STORMWATER POLLUTION PREVENTION PLAN

FOR

SHEFFIELD GARDENS

NYS Route 17K

TOWN OF MONTGOMERY
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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1.0 INTRODUCTION

Engineering & Surveying Properties, PC (EP) prepared this report summarizing the impact of the proposed development of the property, known as Sheffield Gardens, 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 Sheffield Gardens 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 Sheffield Gardens project site is 52.42± acres in size and is located off NYS Route 17K in the Town of Montgomery in Orange County, New York. Local tax maps identify the Site as Town of Montgomery tax lots 29 – 1 – 5.1, 5.2, 5.3, 5.4, & 5.5. A site location map is included as Figure 1 in Appendix 1.

The proposed action, known as Sheffield Gardens, consists of three residential buildings with a total of 261 apartment units. Access to the site will be from new driveway entrances located on NYS Route 17K. The project proposes 669 parking spaces for apartment residents, employees, and guests.

The project site is a rectangular shaped area of land. The existing site cover consists of mostly high canopy forest.

3.0 TOPOGRAPHY AND SOILS

The existing topography in the Sheffield Gardens project area varies across the site, ranging from approximately 389 feet above mean sea level (AMSL) to 451 feet AMSL. Most of the slopes (±77%) on the project site are gently sloped (0%-15%), and moderate sloped areas (15%-25%) consist of approximately 20.6% of the site. The area of significant slope >25% consist of approximately 2.4% of the site. 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 Canandaigua silt loam (Ca), Erie gravelly silt loam (ErB), Pittsfield gravelly loam (PtB, PtC, & PtD), and Udorthents (UH) soils. These soils are considered to be a part of the "A", "B" & "D" hydrologic soils group. A soil map is included in Appendix 2. Our office conducted exploratory geotechnical testing, areas of Pittsfield gravelly loam (PtB, PtC & PtD) are more consistent with soils which are considered to be classified as hydrologic soil group D. Test pit locations and data are included in Appendix 3.

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 Hydraflow Hydrographs.

Hydraflow Hydrographs, developed by Intelisolve of Alpharetta, Georgia, 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.

Hydraflow Hydrographs 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

A letter dated March 14, 2023 was received from NYSOPRHP in response to the Notice of Intent for Designation of Lead Agency regarding the Proposed Action from the Town Planning Board. The letter stated "[t]he project is in an archaeologically sensitive area. Therefore, the State Historic Preservation Office/Office of Parks, Recreation and Historic Preservation (SHPO/OPRHP) recommends a Phase IA/IB archaeological survey for components of the project that will involve ground disturbance, unless substantial prior ground disturbance can be documented. A Phase IA/IB survey is designed to determine the presence or absence of archaeological sites or other cultural resources in the project's Area of Potential Effects (APE)". Based on a letter dated December 4th, 2023 it was determined there was no-impact to cultural resources. Letter is attached in Appendix 17.

Between April 2 and July 19, 2023, TRACKER Archaeology Inc. prepared a Phase 1A literature review & sensitivity analysis and a Phase 1B archaeological field survey for the Project Site. The Area of Potential Effect (APE) consists of approximately 41 acres of the larger 53-acre Project Site and excludes the wetlands.

According to the Phase 1A Analysis, there are two prehistoric sites located within a one-mile radius of the Project area. Furthermore, the APE is located near the Wallkill River and contains level to steeply sloped terrain with well-drained soil. Given these findings, the study area was determined to have an above average potential for the recovery of prehistoric sites such as a procurement/processing site from any of the prehistoric periods.

A historic site file search of a one-mile radius around the study area found two historic sites: (1) the Fowler Site (NYSHPO 7112.000323) a mid-19th century farm occupation with stone well, stone house foundation with mixed 19th-20th century artifacts, located 534 feet from the APE and (2) the Hadden House foundation from the late 18th to late 19th century, with other assorted artifacts. Based on this evidence, the project area was determined to have a higher-than-average potential for the recovery of historic sites.

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 two (2) distinct drainage areas with two (2) 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-A)

Existing drainage area A is comprised of hydrological soil groups A, B & D soils. Existing drainage area A consists of approximately ±35.318 acres of both off-site and on-site areas. The drainage area consists of ±27.370 acres of woods, ±0.928 acres of lawn, ±5.905 acres of water and ±1.115 acres of impervious.

Runoff from this drainage area travels overland via sheet flow and shallow concentrated flow to the adjacent NYSDEC wetland WD-29 and ends at Design Point A (DP-A). Times of concentration for this drainage area is 31.20 minutes.

Existing Drainage Area B (EX-B)

Existing drainage area B is comprised of hydrological soil groups A, B & D soils. Existing drainage area B consists of approximately ±23.109 acres of both off-site and on-site areas. The drainage area consists of ±19.049 acres of woods, ±2.949 acres of lawn, ±0.000 acres of water and ±1.111 acres of impervious.

Runoff from this drainage area travels overland via sheet flow and shallow concentrated flow to the adjacent unnamed NYSDEC wetland and ends at Design Point B (DP-B). Times of concentration for this drainage area is 32.40 minutes.

Table 1 below provides a summary of the See Figure 2 in Appendix 1 for the Existing Drainage Map.

TABLE 1: EXISTING DRAINAGE AREA CHARACTERISTICS

DRAINAGE AREA DESIGNATION	DRAINAGE AREA SIZE (Ac.)	CN	Tc (min)
EX-A	35.318	76	31.20
EX-B	23.109	64	32.40
TOTAL:	58.427		

The watershed responses to the 1-, 10-, 100-, and 500-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 8, 9, 10 and 11.

6.1.2 PROPOSED CONDITIONS

For this analysis, the existing watershed was broken down into a post-development network consisting of four (4) 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 D soils. Proposed drainage area A1-A consists of approximately ±4.891 acres of on-site areas. The drainage area consists of ±0.006 acres of woods, ±2.199 acres of lawn, and ±2.686 acres of impervious.

This drainage area consists of ±2.686 acres of impervious, ±2.686 acres of which is considered “new impervious” area and ±0.000 acres of existing 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 22.20 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 D soils. Proposed drainage area A1-B consists of approximately ±4.432 acres of on-site areas. The drainage area consists of ±0.000 acres of woods, ±2.164 acres of lawn, and ±2.268 acres of impervious.

This drainage area consists of ±2.268 acres of impervious, ±2.268 acres of which is considered “new impervious” area and ±0.000 acres of existing 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-B. 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-C (PR-A1-C)

Proposed drainage area A1-C is comprised of hydrological soil group D soils. Proposed drainage area A1-C consists of approximately ±0.667 acres of on-site areas. The drainage area consists of ±0.000 acres of woods, ±0.667 acres of lawn, and ±0.000 acres of impervious.

This drainage area consists of ±0.000 acres of impervious, ±0.000 acres of which is considered “new impervious” area and ±0.000 acres of existing impervious.

Runoff from this drainage area travels overland via sheet flow into the proposed drainage system which runs to detention pond A1. Times of concentration for this drainage area is 3.6 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 (PR-A2)

Proposed drainage area A2 is comprised of hydrological soil group A, B, & D soils. Proposed drainage area A2 consists of approximately ±27.009 acres of both off-site and on-site areas. The drainage area consists of ±14.890 acres of woods, ±3.707 acres of lawn, and ±2.507 acres of impervious.

This drainage area consists of ±2.507 acres of impervious, ±1.212 acres of which is considered “new impervious” area and ±1.295 acres of existing impervious.

Runoff from this drainage area travels overland via sheet flow and shallow concentrated flow to the adjacent NYSDEC wetland WD-29 and ends at Design Point A (DP-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-A (PR-B1-A)

Proposed drainage area B1-A is comprised of hydrological soil group A & D soils. Proposed drainage area B1-A consists of approximately ±4.885 acres of on-site areas. The drainage area consists of ±0.034 acres of woods, ±2.304 acres of lawn, and ±2.547 acres of impervious.

This drainage area consists of ±2.547 acres of impervious, ±2.547 acres of which is considered “new impervious” area and ±0.000 acres of existing 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 B1-A. Times of concentration for this drainage area is 22.20 minutes.

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

Proposed Drainage Area B1-B (PR-B1-B)

Proposed drainage area B1-B is comprised of hydrological soil group A & D soils. Proposed drainage area B1-B consists of approximately ±4.222 acres of on-site areas. The drainage area consists of ±0.000 acres of woods, ±2.022 acres of lawn, and ±2.200 acres of impervious.

This drainage area consists of ±2.200 acres of impervious, ±2.200 acres of which is considered “new impervious” area and ±0.000 acres of existing 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 B1-B. Times of concentration for this drainage area is 19.20 minutes.

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

Proposed Drainage Area B1-C (PR-B1-C)

Proposed drainage area B1-C is comprised of hydrological soil group A soils. Proposed drainage area B1-C consists of approximately ±0.461 acres of on-site areas. The drainage area consists of ±0.000 acres of woods, ±0.461 acres of lawn, and ±0.000 acres of impervious.

This drainage area consists of ±0.000 acres of impervious, ±0.000 acres of which is considered “new impervious” area and ±0.000 acres of existing impervious.

Runoff from this drainage area travels overland via sheet flow into the proposed drainage system which runs to detention pond B1. Times of concentration for this drainage area is 3.6 minutes but a minimum of 6 minutes is utilized for calculations.

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

Proposed Drainage Area B2 (PR-B2)

Proposed drainage area B2 is comprised of hydrological soil group A & D soils. Proposed drainage area B2 consists of approximately ±11.782 acres of both off-site and on-site areas. The drainage area consists of ±6.620 acres of woods, ±3.832 acres of lawn, and ±1.330 acres of impervious.

This drainage area consists of ±1.330 acres of impervious, ±0.390 acres of which is considered “new impervious” area and ±0.940 acres of existing impervious.

Runoff from this drainage area travels overland via sheet flow and shallow concentrated flow to the adjacent unnamed NYSDEC wetland and ends at Design Point B (DP-B). Times of concentration for this drainage area is 20.40 minutes.

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

TABLE 2: PROPOSED DRAINAGE AREA CHARACTERISTICS

DRAINAGE AREA DESIGNATION	DRAINAGE AREA SIZE (Ac.)	CN	Tc (min)
PR-A1-A	4.891	90	22.20
PR-A1-B	4.432	89	21.60
PR-A1-C	0.667	80	3.60*
PR-A2	27.087	76	20.40
PR-B1-A	4.885	89	22.20
PR-B1-B	4.222	89	19.20
PR-B1-C	0.461	39	3.60*
PR-B2	11.782	61	20.40
TOTAL:	58.427		

*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	WQ_v (Ac-ft)
PR-A	0.864
PR-B	0.664

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 four (4) 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 for 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 6.

TABLE 5: RUNOFF REDUCTION VOLUMES & REVISED WQV

DESIGN POINT	$RR_{v\ MIN}$	Total RR_v (Provided)	Revised WQ_v
PR-A	0.179	0.264	0.289
PR-B	0.180	0.224	0.112

6.4 APPLICATION OF STANDARD SMP'S FOR THE REVISED WQV

The RR_v does reduce the required WQ_v treatment for design point PR-A; 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	RRv Provided (ac-ft)	WQv Provided (ac-ft)
Forebay A1-A	0.000	1.041
Bio-Retention Basin A1-A	0.132	0.414
Forebay A1-B	0.000	1.154
Bio-Retention Basin A1-B	0.132	0.412
Forebay B1-A	0.000	0.911
Bio-Retention Basin B1-A	0.112	0.348
Forebay B1-B	0.000	0.608
Bio-Retention Basin B1-B	0.112	0.308
TOTAL	0.488	5.196

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 (Wet Extended Detention Pond) 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) 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 12.

TABLE 7: CPV EXTENDED DETENTION TIMES

FACILITY	Cp_v ED Time (hrs)
Basin A1	19.40*
Basin B1	7.05*

** 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-, 100-, and 500- 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-, 100- and 500-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
1 – YEAR (Cpv)	Existing (cfs)	15.58	2.54
	Proposed (cfs)	15.36	1.22
	Reduction (cfs)	-0.22	-1.32
	Reduction (%)	-1.41%	-51.97%
10 – YEAR (Qp)	Existing (cfs)	48.98	17.46
	Proposed (cfs)	46.90	9.53
	Reduction (cfs)	-2.08	-7.93
	Reduction (%)	-4.25%	-45.42%
100 – YEAR (Qf)	Existing (cfs)	111.57	52.74
	Proposed (cfs)	104.90	30.65
	Reduction (cfs)	-6.67	-22.09
	Reduction (%)	-5.98%	-41.88%
500 – YEAR	Existing (cfs)	182.01	96.48
	Proposed (cfs)	203.28	64.67
	Reduction (cfs)	+21.27	-31.81
	Reduction (%)	+11.69%	-32.97%

Since the runoff rates have been proven to decrease in the post-development condition, there will be no adverse impact to the downstream receiving waters. Therefore, the SWPPP designed for the Sheffield Gardens project site will accomplish the intent of its design.

The NYSDEC Stormwater Design Manual does not require proposed developments to provide peak rate control for 500-year storms. However at the request of the Town of Montgomery, analysis of the site under a 500-year storm event has been provided. In the event of a storm of this size, runoff will flow via emergency overflow weirs and/or over stormwater basin berms to the on-site wetlands which ultimately discharge to drainage points A and B.

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

<table>
<tr><th>Type of Soil Disturbance</th><th colspan="2">Soil Restoration Requirement</th><th>Comments / Examples</th></tr>
<tr><td>No Soil Disturbance</td><td colspan="2">Restoration not permitted</td><td>Preservation of Natural Features</td></tr>
<tr><td>Minimal Soil Disturbance</td><td colspan="2">Restoration not required</td><td>Clearing and Grubbing</td></tr>
<tr><td rowspan="2">Areas where topsoil is stripped only – NO change in grade.</td><td>HSG A & B</td><td>HSG C & D</td><td rowspan="2">Protect Areas from any ongoing construction activities.</td></tr>
<tr><td>Apply 6” of topsoil</td><td>Aerate* and apply 6” of topsoil</td></tr>
<tr><td rowspan="2">Areas of cut or fill</td><td>HSG A & B</td><td>HSG C & D</td><td rowspan="2"></td></tr>
<tr><td>Aerate* and apply 6” of topsoil</td><td>Apply full Soil Restoration **</td></tr>
<tr><td>Heavy traffic areas on site (especially in a zone 5’-25’ around buildings, but not within the 5’ perimeter around the foundation walls)</td><td colspan="2">Apply full Soil Restoration** (de-compaction and compost enhancement)</td><td></td></tr>
</table>

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 contains 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 Property Owner will seek a waiver from the NYSDEC’s maximum disturbance limit of 5 acres regulation from the Town of Montgomery as the MS4 Administrator as allowed by the current NYSDEC Stormwater Design Manual. The following additional requirements shall be met upon receipt of such waiver:

- The required site inspections by the qualified inspector shall occur two (2) times 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. Additional measures shall be implemented for any site work occurring during the "winter months period" which generally consists of November 15th through April 1st. The additional measures shall be in accordance with the Standards and Specifications for Winter Stabilization as detailed in the New York State Standards and Specifications for Erosion Control, latest edition, as published by the New York State Department of Environmental Conservation.

e. 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.

f. An up to date Construction Site Log Book which includes this SWPPP for Sheffield Gardens 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 as well as the following.

- SPDES General Permit for Stormwater Discharges (Permit No. GP- 0-25-001)
- A copy of the Final (or updated if revised) SWPPP
- A copy of the Final (or updated if revised) Site Plans
- A copy of the Notice of Intent (NOI)
- A copy of the MS4 Signoff (if applicable)
- A copy of the Acknowledgement of the NOI from the NYSDEC
- Owner & Contractor Certifications
- Copies of all erosion & sediment control inspections

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. Stone Diaphragms: Until such time as final site stabilization is completed, the stone diaphragm shown on the plans at the edge of pavement shall receive treatment with stone as to effectively trap sediment and minimize its release off-site.

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

d. 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.

e. 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.

f. Additional maintenance measures during the "winter months" time frame of November 15th through April 1st including but not limited to the following:

    i. Bi-weekly inspection of winter stabilization methods and repair and/replace as necessary to ensure proper function.

    ii. All exposed soils that are in areas with no proposed disturbance within 3 days shall be stabilized through establishing vegetation if possible, others covered with straw, mulch, rock and/or a rolled erosion control product.

g. Additional practices to comply with the Town of Montgomery's General Enhanced Erosion and Sediment Control Plan for Large Projects will be implemented during construction. These guidelines are provided in Appendix 18 of this SWPPP.

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. A stormwater maintenance agreement between lots 1, 2, & 3 and the Town of Montgomery for shared facilities will be executed and filed with Orange County prior to final subdivision approval. If the Town requires the Applicant to establish a drainage district, on will be established per the Town's direction.

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

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

e. 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.

f. 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.

g. 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 Sheffield Gardens 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.

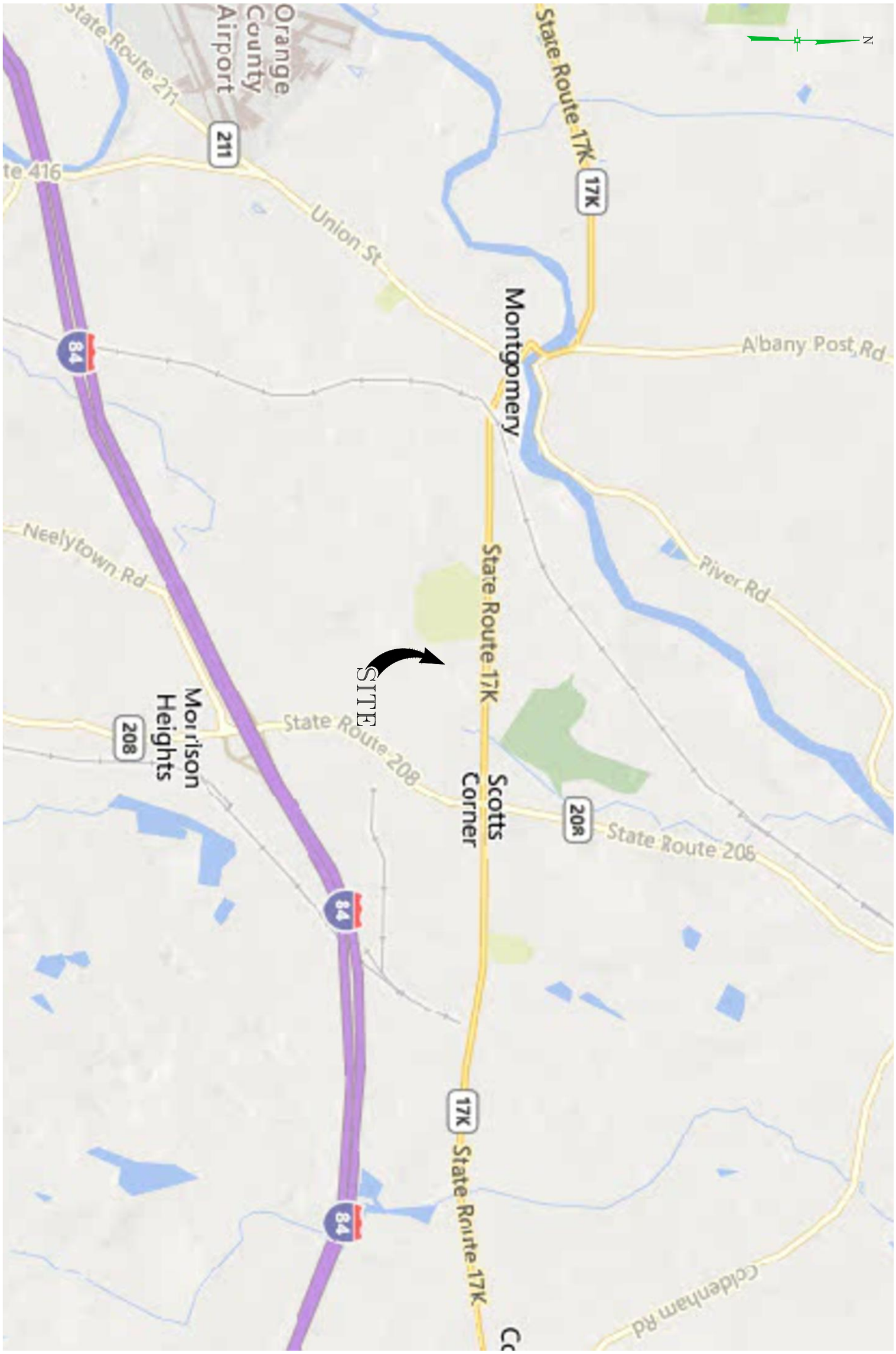
e. All criteria set forth in the New York State Stormwater Management Design Manual have been met.

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



LOCATION MAP	SHEFFIELD GARDENS NYS ROUTE 17K TOWN OF MONTGOMERY ORANGE COUNTY, NEW YORK	DATE: JAN '24 REV MAY '26	JOB # 103.0301	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
		SCALE: 1" = 2,000'	SHEET # SWM-1		

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DATE: JAN '24
REV MAY '26

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SCALE: 1" = 200'

SHEET # SWM-2

SHEFFIELD GARDENS
NYS ROUTE 17K
TOWN OF MONTGOMERY
ORANGE COUNTY, NEW YORK

EXISTING DRAINAGE CONDITIONS

Drawing Name: Z:\103.0301 - Sheffield Apartments\SWM\103.0301 - SWM.dwg Date Printed: May 01, 2026, 4:01pm

N

PR-A2

PR-B2

PR-A2

PR-A1-C

PR-A2

PR-B1-C

DRAINAGE
POINT A

PR-B1-B

PR-A1-B

DRAINAGE
POINT B

PR-B2

PR-B1-A

PR-A1-A

PR-A2

DRAINAGE
POINT A

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DATE: JAN '24
REV MAY '26

JOB # 103.0301

SCALE: 1" = 200'

SHEET # SWM-3

SHEFFIELD GARDENS
NYS ROUTE 17K
TOWN OF MONTGOMERY
ORANGE COUNTY, NEW YORK

PROPOSED DRAINAGE CONDITIONS

Drawing Name: Z:\103.0301 - Sheffield Apartments\SWM\103.0301 - SWM.dwg Date Printed: May 01, 2026, 4:02pm

N

BIO-RETENTION
BASIN A1-B

BIO-RETENTION
BASIN A1-A

BIO-RETENTION
BASIN B1-B

BIO-RETENTION
BASIN B1-A

AREA CONTRIBUTORY
TO BIO-RETENTION BASIN A1-B

AREA CONTRIBUTORY
TO BIO-RETENTION BASIN A1-A

AREA CONTRIBUTORY
TO BIO-RETENTION BASIN B1-B

AREA CONTRIBUTORY
TO BIO-RETENTION BASIN B1-A

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DATE: JAN '24
REV: MAY '26

JOB # 103.0301

SCALE: 1" = 200'

SHEET # SWM-4

SHEFFIELD GARDENS
NYS ROUTE 17K
TOWN OF MONTGOMERY
ORANGE COUNTY, NEW YORK

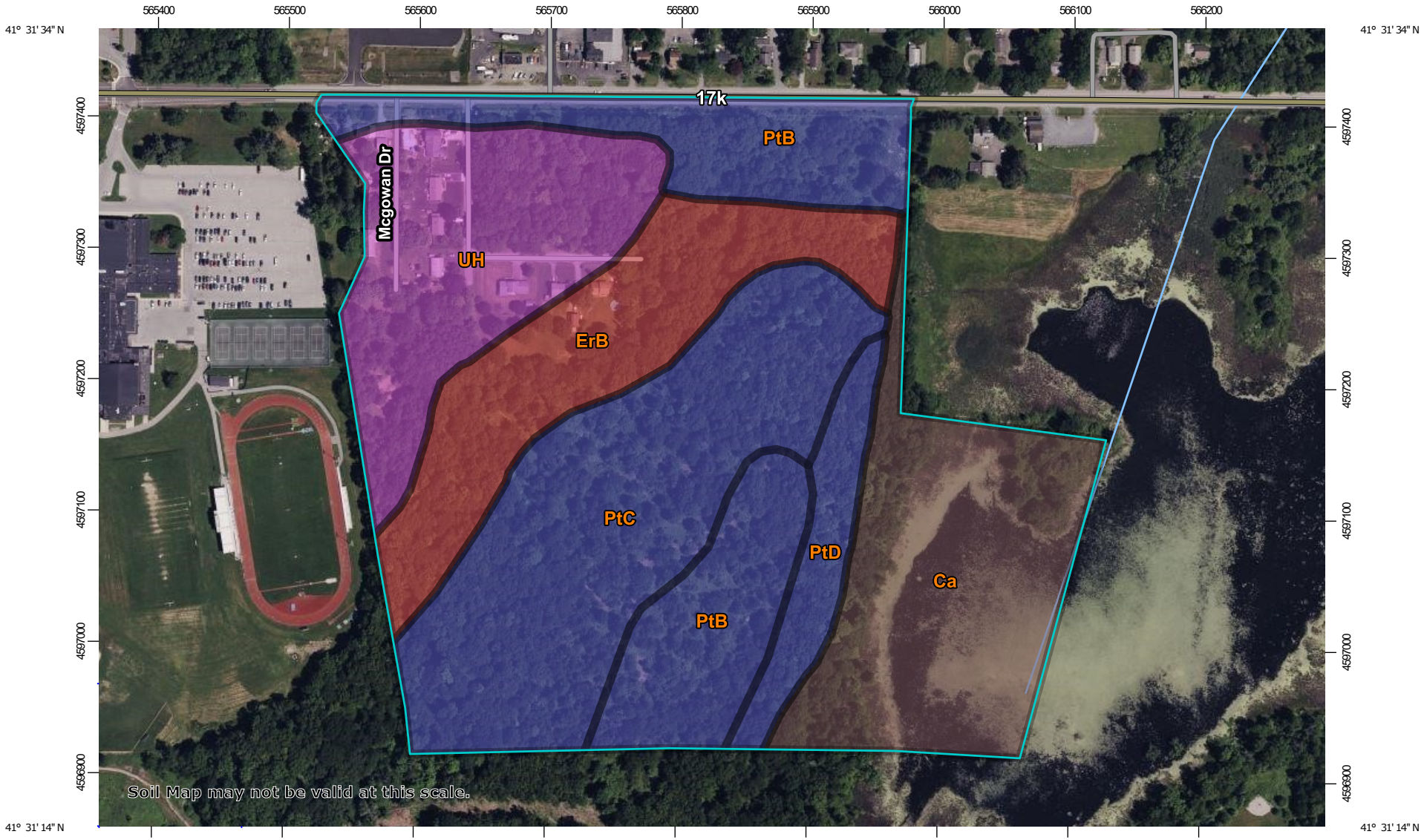
GREEN INFRASTRUCTURE

Drawing Name: Z:\103.0301 - Sheffield Apartments\SWM\103.0301 - SWM.dwg Date Printed: May 01, 2026, 4:03pm

APPENDIX 2

SOILS MAP AND CLASSIFICATIONS

Hydrologic Soil Group—Orange County, New York
(SWPPP Soils)



Map Scale: 1:4,280 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

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 24, Sep 6, 2023

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

Date(s) aerial images were photographed: May 31, 2022—Oct 27, 2022

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
Ca	Canandaigua silt loam	B/D	11.5	19.6%
ErB	Erie gravelly silt loam, 3 to 8 percent slopes	D	9.0	15.4%
PtB	Pittsfield gravelly loam, 3 to 8 percent slopes	B	10.5	18.0%
PtC	Pittsfield gravelly loam, 8 to 15 percent slopes	B	14.8	25.3%
PtD	Pittsfield gravelly loam, 15 to 25 percent slopes	B	2.7	4.7%
UH	Udorthents, smoothed	A	9.9	17.0%
Totals for Area of Interest			**58.4**	**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

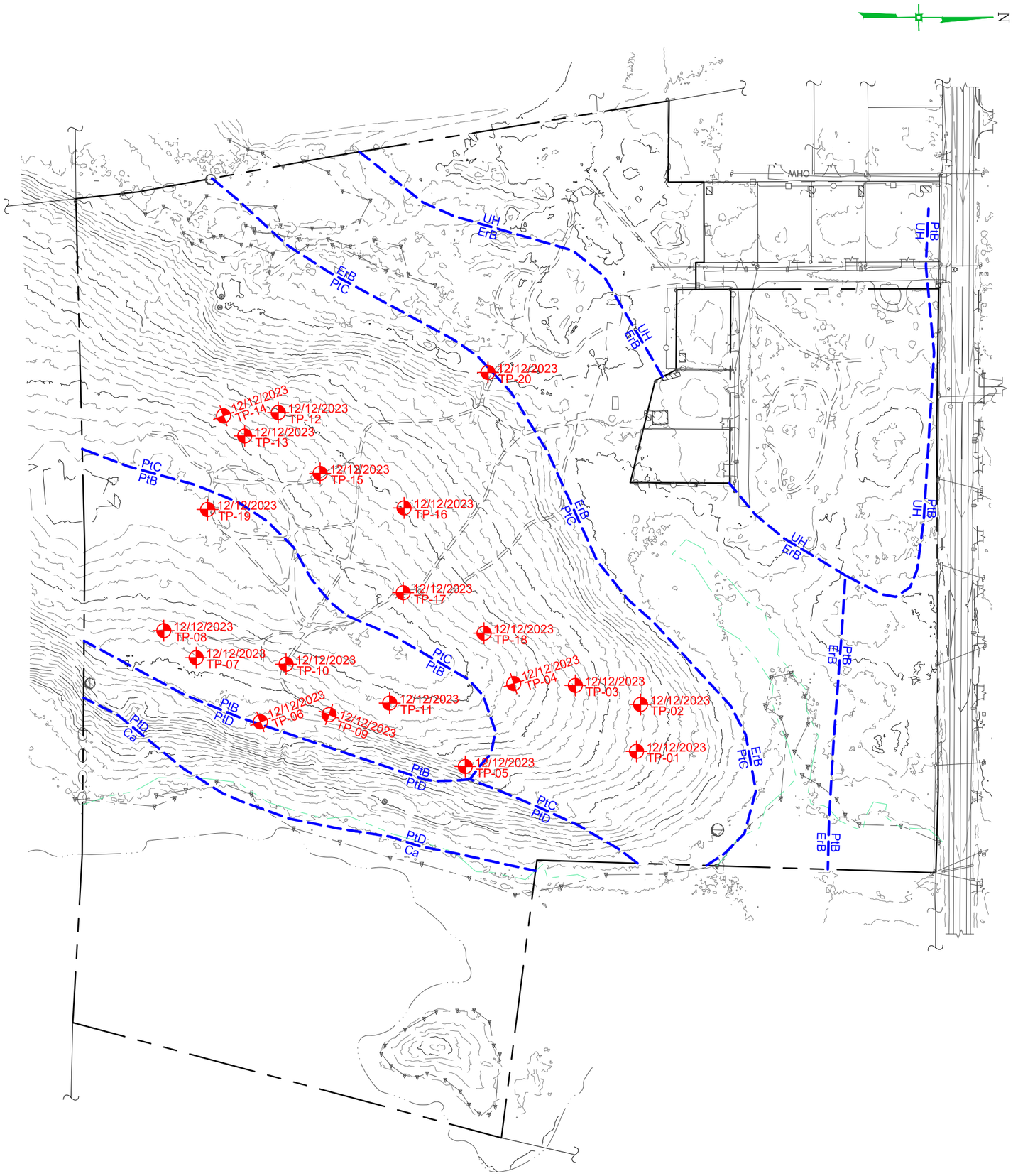
Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX 3

GEOTECHNICAL TEST

PIT DATA



SOIL TYPE	DEPTH TO BEDROCK	DEPTH TO WATER TABLE	EROSION FACTOR Kf	EROSION FACTOR Kw	PERCENT CLAY
Ca | CANANDAIGUA SILT LOAM	>200 CM	0 IN	0.49	0.49	22.2%
ErB | ERIE GRAVELLY SILT LOAM, 3 TO 8 PERCENT SLOPES	>200 CM	6 - 18 IN	0.32	0.20	22.0%
PtB | PITTSFIELD GRAVELLY LOAM, 3 TO 8 PERCENT SLOPES	>200 CM	> 80 IN	0.28	0.17	11.4%
PtC | PITTSFIELD GRAVELLY LOAM, 8 TO 15 PERCENT SLOPES	>200 CM	> 80 IN	0.28	0.17	11.3%
PtD | PITTSFIELD GRAVELLY LOAM, 15 TO 25 PERCENT SLOPES	>200 CM	> 80 IN	0.28	0.17	11.2%
UH | UDORTHENTS, SMOOTHED	>200 CM	36 - 72 IN	0.24	0.15	10.6%

SOIL TESTING LOCATIONS	SHEFFIELD GARDENS NYS ROUTE 17K TOWN OF MONTGOMERY ORANGE COUNTY, NEW YORK	DATE: JAN '24 REV MAY '26	JOB # 103.0301	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
		SCALE: 1" = 200'	SHEET # GT-1		

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DEEP TEST PIT SOIL RESULTS

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**12/13/23**		**1**	**4**

PROJECT TITLE
Sheffield Gardens

LOCATION
NYS Route 17K, Montgomery, NY

CALCULATED BY
AK

APPROVED BY
RW

REF DRAWING(S)
Test Pit Locations 12-12-2023

Deep Test #	Depth	Soil Description
1 ~11:40am	0ft - 0.5ft	Topsoil
	0.5ft - 3ft	Tan Silty Clay Loam
	3ft - 11ft	Brown Silty Clay Loam
	11ft - 14ft	Brown Hard Silty Clay Loam
	Seepage	Seepage found at 7ft
2 ~11:40am	0ft - 0.5ft	Topsoil
	0.5ft - 5ft	Tan Silty Clay Loam
	5ft - 7ft	Brown Hard Silty Clay Loam
	Seepage	Seepage found at 5ft, large mottling at 5.5ft
3 ~11:40am	0ft - 0.5ft	Topsoil
	0.5ft - 4ft	Tan Silty Clay Loam
	Seepage	Seepage found at 1.5ft and below
4 ~12:00pm	0ft - 0.5ft	Topsoil
	0.5ft - 3ft	Tan Silty Clay Loam
	3ft - 9.5ft	Brown Hard Silty Clay Loam
	Seepage	Seepage found at 2ft, 3ft, and 6ft
5 ~12:20pm	0ft - 1ft	Topsoil
	1ft - 2ft	Tan Silty Clay Loam
	2ft - 4.5ft	Brown Hard Silty Clay Loam
	Seepage	Seepage found at 2ft
6 ~12:40pm	0ft - 0.5ft	Topsoil
	0.5ft - 2ft	Tan Silty Clay Loam
	2ft - 4.5ft	Brown Hard Silty Clay Loam
	Seepage	Seepage found at 1ft and below

Comments: Rocks 1 - 12" diameter commonly observed in hard clay layer.

