STORMWATER POLLUTION PREVENTION PLAN

FOR

BRITAIN WOODS

NYS Route 207 / Little Britain Road

TOWN OF NEWBURGH
ORANGE COUNTY, NEW YORK

PREPARED BY

ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

71 Clinton Street
Montgomery, NY 12549



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W.O. 1146.01

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1.0 INTRODUCTION

Engineering & Surveying Properties, PC (EP) prepared this report summarizing the impact of the proposed development of the property, known as Britain Woods, will have on downstream properties and receiving waters.

1.1 PURPOSE

The purpose of the Stormwater Pollution Prevention Plan (SWPPP) is to:

a. Maintain existing drainage patterns as much as possible and continue the conveyance of upland watershed runoff;

b. Mitigate increases in stormwater runoff resulting from the proposed development without adversely affecting downstream conditions;

c. Mitigate potential stormwater impacts and prevent soil erosion and sedimentation resulting from stormwater runoff.

1.2 SCOPE

The scope of the SWPPP for Britain Woods described herein is as follows:

a) Describe and estimate existing stormwater runoff conditions;

b) Describe and estimate proposed stormwater runoff conditions;

c) Describe and evaluate stormwater management facilities planned as part of the proposed development.

2.0 PROJECT DESCRIPTION

The Britain Woods project site is 47.95± acres in size and is located off NYS Route 207 also known as Little Britain Road in the Town of Newburgh and City of Newburgh in Orange County, New York. Local tax maps identify the Site as Town of Newburgh tax lots 97-1-32.1, 32.2, 32.3, 40.1 and City of Newburgh tax lots 41-1-2 & 3. A site location map is included as Figure 1 in Appendix 1.

There are a total of 11 multi-family residential buildings, a clubhouse, a pool equipment storage/dog wash/restroom structure, and a gazebo proposed on-site. Primary access to the Site will be from a main driveway located in the western portion of the Site from Little Britain Road (NYS Route 207). A secondary access will be provided on the east side of the Site. From the main driveway all buildings will be accessible via a roundabout. Multiple stormwater management facilities will be constructed within the

project to mitigate any stormwater runoff quality and quantity increases. The proposed project site is bound by NYS Route 207 to the south, a commercial property to the east, multi-family residences to the North and a single-family residence to the west.

The project site is an irregularly shaped area of land. The existing site cover consists of mostly high canopy forest and foundation remains.

3.0 TOPOGRAPHY AND SOILS

The existing topography in the Britain Woods project area varies across the site, ranging from approximately 198 feet above mean sea level (AMSL) to 324 feet AMSL. Most of the slopes (±62%) on the project site are gently sloped (0%-15%), and moderate sloped areas (15%-25%) consist of approximately 25% of the site. The area of significant slope The Project Site contains eight different soil groups according to the Soil Survey of Orange County, New York. The on-site soil groups include various series complexes including Alden silt loam (Ab), (Ca), (ErA & ErB), (Ptb & PtC), (RMC) and (SXC) soils. These soils are considered to be a part of the “B”, “C” & “D” hydrologic soils group. A soil map is included in Appendix 2.

4.0 METHODOLOGY

The methodology utilized for this analysis is based upon the U.S.D.A. Soil Conservation Service’s Technical Release No. 20 and Technical Release No. 55, as utilized by the software entitled Hydrology Studio.

Hydrology Studio is a Microsoft Windows based program for analyzing the hydrology and hydraulics of stormwater runoff. It utilizes the latest techniques to predict the stormwater flows from any given storm event.

Hydrology Studio has the capability of computing hydrographs (representing discharge rates characteristic of specific watershed conditions, precipitation, and geologic factors), combining hydrographs, and routing flows through pipes, streams and ponds. A drainage model can consist of four different components - subareas, combinations, reaches and reservoirs.

A subarea consists of a relatively homogeneous area of land, which produces a volume and rate of runoff unique to that watershed. A subarea combination is the hydrologic addition of two subareas in order to determine the peak runoff at a design

point. A reach is a channelized conveyance structure which routes the runoff from one point to another. A reservoir consists of a natural or man-made impoundment which temporarily stores stormwater runoff and that empties in a manner determined by various hydraulic structures located at its outlet.

This Stormwater Pollution Prevention Plan was based upon the New York State Stormwater Management Design Manual published by the New York State Department of Environmental Conservation (NYSDEC). Criteria set forth by this manual, requires analysis and determination of the required Water Quality Volume (WQv), to provide extended detention of the 1-year storm event for Stream Channel Protection (Cpv), to control the peak discharge of the 10-year storm event also known as Overbank Flood Protection Criteria (Qp), and to control the peak discharge and safely pass the 100-year storm event otherwise known as Extreme Flood Control Criteria (Qf).

The Stormwater Pollution Prevention Plan was developed by utilizing the "five-step" process for Stormwater Site Planning and Practice Selection. The five steps consists of site planning, determination of the water quality treatment volume, runoff reduction volumes applied through the use of "green technologies", application of standard stormwater management practices (SMP's) for remaining water quality volumes, and application of volume and peak rate control methods as required. Each of the five "steps" is further discussed in detail within this report.

5.0 ARCHEOLOGY

On-site archaeological significance is being addressed during the SEQR process in coordination with New York State Parks, Recreation and for maximum build-out application. A copy of their determination will be provided in Appendix 15.

6.0 STORMWATER MANAGEMENT PLANNING

6.1 INITIAL SITE PLANNING

Development of the proposed site plan within the "site planning" process was an iterative process with different conceptual layouts developed for the project site. During the planning process with the applicant, the current proposed plan was developed after careful consideration of many planning techniques and environmental impacts. The proposed site plan was devised to protect and

preserve natural features, maintain natural drainage patterns, and avoid to the greatest extent practical, the disturbance of erodible soils. The site plan with proposed watershed boundaries can be seen as Figure 3 in Appendix 1.

The hydrologic and hydraulic analysis was performed by delineating the tributary watershed to the design point and then dividing these tributary areas into relatively homogeneous subareas. The separation of the watershed into subareas was dictated by watershed conditions, methods of collection, conveyance and points of discharge. Watershed characteristics for each subarea were then assessed from topographical maps, soil surveys, site investigations and land use maps.

6.1.1 EXISTING CONDITIONS

The existing watershed within the site and areas contributory to the site's discharge location were found to consist of three (3) distinct drainage areas with three (3) distinct design points. A design point represents the point at which stormwater, generated within a watershed, will exit the project site via either sheet flow along a linear boundary or as a point discharge. Figure 2 in Appendix 1 identifies the watershed areas and the corresponding design points. The characteristics of the existing subarea of this watershed is detailed within Table 1 below.

The sub-area was delineated and a contributory area, a curve number (CN) and time of concentration (Tc) was determined for the sub-area. Calculations for the CN's and Tc's are included in Appendices 3 and 4, respectively. It should be noted that the total contributory area includes off-site areas and excludes on site areas not affected by the proposed development and therefore, the total drainage area size will differ from the project lot area.

Existing Drainage Area A (EX-A1)

Existing drainage area A1 is comprised of hydrological soil groups B, C & D soils. Existing drainage area A1 consists of approximately ±22.902 acres of both off-site and on-site areas. The drainage area consists of ±20.444 acres of woods, ±0.599 acres of lawn, and ±1.859 acres of impervious.

Runoff from this drainage area travels overland via sheet flow and shallow concentrated flow to the on-site wetland where it is detained. In larger flow events, runoff from this area will overflow the bank of the wetland and travel towards Harrison Pond approximately 100 feet northeast of the site and ends at Design Point A (DP-A). Times of concentration for this drainage area is 26.40 minutes.

Existing Drainage Area A (EX-A2)

Existing drainage area A2 is comprised of hydrological soil groups B, C & D soils. Existing drainage area A2 consists of approximately ±12.024 acres of both off-site and on-site areas. The drainage area consists of ±11.391 acres of woods, ±0.480 acres of lawn, and ±0.153 acres of impervious.

Runoff from this drainage area travels overland via sheet flow and shallow concentrated flow and travel towards Harrison Pond approximately 100 feet northeast of the site and ends at Design Point A (DP-A). Times of concentration for this drainage area is 19.80 minutes.

Existing Drainage Area B (EX-B)

Existing drainage area B is comprised of hydrological soil groups B, C & D soils. Existing drainage area B consists of approximately ±7.465 acres of both off-site and on-site areas. The drainage area consists of ±7.465 acres of woods, ±0.000 acres of lawn, and ±0.000 acres of impervious.

Runoff from this drainage area travels overland via sheet flow and shallow concentrated flow to the north towards Stony Brook Condominiums and ultimately into the Quassaic Creek and ends at Design Point B (DP-B). Times of concentration for this drainage area is 18.60 minutes.

Existing Drainage Area C (EX-C)

Existing drainage area C is comprised of hydrological soil groups B, C & D soils. Existing drainage area C consists of approximately ±23.004 acres of both off-site and on-site areas. The drainage area consists of ±17.343 acres of woods, ±5.448 acres of lawn, and ±0.213 acres of impervious.

Runoff from this drainage area travels overland via sheet flow and shallow concentrated flow to the southwest towards an on-site culvert and ends at Design Point C (DP-C). Times of concentration for this drainage area is 27.00 minutes.

TABLE 1: EXISTING DRAINAGE AREA CHARACTERISTICS

DRAINAGE AREA DESIGNATION	DRAINAGE AREA SIZE (Ac.)	CN	Tc (min)
EX-A1	22.902	61	26.40
EX-A2	12.024	59	19.80
EX-B	7.465	61	18.60
EX-C	23.004	70	27.00
TOTAL:	65.395		

The watershed responses to the 1-, 10-, 25- and 100-year 24-hour storm events were computed and evaluated at the design point. The peak rates of runoff at each design point are presented in Table 8. Stormwater computations are attached at the end of this report in Appendices 7, 8 and 9.

6.1.2 PROPOSED CONDITIONS

For this analysis, the existing watershed was broken down into a post-development network consisting of four (9) subareas and two (2) stormwater facilities. The subareas under the proposed development are identified in Figure 3 in Appendix 1. The characteristics of each proposed subarea are detailed in Table 2 below. It should be noted that the total contributory area may include off-site areas where appropriate and therefore, the total drainage area size may differ from the project development area.

Proposed Drainage Area A1-A (PR-A1-A)

Proposed drainage area A1-A is comprised of hydrological soil group B & D soils. Proposed drainage area A1-A consists of approximately ±4.762 acres

of on-site areas. The drainage area consists of ±0.000 acres of woods, ±2.492 acres of lawn, and ±2.270 acres of impervious.

Runoff from this drainage area travels overland via sheet flow, shallow concentrated flow and then into the proposed drainage system which runs to bio-retention area A1-A. Times of concentration for this drainage area is 21.60 minutes.

Runoff from this drainage area discharges to Design Point A (DP-A).

Proposed Drainage Area A1-B (PR-A1-B)

Proposed drainage area A1-B is comprised of hydrological soil group B & D soils. Proposed drainage area A1-B consists of approximately ±2.605 acres of on-site areas. The drainage area consists of ±0.008 acres of woods, ±0.941 acres of lawn, and ±1.656 acres of impervious.

Runoff from this drainage area travels overland via sheet flow, shallow concentrated flow and then into the proposed drainage system which runs to forebay A1-B. Times of concentration for this drainage area is 13.20 minutes.

Runoff from this drainage area discharges to Design Point A (DP-A).

Proposed Drainage Area A1-C (PR-A1-C)

Proposed drainage area A1-C is comprised of hydrological soil group B & D soils. Proposed drainage area A1-C consists of approximately ±0.492 acres of on-site areas. The drainage area consists of ±0.000 acres of woods, ±0.492 acres of lawn, and ±0.000 acres of impervious.

Runoff from this drainage area travels overland via sheet flow, shallow concentrated flow and then into the proposed drainage system which runs to detention basin A1. Times of concentration for this drainage area is 2.40 minutes but a minimum of 6 minutes is utilized for calculations.

Runoff from this drainage area discharges to Design Point A (DP-A).

Proposed Drainage Area A2-A (PR-A2-A)

Proposed drainage area A2-A is comprised of hydrological soil group B & D soils. Proposed drainage area A2-A consists of approximately ±14.147 acres of on-site and off-site areas. The drainage area consists of ±8.924 acres of woods, ±3.082 acres of lawn, and ±2.143 acres of impervious.

Runoff from this drainage area travels overland via sheet flow and shallow concentrated flow to the on-site wetland where it is detained. In larger flow events, runoff from this area will overflow the bank of the wetland and travel towards Harrison Pond approximately 100 feet northeast of the site and ends at Design Point A (DP-A). Times of concentration for this drainage area is 23.40 minutes.

Runoff from this drainage area discharges to Design Point A (DP-A).

Proposed Drainage Area A2-B (PR-A2-B)

Proposed drainage area A2-B is comprised of hydrological soil group B, C & D soils. Proposed drainage area A2-B consists of approximately ±10.887 acres of on-site areas. The drainage area consists of ±9.298 acres of woods, ±1.303 acres of lawn, and ±0.286 acres of impervious.

Runoff from this drainage area travels overland via sheet flow, shallow concentrated flow and ends at Design Point A. Times of concentration for this drainage area is 20.40 minutes.

Runoff from this drainage area discharges to Design Point A (DP-A).

Proposed Drainage Area B1 (PR-B1)

Proposed drainage area B1 is comprised of hydrological soil group B & D soils. Proposed drainage area B1 consists of approximately ±1.134 acres of on-site & off-site areas. The drainage area consists of ±0.655 acres of woods, ±0.479 acres of lawn, and ±0.000 acres of impervious.

Runoff from this drainage area travels overland via sheet flow, shallow concentrated flow and then into the proposed drainage system which runs

to detention basin B1. Times of concentration for this drainage area is 14.40 minutes.

Runoff from this drainage area discharges to Design Point A (DP-A).

Proposed Drainage Area B2 (PR-B2)

Proposed drainage area B2 is comprised of hydrological soil group B & D soils. Proposed drainage area B2 consists of approximately ±2.335 acres of on-site areas. The drainage area consists of ±2.216 acres of woods, ±0.119 acres of lawn, and ±0.000 acres of impervious.

Runoff from this drainage area travels overland via sheet flow, shallow concentrated flow and ends at Design Point B. Times of concentration for this drainage area is 16.20 minutes.

Runoff from this drainage area discharges to Design Point B (DP-B).

Proposed Drainage Area C1-A (PR-C1-A)

Proposed drainage area C1-A is comprised of hydrological soil group B & D soils. Proposed drainage area C1-A consists of approximately ±4.929 acres of on-site areas. The drainage area consists of ±0.081 acres of woods, ±1.390 acres of lawn, and ±3.458 acres of impervious.

Runoff from this drainage area travels overland via sheet flow, shallow concentrated flow and then into the proposed drainage system which runs to bio-retention basin C1-A. Times of concentration for this drainage area is 20.40 minutes.

Runoff from this drainage area discharges to Design Point C (DP-C).

Proposed Drainage Area C1-B (PR-C1-B)

Proposed drainage area C1-B is comprised of hydrological soil group B soils. Proposed drainage area C1-B consists of approximately ±6.154 acres of on-site areas. The drainage area consists of ±0.010 acres of woods, ±2.385 acres of lawn, and ±3.759 acres of impervious.

Runoff from this drainage are travels overland via sheet flow, shallow concentrated flow and then into the proposed drainage system which runs

to forebay C1-B. Times of concentration for this drainage area is 17.40 minutes.

Runoff from this drainage area discharges to Design Point C (DP-C).

Proposed Drainage Area C1-C (PR-C1-C)

Proposed drainage area C1-C is comprised of hydrological soil group B & D soils. Proposed drainage area C1-C consists of approximately ±16.837 acres of on-site and off-site areas. The drainage area consists of ±8.493 acres of woods, ±8.300 acres of lawn, and ±0.044 acres of impervious.

Runoff from this drainage area travels overland via sheet flow, shallow concentrated flow and then into the proposed drainage system which runs to detention basin C1. Times of concentration for this drainage area is 23.40 minutes.

Runoff from this drainage area discharges to Design Point C (DP-C).

Proposed Drainage Area C2 (PR-C2)

Proposed drainage area C2 is comprised of hydrological soil group B & D soils. Proposed drainage area C2 consists of approximately ±1.115 acres of on-site and off-site areas. The drainage area consists of ±0.739 acres of woods, ±0.207 acres of lawn, and ±0.169 acres of impervious.

Runoff from this drainage area travels overland via sheet flow, shallow concentrated flow and ends at Design Point C. Times of concentration for this drainage area is 16.80 minutes.

Runoff from this drainage area discharges to Design Point C (DP-C).

TABLE 2: PROPOSED DRAINAGE AREA CHARACTERISTICS

DRAINAGE AREA DESIGNATION	DRAINAGE AREA SIZE (Ac.)	CN	Tc (min)
PR-A1-A	4.762	79	21.60
PR-A1-B	2.605	86	13.20
PR-A1-C	0.492	63	2.40*
PR-A2-A	14.147	68	23.40
PR-A2-B	10.887	59	20.40
PR-B1	1.134	76	14.40
PR-B2	2.335	62	16.20
PR-C1-A	4.929	88	20.40
PR-C1-B	6.154	84	17.40
PR-C1-C	16.837	73	23.40
PR-C2	1.115	75	16.80
TOTAL:	65.393		

*Utilize 6-minute Tc minimum

6.2 WATER QUALITY VOLUME

The second step of the stormwater site planning process is determination of the required water quality treatment volume (WQ_v). WQ_v is calculated using the 90% Rule as defined by NYSDEC Stormwater Management Design Manual. The 90% Rule is defined as:

$$WQ_v = [(P)(R_v)(A)] / 12$$

Where: P is the 90% Rainfall Event Number
R_v is equal to 0.05 + 0.009*I
I is the Impervious Cover in percent
A is the subarea total acreage

The WQ_v was calculated for the design point for which the proposed project will create new impervious coverage. The results of the WQ_v calculations are included in Table 3 below.

TABLE 3: REQUIRED WATER QUALITY VOLUMES

AREA	WQv (Ac-ft)
SITE	1.594

6.3 RUNOFF REDUCTION VOLUME

Step three of the stormwater site planning process is the incorporation of "green infrastructure technologies" and standard SMP's with runoff reduction volume (RR_v) capacity. The intended result of RR_v, is to treat 100% of the WQ_v and replicate pre-development hydrology, however if unattainable, provide the minimum RR_v required and provide additional treatment for the remaining WQ_v. Each of the following green technologies and standard SMP's with RR_v capacity were analyzed for implementation along with an explanation of how they are used or unable to be used on this project. The location of the green technologies used can be seen in Figure 4.

Green Technologies

- Conservation of Natural Areas
  - The proposed site is to be fully developed apart from an area of existing wetlands. Therefore, this practice may not be utilized to provide RR_v for the corresponding tributary area.
- Sheet flow to Riparian Buffers / Filter Areas
  - As previously stated this site is proposed to be fully developed and therefore riparian buffers do not exist within the project site.
- Vegetated Open Swales
  - Due to limitations in the size and slope of the site and the use of sub-surface stormwater conveyance, swales are not practicable.
- Tree Planting / Tree Box
  - The site design proposes a landscaping plan. However, the landscaping will be utilized for aesthetic purposes only and will not be designed to incorporate stormwater quality treatment.
- Disconnection of Rooftop runoff
  - Due to a lack of filter strips or grassed areas uphill of the stormwater conveyance paths, the rooftop runoff from the proposed building will be directed to catch basins.
- Stream Daylighting

  - There are no culverted/piped streams on-site therefore this technology is not applicable to this project.
- Rain Gardens
  - Due to the fact that most of the tributary drainage areas consist of areas greater than 1,000 sq.ft., rain gardens could not be utilized as a green technology on this project.
- Green Roof
  - As all the areas of the proposed development, including all new rooftop areas, have been accounted for in other green technologies, the implementation of this practice is not proposed.
- Stormwater Planters
  - Stormwater planters are suitable for small runoff areas such as rooftops or plaza and courtyards. Stormwater planters work very well within urban redevelopment projects with appropriate soils. However, this project is utilizing other technologies for treatment of rooftop runoff; therefore, the green technology of stormwater planters was not implemented.
- Rain Tanks/Cistern
  - Rain Tanks and cisterns are well-suited to treat rooftop runoff, however as previously stated, rooftop runoff is directed towards the proposed drainage system.
- Porous Pavement
  - Porous pavement was not considered as paved areas were already treated under a different runoff reduction practice.
- Soil Restoration
  - Soil restoration measures must be applied to all areas of disturbance that will be re-established as non-impervious cover to recover the original properties and porosity of the soil to the greatest extent practical. Soil restoration techniques and requirements are discussed further in Section 5.6 of this report.

Standard SMP's with RR_v Capacity

- Infiltration Practice
  - Infiltration practices are not being considered due to soil composition and poor infiltration rates on site.
- Bio-Retention
  - The use of two (2) bio-retention facilities are proposed on site to provide RRv capacity.
- Dry Swale (Open Channel Practice)
  - Dry swales were not utilized for this project as all areas of proposed development have been accounted in other green technologies.

The RR_v for each of the green technologies used has been calculated for the point of analysis. The total RR_v was calculated and compared to the WQ_v for the design point. The minimum RR_v is based upon the hydrological soil group (HSG) classification within the watershed and is assigned a Specific Reduction Factor (*S*). The reduction factors for each HSG are shown below in Table 4.

*TABLE 4: SPECIFIC REDUCTION FACTOR (S)**

HSG	*S*
A	0.55
B	0.40
C	0.30
D	0.20

* Watersheds with multiple HSG's utilize a weighted average

$RR_{v\ MIN}$ was calculated for each watershed in accordance with the following formula:

$$RR_{v\ MIN} = [(P)(0.95)(S)(I)] / 12$$

The total calculated RR_v provided is compared to the $RR_{v\ MIN}$ to ensure that the green technologies proposed provide the minimum reduction of the WQ_v as required. The $RR_{v\ MIN}$ and the total RR_v provided along with the revised WQ_v are shown below in Table 5. The revised WQ_v is calculated using the 90% rule as

noted in Section 5.2 above, however, the contributory area and impervious area are reduced through the application of green technologies that have been utilized. The calculations for the required and adjusted water quality volumes along with the runoff reduction volumes calculations are shown in Appendix 5.

TABLE 5: RUNOFF REDUCTION VOLUMES & REVISED WQV

DESIGN POINT	$RR_{v\ MIN}$	Total RR_v (Provided)	Revised WQ_v
SITE	0.424	0.438	0.936

6.4 APPLICATION OF STANDARD SMP'S FOR THE REVISED WQV

The RR_v does reduce the required WQ_v treatment; however, it does not completely eliminate the need to provide treatment through standard stormwater management practices. Continuing with the stormwater site planning process, step four is to ensure treatment for the remaining WQ_v is provided. The WQ_v provided in each of the standard stormwater management practices throughout the project is provided in Table 6 below.

TABLE 6: WQV PROVIDED IN STANDARD SMP'S

DESIGN POINT	WQv Provided (ac-ft)
Forebay A1-B	0.199
Forebay C1-B	0.953
TOTAL	1.152

6.5 VOLUME AND PEAK RATE CONTROL

The fifth and final step of the stormwater site planning process is to apply volume and peak rate control as necessary through the use of standard stormwater management practices. In preparing the SWPPP, it was determined that on-site stormwater facility (detention basins) will be necessary to mitigate the potential increase in peak stormwater runoff rates from the proposed site improvements.

The on-site stormwater management facilities have been designed as Detention Basins (A1, B1 & C1) which are proposed to mitigate any increase in peak runoff from the site improvements tributary to them.

6.5.1 CHANNEL PROTECTION VOLUME

The required volume control consists of Channel Protection Volume (Cp_v) which is designed to protect downstream channels from erosion. The Cp_v is achieved through providing extended detention of the 1-year storm event for a period of 24 hours. Ponds that do not meet the 24-hour extended detention period will utilize the minimum 3" orifice as required by the regulations. The Cp_v detention time is shown in Table 7 below and the calculated results are shown in Appendix 11.

TABLE 7: CPV EXTENDED DETENTION TIMES

FACILITY	Cp_v ED Time (hrs)
Det. Basin A1	30.78
Det. Basin B1	1.12*
Det. Basin C1	30.04

** FACILITY HAS AN EXTENDED DETENTION TIME LESS THAN 24 HOURS AND WILL UTILIZE A MINIMUM 3" ORIFICE AS REQUIRED.*

6.5.2 PEAK RATE CONTROL

The peak discharge rate is controlled utilizing the storage volume available in the stormwater pond and controlling discharge through an overflow weir. The watershed responses to the 1-, 10-, 25- and 100-year - 24-hour storm events were computed and evaluated at the aforementioned design point. The peak rates of runoff realized at the design points are presented in Table 8. Stormwater computations are attached at the end of this report.

The total peak runoff rates at the design point for the existing condition as well as the final proposed condition have been calculated and shown below in Table 8. The peak runoff rates have been reduced in the proposed conditions during the 1-, 10-, 25- and 100-year design storms for all drainage areas on site.

TABLE 8: SUMMARY OF RESULTS AT THE DESIGN POINTS

Criteria		Design Point A	Design Point B	Design Point C
1 – YEAR (Cpv)	Existing (cfs)	0.58	0.54	6.20
	Proposed (cfs)	0.58	0.48	0.82
	Reduction (cfs)	-0.00	-0.06	-5.38
	Reduction (%)	0.00%	-11.11%	-86.77%
10 – YEAR (Qp)	Existing (cfs)	8.08	3.69	26.48
	Proposed (cfs)	7.35	3.38	18.91
	Reduction (cfs)	-0.73	-0.31	-7.57
	Reduction (%)	-9.03%	-8.40%	-28.59%
25 – YEAR	Existing (cfs)	21.21	10.42	40.10
	Proposed (cfs)	20.28	6.71	35.51
	Reduction (cfs)	-0.93	-3.71	-4.59
	Reduction (%)	-4.38%	-35.60%	-11.45%
100 – YEAR (Qf)	Existing (cfs)	70.33	20.20	68.57
	Proposed (cfs)	66.91	11.99	48.50
	Reduction (cfs)	-3.42	-8.21	-20.07
	Reduction (%)	-4.86%	-40.64%	-29.27%

Since the runoff rates have been proven to decrease in the post-development condition or are within 5% of the pre-developed condition, there will be no adverse impact to the downstream receiving waters. Therefore, the SWPPP designed for the Britain Woods project site will accomplish the intent of its design.

6.6 SOIL RESTORATION

Soil restoration is intended to recover the original properties and porosity of the soil to the greatest extent practicable. Soil restoration measures shall be applied to any disturbed area within the project prior to establishment of permanent vegetation and installation of landscaping. Any proposed impervious areas do not require soil restoration measures. Soil restoration measures such as tilling allows for compacted soil to gather oxygen and create temporary and even permanent air voids and when combined with the incorporation of organic material, greatly

improves the soils characteristics to temporarily store water and subsequent runoff reduction through infiltration and evapotranspiration.

Various soil disturbance activities related to construction of land development within various soil types and the associated minimum required soil restoration techniques are shown in Table 9.

TABLE 9: SOIL RESTORATION REQUIREMENTS

Type of Soil Disturbance	Soil Restoration Requirement		Comments / Examples
No Soil Disturbance	Restoration not permitted		Preservation of Natural Features
Minimal Soil Disturbance	Restoration not required		Clearing and Grubbing
Areas where topsoil is stripped only – NO change in grade.	HSG A & B	HSG C & D	Protect Areas from any ongoing construction activities.
	Apply 6" of topsoil	Aerate* and apply 6" of topsoil	
Areas of cut or fill	HSG A & B	HSG C & D	
	Aerate* and apply 6" of topsoil	Apply full Soil Restoration **	
Heavy traffic areas on site (especially in a zone 5'-25' around buildings, but not within the 5' perimeter around the foundation walls)	Apply full Soil Restoration** (de-compaction and compost enhancement)		
Areas where Runoff Reduction and/or Infiltration Practices are applied.	Restoration not required, but maybe applied to enhance the reduction specified for appropriate practices		Keep construction equipment from crossings these areas. To protect newly installed practice from any ongoing construction activities construct a single phase operation fence area.
Redevelopment projects	Soil restoration is required on redevelopment projects in areas where existing impervious area will be		

	converted to pervious area	

* Aeration includes the use of machines such as tractor-drawn implements with coulters making a narrow slit in the soil, a roller with many spikes making indentations in the soil, or prongs which function like a mini-subsoiler.

** Per “Deep Ripping and De-compaction Guidelines”, NYSDEC 2008

7.0 EROSION AND SEDIMENT CONTROL MEASURES

Soil erosion and sediment control measures have been detailed on the plans and outlined herein. The following are general measures that should be implemented:

a. Damage to surface waters resulting from erosion and sedimentation shall be minimized by stabilizing disturbed areas and by removing sediment from construction site discharges.

b. Site preparation activities shall be planned to minimize the area and duration of soil disturbance. The plans approved for construction shall contain a detailed “Erosion Control Plan” which depicts the limits of grading along with the required earth cut and fill locations (including stockpile locations if necessary). In addition, any additional site-specific erosion control measures required are shown on the approved plans for construction. The following additional requirements shall be met upon receipt of such waiver:

   - The required site inspections by the qualified inspector shall occur one (1) time every seven (7) days.
   - In areas where disturbance has temporarily or permanently ceased, stabilization shall be implemented within seven (7) days from the ceasing of soil disturbance activity.

c. Permanent traffic corridors shall be established, and “routes of convenience” shall be avoided. Off-site sediment tracking shall be minimized through regularly scheduled sweeping and good housekeeping of construction vehicles.

d. A qualified professional shall inspect and log the erosion and sediment control measures once every seven days once earth disturbance has commenced and

continue until the site has achieved final stabilization in accordance with the requirements. During times of possible inactivity (i.e. winter months), upon the site being temporarily stabilized, the professional shall perform inspections monthly. The professional shall make recommendations to the operator on how to maintain the integrity and function of all temporary erosion control measures throughout the duration of the development process. Any deficiencies in the measures shall be corrected as soon as possible by the operator.

e. An up-to-date Construction Site Log Book which includes this SWPPP for Britain Woods shall be maintained on site at all times during construction. The Construction Site Log Book shall also include the items found in the most recent version of the New York Standards and Specifications for Erosion and Sediment Control.

In particular, the following measures will be implemented:

a. Pre-Construction Installation: Prior to any disturbance on site, silt fence shall be installed in accordance with the approved plans in the area of the first phase. Prior to commencement of any subsequent phase, silt fence shall be installed in the proper phase in accordance with the approved plans. Siltation barriers shall be maintained in good condition and reinforced, extended, repaired or replaced as necessary.

b. In no case shall erodible materials be stockpiled within 25 feet of any ditch, stream or other surface water body.

c. Permanent vegetative cover: Immediately following the completion of construction activity in any portion of the site, permanent vegetation shall be established on all exposed soils by properly seeding at a coverage rate as noted on the approved plans and covered with straw. Water shall be applied to newly seeded areas as needed until grass cover is well established.

d. Washouts shall be immediately repaired, reseeded and protected from further erosion. All accumulated sediment shall be removed and contained in

appropriate spoil areas. To effectively control wind erosion, water shall be applied to all exposed soils as necessary.

8.0 LONG TERM MAINTENANCE OF WATER QUALITY FEATURES

Upon completion of the project, the stormwater facilities shall be owned and maintained by the property owner. The property owner shall be responsible for ensuring that the facilities operate and function as designed through proper maintenance as follows.

a. Regular inspection and maintenance of the proposed facilities are required to ensure their long-term water quality and quantity reduction functions.

b. All stormwater facilities and roadways with associated infrastructure are proposed to be located within lands to be owned by the property owner.

c. All side slopes within the stormwater facilities are a minimum of 3:1, to allow for maintenance.

d. Catch Basins:

   i. Basins shall be inspected for accumulated sediment and trash every 6 months.

   ii. Accumulated sediment and trash shall be removed from basins annually, or at more frequent intervals, if needed.

e. Forebay & Detention Pond

   i. The grass within the pond should be mowed at least 3 times per growing season, limiting the grass to a height of no more than 12 inches.

   ii. Sediment removal should be done at least every five years.

f. Bio-Retention Facility

   i. Sediment removal in the forebay shall occur every five to six years or after 50% of total forebay capacity has been lost.

   ii. The grass embankments should be mowed at least 3 times per growing season, limiting the grass to a height of no more than 12”.

   iii. Silt/sediment shall be removed from the filter bed when the accumulation exceeds one inch. When the filtering capacity of the filter diminishes

substantially (i.e., when water ponds on the surface of the filter bed for more than 48 hours), the top few inches of discolored material shall be removed and shall be replaced with fresh material. The removed sediments shall be disposed in an acceptable manner.

9.0 SUMMARY OF FINDINGS AND CONCLUSIONS

Based on the analysis of the pre-development and post-development stormwater conditions, and the implementation of stormwater quality and sediment and erosion control measures, the potential stormwater impacts of the Britain Woods project will be mitigated to the greatest extent practical.

a. Prevent increases in flooding and flood damage through the reduction of the rate of runoff from all areas.

b. Reduce the erosion potential from the development through the reduction of the rate of runoff from the project site and through the implementation of the soil and erosion control measures outlined on the project plans and as highlighted herein.

c. Decreases non-point source pollution and water quality degradation through the use of “green technologies”.

d. Those portions of the site which do not direct runoff into a stormwater management practice, will sheet flow through proposed lawn areas and through existing vegetative cover prior to discharging from the site.

e. All criteria set forth in the New York State Stormwater Management Design Manual have been met.

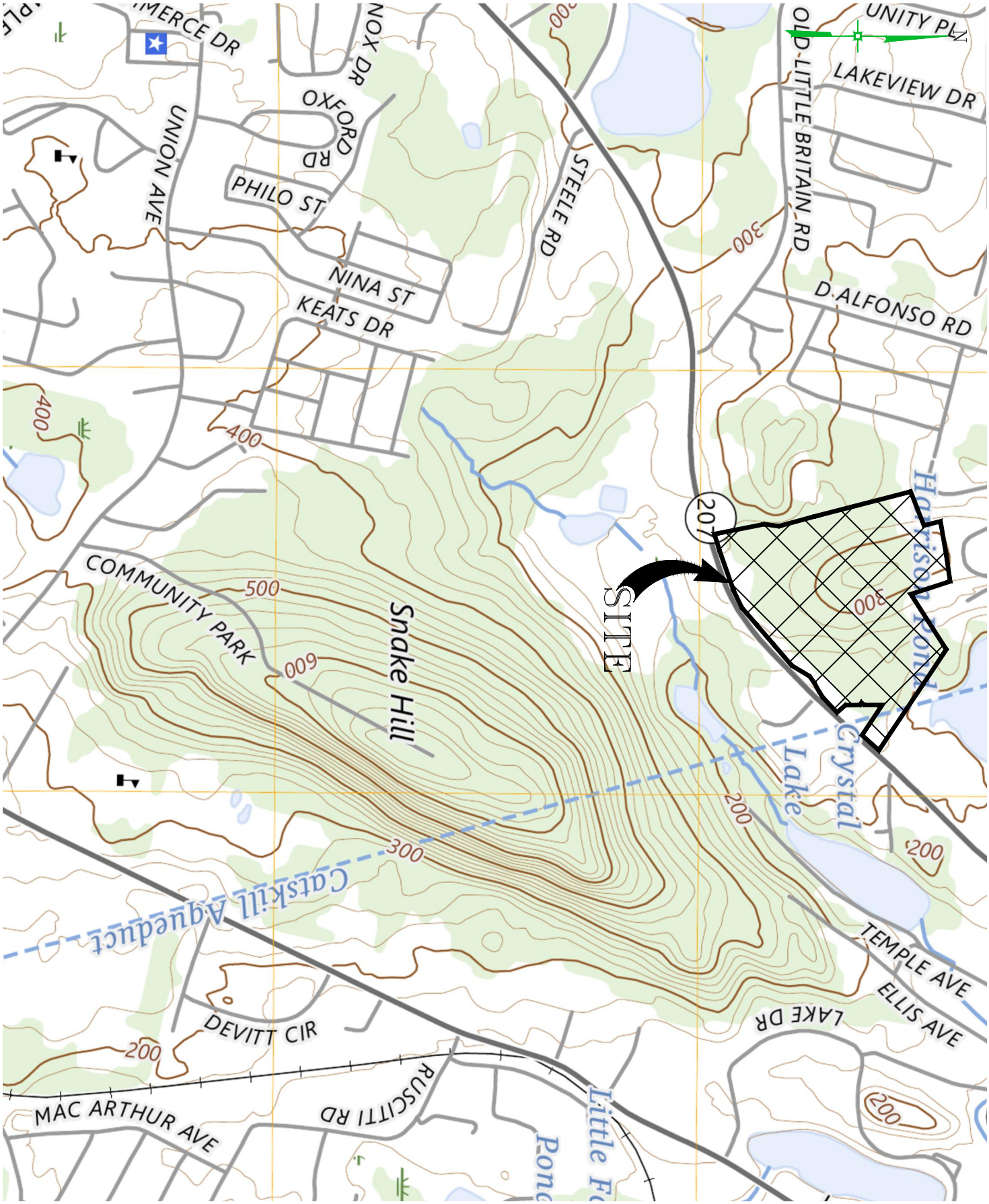
f. Post-development peak discharge rates will be reduced below pre-development peak discharge rates, or their impacts minimized.

g. Sediment and erosion control measures are designed to minimize erosion loss and downstream sediment deposits.

APPENDIX 1

FIGURES

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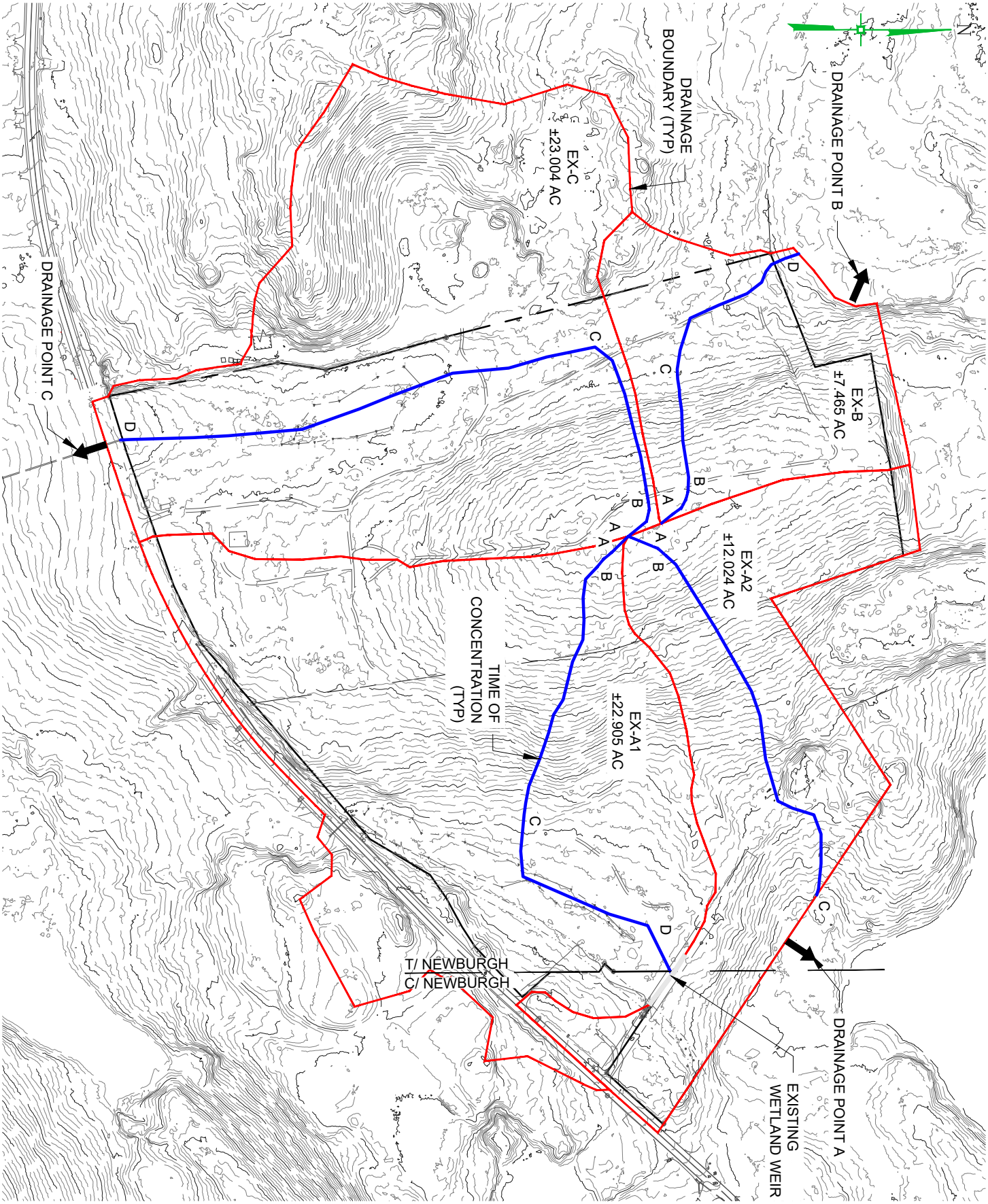


LOCATION MAP	BRITAIN WOODS NEW YORK STATE ROUTE 207 T/ & C/ OF NEWBURGH ORANGE COUNTY, NEW YORK	DATE: 06/29/26 SCALE: 1" = 1,000'	JOB # 1146.01 SHEET # F-1	ENGINEERING & SURVEYING PROPERTIES Achieving Successful Results with Innovative Designs MONTGOMERY OFFICE 71 CLINTON STREET MONTGOMERY, NY 12549 Ph: (845) 457-7727 WWW.EP-PC.COM

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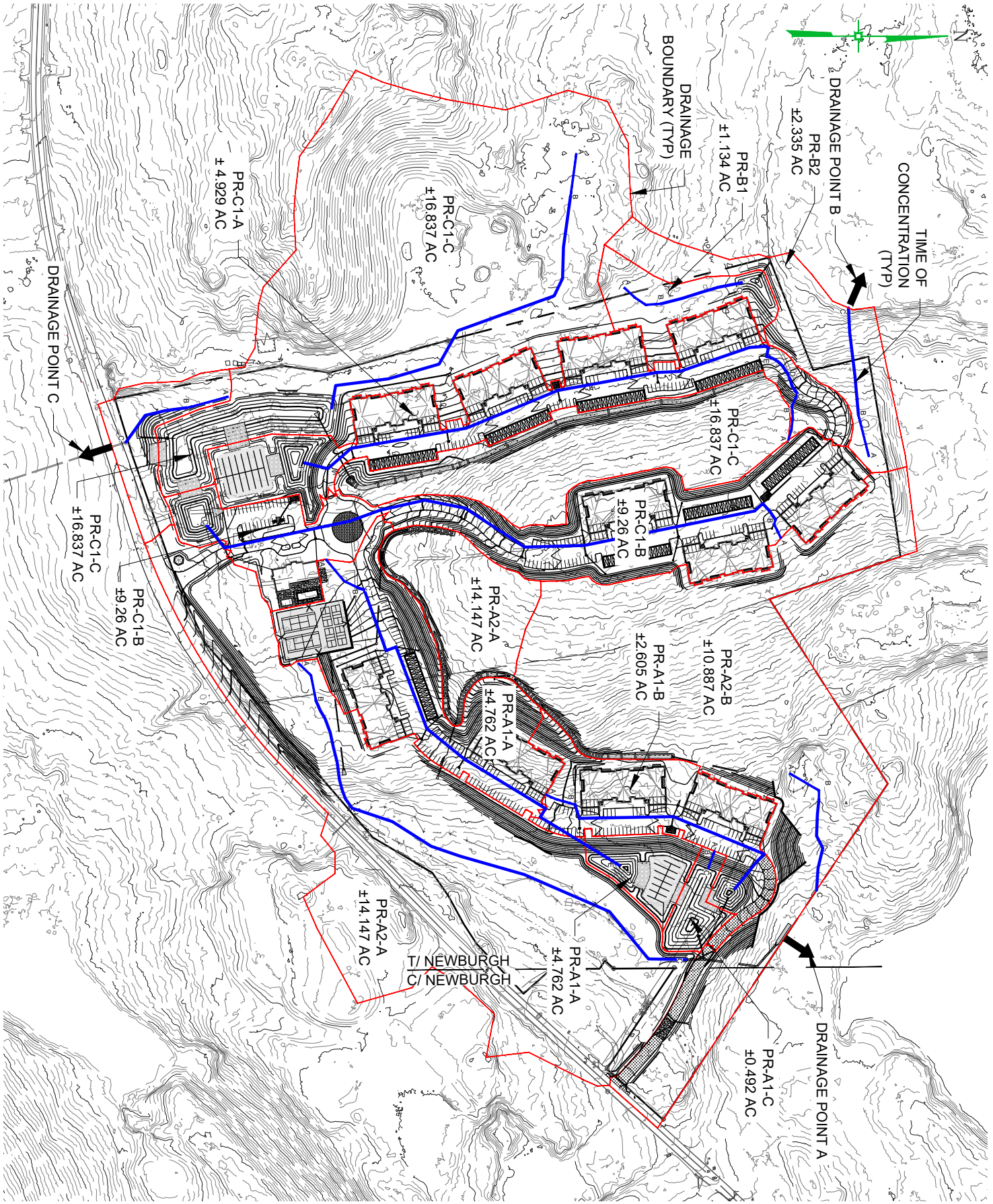
EXISTING DRAINAGE AREAS	BRITAIN WOODS NEW YORK STATE ROUTE 207 T/ & C/ OF NEWBURGH ORANGE COUNTY, NEW YORK	DATE: 06/19/26 SCALE: 1" = 300'	JOB # 1146.01 SHEET # F-3.2C	ENGINEERING & SURVEYING PROPERTIES Achieving Successful Results with Innovative Designs

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PROPOSED DRAINAGE AREAS	BRITAIN WOODS NEW YORK STATE ROUTE 207 T/ & C/ OF NEWBURGH ORANGE COUNTY, NEW YORK	DATE: 06/19/26 SCALE: 1" = 300'	JOB # 1146.01 SHEET # F-3.2D	ENGINEERING & SURVEYING PROPERTIES Achieving Successful Results with Innovative Designs

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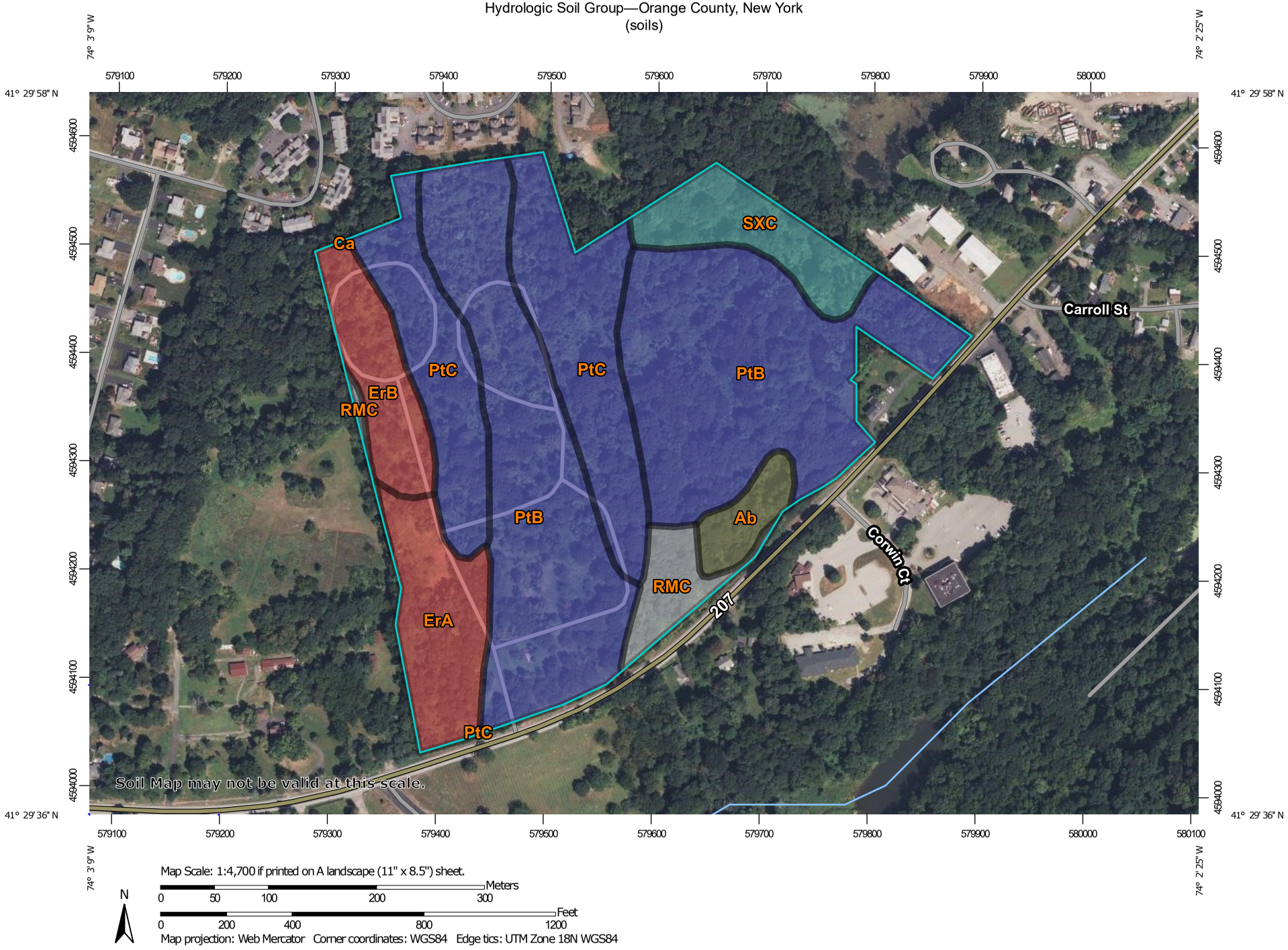
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APPENDIX 2

SOILS MAP AND CLASSIFICATIONS

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Hydrologic Soil Group—Orange County, New York
(soils)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points
- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Orange County, New York
Survey Area Data: Version 22, Aug 29, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 13, 2021—Aug 15, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Ab	Alden silt loam	C/D	1.3	2.7%
Ca	Canandaigua silt loam	B/D	0.0	0.0%
ErA	Erie gravelly silt loam, 0 to 3 percent slopes	D	4.1	8.5%
ErB	Erie gravelly silt loam, 3 to 8 percent slopes	D	3.0	6.3%
PtB	Pittsfield gravelly loam, 3 to 8 percent slopes	B	24.1	50.2%
PtC	Pittsfield gravelly loam, 8 to 15 percent slopes	B	10.6	22.0%
RMC	Rock outcrop-Farmington complex, rolling		1.7	3.6%
SXC	Swartswood and Mardin soils, sloping, very stony	C	3.2	6.6%
Totals for Area of Interest			**48.0**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX 3

CURVE NUMBER

CALCULATIONS

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ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

CURVE NUMBER (CN) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**1**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

1. Runoff curve number (CN) [Existing] Proposed Subarea: **EX-A1**

Soil Name & Hydrologic Group	Cover Description (cover type, treatment & conditions)	CN	Area (acres)	Product of CN x Area
	Impervious	98	1.859	182.18
B	Grass - Good Condition	61	0.599	36.54
C	Grass - Good Condition	74	0.000	
D	Grass - Good Condition	80	0.000	
B	Woods - Good Condition	55	16.539	909.65
C	Woods - Good Condition	70	0.047	3.29
D	Woods - Good Condition	77	3.858	297.07
		TOTAL =	22.90	1428.722

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{1428.722}{22.902}$$

CN (weighted) = 62.384 Use CN= **62**

2. Runoff S = 6.13

		Storm #1	*Storm #2*	*Storm #3*
Frequency	yr			
Rainfall, P	in			
Runoff, Q	in			

(Use P and CN with table 2-1, fig 2-1, or eqns. 2-3 and 2-4)

ENGINEERING & SURVEYING PROPERTIES
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CURVE NUMBER (CN) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**2**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

1. Runoff curve number (CN) [Existing] Proposed Subarea: **EX-A2**

Soil Name & Hydrologic Group	Cover Description (cover type, treatment & conditions)	CN	Area (acres)	Product of CN x Area
	Impervious	98	0.153	14.99
B	Grass - Good Condition	61	0.416	25.38
C	Grass - Good Condition	74	0.000	
D	Grass - Good Condition	80	0.064	5.12
B	Woods - Good Condition	55	8.977	493.74
C	Woods - Good Condition	70	2.414	168.98
D	Woods - Good Condition	77	0.000	
		TOTAL =	12.02	708.205

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{708.205}{12.024}$$

CN (weighted) = 58.899 Use CN= **59**

2. Runoff S = 6.95

		Storm #1	*Storm #2*	*Storm #3*
Frequency	yr			
Rainfall, P	in			
Runoff, Q	in			

(Use P and CN with table 2-1, fig 2-1, or eqns. 2-3 and 2-4)

ENGINEERING & SURVEYING PROPERTIES
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CURVE NUMBER (CN) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**3**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

1. Runoff curve number (CN) [Existing] Proposed Subarea: **EX-B**

Soil Name & Hydrologic Group	Cover Description (cover type, treatment & conditions)	CN	Area (acres)	Product of CN x Area
	Impervious	98	0.000	
B	Grass - Good Condition	61	0.000	
C	Grass - Good Condition	74	0.000	
D	Grass - Good Condition	80	0.000	
B	Woods - Good Condition	55	5.357	294.64
C	Woods - Good Condition	70	0.000	
D	Woods - Good Condition	77	2.108	162.32
		TOTAL =	7.47	456.951

$$CN\ (weighted) = \frac{\text{total product}}{\text{total area}} = \frac{456.951}{7.465}$$

CN (weighted) = 61.212 Use CN= **61**

2. Runoff S = 6.39

		Storm #1	*Storm #2*	*Storm #3*
Frequency	yr			
Rainfall, P	in			
Runoff, Q	in			

(Use P and CN with table 2-1, fig 2-1, or eqns. 2-3 and 2-4)

ENGINEERING & SURVEYING PROPERTIES
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CURVE NUMBER (CN) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**4**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

1. Runoff curve number (CN) [Existing] Proposed Subarea: **EX-C**

Soil Name & Hydrologic Group	Cover Description (cover type, treatment & conditions)	CN	Area (acres)	Product of CN x Area
	Impervious	98	0.213	20.87
B	Grass - Good Condition	61	0.000	
C	Grass - Good Condition	74	0.000	
D	Grass - Good Condition	80	5.448	435.84
B	Woods - Good Condition	55	8.041	442.26
C	Woods - Good Condition	70	0.000	
D	Woods - Good Condition	77	9.302	716.25
		TOTAL =	23.00	1615.223

$$CN\ (weighted) = \frac{\text{total product}}{\text{total area}} = \frac{1615.223}{23.004}$$

CN (weighted) = 70.215 Use CN= **70**

2. Runoff S = 4.29

		Storm #1	*Storm #2*	*Storm #3*
Frequency	yr			
Rainfall, P	in			
Runoff, Q	in			

(Use P and CN with table 2-1, fig 2-1, or eqns. 2-3 and 2-4)

ENGINEERING & SURVEYING PROPERTIES
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CURVE NUMBER (CN) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**5**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

1. Runoff curve number (CN) Existing [Proposed] Subarea: **PR-A1-A**

Soil Name & Hydrologic Group	Cover Description (cover type, treatment & conditions)	CN	Area (acres)	Product of CN x Area
	Impervious	98	2.270	222.46
B	Grass - Good Condition	61	2.345	143.05
C	Grass - Good Condition	74	0.000	
D	Grass - Good Condition	80	0.147	11.76
B	Woods - Good Condition	55	0.000	
C	Woods - Good Condition	70	0.000	
D	Woods - Good Condition	77	0.000	
		TOTAL =	4.76	377.265

$$CN\ (weighted) = \frac{\text{total product}}{\text{total area}} = \frac{377.265}{4.762}$$

CN (weighted) = 79.224 Use CN= **79**

2. Runoff S = 2.66

		Storm #1	*Storm #2*	*Storm #3*
Frequency	yr			
Rainfall, P	in			
Runoff, Q	in			

(Use P and CN with table 2-1, fig 2-1, or eqns. 2-3 and 2-4)

ENGINEERING & SURVEYING PROPERTIES
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CURVE NUMBER (CN) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**6**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

1. Runoff curve number (CN) Existing [Proposed] Subarea: **PR-A1-B**

Soil Name & Hydrologic Group	Cover Description (cover type, treatment & conditions)	CN	Area (acres)	Product of CN x Area
	Impervious	98	1.656	162.29
B	Grass - Good Condition	61	0.660	40.26
C	Grass - Good Condition	74	0.281	20.79
D	Grass - Good Condition	80	0.000	
B	Woods - Good Condition	55	0.008	0.44
C	Woods - Good Condition	70	0.000	
D	Woods - Good Condition	77	0.000	
		TOTAL =	2.61	223.782

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{223.782}{2.605}$$

CN (weighted) = 85.905 Use CN= **86**

2. Runoff S = 1.63

		Storm #1	*Storm #2*	*Storm #3*
Frequency	yr			
Rainfall, P	in			
Runoff, Q	in			

(Use P and CN with table 2-1, fig 2-1, or eqns. 2-3 and 2-4)

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CURVE NUMBER (CN) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**7**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

1. Runoff curve number (CN) Existing [Proposed] Subarea: **PR-A1-C**

Soil Name & Hydrologic Group	Cover Description (cover type, treatment & conditions)	CN	Area (acres)	Product of CN x Area
	Impervious	98	0.000	
B	Grass - Good Condition	61	0.416	25.38
C	Grass - Good Condition	74	0.076	5.62
D	Grass - Good Condition	80	0.000	
B	Woods - Good Condition	55	0.000	
C	Woods - Good Condition	70	0.000	
D	Woods - Good Condition	77	0.000	
		TOTAL =	0.49	31

$$CN\ (weighted) = \frac{\text{total product}}{\text{total area}} = \frac{31}{0.492}$$

CN (weighted) = 63.008 Use CN= **63**

2. Runoff S = 5.87

		Storm #1	*Storm #2*	*Storm #3*
Frequency	yr			
Rainfall, P	in			
Runoff, Q	in			

(Use P and CN with table 2-1, fig 2-1, or eqns. 2-3 and 2-4)

ENGINEERING & SURVEYING PROPERTIES
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CURVE NUMBER (CN) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**8**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

1. Runoff curve number (CN) Existing [Proposed] Subarea: **PR-A2-A**

Soil Name & Hydrologic Group	Cover Description (cover type, treatment & conditions)	CN	Area (acres)	Product of CN x Area
	Impervious	98	2.143	210.01
B	Grass - Good Condition	61	2.239	136.58
C	Grass - Good Condition	74	0.000	
D	Grass - Good Condition	80	0.843	67.44
B	Woods - Good Condition	55	6.404	352.22
C	Woods - Good Condition	70	0.000	
D	Woods - Good Condition	77	2.520	194.04
		TOTAL =	14.15	960.293

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{960.293}{14.149}$$

CN (weighted) = 67.870 Use CN= **68**

2. Runoff S = 4.71

		Storm #1	Storm #2	Storm #3
Frequency	yr			
Rainfall, P	in			
Runoff, Q	in			

(Use P and CN with table 2-1, fig 2-1, or eqns. 2-3 and 2-4)

ENGINEERING & SURVEYING PROPERTIES
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CURVE NUMBER (CN) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**9**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

1. Runoff curve number (CN) Existing [Proposed] Subarea: **PR-A2-B**

Soil Name & Hydrologic Group	Cover Description (cover type, treatment & conditions)	CN	Area (acres)	Product of CN x Area
	Impervious	98	0.286	28.03
B	Grass - Good Condition	61	1.037	63.26
C	Grass - Good Condition	74	0.266	19.68
D	Grass - Good Condition	80	0.000	
B	Woods - Good Condition	55	7.628	419.54
C	Woods - Good Condition	70	1.670	116.90
D	Woods - Good Condition	77	0.000	
		TOTAL =	10.89	647.409

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{647.409}{10.887}$$

CN (weighted) = 59.466 Use CN= **59**

2. Runoff S = 6.95

		Storm #1	*Storm #2*	*Storm #3*
Frequency	yr			
Rainfall, P	in			
Runoff, Q	in			

(Use P and CN with table 2-1, fig 2-1, or eqns. 2-3 and 2-4)

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CURVE NUMBER (CN) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**10**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

1. Runoff curve number (CN) Existing [Proposed] Subarea: **PR-B1**

Soil Name & Hydrologic Group	Cover Description (cover type, treatment & conditions)	CN	Area (acres)	Product of CN x Area
	Impervious	98	0.000	
B	Grass - Good Condition	61	0.116	7.08
C	Grass - Good Condition	74	0.000	
D	Grass - Good Condition	80	0.363	29.04
B	Woods - Good Condition	55	0.005	0.28
C	Woods - Good Condition	70	0.000	
D	Woods - Good Condition	77	0.650	50.05
		TOTAL =	1.13	86.441

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{86.441}{1.134}$$

CN (weighted) = 76.227 Use CN= **76**

2. Runoff S = 3.16

		Storm #1	*Storm #2*	*Storm #3*
Frequency	yr			
Rainfall, P	in			
Runoff, Q	in			

(Use P and CN with table 2-1, fig 2-1, or eqns. 2-3 and 2-4)

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CURVE NUMBER (CN) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
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PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

1. Runoff curve number (CN) Existing [Proposed] Subarea: **PR-B2**

Soil Name & Hydrologic Group	Cover Description (cover type, treatment & conditions)	CN	Area (acres)	Product of CN x Area
	Impervious	98	0.000	
B	Grass - Good Condition	61	0.079	4.82
C	Grass - Good Condition	74	0.000	
D	Grass - Good Condition	80	0.040	3.20
B	Woods - Good Condition	55	1.520	83.60
C	Woods - Good Condition	70	0.000	
D	Woods - Good Condition	77	0.696	53.59
		TOTAL =	2.34	145.211

$$CN\ (weighted) = \frac{\text{total product}}{\text{total area}} = \frac{145.211}{2.335}$$

CN (weighted) = 62.189 Use CN= **62**

2. Runoff S = 6.13

		Storm #1	*Storm #2*	*Storm #3*
Frequency	yr			
Rainfall, P	in			
Runoff, Q	in			

(Use P and CN with table 2-1, fig 2-1, or eqns. 2-3 and 2-4)

ENGINEERING & SURVEYING PROPERTIES
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CURVE NUMBER (CN) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**12**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

1. Runoff curve number (CN) Existing [Proposed] Subarea: **PR-C1-A**

Soil Name & Hydrologic Group	Cover Description (cover type, treatment & conditions)	CN	Area (acres)	Product of CN x Area
	Impervious	98	3.458	338.88
B	Grass - Good Condition	61	1.016	61.98
C	Grass - Good Condition	74	0.000	
D	Grass - Good Condition	80	0.374	29.92
B	Woods - Good Condition	55	0.081	4.46
C	Woods - Good Condition	70	0.000	
D	Woods - Good Condition	77	0.000	
		TOTAL =	4.93	435.235

$$CN\ (weighted) = \frac{\text{total product}}{\text{total area}} = \frac{435.235}{4.929}$$

CN (weighted) = 88.301 Use CN= **88**

2. Runoff S = 1.36

		Storm #1	*Storm #2*	*Storm #3*
Frequency	yr			
Rainfall, P	in			
Runoff, Q	in			

(Use P and CN with table 2-1, fig 2-1, or eqns. 2-3 and 2-4)

ENGINEERING & SURVEYING PROPERTIES
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CURVE NUMBER (CN) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**13**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

1. Runoff curve number (CN) Existing [Proposed] Subarea: **PR-C1-B**

Soil Name & Hydrologic Group	Cover Description (cover type, treatment & conditions)	CN	Area (acres)	Product of CN x Area
	Impervious	98	3.759	368.38
B	Grass - Good Condition	61	2.385	145.49
C	Grass - Good Condition	74	0.000	
D	Grass - Good Condition	80	0.000	
B	Woods - Good Condition	55	0.010	0.55
C	Woods - Good Condition	70	0.000	
D	Woods - Good Condition	77	0.000	
		TOTAL =	6.15	514.417

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{514.417}{6.154}$$

CN (weighted) = 83.591 Use CN= **84**

2. Runoff S = 1.90

		Storm #1	*Storm #2*	*Storm #3*
Frequency	yr			
Rainfall, P	in			
Runoff, Q	in			

(Use P and CN with table 2-1, fig 2-1, or eqns. 2-3 and 2-4)

ENGINEERING & SURVEYING PROPERTIES
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CURVE NUMBER (CN) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**14**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

1. Runoff curve number (CN) Existing [Proposed] Subarea: **PR-C1-C**

Soil Name & Hydrologic Group	Cover Description (cover type, treatment & conditions)	CN	Area (acres)	Product of CN x Area
	Impervious	98	0.044	4.31
B	Grass - Good Condition	61	1.265	77.17
C	Grass - Good Condition	74	0.000	
D	Grass - Good Condition	80	7.035	562.80
B	Woods - Good Condition	55	2.893	159.12
C	Woods - Good Condition	70	0.000	
D	Woods - Good Condition	77	5.600	431.20
		TOTAL =	16.84	1234.592

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{1234.592}{16.837}$$

CN (weighted) = 73.326 Use CN= **73**

2. Runoff S = 3.70

		Storm #1	*Storm #2*	*Storm #3*
Frequency	yr			
Rainfall, P	in			
Runoff, Q	in			

(Use P and CN with table 2-1, fig 2-1, or eqns. 2-3 and 2-4)

ENGINEERING & SURVEYING PROPERTIES
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CURVE NUMBER (CN) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**15**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

1. Runoff curve number (CN) Existing [Proposed] Subarea: **PR-C2**

Soil Name & Hydrologic Group	Cover Description (cover type, treatment & conditions)	CN	Area (acres)	Product of CN x Area
	Impervious	98	0.169	16.56
B	Grass - Good Condition	61	0.070	4.27
C	Grass - Good Condition	74	0.000	
D	Grass - Good Condition	80	0.137	10.96
B	Woods - Good Condition	55	0.222	12.21
C	Woods - Good Condition	70	0.000	
D	Woods - Good Condition	77	0.517	39.81
		TOTAL =	1.12	83.811

$$CN\ (weighted) = \frac{\text{total product}}{\text{total area}} = \frac{83.811}{1.115}$$

CN (weighted) = 75.167 Use CN= **75**

2. Runoff S = 3.33

		Storm #1	*Storm #2*	*Storm #3*
Frequency	yr			
Rainfall, P	in			
Runoff, Q	in			

(Use P and CN with table 2-1, fig 2-1, or eqns. 2-3 and 2-4)

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APPENDIX 4

TIME OF CONCENTRATION

CALCULATIONS

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ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

TIME OF CONCENTRATION (Tc) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**1**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

Existing | Proposed Area: **EX-A1**

1. Sheet Flow

		Segment ID	A-B				
Surface Description (table 3-1)			Woods: L				
Manning's roughness coeff., 'n' (table 3-1)			0.40				
Flow length, L (total L ≤ 300 ft)	ft		100				
Two-year 24-hour rainfall, P_2	in		3.50				
Land Slope, s	ft/ft		0.020				
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr		0.343				0.343

2. Shallow Concentrated Flow

		Segment ID	B-C	C-D			
Surface description (paved or unpaved)			Unpaved	Unpaved			
Flow length, L	ft		606.2	577.9			
Watercourse slope, s	ft/ft		0.148	0.020			
Average velocity, V (figure 3-1)	ft/s		6.206	2.282			
$T_t = \frac{L}{3600\,V}$	hr		0.027	0.070			0.097

3. Channel Flow

		Segment ID					
Cross sectional flow area, a	ft^2						
Wetted perimeter, p_w	ft						
Hydraulic radius, $r = a/p_w$	ft						
Channel slope, s	ft/ft						
Manning's roughness coefficient, n							
$V = \frac{1.49\,r^{2/3}\,s^{1/2}}{n}$	ft/s						
Flow Length, L	ft						
$T_t = \frac{L}{3600\,V}$	hr						

Total Tc For Watershed or Subarea (Add Steps 6, 11, and 19) hr = 0.44

min = 26.40

ENGINEERING & SURVEYING PROPERTIES
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TIME OF CONCENTRATION (Tc) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**2**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

Existing | Proposed — Area: **EX-A2**

1. Sheet Flow

		Segment ID	A-B				
Surface Description (table 3-1)			Woods: L				
Manning's roughness coeff., 'n' (table 3-1)			0.40				
Flow length, L (total L ≤ 300 ft)	ft		100				
Two-year 24-hour rainfall, P_2	in		3.50				
Land Slope, s	ft/ft		0.030				
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr		0.291				0.291

2. Shallow Concentrated Flow

		Segment ID	B-C				
Surface description (paved or unpaved)			Unpaved				
Flow length, L	ft		905.9				
Watercourse slope, s	ft/ft		0.143				
Average velocity, V (figure 3-1)	ft/s		6.101				
$T_t = \frac{L}{3600\,V}$	hr		0.041				0.041

3. Channel Flow

		Segment ID					
Cross sectional flow area, a	ft^2						
Wetted perimeter, p_w	ft						
Hydraulic radius, $r = a/p_w$	ft						
Channel slope, s	ft/ft						
Manning's roughness coefficient, n							
$V = \frac{1.49\,r^{2/3}\,s^{1/2}}{n}$	ft/s						
Flow Length, L	ft						
$T_t = \frac{L}{3600\,V}$	hr						

Total Tc For Watershed or Subarea (Add Steps 6, 11, and 19) **hr =** **0.33**

min = **19.80**

ENGINEERING & SURVEYING PROPERTIES
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TIME OF CONCENTRATION (Tc) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**3**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

Existing | Proposed — Area: **EX-B**

1. Sheet Flow

		Segment ID	A-B				
Surface Description (table 3-1)			Woods: L				
Manning's roughness coeff., 'n' (table 3-1)			0.40				
Flow length, L (total L ≤ 300 ft)	ft		100				
Two-year 24-hour rainfall, P_2	in		3.50				
Land Slope, s	ft/ft		0.036				
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr		0.271				0.271

2. Shallow Concentrated Flow

		Segment ID	B-C	C-D			
Surface description (paved or unpaved)			Unpaved	Unpaved			
Flow length, L	ft		283.1	420.7			
Watercourse slope, s	ft/ft		0.143	0.057			
Average velocity, V (figure 3-1)	ft/s		6.102	3.846			
$T_t = \frac{L}{3600\,V}$	hr		0.013	0.030			0.043

3. Channel Flow

		Segment ID					
Cross sectional flow area, a	ft^2						
Wetted perimeter, p_w	ft						
Hydraulic radius, $r = a/p_w$	ft						
Channel slope, s	ft/ft						
Manning's roughness coefficient, n							
$V = \frac{1.49\,r^{2/3}\,s^{1/2}}{n}$	ft/s						
Flow Length, L	ft						
$T_t = \frac{L}{3600\,V}$	hr						

Total Tc For Watershed or Subarea (Add Steps 6, 11, and 19) **hr =** **0.31**

min = **18.60**

ENGINEERING & SURVEYING PROPERTIES
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TIME OF CONCENTRATION (Tc) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**4**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

Existing | Proposed — Area: **EX-C**

1. Sheet Flow

		Segment ID	A-B				
Surface Description (table 3-1)			Woods: L				
Manning's roughness coeff., 'n' (table 3-1)			0.40				
Flow length, L (total L ≤ 300 ft)	ft		100				
Two-year 24-hour rainfall, P_2	in		3.50				
Land Slope, s	ft/ft		0.030				
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr		0.290				0.290

2. Shallow Concentrated Flow

		Segment ID	B-C	C-D			
Surface description (paved or unpaved)			Unpaved	Unpaved			
Flow length, L	ft		386.2	1,121.1			
Watercourse slope, s	ft/ft		0.120	0.018			
Average velocity, V (figure 3-1)	ft/s		5.594	2.171			
$T_t = \frac{L}{3600\,V}$	hr		0.019	0.143			0.163

3. Channel Flow

		Segment ID					
Cross sectional flow area, a	ft^2						
Wetted perimeter, p_w	ft						
Hydraulic radius, $r = a/p_w$	ft						
Channel slope, s	ft/ft						
Manning's roughness coefficient, n							
$V = \frac{1.49\,r^{2/3}\,s^{1/2}}{n}$	ft/s						
Flow Length, L	ft						
$T_t = \frac{L}{3600\,V}$	hr						

Total Tc For Watershed or Subarea (Add Steps 6, 11, and 19) **hr =** **0.45**

min = **27.00**

ENGINEERING & SURVEYING PROPERTIES
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TIME OF CONCENTRATION (Tc) WORKSHEET

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1146.01	**09/01/23**	**06/29/26**	**5**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

Existing [Proposed] Area: **PR-A1-A**

1. Sheet Flow

		Segment ID	A-B				
Surface Description (table 3-1)			Grass: D				
Manning's roughness coeff., 'n' (table 3-1)			0.24				
Flow length, L (total L ≤ 300 ft)	ft		100				
Two-year 24-hour rainfall, P_2	in		3.50				
Land Slope, s	ft/ft		0.017				
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr		0.242				0.242

2. Shallow Concentrated Flow

		Segment ID	B-C	C-D			
Surface description (paved or unpaved)			Unpaved	Paved			
Flow length, L	ft		16.3	151.6			
Watercourse slope, s	ft/ft		0.124	0.080			
Average velocity, V (figure 3-1)	ft/s		5.682	5.745			
$T_t = \frac{L}{3600\,V}$	hr		0.001	0.007			0.008

3. Channel Flow

		Segment ID	D-E				
Cross sectional flow area, a	ft^2		1.23				
Wetted perimeter, p_w	ft		3.93				
Hydraulic radius, $r = a/p_w$	ft		0.31				
Channel slope, s	ft/ft		0.010				
Manning's roughness coefficient, n			0.035				
$V = \frac{1.49\,r^{2/3}\,s^{1/2}}{n}$	ft/s		1.960				
Flow Length, L	ft		774.9				
$T_t = \frac{L}{3600\,V}$	hr		0.110				0.110

Total Tc For Watershed or Subarea (Add Steps 6, 11, and 19) hr = 0.36

min = 21.60

ENGINEERING & SURVEYING PROPERTIES
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TIME OF CONCENTRATION (Tc) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**6**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

Existing [Proposed] Area: **PR-A1-B**

1. Sheet Flow

		Segment ID	A-B				
Surface Description (table 3-1)			Grass: D				
Manning's roughness coeff., 'n' (table 3-1)			0.24				
Flow length, L (total L ≤ 300 ft)	ft		72				
Two-year 24-hour rainfall, P_2	in		3.50				
Land Slope, s	ft/ft		0.040				
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr		0.133				0.133

2. Shallow Concentrated Flow

		Segment ID					
Surface description (paved or unpaved)							
Flow length, L	ft						
Watercourse slope, s	ft/ft						
Average velocity, V (figure 3-1)	ft/s						
$T_t = \frac{L}{3600\,V}$	hr						0.000

3. Channel Flow

		Segment ID	B-C				
Cross sectional flow area, a	ft^2		1.23				
Wetted perimeter, p_w	ft		3.93				
Hydraulic radius, $r = a/p_w$	ft		0.31				
Channel slope, s	ft/ft		0.010				
Manning's roughness coefficient, n			0.035				
$V = \frac{1.49\,r^{2/3}\,s^{1/2}}{n}$	ft/s		1.960				
Flow Length, L	ft		587.0				
$T_t = \frac{L}{3600\,V}$	hr		0.083				0.083

Total Tc For Watershed or Subarea (Add Steps 6, 11, and 19) hr = 0.22

min = 13.20

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TIME OF CONCENTRATION (Tc) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**7**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

Existing [Proposed] Area: **PR-A1-C**

1. Sheet Flow

		Segment ID	A-B	B-C			
Surface Description (table 3-1)			Grass: D	Grass: D			
Manning's roughness coeff., 'n' (table 3-1)			0.24	0.24			
Flow length, L (total L ≤ 300 ft)	ft		5	36			
Two-year 24-hour rainfall, P_2	in		3.50	3.50			
Land Slope, s	ft/ft		0.050	0.500			
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\, s^{0.4}}$	hr		0.014	0.028			0.042

2. Shallow Concentrated Flow

		Segment ID					
Surface description (paved or unpaved)							
Flow length, L	ft						
Watercourse slope, s	ft/ft						
Average velocity, V (figure 3-1)	ft/s						
$T_t = \frac{L}{3600\, V}$	hr						0.000

3. Channel Flow

		Segment ID					
Cross sectional flow area, a	ft^2						
Wetted perimeter, p_w	ft						
Hydraulic radius, $r = a/p_w$	ft						
Channel slope, s	ft/ft						
Manning's roughness coefficient, n							
$V = \frac{1.49\, r^{2/3}\, s^{1/2}}{n}$	ft/s						
Flow Length, L	ft						
$T_t = \frac{L}{3600\, V}$	hr						

Total Tc For Watershed or Subarea (Add Steps 6, 11, and 19) **hr =** **0.04**

min = **2.40**

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TIME OF CONCENTRATION (Tc) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**8**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

Existing [Proposed] Area: **PR-A2-A**

1. Sheet Flow

		Segment ID	A-B				
Surface Description (table 3-1)			Woods: L				
Manning's roughness coeff., 'n' (table 3-1)			0.40				
Flow length, L (total L ≤ 300 ft)	ft		100				
Two-year 24-hour rainfall, P_2	in		3.50				
Land Slope, s	ft/ft		0.030				
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr		0.291				0.291

2. Shallow Concentrated Flow

		Segment ID	B-C				
Surface description (paved or unpaved)			Unpaved				
Flow length, L	ft		1,131.6				
Watercourse slope, s	ft/ft		0.038				
Average velocity, V (figure 3-1)	ft/s		3.145				
$T_t = \frac{L}{3600\,V}$	hr		0.100				0.100

3. Channel Flow

		Segment ID					
Cross sectional flow area, a	ft^2						
Wetted perimeter, p_w	ft						
Hydraulic radius, $r = a/p_w$	ft						
Channel slope, s	ft/ft						
Manning's roughness coefficient, n							
$V = \frac{1.49\,r^{2/3}\,s^{1/2}}{n}$	ft/s						
Flow Length, L	ft						
$T_t = \frac{L}{3600\,V}$	hr						

Total Tc For Watershed or Subarea (Add Steps 6, 11, and 19) **hr =** **0.39**

min = **23.40**

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TIME OF CONCENTRATION (Tc) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**9**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

Existing | Proposed Area: **PR-A2-B**

1. Sheet Flow

		Segment ID	A-B				
Surface Description (table 3-1)			Woods: L				
Manning's roughness coeff., 'n' (table 3-1)			0.40				
Flow length, L (total L ≤ 300 ft)	ft		100				
Two-year 24-hour rainfall, P_2	in		3.50				
Land Slope, s	ft/ft		0.023				
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr		0.324				0.324

2. Shallow Concentrated Flow

		Segment ID	B-C				
Surface description (paved or unpaved)			Unpaved				
Flow length, L	ft		215.8				
Watercourse slope, s	ft/ft		0.101				
Average velocity, V (figure 3-1)	ft/s		5.128				
$T_t = \frac{L}{3600\,V}$	hr		0.012				0.012

3. Channel Flow

		Segment ID					
Cross sectional flow area, a	ft^2						
Wetted perimeter, p_w	ft						
Hydraulic radius, $r = a/p_w$	ft						
Channel slope, s	ft/ft						
Manning's roughness coefficient, n							
$V = \frac{1.49\,r^{2/3}\,s^{1/2}}{n}$	ft/s						
Flow Length, L	ft						
$T_t = \frac{L}{3600\,V}$	hr						

Total Tc For Watershed or Subarea (Add Steps 6, 11, and 19) **hr =** **0.34**

min = **20.40**

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TIME OF CONCENTRATION (Tc) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**10**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

Existing [Proposed] Area: **PR-B1**

1. Sheet Flow

		Segment ID	A-B				
Surface Description (table 3-1)			Woods: L				
Manning's roughness coeff., 'n' (table 3-1)			0.40				
Flow length, L (total L ≤ 300 ft)	ft		100				
Two-year 24-hour rainfall, P_2	in		3.50				
Land Slope, s	ft/ft		0.059				
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr		0.222				0.222

2. Shallow Concentrated Flow

		Segment ID	B-C				
Surface description (paved or unpaved)			Unpaved				
Flow length, L	ft		193.9				
Watercourse slope, s	ft/ft		0.030				
Average velocity, V (figure 3-1)	ft/s		2.795				
$T_t = \frac{L}{3600\,V}$	hr		0.019				0.019

3. Channel Flow

		Segment ID					
Cross sectional flow area, a	ft^2						
Wetted perimeter, p_w	ft						
Hydraulic radius, $r = a/p_w$	ft						
Channel slope, s	ft/ft						
Manning's roughness coefficient, n							
$V = \frac{1.49\,r^{2/3}\,s^{1/2}}{n}$	ft/s						
Flow Length, L	ft						
$T_t = \frac{L}{3600\,V}$	hr						

Total Tc For Watershed or Subarea (Add Steps 6, 11, and 19) **hr =** **0.24**

min = **14.40**

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TIME OF CONCENTRATION (Tc) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**11**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

Existing | Proposed — Area: **PR-B2**

1. Sheet Flow

		Segment ID	A-B				
Surface Description (table 3-1)			Woods: L				
Manning's roughness coeff., 'n' (table 3-1)			0.40				
Flow length, L (total L ≤ 300 ft)	ft		100				
Two-year 24-hour rainfall, P_2	in		3.50				
Land Slope, s	ft/ft		0.040				
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr		0.259				0.259

2. Shallow Concentrated Flow

		Segment ID	B-C				
Surface description (paved or unpaved)			Paved				
Flow length, L	ft		249.6				
Watercourse slope, s	ft/ft		0.208				
Average velocity, V (figure 3-1)	ft/s		9.277				
$T_t = \frac{L}{3600\,V}$	hr		0.007				0.007

3. Channel Flow

		Segment ID					
Cross sectional flow area, a	ft^2						
Wetted perimeter, p_w	ft						
Hydraulic radius, $r = a/p_w$	ft						
Channel slope, s	ft/ft						
Manning's roughness coefficient, n							
$V = \frac{1.49\,r^{2/3}\,s^{1/2}}{n}$	ft/s						
Flow Length, L	ft						
$T_t = \frac{L}{3600\,V}$	hr						

Total Tc For Watershed or Subarea (Add Steps 6, 11, and 19) **hr =** **0.27**

min = **16.20**

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TIME OF CONCENTRATION (Tc) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**12**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

Existing [Proposed] Area: **PR-C1-A**

1. Sheet Flow

		Segment ID	A-B	B-C			
Surface Description (table 3-1)			Woods: L	Grass: D			
Manning's roughness coeff., 'n' (table 3-1)			0.40	0.24			
Flow length, L (total L ≤ 300 ft)	ft		79	21			
Two-year 24-hour rainfall, P_2	in		3.50	3.50			
Land Slope, s	ft/ft		0.093	0.500			
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr		0.153	0.018			0.171

2. Shallow Concentrated Flow

		Segment ID	C-D	D-E			
Surface description (paved or unpaved)			Unpaved	Paved			
Flow length, L	ft		57.2	73.1			
Watercourse slope, s	ft/ft		0.166	0.066			
Average velocity, V (figure 3-1)	ft/s		6.574	5.204			
$T_t = \frac{L}{3600\,V}$	hr		0.002	0.004			0.006

3. Channel Flow

		Segment ID	E-F				
Cross sectional flow area, a	ft^2		1.23				
Wetted perimeter, p_w	ft		3.93				
Hydraulic radius, $r = a/p_w$	ft		0.31				
Channel slope, s	ft/ft		0.010				
Manning's roughness coefficient, n			0.035				
$V = \frac{1.49\,r^{2/3}\,s^{1/2}}{n}$	ft/s		1.960				
Flow Length, L	ft		1,162.9				
$T_t = \frac{L}{3600\,V}$	hr		0.165				0.165

Total Tc For Watershed or Subarea (Add Steps 6, 11, and 19) hr = 0.34

min = 20.40

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TIME OF CONCENTRATION (Tc) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**13**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

Existing [Proposed] Area: **PR-C1-B**

1. Sheet Flow

		Segment ID	A-B				
Surface Description (table 3-1)			Grass: D				
Manning's roughness coeff., 'n' (table 3-1)			0.24				
Flow length, L (total L ≤ 300 ft)	ft		48				
Two-year 24-hour rainfall, P_2	in		3.50				
Land Slope, s	ft/ft		0.010				
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr		0.167				0.167

2. Shallow Concentrated Flow

		Segment ID					
Surface description (paved or unpaved)							
Flow length, L	ft						
Watercourse slope, s	ft/ft						
Average velocity, V (figure 3-1)	ft/s						
$T_t = \frac{L}{3600\,V}$	hr						0.000

3. Channel Flow

		Segment ID	D-E				
Cross sectional flow area, a	ft^2		1.23				
Wetted perimeter, p_w	ft		3.93				
Hydraulic radius, $r = a/p_w$	ft		0.31				
Channel slope, s	ft/ft		0.028				
Manning's roughness coefficient, n			0.035				
$V = \frac{1.49\,r^{2/3}\,s^{1/2}}{n}$	ft/s		3.298				
Flow Length, L	ft		1,446.5				
$T_t = \frac{L}{3600\,V}$	hr		0.122				0.122

Total Tc For Watershed or Subarea (Add Steps 6, 11, and 19) hr = 0.29

min = 17.40

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TIME OF CONCENTRATION (Tc) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**14**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

Existing [Proposed] Area: **PR-C1-C**

1. Sheet Flow

		Segment ID: A-B				
Surface Description (table 3-1)		Woods: L				
Manning's roughness coeff., 'n' (table 3-1)		0.40				
Flow length, L (total L ≤ 300 ft)	ft	100				
Two-year 24-hour rainfall, P_2	in	3.50				
Land Slope, s	ft/ft	0.029				
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr	0.295				0.295

2. Shallow Concentrated Flow

		Segment ID: B-C				
Surface description (paved or unpaved)		Unpaved				
Flow length, L	ft	863.1				
Watercourse slope, s	ft/ft	0.025				
Average velocity, V (figure 3-1)	ft/s	2.569				
$T_t = \frac{L}{3600\,V}$	hr	0.093				0.093

3. Channel Flow

		Segment ID				
Cross sectional flow area, a	ft^2					
Wetted perimeter, p_w	ft					
Hydraulic radius, $r = a/p_w$	ft					
Channel slope, s	ft/ft					
Manning's roughness coefficient, n						
$V = \frac{1.49\,r^{2/3}\,s^{1/2}}{n}$	ft/s					
Flow Length, L	ft					
$T_t = \frac{L}{3600\,V}$	hr					

Total Tc For Watershed or Subarea (Add Steps 6, 11, and 19) **hr =** **0.39**

min = **23.40**

ENGINEERING & SURVEYING PROPERTIES
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TIME OF CONCENTRATION (Tc) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/29/26**	**15**	**15**

PROJECT TITLE: **Britian Woods**

LOCATION: **Town of Newburgh / City of Newburgh**

CALCULATED BY: **ZS**

APPROVED BY: **RW**

REF DRAWING(S): **DWG LAST REV. 06/29/2026**

Existing | Proposed Area: **PR-C2**

1. Sheet Flow

		Segment ID	A-B				
Surface Description (table 3-1)			Woods: L				
Manning's roughness coeff., 'n' (table 3-1)			0.40				
Flow length, L (total L ≤ 300 ft)	ft		100				
Two-year 24-hour rainfall, P_2	in		3.50				
Land Slope, s	ft/ft		0.036				
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr		0.271				0.271

2. Shallow Concentrated Flow

		Segment ID	B-C				
Surface description (paved or unpaved)			Unpaved				
Flow length, L	ft		174.9				
Watercourse slope, s	ft/ft		0.053				
Average velocity, V (figure 3-1)	ft/s		3.703				
$T_t = \frac{L}{3600\,V}$	hr		0.013				0.013

3. Channel Flow

		Segment ID					
Cross sectional flow area, a	ft^2						
Wetted perimeter, p_w	ft						
Hydraulic radius, $r = a/p_w$	ft						
Channel slope, s	ft/ft						
Manning's roughness coefficient, n							
$V = \frac{1.49\,r^{2/3}\,s^{1/2}}{n}$	ft/s						
Flow Length, L	ft						
$T_t = \frac{L}{3600\,V}$	hr						

Total Tc For Watershed or Subarea (Add Steps 6, 11, and 19) **hr =** **0.28**

min = **16.80**

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APPENDIX 5

WATER QUALITY VOLUME CALCULATIONS & RUNOFF REDUCTION VOLUME CALCULATIONS

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ENGINEERING & SURVEYING PROPERTIES
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WATER QUALITY VOLUME (WQ_v) CALCULATION SHEET

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**09/01/23**	**06/29/26**	**1**	**3**

PROJECT TITLE	LOCATION
Britain Woods	**Town of Newburgh / City of Newburgh**

CALCULATED BY	APPROVED BY	Stormwater Management Design Point Designation
ZS	**RW**	**SITE**

$WQ_v = (P * R_v * A) / (12)$

Drainage Area	90% Rainfall Event # (**P**)	Total Drainage Area (**A**)	Total Impervious Area (**I**)	**R_v** (0.05 + 0.009*I%)	**WQ_v** Required (Ac-ft)	**WQv** Required (ft^3)
SITE	1.40	65.40	11.55	0.209	1.594	69,434.6

HSG	**Area (Ac.)**	**%**	**S**
A	0.00	0%	0.55
B	41.55	64%	0.40
C	2.46	4%	0.30
D	21.39	33%	0.20

Minimum RRv = (P * 0.95 * S * I) / (12)

P =	1.40	
S =	0.33	
I =	11.55	
$RR_{v\ MIN}$	**0.424**	Ac-ft

Green Technology	**Implemented ?** Yes	**Implemented ?** No	Drainage Area Reduction	Contributing Drainage Area Reduction	Total Drainage Area Reduction	Total Impervious Area Reduction
Area Reduction Practices						
Conservation of Natural Areas	☐	☑	-	-	-	-
Sheet Flow to Riparian Buffers or Filter Strips	☐	☑	-	-	-	-
Tree Planting / Tree Box	☐	☑	-	-	-	-
		Subtotals			0.00	0.00

Revised WQ_v after Area Deductions	**P**	**A**	**I**	**R_v**	**WQ_v**	**$RR_{v\ AREA}$**
	1.40	65.40	11.55	0.209	1.594	**0.000**

Disconnection of Rooftop Runoff	Impervious Area Reduction:	0.00 Acres

Revised WQ_v after Impervious Disconnect	**P**	**A**	**I**	**R_v**	**WQ_v**	**$RR_{v\ IMP}$**
	1.40	65.40	11.55	0.209	1.594	**0.000**

Source Control WQ_v Treatment Practices	**Yes**	**No**	**WQ_v**	**$RR_{v\ SC}$***	**(A)** Reduction	**(I)** Reduction
Vegetated Open Swales	☐	☑	-	-	-	-
Rain Garden	☐	☑	-	-	-	-
Green Roof	☐	☑	-	-	-	-
Stormwater Planters	☐	☑	-	-	-	-
Rain Tanks / Cisterns	☐	☑	-	-	-	-
Porous Pavement	☐	☑	-	-	-	-
Standard SMP's with RRv Capacity						
Infiltration	☐	☑	-	-	-	-
Bio-Retention	☑	☐	0.658	0.436	9.69	5.73
Dry Swale (Open Channel)	☐	☑	-	-	-	-
		Subtotals	0.658	**0.436**	9.69	5.73

Is The Total **RR_v** ($RR_{v\ AREA}$ + $RR_{v\ IMP}$ + $RR_{v\ SC}$)	**0.436**	**≥ $RR_{v\ MIN}$?**	**0.424**	**YES**

WQ_v Required by Standard Practices	**P**	**A**	**I**	**R_v**	**WQ_v (Ac-ft)**	**WQ_v (ft^3)**
	1.40	55.71	5.82	0.144	0.936	40,793.0

** For Source Control (if used) RRv calculations see attached Green Technology RRv Calculation Sheets*

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RUNOFF REDUCTION VOLUME (RRv) CALCULATION SHEET

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**09/01/23**	**6/29/2026**	**2**	**3**

PROJECT TITLE		LOCATION
Britain Woods		**Town of Newburgh / City of Newburgh**
CALCULATED BY	APPROVED BY	Stormwater Management Design Point Designation
ZS	**RW**	**PR A1-A**

BIO-RETENTION

Requirement Checks	Yes	No	Notes:
Runoff enters as sheet flow or through a dissipator	☐	☑	Plunge pool forebay provided for pretreatment
Pretreatment provided	☑	☐	
Design Complies with Required Elements of Practice	☑	☐	
Infiltration designed to exfiltrate through bottom of practice only?	☐	☑	Underdrains are provided for filtration bioretention.

Drainage Area (Ac.)	4.762	
Impervious Area (Ac.)	2.270	
Rainfall Event # (P)	1.40	
Rv	0.479	
$WQv_{REQ'D}$	0.266	
A_f (ft^2)	8,066.6	Surface area of filter bed
d_t (ft)	2.5	depth of filter bed
k (ft/day)	1.0	coefficient of permability of filter media
h_f (ft)	0.50	average height of water above filter bed
t_f (days)	2.00	design filter bed drain time
V_f (ft^3)	19,359.9	Design volume of filter (WQ_v Provided)
$V_f > WQv_{REQ'D}$	**YES**	
HSG Soil Classification	D	

RRv Reduction Allowance

Infiltration Bioretention F-4	100%
Filtration Bioretention F-5	40%*

*For practices with underdrains that require sizing the surface area of the filter bed using Darcy's Law,the designer can elect to oversize the surface area of the filter bed to provide additional storage volume and receive additional RRv credit up to 100% of the WQv required.

RRv 0.178

WQv Req.= 11592.55 WQv Prov. = 19,359.89

Increase Factor = 28,058.40/26016.79 = 1.670

Revised RRv Allowance = 1.665 * 40% = 66.80%

ENGINEERING & SURVEYING PROPERTIES
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RUNOFF REDUCTION VOLUME (RRv) CALCULATION SHEET

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**09/01/23**	**6/29/2026**	**3**	**3**

PROJECT TITLE		LOCATION
Britain Woods		**Town of Newburgh / City of Newburgh**
CALCULATED BY	APPROVED BY	Stormwater Management Design Point Designation
ZS	**RW**	**PR-C1-A**

BIO-RETENTION

Requirement Checks	Yes	No	Notes:
Runoff enters as sheet flow or through a dissipator	☐	☑	Plunge pool forebay provided for pretreatment
Pretreatment provided	☑	☐	
Design Complies with Required Elements of Practice	☑	☐	
Infiltration designed to exfiltrate through bottom of practice only?	☐	☑	Underdrains are provided for filtration bioretention.

Drainage Area (Ac.)	4.929	
Impervious Area (Ac.)	3.458	
Rainfall Event # (P)	1.40	
Rv	0.681	
$WQv_{REQ'D}$	0.392	
A_f (ft^2)	11,699.4	Surface area of filter bed
d_t (ft)	2.5	depth of filter bed
k (ft/day)	1.0	coefficient of permability of filter media
h_f (ft)	0.50	average height of water above filter bed
t_f (days)	2.00	design filter bed drain time
V_f (ft^3)	28,078.6	Design volume of filter (WQ_v Provided)
$V_f > WQv_{REQ'D}$	**YES**	
HSG Soil Classification	D	

RRv Reduction Allowance

Infiltration Bioretention F-4	100%
Filtration Bioretention F-5	40%*

*For practices with underdrains that require sizing the surface area of the filter bed using Darcy's Law,the designer can elect to oversize the surface area of the filter bed to provide additional storage volume and receive additional RRv credit up to 100% of the WQv required.

