2	159.28	0.000
87.00	0.000	2	159.28	0.000
87.50	0.000	2	159.28	0.000
88.00	0.000	2	159.28	0.000
88.50	0.000	2	159.28	0.000
89.00	0.000	2	159.28	0.000
89.50	0.000	2	159.28	0.000
90.00	0.000	2	159.28	0.000
90.50	0.000	2	159.28	0.000
91.00	0.000	2	159.28	0.000
91.50	0.000	2	159.28	0.000
92.00	0.000	2	159.28	0.000
92.50	0.000	2	159.28	0.000
93.00	0.000	2	159.28	0.000
93.50	0.000	2	159.28	0.000
94.00	0.000	2	159.28	0.000
94.50	0.000	2	159.28	0.000
95.00	0.000	2	159.28	0.000
95.50	0.000	2	159.28	0.000
96.00	0.000	2	159.28	0.000
96.50	0.000	2	159.28	0.000
97.00	0.000	2	159.28	0.000
97.50	0.000	2	159.28	0.000
98.00	0.000	2	159.28	0.000
98.50	0.000	2	159.28	0.000
99.00	0.000	2	159.28	0.000
99.50	0.000	2	159.28	0.000
100.00	0.000	2	159.28	0.000
100.50	0.000	2	159.28	0.000
101.00	0.000	2	159.28	0.000
101.50	0.000	2	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	2	159.28	0.000
102.50	0.000	2	159.28	0.000
103.00	0.000	2	159.28	0.000
103.50	0.000	2	159.28	0.000
104.00	0.000	2	159.28	0.000
104.50	0.000	2	159.28	0.000
105.00	0.000	2	159.28	0.000
105.50	0.000	2	159.28	0.000
106.00	0.000	2	159.28	0.000
106.50	0.000	2	159.28	0.000
107.00	0.000	2	159.28	0.000
107.50	0.000	2	159.28	0.000
108.00	0.000	2	159.28	0.000
108.50	0.000	2	159.28	0.000
109.00	0.000	2	159.28	0.000
109.50	0.000	2	159.28	0.000
110.00	0.000	2	159.28	0.000
110.50	0.000	2	159.28	0.000
111.00	0.000	2	159.28	0.000
111.50	0.000	1	159.28	0.000
112.00	0.000	1	159.28	0.000
112.50	0.000	1	159.28	0.000
113.00	0.000	1	159.28	0.000
113.50	0.000	1	159.28	0.000
114.00	0.000	1	159.28	0.000
114.50	0.000	1	159.28	0.000
115.00	0.000	1	159.28	0.000
115.50	0.000	1	159.28	0.000
116.00	0.000	1	159.28	0.000
116.50	0.000	1	159.28	0.000
117.00	0.000	1	159.28	0.000
117.50	0.000	1	159.28	0.000
118.00	0.000	1	159.28	0.000
118.50	0.000	1	159.28	0.000
119.00	0.000	1	159.28	0.000
119.50	0.000	1	159.28	0.000
120.00	0.000	1	159.28	0.000
120.50	0.000	1	159.28	0.000
121.00	0.000	1	159.28	0.000
121.50	0.000	1	159.28	0.000
122.00	0.000	1	159.28	0.000
122.50	0.000	1	159.28	0.000
123.00	0.000	1	159.28	0.000
123.50	0.000	1	159.28	0.000
124.00	0.000	1	159.28	0.000
124.50	0.000	1	159.28	0.000
125.00	0.000	1	159.28	0.000
125.50	0.000	1	159.28	0.000
126.00	0.000	1	159.28	0.000
126.50	0.000	1	159.28	0.000
127.00	0.000	1	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	1	159.28	0.000
128.00	0.000	1	159.28	0.000
128.50	0.000	1	159.28	0.000
129.00	0.000	1	159.28	0.000
129.50	0.000	1	159.28	0.000
130.00	0.000	1	159.28	0.000
130.50	0.000	1	159.28	0.000
131.00	0.000	1	159.28	0.000
131.50	0.000	1	159.28	0.000
132.00	0.000	1	159.28	0.000
132.50	0.000	1	159.28	0.000
133.00	0.000	1	159.28	0.000
133.50	0.000	1	159.28	0.000
134.00	0.000	1	159.28	0.000
134.50	0.000	1	159.28	0.000
135.00	0.000	1	159.28	0.000
135.50	0.000	1	159.28	0.000
136.00	0.000	1	159.28	0.000
136.50	0.000	1	159.28	0.000
137.00	0.000	1	159.28	0.000
137.50	0.000	1	159.28	0.000
138.00	0.000	1	159.28	0.000
138.50	0.000	1	159.28	0.000
139.00	0.000	1	159.28	0.000
139.50	0.000	1	159.28	0.000
140.00	0.000	1	159.28	0.000
140.50	0.000	1	159.28	0.000
141.00	0.000	1	159.28	0.000
141.50	0.000	1	159.28	0.000
142.00	0.000	1	159.28	0.000
142.50	0.000	1	159.28	0.000
143.00	0.000	1	159.28	0.000
143.50	0.000	1	159.28	0.000
144.00	0.000	1	159.28	0.000
144.50	0.000	1	159.28	0.000
145.00	0.000	1	159.28	0.000
145.50	0.000	1	159.28	0.000
146.00	0.000	1	159.28	0.000
146.50	0.000	1	159.28	0.000
147.00	0.000	1	159.28	0.000
147.50	0.000	1	159.28	0.000
148.00	0.000	1	159.28	0.000
148.50	0.000	1	159.28	0.000
149.00	0.000	1	159.28	0.000
149.50	0.000	1	159.28	0.000
150.00	0.000	1	159.28	0.000
150.50	0.000	1	159.28	0.000
151.00	0.000	1	159.28	0.000
151.50	0.000	1	159.28	0.000
152.00	0.000	1	159.28	0.000
152.50	0.000	1	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	1	159.28	0.000
153.50	0.000	1	159.28	0.000
154.00	0.000	1	159.28	0.000
154.50	0.000	1	159.28	0.000
155.00	0.000	1	159.28	0.000
155.50	0.000	1	159.28	0.000
156.00	0.000	1	159.28	0.000
156.50	0.000	1	159.28	0.000
157.00	0.000	1	159.28	0.000
157.50	0.000	1	159.28	0.000
158.00	0.000	1	159.28	0.000
158.50	0.000	1	159.28	0.000
159.00	0.000	1	159.28	0.000
159.50	0.000	1	159.28	0.000
160.00	0.000	1	159.28	0.000
160.50	0.000	1	159.28	0.000
161.00	0.000	1	159.28	0.000
161.50	0.000	1	159.28	0.000
162.00	0.000	1	159.28	0.000
162.50	0.000	1	159.28	0.000
163.00	0.000	1	159.28	0.000
163.50	0.000	1	159.28	0.000
164.00	0.000	1	159.28	0.000
164.50	0.000	1	159.28	0.000
165.00	0.000	1	159.28	0.000
165.50	0.000	1	159.28	0.000
166.00	0.000	1	159.28	0.000
166.50	0.000	1	159.28	0.000
167.00	0.000	1	159.28	0.000
167.50	0.000	1	159.28	0.000
168.00	0.000	1	159.28	0.000

Summary for Pond 1P: UG1

Inflow Area = 81,675 sf, 99.20% Impervious, Inflow Depth = 3.05" for 2-yr event
Inflow = 8.979 cfs @ 11.96 hrs, Volume= 20,740 cf
Outflow = 2.634 cfs @ 12.07 hrs, Volume= 20,595 cf, Atten= 71%, Lag= 7.0 min
Primary = 2.634 cfs @ 12.07 hrs, Volume= 20,595 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 158.80' @ 12.07 hrs Surf.Area= 13,041 sf Storage= 11,487 cf

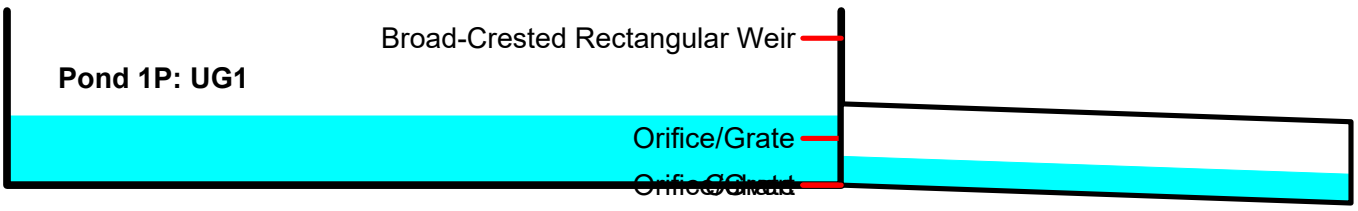
Plug-Flow detention time= 1,278.1 min calculated for 20,594 cf (99% of inflow)
Center-of-Mass det. time= 1,273.8 min (2,024.9 - 751.0)

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'	**40.0" 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= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=2.634 cfs @ 12.07 hrs HW=158.80' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 2.634 cfs of 4.996 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.029 cfs @ 5.345 fps)
  ├**2=Orifice/Grate** (Orifice Controls 2.605 cfs @ 2.344 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

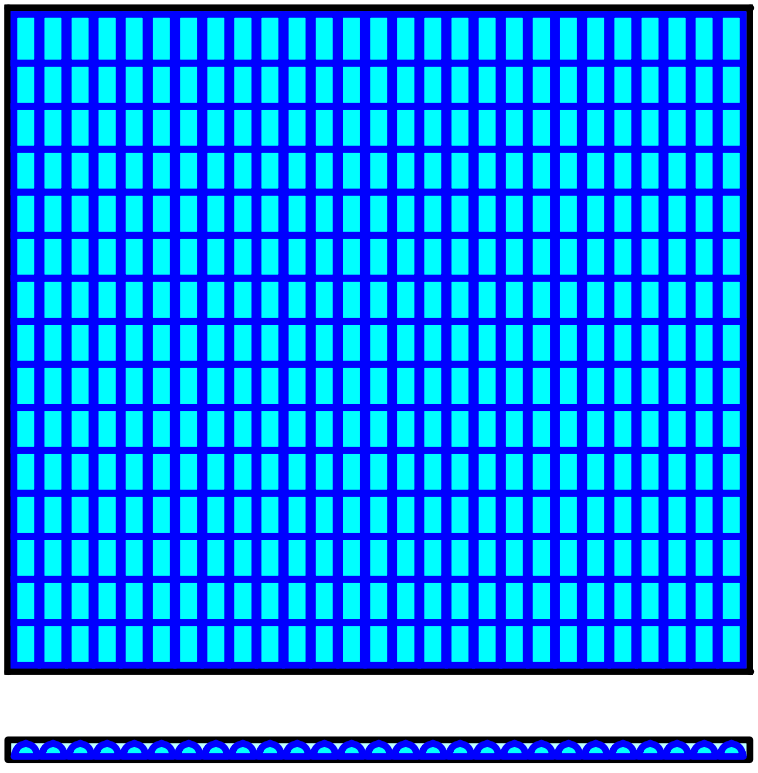
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

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

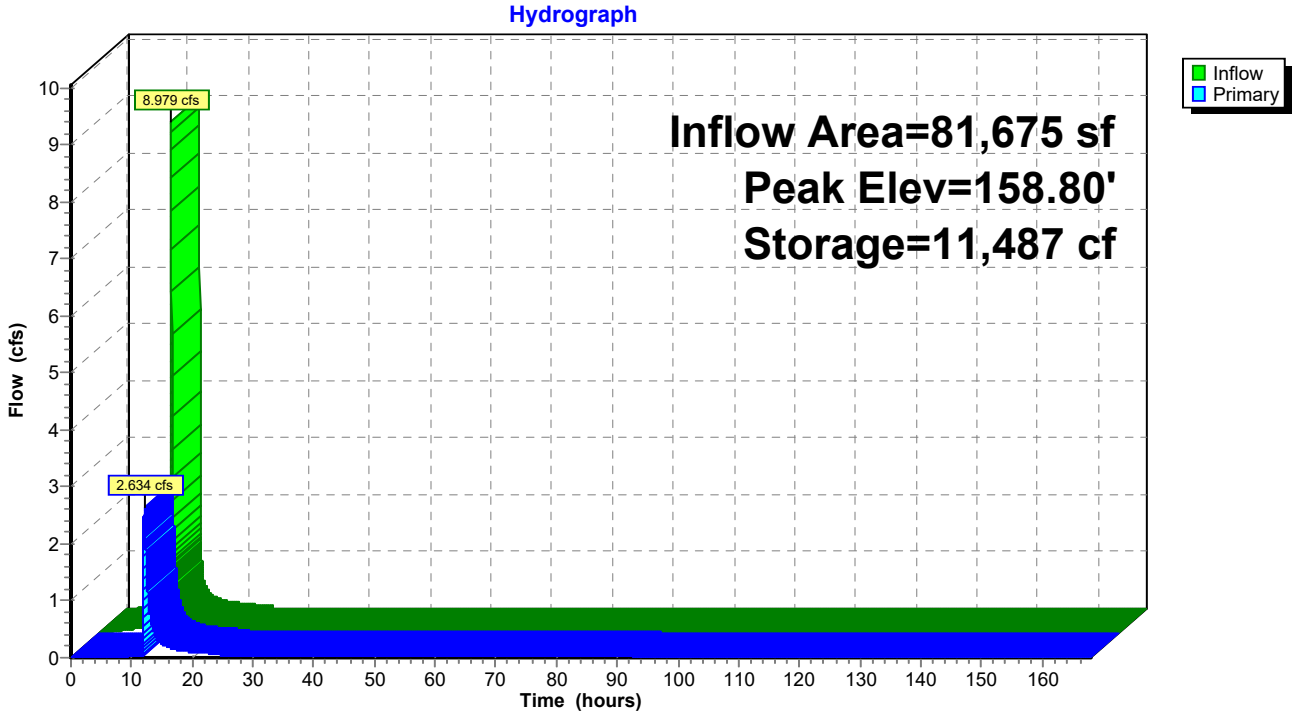
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

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
8.979 cfs
2.634 cfs
Inflow Area=81,675 sf
Peak Elev=158.80'
Storage=11,487 cf
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	24	157.53	0.000
2.50	0.027	63	157.54	0.000
3.00	0.035	118	157.55	0.001
3.50	0.043	187	157.57	0.001
4.00	0.051	268	157.58	0.003
4.50	0.059	360	157.60	0.004
5.00	0.068	465	157.62	0.006
5.50	0.076	583	157.64	0.007
6.00	0.085	715	157.67	0.008
6.50	0.093	859	157.69	0.009
7.00	0.101	1,016	157.72	0.010
7.50	0.109	1,186	157.76	0.011
8.00	0.117	1,368	157.79	0.012
8.50	0.143	1,576	157.83	0.013
9.00	0.174	1,836	157.88	0.015
9.50	0.181	2,131	157.94	0.016
10.00	0.222	2,460	158.00	0.017
10.50	0.292	2,887	158.05	0.018
11.00	0.406	3,476	158.10	0.019
11.50	**0.672**	4,391	158.18	0.021
12.00	**7.417**	**10,877**	**158.75**	**2.285**
12.50	0.645	**9,864**	**158.66**	**1.513**
13.00	0.401	8,785	158.56	0.792
13.50	0.303	8,272	158.52	0.511
14.00	0.238	7,975	158.49	0.370
14.50	0.210	7,788	158.47	0.290
15.00	0.188	7,670	158.46	0.243
15.50	0.167	7,583	158.46	0.211
16.00	0.145	7,509	158.45	0.184
16.50	0.135	7,448	158.45	0.164
17.00	0.128	7,404	158.44	0.149
17.50	0.120	7,368	158.44	0.138
18.00	0.112	7,337	158.44	0.129
18.50	0.105	7,308	158.43	0.120
19.00	0.097	7,280	158.43	0.112
19.50	0.089	7,252	158.43	0.105
20.00	0.081	7,225	158.43	0.097
20.50	0.079	7,200	158.42	0.091
21.00	0.077	7,182	158.42	0.086
21.50	0.076	7,168	158.42	0.083
22.00	0.074	7,157	158.42	0.080
22.50	0.073	7,148	158.42	0.078
23.00	0.071	7,139	158.42	0.076
23.50	0.070	7,132	158.42	0.074
24.00	0.068	7,124	158.42	0.072
24.50	0.000	7,030	158.41	0.052
25.00	0.000	6,950	158.40	0.038

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	6,889	158.40	0.030
26.00	0.000	6,840	158.39	0.025
26.50	0.000	6,797	158.39	0.024
27.00	0.000	6,754	158.39	0.024
27.50	0.000	6,712	158.38	0.024
28.00	0.000	6,669	158.38	0.024
28.50	0.000	6,627	158.37	0.024
29.00	0.000	6,584	158.37	0.023
29.50	0.000	6,542	158.37	0.023
30.00	0.000	6,500	158.36	0.023
30.50	0.000	6,458	158.36	0.023
31.00	0.000	6,416	158.36	0.023
31.50	0.000	6,374	158.35	0.023
32.00	0.000	6,333	158.35	0.023
32.50	0.000	6,291	158.34	0.023
33.00	0.000	6,250	158.34	0.023
33.50	0.000	6,208	158.34	0.023
34.00	0.000	6,167	158.33	0.023
34.50	0.000	6,126	158.33	0.023
35.00	0.000	6,084	158.33	0.023
35.50	0.000	6,043	158.32	0.023
36.00	0.000	6,002	158.32	0.023
36.50	0.000	5,962	158.32	0.023
37.00	0.000	5,921	158.31	0.023
37.50	0.000	5,880	158.31	0.023
38.00	0.000	5,840	158.31	0.023
38.50	0.000	5,799	158.30	0.022
39.00	0.000	5,759	158.30	0.022
39.50	0.000	5,719	158.30	0.022
40.00	0.000	5,678	158.29	0.022
40.50	0.000	5,638	158.29	0.022
41.00	0.000	5,598	158.29	0.022
41.50	0.000	5,558	158.28	0.022
42.00	0.000	5,519	158.28	0.022
42.50	0.000	5,479	158.27	0.022
43.00	0.000	5,439	158.27	0.022
43.50	0.000	5,400	158.27	0.022
44.00	0.000	5,361	158.26	0.022
44.50	0.000	5,321	158.26	0.022
45.00	0.000	5,282	158.26	0.022
45.50	0.000	5,243	158.25	0.022
46.00	0.000	5,204	158.25	0.022
46.50	0.000	5,165	158.25	0.022
47.00	0.000	5,126	158.24	0.022
47.50	0.000	5,087	158.24	0.021
48.00	0.000	5,049	158.24	0.021
48.50	0.000	5,010	158.23	0.021
49.00	0.000	4,972	158.23	0.021
49.50	0.000	4,934	158.23	0.021
50.00	0.000	4,895	158.22	0.021
50.50	0.000	4,857	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	4,819	158.22	0.021
51.50	0.000	4,781	158.21	0.021
52.00	0.000	4,743	158.21	0.021
52.50	0.000	4,705	158.21	0.021
53.00	0.000	4,668	158.20	0.021
53.50	0.000	4,630	158.20	0.021
54.00	0.000	4,593	158.20	0.021
54.50	0.000	4,555	158.20	0.021
55.00	0.000	4,518	158.19	0.021
55.50	0.000	4,481	158.19	0.021
56.00	0.000	4,444	158.19	0.021
56.50	0.000	4,407	158.18	0.021
57.00	0.000	4,370	158.18	0.020
57.50	0.000	4,333	158.18	0.020
58.00	0.000	4,296	158.17	0.020
58.50	0.000	4,260	158.17	0.020
59.00	0.000	4,223	158.17	0.020
59.50	0.000	4,187	158.16	0.020
60.00	0.000	4,151	158.16	0.020
60.50	0.000	4,114	158.16	0.020
61.00	0.000	4,078	158.15	0.020
61.50	0.000	4,042	158.15	0.020
62.00	0.000	4,006	158.15	0.020
62.50	0.000	3,970	158.15	0.020
63.00	0.000	3,935	158.14	0.020
63.50	0.000	3,899	158.14	0.020
64.00	0.000	3,863	158.14	0.020
64.50	0.000	3,828	158.13	0.020
65.00	0.000	3,793	158.13	0.020
65.50	0.000	3,757	158.13	0.020
66.00	0.000	3,722	158.12	0.020
66.50	0.000	3,687	158.12	0.019
67.00	0.000	3,652	158.12	0.019
67.50	0.000	3,617	158.12	0.019
68.00	0.000	3,582	158.11	0.019
68.50	0.000	3,548	158.11	0.019
69.00	0.000	3,513	158.11	0.019
69.50	0.000	3,479	158.10	0.019
70.00	0.000	3,444	158.10	0.019
70.50	0.000	3,410	158.10	0.019
71.00	0.000	3,376	158.09	0.019
71.50	0.000	3,341	158.09	0.019
72.00	0.000	3,307	158.09	0.019
72.50	0.000	3,274	158.09	0.019
73.00	0.000	3,240	158.08	0.019
73.50	0.000	3,206	158.08	0.019
74.00	0.000	3,172	158.08	0.019
74.50	0.000	3,139	158.07	0.019
75.00	0.000	3,105	158.07	0.019
75.50	0.000	3,072	158.07	0.019
76.00	0.000	3,039	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	3,005	158.06	0.018
77.00	0.000	2,972	158.06	0.018
77.50	0.000	2,939	158.06	0.018
78.00	0.000	2,906	158.06	0.018
78.50	0.000	2,873	158.05	0.018
79.00	0.000	2,841	158.05	0.018
79.50	0.000	2,808	158.05	0.018
80.00	0.000	2,776	158.04	0.018
80.50	0.000	2,743	158.04	0.018
81.00	0.000	2,711	158.04	0.018
81.50	0.000	2,679	158.04	0.018
82.00	0.000	2,646	158.03	0.018
82.50	0.000	2,614	158.03	0.018
83.00	0.000	2,582	158.03	0.018
83.50	0.000	2,551	158.02	0.018
84.00	0.000	2,519	158.01	0.017
84.50	0.000	2,488	158.01	0.017
85.00	0.000	2,457	158.00	0.017
85.50	0.000	2,426	158.00	0.017
86.00	0.000	2,395	157.99	0.017
86.50	0.000	2,365	157.98	0.017
87.00	0.000	2,335	157.98	0.017
87.50	0.000	2,305	157.97	0.017
88.00	0.000	2,275	157.97	0.016
88.50	0.000	2,245	157.96	0.016
89.00	0.000	2,216	157.95	0.016
89.50	0.000	2,187	157.95	0.016
90.00	0.000	2,158	157.94	0.016
90.50	0.000	2,129	157.94	0.016
91.00	0.000	2,101	157.93	0.016
91.50	0.000	2,072	157.93	0.016
92.00	0.000	2,044	157.92	0.016
92.50	0.000	2,016	157.92	0.015
93.00	0.000	1,989	157.91	0.015
93.50	0.000	1,961	157.91	0.015
94.00	0.000	1,934	157.90	0.015
94.50	0.000	1,907	157.90	0.015
95.00	0.000	1,880	157.89	0.015
95.50	0.000	1,854	157.89	0.015
96.00	0.000	1,827	157.88	0.015
96.50	0.000	1,801	157.88	0.014
97.00	0.000	1,775	157.87	0.014
97.50	0.000	1,750	157.87	0.014
98.00	0.000	1,724	157.86	0.014
98.50	0.000	1,699	157.86	0.014
99.00	0.000	1,674	157.85	0.014
99.50	0.000	1,649	157.85	0.014
100.00	0.000	1,624	157.84	0.014
100.50	0.000	1,600	157.84	0.014
101.00	0.000	1,575	157.83	0.013
101.50	0.000	1,551	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	1,528	157.82	0.013
102.50	0.000	1,504	157.82	0.013
103.00	0.000	1,481	157.81	0.013
103.50	0.000	1,458	157.81	0.013
104.00	0.000	1,435	157.81	0.013
104.50	0.000	1,412	157.80	0.013
105.00	0.000	1,389	157.80	0.012
105.50	0.000	1,367	157.79	0.012
106.00	0.000	1,345	157.79	0.012
106.50	0.000	1,323	157.78	0.012
107.00	0.000	1,302	157.78	0.012
107.50	0.000	1,280	157.78	0.012
108.00	0.000	1,259	157.77	0.012
108.50	0.000	1,238	157.77	0.012
109.00	0.000	1,217	157.76	0.011
109.50	0.000	1,197	157.76	0.011
110.00	0.000	1,176	157.76	0.011
110.50	0.000	1,156	157.75	0.011
111.00	0.000	1,136	157.75	0.011
111.50	0.000	1,116	157.74	0.011
112.00	0.000	1,097	157.74	0.011
112.50	0.000	1,078	157.74	0.011
113.00	0.000	1,058	157.73	0.011
113.50	0.000	1,040	157.73	0.010
114.00	0.000	1,021	157.73	0.010
114.50	0.000	1,003	157.72	0.010
115.00	0.000	984	157.72	0.010
115.50	0.000	966	157.72	0.010
116.00	0.000	949	157.71	0.010
116.50	0.000	931	157.71	0.010
117.00	0.000	914	157.71	0.010
117.50	0.000	896	157.70	0.009
118.00	0.000	879	157.70	0.009
118.50	0.000	863	157.70	0.009
119.00	0.000	846	157.69	0.009
119.50	0.000	830	157.69	0.009
120.00	0.000	814	157.69	0.009
120.50	0.000	798	157.68	0.009
121.00	0.000	782	157.68	0.009
121.50	0.000	767	157.68	0.009
122.00	0.000	752	157.67	0.008
122.50	0.000	737	157.67	0.008
123.00	0.000	722	157.67	0.008
123.50	0.000	707	157.67	0.008
124.00	0.000	693	157.66	0.008
124.50	0.000	679	157.66	0.008
125.00	0.000	665	157.66	0.008
125.50	0.000	651	157.65	0.008
126.00	0.000	637	157.65	0.007
126.50	0.000	624	157.65	0.007
127.00	0.000	611	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	598	157.64	0.007
128.00	0.000	585	157.64	0.007
128.50	0.000	573	157.64	0.007
129.00	0.000	561	157.64	0.007
129.50	0.000	549	157.64	0.007
130.00	0.000	537	157.63	0.007
130.50	0.000	525	157.63	0.006
131.00	0.000	514	157.63	0.006
131.50	0.000	503	157.63	0.006
132.00	0.000	492	157.62	0.006
132.50	0.000	481	157.62	0.006
133.00	0.000	471	157.62	0.006
133.50	0.000	460	157.62	0.006
134.00	0.000	450	157.62	0.006
134.50	0.000	440	157.61	0.005
135.00	0.000	431	157.61	0.005
135.50	0.000	421	157.61	0.005
136.00	0.000	412	157.61	0.005
136.50	0.000	403	157.61	0.005
137.00	0.000	394	157.61	0.005
137.50	0.000	385	157.60	0.005
138.00	0.000	377	157.60	0.005
138.50	0.000	369	157.60	0.004
139.00	0.000	361	157.60	0.004
139.50	0.000	353	157.60	0.004
140.00	0.000	346	157.60	0.004
140.50	0.000	338	157.59	0.004
141.00	0.000	331	157.59	0.004
141.50	0.000	325	157.59	0.004
142.00	0.000	318	157.59	0.004
142.50	0.000	312	157.59	0.003
143.00	0.000	306	157.59	0.003
143.50	0.000	300	157.59	0.003
144.00	0.000	294	157.59	0.003
144.50	0.000	288	157.59	0.003
145.00	0.000	283	157.58	0.003
145.50	0.000	277	157.58	0.003
146.00	0.000	272	157.58	0.003
146.50	0.000	267	157.58	0.003
147.00	0.000	263	157.58	0.003
147.50	0.000	258	157.58	0.003
148.00	0.000	253	157.58	0.002
148.50	0.000	249	157.58	0.002
149.00	0.000	245	157.58	0.002
149.50	0.000	241	157.58	0.002
150.00	0.000	237	157.58	0.002
150.50	0.000	233	157.57	0.002
151.00	0.000	229	157.57	0.002
151.50	0.000	225	157.57	0.002
152.00	0.000	222	157.57	0.002
152.50	0.000	218	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	211	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	191	157.57	0.001
157.50	0.000	188	157.57	0.001
158.00	0.000	185	157.57	0.001
158.50	0.000	183	157.57	0.001
159.00	0.000	180	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	173	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	150	157.56	0.001
167.00	0.000	148	157.56	0.001
167.50	0.000	146	157.56	0.001
168.00	0.000	145	157.56	0.001

Summary for Pond 3P: UG2

Inflow Area = 21,519 sf, 87.04% Impervious, Inflow Depth = 2.24" for 2-yr event
Inflow = 1.974 cfs @ 11.96 hrs, Volume= 4,022 cf
Outflow = 0.434 cfs @ 12.10 hrs, Volume= 4,021 cf, Atten= 78%, Lag= 8.2 min
Primary = 0.434 cfs @ 12.10 hrs, Volume= 4,021 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 160.28' @ 12.10 hrs Surf.Area= 2,542 sf Storage= 1,595 cf

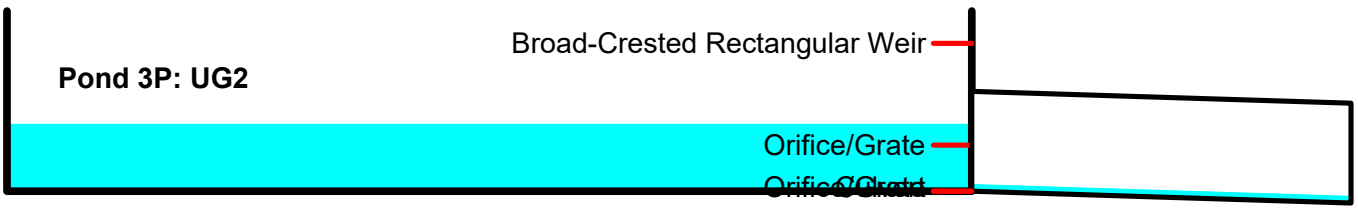
Plug-Flow detention time= 75.8 min calculated for 4,021 cf (100% of inflow)
Center-of-Mass det. time= 76.1 min (878.0 - 801.9)

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'	**5.0" 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= 36.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.434 cfs @ 12.10 hrs HW=160.28' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 0.434 cfs of 3.252 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.221 cfs @ 4.510 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.213 cfs @ 2.042 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 3P: UG2 - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Cultec Recharger®180HD)
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

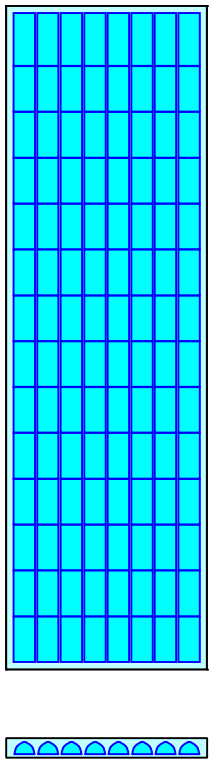
14 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 89.62' Row Length +12.0" End Stone x 2 = 91.62' Base Length
8 Rows x 36.0" Wide + 3.0" Spacing x 7 + 12.0" Side Stone x 2 = 27.75' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

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

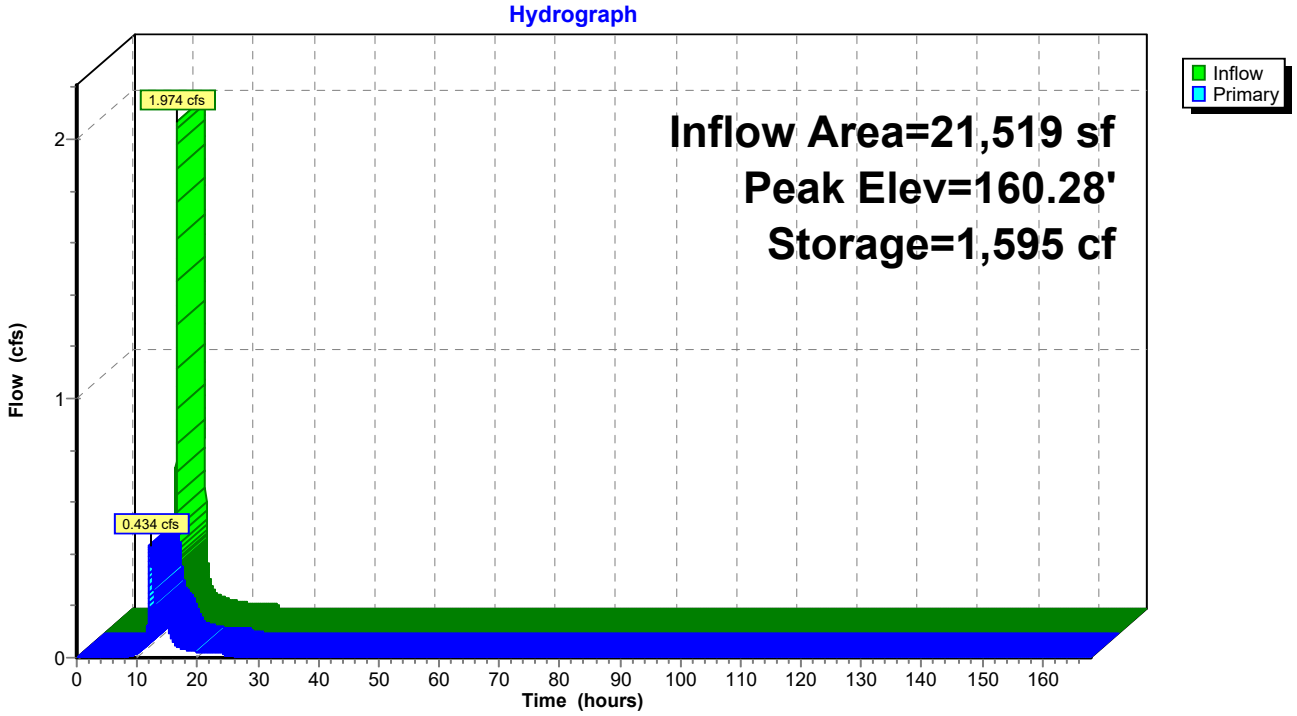
6,885.8 cf Field - 2,466.0 cf Chambers = 4,419.8 cf Stone x 40.0% Voids = 1,767.9 cf Stone Storage

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=21,519 sf
Peak Elev=160.28'
Storage=1,595 cf
1.974 cfs
0.434 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	0.002	2	159.28	0.000
6.50	0.003	7	159.29	0.000
7.00	0.005	14	159.29	0.000
7.50	0.007	23	159.30	0.001
8.00	0.009	34	159.31	0.002
8.50	0.012	46	159.33	0.004
9.00	0.017	62	159.34	0.008
9.50	0.020	78	159.36	0.012
10.00	0.027	94	159.37	0.017
10.50	0.040	116	159.39	0.025
11.00	0.061	149	159.43	0.039
11.50	**0.113**	209	159.49	0.067
12.00	**1.664**	**1,408**	**160.19**	**0.352**
12.50	0.151	**1,361**	**160.17**	**0.329**
13.00	0.095	1,090	160.05	0.218
13.50	0.072	894	159.96	0.175
14.00	0.057	706	159.87	0.161
14.50	0.050	525	159.79	0.146
15.00	0.045	374	159.65	0.116
15.50	0.040	268	159.54	0.088
16.00	0.035	200	159.48	0.063
16.50	0.033	165	159.44	0.046
17.00	0.031	147	159.42	0.038
17.50	0.029	137	159.41	0.034
18.00	0.027	130	159.41	0.031
18.50	0.025	124	159.40	0.028
19.00	0.024	119	159.40	0.026
19.50	0.022	114	159.39	0.024
20.00	0.020	110	159.39	0.023
20.50	0.019	105	159.38	0.021
21.00	0.019	103	159.38	0.020
21.50	0.019	101	159.38	0.019
22.00	0.018	99	159.38	0.019
22.50	0.018	98	159.38	0.019
23.00	0.017	97	159.38	0.018
23.50	0.017	96	159.37	0.018
24.00	0.017	95	159.37	0.017
24.50	0.000	74	159.35	0.011
25.00	0.000	58	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	48	159.33	0.005
26.00	0.000	41	159.32	0.003
26.50	0.000	35	159.31	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	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	18	159.30	0.001
30.50	0.000	17	159.30	0.001
31.00	0.000	16	159.30	0.001
31.50	0.000	15	159.29	0.000
32.00	0.000	14	159.29	0.000
32.50	0.000	13	159.29	0.000
33.00	0.000	13	159.29	0.000
33.50	0.000	12	159.29	0.000
34.00	0.000	12	159.29	0.000
34.50	0.000	11	159.29	0.000
35.00	0.000	11	159.29	0.000
35.50	0.000	10	159.29	0.000
36.00	0.000	10	159.29	0.000
36.50	0.000	9	159.29	0.000
37.00	0.000	9	159.29	0.000
37.50	0.000	9	159.29	0.000
38.00	0.000	9	159.29	0.000
38.50	0.000	8	159.29	0.000
39.00	0.000	8	159.29	0.000
39.50	0.000	8	159.29	0.000
40.00	0.000	8	159.29	0.000
40.50	0.000	7	159.29	0.000
41.00	0.000	7	159.29	0.000
41.50	0.000	7	159.29	0.000
42.00	0.000	7	159.29	0.000
42.50	0.000	7	159.29	0.000
43.00	0.000	6	159.29	0.000
43.50	0.000	6	159.29	0.000
44.00	0.000	6	159.29	0.000
44.50	0.000	6	159.29	0.000
45.00	0.000	6	159.29	0.000
45.50	0.000	6	159.29	0.000
46.00	0.000	6	159.29	0.000
46.50	0.000	5	159.29	0.000
47.00	0.000	5	159.29	0.000
47.50	0.000	5	159.29	0.000
48.00	0.000	5	159.29	0.000
48.50	0.000	5	159.28	0.000
49.00	0.000	5	159.28	0.000
49.50	0.000	5	159.28	0.000
50.00	0.000	5	159.28	0.000
50.50	0.000	5	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	5	159.28	0.000
51.50	0.000	4	159.28	0.000
52.00	0.000	4	159.28	0.000
52.50	0.000	4	159.28	0.000
53.00	0.000	4	159.28	0.000
53.50	0.000	4	159.28	0.000
54.00	0.000	4	159.28	0.000
54.50	0.000	4	159.28	0.000
55.00	0.000	4	159.28	0.000
55.50	0.000	4	159.28	0.000
56.00	0.000	4	159.28	0.000
56.50	0.000	4	159.28	0.000
57.00	0.000	4	159.28	0.000
57.50	0.000	4	159.28	0.000
58.00	0.000	4	159.28	0.000
58.50	0.000	4	159.28	0.000
59.00	0.000	4	159.28	0.000
59.50	0.000	3	159.28	0.000
60.00	0.000	3	159.28	0.000
60.50	0.000	3	159.28	0.000
61.00	0.000	3	159.28	0.000
61.50	0.000	3	159.28	0.000
62.00	0.000	3	159.28	0.000
62.50	0.000	3	159.28	0.000
63.00	0.000	3	159.28	0.000
63.50	0.000	3	159.28	0.000
64.00	0.000	3	159.28	0.000
64.50	0.000	3	159.28	0.000
65.00	0.000	3	159.28	0.000
65.50	0.000	3	159.28	0.000
66.00	0.000	3	159.28	0.000
66.50	0.000	3	159.28	0.000
67.00	0.000	3	159.28	0.000
67.50	0.000	3	159.28	0.000
68.00	0.000	3	159.28	0.000
68.50	0.000	3	159.28	0.000
69.00	0.000	3	159.28	0.000
69.50	0.000	3	159.28	0.000
70.00	0.000	3	159.28	0.000
70.50	0.000	3	159.28	0.000
71.00	0.000	3	159.28	0.000
71.50	0.000	3	159.28	0.000
72.00	0.000	3	159.28	0.000
72.50	0.000	3	159.28	0.000
73.00	0.000	3	159.28	0.000
73.50	0.000	3	159.28	0.000
74.00	0.000	3	159.28	0.000
74.50	0.000	2	159.28	0.000
75.00	0.000	2	159.28	0.000
75.50	0.000	2	159.28	0.000
76.00	0.000	2	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	2	159.28	0.000
77.00	0.000	2	159.28	0.000
77.50	0.000	2	159.28	0.000
78.00	0.000	2	159.28	0.000
78.50	0.000	2	159.28	0.000
79.00	0.000	2	159.28	0.000
79.50	0.000	2	159.28	0.000
80.00	0.000	2	159.28	0.000
80.50	0.000	2	159.28	0.000
81.00	0.000	2	159.28	0.000
81.50	0.000	2	159.28	0.000
82.00	0.000	2	159.28	0.000
82.50	0.000	2	159.28	0.000
83.00	0.000	2	159.28	0.000
83.50	0.000	2	159.28	0.000
84.00	0.000	2	159.28	0.000
84.50	0.000	2	159.28	0.000
85.00	0.000	2	159.28	0.000
85.50	0.000	2	159.28	0.000
86.00	0.000	2	159.28	0.000
86.50	0.000	2	159.28	0.000
87.00	0.000	2	159.28	0.000
87.50	0.000	2	159.28	0.000
88.00	0.000	2	159.28	0.000
88.50	0.000	2	159.28	0.000
89.00	0.000	2	159.28	0.000
89.50	0.000	2	159.28	0.000
90.00	0.000	2	159.28	0.000
90.50	0.000	2	159.28	0.000
91.00	0.000	2	159.28	0.000
91.50	0.000	2	159.28	0.000
92.00	0.000	2	159.28	0.000
92.50	0.000	2	159.28	0.000
93.00	0.000	2	159.28	0.000
93.50	0.000	2	159.28	0.000
94.00	0.000	2	159.28	0.000
94.50	0.000	2	159.28	0.000
95.00	0.000	2	159.28	0.000
95.50	0.000	2	159.28	0.000
96.00	0.000	2	159.28	0.000
96.50	0.000	2	159.28	0.000
97.00	0.000	2	159.28	0.000
97.50	0.000	2	159.28	0.000
98.00	0.000	2	159.28	0.000
98.50	0.000	2	159.28	0.000
99.00	0.000	2	159.28	0.000
99.50	0.000	2	159.28	0.000
100.00	0.000	2	159.28	0.000
100.50	0.000	2	159.28	0.000
101.00	0.000	2	159.28	0.000
101.50	0.000	2	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	2	159.28	0.000
102.50	0.000	2	159.28	0.000
103.00	0.000	2	159.28	0.000
103.50	0.000	2	159.28	0.000
104.00	0.000	2	159.28	0.000
104.50	0.000	2	159.28	0.000
105.00	0.000	2	159.28	0.000
105.50	0.000	2	159.28	0.000
106.00	0.000	2	159.28	0.000
106.50	0.000	2	159.28	0.000
107.00	0.000	2	159.28	0.000
107.50	0.000	2	159.28	0.000
108.00	0.000	2	159.28	0.000
108.50	0.000	2	159.28	0.000
109.00	0.000	2	159.28	0.000
109.50	0.000	2	159.28	0.000
110.00	0.000	2	159.28	0.000
110.50	0.000	2	159.28	0.000
111.00	0.000	2	159.28	0.000
111.50	0.000	2	159.28	0.000
112.00	0.000	1	159.28	0.000
112.50	0.000	1	159.28	0.000
113.00	0.000	1	159.28	0.000
113.50	0.000	1	159.28	0.000
114.00	0.000	1	159.28	0.000
114.50	0.000	1	159.28	0.000
115.00	0.000	1	159.28	0.000
115.50	0.000	1	159.28	0.000
116.00	0.000	1	159.28	0.000
116.50	0.000	1	159.28	0.000
117.00	0.000	1	159.28	0.000
117.50	0.000	1	159.28	0.000
118.00	0.000	1	159.28	0.000
118.50	0.000	1	159.28	0.000
119.00	0.000	1	159.28	0.000
119.50	0.000	1	159.28	0.000
120.00	0.000	1	159.28	0.000
120.50	0.000	1	159.28	0.000
121.00	0.000	1	159.28	0.000
121.50	0.000	1	159.28	0.000
122.00	0.000	1	159.28	0.000
122.50	0.000	1	159.28	0.000
123.00	0.000	1	159.28	0.000
123.50	0.000	1	159.28	0.000
124.00	0.000	1	159.28	0.000
124.50	0.000	1	159.28	0.000
125.00	0.000	1	159.28	0.000
125.50	0.000	1	159.28	0.000
126.00	0.000	1	159.28	0.000
126.50	0.000	1	159.28	0.000
127.00	0.000	1	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	1	159.28	0.000
128.00	0.000	1	159.28	0.000
128.50	0.000	1	159.28	0.000
129.00	0.000	1	159.28	0.000
129.50	0.000	1	159.28	0.000
130.00	0.000	1	159.28	0.000
130.50	0.000	1	159.28	0.000
131.00	0.000	1	159.28	0.000
131.50	0.000	1	159.28	0.000
132.00	0.000	1	159.28	0.000
132.50	0.000	1	159.28	0.000
133.00	0.000	1	159.28	0.000
133.50	0.000	1	159.28	0.000
134.00	0.000	1	159.28	0.000
134.50	0.000	1	159.28	0.000
135.00	0.000	1	159.28	0.000
135.50	0.000	1	159.28	0.000
136.00	0.000	1	159.28	0.000
136.50	0.000	1	159.28	0.000
137.00	0.000	1	159.28	0.000
137.50	0.000	1	159.28	0.000
138.00	0.000	1	159.28	0.000
138.50	0.000	1	159.28	0.000
139.00	0.000	1	159.28	0.000
139.50	0.000	1	159.28	0.000
140.00	0.000	1	159.28	0.000
140.50	0.000	1	159.28	0.000
141.00	0.000	1	159.28	0.000
141.50	0.000	1	159.28	0.000
142.00	0.000	1	159.28	0.000
142.50	0.000	1	159.28	0.000
143.00	0.000	1	159.28	0.000
143.50	0.000	1	159.28	0.000
144.00	0.000	1	159.28	0.000
144.50	0.000	1	159.28	0.000
145.00	0.000	1	159.28	0.000
145.50	0.000	1	159.28	0.000
146.00	0.000	1	159.28	0.000
146.50	0.000	1	159.28	0.000
147.00	0.000	1	159.28	0.000
147.50	0.000	1	159.28	0.000
148.00	0.000	1	159.28	0.000
148.50	0.000	1	159.28	0.000
149.00	0.000	1	159.28	0.000
149.50	0.000	1	159.28	0.000
150.00	0.000	1	159.28	0.000
150.50	0.000	1	159.28	0.000
151.00	0.000	1	159.28	0.000
151.50	0.000	1	159.28	0.000
152.00	0.000	1	159.28	0.000
152.50	0.000	1	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	1	159.28	0.000
153.50	0.000	1	159.28	0.000
154.00	0.000	1	159.28	0.000
154.50	0.000	1	159.28	0.000
155.00	0.000	1	159.28	0.000
155.50	0.000	1	159.28	0.000
156.00	0.000	1	159.28	0.000
156.50	0.000	1	159.28	0.000
157.00	0.000	1	159.28	0.000
157.50	0.000	1	159.28	0.000
158.00	0.000	1	159.28	0.000
158.50	0.000	1	159.28	0.000
159.00	0.000	1	159.28	0.000
159.50	0.000	1	159.28	0.000
160.00	0.000	1	159.28	0.000
160.50	0.000	1	159.28	0.000
161.00	0.000	1	159.28	0.000
161.50	0.000	1	159.28	0.000
162.00	0.000	1	159.28	0.000
162.50	0.000	1	159.28	0.000
163.00	0.000	1	159.28	0.000
163.50	0.000	1	159.28	0.000
164.00	0.000	1	159.28	0.000
164.50	0.000	1	159.28	0.000
165.00	0.000	1	159.28	0.000
165.50	0.000	1	159.28	0.000
166.00	0.000	1	159.28	0.000
166.50	0.000	1	159.28	0.000
167.00	0.000	1	159.28	0.000
167.50	0.000	1	159.28	0.000
168.00	0.000	1	159.28	0.000

Summary for Pond 1P: UG1

Inflow Area = 81,675 sf, 99.20% Impervious, Inflow Depth = 4.59" for 10-yr event
Inflow = 13.300 cfs @ 11.96 hrs, Volume= 31,264 cf
Outflow = 4.346 cfs @ 12.07 hrs, Volume= 31,118 cf, Atten= 67%, Lag= 6.6 min
Primary = 4.346 cfs @ 12.07 hrs, Volume= 31,118 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 159.21' @ 12.07 hrs Surf.Area= 13,041 sf Storage= 15,859 cf

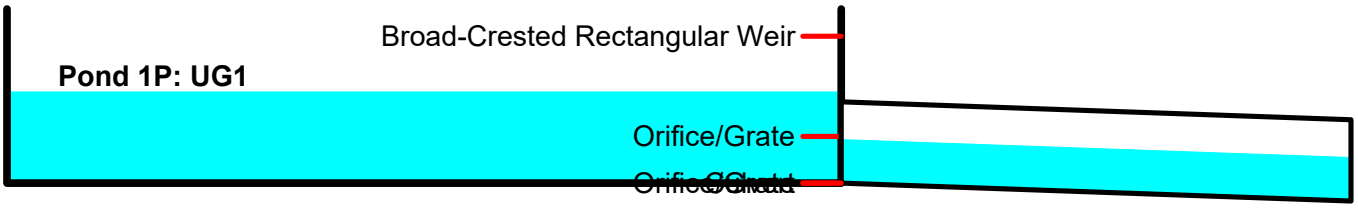
Plug-Flow detention time= 881.1 min calculated for 31,118 cf (100% of inflow)
Center-of-Mass det. time= 877.9 min (1,621.5 - 743.6)

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'	**40.0" 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= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=4.345 cfs @ 12.07 hrs HW=159.21' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 4.345 cfs of 7.271 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.034 cfs @ 6.162 fps)
  ├**2=Orifice/Grate** (Orifice Controls 4.311 cfs @ 3.880 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

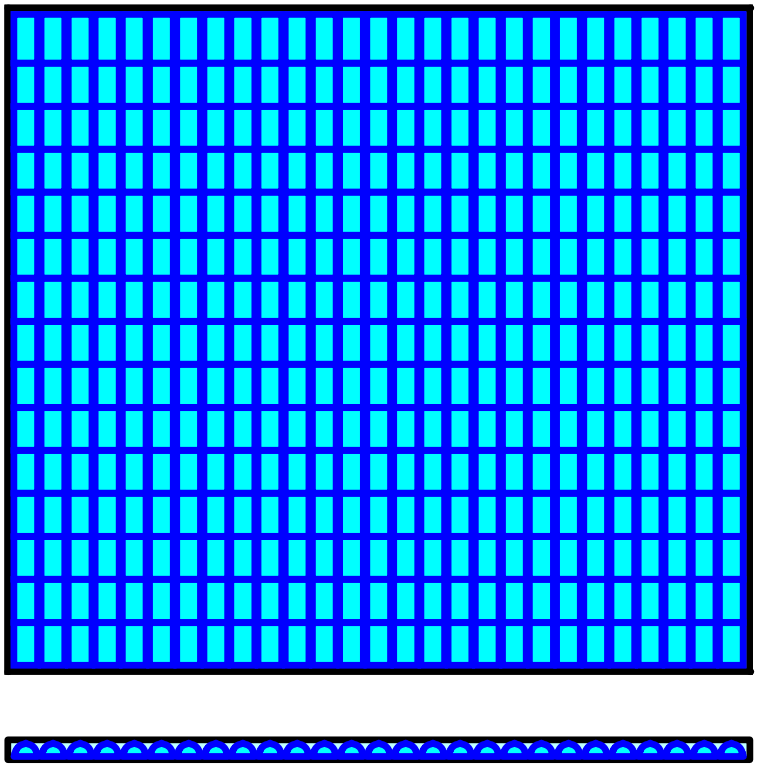
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

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

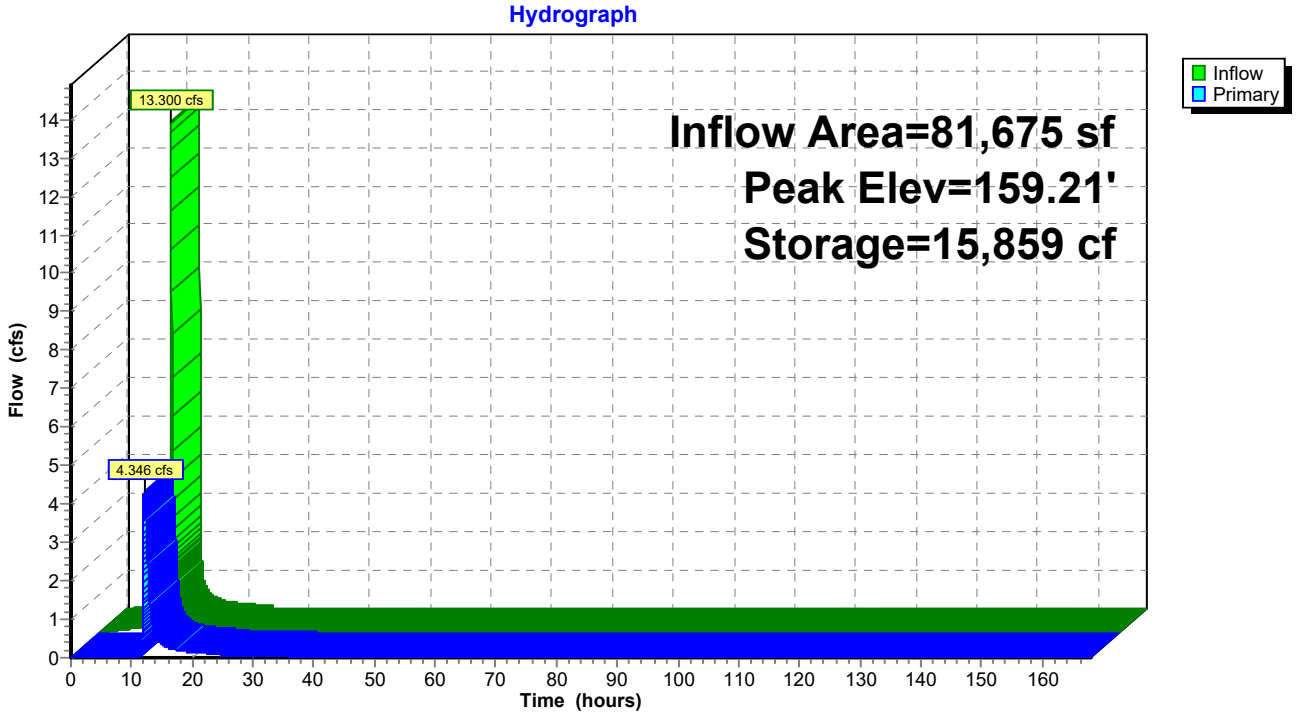
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

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=81,675 sf
Peak Elev=159.21'
Storage=15,859 cf
13.300 cfs
4.346 cfs
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
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	0.005	1	157.53	0.000
1.50	0.027	31	157.54	0.000
2.00	0.044	95	157.55	0.000
2.50	0.059	187	157.57	0.001
3.00	0.071	300	157.59	0.003
3.50	0.082	431	157.61	0.005
4.00	0.092	578	157.64	0.007
4.50	0.104	741	157.67	0.008
5.00	0.116	923	157.71	0.010
5.50	0.128	1,125	157.75	0.011
6.00	0.140	1,345	157.79	0.012
6.50	0.151	1,585	157.83	0.013
7.00	0.162	1,842	157.88	0.015
7.50	0.173	2,116	157.94	0.016
8.00	0.184	2,409	157.99	0.017
8.50	0.224	2,740	158.04	0.018
9.00	0.269	3,150	158.08	0.019
9.50	0.278	3,614	158.11	0.019
10.00	0.340	4,127	158.16	0.020
10.50	0.443	4,790	158.22	0.021
11.00	0.613	5,693	158.29	0.022
11.50	**1.009**	7,078	158.41	0.062
12.00	**10.976**	**15,089**	**159.14**	**4.094**
12.50	0.952	**12,445**	**158.89**	**3.092**
13.00	0.592	9,751	158.65	1.430
13.50	0.448	8,783	158.56	0.790
14.00	0.351	8,329	158.52	0.540
14.50	0.310	8,072	158.50	0.414
15.00	0.278	7,922	158.49	0.346
15.50	0.246	7,814	158.48	0.300
16.00	0.214	7,722	158.47	0.263
16.50	0.200	7,647	158.46	0.234
17.00	0.189	7,594	158.46	0.214
17.50	0.177	7,551	158.45	0.199
18.00	0.166	7,514	158.45	0.186
18.50	0.154	7,478	158.45	0.174
19.00	0.143	7,443	158.44	0.162
19.50	0.132	7,409	158.44	0.151
20.00	0.120	7,374	158.44	0.140
20.50	0.117	7,343	158.44	0.131
21.00	0.114	7,321	158.43	0.124
21.50	0.112	7,306	158.43	0.120
22.00	0.110	7,293	158.43	0.116
22.50	0.107	7,283	158.43	0.113
23.00	0.105	7,273	158.43	0.110
23.50	0.103	7,264	158.43	0.108
24.00	0.101	7,255	158.43	0.105
24.50	0.000	7,122	158.42	0.072
25.00	0.000	7,015	158.41	0.049

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	6,881	158.40	0.029
26.50	0.000	6,833	158.39	0.025
27.00	0.000	6,790	158.39	0.024
27.50	0.000	6,747	158.38	0.024
28.00	0.000	6,705	158.38	0.024
28.50	0.000	6,662	158.38	0.024
29.00	0.000	6,620	158.37	0.024
29.50	0.000	6,577	158.37	0.023
30.00	0.000	6,535	158.37	0.023
30.50	0.000	6,493	158.36	0.023
31.00	0.000	6,451	158.36	0.023
31.50	0.000	6,409	158.36	0.023
32.00	0.000	6,367	158.35	0.023
32.50	0.000	6,326	158.35	0.023
33.00	0.000	6,284	158.34	0.023
33.50	0.000	6,243	158.34	0.023
34.00	0.000	6,201	158.34	0.023
34.50	0.000	6,160	158.33	0.023
35.00	0.000	6,119	158.33	0.023
35.50	0.000	6,078	158.33	0.023
36.00	0.000	6,037	158.32	0.023
36.50	0.000	5,996	158.32	0.023
37.00	0.000	5,955	158.32	0.023
37.50	0.000	5,914	158.31	0.023
38.00	0.000	5,873	158.31	0.023
38.50	0.000	5,833	158.31	0.022
39.00	0.000	5,792	158.30	0.022
39.50	0.000	5,752	158.30	0.022
40.00	0.000	5,712	158.29	0.022
40.50	0.000	5,672	158.29	0.022
41.00	0.000	5,632	158.29	0.022
41.50	0.000	5,592	158.28	0.022
42.00	0.000	5,552	158.28	0.022
42.50	0.000	5,512	158.28	0.022
43.00	0.000	5,472	158.27	0.022
43.50	0.000	5,433	158.27	0.022
44.00	0.000	5,393	158.27	0.022
44.50	0.000	5,354	158.26	0.022
45.00	0.000	5,315	158.26	0.022
45.50	0.000	5,276	158.26	0.022
46.00	0.000	5,236	158.25	0.022
46.50	0.000	5,197	158.25	0.022
47.00	0.000	5,159	158.25	0.022
47.50	0.000	5,120	158.24	0.022
48.00	0.000	5,081	158.24	0.021
48.50	0.000	5,042	158.24	0.021
49.00	0.000	5,004	158.23	0.021
49.50	0.000	4,965	158.23	0.021
50.00	0.000	4,927	158.23	0.021
50.50	0.000	4,889	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	4,851	158.22	0.021
51.50	0.000	4,813	158.22	0.021
52.00	0.000	4,775	158.21	0.021
52.50	0.000	4,737	158.21	0.021
53.00	0.000	4,699	158.21	0.021
53.50	0.000	4,662	158.20	0.021
54.00	0.000	4,624	158.20	0.021
54.50	0.000	4,587	158.20	0.021
55.00	0.000	4,549	158.19	0.021
55.50	0.000	4,512	158.19	0.021
56.00	0.000	4,475	158.19	0.021
56.50	0.000	4,438	158.19	0.021
57.00	0.000	4,401	158.18	0.021
57.50	0.000	4,364	158.18	0.020
58.00	0.000	4,327	158.18	0.020
58.50	0.000	4,290	158.17	0.020
59.00	0.000	4,254	158.17	0.020
59.50	0.000	4,217	158.17	0.020
60.00	0.000	4,181	158.16	0.020
60.50	0.000	4,145	158.16	0.020
61.00	0.000	4,108	158.16	0.020
61.50	0.000	4,072	158.15	0.020
62.00	0.000	4,036	158.15	0.020
62.50	0.000	4,000	158.15	0.020
63.00	0.000	3,965	158.14	0.020
63.50	0.000	3,929	158.14	0.020
64.00	0.000	3,893	158.14	0.020
64.50	0.000	3,858	158.14	0.020
65.00	0.000	3,822	158.13	0.020
65.50	0.000	3,787	158.13	0.020
66.00	0.000	3,752	158.13	0.020
66.50	0.000	3,716	158.12	0.020
67.00	0.000	3,681	158.12	0.019
67.50	0.000	3,646	158.12	0.019
68.00	0.000	3,611	158.11	0.019
68.50	0.000	3,577	158.11	0.019
69.00	0.000	3,542	158.11	0.019
69.50	0.000	3,507	158.11	0.019
70.00	0.000	3,473	158.10	0.019
70.50	0.000	3,438	158.10	0.019
71.00	0.000	3,404	158.10	0.019
71.50	0.000	3,370	158.09	0.019
72.00	0.000	3,336	158.09	0.019
72.50	0.000	3,302	158.09	0.019
73.00	0.000	3,268	158.09	0.019
73.50	0.000	3,234	158.08	0.019
74.00	0.000	3,200	158.08	0.019
74.50	0.000	3,167	158.08	0.019
75.00	0.000	3,133	158.07	0.019
75.50	0.000	3,100	158.07	0.019
76.00	0.000	3,066	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	3,033	158.07	0.018
77.00	0.000	3,000	158.06	0.018
77.50	0.000	2,967	158.06	0.018
78.00	0.000	2,934	158.06	0.018
78.50	0.000	2,901	158.05	0.018
79.00	0.000	2,868	158.05	0.018
79.50	0.000	2,835	158.05	0.018
80.00	0.000	2,803	158.05	0.018
80.50	0.000	2,770	158.04	0.018
81.00	0.000	2,738	158.04	0.018
81.50	0.000	2,705	158.04	0.018
82.00	0.000	2,673	158.04	0.018
82.50	0.000	2,641	158.03	0.018
83.00	0.000	2,609	158.03	0.018
83.50	0.000	2,577	158.02	0.018
84.00	0.000	2,545	158.02	0.018
84.50	0.000	2,514	158.01	0.017
85.00	0.000	2,483	158.01	0.017
85.50	0.000	2,452	158.00	0.017
86.00	0.000	2,421	157.99	0.017
86.50	0.000	2,390	157.99	0.017
87.00	0.000	2,360	157.98	0.017
87.50	0.000	2,330	157.98	0.017
88.00	0.000	2,300	157.97	0.017
88.50	0.000	2,270	157.97	0.016
89.00	0.000	2,240	157.96	0.016
89.50	0.000	2,211	157.95	0.016
90.00	0.000	2,182	157.95	0.016
90.50	0.000	2,153	157.94	0.016
91.00	0.000	2,124	157.94	0.016
91.50	0.000	2,096	157.93	0.016
92.00	0.000	2,068	157.93	0.016
92.50	0.000	2,040	157.92	0.016
93.00	0.000	2,012	157.92	0.015
93.50	0.000	1,984	157.91	0.015
94.00	0.000	1,957	157.91	0.015
94.50	0.000	1,930	157.90	0.015
95.00	0.000	1,903	157.89	0.015
95.50	0.000	1,876	157.89	0.015
96.00	0.000	1,849	157.88	0.015
96.50	0.000	1,823	157.88	0.015
97.00	0.000	1,797	157.87	0.014
97.50	0.000	1,771	157.87	0.014
98.00	0.000	1,745	157.86	0.014
98.50	0.000	1,720	157.86	0.014
99.00	0.000	1,695	157.85	0.014
99.50	0.000	1,670	157.85	0.014
100.00	0.000	1,645	157.85	0.014
100.50	0.000	1,620	157.84	0.014
101.00	0.000	1,596	157.84	0.013
101.50	0.000	1,571	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	1,548	157.83	0.013
102.50	0.000	1,524	157.82	0.013
103.00	0.000	1,500	157.82	0.013
103.50	0.000	1,477	157.81	0.013
104.00	0.000	1,454	157.81	0.013
104.50	0.000	1,431	157.80	0.013
105.00	0.000	1,408	157.80	0.013
105.50	0.000	1,386	157.80	0.012
106.00	0.000	1,363	157.79	0.012
106.50	0.000	1,341	157.79	0.012
107.00	0.000	1,320	157.78	0.012
107.50	0.000	1,298	157.78	0.012
108.00	0.000	1,277	157.77	0.012
108.50	0.000	1,255	157.77	0.012
109.00	0.000	1,234	157.77	0.012
109.50	0.000	1,214	157.76	0.011
110.00	0.000	1,193	157.76	0.011
110.50	0.000	1,173	157.75	0.011
111.00	0.000	1,153	157.75	0.011
111.50	0.000	1,133	157.75	0.011
112.00	0.000	1,113	157.74	0.011
112.50	0.000	1,094	157.74	0.011
113.00	0.000	1,074	157.74	0.011
113.50	0.000	1,055	157.73	0.011
114.00	0.000	1,037	157.73	0.010
114.50	0.000	1,018	157.73	0.010
115.00	0.000	1,000	157.72	0.010
115.50	0.000	981	157.72	0.010
116.00	0.000	963	157.71	0.010
116.50	0.000	946	157.71	0.010
117.00	0.000	928	157.71	0.010
117.50	0.000	911	157.70	0.010
118.00	0.000	894	157.70	0.009
118.50	0.000	877	157.70	0.009
119.00	0.000	860	157.69	0.009
119.50	0.000	843	157.69	0.009
120.00	0.000	827	157.69	0.009
120.50	0.000	811	157.69	0.009
121.00	0.000	795	157.68	0.009
121.50	0.000	780	157.68	0.009
122.00	0.000	764	157.68	0.009
122.50	0.000	749	157.67	0.008
123.00	0.000	734	157.67	0.008
123.50	0.000	719	157.67	0.008
124.00	0.000	705	157.67	0.008
124.50	0.000	690	157.66	0.008
125.00	0.000	676	157.66	0.008
125.50	0.000	662	157.66	0.008
126.00	0.000	649	157.65	0.008
126.50	0.000	635	157.65	0.007
127.00	0.000	622	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	609	157.65	0.007
128.00	0.000	596	157.64	0.007
128.50	0.000	583	157.64	0.007
129.00	0.000	571	157.64	0.007
129.50	0.000	559	157.64	0.007
130.00	0.000	547	157.63	0.007
130.50	0.000	535	157.63	0.006
131.00	0.000	523	157.63	0.006
131.50	0.000	512	157.63	0.006
132.00	0.000	501	157.63	0.006
132.50	0.000	490	157.62	0.006
133.00	0.000	479	157.62	0.006
133.50	0.000	469	157.62	0.006
134.00	0.000	459	157.62	0.006
134.50	0.000	449	157.62	0.006
135.00	0.000	439	157.61	0.005
135.50	0.000	429	157.61	0.005
136.00	0.000	420	157.61	0.005
136.50	0.000	410	157.61	0.005
137.00	0.000	401	157.61	0.005
137.50	0.000	392	157.61	0.005
138.00	0.000	384	157.60	0.005
138.50	0.000	375	157.60	0.005
139.00	0.000	367	157.60	0.004
139.50	0.000	360	157.60	0.004
140.00	0.000	352	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	324	157.59	0.004
142.50	0.000	317	157.59	0.004
143.00	0.000	311	157.59	0.003
143.50	0.000	305	157.59	0.003
144.00	0.000	299	157.59	0.003
144.50	0.000	293	157.59	0.003
145.00	0.000	287	157.59	0.003
145.50	0.000	282	157.58	0.003
146.00	0.000	277	157.58	0.003
146.50	0.000	271	157.58	0.003
147.00	0.000	267	157.58	0.003
147.50	0.000	262	157.58	0.003
148.00	0.000	257	157.58	0.003
148.50	0.000	253	157.58	0.002
149.00	0.000	248	157.58	0.002
149.50	0.000	244	157.58	0.002
150.00	0.000	240	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	218	157.57	0.002
153.50	0.000	214	157.57	0.002
154.00	0.000	211	157.57	0.002
154.50	0.000	208	157.57	0.002
155.00	0.000	205	157.57	0.002
155.50	0.000	202	157.57	0.002
156.00	0.000	199	157.57	0.002
156.50	0.000	196	157.57	0.002
157.00	0.000	193	157.57	0.002
157.50	0.000	190	157.57	0.001
158.00	0.000	188	157.57	0.001
158.50	0.000	185	157.57	0.001
159.00	0.000	182	157.56	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	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	148	157.56	0.001
168.00	0.000	146	157.56	0.001

Summary for Pond 3P: UG2

Inflow Area = 21,519 sf, 87.04% Impervious, Inflow Depth = 3.71" for 10-yr event
Inflow = 3.165 cfs @ 11.96 hrs, Volume= 6,657 cf
Outflow = 0.691 cfs @ 12.10 hrs, Volume= 6,656 cf, Atten= 78%, Lag= 8.3 min
Primary = 0.691 cfs @ 12.10 hrs, Volume= 6,656 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 160.78' @ 12.10 hrs Surf.Area= 2,542 sf Storage= 2,606 cf

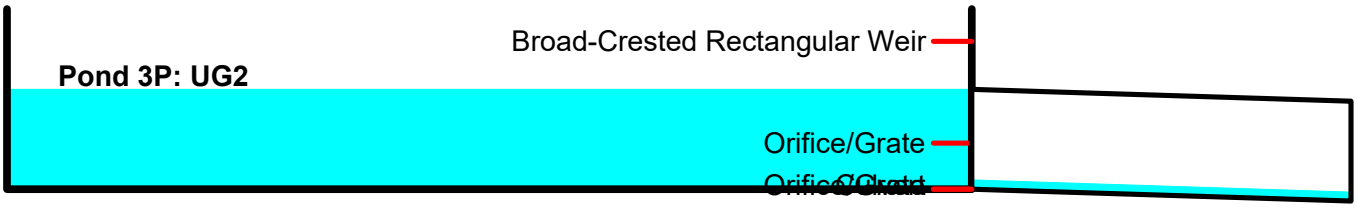
Plug-Flow detention time= 69.3 min calculated for 6,656 cf (100% of inflow)
Center-of-Mass det. time= 69.2 min (856.9 - 787.8)

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'	**5.0" 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= 36.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.691 cfs @ 12.10 hrs HW=160.78' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 0.691 cfs of 6.097 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.277 cfs @ 5.642 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.414 cfs @ 3.974 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 3P: UG2 - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Cultec Recharger®180HD)
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

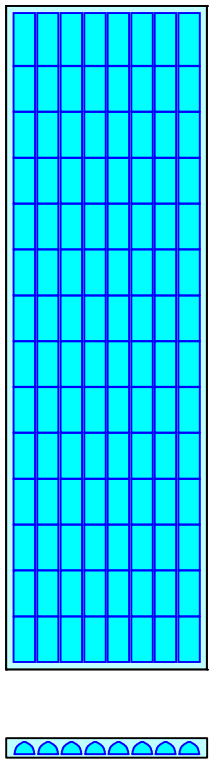
14 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 89.62' Row Length +12.0" End Stone x 2 = 91.62' Base Length
8 Rows x 36.0" Wide + 3.0" Spacing x 7 + 12.0" Side Stone x 2 = 27.75' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

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

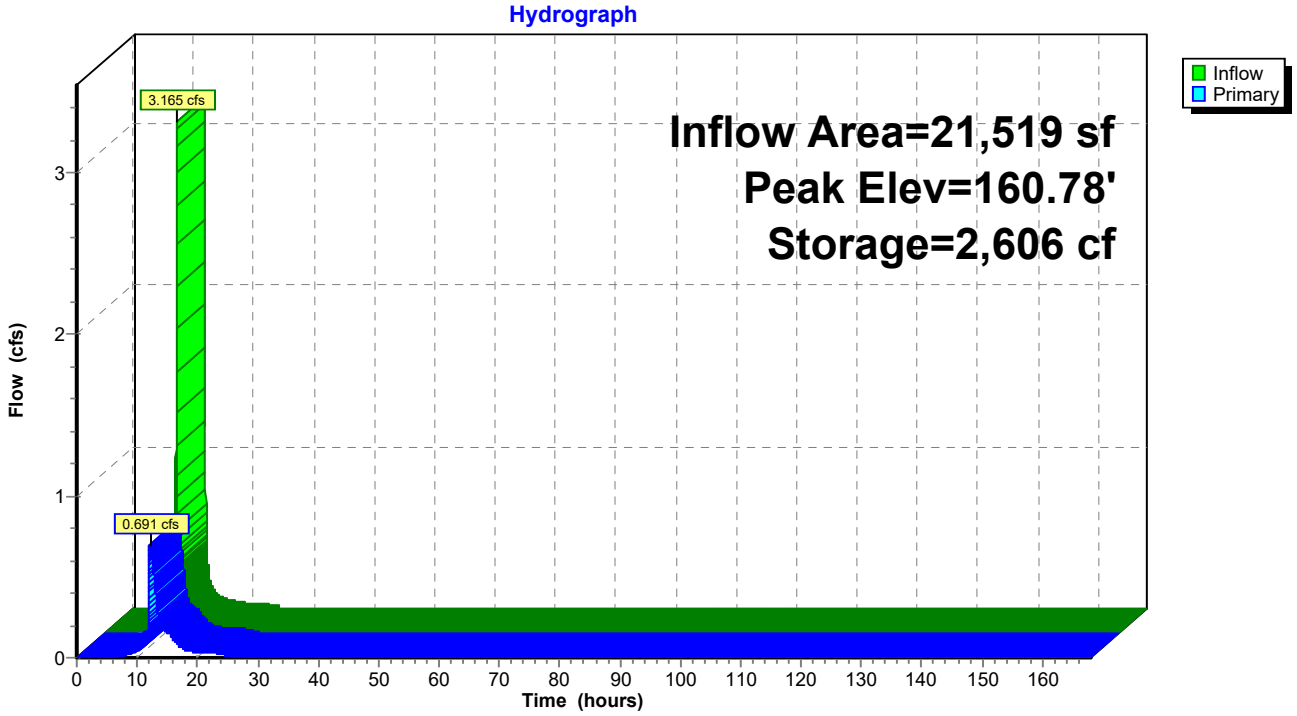
6,885.8 cf Field - 2,466.0 cf Chambers = 4,419.8 cf Stone x 40.0% Voids = 1,767.9 cf Stone Storage

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=21,519 sf
Peak Elev=160.78'
Storage=2,606 cf
3.165 cfs
0.691 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	0.002	2	159.28	0.000
5.00	0.005	9	159.29	0.000
5.50	0.007	19	159.30	0.001
6.00	0.010	32	159.31	0.002
6.50	0.013	47	159.33	0.004
7.00	0.016	62	159.34	0.008
7.50	0.019	76	159.35	0.011
8.00	0.022	89	159.37	0.015
8.50	0.029	103	159.38	0.020
9.00	0.038	121	159.40	0.027
9.50	0.043	139	159.42	0.035
10.00	0.056	157	159.43	0.043
10.50	0.077	187	159.46	0.057
11.00	0.115	237	159.51	0.078
11.50	**0.203**	349	159.62	0.110
12.00	**2.645**	**2,316**	**160.63**	**0.628**
12.50	0.236	**2,180**	**160.56**	**0.597**
13.00	0.147	1,577	160.27	0.428
13.50	0.112	1,205	160.10	0.260
14.00	0.088	989	160.00	0.189
14.50	0.078	818	159.92	0.170
15.00	0.070	656	159.85	0.157
15.50	0.062	504	159.78	0.144
16.00	0.054	374	159.65	0.116
16.50	0.050	281	159.56	0.092
17.00	0.048	222	159.50	0.072
17.50	0.045	189	159.47	0.057
18.00	0.042	172	159.45	0.049
18.50	0.039	161	159.44	0.044
19.00	0.036	152	159.43	0.040
19.50	0.033	145	159.42	0.037
20.00	0.030	138	159.42	0.034
20.50	0.030	133	159.41	0.032
21.00	0.029	129	159.41	0.030
21.50	0.028	127	159.40	0.029
22.00	0.028	125	159.40	0.029
22.50	0.027	124	159.40	0.028
23.00	0.027	122	159.40	0.028
23.50	0.026	121	159.40	0.027
24.00	0.026	119	159.40	0.026
24.50	0.000	89	159.37	0.015
25.00	0.000	67	159.35	0.009

Hydrograph for Pond 3P: UG2 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	54	159.33	0.006
26.00	0.000	45	159.32	0.004
26.50	0.000	38	159.32	0.003
27.00	0.000	34	159.31	0.002
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	19	159.30	0.001
30.50	0.000	18	159.30	0.001
31.00	0.000	17	159.30	0.001
31.50	0.000	16	159.30	0.001
32.00	0.000	15	159.29	0.000
32.50	0.000	14	159.29	0.000
33.00	0.000	13	159.29	0.000
33.50	0.000	13	159.29	0.000
34.00	0.000	12	159.29	0.000
34.50	0.000	11	159.29	0.000
35.00	0.000	11	159.29	0.000
35.50	0.000	10	159.29	0.000
36.00	0.000	10	159.29	0.000
36.50	0.000	10	159.29	0.000
37.00	0.000	9	159.29	0.000
37.50	0.000	9	159.29	0.000
38.00	0.000	9	159.29	0.000
38.50	0.000	8	159.29	0.000
39.00	0.000	8	159.29	0.000
39.50	0.000	8	159.29	0.000
40.00	0.000	8	159.29	0.000
40.50	0.000	7	159.29	0.000
41.00	0.000	7	159.29	0.000
41.50	0.000	7	159.29	0.000
42.00	0.000	7	159.29	0.000
42.50	0.000	7	159.29	0.000
43.00	0.000	6	159.29	0.000
43.50	0.000	6	159.29	0.000
44.00	0.000	6	159.29	0.000
44.50	0.000	6	159.29	0.000
45.00	0.000	6	159.29	0.000
45.50	0.000	6	159.29	0.000
46.00	0.000	6	159.29	0.000
46.50	0.000	6	159.29	0.000
47.00	0.000	5	159.29	0.000
47.50	0.000	5	159.29	0.000
48.00	0.000	5	159.29	0.000
48.50	0.000	5	159.28	0.000
49.00	0.000	5	159.28	0.000
49.50	0.000	5	159.28	0.000
50.00	0.000	5	159.28	0.000
50.50	0.000	5	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	5	159.28	0.000
51.50	0.000	5	159.28	0.000
52.00	0.000	4	159.28	0.000
52.50	0.000	4	159.28	0.000
53.00	0.000	4	159.28	0.000
53.50	0.000	4	159.28	0.000
54.00	0.000	4	159.28	0.000
54.50	0.000	4	159.28	0.000
55.00	0.000	4	159.28	0.000
55.50	0.000	4	159.28	0.000
56.00	0.000	4	159.28	0.000
56.50	0.000	4	159.28	0.000
57.00	0.000	4	159.28	0.000
57.50	0.000	4	159.28	0.000
58.00	0.000	4	159.28	0.000
58.50	0.000	4	159.28	0.000
59.00	0.000	4	159.28	0.000
59.50	0.000	4	159.28	0.000
60.00	0.000	3	159.28	0.000
60.50	0.000	3	159.28	0.000
61.00	0.000	3	159.28	0.000
61.50	0.000	3	159.28	0.000
62.00	0.000	3	159.28	0.000
62.50	0.000	3	159.28	0.000
63.00	0.000	3	159.28	0.000
63.50	0.000	3	159.28	0.000
64.00	0.000	3	159.28	0.000
64.50	0.000	3	159.28	0.000
65.00	0.000	3	159.28	0.000
65.50	0.000	3	159.28	0.000
66.00	0.000	3	159.28	0.000
66.50	0.000	3	159.28	0.000
67.00	0.000	3	159.28	0.000
67.50	0.000	3	159.28	0.000
68.00	0.000	3	159.28	0.000
68.50	0.000	3	159.28	0.000
69.00	0.000	3	159.28	0.000
69.50	0.000	3	159.28	0.000
70.00	0.000	3	159.28	0.000
70.50	0.000	3	159.28	0.000
71.00	0.000	3	159.28	0.000
71.50	0.000	3	159.28	0.000
72.00	0.000	3	159.28	0.000
72.50	0.000	3	159.28	0.000
73.00	0.000	3	159.28	0.000
73.50	0.000	3	159.28	0.000
74.00	0.000	3	159.28	0.000
74.50	0.000	3	159.28	0.000
75.00	0.000	2	159.28	0.000
75.50	0.000	2	159.28	0.000
76.00	0.000	2	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	2	159.28	0.000
77.00	0.000	2	159.28	0.000
77.50	0.000	2	159.28	0.000
78.00	0.000	2	159.28	0.000
78.50	0.000	2	159.28	0.000
79.00	0.000	2	159.28	0.000
79.50	0.000	2	159.28	0.000
80.00	0.000	2	159.28	0.000
80.50	0.000	2	159.28	0.000
81.00	0.000	2	159.28	0.000
81.50	0.000	2	159.28	0.000
82.00	0.000	2	159.28	0.000
82.50	0.000	2	159.28	0.000
83.00	0.000	2	159.28	0.000
83.50	0.000	2	159.28	0.000
84.00	0.000	2	159.28	0.000
84.50	0.000	2	159.28	0.000
85.00	0.000	2	159.28	0.000
85.50	0.000	2	159.28	0.000
86.00	0.000	2	159.28	0.000
86.50	0.000	2	159.28	0.000
87.00	0.000	2	159.28	0.000
87.50	0.000	2	159.28	0.000
88.00	0.000	2	159.28	0.000
88.50	0.000	2	159.28	0.000
89.00	0.000	2	159.28	0.000
89.50	0.000	2	159.28	0.000
90.00	0.000	2	159.28	0.000
90.50	0.000	2	159.28	0.000
91.00	0.000	2	159.28	0.000
91.50	0.000	2	159.28	0.000
92.00	0.000	2	159.28	0.000
92.50	0.000	2	159.28	0.000
93.00	0.000	2	159.28	0.000
93.50	0.000	2	159.28	0.000
94.00	0.000	2	159.28	0.000
94.50	0.000	2	159.28	0.000
95.00	0.000	2	159.28	0.000
95.50	0.000	2	159.28	0.000
96.00	0.000	2	159.28	0.000
96.50	0.000	2	159.28	0.000
97.00	0.000	2	159.28	0.000
97.50	0.000	2	159.28	0.000
98.00	0.000	2	159.28	0.000
98.50	0.000	2	159.28	0.000
99.00	0.000	2	159.28	0.000
99.50	0.000	2	159.28	0.000
100.00	0.000	2	159.28	0.000
100.50	0.000	2	159.28	0.000
101.00	0.000	2	159.28	0.000
101.50	0.000	2	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	2	159.28	0.000
102.50	0.000	2	159.28	0.000
103.00	0.000	2	159.28	0.000
103.50	0.000	2	159.28	0.000
104.00	0.000	2	159.28	0.000
104.50	0.000	2	159.28	0.000
105.00	0.000	2	159.28	0.000
105.50	0.000	2	159.28	0.000
106.00	0.000	2	159.28	0.000
106.50	0.000	2	159.28	0.000
107.00	0.000	2	159.28	0.000
107.50	0.000	2	159.28	0.000
108.00	0.000	2	159.28	0.000
108.50	0.000	2	159.28	0.000
109.00	0.000	2	159.28	0.000
109.50	0.000	2	159.28	0.000
110.00	0.000	2	159.28	0.000
110.50	0.000	2	159.28	0.000
111.00	0.000	2	159.28	0.000
111.50	0.000	2	159.28	0.000
112.00	0.000	1	159.28	0.000
112.50	0.000	1	159.28	0.000
113.00	0.000	1	159.28	0.000
113.50	0.000	1	159.28	0.000
114.00	0.000	1	159.28	0.000
114.50	0.000	1	159.28	0.000
115.00	0.000	1	159.28	0.000
115.50	0.000	1	159.28	0.000
116.00	0.000	1	159.28	0.000
116.50	0.000	1	159.28	0.000
117.00	0.000	1	159.28	0.000
117.50	0.000	1	159.28	0.000
118.00	0.000	1	159.28	0.000
118.50	0.000	1	159.28	0.000
119.00	0.000	1	159.28	0.000
119.50	0.000	1	159.28	0.000
120.00	0.000	1	159.28	0.000
120.50	0.000	1	159.28	0.000
121.00	0.000	1	159.28	0.000
121.50	0.000	1	159.28	0.000
122.00	0.000	1	159.28	0.000
122.50	0.000	1	159.28	0.000
123.00	0.000	1	159.28	0.000
123.50	0.000	1	159.28	0.000
124.00	0.000	1	159.28	0.000
124.50	0.000	1	159.28	0.000
125.00	0.000	1	159.28	0.000
125.50	0.000	1	159.28	0.000
126.00	0.000	1	159.28	0.000
126.50	0.000	1	159.28	0.000
127.00	0.000	1	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	1	159.28	0.000
128.00	0.000	1	159.28	0.000
128.50	0.000	1	159.28	0.000
129.00	0.000	1	159.28	0.000
129.50	0.000	1	159.28	0.000
130.00	0.000	1	159.28	0.000
130.50	0.000	1	159.28	0.000
131.00	0.000	1	159.28	0.000
131.50	0.000	1	159.28	0.000
132.00	0.000	1	159.28	0.000
132.50	0.000	1	159.28	0.000
133.00	0.000	1	159.28	0.000
133.50	0.000	1	159.28	0.000
134.00	0.000	1	159.28	0.000
134.50	0.000	1	159.28	0.000
135.00	0.000	1	159.28	0.000
135.50	0.000	1	159.28	0.000
136.00	0.000	1	159.28	0.000
136.50	0.000	1	159.28	0.000
137.00	0.000	1	159.28	0.000
137.50	0.000	1	159.28	0.000
138.00	0.000	1	159.28	0.000
138.50	0.000	1	159.28	0.000
139.00	0.000	1	159.28	0.000
139.50	0.000	1	159.28	0.000
140.00	0.000	1	159.28	0.000
140.50	0.000	1	159.28	0.000
141.00	0.000	1	159.28	0.000
141.50	0.000	1	159.28	0.000
142.00	0.000	1	159.28	0.000
142.50	0.000	1	159.28	0.000
143.00	0.000	1	159.28	0.000
143.50	0.000	1	159.28	0.000
144.00	0.000	1	159.28	0.000
144.50	0.000	1	159.28	0.000
145.00	0.000	1	159.28	0.000
145.50	0.000	1	159.28	0.000
146.00	0.000	1	159.28	0.000
146.50	0.000	1	159.28	0.000
147.00	0.000	1	159.28	0.000
147.50	0.000	1	159.28	0.000
148.00	0.000	1	159.28	0.000
148.50	0.000	1	159.28	0.000
149.00	0.000	1	159.28	0.000
149.50	0.000	1	159.28	0.000
150.00	0.000	1	159.28	0.000
150.50	0.000	1	159.28	0.000
151.00	0.000	1	159.28	0.000
151.50	0.000	1	159.28	0.000
152.00	0.000	1	159.28	0.000
152.50	0.000	1	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	1	159.28	0.000
153.50	0.000	1	159.28	0.000
154.00	0.000	1	159.28	0.000
154.50	0.000	1	159.28	0.000
155.00	0.000	1	159.28	0.000
155.50	0.000	1	159.28	0.000
156.00	0.000	1	159.28	0.000
156.50	0.000	1	159.28	0.000
157.00	0.000	1	159.28	0.000
157.50	0.000	1	159.28	0.000
158.00	0.000	1	159.28	0.000
158.50	0.000	1	159.28	0.000
159.00	0.000	1	159.28	0.000
159.50	0.000	1	159.28	0.000
160.00	0.000	1	159.28	0.000
160.50	0.000	1	159.28	0.000
161.00	0.000	1	159.28	0.000
161.50	0.000	1	159.28	0.000
162.00	0.000	1	159.28	0.000
162.50	0.000	1	159.28	0.000
163.00	0.000	1	159.28	0.000
163.50	0.000	1	159.28	0.000
164.00	0.000	1	159.28	0.000
164.50	0.000	1	159.28	0.000
165.00	0.000	1	159.28	0.000
165.50	0.000	1	159.28	0.000
166.00	0.000	1	159.28	0.000
166.50	0.000	1	159.28	0.000
167.00	0.000	1	159.28	0.000
167.50	0.000	1	159.28	0.000
168.00	0.000	1	159.28	0.000

Summary for Pond 1P: UG1

Inflow Area = 81,675 sf, 99.20% Impervious, Inflow Depth = 5.62" for 25-yr event
Inflow = 16.163 cfs @ 11.96 hrs, Volume= 38,265 cf
Outflow = 5.111 cfs @ 12.07 hrs, Volume= 38,118 cf, Atten= 68%, Lag= 6.7 min
Primary = 5.111 cfs @ 12.07 hrs, Volume= 38,118 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 159.46' @ 12.07 hrs Surf.Area= 13,041 sf Storage= 18,388 cf

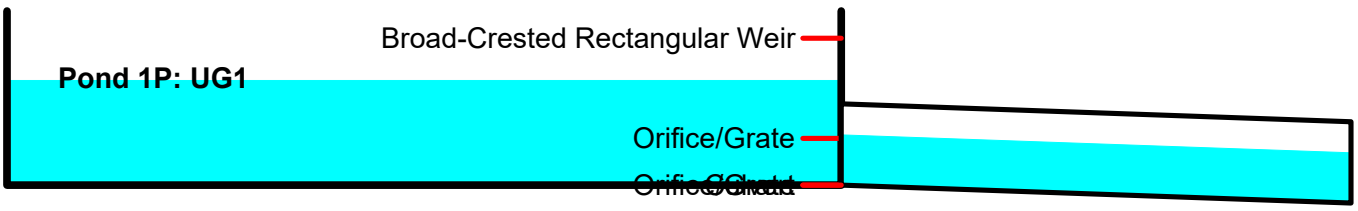
Plug-Flow detention time= 736.7 min calculated for 38,116 cf (100% of inflow)
Center-of-Mass det. time= 734.5 min (1,474.9 - 740.4)

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'	**40.0" 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= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=5.110 cfs @ 12.07 hrs HW=159.46' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 5.110 cfs of 8.192 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.036 cfs @ 6.615 fps)
  ├**2=Orifice/Grate** (Orifice Controls 5.074 cfs @ 4.567 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

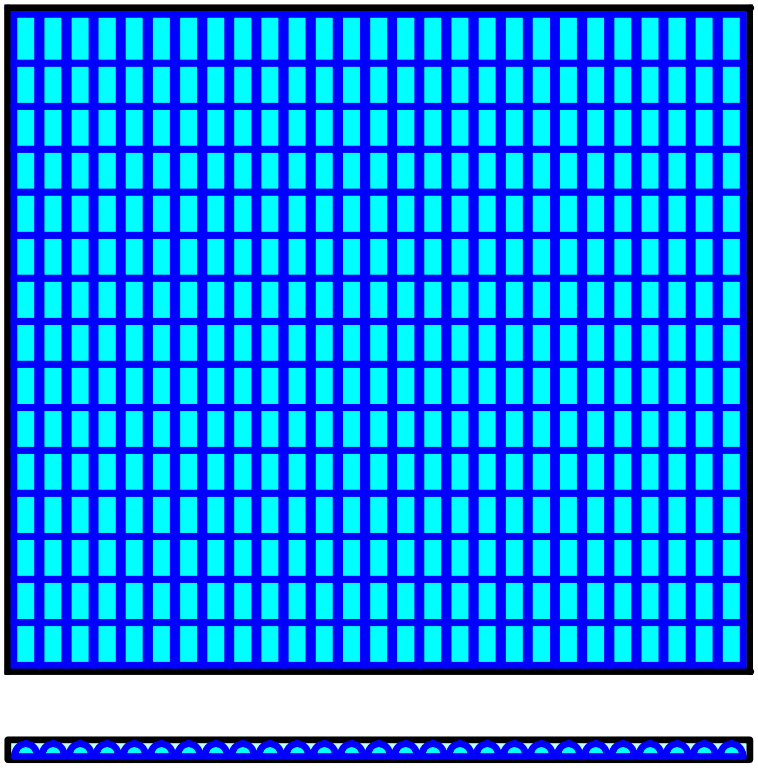
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

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

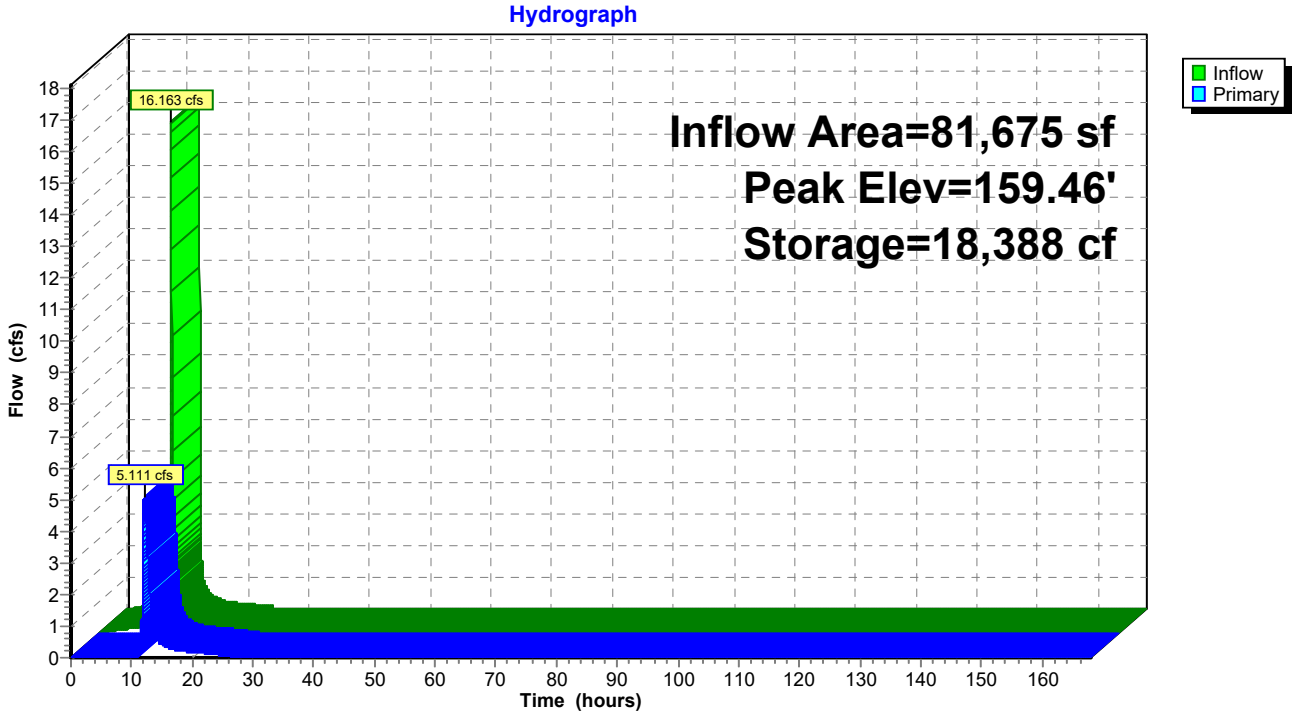
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

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=81,675 sf
Peak Elev=159.46'
Storage=18,388 cf
16.163 cfs
5.111 cfs
Inflow
Primary
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	0.017	8	157.53	0.000
1.50	0.044	63	157.54	0.000
2.00	0.065	161	157.56	0.001
2.50	0.082	291	157.59	0.003
3.00	0.097	445	157.62	0.005
3.50	0.110	620	157.65	0.007
4.00	0.121	813	157.69	0.009
4.50	0.135	1,025	157.73	0.010
5.00	0.149	1,261	157.77	0.012
5.50	0.163	1,519	157.82	0.013
6.00	0.177	1,800	157.88	0.014
6.50	0.190	2,103	157.93	0.016
7.00	0.203	2,426	158.00	0.017
7.50	0.216	2,771	158.04	0.018
8.00	0.228	3,138	158.07	0.019
8.50	0.276	3,553	158.11	0.019
9.00	0.332	4,065	158.15	0.020
9.50	0.342	4,642	158.20	0.021
10.00	0.417	5,277	158.26	0.022
10.50	0.543	6,096	158.33	0.023
11.00	0.749	7,192	158.42	0.089
11.50	**1.231**	8,392	158.53	0.573
12.00	**13.336**	**17,414**	**159.36**	**4.826**
12.50	1.157	**14,330**	**159.07**	**3.832**
13.00	0.719	10,584	158.72	2.079
13.50	0.544	9,138	158.59	1.009
14.00	0.426	8,551	158.54	0.658
14.50	0.376	8,244	158.51	0.497
15.00	0.338	8,073	158.50	0.415
15.50	0.299	7,952	158.49	0.360
16.00	0.260	7,849	158.48	0.315
16.50	0.243	7,766	158.47	0.281
17.00	0.229	7,707	158.47	0.257
17.50	0.215	7,660	158.46	0.239
18.00	0.201	7,619	158.46	0.224
18.50	0.187	7,579	158.46	0.209
19.00	0.174	7,540	158.45	0.195
19.50	0.160	7,501	158.45	0.182
20.00	0.146	7,462	158.45	0.168
20.50	0.141	7,427	158.44	0.157
21.00	0.139	7,404	158.44	0.150
21.50	0.136	7,387	158.44	0.144
22.00	0.133	7,374	158.44	0.140
22.50	0.130	7,362	158.44	0.136
23.00	0.128	7,352	158.44	0.133
23.50	0.125	7,342	158.44	0.130
24.00	0.122	7,332	158.44	0.127
24.50	0.000	7,174	158.42	0.084
25.00	0.000	7,050	158.41	0.056

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	6,965	158.40	0.040
26.00	0.000	6,901	158.40	0.031
26.50	0.000	6,850	158.39	0.026
27.00	0.000	6,806	158.39	0.024
27.50	0.000	6,763	158.39	0.024
28.00	0.000	6,720	158.38	0.024
28.50	0.000	6,678	158.38	0.024
29.00	0.000	6,635	158.37	0.024
29.50	0.000	6,593	158.37	0.023
30.00	0.000	6,551	158.37	0.023
30.50	0.000	6,509	158.36	0.023
31.00	0.000	6,467	158.36	0.023
31.50	0.000	6,425	158.36	0.023
32.00	0.000	6,383	158.35	0.023
32.50	0.000	6,341	158.35	0.023
33.00	0.000	6,300	158.35	0.023
33.50	0.000	6,258	158.34	0.023
34.00	0.000	6,217	158.34	0.023
34.50	0.000	6,175	158.33	0.023
35.00	0.000	6,134	158.33	0.023
35.50	0.000	6,093	158.33	0.023
36.00	0.000	6,052	158.32	0.023
36.50	0.000	6,011	158.32	0.023
37.00	0.000	5,970	158.32	0.023
37.50	0.000	5,929	158.31	0.023
38.00	0.000	5,888	158.31	0.023
38.50	0.000	5,848	158.31	0.023
39.00	0.000	5,807	158.30	0.022
39.50	0.000	5,767	158.30	0.022
40.00	0.000	5,727	158.30	0.022
40.50	0.000	5,687	158.29	0.022
41.00	0.000	5,646	158.29	0.022
41.50	0.000	5,606	158.29	0.022
42.00	0.000	5,567	158.28	0.022
42.50	0.000	5,527	158.28	0.022
43.00	0.000	5,487	158.28	0.022
43.50	0.000	5,447	158.27	0.022
44.00	0.000	5,408	158.27	0.022
44.50	0.000	5,369	158.27	0.022
45.00	0.000	5,329	158.26	0.022
45.50	0.000	5,290	158.26	0.022
46.00	0.000	5,251	158.26	0.022
46.50	0.000	5,212	158.25	0.022
47.00	0.000	5,173	158.25	0.022
47.50	0.000	5,134	158.25	0.022
48.00	0.000	5,095	158.24	0.021
48.50	0.000	5,057	158.24	0.021
49.00	0.000	5,018	158.24	0.021
49.50	0.000	4,980	158.23	0.021
50.00	0.000	4,941	158.23	0.021
50.50	0.000	4,903	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	4,865	158.22	0.021
51.50	0.000	4,827	158.22	0.021
52.00	0.000	4,789	158.22	0.021
52.50	0.000	4,751	158.21	0.021
53.00	0.000	4,713	158.21	0.021
53.50	0.000	4,676	158.21	0.021
54.00	0.000	4,638	158.20	0.021
54.50	0.000	4,600	158.20	0.021
55.00	0.000	4,563	158.20	0.021
55.50	0.000	4,526	158.19	0.021
56.00	0.000	4,489	158.19	0.021
56.50	0.000	4,451	158.19	0.021
57.00	0.000	4,414	158.18	0.021
57.50	0.000	4,378	158.18	0.020
58.00	0.000	4,341	158.18	0.020
58.50	0.000	4,304	158.17	0.020
59.00	0.000	4,267	158.17	0.020
59.50	0.000	4,231	158.17	0.020
60.00	0.000	4,194	158.16	0.020
60.50	0.000	4,158	158.16	0.020
61.00	0.000	4,122	158.16	0.020
61.50	0.000	4,086	158.15	0.020
62.00	0.000	4,050	158.15	0.020
62.50	0.000	4,014	158.15	0.020
63.00	0.000	3,978	158.15	0.020
63.50	0.000	3,942	158.14	0.020
64.00	0.000	3,906	158.14	0.020
64.50	0.000	3,871	158.14	0.020
65.00	0.000	3,835	158.13	0.020
65.50	0.000	3,800	158.13	0.020
66.00	0.000	3,765	158.13	0.020
66.50	0.000	3,729	158.12	0.020
67.00	0.000	3,694	158.12	0.019
67.50	0.000	3,659	158.12	0.019
68.00	0.000	3,624	158.12	0.019
68.50	0.000	3,590	158.11	0.019
69.00	0.000	3,555	158.11	0.019
69.50	0.000	3,520	158.11	0.019
70.00	0.000	3,486	158.10	0.019
70.50	0.000	3,451	158.10	0.019
71.00	0.000	3,417	158.10	0.019
71.50	0.000	3,383	158.10	0.019
72.00	0.000	3,348	158.09	0.019
72.50	0.000	3,314	158.09	0.019
73.00	0.000	3,280	158.09	0.019
73.50	0.000	3,247	158.08	0.019
74.00	0.000	3,213	158.08	0.019
74.50	0.000	3,179	158.08	0.019
75.00	0.000	3,146	158.08	0.019
75.50	0.000	3,112	158.07	0.019
76.00	0.000	3,079	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	3,045	158.07	0.018
77.00	0.000	3,012	158.06	0.018
77.50	0.000	2,979	158.06	0.018
78.00	0.000	2,946	158.06	0.018
78.50	0.000	2,913	158.06	0.018
79.00	0.000	2,880	158.05	0.018
79.50	0.000	2,847	158.05	0.018
80.00	0.000	2,815	158.05	0.018
80.50	0.000	2,782	158.04	0.018
81.00	0.000	2,750	158.04	0.018
81.50	0.000	2,717	158.04	0.018
82.00	0.000	2,685	158.04	0.018
82.50	0.000	2,653	158.03	0.018
83.00	0.000	2,621	158.03	0.018
83.50	0.000	2,589	158.03	0.018
84.00	0.000	2,557	158.02	0.018
84.50	0.000	2,526	158.01	0.017
85.00	0.000	2,494	158.01	0.017
85.50	0.000	2,463	158.00	0.017
86.00	0.000	2,432	158.00	0.017
86.50	0.000	2,402	157.99	0.017
87.00	0.000	2,371	157.98	0.017
87.50	0.000	2,341	157.98	0.017
88.00	0.000	2,311	157.97	0.017
88.50	0.000	2,281	157.97	0.017
89.00	0.000	2,251	157.96	0.016
89.50	0.000	2,222	157.96	0.016
90.00	0.000	2,193	157.95	0.016
90.50	0.000	2,164	157.94	0.016
91.00	0.000	2,135	157.94	0.016
91.50	0.000	2,106	157.93	0.016
92.00	0.000	2,078	157.93	0.016
92.50	0.000	2,050	157.92	0.016
93.00	0.000	2,022	157.92	0.015
93.50	0.000	1,994	157.91	0.015
94.00	0.000	1,967	157.91	0.015
94.50	0.000	1,940	157.90	0.015
95.00	0.000	1,913	157.90	0.015
95.50	0.000	1,886	157.89	0.015
96.00	0.000	1,859	157.89	0.015
96.50	0.000	1,833	157.88	0.015
97.00	0.000	1,806	157.88	0.014
97.50	0.000	1,781	157.87	0.014
98.00	0.000	1,755	157.87	0.014
98.50	0.000	1,729	157.86	0.014
99.00	0.000	1,704	157.86	0.014
99.50	0.000	1,679	157.85	0.014
100.00	0.000	1,654	157.85	0.014
100.50	0.000	1,629	157.84	0.014
101.00	0.000	1,605	157.84	0.014
101.50	0.000	1,580	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	1,556	157.83	0.013
102.50	0.000	1,533	157.82	0.013
103.00	0.000	1,509	157.82	0.013
103.50	0.000	1,485	157.81	0.013
104.00	0.000	1,462	157.81	0.013
104.50	0.000	1,439	157.81	0.013
105.00	0.000	1,417	157.80	0.013
105.50	0.000	1,394	157.80	0.012
106.00	0.000	1,372	157.79	0.012
106.50	0.000	1,350	157.79	0.012
107.00	0.000	1,328	157.78	0.012
107.50	0.000	1,306	157.78	0.012
108.00	0.000	1,284	157.78	0.012
108.50	0.000	1,263	157.77	0.012
109.00	0.000	1,242	157.77	0.012
109.50	0.000	1,221	157.76	0.012
110.00	0.000	1,201	157.76	0.011
110.50	0.000	1,180	157.76	0.011
111.00	0.000	1,160	157.75	0.011
111.50	0.000	1,140	157.75	0.011
112.00	0.000	1,120	157.74	0.011
112.50	0.000	1,101	157.74	0.011
113.00	0.000	1,081	157.74	0.011
113.50	0.000	1,062	157.73	0.011
114.00	0.000	1,043	157.73	0.010
114.50	0.000	1,025	157.73	0.010
115.00	0.000	1,006	157.72	0.010
115.50	0.000	988	157.72	0.010
116.00	0.000	970	157.72	0.010
116.50	0.000	952	157.71	0.010
117.00	0.000	934	157.71	0.010
117.50	0.000	917	157.71	0.010
118.00	0.000	900	157.70	0.009
118.50	0.000	883	157.70	0.009
119.00	0.000	866	157.70	0.009
119.50	0.000	850	157.69	0.009
120.00	0.000	833	157.69	0.009
120.50	0.000	817	157.69	0.009
121.00	0.000	801	157.68	0.009
121.50	0.000	785	157.68	0.009
122.00	0.000	770	157.68	0.009
122.50	0.000	755	157.67	0.008
123.00	0.000	740	157.67	0.008
123.50	0.000	725	157.67	0.008
124.00	0.000	710	157.67	0.008
124.50	0.000	696	157.66	0.008
125.00	0.000	681	157.66	0.008
125.50	0.000	668	157.66	0.008
126.00	0.000	654	157.66	0.008
126.50	0.000	640	157.65	0.007
127.00	0.000	627	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	614	157.65	0.007
128.00	0.000	601	157.65	0.007
128.50	0.000	588	157.64	0.007
129.00	0.000	576	157.64	0.007
129.50	0.000	563	157.64	0.007
130.00	0.000	551	157.64	0.007
130.50	0.000	539	157.63	0.007
131.00	0.000	528	157.63	0.006
131.50	0.000	516	157.63	0.006
132.00	0.000	505	157.63	0.006
132.50	0.000	494	157.62	0.006
133.00	0.000	483	157.62	0.006
133.50	0.000	473	157.62	0.006
134.00	0.000	462	157.62	0.006
134.50	0.000	452	157.62	0.006
135.00	0.000	442	157.61	0.005
135.50	0.000	433	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	387	157.60	0.005
138.50	0.000	379	157.60	0.005
139.00	0.000	370	157.60	0.004
139.50	0.000	362	157.60	0.004
140.00	0.000	355	157.60	0.004
140.50	0.000	347	157.60	0.004
141.00	0.000	340	157.60	0.004
141.50	0.000	333	157.59	0.004
142.00	0.000	326	157.59	0.004
142.50	0.000	319	157.59	0.004
143.00	0.000	313	157.59	0.004
143.50	0.000	307	157.59	0.003
144.00	0.000	301	157.59	0.003
144.50	0.000	295	157.59	0.003
145.00	0.000	289	157.59	0.003
145.50	0.000	284	157.58	0.003
146.00	0.000	278	157.58	0.003
146.50	0.000	273	157.58	0.003
147.00	0.000	268	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	0.002
149.00	0.000	250	157.58	0.002
149.50	0.000	246	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	230	157.57	0.002
152.00	0.000	226	157.57	0.002
152.50	0.000	222	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	219	157.57	0.002
153.50	0.000	215	157.57	0.002
154.00	0.000	212	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	189	157.57	0.001
158.50	0.000	186	157.57	0.001
159.00	0.000	183	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	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	147	157.56	0.001

Summary for Pond 3P: UG2

Inflow Area = 21,519 sf, 87.04% Impervious, Inflow Depth = 4.71" for 25-yr event
Inflow = 3.950 cfs @ 11.96 hrs, Volume= 8,445 cf
Outflow = 0.834 cfs @ 12.10 hrs, Volume= 8,444 cf, Atten= 79%, Lag= 8.4 min
Primary = 0.834 cfs @ 12.10 hrs, Volume= 8,444 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 161.17' @ 12.10 hrs Surf.Area= 2,542 sf Storage= 3,307 cf

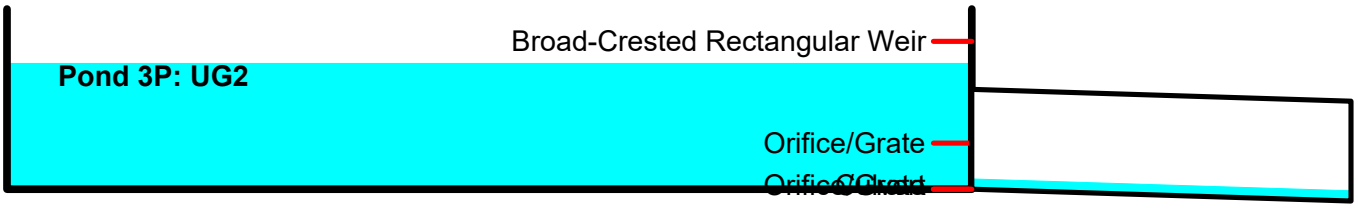
Plug-Flow detention time= 67.5 min calculated for 8,444 cf (100% of inflow)
Center-of-Mass det. time= 67.8 min (849.0 - 781.2)

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'	**5.0" 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= 36.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.834 cfs @ 12.10 hrs HW=161.17' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 0.834 cfs of 8.000 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.314 cfs @ 6.399 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.520 cfs @ 4.992 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 3P: UG2 - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Cultec Recharger®180HD)
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

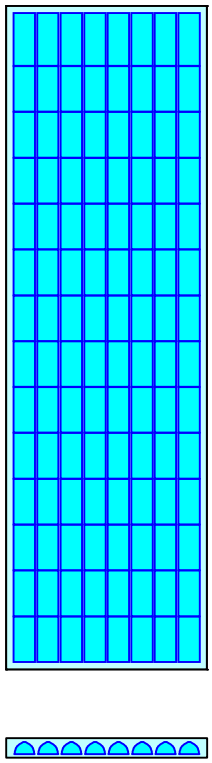
14 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 89.62' Row Length +12.0" End Stone x 2 = 91.62' Base Length
8 Rows x 36.0" Wide + 3.0" Spacing x 7 + 12.0" Side Stone x 2 = 27.75' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

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

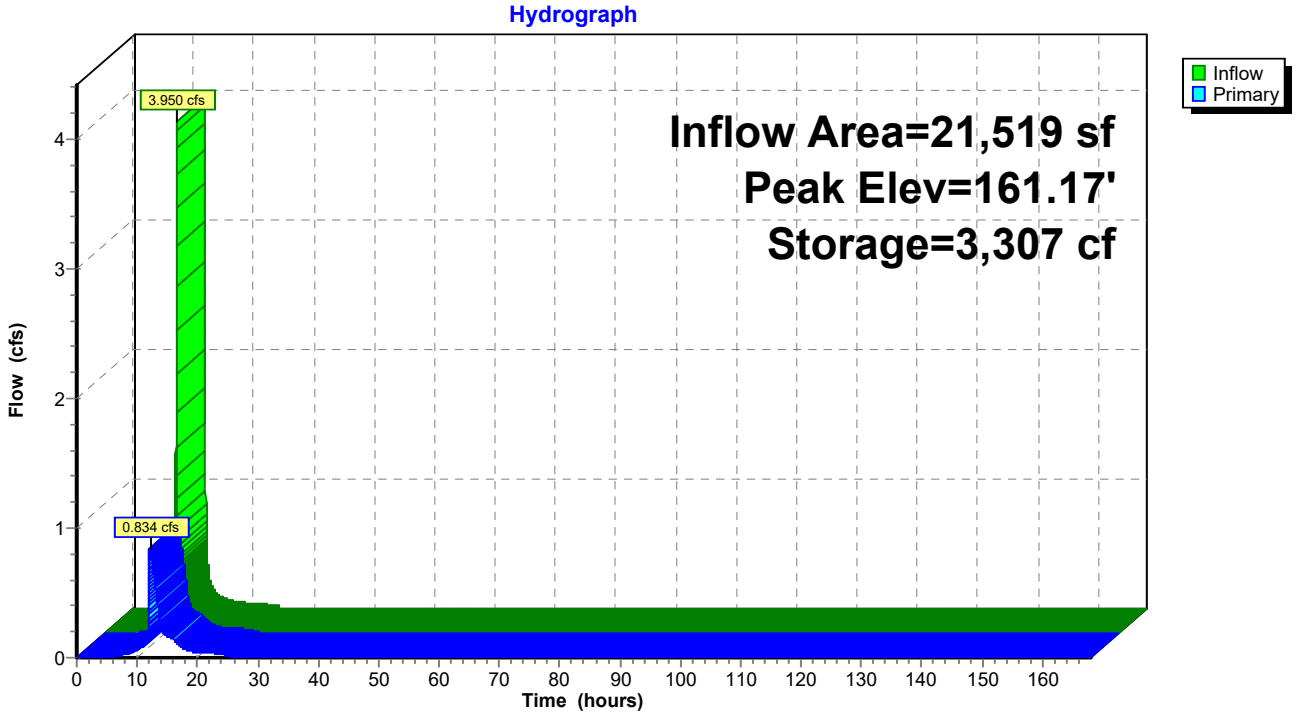
6,885.8 cf Field - 2,466.0 cf Chambers = 4,419.8 cf Stone x 40.0% Voids = 1,767.9 cf Stone Storage

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=21,519 sf
Peak Elev=161.17'
Storage=3,307 cf
3.950 cfs
0.834 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	0.001	0	159.28	0.000
4.00	0.004	4	159.28	0.000
4.50	0.007	13	159.29	0.000
5.00	0.010	26	159.31	0.001
5.50	0.013	42	159.32	0.004
6.00	0.017	60	159.34	0.007
6.50	0.021	76	159.36	0.012
7.00	0.024	92	159.37	0.016
7.50	0.028	105	159.38	0.021
8.00	0.032	118	159.40	0.026
8.50	0.042	132	159.41	0.032
9.00	0.054	153	159.43	0.041
9.50	0.059	173	159.45	0.050
10.00	0.076	195	159.47	0.060
10.50	0.104	233	159.51	0.077
11.00	0.151	304	159.58	0.098
11.50	**0.263**	461	159.73	0.135
12.00	**3.291**	**2,938**	**160.96**	**0.759**
12.50	0.291	**2,803**	**160.88**	**0.732**
13.00	0.182	2,036	160.49	0.562
13.50	0.138	1,466	160.22	0.382
14.00	0.108	1,149	160.07	0.238
14.50	0.096	960	159.99	0.183
15.00	0.086	808	159.92	0.169
15.50	0.076	660	159.85	0.157
16.00	0.066	516	159.78	0.145
16.50	0.062	391	159.66	0.120
17.00	0.058	303	159.58	0.098
17.50	0.055	245	159.52	0.081
18.00	0.051	208	159.49	0.066
18.50	0.048	188	159.46	0.057
19.00	0.044	174	159.45	0.051
19.50	0.041	164	159.44	0.046
20.00	0.037	156	159.43	0.042
20.50	0.036	149	159.43	0.039
21.00	0.036	145	159.42	0.037
21.50	0.035	143	159.42	0.036
22.00	0.034	140	159.42	0.035
22.50	0.033	139	159.42	0.034
23.00	0.033	137	159.41	0.034
23.50	0.032	135	159.41	0.033
24.00	0.031	134	159.41	0.032
24.50	0.000	97	159.38	0.018
25.00	0.000	72	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	57	159.34	0.007
26.00	0.000	47	159.33	0.005
26.50	0.000	40	159.32	0.003
27.00	0.000	35	159.31	0.003
27.50	0.000	31	159.31	0.002
28.00	0.000	28	159.31	0.002
28.50	0.000	25	159.30	0.001
29.00	0.000	23	159.30	0.001
29.50	0.000	21	159.30	0.001
30.00	0.000	19	159.30	0.001
30.50	0.000	18	159.30	0.001
31.00	0.000	17	159.30	0.001
31.50	0.000	16	159.30	0.001
32.00	0.000	15	159.29	0.000
32.50	0.000	14	159.29	0.000
33.00	0.000	13	159.29	0.000
33.50	0.000	13	159.29	0.000
34.00	0.000	12	159.29	0.000
34.50	0.000	12	159.29	0.000
35.00	0.000	11	159.29	0.000
35.50	0.000	11	159.29	0.000
36.00	0.000	10	159.29	0.000
36.50	0.000	10	159.29	0.000
37.00	0.000	9	159.29	0.000
37.50	0.000	9	159.29	0.000
38.00	0.000	9	159.29	0.000
38.50	0.000	8	159.29	0.000
39.00	0.000	8	159.29	0.000
39.50	0.000	8	159.29	0.000
40.00	0.000	8	159.29	0.000
40.50	0.000	7	159.29	0.000
41.00	0.000	7	159.29	0.000
41.50	0.000	7	159.29	0.000
42.00	0.000	7	159.29	0.000
42.50	0.000	7	159.29	0.000
43.00	0.000	7	159.29	0.000
43.50	0.000	6	159.29	0.000
44.00	0.000	6	159.29	0.000
44.50	0.000	6	159.29	0.000
45.00	0.000	6	159.29	0.000
45.50	0.000	6	159.29	0.000
46.00	0.000	6	159.29	0.000
46.50	0.000	6	159.29	0.000
47.00	0.000	5	159.29	0.000
47.50	0.000	5	159.29	0.000
48.00	0.000	5	159.29	0.000
48.50	0.000	5	159.29	0.000
49.00	0.000	5	159.28	0.000
49.50	0.000	5	159.28	0.000
50.00	0.000	5	159.28	0.000
50.50	0.000	5	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	5	159.28	0.000
51.50	0.000	5	159.28	0.000
52.00	0.000	4	159.28	0.000
52.50	0.000	4	159.28	0.000
53.00	0.000	4	159.28	0.000
53.50	0.000	4	159.28	0.000
54.00	0.000	4	159.28	0.000
54.50	0.000	4	159.28	0.000
55.00	0.000	4	159.28	0.000
55.50	0.000	4	159.28	0.000
56.00	0.000	4	159.28	0.000
56.50	0.000	4	159.28	0.000
57.00	0.000	4	159.28	0.000
57.50	0.000	4	159.28	0.000
58.00	0.000	4	159.28	0.000
58.50	0.000	4	159.28	0.000
59.00	0.000	4	159.28	0.000
59.50	0.000	4	159.28	0.000
60.00	0.000	3	159.28	0.000
60.50	0.000	3	159.28	0.000
61.00	0.000	3	159.28	0.000
61.50	0.000	3	159.28	0.000
62.00	0.000	3	159.28	0.000
62.50	0.000	3	159.28	0.000
63.00	0.000	3	159.28	0.000
63.50	0.000	3	159.28	0.000
64.00	0.000	3	159.28	0.000
64.50	0.000	3	159.28	0.000
65.00	0.000	3	159.28	0.000
65.50	0.000	3	159.28	0.000
66.00	0.000	3	159.28	0.000
66.50	0.000	3	159.28	0.000
67.00	0.000	3	159.28	0.000
67.50	0.000	3	159.28	0.000
68.00	0.000	3	159.28	0.000
68.50	0.000	3	159.28	0.000
69.00	0.000	3	159.28	0.000
69.50	0.000	3	159.28	0.000
70.00	0.000	3	159.28	0.000
70.50	0.000	3	159.28	0.000
71.00	0.000	3	159.28	0.000
71.50	0.000	3	159.28	0.000
72.00	0.000	3	159.28	0.000
72.50	0.000	3	159.28	0.000
73.00	0.000	3	159.28	0.000
73.50	0.000	3	159.28	0.000
74.00	0.000	3	159.28	0.000
74.50	0.000	3	159.28	0.000
75.00	0.000	2	159.28	0.000
75.50	0.000	2	159.28	0.000
76.00	0.000	2	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	2	159.28	0.000
77.00	0.000	2	159.28	0.000
77.50	0.000	2	159.28	0.000
78.00	0.000	2	159.28	0.000
78.50	0.000	2	159.28	0.000
79.00	0.000	2	159.28	0.000
79.50	0.000	2	159.28	0.000
80.00	0.000	2	159.28	0.000
80.50	0.000	2	159.28	0.000
81.00	0.000	2	159.28	0.000
81.50	0.000	2	159.28	0.000
82.00	0.000	2	159.28	0.000
82.50	0.000	2	159.28	0.000
83.00	0.000	2	159.28	0.000
83.50	0.000	2	159.28	0.000
84.00	0.000	2	159.28	0.000
84.50	0.000	2	159.28	0.000
85.00	0.000	2	159.28	0.000
85.50	0.000	2	159.28	0.000
86.00	0.000	2	159.28	0.000
86.50	0.000	2	159.28	0.000
87.00	0.000	2	159.28	0.000
87.50	0.000	2	159.28	0.000
88.00	0.000	2	159.28	0.000
88.50	0.000	2	159.28	0.000
89.00	0.000	2	159.28	0.000
89.50	0.000	2	159.28	0.000
90.00	0.000	2	159.28	0.000
90.50	0.000	2	159.28	0.000
91.00	0.000	2	159.28	0.000
91.50	0.000	2	159.28	0.000
92.00	0.000	2	159.28	0.000
92.50	0.000	2	159.28	0.000
93.00	0.000	2	159.28	0.000
93.50	0.000	2	159.28	0.000
94.00	0.000	2	159.28	0.000
94.50	0.000	2	159.28	0.000
95.00	0.000	2	159.28	0.000
95.50	0.000	2	159.28	0.000
96.00	0.000	2	159.28	0.000
96.50	0.000	2	159.28	0.000
97.00	0.000	2	159.28	0.000
97.50	0.000	2	159.28	0.000
98.00	0.000	2	159.28	0.000
98.50	0.000	2	159.28	0.000
99.00	0.000	2	159.28	0.000
99.50	0.000	2	159.28	0.000
100.00	0.000	2	159.28	0.000
100.50	0.000	2	159.28	0.000
101.00	0.000	2	159.28	0.000
101.50	0.000	2	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	2	159.28	0.000
102.50	0.000	2	159.28	0.000
103.00	0.000	2	159.28	0.000
103.50	0.000	2	159.28	0.000
104.00	0.000	2	159.28	0.000
104.50	0.000	2	159.28	0.000
105.00	0.000	2	159.28	0.000
105.50	0.000	2	159.28	0.000
106.00	0.000	2	159.28	0.000
106.50	0.000	2	159.28	0.000
107.00	0.000	2	159.28	0.000
107.50	0.000	2	159.28	0.000
108.00	0.000	2	159.28	0.000
108.50	0.000	2	159.28	0.000
109.00	0.000	2	159.28	0.000
109.50	0.000	2	159.28	0.000
110.00	0.000	2	159.28	0.000
110.50	0.000	2	159.28	0.000
111.00	0.000	2	159.28	0.000
111.50	0.000	2	159.28	0.000
112.00	0.000	2	159.28	0.000
112.50	0.000	1	159.28	0.000
113.00	0.000	1	159.28	0.000
113.50	0.000	1	159.28	0.000
114.00	0.000	1	159.28	0.000
114.50	0.000	1	159.28	0.000
115.00	0.000	1	159.28	0.000
115.50	0.000	1	159.28	0.000
116.00	0.000	1	159.28	0.000
116.50	0.000	1	159.28	0.000
117.00	0.000	1	159.28	0.000
117.50	0.000	1	159.28	0.000
118.00	0.000	1	159.28	0.000
118.50	0.000	1	159.28	0.000
119.00	0.000	1	159.28	0.000
119.50	0.000	1	159.28	0.000
120.00	0.000	1	159.28	0.000
120.50	0.000	1	159.28	0.000
121.00	0.000	1	159.28	0.000
121.50	0.000	1	159.28	0.000
122.00	0.000	1	159.28	0.000
122.50	0.000	1	159.28	0.000
123.00	0.000	1	159.28	0.000
123.50	0.000	1	159.28	0.000
124.00	0.000	1	159.28	0.000
124.50	0.000	1	159.28	0.000
125.00	0.000	1	159.28	0.000
125.50	0.000	1	159.28	0.000
126.00	0.000	1	159.28	0.000
126.50	0.000	1	159.28	0.000
127.00	0.000	1	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	1	159.28	0.000
128.00	0.000	1	159.28	0.000
128.50	0.000	1	159.28	0.000
129.00	0.000	1	159.28	0.000
129.50	0.000	1	159.28	0.000
130.00	0.000	1	159.28	0.000
130.50	0.000	1	159.28	0.000
131.00	0.000	1	159.28	0.000
131.50	0.000	1	159.28	0.000
132.00	0.000	1	159.28	0.000
132.50	0.000	1	159.28	0.000
133.00	0.000	1	159.28	0.000
133.50	0.000	1	159.28	0.000
134.00	0.000	1	159.28	0.000
134.50	0.000	1	159.28	0.000
135.00	0.000	1	159.28	0.000
135.50	0.000	1	159.28	0.000
136.00	0.000	1	159.28	0.000
136.50	0.000	1	159.28	0.000
137.00	0.000	1	159.28	0.000
137.50	0.000	1	159.28	0.000
138.00	0.000	1	159.28	0.000
138.50	0.000	1	159.28	0.000
139.00	0.000	1	159.28	0.000
139.50	0.000	1	159.28	0.000
140.00	0.000	1	159.28	0.000
140.50	0.000	1	159.28	0.000
141.00	0.000	1	159.28	0.000
141.50	0.000	1	159.28	0.000
142.00	0.000	1	159.28	0.000
142.50	0.000	1	159.28	0.000
143.00	0.000	1	159.28	0.000
143.50	0.000	1	159.28	0.000
144.00	0.000	1	159.28	0.000
144.50	0.000	1	159.28	0.000
145.00	0.000	1	159.28	0.000
145.50	0.000	1	159.28	0.000
146.00	0.000	1	159.28	0.000
146.50	0.000	1	159.28	0.000
147.00	0.000	1	159.28	0.000
147.50	0.000	1	159.28	0.000
148.00	0.000	1	159.28	0.000
148.50	0.000	1	159.28	0.000
149.00	0.000	1	159.28	0.000
149.50	0.000	1	159.28	0.000
150.00	0.000	1	159.28	0.000
150.50	0.000	1	159.28	0.000
151.00	0.000	1	159.28	0.000
151.50	0.000	1	159.28	0.000
152.00	0.000	1	159.28	0.000
152.50	0.000	1	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	1	159.28	0.000
153.50	0.000	1	159.28	0.000
154.00	0.000	1	159.28	0.000
154.50	0.000	1	159.28	0.000
155.00	0.000	1	159.28	0.000
155.50	0.000	1	159.28	0.000
156.00	0.000	1	159.28	0.000
156.50	0.000	1	159.28	0.000
157.00	0.000	1	159.28	0.000
157.50	0.000	1	159.28	0.000
158.00	0.000	1	159.28	0.000
158.50	0.000	1	159.28	0.000
159.00	0.000	1	159.28	0.000
159.50	0.000	1	159.28	0.000
160.00	0.000	1	159.28	0.000
160.50	0.000	1	159.28	0.000
161.00	0.000	1	159.28	0.000
161.50	0.000	1	159.28	0.000
162.00	0.000	1	159.28	0.000
162.50	0.000	1	159.28	0.000
163.00	0.000	1	159.28	0.000
163.50	0.000	1	159.28	0.000
164.00	0.000	1	159.28	0.000
164.50	0.000	1	159.28	0.000
165.00	0.000	1	159.28	0.000
165.50	0.000	1	159.28	0.000
166.00	0.000	1	159.28	0.000
166.50	0.000	1	159.28	0.000
167.00	0.000	1	159.28	0.000
167.50	0.000	1	159.28	0.000
168.00	0.000	1	159.28	0.000

Summary for Pond 1P: UG1

Inflow Area = 81,675 sf, 99.20% Impervious, Inflow Depth = 6.49" for 50-yr event
Inflow = 18.580 cfs @ 11.96 hrs, Volume= 44,180 cf
Outflow = 5.666 cfs @ 12.07 hrs, Volume= 44,033 cf, Atten= 70%, Lag= 6.9 min
Primary = 5.666 cfs @ 12.07 hrs, Volume= 44,033 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 159.67' @ 12.07 hrs Surf.Area= 13,041 sf Storage= 20,355 cf

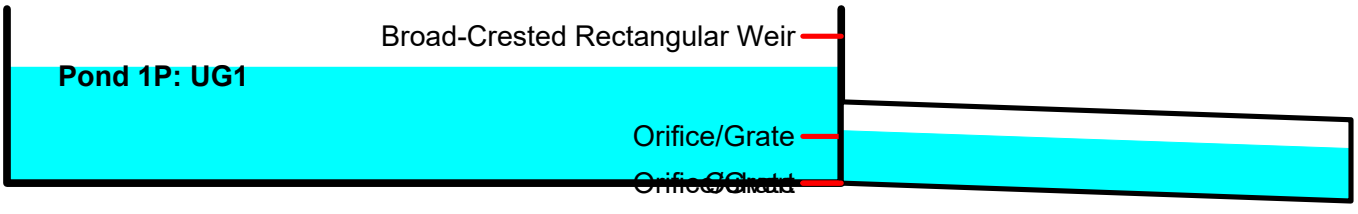
Plug-Flow detention time= 650.3 min calculated for 44,033 cf (100% of inflow)
Center-of-Mass det. time= 647.9 min (1,386.3 - 738.4)

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'	**40.0" 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= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=5.666 cfs @ 12.07 hrs HW=159.67' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 5.666 cfs of 8.762 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.038 cfs @ 6.967 fps)
  ├**2=Orifice/Grate** (Orifice Controls 5.628 cfs @ 5.065 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

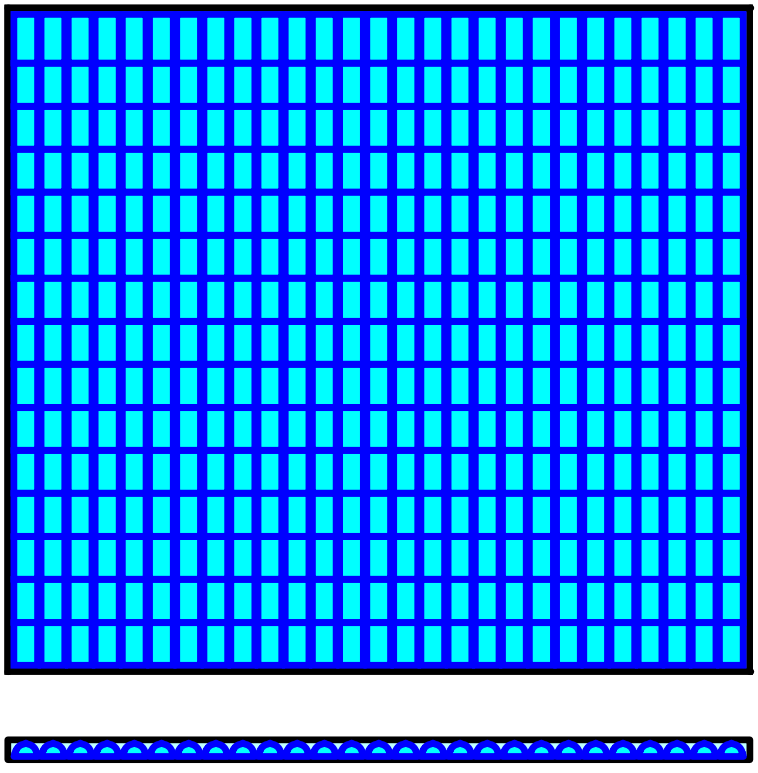
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

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

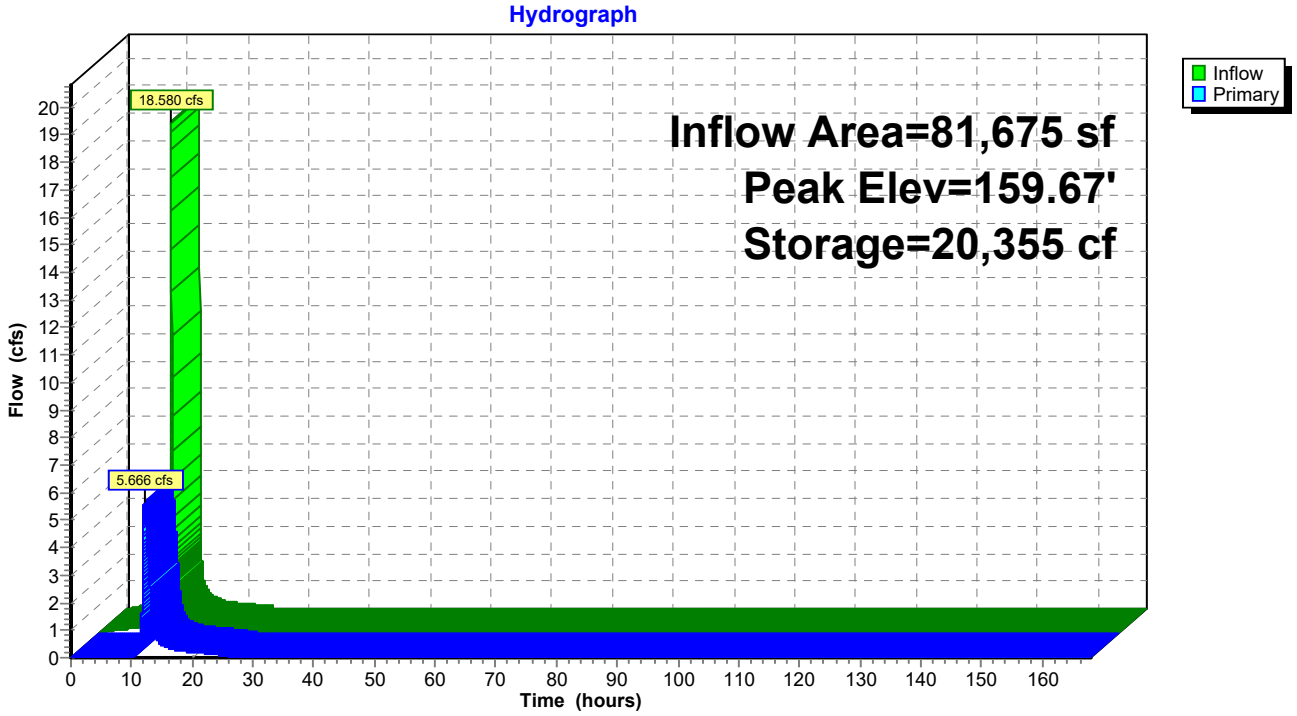
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

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
18.580 cfs
5.666 cfs
Inflow Area=81,675 sf
Peak Elev=159.67'
Storage=20,355 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
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	0.028	18	157.53	0.000
1.50	0.060	97	157.55	0.000
2.00	0.084	226	157.57	0.002
2.50	0.103	388	157.60	0.005
3.00	0.119	578	157.64	0.007
3.50	0.133	791	157.68	0.009
4.00	0.145	1,024	157.73	0.010
4.50	0.161	1,279	157.78	0.012
5.00	0.177	1,560	157.83	0.013
5.50	0.192	1,866	157.89	0.015
6.00	0.207	2,198	157.95	0.016
6.50	0.222	2,554	158.02	0.018
7.00	0.237	2,935	158.06	0.018
7.50	0.251	3,341	158.09	0.019
8.00	0.265	3,771	158.13	0.020
8.50	0.321	4,257	158.17	0.020
9.00	0.384	4,855	158.22	0.021
9.50	0.396	5,525	158.28	0.022
10.00	0.482	6,264	158.34	0.023
10.50	0.626	7,195	158.42	0.089
11.00	0.864	8,085	158.50	0.420
11.50	**1.418**	8,952	158.58	0.892
12.00	**15.328**	**19,182**	**159.54**	**5.338**
12.50	1.329	**15,897**	**159.21**	**4.358**
13.00	0.826	11,448	158.80	2.614
13.50	0.625	9,464	158.62	1.226
14.00	0.490	8,737	158.56	0.764
14.50	0.433	8,384	158.53	0.568
15.00	0.388	8,194	158.51	0.472
15.50	0.344	8,062	158.50	0.409
16.00	0.299	7,950	158.49	0.359
16.50	0.279	7,860	158.48	0.319
17.00	0.263	7,797	158.48	0.293
17.50	0.247	7,747	158.47	0.273
18.00	0.231	7,702	158.47	0.255
18.50	0.215	7,659	158.46	0.239
19.00	0.199	7,617	158.46	0.223
19.50	0.184	7,575	158.46	0.207
20.00	0.168	7,531	158.45	0.192
20.50	0.163	7,494	158.45	0.179
21.00	0.159	7,469	158.45	0.171
21.50	0.156	7,451	158.45	0.165
22.00	0.153	7,437	158.44	0.160
22.50	0.150	7,425	158.44	0.156
23.00	0.147	7,414	158.44	0.153
23.50	0.143	7,403	158.44	0.149
24.00	0.140	7,393	158.44	0.146
24.50	0.000	7,213	158.42	0.094
25.00	0.000	7,076	158.41	0.062

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	6,983	158.40	0.044
26.00	0.000	6,915	158.40	0.033
26.50	0.000	6,861	158.39	0.027
27.00	0.000	6,816	158.39	0.024
27.50	0.000	6,773	158.39	0.024
28.00	0.000	6,731	158.38	0.024
28.50	0.000	6,688	158.38	0.024
29.00	0.000	6,646	158.38	0.024
29.50	0.000	6,604	158.37	0.023
30.00	0.000	6,561	158.37	0.023
30.50	0.000	6,519	158.36	0.023
31.00	0.000	6,477	158.36	0.023
31.50	0.000	6,435	158.36	0.023
32.00	0.000	6,393	158.35	0.023
32.50	0.000	6,351	158.35	0.023
33.00	0.000	6,310	158.35	0.023
33.50	0.000	6,268	158.34	0.023
34.00	0.000	6,227	158.34	0.023
34.50	0.000	6,185	158.34	0.023
35.00	0.000	6,144	158.33	0.023
35.50	0.000	6,103	158.33	0.023
36.00	0.000	6,062	158.33	0.023
36.50	0.000	6,021	158.32	0.023
37.00	0.000	5,980	158.32	0.023
37.50	0.000	5,939	158.31	0.023
38.00	0.000	5,899	158.31	0.023
38.50	0.000	5,858	158.31	0.023
39.00	0.000	5,817	158.30	0.022
39.50	0.000	5,777	158.30	0.022
40.00	0.000	5,737	158.30	0.022
40.50	0.000	5,697	158.29	0.022
41.00	0.000	5,656	158.29	0.022
41.50	0.000	5,616	158.29	0.022
42.00	0.000	5,576	158.28	0.022
42.50	0.000	5,537	158.28	0.022
43.00	0.000	5,497	158.28	0.022
43.50	0.000	5,457	158.27	0.022
44.00	0.000	5,418	158.27	0.022
44.50	0.000	5,378	158.27	0.022
45.00	0.000	5,339	158.26	0.022
45.50	0.000	5,300	158.26	0.022
46.00	0.000	5,261	158.26	0.022
46.50	0.000	5,221	158.25	0.022
47.00	0.000	5,183	158.25	0.022
47.50	0.000	5,144	158.25	0.022
48.00	0.000	5,105	158.24	0.022
48.50	0.000	5,066	158.24	0.021
49.00	0.000	5,028	158.24	0.021
49.50	0.000	4,989	158.23	0.021
50.00	0.000	4,951	158.23	0.021
50.50	0.000	4,913	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	4,874	158.22	0.021
51.50	0.000	4,836	158.22	0.021
52.00	0.000	4,798	158.22	0.021
52.50	0.000	4,760	158.21	0.021
53.00	0.000	4,723	158.21	0.021
53.50	0.000	4,685	158.21	0.021
54.00	0.000	4,647	158.20	0.021
54.50	0.000	4,610	158.20	0.021
55.00	0.000	4,572	158.20	0.021
55.50	0.000	4,535	158.19	0.021
56.00	0.000	4,498	158.19	0.021
56.50	0.000	4,461	158.19	0.021
57.00	0.000	4,424	158.18	0.021
57.50	0.000	4,387	158.18	0.020
58.00	0.000	4,350	158.18	0.020
58.50	0.000	4,313	158.17	0.020
59.00	0.000	4,276	158.17	0.020
59.50	0.000	4,240	158.17	0.020
60.00	0.000	4,203	158.17	0.020
60.50	0.000	4,167	158.16	0.020
61.00	0.000	4,131	158.16	0.020
61.50	0.000	4,095	158.16	0.020
62.00	0.000	4,058	158.15	0.020
62.50	0.000	4,023	158.15	0.020
63.00	0.000	3,987	158.15	0.020
63.50	0.000	3,951	158.14	0.020
64.00	0.000	3,915	158.14	0.020
64.50	0.000	3,880	158.14	0.020
65.00	0.000	3,844	158.13	0.020
65.50	0.000	3,809	158.13	0.020
66.00	0.000	3,773	158.13	0.020
66.50	0.000	3,738	158.13	0.020
67.00	0.000	3,703	158.12	0.019
67.50	0.000	3,668	158.12	0.019
68.00	0.000	3,633	158.12	0.019
68.50	0.000	3,598	158.11	0.019
69.00	0.000	3,563	158.11	0.019
69.50	0.000	3,529	158.11	0.019
70.00	0.000	3,494	158.10	0.019
70.50	0.000	3,460	158.10	0.019
71.00	0.000	3,425	158.10	0.019
71.50	0.000	3,391	158.10	0.019
72.00	0.000	3,357	158.09	0.019
72.50	0.000	3,323	158.09	0.019
73.00	0.000	3,289	158.09	0.019
73.50	0.000	3,255	158.08	0.019
74.00	0.000	3,221	158.08	0.019
74.50	0.000	3,187	158.08	0.019
75.00	0.000	3,154	158.08	0.019
75.50	0.000	3,120	158.07	0.019
76.00	0.000	3,087	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	3,054	158.07	0.018
77.00	0.000	3,020	158.06	0.018
77.50	0.000	2,987	158.06	0.018
78.00	0.000	2,954	158.06	0.018
78.50	0.000	2,921	158.06	0.018
79.00	0.000	2,888	158.05	0.018
79.50	0.000	2,856	158.05	0.018
80.00	0.000	2,823	158.05	0.018
80.50	0.000	2,790	158.05	0.018
81.00	0.000	2,758	158.04	0.018
81.50	0.000	2,725	158.04	0.018
82.00	0.000	2,693	158.04	0.018
82.50	0.000	2,661	158.03	0.018
83.00	0.000	2,629	158.03	0.018
83.50	0.000	2,597	158.03	0.018
84.00	0.000	2,565	158.02	0.018
84.50	0.000	2,533	158.02	0.017
85.00	0.000	2,502	158.01	0.017
85.50	0.000	2,471	158.00	0.017
86.00	0.000	2,440	158.00	0.017
86.50	0.000	2,409	157.99	0.017
87.00	0.000	2,379	157.99	0.017
87.50	0.000	2,348	157.98	0.017
88.00	0.000	2,318	157.97	0.017
88.50	0.000	2,288	157.97	0.017
89.00	0.000	2,259	157.96	0.016
89.50	0.000	2,229	157.96	0.016
90.00	0.000	2,200	157.95	0.016
90.50	0.000	2,171	157.95	0.016
91.00	0.000	2,142	157.94	0.016
91.50	0.000	2,113	157.94	0.016
92.00	0.000	2,085	157.93	0.016
92.50	0.000	2,057	157.92	0.016
93.00	0.000	2,029	157.92	0.015
93.50	0.000	2,001	157.91	0.015
94.00	0.000	1,974	157.91	0.015
94.50	0.000	1,946	157.90	0.015
95.00	0.000	1,919	157.90	0.015
95.50	0.000	1,892	157.89	0.015
96.00	0.000	1,866	157.89	0.015
96.50	0.000	1,839	157.88	0.015
97.00	0.000	1,813	157.88	0.015
97.50	0.000	1,787	157.87	0.014
98.00	0.000	1,761	157.87	0.014
98.50	0.000	1,736	157.86	0.014
99.00	0.000	1,710	157.86	0.014
99.50	0.000	1,685	157.85	0.014
100.00	0.000	1,660	157.85	0.014
100.50	0.000	1,635	157.84	0.014
101.00	0.000	1,611	157.84	0.014
101.50	0.000	1,586	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	1,562	157.83	0.013
102.50	0.000	1,538	157.82	0.013
103.00	0.000	1,515	157.82	0.013
103.50	0.000	1,491	157.82	0.013
104.00	0.000	1,468	157.81	0.013
104.50	0.000	1,445	157.81	0.013
105.00	0.000	1,422	157.80	0.013
105.50	0.000	1,400	157.80	0.012
106.00	0.000	1,377	157.79	0.012
106.50	0.000	1,355	157.79	0.012
107.00	0.000	1,333	157.79	0.012
107.50	0.000	1,311	157.78	0.012
108.00	0.000	1,290	157.78	0.012
108.50	0.000	1,268	157.77	0.012
109.00	0.000	1,247	157.77	0.012
109.50	0.000	1,226	157.77	0.012
110.00	0.000	1,206	157.76	0.011
110.50	0.000	1,185	157.76	0.011
111.00	0.000	1,165	157.75	0.011
111.50	0.000	1,145	157.75	0.011
112.00	0.000	1,125	157.75	0.011
112.50	0.000	1,106	157.74	0.011
113.00	0.000	1,086	157.74	0.011
113.50	0.000	1,067	157.73	0.011
114.00	0.000	1,048	157.73	0.010
114.50	0.000	1,029	157.73	0.010
115.00	0.000	1,011	157.72	0.010
115.50	0.000	993	157.72	0.010
116.00	0.000	974	157.72	0.010
116.50	0.000	957	157.71	0.010
117.00	0.000	939	157.71	0.010
117.50	0.000	921	157.71	0.010
118.00	0.000	904	157.70	0.010
118.50	0.000	887	157.70	0.009
119.00	0.000	870	157.70	0.009
119.50	0.000	854	157.69	0.009
120.00	0.000	837	157.69	0.009
120.50	0.000	821	157.69	0.009
121.00	0.000	805	157.68	0.009
121.50	0.000	789	157.68	0.009
122.00	0.000	774	157.68	0.009
122.50	0.000	758	157.68	0.008
123.00	0.000	743	157.67	0.008
123.50	0.000	728	157.67	0.008
124.00	0.000	714	157.67	0.008
124.50	0.000	699	157.66	0.008
125.00	0.000	685	157.66	0.008
125.50	0.000	671	157.66	0.008
126.00	0.000	657	157.66	0.008
126.50	0.000	644	157.65	0.008
127.00	0.000	630	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	617	157.65	0.007
128.00	0.000	604	157.65	0.007
128.50	0.000	591	157.64	0.007
129.00	0.000	579	157.64	0.007
129.50	0.000	566	157.64	0.007
130.00	0.000	554	157.64	0.007
130.50	0.000	542	157.63	0.007
131.00	0.000	531	157.63	0.006
131.50	0.000	519	157.63	0.006
132.00	0.000	508	157.63	0.006
132.50	0.000	497	157.63	0.006
133.00	0.000	486	157.62	0.006
133.50	0.000	475	157.62	0.006
134.00	0.000	465	157.62	0.006
134.50	0.000	455	157.62	0.006
135.00	0.000	445	157.62	0.005
135.50	0.000	435	157.61	0.005
136.00	0.000	425	157.61	0.005
136.50	0.000	416	157.61	0.005
137.00	0.000	407	157.61	0.005
137.50	0.000	398	157.61	0.005
138.00	0.000	389	157.60	0.005
138.50	0.000	381	157.60	0.005
139.00	0.000	372	157.60	0.005
139.50	0.000	364	157.60	0.004
140.00	0.000	357	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	291	157.59	0.003
145.50	0.000	285	157.58	0.003
146.00	0.000	280	157.58	0.003
146.50	0.000	275	157.58	0.003
147.00	0.000	270	157.58	0.003
147.50	0.000	265	157.58	0.003
148.00	0.000	260	157.58	0.003
148.50	0.000	255	157.58	0.003
149.00	0.000	251	157.58	0.002
149.50	0.000	247	157.58	0.002
150.00	0.000	242	157.58	0.002
150.50	0.000	238	157.58	0.002
151.00	0.000	234	157.57	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	210	157.57	0.002
155.00	0.000	207	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	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	0.001
158.50	0.000	187	157.57	0.001
159.00	0.000	184	157.57	0.001
159.50	0.000	182	157.56	0.001
160.00	0.000	179	157.56	0.001
160.50	0.000	177	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	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	149	157.56	0.001
168.00	0.000	147	157.56	0.001

Summary for Pond 3P: UG2

Inflow Area = 21,519 sf, 87.04% Impervious, Inflow Depth = 5.56" for 50-yr event
Inflow = 4.610 cfs @ 11.96 hrs, Volume= 9,968 cf
Outflow = 1.421 cfs @ 12.07 hrs, Volume= 9,967 cf, Atten= 69%, Lag= 6.8 min
Primary = 1.421 cfs @ 12.07 hrs, Volume= 9,967 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 161.61' @ 12.07 hrs Surf.Area= 2,542 sf Storage= 3,844 cf

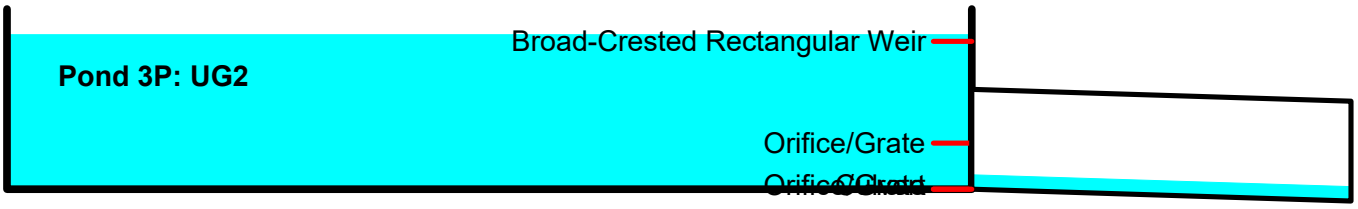
Plug-Flow detention time= 66.6 min calculated for 9,967 cf (100% of inflow)
Center-of-Mass det. time= 66.5 min (843.3 - 776.8)

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'	**5.0" 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= 36.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=1.418 cfs @ 12.07 hrs HW=161.60' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 1.418 cfs of 9.902 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.351 cfs @ 7.141 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.616 cfs @ 5.915 fps)
  └**3=Broad-Crested Rectangular Weir** (Weir Controls 0.452 cfs @ 1.078 fps)



Pond 3P: UG2 - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Cultec Recharger®180HD)
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

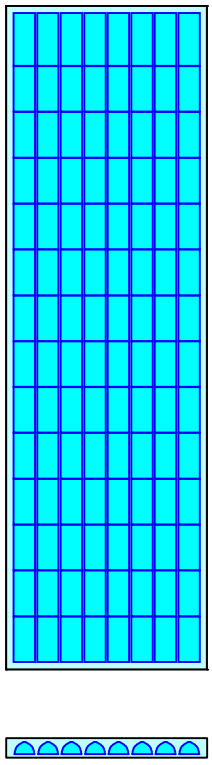
14 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 89.62' Row Length +12.0" End Stone x 2 = 91.62' Base Length
8 Rows x 36.0" Wide + 3.0" Spacing x 7 + 12.0" Side Stone x 2 = 27.75' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

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

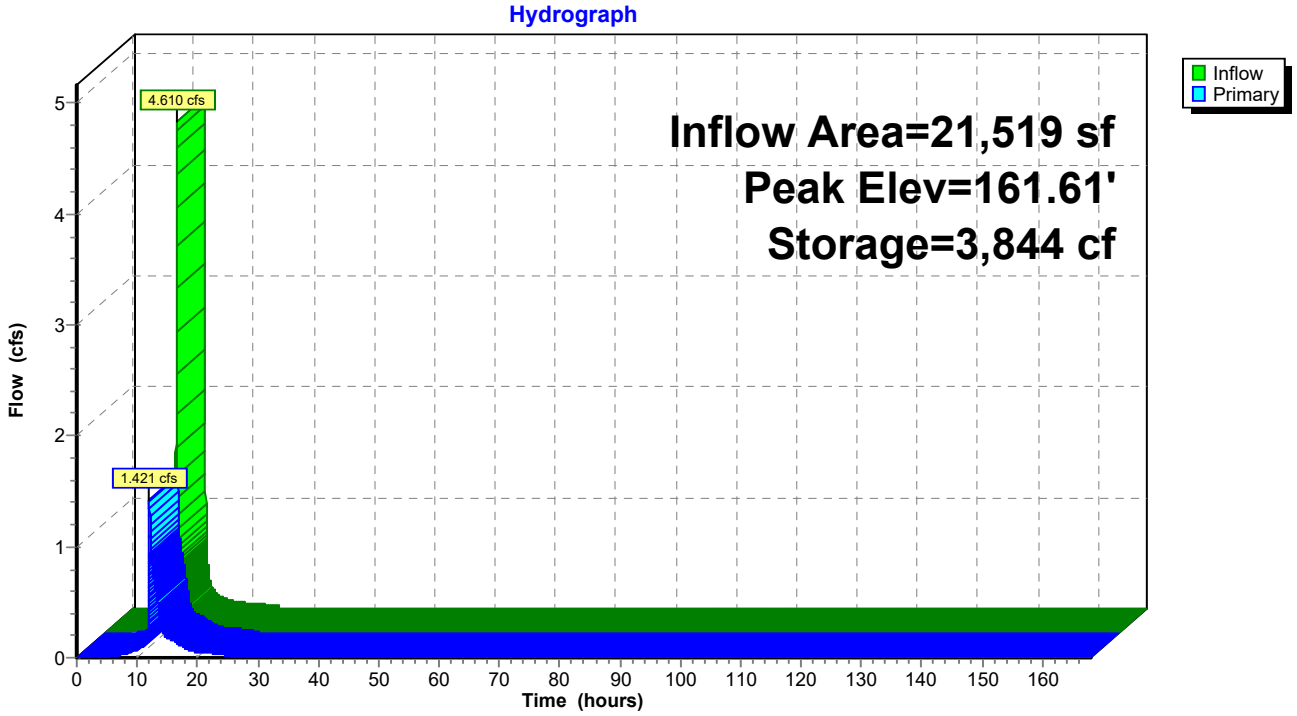
6,885.8 cf Field - 2,466.0 cf Chambers = 4,419.8 cf Stone x 40.0% Voids = 1,767.9 cf Stone Storage

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=21,519 sf
Peak Elev=161.61'
Storage=3,844 cf
4.610 cfs
1.421 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	0.004	4	159.28	0.000
4.00	0.007	13	159.29	0.000
4.50	0.011	27	159.31	0.002
5.00	0.015	45	159.32	0.004
5.50	0.019	64	159.34	0.008
6.00	0.023	82	159.36	0.013
6.50	0.028	99	159.38	0.019
7.00	0.032	114	159.39	0.024
7.50	0.037	127	159.41	0.030
8.00	0.041	140	159.42	0.035
8.50	0.053	155	159.43	0.042
9.00	0.067	179	159.46	0.053
9.50	0.073	202	159.48	0.063
10.00	0.093	226	159.50	0.074
10.50	0.127	275	159.55	0.090
11.00	0.183	368	159.64	0.115
11.50	**0.315**	567	159.81	0.150
12.00	**3.833**	**3,474**	**161.28**	**0.870**
12.50	0.338	**3,241**	**161.13**	**0.820**
13.00	0.211	2,387	160.67	0.644
13.50	0.160	1,711	160.34	0.472
14.00	0.125	1,282	160.14	0.292
14.50	0.111	1,055	160.03	0.207
15.00	0.099	906	159.96	0.176
15.50	0.088	767	159.90	0.166
16.00	0.077	627	159.83	0.155
16.50	0.072	491	159.76	0.141
17.00	0.068	383	159.66	0.119
17.50	0.064	306	159.58	0.099
18.00	0.059	253	159.53	0.083
18.50	0.055	218	159.49	0.071
19.00	0.051	196	159.47	0.061
19.50	0.047	182	159.46	0.054
20.00	0.043	171	159.45	0.049
20.50	0.042	163	159.44	0.045
21.00	0.041	158	159.44	0.043
21.50	0.040	155	159.43	0.042
22.00	0.039	153	159.43	0.041
22.50	0.039	151	159.43	0.040
23.00	0.038	149	159.43	0.039
23.50	0.037	147	159.42	0.038
24.00	0.036	145	159.42	0.037
24.50	0.000	103	159.38	0.020
25.00	0.000	76	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	59	159.34	0.007
26.00	0.000	49	159.33	0.005
26.50	0.000	41	159.32	0.004
27.00	0.000	36	159.32	0.003
27.50	0.000	31	159.31	0.002
28.00	0.000	28	159.31	0.002
28.50	0.000	25	159.30	0.001
29.00	0.000	23	159.30	0.001
29.50	0.000	21	159.30	0.001
30.00	0.000	20	159.30	0.001
30.50	0.000	18	159.30	0.001
31.00	0.000	17	159.30	0.001
31.50	0.000	16	159.30	0.001
32.00	0.000	15	159.29	0.000
32.50	0.000	14	159.29	0.000
33.00	0.000	13	159.29	0.000
33.50	0.000	13	159.29	0.000
34.00	0.000	12	159.29	0.000
34.50	0.000	12	159.29	0.000
35.00	0.000	11	159.29	0.000
35.50	0.000	11	159.29	0.000
36.00	0.000	10	159.29	0.000
36.50	0.000	10	159.29	0.000
37.00	0.000	9	159.29	0.000
37.50	0.000	9	159.29	0.000
38.00	0.000	9	159.29	0.000
38.50	0.000	9	159.29	0.000
39.00	0.000	8	159.29	0.000
39.50	0.000	8	159.29	0.000
40.00	0.000	8	159.29	0.000
40.50	0.000	8	159.29	0.000
41.00	0.000	7	159.29	0.000
41.50	0.000	7	159.29	0.000
42.00	0.000	7	159.29	0.000
42.50	0.000	7	159.29	0.000
43.00	0.000	7	159.29	0.000
43.50	0.000	6	159.29	0.000
44.00	0.000	6	159.29	0.000
44.50	0.000	6	159.29	0.000
45.00	0.000	6	159.29	0.000
45.50	0.000	6	159.29	0.000
46.00	0.000	6	159.29	0.000
46.50	0.000	6	159.29	0.000
47.00	0.000	5	159.29	0.000
47.50	0.000	5	159.29	0.000
48.00	0.000	5	159.29	0.000
48.50	0.000	5	159.29	0.000
49.00	0.000	5	159.28	0.000
49.50	0.000	5	159.28	0.000
50.00	0.000	5	159.28	0.000
50.50	0.000	5	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	5	159.28	0.000
51.50	0.000	5	159.28	0.000
52.00	0.000	4	159.28	0.000
52.50	0.000	4	159.28	0.000
53.00	0.000	4	159.28	0.000
53.50	0.000	4	159.28	0.000
54.00	0.000	4	159.28	0.000
54.50	0.000	4	159.28	0.000
55.00	0.000	4	159.28	0.000
55.50	0.000	4	159.28	0.000
56.00	0.000	4	159.28	0.000
56.50	0.000	4	159.28	0.000
57.00	0.000	4	159.28	0.000
57.50	0.000	4	159.28	0.000
58.00	0.000	4	159.28	0.000
58.50	0.000	4	159.28	0.000
59.00	0.000	4	159.28	0.000
59.50	0.000	4	159.28	0.000
60.00	0.000	3	159.28	0.000
60.50	0.000	3	159.28	0.000
61.00	0.000	3	159.28	0.000
61.50	0.000	3	159.28	0.000
62.00	0.000	3	159.28	0.000
62.50	0.000	3	159.28	0.000
63.00	0.000	3	159.28	0.000
63.50	0.000	3	159.28	0.000
64.00	0.000	3	159.28	0.000
64.50	0.000	3	159.28	0.000
65.00	0.000	3	159.28	0.000
65.50	0.000	3	159.28	0.000
66.00	0.000	3	159.28	0.000
66.50	0.000	3	159.28	0.000
67.00	0.000	3	159.28	0.000
67.50	0.000	3	159.28	0.000
68.00	0.000	3	159.28	0.000
68.50	0.000	3	159.28	0.000
69.00	0.000	3	159.28	0.000
69.50	0.000	3	159.28	0.000
70.00	0.000	3	159.28	0.000
70.50	0.000	3	159.28	0.000
71.00	0.000	3	159.28	0.000
71.50	0.000	3	159.28	0.000
72.00	0.000	3	159.28	0.000
72.50	0.000	3	159.28	0.000
73.00	0.000	3	159.28	0.000
73.50	0.000	3	159.28	0.000
74.00	0.000	3	159.28	0.000
74.50	0.000	3	159.28	0.000
75.00	0.000	2	159.28	0.000
75.50	0.000	2	159.28	0.000
76.00	0.000	2	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	2	159.28	0.000
77.00	0.000	2	159.28	0.000
77.50	0.000	2	159.28	0.000
78.00	0.000	2	159.28	0.000
78.50	0.000	2	159.28	0.000
79.00	0.000	2	159.28	0.000
79.50	0.000	2	159.28	0.000
80.00	0.000	2	159.28	0.000
80.50	0.000	2	159.28	0.000
81.00	0.000	2	159.28	0.000
81.50	0.000	2	159.28	0.000
82.00	0.000	2	159.28	0.000
82.50	0.000	2	159.28	0.000
83.00	0.000	2	159.28	0.000
83.50	0.000	2	159.28	0.000
84.00	0.000	2	159.28	0.000
84.50	0.000	2	159.28	0.000
85.00	0.000	2	159.28	0.000
85.50	0.000	2	159.28	0.000
86.00	0.000	2	159.28	0.000
86.50	0.000	2	159.28	0.000
87.00	0.000	2	159.28	0.000
87.50	0.000	2	159.28	0.000
88.00	0.000	2	159.28	0.000
88.50	0.000	2	159.28	0.000
89.00	0.000	2	159.28	0.000
89.50	0.000	2	159.28	0.000
90.00	0.000	2	159.28	0.000
90.50	0.000	2	159.28	0.000
91.00	0.000	2	159.28	0.000
91.50	0.000	2	159.28	0.000
92.00	0.000	2	159.28	0.000
92.50	0.000	2	159.28	0.000
93.00	0.000	2	159.28	0.000
93.50	0.000	2	159.28	0.000
94.00	0.000	2	159.28	0.000
94.50	0.000	2	159.28	0.000
95.00	0.000	2	159.28	0.000
95.50	0.000	2	159.28	0.000
96.00	0.000	2	159.28	0.000
96.50	0.000	2	159.28	0.000
97.00	0.000	2	159.28	0.000
97.50	0.000	2	159.28	0.000
98.00	0.000	2	159.28	0.000
98.50	0.000	2	159.28	0.000
99.00	0.000	2	159.28	0.000
99.50	0.000	2	159.28	0.000
100.00	0.000	2	159.28	0.000
100.50	0.000	2	159.28	0.000
101.00	0.000	2	159.28	0.000
101.50	0.000	2	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	2	159.28	0.000
102.50	0.000	2	159.28	0.000
103.00	0.000	2	159.28	0.000
103.50	0.000	2	159.28	0.000
104.00	0.000	2	159.28	0.000
104.50	0.000	2	159.28	0.000
105.00	0.000	2	159.28	0.000
105.50	0.000	2	159.28	0.000
106.00	0.000	2	159.28	0.000
106.50	0.000	2	159.28	0.000
107.00	0.000	2	159.28	0.000
107.50	0.000	2	159.28	0.000
108.00	0.000	2	159.28	0.000
108.50	0.000	2	159.28	0.000
109.00	0.000	2	159.28	0.000
109.50	0.000	2	159.28	0.000
110.00	0.000	2	159.28	0.000
110.50	0.000	2	159.28	0.000
111.00	0.000	2	159.28	0.000
111.50	0.000	2	159.28	0.000
112.00	0.000	2	159.28	0.000
112.50	0.000	1	159.28	0.000
113.00	0.000	1	159.28	0.000
113.50	0.000	1	159.28	0.000
114.00	0.000	1	159.28	0.000
114.50	0.000	1	159.28	0.000
115.00	0.000	1	159.28	0.000
115.50	0.000	1	159.28	0.000
116.00	0.000	1	159.28	0.000
116.50	0.000	1	159.28	0.000
117.00	0.000	1	159.28	0.000
117.50	0.000	1	159.28	0.000
118.00	0.000	1	159.28	0.000
118.50	0.000	1	159.28	0.000
119.00	0.000	1	159.28	0.000
119.50	0.000	1	159.28	0.000
120.00	0.000	1	159.28	0.000
120.50	0.000	1	159.28	0.000
121.00	0.000	1	159.28	0.000
121.50	0.000	1	159.28	0.000
122.00	0.000	1	159.28	0.000
122.50	0.000	1	159.28	0.000
123.00	0.000	1	159.28	0.000
123.50	0.000	1	159.28	0.000
124.00	0.000	1	159.28	0.000
124.50	0.000	1	159.28	0.000
125.00	0.000	1	159.28	0.000
125.50	0.000	1	159.28	0.000
126.00	0.000	1	159.28	0.000
126.50	0.000	1	159.28	0.000
127.00	0.000	1	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	1	159.28	0.000
128.00	0.000	1	159.28	0.000
128.50	0.000	1	159.28	0.000
129.00	0.000	1	159.28	0.000
129.50	0.000	1	159.28	0.000
130.00	0.000	1	159.28	0.000
130.50	0.000	1	159.28	0.000
131.00	0.000	1	159.28	0.000
131.50	0.000	1	159.28	0.000
132.00	0.000	1	159.28	0.000
132.50	0.000	1	159.28	0.000
133.00	0.000	1	159.28	0.000
133.50	0.000	1	159.28	0.000
134.00	0.000	1	159.28	0.000
134.50	0.000	1	159.28	0.000
135.00	0.000	1	159.28	0.000
135.50	0.000	1	159.28	0.000
136.00	0.000	1	159.28	0.000
136.50	0.000	1	159.28	0.000
137.00	0.000	1	159.28	0.000
137.50	0.000	1	159.28	0.000
138.00	0.000	1	159.28	0.000
138.50	0.000	1	159.28	0.000
139.00	0.000	1	159.28	0.000
139.50	0.000	1	159.28	0.000
140.00	0.000	1	159.28	0.000
140.50	0.000	1	159.28	0.000
141.00	0.000	1	159.28	0.000
141.50	0.000	1	159.28	0.000
142.00	0.000	1	159.28	0.000
142.50	0.000	1	159.28	0.000
143.00	0.000	1	159.28	0.000
143.50	0.000	1	159.28	0.000
144.00	0.000	1	159.28	0.000
144.50	0.000	1	159.28	0.000
145.00	0.000	1	159.28	0.000
145.50	0.000	1	159.28	0.000
146.00	0.000	1	159.28	0.000
146.50	0.000	1	159.28	0.000
147.00	0.000	1	159.28	0.000
147.50	0.000	1	159.28	0.000
148.00	0.000	1	159.28	0.000
148.50	0.000	1	159.28	0.000
149.00	0.000	1	159.28	0.000
149.50	0.000	1	159.28	0.000
150.00	0.000	1	159.28	0.000
150.50	0.000	1	159.28	0.000
151.00	0.000	1	159.28	0.000
151.50	0.000	1	159.28	0.000
152.00	0.000	1	159.28	0.000
152.50	0.000	1	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	1	159.28	0.000
153.50	0.000	1	159.28	0.000
154.00	0.000	1	159.28	0.000
154.50	0.000	1	159.28	0.000
155.00	0.000	1	159.28	0.000
155.50	0.000	1	159.28	0.000
156.00	0.000	1	159.28	0.000
156.50	0.000	1	159.28	0.000
157.00	0.000	1	159.28	0.000
157.50	0.000	1	159.28	0.000
158.00	0.000	1	159.28	0.000
158.50	0.000	1	159.28	0.000
159.00	0.000	1	159.28	0.000
159.50	0.000	1	159.28	0.000
160.00	0.000	1	159.28	0.000
160.50	0.000	1	159.28	0.000
161.00	0.000	1	159.28	0.000
161.50	0.000	1	159.28	0.000
162.00	0.000	1	159.28	0.000
162.50	0.000	1	159.28	0.000
163.00	0.000	1	159.28	0.000
163.50	0.000	1	159.28	0.000
164.00	0.000	1	159.28	0.000
164.50	0.000	1	159.28	0.000
165.00	0.000	1	159.28	0.000
165.50	0.000	1	159.28	0.000
166.00	0.000	1	159.28	0.000
166.50	0.000	1	159.28	0.000
167.00	0.000	1	159.28	0.000
167.50	0.000	1	159.28	0.000
168.00	0.000	1	159.28	0.000

Summary for Pond 1P: UG1

Inflow Area = 81,675 sf, 99.20% Impervious, Inflow Depth = 7.42" for 100-yr event
Inflow = 21.161 cfs @ 11.96 hrs, Volume= 50,505 cf
Outflow = 6.241 cfs @ 12.07 hrs, Volume= 50,358 cf, Atten= 71%, Lag= 7.0 min
Primary = 6.241 cfs @ 12.07 hrs, Volume= 50,358 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 159.90' @ 12.07 hrs Surf.Area= 13,041 sf Storage= 22,398 cf

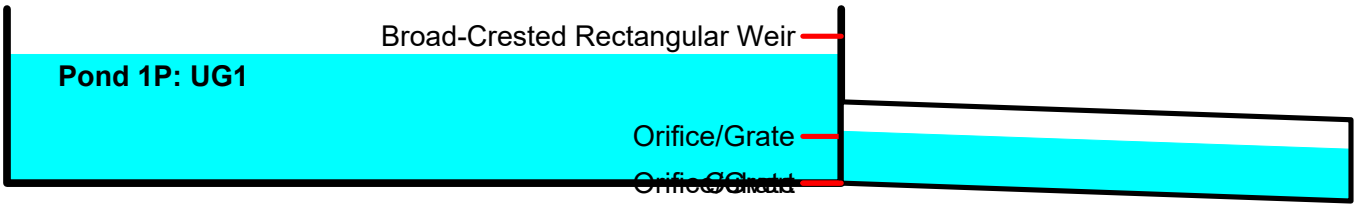
Plug-Flow detention time= 579.2 min calculated for 50,358 cf (100% of inflow)
Center-of-Mass det. time= 577.2 min (1,313.8 - 736.6)

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'	**40.0" 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= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=6.240 cfs @ 12.07 hrs HW=159.90' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 6.240 cfs of 9.776 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.040 cfs @ 7.349 fps)
  ├**2=Orifice/Grate** (Orifice Controls 6.200 cfs @ 5.580 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

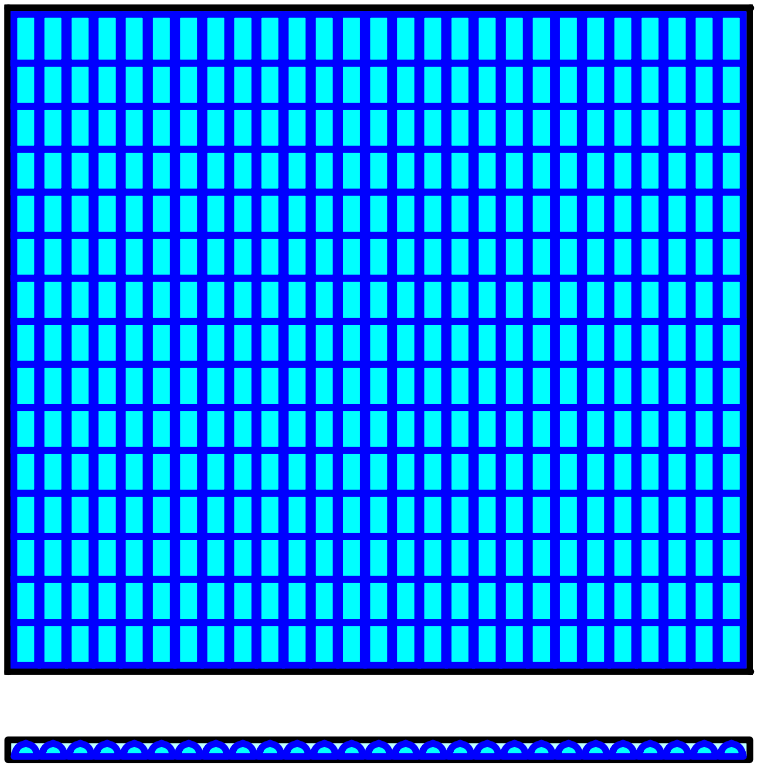
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

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

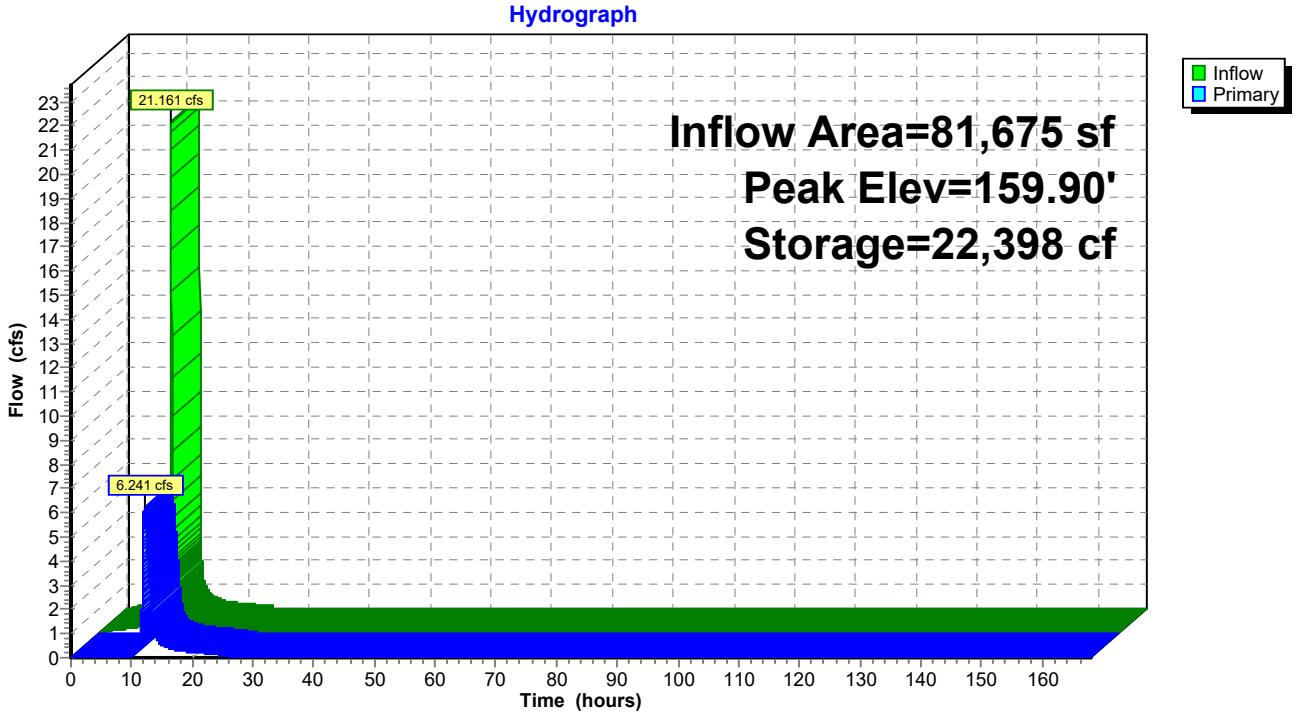
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

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=81,675 sf
Peak Elev=159.90'
Storage=22,398 cf
21.161 cfs
6.241 cfs
Inflow
Primary
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
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	0.041	32	157.54	0.000
1.50	0.078	140	157.56	0.001
2.00	0.104	301	157.59	0.003
2.50	0.126	500	157.63	0.006
3.00	0.143	729	157.67	0.008
3.50	0.158	984	157.72	0.010
4.00	0.171	1,260	157.77	0.012
4.50	0.188	1,560	157.83	0.013
5.00	0.206	1,889	157.89	0.015
5.50	0.223	2,247	157.96	0.016
6.00	0.240	2,634	158.03	0.018
6.50	0.257	3,048	158.07	0.018
7.00	0.273	3,491	158.10	0.019
7.50	0.289	3,961	158.14	0.020
8.00	0.305	4,459	158.19	0.021
8.50	0.368	5,021	158.24	0.021
9.00	0.441	5,709	158.29	0.022
9.50	0.453	6,481	158.36	0.023
10.00	0.551	7,291	158.43	0.115
10.50	0.716	7,989	158.49	0.376
11.00	0.987	8,574	158.54	0.671
11.50	**1.617**	9,307	158.61	1.120
12.00	**17.455**	**21,006**	**159.74**	**5.847**
12.50	1.513	**17,570**	**159.38**	**4.872**
13.00	0.940	12,475	158.89	3.106
13.50	0.711	9,861	158.66	1.511
14.00	0.558	8,941	158.58	0.886
14.50	0.492	8,529	158.54	0.646
15.00	0.442	8,318	158.52	0.534
15.50	0.391	8,174	158.51	0.463
16.00	0.341	8,053	158.50	0.405
16.50	0.317	7,955	158.49	0.361
17.00	0.299	7,888	158.48	0.332
17.50	0.281	7,835	158.48	0.309
18.00	0.263	7,787	158.47	0.289
18.50	0.245	7,741	158.47	0.271
19.00	0.227	7,695	158.47	0.253
19.50	0.209	7,649	158.46	0.235
20.00	0.191	7,602	158.46	0.217
20.50	0.185	7,561	158.46	0.203
21.00	0.181	7,535	158.45	0.193
21.50	0.178	7,517	158.45	0.187
22.00	0.174	7,502	158.45	0.182
22.50	0.171	7,489	158.45	0.177
23.00	0.167	7,477	158.45	0.173
23.50	0.163	7,466	158.45	0.170
24.00	0.160	7,454	158.45	0.166
24.50	0.000	7,253	158.43	0.105
25.00	0.000	7,102	158.42	0.067

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	7,001	158.41	0.047
26.00	0.000	6,928	158.40	0.035
26.50	0.000	6,872	158.40	0.028
27.00	0.000	6,826	158.39	0.024
27.50	0.000	6,783	158.39	0.024
28.00	0.000	6,740	158.38	0.024
28.50	0.000	6,698	158.38	0.024
29.00	0.000	6,655	158.38	0.024
29.50	0.000	6,613	158.37	0.024
30.00	0.000	6,571	158.37	0.023
30.50	0.000	6,528	158.37	0.023
31.00	0.000	6,486	158.36	0.023
31.50	0.000	6,444	158.36	0.023
32.00	0.000	6,402	158.35	0.023
32.50	0.000	6,361	158.35	0.023
33.00	0.000	6,319	158.35	0.023
33.50	0.000	6,277	158.34	0.023
34.00	0.000	6,236	158.34	0.023
34.50	0.000	6,195	158.34	0.023
35.00	0.000	6,153	158.33	0.023
35.50	0.000	6,112	158.33	0.023
36.00	0.000	6,071	158.33	0.023
36.50	0.000	6,030	158.32	0.023
37.00	0.000	5,989	158.32	0.023
37.50	0.000	5,948	158.32	0.023
38.00	0.000	5,907	158.31	0.023
38.50	0.000	5,867	158.31	0.023
39.00	0.000	5,826	158.30	0.022
39.50	0.000	5,786	158.30	0.022
40.00	0.000	5,746	158.30	0.022
40.50	0.000	5,705	158.29	0.022
41.00	0.000	5,665	158.29	0.022
41.50	0.000	5,625	158.29	0.022
42.00	0.000	5,585	158.28	0.022
42.50	0.000	5,545	158.28	0.022
43.00	0.000	5,506	158.28	0.022
43.50	0.000	5,466	158.27	0.022
44.00	0.000	5,426	158.27	0.022
44.50	0.000	5,387	158.27	0.022
45.00	0.000	5,348	158.26	0.022
45.50	0.000	5,308	158.26	0.022
46.00	0.000	5,269	158.26	0.022
46.50	0.000	5,230	158.25	0.022
47.00	0.000	5,191	158.25	0.022
47.50	0.000	5,152	158.25	0.022
48.00	0.000	5,113	158.24	0.022
48.50	0.000	5,075	158.24	0.021
49.00	0.000	5,036	158.24	0.021
49.50	0.000	4,998	158.23	0.021
50.00	0.000	4,959	158.23	0.021
50.50	0.000	4,921	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	4,883	158.22	0.021
51.50	0.000	4,845	158.22	0.021
52.00	0.000	4,807	158.22	0.021
52.50	0.000	4,769	158.21	0.021
53.00	0.000	4,731	158.21	0.021
53.50	0.000	4,693	158.21	0.021
54.00	0.000	4,655	158.20	0.021
54.50	0.000	4,618	158.20	0.021
55.00	0.000	4,581	158.20	0.021
55.50	0.000	4,543	158.19	0.021
56.00	0.000	4,506	158.19	0.021
56.50	0.000	4,469	158.19	0.021
57.00	0.000	4,432	158.18	0.021
57.50	0.000	4,395	158.18	0.021
58.00	0.000	4,358	158.18	0.020
58.50	0.000	4,321	158.18	0.020
59.00	0.000	4,284	158.17	0.020
59.50	0.000	4,248	158.17	0.020
60.00	0.000	4,211	158.17	0.020
60.50	0.000	4,175	158.16	0.020
61.00	0.000	4,139	158.16	0.020
61.50	0.000	4,103	158.16	0.020
62.00	0.000	4,066	158.15	0.020
62.50	0.000	4,030	158.15	0.020
63.00	0.000	3,995	158.15	0.020
63.50	0.000	3,959	158.14	0.020
64.00	0.000	3,923	158.14	0.020
64.50	0.000	3,887	158.14	0.020
65.00	0.000	3,852	158.14	0.020
65.50	0.000	3,816	158.13	0.020
66.00	0.000	3,781	158.13	0.020
66.50	0.000	3,746	158.13	0.020
67.00	0.000	3,711	158.12	0.019
67.50	0.000	3,676	158.12	0.019
68.00	0.000	3,641	158.12	0.019
68.50	0.000	3,606	158.11	0.019
69.00	0.000	3,571	158.11	0.019
69.50	0.000	3,536	158.11	0.019
70.00	0.000	3,502	158.11	0.019
70.50	0.000	3,467	158.10	0.019
71.00	0.000	3,433	158.10	0.019
71.50	0.000	3,399	158.10	0.019
72.00	0.000	3,364	158.09	0.019
72.50	0.000	3,330	158.09	0.019
73.00	0.000	3,296	158.09	0.019
73.50	0.000	3,262	158.09	0.019
74.00	0.000	3,229	158.08	0.019
74.50	0.000	3,195	158.08	0.019
75.00	0.000	3,161	158.08	0.019
75.50	0.000	3,128	158.07	0.019
76.00	0.000	3,094	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	3,061	158.07	0.019
77.00	0.000	3,028	158.07	0.018
77.50	0.000	2,994	158.06	0.018
78.00	0.000	2,961	158.06	0.018
78.50	0.000	2,928	158.06	0.018
79.00	0.000	2,896	158.05	0.018
79.50	0.000	2,863	158.05	0.018
80.00	0.000	2,830	158.05	0.018
80.50	0.000	2,797	158.05	0.018
81.00	0.000	2,765	158.04	0.018
81.50	0.000	2,733	158.04	0.018
82.00	0.000	2,700	158.04	0.018
82.50	0.000	2,668	158.04	0.018
83.00	0.000	2,636	158.03	0.018
83.50	0.000	2,604	158.03	0.018
84.00	0.000	2,572	158.02	0.018
84.50	0.000	2,540	158.02	0.018
85.00	0.000	2,509	158.01	0.017
85.50	0.000	2,478	158.00	0.017
86.00	0.000	2,447	158.00	0.017
86.50	0.000	2,416	157.99	0.017
87.00	0.000	2,385	157.99	0.017
87.50	0.000	2,355	157.98	0.017
88.00	0.000	2,325	157.98	0.017
88.50	0.000	2,295	157.97	0.017
89.00	0.000	2,265	157.96	0.016
89.50	0.000	2,236	157.96	0.016
90.00	0.000	2,206	157.95	0.016
90.50	0.000	2,177	157.95	0.016
91.00	0.000	2,148	157.94	0.016
91.50	0.000	2,120	157.94	0.016
92.00	0.000	2,091	157.93	0.016
92.50	0.000	2,063	157.93	0.016
93.00	0.000	2,035	157.92	0.016
93.50	0.000	2,007	157.91	0.015
94.00	0.000	1,980	157.91	0.015
94.50	0.000	1,952	157.90	0.015
95.00	0.000	1,925	157.90	0.015
95.50	0.000	1,898	157.89	0.015
96.00	0.000	1,872	157.89	0.015
96.50	0.000	1,845	157.88	0.015
97.00	0.000	1,819	157.88	0.015
97.50	0.000	1,793	157.87	0.014
98.00	0.000	1,767	157.87	0.014
98.50	0.000	1,741	157.86	0.014
99.00	0.000	1,716	157.86	0.014
99.50	0.000	1,690	157.85	0.014
100.00	0.000	1,665	157.85	0.014
100.50	0.000	1,641	157.84	0.014
101.00	0.000	1,616	157.84	0.014
101.50	0.000	1,592	157.84	0.013

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	1,568	157.83	0.013
102.50	0.000	1,544	157.83	0.013
103.00	0.000	1,520	157.82	0.013
103.50	0.000	1,496	157.82	0.013
104.00	0.000	1,473	157.81	0.013
104.50	0.000	1,450	157.81	0.013
105.00	0.000	1,427	157.80	0.013
105.50	0.000	1,405	157.80	0.013
106.00	0.000	1,382	157.79	0.012
106.50	0.000	1,360	157.79	0.012
107.00	0.000	1,338	157.79	0.012
107.50	0.000	1,316	157.78	0.012
108.00	0.000	1,294	157.78	0.012
108.50	0.000	1,273	157.77	0.012
109.00	0.000	1,252	157.77	0.012
109.50	0.000	1,231	157.77	0.012
110.00	0.000	1,210	157.76	0.011
110.50	0.000	1,190	157.76	0.011
111.00	0.000	1,170	157.75	0.011
111.50	0.000	1,149	157.75	0.011
112.00	0.000	1,130	157.75	0.011
112.50	0.000	1,110	157.74	0.011
113.00	0.000	1,091	157.74	0.011
113.50	0.000	1,071	157.74	0.011
114.00	0.000	1,052	157.73	0.010
114.50	0.000	1,033	157.73	0.010
115.00	0.000	1,015	157.72	0.010
115.50	0.000	997	157.72	0.010
116.00	0.000	978	157.72	0.010
116.50	0.000	960	157.71	0.010
117.00	0.000	943	157.71	0.010
117.50	0.000	925	157.71	0.010
118.00	0.000	908	157.70	0.010
118.50	0.000	891	157.70	0.009
119.00	0.000	874	157.70	0.009
119.50	0.000	857	157.69	0.009
120.00	0.000	841	157.69	0.009
120.50	0.000	825	157.69	0.009
121.00	0.000	809	157.69	0.009
121.50	0.000	793	157.68	0.009
122.00	0.000	777	157.68	0.009
122.50	0.000	762	157.68	0.008
123.00	0.000	747	157.67	0.008
123.50	0.000	732	157.67	0.008
124.00	0.000	717	157.67	0.008
124.50	0.000	702	157.66	0.008
125.00	0.000	688	157.66	0.008
125.50	0.000	674	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	620	157.65	0.007
128.00	0.000	607	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	488	157.62	0.006
133.50	0.000	478	157.62	0.006
134.00	0.000	467	157.62	0.006
134.50	0.000	457	157.62	0.006
135.00	0.000	447	157.62	0.006
135.50	0.000	437	157.61	0.005
136.00	0.000	428	157.61	0.005
136.50	0.000	418	157.61	0.005
137.00	0.000	409	157.61	0.005
137.50	0.000	400	157.61	0.005
138.00	0.000	391	157.60	0.005
138.50	0.000	382	157.60	0.005
139.00	0.000	374	157.60	0.005
139.50	0.000	366	157.60	0.004
140.00	0.000	358	157.60	0.004
140.50	0.000	351	157.60	0.004
141.00	0.000	343	157.60	0.004
141.50	0.000	336	157.59	0.004
142.00	0.000	329	157.59	0.004
142.50	0.000	322	157.59	0.004
143.00	0.000	316	157.59	0.004
143.50	0.000	310	157.59	0.003
144.00	0.000	304	157.59	0.003
144.50	0.000	298	157.59	0.003
145.00	0.000	292	157.59	0.003
145.50	0.000	286	157.58	0.003
146.00	0.000	281	157.58	0.003
146.50	0.000	276	157.58	0.003
147.00	0.000	271	157.58	0.003
147.50	0.000	266	157.58	0.003
148.00	0.000	261	157.58	0.003
148.50	0.000	256	157.58	0.003
149.00	0.000	252	157.58	0.002
149.50	0.000	248	157.58	0.002
150.00	0.000	243	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	228	157.57	0.002
152.50	0.000	224	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	217	157.57	0.002
154.00	0.000	214	157.57	0.002
154.50	0.000	210	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	193	157.57	0.002
158.00	0.000	190	157.57	0.001
158.50	0.000	187	157.57	0.001
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	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 = 21,519 sf, 87.04% Impervious, Inflow Depth = 6.47" for 100-yr event
Inflow = 5.311 cfs @ 11.96 hrs, Volume= 11,604 cf
Outflow = 3.371 cfs @ 12.03 hrs, Volume= 11,603 cf, Atten= 37%, Lag= 4.1 min
Primary = 3.371 cfs @ 12.03 hrs, Volume= 11,603 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 161.81' @ 12.03 hrs Surf.Area= 2,542 sf Storage= 4,057 cf

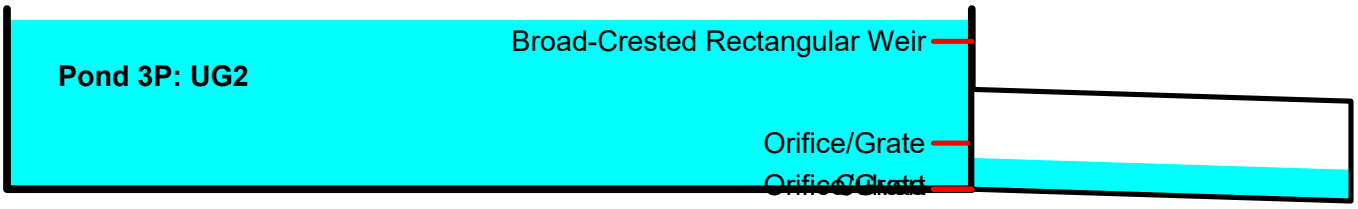
Plug-Flow detention time= 62.4 min calculated for 11,603 cf (100% of inflow)
Center-of-Mass det. time= 62.4 min (835.2 - 772.8)

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'	**5.0" 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= 36.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=3.353 cfs @ 12.03 hrs HW=161.81' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 3.353 cfs of 10.878 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.367 cfs @ 7.471 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.657 cfs @ 6.309 fps)
  └**3=Broad-Crested Rectangular Weir** (Weir Controls 2.329 cfs @ 1.862 fps)



Pond 3P: UG2 - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Cultec Recharger®180HD)
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

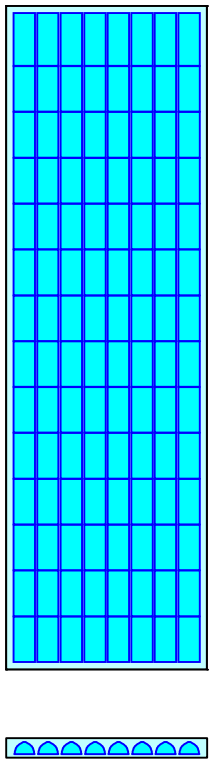
14 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 89.62' Row Length +12.0" End Stone x 2 = 91.62' Base Length
8 Rows x 36.0" Wide + 3.0" Spacing x 7 + 12.0" Side Stone x 2 = 27.75' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

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

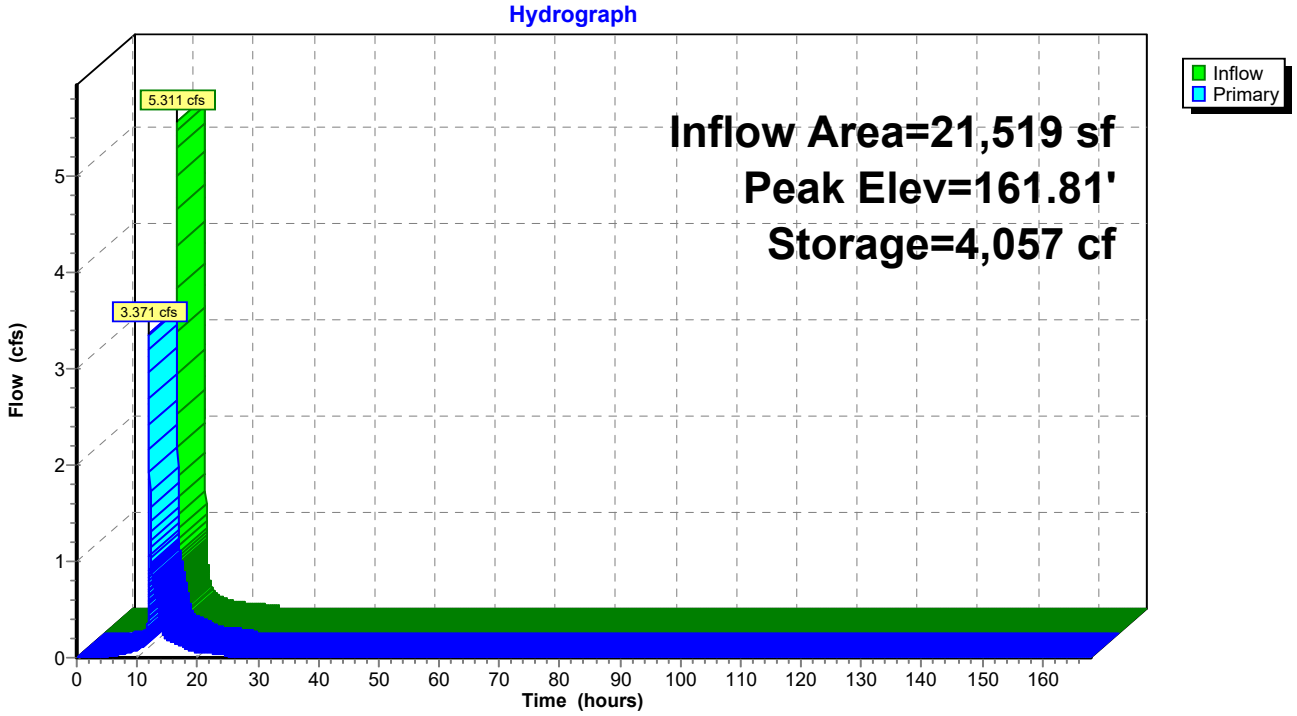
6,885.8 cf Field - 2,466.0 cf Chambers = 4,419.8 cf Stone x 40.0% Voids = 1,767.9 cf Stone Storage

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=21,519 sf
Peak Elev=161.81'
Storage=4,057 cf
5.311 cfs
3.371 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	0.003	2	159.28	0.000
3.50	0.007	11	159.29	0.000
4.00	0.011	26	159.31	0.001
4.50	0.015	45	159.32	0.004
5.00	0.020	66	159.34	0.009
5.50	0.025	86	159.36	0.014
6.00	0.030	104	159.38	0.021
6.50	0.035	121	159.40	0.027
7.00	0.041	135	159.41	0.033
7.50	0.046	149	159.43	0.039
8.00	0.051	161	159.44	0.045
8.50	0.065	179	159.46	0.053
9.00	0.082	206	159.48	0.065
9.50	0.089	232	159.51	0.077
10.00	0.112	264	159.54	0.087
10.50	0.151	328	159.60	0.105
11.00	0.217	443	159.72	0.132
11.50	**0.370**	695	159.86	0.160
12.00	**4.410**	**3,987**	**161.75**	**2.631**
12.50	0.387	**3,334**	**161.19**	**0.840**
13.00	0.241	2,507	160.73	0.670
13.50	0.183	1,825	160.39	0.506
14.00	0.144	1,361	160.17	0.329
14.50	0.127	1,117	160.06	0.227
15.00	0.114	968	159.99	0.185
15.50	0.101	843	159.93	0.172
16.00	0.088	713	159.87	0.162
16.50	0.082	583	159.81	0.151
17.00	0.077	466	159.74	0.136
17.50	0.073	374	159.65	0.116
18.00	0.068	307	159.58	0.099
18.50	0.063	259	159.54	0.085
19.00	0.059	226	159.50	0.074
19.50	0.054	204	159.48	0.064
20.00	0.049	188	159.46	0.057
20.50	0.048	177	159.45	0.052
21.00	0.047	172	159.45	0.049
21.50	0.046	168	159.45	0.048
22.00	0.045	166	159.44	0.046
22.50	0.044	163	159.44	0.045
23.00	0.043	161	159.44	0.044
23.50	0.042	159	159.44	0.043
24.00	0.041	157	159.43	0.043
24.50	0.000	109	159.39	0.023
25.00	0.000	79	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	62	159.34	0.008
26.00	0.000	50	159.33	0.005
26.50	0.000	42	159.32	0.004
27.00	0.000	36	159.32	0.003
27.50	0.000	32	159.31	0.002
28.00	0.000	29	159.31	0.002
28.50	0.000	26	159.31	0.001
29.00	0.000	23	159.30	0.001
29.50	0.000	22	159.30	0.001
30.00	0.000	20	159.30	0.001
30.50	0.000	18	159.30	0.001
31.00	0.000	17	159.30	0.001
31.50	0.000	16	159.30	0.001
32.00	0.000	15	159.29	0.000
32.50	0.000	14	159.29	0.000
33.00	0.000	14	159.29	0.000
33.50	0.000	13	159.29	0.000
34.00	0.000	12	159.29	0.000
34.50	0.000	12	159.29	0.000
35.00	0.000	11	159.29	0.000
35.50	0.000	11	159.29	0.000
36.00	0.000	10	159.29	0.000
36.50	0.000	10	159.29	0.000
37.00	0.000	10	159.29	0.000
37.50	0.000	9	159.29	0.000
38.00	0.000	9	159.29	0.000
38.50	0.000	9	159.29	0.000
39.00	0.000	8	159.29	0.000
39.50	0.000	8	159.29	0.000
40.00	0.000	8	159.29	0.000
40.50	0.000	8	159.29	0.000
41.00	0.000	7	159.29	0.000
41.50	0.000	7	159.29	0.000
42.00	0.000	7	159.29	0.000
42.50	0.000	7	159.29	0.000
43.00	0.000	7	159.29	0.000
43.50	0.000	6	159.29	0.000
44.00	0.000	6	159.29	0.000
44.50	0.000	6	159.29	0.000
45.00	0.000	6	159.29	0.000
45.50	0.000	6	159.29	0.000
46.00	0.000	6	159.29	0.000
46.50	0.000	6	159.29	0.000
47.00	0.000	5	159.29	0.000
47.50	0.000	5	159.29	0.000
48.00	0.000	5	159.29	0.000
48.50	0.000	5	159.29	0.000
49.00	0.000	5	159.28	0.000
49.50	0.000	5	159.28	0.000
50.00	0.000	5	159.28	0.000
50.50	0.000	5	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	5	159.28	0.000
51.50	0.000	5	159.28	0.000
52.00	0.000	4	159.28	0.000
52.50	0.000	4	159.28	0.000
53.00	0.000	4	159.28	0.000
53.50	0.000	4	159.28	0.000
54.00	0.000	4	159.28	0.000
54.50	0.000	4	159.28	0.000
55.00	0.000	4	159.28	0.000
55.50	0.000	4	159.28	0.000
56.00	0.000	4	159.28	0.000
56.50	0.000	4	159.28	0.000
57.00	0.000	4	159.28	0.000
57.50	0.000	4	159.28	0.000
58.00	0.000	4	159.28	0.000
58.50	0.000	4	159.28	0.000
59.00	0.000	4	159.28	0.000
59.50	0.000	4	159.28	0.000
60.00	0.000	4	159.28	0.000
60.50	0.000	3	159.28	0.000
61.00	0.000	3	159.28	0.000
61.50	0.000	3	159.28	0.000
62.00	0.000	3	159.28	0.000
62.50	0.000	3	159.28	0.000
63.00	0.000	3	159.28	0.000
63.50	0.000	3	159.28	0.000
64.00	0.000	3	159.28	0.000
64.50	0.000	3	159.28	0.000
65.00	0.000	3	159.28	0.000
65.50	0.000	3	159.28	0.000
66.00	0.000	3	159.28	0.000
66.50	0.000	3	159.28	0.000
67.00	0.000	3	159.28	0.000
67.50	0.000	3	159.28	0.000
68.00	0.000	3	159.28	0.000
68.50	0.000	3	159.28	0.000
69.00	0.000	3	159.28	0.000
69.50	0.000	3	159.28	0.000
70.00	0.000	3	159.28	0.000
70.50	0.000	3	159.28	0.000
71.00	0.000	3	159.28	0.000
71.50	0.000	3	159.28	0.000
72.00	0.000	3	159.28	0.000
72.50	0.000	3	159.28	0.000
73.00	0.000	3	159.28	0.000
73.50	0.000	3	159.28	0.000
74.00	0.000	3	159.28	0.000
74.50	0.000	3	159.28	0.000
75.00	0.000	2	159.28	0.000
75.50	0.000	2	159.28	0.000
76.00	0.000	2	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	2	159.28	0.000
77.00	0.000	2	159.28	0.000
77.50	0.000	2	159.28	0.000
78.00	0.000	2	159.28	0.000
78.50	0.000	2	159.28	0.000
79.00	0.000	2	159.28	0.000
79.50	0.000	2	159.28	0.000
80.00	0.000	2	159.28	0.000
80.50	0.000	2	159.28	0.000
81.00	0.000	2	159.28	0.000
81.50	0.000	2	159.28	0.000
82.00	0.000	2	159.28	0.000
82.50	0.000	2	159.28	0.000
83.00	0.000	2	159.28	0.000
83.50	0.000	2	159.28	0.000
84.00	0.000	2	159.28	0.000
84.50	0.000	2	159.28	0.000
85.00	0.000	2	159.28	0.000
85.50	0.000	2	159.28	0.000
86.00	0.000	2	159.28	0.000
86.50	0.000	2	159.28	0.000
87.00	0.000	2	159.28	0.000
87.50	0.000	2	159.28	0.000
88.00	0.000	2	159.28	0.000
88.50	0.000	2	159.28	0.000
89.00	0.000	2	159.28	0.000
89.50	0.000	2	159.28	0.000
90.00	0.000	2	159.28	0.000
90.50	0.000	2	159.28	0.000
91.00	0.000	2	159.28	0.000
91.50	0.000	2	159.28	0.000
92.00	0.000	2	159.28	0.000
92.50	0.000	2	159.28	0.000
93.00	0.000	2	159.28	0.000
93.50	0.000	2	159.28	0.000
94.00	0.000	2	159.28	0.000
94.50	0.000	2	159.28	0.000
95.00	0.000	2	159.28	0.000
95.50	0.000	2	159.28	0.000
96.00	0.000	2	159.28	0.000
96.50	0.000	2	159.28	0.000
97.00	0.000	2	159.28	0.000
97.50	0.000	2	159.28	0.000
98.00	0.000	2	159.28	0.000
98.50	0.000	2	159.28	0.000
99.00	0.000	2	159.28	0.000
99.50	0.000	2	159.28	0.000
100.00	0.000	2	159.28	0.000
100.50	0.000	2	159.28	0.000
101.00	0.000	2	159.28	0.000
101.50	0.000	2	159.28	0.000