No bedrock found. Mottling commonly found inside brown hard clay when broken. Clay would become harder with depth

Hardness of clay occassionally prevented from going deeper. Isolated G.W. seepage found in hard clay layer

ENGINEERING & SURVEYING PROPERTIES
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DEEP TEST PIT SOIL RESULTS

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**12/13/23**		**2**	**4**

PROJECT TITLE
Sheffield Gardens

LOCATION
NYS Route 17K, Montgomery, NY

CALCULATED BY
AK

APPROVED BY
RW

REF DRAWING(S)
Test Pit Locations 12-12-2023

Deep Test #	Depth	Soil Description
7 ~1:10pm	0ft - 1ft 1ft - 3ft 3ft - 9.5ft Seepage	Topsoil Tan Silty Clay Loam Brown Hard Silty Clay Loam Groundwater found between 1ft - 5ft, mottling @ 3ft
8 ~1:55pm	0ft - 1ft 1ft - 4ft 4ft - 11ft Seepage	Topsoil Tan Silty Clay Loam Brown Hard Silty Clay Loam Groundwater found between 1ft - 4ft, mottling @ 4ft
9 ~2:25pm	0ft - 1ft 1ft - 4ft 4ft - 6.5ft Seepage	Topsoil Tan Silty Clay Loam Brown Hard Silty Clay Loam Groundwater found between 1ft - 4ft
10 ~3:00pm	0ft - 1ft 1ft - 3ft 3ft - 8ft 8ft - 11ft Seepage	Topsoil Tan Silty Clay Loam Brown Silty Clay Loam Brown Hard Silty Clay Loam Groundwater found between 1ft - 8ft
11 ~3:50pm	0ft - 1ft 1ft - 5ft 5ft - 13 Seepage	Topsoil Tan Silty Clay Loam Brown Hard Silty Clay Loam Groundwater seepage found between 1ft - 5ft

Comments: Rocks 1 - 12" diameter commonly observed in hard clay layer.

No bedrock found. Mottling commonly found inside brown hard clay when broken. Clay would become harder with depth

Hardness of clay occassionally prevented from going deeper. Isolated G.W. seepage found in hard clay layer

ENGINEERING & SURVEYING PROPERTIES
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DEEP TEST PIT SOIL RESULTS

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**12/14/23**		**3**	**4**

PROJECT TITLE
Sheffield Gardens

LOCATION
NYS Route 17K, Montgomery, NY

CALCULATED BY
AK

APPROVED BY
RW

REF DRAWING(S)
Test Pit Locations 12-12-2023

Deep Test #	Depth	Soil Description
12 ~8:15am	0ft - 0.5ft	Topsoil
	0.5ft - 3ft	Tan Silty Clay Loam
	3ft - 5ft	Brown Hard Silty Clay Loam
	Seepage	Seepage found between 0.5ft - 3ft
13 ~8:25am	0ft - 1ft	Topsoil
	1ft - 3ft	Tan Silty Clay Loam
	3ft - 4.5ft	Brown Hard Silty Clay Loam
	Seepage	Seepage found between 1ft - 3ft
14 ~9:00am	0ft - 1ft	Topsoil
	1ft - 3ft	Tan Silty Clay Loam
	3ft - 10.5ft	Brown Hard Silty Clay Loam
	10.5ft - 11.5ft	Brown-Grey Hard Silty Clay Loam
	Seepage	Seepage found between 1ft - 11.5ft
15 ~9:45am	0ft - 1ft	Topsoil
	1ft - 3ft	Tan Silty Clay Loam
	3ft - 10.5ft	Brown Hard Silty Clay Loam
	Seepage	Seepage found between 1ft -7ft, mottling found at 7ft
16 ~10:15am	0ft - 1ft	Topsoil
	1ft - 3ft	Tan Silty Clay Loam
	3ft - 4.5ft	Brown Hard Silty Clay Loam
	Seepage	Seepage seepage found 1ft - 4.5ft
17 ~11:15am	0ft - 1ft	Topsoil
	1ft - 2.5ft	Tan Silty Clay Loam
	2.5ft - 12ft	Brown Hard Silty Clay Loam
	12ft - 13ft	Brown-Grey Hard Silty Clay Loam
	Seepage	Seepage found between 1ft - 7ft

Comments: Rocks 1 - 12" diameter commonly observed in hard clay layer.

No bedrock found. Mottling commonly found inside brown hard clay when broken. Clay would become harder with depth

Hardness of clay occassionally prevented from going deeper. Isolated G.W. seepage found in hard clay layer

ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

DEEP TEST PIT SOIL RESULTS

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**12/14/23**		**4**	**4**

PROJECT TITLE
Sheffield Gardens

LOCATION
NYS Route 17K, Montgomery, NY

CALCULATED BY
AK

APPROVED BY
RW

REF DRAWING(S)
Test Pit Locations 12-12-2023

Deep Test #	Depth	Soil Description
18 ~11:40am	0ft - 1ft 1ft - 4ft 4ft - 10.5ft Seepage	Topsoil Tan Silty Clay Loam Brown Hard Silty Clay Loam Seepage found between 1ft - 7ft
19 ~12:20pm	0ft - 1ft 1ft - 3ft 3ft - 8ft Seepage	Topsoil Tan Silty Clay Loam Brown Hard Silty Clay Loam Seepage found between 1ft - 3ft
20 ~12:45pm	0ft - 1ft 1ft - 3ft 3ft - 6ft Seepage	Topsoil Tan Silty Clay Loam Brown Hard Silty Clay Loam Seepage found between 1ft - 3ft

Comments: Rocks 1 - 12" diameter commonly observed in hard clay layer.

No bedrock found. Mottling commonly found inside brown hard clay when broken. Clay would become harder with depth

Hardness of clay occassionally prevented from going deeper. Isolated G.W. seepage found in hard clay layer

APPENDIX 4

CURVE NUMBER

CALCULATIONS

ENGINEERING & SURVEYING PROPERTIES
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CURVE NUMBER (CN) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**Jan '24**	**May '26**	**1**	**10**

PROJECT TITLE: **Sheffield Gardens**
LOCATION: **Town of Montgomery**
CALCULATED BY: **ZS**
APPROVED BY: **RW**
REF DRAWING(S):

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

Soil Name & Hydrologic Group	Cover Description (cover type, treatment & conditions)	CN	Area (acres)	Product of CN x Area
	Impervious	98	1.115	109.27
A	Grass - Good Condition	39	0.233	9.09
B	Grass - Good Condition	61	0.394	24.03
D	Grass - Good Condition	80	0.301	24.08
A	Woods - Good Condition	30	2.111	63.33
B	Woods - Good Condition	55	3.154	173.47
D	Woods - Good Condition	77	22.105	1,702.09
	Water	98	5.905	578.69
		TOTAL =	35.32	2684.046

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{2684.046}{35.318}$$

CN (weighted) = 75.997 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)

ENGINEERING & SURVEYING PROPERTIES
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CURVE NUMBER (CN) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**Jan '24**	**May '26**	**2**	**10**

PROJECT TITLE: **Sheffield Gardens**
LOCATION: **Town of Montgomery**
CALCULATED BY: **ZS**
APPROVED BY: **RW**
REF DRAWING(S):

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	1.111	108.88
A	Grass - Good Condition	39	2.488	97.03
B	Grass - Good Condition	61	0.000	
D	Grass - Good Condition	80	0.461	36.88
A	Woods - Good Condition	30	5.012	150.36
B	Woods - Good Condition	55	0.000	
D	Woods - Good Condition	77	14.037	1,080.85
	Water	98	0.00	
		TOTAL =	23.11	1473.999

$$CN\ (weighted) = \frac{\text{total product}}{\text{total area}} = \frac{1473.999}{23.109}$$

CN (weighted) = 63.785 Use CN= **64**

2. Runoff S = 5.63

		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)

ENGINEERING & SURVEYING PROPERTIES
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CURVE NUMBER (CN) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**Jan '24**	**May '26**	**3**	**10**

PROJECT TITLE: **Sheffield Gardens**
LOCATION: **Town of Montgomery**
CALCULATED BY: **ZS**
APPROVED BY: **RW**
REF DRAWING(S):

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	2.686	263.23
A	Grass - Good Condition	39	0.000	
B	Grass - Good Condition	61	0.000	
D	Grass - Good Condition	80	2.199	175.92
A	Woods - Good Condition	30	0.000	
B	Woods - Good Condition	55	0.000	
D	Woods - Good Condition	77	0.006	0.46
	Water	98	0.000	
		TOTAL =	4.89	439.61

$$CN\ (weighted) = \frac{\text{total product}}{\text{total area}} = \frac{439.61}{4.891}$$

CN (weighted) = 89.881 Use CN= **90**

2. Runoff S = 1.11

		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
103.0301	**Jan '24**	**May '26**	**4**	**10**

PROJECT TITLE: **Sheffield Gardens**
LOCATION: **Town of Montgomery**
CALCULATED BY: **ZS**
APPROVED BY: **RW**
REF DRAWING(S):

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	2.268	222.26
A	Grass - Good Condition	39	0.000	
B	Grass - Good Condition	61	0.000	
D	Grass - Good Condition	80	2.164	173.12
A	Woods - Good Condition	30	0.000	
B	Woods - Good Condition	55	0.000	
D	Woods - Good Condition	77	0.000	
	Water	98	0.000	
		TOTAL =	4.43	395.384

$$CN\ (weighted) = \frac{\text{total product}}{\text{total area}} = \frac{395.384}{4.432}$$

CN (weighted) = 89.211 Use CN= **89**

2. Runoff S = 1.24

		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
103.0301	**Jan '24**	**May '26**	**5**	**10**

PROJECT TITLE: **Sheffield Gardens**
LOCATION: **Town of Montgomery**
CALCULATED BY: **ZS**
APPROVED BY: **RW**
REF DRAWING(S):

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	
A	Grass - Good Condition	39	0.000	
B	Grass - Good Condition	61	0.000	
D	Grass - Good Condition	80	0.667	53.36
A	Woods - Good Condition	30	0.000	
B	Woods - Good Condition	55	0.000	
D	Woods - Good Condition	77	0.000	
	Water	98	0.000	
		TOTAL =	0.67	53.36

$$CN\ (weighted) = \frac{\text{total product}}{\text{total area}} = \frac{53.36}{0.667}$$

CN (weighted) = 80.000 Use CN= **80**

2. Runoff S = 2.50

		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
103.0301	**Jan '24**	**May '26**	**6**	**10**

PROJECT TITLE: **Sheffield Gardens**
LOCATION: **Town of Montgomery**
CALCULATED BY: **ZS**
APPROVED BY: **RW**
REF DRAWING(S):

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

Soil Name & Hydrologic Group	Cover Description (cover type, treatment & conditions)	CN	Area (acres)	Product of CN x Area
	Impervious	98	2.507	245.69
A	Grass - Good Condition	39	1.062	41.42
B	Grass - Good Condition	61	0.609	37.15
D	Grass - Good Condition	80	2.114	169.12
A	Woods - Good Condition	30	2.216	66.48
B	Woods - Good Condition	55	2.590	142.45
D	Woods - Good Condition	77	10.084	776.47
	Water	98	5.905	578.69
		TOTAL =	27.09	2057.461

$$CN\ (weighted) = \frac{\text{total product}}{\text{total area}} = \frac{2057.461}{27.087}$$

CN (weighted) = 75.958 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)

ENGINEERING & SURVEYING PROPERTIES
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CURVE NUMBER (CN) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**Jan '24**	**May '26**	**7**	**10**

PROJECT TITLE: **Sheffield Gardens**
LOCATION: **Town of Montgomery**
CALCULATED BY: **ZS**
APPROVED BY: **RW**
REF DRAWING(S):

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

Soil Name & Hydrologic Group	Cover Description (cover type, treatment & conditions)	CN	Area (acres)	Product of CN x Area
	Impervious	98	2.547	249.61
A	Grass - Good Condition	39	0.053	2.07
B	Grass - Good Condition	61	0.000	
D	Grass - Good Condition	80	2.251	180.08
A	Woods - Good Condition	30	0.000	
B	Woods - Good Condition	55	0.000	
D	Woods - Good Condition	77	0.034	2.62
	Water	98	0.000	
		TOTAL =	4.89	434.371

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{434.371}{4.885}$$

CN (weighted) = 88.919 Use CN= **89**

2. Runoff S = 1.24

		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
103.0301	**Jan '24**	**May '26**	**8**	**10**

PROJECT TITLE: **Sheffield Gardens**
LOCATION: **Town of Montgomery**
CALCULATED BY: **ZS**
APPROVED BY: **RW**
REF DRAWING(S):

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

Soil Name & Hydrologic Group	Cover Description (cover type, treatment & conditions)	CN	Area (acres)	Product of CN x Area
	Impervious	98	2.200	215.60
A	Grass - Good Condition	39	0.061	2.38
B	Grass - Good Condition	61	0.000	
D	Grass - Good Condition	80	1.961	156.88
A	Woods - Good Condition	30	0.000	
B	Woods - Good Condition	55	0.000	
D	Woods - Good Condition	77	0.000	
	Water	98	0.000	
		TOTAL =	4.22	374.859

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{374.859}{4.222}$$

CN (weighted) = 88.787 Use CN= **89**

2. Runoff S = 1.24

		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
103.0301	**Jan '24**	**May '26**	**9**	**10**

PROJECT TITLE: **Sheffield Gardens**
LOCATION: **Town of Montgomery**
CALCULATED BY: **ZS**
APPROVED BY: **RW**
REF DRAWING(S):

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

Soil Name & Hydrologic Group	Cover Description (cover type, treatment & conditions)	CN	Area (acres)	Product of CN x Area
	Impervious	98	0.000	
A	Grass - Good Condition	39	0.461	17.98
B	Grass - Good Condition	61	0.000	
D	Grass - Good Condition	80	0.000	
A	Woods - Good Condition	30	0.000	
B	Woods - Good Condition	55	0.000	
D	Woods - Good Condition	77	0.000	
	Water	98	0.000	
		TOTAL =	0.46	17.979

$$CN\ (weighted) = \frac{\text{total product}}{\text{total area}} = \frac{17.979}{0.461}$$

CN (weighted) = 39.000 Use CN= **39**

2. Runoff S = 15.64

		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
103.0301	**Jan '24**	**May '26**	**10**	**10**

PROJECT TITLE: **Sheffield Gardens**
LOCATION: **Town of Montgomery**
CALCULATED BY: **ZS**
APPROVED BY: **RW**
REF DRAWING(S):

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	1.330	130.34
A	Grass - Good Condition	39	2.728	106.39
B	Grass - Good Condition	61	0.000	
D	Grass - Good Condition	80	1.104	88.32
A	Woods - Good Condition	30	2.563	76.89
B	Woods - Good Condition	55	0.000	
D	Woods - Good Condition	77	4.057	312.39
	Water	98	0.000	
		TOTAL =	11.78	714.331

$$\text{CN (weighted)} = \frac{\text{total product}}{\text{total area}} = \frac{714.331}{11.782}$$

CN (weighted) = 60.629 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)

APPENDIX 5

TIME OF CONCENTRATION

CALCULATIONS

ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

TIME OF CONCENTRATION (Tc) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**Jan '24**	**Dec '25**	**1**	**10**

PROJECT TITLE: **Sheffield Gardens**
LOCATION: **Town of Montgomery**
CALCULATED BY: **ZS**
APPROVED BY: **RW**
REF DRAWING(S):

Existing | Proposed Area: **EX-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		0.018				
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr		0.357				0.357

2. Shallow Concentrated Flow

		Segment ID	B-C	C-D	D-E		
Surface description (paved or unpaved)			Unpaved	Unpaved	Unpaved		
Flow length, L	ft		506.6	375.0	419.7		
Watercourse slope, s	ft/ft		0.016	0.135	0.010		
Average velocity, V (figure 3-1)	ft/s		2.028	5.928	1.613		
$T_t = \frac{L}{3600\,V}$	hr		0.069	0.018	0.072		0.159

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 = 0.52

min = 31.20

ENGINEERING & SURVEYING PROPERTIES
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TIME OF CONCENTRATION (Tc) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**Jan '24**	**Dec '25**	**2**	**10**

PROJECT TITLE: **Sheffield Gardens**
LOCATION: **Town of Montgomery**
CALCULATED BY: **ZS**
APPROVED BY: **RW**
REF DRAWING(S):

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		0.018				
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr		0.357				0.357

2. Shallow Concentrated Flow

		Segment ID	B-C	C-D	D-E		
Surface description (paved or unpaved)			Unpaved	Unpaved	Unpaved		
Flow length, L	ft		228.7	597.0	588.1		
Watercourse slope, s	ft/ft		0.013	0.082	0.009		
Average velocity, V (figure 3-1)	ft/s		1.840	4.628	1.488		
$T_t = \frac{L}{3600\,V}$	hr		0.035	0.036	0.110		0.180

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 = **0.54**

min = **32.40**

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TIME OF CONCENTRATION (Tc) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**Jan '24**	**Dec '25**	**3**	**10**

PROJECT TITLE: **Sheffield Gardens**
LOCATION: **Town of Montgomery**
CALCULATED BY: **ZS**
APPROVED BY: **RW**
REF DRAWING(S):

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

1. Sheet Flow

Segment ID		A-B	B-C	C-D		
Surface Description (table 3-1)		Grass: D	Paved	Grass: D		
Manning's roughness coeff., 'n' (table 3-1)		0.24	0.01	0.24		
Flow length, L (total L ≤ 300 ft)	ft	59	12	29		
Two-year 24-hour rainfall, P_2	in	3.50	3.50	3.50		
Land Slope, s	ft/ft	0.020	0.020	0.020		
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr	0.149	0.004	0.084		0.237

2. Shallow Concentrated Flow

Segment ID		D-E	E-F			
Surface description (paved or unpaved)		Unpaved	Paved			
Flow length, L	ft	93.0	7.6			
Watercourse slope, s	ft/ft	0.020	0.020			
Average velocity, V (figure 3-1)	ft/s	2.282	2.875			
$T_t = \frac{L}{3600\,V}$	hr	0.011	0.001			0.012

3. Channel Flow

Segment ID		F-G				
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	879.0				
$T_t = \frac{L}{3600\,V}$	hr	0.125				0.125

Total Tc For Watershed or Subarea (Add Steps 6, 11, and 19) hr = 0.37

min = 22.20

ENGINEERING & SURVEYING PROPERTIES
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TIME OF CONCENTRATION (Tc) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**Jan '24**	**Dec '25**	**4**	**10**

PROJECT TITLE: **Sheffield Gardens**
LOCATION: **Town of Montgomery**
CALCULATED BY: **ZS**
APPROVED BY: **RW**
REF DRAWING(S):

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

1. Sheet Flow

Segment ID		A-B	B-C	C-D		
Surface Description (table 3-1)		Grass: D	Paved	Grass: D		
Manning's roughness coeff., 'n' (table 3-1)		0.24	0.01	0.24		
Flow length, L (total L ≤ 300 ft)	ft	71	4	25		
Two-year 24-hour rainfall, P_2	in	3.50	3.50	3.50		
Land Slope, s	ft/ft	0.020	0.020	0.020		
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr	0.173	0.001	0.075		0.249

2. Shallow Concentrated Flow

Segment ID		D-E				
Surface description (paved or unpaved)		Unpaved				
Flow length, L	ft	93.0				
Watercourse slope, s	ft/ft	0.020				
Average velocity, V (figure 3-1)	ft/s	2.282				
$T_t = \frac{L}{3600\,V}$	hr	0.011				0.011

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	706.0				
$T_t = \frac{L}{3600\,V}$	hr	0.100				0.100

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
103.0301	**Jan '24**	**Dec '25**	**5**	**10**

PROJECT TITLE: **Sheffield Gardens**
LOCATION: **Town of Montgomery**
CALCULATED BY: **ZS**
APPROVED BY: **RW**
REF DRAWING(S):

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		67				
Two-year 24-hour rainfall, P_2	in		3.50				
Land Slope, s	ft/ft		0.250				
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr		0.060				0.060

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 =** **0.06**

Use a minimum of 6 minutes. **min =** **3.60**

ENGINEERING & SURVEYING PROPERTIES
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TIME OF CONCENTRATION (Tc) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**Jan '24**	**Dec '25**	**6**	**10**

PROJECT TITLE: **Sheffield Gardens**
LOCATION: **Town of Montgomery**
CALCULATED BY: **ZS**
APPROVED BY: **RW**
REF DRAWING(S):

Existing | Proposed Area: **PR-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		0.053				
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr		0.232				0.232

2. Shallow Concentrated Flow

		Segment ID	B-C	C-D			
Surface description (paved or unpaved)			Unpaved	Unpaved			
Flow length, L	ft		561.7	478.1			
Watercourse slope, s	ft/ft		0.099	0.010			
Average velocity, V (figure 3-1)	ft/s		5.077	1.613			
$T_t = \frac{L}{3600\,V}$	hr		0.031	0.082			0.113

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
103.0301	**Jan '24**	**Dec '25**	**7**	**10**

PROJECT TITLE: **Sheffield Gardens**
LOCATION: **Town of Montgomery**
CALCULATED BY: **ZS**
APPROVED BY: **RW**
REF DRAWING(S):

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

1. Sheet Flow

Segment ID		A-B	B-C	C-D		
Surface Description (table 3-1)		Grass: D	Paved	Grass: D		
Manning's roughness coeff., 'n' (table 3-1)		0.24	0.01	0.24		
Flow length, L (total L ≤ 300 ft)	ft	57	5	38		
Two-year 24-hour rainfall, P_2	in	3.50	3.50	3.50		
Land Slope, s	ft/ft	0.020	0.020	0.020		
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr	0.145	0.002	0.105		0.252

2. Shallow Concentrated Flow

Segment ID		B-C	C-D			
Surface description (paved or unpaved)		Unpaved	Paved			
Flow length, L	ft	93.0	10.5			
Watercourse slope, s	ft/ft	0.020	0.020			
Average velocity, V (figure 3-1)	ft/s	2.282	2.875			
$T_t = \frac{L}{3600\,V}$	hr	0.011	0.001			0.012

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	740.0				
$T_t = \frac{L}{3600\,V}$	hr	0.105				0.105

Total Tc For Watershed or Subarea (Add Steps 6, 11, and 19) hr = **0.37**

min = **22.20**

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TIME OF CONCENTRATION (Tc) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**Jan '24**	**Dec '25**	**8**	**10**

PROJECT TITLE: **Sheffield Gardens**
LOCATION: **Town of Montgomery**
CALCULATED BY: **ZS**
APPROVED BY: **RW**
REF DRAWING(S):

Existing [Proposed] Area: **PR-B1-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	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	0.227				0.227

2. Shallow Concentrated Flow

Segment ID		B-C	C-D	D-E		
Surface description (paved or unpaved)		Unpaved	Paved	Paved		
Flow length, L	ft	19.0	5.0	76.0		
Watercourse slope, s	ft/ft	0.020	0.020	0.020		
Average velocity, V (figure 3-1)	ft/s	2.282	2.875	2.875		
$T_t = \frac{L}{3600\,V}$	hr	0.002	0.000	0.007		0.010

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	552.0				
$T_t = \frac{L}{3600\,V}$	hr	0.078				0.078

Total Tc For Watershed or Subarea (Add Steps 6, 11, and 19) **hr =** **0.32**

min = **19.20**

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TIME OF CONCENTRATION (Tc) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**Jan '24**	**Dec '25**	**9**	**10**

PROJECT TITLE: **Sheffield Gardens**
LOCATION: **Town of Montgomery**
CALCULATED BY: **ZS**
APPROVED BY: **RW**
REF DRAWING(S):

Existing [Proposed] Area: **PR-B1-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		60				
Two-year 24-hour rainfall, P_2	in		3.50				
Land Slope, s	ft/ft		0.250				
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr		0.055				0.055

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 =** **0.06**

Use a minimum of 6 minutes. **min =** **3.60**

ENGINEERING & SURVEYING PROPERTIES
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TIME OF CONCENTRATION (Tc) WORKSHEET

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**Jan '24**	**Dec '25**	**10**	**10**

PROJECT TITLE: **Sheffield Gardens**
LOCATION: **Town of Montgomery**
CALCULATED BY: **ZS**
APPROVED BY: **RW**
REF DRAWING(S):

Existing | **Proposed** Area: **PR-B3**

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	0.027				
$T_t = \frac{0.007\,(nL)^{0.8}}{P_2^{0.5}\,s^{0.4}}$	hr	0.303				0.303

2. Shallow Concentrated Flow

		Segment ID: B-C	C-D			
Surface description (paved or unpaved)		Unpaved	Unpaved			
Flow length, L	ft	495.3	94.8			
Watercourse slope, s	ft/ft	0.108	0.029			
Average velocity, V (figure 3-1)	ft/s	5.298	2.748			
$T_t = \frac{L}{3600\,V}$	hr	0.026	0.010			0.036

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**

APPENDIX 6

WATER QUALITY VOLUME CALCULATIONS & RUNOFF REDUCTION VOLUME CALCULATIONS

ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

WATER QUALITY VOLUME (WQ_v) CALCULATION SHEET

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**Jan '24**	**May '26**	**1**	**2**

PROJECT TITLE	LOCATION
Sheffield Gardens	**Town of Montgomery**

CALCULATED BY	APPROVED BY	Stormwater Management Design Point Designation
ZS	**RW**	**PR-A**

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

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)
PR-A	1.40	37.077	6.166	0.200	0.864	37,635.8

HSG	**Area (Ac.)**	**%**	**S**
A	4.149	11%	0.55
B	4.315	12%	0.40
C	0.000	0%	0.30
D	28.613	77%	0.20

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

P = 1.40
S = 0.26
I = 6.17
$RR_{v\ MIN}$ **0.179** 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	37.08	6.17	0.200	0.864	**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	37.08	6.17	0.200	0.864	**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	☑	☐	0.575	0.264	9.33	4.95
Dry Swale (Open Channel)	☐	☑	-	-	-	-
		Subtotals	0.575	**0.264**	9.33	4.95

Is The Total **RR_v** ($RR_{v\ AREA}$ + $RR_{v\ IMP}$ + $RR_{v\ SC}$)	**0.264**	**≥ $RR_{v\ MIN}$?**	**0.179**	**YES**

WQ_v Required by Standard Practices	**P**	**A**	**I**	**R_v**	**WQ_v (Ac-ft)**	**WQ_v (ft^3)**
	1.40	27.75	1.21	0.089	0.289	12,594.0

** 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	**Jan '24**	**May '26**	**May '26**	**2**

PROJECT TITLE		LOCATION
Sheffield Gardens		**Town of Montgomery**
CALCULATED BY	APPROVED BY	Stormwater Management Design Point Designation
ZS	**RW**	**PR-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.)	9.330	
Impervious Area (Ac.)	4.954	
Rainfall Event # (P)	1.40	
Rv	0.528	
$WQv_{REQ'D}$	0.575	
A_f (ft^2)	11,970.0	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)	28,728.0	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 0.264

WQv Req.= 25029.36 WQv Prov. = 28,728.00

Increase Factor = 28,058.40/26016.79 = 1.148

Revised RRv Allowance = 1.078 * 40% = 45.91%

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

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**Jan '24**	**May '26**	**1**	**2**

PROJECT TITLE	LOCATION
Sheffield Gardens	**Town of Montgomery**

CALCULATED BY	APPROVED BY	Stormwater Management Design Point Designation
ZS	**RW**	**PR-B**

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

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)
PR-B	1.40	21.349	5.137	0.267	0.664	28,923.8

HSG	**Area (Ac.)**	**%**	**S**
A	7.048	33%	0.55
B	0.002	0%	0.40
C	0.000	0%	0.30
D	14.299	67%	0.20

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

P = 1.40
S = 0.32
I = 5.14
$RR_{v\ MIN}$ **0.180** 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	21.35	5.14	0.267	0.664	**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	21.35	5.14	0.267	0.664	**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	☑	☐	0.552	0.243	9.11	4.75
Dry Swale (Open Channel)	☐	☑	-	-	-	-
		Subtotals	0.552	**0.243**	9.11	4.75

Is The Total **RR_v** ($RR_{v\ AREA}$ + $RR_{v\ IMP}$ + $RR_{v\ SC}$)	**0.243**	**≥ $RR_{v\ MIN}$?**	**0.180**	**YES**

WQ_v Required by Standard Practices	**P**	**A**	**I**	**R_v**	**WQ_v (Ac-ft)**	**WQ_v (ft^3)**
	1.40	12.24	0.39	0.079	0.112	4,894.5

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

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

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**Jan '24**	**May '26**	**2**	**2**

PROJECT TITLE		LOCATION
Sheffield Gardens		**Town of Montgomery**
CALCULATED BY	APPROVED BY	Stormwater Management Design Point Designation
ZS	**RW**	**PR-B**

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.)	9.107	
Impervious Area (Ac.)	4.747	
Rainfall Event # (P)	1.40	
Rv	0.519	
$WQv_{REQ'D}$	0.552	
A_f (ft^2)	11,208.0	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)	0.45	average height of water above filter bed
t_f (days)	2.00	design filter bed drain time
V_f (ft^3)	26,450.9	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 0.243

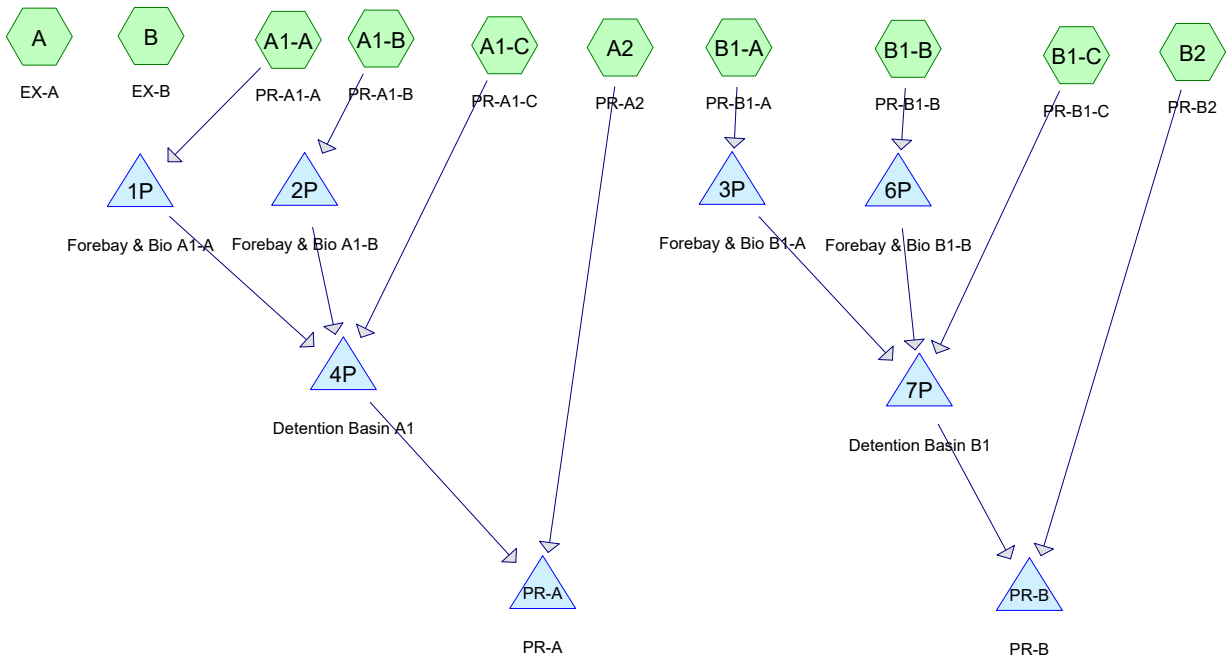
WQv Req.= 24025.92 WQv Prov. = 26,450.88

Increase Factor = 26,450.90/26,450.88 = 1.101

Revised RRv Allowance = 1.101 * 40% = 44.04%

APPENDIX 7

HYDROGRAPH SUMMARIES & DIAGRAMS



Subcat Reach Pond Link

Routing Diagram for 103.0301 - Hydrographs
Prepared by Engineering Surveying Properties, Printed 5/1/2026

Events for Subcatchment A: EX-A

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.62	15.58	2.261	0.77
10-yr	4.69	48.98	6.718	2.28
100-yr	8.25	111.57	15.852	5.39
500-yr	**12.30**	**182.01**	**27.027**	**9.18**

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

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.62	6.11	0.668	1.64
10-yr	4.69	12.46	1.458	3.58
100-yr	8.25	22.54	2.874	7.05
500-yr	**12.30**	**33.28**	**4.508**	**11.06**

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

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.62	5.36	0.576	1.56
10-yr	4.69	11.19	1.284	3.48
100-yr	8.25	20.50	2.560	6.93
500-yr	**12.30**	**30.39**	**4.037**	**10.93**

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

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.62	0.85	0.054	0.97
10-yr	4.69	2.20	0.146	2.62
100-yr	8.25	4.46	0.326	5.86
500-yr	**12.30**	**6.82**	**0.541**	**9.74**

Events for Subcatchment A2: PR-A2

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.62	14.95	1.734	0.77
10-yr	4.69	46.34	5.152	2.28
100-yr	8.25	104.19	12.157	5.39
500-yr	**12.30**	**168.50**	**20.729**	**9.18**

Events for Subcatchment B: EX-B

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.62	2.54	0.605	0.31
10-yr	4.69	17.46	2.663	1.38
100-yr	8.25	52.74	7.668	3.98
500-yr	**12.30**	**96.48**	**14.315**	**7.43**

Events for Subcatchment B1-A: PR-B1-A

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.62	5.82	0.635	1.56
10-yr	4.69	12.16	1.415	3.48
100-yr	8.25	22.28	2.822	6.93
500-yr	**12.30**	**33.05**	**4.450**	**10.93**