RRv 0.258

WQv Req.= 17068.66 WQv Prov. = 28,078.56

Increase Factor = 28,058.40/26016.79 = 1.645

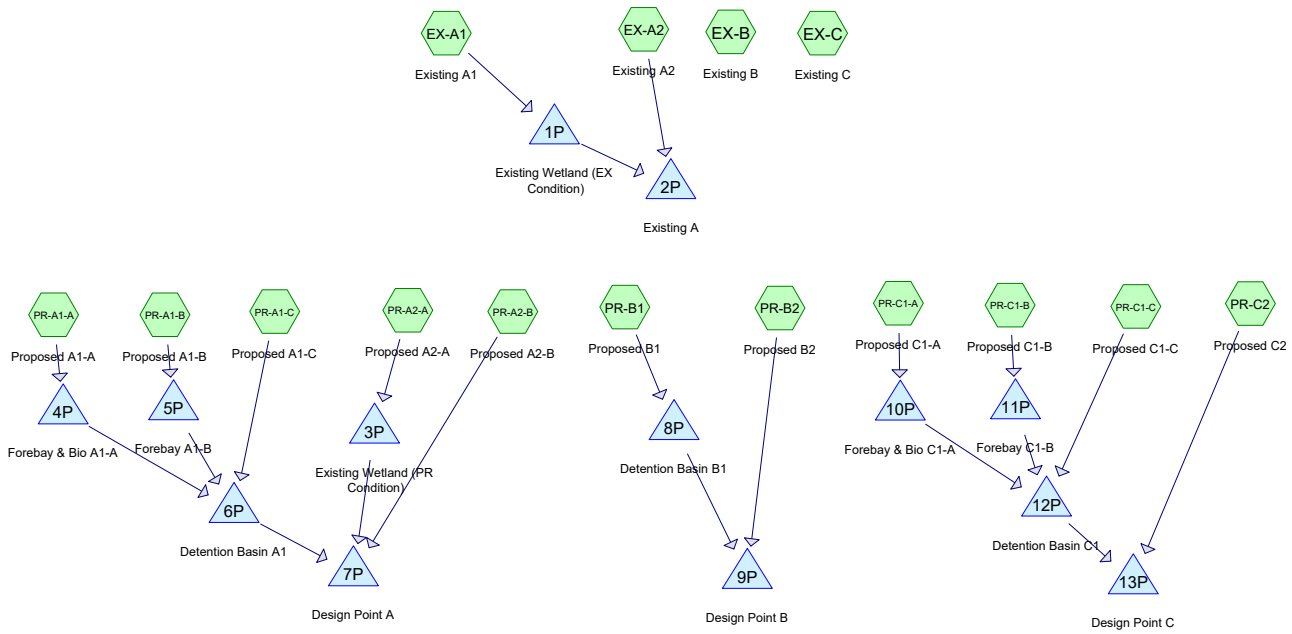
Revised RRv Allowance = 1.665 * 40% = 65.80%

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APPENDIX 6

HYDROGRAPH SUMMARIES & DIAGRAMS

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Subcat Reach Pond Link

Routing Diagram for 1146.01 - HydroCAD new

Prepared by Engineering Surveying Properties, Printed 6/26/2026

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Events for Subcatchment EX-A1: Existing A1

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.60	1.88	0.480	0.25
10-yr	4.70	16.89	2.399	1.26
25-yr	5.91	28.63	3.873	2.03
100-yr	**8.38**	**54.66**	**7.354**	**3.85**

Events for Subcatchment EX-A2: Existing A2

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.60	0.58	0.180	0.18
10-yr	4.70	8.08	1.070	1.07
25-yr	5.91	14.62	1.785	1.78
100-yr	**8.38**	**29.41**	**3.512**	**3.51**

Events for Subcatchment EX-B: Existing B

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.60	0.54	0.141	0.23
10-yr	4.70	6.03	0.742	1.19
25-yr	5.91	10.42	1.210	1.95
100-yr	**8.38**	**20.20**	**2.325**	**3.74**

Events for Subcatchment EX-C: Existing C

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.60	6.20	0.966	0.50
10-yr	4.70	26.48	3.483	1.82
25-yr	5.91	40.10	5.241	2.73
100-yr	**8.38**	**68.57**	**9.187**	**4.79**

Events for Subcatchment PR-A1-A: Proposed A1-A

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.60	3.23	0.359	0.91
10-yr	4.70	8.92	1.010	2.55
25-yr	5.91	12.36	1.428	3.60
100-yr	**8.38**	**19.12**	**2.327**	**5.86**

Events for Subcatchment PR-A1-B: Proposed A1-B

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.60	3.49	0.288	1.33
10-yr	4.70	7.63	0.692	3.19
25-yr	5.91	9.99	0.939	4.32
100-yr	**8.38**	**14.41**	**1.455**	**6.70**

Events for Subcatchment PR-A1-C: Proposed A1-C

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.60	0.07	0.011	0.28
10-yr	4.70	0.73	0.054	1.32
25-yr	5.91	1.20	0.087	2.11
100-yr	**8.38**	**2.20**	**0.163**	**3.97**

Events for Subcatchment PR-A2-A: Proposed A2-A

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.60	3.20	0.510	0.43
10-yr	4.70	15.84	1.968	1.67
25-yr	5.91	24.48	3.009	2.55
100-yr	**8.38**	**42.76**	**5.372**	**4.56**

Events for Subcatchment PR-A2-B: Proposed A2-B

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.60	0.52	0.163	0.18
10-yr	4.70	7.21	0.969	1.07
25-yr	5.91	13.05	1.616	1.78
100-yr	**8.38**	**26.26**	**3.180**	**3.51**

Events for Subcatchment PR-B1: Proposed B1

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.60	0.75	0.071	0.76
10-yr	4.70	2.29	0.216	2.29
25-yr	5.91	3.24	0.312	3.30
100-yr	**8.38**	**5.13**	**0.520**	**5.50**

Events for Subcatchment PR-B2: Proposed B2

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.60	0.21	0.049	0.25
10-yr	4.70	2.15	0.245	1.26
25-yr	5.91	3.65	0.395	2.03
100-yr	**8.38**	**6.93**	**0.750**	**3.85**

Events for Subcatchment PR-C1-A: Proposed C1-A

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.60	5.90	0.603	1.47
10-yr	4.70	12.46	1.390	3.38
25-yr	5.91	16.17	1.864	4.54
100-yr	**8.38**	**23.18**	**2.851**	**6.94**

Events for Subcatchment PR-C1-B: Proposed C1-B

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.60	6.42	0.612	1.19
10-yr	4.70	15.00	1.537	3.00
25-yr	5.91	19.95	2.109	4.11
100-yr	**8.38**	**29.41**	**3.313**	**6.46**

Events for Subcatchment PR-C1-C: Proposed C1-C

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.60	6.71	0.873	0.62
10-yr	4.70	23.88	2.873	2.05
25-yr	5.91	34.96	4.229	3.01
100-yr	**8.38**	**57.56**	**7.223**	**5.15**

Events for Subcatchment PR-C2: Proposed C2

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.60	0.63	0.066	0.71
10-yr	4.70	2.01	0.205	2.21
25-yr	5.91	2.88	0.298	3.21
100-yr	**8.38**	**4.62**	**0.500**	**5.39**

Events for Pond 1P: Existing Wetland (EX Condition)

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-yr	1.88	0.00	224.85	28,370
10-yr	16.89	2.78	225.55	58,933
25-yr	28.63	15.26	225.65	64,868
100-yr	**54.66**	**48.95**	**225.82**	**76,109**

Events for Pond 2P: Existing A

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
1-yr	0.58	0.58	**0.00**	**0.000**
10-yr	8.08	8.08	0.00	0.000
25-yr	21.24	21.24	0.00	0.000
100-yr	**70.33**	**70.33**	0.00	0.000

Events for Pond 3P: Existing Wetland (PR Condition)

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-yr	3.20	0.00	224.89	29,652
10-yr	15.84	4.66	225.22	42,136
25-yr	24.48	12.35	225.42	51,227
100-yr	**42.76**	**29.64**	**225.75**	**69,018**

Events for Pond 4P: Forebay & Bio A1-A

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-yr	3.23	0.14	228.51	30,019
10-yr	8.92	6.21	228.63	31,764
25-yr	12.36	11.62	228.70	32,761
100-yr	**19.12**	**16.31**	**229.05**	**38,284**

Events for Pond 5P: Forebay A1-B

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-yr	3.49	3.45	228.59	11,920
10-yr	7.63	7.57	228.65	12,131
25-yr	9.99	9.93	228.68	12,265
100-yr	**14.41**	**14.34**	**229.04**	**13,586**

Events for Pond 6P: Detention Basin A1

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-yr	3.51	0.07	225.06	12,153
10-yr	9.60	0.83	228.56	41,603
25-yr	18.54	3.80	228.68	43,068
100-yr	**30.54**	**18.82**	**229.04**	**47,582**

Events for Pond 7P: Design Point A

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
1-yr	0.58	0.58	**0.00**	**0.000**
10-yr	7.35	7.35	0.00	0.000
25-yr	20.28	20.28	0.00	0.000
100-yr	**66.91**	**66.91**	0.00	0.000

Events for Pond 8P: Detention Basin B1

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-yr	0.75	0.27	264.95	675
10-yr	2.29	1.55	266.09	2,077
25-yr	3.24	3.07	266.15	2,187
100-yr	**5.13**	**5.09**	**266.22**	**2,308**

Events for Pond 9P: Design Point B

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
1-yr	0.48	0.48	**0.00**	**0.000**
10-yr	3.38	3.38	0.00	0.000
25-yr	6.71	6.71	0.00	0.000
100-yr	**11.99**	**11.99**	0.00	0.000

Events for Pond 10P: Forebay & Bio C1-A

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-yr	5.90	0.25	265.52	51,237
10-yr	12.46	8.51	265.66	54,551
25-yr	16.17	14.61	265.73	56,166
100-yr	**23.18**	**21.98**	**265.97**	**62,104**

Events for Pond 11P: Forebay C1-B

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-yr	6.42	6.24	264.88	42,494
10-yr	15.00	14.77	264.98	43,373
25-yr	19.95	19.73	265.03	43,800
100-yr	**29.41**	**29.18**	**265.97**	**52,727**

Events for Pond 12P: Detention Basin C1

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-yr	12.62	0.43	261.93	56,312
10-yr	42.20	18.40	263.53	97,064
25-yr	67.66	34.36	264.16	115,858
100-yr	**106.73**	**46.95**	**265.97**	**179,909**

Events for Pond 13P: Design Point C

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
1-yr	0.82	0.82	**0.00**	**0.000**
10-yr	18.91	18.91	0.00	0.000
25-yr	35.51	35.51	0.00	0.000
100-yr	**48.50**	**48.50**	0.00	0.000

APPENDIX 7

1-YEAR DESIGN STORM HYDROGRAPHS

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 5
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX-A1: Existing A1 Runoff Area=22.902 ac 8.12% Impervious Runoff Depth=0.25"
Tc=26.4 min CN=62 Runoff=1.88 cfs 0.480 af

Subcatchment EX-A2: Existing A2 Runoff Area=12.024 ac 1.27% Impervious Runoff Depth=0.18"
Tc=19.8 min CN=59 Runoff=0.58 cfs 0.180 af

Subcatchment EX-B: Existing B Runoff Area=7.465 ac 0.00% Impervious Runoff Depth=0.23"
Tc=18.6 min CN=61 Runoff=0.54 cfs 0.141 af

Subcatchment EX-C: Existing C Runoff Area=23.004 ac 0.93% Impervious Runoff Depth=0.50"
Tc=27.0 min CN=70 Runoff=6.20 cfs 0.966 af

Subcatchment PR-A1-A: Proposed A1-A Runoff Area=4.762 ac 47.67% Impervious Runoff Depth=0.91"
Tc=21.6 min CN=79 Runoff=3.23 cfs 0.359 af

Subcatchment PR-A1-B: Proposed A1-B Runoff Area=2.605 ac 63.57% Impervious Runoff Depth=1.33"
Tc=13.2 min CN=86 Runoff=3.49 cfs 0.288 af

Subcatchment PR-A1-C: Proposed A1-C Runoff Area=0.492 ac 0.00% Impervious Runoff Depth=0.28"
Tc=6.0 min CN=63 Runoff=0.07 cfs 0.011 af

Subcatchment PR-A2-A: Proposed A2-A Runoff Area=14.149 ac 15.15% Impervious Runoff Depth=0.43"
Tc=23.4 min CN=68 Runoff=3.20 cfs 0.510 af

Subcatchment PR-A2-B: Proposed A2-B Runoff Area=10.887 ac 2.63% Impervious Runoff Depth=0.18"
Tc=20.4 min CN=59 Runoff=0.52 cfs 0.163 af

Subcatchment PR-B1: Proposed B1 Runoff Area=1.134 ac 0.00% Impervious Runoff Depth=0.76"
Tc=14.4 min CN=76 Runoff=0.75 cfs 0.071 af

Subcatchment PR-B2: Proposed B2 Runoff Area=2.335 ac 0.00% Impervious Runoff Depth=0.25"
Tc=16.2 min CN=62 Runoff=0.21 cfs 0.049 af

Subcatchment PR-C1-A: Proposed C1-A Runoff Area=4.929 ac 70.16% Impervious Runoff Depth=1.47"
Tc=20.4 min CN=88 Runoff=5.90 cfs 0.603 af

Subcatchment PR-C1-B: Proposed C1-B Runoff Area=6.154 ac 61.08% Impervious Runoff Depth=1.19"
Tc=17.4 min CN=84 Runoff=6.42 cfs 0.612 af

Subcatchment PR-C1-C: Proposed C1-C Runoff Area=16.837 ac 0.26% Impervious Runoff Depth=0.62"
Tc=23.4 min CN=73 Runoff=6.71 cfs 0.873 af

Subcatchment PR-C2: Proposed C2 Runoff Area=1.115 ac 15.16% Impervious Runoff Depth=0.71"
Tc=16.8 min CN=75 Runoff=0.63 cfs 0.066 af

Pond 1P: Existing Wetland (EX Condition) Peak Elev=224.85' Storage=28,370 cf Inflow=1.88 cfs 0.480 af
Outflow=0.00 cfs 0.000 af

Pond 2P: Existing A Inflow=0.58 cfs 0.180 af
Primary=0.58 cfs 0.180 af

Pond 3P: Existing Wetland (PR Condition) Peak Elev=224.89' Storage=29,652 cf Inflow=3.20 cfs 0.510 af
Outflow=0.00 cfs 0.000 af

Pond 4P: Forebay & Bio A1-A Peak Elev=228.51' Storage=30,019 cf Inflow=3.23 cfs 0.359 af
Outflow=0.14 cfs 0.054 af

Pond 5P: Forebay A1-B Peak Elev=228.59' Storage=11,920 cf Inflow=3.49 cfs 0.288 af
Outflow=3.45 cfs 0.288 af

Pond 6P: Detention Basin A1 Peak Elev=225.06' Storage=12,153 cf Inflow=3.51 cfs 0.353 af
Outflow=0.07 cfs 0.197 af

Pond 7P: Design Point A Inflow=0.58 cfs 0.360 af
Primary=0.58 cfs 0.360 af

Pond 8P: Detention Basin B1 Peak Elev=264.95' Storage=675 cf Inflow=0.75 cfs 0.071 af
Outflow=0.27 cfs 0.071 af

Pond 9P: Design Point B Inflow=0.48 cfs 0.120 af
Primary=0.48 cfs 0.120 af

Pond 10P: Forebay & Bio C1-A Peak Elev=265.52' Storage=51,237 cf Inflow=5.90 cfs 0.603 af
Outflow=0.25 cfs 0.128 af

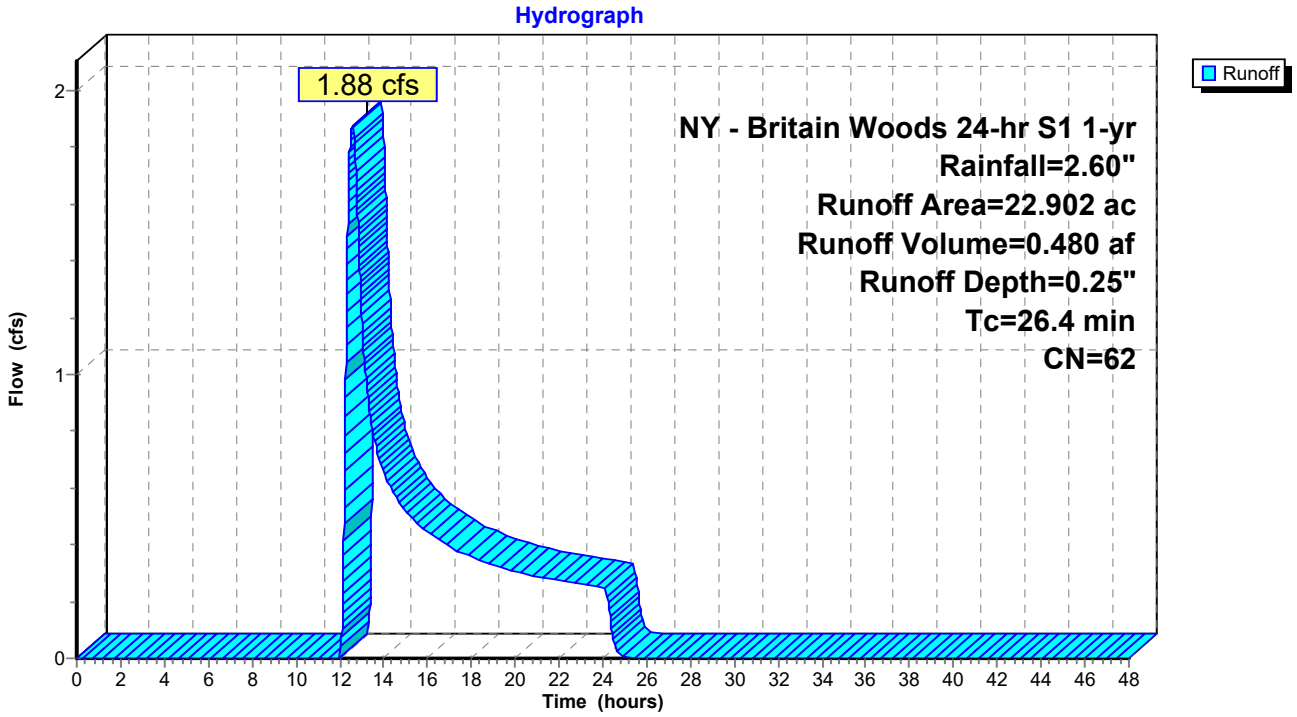
Pond 11P: Forebay C1-B Peak Elev=264.88' Storage=42,494 cf Inflow=6.42 cfs 0.612 af
Outflow=6.24 cfs 0.612 af

Pond 12P: Detention Basin C1 Peak Elev=261.93' Storage=56,312 cf Inflow=12.62 cfs 1.614 af
Outflow=0.43 cfs 1.128 af

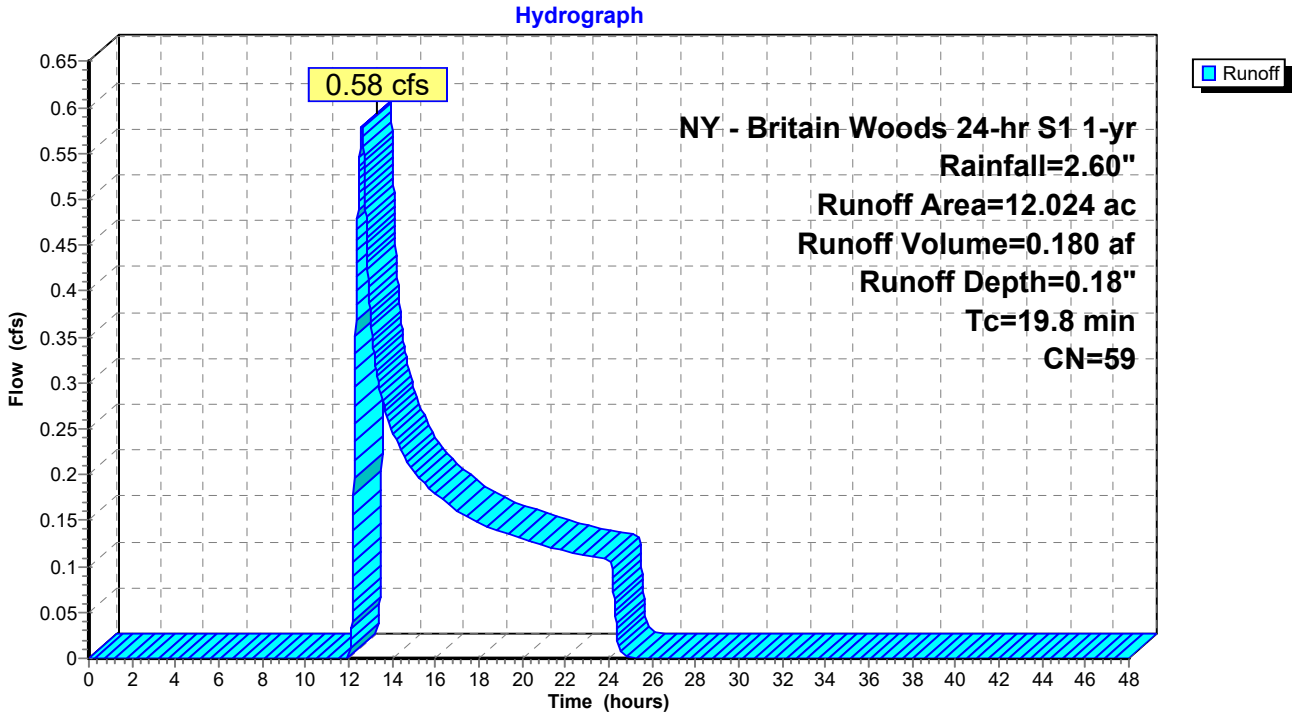
Pond 13P: Design Point C Inflow=0.82 cfs 1.194 af
Primary=0.82 cfs 1.194 af

Total Runoff Area = 130.794 ac Runoff Volume = 5.373 af Average Runoff Depth = 0.49"
87.76% Pervious = 114.784 ac 12.24% Impervious = 16.010 ac

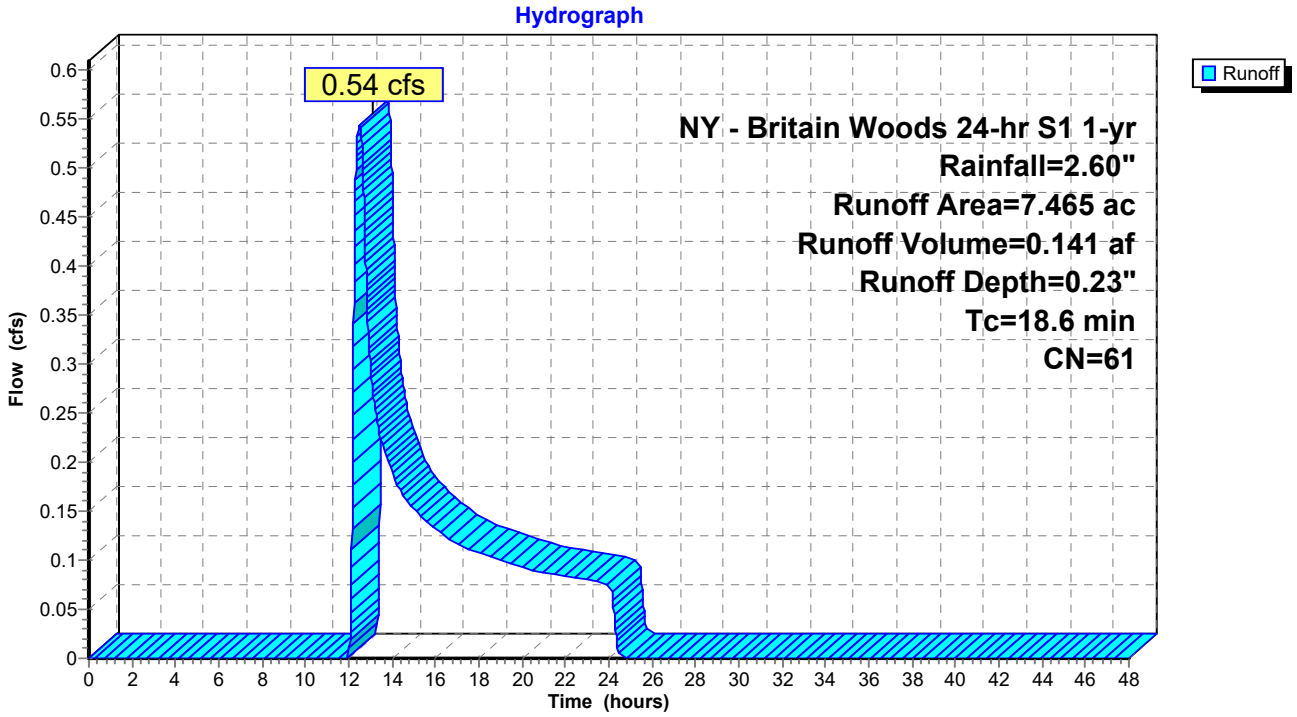
Subcatchment EX-A1: Existing A1



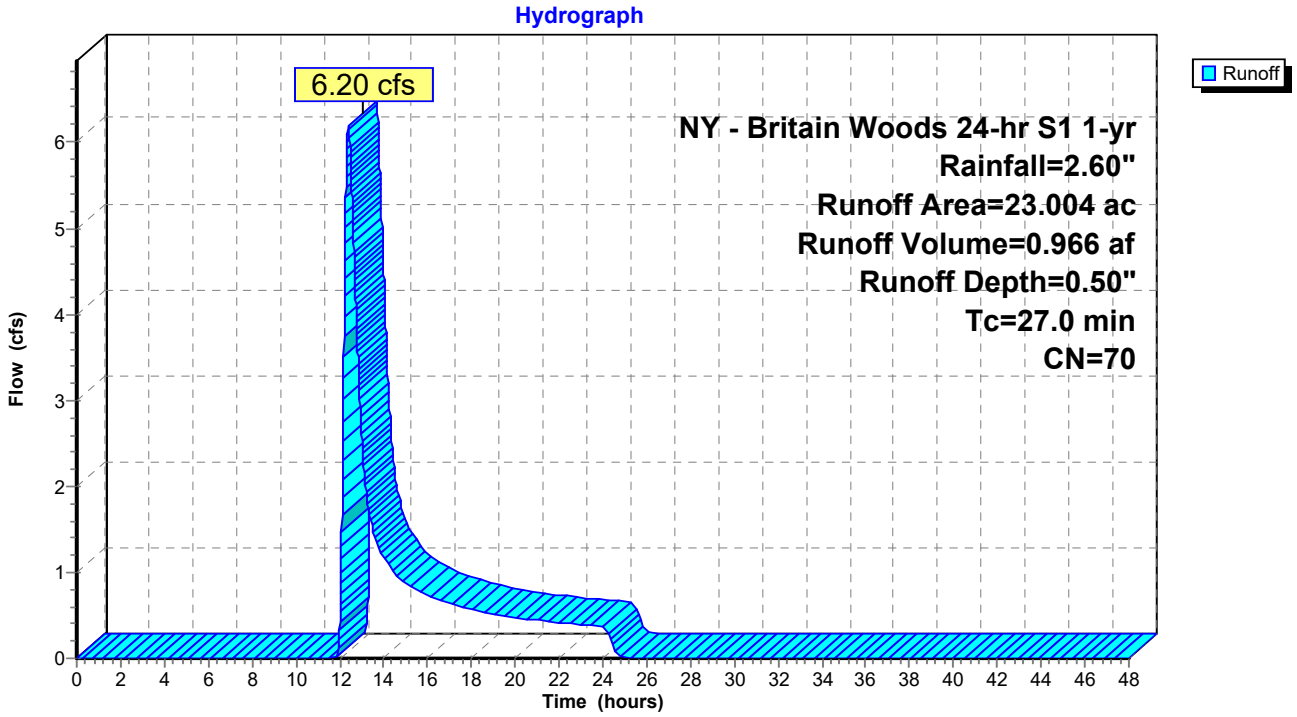
Subcatchment EX-A2: Existing A2



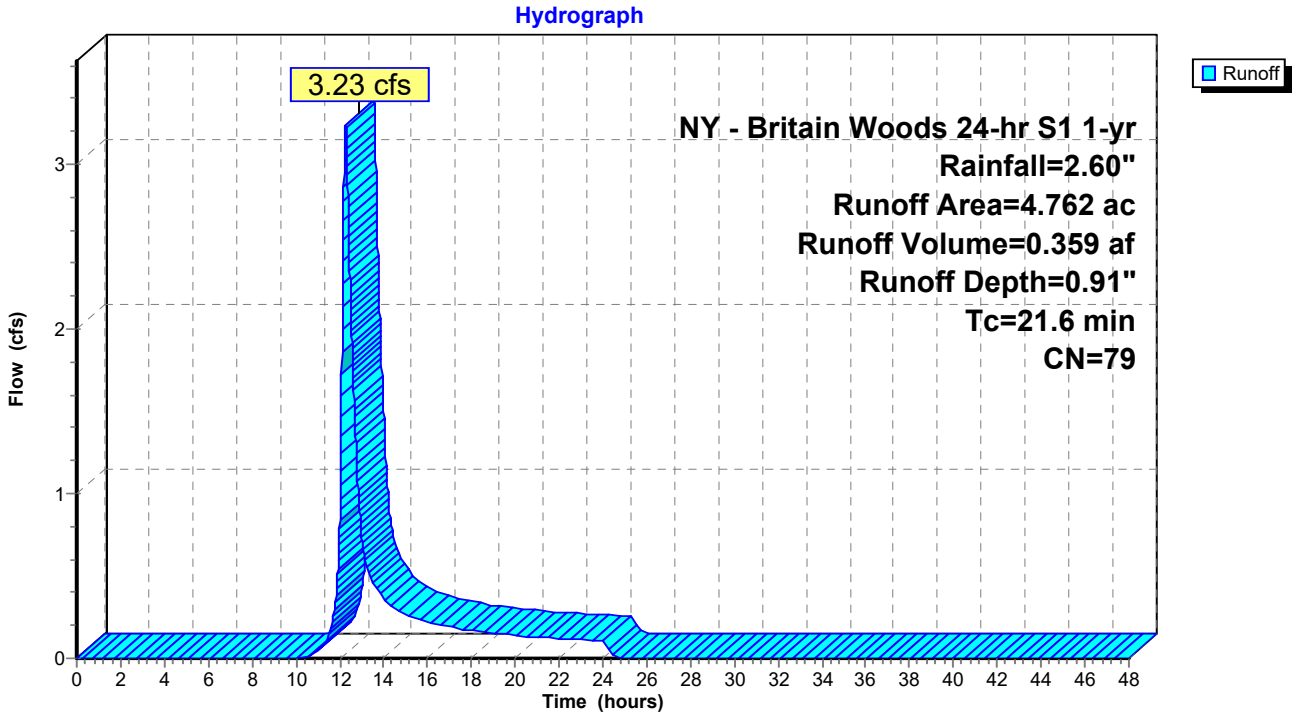
Subcatchment EX-B: Existing B



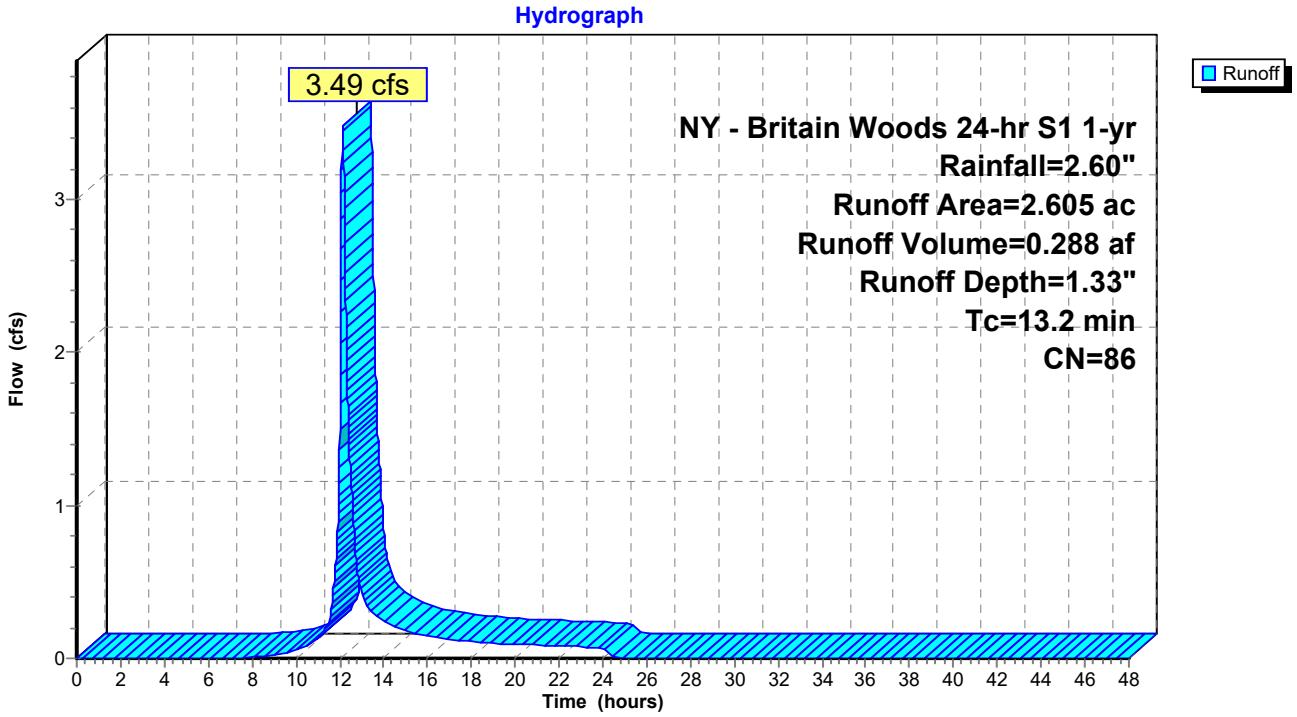
Subcatchment EX-C: Existing C



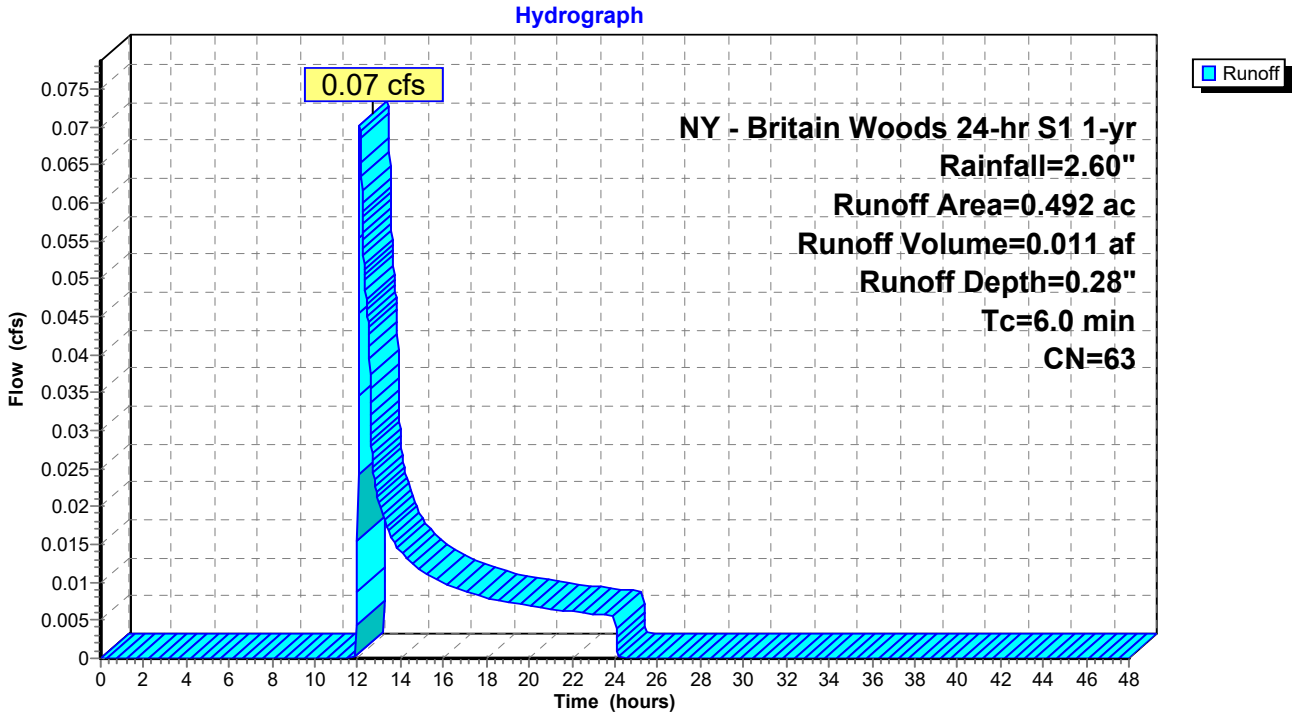
Subcatchment PR-A1-A: Proposed A1-A



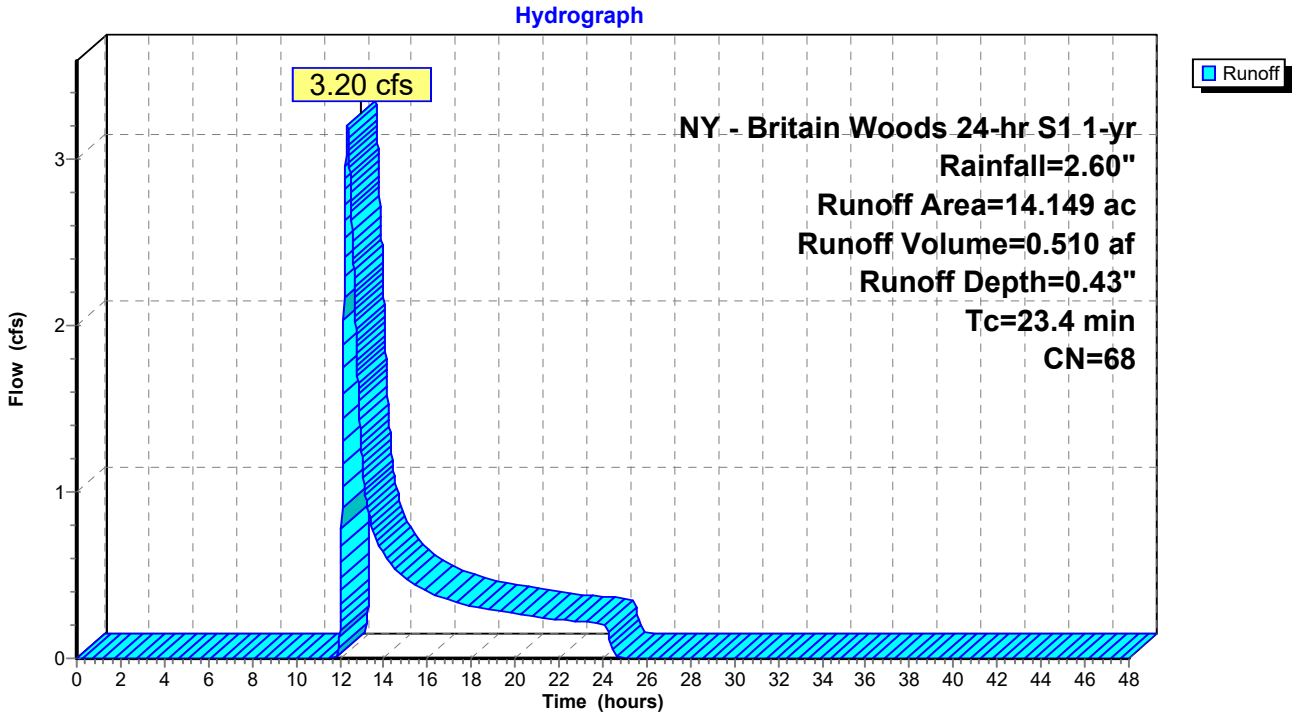
Subcatchment PR-A1-B: Proposed A1-B



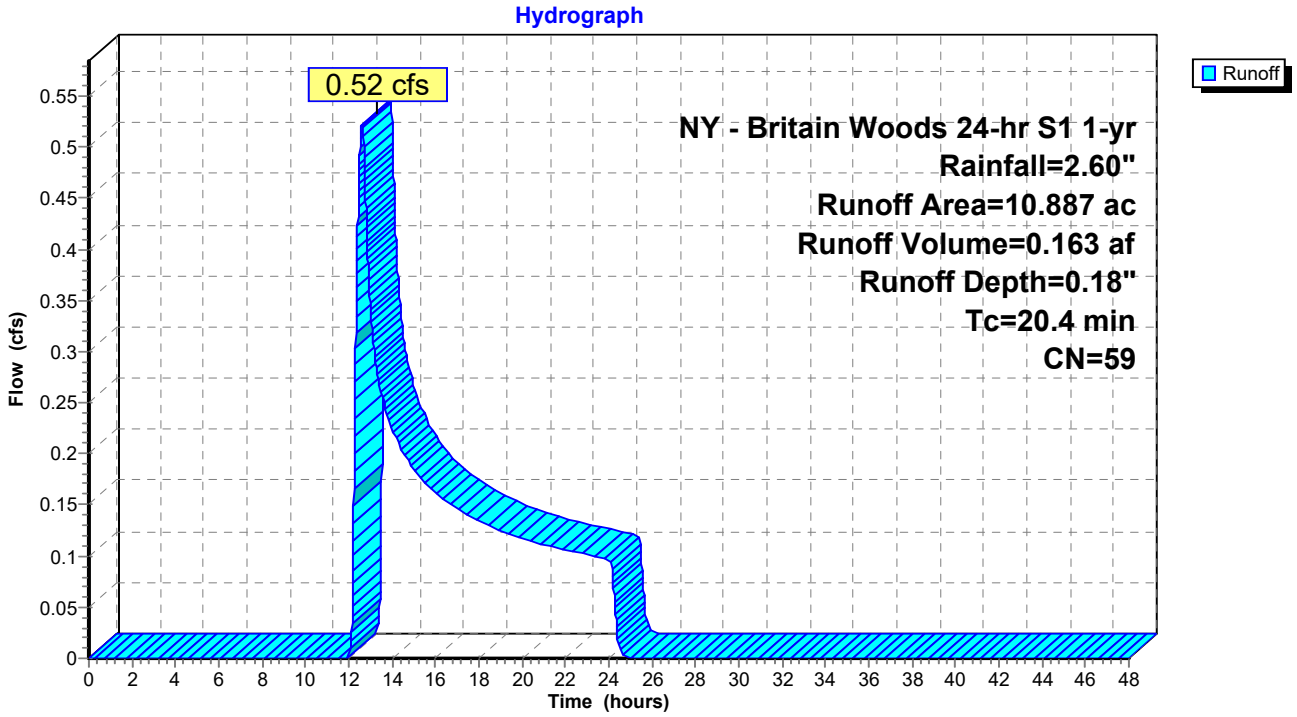
Subcatchment PR-A1-C: Proposed A1-C



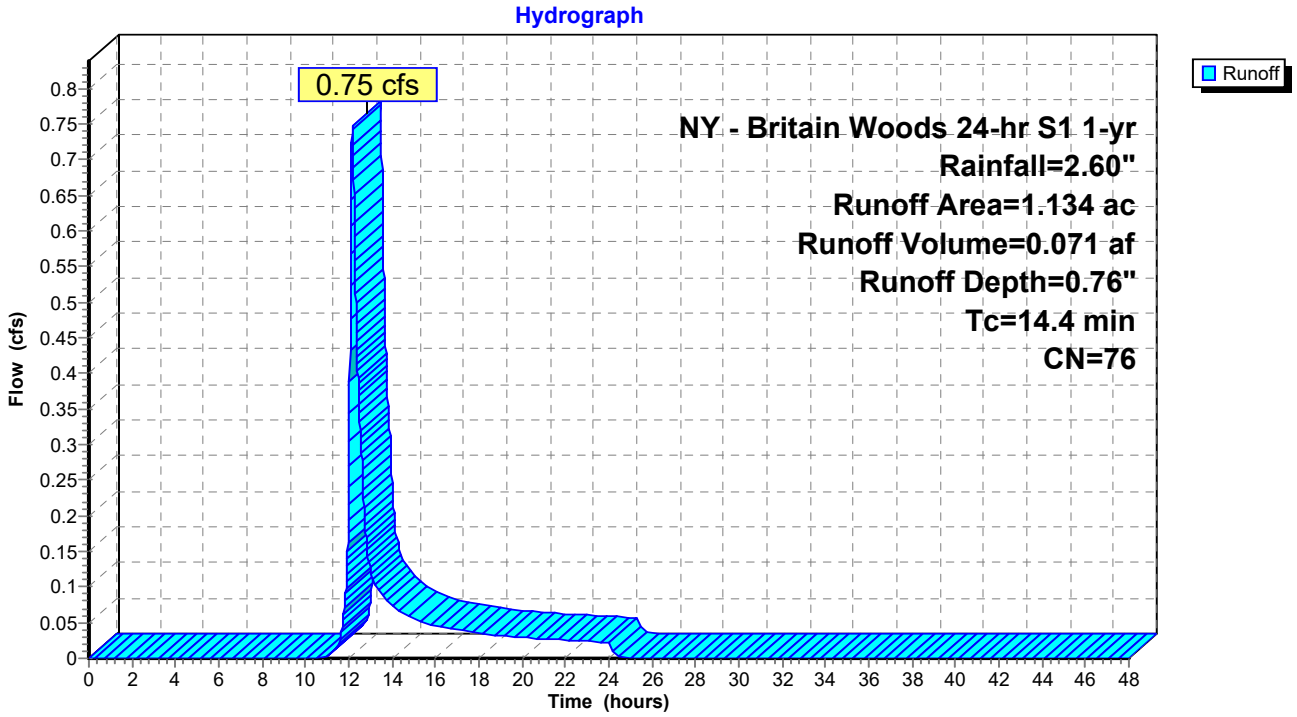
Subcatchment PR-A2-A: Proposed A2-A



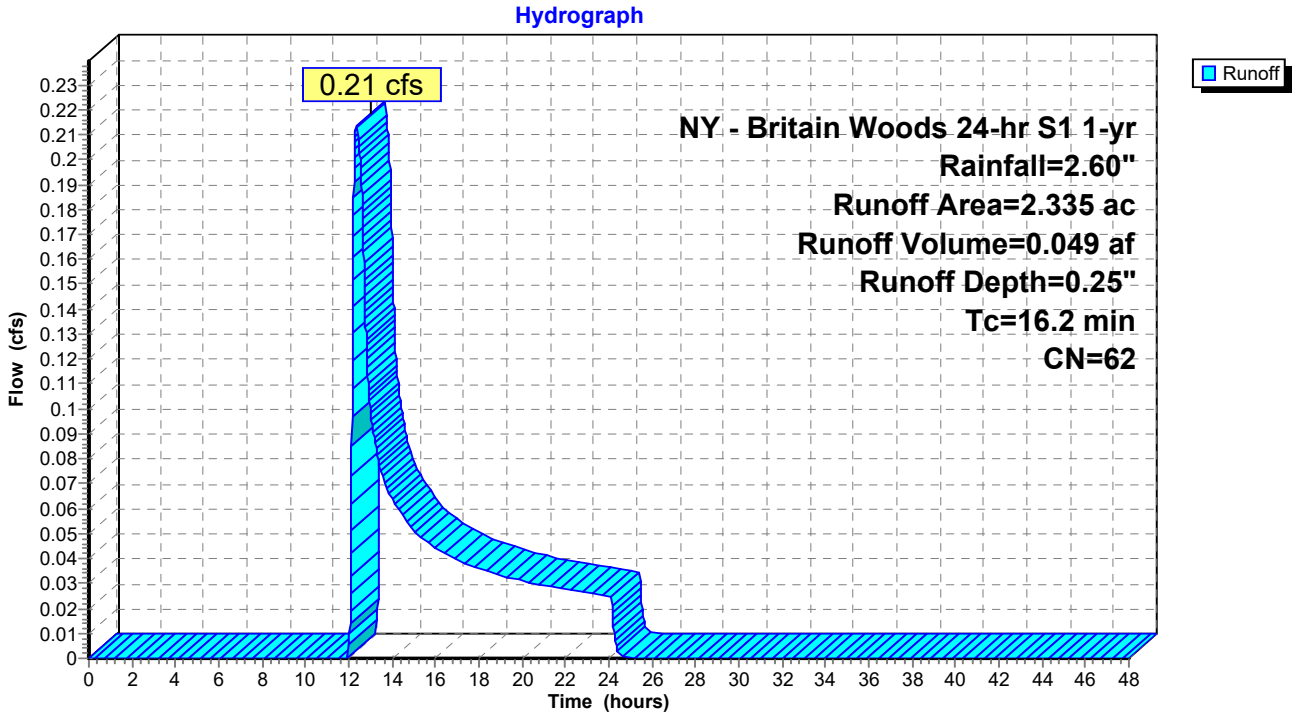
Subcatchment PR-A2-B: Proposed A2-B



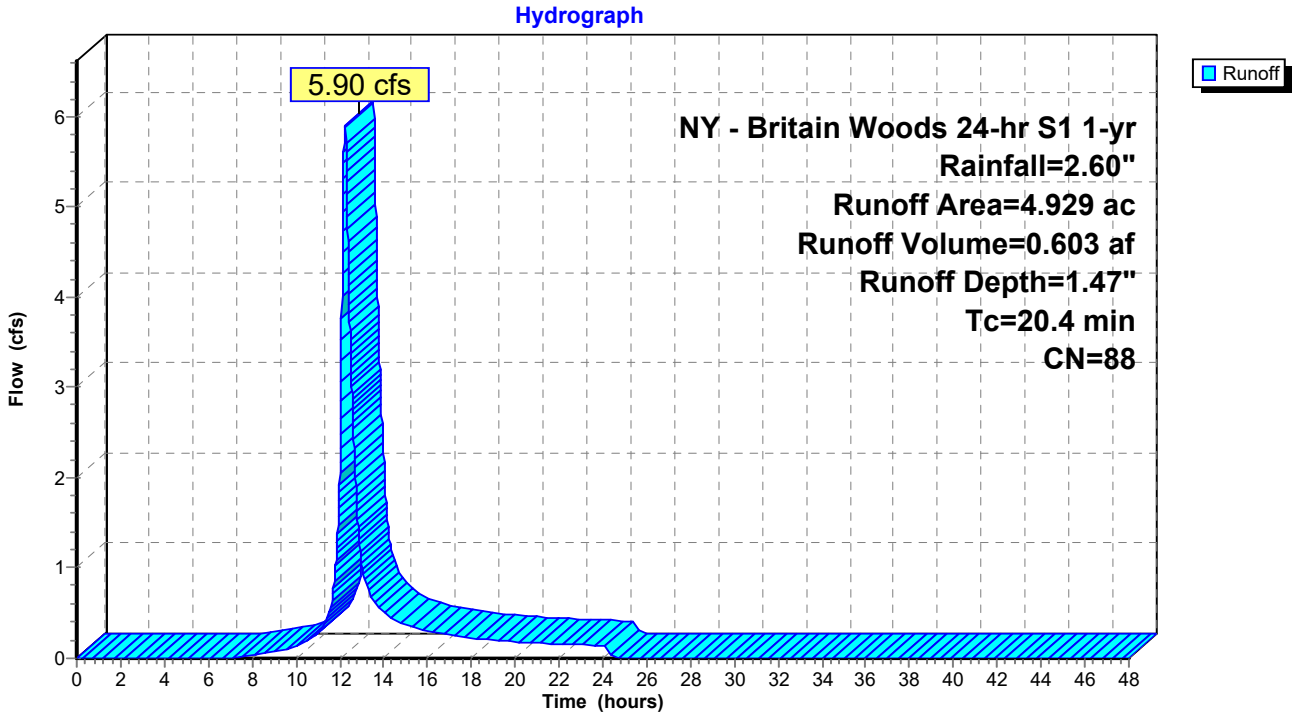
Subcatchment PR-B1: Proposed B1



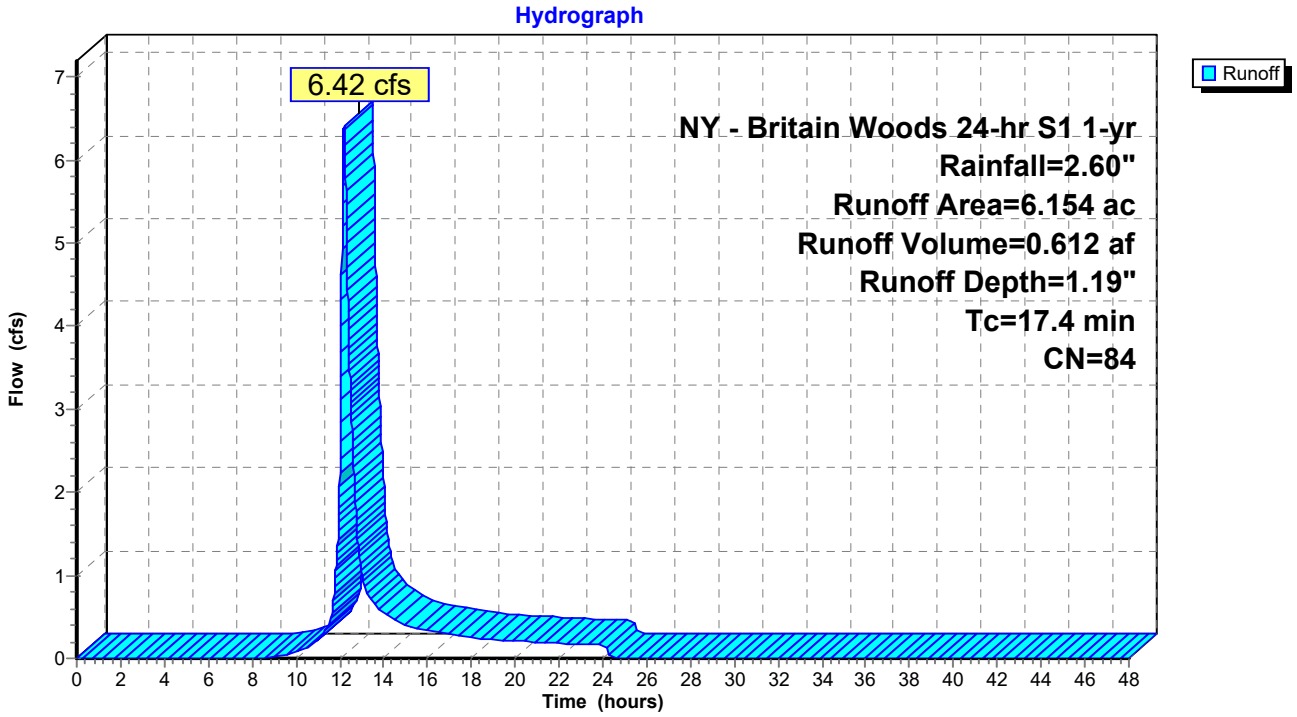
Subcatchment PR-B2: Proposed B2



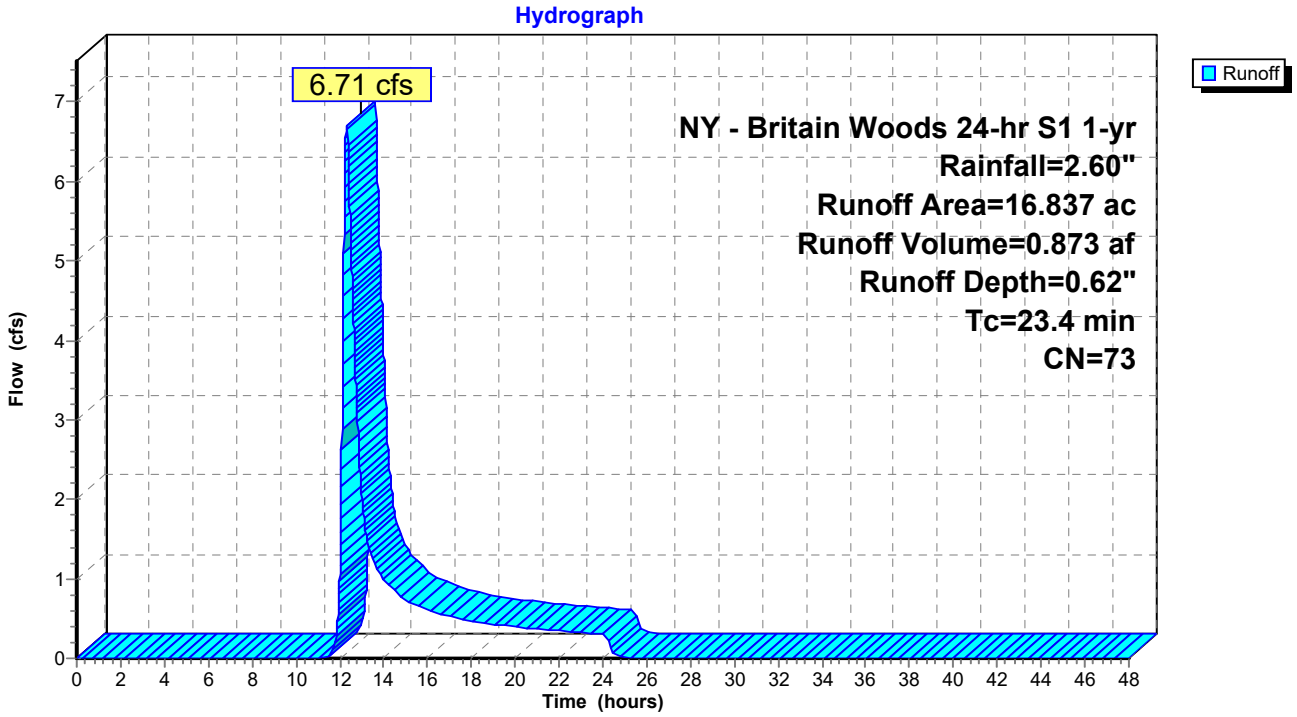
Subcatchment PR-C1-A: Proposed C1-A



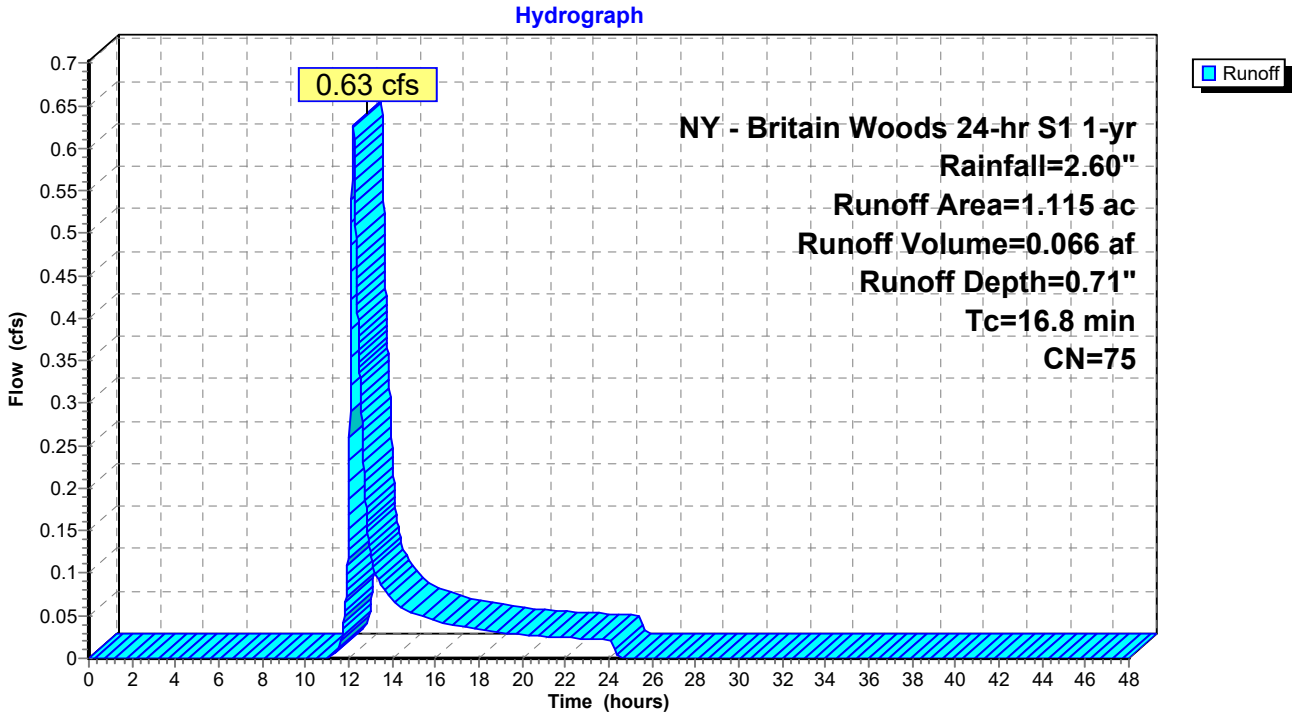
Subcatchment PR-C1-B: Proposed C1-B



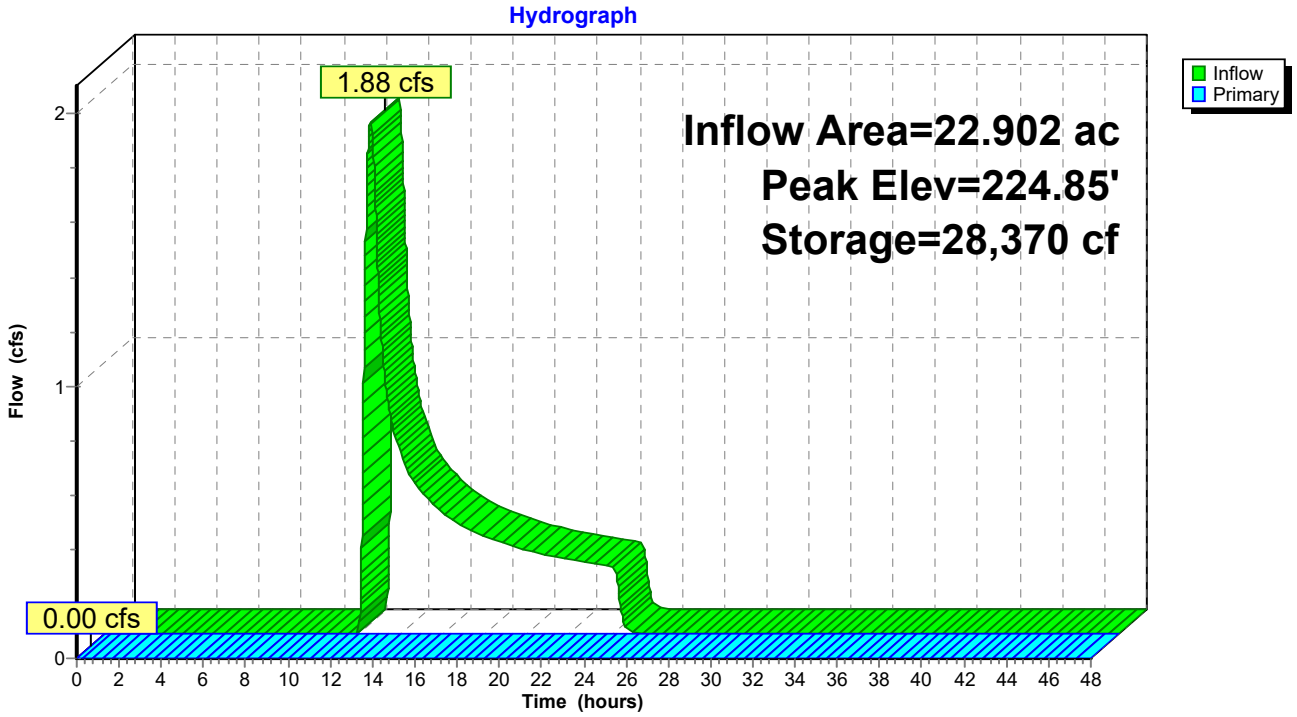
Subcatchment PR-C1-C: Proposed C1-C



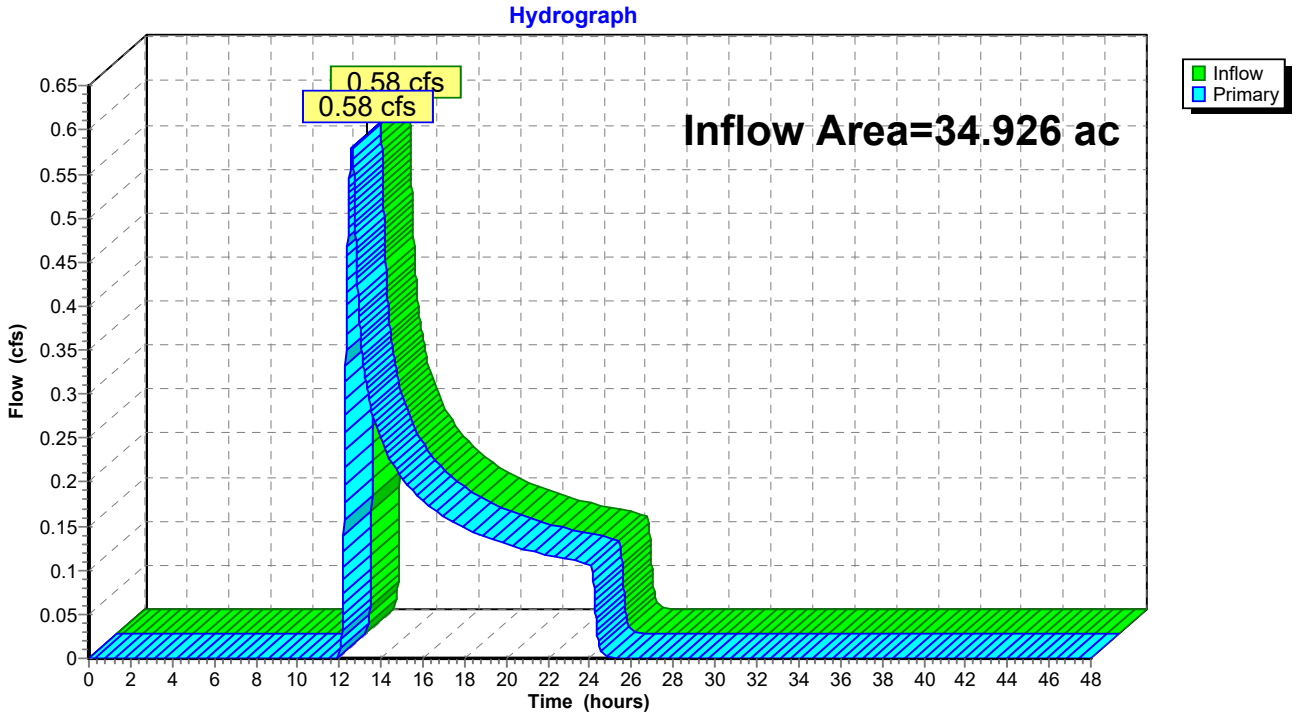
Subcatchment PR-C2: Proposed C2



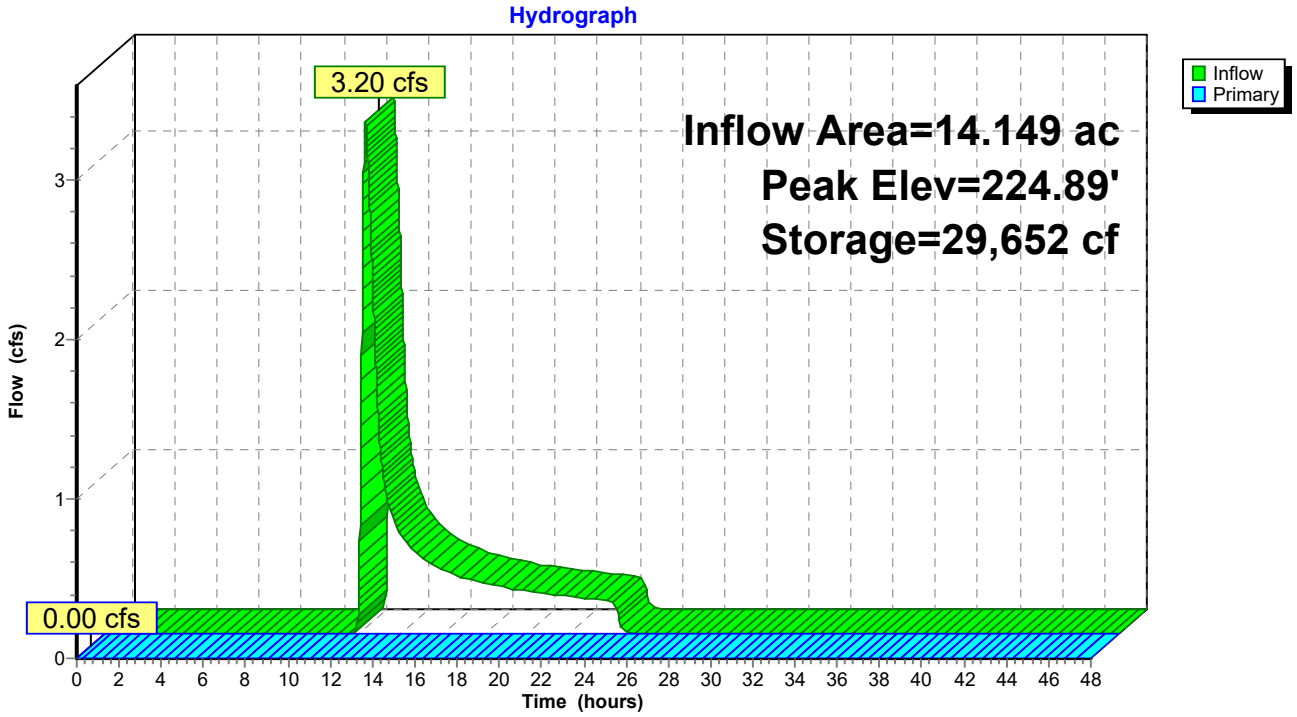
Pond 1P: Existing Wetland (EX Condition)



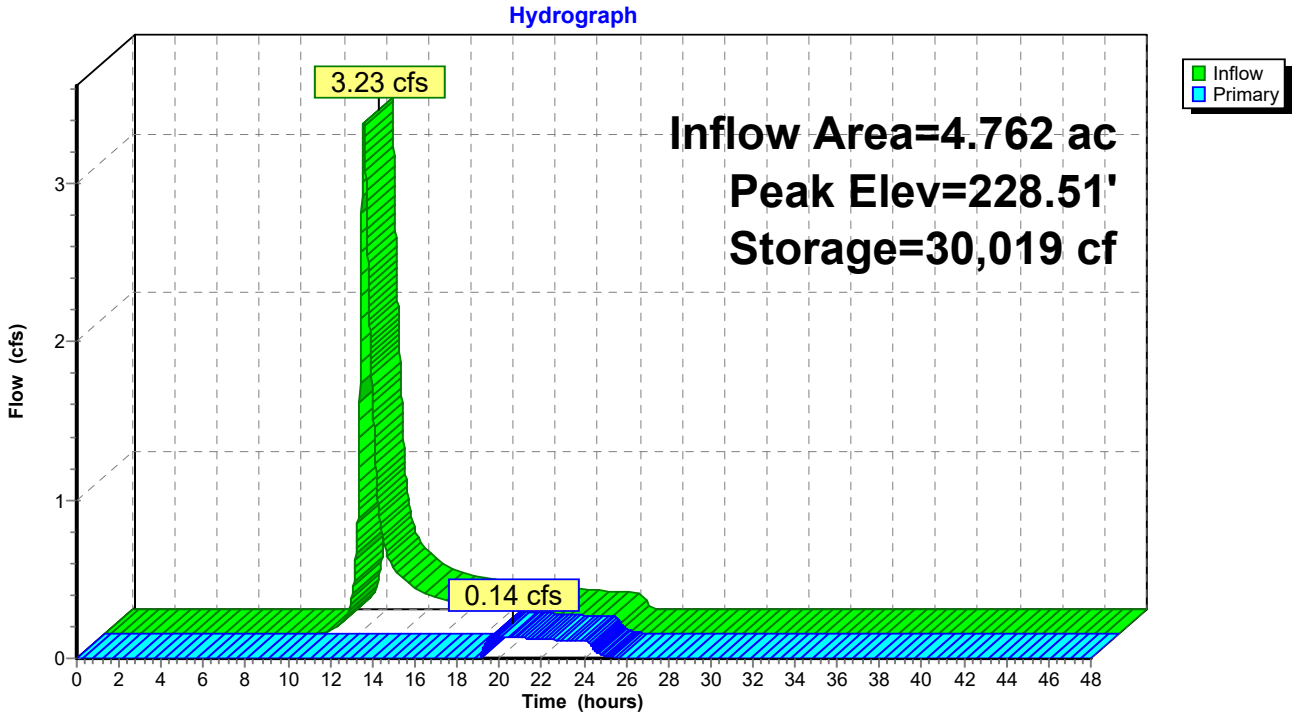
Pond 2P: Existing A



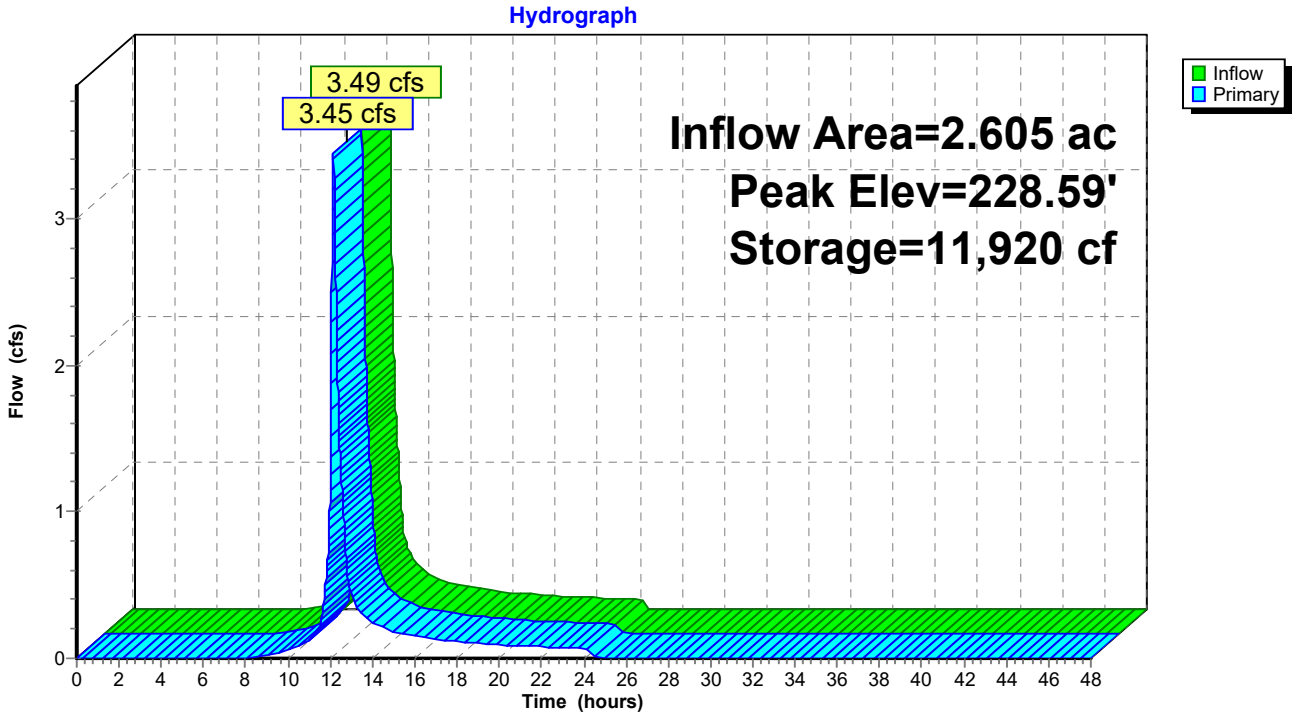
Pond 3P: Existing Wetland (PR Condition)



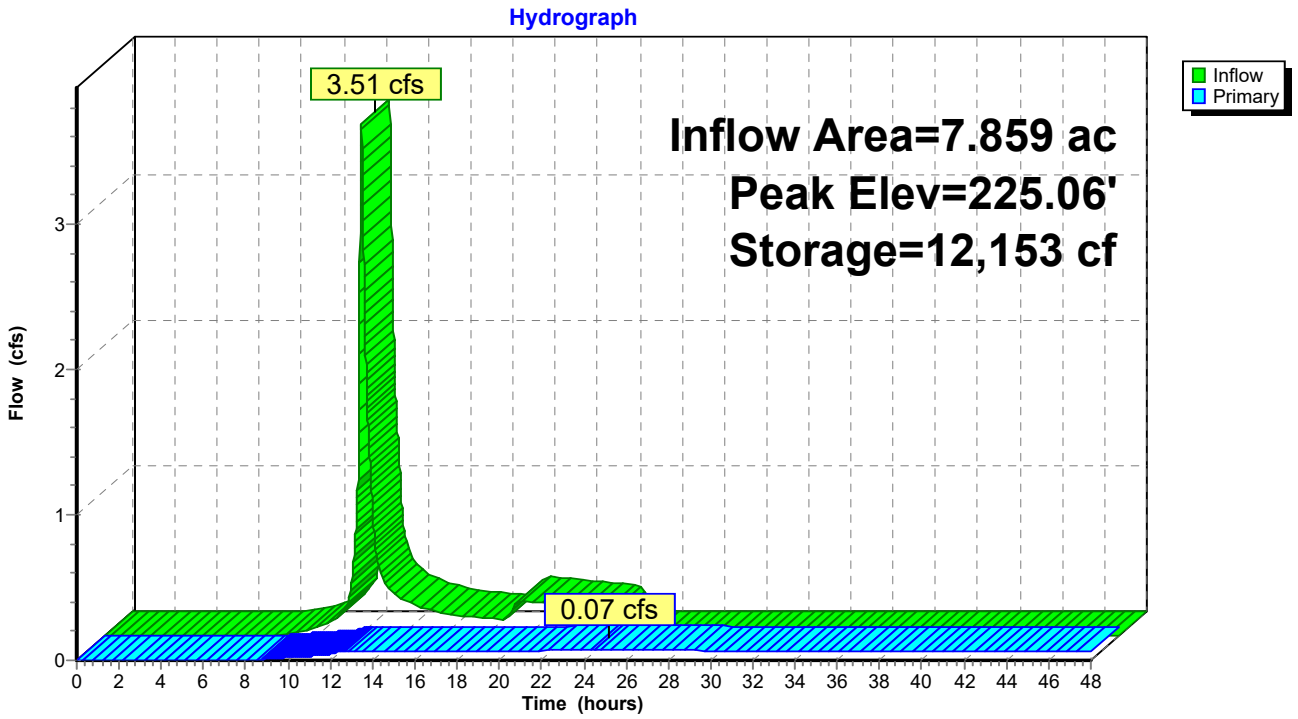
Pond 4P: Forebay & Bio A1-A



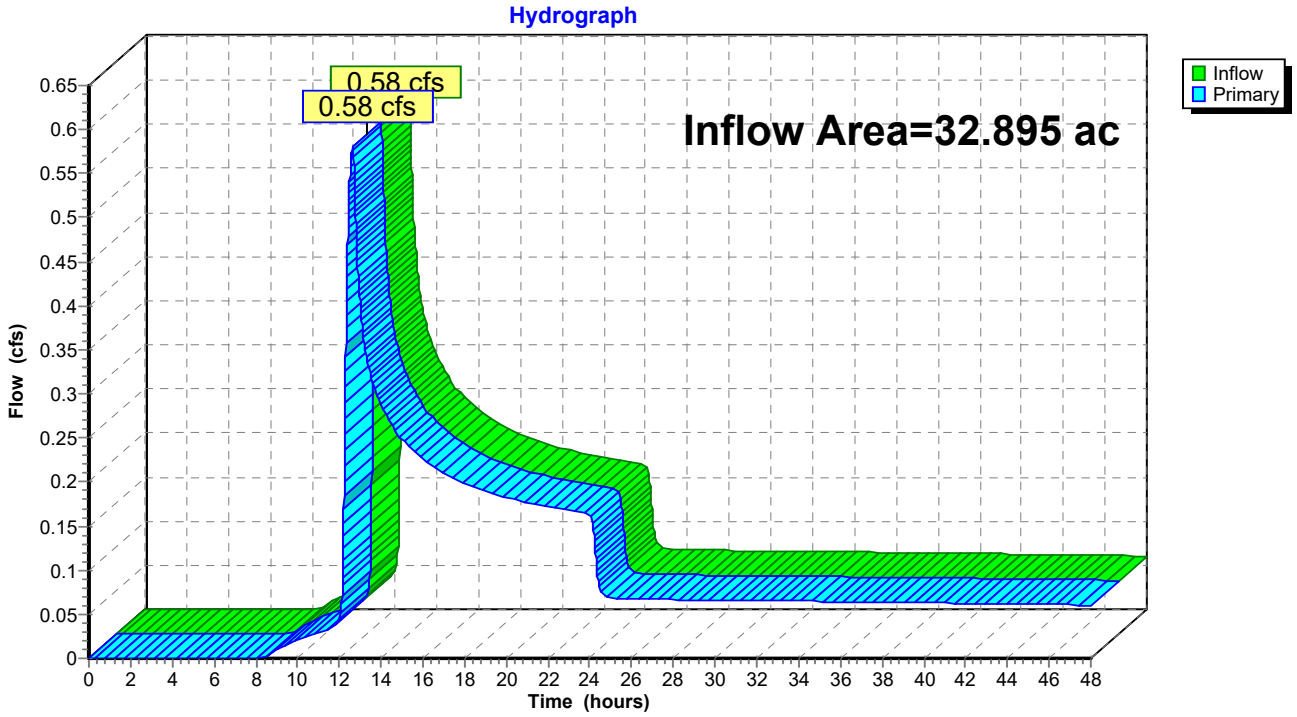
Pond 5P: Forebay A1-B



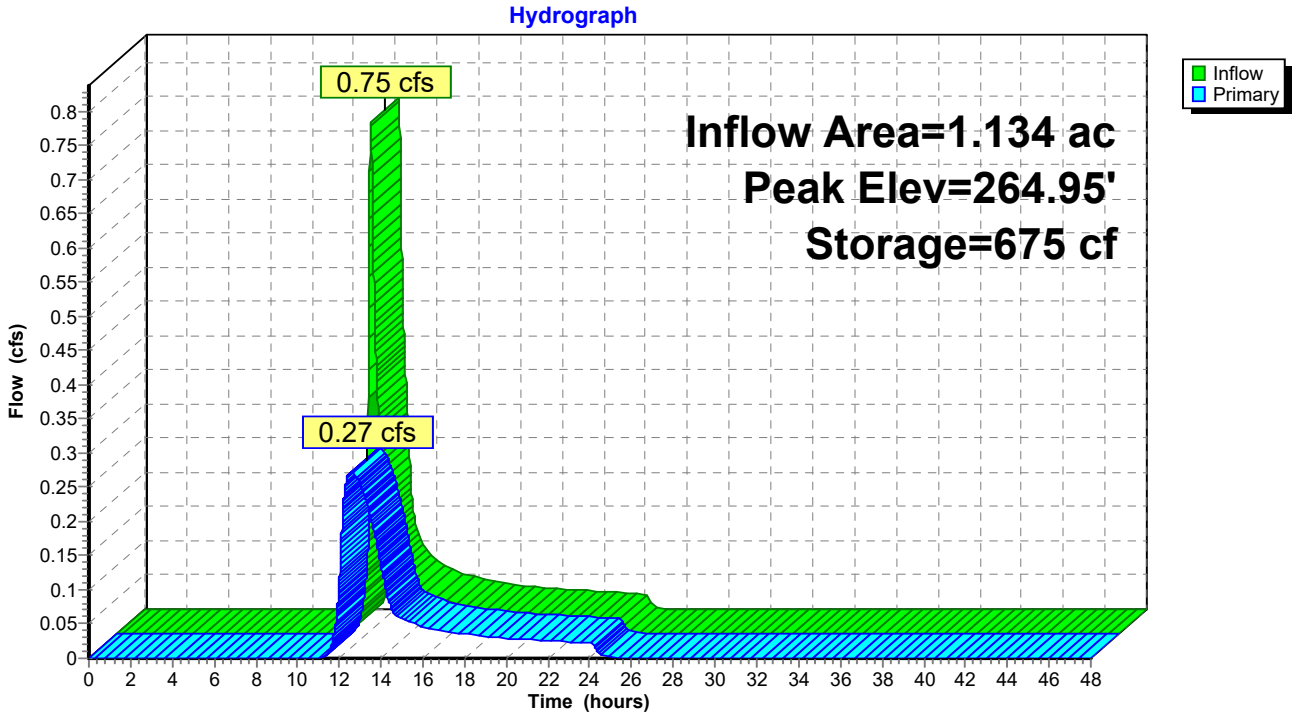
Pond 6P: Detention Basin A1



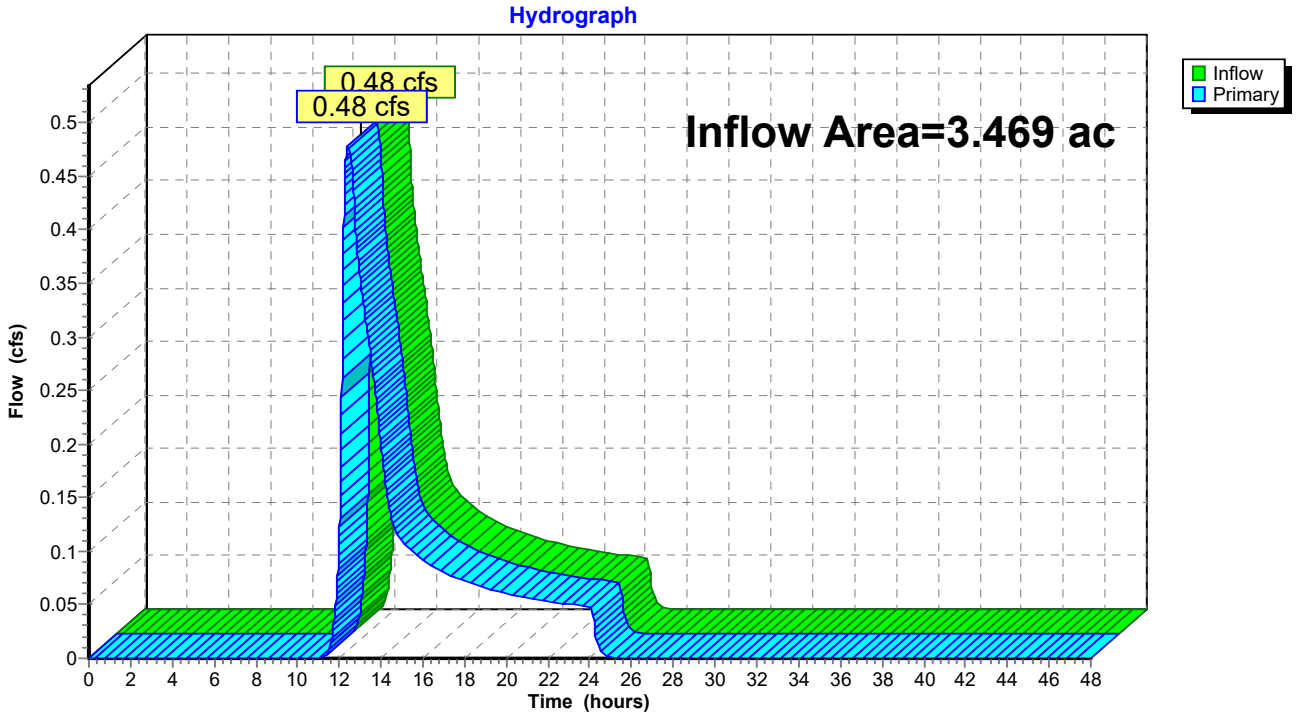
Pond 7P: Design Point A



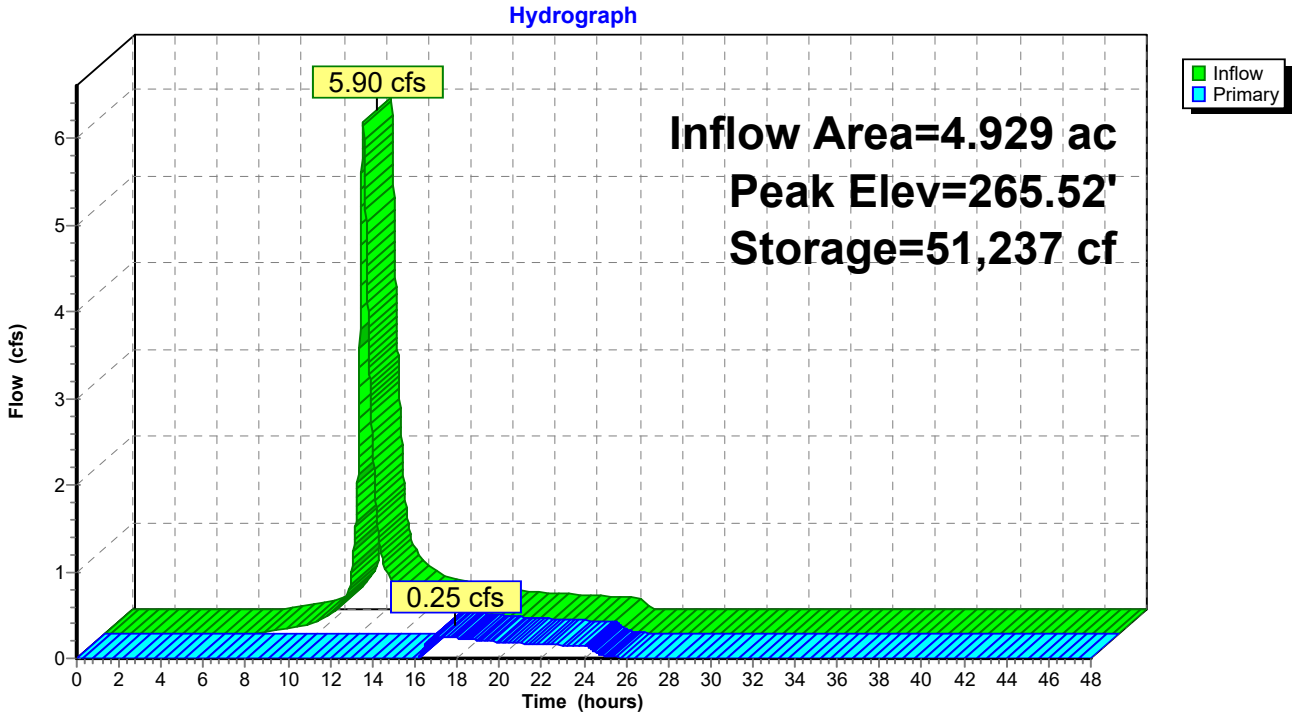
Pond 8P: Detention Basin B1



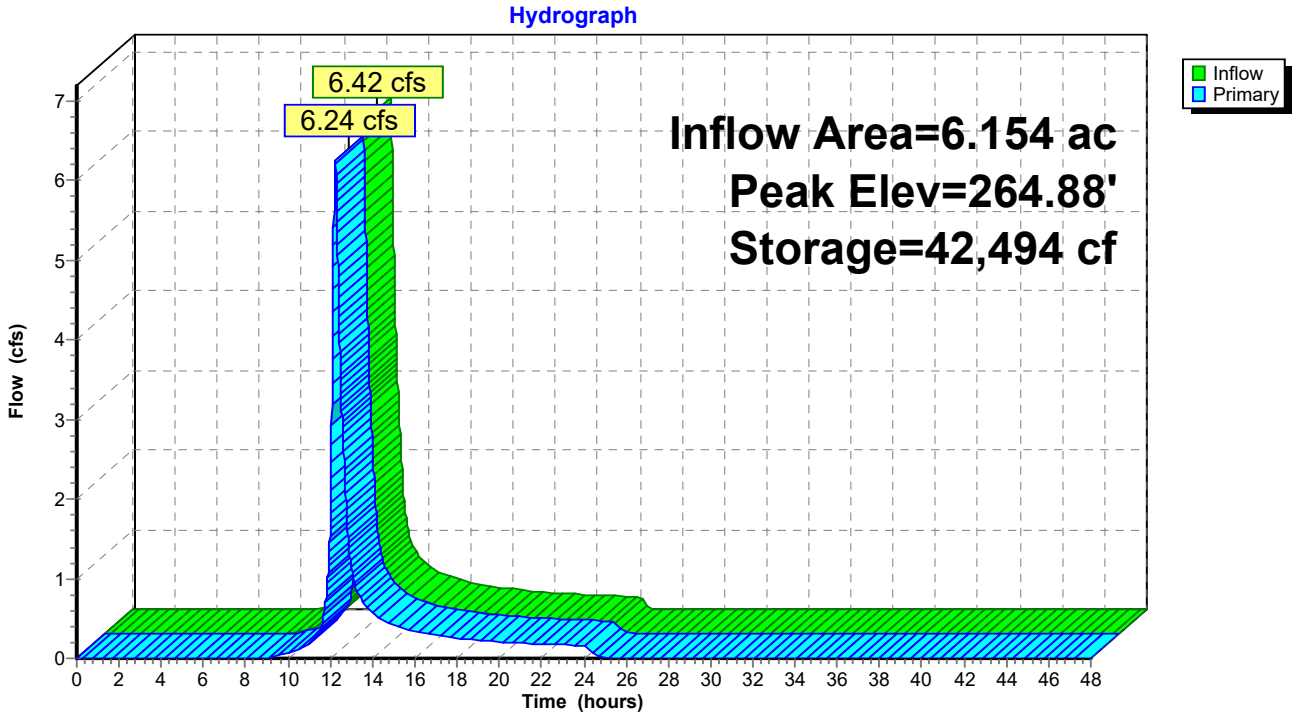
Pond 9P: Design Point B



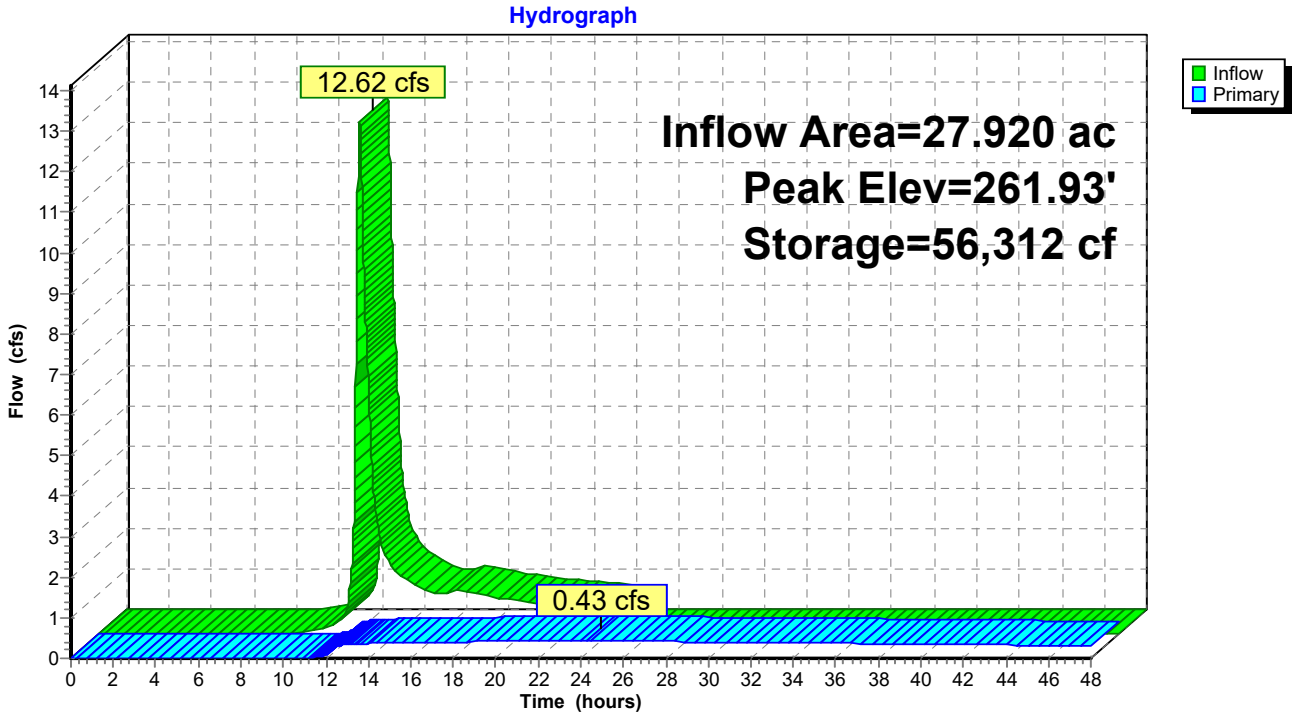
Pond 10P: Forebay & Bio C1-A



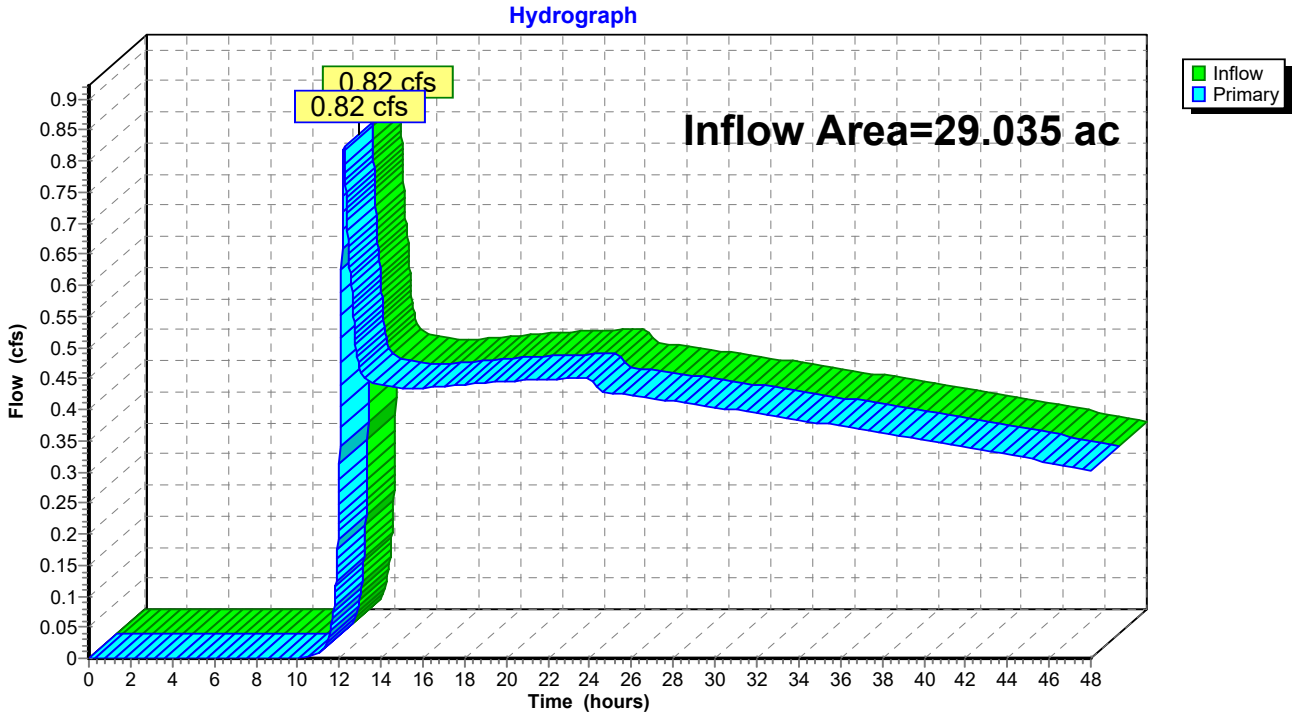
Pond 11P: Forebay C1-B



Pond 12P: Detention Basin C1



Pond 13P: Design Point C



APPENDIX 8

10-YEAR DESIGN STORM HYDROGRAPHS

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 5
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX-A1: Existing A1 Runoff Area=22.902 ac 8.12% Impervious Runoff Depth=1.26"
Tc=26.4 min CN=62 Runoff=16.89 cfs 2.399 af

Subcatchment EX-A2: Existing A2 Runoff Area=12.024 ac 1.27% Impervious Runoff Depth=1.07"
Tc=19.8 min CN=59 Runoff=8.08 cfs 1.070 af

Subcatchment EX-B: Existing B Runoff Area=7.465 ac 0.00% Impervious Runoff Depth=1.19"
Tc=18.6 min CN=61 Runoff=6.03 cfs 0.742 af

Subcatchment EX-C: Existing C Runoff Area=23.004 ac 0.93% Impervious Runoff Depth=1.82"
Tc=27.0 min CN=70 Runoff=26.48 cfs 3.483 af

Subcatchment PR-A1-A: Proposed A1-A Runoff Area=4.762 ac 47.67% Impervious Runoff Depth=2.55"
Tc=21.6 min CN=79 Runoff=8.92 cfs 1.010 af