Hydrograph for Pond 3P: UG2 (continued)

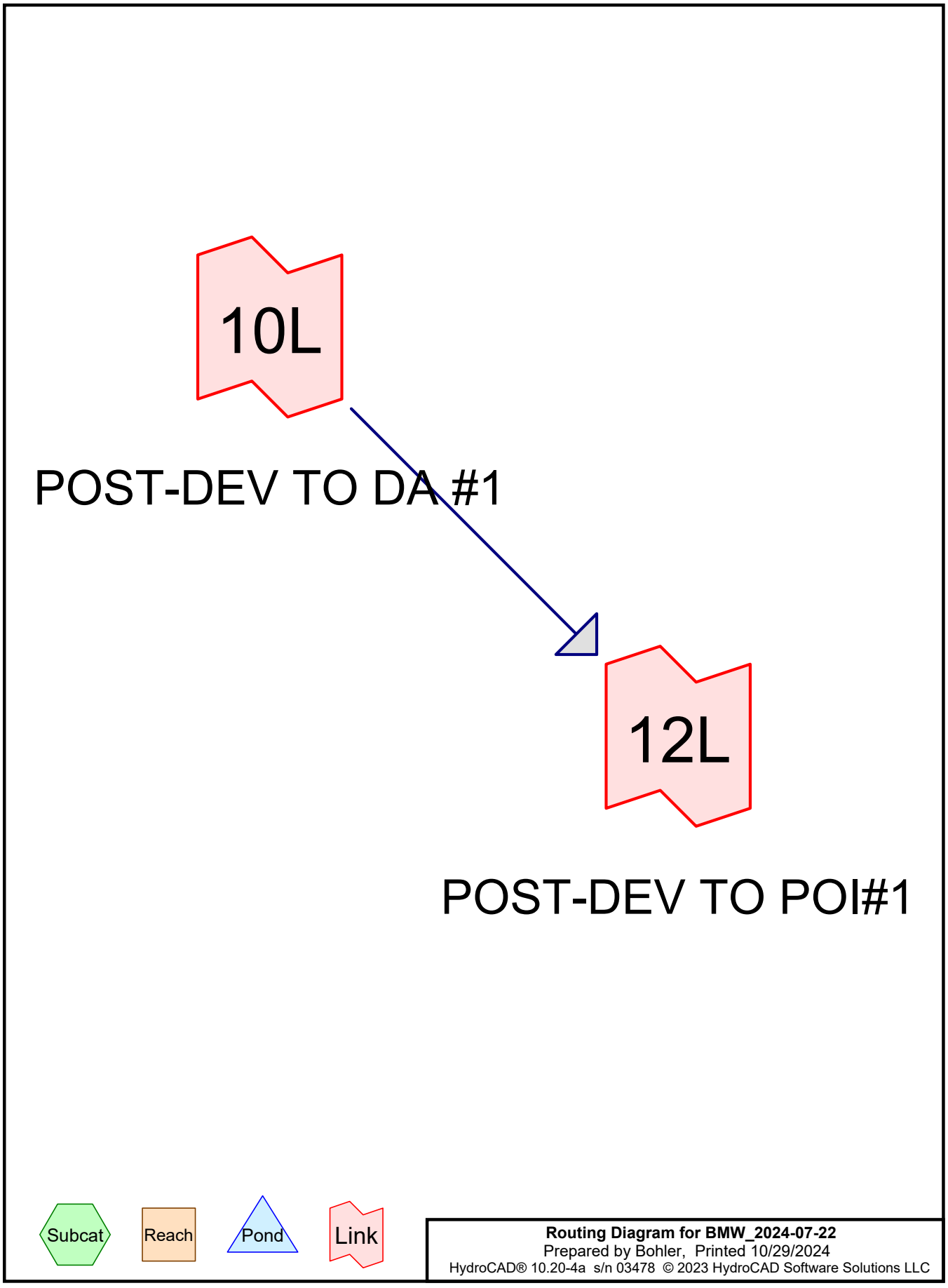
Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
102.00	0.000	2	159.28	0.000
102.50	0.000	2	159.28	0.000
103.00	0.000	2	159.28	0.000
103.50	0.000	2	159.28	0.000
104.00	0.000	2	159.28	0.000
104.50	0.000	2	159.28	0.000
105.00	0.000	2	159.28	0.000
105.50	0.000	2	159.28	0.000
106.00	0.000	2	159.28	0.000
106.50	0.000	2	159.28	0.000
107.00	0.000	2	159.28	0.000
107.50	0.000	2	159.28	0.000
108.00	0.000	2	159.28	0.000
108.50	0.000	2	159.28	0.000
109.00	0.000	2	159.28	0.000
109.50	0.000	2	159.28	0.000
110.00	0.000	2	159.28	0.000
110.50	0.000	2	159.28	0.000
111.00	0.000	2	159.28	0.000
111.50	0.000	2	159.28	0.000
112.00	0.000	2	159.28	0.000
112.50	0.000	1	159.28	0.000
113.00	0.000	1	159.28	0.000
113.50	0.000	1	159.28	0.000
114.00	0.000	1	159.28	0.000
114.50	0.000	1	159.28	0.000
115.00	0.000	1	159.28	0.000
115.50	0.000	1	159.28	0.000
116.00	0.000	1	159.28	0.000
116.50	0.000	1	159.28	0.000
117.00	0.000	1	159.28	0.000
117.50	0.000	1	159.28	0.000
118.00	0.000	1	159.28	0.000
118.50	0.000	1	159.28	0.000
119.00	0.000	1	159.28	0.000
119.50	0.000	1	159.28	0.000
120.00	0.000	1	159.28	0.000
120.50	0.000	1	159.28	0.000
121.00	0.000	1	159.28	0.000
121.50	0.000	1	159.28	0.000
122.00	0.000	1	159.28	0.000
122.50	0.000	1	159.28	0.000
123.00	0.000	1	159.28	0.000
123.50	0.000	1	159.28	0.000
124.00	0.000	1	159.28	0.000
124.50	0.000	1	159.28	0.000
125.00	0.000	1	159.28	0.000
125.50	0.000	1	159.28	0.000
126.00	0.000	1	159.28	0.000
126.50	0.000	1	159.28	0.000
127.00	0.000	1	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	1	159.28	0.000
128.00	0.000	1	159.28	0.000
128.50	0.000	1	159.28	0.000
129.00	0.000	1	159.28	0.000
129.50	0.000	1	159.28	0.000
130.00	0.000	1	159.28	0.000
130.50	0.000	1	159.28	0.000
131.00	0.000	1	159.28	0.000
131.50	0.000	1	159.28	0.000
132.00	0.000	1	159.28	0.000
132.50	0.000	1	159.28	0.000
133.00	0.000	1	159.28	0.000
133.50	0.000	1	159.28	0.000
134.00	0.000	1	159.28	0.000
134.50	0.000	1	159.28	0.000
135.00	0.000	1	159.28	0.000
135.50	0.000	1	159.28	0.000
136.00	0.000	1	159.28	0.000
136.50	0.000	1	159.28	0.000
137.00	0.000	1	159.28	0.000
137.50	0.000	1	159.28	0.000
138.00	0.000	1	159.28	0.000
138.50	0.000	1	159.28	0.000
139.00	0.000	1	159.28	0.000
139.50	0.000	1	159.28	0.000
140.00	0.000	1	159.28	0.000
140.50	0.000	1	159.28	0.000
141.00	0.000	1	159.28	0.000
141.50	0.000	1	159.28	0.000
142.00	0.000	1	159.28	0.000
142.50	0.000	1	159.28	0.000
143.00	0.000	1	159.28	0.000
143.50	0.000	1	159.28	0.000
144.00	0.000	1	159.28	0.000
144.50	0.000	1	159.28	0.000
145.00	0.000	1	159.28	0.000
145.50	0.000	1	159.28	0.000
146.00	0.000	1	159.28	0.000
146.50	0.000	1	159.28	0.000
147.00	0.000	1	159.28	0.000
147.50	0.000	1	159.28	0.000
148.00	0.000	1	159.28	0.000
148.50	0.000	1	159.28	0.000
149.00	0.000	1	159.28	0.000
149.50	0.000	1	159.28	0.000
150.00	0.000	1	159.28	0.000
150.50	0.000	1	159.28	0.000
151.00	0.000	1	159.28	0.000
151.50	0.000	1	159.28	0.000
152.00	0.000	1	159.28	0.000
152.50	0.000	1	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	1	159.28	0.000
153.50	0.000	1	159.28	0.000
154.00	0.000	1	159.28	0.000
154.50	0.000	1	159.28	0.000
155.00	0.000	1	159.28	0.000
155.50	0.000	1	159.28	0.000
156.00	0.000	1	159.28	0.000
156.50	0.000	1	159.28	0.000
157.00	0.000	1	159.28	0.000
157.50	0.000	1	159.28	0.000
158.00	0.000	1	159.28	0.000
158.50	0.000	1	159.28	0.000
159.00	0.000	1	159.28	0.000
159.50	0.000	1	159.28	0.000
160.00	0.000	1	159.28	0.000
160.50	0.000	1	159.28	0.000
161.00	0.000	1	159.28	0.000
161.50	0.000	1	159.28	0.000
162.00	0.000	1	159.28	0.000
162.50	0.000	1	159.28	0.000
163.00	0.000	1	159.28	0.000
163.50	0.000	1	159.28	0.000
164.00	0.000	1	159.28	0.000
164.50	0.000	1	159.28	0.000
165.00	0.000	1	159.28	0.000
165.50	0.000	1	159.28	0.000
166.00	0.000	1	159.28	0.000
166.50	0.000	1	159.28	0.000
167.00	0.000	1	159.28	0.000
167.50	0.000	1	159.28	0.000
168.00	0.000	1	159.28	0.000

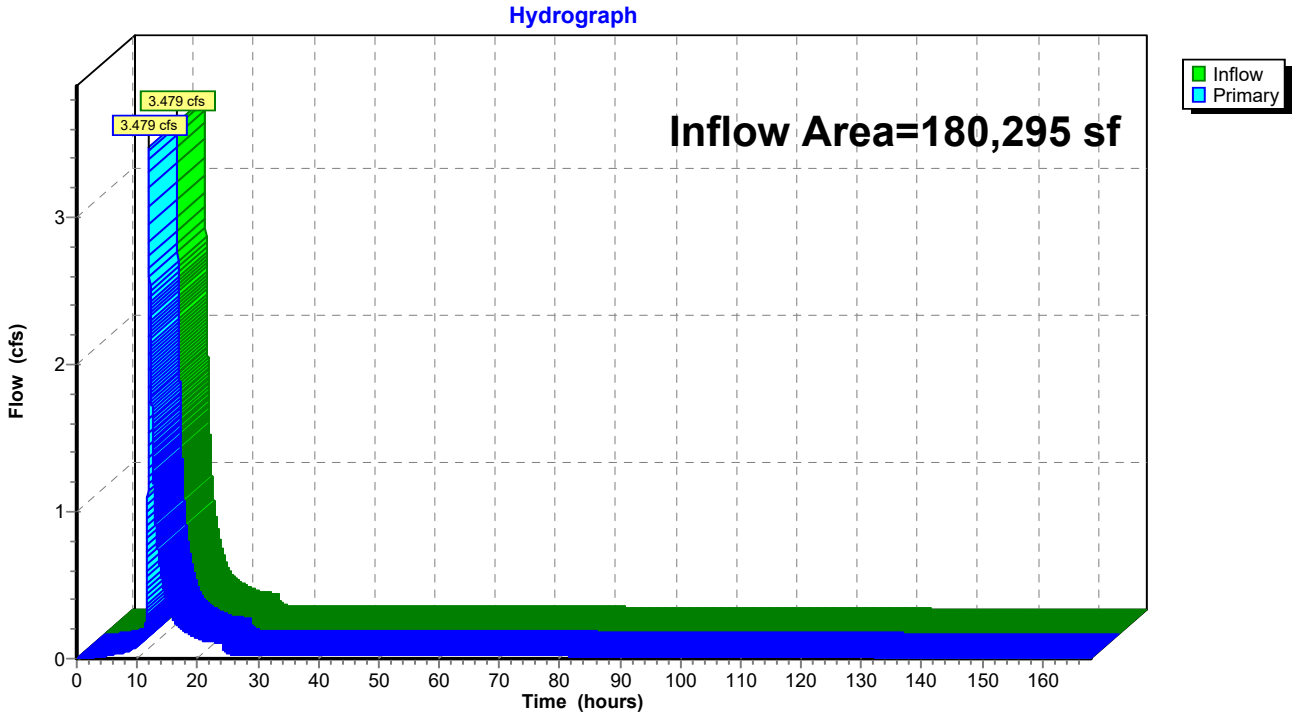

10L
POST-DEV TO DA #1
12L
POST-DEV TO POI#1
Subcat
Reach
Pond
Link
Routing Diagram for BMW_2024-07-22
Prepared by Bohler, Printed 10/29/2024
HydroCAD® 10.20-4a s/n 03478 © 2023 HydroCAD Software Solutions LLC

Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 180,295 sf, 83.43% Impervious, Inflow Depth > 1.82" for 1-yr event
Inflow = 3.479 cfs @ 11.99 hrs, Volume= 27,284 cf
Primary = 3.479 cfs @ 11.99 hrs, Volume= 27,284 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

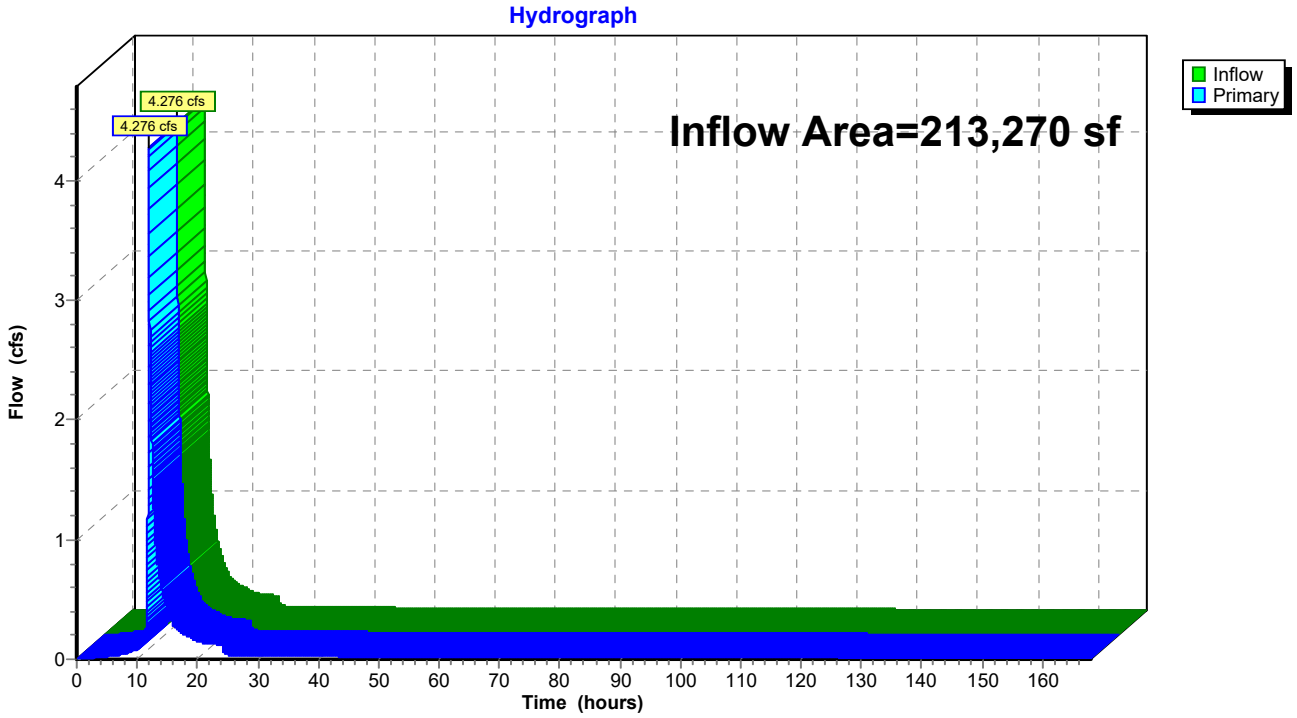


Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 213,270 sf, 77.92% Impervious, Inflow Depth > 1.63" for 1-yr event
Inflow = 4.276 cfs @ 11.98 hrs, Volume= 28,961 cf
Primary = 4.276 cfs @ 11.98 hrs, Volume= 28,961 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

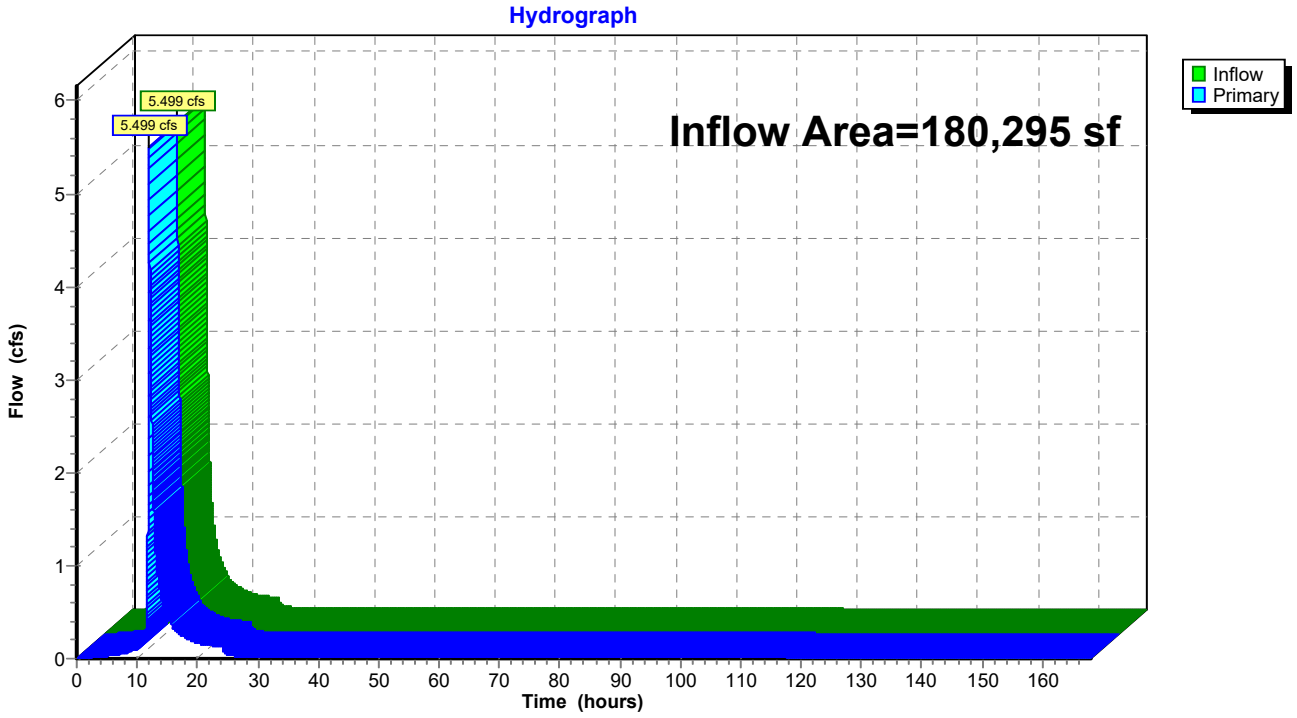


Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 180,295 sf, 83.43% Impervious, Inflow Depth > 2.27" for 2-yr event
Inflow = 5.499 cfs @ 11.99 hrs, Volume= 34,155 cf
Primary = 5.499 cfs @ 11.99 hrs, Volume= 34,155 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

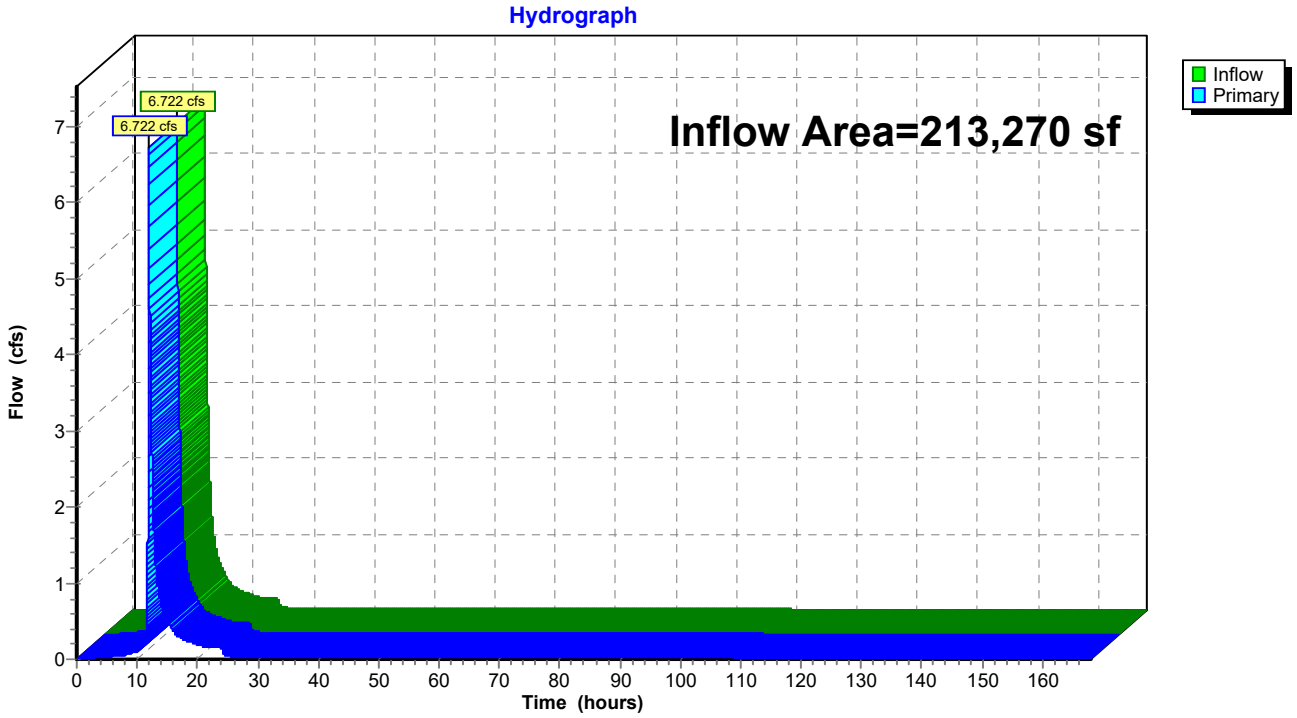


Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 213,270 sf, 77.92% Impervious, Inflow Depth > 2.07" for 2-yr event
Inflow = 6.722 cfs @ 11.99 hrs, Volume= 36,702 cf
Primary = 6.722 cfs @ 11.99 hrs, Volume= 36,702 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

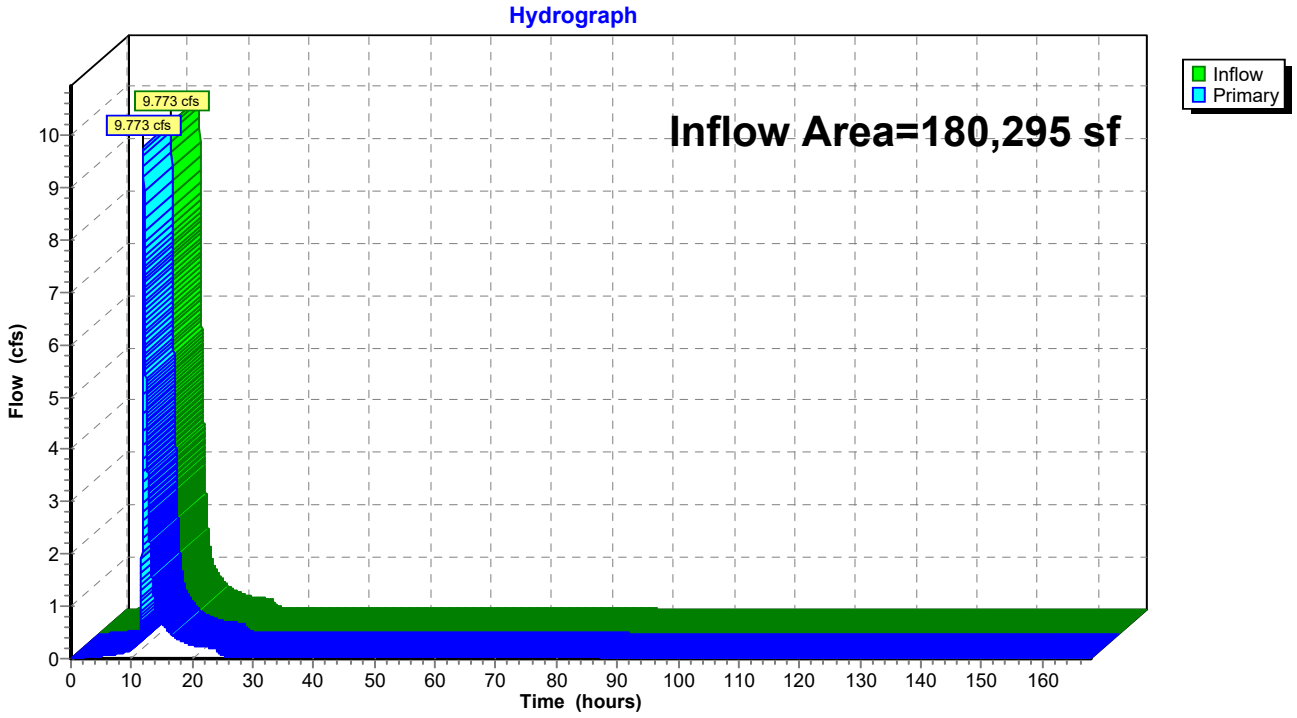


Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 180,295 sf, 83.43% Impervious, Inflow Depth = 3.62" for 10-yr event
Inflow = 9.773 cfs @ 11.98 hrs, Volume= 54,430 cf
Primary = 9.773 cfs @ 11.98 hrs, Volume= 54,430 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

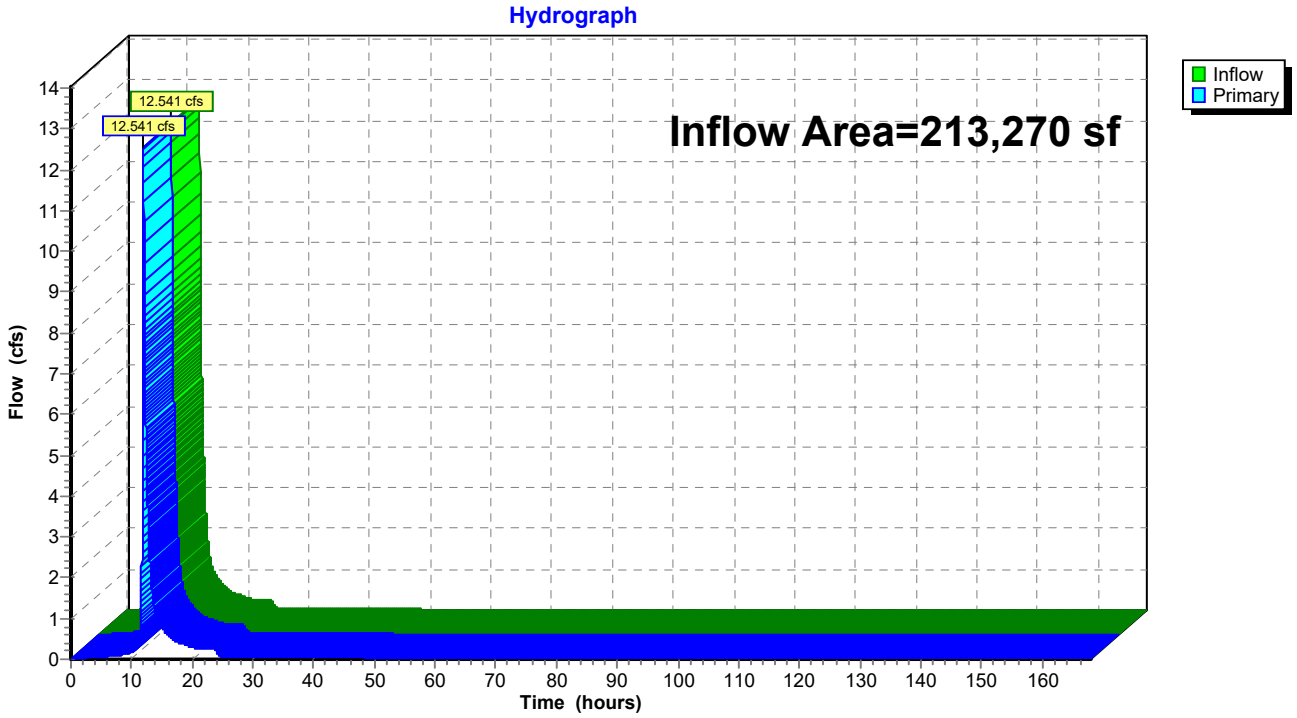


Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 213,270 sf, 77.92% Impervious, Inflow Depth = 3.37" for 10-yr event
Inflow = 12.541 cfs @ 11.97 hrs, Volume= 59,895 cf
Primary = 12.541 cfs @ 11.97 hrs, Volume= 59,895 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

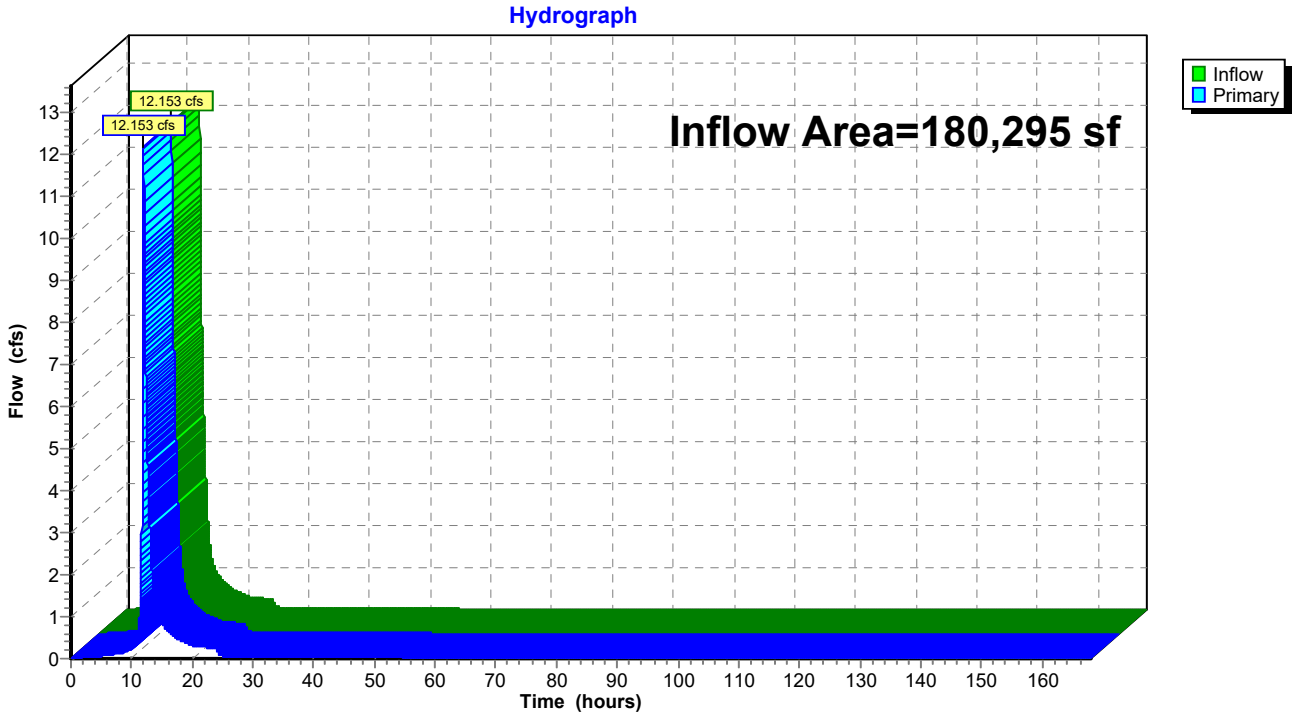


Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 180,295 sf, 83.43% Impervious, Inflow Depth = 4.55" for 25-yr event
Inflow = 12.153 cfs @ 11.98 hrs, Volume= 68,410 cf
Primary = 12.153 cfs @ 11.98 hrs, Volume= 68,410 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

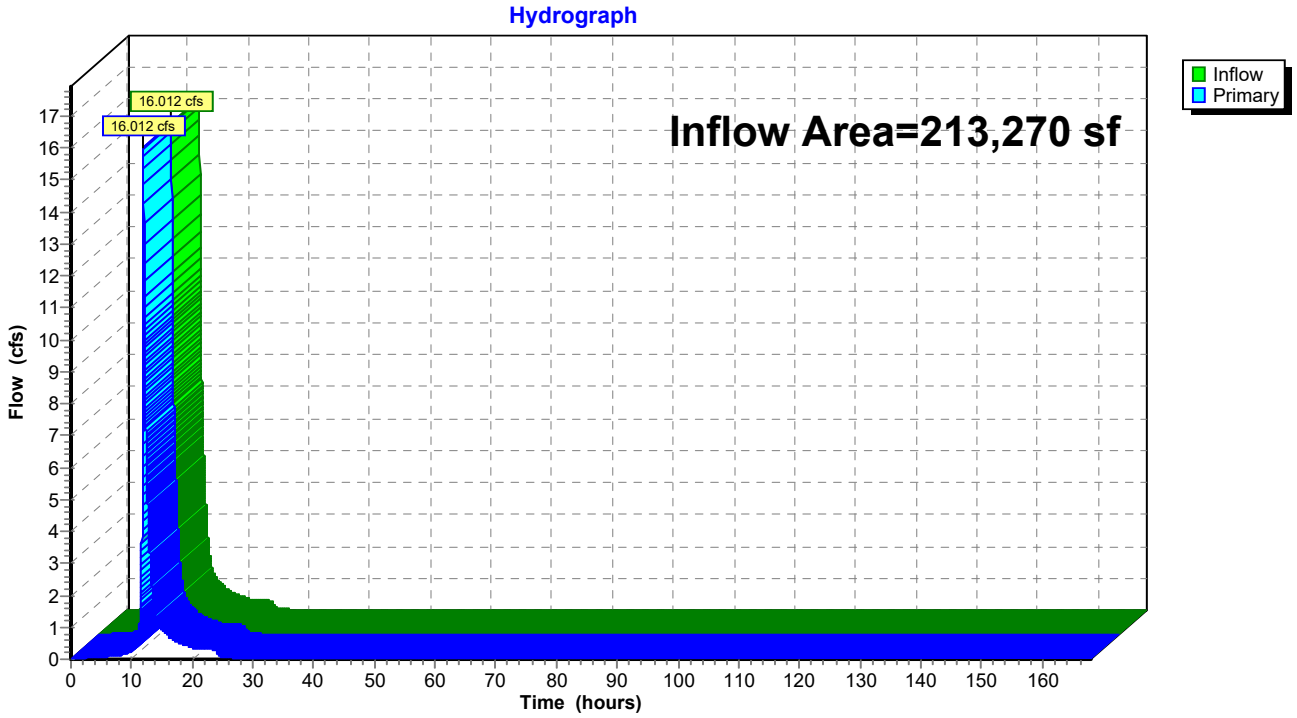


Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 213,270 sf, 77.92% Impervious, Inflow Depth = 4.28" for 25-yr event
Inflow = 16.012 cfs @ 11.97 hrs, Volume= 76,066 cf
Primary = 16.012 cfs @ 11.97 hrs, Volume= 76,066 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

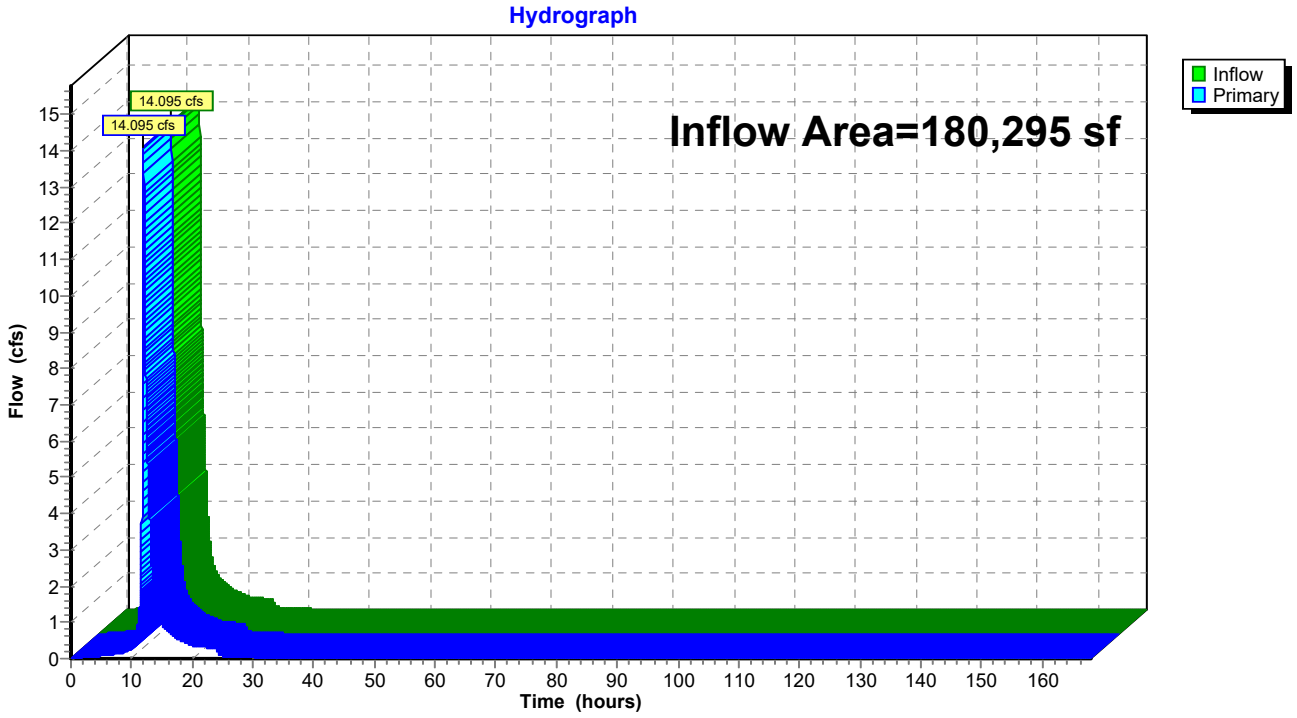


Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 180,295 sf, 83.43% Impervious, Inflow Depth = 5.35" for 50-yr event
Inflow = 14.095 cfs @ 11.98 hrs, Volume= 80,433 cf
Primary = 14.095 cfs @ 11.98 hrs, Volume= 80,433 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

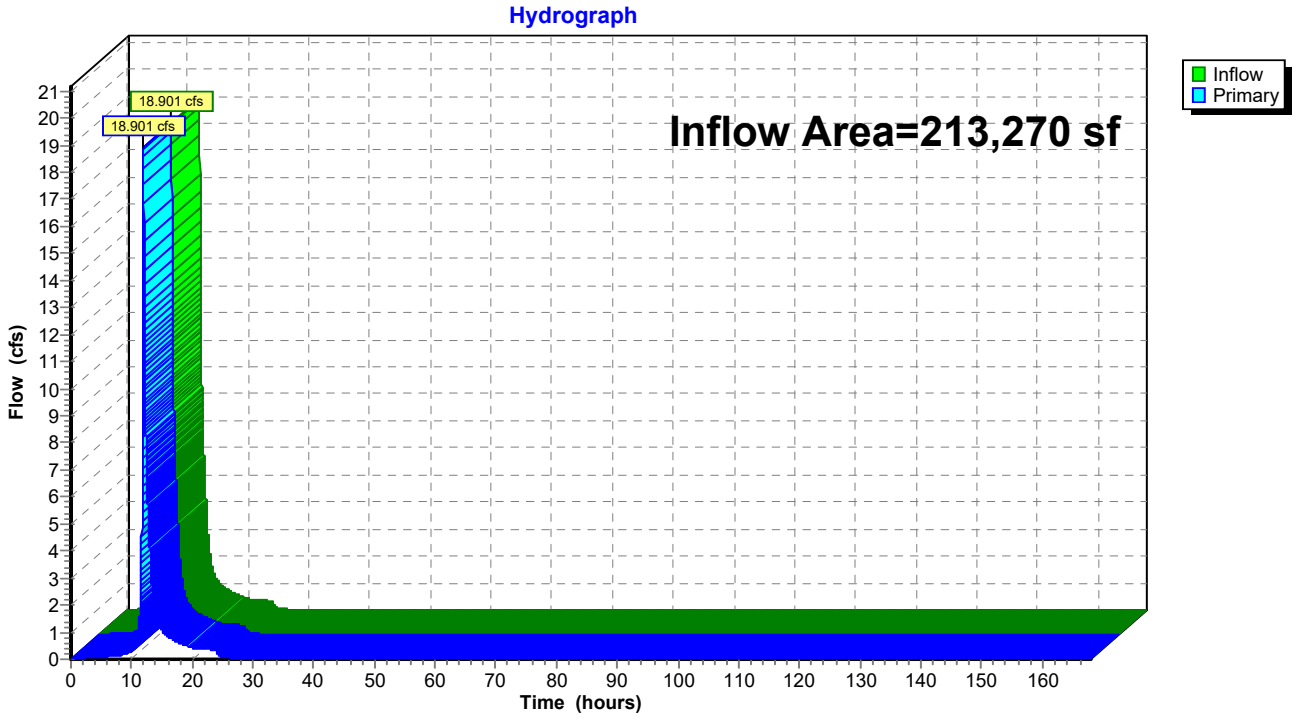


Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 213,270 sf, 77.92% Impervious, Inflow Depth = 5.07" for 50-yr event
Inflow = 18.901 cfs @ 11.97 hrs, Volume= 90,043 cf
Primary = 18.901 cfs @ 11.97 hrs, Volume= 90,043 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

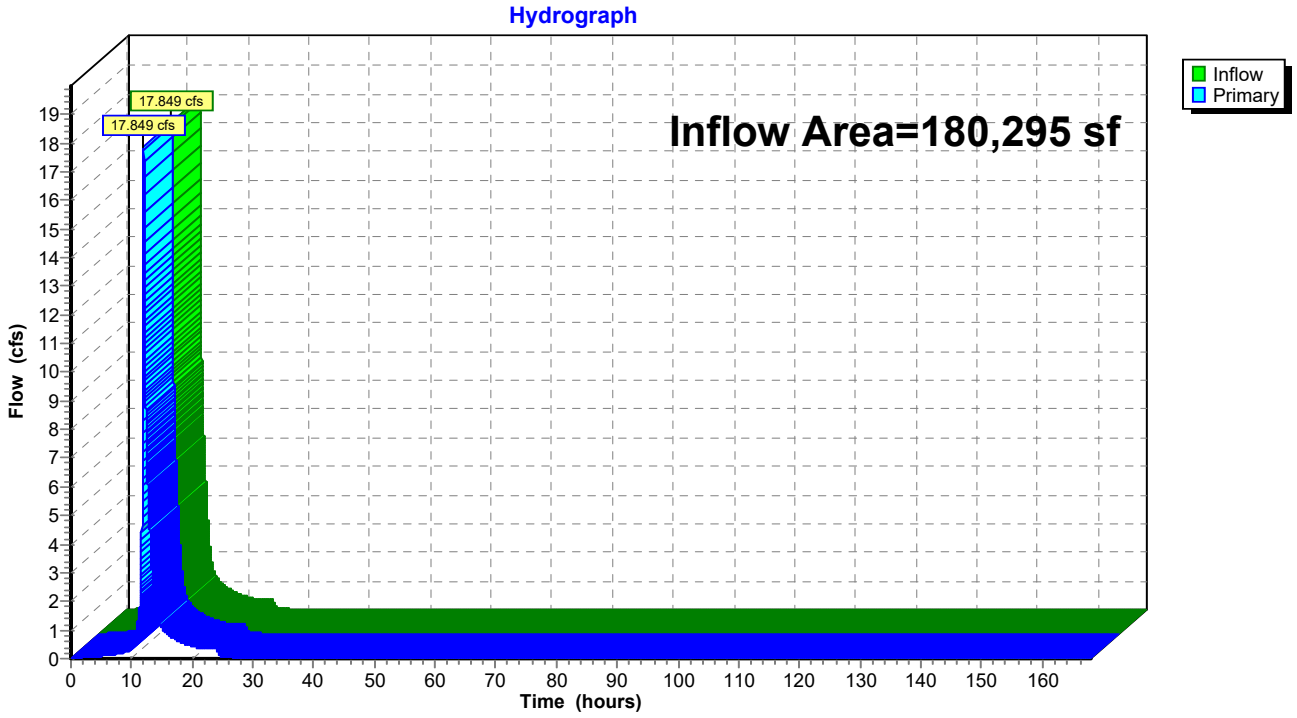


Summary for Link 10L: POST-DEV TO DA #1

Inflow Area = 180,295 sf, 83.43% Impervious, Inflow Depth = 6.22" for 100-yr event
Inflow = 17.849 cfs @ 12.01 hrs, Volume= 93,452 cf
Primary = 17.849 cfs @ 12.01 hrs, Volume= 93,452 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

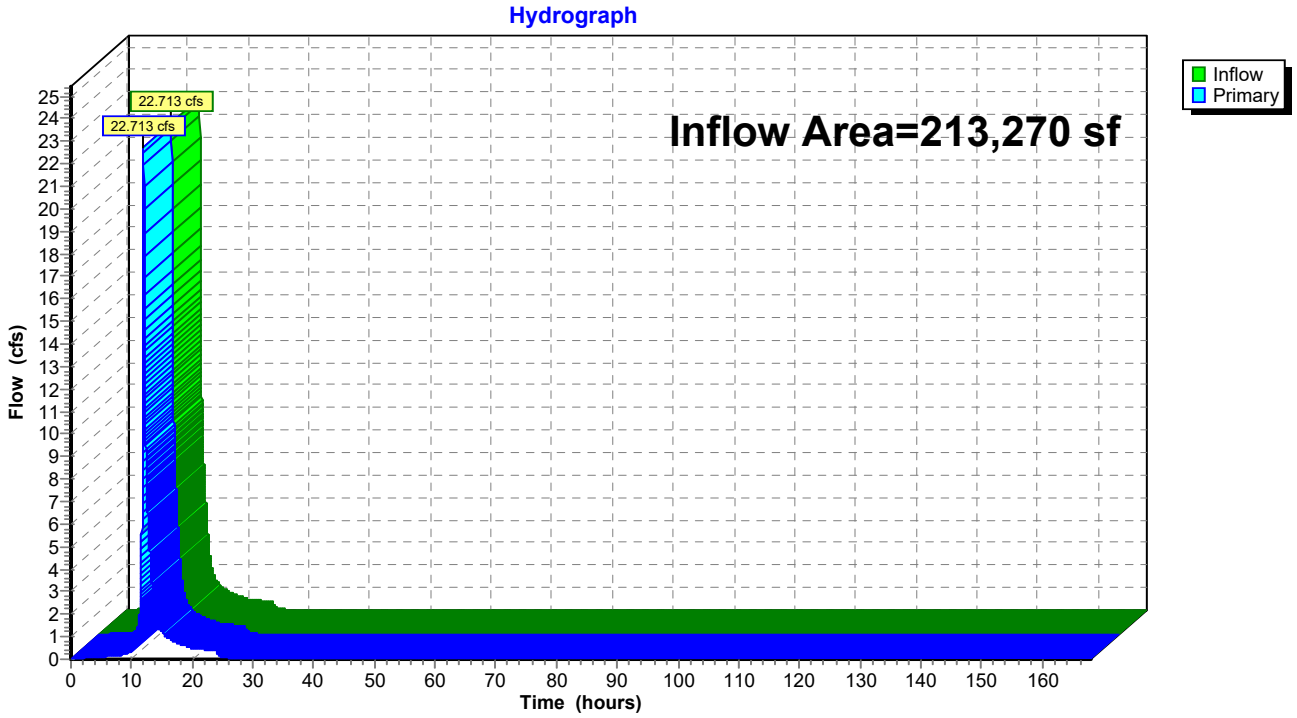


Summary for Link 12L: POST-DEV TO POI#1

Inflow Area = 213,270 sf, 77.92% Impervious, Inflow Depth = 5.92" for 100-yr event
Inflow = 22.713 cfs @ 12.00 hrs, Volume= 105,228 cf
Primary = 22.713 cfs @ 12.00 hrs, Volume= 105,228 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



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	10-yr	Type II 24-hr		Default	24.00	1	4.83	2
4	25-yr	Type II 24-hr		Default	24.00	1	5.86	2
5	50-yr	Type II 24-hr		Default	24.00	1	6.73	2
6	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)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
160.81	2,667	161.32	3,525	161.83	4,073
160.82	2,686	161.33	3,539	161.84	4,083
160.83	2,705	161.34	3,552	161.85	4,093
160.84	2,724	161.35	3,565	161.86	4,103
160.85	2,743	161.36	3,578	161.87	4,114
160.86	2,762	161.37	3,590	161.88	4,124
160.87	2,781	161.38	3,603	161.89	4,134
160.88	2,799	161.39	3,615	161.90	4,144
160.89	2,818	161.40	3,628	161.91	4,154
160.90	2,836	161.41	3,640	161.92	4,164
160.91	2,855	161.42	3,652	161.93	4,175
160.92	2,873	161.43	3,664	161.94	4,185
160.93	2,892	161.44	3,675	161.95	4,195
160.94	2,910	161.45	3,686	161.96	4,205
160.95	2,928	161.46	3,697	161.97	4,215
160.96	2,946	161.47	3,707	161.98	4,225
160.97	2,964	161.48	3,717	161.99	**4,234**
160.98	2,982	161.49	3,727		
160.99	3,000	161.50	3,737		
161.00	3,018	161.51	3,747		
161.01	3,036	161.52	3,758		
161.02	3,053	161.53	3,768		
161.03	3,071	161.54	3,778		
161.04	3,088	161.55	3,788		
161.05	3,106	161.56	3,798		
161.06	3,123	161.57	3,808		
161.07	3,140	161.58	3,819		
161.08	3,157	161.59	3,829		
161.09	3,174	161.60	3,839		
161.10	3,191	161.61	3,849		
161.11	3,208	161.62	3,859		
161.12	3,224	161.63	3,869		
161.13	3,241	161.64	3,880		
161.14	3,257	161.65	3,890		
161.15	3,273	161.66	3,900		
161.16	3,290	161.67	3,910		
161.17	3,306	161.68	3,920		
161.18	3,321	161.69	3,931		
161.19	3,337	161.70	3,941		
161.20	3,353	161.71	3,951		
161.21	3,368	161.72	3,961		
161.22	3,383	161.73	3,971		
161.23	3,398	161.74	3,981		
161.24	3,413	161.75	3,992		
161.25	3,428	161.76	4,002		
161.26	3,442	161.77	4,012		
161.27	3,456	161.78	4,022		
161.28	3,471	161.79	4,032		
161.29	3,484	161.80	4,042		
161.30	3,498	161.81	4,053		
161.31	3,512	161.82	4,063		

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	0.711	159.06	3.810
157.54	0.000	158.05	0.018	158.56	0.776	159.07	3.848
157.55	0.000	158.06	0.018	158.57	0.843	159.08	3.886
157.56	0.001	158.07	0.019	158.58	0.913	159.09	3.923
157.57	0.002	158.08	0.019	158.59	0.984	159.10	3.960
157.58	0.003	158.09	0.019	158.60	1.056	159.11	3.997
157.59	0.004	158.10	0.019	158.61	1.131	159.12	4.033
157.60	0.004	158.11	0.019	158.62	1.207	159.13	4.069
157.61	0.005	158.12	0.019	158.63	1.285	159.14	4.105
157.62	0.006	158.13	0.020	158.64	1.365	159.15	4.140
157.63	0.006	158.14	0.020	158.65	1.446	159.16	4.175
157.64	0.007	158.15	0.020	158.66	1.529	159.17	4.210
157.65	0.007	158.16	0.020	158.67	1.613	159.18	4.244
157.66	0.008	158.17	0.020	158.68	1.699	159.19	4.279
157.67	0.008	158.18	0.020	158.69	1.786	159.20	4.312
157.68	0.009	158.19	0.021	158.70	1.875	159.21	4.346
157.69	0.009	158.20	0.021	158.71	1.965	159.22	4.379
157.70	0.009	158.21	0.021	158.72	2.057	159.23	4.413
157.71	0.010	158.22	0.021	158.73	2.144	159.24	4.445
157.72	0.010	158.23	0.021	158.74	2.221	159.25	4.478
157.73	0.010	158.24	0.021	158.75	2.293	159.26	4.510
157.74	0.011	158.25	0.022	158.76	2.362	159.27	4.542
157.75	0.011	158.26	0.022	158.77	2.427	159.28	4.574
157.76	0.011	158.27	0.022	158.78	2.491	159.29	4.606
157.77	0.012	158.28	0.022	158.79	2.552	159.30	4.637
157.78	0.012	158.29	0.022	158.80	2.611	159.31	4.669
157.79	0.012	158.30	0.022	158.81	2.669	159.32	4.700
157.80	0.013	158.31	0.023	158.82	2.725	159.33	4.730
157.81	0.013	158.32	0.023	158.83	2.780	159.34	4.761
157.82	0.013	158.33	0.023	158.84	2.833	159.35	4.791
157.83	0.013	158.34	0.023	158.85	2.886	159.36	4.822
157.84	0.014	158.35	0.023	158.86	2.937	159.37	4.852
157.85	0.014	158.36	0.023	158.87	2.987	159.38	4.881
157.86	0.014	158.37	0.023	158.88	3.037	159.39	4.911
157.87	0.014	158.38	0.024	158.89	3.085	159.40	4.941
157.88	0.015	158.39	0.024	158.90	3.133	159.41	4.970
157.89	0.015	158.40	0.035	158.91	3.180	159.42	4.999
157.90	0.015	158.41	0.054	158.92	3.226	159.43	5.028
157.91	0.015	158.42	0.080	158.93	3.271	159.44	5.057
157.92	0.015	158.43	0.110	158.94	3.316	159.45	5.085
157.93	0.016	158.44	0.144	158.95	3.360	159.46	5.114
157.94	0.016	158.45	0.182	158.96	3.404	159.47	5.142
157.95	0.016	158.46	0.223	158.97	3.447	159.48	5.170
157.96	0.016	158.47	0.267	158.98	3.489	159.49	5.198
157.97	0.017	158.48	0.314	158.99	3.531	159.50	5.226
157.98	0.017	158.49	0.364	159.00	3.572	159.51	5.254
157.99	0.017	158.50	0.416	159.01	3.613	159.52	5.281
158.00	0.017	158.51	0.470	159.02	3.653	159.53	5.308
158.01	0.017	158.52	0.527	159.03	3.693	159.54	5.336
158.02	0.018	158.53	0.586	159.04	3.732	159.55	5.363
158.03	0.018	158.54	0.647	159.05	3.771	159.56	5.390

Stage-Discharge for Pond 1P: UG1 (continued)

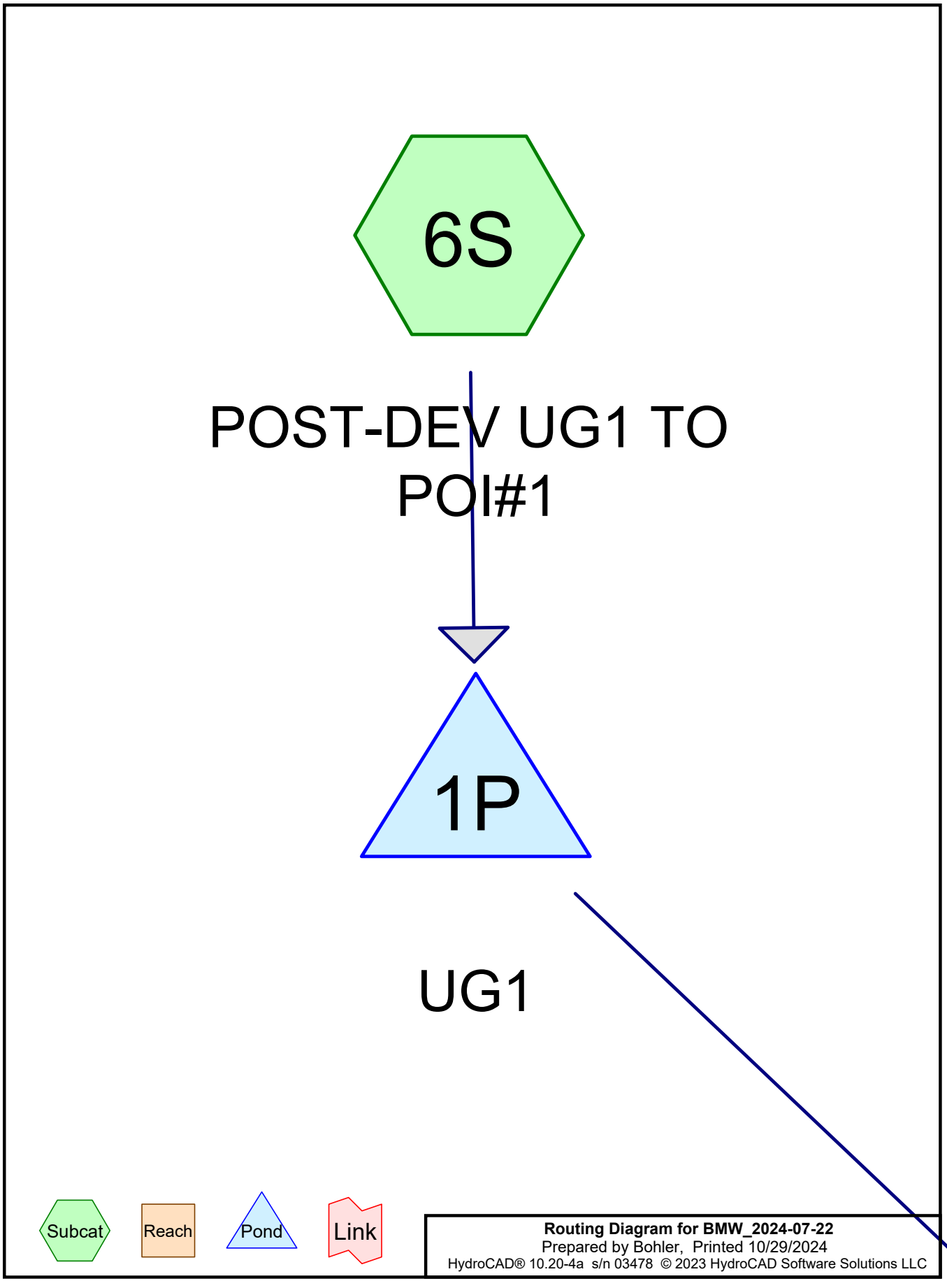
Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
159.57	5.417	160.08	6.641	160.59	10.430
159.58	5.443	160.09	6.663	160.60	10.568
159.59	5.470	160.10	6.685	160.61	10.708
159.60	5.496	160.11	6.706	160.62	10.849
159.61	5.523	160.12	6.728	160.63	10.991
159.62	5.549	160.13	6.749	160.64	11.136
159.63	5.575	160.14	6.771	160.65	11.281
159.64	5.601	160.15	6.792	160.66	11.429
159.65	5.626	160.16	6.813	160.67	11.577
159.66	5.652	160.17	6.835	160.68	11.728
159.67	5.678	160.18	6.856	160.69	11.879
159.68	5.703	160.19	6.877	160.70	12.033
159.69	5.729	160.20	6.898	160.71	12.187
159.70	5.754	160.21	6.919	160.72	12.343
159.71	5.779	160.22	6.940	160.73	12.501
159.72	5.804	160.23	6.961	160.74	**12.659**
159.73	5.829	160.24	6.981		
159.74	5.854	160.25	7.015		
159.75	5.878	160.26	7.060		
159.76	5.903	160.27	7.112		
159.77	5.927	160.28	7.170		
159.78	5.952	160.29	7.233		
159.79	5.976	160.30	7.300		
159.80	6.000	160.31	7.372		
159.81	6.024	160.32	7.447		
159.82	6.048	160.33	7.525		
159.83	6.072	160.34	7.607		
159.84	6.096	160.35	7.692		
159.85	6.120	160.36	7.779		
159.86	6.143	160.37	7.870		
159.87	6.167	160.38	7.963		
159.88	6.190	160.39	8.059		
159.89	6.214	160.40	8.158		
159.90	6.237	160.41	8.259		
159.91	6.260	160.42	8.362		
159.92	6.283	160.43	8.468		
159.93	6.306	160.44	8.575		
159.94	6.329	160.45	8.685		
159.95	6.352	160.46	8.798		
159.96	6.375	160.47	8.912		
159.97	6.397	160.48	9.028		
159.98	6.420	160.49	9.146		
159.99	6.442	160.50	9.267		
160.00	6.465	160.51	9.389		
160.01	6.487	160.52	9.513		
160.02	6.509	160.53	9.639		
160.03	6.532	160.54	9.766		
160.04	6.554	160.55	9.896		
160.05	6.576	160.56	10.027		
160.06	6.598	160.57	10.160		
160.07	6.620	160.58	10.294		

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	0.447	160.81	0.704
159.29	0.000	159.80	0.149	160.31	0.454	160.82	0.708
159.30	0.001	159.81	0.150	160.32	0.461	160.83	0.712
159.31	0.002	159.82	0.152	160.33	0.467	160.84	0.716
159.32	0.003	159.83	0.154	160.34	0.474	160.85	0.719
159.33	0.005	159.84	0.156	160.35	0.480	160.86	0.723
159.34	0.008	159.85	0.158	160.36	0.487	160.87	0.727
159.35	0.010	159.86	0.159	160.37	0.493	160.88	0.731
159.36	0.013	159.87	0.161	160.38	0.499	160.89	0.735
159.37	0.016	159.88	0.163	160.39	0.505	160.90	0.739
159.38	0.020	159.89	0.165	160.40	0.511	160.91	0.742
159.39	0.023	159.90	0.166	160.41	0.517	160.92	0.746
159.40	0.027	159.91	0.168	160.42	0.522	160.93	0.750
159.41	0.032	159.92	0.170	160.43	0.528	160.94	0.753
159.42	0.036	159.93	0.171	160.44	0.533	160.95	0.757
159.43	0.041	159.94	0.173	160.45	0.539	160.96	0.761
159.44	0.045	159.95	0.174	160.46	0.544	160.97	0.764
159.45	0.050	159.96	0.176	160.47	0.550	160.98	0.768
159.46	0.055	159.97	0.178	160.48	0.555	160.99	0.772
159.47	0.059	159.98	0.181	160.49	0.560	161.00	0.775
159.48	0.064	159.99	0.185	160.50	0.565	161.01	0.779
159.49	0.069	160.00	0.189	160.51	0.570	161.02	0.782
159.50	0.073	160.01	0.195	160.52	0.575	161.03	0.786
159.51	0.077	160.02	0.200	160.53	0.580	161.04	0.789
159.52	0.081	160.03	0.207	160.54	0.585	161.05	0.793
159.53	0.084	160.04	0.213	160.55	0.590	161.06	0.796
159.54	0.087	160.05	0.220	160.56	0.595	161.07	0.800
159.55	0.090	160.06	0.227	160.57	0.600	161.08	0.803
159.56	0.093	160.07	0.235	160.58	0.605	161.09	0.807
159.57	0.096	160.08	0.243	160.59	0.609	161.10	0.810
159.58	0.099	160.09	0.251	160.60	0.614	161.11	0.814
159.59	0.102	160.10	0.260	160.61	0.618	161.12	0.817
159.60	0.104	160.11	0.269	160.62	0.623	161.13	0.820
159.61	0.107	160.12	0.278	160.63	0.628	161.14	0.824
159.62	0.110	160.13	0.287	160.64	0.632	161.15	0.827
159.63	0.112	160.14	0.296	160.65	0.637	161.16	0.830
159.64	0.115	160.15	0.306	160.66	0.641	161.17	0.834
159.65	0.117	160.16	0.316	160.67	0.645	161.18	0.837
159.66	0.119	160.17	0.326	160.68	0.650	161.19	0.840
159.67	0.122	160.18	0.337	160.69	0.654	161.20	0.844
159.68	0.124	160.19	0.347	160.70	0.658	161.21	0.847
159.69	0.126	160.20	0.358	160.71	0.663	161.22	0.850
159.70	0.128	160.21	0.369	160.72	0.667	161.23	0.853
159.71	0.131	160.22	0.381	160.73	0.671	161.24	0.857
159.72	0.133	160.23	0.391	160.74	0.675	161.25	0.860
159.73	0.135	160.24	0.400	160.75	0.679	161.26	0.863
159.74	0.137	160.25	0.408	160.76	0.684	161.27	0.866
159.75	0.139	160.26	0.417	160.77	0.688	161.28	0.869
159.76	0.141	160.27	0.425	160.78	0.692	161.29	0.873
159.77	0.143	160.28	0.432	160.79	0.696	161.30	0.876
159.78	0.145	160.29	0.440	160.80	0.700	161.31	0.879

Stage-Discharge for Pond 3P: UG2 (continued)

Elevation (feet)	Primary (cfs)
161.32	0.882
161.33	0.885
161.34	0.888
161.35	0.891
161.36	0.894
161.37	0.897
161.38	0.900
161.39	0.904
161.40	0.907
161.41	0.910
161.42	0.913
161.43	0.916
161.44	0.919
161.45	0.922
161.46	0.925
161.47	0.928
161.48	0.931
161.49	0.933
161.50	0.936
161.51	0.953
161.52	0.980
161.53	1.014
161.54	1.055
161.55	1.100
161.56	1.150
161.57	1.203
161.58	1.261
161.59	1.322
161.60	1.387
161.61	1.454
161.62	1.525
161.63	1.598
161.64	1.674
161.65	1.753
161.66	1.835
161.67	1.919
161.68	2.005
161.69	2.094
161.70	2.185
161.71	2.278
161.72	2.373
161.73	2.471
161.74	2.570
161.75	2.672
161.76	2.776
161.77	2.881
161.78	2.989
161.79	3.098
161.80	3.209
161.81	3.322
161.82	3.437
161.83	3.554
161.84	3.672
161.85	3.792
161.86	3.914
161.87	4.037
161.88	4.162
161.89	4.289
161.90	4.417
161.91	4.547
161.92	4.678
161.93	4.811
161.94	4.945
161.95	5.081
161.96	5.218
161.97	5.357
161.98	5.497
161.99	**5.639**


6S
POST-DEV UG1 TO POI#1
1P
UG1
Subcat
Reach
Pond
Link
Routing Diagram for BMW_2024-07-22
Prepared by Bohler, Printed 10/29/2024
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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1.2 Inch MRC	NJ DEP 2-hr		Default	2.00	1	1.20	2

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

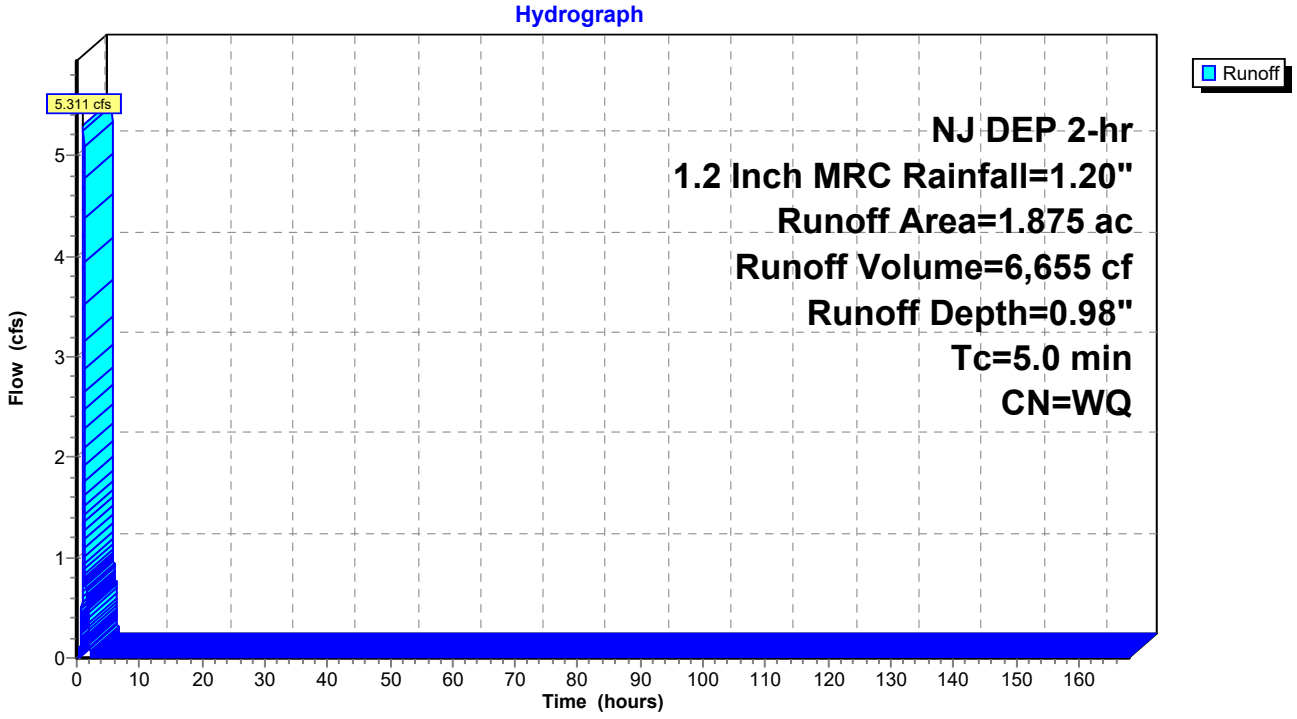
Runoff = 5.311 cfs @ 1.10 hrs, Volume= 6,655 cf, Depth= 0.98"
Routed to Pond 1P : UG1

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
*	0.015	39	Lawn A
*	1.860	98	Impervious
	1.875		Weighted Average
	0.015		0.80% Pervious Area
	1.860		99.20% 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	0.99	0.000
0.20	0.02	0.00	0.000	10.40	1.20	0.99	0.000
0.40	0.07	0.00	0.033	10.60	1.20	0.99	0.000
0.60	0.13	0.03	0.286	10.80	1.20	0.99	0.000
0.80	0.23	0.09	0.559	11.00	1.20	0.99	0.000
1.00	0.60	0.41	**3.869**	11.20	1.20	0.99	0.000
1.20	0.97	0.77	**2.470**	11.40	1.20	0.99	0.000
1.40	1.07	0.85	0.731	11.60	1.20	0.99	0.000
1.60	1.13	0.92	0.562	11.80	1.20	0.99	0.000
1.80	1.18	0.97	0.446	12.00	1.20	0.99	0.000
2.00	**1.20**	**0.99**	0.176	12.20	1.20	0.99	0.000
2.20	1.20	0.99	0.002	12.40	1.20	0.99	0.000
2.40	1.20	0.99	0.000	12.60	1.20	0.99	0.000
2.60	1.20	0.99	0.000	12.80	1.20	0.99	0.000
2.80	1.20	0.99	0.000	13.00	1.20	0.99	0.000
3.00	1.20	0.99	0.000	13.20	1.20	0.99	0.000
3.20	1.20	0.99	0.000	13.40	1.20	0.99	0.000
3.40	1.20	0.99	0.000	13.60	1.20	0.99	0.000
3.60	1.20	0.99	0.000	13.80	1.20	0.99	0.000
3.80	1.20	0.99	0.000	14.00	1.20	0.99	0.000
4.00	1.20	0.99	0.000	14.20	1.20	0.99	0.000
4.20	1.20	0.99	0.000	14.40	1.20	0.99	0.000
4.40	1.20	0.99	0.000	14.60	1.20	0.99	0.000
4.60	1.20	0.99	0.000	14.80	1.20	0.99	0.000
4.80	1.20	0.99	0.000	15.00	1.20	0.99	0.000
5.00	1.20	0.99	0.000	15.20	1.20	0.99	0.000
5.20	1.20	0.99	0.000	15.40	1.20	0.99	0.000
5.40	1.20	0.99	0.000	15.60	1.20	0.99	0.000
5.60	1.20	0.99	0.000	15.80	1.20	0.99	0.000
5.80	1.20	0.99	0.000	16.00	1.20	0.99	0.000
6.00	1.20	0.99	0.000	16.20	1.20	0.99	0.000
6.20	1.20	0.99	0.000	16.40	1.20	0.99	0.000
6.40	1.20	0.99	0.000	16.60	1.20	0.99	0.000
6.60	1.20	0.99	0.000	16.80	1.20	0.99	0.000
6.80	1.20	0.99	0.000	17.00	1.20	0.99	0.000
7.00	1.20	0.99	0.000	17.20	1.20	0.99	0.000
7.20	1.20	0.99	0.000	17.40	1.20	0.99	0.000
7.40	1.20	0.99	0.000	17.60	1.20	0.99	0.000
7.60	1.20	0.99	0.000	17.80	1.20	0.99	0.000
7.80	1.20	0.99	0.000	18.00	1.20	0.99	0.000
8.00	1.20	0.99	0.000	18.20	1.20	0.99	0.000
8.20	1.20	0.99	0.000	18.40	1.20	0.99	0.000
8.40	1.20	0.99	0.000	18.60	1.20	0.99	0.000
8.60	1.20	0.99	0.000	18.80	1.20	0.99	0.000
8.80	1.20	0.99	0.000	19.00	1.20	0.99	0.000
9.00	1.20	0.99	0.000	19.20	1.20	0.99	0.000
9.20	1.20	0.99	0.000	19.40	1.20	0.99	0.000
9.40	1.20	0.99	0.000	19.60	1.20	0.99	0.000
9.60	1.20	0.99	0.000	19.80	1.20	0.99	0.000
9.80	1.20	0.99	0.000	20.00	1.20	0.99	0.000
10.00	1.20	0.99	0.000	20.20	1.20	0.99	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	0.99	0.000	30.60	1.20	0.99	0.000
20.60	1.20	0.99	0.000	30.80	1.20	0.99	0.000
20.80	1.20	0.99	0.000	31.00	1.20	0.99	0.000
21.00	1.20	0.99	0.000	31.20	1.20	0.99	0.000
21.20	1.20	0.99	0.000	31.40	1.20	0.99	0.000
21.40	1.20	0.99	0.000	31.60	1.20	0.99	0.000
21.60	1.20	0.99	0.000	31.80	1.20	0.99	0.000
21.80	1.20	0.99	0.000	32.00	1.20	0.99	0.000
22.00	1.20	0.99	0.000	32.20	1.20	0.99	0.000
22.20	1.20	0.99	0.000	32.40	1.20	0.99	0.000
22.40	1.20	0.99	0.000	32.60	1.20	0.99	0.000
22.60	1.20	0.99	0.000	32.80	1.20	0.99	0.000
22.80	1.20	0.99	0.000	33.00	1.20	0.99	0.000
23.00	1.20	0.99	0.000	33.20	1.20	0.99	0.000
23.20	1.20	0.99	0.000	33.40	1.20	0.99	0.000
23.40	1.20	0.99	0.000	33.60	1.20	0.99	0.000
23.60	1.20	0.99	0.000	33.80	1.20	0.99	0.000
23.80	1.20	0.99	0.000	34.00	1.20	0.99	0.000
24.00	1.20	0.99	0.000	34.20	1.20	0.99	0.000
24.20	1.20	0.99	0.000	34.40	1.20	0.99	0.000
24.40	1.20	0.99	0.000	34.60	1.20	0.99	0.000
24.60	1.20	0.99	0.000	34.80	1.20	0.99	0.000
24.80	1.20	0.99	0.000	35.00	1.20	0.99	0.000
25.00	1.20	0.99	0.000	35.20	1.20	0.99	0.000
25.20	1.20	0.99	0.000	35.40	1.20	0.99	0.000
25.40	1.20	0.99	0.000	35.60	1.20	0.99	0.000
25.60	1.20	0.99	0.000	35.80	1.20	0.99	0.000
25.80	1.20	0.99	0.000	36.00	1.20	0.99	0.000
26.00	1.20	0.99	0.000	36.20	1.20	0.99	0.000
26.20	1.20	0.99	0.000	36.40	1.20	0.99	0.000
26.40	1.20	0.99	0.000	36.60	1.20	0.99	0.000
26.60	1.20	0.99	0.000	36.80	1.20	0.99	0.000
26.80	1.20	0.99	0.000	37.00	1.20	0.99	0.000
27.00	1.20	0.99	0.000	37.20	1.20	0.99	0.000
27.20	1.20	0.99	0.000	37.40	1.20	0.99	0.000
27.40	1.20	0.99	0.000	37.60	1.20	0.99	0.000
27.60	1.20	0.99	0.000	37.80	1.20	0.99	0.000
27.80	1.20	0.99	0.000	38.00	1.20	0.99	0.000
28.00	1.20	0.99	0.000	38.20	1.20	0.99	0.000
28.20	1.20	0.99	0.000	38.40	1.20	0.99	0.000
28.40	1.20	0.99	0.000	38.60	1.20	0.99	0.000
28.60	1.20	0.99	0.000	38.80	1.20	0.99	0.000
28.80	1.20	0.99	0.000	39.00	1.20	0.99	0.000
29.00	1.20	0.99	0.000	39.20	1.20	0.99	0.000
29.20	1.20	0.99	0.000	39.40	1.20	0.99	0.000
29.40	1.20	0.99	0.000	39.60	1.20	0.99	0.000
29.60	1.20	0.99	0.000	39.80	1.20	0.99	0.000
29.80	1.20	0.99	0.000	40.00	1.20	0.99	0.000
30.00	1.20	0.99	0.000	40.20	1.20	0.99	0.000
30.20	1.20	0.99	0.000	40.40	1.20	0.99	0.000
30.40	1.20	0.99	0.000	40.60	1.20	0.99	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	0.99	0.000	51.00	1.20	0.99	0.000
41.00	1.20	0.99	0.000	51.20	1.20	0.99	0.000
41.20	1.20	0.99	0.000	51.40	1.20	0.99	0.000
41.40	1.20	0.99	0.000	51.60	1.20	0.99	0.000
41.60	1.20	0.99	0.000	51.80	1.20	0.99	0.000
41.80	1.20	0.99	0.000	52.00	1.20	0.99	0.000
42.00	1.20	0.99	0.000	52.20	1.20	0.99	0.000
42.20	1.20	0.99	0.000	52.40	1.20	0.99	0.000
42.40	1.20	0.99	0.000	52.60	1.20	0.99	0.000
42.60	1.20	0.99	0.000	52.80	1.20	0.99	0.000
42.80	1.20	0.99	0.000	53.00	1.20	0.99	0.000
43.00	1.20	0.99	0.000	53.20	1.20	0.99	0.000
43.20	1.20	0.99	0.000	53.40	1.20	0.99	0.000
43.40	1.20	0.99	0.000	53.60	1.20	0.99	0.000
43.60	1.20	0.99	0.000	53.80	1.20	0.99	0.000
43.80	1.20	0.99	0.000	54.00	1.20	0.99	0.000
44.00	1.20	0.99	0.000	54.20	1.20	0.99	0.000
44.20	1.20	0.99	0.000	54.40	1.20	0.99	0.000
44.40	1.20	0.99	0.000	54.60	1.20	0.99	0.000
44.60	1.20	0.99	0.000	54.80	1.20	0.99	0.000
44.80	1.20	0.99	0.000	55.00	1.20	0.99	0.000
45.00	1.20	0.99	0.000	55.20	1.20	0.99	0.000
45.20	1.20	0.99	0.000	55.40	1.20	0.99	0.000
45.40	1.20	0.99	0.000	55.60	1.20	0.99	0.000
45.60	1.20	0.99	0.000	55.80	1.20	0.99	0.000
45.80	1.20	0.99	0.000	56.00	1.20	0.99	0.000
46.00	1.20	0.99	0.000	56.20	1.20	0.99	0.000
46.20	1.20	0.99	0.000	56.40	1.20	0.99	0.000
46.40	1.20	0.99	0.000	56.60	1.20	0.99	0.000
46.60	1.20	0.99	0.000	56.80	1.20	0.99	0.000
46.80	1.20	0.99	0.000	57.00	1.20	0.99	0.000
47.00	1.20	0.99	0.000	57.20	1.20	0.99	0.000
47.20	1.20	0.99	0.000	57.40	1.20	0.99	0.000
47.40	1.20	0.99	0.000	57.60	1.20	0.99	0.000
47.60	1.20	0.99	0.000	57.80	1.20	0.99	0.000
47.80	1.20	0.99	0.000	58.00	1.20	0.99	0.000
48.00	1.20	0.99	0.000	58.20	1.20	0.99	0.000
48.20	1.20	0.99	0.000	58.40	1.20	0.99	0.000
48.40	1.20	0.99	0.000	58.60	1.20	0.99	0.000
48.60	1.20	0.99	0.000	58.80	1.20	0.99	0.000
48.80	1.20	0.99	0.000	59.00	1.20	0.99	0.000
49.00	1.20	0.99	0.000	59.20	1.20	0.99	0.000
49.20	1.20	0.99	0.000	59.40	1.20	0.99	0.000
49.40	1.20	0.99	0.000	59.60	1.20	0.99	0.000
49.60	1.20	0.99	0.000	59.80	1.20	0.99	0.000
49.80	1.20	0.99	0.000	60.00	1.20	0.99	0.000
50.00	1.20	0.99	0.000	60.20	1.20	0.99	0.000
50.20	1.20	0.99	0.000	60.40	1.20	0.99	0.000
50.40	1.20	0.99	0.000	60.60	1.20	0.99	0.000
50.60	1.20	0.99	0.000	60.80	1.20	0.99	0.000
50.80	1.20	0.99	0.000	61.00	1.20	0.99	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	0.99	0.000	71.40	1.20	0.99	0.000
61.40	1.20	0.99	0.000	71.60	1.20	0.99	0.000
61.60	1.20	0.99	0.000	71.80	1.20	0.99	0.000
61.80	1.20	0.99	0.000	72.00	1.20	0.99	0.000
62.00	1.20	0.99	0.000	72.20	1.20	0.99	0.000
62.20	1.20	0.99	0.000	72.40	1.20	0.99	0.000
62.40	1.20	0.99	0.000	72.60	1.20	0.99	0.000
62.60	1.20	0.99	0.000	72.80	1.20	0.99	0.000
62.80	1.20	0.99	0.000	73.00	1.20	0.99	0.000
63.00	1.20	0.99	0.000	73.20	1.20	0.99	0.000
63.20	1.20	0.99	0.000	73.40	1.20	0.99	0.000
63.40	1.20	0.99	0.000	73.60	1.20	0.99	0.000
63.60	1.20	0.99	0.000	73.80	1.20	0.99	0.000
63.80	1.20	0.99	0.000	74.00	1.20	0.99	0.000
64.00	1.20	0.99	0.000	74.20	1.20	0.99	0.000
64.20	1.20	0.99	0.000	74.40	1.20	0.99	0.000
64.40	1.20	0.99	0.000	74.60	1.20	0.99	0.000
64.60	1.20	0.99	0.000	74.80	1.20	0.99	0.000
64.80	1.20	0.99	0.000	75.00	1.20	0.99	0.000
65.00	1.20	0.99	0.000	75.20	1.20	0.99	0.000
65.20	1.20	0.99	0.000	75.40	1.20	0.99	0.000
65.40	1.20	0.99	0.000	75.60	1.20	0.99	0.000
65.60	1.20	0.99	0.000	75.80	1.20	0.99	0.000
65.80	1.20	0.99	0.000	76.00	1.20	0.99	0.000
66.00	1.20	0.99	0.000	76.20	1.20	0.99	0.000
66.20	1.20	0.99	0.000	76.40	1.20	0.99	0.000
66.40	1.20	0.99	0.000	76.60	1.20	0.99	0.000
66.60	1.20	0.99	0.000	76.80	1.20	0.99	0.000
66.80	1.20	0.99	0.000	77.00	1.20	0.99	0.000
67.00	1.20	0.99	0.000	77.20	1.20	0.99	0.000
67.20	1.20	0.99	0.000	77.40	1.20	0.99	0.000
67.40	1.20	0.99	0.000	77.60	1.20	0.99	0.000
67.60	1.20	0.99	0.000	77.80	1.20	0.99	0.000
67.80	1.20	0.99	0.000	78.00	1.20	0.99	0.000
68.00	1.20	0.99	0.000	78.20	1.20	0.99	0.000
68.20	1.20	0.99	0.000	78.40	1.20	0.99	0.000
68.40	1.20	0.99	0.000	78.60	1.20	0.99	0.000
68.60	1.20	0.99	0.000	78.80	1.20	0.99	0.000
68.80	1.20	0.99	0.000	79.00	1.20	0.99	0.000
69.00	1.20	0.99	0.000	79.20	1.20	0.99	0.000
69.20	1.20	0.99	0.000	79.40	1.20	0.99	0.000
69.40	1.20	0.99	0.000	79.60	1.20	0.99	0.000
69.60	1.20	0.99	0.000	79.80	1.20	0.99	0.000
69.80	1.20	0.99	0.000	80.00	1.20	0.99	0.000
70.00	1.20	0.99	0.000	80.20	1.20	0.99	0.000
70.20	1.20	0.99	0.000	80.40	1.20	0.99	0.000
70.40	1.20	0.99	0.000	80.60	1.20	0.99	0.000
70.60	1.20	0.99	0.000	80.80	1.20	0.99	0.000
70.80	1.20	0.99	0.000	81.00	1.20	0.99	0.000
71.00	1.20	0.99	0.000	81.20	1.20	0.99	0.000
71.20	1.20	0.99	0.000	81.40	1.20	0.99	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	0.99	0.000	91.80	1.20	0.99	0.000
81.80	1.20	0.99	0.000	92.00	1.20	0.99	0.000
82.00	1.20	0.99	0.000	92.20	1.20	0.99	0.000
82.20	1.20	0.99	0.000	92.40	1.20	0.99	0.000
82.40	1.20	0.99	0.000	92.60	1.20	0.99	0.000
82.60	1.20	0.99	0.000	92.80	1.20	0.99	0.000
82.80	1.20	0.99	0.000	93.00	1.20	0.99	0.000
83.00	1.20	0.99	0.000	93.20	1.20	0.99	0.000
83.20	1.20	0.99	0.000	93.40	1.20	0.99	0.000
83.40	1.20	0.99	0.000	93.60	1.20	0.99	0.000
83.60	1.20	0.99	0.000	93.80	1.20	0.99	0.000
83.80	1.20	0.99	0.000	94.00	1.20	0.99	0.000
84.00	1.20	0.99	0.000	94.20	1.20	0.99	0.000
84.20	1.20	0.99	0.000	94.40	1.20	0.99	0.000
84.40	1.20	0.99	0.000	94.60	1.20	0.99	0.000
84.60	1.20	0.99	0.000	94.80	1.20	0.99	0.000
84.80	1.20	0.99	0.000	95.00	1.20	0.99	0.000
85.00	1.20	0.99	0.000	95.20	1.20	0.99	0.000
85.20	1.20	0.99	0.000	95.40	1.20	0.99	0.000
85.40	1.20	0.99	0.000	95.60	1.20	0.99	0.000
85.60	1.20	0.99	0.000	95.80	1.20	0.99	0.000
85.80	1.20	0.99	0.000	96.00	1.20	0.99	0.000
86.00	1.20	0.99	0.000	96.20	1.20	0.99	0.000
86.20	1.20	0.99	0.000	96.40	1.20	0.99	0.000
86.40	1.20	0.99	0.000	96.60	1.20	0.99	0.000
86.60	1.20	0.99	0.000	96.80	1.20	0.99	0.000
86.80	1.20	0.99	0.000	97.00	1.20	0.99	0.000
87.00	1.20	0.99	0.000	97.20	1.20	0.99	0.000
87.20	1.20	0.99	0.000	97.40	1.20	0.99	0.000
87.40	1.20	0.99	0.000	97.60	1.20	0.99	0.000
87.60	1.20	0.99	0.000	97.80	1.20	0.99	0.000
87.80	1.20	0.99	0.000	98.00	1.20	0.99	0.000
88.00	1.20	0.99	0.000	98.20	1.20	0.99	0.000
88.20	1.20	0.99	0.000	98.40	1.20	0.99	0.000
88.40	1.20	0.99	0.000	98.60	1.20	0.99	0.000
88.60	1.20	0.99	0.000	98.80	1.20	0.99	0.000
88.80	1.20	0.99	0.000	99.00	1.20	0.99	0.000
89.00	1.20	0.99	0.000	99.20	1.20	0.99	0.000
89.20	1.20	0.99	0.000	99.40	1.20	0.99	0.000
89.40	1.20	0.99	0.000	99.60	1.20	0.99	0.000
89.60	1.20	0.99	0.000	99.80	1.20	0.99	0.000
89.80	1.20	0.99	0.000	100.00	1.20	0.99	0.000
90.00	1.20	0.99	0.000	100.20	1.20	0.99	0.000
90.20	1.20	0.99	0.000	100.40	1.20	0.99	0.000
90.40	1.20	0.99	0.000	100.60	1.20	0.99	0.000
90.60	1.20	0.99	0.000	100.80	1.20	0.99	0.000
90.80	1.20	0.99	0.000	101.00	1.20	0.99	0.000
91.00	1.20	0.99	0.000	101.20	1.20	0.99	0.000
91.20	1.20	0.99	0.000	101.40	1.20	0.99	0.000
91.40	1.20	0.99	0.000	101.60	1.20	0.99	0.000
91.60	1.20	0.99	0.000	101.80	1.20	0.99	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	0.99	0.000	112.20	1.20	0.99	0.000
102.20	1.20	0.99	0.000	112.40	1.20	0.99	0.000
102.40	1.20	0.99	0.000	112.60	1.20	0.99	0.000
102.60	1.20	0.99	0.000	112.80	1.20	0.99	0.000
102.80	1.20	0.99	0.000	113.00	1.20	0.99	0.000
103.00	1.20	0.99	0.000	113.20	1.20	0.99	0.000
103.20	1.20	0.99	0.000	113.40	1.20	0.99	0.000
103.40	1.20	0.99	0.000	113.60	1.20	0.99	0.000
103.60	1.20	0.99	0.000	113.80	1.20	0.99	0.000
103.80	1.20	0.99	0.000	114.00	1.20	0.99	0.000
104.00	1.20	0.99	0.000	114.20	1.20	0.99	0.000
104.20	1.20	0.99	0.000	114.40	1.20	0.99	0.000
104.40	1.20	0.99	0.000	114.60	1.20	0.99	0.000
104.60	1.20	0.99	0.000	114.80	1.20	0.99	0.000
104.80	1.20	0.99	0.000	115.00	1.20	0.99	0.000
105.00	1.20	0.99	0.000	115.20	1.20	0.99	0.000
105.20	1.20	0.99	0.000	115.40	1.20	0.99	0.000
105.40	1.20	0.99	0.000	115.60	1.20	0.99	0.000
105.60	1.20	0.99	0.000	115.80	1.20	0.99	0.000
105.80	1.20	0.99	0.000	116.00	1.20	0.99	0.000
106.00	1.20	0.99	0.000	116.20	1.20	0.99	0.000
106.20	1.20	0.99	0.000	116.40	1.20	0.99	0.000
106.40	1.20	0.99	0.000	116.60	1.20	0.99	0.000
106.60	1.20	0.99	0.000	116.80	1.20	0.99	0.000
106.80	1.20	0.99	0.000	117.00	1.20	0.99	0.000
107.00	1.20	0.99	0.000	117.20	1.20	0.99	0.000
107.20	1.20	0.99	0.000	117.40	1.20	0.99	0.000
107.40	1.20	0.99	0.000	117.60	1.20	0.99	0.000
107.60	1.20	0.99	0.000	117.80	1.20	0.99	0.000
107.80	1.20	0.99	0.000	118.00	1.20	0.99	0.000
108.00	1.20	0.99	0.000	118.20	1.20	0.99	0.000
108.20	1.20	0.99	0.000	118.40	1.20	0.99	0.000
108.40	1.20	0.99	0.000	118.60	1.20	0.99	0.000
108.60	1.20	0.99	0.000	118.80	1.20	0.99	0.000
108.80	1.20	0.99	0.000	119.00	1.20	0.99	0.000
109.00	1.20	0.99	0.000	119.20	1.20	0.99	0.000
109.20	1.20	0.99	0.000	119.40	1.20	0.99	0.000
109.40	1.20	0.99	0.000	119.60	1.20	0.99	0.000
109.60	1.20	0.99	0.000	119.80	1.20	0.99	0.000
109.80	1.20	0.99	0.000	120.00	1.20	0.99	0.000
110.00	1.20	0.99	0.000	120.20	1.20	0.99	0.000
110.20	1.20	0.99	0.000	120.40	1.20	0.99	0.000
110.40	1.20	0.99	0.000	120.60	1.20	0.99	0.000
110.60	1.20	0.99	0.000	120.80	1.20	0.99	0.000
110.80	1.20	0.99	0.000	121.00	1.20	0.99	0.000
111.00	1.20	0.99	0.000	121.20	1.20	0.99	0.000
111.20	1.20	0.99	0.000	121.40	1.20	0.99	0.000
111.40	1.20	0.99	0.000	121.60	1.20	0.99	0.000
111.60	1.20	0.99	0.000	121.80	1.20	0.99	0.000
111.80	1.20	0.99	0.000	122.00	1.20	0.99	0.000
112.00	1.20	0.99	0.000	122.20	1.20	0.99	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	0.99	0.000	132.60	1.20	0.99	0.000
122.60	1.20	0.99	0.000	132.80	1.20	0.99	0.000
122.80	1.20	0.99	0.000	133.00	1.20	0.99	0.000
123.00	1.20	0.99	0.000	133.20	1.20	0.99	0.000
123.20	1.20	0.99	0.000	133.40	1.20	0.99	0.000
123.40	1.20	0.99	0.000	133.60	1.20	0.99	0.000
123.60	1.20	0.99	0.000	133.80	1.20	0.99	0.000
123.80	1.20	0.99	0.000	134.00	1.20	0.99	0.000
124.00	1.20	0.99	0.000	134.20	1.20	0.99	0.000
124.20	1.20	0.99	0.000	134.40	1.20	0.99	0.000
124.40	1.20	0.99	0.000	134.60	1.20	0.99	0.000
124.60	1.20	0.99	0.000	134.80	1.20	0.99	0.000
124.80	1.20	0.99	0.000	135.00	1.20	0.99	0.000
125.00	1.20	0.99	0.000	135.20	1.20	0.99	0.000
125.20	1.20	0.99	0.000	135.40	1.20	0.99	0.000
125.40	1.20	0.99	0.000	135.60	1.20	0.99	0.000
125.60	1.20	0.99	0.000	135.80	1.20	0.99	0.000
125.80	1.20	0.99	0.000	136.00	1.20	0.99	0.000
126.00	1.20	0.99	0.000	136.20	1.20	0.99	0.000
126.20	1.20	0.99	0.000	136.40	1.20	0.99	0.000
126.40	1.20	0.99	0.000	136.60	1.20	0.99	0.000
126.60	1.20	0.99	0.000	136.80	1.20	0.99	0.000
126.80	1.20	0.99	0.000	137.00	1.20	0.99	0.000
127.00	1.20	0.99	0.000	137.20	1.20	0.99	0.000
127.20	1.20	0.99	0.000	137.40	1.20	0.99	0.000
127.40	1.20	0.99	0.000	137.60	1.20	0.99	0.000
127.60	1.20	0.99	0.000	137.80	1.20	0.99	0.000
127.80	1.20	0.99	0.000	138.00	1.20	0.99	0.000
128.00	1.20	0.99	0.000	138.20	1.20	0.99	0.000
128.20	1.20	0.99	0.000	138.40	1.20	0.99	0.000
128.40	1.20	0.99	0.000	138.60	1.20	0.99	0.000
128.60	1.20	0.99	0.000	138.80	1.20	0.99	0.000
128.80	1.20	0.99	0.000	139.00	1.20	0.99	0.000
129.00	1.20	0.99	0.000	139.20	1.20	0.99	0.000
129.20	1.20	0.99	0.000	139.40	1.20	0.99	0.000
129.40	1.20	0.99	0.000	139.60	1.20	0.99	0.000
129.60	1.20	0.99	0.000	139.80	1.20	0.99	0.000
129.80	1.20	0.99	0.000	140.00	1.20	0.99	0.000
130.00	1.20	0.99	0.000	140.20	1.20	0.99	0.000
130.20	1.20	0.99	0.000	140.40	1.20	0.99	0.000
130.40	1.20	0.99	0.000	140.60	1.20	0.99	0.000
130.60	1.20	0.99	0.000	140.80	1.20	0.99	0.000
130.80	1.20	0.99	0.000	141.00	1.20	0.99	0.000
131.00	1.20	0.99	0.000	141.20	1.20	0.99	0.000
131.20	1.20	0.99	0.000	141.40	1.20	0.99	0.000
131.40	1.20	0.99	0.000	141.60	1.20	0.99	0.000
131.60	1.20	0.99	0.000	141.80	1.20	0.99	0.000
131.80	1.20	0.99	0.000	142.00	1.20	0.99	0.000
132.00	1.20	0.99	0.000	142.20	1.20	0.99	0.000
132.20	1.20	0.99	0.000	142.40	1.20	0.99	0.000
132.40	1.20	0.99	0.000	142.60	1.20	0.99	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	0.99	0.000	153.00	1.20	0.99	0.000
143.00	1.20	0.99	0.000	153.20	1.20	0.99	0.000
143.20	1.20	0.99	0.000	153.40	1.20	0.99	0.000
143.40	1.20	0.99	0.000	153.60	1.20	0.99	0.000
143.60	1.20	0.99	0.000	153.80	1.20	0.99	0.000
143.80	1.20	0.99	0.000	154.00	1.20	0.99	0.000
144.00	1.20	0.99	0.000	154.20	1.20	0.99	0.000
144.20	1.20	0.99	0.000	154.40	1.20	0.99	0.000
144.40	1.20	0.99	0.000	154.60	1.20	0.99	0.000
144.60	1.20	0.99	0.000	154.80	1.20	0.99	0.000
144.80	1.20	0.99	0.000	155.00	1.20	0.99	0.000
145.00	1.20	0.99	0.000	155.20	1.20	0.99	0.000
145.20	1.20	0.99	0.000	155.40	1.20	0.99	0.000
145.40	1.20	0.99	0.000	155.60	1.20	0.99	0.000
145.60	1.20	0.99	0.000	155.80	1.20	0.99	0.000
145.80	1.20	0.99	0.000	156.00	1.20	0.99	0.000
146.00	1.20	0.99	0.000	156.20	1.20	0.99	0.000
146.20	1.20	0.99	0.000	156.40	1.20	0.99	0.000
146.40	1.20	0.99	0.000	156.60	1.20	0.99	0.000
146.60	1.20	0.99	0.000	156.80	1.20	0.99	0.000
146.80	1.20	0.99	0.000	157.00	1.20	0.99	0.000
147.00	1.20	0.99	0.000	157.20	1.20	0.99	0.000
147.20	1.20	0.99	0.000	157.40	1.20	0.99	0.000
147.40	1.20	0.99	0.000	157.60	1.20	0.99	0.000
147.60	1.20	0.99	0.000	157.80	1.20	0.99	0.000
147.80	1.20	0.99	0.000	158.00	1.20	0.99	0.000
148.00	1.20	0.99	0.000	158.20	1.20	0.99	0.000
148.20	1.20	0.99	0.000	158.40	1.20	0.99	0.000
148.40	1.20	0.99	0.000	158.60	1.20	0.99	0.000
148.60	1.20	0.99	0.000	158.80	1.20	0.99	0.000
148.80	1.20	0.99	0.000	159.00	1.20	0.99	0.000
149.00	1.20	0.99	0.000	159.20	1.20	0.99	0.000
149.20	1.20	0.99	0.000	159.40	1.20	0.99	0.000
149.40	1.20	0.99	0.000	159.60	1.20	0.99	0.000
149.60	1.20	0.99	0.000	159.80	1.20	0.99	0.000
149.80	1.20	0.99	0.000	160.00	1.20	0.99	0.000
150.00	1.20	0.99	0.000	160.20	1.20	0.99	0.000
150.20	1.20	0.99	0.000	160.40	1.20	0.99	0.000
150.40	1.20	0.99	0.000	160.60	1.20	0.99	0.000
150.60	1.20	0.99	0.000	160.80	1.20	0.99	0.000
150.80	1.20	0.99	0.000	161.00	1.20	0.99	0.000
151.00	1.20	0.99	0.000	161.20	1.20	0.99	0.000
151.20	1.20	0.99	0.000	161.40	1.20	0.99	0.000
151.40	1.20	0.99	0.000	161.60	1.20	0.99	0.000
151.60	1.20	0.99	0.000	161.80	1.20	0.99	0.000
151.80	1.20	0.99	0.000	162.00	1.20	0.99	0.000
152.00	1.20	0.99	0.000	162.20	1.20	0.99	0.000
152.20	1.20	0.99	0.000	162.40	1.20	0.99	0.000
152.40	1.20	0.99	0.000	162.60	1.20	0.99	0.000
152.60	1.20	0.99	0.000	162.80	1.20	0.99	0.000
152.80	1.20	0.99	0.000	163.00	1.20	0.99	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	0.99	0.000
163.40	1.20	0.99	0.000
163.60	1.20	0.99	0.000
163.80	1.20	0.99	0.000
164.00	1.20	0.99	0.000
164.20	1.20	0.99	0.000
164.40	1.20	0.99	0.000
164.60	1.20	0.99	0.000
164.80	1.20	0.99	0.000
165.00	1.20	0.99	0.000
165.20	1.20	0.99	0.000
165.40	1.20	0.99	0.000
165.60	1.20	0.99	0.000
165.80	1.20	0.99	0.000
166.00	1.20	0.99	0.000
166.20	1.20	0.99	0.000
166.40	1.20	0.99	0.000
166.60	1.20	0.99	0.000
166.80	1.20	0.99	0.000
167.00	1.20	0.99	0.000
167.20	1.20	0.99	0.000
167.40	1.20	0.99	0.000
167.60	1.20	0.99	0.000
167.80	1.20	0.99	0.000
168.00	1.20	0.99	0.000

Summary for Pond 1P: UG1

Inflow Area = 81,675 sf, 99.20% Impervious, Inflow Depth = 0.98" for 1.2 Inch MRC event
Inflow = 5.311 cfs @ 1.10 hrs, Volume= 6,655 cf
Outflow = 0.023 cfs @ 2.12 hrs, Volume= 6,566 cf, Atten= 100%, Lag= 61.1 min
Primary = 0.023 cfs @ 2.12 hrs, Volume= 6,566 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 158.37' @ 2.12 hrs Surf.Area= 13,041 sf Storage= 6,557 cf

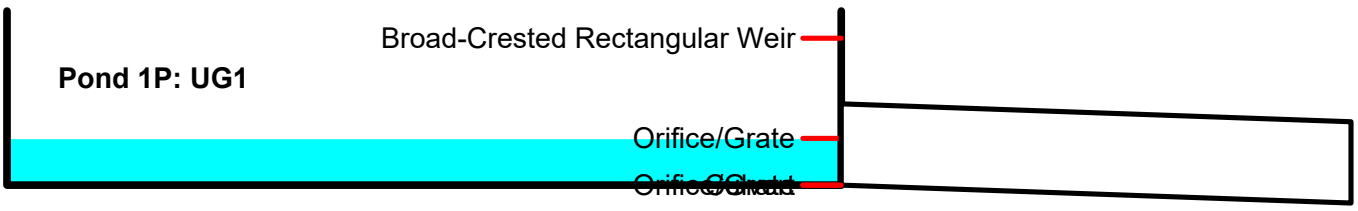
Plug-Flow detention time= 2,846.6 min calculated for 6,566 cf (99% of inflow)
Center-of-Mass det. time= 2,846.3 min (2,915.8 - 69.5)

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'	**40.0" 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= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.023 cfs @ 2.12 hrs HW=158.37' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 0.023 cfs of 2.515 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.023 cfs @ 4.297 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

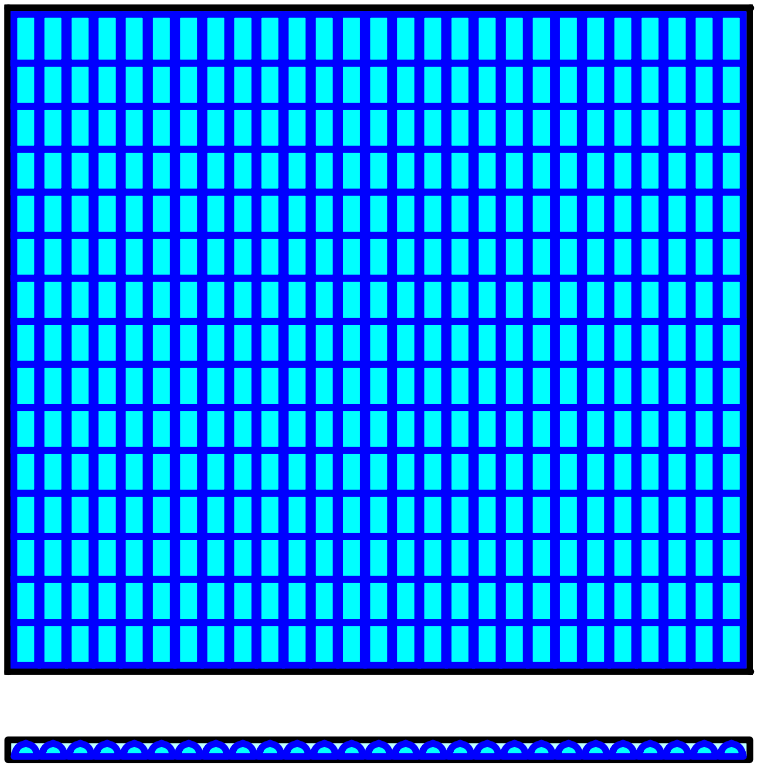
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

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

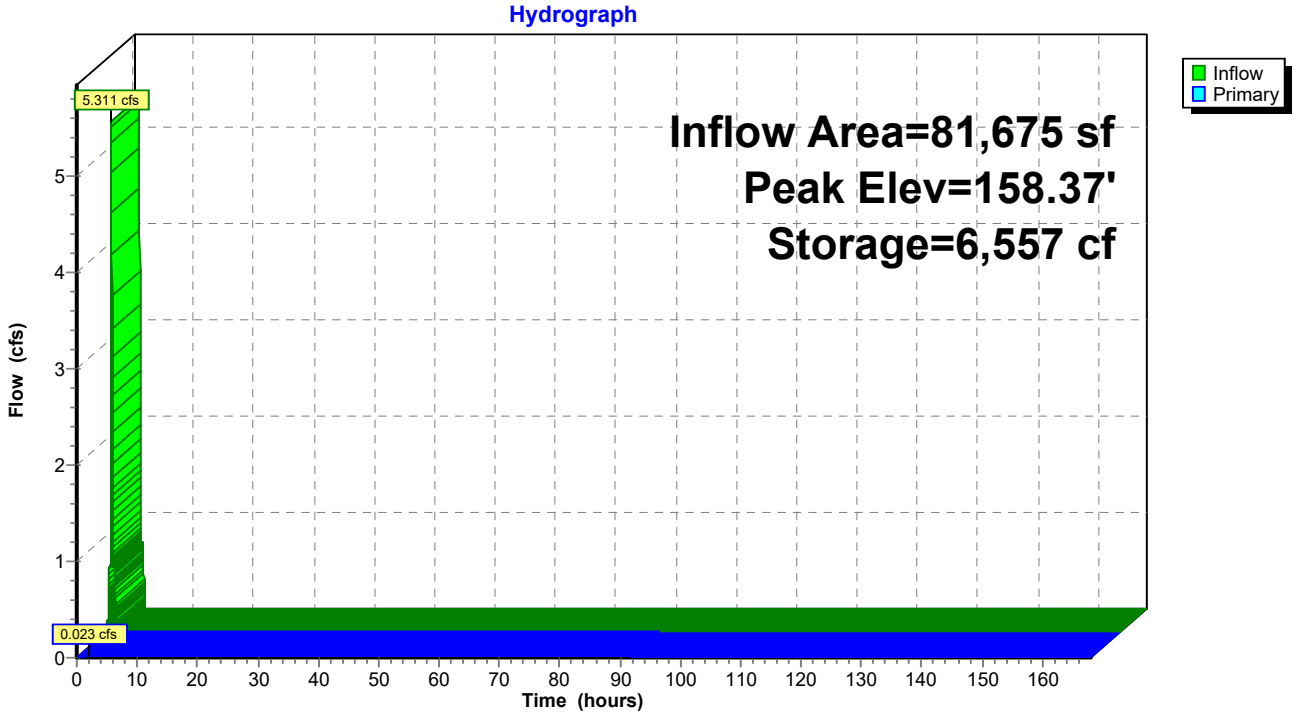
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

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=81,675 sf
Peak Elev=158.37'
Storage=6,557 cf
5.311 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	33	157.54	0.000
1.00	**3.869**	1,465	157.81	0.013
1.50	**0.695**	5,785	158.30	0.022
2.00	0.176	**6,520**	**158.36**	**0.023**
2.50	0.000	**6,527**	**158.37**	**0.023**
3.00	0.000	6,485	158.36	0.023
3.50	0.000	6,443	158.36	0.023
4.00	0.000	6,401	158.35	0.023
4.50	0.000	6,359	158.35	0.023
5.00	0.000	6,318	158.35	0.023
5.50	0.000	6,276	158.34	0.023
6.00	0.000	6,235	158.34	0.023
6.50	0.000	6,193	158.34	0.023
7.00	0.000	6,152	158.33	0.023
7.50	0.000	6,111	158.33	0.023
8.00	0.000	6,070	158.33	0.023
8.50	0.000	6,029	158.32	0.023
9.00	0.000	5,988	158.32	0.023
9.50	0.000	5,947	158.32	0.023
10.00	0.000	5,906	158.31	0.023
10.50	0.000	5,866	158.31	0.023
11.00	0.000	5,825	158.30	0.022
11.50	0.000	5,785	158.30	0.022
12.00	0.000	5,744	158.30	0.022
12.50	0.000	5,704	158.29	0.022
13.00	0.000	5,664	158.29	0.022
13.50	0.000	5,624	158.29	0.022
14.00	0.000	5,584	158.28	0.022
14.50	0.000	5,544	158.28	0.022
15.00	0.000	5,504	158.28	0.022
15.50	0.000	5,465	158.27	0.022
16.00	0.000	5,425	158.27	0.022
16.50	0.000	5,386	158.27	0.022
17.00	0.000	5,346	158.26	0.022
17.50	0.000	5,307	158.26	0.022
18.00	0.000	5,268	158.26	0.022
18.50	0.000	5,229	158.25	0.022
19.00	0.000	5,190	158.25	0.022
19.50	0.000	5,151	158.25	0.022
20.00	0.000	5,112	158.24	0.022
20.50	0.000	5,074	158.24	0.021
21.00	0.000	5,035	158.24	0.021
21.50	0.000	4,996	158.23	0.021
22.00	0.000	4,958	158.23	0.021
22.50	0.000	4,920	158.23	0.021
23.00	0.000	4,882	158.22	0.021
23.50	0.000	4,843	158.22	0.021
24.00	0.000	4,805	158.22	0.021
24.50	0.000	4,768	158.21	0.021
25.00	0.000	4,730	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	4,692	158.21	0.021
26.00	0.000	4,654	158.20	0.021
26.50	0.000	4,617	158.20	0.021
27.00	0.000	4,579	158.20	0.021
27.50	0.000	4,542	158.19	0.021
28.00	0.000	4,505	158.19	0.021
28.50	0.000	4,468	158.19	0.021
29.00	0.000	4,431	158.18	0.021
29.50	0.000	4,394	158.18	0.021
30.00	0.000	4,357	158.18	0.020
30.50	0.000	4,320	158.18	0.020
31.00	0.000	4,283	158.17	0.020
31.50	0.000	4,247	158.17	0.020
32.00	0.000	4,210	158.17	0.020
32.50	0.000	4,174	158.16	0.020
33.00	0.000	4,138	158.16	0.020
33.50	0.000	4,101	158.16	0.020
34.00	0.000	4,065	158.15	0.020
34.50	0.000	4,029	158.15	0.020
35.00	0.000	3,993	158.15	0.020
35.50	0.000	3,958	158.14	0.020
36.00	0.000	3,922	158.14	0.020
36.50	0.000	3,886	158.14	0.020
37.00	0.000	3,851	158.13	0.020
37.50	0.000	3,815	158.13	0.020
38.00	0.000	3,780	158.13	0.020
38.50	0.000	3,745	158.13	0.020
39.00	0.000	3,710	158.12	0.019
39.50	0.000	3,675	158.12	0.019
40.00	0.000	3,640	158.12	0.019
40.50	0.000	3,605	158.11	0.019
41.00	0.000	3,570	158.11	0.019
41.50	0.000	3,535	158.11	0.019
42.00	0.000	3,501	158.11	0.019
42.50	0.000	3,466	158.10	0.019
43.00	0.000	3,432	158.10	0.019
43.50	0.000	3,398	158.10	0.019
44.00	0.000	3,363	158.09	0.019
44.50	0.000	3,329	158.09	0.019
45.00	0.000	3,295	158.09	0.019
45.50	0.000	3,261	158.08	0.019
46.00	0.000	3,228	158.08	0.019
46.50	0.000	3,194	158.08	0.019
47.00	0.000	3,160	158.08	0.019
47.50	0.000	3,127	158.07	0.019
48.00	0.000	3,093	158.07	0.019
48.50	0.000	3,060	158.07	0.019
49.00	0.000	3,027	158.07	0.018
49.50	0.000	2,993	158.06	0.018
50.00	0.000	2,960	158.06	0.018
50.50	0.000	2,927	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	2,895	158.05	0.018
51.50	0.000	2,862	158.05	0.018
52.00	0.000	2,829	158.05	0.018
52.50	0.000	2,796	158.05	0.018
53.00	0.000	2,764	158.04	0.018
53.50	0.000	2,732	158.04	0.018
54.00	0.000	2,699	158.04	0.018
54.50	0.000	2,667	158.03	0.018
55.00	0.000	2,635	158.03	0.018
55.50	0.000	2,603	158.03	0.018
56.00	0.000	2,571	158.02	0.018
56.50	0.000	2,539	158.02	0.018
57.00	0.000	2,508	158.01	0.017
57.50	0.000	2,477	158.00	0.017
58.00	0.000	2,446	158.00	0.017
58.50	0.000	2,415	157.99	0.017
59.00	0.000	2,384	157.99	0.017
59.50	0.000	2,354	157.98	0.017
60.00	0.000	2,324	157.98	0.017
60.50	0.000	2,294	157.97	0.017
61.00	0.000	2,264	157.96	0.016
61.50	0.000	2,235	157.96	0.016
62.00	0.000	2,205	157.95	0.016
62.50	0.000	2,176	157.95	0.016
63.00	0.000	2,147	157.94	0.016
63.50	0.000	2,119	157.94	0.016
64.00	0.000	2,090	157.93	0.016
64.50	0.000	2,062	157.93	0.016
65.00	0.000	2,034	157.92	0.015
65.50	0.000	2,006	157.91	0.015
66.00	0.000	1,979	157.91	0.015
66.50	0.000	1,951	157.90	0.015
67.00	0.000	1,924	157.90	0.015
67.50	0.000	1,897	157.89	0.015
68.00	0.000	1,871	157.89	0.015
68.50	0.000	1,844	157.88	0.015
69.00	0.000	1,818	157.88	0.015
69.50	0.000	1,792	157.87	0.014
70.00	0.000	1,766	157.87	0.014
70.50	0.000	1,740	157.86	0.014
71.00	0.000	1,715	157.86	0.014
71.50	0.000	1,690	157.85	0.014
72.00	0.000	1,665	157.85	0.014
72.50	0.000	1,640	157.84	0.014
73.00	0.000	1,615	157.84	0.014
73.50	0.000	1,591	157.83	0.013
74.00	0.000	1,567	157.83	0.013
74.50	0.000	1,543	157.83	0.013
75.00	0.000	1,519	157.82	0.013
75.50	0.000	1,496	157.82	0.013
76.00	0.000	1,472	157.81	0.013

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
76.50	0.000	1,449	157.81	0.013
77.00	0.000	1,426	157.80	0.013
77.50	0.000	1,404	157.80	0.013
78.00	0.000	1,381	157.79	0.012
78.50	0.000	1,359	157.79	0.012
79.00	0.000	1,337	157.79	0.012
79.50	0.000	1,315	157.78	0.012
80.00	0.000	1,294	157.78	0.012
80.50	0.000	1,272	157.77	0.012
81.00	0.000	1,251	157.77	0.012
81.50	0.000	1,230	157.77	0.012
82.00	0.000	1,210	157.76	0.011
82.50	0.000	1,189	157.76	0.011
83.00	0.000	1,169	157.75	0.011
83.50	0.000	1,149	157.75	0.011
84.00	0.000	1,129	157.75	0.011
84.50	0.000	1,109	157.74	0.011
85.00	0.000	1,090	157.74	0.011
85.50	0.000	1,071	157.74	0.011
86.00	0.000	1,052	157.73	0.010
86.50	0.000	1,033	157.73	0.010
87.00	0.000	1,014	157.72	0.010
87.50	0.000	996	157.72	0.010
88.00	0.000	978	157.72	0.010
88.50	0.000	960	157.71	0.010
89.00	0.000	942	157.71	0.010
89.50	0.000	925	157.71	0.010
90.00	0.000	907	157.70	0.010
90.50	0.000	890	157.70	0.009
91.00	0.000	873	157.70	0.009
91.50	0.000	857	157.69	0.009
92.00	0.000	840	157.69	0.009
92.50	0.000	824	157.69	0.009
93.00	0.000	808	157.68	0.009
93.50	0.000	792	157.68	0.009
94.00	0.000	777	157.68	0.009
94.50	0.000	761	157.68	0.008
95.00	0.000	746	157.67	0.008
95.50	0.000	731	157.67	0.008
96.00	0.000	716	157.67	0.008
96.50	0.000	702	157.66	0.008
97.00	0.000	688	157.66	0.008
97.50	0.000	674	157.66	0.008
98.00	0.000	660	157.66	0.008
98.50	0.000	646	157.65	0.008
99.00	0.000	633	157.65	0.007
99.50	0.000	619	157.65	0.007
100.00	0.000	606	157.65	0.007
100.50	0.000	594	157.64	0.007
101.00	0.000	581	157.64	0.007
101.50	0.000	569	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	556	157.64	0.007
102.50	0.000	545	157.63	0.007
103.00	0.000	533	157.63	0.006
103.50	0.000	521	157.63	0.006
104.00	0.000	510	157.63	0.006
104.50	0.000	499	157.63	0.006
105.00	0.000	488	157.62	0.006
105.50	0.000	477	157.62	0.006
106.00	0.000	467	157.62	0.006
106.50	0.000	457	157.62	0.006
107.00	0.000	447	157.62	0.006
107.50	0.000	437	157.61	0.005
108.00	0.000	427	157.61	0.005
108.50	0.000	418	157.61	0.005
109.00	0.000	409	157.61	0.005
109.50	0.000	400	157.61	0.005
110.00	0.000	391	157.60	0.005
110.50	0.000	382	157.60	0.005
111.00	0.000	374	157.60	0.005
111.50	0.000	366	157.60	0.004
112.00	0.000	358	157.60	0.004
112.50	0.000	350	157.60	0.004
113.00	0.000	343	157.60	0.004
113.50	0.000	336	157.59	0.004
114.00	0.000	329	157.59	0.004
114.50	0.000	322	157.59	0.004
115.00	0.000	316	157.59	0.004
115.50	0.000	309	157.59	0.003
116.00	0.000	303	157.59	0.003
116.50	0.000	297	157.59	0.003
117.00	0.000	292	157.59	0.003
117.50	0.000	286	157.58	0.003
118.00	0.000	281	157.58	0.003
118.50	0.000	276	157.58	0.003
119.00	0.000	271	157.58	0.003
119.50	0.000	266	157.58	0.003
120.00	0.000	261	157.58	0.003
120.50	0.000	256	157.58	0.003
121.00	0.000	252	157.58	0.002
121.50	0.000	247	157.58	0.002
122.00	0.000	243	157.58	0.002
122.50	0.000	239	157.58	0.002
123.00	0.000	235	157.58	0.002
123.50	0.000	231	157.57	0.002
124.00	0.000	228	157.57	0.002
124.50	0.000	224	157.57	0.002
125.00	0.000	220	157.57	0.002
125.50	0.000	217	157.57	0.002
126.00	0.000	214	157.57	0.002
126.50	0.000	210	157.57	0.002
127.00	0.000	207	157.57	0.002

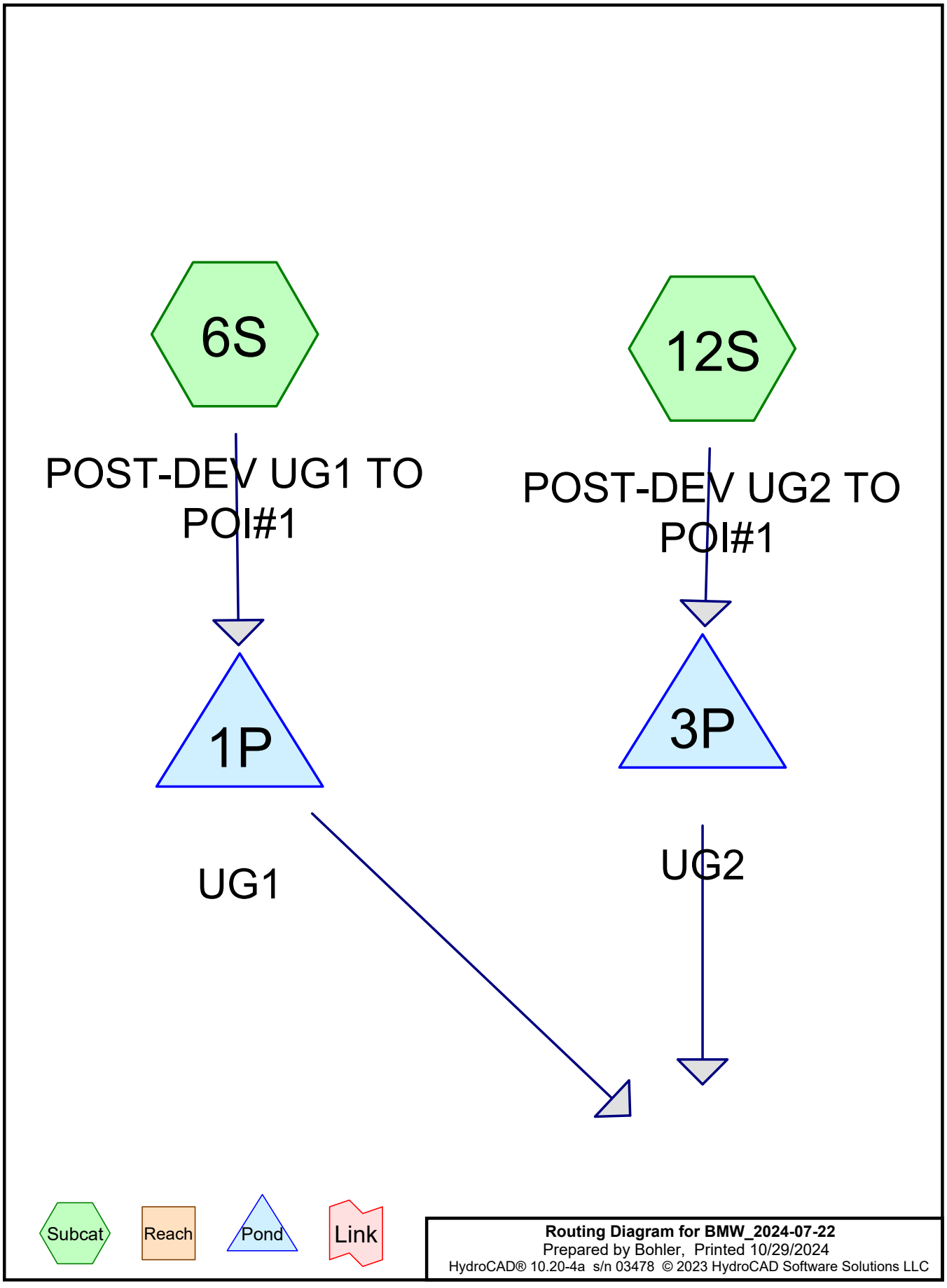
Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
127.50	0.000	204	157.57	0.002
128.00	0.000	201	157.57	0.002
128.50	0.000	198	157.57	0.002
129.00	0.000	195	157.57	0.002
129.50	0.000	192	157.57	0.002
130.00	0.000	190	157.57	0.001
130.50	0.000	187	157.57	0.001
131.00	0.000	185	157.57	0.001
131.50	0.000	182	157.56	0.001
132.00	0.000	180	157.56	0.001
132.50	0.000	177	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	170	157.56	0.001
134.50	0.000	168	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	153	157.56	0.001
139.00	0.000	151	157.56	0.001
139.50	0.000	149	157.56	0.001
140.00	0.000	147	157.56	0.001
140.50	0.000	146	157.56	0.001
141.00	0.000	144	157.56	0.001
141.50	0.000	142	157.56	0.001
142.00	0.000	141	157.56	0.001
142.50	0.000	139	157.56	0.001
143.00	0.000	138	157.56	0.001
143.50	0.000	136	157.56	0.001
144.00	0.000	135	157.56	0.001
144.50	0.000	134	157.56	0.001
145.00	0.000	132	157.56	0.001
145.50	0.000	131	157.56	0.001
146.00	0.000	129	157.55	0.001
146.50	0.000	128	157.55	0.001
147.00	0.000	127	157.55	0.001
147.50	0.000	126	157.55	0.001
148.00	0.000	124	157.55	0.001
148.50	0.000	123	157.55	0.001
149.00	0.000	122	157.55	0.001
149.50	0.000	121	157.55	0.001
150.00	0.000	120	157.55	0.001
150.50	0.000	119	157.55	0.001
151.00	0.000	117	157.55	0.001
151.50	0.000	116	157.55	0.001
152.00	0.000	115	157.55	0.001
152.50	0.000	114	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	113	157.55	0.001
153.50	0.000	112	157.55	0.001
154.00	0.000	111	157.55	0.001
154.50	0.000	110	157.55	0.001
155.00	0.000	109	157.55	0.001
155.50	0.000	108	157.55	0.001
156.00	0.000	107	157.55	0.001
156.50	0.000	107	157.55	0.001
157.00	0.000	106	157.55	0.000
157.50	0.000	105	157.55	0.000
158.00	0.000	104	157.55	0.000
158.50	0.000	103	157.55	0.000
159.00	0.000	102	157.55	0.000
159.50	0.000	101	157.55	0.000
160.00	0.000	101	157.55	0.000
160.50	0.000	100	157.55	0.000
161.00	0.000	99	157.55	0.000
161.50	0.000	98	157.55	0.000
162.00	0.000	97	157.55	0.000
162.50	0.000	97	157.55	0.000
163.00	0.000	96	157.55	0.000
163.50	0.000	95	157.55	0.000
164.00	0.000	94	157.55	0.000
164.50	0.000	94	157.55	0.000
165.00	0.000	93	157.55	0.000
165.50	0.000	92	157.55	0.000
166.00	0.000	92	157.55	0.000
166.50	0.000	91	157.55	0.000
167.00	0.000	90	157.55	0.000
167.50	0.000	90	157.55	0.000
168.00	0.000	89	157.55	0.000

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_2024-07-22
Prepared by Bohler, Printed 10/29/2024
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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

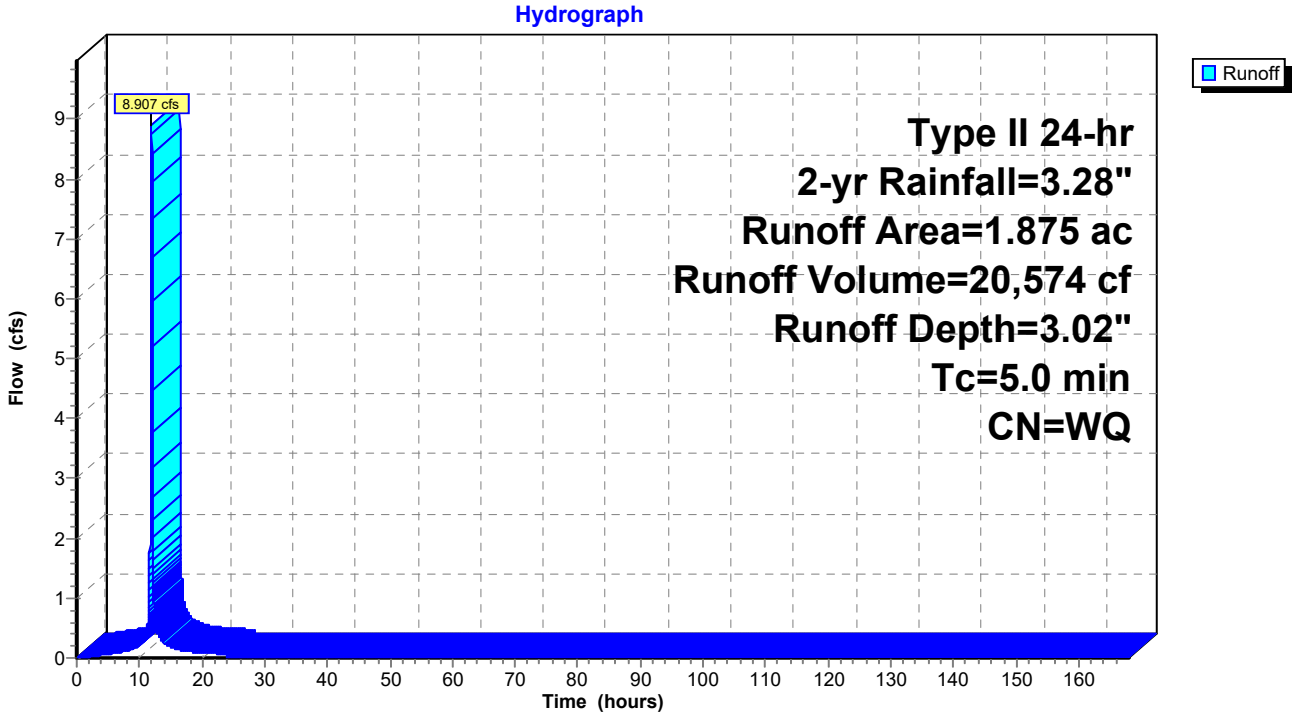
Runoff = 8.907 cfs @ 11.96 hrs, Volume= 20,574 cf, Depth= 3.02"
Routed to Pond 1P : UG1

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
*	0.015	39	Lawn A
*	1.860	98	Impervious
	1.875		Weighted Average
	0.015		0.80% Pervious Area
	1.860		99.20% 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	0.62	0.43	0.246
0.20	0.01	0.00	0.000	10.40	0.65	0.46	0.275
0.40	0.01	0.00	0.000	10.60	0.69	0.49	0.307
0.60	0.02	0.00	0.000	10.80	0.73	0.53	0.354
0.80	0.03	0.00	0.000	11.00	0.77	0.57	0.403
1.00	0.03	0.00	0.000	11.20	0.82	0.62	0.492
1.20	0.04	0.00	0.000	11.40	0.89	0.69	0.608
1.40	0.05	0.00	0.004	11.60	1.01	0.80	1.128
1.60	0.06	0.00	0.008	11.80	1.41	1.19	**3.966**
1.80	0.06	0.00	0.013	12.00	2.17	1.95	**7.357**
2.00	0.07	0.00	0.017	12.20	2.29	2.06	1.080
2.20	0.08	0.01	0.021	12.40	2.38	2.15	0.779
2.40	0.09	0.01	0.025	12.60	2.44	2.21	0.532
2.60	0.10	0.01	0.028	12.80	2.49	2.26	0.461
2.80	0.10	0.02	0.032	13.00	2.53	2.30	0.398
3.00	0.11	0.02	0.035	13.20	2.57	2.34	0.352
3.20	0.12	0.02	0.038	13.40	2.60	2.37	0.318
3.40	0.13	0.03	0.041	13.60	2.64	2.41	0.285
3.60	0.14	0.03	0.044	13.80	2.66	2.43	0.260
3.80	0.15	0.04	0.047	14.00	2.69	2.46	0.236
4.00	0.16	0.04	0.050	14.20	2.71	2.48	0.221
4.20	0.17	0.05	0.053	14.40	2.74	2.51	0.213
4.40	0.18	0.05	0.057	14.60	2.76	2.53	0.204
4.60	0.19	0.06	0.060	14.80	2.78	2.55	0.196
4.80	0.20	0.07	0.064	15.00	2.80	2.57	0.187
5.00	0.21	0.07	0.067	15.20	2.82	2.59	0.178
5.20	0.22	0.08	0.071	15.40	2.84	2.61	0.170
5.40	0.23	0.09	0.074	15.60	2.85	2.62	0.161
5.60	0.24	0.10	0.077	15.80	2.87	2.64	0.153
5.80	0.25	0.11	0.081	16.00	2.89	2.66	0.144
6.00	0.26	0.12	0.084	16.20	2.90	2.67	0.139
6.20	0.27	0.12	0.087	16.40	2.92	2.68	0.136
6.40	0.29	0.13	0.091	16.60	2.93	2.70	0.133
6.60	0.30	0.14	0.094	16.80	2.94	2.71	0.130
6.80	0.31	0.15	0.097	17.00	2.96	2.73	0.127
7.00	0.32	0.17	0.100	17.20	2.97	2.74	0.124
7.20	0.34	0.18	0.103	17.40	2.98	2.75	0.121
7.40	0.35	0.19	0.107	17.60	3.00	2.76	0.118
7.60	0.37	0.20	0.110	17.80	3.01	2.78	0.115
7.80	0.38	0.21	0.113	18.00	3.02	2.79	0.111
8.00	0.39	0.22	0.116	18.20	3.03	2.80	0.108
8.20	0.41	0.24	0.124	18.40	3.04	2.81	0.105
8.40	0.43	0.25	0.136	18.60	3.05	2.82	0.102
8.60	0.44	0.27	0.148	18.80	3.07	2.83	0.099
8.80	0.46	0.28	0.160	19.00	3.08	2.84	0.096
9.00	0.48	0.30	0.172	19.20	3.09	2.85	0.093
9.20	0.50	0.32	0.178	19.40	3.10	2.86	0.090
9.40	0.52	0.34	0.179	19.60	3.10	2.87	0.087
9.60	0.55	0.36	0.183	19.80	3.11	2.88	0.084
9.80	0.57	0.38	0.201	20.00	3.12	2.89	0.081
10.00	0.59	0.40	0.221	20.20	3.13	2.90	0.079

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	2.91	0.079	30.60	3.28	3.05	0.000
20.60	3.15	2.92	0.078	30.80	3.28	3.05	0.000
20.80	3.16	2.92	0.077	31.00	3.28	3.05	0.000
21.00	3.16	2.93	0.077	31.20	3.28	3.05	0.000
21.20	3.17	2.94	0.076	31.40	3.28	3.05	0.000
21.40	3.18	2.95	0.076	31.60	3.28	3.05	0.000
21.60	3.19	2.96	0.075	31.80	3.28	3.05	0.000
21.80	3.20	2.96	0.074	32.00	3.28	3.05	0.000
22.00	3.20	2.97	0.074	32.20	3.28	3.05	0.000
22.20	3.21	2.98	0.073	32.40	3.28	3.05	0.000
22.40	3.22	2.99	0.073	32.60	3.28	3.05	0.000
22.60	3.23	3.00	0.072	32.80	3.28	3.05	0.000
22.80	3.24	3.00	0.071	33.00	3.28	3.05	0.000
23.00	3.24	3.01	0.071	33.20	3.28	3.05	0.000
23.20	3.25	3.02	0.070	33.40	3.28	3.05	0.000
23.40	3.26	3.03	0.070	33.60	3.28	3.05	0.000
23.60	3.27	3.03	0.069	33.80	3.28	3.05	0.000
23.80	3.27	3.04	0.068	34.00	3.28	3.05	0.000
24.00	**3.28**	**3.05**	0.068	34.20	3.28	3.05	0.000
24.20	3.28	3.05	0.001	34.40	3.28	3.05	0.000
24.40	3.28	3.05	0.000	34.60	3.28	3.05	0.000
24.60	3.28	3.05	0.000	34.80	3.28	3.05	0.000
24.80	3.28	3.05	0.000	35.00	3.28	3.05	0.000
25.00	3.28	3.05	0.000	35.20	3.28	3.05	0.000
25.20	3.28	3.05	0.000	35.40	3.28	3.05	0.000
25.40	3.28	3.05	0.000	35.60	3.28	3.05	0.000
25.60	3.28	3.05	0.000	35.80	3.28	3.05	0.000
25.80	3.28	3.05	0.000	36.00	3.28	3.05	0.000
26.00	3.28	3.05	0.000	36.20	3.28	3.05	0.000
26.20	3.28	3.05	0.000	36.40	3.28	3.05	0.000
26.40	3.28	3.05	0.000	36.60	3.28	3.05	0.000
26.60	3.28	3.05	0.000	36.80	3.28	3.05	0.000
26.80	3.28	3.05	0.000	37.00	3.28	3.05	0.000
27.00	3.28	3.05	0.000	37.20	3.28	3.05	0.000
27.20	3.28	3.05	0.000	37.40	3.28	3.05	0.000
27.40	3.28	3.05	0.000	37.60	3.28	3.05	0.000
27.60	3.28	3.05	0.000	37.80	3.28	3.05	0.000
27.80	3.28	3.05	0.000	38.00	3.28	3.05	0.000
28.00	3.28	3.05	0.000	38.20	3.28	3.05	0.000
28.20	3.28	3.05	0.000	38.40	3.28	3.05	0.000
28.40	3.28	3.05	0.000	38.60	3.28	3.05	0.000
28.60	3.28	3.05	0.000	38.80	3.28	3.05	0.000
28.80	3.28	3.05	0.000	39.00	3.28	3.05	0.000
29.00	3.28	3.05	0.000	39.20	3.28	3.05	0.000
29.20	3.28	3.05	0.000	39.40	3.28	3.05	0.000
29.40	3.28	3.05	0.000	39.60	3.28	3.05	0.000
29.60	3.28	3.05	0.000	39.80	3.28	3.05	0.000
29.80	3.28	3.05	0.000	40.00	3.28	3.05	0.000
30.00	3.28	3.05	0.000	40.20	3.28	3.05	0.000
30.20	3.28	3.05	0.000	40.40	3.28	3.05	0.000
30.40	3.28	3.05	0.000	40.60	3.28	3.05	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	3.05	0.000	51.00	3.28	3.05	0.000
41.00	3.28	3.05	0.000	51.20	3.28	3.05	0.000
41.20	3.28	3.05	0.000	51.40	3.28	3.05	0.000
41.40	3.28	3.05	0.000	51.60	3.28	3.05	0.000
41.60	3.28	3.05	0.000	51.80	3.28	3.05	0.000
41.80	3.28	3.05	0.000	52.00	3.28	3.05	0.000
42.00	3.28	3.05	0.000	52.20	3.28	3.05	0.000
42.20	3.28	3.05	0.000	52.40	3.28	3.05	0.000
42.40	3.28	3.05	0.000	52.60	3.28	3.05	0.000
42.60	3.28	3.05	0.000	52.80	3.28	3.05	0.000
42.80	3.28	3.05	0.000	53.00	3.28	3.05	0.000
43.00	3.28	3.05	0.000	53.20	3.28	3.05	0.000
43.20	3.28	3.05	0.000	53.40	3.28	3.05	0.000
43.40	3.28	3.05	0.000	53.60	3.28	3.05	0.000
43.60	3.28	3.05	0.000	53.80	3.28	3.05	0.000
43.80	3.28	3.05	0.000	54.00	3.28	3.05	0.000
44.00	3.28	3.05	0.000	54.20	3.28	3.05	0.000
44.20	3.28	3.05	0.000	54.40	3.28	3.05	0.000
44.40	3.28	3.05	0.000	54.60	3.28	3.05	0.000
44.60	3.28	3.05	0.000	54.80	3.28	3.05	0.000
44.80	3.28	3.05	0.000	55.00	3.28	3.05	0.000
45.00	3.28	3.05	0.000	55.20	3.28	3.05	0.000
45.20	3.28	3.05	0.000	55.40	3.28	3.05	0.000
45.40	3.28	3.05	0.000	55.60	3.28	3.05	0.000
45.60	3.28	3.05	0.000	55.80	3.28	3.05	0.000
45.80	3.28	3.05	0.000	56.00	3.28	3.05	0.000
46.00	3.28	3.05	0.000	56.20	3.28	3.05	0.000
46.20	3.28	3.05	0.000	56.40	3.28	3.05	0.000
46.40	3.28	3.05	0.000	56.60	3.28	3.05	0.000
46.60	3.28	3.05	0.000	56.80	3.28	3.05	0.000
46.80	3.28	3.05	0.000	57.00	3.28	3.05	0.000
47.00	3.28	3.05	0.000	57.20	3.28	3.05	0.000
47.20	3.28	3.05	0.000	57.40	3.28	3.05	0.000
47.40	3.28	3.05	0.000	57.60	3.28	3.05	0.000
47.60	3.28	3.05	0.000	57.80	3.28	3.05	0.000
47.80	3.28	3.05	0.000	58.00	3.28	3.05	0.000
48.00	3.28	3.05	0.000	58.20	3.28	3.05	0.000
48.20	3.28	3.05	0.000	58.40	3.28	3.05	0.000
48.40	3.28	3.05	0.000	58.60	3.28	3.05	0.000
48.60	3.28	3.05	0.000	58.80	3.28	3.05	0.000
48.80	3.28	3.05	0.000	59.00	3.28	3.05	0.000
49.00	3.28	3.05	0.000	59.20	3.28	3.05	0.000
49.20	3.28	3.05	0.000	59.40	3.28	3.05	0.000
49.40	3.28	3.05	0.000	59.60	3.28	3.05	0.000
49.60	3.28	3.05	0.000	59.80	3.28	3.05	0.000
49.80	3.28	3.05	0.000	60.00	3.28	3.05	0.000
50.00	3.28	3.05	0.000	60.20	3.28	3.05	0.000
50.20	3.28	3.05	0.000	60.40	3.28	3.05	0.000
50.40	3.28	3.05	0.000	60.60	3.28	3.05	0.000
50.60	3.28	3.05	0.000	60.80	3.28	3.05	0.000
50.80	3.28	3.05	0.000	61.00	3.28	3.05	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	3.05	0.000	71.40	3.28	3.05	0.000
61.40	3.28	3.05	0.000	71.60	3.28	3.05	0.000
61.60	3.28	3.05	0.000	71.80	3.28	3.05	0.000
61.80	3.28	3.05	0.000	72.00	3.28	3.05	0.000
62.00	3.28	3.05	0.000	72.20	3.28	3.05	0.000
62.20	3.28	3.05	0.000	72.40	3.28	3.05	0.000
62.40	3.28	3.05	0.000	72.60	3.28	3.05	0.000
62.60	3.28	3.05	0.000	72.80	3.28	3.05	0.000
62.80	3.28	3.05	0.000	73.00	3.28	3.05	0.000
63.00	3.28	3.05	0.000	73.20	3.28	3.05	0.000
63.20	3.28	3.05	0.000	73.40	3.28	3.05	0.000
63.40	3.28	3.05	0.000	73.60	3.28	3.05	0.000
63.60	3.28	3.05	0.000	73.80	3.28	3.05	0.000
63.80	3.28	3.05	0.000	74.00	3.28	3.05	0.000
64.00	3.28	3.05	0.000	74.20	3.28	3.05	0.000
64.20	3.28	3.05	0.000	74.40	3.28	3.05	0.000
64.40	3.28	3.05	0.000	74.60	3.28	3.05	0.000
64.60	3.28	3.05	0.000	74.80	3.28	3.05	0.000
64.80	3.28	3.05	0.000	75.00	3.28	3.05	0.000
65.00	3.28	3.05	0.000	75.20	3.28	3.05	0.000
65.20	3.28	3.05	0.000	75.40	3.28	3.05	0.000
65.40	3.28	3.05	0.000	75.60	3.28	3.05	0.000
65.60	3.28	3.05	0.000	75.80	3.28	3.05	0.000
65.80	3.28	3.05	0.000	76.00	3.28	3.05	0.000
66.00	3.28	3.05	0.000	76.20	3.28	3.05	0.000
66.20	3.28	3.05	0.000	76.40	3.28	3.05	0.000
66.40	3.28	3.05	0.000	76.60	3.28	3.05	0.000
66.60	3.28	3.05	0.000	76.80	3.28	3.05	0.000
66.80	3.28	3.05	0.000	77.00	3.28	3.05	0.000
67.00	3.28	3.05	0.000	77.20	3.28	3.05	0.000
67.20	3.28	3.05	0.000	77.40	3.28	3.05	0.000
67.40	3.28	3.05	0.000	77.60	3.28	3.05	0.000
67.60	3.28	3.05	0.000	77.80	3.28	3.05	0.000
67.80	3.28	3.05	0.000	78.00	3.28	3.05	0.000
68.00	3.28	3.05	0.000	78.20	3.28	3.05	0.000
68.20	3.28	3.05	0.000	78.40	3.28	3.05	0.000
68.40	3.28	3.05	0.000	78.60	3.28	3.05	0.000
68.60	3.28	3.05	0.000	78.80	3.28	3.05	0.000
68.80	3.28	3.05	0.000	79.00	3.28	3.05	0.000
69.00	3.28	3.05	0.000	79.20	3.28	3.05	0.000
69.20	3.28	3.05	0.000	79.40	3.28	3.05	0.000
69.40	3.28	3.05	0.000	79.60	3.28	3.05	0.000
69.60	3.28	3.05	0.000	79.80	3.28	3.05	0.000
69.80	3.28	3.05	0.000	80.00	3.28	3.05	0.000
70.00	3.28	3.05	0.000	80.20	3.28	3.05	0.000
70.20	3.28	3.05	0.000	80.40	3.28	3.05	0.000
70.40	3.28	3.05	0.000	80.60	3.28	3.05	0.000
70.60	3.28	3.05	0.000	80.80	3.28	3.05	0.000
70.80	3.28	3.05	0.000	81.00	3.28	3.05	0.000
71.00	3.28	3.05	0.000	81.20	3.28	3.05	0.000
71.20	3.28	3.05	0.000	81.40	3.28	3.05	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	3.05	0.000	91.80	3.28	3.05	0.000
81.80	3.28	3.05	0.000	92.00	3.28	3.05	0.000
82.00	3.28	3.05	0.000	92.20	3.28	3.05	0.000
82.20	3.28	3.05	0.000	92.40	3.28	3.05	0.000
82.40	3.28	3.05	0.000	92.60	3.28	3.05	0.000
82.60	3.28	3.05	0.000	92.80	3.28	3.05	0.000
82.80	3.28	3.05	0.000	93.00	3.28	3.05	0.000
83.00	3.28	3.05	0.000	93.20	3.28	3.05	0.000
83.20	3.28	3.05	0.000	93.40	3.28	3.05	0.000
83.40	3.28	3.05	0.000	93.60	3.28	3.05	0.000
83.60	3.28	3.05	0.000	93.80	3.28	3.05	0.000
83.80	3.28	3.05	0.000	94.00	3.28	3.05	0.000
84.00	3.28	3.05	0.000	94.20	3.28	3.05	0.000
84.20	3.28	3.05	0.000	94.40	3.28	3.05	0.000
84.40	3.28	3.05	0.000	94.60	3.28	3.05	0.000
84.60	3.28	3.05	0.000	94.80	3.28	3.05	0.000
84.80	3.28	3.05	0.000	95.00	3.28	3.05	0.000
85.00	3.28	3.05	0.000	95.20	3.28	3.05	0.000
85.20	3.28	3.05	0.000	95.40	3.28	3.05	0.000
85.40	3.28	3.05	0.000	95.60	3.28	3.05	0.000
85.60	3.28	3.05	0.000	95.80	3.28	3.05	0.000
85.80	3.28	3.05	0.000	96.00	3.28	3.05	0.000
86.00	3.28	3.05	0.000	96.20	3.28	3.05	0.000
86.20	3.28	3.05	0.000	96.40	3.28	3.05	0.000
86.40	3.28	3.05	0.000	96.60	3.28	3.05	0.000
86.60	3.28	3.05	0.000	96.80	3.28	3.05	0.000
86.80	3.28	3.05	0.000	97.00	3.28	3.05	0.000
87.00	3.28	3.05	0.000	97.20	3.28	3.05	0.000
87.20	3.28	3.05	0.000	97.40	3.28	3.05	0.000
87.40	3.28	3.05	0.000	97.60	3.28	3.05	0.000
87.60	3.28	3.05	0.000	97.80	3.28	3.05	0.000
87.80	3.28	3.05	0.000	98.00	3.28	3.05	0.000
88.00	3.28	3.05	0.000	98.20	3.28	3.05	0.000
88.20	3.28	3.05	0.000	98.40	3.28	3.05	0.000
88.40	3.28	3.05	0.000	98.60	3.28	3.05	0.000
88.60	3.28	3.05	0.000	98.80	3.28	3.05	0.000
88.80	3.28	3.05	0.000	99.00	3.28	3.05	0.000
89.00	3.28	3.05	0.000	99.20	3.28	3.05	0.000
89.20	3.28	3.05	0.000	99.40	3.28	3.05	0.000
89.40	3.28	3.05	0.000	99.60	3.28	3.05	0.000
89.60	3.28	3.05	0.000	99.80	3.28	3.05	0.000
89.80	3.28	3.05	0.000	100.00	3.28	3.05	0.000
90.00	3.28	3.05	0.000	100.20	3.28	3.05	0.000
90.20	3.28	3.05	0.000	100.40	3.28	3.05	0.000
90.40	3.28	3.05	0.000	100.60	3.28	3.05	0.000
90.60	3.28	3.05	0.000	100.80	3.28	3.05	0.000
90.80	3.28	3.05	0.000	101.00	3.28	3.05	0.000
91.00	3.28	3.05	0.000	101.20	3.28	3.05	0.000
91.20	3.28	3.05	0.000	101.40	3.28	3.05	0.000
91.40	3.28	3.05	0.000	101.60	3.28	3.05	0.000
91.60	3.28	3.05	0.000	101.80	3.28	3.05	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	3.05	0.000	112.20	3.28	3.05	0.000
102.20	3.28	3.05	0.000	112.40	3.28	3.05	0.000
102.40	3.28	3.05	0.000	112.60	3.28	3.05	0.000
102.60	3.28	3.05	0.000	112.80	3.28	3.05	0.000
102.80	3.28	3.05	0.000	113.00	3.28	3.05	0.000
103.00	3.28	3.05	0.000	113.20	3.28	3.05	0.000
103.20	3.28	3.05	0.000	113.40	3.28	3.05	0.000
103.40	3.28	3.05	0.000	113.60	3.28	3.05	0.000
103.60	3.28	3.05	0.000	113.80	3.28	3.05	0.000
103.80	3.28	3.05	0.000	114.00	3.28	3.05	0.000
104.00	3.28	3.05	0.000	114.20	3.28	3.05	0.000
104.20	3.28	3.05	0.000	114.40	3.28	3.05	0.000
104.40	3.28	3.05	0.000	114.60	3.28	3.05	0.000
104.60	3.28	3.05	0.000	114.80	3.28	3.05	0.000
104.80	3.28	3.05	0.000	115.00	3.28	3.05	0.000
105.00	3.28	3.05	0.000	115.20	3.28	3.05	0.000
105.20	3.28	3.05	0.000	115.40	3.28	3.05	0.000
105.40	3.28	3.05	0.000	115.60	3.28	3.05	0.000
105.60	3.28	3.05	0.000	115.80	3.28	3.05	0.000
105.80	3.28	3.05	0.000	116.00	3.28	3.05	0.000
106.00	3.28	3.05	0.000	116.20	3.28	3.05	0.000
106.20	3.28	3.05	0.000	116.40	3.28	3.05	0.000
106.40	3.28	3.05	0.000	116.60	3.28	3.05	0.000
106.60	3.28	3.05	0.000	116.80	3.28	3.05	0.000
106.80	3.28	3.05	0.000	117.00	3.28	3.05	0.000
107.00	3.28	3.05	0.000	117.20	3.28	3.05	0.000
107.20	3.28	3.05	0.000	117.40	3.28	3.05	0.000
107.40	3.28	3.05	0.000	117.60	3.28	3.05	0.000
107.60	3.28	3.05	0.000	117.80	3.28	3.05	0.000
107.80	3.28	3.05	0.000	118.00	3.28	3.05	0.000
108.00	3.28	3.05	0.000	118.20	3.28	3.05	0.000
108.20	3.28	3.05	0.000	118.40	3.28	3.05	0.000
108.40	3.28	3.05	0.000	118.60	3.28	3.05	0.000
108.60	3.28	3.05	0.000	118.80	3.28	3.05	0.000
108.80	3.28	3.05	0.000	119.00	3.28	3.05	0.000
109.00	3.28	3.05	0.000	119.20	3.28	3.05	0.000
109.20	3.28	3.05	0.000	119.40	3.28	3.05	0.000
109.40	3.28	3.05	0.000	119.60	3.28	3.05	0.000
109.60	3.28	3.05	0.000	119.80	3.28	3.05	0.000
109.80	3.28	3.05	0.000	120.00	3.28	3.05	0.000
110.00	3.28	3.05	0.000	120.20	3.28	3.05	0.000
110.20	3.28	3.05	0.000	120.40	3.28	3.05	0.000
110.40	3.28	3.05	0.000	120.60	3.28	3.05	0.000
110.60	3.28	3.05	0.000	120.80	3.28	3.05	0.000
110.80	3.28	3.05	0.000	121.00	3.28	3.05	0.000
111.00	3.28	3.05	0.000	121.20	3.28	3.05	0.000
111.20	3.28	3.05	0.000	121.40	3.28	3.05	0.000
111.40	3.28	3.05	0.000	121.60	3.28	3.05	0.000
111.60	3.28	3.05	0.000	121.80	3.28	3.05	0.000
111.80	3.28	3.05	0.000	122.00	3.28	3.05	0.000
112.00	3.28	3.05	0.000	122.20	3.28	3.05	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	3.05	0.000	132.60	3.28	3.05	0.000
122.60	3.28	3.05	0.000	132.80	3.28	3.05	0.000
122.80	3.28	3.05	0.000	133.00	3.28	3.05	0.000
123.00	3.28	3.05	0.000	133.20	3.28	3.05	0.000
123.20	3.28	3.05	0.000	133.40	3.28	3.05	0.000
123.40	3.28	3.05	0.000	133.60	3.28	3.05	0.000
123.60	3.28	3.05	0.000	133.80	3.28	3.05	0.000
123.80	3.28	3.05	0.000	134.00	3.28	3.05	0.000
124.00	3.28	3.05	0.000	134.20	3.28	3.05	0.000
124.20	3.28	3.05	0.000	134.40	3.28	3.05	0.000
124.40	3.28	3.05	0.000	134.60	3.28	3.05	0.000
124.60	3.28	3.05	0.000	134.80	3.28	3.05	0.000
124.80	3.28	3.05	0.000	135.00	3.28	3.05	0.000
125.00	3.28	3.05	0.000	135.20	3.28	3.05	0.000
125.20	3.28	3.05	0.000	135.40	3.28	3.05	0.000
125.40	3.28	3.05	0.000	135.60	3.28	3.05	0.000
125.60	3.28	3.05	0.000	135.80	3.28	3.05	0.000
125.80	3.28	3.05	0.000	136.00	3.28	3.05	0.000
126.00	3.28	3.05	0.000	136.20	3.28	3.05	0.000
126.20	3.28	3.05	0.000	136.40	3.28	3.05	0.000
126.40	3.28	3.05	0.000	136.60	3.28	3.05	0.000
126.60	3.28	3.05	0.000	136.80	3.28	3.05	0.000
126.80	3.28	3.05	0.000	137.00	3.28	3.05	0.000
127.00	3.28	3.05	0.000	137.20	3.28	3.05	0.000
127.20	3.28	3.05	0.000	137.40	3.28	3.05	0.000
127.40	3.28	3.05	0.000	137.60	3.28	3.05	0.000
127.60	3.28	3.05	0.000	137.80	3.28	3.05	0.000
127.80	3.28	3.05	0.000	138.00	3.28	3.05	0.000
128.00	3.28	3.05	0.000	138.20	3.28	3.05	0.000
128.20	3.28	3.05	0.000	138.40	3.28	3.05	0.000
128.40	3.28	3.05	0.000	138.60	3.28	3.05	0.000
128.60	3.28	3.05	0.000	138.80	3.28	3.05	0.000
128.80	3.28	3.05	0.000	139.00	3.28	3.05	0.000
129.00	3.28	3.05	0.000	139.20	3.28	3.05	0.000
129.20	3.28	3.05	0.000	139.40	3.28	3.05	0.000
129.40	3.28	3.05	0.000	139.60	3.28	3.05	0.000
129.60	3.28	3.05	0.000	139.80	3.28	3.05	0.000
129.80	3.28	3.05	0.000	140.00	3.28	3.05	0.000
130.00	3.28	3.05	0.000	140.20	3.28	3.05	0.000
130.20	3.28	3.05	0.000	140.40	3.28	3.05	0.000
130.40	3.28	3.05	0.000	140.60	3.28	3.05	0.000
130.60	3.28	3.05	0.000	140.80	3.28	3.05	0.000
130.80	3.28	3.05	0.000	141.00	3.28	3.05	0.000
131.00	3.28	3.05	0.000	141.20	3.28	3.05	0.000
131.20	3.28	3.05	0.000	141.40	3.28	3.05	0.000
131.40	3.28	3.05	0.000	141.60	3.28	3.05	0.000
131.60	3.28	3.05	0.000	141.80	3.28	3.05	0.000
131.80	3.28	3.05	0.000	142.00	3.28	3.05	0.000
132.00	3.28	3.05	0.000	142.20	3.28	3.05	0.000
132.20	3.28	3.05	0.000	142.40	3.28	3.05	0.000
132.40	3.28	3.05	0.000	142.60	3.28	3.05	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	3.05	0.000	153.00	3.28	3.05	0.000
143.00	3.28	3.05	0.000	153.20	3.28	3.05	0.000
143.20	3.28	3.05	0.000	153.40	3.28	3.05	0.000
143.40	3.28	3.05	0.000	153.60	3.28	3.05	0.000
143.60	3.28	3.05	0.000	153.80	3.28	3.05	0.000
143.80	3.28	3.05	0.000	154.00	3.28	3.05	0.000
144.00	3.28	3.05	0.000	154.20	3.28	3.05	0.000
144.20	3.28	3.05	0.000	154.40	3.28	3.05	0.000
144.40	3.28	3.05	0.000	154.60	3.28	3.05	0.000
144.60	3.28	3.05	0.000	154.80	3.28	3.05	0.000
144.80	3.28	3.05	0.000	155.00	3.28	3.05	0.000
145.00	3.28	3.05	0.000	155.20	3.28	3.05	0.000
145.20	3.28	3.05	0.000	155.40	3.28	3.05	0.000
145.40	3.28	3.05	0.000	155.60	3.28	3.05	0.000
145.60	3.28	3.05	0.000	155.80	3.28	3.05	0.000
145.80	3.28	3.05	0.000	156.00	3.28	3.05	0.000
146.00	3.28	3.05	0.000	156.20	3.28	3.05	0.000
146.20	3.28	3.05	0.000	156.40	3.28	3.05	0.000
146.40	3.28	3.05	0.000	156.60	3.28	3.05	0.000
146.60	3.28	3.05	0.000	156.80	3.28	3.05	0.000
146.80	3.28	3.05	0.000	157.00	3.28	3.05	0.000
147.00	3.28	3.05	0.000	157.20	3.28	3.05	0.000
147.20	3.28	3.05	0.000	157.40	3.28	3.05	0.000
147.40	3.28	3.05	0.000	157.60	3.28	3.05	0.000
147.60	3.28	3.05	0.000	157.80	3.28	3.05	0.000
147.80	3.28	3.05	0.000	158.00	3.28	3.05	0.000
148.00	3.28	3.05	0.000	158.20	3.28	3.05	0.000
148.20	3.28	3.05	0.000	158.40	3.28	3.05	0.000
148.40	3.28	3.05	0.000	158.60	3.28	3.05	0.000
148.60	3.28	3.05	0.000	158.80	3.28	3.05	0.000
148.80	3.28	3.05	0.000	159.00	3.28	3.05	0.000
149.00	3.28	3.05	0.000	159.20	3.28	3.05	0.000
149.20	3.28	3.05	0.000	159.40	3.28	3.05	0.000
149.40	3.28	3.05	0.000	159.60	3.28	3.05	0.000
149.60	3.28	3.05	0.000	159.80	3.28	3.05	0.000
149.80	3.28	3.05	0.000	160.00	3.28	3.05	0.000
150.00	3.28	3.05	0.000	160.20	3.28	3.05	0.000
150.20	3.28	3.05	0.000	160.40	3.28	3.05	0.000
150.40	3.28	3.05	0.000	160.60	3.28	3.05	0.000
150.60	3.28	3.05	0.000	160.80	3.28	3.05	0.000
150.80	3.28	3.05	0.000	161.00	3.28	3.05	0.000
151.00	3.28	3.05	0.000	161.20	3.28	3.05	0.000
151.20	3.28	3.05	0.000	161.40	3.28	3.05	0.000
151.40	3.28	3.05	0.000	161.60	3.28	3.05	0.000
151.60	3.28	3.05	0.000	161.80	3.28	3.05	0.000
151.80	3.28	3.05	0.000	162.00	3.28	3.05	0.000
152.00	3.28	3.05	0.000	162.20	3.28	3.05	0.000
152.20	3.28	3.05	0.000	162.40	3.28	3.05	0.000
152.40	3.28	3.05	0.000	162.60	3.28	3.05	0.000
152.60	3.28	3.05	0.000	162.80	3.28	3.05	0.000
152.80	3.28	3.05	0.000	163.00	3.28	3.05	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	3.05	0.000
163.40	3.28	3.05	0.000
163.60	3.28	3.05	0.000
163.80	3.28	3.05	0.000
164.00	3.28	3.05	0.000
164.20	3.28	3.05	0.000
164.40	3.28	3.05	0.000
164.60	3.28	3.05	0.000
164.80	3.28	3.05	0.000
165.00	3.28	3.05	0.000
165.20	3.28	3.05	0.000
165.40	3.28	3.05	0.000
165.60	3.28	3.05	0.000
165.80	3.28	3.05	0.000
166.00	3.28	3.05	0.000
166.20	3.28	3.05	0.000
166.40	3.28	3.05	0.000
166.60	3.28	3.05	0.000
166.80	3.28	3.05	0.000
167.00	3.28	3.05	0.000
167.20	3.28	3.05	0.000
167.40	3.28	3.05	0.000
167.60	3.28	3.05	0.000
167.80	3.28	3.05	0.000
168.00	3.28	3.05	0.000

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

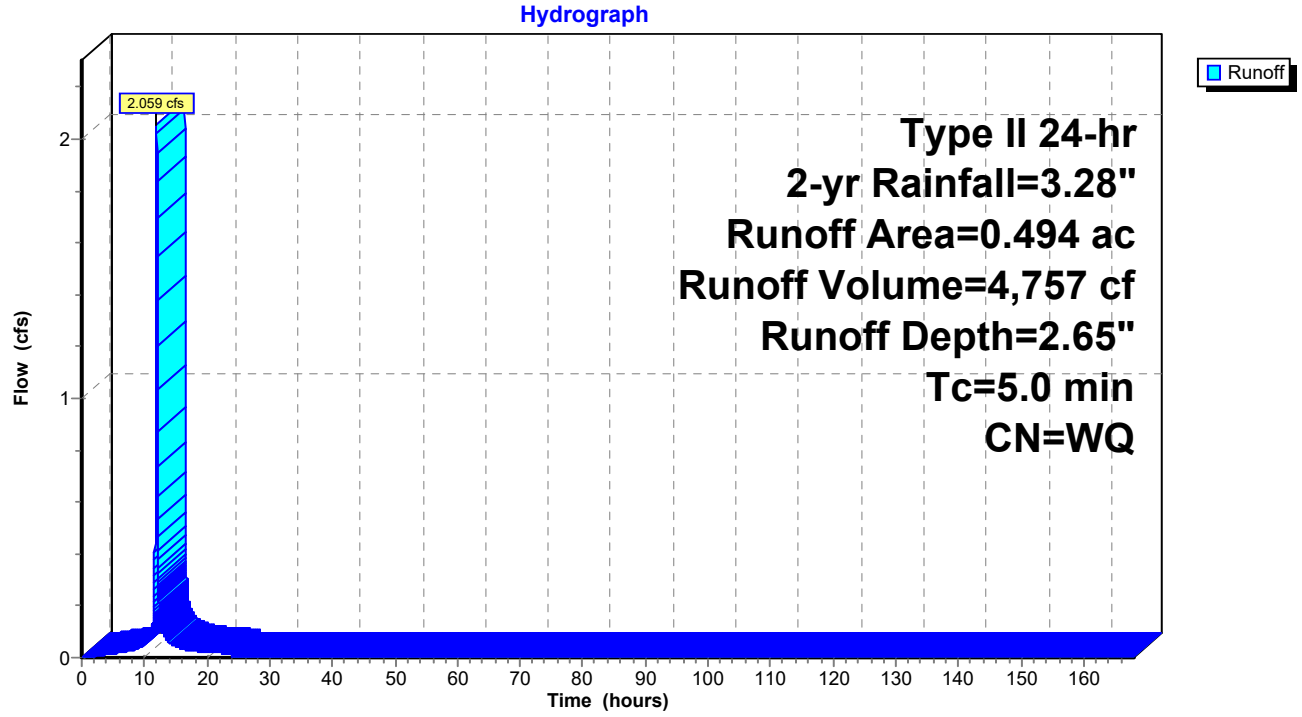
Runoff = 2.059 cfs @ 11.96 hrs, Volume= 4,757 cf, Depth= 2.65"
Routed to Pond 3P : UG2

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
*	0.064	39	Lawn A
*	0.000	30	Wooded A
*	0.430	98	Impervious
	0.494		Weighted Average
	0.064		12.96% Pervious Area
	0.430		87.04% 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	0.11	0.057
0.20	0.01	0.00	0.000	10.40	0.65	0.12	0.064
0.40	0.01	0.00	0.000	10.60	0.69	0.14	0.071
0.60	0.02	0.00	0.000	10.80	0.73	0.16	0.082
0.80	0.03	0.00	0.000	11.00	0.77	0.18	0.093
1.00	0.03	0.00	0.000	11.20	0.82	0.21	0.114
1.20	0.04	0.00	0.000	11.40	0.89	0.25	0.141
1.40	0.05	0.00	0.001	11.60	1.01	0.32	0.261
1.60	0.06	0.00	0.002	11.80	1.41	0.62	**0.917**
1.80	0.06	0.00	0.003	12.00	2.17	1.24	**1.701**
2.00	0.07	0.00	0.004	12.20	2.29	1.35	0.250
2.20	0.08	0.00	0.005	12.40	2.38	1.42	0.180
2.40	0.09	0.00	0.006	12.60	2.44	1.48	0.123
2.60	0.10	0.00	0.007	12.80	2.49	1.52	0.107
2.80	0.10	0.00	0.007	13.00	2.53	1.56	0.092
3.00	0.11	0.00	0.008	13.20	2.57	1.59	0.081
3.20	0.12	0.00	0.009	13.40	2.60	1.62	0.073
3.40	0.13	0.00	0.010	13.60	2.64	1.65	0.066
3.60	0.14	0.00	0.010	13.80	2.66	1.68	0.060
3.80	0.15	0.00	0.011	14.00	2.69	1.70	0.055
4.00	0.16	0.00	0.012	14.20	2.71	1.72	0.051
4.20	0.17	0.00	0.012	14.40	2.74	1.74	0.049
4.40	0.18	0.00	0.013	14.60	2.76	1.76	0.047
4.60	0.19	0.00	0.014	14.80	2.78	1.78	0.045
4.80	0.20	0.00	0.015	15.00	2.80	1.80	0.043
5.00	0.21	0.00	0.016	15.20	2.82	1.82	0.041
5.20	0.22	0.00	0.016	15.40	2.84	1.84	0.039
5.40	0.23	0.00	0.017	15.60	2.85	1.85	0.037
5.60	0.24	0.00	0.018	15.80	2.87	1.87	0.035
5.80	0.25	0.00	0.019	16.00	2.89	1.88	0.033
6.00	0.26	0.00	0.019	16.20	2.90	1.89	0.032
6.20	0.27	0.00	0.020	16.40	2.92	1.91	0.031
6.40	0.29	0.00	0.021	16.60	2.93	1.92	0.031
6.60	0.30	0.00	0.022	16.80	2.94	1.93	0.030
6.80	0.31	0.01	0.022	17.00	2.96	1.95	0.029
7.00	0.32	0.01	0.023	17.20	2.97	1.96	0.029
7.20	0.34	0.01	0.024	17.40	2.98	1.97	0.028
7.40	0.35	0.01	0.025	17.60	3.00	1.98	0.027
7.60	0.37	0.02	0.025	17.80	3.01	1.99	0.026
7.80	0.38	0.02	0.026	18.00	3.02	2.00	0.026
8.00	0.39	0.02	0.027	18.20	3.03	2.01	0.025
8.20	0.41	0.03	0.029	18.40	3.04	2.02	0.024
8.40	0.43	0.03	0.031	18.60	3.05	2.03	0.024
8.60	0.44	0.04	0.034	18.80	3.07	2.04	0.023
8.80	0.46	0.04	0.037	19.00	3.08	2.05	0.022
9.00	0.48	0.05	0.040	19.20	3.09	2.06	0.022
9.20	0.50	0.06	0.041	19.40	3.10	2.07	0.021
9.40	0.52	0.06	0.041	19.60	3.10	2.08	0.020
9.60	0.55	0.07	0.042	19.80	3.11	2.09	0.019
9.80	0.57	0.08	0.047	20.00	3.12	2.10	0.019
10.00	0.59	0.09	0.051	20.20	3.13	2.10	0.018

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	2.11	0.018	30.60	3.28	2.24	0.000
20.60	3.15	2.12	0.018	30.80	3.28	2.24	0.000
20.80	3.16	2.13	0.018	31.00	3.28	2.24	0.000
21.00	3.16	2.14	0.018	31.20	3.28	2.24	0.000
21.20	3.17	2.14	0.018	31.40	3.28	2.24	0.000
21.40	3.18	2.15	0.017	31.60	3.28	2.24	0.000
21.60	3.19	2.16	0.017	31.80	3.28	2.24	0.000
21.80	3.20	2.17	0.017	32.00	3.28	2.24	0.000
22.00	3.20	2.17	0.017	32.20	3.28	2.24	0.000
22.20	3.21	2.18	0.017	32.40	3.28	2.24	0.000
22.40	3.22	2.19	0.017	32.60	3.28	2.24	0.000
22.60	3.23	2.19	0.017	32.80	3.28	2.24	0.000
22.80	3.24	2.20	0.017	33.00	3.28	2.24	0.000
23.00	3.24	2.21	0.016	33.20	3.28	2.24	0.000
23.20	3.25	2.22	0.016	33.40	3.28	2.24	0.000
23.40	3.26	2.22	0.016	33.60	3.28	2.24	0.000
23.60	3.27	2.23	0.016	33.80	3.28	2.24	0.000
23.80	3.27	2.24	0.016	34.00	3.28	2.24	0.000
24.00	**3.28**	**2.24**	0.016	34.20	3.28	2.24	0.000
24.20	3.28	2.24	0.000	34.40	3.28	2.24	0.000
24.40	3.28	2.24	0.000	34.60	3.28	2.24	0.000
24.60	3.28	2.24	0.000	34.80	3.28	2.24	0.000
24.80	3.28	2.24	0.000	35.00	3.28	2.24	0.000
25.00	3.28	2.24	0.000	35.20	3.28	2.24	0.000
25.20	3.28	2.24	0.000	35.40	3.28	2.24	0.000
25.40	3.28	2.24	0.000	35.60	3.28	2.24	0.000
25.60	3.28	2.24	0.000	35.80	3.28	2.24	0.000
25.80	3.28	2.24	0.000	36.00	3.28	2.24	0.000
26.00	3.28	2.24	0.000	36.20	3.28	2.24	0.000
26.20	3.28	2.24	0.000	36.40	3.28	2.24	0.000
26.40	3.28	2.24	0.000	36.60	3.28	2.24	0.000
26.60	3.28	2.24	0.000	36.80	3.28	2.24	0.000
26.80	3.28	2.24	0.000	37.00	3.28	2.24	0.000
27.00	3.28	2.24	0.000	37.20	3.28	2.24	0.000
27.20	3.28	2.24	0.000	37.40	3.28	2.24	0.000
27.40	3.28	2.24	0.000	37.60	3.28	2.24	0.000
27.60	3.28	2.24	0.000	37.80	3.28	2.24	0.000
27.80	3.28	2.24	0.000	38.00	3.28	2.24	0.000
28.00	3.28	2.24	0.000	38.20	3.28	2.24	0.000
28.20	3.28	2.24	0.000	38.40	3.28	2.24	0.000
28.40	3.28	2.24	0.000	38.60	3.28	2.24	0.000
28.60	3.28	2.24	0.000	38.80	3.28	2.24	0.000
28.80	3.28	2.24	0.000	39.00	3.28	2.24	0.000
29.00	3.28	2.24	0.000	39.20	3.28	2.24	0.000
29.20	3.28	2.24	0.000	39.40	3.28	2.24	0.000
29.40	3.28	2.24	0.000	39.60	3.28	2.24	0.000
29.60	3.28	2.24	0.000	39.80	3.28	2.24	0.000
29.80	3.28	2.24	0.000	40.00	3.28	2.24	0.000
30.00	3.28	2.24	0.000	40.20	3.28	2.24	0.000
30.20	3.28	2.24	0.000	40.40	3.28	2.24	0.000
30.40	3.28	2.24	0.000	40.60	3.28	2.24	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	2.24	0.000	51.00	3.28	2.24	0.000
41.00	3.28	2.24	0.000	51.20	3.28	2.24	0.000
41.20	3.28	2.24	0.000	51.40	3.28	2.24	0.000
41.40	3.28	2.24	0.000	51.60	3.28	2.24	0.000
41.60	3.28	2.24	0.000	51.80	3.28	2.24	0.000
41.80	3.28	2.24	0.000	52.00	3.28	2.24	0.000
42.00	3.28	2.24	0.000	52.20	3.28	2.24	0.000
42.20	3.28	2.24	0.000	52.40	3.28	2.24	0.000
42.40	3.28	2.24	0.000	52.60	3.28	2.24	0.000
42.60	3.28	2.24	0.000	52.80	3.28	2.24	0.000
42.80	3.28	2.24	0.000	53.00	3.28	2.24	0.000
43.00	3.28	2.24	0.000	53.20	3.28	2.24	0.000
43.20	3.28	2.24	0.000	53.40	3.28	2.24	0.000
43.40	3.28	2.24	0.000	53.60	3.28	2.24	0.000
43.60	3.28	2.24	0.000	53.80	3.28	2.24	0.000
43.80	3.28	2.24	0.000	54.00	3.28	2.24	0.000
44.00	3.28	2.24	0.000	54.20	3.28	2.24	0.000
44.20	3.28	2.24	0.000	54.40	3.28	2.24	0.000
44.40	3.28	2.24	0.000	54.60	3.28	2.24	0.000
44.60	3.28	2.24	0.000	54.80	3.28	2.24	0.000
44.80	3.28	2.24	0.000	55.00	3.28	2.24	0.000
45.00	3.28	2.24	0.000	55.20	3.28	2.24	0.000
45.20	3.28	2.24	0.000	55.40	3.28	2.24	0.000
45.40	3.28	2.24	0.000	55.60	3.28	2.24	0.000
45.60	3.28	2.24	0.000	55.80	3.28	2.24	0.000
45.80	3.28	2.24	0.000	56.00	3.28	2.24	0.000
46.00	3.28	2.24	0.000	56.20	3.28	2.24	0.000
46.20	3.28	2.24	0.000	56.40	3.28	2.24	0.000
46.40	3.28	2.24	0.000	56.60	3.28	2.24	0.000
46.60	3.28	2.24	0.000	56.80	3.28	2.24	0.000
46.80	3.28	2.24	0.000	57.00	3.28	2.24	0.000
47.00	3.28	2.24	0.000	57.20	3.28	2.24	0.000
47.20	3.28	2.24	0.000	57.40	3.28	2.24	0.000
47.40	3.28	2.24	0.000	57.60	3.28	2.24	0.000
47.60	3.28	2.24	0.000	57.80	3.28	2.24	0.000
47.80	3.28	2.24	0.000	58.00	3.28	2.24	0.000
48.00	3.28	2.24	0.000	58.20	3.28	2.24	0.000
48.20	3.28	2.24	0.000	58.40	3.28	2.24	0.000
48.40	3.28	2.24	0.000	58.60	3.28	2.24	0.000
48.60	3.28	2.24	0.000	58.80	3.28	2.24	0.000
48.80	3.28	2.24	0.000	59.00	3.28	2.24	0.000
49.00	3.28	2.24	0.000	59.20	3.28	2.24	0.000
49.20	3.28	2.24	0.000	59.40	3.28	2.24	0.000
49.40	3.28	2.24	0.000	59.60	3.28	2.24	0.000
49.60	3.28	2.24	0.000	59.80	3.28	2.24	0.000
49.80	3.28	2.24	0.000	60.00	3.28	2.24	0.000
50.00	3.28	2.24	0.000	60.20	3.28	2.24	0.000
50.20	3.28	2.24	0.000	60.40	3.28	2.24	0.000
50.40	3.28	2.24	0.000	60.60	3.28	2.24	0.000
50.60	3.28	2.24	0.000	60.80	3.28	2.24	0.000
50.80	3.28	2.24	0.000	61.00	3.28	2.24	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	2.24	0.000	71.40	3.28	2.24	0.000
61.40	3.28	2.24	0.000	71.60	3.28	2.24	0.000
61.60	3.28	2.24	0.000	71.80	3.28	2.24	0.000
61.80	3.28	2.24	0.000	72.00	3.28	2.24	0.000
62.00	3.28	2.24	0.000	72.20	3.28	2.24	0.000
62.20	3.28	2.24	0.000	72.40	3.28	2.24	0.000
62.40	3.28	2.24	0.000	72.60	3.28	2.24	0.000
62.60	3.28	2.24	0.000	72.80	3.28	2.24	0.000
62.80	3.28	2.24	0.000	73.00	3.28	2.24	0.000
63.00	3.28	2.24	0.000	73.20	3.28	2.24	0.000
63.20	3.28	2.24	0.000	73.40	3.28	2.24	0.000
63.40	3.28	2.24	0.000	73.60	3.28	2.24	0.000
63.60	3.28	2.24	0.000	73.80	3.28	2.24	0.000
63.80	3.28	2.24	0.000	74.00	3.28	2.24	0.000
64.00	3.28	2.24	0.000	74.20	3.28	2.24	0.000
64.20	3.28	2.24	0.000	74.40	3.28	2.24	0.000
64.40	3.28	2.24	0.000	74.60	3.28	2.24	0.000
64.60	3.28	2.24	0.000	74.80	3.28	2.24	0.000
64.80	3.28	2.24	0.000	75.00	3.28	2.24	0.000
65.00	3.28	2.24	0.000	75.20	3.28	2.24	0.000
65.20	3.28	2.24	0.000	75.40	3.28	2.24	0.000
65.40	3.28	2.24	0.000	75.60	3.28	2.24	0.000
65.60	3.28	2.24	0.000	75.80	3.28	2.24	0.000
65.80	3.28	2.24	0.000	76.00	3.28	2.24	0.000
66.00	3.28	2.24	0.000	76.20	3.28	2.24	0.000
66.20	3.28	2.24	0.000	76.40	3.28	2.24	0.000
66.40	3.28	2.24	0.000	76.60	3.28	2.24	0.000
66.60	3.28	2.24	0.000	76.80	3.28	2.24	0.000
66.80	3.28	2.24	0.000	77.00	3.28	2.24	0.000
67.00	3.28	2.24	0.000	77.20	3.28	2.24	0.000
67.20	3.28	2.24	0.000	77.40	3.28	2.24	0.000
67.40	3.28	2.24	0.000	77.60	3.28	2.24	0.000
67.60	3.28	2.24	0.000	77.80	3.28	2.24	0.000
67.80	3.28	2.24	0.000	78.00	3.28	2.24	0.000
68.00	3.28	2.24	0.000	78.20	3.28	2.24	0.000
68.20	3.28	2.24	0.000	78.40	3.28	2.24	0.000
68.40	3.28	2.24	0.000	78.60	3.28	2.24	0.000
68.60	3.28	2.24	0.000	78.80	3.28	2.24	0.000
68.80	3.28	2.24	0.000	79.00	3.28	2.24	0.000
69.00	3.28	2.24	0.000	79.20	3.28	2.24	0.000
69.20	3.28	2.24	0.000	79.40	3.28	2.24	0.000
69.40	3.28	2.24	0.000	79.60	3.28	2.24	0.000
69.60	3.28	2.24	0.000	79.80	3.28	2.24	0.000
69.80	3.28	2.24	0.000	80.00	3.28	2.24	0.000
70.00	3.28	2.24	0.000	80.20	3.28	2.24	0.000
70.20	3.28	2.24	0.000	80.40	3.28	2.24	0.000
70.40	3.28	2.24	0.000	80.60	3.28	2.24	0.000
70.60	3.28	2.24	0.000	80.80	3.28	2.24	0.000
70.80	3.28	2.24	0.000	81.00	3.28	2.24	0.000
71.00	3.28	2.24	0.000	81.20	3.28	2.24	0.000
71.20	3.28	2.24	0.000	81.40	3.28	2.24	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	2.24	0.000	91.80	3.28	2.24	0.000
81.80	3.28	2.24	0.000	92.00	3.28	2.24	0.000
82.00	3.28	2.24	0.000	92.20	3.28	2.24	0.000
82.20	3.28	2.24	0.000	92.40	3.28	2.24	0.000
82.40	3.28	2.24	0.000	92.60	3.28	2.24	0.000
82.60	3.28	2.24	0.000	92.80	3.28	2.24	0.000
82.80	3.28	2.24	0.000	93.00	3.28	2.24	0.000
83.00	3.28	2.24	0.000	93.20	3.28	2.24	0.000
83.20	3.28	2.24	0.000	93.40	3.28	2.24	0.000
83.40	3.28	2.24	0.000	93.60	3.28	2.24	0.000
83.60	3.28	2.24	0.000	93.80	3.28	2.24	0.000
83.80	3.28	2.24	0.000	94.00	3.28	2.24	0.000
84.00	3.28	2.24	0.000	94.20	3.28	2.24	0.000
84.20	3.28	2.24	0.000	94.40	3.28	2.24	0.000
84.40	3.28	2.24	0.000	94.60	3.28	2.24	0.000
84.60	3.28	2.24	0.000	94.80	3.28	2.24	0.000
84.80	3.28	2.24	0.000	95.00	3.28	2.24	0.000
85.00	3.28	2.24	0.000	95.20	3.28	2.24	0.000
85.20	3.28	2.24	0.000	95.40	3.28	2.24	0.000
85.40	3.28	2.24	0.000	95.60	3.28	2.24	0.000
85.60	3.28	2.24	0.000	95.80	3.28	2.24	0.000
85.80	3.28	2.24	0.000	96.00	3.28	2.24	0.000
86.00	3.28	2.24	0.000	96.20	3.28	2.24	0.000
86.20	3.28	2.24	0.000	96.40	3.28	2.24	0.000
86.40	3.28	2.24	0.000	96.60	3.28	2.24	0.000
86.60	3.28	2.24	0.000	96.80	3.28	2.24	0.000
86.80	3.28	2.24	0.000	97.00	3.28	2.24	0.000
87.00	3.28	2.24	0.000	97.20	3.28	2.24	0.000
87.20	3.28	2.24	0.000	97.40	3.28	2.24	0.000
87.40	3.28	2.24	0.000	97.60	3.28	2.24	0.000
87.60	3.28	2.24	0.000	97.80	3.28	2.24	0.000
87.80	3.28	2.24	0.000	98.00	3.28	2.24	0.000
88.00	3.28	2.24	0.000	98.20	3.28	2.24	0.000
88.20	3.28	2.24	0.000	98.40	3.28	2.24	0.000
88.40	3.28	2.24	0.000	98.60	3.28	2.24	0.000
88.60	3.28	2.24	0.000	98.80	3.28	2.24	0.000
88.80	3.28	2.24	0.000	99.00	3.28	2.24	0.000
89.00	3.28	2.24	0.000	99.20	3.28	2.24	0.000
89.20	3.28	2.24	0.000	99.40	3.28	2.24	0.000
89.40	3.28	2.24	0.000	99.60	3.28	2.24	0.000
89.60	3.28	2.24	0.000	99.80	3.28	2.24	0.000
89.80	3.28	2.24	0.000	100.00	3.28	2.24	0.000
90.00	3.28	2.24	0.000	100.20	3.28	2.24	0.000
90.20	3.28	2.24	0.000	100.40	3.28	2.24	0.000
90.40	3.28	2.24	0.000	100.60	3.28	2.24	0.000
90.60	3.28	2.24	0.000	100.80	3.28	2.24	0.000
90.80	3.28	2.24	0.000	101.00	3.28	2.24	0.000
91.00	3.28	2.24	0.000	101.20	3.28	2.24	0.000
91.20	3.28	2.24	0.000	101.40	3.28	2.24	0.000
91.40	3.28	2.24	0.000	101.60	3.28	2.24	0.000
91.60	3.28	2.24	0.000	101.80	3.28	2.24	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	2.24	0.000	112.20	3.28	2.24	0.000
102.20	3.28	2.24	0.000	112.40	3.28	2.24	0.000
102.40	3.28	2.24	0.000	112.60	3.28	2.24	0.000
102.60	3.28	2.24	0.000	112.80	3.28	2.24	0.000
102.80	3.28	2.24	0.000	113.00	3.28	2.24	0.000
103.00	3.28	2.24	0.000	113.20	3.28	2.24	0.000
103.20	3.28	2.24	0.000	113.40	3.28	2.24	0.000
103.40	3.28	2.24	0.000	113.60	3.28	2.24	0.000
103.60	3.28	2.24	0.000	113.80	3.28	2.24	0.000
103.80	3.28	2.24	0.000	114.00	3.28	2.24	0.000
104.00	3.28	2.24	0.000	114.20	3.28	2.24	0.000
104.20	3.28	2.24	0.000	114.40	3.28	2.24	0.000
104.40	3.28	2.24	0.000	114.60	3.28	2.24	0.000
104.60	3.28	2.24	0.000	114.80	3.28	2.24	0.000
104.80	3.28	2.24	0.000	115.00	3.28	2.24	0.000
105.00	3.28	2.24	0.000	115.20	3.28	2.24	0.000
105.20	3.28	2.24	0.000	115.40	3.28	2.24	0.000
105.40	3.28	2.24	0.000	115.60	3.28	2.24	0.000
105.60	3.28	2.24	0.000	115.80	3.28	2.24	0.000
105.80	3.28	2.24	0.000	116.00	3.28	2.24	0.000
106.00	3.28	2.24	0.000	116.20	3.28	2.24	0.000
106.20	3.28	2.24	0.000	116.40	3.28	2.24	0.000
106.40	3.28	2.24	0.000	116.60	3.28	2.24	0.000
106.60	3.28	2.24	0.000	116.80	3.28	2.24	0.000
106.80	3.28	2.24	0.000	117.00	3.28	2.24	0.000
107.00	3.28	2.24	0.000	117.20	3.28	2.24	0.000
107.20	3.28	2.24	0.000	117.40	3.28	2.24	0.000
107.40	3.28	2.24	0.000	117.60	3.28	2.24	0.000
107.60	3.28	2.24	0.000	117.80	3.28	2.24	0.000
107.80	3.28	2.24	0.000	118.00	3.28	2.24	0.000
108.00	3.28	2.24	0.000	118.20	3.28	2.24	0.000
108.20	3.28	2.24	0.000	118.40	3.28	2.24	0.000
108.40	3.28	2.24	0.000	118.60	3.28	2.24	0.000
108.60	3.28	2.24	0.000	118.80	3.28	2.24	0.000
108.80	3.28	2.24	0.000	119.00	3.28	2.24	0.000
109.00	3.28	2.24	0.000	119.20	3.28	2.24	0.000
109.20	3.28	2.24	0.000	119.40	3.28	2.24	0.000
109.40	3.28	2.24	0.000	119.60	3.28	2.24	0.000
109.60	3.28	2.24	0.000	119.80	3.28	2.24	0.000
109.80	3.28	2.24	0.000	120.00	3.28	2.24	0.000
110.00	3.28	2.24	0.000	120.20	3.28	2.24	0.000
110.20	3.28	2.24	0.000	120.40	3.28	2.24	0.000
110.40	3.28	2.24	0.000	120.60	3.28	2.24	0.000
110.60	3.28	2.24	0.000	120.80	3.28	2.24	0.000
110.80	3.28	2.24	0.000	121.00	3.28	2.24	0.000
111.00	3.28	2.24	0.000	121.20	3.28	2.24	0.000
111.20	3.28	2.24	0.000	121.40	3.28	2.24	0.000
111.40	3.28	2.24	0.000	121.60	3.28	2.24	0.000
111.60	3.28	2.24	0.000	121.80	3.28	2.24	0.000
111.80	3.28	2.24	0.000	122.00	3.28	2.24	0.000
112.00	3.28	2.24	0.000	122.20	3.28	2.24	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	2.24	0.000	132.60	3.28	2.24	0.000
122.60	3.28	2.24	0.000	132.80	3.28	2.24	0.000
122.80	3.28	2.24	0.000	133.00	3.28	2.24	0.000
123.00	3.28	2.24	0.000	133.20	3.28	2.24	0.000
123.20	3.28	2.24	0.000	133.40	3.28	2.24	0.000
123.40	3.28	2.24	0.000	133.60	3.28	2.24	0.000
123.60	3.28	2.24	0.000	133.80	3.28	2.24	0.000
123.80	3.28	2.24	0.000	134.00	3.28	2.24	0.000
124.00	3.28	2.24	0.000	134.20	3.28	2.24	0.000
124.20	3.28	2.24	0.000	134.40	3.28	2.24	0.000
124.40	3.28	2.24	0.000	134.60	3.28	2.24	0.000
124.60	3.28	2.24	0.000	134.80	3.28	2.24	0.000
124.80	3.28	2.24	0.000	135.00	3.28	2.24	0.000
125.00	3.28	2.24	0.000	135.20	3.28	2.24	0.000
125.20	3.28	2.24	0.000	135.40	3.28	2.24	0.000
125.40	3.28	2.24	0.000	135.60	3.28	2.24	0.000
125.60	3.28	2.24	0.000	135.80	3.28	2.24	0.000
125.80	3.28	2.24	0.000	136.00	3.28	2.24	0.000
126.00	3.28	2.24	0.000	136.20	3.28	2.24	0.000
126.20	3.28	2.24	0.000	136.40	3.28	2.24	0.000
126.40	3.28	2.24	0.000	136.60	3.28	2.24	0.000
126.60	3.28	2.24	0.000	136.80	3.28	2.24	0.000
126.80	3.28	2.24	0.000	137.00	3.28	2.24	0.000
127.00	3.28	2.24	0.000	137.20	3.28	2.24	0.000
127.20	3.28	2.24	0.000	137.40	3.28	2.24	0.000
127.40	3.28	2.24	0.000	137.60	3.28	2.24	0.000
127.60	3.28	2.24	0.000	137.80	3.28	2.24	0.000
127.80	3.28	2.24	0.000	138.00	3.28	2.24	0.000
128.00	3.28	2.24	0.000	138.20	3.28	2.24	0.000
128.20	3.28	2.24	0.000	138.40	3.28	2.24	0.000
128.40	3.28	2.24	0.000	138.60	3.28	2.24	0.000
128.60	3.28	2.24	0.000	138.80	3.28	2.24	0.000
128.80	3.28	2.24	0.000	139.00	3.28	2.24	0.000
129.00	3.28	2.24	0.000	139.20	3.28	2.24	0.000
129.20	3.28	2.24	0.000	139.40	3.28	2.24	0.000
129.40	3.28	2.24	0.000	139.60	3.28	2.24	0.000
129.60	3.28	2.24	0.000	139.80	3.28	2.24	0.000
129.80	3.28	2.24	0.000	140.00	3.28	2.24	0.000
130.00	3.28	2.24	0.000	140.20	3.28	2.24	0.000
130.20	3.28	2.24	0.000	140.40	3.28	2.24	0.000
130.40	3.28	2.24	0.000	140.60	3.28	2.24	0.000
130.60	3.28	2.24	0.000	140.80	3.28	2.24	0.000
130.80	3.28	2.24	0.000	141.00	3.28	2.24	0.000
131.00	3.28	2.24	0.000	141.20	3.28	2.24	0.000
131.20	3.28	2.24	0.000	141.40	3.28	2.24	0.000
131.40	3.28	2.24	0.000	141.60	3.28	2.24	0.000
131.60	3.28	2.24	0.000	141.80	3.28	2.24	0.000
131.80	3.28	2.24	0.000	142.00	3.28	2.24	0.000
132.00	3.28	2.24	0.000	142.20	3.28	2.24	0.000
132.20	3.28	2.24	0.000	142.40	3.28	2.24	0.000
132.40	3.28	2.24	0.000	142.60	3.28	2.24	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	2.24	0.000	153.00	3.28	2.24	0.000
143.00	3.28	2.24	0.000	153.20	3.28	2.24	0.000
143.20	3.28	2.24	0.000	153.40	3.28	2.24	0.000
143.40	3.28	2.24	0.000	153.60	3.28	2.24	0.000
143.60	3.28	2.24	0.000	153.80	3.28	2.24	0.000
143.80	3.28	2.24	0.000	154.00	3.28	2.24	0.000
144.00	3.28	2.24	0.000	154.20	3.28	2.24	0.000
144.20	3.28	2.24	0.000	154.40	3.28	2.24	0.000
144.40	3.28	2.24	0.000	154.60	3.28	2.24	0.000
144.60	3.28	2.24	0.000	154.80	3.28	2.24	0.000
144.80	3.28	2.24	0.000	155.00	3.28	2.24	0.000
145.00	3.28	2.24	0.000	155.20	3.28	2.24	0.000
145.20	3.28	2.24	0.000	155.40	3.28	2.24	0.000
145.40	3.28	2.24	0.000	155.60	3.28	2.24	0.000
145.60	3.28	2.24	0.000	155.80	3.28	2.24	0.000
145.80	3.28	2.24	0.000	156.00	3.28	2.24	0.000
146.00	3.28	2.24	0.000	156.20	3.28	2.24	0.000
146.20	3.28	2.24	0.000	156.40	3.28	2.24	0.000
146.40	3.28	2.24	0.000	156.60	3.28	2.24	0.000
146.60	3.28	2.24	0.000	156.80	3.28	2.24	0.000
146.80	3.28	2.24	0.000	157.00	3.28	2.24	0.000
147.00	3.28	2.24	0.000	157.20	3.28	2.24	0.000
147.20	3.28	2.24	0.000	157.40	3.28	2.24	0.000
147.40	3.28	2.24	0.000	157.60	3.28	2.24	0.000
147.60	3.28	2.24	0.000	157.80	3.28	2.24	0.000
147.80	3.28	2.24	0.000	158.00	3.28	2.24	0.000
148.00	3.28	2.24	0.000	158.20	3.28	2.24	0.000
148.20	3.28	2.24	0.000	158.40	3.28	2.24	0.000
148.40	3.28	2.24	0.000	158.60	3.28	2.24	0.000
148.60	3.28	2.24	0.000	158.80	3.28	2.24	0.000
148.80	3.28	2.24	0.000	159.00	3.28	2.24	0.000
149.00	3.28	2.24	0.000	159.20	3.28	2.24	0.000
149.20	3.28	2.24	0.000	159.40	3.28	2.24	0.000
149.40	3.28	2.24	0.000	159.60	3.28	2.24	0.000
149.60	3.28	2.24	0.000	159.80	3.28	2.24	0.000
149.80	3.28	2.24	0.000	160.00	3.28	2.24	0.000
150.00	3.28	2.24	0.000	160.20	3.28	2.24	0.000
150.20	3.28	2.24	0.000	160.40	3.28	2.24	0.000
150.40	3.28	2.24	0.000	160.60	3.28	2.24	0.000
150.60	3.28	2.24	0.000	160.80	3.28	2.24	0.000
150.80	3.28	2.24	0.000	161.00	3.28	2.24	0.000
151.00	3.28	2.24	0.000	161.20	3.28	2.24	0.000
151.20	3.28	2.24	0.000	161.40	3.28	2.24	0.000
151.40	3.28	2.24	0.000	161.60	3.28	2.24	0.000
151.60	3.28	2.24	0.000	161.80	3.28	2.24	0.000
151.80	3.28	2.24	0.000	162.00	3.28	2.24	0.000
152.00	3.28	2.24	0.000	162.20	3.28	2.24	0.000
152.20	3.28	2.24	0.000	162.40	3.28	2.24	0.000
152.40	3.28	2.24	0.000	162.60	3.28	2.24	0.000
152.60	3.28	2.24	0.000	162.80	3.28	2.24	0.000
152.80	3.28	2.24	0.000	163.00	3.28	2.24	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	2.24	0.000
163.40	3.28	2.24	0.000
163.60	3.28	2.24	0.000
163.80	3.28	2.24	0.000
164.00	3.28	2.24	0.000
164.20	3.28	2.24	0.000
164.40	3.28	2.24	0.000
164.60	3.28	2.24	0.000
164.80	3.28	2.24	0.000
165.00	3.28	2.24	0.000
165.20	3.28	2.24	0.000
165.40	3.28	2.24	0.000
165.60	3.28	2.24	0.000
165.80	3.28	2.24	0.000
166.00	3.28	2.24	0.000
166.20	3.28	2.24	0.000
166.40	3.28	2.24	0.000
166.60	3.28	2.24	0.000
166.80	3.28	2.24	0.000
167.00	3.28	2.24	0.000
167.20	3.28	2.24	0.000
167.40	3.28	2.24	0.000
167.60	3.28	2.24	0.000
167.80	3.28	2.24	0.000
168.00	3.28	2.24	0.000

Summary for Pond 1P: UG1

Inflow Area = 81,675 sf, 99.20% Impervious, Inflow Depth = 3.02" for 2-yr event
Inflow = 8.907 cfs @ 11.96 hrs, Volume= 20,574 cf
Outflow = 2.597 cfs @ 12.07 hrs, Volume= 20,430 cf, Atten= 71%, Lag= 7.0 min
Primary = 2.597 cfs @ 12.07 hrs, Volume= 20,430 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 158.80' @ 12.07 hrs Surf.Area= 13,041 sf Storage= 11,417 cf

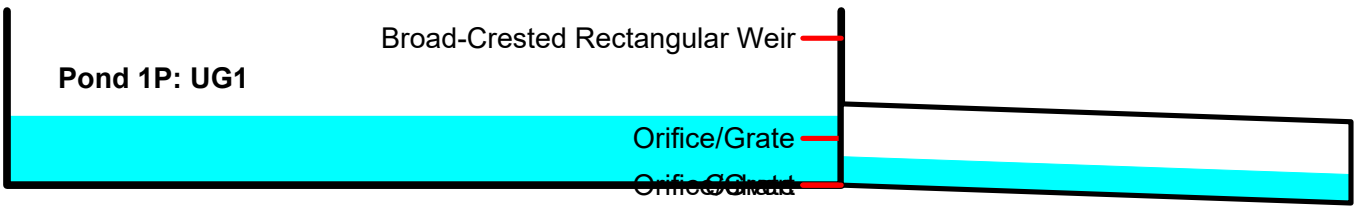
Plug-Flow detention time= 1,288.2 min calculated for 20,430 cf (99% of inflow)
Center-of-Mass det. time= 1,283.4 min (2,034.5 - 751.0)

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'	**40.0" 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= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=2.596 cfs @ 12.07 hrs HW=158.80' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 2.596 cfs of 4.958 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.029 cfs @ 5.331 fps)
  ├**2=Orifice/Grate** (Orifice Controls 2.567 cfs @ 2.311 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