Events for Subcatchment B1-B: PR-B1-B

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.62	5.41	0.549	1.56
10-yr	4.69	11.25	1.223	3.48
100-yr	8.25	20.54	2.439	6.93
500-yr	**12.30**	**30.36**	**3.846**	**10.93**

Events for Subcatchment B1-C: PR-B1-C

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.62	0.00	0.000	0.00
10-yr	4.69	0.01	0.005	0.14
100-yr	8.25	0.41	0.049	1.26
500-yr	**12.30**	**1.49**	**0.130**	**3.39**

Events for Subcatchment B2: PR-B2

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-yr	2.62	0.86	0.228	0.23
10-yr	4.69	9.10	1.165	1.19
100-yr	8.25	30.10	3.570	3.64
500-yr	**12.30**	**56.59**	**6.848**	**6.98**

Events for Pond 1P: Forebay & Bio A1-A

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-yr	6.11	5.66	408.62	68,551
10-yr	12.46	11.90	408.70	69,971
100-yr	22.54	21.90	408.99	75,512
500-yr	**33.28**	**25.52**	**409.40**	**83,079**

Events for Pond 2P: Forebay & Bio A1-B

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-yr	5.36	4.88	408.61	74,349
10-yr	11.19	10.58	408.68	75,787
100-yr	20.50	19.78	408.99	82,052
500-yr	**30.39**	**21.60**	**409.39**	**90,478**

Events for Pond 3P: Forebay & Bio B1-A

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-yr	5.82	0.64	408.46	70,569
10-yr	12.16	9.01	408.74	75,954
100-yr	22.28	19.78	408.97	80,602
500-yr	**33.05**	**20.06**	**409.61**	**94,195**

Events for Pond 4P: Detention Basin A1

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-yr	10.78	0.58	404.52	55,794
10-yr	23.13	0.74	408.18	110,692
100-yr	43.11	16.53	408.99	127,372
500-yr	**49.20**	**46.93**	**409.39**	**136,158**

Events for Pond 6P: Forebay & Bio B1-B

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-yr	5.41	0.70	408.46	46,355
10-yr	11.25	8.78	408.73	50,699
100-yr	20.54	**18.34**	408.95	54,319
500-yr	**30.36**	16.11	**409.73**	**68,387**

Events for Pond 7P: Detention Basin B1

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-yr	1.28	0.38	403.21	9,664
10-yr	17.50	1.50	408.07	51,487
100-yr	**38.04**	24.09	408.76	60,825
500-yr	36.71	**36.25**	**409.27**	**68,237**

Events for Pond PR-A: PR-A

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
1-yr	15.36	15.36	**0.00**	**0.000**
10-yr	46.90	46.90	0.00	0.000
100-yr	104.90	104.90	0.00	0.000
500-yr	**203.28**	**203.28**	0.00	0.000

Events for Pond PR-B: PR-B

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
1-yr	0.86	0.86	**0.00**	**0.000**
10-yr	9.39	9.39	0.00	0.000
100-yr	47.71	47.71	0.00	0.000
500-yr	**80.97**	**80.97**	0.00	0.000

APPENDIX 8

1-YEAR DESIGN STORM HYDROGRAPHS

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

SubcatchmentA: EX-A Runoff Area=35.318 ac 19.88% Impervious Runoff Depth=0.77"
Tc=31.2 min CN=76 Runoff=15.58 cfs 2.261 af

SubcatchmentA1-A: PR-A1-A Runoff Area=4.891 ac 54.92% Impervious Runoff Depth=1.64"
Tc=22.2 min CN=90 Runoff=6.11 cfs 0.668 af

SubcatchmentA1-B: PR-A1-B Runoff Area=4.432 ac 51.17% Impervious Runoff Depth=1.56"
Tc=21.6 min CN=89 Runoff=5.36 cfs 0.576 af

SubcatchmentA1-C: PR-A1-C Runoff Area=0.667 ac 0.00% Impervious Runoff Depth=0.97"
Tc=6.0 min CN=80 Runoff=0.85 cfs 0.054 af

SubcatchmentA2: PR-A2 Runoff Area=27.087 ac 31.06% Impervious Runoff Depth=0.77"
Tc=20.4 min CN=76 Runoff=14.95 cfs 1.734 af

SubcatchmentB: EX-B Runoff Area=23.109 ac 4.81% Impervious Runoff Depth=0.31"
Tc=32.4 min CN=64 Runoff=2.54 cfs 0.605 af

SubcatchmentB1-A: PR-B1-A Runoff Area=4.885 ac 52.14% Impervious Runoff Depth=1.56"
Tc=22.2 min CN=89 Runoff=5.82 cfs 0.635 af

SubcatchmentB1-B: PR-B1-B Runoff Area=4.222 ac 52.11% Impervious Runoff Depth=1.56"
Tc=19.2 min CN=89 Runoff=5.41 cfs 0.549 af

SubcatchmentB1-C: PR-B1-C Runoff Area=0.461 ac 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=39 Runoff=0.00 cfs 0.000 af

SubcatchmentB2: PR-B2 Runoff Area=11.782 ac 11.29% Impervious Runoff Depth=0.23"
Tc=20.4 min CN=61 Runoff=0.86 cfs 0.228 af

Pond 1P: Forebay & Bio A1-A Peak Elev=408.62' Storage=68,551 cf Inflow=6.11 cfs 0.668 af
Outflow=5.66 cfs 0.668 af

Pond 2P: Forebay & Bio A1-B Peak Elev=408.61' Storage=74,349 cf Inflow=5.36 cfs 0.576 af
Outflow=4.88 cfs 0.576 af

Pond 3P: Forebay & Bio B1-A Peak Elev=408.46' Storage=70,569 cf Inflow=5.82 cfs 0.635 af
Outflow=0.64 cfs 0.274 af

Pond 4P: Detention Basin A1 Peak Elev=404.52' Storage=55,794 cf Inflow=10.78 cfs 1.298 af
Outflow=0.58 cfs 1.295 af

Pond 6P: Forebay & Bio B1-B Peak Elev=408.46' Storage=46,355 cf Inflow=5.41 cfs 0.549 af
Outflow=0.70 cfs 0.253 af

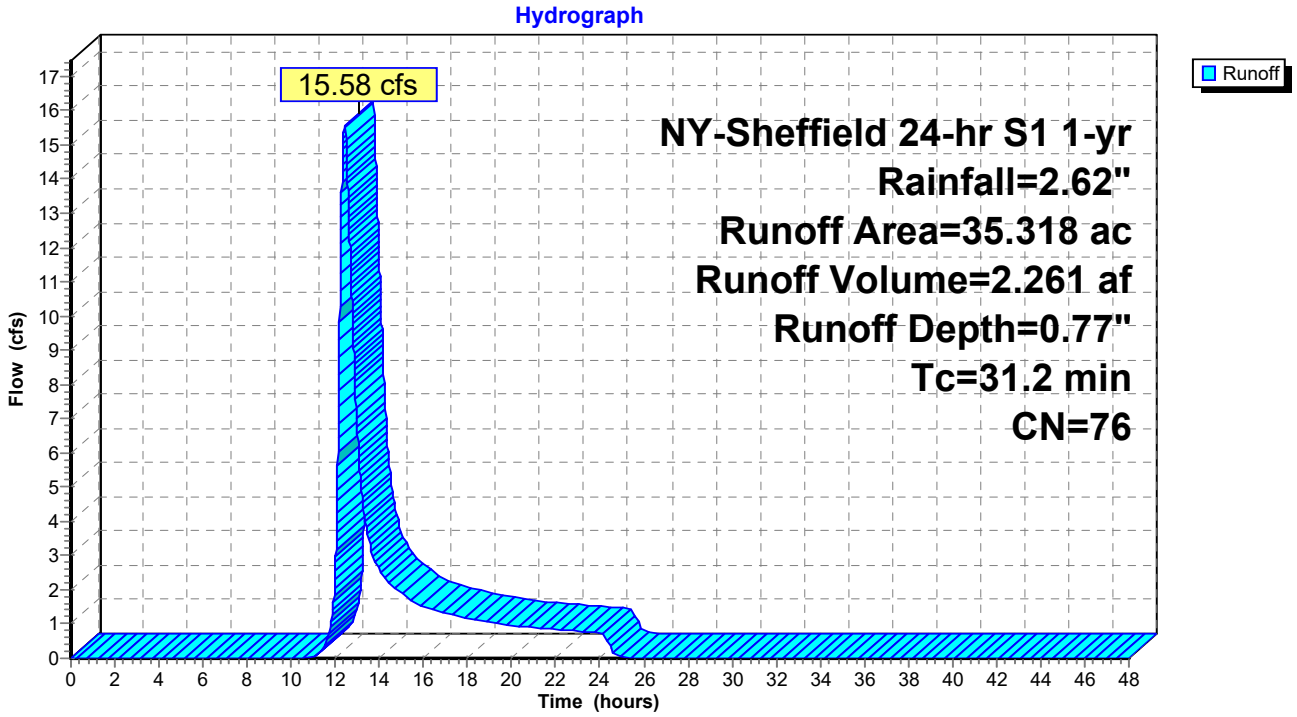
Pond 7P: Detention Basin B1 Peak Elev=403.21' Storage=9,664 cf Inflow=1.28 cfs 0.527 af
Outflow=0.38 cfs 0.526 af

Pond PR-A: PR-A Inflow=15.36 cfs 3.029 af
Primary=15.36 cfs 3.029 af

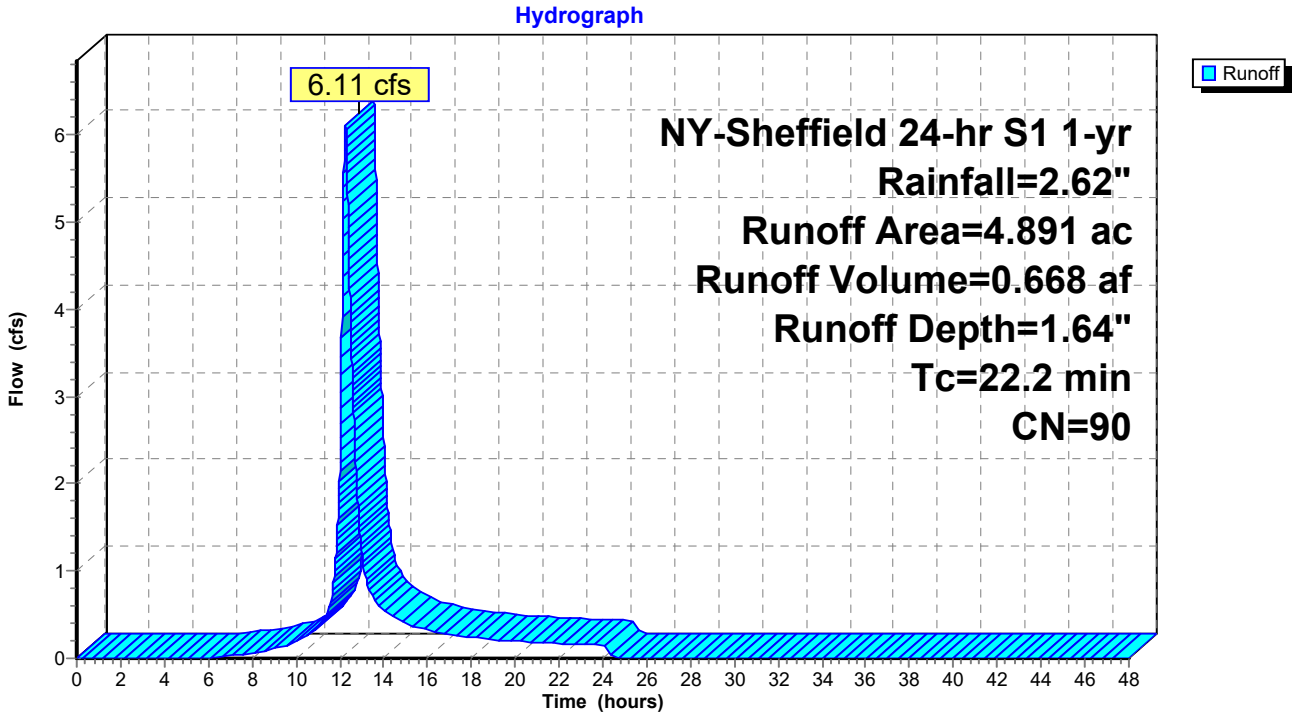
Pond PR-B: PR-B Inflow=0.86 cfs 0.755 af
Primary=0.86 cfs 0.755 af

Total Runoff Area = 116.854 ac Runoff Volume = 7.310 af Average Runoff Depth = 0.75"
76.40% Pervious = 89.280 ac 23.60% Impervious = 27.574 ac