Subcatchment PR-A1-B: Proposed A1-B Runoff Area=2.605 ac 63.57% Impervious Runoff Depth=3.19"
Tc=13.2 min CN=86 Runoff=7.63 cfs 0.692 af

Subcatchment PR-A1-C: Proposed A1-C Runoff Area=0.492 ac 0.00% Impervious Runoff Depth=1.32"
Tc=6.0 min CN=63 Runoff=0.73 cfs 0.054 af

Subcatchment PR-A2-A: Proposed A2-A Runoff Area=14.149 ac 15.15% Impervious Runoff Depth=1.67"
Tc=23.4 min CN=68 Runoff=15.84 cfs 1.968 af

Subcatchment PR-A2-B: Proposed A2-B Runoff Area=10.887 ac 2.63% Impervious Runoff Depth=1.07"
Tc=20.4 min CN=59 Runoff=7.21 cfs 0.969 af

Subcatchment PR-B1: Proposed B1 Runoff Area=1.134 ac 0.00% Impervious Runoff Depth=2.29"
Tc=14.4 min CN=76 Runoff=2.29 cfs 0.216 af

Subcatchment PR-B2: Proposed B2 Runoff Area=2.335 ac 0.00% Impervious Runoff Depth=1.26"
Tc=16.2 min CN=62 Runoff=2.15 cfs 0.245 af

Subcatchment PR-C1-A: Proposed C1-A Runoff Area=4.929 ac 70.16% Impervious Runoff Depth=3.38"
Tc=20.4 min CN=88 Runoff=12.46 cfs 1.390 af

Subcatchment PR-C1-B: Proposed C1-B Runoff Area=6.154 ac 61.08% Impervious Runoff Depth=3.00"
Tc=17.4 min CN=84 Runoff=15.00 cfs 1.537 af

Subcatchment PR-C1-C: Proposed C1-C Runoff Area=16.837 ac 0.26% Impervious Runoff Depth=2.05"
Tc=23.4 min CN=73 Runoff=23.88 cfs 2.873 af

Subcatchment PR-C2: Proposed C2 Runoff Area=1.115 ac 15.16% Impervious Runoff Depth=2.21"
Tc=16.8 min CN=75 Runoff=2.01 cfs 0.205 af

Pond 1P: Existing Wetland (EX Condition) Peak Elev=225.55' Storage=58,933 cf Inflow=16.89 cfs 2.399 af
Outflow=2.78 cfs 1.278 af

Pond 2P: Existing A Inflow=8.08 cfs 2.348 af
Primary=8.08 cfs 2.348 af

Pond 3P: Existing Wetland (PR Condition) Peak Elev=225.22' Storage=42,136 cf Inflow=15.84 cfs 1.968 af
Outflow=4.66 cfs 1.369 af

Pond 4P: Forebay & Bio A1-A Peak Elev=228.63' Storage=31,764 cf Inflow=8.92 cfs 1.010 af
Outflow=6.21 cfs 0.705 af

Pond 5P: Forebay A1-B Peak Elev=228.65' Storage=12,131 cf Inflow=7.63 cfs 0.692 af
Outflow=7.57 cfs 0.692 af

Pond 6P: Detention Basin A1 Peak Elev=228.56' Storage=41,603 cf Inflow=9.60 cfs 1.451 af
Outflow=0.83 cfs 0.661 af

Pond 7P: Design Point A Inflow=7.35 cfs 3.000 af
Primary=7.35 cfs 3.000 af

Pond 8P: Detention Basin B1 Peak Elev=266.09' Storage=2,077 cf Inflow=2.29 cfs 0.216 af
Outflow=1.55 cfs 0.216 af

Pond 9P: Design Point B Inflow=3.38 cfs 0.461 af
Primary=3.38 cfs 0.461 af

Pond 10P: Forebay & Bio C1-A Peak Elev=265.66' Storage=54,551 cf Inflow=12.46 cfs 1.390 af
Outflow=8.51 cfs 0.916 af

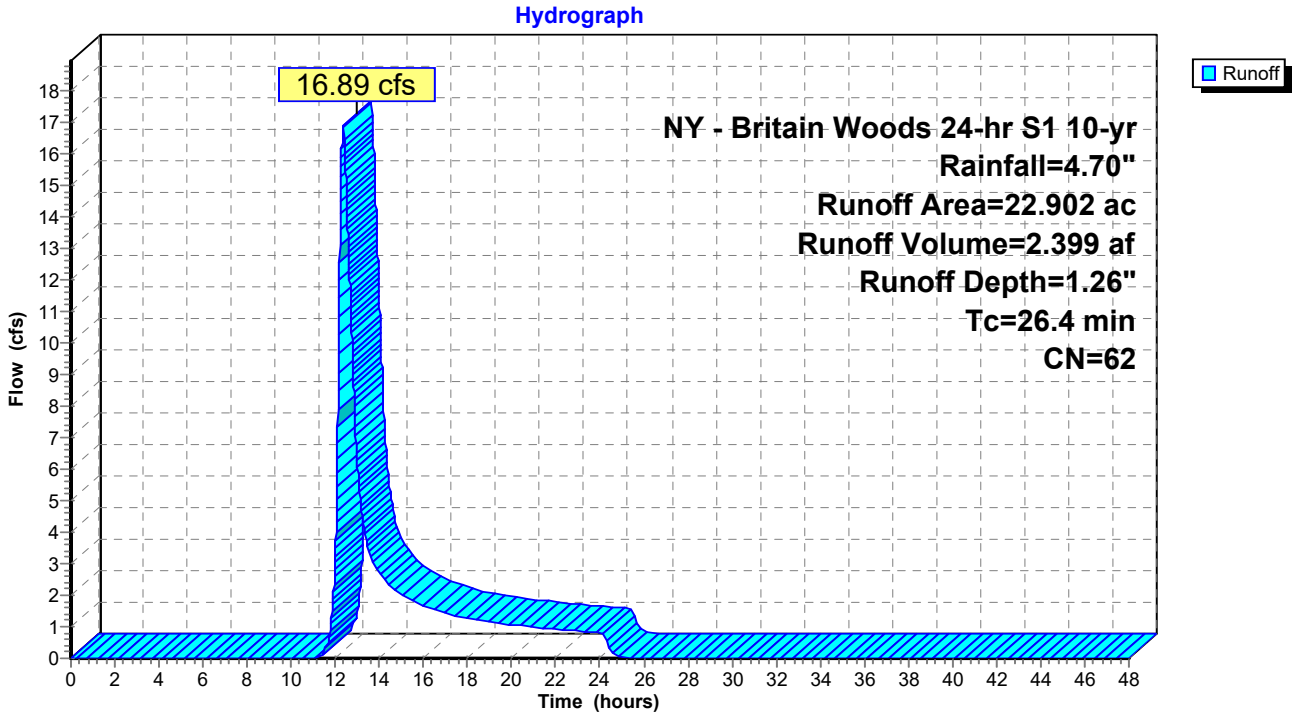
Pond 11P: Forebay C1-B Peak Elev=264.98' Storage=43,373 cf Inflow=15.00 cfs 1.537 af
Outflow=14.77 cfs 1.537 af

Pond 12P: Detention Basin C1 Peak Elev=263.53' Storage=97,064 cf Inflow=42.20 cfs 5.326 af
Outflow=18.40 cfs 4.368 af

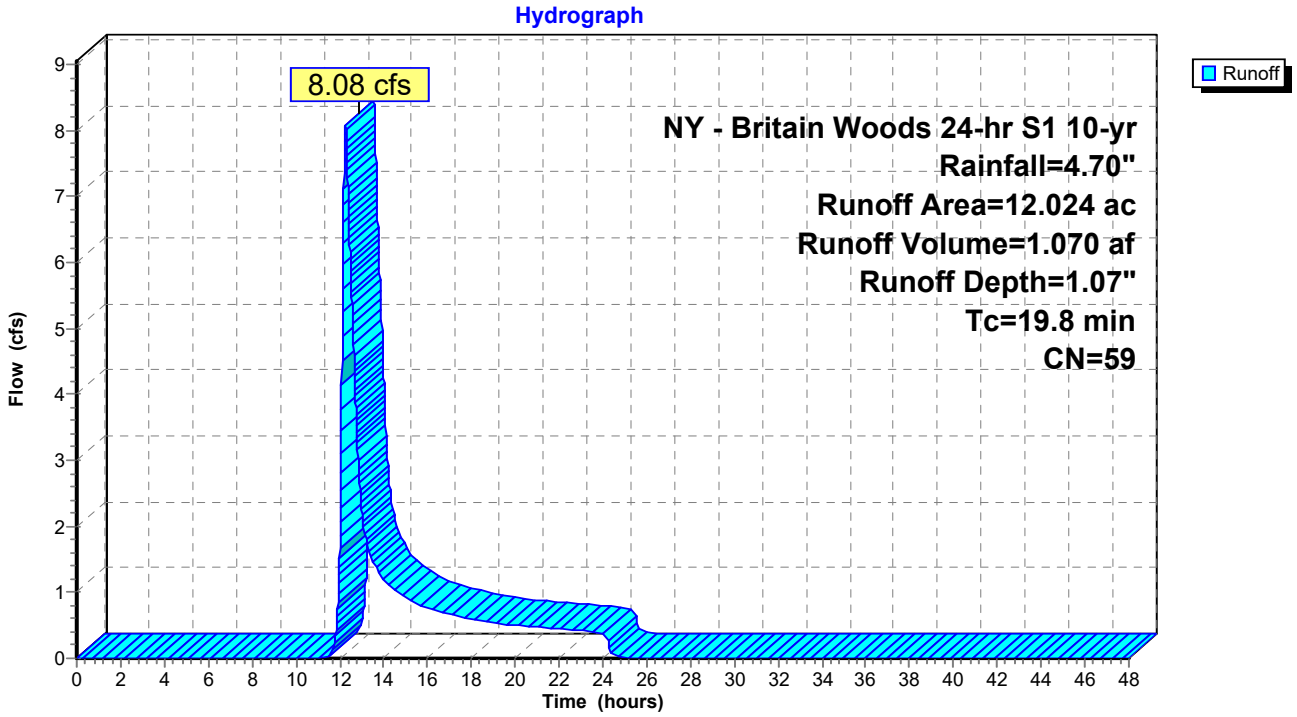
Pond 13P: Design Point C Inflow=18.91 cfs 4.573 af
Primary=18.91 cfs 4.573 af

Total Runoff Area = 130.794 ac Runoff Volume = 18.854 af Average Runoff Depth = 1.73"
87.76% Pervious = 114.784 ac 12.24% Impervious = 16.010 ac

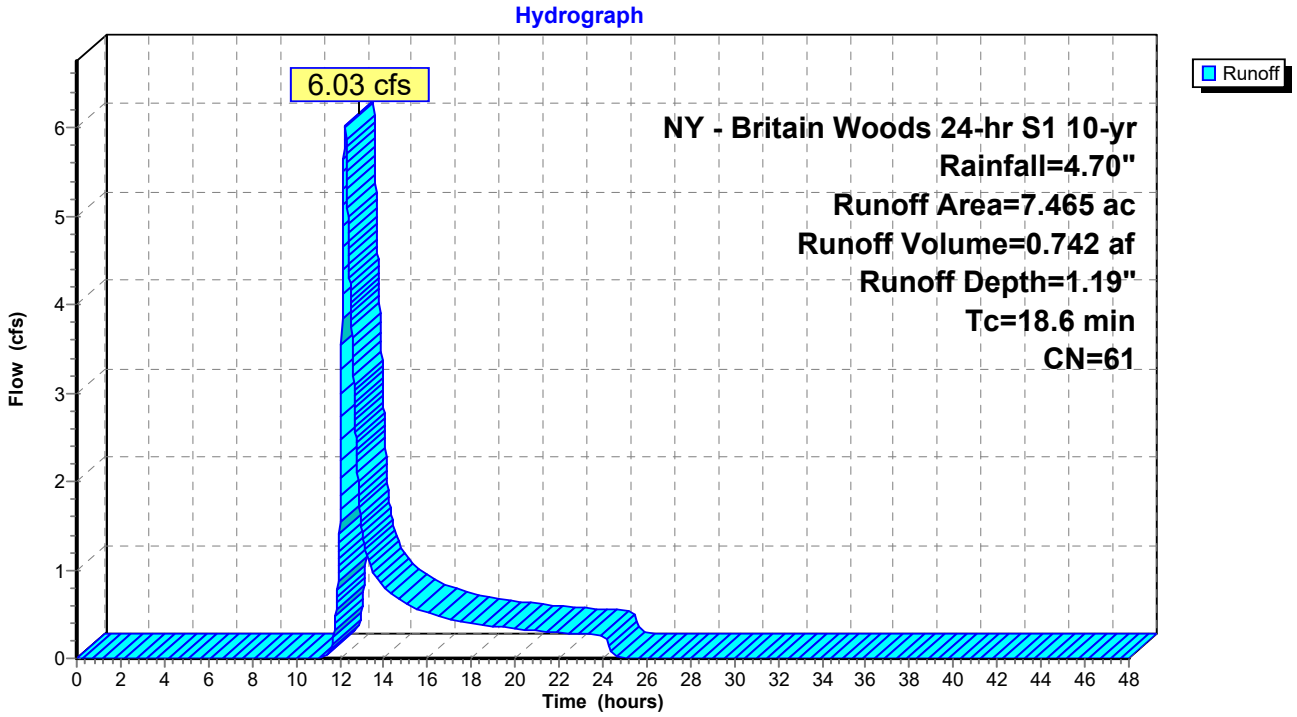
Subcatchment EX-A1: Existing A1



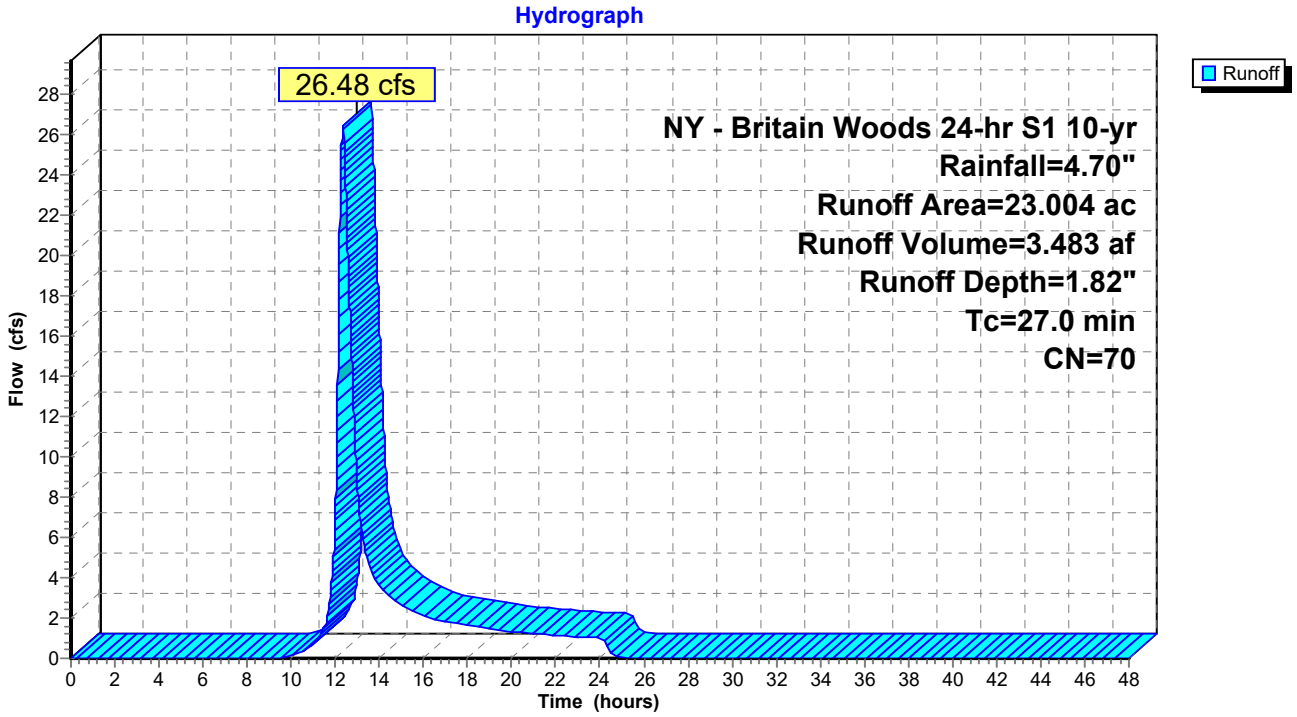
Subcatchment EX-A2: Existing A2



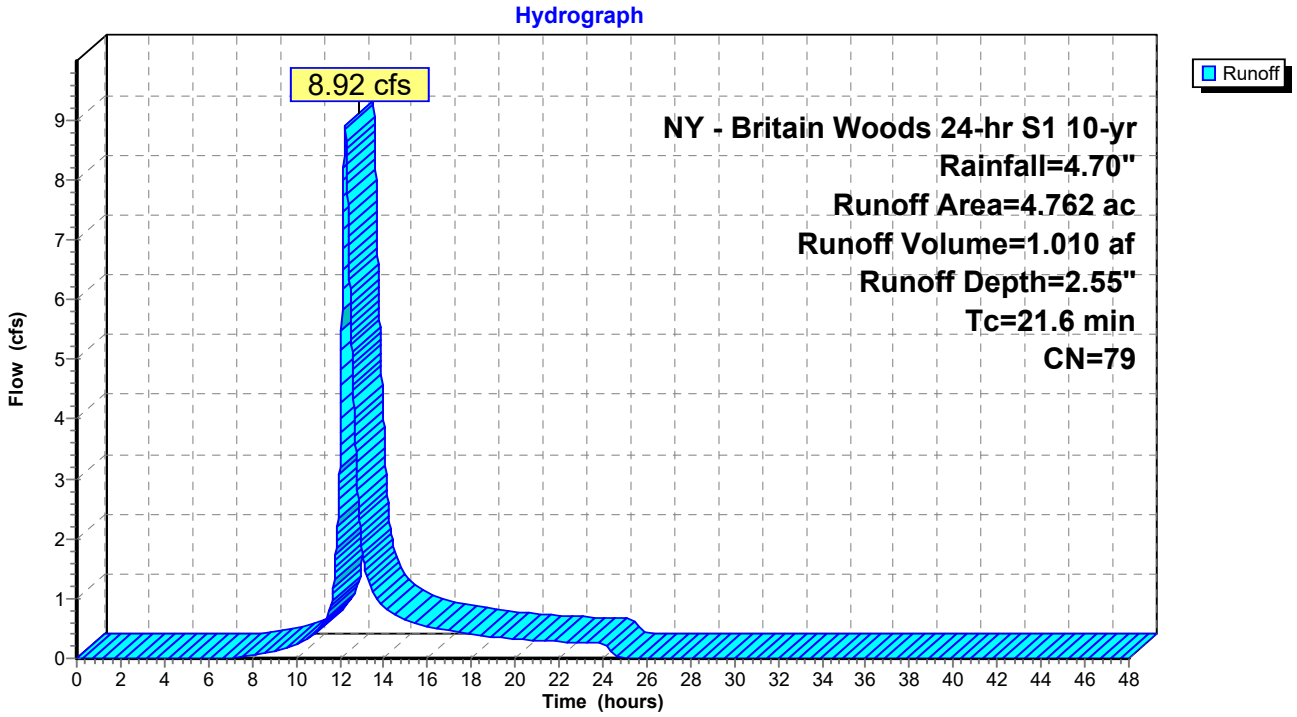
Subcatchment EX-B: Existing B



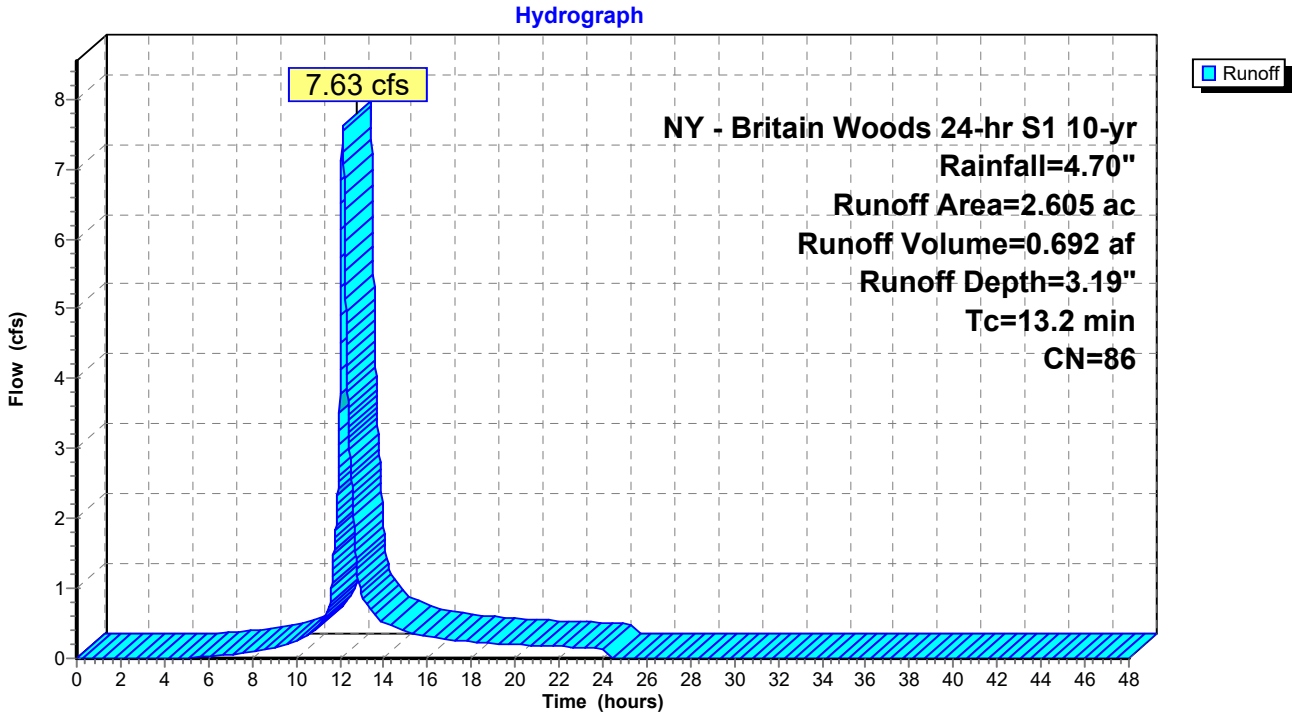
Subcatchment EX-C: Existing C



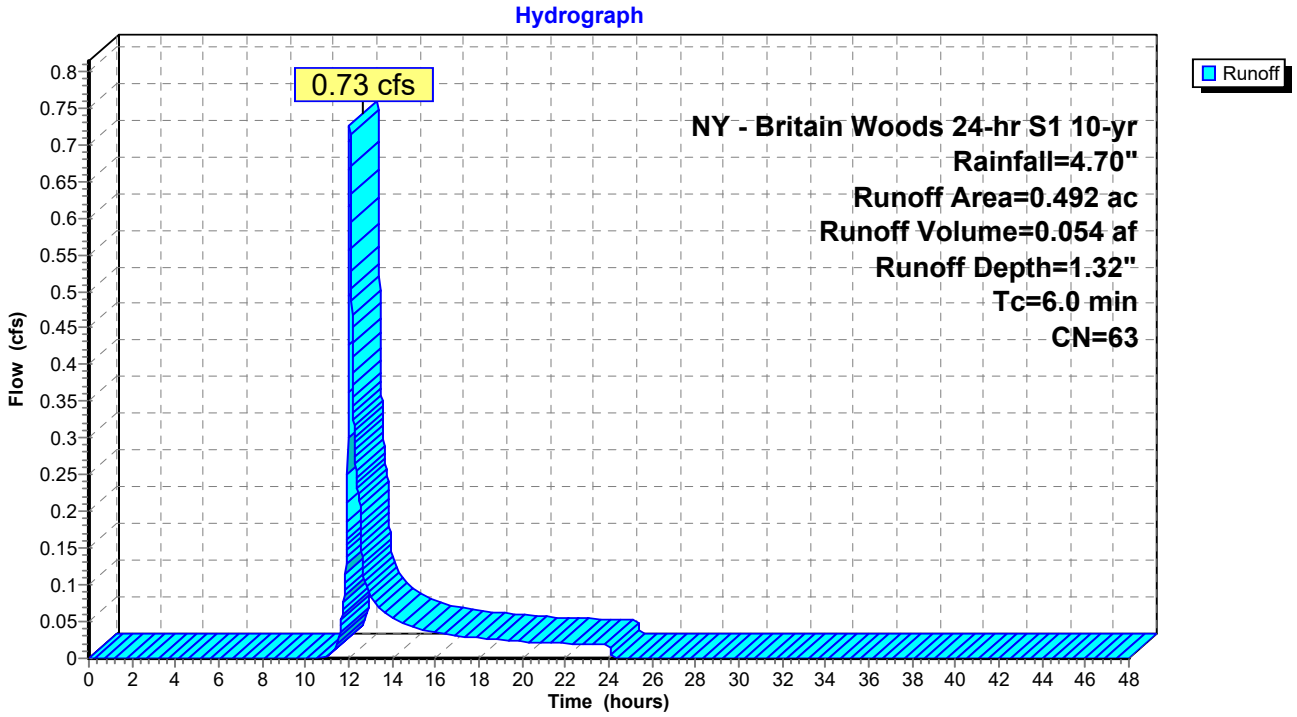
Subcatchment PR-A1-A: Proposed A1-A



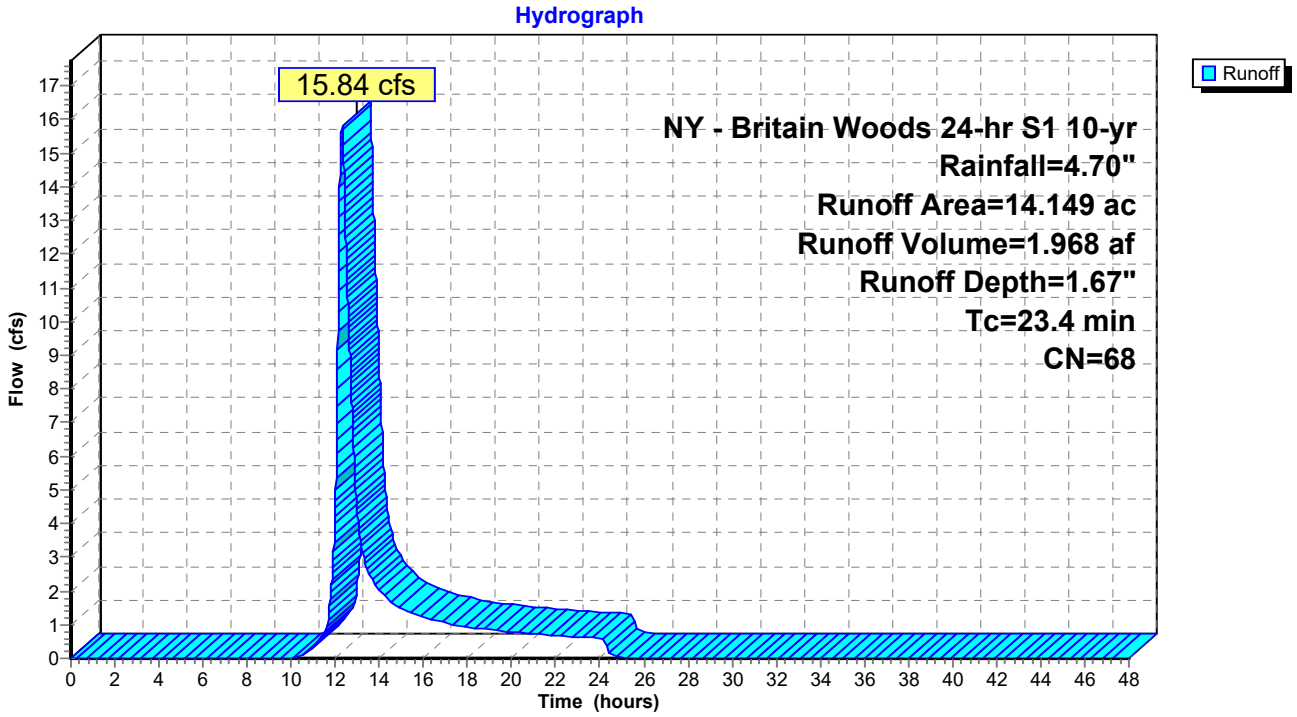
Subcatchment PR-A1-B: Proposed A1-B



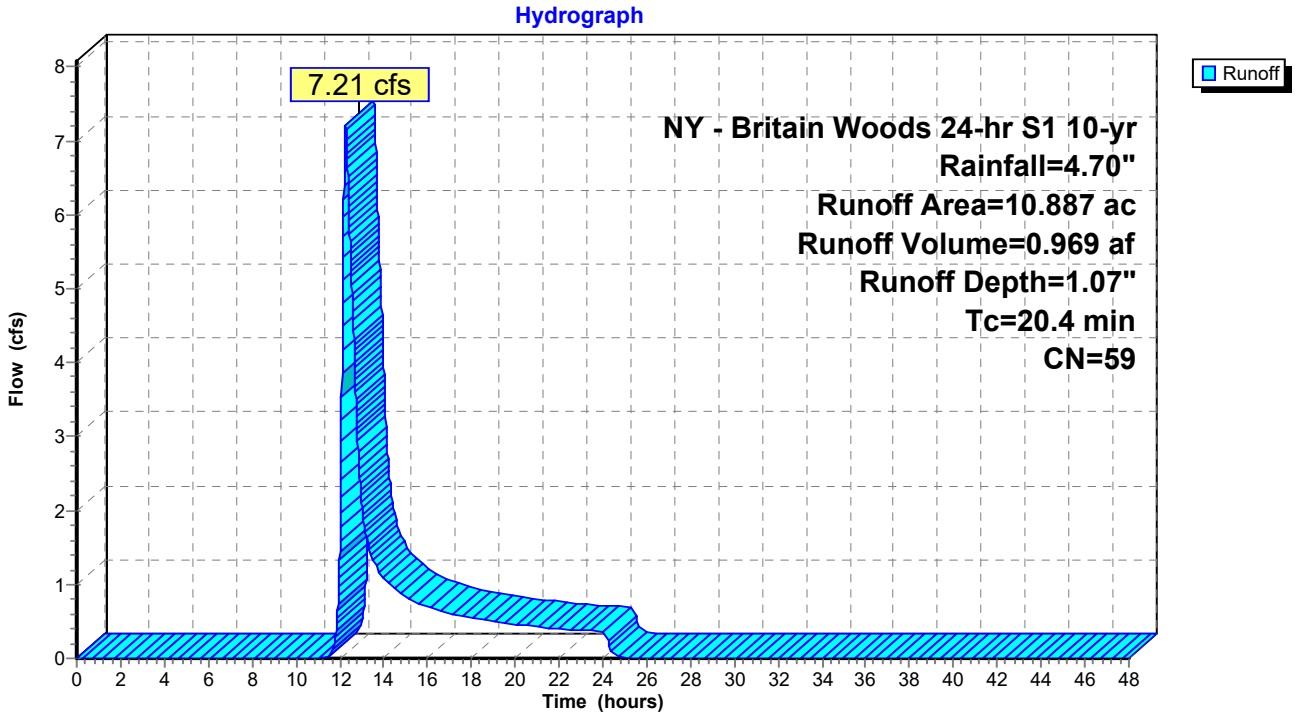
Subcatchment PR-A1-C: Proposed A1-C



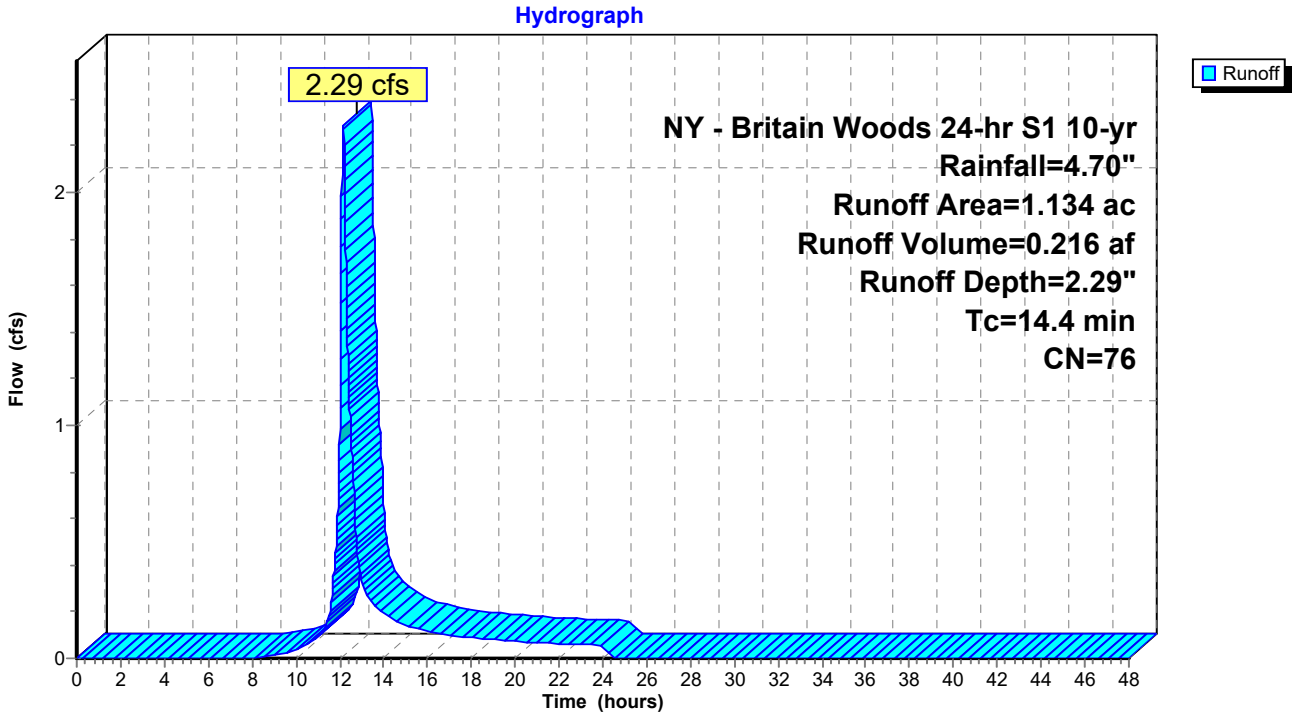
Subcatchment PR-A2-A: Proposed A2-A



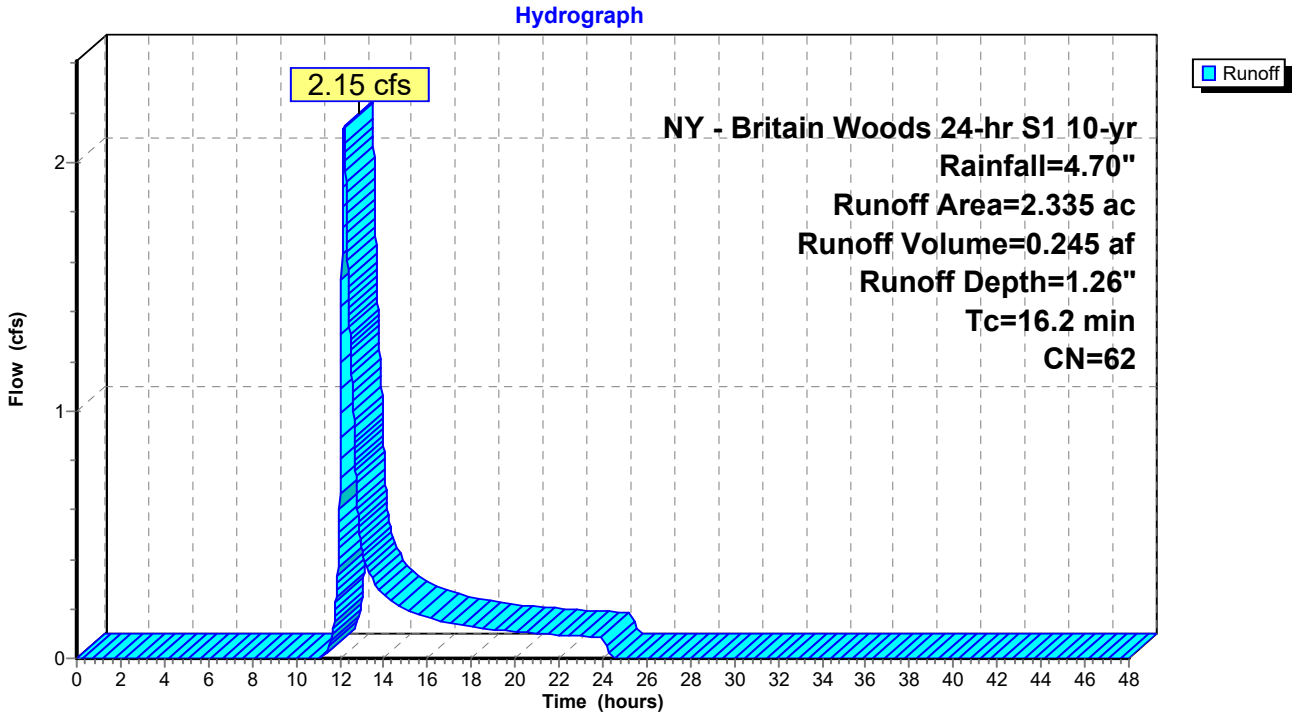
Subcatchment PR-A2-B: Proposed A2-B



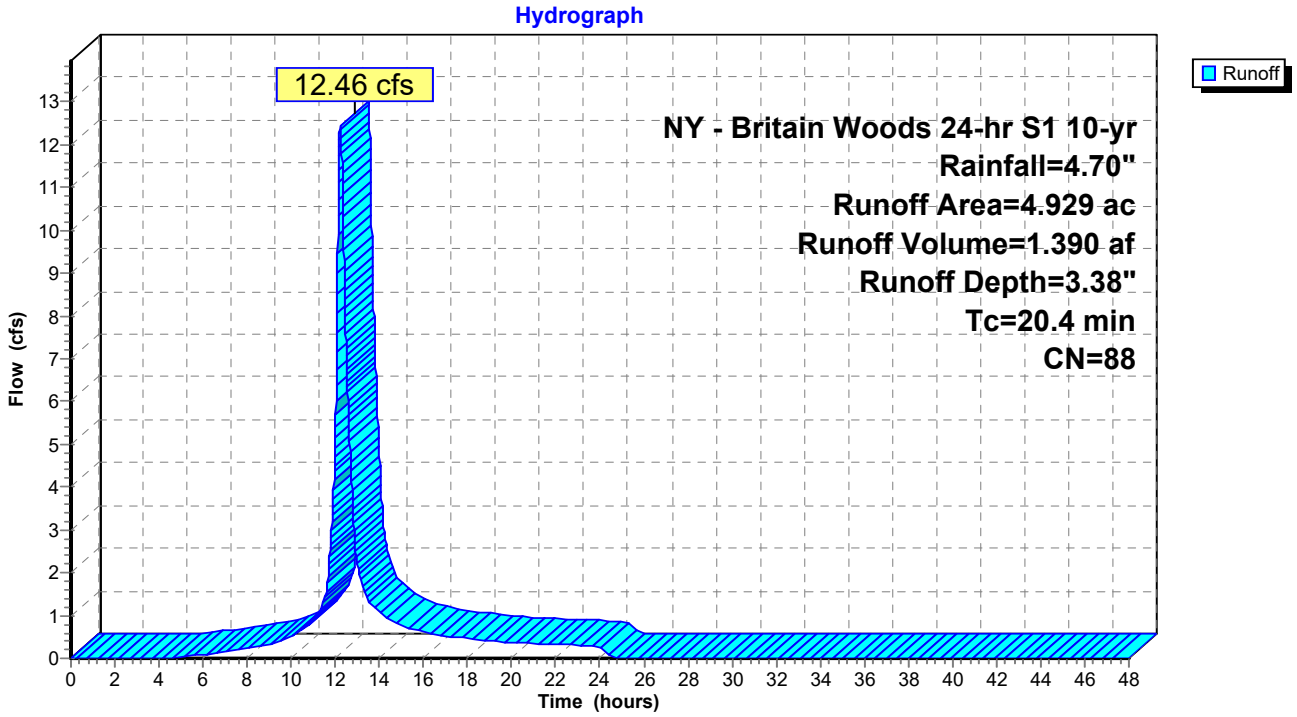
Subcatchment PR-B1: Proposed B1



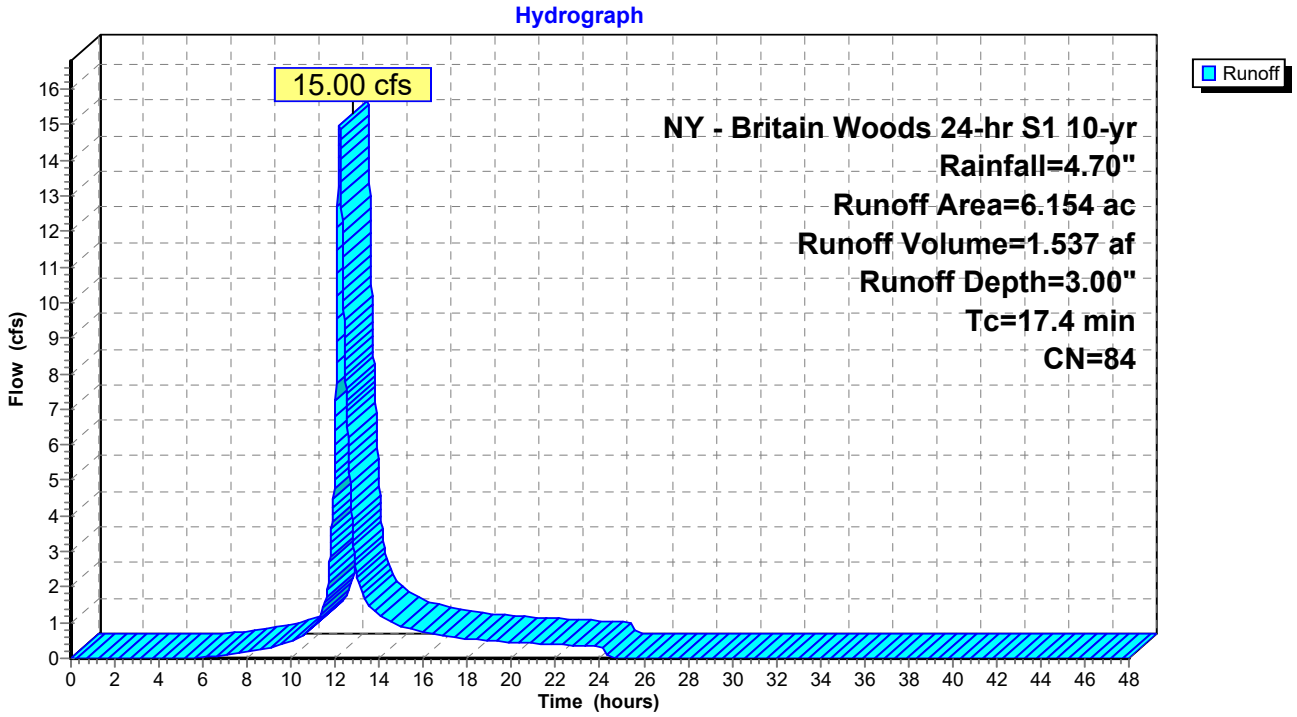
Subcatchment PR-B2: Proposed B2



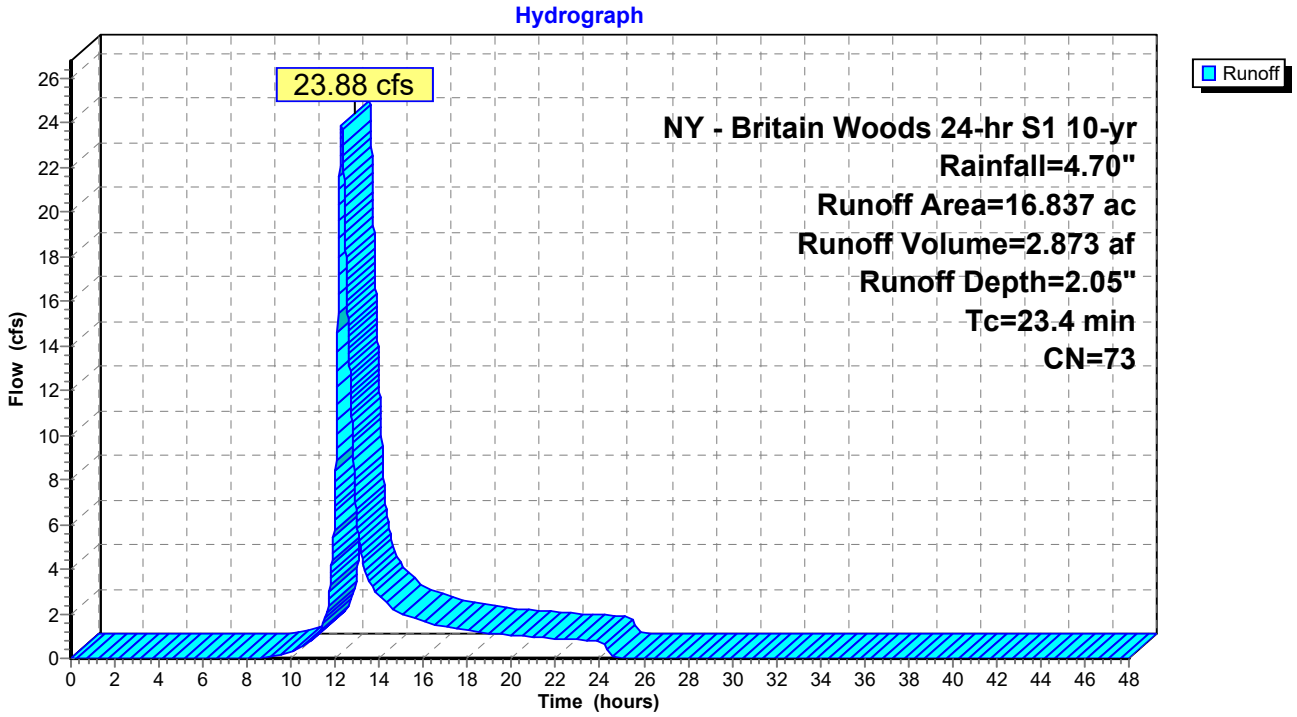
Subcatchment PR-C1-A: Proposed C1-A



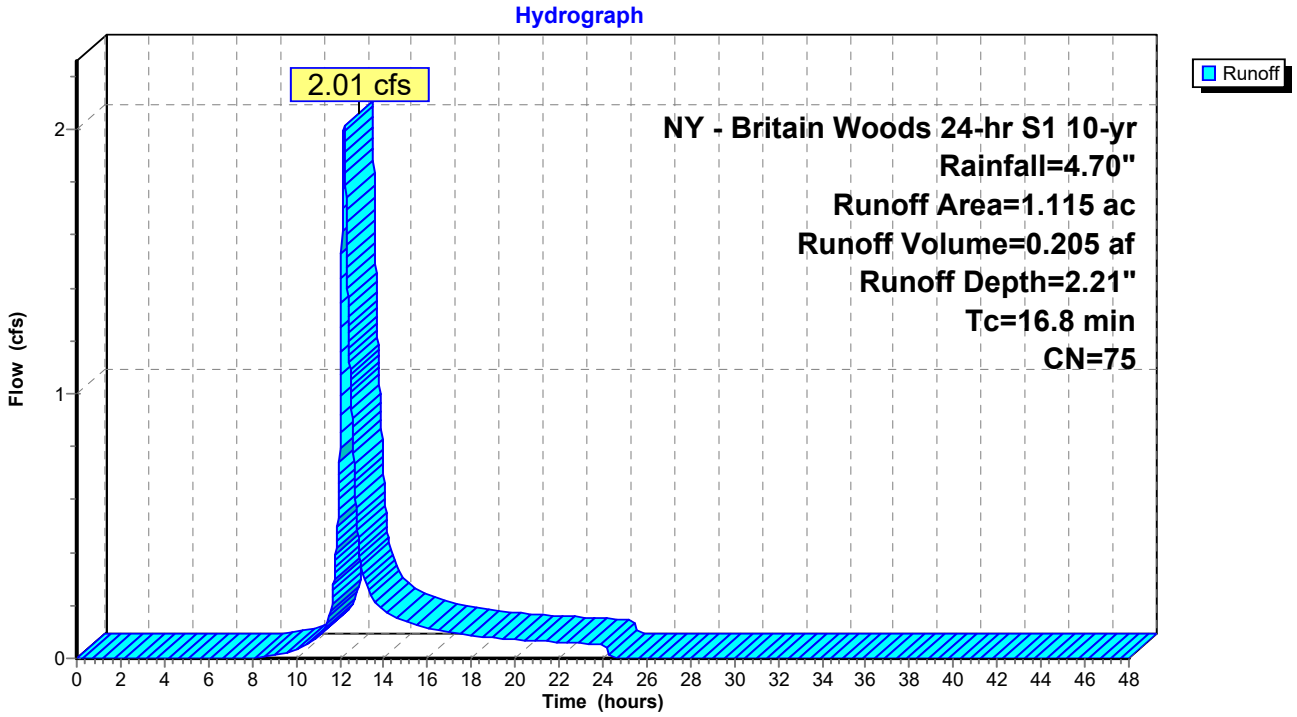
Subcatchment PR-C1-B: Proposed C1-B



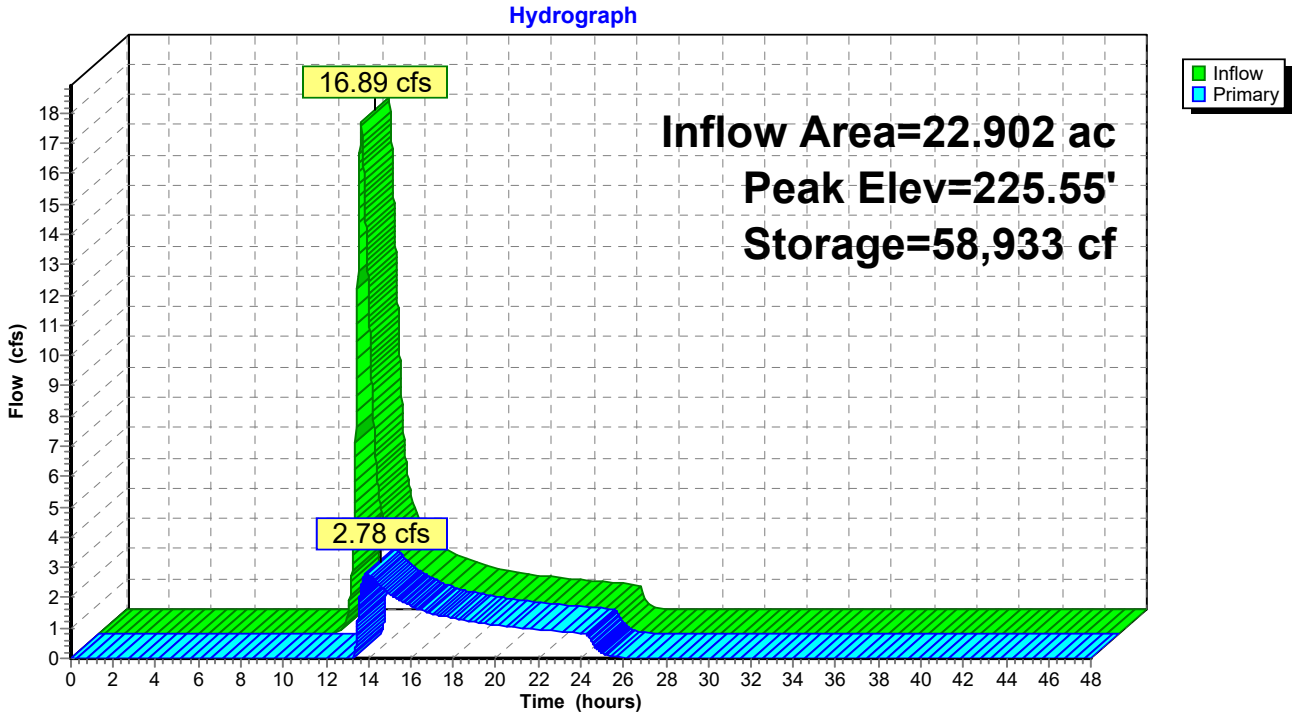
Subcatchment PR-C1-C: Proposed C1-C



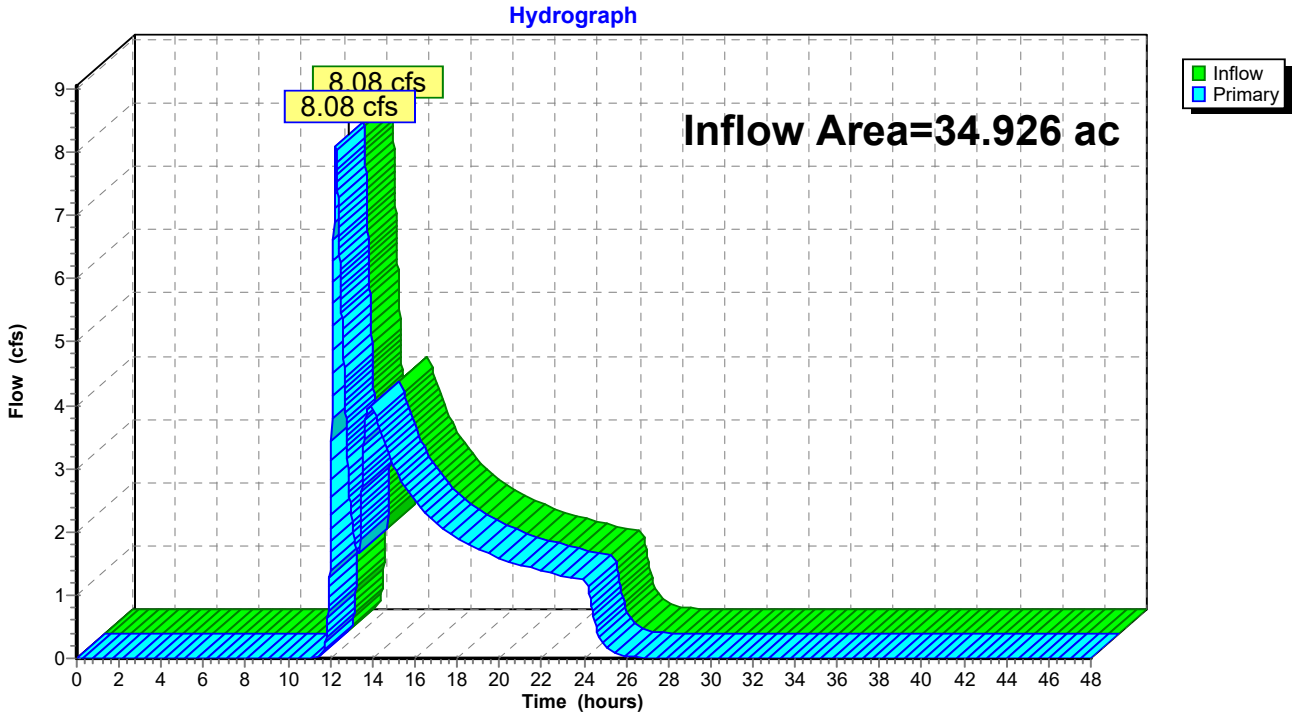
Subcatchment PR-C2: Proposed C2



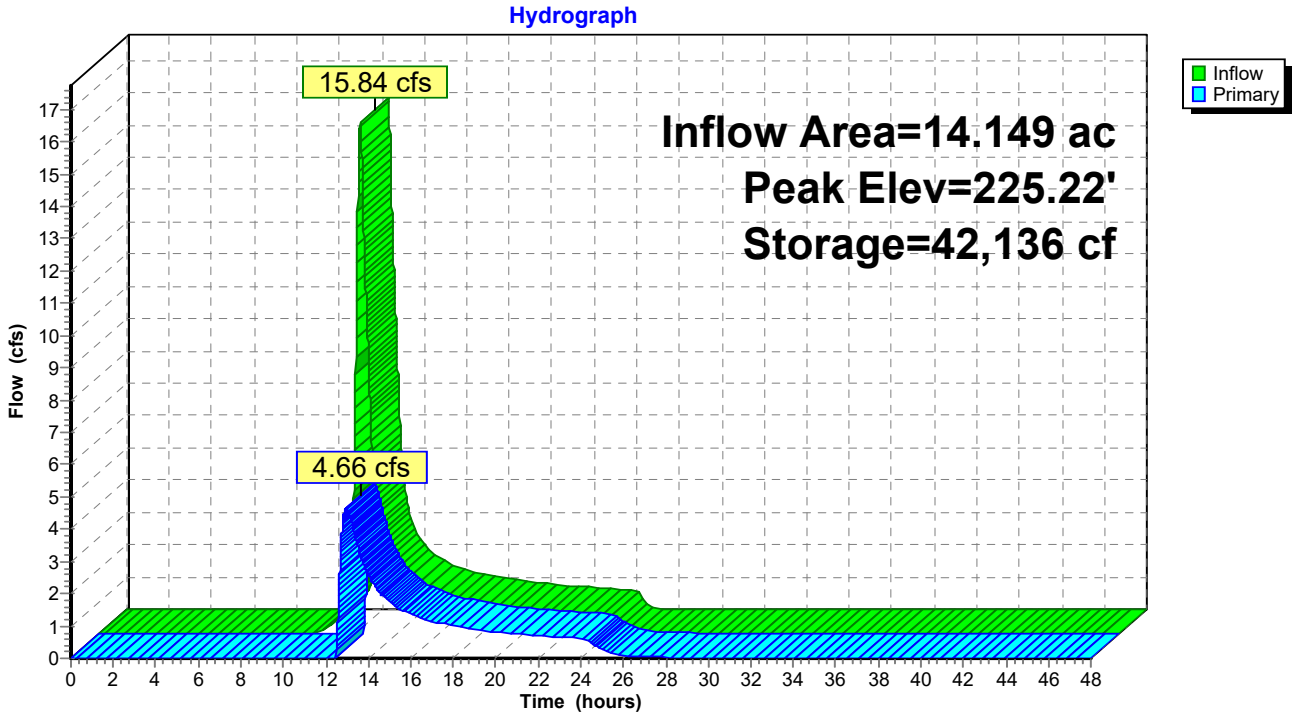
Pond 1P: Existing Wetland (EX Condition)



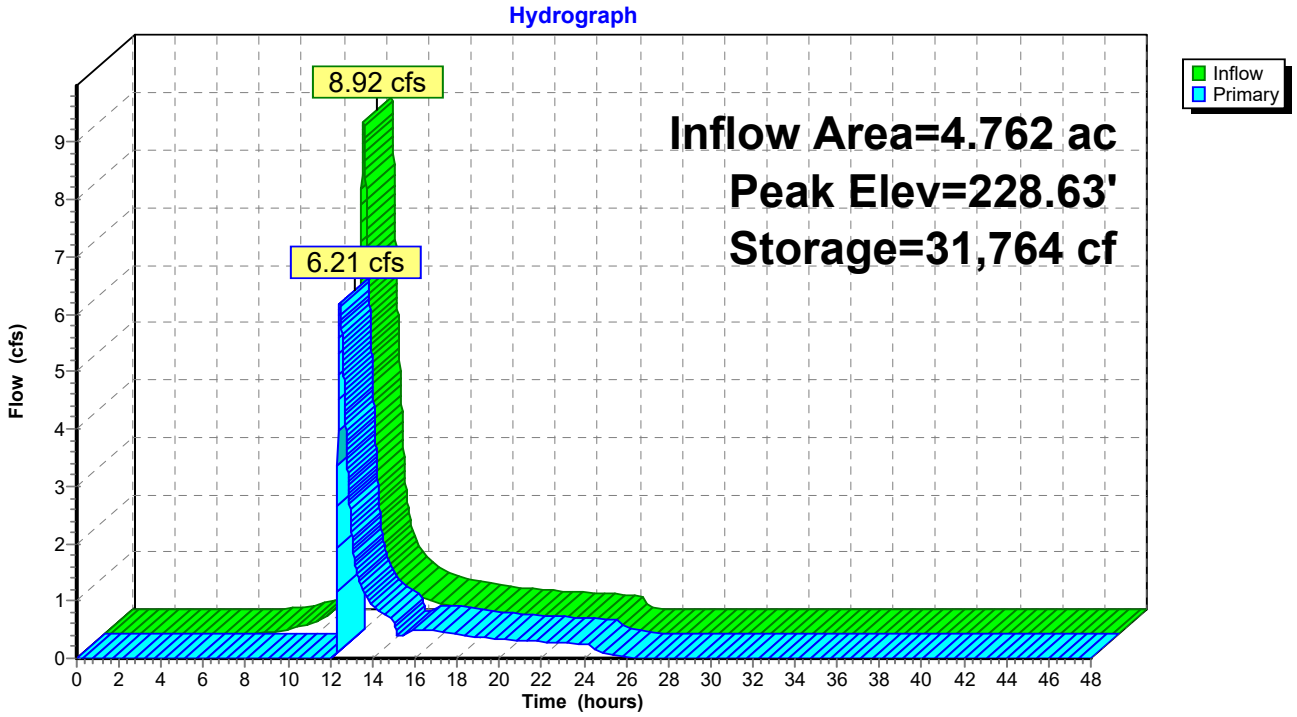
Pond 2P: Existing A



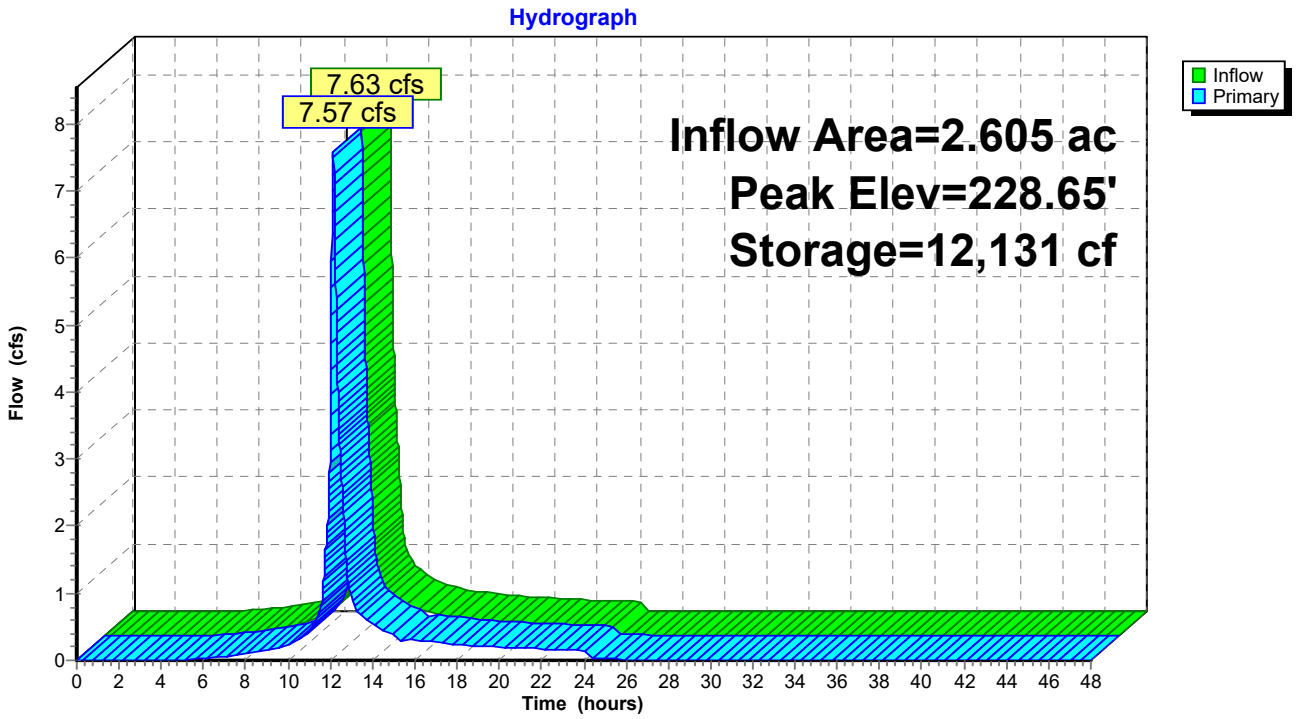
Pond 3P: Existing Wetland (PR Condition)



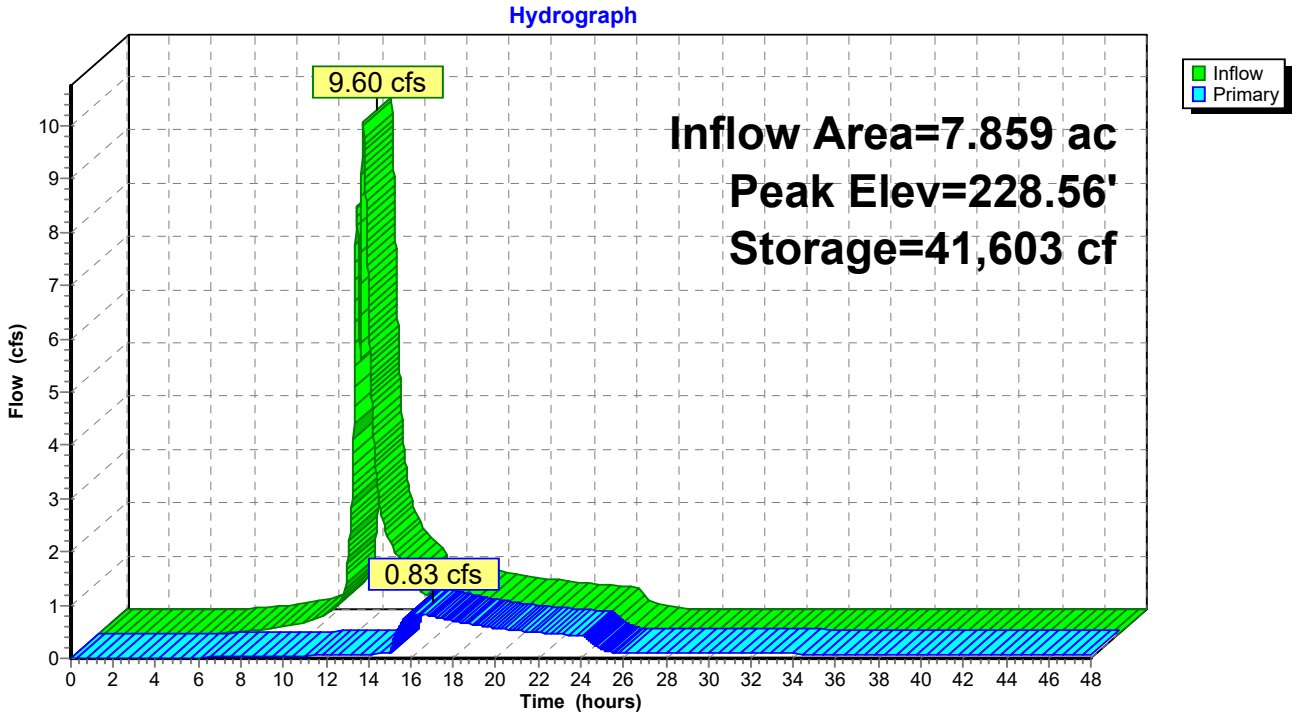
Pond 4P: Forebay & Bio A1-A



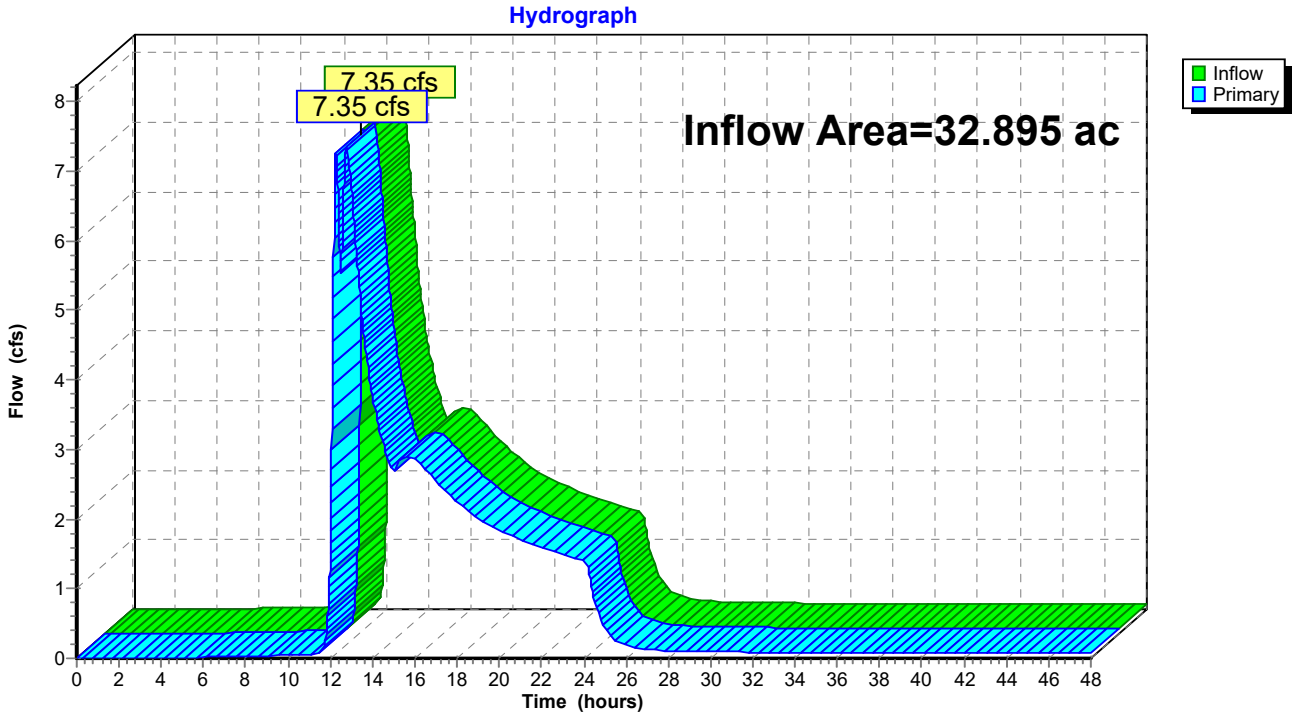
Pond 5P: Forebay A1-B



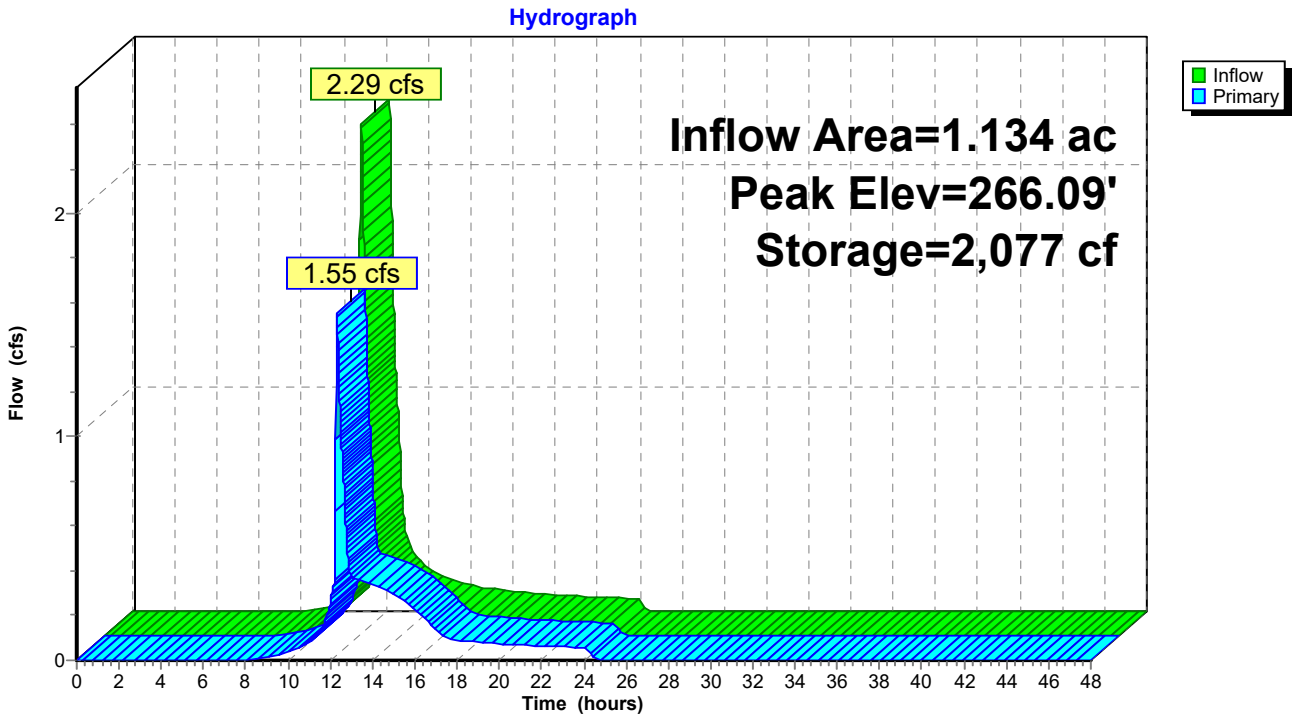
Pond 6P: Detention Basin A1



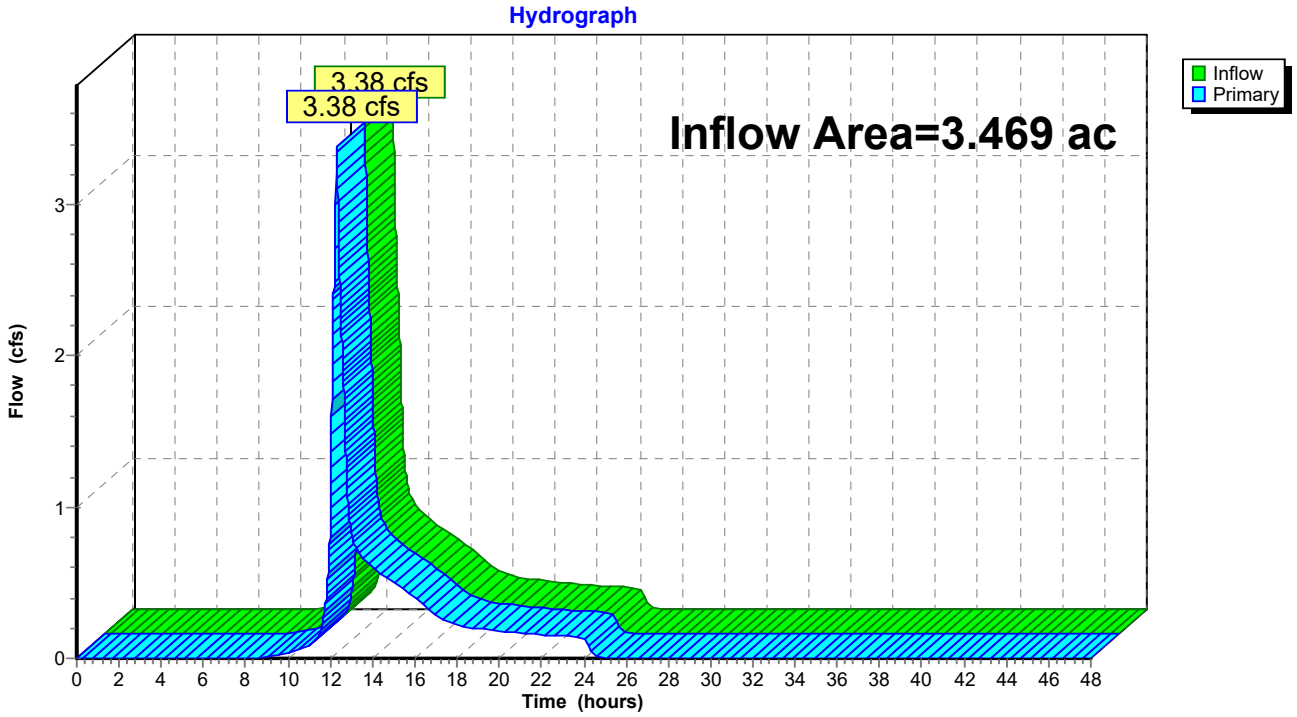
Pond 7P: Design Point A



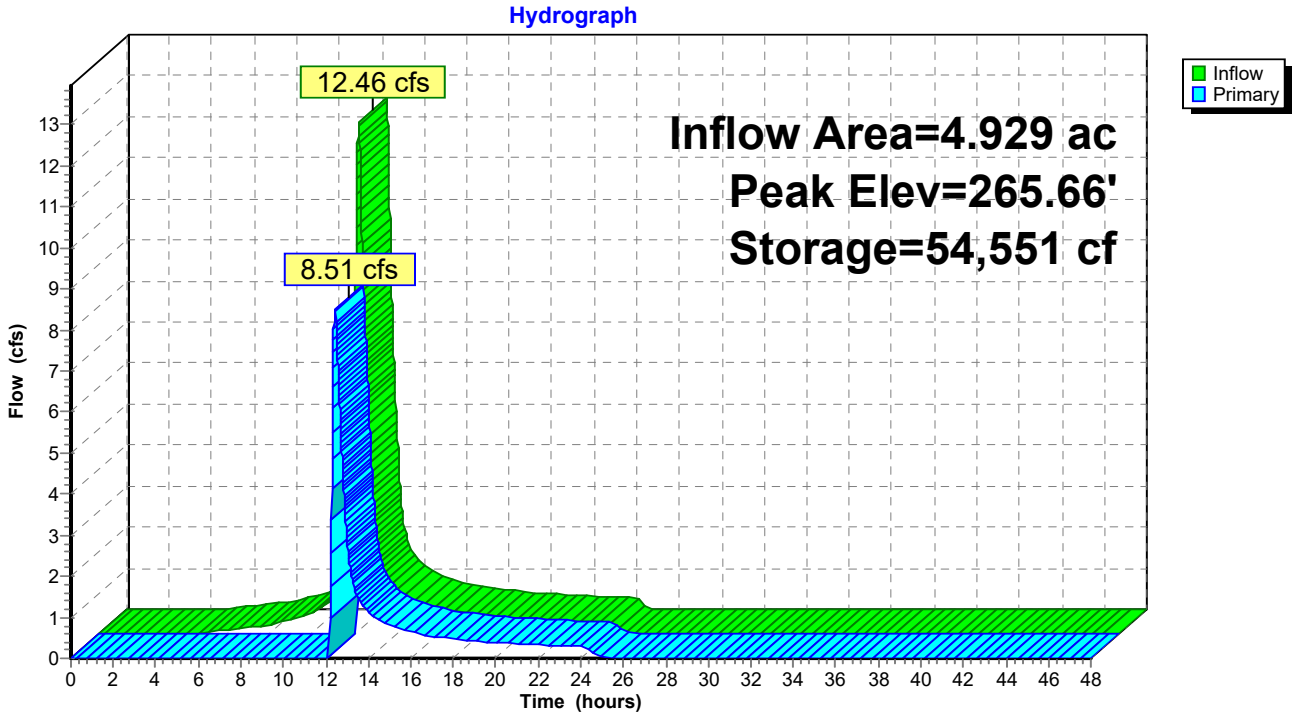
Pond 8P: Detention Basin B1



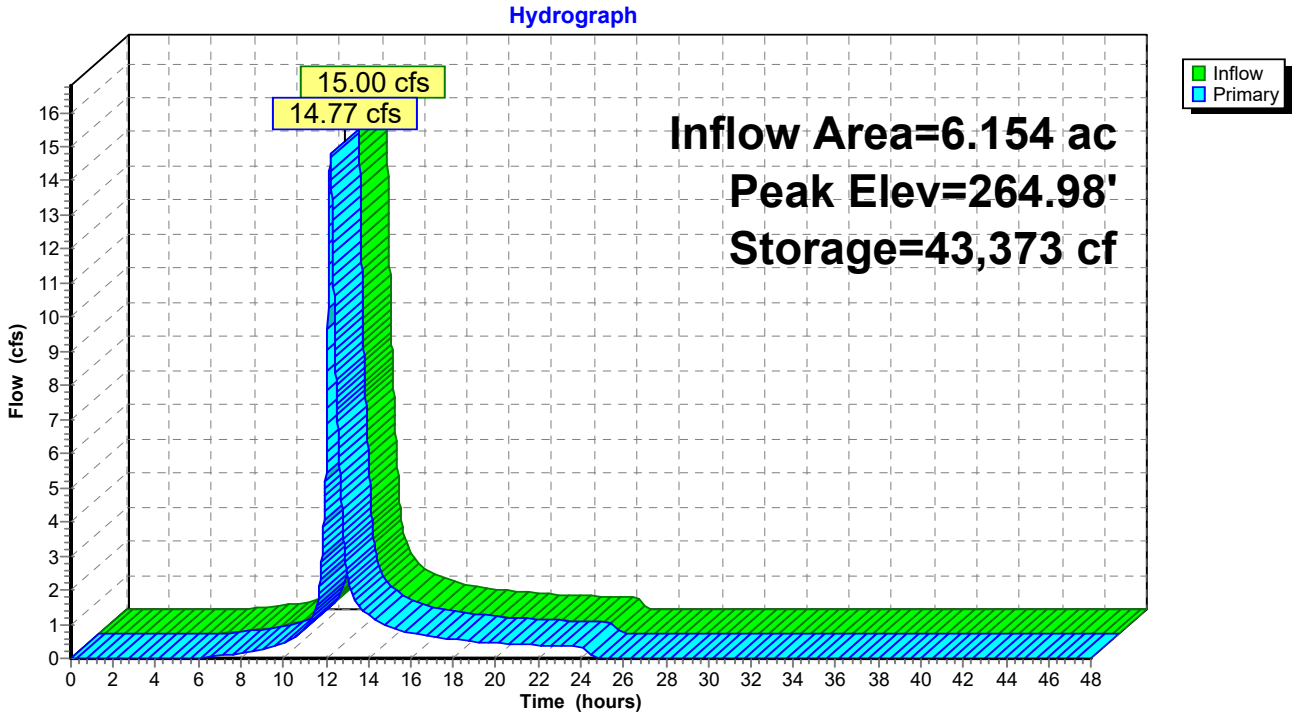
Pond 9P: Design Point B



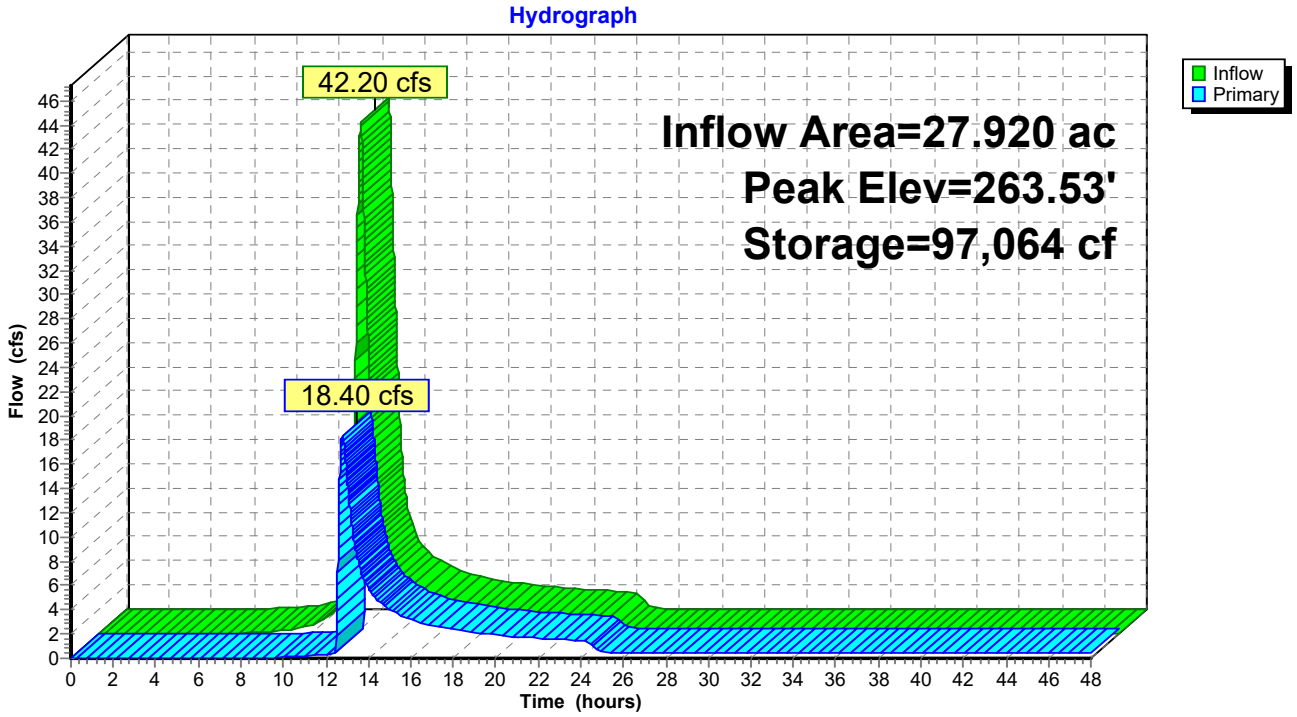
Pond 10P: Forebay & Bio C1-A



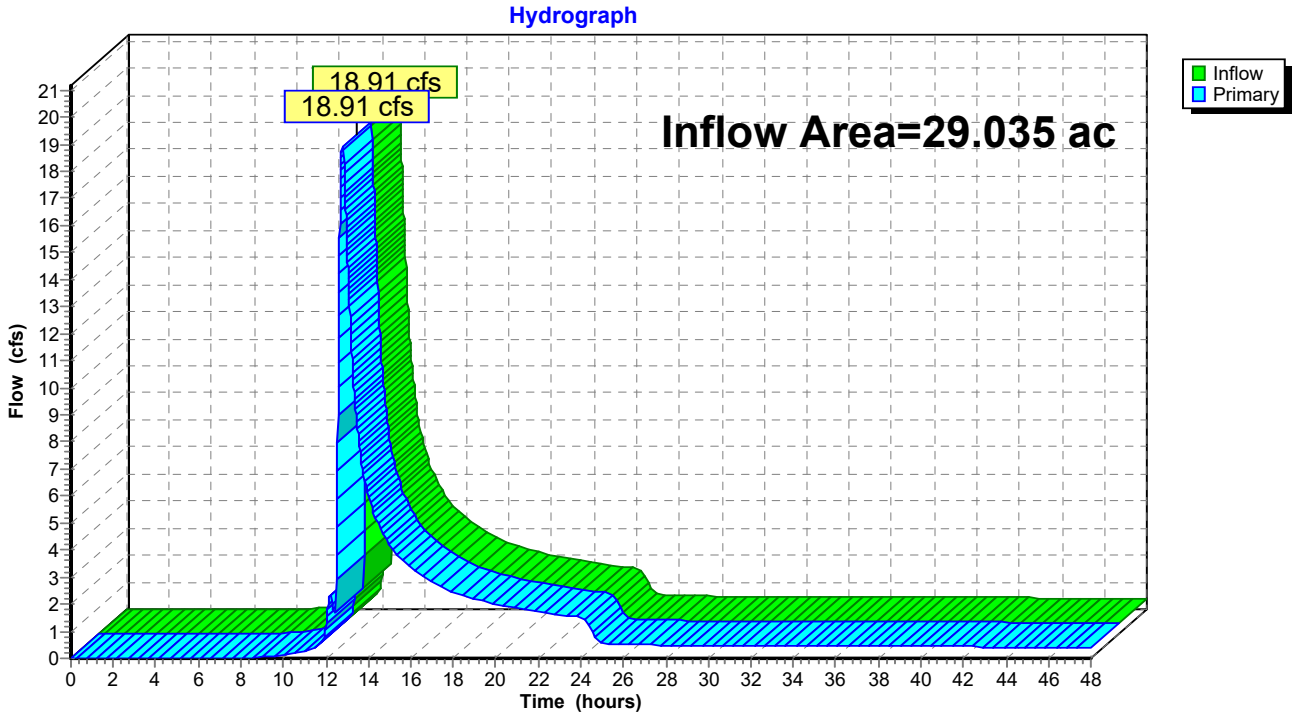
Pond 11P: Forebay C1-B



Pond 12P: Detention Basin C1



Pond 13P: Design Point C



APPENDIX 9

25-YEAR DESIGN STORM

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 5
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX-A1: Existing A1 Runoff Area=22.902 ac 8.12% Impervious Runoff Depth=2.03"
Tc=26.4 min CN=62 Runoff=28.63 cfs 3.873 af

Subcatchment EX-A2: Existing A2 Runoff Area=12.024 ac 1.27% Impervious Runoff Depth=1.78"
Tc=19.8 min CN=59 Runoff=14.62 cfs 1.785 af

Subcatchment EX-B: Existing B Runoff Area=7.465 ac 0.00% Impervious Runoff Depth=1.95"
Tc=18.6 min CN=61 Runoff=10.42 cfs 1.210 af

Subcatchment EX-C: Existing C Runoff Area=23.004 ac 0.93% Impervious Runoff Depth=2.73"
Tc=27.0 min CN=70 Runoff=40.10 cfs 5.241 af

Subcatchment PR-A1-A: Proposed A1-A Runoff Area=4.762 ac 47.67% Impervious Runoff Depth=3.60"
Tc=21.6 min CN=79 Runoff=12.36 cfs 1.428 af

Subcatchment PR-A1-B: Proposed A1-B Runoff Area=2.605 ac 63.57% Impervious Runoff Depth=4.32"
Tc=13.2 min CN=86 Runoff=9.99 cfs 0.939 af

Subcatchment PR-A1-C: Proposed A1-C Runoff Area=0.492 ac 0.00% Impervious Runoff Depth=2.11"
Tc=6.0 min CN=63 Runoff=1.20 cfs 0.087 af

Subcatchment PR-A2-A: Proposed A2-A Runoff Area=14.149 ac 15.15% Impervious Runoff Depth=2.55"
Tc=23.4 min CN=68 Runoff=24.48 cfs 3.009 af

Subcatchment PR-A2-B: Proposed A2-B Runoff Area=10.887 ac 2.63% Impervious Runoff Depth=1.78"
Tc=20.4 min CN=59 Runoff=13.05 cfs 1.616 af

Subcatchment PR-B1: Proposed B1 Runoff Area=1.134 ac 0.00% Impervious Runoff Depth=3.30"
Tc=14.4 min CN=76 Runoff=3.24 cfs 0.312 af

Subcatchment PR-B2: Proposed B2 Runoff Area=2.335 ac 0.00% Impervious Runoff Depth=2.03"
Tc=16.2 min CN=62 Runoff=3.65 cfs 0.395 af

Subcatchment PR-C1-A: Proposed C1-A Runoff Area=4.929 ac 70.16% Impervious Runoff Depth=4.54"
Tc=20.4 min CN=88 Runoff=16.17 cfs 1.864 af

Subcatchment PR-C1-B: Proposed C1-B Runoff Area=6.154 ac 61.08% Impervious Runoff Depth=4.11"
Tc=17.4 min CN=84 Runoff=19.95 cfs 2.109 af

Subcatchment PR-C1-C: Proposed C1-C Runoff Area=16.837 ac 0.26% Impervious Runoff Depth=3.01"
Tc=23.4 min CN=73 Runoff=34.96 cfs 4.229 af

Subcatchment PR-C2: Proposed C2 Runoff Area=1.115 ac 15.16% Impervious Runoff Depth=3.21"
Tc=16.8 min CN=75 Runoff=2.88 cfs 0.298 af

Pond 1P: Existing Wetland (EX Condition) Peak Elev=225.65' Storage=64,868 cf Inflow=28.63 cfs 3.873 af
Outflow=15.26 cfs 2.752 af

Pond 2P: Existing A Inflow=21.24 cfs 4.537 af
Primary=21.24 cfs 4.537 af

Pond 3P: Existing Wetland (PR Condition) Peak Elev=225.42' Storage=51,227 cf Inflow=24.48 cfs 3.009 af
Outflow=12.35 cfs 2.410 af

Pond 4P: Forebay & Bio A1-A Peak Elev=228.70' Storage=32,761 cf Inflow=12.36 cfs 1.428 af
Outflow=11.62 cfs 1.123 af

Pond 5P: Forebay A1-B Peak Elev=228.68' Storage=12,265 cf Inflow=9.99 cfs 0.939 af
Outflow=9.93 cfs 0.939 af

Pond 6P: Detention Basin A1 Peak Elev=228.68' Storage=43,068 cf Inflow=18.54 cfs 2.149 af
Outflow=3.80 cfs 1.358 af

Pond 7P: Design Point A Inflow=20.28 cfs 5.384 af
Primary=20.28 cfs 5.384 af

Pond 8P: Detention Basin B1 Peak Elev=266.15' Storage=2,187 cf Inflow=3.24 cfs 0.312 af
Outflow=3.07 cfs 0.312 af

Pond 9P: Design Point B Inflow=6.71 cfs 0.707 af
Primary=6.71 cfs 0.707 af

Pond 10P: Forebay & Bio C1-A Peak Elev=265.73' Storage=56,166 cf Inflow=16.17 cfs 1.864 af
Outflow=14.61 cfs 1.390 af

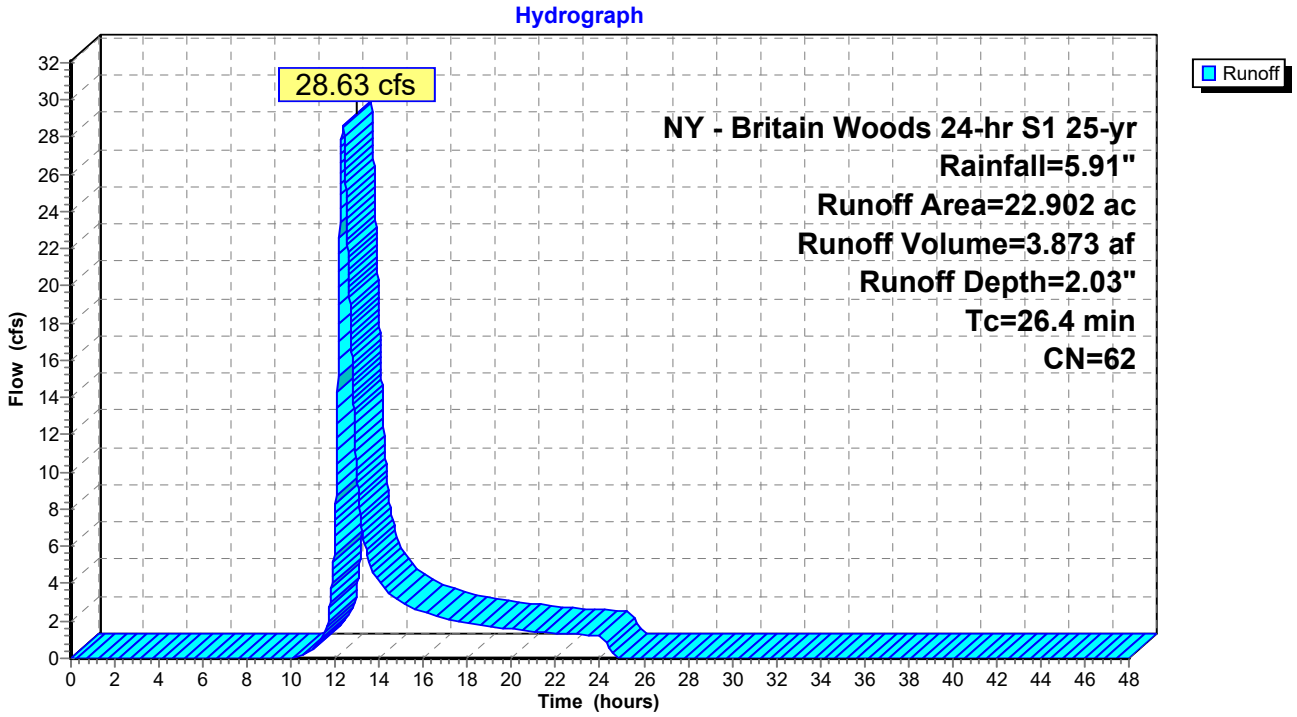
Pond 11P: Forebay C1-B Peak Elev=265.03' Storage=43,800 cf Inflow=19.95 cfs 2.109 af
Outflow=19.73 cfs 2.109 af

Pond 12P: Detention Basin C1 Peak Elev=264.16' Storage=115,858 cf Inflow=67.66 cfs 7.728 af
Outflow=34.36 cfs 6.766 af

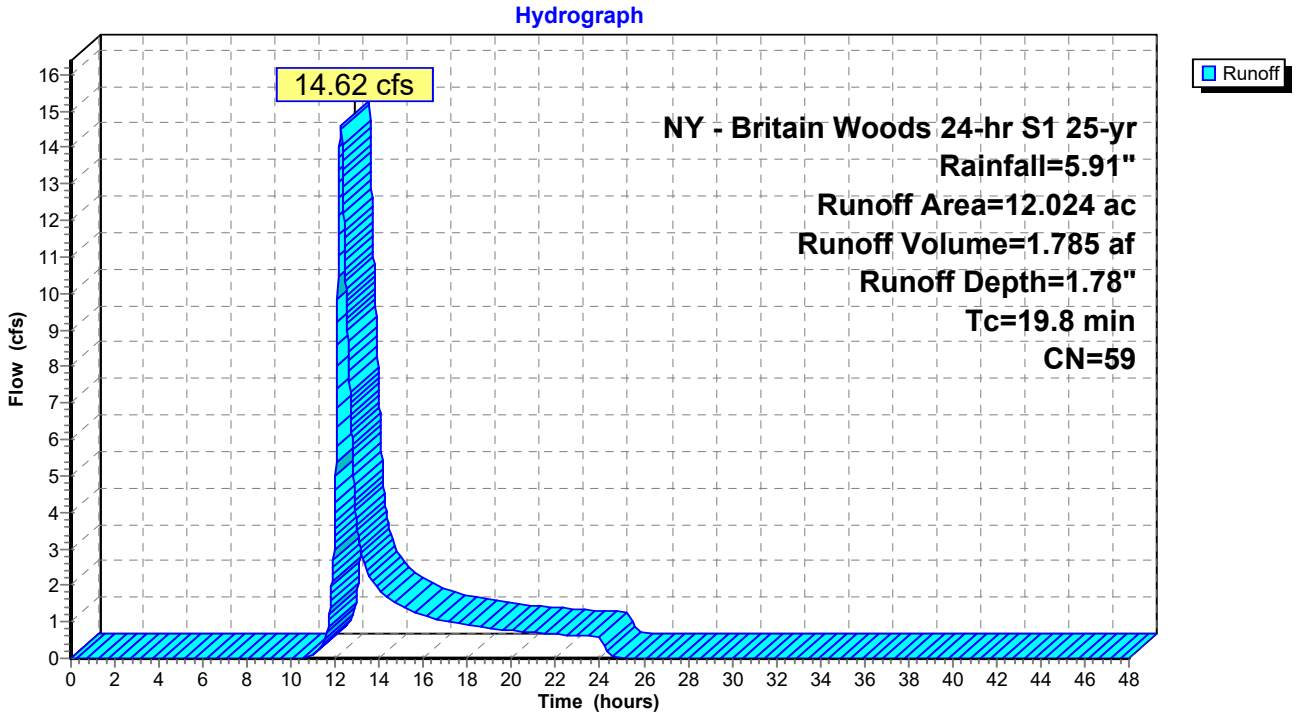
Pond 13P: Design Point C Inflow=35.51 cfs 7.064 af
Primary=35.51 cfs 7.064 af