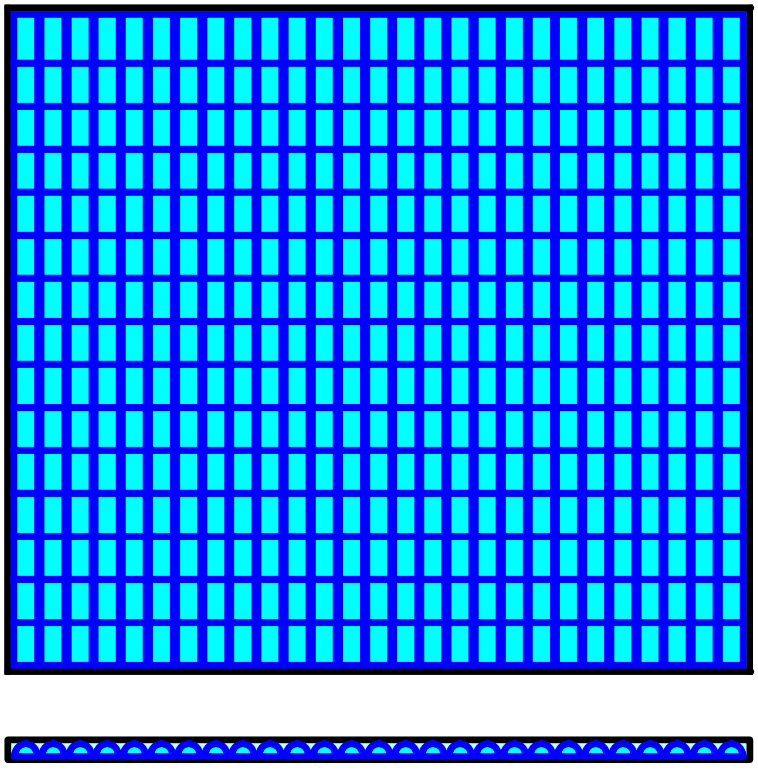
15 Chambers/Row x 7.00' Long +1.00' Row Adjustment = 106.00' Row Length +12.0" End Stone x 2 = 108.00' Base Length
27 Rows x 47.0" Wide + 6.0" Spacing x 26 + 12.0" Side Stone x 2 = 120.75' Base Width
6.0" Stone Base + 26.5" Chamber Height + 6.0" Stone Cover = 3.21' Field Height

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

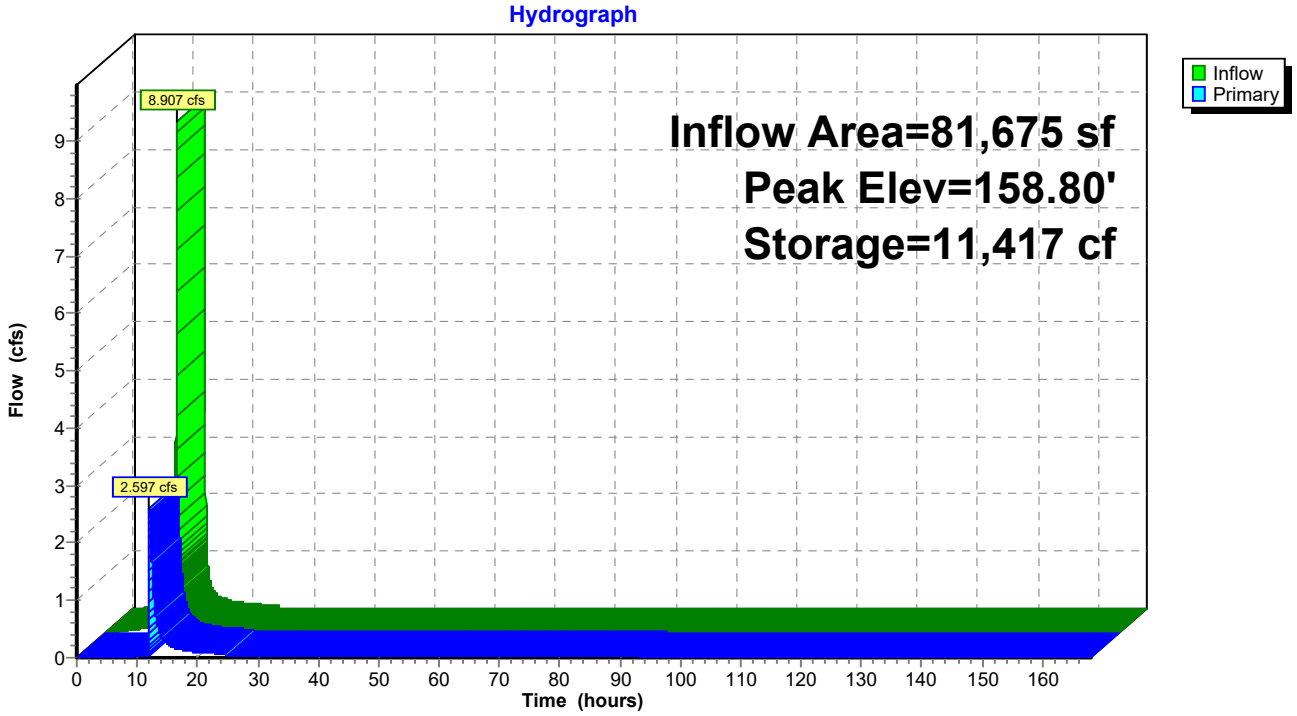
41,839.9 cf Field - 17,377.3 cf Chambers = 24,462.5 cf Stone x 40.0% Voids = 9,785.0 cf Stone Storage

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=81,675 sf
Peak Elev=158.80'
Storage=11,417 cf
8.907 cfs
2.597 cfs
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
8
9
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	0.026	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	357	157.60	0.004
5.00	0.067	462	157.62	0.006
5.50	0.076	579	157.64	0.007
6.00	0.084	709	157.67	0.008
6.50	0.092	852	157.69	0.009
7.00	0.100	1,008	157.72	0.010
7.50	0.108	1,176	157.76	0.011
8.00	0.116	1,357	157.79	0.012
8.50	0.142	1,563	157.83	0.013
9.00	0.172	1,821	157.88	0.015
9.50	0.180	2,114	157.94	0.016
10.00	0.221	2,439	158.00	0.017
10.50	0.289	2,864	158.05	0.018
11.00	0.403	3,447	158.10	0.019
11.50	**0.667**	4,355	158.18	0.020
12.00	**7.357**	**10,806**	**158.74**	**2.239**
12.50	0.639	**9,833**	**158.66**	**1.490**
13.00	0.398	8,772	158.56	0.784
13.50	0.301	8,264	158.52	0.507
14.00	0.236	7,969	158.49	0.367
14.50	0.208	7,783	158.47	0.288
15.00	0.187	7,666	158.46	0.241
15.50	0.166	7,579	158.46	0.209
16.00	0.144	7,505	158.45	0.183
16.50	0.134	7,445	158.45	0.163
17.00	0.127	7,400	158.44	0.148
17.50	0.119	7,365	158.44	0.137
18.00	0.111	7,334	158.44	0.128
18.50	0.104	7,305	158.43	0.119
19.00	0.096	7,277	158.43	0.111
19.50	0.088	7,250	158.43	0.104
20.00	0.081	7,222	158.43	0.096
20.50	0.078	7,197	158.42	0.090
21.00	0.077	7,179	158.42	0.085
21.50	0.075	7,166	158.42	0.082
22.00	0.074	7,155	158.42	0.079
22.50	0.072	7,145	158.42	0.077
23.00	0.071	7,137	158.42	0.075
23.50	0.069	7,129	158.42	0.073
24.00	0.068	7,122	158.42	0.072
24.50	0.000	7,029	158.41	0.052
25.00	0.000	6,949	158.40	0.038

Hydrograph for Pond 1P: UG1 (continued)

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
25.50	0.000	6,888	158.40	0.030
26.00	0.000	6,839	158.39	0.025
26.50	0.000	6,796	158.39	0.024
27.00	0.000	6,753	158.39	0.024
27.50	0.000	6,711	158.38	0.024
28.00	0.000	6,668	158.38	0.024
28.50	0.000	6,626	158.37	0.024
29.00	0.000	6,584	158.37	0.023
29.50	0.000	6,541	158.37	0.023
30.00	0.000	6,499	158.36	0.023
30.50	0.000	6,457	158.36	0.023
31.00	0.000	6,415	158.36	0.023
31.50	0.000	6,374	158.35	0.023
32.00	0.000	6,332	158.35	0.023
32.50	0.000	6,290	158.34	0.023
33.00	0.000	6,249	158.34	0.023
33.50	0.000	6,207	158.34	0.023
34.00	0.000	6,166	158.33	0.023
34.50	0.000	6,125	158.33	0.023
35.00	0.000	6,084	158.33	0.023
35.50	0.000	6,043	158.32	0.023
36.00	0.000	6,002	158.32	0.023
36.50	0.000	5,961	158.32	0.023
37.00	0.000	5,920	158.31	0.023
37.50	0.000	5,879	158.31	0.023
38.00	0.000	5,839	158.31	0.023
38.50	0.000	5,798	158.30	0.022
39.00	0.000	5,758	158.30	0.022
39.50	0.000	5,718	158.30	0.022
40.00	0.000	5,678	158.29	0.022
40.50	0.000	5,638	158.29	0.022
41.00	0.000	5,598	158.29	0.022
41.50	0.000	5,558	158.28	0.022
42.00	0.000	5,518	158.28	0.022
42.50	0.000	5,478	158.27	0.022
43.00	0.000	5,439	158.27	0.022
43.50	0.000	5,399	158.27	0.022
44.00	0.000	5,360	158.26	0.022
44.50	0.000	5,320	158.26	0.022
45.00	0.000	5,281	158.26	0.022
45.50	0.000	5,242	158.25	0.022
46.00	0.000	5,203	158.25	0.022
46.50	0.000	5,164	158.25	0.022
47.00	0.000	5,125	158.24	0.022
47.50	0.000	5,087	158.24	0.021
48.00	0.000	5,048	158.24	0.021
48.50	0.000	5,010	158.23	0.021
49.00	0.000	4,971	158.23	0.021
49.50	0.000	4,933	158.23	0.021
50.00	0.000	4,895	158.22	0.021
50.50	0.000	4,856	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	4,818	158.22	0.021
51.50	0.000	4,780	158.21	0.021
52.00	0.000	4,743	158.21	0.021
52.50	0.000	4,705	158.21	0.021
53.00	0.000	4,667	158.20	0.021
53.50	0.000	4,630	158.20	0.021
54.00	0.000	4,592	158.20	0.021
54.50	0.000	4,555	158.20	0.021
55.00	0.000	4,517	158.19	0.021
55.50	0.000	4,480	158.19	0.021
56.00	0.000	4,443	158.19	0.021
56.50	0.000	4,406	158.18	0.021
57.00	0.000	4,369	158.18	0.020
57.50	0.000	4,333	158.18	0.020
58.00	0.000	4,296	158.17	0.020
58.50	0.000	4,259	158.17	0.020
59.00	0.000	4,223	158.17	0.020
59.50	0.000	4,186	158.16	0.020
60.00	0.000	4,150	158.16	0.020
60.50	0.000	4,114	158.16	0.020
61.00	0.000	4,078	158.15	0.020
61.50	0.000	4,042	158.15	0.020
62.00	0.000	4,006	158.15	0.020
62.50	0.000	3,970	158.15	0.020
63.00	0.000	3,934	158.14	0.020
63.50	0.000	3,898	158.14	0.020
64.00	0.000	3,863	158.14	0.020
64.50	0.000	3,827	158.13	0.020
65.00	0.000	3,792	158.13	0.020
65.50	0.000	3,757	158.13	0.020
66.00	0.000	3,722	158.12	0.020
66.50	0.000	3,686	158.12	0.019
67.00	0.000	3,651	158.12	0.019
67.50	0.000	3,617	158.12	0.019
68.00	0.000	3,582	158.11	0.019
68.50	0.000	3,547	158.11	0.019
69.00	0.000	3,512	158.11	0.019
69.50	0.000	3,478	158.10	0.019
70.00	0.000	3,444	158.10	0.019
70.50	0.000	3,409	158.10	0.019
71.00	0.000	3,375	158.09	0.019
71.50	0.000	3,341	158.09	0.019
72.00	0.000	3,307	158.09	0.019
72.50	0.000	3,273	158.09	0.019
73.00	0.000	3,239	158.08	0.019
73.50	0.000	3,205	158.08	0.019
74.00	0.000	3,172	158.08	0.019
74.50	0.000	3,138	158.07	0.019
75.00	0.000	3,105	158.07	0.019
75.50	0.000	3,071	158.07	0.019
76.00	0.000	3,038	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	3,005	158.06	0.018
77.00	0.000	2,972	158.06	0.018
77.50	0.000	2,939	158.06	0.018
78.00	0.000	2,906	158.05	0.018
78.50	0.000	2,873	158.05	0.018
79.00	0.000	2,840	158.05	0.018
79.50	0.000	2,808	158.05	0.018
80.00	0.000	2,775	158.04	0.018
80.50	0.000	2,743	158.04	0.018
81.00	0.000	2,710	158.04	0.018
81.50	0.000	2,678	158.04	0.018
82.00	0.000	2,646	158.03	0.018
82.50	0.000	2,614	158.03	0.018
83.00	0.000	2,582	158.02	0.018
83.50	0.000	2,550	158.02	0.018
84.00	0.000	2,519	158.01	0.017
84.50	0.000	2,487	158.01	0.017
85.00	0.000	2,456	158.00	0.017
85.50	0.000	2,425	157.99	0.017
86.00	0.000	2,395	157.99	0.017
86.50	0.000	2,364	157.98	0.017
87.00	0.000	2,334	157.98	0.017
87.50	0.000	2,304	157.97	0.017
88.00	0.000	2,274	157.97	0.016
88.50	0.000	2,245	157.96	0.016
89.00	0.000	2,215	157.95	0.016
89.50	0.000	2,186	157.95	0.016
90.00	0.000	2,157	157.94	0.016
90.50	0.000	2,129	157.94	0.016
91.00	0.000	2,100	157.93	0.016
91.50	0.000	2,072	157.93	0.016
92.00	0.000	2,044	157.92	0.016
92.50	0.000	2,016	157.92	0.015
93.00	0.000	1,988	157.91	0.015
93.50	0.000	1,961	157.91	0.015
94.00	0.000	1,934	157.90	0.015
94.50	0.000	1,907	157.90	0.015
95.00	0.000	1,880	157.89	0.015
95.50	0.000	1,853	157.89	0.015
96.00	0.000	1,827	157.88	0.015
96.50	0.000	1,801	157.88	0.014
97.00	0.000	1,775	157.87	0.014
97.50	0.000	1,749	157.87	0.014
98.00	0.000	1,724	157.86	0.014
98.50	0.000	1,698	157.86	0.014
99.00	0.000	1,673	157.85	0.014
99.50	0.000	1,648	157.85	0.014
100.00	0.000	1,624	157.84	0.014
100.50	0.000	1,599	157.84	0.014
101.00	0.000	1,575	157.83	0.013
101.50	0.000	1,551	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	1,527	157.82	0.013
102.50	0.000	1,504	157.82	0.013
103.00	0.000	1,480	157.81	0.013
103.50	0.000	1,457	157.81	0.013
104.00	0.000	1,434	157.80	0.013
104.50	0.000	1,412	157.80	0.013
105.00	0.000	1,389	157.80	0.012
105.50	0.000	1,367	157.79	0.012
106.00	0.000	1,345	157.79	0.012
106.50	0.000	1,323	157.78	0.012
107.00	0.000	1,301	157.78	0.012
107.50	0.000	1,280	157.78	0.012
108.00	0.000	1,259	157.77	0.012
108.50	0.000	1,238	157.77	0.012
109.00	0.000	1,217	157.76	0.011
109.50	0.000	1,196	157.76	0.011
110.00	0.000	1,176	157.76	0.011
110.50	0.000	1,156	157.75	0.011
111.00	0.000	1,136	157.75	0.011
111.50	0.000	1,116	157.74	0.011
112.00	0.000	1,097	157.74	0.011
112.50	0.000	1,077	157.74	0.011
113.00	0.000	1,058	157.73	0.011
113.50	0.000	1,039	157.73	0.010
114.00	0.000	1,021	157.73	0.010
114.50	0.000	1,002	157.72	0.010
115.00	0.000	984	157.72	0.010
115.50	0.000	966	157.72	0.010
116.00	0.000	948	157.71	0.010
116.50	0.000	931	157.71	0.010
117.00	0.000	913	157.71	0.010
117.50	0.000	896	157.70	0.009
118.00	0.000	879	157.70	0.009
118.50	0.000	862	157.70	0.009
119.00	0.000	846	157.69	0.009
119.50	0.000	830	157.69	0.009
120.00	0.000	814	157.69	0.009
120.50	0.000	798	157.68	0.009
121.00	0.000	782	157.68	0.009
121.50	0.000	767	157.68	0.009
122.00	0.000	751	157.67	0.008
122.50	0.000	736	157.67	0.008
123.00	0.000	721	157.67	0.008
123.50	0.000	707	157.67	0.008
124.00	0.000	693	157.66	0.008
124.50	0.000	678	157.66	0.008
125.00	0.000	664	157.66	0.008
125.50	0.000	651	157.65	0.008
126.00	0.000	637	157.65	0.007
126.50	0.000	624	157.65	0.007
127.00	0.000	611	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	598	157.64	0.007
128.00	0.000	585	157.64	0.007
128.50	0.000	573	157.64	0.007
129.00	0.000	561	157.64	0.007
129.50	0.000	549	157.64	0.007
130.00	0.000	537	157.63	0.006
130.50	0.000	525	157.63	0.006
131.00	0.000	514	157.63	0.006
131.50	0.000	503	157.63	0.006
132.00	0.000	492	157.62	0.006
132.50	0.000	481	157.62	0.006
133.00	0.000	470	157.62	0.006
133.50	0.000	460	157.62	0.006
134.00	0.000	450	157.62	0.006
134.50	0.000	440	157.61	0.005
135.00	0.000	430	157.61	0.005
135.50	0.000	421	157.61	0.005
136.00	0.000	412	157.61	0.005
136.50	0.000	403	157.61	0.005
137.00	0.000	394	157.61	0.005
137.50	0.000	385	157.60	0.005
138.00	0.000	377	157.60	0.005
138.50	0.000	369	157.60	0.004
139.00	0.000	361	157.60	0.004
139.50	0.000	353	157.60	0.004
140.00	0.000	346	157.60	0.004
140.50	0.000	338	157.59	0.004
141.00	0.000	331	157.59	0.004
141.50	0.000	325	157.59	0.004
142.00	0.000	318	157.59	0.004
142.50	0.000	312	157.59	0.003
143.00	0.000	305	157.59	0.003
143.50	0.000	299	157.59	0.003
144.00	0.000	294	157.59	0.003
144.50	0.000	288	157.59	0.003
145.00	0.000	283	157.58	0.003
145.50	0.000	277	157.58	0.003
146.00	0.000	272	157.58	0.003
146.50	0.000	267	157.58	0.003
147.00	0.000	262	157.58	0.003
147.50	0.000	258	157.58	0.003
148.00	0.000	253	157.58	0.002
148.50	0.000	249	157.58	0.002
149.00	0.000	245	157.58	0.002
149.50	0.000	240	157.58	0.002
150.00	0.000	236	157.58	0.002
150.50	0.000	233	157.57	0.002
151.00	0.000	229	157.57	0.002
151.50	0.000	225	157.57	0.002
152.00	0.000	222	157.57	0.002
152.50	0.000	218	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	211	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	191	157.57	0.001
157.50	0.000	188	157.57	0.001
158.00	0.000	185	157.57	0.001
158.50	0.000	183	157.57	0.001
159.00	0.000	180	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	173	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	150	157.56	0.001
167.00	0.000	148	157.56	0.001
167.50	0.000	146	157.56	0.001
168.00	0.000	145	157.56	0.001

Summary for Pond 3P: UG2

Inflow Area = 21,519 sf, 87.04% Impervious, Inflow Depth = 2.65" for 2-yr event
Inflow = 2.059 cfs @ 11.96 hrs, Volume= 4,757 cf
Outflow = 0.492 cfs @ 12.09 hrs, Volume= 4,756 cf, Atten= 76%, Lag= 7.8 min
Primary = 0.492 cfs @ 12.09 hrs, Volume= 4,756 cf
Routed to Link 10L : POST-DEV TO DA #1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs / 2
Peak Elev= 160.37' @ 12.09 hrs Surf.Area= 2,542 sf Storage= 1,777 cf

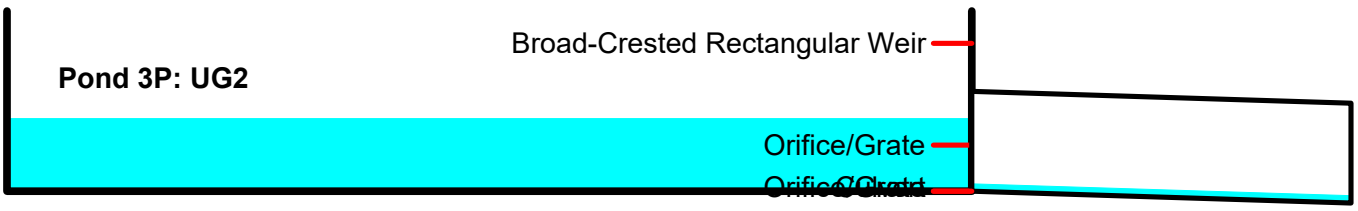
Plug-Flow detention time= 73.9 min calculated for 4,755 cf (100% of inflow)
Center-of-Mass det. time= 74.2 min (825.3 - 751.1)

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'	**5.0" 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= 36.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.492 cfs @ 12.09 hrs HW=160.37' TW=0.00' (Dynamic Tailwater)
└**4=Culvert** (Passes 0.492 cfs of 3.732 cfs potential flow)
  ├**1=Orifice/Grate** (Orifice Controls 0.232 cfs @ 4.728 fps)
  ├**2=Orifice/Grate** (Orifice Controls 0.260 cfs @ 2.498 fps)
  └**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)



Pond 3P: UG2 - Chamber Wizard Field A

Chamber Model = Cultec R-180 (Cultec Recharger®180HD)
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

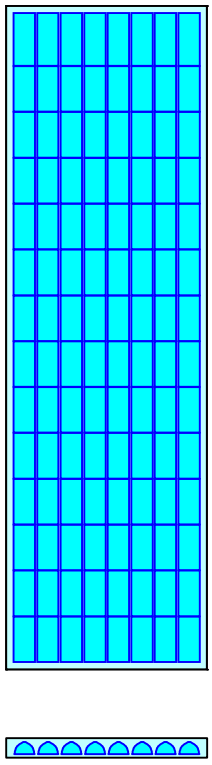
14 Chambers/Row x 6.33' Long +1.00' Row Adjustment = 89.62' Row Length +12.0" End Stone x 2 = 91.62' Base Length
8 Rows x 36.0" Wide + 3.0" Spacing x 7 + 12.0" Side Stone x 2 = 27.75' Base Width
6.0" Stone Base + 20.5" Chamber Height + 6.0" Stone Cover = 2.71' Field Height

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

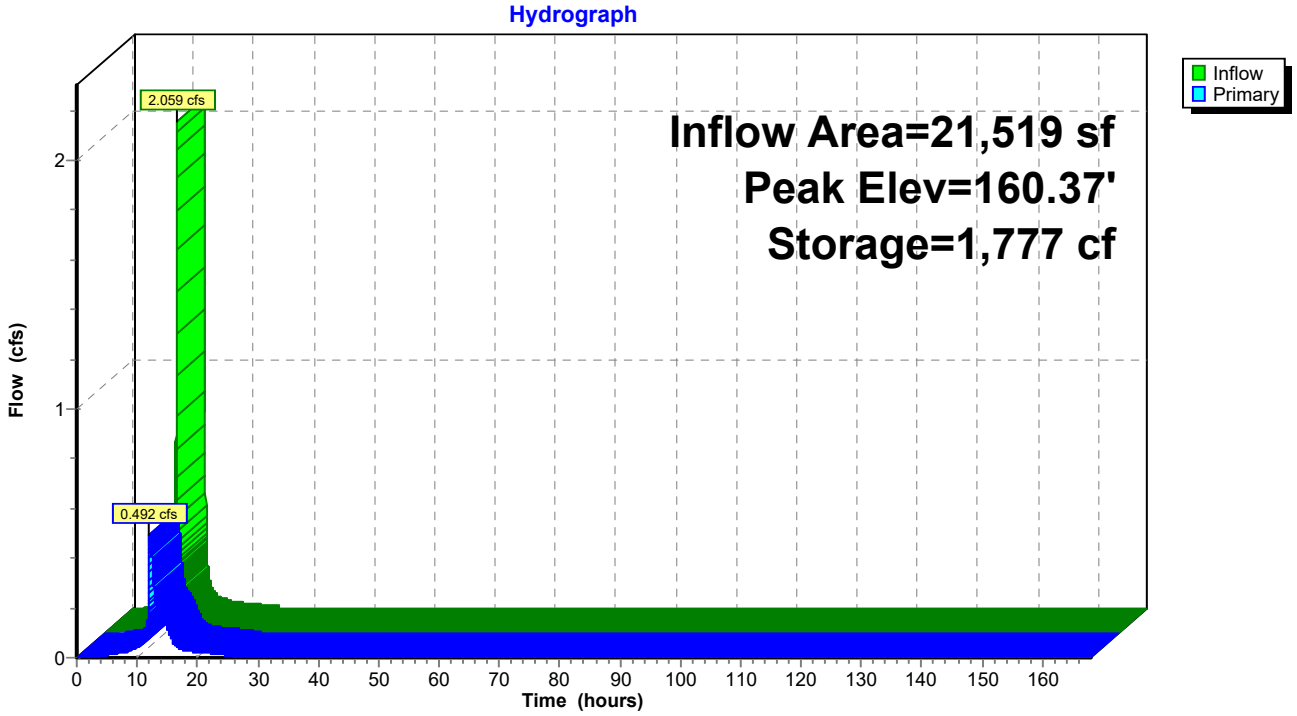
6,885.8 cf Field - 2,466.0 cf Chambers = 4,419.8 cf Stone x 40.0% Voids = 1,767.9 cf Stone Storage

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
2.059 cfs
0.492 cfs
Inflow Area=21,519 sf
Peak Elev=160.37'
Storage=1,777 cf
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	159.29	0.000
2.50	0.006	14	159.29	0.000
3.00	0.008	25	159.30	0.001
3.50	0.010	38	159.32	0.003
4.00	0.012	50	159.33	0.005
4.50	0.014	61	159.34	0.008
5.00	0.016	71	159.35	0.010
5.50	0.017	80	159.36	0.013
6.00	0.019	88	159.37	0.015
6.50	0.021	96	159.37	0.018
7.00	0.023	102	159.38	0.020
7.50	0.025	108	159.39	0.022
8.00	0.027	113	159.39	0.024
8.50	0.033	121	159.40	0.027
9.00	0.040	133	159.41	0.032
9.50	0.042	145	159.42	0.037
10.00	0.051	156	159.43	0.042
10.50	0.067	178	159.45	0.052
11.00	0.093	213	159.49	0.068
11.50	**0.154**	287	159.56	0.094
12.00	**1.701**	**1,607**	**160.29**	**0.438**
12.50	0.148	**1,460**	**160.22**	**0.379**
13.00	0.092	1,132	160.07	0.232
13.50	0.070	917	159.97	0.177
14.00	0.055	723	159.88	0.162
14.50	0.048	535	159.79	0.147
15.00	0.043	378	159.65	0.117
15.50	0.038	267	159.54	0.088
16.00	0.033	198	159.47	0.061
16.50	0.031	162	159.44	0.045
17.00	0.029	144	159.42	0.037
17.50	0.028	133	159.41	0.032
18.00	0.026	126	159.40	0.029
18.50	0.024	121	159.40	0.027
19.00	0.022	116	159.39	0.025
19.50	0.020	111	159.39	0.023
20.00	0.019	106	159.38	0.021
20.50	0.018	102	159.38	0.020
21.00	0.018	99	159.38	0.019
21.50	0.017	98	159.38	0.018
22.00	0.017	96	159.37	0.018
22.50	0.017	95	159.37	0.017
23.00	0.016	94	159.37	0.017
23.50	0.016	93	159.37	0.017
24.00	0.016	92	159.37	0.016
24.50	0.000	72	159.35	0.010
25.00	0.000	57	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	47	159.33	0.005
26.00	0.000	40	159.32	0.003
26.50	0.000	35	159.31	0.003
27.00	0.000	31	159.31	0.002
27.50	0.000	27	159.31	0.002
28.00	0.000	25	159.30	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	18	159.30	0.001
30.50	0.000	17	159.30	0.001
31.00	0.000	16	159.30	0.001
31.50	0.000	15	159.29	0.000
32.00	0.000	14	159.29	0.000
32.50	0.000	13	159.29	0.000
33.00	0.000	13	159.29	0.000
33.50	0.000	12	159.29	0.000
34.00	0.000	12	159.29	0.000
34.50	0.000	11	159.29	0.000
35.00	0.000	11	159.29	0.000
35.50	0.000	10	159.29	0.000
36.00	0.000	10	159.29	0.000
36.50	0.000	9	159.29	0.000
37.00	0.000	9	159.29	0.000
37.50	0.000	9	159.29	0.000
38.00	0.000	8	159.29	0.000
38.50	0.000	8	159.29	0.000
39.00	0.000	8	159.29	0.000
39.50	0.000	8	159.29	0.000
40.00	0.000	7	159.29	0.000
40.50	0.000	7	159.29	0.000
41.00	0.000	7	159.29	0.000
41.50	0.000	7	159.29	0.000
42.00	0.000	7	159.29	0.000
42.50	0.000	7	159.29	0.000
43.00	0.000	6	159.29	0.000
43.50	0.000	6	159.29	0.000
44.00	0.000	6	159.29	0.000
44.50	0.000	6	159.29	0.000
45.00	0.000	6	159.29	0.000
45.50	0.000	6	159.29	0.000
46.00	0.000	6	159.29	0.000
46.50	0.000	5	159.29	0.000
47.00	0.000	5	159.29	0.000
47.50	0.000	5	159.29	0.000
48.00	0.000	5	159.29	0.000
48.50	0.000	5	159.28	0.000
49.00	0.000	5	159.28	0.000
49.50	0.000	5	159.28	0.000
50.00	0.000	5	159.28	0.000
50.50	0.000	5	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	5	159.28	0.000
51.50	0.000	4	159.28	0.000
52.00	0.000	4	159.28	0.000
52.50	0.000	4	159.28	0.000
53.00	0.000	4	159.28	0.000
53.50	0.000	4	159.28	0.000
54.00	0.000	4	159.28	0.000
54.50	0.000	4	159.28	0.000
55.00	0.000	4	159.28	0.000
55.50	0.000	4	159.28	0.000
56.00	0.000	4	159.28	0.000
56.50	0.000	4	159.28	0.000
57.00	0.000	4	159.28	0.000
57.50	0.000	4	159.28	0.000
58.00	0.000	4	159.28	0.000
58.50	0.000	4	159.28	0.000
59.00	0.000	4	159.28	0.000
59.50	0.000	3	159.28	0.000
60.00	0.000	3	159.28	0.000
60.50	0.000	3	159.28	0.000
61.00	0.000	3	159.28	0.000
61.50	0.000	3	159.28	0.000
62.00	0.000	3	159.28	0.000
62.50	0.000	3	159.28	0.000
63.00	0.000	3	159.28	0.000
63.50	0.000	3	159.28	0.000
64.00	0.000	3	159.28	0.000
64.50	0.000	3	159.28	0.000
65.00	0.000	3	159.28	0.000
65.50	0.000	3	159.28	0.000
66.00	0.000	3	159.28	0.000
66.50	0.000	3	159.28	0.000
67.00	0.000	3	159.28	0.000
67.50	0.000	3	159.28	0.000
68.00	0.000	3	159.28	0.000
68.50	0.000	3	159.28	0.000
69.00	0.000	3	159.28	0.000
69.50	0.000	3	159.28	0.000
70.00	0.000	3	159.28	0.000
70.50	0.000	3	159.28	0.000
71.00	0.000	3	159.28	0.000
71.50	0.000	3	159.28	0.000
72.00	0.000	3	159.28	0.000
72.50	0.000	3	159.28	0.000
73.00	0.000	3	159.28	0.000
73.50	0.000	3	159.28	0.000
74.00	0.000	3	159.28	0.000
74.50	0.000	2	159.28	0.000
75.00	0.000	2	159.28	0.000
75.50	0.000	2	159.28	0.000
76.00	0.000	2	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	2	159.28	0.000
77.00	0.000	2	159.28	0.000
77.50	0.000	2	159.28	0.000
78.00	0.000	2	159.28	0.000
78.50	0.000	2	159.28	0.000
79.00	0.000	2	159.28	0.000
79.50	0.000	2	159.28	0.000
80.00	0.000	2	159.28	0.000
80.50	0.000	2	159.28	0.000
81.00	0.000	2	159.28	0.000
81.50	0.000	2	159.28	0.000
82.00	0.000	2	159.28	0.000
82.50	0.000	2	159.28	0.000
83.00	0.000	2	159.28	0.000
83.50	0.000	2	159.28	0.000
84.00	0.000	2	159.28	0.000
84.50	0.000	2	159.28	0.000
85.00	0.000	2	159.28	0.000
85.50	0.000	2	159.28	0.000
86.00	0.000	2	159.28	0.000
86.50	0.000	2	159.28	0.000
87.00	0.000	2	159.28	0.000
87.50	0.000	2	159.28	0.000
88.00	0.000	2	159.28	0.000
88.50	0.000	2	159.28	0.000
89.00	0.000	2	159.28	0.000
89.50	0.000	2	159.28	0.000
90.00	0.000	2	159.28	0.000
90.50	0.000	2	159.28	0.000
91.00	0.000	2	159.28	0.000
91.50	0.000	2	159.28	0.000
92.00	0.000	2	159.28	0.000
92.50	0.000	2	159.28	0.000
93.00	0.000	2	159.28	0.000
93.50	0.000	2	159.28	0.000
94.00	0.000	2	159.28	0.000
94.50	0.000	2	159.28	0.000
95.00	0.000	2	159.28	0.000
95.50	0.000	2	159.28	0.000
96.00	0.000	2	159.28	0.000
96.50	0.000	2	159.28	0.000
97.00	0.000	2	159.28	0.000
97.50	0.000	2	159.28	0.000
98.00	0.000	2	159.28	0.000
98.50	0.000	2	159.28	0.000
99.00	0.000	2	159.28	0.000
99.50	0.000	2	159.28	0.000
100.00	0.000	2	159.28	0.000
100.50	0.000	2	159.28	0.000
101.00	0.000	2	159.28	0.000
101.50	0.000	2	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	2	159.28	0.000
102.50	0.000	2	159.28	0.000
103.00	0.000	2	159.28	0.000
103.50	0.000	2	159.28	0.000
104.00	0.000	2	159.28	0.000
104.50	0.000	2	159.28	0.000
105.00	0.000	2	159.28	0.000
105.50	0.000	2	159.28	0.000
106.00	0.000	2	159.28	0.000
106.50	0.000	2	159.28	0.000
107.00	0.000	2	159.28	0.000
107.50	0.000	2	159.28	0.000
108.00	0.000	2	159.28	0.000
108.50	0.000	2	159.28	0.000
109.00	0.000	2	159.28	0.000
109.50	0.000	2	159.28	0.000
110.00	0.000	2	159.28	0.000
110.50	0.000	2	159.28	0.000
111.00	0.000	2	159.28	0.000
111.50	0.000	2	159.28	0.000
112.00	0.000	1	159.28	0.000
112.50	0.000	1	159.28	0.000
113.00	0.000	1	159.28	0.000
113.50	0.000	1	159.28	0.000
114.00	0.000	1	159.28	0.000
114.50	0.000	1	159.28	0.000
115.00	0.000	1	159.28	0.000
115.50	0.000	1	159.28	0.000
116.00	0.000	1	159.28	0.000
116.50	0.000	1	159.28	0.000
117.00	0.000	1	159.28	0.000
117.50	0.000	1	159.28	0.000
118.00	0.000	1	159.28	0.000
118.50	0.000	1	159.28	0.000
119.00	0.000	1	159.28	0.000
119.50	0.000	1	159.28	0.000
120.00	0.000	1	159.28	0.000
120.50	0.000	1	159.28	0.000
121.00	0.000	1	159.28	0.000
121.50	0.000	1	159.28	0.000
122.00	0.000	1	159.28	0.000
122.50	0.000	1	159.28	0.000
123.00	0.000	1	159.28	0.000
123.50	0.000	1	159.28	0.000
124.00	0.000	1	159.28	0.000
124.50	0.000	1	159.28	0.000
125.00	0.000	1	159.28	0.000
125.50	0.000	1	159.28	0.000
126.00	0.000	1	159.28	0.000
126.50	0.000	1	159.28	0.000
127.00	0.000	1	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	1	159.28	0.000
128.00	0.000	1	159.28	0.000
128.50	0.000	1	159.28	0.000
129.00	0.000	1	159.28	0.000
129.50	0.000	1	159.28	0.000
130.00	0.000	1	159.28	0.000
130.50	0.000	1	159.28	0.000
131.00	0.000	1	159.28	0.000
131.50	0.000	1	159.28	0.000
132.00	0.000	1	159.28	0.000
132.50	0.000	1	159.28	0.000
133.00	0.000	1	159.28	0.000
133.50	0.000	1	159.28	0.000
134.00	0.000	1	159.28	0.000
134.50	0.000	1	159.28	0.000
135.00	0.000	1	159.28	0.000
135.50	0.000	1	159.28	0.000
136.00	0.000	1	159.28	0.000
136.50	0.000	1	159.28	0.000
137.00	0.000	1	159.28	0.000
137.50	0.000	1	159.28	0.000
138.00	0.000	1	159.28	0.000
138.50	0.000	1	159.28	0.000
139.00	0.000	1	159.28	0.000
139.50	0.000	1	159.28	0.000
140.00	0.000	1	159.28	0.000
140.50	0.000	1	159.28	0.000
141.00	0.000	1	159.28	0.000
141.50	0.000	1	159.28	0.000
142.00	0.000	1	159.28	0.000
142.50	0.000	1	159.28	0.000
143.00	0.000	1	159.28	0.000
143.50	0.000	1	159.28	0.000
144.00	0.000	1	159.28	0.000
144.50	0.000	1	159.28	0.000
145.00	0.000	1	159.28	0.000
145.50	0.000	1	159.28	0.000
146.00	0.000	1	159.28	0.000
146.50	0.000	1	159.28	0.000
147.00	0.000	1	159.28	0.000
147.50	0.000	1	159.28	0.000
148.00	0.000	1	159.28	0.000
148.50	0.000	1	159.28	0.000
149.00	0.000	1	159.28	0.000
149.50	0.000	1	159.28	0.000
150.00	0.000	1	159.28	0.000
150.50	0.000	1	159.28	0.000
151.00	0.000	1	159.28	0.000
151.50	0.000	1	159.28	0.000
152.00	0.000	1	159.28	0.000
152.50	0.000	1	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	1	159.28	0.000
153.50	0.000	1	159.28	0.000
154.00	0.000	1	159.28	0.000
154.50	0.000	1	159.28	0.000
155.00	0.000	1	159.28	0.000
155.50	0.000	1	159.28	0.000
156.00	0.000	1	159.28	0.000
156.50	0.000	1	159.28	0.000
157.00	0.000	1	159.28	0.000
157.50	0.000	1	159.28	0.000
158.00	0.000	1	159.28	0.000
158.50	0.000	1	159.28	0.000
159.00	0.000	1	159.28	0.000
159.50	0.000	1	159.28	0.000
160.00	0.000	1	159.28	0.000
160.50	0.000	1	159.28	0.000
161.00	0.000	1	159.28	0.000
161.50	0.000	1	159.28	0.000
162.00	0.000	1	159.28	0.000
162.50	0.000	1	159.28	0.000
163.00	0.000	1	159.28	0.000
163.50	0.000	1	159.28	0.000
164.00	0.000	1	159.28	0.000
164.50	0.000	1	159.28	0.000
165.00	0.000	1	159.28	0.000
165.50	0.000	1	159.28	0.000
166.00	0.000	1	159.28	0.000
166.50	0.000	1	159.28	0.000
167.00	0.000	1	159.28	0.000
167.50	0.000	1	159.28	0.000
168.00	0.000	1	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

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	1.87	1.87	1.75	1.86	Sandy Run	TSF, MF	Yes
002					Sandy Run	TSF, MF	No
003	0.50	0.50	0.21	0.43	Sandy Run	TSF, MF	Yes
004					Dis. to MS4 - Bodenstein Channel (UNT to Sandy Run)	TSF, MF	No
Undetained Areas	2.56	2.56	1.77	1.53	Sandy Run, UNT to Sandy Run/Bodenstein Channel	TSF, MF	
Totals:	**4.93**	**4.93**	**3.73**	**3.82**			

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%)	0.73	A	39	3.128	0.00	4

Woods (Good Condition)	0.28	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	173
Impervious Areas: Commercial	3.82	N/A	98	0.041	3.05	42,254
TOTAL (ACRES):	**4.93**				**TOTAL (CF):**	**42,431**

NET CHANGE IN VOLUME TO MANAGE (CF): **9,412**

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	20,574	0	0.00	12	No	1.0	20,574	**0**	
003	3	Dry Extended Detention Basin	-	Off-Site	0.50	4,757	0	0.00	12	No	1.0	4,757	**0**	
												Totals:		

INFILTRATION & ET CREDITS (CF):

MANAGED RELEASE CREDIT (CF): **20,574**

NET CHANGE IN VOLUME TO MANAGE (CF): **9,412**

TOTAL CREDITS (CF): **21,148**

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:	**8.62**	**8.19**	**-0.43**	***Rate Control Satisfied***
10-Year Storm:	**15.21**	**13.37**	**-1.84**	***Rate Control Satisfied***
50-Year Storm:	**23.72**	**18.73**	**-4.99**	***Rate Control Satisfied***
100-Year Storm:	**27.95**	**21.36**	**-6.59**	***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):

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	0.73	A	4	78.0	0.25	1.25	0.02	0.00	0.00
Woods (Good Condition)	Deciduous Forest/Evergreen Forest/Mixed Forest	0.28	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	173	78.0	0.25	1.25	0.84	0.00	0.01
Impervious Areas: Commercial	Commercial	3.82	N/A	42,254	61.7	0.22	2.02	162.85	0.58	5.33
	TOTAL (ACRES):	**4.93**					**TOTALS:**	**163.71**	**0.58**	**5.34**

POLLUTANT LOAD REDUCTION REQUIREMENTS (LBS):	36.56	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%)	**0.65**	**A**	**39**	**3.128**	**0.00**	**3**
Open Space (Lawns, Parks, Golf Courses, Cemeteries, Etc.) - Good Condition (Grass Cover > 75%)	**0.1**	**B**	**61**	**1.279**	**0.48**	**173**
Woods (Good Condition)	**0.282**	**A**	**30**	**4.667**	**0.00**	**0**
Impervious Areas: Commercial	**0.856**	**N/A**	**98**	**0.041**	**3.05**	**9,468**

Non-Structural BMP Water Quality Credits:

☑ Pervious Undetained Area Credit

TSS	TP	TN
0.13	0.00	0.00

☐ 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	20,574	0		20,574	-	-	-	-	-	-
003	3	Dry Extended Detention Basin	-	0.50	4,757	0		4,757	22.00	0.19	1.22	6.53	0.06	0.36

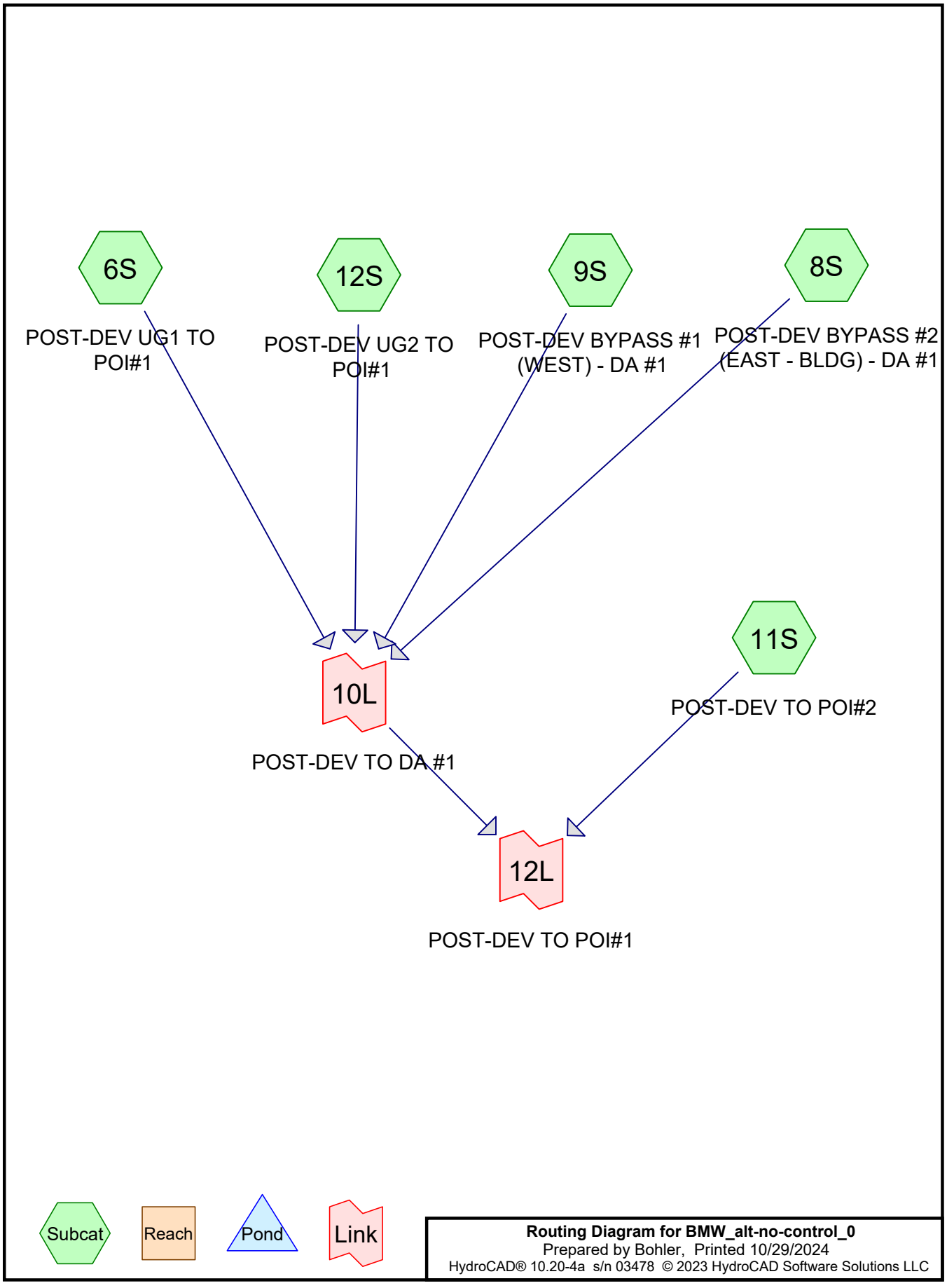
	TSS	TP	TN
POLLUTANT LOADS FROM STRUCTURAL BMP (TREATED) OUTFLOWS (LBS):	**6.53**	**0.06**	**0.36**
POLLUTANT LOADS FROM UNTREATED STORMWATER (LBS):	**37.35**	**0.13**	**1.21**
NON-STRUCTURAL BMP WATER QUALITY CREDITS (LBS):	**0.13**	**0.00**	**0.00**
NET POLLUTANT LOADS FROM SITE, POST-CONSTRUCTION (LBS):	**43.75**	**0.19**	**1.57**
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	10/29/2024
Spreadsheet User Name	Date


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_0
Prepared by Bohler, Printed 10/29/2024
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Summary for Subcatchment 6S: POST-DEV UG1 TO POI#1

Runoff = 8.979 cfs @ 11.96 hrs, Volume= 20,740 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
*	0.015	39	Lawn A
*	1.860	98	Impervious
	1.875	98	Weighted Average
	0.015		0.80% Pervious Area
	1.860		99.20% 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 = 3.161 cfs @ 11.96 hrs, Volume= 7,300 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
*	0.660	98	Impervious
	0.660	98	Weighted Average
	0.660		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 = 0.543 cfs @ 12.15 hrs, Volume= 2,239 cf, Depth= 0.56"
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
*	0.322	39	Lawn A
*	0.285	30	Wooded A
*	0.503	98	Impervious
	1.110	63	Weighted Average
	0.607		54.68% Pervious Area
	0.503		45.32% 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 = 1.279 cfs @ 11.97 hrs, Volume= 2,546 cf, Depth= 0.93"
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
*	0.265	39	Lawn A
*	0.130	61	Lawn B
*	0.362	98	Impervious
	0.757	71	Weighted Average
	0.395		52.18% Pervious Area
	0.362		47.82% 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 = 1.974 cfs @ 11.96 hrs, Volume= 4,022 cf, Depth= 2.24"
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
*	0.064	39	Lawn A
*	0.000	30	Wooded A
*	0.430	98	Impervious
	0.494	90	Weighted Average
	0.064		12.96% Pervious Area
	0.430		87.04% 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 = 180,295 sf, 83.43% Impervious, Inflow Depth = 2.28" for 2-yr event
Inflow = 14.229 cfs @ 11.96 hrs, Volume= 34,301 cf
Primary = 14.229 cfs @ 11.96 hrs, Volume= 34,301 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 = 213,270 sf, 77.92% Impervious, Inflow Depth = 2.07" for 2-yr event
Inflow = 15.488 cfs @ 11.96 hrs, Volume= 36,847 cf
Primary = 15.488 cfs @ 11.96 hrs, Volume= 36,847 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 = 13.300 cfs @ 11.96 hrs, Volume= 31,264 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
*	0.015	39	Lawn A
*	1.860	98	Impervious
	1.875	98	Weighted Average
	0.015		0.80% Pervious Area
	1.860		99.20% 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 = 4.682 cfs @ 11.96 hrs, Volume= 11,005 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
*	0.660	98	Impervious
	0.660	98	Weighted Average
	0.660		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 = 1.681 cfs @ 12.13 hrs, Volume= 5,650 cf, Depth= 1.40"
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 10-yr Rainfall=4.83"

	Area (ac)	CN	Description
*	0.322	39	Lawn A
*	0.285	30	Wooded A
*	0.503	98	Impervious
	1.110	63	Weighted Average
	0.607		54.68% Pervious Area
	0.503		45.32% 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 = 2.805 cfs @ 11.96 hrs, Volume= 5,465 cf, Depth= 1.99"
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
*	0.265	39	Lawn A
*	0.130	61	Lawn B
*	0.362	98	Impervious
	0.757	71	Weighted Average
	0.395		52.18% Pervious Area
	0.362		47.82% 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 = 3.165 cfs @ 11.96 hrs, Volume= 6,657 cf, Depth= 3.71"
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
*	0.064	39	Lawn A
*	0.000	30	Wooded A
*	0.430	98	Impervious
	0.494	90	Weighted Average
	0.064		12.96% Pervious Area
	0.430		87.04% 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 = 180,295 sf, 83.43% Impervious, Inflow Depth = 3.63" for 10-yr event
Inflow = 21.842 cfs @ 11.96 hrs, Volume= 54,577 cf
Primary = 21.842 cfs @ 11.96 hrs, Volume= 54,577 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 = 213,270 sf, 77.92% Impervious, Inflow Depth = 3.38" for 10-yr event
Inflow = 24.634 cfs @ 11.96 hrs, Volume= 60,042 cf
Primary = 24.634 cfs @ 11.96 hrs, Volume= 60,042 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 = 18.580 cfs @ 11.96 hrs, Volume= 44,180 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
*	0.015	39	Lawn A
*	1.860	98	Impervious
	1.875	98	Weighted Average
	0.015		0.80% Pervious Area
	1.860		99.20% 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 = 6.540 cfs @ 11.96 hrs, Volume= 15,551 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
*	0.660	98	Impervious
	0.660	98	Weighted Average
	0.660		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 = 3.425 cfs @ 12.11 hrs, Volume= 10,881 cf, Depth= 2.70"
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
*	0.322	39	Lawn A
*	0.285	30	Wooded A
*	0.503	98	Impervious
	1.110	63	Weighted Average
	0.607		54.68% Pervious Area
	0.503		45.32% 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 = 4.895 cfs @ 11.96 hrs, Volume= 9,610 cf, Depth= 3.50"
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
*	0.265	39	Lawn A
*	0.130	61	Lawn B
*	0.362	98	Impervious
	0.757	71	Weighted Average
	0.395		52.18% Pervious Area
	0.362		47.82% 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 = 4.610 cfs @ 11.96 hrs, Volume= 9,968 cf, Depth= 5.56"
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
*	0.064	39	Lawn A
*	0.000	30	Wooded A
*	0.430	98	Impervious
	0.494	90	Weighted Average
	0.064		12.96% Pervious Area
	0.430		87.04% 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 = 180,295 sf, 83.43% Impervious, Inflow Depth = 5.36" for 50-yr event
Inflow = 31.412 cfs @ 11.96 hrs, Volume= 80,581 cf
Primary = 31.412 cfs @ 11.96 hrs, Volume= 80,581 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 = 213,270 sf, 77.92% Impervious, Inflow Depth = 5.07" for 50-yr event
Inflow = 36.300 cfs @ 11.96 hrs, Volume= 90,191 cf
Primary = 36.300 cfs @ 11.96 hrs, Volume= 90,191 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 = 21.161 cfs @ 11.96 hrs, Volume= 50,505 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
*	0.015	39	Lawn A
*	1.860	98	Impervious
	1.875	98	Weighted Average
	0.015		0.80% Pervious Area
	1.860		99.20% 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 = 7.449 cfs @ 11.96 hrs, Volume= 17,778 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
*	0.660	98	Impervious
	0.660	98	Weighted Average
	0.660		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 = 4.360 cfs @ 12.11 hrs, Volume= 13,713 cf, Depth= 3.40"
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 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.322	39	Lawn A
*	0.285	30	Wooded A
*	0.503	98	Impervious
	1.110	63	Weighted Average
	0.607		54.68% Pervious Area
	0.503		45.32% 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 = 5.960 cfs @ 11.96 hrs, Volume= 11,776 cf, Depth= 4.29"
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 100-yr Rainfall=7.66"

	Area (ac)	CN	Description
*	0.265	39	Lawn A
*	0.130	61	Lawn B
*	0.362	98	Impervious
	0.757	71	Weighted Average
	0.395		52.18% Pervious Area
	0.362		47.82% 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 = 5.311 cfs @ 11.96 hrs, Volume= 11,604 cf, Depth= 6.47"
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
*	0.064	39	Lawn A
*	0.000	30	Wooded A
*	0.430	98	Impervious
	0.494	90	Weighted Average
	0.064		12.96% Pervious Area
	0.430		87.04% 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 = 180,295 sf, 83.43% Impervious, Inflow Depth = 6.23" for 100-yr event
Inflow = 36.150 cfs @ 11.96 hrs, Volume= 93,600 cf
Primary = 36.150 cfs @ 11.96 hrs, Volume= 93,600 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 = 213,270 sf, 77.92% Impervious, Inflow Depth = 5.93" for 100-yr event
Inflow = 42.106 cfs @ 11.96 hrs, Volume= 105,376 cf
Primary = 42.106 cfs @ 11.96 hrs, Volume= 105,376 cf, Atten= 0%, Lag= 0.0 min

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

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

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-yr	3.28	8.979	20,740	3.05
10-yr	4.83	13.300	31,264	4.59
50-yr	6.73	18.580	44,180	6.49
100-yr	**7.66**	**21.161**	**50,505**	**7.42**

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	3.161	7,300	3.05
10-yr	4.83	4.682	11,005	4.59
50-yr	6.73	6.540	15,551	6.49
100-yr	**7.66**	**7.449**	**17,778**	**7.42**

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	0.543	2,239	0.56
10-yr	4.83	1.681	5,650	1.40
50-yr	6.73	3.425	10,881	2.70
100-yr	**7.66**	**4.360**	**13,713**	**3.40**

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

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-yr	3.28	1.279	2,546	0.93
10-yr	4.83	2.805	5,465	1.99
50-yr	6.73	4.895	9,610	3.50
100-yr	**7.66**	**5.960**	**11,776**	**4.29**

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

Event	Rainfall (inches)	Runoff (cfs)	Volume (cubic-feet)	Depth (inches)
2-yr	3.28	1.974	4,022	2.24
10-yr	4.83	3.165	6,657	3.71
50-yr	6.73	4.610	9,968	5.56
100-yr	**7.66**	**5.311**	**11,604**	**6.47**

Events for Link 10L: POST-DEV TO DA #1

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)
2-yr	14.229	14.229	**0.00**
10-yr	21.842	21.842	0.00
50-yr	31.412	31.412	0.00
100-yr	**36.150**	**36.150**	0.00

Events for Link 12L: POST-DEV TO POI#1

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)
2-yr	15.488	15.488	**0.00**
10-yr	24.634	24.634	0.00
50-yr	36.300	36.300	0.00
100-yr	**42.106**	**42.106**	0.00

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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	3.701	0.014

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)	**1.88**	
Equivalent Contributing Impervious Area to BMP (acres)	**1.86**	
Total Drainage Area to BMP (acres)	**1.89**	
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)	**1.28**	*1 ft (recommended) (2 ft max)*
Maximum Ponding Depth (ft)	**2.39**	*4 ft (max)*
Overflow Bypass Elevation (ft)	**158.39**	
Media Depth (ft)	**3.71**	*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)	**6.37**	
2-Yr/24-Hr **Post**-Development Peak Rate (cfs)	**2.68**	*1-Yr/24-Hr Pre-Development Peak Rate (or per approved Act 167 Plan)*
10-Yr/24-Hr **Post**-Development Peak Rate (cfs)	**4.38**	*10-Yr/24-Hr Pre-Development Peak Rate*
50-Yr/24-Hr **Post**-Development Peak Rate (cfs)	**5.71**	*50-Yr/24-Hr Pre-Development Peak Rate*
100-Yr/24-Hr **Post**-Development Peak Rate (cfs)	**6.29**	*100-Yr/24-Hr Pre-Development Peak Rate*
Total 2-Yr/24-Hr Runoff Volume Managed by BMP (cf)	**20,840**	
Ponding Time @ 2-Yr/24-Hr Storm (hrs)	**114.50**	*72 hrs (surface), 7 days (underground)*
Ponding Time @ 10-Yr/24-Hr Storm (hrs)	**115.00**	*72 hrs (surface), 7 days (underground)*
Ponding Time @ 50-Yr/24-Hr Storm (hrs)	**115.50**	*72 hrs (surface), 7 days (underground)*
Ponding Time @ 100-Yr/24-Hr Storm (hrs)	**115.50**	*72 hrs (surface), 7 days (underground)*

Jeffrey A. Beavan
Licensed P.E. Name

Licensed P.E. Signature

PE082055
License No.

07/22/2024
Date

Licensed Professional's Seal

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	6741	80924.36975	1.86	0.02

Outflow Calculations from Perforated Pipe

Project Name	BMW Automotive Dealership Expansion
Date Prepared	3/20/2024
Prepared By	RMS
Prepared For	JAB

Height of Water[1] (top of pipe to water surface)	5.4	in
Orifice Coefficient, Cd	0.56	

Pipe Diam (in)	**Perforation Type**	**Inlet Area/Foot[2]** (AASHTO Min., in^2/ft)	**Flow Rate/Perforation** ft^3/sec	gal/min	**Flow Rate/Foot of Pipe** ft^3/sec	gal/min
2	slotted	1.0	0.0003	0.14	0.0228	10.23
3	slotted	1.0	0.0005	0.23	0.0237	10.62
4	slotted	1.0	0.0004	0.20	0.0245	11.00
6	slotted	1.0	0.0006	0.25	0.0261	11.72
8	slotted	1.0	0.0007	0.33	0.0276	12.40
10	slotted	1.0	0.0010	0.46	0.0291	13.04
12	drilled	1.5	0.0013	0.57	0.0456	20.48
15	drilled	1.5	0.0017	0.78	0.0485	21.78
18	drilled	1.5	0.0018	0.82	0.0513	23.02
24	drilled	2.0	0.0025	1.11	0.0752	33.73
30	drilled	2.0	0.0017	0.78	0.0814	36.53
36	drilled	2.0	0.0024	1.07	0.0872	39.12
42	drilled	2.0	0.0025	1.12	0.0926	41.55
48	drilled	2.0	0.0027	1.20	0.0977	43.85
60	drilled	2.0	0.0034	1.50	0.1072	48.12

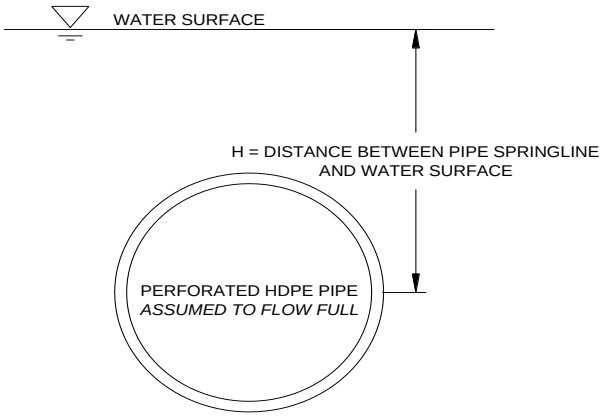
Notes

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 - AASHTO minimum inlet area requirements are used for calculations. Actual inlet areas are equal to or greater than those listed per AASHTO. Contact a representative for actual values.

3 - Calculations based on A-profile pipe

4 - Single wall is available for 2"-24"; Dual wall is available for 4"-60"



$$Q_p = C_d A\sqrt{2gH}$$

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)

Outflow Calculations from Perforated Pipe

Project Name	BMW Automotive Dealership Expansion
Date Prepared	3/20/2024
Prepared By	RMS
Prepared For	JAB

Height of Water[1] (top of pipe to water surface)	0.5	in
Orifice Coefficient, Cd	0.56	

Pipe Diam (in)	**Perforation Type**	**Inlet Area/Foot[2]** (AASHTO Min., in^2/ft)	**Flow Rate/Perforation** ft^3/sec	gal/min	**Flow Rate/Foot of Pipe** ft^3/sec	gal/min
2	slotted	1.0	0.0001	0.07	0.0110	4.95
3	slotted	1.0	0.0003	0.12	0.0127	5.72
4	slotted	1.0	0.0003	0.12	0.0142	6.39
6	slotted	1.0	0.0004	0.16	0.0169	7.56
8	slotted	1.0	0.0005	0.23	0.0191	8.58
10	slotted	1.0	0.0007	0.33	0.0211	9.48
12	drilled	1.5	0.0010	0.43	0.0345	15.46
15	drilled	1.5	0.0014	0.62	0.0382	17.16
18	drilled	1.5	0.0015	0.67	0.0417	18.69
24	drilled	2.0	0.0021	0.94	0.0637	28.59
30	drilled	2.0	0.0015	0.68	0.0709	31.84
36	drilled	2.0	0.0021	0.95	0.0775	34.78
42	drilled	2.0	0.0023	1.01	0.0835	37.50
48	drilled	2.0	0.0024	1.09	0.0892	40.03
60	drilled	2.0	0.0031	1.40	0.0995	44.66

Notes

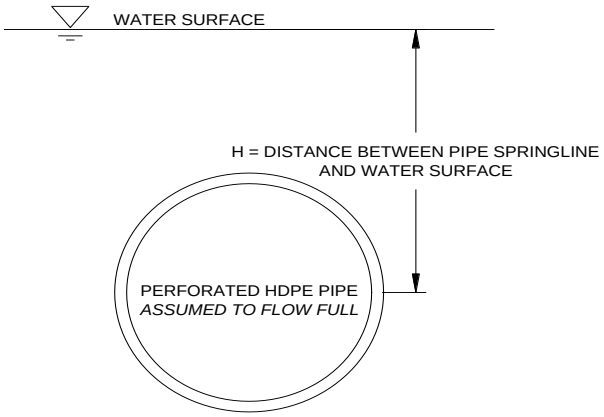
1 - Calculations assume the pipe is flowing full. User input is measured from top of pipe to water surface. The height of water, H, is then calculated to be 1/2*Pipe ID plus the distance between top of pipe and water surface (user-entered value). Enter 0 if the water surface is not above the top of pipe. Calculations represent free-flow conditions and do not account for any backfill material.

2 - AASHTO minimum inlet area requirements are used for calculations. Actual inlet areas are equal to or greater than those listed per AASHTO. Contact a representative for actual values.

3 - Calculations based on A-profile pipe

4 - Single wall is available for 2"-24"; Dual wall is available for 4"-60"

$$Q_p = C_d A\sqrt{2gH}$$



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)

Outflow Calculations from Perforated Pipe

Project Name	BMW Automotive Dealership Expansion
Date Prepared	7/22/2024
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
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

A-profile Pipe

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
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

H-profile Pipe

** 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

$$Q_p = C_d A \sqrt{2gH}$$

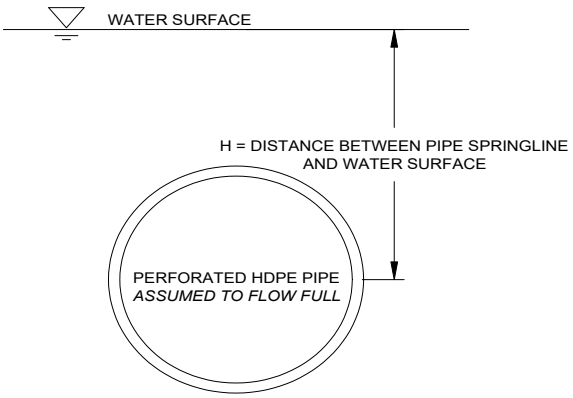
Qp = Free outfall flow rate (ft^3/sec)

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

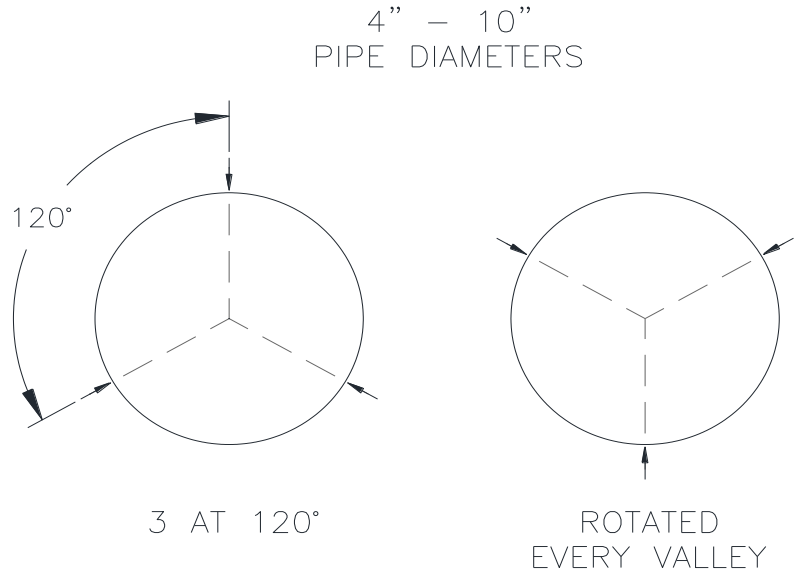
The following terminology for perforations is derived from the applicable AASHTO specification. Differences between the specifications are covered in the table below. Class II perforations shall be located in the outside valleys of the corrugations, be circular and/or slotted and evenly spaced around 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.

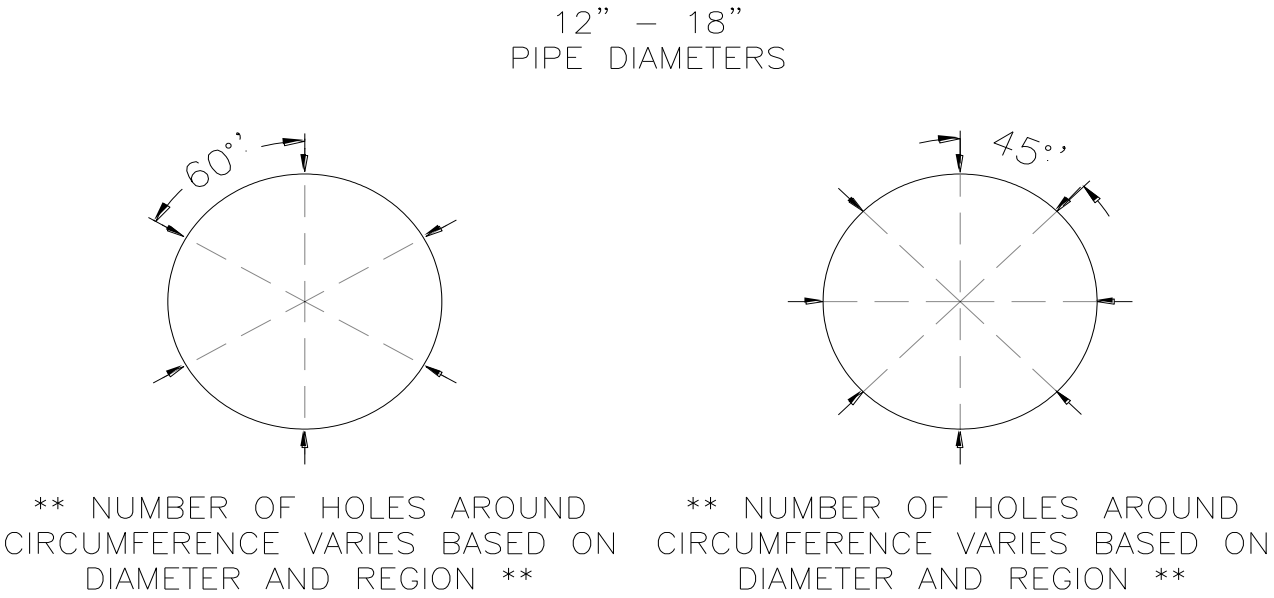
Nominal I.D.	Perforation Type	Maximum Slot Length or Diameter	Maximum Slot Width	Minimum Inlet Area
4” (100 mm)	Slot	0.875” (22 mm)	0.125” (3 mm)	1.0 in^2/ft (21 cm^2/m)
6” (150 mm)	Slot	0.875” (22 mm)	0.125” (3 mm)	1.0 in^2/ft (21 cm^2/m)
8” (200 mm)	Slot	1.18” (30 mm)	0.125” (3 mm)	1.0 in^2/ft (21 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

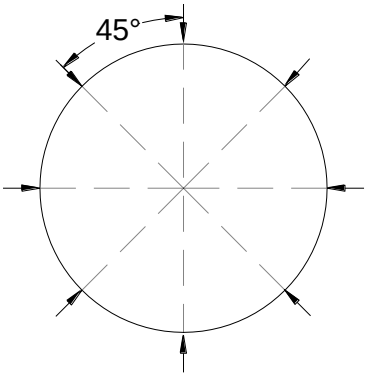
AASHTO Class II Perforation Patterns

Note: Actual pattern may vary by region, however all patterns meet the AASHTO and ASTM minimum requirements for the open inlet area.

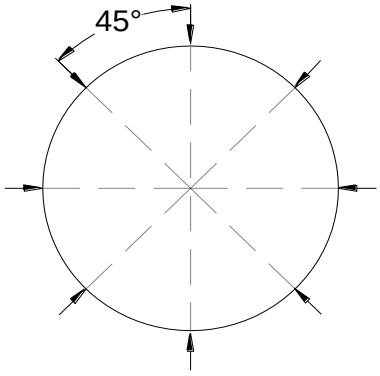


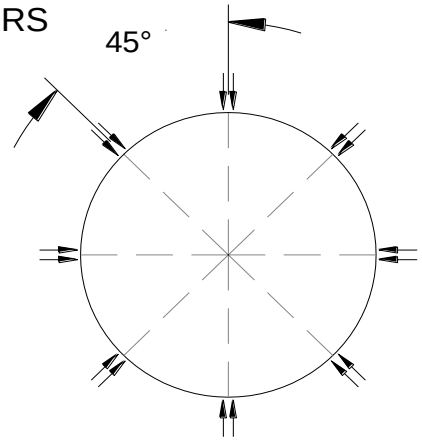


24"
PIPE DIAMETERS



30"
PIPE DIAMETERS

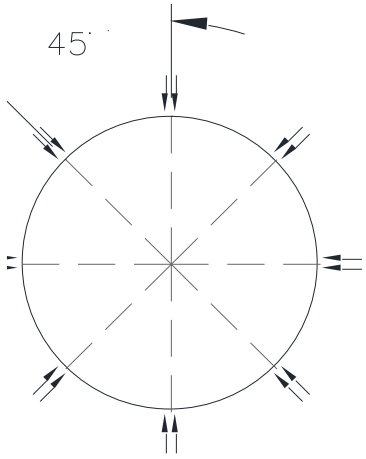




2 AT EVERY 45°

** 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

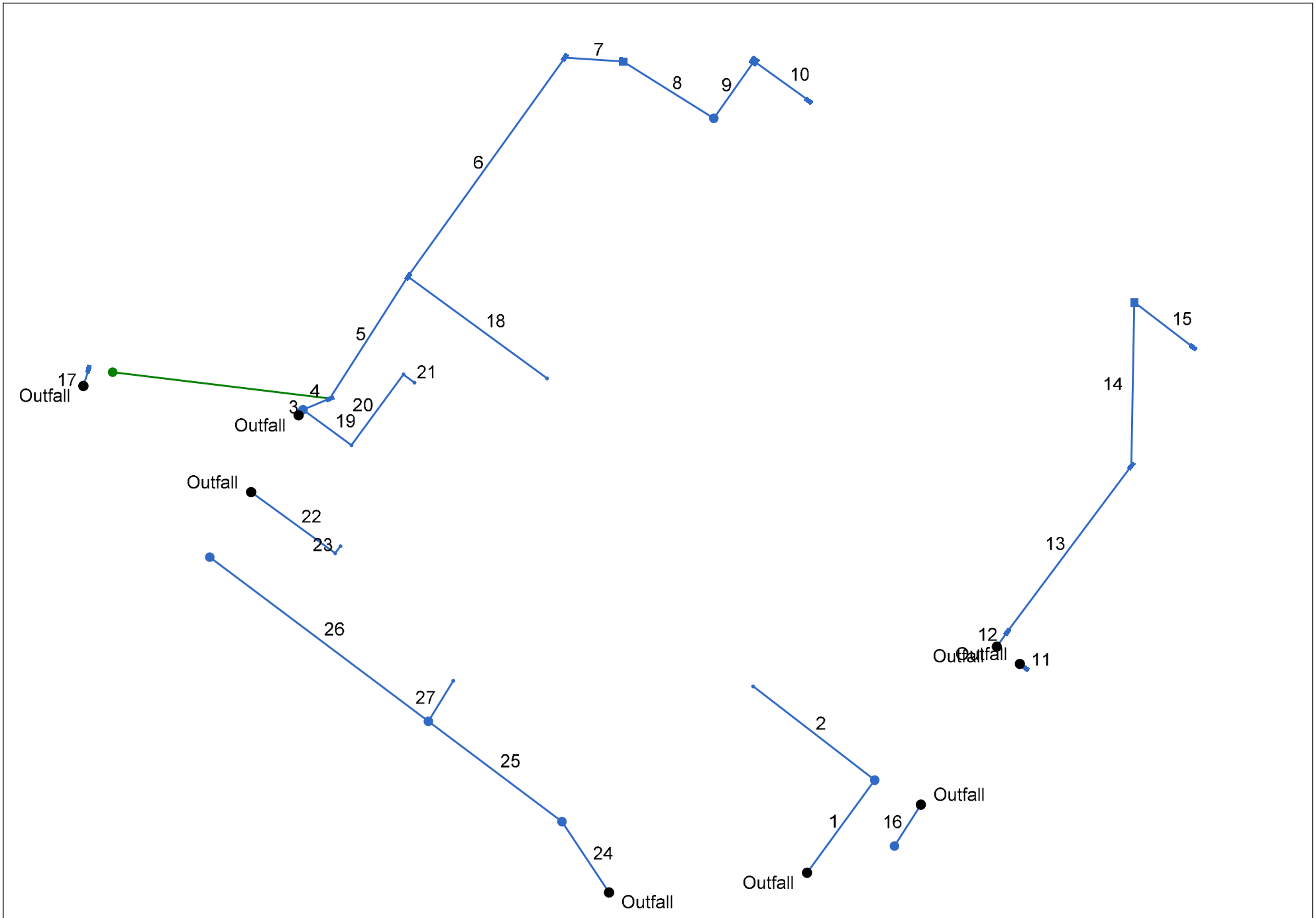
Project: **BMW Fort Washington**

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	0.556	**0.56**	**0.95**
INL-121	Impervious	0.95	0.234	**0.24**	**0.93**
	Pervious	0.35	0.008		
INL-122	Impervious	0.95	0.066	**0.07**	**0.95**
INL-123	Impervious	0.95	0.033	**0.03**	**0.95**
INL-124	Impervious	0.95	0.058	**0.06**	**0.95**
INL-126	Impervious	0.95	0.095	**0.10**	**0.90**
	Pervious	0.35	0.008		
INL-127	Impervious	0.95	0.155	**0.17**	**0.90**
	Pervious	0.35	0.013		
INL-211	Impervious	0.95	0.035	**0.07**	**0.65**
	Pervious	0.35	0.036		

INL-212	Impervious	0.95	0.034	**0.03**	**0.95**
INL-213	Impervious	0.95	0.093	**0.10**	**0.91**
	Pervious	0.35	0.007		
INL-214	Impervious	0.95	0.030	**0.04**	**0.86**
	Pervious	0.35	0.005		
INL-221	Impervious	0.95	0.050	**0.07**	**0.78**
	Pervious	0.35	0.019		
INL-231	Impervious	0.95	0.130	**0.13**	**0.95**
RD1	Impervious	0.95	0.220	**0.22**	**0.95**
RD2	Impervious	0.95	0.028	**0.03**	**0.95**
RD3	Impervious	0.95	0.399	**0.40**	**0.95**
RD4	Impervious	0.95	0.018	**0.02**	**0.95**
RD5	Impervious	0.95	0.664	**0.66**	**0.95**

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: PAB220113.01-Storm_Rev0_2-yr.stm	Number of lines: 27	Date: 10/29/2024

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	OCS 201	Manhole	163.96	Cir	4.00	4.00	18	Cir	158.13	12	Cir	161.11
2	RD5	Generic	168.64	Cir	1.00	1.00	12	Cir	161.52			
3	MH 120	Manhole	163.93	Cir	4.00	4.00	24	Cir	158.03	24 12	Cir Cir	158.03 158.03
4	INL 121	Combination	164.19	Rect	4.00	2.00	24	Cir	158.28	24	Cir	158.28
5	INL 122	Combination	164.99	Rect	4.00	2.00	24	Cir	158.66	18 12	Cir Cir	158.66 158.66
6	INL 123	Combination	165.11	Rect	4.00	2.00	18	Cir	159.37	18	Cir	159.37
7	INL 124	Combination	165.05	Rect	4.00	4.00	18	Cir	159.52	18	Cir	159.52
8	MH 125	Manhole	164.85	Cir	4.00	4.00	18	Cir	159.80	18	Cir	159.90
9	INL 126	Combination	163.79	Rect	4.00	4.00	18	Cir	160.08	15	Cir	160.08
10	INL 127	Combination	163.64	Rect	4.00	2.00	15	Cir	160.26			
11	INL-221	Combination	164.29	Rect	4.00	2.00	15	Cir	160.15			
12	INL 211	Combination	164.75	Rect	4.00	2.00	18	Cir	158.68	15	Cir	158.93
13	INL-212	Combination	164.93	Rect	4.00	2.00	15	Cir	159.47	15	Cir	159.47
14	INL-213	Combination	163.42	Rect	4.00	4.00	15	Cir	159.90	15	Cir	159.90
15	INL-214	Combination	163.46	Rect	4.00	2.00	15	Cir	160.09			
16	INL 231	Combination	163.15	Cir	4.00	4.00	15	Cir	159.85			
17	INL 110	Combination	162.50	Rect	4.00	2.00	18	Cir	159.25			
18	RD1	Generic	166.88	Cir	1.00	1.00	12	Cir	159.11			
19	RD2(2)	Manhole	164.63	Cir	1.00	1.00	12	Cir	158.20	12	Cir	158.20
20	RD2(1)	Manhole	165.23	Cir	1.00	1.00	12	Cir	158.44	12	Cir	158.44
21	RD2	Combination	165.30	Cir	1.00	1.00	12	Cir	158.48			
22	RD3(1)	Manhole	164.48	Cir	1.00	1.00	12	Cir	158.30	12	Cir	158.30

Project File: PAB220113.01-Storm_Rev0_2-yr.stm | Number of Structures: 27 | Run Date: 10/29/2024

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)
23	RD3	Combination	164.60	Cir	1.00	1.00	12	Cir	158.33			
24	MH 101	Manhole	160.87	Cir	4.00	4.00	18	Cir	156.38	18	Cir	156.38
25	MH 102	Manhole	162.83	Cir	4.00	4.00	18	Cir	156.82	18 12	Cir Cir	156.82 156.82
26	OCS-103	Manhole	163.82	Cir	4.00	4.00	18	Cir	157.53			
27	RD4	Generic	165.47	Cir	1.00	1.00	12	Cir	156.95			

Project File: PAB220113.01-Storm_Rev0_2-yr.stm | Number of Structures: 27 | Run Date: 10/29/2024

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 - (58)	3.48	18	Cir	59.750	157.83	158.13	0.502	158.54	158.84	n/a	158.84	End	Manhole
2	Pipe - (71)	3.10	12	Cir	80.059	161.11	161.52	0.512	162.11*	162.63*	0.24	162.87	1	Generic
3	Pipe - (85)	3.02	24	Cir	3.640	158.01	158.03	0.550	158.62	158.64	n/a	158.64	End	Manhole
4	Pipe - (63)	2.94	24	Cir	15.229	158.03	158.28	1.642	158.64	158.88	n/a	158.88 j	3	Combination
5	Pipe - (64)	2.26	24	Cir	75.492	158.28	158.66	0.503	158.88	159.18	n/a	159.18 j	4	Combination
6	Pipe - (65)	1.36	18	Cir	140.496	158.66	159.37	0.505	159.18	159.81	n/a	159.81 j	5	Combination
7	Pipe - (66)	1.27	18	Cir	30.318	159.37	159.52	0.495	159.81	159.94	n/a	159.94 j	6	Combination
8	Pipe - (67)	1.10	18	Cir	55.960	159.52	159.80	0.500	159.94	160.19	n/a	160.19 j	7	Manhole
9	Pipe - (68)	1.14	18	Cir	36.465	159.90	160.08	0.494	160.28	160.48	n/a	160.48	8	Combination
10	Pipe - (69)	0.75	15	Cir	35.065	160.08	160.26	0.513	160.48	160.60	n/a	160.60 j	9	Combination
11	Pipe - (56)	0.27	15	Cir	3.658	160.13	160.15	0.546	160.33	160.35	0.07	160.35	End	Combination
12	Pipe - (52)	0.65	18	Cir	9.379	158.63	158.68	0.533	158.93	158.98	n/a	158.98	End	Combination
13	Pipe - (53)	0.56	15	Cir	108.126	158.93	159.47	0.499	159.21	159.76	0.10	159.76	12	Combination
14	Pipe - (54)	0.50	15	Cir	85.481	159.47	159.90	0.503	159.76	160.18	n/a	160.18 j	13	Combination
15	Pipe - (55)	0.17	15	Cir	38.702	159.90	160.09	0.491	160.18	160.25	0.05	160.30	14	Combination
16	Pipe - (57)	0.61	15	Cir	25.570	159.13	159.85	2.816	159.43	160.15	0.11	160.15	End	Combination
17	Pipe - (62)	2.62	18	Cir	9.207	158.03	159.25	13.251	158.64	159.86	n/a	159.86	End	Combination
18	Pipe - (77)	1.03	12	Cir	89.896	158.66	159.11	0.501	159.18	159.54	0.16	159.54	5	Generic
19	Pipe - (78)	0.11	12	Cir	31.389	158.03	158.20	0.542	158.64	158.34	n/a	158.34	3	Manhole
20	Pipe - (79)	0.14	12	Cir	45.661	158.20	158.44	0.526	158.35	158.59	n/a	158.59	19	Manhole
21	Pipe - (80)	0.14	12	Cir	7.212	158.44	158.48	0.555	158.59	158.63	0.05	158.63	20	Combination
22	Pipe - (82)	1.87	12	Cir	54.188	158.03	158.30	0.498	158.61	158.93	0.20	159.13	End	Manhole
23	Pipe - (83)	1.87	12	Cir	4.414	158.30	158.33	0.680	159.13	158.91	0.24	158.91	22	Combination
24	Pipe - (59)	2.71	18	Cir	44.321	156.15	156.38	0.519	156.77	157.00	0.09	157.00	End	Manhole

Project File: PAB220113.01-Storm_Rev0_2-yr.stm | Number of lines: 27 | Run Date: 10/29/2024

NOTES: Return period = 2 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 - (60)	2.71	18	Cir	87.044	156.38	156.82	0.505	157.00	157.44	n/a	157.44	24	Manhole
26	Pipe - (61)	2.63	18	Cir	142.460	156.82	157.53	0.498	157.44	158.14	n/a	158.14 j	25	Manhole
27	Pipe - (72)	0.09	12	Cir	24.911	156.82	156.95	0.522	157.44	157.44	0.00	157.44	25	Generic

Project File: PAB220113.01-Storm_Rev0_2-yr.stm | Number of lines: 27 | Run Date: 10/29/2024

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	OCS 201	0.43*	0.00	0.00	0.43	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	RD5	3.10	0.00	3.10	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
3	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
4	INL 121	1.10	0.00	1.02	0.08	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.14	4.06	0.05	1.09	0.0	17
5	INL 122	0.33	0.00	0.33	0.00	Comb	4.0	0.06	0.12	0.06	2.00	Sag	2.00	0.050	0.020	0.013	0.13	3.35	0.13	3.35	0.0	Off
6	INL 123	0.14	0.00	0.14	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.08	1.68	0.08	1.68	0.0	Off
7	INL 124	0.28	0.00	0.28	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.10	2.13	0.10	2.13	0.0	Off
8	MH 125	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
9	INL 126	0.44	0.00	0.44	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	2.13	0.00	0.00	0.0	Off
10	INL 127	0.75	0.00	0.73	0.02	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.12	3.21	0.03	0.63	0.0	Off
11	INL-221	0.27	0.00	0.27	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.10	2.06	0.10	2.06	0.0	Off
12	INL 211	0.22	0.00	0.22	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
13	INL-212	0.14	0.00	0.14	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.08	1.68	0.08	1.68	0.0	Off
14	INL-213	0.45	0.00	0.45	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	2.15	0.00	0.00	0.0	Off
15	INL-214	0.17	0.00	0.17	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	1.43	0.00	0.00	0.0	Off
16	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
17	INL 110	2.62	0.08	2.70	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.29	11.38	0.29	11.38	0.0	Off
18	RD1	1.03	0.00	1.03	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
19	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
20	RD2(1)	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
21	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	2.18	0.10	2.18	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	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
23	RD3	1.87	0.00	1.87	0.00	Comb	4.0	0.99	1.97	0.99	2.00	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_Rev0_2-yr.stm | Number of lines: 27 | Run Date: 10/29/2024

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.

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	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
25	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
26	OCS-103	2.63*	0.00	0.00	2.63	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
27	RD4	0.09	0.00	0.09	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_Rev0_2-yr.stm | Number of lines: 27 | Run Date: 10/29/2024

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 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: 10/29/2024 / 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
1	End	MH	0.012	59.750	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.34	0.51	4.84	0.63	0.43 3.48	163.96	158.84 159.63 158.13	158.54 159.33 157.83	0.30 0.30	18 18 Cir	0.50 0.50	4.22 4.56	3.48 8.06	Pipe - (58)
2	1	Genr	0.012	80.059	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.34	4.92	0.63	0.00 3.10	168.64	162.63 162.52 161.52	162.11 162.11 161.11	0.52 0.41	12 12 Cir	0.65 0.51	3.95 3.52	3.10 2.76	Pipe - (71)
3	End	MH	0.012	3.640	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	13.22	0.05	3.53	0.86	0.00 3.02	163.93	158.64 160.03 158.03	158.62 160.01 158.01	0.02 0.02	24 24 Cir	0.44 0.55	3.74 5.78	3.02 18.16	Pipe - (85)
4	3	Comb	0.012	15.229	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	13.00	0.22	3.55	0.83	0.00 2.94	164.19	158.88 160.28 158.28	158.64 160.03 158.03	0.24 0.25	24 24 Cir	1.59 1.64	3.69 9.99	2.94 31.39	Pipe - (63)
5	4	Comb	0.012	75.492	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	11.56	1.44	3.74	0.60	0.00 2.26	164.99	159.18 160.66 158.66	158.88 160.28 158.28	0.30 0.38	24 24 Cir	0.40 0.50	3.16 5.53	2.26 17.38	Pipe - (64)
6	5	Comb	0.012	140.496	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	8.89	2.67	4.14	0.33	0.00 1.36	165.11	159.81 160.87 159.37	159.18 160.16 158.66	0.62 0.71	18 18 Cir	0.44 0.51	2.83 4.58	1.36 8.09	Pipe - (65)
7	6	Comb	0.012	30.318	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	8.27	0.63	4.25	0.30	0.00 1.27	165.05	159.94 161.02 159.52	159.81 160.87 159.37	0.14 0.15	18 18 Cir	0.45 0.49	3.05 4.53	1.27 8.00	Pipe - (66)
8	7	MH	0.012	55.960	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	6.86	1.41	4.51	0.24	0.00 1.10	164.85	160.19 161.30 159.80	159.94 161.02 159.52	0.25 0.28	18 18 Cir	0.44 0.50	2.84 4.55	1.10 8.05	Pipe - (67)
9	8	Comb	0.012	36.465	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.95	0.91	4.70	0.24	0.00 1.14	163.79	160.48 161.58 160.08	160.28 161.40 159.90	0.20 0.18	18 18 Cir	0.54 0.49	3.12 4.52	1.14 7.99	Pipe - (68)
10	9	Comb	0.012	35.065	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.95	4.92	0.15	0.00 0.75	163.64	160.60 161.51 160.26	160.48 161.33 160.08	0.12 0.18	15 15 Cir	0.34 0.51	2.51 4.08	0.75 5.01	Pipe - (69)

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_Rev0_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: 10/29/2024
					C1 = 0.2 C2 = 0.5 C3 = 0.9							Elev of Crown					Span	Pipe	Full Flow		Frequency: 2 yrs
												Total Flow		Elev of Invert							Proj: PAB220113.01-Storm
					Incre-ment (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	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	0.28	4.92	0.05	0.00 0.27	164.29	160.35 161.40 160.15	160.33 161.38 160.13	0.02 0.02	15 15 Cir	0.56 0.55	2.12 4.21	0.27 5.17	Pipe - (56)
12	End	Comb	0.012	9.379	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	15.56	0.30	3.27	0.20	0.00 0.65	164.75	158.98 160.18 158.68	158.93 160.13 158.63	0.05 0.05	18 18 Cir	0.53 0.53	2.60 4.70	0.65 8.31	Pipe - (52)
13	12	Comb	0.012	108.126	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	12.54	3.02	3.61	0.15	0.00 0.56	164.93	159.76 160.72 159.47	159.21 160.18 158.93	0.55 0.54	15 15 Cir	0.51 0.50	2.62 4.03	0.56 4.94	Pipe - (53)
14	13	Comb	0.012	85.481	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	9.68	2.86	4.01	0.13	0.00 0.50	163.42	160.18 161.15 159.90	159.76 160.72 159.47	0.42 0.43	15 15 Cir	0.49 0.50	2.41 4.04	0.50 4.96	Pipe - (54)
15	14	Comb	0.012	38.702	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	4.68	4.92	0.03	0.00 0.17	163.46	160.25 161.34 160.09	160.18 161.15 159.90	0.07 0.19	15 15 Cir	0.19 0.49	1.34 3.99	0.17 4.90	Pipe - (55)
16	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	0.86	4.92	0.12	0.00 0.61	163.15	160.15 161.10 159.85	159.43 160.38 159.13	0.72 0.72	15 15 Cir	2.83 2.82	2.66 9.57	0.61 11.74	Pipe - (57)
17	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	0.10	4.92	0.53	0.00 2.62	162.50	159.86 160.75 159.25	158.64 159.53 158.03	1.22 1.22	18 18 Cir	13.28 13.25	3.87 23.43	2.62 41.41	Pipe - (62)
18	5	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	1.14	4.92	0.21	0.00 1.03	166.88	159.54 160.11 159.11	159.18 159.66 158.66	0.35 0.45	12 12 Cir	0.39 0.50	2.85 3.48	1.03 2.73	Pipe - (77)
19	3	MH	0.012	31.389	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	9.94	2.97	3.97	0.03	0.00 0.11	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	0.98 3.61	0.11 2.84	Pipe - (78)
20	19	MH	0.012	45.661	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.67	4.27	4.76	0.03	0.00 0.14	165.23	158.59 159.44 158.44	158.35 159.20 158.20	0.24 0.24	12 12 Cir	0.53 0.53	1.83 3.56	0.14 2.80	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_Rev0_2-yr.stm

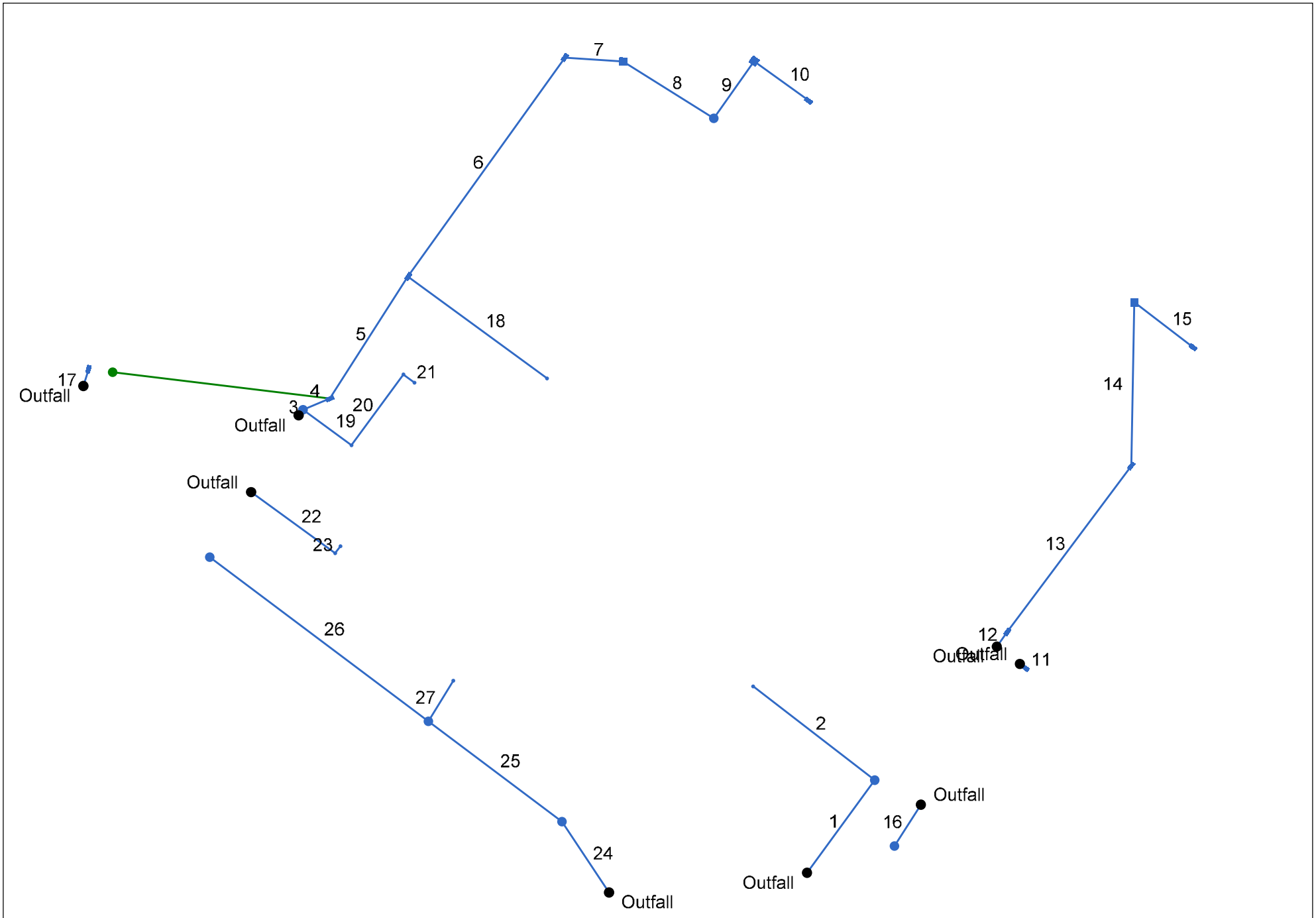
FL-DOT Report

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: 10/29/2024
					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_
				(ft)				(min)	(min)	(in/hr)		(cfs)	(ft)	(ft)	(ft)	(ft)	(in)	(%)	(ft/s)	(cfs)	Line description
21	20	Comb	0.012	7.212	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.67	4.92	0.03	0.00 0.14	165.30	158.63 159.48 158.48	158.59 159.44 158.44	0.04 0.04	12 12 Cir	0.59 0.55	1.87 3.66	0.14 2.87	Pipe - (80)
22	End	MH	0.012	54.188	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.03	0.38	4.91	0.38	0.00 1.87	164.48	158.93 159.30 158.30	158.61 159.03 158.03	0.32 0.27	12 12 Cir	0.59 0.50	3.76 3.47	1.87 2.72	Pipe - (82)
23	22	Comb	0.012	4.414	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.03	4.92	0.38	0.00 1.87	164.60	158.91 159.33 158.33	159.13 159.30 158.30	-0.22 0.03	12 12 Cir	-4.93 0.68	3.31 4.05	1.87 3.18	Pipe - (83)
24	End	MH	0.012	44.321	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	9.43	0.48	4.05	0.02	0.00 2.71	160.87	157.00 157.88 156.38	156.77 157.65 156.15	0.23 0.23	18 18 Cir	0.53 0.52	3.91 4.64	2.71 8.20	Pipe - (59)
25	24	MH	0.012	87.044	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	8.49	0.94	4.21	0.02	0.00 2.71	162.83	157.44 158.32 156.82	157.00 157.88 156.38	0.44 0.44	18 18 Cir	0.51 0.51	3.90 4.58	2.71 8.09	Pipe - (60)
26	25	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	1.60	0.00	0.00	2.63 2.63	163.82	158.14 159.03 157.53	157.44 158.32 156.82	0.70 0.71	18 18 Cir	0.49 0.50	3.82 4.54	2.63 8.03	Pipe - (61)
27	25	Genr	0.012	24.911	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	3.49	4.92	0.02	0.00 0.09	165.47	157.44 157.95 156.95	157.44 157.82 156.82	0.00 0.13	12 12 Cir	0.00 0.52	0.21 3.55	0.09 2.79	Pipe - (72)

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_Rev0_2-yr.stm

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev0.stm	Number of lines: 27	Date: 10/29/2024

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	OCS 201	Manhole	163.96	Cir	4.00	4.00	18	Cir	158.13	12	Cir	161.11
2	RD5	Generic	168.64	Cir	1.00	1.00	12	Cir	161.52			
3	MH 120	Manhole	163.93	Cir	4.00	4.00	24	Cir	158.03	24 12	Cir Cir	158.03 158.03
4	INL 121	Combination	164.19	Rect	4.00	2.00	24	Cir	158.28	24	Cir	158.28
5	INL 122	Combination	164.99	Rect	4.00	2.00	24	Cir	158.66	18 12	Cir Cir	158.66 158.66
6	INL 123	Combination	165.11	Rect	4.00	2.00	18	Cir	159.37	18	Cir	159.37
7	INL 124	Combination	165.05	Rect	4.00	4.00	18	Cir	159.52	18	Cir	159.52
8	MH 125	Manhole	164.85	Cir	4.00	4.00	18	Cir	159.80	18	Cir	159.90
9	INL 126	Combination	163.79	Rect	4.00	4.00	18	Cir	160.08	15	Cir	160.08
10	INL 127	Combination	163.64	Rect	4.00	2.00	15	Cir	160.26			
11	INL-221	Combination	164.29	Rect	4.00	2.00	15	Cir	160.15			
12	INL 211	Combination	164.75	Rect	4.00	2.00	18	Cir	158.68	15	Cir	158.93
13	INL-212	Combination	164.93	Rect	4.00	2.00	15	Cir	159.47	15	Cir	159.47
14	INL-213	Combination	163.42	Rect	4.00	4.00	15	Cir	159.90	15	Cir	159.90
15	INL-214	Combination	163.46	Rect	4.00	2.00	15	Cir	160.09			
16	INL 231	Combination	163.15	Cir	4.00	4.00	15	Cir	159.85			
17	INL 110	Combination	162.50	Rect	4.00	2.00	18	Cir	159.25			
18	RD1	Generic	166.88	Cir	1.00	1.00	12	Cir	159.11			
19	RD2(2)	Manhole	164.63	Cir	1.00	1.00	12	Cir	158.20	12	Cir	158.20
20	RD2(1)	Manhole	165.23	Cir	1.00	1.00	12	Cir	158.44	12	Cir	158.44
21	RD2	Combination	165.30	Cir	1.00	1.00	12	Cir	158.48			
22	RD3(1)	Manhole	164.48	Cir	1.00	1.00	12	Cir	158.30	12	Cir	158.30

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev0.stm | Number of Structures: 27 | Run Date: 10/29/2024

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)
23	RD3	Combination	164.60	Cir	1.00	1.00	12	Cir	158.33			
24	MH 101	Manhole	160.87	Cir	4.00	4.00	18	Cir	156.38	18	Cir	156.38
25	MH 102	Manhole	162.83	Cir	4.00	4.00	18	Cir	156.82	18 12	Cir Cir	156.82 156.82
26	OCS-103	Manhole	163.82	Cir	4.00	4.00	18	Cir	157.53			
27	RD4	Generic	165.47	Cir	1.00	1.00	12	Cir	156.95			

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev0.stm | Number of Structures: 27 | Run Date: 10/29/2024

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 - (58)	5.29	18	Cir	59.750	157.83	158.13	0.502	158.72	159.02	n/a	159.39 j	End	Manhole
2	Pipe - (71)	4.51	12	Cir	80.059	161.11	161.52	0.512	162.11*	163.21*	0.51	163.72	1	Generic
3	Pipe - (85)	4.90	24	Cir	3.640	158.01	158.03	0.550	158.72	158.81	0.29	158.81	End	Manhole
4	Pipe - (63)	4.76	24	Cir	15.229	158.03	158.28	1.642	158.81	159.05	n/a	159.05 j	3	Combination
5	Pipe - (64)	3.60	24	Cir	75.492	158.28	158.66	0.503	159.05	159.32	n/a	159.32 j	4	Combination
6	Pipe - (65)	2.10	18	Cir	140.496	158.66	159.37	0.505	159.32	159.92	n/a	159.92 j	5	Combination
7	Pipe - (66)	1.95	18	Cir	30.318	159.37	159.52	0.495	159.92	160.05	n/a	160.05 j	6	Combination
8	Pipe - (67)	1.64	18	Cir	55.960	159.52	159.80	0.500	160.05	160.28	n/a	160.28 j	7	Manhole
9	Pipe - (68)	1.69	18	Cir	36.465	159.90	160.08	0.494	160.37	160.57	0.27	160.57	8	Combination
10	Pipe - (69)	1.09	15	Cir	35.065	160.08	160.26	0.513	160.57	160.67	n/a	160.67 j	9	Combination
11	Pipe - (56)	0.39	15	Cir	3.658	160.13	160.15	0.546	160.36	160.39	n/a	160.39	End	Combination
12	Pipe - (52)	1.08	18	Cir	9.379	158.63	158.68	0.533	159.00	159.07	n/a	159.07	End	Combination
13	Pipe - (53)	0.89	15	Cir	108.126	158.93	159.47	0.499	159.29	159.84	n/a	159.84	12	Combination
14	Pipe - (54)	0.78	15	Cir	85.481	159.47	159.90	0.503	159.84	160.25	n/a	160.25	13	Combination
15	Pipe - (55)	0.25	15	Cir	38.702	159.90	160.09	0.491	160.25	160.28	0.07	160.28	14	Combination
16	Pipe - (57)	0.88	15	Cir	25.570	159.13	159.85	2.816	159.43	160.22	n/a	160.22	End	Combination
17	Pipe - (62)	3.80	18	Cir	9.207	158.03	159.25	13.251	158.64	159.99	0.29	159.99	End	Combination
18	Pipe - (77)	1.49	12	Cir	89.896	158.66	159.11	0.501	159.32	159.63	0.20	159.83	5	Generic
19	Pipe - (78)	0.18	12	Cir	31.389	158.03	158.20	0.542	158.81	158.37	0.06	158.37	3	Manhole
20	Pipe - (79)	0.20	12	Cir	45.661	158.20	158.44	0.526	158.38	158.62	n/a	158.62	19	Manhole
21	Pipe - (80)	0.20	12	Cir	7.212	158.44	158.48	0.555	158.62	158.67	n/a	158.67	20	Combination
22	Pipe - (82)	2.72	12	Cir	54.188	158.03	158.30	0.498	158.74	159.15	0.23	159.37	End	Manhole
23	Pipe - (83)	2.72	12	Cir	4.414	158.30	158.33	0.680	159.37*	159.40*	0.19	159.58	22	Combination
24	Pipe - (59)	5.23	18	Cir	44.321	156.15	156.38	0.519	157.02	157.26	n/a	157.26	End	Manhole

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev0.stm | Number of lines: 27 | Run Date: 10/29/2024

NOTES: Return period = 25 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 - (60)	5.23	18	Cir	87.044	156.38	156.82	0.505	157.26	157.70	0.37	157.70	24	Manhole
26	Pipe - (61)	5.11	18	Cir	142.460	156.82	157.53	0.498	157.70	158.40	n/a	158.76 j	25	Manhole
27	Pipe - (72)	0.14	12	Cir	24.911	156.82	156.95	0.522	157.70	157.10	n/a	157.10	25	Generic

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev0.stm | Number of lines: 27 | Run Date: 10/29/2024

NOTES: Return period = 25 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	OCS 201	0.83*	0.00	0.00	0.83	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	RD5	4.51	0.00	3.10	1.41	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
3	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
4	INL 121	1.60	0.00	1.37	0.23	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.16	4.98	0.08	1.59	0.0	17
5	INL 122	0.48	0.00	0.48	0.00	Comb	4.0	0.06	0.12	0.06	2.00	Sag	2.00	0.050	0.020	0.013	0.16	4.93	0.16	4.93	0.0	Off
6	INL 123	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
7	INL 124	0.41	0.00	0.41	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.12	2.87	0.12	2.87	0.0	Off
8	MH 125	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
9	INL 126	0.64	0.00	0.64	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	2.88	0.02	0.46	0.0	Off
10	INL 127	1.09	0.00	1.01	0.08	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.14	4.05	0.05	1.09	0.0	Off
11	INL-221	0.39	0.00	0.39	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.12	2.78	0.12	2.78	0.0	Off
12	INL 211	0.33	0.00	0.33	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.11	2.40	0.11	2.40	0.0	Off
13	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
14	INL-213	0.65	0.00	0.64	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	2.90	0.02	0.46	0.0	Off
15	INL-214	0.25	0.00	0.25	0.00	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.08	1.64	0.00	0.00	0.0	Off
16	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
17	INL 110	3.80	0.23	4.03	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.36	15.02	0.36	15.02	0.0	Off
18	RD1	1.49	0.00	1.03	0.47	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
19	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
20	RD2(1)	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
21	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	3.10	0.12	3.10	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	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
23	RD3	2.72	0.00	2.72	0.00	Comb	4.0	0.99	1.97	0.99	2.00	Sag	2.00	0.050	0.020	0.013	0.37	15.54	0.37	15.54	0.0	Off

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev0.stm | Number of lines: 27 | Run Date: 10/29/2024

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	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
25	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
26	OCS-103	5.11*	0.00	0.00	5.11	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
27	RD4	0.14	0.00	0.09	0.04	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)_Rev0.stm | Number of lines: 27 | Run Date: 10/29/2024

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: 10/29/2024 / 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	59.750	0.00	0.00	0.00	5.23	0.34	7.08	0.63	0.83	163.96	159.02	158.72	0.30	18	0.50	4.85	5.29	Pipe - (58)
					0.00	0.00	0.00					5.29		159.63	159.33		18	0.50	4.56	8.06	
					0.00	0.00	0.00							158.13	157.83	0.30	Cir				
2	1	Genr	0.012	80.059	0.00	0.00	0.00	5.00	0.23	7.15	0.63	0.00	168.64	163.21	162.11	1.10	12	1.37	5.74	4.51	Pipe - (71)
					0.00	0.00	0.00					4.51		162.52	162.11		12	0.51	3.52	2.76	
					0.00	0.00	0.00							161.52	161.11	0.41	Cir				
3	End	MH	0.012	3.640	0.00	0.00	0.00	10.64	0.03	5.72	0.86	0.00	163.93	158.81	158.72	0.09	24	2.43	4.61	4.90	Pipe - (85)
					0.00	0.00	0.00					4.90		160.03	160.01		24	0.55	5.78	18.16	
					0.00	0.00	0.00							158.03	158.01	0.02	Cir				
4	3	Comb	0.012	15.229	0.00	0.00	0.00	10.49	0.15	5.75	0.83	0.00	164.19	159.05	158.81	0.24	24	1.56	4.25	4.76	Pipe - (63)
					0.00	0.00	0.00					4.76		160.28	160.03		24	1.64	9.99	31.39	
					0.00	0.00	0.00							158.28	158.03	0.25	Cir				
5	4	Comb	0.012	75.492	0.00	0.00	0.00	9.51	0.98	5.95	0.60	0.00	164.99	159.32	159.05	0.28	24	0.37	3.60	3.60	Pipe - (64)
					0.00	0.00	0.00					3.60		160.66	160.28		24	0.50	5.53	17.38	
					0.00	0.00	0.00							158.66	158.28	0.38	Cir				
6	5	Comb	0.012	140.496	0.00	0.00	0.00	7.67	1.83	6.38	0.33	0.00	165.11	159.92	159.32	0.59	18	0.42	3.19	2.10	Pipe - (65)
					0.00	0.00	0.00					2.10		160.87	160.16		18	0.51	4.58	8.09	
					0.00	0.00	0.00							159.37	158.66	0.71	Cir				
7	6	Comb	0.012	30.318	0.00	0.00	0.00	7.24	0.43	6.49	0.30	0.00	165.05	160.05	159.92	0.13	18	0.43	3.44	1.95	Pipe - (66)
					0.00	0.00	0.00					1.95		161.02	160.87		18	0.49	4.53	8.00	
					0.00	0.00	0.00							159.52	159.37	0.15	Cir				
8	7	MH	0.012	55.960	0.00	0.00	0.00	6.28	0.97	6.76	0.24	0.00	164.85	160.28	160.05	0.24	18	0.42	3.17	1.64	Pipe - (67)
					0.00	0.00	0.00					1.64		161.30	161.02		18	0.50	4.55	8.05	
					0.00	0.00	0.00							159.80	159.52	0.28	Cir				
9	8	Comb	0.012	36.465	0.00	0.00	0.00	5.66	0.62	6.94	0.24	0.00	163.79	160.57	160.37	0.20	18	0.55	3.48	1.69	Pipe - (68)
					0.00	0.00	0.00					1.69		161.58	161.40		18	0.49	4.52	7.99	
					0.00	0.00	0.00							160.08	159.90	0.18	Cir				
10	9	Comb	0.012	35.065	0.00	0.00	0.00	5.00	0.66	7.15	0.15	0.00	163.64	160.67	160.57	0.10	15	0.29	2.79	1.09	Pipe - (69)
					0.00	0.00	0.00					1.09		161.51	161.33		15	0.51	4.08	5.01	
					0.00	0.00	0.00							160.26	160.08	0.18	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)_Rev0.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: 10/29/2024
					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: PAB220113.00-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	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	0.19	7.15	0.05	0.00 0.39	164.29	160.39 161.40 160.15	160.36 161.38 160.13	0.03 0.02	15 15 Cir	0.81 0.55	2.41 4.21	0.39 5.17	Pipe - (56)
12	End	Comb	0.012	9.379	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	12.26	0.21	5.43	0.20	0.00 1.08	164.75	159.07 160.18 158.68	159.00 160.13 158.63	0.07 0.05	18 18 Cir	0.72 0.53	3.09 4.70	1.08 8.31	Pipe - (52)
13	12	Comb	0.012	108.126	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.19	2.07	5.81	0.15	0.00 0.89	164.93	159.84 160.72 159.47	159.29 160.18 158.93	0.55 0.54	15 15 Cir	0.51 0.50	2.99 4.03	0.89 4.94	Pipe - (53)
14	13	Comb	0.012	85.481	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	8.22	1.97	6.25	0.13	0.00 0.78	163.42	160.25 161.15 159.90	159.84 160.72 159.47	0.41 0.43	15 15 Cir	0.47 0.50	2.70 4.04	0.78 4.96	Pipe - (54)
15	14	Comb	0.012	38.702	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	3.22	7.15	0.03	0.00 0.25	163.46	160.28 161.34 160.09	160.25 161.15 159.90	0.04 0.19	15 15 Cir	0.09 0.49	1.48 3.99	0.25 4.90	Pipe - (55)
16	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	160.22 161.10 159.85	159.43 160.38 159.13	0.79 0.72	15 15 Cir	3.08 2.82	3.41 9.57	0.88 11.74	Pipe - (57)
17	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	0.53	0.00 3.80	162.50	159.99 160.75 159.25	158.64 159.53 158.03	1.35 1.22	18 18 Cir	14.72 13.25	4.99 23.43	3.80 41.41	Pipe - (62)
18	5	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	0.79	7.15	0.21	0.00 1.49	166.88	159.63 160.11 159.11	159.32 159.66 158.66	0.31 0.45	12 12 Cir	0.34 0.50	3.16 3.48	1.49 2.73	Pipe - (77)
19	3	MH	0.012	31.389	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	8.40	2.04	6.20	0.03	0.00 0.18	164.63	158.37 159.20 158.20	158.81 159.03 158.03	-0.44 0.17	12 12 Cir	-1.39 0.54	1.12 3.61	0.18 2.84	Pipe - (78)
20	19	MH	0.012	45.661	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.46	2.94	7.00	0.03	0.00 0.20	165.23	158.62 159.44 158.44	158.38 159.20 158.20	0.24 0.24	12 12 Cir	0.53 0.53	2.04 3.56	0.20 2.80	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)_Rev0.stm

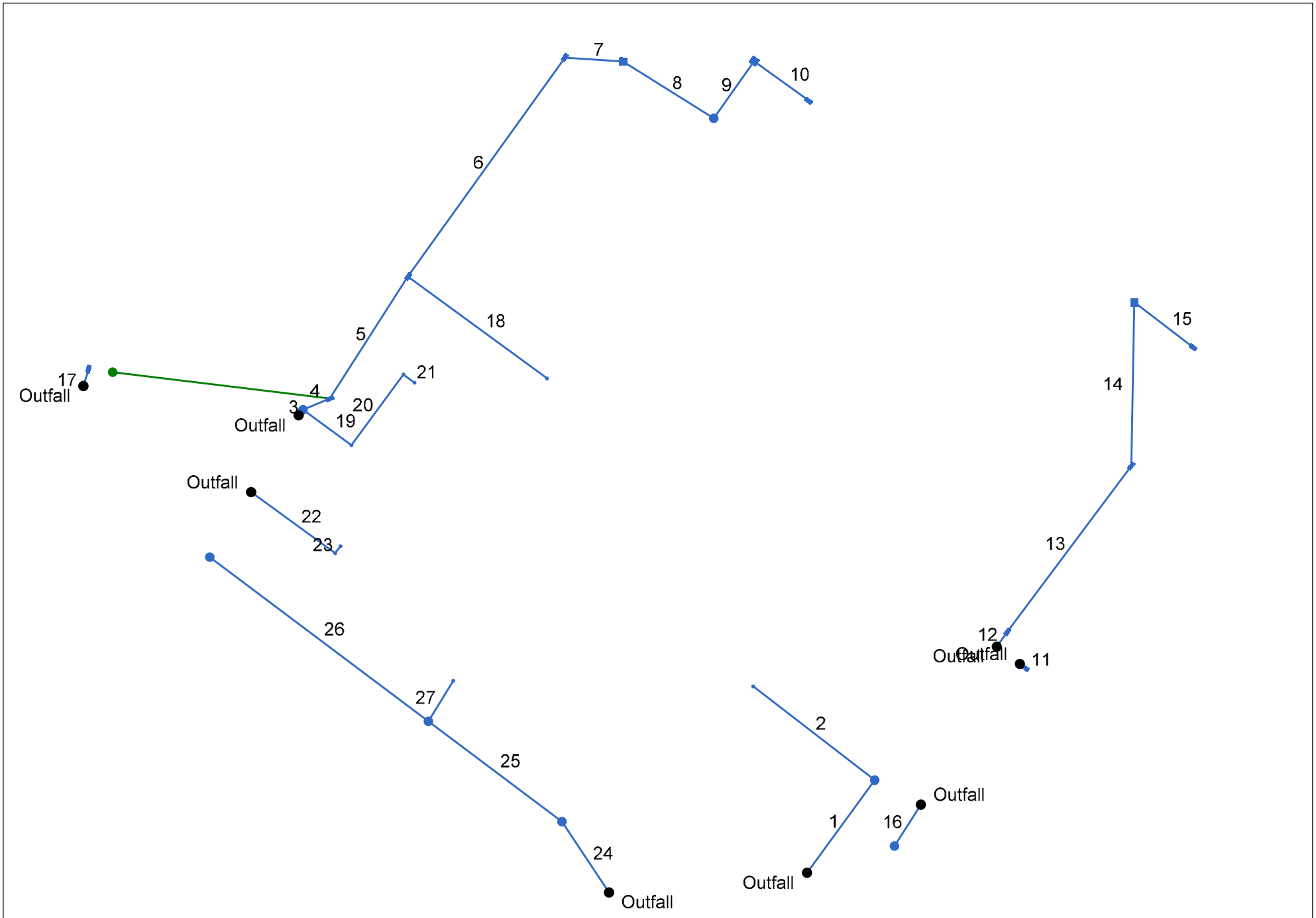
FL-DOT Report

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: 10/29/2024 / 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	20	Comb	0.012	7.212	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	158.67 159.48 158.48	158.62 159.44 158.44	0.04 0.04	12 12 Cir	0.58 0.55	2.05 3.66	0.20 2.87	Pipe - (80)
22	End	MH	0.012	54.188	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.02	0.26	7.15	0.38	0.00 2.72	164.48	159.15 159.30 158.30	158.74 159.03 158.03	0.41 0.27	12 12 Cir	0.75 0.50	4.19 3.47	2.72 2.72	Pipe - (82)
23	22	Comb	0.012	4.414	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.02	7.15	0.38	0.00 2.72	164.60	159.40 159.33 158.33	159.37 159.30 158.30	0.02 0.03	12 12 Cir	0.50 0.68	3.46 4.05	2.72 3.18	Pipe - (83)
24	End	MH	0.012	44.321	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.89	0.25	6.33	0.02	0.00 5.23	160.87	157.26 157.88 156.38	157.02 157.65 156.15	0.24 0.23	18 18 Cir	0.54 0.52	4.89 4.64	5.23 8.20	Pipe - (59)
25	24	MH	0.012	87.044	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.40	0.49	6.45	0.02	0.00 5.23	162.83	157.70 158.32 156.82	157.26 157.88 156.38	0.44 0.44	18 18 Cir	0.51 0.51	4.85 4.58	5.23 8.09	Pipe - (60)
26	25	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	0.82	0.00	0.00	5.11 5.11	163.82	158.40 159.03 157.53	157.70 158.32 156.82	0.70 0.71	18 18 Cir	0.49 0.50	4.76 4.54	5.11 8.03	Pipe - (61)
27	25	Genr	0.012	24.911	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	2.40	7.15	0.02	0.00 0.14	165.47	157.10 157.95 156.95	157.70 157.82 156.82	-0.60 0.13	12 12 Cir	-2.41 0.52	1.01 3.55	0.14 2.79	Pipe - (72)

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)_Rev0.stm

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev0.stm	Number of lines: 27	Date: 10/29/2024

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	OCS 201	Manhole	163.96	Cir	4.00	4.00	18	Cir	158.13	12	Cir	161.11
2	RD5	Generic	168.64	Cir	1.00	1.00	12	Cir	161.52			
3	MH 120	Manhole	163.93	Cir	4.00	4.00	24	Cir	158.03	24 12	Cir Cir	158.03 158.03
4	INL 121	Combination	164.19	Rect	4.00	2.00	24	Cir	158.28	24	Cir	158.28
5	INL 122	Combination	164.99	Rect	4.00	2.00	24	Cir	158.66	18 12	Cir Cir	158.66 158.66
6	INL 123	Combination	165.11	Rect	4.00	2.00	18	Cir	159.37	18	Cir	159.37
7	INL 124	Combination	165.05	Rect	4.00	4.00	18	Cir	159.52	18	Cir	159.52
8	MH 125	Manhole	164.85	Cir	4.00	4.00	18	Cir	159.80	18	Cir	159.90
9	INL 126	Combination	163.79	Rect	4.00	4.00	18	Cir	160.08	15	Cir	160.08
10	INL 127	Combination	163.64	Rect	4.00	2.00	15	Cir	160.26			
11	INL-221	Combination	164.29	Rect	4.00	2.00	15	Cir	160.15			
12	INL 211	Combination	164.75	Rect	4.00	2.00	18	Cir	158.68	15	Cir	158.93
13	INL-212	Combination	164.93	Rect	4.00	2.00	15	Cir	159.47	15	Cir	159.47
14	INL-213	Combination	163.42	Rect	4.00	4.00	15	Cir	159.90	15	Cir	159.90
15	INL-214	Combination	163.46	Rect	4.00	2.00	15	Cir	160.09			
16	INL 231	Combination	163.15	Cir	4.00	4.00	15	Cir	159.85			
17	INL 110	Combination	162.50	Rect	4.00	2.00	18	Cir	159.25			
18	RD1	Generic	166.88	Cir	1.00	1.00	12	Cir	159.11			
19	RD2(2)	Manhole	164.63	Cir	1.00	1.00	12	Cir	158.20	12	Cir	158.20
20	RD2(1)	Manhole	165.23	Cir	1.00	1.00	12	Cir	158.44	12	Cir	158.44
21	RD2	Combination	165.30	Cir	1.00	1.00	12	Cir	158.48			
22	RD3(1)	Manhole	164.48	Cir	1.00	1.00	12	Cir	158.30	12	Cir	158.30

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev0.stm | Number of Structures: 27 | Run Date: 10/29/2024

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)
23	RD3	Combination	164.60	Cir	1.00	1.00	12	Cir	158.33			
24	MH 101	Manhole	160.87	Cir	4.00	4.00	18	Cir	156.38	18	Cir	156.38
25	MH 102	Manhole	162.83	Cir	4.00	4.00	18	Cir	156.82	18 12	Cir Cir	156.82 156.82
26	OCS-103	Manhole	163.82	Cir	4.00	4.00	18	Cir	157.53			
27	RD4	Generic	165.47	Cir	1.00	1.00	12	Cir	156.95			

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 - (58)	5.29	18	Cir	59.750	157.83	158.13	0.502	167.66*	167.79*	0.14	167.93	End	Manhole
2	Pipe - (71)	4.51	12	Cir	80.059	161.11	161.52	0.512	167.93*	169.02*	0.51	169.54	1	Generic
3	Pipe - (85)	4.90	24	Cir	3.640	158.01	158.03	0.550	167.66*	167.66*	0.04	167.70	End	Manhole
4	Pipe - (63)	4.76	24	Cir	15.229	158.03	158.28	1.642	167.70*	167.71*	0.03	167.74	3	Combination
5	Pipe - (64)	3.60	24	Cir	75.492	158.28	158.66	0.503	167.74*	167.75*	0.03	167.79	4	Combination
6	Pipe - (65)	2.10	18	Cir	140.496	158.66	159.37	0.505	167.79*	167.83*	0.03	167.86	5	Combination
7	Pipe - (66)	1.95	18	Cir	30.318	159.37	159.52	0.495	167.86*	167.87*	0.02	167.89	6	Combination
8	Pipe - (67)	1.64	18	Cir	55.960	159.52	159.80	0.500	167.89*	167.90*	0.01	167.91	7	Manhole
9	Pipe - (68)	1.69	18	Cir	36.465	159.90	160.08	0.494	167.91*	167.92*	0.02	167.94	8	Combination
10	Pipe - (69)	1.09	15	Cir	35.065	160.08	160.26	0.513	167.94*	167.95*	0.01	167.96	9	Combination
11	Pipe - (56)	0.39	15	Cir	3.658	160.13	160.15	0.546	167.66*	167.66*	0.00	167.66	End	Combination
12	Pipe - (52)	1.08	18	Cir	9.379	158.63	158.68	0.533	167.66*	167.66*	0.00	167.66	End	Combination
13	Pipe - (53)	0.89	15	Cir	108.126	158.93	159.47	0.499	167.66*	167.68*	0.01	167.69	12	Combination
14	Pipe - (54)	0.78	15	Cir	85.481	159.47	159.90	0.503	167.69*	167.70*	0.01	167.71	13	Combination
15	Pipe - (55)	0.25	15	Cir	38.702	159.90	160.09	0.491	167.71*	167.71*	0.00	167.71	14	Combination
16	Pipe - (57)	0.88	15	Cir	25.570	159.13	159.85	2.816	167.66*	167.66*	0.01	167.67	End	Combination
17	Pipe - (62)	3.80	18	Cir	9.207	158.03	159.25	13.251	167.66*	167.67*	0.07	167.74	End	Combination
18	Pipe - (77)	1.49	12	Cir	89.896	158.66	159.11	0.501	167.79*	167.92*	0.06	167.98	5	Generic
19	Pipe - (78)	0.18	12	Cir	31.389	158.03	158.20	0.542	167.70*	167.70*	0.00	167.70	3	Manhole
20	Pipe - (79)	0.20	12	Cir	45.661	158.20	158.44	0.526	167.70*	167.70*	0.00	167.70	19	Manhole
21	Pipe - (80)	0.20	12	Cir	7.212	158.44	158.48	0.555	167.70*	167.70*	0.00	167.70	20	Combination
22	Pipe - (82)	2.72	12	Cir	54.188	158.03	158.30	0.498	167.66*	167.93*	0.19	168.11	End	Manhole
23	Pipe - (83)	2.72	12	Cir	4.414	158.30	158.33	0.680	168.11*	168.14*	0.19	168.32	22	Combination
24	Pipe - (59)	5.23	18	Cir	44.321	156.15	156.38	0.519	167.66*	167.75*	0.05	167.81	End	Manhole

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev0.stm | Number of lines: 27 | Run Date: 10/29/2024

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 - (60)	5.23	18	Cir	87.044	156.38	156.82	0.505	167.81*	167.99*	0.14	168.13	24	Manhole
26	Pipe - (61)	5.11	18	Cir	142.460	156.82	157.53	0.498	168.13*	168.42*	0.13	168.55	25	Manhole
27	Pipe - (72)	0.14	12	Cir	24.911	156.82	156.95	0.522	168.13*	168.13*	0.00	168.13	25	Generic

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev0.stm | Number of lines: 27 | Run Date: 10/29/2024

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	OCS 201	0.83*	0.00	0.00	0.83	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	RD5	4.51	0.00	3.10	1.41	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
3	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
4	INL 121	1.60	0.00	1.37	0.23	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.16	4.98	0.08	1.59	0.0	17
5	INL 122	0.48	0.00	0.48	0.00	Comb	4.0	0.06	0.12	0.06	2.00	Sag	2.00	0.050	0.020	0.013	0.16	4.93	0.16	4.93	0.0	Off
6	INL 123	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
7	INL 124	0.41	0.00	0.41	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.12	2.87	0.12	2.87	0.0	Off
8	MH 125	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
9	INL 126	0.64	0.00	0.64	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	2.88	0.02	0.46	0.0	Off
10	INL 127	1.09	0.00	1.01	0.08	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.14	4.05	0.05	1.09	0.0	Off
11	INL-221	0.39	0.00	0.39	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.12	2.78	0.12	2.78	0.0	Off
12	INL 211	0.33	0.00	0.33	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.11	2.40	0.11	2.40	0.0	Off
13	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
14	INL-213	0.65	0.00	0.64	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	2.90	0.02	0.46	0.0	Off
15	INL-214	0.25	0.00	0.25	0.00	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.08	1.64	0.00	0.00	0.0	Off
16	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
17	INL 110	3.80	0.23	4.03	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.36	15.02	0.36	15.02	0.0	Off
18	RD1	1.49	0.00	1.03	0.47	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
19	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
20	RD2(1)	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
21	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	3.10	0.12	3.10	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	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
23	RD3	2.72	0.00	2.72	0.00	Comb	4.0	0.99	1.97	0.99	2.00	Sag	2.00	0.050	0.020	0.013	0.37	15.54	0.37	15.54	0.0	Off

Project File: PAB220113.00-Storm(25-yr-Tailwater)_Rev0.stm | Number of lines: 27 | Run Date: 10/29/2024

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	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
25	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
26	OCS-103	5.11*	0.00	0.00	5.11	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
27	RD4	0.14	0.00	0.09	0.04	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)_Rev0.stm | Number of lines: 27 | Run Date: 10/29/2024

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: 10/29/2024 / 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	59.750	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.23	0.34	7.08	0.63	0.83 5.29	163.96	167.79 159.63 158.13	167.66 159.33 157.83	0.13 0.30	18 18 Cir	0.22 0.50	3.00 4.56	5.29 8.06	Pipe - (58)
2	1	Genr	0.012	80.059	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.23	7.15	0.63	0.00 4.51	168.64	169.02 162.52 161.52	167.93 162.11 161.11	1.10 0.41	12 12 Cir	1.37 0.51	5.74 3.52	4.51 2.76	Pipe - (71)
3	End	MH	0.012	3.640	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.64	0.03	5.72	0.86	0.00 4.90	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	1.56 5.78	4.90 18.16	Pipe - (85)
4	3	Comb	0.012	15.229	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.49	0.15	5.75	0.83	0.00 4.76	164.19	167.71 160.28 158.28	167.70 160.03 158.03	0.01 0.25	24 24 Cir	0.04 1.64	1.51 9.99	4.76 31.39	Pipe - (63)
5	4	Comb	0.012	75.492	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	9.51	0.98	5.95	0.60	0.00 3.60	164.99	167.75 160.66 158.66	167.74 160.28 158.28	0.02 0.38	24 24 Cir	0.02 0.50	1.14 5.53	3.60 17.38	Pipe - (64)
6	5	Comb	0.012	140.496	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.67	1.83	6.38	0.33	0.00 2.10	165.11	167.83 160.87 159.37	167.79 160.16 158.66	0.05 0.71	18 18 Cir	0.03 0.51	1.19 4.58	2.10 8.09	Pipe - (65)
7	6	Comb	0.012	30.318	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.24	0.43	6.49	0.30	0.00 1.95	165.05	167.87 161.02 159.52	167.86 160.87 159.37	0.01 0.15	18 18 Cir	0.03 0.49	1.10 4.53	1.95 8.00	Pipe - (66)
8	7	MH	0.012	55.960	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	6.28	0.97	6.76	0.24	0.00 1.64	164.85	167.90 161.30 159.80	167.89 161.02 159.52	0.01 0.28	18 18 Cir	0.02 0.50	0.93 4.55	1.64 8.05	Pipe - (67)
9	8	Comb	0.012	36.465	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.66	0.62	6.94	0.24	0.00 1.69	163.79	167.92 161.58 160.08	167.91 161.40 159.90	0.01 0.18	18 18 Cir	0.02 0.49	0.95 4.52	1.69 7.99	Pipe - (68)
10	9	Comb	0.012	35.065	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.66	7.15	0.15	0.00 1.09	163.64	167.95 161.51 160.26	167.94 161.33 160.08	0.01 0.18	15 15 Cir	0.02 0.51	0.89 4.08	1.09 5.01	Pipe - (69)

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)_Rev0.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: 10/29/2024
					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: PAB220113.00-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	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	0.19	7.15	0.05	0.00 0.39	164.29	167.66 161.40 160.15	167.66 161.38 160.13	0.00 0.02	15 15 Cir	0.00 0.55	0.32 4.21	0.39 5.17	Pipe - (56)
12	End	Comb	0.012	9.379	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	12.26	0.21	5.43	0.20	0.00 1.08	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	0.61 4.70	1.08 8.31	Pipe - (52)
13	12	Comb	0.012	108.126	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	10.19	2.07	5.81	0.15	0.00 0.89	164.93	167.68 160.72 159.47	167.66 160.18 158.93	0.02 0.54	15 15 Cir	0.02 0.50	0.73 4.03	0.89 4.94	Pipe - (53)
14	13	Comb	0.012	85.481	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	8.22	1.97	6.25	0.13	0.00 0.78	163.42	167.70 161.15 159.90	167.69 160.72 159.47	0.01 0.43	15 15 Cir	0.01 0.50	0.64 4.04	0.78 4.96	Pipe - (54)
15	14	Comb	0.012	38.702	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	3.22	7.15	0.03	0.00 0.25	163.46	167.71 161.34 160.09	167.71 161.15 159.90	0.00 0.19	15 15 Cir	0.00 0.49	0.20 3.99	0.25 4.90	Pipe - (55)
16	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	167.66 161.10 159.85	167.66 160.38 159.13	0.00 0.72	15 15 Cir	0.02 2.82	0.72 9.57	0.88 11.74	Pipe - (57)
17	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	0.53	0.00 3.80	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	2.15 23.43	3.80 41.41	Pipe - (62)
18	5	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	0.79	7.15	0.21	0.00 1.49	166.88	167.92 160.11 159.11	167.79 159.66 158.66	0.13 0.45	12 12 Cir	0.15 0.50	1.90 3.48	1.49 2.73	Pipe - (77)
19	3	MH	0.012	31.389	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	8.40	2.04	6.20	0.03	0.00 0.18	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	0.23 3.61	0.18 2.84	Pipe - (78)
20	19	MH	0.012	45.661	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.46	2.94	7.00	0.03	0.00 0.20	165.23	167.70 159.44 158.44	167.70 159.20 158.20	0.00 0.24	12 12 Cir	0.00 0.53	0.25 3.56	0.20 2.80	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)_Rev0.stm

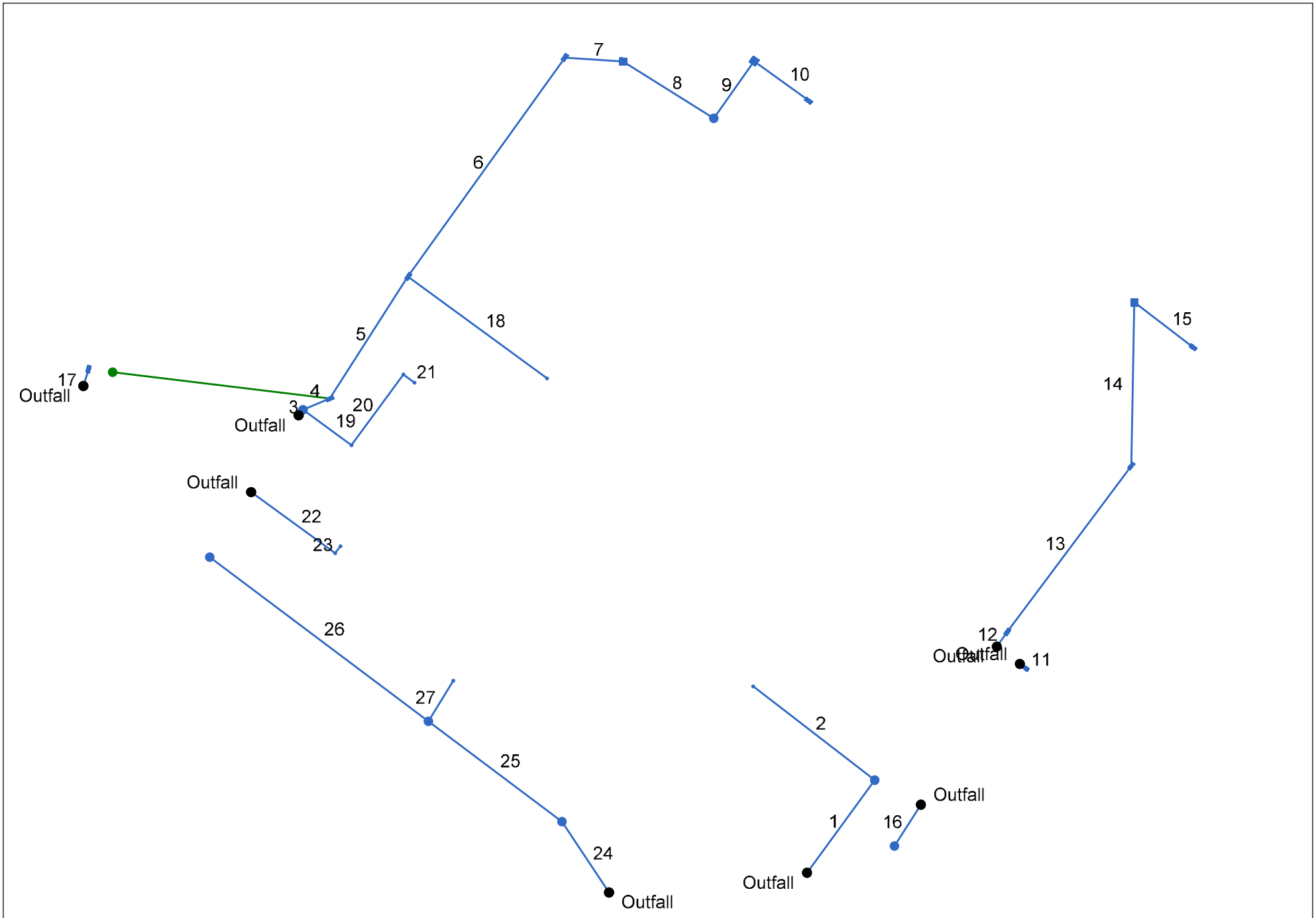
FL-DOT Report

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: 10/29/2024
					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: PAB220113.00-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	20	Comb	0.012	7.212	0.00	0.00	0.00	5.00	0.46	7.15	0.03	0.00	165.30	167.70	167.70	0.00	12	0.00	0.26	0.20	Pipe - (80)
					0.00	0.00	0.00					0.20		159.48	159.44		12	0.55	3.66	2.87	
					0.00	0.00	0.00							158.48	158.44	0.04	Cir				
22	End	MH	0.012	54.188	0.00	0.00	0.00	5.02	0.26	7.15	0.38	0.00	164.48	167.93	167.66	0.27	12	0.50	3.46	2.72	Pipe - (82)
					0.00	0.00	0.00					2.72		159.30	159.03		12	0.50	3.47	2.72	
					0.00	0.00	0.00							158.30	158.03	0.27	Cir				
23	22	Comb	0.012	4.414	0.00	0.00	0.00	5.00	0.02	7.15	0.38	0.00	164.60	168.14	168.11	0.02	12	0.50	3.46	2.72	Pipe - (83)
					0.00	0.00	0.00					2.72		159.33	159.30		12	0.68	4.05	3.18	
					0.00	0.00	0.00							158.33	158.30	0.03	Cir				
24	End	MH	0.012	44.321	0.00	0.00	0.00	7.89	0.25	6.33	0.02	0.00	160.87	167.75	167.66	0.09	18	0.21	2.96	5.23	Pipe - (59)
					0.00	0.00	0.00					5.23		157.88	157.65		18	0.52	4.64	8.20	
					0.00	0.00	0.00							156.38	156.15	0.23	Cir				
25	24	MH	0.012	87.044	0.00	0.00	0.00	7.40	0.49	6.45	0.02	0.00	162.83	167.99	167.81	0.18	18	0.21	2.96	5.23	Pipe - (60)
					0.00	0.00	0.00					5.23		158.32	157.88		18	0.51	4.58	8.09	
					0.00	0.00	0.00							156.82	156.38	0.44	Cir				
26	25	MH	0.012	142.460	0.00	0.00	0.00	0.00	0.82	0.00	0.00	5.11	163.82	168.42	168.13	0.29	18	0.20	2.89	5.11	Pipe - (61)
					0.00	0.00	0.00					5.11		159.03	158.32		18	0.50	4.54	8.03	
					0.00	0.00	0.00							157.53	156.82	0.71	Cir				
27	25	Genr	0.012	24.911	0.00	0.00	0.00	5.00	2.40	7.15	0.02	0.00	165.47	168.13	168.13	0.00	12	0.00	0.17	0.14	Pipe - (72)
					0.00	0.00	0.00					0.14		157.95	157.82		12	0.52	3.55	2.79	
					0.00	0.00	0.00							156.95	156.82	0.13	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)_Rev0.stm

Hydraflow Storm Sewers Extension for Autodesk® Civil 3D® Plan



Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev0.stm	Number of lines: 27	Date: 10/29/2024

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	OCS 201	Manhole	163.96	Cir	4.00	4.00	18	Cir	158.13	12	Cir	161.11
2	RD5	Generic	168.64	Cir	1.00	1.00	12	Cir	161.52			
3	MH 120	Manhole	163.93	Cir	4.00	4.00	24	Cir	158.03	24 12	Cir Cir	158.03 158.03
4	INL 121	Combination	164.19	Rect	4.00	2.00	24	Cir	158.28	24	Cir	158.28
5	INL 122	Combination	164.99	Rect	4.00	2.00	24	Cir	158.66	18 12	Cir Cir	158.66 158.66
6	INL 123	Combination	165.11	Rect	4.00	2.00	18	Cir	159.37	18	Cir	159.37
7	INL 124	Combination	165.05	Rect	4.00	4.00	18	Cir	159.52	18	Cir	159.52
8	MH 125	Manhole	164.85	Cir	4.00	4.00	18	Cir	159.80	18	Cir	159.90
9	INL 126	Combination	163.79	Rect	4.00	4.00	18	Cir	160.08	15	Cir	160.08
10	INL 127	Combination	163.64	Rect	4.00	2.00	15	Cir	160.26			
11	INL-221	Combination	164.29	Rect	4.00	2.00	15	Cir	160.15			
12	INL 211	Combination	164.75	Rect	4.00	2.00	18	Cir	158.68	15	Cir	158.93
13	INL-212	Combination	164.93	Rect	4.00	2.00	15	Cir	159.47	15	Cir	159.47
14	INL-213	Combination	163.42	Rect	4.00	4.00	15	Cir	159.90	15	Cir	159.90
15	INL-214	Combination	163.46	Rect	4.00	2.00	15	Cir	160.09			
16	INL 231	Combination	163.15	Cir	4.00	4.00	15	Cir	159.85			
17	INL 110	Combination	162.50	Rect	4.00	2.00	18	Cir	159.25			
18	RD1	Generic	166.88	Cir	1.00	1.00	12	Cir	159.11			
19	RD2(2)	Manhole	164.63	Cir	1.00	1.00	12	Cir	158.20	12	Cir	158.20
20	RD2(1)	Manhole	165.23	Cir	1.00	1.00	12	Cir	158.44	12	Cir	158.44
21	RD2	Combination	165.30	Cir	1.00	1.00	12	Cir	158.48			
22	RD3(1)	Manhole	164.48	Cir	1.00	1.00	12	Cir	158.30	12	Cir	158.30

Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev0.stm | Number of Structures: 27 | Run Date: 10/29/2024

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)
23	RD3	Combination	164.60	Cir	1.00	1.00	12	Cir	158.33			
24	MH 101	Manhole	160.87	Cir	4.00	4.00	18	Cir	156.38	18	Cir	156.38
25	MH 102	Manhole	162.83	Cir	4.00	4.00	18	Cir	156.82	18 12	Cir Cir	156.82 156.82
26	OCS-103	Manhole	163.82	Cir	4.00	4.00	18	Cir	157.53			
27	RD4	Generic	165.47	Cir	1.00	1.00	12	Cir	156.95			

Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev0.stm | Number of Structures: 27 | Run Date: 10/29/2024

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 - (58)	8.47	18	Cir	59.750	157.83	158.13	0.502	168.67*	169.00*	0.36	169.36	End	Manhole
2	Pipe - (71)	5.17	12	Cir	80.059	161.11	161.52	0.512	169.36*	170.79*	0.67	171.47	1	Generic
3	Pipe - (85)	5.76	24	Cir	3.640	158.01	158.03	0.550	168.67*	168.67*	0.05	168.72	End	Manhole
4	Pipe - (63)	5.60	24	Cir	15.229	158.03	158.28	1.642	168.72*	168.73*	0.05	168.78	3	Combination
5	Pipe - (64)	4.21	24	Cir	75.492	158.28	158.66	0.503	168.78*	168.80*	0.04	168.84	4	Combination
6	Pipe - (65)	2.43	18	Cir	140.496	158.66	159.37	0.505	168.84*	168.91*	0.04	168.95	5	Combination
7	Pipe - (66)	2.26	18	Cir	30.318	159.37	159.52	0.495	168.95*	168.96*	0.02	168.98	6	Combination
8	Pipe - (67)	1.89	18	Cir	55.960	159.52	159.80	0.500	168.98*	168.99*	0.02	169.01	7	Manhole
9	Pipe - (68)	1.94	18	Cir	36.465	159.90	160.08	0.494	169.01*	169.02*	0.03	169.05	8	Combination
10	Pipe - (69)	1.25	15	Cir	35.065	160.08	160.26	0.513	169.05*	169.06*	0.02	169.08	9	Combination
11	Pipe - (56)	0.45	15	Cir	3.658	160.13	160.15	0.546	168.67*	168.67*	0.00	168.67	End	Combination
12	Pipe - (52)	1.28	18	Cir	9.379	158.63	158.68	0.533	168.67*	168.67*	0.00	168.68	End	Combination
13	Pipe - (53)	1.05	15	Cir	108.126	158.93	159.47	0.499	168.68*	168.70*	0.01	168.71	12	Combination
14	Pipe - (54)	0.91	15	Cir	85.481	159.47	159.90	0.503	168.71*	168.73*	0.01	168.74	13	Combination
15	Pipe - (55)	0.28	15	Cir	38.702	159.90	160.09	0.491	168.74*	168.74*	0.00	168.74	14	Combination
16	Pipe - (57)	1.01	15	Cir	25.570	159.13	159.85	2.816	168.67*	168.68*	0.01	168.69	End	Combination
17	Pipe - (62)	4.36	18	Cir	9.207	158.03	159.25	13.251	168.67*	168.68*	0.09	168.78	End	Combination
18	Pipe - (77)	1.71	12	Cir	89.896	158.66	159.11	0.501	168.84*	169.02*	0.07	169.09	5	Generic
19	Pipe - (78)	0.21	12	Cir	31.389	158.03	158.20	0.542	168.72*	168.73*	0.00	168.73	3	Manhole
20	Pipe - (79)	0.23	12	Cir	45.661	158.20	158.44	0.526	168.73*	168.73*	0.00	168.73	19	Manhole
21	Pipe - (80)	0.23	12	Cir	7.212	158.44	158.48	0.555	168.73*	168.73*	0.00	168.73	20	Combination
22	Pipe - (82)	3.11	12	Cir	54.188	158.03	158.30	0.498	168.67*	169.02*	0.24	169.27	End	Manhole
23	Pipe - (83)	3.11	12	Cir	4.414	158.30	158.33	0.680	169.27*	169.29*	0.24	169.54	22	Combination
24	Pipe - (59)	6.38	18	Cir	44.321	156.15	156.38	0.519	168.67*	168.81*	0.08	168.89	End	Manhole

Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev0.stm | Number of lines: 27 | Run Date: 10/29/2024

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 - (60)	6.38	18	Cir	87.044	156.38	156.82	0.505	168.89*	169.16*	0.20	169.37	24	Manhole
26	Pipe - (61)	6.24	18	Cir	142.460	156.82	157.53	0.498	169.37*	169.79*	0.19	169.99	25	Manhole
27	Pipe - (72)	0.16	12	Cir	24.911	156.82	156.95	0.522	169.37*	169.37*	0.00	169.37	25	Generic

Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev0.stm | Number of lines: 27 | Run Date: 10/29/2024

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	OCS 201	3.35*	0.00	0.00	3.35	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	RD5	5.17	0.00	3.10	2.06	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	Off
3	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
4	INL 121	1.83	0.00	1.52	0.31	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.17	5.33	0.09	1.79	0.0	17
5	INL 122	0.54	0.00	0.54	0.00	Comb	4.0	0.06	0.12	0.06	2.00	Sag	2.00	0.050	0.020	0.013	0.17	5.61	0.17	5.61	0.0	Off
6	INL 123	0.23	0.00	0.23	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
7	INL 124	0.47	0.00	0.47	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.12	3.19	0.12	3.19	0.0	Off
8	MH 125	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
9	INL 126	0.74	0.00	0.72	0.02	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.12	3.17	0.03	0.61	0.0	Off
10	INL 127	1.25	0.00	1.13	0.12	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.15	4.38	0.06	1.26	0.0	Off
11	INL-221	0.45	0.00	0.45	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.12	3.09	0.12	3.09	0.0	Off
12	INL 211	0.37	0.00	0.37	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.11	2.68	0.11	2.68	0.0	Off
13	INL-212	0.23	0.00	0.23	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
14	INL-213	0.75	0.00	0.73	0.02	Comb	4.0	3.77	0.00	3.77	2.00	0.050	2.00	0.050	0.020	0.013	0.12	3.19	0.03	0.61	0.0	Off
15	INL-214	0.28	0.00	0.28	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	1.73	0.00	0.00	0.0	Off
16	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
17	INL 110	4.36	0.31	4.66	0.00	Comb	4.0	3.77	7.54	3.77	2.00	Sag	2.00	0.050	0.020	0.013	0.39	16.61	0.39	16.61	0.0	Off
18	RD1	1.71	0.00	1.03	0.68	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
19	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
20	RD2(1)	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
21	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	3.50	0.13	3.50	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	0.000	0.00	0.000	0.000	0.000	0.00	0.00	0.00	0.00	0.0	Off
23	RD3	3.11	0.00	3.11	0.00	Comb	4.0	0.99	1.97	0.99	2.00	Sag	2.00	0.050	0.020	0.013	0.40	17.06	0.40	17.06	0.0	Off

Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev0.stm | Number of lines: 27 | Run Date: 10/29/2024

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	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
25	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
26	OCS-103	6.24*	0.00	0.00	6.24	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
27	RD4	0.16	0.00	0.09	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	Off

Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev0.stm | Number of lines: 27 | Run Date: 10/29/2024

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 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: 10/29/2024 / 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
1	End	MH	0.012	59.750	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.20	0.21	8.11	0.63	3.35 8.47	163.96	169.00 159.63 158.13	168.67 159.33 157.83	0.33 0.30	18 18 Cir	0.55 0.50	4.79 4.56	8.47 8.06	Pipe - (58)
2	1	Genr	0.012	80.059	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.20	8.19	0.63	0.00 5.17	168.64	170.79 162.52 161.52	169.36 162.11 161.11	1.44 0.41	12 12 Cir	1.79 0.51	6.58 3.52	5.17 2.76	Pipe - (71)
3	End	MH	0.012	3.640	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	9.92	0.03	6.73	0.86	0.00 5.76	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	1.83 5.78	5.76 18.16	Pipe - (85)
4	3	Comb	0.012	15.229	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	9.79	0.13	6.76	0.83	0.00 5.60	164.19	168.73 160.28 158.28	168.72 160.03 158.03	0.01 0.25	24 24 Cir	0.05 1.64	1.78 9.99	5.60 31.39	Pipe - (63)
5	4	Comb	0.012	75.492	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	8.93	0.86	6.97	0.60	0.00 4.21	164.99	168.80 160.66 158.66	168.78 160.28 158.28	0.02 0.38	24 24 Cir	0.03 0.50	1.34 5.53	4.21 17.38	Pipe - (64)
6	5	Comb	0.012	140.496	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.34	1.60	7.41	0.33	0.00 2.43	165.11	168.91 160.87 159.37	168.84 160.16 158.66	0.06 0.71	18 18 Cir	0.05 0.51	1.38 4.58	2.43 8.09	Pipe - (65)
7	6	Comb	0.012	30.318	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	6.96	0.38	7.52	0.30	0.00 2.26	165.05	168.96 161.02 159.52	168.95 160.87 159.37	0.01 0.15	18 18 Cir	0.04 0.49	1.28 4.53	2.26 8.00	Pipe - (66)
8	7	MH	0.012	55.960	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	6.12	0.84	7.79	0.24	0.00 1.89	164.85	168.99 161.30 159.80	168.98 161.02 159.52	0.02 0.28	18 18 Cir	0.03 0.50	1.07 4.55	1.89 8.05	Pipe - (67)
9	8	Comb	0.012	36.465	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.57	0.54	7.98	0.24	0.00 1.94	163.79	169.02 161.58 160.08	169.01 161.40 159.90	0.01 0.18	18 18 Cir	0.03 0.49	1.10 4.52	1.94 7.99	Pipe - (68)
10	9	Comb	0.012	35.065	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.57	8.19	0.15	0.00 1.25	163.64	169.06 161.51 160.26	169.05 161.33 160.08	0.01 0.18	15 15 Cir	0.03 0.51	1.02 4.08	1.25 5.01	Pipe - (69)

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)_Rev0.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: 10/29/2024
					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	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	0.17	8.19	0.05	0.00 0.45	164.29	168.67 161.40 160.15	168.67 161.38 160.13	0.00 0.02	15 15 Cir	0.00 0.55	0.36 4.21	0.45 5.17	Pipe - (56)
12	End	Comb	0.012	9.379	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	11.34	0.18	6.43	0.20	0.00 1.28	164.75	168.67 160.18 158.68	168.67 160.13 158.63	0.00 0.05	18 18 Cir	0.01 0.53	0.73 4.70	1.28 8.31	Pipe - (52)
13	12	Comb	0.012	108.126	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	9.53	1.81	6.83	0.15	0.00 1.05	164.93	168.70 160.72 159.47	168.68 160.18 158.93	0.02 0.54	15 15 Cir	0.02 0.50	0.86 4.03	1.05 4.94	Pipe - (53)
14	13	Comb	0.012	85.481	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.81	1.72	7.27	0.13	0.00 0.91	163.42	168.73 161.15 159.90	168.71 160.72 159.47	0.01 0.43	15 15 Cir	0.02 0.50	0.74 4.04	0.91 4.96	Pipe - (54)
15	14	Comb	0.012	38.702	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	2.81	8.19	0.03	0.00 0.28	163.46	168.74 161.34 160.09	168.74 161.15 159.90	0.00 0.19	15 15 Cir	0.00 0.49	0.23 3.99	0.28 4.90	Pipe - (55)
16	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	168.68 161.10 159.85	168.67 160.38 159.13	0.01 0.72	15 15 Cir	0.02 2.82	0.82 9.57	1.01 11.74	Pipe - (57)
17	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	0.53	0.00 4.36	162.50	168.68 160.75 159.25	168.67 159.53 158.03	0.01 1.22	18 18 Cir	0.15 13.25	2.47 23.43	4.36 41.41	Pipe - (62)
18	5	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	0.69	8.19	0.21	0.00 1.71	166.88	169.02 160.11 159.11	168.84 159.66 158.66	0.18 0.45	12 12 Cir	0.20 0.50	2.18 3.48	1.71 2.73	Pipe - (77)
19	3	MH	0.012	31.389	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.97	1.78	7.23	0.03	0.00 0.21	164.63	168.73 159.20 158.20	168.72 159.03 158.03	0.00 0.17	12 12 Cir	0.00 0.54	0.26 3.61	0.21 2.84	Pipe - (78)
20	19	MH	0.012	45.661	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.40	2.57	8.04	0.03	0.00 0.23	165.23	168.73 159.44 158.44	168.73 159.20 158.20	0.00 0.24	12 12 Cir	0.00 0.53	0.29 3.56	0.23 2.80	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)_Rev0.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: 10/29/2024 / 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	20	Comb	0.012	7.212	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	168.73 159.48 158.48	168.73 159.44 158.44	0.00 0.04	12 12 Cir	0.00 0.55	0.30 3.66	0.23 2.87	Pipe - (80)
22	End	MH	0.012	54.188	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.02	0.23	8.18	0.38	0.00 3.11	164.48	169.02 159.30 158.30	168.67 159.03 158.03	0.35 0.27	12 12 Cir	0.65 0.50	3.96 3.47	3.11 2.72	Pipe - (82)
23	22	Comb	0.012	4.414	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	0.02	8.19	0.38	0.00 3.11	164.60	169.29 159.33 158.33	169.27 159.30 158.30	0.03 0.03	12 12 Cir	0.65 0.68	3.96 4.05	3.11 3.18	Pipe - (83)
24	End	MH	0.012	44.321	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.50	0.20	7.36	0.02	0.00 6.38	160.87	168.81 157.88 156.38	168.67 157.65 156.15	0.14 0.23	18 18 Cir	0.31 0.52	3.61 4.64	6.38 8.20	Pipe - (59)
25	24	MH	0.012	87.044	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	7.10	0.40	7.48	0.02	0.00 6.38	162.83	169.16 158.32 156.82	168.89 157.88 156.38	0.27 0.44	18 18 Cir	0.31 0.51	3.61 4.58	6.38 8.09	Pipe - (60)
26	25	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	0.67	0.00	0.00	6.24 6.24	163.82	169.79 159.03 157.53	169.37 158.32 156.82	0.43 0.71	18 18 Cir	0.30 0.50	3.53 4.54	6.24 8.03	Pipe - (61)
27	25	Genr	0.012	24.911	0.00 0.00 0.00	0.00 0.00 0.00	0.00 0.00 0.00	5.00	2.10	8.19	0.02	0.00 0.16	165.47	169.37 157.95 156.95	169.37 157.82 156.82	0.00 0.13	12 12 Cir	0.00 0.52	0.20 3.55	0.16 2.79	Pipe - (72)

NOTES: Intensity = 46.91 / (Inlet time + 9.20) ^ 0.66 (in/hr) ; Time of flow in section is based on full flow.

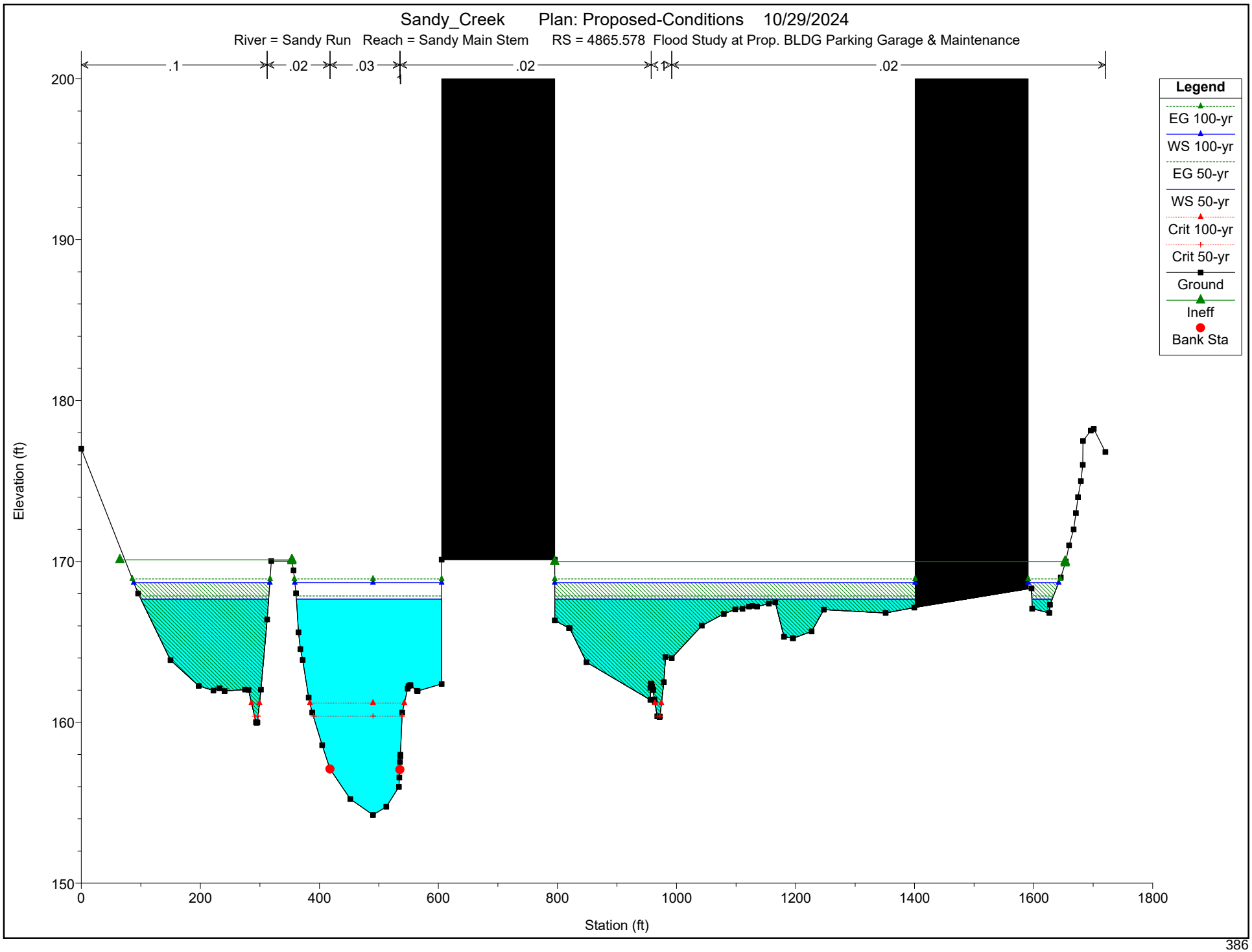
Project File: PAB220113.00-Storm(100-yr-Tailwater)_Rev0.stm

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
.1
.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)
200
190
180
170
160
150
0
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)

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**

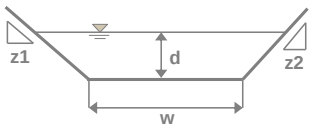
Description: **500 Pennsylvania Avenue**
Whitemarsh Township, Montgomery County

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**

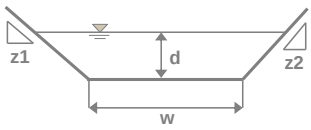
Description: **500 Pennsylvania Avenue**
Whitemarsh Township, Montgomery County

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)

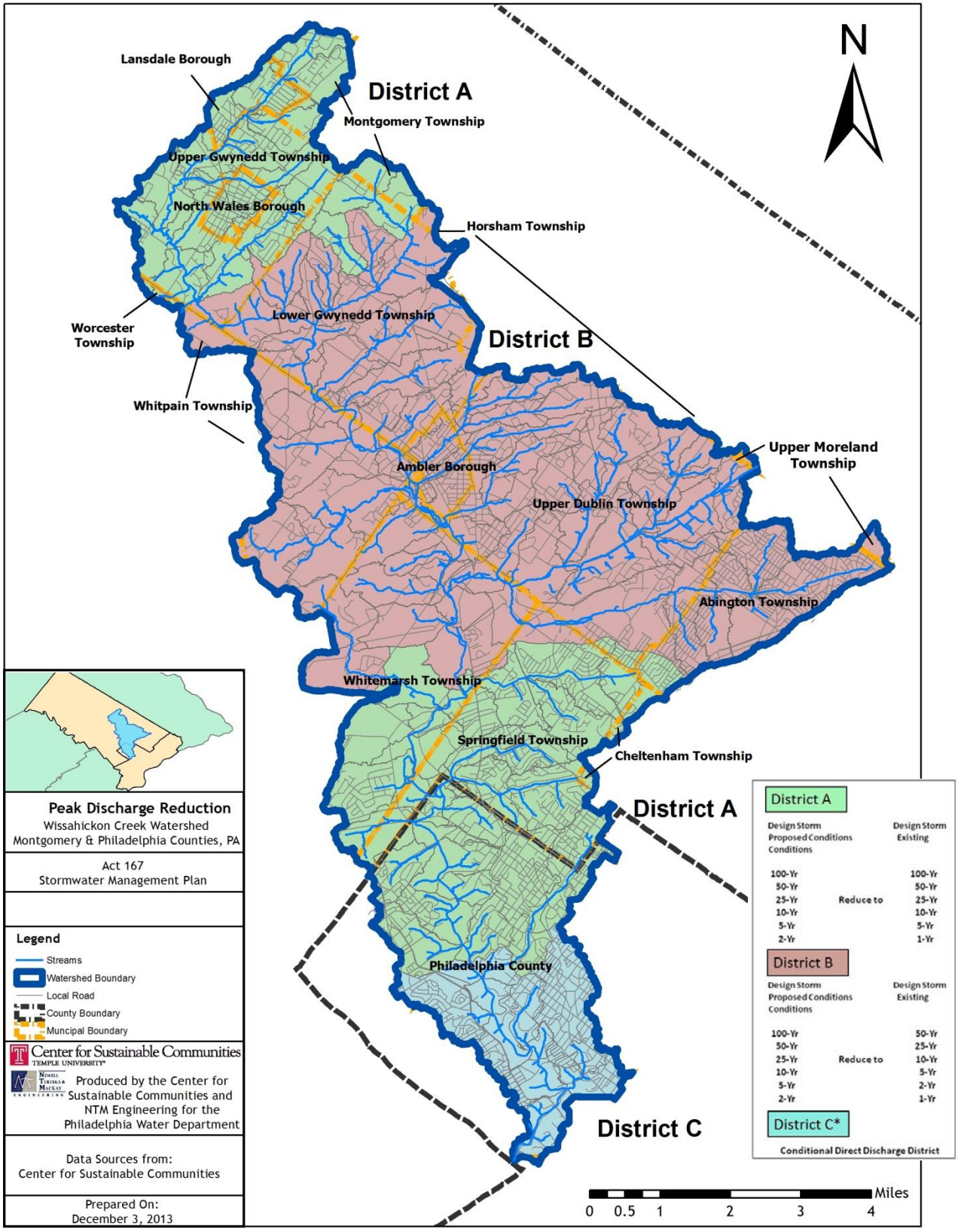
Select Lining Material

	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**

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.

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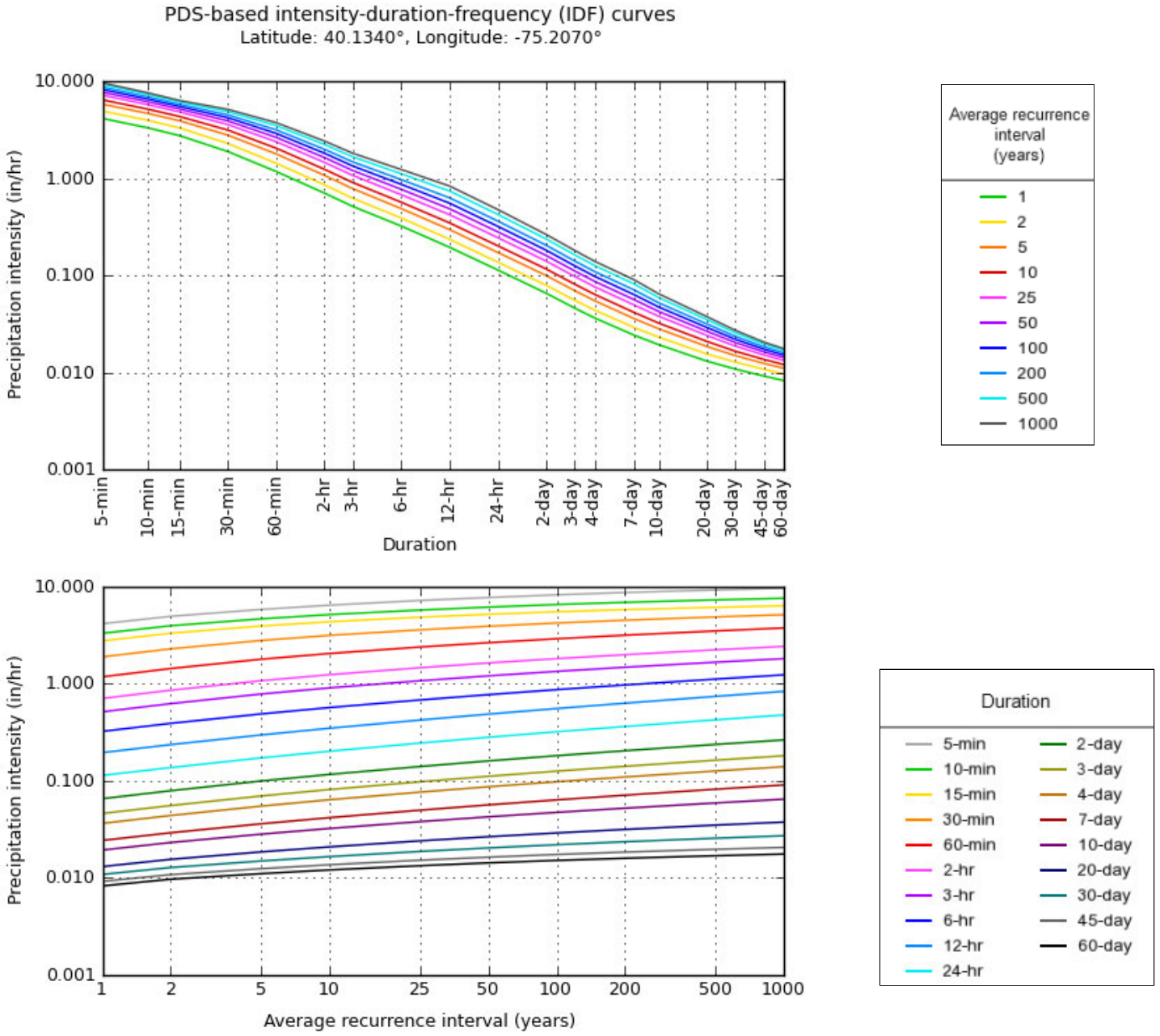
PF graphical



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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.

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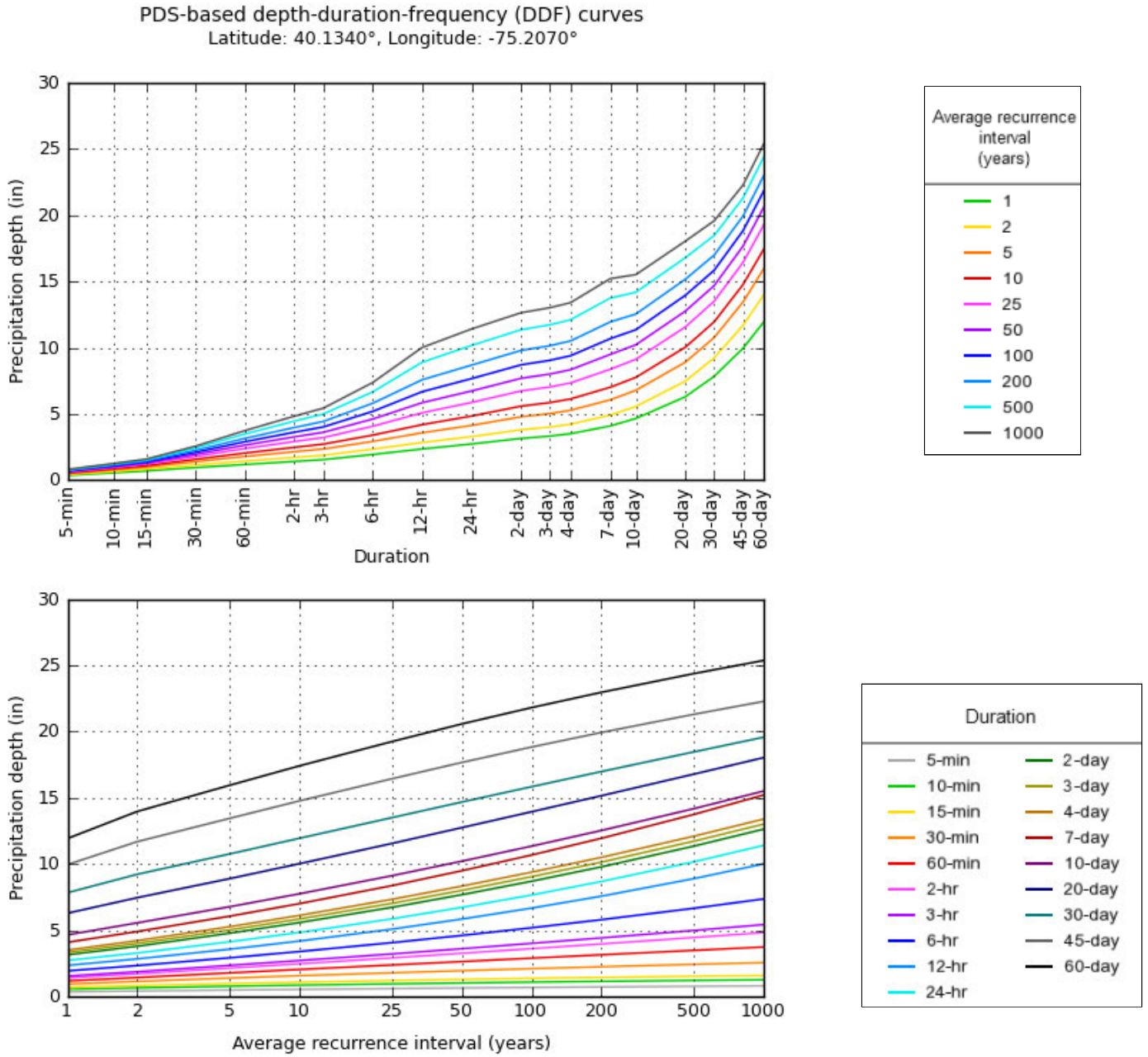
PF graphical



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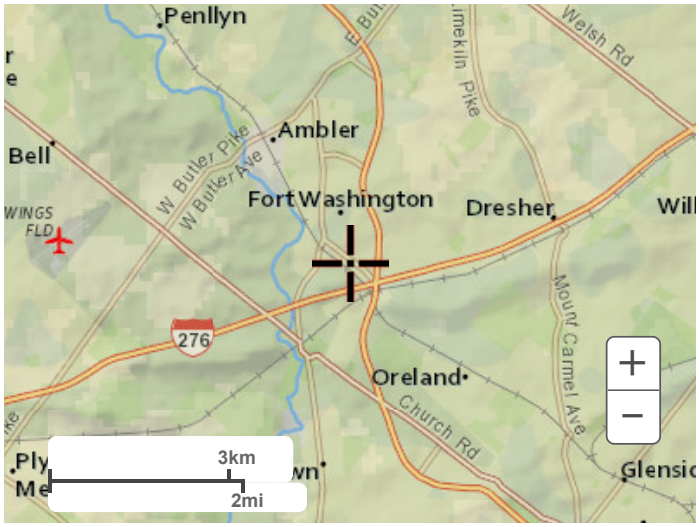
Maps & aerials

Small scale terrain



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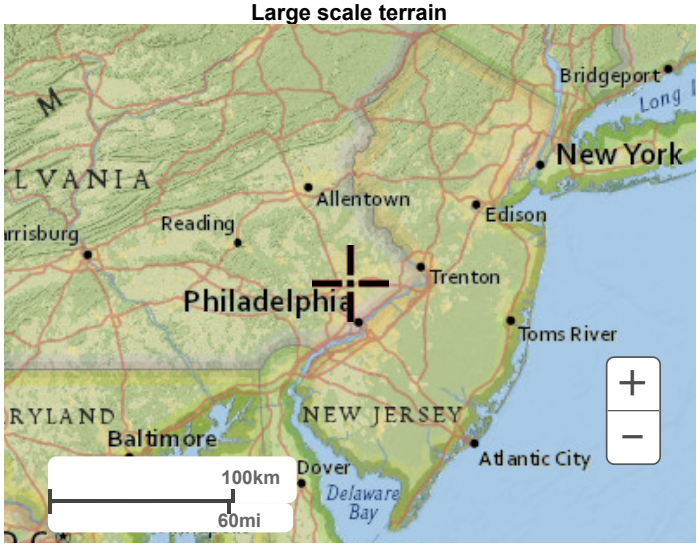

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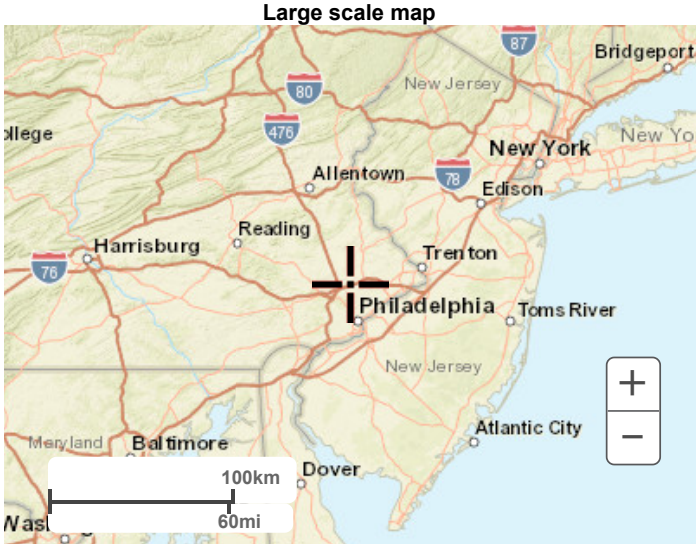

Large scale aerial

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National Weather Service
National Water Center
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Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

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Appendix A – Supplemental Stormwater Calculations

Storm Sewer Profile

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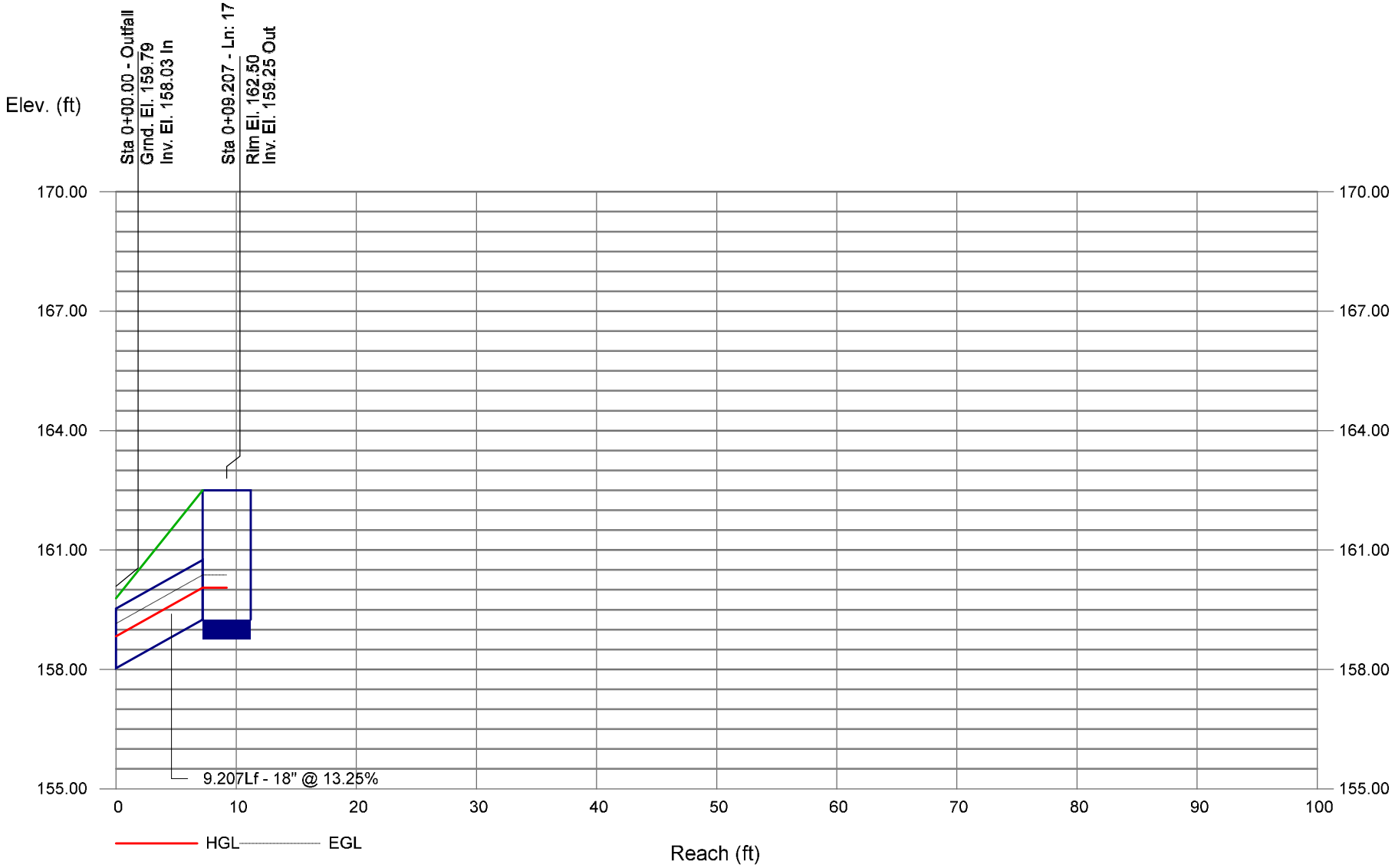

Storm Sewer Profile

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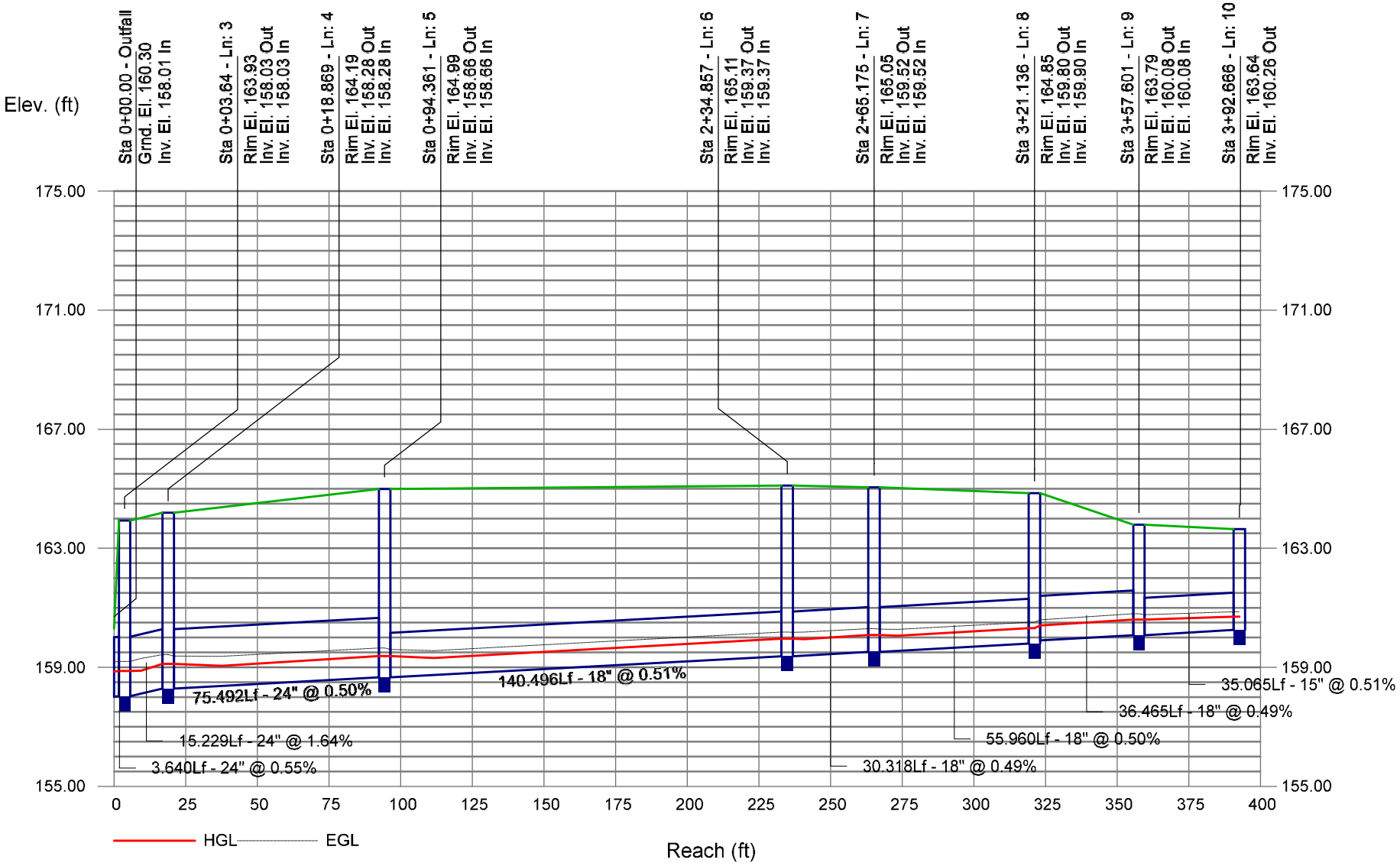

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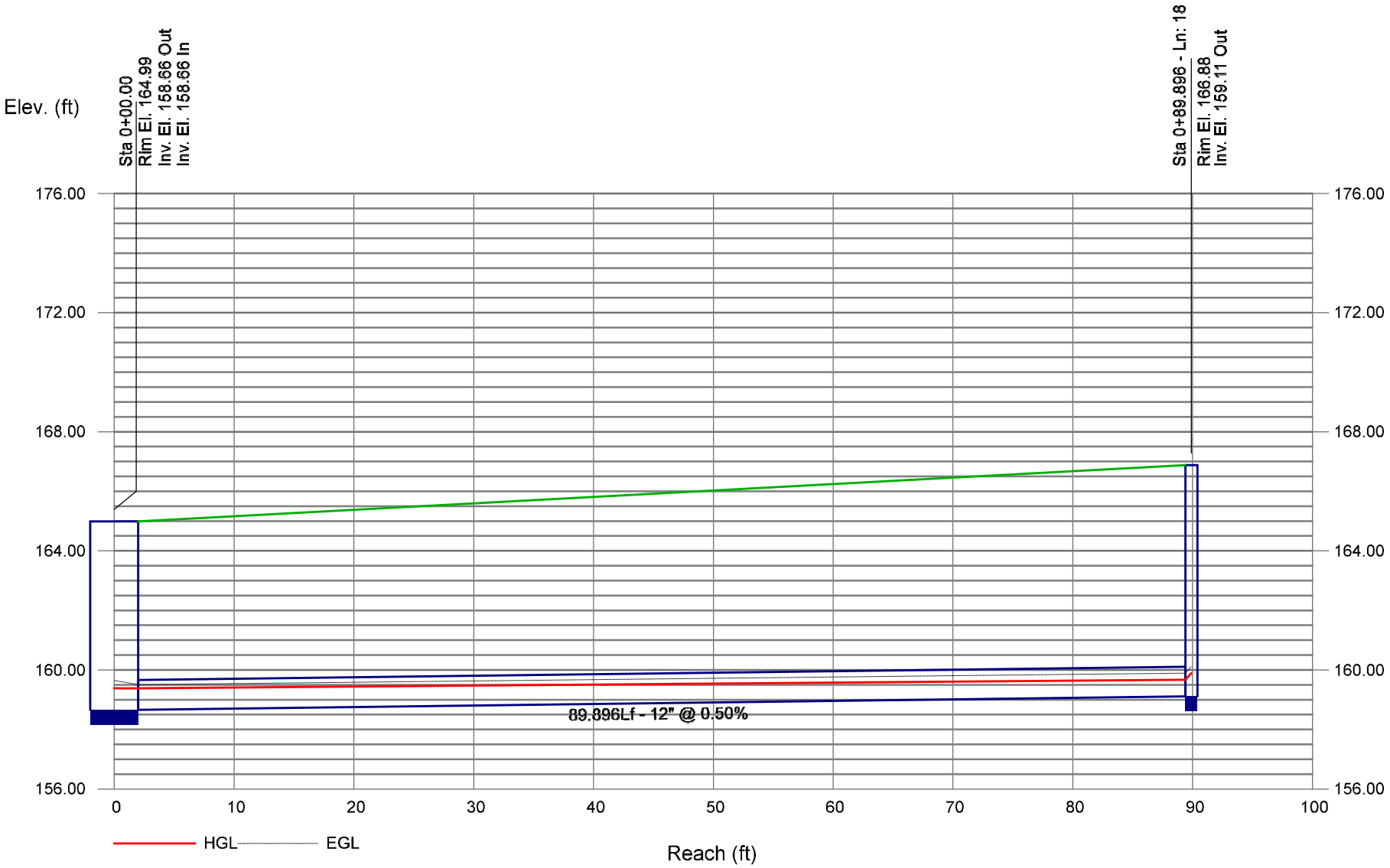

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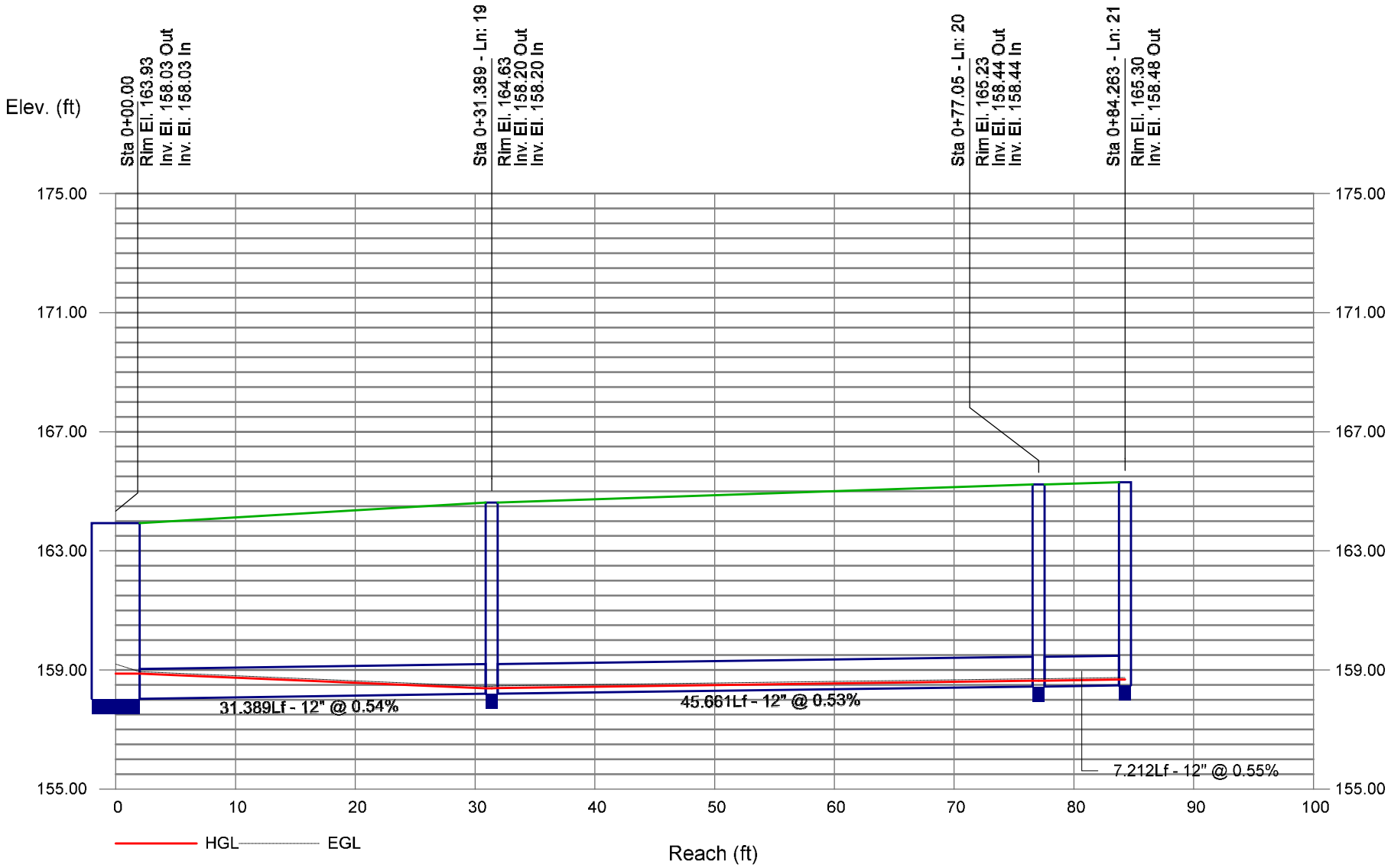

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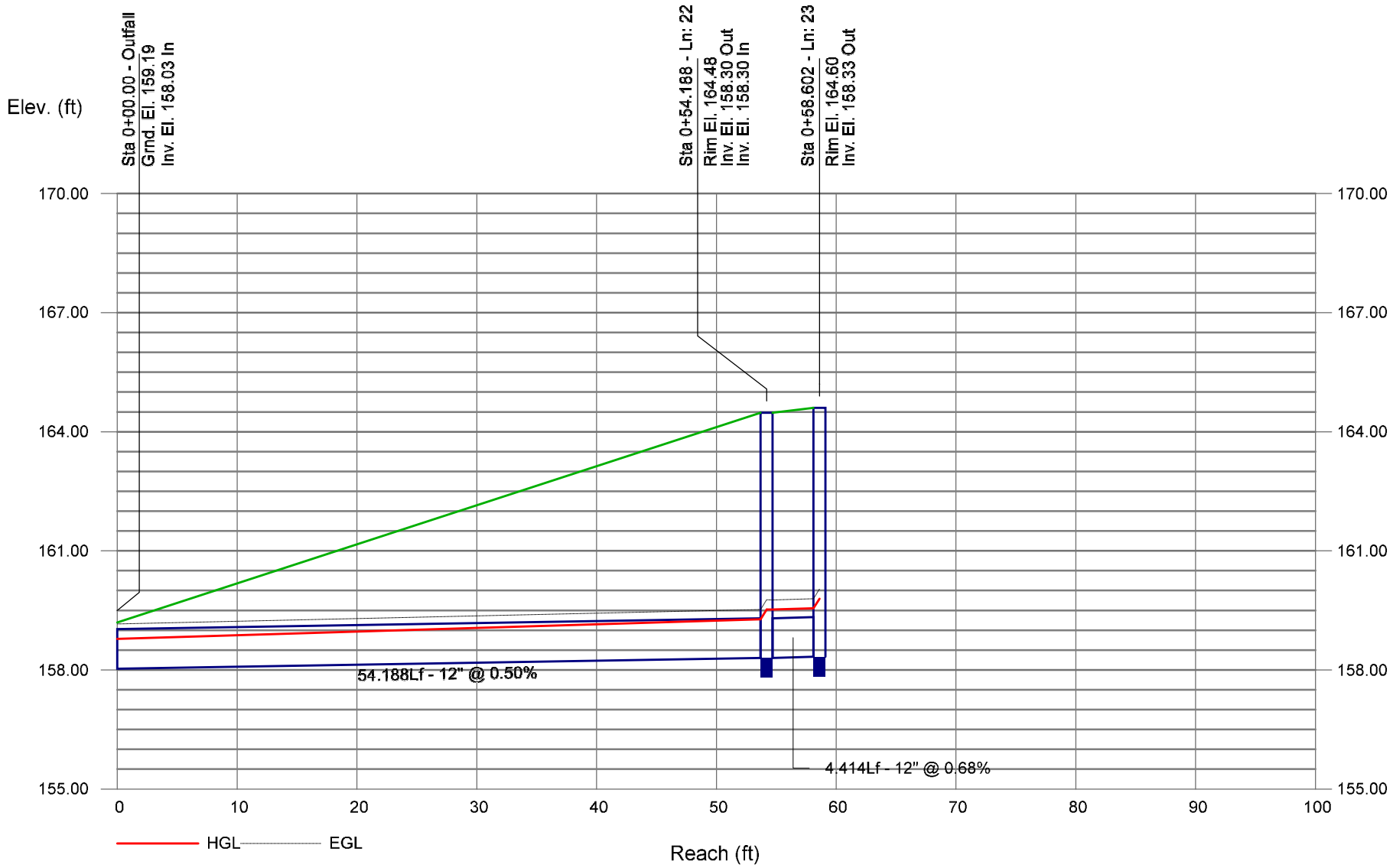

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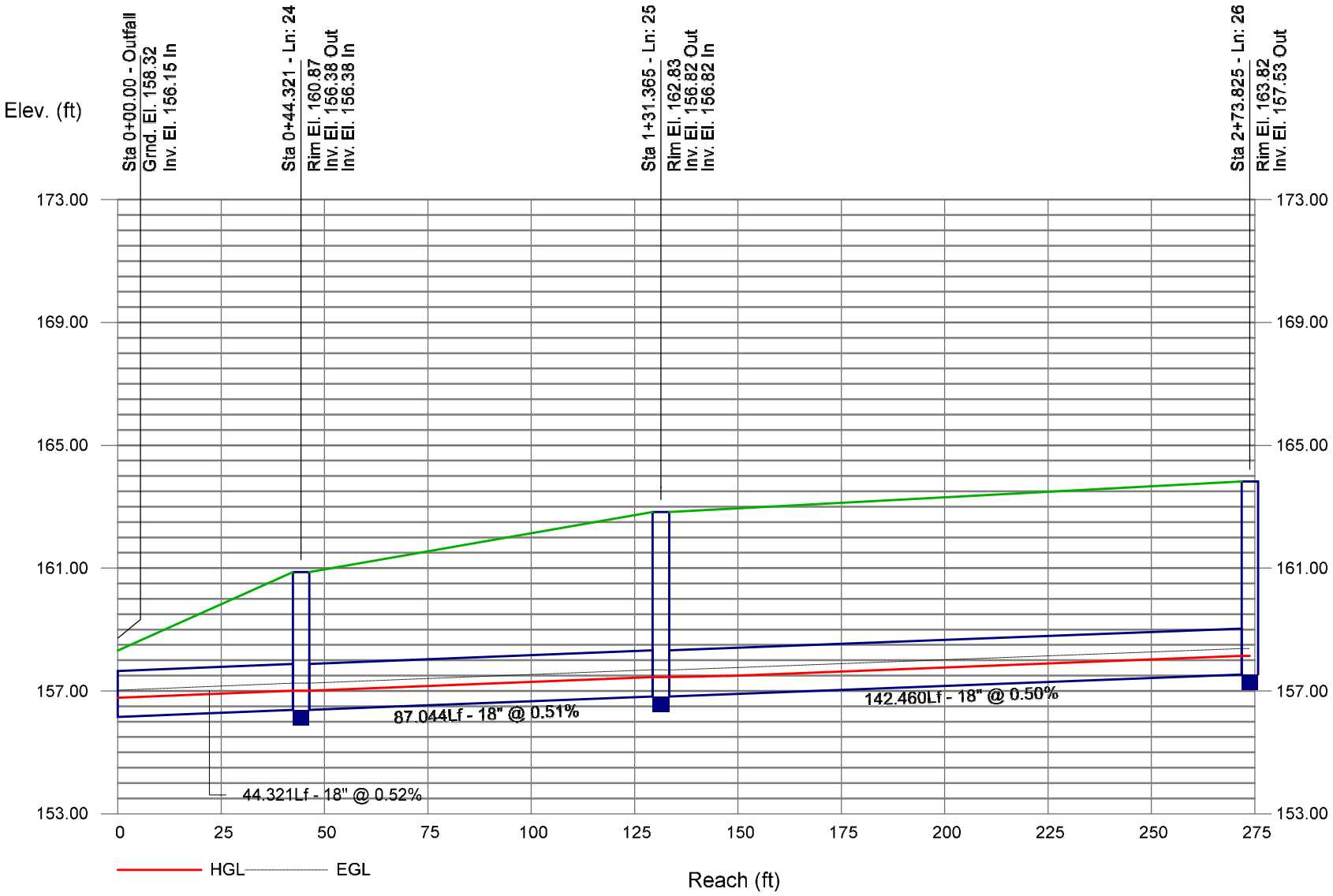

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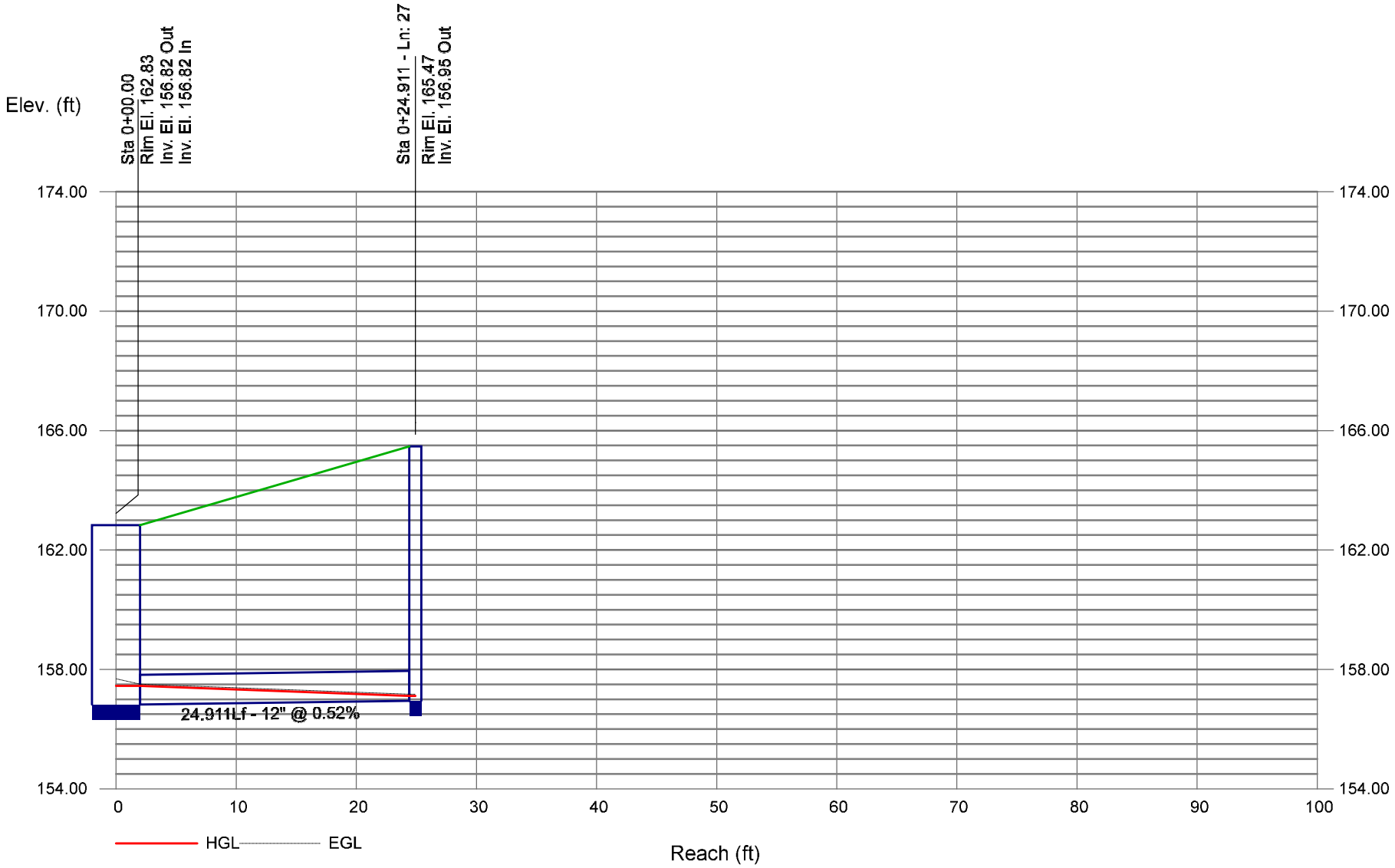