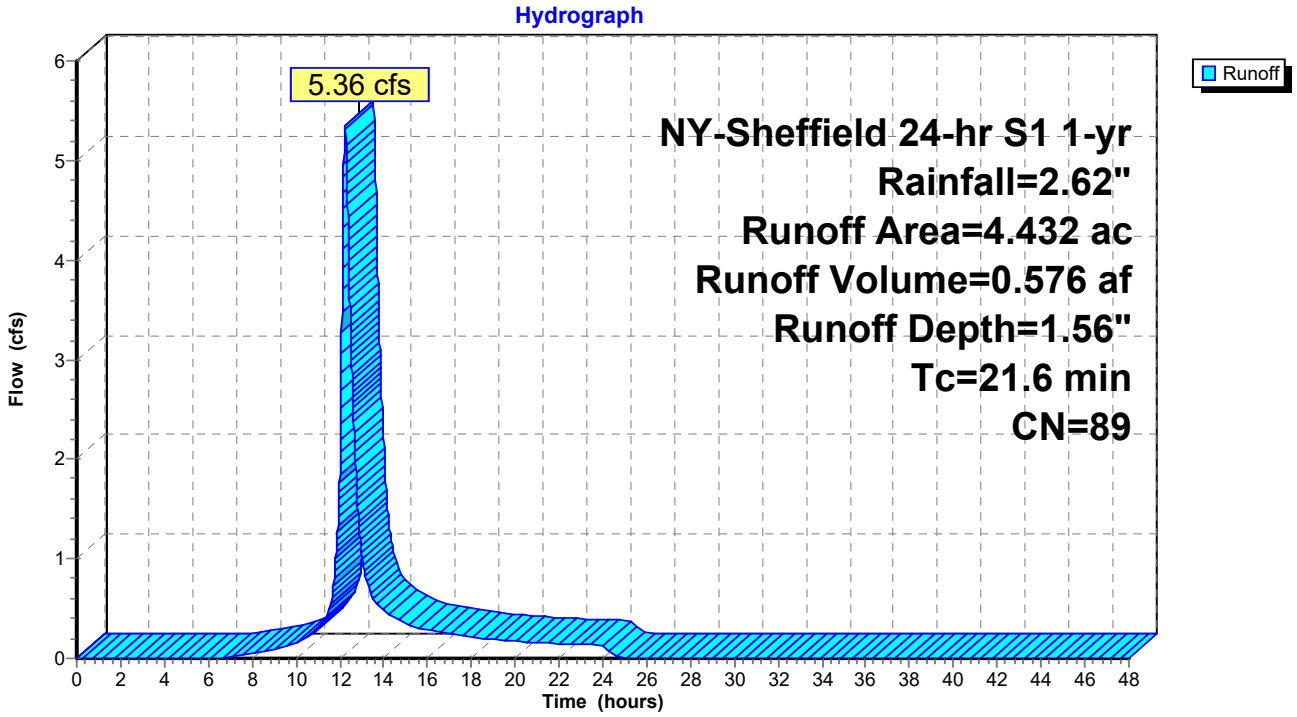
Subcatchment A: EX-A



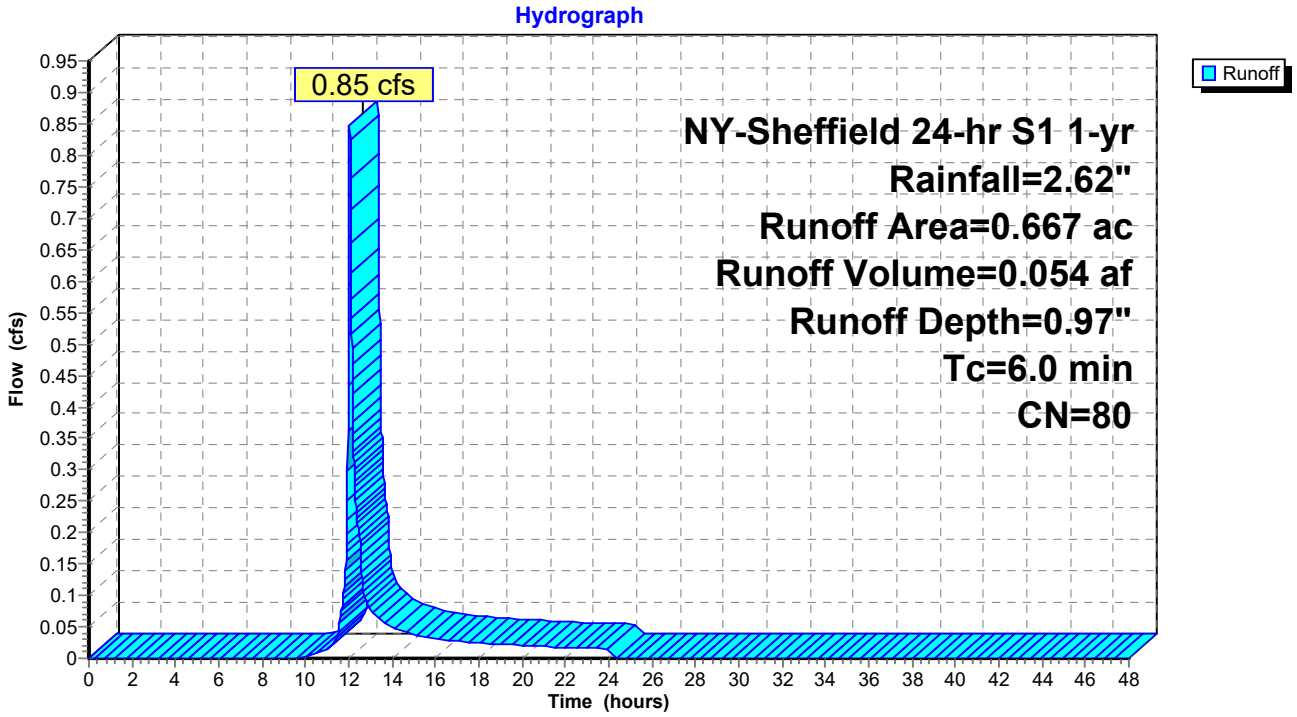
Subcatchment A1-A: PR-A1-A



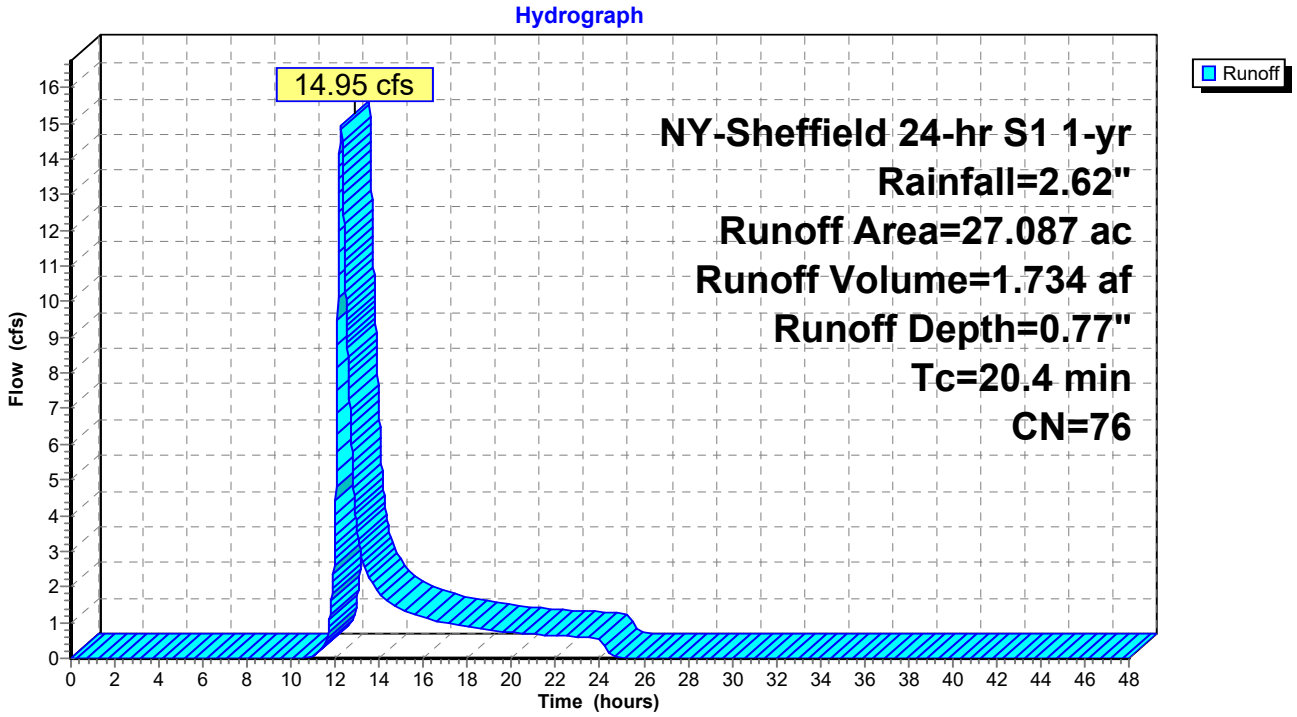
Subcatchment A1-B: PR-A1-B



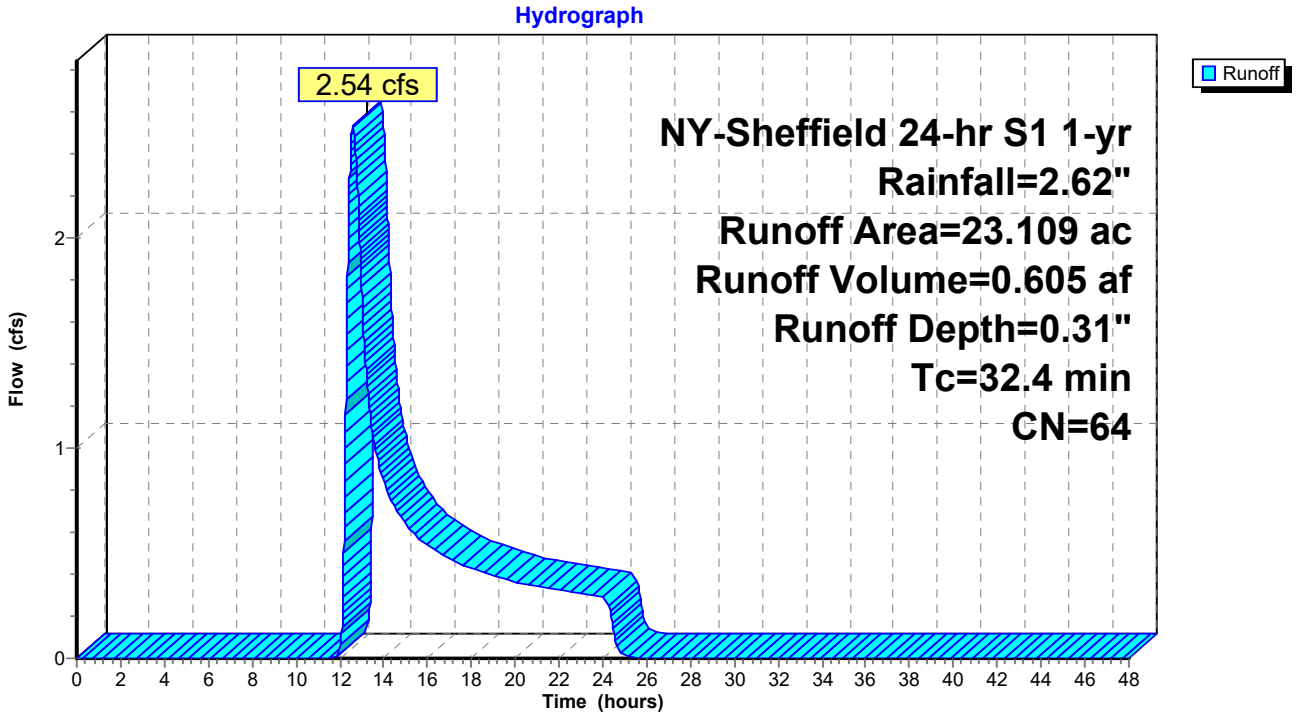
Subcatchment A1-C: PR-A1-C



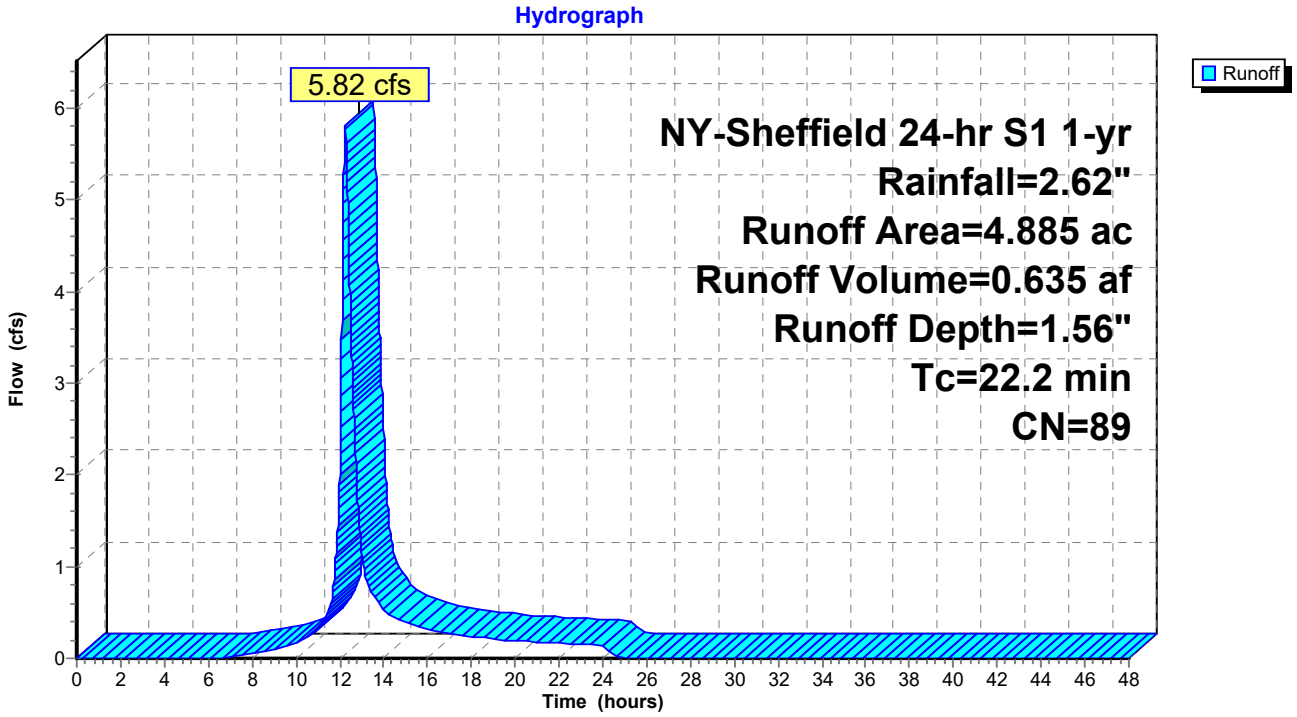
Subcatchment A2: PR-A2



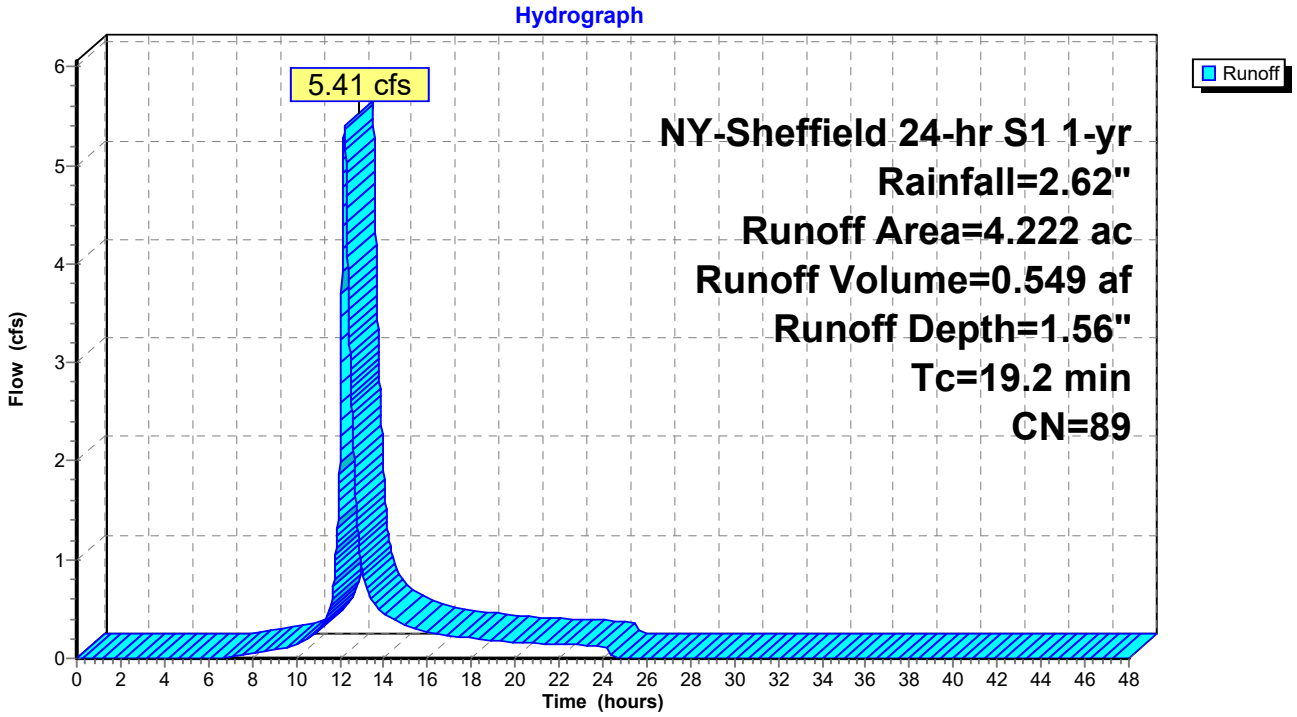
Subcatchment B: EX-B



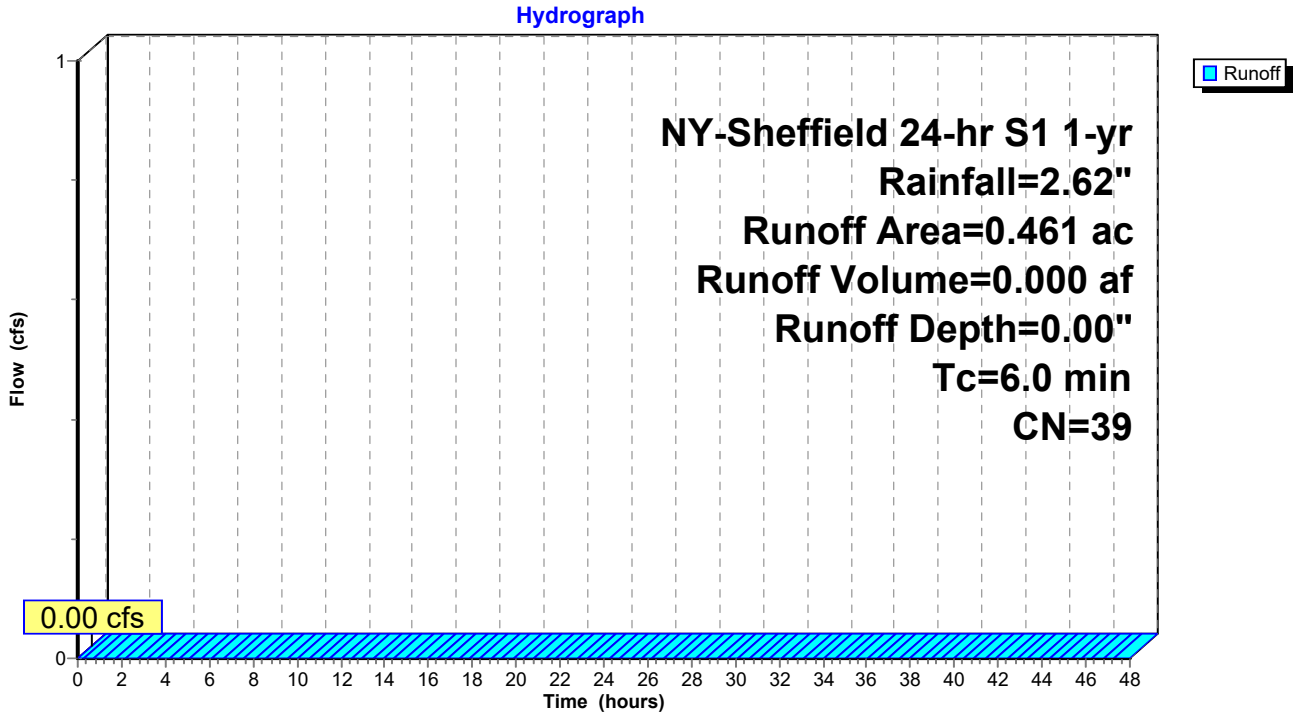
Subcatchment B1-A: PR-B1-A



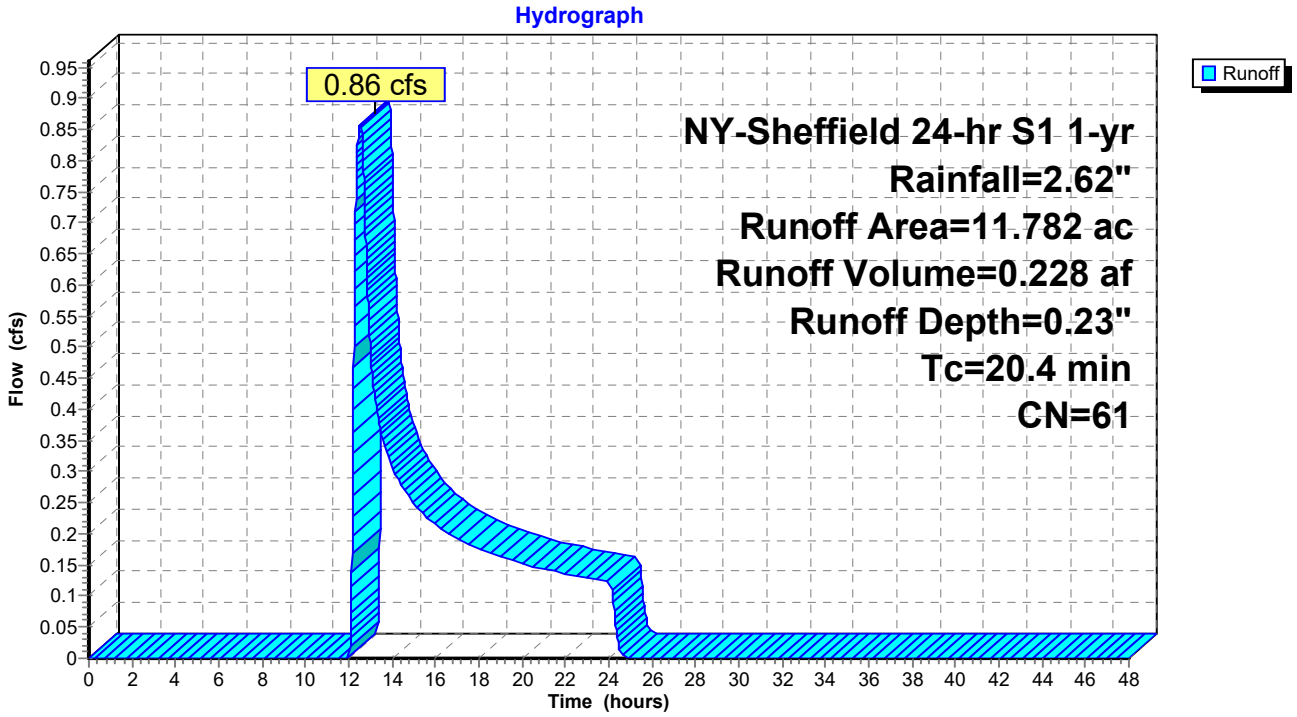
Subcatchment B1-B: PR-B1-B



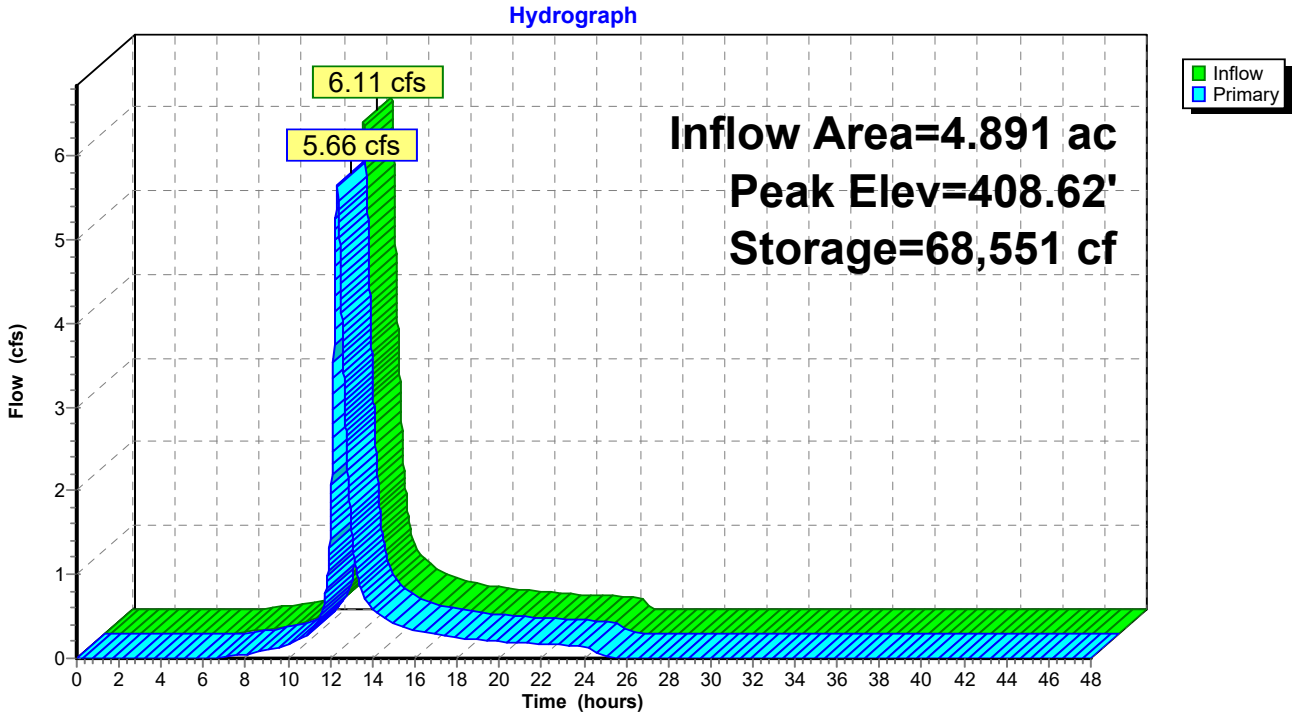
Subcatchment B1-C: PR-B1-C



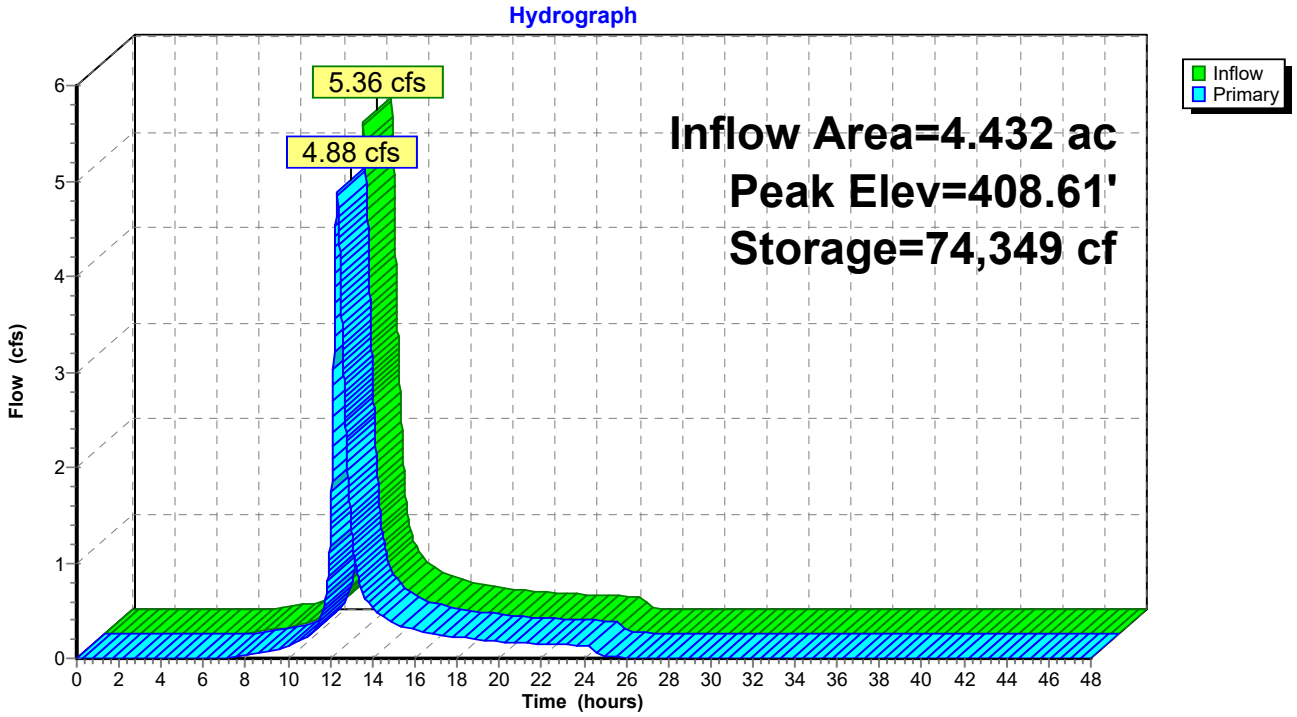
Subcatchment B2: PR-B2



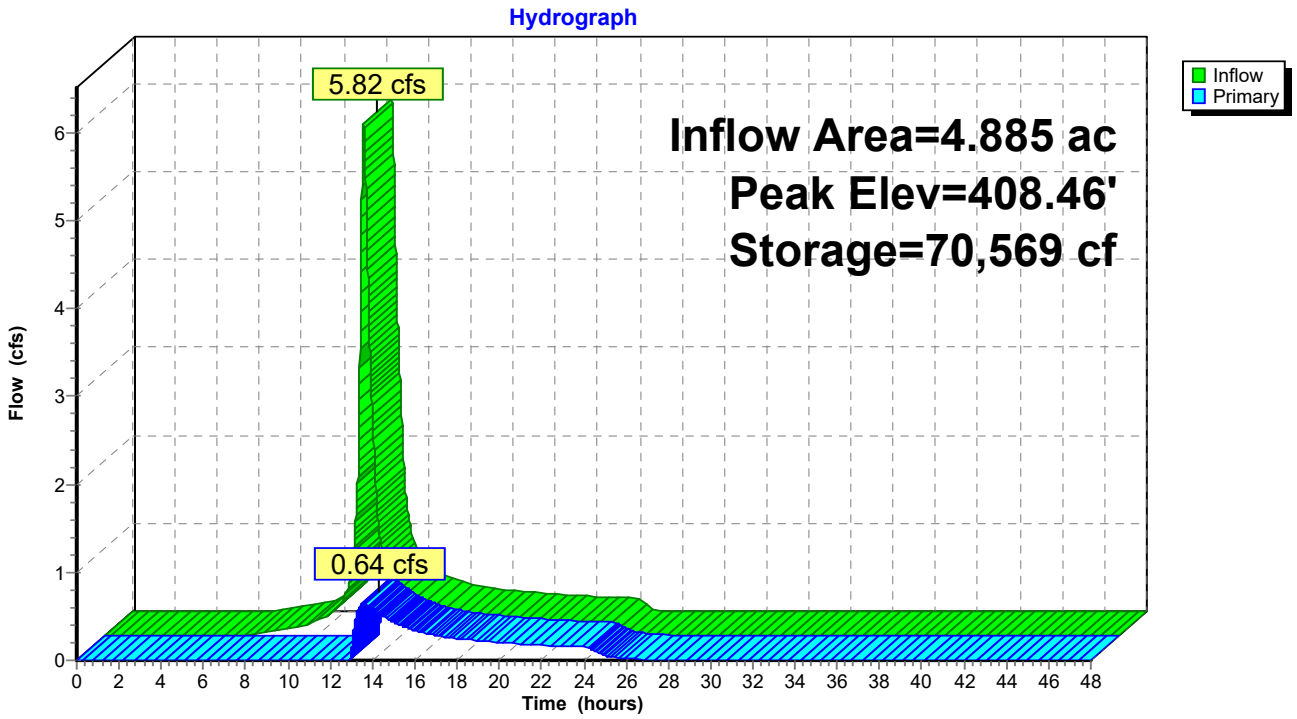
Pond 1P: Forebay & Bio A1-A



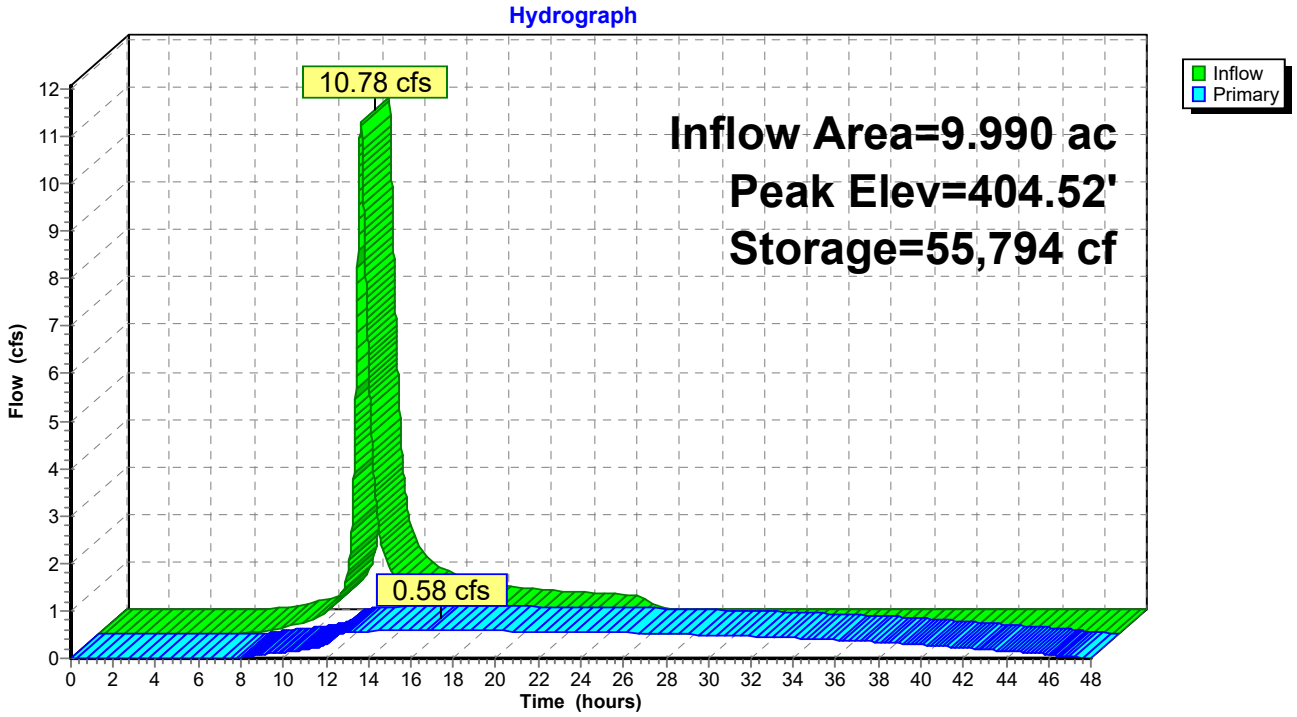
Pond 2P: Forebay & Bio A1-B



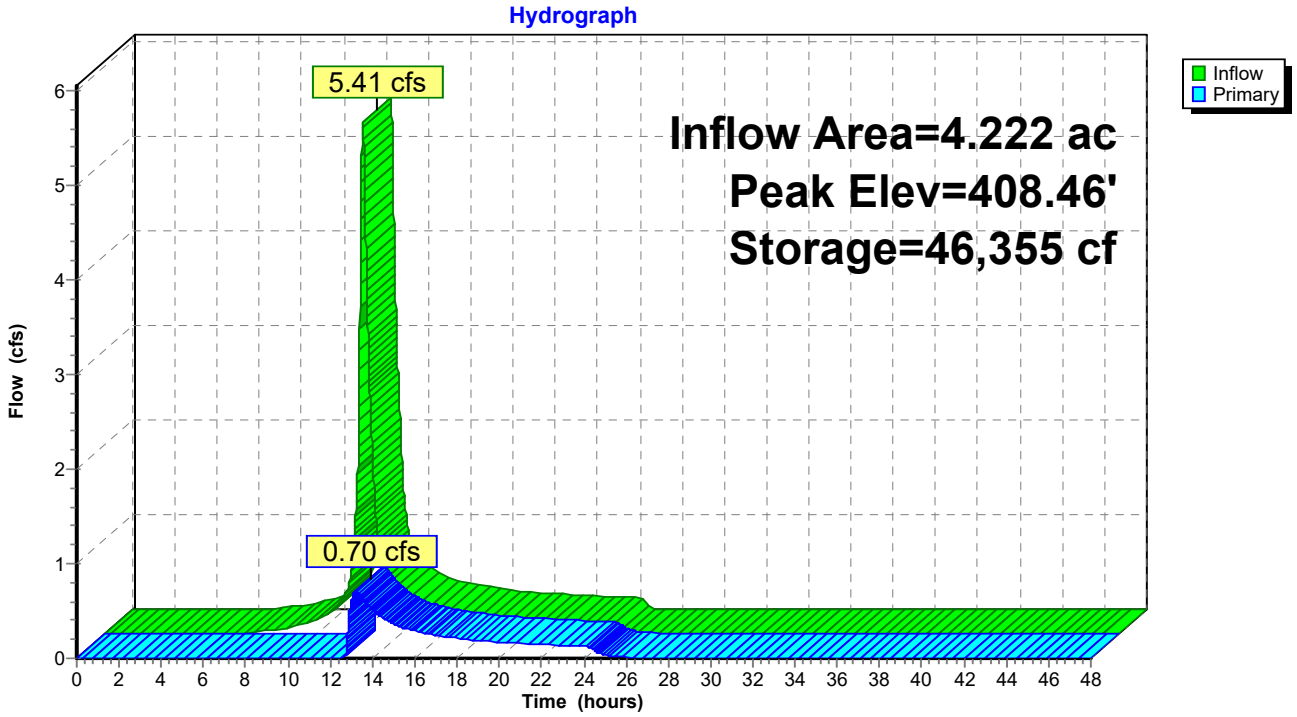
Pond 3P: Forebay & Bio B1-A



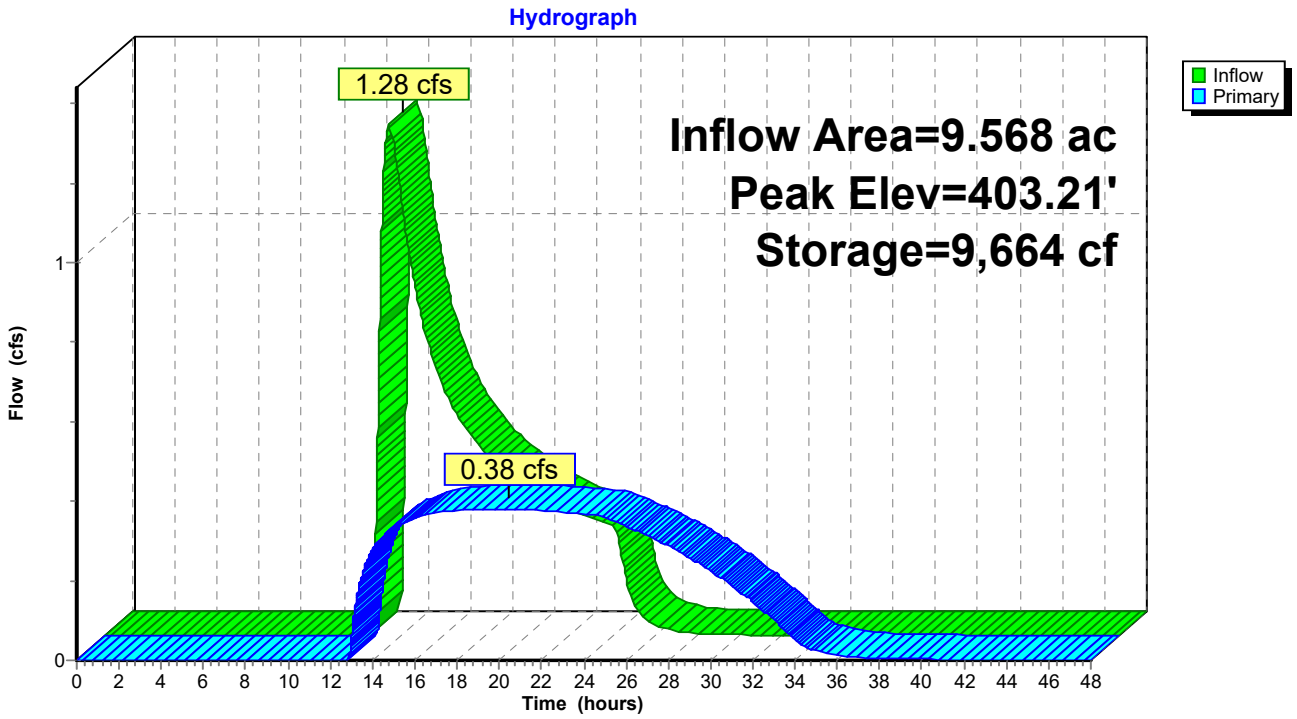
Pond 4P: Detention Basin A1



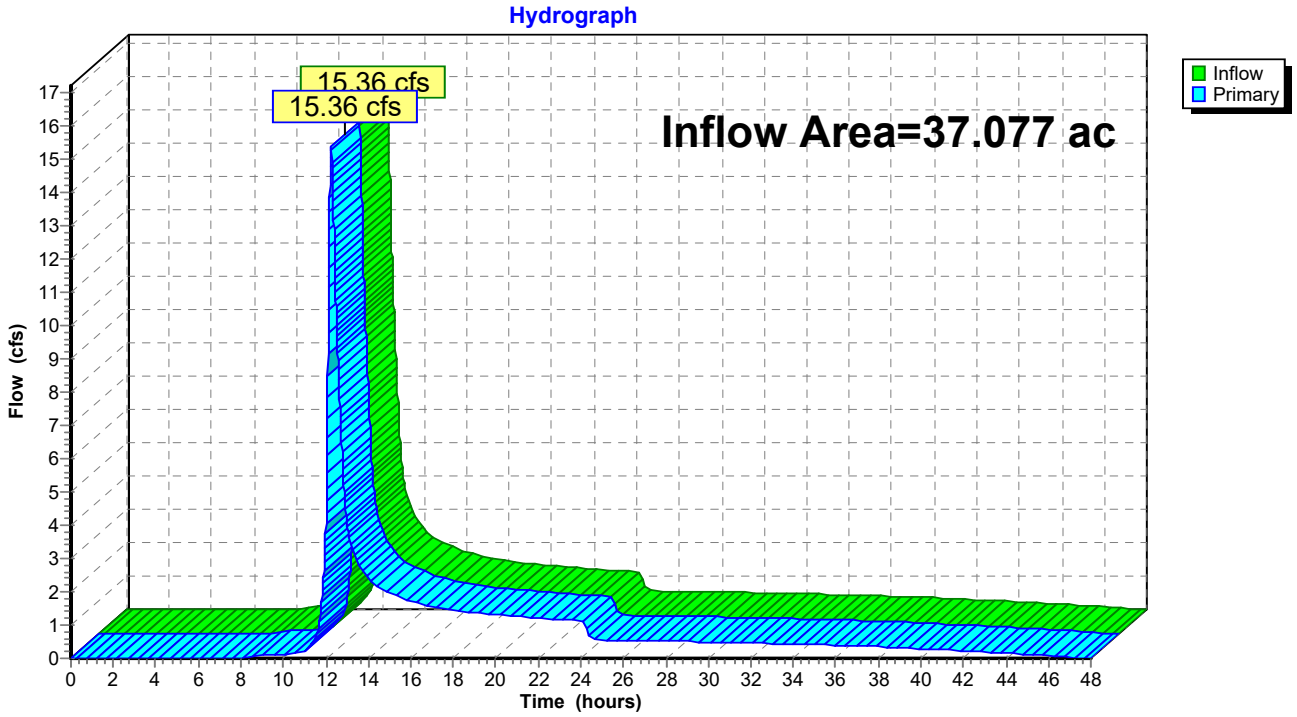
Pond 6P: Forebay & Bio B1-B



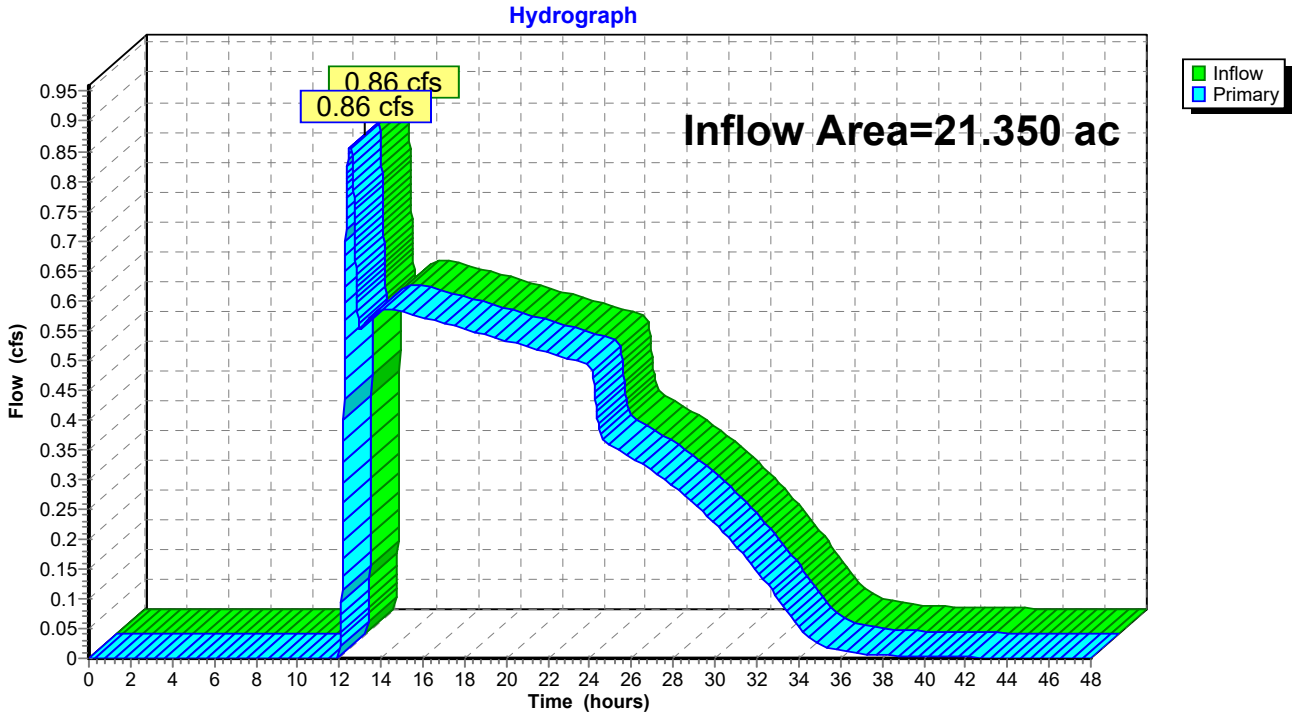
Pond 7P: Detention Basin B1



Pond PR-A: PR-A


Hydrograph
15.36 cfs
15.36 cfs
Inflow Area=37.077 ac
Inflow
Primary
Flow (cfs)
Time (hours)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

Pond PR-B: PR-B


Hydrograph
0.86 cfs
0.86 cfs
Inflow Area=21.350 ac
Inflow
Primary
Flow (cfs)
Time (hours)
0 0.05 0.1 0.15 0.2 0.25 0.3 0.35 0.4 0.45 0.5 0.55 0.6 0.65 0.7 0.75 0.8 0.85 0.9 0.95
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

APPENDIX 9

10-YEAR DESIGN STORM HYDROGRAPHS

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

SubcatchmentA: EX-A Runoff Area=35.318 ac 19.88% Impervious Runoff Depth=2.28"
Tc=31.2 min CN=76 Runoff=48.98 cfs 6.718 af

SubcatchmentA1-A: PR-A1-A Runoff Area=4.891 ac 54.92% Impervious Runoff Depth=3.58"
Tc=22.2 min CN=90 Runoff=12.46 cfs 1.458 af

SubcatchmentA1-B: PR-A1-B Runoff Area=4.432 ac 51.17% Impervious Runoff Depth=3.48"
Tc=21.6 min CN=89 Runoff=11.19 cfs 1.284 af

SubcatchmentA1-C: PR-A1-C Runoff Area=0.667 ac 0.00% Impervious Runoff Depth=2.62"
Tc=6.0 min CN=80 Runoff=2.20 cfs 0.146 af

SubcatchmentA2: PR-A2 Runoff Area=27.087 ac 31.06% Impervious Runoff Depth=2.28"
Tc=20.4 min CN=76 Runoff=46.34 cfs 5.152 af

SubcatchmentB: EX-B Runoff Area=23.109 ac 4.81% Impervious Runoff Depth=1.38"
Tc=32.4 min CN=64 Runoff=17.46 cfs 2.663 af

SubcatchmentB1-A: PR-B1-A Runoff Area=4.885 ac 52.14% Impervious Runoff Depth=3.48"
Tc=22.2 min CN=89 Runoff=12.16 cfs 1.415 af

SubcatchmentB1-B: PR-B1-B Runoff Area=4.222 ac 52.11% Impervious Runoff Depth=3.48"
Tc=19.2 min CN=89 Runoff=11.25 cfs 1.223 af

SubcatchmentB1-C: PR-B1-C Runoff Area=0.461 ac 0.00% Impervious Runoff Depth=0.14"
Tc=6.0 min CN=39 Runoff=0.01 cfs 0.005 af

SubcatchmentB2: PR-B2 Runoff Area=11.782 ac 11.29% Impervious Runoff Depth=1.19"
Tc=20.4 min CN=61 Runoff=9.10 cfs 1.165 af

Pond 1P: Forebay & Bio A1-A Peak Elev=408.70' Storage=69,971 cf Inflow=12.46 cfs 1.458 af
Outflow=11.90 cfs 1.458 af

Pond 2P: Forebay & Bio A1-B Peak Elev=408.68' Storage=75,787 cf Inflow=11.19 cfs 1.284 af
Outflow=10.58 cfs 1.284 af

Pond 3P: Forebay & Bio B1-A Peak Elev=408.74' Storage=75,954 cf Inflow=12.16 cfs 1.415 af
Outflow=9.01 cfs 1.054 af

Pond 4P: Detention Basin A1 Peak Elev=408.18' Storage=110,692 cf Inflow=23.13 cfs 2.888 af
Outflow=0.74 cfs 2.155 af

Pond 6P: Forebay & Bio B1-B Peak Elev=408.73' Storage=50,699 cf Inflow=11.25 cfs 1.223 af
Outflow=8.78 cfs 0.927 af

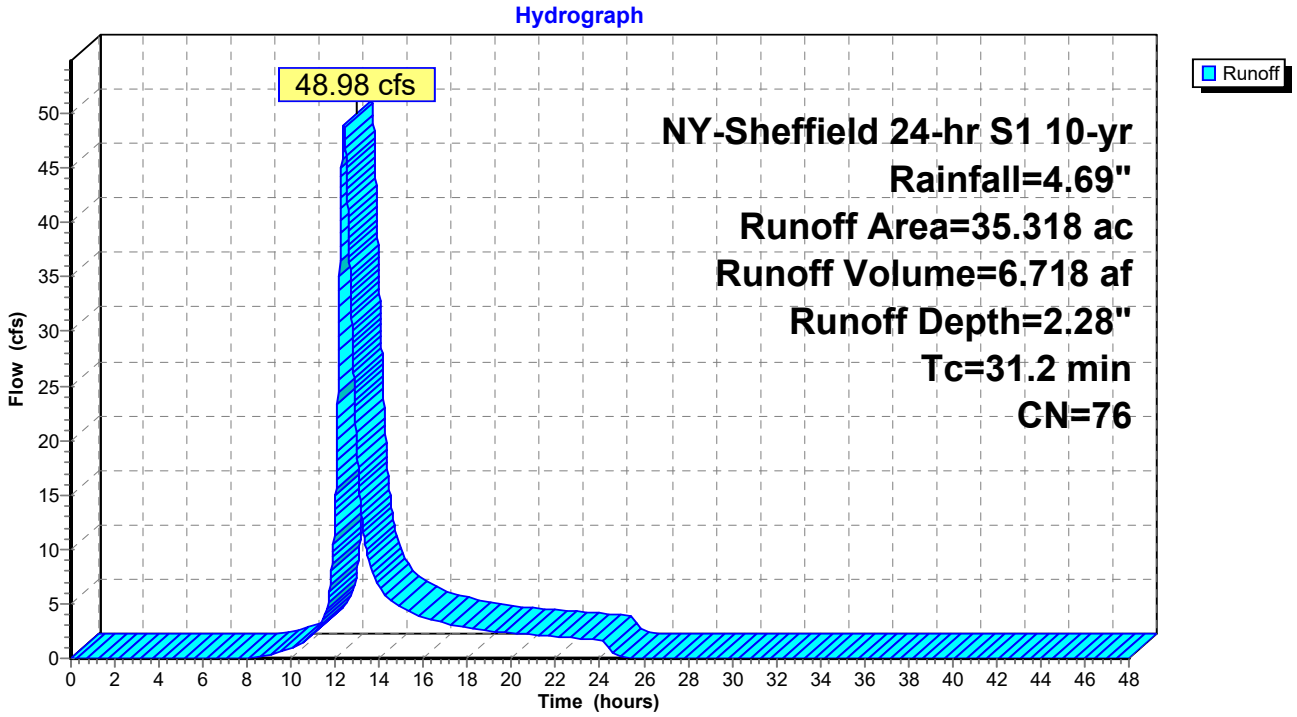
Pond 7P: Detention Basin B1 Peak Elev=408.07' Storage=51,487 cf Inflow=17.50 cfs 1.986 af
Outflow=1.50 cfs 1.843 af