Total Runoff Area = 130.794 ac Runoff Volume = 28.395 af Average Runoff Depth = 2.61"
87.76% Pervious = 114.784 ac 12.24% Impervious = 16.010 ac

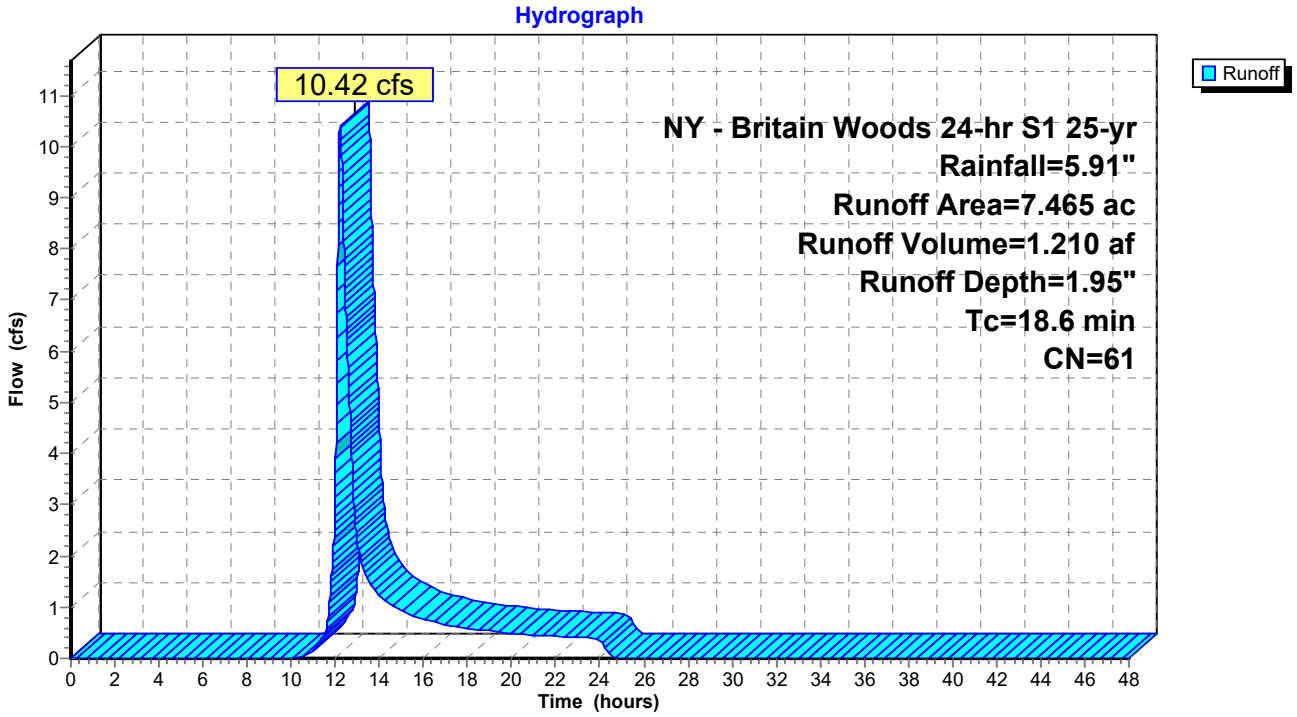
Subcatchment EX-A1: Existing A1



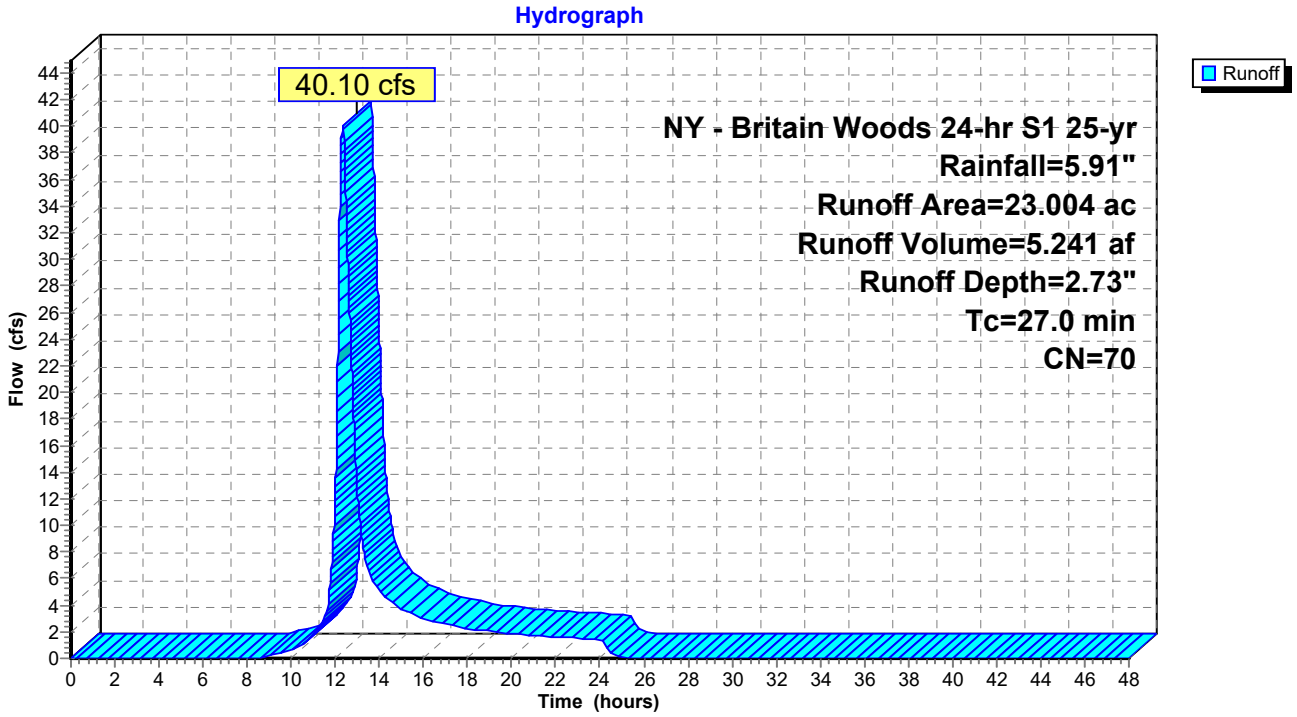
Subcatchment EX-A2: Existing A2



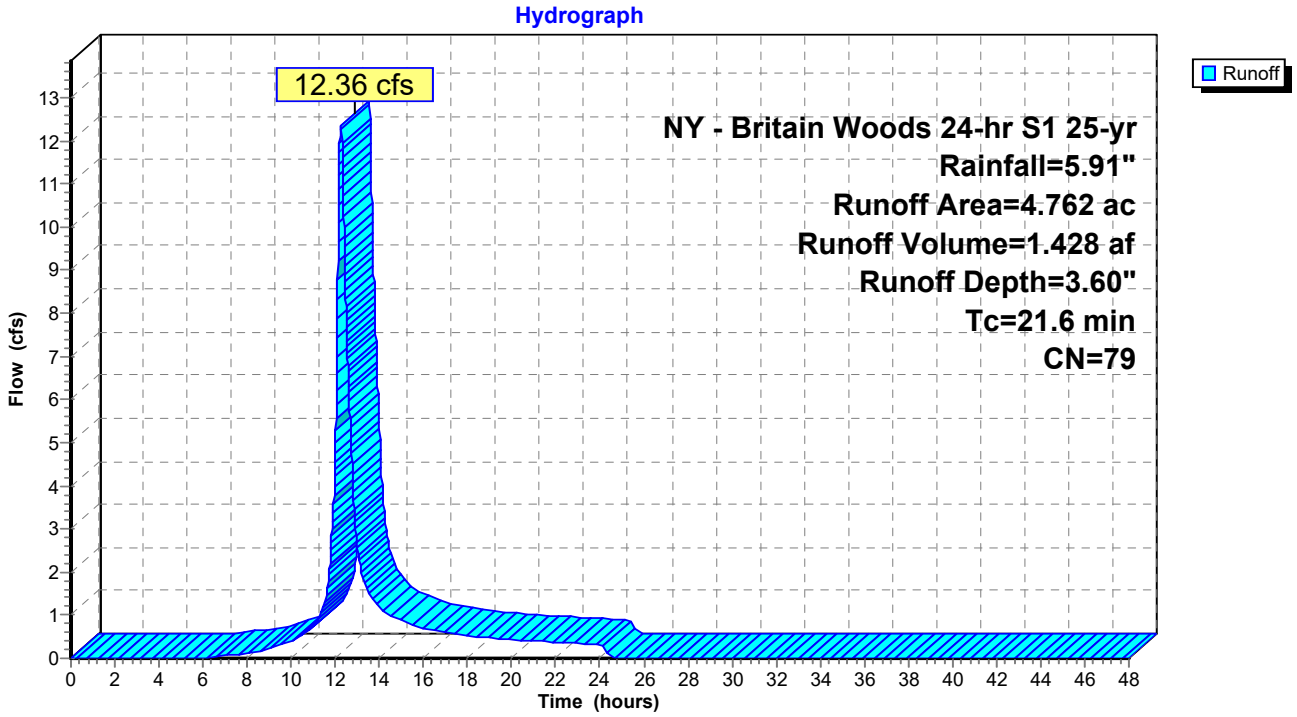
Subcatchment EX-B: Existing B



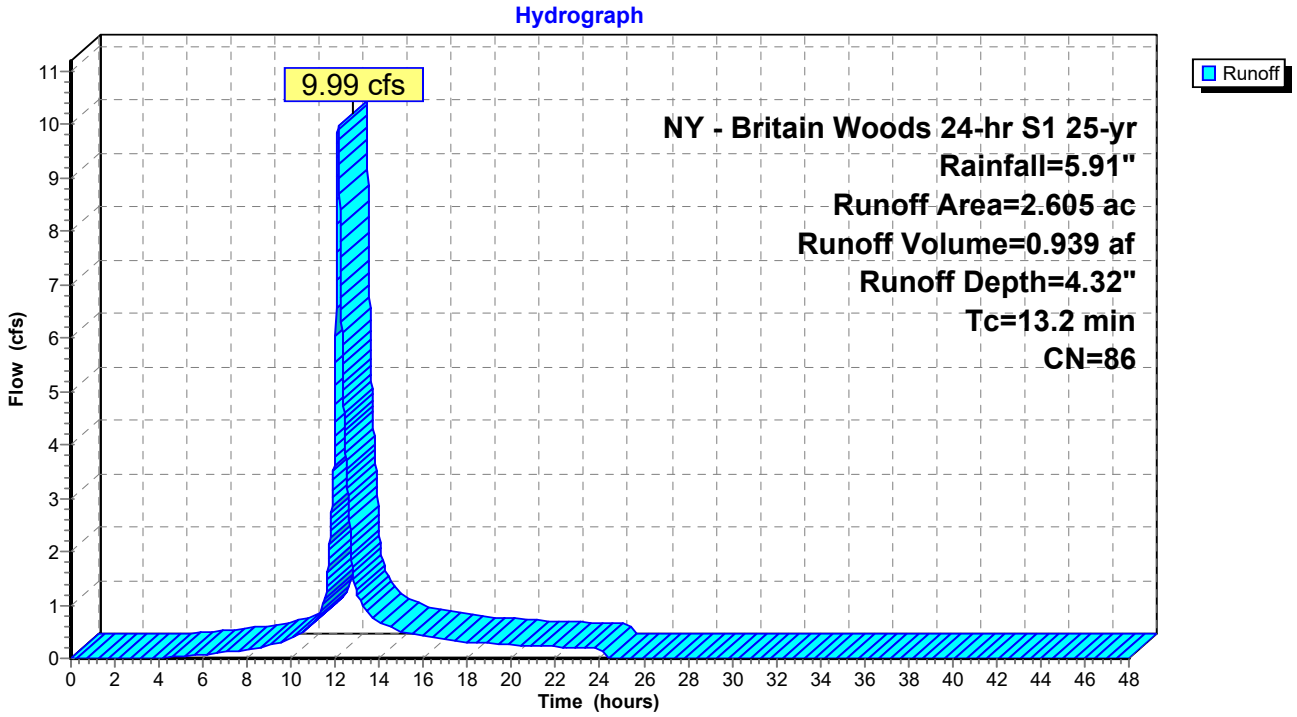
Subcatchment EX-C: Existing C



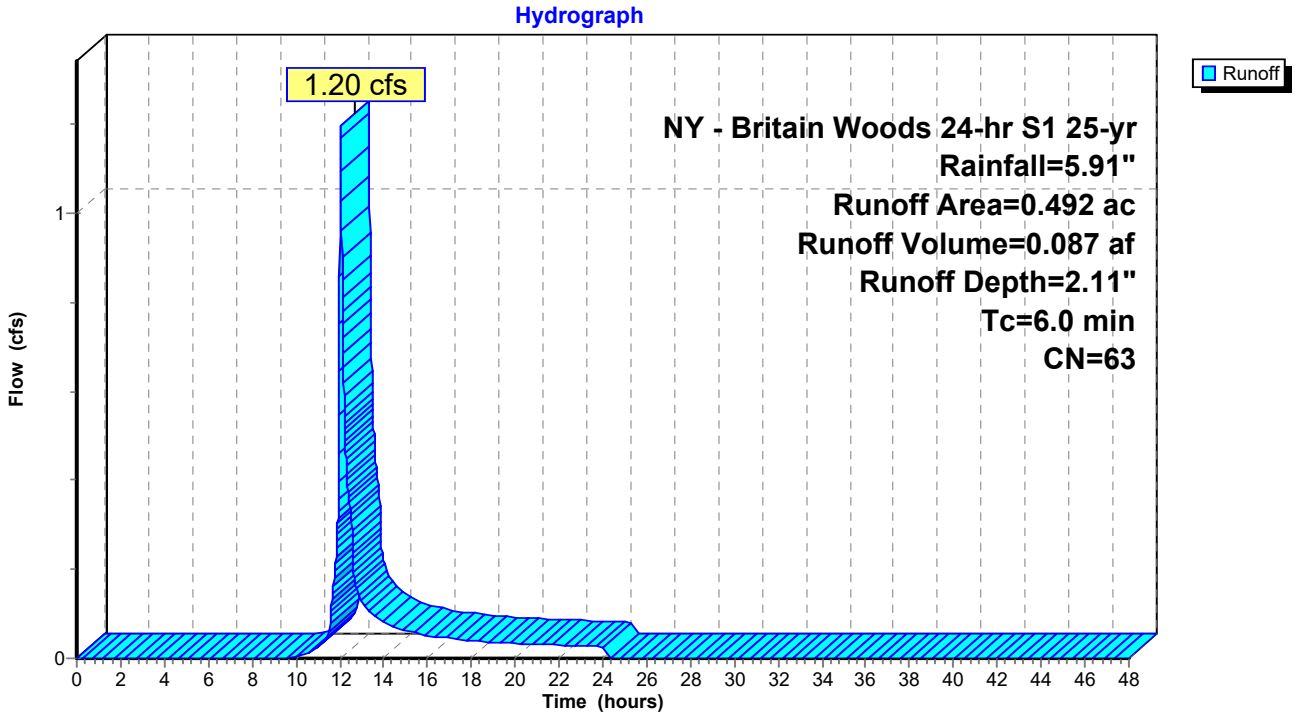
Subcatchment PR-A1-A: Proposed A1-A



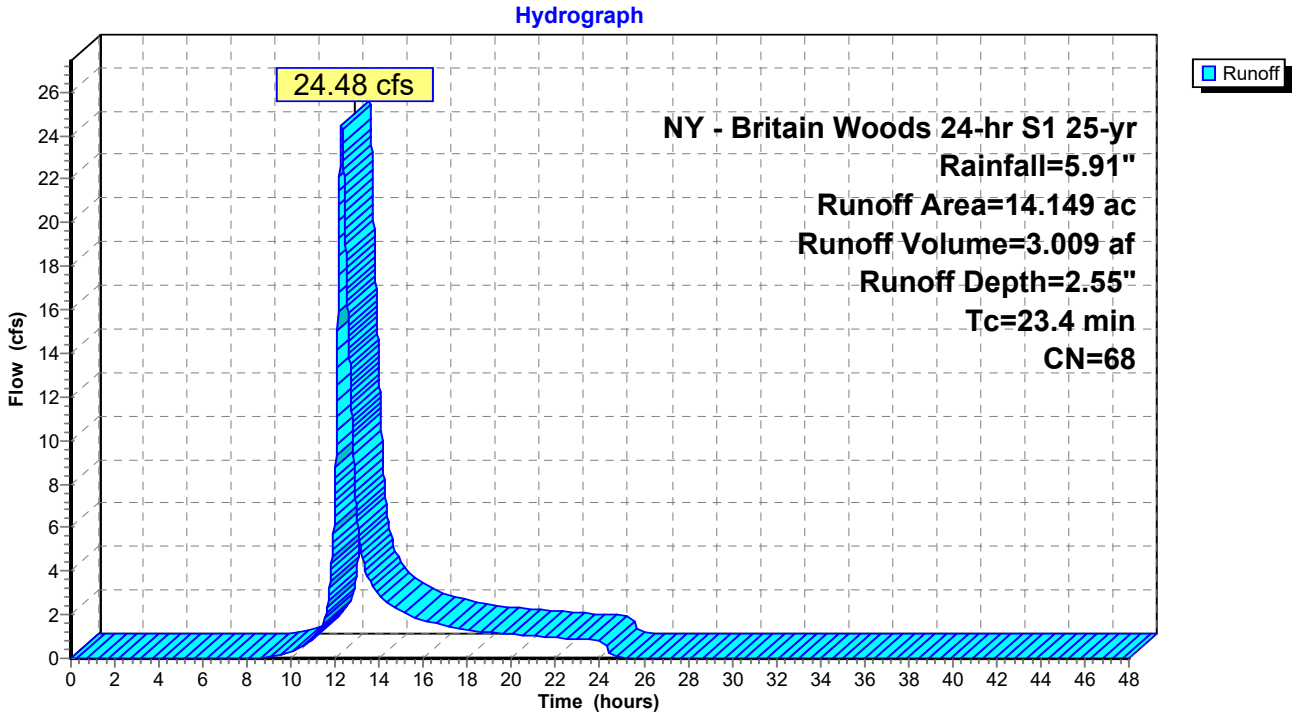
Subcatchment PR-A1-B: Proposed A1-B



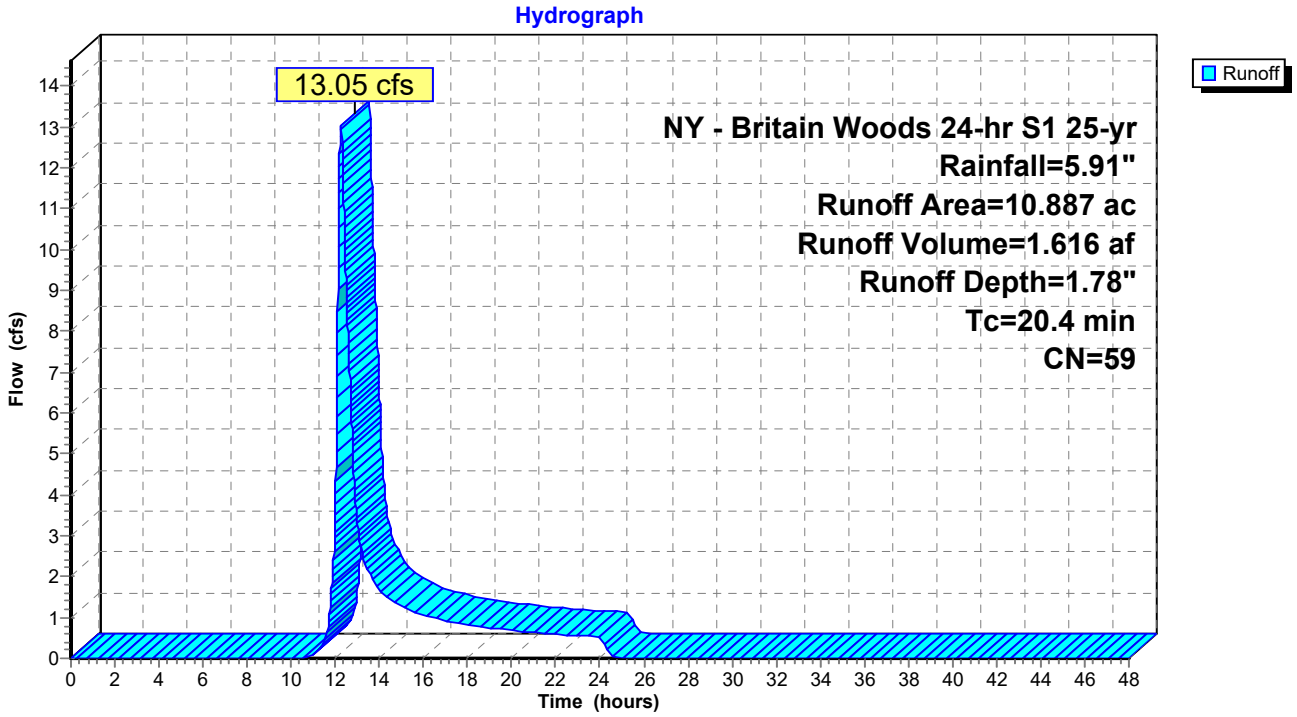
Subcatchment PR-A1-C: Proposed A1-C



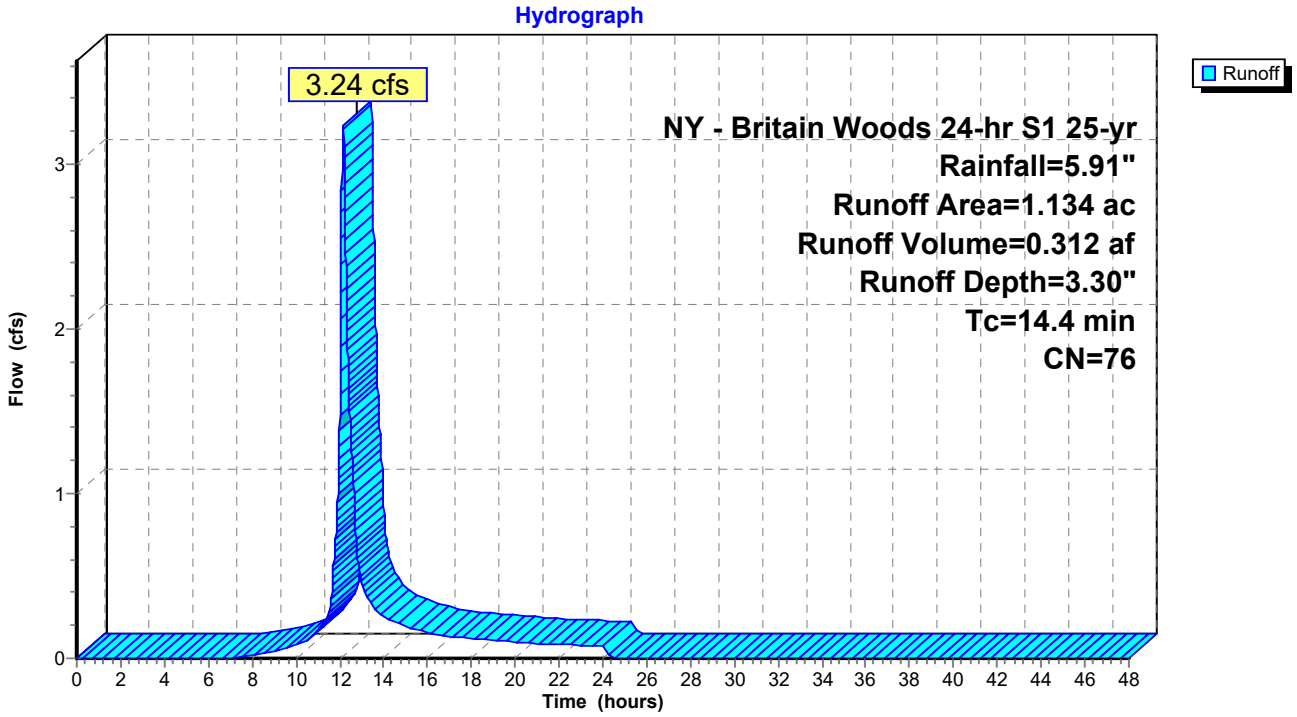
Subcatchment PR-A2-A: Proposed A2-A



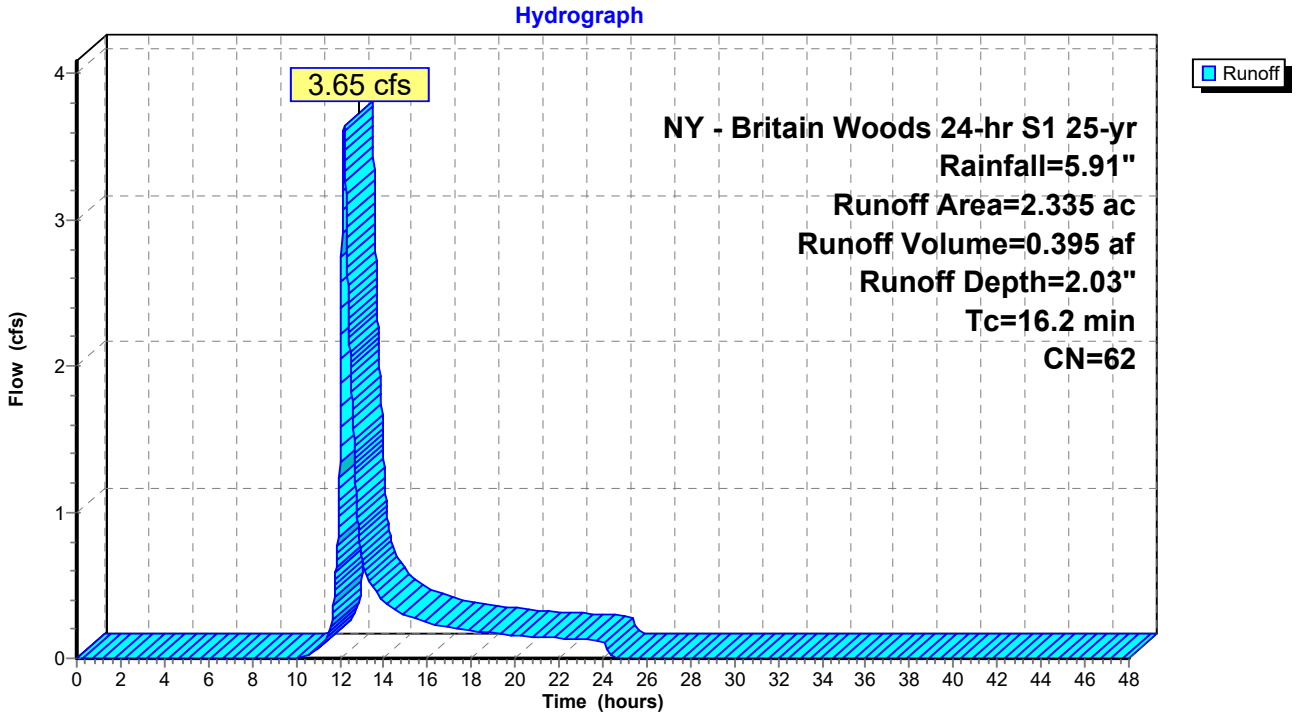
Subcatchment PR-A2-B: Proposed A2-B



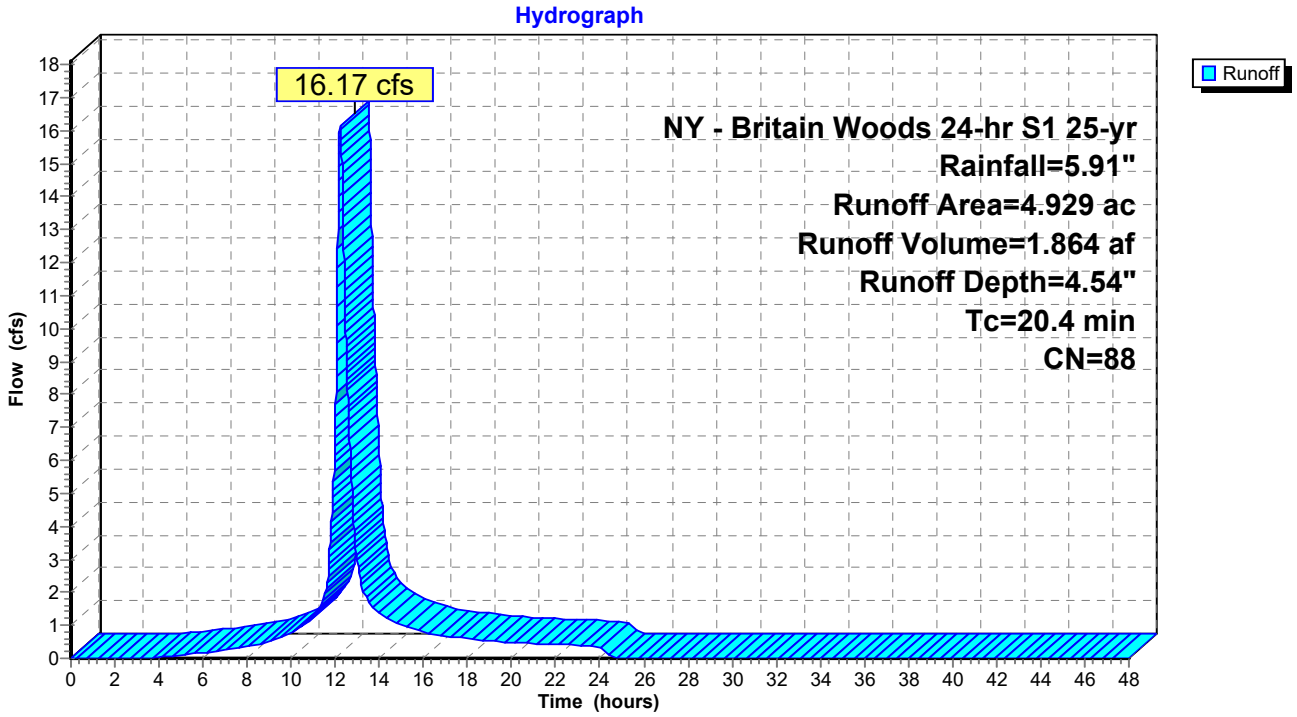
Subcatchment PR-B1: Proposed B1



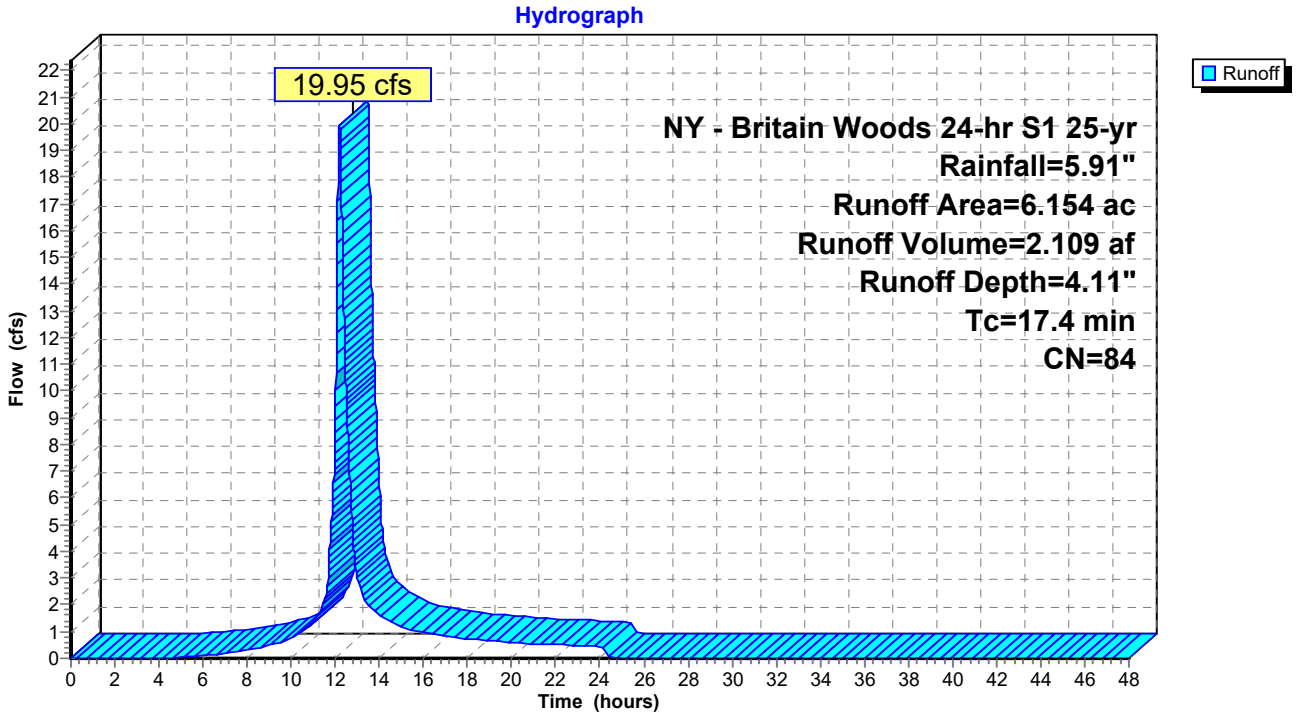
Subcatchment PR-B2: Proposed B2



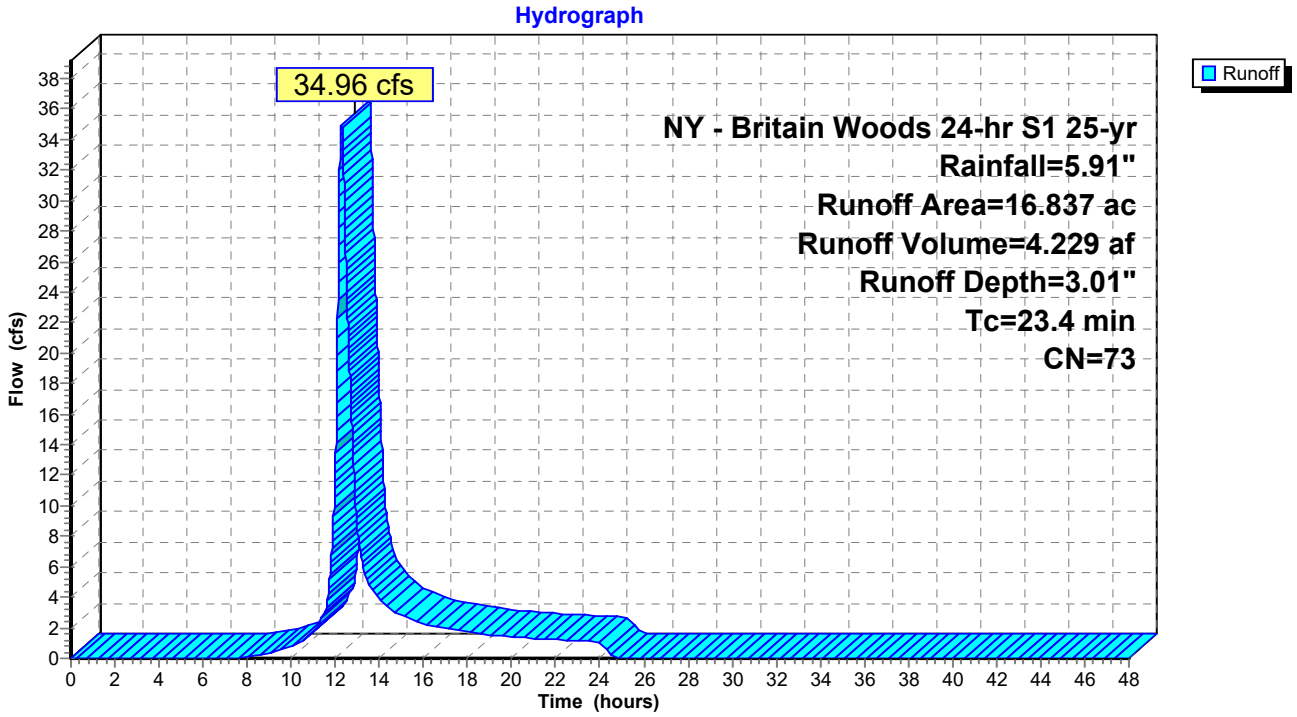
Subcatchment PR-C1-A: Proposed C1-A



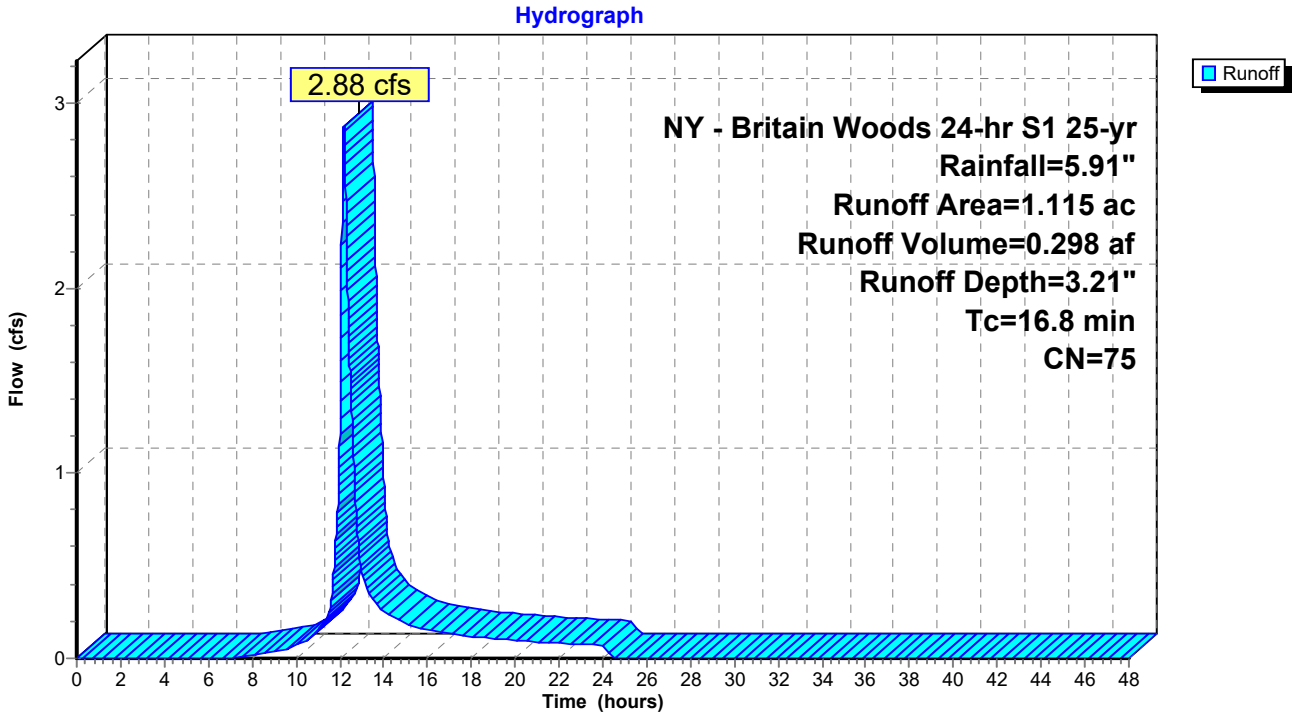
Subcatchment PR-C1-B: Proposed C1-B



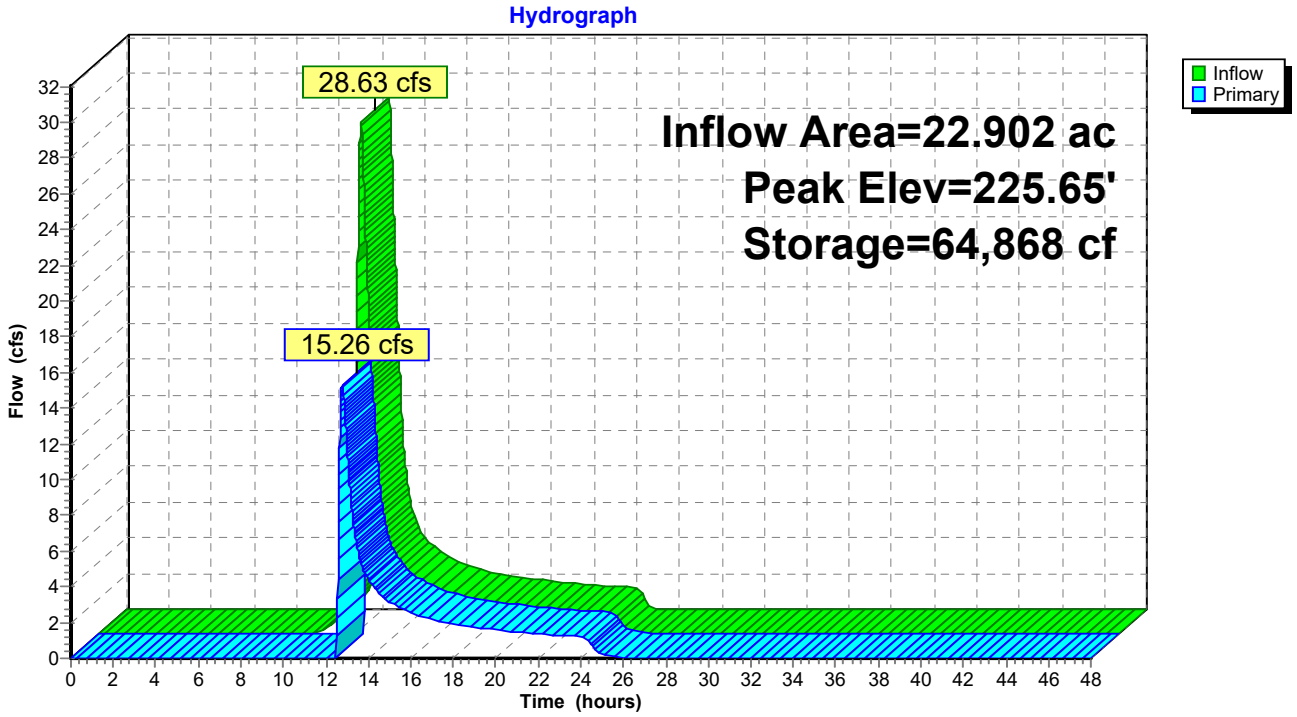
Subcatchment PR-C1-C: Proposed C1-C



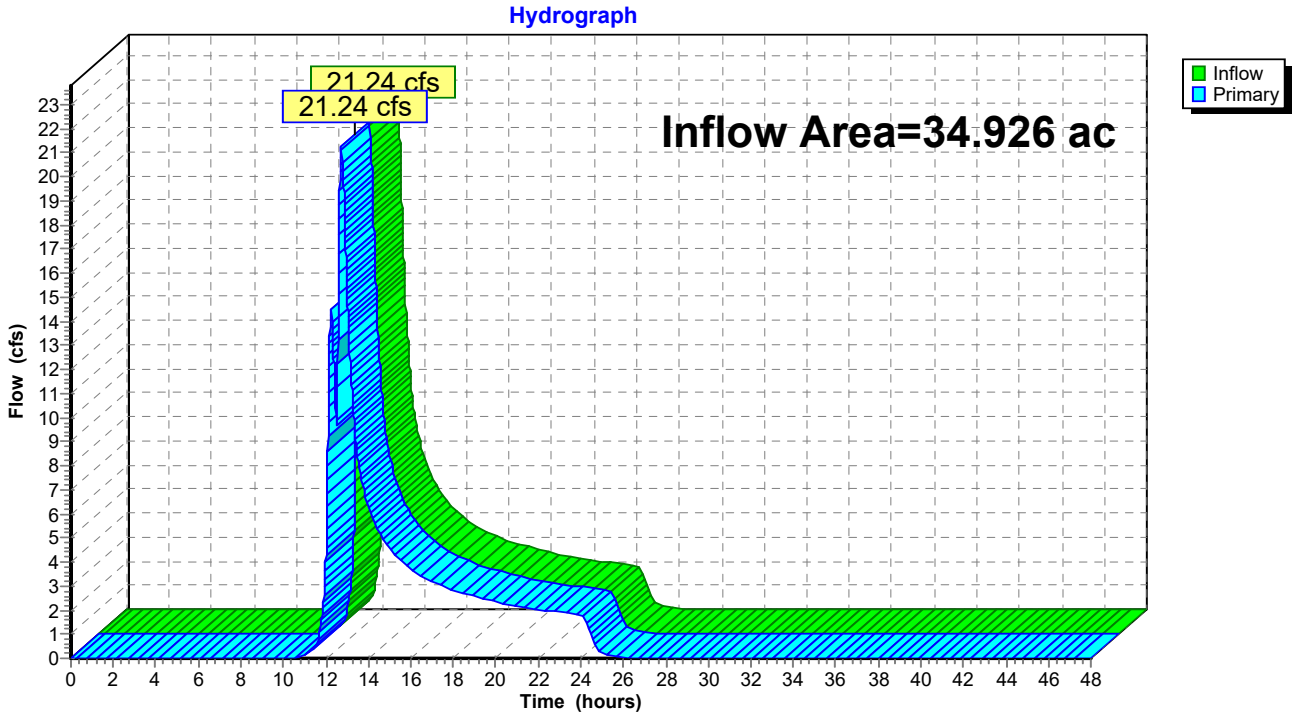
Subcatchment PR-C2: Proposed C2



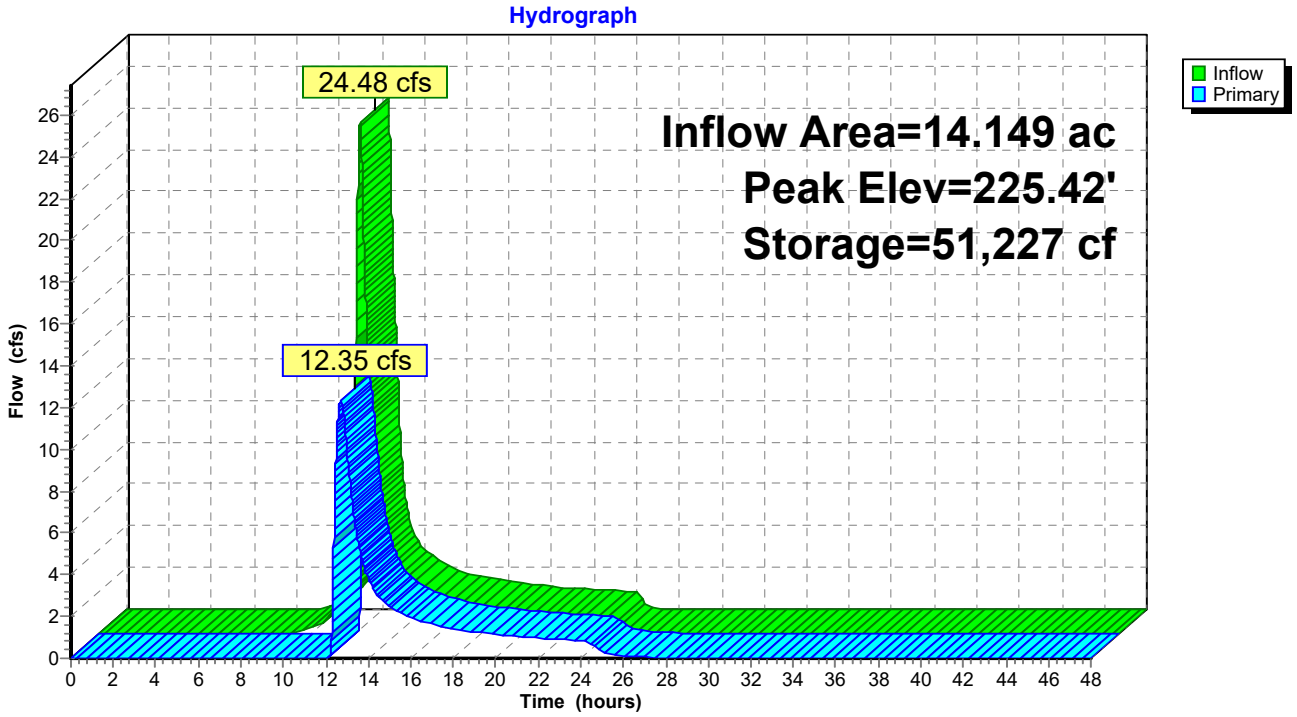
Pond 1P: Existing Wetland (EX Condition)



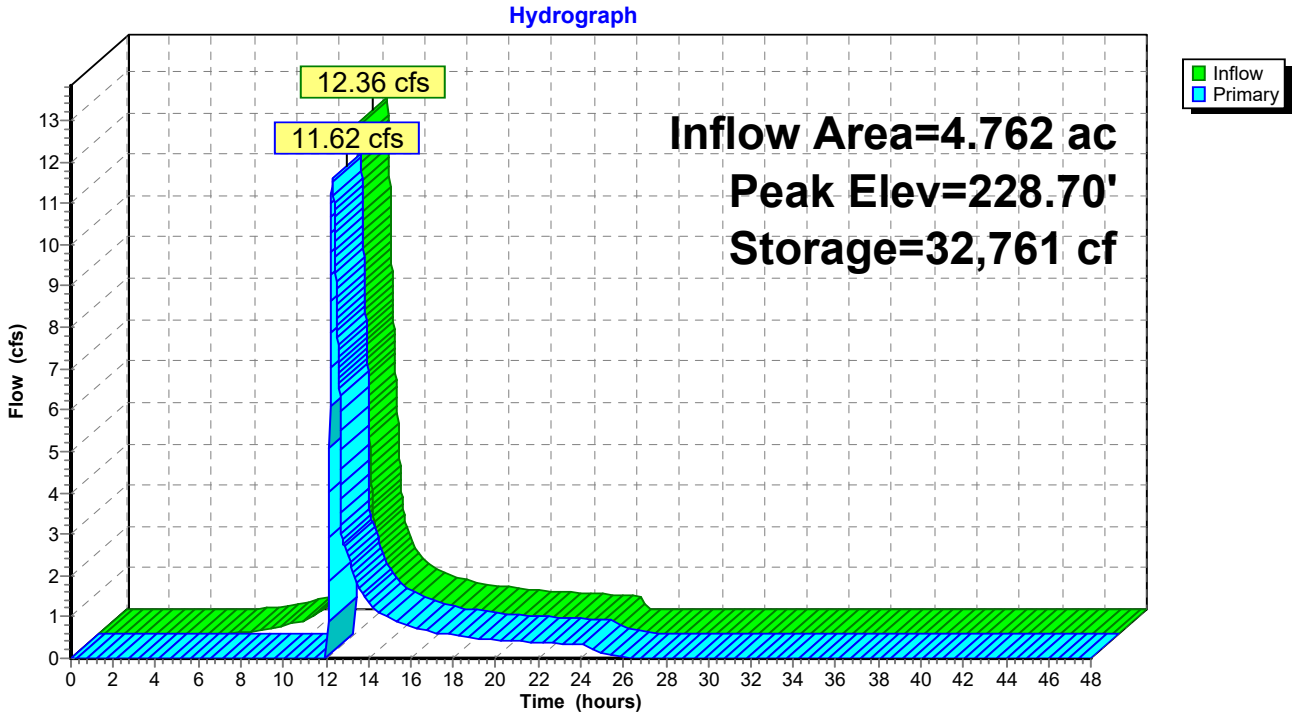
Pond 2P: Existing A



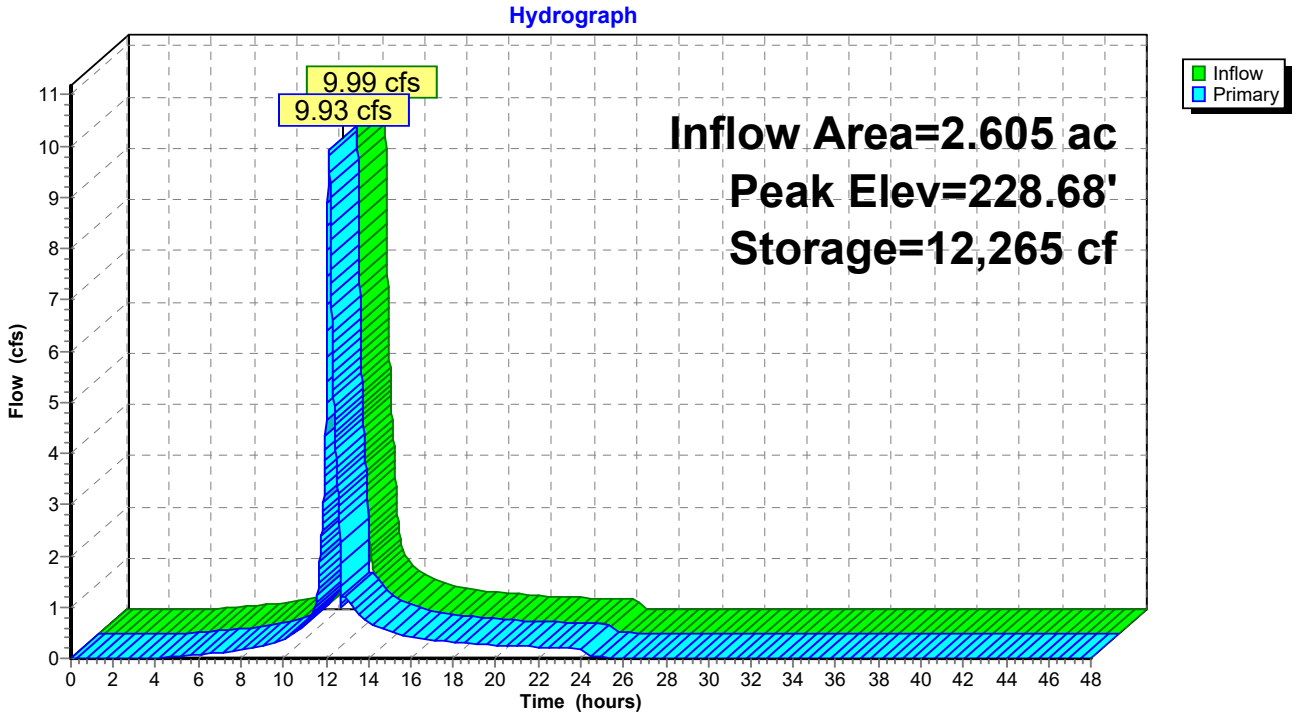
Pond 3P: Existing Wetland (PR Condition)



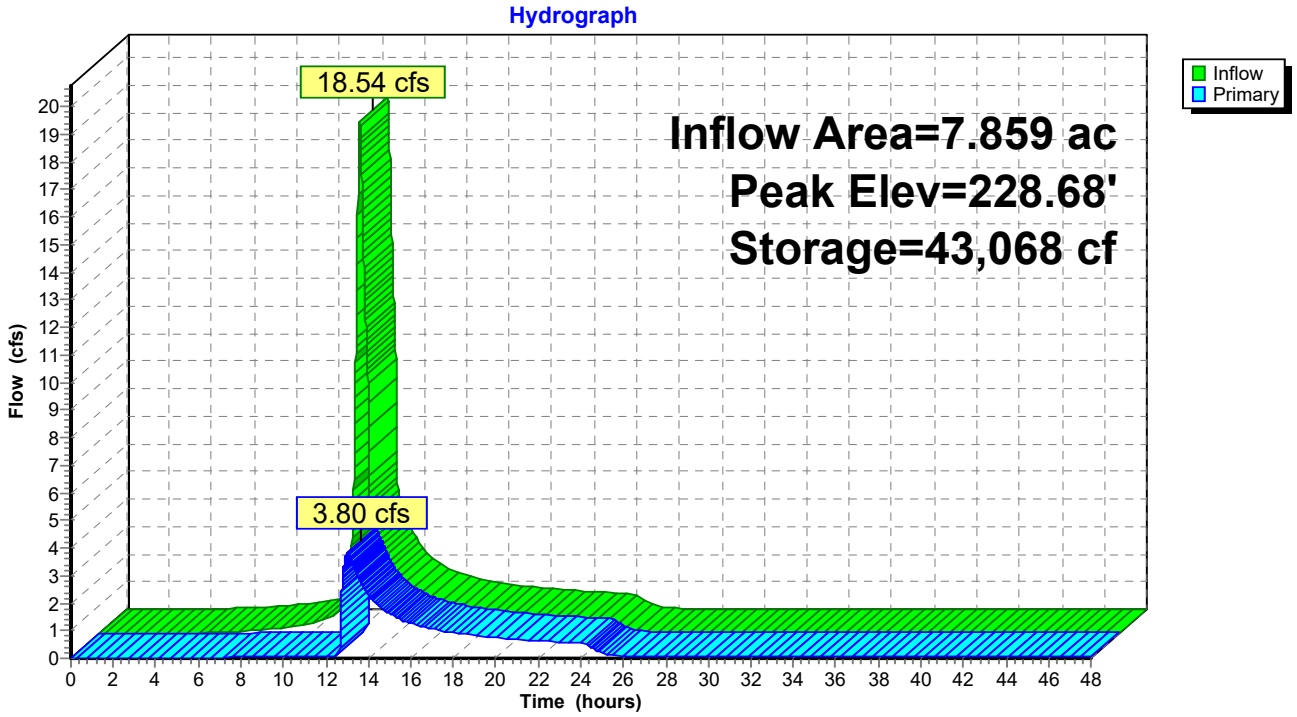
Pond 4P: Forebay & Bio A1-A



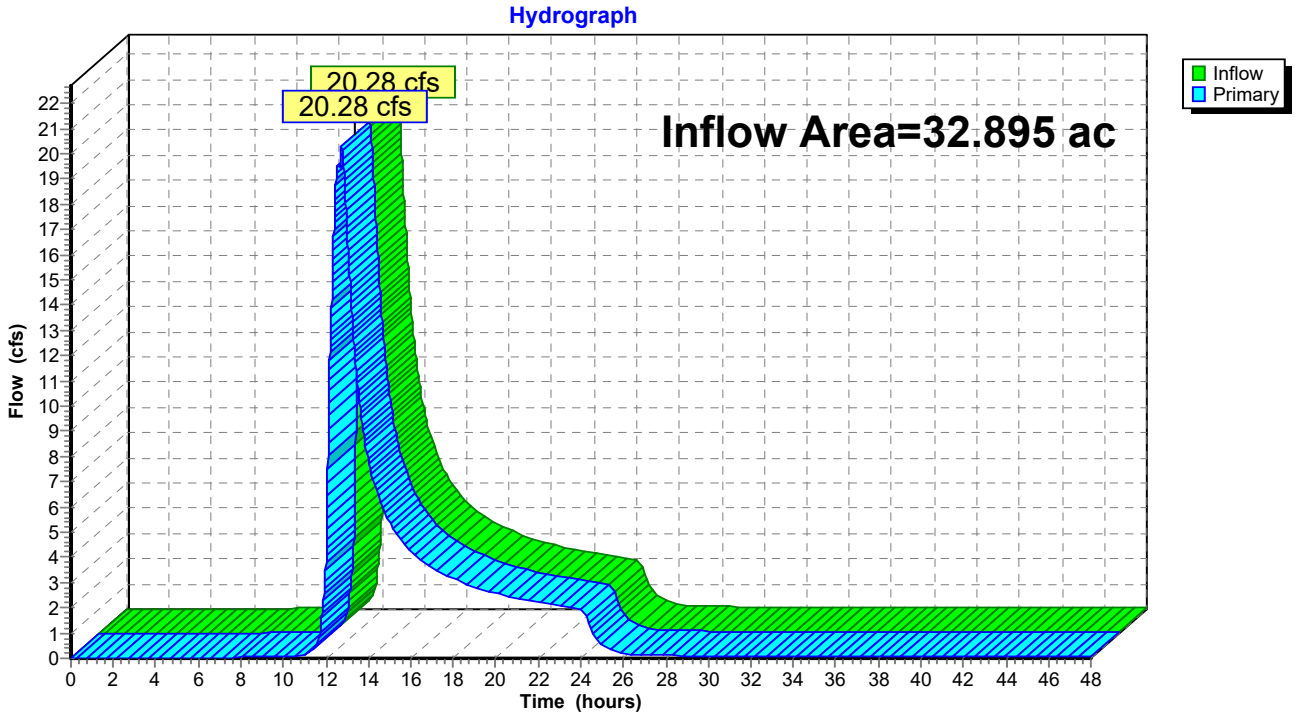
Pond 5P: Forebay A1-B



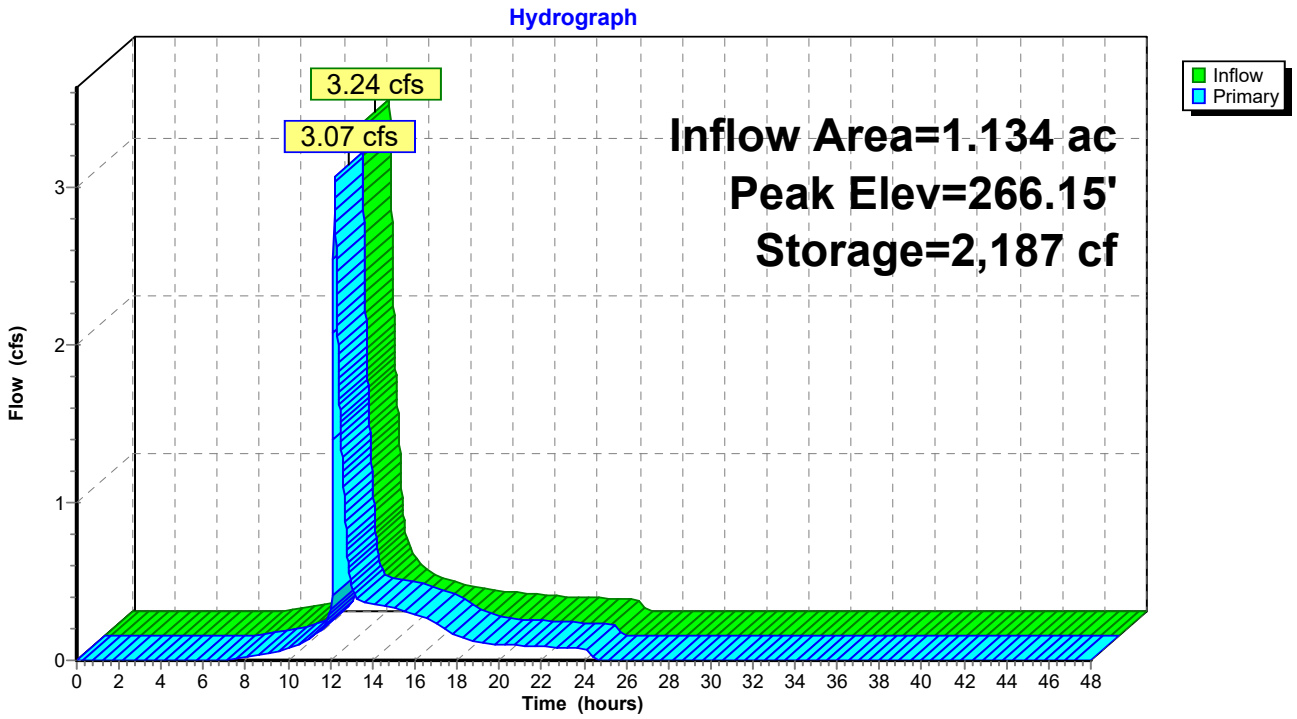
Pond 6P: Detention Basin A1



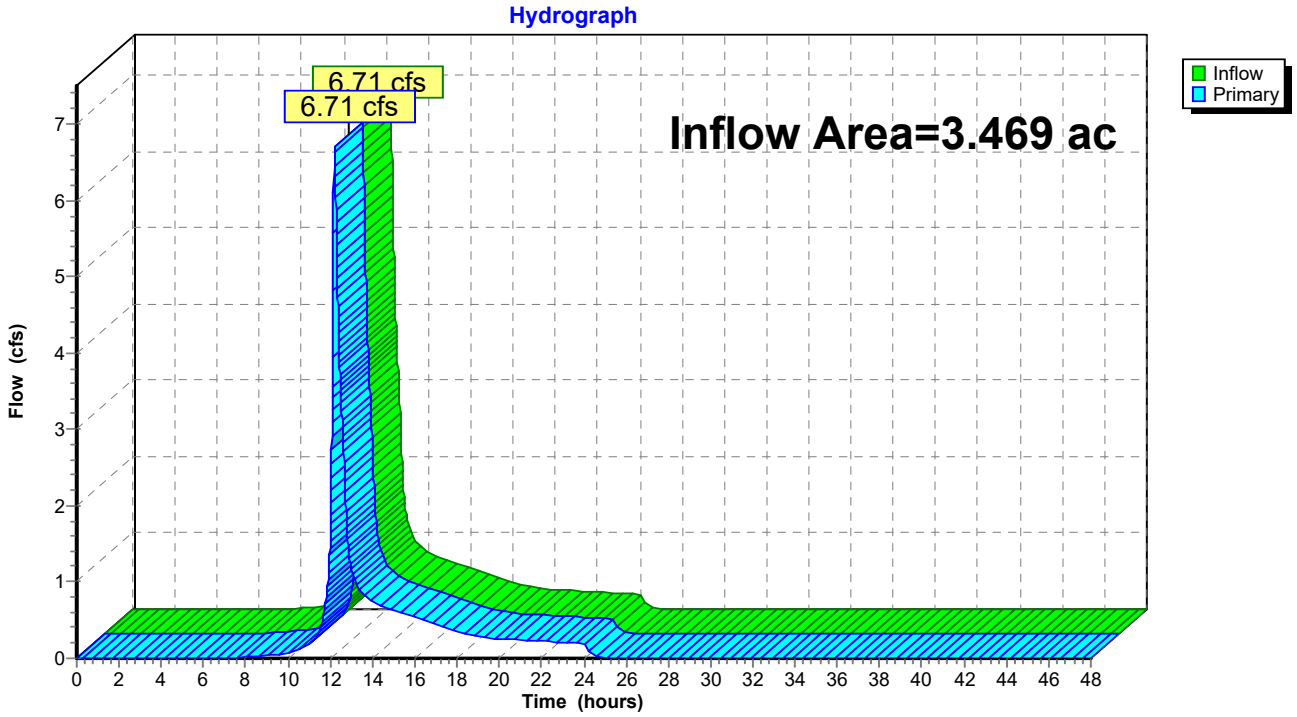
Pond 7P: Design Point A



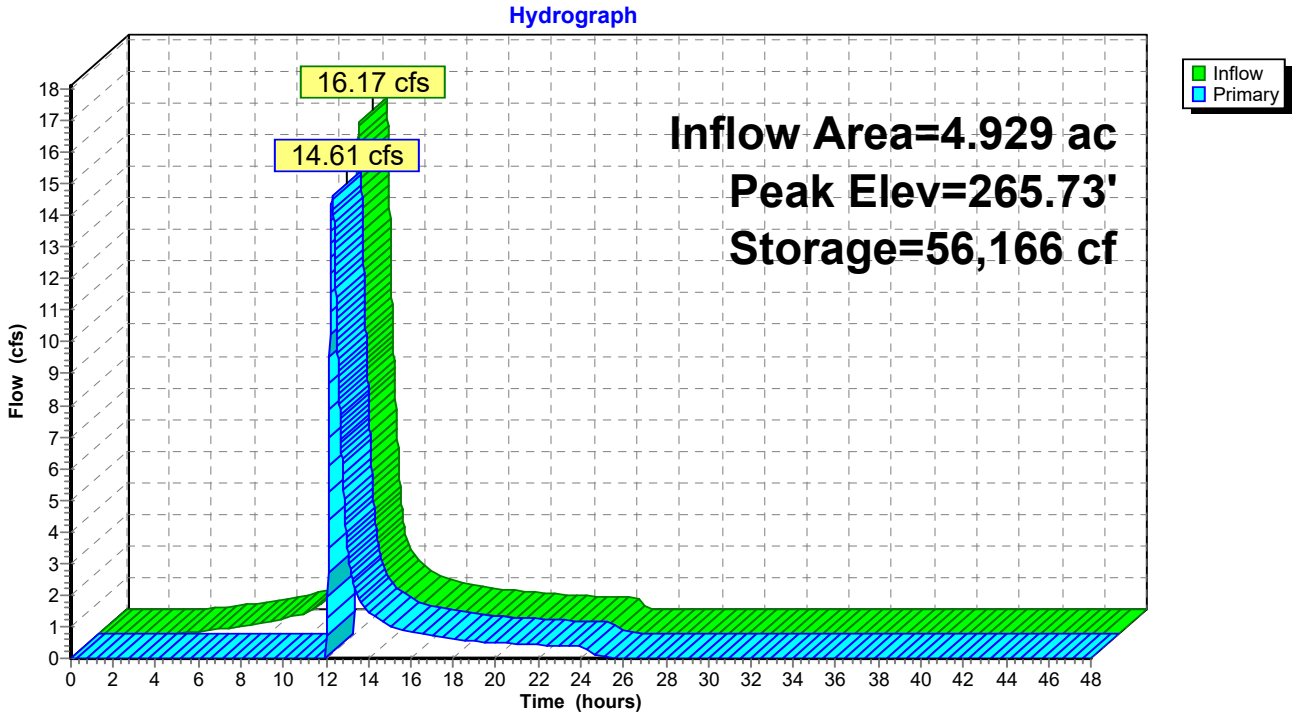
Pond 8P: Detention Basin B1



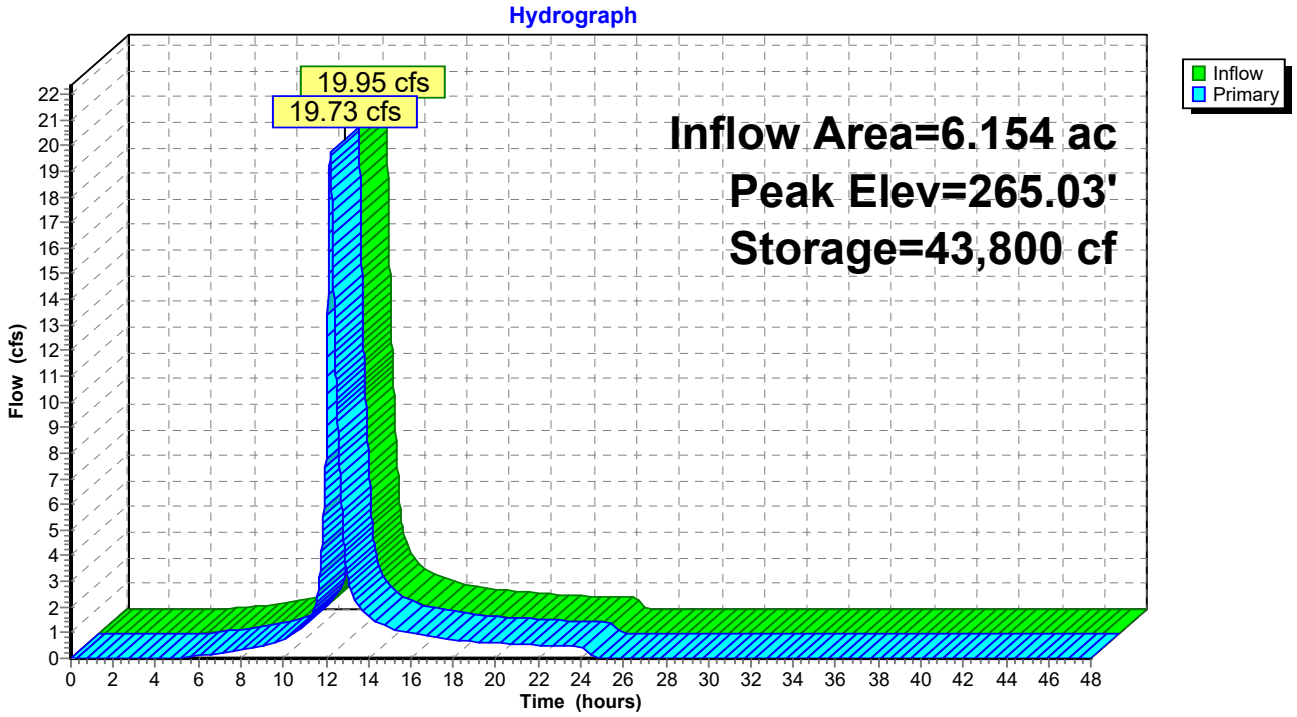
Pond 9P: Design Point B



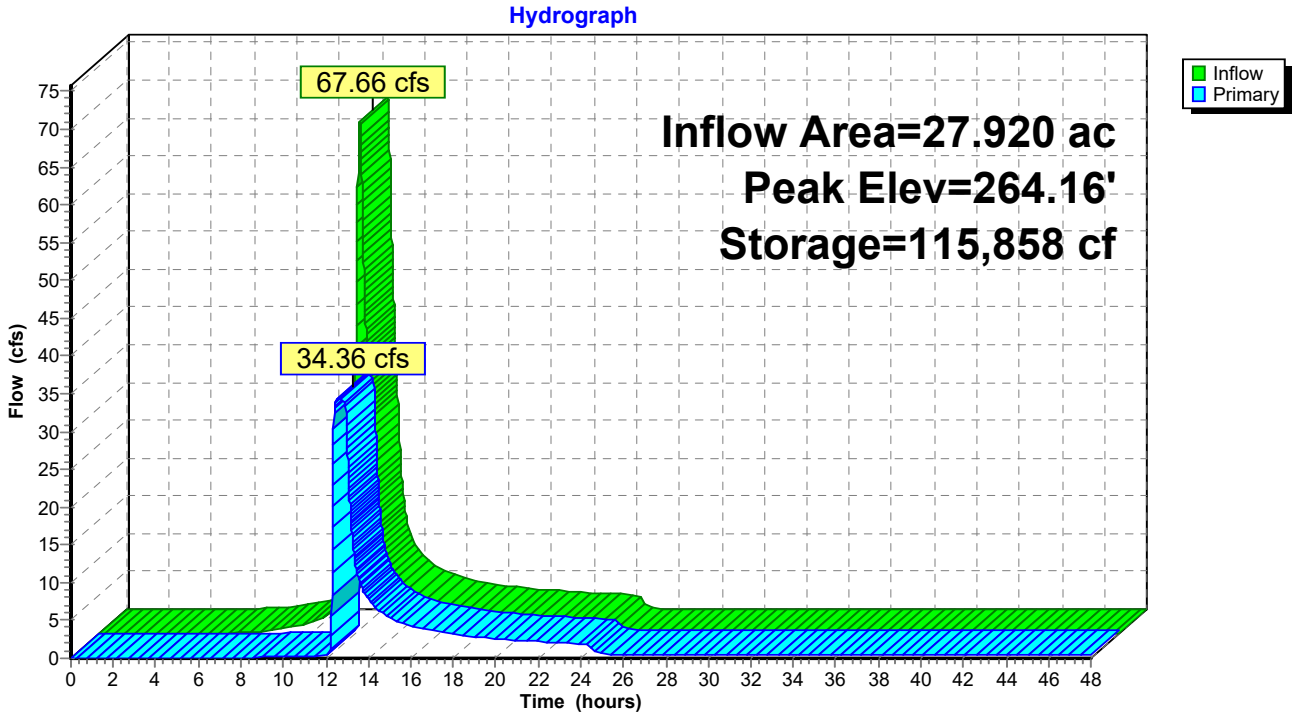
Pond 10P: Forebay & Bio C1-A



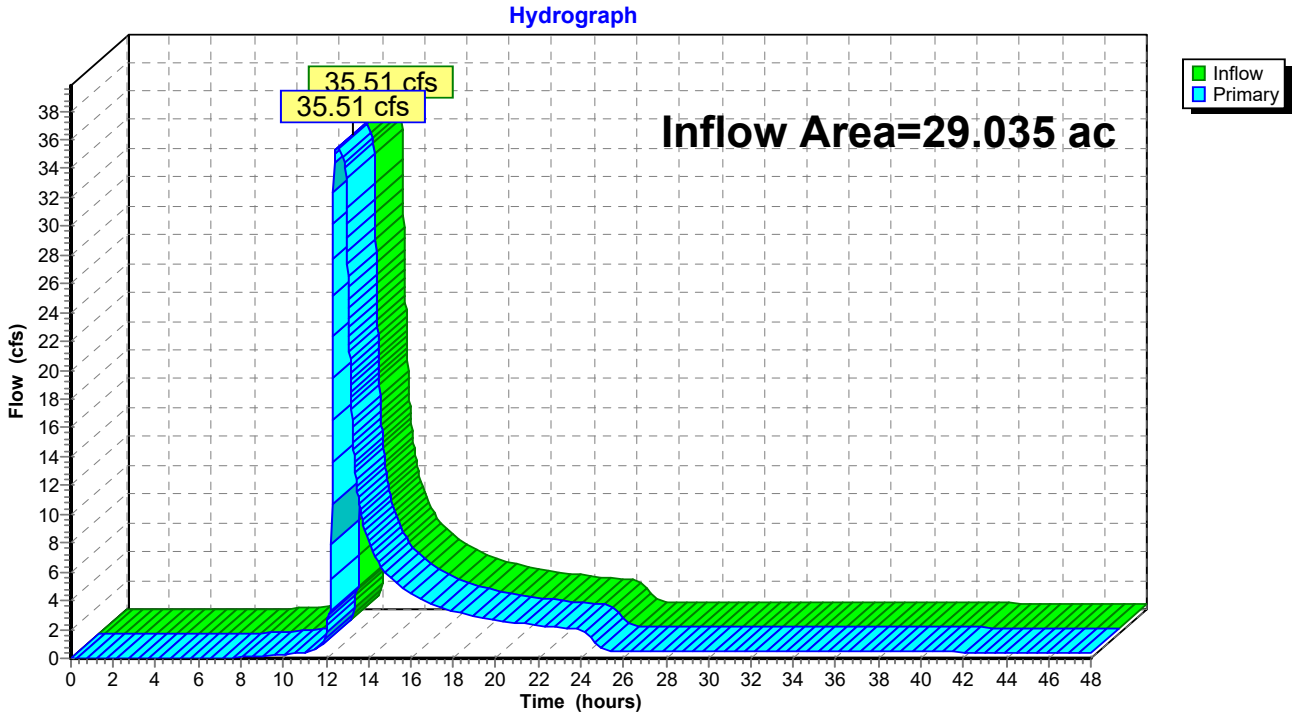
Pond 11P: Forebay C1-B



Pond 12P: Detention Basin C1



Pond 13P: Design Point C



APPENDIX 10

100-YEAR DESIGN STORM HYDROGRAPHS

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Time span=0.00-48.00 hrs, dt=0.01 hrs, 4801 points x 5
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EX-A1: Existing A1 Runoff Area=22.902 ac 8.12% Impervious Runoff Depth=3.85"
Tc=26.4 min CN=62 Runoff=54.66 cfs 7.354 af

Subcatchment EX-A2: Existing A2 Runoff Area=12.024 ac 1.27% Impervious Runoff Depth=3.51"
Tc=19.8 min CN=59 Runoff=29.41 cfs 3.512 af

Subcatchment EX-B: Existing B Runoff Area=7.465 ac 0.00% Impervious Runoff Depth=3.74"
Tc=18.6 min CN=61 Runoff=20.20 cfs 2.325 af

Subcatchment EX-C: Existing C Runoff Area=23.004 ac 0.93% Impervious Runoff Depth=4.79"
Tc=27.0 min CN=70 Runoff=68.57 cfs 9.187 af

Subcatchment PR-A1-A: Proposed A1-A Runoff Area=4.762 ac 47.67% Impervious Runoff Depth=5.86"
Tc=21.6 min CN=79 Runoff=19.12 cfs 2.327 af

Subcatchment PR-A1-B: Proposed A1-B Runoff Area=2.605 ac 63.57% Impervious Runoff Depth=6.70"
Tc=13.2 min CN=86 Runoff=14.41 cfs 1.455 af

Subcatchment PR-A1-C: Proposed A1-C Runoff Area=0.492 ac 0.00% Impervious Runoff Depth=3.97"
Tc=6.0 min CN=63 Runoff=2.20 cfs 0.163 af

Subcatchment PR-A2-A: Proposed A2-A Runoff Area=14.149 ac 15.15% Impervious Runoff Depth=4.56"
Tc=23.4 min CN=68 Runoff=42.76 cfs 5.372 af

Subcatchment PR-A2-B: Proposed A2-B Runoff Area=10.887 ac 2.63% Impervious Runoff Depth=3.51"
Tc=20.4 min CN=59 Runoff=26.26 cfs 3.180 af

Subcatchment PR-B1: Proposed B1 Runoff Area=1.134 ac 0.00% Impervious Runoff Depth=5.50"
Tc=14.4 min CN=76 Runoff=5.13 cfs 0.520 af

Subcatchment PR-B2: Proposed B2 Runoff Area=2.335 ac 0.00% Impervious Runoff Depth=3.85"
Tc=16.2 min CN=62 Runoff=6.93 cfs 0.750 af

Subcatchment PR-C1-A: Proposed C1-A Runoff Area=4.929 ac 70.16% Impervious Runoff Depth=6.94"
Tc=20.4 min CN=88 Runoff=23.18 cfs 2.851 af

Subcatchment PR-C1-B: Proposed C1-B Runoff Area=6.154 ac 61.08% Impervious Runoff Depth=6.46"
Tc=17.4 min CN=84 Runoff=29.41 cfs 3.313 af

Subcatchment PR-C1-C: Proposed C1-C Runoff Area=16.837 ac 0.26% Impervious Runoff Depth=5.15"
Tc=23.4 min CN=73 Runoff=57.56 cfs 7.223 af

Subcatchment PR-C2: Proposed C2 Runoff Area=1.115 ac 15.16% Impervious Runoff Depth=5.39"
Tc=16.8 min CN=75 Runoff=4.62 cfs 0.500 af

Pond 1P: Existing Wetland (EX Condition) Peak Elev=225.82' Storage=76,109 cf Inflow=54.66 cfs 7.354 af
Outflow=48.95 cfs 6.233 af

Pond 2P: Existing A Inflow=70.33 cfs 9.745 af
Primary=70.33 cfs 9.745 af

Pond 3P: Existing Wetland (PR Condition) Peak Elev=225.75' Storage=69,018 cf Inflow=42.76 cfs 5.372 af
Outflow=29.64 cfs 4.774 af

Pond 4P: Forebay & Bio A1-A Peak Elev=229.05' Storage=38,284 cf Inflow=19.12 cfs 2.327 af
Outflow=16.31 cfs 2.022 af

Pond 5P: Forebay A1-B Peak Elev=229.04' Storage=13,586 cf Inflow=14.41 cfs 1.455 af
Outflow=14.34 cfs 1.455 af

Pond 6P: Detention Basin A1 Peak Elev=229.04' Storage=47,582 cf Inflow=30.54 cfs 3.639 af
Outflow=18.82 cfs 2.846 af

Pond 7P: Design Point A Inflow=66.91 cfs 10.800 af
Primary=66.91 cfs 10.800 af

Pond 8P: Detention Basin B1 Peak Elev=266.22' Storage=2,308 cf Inflow=5.13 cfs 0.520 af
Outflow=5.09 cfs 0.520 af

Pond 9P: Design Point B Inflow=11.99 cfs 1.270 af
Primary=11.99 cfs 1.270 af

Pond 10P: Forebay & Bio C1-A Peak Elev=265.97' Storage=62,104 cf Inflow=23.18 cfs 2.851 af
Outflow=21.98 cfs 2.376 af

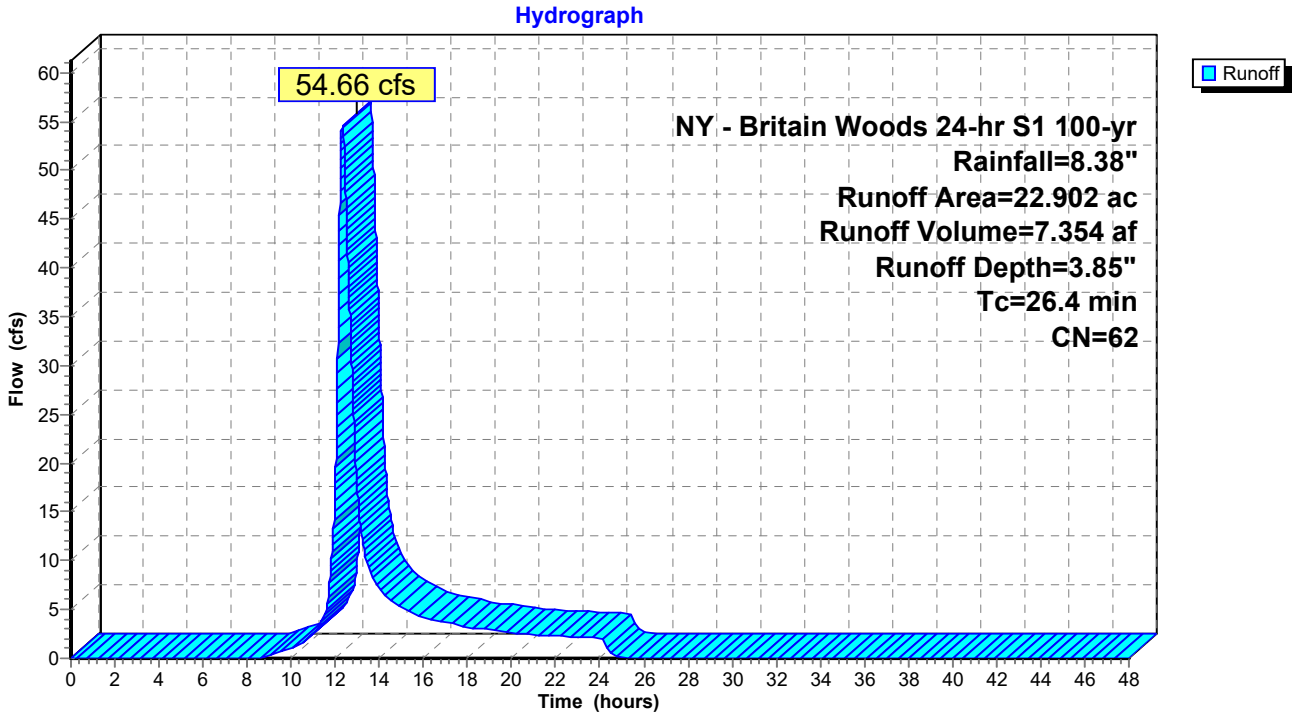
Pond 11P: Forebay C1-B Peak Elev=265.97' Storage=52,727 cf Inflow=29.41 cfs 3.313 af
Outflow=29.18 cfs 3.313 af

Pond 12P: Detention Basin C1 Peak Elev=265.97' Storage=179,909 cf Inflow=106.73 cfs 12.912 af
Outflow=46.95 cfs 11.946 af

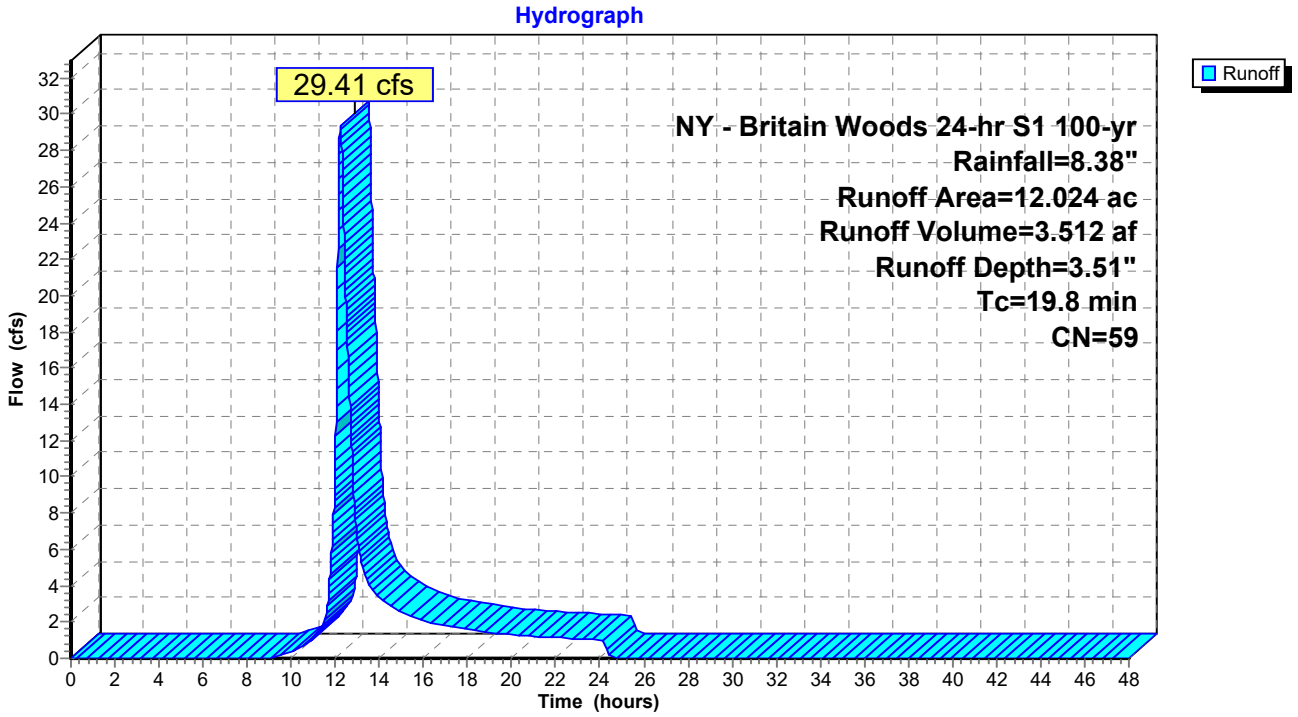
Pond 13P: Design Point C Inflow=48.50 cfs 12.447 af
Primary=48.50 cfs 12.447 af

Total Runoff Area = 130.794 ac Runoff Volume = 50.032 af Average Runoff Depth = 4.59"
87.76% Pervious = 114.784 ac 12.24% Impervious = 16.010 ac