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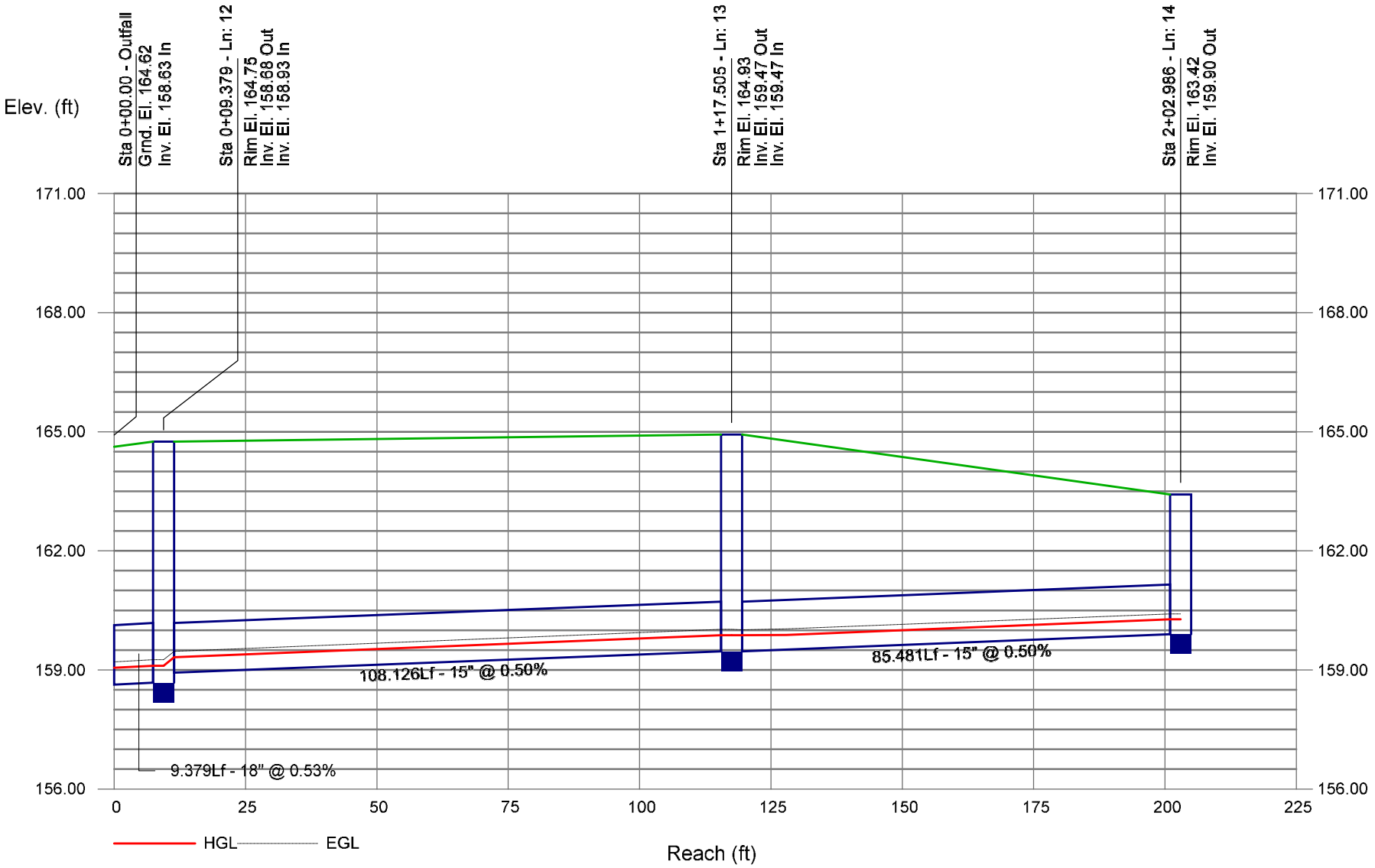

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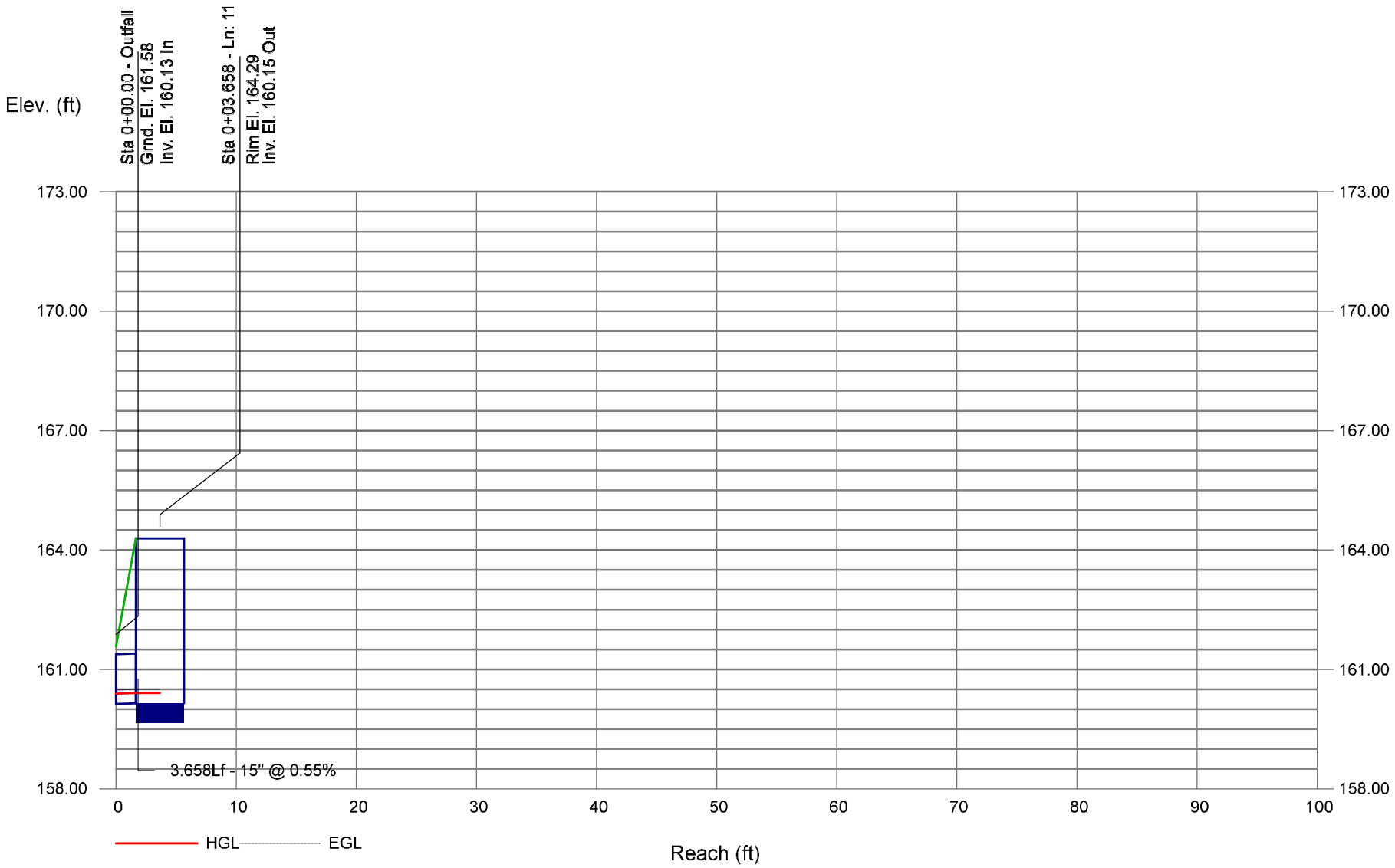

Storm Sewer Profile

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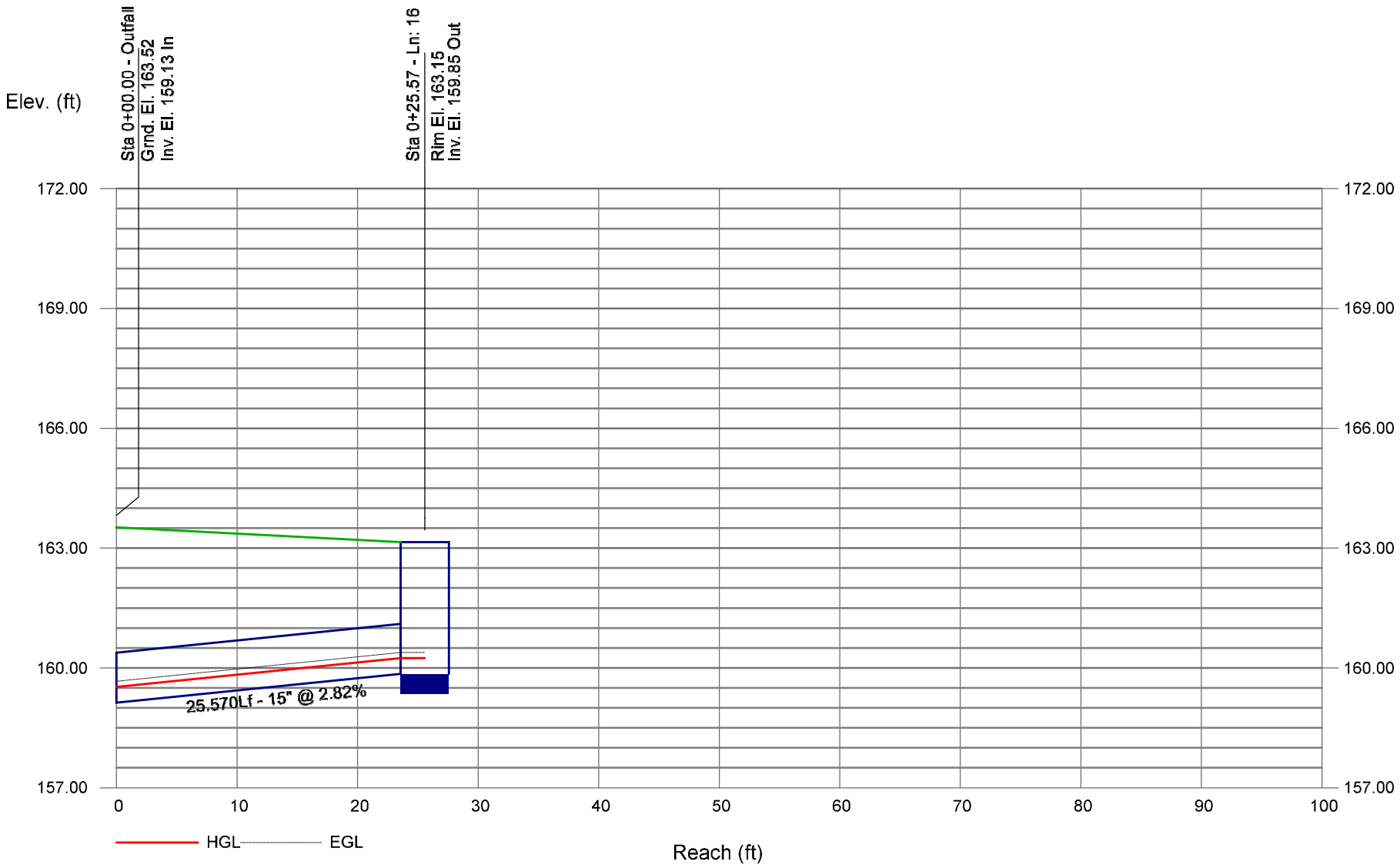

Storm Sewer Profile

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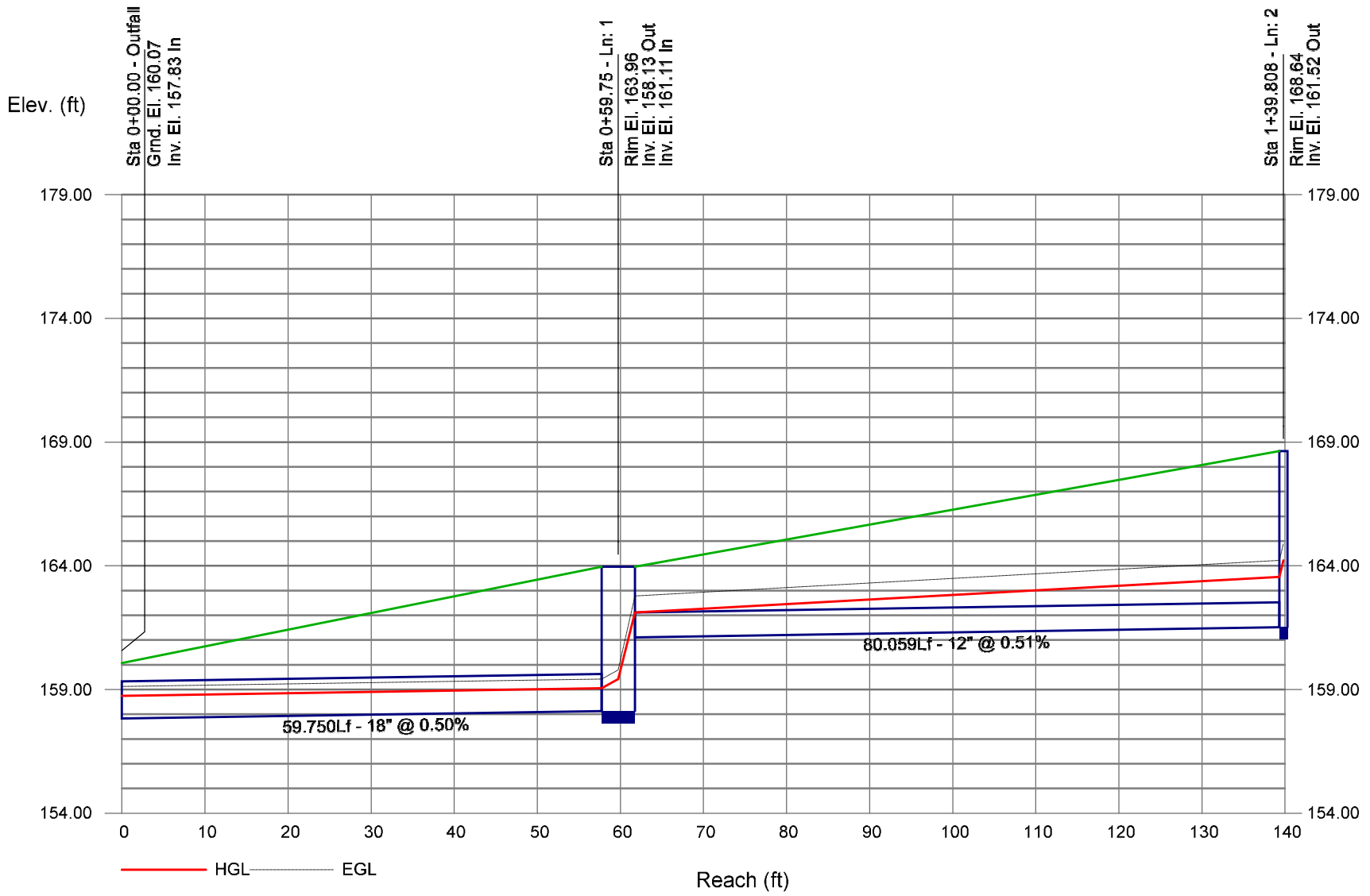
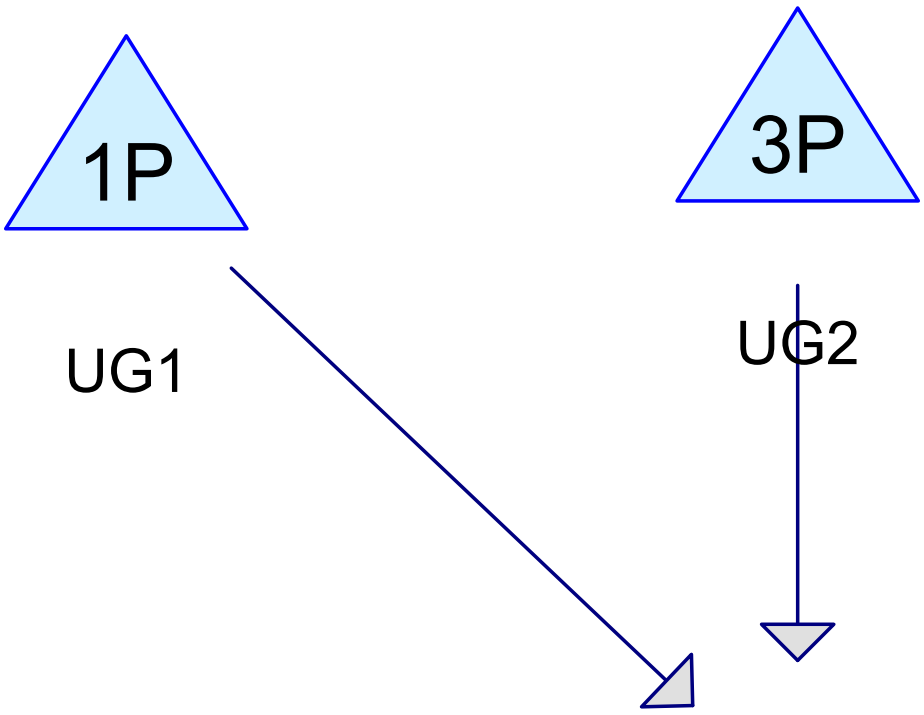




Subcat Reach Pond Link

Routing Diagram for BMW_2024-07-22
Prepared by Bohler, Printed 10/29/2024
HydroCAD® 10.20-4a s/n 03478 © 2023 HydroCAD Software Solutions LLC

Summary for Pond 1P: UG1

Inflow Area = 81,675 sf, 99.20% Impervious, Inflow Depth = 3.02" for 2-yr event
Inflow = 8.907 cfs @ 11.96 hrs, Volume= 20,574 cf
Outflow = 2.524 cfs @ 12.07 hrs, Volume= 11,363 cf, Atten= 72%, Lag= 7.1 min
Primary = 2.524 cfs @ 12.07 hrs, Volume= 11,363 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= 158.84' @ 12.07 hrs Surf.Area= 13,041 sf Storage= 11,936 cf

Plug-Flow detention time= 236.3 min calculated for 11,363 cf (55% of inflow)
Center-of-Mass det. time= 120.3 min (871.3 - 751.0)

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'	**40.0" 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= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=2.523 cfs @ 12.07 hrs HW=158.84' TW=158.60' (Fixed TW Elev= 158.60')
└─**4=Culvert** (Passes 2.523 cfs of 3.192 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.013 cfs @ 2.382 fps)
  ├─**2=Orifice/Grate** (Orifice Controls 2.510 cfs @ 2.259 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

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	0.000	158.55	0.000	159.06	3.552
157.54	0.000	158.05	0.000	158.56	0.000	159.07	3.592
157.55	0.000	158.06	0.000	158.57	0.000	159.08	3.632
157.56	0.000	158.07	0.000	158.58	0.000	159.09	3.672
157.57	0.000	158.08	0.000	158.59	0.000	159.10	3.711
157.58	0.000	158.09	0.000	158.60	0.000	159.11	3.750
157.59	0.000	158.10	0.000	158.61	0.350	159.12	3.789
157.60	0.000	158.11	0.000	158.62	0.511	159.13	3.827
157.61	0.000	158.12	0.000	158.63	0.644	159.14	3.864
157.62	0.000	158.13	0.000	158.64	0.765	159.15	3.901
157.63	0.000	158.14	0.000	158.65	0.879	159.16	3.938
157.64	0.000	158.15	0.000	158.66	0.989	159.17	3.975
157.65	0.000	158.16	0.000	158.67	1.097	159.18	4.011
157.66	0.000	158.17	0.000	158.68	1.203	159.19	4.047
157.67	0.000	158.18	0.000	158.69	1.308	159.20	4.083
157.68	0.000	158.19	0.000	158.70	1.413	159.21	4.118
157.69	0.000	158.20	0.000	158.71	1.517	159.22	4.153
157.70	0.000	158.21	0.000	158.72	1.621	159.23	4.188
157.71	0.000	158.22	0.000	158.73	1.720	159.24	4.222
157.72	0.000	158.23	0.000	158.74	1.808	159.25	4.256
157.73	0.000	158.24	0.000	158.75	1.891	159.26	4.290
157.74	0.000	158.25	0.000	158.76	1.968	159.27	4.324
157.75	0.000	158.26	0.000	158.77	2.043	159.28	4.357
157.76	0.000	158.27	0.000	158.78	2.114	159.29	4.390
157.77	0.000	158.28	0.000	158.79	2.183	159.30	4.423
157.78	0.000	158.29	0.000	158.80	2.249	159.31	4.455
157.79	0.000	158.30	0.000	158.81	2.313	159.32	4.488
157.80	0.000	158.31	0.000	158.82	2.376	159.33	4.520
157.81	0.000	158.32	0.000	158.83	2.437	159.34	4.552
157.82	0.000	158.33	0.000	158.84	2.496	159.35	4.583
157.83	0.000	158.34	0.000	158.85	2.554	159.36	4.615
157.84	0.000	158.35	0.000	158.86	2.610	159.37	4.646
157.85	0.000	158.36	0.000	158.87	2.665	159.38	4.677
157.86	0.000	158.37	0.000	158.88	2.719	159.39	4.708
157.87	0.000	158.38	0.000	158.89	2.772	159.40	4.739
157.88	0.000	158.39	0.000	158.90	2.824	159.41	4.769
157.89	0.000	158.40	0.000	158.91	2.875	159.42	4.799
157.90	0.000	158.41	0.000	158.92	2.925	159.43	4.829
157.91	0.000	158.42	0.000	158.93	2.974	159.44	4.859
157.92	0.000	158.43	0.000	158.94	3.023	159.45	4.889
157.93	0.000	158.44	0.000	158.95	3.070	159.46	4.918
157.94	0.000	158.45	0.000	158.96	3.117	159.47	4.948
157.95	0.000	158.46	0.000	158.97	3.163	159.48	4.977
157.96	0.000	158.47	0.000	158.98	3.209	159.49	5.006
157.97	0.000	158.48	0.000	158.99	3.254	159.50	5.034
157.98	0.000	158.49	0.000	159.00	3.298	159.51	5.063
157.99	0.000	158.50	0.000	159.01	3.342	159.52	5.092
158.00	0.000	158.51	0.000	159.02	3.385	159.53	5.120
158.01	0.000	158.52	0.000	159.03	3.427	159.54	5.148
158.02	0.000	158.53	0.000	159.04	3.469	159.55	5.176
158.03	0.000	158.54	0.000	159.05	3.511	159.56	5.204

Stage-Discharge for Pond 1P: UG1 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
159.57	5.232	160.08	6.490	160.59	10.298
159.58	5.259	160.09	6.512	160.60	10.437
159.59	5.287	160.10	6.534	160.61	10.576
159.60	5.314	160.11	6.556	160.62	10.718
159.61	5.341	160.12	6.578	160.63	10.861
159.62	5.368	160.13	6.600	160.64	11.005
159.63	5.395	160.14	6.622	160.65	11.151
159.64	5.422	160.15	6.644	160.66	11.299
159.65	5.448	160.16	6.665	160.67	11.448
159.66	5.475	160.17	6.687	160.68	11.599
159.67	5.501	160.18	6.709	160.69	11.751
159.68	5.527	160.19	6.730	160.70	11.904
159.69	5.553	160.20	6.752	160.71	12.059
159.70	5.579	160.21	6.773	160.72	12.215
159.71	5.605	160.22	6.794	160.73	12.373
159.72	5.631	160.23	6.815	160.74	**12.447**
159.73	5.657	160.24	6.837		
159.74	5.682	160.25	6.871		
159.75	5.707	160.26	6.916		
159.76	5.733	160.27	6.969		
159.77	5.758	160.28	7.027		
159.78	5.783	160.29	7.090		
159.79	5.808	160.30	7.158		
159.80	5.833	160.31	7.230		
159.81	5.857	160.32	7.305		
159.82	5.882	160.33	7.384		
159.83	5.907	160.34	7.466		
159.84	5.931	160.35	7.551		
159.85	5.955	160.36	7.640		
159.86	5.980	160.37	7.731		
159.87	6.004	160.38	7.824		
159.88	6.028	160.39	7.921		
159.89	6.052	160.40	8.019		
159.90	6.075	160.41	8.121		
159.91	6.099	160.42	8.224		
159.92	6.123	160.43	8.330		
159.93	6.146	160.44	8.439		
159.94	6.170	160.45	8.549		
159.95	6.193	160.46	8.661		
159.96	6.217	160.47	8.776		
159.97	6.240	160.48	8.893		
159.98	6.263	160.49	9.011		
159.99	6.286	160.50	9.132		
160.00	6.309	160.51	9.254		
160.01	6.332	160.52	9.379		
160.02	6.355	160.53	9.505		
160.03	6.377	160.54	9.633		
160.04	6.400	160.55	9.762		
160.05	6.422	160.56	9.894		
160.06	6.445	160.57	10.027		
160.07	6.467	160.58	10.162		

Summary for Pond 3P: UG2

Inflow Area = 21,519 sf, 87.04% Impervious, Inflow Depth = 2.65" for 2-yr event
Inflow = 2.059 cfs @ 11.96 hrs, Volume= 4,757 cf
Outflow = 0.492 cfs @ 12.09 hrs, Volume= 4,757 cf, Atten= 76%, Lag= 7.8 min
Primary = 0.492 cfs @ 12.09 hrs, Volume= 4,757 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= 160.37' @ 12.09 hrs Surf.Area= 2,542 sf Storage= 1,778 cf

Plug-Flow detention time= 71.7 min calculated for 4,756 cf (100% of inflow)
Center-of-Mass det. time= 71.8 min (822.9 - 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'	**5.0" 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= 36.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

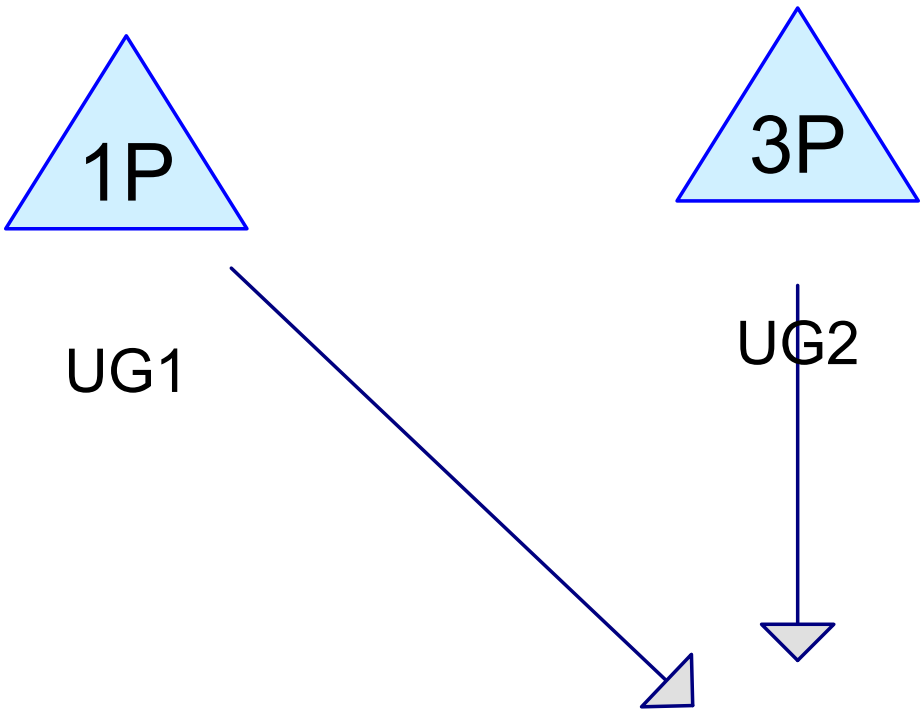
Primary OutFlow Max=0.492 cfs @ 12.09 hrs HW=160.37' TW=158.60' (Fixed TW Elev= 158.60')
└─**4=Culvert** (Passes 0.492 cfs of 3.732 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.232 cfs @ 4.728 fps)
  ├─**2=Orifice/Grate** (Orifice Controls 0.260 cfs @ 2.498 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

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	0.447	160.81	0.704
159.29	0.000	159.80	0.149	160.31	0.454	160.82	0.708
159.30	0.001	159.81	0.150	160.32	0.461	160.83	0.712
159.31	0.002	159.82	0.152	160.33	0.467	160.84	0.716
159.32	0.003	159.83	0.154	160.34	0.474	160.85	0.719
159.33	0.005	159.84	0.156	160.35	0.480	160.86	0.723
159.34	0.008	159.85	0.158	160.36	0.487	160.87	0.727
159.35	0.010	159.86	0.159	160.37	0.493	160.88	0.731
159.36	0.013	159.87	0.161	160.38	0.499	160.89	0.735
159.37	0.016	159.88	0.163	160.39	0.505	160.90	0.739
159.38	0.020	159.89	0.165	160.40	0.511	160.91	0.742
159.39	0.023	159.90	0.166	160.41	0.517	160.92	0.746
159.40	0.027	159.91	0.168	160.42	0.522	160.93	0.750
159.41	0.032	159.92	0.170	160.43	0.528	160.94	0.753
159.42	0.036	159.93	0.171	160.44	0.533	160.95	0.757
159.43	0.041	159.94	0.173	160.45	0.539	160.96	0.761
159.44	0.045	159.95	0.174	160.46	0.544	160.97	0.764
159.45	0.050	159.96	0.176	160.47	0.550	160.98	0.768
159.46	0.055	159.97	0.178	160.48	0.555	160.99	0.772
159.47	0.059	159.98	0.181	160.49	0.560	161.00	0.775
159.48	0.064	159.99	0.185	160.50	0.565	161.01	0.779
159.49	0.069	160.00	0.189	160.51	0.570	161.02	0.782
159.50	0.073	160.01	0.195	160.52	0.575	161.03	0.786
159.51	0.077	160.02	0.200	160.53	0.580	161.04	0.789
159.52	0.081	160.03	0.207	160.54	0.585	161.05	0.793
159.53	0.084	160.04	0.213	160.55	0.590	161.06	0.796
159.54	0.087	160.05	0.220	160.56	0.595	161.07	0.800
159.55	0.090	160.06	0.227	160.57	0.600	161.08	0.803
159.56	0.093	160.07	0.235	160.58	0.605	161.09	0.807
159.57	0.096	160.08	0.243	160.59	0.609	161.10	0.810
159.58	0.099	160.09	0.251	160.60	0.614	161.11	0.814
159.59	0.102	160.10	0.260	160.61	0.618	161.12	0.817
159.60	0.104	160.11	0.269	160.62	0.623	161.13	0.820
159.61	0.107	160.12	0.278	160.63	0.628	161.14	0.824
159.62	0.110	160.13	0.287	160.64	0.632	161.15	0.827
159.63	0.112	160.14	0.296	160.65	0.637	161.16	0.830
159.64	0.115	160.15	0.306	160.66	0.641	161.17	0.834
159.65	0.117	160.16	0.316	160.67	0.645	161.18	0.837
159.66	0.119	160.17	0.326	160.68	0.650	161.19	0.840
159.67	0.122	160.18	0.337	160.69	0.654	161.20	0.844
159.68	0.124	160.19	0.347	160.70	0.658	161.21	0.847
159.69	0.126	160.20	0.358	160.71	0.663	161.22	0.850
159.70	0.128	160.21	0.369	160.72	0.667	161.23	0.853
159.71	0.131	160.22	0.381	160.73	0.671	161.24	0.857
159.72	0.133	160.23	0.391	160.74	0.675	161.25	0.860
159.73	0.135	160.24	0.400	160.75	0.679	161.26	0.863
159.74	0.137	160.25	0.408	160.76	0.684	161.27	0.866
159.75	0.139	160.26	0.417	160.77	0.688	161.28	0.869
159.76	0.141	160.27	0.425	160.78	0.692	161.29	0.873
159.77	0.143	160.28	0.432	160.79	0.696	161.30	0.876
159.78	0.145	160.29	0.440	160.80	0.700	161.31	0.879

Stage-Discharge for Pond 3P: UG2 (continued)

Elevation (feet)	Primary (cfs)
161.32	0.882
161.33	0.885
161.34	0.888
161.35	0.891
161.36	0.894
161.37	0.897
161.38	0.900
161.39	0.904
161.40	0.907
161.41	0.910
161.42	0.913
161.43	0.916
161.44	0.919
161.45	0.922
161.46	0.925
161.47	0.928
161.48	0.931
161.49	0.933
161.50	0.936
161.51	0.953
161.52	0.980
161.53	1.014
161.54	1.055
161.55	1.100
161.56	1.150
161.57	1.203
161.58	1.261
161.59	1.322
161.60	1.387
161.61	1.454
161.62	1.525
161.63	1.598
161.64	1.674
161.65	1.753
161.66	1.835
161.67	1.919
161.68	2.005
161.69	2.094
161.70	2.185
161.71	2.278
161.72	2.373
161.73	2.471
161.74	2.570
161.75	2.672
161.76	2.776
161.77	2.881
161.78	2.989
161.79	3.098
161.80	3.209
161.81	3.322
161.82	3.437
161.83	3.554
161.84	3.672
161.85	3.792
161.86	3.914
161.87	4.037
161.88	4.162
161.89	4.289
161.90	4.417
161.91	4.547
161.92	4.678
161.93	4.811
161.94	4.945
161.95	5.081
161.96	5.218
161.97	5.357
161.98	5.497
161.99	**5.639**



Subcat Reach Pond Link

Routing Diagram for BMW_2024-07-22
Prepared by Bohler, Printed 10/29/2024
HydroCAD® 10.20-4a s/n 03478 © 2023 HydroCAD Software Solutions LLC

Summary for Pond 1P: UG1

Inflow Area = 81,675 sf, 99.20% Impervious, Inflow Depth = 3.86" for 5-yr event
Inflow = 11.260 cfs @ 11.96 hrs, Volume= 26,300 cf
Outflow = 0.453 cfs @ 13.16 hrs, Volume= 6,554 cf, Atten= 96%, Lag= 72.3 min
Primary = 0.453 cfs @ 13.16 hrs, Volume= 6,554 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' @ 13.16 hrs Surf.Area= 13,041 sf Storage= 19,838 cf

Plug-Flow detention time= 492.7 min calculated for 6,554 cf (25% of inflow)
Center-of-Mass det. time= 274.2 min (1,020.6 - 746.5)

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'	**40.0" 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= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.530 cfs @ 13.16 hrs HW=159.61' TW=159.60' (Fixed TW Elev= 159.60')
└─**4=Culvert** (Passes 0.530 cfs of 0.839 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.003 cfs @ 0.475 fps)
  ├─**2=Orifice/Grate** (Orifice Controls 0.528 cfs @ 0.475 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

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	0.000	158.55	0.000	159.06	0.000
157.54	0.000	158.05	0.000	158.56	0.000	159.07	0.000
157.55	0.000	158.06	0.000	158.57	0.000	159.08	0.000
157.56	0.000	158.07	0.000	158.58	0.000	159.09	0.000
157.57	0.000	158.08	0.000	158.59	0.000	159.10	0.000
157.58	0.000	158.09	0.000	158.60	0.000	159.11	0.000
157.59	0.000	158.10	0.000	158.61	0.000	159.12	0.000
157.60	0.000	158.11	0.000	158.62	0.000	159.13	0.000
157.61	0.000	158.12	0.000	158.63	0.000	159.14	0.000
157.62	0.000	158.13	0.000	158.64	0.000	159.15	0.000
157.63	0.000	158.14	0.000	158.65	0.000	159.16	0.000
157.64	0.000	158.15	0.000	158.66	0.000	159.17	0.000
157.65	0.000	158.16	0.000	158.67	0.000	159.18	0.000
157.66	0.000	158.17	0.000	158.68	0.000	159.19	0.000
157.67	0.000	158.18	0.000	158.69	0.000	159.20	0.000
157.68	0.000	158.19	0.000	158.70	0.000	159.21	0.000
157.69	0.000	158.20	0.000	158.71	0.000	159.22	0.000
157.70	0.000	158.21	0.000	158.72	0.000	159.23	0.000
157.71	0.000	158.22	0.000	158.73	0.000	159.24	0.000
157.72	0.000	158.23	0.000	158.74	0.000	159.25	0.000
157.73	0.000	158.24	0.000	158.75	0.000	159.26	0.000
157.74	0.000	158.25	0.000	158.76	0.000	159.27	0.000
157.75	0.000	158.26	0.000	158.77	0.000	159.28	0.000
157.76	0.000	158.27	0.000	158.78	0.000	159.29	0.000
157.77	0.000	158.28	0.000	158.79	0.000	159.30	0.000
157.78	0.000	158.29	0.000	158.80	0.000	159.31	0.000
157.79	0.000	158.30	0.000	158.81	0.000	159.32	0.000
157.80	0.000	158.31	0.000	158.82	0.000	159.33	0.000
157.81	0.000	158.32	0.000	158.83	0.000	159.34	0.000
157.82	0.000	158.33	0.000	158.84	0.000	159.35	0.000
157.83	0.000	158.34	0.000	158.85	0.000	159.36	0.000
157.84	0.000	158.35	0.000	158.86	0.000	159.37	0.000
157.85	0.000	158.36	0.000	158.87	0.000	159.38	0.000
157.86	0.000	158.37	0.000	158.88	0.000	159.39	0.000
157.87	0.000	158.38	0.000	158.89	0.000	159.40	0.000
157.88	0.000	158.39	0.000	158.90	0.000	159.41	0.000
157.89	0.000	158.40	0.000	158.91	0.000	159.42	0.000
157.90	0.000	158.41	0.000	158.92	0.000	159.43	0.000
157.91	0.000	158.42	0.000	158.93	0.000	159.44	0.000
157.92	0.000	158.43	0.000	158.94	0.000	159.45	0.000
157.93	0.000	158.44	0.000	158.95	0.000	159.46	0.000
157.94	0.000	158.45	0.000	158.96	0.000	159.47	0.000
157.95	0.000	158.46	0.000	158.97	0.000	159.48	0.000
157.96	0.000	158.47	0.000	158.98	0.000	159.49	0.000
157.97	0.000	158.48	0.000	158.99	0.000	159.50	0.000
157.98	0.000	158.49	0.000	159.00	0.000	159.51	0.000
157.99	0.000	158.50	0.000	159.01	0.000	159.52	0.000
158.00	0.000	158.51	0.000	159.02	0.000	159.53	0.000
158.01	0.000	158.52	0.000	159.03	0.000	159.54	0.000
158.02	0.000	158.53	0.000	159.04	0.000	159.55	0.000
158.03	0.000	158.54	0.000	159.05	0.000	159.56	0.000

Stage-Discharge for Pond 1P: UG1 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
159.57	0.000	160.08	3.725	160.59	8.107
159.58	0.000	160.09	3.763	160.60	8.253
159.59	0.000	160.10	3.802	160.61	8.401
159.60	0.000	160.11	3.839	160.62	8.550
159.61	0.538	160.12	3.877	160.63	8.635
159.62	0.760	160.13	3.914	160.64	8.677
159.63	0.931	160.14	3.951	160.65	8.719
159.64	1.075	160.15	3.987	160.66	8.760
159.65	1.202	160.16	4.023	160.67	8.802
159.66	1.317	160.17	4.059	160.68	8.843
159.67	1.422	160.18	4.094	160.69	8.883
159.68	1.521	160.19	4.130	160.70	8.924
159.69	1.613	160.20	4.164	160.71	8.965
159.70	1.700	160.21	4.199	160.72	9.005
159.71	1.783	160.22	4.233	160.73	9.045
159.72	1.862	160.23	4.267	160.74	**9.085**
159.73	1.938	160.24	4.301		
159.74	2.012	160.25	4.348		
159.75	2.082	160.26	4.405		
159.76	2.150	160.27	4.470		
159.77	2.217	160.28	4.540		
159.78	2.281	160.29	4.615		
159.79	2.343	160.30	4.694		
159.80	2.404	160.31	4.777		
159.81	2.464	160.32	4.863		
159.82	2.522	160.33	4.953		
159.83	2.578	160.34	5.046		
159.84	2.634	160.35	5.142		
159.85	2.688	160.36	5.241		
159.86	2.741	160.37	5.342		
159.87	2.794	160.38	5.446		
159.88	2.845	160.39	5.552		
159.89	2.895	160.40	5.661		
159.90	2.945	160.41	5.772		
159.91	2.993	160.42	5.886		
159.92	3.041	160.43	6.001		
159.93	3.088	160.44	6.119		
159.94	3.135	160.45	6.238		
159.95	3.181	160.46	6.360		
159.96	3.226	160.47	6.484		
159.97	3.270	160.48	6.609		
159.98	3.314	160.49	6.737		
159.99	3.357	160.50	6.866		
160.00	3.400	160.51	6.997		
160.01	3.442	160.52	7.130		
160.02	3.484	160.53	7.265		
160.03	3.525	160.54	7.401		
160.04	3.566	160.55	7.539		
160.05	3.606	160.56	7.679		
160.06	3.646	160.57	7.820		
160.07	3.686	160.58	7.963		

Summary for Pond 3P: UG2

Inflow Area = 21,519 sf, 87.04% Impervious, Inflow Depth = 3.40" for 5-yr event
Inflow = 2.603 cfs @ 11.96 hrs, Volume= 6,093 cf
Outflow = 0.631 cfs @ 12.09 hrs, Volume= 5,768 cf, Atten= 76%, Lag= 7.8 min
Primary = 0.631 cfs @ 12.09 hrs, Volume= 5,768 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= 160.69' @ 12.09 hrs Surf.Area= 2,542 sf Storage= 2,427 cf

Plug-Flow detention time= 101.4 min calculated for 5,768 cf (95% of inflow)
Center-of-Mass det. time= 69.2 min (816.5 - 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

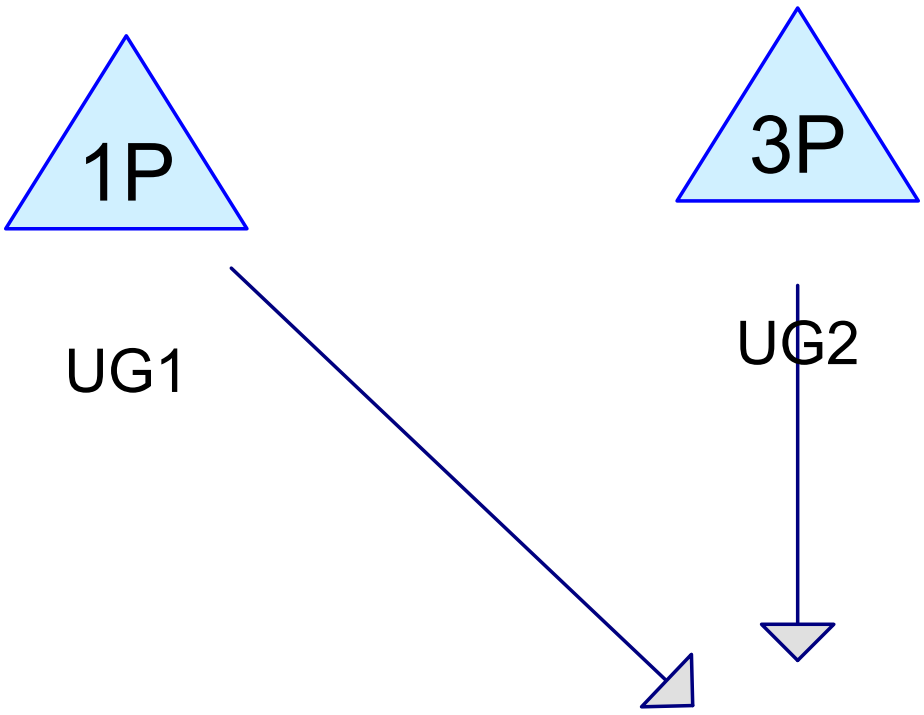
Storage Group A created with Chamber Wizard

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'	**5.0" 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= 36.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.631 cfs @ 12.09 hrs HW=160.69' TW=159.60' (Fixed TW Elev= 159.60')
└─**4=Culvert** (Passes 0.631 cfs of 5.568 cfs potential flow)
  ├─**1=Orifice/Grate** (Orifice Controls 0.246 cfs @ 5.018 fps)
  ├─**2=Orifice/Grate** (Orifice Controls 0.385 cfs @ 3.695 fps)
  └─**3=Broad-Crested Rectangular Weir** (Controls 0.000 cfs)

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	0.103	160.30	0.421	160.81	0.684
159.29	0.000	159.80	0.106	160.31	0.428	160.82	0.688
159.30	0.000	159.81	0.108	160.32	0.435	160.83	0.692
159.31	0.000	159.82	0.111	160.33	0.442	160.84	0.696
159.32	0.000	159.83	0.113	160.34	0.449	160.85	0.700
159.33	0.000	159.84	0.116	160.35	0.455	160.86	0.704
159.34	0.000	159.85	0.118	160.36	0.462	160.87	0.707
159.35	0.000	159.86	0.121	160.37	0.468	160.88	0.711
159.36	0.000	159.87	0.123	160.38	0.474	160.89	0.715
159.37	0.000	159.88	0.125	160.39	0.480	160.90	0.719
159.38	0.000	159.89	0.127	160.40	0.486	160.91	0.723
159.39	0.000	159.90	0.129	160.41	0.492	160.92	0.727
159.40	0.000	159.91	0.132	160.42	0.498	160.93	0.730
159.41	0.000	159.92	0.134	160.43	0.504	160.94	0.734
159.42	0.000	159.93	0.136	160.44	0.510	160.95	0.738
159.43	0.000	159.94	0.138	160.45	0.515	160.96	0.742
159.44	0.000	159.95	0.140	160.46	0.521	160.97	0.745
159.45	0.000	159.96	0.142	160.47	0.526	160.98	0.749
159.46	0.000	159.97	0.144	160.48	0.532	160.99	0.753
159.47	0.000	159.98	0.147	160.49	0.537	161.00	0.756
159.48	0.000	159.99	0.151	160.50	0.542	161.01	0.760
159.49	0.000	160.00	0.156	160.51	0.547	161.02	0.764
159.50	0.000	160.01	0.162	160.52	0.552	161.03	0.767
159.51	0.000	160.02	0.168	160.53	0.558	161.04	0.771
159.52	0.000	160.03	0.175	160.54	0.563	161.05	0.774
159.53	0.000	160.04	0.182	160.55	0.568	161.06	0.778
159.54	0.000	160.05	0.189	160.56	0.573	161.07	0.781
159.55	0.000	160.06	0.196	160.57	0.577	161.08	0.785
159.56	0.000	160.07	0.204	160.58	0.582	161.09	0.788
159.57	0.000	160.08	0.213	160.59	0.587	161.10	0.792
159.58	0.000	160.09	0.221	160.60	0.592	161.11	0.795
159.59	0.000	160.10	0.230	160.61	0.597	161.12	0.799
159.60	0.000	160.11	0.239	160.62	0.601	161.13	0.802
159.61	0.024	160.12	0.248	160.63	0.606	161.14	0.806
159.62	0.033	160.13	0.258	160.64	0.610	161.15	0.809
159.63	0.041	160.14	0.267	160.65	0.615	161.16	0.813
159.64	0.047	160.15	0.277	160.66	0.620	161.17	0.816
159.65	0.053	160.16	0.288	160.67	0.624	161.18	0.819
159.66	0.058	160.17	0.298	160.68	0.629	161.19	0.823
159.67	0.063	160.18	0.309	160.69	0.633	161.20	0.826
159.68	0.067	160.19	0.320	160.70	0.637	161.21	0.829
159.69	0.071	160.20	0.331	160.71	0.642	161.22	0.833
159.70	0.075	160.21	0.342	160.72	0.646	161.23	0.836
159.71	0.078	160.22	0.353	160.73	0.650	161.24	0.839
159.72	0.082	160.23	0.364	160.74	0.655	161.25	0.842
159.73	0.085	160.24	0.373	160.75	0.659	161.26	0.846
159.74	0.088	160.25	0.382	160.76	0.663	161.27	0.849
159.75	0.092	160.26	0.390	160.77	0.667	161.28	0.852
159.76	0.095	160.27	0.398	160.78	0.671	161.29	0.855
159.77	0.097	160.28	0.406	160.79	0.675	161.30	0.858
159.78	0.100	160.29	0.414	160.80	0.679	161.31	0.862



Subcat Reach Pond Link

Routing Diagram for BMW_2024-07-22
Prepared by Bohler, Printed 10/29/2024
HydroCAD® 10.20-4a s/n 03478 © 2023 HydroCAD Software Solutions LLC

Stage-Discharge for Pond 3P: UG2 (continued)

Elevation (feet)	Primary (cfs)
161.32	0.865
161.33	0.868
161.34	0.871
161.35	0.874
161.36	0.877
161.37	0.881
161.38	0.884
161.39	0.887
161.40	0.890
161.41	0.893
161.42	0.896
161.43	0.899
161.44	0.902
161.45	0.905
161.46	0.908
161.47	0.911
161.48	0.914
161.49	0.917
161.50	0.920
161.51	0.936
161.52	0.964
161.53	0.998
161.54	1.038
161.55	1.084
161.56	1.134
161.57	1.187
161.58	1.245
161.59	1.306
161.60	1.371
161.61	1.438
161.62	1.509
161.63	1.582
161.64	1.659
161.65	1.738
161.66	1.819
161.67	1.903
161.68	1.989
161.69	2.078
161.70	2.169
161.71	2.262
161.72	2.358
161.73	2.455
161.74	2.555
161.75	2.657
161.76	2.760
161.77	2.866
161.78	2.973
161.79	3.083
161.80	3.194
161.81	3.307
161.82	3.422
161.83	3.539
161.84	3.657
161.85	3.777
161.86	3.899
161.87	4.022
161.88	4.147
161.89	4.274
161.90	4.402
161.91	4.532
161.92	4.663
161.93	4.796
161.94	4.930
161.95	5.066
161.96	5.204
161.97	5.342
161.98	5.483
161.99	**5.624**

Summary for Pond 1P: UG1

Inflow Area = 81,675 sf, 99.20% Impervious, Inflow Depth = 4.56" for 10-yr event
Inflow = 13.193 cfs @ 11.96 hrs, Volume= 31,023 cf
Outflow = 0.222 cfs @ 16.15 hrs, Volume= 3,861 cf, Atten= 98%, Lag= 251.6 min
Primary = 0.222 cfs @ 16.15 hrs, Volume= 3,861 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= 163.82' @ 16.15 hrs Surf.Area= 13,041 sf Storage= 27,162 cf

Plug-Flow detention time= 782.2 min calculated for 3,861 cf (12% of inflow)
Center-of-Mass det. time= 431.7 min (1,175.4 - 743.7)

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'	**40.0" 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= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=0.688 cfs @ 16.15 hrs HW=163.82' TW=163.81' (Fixed TW Elev= 163.81')
└─**4=Culvert** (Inlet Controls 0.688 cfs @ 0.390 fps)
  ├─**1=Orifice/Grate** (Passes < 0.002 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 0.433 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 9.300 cfs potential flow)

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	0.000	158.55	0.000	159.06	0.000
157.54	0.000	158.05	0.000	158.56	0.000	159.07	0.000
157.55	0.000	158.06	0.000	158.57	0.000	159.08	0.000
157.56	0.000	158.07	0.000	158.58	0.000	159.09	0.000
157.57	0.000	158.08	0.000	158.59	0.000	159.10	0.000
157.58	0.000	158.09	0.000	158.60	0.000	159.11	0.000
157.59	0.000	158.10	0.000	158.61	0.000	159.12	0.000
157.60	0.000	158.11	0.000	158.62	0.000	159.13	0.000
157.61	0.000	158.12	0.000	158.63	0.000	159.14	0.000
157.62	0.000	158.13	0.000	158.64	0.000	159.15	0.000
157.63	0.000	158.14	0.000	158.65	0.000	159.16	0.000
157.64	0.000	158.15	0.000	158.66	0.000	159.17	0.000
157.65	0.000	158.16	0.000	158.67	0.000	159.18	0.000
157.66	0.000	158.17	0.000	158.68	0.000	159.19	0.000
157.67	0.000	158.18	0.000	158.69	0.000	159.20	0.000
157.68	0.000	158.19	0.000	158.70	0.000	159.21	0.000
157.69	0.000	158.20	0.000	158.71	0.000	159.22	0.000
157.70	0.000	158.21	0.000	158.72	0.000	159.23	0.000
157.71	0.000	158.22	0.000	158.73	0.000	159.24	0.000
157.72	0.000	158.23	0.000	158.74	0.000	159.25	0.000
157.73	0.000	158.24	0.000	158.75	0.000	159.26	0.000
157.74	0.000	158.25	0.000	158.76	0.000	159.27	0.000
157.75	0.000	158.26	0.000	158.77	0.000	159.28	0.000
157.76	0.000	158.27	0.000	158.78	0.000	159.29	0.000
157.77	0.000	158.28	0.000	158.79	0.000	159.30	0.000
157.78	0.000	158.29	0.000	158.80	0.000	159.31	0.000
157.79	0.000	158.30	0.000	158.81	0.000	159.32	0.000
157.80	0.000	158.31	0.000	158.82	0.000	159.33	0.000
157.81	0.000	158.32	0.000	158.83	0.000	159.34	0.000
157.82	0.000	158.33	0.000	158.84	0.000	159.35	0.000
157.83	0.000	158.34	0.000	158.85	0.000	159.36	0.000
157.84	0.000	158.35	0.000	158.86	0.000	159.37	0.000
157.85	0.000	158.36	0.000	158.87	0.000	159.38	0.000
157.86	0.000	158.37	0.000	158.88	0.000	159.39	0.000
157.87	0.000	158.38	0.000	158.89	0.000	159.40	0.000
157.88	0.000	158.39	0.000	158.90	0.000	159.41	0.000
157.89	0.000	158.40	0.000	158.91	0.000	159.42	0.000
157.90	0.000	158.41	0.000	158.92	0.000	159.43	0.000
157.91	0.000	158.42	0.000	158.93	0.000	159.44	0.000
157.92	0.000	158.43	0.000	158.94	0.000	159.45	0.000
157.93	0.000	158.44	0.000	158.95	0.000	159.46	0.000
157.94	0.000	158.45	0.000	158.96	0.000	159.47	0.000
157.95	0.000	158.46	0.000	158.97	0.000	159.48	0.000
157.96	0.000	158.47	0.000	158.98	0.000	159.49	0.000
157.97	0.000	158.48	0.000	158.99	0.000	159.50	0.000
157.98	0.000	158.49	0.000	159.00	0.000	159.51	0.000
157.99	0.000	158.50	0.000	159.01	0.000	159.52	0.000
158.00	0.000	158.51	0.000	159.02	0.000	159.53	0.000
158.01	0.000	158.52	0.000	159.03	0.000	159.54	0.000
158.02	0.000	158.53	0.000	159.04	0.000	159.55	0.000
158.03	0.000	158.54	0.000	159.05	0.000	159.56	0.000

Stage-Discharge for Pond 1P: UG1 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
159.57	0.000	160.08	0.000	160.59	0.000	161.10	0.000
159.58	0.000	160.09	0.000	160.60	0.000	161.11	0.000
159.59	0.000	160.10	0.000	160.61	0.000	161.12	0.000
159.60	0.000	160.11	0.000	160.62	0.000	161.13	0.000
159.61	0.000	160.12	0.000	160.63	0.000	161.14	0.000
159.62	0.000	160.13	0.000	160.64	0.000	161.15	0.000
159.63	0.000	160.14	0.000	160.65	0.000	161.16	0.000
159.64	0.000	160.15	0.000	160.66	0.000	161.17	0.000
159.65	0.000	160.16	0.000	160.67	0.000	161.18	0.000
159.66	0.000	160.17	0.000	160.68	0.000	161.19	0.000
159.67	0.000	160.18	0.000	160.69	0.000	161.20	0.000
159.68	0.000	160.19	0.000	160.70	0.000	161.21	0.000
159.69	0.000	160.20	0.000	160.71	0.000	161.22	0.000
159.70	0.000	160.21	0.000	160.72	0.000	161.23	0.000
159.71	0.000	160.22	0.000	160.73	0.000	161.24	0.000
159.72	0.000	160.23	0.000	160.74	0.000	161.25	0.000
159.73	0.000	160.24	0.000	160.75	0.000	161.26	0.000
159.74	0.000	160.25	0.000	160.76	0.000	161.27	0.000
159.75	0.000	160.26	0.000	160.77	0.000	161.28	0.000
159.76	0.000	160.27	0.000	160.78	0.000	161.29	0.000
159.77	0.000	160.28	0.000	160.79	0.000	161.30	0.000
159.78	0.000	160.29	0.000	160.80	0.000	161.31	0.000
159.79	0.000	160.30	0.000	160.81	0.000	161.32	0.000
159.80	0.000	160.31	0.000	160.82	0.000	161.33	0.000
159.81	0.000	160.32	0.000	160.83	0.000	161.34	0.000
159.82	0.000	160.33	0.000	160.84	0.000	161.35	0.000
159.83	0.000	160.34	0.000	160.85	0.000	161.36	0.000
159.84	0.000	160.35	0.000	160.86	0.000	161.37	0.000
159.85	0.000	160.36	0.000	160.87	0.000	161.38	0.000
159.86	0.000	160.37	0.000	160.88	0.000	161.39	0.000
159.87	0.000	160.38	0.000	160.89	0.000	161.40	0.000
159.88	0.000	160.39	0.000	160.90	0.000	161.41	0.000
159.89	0.000	160.40	0.000	160.91	0.000	161.42	0.000
159.90	0.000	160.41	0.000	160.92	0.000	161.43	0.000
159.91	0.000	160.42	0.000	160.93	0.000	161.44	0.000
159.92	0.000	160.43	0.000	160.94	0.000	161.45	0.000
159.93	0.000	160.44	0.000	160.95	0.000	161.46	0.000
159.94	0.000	160.45	0.000	160.96	0.000	161.47	0.000
159.95	0.000	160.46	0.000	160.97	0.000	161.48	0.000
159.96	0.000	160.47	0.000	160.98	0.000	161.49	0.000
159.97	0.000	160.48	0.000	160.99	0.000	161.50	0.000
159.98	0.000	160.49	0.000	161.00	0.000	161.51	0.000
159.99	0.000	160.50	0.000	161.01	0.000	161.52	0.000
160.00	0.000	160.51	0.000	161.02	0.000	161.53	0.000
160.01	0.000	160.52	0.000	161.03	0.000	161.54	0.000
160.02	0.000	160.53	0.000	161.04	0.000	161.55	0.000
160.03	0.000	160.54	0.000	161.05	0.000	161.56	0.000
160.04	0.000	160.55	0.000	161.06	0.000	161.57	0.000
160.05	0.000	160.56	0.000	161.07	0.000	161.58	0.000
160.06	0.000	160.57	0.000	161.08	0.000	161.59	0.000
160.07	0.000	160.58	0.000	161.09	0.000	161.60	0.000

Stage-Discharge for Pond 1P: UG1 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
161.61	0.000	162.12	0.000	162.63	0.000	163.14	0.000
161.62	0.000	162.13	0.000	162.64	0.000	163.15	0.000
161.63	0.000	162.14	0.000	162.65	0.000	163.16	0.000
161.64	0.000	162.15	0.000	162.66	0.000	163.17	0.000
161.65	0.000	162.16	0.000	162.67	0.000	163.18	0.000
161.66	0.000	162.17	0.000	162.68	0.000	163.19	0.000
161.67	0.000	162.18	0.000	162.69	0.000	163.20	0.000
161.68	0.000	162.19	0.000	162.70	0.000	163.21	0.000
161.69	0.000	162.20	0.000	162.71	0.000	163.22	0.000
161.70	0.000	162.21	0.000	162.72	0.000	163.23	0.000
161.71	0.000	162.22	0.000	162.73	0.000	163.24	0.000
161.72	0.000	162.23	0.000	162.74	0.000	163.25	0.000
161.73	0.000	162.24	0.000	162.75	0.000	163.26	0.000
161.74	0.000	162.25	0.000	162.76	0.000	163.27	0.000
161.75	0.000	162.26	0.000	162.77	0.000	163.28	0.000
161.76	0.000	162.27	0.000	162.78	0.000	163.29	0.000
161.77	0.000	162.28	0.000	162.79	0.000	163.30	0.000
161.78	0.000	162.29	0.000	162.80	0.000	163.31	0.000
161.79	0.000	162.30	0.000	162.81	0.000	163.32	0.000
161.80	0.000	162.31	0.000	162.82	0.000	163.33	0.000
161.81	0.000	162.32	0.000	162.83	0.000	163.34	0.000
161.82	0.000	162.33	0.000	162.84	0.000	163.35	0.000
161.83	0.000	162.34	0.000	162.85	0.000	163.36	0.000
161.84	0.000	162.35	0.000	162.86	0.000	163.37	0.000
161.85	0.000	162.36	0.000	162.87	0.000	163.38	0.000
161.86	0.000	162.37	0.000	162.88	0.000	163.39	0.000
161.87	0.000	162.38	0.000	162.89	0.000	163.40	0.000
161.88	0.000	162.39	0.000	162.90	0.000	163.41	0.000
161.89	0.000	162.40	0.000	162.91	0.000	163.42	0.000
161.90	0.000	162.41	0.000	162.92	0.000	163.43	0.000
161.91	0.000	162.42	0.000	162.93	0.000	163.44	0.000
161.92	0.000	162.43	0.000	162.94	0.000	163.45	0.000
161.93	0.000	162.44	0.000	162.95	0.000	163.46	0.000
161.94	0.000	162.45	0.000	162.96	0.000	163.47	0.000
161.95	0.000	162.46	0.000	162.97	0.000	163.48	0.000
161.96	0.000	162.47	0.000	162.98	0.000	163.49	0.000
161.97	0.000	162.48	0.000	162.99	0.000	163.50	0.000
161.98	0.000	162.49	0.000	163.00	0.000	163.51	0.000
161.99	0.000	162.50	0.000	163.01	0.000	163.52	0.000
162.00	0.000	162.51	0.000	163.02	0.000	163.53	0.000
162.01	0.000	162.52	0.000	163.03	0.000	163.54	0.000
162.02	0.000	162.53	0.000	163.04	0.000	163.55	0.000
162.03	0.000	162.54	0.000	163.05	0.000	163.56	0.000
162.04	0.000	162.55	0.000	163.06	0.000	163.57	0.000
162.05	0.000	162.56	0.000	163.07	0.000	163.58	0.000
162.06	0.000	162.57	0.000	163.08	0.000	163.59	0.000
162.07	0.000	162.58	0.000	163.09	0.000	163.60	0.000
162.08	0.000	162.59	0.000	163.10	0.000	163.61	0.000
162.09	0.000	162.60	0.000	163.11	0.000	163.62	0.000
162.10	0.000	162.61	0.000	163.12	0.000	163.63	0.000
162.11	0.000	162.62	0.000	163.13	0.000	163.64	0.000

Stage-Discharge for Pond 1P: UG1 (continued)

Elevation (feet)	Primary (cfs)
163.65	0.000
163.66	0.000
163.67	0.000
163.68	0.000
163.69	0.000
163.70	0.000
163.71	0.000
163.72	0.000
163.73	0.000
163.74	0.000
163.75	0.000
163.76	0.000
163.77	0.000
163.78	0.000
163.79	0.000
163.80	0.000
163.81	0.000
163.82	0.851
163.83	1.203
163.84	1.474
163.85	1.702
163.86	1.903
163.87	**2.084**

Summary for Pond 3P: UG2

Inflow Area = 21,519 sf, 87.04% Impervious, Inflow Depth = 4.02" for 10-yr event
Inflow = 3.050 cfs @ 11.96 hrs, Volume= 7,209 cf
Outflow = 3.938 cfs @ 12.02 hrs, Volume= 3,009 cf, Atten= 0%, Lag= 3.8 min
Primary = 3.938 cfs @ 12.02 hrs, Volume= 3,009 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= 164.02' @ 12.02 hrs Surf.Area= 2,542 sf Storage= 4,234 cf

Plug-Flow detention time= 310.8 min calculated for 3,009 cf (42% of inflow)
Center-of-Mass det. time= 161.1 min (906.3 - 745.1)

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'	**5.0" 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= 36.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=3.943 cfs @ 12.02 hrs HW=164.02' TW=163.81' (Fixed TW Elev= 163.81')
└─**4=Culvert** (Inlet Controls 3.943 cfs @ 2.231 fps)
  ├─**1=Orifice/Grate** (Passes < 0.110 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 0.232 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 23.982 cfs potential flow)

Stage-Discharge for Pond 3P: UG2

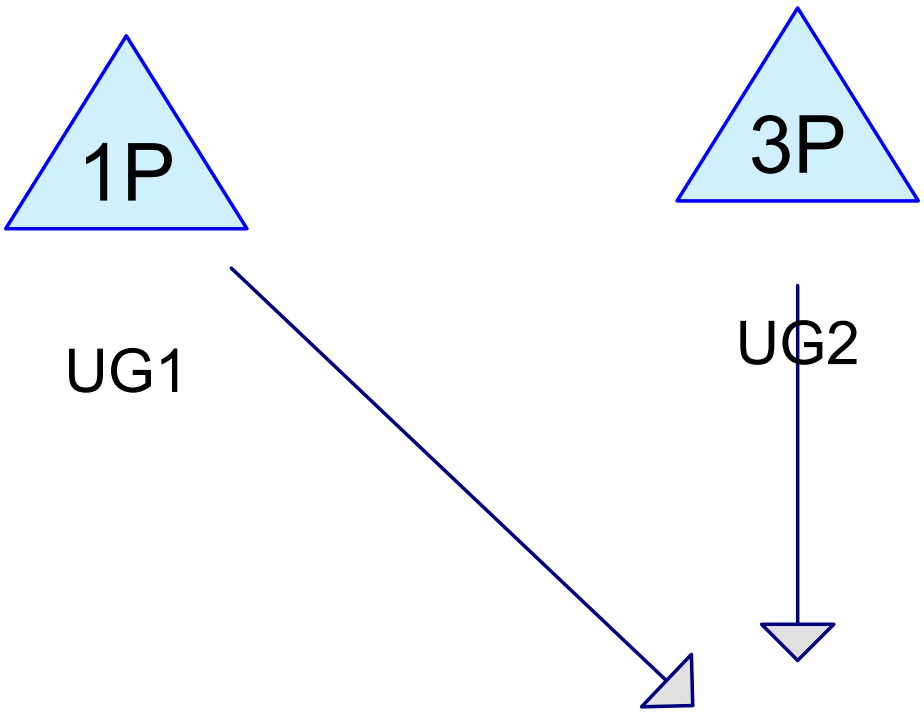
Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
159.28	0.000	159.79	0.000	160.30	0.000	160.81	0.000
159.29	0.000	159.80	0.000	160.31	0.000	160.82	0.000
159.30	0.000	159.81	0.000	160.32	0.000	160.83	0.000
159.31	0.000	159.82	0.000	160.33	0.000	160.84	0.000
159.32	0.000	159.83	0.000	160.34	0.000	160.85	0.000
159.33	0.000	159.84	0.000	160.35	0.000	160.86	0.000
159.34	0.000	159.85	0.000	160.36	0.000	160.87	0.000
159.35	0.000	159.86	0.000	160.37	0.000	160.88	0.000
159.36	0.000	159.87	0.000	160.38	0.000	160.89	0.000
159.37	0.000	159.88	0.000	160.39	0.000	160.90	0.000
159.38	0.000	159.89	0.000	160.40	0.000	160.91	0.000
159.39	0.000	159.90	0.000	160.41	0.000	160.92	0.000
159.40	0.000	159.91	0.000	160.42	0.000	160.93	0.000
159.41	0.000	159.92	0.000	160.43	0.000	160.94	0.000
159.42	0.000	159.93	0.000	160.44	0.000	160.95	0.000
159.43	0.000	159.94	0.000	160.45	0.000	160.96	0.000
159.44	0.000	159.95	0.000	160.46	0.000	160.97	0.000
159.45	0.000	159.96	0.000	160.47	0.000	160.98	0.000
159.46	0.000	159.97	0.000	160.48	0.000	160.99	0.000
159.47	0.000	159.98	0.000	160.49	0.000	161.00	0.000
159.48	0.000	159.99	0.000	160.50	0.000	161.01	0.000
159.49	0.000	160.00	0.000	160.51	0.000	161.02	0.000
159.50	0.000	160.01	0.000	160.52	0.000	161.03	0.000
159.51	0.000	160.02	0.000	160.53	0.000	161.04	0.000
159.52	0.000	160.03	0.000	160.54	0.000	161.05	0.000
159.53	0.000	160.04	0.000	160.55	0.000	161.06	0.000
159.54	0.000	160.05	0.000	160.56	0.000	161.07	0.000
159.55	0.000	160.06	0.000	160.57	0.000	161.08	0.000
159.56	0.000	160.07	0.000	160.58	0.000	161.09	0.000
159.57	0.000	160.08	0.000	160.59	0.000	161.10	0.000
159.58	0.000	160.09	0.000	160.60	0.000	161.11	0.000
159.59	0.000	160.10	0.000	160.61	0.000	161.12	0.000
159.60	0.000	160.11	0.000	160.62	0.000	161.13	0.000
159.61	0.000	160.12	0.000	160.63	0.000	161.14	0.000
159.62	0.000	160.13	0.000	160.64	0.000	161.15	0.000
159.63	0.000	160.14	0.000	160.65	0.000	161.16	0.000
159.64	0.000	160.15	0.000	160.66	0.000	161.17	0.000
159.65	0.000	160.16	0.000	160.67	0.000	161.18	0.000
159.66	0.000	160.17	0.000	160.68	0.000	161.19	0.000
159.67	0.000	160.18	0.000	160.69	0.000	161.20	0.000
159.68	0.000	160.19	0.000	160.70	0.000	161.21	0.000
159.69	0.000	160.20	0.000	160.71	0.000	161.22	0.000
159.70	0.000	160.21	0.000	160.72	0.000	161.23	0.000
159.71	0.000	160.22	0.000	160.73	0.000	161.24	0.000
159.72	0.000	160.23	0.000	160.74	0.000	161.25	0.000
159.73	0.000	160.24	0.000	160.75	0.000	161.26	0.000
159.74	0.000	160.25	0.000	160.76	0.000	161.27	0.000
159.75	0.000	160.26	0.000	160.77	0.000	161.28	0.000
159.76	0.000	160.27	0.000	160.78	0.000	161.29	0.000
159.77	0.000	160.28	0.000	160.79	0.000	161.30	0.000
159.78	0.000	160.29	0.000	160.80	0.000	161.31	0.000

Stage-Discharge for Pond 3P: UG2 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
161.32	0.000	161.83	0.000	162.34	0.000	162.85	0.000
161.33	0.000	161.84	0.000	162.35	0.000	162.86	0.000
161.34	0.000	161.85	0.000	162.36	0.000	162.87	0.000
161.35	0.000	161.86	0.000	162.37	0.000	162.88	0.000
161.36	0.000	161.87	0.000	162.38	0.000	162.89	0.000
161.37	0.000	161.88	0.000	162.39	0.000	162.90	0.000
161.38	0.000	161.89	0.000	162.40	0.000	162.91	0.000
161.39	0.000	161.90	0.000	162.41	0.000	162.92	0.000
161.40	0.000	161.91	0.000	162.42	0.000	162.93	0.000
161.41	0.000	161.92	0.000	162.43	0.000	162.94	0.000
161.42	0.000	161.93	0.000	162.44	0.000	162.95	0.000
161.43	0.000	161.94	0.000	162.45	0.000	162.96	0.000
161.44	0.000	161.95	0.000	162.46	0.000	162.97	0.000
161.45	0.000	161.96	0.000	162.47	0.000	162.98	0.000
161.46	0.000	161.97	0.000	162.48	0.000	162.99	0.000
161.47	0.000	161.98	0.000	162.49	0.000	163.00	0.000
161.48	0.000	161.99	0.000	162.50	0.000	163.01	0.000
161.49	0.000	162.00	0.000	162.51	0.000	163.02	0.000
161.50	0.000	162.01	0.000	162.52	0.000	163.03	0.000
161.51	0.000	162.02	0.000	162.53	0.000	163.04	0.000
161.52	0.000	162.03	0.000	162.54	0.000	163.05	0.000
161.53	0.000	162.04	0.000	162.55	0.000	163.06	0.000
161.54	0.000	162.05	0.000	162.56	0.000	163.07	0.000
161.55	0.000	162.06	0.000	162.57	0.000	163.08	0.000
161.56	0.000	162.07	0.000	162.58	0.000	163.09	0.000
161.57	0.000	162.08	0.000	162.59	0.000	163.10	0.000
161.58	0.000	162.09	0.000	162.60	0.000	163.11	0.000
161.59	0.000	162.10	0.000	162.61	0.000	163.12	0.000
161.60	0.000	162.11	0.000	162.62	0.000	163.13	0.000
161.61	0.000	162.12	0.000	162.63	0.000	163.14	0.000
161.62	0.000	162.13	0.000	162.64	0.000	163.15	0.000
161.63	0.000	162.14	0.000	162.65	0.000	163.16	0.000
161.64	0.000	162.15	0.000	162.66	0.000	163.17	0.000
161.65	0.000	162.16	0.000	162.67	0.000	163.18	0.000
161.66	0.000	162.17	0.000	162.68	0.000	163.19	0.000
161.67	0.000	162.18	0.000	162.69	0.000	163.20	0.000
161.68	0.000	162.19	0.000	162.70	0.000	163.21	0.000
161.69	0.000	162.20	0.000	162.71	0.000	163.22	0.000
161.70	0.000	162.21	0.000	162.72	0.000	163.23	0.000
161.71	0.000	162.22	0.000	162.73	0.000	163.24	0.000
161.72	0.000	162.23	0.000	162.74	0.000	163.25	0.000
161.73	0.000	162.24	0.000	162.75	0.000	163.26	0.000
161.74	0.000	162.25	0.000	162.76	0.000	163.27	0.000
161.75	0.000	162.26	0.000	162.77	0.000	163.28	0.000
161.76	0.000	162.27	0.000	162.78	0.000	163.29	0.000
161.77	0.000	162.28	0.000	162.79	0.000	163.30	0.000
161.78	0.000	162.29	0.000	162.80	0.000	163.31	0.000
161.79	0.000	162.30	0.000	162.81	0.000	163.32	0.000
161.80	0.000	162.31	0.000	162.82	0.000	163.33	0.000
161.81	0.000	162.32	0.000	162.83	0.000	163.34	0.000
161.82	0.000	162.33	0.000	162.84	0.000	163.35	0.000

Stage-Discharge for Pond 3P: UG2 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
163.36	0.000	163.87	2.084
163.37	0.000	163.88	2.251
163.38	0.000	163.89	2.407
163.39	0.000	163.90	2.553
163.40	0.000	163.91	2.691
163.41	0.000	163.92	2.822
163.42	0.000	163.93	2.948
163.43	0.000	163.94	3.068
163.44	0.000	163.95	3.184
163.45	0.000	163.96	3.295
163.46	0.000	163.97	3.404
163.47	0.000	163.98	3.508
163.48	0.000	163.99	3.610
163.49	0.000	164.00	3.709
163.50	0.000	164.01	3.805
163.51	0.000	164.02	3.899
163.52	0.000	164.03	3.991
163.53	0.000	164.04	**4.081**
163.54	0.000		
163.55	0.000		
163.56	0.000		
163.57	0.000		
163.58	0.000		
163.59	0.000		
163.60	0.000		
163.61	0.000		
163.62	0.000		
163.63	0.000		
163.64	0.000		
163.65	0.000		
163.66	0.000		
163.67	0.000		
163.68	0.000		
163.69	0.000		
163.70	0.000		
163.71	0.000		
163.72	0.000		
163.73	0.000		
163.74	0.000		
163.75	0.000		
163.76	0.000		
163.77	0.000		
163.78	0.000		
163.79	0.000		
163.80	0.000		
163.81	0.000		
163.82	0.851		
163.83	1.203		
163.84	1.474		
163.85	1.702		
163.86	1.903		



Subcat Reach Pond Link

Routing Diagram for BMW_2024-07-22
Prepared by Bohler, Printed 10/29/2024
HydroCAD® 10.20-4a s/n 03478 © 2023 HydroCAD Software Solutions LLC

Summary for Pond 1P: UG1

Inflow Area = 81,675 sf, 99.20% Impervious, Inflow Depth = 6.44" for 50-yr event
Inflow = 18.440 cfs @ 11.96 hrs, Volume= 43,864 cf
Outflow = 9.606 cfs @ 12.04 hrs, Volume= 16,714 cf, Atten= 48%, Lag= 5.3 min
Primary = 9.606 cfs @ 12.04 hrs, Volume= 16,714 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= 169.66' @ 12.04 hrs Surf.Area= 13,041 sf Storage= 27,162 cf

Plug-Flow detention time= 345.4 min calculated for 16,714 cf (38% of inflow)
Center-of-Mass det. time= 179.7 min (918.3 - 738.5)

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'	**40.0" 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= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=8.534 cfs @ 12.04 hrs HW=168.67' TW=167.66' (Fixed TW Elev= 167.66')
└─**4=Culvert** (Inlet Controls 8.534 cfs @ 4.829 fps)
  ├─**1=Orifice/Grate** (Passes < 0.026 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 5.366 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 166.036 cfs potential flow)

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	0.000	158.55	0.000	159.06	0.000
157.54	0.000	158.05	0.000	158.56	0.000	159.07	0.000
157.55	0.000	158.06	0.000	158.57	0.000	159.08	0.000
157.56	0.000	158.07	0.000	158.58	0.000	159.09	0.000
157.57	0.000	158.08	0.000	158.59	0.000	159.10	0.000
157.58	0.000	158.09	0.000	158.60	0.000	159.11	0.000
157.59	0.000	158.10	0.000	158.61	0.000	159.12	0.000
157.60	0.000	158.11	0.000	158.62	0.000	159.13	0.000
157.61	0.000	158.12	0.000	158.63	0.000	159.14	0.000
157.62	0.000	158.13	0.000	158.64	0.000	159.15	0.000
157.63	0.000	158.14	0.000	158.65	0.000	159.16	0.000
157.64	0.000	158.15	0.000	158.66	0.000	159.17	0.000
157.65	0.000	158.16	0.000	158.67	0.000	159.18	0.000
157.66	0.000	158.17	0.000	158.68	0.000	159.19	0.000
157.67	0.000	158.18	0.000	158.69	0.000	159.20	0.000
157.68	0.000	158.19	0.000	158.70	0.000	159.21	0.000
157.69	0.000	158.20	0.000	158.71	0.000	159.22	0.000
157.70	0.000	158.21	0.000	158.72	0.000	159.23	0.000
157.71	0.000	158.22	0.000	158.73	0.000	159.24	0.000
157.72	0.000	158.23	0.000	158.74	0.000	159.25	0.000
157.73	0.000	158.24	0.000	158.75	0.000	159.26	0.000
157.74	0.000	158.25	0.000	158.76	0.000	159.27	0.000
157.75	0.000	158.26	0.000	158.77	0.000	159.28	0.000
157.76	0.000	158.27	0.000	158.78	0.000	159.29	0.000
157.77	0.000	158.28	0.000	158.79	0.000	159.30	0.000
157.78	0.000	158.29	0.000	158.80	0.000	159.31	0.000
157.79	0.000	158.30	0.000	158.81	0.000	159.32	0.000
157.80	0.000	158.31	0.000	158.82	0.000	159.33	0.000
157.81	0.000	158.32	0.000	158.83	0.000	159.34	0.000
157.82	0.000	158.33	0.000	158.84	0.000	159.35	0.000
157.83	0.000	158.34	0.000	158.85	0.000	159.36	0.000
157.84	0.000	158.35	0.000	158.86	0.000	159.37	0.000
157.85	0.000	158.36	0.000	158.87	0.000	159.38	0.000
157.86	0.000	158.37	0.000	158.88	0.000	159.39	0.000
157.87	0.000	158.38	0.000	158.89	0.000	159.40	0.000
157.88	0.000	158.39	0.000	158.90	0.000	159.41	0.000
157.89	0.000	158.40	0.000	158.91	0.000	159.42	0.000
157.90	0.000	158.41	0.000	158.92	0.000	159.43	0.000
157.91	0.000	158.42	0.000	158.93	0.000	159.44	0.000
157.92	0.000	158.43	0.000	158.94	0.000	159.45	0.000
157.93	0.000	158.44	0.000	158.95	0.000	159.46	0.000
157.94	0.000	158.45	0.000	158.96	0.000	159.47	0.000
157.95	0.000	158.46	0.000	158.97	0.000	159.48	0.000
157.96	0.000	158.47	0.000	158.98	0.000	159.49	0.000
157.97	0.000	158.48	0.000	158.99	0.000	159.50	0.000
157.98	0.000	158.49	0.000	159.00	0.000	159.51	0.000
157.99	0.000	158.50	0.000	159.01	0.000	159.52	0.000
158.00	0.000	158.51	0.000	159.02	0.000	159.53	0.000
158.01	0.000	158.52	0.000	159.03	0.000	159.54	0.000
158.02	0.000	158.53	0.000	159.04	0.000	159.55	0.000
158.03	0.000	158.54	0.000	159.05	0.000	159.56	0.000

Stage-Discharge for Pond 1P: UG1 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
159.57	0.000	160.08	0.000	160.59	0.000	161.10	0.000
159.58	0.000	160.09	0.000	160.60	0.000	161.11	0.000
159.59	0.000	160.10	0.000	160.61	0.000	161.12	0.000
159.60	0.000	160.11	0.000	160.62	0.000	161.13	0.000
159.61	0.000	160.12	0.000	160.63	0.000	161.14	0.000
159.62	0.000	160.13	0.000	160.64	0.000	161.15	0.000
159.63	0.000	160.14	0.000	160.65	0.000	161.16	0.000
159.64	0.000	160.15	0.000	160.66	0.000	161.17	0.000
159.65	0.000	160.16	0.000	160.67	0.000	161.18	0.000
159.66	0.000	160.17	0.000	160.68	0.000	161.19	0.000
159.67	0.000	160.18	0.000	160.69	0.000	161.20	0.000
159.68	0.000	160.19	0.000	160.70	0.000	161.21	0.000
159.69	0.000	160.20	0.000	160.71	0.000	161.22	0.000
159.70	0.000	160.21	0.000	160.72	0.000	161.23	0.000
159.71	0.000	160.22	0.000	160.73	0.000	161.24	0.000
159.72	0.000	160.23	0.000	160.74	0.000	161.25	0.000
159.73	0.000	160.24	0.000	160.75	0.000	161.26	0.000
159.74	0.000	160.25	0.000	160.76	0.000	161.27	0.000
159.75	0.000	160.26	0.000	160.77	0.000	161.28	0.000
159.76	0.000	160.27	0.000	160.78	0.000	161.29	0.000
159.77	0.000	160.28	0.000	160.79	0.000	161.30	0.000
159.78	0.000	160.29	0.000	160.80	0.000	161.31	0.000
159.79	0.000	160.30	0.000	160.81	0.000	161.32	0.000
159.80	0.000	160.31	0.000	160.82	0.000	161.33	0.000
159.81	0.000	160.32	0.000	160.83	0.000	161.34	0.000
159.82	0.000	160.33	0.000	160.84	0.000	161.35	0.000
159.83	0.000	160.34	0.000	160.85	0.000	161.36	0.000
159.84	0.000	160.35	0.000	160.86	0.000	161.37	0.000
159.85	0.000	160.36	0.000	160.87	0.000	161.38	0.000
159.86	0.000	160.37	0.000	160.88	0.000	161.39	0.000
159.87	0.000	160.38	0.000	160.89	0.000	161.40	0.000
159.88	0.000	160.39	0.000	160.90	0.000	161.41	0.000
159.89	0.000	160.40	0.000	160.91	0.000	161.42	0.000
159.90	0.000	160.41	0.000	160.92	0.000	161.43	0.000
159.91	0.000	160.42	0.000	160.93	0.000	161.44	0.000
159.92	0.000	160.43	0.000	160.94	0.000	161.45	0.000
159.93	0.000	160.44	0.000	160.95	0.000	161.46	0.000
159.94	0.000	160.45	0.000	160.96	0.000	161.47	0.000
159.95	0.000	160.46	0.000	160.97	0.000	161.48	0.000
159.96	0.000	160.47	0.000	160.98	0.000	161.49	0.000
159.97	0.000	160.48	0.000	160.99	0.000	161.50	0.000
159.98	0.000	160.49	0.000	161.00	0.000	161.51	0.000
159.99	0.000	160.50	0.000	161.01	0.000	161.52	0.000
160.00	0.000	160.51	0.000	161.02	0.000	161.53	0.000
160.01	0.000	160.52	0.000	161.03	0.000	161.54	0.000
160.02	0.000	160.53	0.000	161.04	0.000	161.55	0.000
160.03	0.000	160.54	0.000	161.05	0.000	161.56	0.000
160.04	0.000	160.55	0.000	161.06	0.000	161.57	0.000
160.05	0.000	160.56	0.000	161.07	0.000	161.58	0.000
160.06	0.000	160.57	0.000	161.08	0.000	161.59	0.000
160.07	0.000	160.58	0.000	161.09	0.000	161.60	0.000

Stage-Discharge for Pond 1P: UG1 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
161.61	0.000	162.12	0.000	162.63	0.000	163.14	0.000
161.62	0.000	162.13	0.000	162.64	0.000	163.15	0.000
161.63	0.000	162.14	0.000	162.65	0.000	163.16	0.000
161.64	0.000	162.15	0.000	162.66	0.000	163.17	0.000
161.65	0.000	162.16	0.000	162.67	0.000	163.18	0.000
161.66	0.000	162.17	0.000	162.68	0.000	163.19	0.000
161.67	0.000	162.18	0.000	162.69	0.000	163.20	0.000
161.68	0.000	162.19	0.000	162.70	0.000	163.21	0.000
161.69	0.000	162.20	0.000	162.71	0.000	163.22	0.000
161.70	0.000	162.21	0.000	162.72	0.000	163.23	0.000
161.71	0.000	162.22	0.000	162.73	0.000	163.24	0.000
161.72	0.000	162.23	0.000	162.74	0.000	163.25	0.000
161.73	0.000	162.24	0.000	162.75	0.000	163.26	0.000
161.74	0.000	162.25	0.000	162.76	0.000	163.27	0.000
161.75	0.000	162.26	0.000	162.77	0.000	163.28	0.000
161.76	0.000	162.27	0.000	162.78	0.000	163.29	0.000
161.77	0.000	162.28	0.000	162.79	0.000	163.30	0.000
161.78	0.000	162.29	0.000	162.80	0.000	163.31	0.000
161.79	0.000	162.30	0.000	162.81	0.000	163.32	0.000
161.80	0.000	162.31	0.000	162.82	0.000	163.33	0.000
161.81	0.000	162.32	0.000	162.83	0.000	163.34	0.000
161.82	0.000	162.33	0.000	162.84	0.000	163.35	0.000
161.83	0.000	162.34	0.000	162.85	0.000	163.36	0.000
161.84	0.000	162.35	0.000	162.86	0.000	163.37	0.000
161.85	0.000	162.36	0.000	162.87	0.000	163.38	0.000
161.86	0.000	162.37	0.000	162.88	0.000	163.39	0.000
161.87	0.000	162.38	0.000	162.89	0.000	163.40	0.000
161.88	0.000	162.39	0.000	162.90	0.000	163.41	0.000
161.89	0.000	162.40	0.000	162.91	0.000	163.42	0.000
161.90	0.000	162.41	0.000	162.92	0.000	163.43	0.000
161.91	0.000	162.42	0.000	162.93	0.000	163.44	0.000
161.92	0.000	162.43	0.000	162.94	0.000	163.45	0.000
161.93	0.000	162.44	0.000	162.95	0.000	163.46	0.000
161.94	0.000	162.45	0.000	162.96	0.000	163.47	0.000
161.95	0.000	162.46	0.000	162.97	0.000	163.48	0.000
161.96	0.000	162.47	0.000	162.98	0.000	163.49	0.000
161.97	0.000	162.48	0.000	162.99	0.000	163.50	0.000
161.98	0.000	162.49	0.000	163.00	0.000	163.51	0.000
161.99	0.000	162.50	0.000	163.01	0.000	163.52	0.000
162.00	0.000	162.51	0.000	163.02	0.000	163.53	0.000
162.01	0.000	162.52	0.000	163.03	0.000	163.54	0.000
162.02	0.000	162.53	0.000	163.04	0.000	163.55	0.000
162.03	0.000	162.54	0.000	163.05	0.000	163.56	0.000
162.04	0.000	162.55	0.000	163.06	0.000	163.57	0.000
162.05	0.000	162.56	0.000	163.07	0.000	163.58	0.000
162.06	0.000	162.57	0.000	163.08	0.000	163.59	0.000
162.07	0.000	162.58	0.000	163.09	0.000	163.60	0.000
162.08	0.000	162.59	0.000	163.10	0.000	163.61	0.000
162.09	0.000	162.60	0.000	163.11	0.000	163.62	0.000
162.10	0.000	162.61	0.000	163.12	0.000	163.63	0.000
162.11	0.000	162.62	0.000	163.13	0.000	163.64	0.000

Stage-Discharge for Pond 1P: UG1 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
163.65	0.000	164.16	0.000	164.67	0.000	165.18	0.000
163.66	0.000	164.17	0.000	164.68	0.000	165.19	0.000
163.67	0.000	164.18	0.000	164.69	0.000	165.20	0.000
163.68	0.000	164.19	0.000	164.70	0.000	165.21	0.000
163.69	0.000	164.20	0.000	164.71	0.000	165.22	0.000
163.70	0.000	164.21	0.000	164.72	0.000	165.23	0.000
163.71	0.000	164.22	0.000	164.73	0.000	165.24	0.000
163.72	0.000	164.23	0.000	164.74	0.000	165.25	0.000
163.73	0.000	164.24	0.000	164.75	0.000	165.26	0.000
163.74	0.000	164.25	0.000	164.76	0.000	165.27	0.000
163.75	0.000	164.26	0.000	164.77	0.000	165.28	0.000
163.76	0.000	164.27	0.000	164.78	0.000	165.29	0.000
163.77	0.000	164.28	0.000	164.79	0.000	165.30	0.000
163.78	0.000	164.29	0.000	164.80	0.000	165.31	0.000
163.79	0.000	164.30	0.000	164.81	0.000	165.32	0.000
163.80	0.000	164.31	0.000	164.82	0.000	165.33	0.000
163.81	0.000	164.32	0.000	164.83	0.000	165.34	0.000
163.82	0.000	164.33	0.000	164.84	0.000	165.35	0.000
163.83	0.000	164.34	0.000	164.85	0.000	165.36	0.000
163.84	0.000	164.35	0.000	164.86	0.000	165.37	0.000
163.85	0.000	164.36	0.000	164.87	0.000	165.38	0.000
163.86	0.000	164.37	0.000	164.88	0.000	165.39	0.000
163.87	0.000	164.38	0.000	164.89	0.000	165.40	0.000
163.88	0.000	164.39	0.000	164.90	0.000	165.41	0.000
163.89	0.000	164.40	0.000	164.91	0.000	165.42	0.000
163.90	0.000	164.41	0.000	164.92	0.000	165.43	0.000
163.91	0.000	164.42	0.000	164.93	0.000	165.44	0.000
163.92	0.000	164.43	0.000	164.94	0.000	165.45	0.000
163.93	0.000	164.44	0.000	164.95	0.000	165.46	0.000
163.94	0.000	164.45	0.000	164.96	0.000	165.47	0.000
163.95	0.000	164.46	0.000	164.97	0.000	165.48	0.000
163.96	0.000	164.47	0.000	164.98	0.000	165.49	0.000
163.97	0.000	164.48	0.000	164.99	0.000	165.50	0.000
163.98	0.000	164.49	0.000	165.00	0.000	165.51	0.000
163.99	0.000	164.50	0.000	165.01	0.000	165.52	0.000
164.00	0.000	164.51	0.000	165.02	0.000	165.53	0.000
164.01	0.000	164.52	0.000	165.03	0.000	165.54	0.000
164.02	0.000	164.53	0.000	165.04	0.000	165.55	0.000
164.03	0.000	164.54	0.000	165.05	0.000	165.56	0.000
164.04	0.000	164.55	0.000	165.06	0.000	165.57	0.000
164.05	0.000	164.56	0.000	165.07	0.000	165.58	0.000
164.06	0.000	164.57	0.000	165.08	0.000	165.59	0.000
164.07	0.000	164.58	0.000	165.09	0.000	165.60	0.000
164.08	0.000	164.59	0.000	165.10	0.000	165.61	0.000
164.09	0.000	164.60	0.000	165.11	0.000	165.62	0.000
164.10	0.000	164.61	0.000	165.12	0.000	165.63	0.000
164.11	0.000	164.62	0.000	165.13	0.000	165.64	0.000
164.12	0.000	164.63	0.000	165.14	0.000	165.65	0.000
164.13	0.000	164.64	0.000	165.15	0.000	165.66	0.000
164.14	0.000	164.65	0.000	165.16	0.000	165.67	0.000
164.15	0.000	164.66	0.000	165.17	0.000	165.68	0.000

Stage-Discharge for Pond 1P: UG1 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
165.69	0.000	166.20	0.000	166.71	0.000	167.22	0.000
165.70	0.000	166.21	0.000	166.72	0.000	167.23	0.000
165.71	0.000	166.22	0.000	166.73	0.000	167.24	0.000
165.72	0.000	166.23	0.000	166.74	0.000	167.25	0.000
165.73	0.000	166.24	0.000	166.75	0.000	167.26	0.000
165.74	0.000	166.25	0.000	166.76	0.000	167.27	0.000
165.75	0.000	166.26	0.000	166.77	0.000	167.28	0.000
165.76	0.000	166.27	0.000	166.78	0.000	167.29	0.000
165.77	0.000	166.28	0.000	166.79	0.000	167.30	0.000
165.78	0.000	166.29	0.000	166.80	0.000	167.31	0.000
165.79	0.000	166.30	0.000	166.81	0.000	167.32	0.000
165.80	0.000	166.31	0.000	166.82	0.000	167.33	0.000
165.81	0.000	166.32	0.000	166.83	0.000	167.34	0.000
165.82	0.000	166.33	0.000	166.84	0.000	167.35	0.000
165.83	0.000	166.34	0.000	166.85	0.000	167.36	0.000
165.84	0.000	166.35	0.000	166.86	0.000	167.37	0.000
165.85	0.000	166.36	0.000	166.87	0.000	167.38	0.000
165.86	0.000	166.37	0.000	166.88	0.000	167.39	0.000
165.87	0.000	166.38	0.000	166.89	0.000	167.40	0.000
165.88	0.000	166.39	0.000	166.90	0.000	167.41	0.000
165.89	0.000	166.40	0.000	166.91	0.000	167.42	0.000
165.90	0.000	166.41	0.000	166.92	0.000	167.43	0.000
165.91	0.000	166.42	0.000	166.93	0.000	167.44	0.000
165.92	0.000	166.43	0.000	166.94	0.000	167.45	0.000
165.93	0.000	166.44	0.000	166.95	0.000	167.46	0.000
165.94	0.000	166.45	0.000	166.96	0.000	167.47	0.000
165.95	0.000	166.46	0.000	166.97	0.000	167.48	0.000
165.96	0.000	166.47	0.000	166.98	0.000	167.49	0.000
165.97	0.000	166.48	0.000	166.99	0.000	167.50	0.000
165.98	0.000	166.49	0.000	167.00	0.000	167.51	0.000
165.99	0.000	166.50	0.000	167.01	0.000	167.52	0.000
166.00	0.000	166.51	0.000	167.02	0.000	167.53	0.000
166.01	0.000	166.52	0.000	167.03	0.000	167.54	0.000
166.02	0.000	166.53	0.000	167.04	0.000	167.55	0.000
166.03	0.000	166.54	0.000	167.05	0.000	167.56	0.000
166.04	0.000	166.55	0.000	167.06	0.000	167.57	0.000
166.05	0.000	166.56	0.000	167.07	0.000	167.58	0.000
166.06	0.000	166.57	0.000	167.08	0.000	167.59	0.000
166.07	0.000	166.58	0.000	167.09	0.000	167.60	0.000
166.08	0.000	166.59	0.000	167.10	0.000	167.61	0.000
166.09	0.000	166.60	0.000	167.11	0.000	167.62	0.000
166.10	0.000	166.61	0.000	167.12	0.000	167.63	0.000
166.11	0.000	166.62	0.000	167.13	0.000	167.64	0.000
166.12	0.000	166.63	0.000	167.14	0.000	167.65	0.000
166.13	0.000	166.64	0.000	167.15	0.000	167.66	0.000
166.14	0.000	166.65	0.000	167.16	0.000	167.67	0.851
166.15	0.000	166.66	0.000	167.17	0.000	167.68	1.203
166.16	0.000	166.67	0.000	167.18	0.000	167.69	1.474
166.17	0.000	166.68	0.000	167.19	0.000	167.70	1.702
166.18	0.000	166.69	0.000	167.20	0.000	167.71	1.903
166.19	0.000	166.70	0.000	167.21	0.000	167.72	2.084

Stage-Discharge for Pond 1P: UG1 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
167.73	2.251	168.24	6.480
167.74	2.407	168.25	6.536
167.75	2.553	168.26	6.591
167.76	2.691	168.27	6.646
167.77	2.822	168.28	6.700
167.78	2.948	168.29	6.754
167.79	3.068	168.30	6.807
167.80	3.184	168.31	6.860
167.81	3.295	168.32	6.913
167.82	3.404	168.33	6.965
167.83	3.508	168.34	7.017
167.84	3.610	168.35	7.068
167.85	3.709	168.36	7.119
167.86	3.805	168.37	7.170
167.87	3.899	168.38	7.220
167.88	3.991	168.39	7.270
167.89	4.081	168.40	7.320
167.90	4.168	168.41	7.369
167.91	4.254	168.42	7.418
167.92	4.339	168.43	7.466
167.93	4.421	168.44	7.515
167.94	4.502	168.45	7.563
167.95	4.582	168.46	7.610
167.96	4.660	168.47	7.658
167.97	4.737	168.48	7.705
167.98	4.813	168.49	7.752
167.99	4.888	168.50	7.798
168.00	4.961	168.51	7.845
168.01	5.034	168.52	7.891
168.02	5.105	168.53	7.936
168.03	5.176	168.54	7.982
168.04	5.245	168.55	8.027
168.05	5.314	168.56	8.072
168.06	5.381	168.57	8.117
168.07	5.448	168.58	8.161
168.08	5.514	168.59	8.206
168.09	5.580	168.60	8.250
168.10	5.644	168.61	8.293
168.11	5.708	168.62	8.337
168.12	5.771	168.63	8.380
168.13	5.833	168.64	8.423
168.14	5.895	168.65	8.466
168.15	5.956	168.66	8.509
168.16	6.017	168.67	**8.551**
168.17	6.076		
168.18	6.136		
168.19	6.194		
168.20	6.253		
168.21	6.310		
168.22	6.367		
168.23	6.424		

Summary for Pond 3P: UG2

Inflow Area = 21,519 sf, 87.04% Impervious, Inflow Depth = 5.74" for 50-yr event
Inflow = 4.301 cfs @ 11.96 hrs, Volume= 10,289 cf
Outflow = 7.118 cfs @ 11.95 hrs, Volume= 6,106 cf, Atten= 0%, Lag= 0.0 min
Primary = 7.118 cfs @ 11.95 hrs, Volume= 6,106 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= 168.36' @ 11.95 hrs Surf.Area= 2,542 sf Storage= 4,234 cf

Plug-Flow detention time= 224.4 min calculated for 6,105 cf (59% of inflow)
Center-of-Mass det. time= 108.5 min (849.9 - 741.4)

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'	**5.0" 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= 36.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=7.106 cfs @ 11.95 hrs HW=168.36' TW=167.66' (Fixed TW Elev= 167.66')
└─**4=Culvert** (Inlet Controls 7.106 cfs @ 4.021 fps)
  ├─**1=Orifice/Grate** (Passes < 0.197 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 0.419 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 114.811 cfs potential flow)

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	0.000	160.30	0.000	160.81	0.000
159.29	0.000	159.80	0.000	160.31	0.000	160.82	0.000
159.30	0.000	159.81	0.000	160.32	0.000	160.83	0.000
159.31	0.000	159.82	0.000	160.33	0.000	160.84	0.000
159.32	0.000	159.83	0.000	160.34	0.000	160.85	0.000
159.33	0.000	159.84	0.000	160.35	0.000	160.86	0.000
159.34	0.000	159.85	0.000	160.36	0.000	160.87	0.000
159.35	0.000	159.86	0.000	160.37	0.000	160.88	0.000
159.36	0.000	159.87	0.000	160.38	0.000	160.89	0.000
159.37	0.000	159.88	0.000	160.39	0.000	160.90	0.000
159.38	0.000	159.89	0.000	160.40	0.000	160.91	0.000
159.39	0.000	159.90	0.000	160.41	0.000	160.92	0.000
159.40	0.000	159.91	0.000	160.42	0.000	160.93	0.000
159.41	0.000	159.92	0.000	160.43	0.000	160.94	0.000
159.42	0.000	159.93	0.000	160.44	0.000	160.95	0.000
159.43	0.000	159.94	0.000	160.45	0.000	160.96	0.000
159.44	0.000	159.95	0.000	160.46	0.000	160.97	0.000
159.45	0.000	159.96	0.000	160.47	0.000	160.98	0.000
159.46	0.000	159.97	0.000	160.48	0.000	160.99	0.000
159.47	0.000	159.98	0.000	160.49	0.000	161.00	0.000
159.48	0.000	159.99	0.000	160.50	0.000	161.01	0.000
159.49	0.000	160.00	0.000	160.51	0.000	161.02	0.000
159.50	0.000	160.01	0.000	160.52	0.000	161.03	0.000
159.51	0.000	160.02	0.000	160.53	0.000	161.04	0.000
159.52	0.000	160.03	0.000	160.54	0.000	161.05	0.000
159.53	0.000	160.04	0.000	160.55	0.000	161.06	0.000
159.54	0.000	160.05	0.000	160.56	0.000	161.07	0.000
159.55	0.000	160.06	0.000	160.57	0.000	161.08	0.000
159.56	0.000	160.07	0.000	160.58	0.000	161.09	0.000
159.57	0.000	160.08	0.000	160.59	0.000	161.10	0.000
159.58	0.000	160.09	0.000	160.60	0.000	161.11	0.000
159.59	0.000	160.10	0.000	160.61	0.000	161.12	0.000
159.60	0.000	160.11	0.000	160.62	0.000	161.13	0.000
159.61	0.000	160.12	0.000	160.63	0.000	161.14	0.000
159.62	0.000	160.13	0.000	160.64	0.000	161.15	0.000
159.63	0.000	160.14	0.000	160.65	0.000	161.16	0.000
159.64	0.000	160.15	0.000	160.66	0.000	161.17	0.000
159.65	0.000	160.16	0.000	160.67	0.000	161.18	0.000
159.66	0.000	160.17	0.000	160.68	0.000	161.19	0.000
159.67	0.000	160.18	0.000	160.69	0.000	161.20	0.000
159.68	0.000	160.19	0.000	160.70	0.000	161.21	0.000
159.69	0.000	160.20	0.000	160.71	0.000	161.22	0.000
159.70	0.000	160.21	0.000	160.72	0.000	161.23	0.000
159.71	0.000	160.22	0.000	160.73	0.000	161.24	0.000
159.72	0.000	160.23	0.000	160.74	0.000	161.25	0.000
159.73	0.000	160.24	0.000	160.75	0.000	161.26	0.000
159.74	0.000	160.25	0.000	160.76	0.000	161.27	0.000
159.75	0.000	160.26	0.000	160.77	0.000	161.28	0.000
159.76	0.000	160.27	0.000	160.78	0.000	161.29	0.000
159.77	0.000	160.28	0.000	160.79	0.000	161.30	0.000
159.78	0.000	160.29	0.000	160.80	0.000	161.31	0.000

Stage-Discharge for Pond 3P: UG2 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
161.32	0.000	161.83	0.000	162.34	0.000	162.85	0.000
161.33	0.000	161.84	0.000	162.35	0.000	162.86	0.000
161.34	0.000	161.85	0.000	162.36	0.000	162.87	0.000
161.35	0.000	161.86	0.000	162.37	0.000	162.88	0.000
161.36	0.000	161.87	0.000	162.38	0.000	162.89	0.000
161.37	0.000	161.88	0.000	162.39	0.000	162.90	0.000
161.38	0.000	161.89	0.000	162.40	0.000	162.91	0.000
161.39	0.000	161.90	0.000	162.41	0.000	162.92	0.000
161.40	0.000	161.91	0.000	162.42	0.000	162.93	0.000
161.41	0.000	161.92	0.000	162.43	0.000	162.94	0.000
161.42	0.000	161.93	0.000	162.44	0.000	162.95	0.000
161.43	0.000	161.94	0.000	162.45	0.000	162.96	0.000
161.44	0.000	161.95	0.000	162.46	0.000	162.97	0.000
161.45	0.000	161.96	0.000	162.47	0.000	162.98	0.000
161.46	0.000	161.97	0.000	162.48	0.000	162.99	0.000
161.47	0.000	161.98	0.000	162.49	0.000	163.00	0.000
161.48	0.000	161.99	0.000	162.50	0.000	163.01	0.000
161.49	0.000	162.00	0.000	162.51	0.000	163.02	0.000
161.50	0.000	162.01	0.000	162.52	0.000	163.03	0.000
161.51	0.000	162.02	0.000	162.53	0.000	163.04	0.000
161.52	0.000	162.03	0.000	162.54	0.000	163.05	0.000
161.53	0.000	162.04	0.000	162.55	0.000	163.06	0.000
161.54	0.000	162.05	0.000	162.56	0.000	163.07	0.000
161.55	0.000	162.06	0.000	162.57	0.000	163.08	0.000
161.56	0.000	162.07	0.000	162.58	0.000	163.09	0.000
161.57	0.000	162.08	0.000	162.59	0.000	163.10	0.000
161.58	0.000	162.09	0.000	162.60	0.000	163.11	0.000
161.59	0.000	162.10	0.000	162.61	0.000	163.12	0.000
161.60	0.000	162.11	0.000	162.62	0.000	163.13	0.000
161.61	0.000	162.12	0.000	162.63	0.000	163.14	0.000
161.62	0.000	162.13	0.000	162.64	0.000	163.15	0.000
161.63	0.000	162.14	0.000	162.65	0.000	163.16	0.000
161.64	0.000	162.15	0.000	162.66	0.000	163.17	0.000
161.65	0.000	162.16	0.000	162.67	0.000	163.18	0.000
161.66	0.000	162.17	0.000	162.68	0.000	163.19	0.000
161.67	0.000	162.18	0.000	162.69	0.000	163.20	0.000
161.68	0.000	162.19	0.000	162.70	0.000	163.21	0.000
161.69	0.000	162.20	0.000	162.71	0.000	163.22	0.000
161.70	0.000	162.21	0.000	162.72	0.000	163.23	0.000
161.71	0.000	162.22	0.000	162.73	0.000	163.24	0.000
161.72	0.000	162.23	0.000	162.74	0.000	163.25	0.000
161.73	0.000	162.24	0.000	162.75	0.000	163.26	0.000
161.74	0.000	162.25	0.000	162.76	0.000	163.27	0.000
161.75	0.000	162.26	0.000	162.77	0.000	163.28	0.000
161.76	0.000	162.27	0.000	162.78	0.000	163.29	0.000
161.77	0.000	162.28	0.000	162.79	0.000	163.30	0.000
161.78	0.000	162.29	0.000	162.80	0.000	163.31	0.000
161.79	0.000	162.30	0.000	162.81	0.000	163.32	0.000
161.80	0.000	162.31	0.000	162.82	0.000	163.33	0.000
161.81	0.000	162.32	0.000	162.83	0.000	163.34	0.000
161.82	0.000	162.33	0.000	162.84	0.000	163.35	0.000

Stage-Discharge for Pond 3P: UG2 (continued)

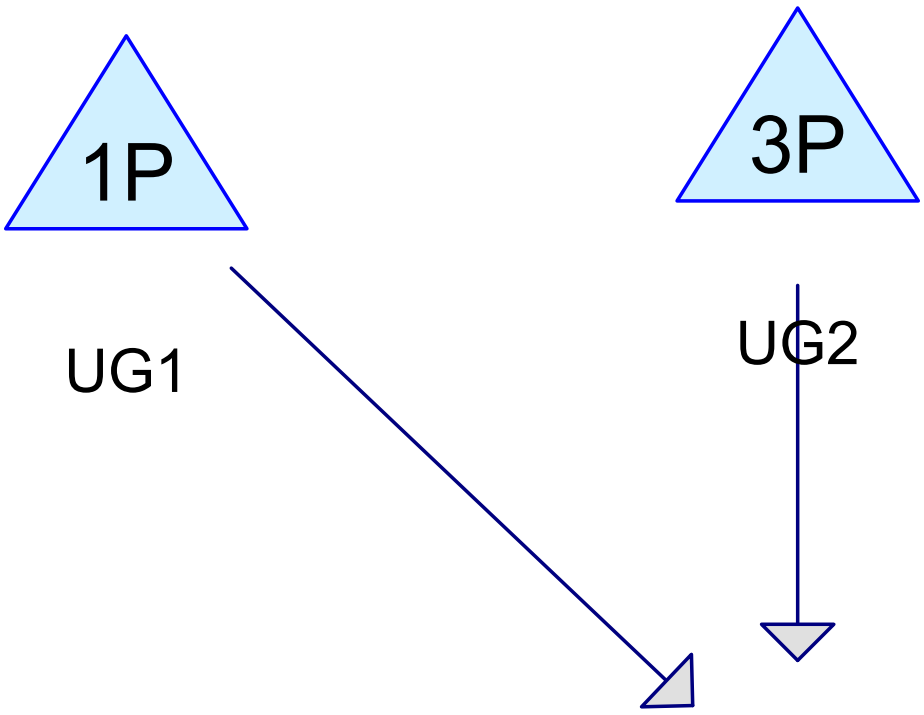
Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
163.36	0.000	163.87	0.000	164.38	0.000	164.89	0.000
163.37	0.000	163.88	0.000	164.39	0.000	164.90	0.000
163.38	0.000	163.89	0.000	164.40	0.000	164.91	0.000
163.39	0.000	163.90	0.000	164.41	0.000	164.92	0.000
163.40	0.000	163.91	0.000	164.42	0.000	164.93	0.000
163.41	0.000	163.92	0.000	164.43	0.000	164.94	0.000
163.42	0.000	163.93	0.000	164.44	0.000	164.95	0.000
163.43	0.000	163.94	0.000	164.45	0.000	164.96	0.000
163.44	0.000	163.95	0.000	164.46	0.000	164.97	0.000
163.45	0.000	163.96	0.000	164.47	0.000	164.98	0.000
163.46	0.000	163.97	0.000	164.48	0.000	164.99	0.000
163.47	0.000	163.98	0.000	164.49	0.000	165.00	0.000
163.48	0.000	163.99	0.000	164.50	0.000	165.01	0.000
163.49	0.000	164.00	0.000	164.51	0.000	165.02	0.000
163.50	0.000	164.01	0.000	164.52	0.000	165.03	0.000
163.51	0.000	164.02	0.000	164.53	0.000	165.04	0.000
163.52	0.000	164.03	0.000	164.54	0.000	165.05	0.000
163.53	0.000	164.04	0.000	164.55	0.000	165.06	0.000
163.54	0.000	164.05	0.000	164.56	0.000	165.07	0.000
163.55	0.000	164.06	0.000	164.57	0.000	165.08	0.000
163.56	0.000	164.07	0.000	164.58	0.000	165.09	0.000
163.57	0.000	164.08	0.000	164.59	0.000	165.10	0.000
163.58	0.000	164.09	0.000	164.60	0.000	165.11	0.000
163.59	0.000	164.10	0.000	164.61	0.000	165.12	0.000
163.60	0.000	164.11	0.000	164.62	0.000	165.13	0.000
163.61	0.000	164.12	0.000	164.63	0.000	165.14	0.000
163.62	0.000	164.13	0.000	164.64	0.000	165.15	0.000
163.63	0.000	164.14	0.000	164.65	0.000	165.16	0.000
163.64	0.000	164.15	0.000	164.66	0.000	165.17	0.000
163.65	0.000	164.16	0.000	164.67	0.000	165.18	0.000
163.66	0.000	164.17	0.000	164.68	0.000	165.19	0.000
163.67	0.000	164.18	0.000	164.69	0.000	165.20	0.000
163.68	0.000	164.19	0.000	164.70	0.000	165.21	0.000
163.69	0.000	164.20	0.000	164.71	0.000	165.22	0.000
163.70	0.000	164.21	0.000	164.72	0.000	165.23	0.000
163.71	0.000	164.22	0.000	164.73	0.000	165.24	0.000
163.72	0.000	164.23	0.000	164.74	0.000	165.25	0.000
163.73	0.000	164.24	0.000	164.75	0.000	165.26	0.000
163.74	0.000	164.25	0.000	164.76	0.000	165.27	0.000
163.75	0.000	164.26	0.000	164.77	0.000	165.28	0.000
163.76	0.000	164.27	0.000	164.78	0.000	165.29	0.000
163.77	0.000	164.28	0.000	164.79	0.000	165.30	0.000
163.78	0.000	164.29	0.000	164.80	0.000	165.31	0.000
163.79	0.000	164.30	0.000	164.81	0.000	165.32	0.000
163.80	0.000	164.31	0.000	164.82	0.000	165.33	0.000
163.81	0.000	164.32	0.000	164.83	0.000	165.34	0.000
163.82	0.000	164.33	0.000	164.84	0.000	165.35	0.000
163.83	0.000	164.34	0.000	164.85	0.000	165.36	0.000
163.84	0.000	164.35	0.000	164.86	0.000	165.37	0.000
163.85	0.000	164.36	0.000	164.87	0.000	165.38	0.000
163.86	0.000	164.37	0.000	164.88	0.000	165.39	0.000

Stage-Discharge for Pond 3P: UG2 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
165.40	0.000	165.91	0.000	166.42	0.000	166.93	0.000
165.41	0.000	165.92	0.000	166.43	0.000	166.94	0.000
165.42	0.000	165.93	0.000	166.44	0.000	166.95	0.000
165.43	0.000	165.94	0.000	166.45	0.000	166.96	0.000
165.44	0.000	165.95	0.000	166.46	0.000	166.97	0.000
165.45	0.000	165.96	0.000	166.47	0.000	166.98	0.000
165.46	0.000	165.97	0.000	166.48	0.000	166.99	0.000
165.47	0.000	165.98	0.000	166.49	0.000	167.00	0.000
165.48	0.000	165.99	0.000	166.50	0.000	167.01	0.000
165.49	0.000	166.00	0.000	166.51	0.000	167.02	0.000
165.50	0.000	166.01	0.000	166.52	0.000	167.03	0.000
165.51	0.000	166.02	0.000	166.53	0.000	167.04	0.000
165.52	0.000	166.03	0.000	166.54	0.000	167.05	0.000
165.53	0.000	166.04	0.000	166.55	0.000	167.06	0.000
165.54	0.000	166.05	0.000	166.56	0.000	167.07	0.000
165.55	0.000	166.06	0.000	166.57	0.000	167.08	0.000
165.56	0.000	166.07	0.000	166.58	0.000	167.09	0.000
165.57	0.000	166.08	0.000	166.59	0.000	167.10	0.000
165.58	0.000	166.09	0.000	166.60	0.000	167.11	0.000
165.59	0.000	166.10	0.000	166.61	0.000	167.12	0.000
165.60	0.000	166.11	0.000	166.62	0.000	167.13	0.000
165.61	0.000	166.12	0.000	166.63	0.000	167.14	0.000
165.62	0.000	166.13	0.000	166.64	0.000	167.15	0.000
165.63	0.000	166.14	0.000	166.65	0.000	167.16	0.000
165.64	0.000	166.15	0.000	166.66	0.000	167.17	0.000
165.65	0.000	166.16	0.000	166.67	0.000	167.18	0.000
165.66	0.000	166.17	0.000	166.68	0.000	167.19	0.000
165.67	0.000	166.18	0.000	166.69	0.000	167.20	0.000
165.68	0.000	166.19	0.000	166.70	0.000	167.21	0.000
165.69	0.000	166.20	0.000	166.71	0.000	167.22	0.000
165.70	0.000	166.21	0.000	166.72	0.000	167.23	0.000
165.71	0.000	166.22	0.000	166.73	0.000	167.24	0.000
165.72	0.000	166.23	0.000	166.74	0.000	167.25	0.000
165.73	0.000	166.24	0.000	166.75	0.000	167.26	0.000
165.74	0.000	166.25	0.000	166.76	0.000	167.27	0.000
165.75	0.000	166.26	0.000	166.77	0.000	167.28	0.000
165.76	0.000	166.27	0.000	166.78	0.000	167.29	0.000
165.77	0.000	166.28	0.000	166.79	0.000	167.30	0.000
165.78	0.000	166.29	0.000	166.80	0.000	167.31	0.000
165.79	0.000	166.30	0.000	166.81	0.000	167.32	0.000
165.80	0.000	166.31	0.000	166.82	0.000	167.33	0.000
165.81	0.000	166.32	0.000	166.83	0.000	167.34	0.000
165.82	0.000	166.33	0.000	166.84	0.000	167.35	0.000
165.83	0.000	166.34	0.000	166.85	0.000	167.36	0.000
165.84	0.000	166.35	0.000	166.86	0.000	167.37	0.000
165.85	0.000	166.36	0.000	166.87	0.000	167.38	0.000
165.86	0.000	166.37	0.000	166.88	0.000	167.39	0.000
165.87	0.000	166.38	0.000	166.89	0.000	167.40	0.000
165.88	0.000	166.39	0.000	166.90	0.000	167.41	0.000
165.89	0.000	166.40	0.000	166.91	0.000	167.42	0.000
165.90	0.000	166.41	0.000	166.92	0.000	167.43	0.000

Stage-Discharge for Pond 3P: UG2 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
167.44	0.000	167.95	4.582
167.45	0.000	167.96	4.660
167.46	0.000	167.97	4.737
167.47	0.000	167.98	4.813
167.48	0.000	167.99	4.888
167.49	0.000	168.00	4.961
167.50	0.000	168.01	5.034
167.51	0.000	168.02	5.105
167.52	0.000	168.03	5.176
167.53	0.000	168.04	5.245
167.54	0.000	168.05	5.314
167.55	0.000	168.06	5.381
167.56	0.000	168.07	5.448
167.57	0.000	168.08	5.514
167.58	0.000	168.09	5.580
167.59	0.000	168.10	5.644
167.60	0.000	168.11	5.708
167.61	0.000	168.12	5.771
167.62	0.000	168.13	5.833
167.63	0.000	168.14	5.895
167.64	0.000	168.15	5.956
167.65	0.000	168.16	6.017
167.66	0.000	168.17	6.076
167.67	0.851	168.18	6.136
167.68	1.203	168.19	6.194
167.69	1.474	168.20	6.253
167.70	1.702	168.21	6.310
167.71	1.903	168.22	6.367
167.72	2.084	168.23	6.424
167.73	2.251	168.24	6.480
167.74	2.407	168.25	6.536
167.75	2.553	168.26	6.591
167.76	2.691	168.27	6.646
167.77	2.822	168.28	6.700
167.78	2.948	168.29	6.754
167.79	3.068	168.30	6.807
167.80	3.184	168.31	6.860
167.81	3.295	168.32	6.913
167.82	3.404	168.33	6.965
167.83	3.508	168.34	7.017
167.84	3.610	168.35	7.068
167.85	3.709	168.36	7.119
167.86	3.805	168.37	7.170
167.87	3.899	168.38	7.220
167.88	3.991	168.39	7.270
167.89	4.081	168.40	7.320
167.90	4.168	168.41	**7.369**
167.91	4.254		
167.92	4.339		
167.93	4.421		
167.94	4.502		



Subcat Reach Pond Link

Routing Diagram for BMW_2024-07-22
Prepared by Bohler, Printed 10/29/2024
HydroCAD® 10.20-4a s/n 03478 © 2023 HydroCAD Software Solutions LLC

Summary for Pond 1P: UG1

Inflow Area = 81,675 sf, 99.20% Impervious, Inflow Depth = 7.37" for 100-yr event
Inflow = 21.011 cfs @ 11.96 hrs, Volume= 50,157 cf
Outflow = 37.194 cfs @ 11.98 hrs, Volume= 23,307 cf, Atten= 0%, Lag= 1.4 min
Primary = 37.194 cfs @ 11.98 hrs, Volume= 23,307 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= 187.77' @ 11.98 hrs Surf.Area= 13,041 sf Storage= 27,162 cf

Plug-Flow detention time= 287.0 min calculated for 23,307 cf (46% of inflow)
Center-of-Mass det. time= 145.2 min (882.0 - 736.8)

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'	**40.0" 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= 66.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 157.53' / 157.20' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=36.939 cfs @ 11.98 hrs HW=187.52' TW=168.67' (Fixed TW Elev= 168.67')
└─**4=Culvert** (Inlet Controls 36.939 cfs @ 20.903 fps)
  ├─**1=Orifice/Grate** (Passes < 0.114 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 23.226 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 1,764.703 cfs potential flow)

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	158.55	0.000	159.57	0.000	160.59	0.000
157.55	0.000	158.57	0.000	159.59	0.000	160.61	0.000
157.57	0.000	158.59	0.000	159.61	0.000	160.63	0.000
157.59	0.000	158.61	0.000	159.63	0.000	160.65	0.000
157.61	0.000	158.63	0.000	159.65	0.000	160.67	0.000
157.63	0.000	158.65	0.000	159.67	0.000	160.69	0.000
157.65	0.000	158.67	0.000	159.69	0.000	160.71	0.000
157.67	0.000	158.69	0.000	159.71	0.000	160.73	0.000
157.69	0.000	158.71	0.000	159.73	0.000	160.75	0.000
157.71	0.000	158.73	0.000	159.75	0.000	160.77	0.000
157.73	0.000	158.75	0.000	159.77	0.000	160.79	0.000
157.75	0.000	158.77	0.000	159.79	0.000	160.81	0.000
157.77	0.000	158.79	0.000	159.81	0.000	160.83	0.000
157.79	0.000	158.81	0.000	159.83	0.000	160.85	0.000
157.81	0.000	158.83	0.000	159.85	0.000	160.87	0.000
157.83	0.000	158.85	0.000	159.87	0.000	160.89	0.000
157.85	0.000	158.87	0.000	159.89	0.000	160.91	0.000
157.87	0.000	158.89	0.000	159.91	0.000	160.93	0.000
157.89	0.000	158.91	0.000	159.93	0.000	160.95	0.000
157.91	0.000	158.93	0.000	159.95	0.000	160.97	0.000
157.93	0.000	158.95	0.000	159.97	0.000	160.99	0.000
157.95	0.000	158.97	0.000	159.99	0.000	161.01	0.000
157.97	0.000	158.99	0.000	160.01	0.000	161.03	0.000
157.99	0.000	159.01	0.000	160.03	0.000	161.05	0.000
158.01	0.000	159.03	0.000	160.05	0.000	161.07	0.000
158.03	0.000	159.05	0.000	160.07	0.000	161.09	0.000
158.05	0.000	159.07	0.000	160.09	0.000	161.11	0.000
158.07	0.000	159.09	0.000	160.11	0.000	161.13	0.000
158.09	0.000	159.11	0.000	160.13	0.000	161.15	0.000
158.11	0.000	159.13	0.000	160.15	0.000	161.17	0.000
158.13	0.000	159.15	0.000	160.17	0.000	161.19	0.000
158.15	0.000	159.17	0.000	160.19	0.000	161.21	0.000
158.17	0.000	159.19	0.000	160.21	0.000	161.23	0.000
158.19	0.000	159.21	0.000	160.23	0.000	161.25	0.000
158.21	0.000	159.23	0.000	160.25	0.000	161.27	0.000
158.23	0.000	159.25	0.000	160.27	0.000	161.29	0.000
158.25	0.000	159.27	0.000	160.29	0.000	161.31	0.000
158.27	0.000	159.29	0.000	160.31	0.000	161.33	0.000
158.29	0.000	159.31	0.000	160.33	0.000	161.35	0.000
158.31	0.000	159.33	0.000	160.35	0.000	161.37	0.000
158.33	0.000	159.35	0.000	160.37	0.000	161.39	0.000
158.35	0.000	159.37	0.000	160.39	0.000	161.41	0.000
158.37	0.000	159.39	0.000	160.41	0.000	161.43	0.000
158.39	0.000	159.41	0.000	160.43	0.000	161.45	0.000
158.41	0.000	159.43	0.000	160.45	0.000	161.47	0.000
158.43	0.000	159.45	0.000	160.47	0.000	161.49	0.000
158.45	0.000	159.47	0.000	160.49	0.000	161.51	0.000
158.47	0.000	159.49	0.000	160.51	0.000	161.53	0.000
158.49	0.000	159.51	0.000	160.53	0.000	161.55	0.000
158.51	0.000	159.53	0.000	160.55	0.000	161.57	0.000
158.53	0.000	159.55	0.000	160.57	0.000	161.59	0.000

Stage-Discharge for Pond 1P: UG1 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
161.61	0.000	162.63	0.000	163.65	0.000	164.67	0.000
161.63	0.000	162.65	0.000	163.67	0.000	164.69	0.000
161.65	0.000	162.67	0.000	163.69	0.000	164.71	0.000
161.67	0.000	162.69	0.000	163.71	0.000	164.73	0.000
161.69	0.000	162.71	0.000	163.73	0.000	164.75	0.000
161.71	0.000	162.73	0.000	163.75	0.000	164.77	0.000
161.73	0.000	162.75	0.000	163.77	0.000	164.79	0.000
161.75	0.000	162.77	0.000	163.79	0.000	164.81	0.000
161.77	0.000	162.79	0.000	163.81	0.000	164.83	0.000
161.79	0.000	162.81	0.000	163.83	0.000	164.85	0.000
161.81	0.000	162.83	0.000	163.85	0.000	164.87	0.000
161.83	0.000	162.85	0.000	163.87	0.000	164.89	0.000
161.85	0.000	162.87	0.000	163.89	0.000	164.91	0.000
161.87	0.000	162.89	0.000	163.91	0.000	164.93	0.000
161.89	0.000	162.91	0.000	163.93	0.000	164.95	0.000
161.91	0.000	162.93	0.000	163.95	0.000	164.97	0.000
161.93	0.000	162.95	0.000	163.97	0.000	164.99	0.000
161.95	0.000	162.97	0.000	163.99	0.000	165.01	0.000
161.97	0.000	162.99	0.000	164.01	0.000	165.03	0.000
161.99	0.000	163.01	0.000	164.03	0.000	165.05	0.000
162.01	0.000	163.03	0.000	164.05	0.000	165.07	0.000
162.03	0.000	163.05	0.000	164.07	0.000	165.09	0.000
162.05	0.000	163.07	0.000	164.09	0.000	165.11	0.000
162.07	0.000	163.09	0.000	164.11	0.000	165.13	0.000
162.09	0.000	163.11	0.000	164.13	0.000	165.15	0.000
162.11	0.000	163.13	0.000	164.15	0.000	165.17	0.000
162.13	0.000	163.15	0.000	164.17	0.000	165.19	0.000
162.15	0.000	163.17	0.000	164.19	0.000	165.21	0.000
162.17	0.000	163.19	0.000	164.21	0.000	165.23	0.000
162.19	0.000	163.21	0.000	164.23	0.000	165.25	0.000
162.21	0.000	163.23	0.000	164.25	0.000	165.27	0.000
162.23	0.000	163.25	0.000	164.27	0.000	165.29	0.000
162.25	0.000	163.27	0.000	164.29	0.000	165.31	0.000
162.27	0.000	163.29	0.000	164.31	0.000	165.33	0.000
162.29	0.000	163.31	0.000	164.33	0.000	165.35	0.000
162.31	0.000	163.33	0.000	164.35	0.000	165.37	0.000
162.33	0.000	163.35	0.000	164.37	0.000	165.39	0.000
162.35	0.000	163.37	0.000	164.39	0.000	165.41	0.000
162.37	0.000	163.39	0.000	164.41	0.000	165.43	0.000
162.39	0.000	163.41	0.000	164.43	0.000	165.45	0.000
162.41	0.000	163.43	0.000	164.45	0.000	165.47	0.000
162.43	0.000	163.45	0.000	164.47	0.000	165.49	0.000
162.45	0.000	163.47	0.000	164.49	0.000	165.51	0.000
162.47	0.000	163.49	0.000	164.51	0.000	165.53	0.000
162.49	0.000	163.51	0.000	164.53	0.000	165.55	0.000
162.51	0.000	163.53	0.000	164.55	0.000	165.57	0.000
162.53	0.000	163.55	0.000	164.57	0.000	165.59	0.000
162.55	0.000	163.57	0.000	164.59	0.000	165.61	0.000
162.57	0.000	163.59	0.000	164.61	0.000	165.63	0.000
162.59	0.000	163.61	0.000	164.63	0.000	165.65	0.000
162.61	0.000	163.63	0.000	164.65	0.000	165.67	0.000

Stage-Discharge for Pond 1P: UG1 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
165.69	0.000	166.71	0.000	167.73	0.000	168.75	2.407
165.71	0.000	166.73	0.000	167.75	0.000	168.77	2.691
165.73	0.000	166.75	0.000	167.77	0.000	168.79	2.948
165.75	0.000	166.77	0.000	167.79	0.000	168.81	3.184
165.77	0.000	166.79	0.000	167.81	0.000	168.83	3.404
165.79	0.000	166.81	0.000	167.83	0.000	168.85	3.610
165.81	0.000	166.83	0.000	167.85	0.000	168.87	3.805
165.83	0.000	166.85	0.000	167.87	0.000	168.89	3.991
165.85	0.000	166.87	0.000	167.89	0.000	168.91	4.168
165.87	0.000	166.89	0.000	167.91	0.000	168.93	4.339
165.89	0.000	166.91	0.000	167.93	0.000	168.95	4.502
165.91	0.000	166.93	0.000	167.95	0.000	168.97	4.660
165.93	0.000	166.95	0.000	167.97	0.000	168.99	4.813
165.95	0.000	166.97	0.000	167.99	0.000	169.01	4.961
165.97	0.000	166.99	0.000	168.01	0.000	169.03	5.105
165.99	0.000	167.01	0.000	168.03	0.000	169.05	5.245
166.01	0.000	167.03	0.000	168.05	0.000	169.07	5.381
166.03	0.000	167.05	0.000	168.07	0.000	169.09	5.514
166.05	0.000	167.07	0.000	168.09	0.000	169.11	5.644
166.07	0.000	167.09	0.000	168.11	0.000	169.13	5.771
166.09	0.000	167.11	0.000	168.13	0.000	169.15	5.895
166.11	0.000	167.13	0.000	168.15	0.000	169.17	6.017
166.13	0.000	167.15	0.000	168.17	0.000	169.19	6.136
166.15	0.000	167.17	0.000	168.19	0.000	169.21	6.253
166.17	0.000	167.19	0.000	168.21	0.000	169.23	6.367
166.19	0.000	167.21	0.000	168.23	0.000	169.25	6.480
166.21	0.000	167.23	0.000	168.25	0.000	169.27	6.591
166.23	0.000	167.25	0.000	168.27	0.000	169.29	6.700
166.25	0.000	167.27	0.000	168.29	0.000	169.31	6.807
166.27	0.000	167.29	0.000	168.31	0.000	169.33	6.913
166.29	0.000	167.31	0.000	168.33	0.000	169.35	7.017
166.31	0.000	167.33	0.000	168.35	0.000	169.37	7.119
166.33	0.000	167.35	0.000	168.37	0.000	169.39	7.220
166.35	0.000	167.37	0.000	168.39	0.000	169.41	7.320
166.37	0.000	167.39	0.000	168.41	0.000	169.43	7.418
166.39	0.000	167.41	0.000	168.43	0.000	169.45	7.515
166.41	0.000	167.43	0.000	168.45	0.000	169.47	7.610
166.43	0.000	167.45	0.000	168.47	0.000	169.49	7.705
166.45	0.000	167.47	0.000	168.49	0.000	169.51	7.798
166.47	0.000	167.49	0.000	168.51	0.000	169.53	7.891
166.49	0.000	167.51	0.000	168.53	0.000	169.55	7.982
166.51	0.000	167.53	0.000	168.55	0.000	169.57	8.072
166.53	0.000	167.55	0.000	168.57	0.000	169.59	8.161
166.55	0.000	167.57	0.000	168.59	0.000	169.61	8.250
166.57	0.000	167.59	0.000	168.61	0.000	169.63	8.337
166.59	0.000	167.61	0.000	168.63	0.000	169.65	8.423
166.61	0.000	167.63	0.000	168.65	0.000	169.67	8.509
166.63	0.000	167.65	0.000	168.67	0.000	169.69	8.593
166.65	0.000	167.67	0.000	168.69	1.203	169.71	8.677
166.67	0.000	167.69	0.000	168.71	1.702	169.73	8.760
166.69	0.000	167.71	0.000	168.73	2.084	169.75	8.843

Stage-Discharge for Pond 1P: UG1 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
169.77	8.924	170.79	12.389	171.81	15.078	172.83	17.355
169.79	9.005	170.81	12.447	171.83	15.126	172.85	17.396
169.81	9.085	170.83	12.505	171.85	15.173	172.87	17.438
169.83	9.164	170.85	12.563	171.87	15.221	172.89	17.479
169.85	9.243	170.87	12.621	171.89	15.268	172.91	17.521
169.87	9.321	170.89	12.678	171.91	15.316	172.93	17.562
169.89	9.398	170.91	12.735	171.93	15.363	172.95	17.603
169.91	9.475	170.93	12.791	171.95	15.410	172.97	17.644
169.93	9.551	170.95	12.848	171.97	15.457	172.99	17.685
169.95	9.627	170.97	12.904	171.99	15.504	173.01	17.726
169.97	9.701	170.99	12.960	172.01	15.550	173.03	17.767
169.99	9.776	171.01	13.016	172.03	15.597	173.05	17.808
170.01	9.850	171.03	13.071	172.05	15.643	173.07	17.848
170.03	9.923	171.05	13.127	172.07	15.689	173.09	17.889
170.05	9.996	171.07	13.182	172.09	15.735	173.11	17.929
170.07	10.068	171.09	13.237	172.11	15.781	173.13	17.969
170.09	10.139	171.11	13.291	172.13	15.827	173.15	18.010
170.11	10.211	171.13	13.345	172.15	15.873	173.17	18.050
170.13	10.281	171.15	13.400	172.17	15.918	173.19	18.090
170.15	10.351	171.17	13.454	172.19	15.964	173.21	18.130
170.17	10.421	171.19	13.507	172.21	16.009	173.23	18.170
170.19	10.490	171.21	13.561	172.23	16.054	173.25	18.210
170.21	10.559	171.23	13.614	172.25	16.099	173.27	18.249
170.23	10.627	171.25	13.667	172.27	16.144	173.29	18.289
170.25	10.695	171.27	13.720	172.29	16.189	173.31	18.328
170.27	10.763	171.29	13.773	172.31	16.234	173.33	18.368
170.29	10.830	171.31	13.825	172.33	16.278	173.35	18.407
170.31	10.897	171.33	13.877	172.35	16.323	173.37	18.447
170.33	10.963	171.35	13.929	172.37	16.367	173.39	18.486
170.35	11.029	171.37	13.981	172.39	16.411	173.41	18.525
170.37	11.094	171.39	14.033	172.41	16.455	173.43	18.564
170.39	11.159	171.41	14.085	172.43	16.499	173.45	18.603
170.41	11.224	171.43	14.136	172.45	16.543	173.47	18.642
170.43	11.288	171.45	14.187	172.47	16.587	173.49	18.681
170.45	11.352	171.47	14.238	172.49	16.630	173.51	18.719
170.47	11.416	171.49	14.289	172.51	16.674	173.53	18.758
170.49	11.479	171.51	14.339	172.53	16.717	173.55	18.796
170.51	11.542	171.53	14.390	172.55	16.760	173.57	18.835
170.53	11.604	171.55	14.440	172.57	16.803	173.59	18.873
170.55	11.667	171.57	14.490	172.59	16.846	173.61	18.912
170.57	11.729	171.59	14.540	172.61	16.889	173.63	18.950
170.59	11.790	171.61	14.589	172.63	16.932	173.65	18.988
170.61	11.851	171.63	14.639	172.65	16.975	173.67	19.026
170.63	11.912	171.65	14.688	172.67	17.018	173.69	19.064
170.65	11.973	171.67	14.738	172.69	17.060	173.71	19.102
170.67	12.033	171.69	14.787	172.71	17.102	173.73	19.140
170.69	12.093	171.71	14.836	172.73	17.145	173.75	19.178
170.71	12.153	171.73	14.884	172.75	17.187	173.77	19.215
170.73	12.212	171.75	14.933	172.77	17.229	173.79	19.253
170.75	12.272	171.77	14.981	172.79	17.271	173.81	19.291
170.77	12.330	171.79	15.029	172.81	17.313	173.83	19.328

Stage-Discharge for Pond 1P: UG1 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
173.85	19.366	174.87	21.187	175.89	22.863	176.91	24.425
173.87	19.403	174.89	21.221	175.91	22.895	176.93	24.454
173.89	19.440	174.91	21.255	175.93	22.926	176.95	24.484
173.91	19.477	174.93	21.289	175.95	22.958	176.97	24.514
173.93	19.515	174.95	21.323	175.97	22.989	176.99	24.543
173.95	19.552	174.97	21.357	175.99	23.021	177.01	24.573
173.97	19.589	174.99	21.391	176.01	23.052	177.03	24.602
173.99	19.626	175.01	21.425	176.03	23.084	177.05	24.631
174.01	19.662	175.03	21.458	176.05	23.115	177.07	24.661
174.03	19.699	175.05	21.492	176.07	23.146	177.09	24.690
174.05	19.736	175.07	21.526	176.09	23.178	177.11	24.719
174.07	19.773	175.09	21.559	176.11	23.209	177.13	24.749
174.09	19.809	175.11	21.593	176.13	23.240	177.15	24.778
174.11	19.846	175.13	21.626	176.15	23.271	177.17	24.807
174.13	19.882	175.15	21.660	176.17	23.302	177.19	24.836
174.15	19.919	175.17	21.693	176.19	23.333	177.21	24.865
174.17	19.955	175.19	21.727	176.21	23.364	177.23	24.895
174.19	19.991	175.21	21.760	176.23	23.395	177.25	24.924
174.21	20.027	175.23	21.793	176.25	23.426	177.27	24.953
174.23	20.063	175.25	21.826	176.27	23.457	177.29	24.982
174.25	20.099	175.27	21.859	176.29	23.488	177.31	25.011
174.27	20.135	175.29	21.893	176.31	23.519	177.33	25.039
174.29	20.171	175.31	21.926	176.33	23.549	177.35	25.068
174.31	20.207	175.33	21.959	176.35	23.580	177.37	25.097
174.33	20.243	175.35	21.991	176.37	23.611	177.39	25.126
174.35	20.279	175.37	22.024	176.39	23.642	177.41	25.155
174.37	20.314	175.39	22.057	176.41	23.672	177.43	25.184
174.39	20.350	175.41	22.090	176.43	23.703	177.45	25.212
174.41	20.386	175.43	22.123	176.45	23.733	177.47	25.241
174.43	20.421	175.45	22.155	176.47	23.764	177.49	25.270
174.45	20.456	175.47	22.188	176.49	23.794	177.51	25.298
174.47	20.492	175.49	22.221	176.51	23.825	177.53	25.327
174.49	20.527	175.51	22.253	176.53	23.855	177.55	25.356
174.51	20.562	175.53	22.286	176.55	23.885	177.57	25.384
174.53	20.598	175.55	22.318	176.57	23.916	177.59	25.413
174.55	20.633	175.57	22.351	176.59	23.946	177.61	25.441
174.57	20.668	175.59	22.383	176.61	23.976	177.63	25.470
174.59	20.703	175.61	22.415	176.63	24.006	177.65	25.498
174.61	20.738	175.63	22.448	176.65	24.036	177.67	25.526
174.63	20.773	175.65	22.480	176.67	24.066	177.69	25.555
174.65	20.807	175.67	22.512	176.69	24.096	177.71	25.583
174.67	20.842	175.69	22.544	176.71	24.127	177.73	25.611
174.69	20.877	175.71	22.576	176.73	24.157	177.75	25.639
174.71	20.911	175.73	22.608	176.75	24.186	177.77	25.668
174.73	20.946	175.75	22.640	176.77	24.216	177.79	25.696
174.75	20.981	175.77	22.672	176.79	24.246	177.81	25.724
174.77	21.015	175.79	22.704	176.81	24.276	177.83	25.752
174.79	21.050	175.81	22.736	176.83	24.306	177.85	25.780
174.81	21.084	175.83	22.768	176.85	24.336	177.87	25.808
174.83	21.118	175.85	22.800	176.87	24.365	177.89	25.836
174.85	21.152	175.87	22.831	176.89	24.395	177.91	25.864

Stage-Discharge for Pond 1P: UG1 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
177.93	25.892	178.95	27.281	179.97	28.603	180.99	29.866
177.95	25.920	178.97	27.308	179.99	28.628	181.01	29.890
177.97	25.948	178.99	27.334	180.01	28.653	181.03	29.914
177.99	25.976	179.01	27.361	180.03	28.678	181.05	29.938
178.01	26.004	179.03	27.387	180.05	28.704	181.07	29.962
178.03	26.032	179.05	27.414	180.07	28.729	181.09	29.987
178.05	26.060	179.07	27.440	180.09	28.754	181.11	30.011
178.07	26.087	179.09	27.466	180.11	28.779	181.13	30.035
178.09	26.115	179.11	27.493	180.13	28.804	181.15	30.059
178.11	26.143	179.13	27.519	180.15	28.830	181.17	30.083
178.13	26.171	179.15	27.545	180.17	28.855	181.19	30.107
178.15	26.198	179.17	27.572	180.19	28.880	181.21	30.131
178.17	26.226	179.19	27.598	180.21	28.905	181.23	30.155
178.19	26.253	179.21	27.624	180.23	28.930	181.25	30.179
178.21	26.281	179.23	27.650	180.25	28.955	181.27	30.203
178.23	26.308	179.25	27.676	180.27	28.980	181.29	30.227
178.25	26.336	179.27	27.703	180.29	29.005	181.31	30.251
178.27	26.363	179.29	27.729	180.31	29.030	181.33	30.275
178.29	26.391	179.31	27.755	180.33	29.055	181.35	30.299
178.31	26.418	179.33	27.781	180.35	29.080	181.37	30.323
178.33	26.446	179.35	27.807	180.37	29.104	181.39	30.347
178.35	26.473	179.37	27.833	180.39	29.129	181.41	30.370
178.37	26.500	179.39	27.859	180.41	29.154	181.43	30.394
178.39	26.528	179.41	27.885	180.43	29.179	181.45	30.418
178.41	26.555	179.43	27.911	180.45	29.204	181.47	30.442
178.43	26.582	179.45	27.937	180.47	29.229	181.49	30.466
178.45	26.609	179.47	27.963	180.49	29.253	181.51	30.489
178.47	26.637	179.49	27.989	180.51	29.278	181.53	30.513
178.49	26.664	179.51	28.014	180.53	29.303	181.55	30.537
178.51	26.691	179.53	28.040	180.55	29.327	181.57	30.561
178.53	26.718	179.55	28.066	180.57	29.352	181.59	30.584
178.55	26.745	179.57	28.092	180.59	29.377	181.61	30.608
178.57	26.772	179.59	28.118	180.61	29.401	181.63	30.632
178.59	26.799	179.61	28.143	180.63	29.426	181.65	30.655
178.61	26.826	179.63	28.169	180.65	29.451	181.67	30.679
178.63	26.853	179.65	28.195	180.67	29.475	181.69	30.702
178.65	26.880	179.67	28.220	180.69	29.500	181.71	30.726
178.67	26.907	179.69	28.246	180.71	29.524	181.73	30.750
178.69	26.934	179.71	28.272	180.73	29.549	181.75	30.773
178.71	26.961	179.73	28.297	180.75	29.573	181.77	30.797
178.73	26.988	179.75	28.323	180.77	29.598	181.79	30.820
178.75	27.014	179.77	28.348	180.79	29.622	181.81	30.844
178.77	27.041	179.79	28.374	180.81	29.647	181.83	30.867
178.79	27.068	179.81	28.399	180.83	29.671	181.85	30.890
178.81	27.095	179.83	28.425	180.85	29.695	181.87	30.914
178.83	27.121	179.85	28.450	180.87	29.720	181.89	30.937
178.85	27.148	179.87	28.476	180.89	29.744	181.91	30.961
178.87	27.175	179.89	28.501	180.91	29.769	181.93	30.984
178.89	27.201	179.91	28.527	180.93	29.793	181.95	31.007
178.91	27.228	179.93	28.552	180.95	29.817	181.97	31.031
178.93	27.255	179.95	28.577	180.97	29.841	181.99	31.054

Stage-Discharge for Pond 1P: UG1 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
182.01	31.077	183.03	32.244	184.05	33.369	185.07	34.458
182.03	31.101	183.05	32.266	184.07	33.391	185.09	34.479
182.05	31.124	183.07	32.288	184.09	33.412	185.11	34.500
182.07	31.147	183.09	32.311	184.11	33.434	185.13	34.521
182.09	31.170	183.11	32.333	184.13	33.456	185.15	34.542
182.11	31.194	183.13	32.356	184.15	33.477	185.17	34.563
182.13	31.217	183.15	32.378	184.17	33.499	185.19	34.584
182.15	31.240	183.17	32.400	184.19	33.521	185.21	34.605
182.17	31.263	183.19	32.423	184.21	33.542	185.23	34.626
182.19	31.286	183.21	32.445	184.23	33.564	185.25	34.646
182.21	31.309	183.23	32.467	184.25	33.585	185.27	34.667
182.23	31.333	183.25	32.490	184.27	33.607	185.29	34.688
182.25	31.356	183.27	32.512	184.29	33.628	185.31	34.709
182.27	31.379	183.29	32.534	184.31	33.650	185.33	34.730
182.29	31.402	183.31	32.556	184.33	33.671	185.35	34.751
182.31	31.425	183.33	32.579	184.35	33.693	185.37	34.772
182.33	31.448	183.35	32.601	184.37	33.714	185.39	34.792
182.35	31.471	183.37	32.623	184.39	33.736	185.41	34.813
182.37	31.494	183.39	32.645	184.41	33.757	185.43	34.834
182.39	31.517	183.41	32.667	184.43	33.779	185.45	34.855
182.41	31.540	183.43	32.690	184.45	33.800	185.47	34.876
182.43	31.563	183.45	32.712	184.47	33.822	185.49	34.896
182.45	31.586	183.47	32.734	184.49	33.843	185.51	34.917
182.47	31.609	183.49	32.756	184.51	33.864	185.53	34.938
182.49	31.632	183.51	32.778	184.53	33.886	185.55	34.959
182.51	31.654	183.53	32.800	184.55	33.907	185.57	34.979
182.53	31.677	183.55	32.822	184.57	33.929	185.59	35.000
182.55	31.700	183.57	32.844	184.59	33.950	185.61	35.021
182.57	31.723	183.59	32.866	184.61	33.971	185.63	35.041
182.59	31.746	183.61	32.888	184.63	33.992	185.65	35.062
182.61	31.769	183.63	32.910	184.65	34.014	185.67	35.083
182.63	31.791	183.65	32.932	184.67	34.035	185.69	35.103
182.65	31.814	183.67	32.954	184.69	34.056	185.71	35.124
182.67	31.837	183.69	32.976	184.71	34.078	185.73	35.144
182.69	31.860	183.71	32.998	184.73	34.099	185.75	35.165
182.71	31.882	183.73	33.020	184.75	34.120	185.77	35.186
182.73	31.905	183.75	33.042	184.77	34.141	185.79	35.206
182.75	31.928	183.77	33.064	184.79	34.162	185.81	35.227
182.77	31.950	183.79	33.086	184.81	34.184	185.83	35.247
182.79	31.973	183.81	33.108	184.83	34.205	185.85	35.268
182.81	31.996	183.83	33.130	184.85	34.226	185.87	35.288
182.83	32.018	183.85	33.151	184.87	34.247	185.89	35.309
182.85	32.041	183.87	33.173	184.89	34.268	185.91	35.329
182.87	32.063	183.89	33.195	184.91	34.289	185.93	35.350
182.89	32.086	183.91	33.217	184.93	34.310	185.95	35.370
182.91	32.109	183.93	33.239	184.95	34.332	185.97	35.391
182.93	32.131	183.95	33.260	184.97	34.353	185.99	35.411
182.95	32.154	183.97	33.282	184.99	34.374	186.01	35.432
182.97	32.176	183.99	33.304	185.01	34.395	186.03	35.452
182.99	32.199	184.01	33.326	185.03	34.416	186.05	35.472
183.01	32.221	184.03	33.347	185.05	34.437	186.07	35.493

Stage-Discharge for Pond 1P: UG1 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
186.09	35.513	187.11	36.538
186.11	35.534	187.13	36.558
186.13	35.554	187.15	36.578
186.15	35.574	187.17	36.598
186.17	35.595	187.19	36.617
186.19	35.615	187.21	36.637
186.21	35.635	187.23	36.657
186.23	35.656	187.25	36.677
186.25	35.676	187.27	36.696
186.27	35.696	187.29	36.716
186.29	35.717	187.31	36.736
186.31	35.737	187.33	36.756
186.33	35.757	187.35	36.775
186.35	35.777	187.37	36.795
186.37	35.798	187.39	36.815
186.39	35.818	187.41	36.834
186.41	35.838	187.43	36.854
186.43	35.858	187.45	36.874
186.45	35.878	187.47	36.893
186.47	35.899	187.49	36.913
186.49	35.919	187.51	36.932
186.51	35.939	187.53	36.952
186.53	35.959	187.55	36.972
186.55	35.979	187.57	36.991
186.57	35.999	187.59	37.011
186.59	36.019	187.61	37.030
186.61	36.039	187.63	37.050
186.63	36.060	187.65	37.069
186.65	36.080	187.67	37.089
186.67	36.100	187.69	37.108
186.69	36.120	187.71	37.128
186.71	36.140	187.73	37.147
186.73	36.160	187.75	37.167
186.75	36.180	187.77	37.186
186.77	36.200	187.79	37.206
186.79	36.220	187.81	37.225
186.81	36.240	187.83	**37.245**
186.83	36.260		
186.85	36.280		
186.87	36.300		
186.89	36.320		
186.91	36.340		
186.93	36.359		
186.95	36.379		
186.97	36.399		
186.99	36.419		
187.01	36.439		
187.03	36.459		
187.05	36.479		
187.07	36.499		
187.09	36.518		

Summary for Pond 3P: UG2

Inflow Area = 21,519 sf, 87.04% Impervious, Inflow Depth = 6.59" for 100-yr event
Inflow = 4.938 cfs @ 11.96 hrs, Volume= 11,819 cf
Outflow = 7.249 cfs @ 11.95 hrs, Volume= 7,627 cf, Atten= 0%, Lag= 0.0 min
Primary = 7.249 cfs @ 11.95 hrs, Volume= 7,627 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= 169.40' @ 11.95 hrs Surf.Area= 2,542 sf Storage= 4,234 cf

Plug-Flow detention time= 207.1 min calculated for 7,627 cf (65% of inflow)
Center-of-Mass det. time= 98.4 min (838.6 - 740.2)

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'	**5.0" 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= 36.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 159.28' / 159.10' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf

Primary OutFlow Max=7.232 cfs @ 11.95 hrs HW=169.39' TW=168.67' (Fixed TW Elev= 168.67')
└─**4=Culvert** (Inlet Controls 7.232 cfs @ 4.093 fps)
  ├─**1=Orifice/Grate** (Passes < 0.201 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes < 0.426 cfs potential flow)
  └─**3=Broad-Crested Rectangular Weir** (Passes < 136.267 cfs potential flow)

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	0.000	160.30	0.000	160.81	0.000
159.29	0.000	159.80	0.000	160.31	0.000	160.82	0.000
159.30	0.000	159.81	0.000	160.32	0.000	160.83	0.000
159.31	0.000	159.82	0.000	160.33	0.000	160.84	0.000
159.32	0.000	159.83	0.000	160.34	0.000	160.85	0.000
159.33	0.000	159.84	0.000	160.35	0.000	160.86	0.000
159.34	0.000	159.85	0.000	160.36	0.000	160.87	0.000
159.35	0.000	159.86	0.000	160.37	0.000	160.88	0.000
159.36	0.000	159.87	0.000	160.38	0.000	160.89	0.000
159.37	0.000	159.88	0.000	160.39	0.000	160.90	0.000
159.38	0.000	159.89	0.000	160.40	0.000	160.91	0.000
159.39	0.000	159.90	0.000	160.41	0.000	160.92	0.000
159.40	0.000	159.91	0.000	160.42	0.000	160.93	0.000
159.41	0.000	159.92	0.000	160.43	0.000	160.94	0.000
159.42	0.000	159.93	0.000	160.44	0.000	160.95	0.000
159.43	0.000	159.94	0.000	160.45	0.000	160.96	0.000
159.44	0.000	159.95	0.000	160.46	0.000	160.97	0.000
159.45	0.000	159.96	0.000	160.47	0.000	160.98	0.000
159.46	0.000	159.97	0.000	160.48	0.000	160.99	0.000
159.47	0.000	159.98	0.000	160.49	0.000	161.00	0.000
159.48	0.000	159.99	0.000	160.50	0.000	161.01	0.000
159.49	0.000	160.00	0.000	160.51	0.000	161.02	0.000
159.50	0.000	160.01	0.000	160.52	0.000	161.03	0.000
159.51	0.000	160.02	0.000	160.53	0.000	161.04	0.000
159.52	0.000	160.03	0.000	160.54	0.000	161.05	0.000
159.53	0.000	160.04	0.000	160.55	0.000	161.06	0.000
159.54	0.000	160.05	0.000	160.56	0.000	161.07	0.000
159.55	0.000	160.06	0.000	160.57	0.000	161.08	0.000
159.56	0.000	160.07	0.000	160.58	0.000	161.09	0.000
159.57	0.000	160.08	0.000	160.59	0.000	161.10	0.000
159.58	0.000	160.09	0.000	160.60	0.000	161.11	0.000
159.59	0.000	160.10	0.000	160.61	0.000	161.12	0.000
159.60	0.000	160.11	0.000	160.62	0.000	161.13	0.000
159.61	0.000	160.12	0.000	160.63	0.000	161.14	0.000
159.62	0.000	160.13	0.000	160.64	0.000	161.15	0.000
159.63	0.000	160.14	0.000	160.65	0.000	161.16	0.000
159.64	0.000	160.15	0.000	160.66	0.000	161.17	0.000
159.65	0.000	160.16	0.000	160.67	0.000	161.18	0.000
159.66	0.000	160.17	0.000	160.68	0.000	161.19	0.000
159.67	0.000	160.18	0.000	160.69	0.000	161.20	0.000
159.68	0.000	160.19	0.000	160.70	0.000	161.21	0.000
159.69	0.000	160.20	0.000	160.71	0.000	161.22	0.000
159.70	0.000	160.21	0.000	160.72	0.000	161.23	0.000
159.71	0.000	160.22	0.000	160.73	0.000	161.24	0.000
159.72	0.000	160.23	0.000	160.74	0.000	161.25	0.000
159.73	0.000	160.24	0.000	160.75	0.000	161.26	0.000
159.74	0.000	160.25	0.000	160.76	0.000	161.27	0.000
159.75	0.000	160.26	0.000	160.77	0.000	161.28	0.000
159.76	0.000	160.27	0.000	160.78	0.000	161.29	0.000
159.77	0.000	160.28	0.000	160.79	0.000	161.30	0.000
159.78	0.000	160.29	0.000	160.80	0.000	161.31	0.000

Stage-Discharge for Pond 3P: UG2 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
161.32	0.000	161.83	0.000	162.34	0.000	162.85	0.000
161.33	0.000	161.84	0.000	162.35	0.000	162.86	0.000
161.34	0.000	161.85	0.000	162.36	0.000	162.87	0.000
161.35	0.000	161.86	0.000	162.37	0.000	162.88	0.000
161.36	0.000	161.87	0.000	162.38	0.000	162.89	0.000
161.37	0.000	161.88	0.000	162.39	0.000	162.90	0.000
161.38	0.000	161.89	0.000	162.40	0.000	162.91	0.000
161.39	0.000	161.90	0.000	162.41	0.000	162.92	0.000
161.40	0.000	161.91	0.000	162.42	0.000	162.93	0.000
161.41	0.000	161.92	0.000	162.43	0.000	162.94	0.000
161.42	0.000	161.93	0.000	162.44	0.000	162.95	0.000
161.43	0.000	161.94	0.000	162.45	0.000	162.96	0.000
161.44	0.000	161.95	0.000	162.46	0.000	162.97	0.000
161.45	0.000	161.96	0.000	162.47	0.000	162.98	0.000
161.46	0.000	161.97	0.000	162.48	0.000	162.99	0.000
161.47	0.000	161.98	0.000	162.49	0.000	163.00	0.000
161.48	0.000	161.99	0.000	162.50	0.000	163.01	0.000
161.49	0.000	162.00	0.000	162.51	0.000	163.02	0.000
161.50	0.000	162.01	0.000	162.52	0.000	163.03	0.000
161.51	0.000	162.02	0.000	162.53	0.000	163.04	0.000
161.52	0.000	162.03	0.000	162.54	0.000	163.05	0.000
161.53	0.000	162.04	0.000	162.55	0.000	163.06	0.000
161.54	0.000	162.05	0.000	162.56	0.000	163.07	0.000
161.55	0.000	162.06	0.000	162.57	0.000	163.08	0.000
161.56	0.000	162.07	0.000	162.58	0.000	163.09	0.000
161.57	0.000	162.08	0.000	162.59	0.000	163.10	0.000
161.58	0.000	162.09	0.000	162.60	0.000	163.11	0.000
161.59	0.000	162.10	0.000	162.61	0.000	163.12	0.000
161.60	0.000	162.11	0.000	162.62	0.000	163.13	0.000
161.61	0.000	162.12	0.000	162.63	0.000	163.14	0.000
161.62	0.000	162.13	0.000	162.64	0.000	163.15	0.000
161.63	0.000	162.14	0.000	162.65	0.000	163.16	0.000
161.64	0.000	162.15	0.000	162.66	0.000	163.17	0.000
161.65	0.000	162.16	0.000	162.67	0.000	163.18	0.000
161.66	0.000	162.17	0.000	162.68	0.000	163.19	0.000
161.67	0.000	162.18	0.000	162.69	0.000	163.20	0.000
161.68	0.000	162.19	0.000	162.70	0.000	163.21	0.000
161.69	0.000	162.20	0.000	162.71	0.000	163.22	0.000
161.70	0.000	162.21	0.000	162.72	0.000	163.23	0.000
161.71	0.000	162.22	0.000	162.73	0.000	163.24	0.000
161.72	0.000	162.23	0.000	162.74	0.000	163.25	0.000
161.73	0.000	162.24	0.000	162.75	0.000	163.26	0.000
161.74	0.000	162.25	0.000	162.76	0.000	163.27	0.000
161.75	0.000	162.26	0.000	162.77	0.000	163.28	0.000
161.76	0.000	162.27	0.000	162.78	0.000	163.29	0.000
161.77	0.000	162.28	0.000	162.79	0.000	163.30	0.000
161.78	0.000	162.29	0.000	162.80	0.000	163.31	0.000
161.79	0.000	162.30	0.000	162.81	0.000	163.32	0.000
161.80	0.000	162.31	0.000	162.82	0.000	163.33	0.000
161.81	0.000	162.32	0.000	162.83	0.000	163.34	0.000
161.82	0.000	162.33	0.000	162.84	0.000	163.35	0.000

Stage-Discharge for Pond 3P: UG2 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
163.36	0.000	163.87	0.000	164.38	0.000	164.89	0.000
163.37	0.000	163.88	0.000	164.39	0.000	164.90	0.000
163.38	0.000	163.89	0.000	164.40	0.000	164.91	0.000
163.39	0.000	163.90	0.000	164.41	0.000	164.92	0.000
163.40	0.000	163.91	0.000	164.42	0.000	164.93	0.000
163.41	0.000	163.92	0.000	164.43	0.000	164.94	0.000
163.42	0.000	163.93	0.000	164.44	0.000	164.95	0.000
163.43	0.000	163.94	0.000	164.45	0.000	164.96	0.000
163.44	0.000	163.95	0.000	164.46	0.000	164.97	0.000
163.45	0.000	163.96	0.000	164.47	0.000	164.98	0.000
163.46	0.000	163.97	0.000	164.48	0.000	164.99	0.000
163.47	0.000	163.98	0.000	164.49	0.000	165.00	0.000
163.48	0.000	163.99	0.000	164.50	0.000	165.01	0.000
163.49	0.000	164.00	0.000	164.51	0.000	165.02	0.000
163.50	0.000	164.01	0.000	164.52	0.000	165.03	0.000
163.51	0.000	164.02	0.000	164.53	0.000	165.04	0.000
163.52	0.000	164.03	0.000	164.54	0.000	165.05	0.000
163.53	0.000	164.04	0.000	164.55	0.000	165.06	0.000
163.54	0.000	164.05	0.000	164.56	0.000	165.07	0.000
163.55	0.000	164.06	0.000	164.57	0.000	165.08	0.000
163.56	0.000	164.07	0.000	164.58	0.000	165.09	0.000
163.57	0.000	164.08	0.000	164.59	0.000	165.10	0.000
163.58	0.000	164.09	0.000	164.60	0.000	165.11	0.000
163.59	0.000	164.10	0.000	164.61	0.000	165.12	0.000
163.60	0.000	164.11	0.000	164.62	0.000	165.13	0.000
163.61	0.000	164.12	0.000	164.63	0.000	165.14	0.000
163.62	0.000	164.13	0.000	164.64	0.000	165.15	0.000
163.63	0.000	164.14	0.000	164.65	0.000	165.16	0.000
163.64	0.000	164.15	0.000	164.66	0.000	165.17	0.000
163.65	0.000	164.16	0.000	164.67	0.000	165.18	0.000
163.66	0.000	164.17	0.000	164.68	0.000	165.19	0.000
163.67	0.000	164.18	0.000	164.69	0.000	165.20	0.000
163.68	0.000	164.19	0.000	164.70	0.000	165.21	0.000
163.69	0.000	164.20	0.000	164.71	0.000	165.22	0.000
163.70	0.000	164.21	0.000	164.72	0.000	165.23	0.000
163.71	0.000	164.22	0.000	164.73	0.000	165.24	0.000
163.72	0.000	164.23	0.000	164.74	0.000	165.25	0.000
163.73	0.000	164.24	0.000	164.75	0.000	165.26	0.000
163.74	0.000	164.25	0.000	164.76	0.000	165.27	0.000
163.75	0.000	164.26	0.000	164.77	0.000	165.28	0.000
163.76	0.000	164.27	0.000	164.78	0.000	165.29	0.000
163.77	0.000	164.28	0.000	164.79	0.000	165.30	0.000
163.78	0.000	164.29	0.000	164.80	0.000	165.31	0.000
163.79	0.000	164.30	0.000	164.81	0.000	165.32	0.000
163.80	0.000	164.31	0.000	164.82	0.000	165.33	0.000
163.81	0.000	164.32	0.000	164.83	0.000	165.34	0.000
163.82	0.000	164.33	0.000	164.84	0.000	165.35	0.000
163.83	0.000	164.34	0.000	164.85	0.000	165.36	0.000
163.84	0.000	164.35	0.000	164.86	0.000	165.37	0.000
163.85	0.000	164.36	0.000	164.87	0.000	165.38	0.000
163.86	0.000	164.37	0.000	164.88	0.000	165.39	0.000

Stage-Discharge for Pond 3P: UG2 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
165.40	0.000	165.91	0.000	166.42	0.000	166.93	0.000
165.41	0.000	165.92	0.000	166.43	0.000	166.94	0.000
165.42	0.000	165.93	0.000	166.44	0.000	166.95	0.000
165.43	0.000	165.94	0.000	166.45	0.000	166.96	0.000
165.44	0.000	165.95	0.000	166.46	0.000	166.97	0.000
165.45	0.000	165.96	0.000	166.47	0.000	166.98	0.000
165.46	0.000	165.97	0.000	166.48	0.000	166.99	0.000
165.47	0.000	165.98	0.000	166.49	0.000	167.00	0.000
165.48	0.000	165.99	0.000	166.50	0.000	167.01	0.000
165.49	0.000	166.00	0.000	166.51	0.000	167.02	0.000
165.50	0.000	166.01	0.000	166.52	0.000	167.03	0.000
165.51	0.000	166.02	0.000	166.53	0.000	167.04	0.000
165.52	0.000	166.03	0.000	166.54	0.000	167.05	0.000
165.53	0.000	166.04	0.000	166.55	0.000	167.06	0.000
165.54	0.000	166.05	0.000	166.56	0.000	167.07	0.000
165.55	0.000	166.06	0.000	166.57	0.000	167.08	0.000
165.56	0.000	166.07	0.000	166.58	0.000	167.09	0.000
165.57	0.000	166.08	0.000	166.59	0.000	167.10	0.000
165.58	0.000	166.09	0.000	166.60	0.000	167.11	0.000
165.59	0.000	166.10	0.000	166.61	0.000	167.12	0.000
165.60	0.000	166.11	0.000	166.62	0.000	167.13	0.000
165.61	0.000	166.12	0.000	166.63	0.000	167.14	0.000
165.62	0.000	166.13	0.000	166.64	0.000	167.15	0.000
165.63	0.000	166.14	0.000	166.65	0.000	167.16	0.000
165.64	0.000	166.15	0.000	166.66	0.000	167.17	0.000
165.65	0.000	166.16	0.000	166.67	0.000	167.18	0.000
165.66	0.000	166.17	0.000	166.68	0.000	167.19	0.000
165.67	0.000	166.18	0.000	166.69	0.000	167.20	0.000
165.68	0.000	166.19	0.000	166.70	0.000	167.21	0.000
165.69	0.000	166.20	0.000	166.71	0.000	167.22	0.000
165.70	0.000	166.21	0.000	166.72	0.000	167.23	0.000
165.71	0.000	166.22	0.000	166.73	0.000	167.24	0.000
165.72	0.000	166.23	0.000	166.74	0.000	167.25	0.000
165.73	0.000	166.24	0.000	166.75	0.000	167.26	0.000
165.74	0.000	166.25	0.000	166.76	0.000	167.27	0.000
165.75	0.000	166.26	0.000	166.77	0.000	167.28	0.000
165.76	0.000	166.27	0.000	166.78	0.000	167.29	0.000
165.77	0.000	166.28	0.000	166.79	0.000	167.30	0.000
165.78	0.000	166.29	0.000	166.80	0.000	167.31	0.000
165.79	0.000	166.30	0.000	166.81	0.000	167.32	0.000
165.80	0.000	166.31	0.000	166.82	0.000	167.33	0.000
165.81	0.000	166.32	0.000	166.83	0.000	167.34	0.000
165.82	0.000	166.33	0.000	166.84	0.000	167.35	0.000
165.83	0.000	166.34	0.000	166.85	0.000	167.36	0.000
165.84	0.000	166.35	0.000	166.86	0.000	167.37	0.000
165.85	0.000	166.36	0.000	166.87	0.000	167.38	0.000
165.86	0.000	166.37	0.000	166.88	0.000	167.39	0.000
165.87	0.000	166.38	0.000	166.89	0.000	167.40	0.000
165.88	0.000	166.39	0.000	166.90	0.000	167.41	0.000
165.89	0.000	166.40	0.000	166.91	0.000	167.42	0.000
165.90	0.000	166.41	0.000	166.92	0.000	167.43	0.000

Stage-Discharge for Pond 3P: UG2 (continued)

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
167.44	0.000	167.95	0.000	168.46	0.000	168.97	4.660
167.45	0.000	167.96	0.000	168.47	0.000	168.98	4.737
167.46	0.000	167.97	0.000	168.48	0.000	168.99	4.813
167.47	0.000	167.98	0.000	168.49	0.000	169.00	4.888
167.48	0.000	167.99	0.000	168.50	0.000	169.01	4.961
167.49	0.000	168.00	0.000	168.51	0.000	169.02	5.034
167.50	0.000	168.01	0.000	168.52	0.000	169.03	5.105
167.51	0.000	168.02	0.000	168.53	0.000	169.04	5.176
167.52	0.000	168.03	0.000	168.54	0.000	169.05	5.245
167.53	0.000	168.04	0.000	168.55	0.000	169.06	5.314
167.54	0.000	168.05	0.000	168.56	0.000	169.07	5.381
167.55	0.000	168.06	0.000	168.57	0.000	169.08	5.448
167.56	0.000	168.07	0.000	168.58	0.000	169.09	5.514
167.57	0.000	168.08	0.000	168.59	0.000	169.10	5.580
167.58	0.000	168.09	0.000	168.60	0.000	169.11	5.644
167.59	0.000	168.10	0.000	168.61	0.000	169.12	5.708
167.60	0.000	168.11	0.000	168.62	0.000	169.13	5.771
167.61	0.000	168.12	0.000	168.63	0.000	169.14	5.833
167.62	0.000	168.13	0.000	168.64	0.000	169.15	5.895
167.63	0.000	168.14	0.000	168.65	0.000	169.16	5.956
167.64	0.000	168.15	0.000	168.66	0.000	169.17	6.017
167.65	0.000	168.16	0.000	168.67	0.000	169.18	6.076
167.66	0.000	168.17	0.000	168.68	0.851	169.19	6.136
167.67	0.000	168.18	0.000	168.69	1.203	169.20	6.194
167.68	0.000	168.19	0.000	168.70	1.474	169.21	6.253
167.69	0.000	168.20	0.000	168.71	1.702	169.22	6.310
167.70	0.000	168.21	0.000	168.72	1.903	169.23	6.367
167.71	0.000	168.22	0.000	168.73	2.084	169.24	6.424
167.72	0.000	168.23	0.000	168.74	2.251	169.25	6.480
167.73	0.000	168.24	0.000	168.75	2.407	169.26	6.536
167.74	0.000	168.25	0.000	168.76	2.553	169.27	6.591
167.75	0.000	168.26	0.000	168.77	2.691	169.28	6.646
167.76	0.000	168.27	0.000	168.78	2.822	169.29	6.700
167.77	0.000	168.28	0.000	168.79	2.948	169.30	6.754
167.78	0.000	168.29	0.000	168.80	3.068	169.31	6.807
167.79	0.000	168.30	0.000	168.81	3.184	169.32	6.860
167.80	0.000	168.31	0.000	168.82	3.295	169.33	6.913
167.81	0.000	168.32	0.000	168.83	3.404	169.34	6.965
167.82	0.000	168.33	0.000	168.84	3.508	169.35	7.017
167.83	0.000	168.34	0.000	168.85	3.610	169.36	7.068
167.84	0.000	168.35	0.000	168.86	3.709	169.37	7.119
167.85	0.000	168.36	0.000	168.87	3.805	169.38	7.170
167.86	0.000	168.37	0.000	168.88	3.899	169.39	7.220
167.87	0.000	168.38	0.000	168.89	3.991	169.40	7.270
167.88	0.000	168.39	0.000	168.90	4.081	169.41	7.320
167.89	0.000	168.40	0.000	168.91	4.168	169.42	**7.369**
167.90	0.000	168.41	0.000	168.92	4.254		
167.91	0.000	168.42	0.000	168.93	4.339		
167.92	0.000	168.43	0.000	168.94	4.421		
167.93	0.000	168.44	0.000	168.95	4.502		
167.94	0.000	168.45	0.000	168.96	4.582		

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. BUILDING CONSTRUCTION OF THE PARKING STRUCTURE (PART-A) 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. AREAS UNDER THE INITIAL PARKING GARAGE AREA SHALL BE STABILIZED IMMEDIATELY WITH R-3 RIPRAP UPON ACHIEVING FINAL GRADE, WITH COMPOST FILTER SOCK SEDIMENT TRAP #1 REMOVED AFTER STABILIZATION WITH ROCK AND PRIOR TO THE INSTALLATION OF THE SOUTHERN FOUNDATION WALL.
7. UPON COMPLETION OF PARKING STRUCTURE PART-A AND COORDINATION WITH SITE OWNER, 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.
11. **CRITICAL STAGE -** UNDERGROUND DETENTION BASIN 2 - UPON REMOVAL OF EXISTING BUILDING 2 COMMENCE INSTALLATION OF UNDERGROUND DETENTION BASIN UG2. INITIATE STORM SEWER AND SUBSURFACE BASIN INSTALLATION FOR THE FEATURES SHOWN ON THE PLANS STARTING AT THE FURTHEST DOWNSTREAM STRUCTURE. **THE PERMITTEE SHALL PROVIDE ENGINEERING OVERSIGHT FOR THE CONSTRUCTION OF SUBSURFACE DETENTION BASIN, INCLUDING PREPARATION OF THE SUBGRADE AND INSTALLATION OF THE OUTLET CONTROL STRUCTURE (OCS-201). A LICENSED PROFESSIONAL OR DESIGNEE KNOWLEDGEABLE IN THE DESIGN AND CONSTRUCTION OF SUBSURFACE DETENTION BASINS, PREFERABLY THE DESIGN ENGINEER, SHALL CONDUCT THE OVERSIGHT.** GC TO INSTALL E&S BMPS (INLET PROTECTION) 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.]
12. UPON COMPLETION OF SUBSURFACE DETENTION BASIN UG2, 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.
13. UPON COMPLETION OF PARKING STRUCTURE (PART-A) AND SITE STABILIZATION FOR TRIBUTARY AREA OF FILTER SOCK SEDIMENT TRAP 1 (UNIFORM COVERAGE OR DENSITY OF 70% ACROSS ALL DISTURBED AREAS AND RIPRAP (R-3) STABILIZATION WITHIN FLOOD STORAGE ENVELOPE BENEATH FIRST FLOOR PARKING LEVEL) 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.
14. 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

15. INSTALL 100 FOOT ROCK CONSTRUCTION ENTRANCE AND STAGING AREAS AS DESIGNATED ON THE PLANS.
16. 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.
17. 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.
18. **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 BASINS, INCLUDING PREPARATION OF THE SUBGRADE AND OUTLET CONTROL STRUCTURE (OCS-103). A LICENSED PROFESSIONAL OR DESIGNEE KNOWLEDGEABLE IN THE DESIGN AND CONSTRUCTION OF SUBSURFACE MANAGED RELEASE CONCEPT BASINS, PREFERABLY THE DESIGN ENGINEER, SHALL CONDUCT THE OVERSIGHT.** GC TO INSTALL E&S BMPS (INLET PROTECTION) 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.] **INSTALL CULVERT REALIGNMENT FROM DOWNSTREAM TO UPSTREAM. PROVIDE BYPASS PUMPING DURING FINAL CONNECTION IF NECESSARY**
19. CONTINUE WITH THE BALANCE OF EARTHWORK INCLUDING UTILITY INSTALLATION (SANITARY, ELECTRIC, TELEPHONE, CABLE AND GAS) WHERE APPLICABLE.
20. INSTALL ALL CURBING SHOWN IN THIS PHASE AND INSTALL STONE BASE COURSE IN THE DRIVEWAY AND PARKING AREAS.
21. 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.
22. INSTALL BITUMINOUS PAVEMENT AND CONCRETE INCLUDING SIDEWALKS.
23. 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.**
24. 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.
25. 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.
26. DEMOBILIZE.
27. 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.	• INSPECT BASIN STRUCTURES INCLUDING BASIN BOTTOMS, OUTLET STRUCTURES, RIP-RAP STRUCTURES, AND INLETS FOR CLOGGING AND EXCESS DEBRIS.	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.
		ANNUALLY	• INSPECT BASIN STRUCTURES INCLUDING OUTLET STRUCTURES, RIP-RAP STRUCTURES, AND INLETS FOR DAMAGE.		
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.	• INSPECT BASIN STRUCTURES INCLUDING INSPECTION PORTS, BASIN BOTTOMS, OUTLET STRUCTURES, RIP-RAP STRUCTURES, UNDERDRAINS, AND INLETS FOR CLOGGING AND EXCESS DEBRIS.	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, FEDERAL, AND OSHA REGULATIONS. IF ENTRY INTO ANY MANHOLE IS REQUIRED, ALL LOCAL AND OSHA RULES FOR CONFINED SPACE ENTRIES MUST BE STRICTLY FOLLOWED.	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.
		ANNUALLY	• INSPECT BASIN STRUCTURES INCLUDING THE INSPECTION PORTS, OUTLET STRUCTURES, RIP-RAP STRUCTURES, UNDERDRAINS, AND INLETS FOR DAMAGE.		

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.

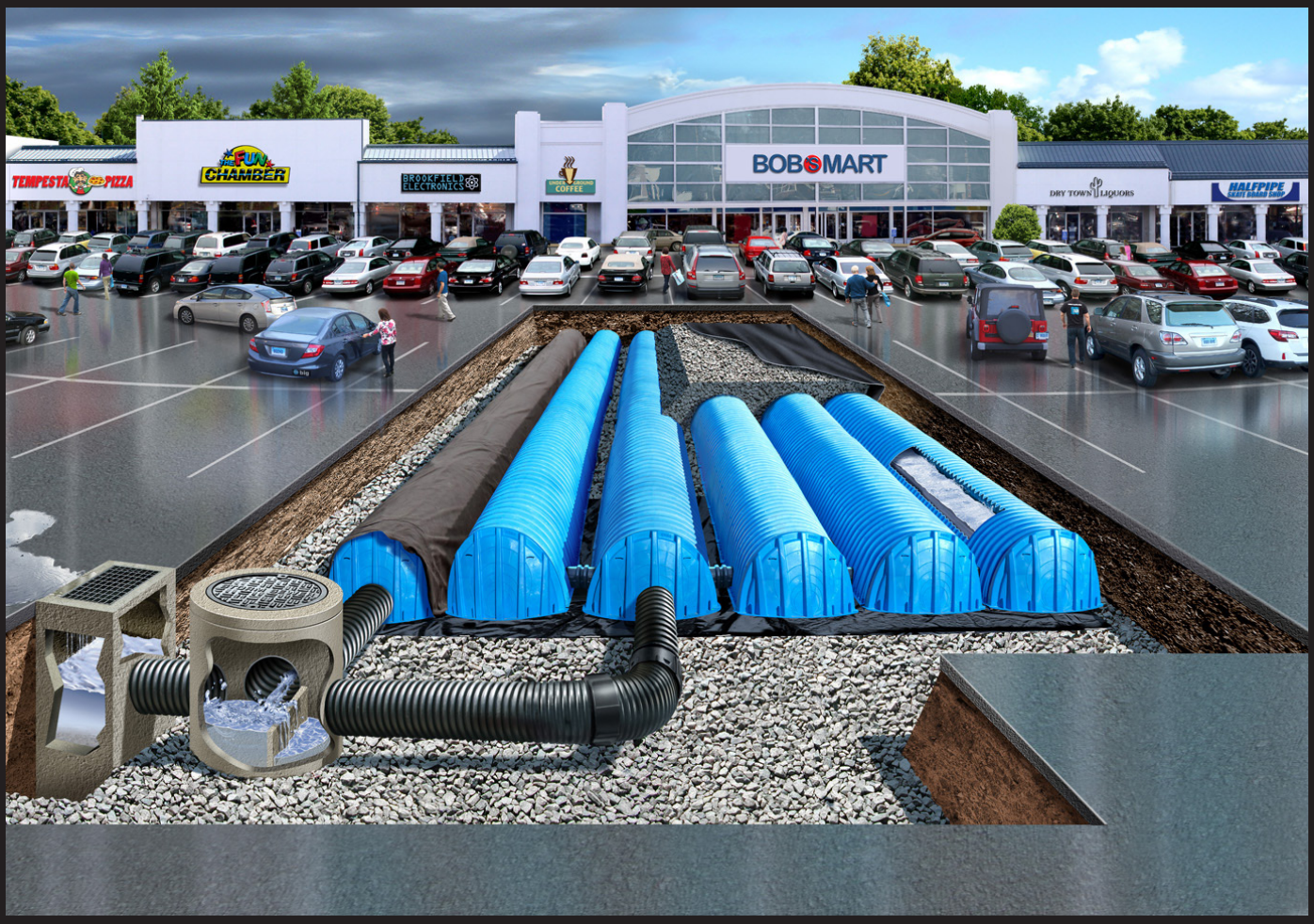
LIMITATION: ACIDIC, pH
RESOLUTIONS: APPLYING LIME CONSISTENT WITH RATES DETERMINED BY SOIL TESTING; SELECTING VEGETATIVE SPECIES TOLERANT TO ACIDIC SOIL CONDITIONS; AND IMPLEMENTING COMBINATIONS OF THESE AND/OR OTHER METHODS. SPECIFIC TOLERANCE INFORMATION IS PROVIDED IN TABLE 1 OF THE EROSION CONTROL & 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

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Published by
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Brookfield, Connecticut 06804 USA
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Doc ID: CLT043 02-22
Feb 2022

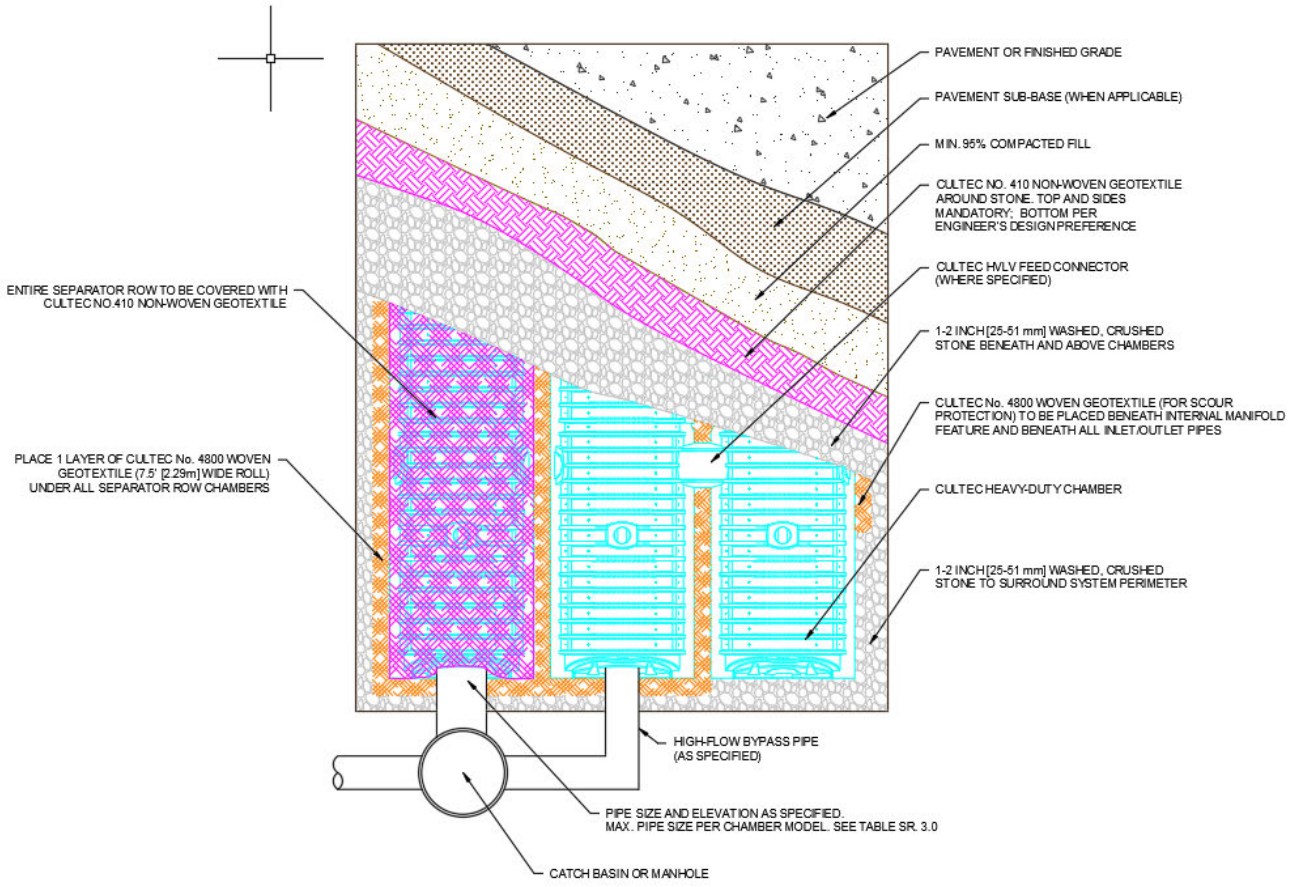
Introduction

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.



For more information, contact CULTEC at (203) 775-4416 or visit www.cultec.com.

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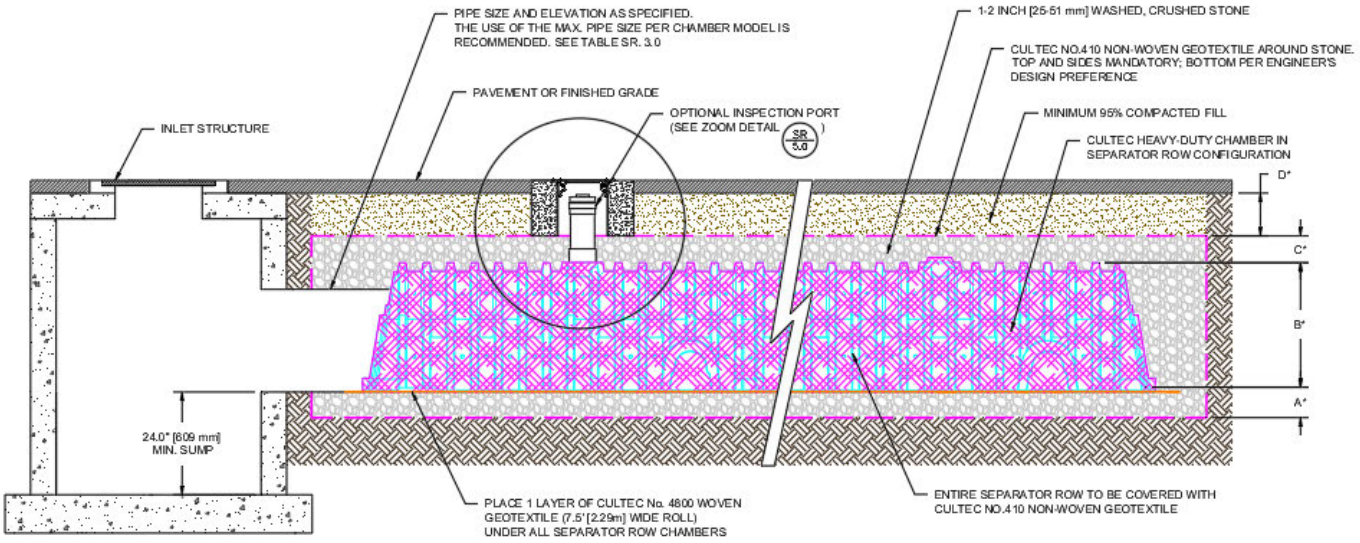
Design

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.

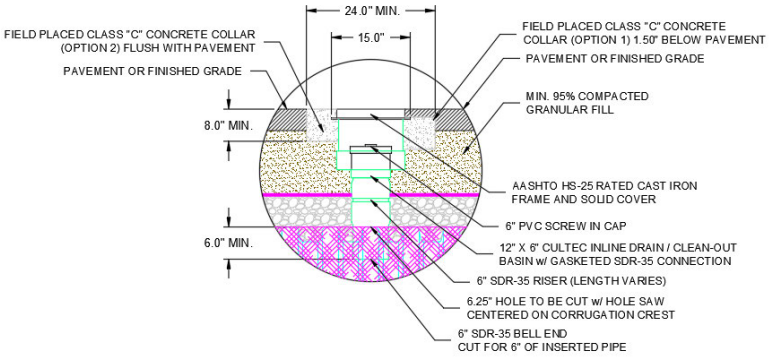
The following is a list of recommended design practices to ensure proper maintenance for the life of the system:

- 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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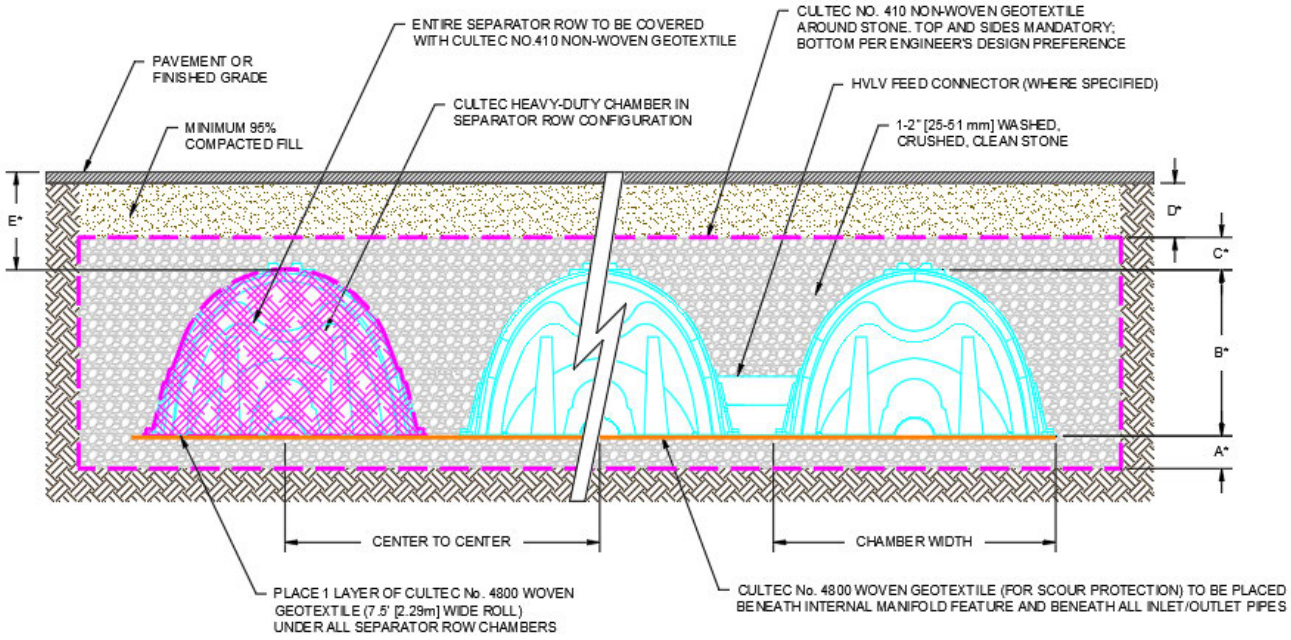

*SEE SR 3.0 - CROSS SECTION TABLE REFERENCE

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: ***10/28/2024***
BY: ***RS***
CHECKED BY: ***JAB***
SHEET NO.: ***Summary***
REVISION: ***0***

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)	3.479	27,284	5.499	34,155	8.012	45,136	9.773	54,430	12.153	68,410	14.095	80,443	17.849	93,452
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)	-2.517	8,555	-2.542	9,085	-3.282	9,794	-4.242	10,343	-5.888	11,153	-7.350	11,870	-7.214	12,650

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)	0.813	1,677	1.279	2,546	2.087	4,077	2.805	5,465	3.919	7,657	4.895	9,610	5.960	11,776
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)	-0.956	-1,814	-1.300	-2,488	-1.843	-3,585	-2.296	-4,520	-2.960	-5,927	-3.515	-7,133	-4.103	-8,433

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)	4.276	28,961	6.722	36,702	10.068	49,214	12.541	59,895	16.012	76,066	18.901	90,043	22.713	105,228
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)	-2.116	6,741	-1.895	6,598	-2.114	6,210	-2.669	5,825	-3.779	5,225	-4.823	4,727	-5.239	4,217

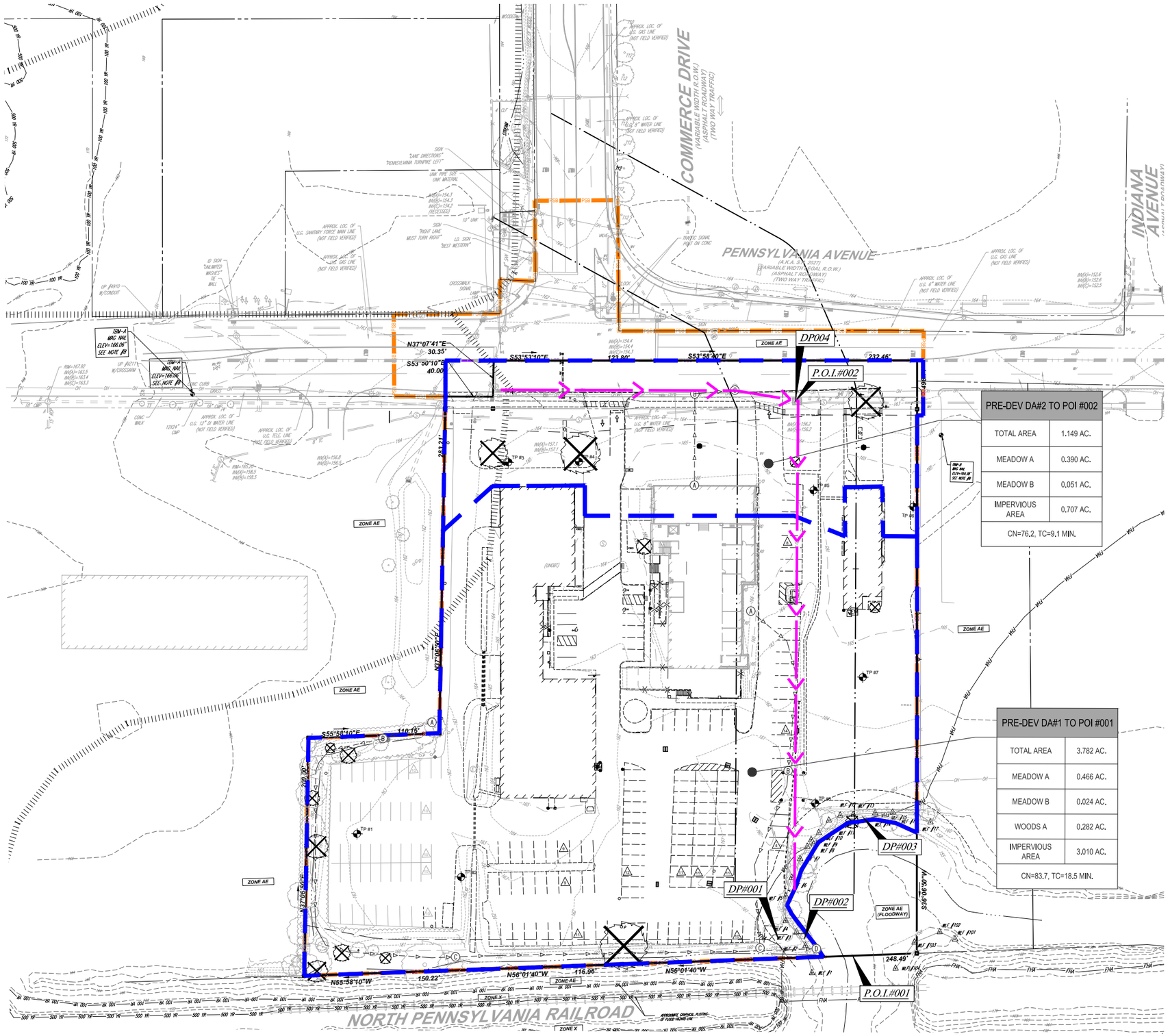
COMPUTATION SHEET : COMPOSITE CURVE NUMBER (CN)

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

DATE: ***10/28/2024***
BY: ***RMS***
CHECKED BY: ***JAB***
REVISION: ***2***

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

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=9.1 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.	