Pond PR-A: PR-A Inflow=46.90 cfs 7.307 af
Primary=46.90 cfs 7.307 af

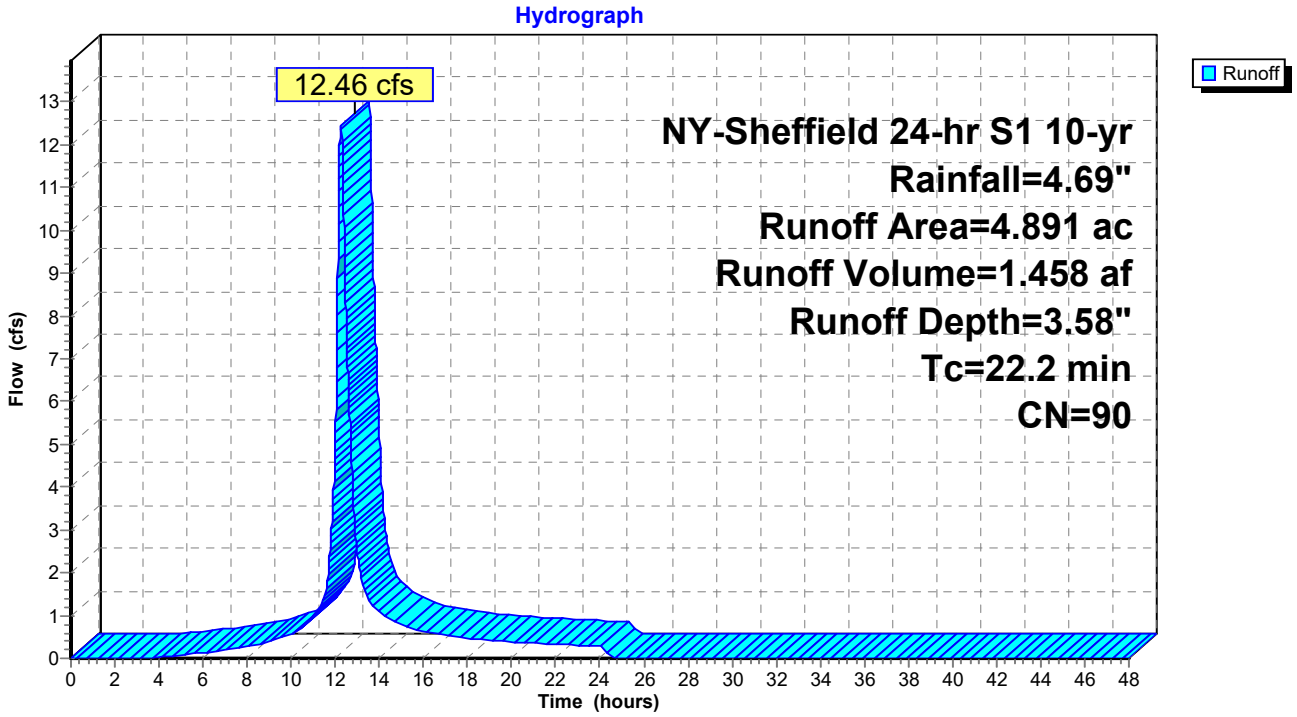
Pond PR-B: PR-B Inflow=9.39 cfs 3.009 af
Primary=9.39 cfs 3.009 af

Total Runoff Area = 116.854 ac Runoff Volume = 21.229 af Average Runoff Depth = 2.18"
76.40% Pervious = 89.280 ac 23.60% Impervious = 27.574 ac