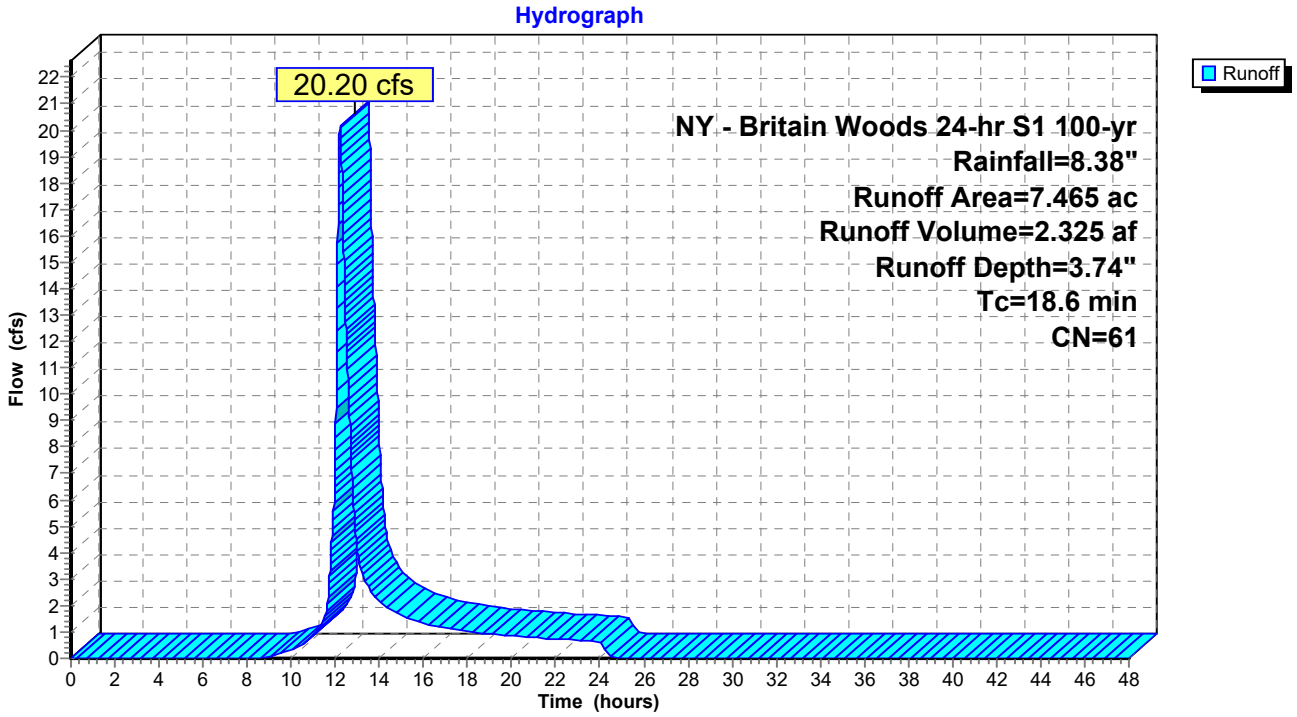
Subcatchment EX-A1: Existing A1



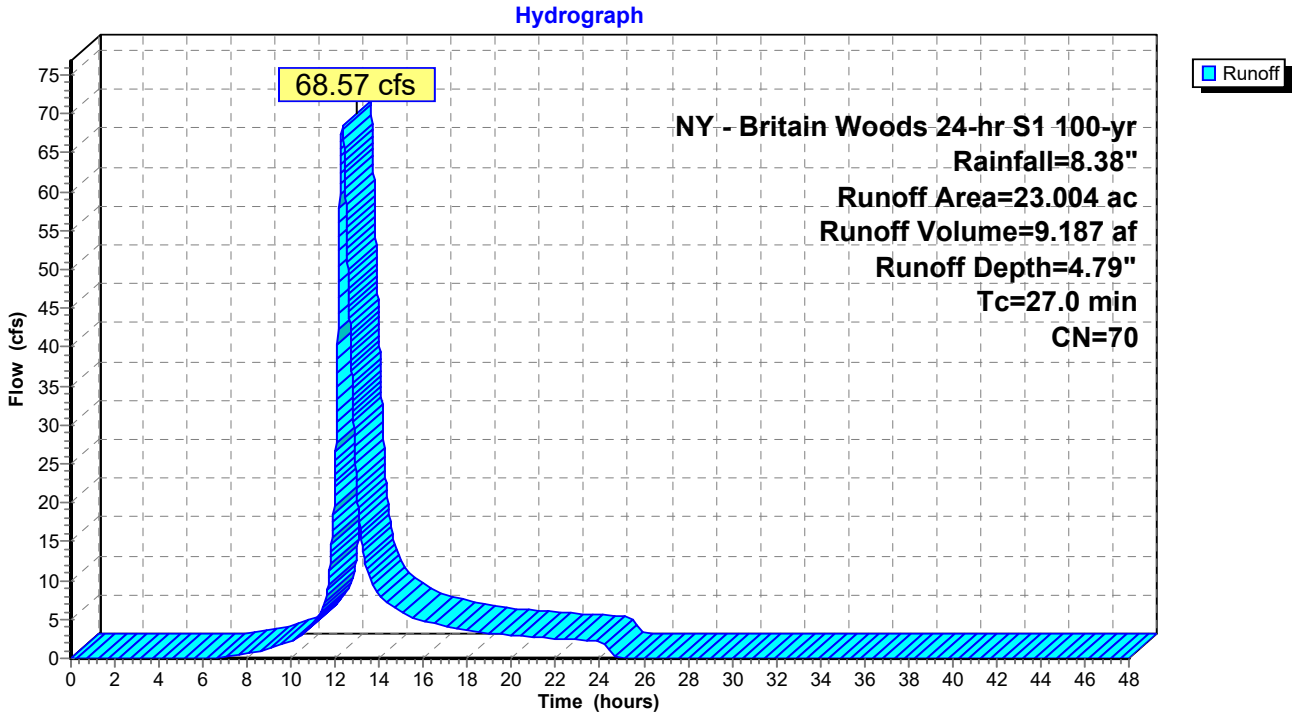
Subcatchment EX-A2: Existing A2



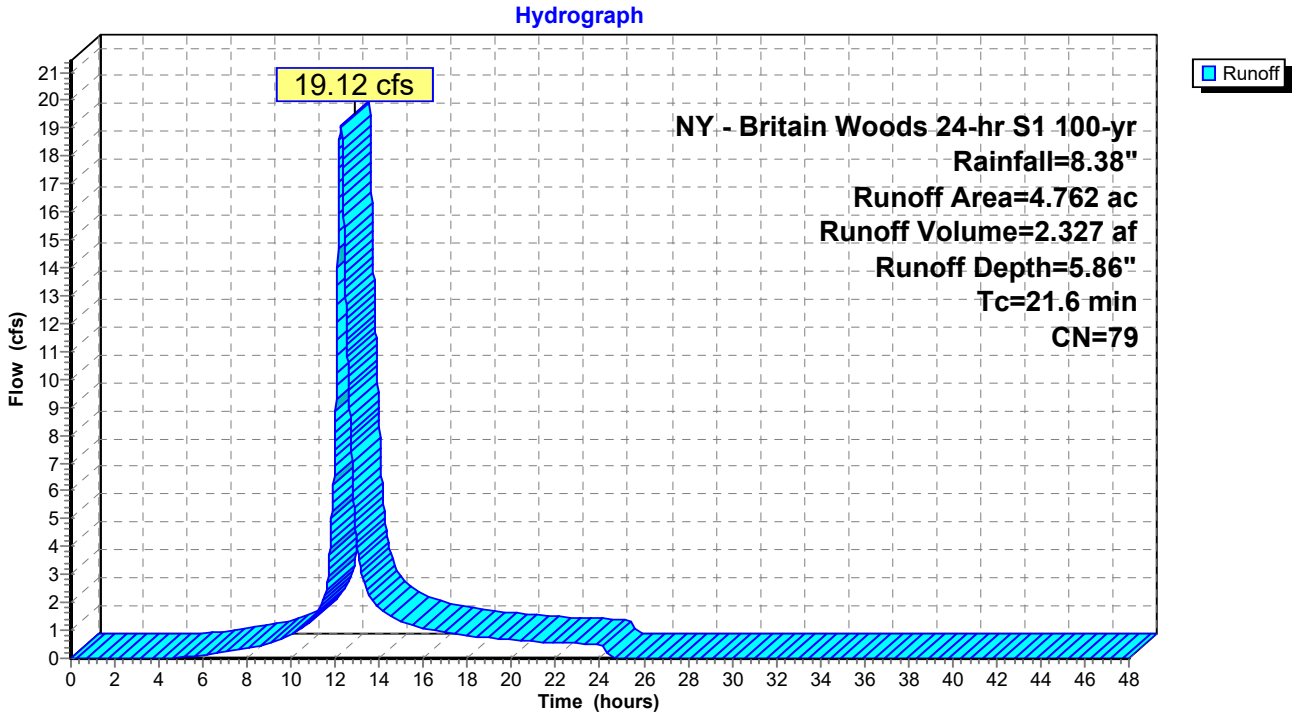
Subcatchment EX-B: Existing B



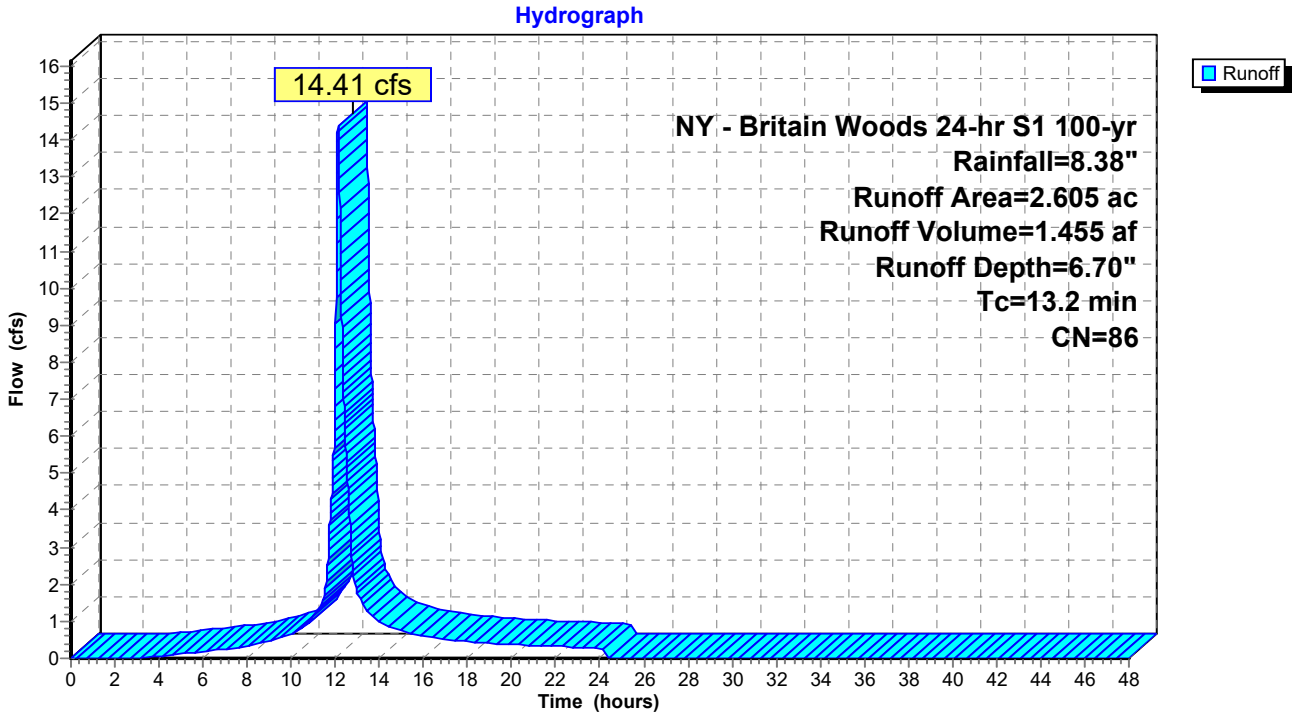
Subcatchment EX-C: Existing C



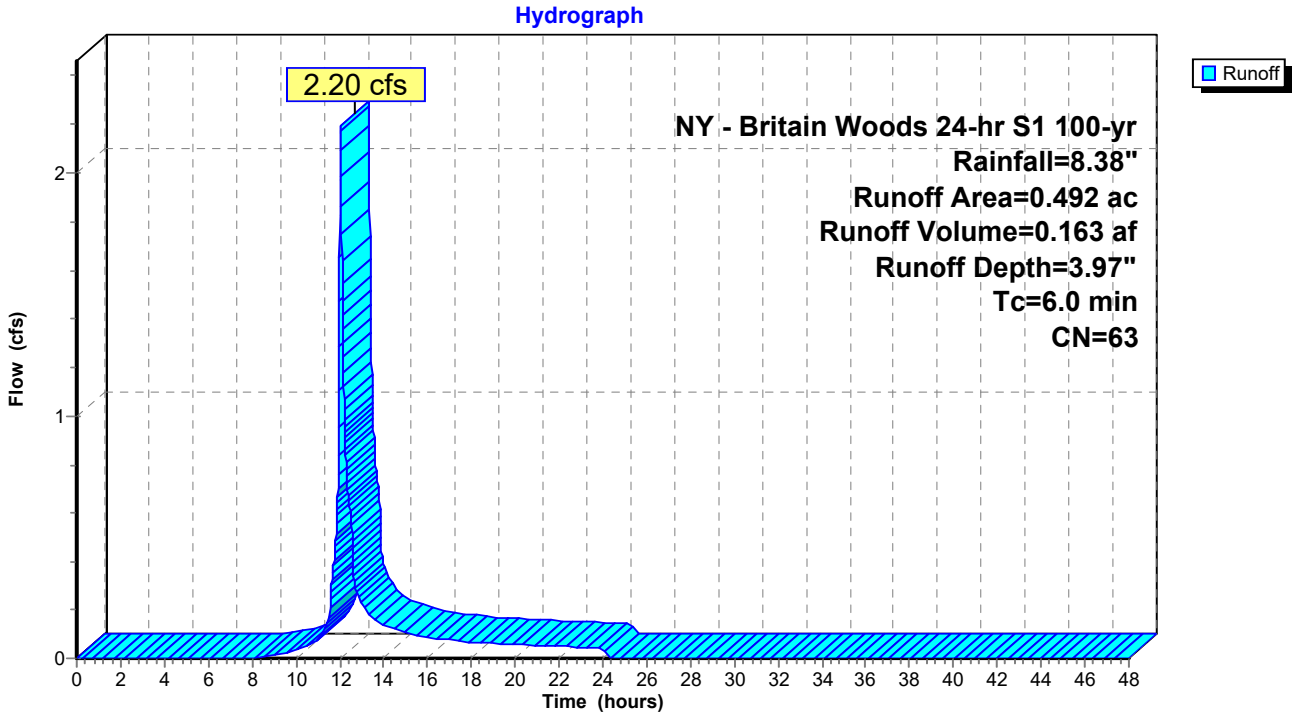
Subcatchment PR-A1-A: Proposed A1-A



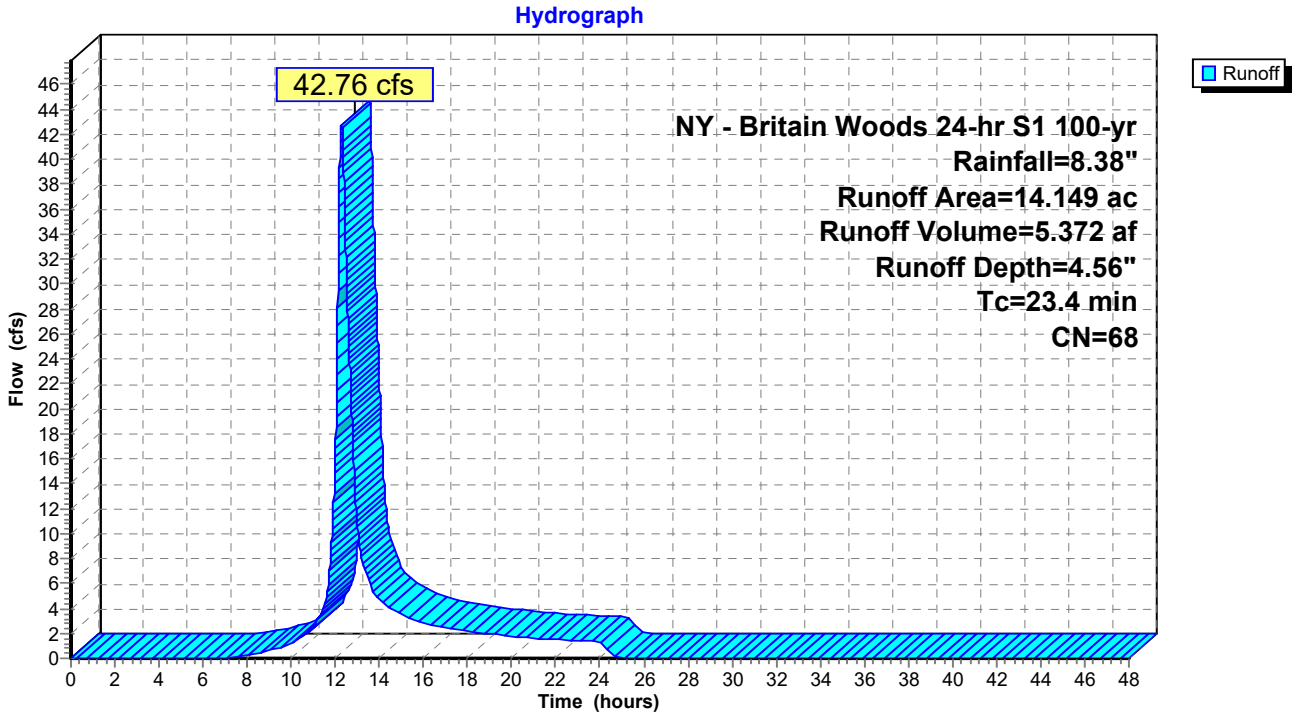
Subcatchment PR-A1-B: Proposed A1-B



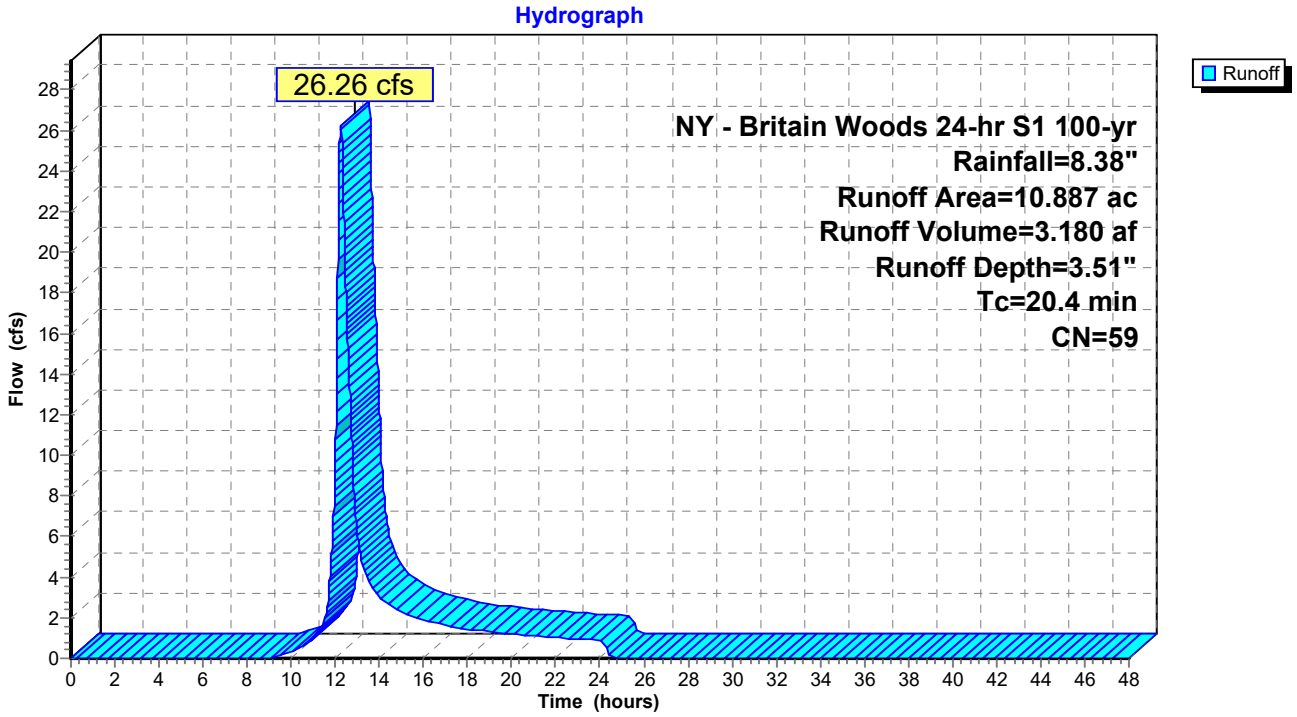
Subcatchment PR-A1-C: Proposed A1-C



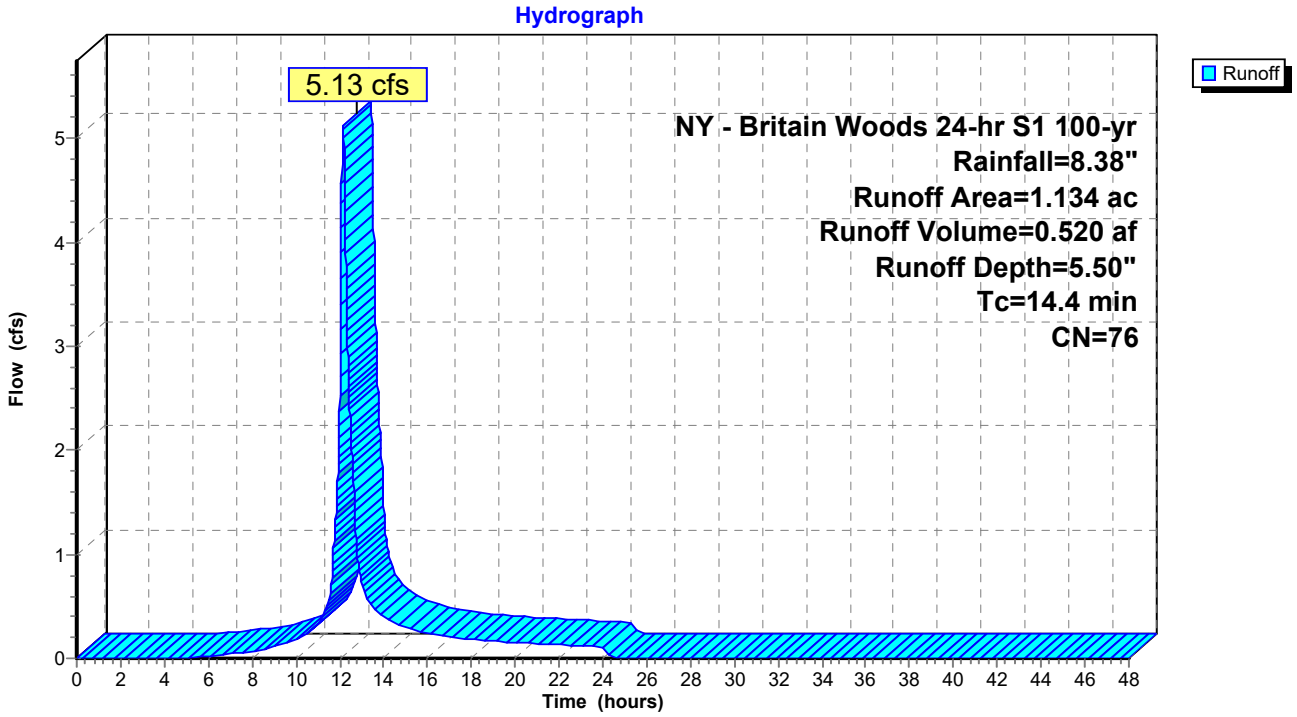
Subcatchment PR-A2-A: Proposed A2-A



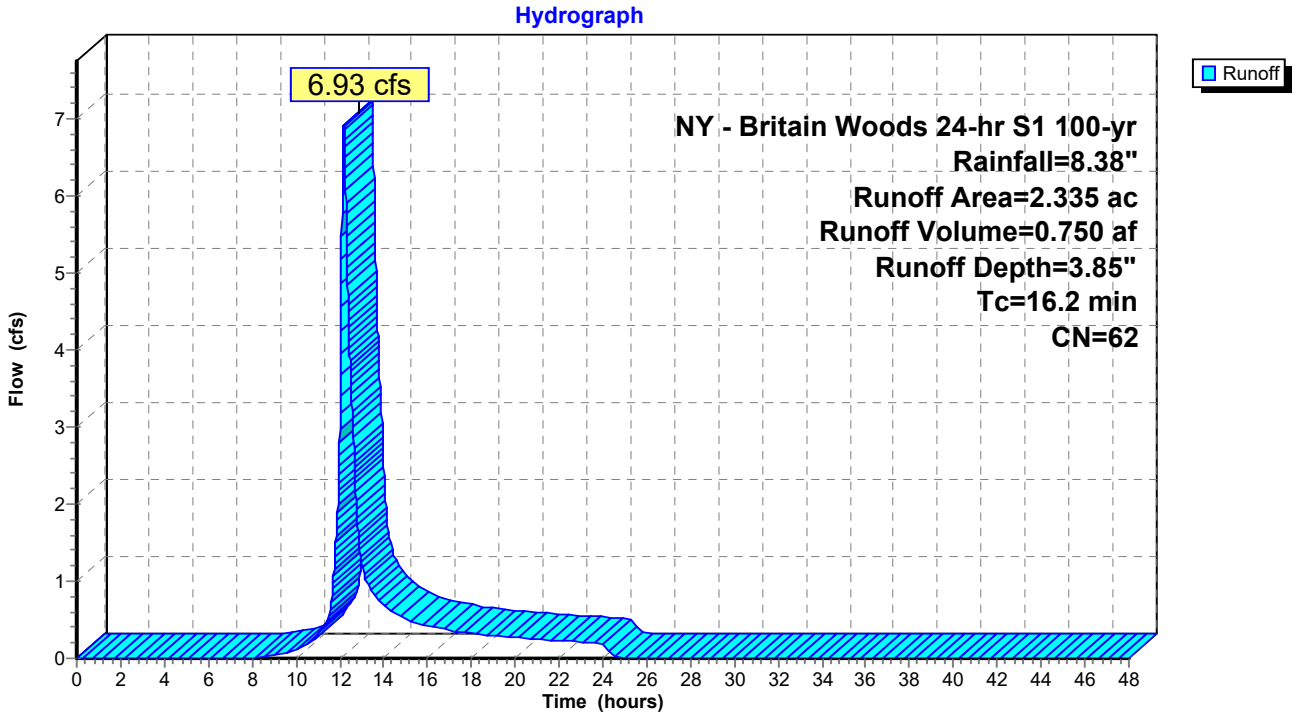
Subcatchment PR-A2-B: Proposed A2-B



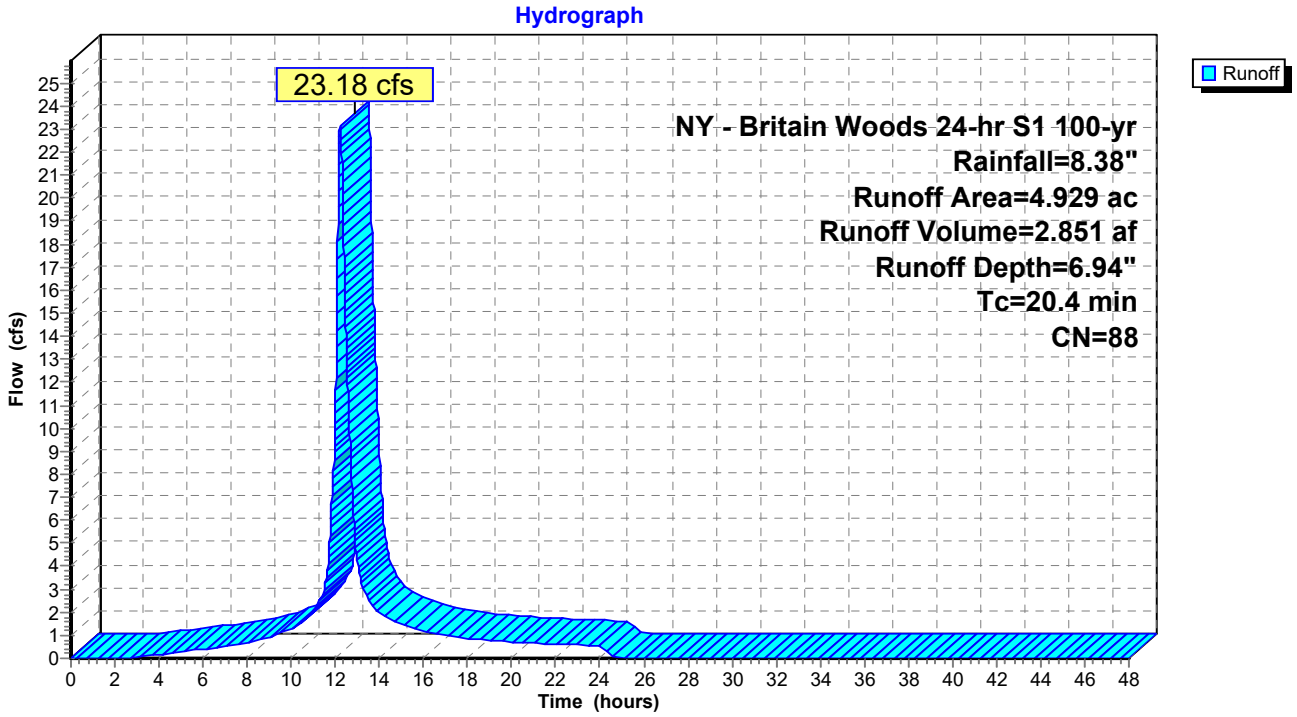
Subcatchment PR-B1: Proposed B1



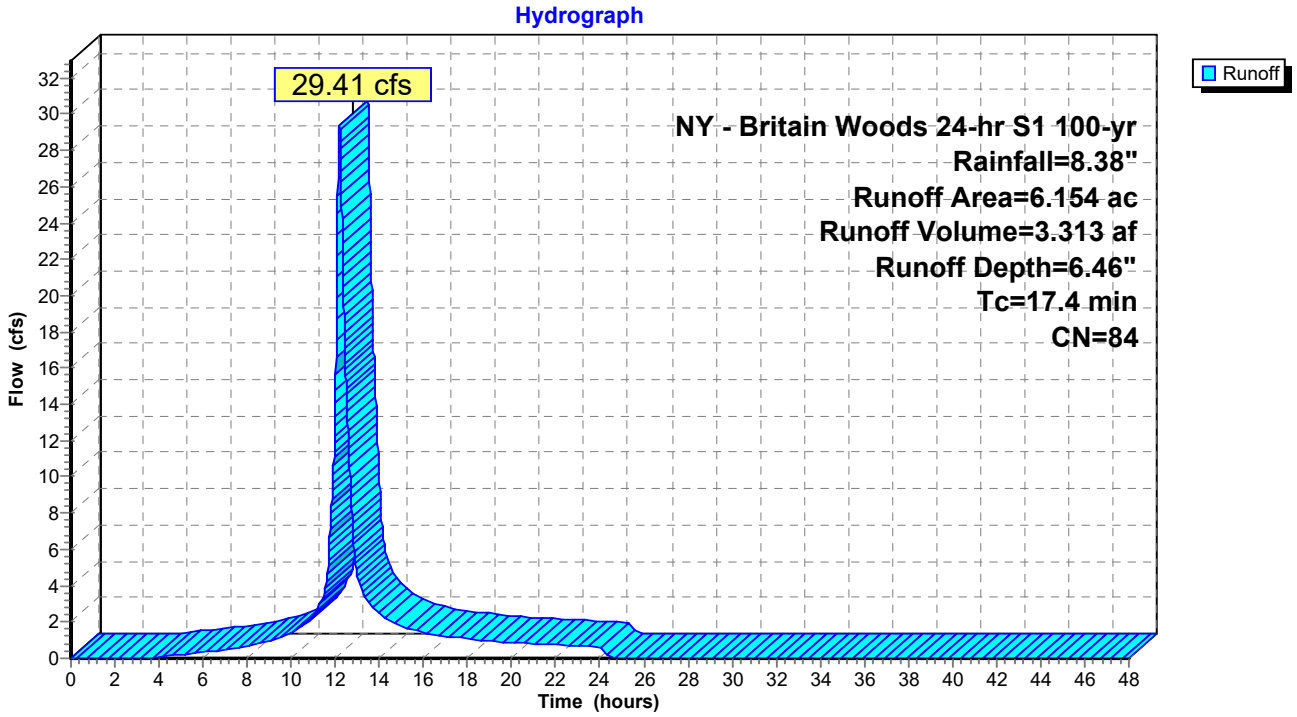
Subcatchment PR-B2: Proposed B2



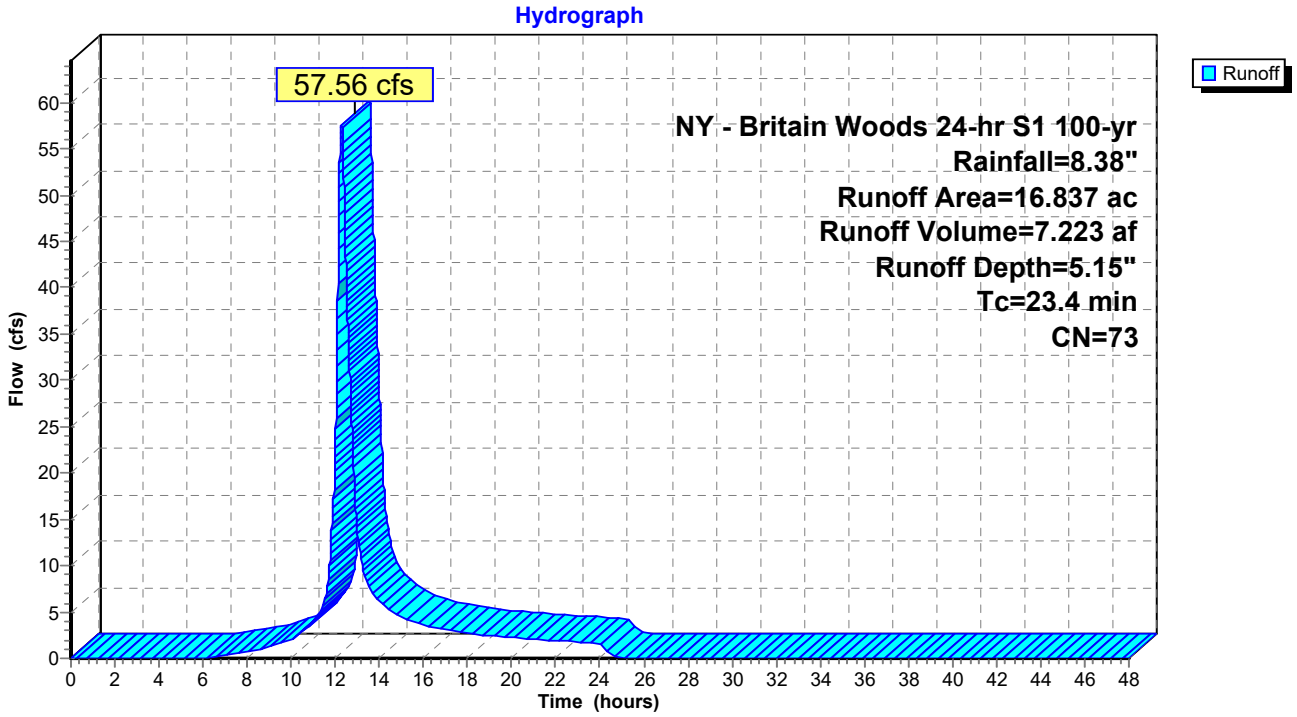
Subcatchment PR-C1-A: Proposed C1-A



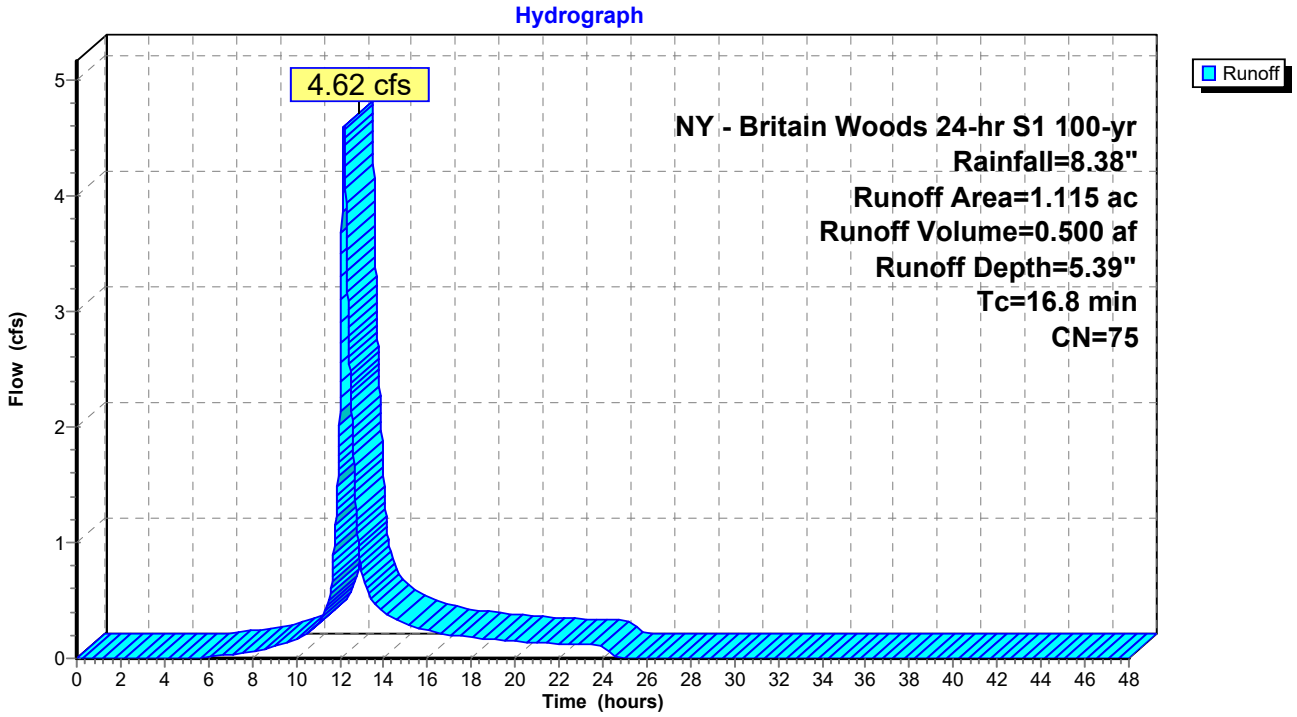
Subcatchment PR-C1-B: Proposed C1-B



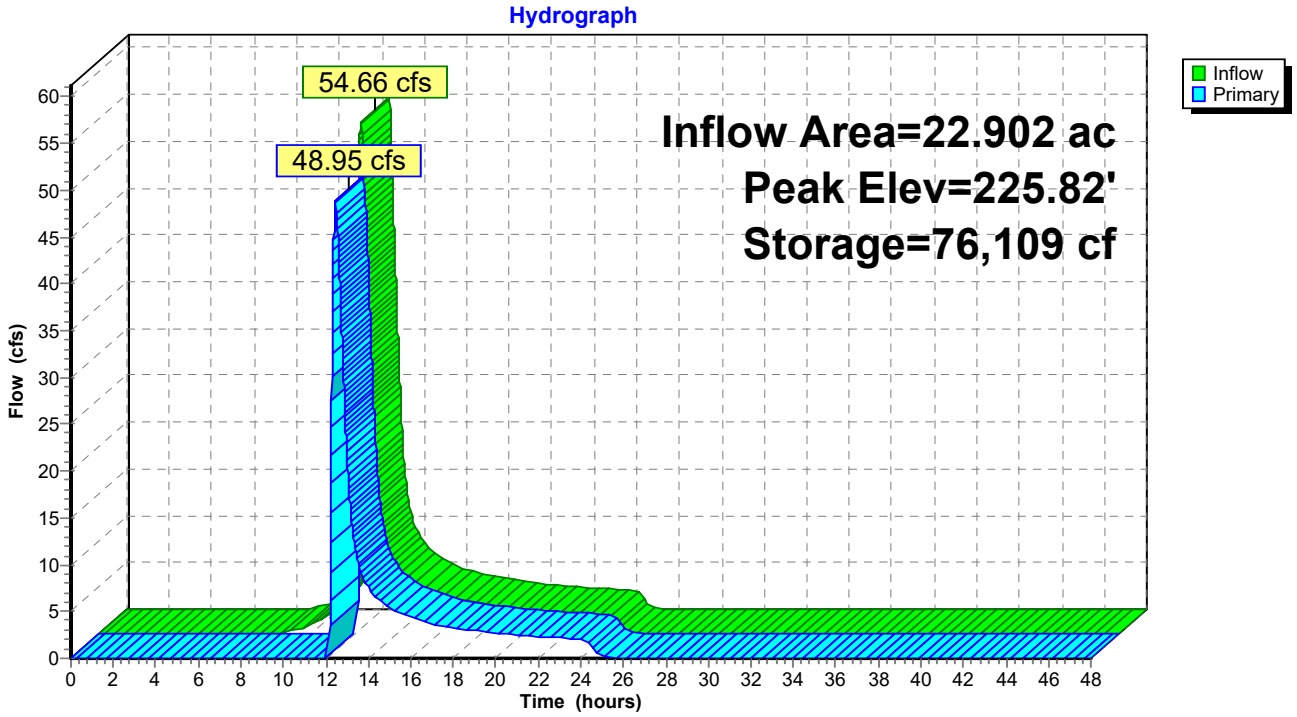
Subcatchment PR-C1-C: Proposed C1-C



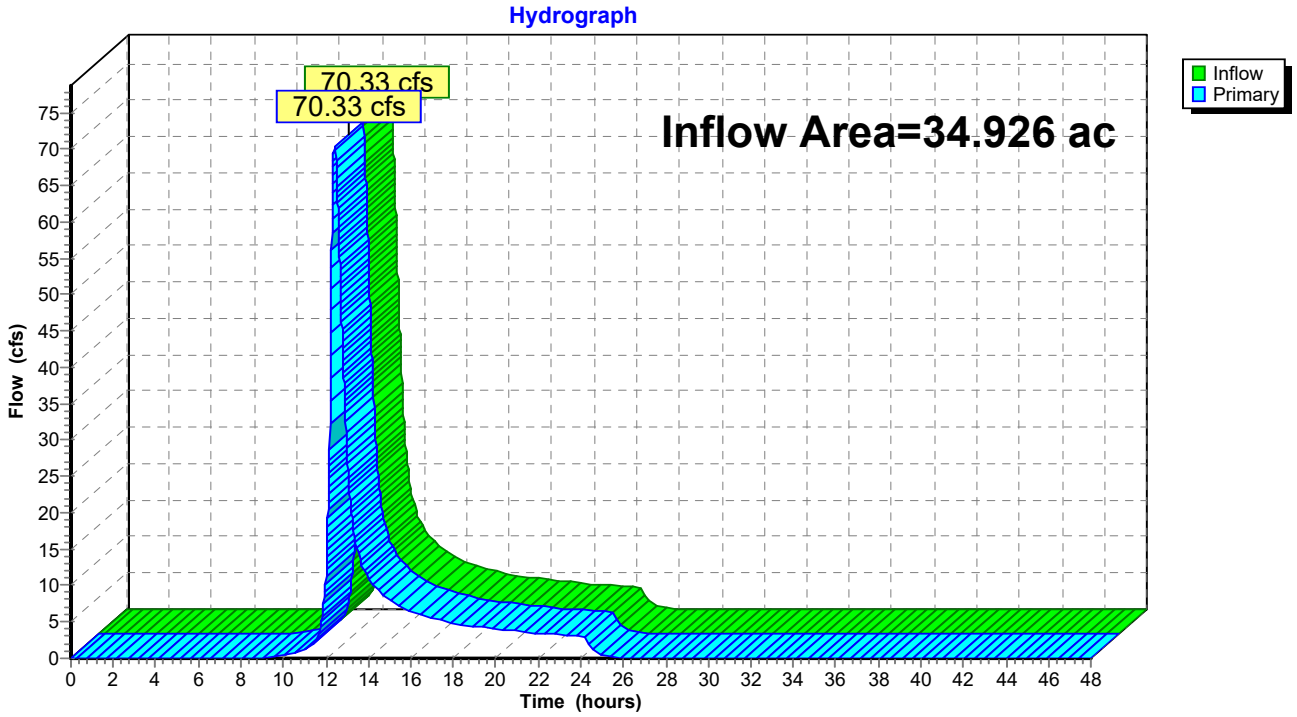
Subcatchment PR-C2: Proposed C2



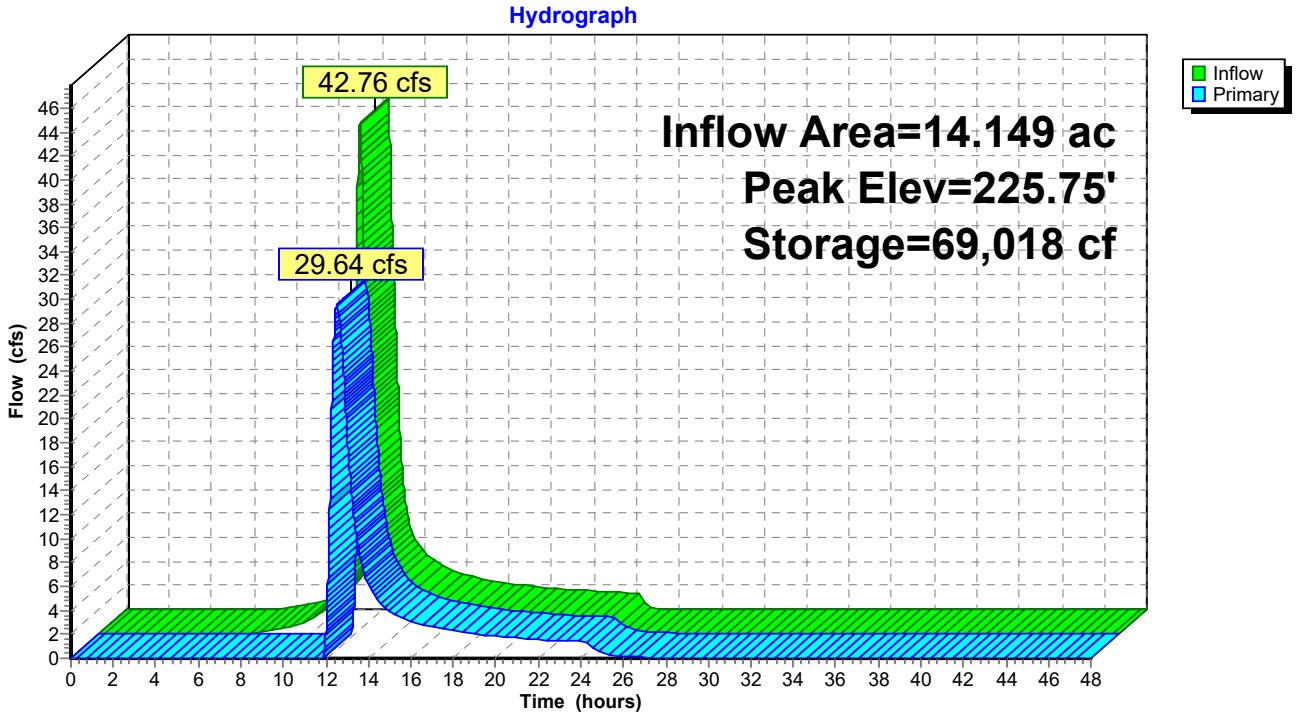
Pond 1P: Existing Wetland (EX Condition)



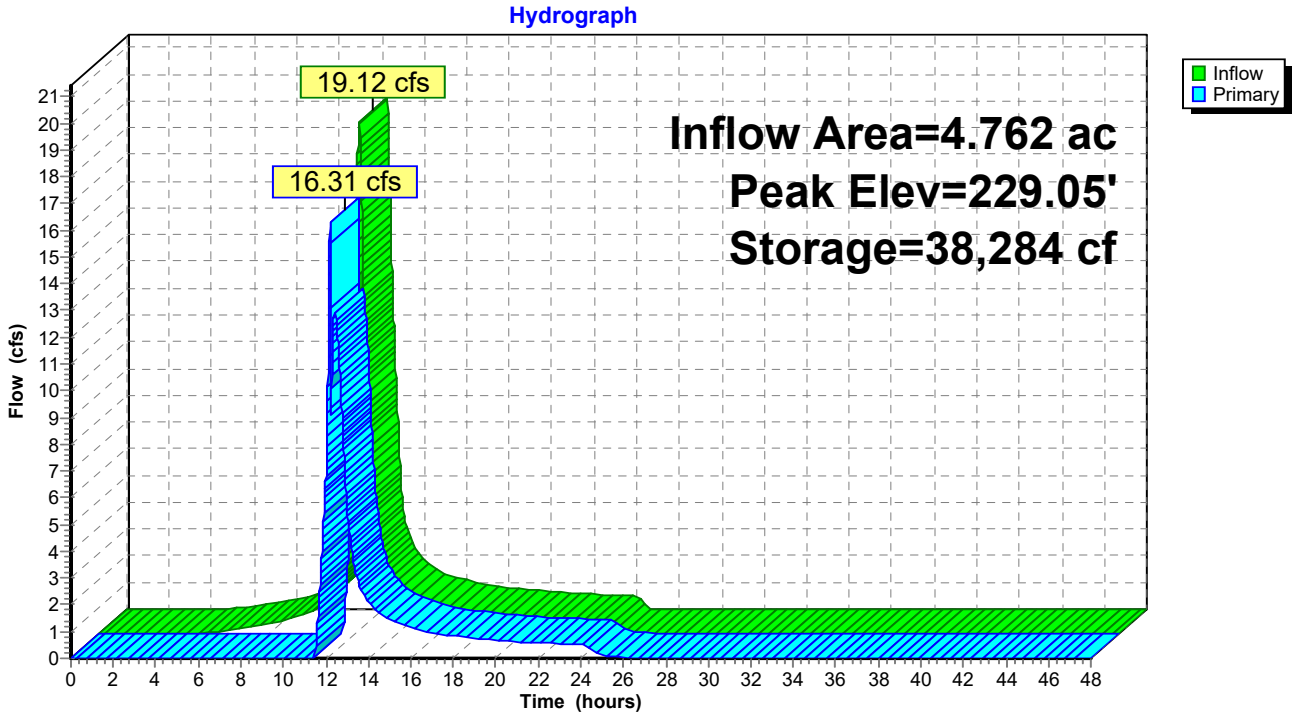
Pond 2P: Existing A



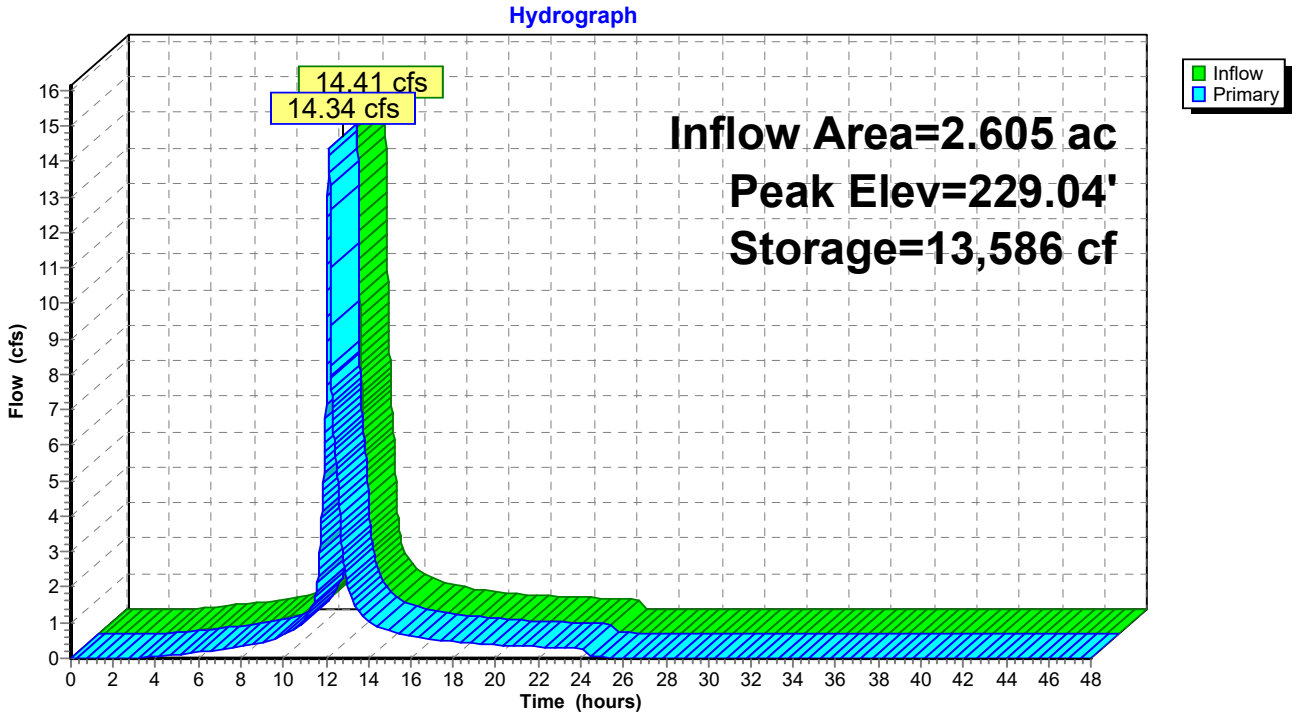
Pond 3P: Existing Wetland (PR Condition)



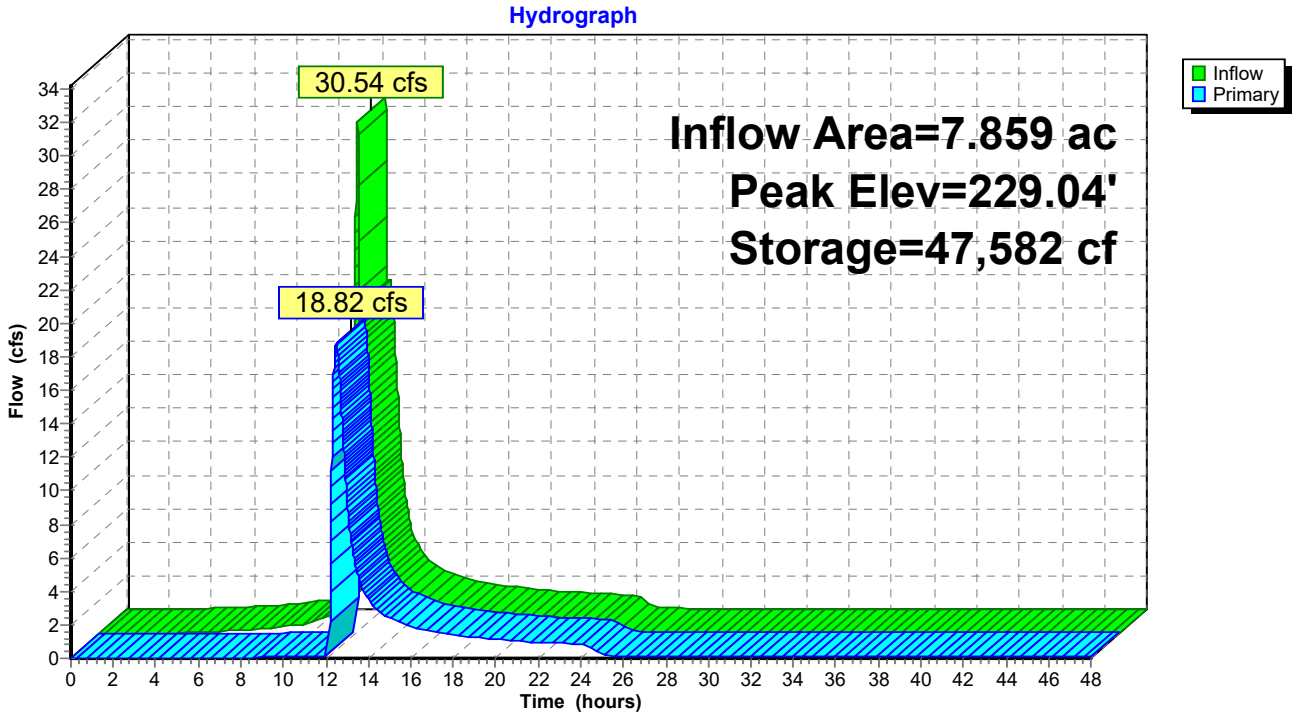
Pond 4P: Forebay & Bio A1-A



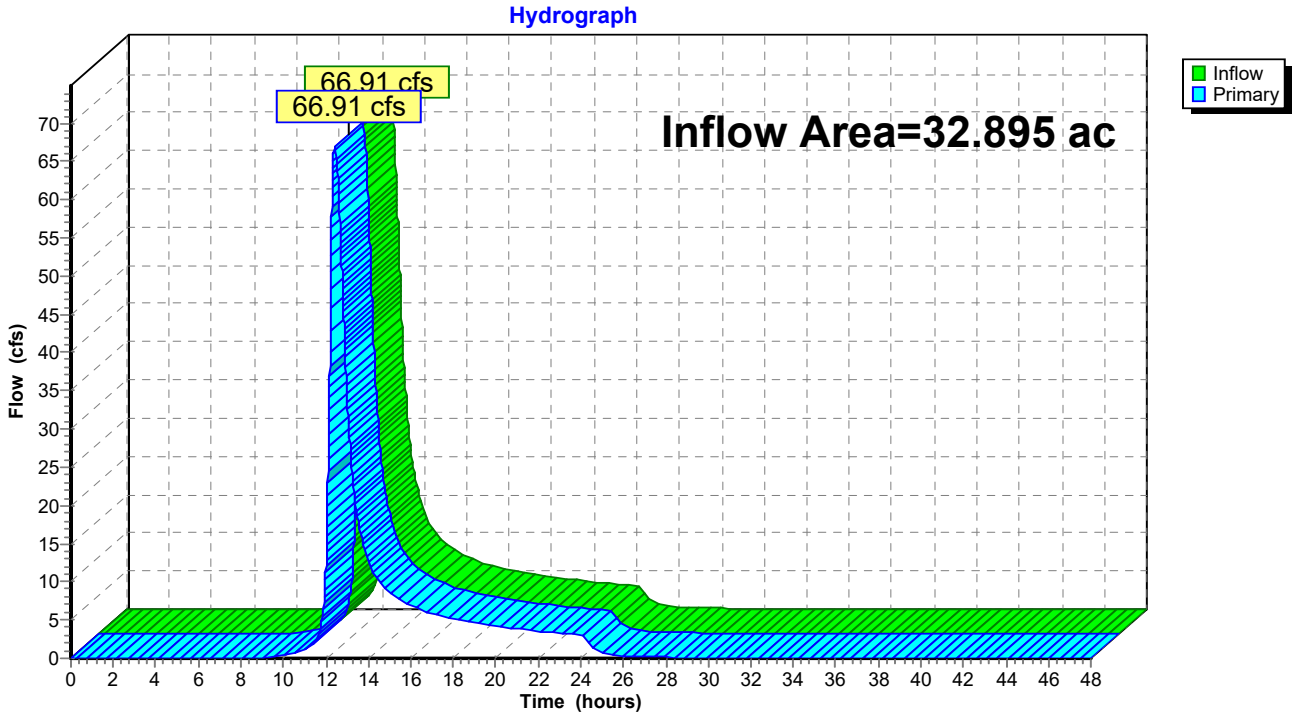
Pond 5P: Forebay A1-B



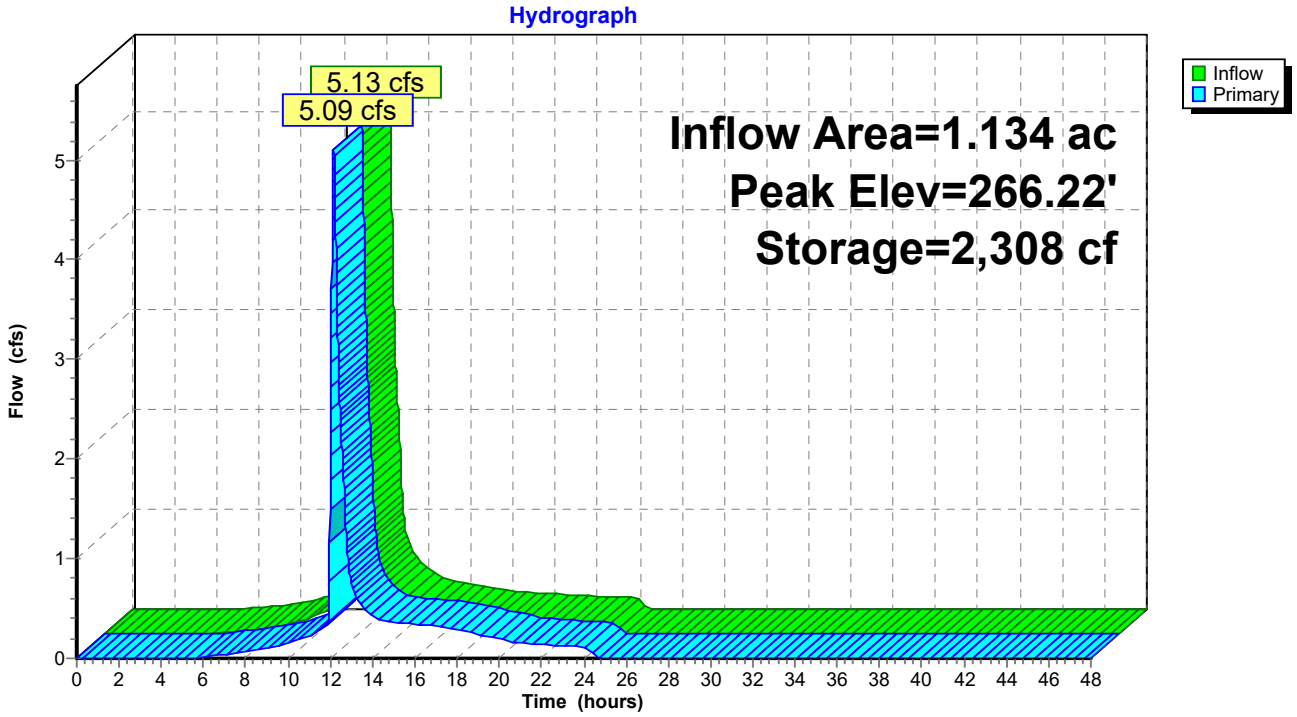
Pond 6P: Detention Basin A1



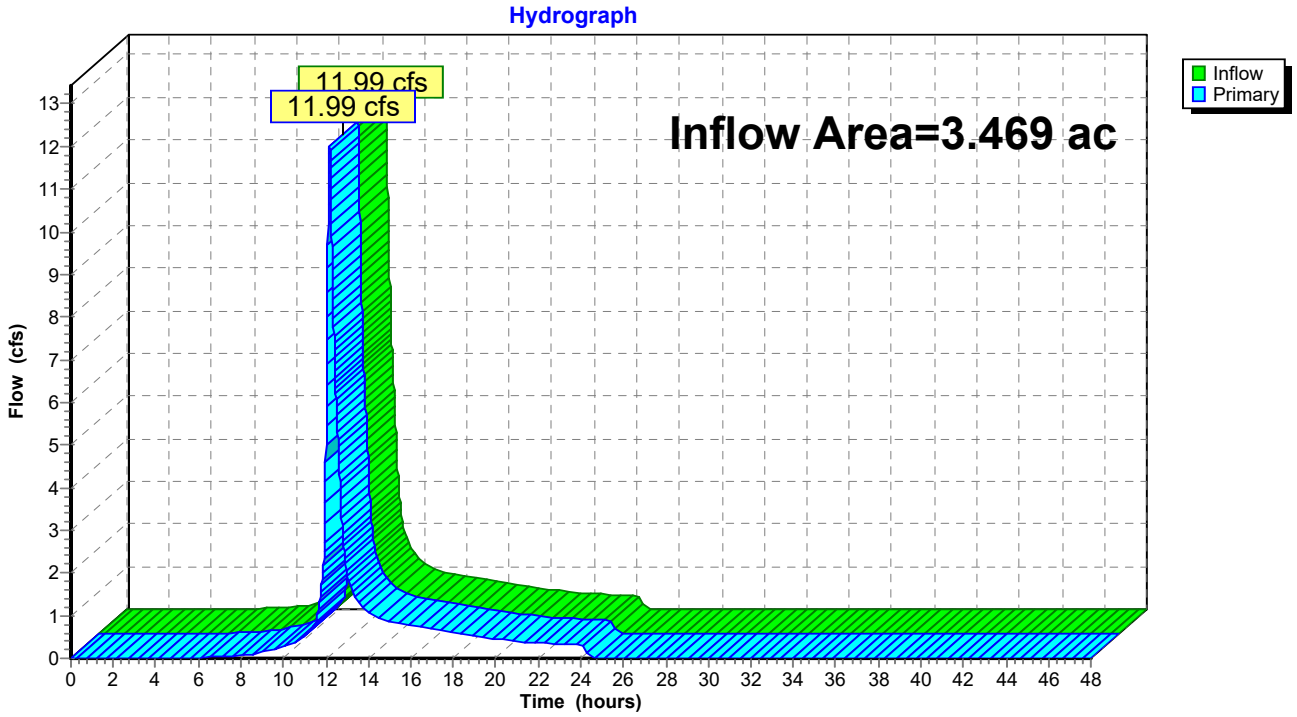
Pond 7P: Design Point A



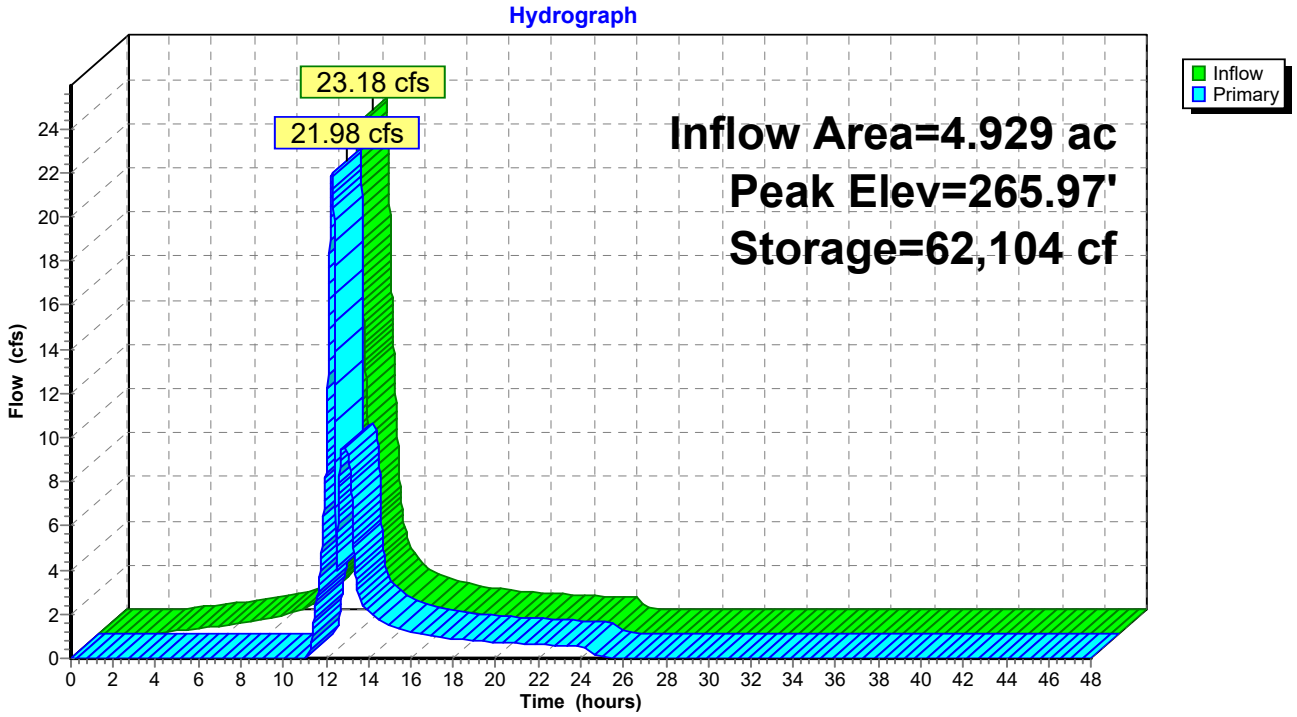
Pond 8P: Detention Basin B1



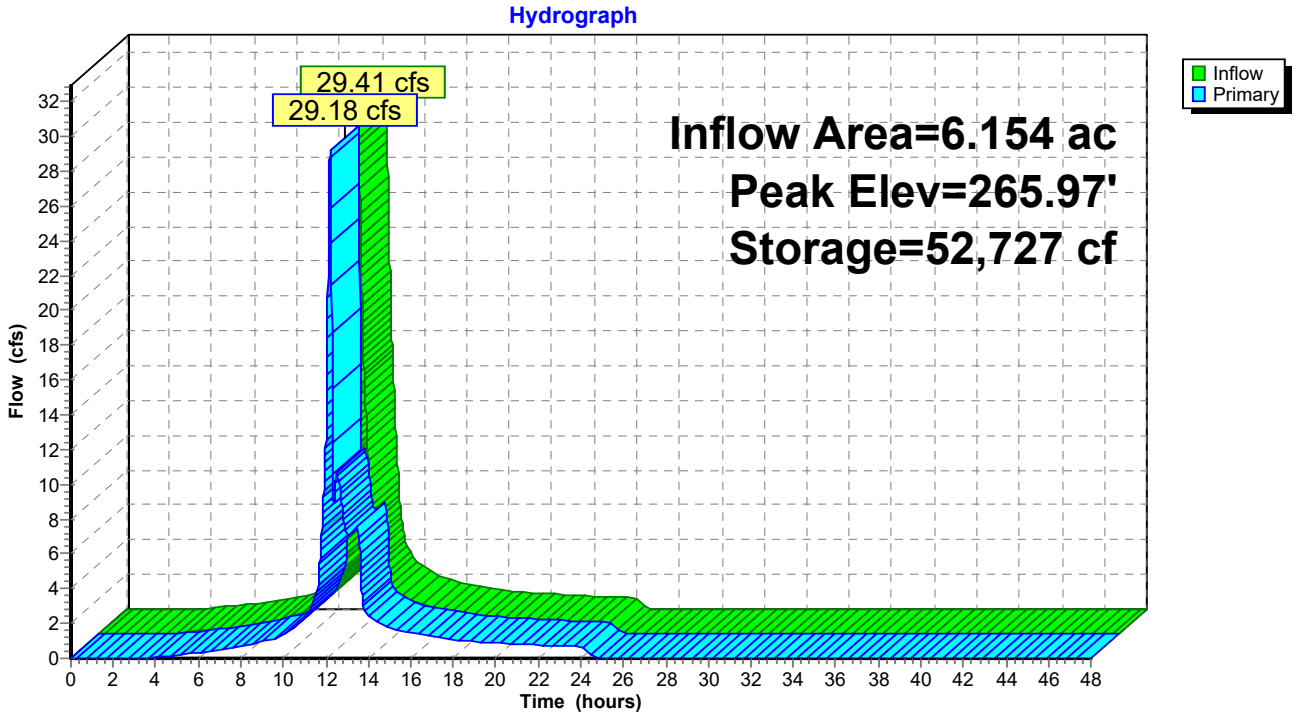
Pond 9P: Design Point B



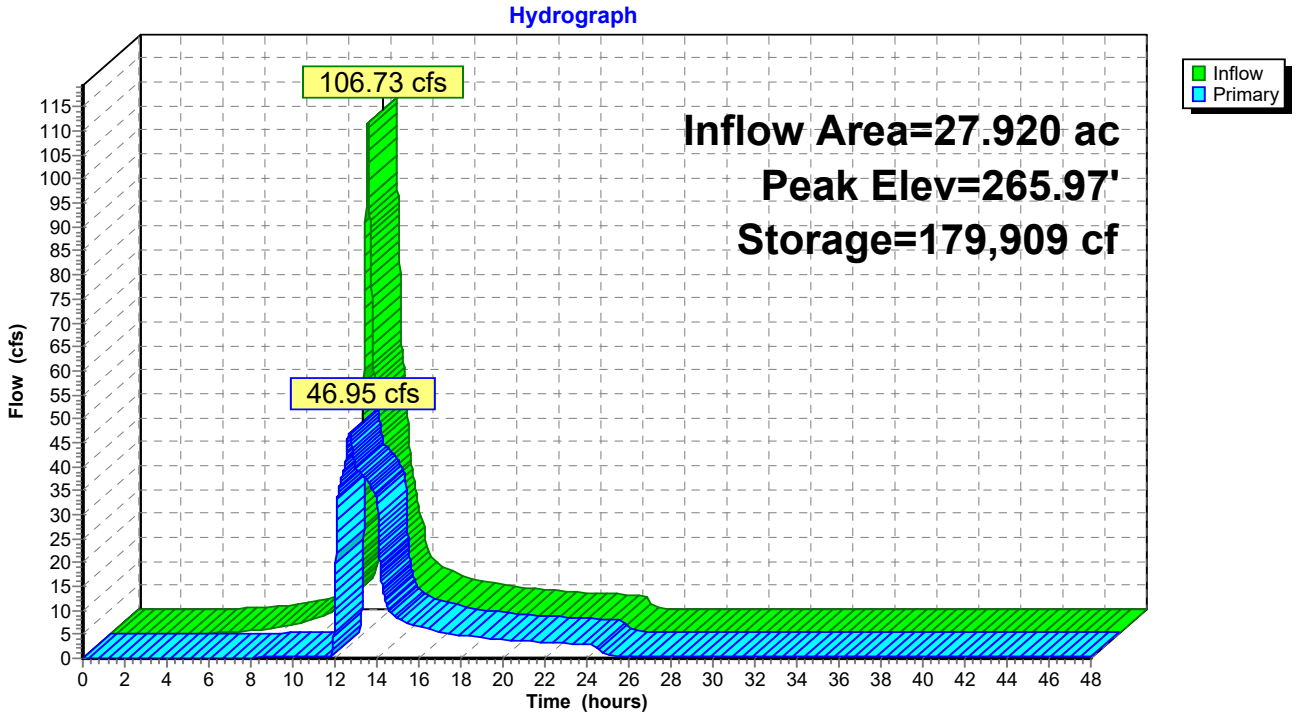
Pond 10P: Forebay & Bio C1-A



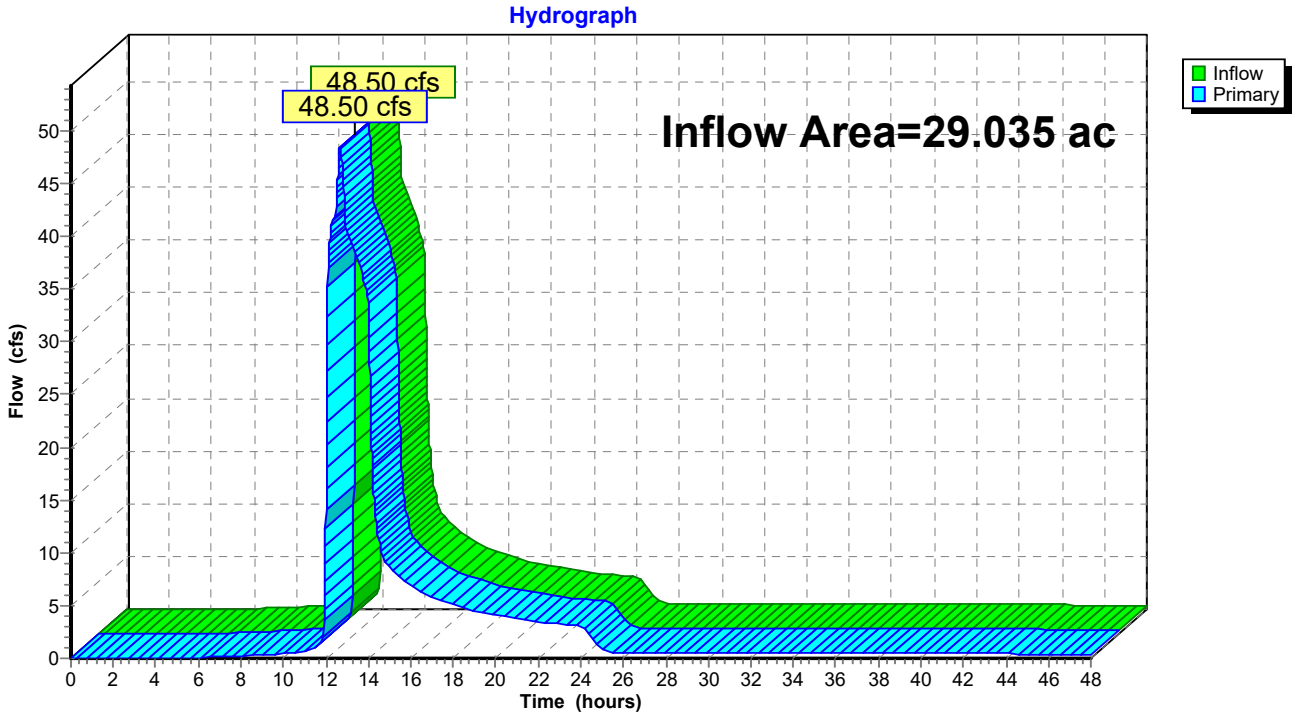
Pond 11P: Forebay C1-B



Pond 12P: Detention Basin C1



Pond 13P: Design Point C



APPENDIX 11

RESERVOIR REPORTS & CPV CALCULATIONS

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Summary for Pond 1P: Existing Wetland (EX Condition)

Inflow Area = 22.902 ac, 8.12% Impervious, Inflow Depth = 0.25" for 1-yr event
Inflow = 1.88 cfs @ 12.58 hrs, Volume= 0.480 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 2P : Existing A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Starting Elev= 224.00' Surf.Area= 16,787 sf Storage= 7,446 cf
Peak Elev= 224.85' @ 25.53 hrs Surf.Area= 33,212 sf Storage= 28,370 cf (20,923 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

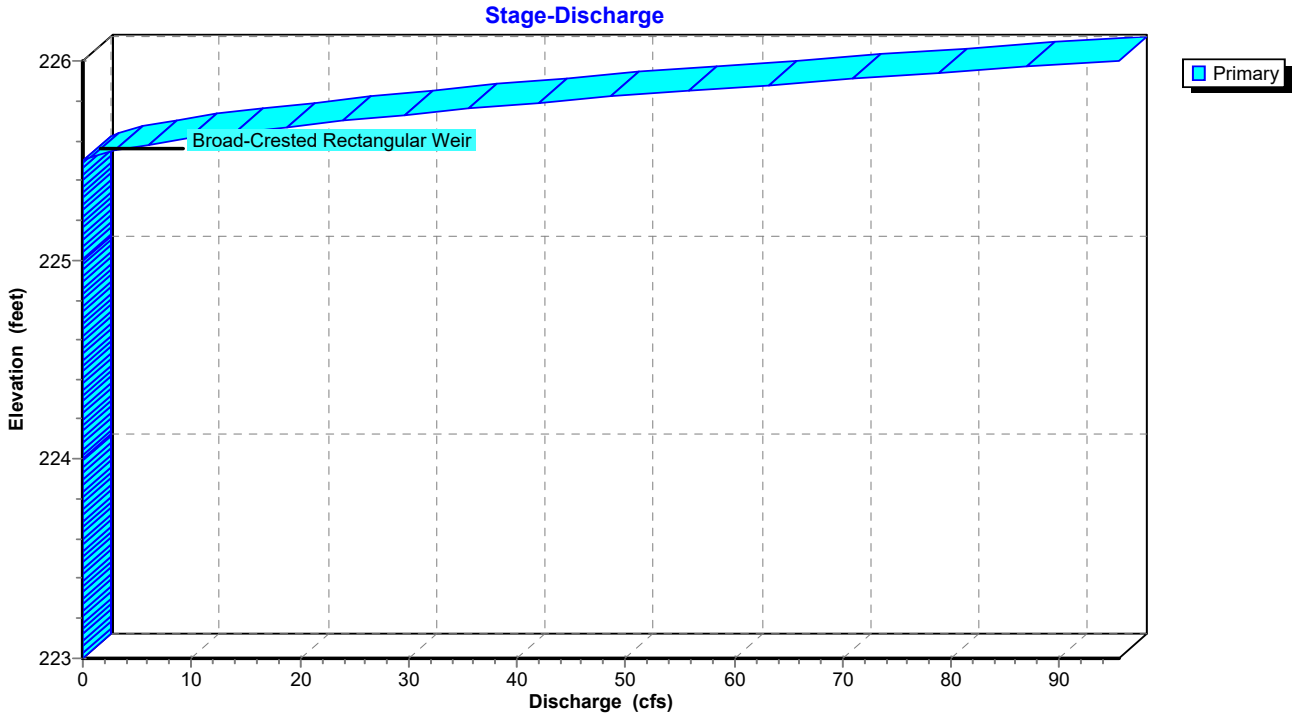
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	89,179 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
223.00	1,153	0	0	1,153
224.00	16,787	7,446	7,446	16,790
225.00	36,611	26,063	33,509	36,622
226.00	77,225	55,669	89,179	77,244

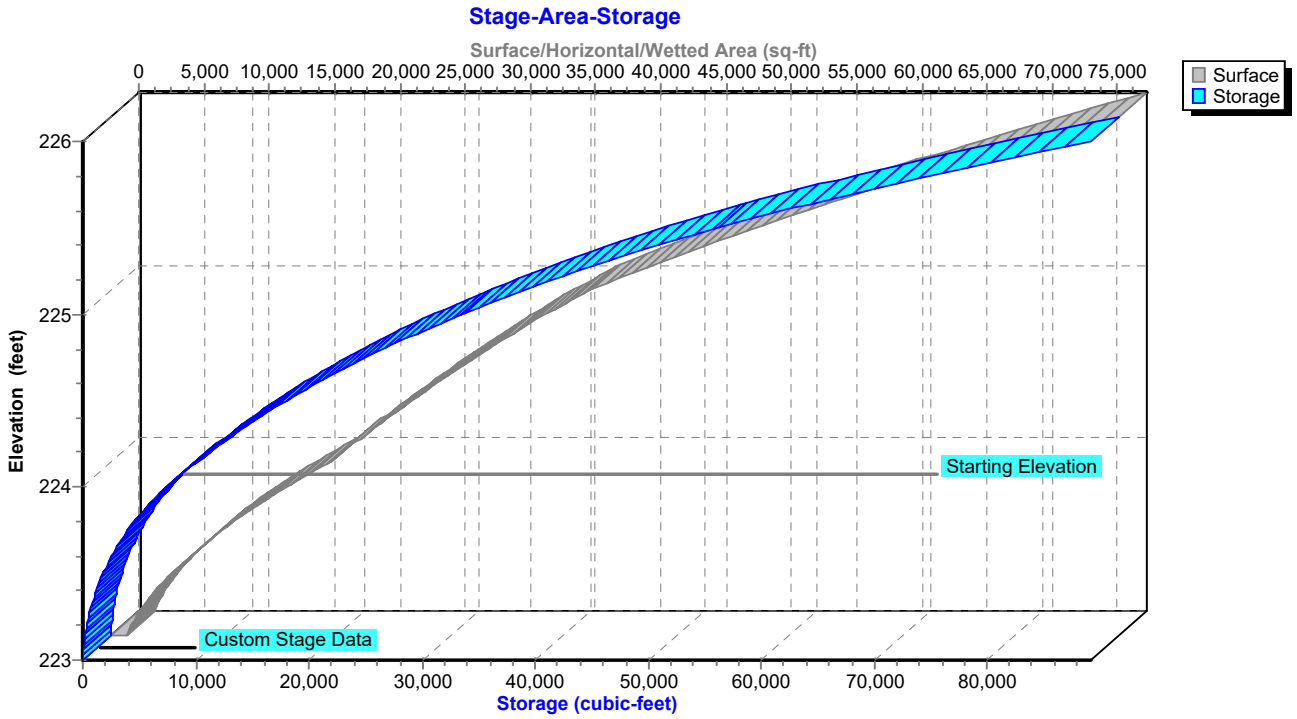
Device	Routing	Invert	Outlet Devices
#1	Primary	225.50'	**100.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=224.00' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Existing Wetland (EX Condition)



Pond 1P: Existing Wetland (EX Condition)



Summary for Pond 2P: Existing A

Inflow Area = 34.926 ac, 5.76% Impervious, Inflow Depth = 0.06" for 1-yr event
Inflow = 0.58 cfs @ 12.61 hrs, Volume= 0.180 af
Primary = 0.58 cfs @ 12.61 hrs, Volume= 0.180 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5

Summary for Pond 3P: Existing Wetland (PR Condition)

Inflow Area = 14.149 ac, 15.15% Impervious, Inflow Depth = 0.43" for 1-yr event
Inflow = 3.20 cfs @ 12.35 hrs, Volume= 0.510 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Routed to Pond 7P : Design Point A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Starting Elev= 224.00' Surf.Area= 16,787 sf Storage= 7,446 cf
Peak Elev= 224.89' @ 25.33 hrs Surf.Area= 34,076 sf Storage= 29,652 cf (22,205 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

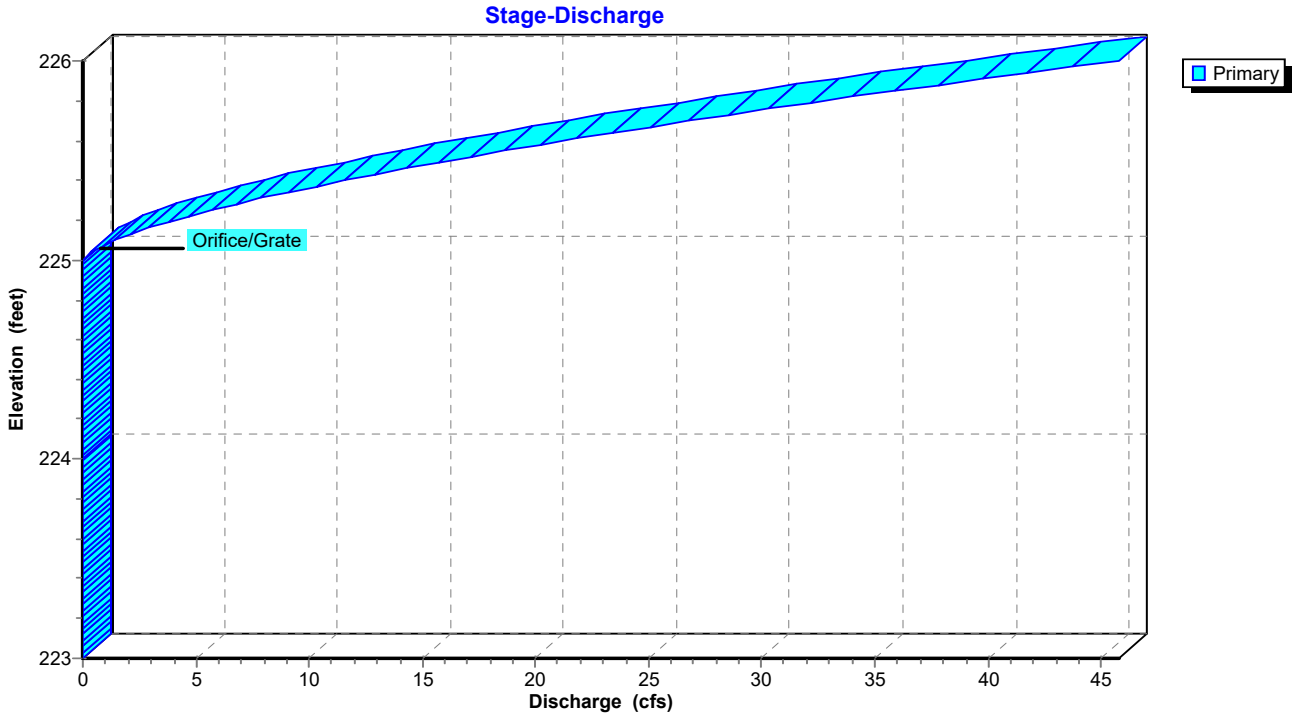
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	85,006 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
223.00	1,153	0	0	1,153
224.00	16,787	7,446	7,446	16,790
225.00	36,611	26,063	33,509	36,622
226.00	67,988	51,497	85,006	68,009

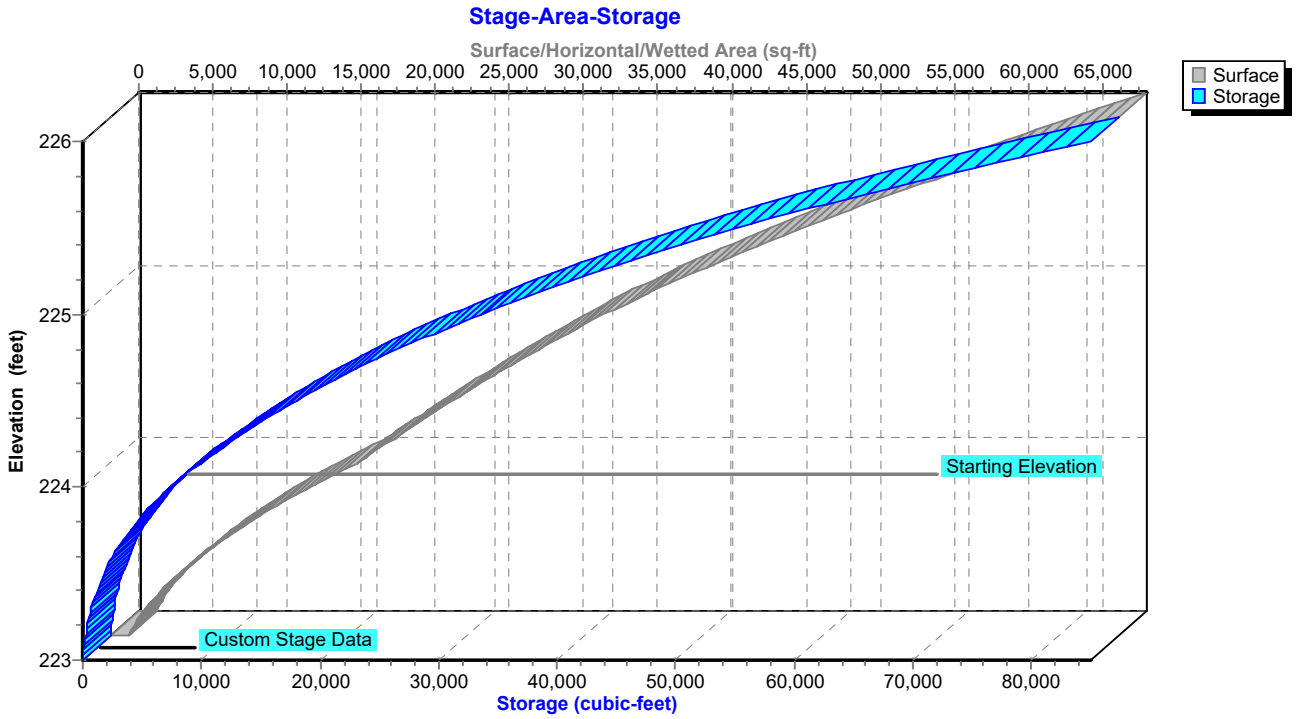
Device	Routing	Invert	Outlet Devices
#1	Primary	220.00'	**36.0" Round Culvert** L= 57.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 220.00' / 216.48' S= 0.0618 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 7.07 sf
#2	Device 1	225.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=224.00' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.00 cfs of 42.48 cfs potential flow)
↑**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 3P: Existing Wetland (PR Condition)



Pond 3P: Existing Wetland (PR Condition)



Summary for Pond 4P: Forebay & Bio A1-A

Inflow Area = 4.762 ac, 47.67% Impervious, Inflow Depth = 0.91" for 1-yr event
Inflow = 3.23 cfs @ 12.26 hrs, Volume= 0.359 af
Outflow = 0.14 cfs @ 20.00 hrs, Volume= 0.054 af, Atten= 96%, Lag= 464.5 min
Primary = 0.14 cfs @ 20.00 hrs, Volume= 0.054 af
Routed to Pond 6P : Detention Basin A1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Starting Elev= 227.50' Surf.Area= 12,044 sf Storage= 16,584 cf
Peak Elev= 228.51' @ 20.00 hrs Surf.Area= 14,586 sf Storage= 30,019 cf (13,435 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 422.6 min (1,311.7 - 889.1)

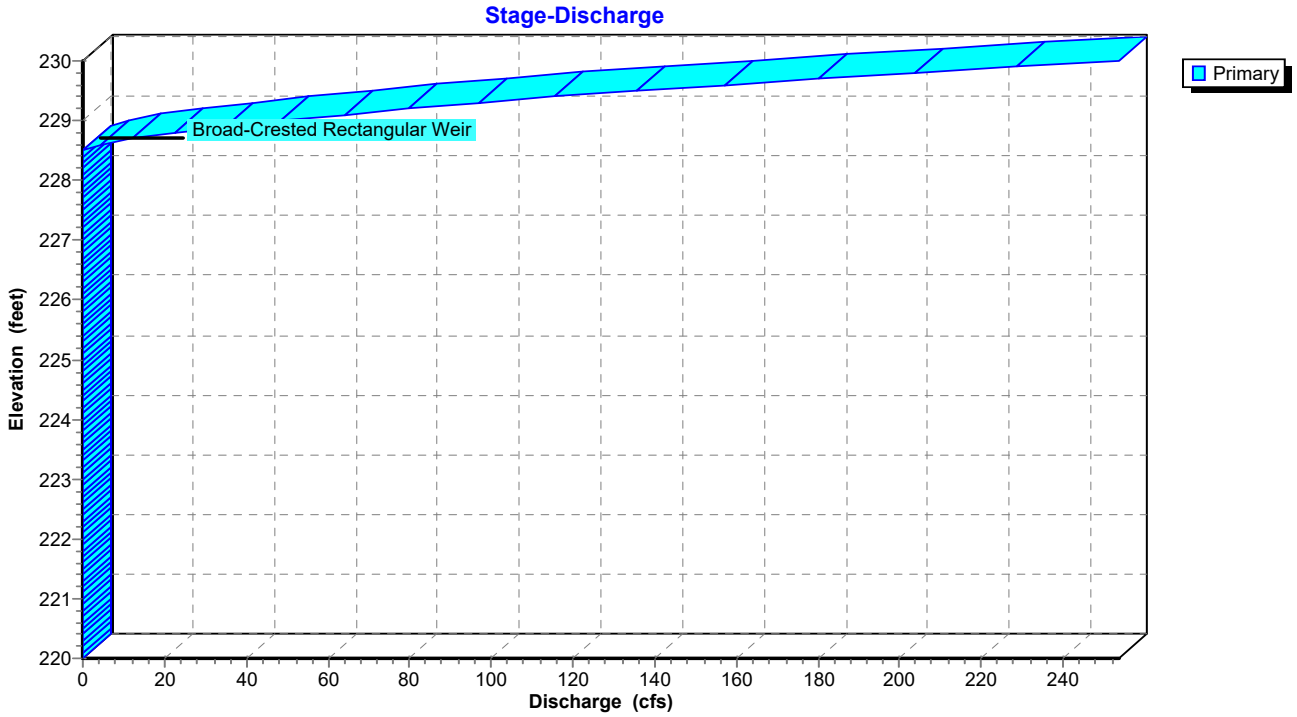
Volume	Invert	Avail.Storage	Storage Description
#1	220.00'	54,786 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
220.00	65	0	0	65
222.00	514	508	508	527
224.00	1,391	1,834	2,342	1,429
226.00	2,700	4,019	6,361	2,776
227.50	12,044	10,223	16,584	12,130
228.00	13,280	6,328	22,913	13,382
230.00	18,750	31,873	54,786	18,925

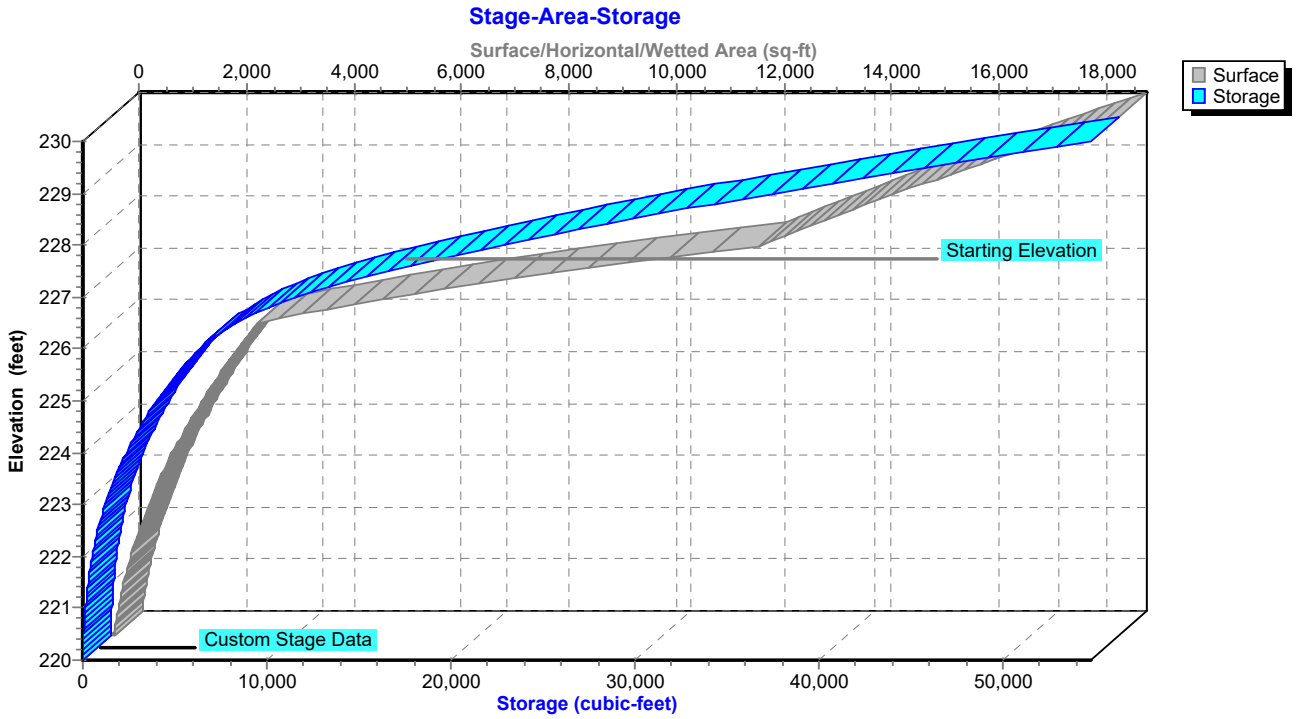
Device	Routing	Invert	Outlet Devices
#1	Primary	228.50'	**50.0' long + 2.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.14 cfs @ 20.00 hrs HW=228.51' TW=224.61' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.14 cfs @ 0.27 fps)

Pond 4P: Forebay & Bio A1-A



Pond 4P: Forebay & Bio A1-A



Summary for Pond 5P: Forebay A1-B

Inflow Area = 2.605 ac, 63.57% Impervious, Inflow Depth = 1.33" for 1-yr event
Inflow = 3.49 cfs @ 12.13 hrs, Volume= 0.288 af
Outflow = 3.45 cfs @ 12.15 hrs, Volume= 0.288 af, Atten= 1%, Lag= 1.1 min
Primary = 3.45 cfs @ 12.15 hrs, Volume= 0.288 af
Routed to Pond 6P : Detention Basin A1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Starting Elev= 228.50' Surf.Area= 3,432 sf Storage= 11,619 cf
Peak Elev= 228.59' @ 12.15 hrs Surf.Area= 3,491 sf Storage= 11,920 cf (301 cf above start)

Plug-Flow detention time= 713.8 min calculated for 0.021 af (7% of inflow)
Center-of-Mass det. time= 3.1 min (855.1 - 852.0)

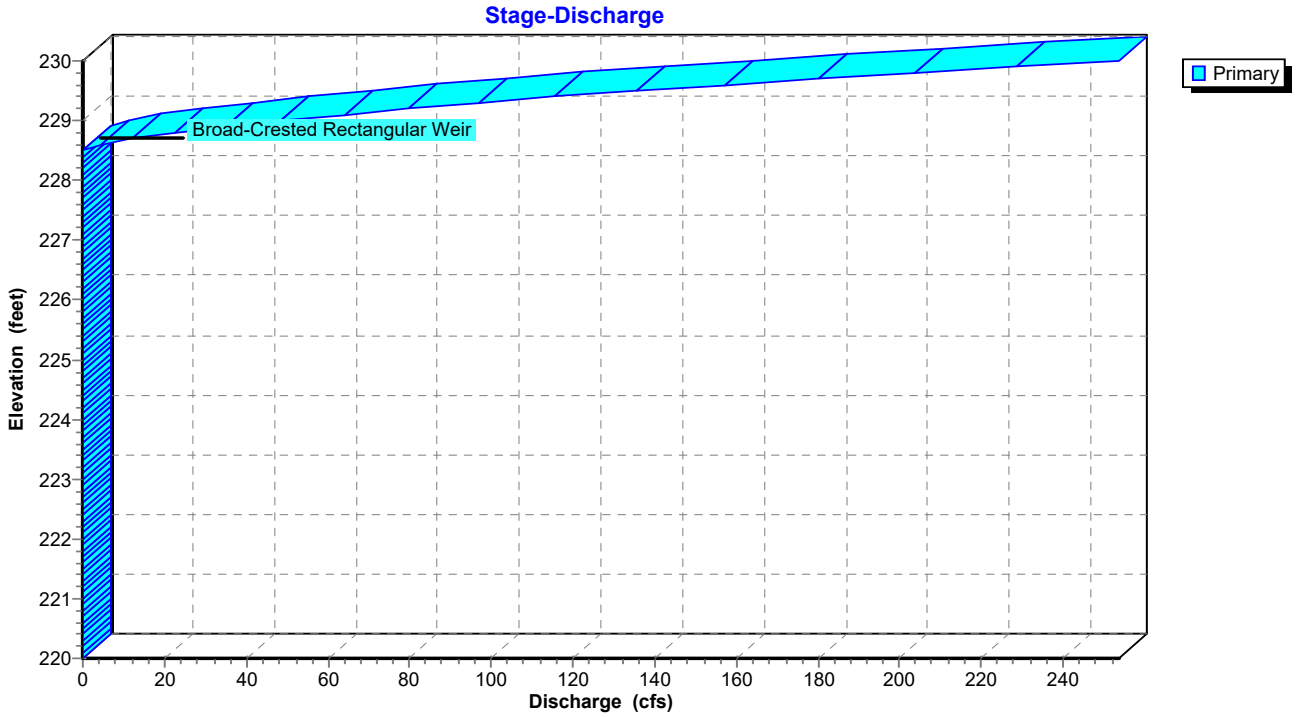
Volume	Invert	Avail.Storage	Storage Description
#1	220.00'	17,559 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
220.00	88	0	0	88
222.00	451	492	492	467
224.00	1,075	1,482	1,974	1,120
226.00	1,960	2,991	4,965	2,046
227.50	2,794	3,547	8,512	2,919
228.00	3,105	1,474	9,986	3,244
230.00	4,512	7,573	17,559	4,717

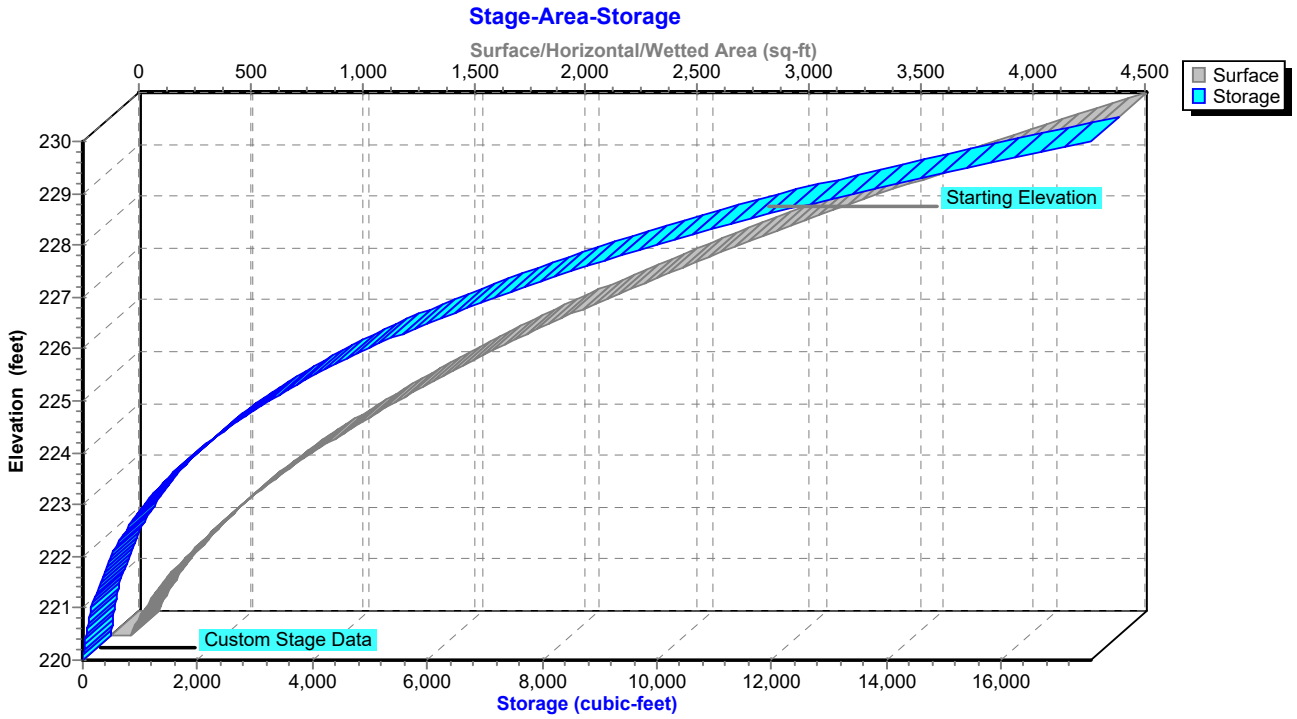
Device	Routing	Invert	Outlet Devices
#1	Primary	228.50'	**50.0' long + 2.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=3.44 cfs @ 12.15 hrs HW=228.59' TW=222.11' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 3.44 cfs @ 0.79 fps)