40 20 10 0 40
1"= 40'

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1	5/4/2023	NPDES SUBMISSION NPDES REV-0	KMP MSL
2	7/11/2023	SHADE TREE COMMISSION	HMP MSL
3	8/4/2023	NPDES SUBMISSION NPDES REV-1	HMP MSL
4	9/20/2023	TOWNSHIP RESUBMISSION	RMS MSL
5	12/15/2023	PER NPDES COMMENT	RMS MSL
6	03/15/2024	PER NPDES COMMENT	RMS JAB
7	05/09/2024	PER NPDES COMMENT	RMS JAB

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CAD I.D.:	PAB220113.00-DRIN-7A

PROJECT:

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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PROFESSIONAL ENGINEER
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NEW YORK LICENSE No. 16 093204
NEW JERSEY LICENSE No. 24GE05309500

SHEET TITLE:

PRE DEVELOPMENT DRAINAGE AREA PLAN

SHEET NUMBER:

C-1001

REVISION 7 - 05/09/2024

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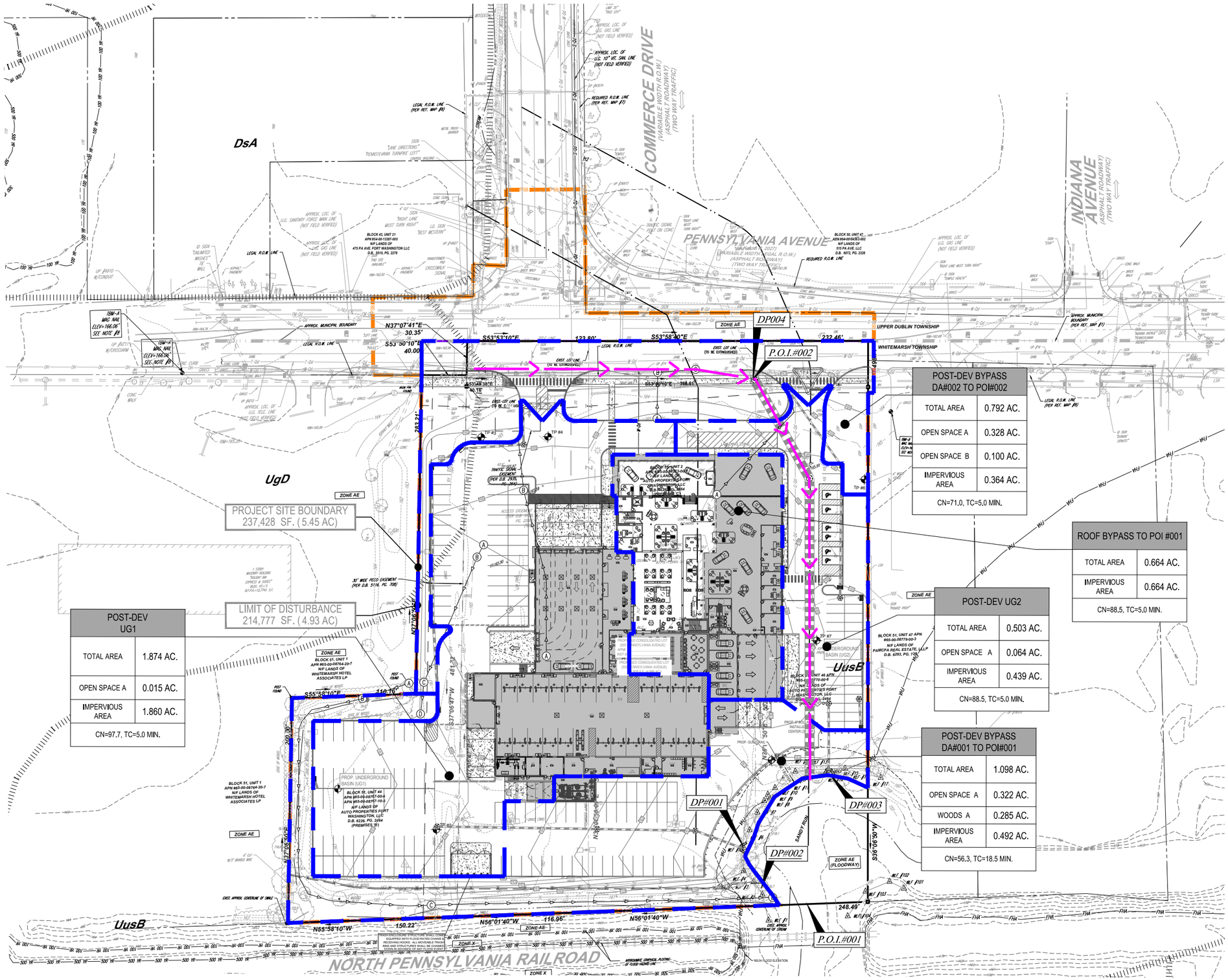

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PROJECT:

AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

**500 PENNSYLVANIA AVENUE
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY, PA**

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BETHLEHEM, PA 18018
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PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE082005
NEW YORK LICENSE No. 16 093204
NEW JERSEY LICENSE No. 24GE05309500

SHEET TITLE:

POST DEVELOPMENT DRAINAGE AREA PLAN

SHEET NUMBER:

C-1002

ORG. DATE - 10/24/2024

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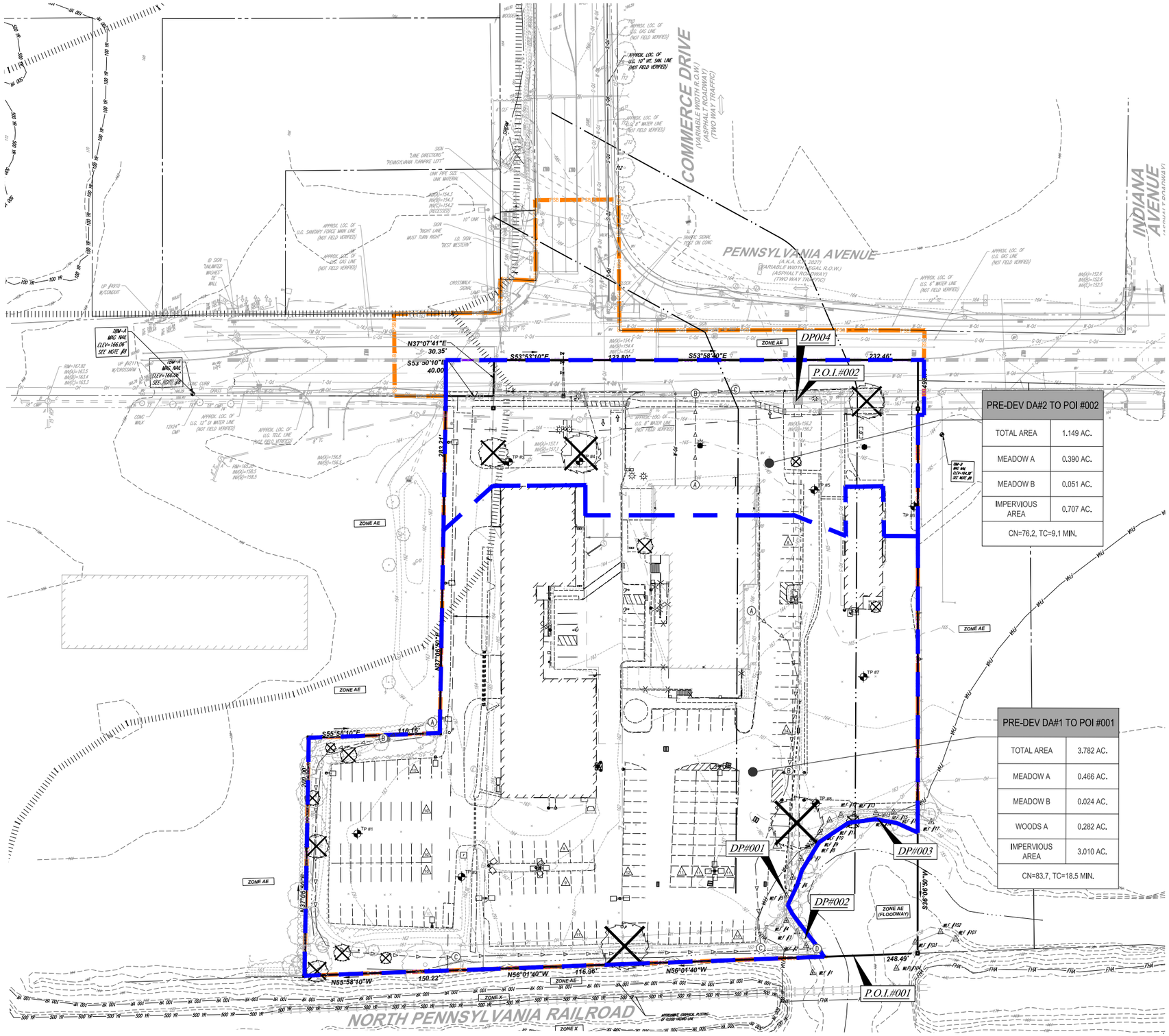

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40 20 10 0 40
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CAD I.D.:	PAB220113.01-DRIN-0A

PROJECT:

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. 24GE05306500

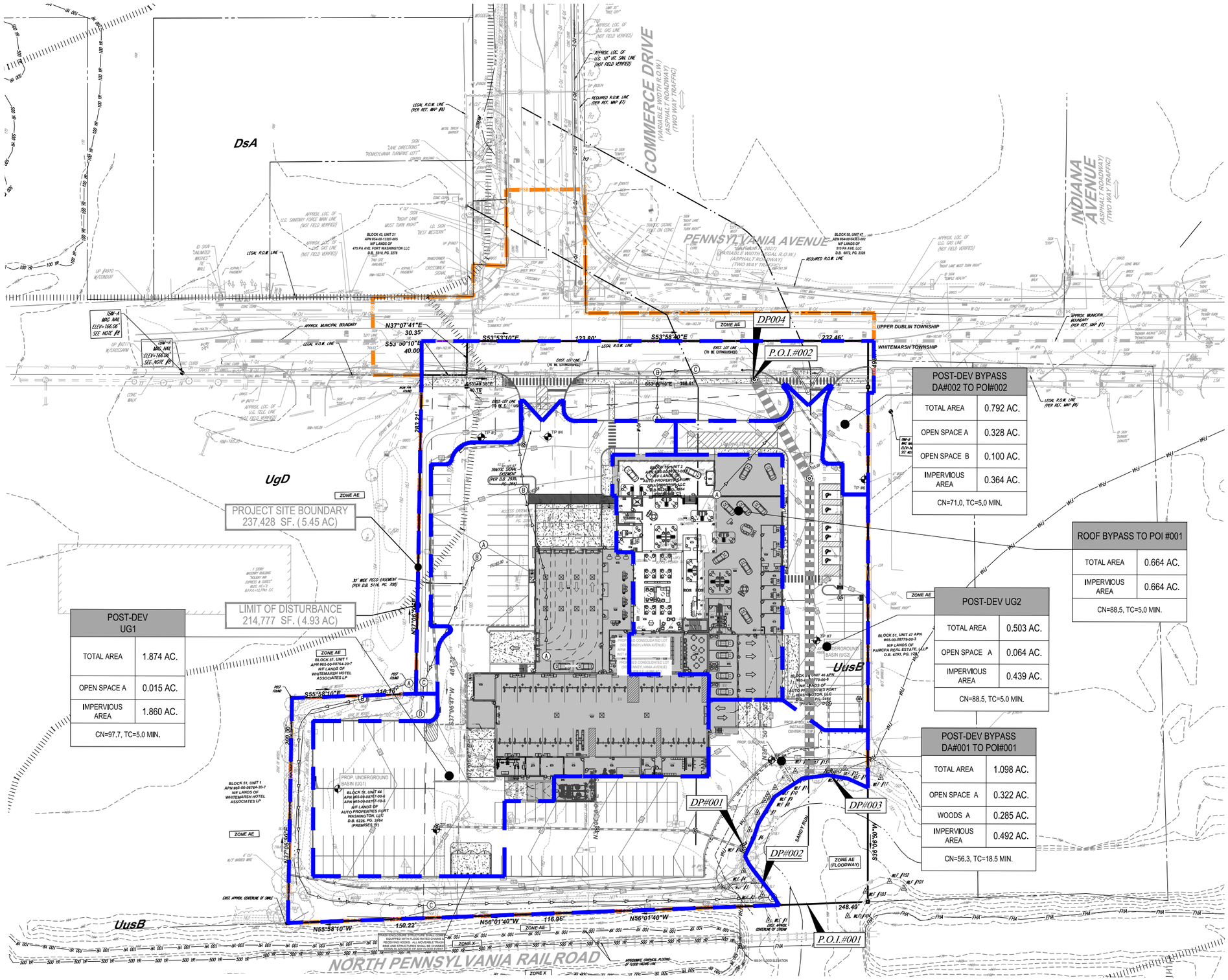
SHEET TITLE:

PRE DEVELOPMENT DRAINAGE AREA PLAN

SHEET NUMBER:

C-1001

ORG. DATE - 10/24/2024



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PROJECT No.: PAB220113.01
DRAWN BY: RMS
CHECKED BY: JAB
DATE: 10/24/2024
CAD I.D.: PAB220113.01-DRIN-0A

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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NEW YORK LICENSE No. 16 093204
NEW JERSEY LICENSE No. 24GE05309500

SHEET TITLE:
POST DEVELOPMENT DRAINAGE AREA PLAN
SHEET NUMBER:
C-1002

ORG. DATE - 10/24/2024

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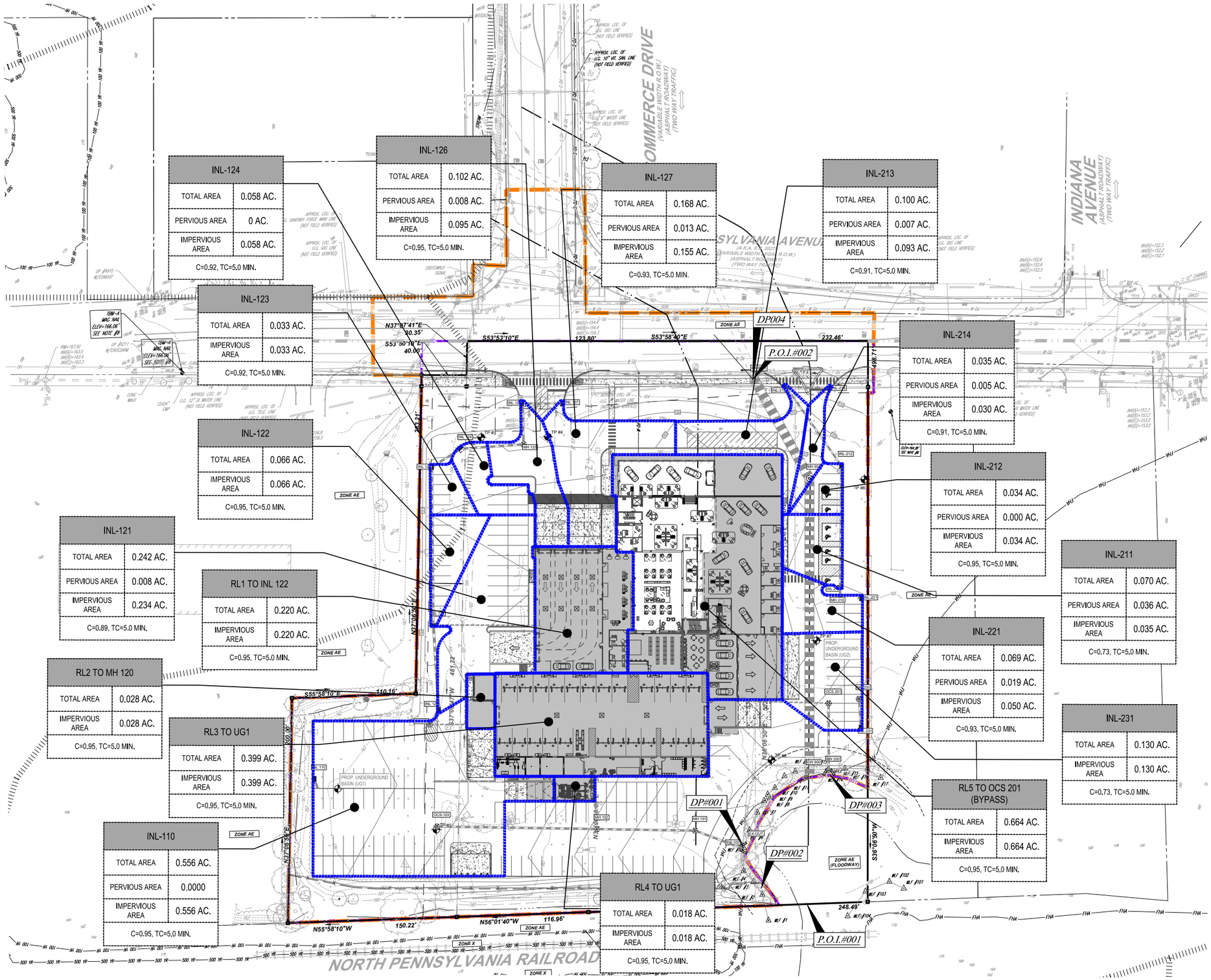

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DRAWN BY:	RMS
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DATE:	10/24/2024
CAD I.D.:	PAB220113.01-DRIN-0A

PROJECT:

PRELIMINARY/FINAL LAND DEVELOPMENT PLANS

FOR

MILEONE FORT WASHINGTON, LLC

BMW AUTOMOTIVE DEALERSHIP EXPANSION

**500 PENNSYLVANIA AVENUE
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PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE082005
NEW YORK LICENSE No. 16 093204
NEW JERSEY LICENSE No. 24GE05309500

SHEET TITLE:

INLET DRAINAGE AREA PLAN

SHEET NUMBER:

C-1003

ORG. DATE - 10/24/2024

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74 W. Broad Street, Suite 500
Bethlehem, PA 18018
610.709.9971

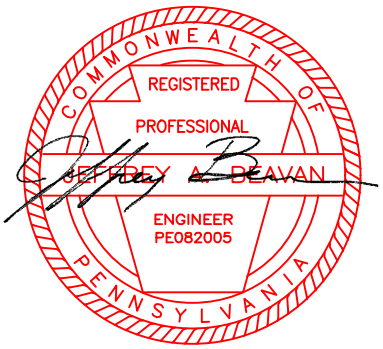
HEC-RAS Flood Analysis for Sandy Run

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: 10/28/2024



Professional Engineer: Jeff A. Beavan, P.E.
PA License #PE082005

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Appendix A – Cross Section Plan ..... A

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Flood Analysis Narrative

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 Preliminary Land Development 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 exist and are present on the project site and have been delineated by survey. No wetland areas exist on site. The entire site is located within the existing 100 and 500 year floodplain as delineated on the effective FEMA Flood Insurance Rate Map panel covering the site area (panel number 42091C0289G, revised May 24, 2021).

FLOODPLAIN ANALYSIS

A hydraulic analysis was performed based on a HEC-RAS geometric model of the confluence of the Sandy Run, including the main stem and a number of upstream tributaries. The intent of the analysis is to indicate that the proposed development will not impact flood elevations beyond 1 foot elevation as a result of the placement of the building and grading operations (net cut) within the floodplain. The HEC-RAS river analysis system software, as developed by the U.S. Army Corps of Engineers, was used for the analysis. The data for the Schuylkill River model was based on a HEC-RAS model provided by FEMA, dated January 2010, revised November 2012. Elevations were compared to the cross-sections contained in the May 24, 2021 Flood Insurance Study for Montgomery County. The cross-sections within the site area include from station 4790.088 to station 5084.678 of the Sandy Run Main Stem.

The Effective condition of the Site is based on the Approved LOMR of the as-built conditions for the Audi of Fort Washington dealership, located at 432 Pennsylvania Avenue, Whitemarsh Township, Montgomery County, PA.

The Corrected Effective condition of the site supplements the Audi of Fort Washington conditions with surveyed conditions of the BMW of Fort Washington property located at 500, 506, 510, and 512 Pennsylvania Avenue, Whitemarsh Township, Montgomery County, PA. In order to provide a direct comparison between development conditions, the Corrected Effective conditions adjust the cross section geometry to align with the proposed building footprints in the Post-Development conditions.

The Post-Development conditions for the BMW of Fort Washington property are modeled to provide access to all entry points of the building. The proposed building expansion proposes a finished floor elevation of 171.00 on top of a solid foundation.

In comparison to the corrected effective FEMA Flood Insurance Rate Map panels covering the site area (panel number 42091C0289G, revised May 24, 2021), the HEC-RAS analysis indicates that the 100-year storm event (1-percent-annual-chance storm) for the Sandy Run maintains an elevation below the floodproofing elevation 170.00 where floodproofing is applicable within the project site. Upstream of the project site, including the cross sections within Upper Dublin Township, both the 100-year and 500-year elevations decrease in comparison to the effective flood study for a length of 1200 feet within the study area. The portions of the building that are to be floodproofed were modeled as obstructions in the applicable cross-sections. The underground basins within the site are located within the existing floodplain and were modeled as cut, providing flood storage in this area as intended to offset building fill and floodproofing elsewhere. The basins were not modeled in the cross sections as there is no stream-driven flow through the cross section of the basin.

In addition to the HEC-RAS analysis, a cut/fill comparison was made based on the proposed site grading, showing that the proposed project will result in a net fill of 9,650 cubic yards within the floodplain area.

Based on this analysis, the proposed project will result in a decrease between 0.09 and 0.37 feet in the base flood elevation for the Sandy Run upstream of the project site.

Endangered Species Act Compliance

In accordance with the Endangered Species Act (ESA) of 1973, the project uses consist of an existing automotive dealership, a car wash, and a service and maintenance building; therefore, no potential for "Take" exists (meaning that the project has no potential to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct) to threatened and endangered species.

Conclusion

The HEC-RAS outputs for the 1-percent-annual-chance storm event floodplain analysis for the Sandy Run is included herein, and shows a 0.03 foot decrease in the base flood elevation upstream as a result of development. In addition, cut/fill calculations are provided showing that the proposed development will result in a net cut condition, thereby increasing the storage within the floodplain. Based on this analysis, the project has been designed to comply with the Whitemarsh Township Floodplain Ordinance, Chapter 101, as well as applicable State and Federal floodplain regulations.

USGS MAP

SCALE: 1" = 2,000'
AMBLER QUAD

HEC-RAS Summary of Analysis Results

Sandy Main Stem (NAVD 88)
100-Year Profile Analysis

River Sta	Profile	Duplicate Effective W.S. Elev (ft)	Corrected W.S. Elev (ft)	Proposed W.S. Elev (ft)	Proposed Comparison Duplicate	Proposed Comparison Corrected
6709.658	100-yr	173.95	173.97	173.94	-0.01	-0.03
6668.16	100-yr	174.06	174.08	174.06	0.00	-0.02
6572.639	100-yr	172.83	172.85	172.82	-0.01	-0.03
6414.98	100-yr	172.43	172.46	172.43	0.00	-0.03
6189.177	100-yr	168.81	168.97	168.72	-0.09	-0.25
5508.105	100-yr	169.13	169.29	169.04	-0.09	-0.25
5084.678	100-yr	169.05	168.99	168.81	-0.24	-0.18
5065.378	100-yr	169.06	169.04	168.71	-0.35	-0.33
5039.878	100-yr	168.63	169.14	168.82	+0.19	-0.32
4865.578	100-yr	168.67	168.85	168.67	0.00	-0.18
4790.088	100-yr	168.63	168.39	168.37	-0.26	-0.02
4777.088	100-yr	168.53	168.28	168.16	-0.37	-0.12
4685.592	100-yr	163.53	163.53	163.53	0.00	0.00
4327.181	100-yr	164.33	164.33	164.33	0.00	0.00
3964.325	100-yr	163.81	163.81	163.81	0.00	0.00
3515.389	100-yr	163.59	163.59	163.59	0.00	0.00

= River stations within project limits

= Decrease in proposed water surface elevations vs given comparison model

= Increase in proposed water surface elevations vs given comparison model

= Duplicate Effective Model

Sandy Main Stem (NAVD 88)
500-Year Profile Analysis

River Sta	Profile	Duplicate Effective W.S. Elev	Corrected W.S. Elev	Proposed W.S. Elev	Proposed Comparison	
					Duplicate	Corrected
0	0	(ft)	(ft)	(ft)		
6709.658	500-yr	177.15	177.15	177.15	0.00	0.00
6668.16	500-yr	177.24	177.24	177.24	0.00	0.00
6572.639	500-yr	176.93	176.93	176.93	0.00	0.00
6414.98	500-yr	176.38	176.39	176.38	0.00	-0.01
6189.177	500-yr	170.74	170.73	170.75	+0.01	+0.02
5508.105	500-yr	171.4	171.39	171.4	0.00	+0.01
5084.678	500-yr	171.34	171.37	171.38	+0.04	+0.01
5065.378	500-yr	171.34	171.32	171.29	-0.05	-0.03
5039.878	500-yr	171.36	171.35	171.32	-0.04	-0.03
4865.578	500-yr	171.36	171.35	171.32	-0.04	-0.03
4790.088	500-yr	171.34	171.33	171.32	-0.02	-0.01
4777.088	500-yr	171.35	171.34	171.34	-0.01	0.00
4685.592	500-yr	167.22	167.22	167.22	0.00	0.00
4327.181	500-yr	166.74	166.74	166.74	0.00	0.00
3964.325	500-yr	165.93	165.93	165.93	0.00	0.00
3515.389	500-yr	165.62	165.62	165.62	0.00	0.00

= River stations within project limits

= Decrease in proposed water surface elevations vs given comparison model

= Increase in proposed water surface elevations vs given comparison model

= Duplicate Effective Model

Sandy Main Stem (NAVD 88)
Encroached Floodway Analysis

River Sta	W.S. Elev (ft)	W.S. Delta (ft)	E.G. Elev (ft)	Top Wdth Act (ft)	Top Width Delta	Enc Sta L (ft)	Enc Sta L Delta	Enc Sta R (ft)	Enc Sta R Delta
6572.639	172.83		172.87	335.45		0		0	
6572.639	172.82	-0.01	172.86	335.41	-0.04	0	0.00	0	0.00
6414.98	172.43		172.76	128.81		0		0	
6414.98	172.43	0.00	172.76	128.58	-0.23	0	0.00	0	0.00
6300 BR U #1	0		0	0		0		0	
6300 BR U #1	0	0.00	0	0	0.00	0	0.00	0	0.00
6300 BR D #1	169.08		169.08	13.93		0		0	
6300 BR D #1	169.07	-0.01	169.07	11.44	-2.49	0	0.00	0	0.00
6189.177	169.8		170.81	92		558		650	
6189.177	169.54	-0.26	170.59	92	0.00	558	0.00	650	0.00
5508.105	169.77		170.15	263.21		294		810	
5508.105	169.49	-0.28	169.89	262.97	-0.24	294	0.00	810	0.00
5084.678	169.65		170	255		525		780	
5084.678	169.34	-0.31	169.72	255	0.00	525	0.00	780	0.00
5065.378	169.51		169.98	207		353		560	
5065.378	169.24	-0.27	169.7	223.3	+16.30	336.7	-16.30	560	0.00
5039.878	169.42		169.96	180.84		359.16		540	
5039.878	169.13	-0.29	169.68	194.47	+13.63	345.53	-13.63	540	0.00
4865.578	169.48		169.84	153		382		535	
4865.578	169.21	-0.27	169.55	175.32	+22.32	359.68	-22.32	535	0.00
4790.088	168.88		169.75	136.8		513.2		650	
4790.088	167.92	-0.96	169.39	136.34	-0.46	493.39	-19.81	630	-20.00
4777.088	168.59		169.68	104.47		388.53		493	
4777.088	168.15	-0.44	169.14	120.82	+16.35	378.18	-10.35	499	+6.00
4740 BR U	169.42		169.96	180.84		359.16		540	
4740 BR U	166.25	-3.17	169.14	0	-180.84	378.18	+19.02	499	-41.00
4740 BR D	169.48		169.84	153		382		535	
4740 BR D	164.54	-4.94	168.5	95.9	-57.10	400	+18.00	580	+45.00
4685.592	168.88		169.75	136.8		513.2		650	
4685.592	164.54	-4.34	167.01	180	+43.20	400	-113.20	580	-70.00
4327.181	168.59		169.68	104.47		388.53		493	
4327.181	165.21	-3.38	165.41	520	+415.53	315	-73.53	835	+342.00

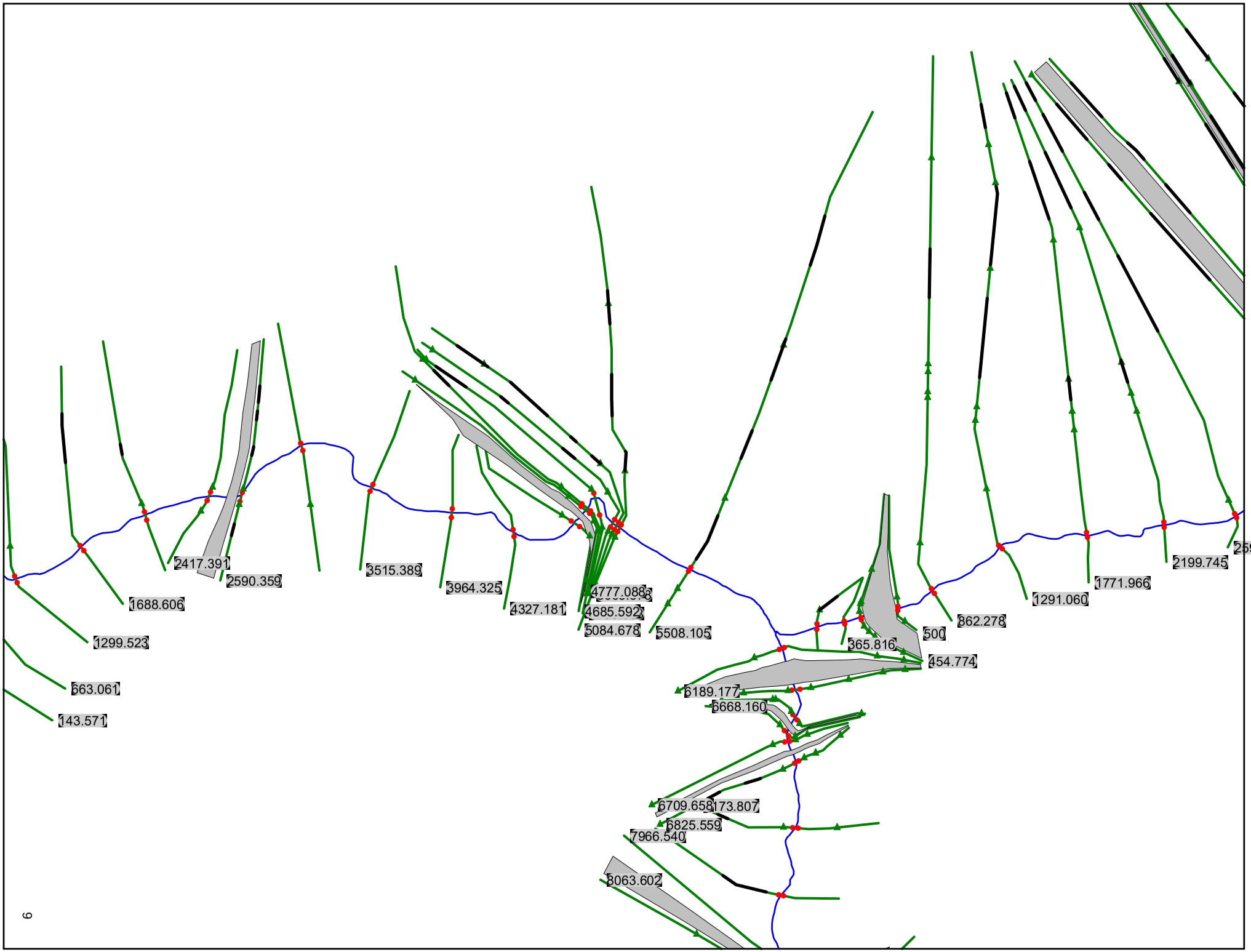
= River stations within project limits

= Decrease in proposed water surface elevations vs duplicate effective model

= Increase in proposed water surface elevations vs duplicate effective model

= Duplicate Effective Model

HEC-RAS Detailed Analysis Results – Duplicate Effective Model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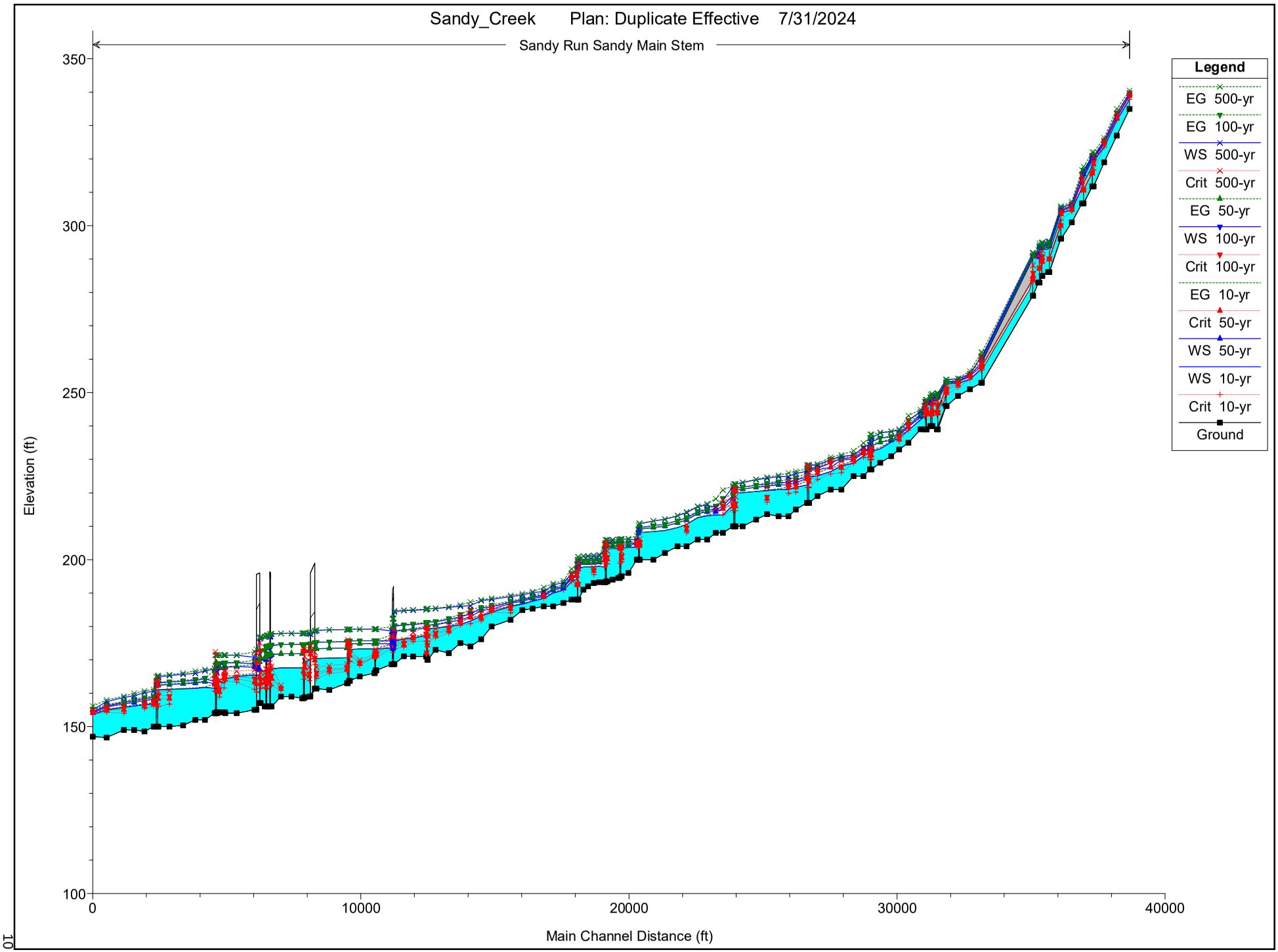
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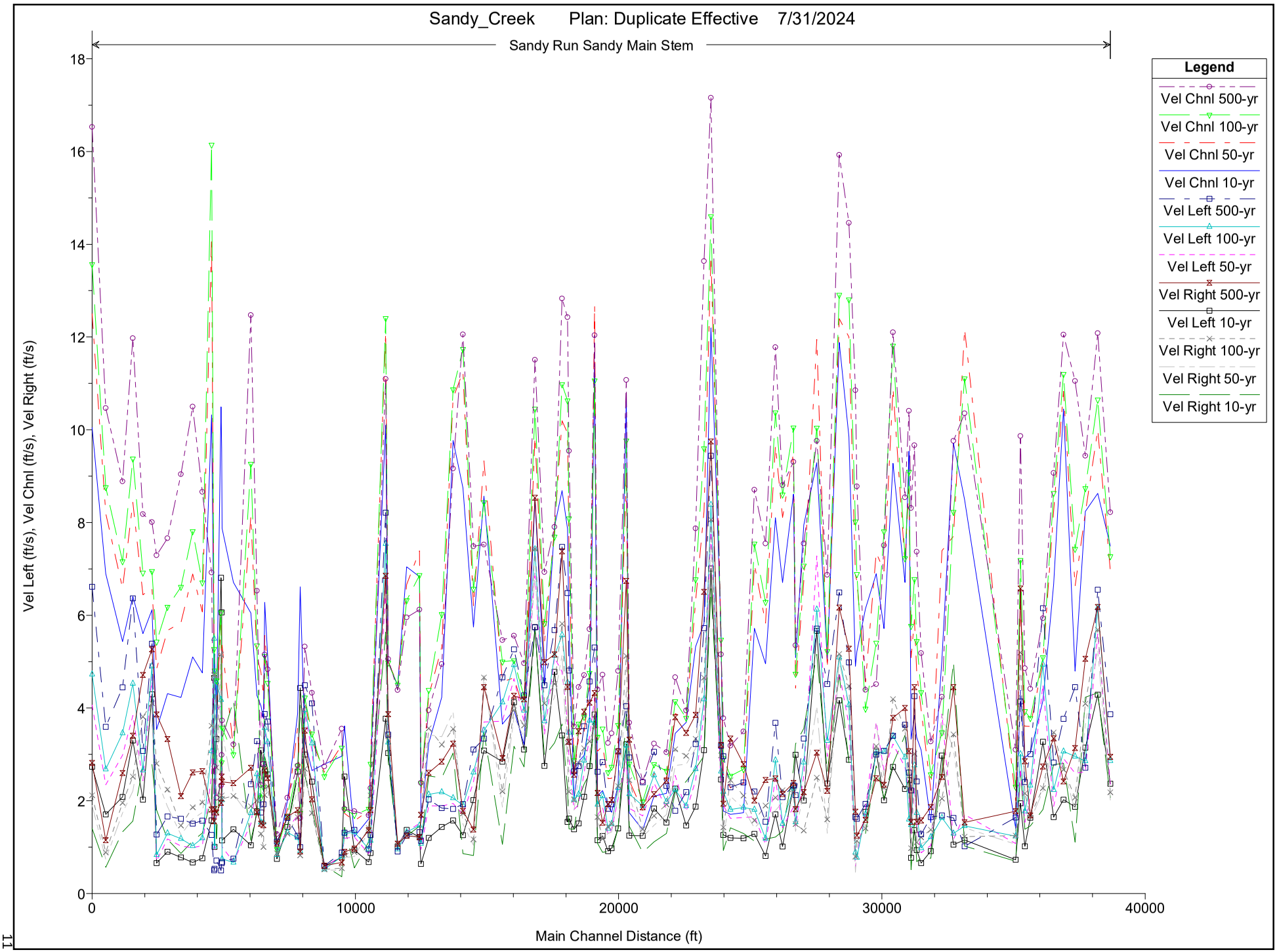
Sandy Run Sandy Main Stem
Elevation (ft)
350
300
250
200
150
100
0
10000
20000
30000
40000
Main Channel Distance (ft)
Legend
EG 500-yr
EG 100-yr
WS 500-yr
Crit 500-yr
EG 50-yr
WS 100-yr
Crit 100-yr
EG 10-yr
Crit 50-yr
WS 50-yr
WS 10-yr
Crit 10-yr
Ground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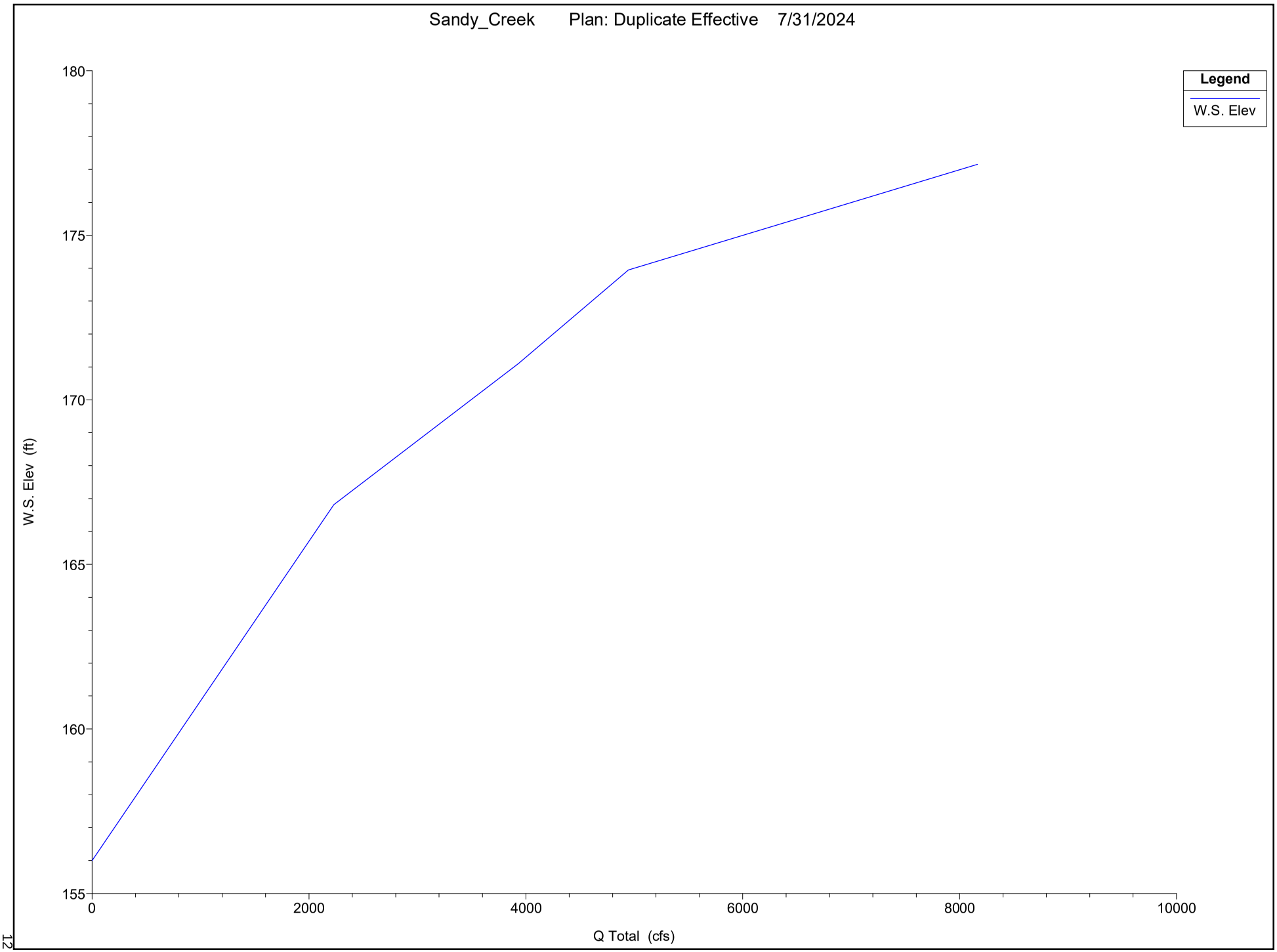
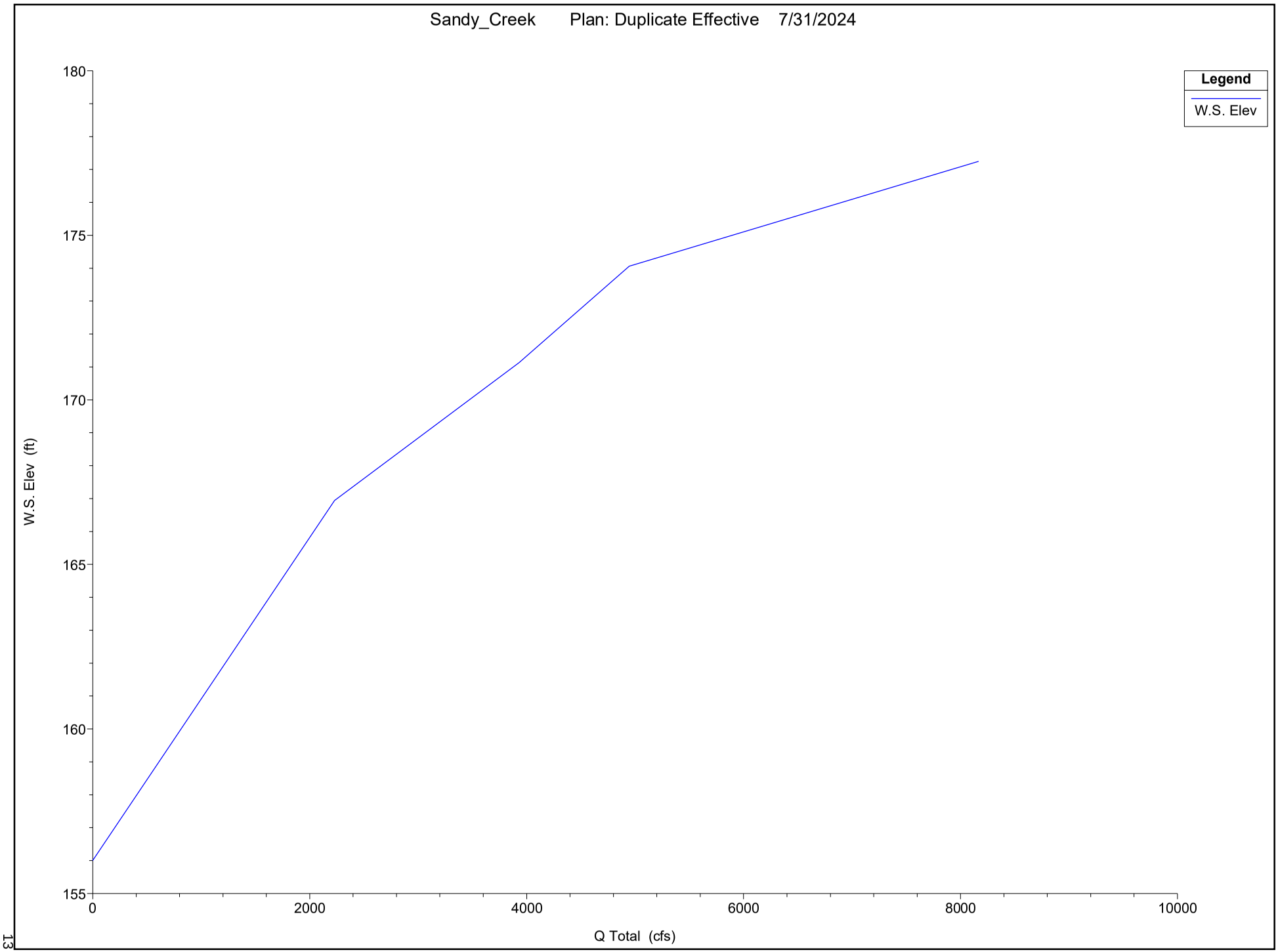
Sandy Run Sandy Main Stem
Legend
Vel Chnl 500-yr
Vel Chnl 100-yr
Vel Chnl 50-yr
Vel Chnl 10-yr
Vel Left 500-yr
Vel Left 100-yr
Vel Left 50-yr
Vel Right 500-yr
Vel Left 10-yr
Vel Right 100-yr
Vel Right 50-yr
Vel Right 10-yr
Vel Left (ft/s), Vel Chnl (ft/s), Vel Right (ft/s)
Main Channel Distance (ft)
0
2
4
6
8
10
12
14
16
18
0
10000
20000
30000
40000


Sandy_Creek Plan: Duplicate Effective 7/31/2024
Legend
W.S. Elev
W.S. Elev (ft)
180
175
170
165
160
155
0
2000
4000
6000
8000
10000
Q Total (cfs)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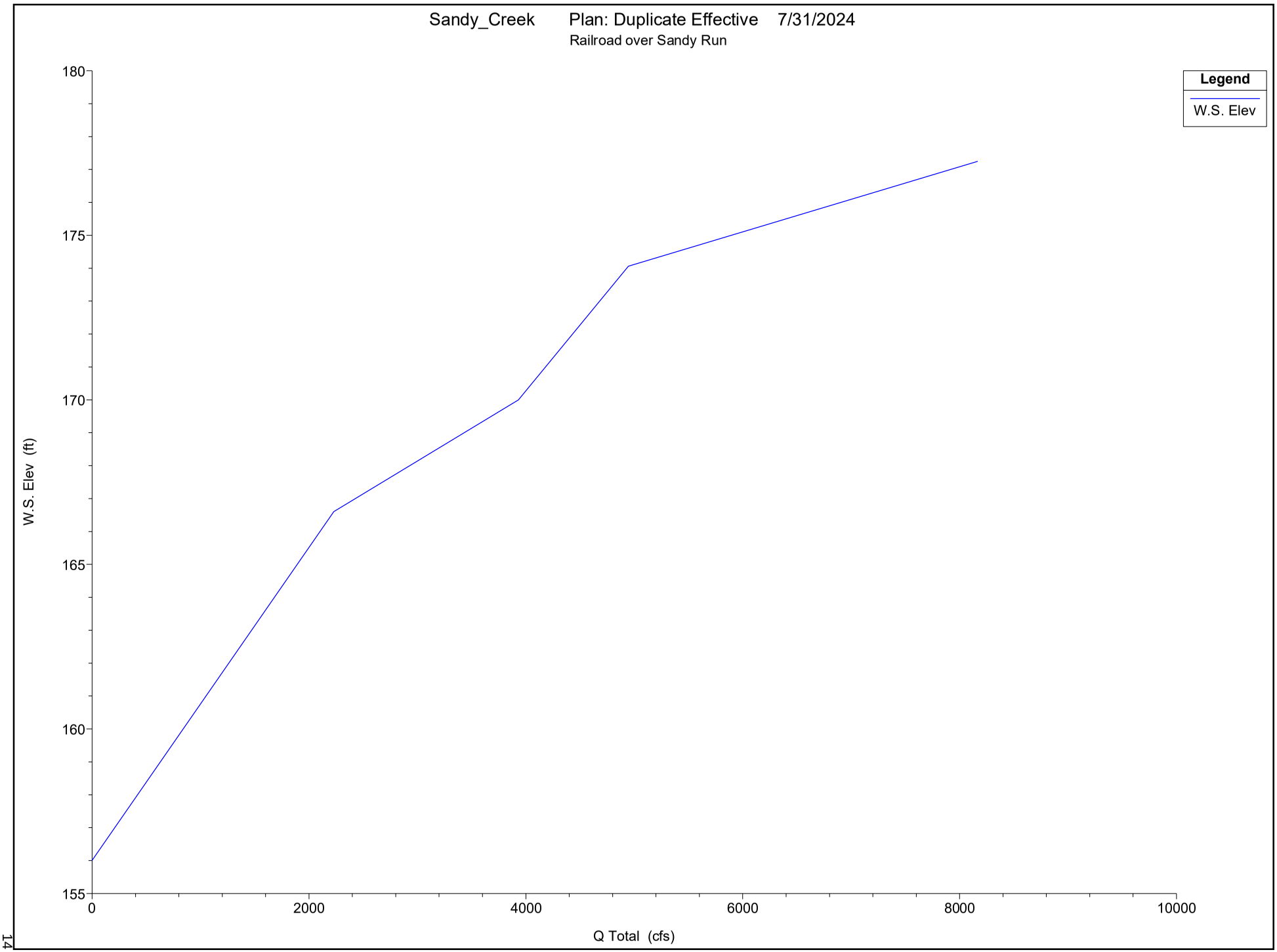
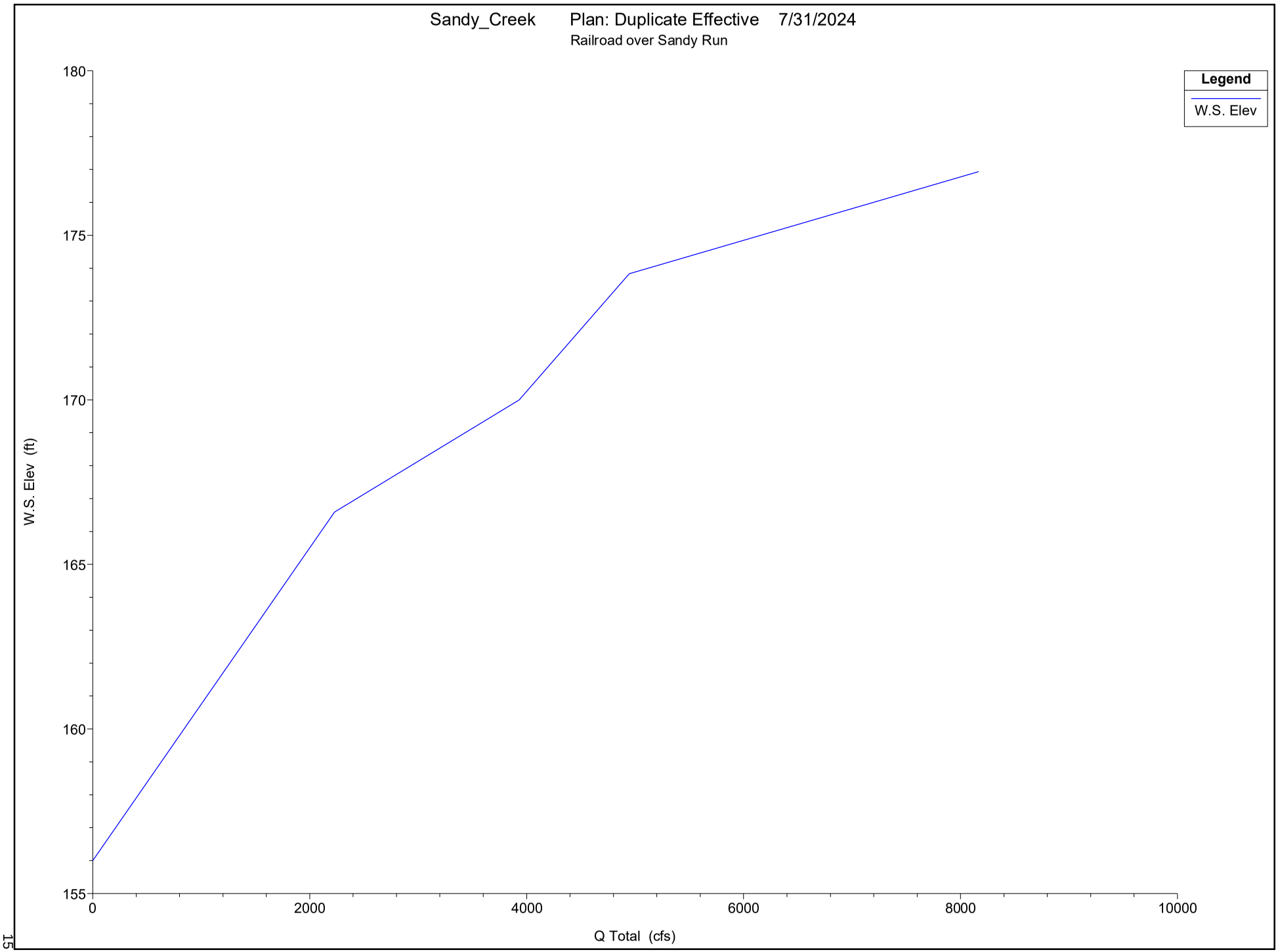
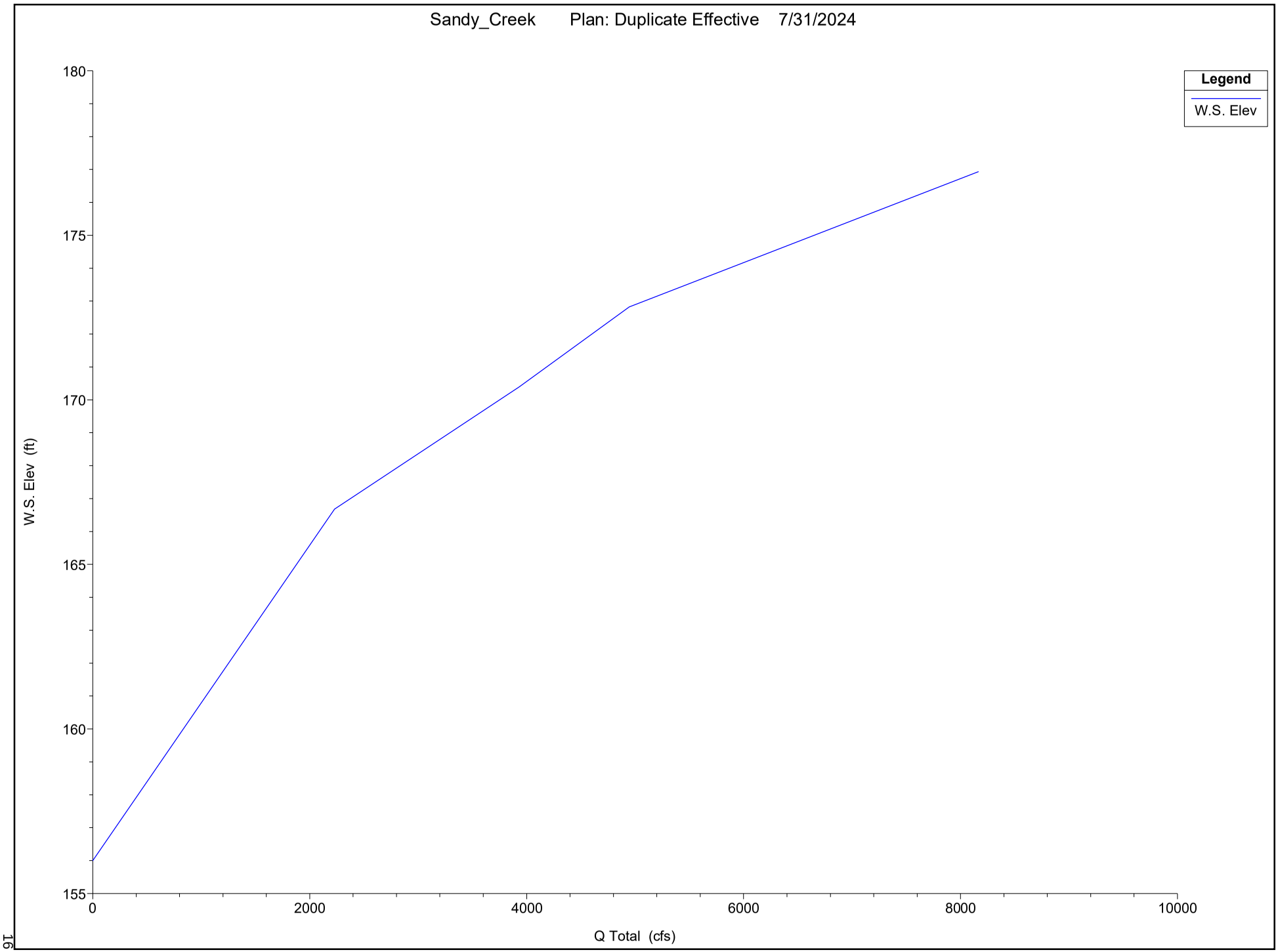
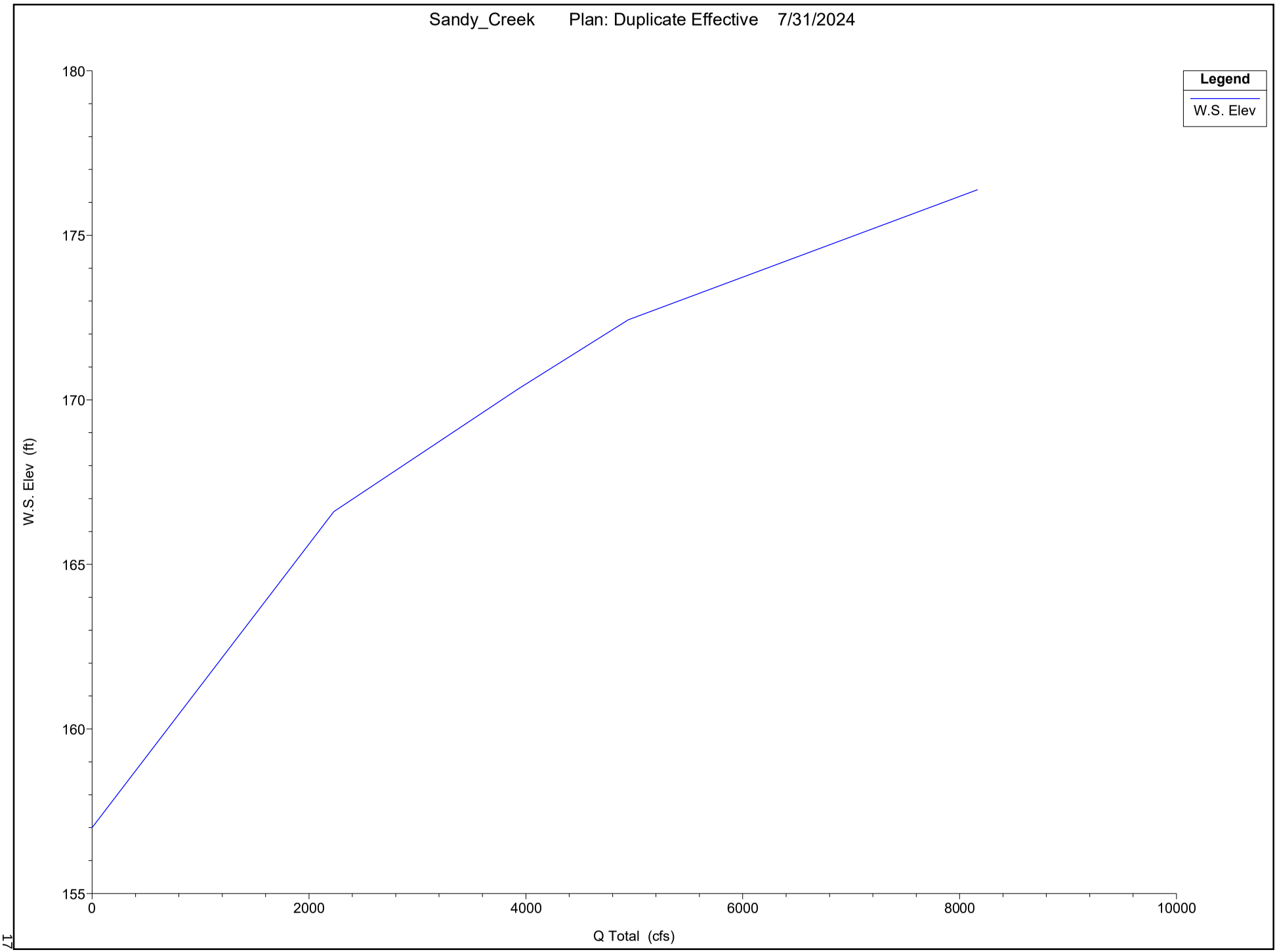
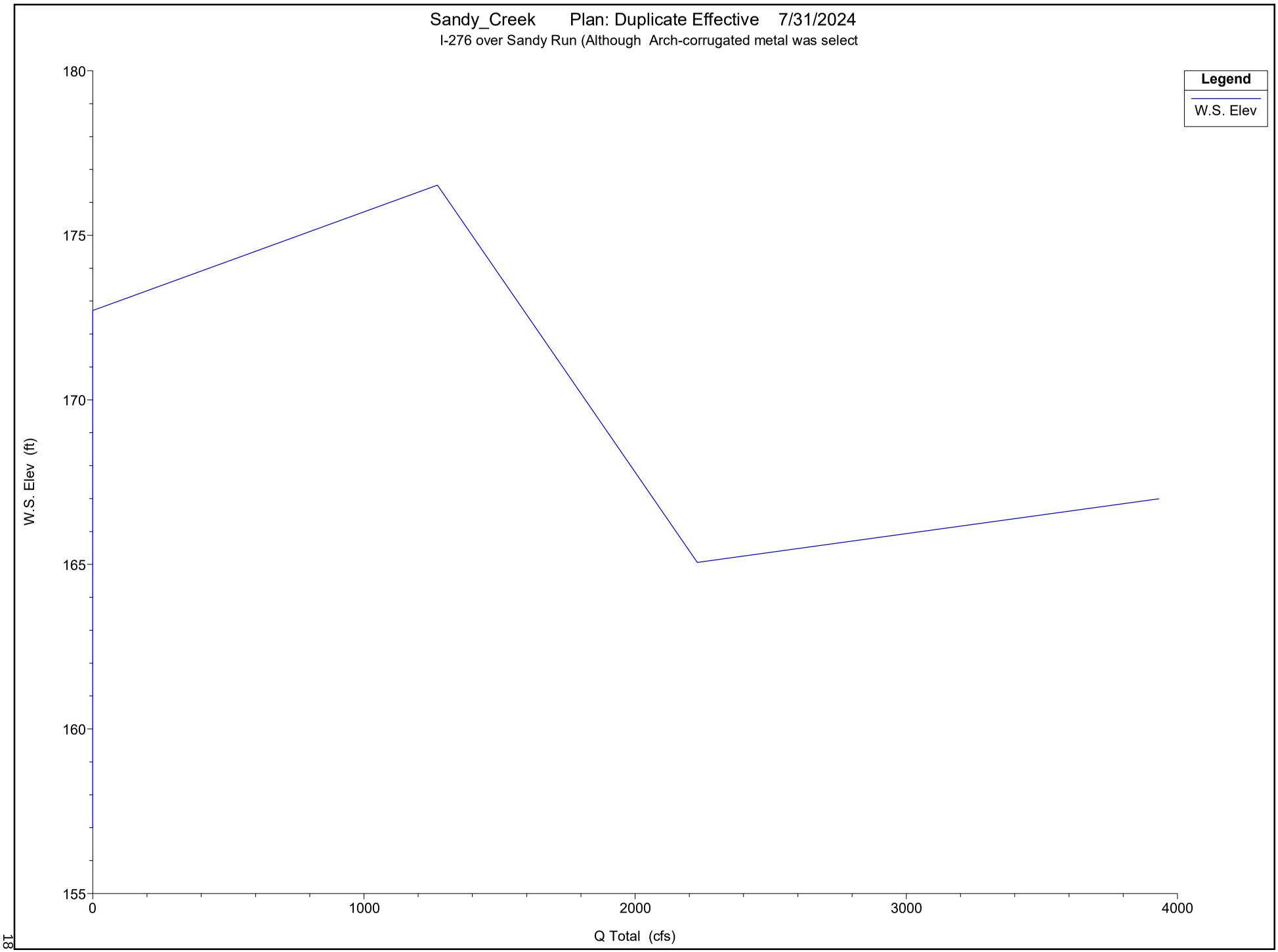
Legend
W.S. Elev
W.S. Elev (ft)
180
175
170
165
160
155
0
2000
4000
6000
8000
10000
Q Total (cfs)

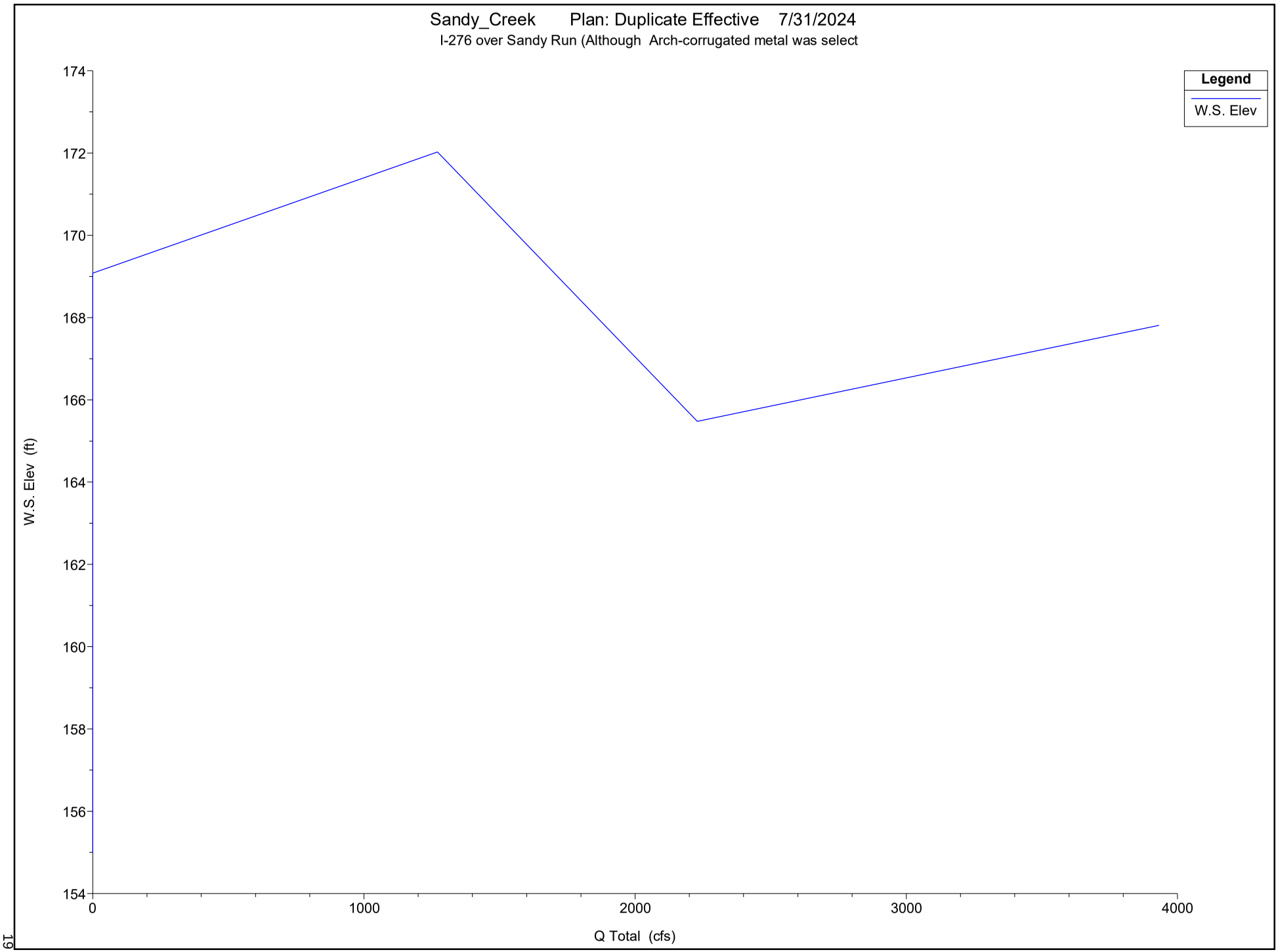

Sandy_Creek Plan: Duplicate Effective 7/31/2024
Railroad over Sandy Run
Legend
W.S. Elev
W.S. Elev (ft)
180
175
170
165
160
155
0
2000
4000
6000
8000
10000
Q Total (cfs)

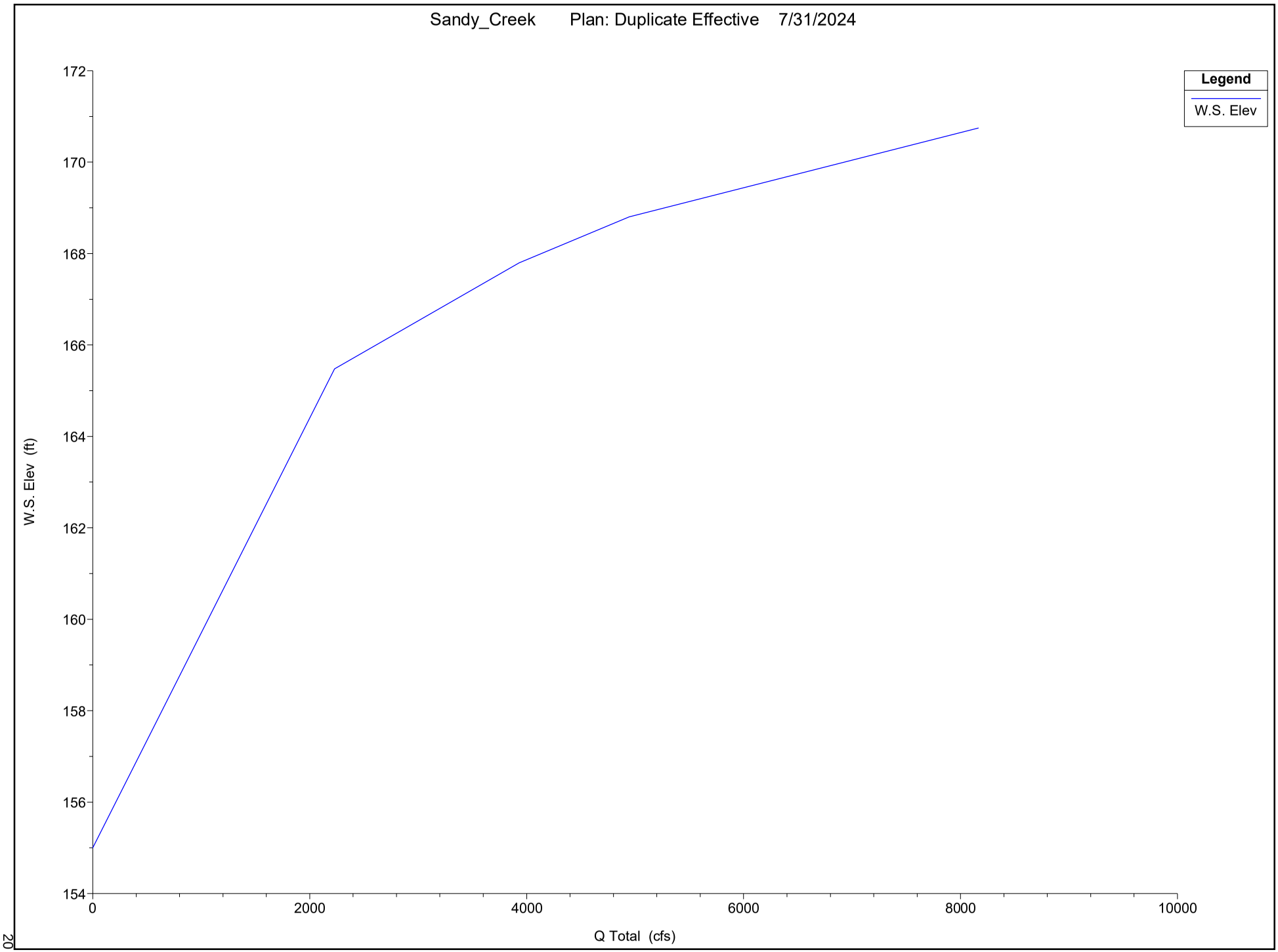

Sandy_Creek Plan: Duplicate Effective 7/31/2024
Railroad over Sandy Run
Legend
W.S. Elev
W.S. Elev (ft)
Q Total (cfs)
180
175
170
165
160
155
0
2000
4000
6000
8000
10000

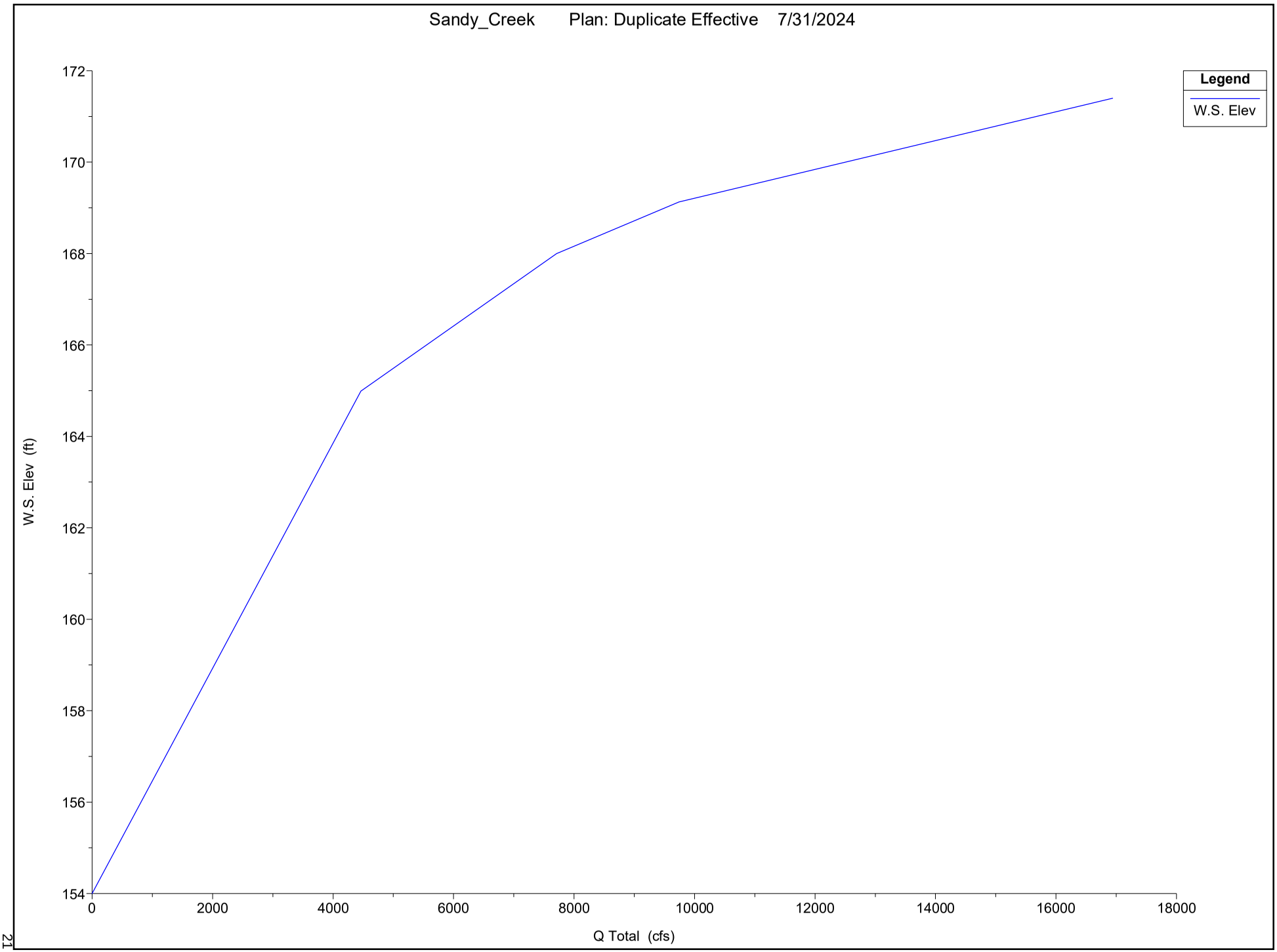

Sandy_Creek Plan: Duplicate Effective 7/31/2024
Legend
W.S. Elev
W.S. Elev (ft)
180
175
170
165
160
155
0
2000
4000
6000
8000
10000
Q Total (cfs)

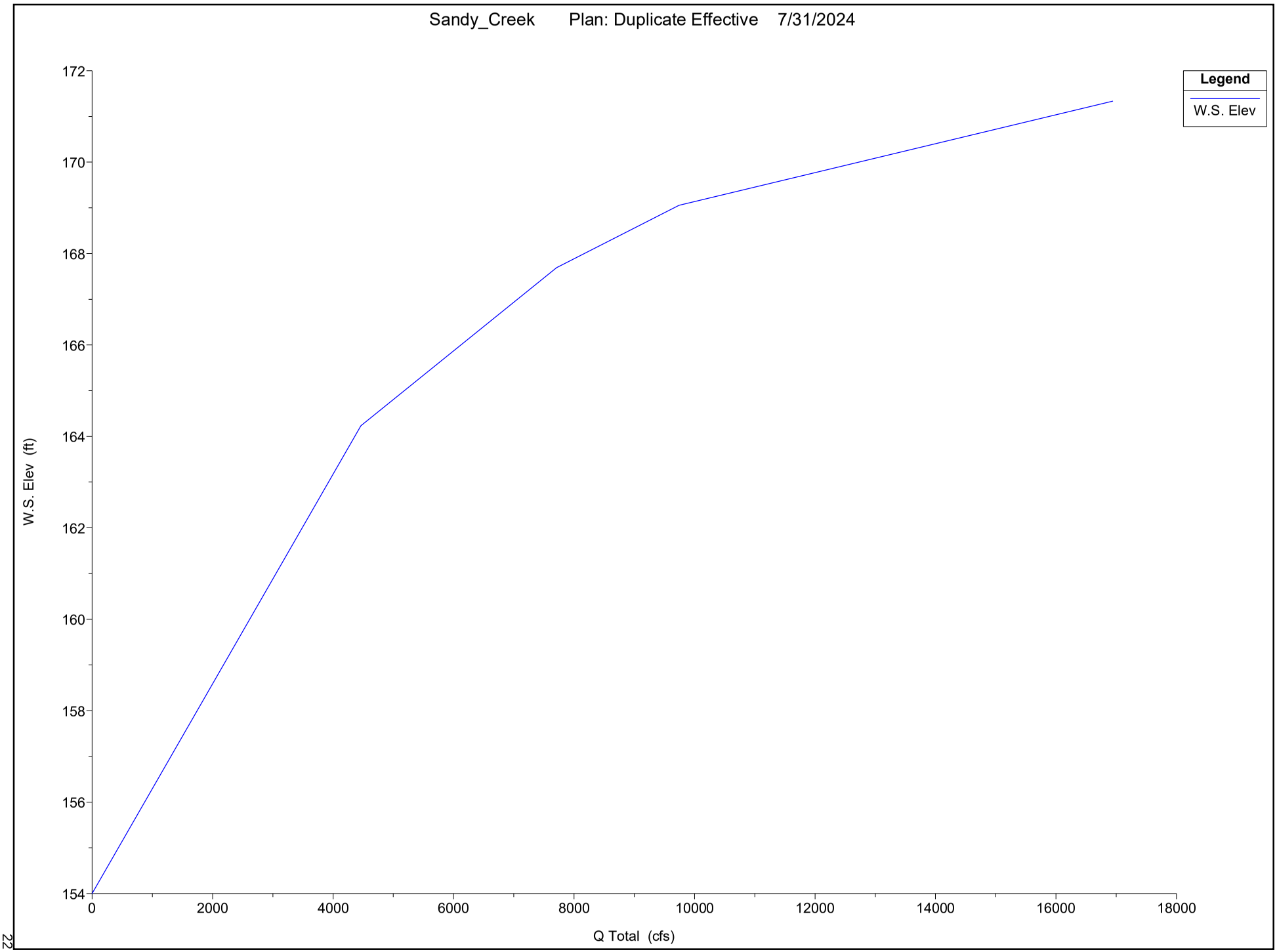

Sandy_Creek Plan: Duplicate Effective 7/31/2024
Legend
W.S. Elev
W.S. Elev (ft)
180
175
170
165
160
155
0
2000
4000
6000
8000
10000
Q Total (cfs)


Sandy_Creek Plan: Duplicate Effective 7/31/2024
I-276 over Sandy Run (Although Arch-corrugated metal was select
Legend
W.S. Elev
180
175
170
165
160
155
W.S. Elev (ft)
0
1000
2000
3000
4000
Q Total (cfs)


Sandy_Creek Plan: Duplicate Effective 7/31/2024
I-276 over Sandy Run (Although Arch-corrugated metal was select
Legend
W.S. Elev
174
172
170
168
166
164
162
160
158
156
154
W.S. Elev (ft)
0
1000
2000
3000
4000
Q Total (cfs)

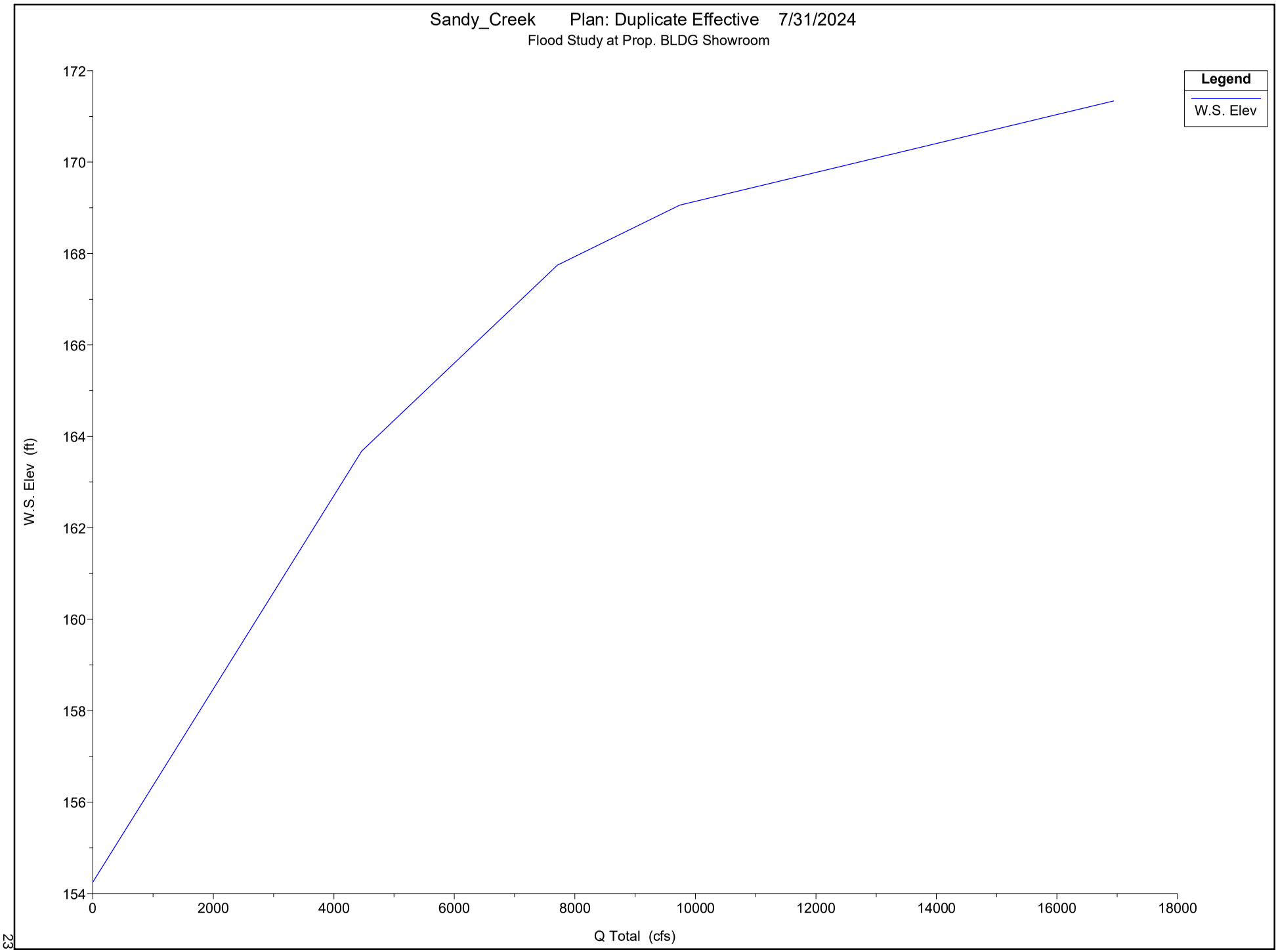

Sandy_Creek Plan: Duplicate Effective 7/31/2024
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
Q Total (cfs)

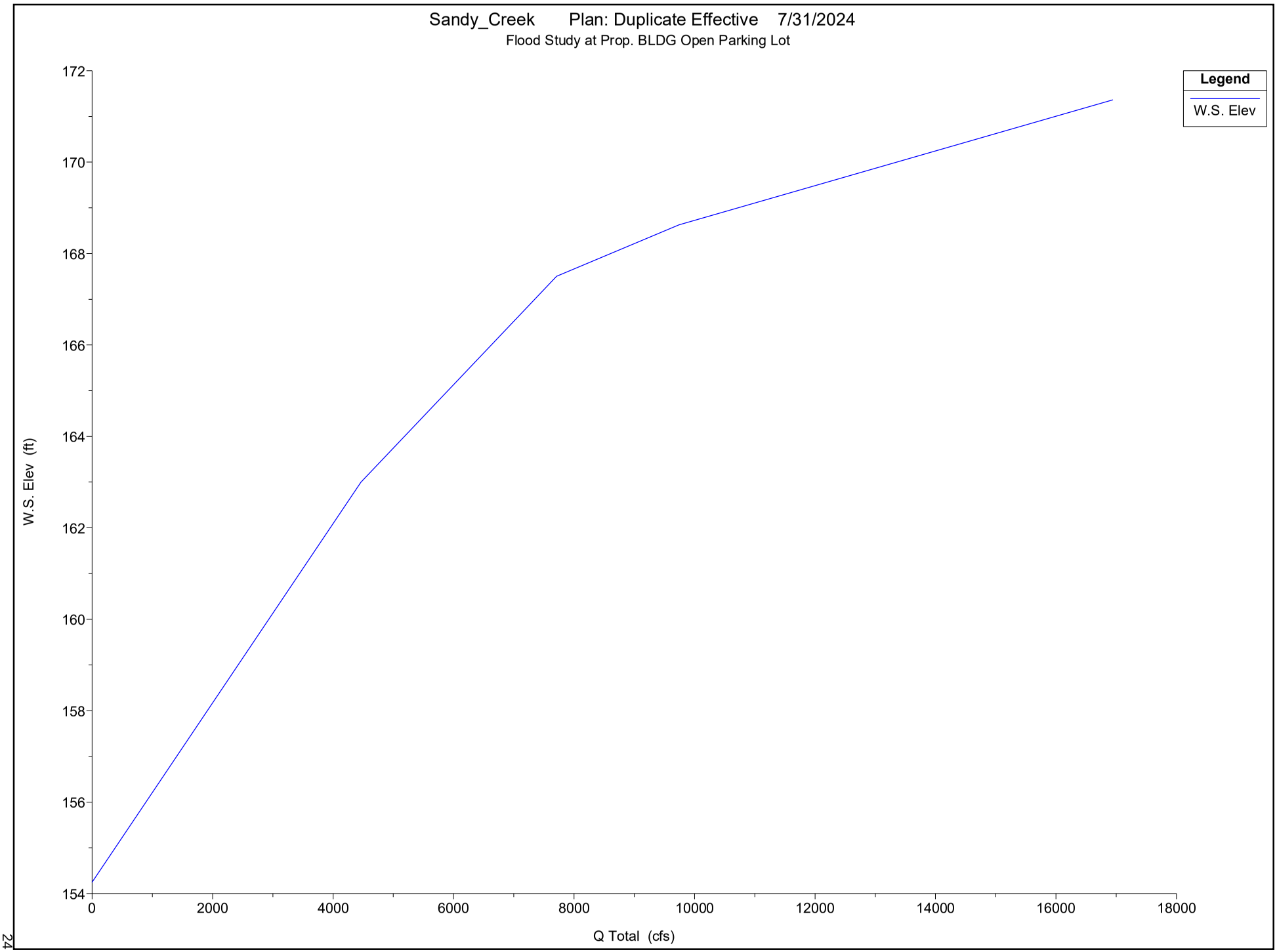

Sandy_Creek Plan: Duplicate Effective 7/31/2024
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

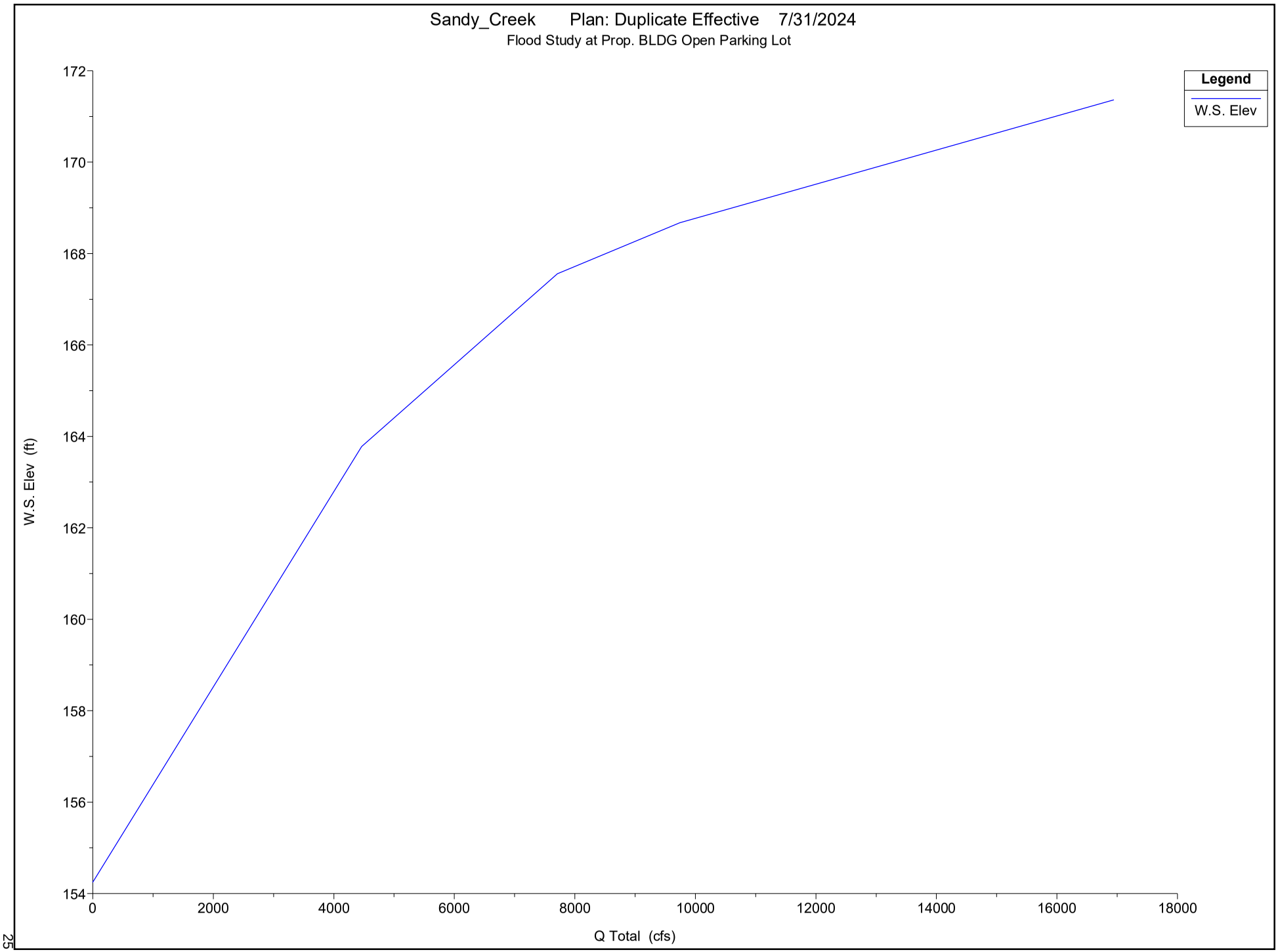

Sandy_Creek Plan: Duplicate Effective 7/31/2024
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

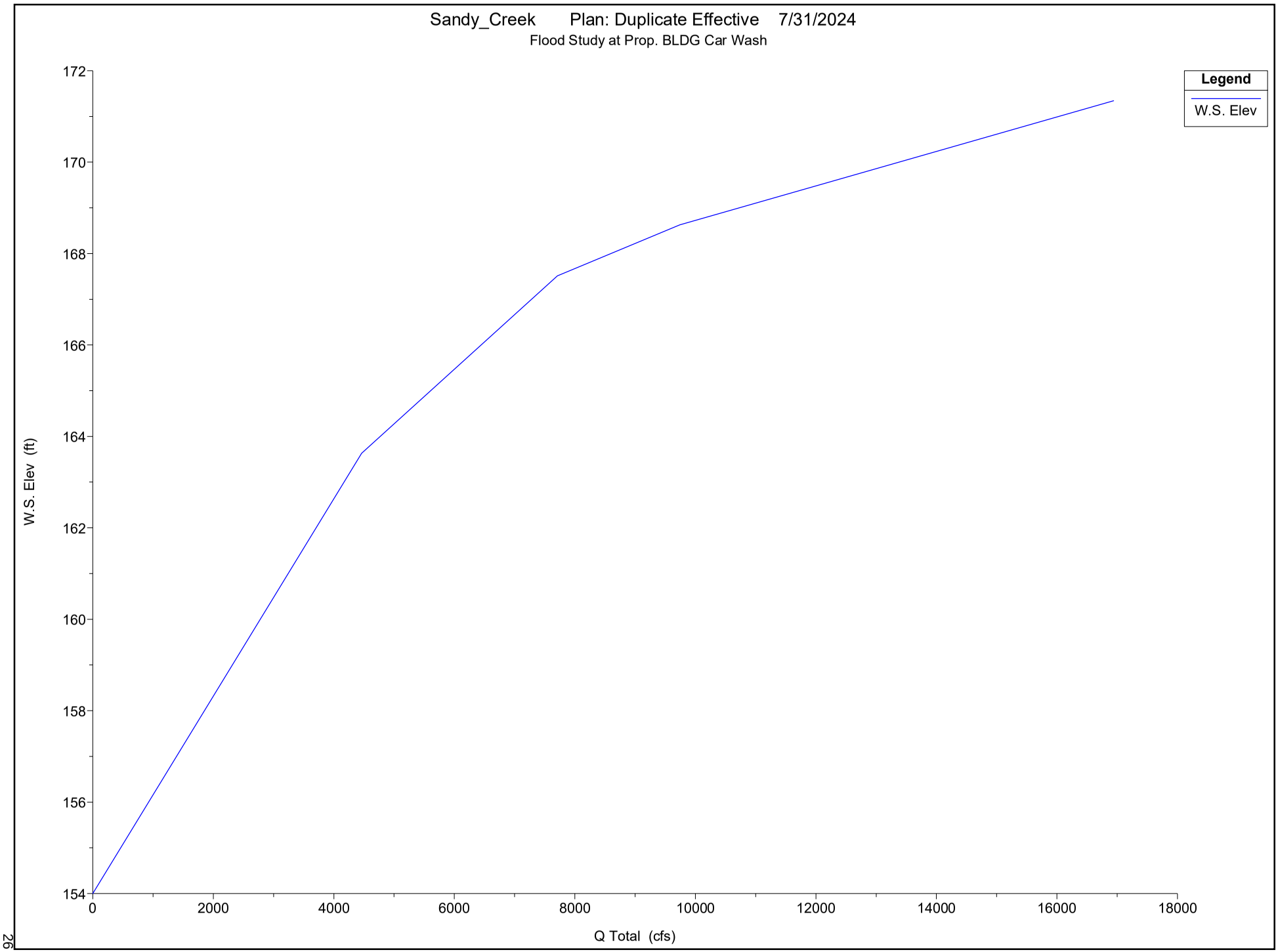
Sandy_Creek Plan: Duplicate Effective 7/31/2024

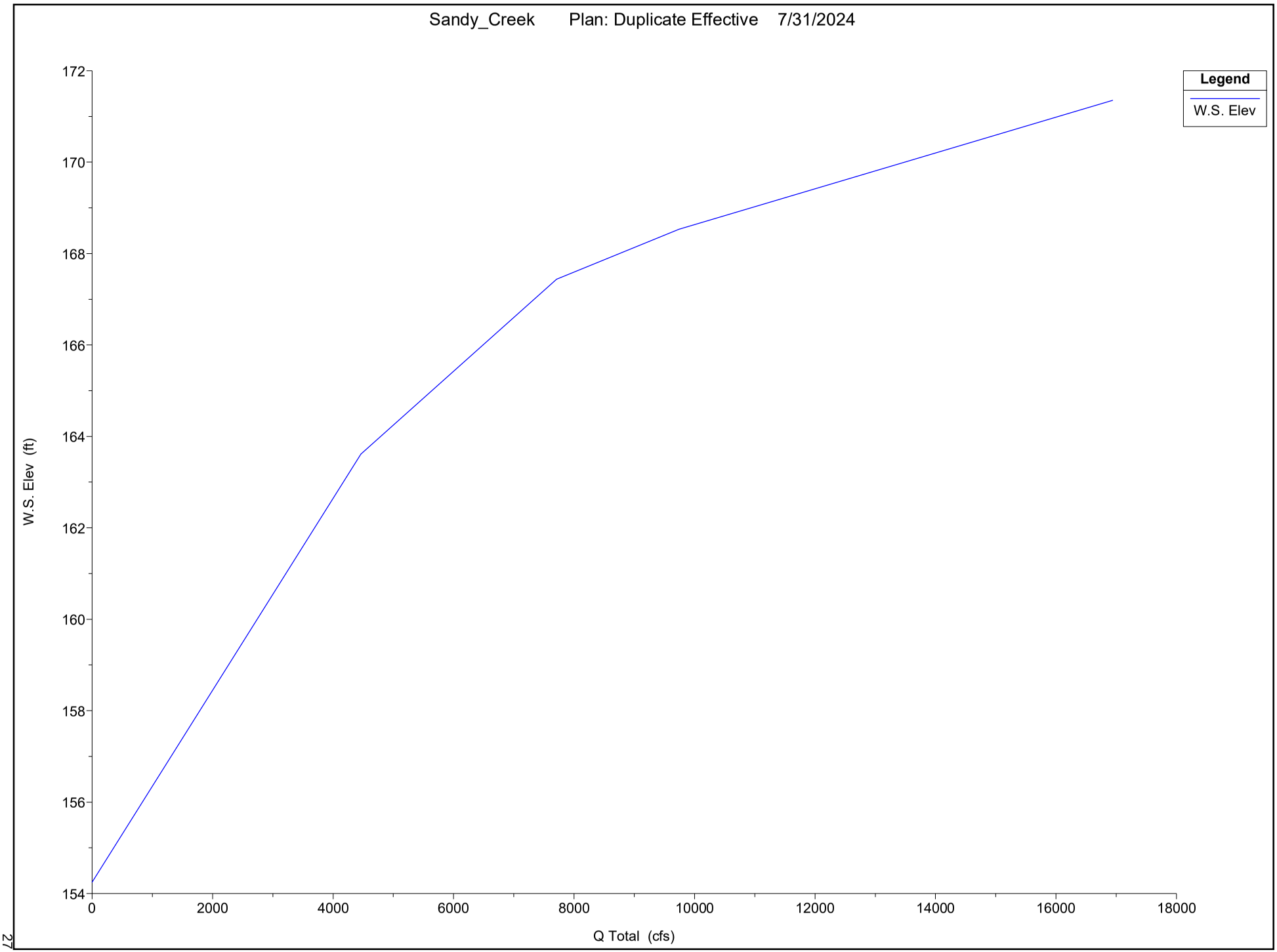
Flood Study at Prop. BLDG Showroom

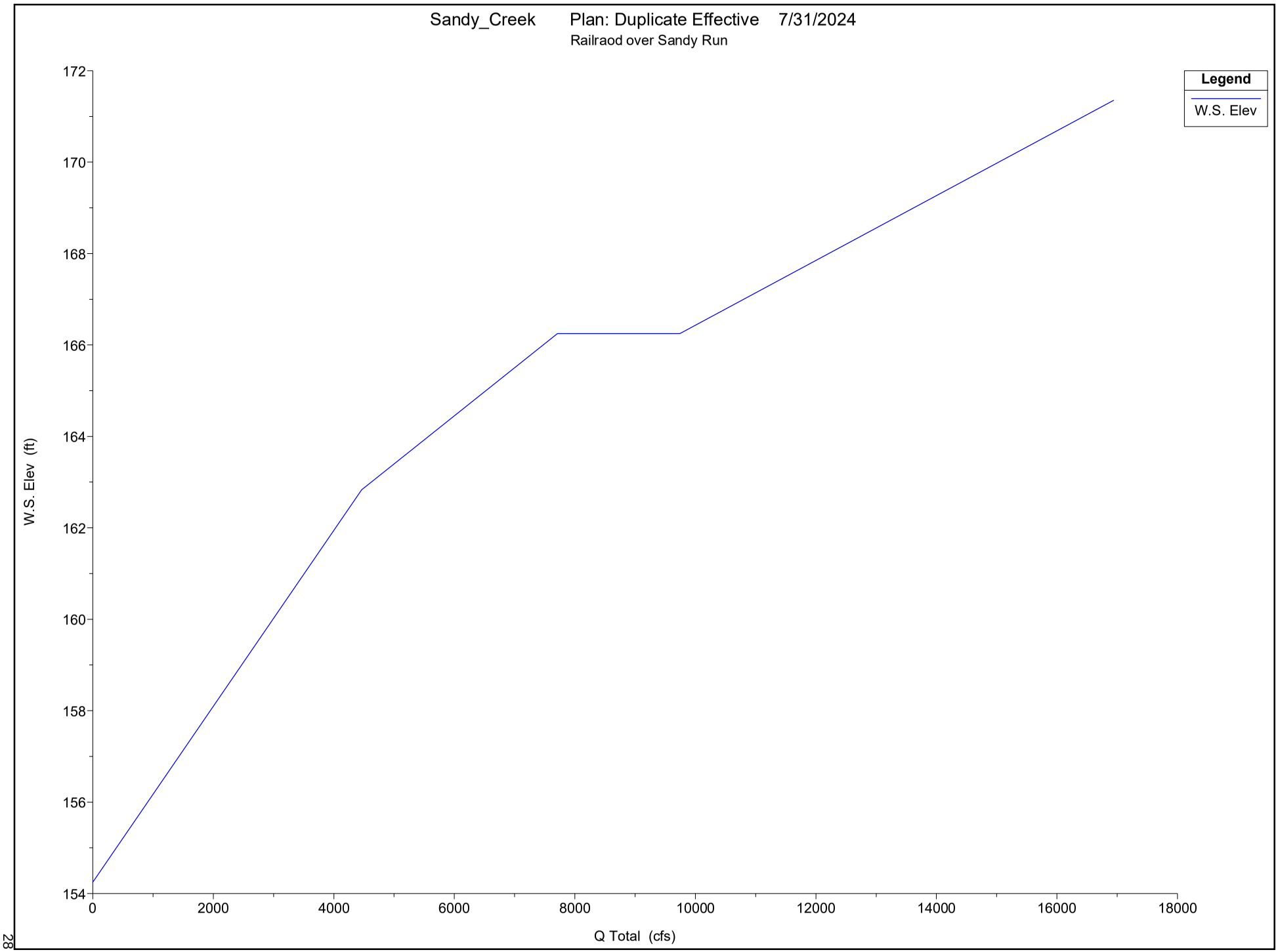


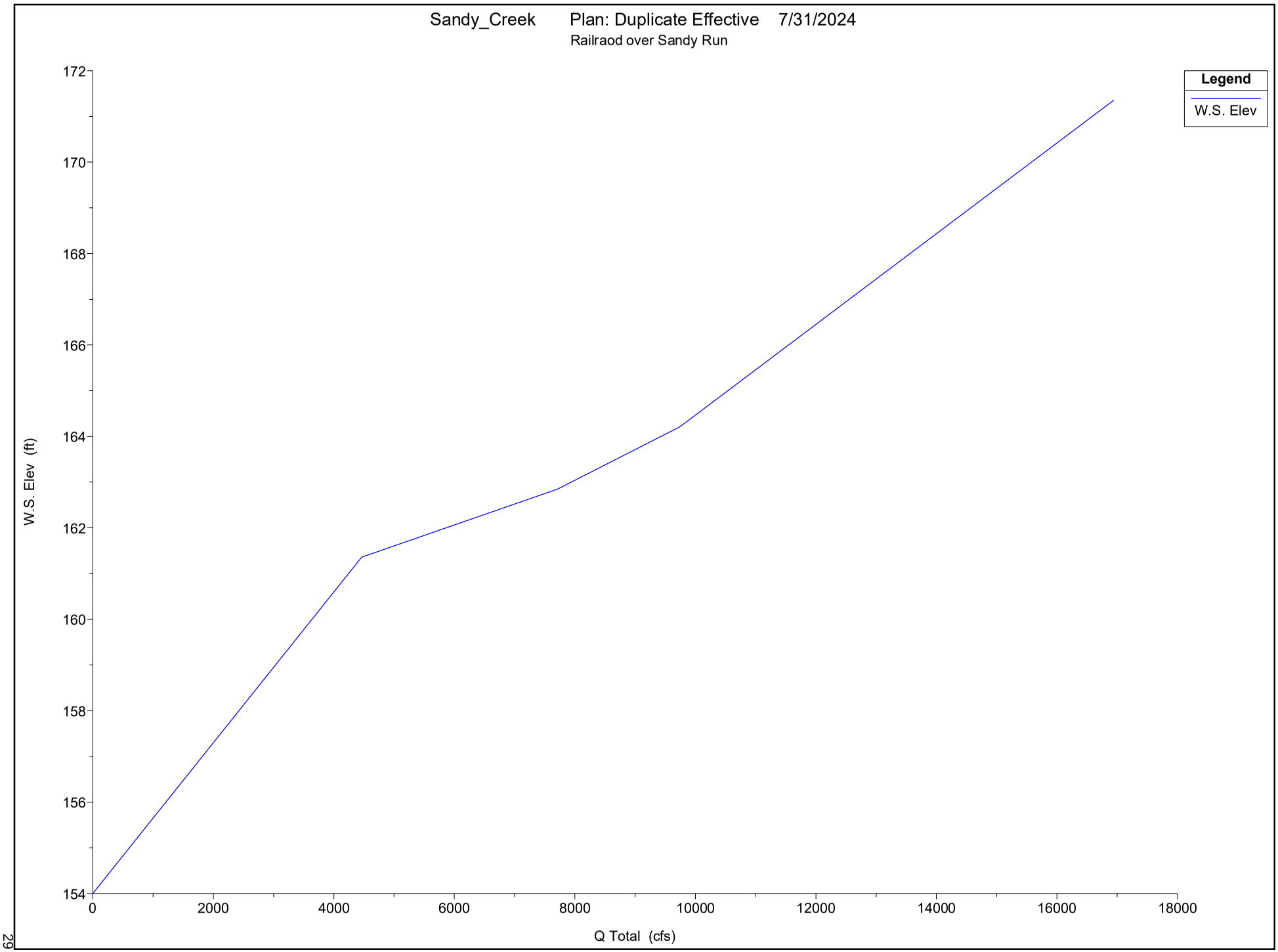

Sandy_Creek Plan: Duplicate Effective 7/31/2024
Flood Study at Prop. BLDG Open Parking Lot
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

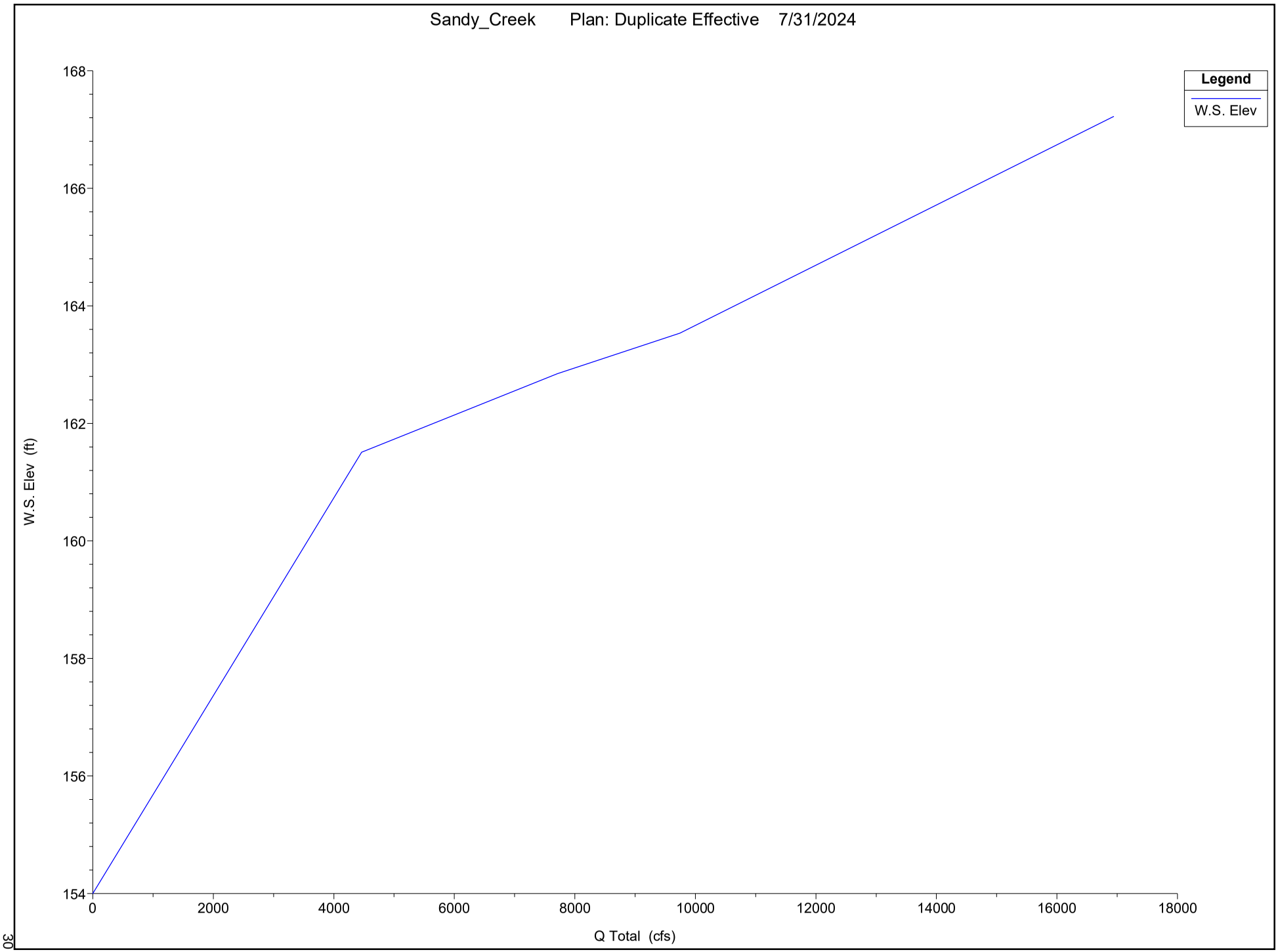

Sandy_Creek Plan: Duplicate Effective 7/31/2024
Flood Study at Prop. BLDG Open Parking Lot
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

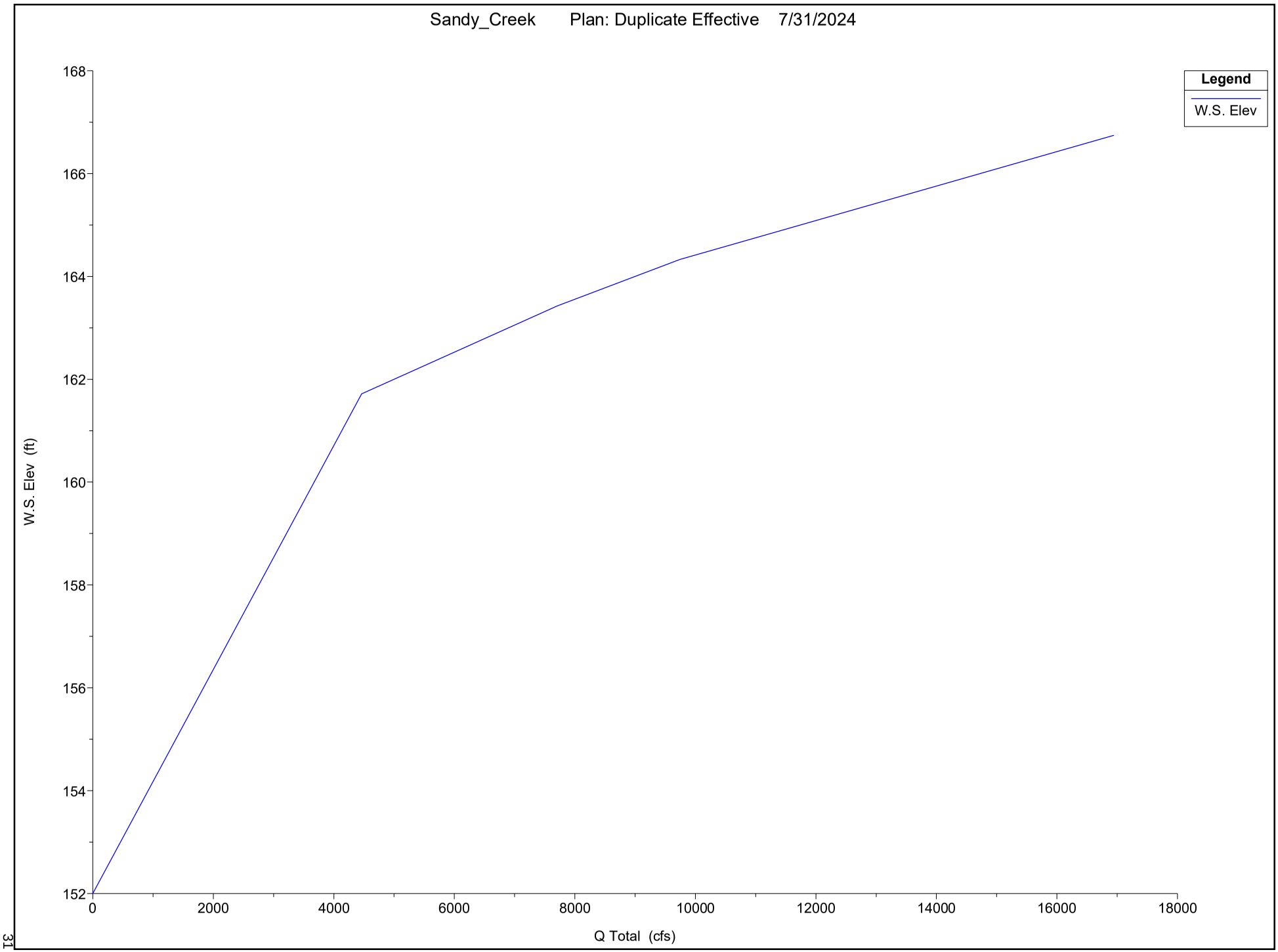

Sandy_Creek Plan: Duplicate Effective 7/31/2024
Flood Study at Prop. BLDG Car Wash
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

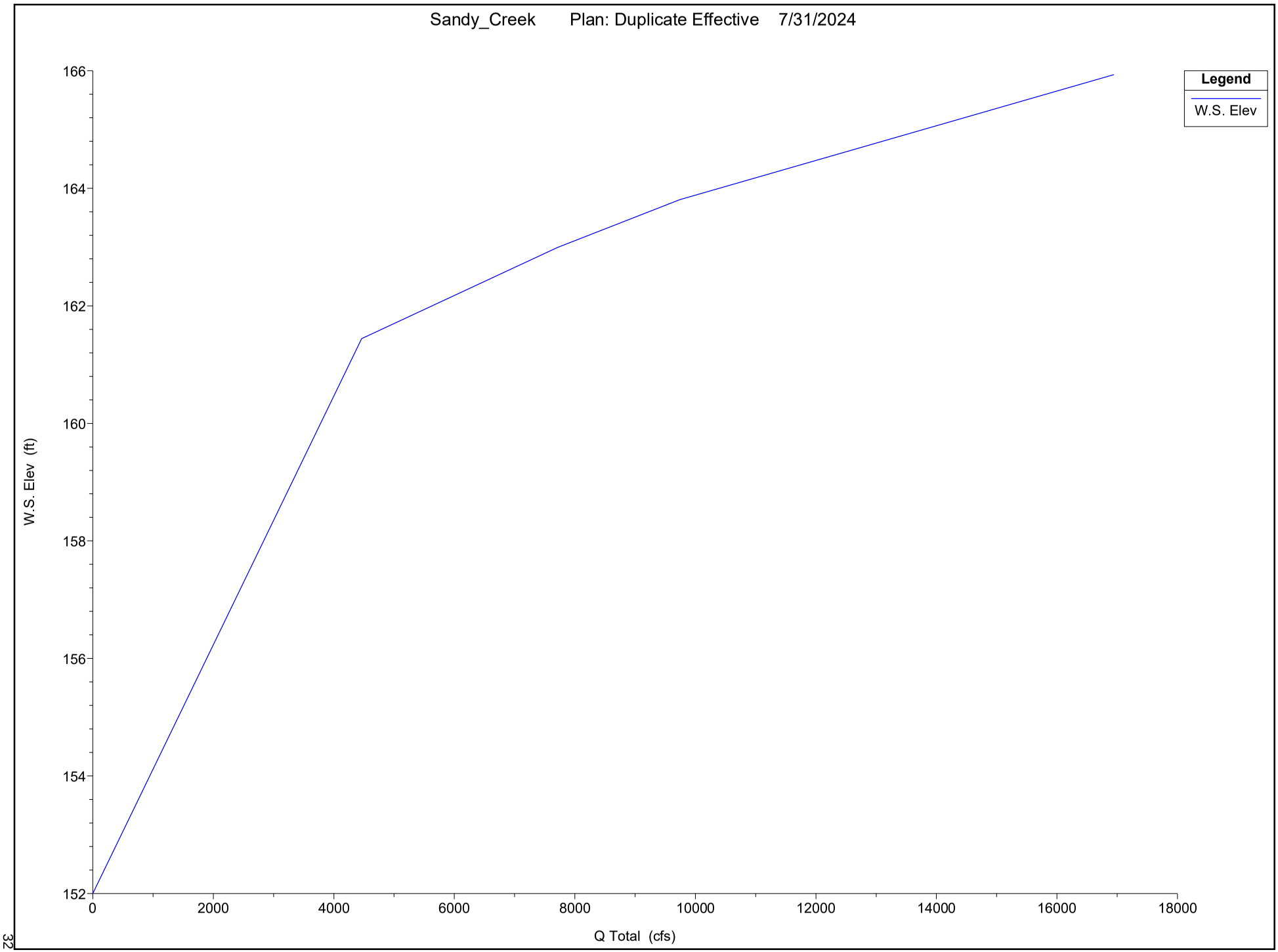

Sandy_Creek Plan: Duplicate Effective 7/31/2024
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

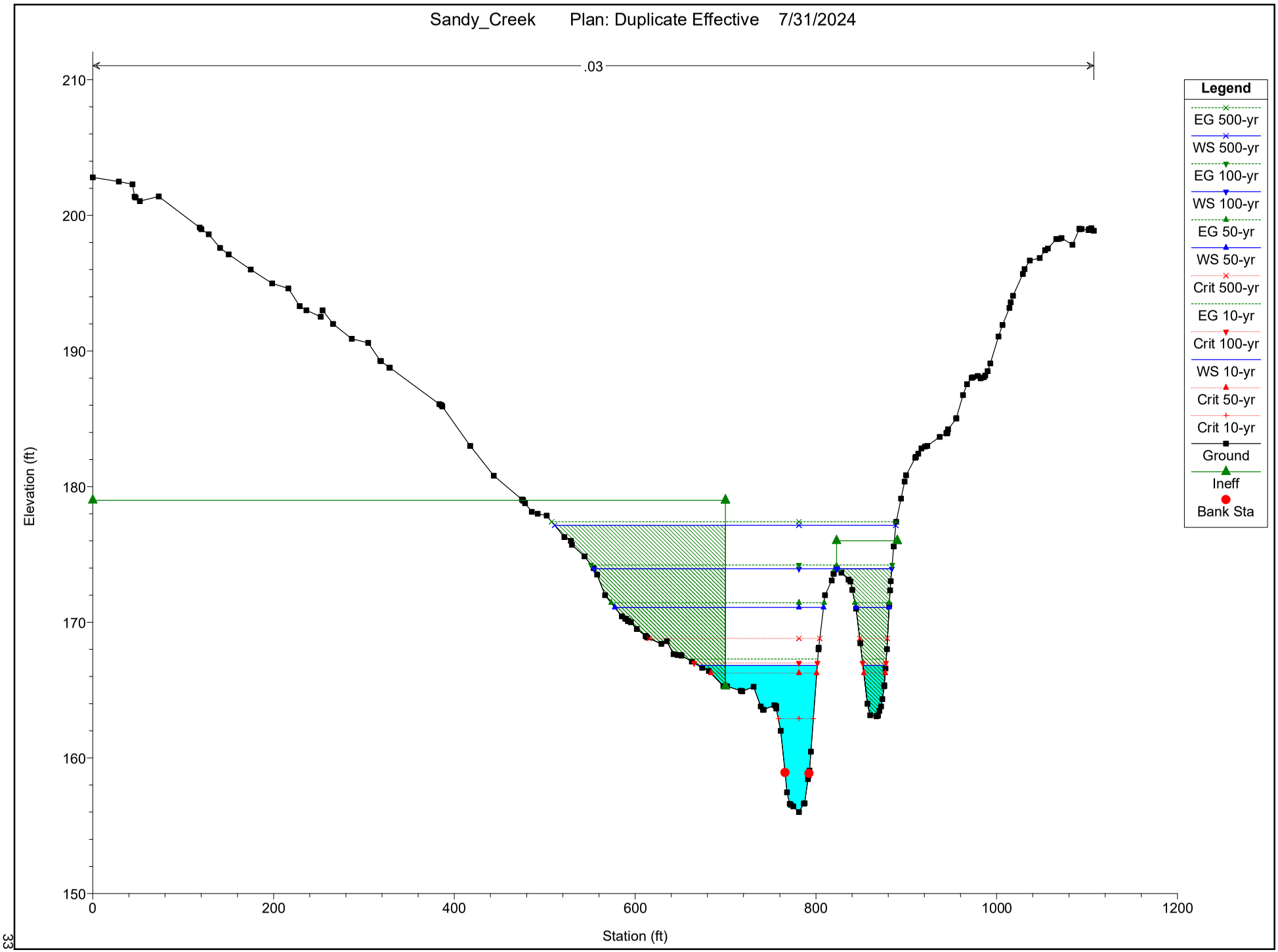

Sandy_Creek Plan: Duplicate Effective 7/31/2024
Railraod over Sandy Run
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

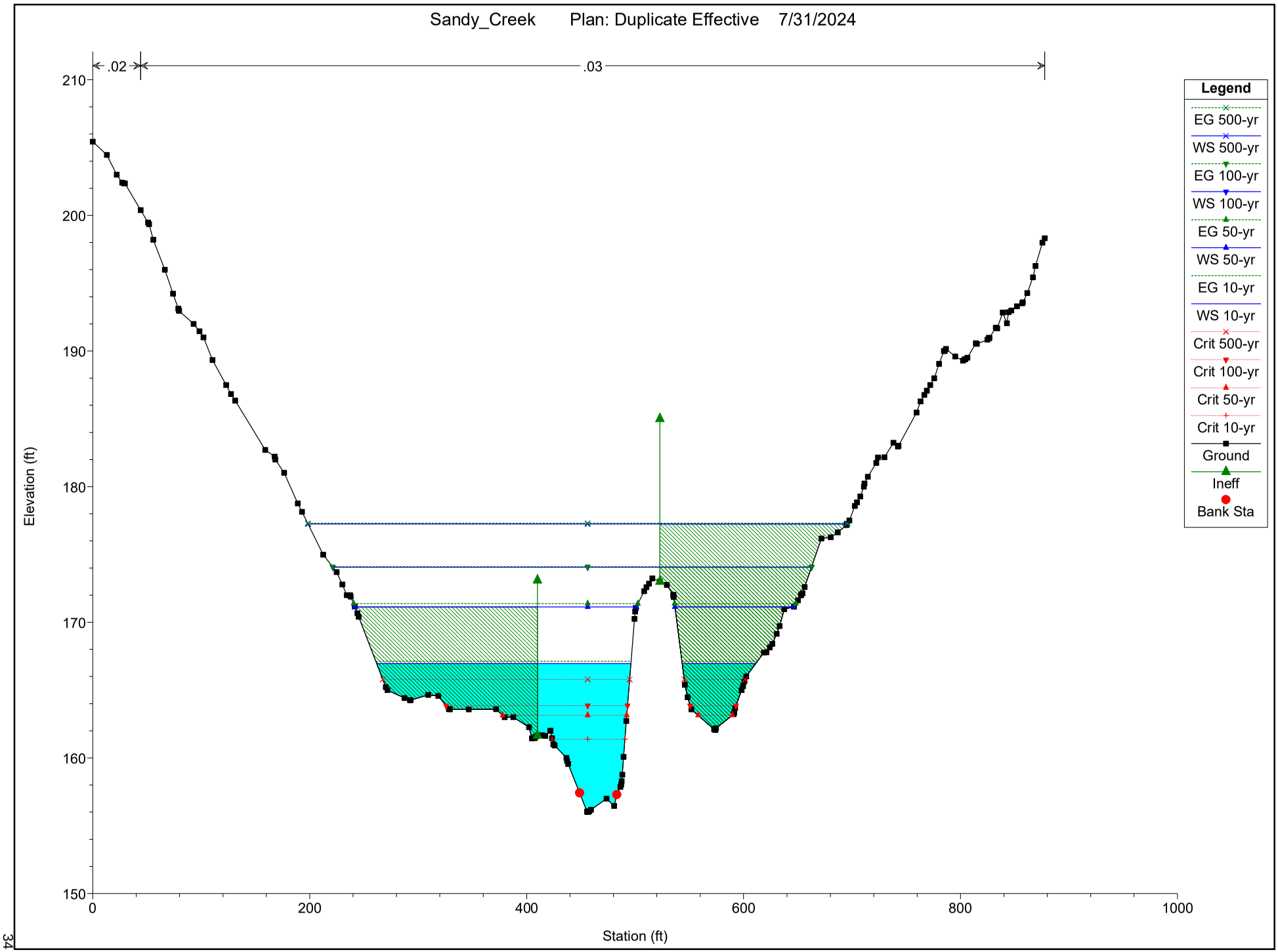

Sandy_Creek Plan: Duplicate Effective 7/31/2024
Railraod over Sandy Run
Legend
W.S. Elev
W.S. Elev (ft)
Q Total (cfs)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000

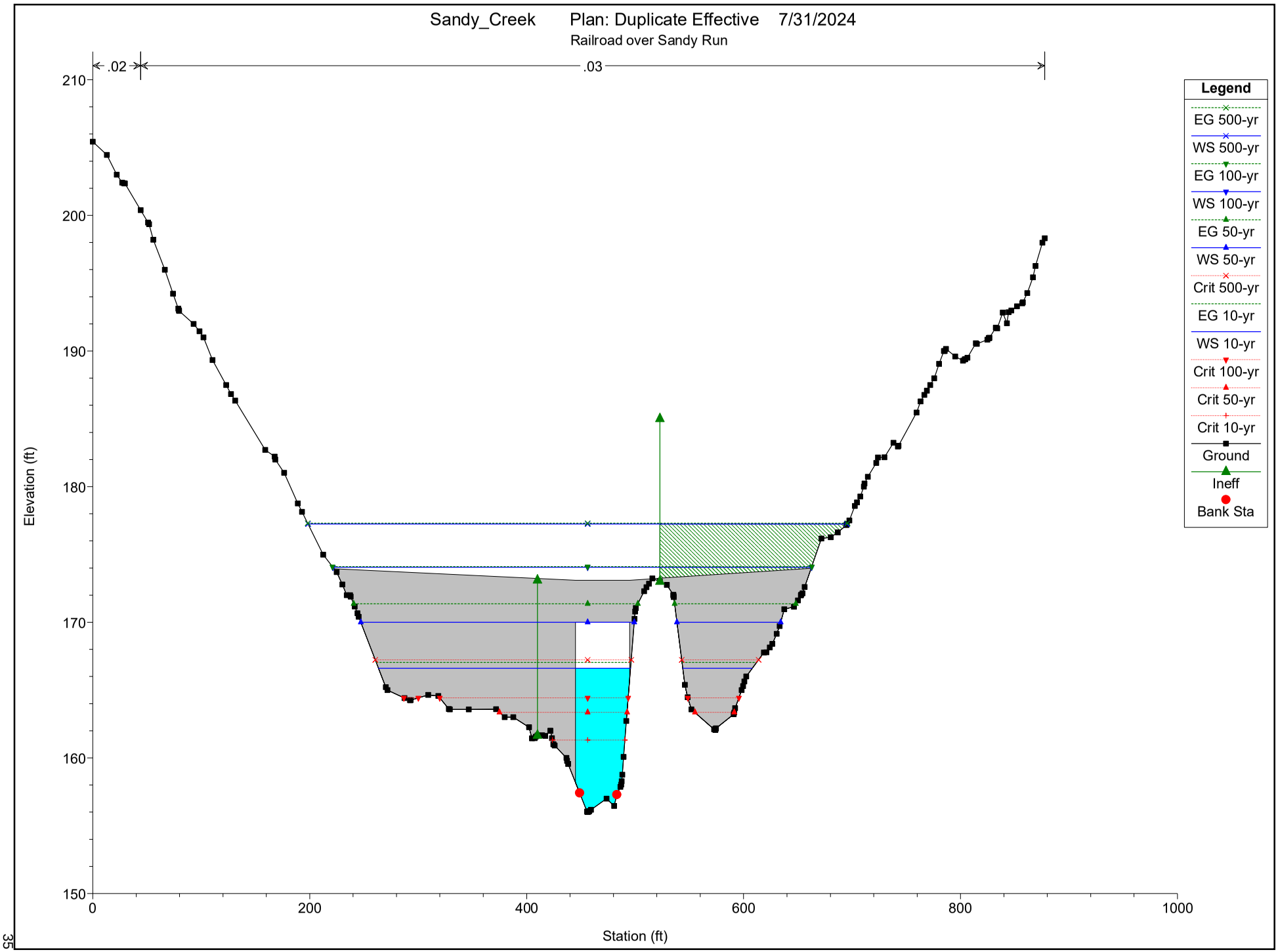

Sandy_Creek Plan: Duplicate Effective 7/31/2024
Legend
W.S. Elev
W.S. Elev (ft)
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

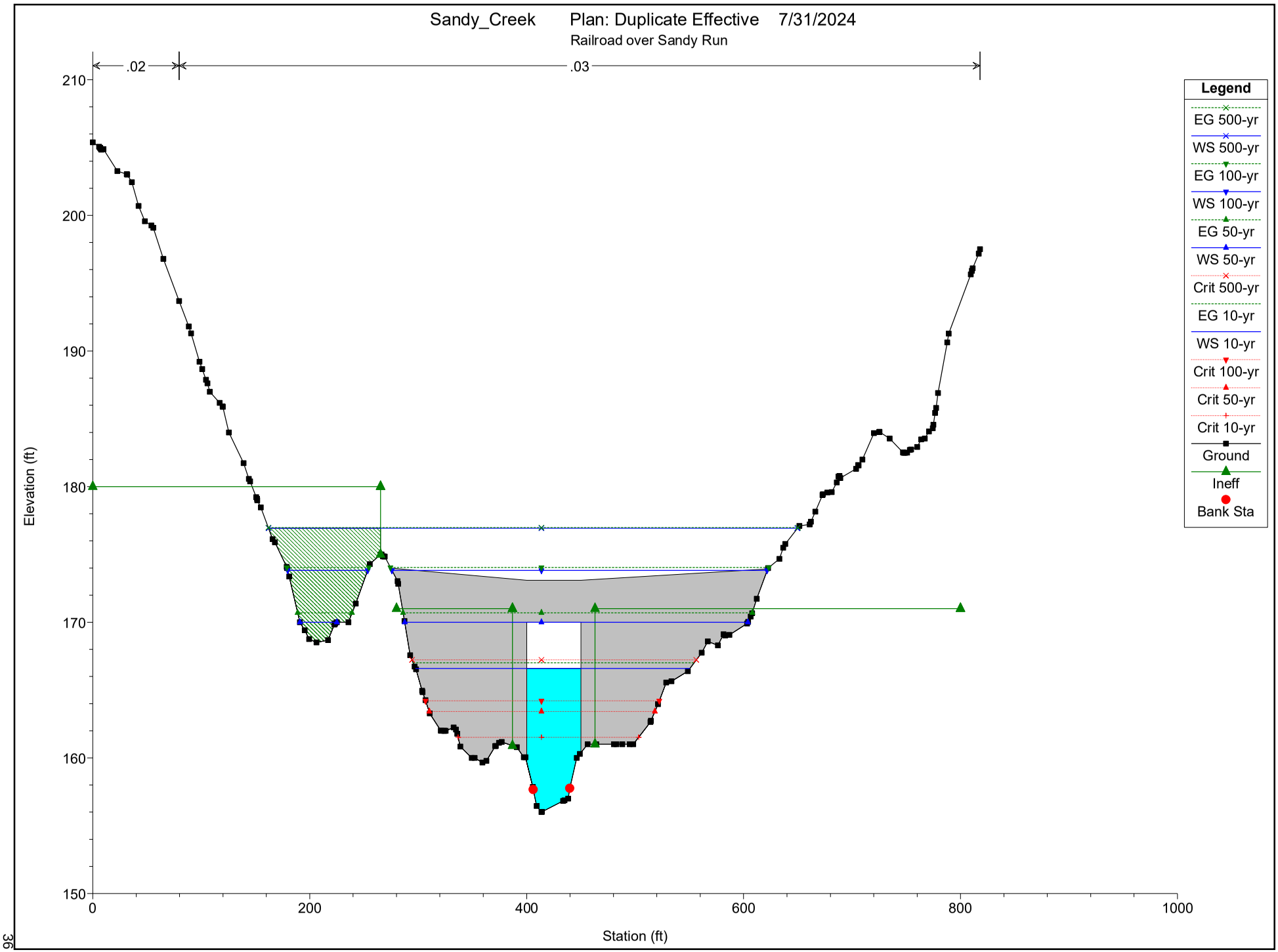

Sandy_Creek Plan: Duplicate Effective 7/31/2024
Legend
W.S. Elev
W.S. Elev (ft)
168
166
164
162
160
158
156
154
152
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

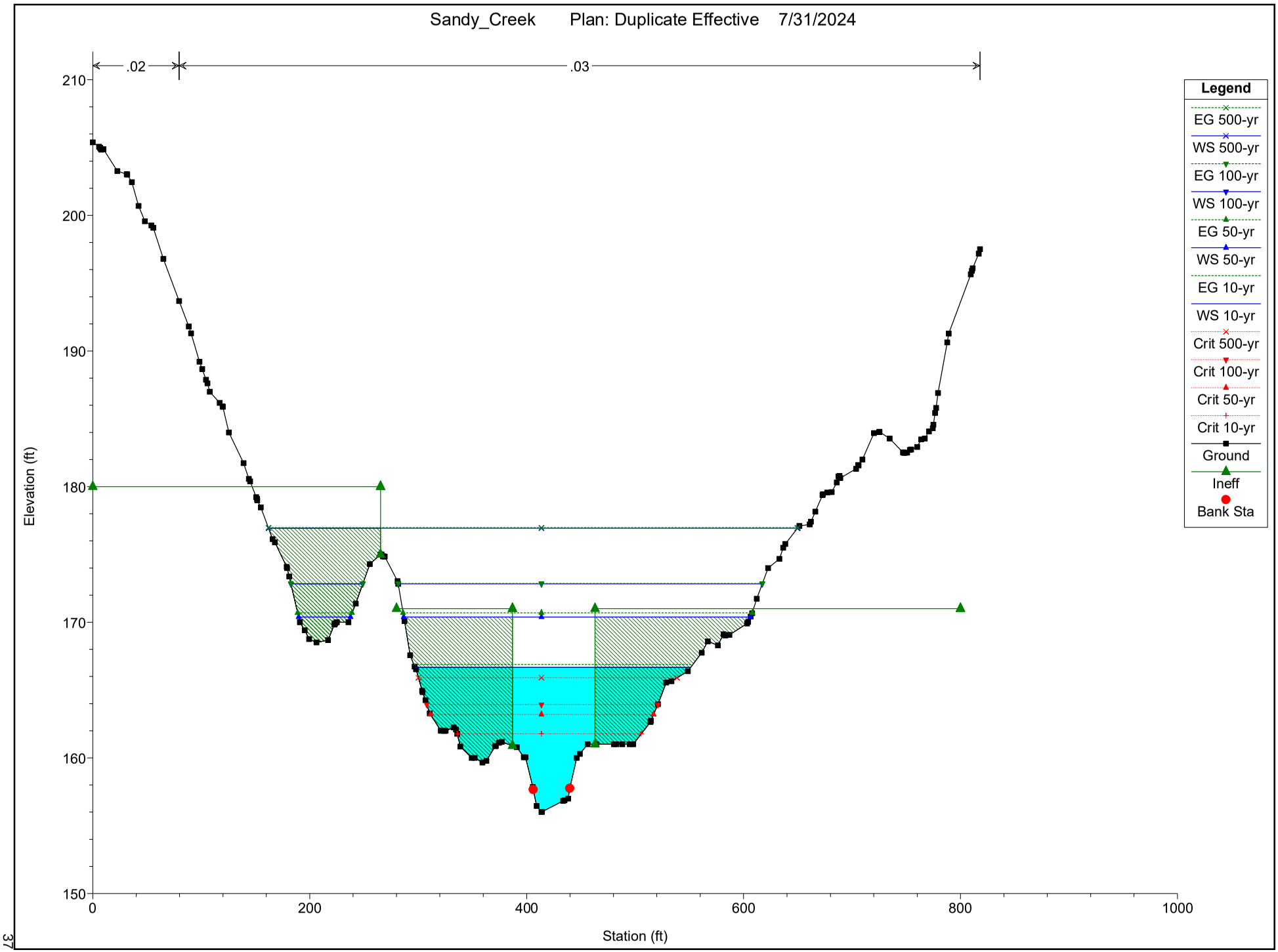

Sandy_Creek Plan: Duplicate Effective 7/31/2024
Legend
W.S. Elev
W.S. Elev (ft)
166
164
162
160
158
156
154
152
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

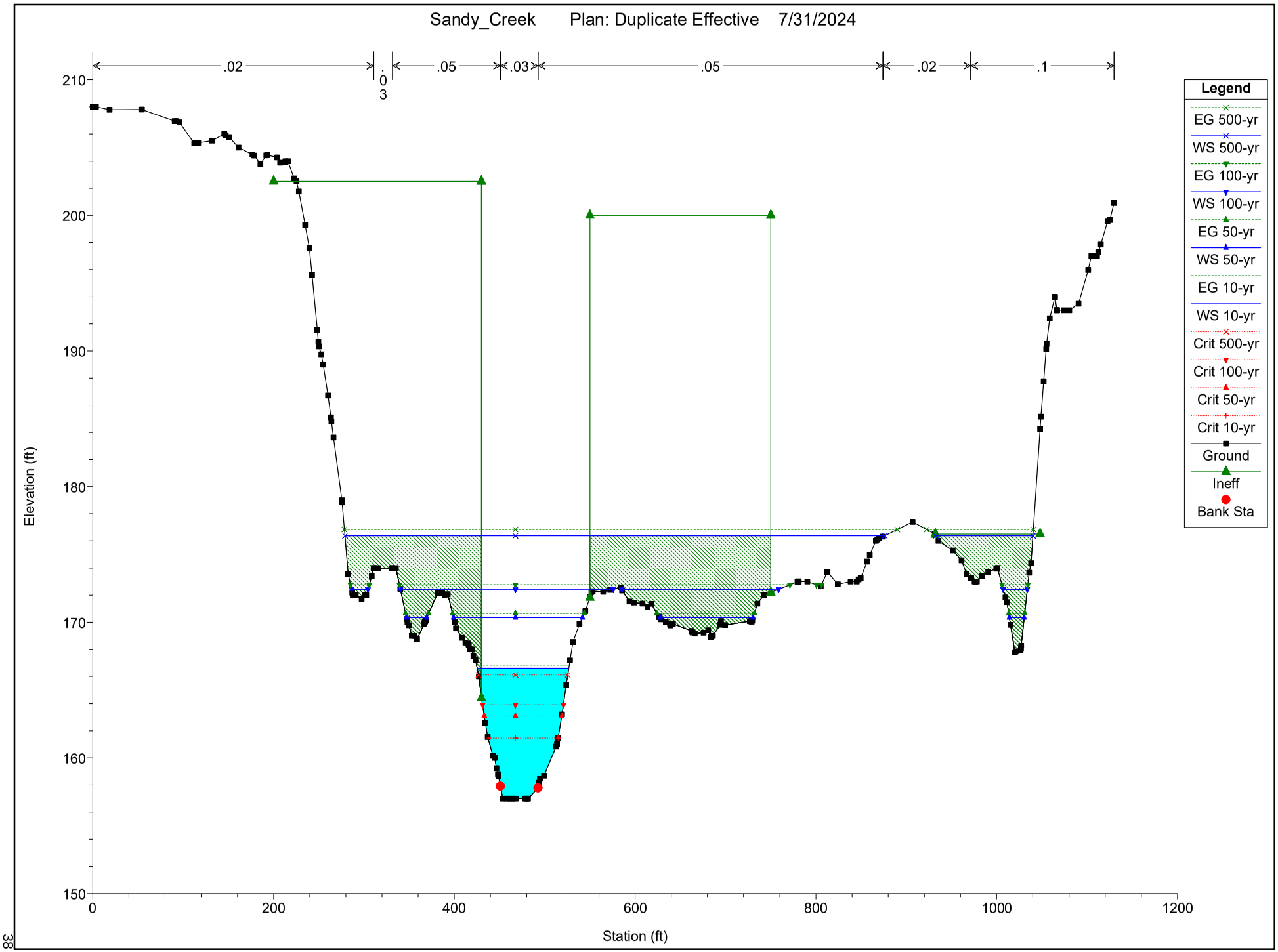

Sandy_Creek Plan: Duplicate Effective 7/31/2024
.03
Elevation (ft)
Station (ft)
210
200
190
180
170
160
150
0
200
400
600
800
1000
1200
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
EG 10-yr
Crit 100-yr
WS 10-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta

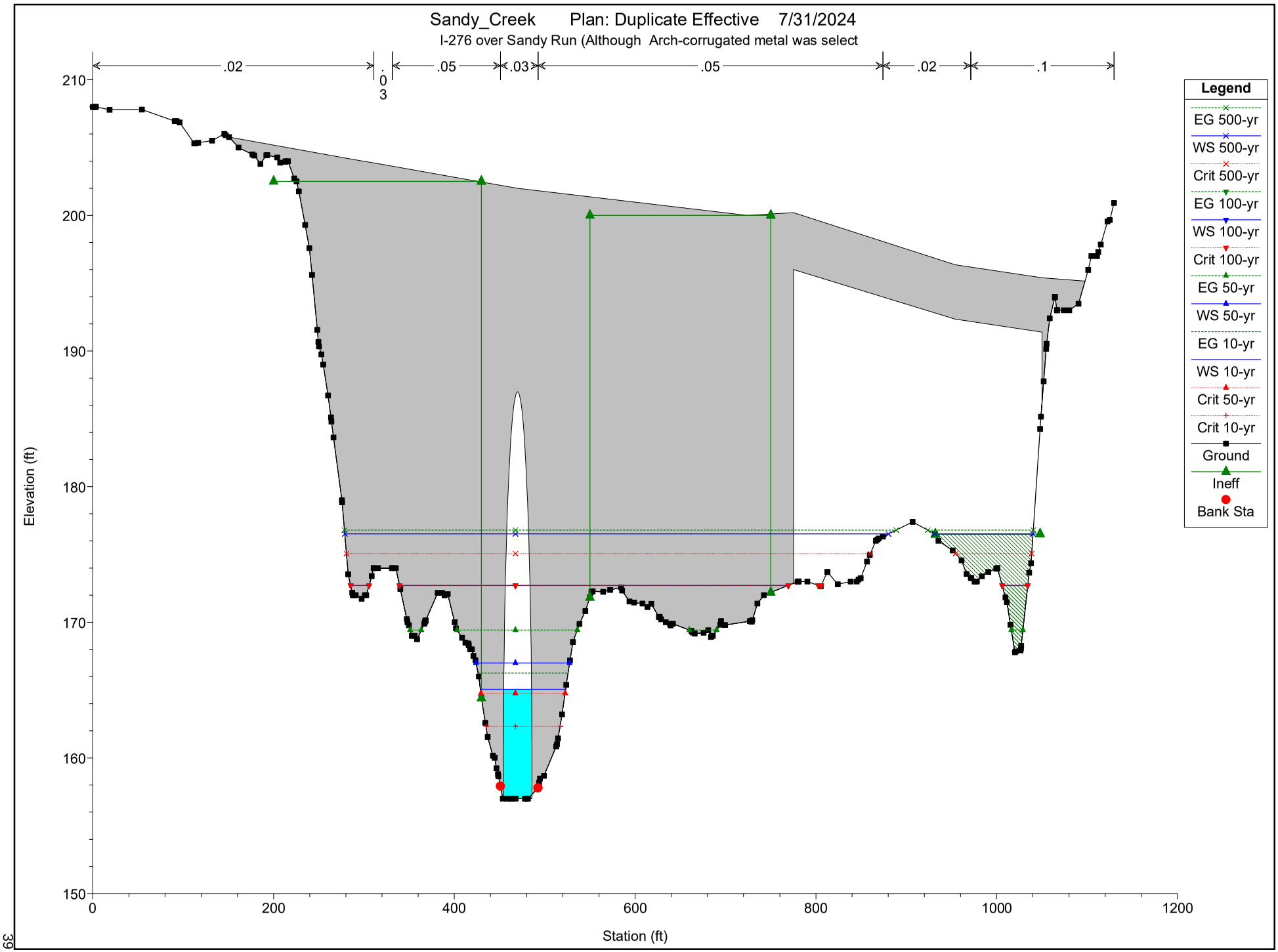

Sandy_Creek Plan: Duplicate Effective 7/31/2024
.02
.03
Elevation (ft)
210
200
190
180
170
160
150
0
200
400
600
800
1000
Station (ft)
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Crit 500-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta

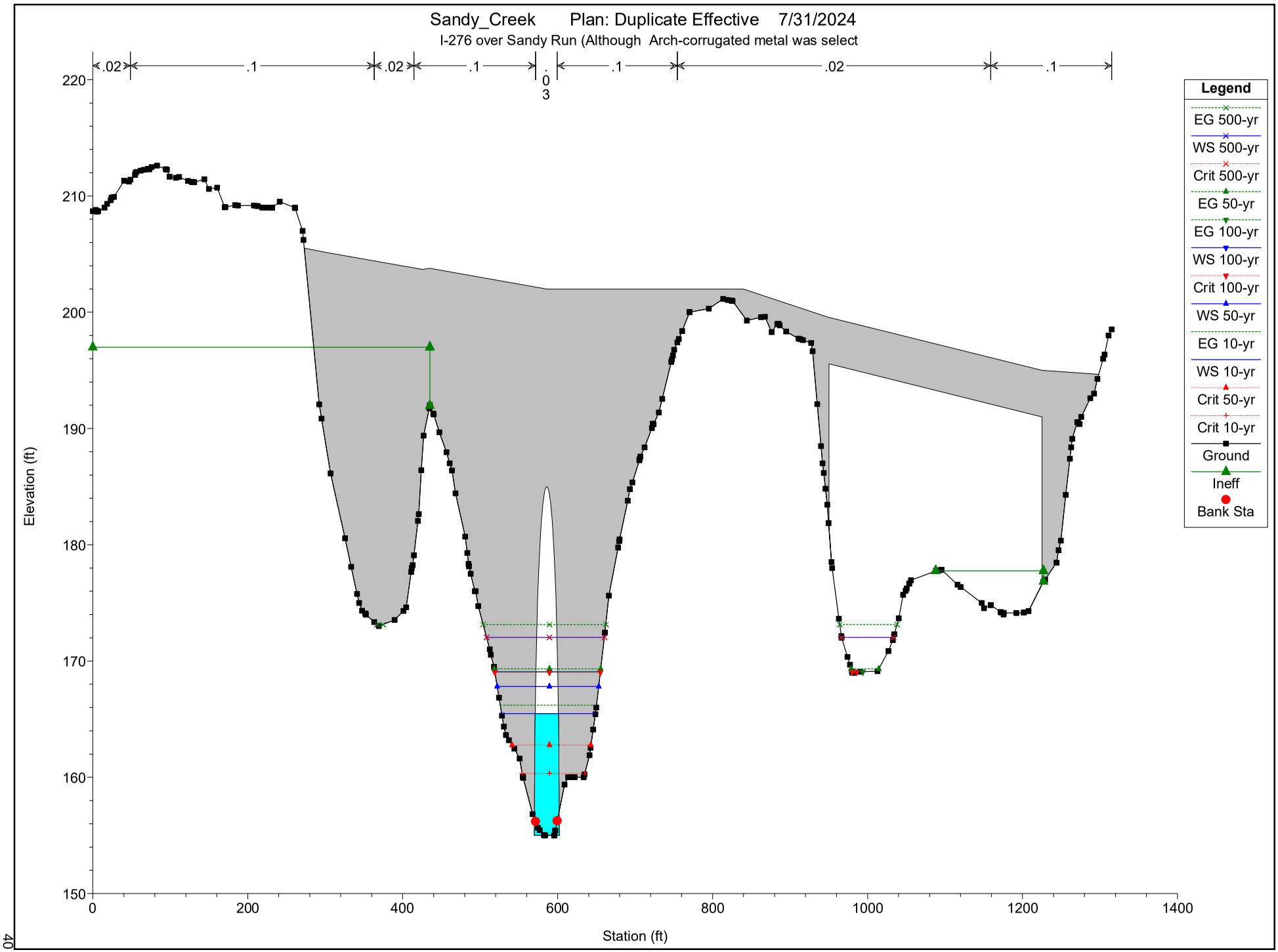

Sandy_Creek Plan: Duplicate Effective 7/31/2024
Railroad over Sandy Run
.02
.03
Elevation (ft)
Station (ft)
210
200
190
180
170
160
150
0
200
400
600
800
1000
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
EG 10-yr
WS 10-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta

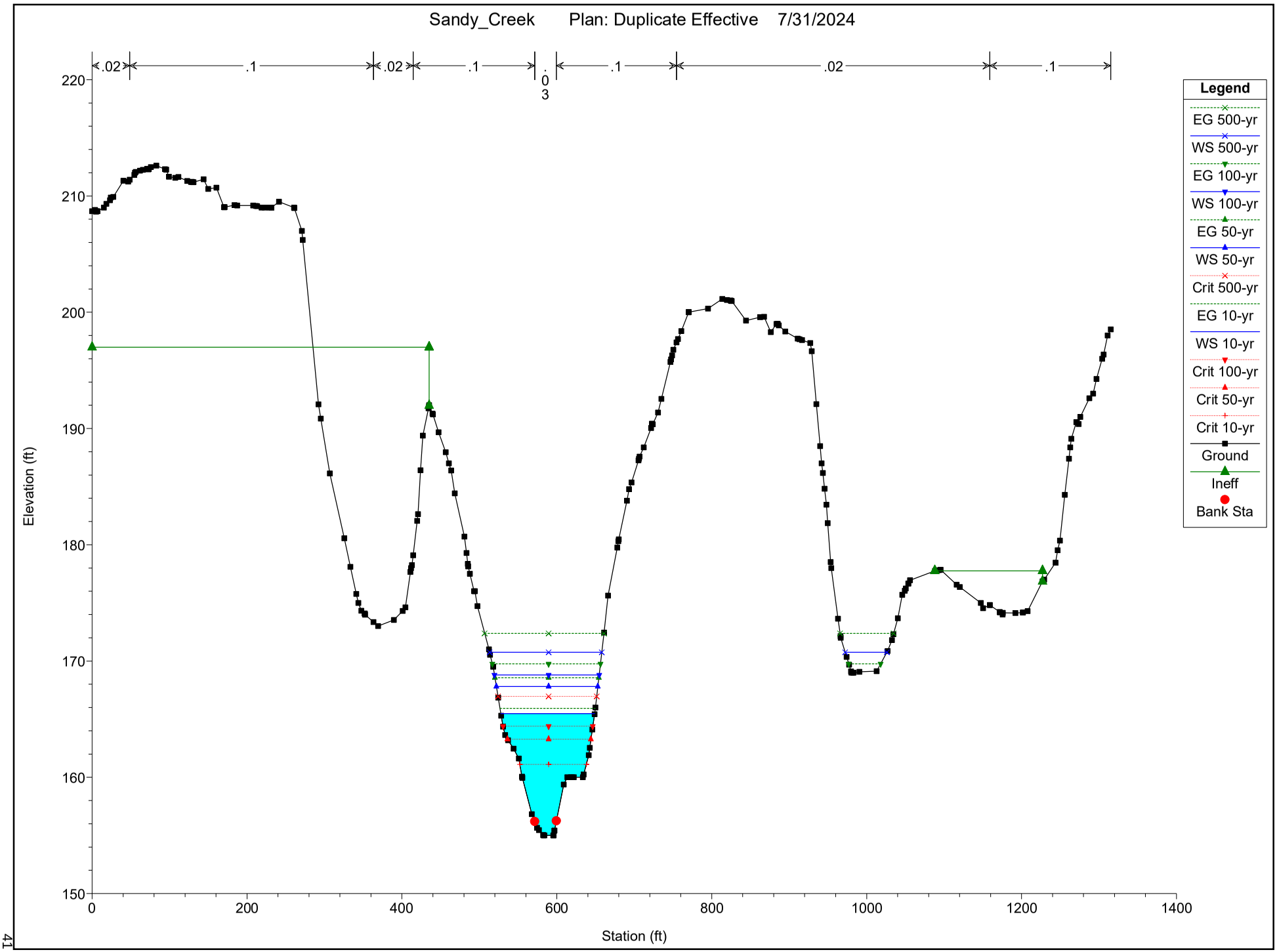

Sandy_Creek Plan: Duplicate Effective 7/31/2024
Railroad over Sandy Run
.02
.03
Elevation (ft)
Station (ft)
210
200
190
180
170
160
150
0
200
400
600
800
1000
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
EG 10-yr
WS 10-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta


Sandy_Creek Plan: Duplicate Effective 7/31/2024
.02
.03
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Crit 500-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
210
200
190
180
170
160
150
0
200
400
600
800
1000
Station (ft)


Sandy_Creek Plan: Duplicate Effective 7/31/2024
.02
.03
.05
.03
.05
.02
.1
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Crit 500-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
210
200
190
180
170
160
150
0
200
400
600
800
1000
1200


Sandy_Creek Plan: Duplicate Effective 7/31/2024
I-276 over Sandy Run (Although Arch-corrugated metal was select
.02
.03
.05
.03
.05
.02
.1
Legend
EG 500-yr
WS 500-yr
Crit 500-yr
EG 100-yr
WS 100-yr
Crit 100-yr
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
210
200
190
180
170
160
150
0
200
400
600
800
1000
1200
Station (ft)


Sandy_Creek Plan: Duplicate Effective 7/31/2024
I-276 over Sandy Run (Although Arch-corrugated metal was select
.02
.1
.02
.1
.03
.1
.02
.1
Legend
EG 500-yr
WS 500-yr
Crit 500-yr
EG 50-yr
EG 100-yr
WS 100-yr
Crit 100-yr
WS 50-yr
EG 10-yr
WS 10-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
220
210
200
190
180
170
160
150
0
200
400
600
800
1000
1200
1400
Station (ft)


Sandy_Creek Plan: Duplicate Effective 7/31/2024
.02
.1
.02
.1
.03
.1
.02
.1
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
EG 10-yr
WS 10-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
220
210
200
190
180
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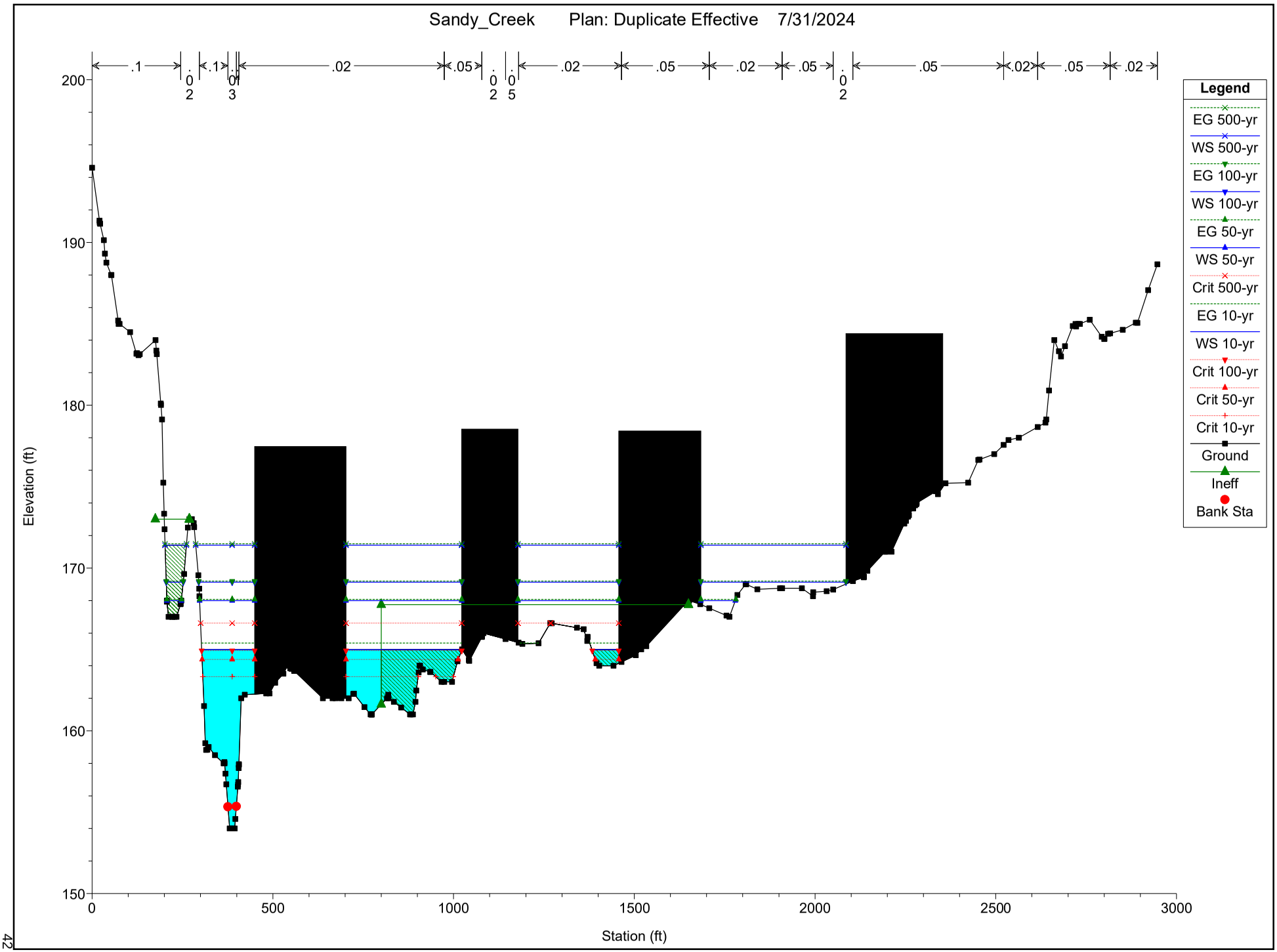
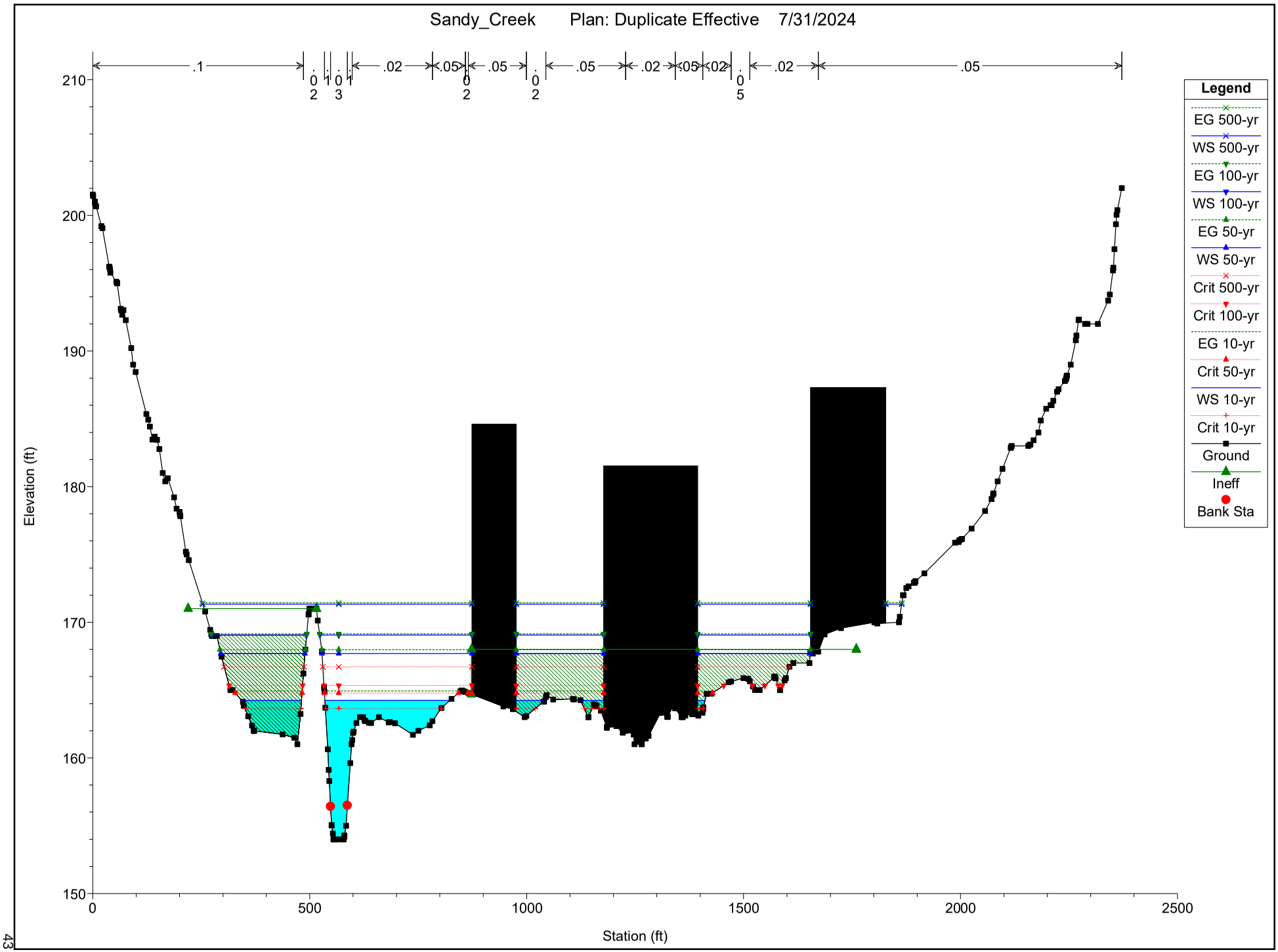
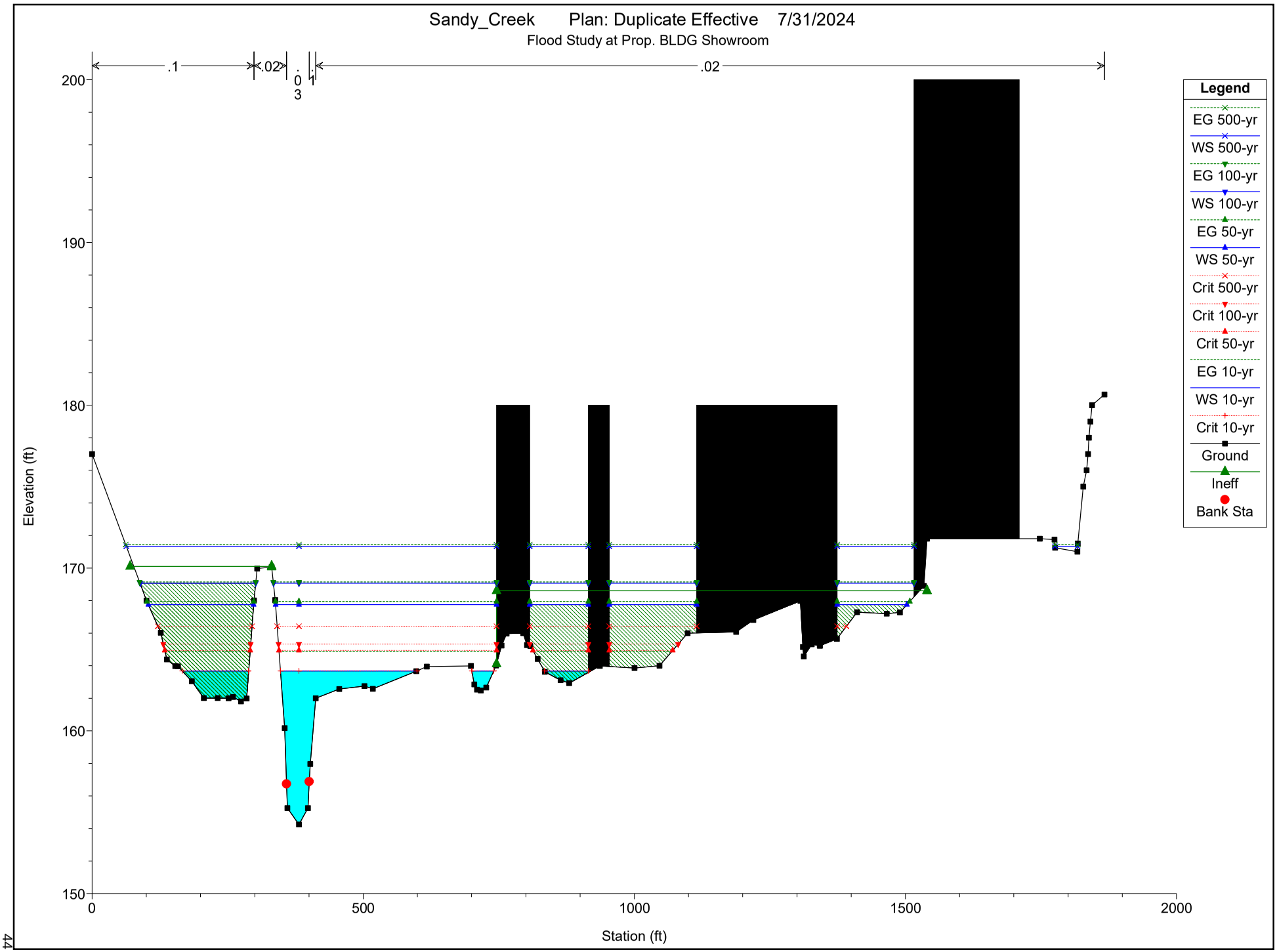
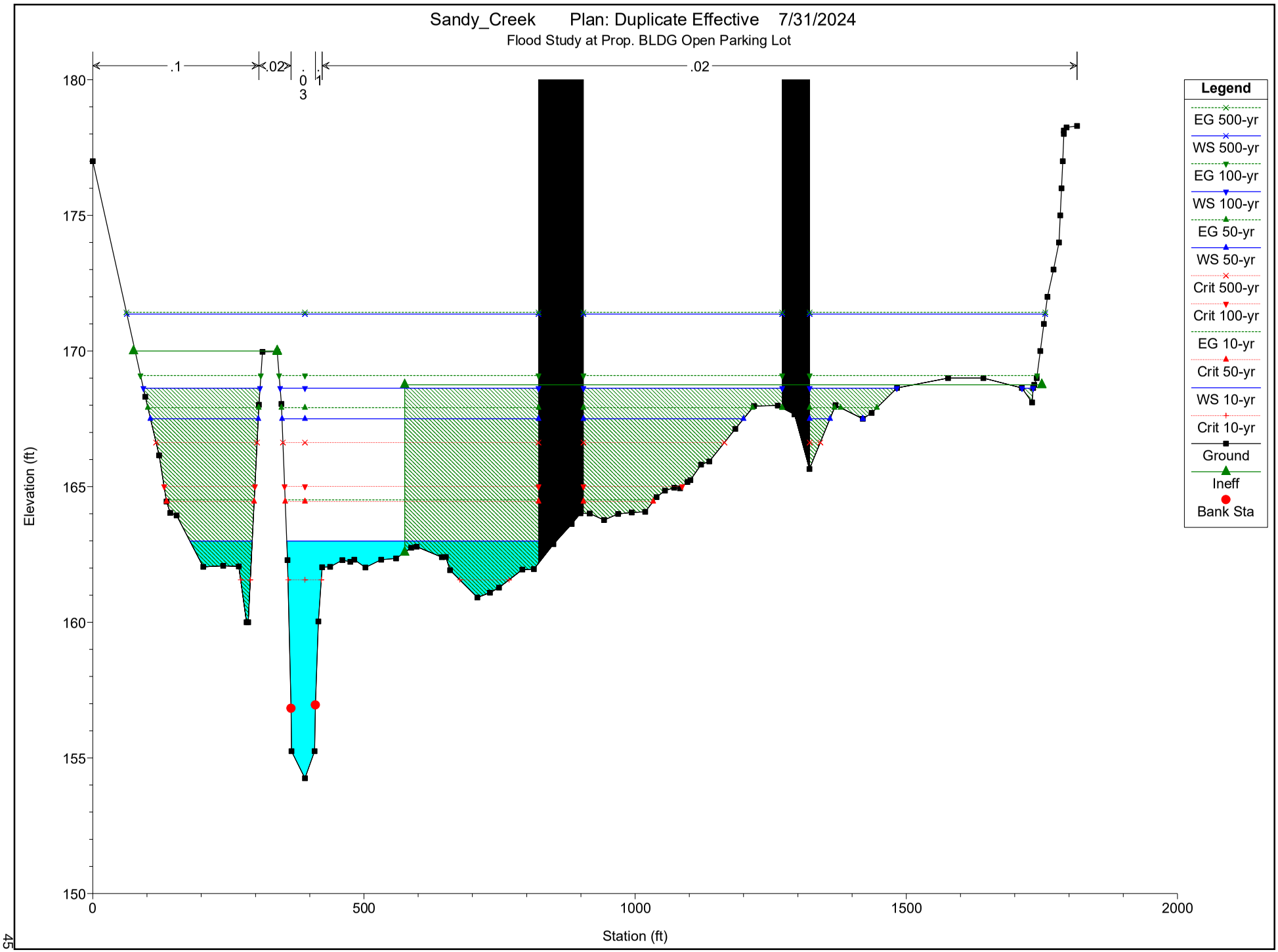
160
150
0
200
400
600
800
1000
1200
1400
Station (ft)


Sandy_Creek Plan: Duplicate Effective 7/31/2024
.1
.02
.1
.02
.05
.02
.05
.02
.05
.05
.02
.05
.02
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
EG 10-yr
WS 10-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
200
190
180
170
160
150
0
500
1000
1500
2000
2500
3000
Station (ft)


Sandy_Creek Plan: Duplicate Effective 7/31/2024
.1
.02
.05
.05
.05
.02
.05
.02
.02
.05
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
Crit 100-yr
EG 10-yr
Crit 50-yr
WS 10-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
210
200
190
180
170
160
150
0
500
1000
1500
2000
2500
Station (ft)


Sandy_Creek Plan: Duplicate Effective 7/31/2024
Flood Study at Prop. BLDG Showroom
.1
.02
.02
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
Crit 100-yr
Crit 50-yr
EG 10-yr
WS 10-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
200
190
180
170
160
150
0
500
1000
1500
2000
Station (ft)


Sandy_Creek Plan: Duplicate Effective 7/31/2024
Flood Study at Prop. BLDG Open Parking Lot
.1
.02
.03
.1
.02
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
Crit 100-yr
EG 10-yr
Crit 50-yr
WS 10-yr
Crit 10-yr
Ground
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Bank Sta
Elevation (ft)
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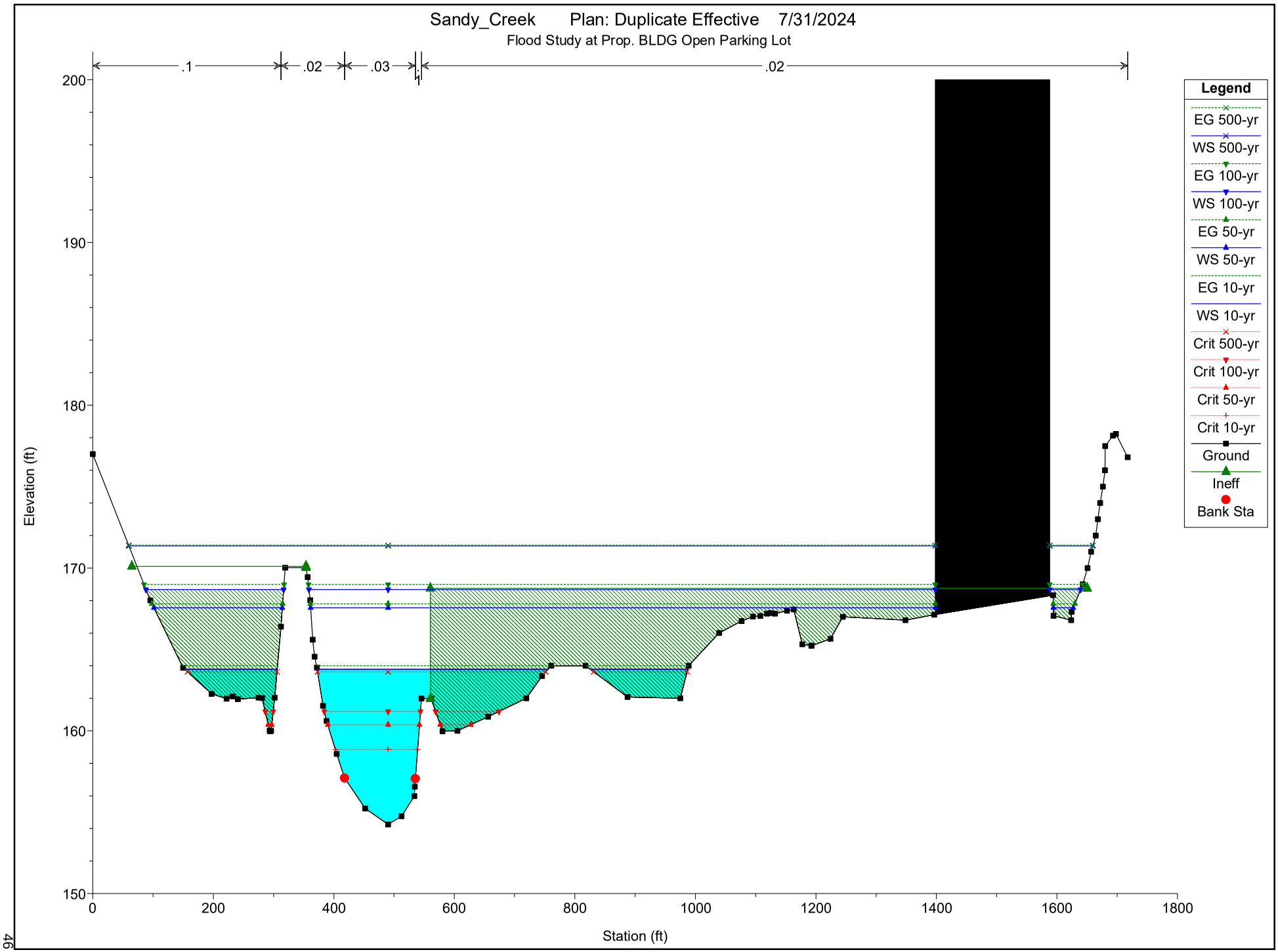
2000
Station (ft)


Sandy_Creek Plan: Duplicate Effective 7/31/2024
Flood Study at Prop. BLDG Open Parking Lot
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Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
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EG 10-yr
WS 10-yr
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Crit 100-yr
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Crit 10-yr
Ground
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Elevation (ft)
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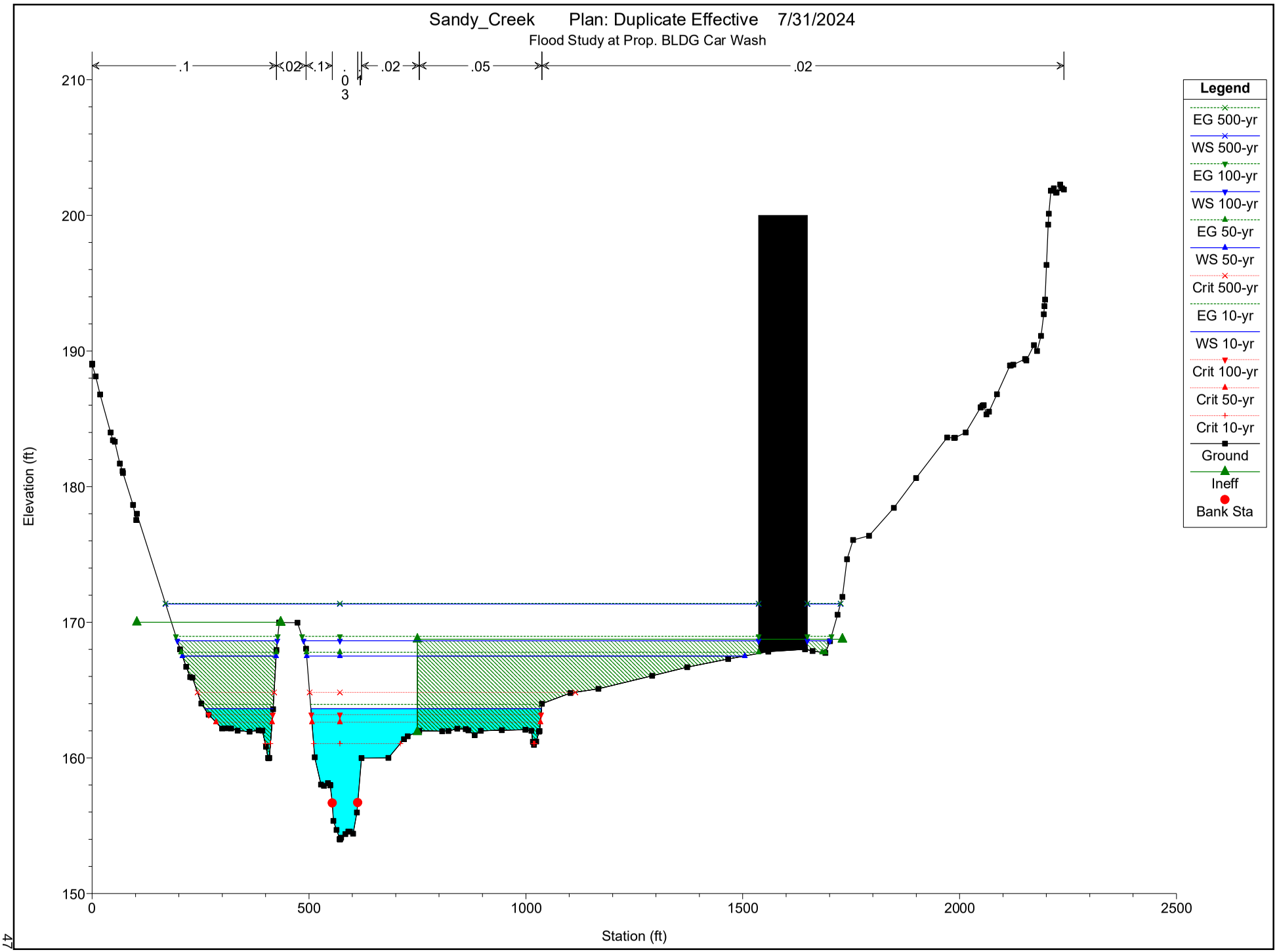
Station (ft)


Sandy_Creek Plan: Duplicate Effective 7/31/2024
Flood Study at Prop. BLDG Car Wash
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Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
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Elevation (ft)
210
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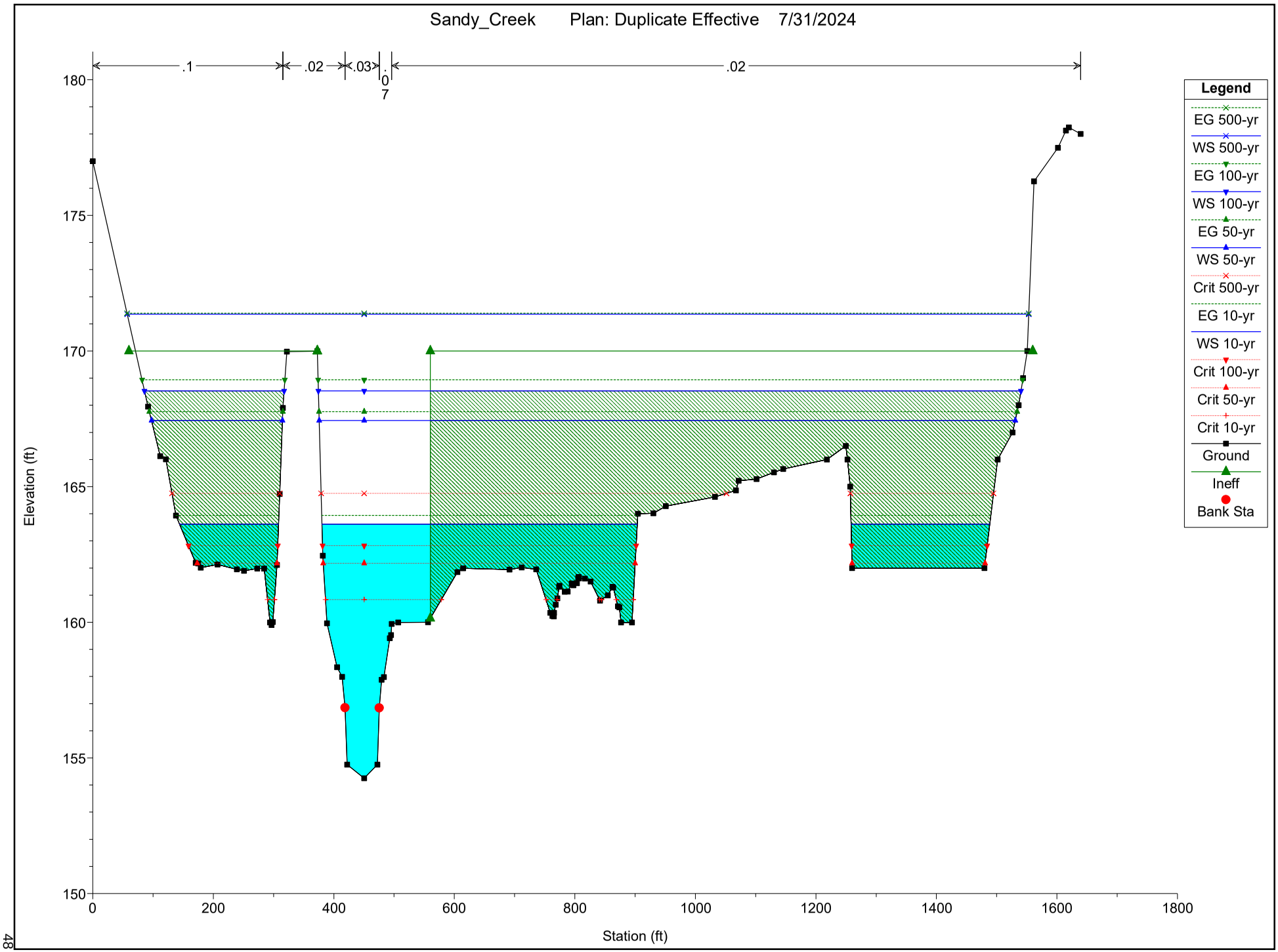
Station (ft)


Sandy_Creek Plan: Duplicate Effective 7/31/2024
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Legend
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Ground
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Elevation (ft)
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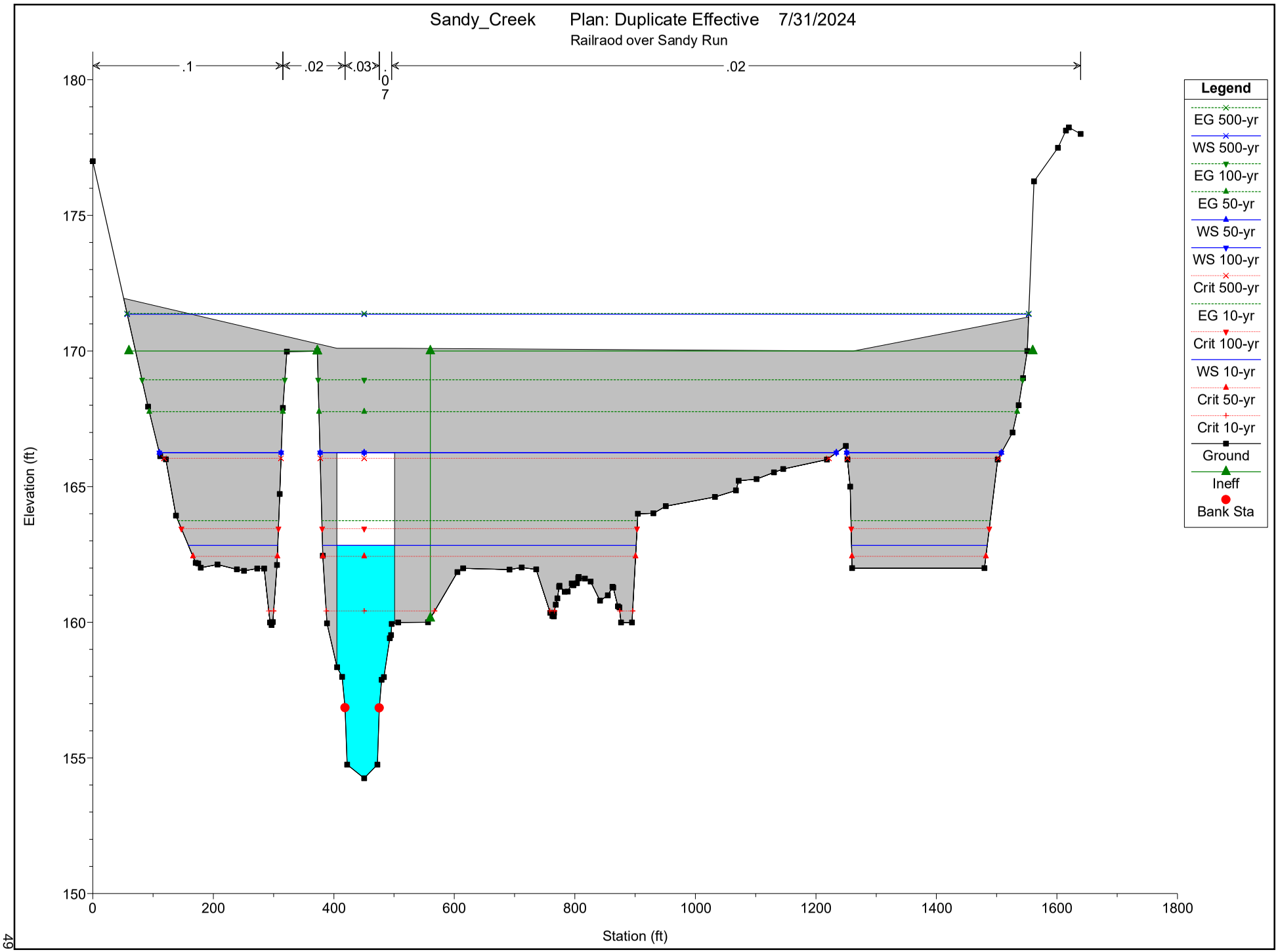
Sandy_Creek Plan: Duplicate Effective 7/31/2024
Railraod over Sandy Run
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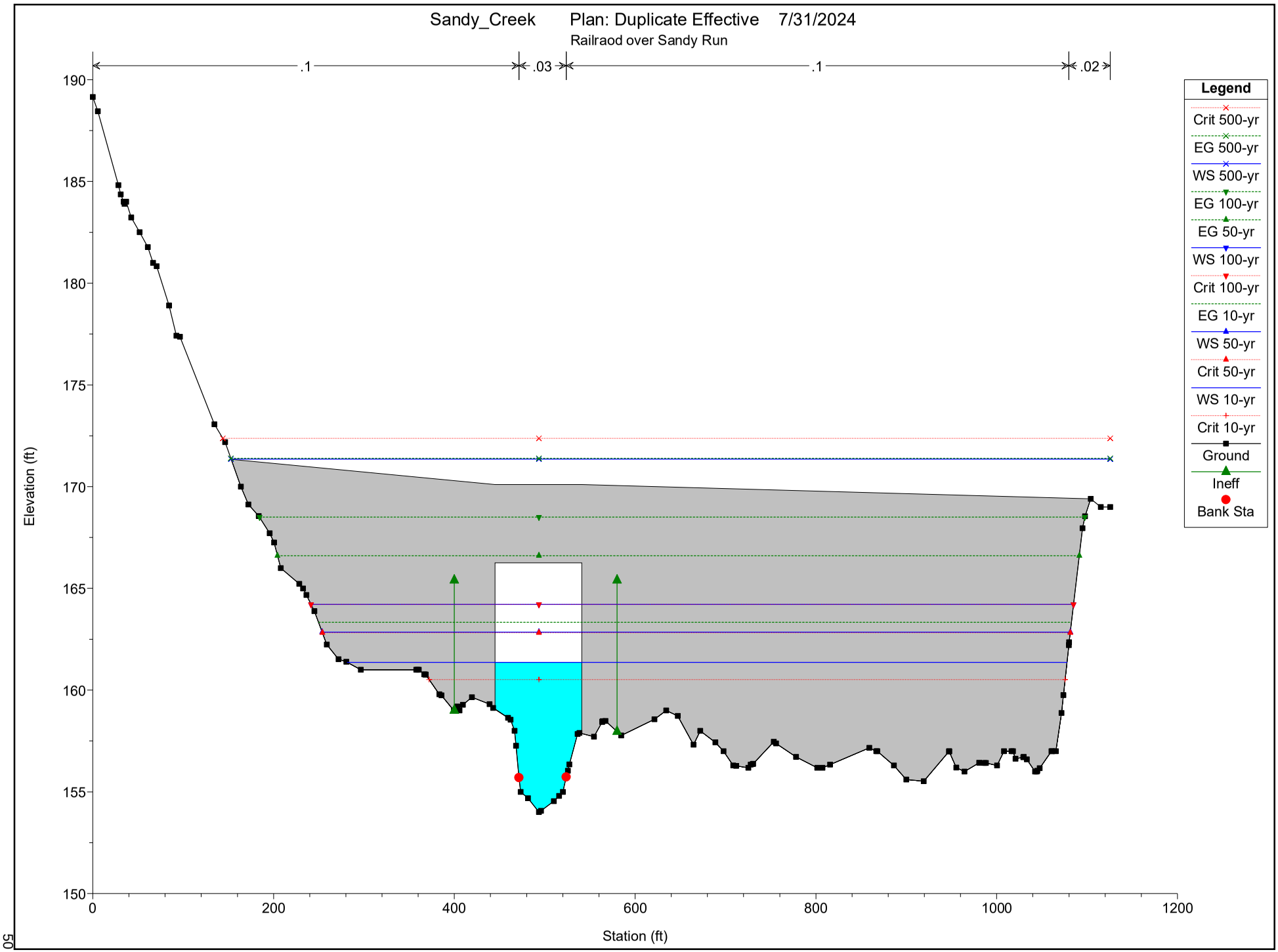
Sandy_Creek Plan: Duplicate Effective 7/31/2024
Railraod over Sandy Run
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Legend
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Crit 100-yr
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Crit 50-yr
WS 10-yr
Crit 10-yr
Ground
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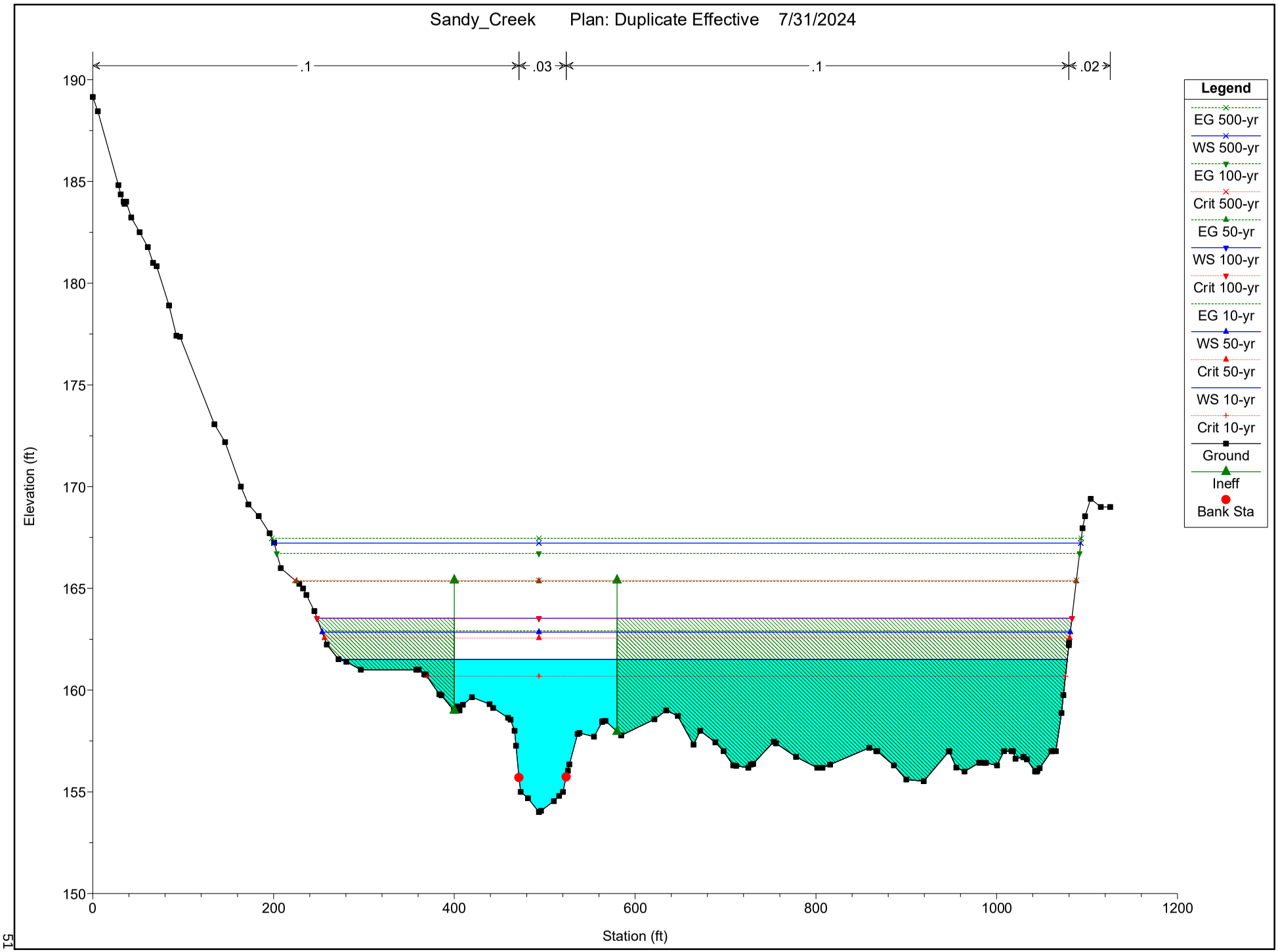
Sandy_Creek Plan: Duplicate Effective 7/31/2024
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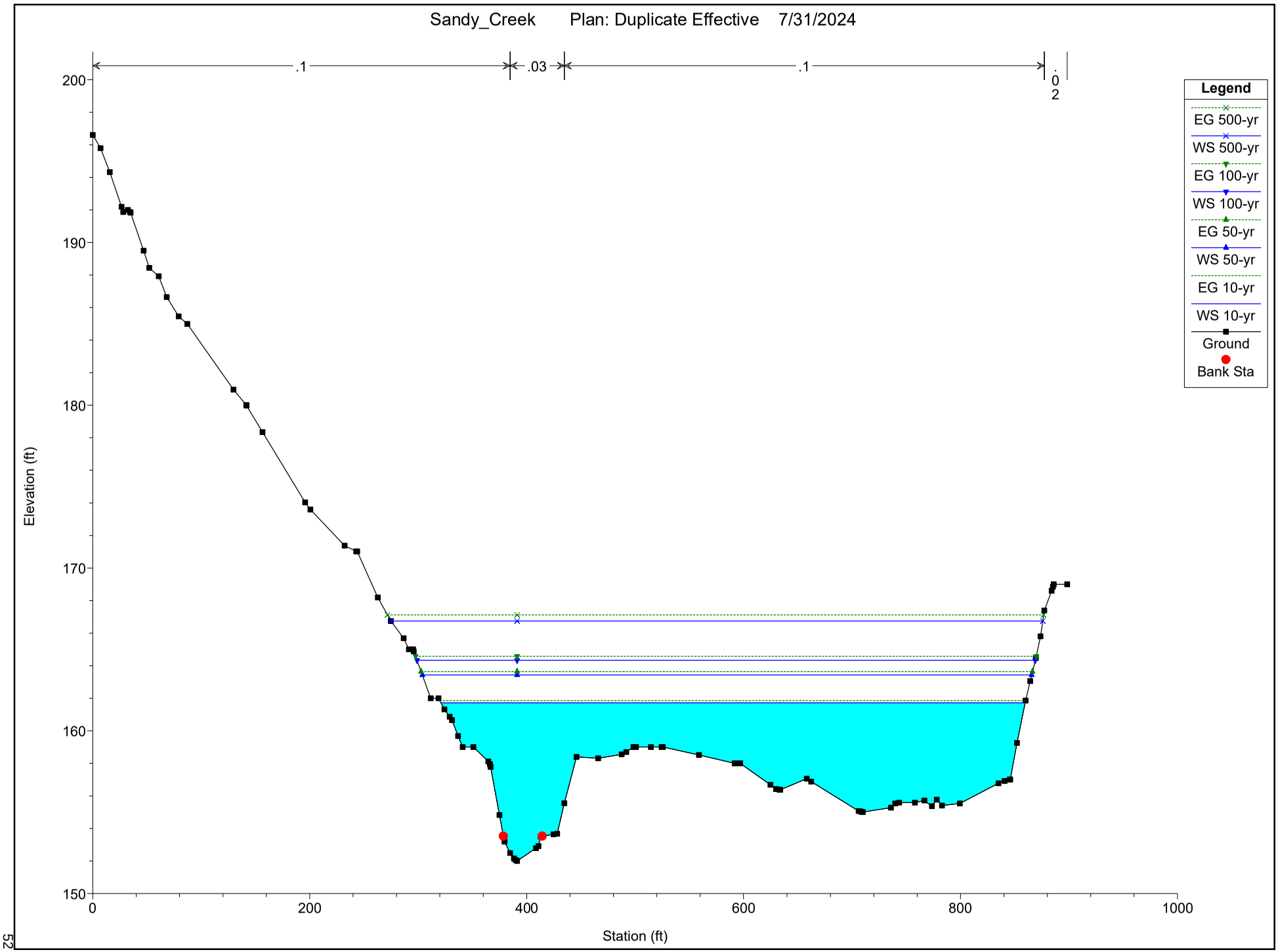
Station (ft)


Sandy_Creek Plan: Duplicate Effective 7/31/2024
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Legend
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EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Ground
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Elevation (ft)
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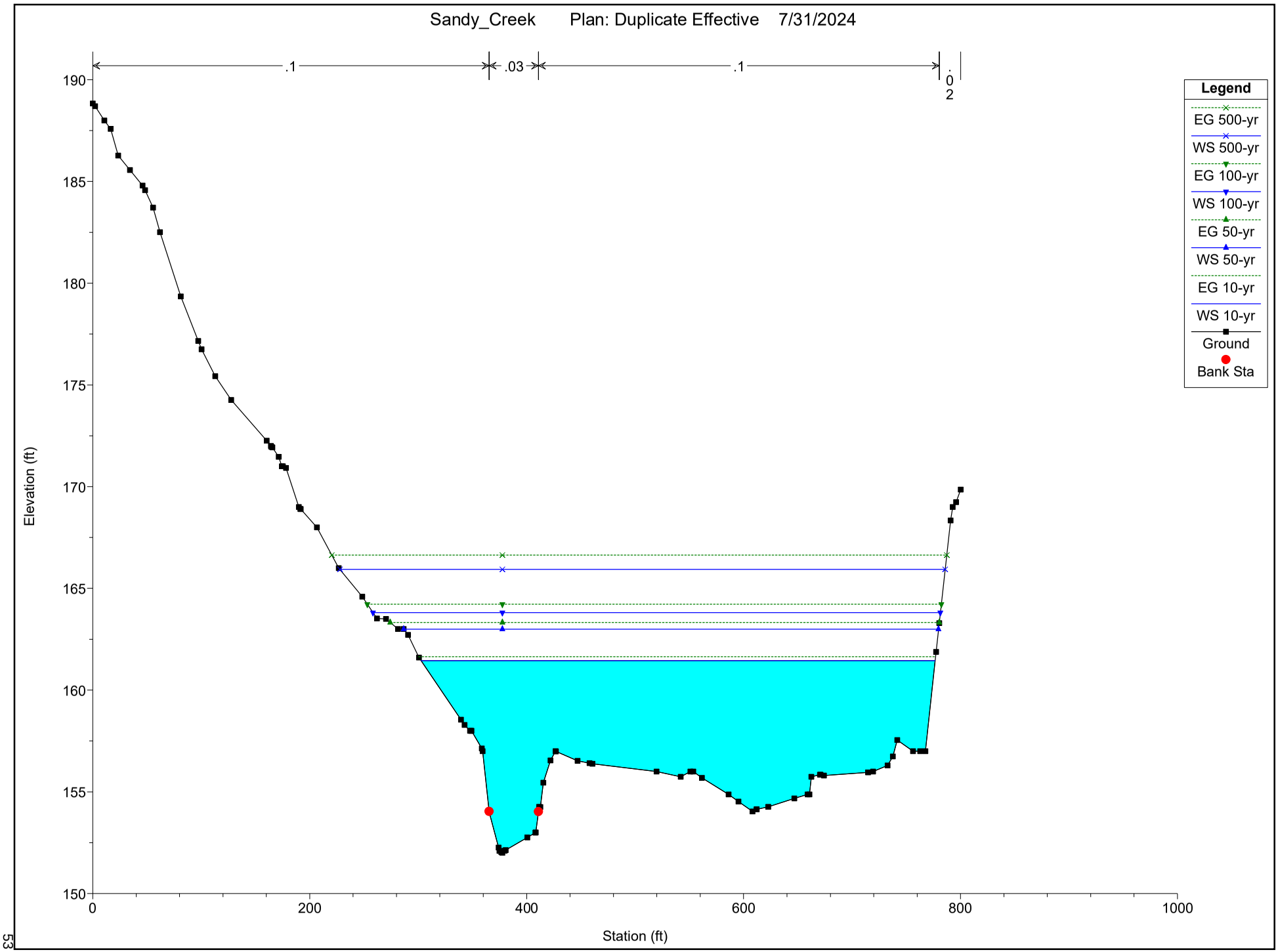
Sandy_Creek Plan: Duplicate Effective 7/31/2024
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Legend
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WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Elevation (ft)
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Station (ft)

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 6709.658 Profile: 100-yr

E.G. Elev (ft)	174.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.	0.030	0.030	0.030
W.S. Elev (ft)	173.95	Reach Len. (ft)	95.93	41.50	20.00
Crit W.S. (ft)	167.00	Flow Area (sq ft)	643.99	453.23	152.56
E.G. Slope (ft/ft)	0.000256	Area (sq ft)	1401.88	453.23	482.00
Q Total (cfs)	4945.00	Flow (cfs)	2300.66	2320.21	324.13
Top Width (ft)	328.32	Top Width (ft)	211.46	26.49	90.37
Vel Total (ft/s)	3.96	Avg. Vel. (ft/s)	3.57	5.12	2.12
Max Chl Dpth (ft)	17.95	Hydr. Depth (ft)	9.78	17.11	5.07
Conv. Total (cfs)	309212.4	Conv. (cfs)	143861.1	145083.5	20267.8
Length Wtd. (ft)	71.37	Wetted Per. (ft)	67.24	27.59	34.73
Min Ch El (ft)	156.00	Shear (lb/sq ft)	0.15	0.26	0.07
Alpha	1.18	Stream Power (lb/ft s)	1107.41	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	141.86	63.12	335.18
C & E Loss (ft)	0.12	Cum SA (acres)	33.52	5.71	70.71

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 6668.160 Profile: 100-yr

E.G. Elev (ft)	174.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.030	0.030	0.030
W.S. Elev (ft)	174.06	Reach Len. (ft)	22.00	22.00	22.00
Crit W.S. (ft)	163.85	Flow Area (sq ft)	2176.46	599.77	226.91
E.G. Slope (ft/ft)	0.000048	Area (sq ft)	2176.46	599.77	1175.77
Q Total (cfs)	4945.00	Flow (cfs)	3343.91	1373.45	227.63
Top Width (ft)	441.21	Top Width (ft)	227.44	34.37	179.40
Vel Total (ft/s)	1.65	Avg. Vel. (ft/s)	1.54	2.29	1.00
Max Chl Dpth (ft)	18.05	Hydr. Depth (ft)	9.57	17.45	5.72
Conv. Total (cfs)	715122.0	Conv. (cfs)	483580.4	198622.2	32919.4
Length Wtd. (ft)	22.00	Wetted Per. (ft)	229.08	34.69	45.27
Min Ch El (ft)	156.01	Shear (lb/sq ft)	0.03	0.05	0.01
Alpha	1.14	Stream Power (lb/ft s)	877.68	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	137.92	62.61	334.80
C & E Loss (ft)		Cum SA (acres)	33.04	5.68	70.65