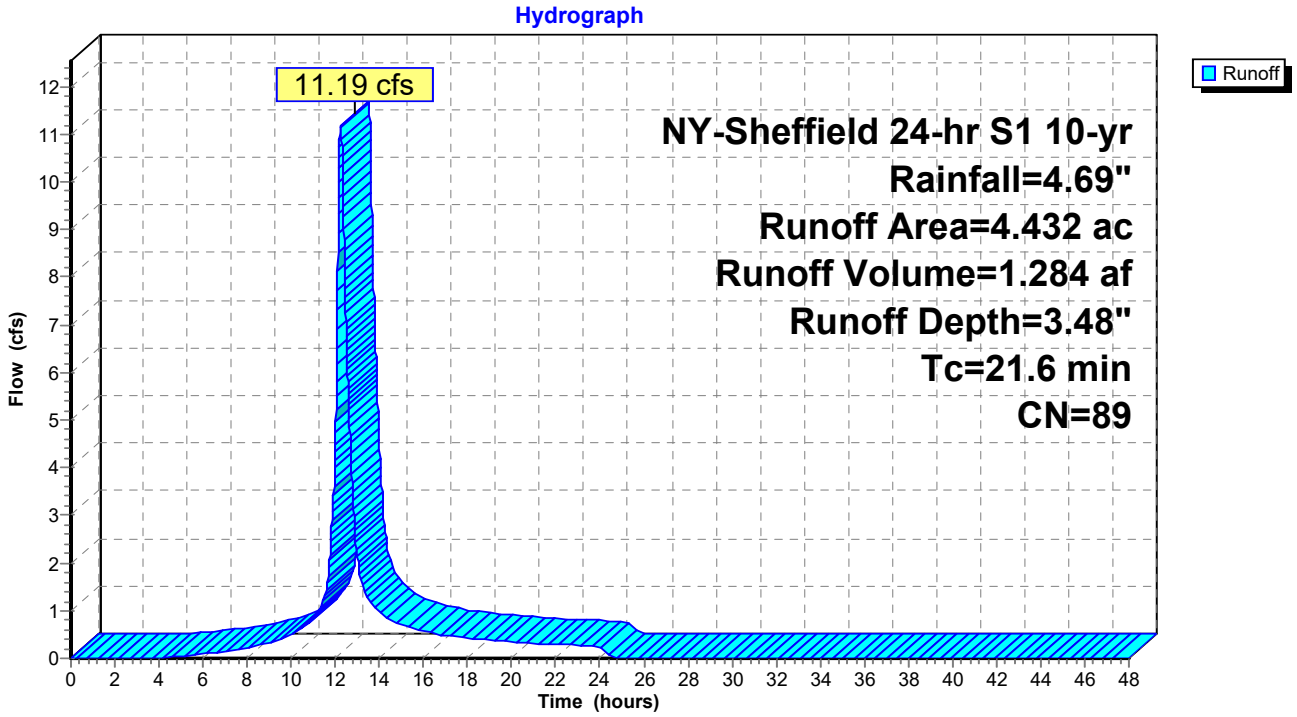
Subcatchment A: EX-A



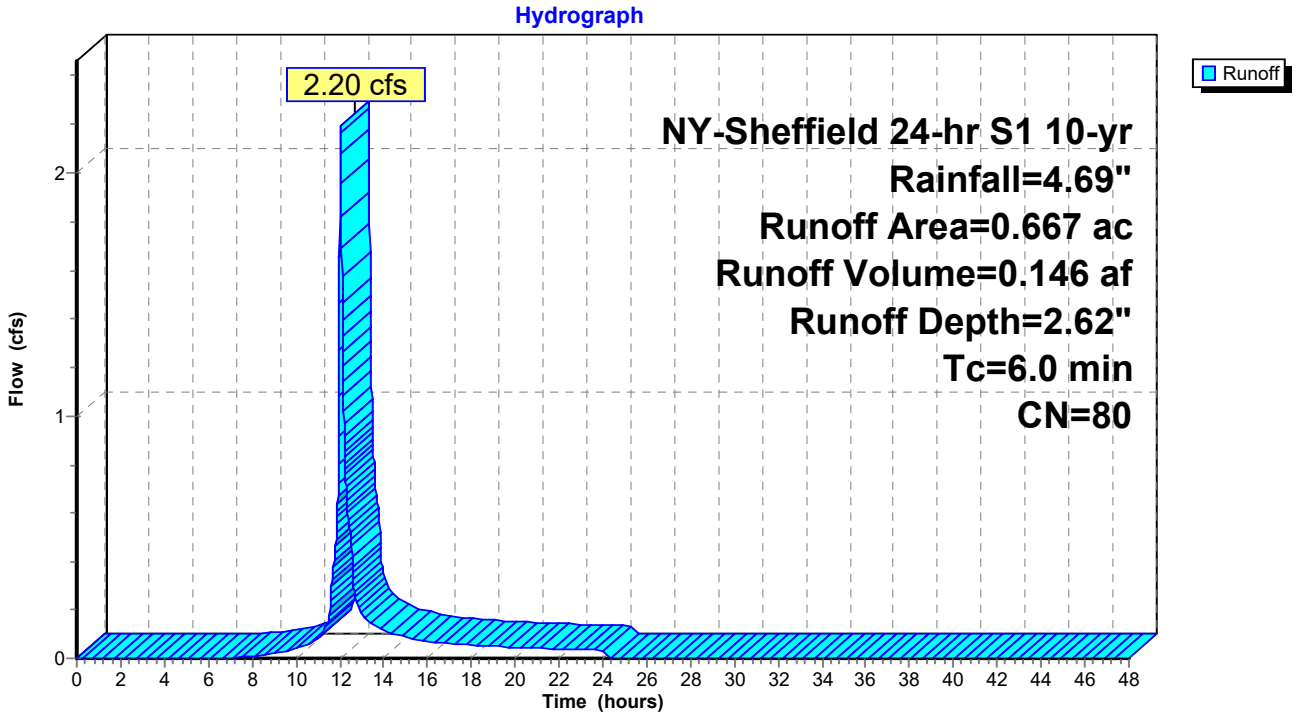
Subcatchment A1-A: PR-A1-A



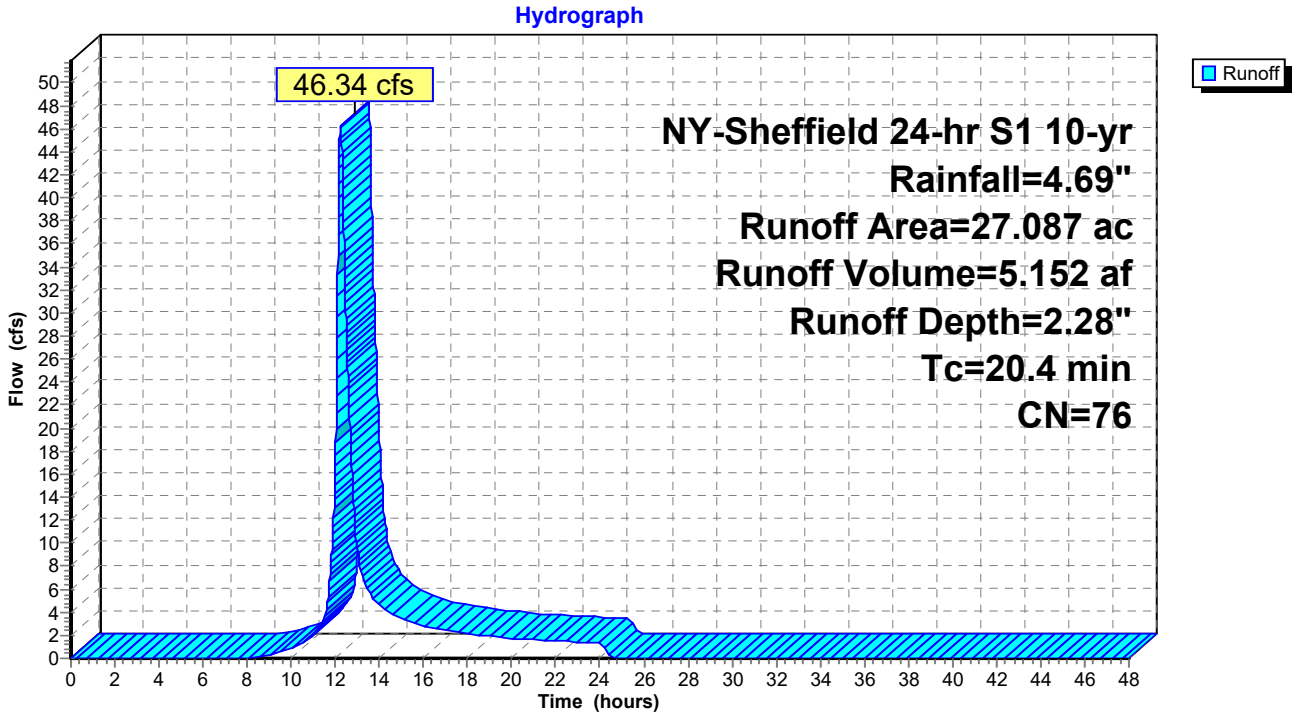
Subcatchment A1-B: PR-A1-B



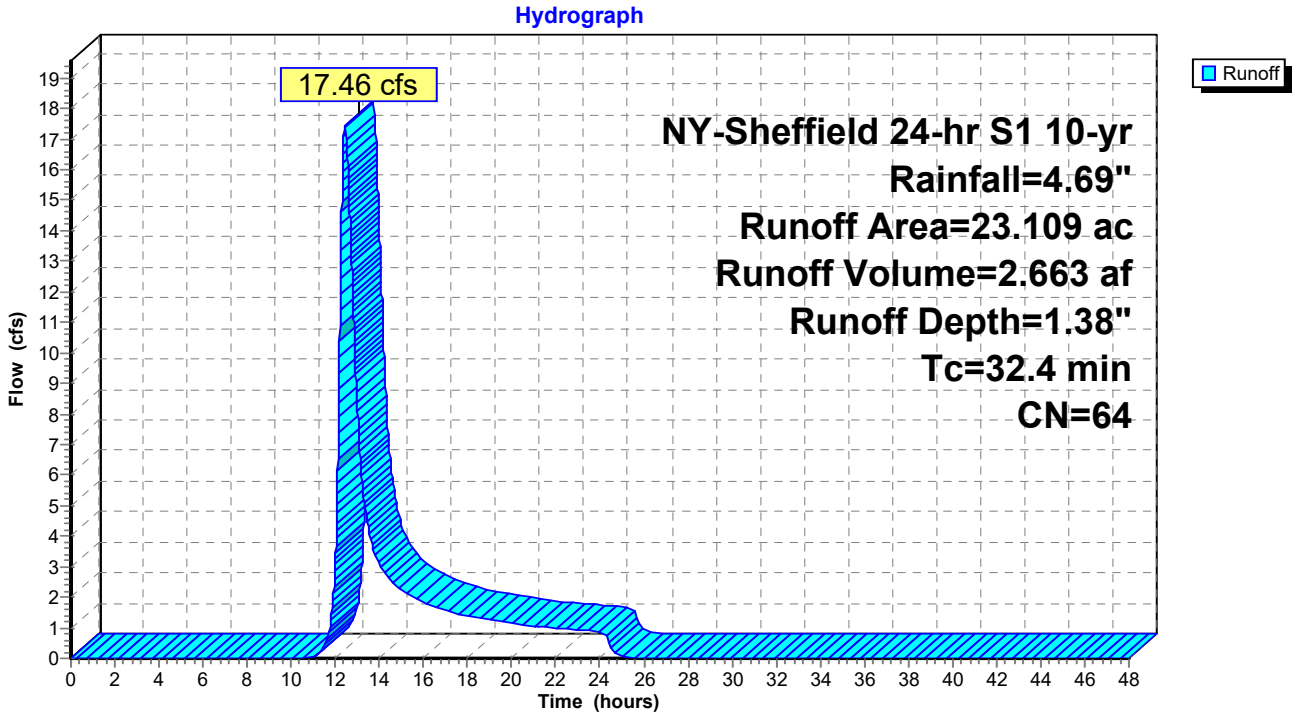
Subcatchment A1-C: PR-A1-C



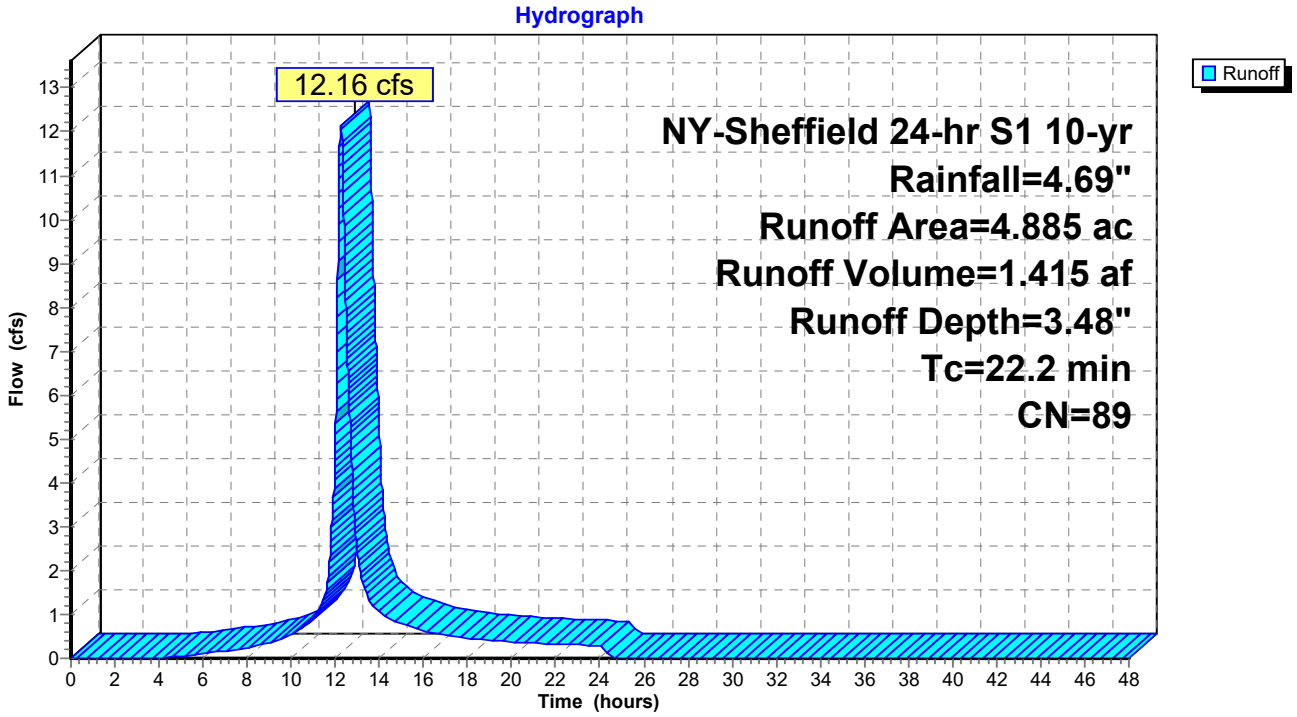
Subcatchment A2: PR-A2



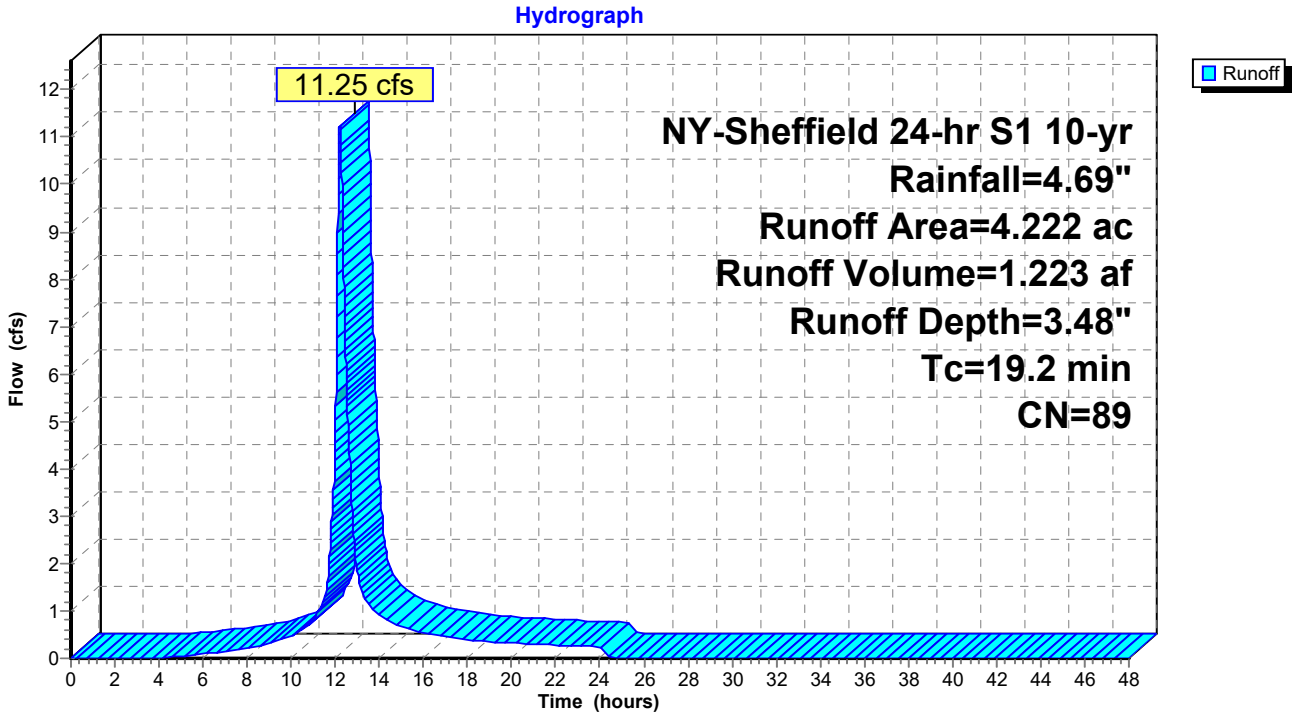
Subcatchment B: EX-B



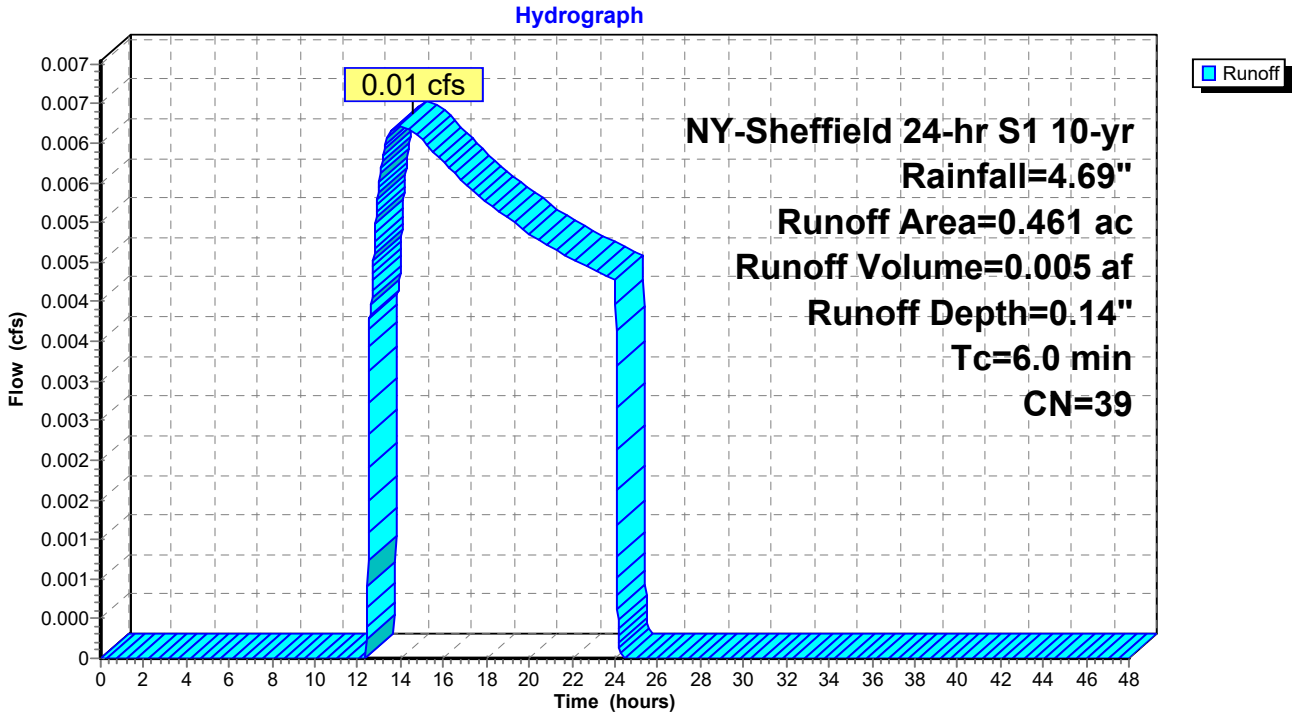
Subcatchment B1-A: PR-B1-A



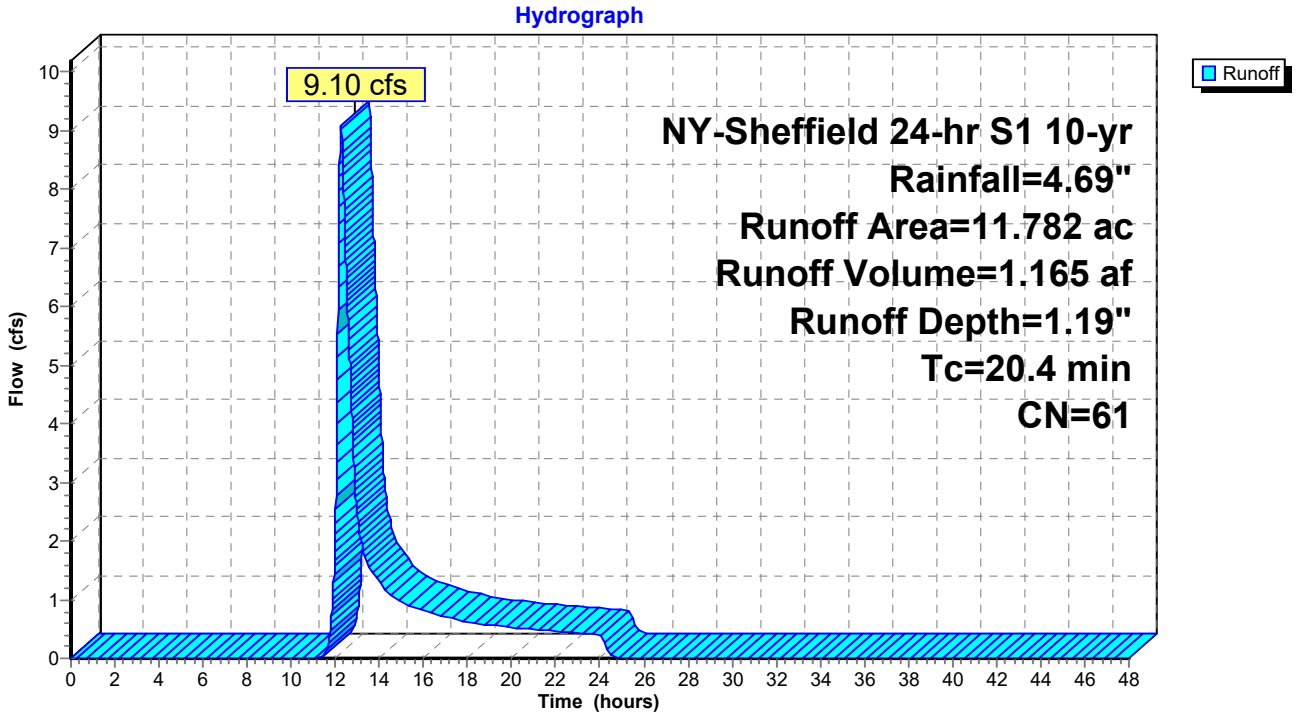
Subcatchment B1-B: PR-B1-B



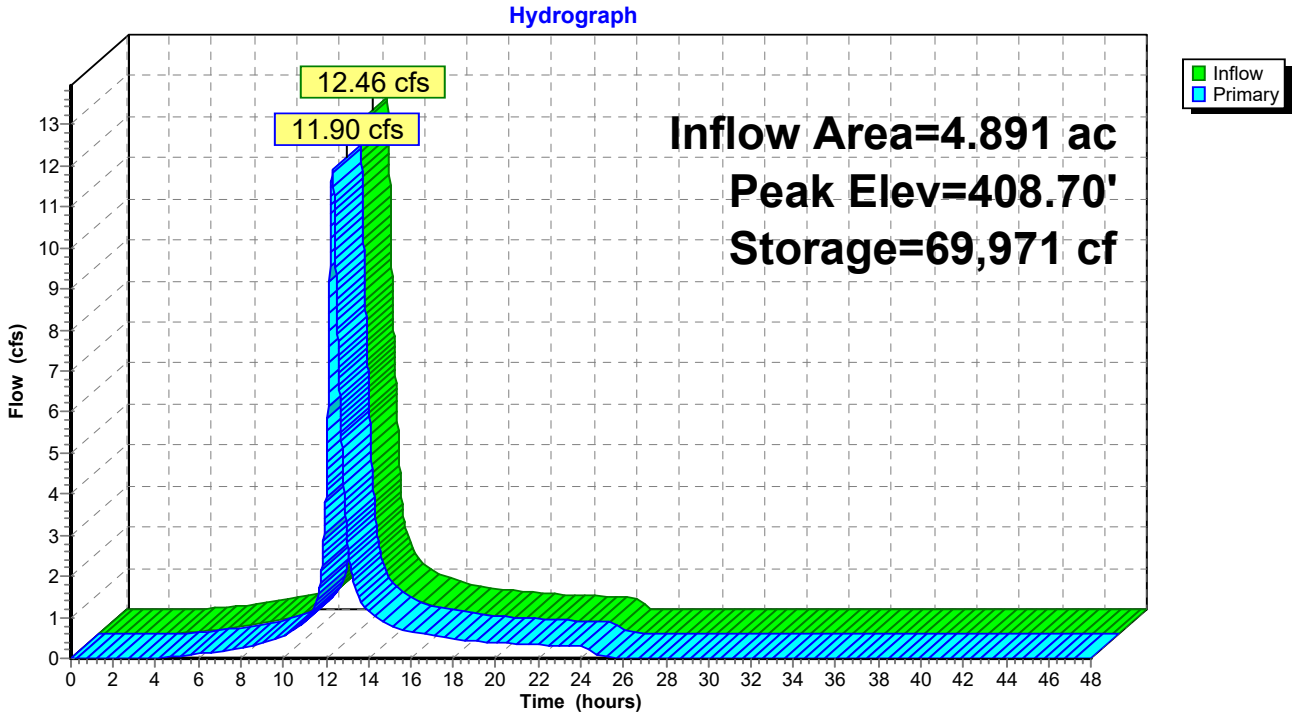
Subcatchment B1-C: PR-B1-C



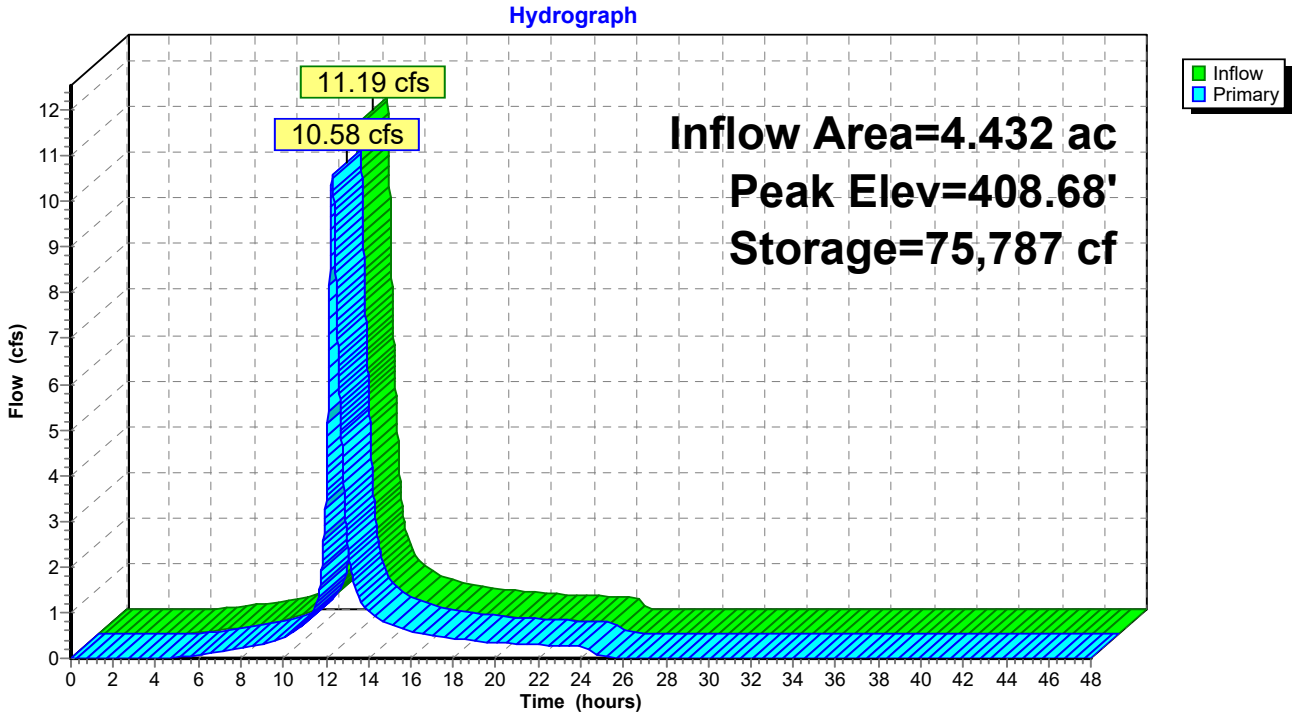
Subcatchment B2: PR-B2



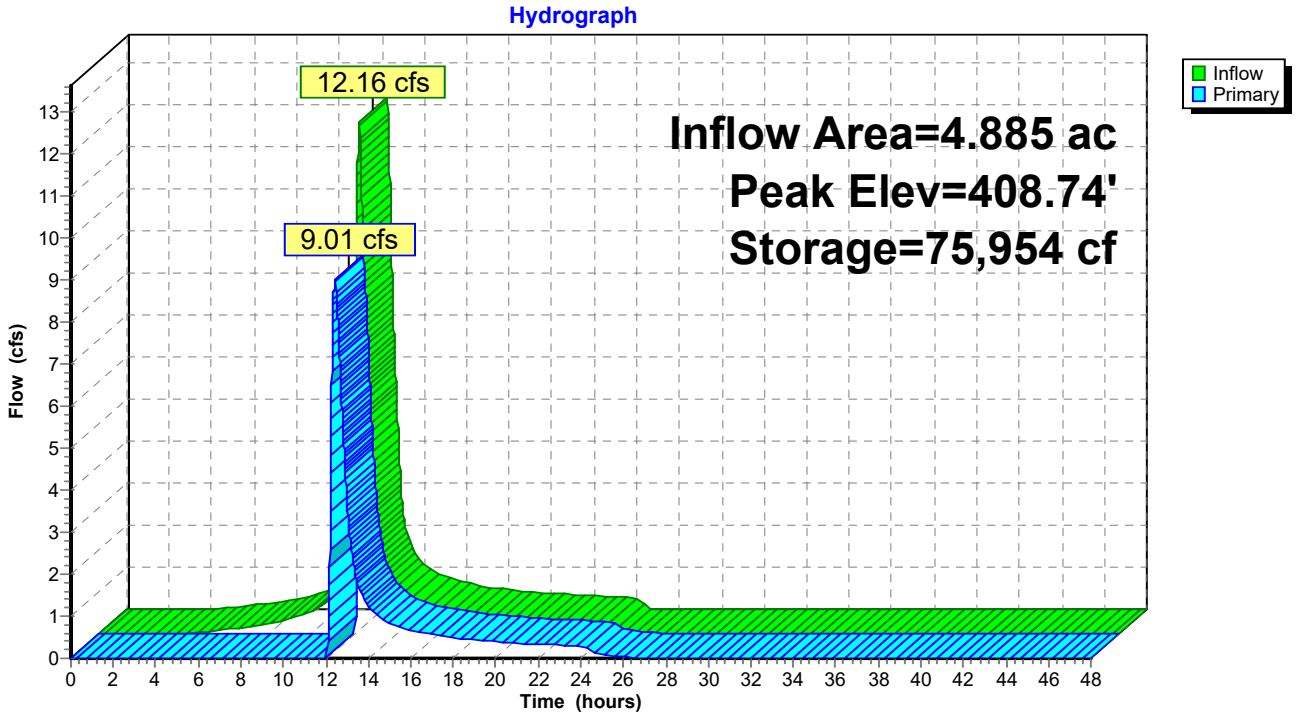
Pond 1P: Forebay & Bio A1-A



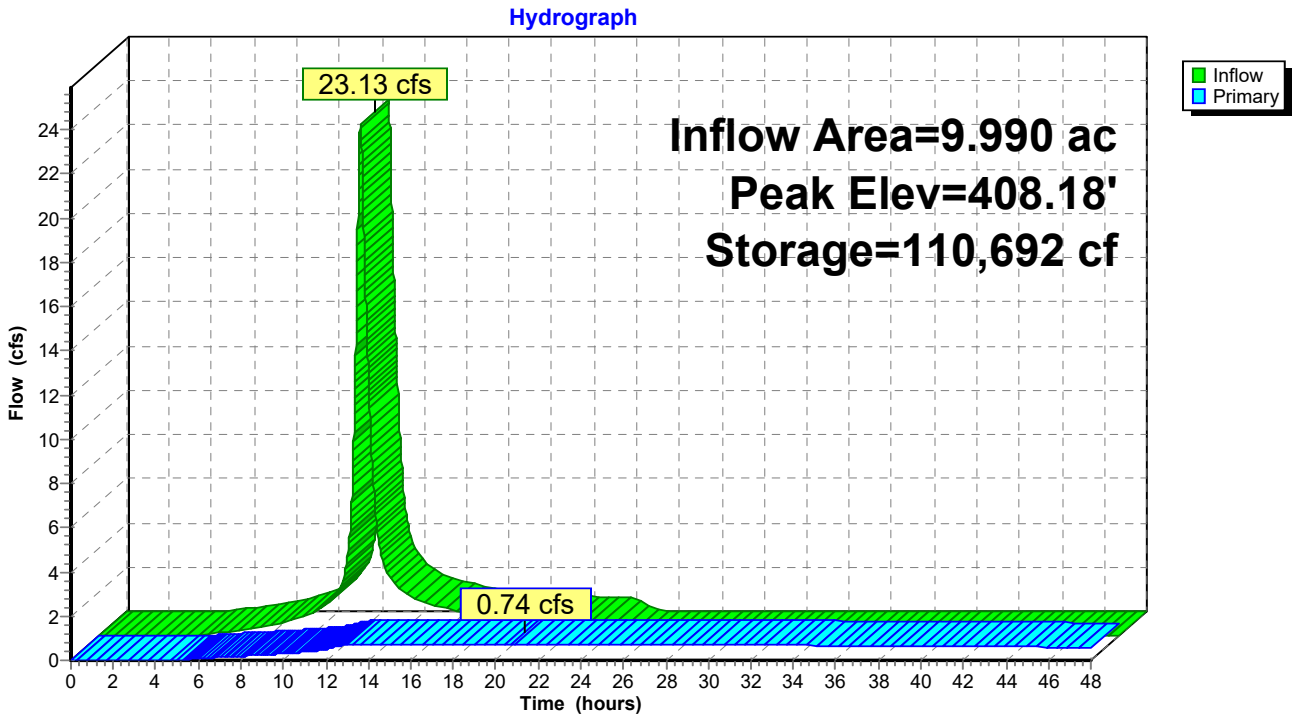
Pond 2P: Forebay & Bio A1-B



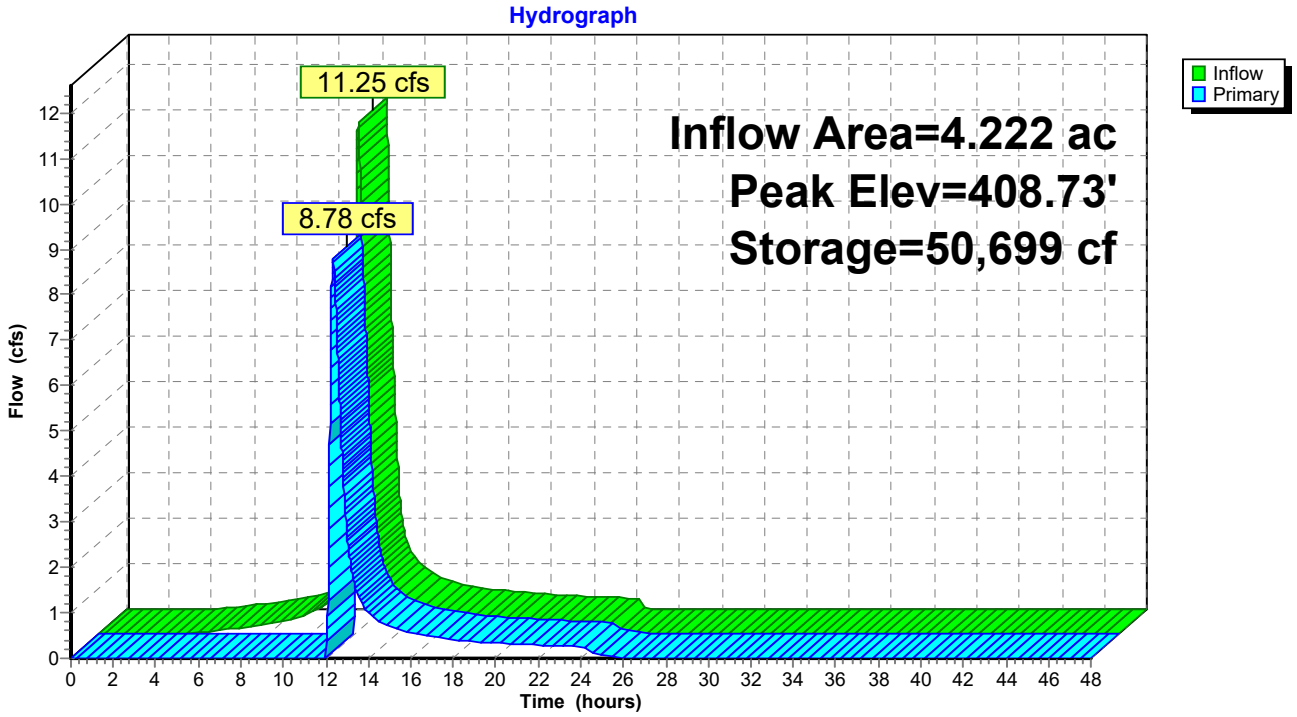
Pond 3P: Forebay & Bio B1-A



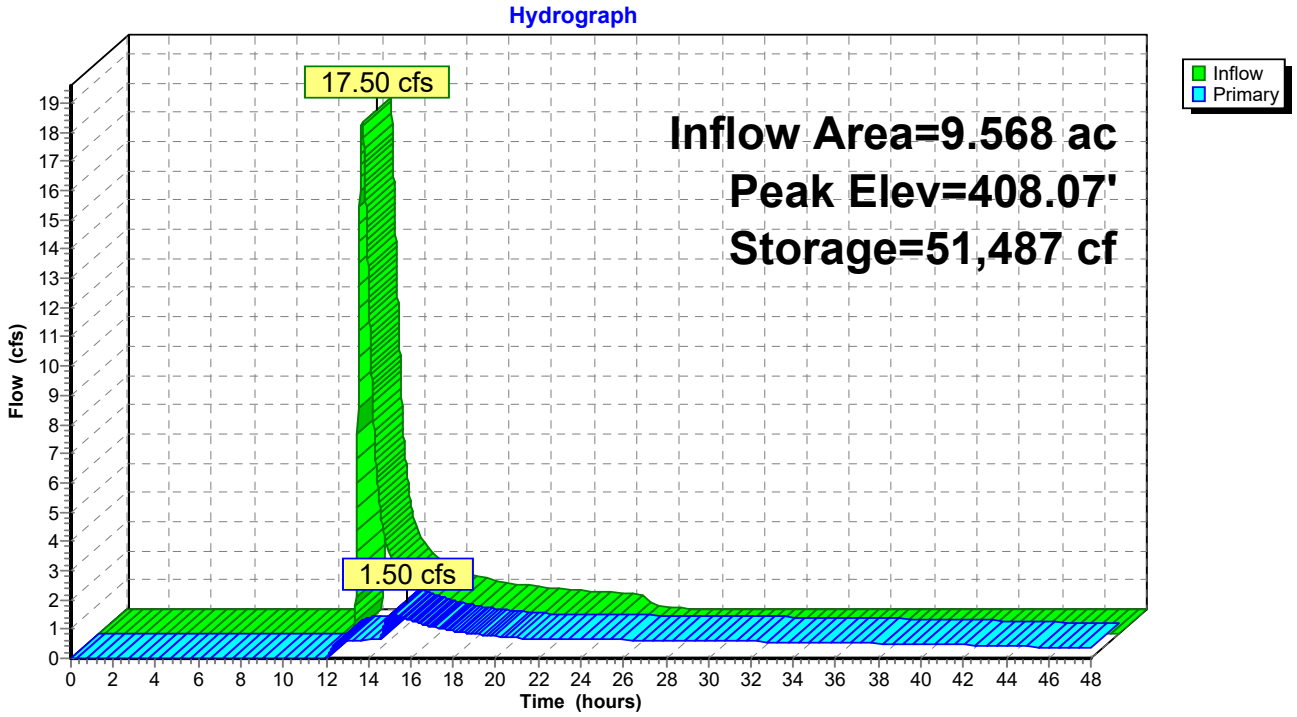
Pond 4P: Detention Basin A1



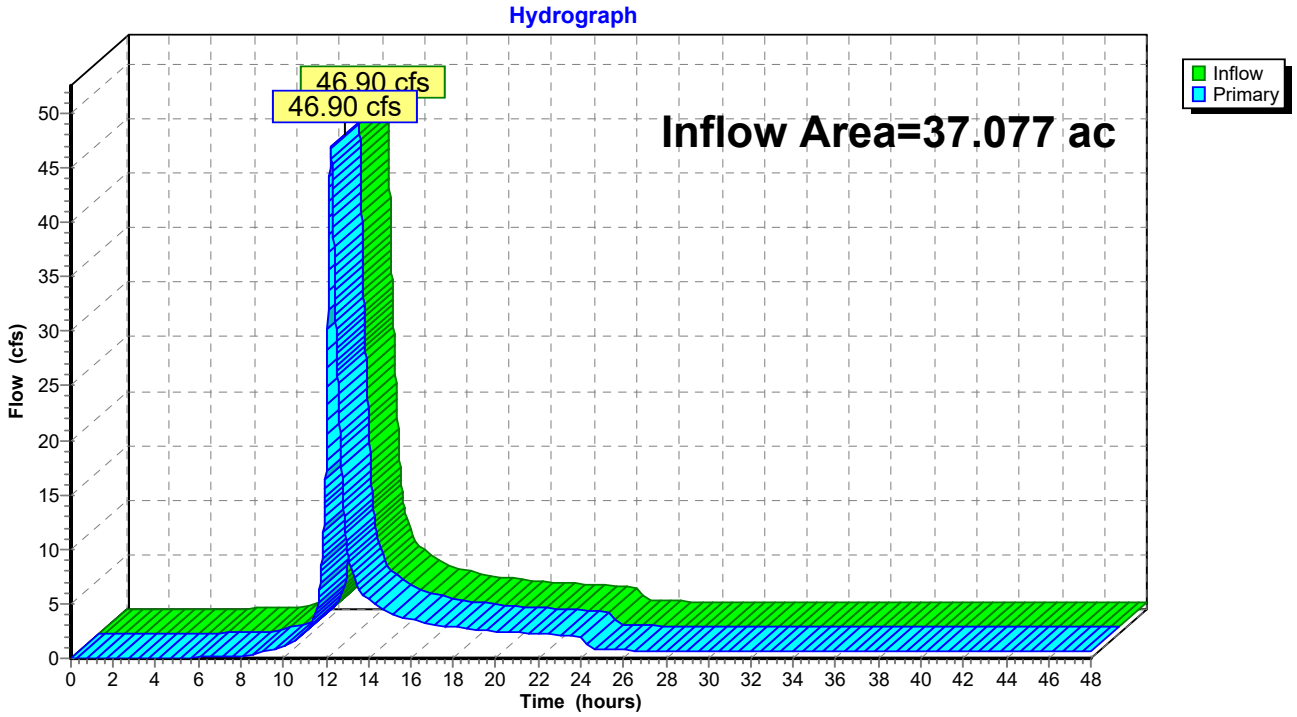
Pond 6P: Forebay & Bio B1-B



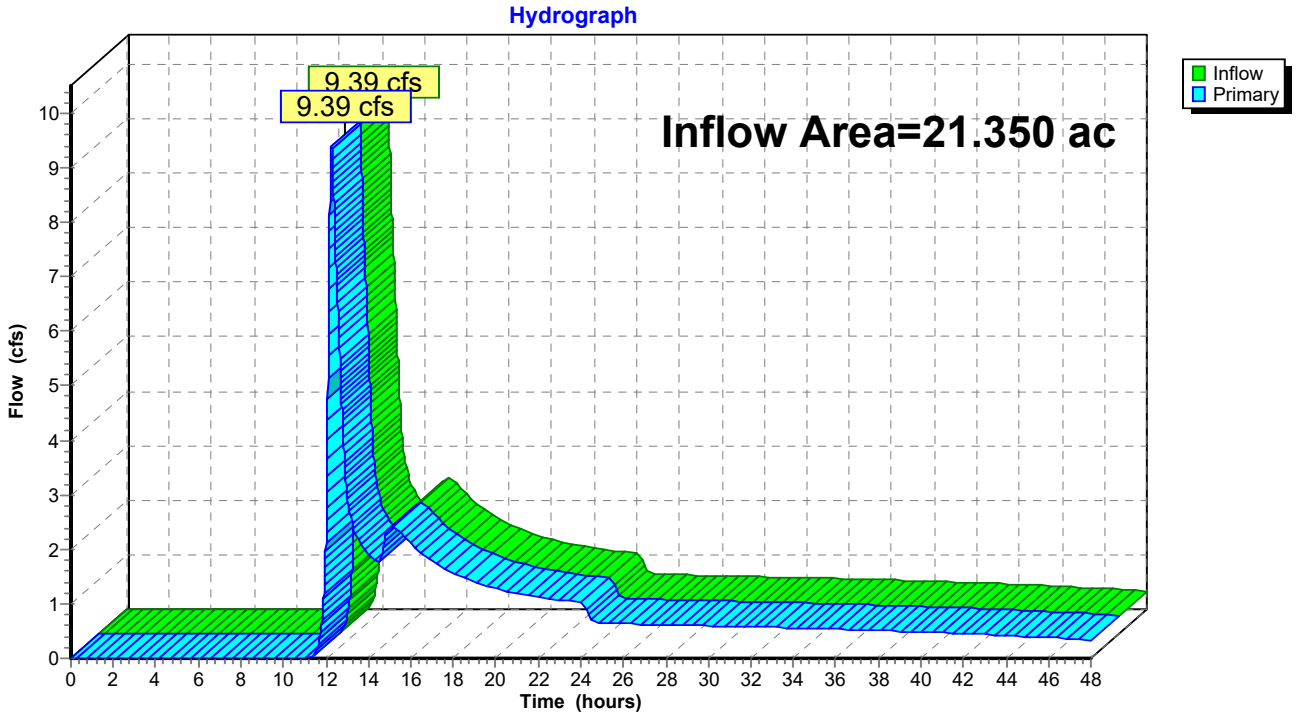
Pond 7P: Detention Basin B1



Pond PR-A: PR-A


Hydrograph
46.90 cfs
46.90 cfs
Inflow Area=37.077 ac
Inflow
Primary
Flow (cfs)
0
5
10
15
20
25
30
35
40
45
50
Time (hours)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Pond PR-B: PR-B


Hydrograph
9.39 cfs
9.39 cfs
Inflow Area=21.350 ac
Inflow
Primary
Flow (cfs)
Time (hours)
0 1 2 3 4 5 6 7 8 9 10
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

APPENDIX 10

100-YEAR DESIGN STORM

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

SubcatchmentA: EX-A Runoff Area=35.318 ac 19.88% Impervious Runoff Depth=5.39"
Tc=31.2 min CN=76 Runoff=111.57 cfs 15.852 af

SubcatchmentA1-A: PR-A1-A Runoff Area=4.891 ac 54.92% Impervious Runoff Depth=7.05"
Tc=22.2 min CN=90 Runoff=22.54 cfs 2.874 af

SubcatchmentA1-B: PR-A1-B Runoff Area=4.432 ac 51.17% Impervious Runoff Depth=6.93"
Tc=21.6 min CN=89 Runoff=20.50 cfs 2.560 af

SubcatchmentA1-C: PR-A1-C Runoff Area=0.667 ac 0.00% Impervious Runoff Depth=5.86"
Tc=6.0 min CN=80 Runoff=4.46 cfs 0.326 af

SubcatchmentA2: PR-A2 Runoff Area=27.087 ac 31.06% Impervious Runoff Depth=5.39"
Tc=20.4 min CN=76 Runoff=104.19 cfs 12.157 af

SubcatchmentB: EX-B Runoff Area=23.109 ac 4.81% Impervious Runoff Depth=3.98"
Tc=32.4 min CN=64 Runoff=52.74 cfs 7.668 af

SubcatchmentB1-A: PR-B1-A Runoff Area=4.885 ac 52.14% Impervious Runoff Depth=6.93"
Tc=22.2 min CN=89 Runoff=22.28 cfs 2.822 af

SubcatchmentB1-B: PR-B1-B Runoff Area=4.222 ac 52.11% Impervious Runoff Depth=6.93"
Tc=19.2 min CN=89 Runoff=20.54 cfs 2.439 af

SubcatchmentB1-C: PR-B1-C Runoff Area=0.461 ac 0.00% Impervious Runoff Depth=1.26"
Tc=6.0 min CN=39 Runoff=0.41 cfs 0.049 af

SubcatchmentB2: PR-B2 Runoff Area=11.782 ac 11.29% Impervious Runoff Depth=3.64"
Tc=20.4 min CN=61 Runoff=30.10 cfs 3.570 af

Pond 1P: Forebay & Bio A1-A Peak Elev=408.99' Storage=75,512 cf Inflow=22.54 cfs 2.874 af
Outflow=21.90 cfs 2.874 af

Pond 2P: Forebay & Bio A1-B Peak Elev=408.99' Storage=82,052 cf Inflow=20.50 cfs 2.560 af
Outflow=19.78 cfs 2.560 af

Pond 3P: Forebay & Bio B1-A Peak Elev=408.97' Storage=80,602 cf Inflow=22.28 cfs 2.822 af
Outflow=19.78 cfs 2.461 af

Pond 4P: Detention Basin A1 Peak Elev=408.99' Storage=127,372 cf Inflow=43.11 cfs 5.760 af
Outflow=16.53 cfs 4.863 af

Pond 6P: Forebay & Bio B1-B Peak Elev=408.95' Storage=54,319 cf Inflow=20.54 cfs 2.439 af
Outflow=18.34 cfs 2.143 af

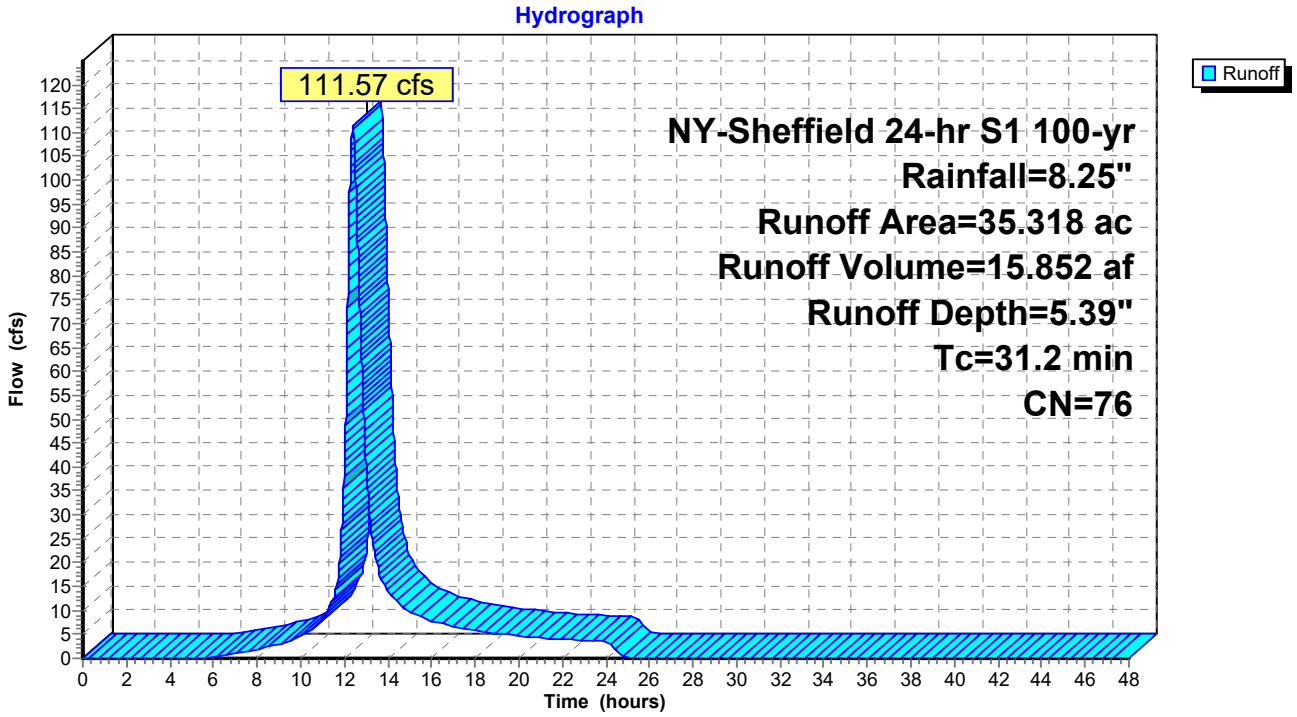
Pond 7P: Detention Basin B1 Peak Elev=408.76' Storage=60,825 cf Inflow=38.04 cfs 4.652 af
Outflow=24.09 cfs 4.493 af

Pond PR-A: PR-A Inflow=104.90 cfs 17.021 af
Primary=104.90 cfs 17.021 af

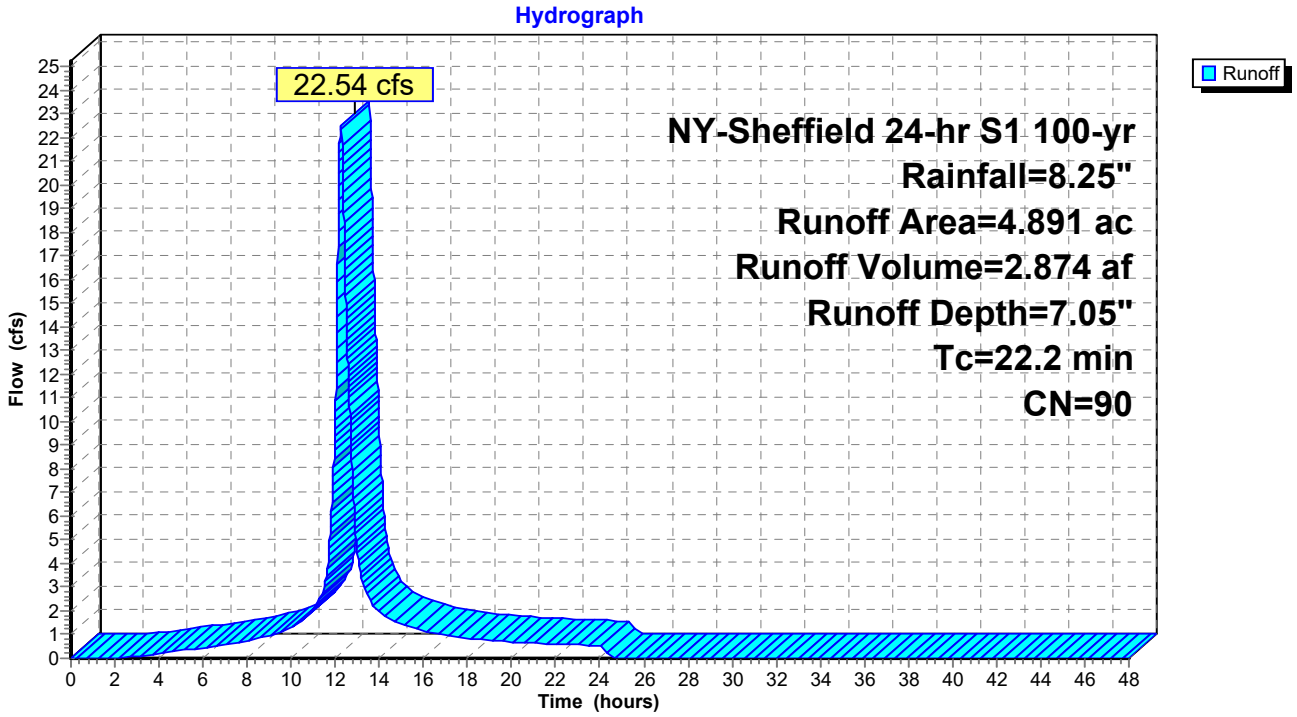
Pond PR-B: PR-B Inflow=47.71 cfs 8.064 af
Primary=47.71 cfs 8.064 af

Total Runoff Area = 116.854 ac Runoff Volume = 50.317 af Average Runoff Depth = 5.17"
76.40% Pervious = 89.280 ac 23.60% Impervious = 27.574 ac