Pond 5P: Forebay A1-B



Pond 5P: Forebay A1-B



Summary for Pond 6P: Detention Basin A1

Inflow Area = 7.859 ac, 49.96% Impervious, Inflow Depth = 0.54" for 1-yr event
Inflow = 3.51 cfs @ 12.15 hrs, Volume= 0.353 af
Outflow = 0.07 cfs @ 24.47 hrs, Volume= 0.197 af, Atten= 98%, Lag= 739.4 min
Primary = 0.07 cfs @ 24.47 hrs, Volume= 0.197 af
Routed to Pond 7P : Design Point A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Peak Elev= 225.06' @ 24.47 hrs Surf.Area= 5,108 sf Storage= 12,153 cf

Plug-Flow detention time= 1,020.9 min calculated for 0.197 af (56% of inflow)
Center-of-Mass det. time= 830.4 min (1,758.8 - 928.4)

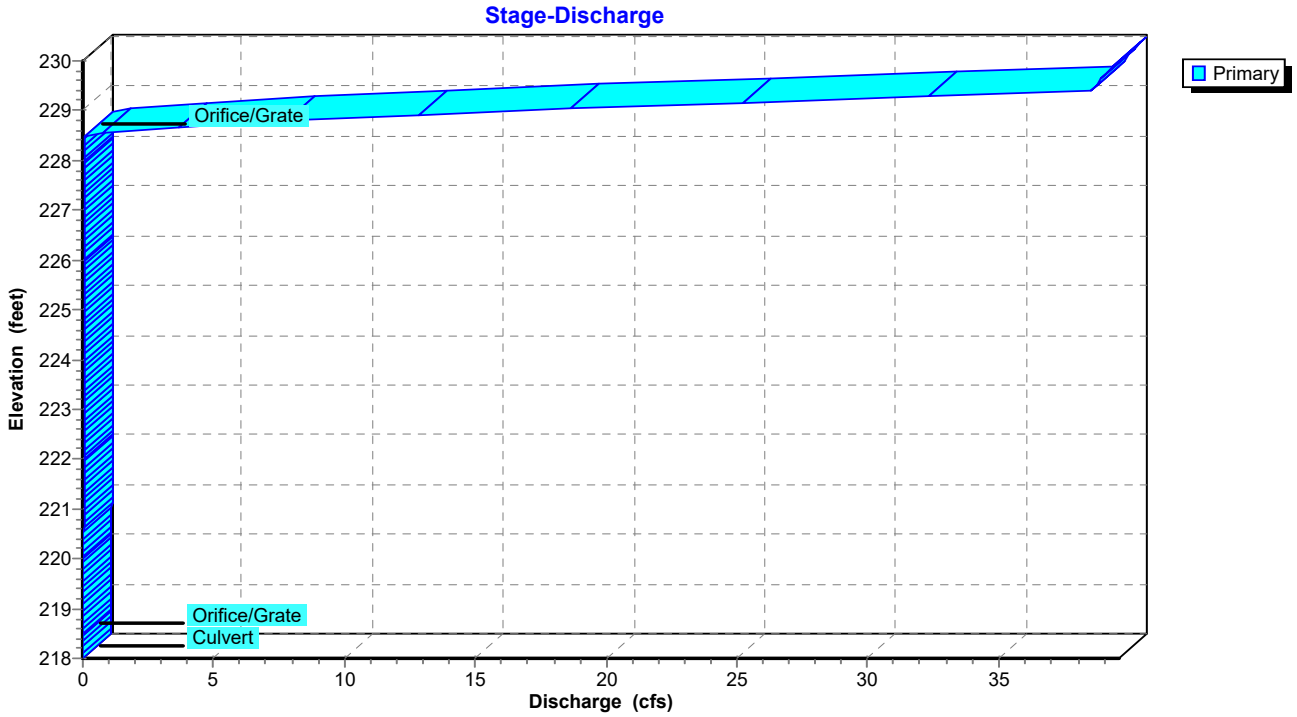
Volume	Invert	Avail.Storage	Storage Description
#1	218.00'	61,071 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
218.00	13	0	0	13
220.00	571	447	447	579
222.00	1,689	2,161	2,608	1,721
224.00	3,441	5,027	7,635	3,508
226.00	6,846	10,094	17,729	6,950
228.00	10,779	17,477	35,206	10,938
230.00	15,213	25,865	61,071	15,445

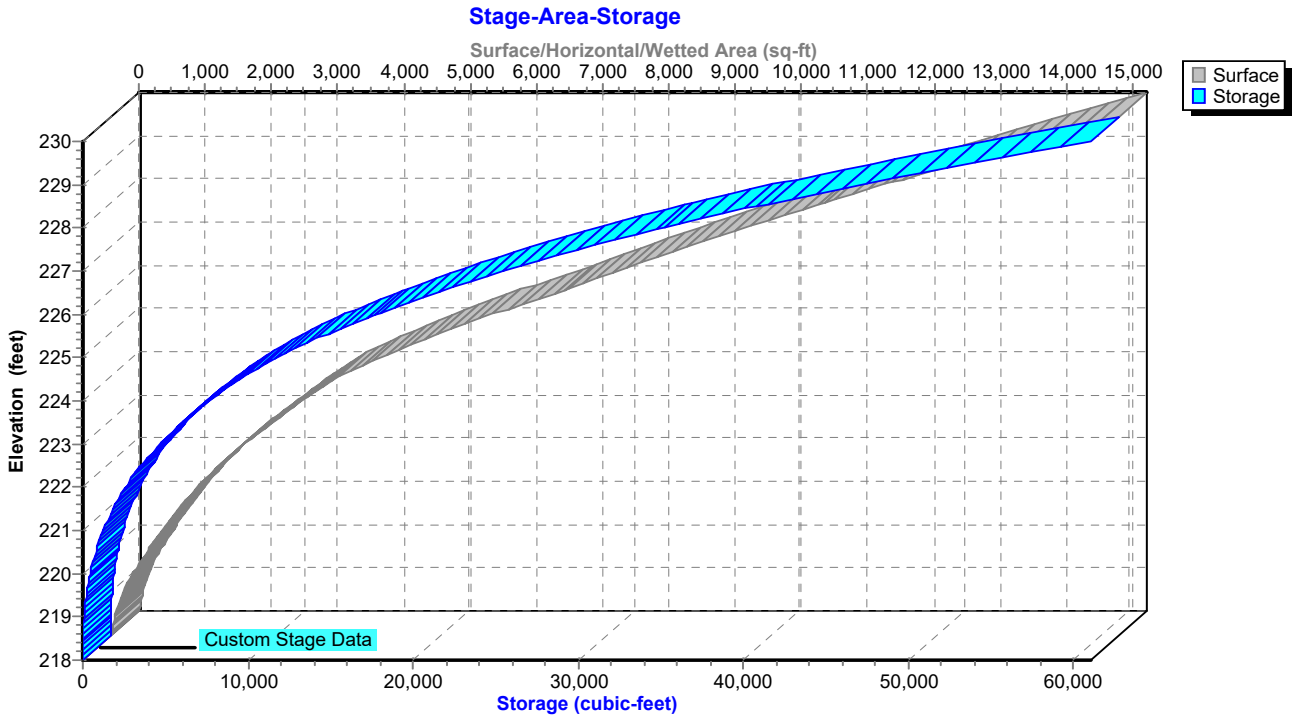
Device	Routing	Invert	Outlet Devices
#1	Primary	218.00'	**24.0" Round Culvert** L= 52.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 218.00' / 217.48' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	218.45'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	228.50'	**38.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.07 cfs @ 24.47 hrs HW=225.06' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.07 cfs of 29.41 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.07 cfs @ 12.34 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 6P: Detention Basin A1



Pond 6P: Detention Basin A1



Summary for Pond 7P: Design Point A

Inflow Area = 32.895 ac, 19.32% Impervious, Inflow Depth > 0.13" for 1-yr event
Inflow = 0.58 cfs @ 12.62 hrs, Volume= 0.360 af
Primary = 0.58 cfs @ 12.62 hrs, Volume= 0.360 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5

Summary for Pond 8P: Detention Basin B1

Inflow Area = 1.134 ac, 0.00% Impervious, Inflow Depth = 0.76" for 1-yr event
Inflow = 0.75 cfs @ 12.16 hrs, Volume= 0.071 af
Outflow = 0.27 cfs @ 12.61 hrs, Volume= 0.071 af, Atten= 64%, Lag= 26.9 min
Primary = 0.27 cfs @ 12.61 hrs, Volume= 0.071 af
Routed to Pond 9P : Design Point B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Automatic Starting Elev= 263.50' Surf.Area= 154 sf Storage= 50 cf
Peak Elev= 264.95' @ 12.61 hrs Surf.Area= 809 sf Storage= 675 cf (625 cf above start)

Plug-Flow detention time= 32.7 min calculated for 0.070 af (98% of inflow)
Center-of-Mass det. time= 20.3 min (915.3 - 895.0)

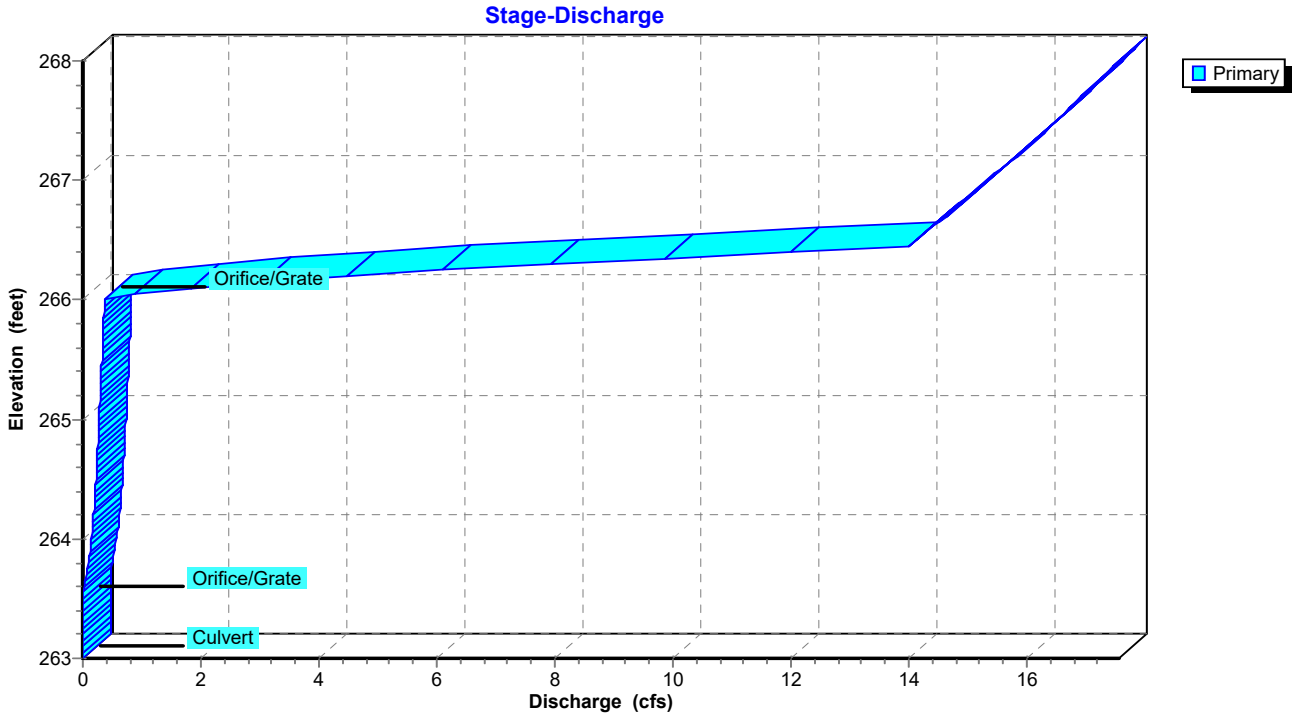
Volume	Invert	Avail.Storage	Storage Description
#1	263.00'	6,709 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
263.00	54	0	0	54
264.00	306	163	163	310
266.00	1,639	1,769	1,932	1,659
268.00	3,227	4,777	6,709	3,284

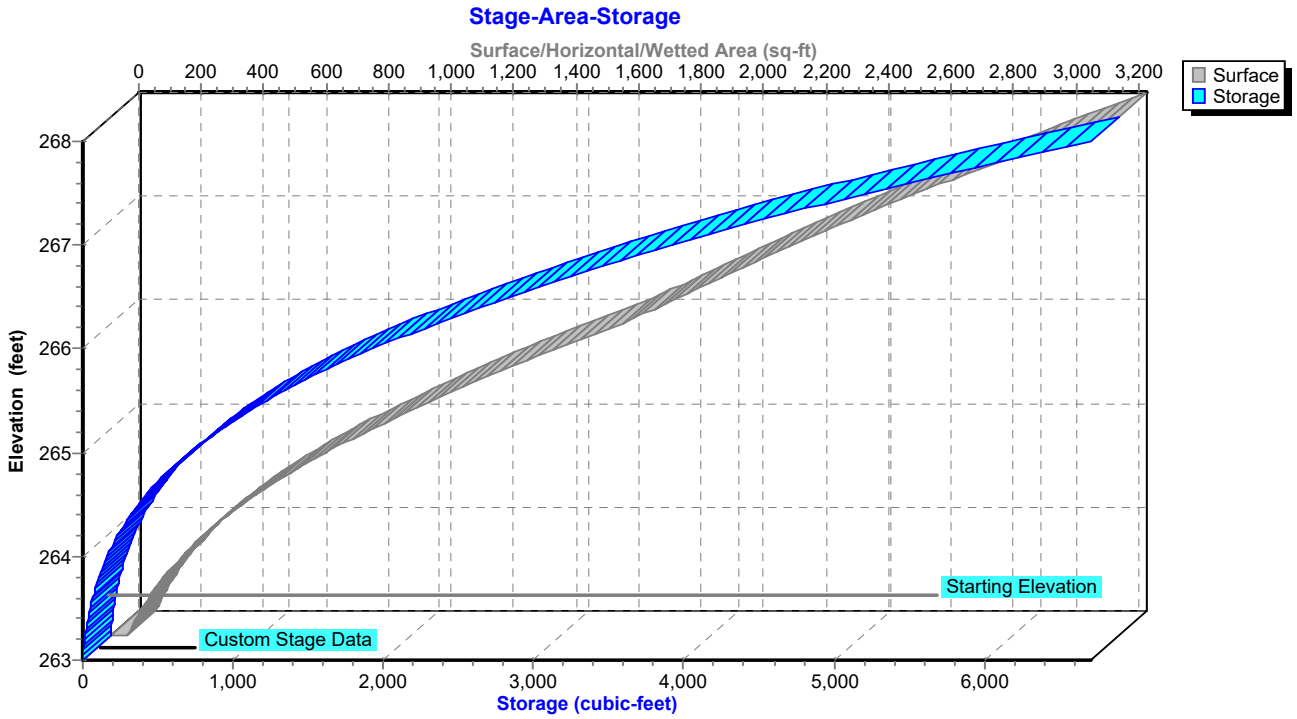
Device	Routing	Invert	Outlet Devices
#1	Primary	263.00'	**18.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 263.00' / 262.50' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	263.50'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	266.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.27 cfs @ 12.61 hrs HW=264.95' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.27 cfs of 9.33 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.27 cfs @ 5.55 fps)
  └─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 8P: Detention Basin B1



Pond 8P: Detention Basin B1



Summary for Pond 9P: Design Point B

Inflow Area = 3.469 ac, 0.00% Impervious, Inflow Depth = 0.42" for 1-yr event
Inflow = 0.48 cfs @ 12.40 hrs, Volume= 0.120 af
Primary = 0.48 cfs @ 12.40 hrs, Volume= 0.120 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5

Summary for Pond 10P: Forebay & Bio C1-A

Inflow Area = 4.929 ac, 70.16% Impervious, Inflow Depth = 1.47" for 1-yr event
Inflow = 5.90 cfs @ 12.23 hrs, Volume= 0.603 af
Outflow = 0.25 cfs @ 17.21 hrs, Volume= 0.128 af, Atten= 96%, Lag= 298.8 min
Primary = 0.25 cfs @ 17.21 hrs, Volume= 0.128 af
Routed to Pond 12P : Detention Basin C1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Starting Elev= 264.50' Surf.Area= 18,768 sf Storage= 30,218 cf
Peak Elev= 265.52' @ 17.21 hrs Surf.Area= 22,707 sf Storage= 51,237 cf (21,020 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 361.9 min (1,211.2 - 849.4)

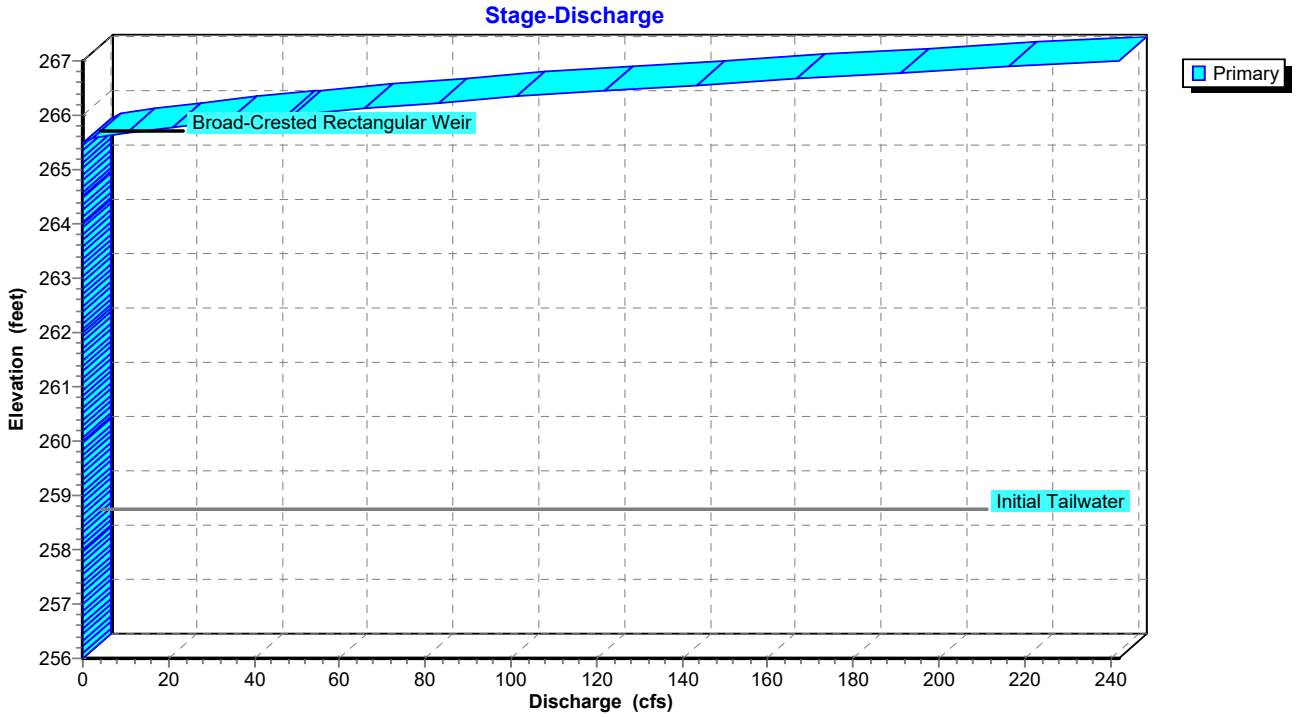
Volume	Invert	Avail.Storage	Storage Description
#1	256.00'	89,274 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
256.00	549	0	0	549
258.00	1,512	1,981	1,981	1,537
260.00	2,803	4,249	6,231	2,868
262.00	4,430	7,171	13,402	4,550
264.00	6,420	10,789	24,190	6,606
264.50	18,768	6,027	30,218	18,956
266.00	24,721	32,514	62,732	24,960
267.00	28,405	26,542	89,274	28,689

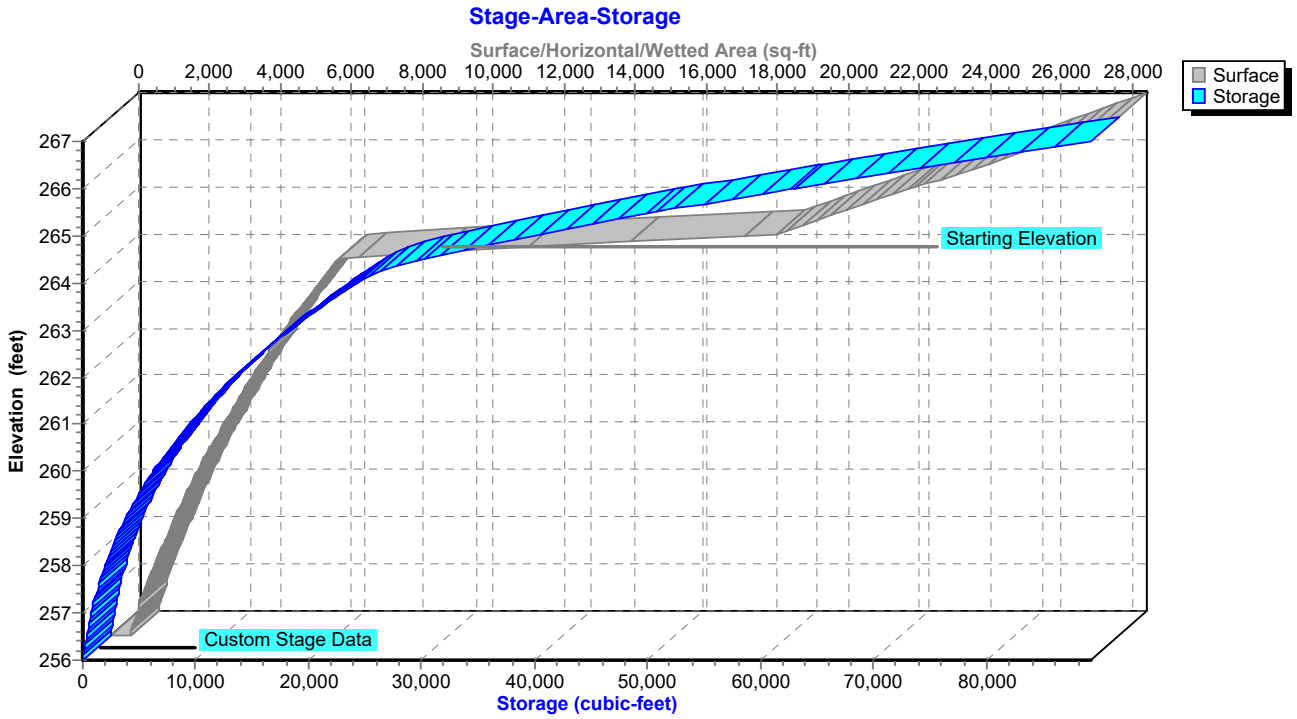
Device	Routing	Invert	Outlet Devices
#1	Primary	265.50'	**50.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.25 cfs @ 17.21 hrs HW=265.52' TW=261.50' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.25 cfs @ 0.33 fps)

Pond 10P: Forebay & Bio C1-A



Pond 10P: Forebay & Bio C1-A



Summary for Pond 11P: Forebay C1-B

Inflow Area = 6.154 ac, 61.08% Impervious, Inflow Depth = 1.19" for 1-yr event
Inflow = 6.42 cfs @ 12.20 hrs, Volume= 0.612 af
Outflow = 6.24 cfs @ 12.23 hrs, Volume= 0.612 af, Atten= 3%, Lag= 2.1 min
Primary = 6.24 cfs @ 12.23 hrs, Volume= 0.612 af
Routed to Pond 12P : Detention Basin C1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Automatic Starting Elev= 264.75' Surf.Area= 8,627 sf Storage= 41,372 cf
Peak Elev= 264.88' @ 12.23 hrs Surf.Area= 8,768 sf Storage= 42,494 cf (1,122 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 6.0 min (870.6 - 864.6)

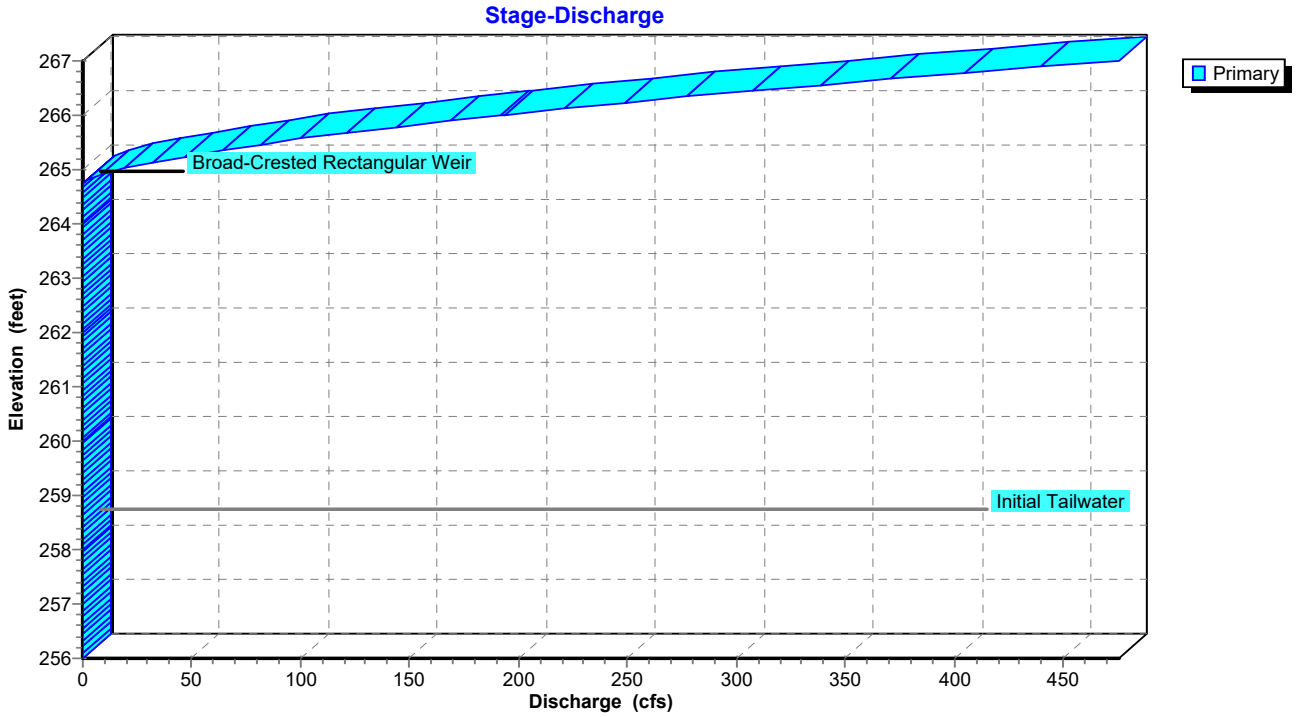
Volume	Invert	Avail.Storage	Storage Description
#1	256.00'	63,668 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
256.00	1,704	0	0	1,704
258.00	2,823	4,480	4,480	2,872
260.00	4,218	6,994	11,475	4,328
262.00	5,887	10,059	21,533	6,071
264.00	7,829	13,670	35,203	8,100
266.00	10,042	17,825	53,028	10,412
267.00	11,249	10,640	63,668	11,673

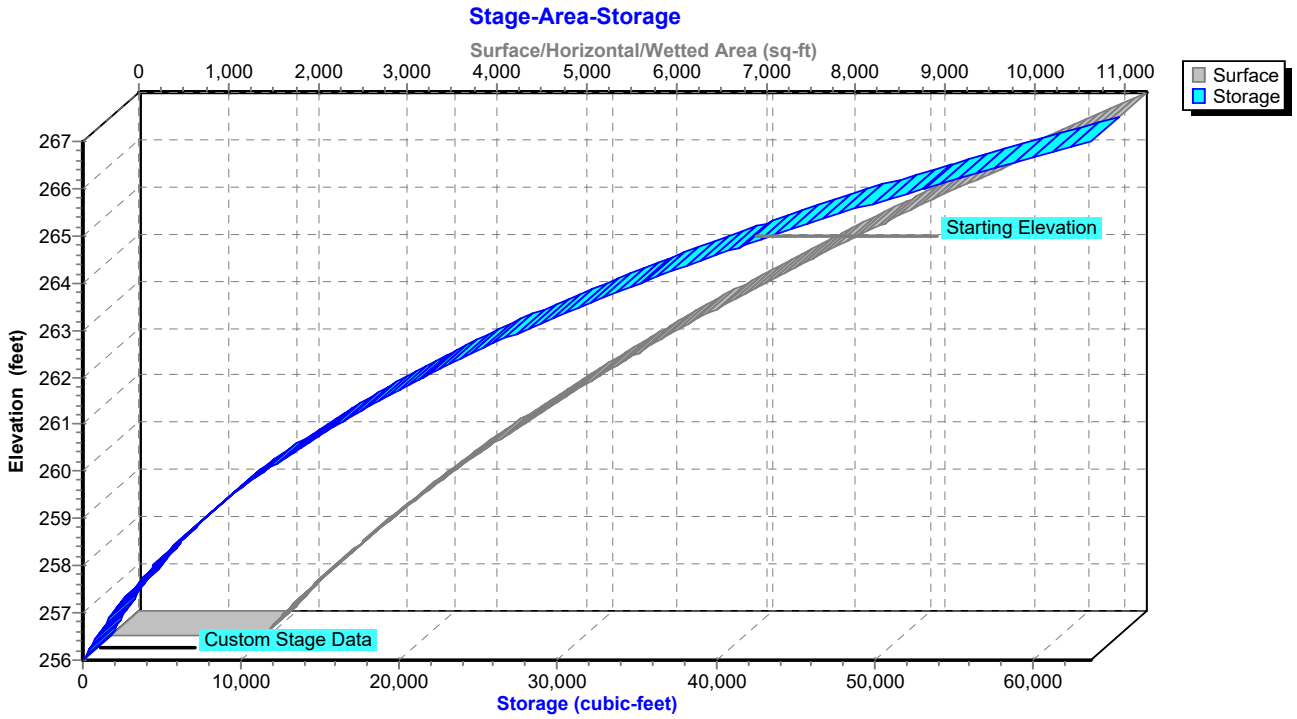
Device	Routing	Invert	Outlet Devices
#1	Primary	264.75'	**50.0' long + 2.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=6.23 cfs @ 12.23 hrs HW=264.88' TW=259.38' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 6.23 cfs @ 0.96 fps)

Pond 11P: Forebay C1-B



Pond 11P: Forebay C1-B



Summary for Pond 12P: Detention Basin C1

Inflow Area = 27.920 ac, 26.01% Impervious, Inflow Depth = 0.69" for 1-yr event
Inflow = 12.62 cfs @ 12.27 hrs, Volume= 1.614 af
Outflow = 0.43 cfs @ 24.28 hrs, Volume= 1.128 af, Atten= 97%, Lag= 720.9 min
Primary = 0.43 cfs @ 24.28 hrs, Volume= 1.128 af
Routed to Pond 13P : Design Point C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Automatic Starting Elev= 258.50' Surf.Area= 8,775 sf Storage= 3,981 cf
Peak Elev= 261.93' @ 24.28 hrs Surf.Area= 22,090 sf Storage= 56,312 cf (52,331 cf above start)

Plug-Flow detention time= 1,068.7 min calculated for 1.036 af (64% of inflow)
Center-of-Mass det. time= 840.8 min (1,763.3 - 922.5)

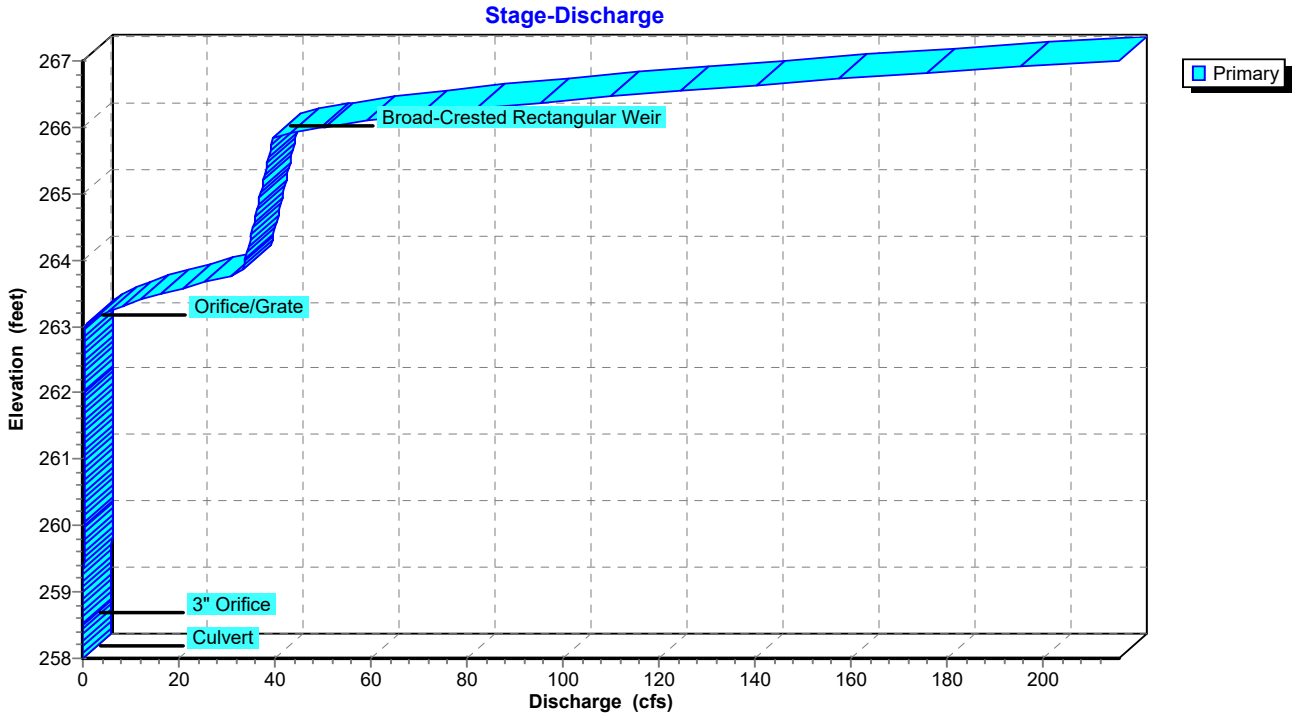
Volume	Invert	Avail.Storage	Storage Description
#1	258.00'	222,991 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
258.00	7,176	0	0	7,176
260.00	14,538	21,285	21,285	14,574
262.00	22,410	36,665	57,951	22,504
264.00	30,774	52,963	110,914	30,947
266.00	39,609	70,197	181,111	39,881
267.00	44,193	41,880	222,991	44,522

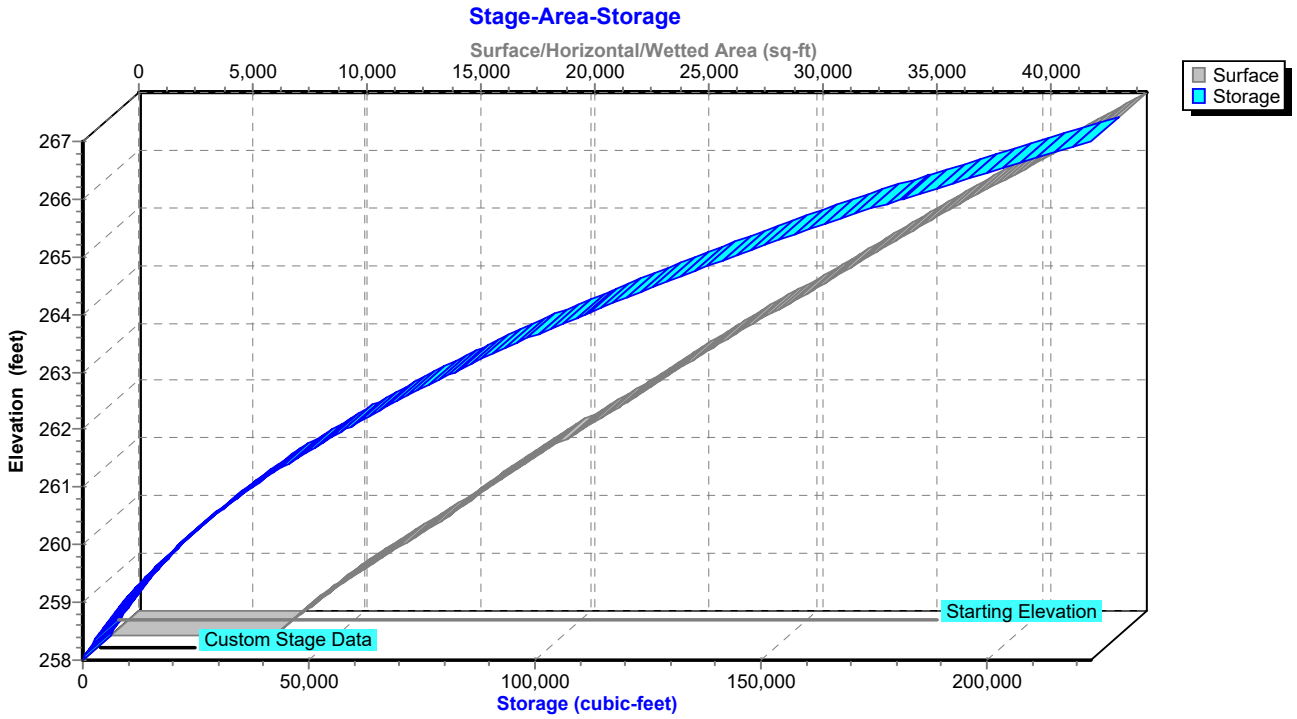
Device	Routing	Invert	Outlet Devices
#1	Primary	258.00'	**24.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 258.00' / 256.00' S= 0.0400 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	258.50'	**3.0" Vert. 3" Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	263.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	265.83'	**50.0' long + 2.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.43 cfs @ 24.28 hrs HW=261.93' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.43 cfs of 25.88 cfs potential flow)
  - **2=3" Orifice** (Orifice Controls 0.43 cfs @ 8.75 fps)
  - **3=Orifice/Grate** (Controls 0.00 cfs)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 12P: Detention Basin C1



Pond 12P: Detention Basin C1



Summary for Pond 13P: Design Point C

Inflow Area = 29.035 ac, 25.59% Impervious, Inflow Depth > 0.49" for 1-yr event
Inflow = 0.82 cfs @ 12.22 hrs, Volume= 1.194 af
Primary = 0.82 cfs @ 12.22 hrs, Volume= 1.194 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5

Summary for Pond 1P: Existing Wetland (EX Condition)

Inflow Area = 22.902 ac, 8.12% Impervious, Inflow Depth = 1.26" for 10-yr event
Inflow = 16.89 cfs @ 12.35 hrs, Volume= 2.399 af
Outflow = 2.78 cfs @ 13.93 hrs, Volume= 1.278 af, Atten= 84%, Lag= 94.7 min
Primary = 2.78 cfs @ 13.93 hrs, Volume= 1.278 af
Routed to Pond 2P : Existing A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Starting Elev= 224.00' Surf.Area= 16,787 sf Storage= 7,446 cf
Peak Elev= 225.55' @ 13.93 hrs Surf.Area= 56,995 sf Storage= 58,933 cf (51,487 cf above start)

Plug-Flow detention time= 364.3 min calculated for 1.107 af (46% of inflow)
Center-of-Mass det. time= 163.2 min (1,078.8 - 915.6)

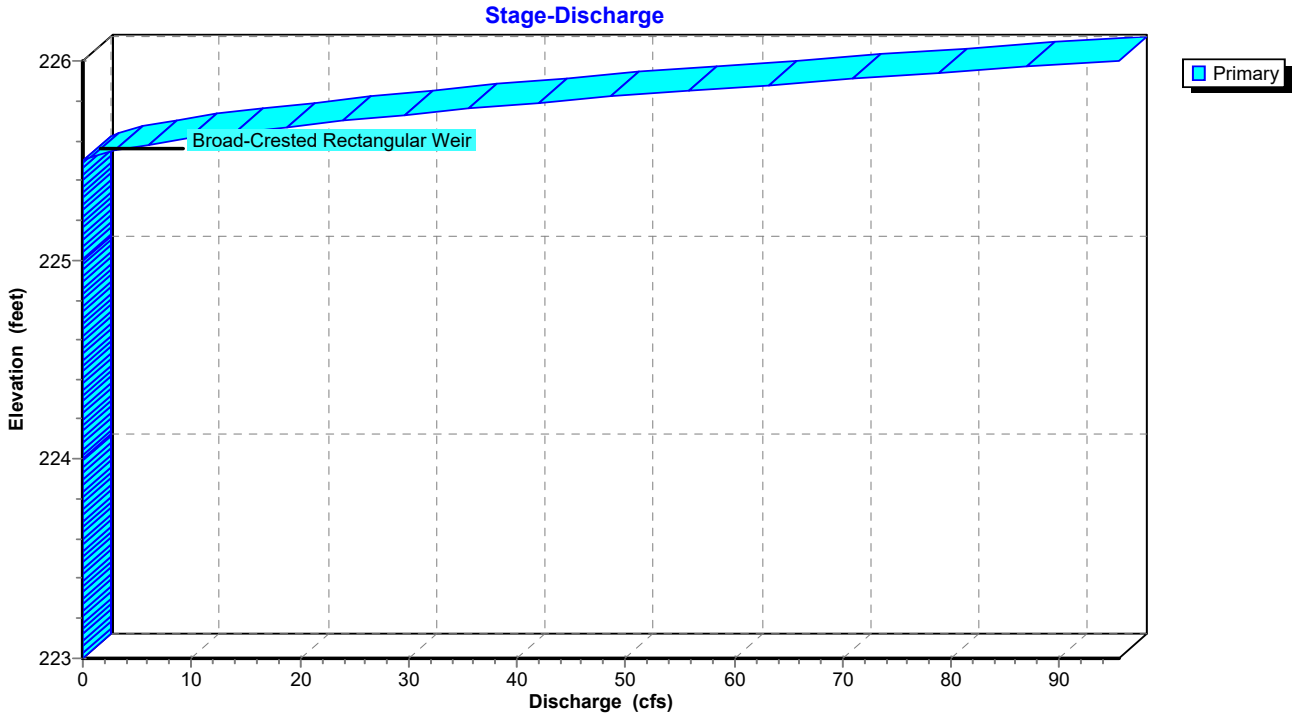
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	89,179 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
223.00	1,153	0	0	1,153
224.00	16,787	7,446	7,446	16,790
225.00	36,611	26,063	33,509	36,622
226.00	77,225	55,669	89,179	77,244

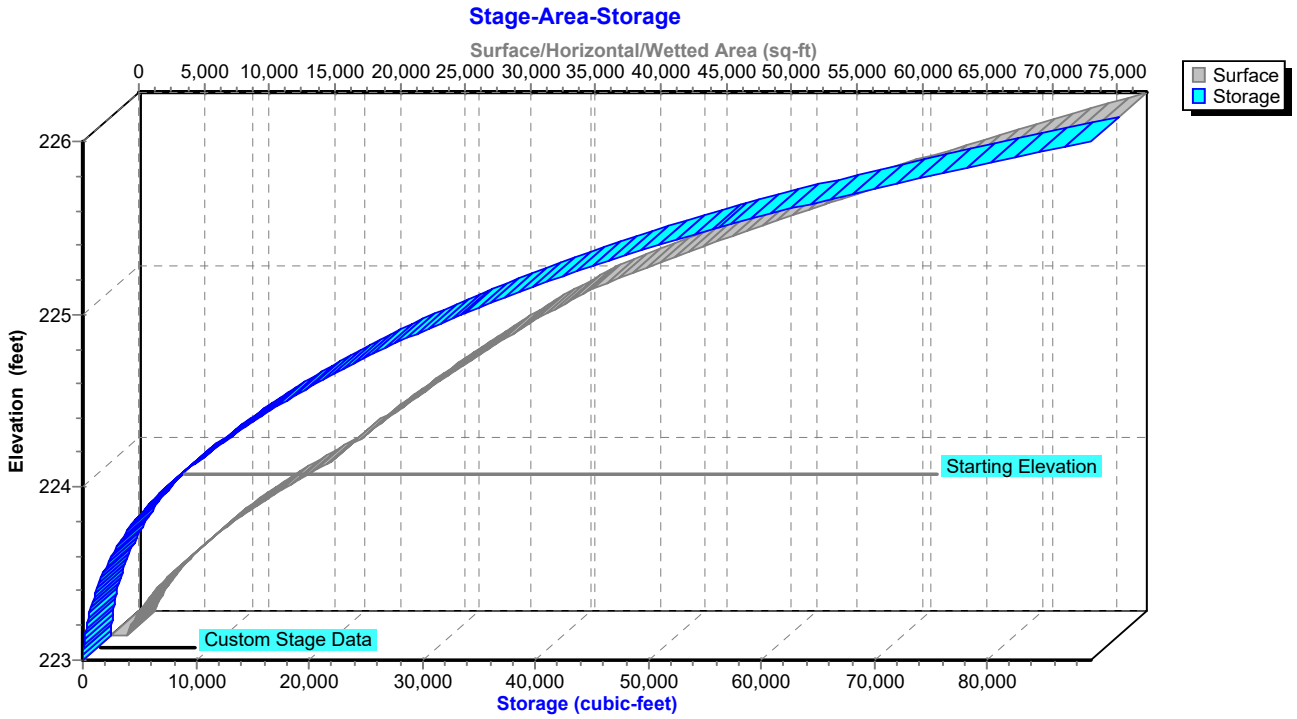
Device	Routing	Invert	Outlet Devices
#1	Primary	225.50'	**100.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=2.78 cfs @ 13.93 hrs HW=225.55' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 2.78 cfs @ 0.58 fps)

Pond 1P: Existing Wetland (EX Condition)



Pond 1P: Existing Wetland (EX Condition)



Summary for Pond 2P: Existing A

Inflow Area = 34.926 ac, 5.76% Impervious, Inflow Depth = 0.81" for 10-yr event
Inflow = 8.08 cfs @ 12.26 hrs, Volume= 2.348 af
Primary = 8.08 cfs @ 12.26 hrs, Volume= 2.348 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5

Summary for Pond 3P: Existing Wetland (PR Condition)

Inflow Area = 14.149 ac, 15.15% Impervious, Inflow Depth = 1.67" for 10-yr event
Inflow = 15.84 cfs @ 12.30 hrs, Volume= 1.968 af
Outflow = 4.66 cfs @ 12.96 hrs, Volume= 1.369 af, Atten= 71%, Lag= 39.6 min
Primary = 4.66 cfs @ 12.96 hrs, Volume= 1.369 af
Routed to Pond 7P : Design Point A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Starting Elev= 224.00' Surf.Area= 16,787 sf Storage= 7,446 cf
Peak Elev= 225.22' @ 12.96 hrs Surf.Area= 42,629 sf Storage= 42,136 cf (34,690 cf above start)

Plug-Flow detention time= 285.9 min calculated for 1.198 af (61% of inflow)
Center-of-Mass det. time= 116.3 min (1,009.1 - 892.7)

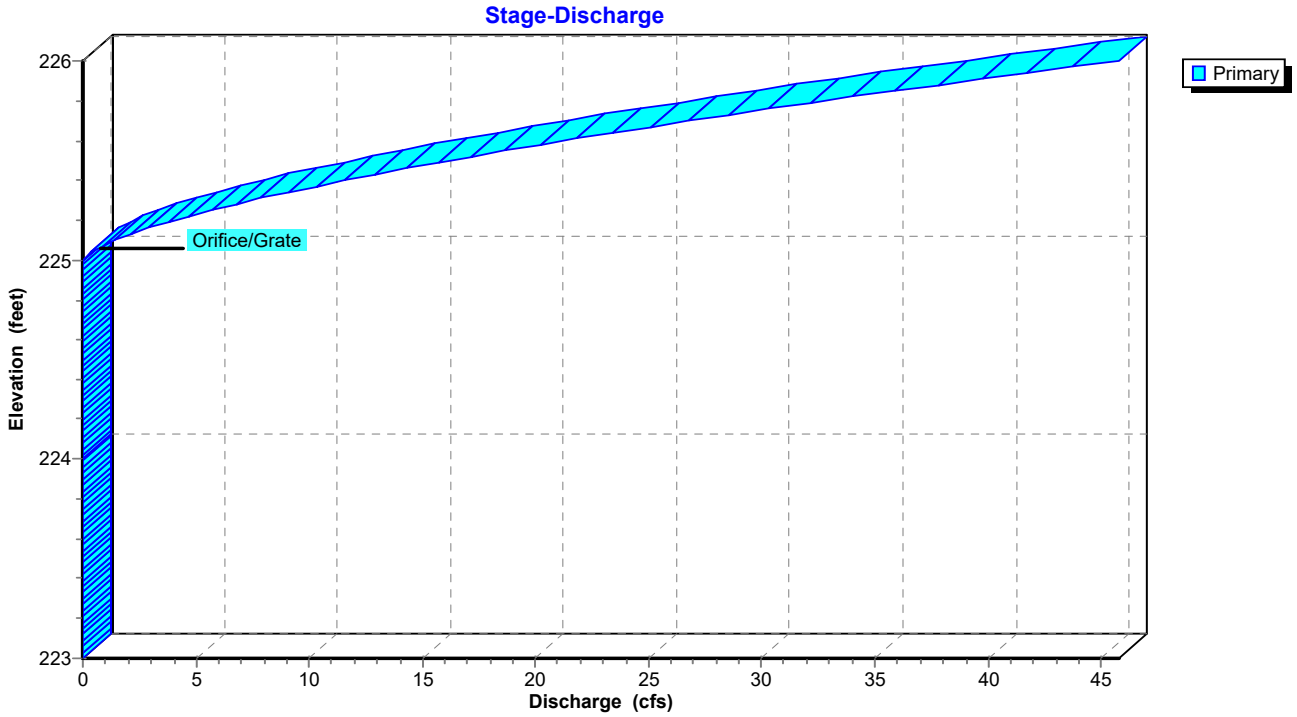
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	85,006 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
223.00	1,153	0	0	1,153
224.00	16,787	7,446	7,446	16,790
225.00	36,611	26,063	33,509	36,622
226.00	67,988	51,497	85,006	68,009

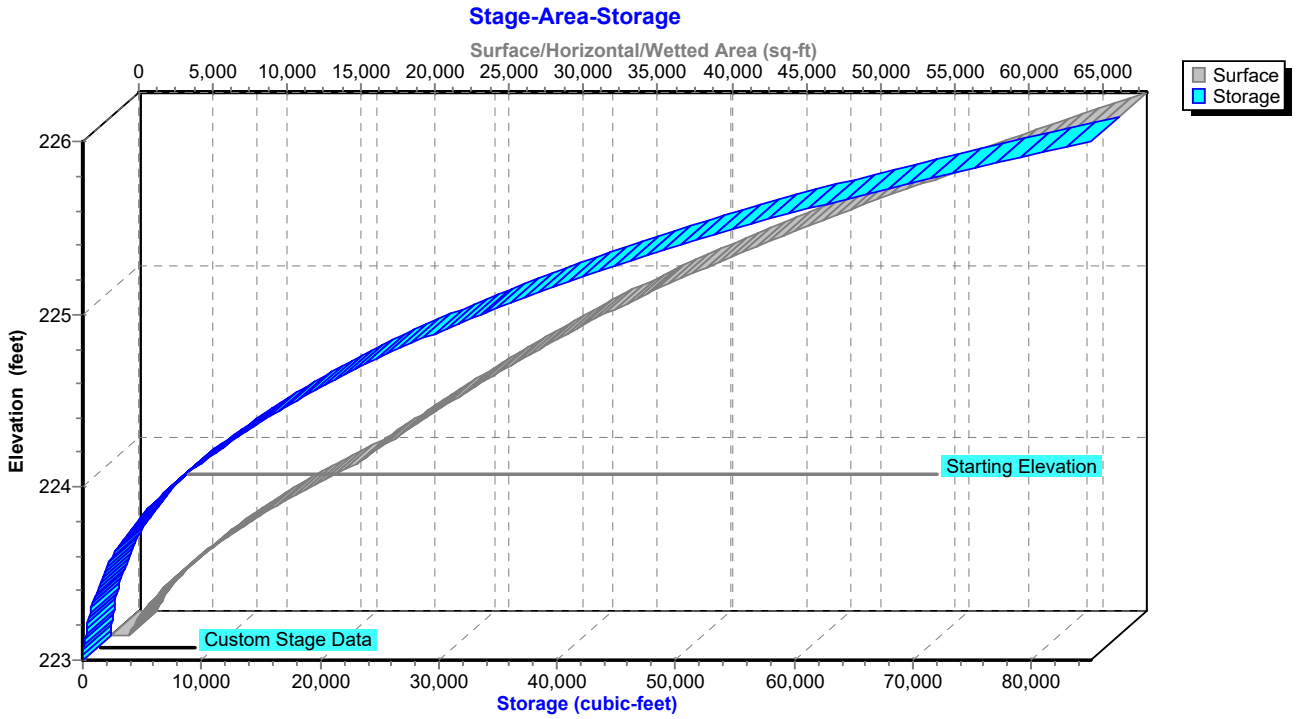
Device	Routing	Invert	Outlet Devices
#1	Primary	220.00'	**36.0" Round Culvert** L= 57.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 220.00' / 216.48' S= 0.0618 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 7.07 sf
#2	Device 1	225.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.66 cfs @ 12.96 hrs HW=225.22' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Passes 4.66 cfs of 51.81 cfs potential flow)
↑**2=Orifice/Grate** (Weir Controls 4.66 cfs @ 1.53 fps)

Pond 3P: Existing Wetland (PR Condition)



Pond 3P: Existing Wetland (PR Condition)



Summary for Pond 4P: Forebay & Bio A1-A

Inflow Area = 4.762 ac, 47.67% Impervious, Inflow Depth = 2.55" for 10-yr event
Inflow = 8.92 cfs @ 12.26 hrs, Volume= 1.010 af
Outflow = 6.21 cfs @ 12.46 hrs, Volume= 0.705 af, Atten= 30%, Lag= 12.1 min
Primary = 6.21 cfs @ 12.46 hrs, Volume= 0.705 af
Routed to Pond 6P : Detention Basin A1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Starting Elev= 227.50' Surf.Area= 12,044 sf Storage= 16,584 cf
Peak Elev= 228.63' @ 12.46 hrs Surf.Area= 14,898 sf Storage= 31,764 cf (15,180 cf above start)

Plug-Flow detention time= 430.3 min calculated for 0.324 af (32% of inflow)
Center-of-Mass det. time= 85.4 min (942.2 - 856.7)

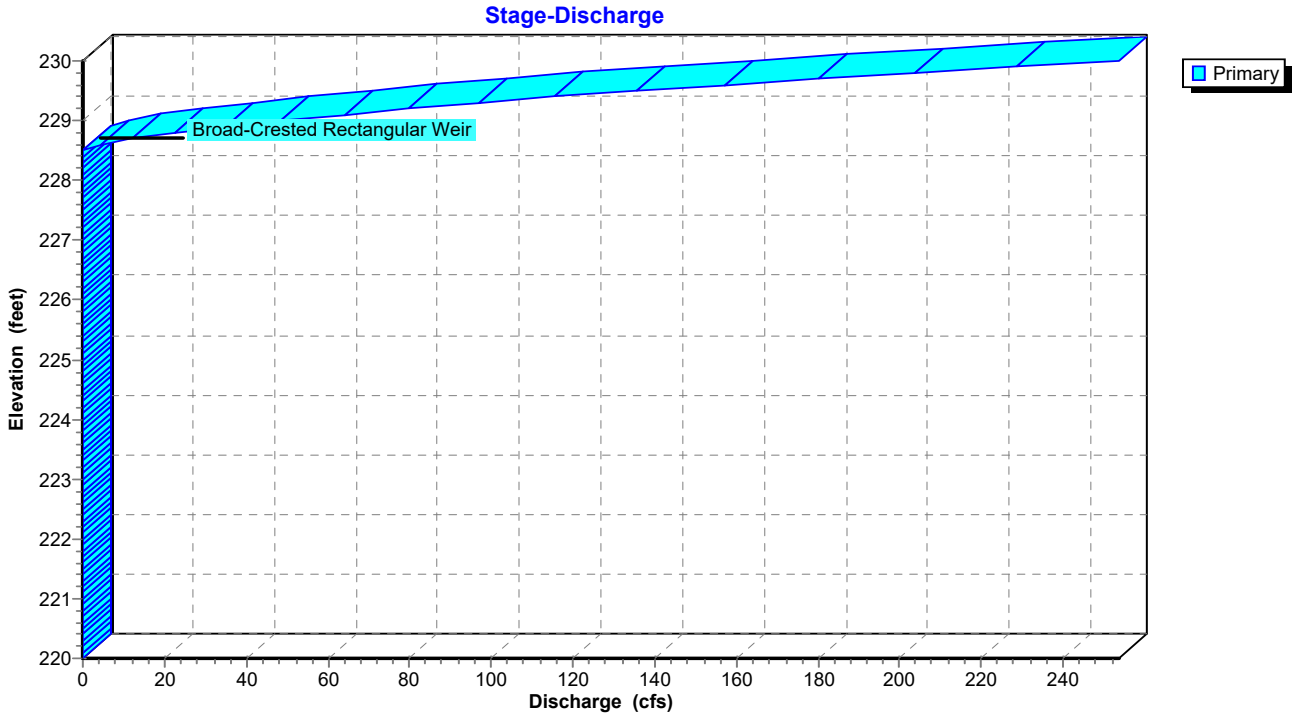
Volume	Invert	Avail.Storage	Storage Description
#1	220.00'	54,786 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
220.00	65	0	0	65
222.00	514	508	508	527
224.00	1,391	1,834	2,342	1,429
226.00	2,700	4,019	6,361	2,776
227.50	12,044	10,223	16,584	12,130
228.00	13,280	6,328	22,913	13,382
230.00	18,750	31,873	54,786	18,925

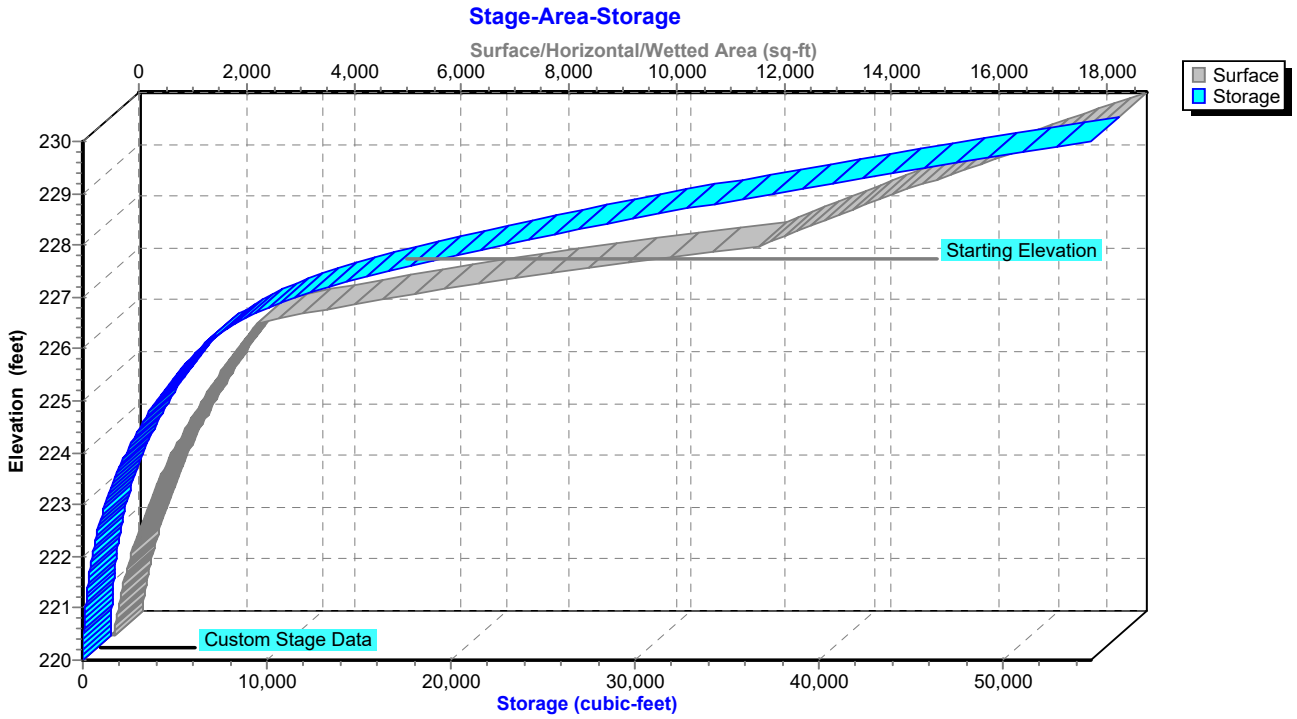
Device	Routing	Invert	Outlet Devices
#1	Primary	228.50'	**50.0' long + 2.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=6.20 cfs @ 12.46 hrs HW=228.63' TW=226.01' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 6.20 cfs @ 0.96 fps)

Pond 4P: Forebay & Bio A1-A



Pond 4P: Forebay & Bio A1-A



Summary for Pond 5P: Forebay A1-B

Inflow Area = 2.605 ac, 63.57% Impervious, Inflow Depth = 3.19" for 10-yr event
Inflow = 7.63 cfs @ 12.13 hrs, Volume= 0.692 af
Outflow = 7.57 cfs @ 12.14 hrs, Volume= 0.692 af, Atten= 1%, Lag= 0.8 min
Primary = 7.57 cfs @ 12.14 hrs, Volume= 0.692 af
Routed to Pond 6P : Detention Basin A1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Starting Elev= 228.50' Surf.Area= 3,432 sf Storage= 11,619 cf
Peak Elev= 228.65' @ 12.14 hrs Surf.Area= 3,531 sf Storage= 12,131 cf (511 cf above start)

Plug-Flow detention time= 219.9 min calculated for 0.425 af (61% of inflow)
Center-of-Mass det. time= 4.8 min (829.3 - 824.5)

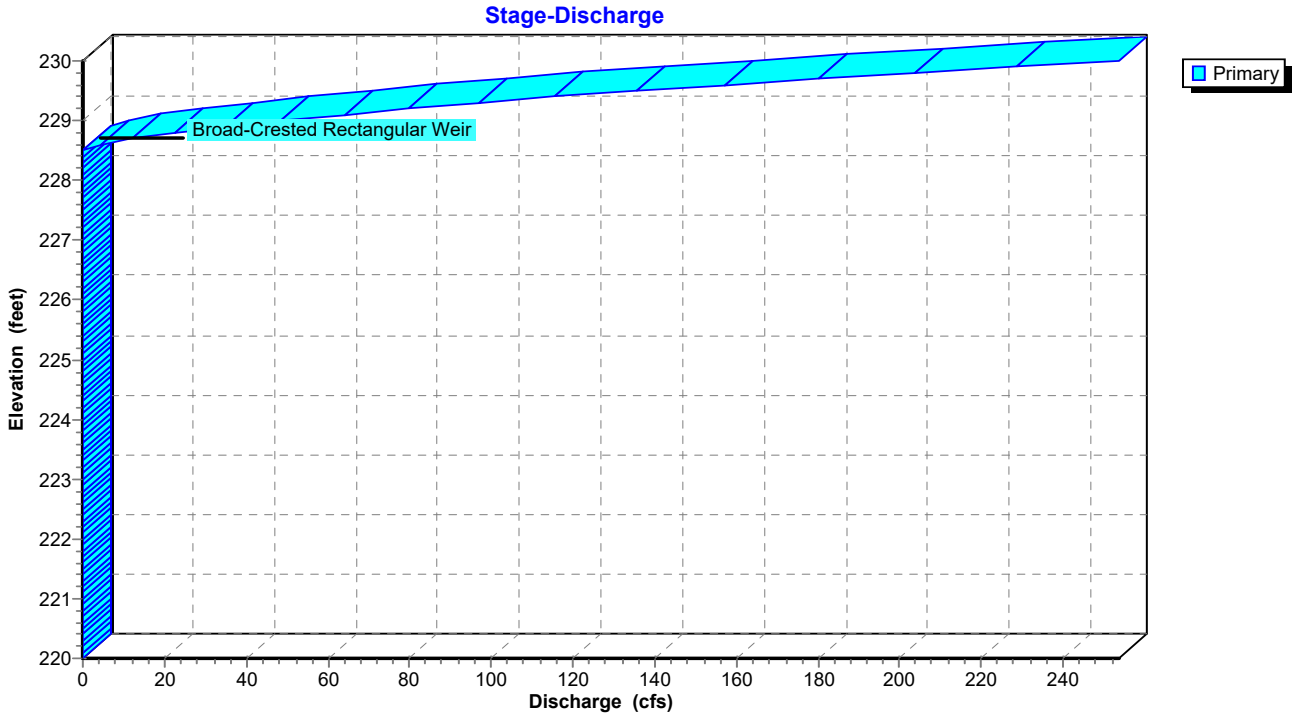
Volume	Invert	Avail.Storage	Storage Description
#1	220.00'	17,559 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
220.00	88	0	0	88
222.00	451	492	492	467
224.00	1,075	1,482	1,974	1,120
226.00	1,960	2,991	4,965	2,046
227.50	2,794	3,547	8,512	2,919
228.00	3,105	1,474	9,986	3,244
230.00	4,512	7,573	17,559	4,717

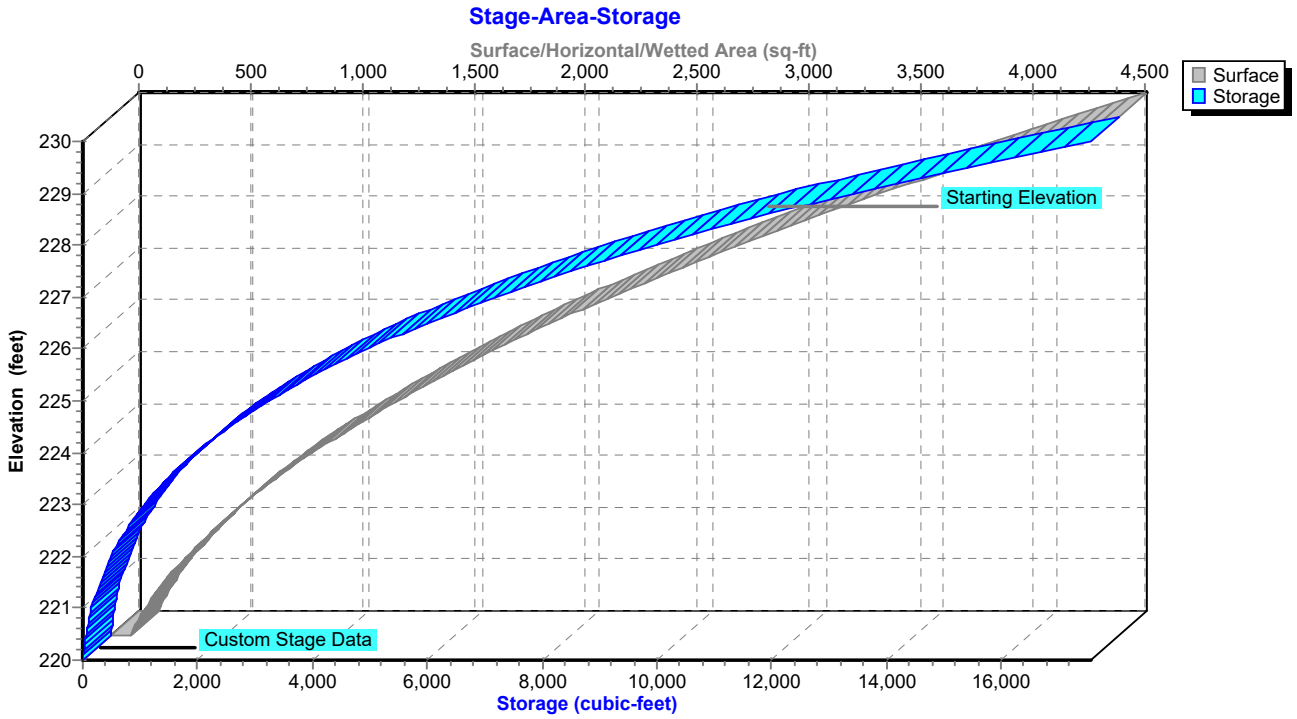
Device	Routing	Invert	Outlet Devices
#1	Primary	228.50'	**50.0' long + 2.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=7.57 cfs @ 12.14 hrs HW=228.65' TW=224.45' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 7.57 cfs @ 1.03 fps)

Pond 5P: Forebay A1-B



Pond 5P: Forebay A1-B



Summary for Pond 6P: Detention Basin A1

Inflow Area = 7.859 ac, 49.96% Impervious, Inflow Depth = 2.22" for 10-yr event
Inflow = 9.60 cfs @ 12.43 hrs, Volume= 1.451 af
Outflow = 0.83 cfs @ 16.34 hrs, Volume= 0.661 af, Atten= 91%, Lag= 234.4 min
Primary = 0.83 cfs @ 16.34 hrs, Volume= 0.661 af
Routed to Pond 7P : Design Point A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Peak Elev= 228.56' @ 16.34 hrs Surf.Area= 11,950 sf Storage= 41,603 cf

Plug-Flow detention time= 657.8 min calculated for 0.661 af (46% of inflow)
Center-of-Mass det. time= 493.6 min (1,380.1 - 886.5)

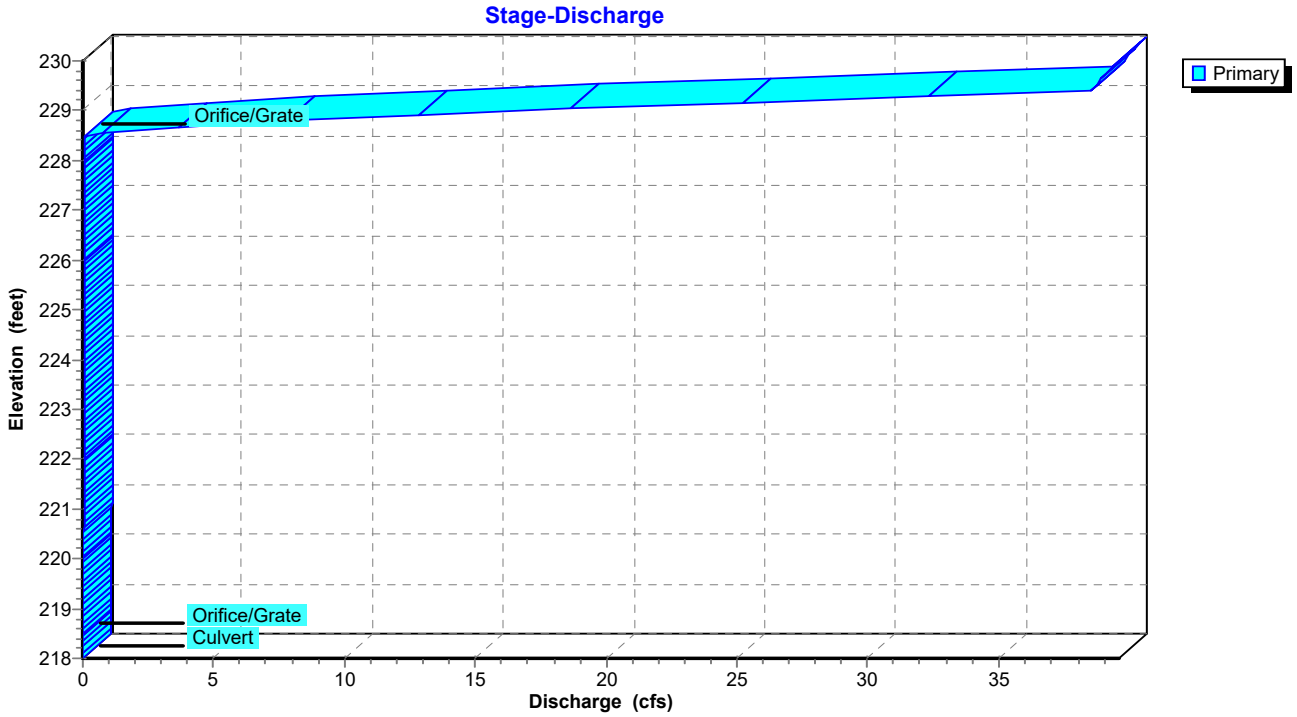
Volume	Invert	Avail.Storage	Storage Description
#1	218.00'	61,071 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
218.00	13	0	0	13
220.00	571	447	447	579
222.00	1,689	2,161	2,608	1,721
224.00	3,441	5,027	7,635	3,508
226.00	6,846	10,094	17,729	6,950
228.00	10,779	17,477	35,206	10,938
230.00	15,213	25,865	61,071	15,445

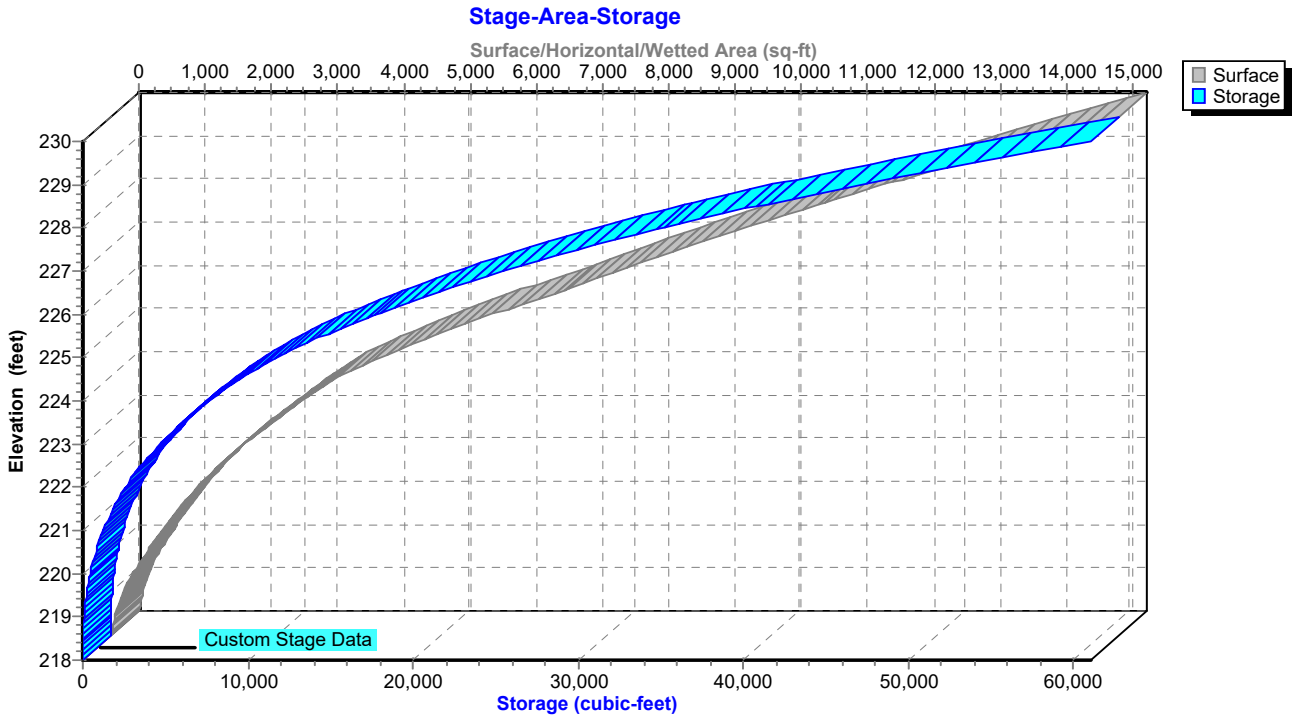
Device	Routing	Invert	Outlet Devices
#1	Primary	218.00'	**24.0" Round Culvert** L= 52.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 218.00' / 217.48' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	218.45'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	228.50'	**38.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.83 cfs @ 16.34 hrs HW=228.56' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.83 cfs of 36.93 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.08 cfs @ 15.28 fps)
  └─**3=Orifice/Grate** (Weir Controls 0.74 cfs @ 0.82 fps)

Pond 6P: Detention Basin A1



Pond 6P: Detention Basin A1



Summary for Pond 7P: Design Point A

Inflow Area = 32.895 ac, 19.32% Impervious, Inflow Depth > 1.09" for 10-yr event
Inflow = 7.35 cfs @ 12.77 hrs, Volume= 3.000 af
Primary = 7.35 cfs @ 12.77 hrs, Volume= 3.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5

Summary for Pond 8P: Detention Basin B1

Inflow Area = 1.134 ac, 0.00% Impervious, Inflow Depth = 2.29" for 10-yr event
Inflow = 2.29 cfs @ 12.15 hrs, Volume= 0.216 af
Outflow = 1.55 cfs @ 12.31 hrs, Volume= 0.216 af, Atten= 32%, Lag= 9.5 min
Primary = 1.55 cfs @ 12.31 hrs, Volume= 0.216 af
Routed to Pond 9P : Design Point B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Automatic Starting Elev= 263.50' Surf.Area= 154 sf Storage= 50 cf
Peak Elev= 266.09' @ 12.31 hrs Surf.Area= 1,697 sf Storage= 2,077 cf (2,027 cf above start)

Plug-Flow detention time= 43.4 min calculated for 0.215 af (99% of inflow)
Center-of-Mass det. time= 38.3 min (897.8 - 859.6)

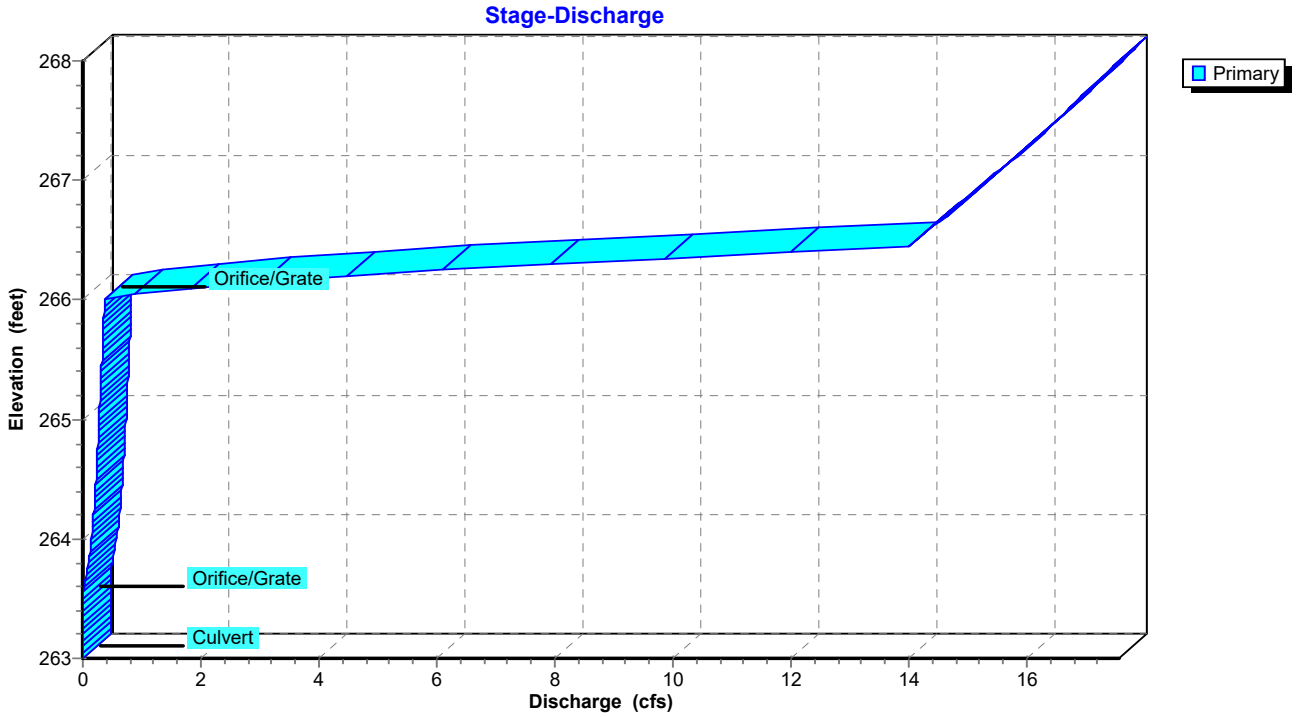
Volume	Invert	Avail.Storage	Storage Description
#1	263.00'	6,709 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
263.00	54	0	0	54
264.00	306	163	163	310
266.00	1,639	1,769	1,932	1,659
268.00	3,227	4,777	6,709	3,284

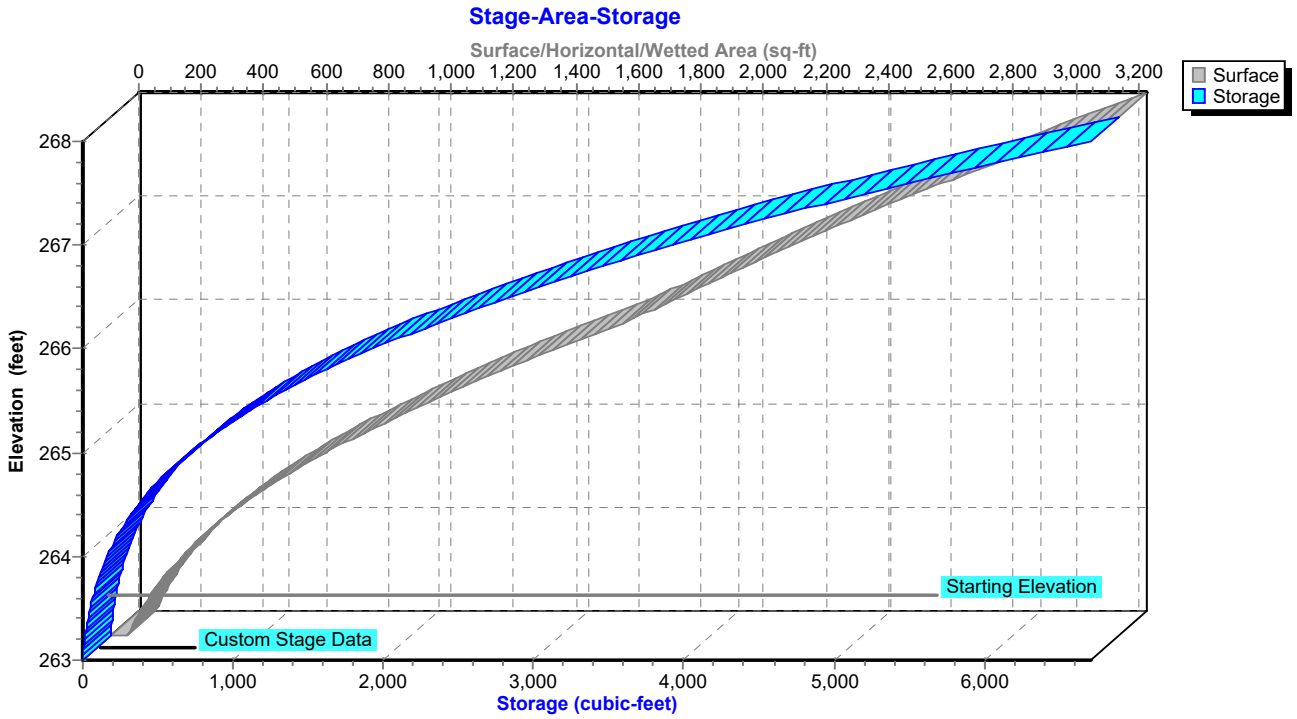
Device	Routing	Invert	Outlet Devices
#1	Primary	263.00'	**18.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 263.00' / 262.50' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	263.50'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	266.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.55 cfs @ 12.31 hrs HW=266.09' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 1.55 cfs of 13.01 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.37 cfs @ 7.56 fps)
  └─**3=Orifice/Grate** (Weir Controls 1.18 cfs @ 0.97 fps)

Pond 8P: Detention Basin B1



Pond 8P: Detention Basin B1



Summary for Pond 9P: Design Point B

Inflow Area = 3.469 ac, 0.00% Impervious, Inflow Depth = 1.59" for 10-yr event
Inflow = 3.38 cfs @ 12.30 hrs, Volume= 0.461 af
Primary = 3.38 cfs @ 12.30 hrs, Volume= 0.461 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5

Summary for Pond 10P: Forebay & Bio C1-A

Inflow Area = 4.929 ac, 70.16% Impervious, Inflow Depth = 3.38" for 10-yr event
Inflow = 12.46 cfs @ 12.22 hrs, Volume= 1.390 af
Outflow = 8.51 cfs @ 12.42 hrs, Volume= 0.916 af, Atten= 32%, Lag= 12.0 min
Primary = 8.51 cfs @ 12.42 hrs, Volume= 0.916 af
Routed to Pond 12P : Detention Basin C1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Starting Elev= 264.50' Surf.Area= 18,768 sf Storage= 30,218 cf
Peak Elev= 265.66' @ 12.42 hrs Surf.Area= 23,297 sf Storage= 54,551 cf (24,333 cf above start)

Plug-Flow detention time= 641.0 min calculated for 0.222 af (16% of inflow)
Center-of-Mass det. time= 95.3 min (918.5 - 823.2)

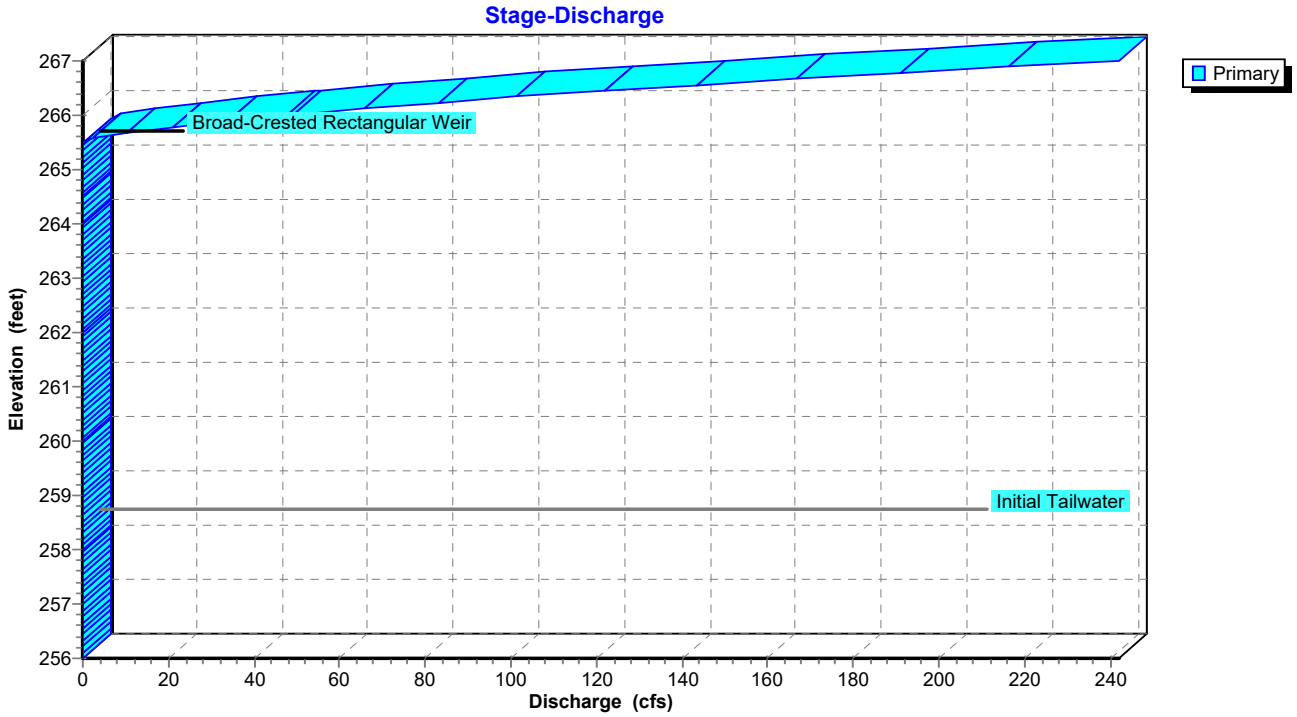
Volume	Invert	Avail.Storage	Storage Description
#1	256.00'	89,274 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
256.00	549	0	0	549
258.00	1,512	1,981	1,981	1,537
260.00	2,803	4,249	6,231	2,868
262.00	4,430	7,171	13,402	4,550
264.00	6,420	10,789	24,190	6,606
264.50	18,768	6,027	30,218	18,956
266.00	24,721	32,514	62,732	24,960
267.00	28,405	26,542	89,274	28,689

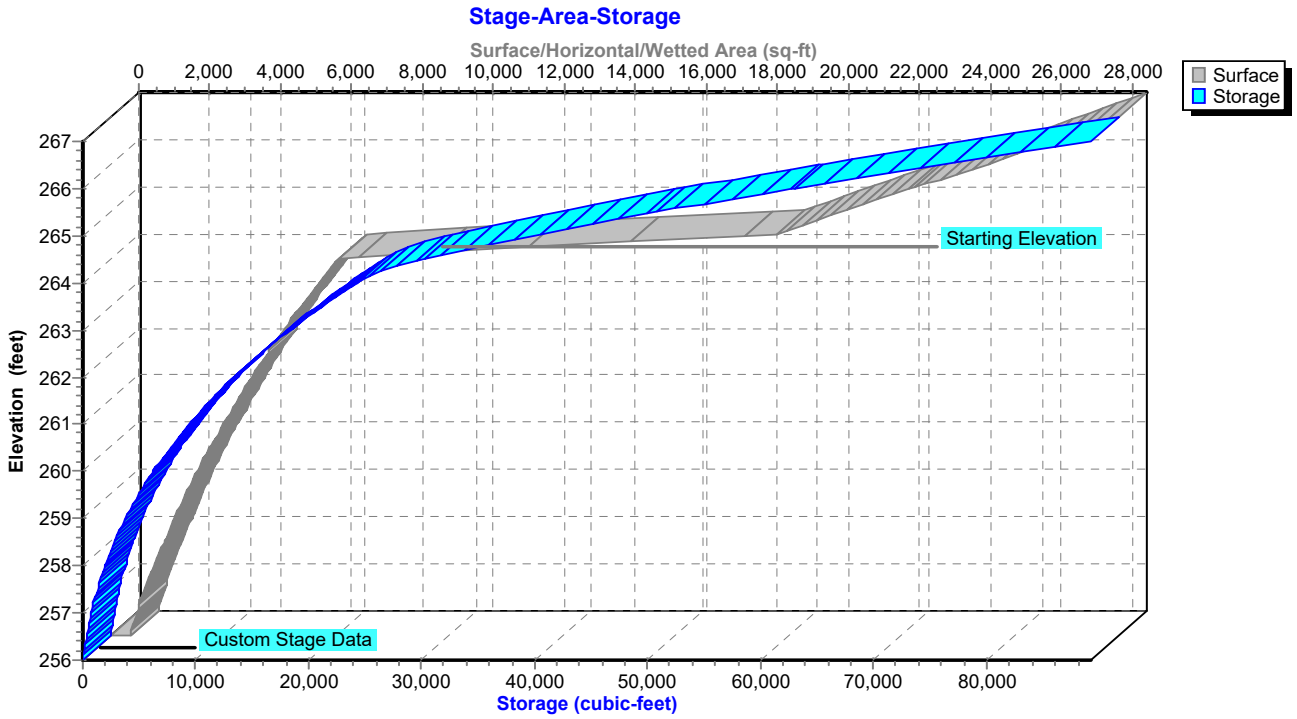
Device	Routing	Invert	Outlet Devices
#1	Primary	265.50'	**50.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=8.51 cfs @ 12.42 hrs HW=265.66' TW=262.69' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 8.51 cfs @ 1.07 fps)

Pond 10P: Forebay & Bio C1-A



Pond 10P: Forebay & Bio C1-A



Summary for Pond 11P: Forebay C1-B

Inflow Area = 6.154 ac, 61.08% Impervious, Inflow Depth = 3.00" for 10-yr event
Inflow = 15.00 cfs @ 12.20 hrs, Volume= 1.537 af
Outflow = 14.77 cfs @ 12.22 hrs, Volume= 1.537 af, Atten= 1%, Lag= 1.3 min
Primary = 14.77 cfs @ 12.22 hrs, Volume= 1.537 af
Routed to Pond 12P : Detention Basin C1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Automatic Starting Elev= 264.75' Surf.Area= 8,627 sf Storage= 41,372 cf
Peak Elev= 264.98' @ 12.22 hrs Surf.Area= 8,878 sf Storage= 43,373 cf (2,001 cf above start)

Plug-Flow detention time= 349.9 min calculated for 0.587 af (38% of inflow)
Center-of-Mass det. time= 4.6 min (840.5 - 835.8)

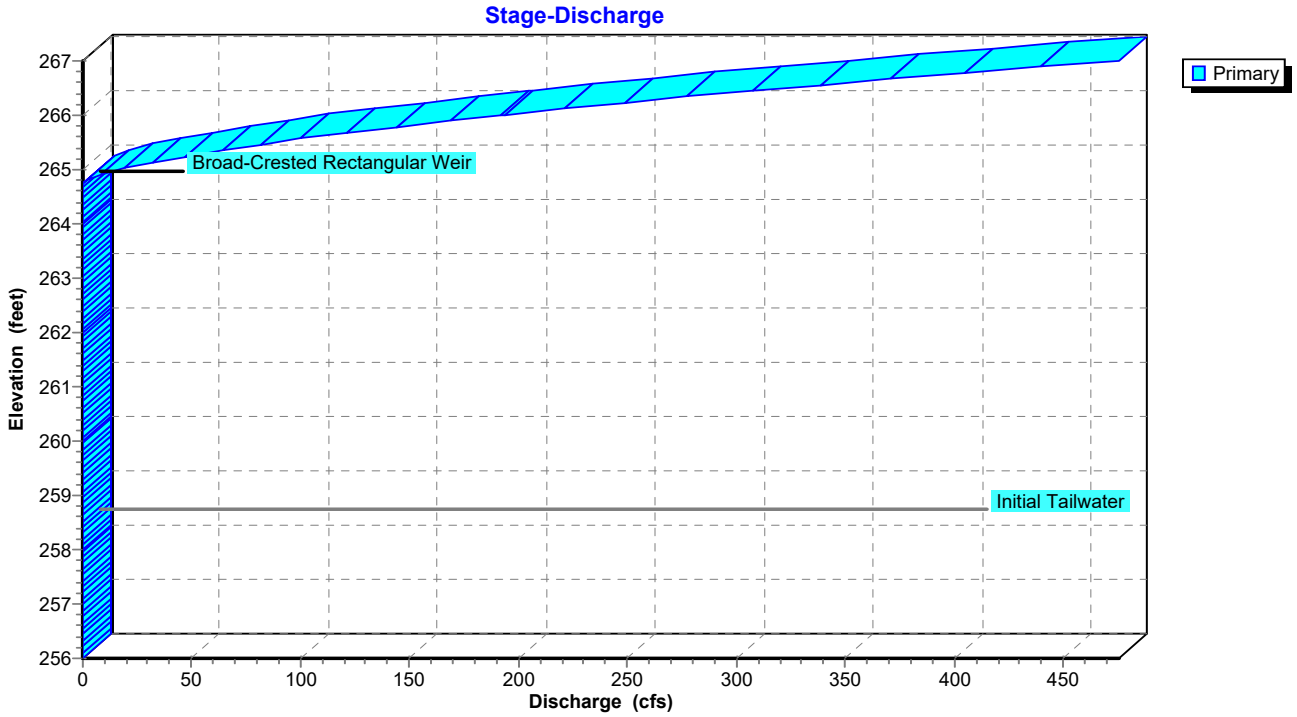
Volume	Invert	Avail.Storage	Storage Description
#1	256.00'	63,668 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
256.00	1,704	0	0	1,704
258.00	2,823	4,480	4,480	2,872
260.00	4,218	6,994	11,475	4,328
262.00	5,887	10,059	21,533	6,071
264.00	7,829	13,670	35,203	8,100
266.00	10,042	17,825	53,028	10,412
267.00	11,249	10,640	63,668	11,673

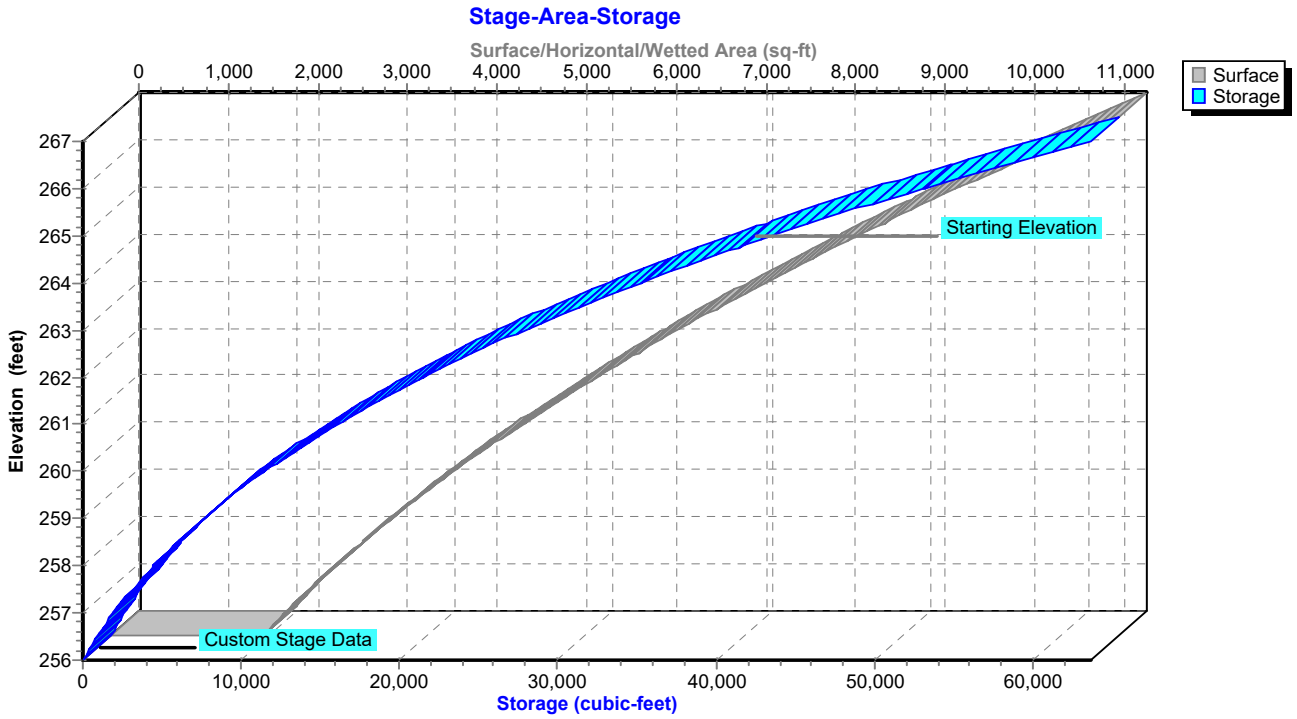
Device	Routing	Invert	Outlet Devices
#1	Primary	264.75'	**50.0' long + 2.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=14.77 cfs @ 12.22 hrs HW=264.98' TW=261.37' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 14.77 cfs @ 1.28 fps)