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 6600 BR U Profile: 100-yr

E.G. Elev (ft)	174.11	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.76	Wt. n-Val.			
W.S. Elev (ft)	174.06	Reach Len. (ft)	35.00	35.00	35.00
Crit W.S. (ft)	164.43	Flow Area (sq ft)	178.28	494.88	151.27
E.G. Slope (ft/ft)		Area (sq ft)	167.32	493.23	211.00
Q Total (cfs)	4945.00	Flow (cfs)	437.05	3833.80	674.56
Top Width (ft)	441.21	Top Width (ft)	227.44	34.37	179.40
Vel Total (ft/s)	6.00	Avg. Vel. (ft/s)	2.45	7.75	4.46
Max Chl Dpth (ft)	18.05	Hydr. Depth (ft)	0.78	14.40	3.81
Conv. Total (cfs)		Conv. (cfs)			
Length Wtd. (ft)	35.00	Wetted Per. (ft)	246.76	103.43	70.84
Min Ch El (ft)	156.01	Shear (lb/sq ft)			
Alpha	1.31	Stream Power (lb/ft s)	877.68	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	137.33	62.34	334.45
C & E Loss (ft)		Cum SA (acres)	32.93	5.67	70.56

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 6600 BR D Profile: 100-yr

E.G. Elev (ft)	174.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.81	Wt. n-Val.			
W.S. Elev (ft)	173.83	Reach Len. (ft)	38.52	38.52	38.52
Crit W.S. (ft)	164.21	Flow Area (sq ft)	145.54	484.44	221.26
E.G. Slope (ft/ft)		Area (sq ft)	371.92	475.12	171.60
Q Total (cfs)	4945.00	Flow (cfs)	579.27	3724.38	641.75
Top Width (ft)	376.23	Top Width (ft)	182.70	33.53	160.00
Vel Total (ft/s)	5.81	Avg. Vel. (ft/s)	3.98	7.69	2.90

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 6600 BR D Profile: 100-yr (Continued)

Max Chl Dpth (ft)	17.83	Hydr. Depth (ft)	1.34	14.45	1.38
Conv. Total (cfs)		Conv. (cfs)			
Length Wtd. (ft)	38.52	Wetted Per. (ft)	131.74	101.05	190.62
Min Ch El (ft)	156.00	Shear (lb/sq ft)			
Alpha	1.22	Stream Power (lb/ft s)	818.01	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	137.11	61.95	334.30
C & E Loss (ft)		Cum SA (acres)	32.76	5.64	70.42

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 6572.639 Profile: 100-yr

E.G. Elev (ft)	172.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.030	0.030	0.030
W.S. Elev (ft)	172.83	Reach Len. (ft)	97.36	157.66	211.49
Crit W.S. (ft)	163.93	Flow Area (sq ft)	1304.88	545.47	1409.10
E.G. Slope (ft/ft)	0.000043	Area (sq ft)	1495.93	545.47	1409.10
Q Total (cfs)	4945.00	Flow (cfs)	2003.44	1127.75	1813.81
Top Width (ft)	401.74	Top Width (ft)	190.82	33.53	177.38
Vel Total (ft/s)	1.52	Avg. Vel. (ft/s)	1.54	2.07	1.29
Max Chl Dpth (ft)	16.83	Hydr. Depth (ft)	10.48	16.27	7.94
Conv. Total (cfs)	753702.3	Conv. (cfs)	305358.0	171888.4	276455.9
Length Wtd. (ft)	156.45	Wetted Per. (ft)	127.06	33.99	178.74
Min Ch El (ft)	156.00	Shear (lb/sq ft)	0.03	0.04	0.02
Alpha	1.10	Stream Power (lb/ft s)	818.01	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	136.28	61.50	333.60
C & E Loss (ft)	0.09	Cum SA (acres)	32.60	5.61	70.27

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 6414.980 Profile: 100-yr

E.G. Elev (ft)	172.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.	0.050	0.030	0.050
W.S. Elev (ft)	172.43	Reach Len. (ft)	225.80	225.80	225.80
Crit W.S. (ft)	163.92	Flow Area (sq ft)	241.75	638.83	451.26
E.G. Slope (ft/ft)	0.000309	Area (sq ft)	485.69	638.83	871.56
Q Total (cfs)	4945.00	Flow (cfs)	623.27	3415.10	906.64
Top Width (ft)	454.18	Top Width (ft)	129.04	41.76	283.39
Vel Total (ft/s)	3.71	Avg. Vel. (ft/s)	2.58	5.35	2.01
Max Chl Dpth (ft)	15.43	Hydr. Depth (ft)	11.54	15.30	6.83
Conv. Total (cfs)	281535.6	Conv. (cfs)	35484.7	194433.1	51617.8
Length Wtd. (ft)	225.80	Wetted Per. (ft)	22.02	41.94	68.25
Min Ch El (ft)	157.00	Shear (lb/sq ft)	0.21	0.29	0.13
Alpha	1.55	Stream Power (lb/ft s)	1129.78	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	134.07	59.35	328.06
C & E Loss (ft)		Cum SA (acres)	32.24	5.47	69.15

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 6189.177 Profile: 100-yr

E.G. Elev (ft)	169.77	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.96	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	168.81	Reach Len. (ft)	633.10	668.48	716.54
Crit W.S. (ft)	164.39	Flow Area (sq ft)	356.14	379.32	431.45
E.G. Slope (ft/ft)	0.001100	Area (sq ft)	356.14	379.32	431.45
Q Total (cfs)	4945.00	Flow (cfs)	619.32	3513.14	812.55
Top Width (ft)	135.24	Top Width (ft)	51.90	28.04	55.30
Vel Total (ft/s)	4.24	Avg. Vel. (ft/s)	1.74	9.26	1.88
Max Chl Dpth (ft)	13.81	Hydr. Depth (ft)	6.86	13.53	7.80
Conv. Total (cfs)	149101.3	Conv. (cfs)	18673.7	105927.8	24499.9
Length Wtd. (ft)	695.25	Wetted Per. (ft)	53.73	28.33	57.75
Min Ch El (ft)	155.00	Shear (lb/sq ft)	0.46	0.92	0.51
Alpha	3.45	Stream Power (lb/ft s)	1315.13	0.00	0.00
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	134.07	59.35	328.06
C & E Loss (ft)	0.44	Cum SA (acres)	31.77	5.29	68.27

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 5508.105 Profile: 100-yr

E.G. Elev (ft)	169.20	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.100	0.030	0.022
W.S. Elev (ft)	169.13	Reach Len. (ft)	418.82	423.43	428.32
Crit W.S. (ft)	164.93	Flow Area (sq ft)	767.47	341.66	3894.18
E.G. Slope (ft/ft)	0.000103	Area (sq ft)	848.30	341.66	3894.18
Q Total (cfs)	9741.00	Flow (cfs)	513.64	1024.35	8203.02
Top Width (ft)	1201.65	Top Width (ft)	127.70	22.99	1050.96
Vel Total (ft/s)	1.95	Avg. Vel. (ft/s)	0.67	3.00	2.11
Max Chl Dpth (ft)	15.13	Hydr. Depth (ft)	9.51	14.86	3.71
Conv. Total (cfs)	962012.4	Conv. (cfs)	50726.6	101163.4	810122.4
Length Wtd. (ft)	427.25	Wetted Per. (ft)	83.71	23.38	1081.76
Min Ch El (ft)	154.00	Shear (lb/sq ft)	0.06	0.09	0.02
Alpha	1.24	Stream Power (lb/ft s)	2947.19	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	125.32	53.82	292.48
C & E Loss (ft)	0.00	Cum SA (acres)	30.47	4.90	59.17

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 5084.678 Profile: 100-yr

E.G. Elev (ft)	169.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.082	0.030	0.027
W.S. Elev (ft)	169.05	Reach Len. (ft)	19.30	19.30	19.30
Crit W.S. (ft)	165.34	Flow Area (sq ft)	136.89	569.47	3722.10
E.G. Slope (ft/ft)	0.000150	Area (sq ft)	1306.07	569.47	3722.10
Q Total (cfs)	9741.00	Flow (cfs)	102.24	2035.33	7603.44
Top Width (ft)	1031.22	Top Width (ft)	244.16	38.79	748.27
Vel Total (ft/s)	2.20	Avg. Vel. (ft/s)	0.75	3.57	2.04
Max Chl Dpth (ft)	15.05	Hydr. Depth (ft)	5.47	14.68	4.97
Conv. Total (cfs)	796656.4	Conv. (cfs)	8361.5	166456.8	621838.1
Length Wtd. (ft)	19.30	Wetted Per. (ft)	28.23	39.72	773.41
Min Ch El (ft)	154.00	Shear (lb/sq ft)	0.05	0.13	0.04
Alpha	1.23	Stream Power (lb/ft s)	2371.66	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	114.96	49.39	255.04
C & E Loss (ft)	0.00	Cum SA (acres)	28.68	4.60	50.33

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 5065.378 Profile: 100-yr

E.G. Elev (ft)	169.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.020	0.030	0.021
W.S. Elev (ft)	169.06	Reach Len. (ft)	25.50	25.50	25.50
Crit W.S. (ft)	165.33	Flow Area (sq ft)	123.59	596.09	3689.48
E.G. Slope (ft/ft)	0.000098	Area (sq ft)	1230.29	596.09	3689.48
Q Total (cfs)	9741.00	Flow (cfs)	248.77	1684.18	7808.05
Top Width (ft)	1035.59	Top Width (ft)	237.09	42.00	756.50
Vel Total (ft/s)	2.21	Avg. Vel. (ft/s)	2.01	2.83	2.12
Max Chl Dpth (ft)	14.81	Hydr. Depth (ft)	5.14	14.19	4.88
Conv. Total (cfs)	983310.3	Conv. (cfs)	25112.6	170010.0	788187.6
Length Wtd. (ft)	25.50	Wetted Per. (ft)	27.33	43.14	784.58
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.03	0.08	0.03
Alpha	1.04	Stream Power (lb/ft s)	1867.06	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	114.40	49.14	253.40
C & E Loss (ft)	0.04	Cum SA (acres)	28.57	4.58	50.00

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 5039.878 Profile: 100-yr

E.G. Elev (ft)	169.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.47	Wt. n-Val.	0.020	0.030	0.022
W.S. Elev (ft)	168.63	Reach Len. (ft)	93.53	174.30	218.10
Crit W.S. (ft)	165.00	Flow Area (sq ft)	97.85	621.13	1081.50
E.G. Slope (ft/ft)	0.000474	Area (sq ft)	1198.38	621.13	4053.35
Q Total (cfs)	9741.00	Flow (cfs)	408.84	3761.53	5570.63
Top Width (ft)	1239.02	Top Width (ft)	235.27	45.00	958.75
Vel Total (ft/s)	5.41	Avg. Vel. (ft/s)	4.18	6.06	5.15

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 5039.878 Profile: 100-yr (Continued)

Max Chl Dpth (ft)	14.38	Hydr. Depth (ft)	4.87	13.80	6.57
Conv. Total (cfs)	447514.2	Conv. (cfs)	18782.8	172809.4	255922.0
Length Wtd. (ft)	177.99	Wetted Per. (ft)	23.56	46.66	165.61
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.12	0.39	0.19
Alpha	1.03	Stream Power (lb/ft s)	1815.02	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	113.69	48.78	251.13
C & E Loss (ft)	0.05	Cum SA (acres)	28.43	4.56	49.49

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 4865.578 Profile: 100-yr

E.G. Elev (ft)	168.99	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.	0.020	0.030	0.034
W.S. Elev (ft)	168.67	Reach Len. (ft)	41.51	75.49	113.50
Crit W.S. (ft)	161.18	Flow Area (sq ft)	438.68	1573.45	190.47
E.G. Slope (ft/ft)	0.000271	Area (sq ft)	1624.95	1573.45	3963.84
Q Total (cfs)	9741.00	Flow (cfs)	2002.49	7221.11	517.40
Top Width (ft)	1318.82	Top Width (ft)	287.72	117.19	913.91
Vel Total (ft/s)	4.42	Avg. Vel. (ft/s)	4.56	4.59	2.72
Max Chl Dpth (ft)	14.42	Hydr. Depth (ft)	7.40	13.43	7.70
Conv. Total (cfs)	592129.4	Conv. (cfs)	121726.1	438952.0	31451.3
Length Wtd. (ft)	82.48	Wetted Per. (ft)	60.78	117.71	25.89
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.12	0.23	0.12
Alpha	1.04	Stream Power (lb/ft s)	1717.52	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	110.65	44.39	231.06
C & E Loss (ft)	0.00	Cum SA (acres)	27.87	4.23	44.81

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 4790.088 Profile: 100-yr

E.G. Elev (ft)	168.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.	0.100	0.030	0.022
W.S. Elev (ft)	168.63	Reach Len. (ft)	13.00	13.00	13.00
Crit W.S. (ft)	163.19	Flow Area (sq ft)	513.98	810.65	1126.93
E.G. Slope (ft/ft)	0.000285	Area (sq ft)	1731.91	810.65	4383.67
Q Total (cfs)	9741.00	Flow (cfs)	523.78	3894.26	5322.96
Top Width (ft)	1331.94	Top Width (ft)	297.19	58.20	976.55
Vel Total (ft/s)	3.97	Avg. Vel. (ft/s)	1.02	4.80	4.72
Max Chl Dpth (ft)	14.63	Hydr. Depth (ft)	7.72	13.93	8.18
Conv. Total (cfs)	576779.1	Conv. (cfs)	31014.0	230585.1	315180.1
Length Wtd. (ft)	13.00	Wetted Per. (ft)	68.47	58.90	138.43
Min Ch El (ft)	154.00	Shear (lb/sq ft)	0.13	0.25	0.14
Alpha	1.36	Stream Power (lb/ft s)	2240.63	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	109.06	42.32	220.18
C & E Loss (ft)	0.02	Cum SA (acres)	27.59	4.08	42.34

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 4777.088 Profile: 100-yr

E.G. Elev (ft)	168.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.41	Wt. n-Val.	0.020	0.030	0.025
W.S. Elev (ft)	168.53	Reach Len. (ft)	15.00	15.00	15.00
Crit W.S. (ft)	162.82	Flow Area (sq ft)	369.83	790.84	753.20
E.G. Slope (ft/ft)	0.000349	Area (sq ft)	1604.50	790.84	6031.65
Q Total (cfs)	9741.00	Flow (cfs)	2031.79	4167.68	3541.54
Top Width (ft)	1397.55	Top Width (ft)	275.68	57.00	1064.87
Vel Total (ft/s)	5.09	Avg. Vel. (ft/s)	5.49	5.27	4.70
Max Chl Dpth (ft)	14.28	Hydr. Depth (ft)	8.38	13.87	8.91
Conv. Total (cfs)	521382.3	Conv. (cfs)	108750.5	223072.9	189558.9
Length Wtd. (ft)	15.00	Wetted Per. (ft)	46.97	58.19	84.81
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.17	0.30	0.19
Alpha	1.01	Stream Power (lb/ft s)	1639.28	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	108.56	42.08	218.63
C & E Loss (ft)		Cum SA (acres)	27.51	4.06	42.04

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 4740 BR U Profile: 100-yr

E.G. Elev (ft)	168.94	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.85	Wt. n-Val.	0.020	0.030	0.052
W.S. Elev (ft)	166.25	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)	163.45	Flow Area (sq ft)	111.79	660.85	191.64
E.G. Slope (ft/ft)	0.005109	Area (sq ft)	111.79	660.85	191.64
Q Total (cfs)	9741.00	Flow (cfs)	1291.73	7497.58	951.70
Top Width (ft)		Top Width (ft)			
Vel Total (ft/s)	10.10	Avg. Vel. (ft/s)	11.56	11.35	4.97
Max Chl Dpth (ft)	12.00	Hydr. Depth (ft)	111000.50		392478.90
Conv. Total (cfs)	136284.4	Conv. (cfs)	18072.3	104897.1	13315.0
Length Wtd. (ft)	40.00	Wetted Per. (ft)	34.83	115.19	51.31
Min Ch El (ft)	154.25	Shear (lb/sq ft)	1.02	1.83	1.19
Alpha	1.17	Stream Power (lb/ft s)	1639.28	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	108.26	41.83	217.56
C & E Loss (ft)		Cum SA (acres)	27.46	4.05	41.85

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 4740 BR D Profile: 100-yr

E.G. Elev (ft)	168.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.29	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	164.21	Reach Len. (ft)	36.50	36.50	36.50
Crit W.S. (ft)	164.21	Flow Area (sq ft)	153.94	504.52	121.71
E.G. Slope (ft/ft)	0.006107	Area (sq ft)	153.94	504.52	121.71
Q Total (cfs)	9741.00	Flow (cfs)	510.06	8806.81	424.13
Top Width (ft)	95.90	Top Width (ft)	26.33	52.44	17.13
Vel Total (ft/s)	12.49	Avg. Vel. (ft/s)	3.31	17.46	3.48
Max Chl Dpth (ft)	10.21	Hydr. Depth (ft)	5.85	9.62	7.11
Conv. Total (cfs)	124649.9	Conv. (cfs)	6527.0	112695.6	5427.3
Length Wtd. (ft)	36.50	Wetted Per. (ft)	31.94	52.68	23.41
Min Ch El (ft)	154.00	Shear (lb/sq ft)	1.84	3.65	1.98
Alpha	1.77	Stream Power (lb/ft s)	1125.57	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	108.14	41.30	217.41
C & E Loss (ft)		Cum SA (acres)	27.45	4.03	41.85

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 4685.592 Profile: 100-yr

E.G. Elev (ft)	166.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.19	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	163.53	Reach Len. (ft)	393.59	358.41	320.67
Crit W.S. (ft)	163.53	Flow Area (sq ft)	324.58	469.05	323.61
E.G. Slope (ft/ft)	0.005757	Area (sq ft)	708.87	469.05	3610.28
Q Total (cfs)	9741.00	Flow (cfs)	998.23	7572.73	1170.04
Top Width (ft)	835.28	Top Width (ft)	223.41	52.44	559.43
Vel Total (ft/s)	8.72	Avg. Vel. (ft/s)	3.08	16.14	3.62
Max Chl Dpth (ft)	9.53	Hydr. Depth (ft)	4.54	8.94	5.77
Conv. Total (cfs)	128379.3	Conv. (cfs)	13155.9	99803.1	15420.3
Length Wtd. (ft)	346.18	Wetted Per. (ft)	72.05	52.68	56.35
Min Ch El (ft)	154.00	Shear (lb/sq ft)	1.62	3.20	2.06
Alpha	2.70	Stream Power (lb/ft s)	1125.57	0.00	0.00
Frctn Loss (ft)	0.63	Cum Volume (acre-ft)	107.78	40.89	215.85
C & E Loss (ft)	1.47	Cum SA (acres)	27.34	3.99	41.61

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 4327.181 Profile: 100-yr

E.G. Elev (ft)	164.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.	0.100	0.034	0.084
W.S. Elev (ft)	164.33	Reach Len. (ft)	379.56	362.86	348.11
Crit W.S. (ft)		Flow Area (sq ft)	360.83	422.58	3294.76
E.G. Slope (ft/ft)	0.000880	Area (sq ft)	360.83	422.58	3294.76
Q Total (cfs)	9741.00	Flow (cfs)	431.40	2833.47	6476.13
Top Width (ft)	570.04	Top Width (ft)	79.57	35.94	454.53
Vel Total (ft/s)	2.39	Avg. Vel. (ft/s)	1.20	6.71	1.97

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 4327.181 Profile: 100-yr (Continued)

Max Chl Dpth (ft)	12.33	Hydr. Depth (ft)	4.54	11.76	7.25
Conv. Total (cfs)	328319.1	Conv. (cfs)	14540.3	95501.6	218277.2
Length Wtd. (ft)	354.53	Wetted Per. (ft)	80.80	36.17	456.48
Min Ch El (ft)	152.00	Shear (lb/sq ft)	0.25	0.64	0.40
Alpha	2.75	Stream Power (lb/ft s)	898.41	0.00	0.00
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)	102.95	37.22	190.43
C & E Loss (ft)	0.02	Cum SA (acres)	25.97	3.62	37.87

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 3964.325 Profile: 100-yr

E.G. Elev (ft)	164.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	163.81	Reach Len. (ft)	460.88	448.94	432.66
Crit W.S. (ft)		Flow Area (sq ft)	345.72	508.62	2907.00
E.G. Slope (ft/ft)	0.001011	Area (sq ft)	345.72	508.62	2907.00
Q Total (cfs)	9741.00	Flow (cfs)	355.05	3973.03	5412.92
Top Width (ft)	523.02	Top Width (ft)	106.93	45.65	370.44
Vel Total (ft/s)	2.59	Avg. Vel. (ft/s)	1.03	7.81	1.86
Max Chl Dpth (ft)	11.81	Hydr. Depth (ft)	3.23	11.14	7.85
Conv. Total (cfs)	306286.6	Conv. (cfs)	11163.8	124924.2	170198.6
Length Wtd. (ft)	441.11	Wetted Per. (ft)	107.91	46.06	372.81
Min Ch El (ft)	152.00	Shear (lb/sq ft)	0.20	0.70	0.49
Alpha	4.00	Stream Power (lb/ft s)	800.12	0.00	0.00
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	99.87	33.34	165.65
C & E Loss (ft)	0.05	Cum SA (acres)	25.16	3.28	34.58

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 6709.658 Profile: 500-yr

E.G. Elev (ft)	177.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.26	Wt. n-Val.	0.030	0.030	0.030
W.S. Elev (ft)	177.15	Reach Len. (ft)	95.93	41.50	20.00
Crit W.S. (ft)	168.81	Flow Area (sq ft)	855.21	538.21	782.90
E.G. Slope (ft/ft)	0.000206	Area (sq ft)	2148.16	538.21	782.90
Q Total (cfs)	8165.00	Flow (cfs)	3311.18	2771.59	2082.23
Top Width (ft)	377.44	Top Width (ft)	254.91	26.49	96.04
Vel Total (ft/s)	3.75	Avg. Vel. (ft/s)	3.87	5.15	2.66
Max Chl Dpth (ft)	21.15	Hydr. Depth (ft)	12.99	20.32	8.15
Conv. Total (cfs)	569159.6	Conv. (cfs)	230812.9	193199.9	145146.7
Length Wtd. (ft)	67.98	Wetted Per. (ft)	67.24	27.59	108.11
Min Ch El (ft)	156.00	Shear (lb/sq ft)	0.16	0.25	0.09
Alpha	1.20	Stream Power (lb/ft s)	1107.41	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	204.58	74.64	487.82
C & E Loss (ft)	0.10	Cum SA (acres)	39.00	5.75	78.18

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 6668.160 Profile: 500-yr

E.G. Elev (ft)	177.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.030	0.030	0.030
W.S. Elev (ft)	177.24	Reach Len. (ft)	22.00	22.00	22.00
Crit W.S. (ft)	165.78	Flow Area (sq ft)	2940.39	709.19	353.20
E.G. Slope (ft/ft)	0.000057	Area (sq ft)	2940.39	709.19	1783.14
Q Total (cfs)	8165.00	Flow (cfs)	5659.90	1984.93	520.18
Top Width (ft)	496.79	Top Width (ft)	250.33	34.37	212.09
Vel Total (ft/s)	2.04	Avg. Vel. (ft/s)	1.92	2.80	1.47
Max Chl Dpth (ft)	21.23	Hydr. Depth (ft)	11.75	20.63	8.90
Conv. Total (cfs)	1080269.0	Conv. (cfs)	748831.4	262615.4	68822.2
Length Wtd. (ft)	22.00	Wetted Per. (ft)	252.20	34.69	45.27
Min Ch El (ft)	156.01	Shear (lb/sq ft)	0.04	0.07	0.03
Alpha	1.11	Stream Power (lb/ft s)	877.68	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	198.97	74.04	487.23
C & E Loss (ft)		Cum SA (acres)	38.45	5.72	78.11

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 6600 BR U Profile: 500-yr

E.G. Elev (ft)	177.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.			
W.S. Elev (ft)	177.24	Reach Len. (ft)	35.00	35.00	35.00
Crit W.S. (ft)	167.23	Flow Area (sq ft)	949.19	605.10	278.49
E.G. Slope (ft/ft)		Area (sq ft)	931.25	602.64	818.37
Q Total (cfs)	8165.00	Flow (cfs)	4242.39	3036.97	887.96
Top Width (ft)	496.79	Top Width (ft)	250.33	34.37	212.09
Vel Total (ft/s)	4.45	Avg. Vel. (ft/s)	4.47	5.02	3.19
Max Chl Dpth (ft)	21.23	Hydr. Depth (ft)	3.79	17.61	7.02
Conv. Total (cfs)		Conv. (cfs)			
Length Wtd. (ft)	35.00	Wetted Per. (ft)	269.88	103.43	70.84
Min Ch El (ft)	156.01	Shear (lb/sq ft)			
Alpha	1.08	Stream Power (lb/ft s)	877.68	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	198.00	73.71	486.57
C & E Loss (ft)		Cum SA (acres)	38.32	5.70	78.01

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 6600 BR D Profile: 500-yr

E.G. Elev (ft)	176.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.			
W.S. Elev (ft)	176.93	Reach Len. (ft)	38.52	38.52	38.52
Crit W.S. (ft)	167.22	Flow Area (sq ft)	592.49	591.97	862.37
E.G. Slope (ft/ft)		Area (sq ft)	1083.78	579.11	779.87
Q Total (cfs)	8165.00	Flow (cfs)	4319.92	2977.32	870.08
Top Width (ft)	487.54	Top Width (ft)	244.13	33.53	209.88
Vel Total (ft/s)	3.99	Avg. Vel. (ft/s)	7.29	5.03	1.01

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 6600 BR D Profile: 500-yr (Continued)

Max Chl Dpth (ft)	20.93	Hydr. Depth (ft)	4.20	17.65	4.11
Conv. Total (cfs)		Conv. (cfs)			
Length Wtd. (ft)	38.52	Wetted Per. (ft)	163.82	101.05	240.70
Min Ch El (ft)	156.00	Shear (lb/sq ft)			
Alpha	1.11	Stream Power (lb/ft s)	818.01	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	197.19	73.24	485.93
C & E Loss (ft)		Cum SA (acres)	38.12	5.68	77.84

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 6572.639 Profile: 500-yr

E.G. Elev (ft)	176.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.030	0.030	0.030
W.S. Elev (ft)	176.93	Reach Len. (ft)	97.36	157.66	211.49
Crit W.S. (ft)	165.91	Flow Area (sq ft)	1861.68	683.06	2198.59
E.G. Slope (ft/ft)	0.000041	Area (sq ft)	2407.02	683.06	2198.59
Q Total (cfs)	8165.00	Flow (cfs)	3251.95	1598.37	3314.68
Top Width (ft)	487.54	Top Width (ft)	244.13	33.53	209.88
Vel Total (ft/s)	1.72	Avg. Vel. (ft/s)	1.75	2.34	1.51
Max Chl Dpth (ft)	20.93	Hydr. Depth (ft)	13.21	20.37	10.48
Conv. Total (cfs)	1277434.0	Conv. (cfs)	508775.8	250068.4	518590.1
Length Wtd. (ft)	158.74	Wetted Per. (ft)	143.64	33.99	211.56
Min Ch El (ft)	156.00	Shear (lb/sq ft)	0.03	0.05	0.03
Alpha	1.08	Stream Power (lb/ft s)	818.01	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	195.64	72.68	484.62
C & E Loss (ft)	0.12	Cum SA (acres)	37.91	5.65	77.65

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 6414.980 Profile: 500-yr

E.G. Elev (ft)	176.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.46	Wt. n-Val.	0.050	0.030	0.050
W.S. Elev (ft)	176.38	Reach Len. (ft)	225.80	225.80	225.80
Crit W.S. (ft)	166.12	Flow Area (sq ft)	324.54	803.85	1055.32
E.G. Slope (ft/ft)	0.000339	Area (sq ft)	1106.82	803.85	2543.39
Q Total (cfs)	8165.00	Flow (cfs)	1066.90	5248.20	1849.90
Top Width (ft)	704.48	Top Width (ft)	171.94	41.76	490.78
Vel Total (ft/s)	3.74	Avg. Vel. (ft/s)	3.29	6.53	1.75
Max Chl Dpth (ft)	19.38	Hydr. Depth (ft)	15.49	19.25	5.76
Conv. Total (cfs)	443639.5	Conv. (cfs)	57969.2	285157.4	100512.8
Length Wtd. (ft)	225.80	Wetted Per. (ft)	22.02	41.94	185.88
Min Ch El (ft)	157.00	Shear (lb/sq ft)	0.31	0.41	0.12
Alpha	2.11	Stream Power (lb/ft s)	1129.78	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	191.72	69.99	473.10
C & E Loss (ft)		Cum SA (acres)	37.44	5.51	75.95

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 6189.177 Profile: 500-yr

E.G. Elev (ft)	172.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.64	Wt. n-Val.	0.100	0.030	0.087
W.S. Elev (ft)	170.74	Reach Len. (ft)	633.10	668.48	716.54
Crit W.S. (ft)	166.96	Flow Area (sq ft)	462.47	433.70	613.90
E.G. Slope (ft/ft)	0.001668	Area (sq ft)	462.47	433.70	613.90
Q Total (cfs)	8165.00	Flow (cfs)	1090.93	5409.27	1664.81
Top Width (ft)	198.80	Top Width (ft)	58.23	28.04	112.53
Vel Total (ft/s)	5.41	Avg. Vel. (ft/s)	2.36	12.47	2.71
Max Chl Dpth (ft)	15.74	Hydr. Depth (ft)	7.94	15.47	5.46
Conv. Total (cfs)	199895.2	Conv. (cfs)	26708.0	132429.5	40757.7
Length Wtd. (ft)	697.73	Wetted Per. (ft)	60.36	28.33	115.78
Min Ch El (ft)	155.00	Shear (lb/sq ft)	0.80	1.59	0.55
Alpha	3.60	Stream Power (lb/ft s)	1315.13	0.00	0.00
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	191.72	69.99	473.10
C & E Loss (ft)	0.77	Cum SA (acres)	36.85	5.33	74.39

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 5508.105 Profile: 500-yr

E.G. Elev (ft)	171.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.099	0.030	0.022
W.S. Elev (ft)	171.40	Reach Len. (ft)	418.82	423.43	428.32
Crit W.S. (ft)	166.61	Flow Area (sq ft)	959.70	393.84	6279.26
E.G. Slope (ft/ft)	0.000098	Area (sq ft)	1161.17	393.84	6279.26
Q Total (cfs)	16941.00	Flow (cfs)	722.46	1266.10	14952.44
Top Width (ft)	1222.30	Top Width (ft)	148.35	22.99	1050.96
Vel Total (ft/s)	2.22	Avg. Vel. (ft/s)	0.75	3.21	2.38
Max Chl Dpth (ft)	17.40	Hydr. Depth (ft)	10.76	17.13	5.97
Conv. Total (cfs)	1715375.0	Conv. (cfs)	73153.0	128200.0	1514022.0
Length Wtd. (ft)	427.22	Wetted Per. (ft)	92.50	23.38	1097.65
Min Ch El (ft)	154.00	Shear (lb/sq ft)	0.06	0.10	0.03
Alpha	1.18	Stream Power (lb/ft s)	2947.19	0.00	0.00
Frctn Loss (ft)	0.05	Cum Volume (acre-ft)	179.92	63.64	416.41
C & E Loss (ft)	0.00	Cum SA (acres)	35.34	4.94	64.82

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 5084.678 Profile: 500-yr

E.G. Elev (ft)	171.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.093	0.030	0.026
W.S. Elev (ft)	171.34	Reach Len. (ft)	19.30	19.30	19.30
Crit W.S. (ft)	166.71	Flow Area (sq ft)	1908.99	657.95	5474.35
E.G. Slope (ft/ft)	0.000134	Area (sq ft)	1908.99	657.95	5474.35
Q Total (cfs)	16941.00	Flow (cfs)	1294.47	2455.03	13191.51
Top Width (ft)	1118.37	Top Width (ft)	294.74	38.79	784.84
Vel Total (ft/s)	2.11	Avg. Vel. (ft/s)	0.68	3.73	2.41
Max Chl Dpth (ft)	17.34	Hydr. Depth (ft)	6.48	16.96	6.98
Conv. Total (cfs)	1461229.0	Conv. (cfs)	111653.0	211755.8	1137820.0
Length Wtd. (ft)	19.30	Wetted Per. (ft)	300.49	39.72	822.91
Min Ch El (ft)	154.00	Shear (lb/sq ft)	0.05	0.14	0.06
Alpha	1.48	Stream Power (lb/ft s)	2371.66	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	165.16	58.53	358.62
C & E Loss (ft)	0.00	Cum SA (acres)	33.21	4.64	55.79

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 5065.378 Profile: 500-yr

E.G. Elev (ft)	171.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.074	0.030	0.021
W.S. Elev (ft)	171.34	Reach Len. (ft)	25.50	25.50	25.50
Crit W.S. (ft)	166.42	Flow Area (sq ft)	1844.82	691.65	5419.59
E.G. Slope (ft/ft)	0.000090	Area (sq ft)	1844.82	691.65	5419.59
Q Total (cfs)	16941.00	Flow (cfs)	1205.90	2066.92	13668.18
Top Width (ft)	1135.65	Top Width (ft)	295.30	42.00	798.35
Vel Total (ft/s)	2.13	Avg. Vel. (ft/s)	0.65	2.99	2.52
Max Chl Dpth (ft)	17.09	Hydr. Depth (ft)	6.25	16.47	6.79
Conv. Total (cfs)	1785334.0	Conv. (cfs)	127084.1	217823.5	1440426.0
Length Wtd. (ft)	25.50	Wetted Per. (ft)	300.74	43.14	842.46
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.03	0.09	0.04
Alpha	1.38	Stream Power (lb/ft s)	1867.06	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	164.33	58.23	356.21
C & E Loss (ft)	0.01	Cum SA (acres)	33.08	4.62	55.44

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 5039.878 Profile: 500-yr

E.G. Elev (ft)	171.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.077	0.030	0.020
W.S. Elev (ft)	171.36	Reach Len. (ft)	93.53	174.30	218.10
Crit W.S. (ft)	166.63	Flow Area (sq ft)	1940.63	744.07	7282.92
E.G. Slope (ft/ft)	0.000055	Area (sq ft)	1940.63	744.07	7282.92
Q Total (cfs)	16941.00	Flow (cfs)	969.20	1732.66	14239.14
Top Width (ft)	1559.51	Top Width (ft)	302.69	45.00	1211.82
Vel Total (ft/s)	1.70	Avg. Vel. (ft/s)	0.50	2.33	1.96

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 5039.878 Profile: 500-yr (Continued)

Max Chl Dpth (ft)	17.11	Hydr. Depth (ft)	6.41	16.53	6.01
Conv. Total (cfs)	2283015.0	Conv. (cfs)	130612.4	233497.7	1918905.0
Length Wtd. (ft)	200.73	Wetted Per. (ft)	308.71	46.66	1239.04
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.02	0.05	0.02
Alpha	1.31	Stream Power (lb/ft s)	1815.02	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	163.22	57.81	352.49
C & E Loss (ft)	0.00	Cum SA (acres)	32.91	4.59	54.85

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 4865.578 Profile: 500-yr

E.G. Elev (ft)	171.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.050	0.030	0.020
W.S. Elev (ft)	171.36	Reach Len. (ft)	41.51	75.49	113.50
Crit W.S. (ft)	163.63	Flow Area (sq ft)	2497.19	1888.24	6448.34
E.G. Slope (ft/ft)	0.000043	Area (sq ft)	2497.19	1888.24	6448.34
Q Total (cfs)	16941.00	Flow (cfs)	1774.51	3897.61	11268.88
Top Width (ft)	1409.59	Top Width (ft)	358.24	117.19	934.15
Vel Total (ft/s)	1.56	Avg. Vel. (ft/s)	0.71	2.06	1.75
Max Chl Dpth (ft)	17.11	Hydr. Depth (ft)	6.97	16.11	6.90
Conv. Total (cfs)	2585616.0	Conv. (cfs)	270833.4	594872.1	1719910.0
Length Wtd. (ft)	99.36	Wetted Per. (ft)	362.55	117.71	944.15
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.02	0.04	0.02
Alpha	1.25	Stream Power (lb/ft s)	1717.52	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	158.45	52.54	318.12
C & E Loss (ft)	0.00	Cum SA (acres)	32.20	4.27	49.48

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 4790.088 Profile: 500-yr

E.G. Elev (ft)	171.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.094	0.030	0.027
W.S. Elev (ft)	171.34	Reach Len. (ft)	13.00	13.00	13.00
Crit W.S. (ft)	164.84	Flow Area (sq ft)	2669.31	968.53	7065.96
E.G. Slope (ft/ft)	0.000073	Area (sq ft)	2669.31	968.53	7065.96
Q Total (cfs)	16941.00	Flow (cfs)	1421.96	2651.02	12868.02
Top Width (ft)	1443.42	Top Width (ft)	384.53	58.20	1000.69
Vel Total (ft/s)	1.58	Avg. Vel. (ft/s)	0.53	2.74	1.82
Max Chl Dpth (ft)	17.34	Hydr. Depth (ft)	6.94	16.64	7.06
Conv. Total (cfs)	1982242.0	Conv. (cfs)	166381.1	310192.1	1505669.0
Length Wtd. (ft)	13.00	Wetted Per. (ft)	389.21	58.90	1009.08
Min Ch El (ft)	154.00	Shear (lb/sq ft)	0.03	0.07	0.03
Alpha	1.48	Stream Power (lb/ft s)	2240.63	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	155.99	50.06	300.51
C & E Loss (ft)	0.01	Cum SA (acres)	31.85	4.12	46.96

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 4777.088 Profile: 500-yr

E.G. Elev (ft)	171.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.056	0.030	0.021
W.S. Elev (ft)	171.35	Reach Len. (ft)	15.00	15.00	15.00
Crit W.S. (ft)	164.75	Flow Area (sq ft)	2505.59	951.75	9061.23
E.G. Slope (ft/ft)	0.000027	Area (sq ft)	2505.59	951.75	9061.23
Q Total (cfs)	16941.00	Flow (cfs)	1262.72	1581.16	14097.12
Top Width (ft)	1495.91	Top Width (ft)	361.22	57.00	1077.69
Vel Total (ft/s)	1.35	Avg. Vel. (ft/s)	0.50	1.66	1.56
Max Chl Dpth (ft)	17.10	Hydr. Depth (ft)	6.94	16.70	8.41
Conv. Total (cfs)	3254400.0	Conv. (cfs)	242571.1	303743.1	2708086.0
Length Wtd. (ft)	15.00	Wetted Per. (ft)	367.47	58.19	1081.37
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.01	0.03	0.01
Alpha	1.25	Stream Power (lb/ft s)	1639.28	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	155.22	49.78	298.10
C & E Loss (ft)		Cum SA (acres)	31.73	4.10	46.65

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 4740 BR U Profile: 500-yr

E.G. Elev (ft)	171.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.90	Wt. n-Val.			
W.S. Elev (ft)	171.35	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)	166.05	Flow Area (sq ft)	288.80	734.33	1465.30
E.G. Slope (ft/ft)		Area (sq ft)	279.64	732.30	1426.97
Q Total (cfs)	16941.00	Flow (cfs)	2055.34	10178.08	4706.07
Top Width (ft)	1389.00	Top Width (ft)	254.30	57.00	1077.70
Vel Total (ft/s)	6.81	Avg. Vel. (ft/s)	7.12	13.86	3.21
Max Chl Dpth (ft)	17.10	Hydr. Depth (ft)	1.14	12.88	1.36
Conv. Total (cfs)		Conv. (cfs)			
Length Wtd. (ft)	40.00	Wetted Per. (ft)	289.13	172.19	1135.32
Min Ch El (ft)	154.25	Shear (lb/sq ft)			
Alpha	1.20	Stream Power (lb/ft s)	1639.28	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	154.74	49.49	296.30
C & E Loss (ft)		Cum SA (acres)	31.63	4.08	46.28

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 4740 BR D Profile: 500-yr

E.G. Elev (ft)	171.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.03	Wt. n-Val.			
W.S. Elev (ft)	171.35	Reach Len. (ft)	36.50	36.50	36.50
Crit W.S. (ft)	172.38	Flow Area (sq ft)	436.13	679.11	1150.80
E.G. Slope (ft/ft)		Area (sq ft)	424.80	677.25	1129.40
Q Total (cfs)	16941.00	Flow (cfs)	1165.41	11554.15	4219.92
Top Width (ft)	972.59	Top Width (ft)	318.45	52.44	601.70
Vel Total (ft/s)	7.48	Avg. Vel. (ft/s)	2.67	17.01	3.67
Max Chl Dpth (ft)	17.35	Hydr. Depth (ft)	1.37	12.95	1.91
Conv. Total (cfs)		Conv. (cfs)			
Length Wtd. (ft)	36.50	Wetted Per. (ft)	378.88	157.56	646.89
Min Ch El (ft)	154.00	Shear (lb/sq ft)			
Alpha	3.39	Stream Power (lb/ft s)	1125.57	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	154.42	48.84	295.12
C & E Loss (ft)		Cum SA (acres)	31.37	4.03	45.51

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 4685.592 Profile: 500-yr

E.G. Elev (ft)	167.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.	0.100	0.030	0.099
W.S. Elev (ft)	167.22	Reach Len. (ft)	393.59	358.41	320.67
Crit W.S. (ft)	165.40	Flow Area (sq ft)	1624.05	662.45	5691.32
E.G. Slope (ft/ft)	0.000668	Area (sq ft)	1624.05	662.45	5691.32
Q Total (cfs)	16941.00	Flow (cfs)	2054.40	4586.96	10299.64
Top Width (ft)	892.39	Top Width (ft)	270.81	52.44	569.14
Vel Total (ft/s)	2.12	Avg. Vel. (ft/s)	1.26	6.92	1.81
Max Chl Dpth (ft)	13.22	Hydr. Depth (ft)	6.00	12.63	10.00
Conv. Total (cfs)	655301.1	Conv. (cfs)	79467.1	177429.9	398404.1
Length Wtd. (ft)	337.08	Wetted Per. (ft)	271.78	52.68	571.66
Min Ch El (ft)	154.00	Shear (lb/sq ft)	0.25	0.52	0.42
Alpha	3.36	Stream Power (lb/ft s)	1125.57	0.00	0.00
Frctn Loss (ft)	0.29	Cum Volume (acre-ft)	153.56	48.28	292.27
C & E Loss (ft)	0.04	Cum SA (acres)	31.12	3.99	45.02

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 4327.181 Profile: 500-yr

E.G. Elev (ft)	167.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.38	Wt. n-Val.	0.100	0.034	0.086
W.S. Elev (ft)	166.74	Reach Len. (ft)	379.56	362.86	348.11
Crit W.S. (ft)		Flow Area (sq ft)	580.19	509.36	4401.13
E.G. Slope (ft/ft)	0.001147	Area (sq ft)	580.19	509.36	4401.13
Q Total (cfs)	16941.00	Flow (cfs)	912.41	4411.16	11617.43
Top Width (ft)	600.96	Top Width (ft)	103.66	35.94	461.36
Vel Total (ft/s)	3.09	Avg. Vel. (ft/s)	1.57	8.66	2.64

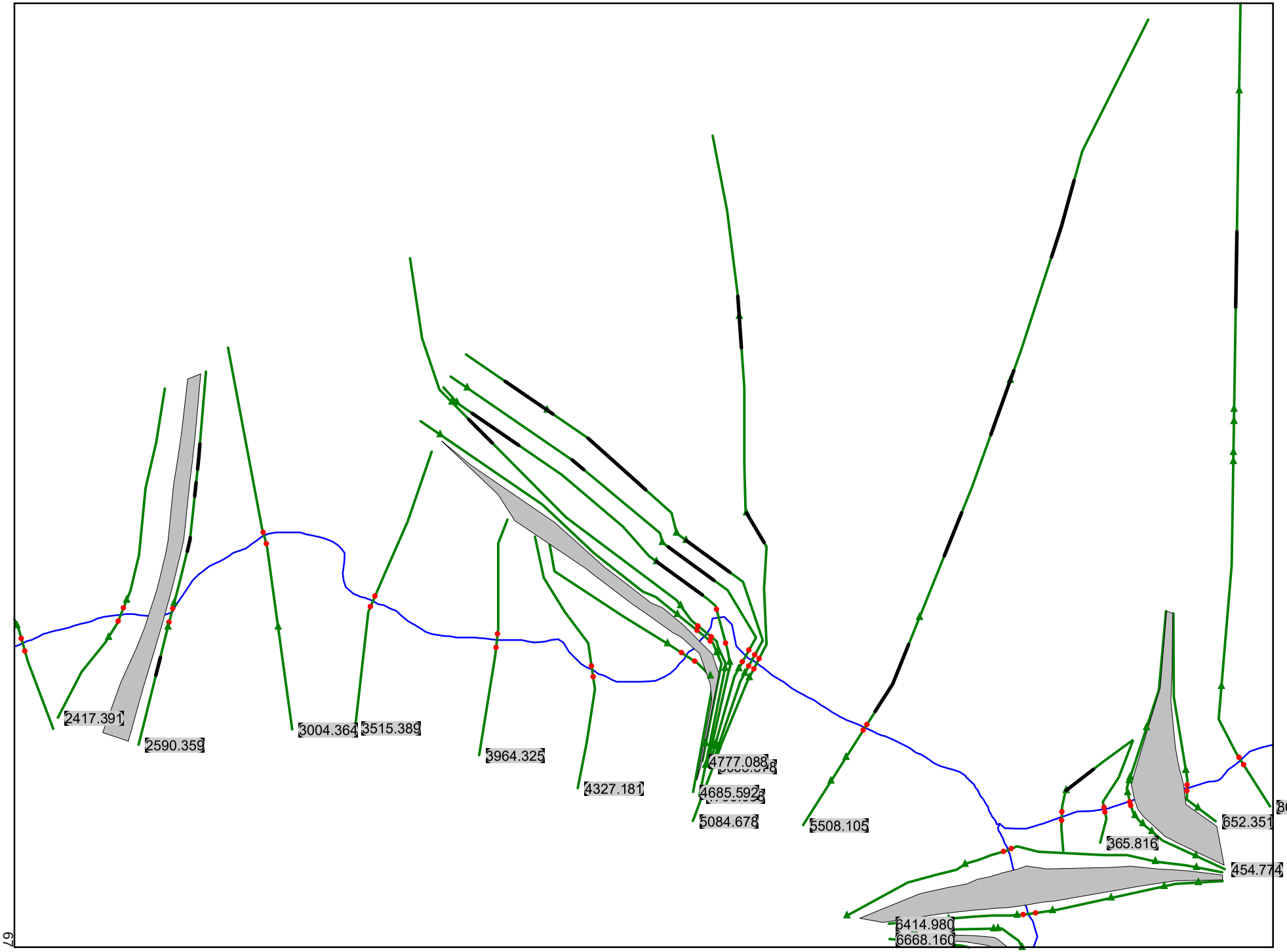
Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 4327.181 Profile: 500-yr (Continued)

Max Chl Dpth (ft)	14.74	Hydr. Depth (ft)	5.60	14.17	9.54
Conv. Total (cfs)	500132.0	Conv. (cfs)	26936.1	130226.2	342969.7
Length Wtd. (ft)	354.49	Wetted Per. (ft)	105.06	36.17	463.73
Min Ch El (ft)	152.00	Shear (lb/sq ft)	0.40	1.01	0.68
Alpha	2.57	Stream Power (lb/ft s)	898.41	0.00	0.00
Frctn Loss (ft)	0.46	Cum Volume (acre-ft)	143.60	43.46	255.12
C & E Loss (ft)	0.03	Cum SA (acres)	29.43	3.62	41.22

Plan: Dup-Effective Sandy Run Sandy Main Stem RS: 3964.325 Profile: 500-yr

E.G. Elev (ft)	166.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	165.93	Reach Len. (ft)	460.88	448.94	432.66
Crit W.S. (ft)		Flow Area (sq ft)	603.97	605.64	3698.99
E.G. Slope (ft/ft)	0.001448	Area (sq ft)	603.97	605.64	3698.99
Q Total (cfs)	16941.00	Flow (cfs)	911.42	6359.54	9670.05
Top Width (ft)	558.01	Top Width (ft)	137.49	45.65	374.88
Vel Total (ft/s)	3.45	Avg. Vel. (ft/s)	1.51	10.50	2.61
Max Chl Dpth (ft)	13.93	Hydr. Depth (ft)	4.39	13.27	9.87
Conv. Total (cfs)	445169.4	Conv. (cfs)	23949.9	167113.6	254105.9
Length Wtd. (ft)	441.02	Wetted Per. (ft)	138.54	46.06	377.73
Min Ch El (ft)	152.00	Shear (lb/sq ft)	0.39	1.19	0.89
Alpha	3.81	Stream Power (lb/ft s)	800.12	0.00	0.00
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)	138.44	38.81	222.75
C & E Loss (ft)	0.08	Cum SA (acres)	28.38	3.28	37.88

HEC-RAS Detailed Analysis Results – Corrected Effective Model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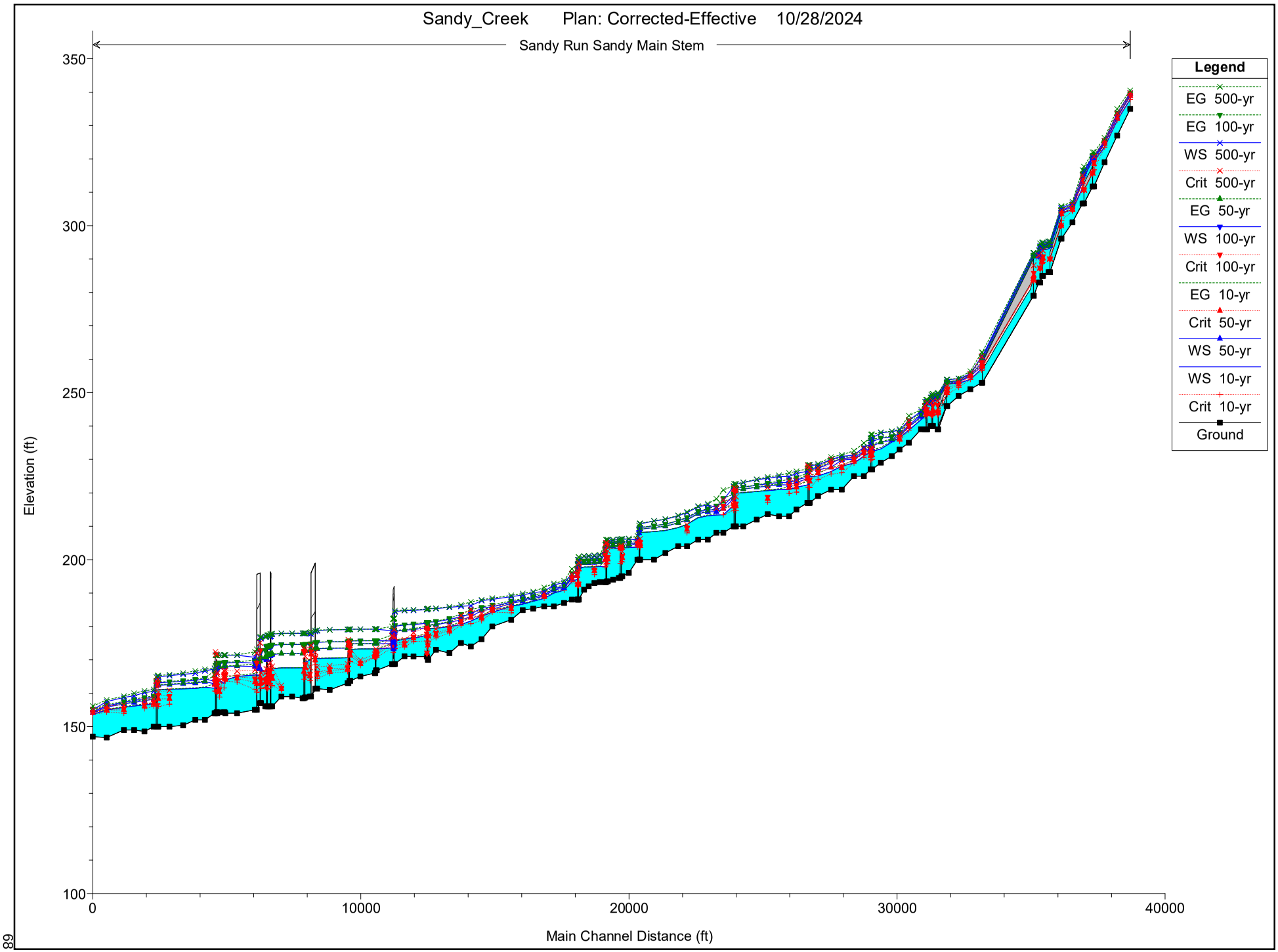
Sandy_Creek Plan: Corrected-Effective 10/28/2024
Sandy Run Sandy Main Stem
Legend
EG 500-yr
EG 100-yr
WS 500-yr
Crit 500-yr
EG 50-yr
WS 100-yr
Crit 100-yr
EG 10-yr
Crit 50-yr
WS 50-yr
WS 10-yr
Crit 10-yr
Ground
Elevation (ft)
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300
250
200
150
100
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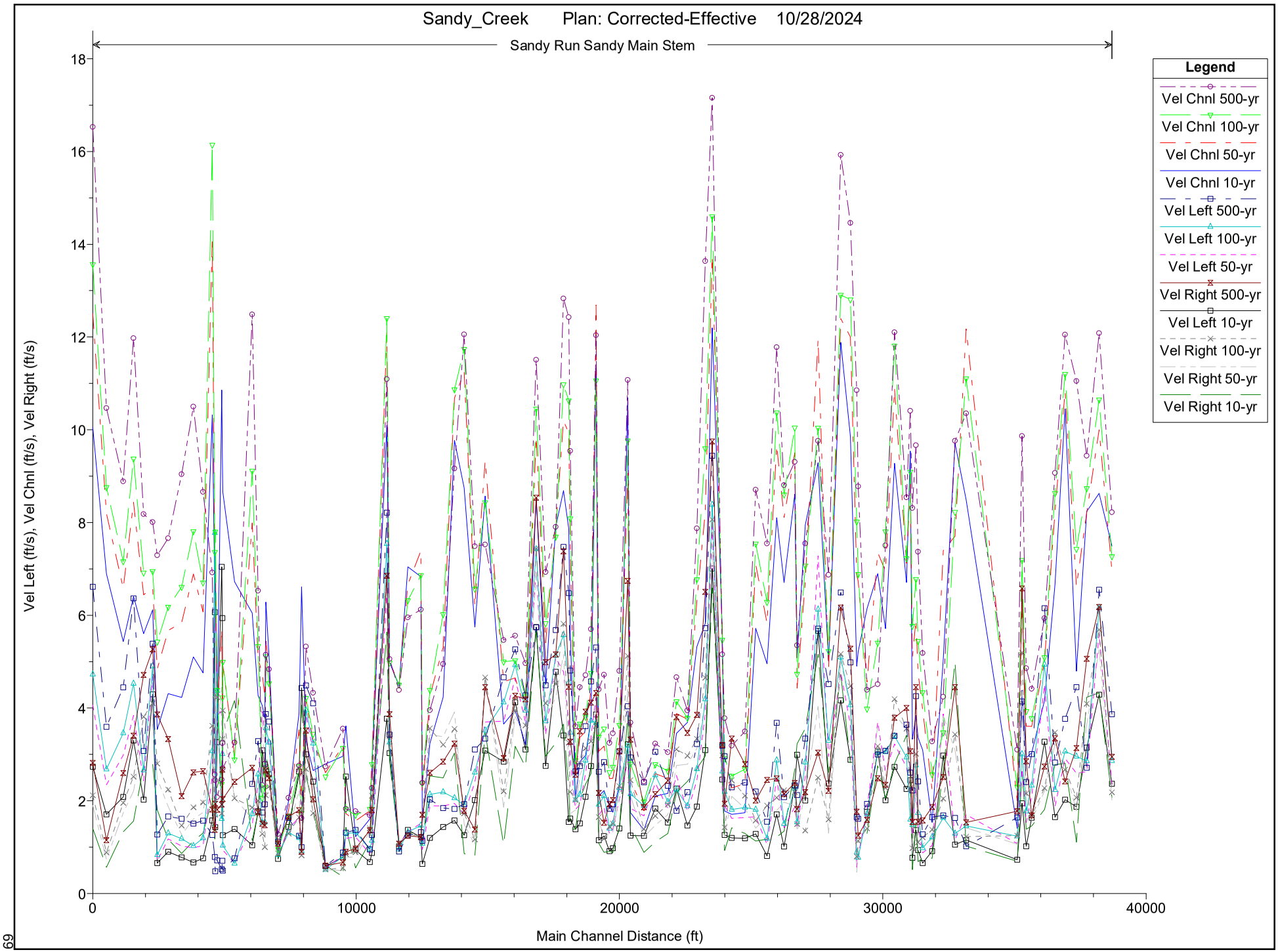
20000
30000
40000
Main Channel Distance (ft)


Sandy_Creek Plan: Corrected-Effective 10/28/2024
Sandy Run Sandy Main Stem
Legend
Vel Chnl 500-yr
Vel Chnl 100-yr
Vel Chnl 50-yr
Vel Chnl 10-yr
Vel Left 500-yr
Vel Left 100-yr
Vel Left 50-yr
Vel Right 500-yr
Vel Left 10-yr
Vel Right 100-yr
Vel Right 50-yr
Vel Right 10-yr
Vel Left (ft/s), Vel Chnl (ft/s), Vel Right (ft/s)
Main Channel Distance (ft)
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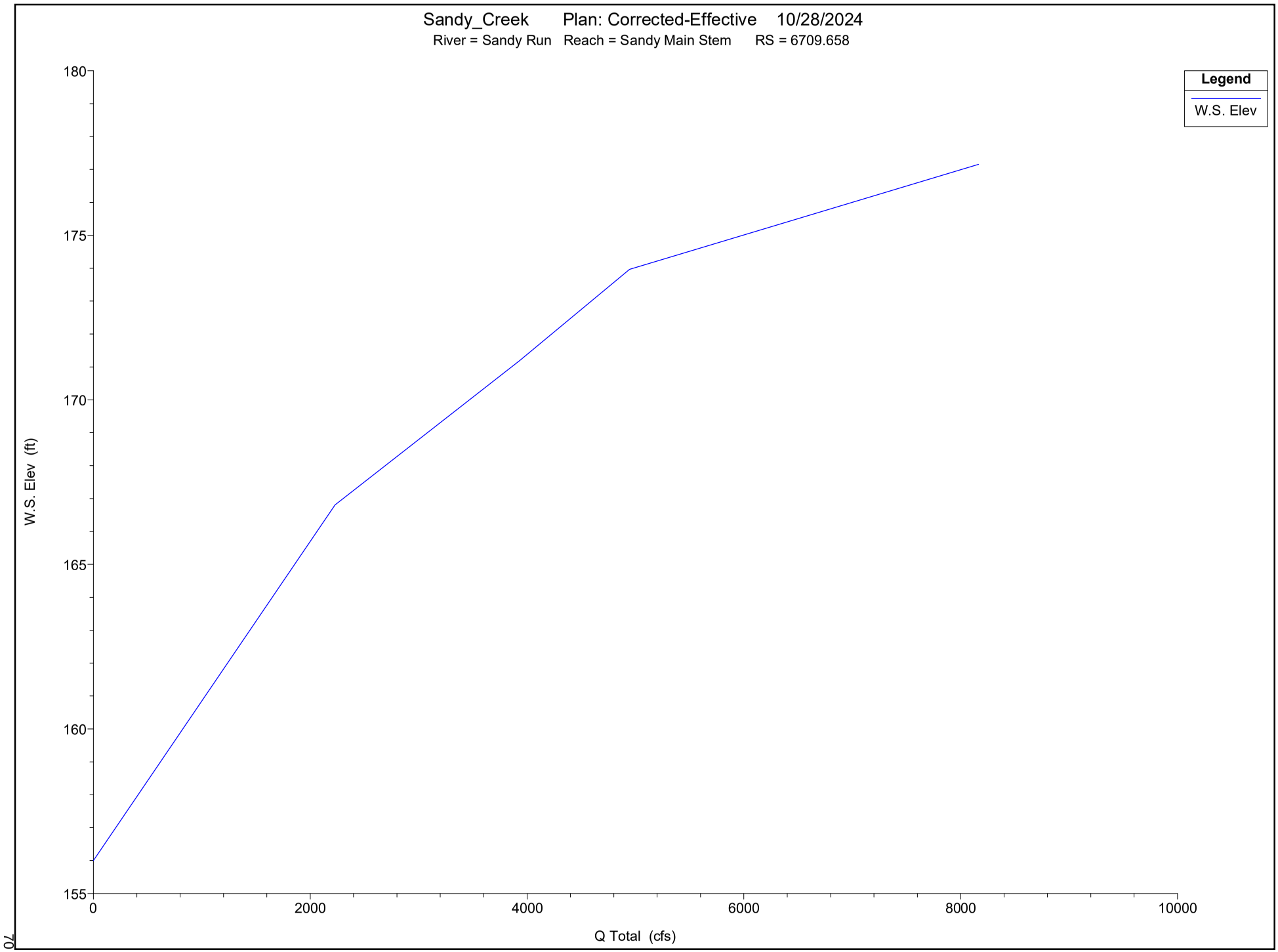
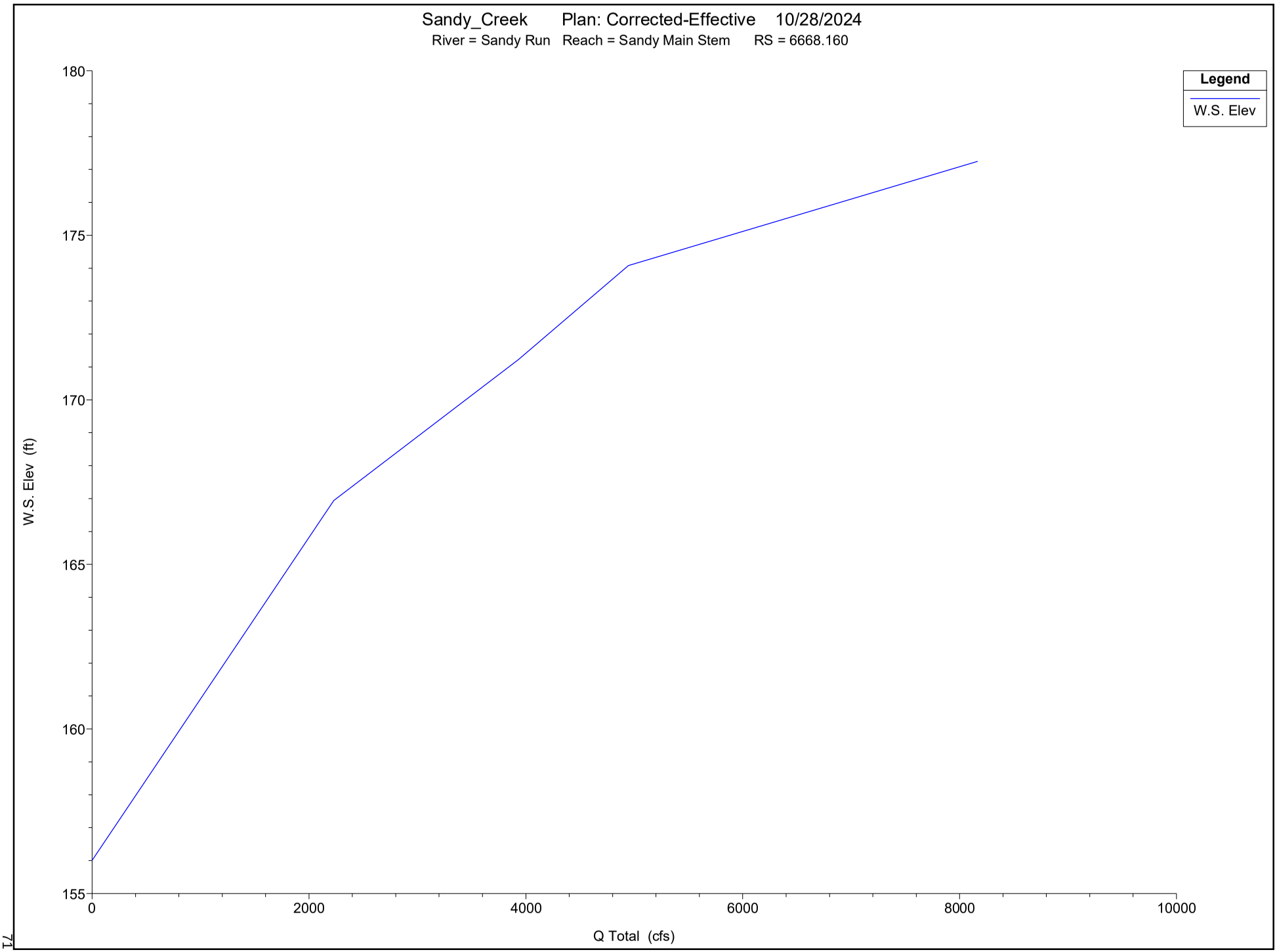
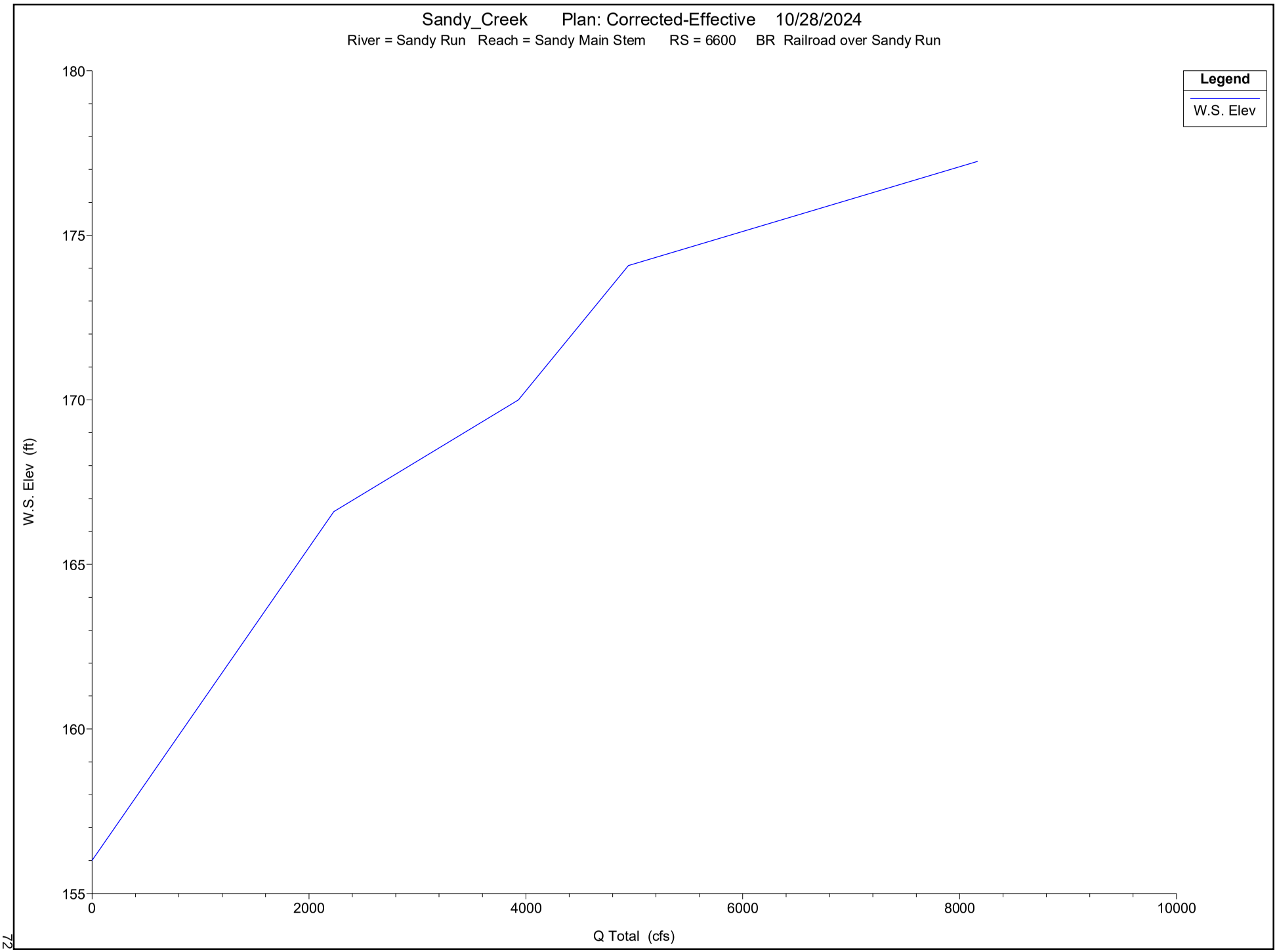
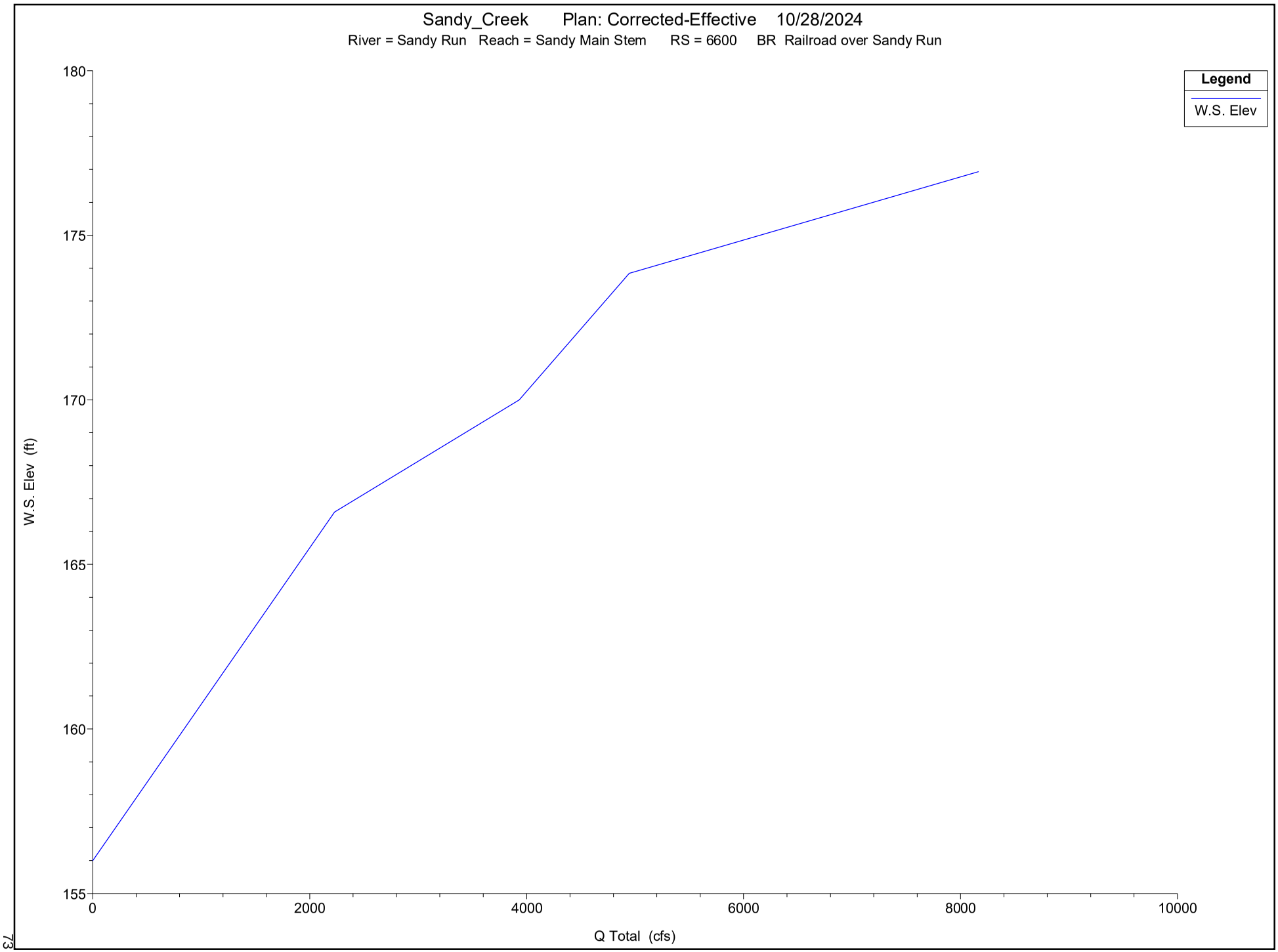
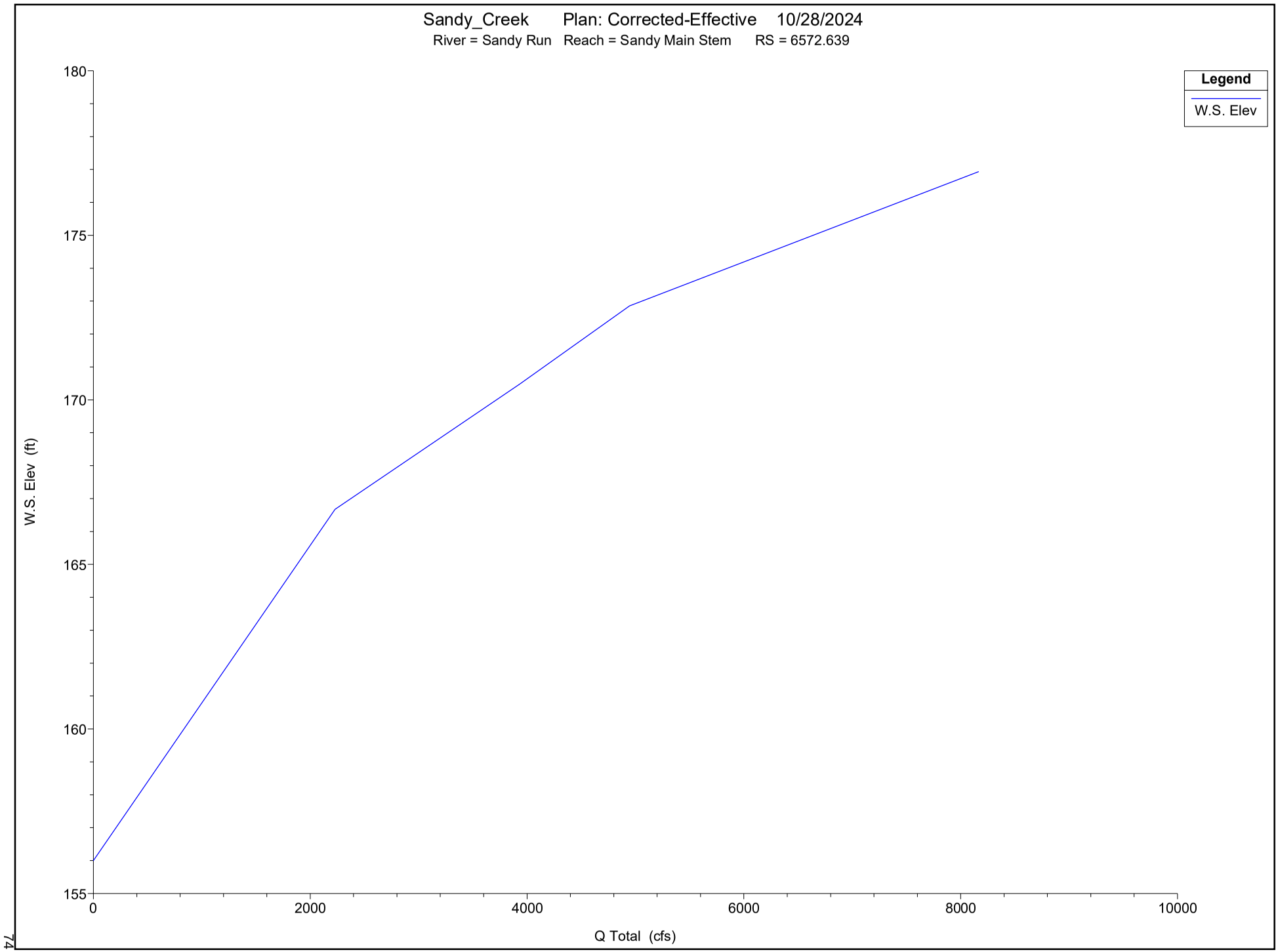
6
8
10
12
14
16
18
0
10000
20000
30000
40000

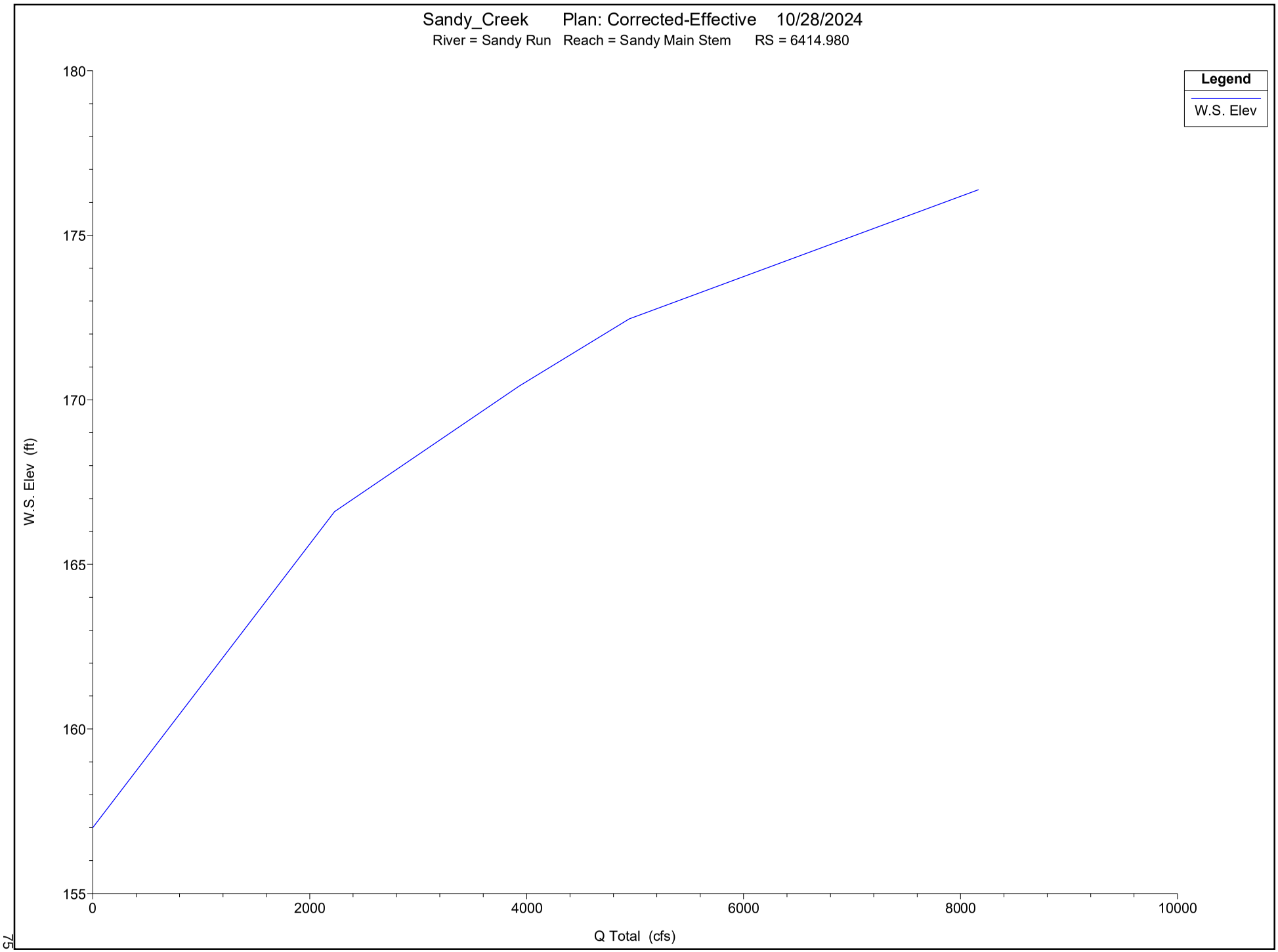

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6709.658
Legend
W.S. Elev
W.S. Elev (ft)
Q Total (cfs)
180
175
170
165
160
155
0
2000
4000
6000
8000
10000

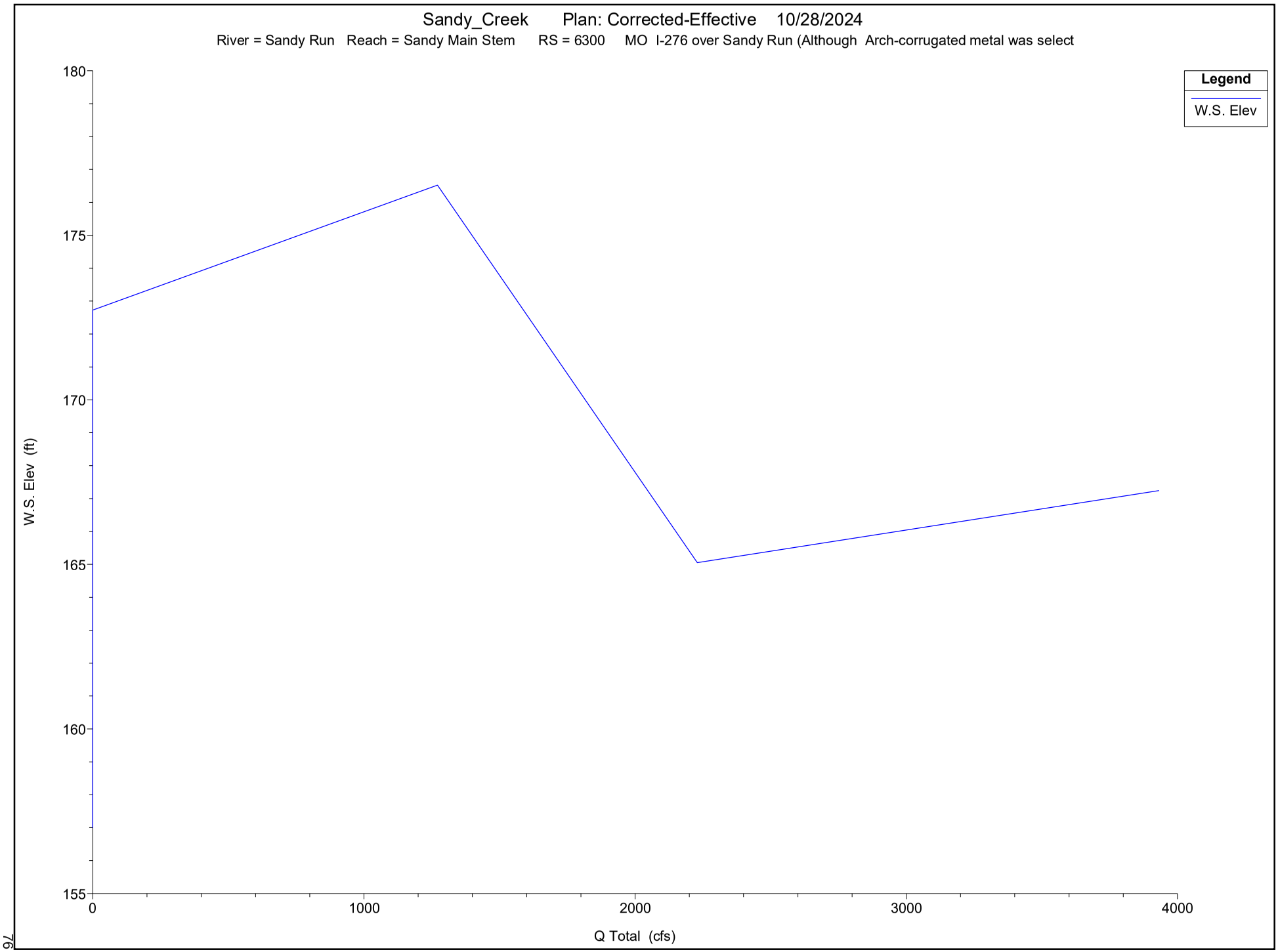

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6668.160
Legend
W.S. Elev
W.S. Elev (ft)
180
175
170
165
160
155
0
2000
4000
6000
8000
10000
Q Total (cfs)

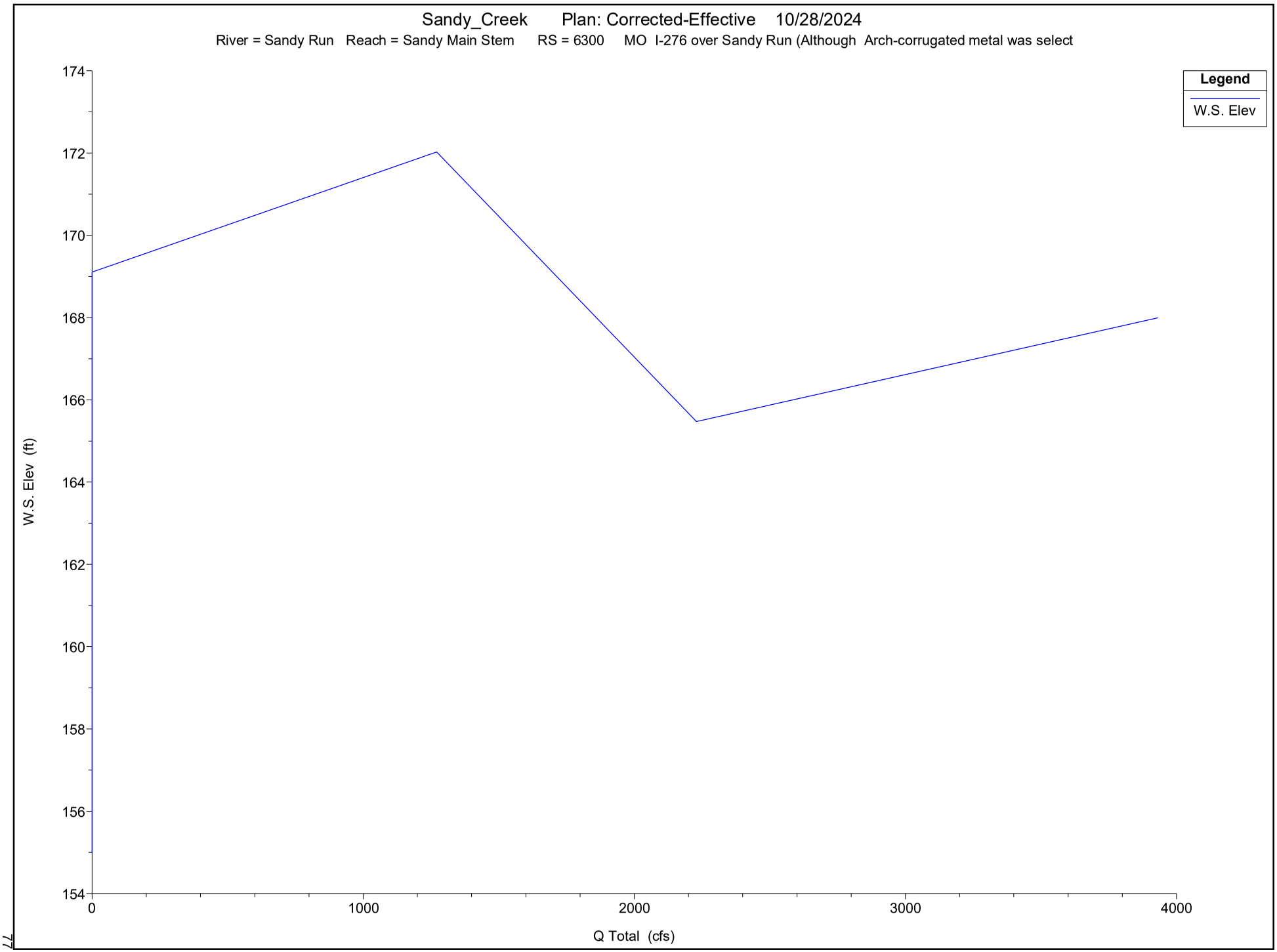

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6600 BR Railroad over Sandy Run
Legend
W.S. Elev
W.S. Elev (ft)
180
175
170
165
160
155
0
2000
4000
6000
8000
10000
Q Total (cfs)

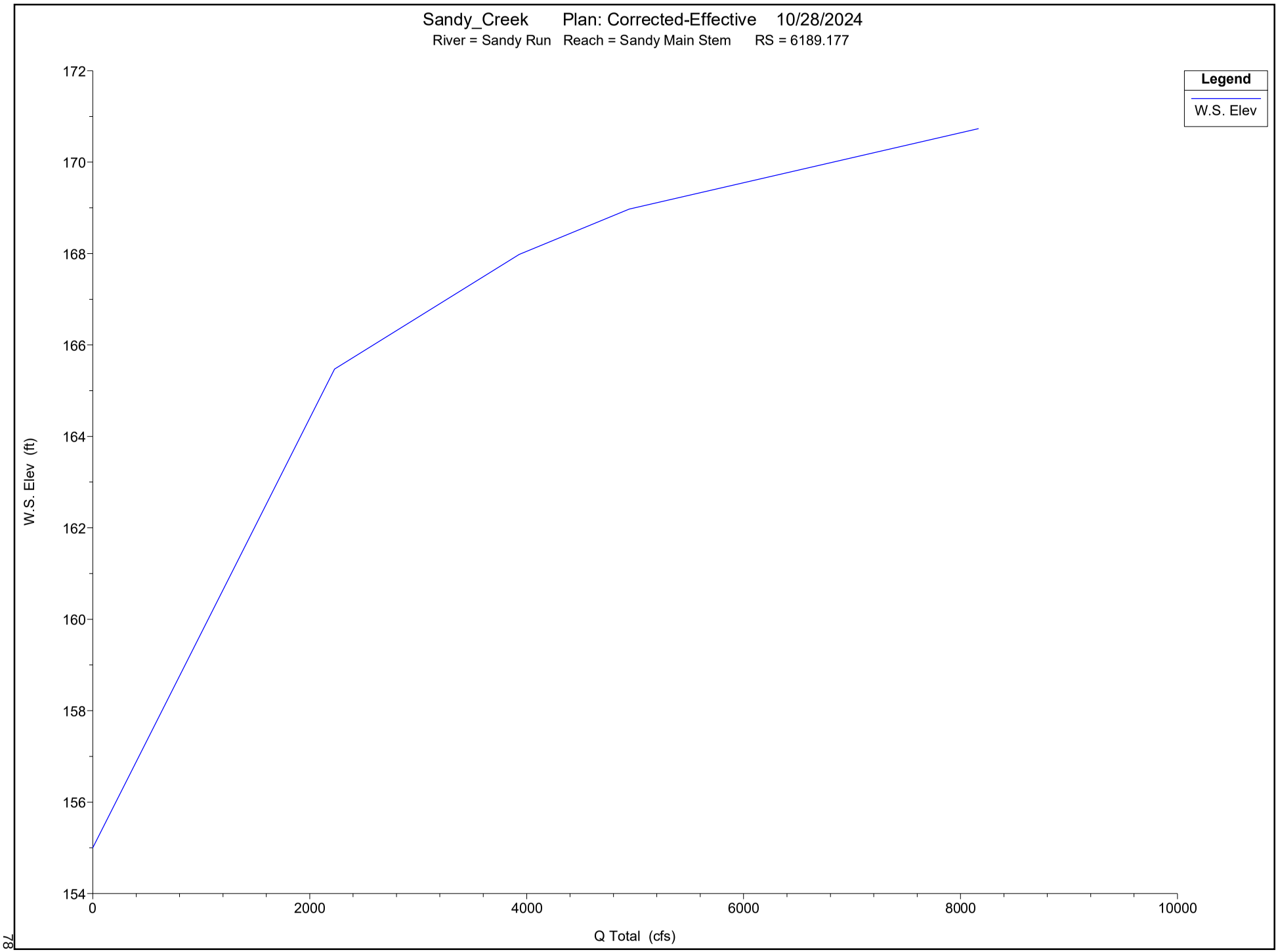

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6600 BR Railroad over Sandy Run
Legend
W.S. Elev
W.S. Elev (ft)
180
175
170
165
160
155
0
2000
4000
6000
8000
10000
Q Total (cfs)

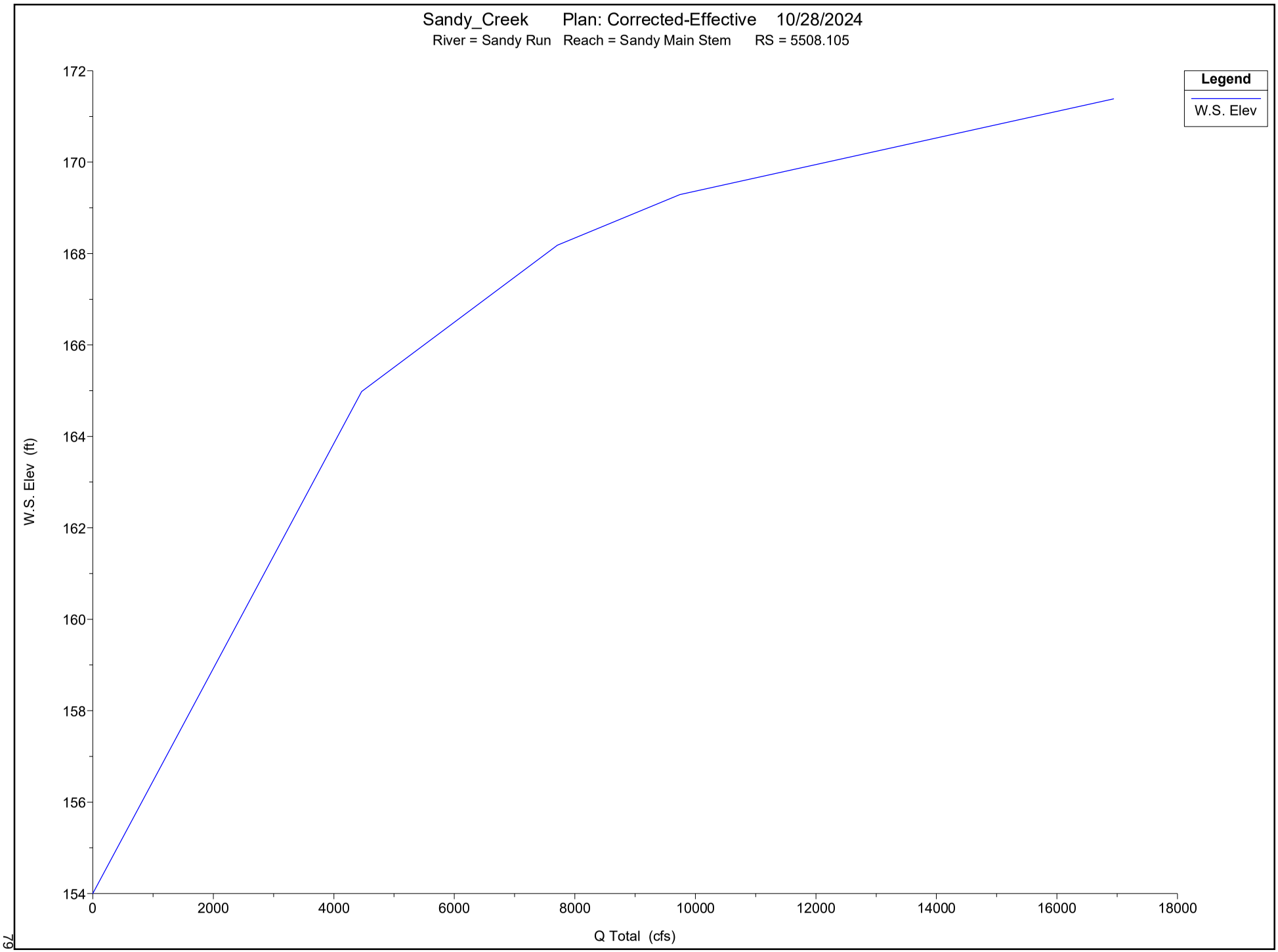

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6572.639
Legend
W.S. Elev
W.S. Elev (ft)
180
175
170
165
160
155
0
2000
4000
6000
8000
10000
Q Total (cfs)

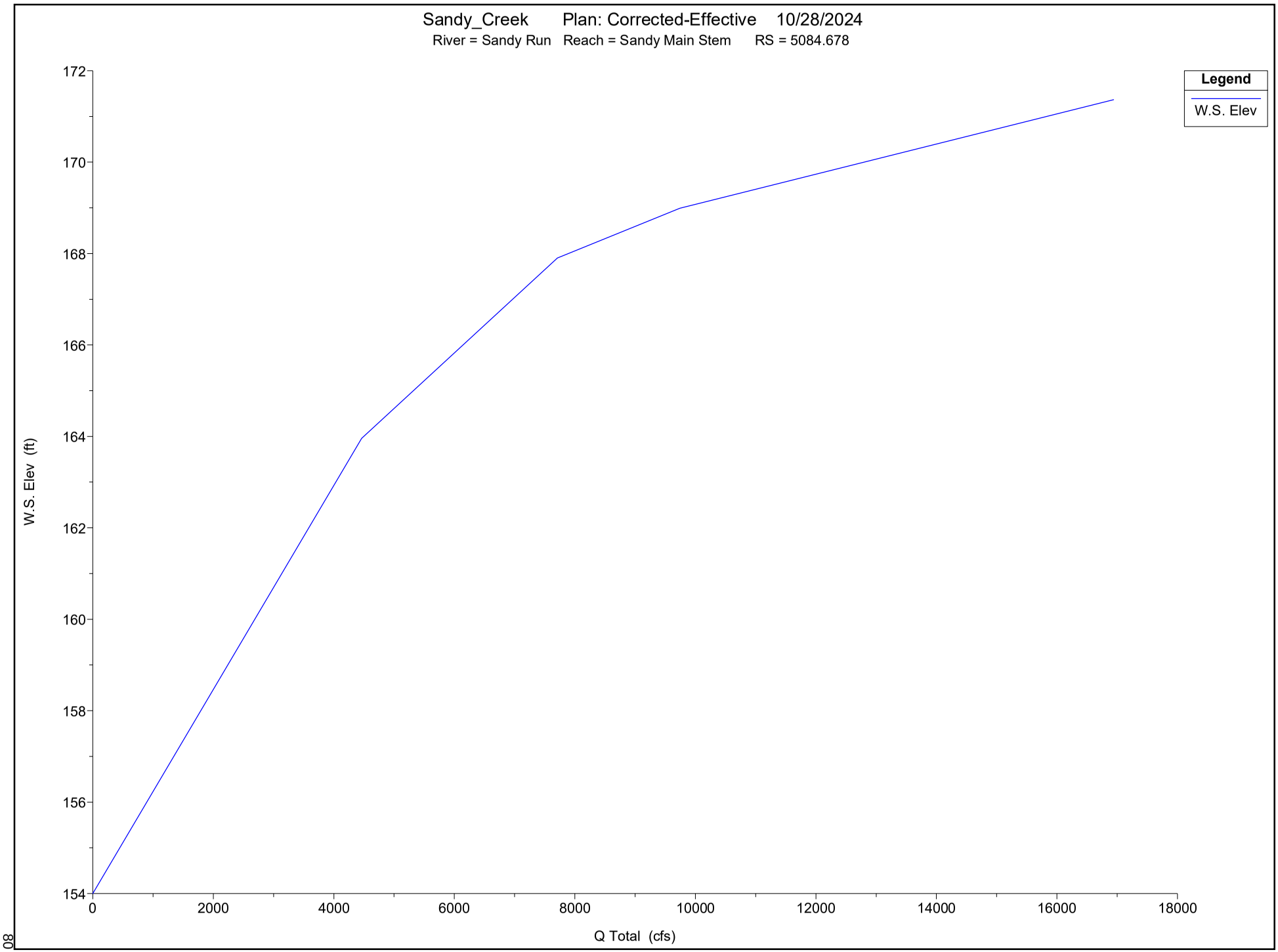

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6414.980
Legend
W.S. Elev
W.S. Elev (ft)
180
175
170
165
160
155
0
2000
4000
6000
8000
10000
Q Total (cfs)

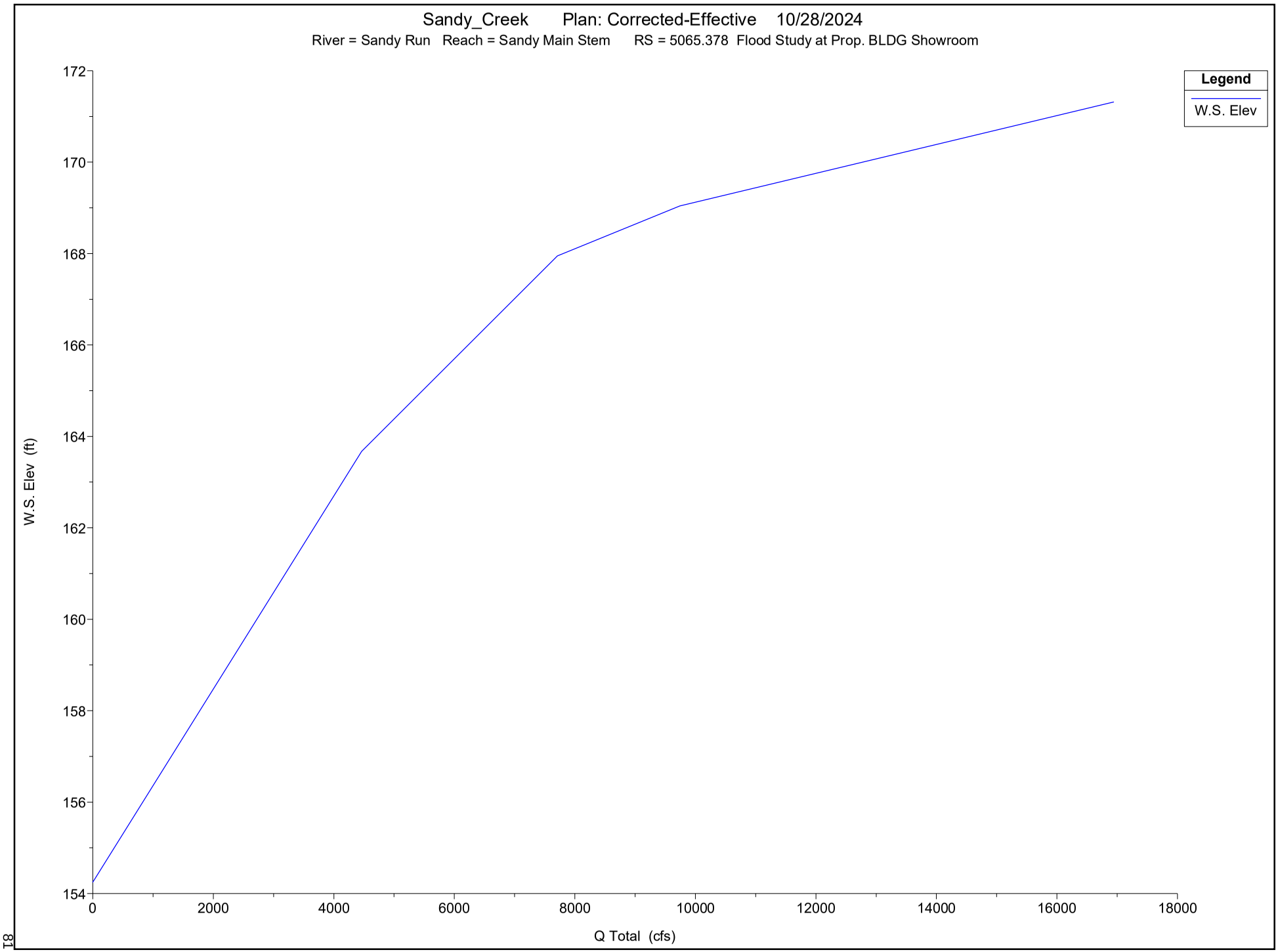

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6300 MO I-276 over Sandy Run (Although Arch-corrugated metal was select
Legend
W.S. Elev
W.S. Elev (ft)
180
175
170
165
160
155
0
1000
2000
3000
4000
Q Total (cfs)

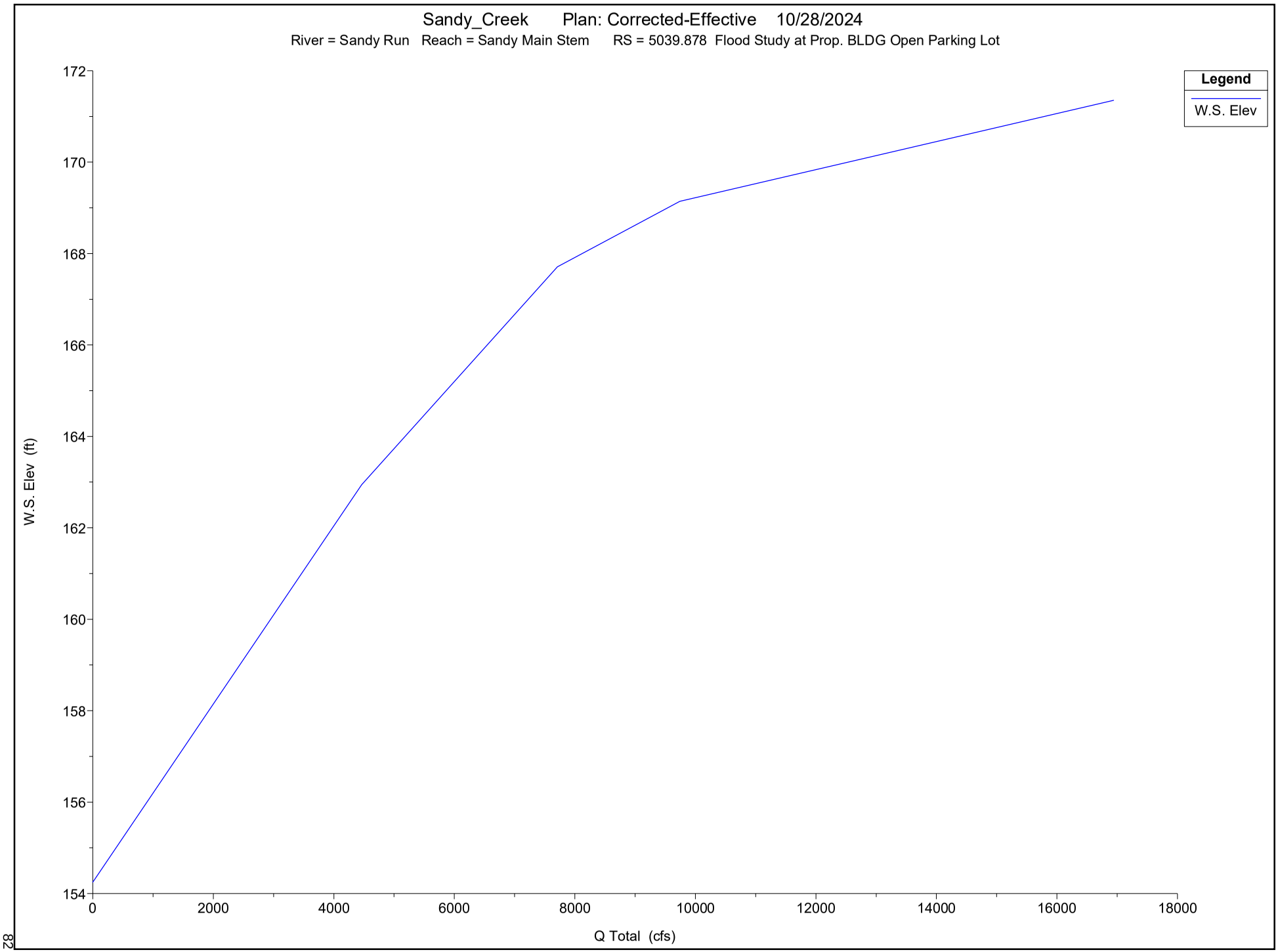

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6300 MO I-276 over Sandy Run (Although Arch-corrugated metal was select
Legend
W.S. Elev
W.S. Elev (ft)
174
172
170
168
166
164
162
160
158
156
154
0
1000
2000
3000
4000
Q Total (cfs)

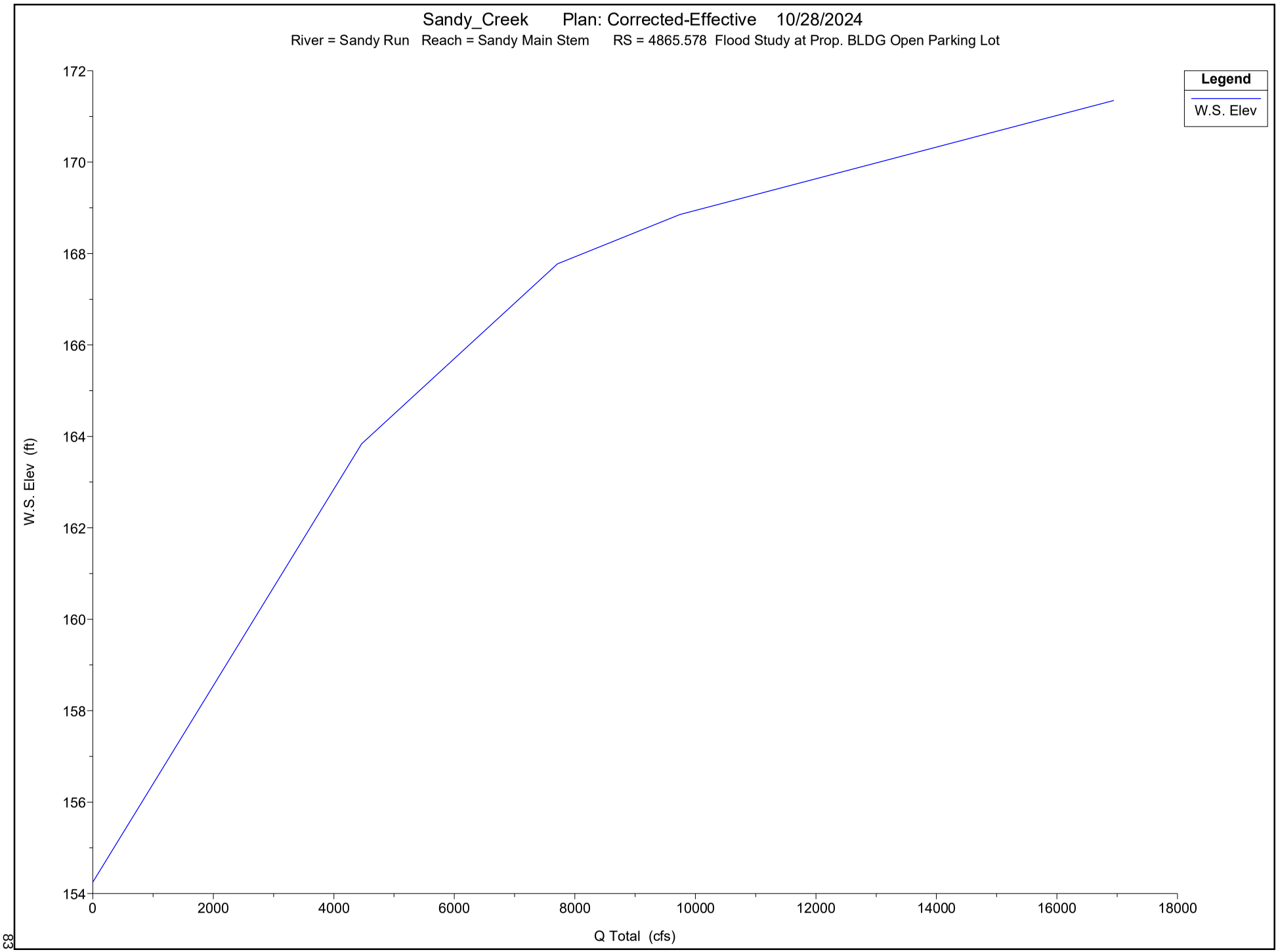

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6189.177
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
Q Total (cfs)

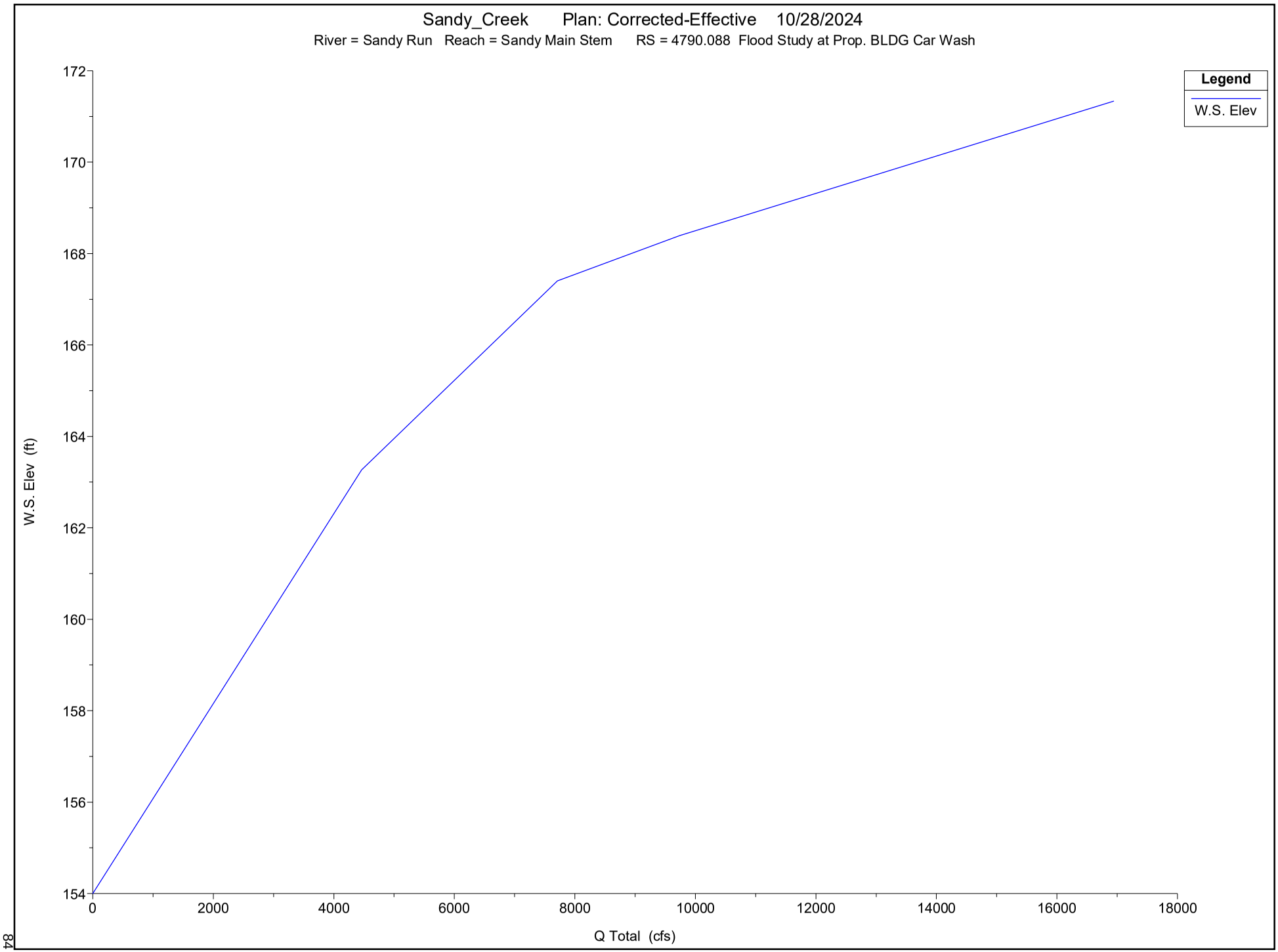

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 5508.105
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

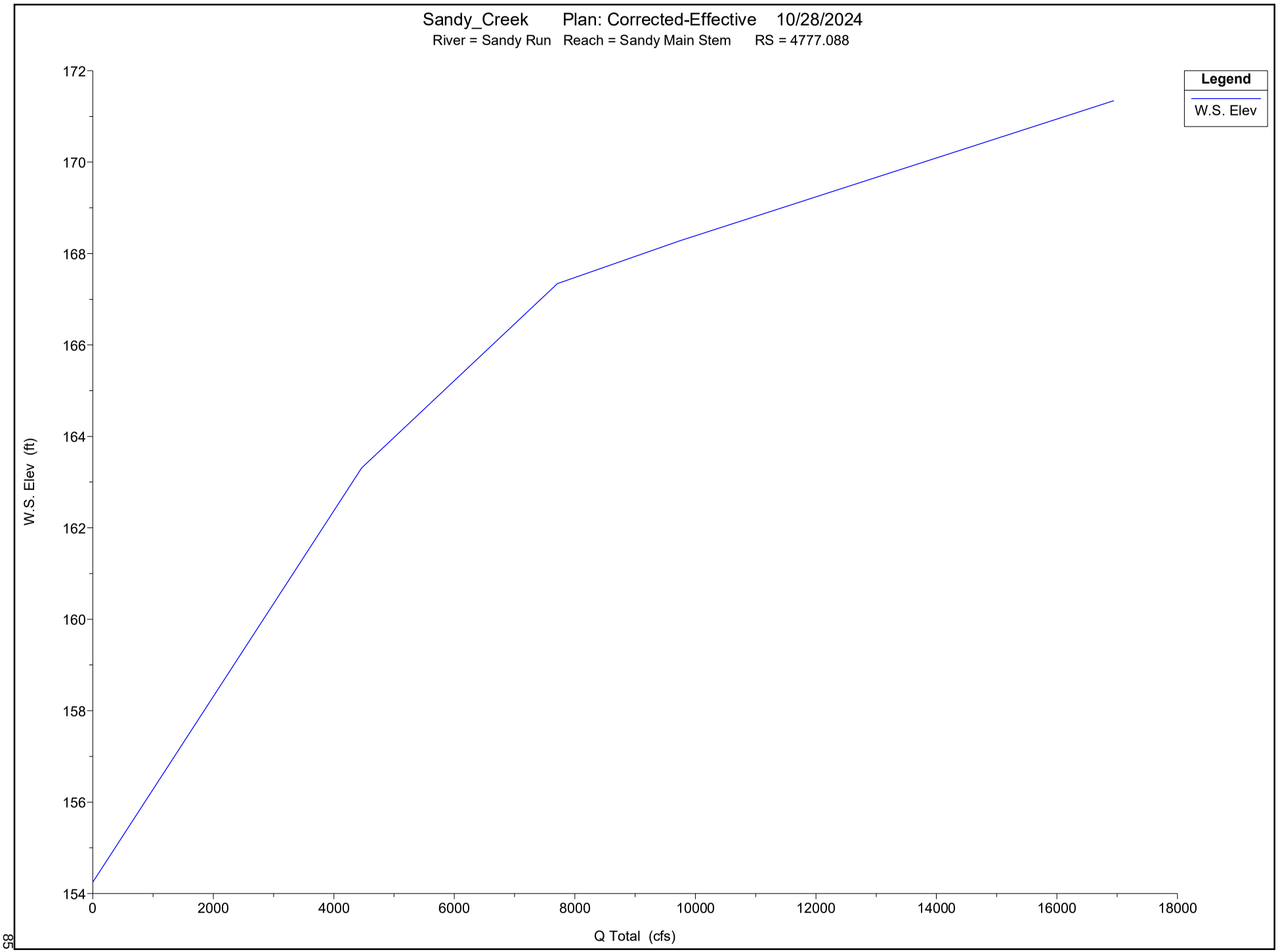

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 5084.678
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

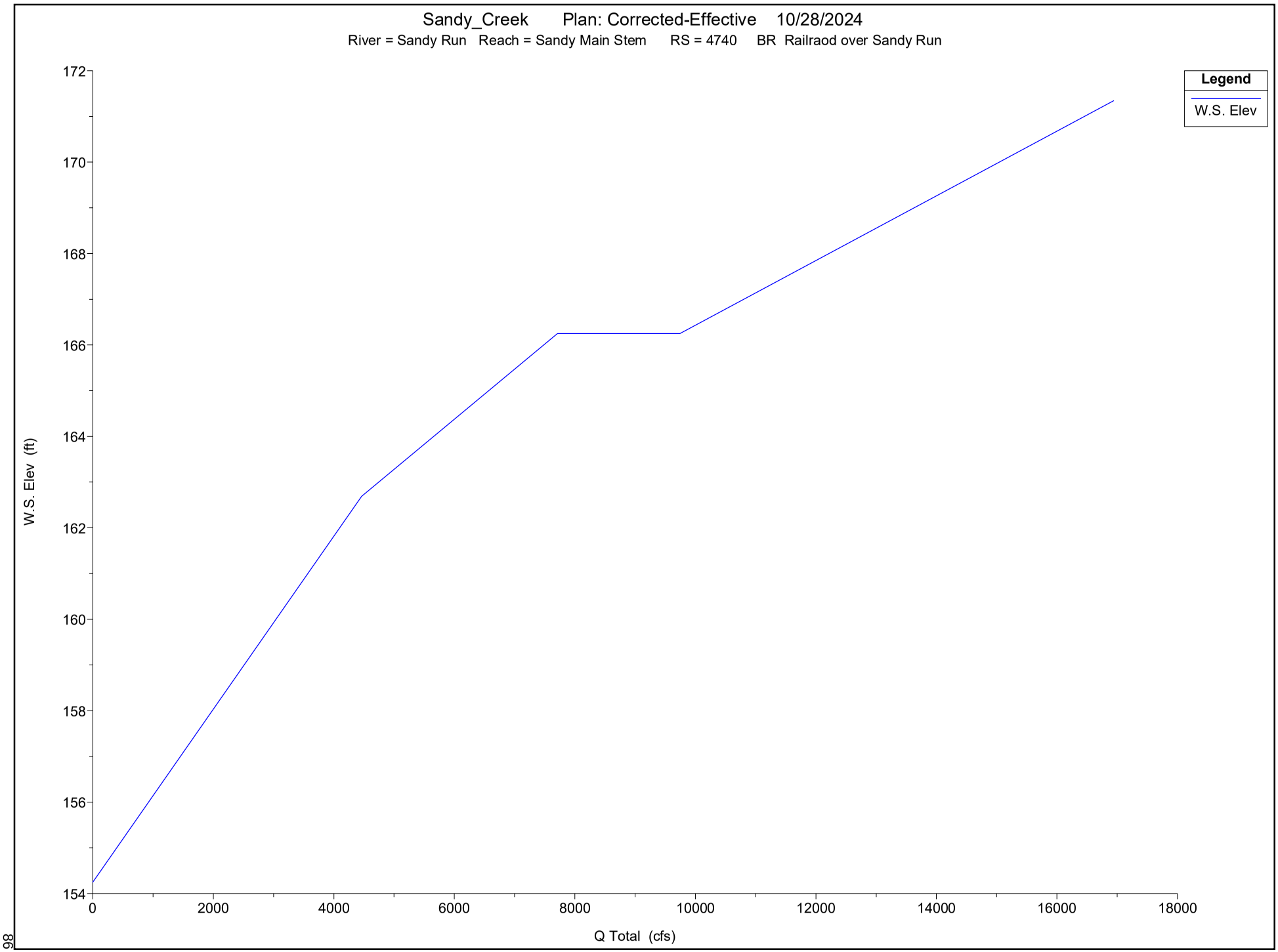

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 5065.378 Flood Study at Prop. BLDG Showroom
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

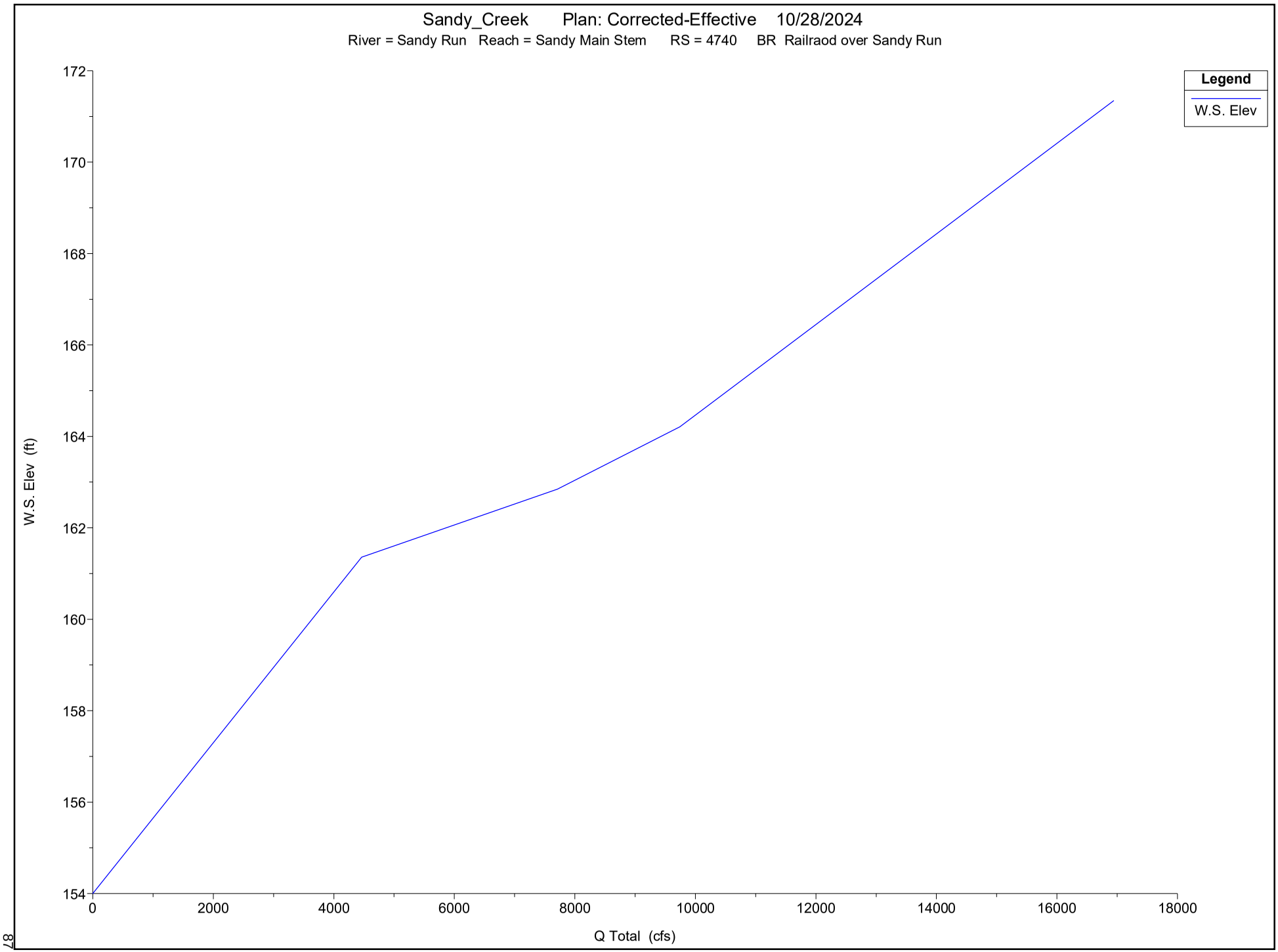

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 5039.878 Flood Study at Prop. BLDG Open Parking Lot
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

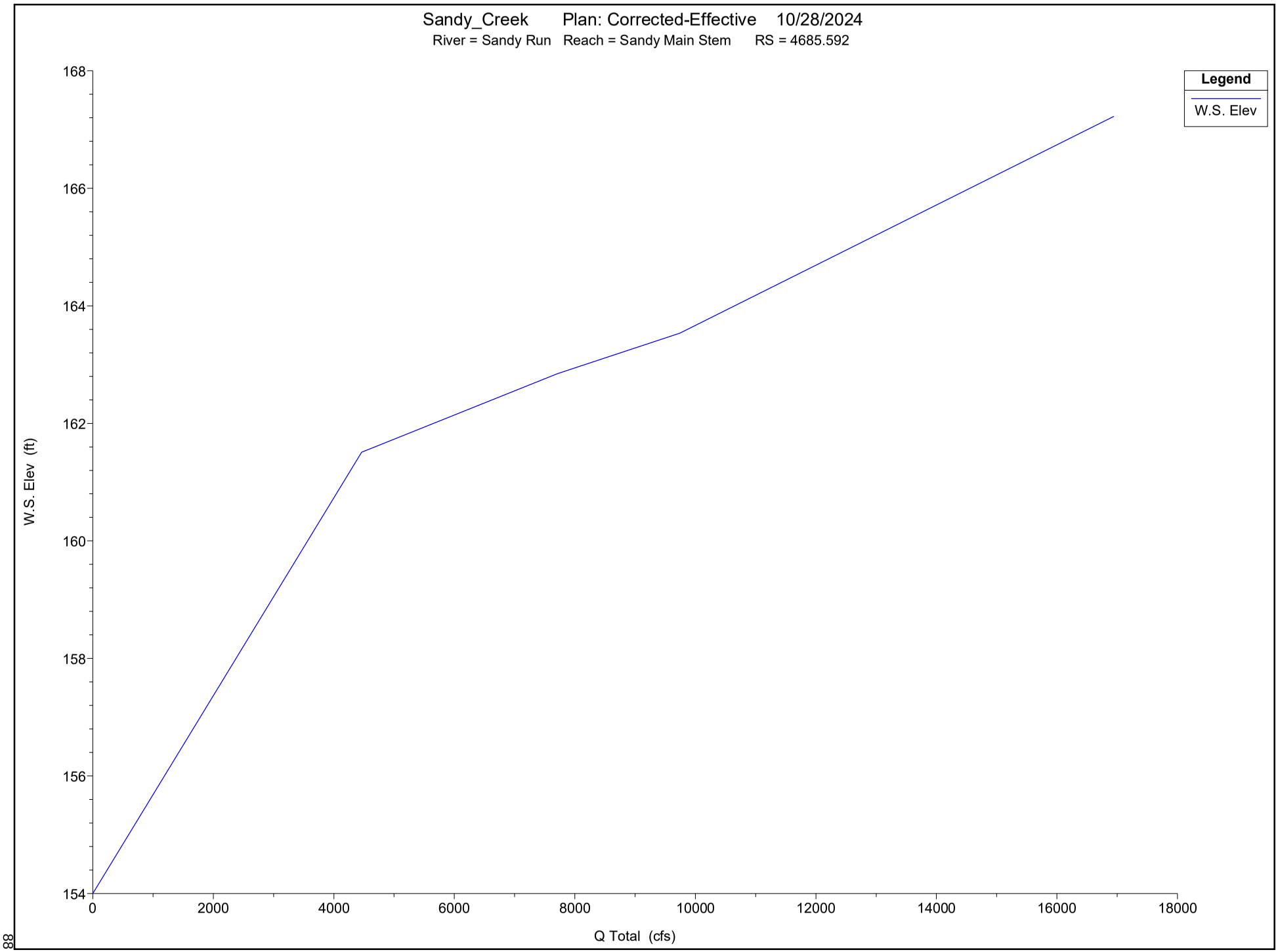

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4865.578 Flood Study at Prop. BLDG Open Parking Lot
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

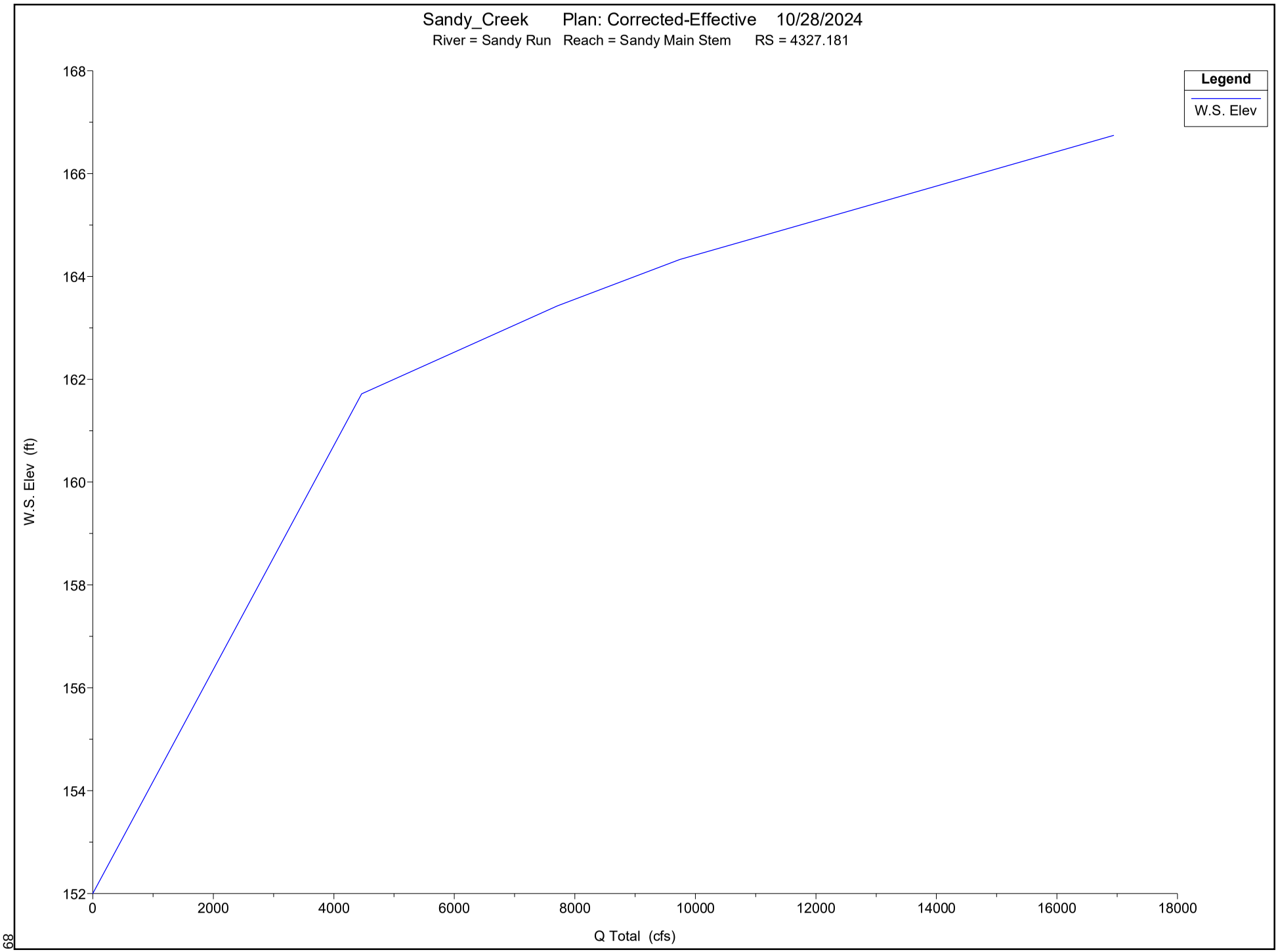

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4790.088 Flood Study at Prop. BLDG Car Wash
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

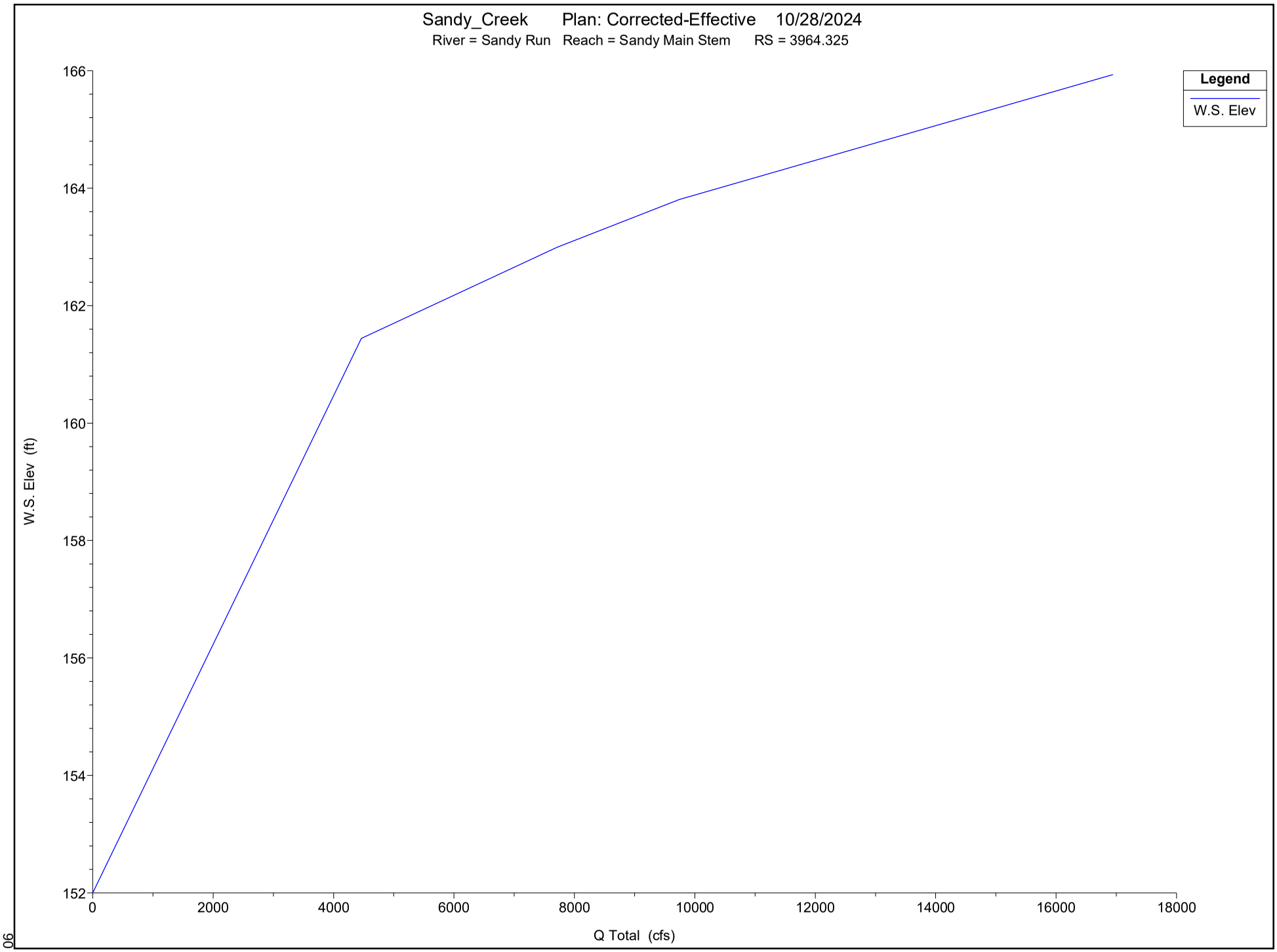

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4777.088
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

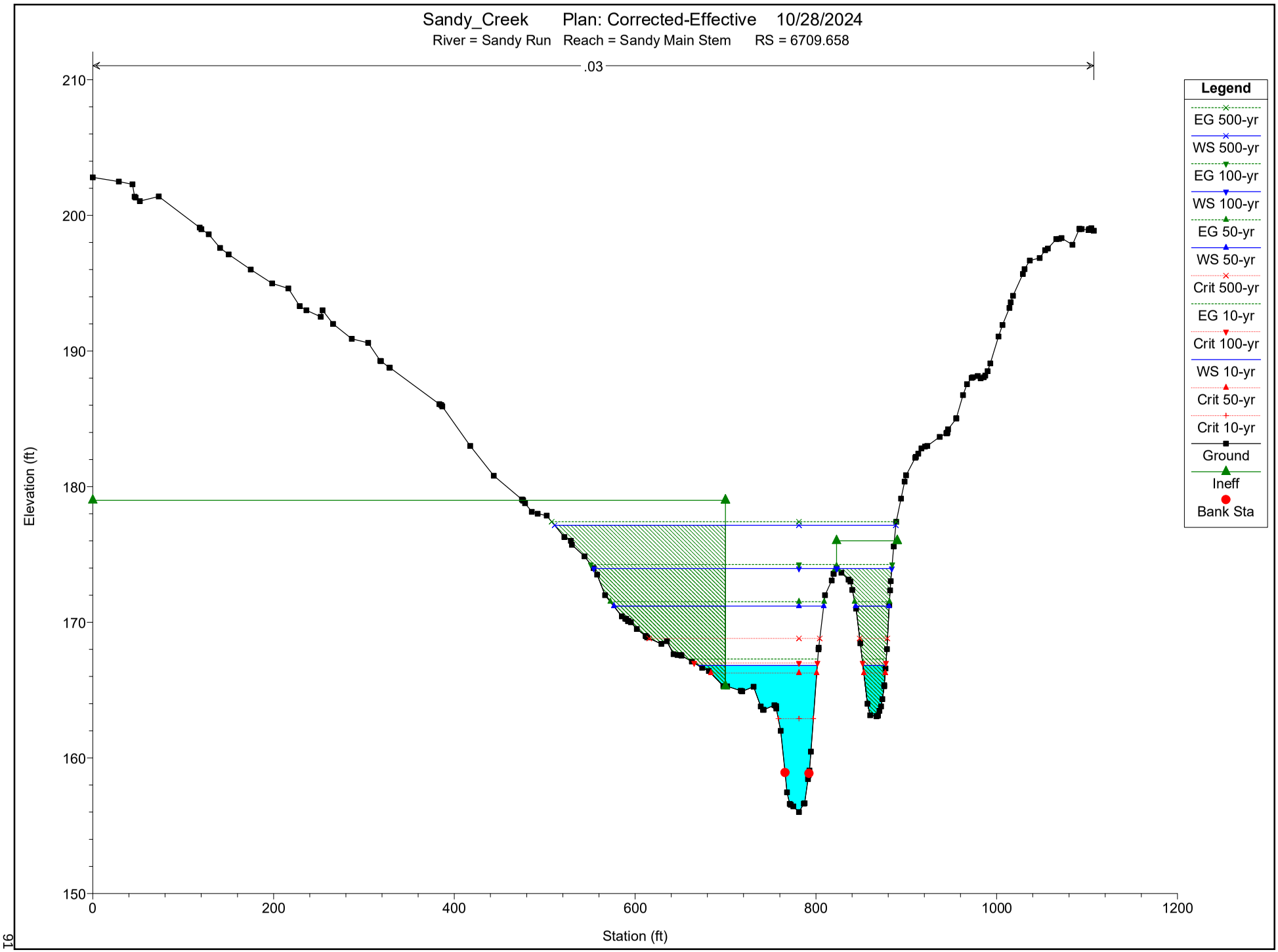

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4740 BR Railraod over Sandy Run
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

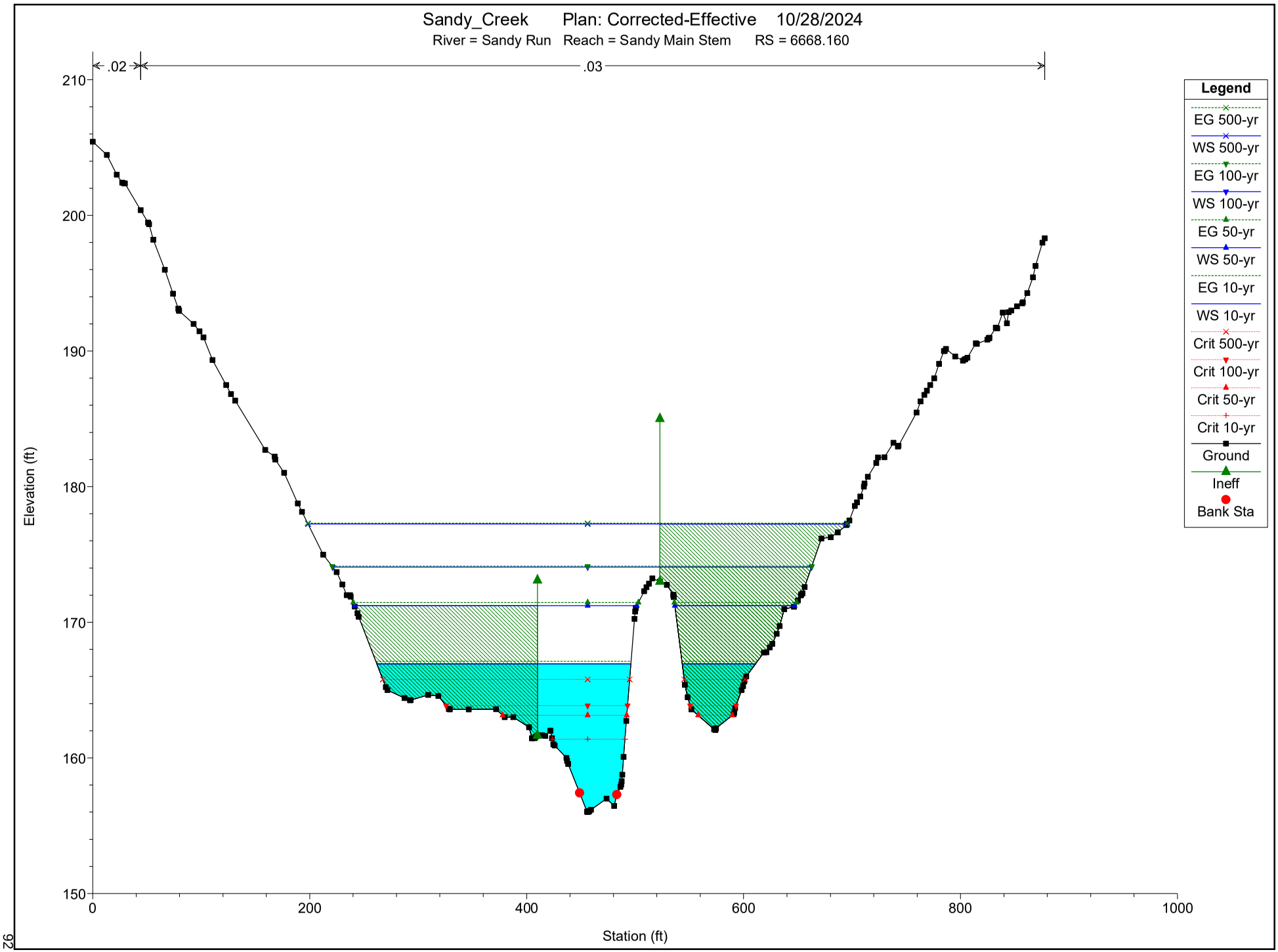

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4740 BR Railraod over Sandy Run
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

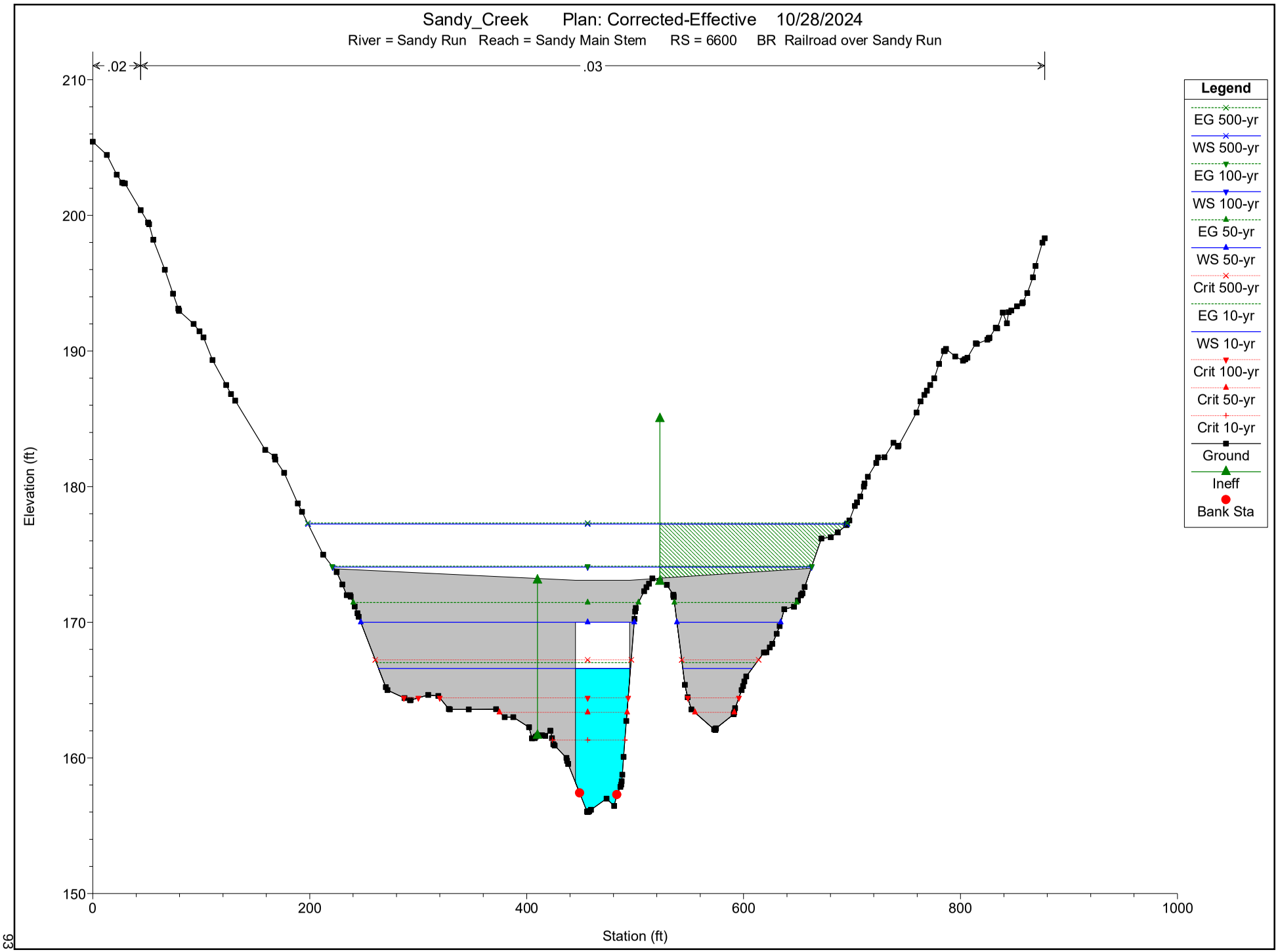

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4685.592
Legend
W.S. Elev
W.S. Elev (ft)
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

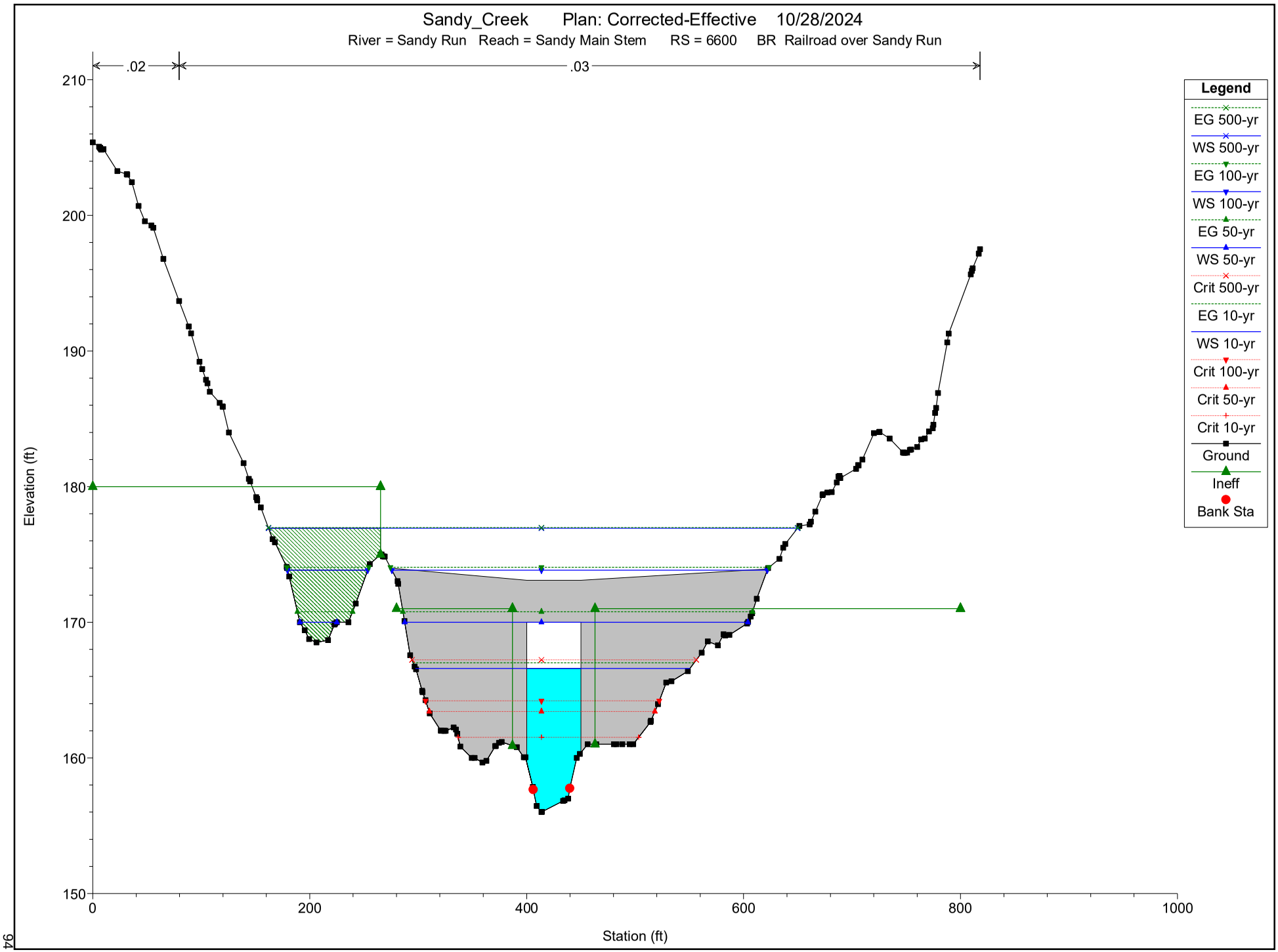

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4327.181
Legend
W.S. Elev
W.S. Elev (ft)
168
166
164
162
160
158
156
154
152
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

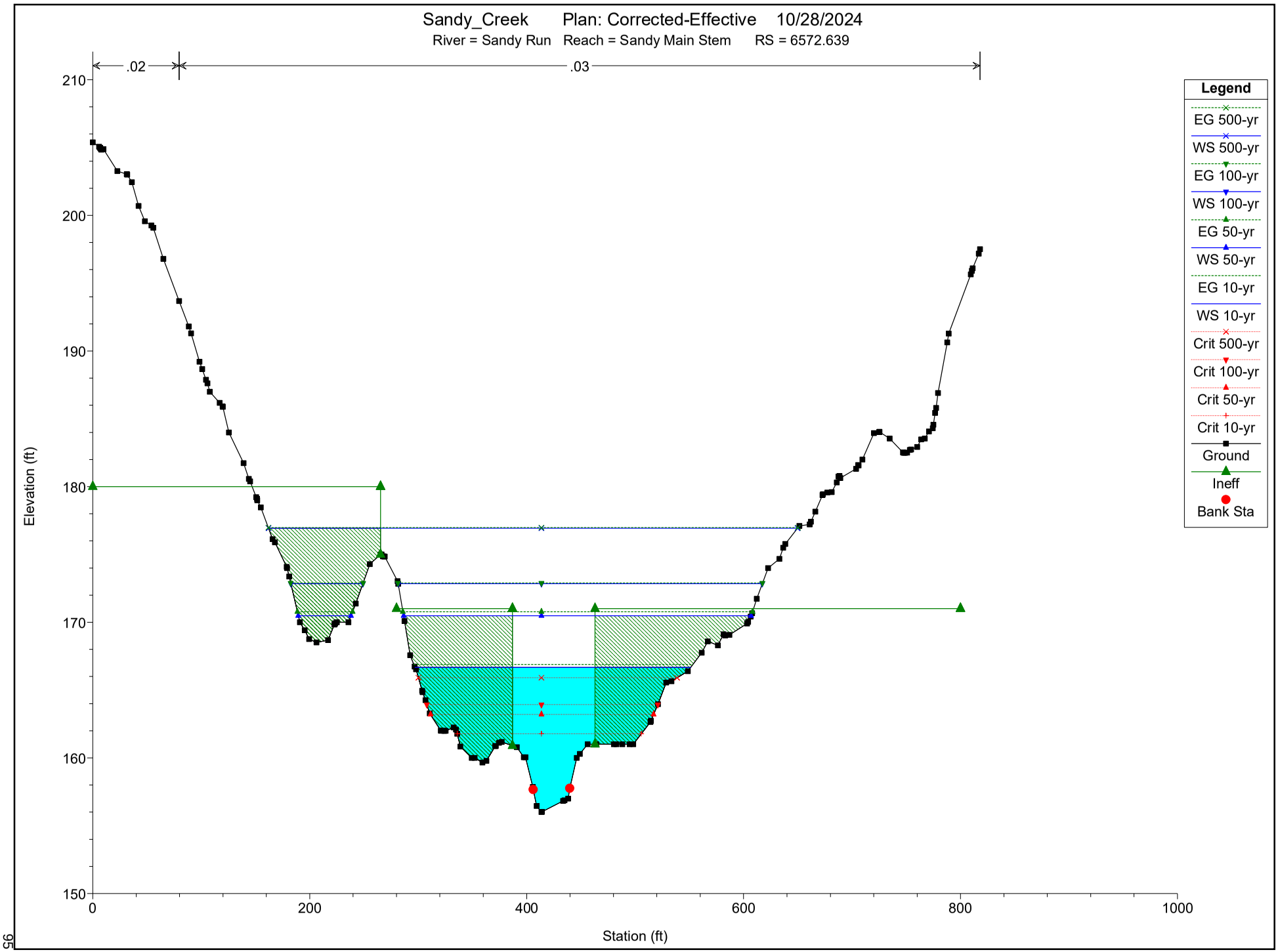

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 3964.325
Legend
W.S. Elev
W.S. Elev (ft)
166
164
162
160
158
156
154
152
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

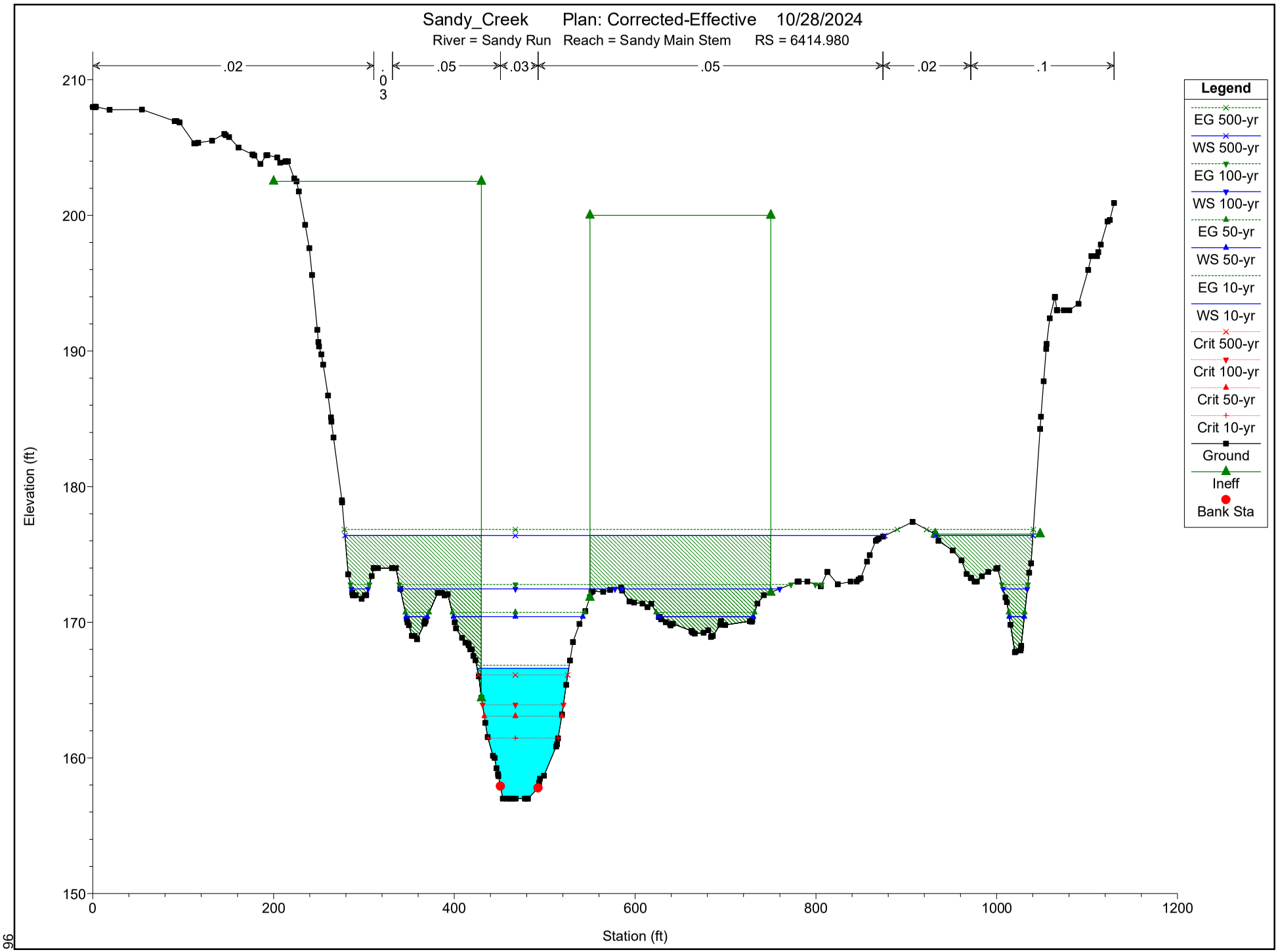

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6709.658
.03
Elevation (ft)
Station (ft)
210
200
190
180
170
160
150
0
200
400
600
800
1000
1200
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
EG 10-yr
Crit 100-yr
WS 10-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta

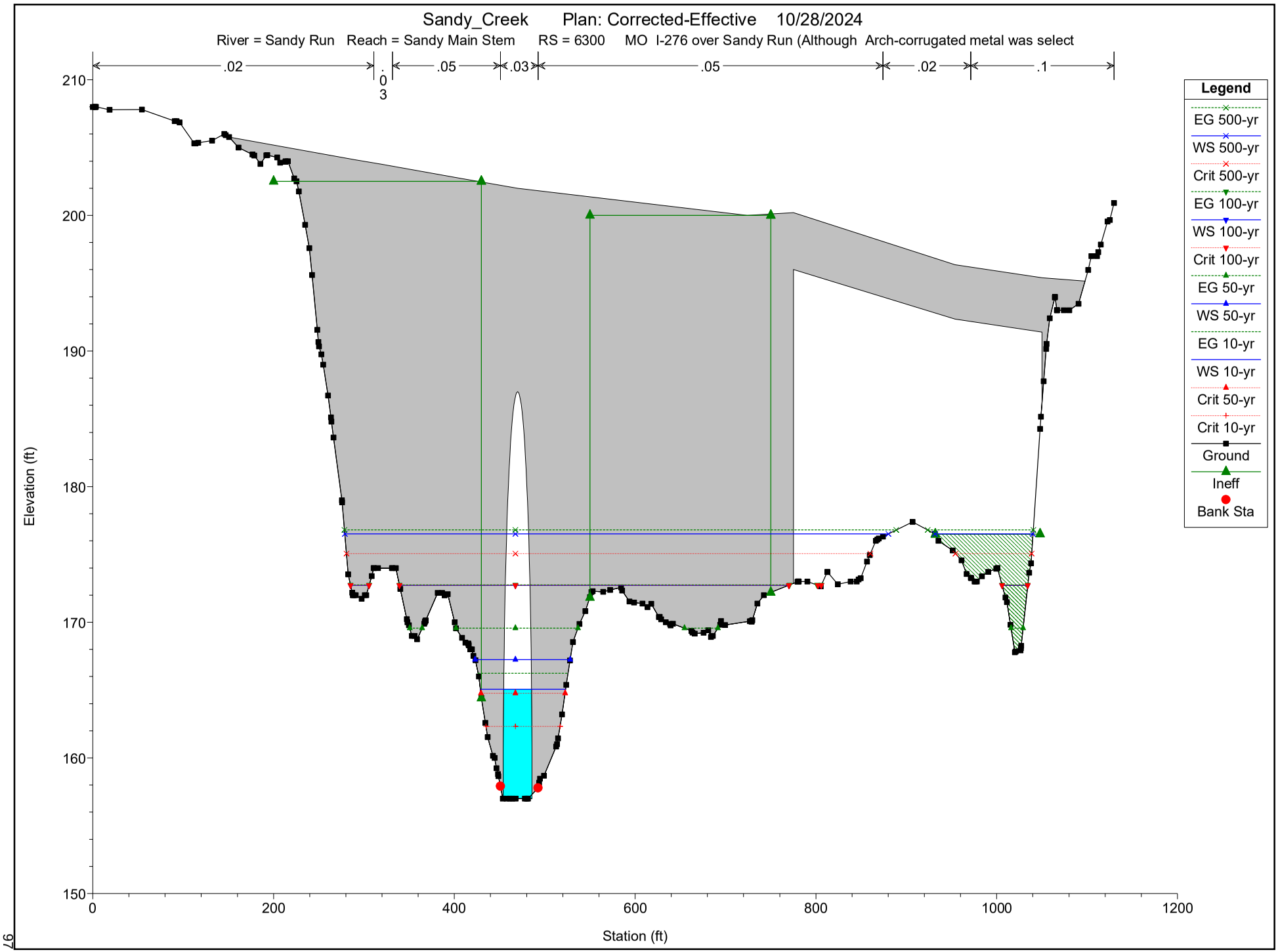

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6668.160
.02
.03
Elevation (ft)
Station (ft)
210
200
190
180
170
160
150
0
200
400
600
800
1000
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Crit 500-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta

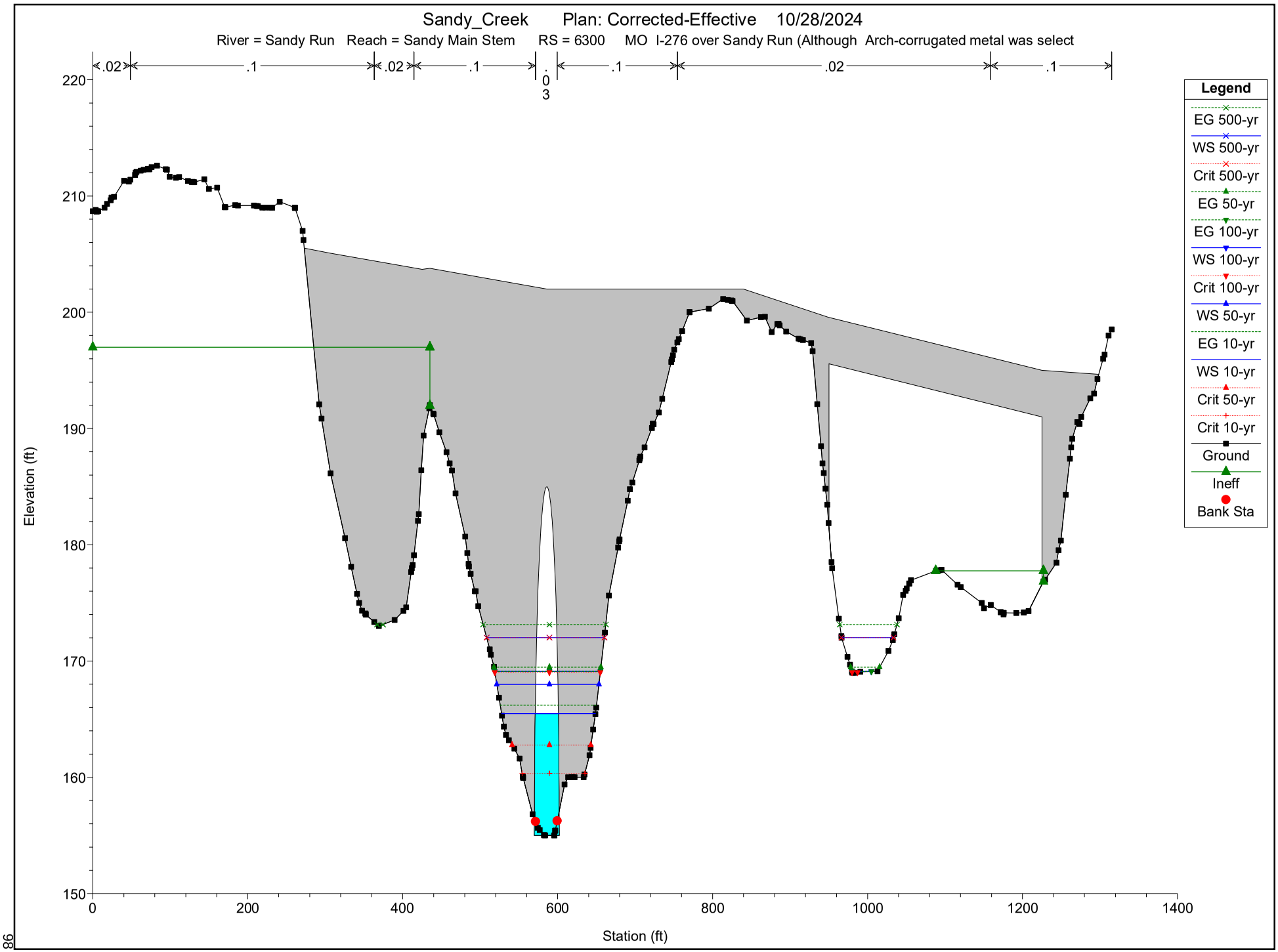

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6600 BR Railroad over Sandy Run
.02
.03
Elevation (ft)
Station (ft)
210
200
190
180
170
160
150
0
200
400
600
800
1000
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
EG 10-yr
WS 10-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta

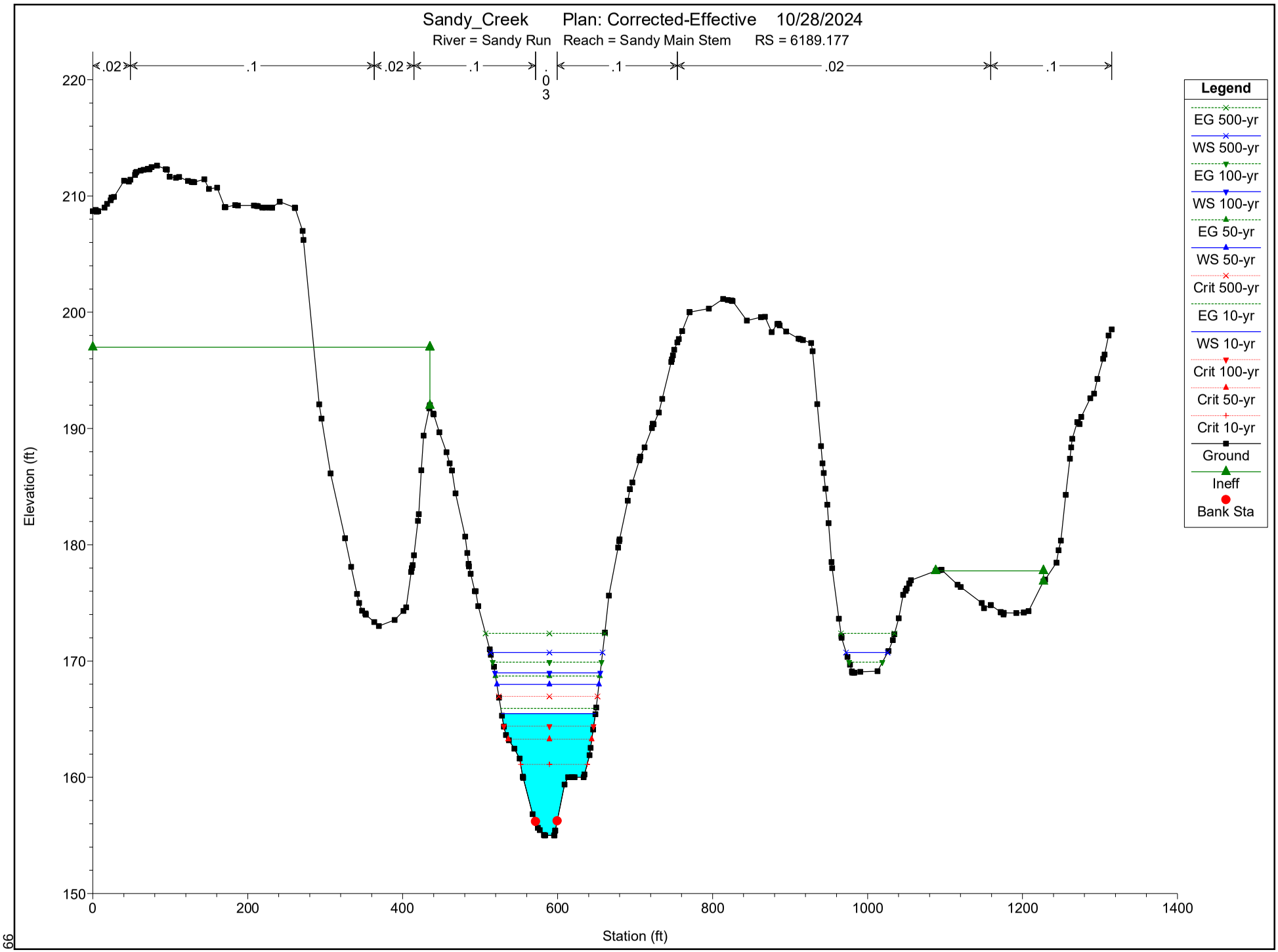

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6600 BR Railroad over Sandy Run
.02
.03
Elevation (ft)
Station (ft)
210
200
190
180
170
160
150
0
200
400
600
800
1000
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
EG 10-yr
WS 10-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta

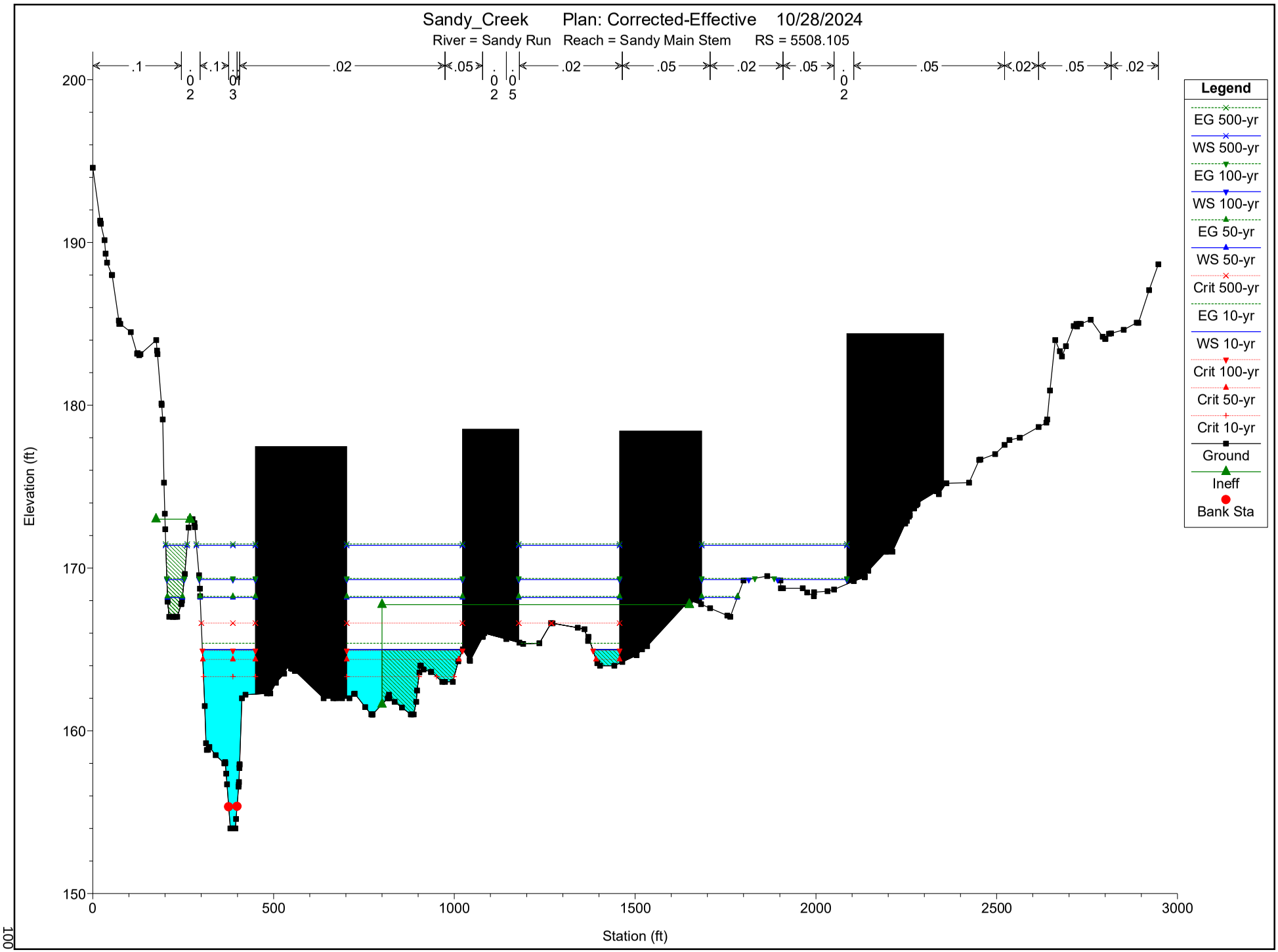

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6572.639
.02
.03
Elevation (ft)
Station (ft)
210
200
190
180
170
160
150
0
200
400
600
800
1000
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Crit 500-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta

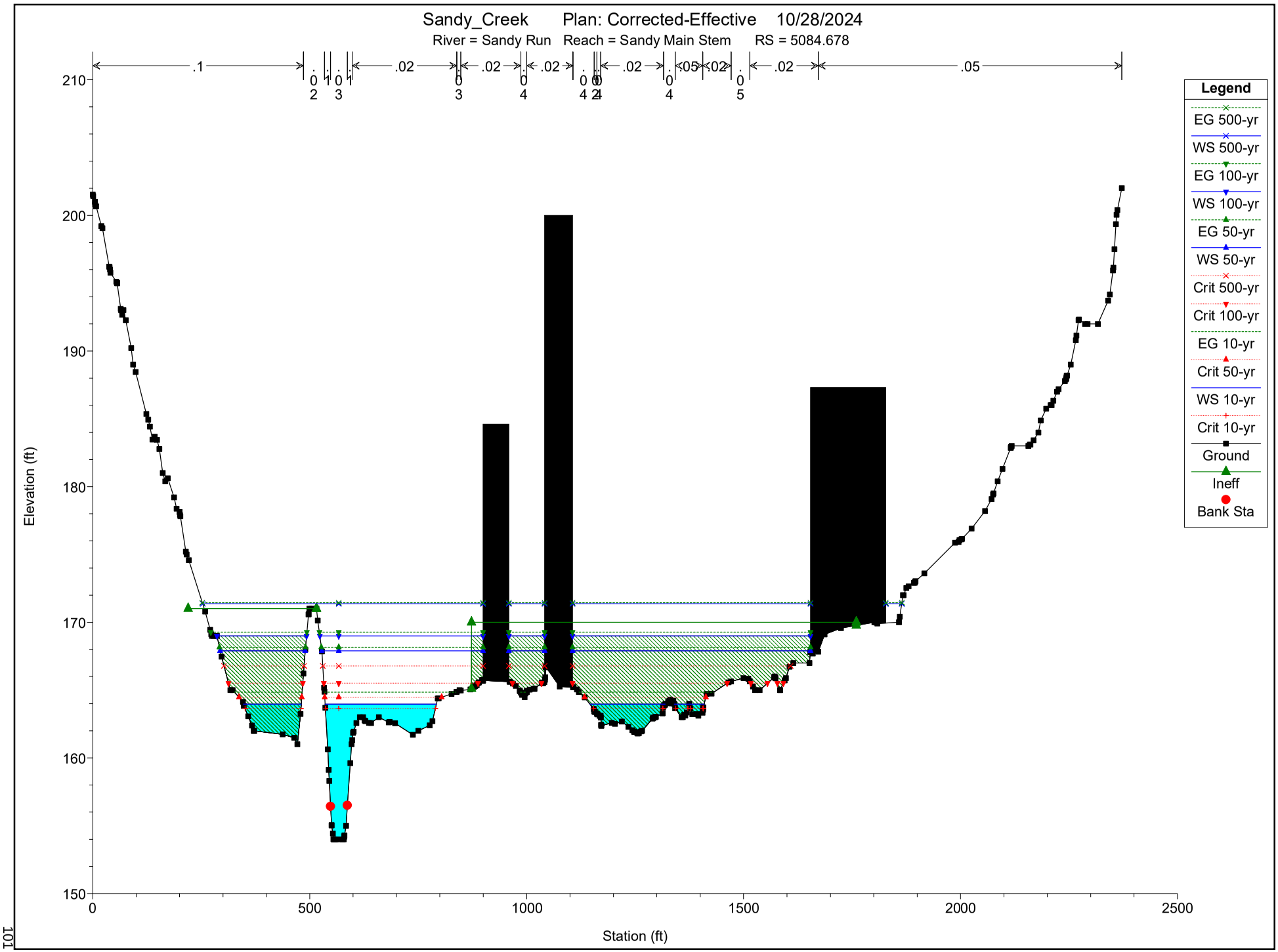

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6414.980
.02
.03
.05
.03
.05
.02
.1
Elevation (ft)
Station (ft)
210
200
190
180
170
160
150
0
200
400
600
800
1000
1200
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Crit 500-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta

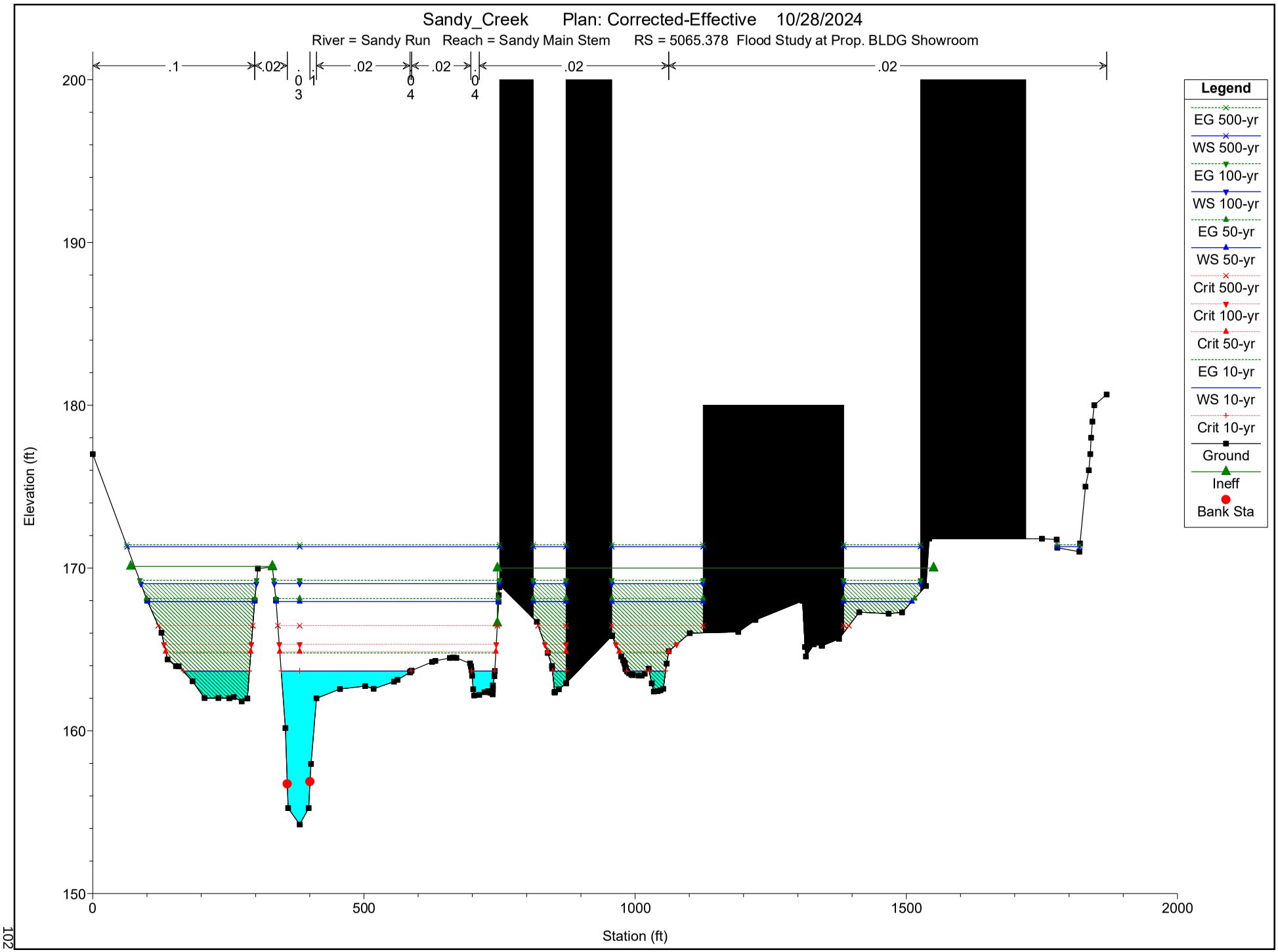

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6300 MO I-276 over Sandy Run (Although Arch-corrugated metal was select
.02
.03
.05
.03
.05
.02
.1
Legend
EG 500-yr
WS 500-yr
Crit 500-yr
EG 100-yr
WS 100-yr
Crit 100-yr
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
210
200
190
180
170
160
150
0
200
400
600
800
1000
1200
Station (ft)

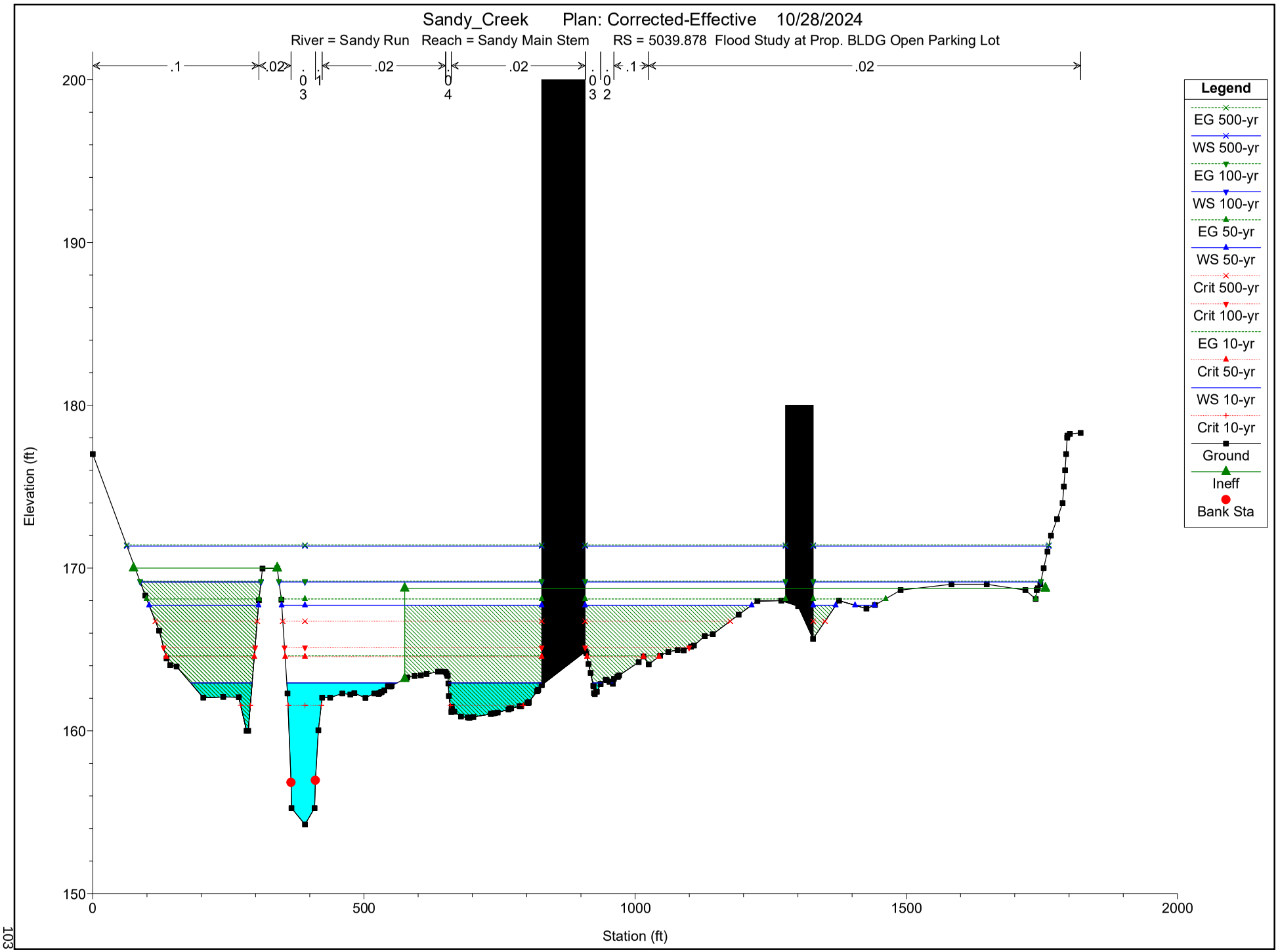

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6300 MO I-276 over Sandy Run (Although Arch-corrugated metal was select
.02
.1
.02
.1
.03
.1
.02
.1
Legend
EG 500-yr
WS 500-yr
Crit 500-yr
EG 50-yr
EG 100-yr
WS 100-yr
Crit 100-yr
WS 50-yr
EG 10-yr
WS 10-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
220
210
200
190
180
170
160
150
0
200
400
600
800
1000
1200
1400
Station (ft)

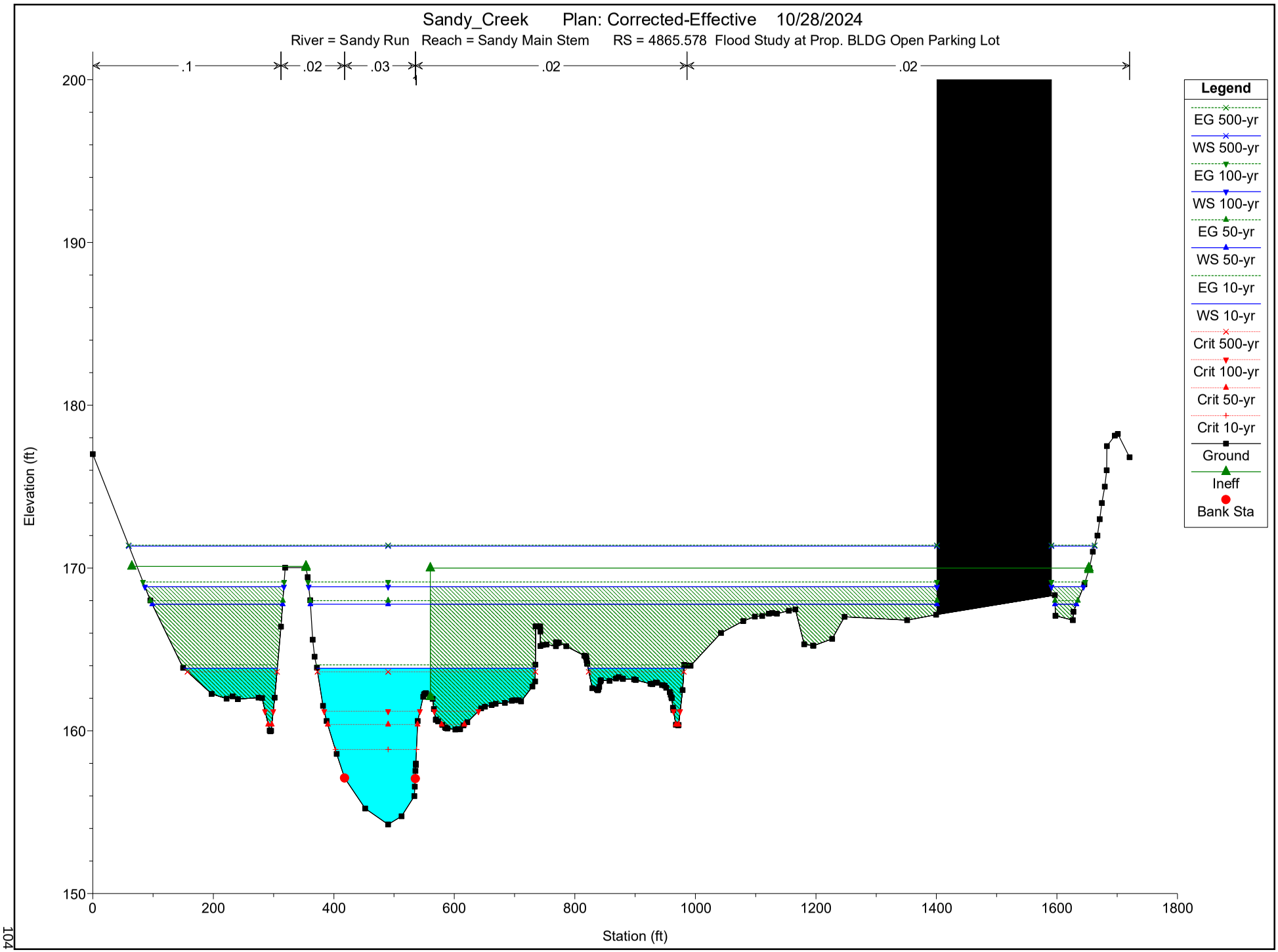

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6189.177
.02
.1
.02
.1
.03
.1
.02
.1
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
EG 10-yr
WS 10-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
220
210
200
190
180
170
160
150
0
200
400
600
800
1000
1200
1400
Station (ft)

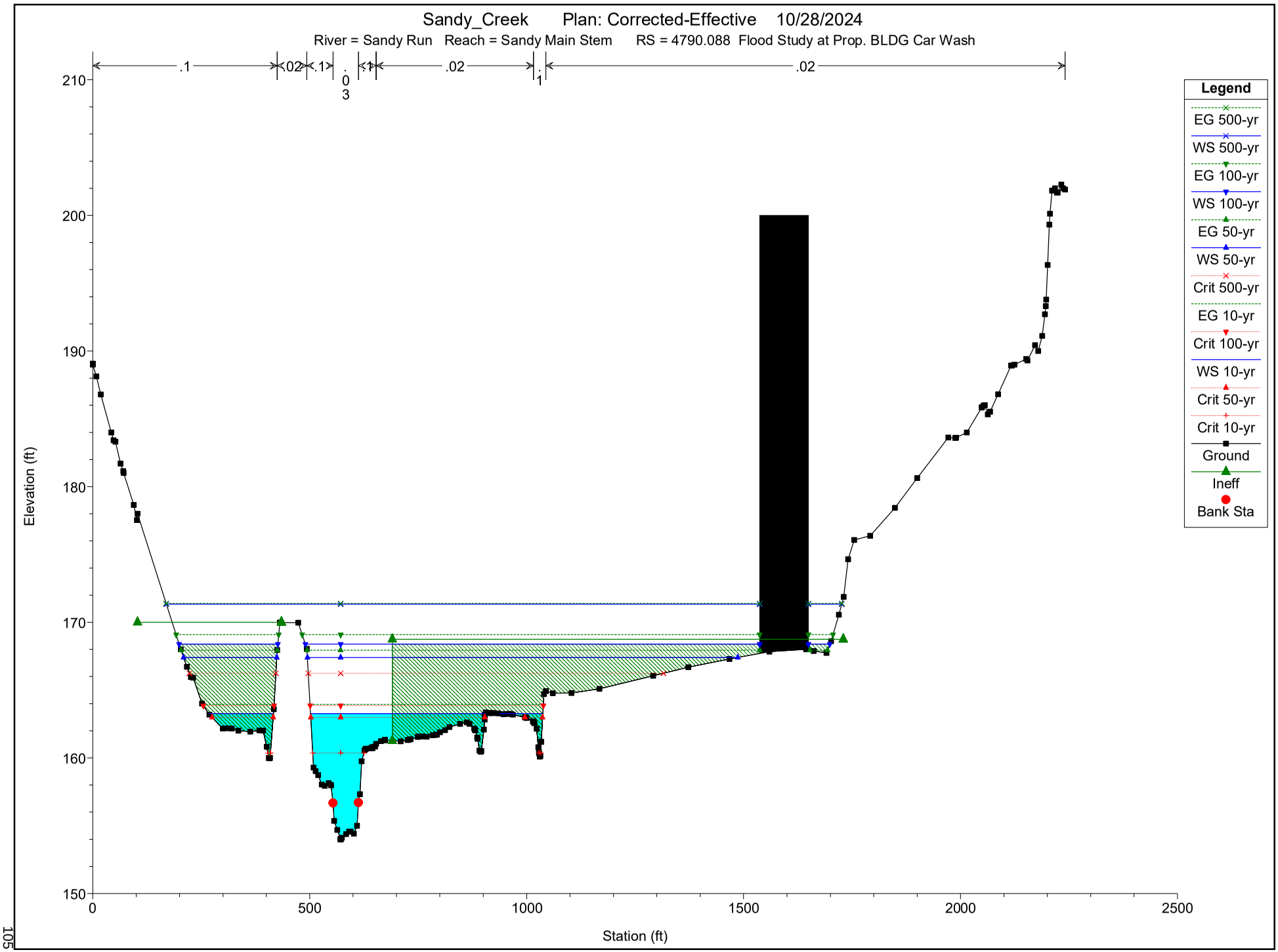

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 5508.105
.1 .1 .02 .05 .02 .05 .02 .05 .02 .05 .02 .05 .02
0 2 0 3 0 2 0 5 0 2
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
EG 10-yr
WS 10-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
200
190
180
170
160
150
0
500
1000
1500
2000
2500
3000
Station (ft)

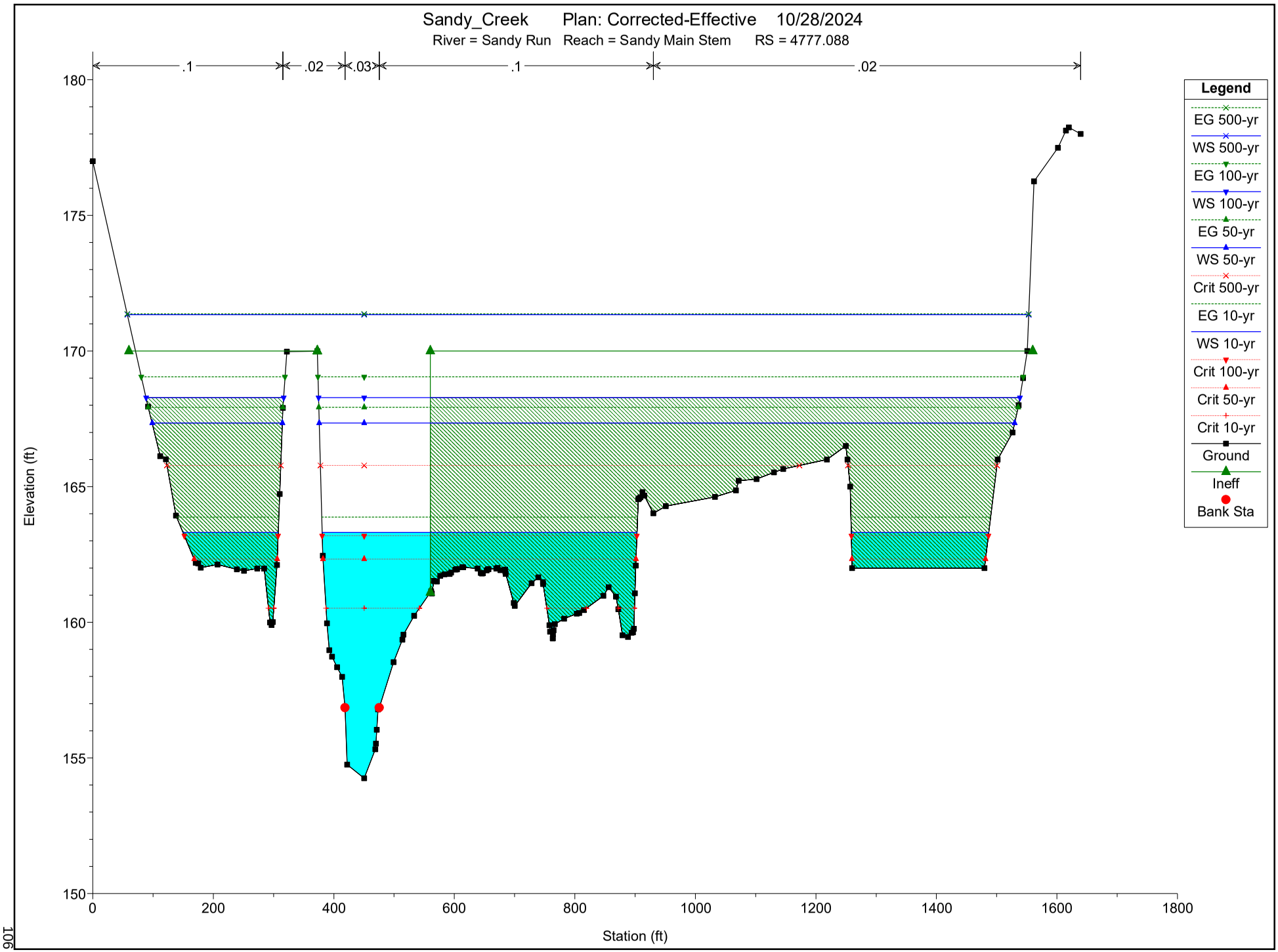

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 5084.678
.1
.02
.02
.02
.02
.05
.02
.02
.05
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
Crit 100-yr
EG 10-yr
Crit 50-yr
WS 10-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
210
200
190
180
170
160
150
0
500
1000
1500
2000
2500
Station (ft)