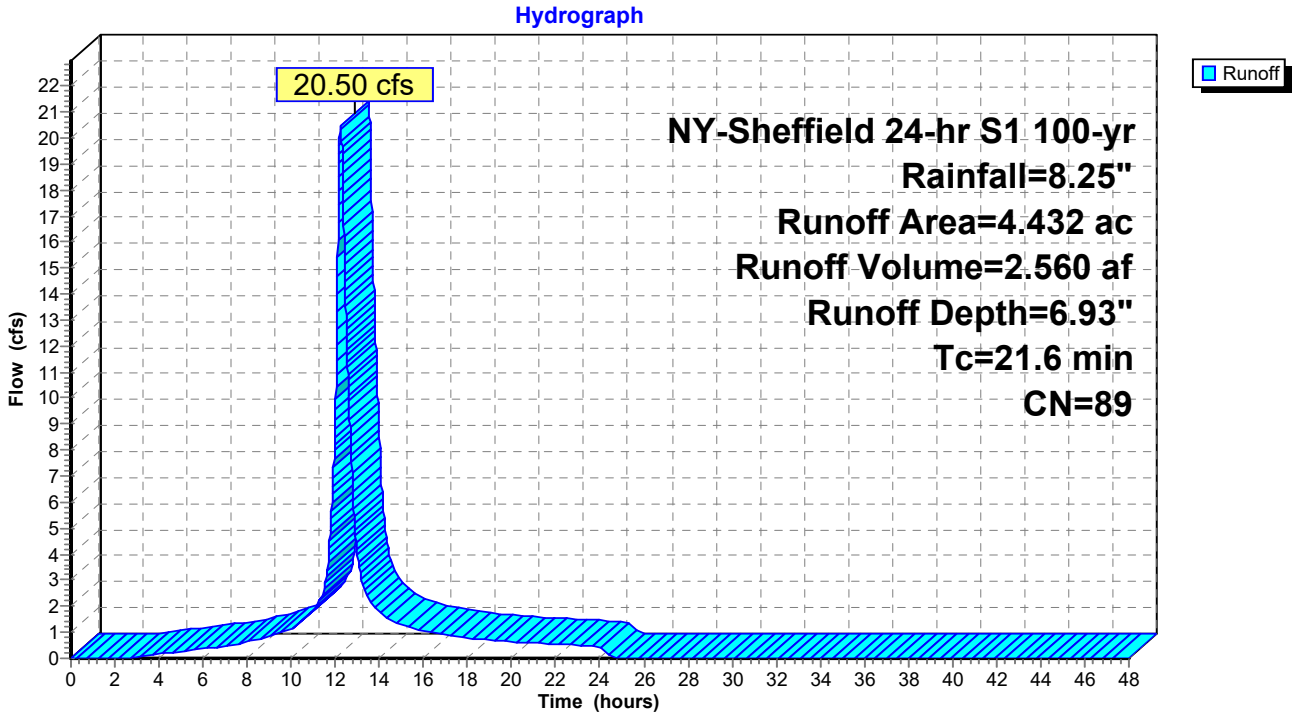
Subcatchment A: EX-A



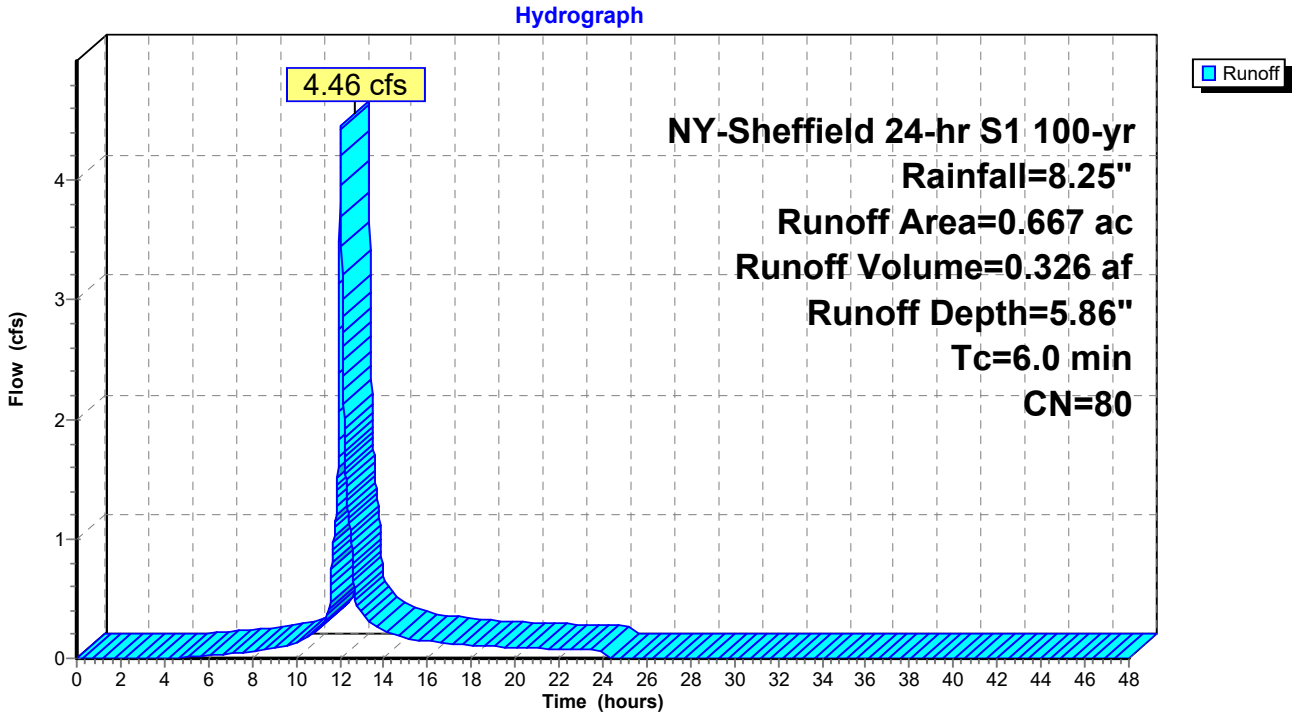
Subcatchment A1-A: PR-A1-A



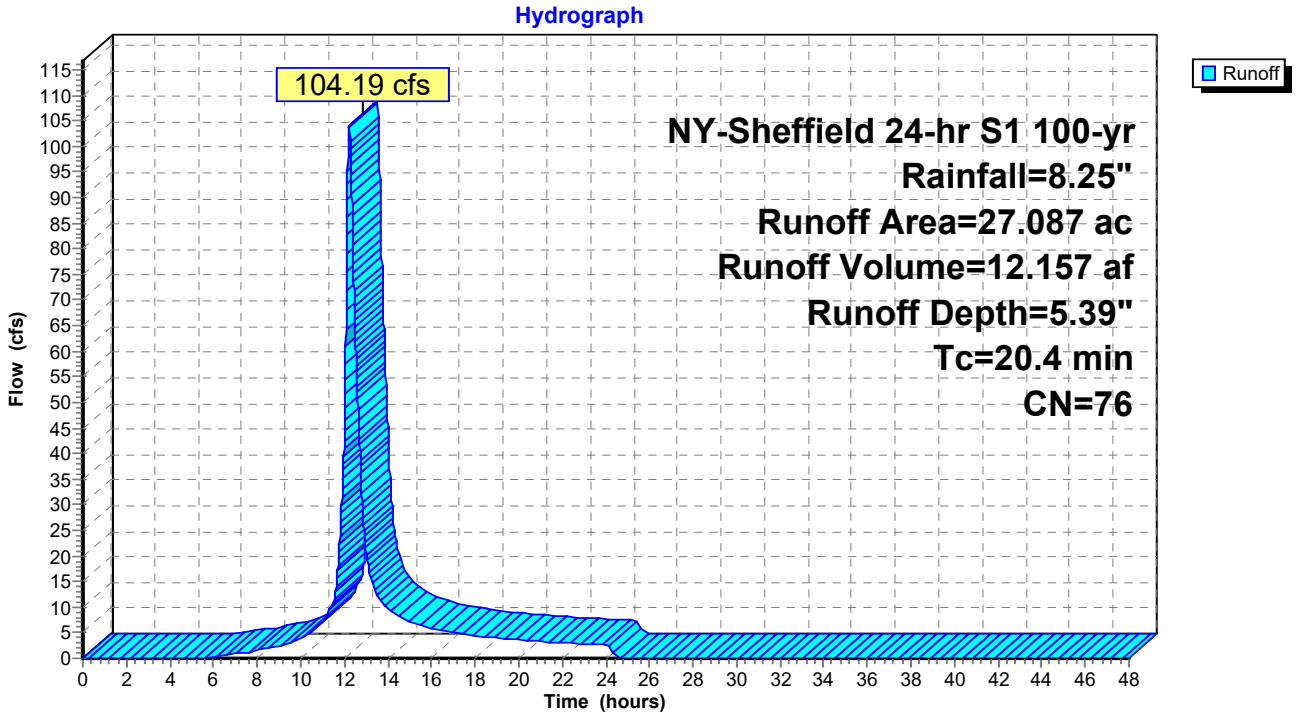
Subcatchment A1-B: PR-A1-B



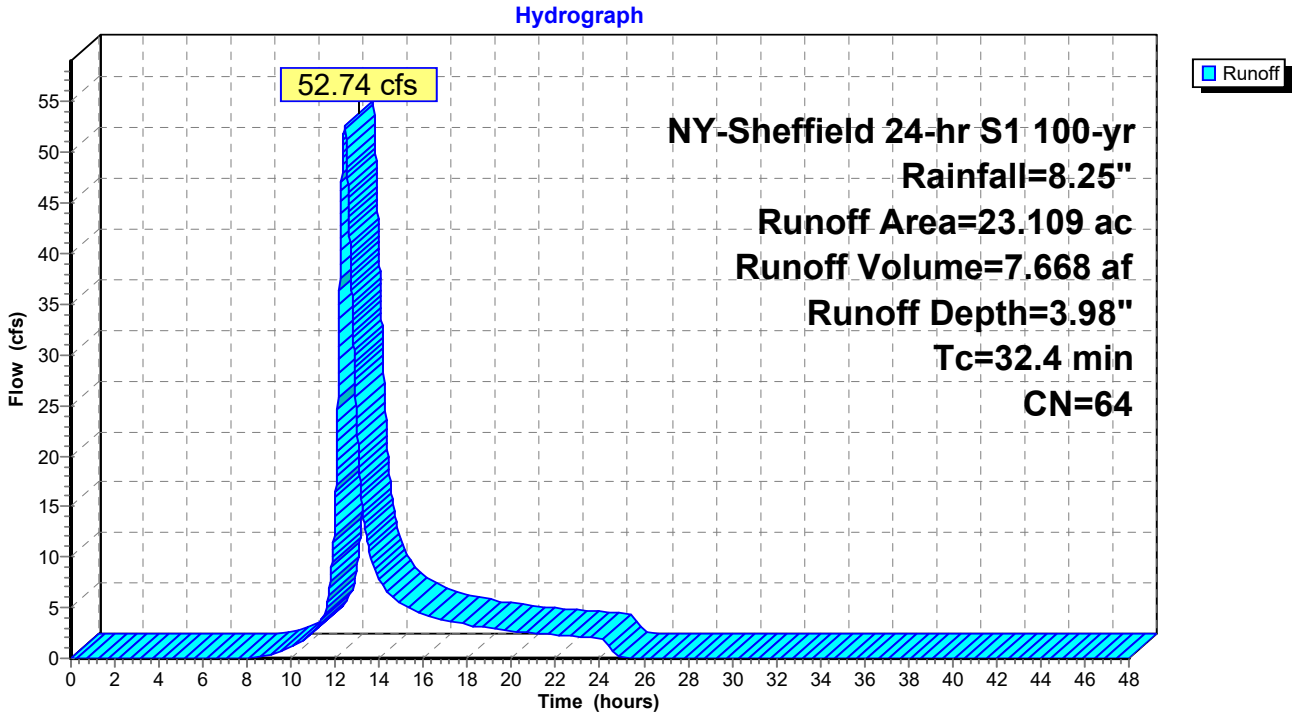
Subcatchment A1-C: PR-A1-C



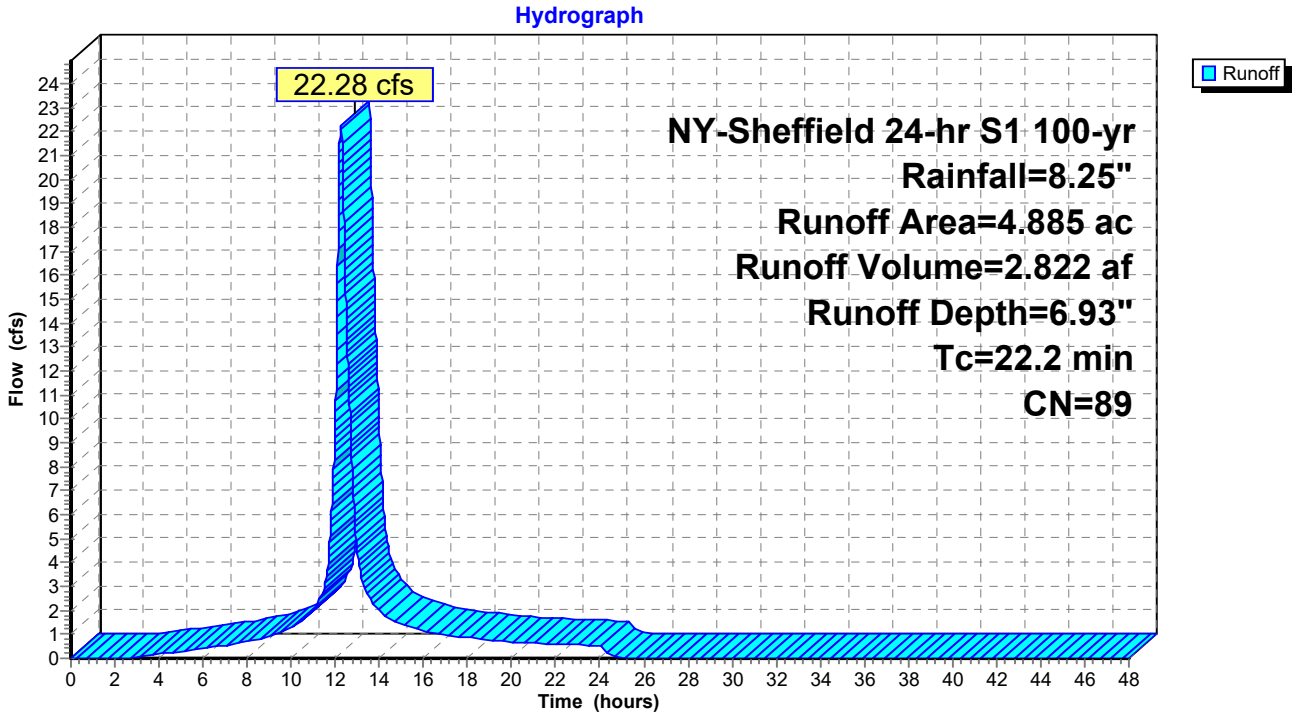
Subcatchment A2: PR-A2



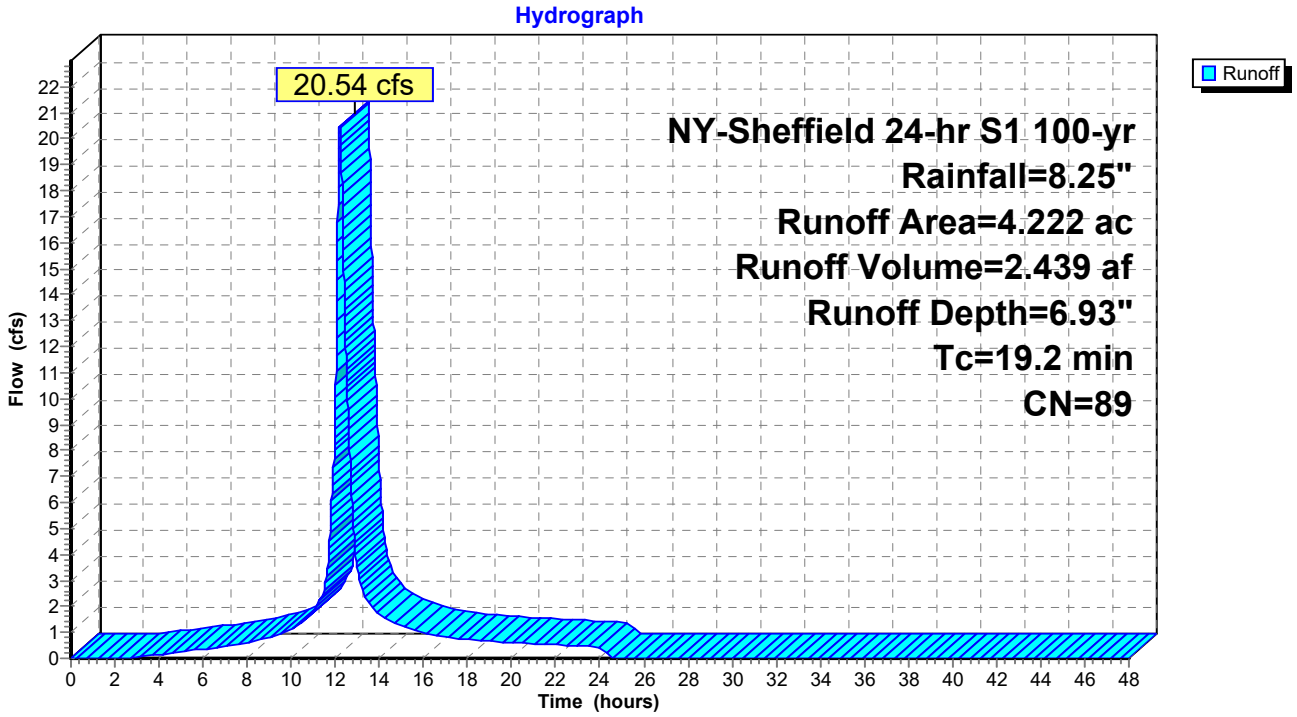
Subcatchment B: EX-B



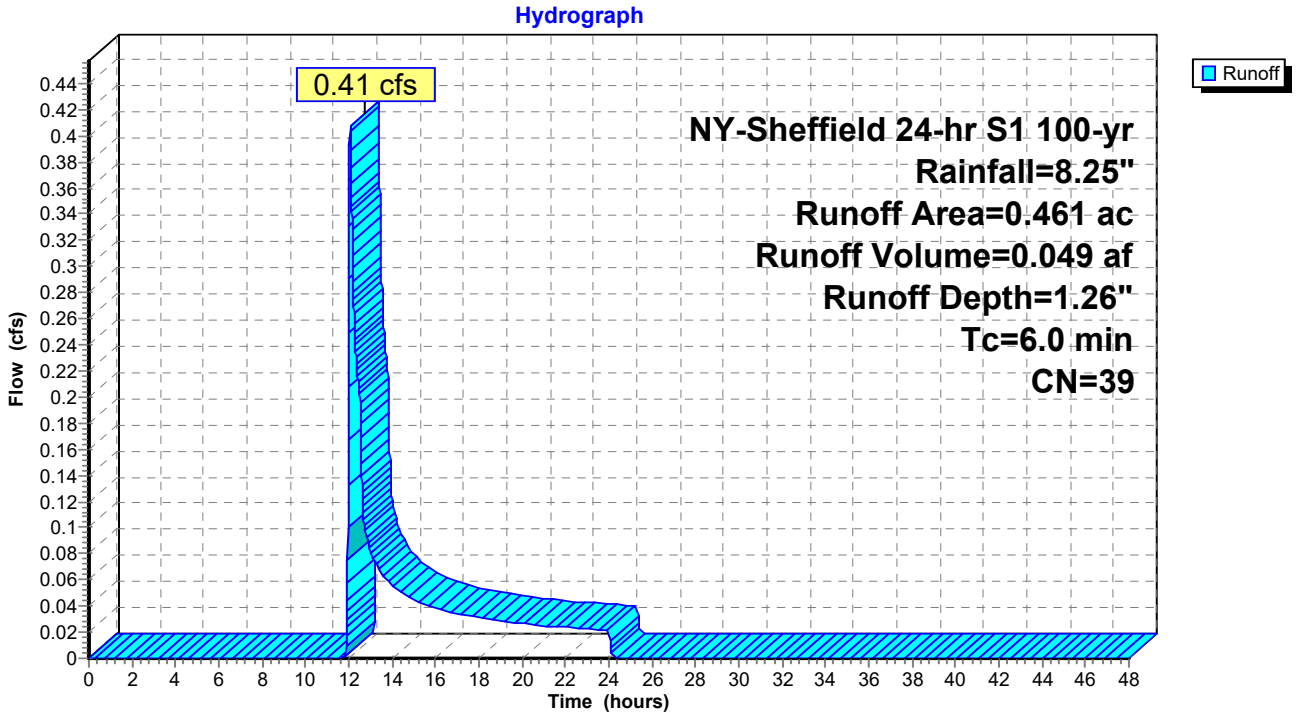
Subcatchment B1-A: PR-B1-A



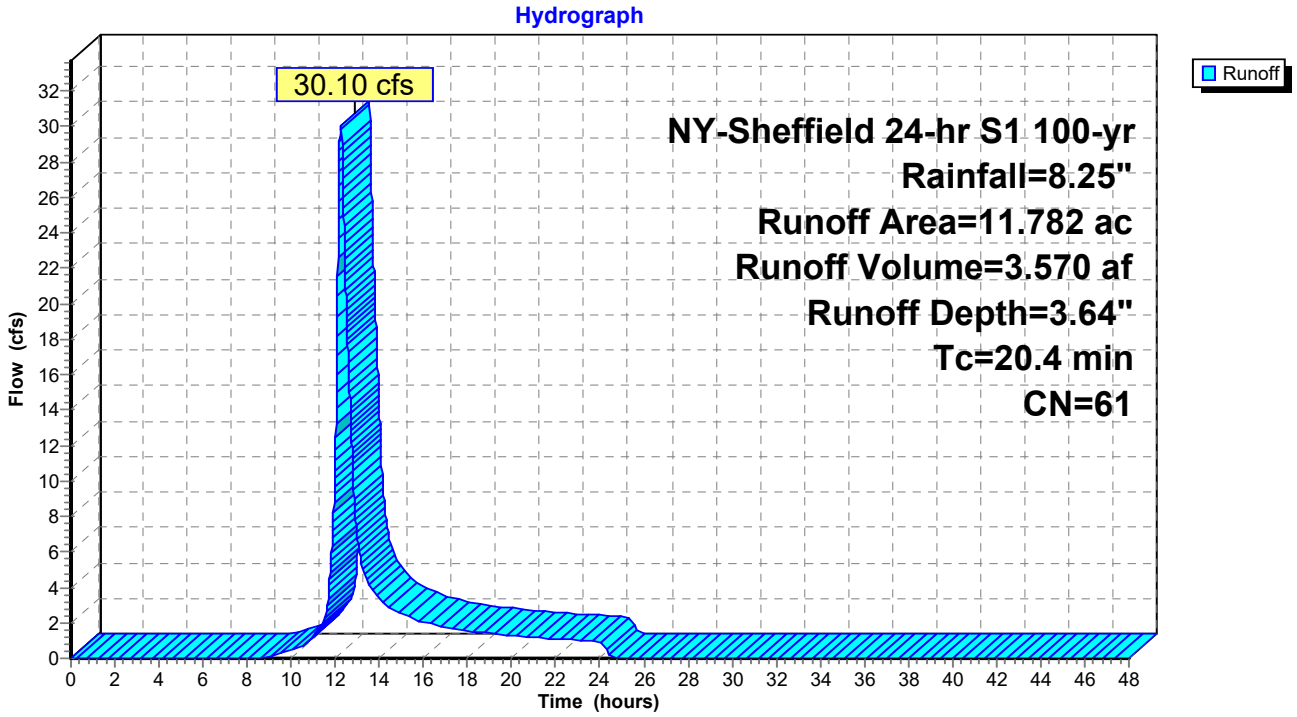
Subcatchment B1-B: PR-B1-B



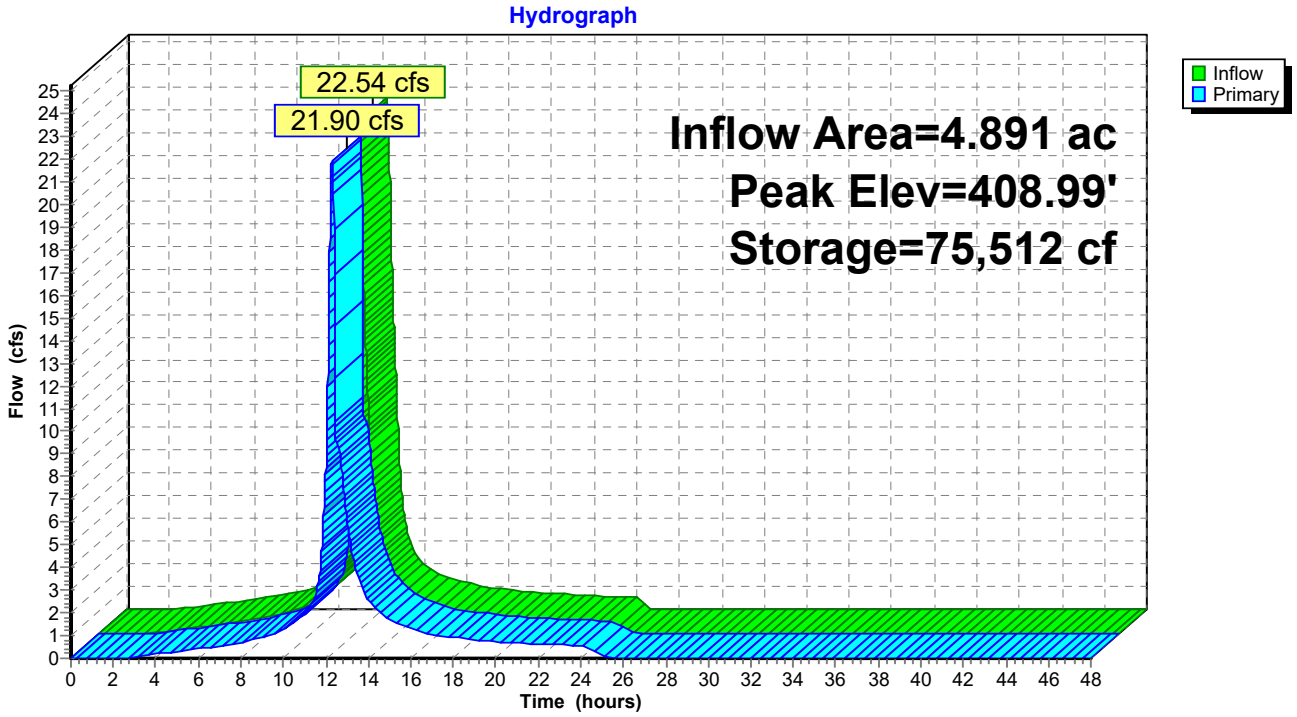
Subcatchment B1-C: PR-B1-C



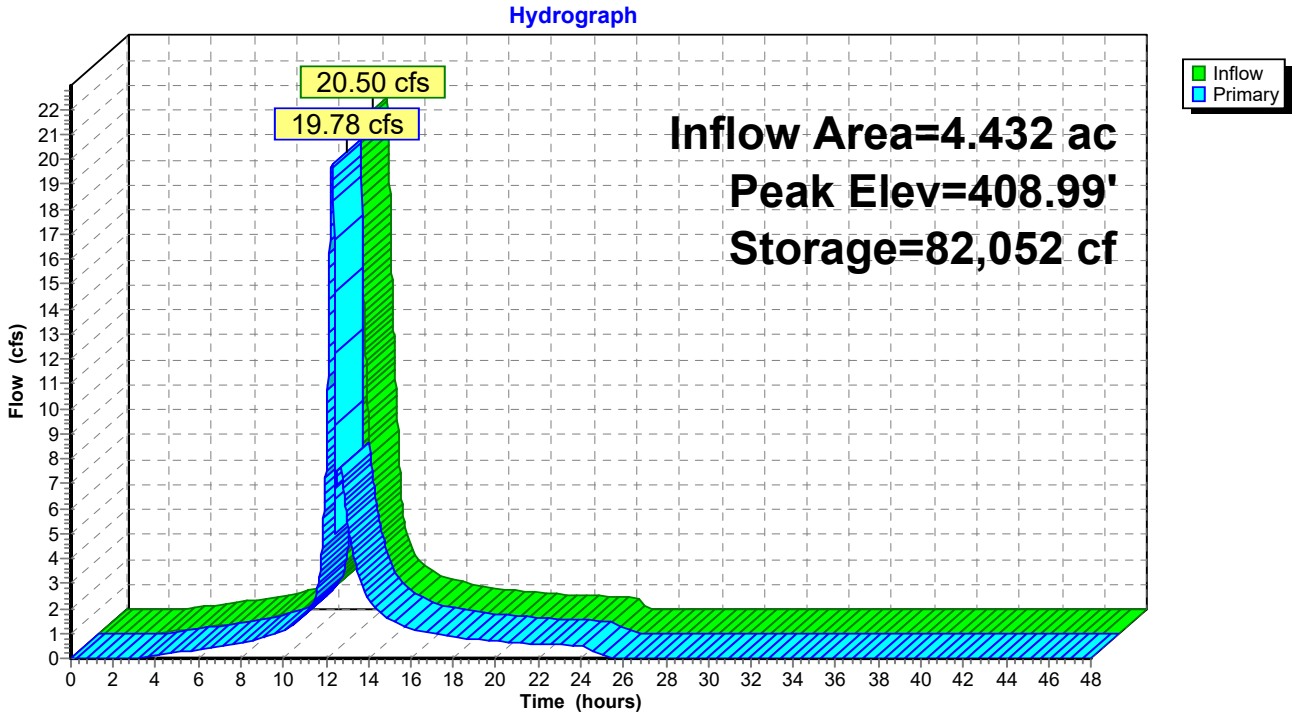
Subcatchment B2: PR-B2



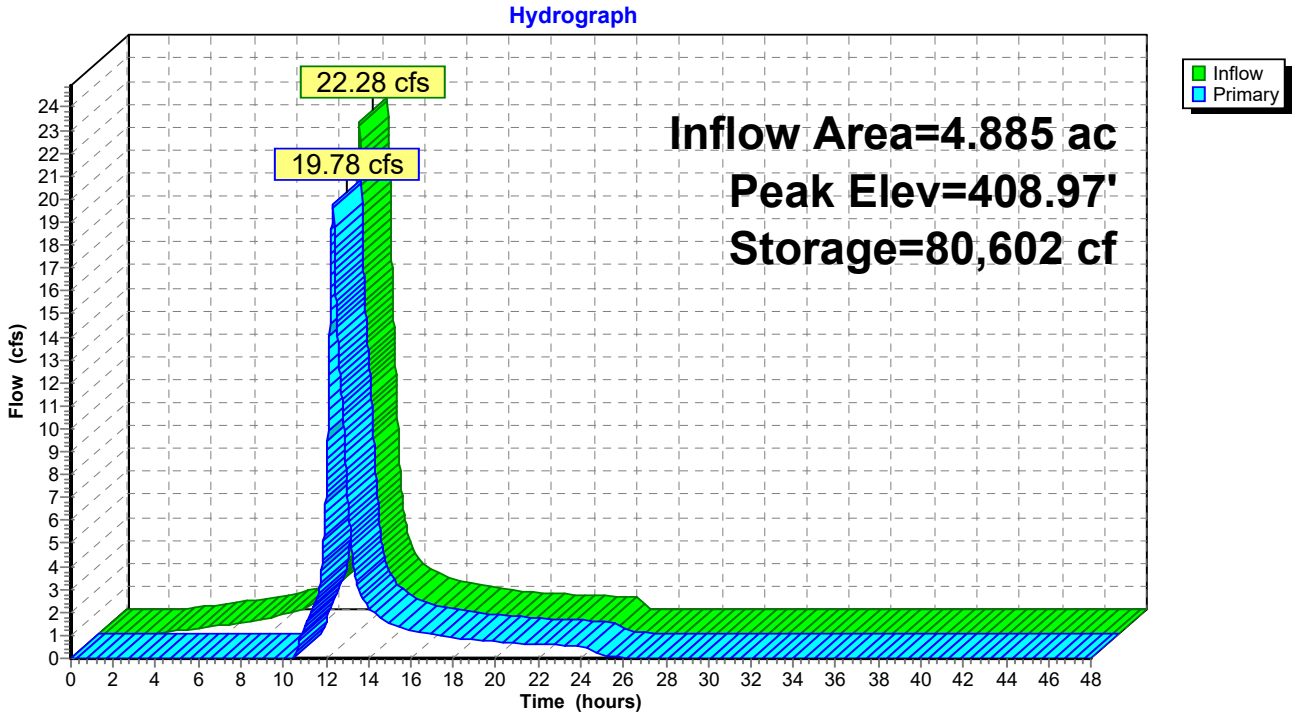
Pond 1P: Forebay & Bio A1-A



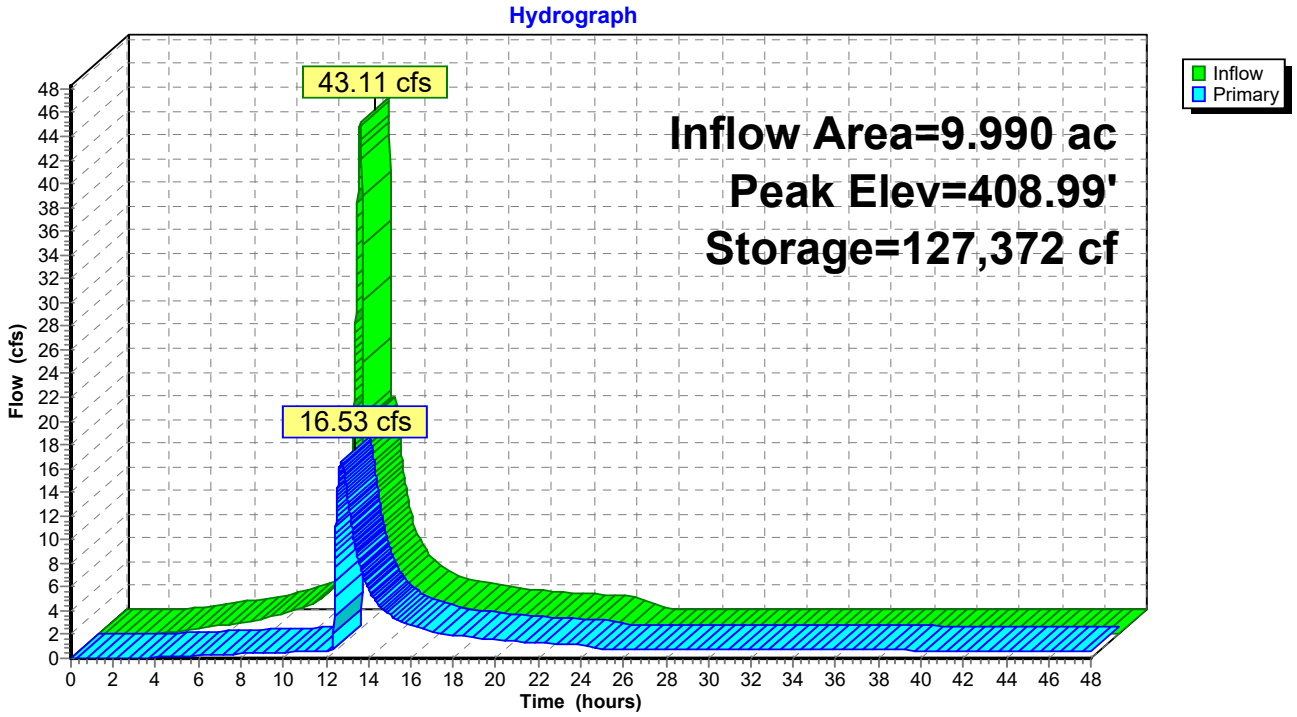
Pond 2P: Forebay & Bio A1-B



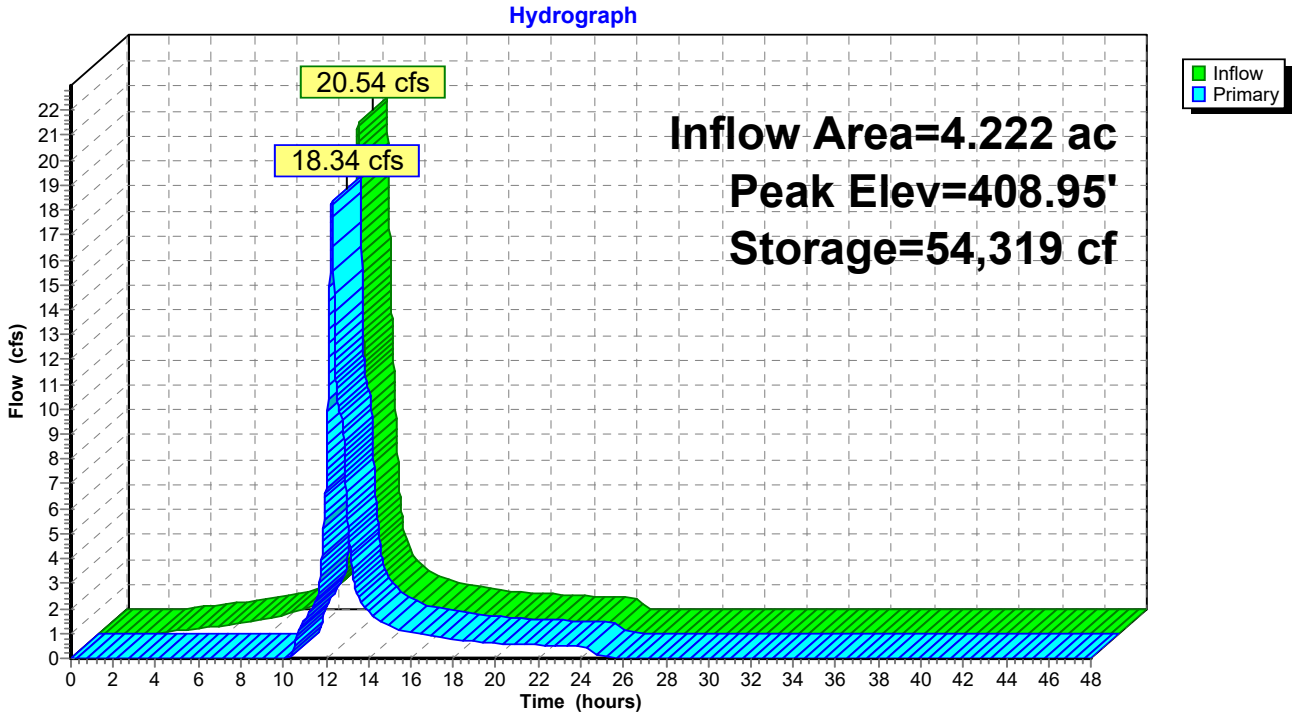
Pond 3P: Forebay & Bio B1-A



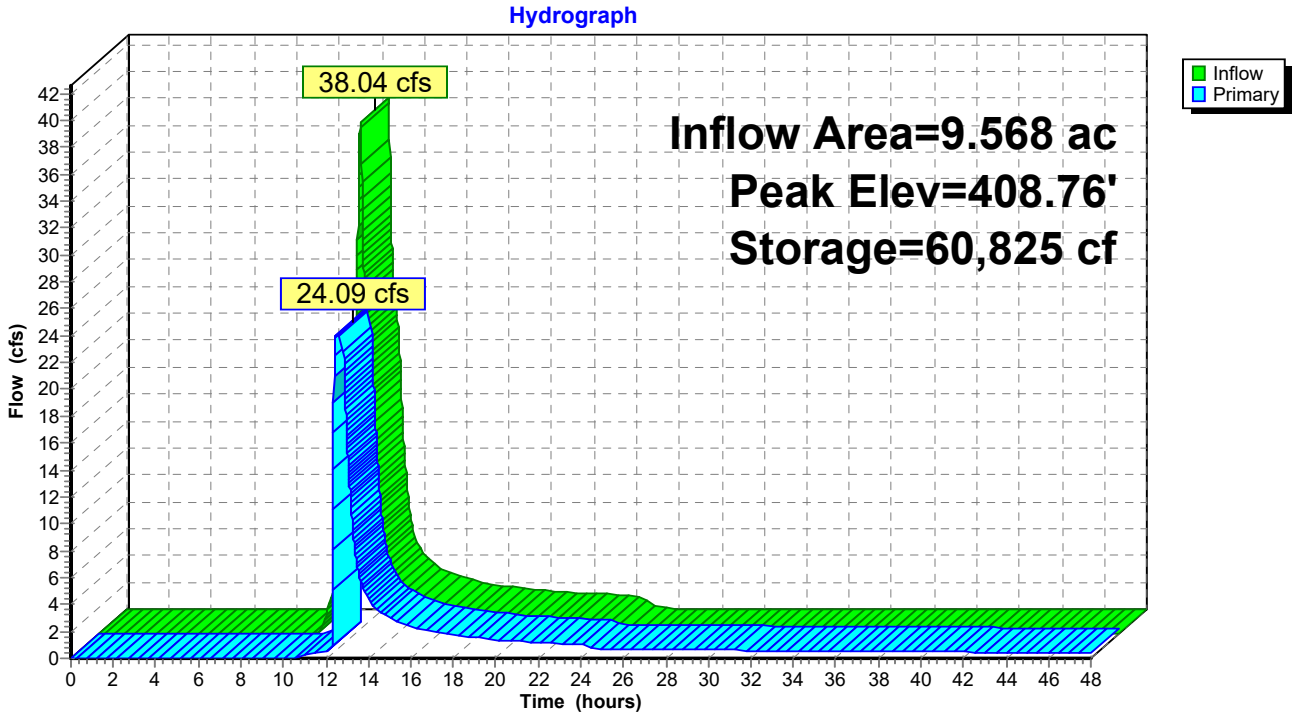
Pond 4P: Detention Basin A1



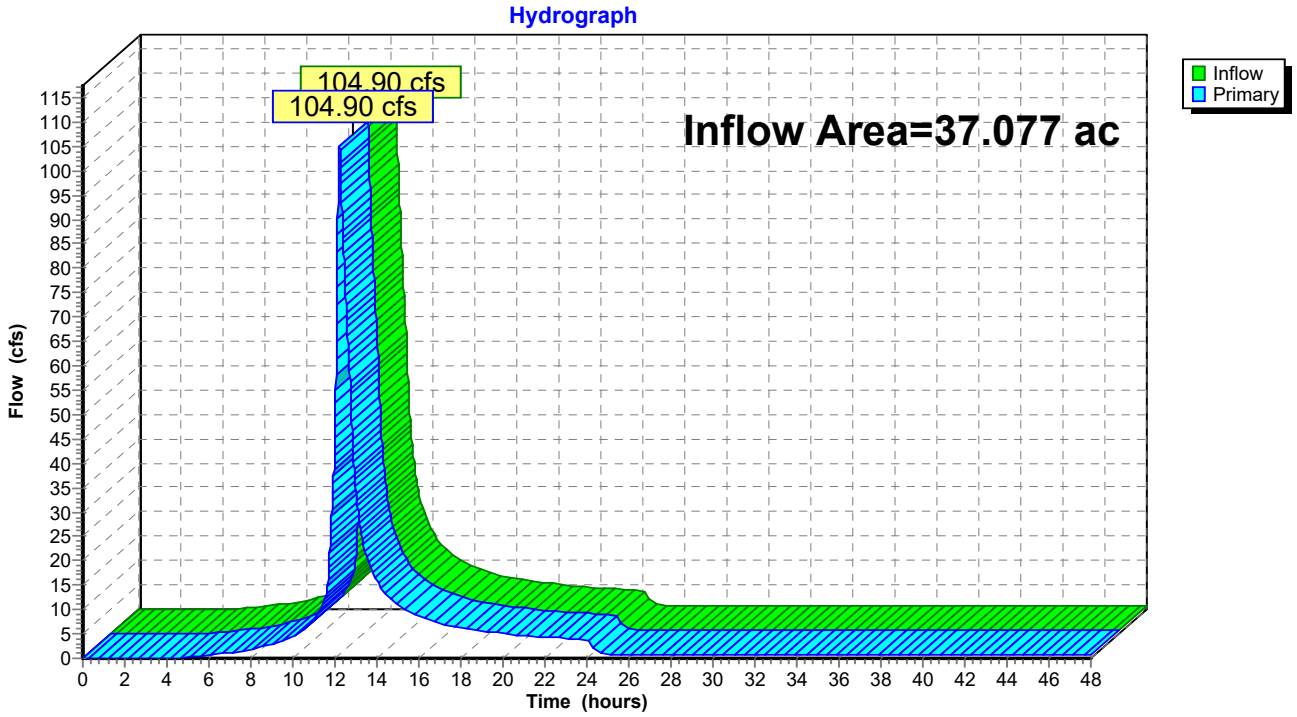
Pond 6P: Forebay & Bio B1-B



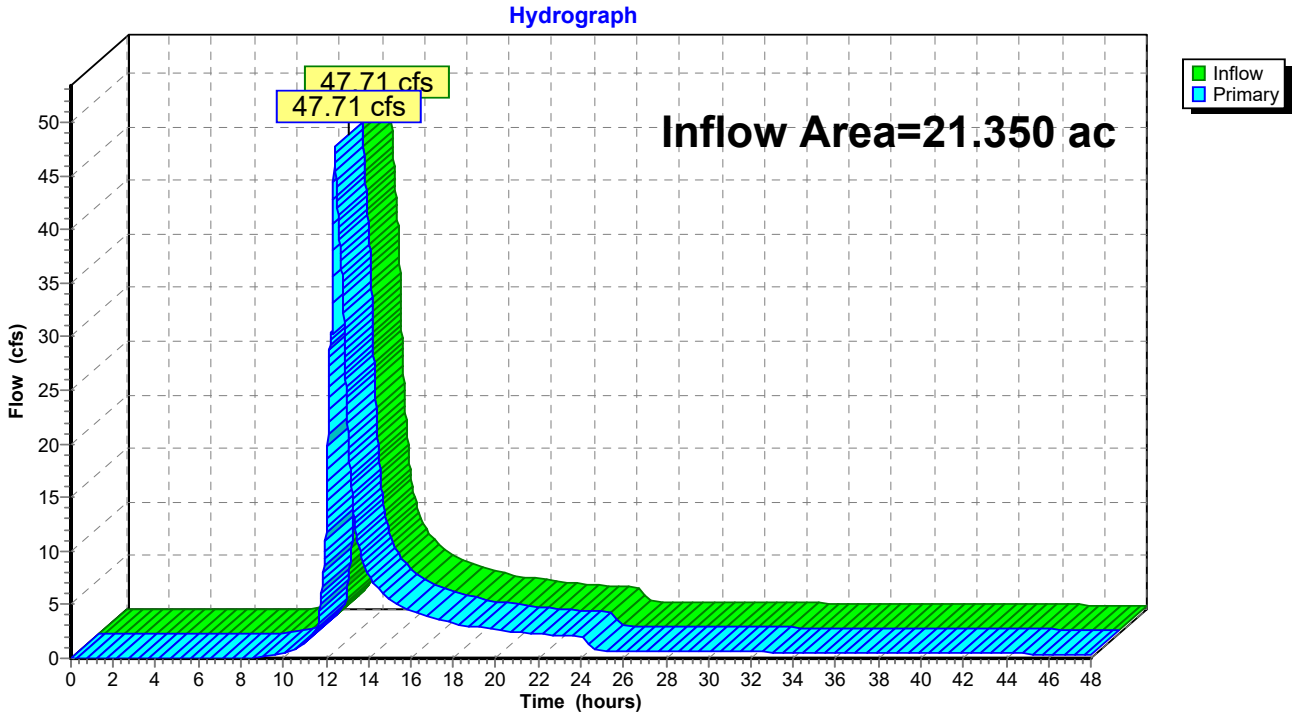
Pond 7P: Detention Basin B1



Pond PR-A: PR-A


Hydrograph
104.90 cfs
104.90 cfs
Inflow Area=37.077 ac
Inflow
Primary
Flow (cfs)
Time (hours)
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Pond PR-B: PR-B


Hydrograph
47.71 cfs
47.71 cfs
Inflow Area=21.350 ac
Inflow
Primary
Flow (cfs)
0
5
10
15
20
25
30
35
40
45
50
Time (hours)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

APPENDIX 11

500-YEAR DESIGN STORM HYDROGRAPHS

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

SubcatchmentA: EX-A Runoff Area=35.318 ac 19.88% Impervious Runoff Depth=9.18"
Tc=31.2 min CN=76 Runoff=182.01 cfs 27.027 af

SubcatchmentA1-A: PR-A1-A Runoff Area=4.891 ac 54.92% Impervious Runoff Depth=11.06"
Tc=22.2 min CN=90 Runoff=33.28 cfs 4.508 af

SubcatchmentA1-B: PR-A1-B Runoff Area=4.432 ac 51.17% Impervious Runoff Depth=10.93"
Tc=21.6 min CN=89 Runoff=30.39 cfs 4.037 af

SubcatchmentA1-C: PR-A1-C Runoff Area=0.667 ac 0.00% Impervious Runoff Depth=9.74"
Tc=6.0 min CN=80 Runoff=6.82 cfs 0.541 af

SubcatchmentA2: PR-A2 Runoff Area=27.087 ac 31.06% Impervious Runoff Depth=9.18"