Pond 11P: Forebay C1-B



Pond 11P: Forebay C1-B



Summary for Pond 12P: Detention Basin C1

Inflow Area = 27.920 ac, 26.01% Impervious, Inflow Depth = 2.29" for 10-yr event
Inflow = 42.20 cfs @ 12.32 hrs, Volume= 5.326 af
Outflow = 18.40 cfs @ 12.78 hrs, Volume= 4.368 af, Atten= 56%, Lag= 27.7 min
Primary = 18.40 cfs @ 12.78 hrs, Volume= 4.368 af
Routed to Pond 13P : Design Point C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Automatic Starting Elev= 258.50' Surf.Area= 8,775 sf Storage= 3,981 cf
Peak Elev= 263.53' @ 12.78 hrs Surf.Area= 28,708 sf Storage= 97,064 cf (93,082 cf above start)

Plug-Flow detention time= 428.6 min calculated for 4.277 af (80% of inflow)
Center-of-Mass det. time= 329.5 min (1,203.2 - 873.7)

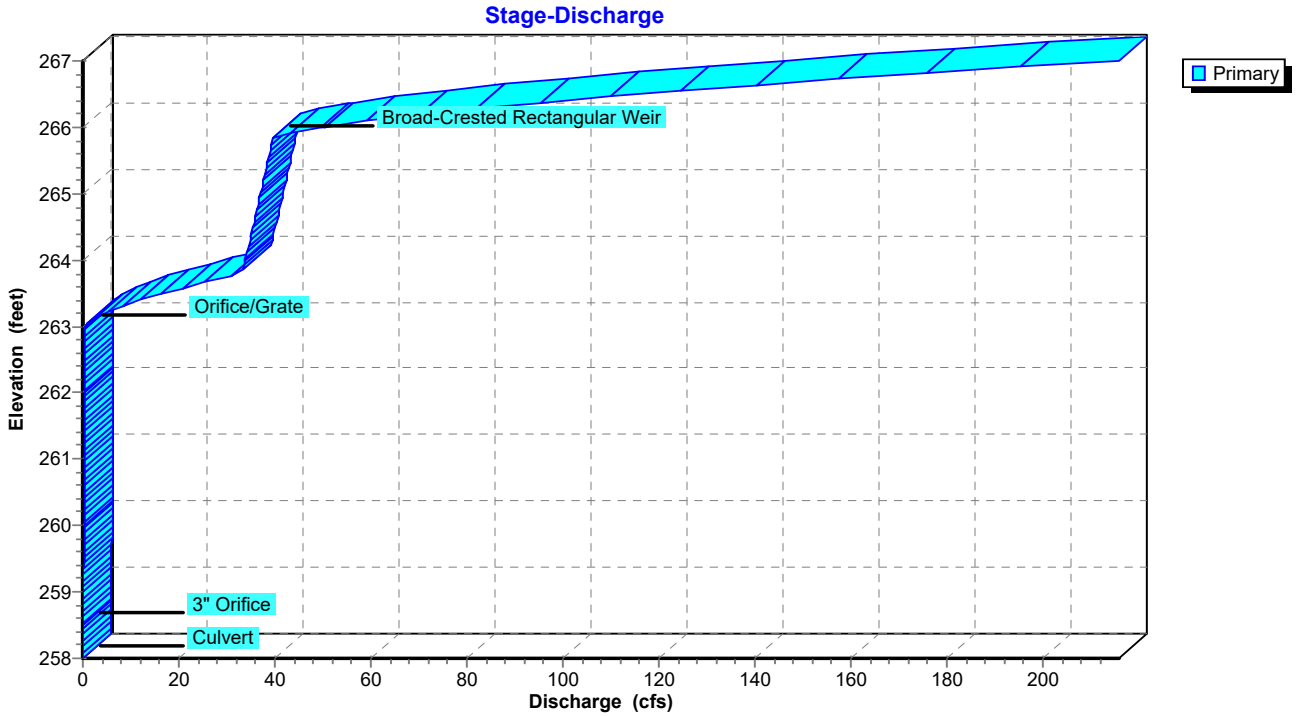
Volume	Invert	Avail.Storage	Storage Description
#1	258.00'	222,991 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
258.00	7,176	0	0	7,176
260.00	14,538	21,285	21,285	14,574
262.00	22,410	36,665	57,951	22,504
264.00	30,774	52,963	110,914	30,947
266.00	39,609	70,197	181,111	39,881
267.00	44,193	41,880	222,991	44,522

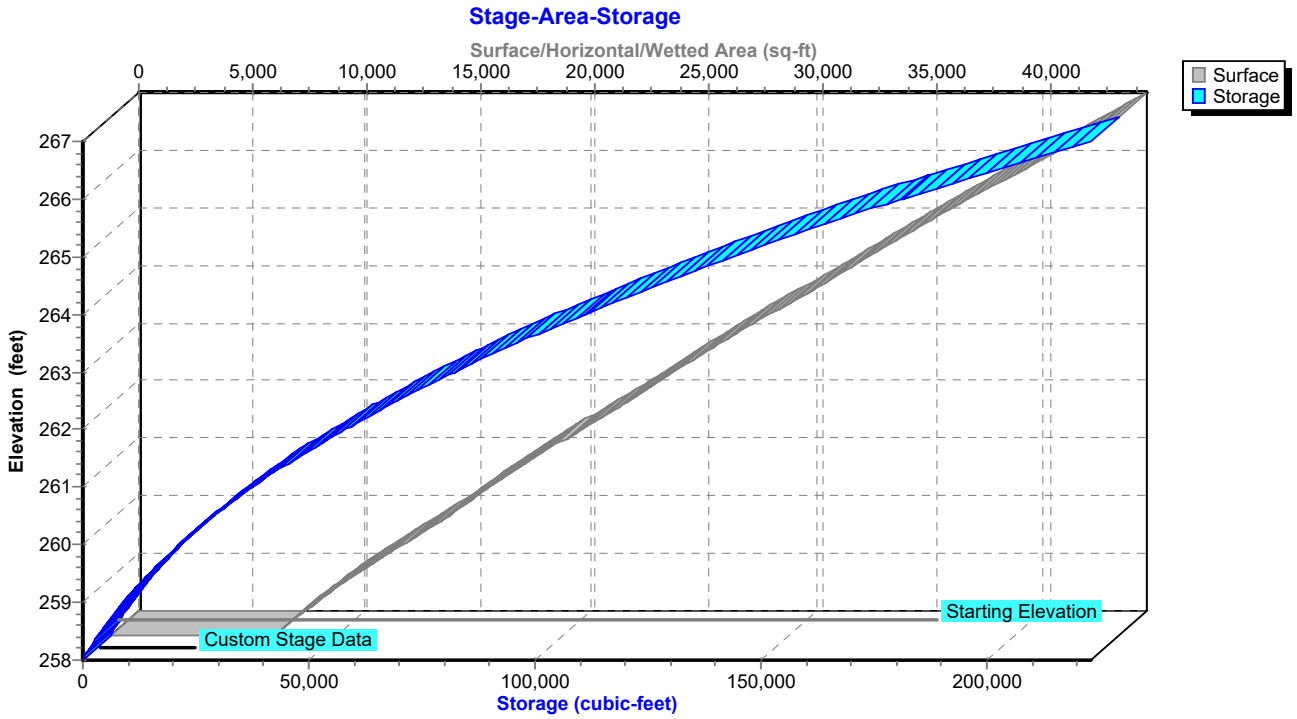
Device	Routing	Invert	Outlet Devices
#1	Primary	258.00'	**24.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 258.00' / 256.00' S= 0.0400 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	258.50'	**3.0" Vert. 3" Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	263.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	265.83'	**50.0' long + 2.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=18.39 cfs @ 12.78 hrs HW=263.53' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 18.39 cfs of 32.21 cfs potential flow)
  - **2=3" Orifice** (Orifice Controls 0.52 cfs @ 10.67 fps)
  - **3=Orifice/Grate** (Weir Controls 17.87 cfs @ 2.39 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 12P: Detention Basin C1



Pond 12P: Detention Basin C1



Summary for Pond 13P: Design Point C

Inflow Area = 29.035 ac, 25.59% Impervious, Inflow Depth > 1.89" for 10-yr event
Inflow = 18.91 cfs @ 12.78 hrs, Volume= 4.573 af
Primary = 18.91 cfs @ 12.78 hrs, Volume= 4.573 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5

Summary for Pond 1P: Existing Wetland (EX Condition)

Inflow Area = 22.902 ac, 8.12% Impervious, Inflow Depth = 2.03" for 25-yr event
Inflow = 28.63 cfs @ 12.35 hrs, Volume= 3.873 af
Outflow = 15.26 cfs @ 12.78 hrs, Volume= 2.752 af, Atten= 47%, Lag= 25.8 min
Primary = 15.26 cfs @ 12.78 hrs, Volume= 2.752 af
Routed to Pond 2P : Existing A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Starting Elev= 224.00' Surf.Area= 16,787 sf Storage= 7,446 cf
Peak Elev= 225.65' @ 12.78 hrs Surf.Area= 61,221 sf Storage= 64,868 cf (57,421 cf above start)

Plug-Flow detention time= 224.9 min calculated for 2.581 af (67% of inflow)
Center-of-Mass det. time= 83.7 min (982.7 - 899.0)

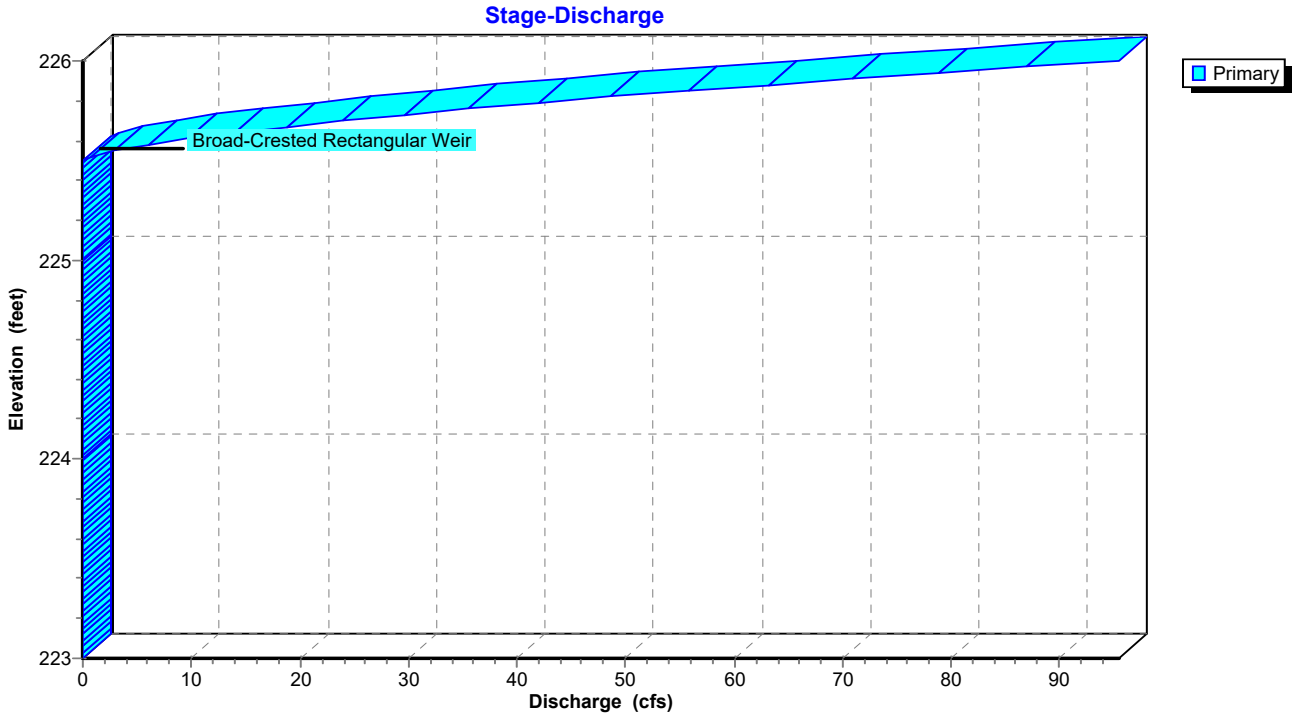
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	89,179 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
223.00	1,153	0	0	1,153
224.00	16,787	7,446	7,446	16,790
225.00	36,611	26,063	33,509	36,622
226.00	77,225	55,669	89,179	77,244

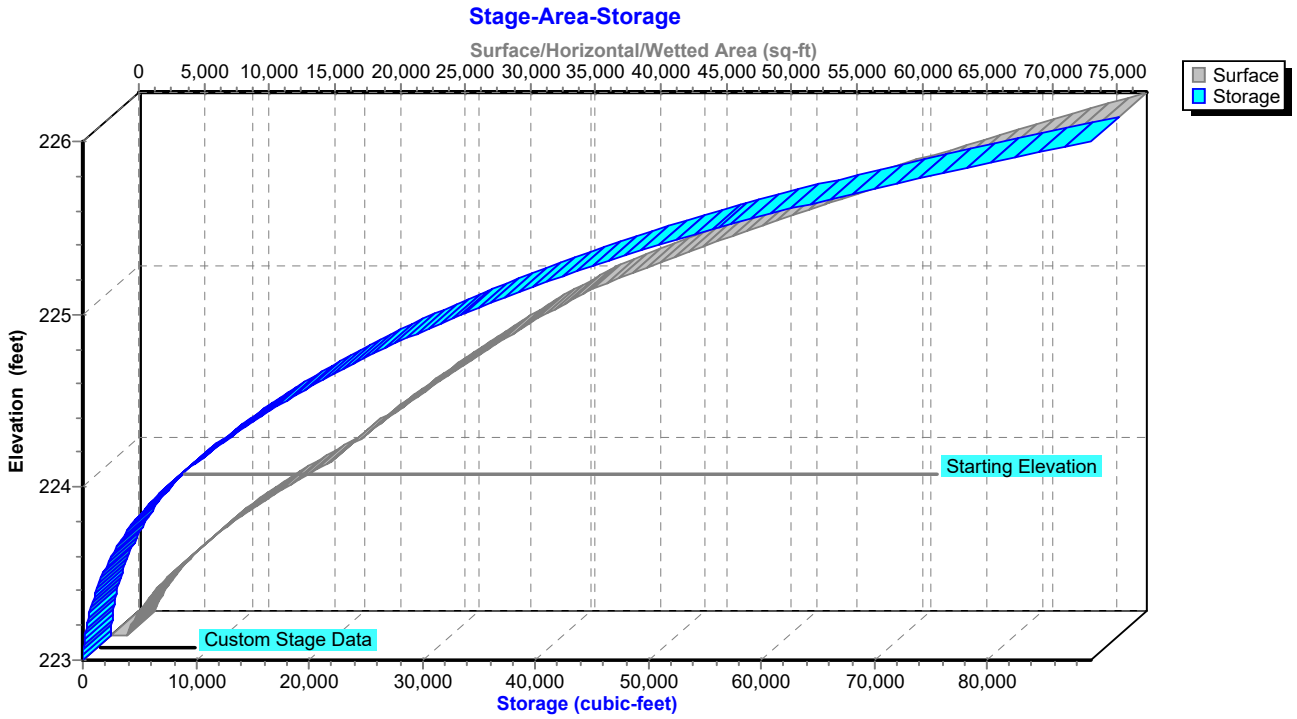
Device	Routing	Invert	Outlet Devices
#1	Primary	225.50'	**100.0' long x 20.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=15.26 cfs @ 12.78 hrs HW=225.65' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 15.26 cfs @ 1.03 fps)

Pond 1P: Existing Wetland (EX Condition)



Pond 1P: Existing Wetland (EX Condition)



Summary for Pond 2P: Existing A

Inflow Area = 34.926 ac, 5.76% Impervious, Inflow Depth = 1.56" for 25-yr event
Inflow = 21.24 cfs @ 12.73 hrs, Volume= 4.537 af
Primary = 21.24 cfs @ 12.73 hrs, Volume= 4.537 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5

Summary for Pond 3P: Existing Wetland (PR Condition)

Inflow Area = 14.149 ac, 15.15% Impervious, Inflow Depth = 2.55" for 25-yr event
Inflow = 24.48 cfs @ 12.29 hrs, Volume= 3.009 af
Outflow = 12.35 cfs @ 12.70 hrs, Volume= 2.410 af, Atten= 50%, Lag= 24.6 min
Primary = 12.35 cfs @ 12.70 hrs, Volume= 2.410 af
Routed to Pond 7P : Design Point A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Starting Elev= 224.00' Surf.Area= 16,787 sf Storage= 7,446 cf
Peak Elev= 225.42' @ 12.70 hrs Surf.Area= 48,540 sf Storage= 51,227 cf (43,781 cf above start)

Plug-Flow detention time= 200.2 min calculated for 2.239 af (74% of inflow)
Center-of-Mass det. time= 78.8 min (957.6 - 878.8)

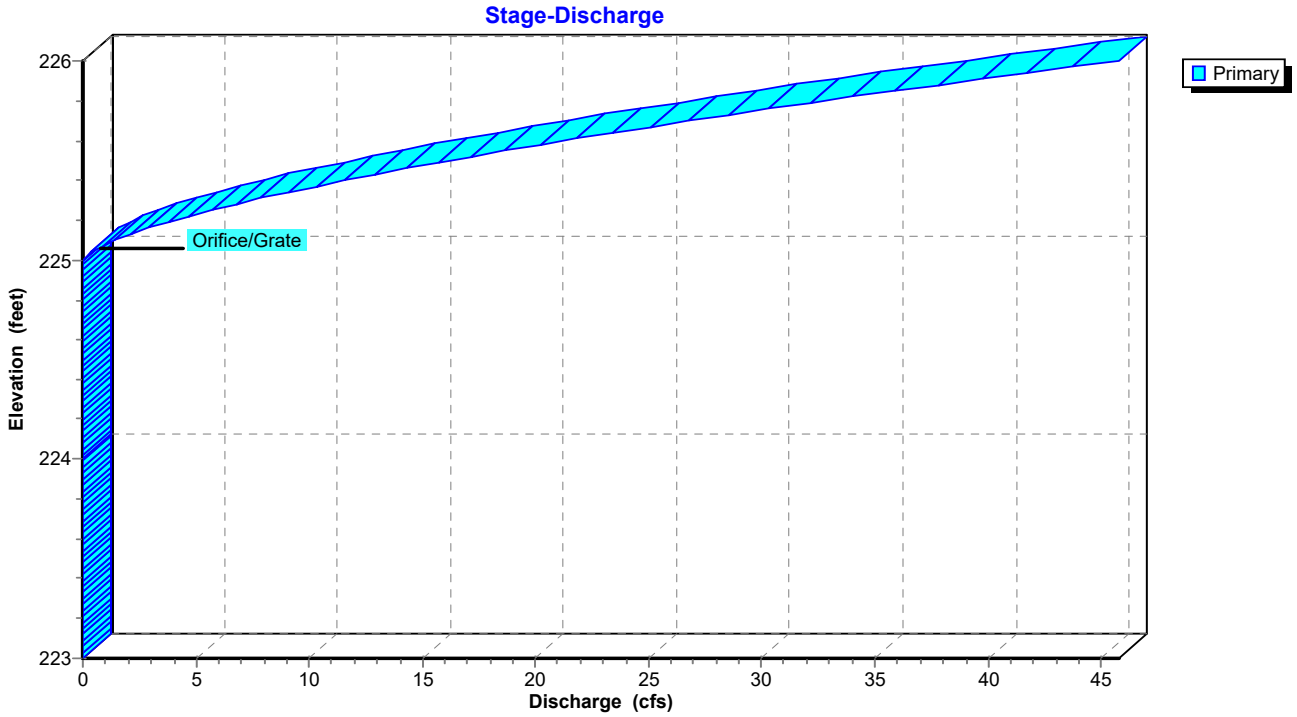
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	85,006 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
223.00	1,153	0	0	1,153
224.00	16,787	7,446	7,446	16,790
225.00	36,611	26,063	33,509	36,622
226.00	67,988	51,497	85,006	68,009

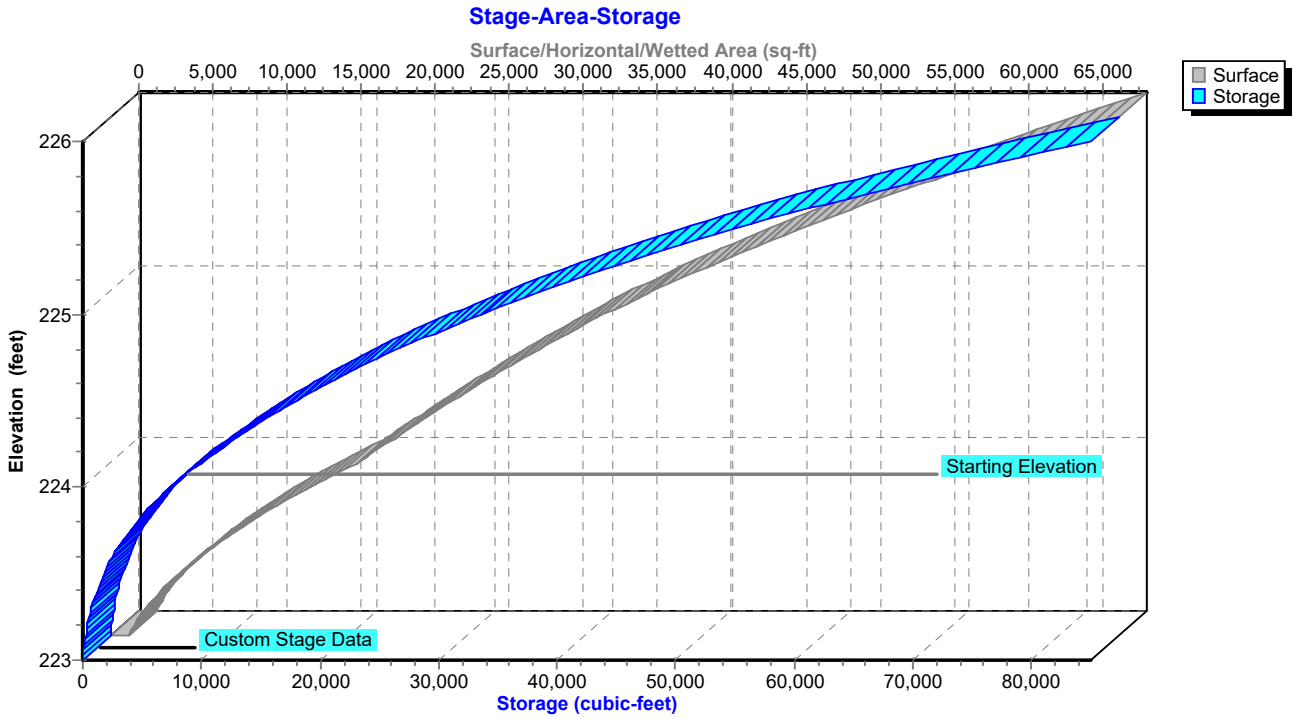
Device	Routing	Invert	Outlet Devices
#1	Primary	220.00'	**36.0" Round Culvert** L= 57.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 220.00' / 216.48' S= 0.0618 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 7.07 sf
#2	Device 1	225.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=12.35 cfs @ 12.70 hrs HW=225.42' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Passes 12.35 cfs of 53.18 cfs potential flow)
↑**2=Orifice/Grate** (Weir Controls 12.35 cfs @ 2.11 fps)

Pond 3P: Existing Wetland (PR Condition)



Pond 3P: Existing Wetland (PR Condition)



Summary for Pond 4P: Forebay & Bio A1-A

Inflow Area = 4.762 ac, 47.67% Impervious, Inflow Depth = 3.60" for 25-yr event
Inflow = 12.36 cfs @ 12.26 hrs, Volume= 1.428 af
Outflow = 11.62 cfs @ 12.32 hrs, Volume= 1.123 af, Atten= 6%, Lag= 3.8 min
Primary = 11.62 cfs @ 12.32 hrs, Volume= 1.123 af
Routed to Pond 6P : Detention Basin A1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Starting Elev= 227.50' Surf.Area= 12,044 sf Storage= 16,584 cf
Peak Elev= 228.70' @ 12.32 hrs Surf.Area= 15,074 sf Storage= 32,761 cf (16,176 cf above start)

Plug-Flow detention time= 287.6 min calculated for 0.743 af (52% of inflow)
Center-of-Mass det. time= 67.3 min (912.8 - 845.5)

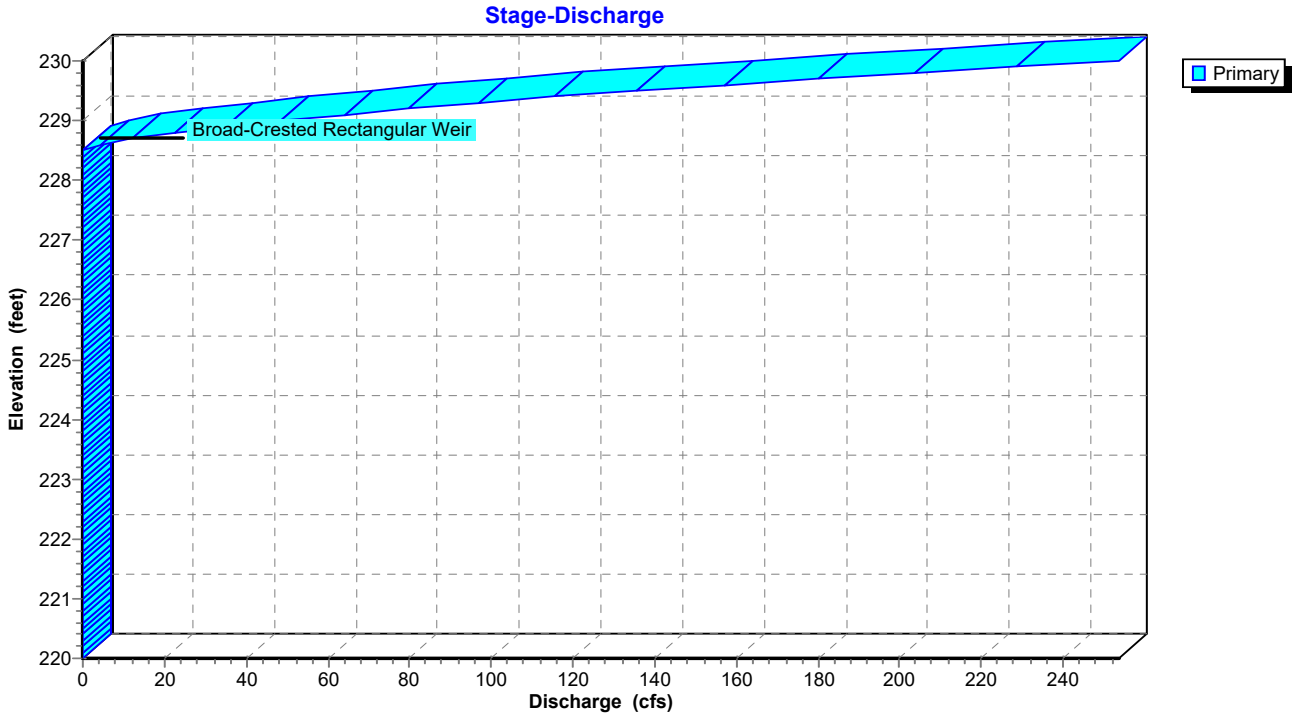
Volume	Invert	Avail.Storage	Storage Description
#1	220.00'	54,786 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
220.00	65	0	0	65
222.00	514	508	508	527
224.00	1,391	1,834	2,342	1,429
226.00	2,700	4,019	6,361	2,776
227.50	12,044	10,223	16,584	12,130
228.00	13,280	6,328	22,913	13,382
230.00	18,750	31,873	54,786	18,925

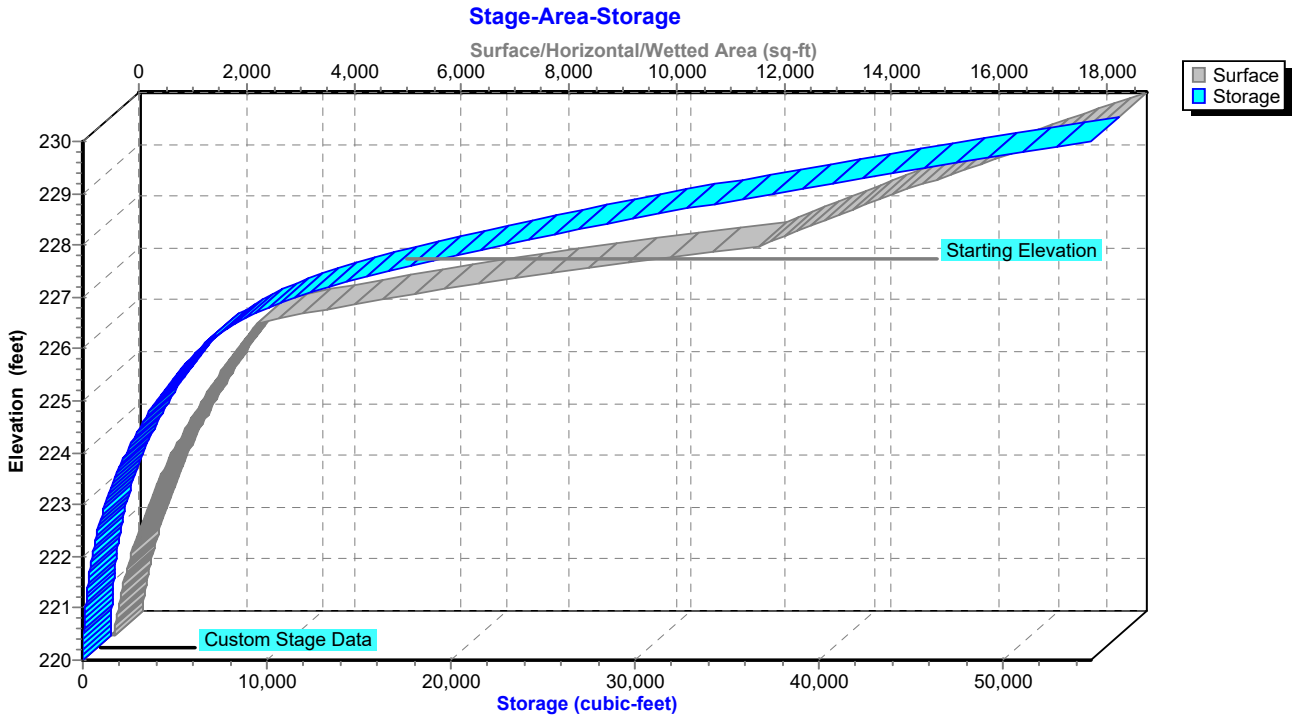
Device	Routing	Invert	Outlet Devices
#1	Primary	228.50'	**50.0' long + 2.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=11.62 cfs @ 12.32 hrs HW=228.70' TW=226.92' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 11.62 cfs @ 1.18 fps)

Pond 4P: Forebay & Bio A1-A



Pond 4P: Forebay & Bio A1-A



Summary for Pond 5P: Forebay A1-B

Inflow Area = 2.605 ac, 63.57% Impervious, Inflow Depth = 4.32" for 25-yr event
Inflow = 9.99 cfs @ 12.13 hrs, Volume= 0.939 af
Outflow = 9.93 cfs @ 12.14 hrs, Volume= 0.939 af, Atten= 1%, Lag= 0.7 min
Primary = 9.93 cfs @ 12.14 hrs, Volume= 0.939 af
Routed to Pond 6P : Detention Basin A1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Starting Elev= 228.50' Surf.Area= 3,432 sf Storage= 11,619 cf
Peak Elev= 228.68' @ 13.02 hrs Surf.Area= 3,557 sf Storage= 12,265 cf (646 cf above start)

Plug-Flow detention time= 182.6 min calculated for 0.672 af (72% of inflow)
Center-of-Mass det. time= 5.9 min (820.6 - 814.6)

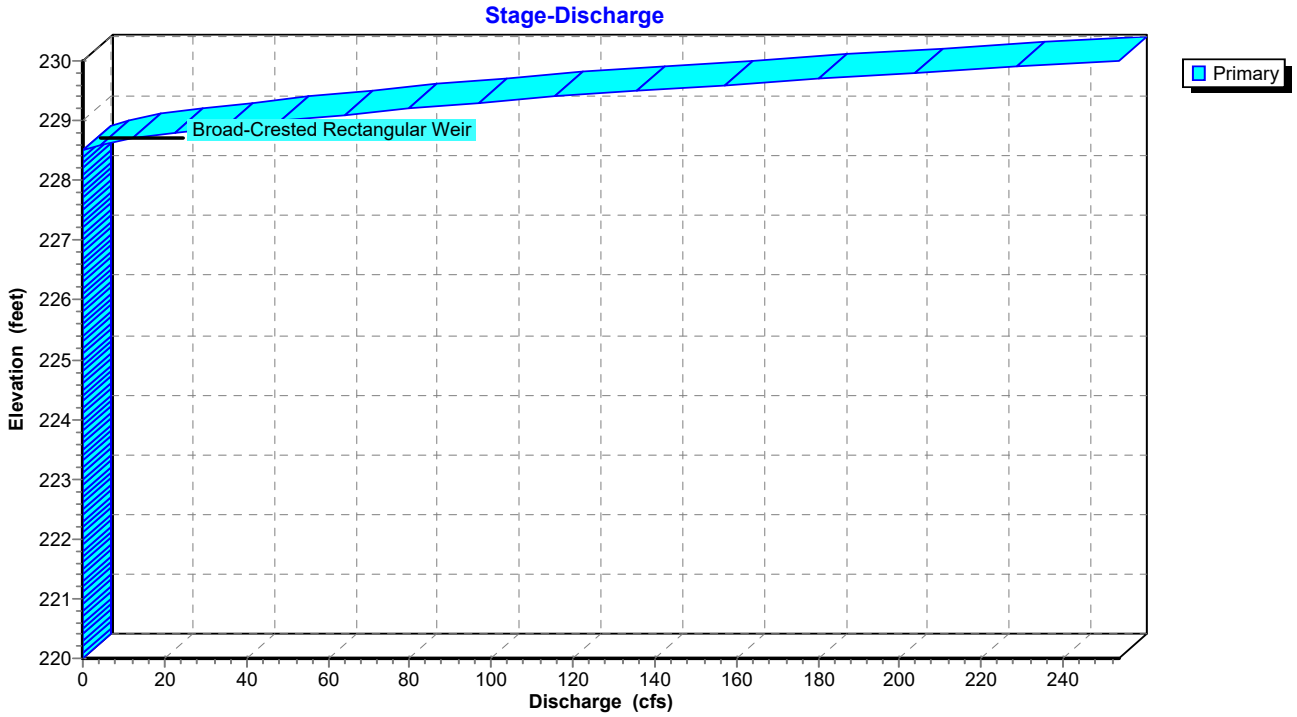
Volume	Invert	Avail.Storage	Storage Description
#1	220.00'	17,559 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
220.00	88	0	0	88
222.00	451	492	492	467
224.00	1,075	1,482	1,974	1,120
226.00	1,960	2,991	4,965	2,046
227.50	2,794	3,547	8,512	2,919
228.00	3,105	1,474	9,986	3,244
230.00	4,512	7,573	17,559	4,717

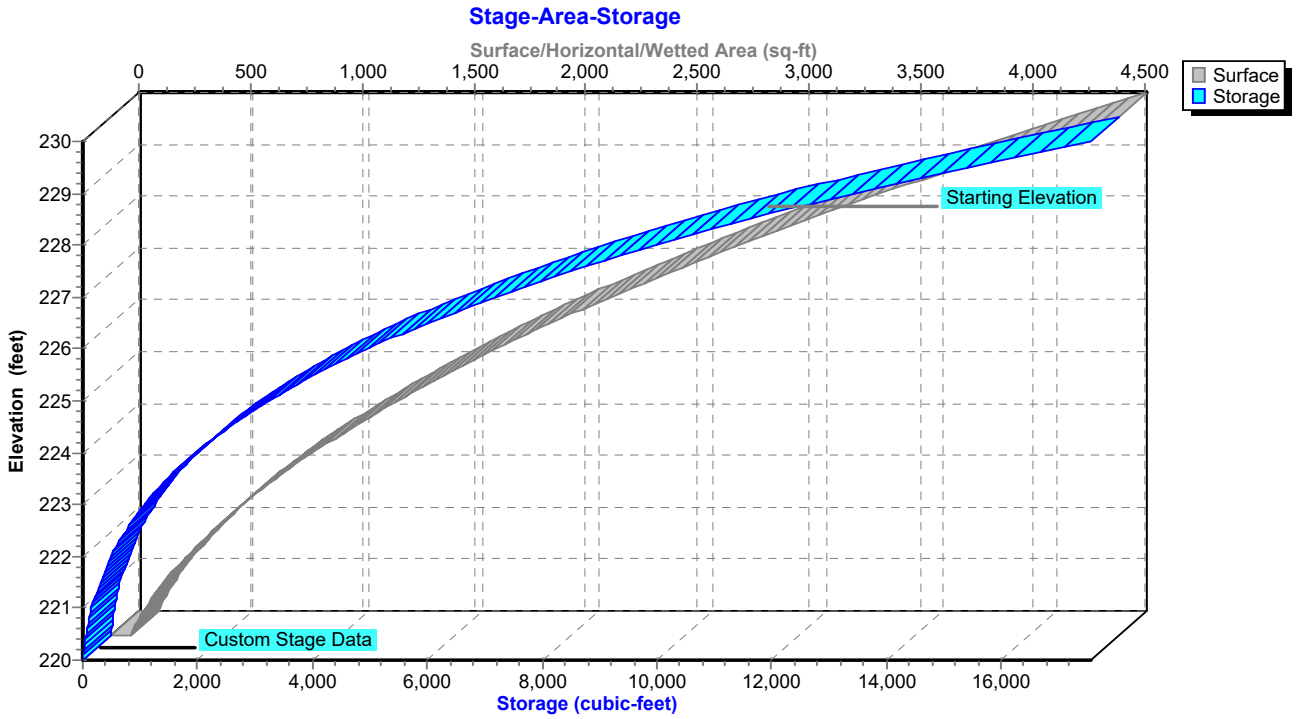
Device	Routing	Invert	Outlet Devices
#1	Primary	228.50'	**50.0' long + 2.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=9.92 cfs @ 12.14 hrs HW=228.68' TW=225.41' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 9.92 cfs @ 1.12 fps)

Pond 5P: Forebay A1-B



Pond 5P: Forebay A1-B



Summary for Pond 6P: Detention Basin A1

Inflow Area = 7.859 ac, 49.96% Impervious, Inflow Depth = 3.28" for 25-yr event
Inflow = 18.54 cfs @ 12.27 hrs, Volume= 2.149 af
Outflow = 3.80 cfs @ 13.02 hrs, Volume= 1.358 af, Atten= 80%, Lag= 44.6 min
Primary = 3.80 cfs @ 13.02 hrs, Volume= 1.358 af
Routed to Pond 7P : Design Point A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Peak Elev= 228.68' @ 13.02 hrs Surf.Area= 12,211 sf Storage= 43,068 cf

Plug-Flow detention time= 397.4 min calculated for 1.357 af (63% of inflow)
Center-of-Mass det. time= 264.2 min (1,135.3 - 871.0)

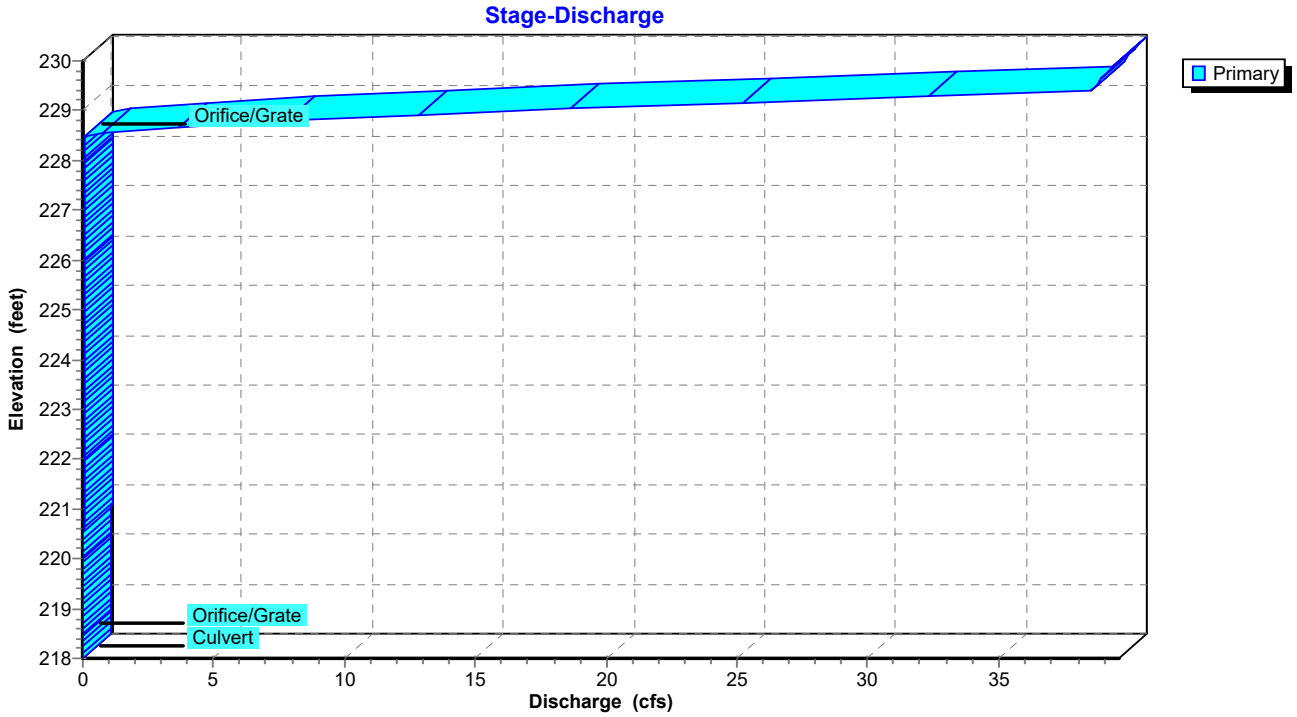
Volume	Invert	Avail.Storage	Storage Description
#1	218.00'	61,071 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
218.00	13	0	0	13
220.00	571	447	447	579
222.00	1,689	2,161	2,608	1,721
224.00	3,441	5,027	7,635	3,508
226.00	6,846	10,094	17,729	6,950
228.00	10,779	17,477	35,206	10,938
230.00	15,213	25,865	61,071	15,445

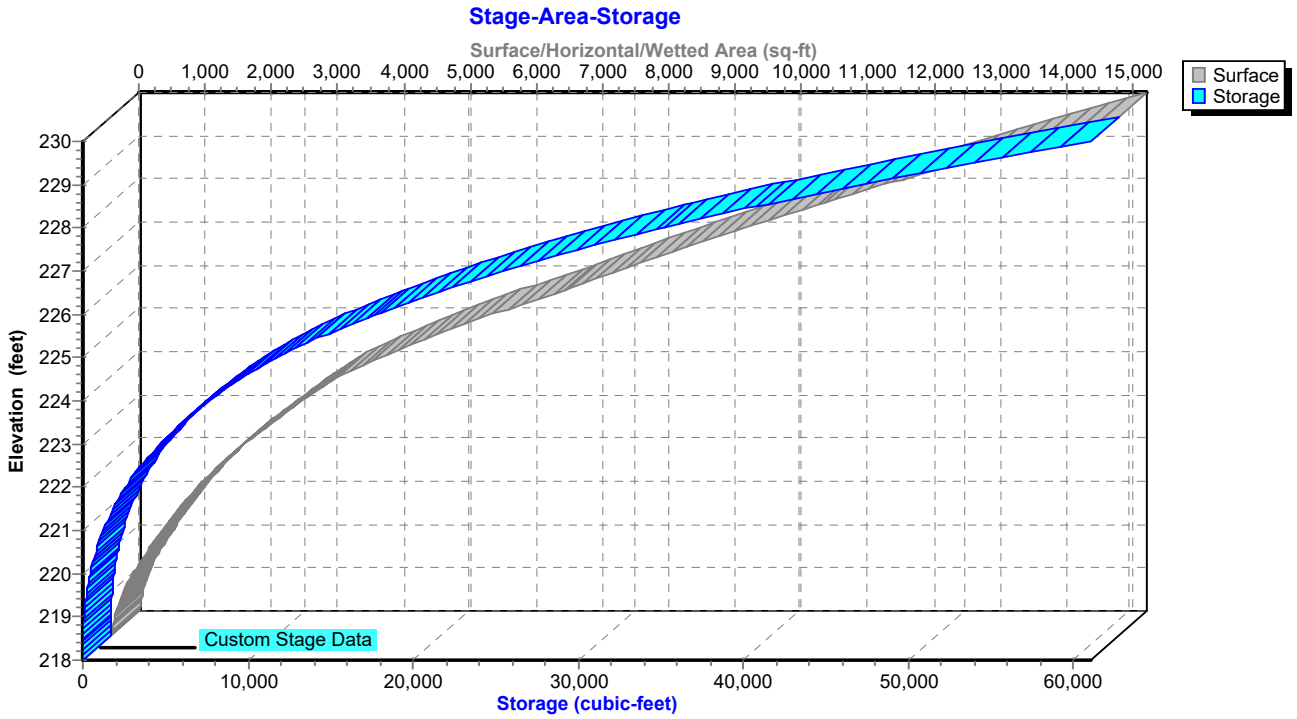
Device	Routing	Invert	Outlet Devices
#1	Primary	218.00'	**24.0" Round Culvert** L= 52.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 218.00' / 217.48' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	218.45'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	228.50'	**38.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.80 cfs @ 13.02 hrs HW=228.68' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 3.80 cfs of 37.16 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.08 cfs @ 15.37 fps)
  - **3=Orifice/Grate** (Weir Controls 3.71 cfs @ 1.40 fps)

Pond 6P: Detention Basin A1



Pond 6P: Detention Basin A1



Summary for Pond 7P: Design Point A

Inflow Area = 32.895 ac, 19.32% Impervious, Inflow Depth > 1.96" for 25-yr event
Inflow = 20.28 cfs @ 12.74 hrs, Volume= 5.384 af
Primary = 20.28 cfs @ 12.74 hrs, Volume= 5.384 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5

Summary for Pond 8P: Detention Basin B1

Inflow Area = 1.134 ac, 0.00% Impervious, Inflow Depth = 3.30" for 25-yr event
Inflow = 3.24 cfs @ 12.15 hrs, Volume= 0.312 af
Outflow = 3.07 cfs @ 12.20 hrs, Volume= 0.312 af, Atten= 6%, Lag= 2.9 min
Primary = 3.07 cfs @ 12.20 hrs, Volume= 0.312 af
Routed to Pond 9P : Design Point B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Automatic Starting Elev= 263.50' Surf.Area= 154 sf Storage= 50 cf
Peak Elev= 266.15' @ 12.20 hrs Surf.Area= 1,740 sf Storage= 2,187 cf (2,137 cf above start)

Plug-Flow detention time= 38.8 min calculated for 0.311 af (100% of inflow)
Center-of-Mass det. time= 35.1 min (882.8 - 847.7)

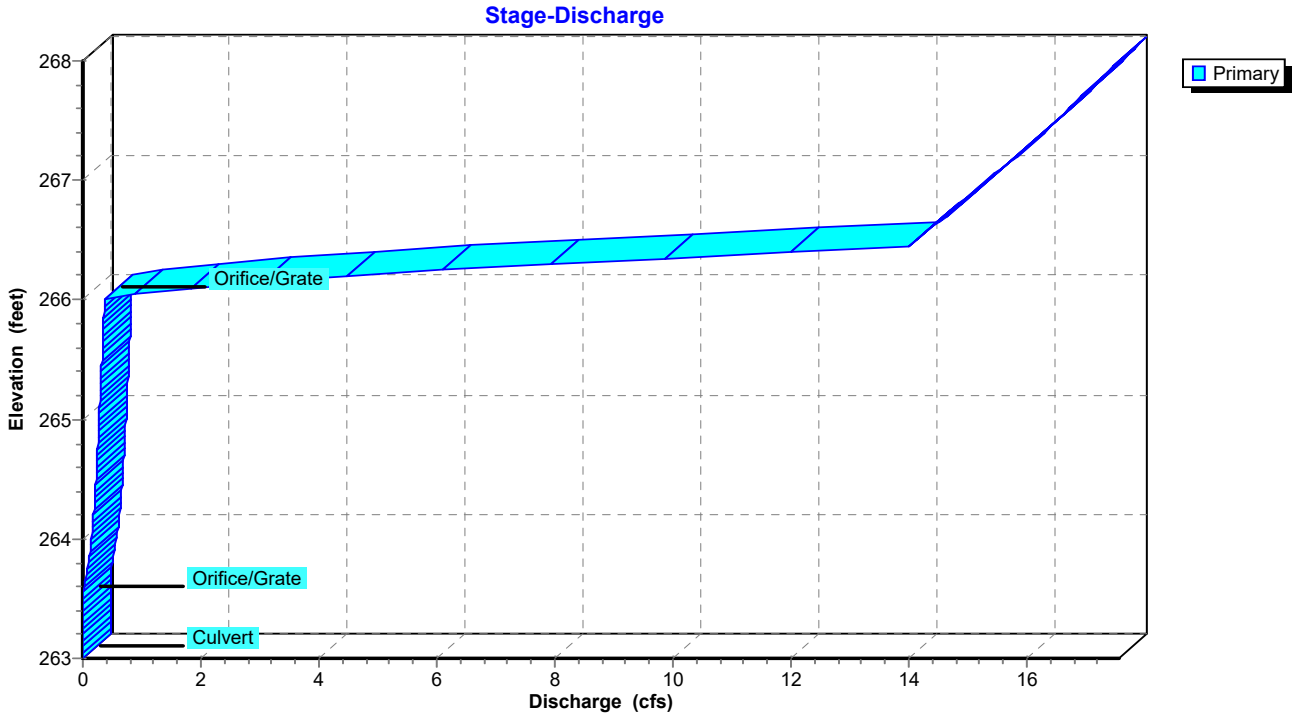
Volume	Invert	Avail.Storage	Storage Description
#1	263.00'	6,709 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
263.00	54	0	0	54
264.00	306	163	163	310
266.00	1,639	1,769	1,932	1,659
268.00	3,227	4,777	6,709	3,284

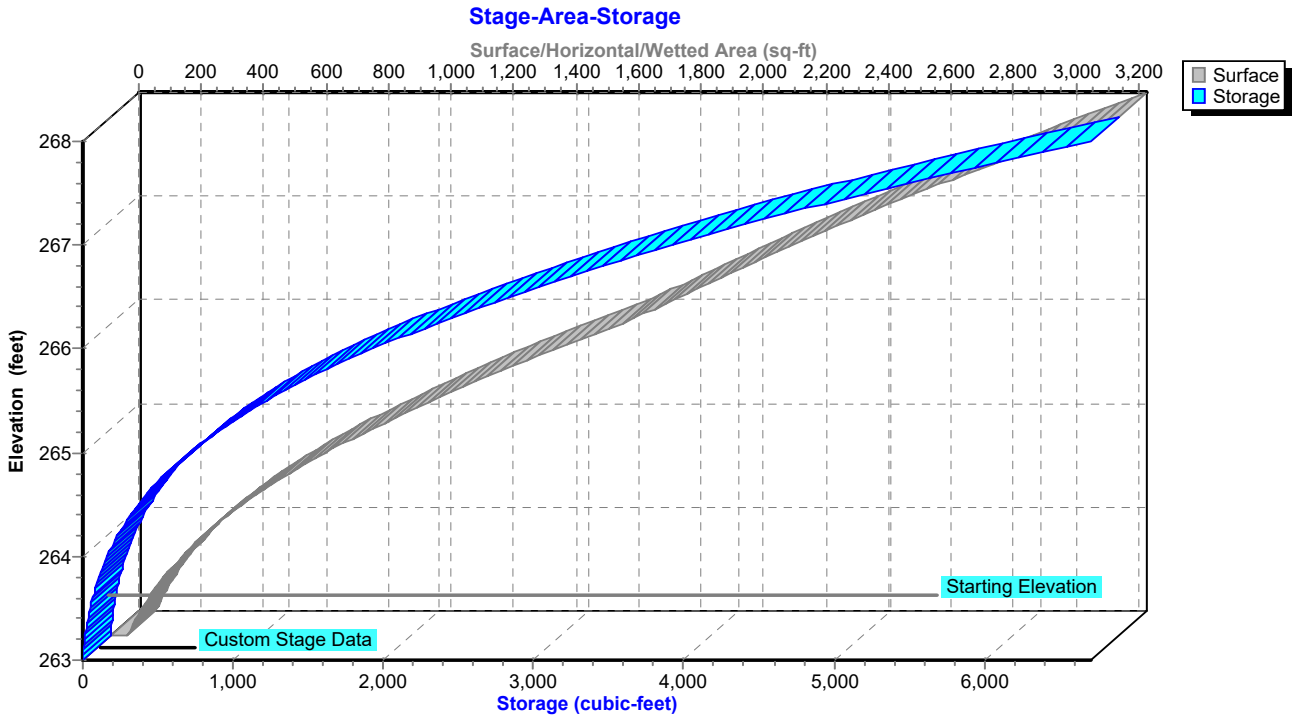
Device	Routing	Invert	Outlet Devices
#1	Primary	263.00'	**18.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 263.00' / 262.50' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	263.50'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	266.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.06 cfs @ 12.20 hrs HW=266.15' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 3.06 cfs of 13.18 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.38 cfs @ 7.65 fps)
  └─**3=Orifice/Grate** (Weir Controls 2.69 cfs @ 1.27 fps)

Pond 8P: Detention Basin B1



Pond 8P: Detention Basin B1



Summary for Pond 9P: Design Point B

Inflow Area = 3.469 ac, 0.00% Impervious, Inflow Depth = 2.45" for 25-yr event
Inflow = 6.71 cfs @ 12.19 hrs, Volume= 0.707 af
Primary = 6.71 cfs @ 12.19 hrs, Volume= 0.707 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5

Summary for Pond 10P: Forebay & Bio C1-A

Inflow Area = 4.929 ac, 70.16% Impervious, Inflow Depth = 4.54" for 25-yr event
Inflow = 16.17 cfs @ 12.22 hrs, Volume= 1.864 af
Outflow = 14.61 cfs @ 12.31 hrs, Volume= 1.390 af, Atten= 10%, Lag= 5.4 min
Primary = 14.61 cfs @ 12.31 hrs, Volume= 1.390 af
Routed to Pond 12P : Detention Basin C1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Starting Elev= 264.50' Surf.Area= 18,768 sf Storage= 30,218 cf
Peak Elev= 265.73' @ 12.31 hrs Surf.Area= 23,581 sf Storage= 56,166 cf (25,948 cf above start)

Plug-Flow detention time= 373.8 min calculated for 0.696 af (37% of inflow)
Center-of-Mass det. time= 76.7 min (890.5 - 813.8)

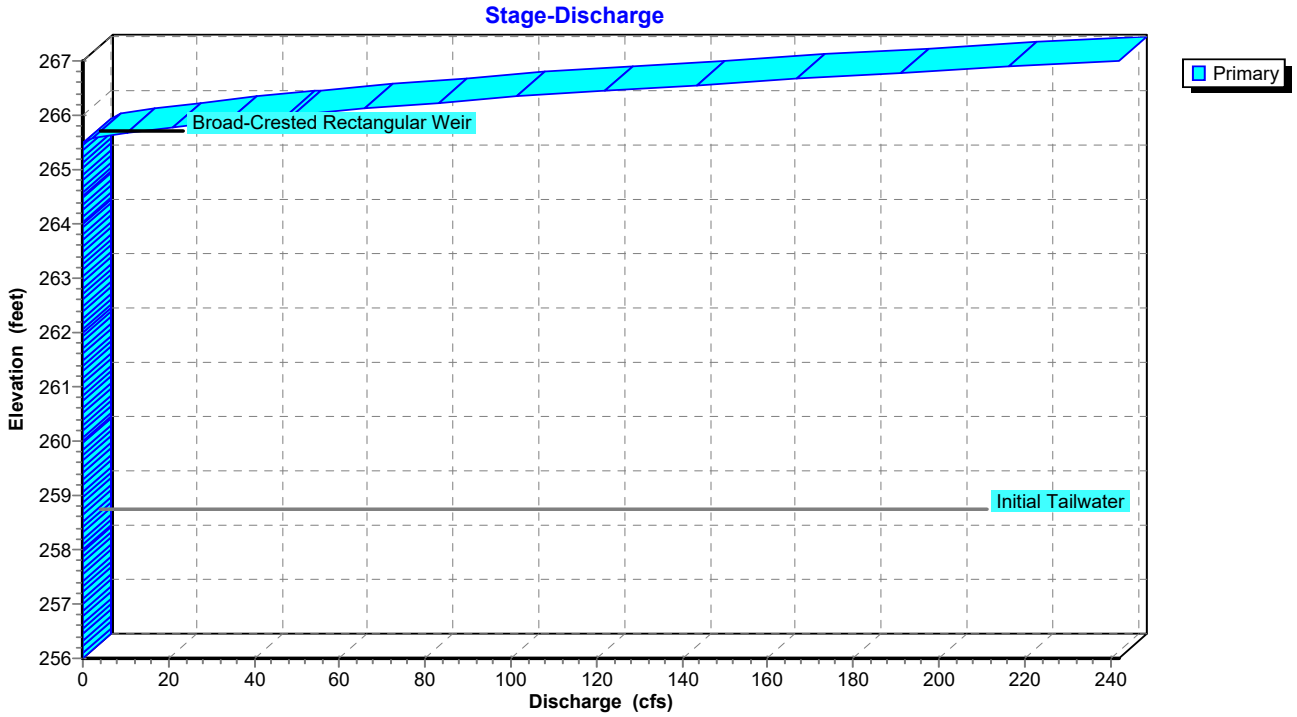
Volume	Invert	Avail.Storage	Storage Description
#1	256.00'	89,274 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
256.00	549	0	0	549
258.00	1,512	1,981	1,981	1,537
260.00	2,803	4,249	6,231	2,868
262.00	4,430	7,171	13,402	4,550
264.00	6,420	10,789	24,190	6,606
264.50	18,768	6,027	30,218	18,956
266.00	24,721	32,514	62,732	24,960
267.00	28,405	26,542	89,274	28,689

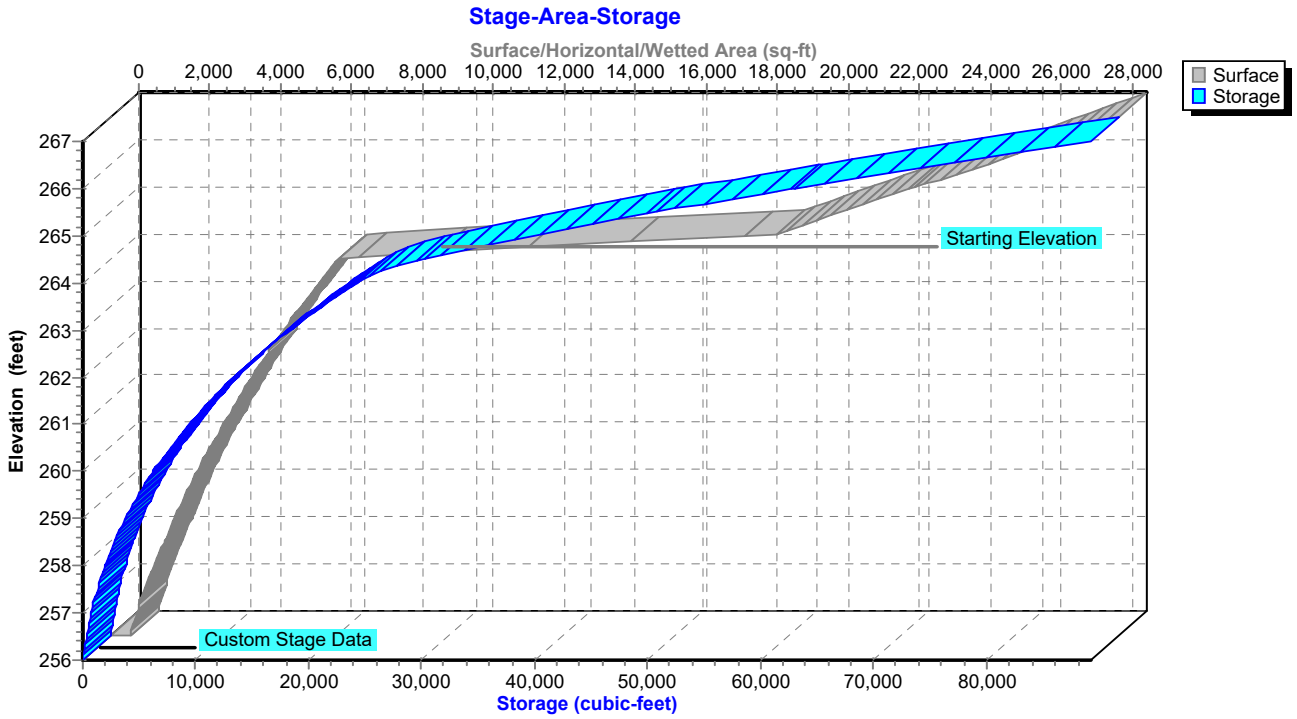
Device	Routing	Invert	Outlet Devices
#1	Primary	265.50'	**50.0' long x 30.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=14.61 cfs @ 12.31 hrs HW=265.73' TW=263.47' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 14.61 cfs @ 1.28 fps)

Pond 10P: Forebay & Bio C1-A



Pond 10P: Forebay & Bio C1-A



Summary for Pond 11P: Forebay C1-B

Inflow Area = 6.154 ac, 61.08% Impervious, Inflow Depth = 4.11" for 25-yr event
Inflow = 19.95 cfs @ 12.19 hrs, Volume= 2.109 af
Outflow = 19.73 cfs @ 12.21 hrs, Volume= 2.109 af, Atten= 1%, Lag= 1.2 min
Primary = 19.73 cfs @ 12.21 hrs, Volume= 2.109 af
Routed to Pond 12P : Detention Basin C1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Automatic Starting Elev= 264.75' Surf.Area= 8,627 sf Storage= 41,372 cf
Peak Elev= 265.03' @ 12.21 hrs Surf.Area= 8,931 sf Storage= 43,800 cf (2,429 cf above start)

Plug-Flow detention time= 249.0 min calculated for 1.159 af (55% of inflow)
Center-of-Mass det. time= 4.2 min (829.8 - 825.6)

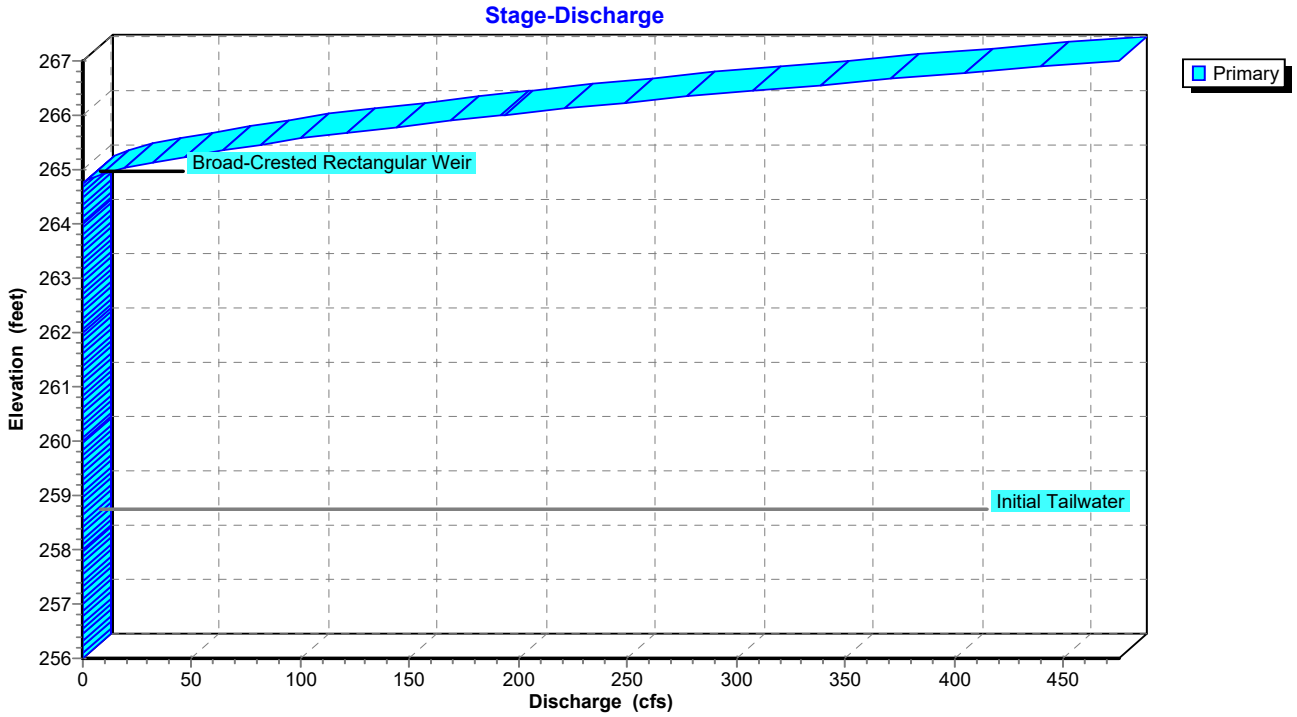
Volume	Invert	Avail.Storage	Storage Description
#1	256.00'	63,668 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
256.00	1,704	0	0	1,704
258.00	2,823	4,480	4,480	2,872
260.00	4,218	6,994	11,475	4,328
262.00	5,887	10,059	21,533	6,071
264.00	7,829	13,670	35,203	8,100
266.00	10,042	17,825	53,028	10,412
267.00	11,249	10,640	63,668	11,673

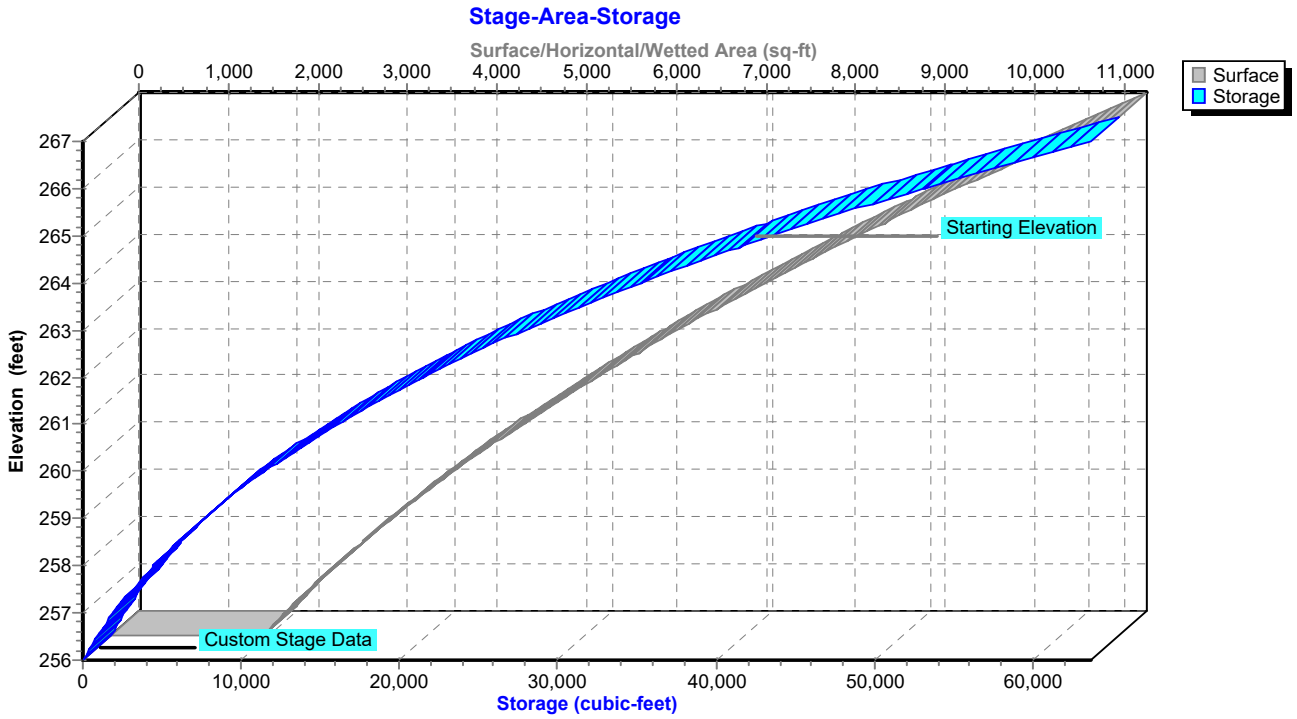
Device	Routing	Invert	Outlet Devices
#1	Primary	264.75'	**50.0' long + 2.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=19.72 cfs @ 12.21 hrs HW=265.03' TW=262.63' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 19.72 cfs @ 1.41 fps)

Pond 11P: Forebay C1-B



Pond 11P: Forebay C1-B



Summary for Pond 12P: Detention Basin C1

Inflow Area = 27.920 ac, 26.01% Impervious, Inflow Depth = 3.32" for 25-yr event
Inflow = 67.66 cfs @ 12.27 hrs, Volume= 7.728 af
Outflow = 34.36 cfs @ 12.65 hrs, Volume= 6.766 af, Atten= 49%, Lag= 23.0 min
Primary = 34.36 cfs @ 12.65 hrs, Volume= 6.766 af
Routed to Pond 13P : Design Point C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Automatic Starting Elev= 258.50' Surf.Area= 8,775 sf Storage= 3,981 cf
Peak Elev= 264.16' @ 12.65 hrs Surf.Area= 31,435 sf Storage= 115,858 cf (111,876 cf above start)

Plug-Flow detention time= 294.9 min calculated for 6.675 af (86% of inflow)
Center-of-Mass det. time= 222.1 min (1,081.9 - 859.8)

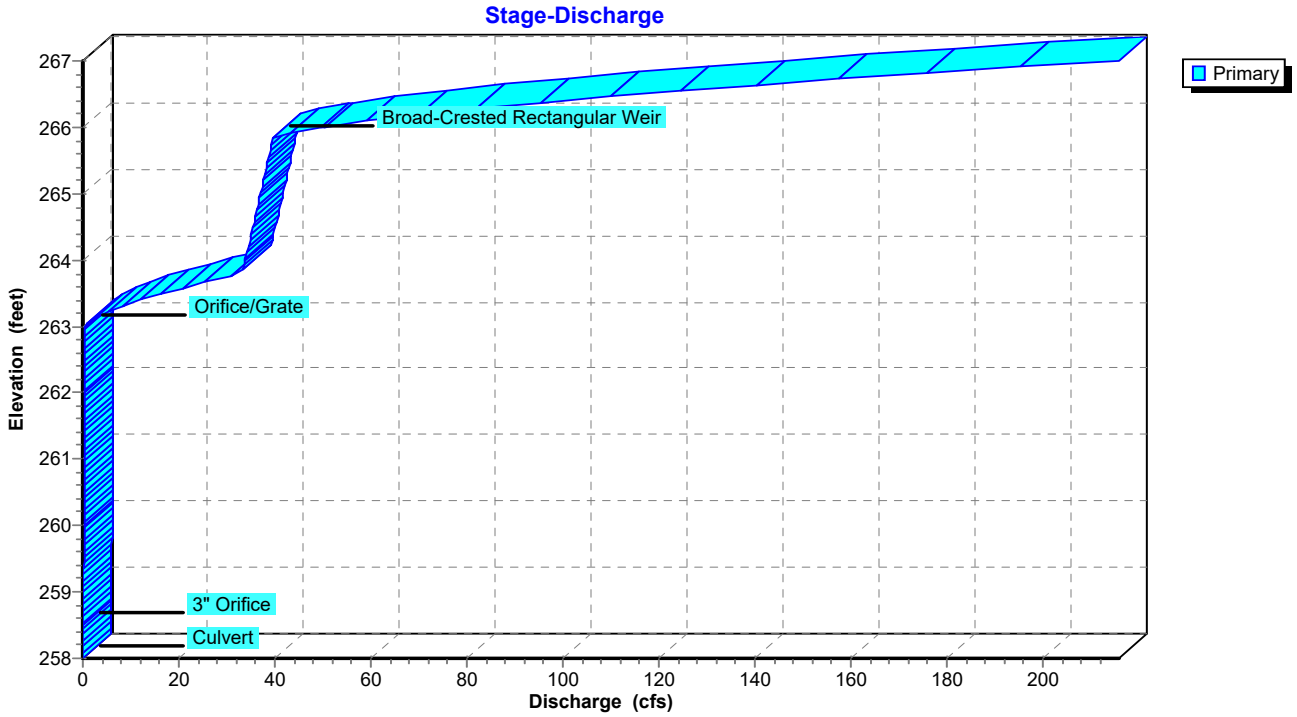
Volume	Invert	Avail.Storage	Storage Description
#1	258.00'	222,991 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
258.00	7,176	0	0	7,176
260.00	14,538	21,285	21,285	14,574
262.00	22,410	36,665	57,951	22,504
264.00	30,774	52,963	110,914	30,947
266.00	39,609	70,197	181,111	39,881
267.00	44,193	41,880	222,991	44,522

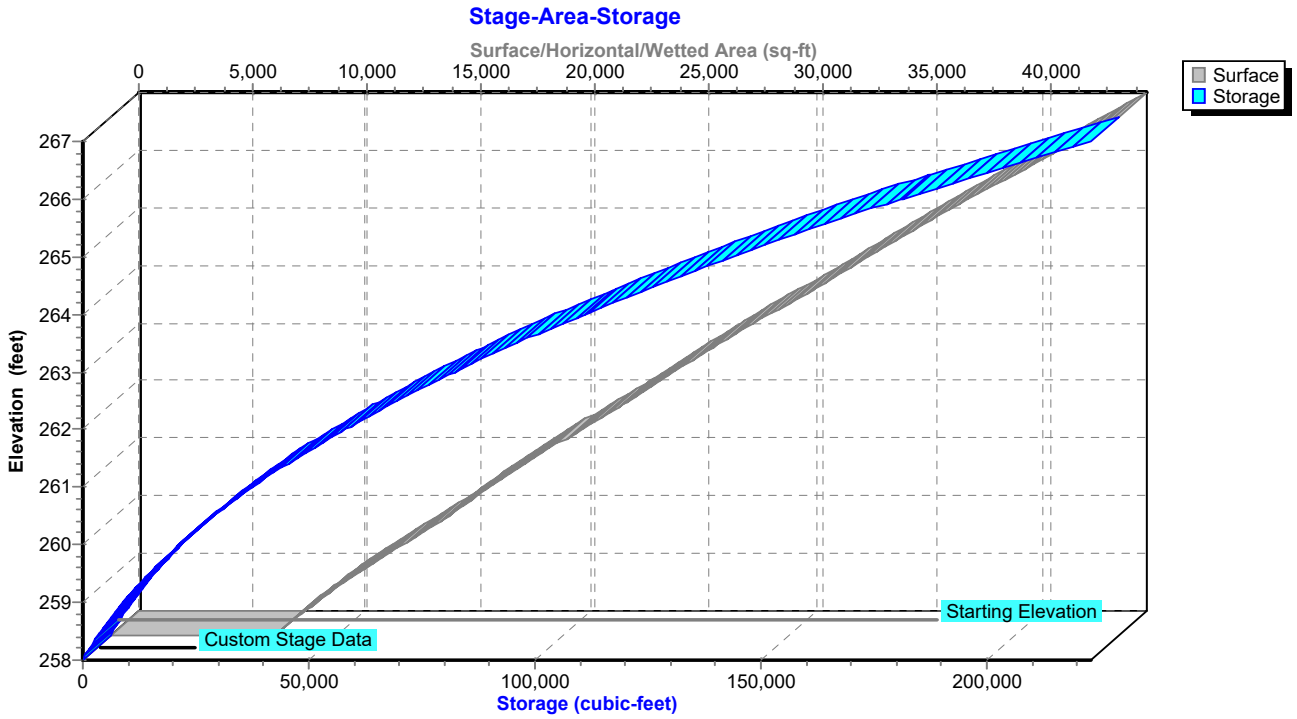
Device	Routing	Invert	Outlet Devices
#1	Primary	258.00'	**24.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 258.00' / 256.00' S= 0.0400 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	258.50'	**3.0" Vert. 3" Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	263.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	265.83'	**50.0' long + 2.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=34.36 cfs @ 12.65 hrs HW=264.16' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Inlet Controls 34.36 cfs @ 10.94 fps)
  - **2=3" Orifice** (Passes < 0.56 cfs potential flow)
  - **3=Orifice/Grate** (Passes < 57.11 cfs potential flow)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 12P: Detention Basin C1



Pond 12P: Detention Basin C1



Summary for Pond 13P: Design Point C

Inflow Area = 29.035 ac, 25.59% Impervious, Inflow Depth > 2.92" for 25-yr event
Inflow = 35.51 cfs @ 12.57 hrs, Volume= 7.064 af
Primary = 35.51 cfs @ 12.57 hrs, Volume= 7.064 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5

Summary for Pond 1P: Existing Wetland (EX Condition)

Inflow Area = 22.902 ac, 8.12% Impervious, Inflow Depth = 3.85" for 100-yr event
Inflow = 54.66 cfs @ 12.34 hrs, Volume= 7.354 af
Outflow = 48.95 cfs @ 12.45 hrs, Volume= 6.233 af, Atten= 10%, Lag= 7.0 min
Primary = 48.95 cfs @ 12.45 hrs, Volume= 6.233 af
Routed to Pond 2P : Existing A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Starting Elev= 224.00' Surf.Area= 16,787 sf Storage= 7,446 cf
Peak Elev= 225.82' @ 12.45 hrs Surf.Area= 68,852 sf Storage= 76,109 cf (68,662 cf above start)

Plug-Flow detention time= 131.0 min calculated for 6.062 af (82% of inflow)
Center-of-Mass det. time= 44.3 min (922.6 - 878.2)

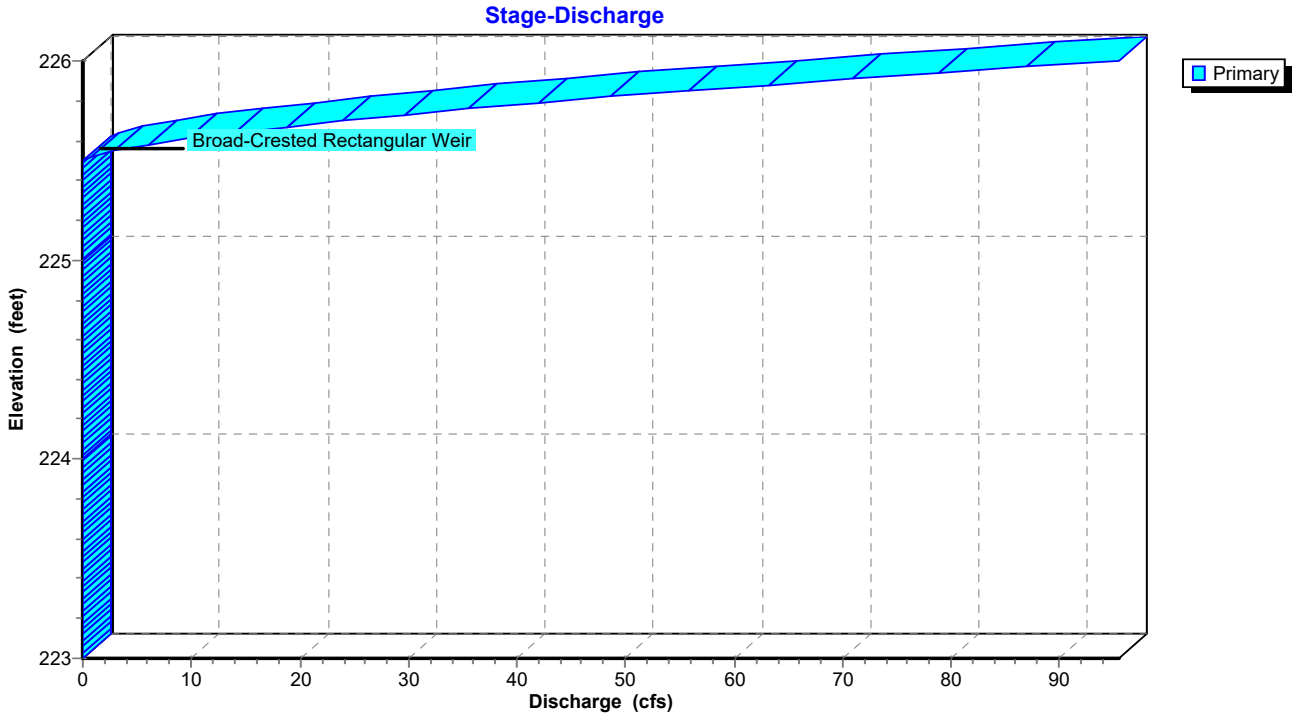
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	89,179 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
223.00	1,153	0	0	1,153
224.00	16,787	7,446	7,446	16,790
225.00	36,611	26,063	33,509	36,622
226.00	77,225	55,669	89,179	77,244

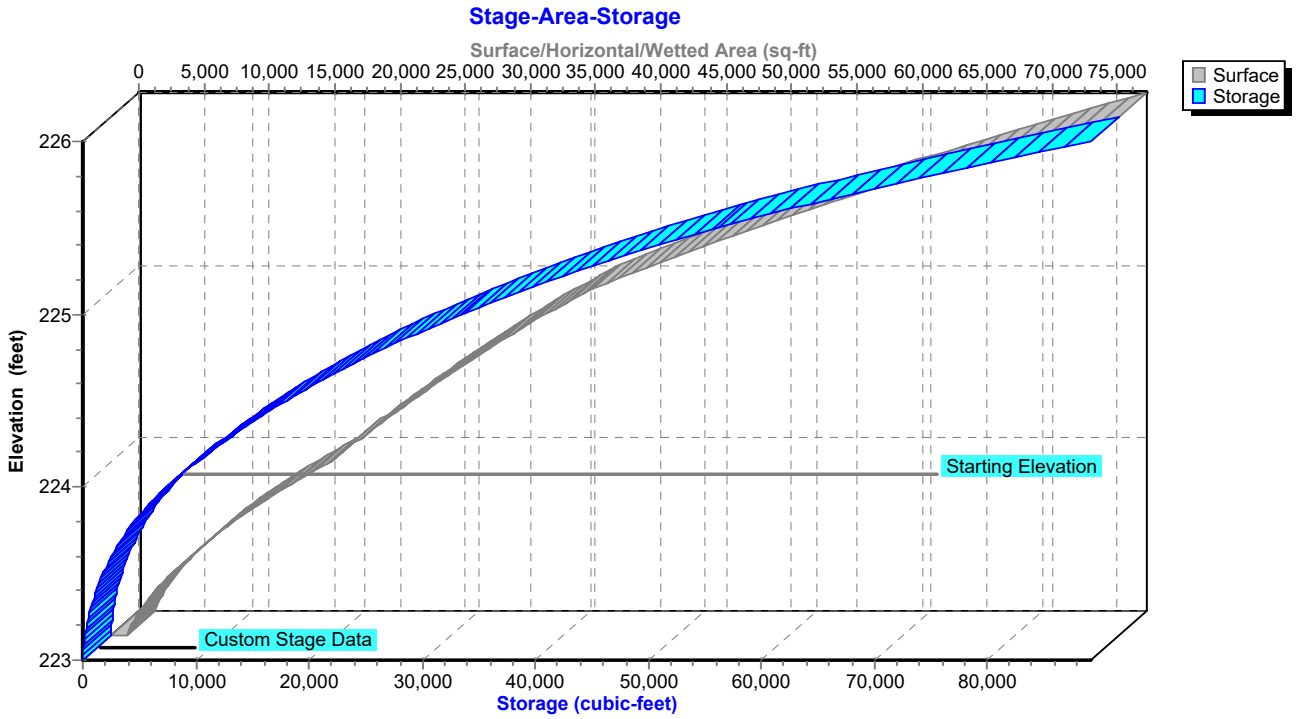
Device	Routing	Invert	Outlet Devices
#1	Primary	225.50'	**100.0' long x 20.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=48.94 cfs @ 12.45 hrs HW=225.82' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 48.94 cfs @ 1.53 fps)

Pond 1P: Existing Wetland (EX Condition)



Pond 1P: Existing Wetland (EX Condition)



Summary for Pond 2P: Existing A

Inflow Area = 34.926 ac, 5.76% Impervious, Inflow Depth = 3.35" for 100-yr event
Inflow = 70.33 cfs @ 12.42 hrs, Volume= 9.745 af
Primary = 70.33 cfs @ 12.42 hrs, Volume= 9.745 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5

Summary for Pond 3P: Existing Wetland (PR Condition)

Inflow Area = 14.149 ac, 15.15% Impervious, Inflow Depth = 4.56" for 100-yr event
Inflow = 42.76 cfs @ 12.29 hrs, Volume= 5.372 af
Outflow = 29.64 cfs @ 12.52 hrs, Volume= 4.774 af, Atten= 31%, Lag= 14.3 min
Primary = 29.64 cfs @ 12.52 hrs, Volume= 4.774 af
Routed to Pond 7P : Design Point A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Starting Elev= 224.00' Surf.Area= 16,787 sf Storage= 7,446 cf
Peak Elev= 225.75' @ 12.52 hrs Surf.Area= 59,185 sf Storage= 69,018 cf (61,571 cf above start)

Plug-Flow detention time= 132.5 min calculated for 4.603 af (86% of inflow)
Center-of-Mass det. time= 55.9 min (916.2 - 860.3)

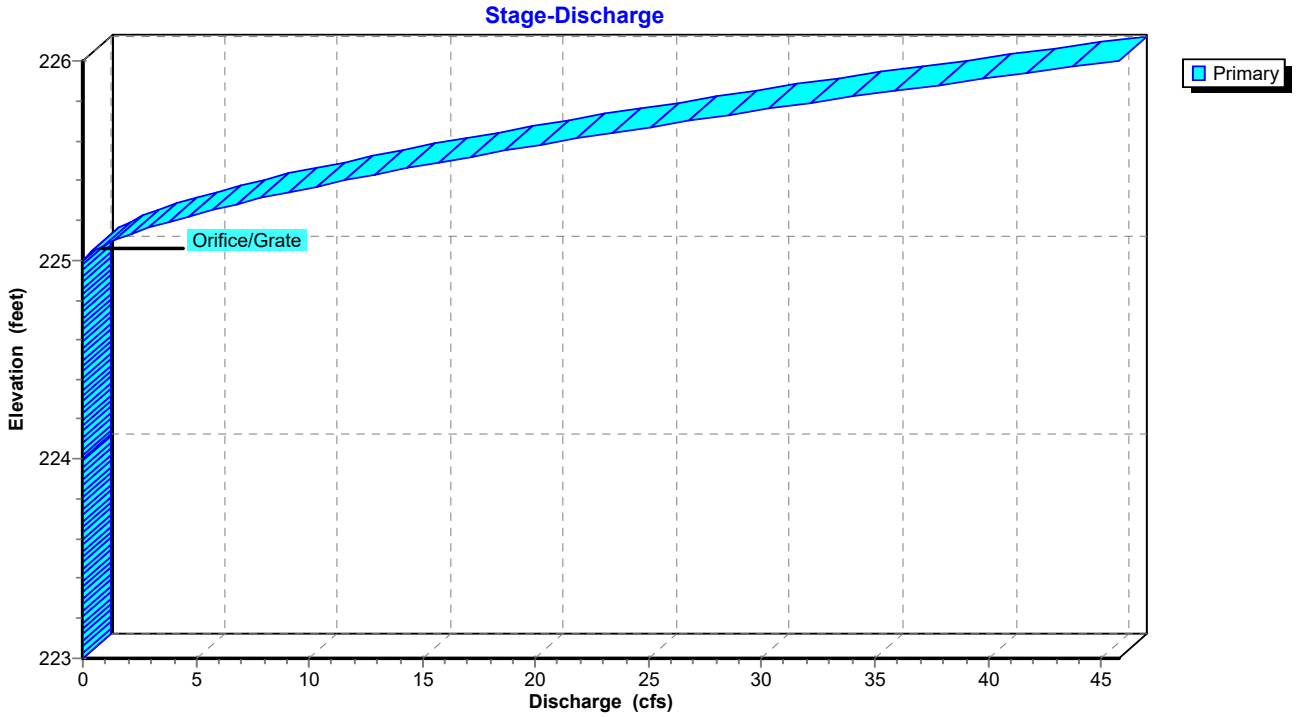
Volume	Invert	Avail.Storage	Storage Description
#1	223.00'	85,006 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
223.00	1,153	0	0	1,153
224.00	16,787	7,446	7,446	16,790
225.00	36,611	26,063	33,509	36,622
226.00	67,988	51,497	85,006	68,009

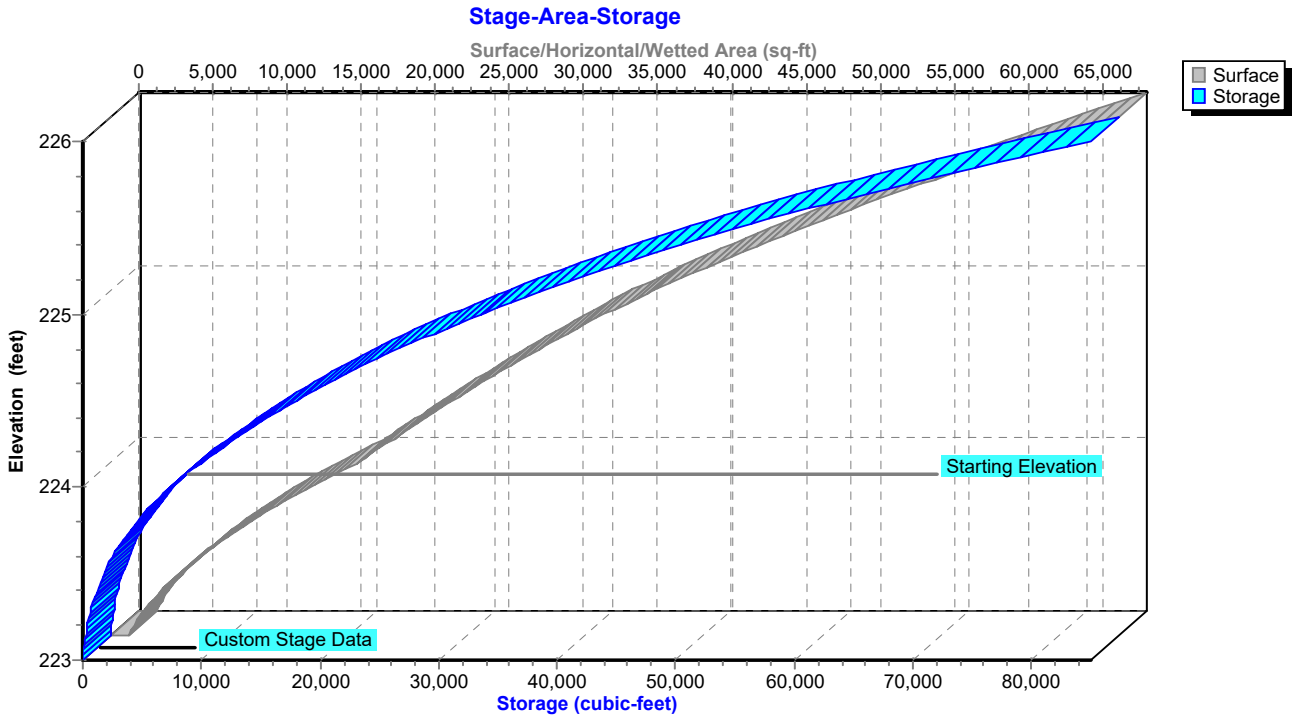
Device	Routing	Invert	Outlet Devices
#1	Primary	220.00'	**36.0" Round Culvert** L= 57.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 220.00' / 216.48' S= 0.0618 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 7.07 sf
#2	Device 1	225.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=29.64 cfs @ 12.52 hrs HW=225.75' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Passes 29.64 cfs of 55.38 cfs potential flow)
↑**2=Orifice/Grate** (Weir Controls 29.64 cfs @ 2.83 fps)

Pond 3P: Existing Wetland (PR Condition)



Pond 3P: Existing Wetland (PR Condition)



Summary for Pond 4P: Forebay & Bio A1-A

Inflow Area = 4.762 ac, 47.67% Impervious, Inflow Depth = 5.86" for 100-yr event
Inflow = 19.12 cfs @ 12.25 hrs, Volume= 2.327 af
Outflow = 16.31 cfs @ 12.20 hrs, Volume= 2.022 af, Atten= 15%, Lag= 0.0 min
Primary = 16.31 cfs @ 12.20 hrs, Volume= 2.022 af
Routed to Pond 6P : Detention Basin A1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Starting Elev= 227.50' Surf.Area= 12,044 sf Storage= 16,584 cf
Peak Elev= 229.05' @ 12.48 hrs Surf.Area= 16,035 sf Storage= 38,284 cf (21,699 cf above start)

Plug-Flow detention time= 201.6 min calculated for 1.641 af (71% of inflow)
Center-of-Mass det. time= 54.1 min (883.8 - 829.7)

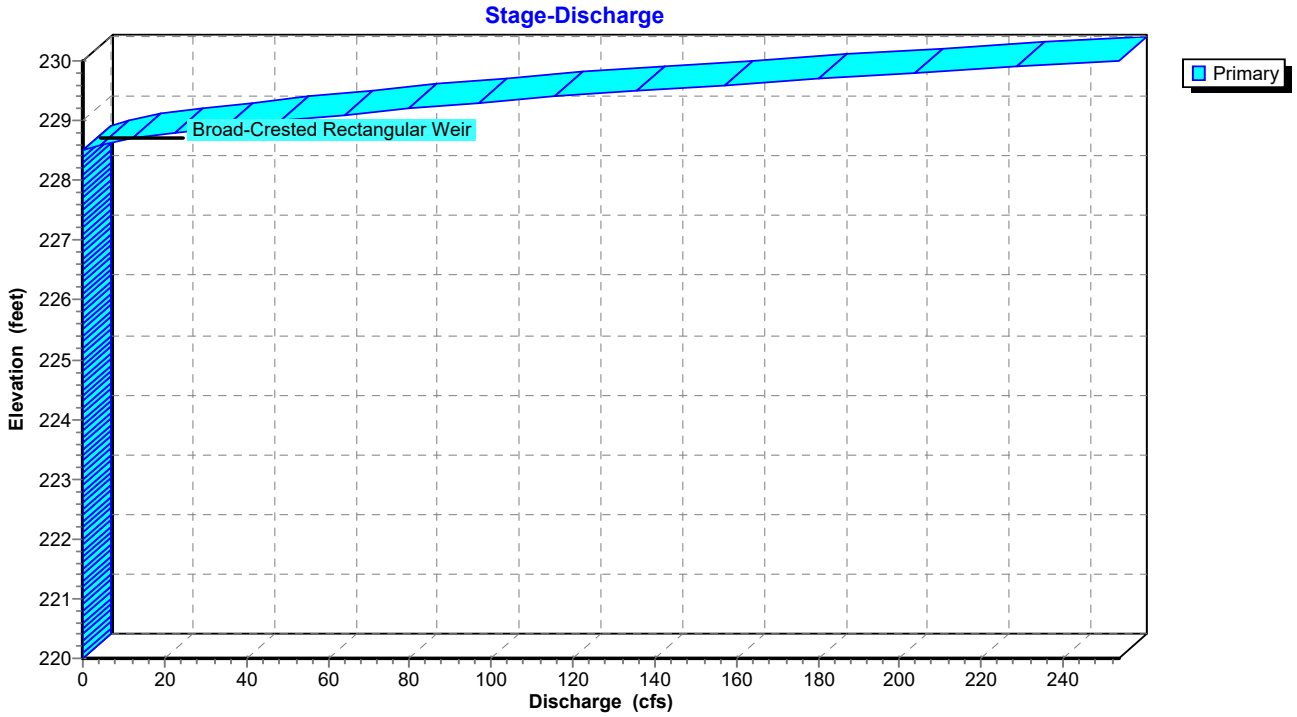
Volume	Invert	Avail.Storage	Storage Description
#1	220.00'	54,786 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
220.00	65	0	0	65
222.00	514	508	508	527
224.00	1,391	1,834	2,342	1,429
226.00	2,700	4,019	6,361	2,776
227.50	12,044	10,223	16,584	12,130
228.00	13,280	6,328	22,913	13,382
230.00	18,750	31,873	54,786	18,925