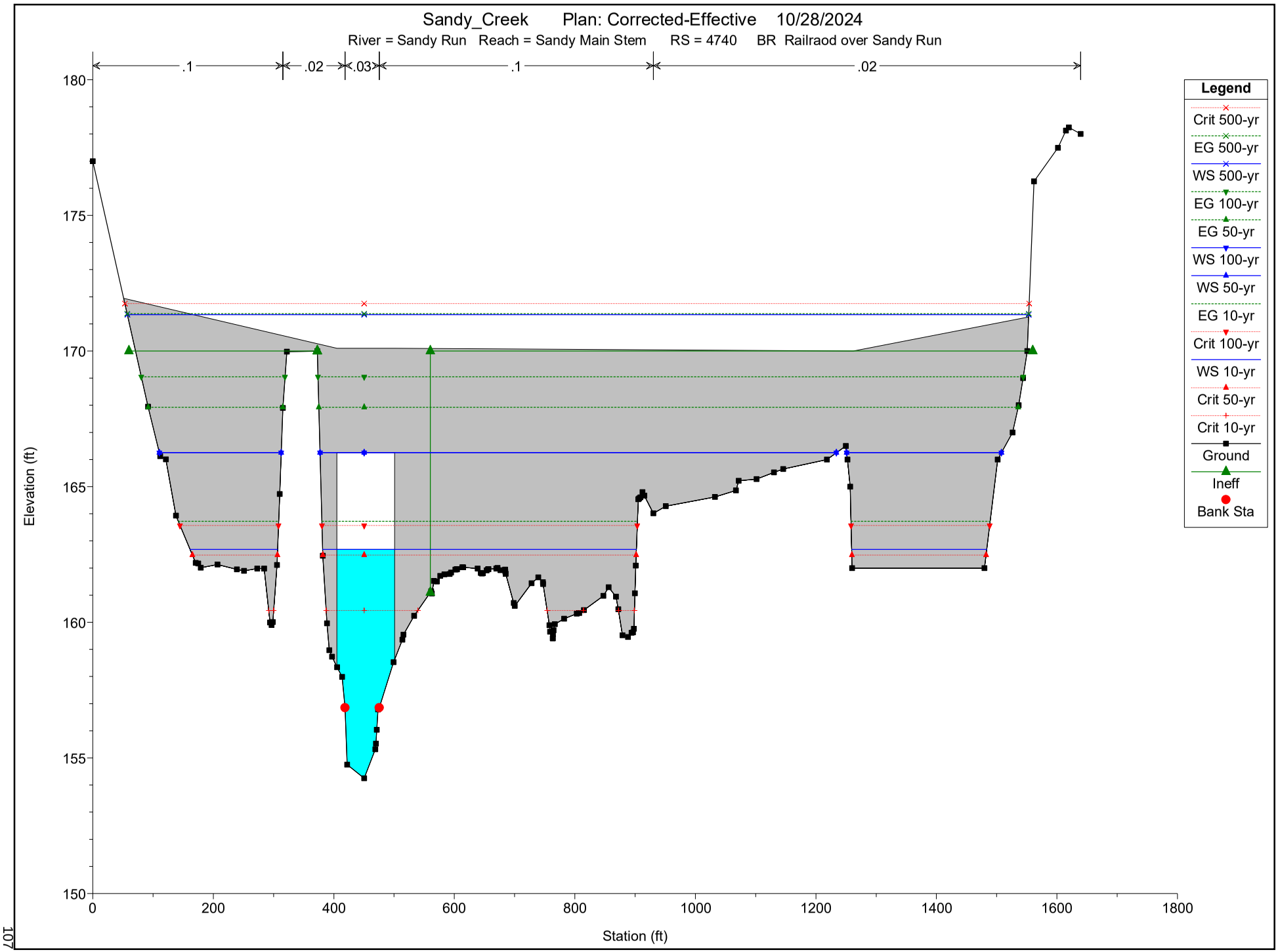

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 5065.378 Flood Study at Prop. BLDG Showroom
.1
.02
.02
.02
.02
.02
Elevation (ft)
200
190
180
170
160
150
0
500
1000
1500
2000
Station (ft)
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
Crit 100-yr
Crit 50-yr
EG 10-yr
WS 10-yr
Crit 10-yr
Ground
Ineff
Bank Sta

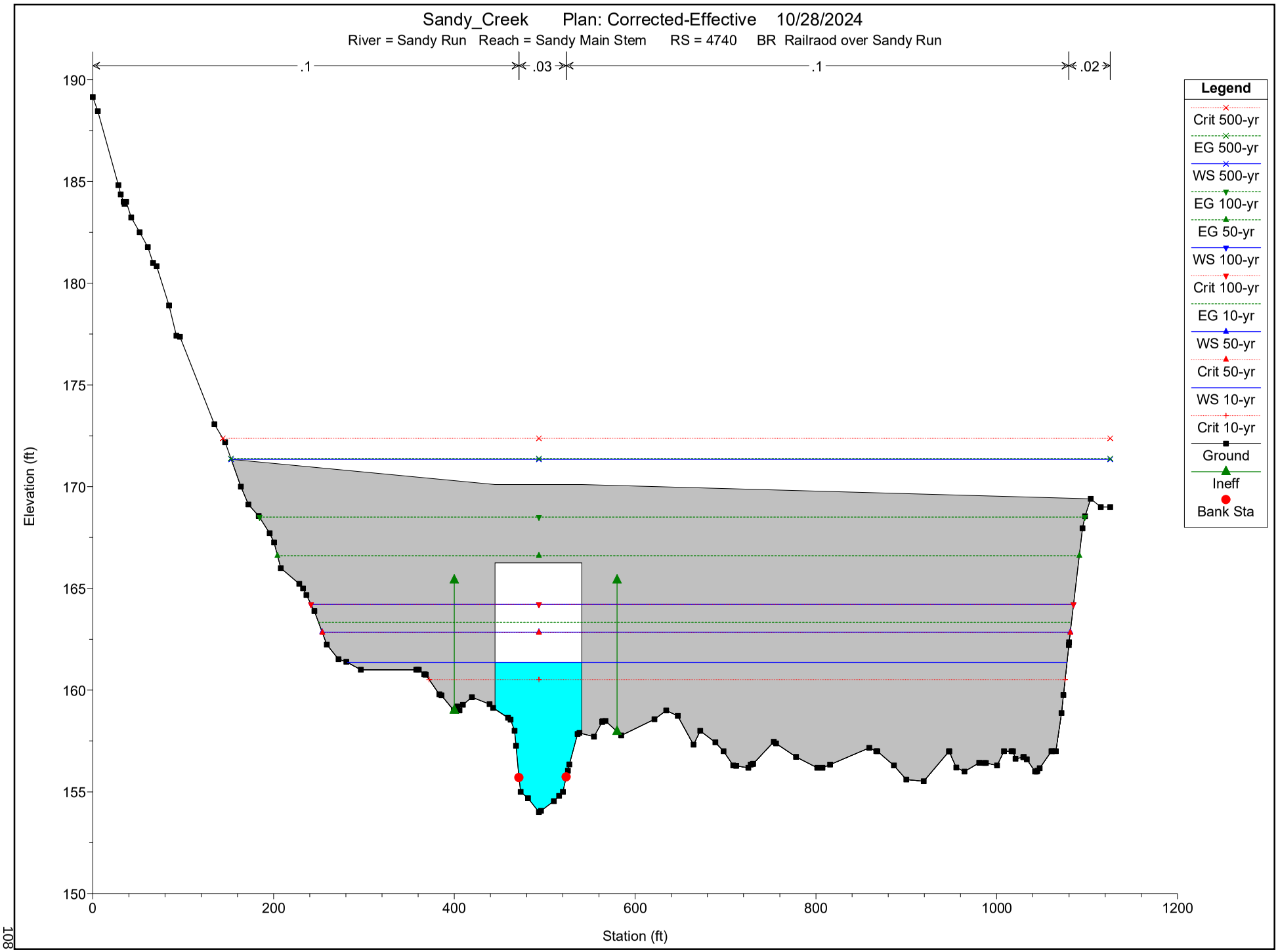

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 5039.878 Flood Study at Prop. BLDG Open Parking Lot
.1
.02
.02
.02
.1
.02
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
Crit 100-yr
EG 10-yr
Crit 50-yr
WS 10-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
200
190
180
170
160
150
0
500
1000
1500
2000
Station (ft)

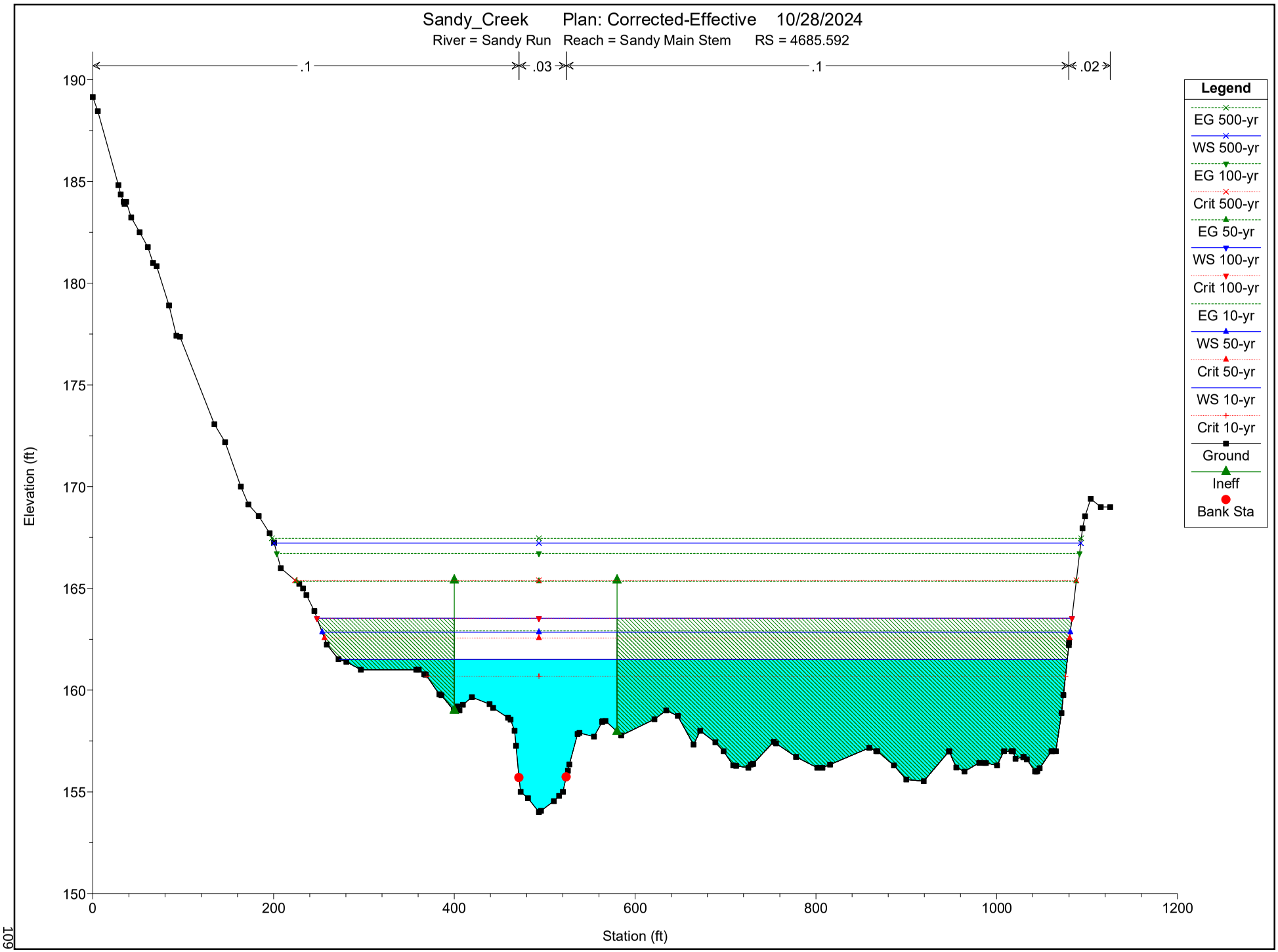

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4865.578 Flood Study at Prop. BLDG Open Parking Lot
.1
.02
.03
.02
.02
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Crit 500-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
200
190
180
170
160
150
0
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)

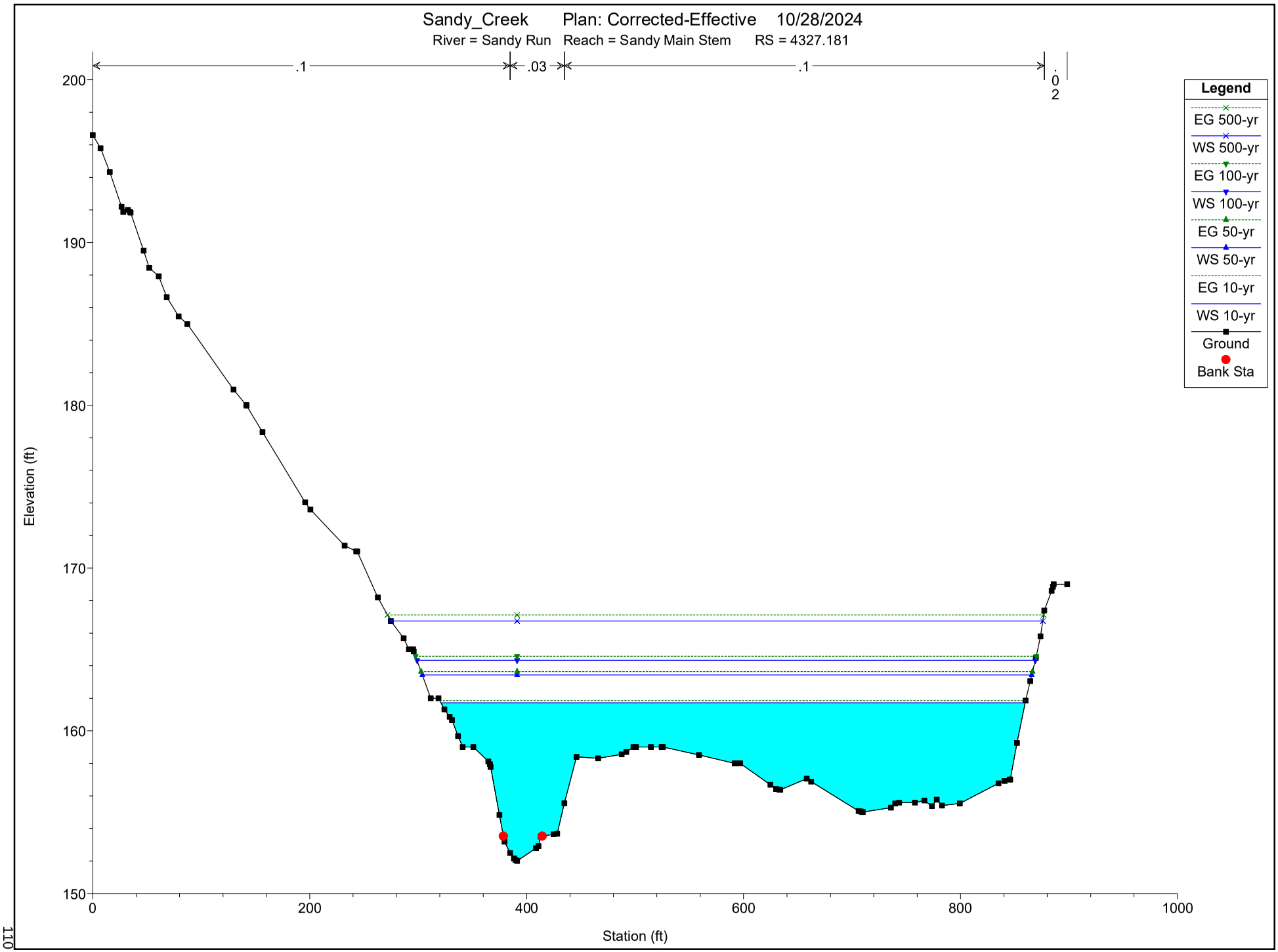

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4790.088 Flood Study at Prop. BLDG Car Wash
.1
.02
.1
.03
.1
.02
.1
.02
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
EG 10-yr
Crit 100-yr
WS 10-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
210
200
190
180
170
160
150
0
500
1000
1500
2000
2500
Station (ft)

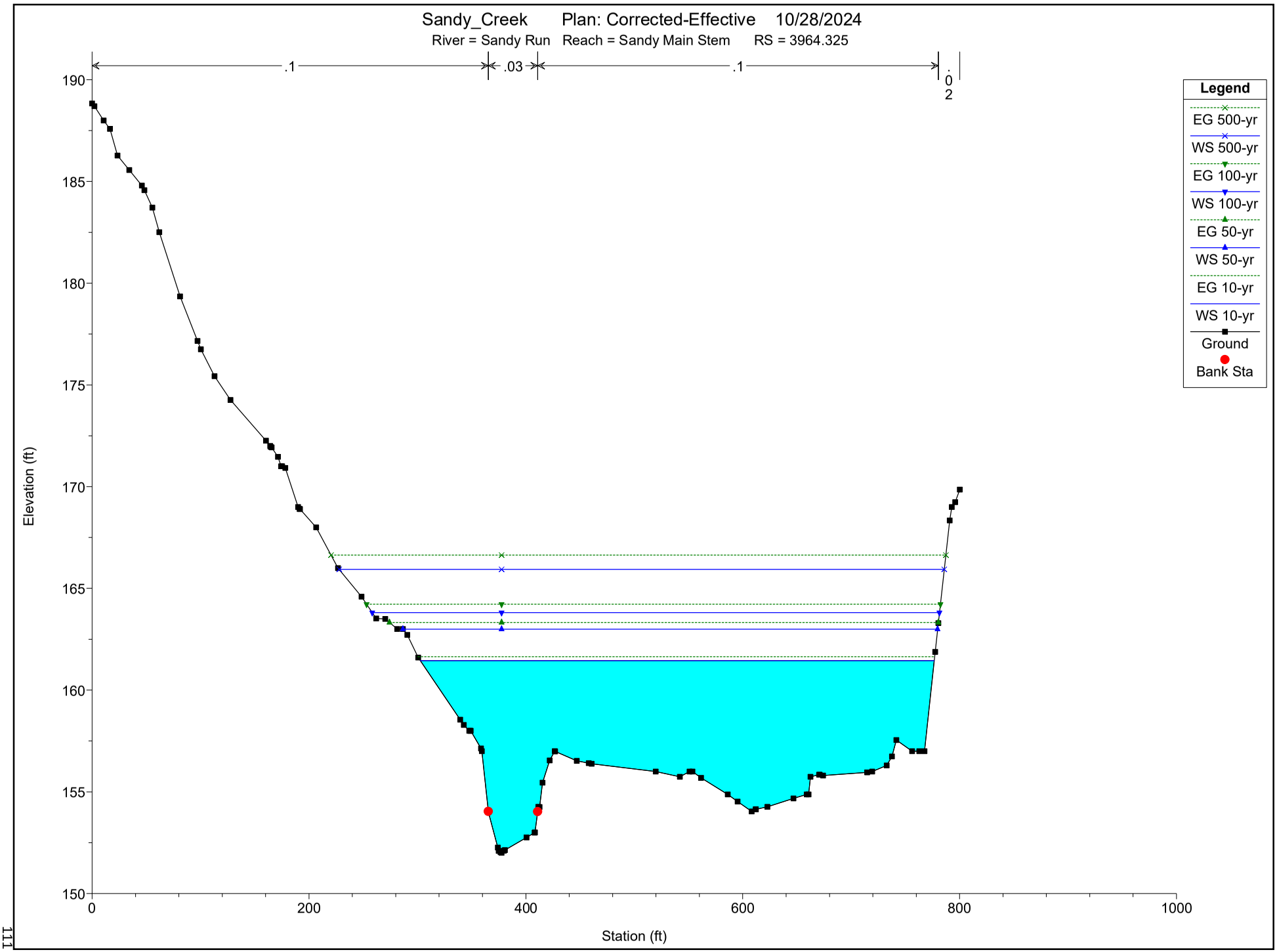

Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4777.088
.1
.02
.03
.1
.02
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
EG 10-yr
WS 10-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
180
175
170
165
160
155
150
0
200
400
600
800
1000
1200
1400
1600
1800


Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4740 BR Railraod over Sandy Run
.1
.02
.03
.1
.02
Legend
Crit 500-yr
EG 500-yr
WS 500-yr
EG 100-yr
EG 50-yr
WS 100-yr
WS 50-yr
EG 10-yr
Crit 100-yr
WS 10-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
180
175
170
165
160
155
150
0
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)


Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4740 BR Railraod over Sandy Run
.1
.03
.1
.02
Elevation (ft)
190
185
180
175
170
165
160
155
150
0
200
400
600
800
1000
1200
Station (ft)
Legend
Crit 500-yr
EG 500-yr
WS 500-yr
EG 100-yr
EG 50-yr
WS 100-yr
Crit 100-yr
EG 10-yr
WS 50-yr
Crit 50-yr
WS 10-yr
Crit 10-yr
Ground
Ineff
Bank Sta


Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4685.592
.1
.03
.1
.02
Legend
EG 500-yr
WS 500-yr
EG 100-yr
Crit 500-yr
EG 50-yr
WS 100-yr
Crit 100-yr
EG 10-yr
WS 50-yr
Crit 50-yr
WS 10-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
190
185
180
175
170
165
160
155
150
0
200
400
600
800
1000
1200
Station (ft)


Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4327.181
.1
.03
.1
.02
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Elevation (ft)
200
190
180
170
160
150
0
200
400
600
800
1000
Station (ft)


Sandy_Creek Plan: Corrected-Effective 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 3964.325
.1
.03
.1
.02
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Elevation (ft)
190
185
180
175
170
165
160
155
150
0
200
400
600
800
1000
Station (ft)

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 6709.658 Profile: 100-yr

E.G. Elev (ft)	174.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.	0.030	0.030	0.030
W.S. Elev (ft)	173.97	Reach Len. (ft)	95.93	41.50	20.00
Crit W.S. (ft)	167.00	Flow Area (sq ft)	645.32	453.76	153.17
E.G. Slope (ft/ft)	0.000254	Area (sq ft)	1406.15	453.76	483.83
Q Total (cfs)	4945.00	Flow (cfs)	2302.22	2318.36	324.42
Top Width (ft)	328.98	Top Width (ft)	211.63	26.49	90.86
Vel Total (ft/s)	3.95	Avg. Vel. (ft/s)	3.57	5.11	2.12
Max Chl Dpth (ft)	17.97	Hydr. Depth (ft)	9.80	17.13	5.06
Conv. Total (cfs)	310067.6	Conv. (cfs)	144356.4	145369.0	20342.3
Length Wtd. (ft)	71.37	Wetted Per. (ft)	67.24	27.59	34.88
Min Ch El (ft)	156.00	Shear (lb/sq ft)	0.15	0.26	0.07
Alpha	1.18	Stream Power (lb/ft s)	1107.41	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	143.09	63.48	340.17
C & E Loss (ft)	0.12	Cum SA (acres)	33.63	5.73	70.78

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 6668.160 Profile: 100-yr

E.G. Elev (ft)	174.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.030	0.030	0.030
W.S. Elev (ft)	174.08	Reach Len. (ft)	22.00	22.00	22.00
Crit W.S. (ft)	163.85	Flow Area (sq ft)	2180.96	600.45	227.69
E.G. Slope (ft/ft)	0.000048	Area (sq ft)	2180.96	600.45	1179.32
Q Total (cfs)	4945.00	Flow (cfs)	3344.40	1372.28	228.32
Top Width (ft)	441.48	Top Width (ft)	227.63	34.37	179.48
Vel Total (ft/s)	1.64	Avg. Vel. (ft/s)	1.53	2.29	1.00
Max Chl Dpth (ft)	18.07	Hydr. Depth (ft)	9.58	17.47	5.74
Conv. Total (cfs)	717087.8	Conv. (cfs)	484981.0	198997.5	33109.3
Length Wtd. (ft)	22.00	Wetted Per. (ft)	229.27	34.69	45.27
Min Ch El (ft)	156.01	Shear (lb/sq ft)	0.03	0.05	0.01
Alpha	1.14	Stream Power (lb/ft s)	877.68	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	139.14	62.98	339.79
C & E Loss (ft)		Cum SA (acres)	33.14	5.70	70.72

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 6600 BR U Profile: 100-yr

E.G. Elev (ft)	174.13	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.75	Wt. n-Val.			
W.S. Elev (ft)	174.08	Reach Len. (ft)	35.00	35.00	35.00
Crit W.S. (ft)	164.43	Flow Area (sq ft)	182.74	495.55	152.05
E.G. Slope (ft/ft)		Area (sq ft)	171.82	493.91	214.55
Q Total (cfs)	4945.00	Flow (cfs)	449.37	3821.98	674.04
Top Width (ft)	441.48	Top Width (ft)	227.63	34.37	179.48
Vel Total (ft/s)	5.96	Avg. Vel. (ft/s)	2.46	7.71	4.43
Max Chl Dpth (ft)	18.07	Hydr. Depth (ft)	0.80	14.42	3.83
Conv. Total (cfs)		Conv. (cfs)			
Length Wtd. (ft)	35.00	Wetted Per. (ft)	246.95	103.43	70.84
Min Ch El (ft)	156.01	Shear (lb/sq ft)			
Alpha	1.32	Stream Power (lb/ft s)	877.68	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	138.55	62.70	339.44
C & E Loss (ft)		Cum SA (acres)	33.03	5.68	70.63

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 6600 BR D Profile: 100-yr

E.G. Elev (ft)	174.06	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.80	Wt. n-Val.			
W.S. Elev (ft)	173.84	Reach Len. (ft)	38.52	38.52	38.52
Crit W.S. (ft)	164.21	Flow Area (sq ft)	148.12	485.10	224.88
E.G. Slope (ft/ft)		Area (sq ft)	374.92	475.66	174.24
Q Total (cfs)	4945.00	Flow (cfs)	591.00	3713.03	641.38
Top Width (ft)	382.01	Top Width (ft)	185.12	33.53	163.36
Vel Total (ft/s)	5.76	Avg. Vel. (ft/s)	3.99	7.65	2.85

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 6600 BR D Profile: 100-yr (Continued)

Max Chl Dpth (ft)	17.84	Hydr. Depth (ft)	1.33	14.47	1.38
Conv. Total (cfs)		Conv. (cfs)			
Length Wtd. (ft)	38.52	Wetted Per. (ft)	134.04	101.05	193.97
Min Ch El (ft)	156.00	Shear (lb/sq ft)			
Alpha	1.22	Stream Power (lb/ft s)	818.01	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	138.33	62.31	339.28
C & E Loss (ft)		Cum SA (acres)	32.86	5.65	70.49

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 6572.639 Profile: 100-yr

E.G. Elev (ft)	172.89	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.030	0.030	0.030
W.S. Elev (ft)	172.85	Reach Len. (ft)	97.36	157.66	211.49
Crit W.S. (ft)	163.93	Flow Area (sq ft)	1308.29	546.38	1413.95
E.G. Slope (ft/ft)	0.000043	Area (sq ft)	1501.15	546.38	1413.95
Q Total (cfs)	4945.00	Flow (cfs)	2002.99	1126.22	1815.79
Top Width (ft)	402.14	Top Width (ft)	191.10	33.53	177.51
Vel Total (ft/s)	1.51	Avg. Vel. (ft/s)	1.53	2.06	1.28
Max Chl Dpth (ft)	16.85	Hydr. Depth (ft)	10.50	16.30	7.97
Conv. Total (cfs)	756842.8	Conv. (cfs)	306562.1	172370.1	277910.6
Length Wtd. (ft)	156.48	Wetted Per. (ft)	127.14	33.99	178.87
Min Ch El (ft)	156.00	Shear (lb/sq ft)	0.03	0.04	0.02
Alpha	1.10	Stream Power (lb/ft s)	818.01	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	137.50	61.86	338.58
C & E Loss (ft)	0.09	Cum SA (acres)	32.70	5.62	70.34

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 6414.980 Profile: 100-yr

E.G. Elev (ft)	172.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.	0.050	0.030	0.050
W.S. Elev (ft)	172.46	Reach Len. (ft)	225.80	225.80	225.80
Crit W.S. (ft)	163.92	Flow Area (sq ft)	242.37	640.06	453.24
E.G. Slope (ft/ft)	0.000306	Area (sq ft)	489.51	640.06	880.00
Q Total (cfs)	4945.00	Flow (cfs)	623.48	3412.71	908.81
Top Width (ft)	457.81	Top Width (ft)	129.35	41.76	286.70
Vel Total (ft/s)	3.70	Avg. Vel. (ft/s)	2.57	5.33	2.01
Max Chl Dpth (ft)	15.46	Hydr. Depth (ft)	11.57	15.33	6.74
Conv. Total (cfs)	282641.5	Conv. (cfs)	35636.4	195060.3	51944.8
Length Wtd. (ft)	225.80	Wetted Per. (ft)	22.02	41.94	69.37
Min Ch El (ft)	157.00	Shear (lb/sq ft)	0.21	0.29	0.12
Alpha	1.55	Stream Power (lb/ft s)	1129.78	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	135.28	59.71	333.01
C & E Loss (ft)		Cum SA (acres)	32.34	5.49	69.21

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 6189.177 Profile: 100-yr

E.G. Elev (ft)	169.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.93	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	168.97	Reach Len. (ft)	633.10	668.48	716.54
Crit W.S. (ft)	164.39	Flow Area (sq ft)	364.90	384.03	440.78
E.G. Slope (ft/ft)	0.001048	Area (sq ft)	364.90	384.03	440.78
Q Total (cfs)	4945.00	Flow (cfs)	626.01	3500.33	818.66
Top Width (ft)	135.94	Top Width (ft)	52.31	28.04	55.59
Vel Total (ft/s)	4.16	Avg. Vel. (ft/s)	1.72	9.11	1.86
Max Chl Dpth (ft)	13.97	Hydr. Depth (ft)	6.98	13.70	7.93
Conv. Total (cfs)	152759.3	Conv. (cfs)	19338.5	108131.2	25289.6
Length Wtd. (ft)	695.39	Wetted Per. (ft)	54.17	28.33	58.09
Min Ch El (ft)	155.00	Shear (lb/sq ft)	0.44	0.89	0.50
Alpha	3.46	Stream Power (lb/ft s)	1315.13	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	135.28	59.71	333.01
C & E Loss (ft)	0.43	Cum SA (acres)	31.87	5.31	68.32

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 5508.105 Profile: 100-yr

E.G. Elev (ft)	169.36	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.100	0.030	0.022
W.S. Elev (ft)	169.29	Reach Len. (ft)	438.29	442.90	447.79
Crit W.S. (ft)	164.93	Flow Area (sq ft)	780.67	345.41	4010.33
E.G. Slope (ft/ft)	0.000094	Area (sq ft)	869.24	345.41	4010.33
Q Total (cfs)	9741.00	Flow (cfs)	505.15	997.52	8238.33
Top Width (ft)	1123.57	Top Width (ft)	129.04	22.99	971.54
Vel Total (ft/s)	1.90	Avg. Vel. (ft/s)	0.65	2.89	2.05
Max Chl Dpth (ft)	15.29	Hydr. Depth (ft)	9.62	15.02	4.13
Conv. Total (cfs)	1006021.0	Conv. (cfs)	52170.7	103020.9	850828.8
Length Wtd. (ft)	446.51	Wetted Per. (ft)	84.14	23.38	1003.61
Min Ch El (ft)	154.00	Shear (lb/sq ft)	0.05	0.09	0.02
Alpha	1.24	Stream Power (lb/ft s)	2947.19	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	126.31	54.12	296.40
C & E Loss (ft)	0.02	Cum SA (acres)	30.55	4.92	59.88

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 5084.678 Profile: 100-yr

E.G. Elev (ft)	169.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.28	Wt. n-Val.	0.083	0.030	0.022
W.S. Elev (ft)	168.99	Reach Len. (ft)	19.30	19.30	19.30
Crit W.S. (ft)	165.51	Flow Area (sq ft)	135.27	566.95	1715.30
E.G. Slope (ft/ft)	0.000294	Area (sq ft)	1290.35	566.95	4687.01
Q Total (cfs)	9741.00	Flow (cfs)	140.34	2831.18	6769.48
Top Width (ft)	1213.91	Top Width (ft)	231.38	38.79	943.74
Vel Total (ft/s)	4.03	Avg. Vel. (ft/s)	1.04	4.99	3.95
Max Chl Dpth (ft)	14.99	Hydr. Depth (ft)	5.46	14.62	6.00
Conv. Total (cfs)	568492.3	Conv. (cfs)	8190.5	165229.7	395072.1
Length Wtd. (ft)	19.30	Wetted Per. (ft)	27.95	39.72	287.40
Min Ch El (ft)	154.00	Shear (lb/sq ft)	0.09	0.26	0.11
Alpha	1.11	Stream Power (lb/ft s)	2371.66	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	115.44	49.48	251.70
C & E Loss (ft)	0.02	Cum SA (acres)	28.73	4.60	50.03

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 5065.378 Profile: 100-yr

E.G. Elev (ft)	169.24	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.20	Wt. n-Val.	0.020	0.030	0.022
W.S. Elev (ft)	169.04	Reach Len. (ft)	25.03	25.37	25.53
Crit W.S. (ft)	165.31	Flow Area (sq ft)	123.14	595.29	2057.54
E.G. Slope (ft/ft)	0.000220	Area (sq ft)	1225.79	595.29	3372.72
Q Total (cfs)	9741.00	Flow (cfs)	370.51	2514.26	6856.23
Top Width (ft)	999.41	Top Width (ft)	236.76	42.00	720.65
Vel Total (ft/s)	3.51	Avg. Vel. (ft/s)	3.01	4.22	3.33
Max Chl Dpth (ft)	14.79	Hydr. Depth (ft)	5.14	14.17	5.96
Conv. Total (cfs)	657202.1	Conv. (cfs)	24997.5	169631.2	462573.4
Length Wtd. (ft)	25.48	Wetted Per. (ft)	27.26	43.14	348.10
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.06	0.19	0.08
Alpha	1.04	Stream Power (lb/ft s)	1869.34	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	114.89	49.22	249.91
C & E Loss (ft)	0.04	Cum SA (acres)	28.63	4.58	49.66

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 5039.878 Profile: 100-yr

E.G. Elev (ft)	169.19	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.020	0.030	0.022
W.S. Elev (ft)	169.14	Reach Len. (ft)	87.37	174.14	193.13
Crit W.S. (ft)	165.11	Flow Area (sq ft)	108.65	644.16	4659.21
E.G. Slope (ft/ft)	0.000069	Area (sq ft)	1321.21	644.16	4659.21
Q Total (cfs)	9741.00	Flow (cfs)	175.05	1520.72	8045.23
Top Width (ft)	1496.02	Top Width (ft)	244.73	45.00	1206.29
Vel Total (ft/s)	1.80	Avg. Vel. (ft/s)	1.61	2.36	1.73

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 5039.878 Profile: 100-yr (Continued)

Max Chl Dpth (ft)	14.89	Hydr. Depth (ft)	4.91	14.31	3.86
Conv. Total (cfs)	1176180.0	Conv. (cfs)	21136.6	183619.8	971423.5
Length Wtd. (ft)	173.23	Wetted Per. (ft)	25.64	46.66	1224.20
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.02	0.06	0.02
Alpha	1.04	Stream Power (lb/ft s)	1821.48	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	114.15	48.86	247.56
C & E Loss (ft)	0.02	Cum SA (acres)	28.49	4.56	49.10

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 4865.578 Profile: 100-yr

E.G. Elev (ft)	169.15	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.30	Wt. n-Val.	0.020	0.030	0.020
W.S. Elev (ft)	168.85	Reach Len. (ft)	54.72	75.61	94.12
Crit W.S. (ft)	161.20	Flow Area (sq ft)	449.34	1594.45	185.15
E.G. Slope (ft/ft)	0.000243	Area (sq ft)	1676.75	1594.45	3906.17
Q Total (cfs)	9741.00	Flow (cfs)	1962.53	6994.63	783.85
Top Width (ft)	1326.53	Top Width (ft)	290.51	117.19	918.82
Vel Total (ft/s)	4.37	Avg. Vel. (ft/s)	4.37	4.39	4.23
Max Chl Dpth (ft)	14.60	Hydr. Depth (ft)	7.52	13.61	7.48
Conv. Total (cfs)	624957.4	Conv. (cfs)	125910.8	448757.1	50289.5
Length Wtd. (ft)	75.74	Wetted Per. (ft)	61.35	117.71	26.31
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.11	0.21	0.11
Alpha	1.00	Stream Power (lb/ft s)	1720.50	0.00	0.00
Frctn Loss (ft)	0.03	Cum Volume (acre-ft)	111.15	44.38	228.57
C & E Loss (ft)	0.04	Cum SA (acres)	27.96	4.23	44.39

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 4790.088 Profile: 100-yr

E.G. Elev (ft)	169.08	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.69	Wt. n-Val.	0.100	0.030	0.037
W.S. Elev (ft)	168.39	Reach Len. (ft)	13.00	13.00	13.00
Crit W.S. (ft)	163.86	Flow Area (sq ft)	531.28	800.72	605.48
E.G. Slope (ft/ft)	0.000768	Area (sq ft)	1695.26	800.72	3947.97
Q Total (cfs)	9741.00	Flow (cfs)	903.86	6244.92	2592.22
Top Width (ft)	1324.09	Top Width (ft)	291.71	58.20	974.18
Vel Total (ft/s)	5.03	Avg. Vel. (ft/s)	1.70	7.80	4.28
Max Chl Dpth (ft)	14.39	Hydr. Depth (ft)	8.28	13.76	7.75
Conv. Total (cfs)	351599.2	Conv. (cfs)	32624.8	225409.0	93565.4
Length Wtd. (ft)	13.00	Wetted Per. (ft)	66.69	59.09	78.96
Min Ch El (ft)	154.00	Shear (lb/sq ft)	0.38	0.65	0.37
Alpha	1.75	Stream Power (lb/ft s)	2241.15	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	109.03	42.31	220.09
C & E Loss (ft)	0.02	Cum SA (acres)	27.59	4.08	42.34

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 4777.088 Profile: 100-yr

E.G. Elev (ft)	169.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.77	Wt. n-Val.	0.020	0.030	0.100
W.S. Elev (ft)	168.28	Reach Len. (ft)	15.00	15.00	15.00
Crit W.S. (ft)	163.19	Flow Area (sq ft)	364.13	763.88	755.04
E.G. Slope (ft/ft)	0.000708	Area (sq ft)	1541.54	763.88	5881.60
Q Total (cfs)	9741.00	Flow (cfs)	2832.46	5624.53	1284.01
Top Width (ft)	1392.17	Top Width (ft)	272.08	57.00	1063.09
Vel Total (ft/s)	5.17	Avg. Vel. (ft/s)	7.78	7.36	1.70
Max Chl Dpth (ft)	14.03	Hydr. Depth (ft)	8.31	13.40	8.94
Conv. Total (cfs)	366149.9	Conv. (cfs)	106467.9	211417.8	48264.2
Length Wtd. (ft)	15.00	Wetted Per. (ft)	46.64	57.83	84.62
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.34	0.58	0.39
Alpha	1.84	Stream Power (lb/ft s)	1639.28	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	108.55	42.07	218.62
C & E Loss (ft)		Cum SA (acres)	27.51	4.06	42.04

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 4740 BR U Profile: 100-yr

E.G. Elev (ft)	169.05	Element	Left OB	Channel	Right OB
Vel Head (ft)	2.09	Wt. n-Val.	0.020	0.030	0.100
W.S. Elev (ft)	166.25	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)	163.57	Flow Area (sq ft)	111.79	648.09	216.63
E.G. Slope (ft/ft)	0.005768	Area (sq ft)	111.79	648.09	216.63
Q Total (cfs)	9741.00	Flow (cfs)	1372.24	7728.09	640.67
Top Width (ft)		Top Width (ft)			
Vel Total (ft/s)	9.98	Avg. Vel. (ft/s)	12.28	11.92	2.96
Max Chl Dpth (ft)	12.00	Hydr. Depth (ft)	111002.70		354925.80
Conv. Total (cfs)	128258.9	Conv. (cfs)	18068.1	101755.1	8435.7
Length Wtd. (ft)	40.00	Wetted Per. (ft)	34.84	114.83	51.06
Min Ch El (ft)	154.25	Shear (lb/sq ft)	1.16	2.03	1.53
Alpha	1.35	Stream Power (lb/ft s)	1639.28	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	108.26	41.83	217.57
C & E Loss (ft)		Cum SA (acres)	27.46	4.05	41.85

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 4740 BR D Profile: 100-yr

E.G. Elev (ft)	168.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.29	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	164.21	Reach Len. (ft)	36.50	36.50	36.50
Crit W.S. (ft)	164.21	Flow Area (sq ft)	153.94	504.52	121.71
E.G. Slope (ft/ft)	0.006107	Area (sq ft)	153.94	504.52	121.71
Q Total (cfs)	9741.00	Flow (cfs)	510.06	8806.81	424.13
Top Width (ft)	95.90	Top Width (ft)	26.33	52.44	17.13
Vel Total (ft/s)	12.49	Avg. Vel. (ft/s)	3.31	17.46	3.48
Max Chl Dpth (ft)	10.21	Hydr. Depth (ft)	5.85	9.62	7.11
Conv. Total (cfs)	124649.9	Conv. (cfs)	6527.0	112695.6	5427.3
Length Wtd. (ft)	36.50	Wetted Per. (ft)	31.94	52.68	23.41
Min Ch El (ft)	154.00	Shear (lb/sq ft)	1.84	3.65	1.98
Alpha	1.77	Stream Power (lb/ft s)	1125.57	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	108.14	41.30	217.41
C & E Loss (ft)		Cum SA (acres)	27.45	4.03	41.85

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 4685.592 Profile: 100-yr

E.G. Elev (ft)	166.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.19	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	163.53	Reach Len. (ft)	393.59	358.41	320.67
Crit W.S. (ft)	163.53	Flow Area (sq ft)	324.58	469.05	323.61
E.G. Slope (ft/ft)	0.005757	Area (sq ft)	708.87	469.05	3610.28
Q Total (cfs)	9741.00	Flow (cfs)	998.23	7572.73	1170.04
Top Width (ft)	835.28	Top Width (ft)	223.41	52.44	559.43
Vel Total (ft/s)	8.72	Avg. Vel. (ft/s)	3.08	16.14	3.62
Max Chl Dpth (ft)	9.53	Hydr. Depth (ft)	4.54	8.94	5.77
Conv. Total (cfs)	128379.3	Conv. (cfs)	13155.9	99803.1	15420.3
Length Wtd. (ft)	346.18	Wetted Per. (ft)	72.05	52.68	56.35
Min Ch El (ft)	154.00	Shear (lb/sq ft)	1.62	3.20	2.06
Alpha	2.70	Stream Power (lb/ft s)	1125.57	0.00	0.00
Frctn Loss (ft)	0.63	Cum Volume (acre-ft)	107.78	40.89	215.85
C & E Loss (ft)	1.47	Cum SA (acres)	27.34	3.99	41.61

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 4327.181 Profile: 100-yr

E.G. Elev (ft)	164.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.	0.100	0.034	0.084
W.S. Elev (ft)	164.33	Reach Len. (ft)	379.56	362.86	348.11
Crit W.S. (ft)		Flow Area (sq ft)	360.83	422.58	3294.76
E.G. Slope (ft/ft)	0.000880	Area (sq ft)	360.83	422.58	3294.76
Q Total (cfs)	9741.00	Flow (cfs)	431.40	2833.47	6476.13
Top Width (ft)	570.04	Top Width (ft)	79.57	35.94	454.53
Vel Total (ft/s)	2.39	Avg. Vel. (ft/s)	1.20	6.71	1.97

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 4327.181 Profile: 100-yr (Continued)

Max Chl Dpth (ft)	12.33	Hydr. Depth (ft)	4.54	11.76	7.25
Conv. Total (cfs)	328319.1	Conv. (cfs)	14540.3	95501.6	218277.2
Length Wtd. (ft)	354.53	Wetted Per. (ft)	80.80	36.17	456.48
Min Ch El (ft)	152.00	Shear (lb/sq ft)	0.25	0.64	0.40
Alpha	2.75	Stream Power (lb/ft s)	898.41	0.00	0.00
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)	102.95	37.22	190.43
C & E Loss (ft)	0.02	Cum SA (acres)	25.97	3.62	37.87

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 3964.325 Profile: 100-yr

E.G. Elev (ft)	164.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	163.81	Reach Len. (ft)	460.88	448.94	432.66
Crit W.S. (ft)		Flow Area (sq ft)	345.72	508.62	2907.00
E.G. Slope (ft/ft)	0.001011	Area (sq ft)	345.72	508.62	2907.00
Q Total (cfs)	9741.00	Flow (cfs)	355.05	3973.03	5412.92
Top Width (ft)	523.02	Top Width (ft)	106.93	45.65	370.44
Vel Total (ft/s)	2.59	Avg. Vel. (ft/s)	1.03	7.81	1.86
Max Chl Dpth (ft)	11.81	Hydr. Depth (ft)	3.23	11.14	7.85
Conv. Total (cfs)	306286.6	Conv. (cfs)	11163.8	124924.2	170198.6
Length Wtd. (ft)	441.11	Wetted Per. (ft)	107.91	46.06	372.81
Min Ch El (ft)	152.00	Shear (lb/sq ft)	0.20	0.70	0.49
Alpha	4.00	Stream Power (lb/ft s)	800.12	0.00	0.00
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	99.87	33.34	165.65
C & E Loss (ft)	0.05	Cum SA (acres)	25.16	3.28	34.58

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 6709.658 Profile: 500-yr

E.G. Elev (ft)	177.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.26	Wt. n-Val.	0.030	0.030	0.030
W.S. Elev (ft)	177.15	Reach Len. (ft)	95.93	41.50	20.00
Crit W.S. (ft)	168.81	Flow Area (sq ft)	855.28	538.24	783.01
E.G. Slope (ft/ft)	0.000206	Area (sq ft)	2148.44	538.24	783.01
Q Total (cfs)	8165.00	Flow (cfs)	3311.17	2771.45	2082.38
Top Width (ft)	377.46	Top Width (ft)	254.93	26.49	96.04
Vel Total (ft/s)	3.75	Avg. Vel. (ft/s)	3.87	5.15	2.66
Max Chl Dpth (ft)	21.15	Hydr. Depth (ft)	12.99	20.32	8.15
Conv. Total (cfs)	569240.4	Conv. (cfs)	230845.5	193217.3	145177.6
Length Wtd. (ft)	67.98	Wetted Per. (ft)	67.24	27.59	108.11
Min Ch El (ft)	156.00	Shear (lb/sq ft)	0.16	0.25	0.09
Alpha	1.20	Stream Power (lb/ft s)	1107.41	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	205.74	74.85	489.50
C & E Loss (ft)	0.10	Cum SA (acres)	39.16	5.76	78.61

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 6668.160 Profile: 500-yr

E.G. Elev (ft)	177.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.030	0.030	0.030
W.S. Elev (ft)	177.24	Reach Len. (ft)	22.00	22.00	22.00
Crit W.S. (ft)	165.78	Flow Area (sq ft)	2940.66	709.23	353.24
E.G. Slope (ft/ft)	0.000057	Area (sq ft)	2940.66	709.23	1783.37
Q Total (cfs)	8165.00	Flow (cfs)	5659.94	1984.85	520.22
Top Width (ft)	496.81	Top Width (ft)	250.34	34.37	212.10
Vel Total (ft/s)	2.04	Avg. Vel. (ft/s)	1.92	2.80	1.47
Max Chl Dpth (ft)	21.23	Hydr. Depth (ft)	11.75	20.64	8.90
Conv. Total (cfs)	1080408.0	Conv. (cfs)	748932.9	262638.4	68836.2
Length Wtd. (ft)	22.00	Wetted Per. (ft)	252.21	34.69	45.27
Min Ch El (ft)	156.01	Shear (lb/sq ft)	0.04	0.07	0.03
Alpha	1.11	Stream Power (lb/ft s)	877.68	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	200.13	74.26	488.91
C & E Loss (ft)		Cum SA (acres)	38.61	5.73	78.54

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 6600 BR U Profile: 500-yr

E.G. Elev (ft)	177.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.			
W.S. Elev (ft)	177.24	Reach Len. (ft)	35.00	35.00	35.00
Crit W.S. (ft)	167.23	Flow Area (sq ft)	949.46	605.14	278.54
E.G. Slope (ft/ft)		Area (sq ft)	931.52	602.68	818.60
Q Total (cfs)	8165.00	Flow (cfs)	4243.92	3035.55	887.85
Top Width (ft)	496.81	Top Width (ft)	250.34	34.37	212.10
Vel Total (ft/s)	4.45	Avg. Vel. (ft/s)	4.47	5.02	3.19
Max Chl Dpth (ft)	21.23	Hydr. Depth (ft)	3.79	17.61	7.02
Conv. Total (cfs)		Conv. (cfs)			
Length Wtd. (ft)	35.00	Wetted Per. (ft)	269.89	103.43	70.84
Min Ch El (ft)	156.01	Shear (lb/sq ft)			
Alpha	1.08	Stream Power (lb/ft s)	877.68	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	199.16	73.93	488.26
C & E Loss (ft)		Cum SA (acres)	38.48	5.72	78.43

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 6600 BR D Profile: 500-yr

E.G. Elev (ft)	176.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.			
W.S. Elev (ft)	176.93	Reach Len. (ft)	38.52	38.52	38.52
Crit W.S. (ft)	167.22	Flow Area (sq ft)	592.64	592.01	862.61
E.G. Slope (ft/ft)		Area (sq ft)	1084.04	579.15	780.09
Q Total (cfs)	8165.00	Flow (cfs)	4321.39	2975.95	869.98
Top Width (ft)	487.56	Top Width (ft)	244.14	33.53	209.89
Vel Total (ft/s)	3.99	Avg. Vel. (ft/s)	7.29	5.03	1.01

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 6600 BR D Profile: 500-yr (Continued)

Max Chl Dpth (ft)	20.93	Hydr. Depth (ft)	4.21	17.66	4.11
Conv. Total (cfs)		Conv. (cfs)			
Length Wtd. (ft)	38.52	Wetted Per. (ft)	163.82	101.05	240.71
Min Ch El (ft)	156.00	Shear (lb/sq ft)			
Alpha	1.11	Stream Power (lb/ft s)	818.01	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	198.35	73.45	487.61
C & E Loss (ft)		Cum SA (acres)	38.28	5.69	78.26

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 6572.639 Profile: 500-yr

E.G. Elev (ft)	176.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.030	0.030	0.030
W.S. Elev (ft)	176.93	Reach Len. (ft)	97.36	157.66	211.49
Crit W.S. (ft)	165.91	Flow Area (sq ft)	1861.83	683.09	2198.81
E.G. Slope (ft/ft)	0.000041	Area (sq ft)	2407.28	683.09	2198.81
Q Total (cfs)	8165.00	Flow (cfs)	3251.98	1598.31	3314.72
Top Width (ft)	487.56	Top Width (ft)	244.14	33.53	209.89
Vel Total (ft/s)	1.72	Avg. Vel. (ft/s)	1.75	2.34	1.51
Max Chl Dpth (ft)	20.93	Hydr. Depth (ft)	13.21	20.37	10.48
Conv. Total (cfs)	1277596.0	Conv. (cfs)	508844.3	250090.3	518661.0
Length Wtd. (ft)	158.74	Wetted Per. (ft)	143.64	33.99	211.57
Min Ch El (ft)	156.00	Shear (lb/sq ft)	0.03	0.05	0.03
Alpha	1.08	Stream Power (lb/ft s)	818.01	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	196.80	72.90	486.30
C & E Loss (ft)	0.12	Cum SA (acres)	38.07	5.66	78.08

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 6414.980 Profile: 500-yr

E.G. Elev (ft)	176.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.46	Wt. n-Val.	0.050	0.030	0.050
W.S. Elev (ft)	176.39	Reach Len. (ft)	225.80	225.80	225.80
Crit W.S. (ft)	166.12	Flow Area (sq ft)	324.56	803.90	1055.55
E.G. Slope (ft/ft)	0.000339	Area (sq ft)	1107.04	803.90	2544.01
Q Total (cfs)	8165.00	Flow (cfs)	1066.86	5247.89	1850.25
Top Width (ft)	704.53	Top Width (ft)	171.94	41.76	490.83
Vel Total (ft/s)	3.74	Avg. Vel. (ft/s)	3.29	6.53	1.75
Max Chl Dpth (ft)	19.39	Hydr. Depth (ft)	15.49	19.25	5.76
Conv. Total (cfs)	443714.3	Conv. (cfs)	57977.0	285188.3	100548.9
Length Wtd. (ft)	225.80	Wetted Per. (ft)	22.02	41.94	185.91
Min Ch El (ft)	157.00	Shear (lb/sq ft)	0.31	0.41	0.12
Alpha	2.11	Stream Power (lb/ft s)	1129.78	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	192.88	70.20	474.78
C & E Loss (ft)		Cum SA (acres)	37.60	5.52	76.38

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 6189.177 Profile: 500-yr

E.G. Elev (ft)	172.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.64	Wt. n-Val.	0.100	0.030	0.087
W.S. Elev (ft)	170.73	Reach Len. (ft)	633.10	668.48	716.54
Crit W.S. (ft)	166.96	Flow Area (sq ft)	461.86	433.40	612.70
E.G. Slope (ft/ft)	0.001674	Area (sq ft)	461.86	433.40	612.70
Q Total (cfs)	8165.00	Flow (cfs)	1090.73	5412.10	1662.18
Top Width (ft)	198.61	Top Width (ft)	58.20	28.04	112.37
Vel Total (ft/s)	5.41	Avg. Vel. (ft/s)	2.36	12.49	2.71
Max Chl Dpth (ft)	15.73	Hydr. Depth (ft)	7.94	15.46	5.45
Conv. Total (cfs)	199561.8	Conv. (cfs)	26658.6	132277.8	40625.4
Length Wtd. (ft)	697.68	Wetted Per. (ft)	60.33	28.33	115.62
Min Ch El (ft)	155.00	Shear (lb/sq ft)	0.80	1.60	0.55
Alpha	3.60	Stream Power (lb/ft s)	1315.13	0.00	0.00
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	192.88	70.20	474.78
C & E Loss (ft)	0.77	Cum SA (acres)	37.00	5.34	74.81

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 5508.105 Profile: 500-yr

E.G. Elev (ft)	171.48	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.099	0.030	0.022
W.S. Elev (ft)	171.39	Reach Len. (ft)	438.29	442.90	447.79
Crit W.S. (ft)	166.61	Flow Area (sq ft)	958.63	393.56	6203.03
E.G. Slope (ft/ft)	0.000100	Area (sq ft)	1159.38	393.56	6203.03
Q Total (cfs)	16941.00	Flow (cfs)	730.14	1280.42	14930.44
Top Width (ft)	1222.19	Top Width (ft)	148.23	22.99	1050.96
Vel Total (ft/s)	2.24	Avg. Vel. (ft/s)	0.76	3.25	2.41
Max Chl Dpth (ft)	17.39	Hydr. Depth (ft)	10.75	17.12	5.90
Conv. Total (cfs)	1694212.0	Conv. (cfs)	73018.6	128050.3	1493143.0
Length Wtd. (ft)	446.88	Wetted Per. (ft)	92.45	23.38	1097.69
Min Ch El (ft)	154.00	Shear (lb/sq ft)	0.06	0.11	0.04
Alpha	1.18	Stream Power (lb/ft s)	2947.19	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	181.09	63.86	418.73
C & E Loss (ft)	0.01	Cum SA (acres)	35.50	4.95	65.25

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 5084.678 Profile: 500-yr

E.G. Elev (ft)	171.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.093	0.030	0.023
W.S. Elev (ft)	171.37	Reach Len. (ft)	19.30	19.30	19.30
Crit W.S. (ft)	166.79	Flow Area (sq ft)	1918.01	659.14	6976.48
E.G. Slope (ft/ft)	0.000070	Area (sq ft)	1918.01	659.14	6976.48
Q Total (cfs)	16941.00	Flow (cfs)	942.83	1779.25	14218.93
Top Width (ft)	1314.29	Top Width (ft)	295.05	38.79	980.45
Vel Total (ft/s)	1.77	Avg. Vel. (ft/s)	0.49	2.70	2.04
Max Chl Dpth (ft)	17.37	Hydr. Depth (ft)	6.50	16.99	7.12
Conv. Total (cfs)	2022287.0	Conv. (cfs)	112547.4	212392.7	1697347.0
Length Wtd. (ft)	19.30	Wetted Per. (ft)	300.80	39.72	1011.41
Min Ch El (ft)	154.00	Shear (lb/sq ft)	0.03	0.07	0.03
Alpha	1.36	Stream Power (lb/ft s)	2371.66	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	165.61	58.51	350.98
C & E Loss (ft)	0.00	Cum SA (acres)	33.27	4.64	54.81

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 5065.378 Profile: 500-yr

E.G. Elev (ft)	171.43	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.074	0.030	0.021
W.S. Elev (ft)	171.32	Reach Len. (ft)	25.03	25.37	25.53
Crit W.S. (ft)	166.46	Flow Area (sq ft)	1838.85	690.80	5019.53
E.G. Slope (ft/ft)	0.000106	Area (sq ft)	1838.85	690.80	5019.53
Q Total (cfs)	16941.00	Flow (cfs)	1302.54	2240.75	13397.72
Top Width (ft)	1099.49	Top Width (ft)	295.08	42.00	762.42
Vel Total (ft/s)	2.24	Avg. Vel. (ft/s)	0.71	3.24	2.67
Max Chl Dpth (ft)	17.07	Hydr. Depth (ft)	6.23	16.45	6.58
Conv. Total (cfs)	1643468.0	Conv. (cfs)	126360.5	217378.0	1299729.0
Length Wtd. (ft)	25.48	Wetted Per. (ft)	300.51	43.14	800.70
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.04	0.11	0.04
Alpha	1.40	Stream Power (lb/ft s)	1869.34	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	164.78	58.21	348.33
C & E Loss (ft)	0.02	Cum SA (acres)	33.14	4.62	54.42

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 5039.878 Profile: 500-yr

E.G. Elev (ft)	171.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.078	0.030	0.022
W.S. Elev (ft)	171.35	Reach Len. (ft)	87.37	174.14	193.13
Crit W.S. (ft)	166.74	Flow Area (sq ft)	1937.30	743.58	7340.07
E.G. Slope (ft/ft)	0.000061	Area (sq ft)	1937.30	743.58	7340.07
Q Total (cfs)	16941.00	Flow (cfs)	1018.50	1824.29	14098.21
Top Width (ft)	1568.44	Top Width (ft)	302.57	45.00	1220.87
Vel Total (ft/s)	1.69	Avg. Vel. (ft/s)	0.53	2.45	1.92

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 5039.878 Profile: 500-yr (Continued)

Max Chl Dpth (ft)	17.10	Hydr. Depth (ft)	6.40	16.52	6.01
Conv. Total (cfs)	2165944.0	Conv. (cfs)	130217.7	233239.1	1802487.0
Length Wtd. (ft)	181.18	Wetted Per. (ft)	308.58	46.66	1247.78
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.02	0.06	0.02
Alpha	1.31	Stream Power (lb/ft s)	1821.48	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	163.69	57.79	344.70
C & E Loss (ft)	0.00	Cum SA (acres)	32.97	4.59	53.84

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 4865.578 Profile: 500-yr

E.G. Elev (ft)	171.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.050	0.030	0.020
W.S. Elev (ft)	171.35	Reach Len. (ft)	54.72	75.61	94.12
Crit W.S. (ft)	163.62	Flow Area (sq ft)	2492.65	1886.76	6222.37
E.G. Slope (ft/ft)	0.000043	Area (sq ft)	2492.65	1886.76	6222.37
Q Total (cfs)	16941.00	Flow (cfs)	1779.97	3916.36	11244.67
Top Width (ft)	1412.33	Top Width (ft)	358.11	117.19	937.03
Vel Total (ft/s)	1.60	Avg. Vel. (ft/s)	0.71	2.08	1.81
Max Chl Dpth (ft)	17.10	Hydr. Depth (ft)	6.96	16.10	6.64
Conv. Total (cfs)	2569868.0	Conv. (cfs)	270012.9	594092.8	1705762.0
Length Wtd. (ft)	87.11	Wetted Per. (ft)	362.41	117.71	952.54
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.02	0.04	0.02
Alpha	1.26	Stream Power (lb/ft s)	1720.50	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	159.25	52.53	314.64
C & E Loss (ft)	0.00	Cum SA (acres)	32.31	4.27	49.05

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 4790.088 Profile: 500-yr

E.G. Elev (ft)	171.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.094	0.030	0.022
W.S. Elev (ft)	171.33	Reach Len. (ft)	13.00	13.00	13.00
Crit W.S. (ft)	166.24	Flow Area (sq ft)	2698.04	971.70	6851.15
E.G. Slope (ft/ft)	0.000058	Area (sq ft)	2698.04	971.70	6851.15
Q Total (cfs)	16941.00	Flow (cfs)	1292.08	2370.64	13278.28
Top Width (ft)	1443.75	Top Width (ft)	384.42	58.20	1001.13
Vel Total (ft/s)	1.61	Avg. Vel. (ft/s)	0.48	2.44	1.94
Max Chl Dpth (ft)	17.33	Hydr. Depth (ft)	7.02	16.70	6.84
Conv. Total (cfs)	2224017.0	Conv. (cfs)	169624.5	311217.5	1743175.0
Length Wtd. (ft)	13.00	Wetted Per. (ft)	389.76	59.09	1011.41
Min Ch El (ft)	154.00	Shear (lb/sq ft)	0.03	0.06	0.02
Alpha	1.46	Stream Power (lb/ft s)	2241.15	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	155.99	50.05	300.51
C & E Loss (ft)	0.01	Cum SA (acres)	31.84	4.12	46.96

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 4777.088 Profile: 500-yr

E.G. Elev (ft)	171.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.055	0.030	0.037
W.S. Elev (ft)	171.34	Reach Len. (ft)	15.00	15.00	15.00
Crit W.S. (ft)	165.78	Flow Area (sq ft)	2506.94	938.37	9164.52
E.G. Slope (ft/ft)	0.000065	Area (sq ft)	2506.94	938.37	9164.52
Q Total (cfs)	16941.00	Flow (cfs)	1972.75	2409.65	12558.60
Top Width (ft)	1495.78	Top Width (ft)	361.11	57.00	1077.68
Vel Total (ft/s)	1.34	Avg. Vel. (ft/s)	0.79	2.57	1.37
Max Chl Dpth (ft)	17.09	Hydr. Depth (ft)	6.94	16.46	8.50
Conv. Total (cfs)	2094320.0	Conv. (cfs)	243880.4	297891.3	1552549.0
Length Wtd. (ft)	15.00	Wetted Per. (ft)	367.42	57.83	1081.92
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.03	0.07	0.03
Alpha	1.33	Stream Power (lb/ft s)	1639.28	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	155.22	49.77	298.12
C & E Loss (ft)		Cum SA (acres)	31.73	4.10	46.65

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 4740 BR U Profile: 500-yr

E.G. Elev (ft)	171.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.34	Wt. n-Val.			
W.S. Elev (ft)	171.34	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)	171.75	Flow Area (sq ft)	286.45	721.05	1480.52
E.G. Slope (ft/ft)		Area (sq ft)	276.91	718.92	1440.33
Q Total (cfs)	16941.00	Flow (cfs)	2163.55	10544.91	4299.10
Top Width (ft)	1386.91	Top Width (ft)	252.23	57.00	1077.68
Vel Total (ft/s)	6.81	Avg. Vel. (ft/s)	7.55	14.62	2.90
Max Chl Dpth (ft)	17.09	Hydr. Depth (ft)	1.14	12.65	1.37
Conv. Total (cfs)		Conv. (cfs)			
Length Wtd. (ft)	40.00	Wetted Per. (ft)	287.08	171.83	1136.38
Min Ch El (ft)	154.25	Shear (lb/sq ft)			
Alpha	1.79	Stream Power (lb/ft s)	1639.28	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	154.74	49.48	296.30
C & E Loss (ft)		Cum SA (acres)	31.63	4.08	46.28

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 4740 BR D Profile: 500-yr

E.G. Elev (ft)	171.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.06	Wt. n-Val.			
W.S. Elev (ft)	171.34	Reach Len. (ft)	36.50	36.50	36.50
Crit W.S. (ft)	172.38	Flow Area (sq ft)	433.24	678.64	1145.35
E.G. Slope (ft/ft)		Area (sq ft)	421.37	676.68	1122.91
Q Total (cfs)	16941.00	Flow (cfs)	1166.68	11673.19	4167.68
Top Width (ft)	971.63	Top Width (ft)	317.49	52.44	601.70
Vel Total (ft/s)	7.51	Avg. Vel. (ft/s)	2.69	17.20	3.64
Max Chl Dpth (ft)	17.34	Hydr. Depth (ft)	1.36	12.94	1.90
Conv. Total (cfs)		Conv. (cfs)			
Length Wtd. (ft)	36.50	Wetted Per. (ft)	377.92	157.56	646.88
Min Ch El (ft)	154.00	Shear (lb/sq ft)			
Alpha	3.39	Stream Power (lb/ft s)	1125.57	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	154.42	48.84	295.12
C & E Loss (ft)		Cum SA (acres)	31.36	4.03	45.51

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 4685.592 Profile: 500-yr

E.G. Elev (ft)	167.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.	0.100	0.030	0.099
W.S. Elev (ft)	167.22	Reach Len. (ft)	393.59	358.41	320.67
Crit W.S. (ft)	165.40	Flow Area (sq ft)	1624.05	662.45	5691.32
E.G. Slope (ft/ft)	0.000668	Area (sq ft)	1624.05	662.45	5691.32
Q Total (cfs)	16941.00	Flow (cfs)	2054.40	4586.96	10299.64
Top Width (ft)	892.39	Top Width (ft)	270.81	52.44	569.14
Vel Total (ft/s)	2.12	Avg. Vel. (ft/s)	1.26	6.92	1.81
Max Chl Dpth (ft)	13.22	Hydr. Depth (ft)	6.00	12.63	10.00
Conv. Total (cfs)	655301.1	Conv. (cfs)	79467.1	177429.9	398404.1
Length Wtd. (ft)	337.08	Wetted Per. (ft)	271.78	52.68	571.66
Min Ch El (ft)	154.00	Shear (lb/sq ft)	0.25	0.52	0.42
Alpha	3.36	Stream Power (lb/ft s)	1125.57	0.00	0.00
Frctn Loss (ft)	0.29	Cum Volume (acre-ft)	153.56	48.28	292.27
C & E Loss (ft)	0.04	Cum SA (acres)	31.12	3.99	45.02

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 4327.181 Profile: 500-yr

E.G. Elev (ft)	167.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.38	Wt. n-Val.	0.100	0.034	0.086
W.S. Elev (ft)	166.74	Reach Len. (ft)	379.56	362.86	348.11
Crit W.S. (ft)		Flow Area (sq ft)	580.19	509.36	4401.13
E.G. Slope (ft/ft)	0.001147	Area (sq ft)	580.19	509.36	4401.13
Q Total (cfs)	16941.00	Flow (cfs)	912.41	4411.16	11617.43
Top Width (ft)	600.96	Top Width (ft)	103.66	35.94	461.36
Vel Total (ft/s)	3.09	Avg. Vel. (ft/s)	1.57	8.66	2.64

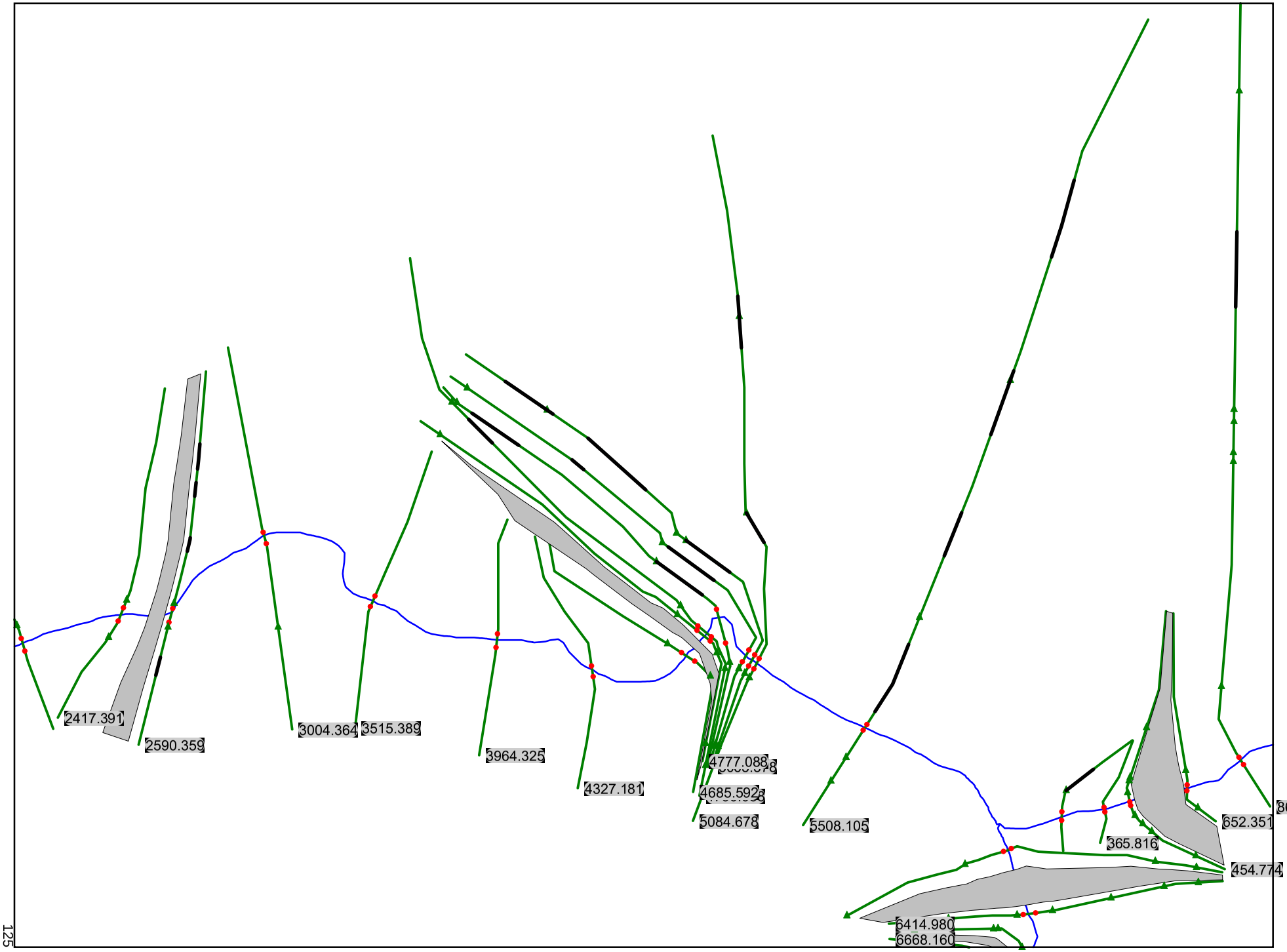
Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 4327.181 Profile: 500-yr (Continued)

Max Chl Dpth (ft)	14.74	Hydr. Depth (ft)	5.60	14.17	9.54
Conv. Total (cfs)	500132.0	Conv. (cfs)	26936.1	130226.2	342969.7
Length Wtd. (ft)	354.49	Wetted Per. (ft)	105.06	36.17	463.73
Min Ch El (ft)	152.00	Shear (lb/sq ft)	0.40	1.01	0.68
Alpha	2.57	Stream Power (lb/ft s)	898.41	0.00	0.00
Frctn Loss (ft)	0.46	Cum Volume (acre-ft)	143.60	43.46	255.12
C & E Loss (ft)	0.03	Cum SA (acres)	29.43	3.62	41.22

Plan: Corr-Eff Sandy Run Sandy Main Stem RS: 3964.325 Profile: 500-yr

E.G. Elev (ft)	166.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	165.93	Reach Len. (ft)	460.88	448.94	432.66
Crit W.S. (ft)		Flow Area (sq ft)	603.97	605.64	3698.99
E.G. Slope (ft/ft)	0.001448	Area (sq ft)	603.97	605.64	3698.99
Q Total (cfs)	16941.00	Flow (cfs)	911.42	6359.54	9670.05
Top Width (ft)	558.01	Top Width (ft)	137.49	45.65	374.88
Vel Total (ft/s)	3.45	Avg. Vel. (ft/s)	1.51	10.50	2.61
Max Chl Dpth (ft)	13.93	Hydr. Depth (ft)	4.39	13.27	9.87
Conv. Total (cfs)	445169.4	Conv. (cfs)	23949.9	167113.6	254105.9
Length Wtd. (ft)	441.02	Wetted Per. (ft)	138.54	46.06	377.73
Min Ch El (ft)	152.00	Shear (lb/sq ft)	0.39	1.19	0.89
Alpha	3.81	Stream Power (lb/ft s)	800.12	0.00	0.00
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)	138.44	38.81	222.75
C & E Loss (ft)	0.08	Cum SA (acres)	28.38	3.28	37.88

HEC-RAS Detailed Analysis Results – Proposed Model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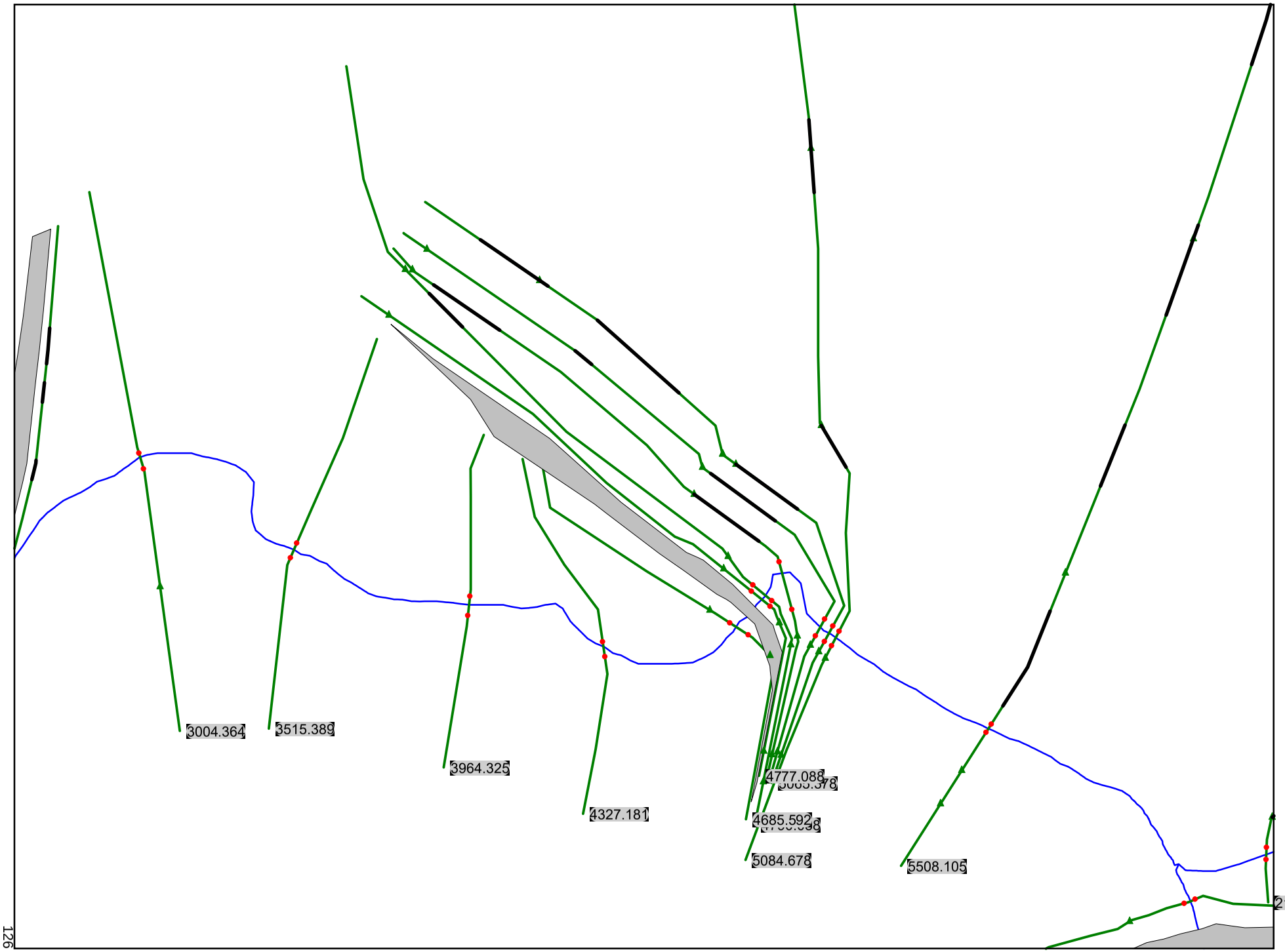
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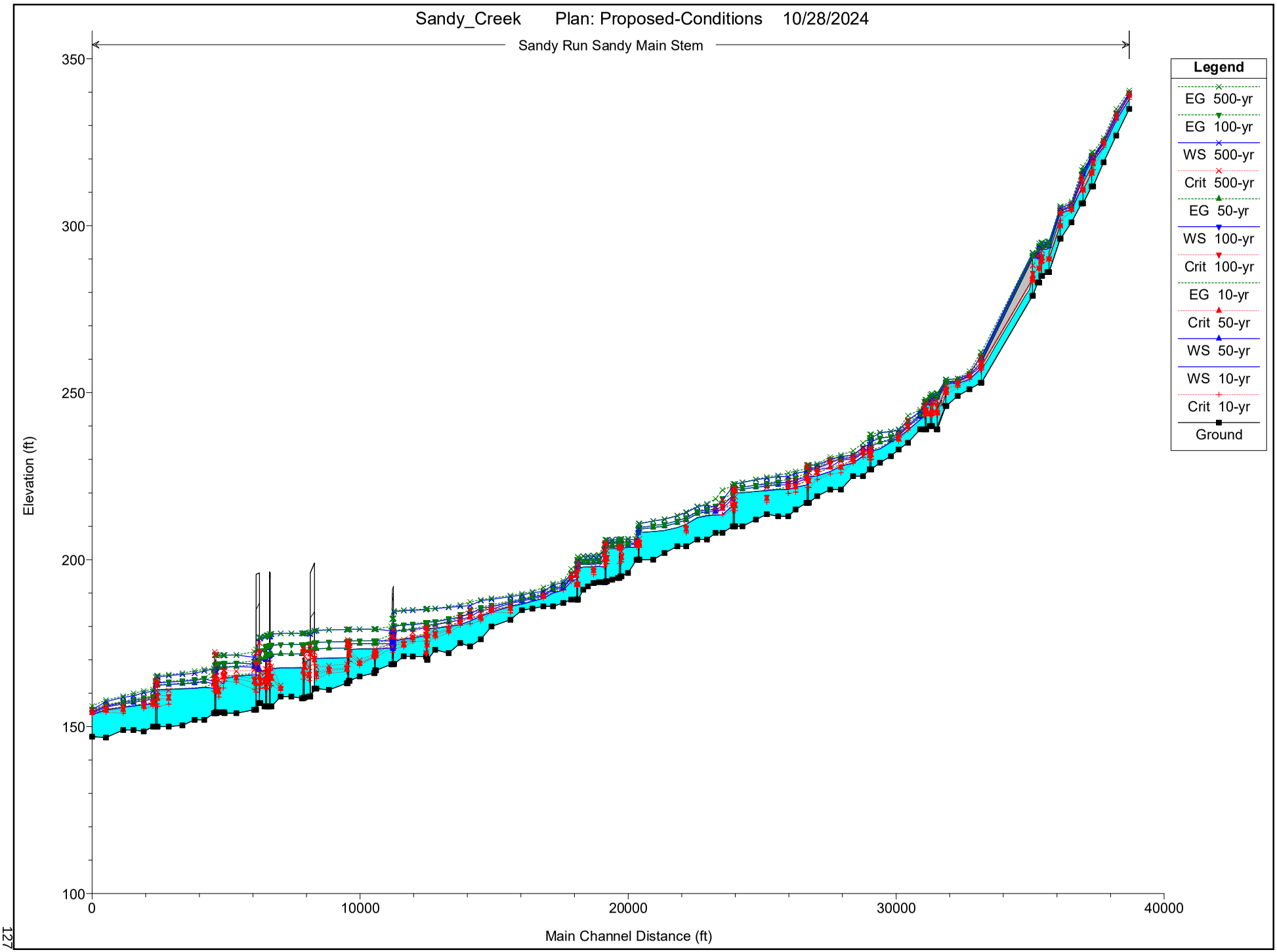
Sandy_Creek Plan: Proposed-Conditions 10/28/2024
Sandy Run Sandy Main Stem
Elevation (ft)
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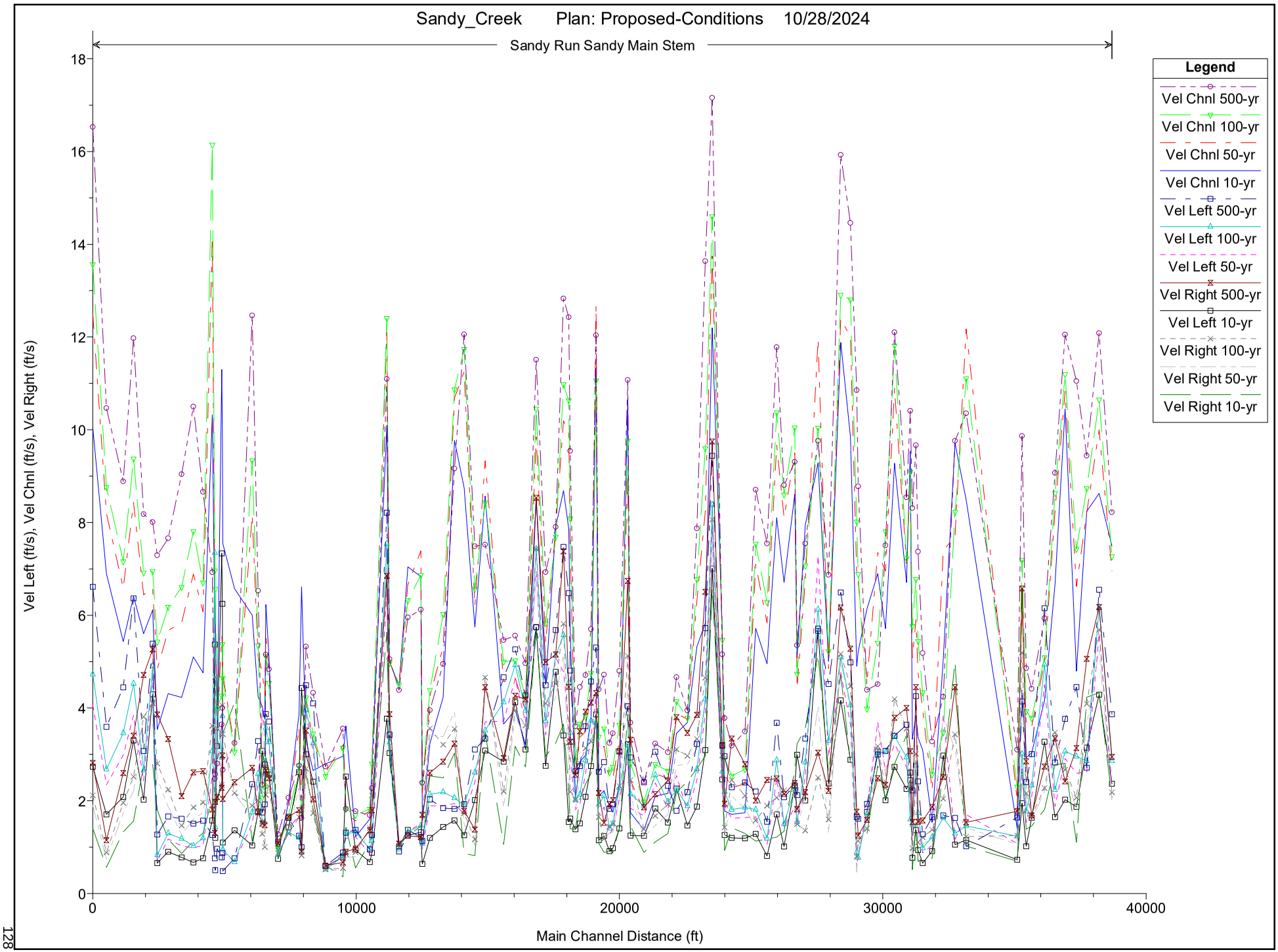
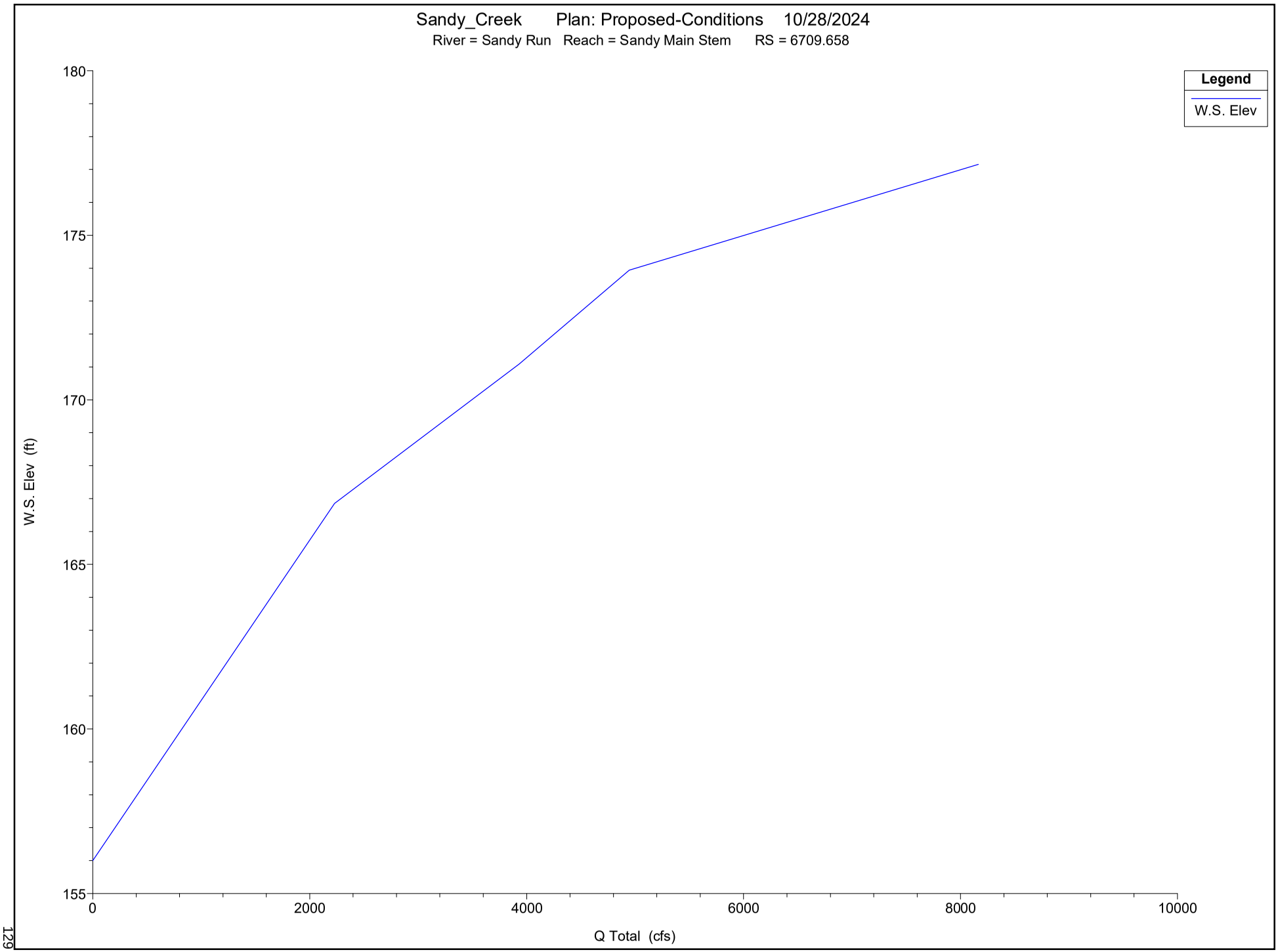
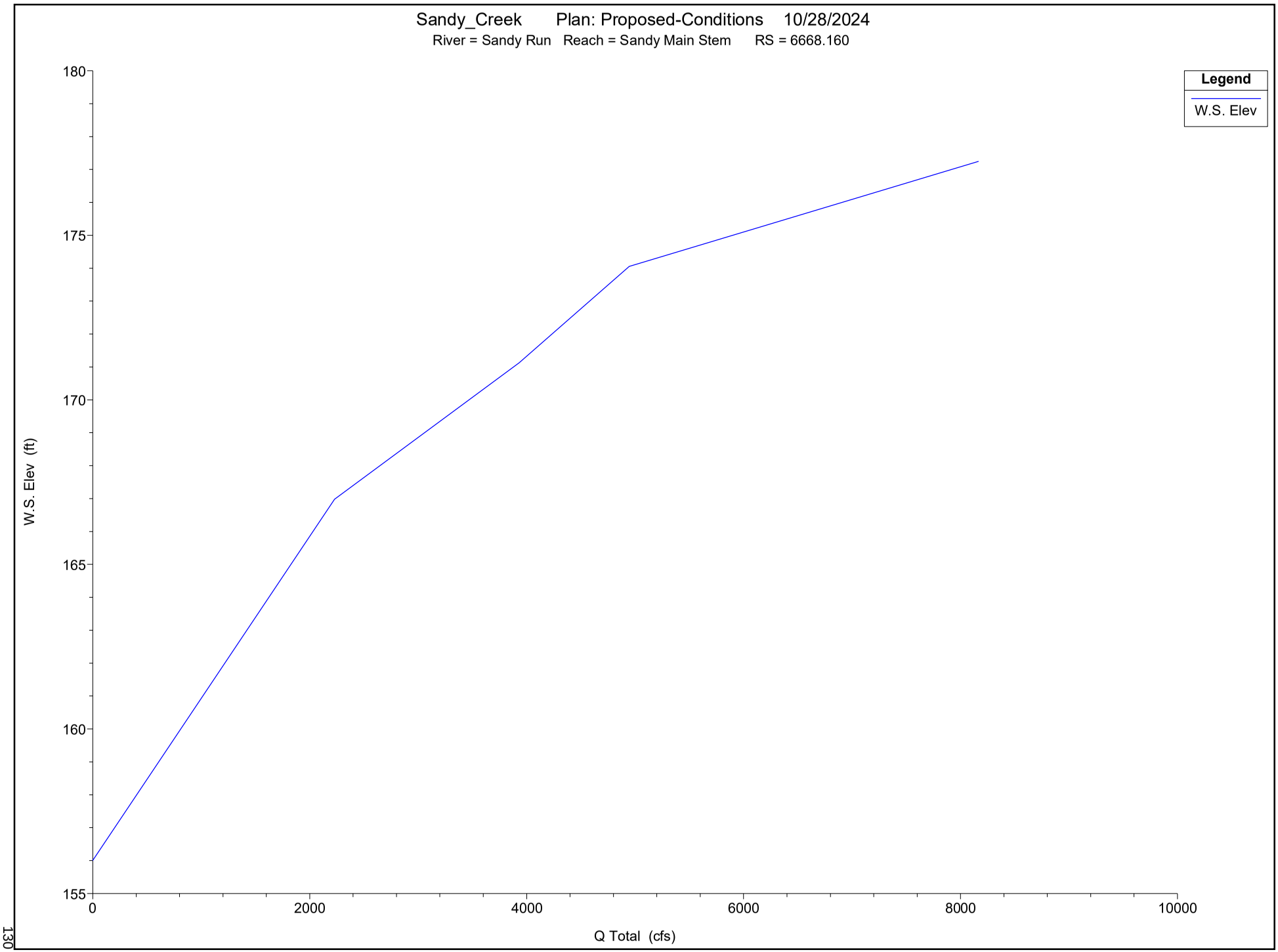
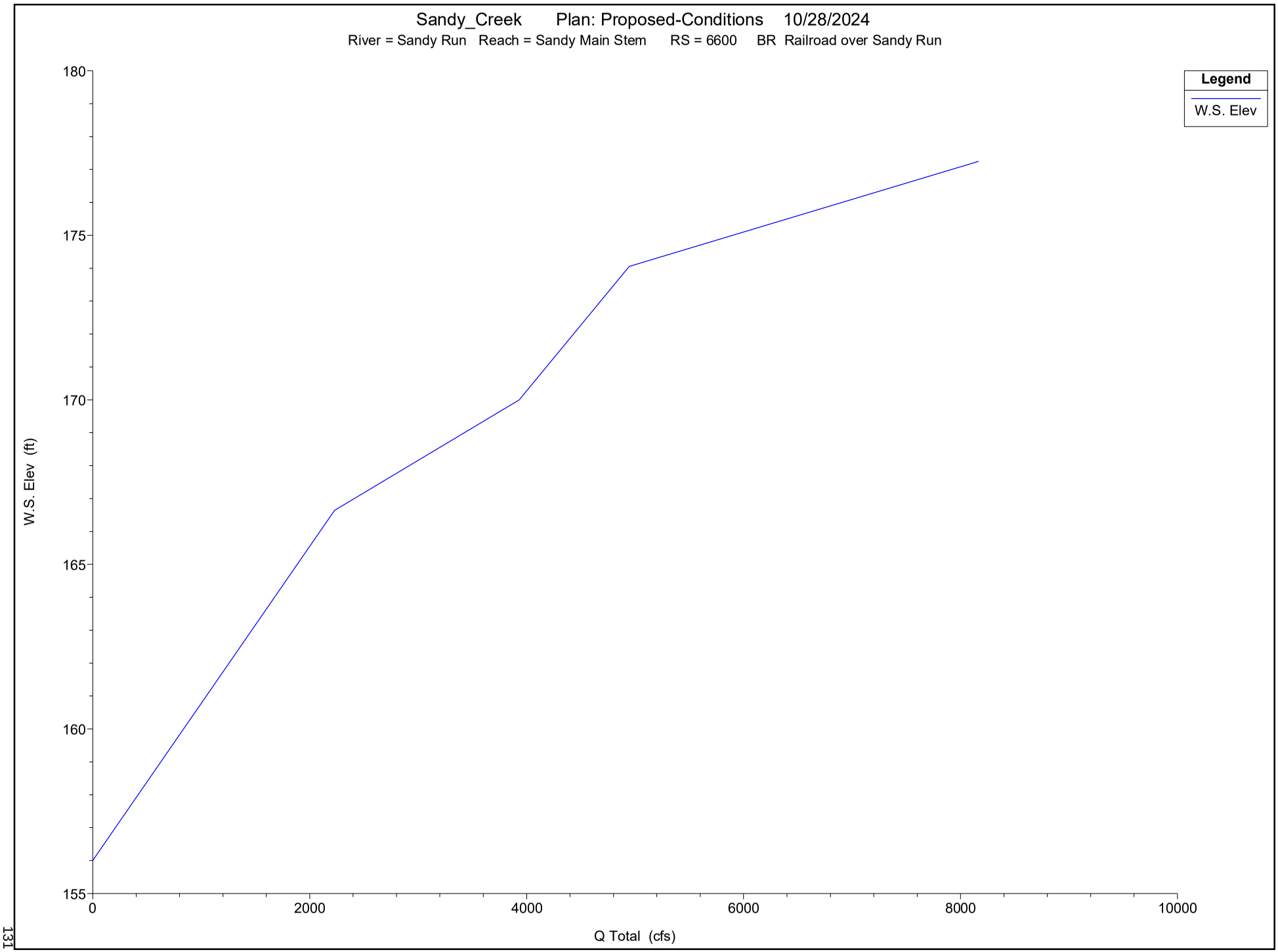
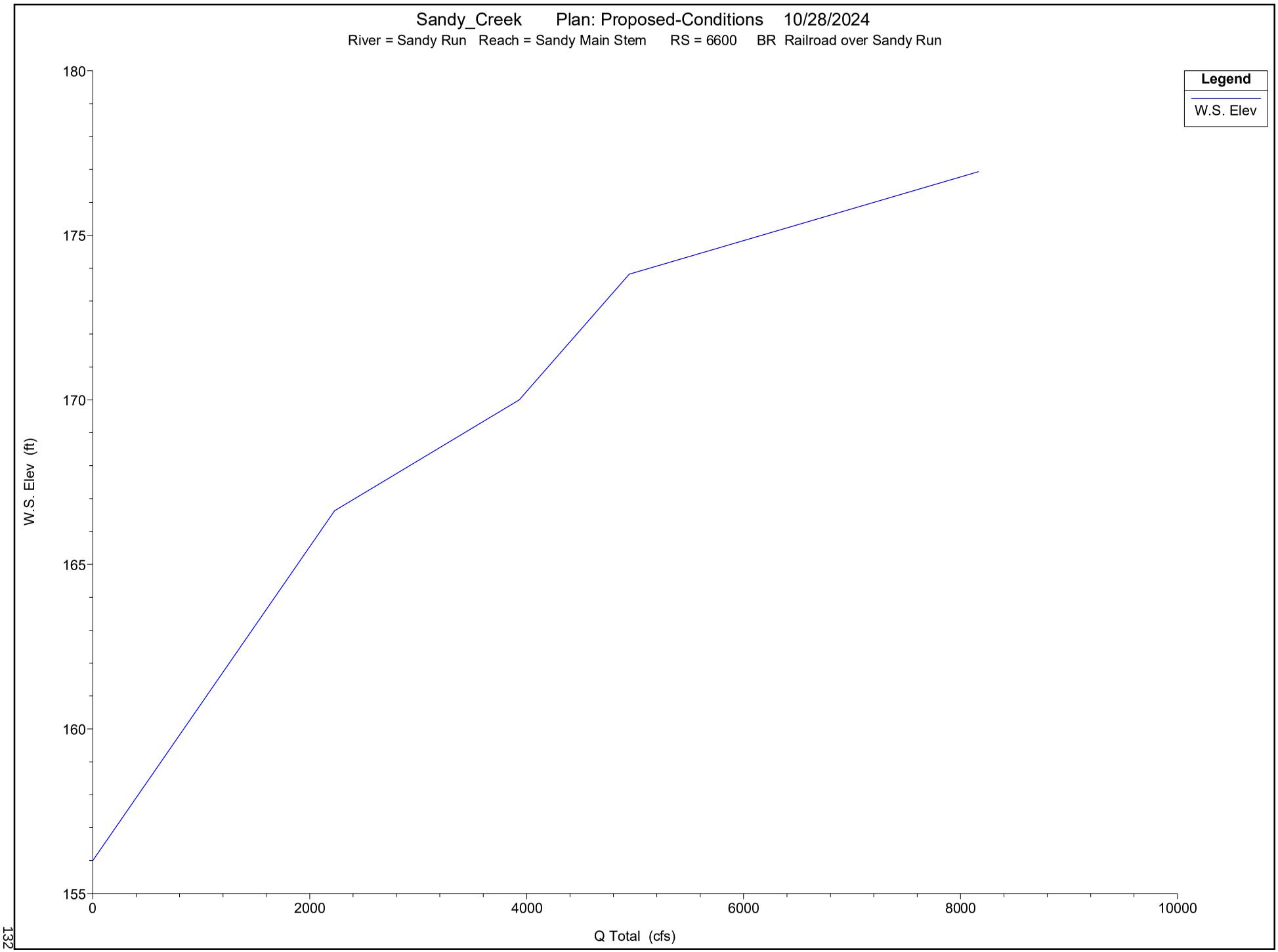
300
250
200
150
100
0
10000
20000
30000
40000
Main Channel Distance (ft)
Legend
EG 500-yr
EG 100-yr
WS 500-yr
Crit 500-yr
EG 50-yr
WS 100-yr
Crit 100-yr
EG 10-yr
Crit 50-yr
WS 50-yr
WS 10-yr
Crit 10-yr
Ground

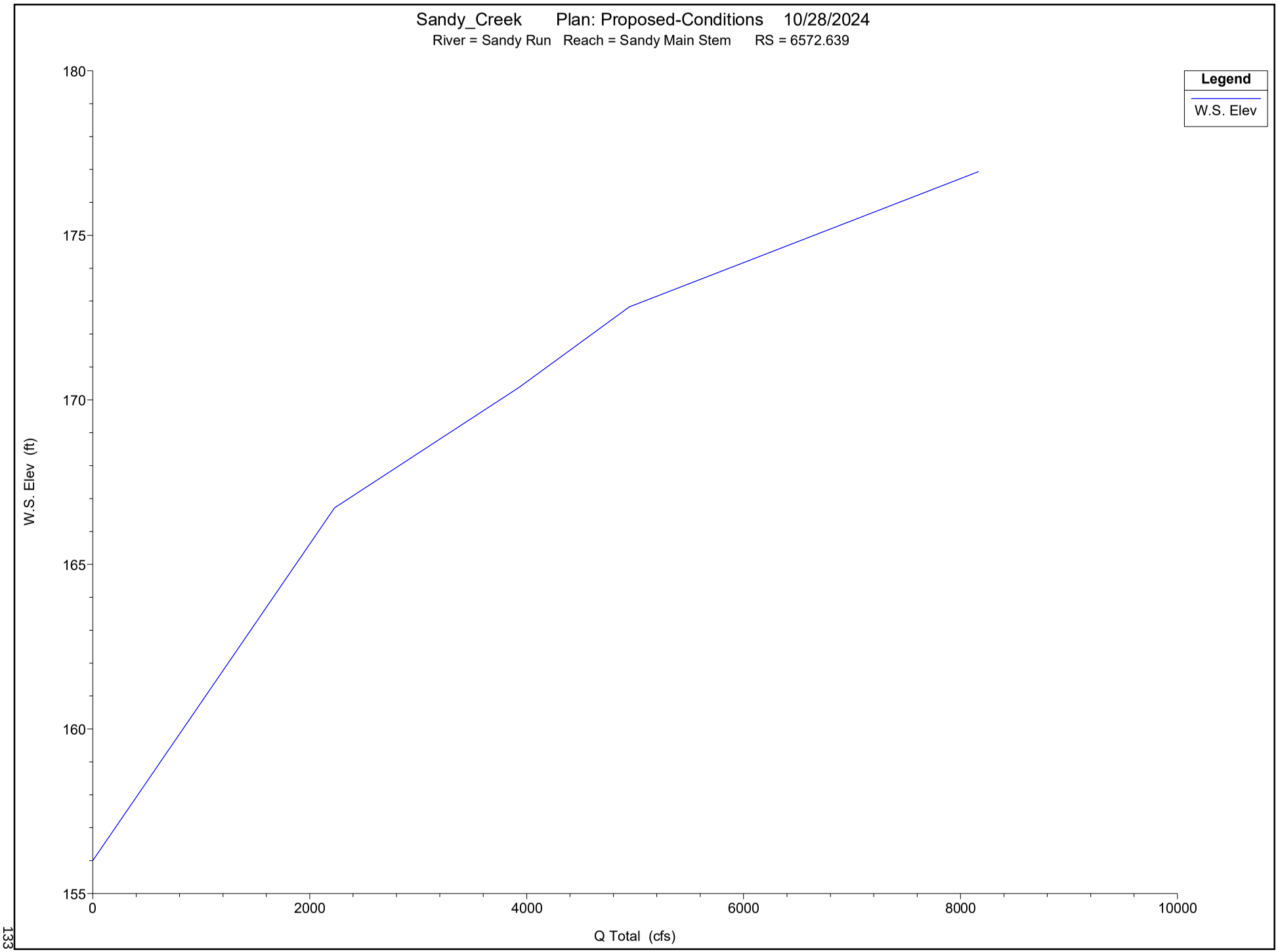

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
Sandy Run Sandy Main Stem
Legend
Vel Chnl 500-yr
Vel Chnl 100-yr
Vel Chnl 50-yr
Vel Chnl 10-yr
Vel Left 500-yr
Vel Left 100-yr
Vel Left 50-yr
Vel Right 500-yr
Vel Left 10-yr
Vel Right 100-yr
Vel Right 50-yr
Vel Right 10-yr
Vel Left (ft/s), Vel Chnl (ft/s), Vel Right (ft/s)
Main Channel Distance (ft)
0
2
4
6
8
10
12
14
16
18
0
10000
20000
30000
40000

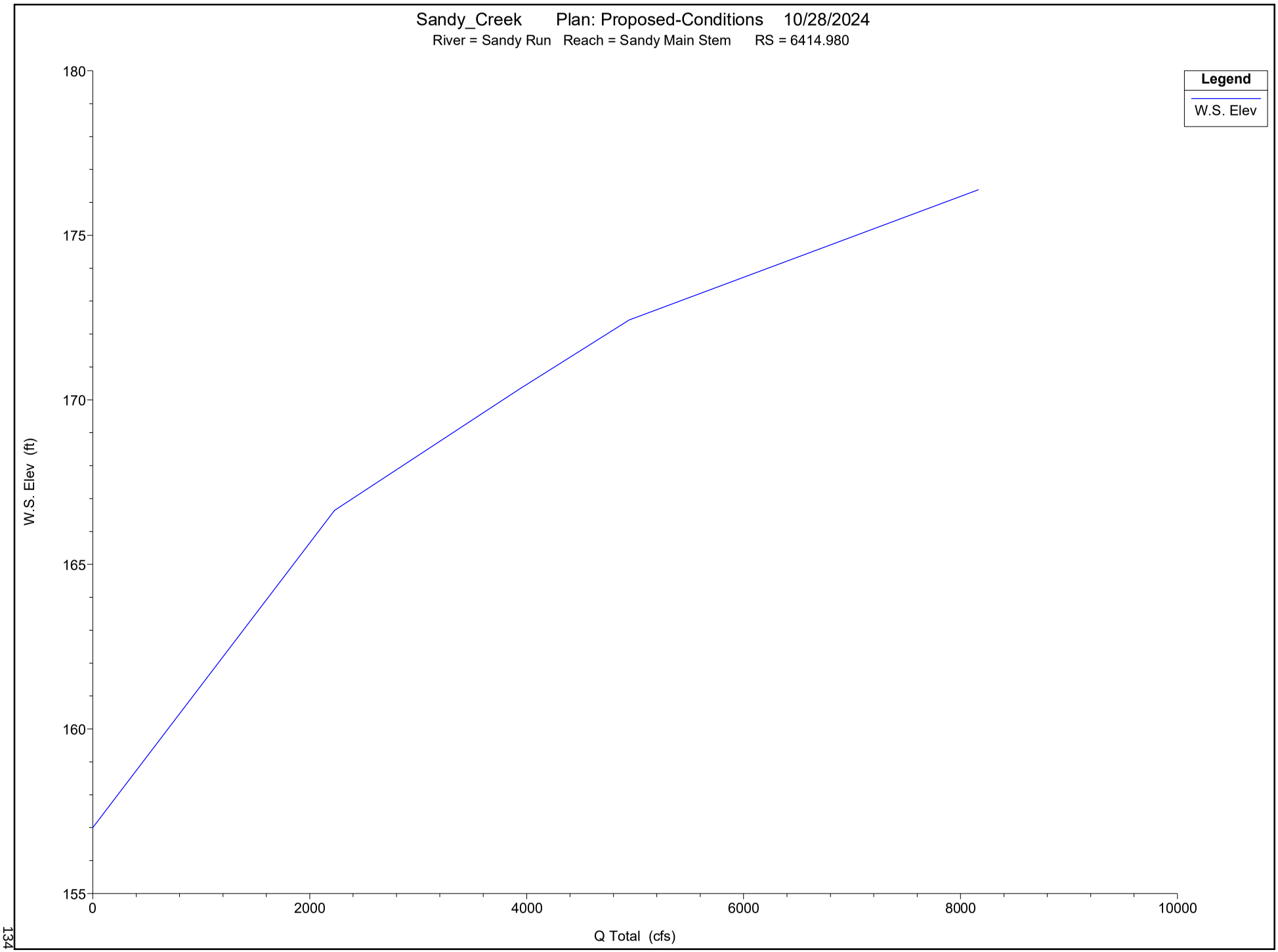

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6709.658
Legend
W.S. Elev
W.S. Elev (ft)
180
175
170
165
160
155
0
2000
4000
6000
8000
10000
Q Total (cfs)

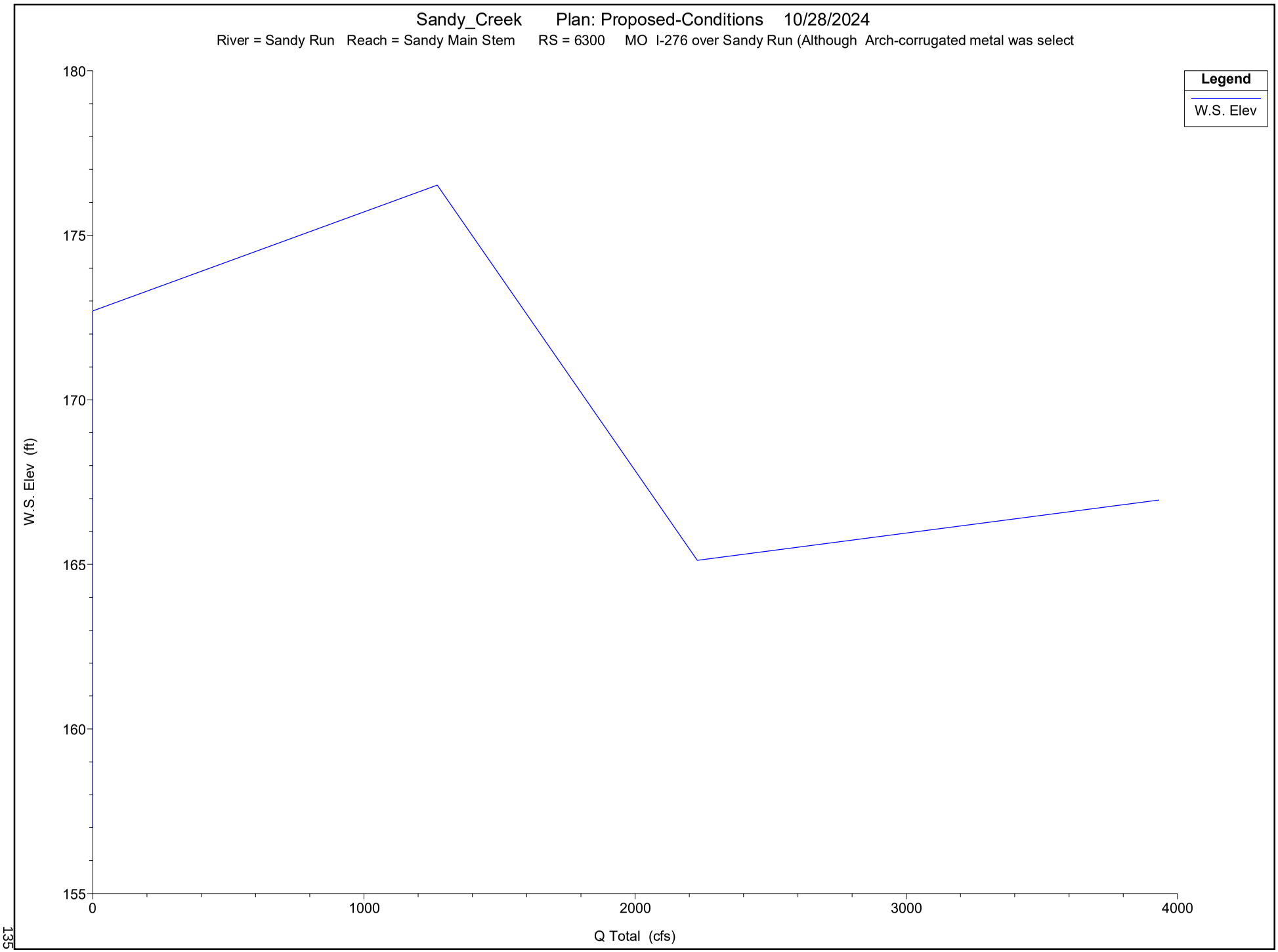

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6668.160
Legend
W.S. Elev
W.S. Elev (ft)
180
175
170
165
160
155
0
2000
4000
6000
8000
10000
Q Total (cfs)

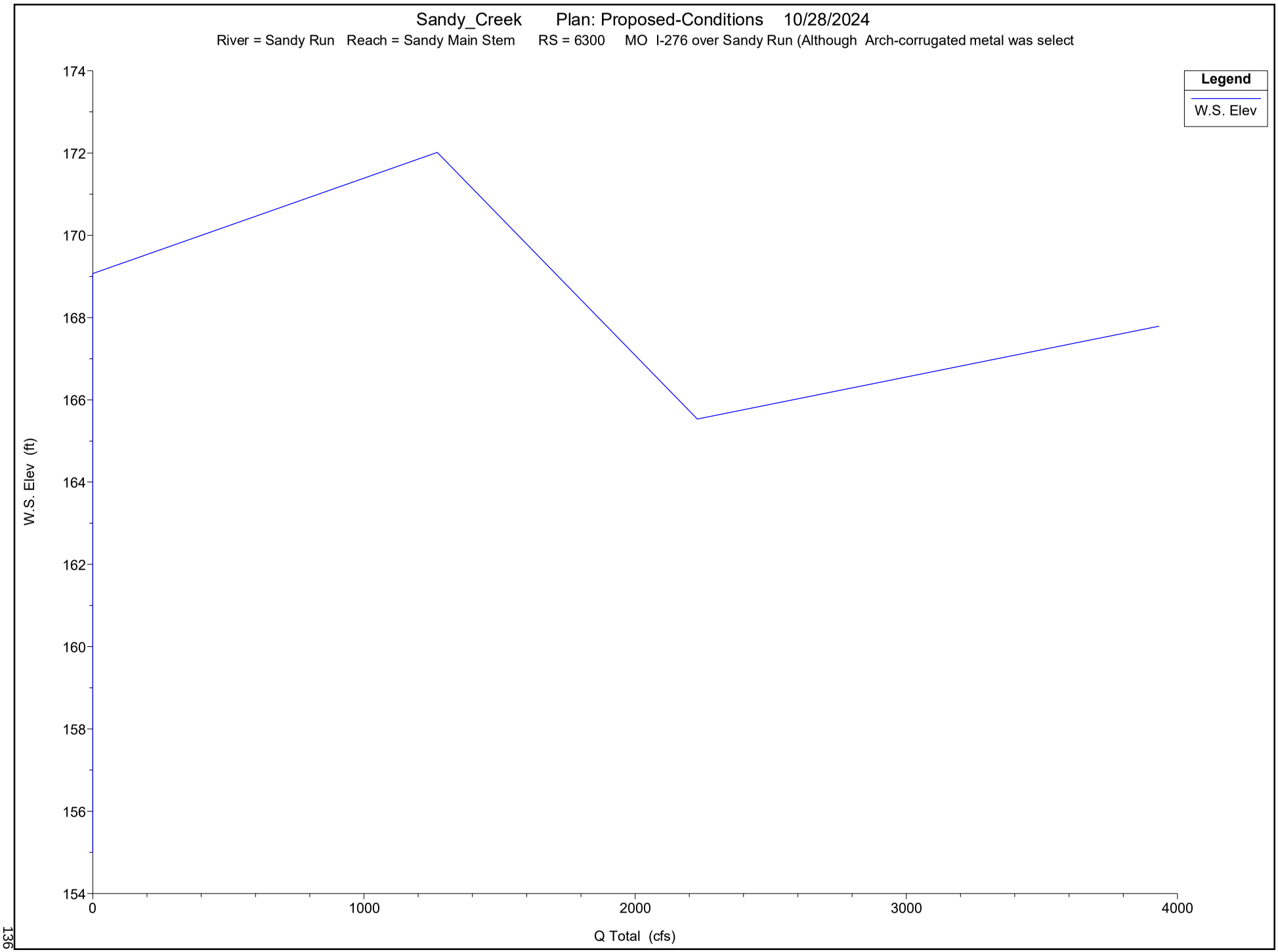

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6600 BR Railroad over Sandy Run
Legend
W.S. Elev
W.S. Elev (ft)
180
175
170
165
160
155
0
2000
4000
6000
8000
10000
Q Total (cfs)

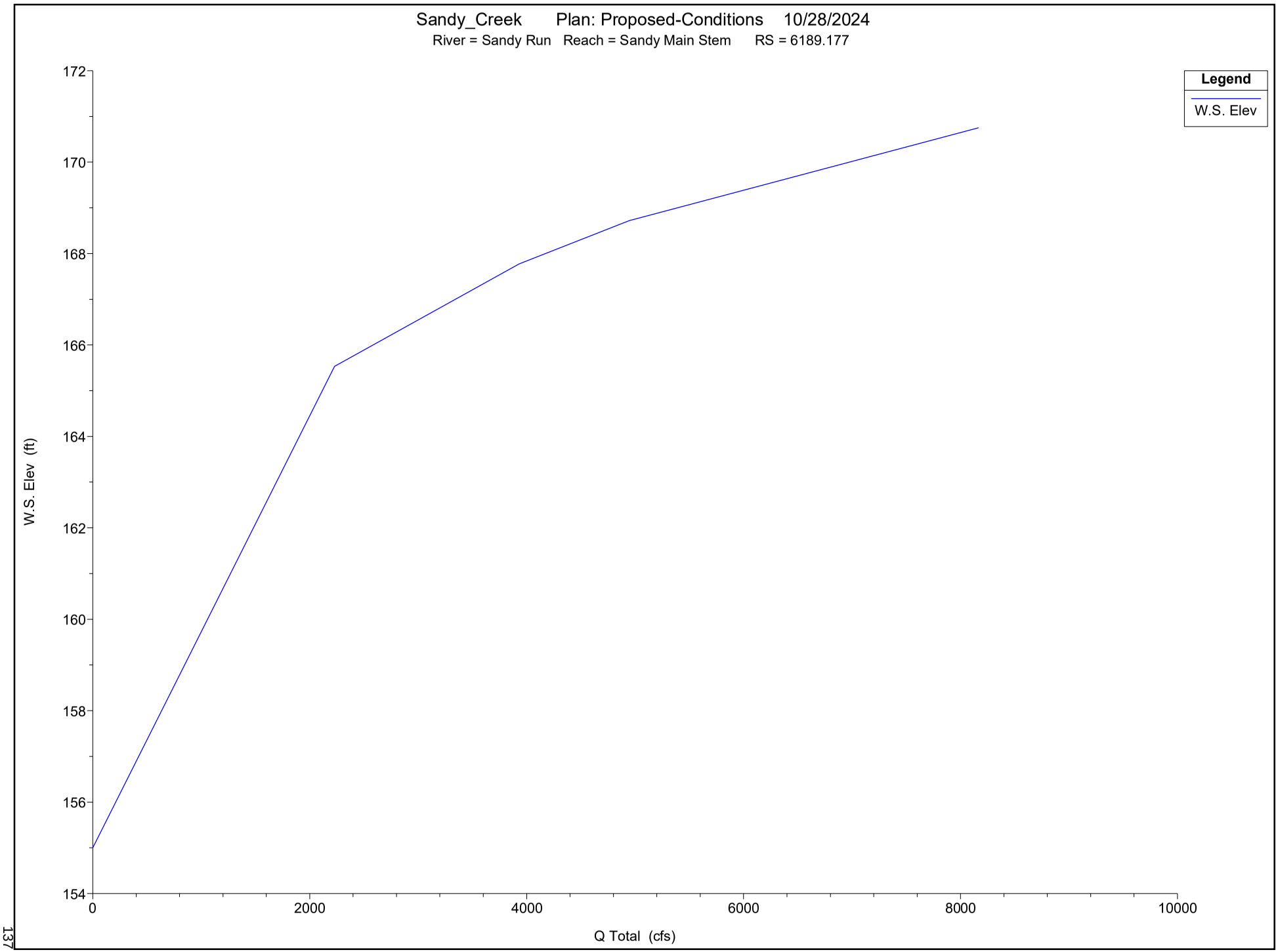

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6600 BR Railroad over Sandy Run
Legend
W.S. Elev
W.S. Elev (ft)
180
175
170
165
160
155
0
2000
4000
6000
8000
10000
Q Total (cfs)

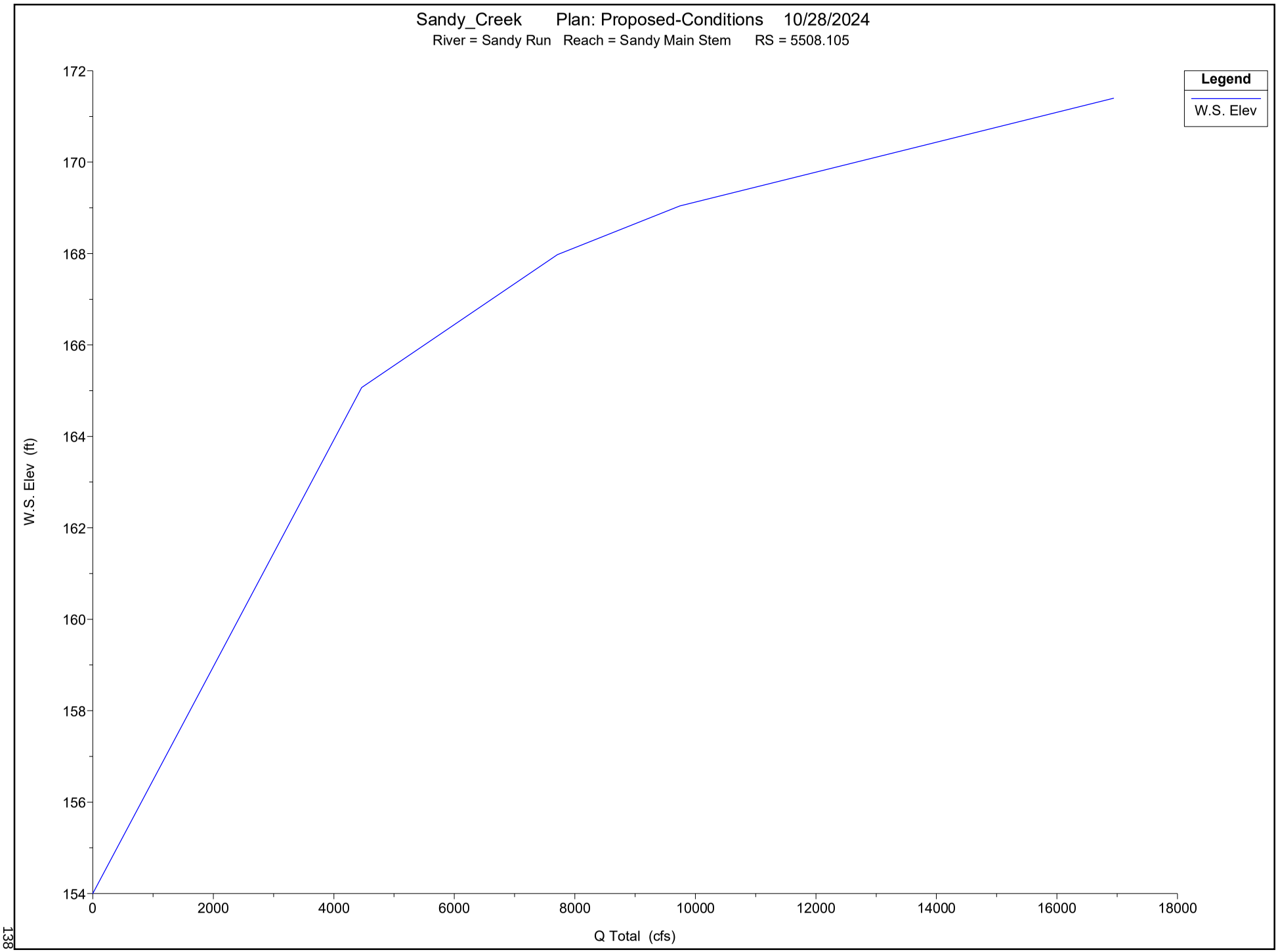

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6572.639
Legend
W.S. Elev
180
175
170
165
160
155
W.S. Elev (ft)
0
2000
4000
6000
8000
10000
Q Total (cfs)

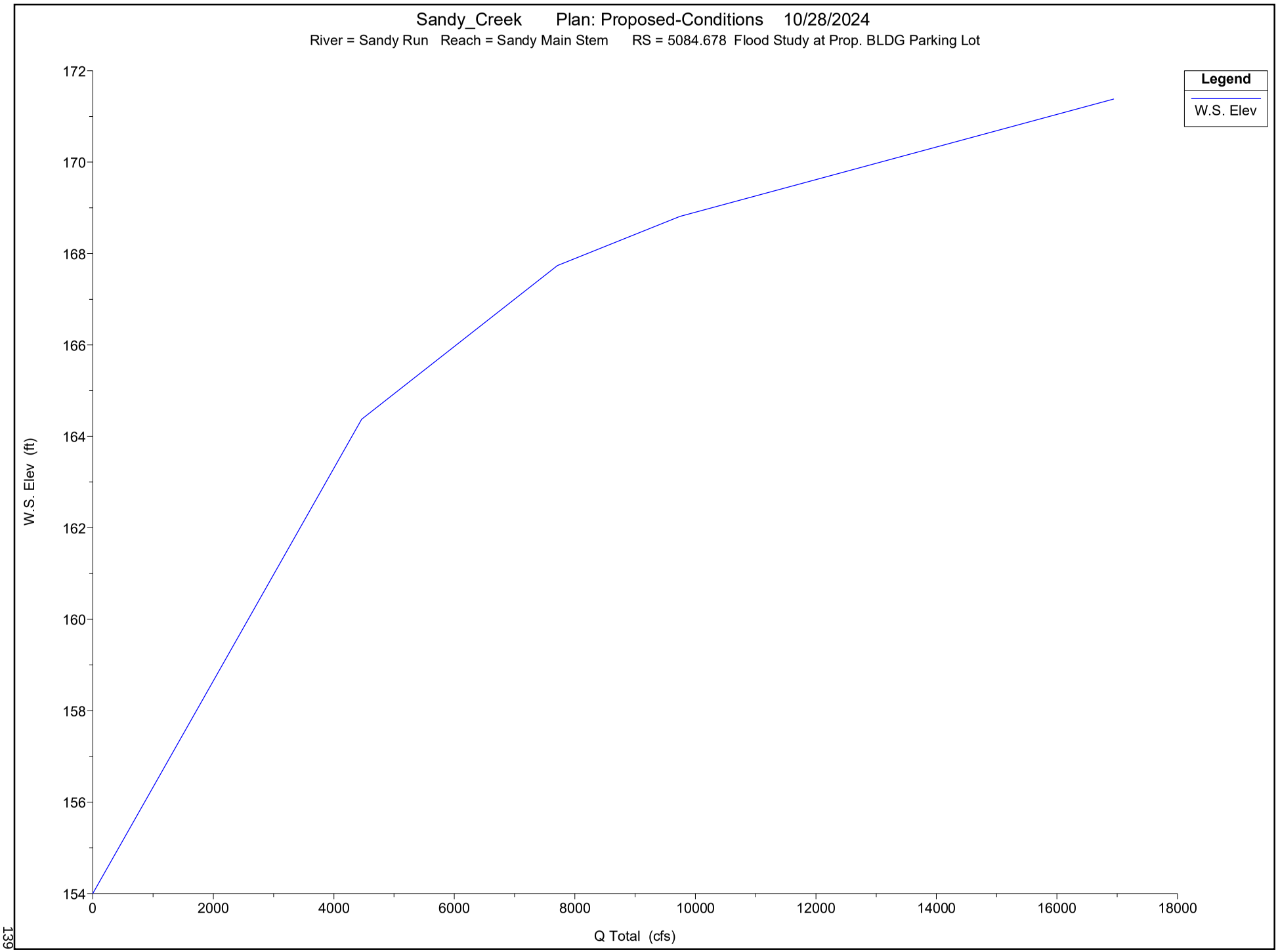

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6414.980
Legend
W.S. Elev
W.S. Elev (ft)
Q Total (cfs)
180
175
170
165
160
155
0
2000
4000
6000
8000
10000

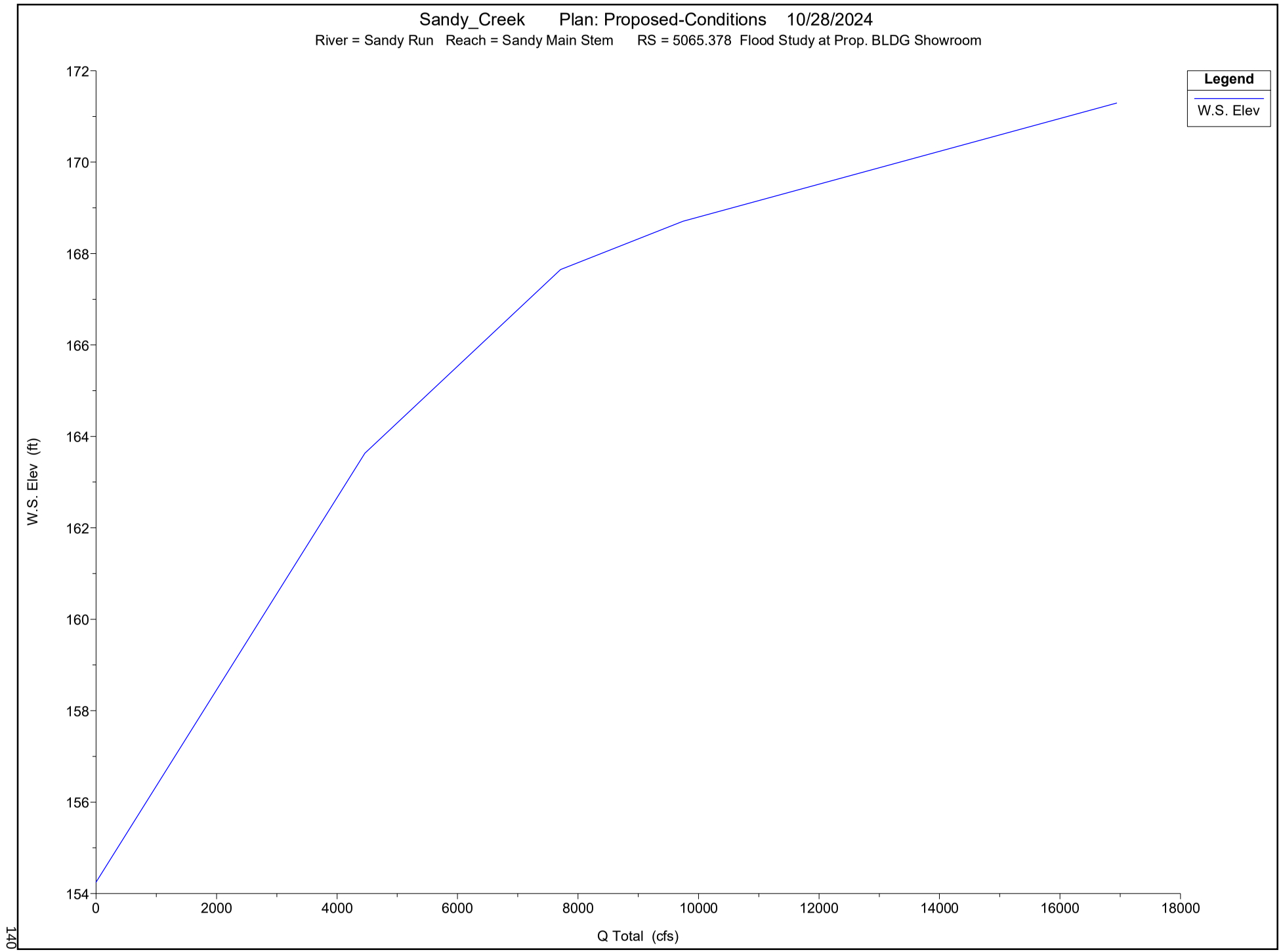

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6300 MO I-276 over Sandy Run (Although Arch-corrugated metal was select
Legend
W.S. Elev
W.S. Elev (ft)
180
175
170
165
160
155
0
1000
2000
3000
4000
Q Total (cfs)

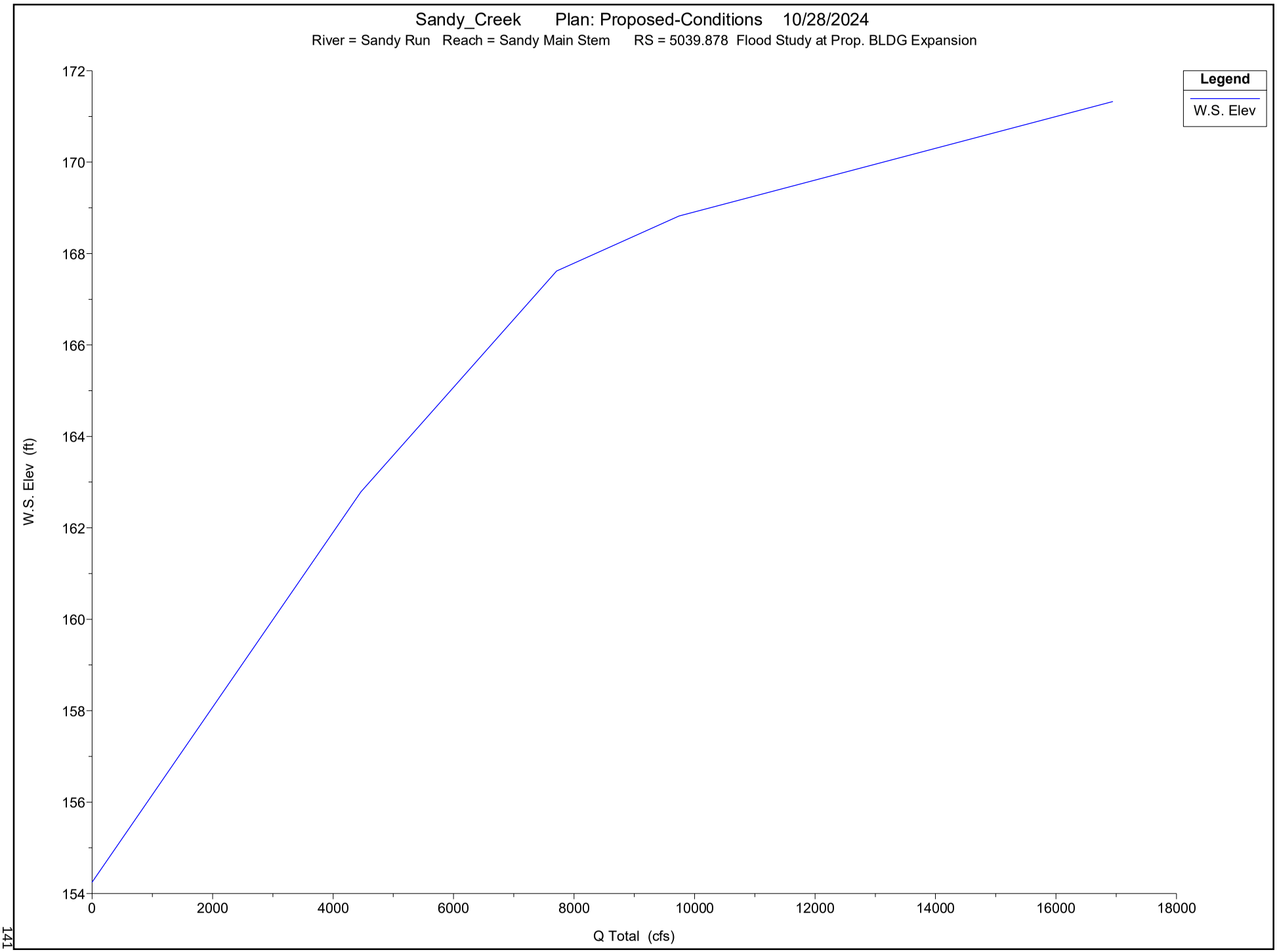

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6300 MO I-276 over Sandy Run (Although Arch-corrugated metal was select
Legend
W.S. Elev
W.S. Elev (ft)
174
172
170
168
166
164
162
160
158
156
154
0
1000
2000
3000
4000
Q Total (cfs)

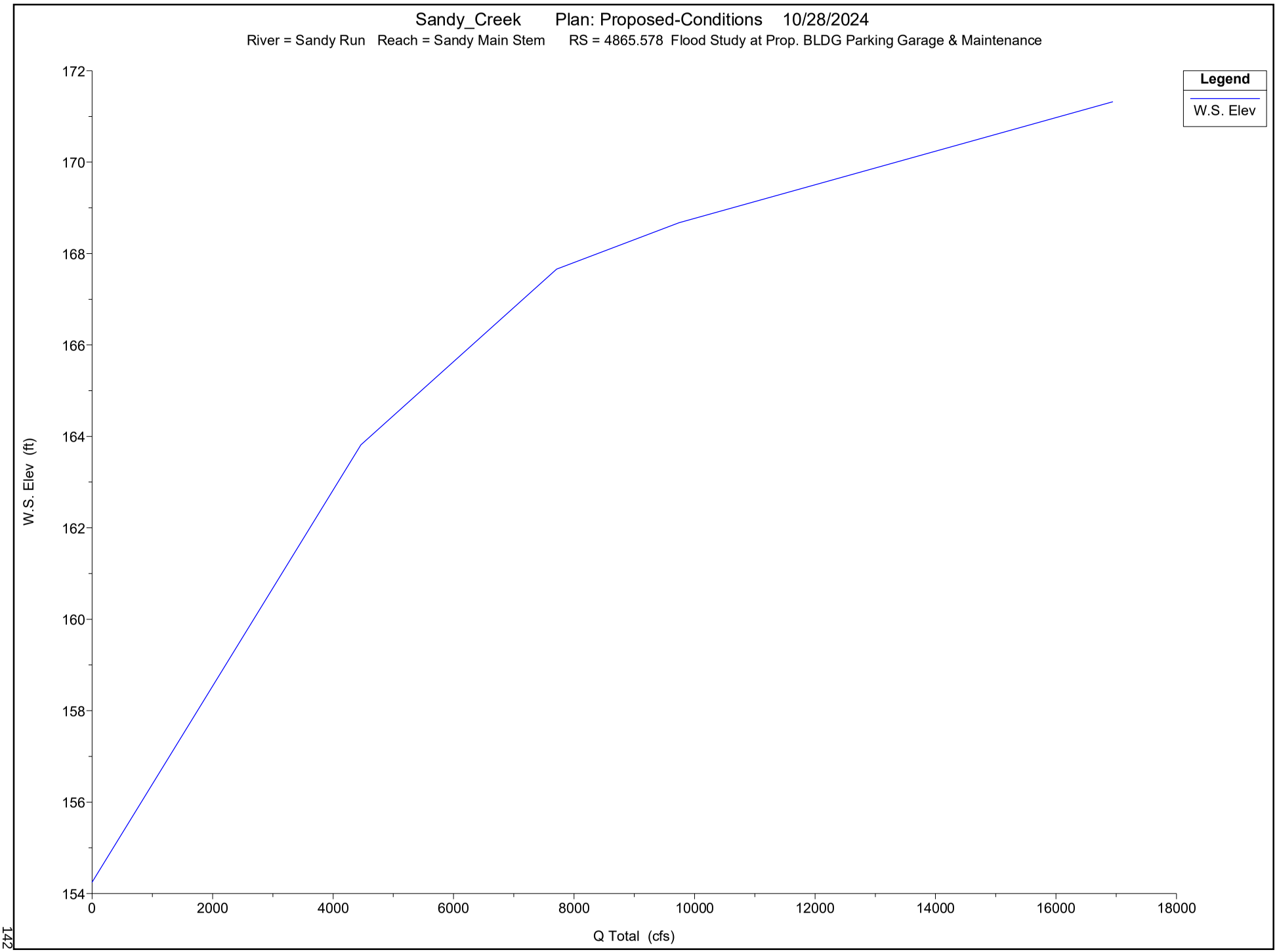

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6189.177
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
Q Total (cfs)

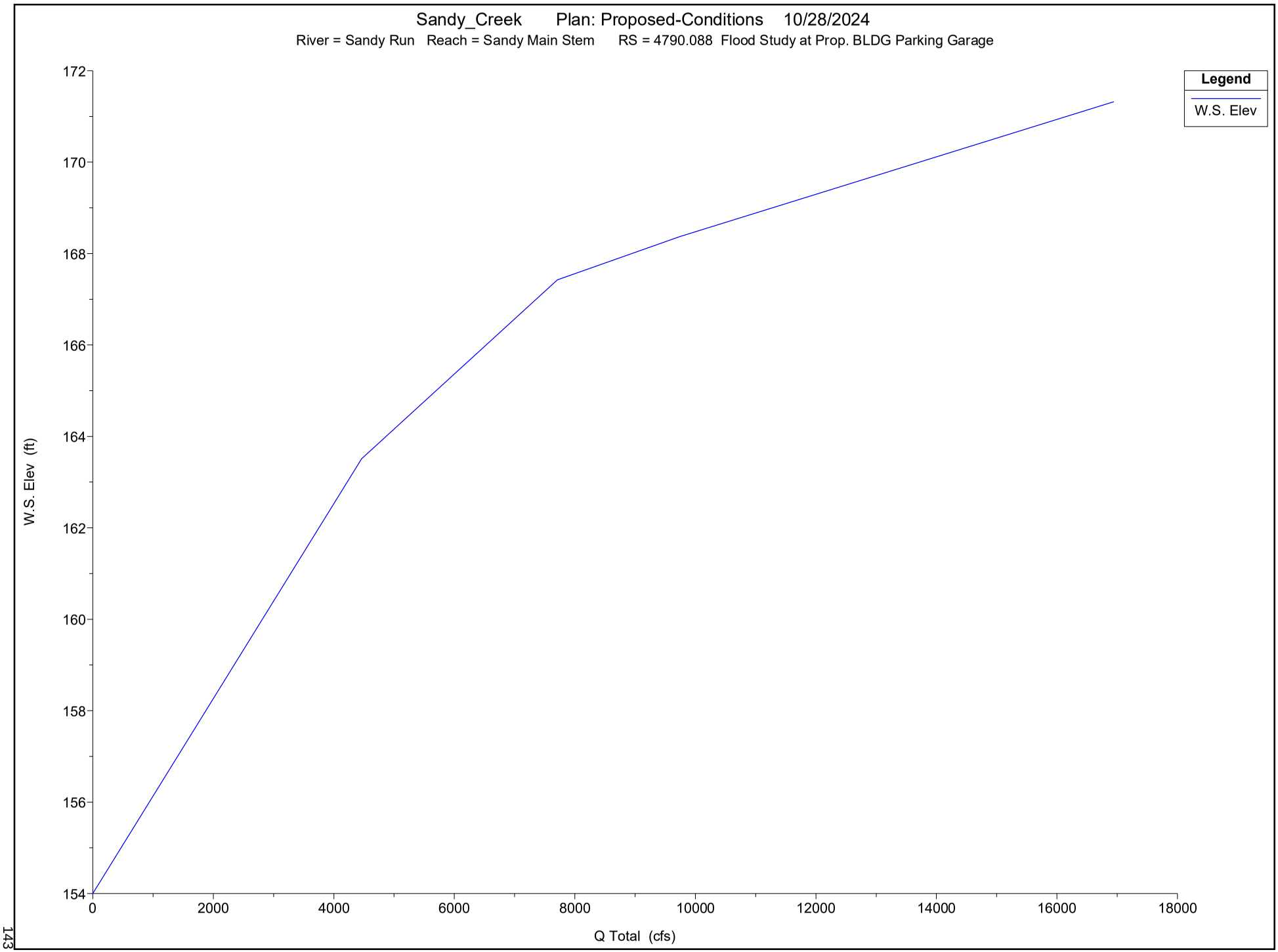

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 5508.105
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

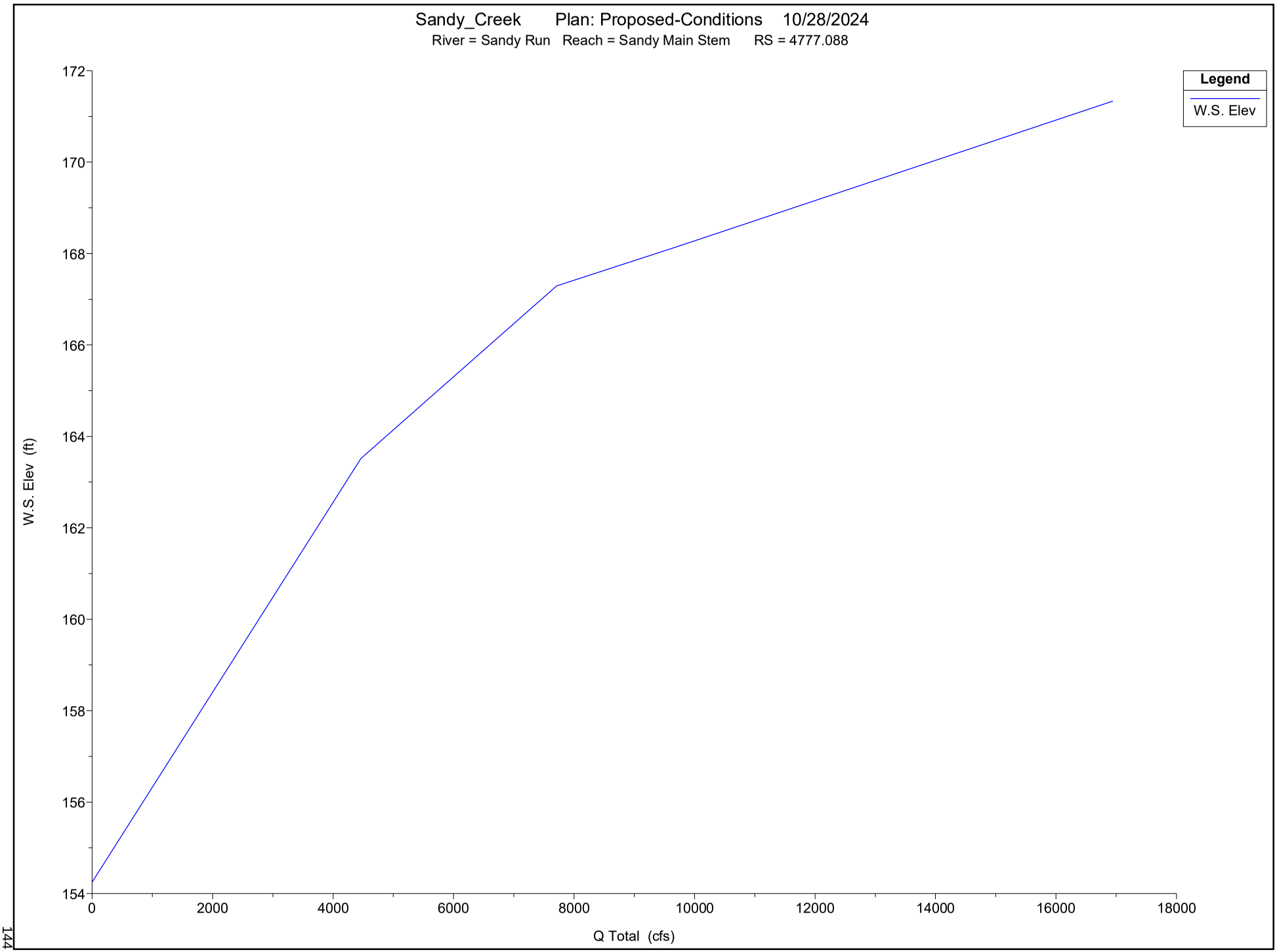

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 5084.678 Flood Study at Prop. BLDG Parking Lot
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

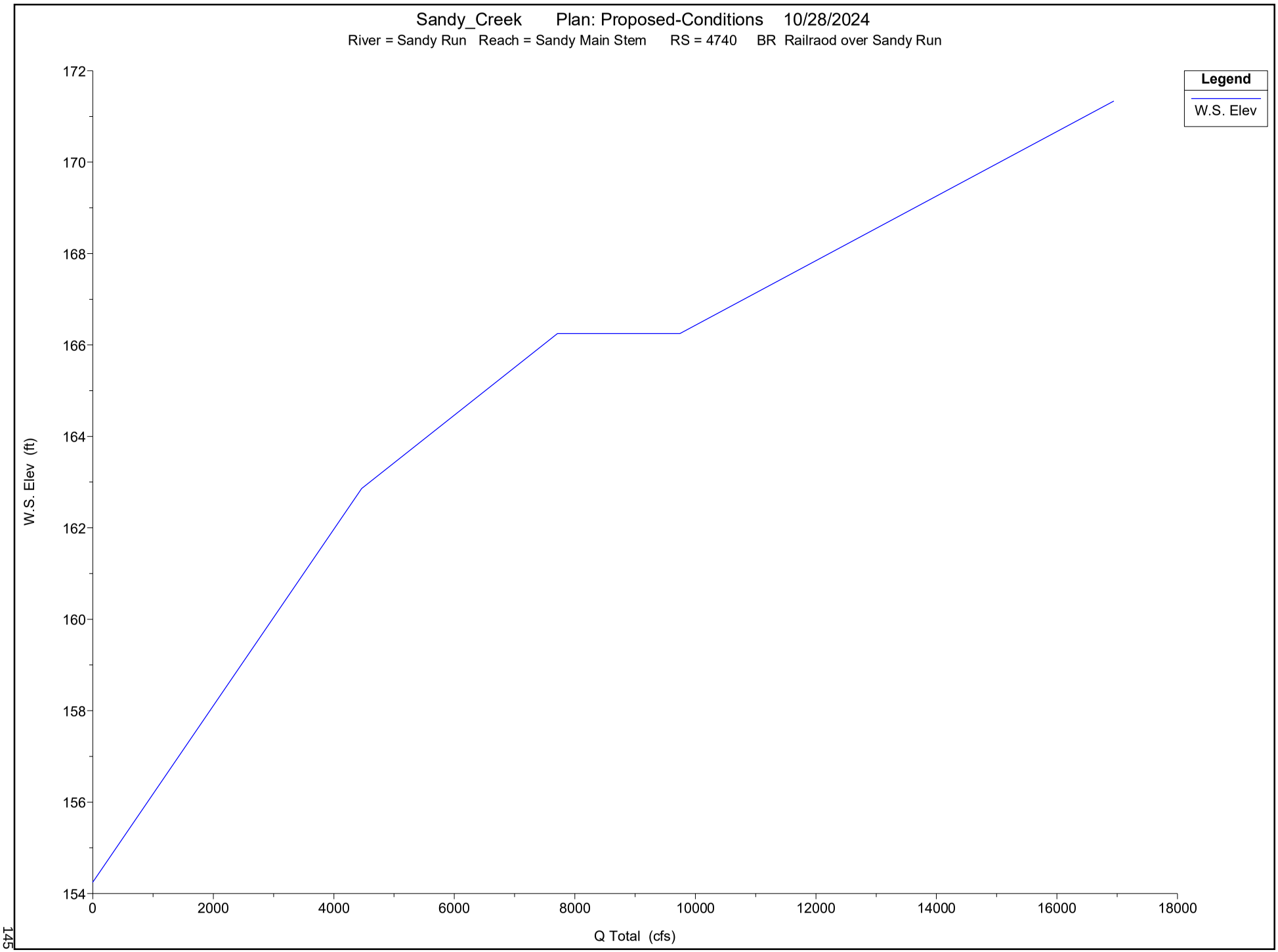

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 5065.378 Flood Study at Prop. BLDG Showroom
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

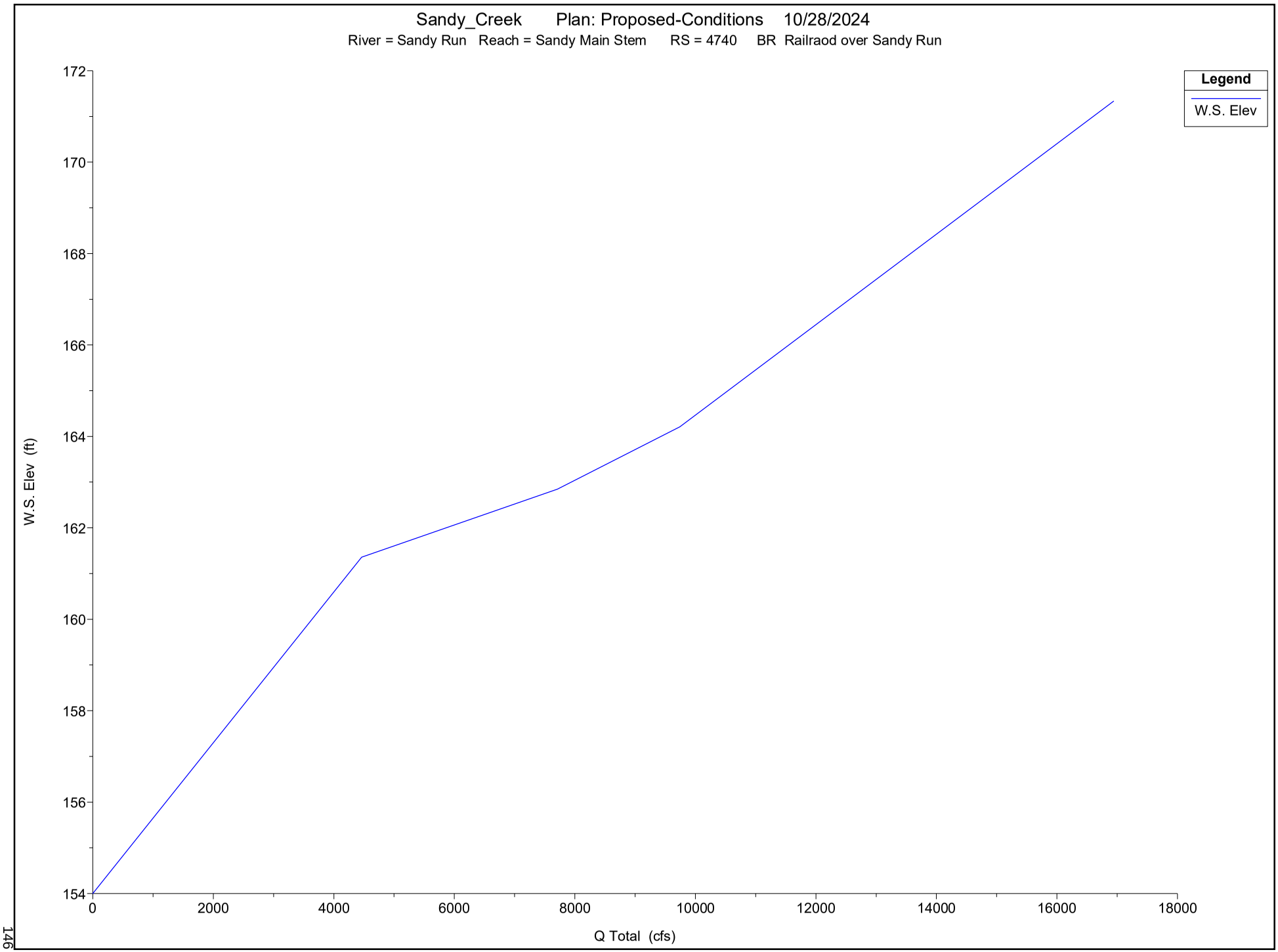

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 5039.878 Flood Study at Prop. BLDG Expansion
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

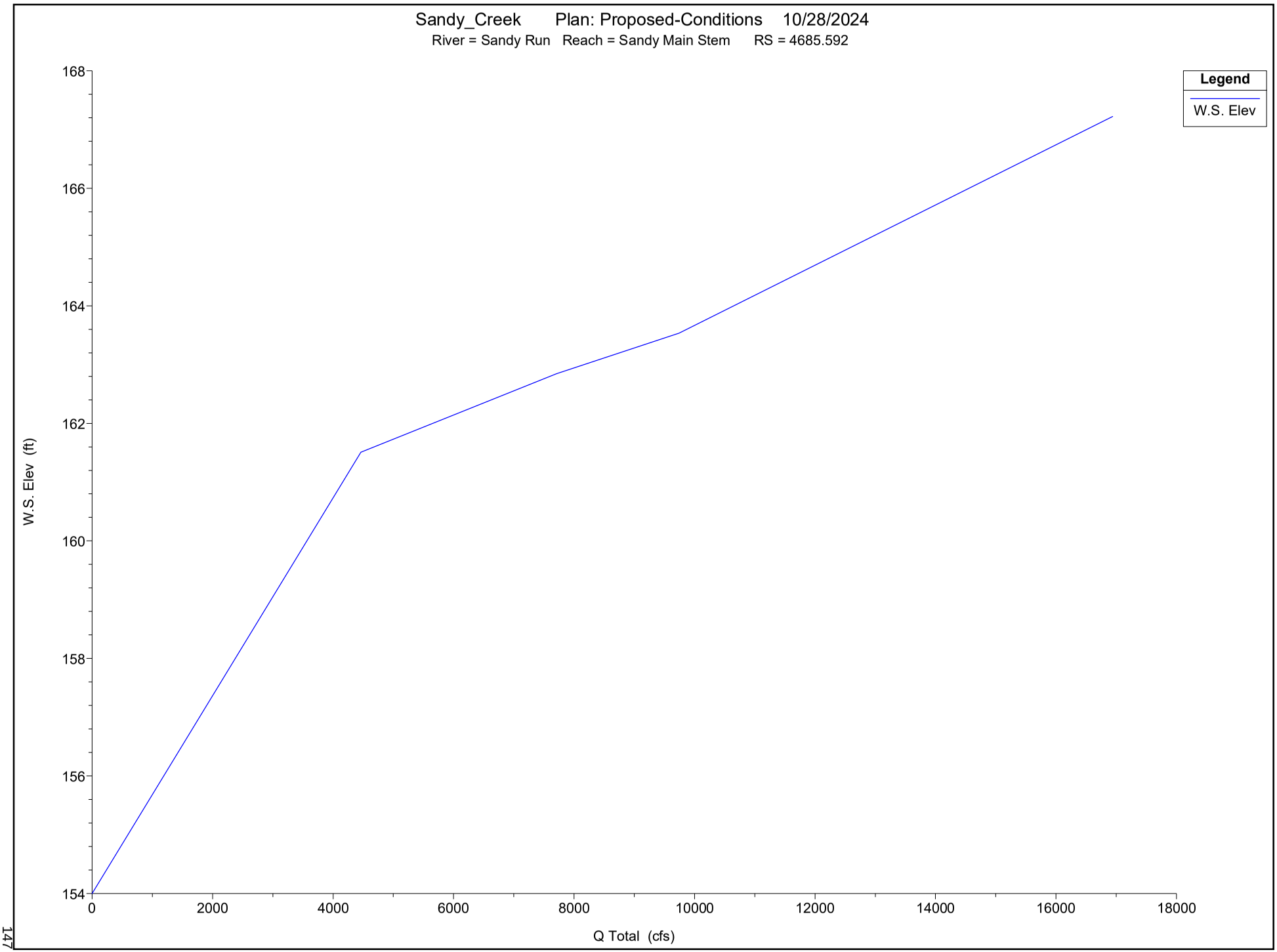

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4865.578 Flood Study at Prop. BLDG Parking Garage & Maintenance
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

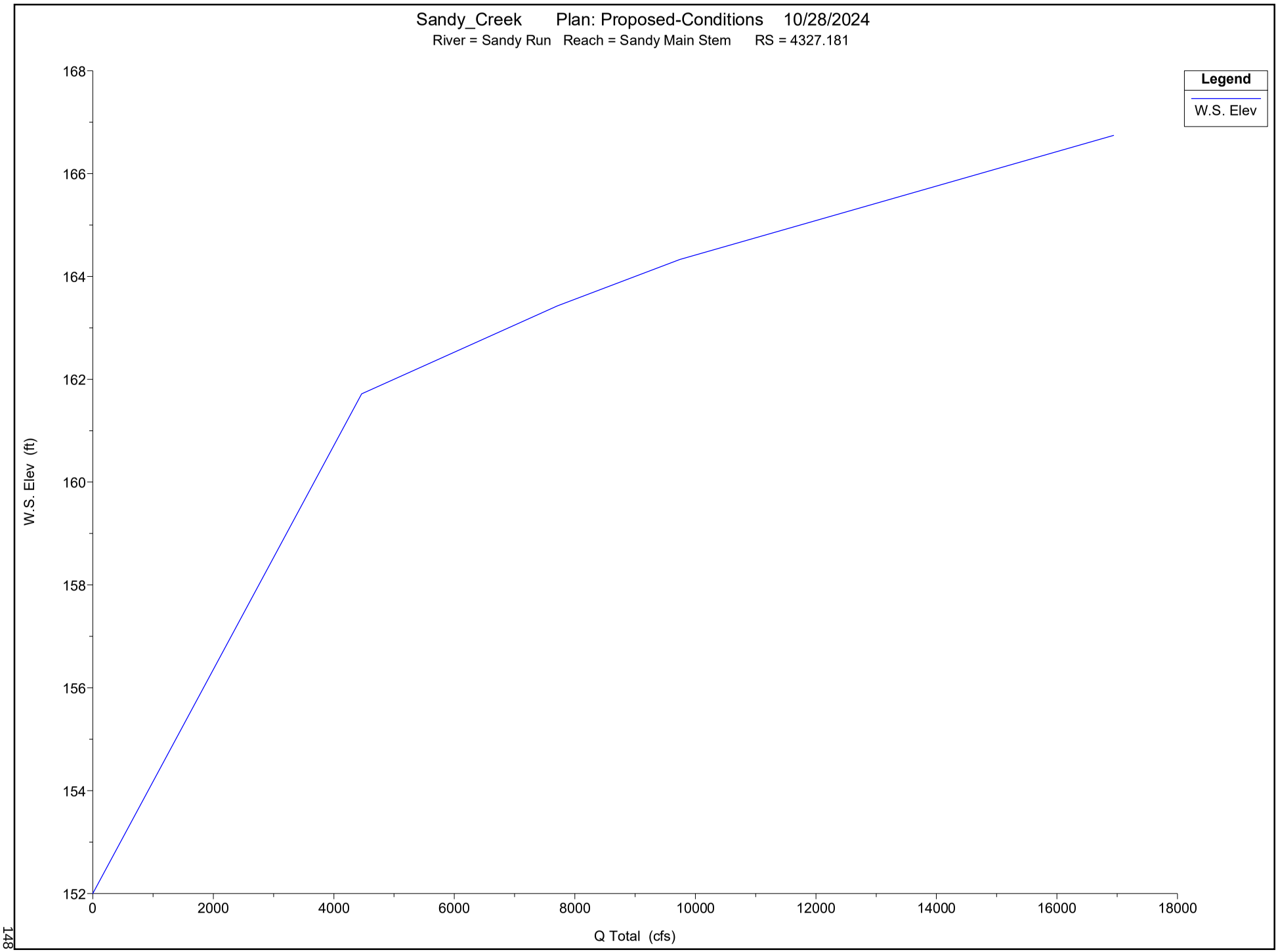

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4790.088 Flood Study at Prop. BLDG Parking Garage
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

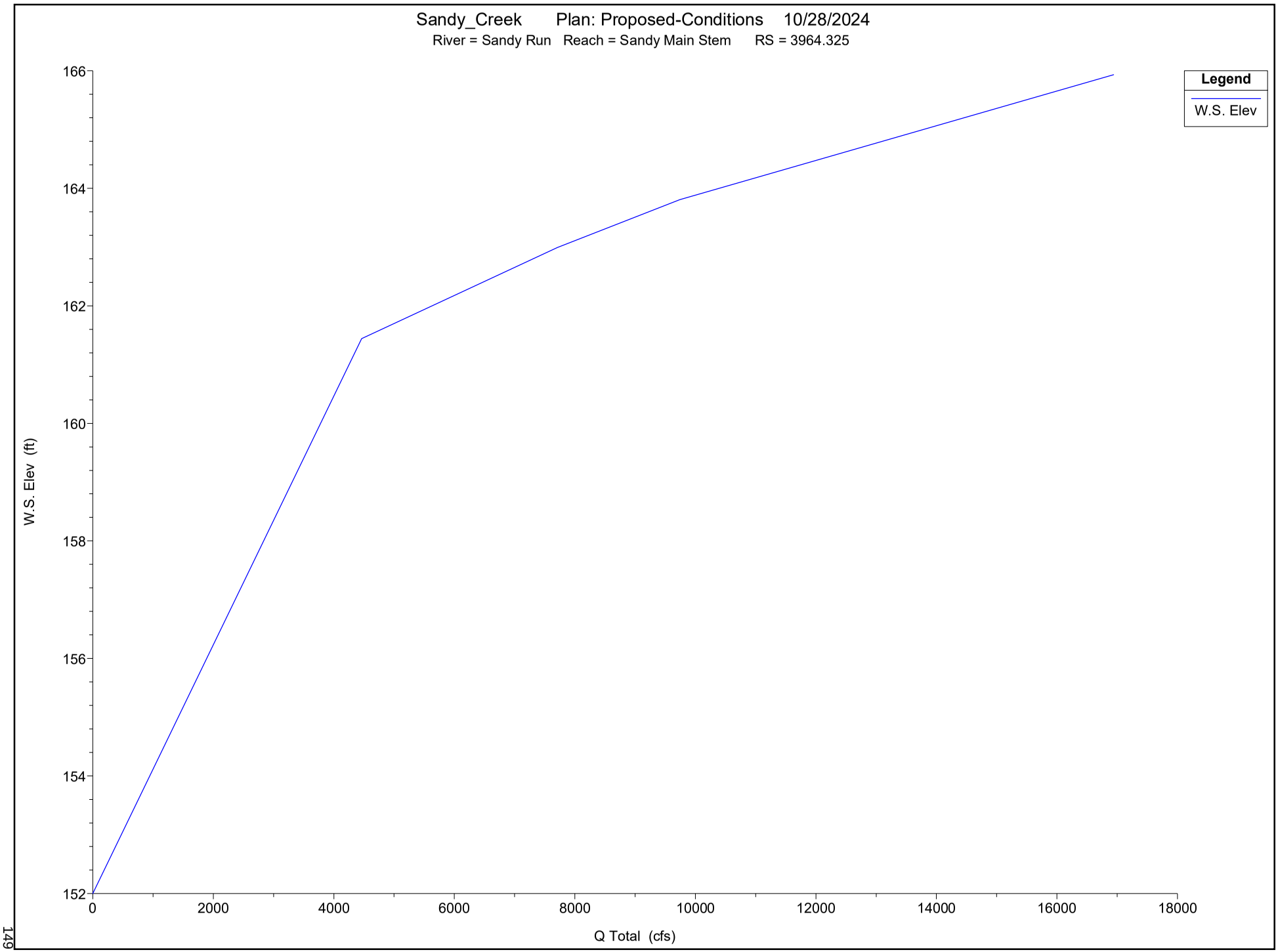

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4777.088
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

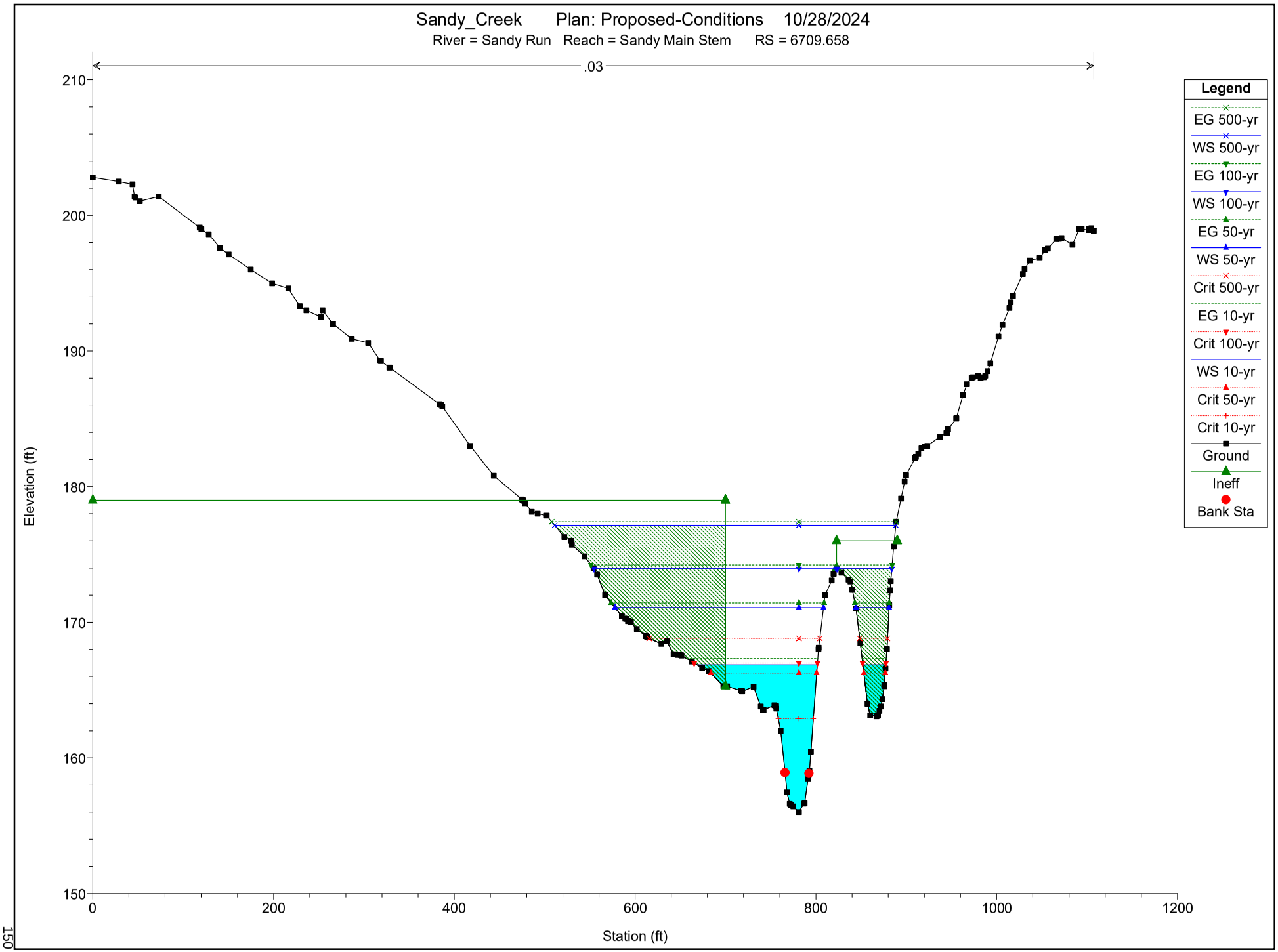

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4740 BR Railraod over Sandy Run
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

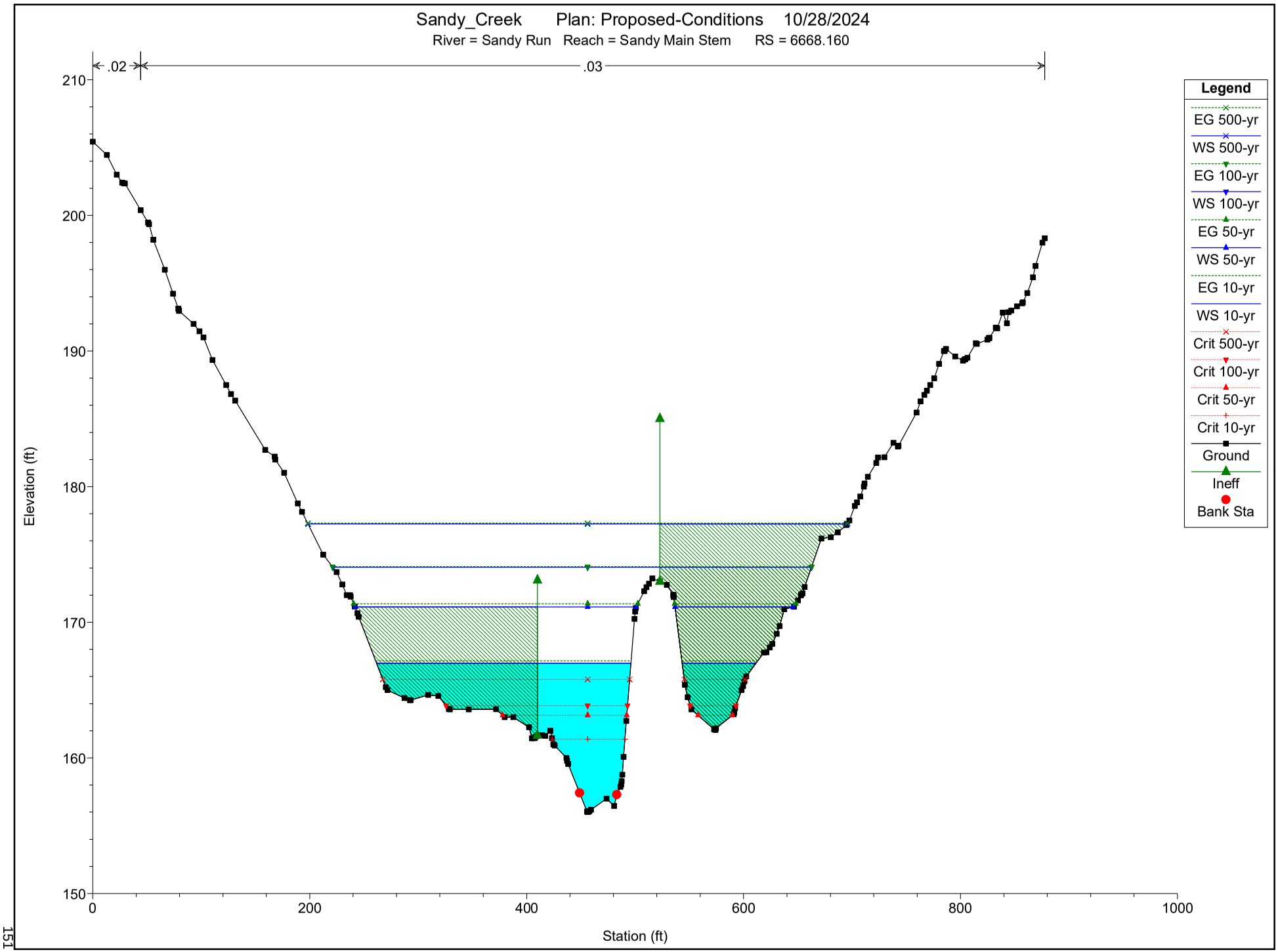

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4740 BR Railraod over Sandy Run
Legend
W.S. Elev
W.S. Elev (ft)
172
170
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

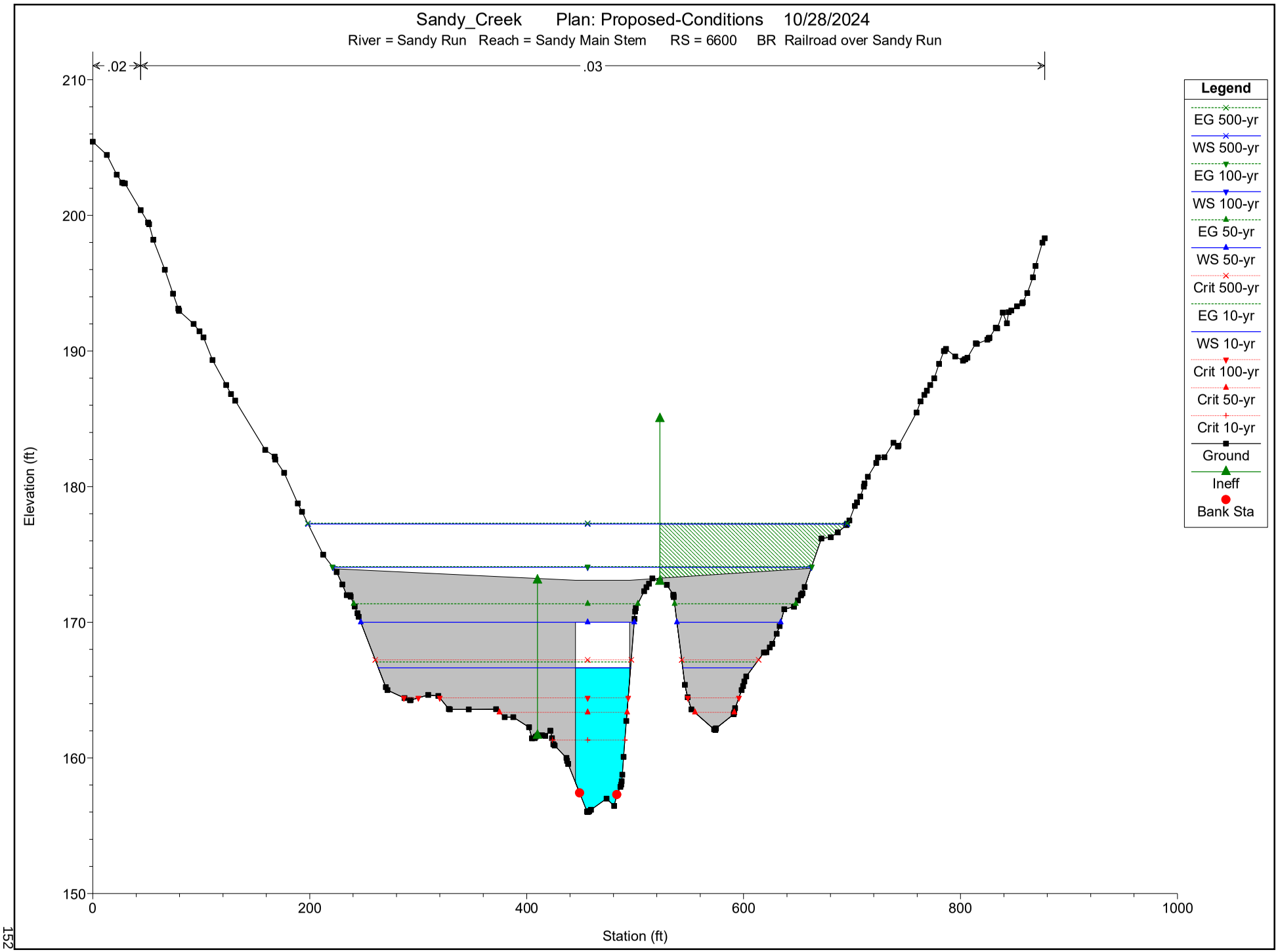

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4685.592
Legend
W.S. Elev
W.S. Elev (ft)
168
166
164
162
160
158
156
154
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

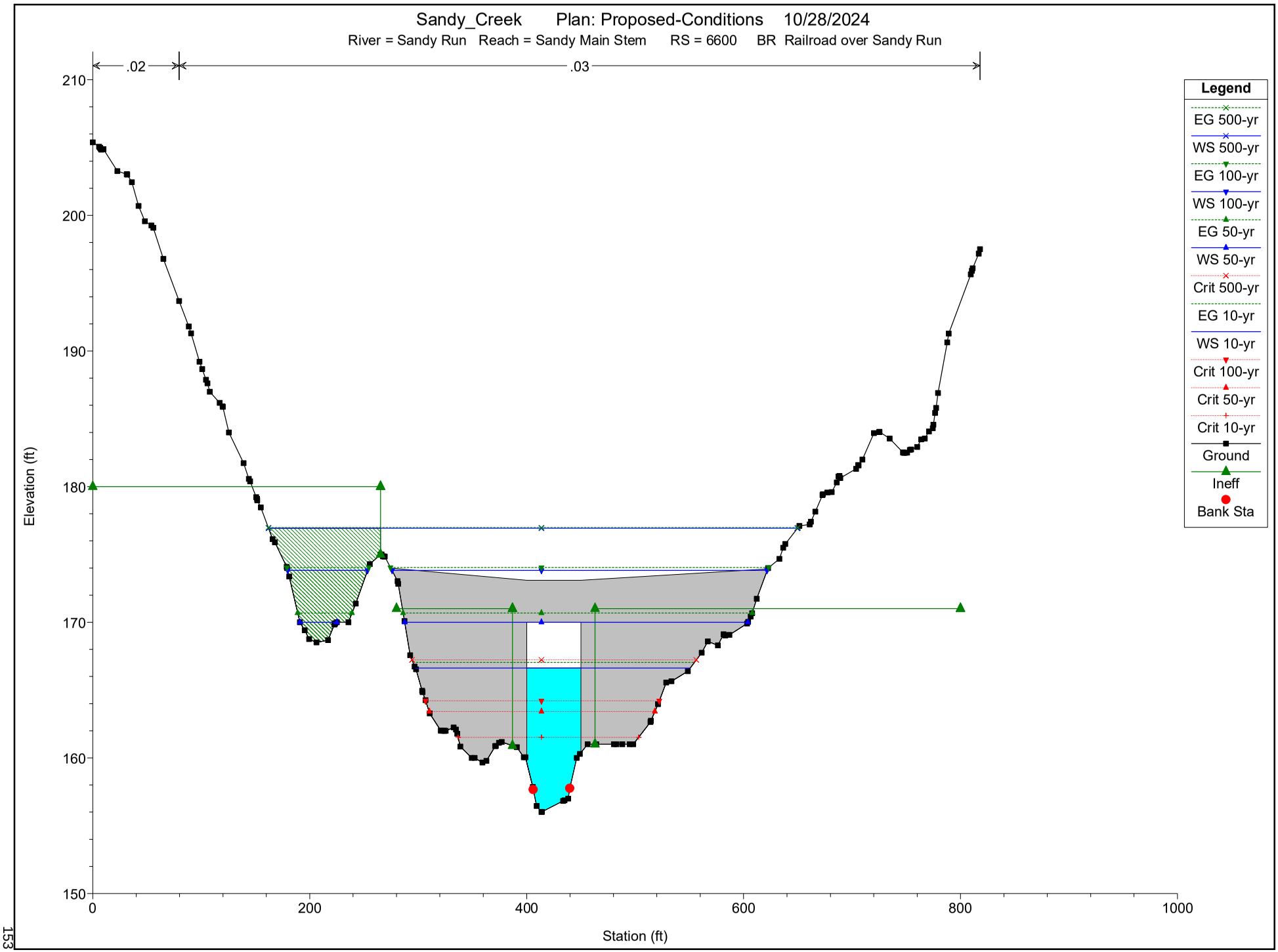

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4327.181
Legend
W.S. Elev
W.S. Elev (ft)
168
166
164
162
160
158
156
154
152
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

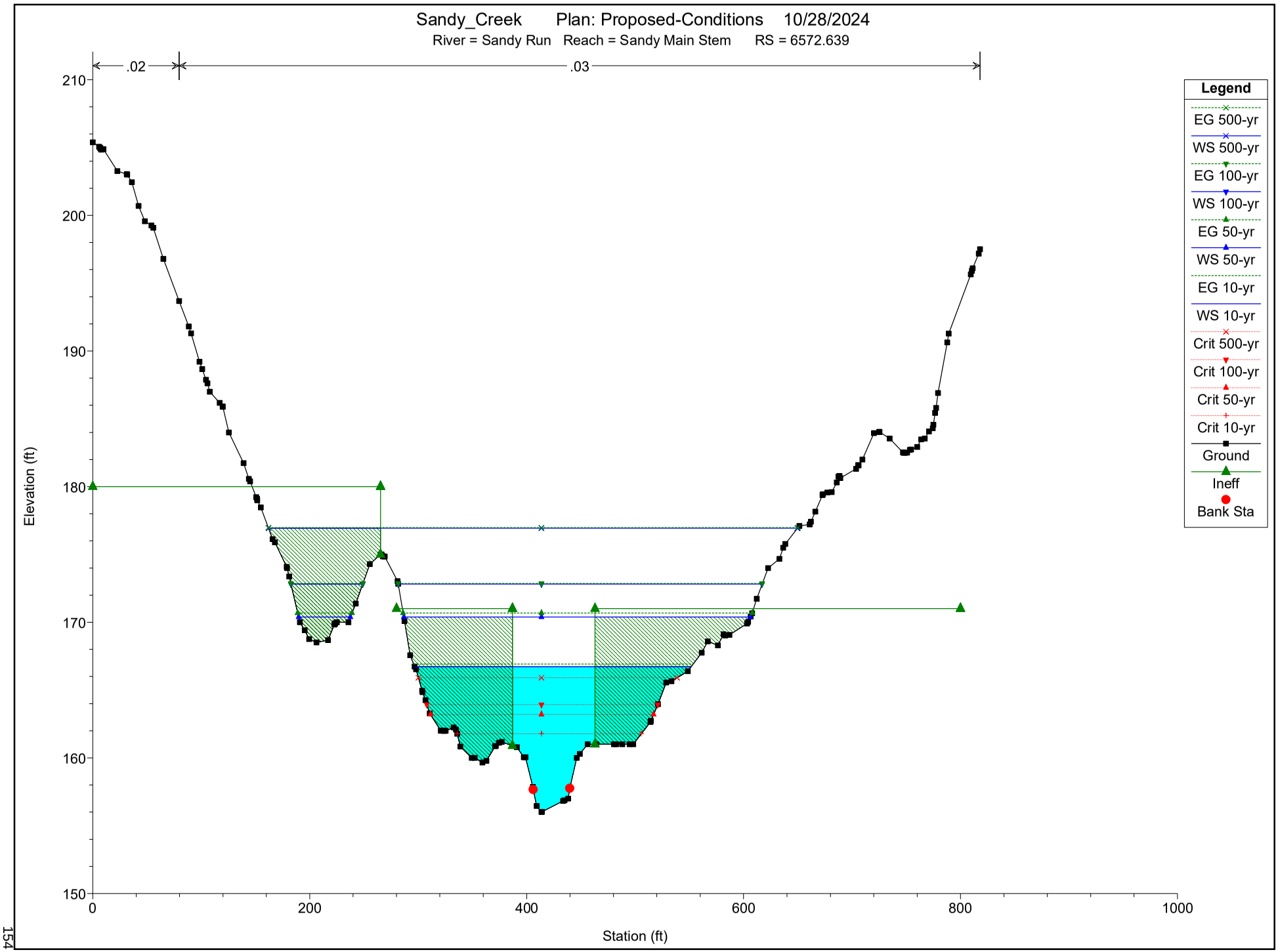

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 3964.325
Legend
W.S. Elev
W.S. Elev (ft)
166
164
162
160
158
156
154
152
0
2000
4000
6000
8000
10000
12000
14000
16000
18000
Q Total (cfs)

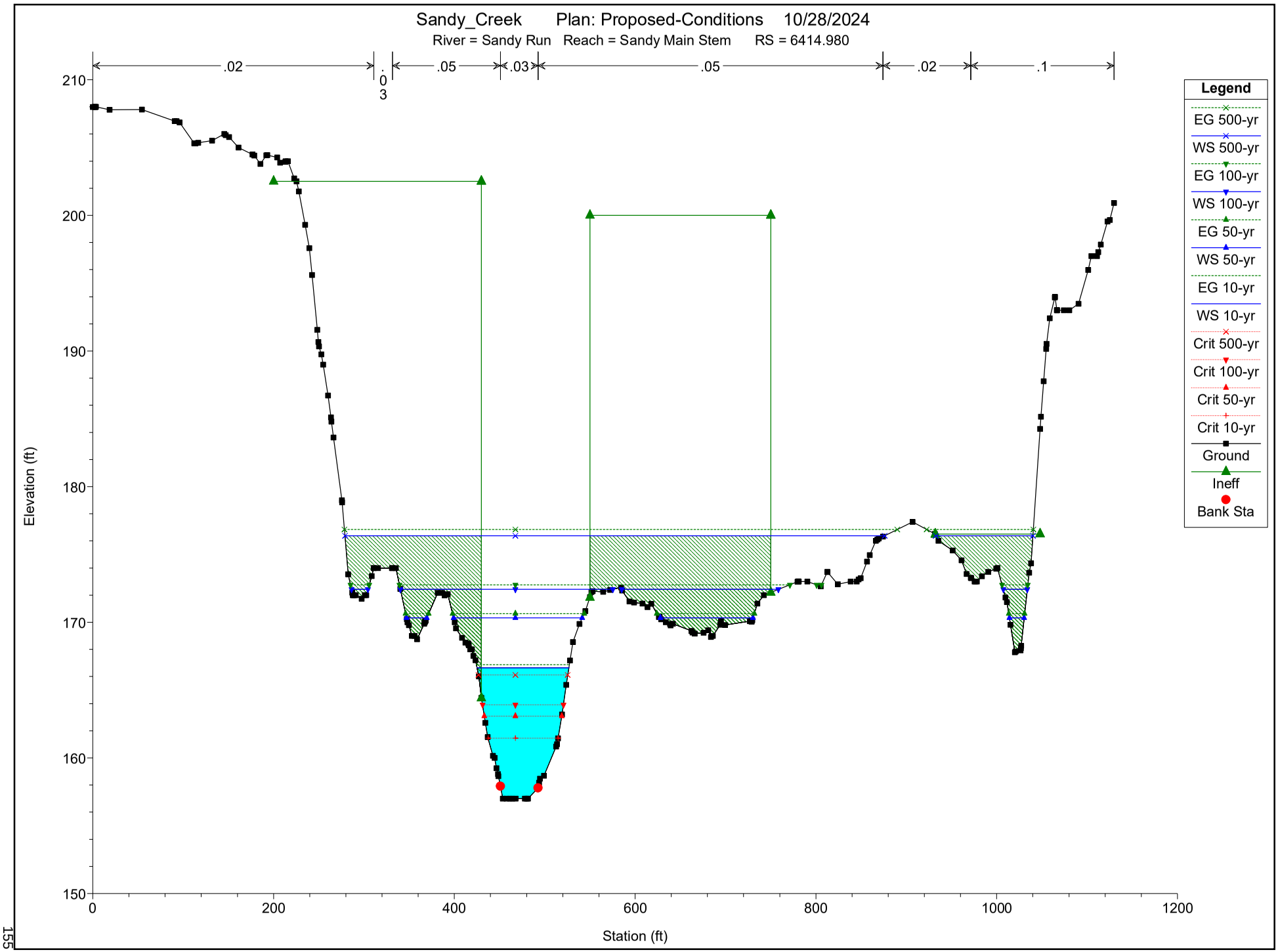

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6709.658
.03
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
EG 10-yr
Crit 100-yr
WS 10-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
210
200
190
180
170
160
150
0
200
400
600
800
1000
1200
Station (ft)

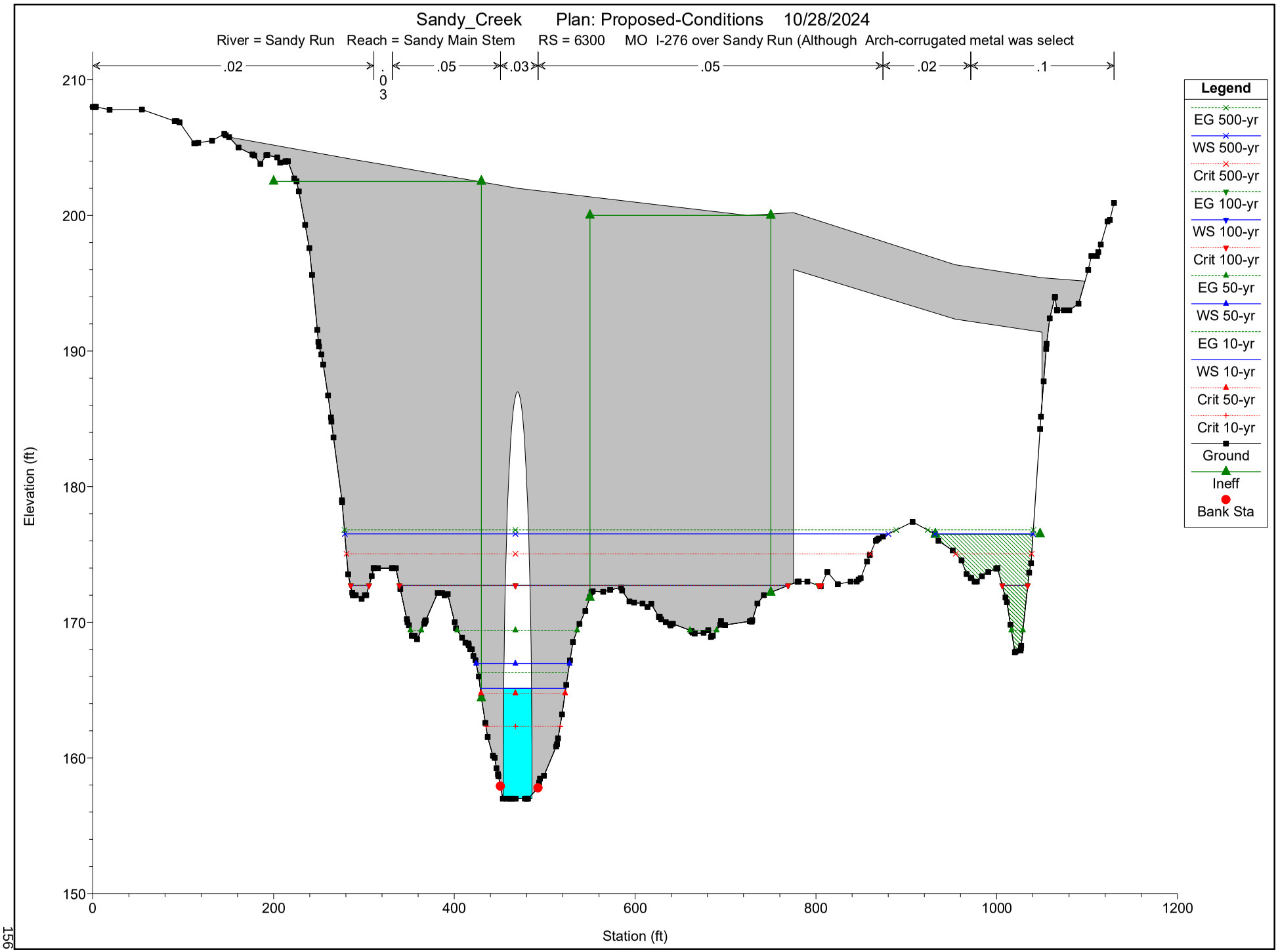

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6668.160
.02
.03
Elevation (ft)
Station (ft)
210
200
190
180
170
160
150
0
200
400
600
800
1000
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Crit 500-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta

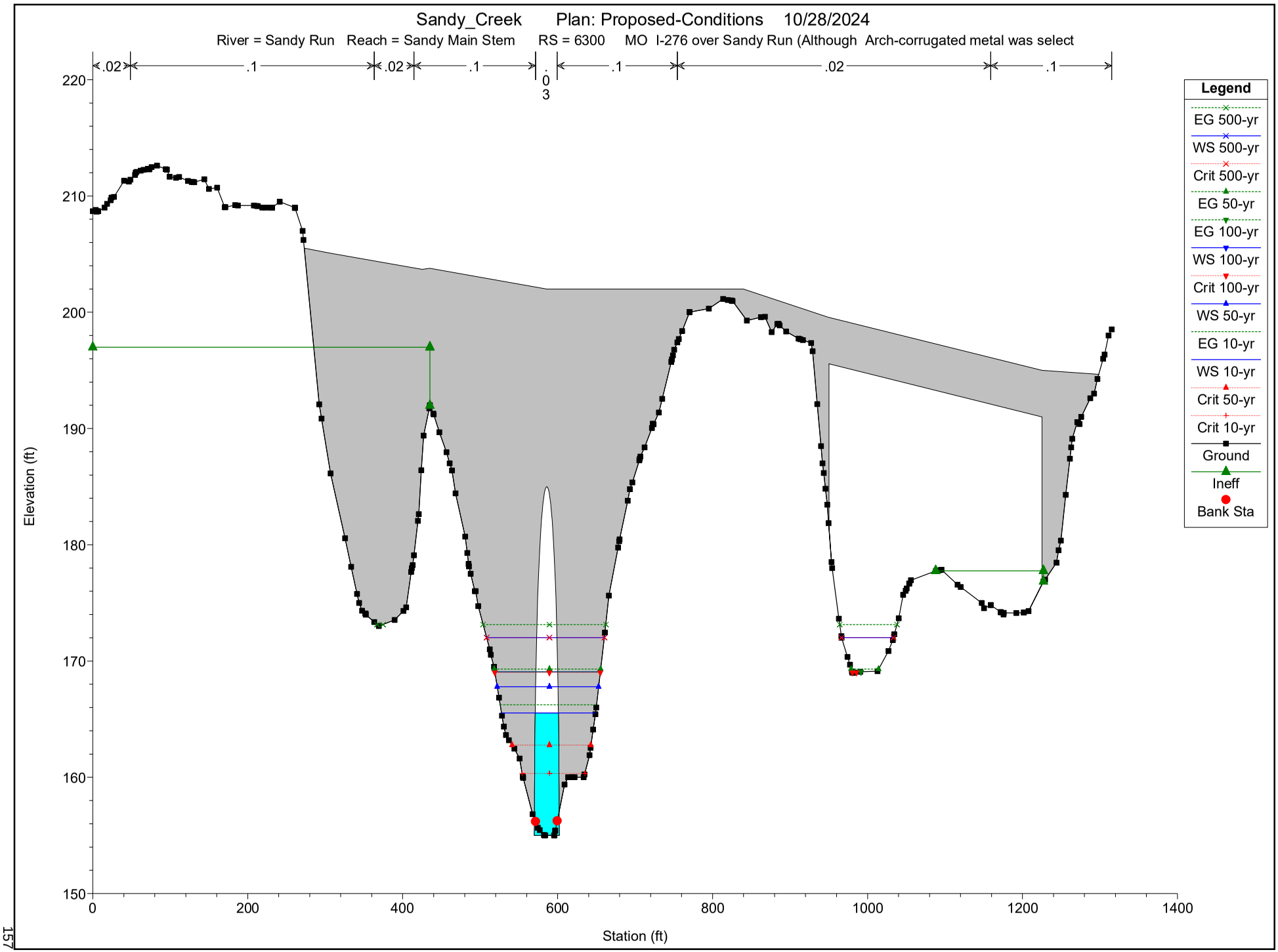

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6600 BR Railroad over Sandy Run
.02
.03
Elevation (ft)
Station (ft)
210
200
190
180
170
160
150
0
200
400
600
800
1000
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
EG 10-yr
WS 10-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta

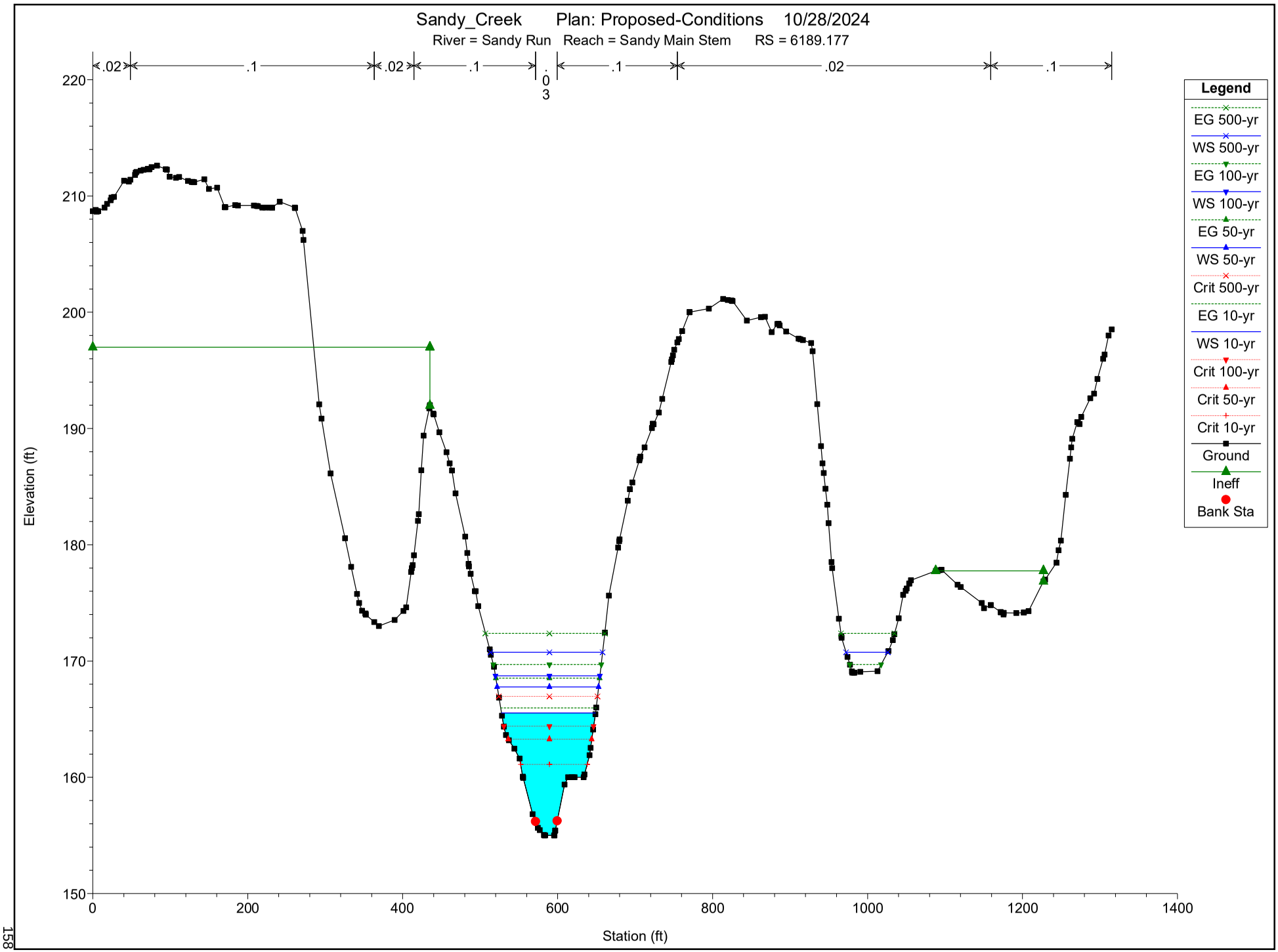

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6600 BR Railroad over Sandy Run
.02
.03
Elevation (ft)
Station (ft)
210
200
190
180
170
160
150
0
200
400
600
800
1000
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
EG 10-yr
WS 10-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta