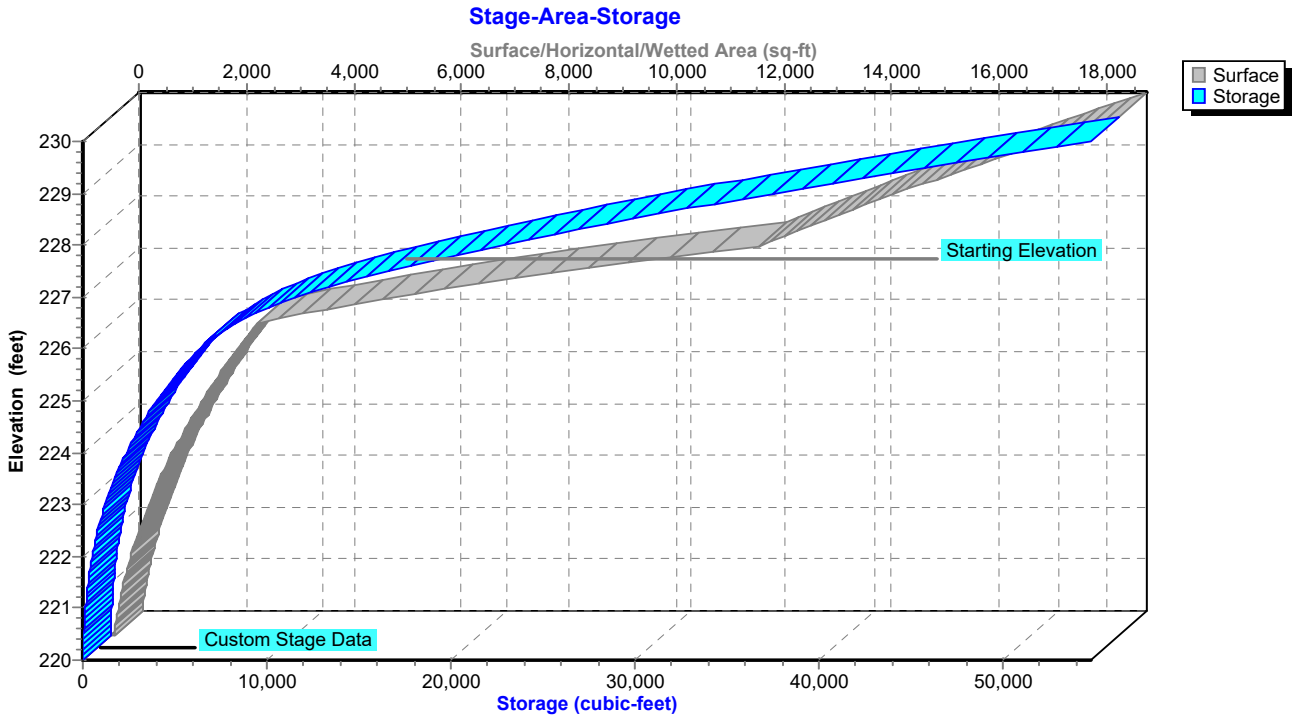
Device	Routing	Invert	Outlet Devices
#1	Primary	228.50'	**50.0' long + 2.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=16.39 cfs @ 12.20 hrs HW=228.74' TW=228.50' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 16.39 cfs @ 1.33 fps)

Pond 4P: Forebay & Bio A1-A



Pond 4P: Forebay & Bio A1-A



Summary for Pond 5P: Forebay A1-B

Inflow Area = 2.605 ac, 63.57% Impervious, Inflow Depth = 6.70" for 100-yr event
Inflow = 14.41 cfs @ 12.13 hrs, Volume= 1.455 af
Outflow = 14.34 cfs @ 12.14 hrs, Volume= 1.455 af, Atten= 0%, Lag= 0.6 min
Primary = 14.34 cfs @ 12.14 hrs, Volume= 1.455 af
Routed to Pond 6P : Detention Basin A1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Starting Elev= 228.50' Surf.Area= 3,432 sf Storage= 11,619 cf
Peak Elev= 229.04' @ 12.48 hrs Surf.Area= 3,806 sf Storage= 13,586 cf (1,966 cf above start)

Plug-Flow detention time= 145.4 min calculated for 1.188 af (82% of inflow)
Center-of-Mass det. time= 6.1 min (806.9 - 800.9)

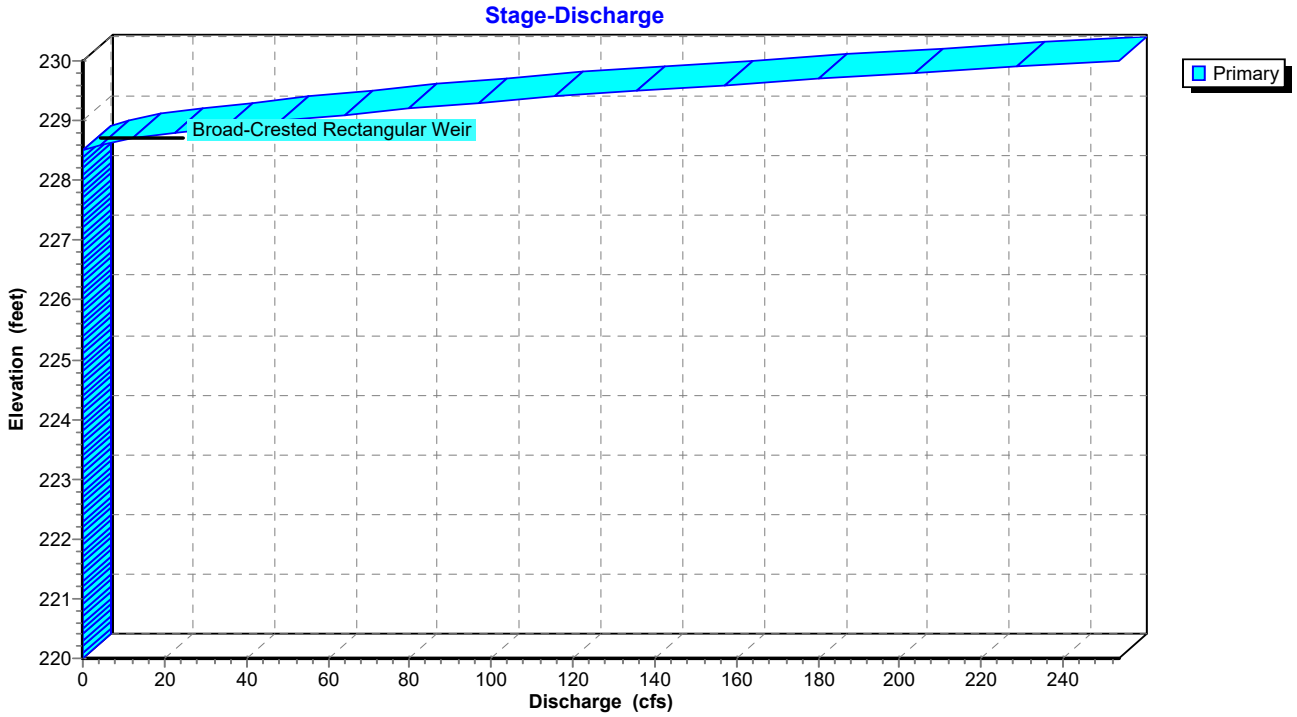
Volume	Invert	Avail.Storage	Storage Description
#1	220.00'	17,559 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
220.00	88	0	0	88
222.00	451	492	492	467
224.00	1,075	1,482	1,974	1,120
226.00	1,960	2,991	4,965	2,046
227.50	2,794	3,547	8,512	2,919
228.00	3,105	1,474	9,986	3,244
230.00	4,512	7,573	17,559	4,717

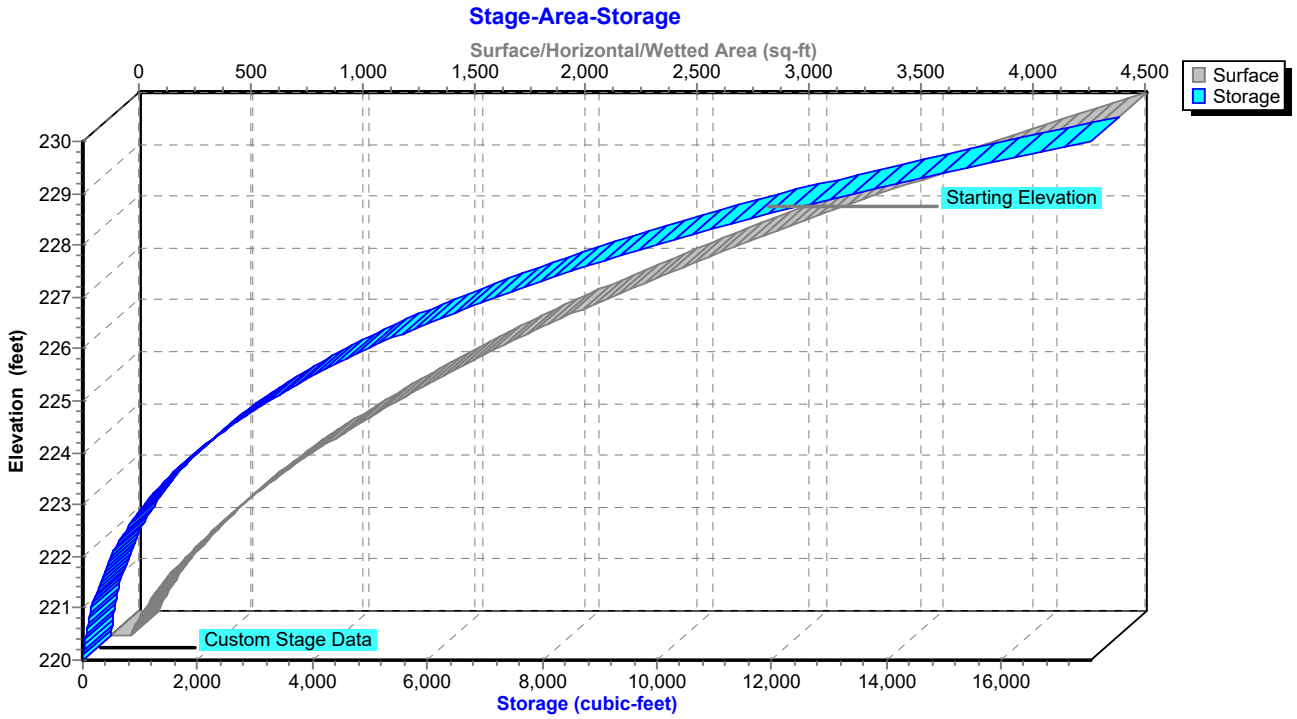
Device	Routing	Invert	Outlet Devices
#1	Primary	228.50'	**50.0' long + 2.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=14.34 cfs @ 12.14 hrs HW=228.72' TW=227.97' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 14.34 cfs @ 1.27 fps)

Pond 5P: Forebay A1-B



Pond 5P: Forebay A1-B



Summary for Pond 6P: Detention Basin A1

Inflow Area = 7.859 ac, 49.96% Impervious, Inflow Depth = 5.56" for 100-yr event
Inflow = 30.54 cfs @ 12.19 hrs, Volume= 3.639 af
Outflow = 18.82 cfs @ 12.48 hrs, Volume= 2.846 af, Atten= 38%, Lag= 17.6 min
Primary = 18.82 cfs @ 12.48 hrs, Volume= 2.846 af
Routed to Pond 7P : Design Point A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Peak Elev= 229.04' @ 12.48 hrs Surf.Area= 12,996 sf Storage= 47,582 cf

Plug-Flow detention time= 232.1 min calculated for 2.846 af (78% of inflow)
Center-of-Mass det. time= 136.5 min (988.4 - 851.9)

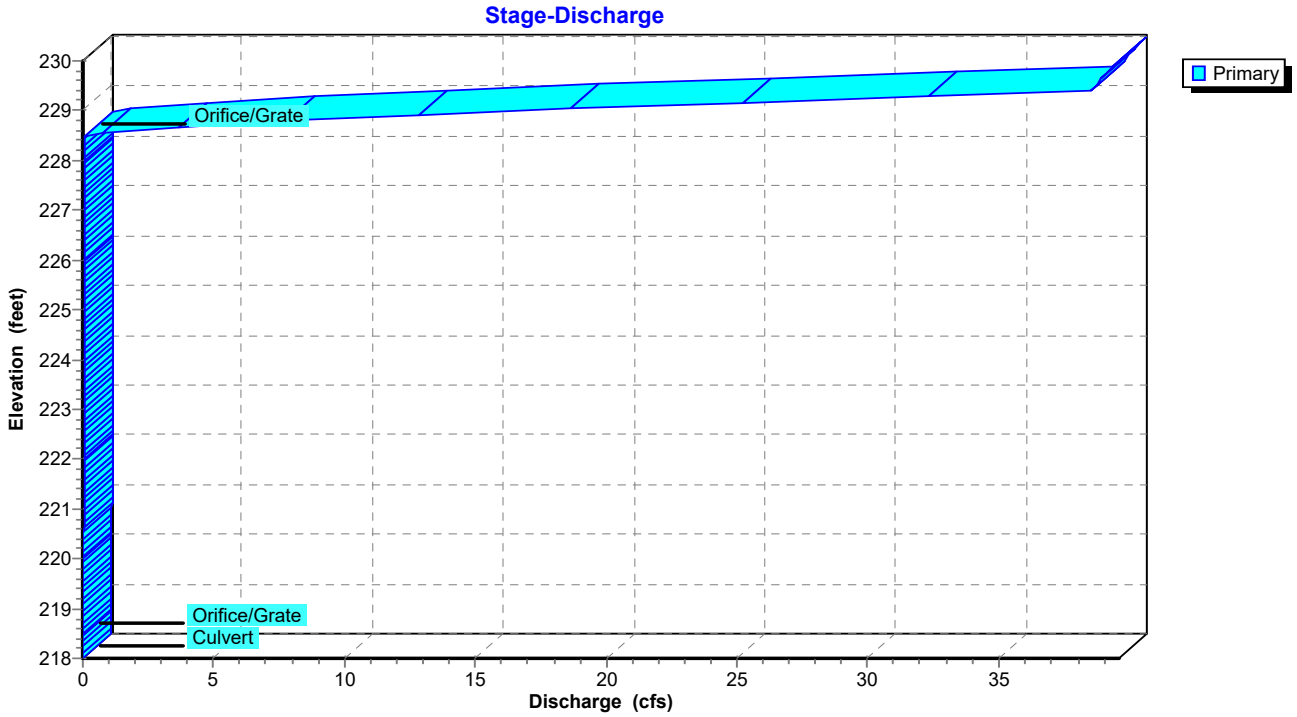
Volume	Invert	Avail.Storage	Storage Description
#1	218.00'	61,071 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
218.00	13	0	0	13
220.00	571	447	447	579
222.00	1,689	2,161	2,608	1,721
224.00	3,441	5,027	7,635	3,508
226.00	6,846	10,094	17,729	6,950
228.00	10,779	17,477	35,206	10,938
230.00	15,213	25,865	61,071	15,445

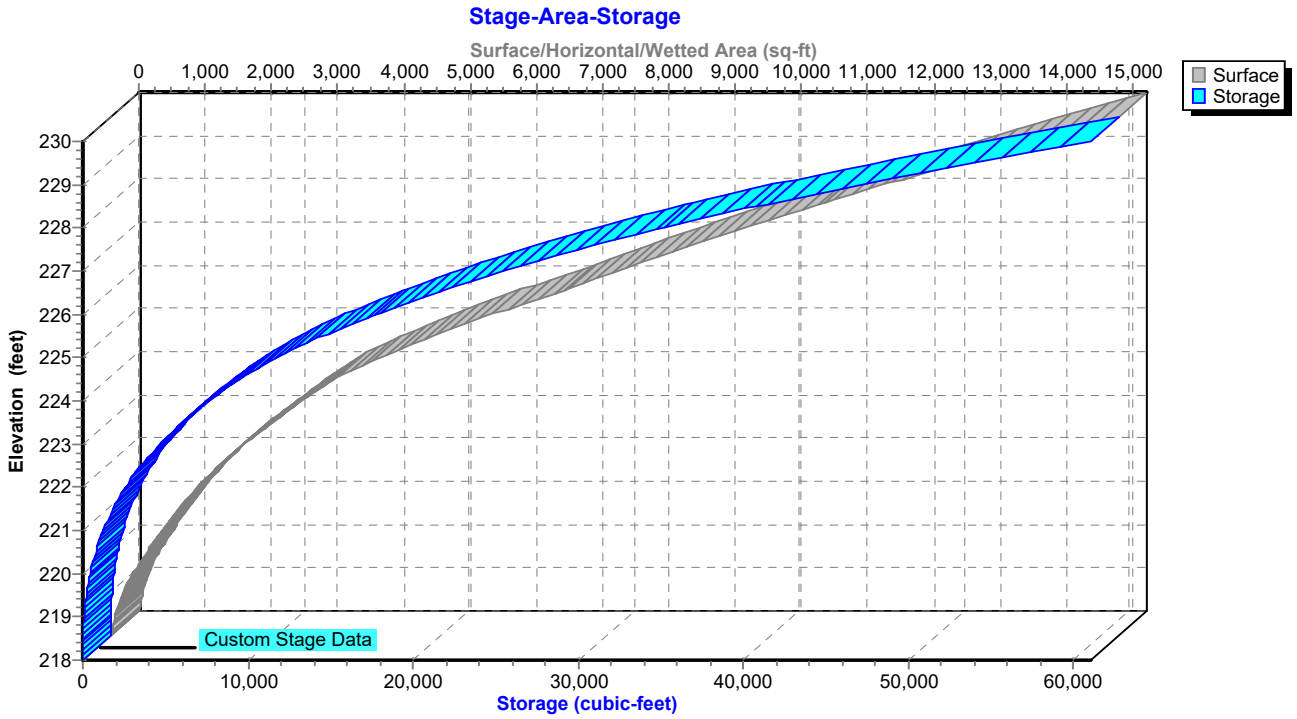
Device	Routing	Invert	Outlet Devices
#1	Primary	218.00'	**24.0" Round Culvert** L= 52.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 218.00' / 217.48' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	218.45'	**1.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	228.50'	**38.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=18.82 cfs @ 12.48 hrs HW=229.04' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 18.82 cfs of 37.84 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.09 cfs @ 15.64 fps)
  └─**3=Orifice/Grate** (Weir Controls 18.74 cfs @ 2.41 fps)

Pond 6P: Detention Basin A1



Pond 6P: Detention Basin A1



Summary for Pond 7P: Design Point A

Inflow Area = 32.895 ac, 19.32% Impervious, Inflow Depth > 3.94" for 100-yr event
Inflow = 66.91 cfs @ 12.43 hrs, Volume= 10.800 af
Primary = 66.91 cfs @ 12.43 hrs, Volume= 10.800 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5

Summary for Pond 8P: Detention Basin B1

Inflow Area = 1.134 ac, 0.00% Impervious, Inflow Depth = 5.50" for 100-yr event
Inflow = 5.13 cfs @ 12.15 hrs, Volume= 0.520 af
Outflow = 5.09 cfs @ 12.16 hrs, Volume= 0.520 af, Atten= 1%, Lag= 1.0 min
Primary = 5.09 cfs @ 12.16 hrs, Volume= 0.520 af
Routed to Pond 9P : Design Point B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Automatic Starting Elev= 263.50' Surf.Area= 154 sf Storage= 50 cf
Peak Elev= 266.22' @ 12.16 hrs Surf.Area= 1,787 sf Storage= 2,308 cf (2,258 cf above start)

Plug-Flow detention time= 35.4 min calculated for 0.519 af (100% of inflow)
Center-of-Mass det. time= 32.8 min (864.0 - 831.3)

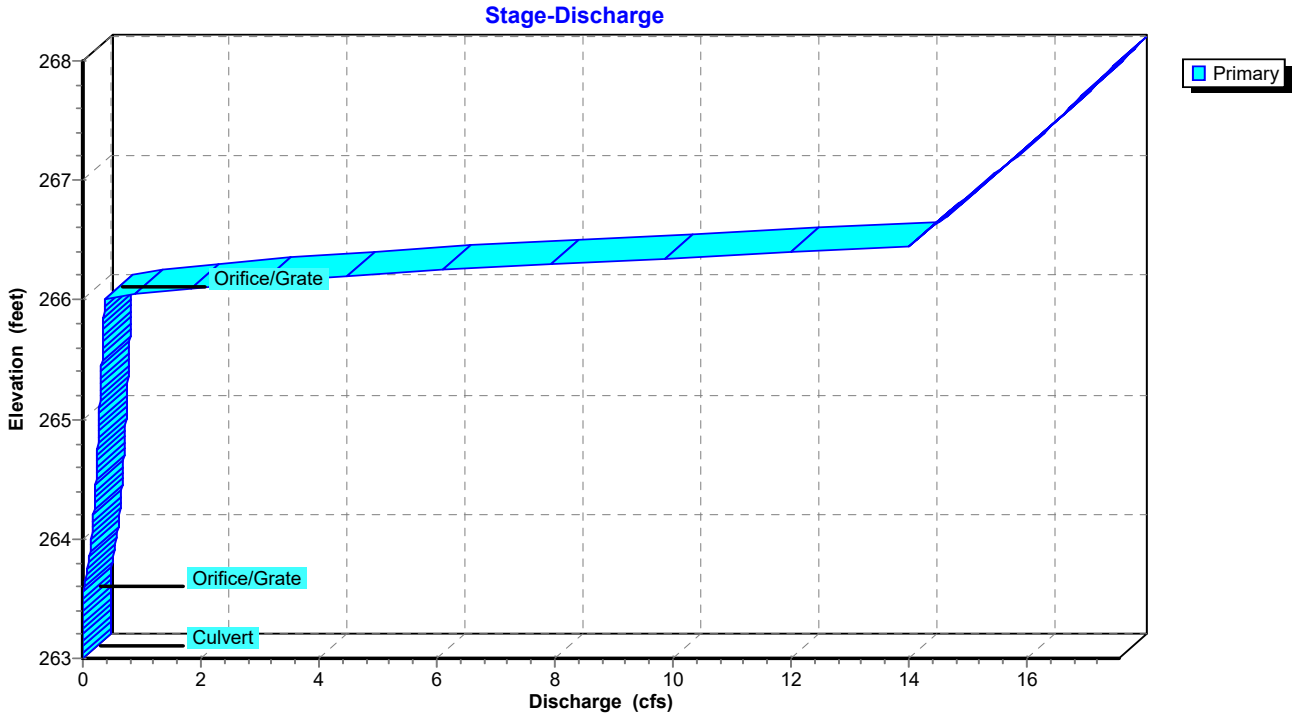
Volume	Invert	Avail.Storage	Storage Description
#1	263.00'	6,709 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
263.00	54	0	0	54
264.00	306	163	163	310
266.00	1,639	1,769	1,932	1,659
268.00	3,227	4,777	6,709	3,284

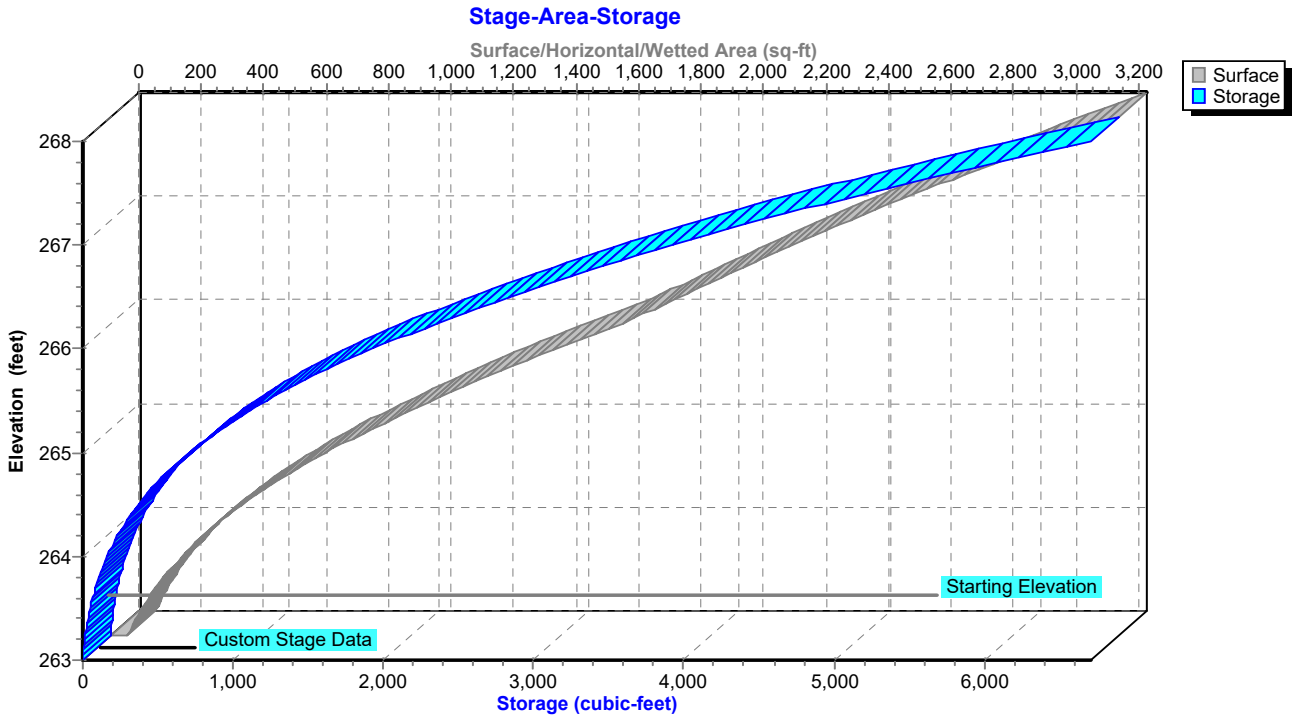
Device	Routing	Invert	Outlet Devices
#1	Primary	263.00'	**18.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 263.00' / 262.50' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	263.50'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	266.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=5.09 cfs @ 12.16 hrs HW=266.22' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 5.09 cfs of 13.37 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.38 cfs @ 7.76 fps)
  └─**3=Orifice/Grate** (Weir Controls 4.71 cfs @ 1.53 fps)

Pond 8P: Detention Basin B1



Pond 8P: Detention Basin B1



Summary for Pond 9P: Design Point B

Inflow Area = 3.469 ac, 0.00% Impervious, Inflow Depth = 4.39" for 100-yr event
Inflow = 11.99 cfs @ 12.18 hrs, Volume= 1.270 af
Primary = 11.99 cfs @ 12.18 hrs, Volume= 1.270 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5

Summary for Pond 10P: Forebay & Bio C1-A

Inflow Area = 4.929 ac, 70.16% Impervious, Inflow Depth = 6.94" for 100-yr event
Inflow = 23.18 cfs @ 12.22 hrs, Volume= 2.851 af
Outflow = 21.98 cfs @ 12.29 hrs, Volume= 2.376 af, Atten= 5%, Lag= 3.9 min
Primary = 21.98 cfs @ 12.29 hrs, Volume= 2.376 af
Routed to Pond 12P : Detention Basin C1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Starting Elev= 264.50' Surf.Area= 18,768 sf Storage= 30,218 cf
Peak Elev= 265.97' @ 12.69 hrs Surf.Area= 24,613 sf Storage= 62,104 cf (31,886 cf above start)

Plug-Flow detention time= 252.2 min calculated for 1.682 af (59% of inflow)
Center-of-Mass det. time= 66.0 min (866.7 - 800.7)

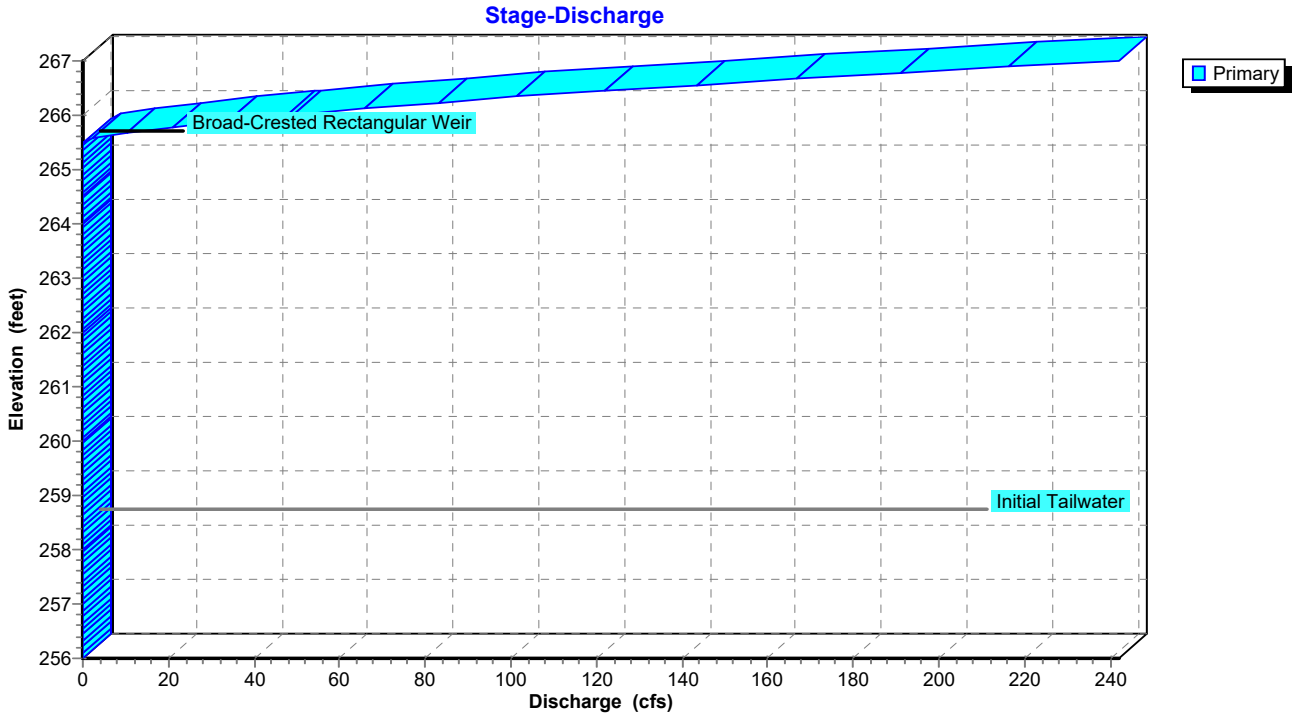
Volume	Invert	Avail.Storage	Storage Description
#1	256.00'	89,274 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
256.00	549	0	0	549
258.00	1,512	1,981	1,981	1,537
260.00	2,803	4,249	6,231	2,868
262.00	4,430	7,171	13,402	4,550
264.00	6,420	10,789	24,190	6,606
264.50	18,768	6,027	30,218	18,956
266.00	24,721	32,514	62,732	24,960
267.00	28,405	26,542	89,274	28,689

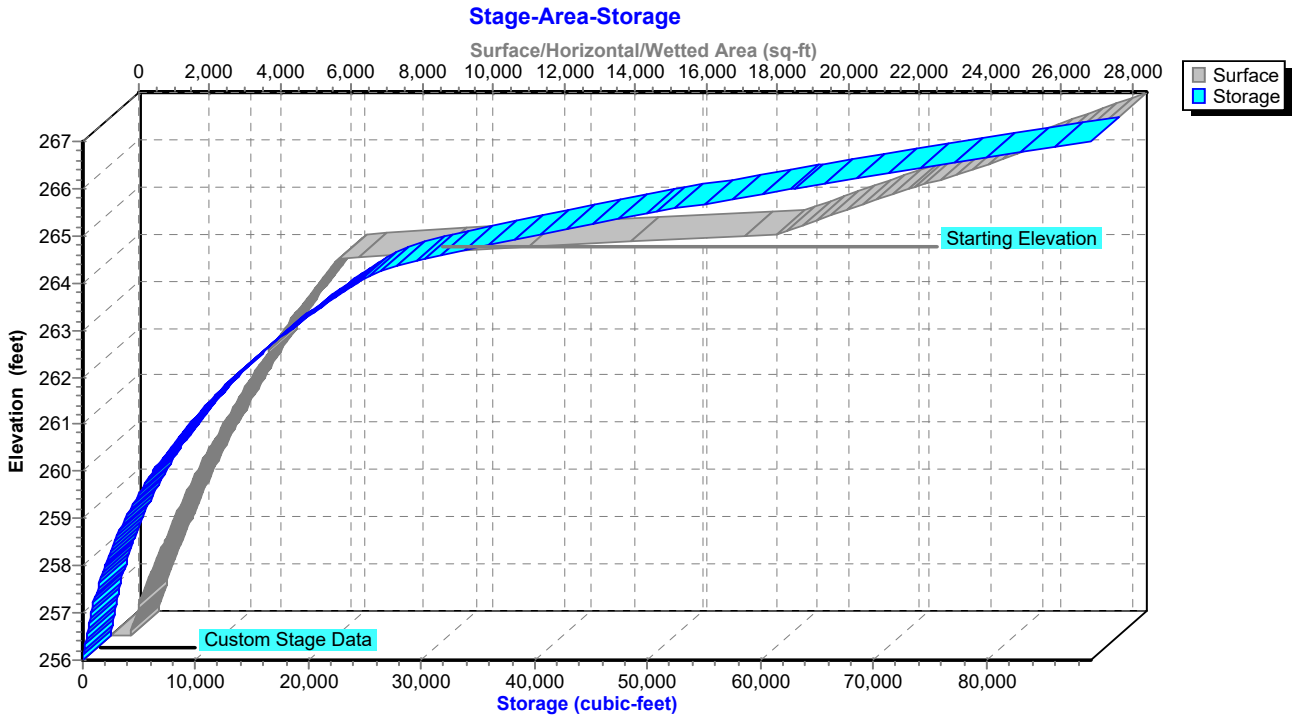
Device	Routing	Invert	Outlet Devices
#1	Primary	265.50'	**50.0' long x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=21.97 cfs @ 12.29 hrs HW=265.80' TW=265.07' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 21.97 cfs @ 1.47 fps)

Pond 10P: Forebay & Bio C1-A



Pond 10P: Forebay & Bio C1-A



Summary for Pond 11P: Forebay C1-B

Inflow Area = 6.154 ac, 61.08% Impervious, Inflow Depth = 6.46" for 100-yr event
Inflow = 29.41 cfs @ 12.19 hrs, Volume= 3.313 af
Outflow = 29.18 cfs @ 12.21 hrs, Volume= 3.313 af, Atten= 1%, Lag= 1.1 min
Primary = 29.18 cfs @ 12.21 hrs, Volume= 3.313 af
Routed to Pond 12P : Detention Basin C1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Automatic Starting Elev= 264.75' Surf.Area= 8,627 sf Storage= 41,372 cf
Peak Elev= 265.97' @ 12.69 hrs Surf.Area= 10,007 sf Storage= 52,727 cf (11,355 cf above start)

Plug-Flow detention time= 190.6 min calculated for 2.363 af (71% of inflow)
Center-of-Mass det. time= 7.4 min (818.6 - 811.2)

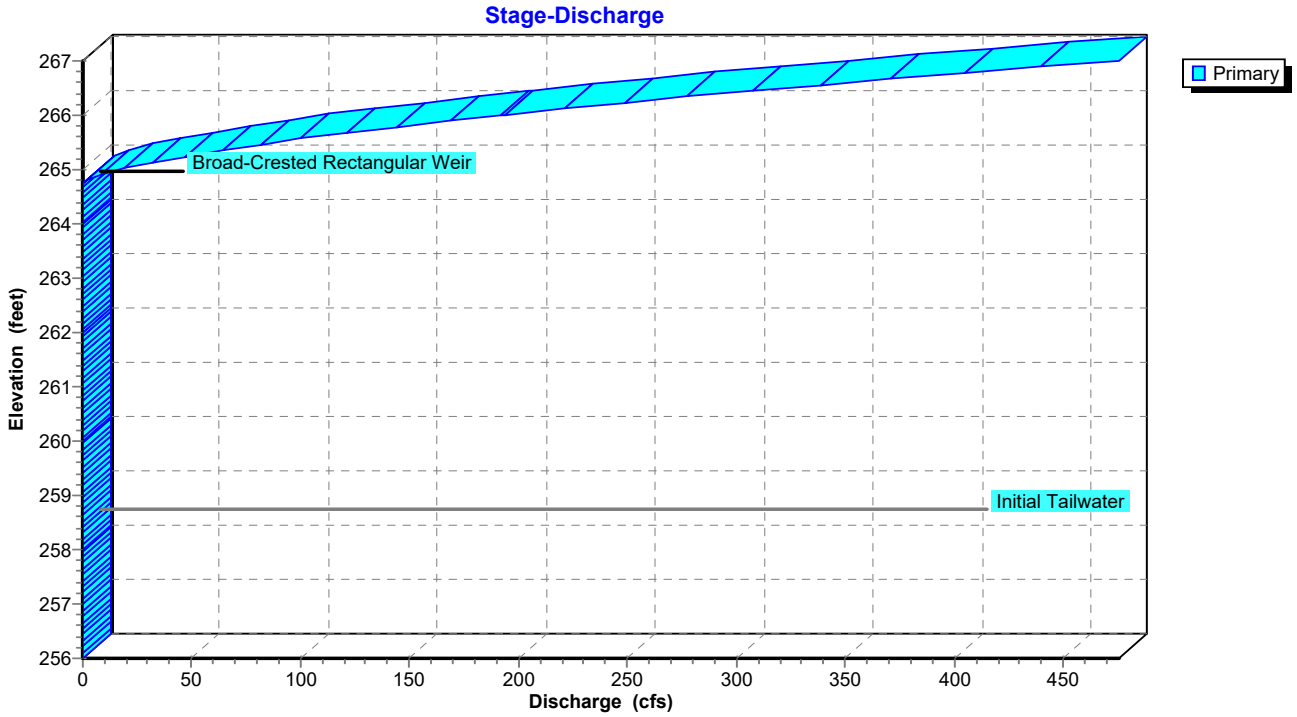
Volume	Invert	Avail.Storage	Storage Description
#1	256.00'	63,668 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
256.00	1,704	0	0	1,704
258.00	2,823	4,480	4,480	2,872
260.00	4,218	6,994	11,475	4,328
262.00	5,887	10,059	21,533	6,071
264.00	7,829	13,670	35,203	8,100
266.00	10,042	17,825	53,028	10,412
267.00	11,249	10,640	63,668	11,673

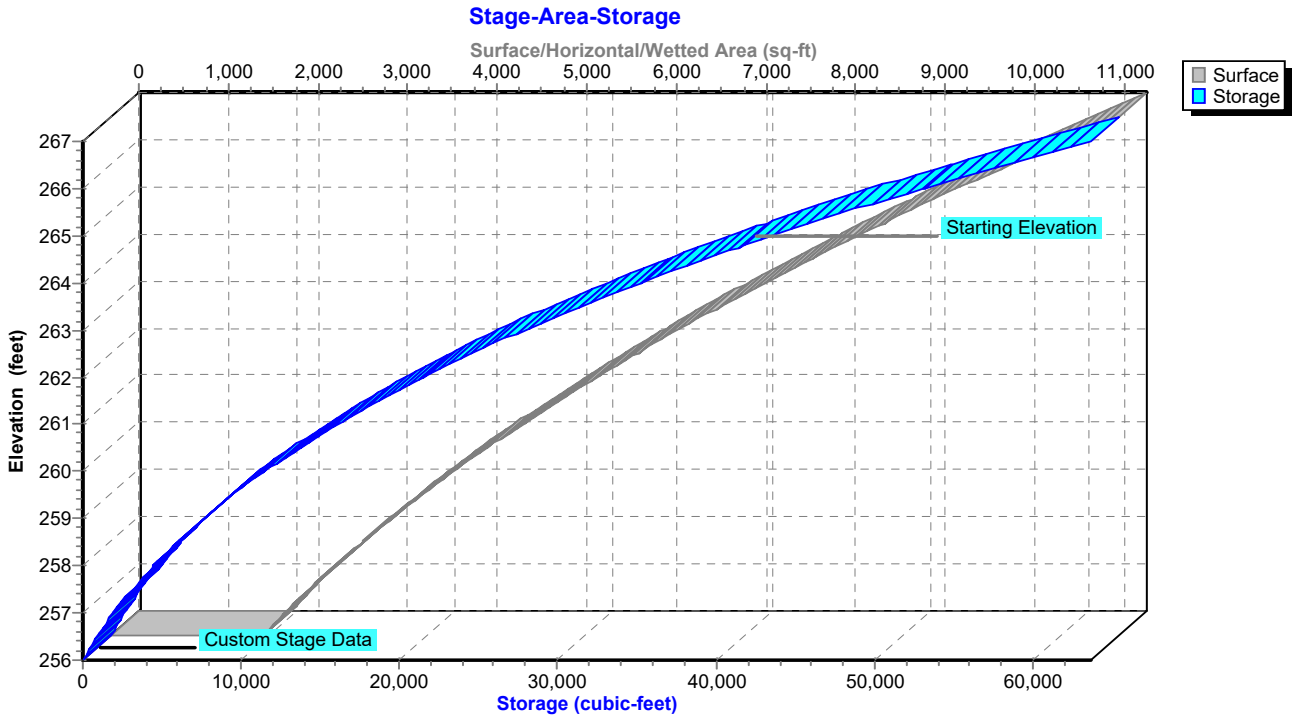
Device	Routing	Invert	Outlet Devices
#1	Primary	264.75'	**50.0' long + 2.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=29.18 cfs @ 12.21 hrs HW=265.11' TW=264.51' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 29.18 cfs @ 1.61 fps)

Pond 11P: Forebay C1-B



Pond 11P: Forebay C1-B



Summary for Pond 12P: Detention Basin C1

Inflow Area = 27.920 ac, 26.01% Impervious, Inflow Depth = 5.55" for 100-yr event
Inflow = 106.73 cfs @ 12.24 hrs, Volume= 12.912 af
Outflow = 46.95 cfs @ 12.69 hrs, Volume= 11.946 af, Atten= 56%, Lag= 26.8 min
Primary = 46.95 cfs @ 12.69 hrs, Volume= 11.946 af
Routed to Pond 13P : Design Point C

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5
Automatic Starting Elev= 258.50' Surf.Area= 8,775 sf Storage= 3,981 cf
Peak Elev= 265.97' @ 12.69 hrs Surf.Area= 39,466 sf Storage= 179,909 cf (175,928 cf above start)

Plug-Flow detention time= 195.4 min calculated for 11.853 af (92% of inflow)
Center-of-Mass det. time= 147.9 min (991.6 - 843.6)

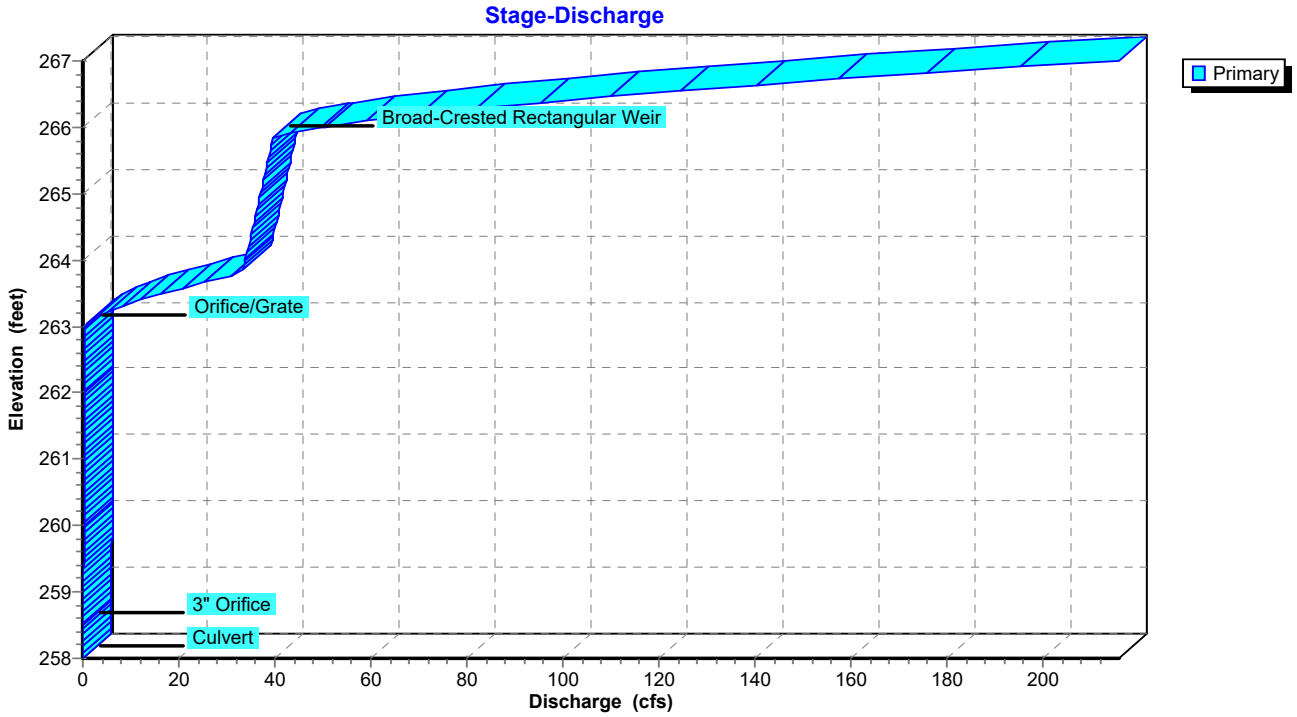
Volume	Invert	Avail.Storage	Storage Description
#1	258.00'	222,991 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
258.00	7,176	0	0	7,176
260.00	14,538	21,285	21,285	14,574
262.00	22,410	36,665	57,951	22,504
264.00	30,774	52,963	110,914	30,947
266.00	39,609	70,197	181,111	39,881
267.00	44,193	41,880	222,991	44,522

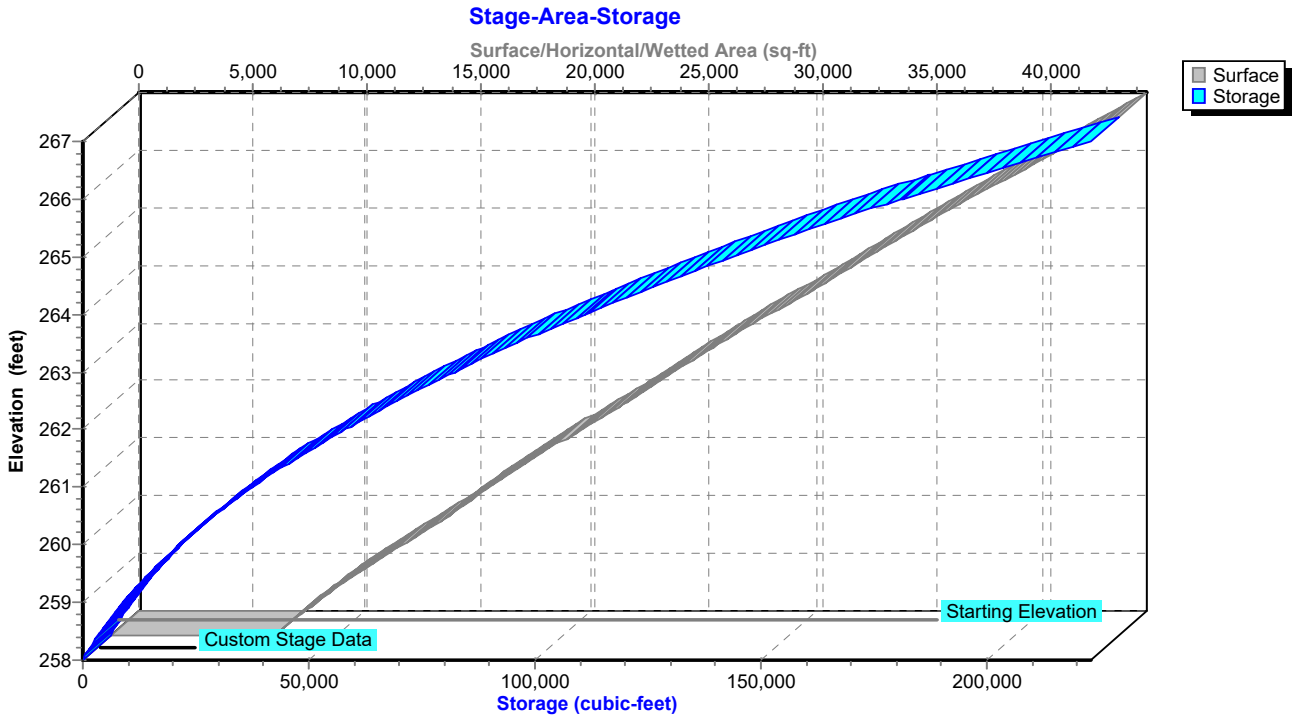
Device	Routing	Invert	Outlet Devices
#1	Primary	258.00'	**24.0" Round Culvert** L= 50.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 258.00' / 256.00' S= 0.0400 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 3.14 sf
#2	Device 1	258.50'	**3.0" Vert. 3" Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	263.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	265.83'	**50.0' long + 2.0 '/' SideZ x 30.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=46.95 cfs @ 12.69 hrs HW=265.97' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Inlet Controls 39.93 cfs @ 12.71 fps)
  - **2=3" Orifice** (Passes < 0.64 cfs potential flow)
  - **3=Orifice/Grate** (Passes < 99.57 cfs potential flow)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 7.02 cfs @ 1.00 fps)

Pond 12P: Detention Basin C1



Pond 12P: Detention Basin C1



Summary for Pond 13P: Design Point C

Inflow Area = 29.035 ac, 25.59% Impervious, Inflow Depth > 5.14" for 100-yr event
Inflow = 48.50 cfs @ 12.68 hrs, Volume= 12.447 af
Primary = 48.50 cfs @ 12.68 hrs, Volume= 12.447 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs / 5

APPENDIX 12

FOREBAY & WQV

CALCULATIONS

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ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

WATER QUALITY VOLUME CALCULATIONS

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**06/26/26**	**1**	**1**

PROJECT TITLE
Britain Woods

LOCATION
Town of Newburgh / City of Newburgh

CALCULATED BY
ZS

APPROVED BY
RW

REF DRAWING(S)

$$WQ_v = (P * R_v * A) / (12)$$

Drainage Area	90% Rainfall Event Number (**P**)	Impervious Area (**I**)	Drainage Area (**A**)	**R_v** (0.05 + 0.009 * I%)	**WQ_v** (Ac-ft)
PR - A1-A	1.40	2.27	4.76	0.479	11,593 0.266
PR - A1-B	1.40	1.66	2.61	0.622	8,233 0.189
PR - A1-C	1.40	0.00	0.49	0.050	126 0.003
PR - A2-A	1.40	0.31	14.15	0.070	5,027 0.115
PR - A2-B	1.40	0.23	10.89	0.069	3,823 0.088
PR - B1	1.40	0.00	1.13	0.050	289 0.007
PR - B2	1.40	0.00	2.34	0.050	610 0.014
PR-C1-A	1.40	3.46	4.93	0.681	17,069 0.392
PR-C1-B	1.40	3.76	6.15	0.600	18,775 0.431
PR-C1-C	1.40	0.00	16.84	0.050	4,269 0.098
PR-C2	1.40	0.04	1.12	0.082	480 0.011

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ENGINEERING & SURVEYING PROPERTIES
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WQv Provided in SMP

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	09/01/23	02/09/26	1	6

PROJECT TITLE
Britain Woods

LOCATION
Town of Newburgh / City of Newburgh

CALCULATED BY
ZS

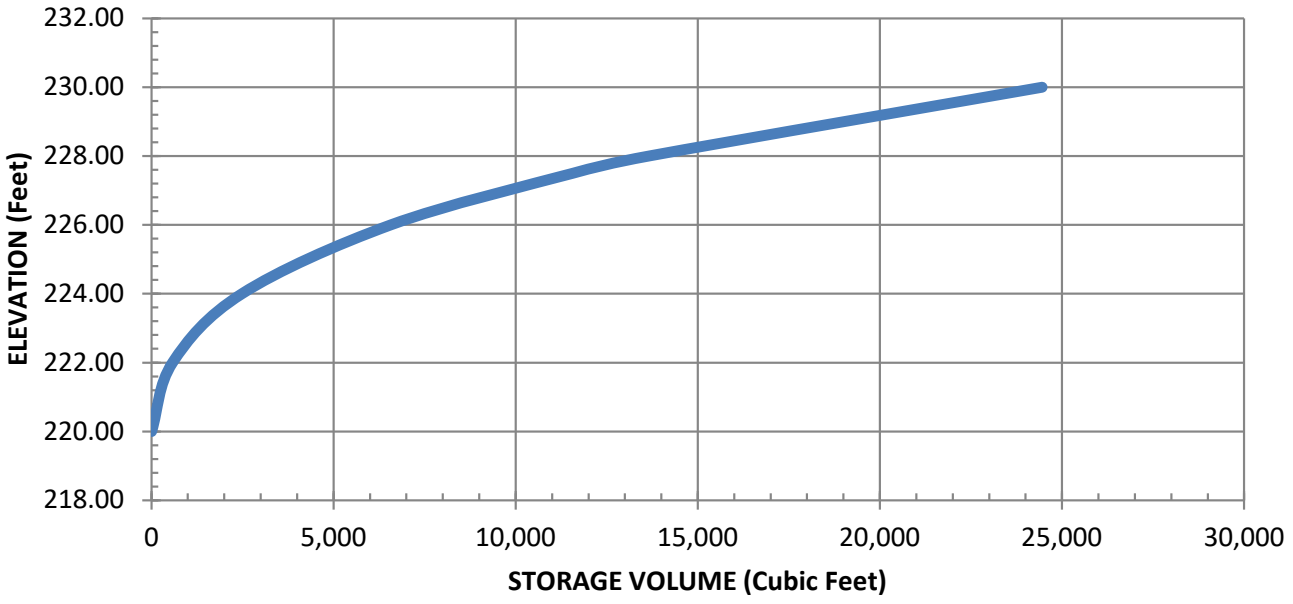
APPROVED BY
RW

REF DRAWING(S)
DWG LAST REV. 02/09/2026

Basin **Forebay A1-A** WQv provided: 0.265 ac-ft

Water Surface Elevation (Feet)	Surface Area (Square Feet)	Average Area (Square Feet)	Difference in Elevation (Feet)	Incremental Storage (Cubic Feet)	Total Storage Volume (Cubic Feet)
220.00	65.0	--	--	--	0.0
222.00	514.0	289.5	2.0	579.0	579.0
224.00	1,391.0	952.5	2.0	1,905.0	2,484.0
226.00	2,700.0	2,045.5	2.0	4,091.0	6,575.0
227.50	3,951.0	3,325.5	1.5	4,988.3	11,563.3
228.00	4,405.0	4,178.0	0.5	2,089.0	13,652.3
230.00	6,392.0	5,398.5	2.0	10,797.0	24,449.3

Stage Storage Curve



ENGINEERING & SURVEYING PROPERTIES
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WQv Provided in SMP

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	09/01/23	02/09/26	2	6

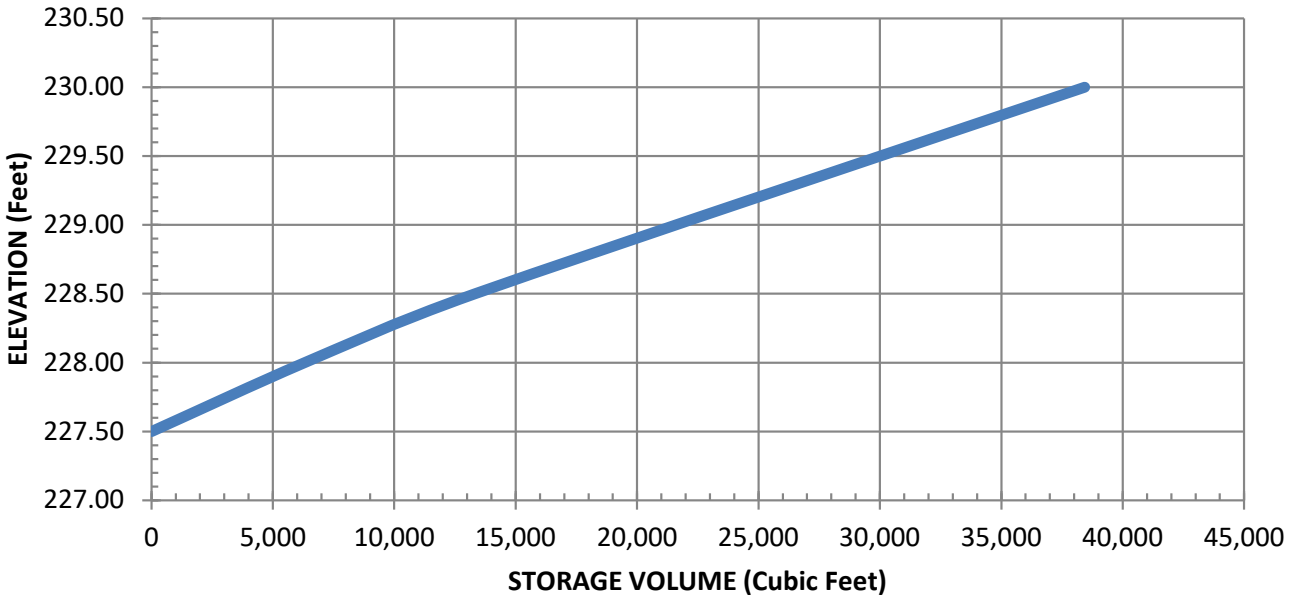
PROJECT TITLE	LOCATION
Britain Woods	**Town of Newburgh / City of Newburgh**

CALCULATED BY	APPROVED BY	REF DRAWING(S)
ZS	**RW**	**DWG LAST REV. 02/09/2026**

Basin **Bio-Basin A1-A** WQv provided: 0.306 ac-ft

Water Surface Elevation (Feet)	Surface Area (Square Feet)	Average Area (Square Feet)	Difference in Elevation (Feet)	Incremental Storage (Cubic Feet)	Total Storage Volume (Cubic Feet)
227.50	12,044.0	--	--	--	0.0
228.00	13,280.0	12,662.0	0.5	6,331.0	6,331.0
228.50	14,722.0	14,001.0	0.5	7,000.5	13,331.5
230.00	18,750.0	16,736.0	1.5	25,104.0	38,435.5

Stage Storage Curve



ENGINEERING & SURVEYING PROPERTIES
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WQv Provided in SMP

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**09/01/23**	**02/09/26**	**3**	**6**

PROJECT TITLE
Britain Woods

LOCATION
Town of Newburgh / City of Newburgh

CALCULATED BY
ZS

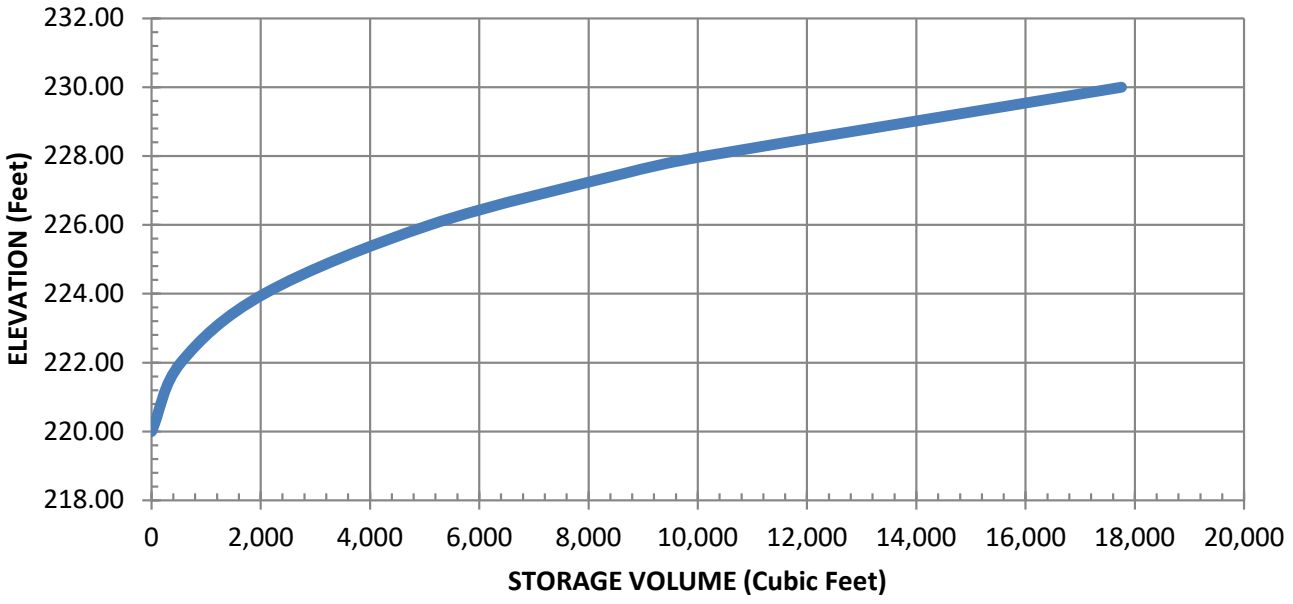
APPROVED BY
RW

REF DRAWING(S)
DWG LAST REV. 02/09/2026

Basin **Forebay A1-B** WQv provided: 0.199 ac-ft

Water Surface Elevation (Feet)	Surface Area (Square Feet)	Average Area (Square Feet)	Difference in Elevation (Feet)	Incremental Storage (Cubic Feet)	Total Storage Volume (Cubic Feet)
220.00	88.0	--	--	--	0.0
222.00	451.0	269.5	2.0	539.0	539.0
224.00	1,075.0	763.0	2.0	1,526.0	2,065.0
226.00	1,960.0	1,517.5	2.0	3,035.0	5,100.0
227.50	2,794.0	2,377.0	1.5	3,565.5	8,665.5
228.00	3,105.0	2,949.5	0.5	1,474.8	10,140.3
230.00	4,512.0	3,808.5	2.0	7,617.0	17,757.3

Stage Storage Curve



ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

WQv Provided in SMP

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	09/01/23	02/09/26	4	6

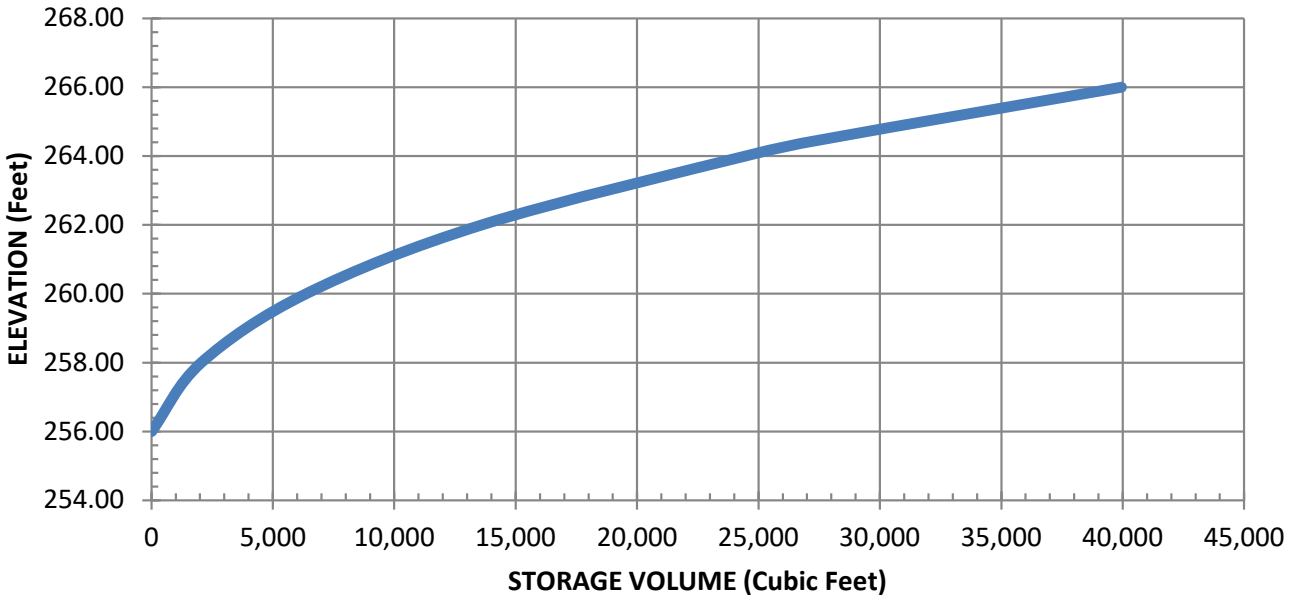
PROJECT TITLE	LOCATION
Britain Woods	**Town of Newburgh / City of Newburgh**

CALCULATED BY	APPROVED BY	REF DRAWING(S)
ZS	**RW**	**DWG LAST REV. 02/09/2026**

Basin **Forebay C1-A** WQv provided: 0.638 ac-ft

Water Surface Elevation (Feet)	Surface Area (Square Feet)	Average Area (Square Feet)	Difference in Elevation (Feet)	Incremental Storage (Cubic Feet)	Total Storage Volume (Cubic Feet)
256.00	549.0	--	--	--	0.0
258.00	1,512.0	1,030.5	2.0	2,061.0	2,061.0
260.00	2,803.0	2,157.5	2.0	4,315.0	6,376.0
262.00	4,430.0	3,616.5	2.0	7,233.0	13,609.0
264.00	6,420.0	5,425.0	2.0	10,850.0	24,459.0
264.50	6,983.0	6,701.5	0.5	3,350.8	27,809.8
266.00	9,205.0	8,094.0	1.5	12,141.0	39,950.8
267.00	10,831.0	10,018.0	1.0	10,018.0	

Stage Storage Curve



ENGINEERING & SURVEYING PROPERTIES
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WQv Provided in SMP

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	09/01/23	02/09/26	5	6

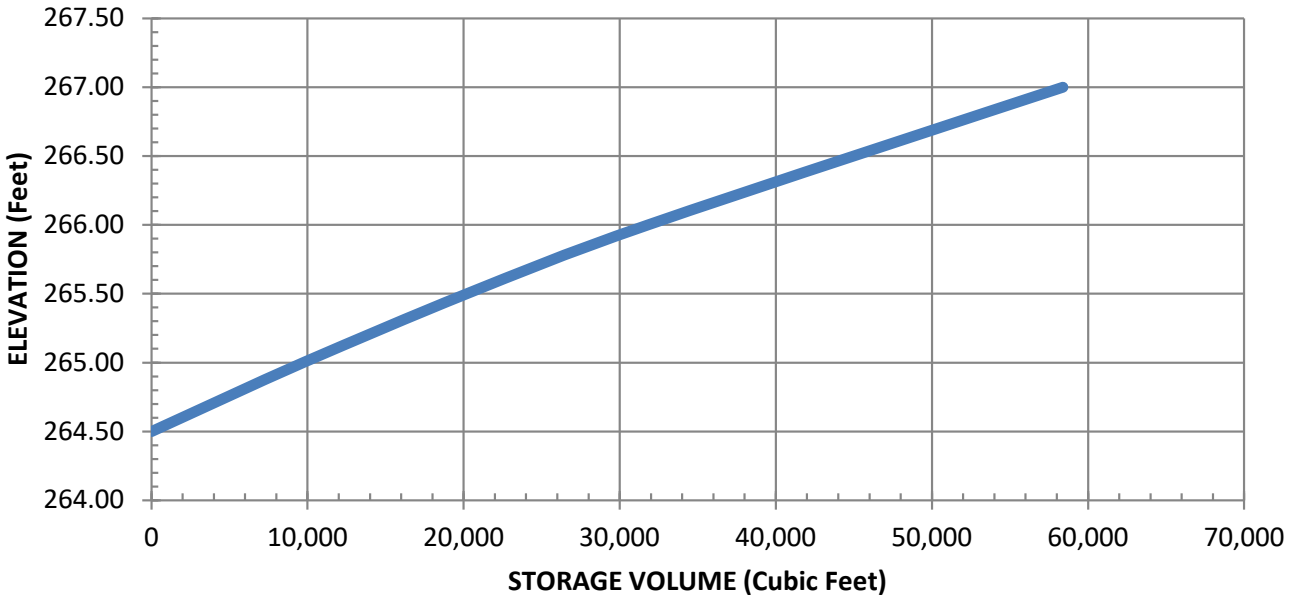
PROJECT TITLE	LOCATION
Britain Woods	**Town of Newburgh / City of Newburgh**

CALCULATED BY	APPROVED BY	REF DRAWING(S)
ZS	**RW**	**DWG LAST REV. 02/09/2026**

Basin **Bio-Basin C1-A** WQv provided: 0.464 ac-ft

Water Surface Elevation (Feet)	Surface Area (Square Feet)	Average Area (Square Feet)	Difference in Elevation (Feet)	Incremental Storage (Cubic Feet)	Total Storage Volume (Cubic Feet)
264.50	18,768.0	--	--	--	0.0
265.00	20,210.0	19,489.0	0.5	9,744.5	9,744.5
265.50	21,700.0	20,955.0	0.5	10,477.5	20,222.0
266.00	24,721.0	23,210.5	0.5	11,605.3	31,827.3
267.00	28,405.0	26,563.0	1.0	26,563.0	58,390.3

Stage Storage Curve



ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

WQv Provided in SMP

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	09/01/23	02/09/26	6	6

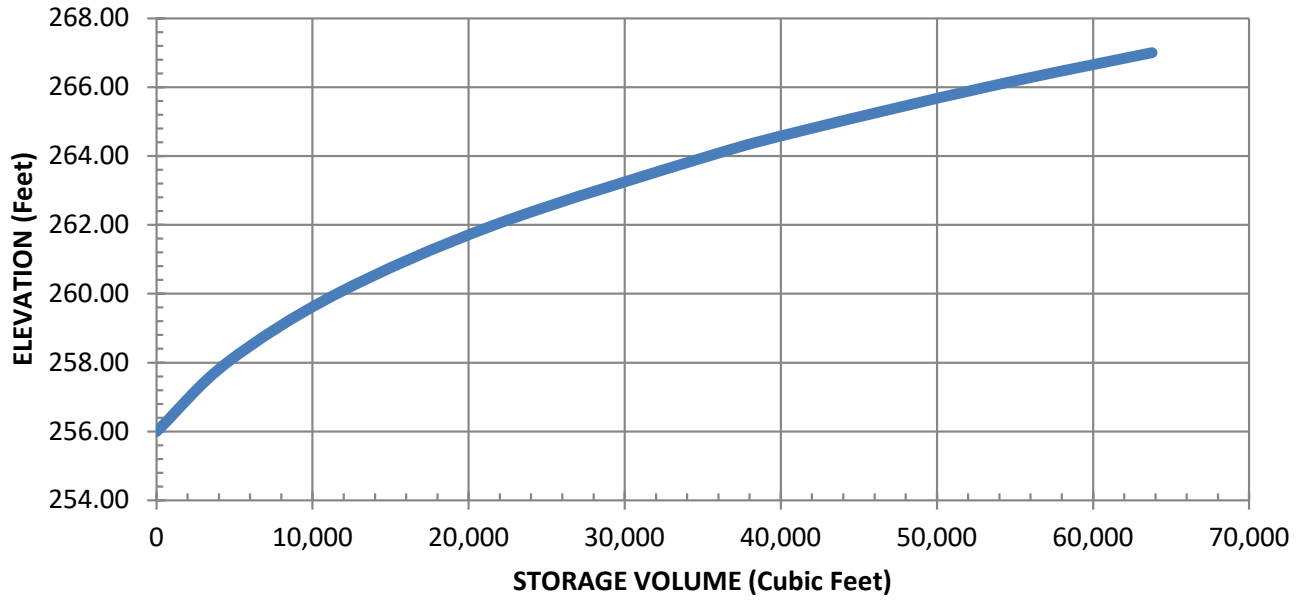
PROJECT TITLE	LOCATION
Britain Woods	**Town of Newburgh / City of Newburgh**

CALCULATED BY	APPROVED BY	REF DRAWING(S)
ZS	**RW**	**DWG LAST REV. 02/09/2026**

Basin **Forebay C1-B** WQv provided: 0.953 ac-ft

Water Surface Elevation (Feet)	Surface Area (Square Feet)	Average Area (Square Feet)	Difference in Elevation (Feet)	Incremental Storage (Cubic Feet)	Total Storage Volume (Cubic Feet)
256.00	1,704.0	--	--	--	0.0
258.00	2,823.0	2,263.5	2.0	4,527.0	4,527.0
260.00	4,218.0	3,520.5	2.0	7,041.0	11,568.0
262.00	5,887.0	5,052.5	2.0	10,105.0	21,673.0
264.00	7,829.0	6,858.0	2.0	13,716.0	35,389.0
264.75	8,532.0	8,180.5	0.8	6,135.4	41,524.4
266.00	10,042.0	9,287.0	1.3	11,608.8	53,133.1
267.00	11,249.0	10,645.5	1.0	10,645.5	63,778.6

Stage Storage Curve



APPENDIX 13

CONSTRUCTION SITE INSPECTION FORM, NOTICE OF INTENT & MS4 ACCEPTANCE

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SWPPP INSPECTION REPORT

ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

W.O. No.:	Date:	Greater than 5 Ac. Of Disturbance? Waiver?	Page Of
Project Name:		Weather Conditions: ☐ Dry ☐ Rain ☐ Snow	
		Soil Conditions: ☐ Dry ☐ Wet ☐ Saturated	
Location:		Arrival Time :	Photographs Taken? ☐ Yes ☐ No
		Departing Time:	

Owner:	**Phone:**	**Documents on-site?**		SWPPP:	
Contractor:	**Phone:**	Weekly Inspections:		NOI:	

1. Description of current activities onsite and phase of construction (attach sketch showing areas of stabilization, current work, and photo locations):

2. Description of the condition of the runoff at all points of discharge from the construction site (including onsite conveyance systems):	3. Description of the condition of all natural surface water bodies located within, or immediately adjacent to the construction site:

4. Identify all erosion and sediment control practices that require repair and/or maintenance:	5. Identify all erosion and sediment control practices that were not installed properly or are not functioning as designed:

6. Identify current status of construction for all post-construction stormwater management practices:	7. Corrective action(s) required to erosion and sediment control measures and post-construction stormwater management practices:

Was the owner and contractor(s) notified of the deficiencies and repairs needed within one (1) business day? ☐ Yes ☐ No

Qualified Inspector

Notice:

This inspection was performed solely for the purpose of determining compliance with NYSDEC SPDES General Permit:

☐ GP-02-01
☐ GP-08-001
☐ GP-10-001

Name and Title

Signature

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NYS Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance Form

for

Construction Activities Seeking Authorization Under SPDES General Permit

*(NOTE: Attach Completed Form to Notice Of Intent and Submit to Address Above)

I. Project Owner/Operator Information
1. Owner/Operator Name:
2. Contact Person:
3. Street Address:
4. City/State/Zip:
II. Project Site Information
5. Project/Site Name:
6. Street Address:
7. City/State/Zip:
III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information
8. SWPPP Reviewed by:
9. Title/Position:
10. Date Final SWPPP Reviewed and Accepted:
IV. Regulated MS4 Information
11. Name of MS4:
12. MS4 SPDES Permit Identification Number: NYR20A _____
13. Contact Person:
14. Street Address:
15. City/State/Zip:
16. Telephone Number:

MS4 SWPPP Acceptance Form - continued

V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in question 5 has been reviewed and meets the substantive requirements in the SPDES General Permit For Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s). Note: The MS4, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name:

Title/Position:

Signature:

Date:

VI. Additional Information

(NYS DEC - MS4 SWPPP Acceptance Form - January 2015)

APPENDIX 14

CONSTRUCTION WASTE MANAGEMENT & SPILL PREVENTION PLANS

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CONSTRUCTION WASTE MANAGEMENT & SPILL PREVENTION PLAN

Early in the construction activities, land clearing materials will be collected and recycled either off site or re-used on site as erosion control materials. During early phase construction activities, cardboard, concrete, metal, wood and general trash collection dumpsters will be on site for collection and processing. As the project progresses, concrete dumpsters will be changed over to drywall collection, site clearing dumpsters will be changed over to finish material containers, etc. Typically, (4) open top containers will be on site for the duration of the project. General waste and cardboard/paper containers will be on site for the duration of the project. The contractor will be responsible for organizing and placing containers on site and timely removal/replacement when containers are filled to capacity. As necessary, the contractor will provide areas of collection or hoppers for subcontractors to utilize for intermediate storage of construction and demolition (CD) materials. All containers will be clearly identified with signage indicating stored materials.

Those CD materials generated on this project will be salvaged and re-processed as listed. The contractor will research available processing sources specific to the job site and make all trades aware of project qualifying CD recyclable materials as follows:

Brick: Materials will be stored on site and palletized by processor who will resell as product.

Cardboard: Materials will be separated on the jobsite and stored within dedicated on-site dumpster and delivered loose to processor. Processor will bale materials and deliver/resell to end market users.

Concrete: Scrap and loose materials will either be crushed on site and used for aggregate or stored within dedicated on-site dumpster and delivered to processor. Processor will reuse or resell materials as clean fill back or crush and use for aggregate.

Metals: Materials will be sorted and stored within dedicated on-site dumpster and delivered to processor. Processor will sell materials to metal recyclers (steel, aluminum, brass, copper, lead, stainless).

Stone and Granite: Materials will be collected on site in piles or containers and processor will palletize and haul materials. Processor will re-sell as product or crushed and use as aggregate.

Plastic, paper goods, and aluminum cans: Materials will be collected on job site within construction trailers, cantina areas, etc. and stored in on-site trailers. Materials will be hauled/recycled by processor.

Drywall: Waste materials will be sorted and collected in dedicated on-site containers or materials will be ground on site and used as an erosion control product. Hauled materials to processor will be processed as a soil amendment or used in alternate fuel mixture.

Wood or Lumber: Materials will be sorted and stored on-site within dedicated on-site containers and either resold as retail lumber by processor or ground and mixed with commercial land

clearing and/or approved materials for erosion control applications. Lumber will need to be clean, no paint or other wood treatment.

Land Clearing Debris: Woody materials (stumps, large limbs) will be ground on-site and used for soil erosion control products or hauled to processor to be ground as re-sold as erosion control products.

Roofing Shingles: Materials will be stored on site and processed as temporary road base, mixed into hot asphalt mix or used as alternate fuel blend or hauled offsite via appropriate methods to an authorized disposal/recycling facility.

Fuel Tanks: On site storage of fuel chemicals shall be equipped with a spill kit. The contractor must provide secondary containment for storing any hazardous chemicals on site.

Equipment storage: All equipment stored on site shall be inspected daily by the contractor for any oil or lubricant spills or leaks. Any leaks shall be repaired immediately. In addition all equipment must be closely inspected prior to working in the Village R.O.W.

Spill Response: All petroleum spills that occur within New York State must be reported to the NYS Spill Hotline (1-800-457-7362) within 2 hours of discovery, except spills which meet **all of the following criteria**:

1. The quantity is known to be less than 5 gallons; and
2. The spill is contained and under the control of the spiller; and
3. The spill has not and will not reach the State's water or any land; and
4. The spill is cleaned up within 2 hours of discovery.

A spill is considered to have not impacted land if it occurs on a paved surface such as asphalt or concrete. A spill in a dirt or gravel parking lot is considered to have impacted land is reportable.

Hazardous Material Spills & Waste: Materials deemed to be hazardous (ie, antifreeze, fertilizers, paint, pesticides), as defined by State and Federal regulations, shall be stored in their approved containers, and maintained in good condition. All spills of hazardous materials shall be cleaned sufficiently, in accordance with all State and Federal regulations, and documented accordingly. All hazardous material waste shall be properly collected, handled and transported to an approved hazardous waste processing facility.

This Plan will be displayed in the construction jobsite trailer at all times.

APPENDIX 15

NEW YORK STATE

RECREATION AND HISTORIC

PRESERVATION

DETERMINATION

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APPENDIX 16

DRAINAGE PIPE

CALCULATIONS

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ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

STORM DRAINAGE PIPE DESIGN WORKSHEET

WO. NO.	DATE	REVISED	SHEET
1146.01	02/09/26		1 OF 4

PROJECT TITLE	LOCATION	STORM FREQUENCY	PIPE TYPE
Britain Woods	Town/City of Newburgh	25 Year	HDPE

CALCULATED BY	APPROVED BY	REF DRAWING(S)	RAINFALL CURVE
ZS	RW	DWG LAST REV. 02/09/2026	Orange County, NY

LOCATION		ROAD	ACRES		" C "	CA	ΣCA	TIME CONC. - MIN			" i "	" Q "		PIPE								DROP	INV	INV	GRATE	Depth to	Cover	Cover
FROM	TO	STA.	SUB.	TOTAL				Inlet	Pipe	TOTAL		Des.	Cap.	" n "	Size	Height	V Des	V Cap	Slope	Lgth.	Fall	(feet)	Upper	Lower	Elev	INV	Upper	Lower
CB41	CB42		0.22	0.48	0.90	0.27	0.27	5.00	-	5.00	8.33	2.3	8.40	0.010	15		5.8	6.8	1.00%	22	0.22	0.00	278.63	278.41	281.88	3.25	2.00	2.22
			0.26		0.30																							
CB42	DMH 43		0.37	0.93	0.90	0.36	0.63	5.00	0.06	5.06	8.33	5.2	8.40	0.010	15		7.2	6.8	1.00%	41	0.41	0.00	278.41	278.00	281.88	3.47	2.22	2.99
			0.09		0.30																							
DMH 43	DMH 44		-	0.93	0.90	-	0.63	5.06	0.09	5.16	8.31	5.2	8.40	0.010	15		7.2	6.8	1.00%	167	1.67	0.00	278.00	276.33	282.24	4.24	2.99	4.29
			-		0.30																							
DMH 44	CB 45		-	0.93	0.90	-	0.63	5.16	0.39	5.54	8.28	5.2	8.40	0.010	15		7.2	6.8	1.00%	50	0.50	0.00	276.33	275.83	281.87	5.54	4.29	4.32
			-		0.30																							
CB 45	CB 47		0.58	1.54	0.90	0.53	1.40	5.54	0.12	5.66	8.15	11.4	13.66	0.010	18		8.6	7.7	1.00%	230	2.30	0.25	275.58	273.28	281.40	5.82	4.32	6.60
			0.03		0.30																							
CB 47	DMH 49		0.55	2.11	0.90	0.50	2.10	5.66	0.44	6.11	8.11	17.1	29.41	0.010	24		9.7	9.4	1.00%	226	2.26	0.50	272.78	270.52	281.38	8.60	6.60	8.84
			0.03		0.30																							
DMH 49	CB 50		-	2.11	0.90	-	2.10	6.11	0.39	6.50	7.97	16.8	29.41	0.010	24		9.7	9.4	1.00%	42	0.42	0.00	270.52	270.10	281.36	10.84	8.84	8.84
			-		0.30																							
CB 50	CB 52		0.57	2.71	0.90	0.52	2.85	6.50	0.07	6.57	7.85	22.4	29.41	0.010	24		10.3	9.4	1.00%	222	2.22	0.00	270.10	267.88	280.94	10.84	8.84	10.87
			0.03		0.30																							
CB 52	DMH 40		0.27	3.00	0.90	0.25	3.19	6.57	0.36	6.93	7.82	24.9	29.41	0.010	24		10.5	9.4	1.00%	68	0.68	0.00	267.88	267.20	280.75	12.87	10.87	8.32
			0.02		0.30																							
DMH 40	ES 1		-	3.00	0.90	-	3.28	6.93	0.11	7.04	7.72	25.3	112.83	0.010	24		28.9	35.9	14.72%	54	7.95	0.00	267.20	259.25	277.52	10.32	8.32	**-261.25**
			-		0.30																							
CB 46	CB 45		0.26	0.31	0.90	0.25	0.25	-	-	-	10.61	2.6	8.40	0.010	15		6.0	6.8	1.00%	22	0.22	1.25	276.05	275.83	281.40	5.35	4.10	**-277.08**
			0.05		0.30																							
CB 48	CB 47		0.22	0.23	0.90	0.20	0.20	-	-	-	10.61	2.1	8.40	0.010	15		5.7	6.8	1.00%	22	0.22	1.25	273.75	273.53	281.38	7.63	6.38	**-274.78**
			0.00		0.30																							
CB 38	CB 39		0.03	0.03	0.90	0.03	0.03	-	-	-	10.61	0.3	8.40	0.010	15		3.2	6.8	1.00%	22	0.22	1.25	268.50	268.28	274.03	5.53	4.28	4.55
			-		0.30																							
CB 39	DMH 40		0.06	0.11	0.90	0.06	0.09	-	0.11	0.11	10.61	1.0	8.40	0.010	15		4.5	6.8	1.00%	65	0.65	0.00	268.28	267.63	274.08	5.80	4.55	**-268.88**
			0.02		0.30																							
CB 53	CB 52		0.10	0.10	0.90	0.09	0.09	-	-	-	10.61	0.9	8.40	0.010	15		4.5	6.8	1.00%	22	0.22	1.25	268.85	268.63	280.75	11.90	10.65	**-269.88**
			-		0.30																							
CB 51	CB 50		0.25	0.26	0.90	0.23	0.23	-	-	-	10.61	2.4	8.40	0.010	15		5.9	6.8	1.00%	22	0.22	1.25	271.07	270.85	280.94	9.87	8.62	**-272.10**
			0.01		0.30																							

ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

STORM DRAINAGE PIPE DESIGN WORKSHEET

WO. NO.	DATE	REVISED	SHEET
1146.01	02/09/26		2 OF 4

PROJECT TITLE	LOCATION	STORM FREQUENCY	PIPE TYPE
Britain Woods	**Town/City of Newburgh**	**25 Year**	**HDPE**

CALCULATED BY	APPROVED BY	REF DRAWING(S)	RAINFALL CURVE
XXX	**XXX**	**DWG LAST REV. 02/09/2026**	**Orange County, NY**

LOCATION		ROAD	ACRES		" C "	CA	ΣCA	TIME CONC. - MIN			" i "	" Q "		PIPE								DROP	INV	INV	GRATE	Depth to	Cover	Cover
FROM	TO	STA.	SUB.	TOTAL				Inlet	Pipe	TOTAL		Des.	Cap.	" n "	Size	Height	V Des	V Cap	Slope	Lgth.	Fall	(feet)	Upper	Lower	Elev	INV	Upper	Lower
CB 21	CB 22		0.27		0.90																							
			0.07	0.34	0.30	0.26	0.26	5.00	-	5.00	8.33	2.2	8.40	0.010	15		5.7	6.8	1.00%	22	0.22	0.00	303.31	303.09	306.56	3.25	2.00	2.19
CB 22	CB 23		0.10		0.90																							
			0.08	0.51	0.30	0.11	0.89	5.00	0.06	5.06	8.33	7.4	8.40	0.010	15		7.7	6.8	1.00%	213	2.13	0.00	303.09	300.96	306.53	3.44	2.19	4.53
CB 23	DMH 25		0.20		0.90																							
			0.20	0.91	0.30	0.24	1.64	5.06	0.46	5.53	8.31	13.6	13.66	0.010	18		8.8	7.7	1.00%	22	0.22	0.25	300.71	300.49	306.74	6.03	4.53	5.00
DMH 25	CB 26		-		0.90																							
			-	0.91	0.30	-	1.64	5.53	0.04	5.57	8.16	13.4	13.66	0.010	18		8.8	7.7	1.00%	183	1.83	0.00	300.49	298.66	306.99	6.50	5.00	6.67
CB 26	CB 28		0.36		0.90																							
			0.26	1.53	0.30	0.40	2.52	5.57	0.35	5.91	8.14	20.6	29.41	0.010	24		10.1	9.4	1.00%	215	2.15	0.50	298.16	296.01	306.83	8.67	6.67	8.60
CB 28	CB 30		0.27		0.90																							
			0.19	1.99	0.30	0.30	2.95	5.91	0.36	6.27	8.03	23.7	29.41	0.010	24		10.4	9.4	1.00%	135	1.35	0.00	296.01	294.66	306.61	10.60	8.60	6.85
CB 30	CB 32		0.11		0.90																							
			0.09	2.19	0.30	0.12	3.21	6.27	0.22	6.48	7.92	25.4	73.52	0.010	24		21.1	23.4	6.25%	161	10.06	0.00	294.66	284.59	303.51	8.85	6.85	2.48
CB 32	DMH 34		0.05		0.90																							
			0.11	2.35	0.30	0.08	3.38	6.48	0.13	6.61	7.85	26.6	90.64	0.010	24		25.0	28.9	9.50%	93	8.84	0.00	284.59	275.75	289.07	4.48	2.48	2.55
DMH 34	CB 35		-		0.90																							
			-	2.35	0.30	-	3.38	6.61	0.06	6.67	7.81	26.4	65.10	0.010	24		19.6	20.7	4.90%	102	5.00	0.00	275.75	270.75	280.30	4.55	2.55	2.54
CB 35	DMH 37		0.06		0.90																							
			0.06	2.47	0.30	0.07	3.56	6.67	0.09	6.76	7.79	27.8	50.94	0.010	24		16.5	16.2	3.00%	73	2.19	0.00	270.75	268.56	275.29	4.54	2.54	3.00
DMH 37	CB 55		-		0.90																							
			-	2.47	0.30	-	3.56	6.76	0.07	6.83	7.76	27.7	50.94	0.010	24		16.5	16.2	3.00%	84	2.52	0.00	268.56	266.04	273.56	5.00	3.00	3.57
CB 55	CB 57		0.21		0.90																							
			0.02	2.71	0.30	0.20	4.07	6.83	0.08	6.92	7.74	31.5	41.59	0.010	24		14.6	13.2	2.00%	211	4.22	0.00	266.04	261.82	271.61	5.57	3.57	3.35
CB 57	ES 3		0.04		0.90																							
			-	2.75	0.30	0.04	4.35	6.92	0.24	7.16	7.72	33.6	94.89	0.010	24		27.6	30.2	10.41%	67	6.97	0.00	261.82	254.84	267.17	5.35	3.35	**-256.84**
CB 24	CB 23		0.54		0.90																							
			0.10	0.64	0.30	0.51	0.51	-	-	-	10.61	5.5	8.40	0.010	15		7.3	6.8	1.00%	22	0.22	1.25	301.18	300.96	306.74	5.56	4.31	**-302.21**
CB 27	CB 26		0.49		0.90																							
			0.13	0.62	0.30	0.48	0.48	-	-	-	10.61	5.1	8.40	0.010	15		7.2	6.8	1.00%	22	0.22	1.25	299.13	298.91	306.83	7.70	6.45	**-300.16**
CB 29	CB 28		0.11		0.90																							
			0.12	0.22	0.30	0.13	0.13	-	-	-	10.61	1.4	8.40	0.010	15		5.0	6.8	1.00%	22	0.22	1.25	296.98	296.76	306.61	9.63	8.38	**-298.01**
CB 31	CB 30		0.11		0.90																							
			0.11	0.22	0.30	0.13	0.13	-	-	-	10.61	1.4	8.40	0.010	15		5.0	6.8	1.00%	22	0.22	1.25	295.63	295.41	303.51	7.88	6.63	**-296.66**
CB 33	CB 32		0.07		0.90																							
			0.11	0.18	0.30	0.10	0.10	-	-	-	10.61	1.0	8.40	0.010	15		4.6	6.8	1.00%	22	0.22	1.25	285.56	285.34	289.08	3.52	2.27	**-286.59**
			0.08		0.90																							

ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

STORM DRAINAGE PIPE DESIGN WORKSHEET

WO. NO.	DATE	REVISED	SHEET
1146.01	02/09/26		2 OF 4

PROJECT TITLE	LOCATION	STORM FREQUENCY	PIPE TYPE
Britain Woods	**Town/City of Newburgh**	**25 Year**	**HDPE**

CALCULATED BY	APPROVED BY	REF DRAWING(S)	RAINFALL CURVE
XXX	**XXX**	**DWG LAST REV. 02/09/2026**	**Orange County, NY**

LOCATION		ROAD	ACRES		" C "	CA	ΣCA	TIME CONC. - MIN			" i "	" Q "		PIPE								DROP	INV	INV	GRATE	Depth to	Cover	Cover
FROM	TO	STA.	SUB.	TOTAL				Inlet	Pipe	TOTAL		Des.	Cap.	" n "	Size	Height	V Des	V Cap	Slope	Lgth.	Fall	(feet)	Upper	Lower	Elev	INV	Upper	Lower
CB 36	CB 35		0.12	0.20	0.30	0.11	0.11	-	-	-	10.61	1.1	8.40	0.010	15		4.7	6.8	1.00%	22	0.22	1.25	271.72	271.50	275.29	3.57	2.32	**-272.75**
CB 54	CB 55		0.32 0.07	0.39	0.90 0.30	0.31	0.31	-	-	-	10.61	3.3	8.40	0.010	15		6.4	6.8	1.00%	22	0.22	1.25	267.01	266.79	271.61	4.60	3.35	**-268.04**
CB 56	CB 57		0.21 0.16	0.37	0.90 0.30	0.24	0.24	-	-	-	10.61	2.5	8.40	0.010	15		5.9	6.8	1.00%	22	0.22	1.25	262.79	262.57	267.16	4.37	3.12	**-263.82**

ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

STORM DRAINAGE PIPE DESIGN WORKSHEET

WO. NO.	DATE	REVISED	SHEET
1146.01	02/09/26		3 OF 4

PROJECT TITLE	LOCATION	STORM FREQUENCY	PIPE TYPE
Britain Woods	**Town/City of Newburgh**	**25 Year**	**HDPE**

CALCULATED BY	APPROVED BY	REF DRAWING(S)	RAINFALL CURVE
XXX	**XXX**	**DWG LAST REV. 02/09/2026**	**Orange County, NY**

LOCATION		ROAD	ACRES		" C "	CA	ΣCA	TIME CONC. - MIN			" i "	" Q "		PIPE								DROP	INV	INV	GRATE	Depth to	Cover	Cover
FROM	TO	STA.	SUB.	TOTAL				Inlet	Pipe	TOTAL		Des.	Cap.	" n "	Size	Height	V Des	V Cap	Slope	Lgth.	Fall	(feet)	Upper	Lower	Elev	INV	Upper	Lower
CB 1	CB 2		0.82	1.42	0.90	0.92	0.92	5.00	-	5.00	8.33	7.7	8.40	0.010	15		7.7	6.8	1.00%	22	0.22	0.00	253.14	252.92	256.39	3.25	2.00	2.22
			0.60		0.30																							
CB 2	CB 3		0.27	2.14	0.90	0.38	1.29	5.00	0.05	5.05	8.33	10.8	13.66	0.010	18		8.6	7.7	1.00%	199	1.99	0.25	252.67	250.68	256.39	3.72	2.22	4.23
			0.45		0.30																							
CB 3	CB 5		0.10	2.28	0.90	0.10	1.64	5.05	0.39	5.43	8.32	13.7	26.25	0.010	18		15.0	14.9	3.69%	108	3.99	0.00	250.68	246.69	256.41	5.73	4.23	2.50
			0.05		0.30																							
CB 5	CB 7		0.35	3.18	0.90	0.48	2.25	5.43	0.12	5.55	8.19	18.4	41.59	0.010	24		12.8	13.2	2.00%	218	4.36	0.50	246.19	241.83	250.69	4.50	2.50	6.74
			0.55		0.30																							
CB 7	CB 8		0.27	3.46	0.90	0.25	2.50	5.55	0.28	5.84	8.15	20.4	29.41	0.010	24		10.1	9.4	1.00%	22	0.22	0.00	241.83	241.61	250.57	8.74	6.74	6.96
			0.02		0.30																							
CB 8	ES 5		0.07	3.53	0.90	0.06	2.56	5.84	0.04	5.88	8.05	20.6	94.77	0.010	24		23.8	30.2	10.39%	217	22.54	0.00	241.61	219.07	250.57	8.96	6.96	**-221.07**
			-		0.30																							
CB 4	CB 3		0.27	0.29	0.90	0.25	0.25	-	-	-	10.61	2.6	8.40	0.010	15		6.0	6.8	1.00%	24	0.24	1.25	251.17	250.93	256.12	4.95	3.70	**-252.18**
			0.02		0.30																							
CB 6	CB 5		0.15	0.15	0.90	0.14	0.14	-	-	-	10.61	1.4	8.40	0.010	15		5.0	6.8	1.00%	22	0.22	1.25	247.16	246.94	250.69	3.53	2.28	**-248.19**
			-		0.30																							

ENGINEERING & SURVEYING PROPERTIES
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STORM DRAINAGE PIPE DESIGN WORKSHEET

WO. NO.	DATE	REVISED	SHEET
1146.01	02/09/26		OF 4

PROJECT TITLE	LOCATION	STORM FREQUENCY	PIPE TYPE
Britain Woods	Town/City of Newburgh	25 Year	HDPE

CALCULATED BY	APPROVED BY	REF DRAWING(S)	RAINFALL CURVE
XXX	XXX	DWG LAST REV. 02/09/2026	Orange County, NY

LOCATION		ROAD	ACRES		" C "	CA	ΣCA	TIME CONC. - MIN			" i "	" Q "		PIPE								DROP	INV	INV	GRATE	Depth to	Cover	Cover
FROM	TO	STA.	SUB.	TOTAL				Inlet	Pipe	TOTAL		Des.	Cap.	" n "	Size	Height	V Des	V Cap	Slope	Lgth.	Fall	(feet)	Upper	Lower	Elev	INV	Upper	Lower
CB 10	CB 9		0.15	0.15	0.90	0.13	0.13	5.00	-	5.00	8.33	1.1	8.40	0.010	15		4.7	6.8	1.00%	22	0.22	0.00	244.29	244.07	247.54	3.25	2.00	2.22
			0.00		0.30																							
CB 9	CB 11		0.32	0.87	0.90	0.41	0.54	5.00	0.08	5.08	8.33	4.5	8.40	0.010	15		7.0	6.8	1.00%	215	2.15	0.00	244.07	241.92	247.54	3.47	2.22	4.37
			0.40		0.30																							
CB 11	CB 13		0.54	1.66	0.90	0.56	1.24	5.08	0.52	5.59	8.31	10.3	13.66	0.010	18		8.5	7.7	1.00%	227	2.27	0.25	241.67	239.40	247.54	5.87	4.37	6.47
			0.25		0.30																							
CB 13	CB 14		0.27	1.94	0.90	0.25	1.48	5.59	0.45	6.04	8.13	12.0	13.66	0.010	18		8.7	7.7	1.00%	22	0.22	0.00	239.40	239.18	247.37	7.97	6.47	6.69
			0.02		0.30																							
CB 14	ES 7		0.07	2.01	0.90	0.06	1.54	6.04	0.04	6.08	7.99	12.3	62.62	0.010	18		27.5	35.4	21.03%	91	19.18	0.00	239.18	220.00	247.37	8.19	6.69	**-221.50**
			-		0.30																							
CB 12	CB 11		0.15	0.15	0.90	0.13	0.13	-	-	-	10.61	1.4	8.40	0.010	15		5.0	6.8	1.00%	22	0.22	1.25	242.14	241.92	247.54	5.40	4.15	**-243.17**
			-		0.30																							