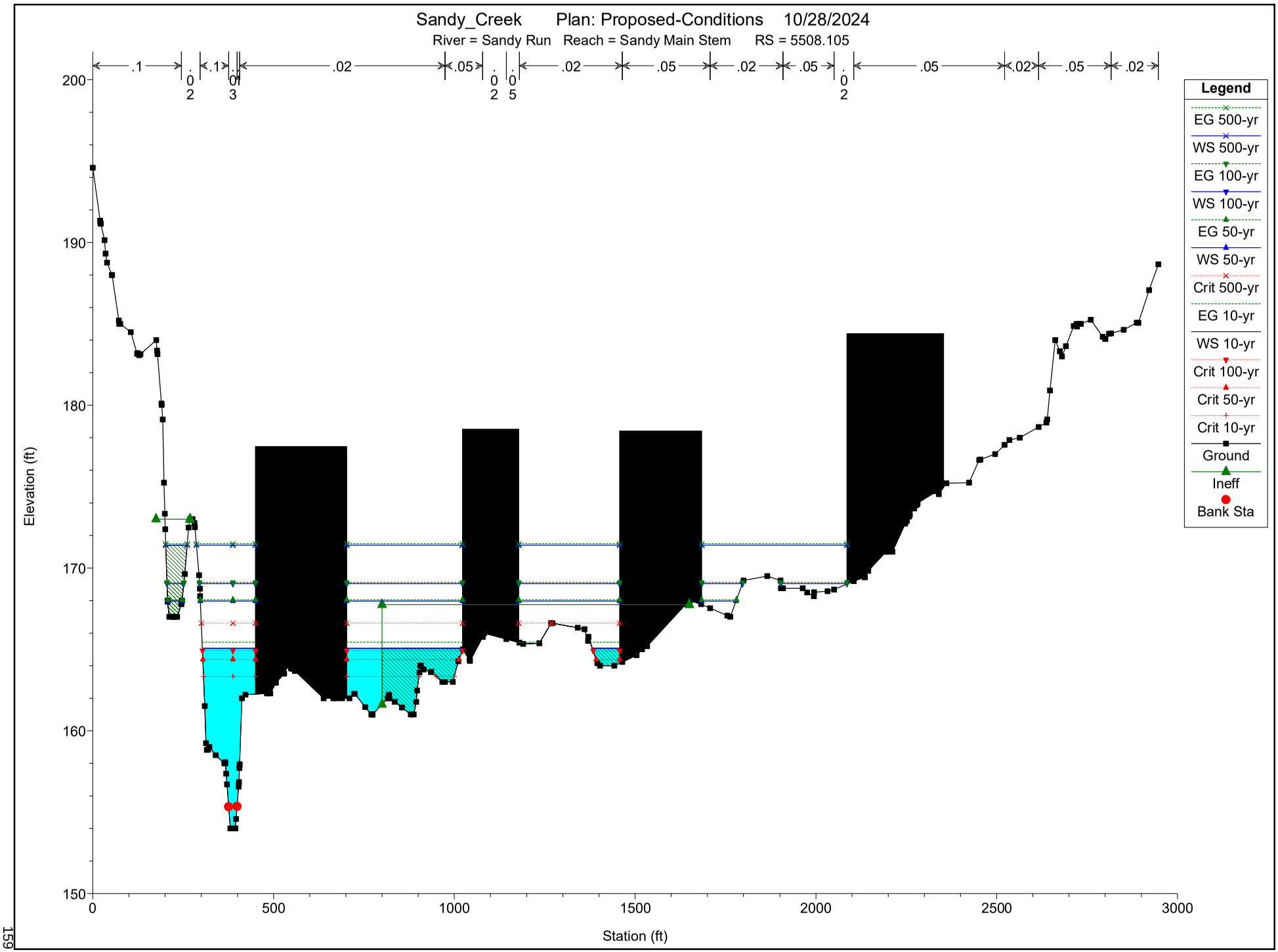

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6572.639
.02
.03
Elevation (ft)
Station (ft)
210
200
190
180
170
160
150
0
200
400
600
800
1000
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Crit 500-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta

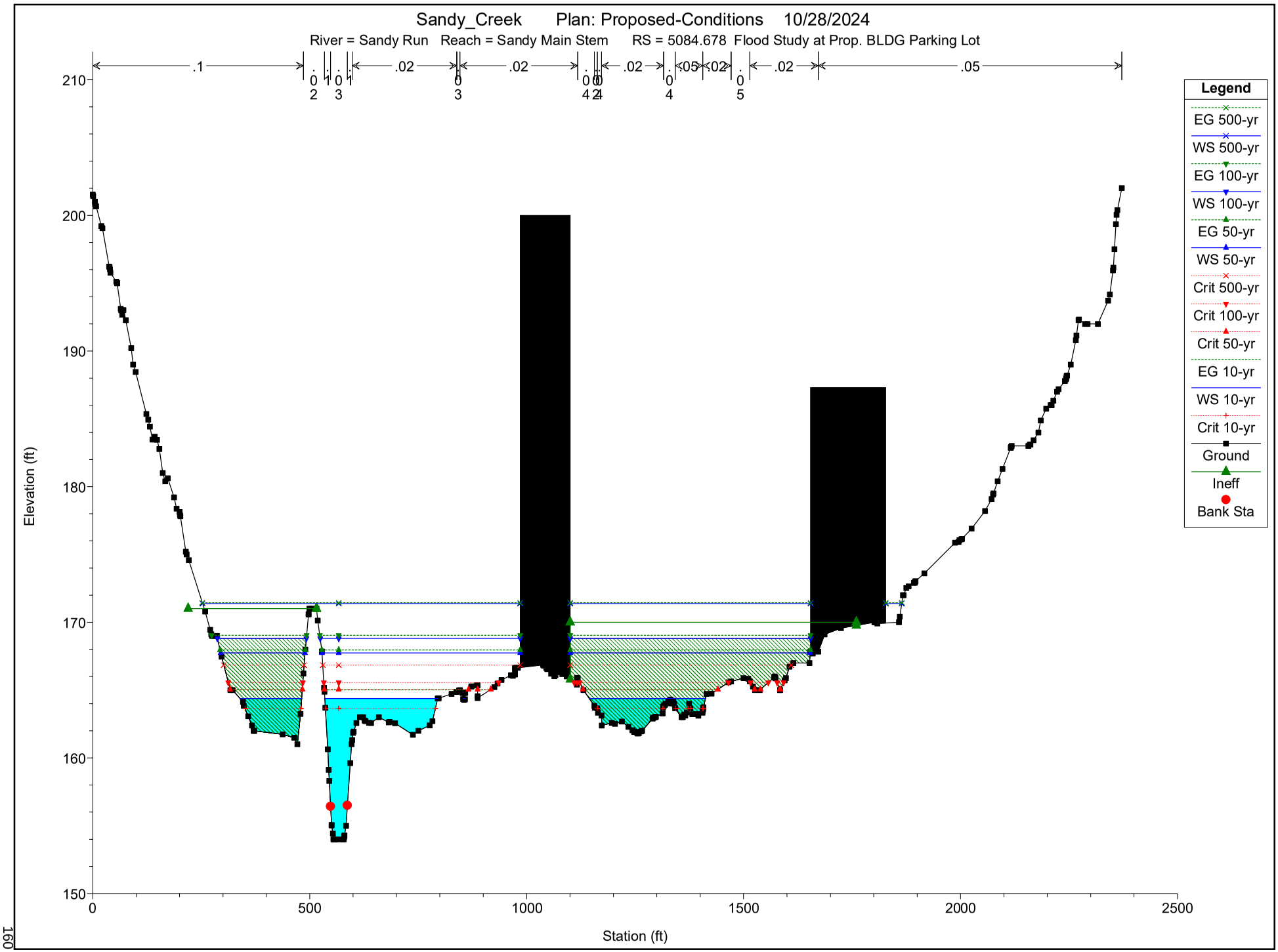

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6414.980
.02
.03
.05
.03
.05
.02
.1
Elevation (ft)
Station (ft)
210
200
190
180
170
160
150
0
200
400
600
800
1000
1200
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Crit 500-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta

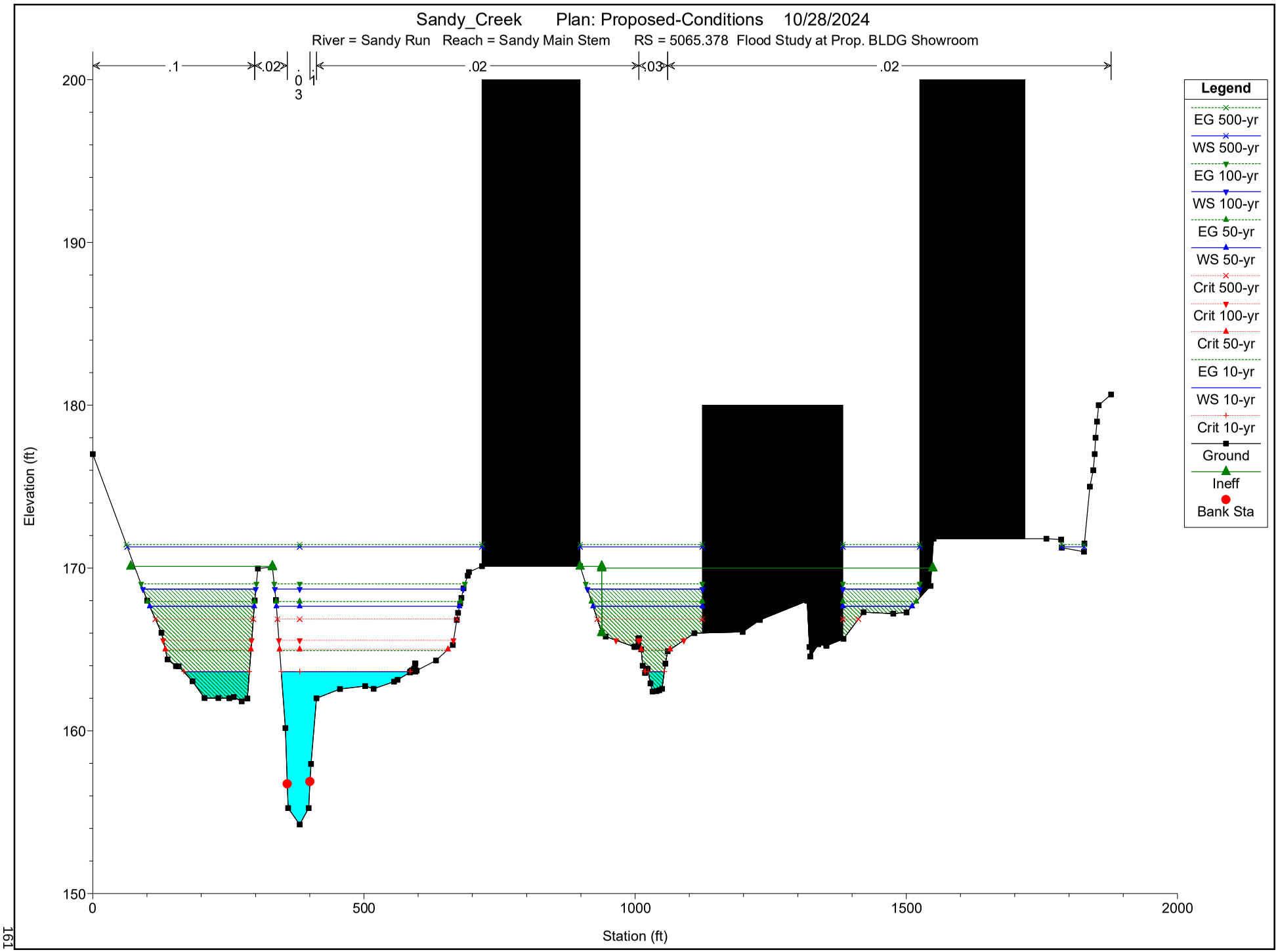

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6300 MO I-276 over Sandy Run (Although Arch-corrugated metal was select
.02
.03
.05
.03
.05
.02
.1
Legend
EG 500-yr
WS 500-yr
Crit 500-yr
EG 100-yr
WS 100-yr
Crit 100-yr
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
210
200
190
180
170
160
150
0
200
400
600
800
1000
1200
Station (ft)

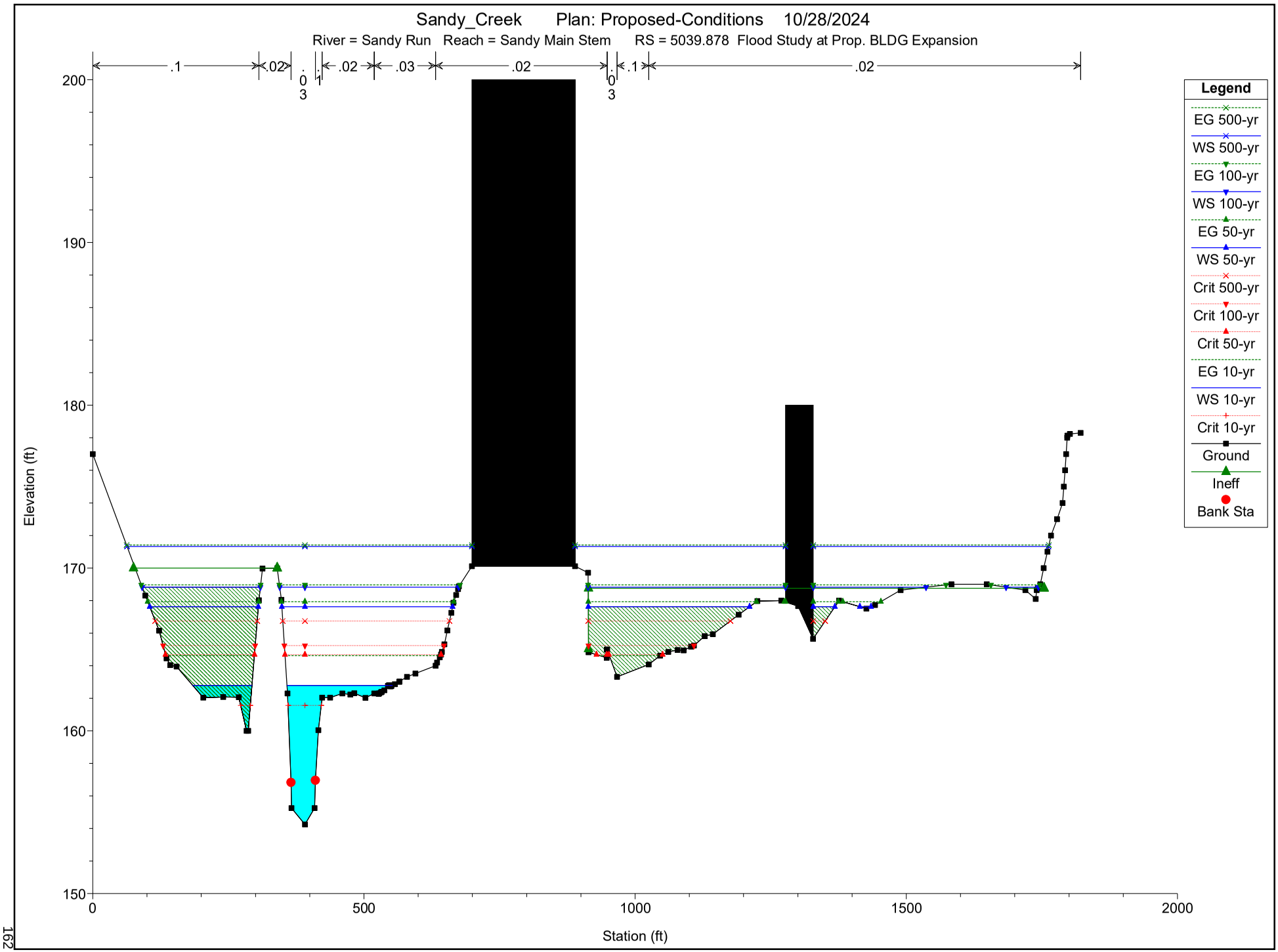

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6300 MO I-276 over Sandy Run (Although Arch-corrugated metal was select
.02
.1
.02
.1
.03
.1
.02
.1
Legend
EG 500-yr
WS 500-yr
Crit 500-yr
EG 50-yr
EG 100-yr
WS 100-yr
Crit 100-yr
WS 50-yr
EG 10-yr
WS 10-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
220
210
200
190
180
170
160
150
0
200
400
600
800
1000
1200
1400
Station (ft)

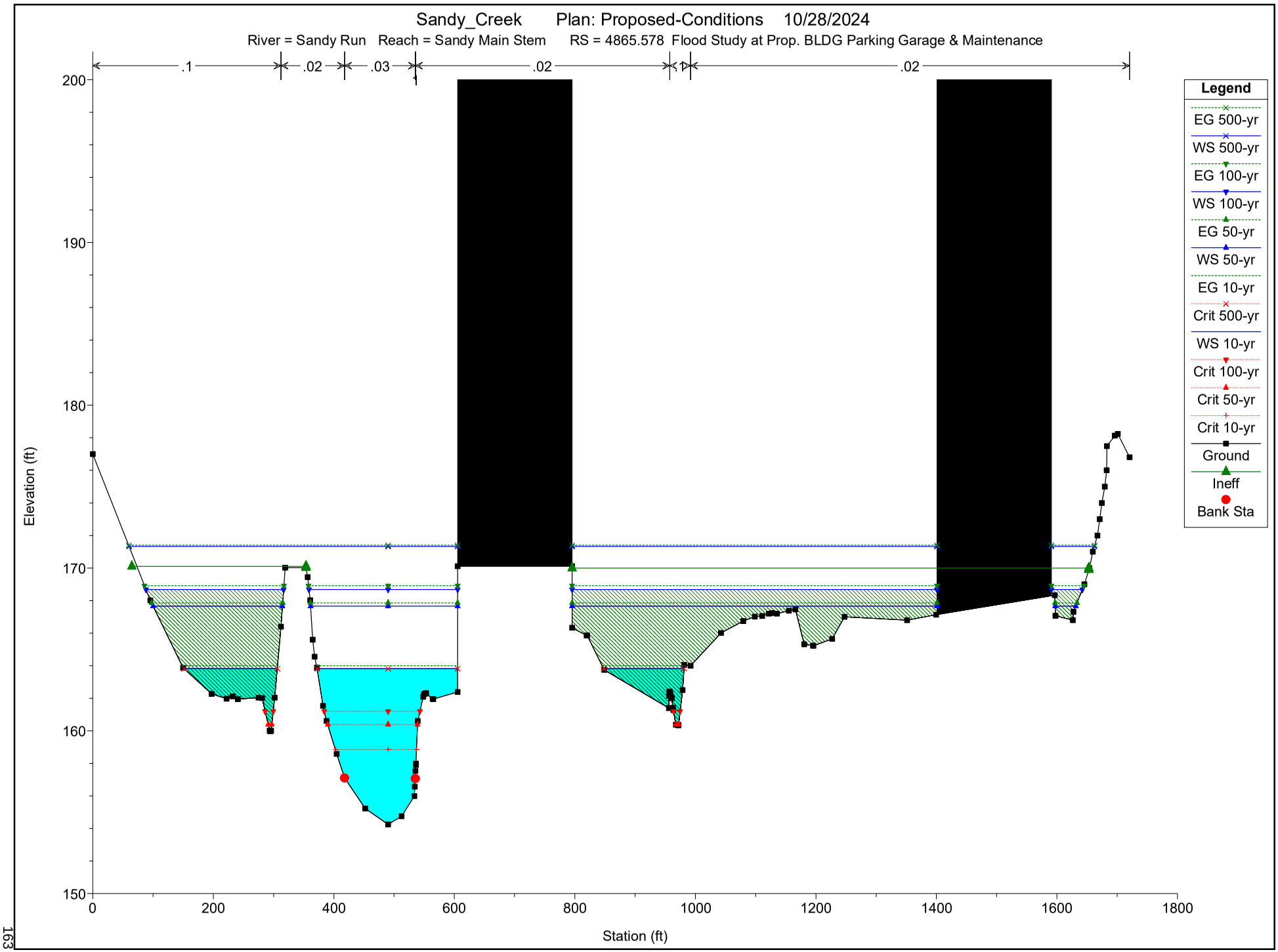

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 6189.177
.02
.1
.02
.1
.03
.1
.02
.1
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
EG 10-yr
WS 10-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
220
210
200
190
180
170
160
150
0
200
400
600
800
1000
1200
1400
Station (ft)

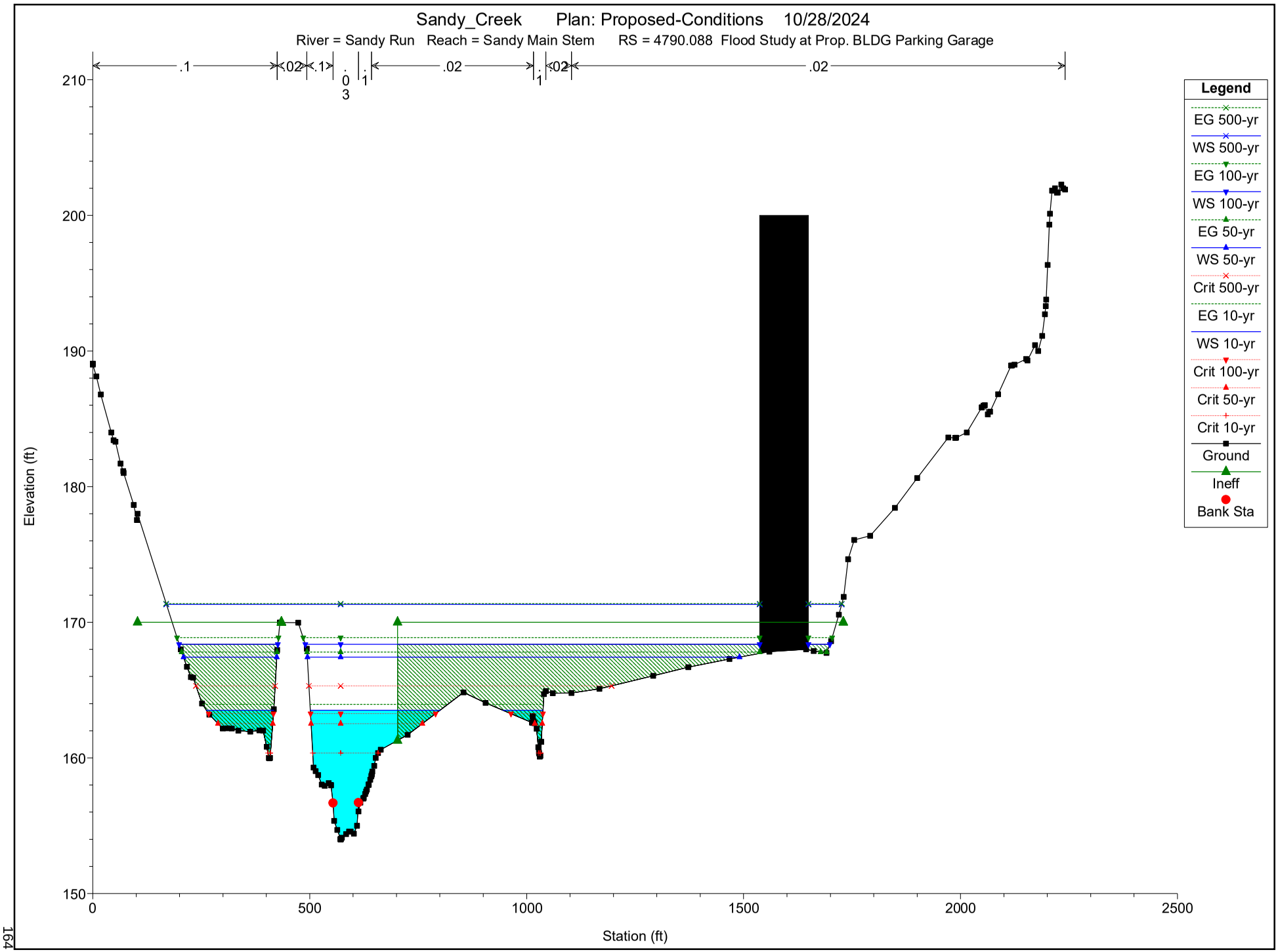

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 5508.105
.1
.1
.02
.05
.02
.05
.02
.05
.05
.02
.05
.02
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
EG 10-yr
WS 10-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
200
190
180
170
160
150
0
500
1000
1500
2000
2500
3000
Station (ft)

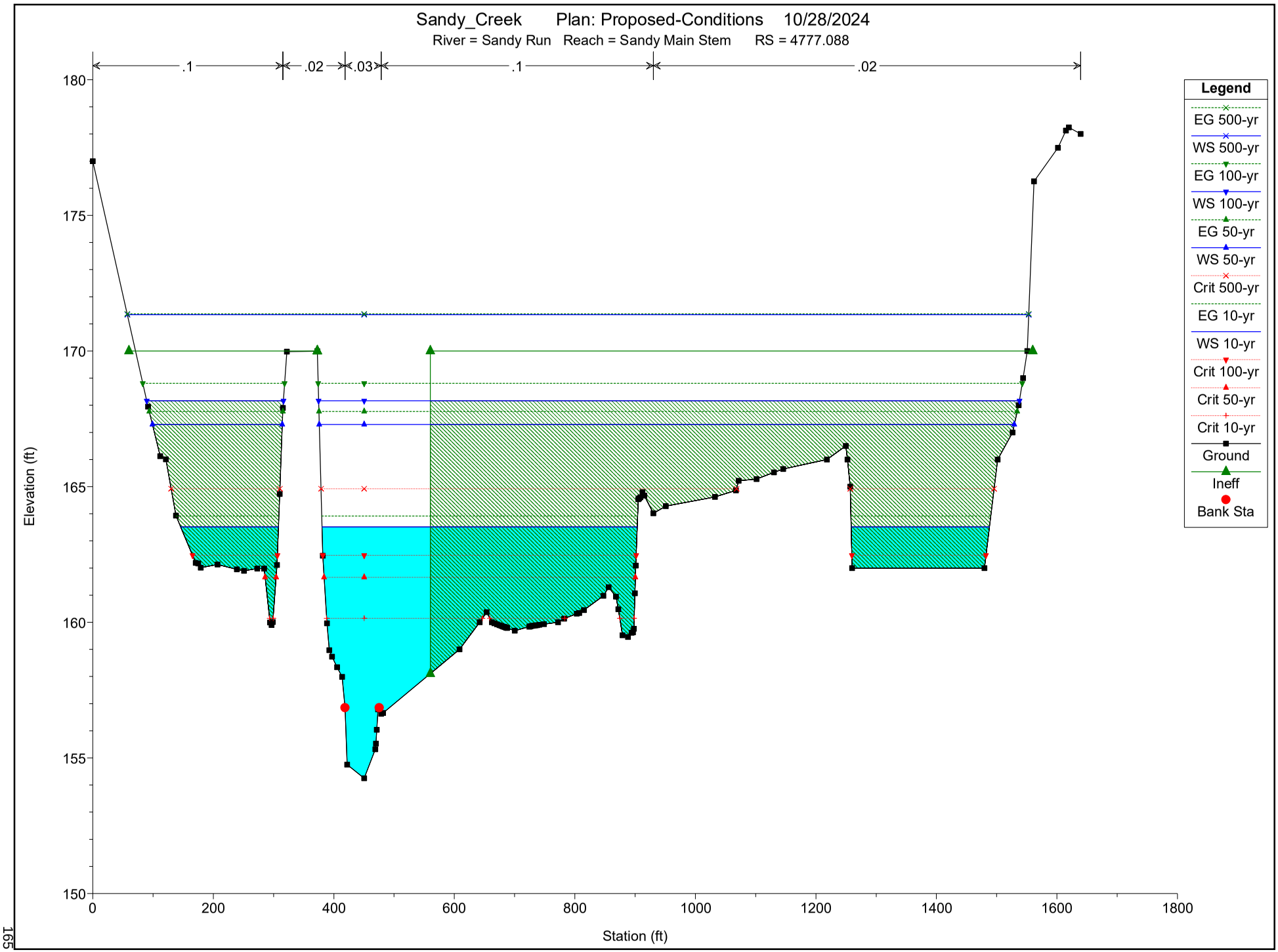

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 5084.678 Flood Study at Prop. BLDG Parking Lot
.1
.02
.02
.02
.05
.02
.02
.05
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
Crit 100-yr
Crit 50-yr
EG 10-yr
WS 10-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
210
200
190
180
170
160
150
0
500
1000
1500
2000
2500
Station (ft)

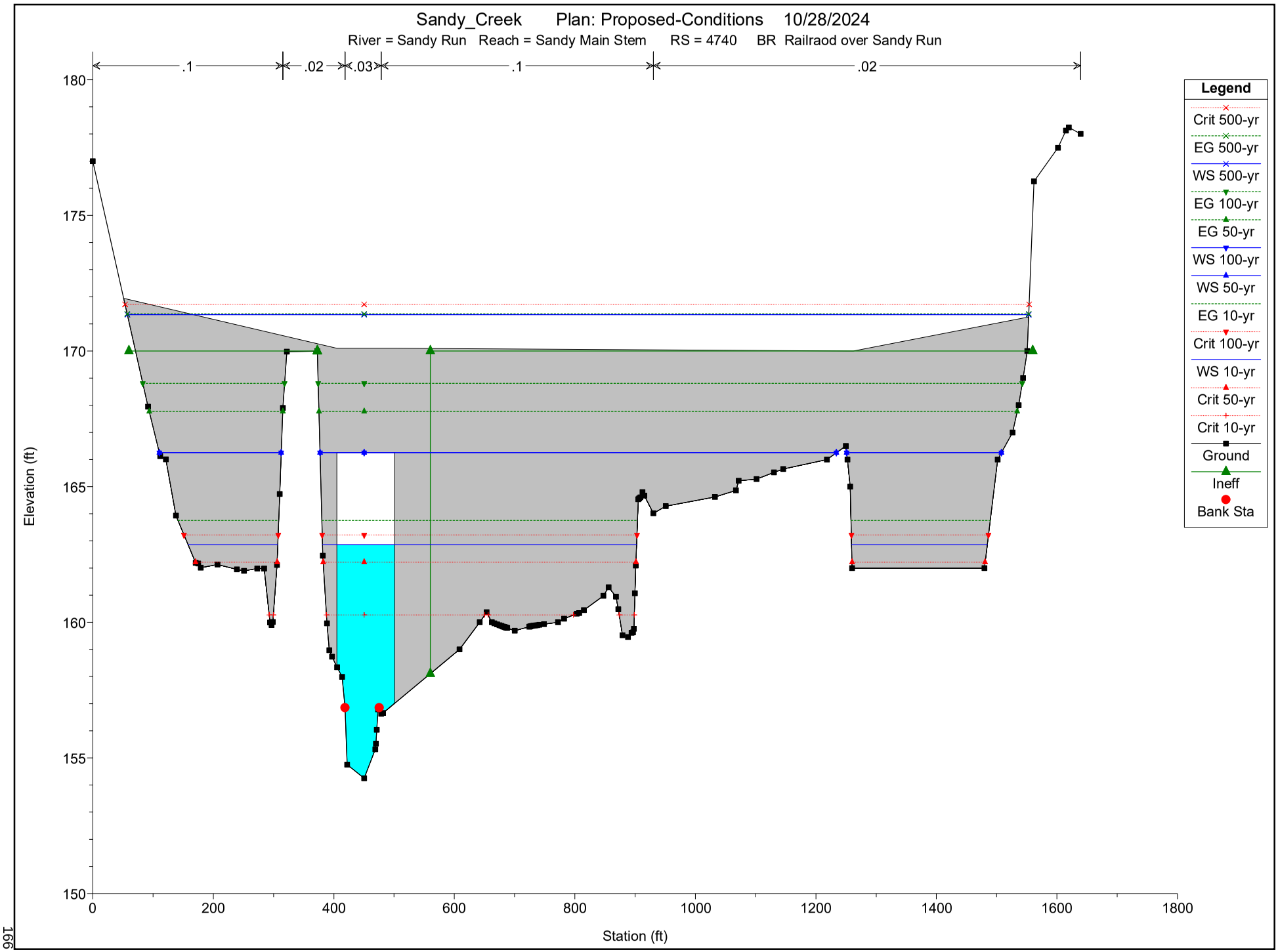

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 5065.378 Flood Study at Prop. BLDG Showroom
.1
.02
.03
.02
.02
Elevation (ft)
200
190
180
170
160
150
0
500
1000
1500
2000
Station (ft)
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
Crit 100-yr
Crit 50-yr
EG 10-yr
WS 10-yr
Crit 10-yr
Ground
Ineff
Bank Sta

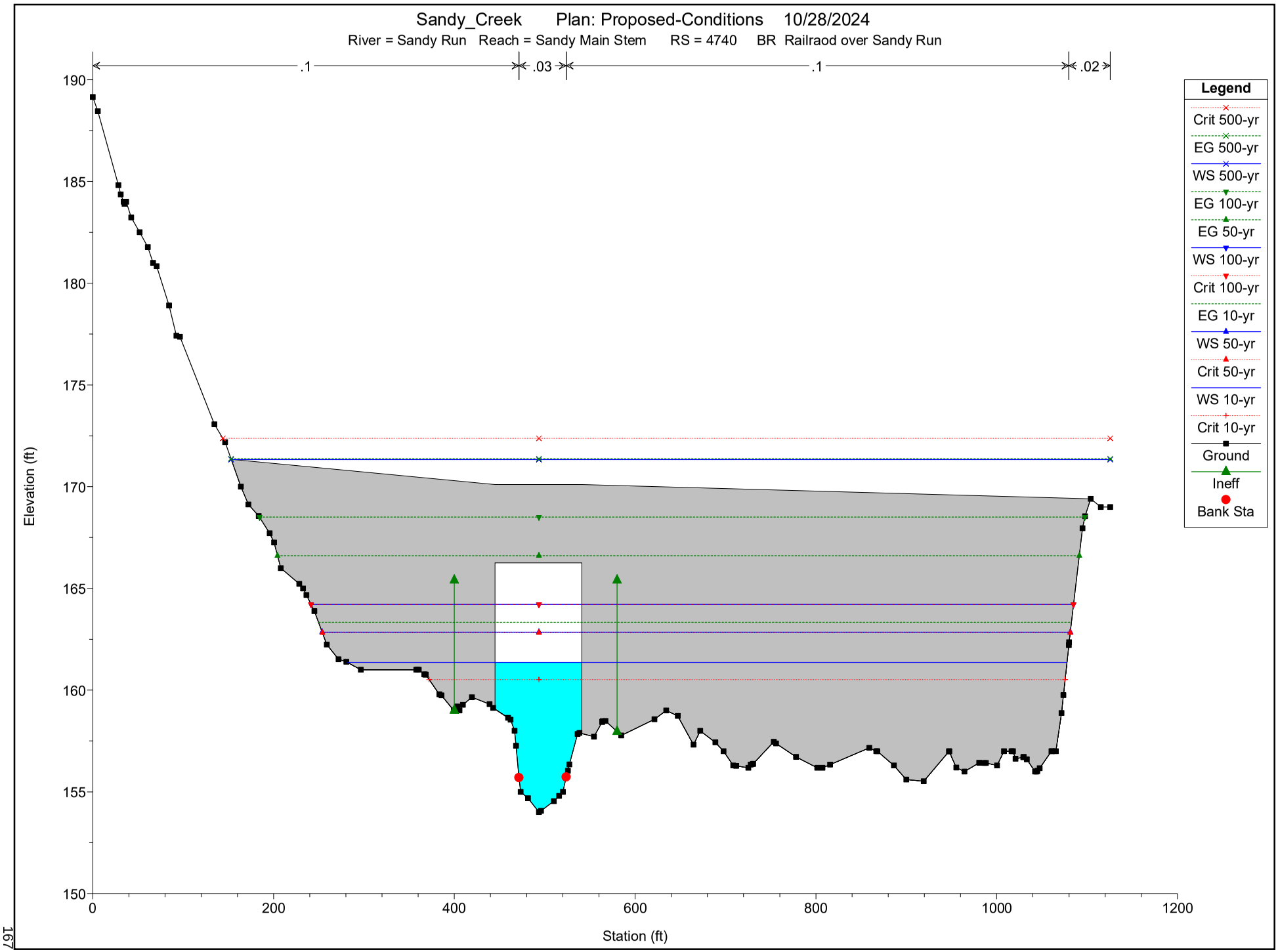

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 5039.878 Flood Study at Prop. BLDG Expansion
.1
.02
.02
.03
.02
.1
.02
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
Crit 100-yr
Crit 50-yr
EG 10-yr
WS 10-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
200
190
180
170
160
150
0
500
1000
1500
2000
Station (ft)

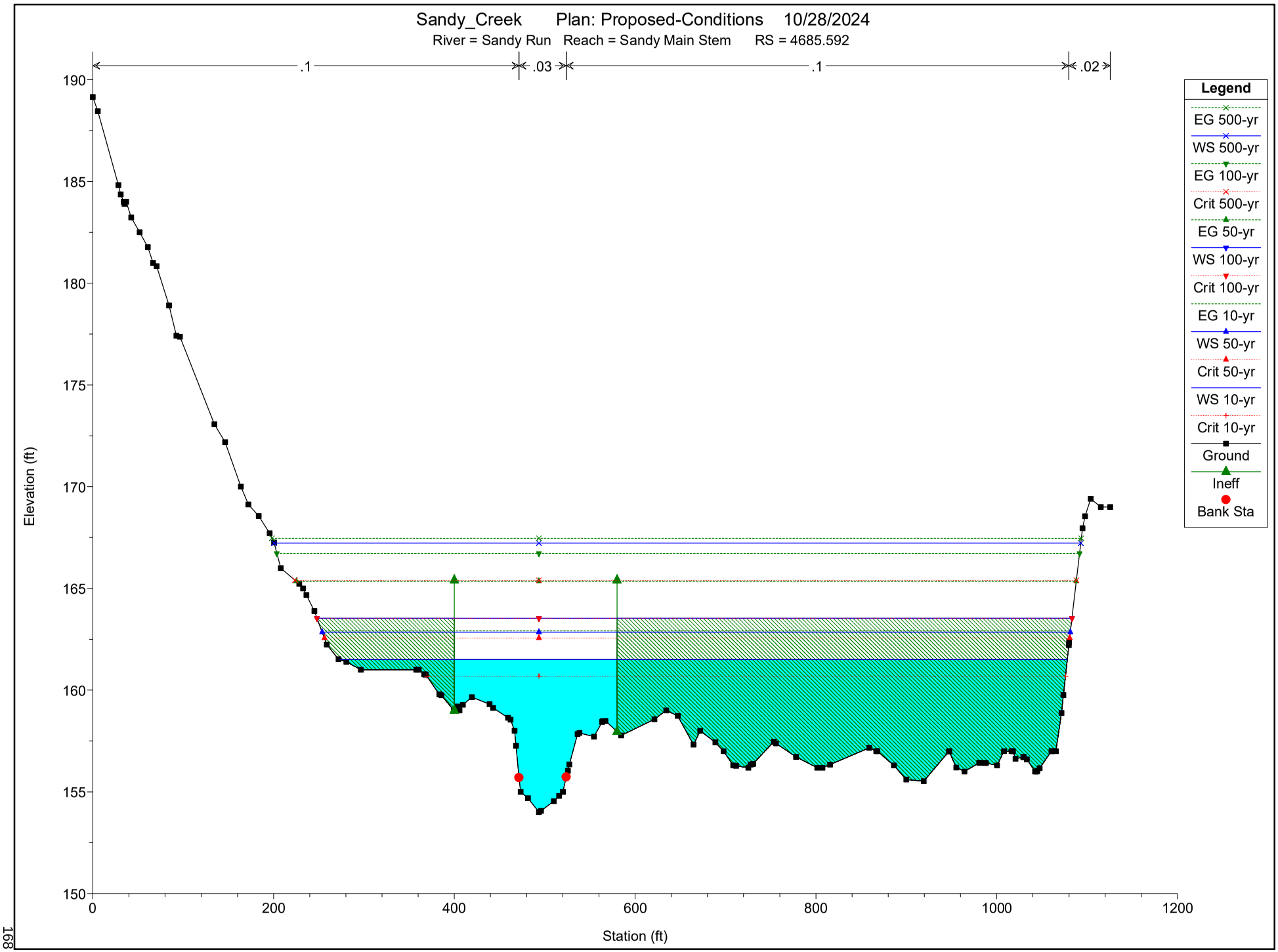

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4865.578 Flood Study at Prop. BLDG Parking Garage & Maintenance
.1
.02
.03
.02
.02
Elevation (ft)
200
190
180
170
160
150
0
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
EG 10-yr
Crit 500-yr
WS 10-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta

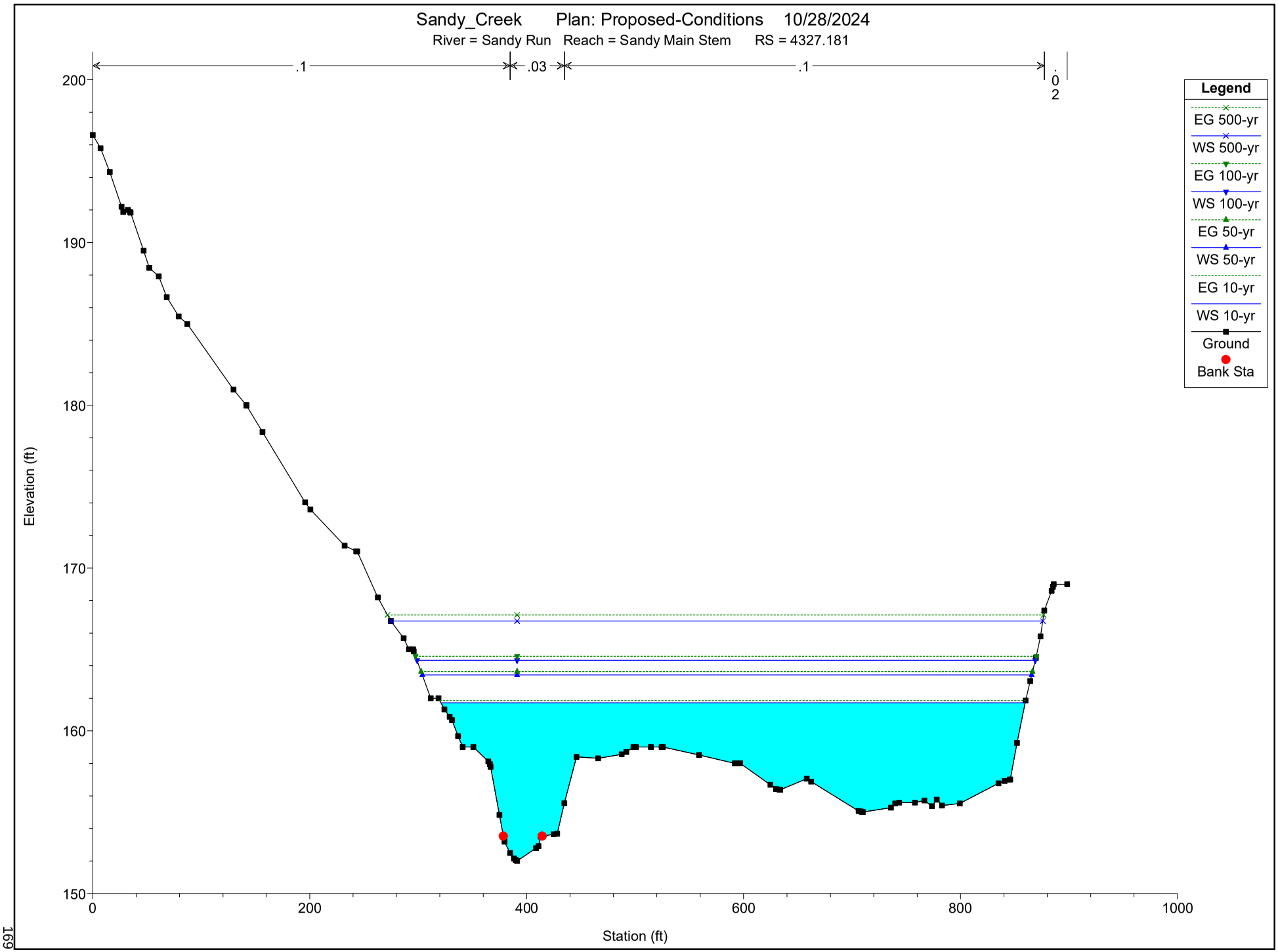

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4790.088 Flood Study at Prop. BLDG Parking Garage
.1
.02
.1
.03
.1
.02
.02
.02
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
EG 10-yr
WS 10-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
210
200
190
180
170
160
150
0
500
1000
1500
2000
2500
Station (ft)

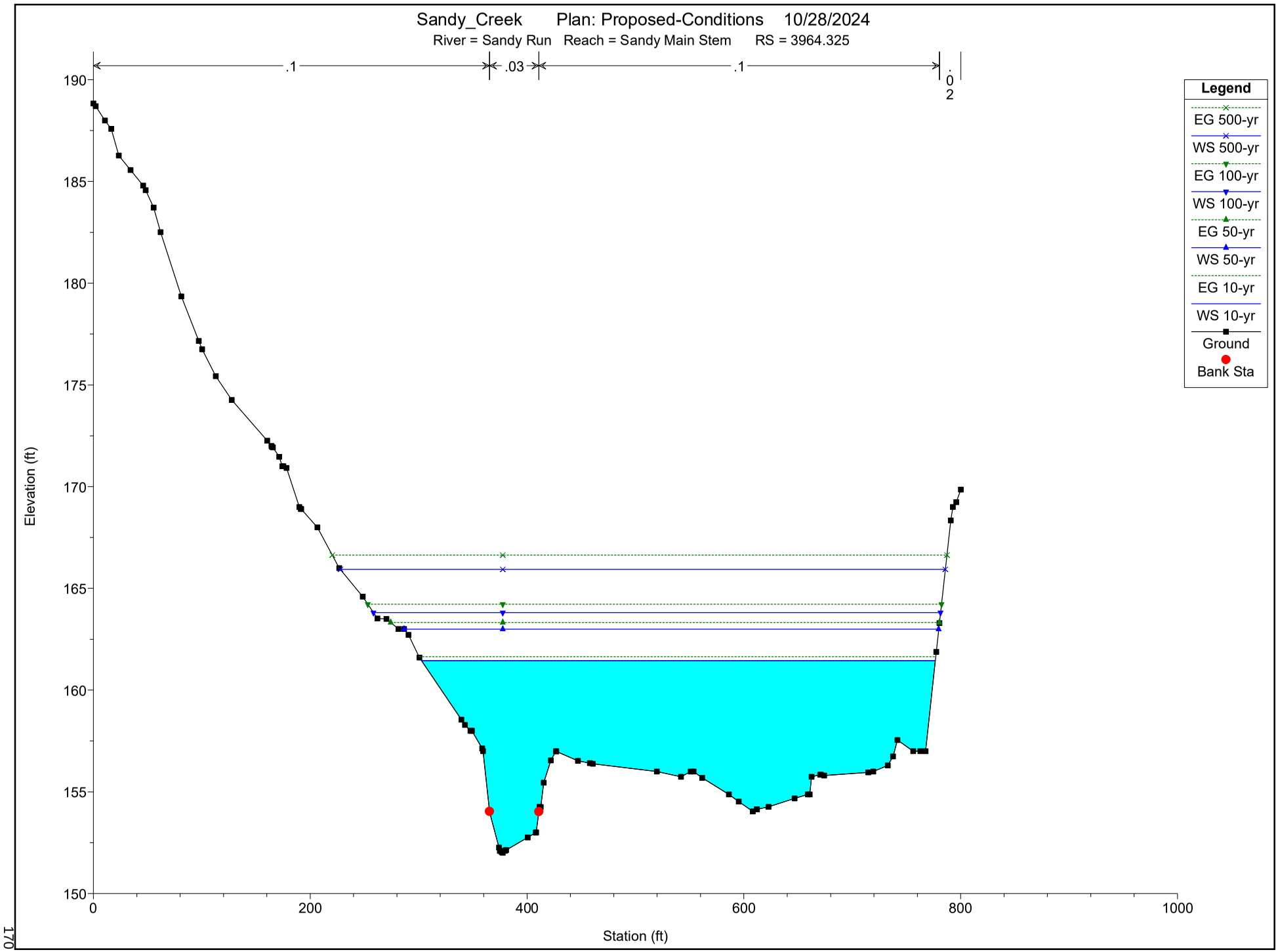

Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4777.088
.1
.02
.03
.1
.02
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
Crit 500-yr
EG 10-yr
WS 10-yr
Crit 100-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
180
175
170
165
160
155
150
0
200
400
600
800
1000
1200
1400
1600
1800
Station (ft)


Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4740 BR Railraod over Sandy Run
.1
.02
.03
.1
.02
Elevation (ft)
Station (ft)
180
175
170
165
160
155
150
0
200
400
600
800
1000
1200
1400
1600
1800
Legend
Crit 500-yr
EG 500-yr
WS 500-yr
EG 100-yr
EG 50-yr
WS 100-yr
WS 50-yr
EG 10-yr
Crit 100-yr
WS 10-yr
Crit 50-yr
Crit 10-yr
Ground
Ineff
Bank Sta


Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4740 BR Railraod over Sandy Run
.1
.03
.1
.02
Legend
Crit 500-yr
EG 500-yr
WS 500-yr
EG 100-yr
EG 50-yr
WS 100-yr
Crit 100-yr
EG 10-yr
WS 50-yr
Crit 50-yr
WS 10-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
190
185
180
175
170
165
160
155
150
0
200
400
600
800
1000
1200
Station (ft)


Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4685.592
.1
.03
.1
.02
Legend
EG 500-yr
WS 500-yr
EG 100-yr
Crit 500-yr
EG 50-yr
WS 100-yr
Crit 100-yr
EG 10-yr
WS 50-yr
Crit 50-yr
WS 10-yr
Crit 10-yr
Ground
Ineff
Bank Sta
Elevation (ft)
190
185
180
175
170
165
160
155
150
0
200
400
600
800
1000
1200
Station (ft)


Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 4327.181
.1
.03
.1
.02
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Elevation (ft)
200
190
180
170
160
150
0
200
400
600
800
1000
Station (ft)


Sandy_Creek Plan: Proposed-Conditions 10/28/2024
River = Sandy Run Reach = Sandy Main Stem RS = 3964.325
.1
.03
.1
.02
Legend
EG 500-yr
WS 500-yr
EG 100-yr
WS 100-yr
EG 50-yr
WS 50-yr
EG 10-yr
WS 10-yr
Ground
Bank Sta
Elevation (ft)
190
185
180
175
170
165
160
155
150
0
200
400
600
800
1000
Station (ft)

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 6709.658 Profile: 100-yr

E.G. Elev (ft)	174.23	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.29	Wt. n-Val.	0.030	0.030	0.030
W.S. Elev (ft)	173.94	Reach Len. (ft)	95.93	41.50	20.00
Crit W.S. (ft)	167.00	Flow Area (sq ft)	643.79	453.14	152.46
E.G. Slope (ft/ft)	0.000256	Area (sq ft)	1401.22	453.14	481.72
Q Total (cfs)	4945.00	Flow (cfs)	2300.42	2320.50	324.08
Top Width (ft)	328.22	Top Width (ft)	211.44	26.49	90.29
Vel Total (ft/s)	3.96	Avg. Vel. (ft/s)	3.57	5.12	2.13
Max Chl Dpth (ft)	17.94	Hydr. Depth (ft)	9.78	17.11	5.07
Conv. Total (cfs)	309080.1	Conv. (cfs)	143784.5	145039.3	20256.3
Length Wtd. (ft)	71.36	Wetted Per. (ft)	67.24	27.59	34.70
Min Ch El (ft)	156.00	Shear (lb/sq ft)	0.15	0.26	0.07
Alpha	1.18	Stream Power (lb/ft s)	1107.41	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	142.12	63.21	326.20
C & E Loss (ft)	0.12	Cum SA (acres)	33.56	5.73	68.98

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 6668.160 Profile: 100-yr

E.G. Elev (ft)	174.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.030	0.030	0.030
W.S. Elev (ft)	174.06	Reach Len. (ft)	22.00	22.00	22.00
Crit W.S. (ft)	163.85	Flow Area (sq ft)	2175.77	599.67	226.79
E.G. Slope (ft/ft)	0.000048	Area (sq ft)	2175.77	599.67	1175.22
Q Total (cfs)	4945.00	Flow (cfs)	3343.84	1373.64	227.53
Top Width (ft)	441.16	Top Width (ft)	227.41	34.37	179.39
Vel Total (ft/s)	1.65	Avg. Vel. (ft/s)	1.54	2.29	1.00
Max Chl Dpth (ft)	18.05	Hydr. Depth (ft)	9.57	17.45	5.72
Conv. Total (cfs)	714819.0	Conv. (cfs)	483364.6	198564.3	32890.1
Length Wtd. (ft)	22.00	Wetted Per. (ft)	229.05	34.69	45.27
Min Ch El (ft)	156.01	Shear (lb/sq ft)	0.03	0.05	0.01
Alpha	1.14	Stream Power (lb/ft s)	877.68	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	138.19	62.70	325.82
C & E Loss (ft)		Cum SA (acres)	33.08	5.70	68.92

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 6600 BR U Profile: 100-yr

E.G. Elev (ft)	174.10	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.76	Wt. n-Val.			
W.S. Elev (ft)	174.06	Reach Len. (ft)	35.00	35.00	35.00
Crit W.S. (ft)	164.43	Flow Area (sq ft)	177.59	494.78	151.15
E.G. Slope (ft/ft)		Area (sq ft)	166.63	493.12	210.45
Q Total (cfs)	4945.00	Flow (cfs)	435.17	3835.61	674.64
Top Width (ft)	441.16	Top Width (ft)	227.41	34.37	179.39
Vel Total (ft/s)	6.00	Avg. Vel. (ft/s)	2.45	7.75	4.46
Max Chl Dpth (ft)	18.05	Hydr. Depth (ft)	0.78	14.40	3.81
Conv. Total (cfs)		Conv. (cfs)			
Length Wtd. (ft)	35.00	Wetted Per. (ft)	246.73	103.43	70.84
Min Ch El (ft)	156.01	Shear (lb/sq ft)			
Alpha	1.31	Stream Power (lb/ft s)	877.68	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	137.59	62.43	325.47
C & E Loss (ft)		Cum SA (acres)	32.96	5.68	68.83

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 6600 BR D Profile: 100-yr

E.G. Elev (ft)	174.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.81	Wt. n-Val.			
W.S. Elev (ft)	173.82	Reach Len. (ft)	38.52	38.52	38.52
Crit W.S. (ft)	164.21	Flow Area (sq ft)	145.14	484.34	220.71
E.G. Slope (ft/ft)		Area (sq ft)	370.47	474.85	170.33
Q Total (cfs)	4945.00	Flow (cfs)	577.48	3726.12	641.81
Top Width (ft)	373.41	Top Width (ft)	181.51	33.53	158.36
Vel Total (ft/s)	5.82	Avg. Vel. (ft/s)	3.98	7.69	2.91

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 6600 BR D Profile: 100-yr (Continued)

Max Chl Dpth (ft)	17.82	Hydr. Depth (ft)	1.35	14.45	1.39
Conv. Total (cfs)		Conv. (cfs)			
Length Wtd. (ft)	38.52	Wetted Per. (ft)	130.61	101.05	188.98
Min Ch El (ft)	156.00	Shear (lb/sq ft)			
Alpha	1.22	Stream Power (lb/ft s)	818.01	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	137.38	62.04	325.32
C & E Loss (ft)		Cum SA (acres)	32.80	5.65	68.70

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 6572.639 Profile: 100-yr

E.G. Elev (ft)	172.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.030	0.030	0.030
W.S. Elev (ft)	172.82	Reach Len. (ft)	97.36	157.66	211.49
Crit W.S. (ft)	163.93	Flow Area (sq ft)	1304.19	545.28	1408.11
E.G. Slope (ft/ft)	0.000043	Area (sq ft)	1494.87	545.28	1408.11
Q Total (cfs)	4945.00	Flow (cfs)	2003.51	1128.07	1813.42
Top Width (ft)	401.66	Top Width (ft)	190.77	33.53	177.36
Vel Total (ft/s)	1.52	Avg. Vel. (ft/s)	1.54	2.07	1.29
Max Chl Dpth (ft)	16.82	Hydr. Depth (ft)	10.47	16.26	7.94
Conv. Total (cfs)	753058.1	Conv. (cfs)	305108.0	171790.3	276159.8
Length Wtd. (ft)	156.45	Wetted Per. (ft)	127.05	33.99	178.71
Min Ch El (ft)	156.00	Shear (lb/sq ft)	0.03	0.04	0.02
Alpha	1.10	Stream Power (lb/ft s)	818.01	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	136.55	61.59	324.62
C & E Loss (ft)	0.09	Cum SA (acres)	32.63	5.62	68.55

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 6414.980 Profile: 100-yr

E.G. Elev (ft)	172.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.33	Wt. n-Val.	0.050	0.030	0.050
W.S. Elev (ft)	172.43	Reach Len. (ft)	225.80	225.80	225.80
Crit W.S. (ft)	163.92	Flow Area (sq ft)	241.63	638.57	450.86
E.G. Slope (ft/ft)	0.000309	Area (sq ft)	484.91	638.57	869.84
Q Total (cfs)	4945.00	Flow (cfs)	623.22	3415.59	906.19
Top Width (ft)	453.44	Top Width (ft)	128.97	41.76	282.71
Vel Total (ft/s)	3.72	Avg. Vel. (ft/s)	2.58	5.35	2.01
Max Chl Dpth (ft)	15.43	Hydr. Depth (ft)	11.53	15.29	6.84
Conv. Total (cfs)	281308.9	Conv. (cfs)	35453.5	194304.5	51550.9
Length Wtd. (ft)	225.80	Wetted Per. (ft)	22.02	41.94	68.02
Min Ch El (ft)	157.00	Shear (lb/sq ft)	0.21	0.29	0.13
Alpha	1.55	Stream Power (lb/ft s)	1129.78	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	134.34	59.45	319.09
C & E Loss (ft)		Cum SA (acres)	32.28	5.49	67.43

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 6189.177 Profile: 100-yr

E.G. Elev (ft)	169.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.98	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	168.72	Reach Len. (ft)	633.10	668.48	716.54
Crit W.S. (ft)	164.39	Flow Area (sq ft)	351.73	376.93	426.76
E.G. Slope (ft/ft)	0.001128	Area (sq ft)	351.73	376.93	426.76
Q Total (cfs)	4945.00	Flow (cfs)	615.89	3519.71	809.40
Top Width (ft)	134.88	Top Width (ft)	51.69	28.04	55.15
Vel Total (ft/s)	4.28	Avg. Vel. (ft/s)	1.75	9.34	1.90
Max Chl Dpth (ft)	13.72	Hydr. Depth (ft)	6.80	13.44	7.74
Conv. Total (cfs)	147266.5	Conv. (cfs)	18341.7	104820.1	24104.7
Length Wtd. (ft)	695.19	Wetted Per. (ft)	53.50	28.33	57.58
Min Ch El (ft)	155.00	Shear (lb/sq ft)	0.46	0.94	0.52
Alpha	3.44	Stream Power (lb/ft s)	1315.13	0.00	0.00
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	134.34	59.45	319.09
C & E Loss (ft)	0.45	Cum SA (acres)	31.81	5.31	66.56

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 5508.105 Profile: 100-yr

E.G. Elev (ft)	169.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.100	0.030	0.022
W.S. Elev (ft)	169.04	Reach Len. (ft)	438.29	442.90	447.79
Crit W.S. (ft)	164.93	Flow Area (sq ft)	760.75	339.75	3776.17
E.G. Slope (ft/ft)	0.000107	Area (sq ft)	837.69	339.75	3776.17
Q Total (cfs)	9741.00	Flow (cfs)	517.35	1037.04	8186.61
Top Width (ft)	1095.03	Top Width (ft)	127.02	22.99	945.03
Vel Total (ft/s)	2.00	Avg. Vel. (ft/s)	0.68	3.05	2.17
Max Chl Dpth (ft)	15.04	Hydr. Depth (ft)	9.45	14.78	4.00
Conv. Total (cfs)	941371.1	Conv. (cfs)	49997.0	100219.6	791154.6
Length Wtd. (ft)	446.56	Wetted Per. (ft)	83.49	23.38	975.32
Min Ch El (ft)	154.00	Shear (lb/sq ft)	0.06	0.10	0.03
Alpha	1.24	Stream Power (lb/ft s)	2947.19	0.00	0.00
Frctn Loss (ft)	0.07	Cum Volume (acre-ft)	125.70	53.95	284.52
C & E Loss (ft)	0.01	Cum SA (acres)	30.51	4.92	58.33

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 5084.678 Profile: 100-yr

E.G. Elev (ft)	169.04	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.084	0.030	0.021
W.S. Elev (ft)	168.81	Reach Len. (ft)	19.30	19.30	19.30
Crit W.S. (ft)	165.56	Flow Area (sq ft)	131.01	560.18	2041.65
E.G. Slope (ft/ft)	0.000258	Area (sq ft)	1250.16	560.18	4494.84
Q Total (cfs)	9741.00	Flow (cfs)	124.38	2599.17	7017.45
Top Width (ft)	1219.79	Top Width (ft)	228.95	38.79	952.05
Vel Total (ft/s)	3.56	Avg. Vel. (ft/s)	0.95	4.64	3.44
Max Chl Dpth (ft)	14.81	Hydr. Depth (ft)	5.45	14.44	5.13
Conv. Total (cfs)	606954.7	Conv. (cfs)	7749.9	161952.4	437252.4
Length Wtd. (ft)	19.30	Wetted Per. (ft)	27.21	39.72	404.11
Min Ch El (ft)	154.00	Shear (lb/sq ft)	0.08	0.23	0.08
Alpha	1.12	Stream Power (lb/ft s)	2371.66	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	115.19	49.37	242.01
C & E Loss (ft)	0.01	Cum SA (acres)	28.72	4.60	48.58

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 5065.378 Profile: 100-yr

E.G. Elev (ft)	169.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.	0.020	0.030	0.022
W.S. Elev (ft)	168.71	Reach Len. (ft)	25.03	25.37	25.53
Crit W.S. (ft)	165.56	Flow Area (sq ft)	115.23	581.12	1523.48
E.G. Slope (ft/ft)	0.000367	Area (sq ft)	1146.90	581.12	2488.54
Q Total (cfs)	9741.00	Flow (cfs)	441.23	3122.92	6176.85
Top Width (ft)	909.50	Top Width (ft)	230.92	42.00	636.58
Vel Total (ft/s)	4.39	Avg. Vel. (ft/s)	3.83	5.37	4.05
Max Chl Dpth (ft)	14.46	Hydr. Depth (ft)	5.04	13.84	5.39
Conv. Total (cfs)	508290.2	Conv. (cfs)	23023.8	162955.5	322310.9
Length Wtd. (ft)	25.46	Wetted Per. (ft)	26.13	43.14	284.95
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.10	0.31	0.12
Alpha	1.06	Stream Power (lb/ft s)	1877.56	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	114.66	49.12	240.47
C & E Loss (ft)	0.05	Cum SA (acres)	28.62	4.58	48.23

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 5039.878 Profile: 100-yr

E.G. Elev (ft)	168.96	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.	0.020	0.030	0.026
W.S. Elev (ft)	168.82	Reach Len. (ft)	87.37	174.14	193.13
Crit W.S. (ft)	165.24	Flow Area (sq ft)	101.75	629.71	2886.45
E.G. Slope (ft/ft)	0.000230	Area (sq ft)	1243.54	629.71	2886.45
Q Total (cfs)	9741.00	Flow (cfs)	297.84	2684.08	6759.08
Top Width (ft)	1179.96	Top Width (ft)	238.79	45.00	896.17
Vel Total (ft/s)	2.69	Avg. Vel. (ft/s)	2.93	4.26	2.34

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 5039.878 Profile: 100-yr (Continued)

Max Chl Dpth (ft)	14.57	Hydr. Depth (ft)	4.88	13.99	3.22
Conv. Total (cfs)	641651.8	Conv. (cfs)	19619.2	176803.5	445229.1
Length Wtd. (ft)	173.28	Wetted Per. (ft)	24.34	46.66	905.72
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.06	0.19	0.05
Alpha	1.25	Stream Power (lb/ft s)	1821.48	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	113.98	48.77	238.89
C & E Loss (ft)	0.01	Cum SA (acres)	28.48	4.56	47.78

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

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 4790.088 Profile: 100-yr

E.G. Elev (ft)	168.86	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.49	Wt. n-Val.	0.100	0.030	0.032
W.S. Elev (ft)	168.37	Reach Len. (ft)	13.00	13.00	13.00
Crit W.S. (ft)	163.26	Flow Area (sq ft)	529.72	799.29	799.54
E.G. Slope (ft/ft)	0.000546	Area (sq ft)	1688.14	799.29	3705.85
Q Total (cfs)	9741.00	Flow (cfs)	758.41	5249.24	3733.35
Top Width (ft)	1323.22	Top Width (ft)	291.14	58.20	973.87
Vel Total (ft/s)	4.58	Avg. Vel. (ft/s)	1.43	6.57	4.67
Max Chl Dpth (ft)	14.37	Hydr. Depth (ft)	8.29	13.73	8.88
Conv. Total (cfs)	417054.3	Conv. (cfs)	32470.9	224742.7	159840.7
Length Wtd. (ft)	13.00	Wetted Per. (ft)	66.44	59.09	90.85
Min Ch El (ft)	154.00	Shear (lb/sq ft)	0.27	0.46	0.30
Alpha	1.52	Stream Power (lb/ft s)	2241.15	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	109.02	42.30	220.21
C & E Loss (ft)	0.05	Cum SA (acres)	27.59	4.08	42.34

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 4777.088 Profile: 100-yr

E.G. Elev (ft)	168.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.65	Wt. n-Val.	0.020	0.030	0.092
W.S. Elev (ft)	168.16	Reach Len. (ft)	15.00	15.00	15.00
Crit W.S. (ft)	162.47	Flow Area (sq ft)	359.00	757.20	915.42
E.G. Slope (ft/ft)	0.000640	Area (sq ft)	1509.76	757.20	6337.80
Q Total (cfs)	9741.00	Flow (cfs)	2637.46	5270.77	1832.77
Top Width (ft)	1389.64	Top Width (ft)	270.39	57.00	1062.25
Vel Total (ft/s)	4.79	Avg. Vel. (ft/s)	7.35	6.96	2.00
Max Chl Dpth (ft)	13.91	Hydr. Depth (ft)	8.22	13.28	10.83
Conv. Total (cfs)	385047.1	Conv. (cfs)	104254.8	208345.6	72446.7
Length Wtd. (ft)	15.00	Wetted Per. (ft)	46.46	57.83	84.52
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.31	0.52	0.43
Alpha	1.81	Stream Power (lb/ft s)	1639.28	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	108.54	42.07	218.71
C & E Loss (ft)		Cum SA (acres)	27.51	4.06	42.04

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 4740 BR U Profile: 100-yr

E.G. Elev (ft)	168.81	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.91	Wt. n-Val.	0.020	0.030	0.079
W.S. Elev (ft)	166.25	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)	163.22	Flow Area (sq ft)	111.79	648.09	240.96
E.G. Slope (ft/ft)	0.005395	Area (sq ft)	111.79	648.09	240.96
Q Total (cfs)	9741.00	Flow (cfs)	1327.07	7473.74	940.19
Top Width (ft)		Top Width (ft)			
Vel Total (ft/s)	9.73	Avg. Vel. (ft/s)	11.87	11.53	3.90
Max Chl Dpth (ft)	12.00	Hydr. Depth (ft)	111002.70		303686.50
Conv. Total (cfs)	132623.9	Conv. (cfs)	18068.1	101755.1	12800.8
Length Wtd. (ft)	40.00	Wetted Per. (ft)	34.84	114.83	51.01
Min Ch El (ft)	154.25	Shear (lb/sq ft)	1.08	1.90	1.59
Alpha	1.30	Stream Power (lb/ft s)	1639.28	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	108.26	41.83	217.58
C & E Loss (ft)		Cum SA (acres)	27.46	4.05	41.85

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 4740 BR D Profile: 100-yr

E.G. Elev (ft)	168.50	Element	Left OB	Channel	Right OB
Vel Head (ft)	4.29	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	164.21	Reach Len. (ft)	36.50	36.50	36.50
Crit W.S. (ft)	164.21	Flow Area (sq ft)	153.94	504.52	121.71
E.G. Slope (ft/ft)	0.006107	Area (sq ft)	153.94	504.52	121.71
Q Total (cfs)	9741.00	Flow (cfs)	510.06	8806.81	424.13
Top Width (ft)	95.90	Top Width (ft)	26.33	52.44	17.13
Vel Total (ft/s)	12.49	Avg. Vel. (ft/s)	3.31	17.46	3.48
Max Chl Dpth (ft)	10.21	Hydr. Depth (ft)	5.85	9.62	7.11
Conv. Total (cfs)	124649.9	Conv. (cfs)	6527.0	112695.6	5427.3
Length Wtd. (ft)	36.50	Wetted Per. (ft)	31.94	52.68	23.41
Min Ch El (ft)	154.00	Shear (lb/sq ft)	1.84	3.65	1.98
Alpha	1.77	Stream Power (lb/ft s)	1125.57	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	108.14	41.30	217.41
C & E Loss (ft)		Cum SA (acres)	27.45	4.03	41.85

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 4685.592 Profile: 100-yr

E.G. Elev (ft)	166.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.19	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	163.53	Reach Len. (ft)	393.59	358.41	320.67
Crit W.S. (ft)	163.53	Flow Area (sq ft)	324.58	469.05	323.61
E.G. Slope (ft/ft)	0.005757	Area (sq ft)	708.87	469.05	3610.28
Q Total (cfs)	9741.00	Flow (cfs)	998.23	7572.73	1170.04
Top Width (ft)	835.28	Top Width (ft)	223.41	52.44	559.43
Vel Total (ft/s)	8.72	Avg. Vel. (ft/s)	3.08	16.14	3.62
Max Chl Dpth (ft)	9.53	Hydr. Depth (ft)	4.54	8.94	5.77
Conv. Total (cfs)	128379.3	Conv. (cfs)	13155.9	99803.1	15420.3
Length Wtd. (ft)	346.18	Wetted Per. (ft)	72.05	52.68	56.35
Min Ch El (ft)	154.00	Shear (lb/sq ft)	1.62	3.20	2.06
Alpha	2.70	Stream Power (lb/ft s)	1125.57	0.00	0.00
Frctn Loss (ft)	0.63	Cum Volume (acre-ft)	107.78	40.89	215.85
C & E Loss (ft)	1.47	Cum SA (acres)	27.34	3.99	41.61

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 4327.181 Profile: 100-yr

E.G. Elev (ft)	164.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.	0.100	0.034	0.084
W.S. Elev (ft)	164.33	Reach Len. (ft)	379.56	362.86	348.11
Crit W.S. (ft)		Flow Area (sq ft)	360.83	422.58	3294.76
E.G. Slope (ft/ft)	0.000880	Area (sq ft)	360.83	422.58	3294.76
Q Total (cfs)	9741.00	Flow (cfs)	431.40	2833.47	6476.13
Top Width (ft)	570.04	Top Width (ft)	79.57	35.94	454.53
Vel Total (ft/s)	2.39	Avg. Vel. (ft/s)	1.20	6.71	1.97

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 4327.181 Profile: 100-yr (Continued)

Max Chl Dpth (ft)	12.33	Hydr. Depth (ft)	4.54	11.76	7.25
Conv. Total (cfs)	328319.1	Conv. (cfs)	14540.3	95501.6	218277.2
Length Wtd. (ft)	354.53	Wetted Per. (ft)	80.80	36.17	456.48
Min Ch El (ft)	152.00	Shear (lb/sq ft)	0.25	0.64	0.40
Alpha	2.75	Stream Power (lb/ft s)	898.41	0.00	0.00
Frctn Loss (ft)	0.33	Cum Volume (acre-ft)	102.95	37.22	190.43
C & E Loss (ft)	0.02	Cum SA (acres)	25.97	3.62	37.87

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 3964.325 Profile: 100-yr

E.G. Elev (ft)	164.22	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.42	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	163.81	Reach Len. (ft)	460.88	448.94	432.66
Crit W.S. (ft)		Flow Area (sq ft)	345.72	508.62	2907.00
E.G. Slope (ft/ft)	0.001011	Area (sq ft)	345.72	508.62	2907.00
Q Total (cfs)	9741.00	Flow (cfs)	355.05	3973.03	5412.92
Top Width (ft)	523.02	Top Width (ft)	106.93	45.65	370.44
Vel Total (ft/s)	2.59	Avg. Vel. (ft/s)	1.03	7.81	1.86
Max Chl Dpth (ft)	11.81	Hydr. Depth (ft)	3.23	11.14	7.85
Conv. Total (cfs)	306286.6	Conv. (cfs)	11163.8	124924.2	170198.6
Length Wtd. (ft)	441.11	Wetted Per. (ft)	107.91	46.06	372.81
Min Ch El (ft)	152.00	Shear (lb/sq ft)	0.20	0.70	0.49
Alpha	4.00	Stream Power (lb/ft s)	800.12	0.00	0.00
Frctn Loss (ft)	0.34	Cum Volume (acre-ft)	99.87	33.34	165.65
C & E Loss (ft)	0.05	Cum SA (acres)	25.16	3.28	34.58

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 6709.658 Profile: 500-yr

E.G. Elev (ft)	177.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.26	Wt. n-Val.	0.030	0.030	0.030
W.S. Elev (ft)	177.15	Reach Len. (ft)	95.93	41.50	20.00
Crit W.S. (ft)	168.81	Flow Area (sq ft)	855.19	538.20	782.87
E.G. Slope (ft/ft)	0.000206	Area (sq ft)	2148.09	538.20	782.87
Q Total (cfs)	8165.00	Flow (cfs)	3311.18	2771.63	2082.20
Top Width (ft)	377.44	Top Width (ft)	254.91	26.49	96.04
Vel Total (ft/s)	3.75	Avg. Vel. (ft/s)	3.87	5.15	2.66
Max Chl Dpth (ft)	21.15	Hydr. Depth (ft)	12.99	20.32	8.15
Conv. Total (cfs)	569139.3	Conv. (cfs)	230804.8	193195.6	145138.9
Length Wtd. (ft)	67.98	Wetted Per. (ft)	67.24	27.59	108.11
Min Ch El (ft)	156.00	Shear (lb/sq ft)	0.16	0.25	0.09
Alpha	1.20	Stream Power (lb/ft s)	1107.41	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	205.75	74.85	479.05
C & E Loss (ft)	0.10	Cum SA (acres)	39.16	5.76	77.74

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 6668.160 Profile: 500-yr

E.G. Elev (ft)	177.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.030	0.030	0.030
W.S. Elev (ft)	177.24	Reach Len. (ft)	22.00	22.00	22.00
Crit W.S. (ft)	165.78	Flow Area (sq ft)	2940.32	709.18	353.19
E.G. Slope (ft/ft)	0.000057	Area (sq ft)	2940.32	709.18	1783.08
Q Total (cfs)	8165.00	Flow (cfs)	5659.88	1984.95	520.17
Top Width (ft)	496.79	Top Width (ft)	250.33	34.37	212.09
Vel Total (ft/s)	2.04	Avg. Vel. (ft/s)	1.92	2.80	1.47
Max Chl Dpth (ft)	21.23	Hydr. Depth (ft)	11.75	20.63	8.90
Conv. Total (cfs)	1080236.0	Conv. (cfs)	748807.1	262609.9	68818.9
Length Wtd. (ft)	22.00	Wetted Per. (ft)	252.20	34.69	45.27
Min Ch El (ft)	156.01	Shear (lb/sq ft)	0.04	0.07	0.03
Alpha	1.11	Stream Power (lb/ft s)	877.68	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	200.15	74.26	478.46
C & E Loss (ft)		Cum SA (acres)	38.61	5.73	77.67

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 6600 BR U Profile: 500-yr

E.G. Elev (ft)	177.31	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.34	Wt. n-Val.			
W.S. Elev (ft)	177.24	Reach Len. (ft)	35.00	35.00	35.00
Crit W.S. (ft)	167.23	Flow Area (sq ft)	949.12	605.09	278.48
E.G. Slope (ft/ft)		Area (sq ft)	931.18	602.63	818.31
Q Total (cfs)	8165.00	Flow (cfs)	4242.01	3037.31	887.99
Top Width (ft)	496.79	Top Width (ft)	250.33	34.37	212.09
Vel Total (ft/s)	4.46	Avg. Vel. (ft/s)	4.47	5.02	3.19
Max Chl Dpth (ft)	21.23	Hydr. Depth (ft)	3.79	17.61	7.02
Conv. Total (cfs)		Conv. (cfs)			
Length Wtd. (ft)	35.00	Wetted Per. (ft)	269.88	103.43	70.84
Min Ch El (ft)	156.01	Shear (lb/sq ft)			
Alpha	1.08	Stream Power (lb/ft s)	877.68	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	199.17	73.92	477.80
C & E Loss (ft)		Cum SA (acres)	38.48	5.72	77.56

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 6600 BR D Profile: 500-yr

E.G. Elev (ft)	176.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.32	Wt. n-Val.			
W.S. Elev (ft)	176.93	Reach Len. (ft)	38.52	38.52	38.52
Crit W.S. (ft)	167.22	Flow Area (sq ft)	592.45	591.96	862.31
E.G. Slope (ft/ft)		Area (sq ft)	1083.72	579.10	779.81
Q Total (cfs)	8165.00	Flow (cfs)	4319.56	2977.65	870.10
Top Width (ft)	487.54	Top Width (ft)	244.13	33.53	209.88
Vel Total (ft/s)	3.99	Avg. Vel. (ft/s)	7.29	5.03	1.01

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 6600 BR D Profile: 500-yr (Continued)

Max Chl Dpth (ft)	20.93	Hydr. Depth (ft)	4.20	17.65	4.11
Conv. Total (cfs)		Conv. (cfs)			
Length Wtd. (ft)	38.52	Wetted Per. (ft)	163.82	101.05	240.69
Min Ch El (ft)	156.00	Shear (lb/sq ft)			
Alpha	1.11	Stream Power (lb/ft s)	818.01	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	198.36	73.45	477.16
C & E Loss (ft)		Cum SA (acres)	38.28	5.69	77.39

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 6572.639 Profile: 500-yr

E.G. Elev (ft)	176.98	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.030	0.030	0.030
W.S. Elev (ft)	176.93	Reach Len. (ft)	97.36	157.66	211.49
Crit W.S. (ft)	165.91	Flow Area (sq ft)	1861.64	683.05	2198.53
E.G. Slope (ft/ft)	0.000041	Area (sq ft)	2406.95	683.05	2198.53
Q Total (cfs)	8165.00	Flow (cfs)	3251.95	1598.38	3314.67
Top Width (ft)	487.54	Top Width (ft)	244.13	33.53	209.88
Vel Total (ft/s)	1.72	Avg. Vel. (ft/s)	1.75	2.34	1.51
Max Chl Dpth (ft)	20.93	Hydr. Depth (ft)	13.21	20.37	10.48
Conv. Total (cfs)	1277395.0	Conv. (cfs)	508759.2	250063.1	518572.8
Length Wtd. (ft)	158.74	Wetted Per. (ft)	143.64	33.99	211.56
Min Ch El (ft)	156.00	Shear (lb/sq ft)	0.03	0.05	0.03
Alpha	1.08	Stream Power (lb/ft s)	818.01	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	196.82	72.89	475.85
C & E Loss (ft)	0.12	Cum SA (acres)	38.07	5.66	77.20

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 6414.980 Profile: 500-yr

E.G. Elev (ft)	176.84	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.46	Wt. n-Val.	0.050	0.030	0.050
W.S. Elev (ft)	176.38	Reach Len. (ft)	225.80	225.80	225.80
Crit W.S. (ft)	166.12	Flow Area (sq ft)	324.53	803.83	1055.27
E.G. Slope (ft/ft)	0.000339	Area (sq ft)	1106.77	803.83	2543.26
Q Total (cfs)	8165.00	Flow (cfs)	1066.91	5248.27	1849.82
Top Width (ft)	704.47	Top Width (ft)	171.94	41.76	490.77
Vel Total (ft/s)	3.74	Avg. Vel. (ft/s)	3.29	6.53	1.75
Max Chl Dpth (ft)	19.38	Hydr. Depth (ft)	15.49	19.25	5.76
Conv. Total (cfs)	443623.0	Conv. (cfs)	57967.5	285150.6	100504.9
Length Wtd. (ft)	225.80	Wetted Per. (ft)	22.02	41.94	185.87
Min Ch El (ft)	157.00	Shear (lb/sq ft)	0.31	0.41	0.12
Alpha	2.11	Stream Power (lb/ft s)	1129.78	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	192.89	70.20	464.33
C & E Loss (ft)		Cum SA (acres)	37.60	5.52	75.50

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 6189.177 Profile: 500-yr

E.G. Elev (ft)	172.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.63	Wt. n-Val.	0.100	0.030	0.087
W.S. Elev (ft)	170.75	Reach Len. (ft)	633.10	668.48	716.54
Crit W.S. (ft)	166.96	Flow Area (sq ft)	462.87	433.88	614.66
E.G. Slope (ft/ft)	0.001665	Area (sq ft)	462.87	433.88	614.66
Q Total (cfs)	8165.00	Flow (cfs)	1091.05	5407.47	1666.48
Top Width (ft)	198.92	Top Width (ft)	58.25	28.04	112.62
Vel Total (ft/s)	5.40	Avg. Vel. (ft/s)	2.36	12.46	2.71
Max Chl Dpth (ft)	15.75	Hydr. Depth (ft)	7.95	15.47	5.46
Conv. Total (cfs)	200107.0	Conv. (cfs)	26739.4	132525.8	40841.9
Length Wtd. (ft)	697.69	Wetted Per. (ft)	60.38	28.33	115.88
Min Ch El (ft)	155.00	Shear (lb/sq ft)	0.80	1.59	0.55
Alpha	3.60	Stream Power (lb/ft s)	1315.13	0.00	0.00
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	192.89	70.20	464.33
C & E Loss (ft)	0.77	Cum SA (acres)	37.00	5.34	73.94

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 5508.105 Profile: 500-yr

E.G. Elev (ft)	171.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.099	0.030	0.022
W.S. Elev (ft)	171.40	Reach Len. (ft)	438.29	442.90	447.79
Crit W.S. (ft)	166.61	Flow Area (sq ft)	959.92	393.89	6218.30
E.G. Slope (ft/ft)	0.000099	Area (sq ft)	1161.54	393.89	6218.30
Q Total (cfs)	16941.00	Flow (cfs)	729.39	1278.08	14933.53
Top Width (ft)	1222.32	Top Width (ft)	148.37	22.99	1050.96
Vel Total (ft/s)	2.24	Avg. Vel. (ft/s)	0.76	3.24	2.40
Max Chl Dpth (ft)	17.40	Hydr. Depth (ft)	10.76	17.13	5.92
Conv. Total (cfs)	1699719.0	Conv. (cfs)	73181.2	128231.4	1498307.0
Length Wtd. (ft)	446.88	Wetted Per. (ft)	92.51	23.38	1097.79
Min Ch El (ft)	154.00	Shear (lb/sq ft)	0.06	0.10	0.04
Alpha	1.18	Stream Power (lb/ft s)	2947.19	0.00	0.00
Frctn Loss (ft)	0.04	Cum Volume (acre-ft)	181.09	63.85	408.14
C & E Loss (ft)	0.01	Cum SA (acres)	35.50	4.95	64.37

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 5084.678 Profile: 500-yr

E.G. Elev (ft)	171.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.092	0.030	0.023
W.S. Elev (ft)	171.38	Reach Len. (ft)	19.30	19.30	19.30
Crit W.S. (ft)	166.84	Flow Area (sq ft)	1922.43	659.72	6985.10
E.G. Slope (ft/ft)	0.000069	Area (sq ft)	1922.43	659.72	6985.10
Q Total (cfs)	16941.00	Flow (cfs)	935.13	1760.44	14245.43
Top Width (ft)	1322.82	Top Width (ft)	295.20	38.79	988.83
Vel Total (ft/s)	1.77	Avg. Vel. (ft/s)	0.49	2.67	2.04
Max Chl Dpth (ft)	17.38	Hydr. Depth (ft)	6.51	17.01	7.06
Conv. Total (cfs)	2046884.0	Conv. (cfs)	112986.3	212704.3	1721194.0
Length Wtd. (ft)	19.30	Wetted Per. (ft)	300.95	39.72	1009.74
Min Ch El (ft)	154.00	Shear (lb/sq ft)	0.03	0.07	0.03
Alpha	1.36	Stream Power (lb/ft s)	2371.66	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	165.58	58.49	340.27
C & E Loss (ft)	0.01	Cum SA (acres)	33.27	4.64	53.88

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 5065.378 Profile: 500-yr

E.G. Elev (ft)	171.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.	0.074	0.030	0.022
W.S. Elev (ft)	171.29	Reach Len. (ft)	25.03	25.37	25.53
Crit W.S. (ft)	166.86	Flow Area (sq ft)	1831.96	689.82	4222.65
E.G. Slope (ft/ft)	0.000162	Area (sq ft)	1831.96	689.82	4222.65
Q Total (cfs)	16941.00	Flow (cfs)	1597.27	2759.48	12584.25
Top Width (ft)	1062.99	Top Width (ft)	294.82	42.00	726.17
Vel Total (ft/s)	2.51	Avg. Vel. (ft/s)	0.87	4.00	2.98
Max Chl Dpth (ft)	17.04	Hydr. Depth (ft)	6.21	16.42	5.81
Conv. Total (cfs)	1331368.0	Conv. (cfs)	125527.0	216863.6	988977.1
Length Wtd. (ft)	25.46	Wetted Per. (ft)	300.25	43.14	746.26
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.06	0.16	0.06
Alpha	1.47	Stream Power (lb/ft s)	1877.56	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	164.74	58.19	337.79
C & E Loss (ft)	0.01	Cum SA (acres)	33.14	4.62	53.51

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 5039.878 Profile: 500-yr

E.G. Elev (ft)	171.42	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.078	0.030	0.025
W.S. Elev (ft)	171.32	Reach Len. (ft)	87.37	174.14	193.13
Crit W.S. (ft)	166.75	Flow Area (sq ft)	1929.28	742.38	5585.44
E.G. Slope (ft/ft)	0.000135	Area (sq ft)	1929.28	742.38	5585.44
Q Total (cfs)	16941.00	Flow (cfs)	1503.00	2704.65	12733.35
Top Width (ft)	1458.15	Top Width (ft)	302.27	45.00	1110.87
Vel Total (ft/s)	2.05	Avg. Vel. (ft/s)	0.78	3.64	2.28

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 5039.878 Profile: 500-yr (Continued)

Max Chl Dpth (ft)	17.07	Hydr. Depth (ft)	6.38	16.50	5.03
Conv. Total (cfs)	1457025.0	Conv. (cfs)	129267.0	232615.2	1095143.0
Length Wtd. (ft)	176.50	Wetted Per. (ft)	308.29	46.66	1128.82
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.05	0.13	0.04
Alpha	1.44	Stream Power (lb/ft s)	1821.48	0.00	0.00
Frctn Loss (ft)	0.02	Cum Volume (acre-ft)	163.66	57.78	334.91
C & E Loss (ft)	0.01	Cum SA (acres)	32.97	4.59	52.97

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 4865.578 Profile: 500-yr

E.G. Elev (ft)	171.40	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.050	0.030	0.022
W.S. Elev (ft)	171.32	Reach Len. (ft)	54.72	75.61	94.12
Crit W.S. (ft)	163.82	Flow Area (sq ft)	2482.40	1883.40	4460.44
E.G. Slope (ft/ft)	0.000080	Area (sq ft)	2482.40	1883.40	4460.44
Q Total (cfs)	16941.00	Flow (cfs)	2391.16	5281.76	9268.08
Top Width (ft)	1221.83	Top Width (ft)	357.81	117.19	746.83
Vel Total (ft/s)	1.92	Avg. Vel. (ft/s)	0.96	2.80	2.08
Max Chl Dpth (ft)	17.07	Hydr. Depth (ft)	6.94	16.07	5.97
Conv. Total (cfs)	1899880.0	Conv. (cfs)	268161.4	592332.5	1039386.0
Length Wtd. (ft)	85.51	Wetted Per. (ft)	362.11	117.71	772.60
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.03	0.08	0.03
Alpha	1.34	Stream Power (lb/ft s)	1720.50	0.00	0.00
Frctn Loss (ft)	0.01	Cum Volume (acre-ft)	159.24	52.53	312.64
C & E Loss (ft)	0.00	Cum SA (acres)	32.31	4.27	48.85

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 4790.088 Profile: 500-yr

E.G. Elev (ft)	171.38	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.094	0.030	0.023
W.S. Elev (ft)	171.32	Reach Len. (ft)	13.00	13.00	13.00
Crit W.S. (ft)	165.31	Flow Area (sq ft)	2694.05	971.10	6622.41
E.G. Slope (ft/ft)	0.000065	Area (sq ft)	2694.05	971.10	6622.41
Q Total (cfs)	16941.00	Flow (cfs)	1359.61	2498.16	13083.23
Top Width (ft)	1443.56	Top Width (ft)	384.32	58.20	1001.04
Vel Total (ft/s)	1.65	Avg. Vel. (ft/s)	0.50	2.57	1.98
Max Chl Dpth (ft)	17.32	Hydr. Depth (ft)	7.01	16.69	6.62
Conv. Total (cfs)	2108296.0	Conv. (cfs)	169202.0	310894.7	1628200.0
Length Wtd. (ft)	13.00	Wetted Per. (ft)	389.66	59.09	1011.12
Min Ch El (ft)	154.00	Shear (lb/sq ft)	0.03	0.07	0.03
Alpha	1.48	Stream Power (lb/ft s)	2241.15	0.00	0.00
Frctn Loss (ft)	0.00	Cum Volume (acre-ft)	155.99	50.05	300.67
C & E Loss (ft)	0.01	Cum SA (acres)	31.84	4.12	46.96

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 4777.088 Profile: 500-yr

E.G. Elev (ft)	171.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.055	0.030	0.040
W.S. Elev (ft)	171.34	Reach Len. (ft)	15.00	15.00	15.00
Crit W.S. (ft)	164.92	Flow Area (sq ft)	2504.39	937.97	9737.63
E.G. Slope (ft/ft)	0.000061	Area (sq ft)	2504.39	937.97	9737.63
Q Total (cfs)	16941.00	Flow (cfs)	1899.35	2322.44	12719.21
Top Width (ft)	1495.70	Top Width (ft)	361.04	57.00	1077.66
Vel Total (ft/s)	1.29	Avg. Vel. (ft/s)	0.76	2.48	1.31
Max Chl Dpth (ft)	17.09	Hydr. Depth (ft)	6.94	16.46	9.04
Conv. Total (cfs)	2171411.0	Conv. (cfs)	243448.9	297678.3	1630284.0
Length Wtd. (ft)	15.00	Wetted Per. (ft)	367.34	57.83	1081.52
Min Ch El (ft)	154.25	Shear (lb/sq ft)	0.03	0.06	0.03
Alpha	1.32	Stream Power (lb/ft s)	1639.28	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	155.21	49.77	298.23
C & E Loss (ft)		Cum SA (acres)	31.73	4.10	46.65

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 4740 BR U Profile: 500-yr

E.G. Elev (ft)	171.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	1.29	Wt. n-Val.			
W.S. Elev (ft)	171.34	Reach Len. (ft)	40.00	40.00	40.00
Crit W.S. (ft)	171.72	Flow Area (sq ft)	283.75	720.46	1493.62
E.G. Slope (ft/ft)		Area (sq ft)	275.13	718.52	1457.05
Q Total (cfs)	16941.00	Flow (cfs)	2100.72	10142.42	4708.48
Top Width (ft)	1385.54	Top Width (ft)	250.88	57.00	1077.66
Vel Total (ft/s)	6.78	Avg. Vel. (ft/s)	7.40	14.08	3.15
Max Chl Dpth (ft)	17.09	Hydr. Depth (ft)	1.13	12.64	1.39
Conv. Total (cfs)		Conv. (cfs)			
Length Wtd. (ft)	40.00	Wetted Per. (ft)	285.72	171.83	1137.94
Min Ch El (ft)	154.25	Shear (lb/sq ft)			
Alpha	1.74	Stream Power (lb/ft s)	1639.28	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	154.73	49.48	296.30
C & E Loss (ft)		Cum SA (acres)	31.62	4.08	46.28

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 4740 BR D Profile: 500-yr

E.G. Elev (ft)	171.37	Element	Left OB	Channel	Right OB
Vel Head (ft)	3.08	Wt. n-Val.			
W.S. Elev (ft)	171.34	Reach Len. (ft)	36.50	36.50	36.50
Crit W.S. (ft)	172.38	Flow Area (sq ft)	429.92	678.09	1139.07
E.G. Slope (ft/ft)		Area (sq ft)	419.13	676.31	1118.66
Q Total (cfs)	16941.00	Flow (cfs)	1159.71	11586.00	4205.90
Top Width (ft)	969.98	Top Width (ft)	315.84	52.44	601.70
Vel Total (ft/s)	7.54	Avg. Vel. (ft/s)	2.70	17.09	3.69
Max Chl Dpth (ft)	17.34	Hydr. Depth (ft)	1.36	12.93	1.89
Conv. Total (cfs)		Conv. (cfs)			
Length Wtd. (ft)	36.50	Wetted Per. (ft)	376.27	157.56	646.87
Min Ch El (ft)	154.00	Shear (lb/sq ft)			
Alpha	3.38	Stream Power (lb/ft s)	1125.57	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	154.41	48.84	295.12
C & E Loss (ft)		Cum SA (acres)	31.36	4.03	45.51

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 4685.592 Profile: 500-yr

E.G. Elev (ft)	167.46	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.24	Wt. n-Val.	0.100	0.030	0.099
W.S. Elev (ft)	167.22	Reach Len. (ft)	393.59	358.41	320.67
Crit W.S. (ft)	165.40	Flow Area (sq ft)	1624.05	662.44	5691.30
E.G. Slope (ft/ft)	0.000668	Area (sq ft)	1624.05	662.44	5691.30
Q Total (cfs)	16941.00	Flow (cfs)	2054.40	4586.97	10299.64
Top Width (ft)	892.39	Top Width (ft)	270.81	52.44	569.14
Vel Total (ft/s)	2.12	Avg. Vel. (ft/s)	1.26	6.92	1.81
Max Chl Dpth (ft)	13.22	Hydr. Depth (ft)	6.00	12.63	10.00
Conv. Total (cfs)	655297.8	Conv. (cfs)	79466.5	177429.2	398402.0
Length Wtd. (ft)	337.08	Wetted Per. (ft)	271.78	52.68	571.66
Min Ch El (ft)	154.00	Shear (lb/sq ft)	0.25	0.52	0.42
Alpha	3.36	Stream Power (lb/ft s)	1125.57	0.00	0.00
Frctn Loss (ft)	0.29	Cum Volume (acre-ft)	153.56	48.28	292.27
C & E Loss (ft)	0.04	Cum SA (acres)	31.12	3.99	45.02

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 4327.181 Profile: 500-yr

E.G. Elev (ft)	167.12	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.38	Wt. n-Val.	0.100	0.034	0.086
W.S. Elev (ft)	166.74	Reach Len. (ft)	379.56	362.86	348.11
Crit W.S. (ft)		Flow Area (sq ft)	580.19	509.36	4401.12
E.G. Slope (ft/ft)	0.001147	Area (sq ft)	580.19	509.36	4401.12
Q Total (cfs)	16941.00	Flow (cfs)	912.41	4411.17	11617.43
Top Width (ft)	600.96	Top Width (ft)	103.66	35.94	461.36
Vel Total (ft/s)	3.09	Avg. Vel. (ft/s)	1.57	8.66	2.64

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 4327.181 Profile: 500-yr (Continued)

Max Chl Dpth (ft)	14.74	Hydr. Depth (ft)	5.60	14.17	9.54
Conv. Total (cfs)	500129.6	Conv. (cfs)	26935.9	130225.8	342967.9
Length Wtd. (ft)	354.49	Wetted Per. (ft)	105.06	36.17	463.73
Min Ch El (ft)	152.00	Shear (lb/sq ft)	0.40	1.01	0.68
Alpha	2.57	Stream Power (lb/ft s)	898.41	0.00	0.00
Frctn Loss (ft)	0.46	Cum Volume (acre-ft)	143.60	43.46	255.12
C & E Loss (ft)	0.03	Cum SA (acres)	29.43	3.62	41.22

Plan: Prop-Conditions Sandy Run Sandy Main Stem RS: 3964.325 Profile: 500-yr

E.G. Elev (ft)	166.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.71	Wt. n-Val.	0.100	0.030	0.100
W.S. Elev (ft)	165.93	Reach Len. (ft)	460.88	448.94	432.66
Crit W.S. (ft)		Flow Area (sq ft)	603.96	605.64	3698.97
E.G. Slope (ft/ft)	0.001448	Area (sq ft)	603.96	605.64	3698.97
Q Total (cfs)	16941.00	Flow (cfs)	911.41	6359.54	9670.04
Top Width (ft)	558.01	Top Width (ft)	137.49	45.65	374.88
Vel Total (ft/s)	3.45	Avg. Vel. (ft/s)	1.51	10.50	2.61
Max Chl Dpth (ft)	13.93	Hydr. Depth (ft)	4.39	13.27	9.87
Conv. Total (cfs)	445167.1	Conv. (cfs)	23949.7	167112.9	254104.5
Length Wtd. (ft)	441.02	Wetted Per. (ft)	138.54	46.06	377.73
Min Ch El (ft)	152.00	Shear (lb/sq ft)	0.39	1.19	0.89
Alpha	3.81	Stream Power (lb/ft s)	800.12	0.00	0.00
Frctn Loss (ft)	0.51	Cum Volume (acre-ft)	138.44	38.81	222.75
C & E Loss (ft)	0.08	Cum SA (acres)	28.38	3.28	37.88

Sandy Main Stem (NAVD 88)
100-Year Water surface Station Comparison

River Sta	Profile	Duplicate Effective		Corrected Effective		Proposed		Proposed-Duplicate Comparison		Proposed-Corrected Comparison	
		Sta W.S. Lft	Sta W.S. Rgt	Sta W.S. Lft	Sta W.S. Rgt	Sta W.S. Lft	Sta W.S. Rgt	Sta W.S. Lft	Sta W.S. Rgt	Sta W.S. Lft	Sta W.S. Rgt
0	0	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)				
6709.658	100-yr	554.38	883.97	554.21	883.99	554.4	883.96	+0.02	-0.01	+0.19	-0.03
6668.16	100-yr	221.36	662.57	221.17	662.65	221.39	662.55	+0.03	-0.02	+0.22	-0.10
6572.639	100-yr	182.63	617.08	182.55	617.21	182.65	617.06	+0.02	-0.02	+0.10	-0.15
6414.98	100-yr	286.17	1033.89	286.08	1033.94	286.19	1033.88	+0.02	-0.01	+0.11	-0.06
6189.177	100-yr	519.47	654.71	519.06	655	519.7	654.54	+0.23	-0.17	+0.64	-0.46
5508.105	100-yr	205.04	2085.5	204.8	2085.5	205.17	2085.5	+0.13	0	+0.37	0.00
5084.678	100-yr	273.77	1654.28	286.08	1654.28	287.42	1654.28	+13.65	0	+1.34	0.00
5065.378	100-yr	88.59	1516	88.8	1526.5	92.71	1524.91	+4.12	8.91	+3.91	-1.59
5039.878	100-yr	93.24	1733.96	87.54	1747.95	91.26	1743.5	-1.98	9.54	+3.72	-4.45
4865.578	100-yr	88.3	1639.16	86.4	1644.07	88.43	1642.02	+0.13	2.86	+2.03	-2.05
4790.088	100-yr	196.45	1701.35	198.79	1698.98	199.94	1697.54	+3.49	-3.81	+1.15	-1.44
4777.088	100-yr	85.92	1540.37	88.45	1538.59	89.64	1537.75	+3.72	-2.62	+1.19	-0.84
4685.592	100-yr	248.02	1083.3	248.02	1083.3	248.02	1083.3	0.00	0	0.00	0.00
4327.181	100-yr	298.93	868.97	298.93	868.97	298.93	868.97	0.00	0	0.00	0.00
3964.325	100-yr	258.4	781.42	258.4	781.42	258.4	781.42	0.00	0	0.00	0.00
3515.389	100-yr	213.69	887.67	213.69	887.67	213.69	887.67	0.00	0	0.00	0.00

= River stations within project limits

= Contraction in proposed water surface stationing vs duplicate model

= Expansion in proposed water surface stationing vs duplicate model

= Duplicate Effective Model

Appendix A – Cross-Section Plan

PROJECT SITE BOUNDARY
237,428 SF. (5.45 AC)

LIMIT OF DISTURBANCE
214,777 SF. (4.93 AC)

STA. 5084.678
STA. 5065.378
STA. 5039.878
STA. 4865.578
STA. 4790.088
STA. 4777.088

UgD
UusB

ZONE AE
ZONE X

EXISTING BUILDING TO REMAIN (11,370 SF)
FFE = 170.11'
(11,640 SF)
ELEVATION 170.11'

PROPOSED CONSOLIDATED LOT
(500 PENNSYLVANIA AVENUE)
202,828 S.F. (4.886 AC.)

SERVICE DRIVE LANES
FFE = 170.11'

SERVICE DEPT.
FFE = 170.11'

PROP. UNDERGROUND BASIN (UG1)

PROP. UNDERGROUND BASIN (UG2)

PROP. 40 LF 6" SDR 26 PVC

PROP. RAILING

PROP. 8' WIDE TRAIL CONNECTION

PROP. 6' PAINTED CROSSWALK (TYP.)

PROP. 'ALL TRAFFIC MUST TURN RIGHT' SIGN AND 'NO TURN LEFT' SIGN

PROP. STOP SIGN

PROP. MOUNTABLE CURB ISLAND WITH OBJECT MARKERS

PROP. POLE TO BE RELOCATED REQUIRED AND COORDINATED WITH UTILITY PROVIDER

EXISTING TREES TO REMAIN

PROP TRANSFORMER AND OVERHEAD UTILITY POLE

TRASH ENCLOSURE STRUCTURE SHALL COMPLY EQUIPPED WITH FLOOD RATED CHAINS & RECEIVING HOOKS. ALL MOVEABLE TRASH BINS AND STRUCTURES SHALL BE CHAINED DOWN IN ADVANCE OF ANY FLOOD EVENT

APPROXIMATE GRAPHICAL PLOTTING OF FLOOD HAZARD LINE

169.04 FLOOD ELEVATION

EXIST. APPROX. CENTERLINE OF STREAM

SANDY RUN

N30°06'50"W 220.00'

S27°06'44"W 272.72'

S28°06'50"E 220.00'

30 15 7.5 0 30
1"= 30'

USGS MAP

AMBLER QUAD

SCALE: 1"=2,000'

1000' 0 2000'

BOHLER

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
SUSTAINABLE DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

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PROJECT No.: PAB220113.01
DRAWN BY: RMS
CHECKED BY: JAB
DATE: 10/23/2024
CAD I.D.: PAB220113_CUTFILL-0A_FEMA

PROJECT:

FLOODPLAIN ANALYSIS 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
ENGINEER
JEFFREY A. BEAVAN
PROFESSIONAL ENGINEER
PENNSYLVANIA LICENSE No. PE082005
NEW JERSEY LICENSE No. 24GE05036500

SHEET TITLE:

FLOODPLAIN CROSS-SECTION EXHIBIT

SHEET NUMBER:

C-301

ORG. DATE - 10/23/2024

R:\2022\PAB220113.01\CAD\04WKNG\EXHIBITS\FEMA\PAB220113_CUTFILL-0A_FEMA---LAYOUT C-301 FEMA CROSS-SECTIONS

Appendix B – Cut/Fill Exhibit

PROJECT SITE BOUNDARY
237,428 SF. (5.45 AC)

LIMIT OF DISTURBANCE
214,777 SF. (4.93 AC)

UgD

ZONE AE

PROP. CLEAR SIGHT TRIANGLE

EXIST. LOT LINE (TO BE EXTINGUISHED)

PROP. 6' PAINTED (TO BE CROSSWALK (TYP.)

8' WIDE TRAIL CONNECTION

PROP. 'ALL TRAFFIC MUST TURN RIGHT' SIGN AND 'NO TURN LEFT' SIGN

PROP. SIGHT DISTANCE = 750'

PROP. POLE TO BE RELOCATEL REQUIRED AND COORDINATED WITH UTILITY PROVIDER

TBM-B MAG NAIL ELEV=164.38' SEE NOTE #8

EXISTING OFFICE/SHOWROOM BUILDING TO REMAIN (11,640 SF) ELEVATION 170.11'

INV. OUT: 161.20

PROP. UNDERGROUND BASIN (UG2)

PROP. UNDERGROUND BASIN (UG1)

PROP TRANSFORMER AND OVERHEAD UTILITY POLE

EXISTING TREES TO REMAIN

SIDE YARD SETBACK

REAR YARD SETBACK

EXIST. APPROX. CENTERLINE OF SWALE

EXIST. APPROX. CENTERLINE OF STREAM

SANDY RUN

APPROXIMATE GRAPHICAL PLOTTING OF FLOOD HAZARD LINE

169.04 FLOOD ELEVATION

STA: 5065.578

STA: 5039.878

STA: 4863.578

STA: 4790.088

STA: 4777.088

30 15 7.5 0 30
1"= 30'

USGS MAP

AMBLER QUAD

SCALE: 1"=2,000'

1000' 0 2000'

CUT FILL LEGEND

FLOODPLAIN FILL AREA

FLOODPLAIN CUT AREA

AS-BUILT FLOODPLAIN CUT/FILL CALCULATION

CUT WITHIN FLOODPLAIN: 2,141 CY
FILL WITHIN FLOODPLAIN: 11,791 CY

NET CUT WITHIN FLOODPLAIN: 0 CY
NET FILL WITHIN FLOODPLAIN = 9,650 CY

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PROJECT No.:	PAB220113.01
DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/23/2024
CAD I.D.:	PAB220113_CUTFILL-0A_FEMA

PROJECT:

FLOODPLAIN ANALYSIS 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. PE082205
NEW JERSEY LICENSE No. GE49034
NEW JERSEY LICENSE No. 24GA28039500

SHEET TITLE:

FLOODPLAIN CUT-FILL EXHIBIT

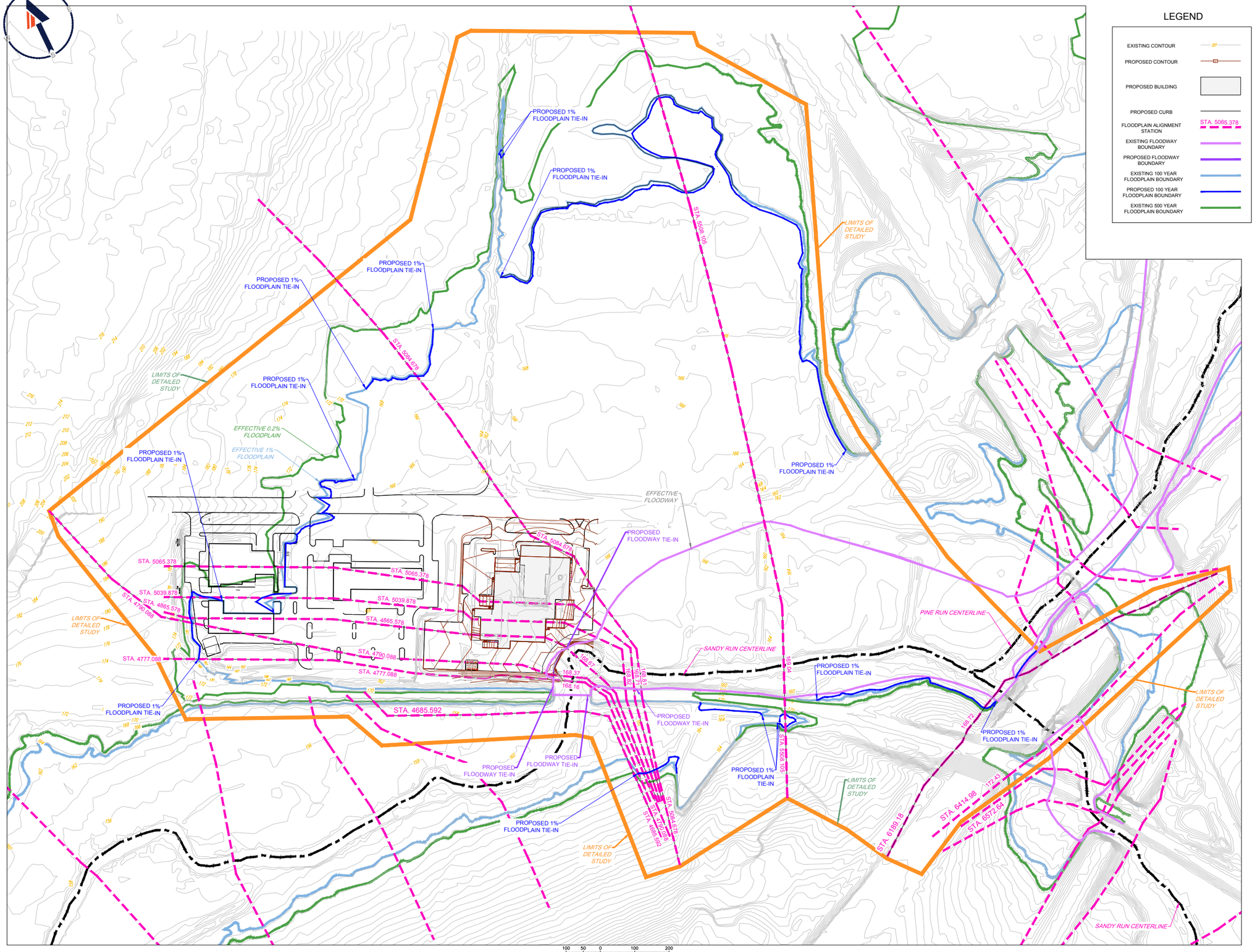
SHEET NUMBER:

C-302

ORG. DATE - 10/23/2024

R:\2022\PAB220113.01\C-ADD\DRAWING\EXHIBITS\FEMA\PAB220113_CUTFILL-0A_FEMA — LAYOUT: C-302 CUT-FILL

Appendix C – Topographic Work Map Exhibit



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REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY
1	5/29/2024	PER FEMA REVIEW	RMS / JAB

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PROJECT No.: PAB220113.00
DRAWN BY: RMS
CHECKED BY: JAB
DATE: 07/17/2023
CAD I.D.: WORK MAP-1

PROJECT:

MONTGOMERY COUNTY
COMMONWEALTH OF PA
WHITEMARSH TOWNSHIP
SANDY RUN WATERSHED

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
JEFFREY A. BEAVAN
PROFESSIONAL ENGINEER
NEW JERSEY LICENSE NO. 24GE05039600
NEW JERSEY CERTIFICATE OF AUTHORIZATION NO. 24GA28039600

SHEET TITLE:

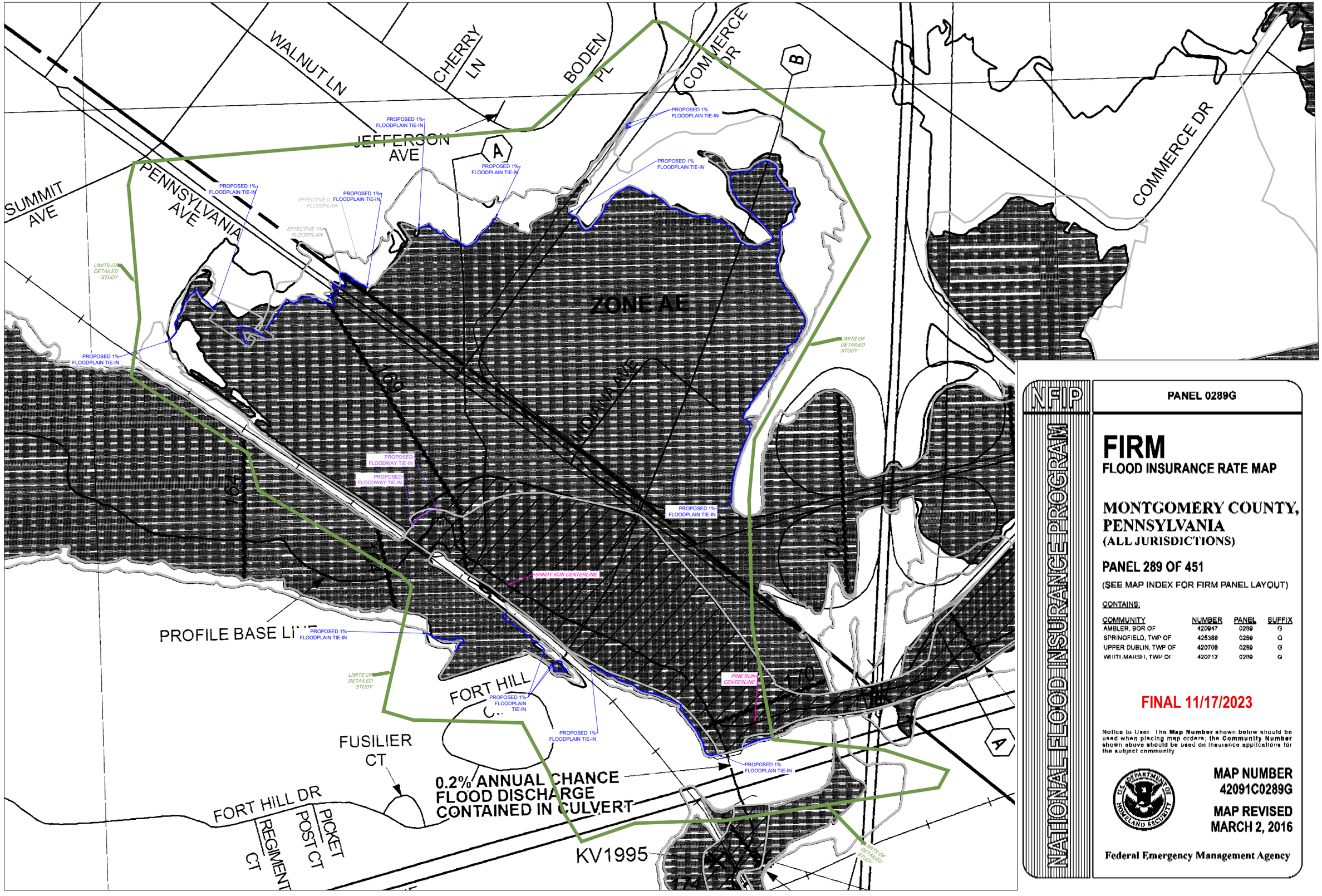
APPLICATION FOR CLOMR
TOPOGRAPHIC WORK MAP
NAVD88

SHEET NUMBER: 1

REVISION 1 - 5/29/2024

G:\2022\PAB220113.00\ENGINEERING\CLOMR\CLOMR WORK MAP.dwg — Last saved by JEFFREY.BEAVAN on 5/29/2024 by JEFFREY.BEAVAN (BOHLER)

Appendix D – Annotated FIRM Map Exhibit



NATIONAL FLOOD INSURANCE PROGRAM

NFIP

PANEL 0289G

FIRM

FLOOD INSURANCE RATE MAP

MONTGOMERY COUNTY, PENNSYLVANIA

(ALL JURISDICTIONS)

PANEL 289 OF 451

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
AMBLER, BOR OF	420047	0289	G
SPRINGFIELD, TWP OF	425388	0289	G
UPPER DUBLIN, TWP OF	420700	0289	G
WHITEMARSH, TWP OF	420712	0289	G

FINAL 11/17/2023

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
42091C0289G

MAP REVISED
MARCH 2, 2016

Federal Emergency Management Agency

Whitemarsh TOWNSHIP
616 GERMANTOWN PIKE - LAFAYETTE HILL, PA 19444-1821
TEL: 610-825-3535 FAX: 610-825-9416
www.whitemarshtwp.org

BOARD of SUPERVISORS
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Jacy Toll – Vice Chair
Vincent Manuele
Elizabeth Moy
Patrice Turenne

Craig T. McAnally
Township Manager

December 20, 2024

Mile One Fort Washington, LLC
c/o Craig Colton
3301 Briggs Chaney Road
Silver Springs, MD 20904

RE: SLD#03-23 R1/ 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 amended preliminary minor subdivision/ major land development plan. We reviewed a land development plan set prepared by Bohler Engineering, dated October 4, 2024 with no revisions. 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; this plan represents a 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 ar a 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.	§116-164.	We acknowledge General Note #14 on page C-303 denoting that the entire site is within the 100-year floodplain. Please revise plans to either remove the FEMA line from the legend or include the FEMA line on the plans. Additionally, the plans should be revised to identify the FHA line in the legend as the floodway line.
2.	§ 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.
3.	§ 116-169.B.	We acknowledge that a variance was granted to allow disturbance of slopes greater than 25%; however, all slopes 15%-25% and greater than 25% shall be shown on the plans.
4.	§ 116-184.	The applicant should note that there are discrepancies between the parking table on Sheet C-302 and Sheet C-303. This must be corrected. Additionally, please identify the difference between inventory and public parking spaces.

5. § 116-188.3. This section requires at least 50% of EV spaces to be ADA accessible; these spaces need to be clearly marked on the plans. Additionally, certain interior spaces (some EV and some other) appear to be wider and have unidentified symbols in the right front corner of the space; these symbols need to be identified.

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. The plans should be modified to show compliance with this section since these materials will be stored on site.

8. § 116-206 Proposed 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.

9. § 116-258 We acknowledge that the 100 year floodplain is coterminous with RCCD Zone Two; however, the plans must clearly indicate the boundaries of the Riparian Corridor Conservation District (RCCD) Zones One and Two.

Additional Comment

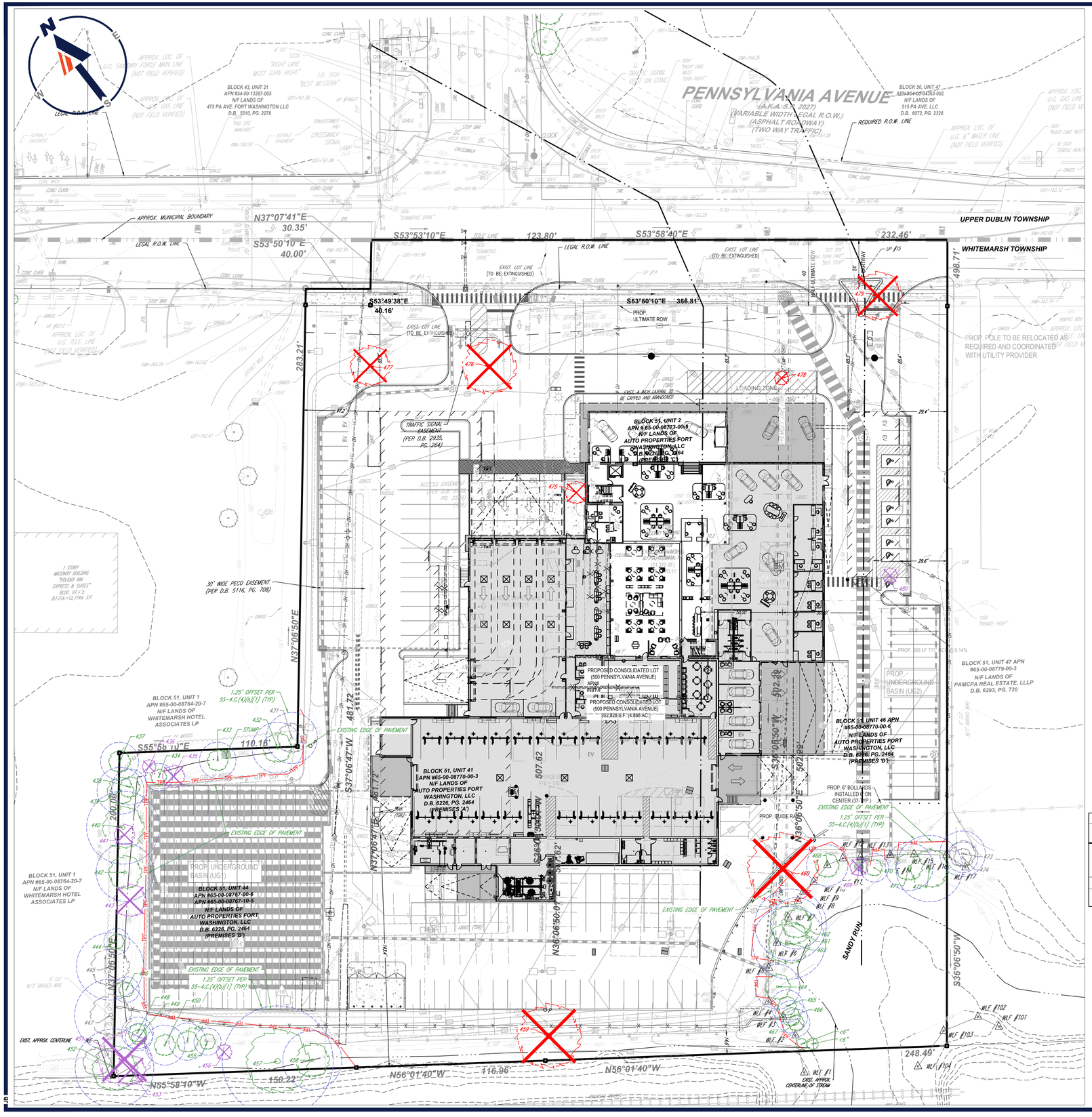
10. We are aware that there is a trail easement that the applicant is granting to the County for a portion of the Cross County Trail. We understand that there is an agreement drafted and executed with the County and that no specific easement will be shown on the plans because design of the trail has 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
Whitemarsh 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


PENNSYLVANIA AVENUE
(A.K.A. S.R. 2027)
(VARIABLE WIDTH-LEGAL R.O.W.)
(ASPHALT ROADWAY)
(TWO WAY TRAFFIC)
REQUIRED R.O.W. LINE
LEGAL R.O.W. LINE
APPROX. MUNICIPAL BOUNDARY
UPPER DUBLIN TOWNSHIP
WHITEMARSH TOWNSHIP
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
N37°07'41"E 30.35'
S53°50'10"E 40.00'
S53°53'10"E 123.80'
S53°58'40"E 232.46'
S53°49'38"E 40.16'
S53°50'10"E 356.81'
498.71'
283.21'
EXIST. LOT LINE (TO BE EXTINGUISHED)
PROP. ULTIMATE ROW
PROP. POLE TO BE RELOCATED AS REQUIRED AND COORDINATED WITH UTILITY PROVIDER
LOADING ZONE
EXIST. 4 INCH LATERAL TO BE CAPPED AND ABANDONED
BLOCK 51, UNIT 2
APN # 65-00-08713-00-9
N/F LANDS OF
AUTO PROPERTIES FORT WASHINGTON, LLC
D.B. 6226, PG. 2464
(PREMISES 'C')
TRAFFIC SIGNAL EASEMENT (PER D.B. 2915, PG. 264)
ACCESS EASEMENT (PER D.B. 2915, PG. 264)
30' WIDE PECO EASEMENT (PER D.B. 5116, PG. 708)
1 STORY MASONRY BUILDING "HOLIDAY INN EXPRESS & SUITES" BLDG. HT.=± BLD'G.A.=12,744 S.F.
PROPOSED CONSOLIDATED LOT (500 PENNSYLVANIA AVENUE)
APN#
PROPOSED CONSOLIDATED LOT (500 PENNSYLVANIA AVENUE)
202,828 S.F. (4.986 AC.)
PROP. UNDERGROUND BASIN (UG2)
PROP. UNDERGROUND BASIN (UG1)
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 #65-00-08770-00-6
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
PROP. GUIDE RAIL
PROP. 6" BOLLARDS INSTALLED ON CENTER (37'-TYP.)
EXISTING EDGE OF PAVEMENT
1.25" OFFSET PER 55-4.C.(4)b.[1] (TYP)
SANDY RUN
EXIST. APPROX. CENTERLINE OF STREAM
S55°58'10"E 110.16'
N55°58'10"W 150.22'
N56°01'40"W 116.96'
N56°01'40"W 248.49'
N37°06'50"E 481.72'
S37°06'47"W 481.72'
S36°06'50"W 502.39'
N36°06'50"E 507.62'
S36°06'50"W 507.62'
N37°06'50"E 260.00'
N37°06'50"E 260.00'
S36°06'50"W 502.39'
S36°06'50"W
PROP. 263 LF ??? @ 0.14%
PROP. 6" CLEANOUT
PROP. 8" SANITARY SEWER
PROP. 6" SANITARY LATERAL
PROP. 6" WATER LINE
PROP. 8" WATER LINE
PROP. 6" GAS LINE
PROP. 4" GAS LINE
PROP. 2" GAS LINE
PROP. 1" GAS LINE
PROP. 6" FIRE LINE
PROP. 4" FIRE LINE
PROP. 2" FIRE LINE
PROP. 1" FIRE LINE
PROP. 6" DOMESTIC LINE
PROP. 4" DOMESTIC LINE
PROP. 2" DOMESTIC LINE
PROP. 1" DOMESTIC LINE
PROP. 6" IRRIGATION LINE
PROP. 4" IRRIGATION LINE
PROP. 2" IRRIGATION LINE
PROP. 1" IRRIGATION LINE
PROP. 6" FIRE SERVICE
PROP. 4" FIRE SERVICE
PROP. 2" FIRE SERVICE
PROP. 1" FIRE SERVICE
PROP. 6" DOMESTIC SERVICE
PROP. 4" DOMESTIC SERVICE
PROP. 2" DOMESTIC SERVICE
PROP. 1" DOMESTIC SERVICE
PROP. 6" IRRIGATION SERVICE
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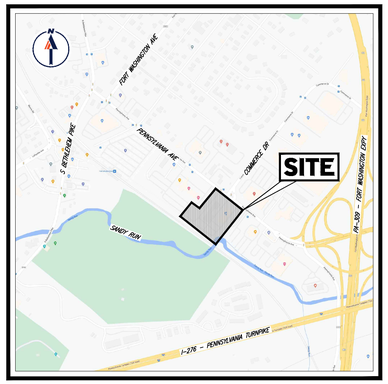
PROP. 1" GAS SERVIC



LOCATION MAP

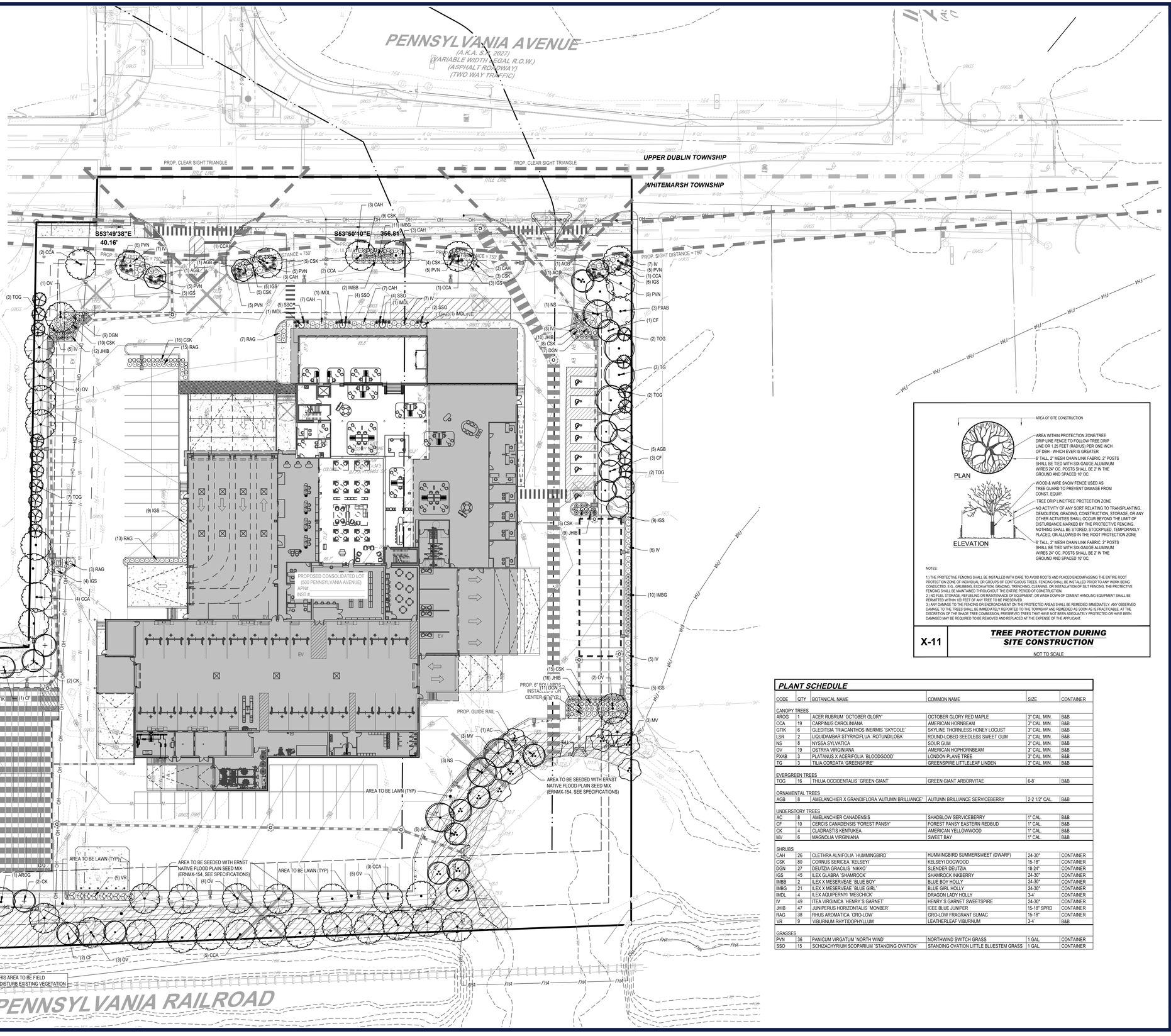
SCALE: 1" = 800'

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 DUMPING 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	5	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	26	CLETHRA ALNIFOLIA 'HUMMINGBIRD'	HUMMINGBIRD SUMMERSWEET (DWARF)	24-30"	CONTAINER
CSK	80	CORNUS SERICEA 'KELSEYI'	KELSEYI DOGWOOD	15-18"	CONTAINER
DGN	27	DEUTZIA GRACILIS 'NIKKO'	SLENDER DEUTZIA	18-24"	CONTAINER
IGS	45	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	4	ILEX AQUIPERNYI 'MESCHICK'	DRAGON LADY HOLLY	3-4'	CONTAINER
IV	49	ITEA VIRGINICA 'HENRY`S GARNET'	HENRY`S GARNET SWEETSPIRE	24-30"	CONTAINER
JHIB	47	JUNIPERUS HORIZONTALIS 'MONBER'	ICEE BLUE JUNIPER	15-18" SPRD	CONTAINER
RAG	38	RHUS AROMATICA 'GRO-LOW'	GRO-LOW FRAGRANT SUMAC	15-18"	CONTAINER
VR	9	VIBURNUM RHYTIDOPHYLLUM	LEATHERLEAF VIBURNUM	3-4'	B&B
GRASSES					
PVN	36	PANICUM VIRGATUM 'NORTH WIND'	NORTHWIND SWITCH GRASS	1 GAL.	CONTAINER
SSO	15	SCHIZACHYRIUM SCOPARIUM `STANDING OVATION'	STANDING OVATION LITTLE BLUESTEM GRASS	1 GAL.	CONTAINER

R:\2025\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-LLGT-0B.....LAYOUT C-701 LSCP

BOHLER

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
INDUSTRIAL DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

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PROJECT NO.:	PAB220113.01
DRAWN BY:	RMS
CHECKED BY:	JAB
DATE:	10/24/2024
CAD I.D.:	PAB220113.01-LLGT-0B

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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D.T. NORTH
REGISTERED LANDSCAPE ARCHITECT
PENNSYLVANIA LICENSE No. LA002729

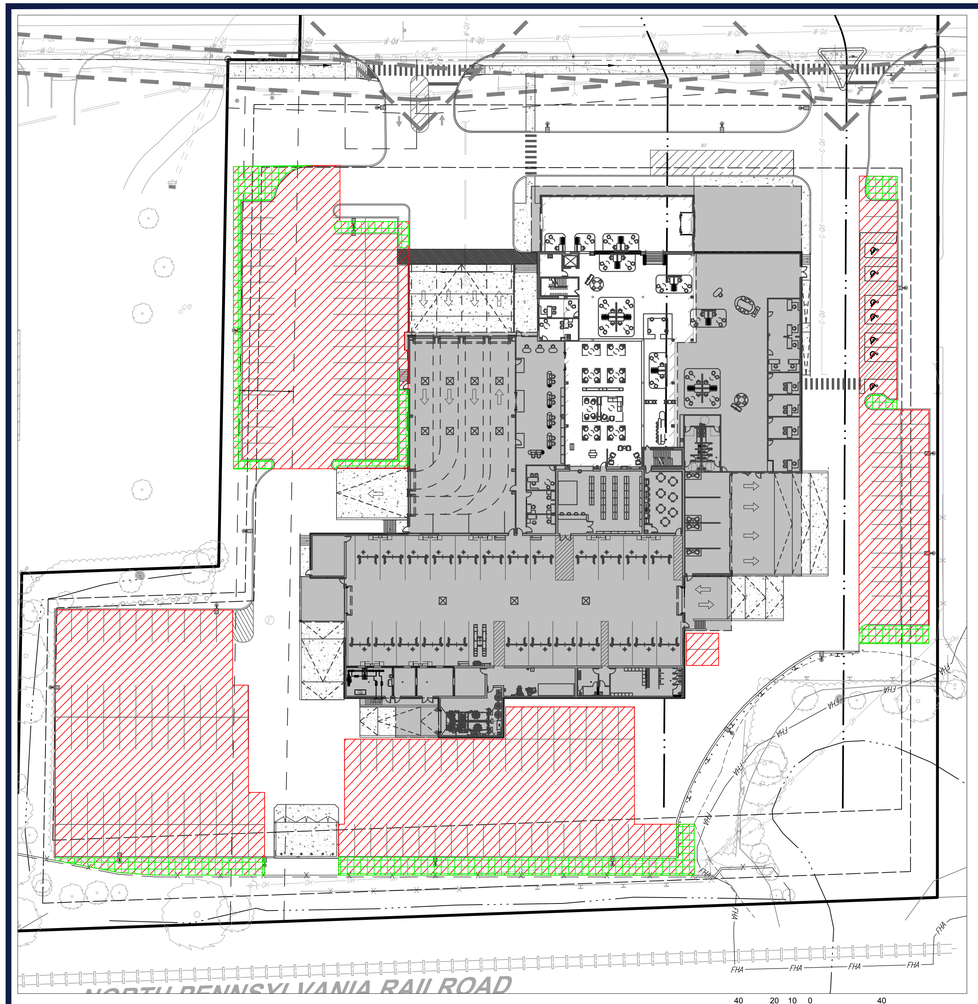
SHEET TITLE:

LANDSCAPE PLAN

SHEET NUMBER:

C-701

ORG. DATE - 10/24/2024



40 20 10 0 40

1"= 40'

PARKING LOT LANDSCAPE REQUIREMENT

TOTAL OPEN AIR PARKING AREA
(54,041± SF)

TOTAL OPEN AIR PARKING AREA
LANDSCAPE AREA
(5,630± SF (10.4%))

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 CLAY CLODS.

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 II 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 12" 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 'VISI-FENCE' OR APPROVED EQUAL, MOUNTED ON STEEL POSTS SHALL BE PLACED ALONG THE BOUNDARY OF THE TREE PROTECTION ZONE. POSTS SHALL BE ALLOCATED 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 SLOW RELEASE) 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 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 SPECIES 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, REGARDING 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 OPEN AIR PARKING SPACES = 46 (EXCLUDING GARAGE PARKING AND INVENTORY SPACES) REQUIRED: 46 / 2 = 23 TREES PROVIDED: 1 ARDG, 3 CCA, 6 GTK, 2 LSR, 5 NS, 6 OV (23 TREES)	COMPLIES
	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 = 54,041± SF REQUIRED (10%): 5,404.1 SF LANDSCAPE AREA PROVIDED: 5,630± SF LANDSCAPE AREA (10.4%)	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 PARCEL. THE IMPACT OF THE 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 AND CONSUMER SERVICE –; UTILITIES + PUBLIC SERVICE –; NON-RESIDENTIAL PARKING –; ADJ. STREET MAJOR COLLECTOR A *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: 304 FEET 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 S

ROCKWELL ASSOCIATES

Urban Foresters - Natural Resource Consultants
Planners - Forensic Arborists

BMW - Fort Washington

December 21, 2024
To: Samantha Zrillo
Whitemarsh Township - Planner
616 Germantown Pike
Lafayette Hill, PA 19444-1821
From: John Hosbach
Applicant: BMW - FW

Dear Sam,

As you may recall, the applicant provided a plan set, appeared in front of the STC and was approved in the summer of 2023 The applicant has revised it plan set to meet building design measures and modifications based on corporate design requirements.

Tree survey plan

Plan identifying the size, species, and location of all existing trees having a diameter at breast height (DBH) of six inches or greater and denoting each tree to be saved or removed. All removed trees shall be identified if removed in the past five years. Applicant has provided the inventory of the natural features including trees.

Tree Removal

The subject trees being proposed for removal are clearly denoted with a red x.

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. The applicant will require a waiver. The plan denotes 35% removal. However, I support this waiver as the additional trees are declining ash and one invasive flowering pear.

Tree Protection

Denote location and species of each preserved tree and all boundary trees, and the location of tree protection fences, encompassing the dimensions of each root protection zone as established by one of the following two means, whichever is greater:

[1] Calculated at 1.25 feet (radius) per one inch of (DBH) diameter breast height.
[2] A circle with a radius extending from a tree's trunk to a point no less than the furthest crown dripline.

The applicant is compliant, and the protection is shown on the plan. Please note, that some areas denote TPF along infrastructure (drive lane/parking). This is satisfactory for these areas.

Replacement tree requirement.

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.

The applicant will require a waiver. A total of (45) 3" caliper trees is required. The applicant has proposed a total of 38 trees which denotes a deficiency of 7 trees. Perhaps a fee in lieu can be arranged. The plant schedule shows a compliant native palate. The areas for mitigation plans are shown on the plan. The plan denotes filed locating trees to avoid existing vegetation disturbance. During my field review, I observed this area, and this is a satisfactory proposal. In addition, the applicant is providing 1" understory trees. From my conversation with the applicant's consultant, I believe the replacements as it pertains to Ch.55 are strictly the 3" caliper trees and that they are not utilizing the 1" stock for their compensatory requirements.

Note – The applicant has not provided compensation for the pear and ash. This was originally approved, I believe. I support this as the ash are declined beyond recovery and the pear is invasive.

General Notes.

I. I have confirmed during my visit that the subject trees noted as hazards are in fact true.
II. I would like to see the subject trees preserved, pruned and fertilized to preserve their existence and to increase longevity.
III. Due to the site be mostly infrastructure, the amount of disturbance within the LOD is minimal as it relates to the environmental impact.
IV. No heritage trees are being removed.

MONTGOMERY COUNTY
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PLANNING COMMISSION

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SCOTT FRANCE, AICP
EXECUTIVE DIRECTOR

January 8, 2025

Mr. Charles L. Guttenplan, AICP
Director of Planning & Zoning Officer
Whitmarsh Township
616 Germantown Pike
Lafayette Hill, Pennsylvania 19444

Re: MCPC #23-0041-002
Plan Name: BMW Automotive Dealership Expansion
Consolidation of 4 tax parcels into one (1) lot
Comprising 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 proposal in accordance with Section 502 of Act 247, "The Pennsylvania Municipalities Planning Code," as you requested on November 1, 2024. 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 was previously reviewed by this office in a letter to the township dated August 3, 2023. The plan proposes the redevelopment of an existing automobile dealership at 500 Pennsylvania Avenue. The development plan proposes to replace the dealership's existing 22,065 sq. ft. building with a five-story, 72,995 sq. ft. building. According to applicant, the BMW facility will be utilized for sales, service, storage and parking on the site. The plan states that after discussion with PennDOT, the five existing access points to Pennsylvania Avenue will be reduced to two access points: one full movement access driveway opposite Commerce Drive, and one right-in/right-out to the southeast of the signalized intersection at Pennsylvania Avenue and Commerce Drive. 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 in the 100-year floodplain and is immediately adjacent to the Sandy Run. The proposed structure

appears to be elevated, and according to the applicant's documentation, various flood-proofing measures will be incorporated into the development.

In their decision on June 7, 2023, the Zoning Hearing Board (ZHB) of Whitemarsh Township granted 16 Variances and 2 Special Exceptions from the Floodplain Management Ordinance and the Riparian Corridor Conservation District. The board found that "The project does not involve development which may endanger human life or prohibited activities." One of the conditions of this decision is that ". . . All structures shall be designed and constructed so as to have the capability of resisting the one-percent – annual chance flood."

The submitted plan proposes the consolidation of four (4) existing lots and the elimination of the existing lot lines to create a new 5.133-acre lot. The lot at 500-514 Pennsylvania Avenue is immediately adjacent to the SEPTA Lansdale/Doylestown Regional Rail corridor. According to the applicant's submitted documentation, the entire site is located within the existing 100 and 500 year floodplain, as delineated on the effective FEMA Flood Insurance Rate Map plan covering the site area -- Panel number 42091C0289G, revised May 24, 2021. The building's expansion plan proposes a finished floor elevation of 171.0 ft on columns, in order to provide flood storage for the site.

COMPREHENSIVE PLAN COMPLIANCE

Consistency with the *MONTCO 2040* – County Comprehensive Plan

The county plan supports redevelopment and reinvestment in areas where infrastructure exists, with a special emphasis on opportunities near transit centers such as the Ft. Washington commuter rail center. However, the redevelopment of the site is entirely within the 100 and 500 year floodplain. This is inconsistent with the '*Sustainable Places*' land use vision of the *Montco 2040: A Shared Vison*, the Montgomery County Comprehensive Plan. The vision and plan recommendation is for communities to adopt local floodplain regulations that prohibit fill and buildings within the floodplain, except for sites that are brownfield redevelopments. Specifically it recommends that *"Auto-related uses and other uses that could have a strong negative environmental impact should be prohibited in all floodplain areas*." (pg. 41)

Consistency with the Whitemarsh Township Plan Update, 2020

The proposed development plan for this site is consistent with the township's Future Land Use Plan, 2028. The Whitemarsh Township Selective Comprehensive Plan Update, November 2020 identifies this area in the Future Land Use Plan, 2028 as a 'Mixed-Use Node'. The plan recommends leveraging the multi-modal, mixed-use assets with restaurants, retail and other related services, and including public space amenities in future developments.

RECOMMENDATION

We support the redevelopment of this site as proposed, and in our review we have identified several issues first raised in our previous review letter of August 2023 that remain relevant and we believe should be addressed in the township's consideration of this plan. One of the key issues is to ensure that the site's redevelopment is integrated with the Cross-County Trail planning and the need for safe pedestrian movements across the applicant's frontage and across Pennsylvania Avenue to provide safe connections to the CCT's Commerce Drive trail segment. This improvement and others are discussed below.

REVIEW COMMENTS

SITE PLANNING

1. **Floodplain Management Ordinance**

   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.

2. **Cross-County Trail Connection- Intersection of Pennsylvania Ave. & Commerce Drive**.

   a. Cross-County Trail Corridor

   The planning, design and construction for Phase 3 of the Cross County Trail (CCT) & Road Diet is underway in the immediate vicinity of the applicant's development tract. A segment of the CCT trail is planned along the rear of the applicant's property. The township should be aware that discussions and agreements have occurred between the applicant and the County of Montgomery regarding the easement agreement needed to make the connection to the Commerce Drive segment of the CCT.

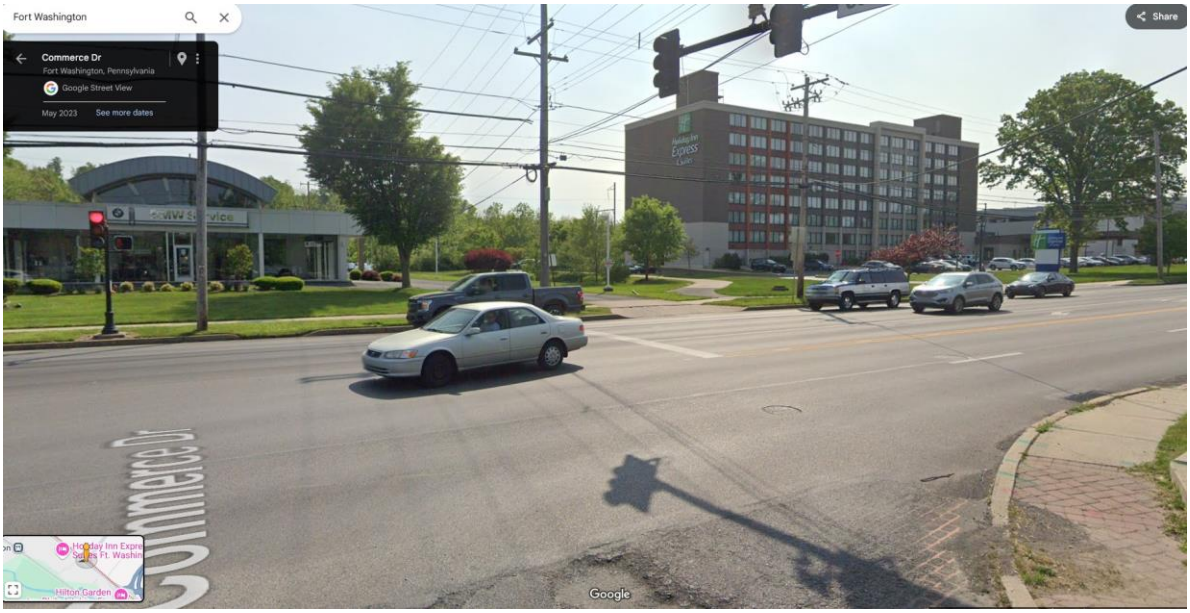
b. *Site Improvements - Intersection of Pennsylvania Avenue & Commerce Drive*.

- *Sidewalk along the frontage*.

In our letter of August 2023, we raised the issue that an inadequate sidewalk width was proposed along the frontage of the applicant's property and stressed the need for the applicant to assist in the improvements of the deteriorated crosswalk at the intersection of Pennsylvania Avenue and Commerce Drive. These improvements are not shown in the submitted development plan. The Cross-County Trail is a regionally significant trail that will connect the Schuylkill Trail in Conshohocken with the Pennypack Preserve and Trail in Willow Grove area. The trail utilizes the sidewalk along the applicant's frontage for the trail, and the standard width for this trail is 10 feet. We recommend the applicant revise the plan to include this dimension for the sidewalk.

- *Crosswalk at Pennsylvania Avenue and Commerce Drive*.

The applicant's site plan does not show an improved crosswalk at this intersection or the needed ADA curb ramp to provide safe and universal accessibility to the opposite side that is Commerce Drive in Upper Dublin Township. We believe this is the time to make both the crosswalk improvements and provide the needed ADA ramp. We recommend the applicant's planned improvements include the re-establishment of the pedestrian crosswalk and the construction of ADA curb ramps between the south side of Pennsylvania Avenue to the opposite side and the roadway. As shown in the attached photos, a thermal-stamped crosswalk existed across both Pennsylvania Avenue and Commerce Drive as recently as 2019. It has deteriorated and should be reinstituted to provide safe access for pedestrians and cyclists at this intersection (see below the May 2023 photo of this area).



Degraded crosswalk at Commerce Drive & Pennsylvania Avenue.

3. **MCPC # 23-0041-002 - Stamp of Approval**

   Please note that the submitted plan set has the incorrect MCPC number of #14-0121-003 on the various plan sheets. It should be corrected before final recording, and the correct number is MCPC # #23-0041-002, which should be placed on the plan.

CONCLUSION

We recommend the township address the above-mentioned issues and comments to its satisfaction. Please note that the review comments and recommendation contained in this report are advisory to the municipality and final disposition for the approval of any proposal will be made by the municipality.

Please be aware that the MCPC number #23-0041-002 has been set aside for the applicant' plan. If any subsequent plans are submitted for final recording, this MCPC number should appear on the applicant sheets within the plans in the box reserved for the seal of this agency.

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.

Sincerely,

Barry W. Jeffries

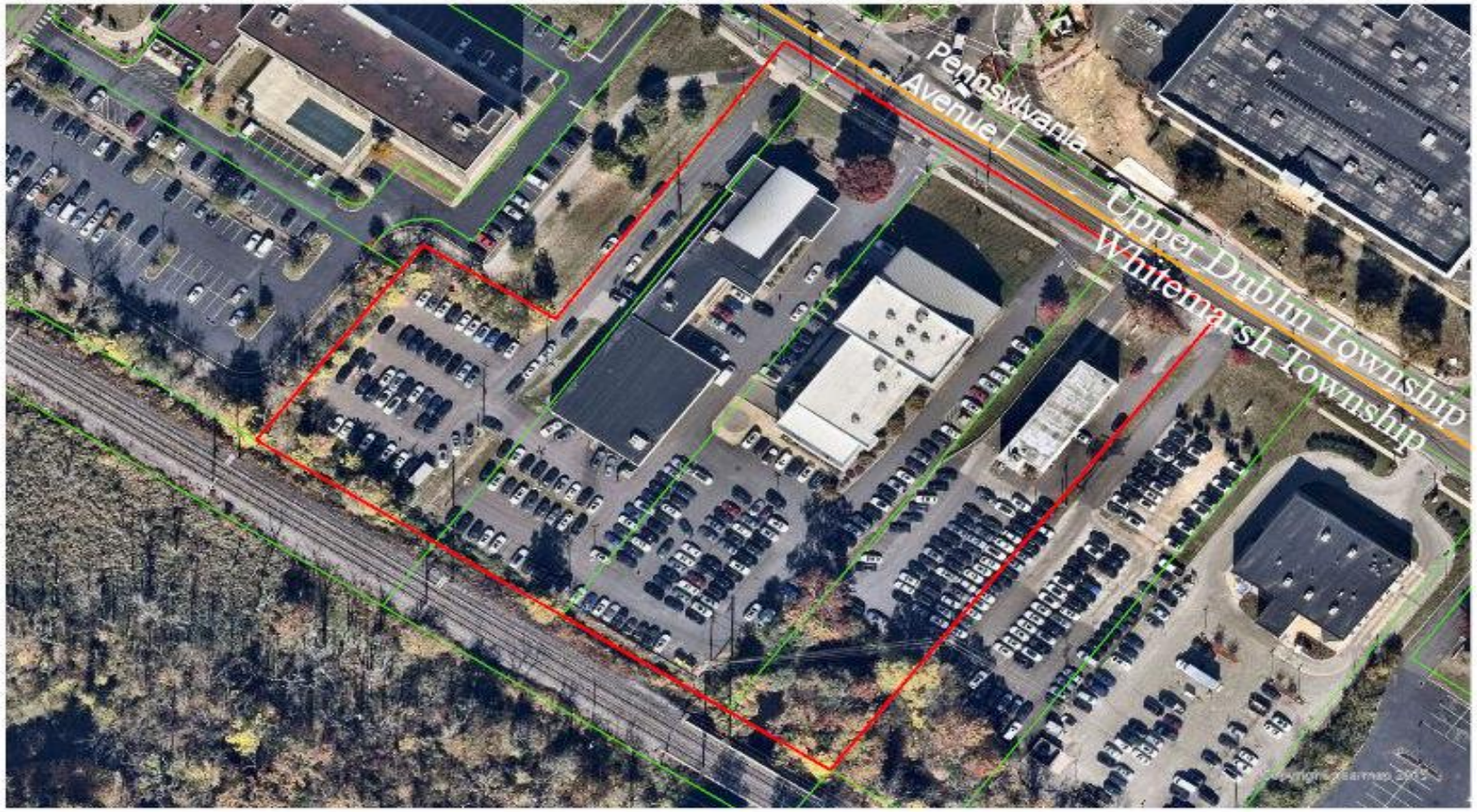
Barry W Jeffries, ASLA, Senior Design Planner
bjeffrie@montgomerycountypa.gov
(610) 278-3444

c: Aaron Kostyk, Chair, Township Planning Commission
Krista Heinrich, PE, Township Engineer
David Sander, Esq., Township Solicitor

Kurt Ferguson, Mgr., Upper Dublin Township
Fran Hanney, PennDOT District 6-0

Attachment A: Aerial Image of Site
Attachment B: Reduced Copy of Applicant's Proposed Site Plan

ATTACHMENTS A, B



BMW Automotive Dealership Expansion
MCPC#230041002

Montgomery County Planning Commission
Montgomery County Courthouse - Planning Commission
PO Box 311 Norristown PA 19404-0311
(p) 610 278-3722 (f) 610 278-3941
www.montcopa.org/planning
Aerial photography provided by Nearmap

0 50 100 200 Feet

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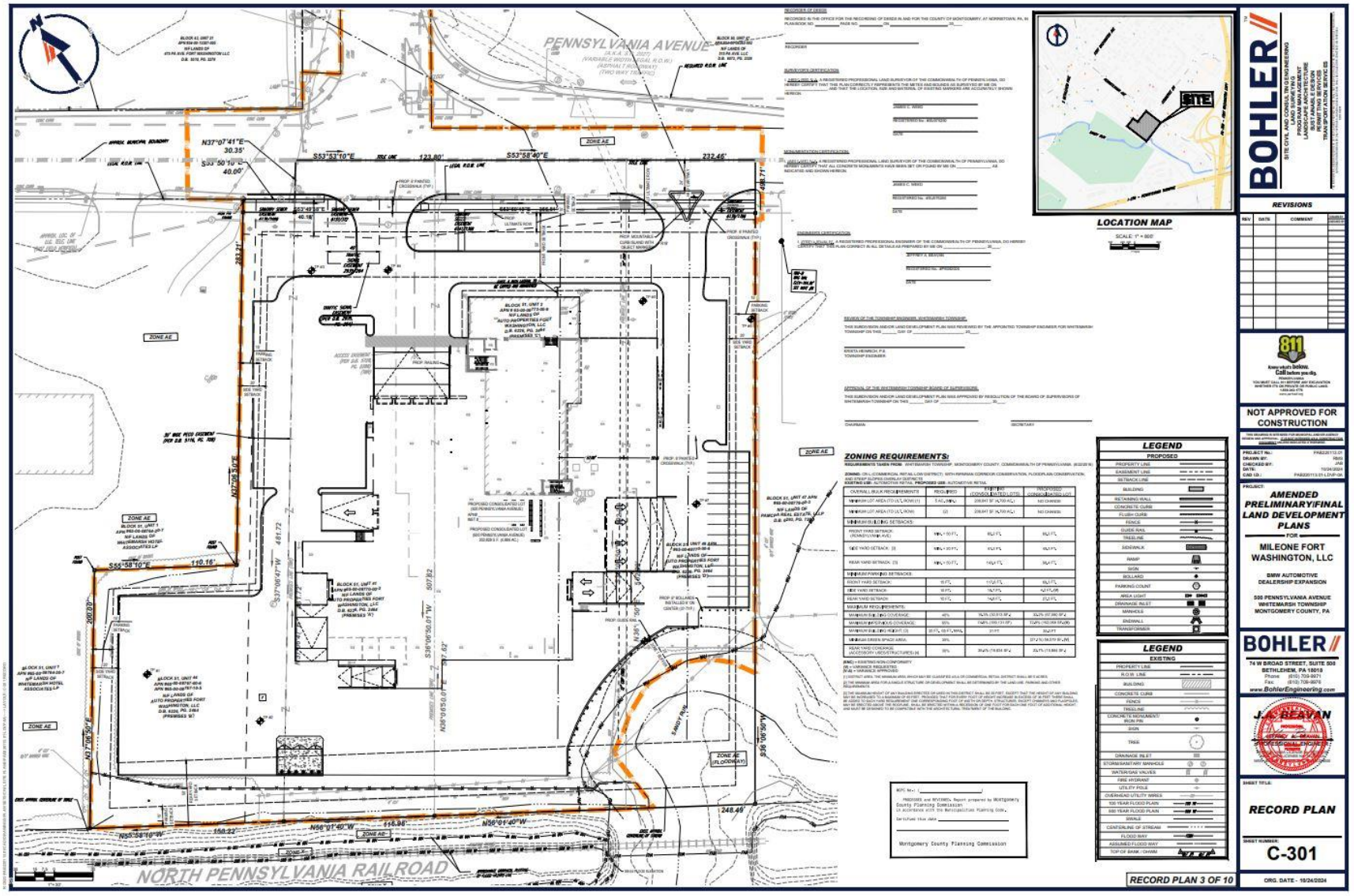
PENNSYLVANIA AVENUE
NORTH PENNSYLVANIA RAILROAD
LOCATION MAP
SITE
ZONING REQUIREMENTS:
LEGEND
PROPOSED
LEGEND
EXISTING
BOHLER
REVISIONS
NOT APPROVED FOR CONSTRUCTION
AMENDED PRELIMINARY/FINAL LAND DEVELOPMENT PLANS
MILEONE FORT WASHINGTON, LLC
BMW AUTOMOTIVE DEALERSHIP EXPANSION
500 PENNSYLVANIA AVENUE
WHITEMARSH TOWNSHIP
MONTGOMERY COUNTY, PA
74 W BROAD STREET, SUITE 500
BETHLEHEM, PA 18018
Phone (610) 709-9071
Fax (610) 709-9076
www.BohlerEngineering.com
J. A. BEAVAN
RECORD PLAN
C-301
RECORD PLAN 3 OF 10

WHITEMARSH TOWNSHIP

To:	Craig McAnally, Township Manager
From:	Samantha Zrillo, Township Planner
Subject:	**SLD# 03-23 R1: MileOne Ft. Washington, LLC (500-512 Pennsylvania Avenue)- 1.7.25 STC Meeting**
Date:	January 9, 2025
cc:	**Charlie Guttenplan, AICP, Township Director of Planning and Zoning** **Krista Heinrich, PE, Township Engineer, Gilmore Associates** **Craig Colton, Applicant's Representative** **John Iannozzi, Esquire, Applicant's Attorney**

Plans Reviewed: *Bohler Engineering, dated 10/24/2024. Revised sheets C-701 & 702 and T-001 received 12/17/24.*

At the January 7, 2025 Shade Tree Commission Meeting, John J. Iannozzi, Esq., from Hamburg, Rubin, Mullin, Maxwell & Lupin, P.C., and Travis North, RLA, LLA, from Bohler Engineering, represented the applicant for scaled-down, amended Land Development proposal (the Commission recommended approval for a prior land development plan in the summer of 2023).

Mr. Iannozzi and Mr. North explained that there are few changes to the landscaping plan. There is one additional tree, a Sycamore, being removed due the proposed curbline, which will put the percentage of trees being removed at 35.6%. The plan is now only deficient 7 trees, whereas the previous plan was deficient 17. Waivers were requested for exceeding 33% removal and being deficient in tree replacement requirements.

Overall, there are 45 trees on the site. Sixteen trees are being removed, but 9 are excluded from the replacement requirement as they are hazardous Ash trees and an invasive Pear tree (this was approved on the prior proposal). The 7 viable trees being removed requires 45 replacement trees. This plan proposes to plant 38 trees (23 shade trees, 2 ornamental trees equating to 1 replacement tree, and 28 understory trees equating to 14 trees). The understory tree species are the same species as previously approved (Serviceberry, Redbud, Yellowwood, and Sweet Bay Magnolia). All preserved trees will undergo vine removal and be maintained in perpetuity.

The applicant is also seeking a waiver from tree protection fencing as existing and proposed infrastructure is within the root protection zone. The applicant is not requesting any waivers from the landscape requirements outside of Chapter 55.

During public comment, other concerns were raised that included replacement trees going in preserved tree root protection zones, notes on Sheet C-608 regarding "protection from mechanical injury" and "protection from grade change" that can conflict with Chapter 55 requirements, and the percentage of substitution trees.

There was discussion about the project overall and what waivers are needed. Mr. North said he would work with the engineers on the notes listed on page C-608 to see if they can be removed. Mr. Iannozzi said the applicant is agreeable to paying a fee-in-lieu for the seven deficient trees.

Ms. Kosabutski made a motion to recommend approval to the Board of Supervisors with the following waivers:

- **55-4.B. to allow the removal of 35.6% of trees**
- **55-4.C.(4)(b) allowing the proposed tree protection fencing placement**
- **55-4.D.(1)(d) to allow the "protection from grade change" note to remain on Sheet C-608 if required by County or State**
- **55-4.D.(6)(a) to remove invasive trees from replacement requirements**
- **55-4.F.(1) to allow the applicant to substitute shade trees with a combination of understory trees and a fee-in-lieu of seven required replacement trees**

Ms. D'Amore seconded the motion. Motion carried unanimously (3-0).

Samantha Zrillo
Township Planner
616 Germantown Pike
Lafayette Hill, PA 19444
Phone: 610-825-3535 ext. 2608
Email: szrillo@whitemarshtwp.org

GILMORE & ASSOCIATES, INC.
ENGINEERING & CONSULTING SERVICES

January 9, 2025

Mr. Craig McAnally - Township Manager
Whitemarsh Township Municipal Building
616 Germantown Pike
Lafayette Hill, PA 19444

RE: 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:

- 33-Sheet Plan Set prepared by Bohler Engineering dated October 24, 2024, with no noted revisions.
- Post Construction Stormwater Management (PCSM) plan narrative prepared by Bohler Engineering dated October 28, 2024
- Flood Analysis Report dated October 28, 2024
- Various supporting documents, forms and correspondence enclosed with the application

The following comments are offered for your consideration:

The applicant is requesting waivers and/or relief from the requirements of the following sections of the ordinance:

	Section	Description
1.	105-21(B)(1)(n)	The applicant is requesting a waiver from the requirements of this section of the ordinance which requires the preliminary plan to show all sewer lines, storm drains, culverts, bridges, utility easements, railroads, and other significant man-made features within 500 feet of and within the site and to allow an aerial photo to be included within the plan set to satisfy this requirement. The granting of any waiver should be conditioned upon the plans showing existing features along Pennsylvania Avenue for approximately 200 feet to the East of the property to verify proper alignment.
2.	105-21(B)(13)	The applicant is requesting a waiver from the requirements of this section of the ordinance, which requires an Existing Resources and Site Analysis Plan (ERSAP) to be prepared which provides a comprehensive analysis of existing conditions, both on the proposed development tract and within 500 feet of the tract boundaries.
3.	105-21(B)(15)	The applicant is requesting a waiver from the requirements of this section of the ordinance which requires a Preliminary Resource Impact and Conservation Plan to be prepared and to allow the Post-Construction Stormwater Management (PCSM) plans and details to show the required features.

	Section	Description
4.	105-21.1(E)	The applicant is requesting a waiver from the requirement for payment of a traffic impact fee and to allow for the payment of a voluntary contribution. Within the North Transportation Service Area an impact fee in the amount of Two Thousand Eight Hundred and Twenty-Five Dollars ($2,825.00) per anticipated peak hour trip must be provided by the applicant. Based on data documented within the latest edition of the ITE Trip Generation Manual, the proposed development will generate 56 PM peak hour trips. Therefore, the traffic impact fee totals $158,200.00 ($2,825.00 x 56 peak hour trips). Note 15 of the waiver requests located on Sheet C-101 must be revised to remove "…in accordance with paragraph 8, above".
5.	105-30(A)	The applicant is requesting a waiver from the requirements of this section of the ordinance to allow street trees to be planted outside of the tree planting zone, situated between the sidewalk and curb. Note 4 of the waiver requests located on Sheet C-101 must be revised to reference Section 105-30.
6.	105-38(A)	The applicant is requesting a waiver from the requirements of this section of the ordinance which requires that two-way aisles for parking spaces having a 90-degree angle of parking must be 24 feet wide, with a minimum parking stall width of 9 ft x 18 ft. This existing parking area in the southwestern corner of the site is proposed to be used for Dealership operations and is not intended for customer parking.
7.	105-38(B)	The applicant is requesting a waiver from the requirements of this section of the ordinance which limits the width of entrance and exit drives to a maximum of thirty-five feet (35') at the street line, in order to allow an approximate width of forty-seven feet (47') feet to provide alignment with the opposite travel and auxiliary lanes and to satisfy PennDOT design criteria along a State Route.
8.	105-38(C)	The applicant is requesting a waiver from the requirements of this section of the ordinance which requires that curves/turns in entrance and exit drives and all internal parking lot aisles necessary for providing access for fire protection equipment to have a minimum inside turning radius of 25 feet and a minimum outside turning radius of 50 feet. The granting of any waiver should be conditioned that the Applicant provides the Township with truck turning templates to the satisfaction of the Township Fire Marshal and the Township Engineer.
9.	105-38(D)	The applicant is requesting a waiver from the requirements of this section of the ordinance which requires parking areas to 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.	105-38(H)	The applicant is requesting a waiver from the requirements of this section of the ordinance which requires 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.

	Section	Description
11.	105-38(I)	The applicant is requesting a waiver from the requirements of this section of the ordinance which requires no more than 15 parking spaces to be permitted in a continuous row without being interrupted by a landscaping area. Note 10 of the waiver request located on sheet C-101 must be revised to remove reference to a parking structure.
12.	105-38(J)	The applicant is requesting a waiver from the requirements of this section of the ordinance which requires no one area for off-street parking of motor vehicles to 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 double stacked inventory/service storage spaces on the Property) to remain in their existing paved state, and for limited double-stacked inventory/service storage spaces on the Property. Note 11 of the waiver request located on sheet C-101 must be revised to remove reference to parking deck building.
13.	105-38(O)	The applicant is requesting a waiver from the requirements of this section of the ordinance to allow less than ten feet (10.0') to be provided between the proposed building and the 14 parking spaces located near the service drive lane and 26 parking spaces located near the car wash. The waiver request must be expanded to allow less than 10.0' for the proposed service lanes. Additionally, the plans must be revised to include dimensions between the building and the parking facilities. The granting of any waiver should be conditioned that the Applicant obtain the approval of the Township Fire Marshal.
14.	105-48(E)	The applicant is requesting a waiver from the requirements of this section of the ordinance to allow street trees to be planted outside of the tree planting zone, situated between the sidewalk and curb. The tree planting schedule should be expanded to clearly demonstrate the required number of trees to be planted is satisfied.
15.	105-52(B)(2)	The applicant is requesting a waiver from the requirements of this section of the ordinance which requires all buffers to have a minimum width of 50 feet, to allow an alternative planting option for the buffers along Pennsylvania Avenue and the southeastern property line. The applicant has indicated their intent to provide the required quantity of buffer plantings to meet the screening requirements. The tree planting schedule should be expanded to clearly demonstrate the required number of buffer plantings is satisfied.
16.	105-53(D)	The applicant is requesting a partial waiver from the requirements of this section of the ordinance which requires the dedication of land in the amount of 10% of the total Site Area for Park and/or Recreational use. The applicant requests that the preservation of the stream and potential easement dedication to the County for use in extending the cross-county trail along the rear of the property be considered towards meeting this requirement. The plans do not appear to show any proposed easements being provided or area being reserved for the County's Cross County Trail.

	Section	Description
17.	58-30(A)(9)	The applicant is requesting relief from the requirements of this section of the ordinance which requires detention/retention facilities to be in place and functioning prior to the creation of any impervious area. The granting of any waiver should be conditioned that the Applicant obtain an NPDES Permit from the PADEP and Montgomery County Conservation District.
18.	58-34(B)(7)(d)	The applicant is requesting relief from the requirements of this section of the ordinance, which requires the minimum diameter of all storm drainage pipes to be eighteen inches and reinforced concrete pipe, to permit stormwater pipe sizes under 18-inches and to permit the use of High Density Polyethylene (HDPE) pipe.
19.	58-34(B)(7)(h)	The applicant is requesting relief from the requirements of this section of the ordinance, which requires storm pipes to have a minimum eighteen-inch depth of cover over the top of the pipe to permit roof leader piping to have a minimum of 12-inches of cover over the top of the pipe.
20.	55-4(C)(3), 55-4(D)(6)	The applicant is requesting a waiver from the requirements of these sections of the ordinance which require that 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.

SUBDIVISION AND LAND DEVELOPMENT ORDINANCE

	Section	Description
21.	105-21(A)(3)	The Sheet Index located on C-101 must be revised to identify Sheet C-1004.
22.	105-21(A)(5)	The following plans and legend must be revised and/or updated accordingly: Sheet C-201, C-301, C-303, C-401 and C-501: • Floodway linetype shown on plan not consistent with legend • Existing drainage easement linetype containing 72” CMP must be identified in the legend Sheet C-301: • Remove internal building linework and annotations (i.e. “mens tech lockers”) • Identify graphic hatch parallel to service drive thru lanes • Remove project site boundary from the plan Sheet C-302: • Existing drainage easement linetype containing 72” CMP must be identified in the legend • Proposed PECO easement not shown on the plan • Remove project site boundary from the plan Sheet C-303 • Clearly distinguish proposed curbing (specifically along the rear parking areas) Sheet C-607 • Provide underground basin extents (UG1 and UG2) and identify in legend • Remove ‘Major contour beneath structure’ and ‘Minor contour beneath structure’ from the legend

	Section	Description
23.	105-21(B)(1)(j)	The applicant must submit legal descriptions for the proposed lot consolidation for review by the Township Engineer. Additionally, the Record Plan must be revised to include two points along the boundary referencing state plane coordinates.
24.	105-21(B)(1)(m)	The labels for Pennsylvania Avenue must be revised to reference the State Route Number as SR 2037.
25.	105-21(B)(1)(o)(3)	The plans must be revised to include the following information for the proposed building and parking areas: • Dimensions of building • Proposed uses of the building which specifies the retail, office, and service bays areas with square footage noted must be identified • Parking space delineations and dimensions are missing from the Record Plan • Actual building setbacks must be dimensioned on the Record Plan
26.	105-21(B)(1)(o)(9)	The plans must be revised to identify the location of the nearest fire hydrant.
27.	105-21(B)(7)	Intersection grading plans must be submitted for review at the proposed driveway locations.
28.	105-21(B)(9)(d)[2][b]	The Transportation Impact Assessment Report must be revised to provide a description of the public transportation (i.e., SEPTA) available in the area. Additionally, the plans must be revised to show the relocation of the existing bus stop which is currently in the center of the right in/right out driveway. This should be addressed within the traffic study with recommendations on a proposed location that will better serve loading/unloading passengers. The location should be coordinated with SEPTA. Include the Township in all correspondence.
29.	105-21(B)(9)(d)[3][b]	The Transportation Impact Assessment Report must be revised to identify roadways and/or intersections experiencing levels of service E or F.
30.	105-21(B)(9)(d)[5][a]	The Transportation Impact Assessment Report 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 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
31.	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 for the elimination of these problems shall be listed. This listing of recommended improvements shall include but are not 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 must be revised to provide recommendations to eliminate the various deficiencies noted.

	Section	Description
32.	105-21(B)(9)(d)[6][a]	Signal Design Plans for the revised Pennsylvania Avenue/Commerce Drive intersection showing new alignment and updated timings must be submitted for review.
33.	105-21(B)(9)(d)[6][f]	Any submittal to the Pennsylvania Department of Transportation shall be accompanied by comments from the Planning Commission and the Montgomery County Planning Commission. Please include the Township in any submission to PennDOT.
34.	105-21(B)(10)(a), 105-78	The applicant shall submit a letter from the appropriate municipal authority indicating the availability of public sanitary sewer facilities.
35.	105-21(B)(10)(b)	The applicant shall submit a letter from the appropriate municipal authority indicating the availability of central water supply.
36.	105-21(B)(12)	A map showing the location of the proposed subdivision within its neighborhood context shall be submitted.
37.	105-21(B)(16)(a)	The plans must be revised to remove the topography from the Record Plan. Additionally, it appears two foot contour intervals are shown adjacent to the railroad and does not coincide with the remaining one foot contour intervals on the project site.
38.	105-21(B)(16)(l)	The Dedication and Easement Plan (Sheet C-302) must be revised to provide the bearings and distance of the proposed PECO Electric Easement. Additionally, the General Blanket Common Access and Utility Easement note located on Sheet C-303 appears to reference the wrong sheet number.
39.	105-22(B)(10)	A Final Resource Impact and Conservation Plan must be provided which shall comply with all the requirements for the Preliminary Impact Plan, as set forth in Section 105-21(B)(15) and shall reflect all proposed improvements described in the other Final Plan documents as required under Section 105-22 herein.
40.	105-28(I)	This section of the ordinance requires the applicant to 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 Highway Occupancy Permit Application Plans must be submitted to the Township for review prior to submission to PennDOT. 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.
41.	105-38(D)	The parking requirements tables located on Sheet C-302 and C-303 are not consistent and must be revised to accurately reflect the required and proposed parking spaces. Additionally, it appears that only 25 parking spaces are designated to satisfy the off-street parking requirement whereas 181 parking spaces are required.
42.	105-38(P)	Tire bumpers or curbing must be provided at the fourteen parking spaces adjacent to the service drive lanes so as to prevent vehicle overhang on the sidewalk.

	Section	Description
43.	105-38(Q)	The plans must be revised to remove the curb conflict located at the service drive lane exit ramp.
44.	105-38(V)	The plans indicate that the proposed lights will illuminate TMP #65-00-08764-20-7, TMP #65-00-08779-00-3, and Pennsylvania Avenue. The plans must be revised so that no direct rays from such lighting shall fall upon any neighboring property or streets, nor shall any high brightness surface of the luminaires be visible from neighboring residential properties or from a public street.
45.	105-39(A)	This section of the ordinance requires that all parking areas shall have at least one tree of three inches minimum caliper for every two parking spaces provided or the applicant must request a waiver. The tree planting schedule should be expanded to clearly demonstrate the required number of parking plantings are satisfied.
46.	105-72(A)	The plans must be revised to label existing and proposed monuments at each change in direction of a boundary along the street line.
47.	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.
48.	105-78	The applicant must obtain the approval of the appropriate municipal Authority with regard to proposed sanitary sewerage facilities.
49.	105-79	All preliminary plan submissions shall include documentation of sewerage facilities planning as required by the PADEP.
50.	105-89	The developer shall enter into a written agreement with the Township in the manner and form approved by they Solicitor wherein the developer shall agree, to construct or cause to be constructed at his own expense all proposed improvements shown on the approved land development plan, all in strict accordance with the standards and specifications of the Township and within the time specified in said agreement and to deposit with the Township financial security in an amount sufficient to cover the cost of all subdivision or land development improvements, including both public and private improvements.

CHAPTER 55 - TREE PROTECTION STANDARDS

	Section	Description
51.	55-4(C)(3)(a)	This section of the ordinance requires that the tree survey plan shall identify the size, species, and location of all existing trees having a DBH of six inches or greater, denoting preserved tree/s, and removed tree/s.
52.	55-4(C)(4)(b)	The plans must be revised to include provisions for tree protection to preserve healthy trees and shrubs on site in accordance with this section of the ordinance. Protective fencing must be shown on the plans in the areas where it will be required, and must also be installed during Stage-0, and shown on Sheet C-601.

	Section	Description
53.	55-4(D)(1)(a)	The protective fencing shall be placed around the root protection zone. The fencing shall be at least six feet tall with two-inch mesh chain link fabric. Two-inch posts shall be tied with six-gauge aluminum wires at 24 inches on center. Posts shall be a minimum of two feet in the ground and space of 10 feet on center. Plastic zip ties may not be used in place of required six-gauge aluminum wire. Detail X-11 on Sheet C-606 must be revised accordingly.
54.	55-4(D)(2)	A note must be added to the plans requiring a pre-construction conference with the Township Shade Tree Commission prior to start of construction. This must also be added to Item 3 (Stage 0) of the Construction Sequence. Item 3 (Stage 0) of the Construction Sequence must also call for installation of tree protection fencing prior to any other work proceeding.

GRADING, EROSION CONTROL, STORMWATER MANAGEMENT AND BEST MANAGEMENT PRACTICES ORDINANCE:

	Section	Description
55.	58-14(A)(2)(b)	The stormwater management design must be revised to analyze 20% of the existing impervious area of the site as meadow in good condition. Based upon the soils classification on the site it does not appear that A and B soil groups are present and must be confirmed. If present and utilized in the design, the meadow curve numbers for soil groups A and B must be revised to be consistent with the TR-55 manual. Additionally, it appears the post development total runoff volume exceeds the pre-development total runoff volumes for the one year and two year storms. The lowest orifice should be elevated to detain the required volume for these storms.
56.	58-15(B)	The stormwater management design must be revised such that the 1-year through 25-year post-development discharge rates do exceed required design discharge rates.
57.	58-17(A)(2)(k)	The proposed contours along the rear parking areas do not appear to account for curbing, and must be revised.
58.	58-17(A)(2)(p)	The following inconsistencies between the stormwater plans/details and the stormwater management report must be addressed: • Provide consistent annotations for drainage areas for clarity. 'Post-Dev Bypass DA#002 to POI #2' and 'Roof Bypass to POI #001' shown on the maps do not match the report. • 'Post-Dev Bypass DA#001 to POI #001' curve number noted on the maps (56.3) conflicts with report (63.0) • 'Pre-Dev POI #2 to POI #1' time of concentration noted on the maps (TC=9.1 min) conflicts with report (TC=5 min) • 'Post-Dev to POI #2' drainage area (0.757 ac) shown in report does not coincide with the maps (0.792 ac) • UG Basin 1: Bottom of Stone elevation noted in report (157.53) does not match detail (156.53) • UG Basin 1: Top of Pavement Elevation noted in detail (172.24) is not consistent with grading plans (162.0-163.50)

	Section	Description
	58-17(A)(2)(p), (con't)	• OCS-201: 3"x6" orifice shown on detail is not consistent with the 5"x3" orifice utilized in report • UG Basin 2: Outlet pipe length noted in report is not consistent with plans • UG Basin 2: 100 year water surface elevation noted on detail (161.28) is not consistent with report (161.81)
59.	58-17(A)(4)	The stormwater management report must be revised to include the 5-year storm hydrograph calculations.
60.	58-17(A)(7)	The profiles for the existing culvert replacement on Sheet C-802 must be revised to show the 8" TC crossing.
61.	58-17(A)(7)	The storm pipe schedule table noted on the Utility Plan and PCSM details indicates the incorrect pipe direction and must be revised. Additionally, structure EW-900 must be shown on the plans.
62.	58-18(A)(2)	Since the limit of disturbance is greater than one acre, the applicant must obtain a National Pollutant Discharge Elimination System (NPDES) permit from the Pennsylvania Department of Environmental Protection. Once obtained, a copy must be submitted to the Township.
63.	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.
64.	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.
65.	58-25	The property owner shall sign an operations and maintenance agreement with the Township addressing stormwater BMPs that are to be privately owned.
66.	58-28(D)(10)	It appears the proposed grading along the western driveway between INL 124 and where the curb is labelled 'TC:165.55, BC:165.05' will cause ponding and must be revised.
67.	58-28(D)(11)	This section of the ordinance requires that edges of slopes shall be a minimum of five feet from property lines or right-of-way lines in order to permit the normal rounding of the edge without encroaching on the abutting property. It appears that the eastern driveway grading operations will impede on the adjacent property. The plans must be revised to show the full extents of the proposed '163' contour along the curbline and its connection to existing grade.
68.	58-29(A)(2)	No excavation shall be made with a cut face steeper than 3:1 unless a concrete, masonry, or other approved retaining wall designed by a Registered Professional Engineer experienced in structural engineering, and constructed in accordance with approved standards, is provided to support the face of the excavation. Design calculations/details pertaining to the retaining walls must be submitted for review by the Township Engineer. Additional bottom/top of wall elevations must be included on the grading plan and elevation views of the retaining walls must be provided.

	Section	Description
69.	58-33(A)(13)	Energy dissipaters and/or level spreaders shall be installed at points where pipes or drainage ways drain to or from basins. Energy dissipaters shall comply with criteria in the Erosion and Sediment Control Manual, published by the Pennsylvania Department of Environmental Protection or the Engineering Field Manual for Conservation Practices, SCS. Energy dissipating device calculations shall be submitted to the Township for review.
70.	58-31(A)(8)	A flap gate, or similar, must be shown at the outlet structures for each underground basin.
71.	58-31(A)(1)	The time of concentration flow paths for 'Post-Dev UG1' shown on the Post Development Drainage Area Maps does not appear accurate and must be revised. Time of concentration flow paths with an assumed 5 minute minimum do not need to be shown on the maps.
72.	58-32(E)(4)	The following note must be attached to all drainage plans and signed and sealed by the applicant's registered professional engineer experienced in geotechnical and soil engineering: "I certify that the proposed facility is/is not underlain by limestone."
73.	58-34(B)(4)	The storm sewer facilities must be revised to provide a minimum drop of two inches between the lowest pipe invert elevation and the outlet pipe invert elevation.

CHAPTER 101 – FLOODPLAIN MANAGEMENT ORDINANCE:

	Section	Description
74.	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 (1163 CY) will mitigate the proposed fill (9,650 CY). Additionally, the following information is missing or inconsistent within the Sandy Run Report data and must be revised: • Obstructions must be identified in the models (i.e. existing BMW, hotel, Audi, etc.) • 'Duplicate Effective' Model cross sections are missing the river station identifications. • River Station 5084.678: The obstruction shown in the 'Duplicate Effective' and 'Corrected Effective' models between Sta: 1175-1400 and 1040-1100, respectively, do not coincide • It appears the Starbucks is missing from the Analysis
75.	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.

ADDITIONAL COMMENTS

76. The plans must be revised to include ADA ramp details for the crossings of both access driveways. The details should include spot elevations, slopes, and lengths to verify ADA compliance and constructability.

77. Provide ADA ramp details for the building entrance and all internal crossings. For ease of reference, each ramp should be labelled/numbered with corresponding unique labels for the details. The ramp details should include spot elevations, slopes, and lengths to verify ADA compliance and constructability.

78. To the west of the proposed right-in/right-out driveway, show proposed curb tying into the existing curb along Pennsylvania Avenue to replace the depressed curb for the existing driveways to be removed.

79. Provide a crossing of Pennsylvania Avenue at the traffic signal. ADA ramps and pedestrian signal head with countdown timers and pushbuttons must be proposed.

80. On the Auto Carrier Truck Turning Plans, the carrier is shown running over curbing on the right-in/right-out driveway. In addition, the turning movements show the truck partially in the opposing traffic lanes. Radii may need to be increased at the site driveways for the largest anticipated vehicle, the auto carrier. Revise the design to avoid the carrier running over curbs and from going into the opposing traffic along Pennsylvania Avenue.

81. The Traffic Impact Assessment Report indicated a separate left turn lane exiting the driveway at the intersection of Pennsylvania Avenue (SR 2037) and Commerce Drive/Site Driveway. The plans must be revised to show the separate left turn lane leaving the site driveway.

82. Include all turning movements on the auto carrier truck turning plans to show the auto carrier leaving the site to the west.

83. Ensure existing utilities shown on Sheet 4 are not conflicting with proposed curbing and turning island for the right-in/right-out driveway. We note that the proposed curb for the right-in/right-out driveway appears to conflict with an existing gas valve and sewer/manhole cover.

84. Update Figure 2 in the Traffic Impact Report to include the latest site plan for consistency.

85. The western driveway design should be discussed with PennDOT. Typically, with a signalized intersection, 150’ length is preferred to first internal intersection. We note the proposed length (45’) between the signal and first existing internal intersection is less than existing conditions (60’).

86. Include the proposed object marker sign detail and size on the detail sheet.

87. Provide a copy of submitted HOP documents and ensure all future submissions are provided electronically to the Township for concurrent review.

88. The TIA recommends revising the southbound Commerce Drive approach to provide dual left turn lanes and a separate through/right turn lane. With this reconfiguration, the alignment through the intersection is skewed. This should be coordinated with PennDOT to determine the optimal driveway/intersection design and the plans updated accordingly.

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

O:\MUNICIPL\2023\2303063-WshT_500-512 Pennsylvania Ave_S-LD 03-23\correspondence\Review #3.doc

EMERGENCY OPERATIONS & EGRESS PLAN

Prepared for:

BMW Fort Washington
Automotive Dealership Expansion

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

500 Pennsylvania Avenue
Whitemarsh Township
Montgomery County, Pennsylvania

Prepared by:

BOHLER

74 W. Broad St. Suite 500
Bethlehem, PA 18018
(610) 709-9971

BEPA File No. PAB220113.01

Dated: December 6, 2024

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Emergency Contact Agency & Telephone 2
Proposed Emergency Access/Egress Plan 2

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BMW Fort Washington Floodwater Emergency Access/Egress & Operations Plan

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.

The project received Special Exception and Variance approval from the Whitemarsh Township Zoning Hearing Board to permit the construction of the proposed building and associated driveways, parking areas, utilities and amenities within the 100-year floodplain on the site. Studies and Stormwater Calculations were prepared (and subsequently reviewed and approved by the Township Engineer) through the Special Exception and Zoning approval process, which showed the building would be elevated so that it would not be inundated by the 100-yr flood waters of Sandy Run. However, as floodwaters rise, the parking and accessways around the building and access drives would be inundated by the 100-yr flood waters. This emergency Action Plan was developed to allow BMW Fort Washington employees and customers to properly secure and to safely exit the premises during a flood event.

FACILITY GENERAL INFORMATION

Address & Property Info:

BMW Fort Washington
500 Pennsylvania Avenue
Fort Washington, PA 19034
Montgomery County, PA
Parcel #TBD upon recording of consolidation

Owner Name, Address & Telephone:

Auto Properties Fort Washington, LLC
1 Olympic Place, Suite 1000
Towson, MD 21204

Phone: 410-575-1930

Facility Contact Name & Telephone: Michael Fastman, General Manager, (215) 643-3322

EMERGENCY CONTACT AGENCY & TELEPHONE:

Police/Fire/Medical Emergencies Call: 911
Local Emergency Planning Commission, LEPC (Montgomery County, PA): (610) 631-6500
Whitemarsh Township Fire Department: (610) 825-2250
Whitemarsh Township Police Department: (610) 825-6530

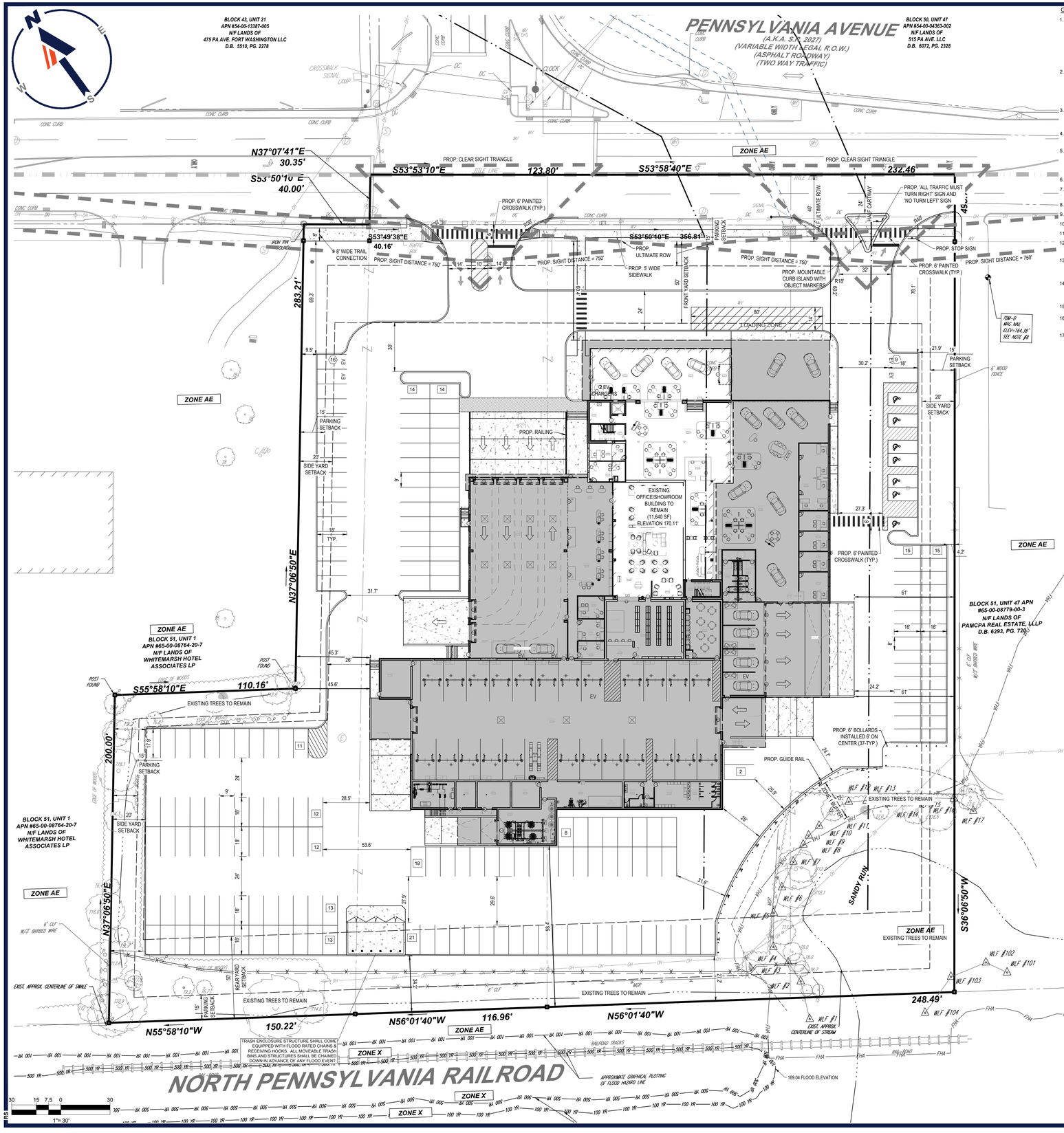
PROPOSED EMERGENCY ACCESS/EGRESS PLAN

- In the event of a rising Sandy Run, the company managing the BMW Fort Washington facility or the owner of the property (collectively, "owner") will be alerted, if possible, in a timely fashion by either a phone message, email or in person by the Whitemarsh Township's Emergency Management Office. The owner will notify staff and customers of the situation via email and posting at the facility, and will be asked to move their vehicles from the property that is at or below the anticipated level of a 100-year storm (entire property) to higher ground. The employees and tenant will also be advised to take appropriate measures in regard to occupancies above the flood level. Unless the governor of the commonwealth of Pennsylvania declares a state of emergency, all evacuations will be voluntary.

- During rainfall events, BMW Fort Washington will assign an employee to periodically monitor (during a storm event up to 4 hours after commencement of the rainfall event) any rise in water level in the storm channel to the southeast of the property. This can simply be done by an employee walking down the driveway to the rear of the property to see if flooding in the channel is occurring. Once the employee observes floodwaters beginning to inundate the Channel, the following measures as outlined below shall commence.

    - The owner will make a decision regarding access to the dealership, parking Garage, service area and car wash during flooding. Barricades will be placed at the entrances to the various areas as deemed appropriate and in accordance with the approved architectural plans.
    - All customers will be directed to leave the premises and move their personal vehicles from the site to an area above the floodplain elevation.
    - All on-site service and inventory vehicles shall be moved into the building, in accordance with the Emergency Parking Study plan dated 10/23/2024 plan or latest revision, or moved off-site to another facility owned by Owner that is located above the flood elevation, including the property owned by MileOne at 525 North Bethlehem Pike, Ambler, PA 19002. **There is sufficient parking for 123 vehicles inside the building in the event of an emergency.** Once all on-site service and inventory vehicles have been moved, employees will be directed to evacuate the premises and move their personal vehicles from the site to an area above the floodplain elevation.
    - Trash enclosure bins shall be chained down. Any and all moveable bins, containers, unsecured structures and/or floatable objects shall either be secured in place with chains or moved inside above flood elevation.
    - Owner shall include this emergency evacuation plan in materials provided to employees and/or tenants upon their initial occupancy.
    - All floodproofing equipment and fixtures on the building shall be activated and remain activated throughout the entire duration of the flood event.
    - Once flood waters subside, any temporary barricades will be removed and normal business operations shall resume.

Supporting Documentation



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)**
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)	72.9% (152,069 SF.)**(V)**
MAXIMUM BUILDING HEIGHT: [3]	35 FT., 65 FT. MAX.	31 FT	35.0 FT
MINIMUM GREEN SPACE AREA:	35%		(27.1%) 56,579 SF. **(V)**
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 + 12,201 SF SERVICE RECEPTION)	1 SPACE/200 SF	118
OFFICE (5,915 SF - EXIST. BLDG 2ND FLR)	1 SPACE/250 SF	24
SERVICE BAYS (24)	1 SPACE PER BAY	24
OTHER COMMERCIAL (14,800 SF SRV/CPARTS/TECH)	1 SPACE/1000 SF	15
TOTAL SPACES REQUIRED:		181
TOTAL ADA SPACES REQUIRED		7 CAR AND VAN (2 VAN)
TOTAL OFF-STREET PARKING SPACES PROPOSED:		179
EV PARKING SPACES PROPOSED (8 REQUIRED PER §116-188.3):		8
TOTAL ADA SPACES PROPOSED		7 CAR AND VAN (2 VAN)
TOTAL SPACES PROPOSED:		**193**

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 SHEET C-601 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.

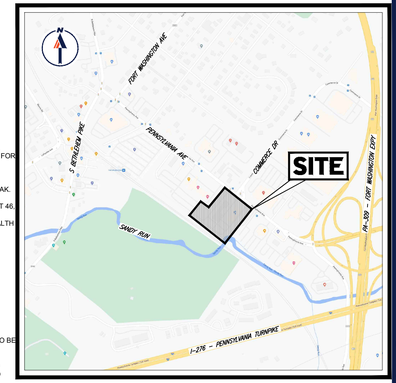
MCPC No.: (14-0121-003)

PROCESSED and REVIEWED, Report prepared by Montgomery County Planning Commission in accordance with the Municipalities Planning Code.

Certified this date _____

_____

Montgomery County Planning Commission



LOCATION MAP

SCALE: 1" = 800'

800 400 200 0 800
1"=800'

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.

LEGEND

PROPOSED	
PROPERTY LINE	
EASEMENT LINE	
SETBACK LINE	
BUILDING	
RETAINING WALL	
CONCRETE CURB	
FLUSH CURB	
FENCE	
GUIDE RAIL	
TREELINE	
SIDEWALK	
RAMP	
SIGN	
BOLLARD	
INVENTORY PARKING COUNT	10
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	100 YR
500 YEAR FLOOD PLAIN	500 YR
FLOOD WAY	FDWY
ASSUMED FLOOD WAY	
ASSUMED STREAM CROSSING FLOOD WAY	
TOP OF BANK / OHWM	WLF #5 WLF #6

RECORD PLAN 5 OF 10

BOHLER

SITE CIVIL AND CONSULTING ENGINEERING
LAND SURVEYING
PROGRAM MANAGEMENT
LANDSCAPE ARCHITECTURE
INDUSTRIAL DESIGN
PERMITTING SERVICES
TRANSPORTATION SERVICES

THE INFORMATION, DESIGN AND CONCEPTS OF THIS PLAN ARE COPYRIGHTED AND ONLY MAY NOT BE EXHIBITED OR USED FOR ANY PURPOSE WITHOUT PRIOR WRITTEN AUTHORIZATION FROM BOHLER. ONLY APPROVED, SEALED PLANS SHALL BE UTILIZED FOR CONSTRUCTION PURPOSES. ©2024 BOHLER

REVISIONS

REV	DATE	COMMENT	DRAWN BY / CHECKED BY

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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-0A

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. PE082005
NEW YORK LICENSE No. 16 093204
NEW JERSEY LICENSE No. 24GE05339500

SHEET TITLE:

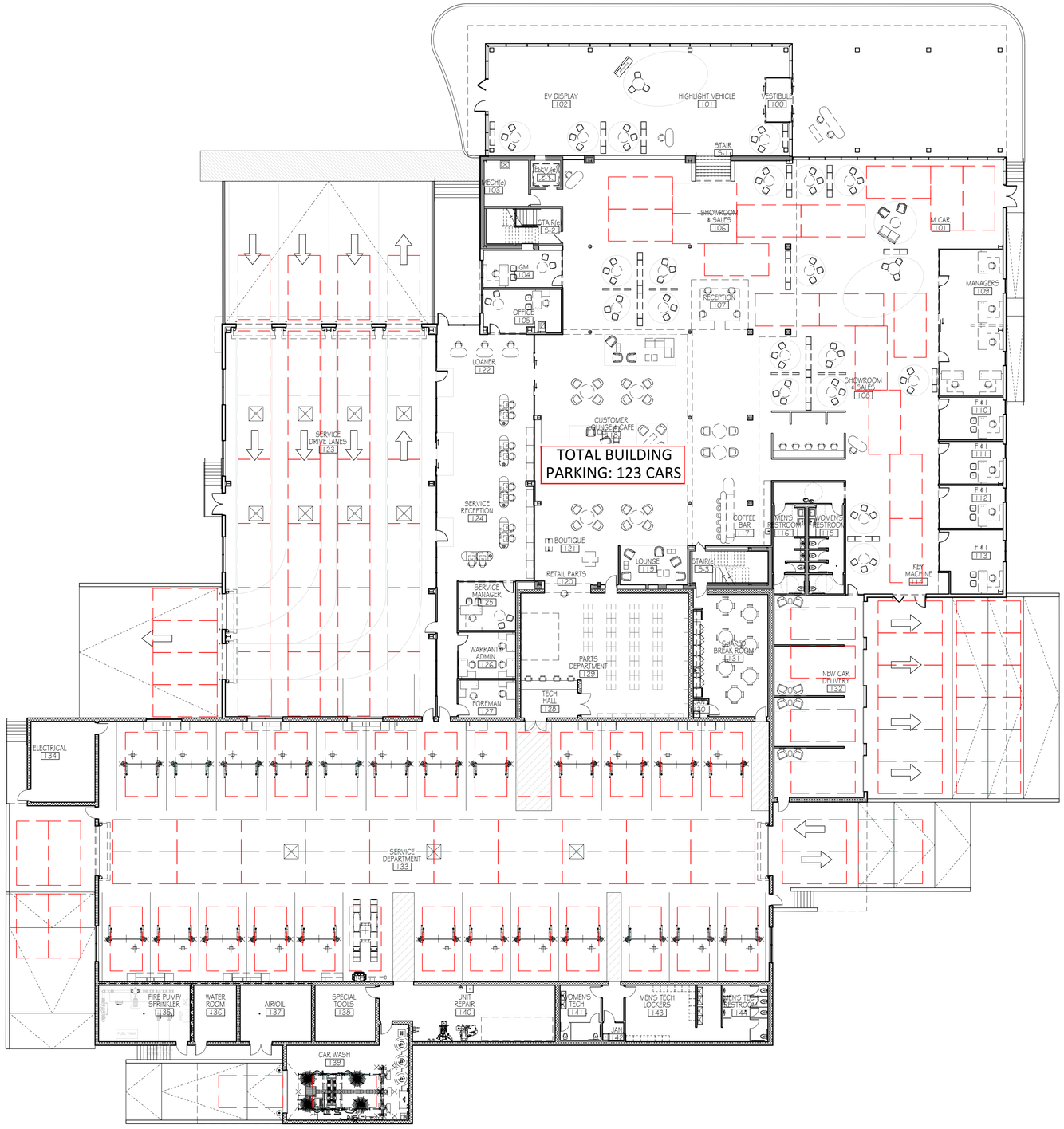
SITE PLAN

SHEET NUMBER:

C-303

ORG. DATE - 10/24/2024

R:\2022\PAB220113.01\CAD\DRAWINGS\PLAN SETS\CIVIL SITE PLANS\PAB220113.01-LDVP-0A-----LAYOUT: C-303 SITE



PENNEY DESIGN GROUP
8120 Woodmont Avenue | Suite 750 | Bethesda, Maryland 20814
p.301.979.7600 | f.301.710.6384 | www.penneydesigngroup.com

MileOne Automotive

Emergency Parking Study

10/23/24

BMW Ft. Washington

510 Pennsylvania Ave
Fort Washington, PA 19034
MOA039a

PK-1

SCALE:
1/16"=1'-0"
24 x 36

WHITEMARSH TOWNSHIP

To: Charlie L. Guttenplan, Director of Planning & Zoning/Zoning Officer.

From: **Andrew G. Thomas, Fire Marshal**

Subject: SLD#03-23 MILEONE FORT WASHINGTON LLC
PRELIMINARY/FINAL PLAN REVIEW
500-512 PENNSYLVANIA AVENUE
FORT WASHINGTON, PA 19034

Date: 1/9/2025

This letter is after a review of the updated plans for 500-512 Pennsylvania Ave. All updated responses are in **bold**.

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.*

2. The plan shall be in accordance with Appendix D section D101 of the 2018 International Fire Code "Fire Apparatus Access Roads". The submitted plan indicates 24' access roads. Section D105 requires 26' access roads.

Bohler Response: No access roads are proposed for the site development. Onsite parking lots are shown at 24-foot widths consistent with Township SALDO requirements.
Fire Marshal Response: all driving areas indicated on the truck turning plan are part of the access roads needed for the fire department to safely position in the event of an emergency, the 24 foot widths of those roads must remain clear at all times and be marked accordingly.
1/9/2025: Fire Marshal Response: The truck turning plan is adequate, but appropriate fire lane striping and signage is needed.

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

3. The plan shall be in accordance with Appendix D section 103.6 "Signs". The submitted plan does not indicate on the detail sheet "NO PARKING - FIRE LANE" signs.

Bohler Response: Will comply,
Fire Marshal Response: There is no striping or signage for fire lanes indicated in the plan received. This must be completed before any final plans are recorded.
1/9/2025: Fire Marshal Response: <u>There is still no striping or signage for fire lanes indicated in the plan received.</u> This must be completed before any final plans are recorded.

WHITEMARSH TOWNSHIP

To: Charlie Guttenplan- Director of Planning & Zoning

From: **Andrew G. Thomas, Fire Marshal/Emergency Management Coordinator**

Subject: 500 Pennsylvania Ave (BMW Fort Washington) Emergency Plan

Date: 1/10/2025

The following comments are from the review of the 1001 Washington Street Emergency Plan-(4/22/2024)

- The business or a representative from the business must sign up for ReadyMontco and Everbridge, this will keep them apprised of all emergency notifications sent out by the township.

- The Emergency Contact Agency & Telephone list should read as follows:
  - For any emergency Police, Fire, or Medical call 9-1-1 first:
    - Give the proper address.
    - Cross streets.
    - What the type of emergency is (police, fire, medical).
  - Whitemarsh Township Fire Marshal/Emergency Management: (484)-594-2614
  - Barren Hill Volunteer Fire Company (Non-Emergency): (610) 825-2250
  - Whitemarsh Township Police Department (Non-Emergency): (610) 825-6530
  - Whitemarsh Community Ambulance (Non-Emergency): (610)-828-0955
  - Local Emergency Planning Commission, LEPC (Montgomery County, PA): (610) 631-6500

- There should be a list of emergency contacts for BMW Fort Washington or for MileOne

- The mentioned barricades placed during flooding conditions at the entrances will these be easily moved if an emergency occurs or what type of barricade is it?

- This is a labeled emergency plan but the only emergency it covers is flooding, are there other portions of this plan that cover fire, fire alarm, broken sprinkler, medical, or any other type of emergency?

- There should be a spill response portion since you will have chemicals and other items associated with vehicle repair and maintenance stored on site.

- Do you have a list of chemicals that would be stored on site? This would be helpful if there is a spill, fire or the building is flooded.

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

- If there is an updated Emergency Parking Study then that must be updated with township as soon as it is conducted.

- There should be a planned or predetermined location to where employees will move their vehicles if flooding does occur.

- If the vehicles are being moved offsite and not to 525 North Bethlehem Pike in Ambler then we should have a copy of the agreement as to what additional location vehicles will be moved to.

- In the event of a fire, fire alarm, or other emergency is there a meeting location where employees and customers will meet when told to evacuate the building?

74 W. Broad Street, Suite 500
Bethlehem, PA 18018
610.709.9971

October 30, 2024
Revised January 13, 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:

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 fourteen (14) parking spaces located near the service drive lane and 26 parking spaces around the car wash to remain, and for less than 10.0’ from the building or structure for the proposed service lanes.

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 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.

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.

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.

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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.

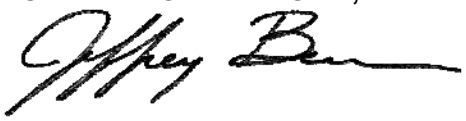
20. From SALDO §58-34.B.(7).(d) from the requirement that minimum diameter of all storm drainage pipes shall be 18-inches or equivalent thereto, or Whitemarsh Township specifications, whichever are more stringent, to permit stormwater pipe sizes under 18-inches and to permit HDPE pipe in lieu of the 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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