Tc=20.4 min CN=76 Runoff=168.50 cfs 20.729 af

SubcatchmentB: EX-B Runoff Area=23.109 ac 4.81% Impervious Runoff Depth=7.43"
Tc=32.4 min CN=64 Runoff=96.48 cfs 14.315 af

SubcatchmentB1-A: PR-B1-A Runoff Area=4.885 ac 52.14% Impervious Runoff Depth=10.93"
Tc=22.2 min CN=89 Runoff=33.05 cfs 4.450 af

SubcatchmentB1-B: PR-B1-B Runoff Area=4.222 ac 52.11% Impervious Runoff Depth=10.93"
Tc=19.2 min CN=89 Runoff=30.36 cfs 3.846 af

SubcatchmentB1-C: PR-B1-C Runoff Area=0.461 ac 0.00% Impervious Runoff Depth=3.39"
Tc=6.0 min CN=39 Runoff=1.49 cfs 0.130 af

SubcatchmentB2: PR-B2 Runoff Area=11.782 ac 11.29% Impervious Runoff Depth=6.98"
Tc=20.4 min CN=61 Runoff=56.59 cfs 6.848 af

Pond 1P: Forebay & Bio A1-A Peak Elev=409.40' Storage=83,079 cf Inflow=33.28 cfs 4.508 af
Outflow=25.52 cfs 4.508 af

Pond 2P: Forebay & Bio A1-B Peak Elev=409.39' Storage=90,478 cf Inflow=30.39 cfs 4.037 af
Outflow=21.60 cfs 4.037 af

Pond 3P: Forebay & Bio B1-A Peak Elev=409.61' Storage=94,195 cf Inflow=33.05 cfs 4.450 af
Outflow=20.06 cfs 4.089 af

Pond 4P: Detention Basin A1 Peak Elev=409.39' Storage=136,158 cf Inflow=49.20 cfs 9.087 af
Outflow=46.93 cfs 8.170 af

Pond 6P: Forebay & Bio B1-B Peak Elev=409.73' Storage=68,387 cf Inflow=30.36 cfs 3.846 af
Outflow=16.11 cfs 3.550 af

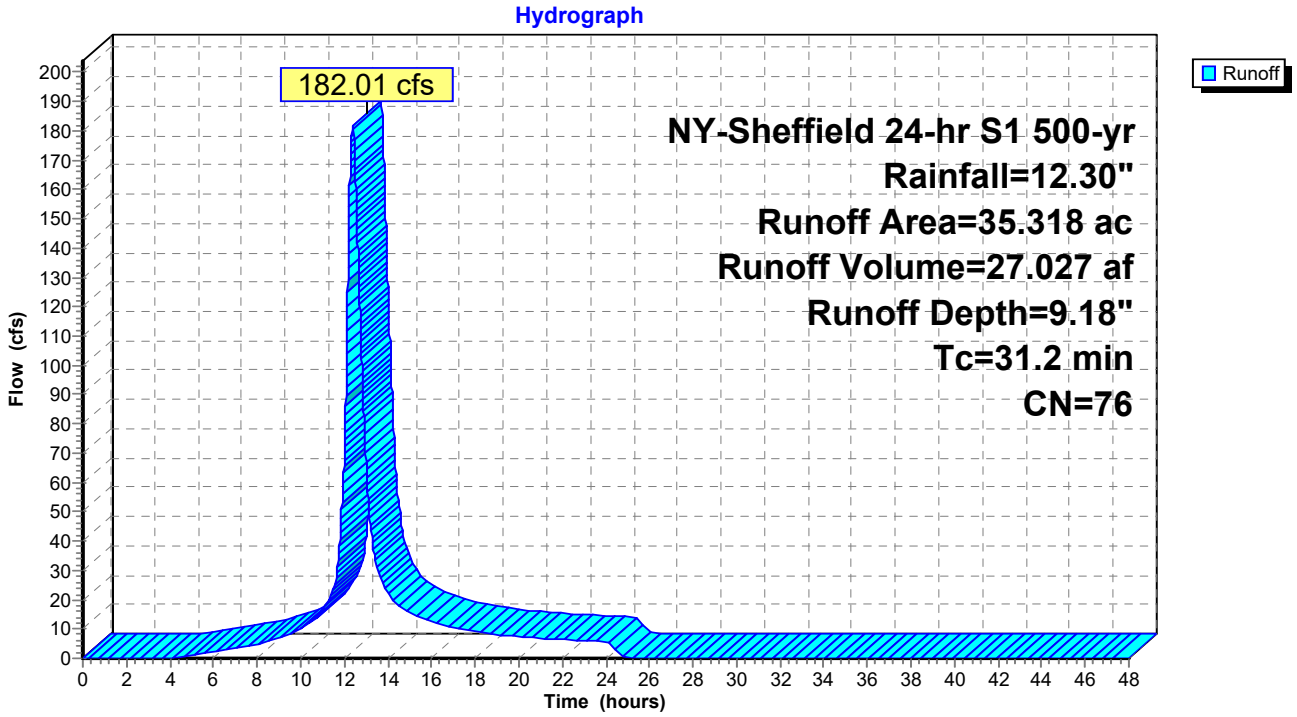
Pond 7P: Detention Basin B1 Peak Elev=409.27' Storage=68,237 cf Inflow=36.71 cfs 7.770 af
Outflow=36.25 cfs 7.606 af

Pond PR-A: PR-A Inflow=203.28 cfs 28.899 af
Primary=203.28 cfs 28.899 af

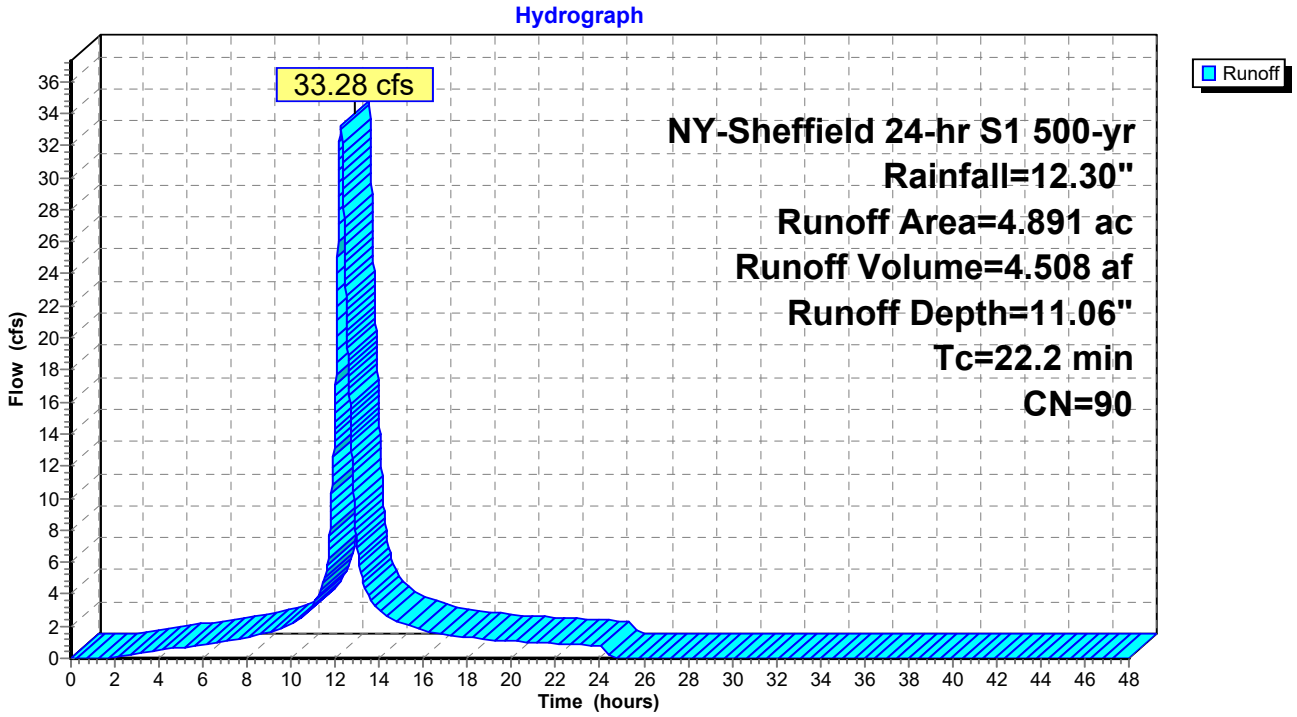
Pond PR-B: PR-B Inflow=80.97 cfs 14.454 af
Primary=80.97 cfs 14.454 af

Total Runoff Area = 116.854 ac Runoff Volume = 86.433 af Average Runoff Depth = 8.88"
76.40% Pervious = 89.280 ac 23.60% Impervious = 27.574 ac

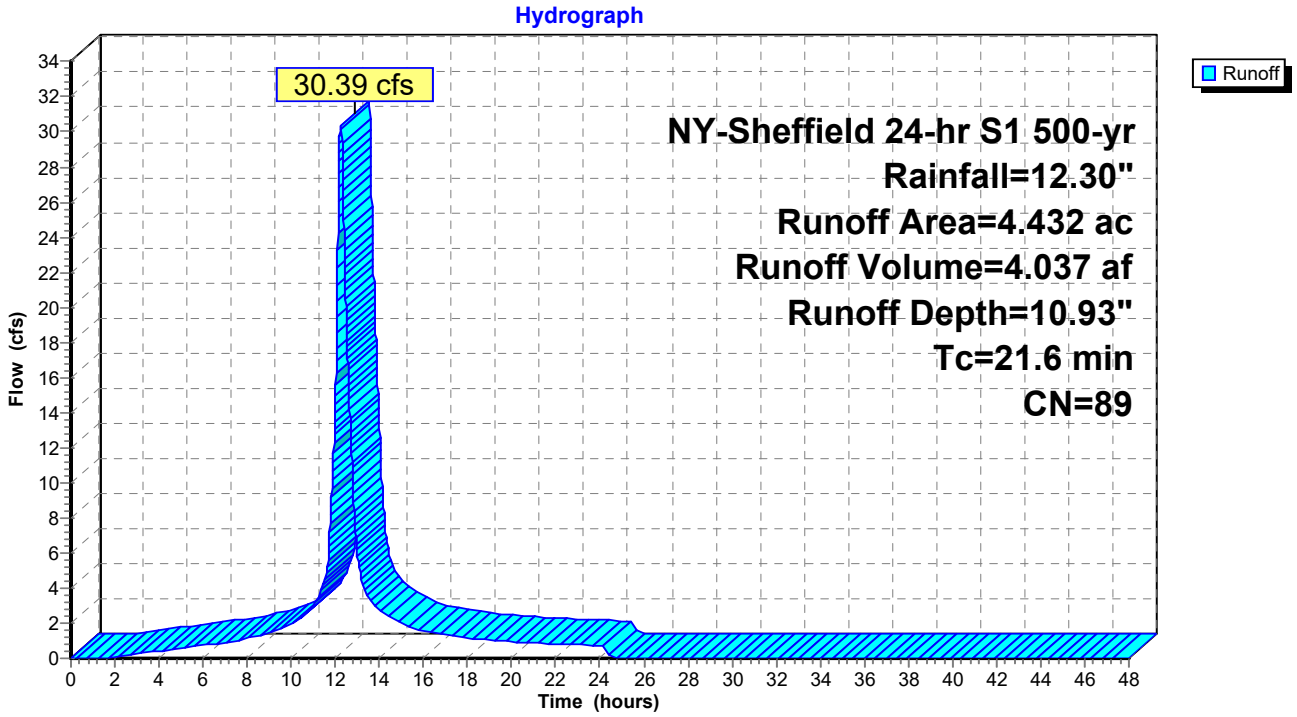
Subcatchment A: EX-A



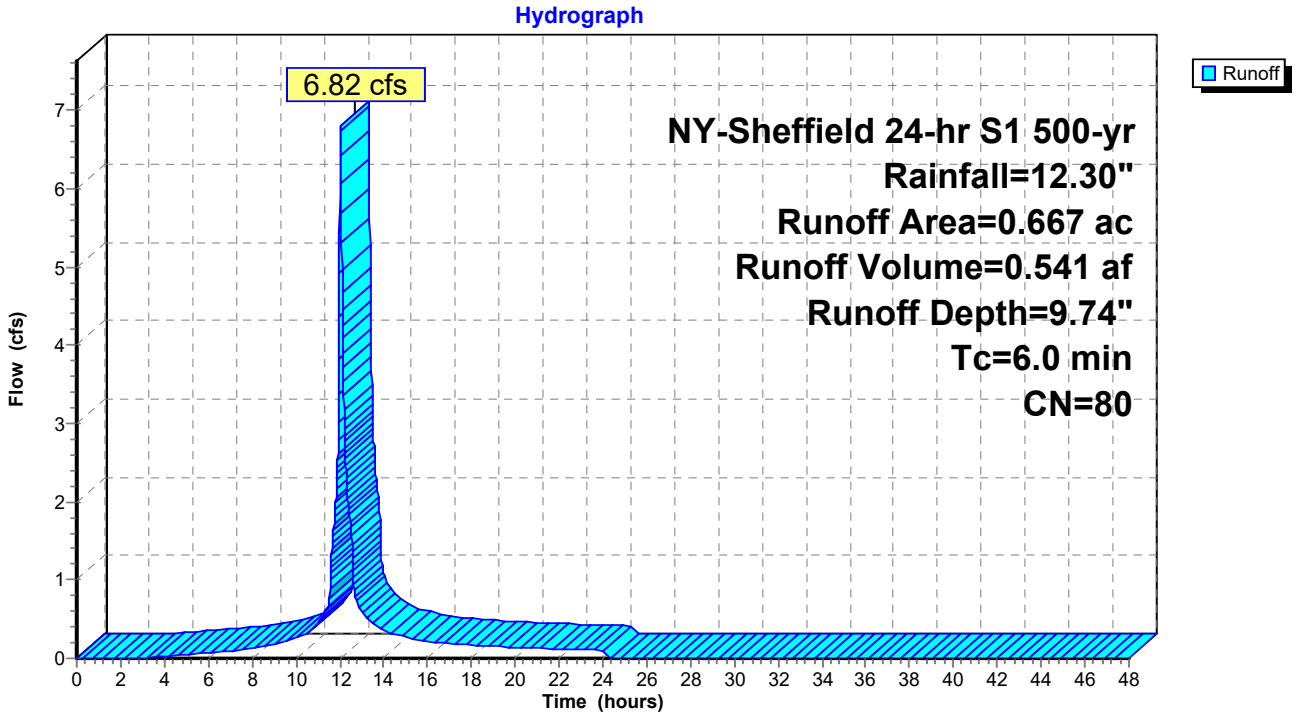
Subcatchment A1-A: PR-A1-A



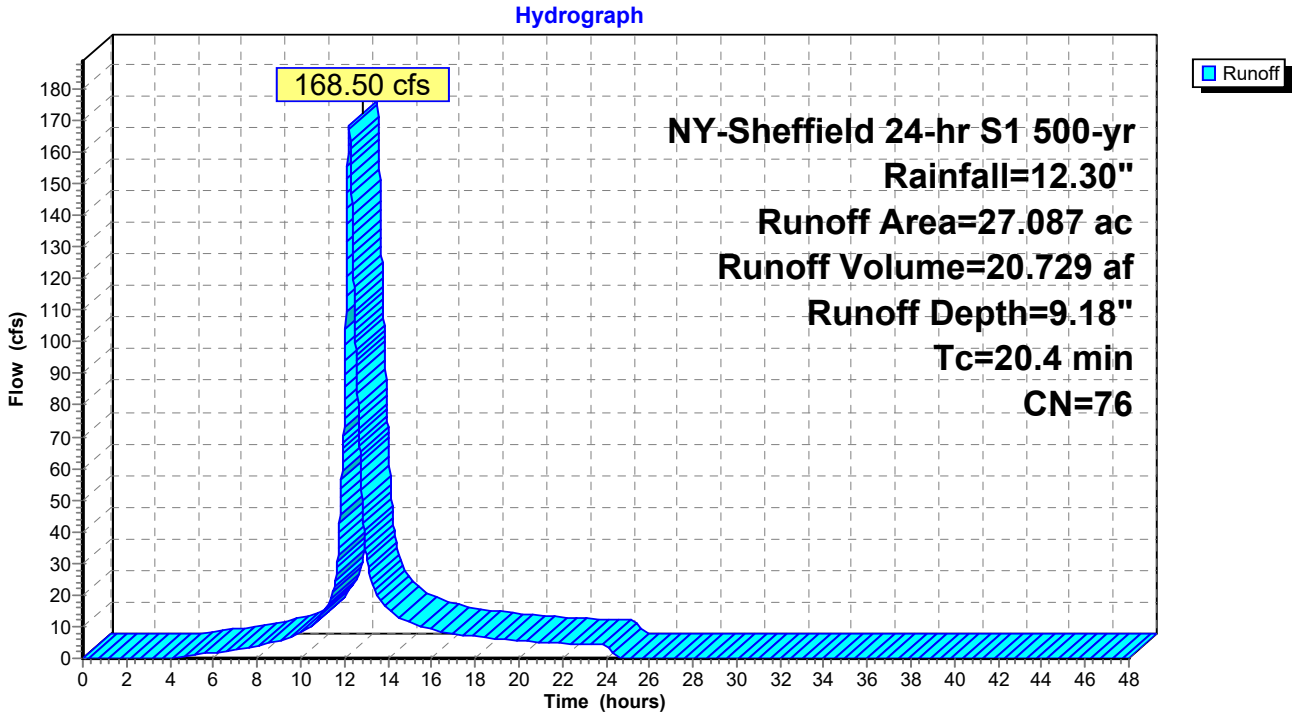
Subcatchment A1-B: PR-A1-B



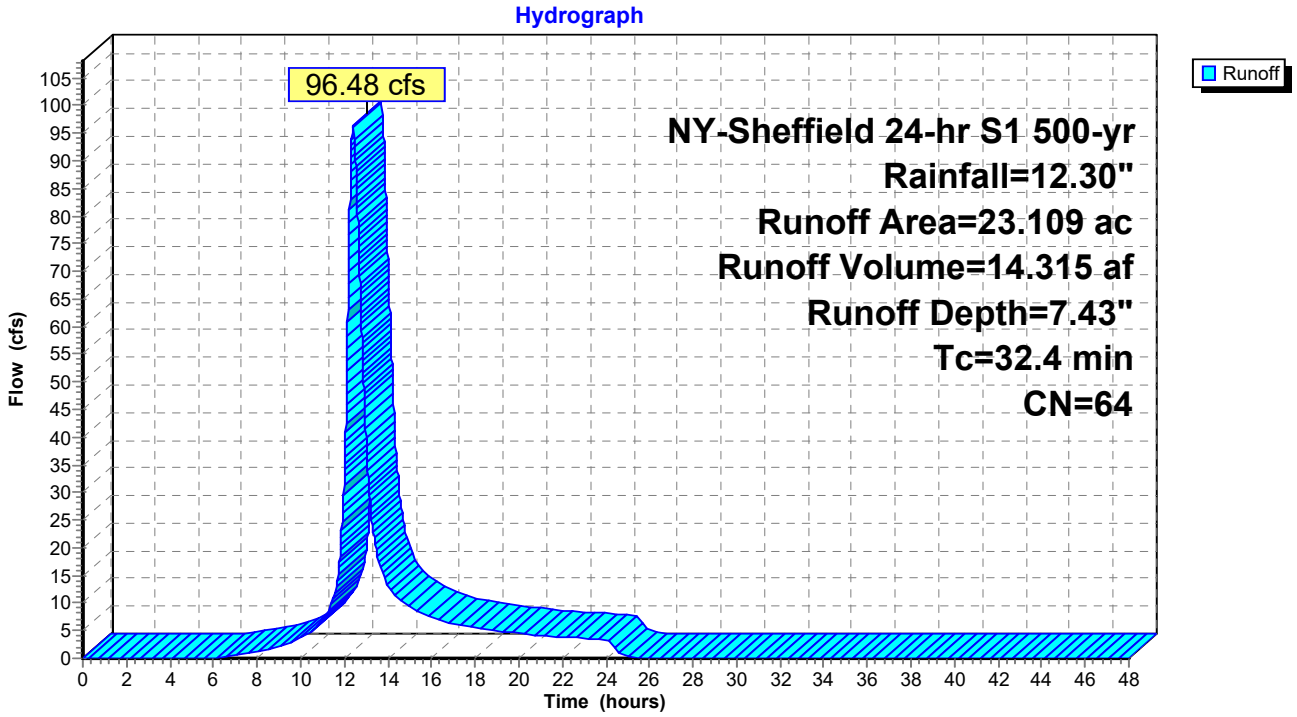
Subcatchment A1-C: PR-A1-C



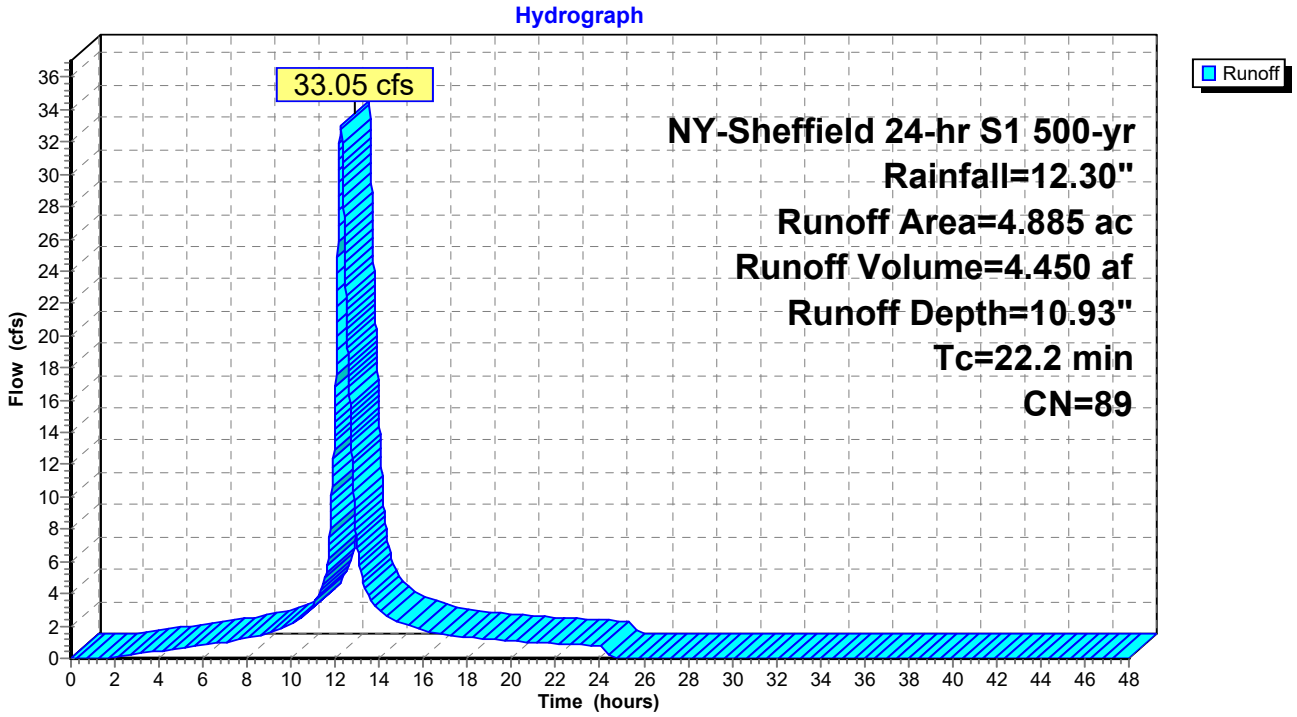
Subcatchment A2: PR-A2



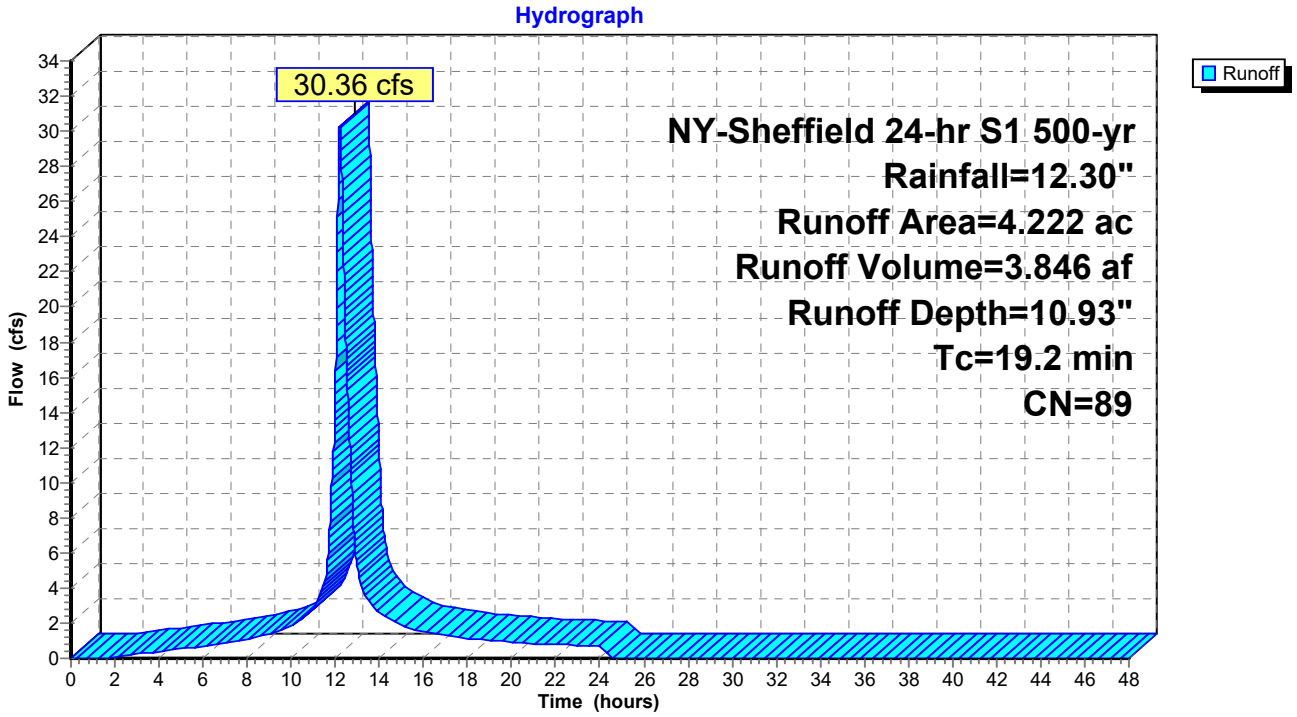
Subcatchment B: EX-B



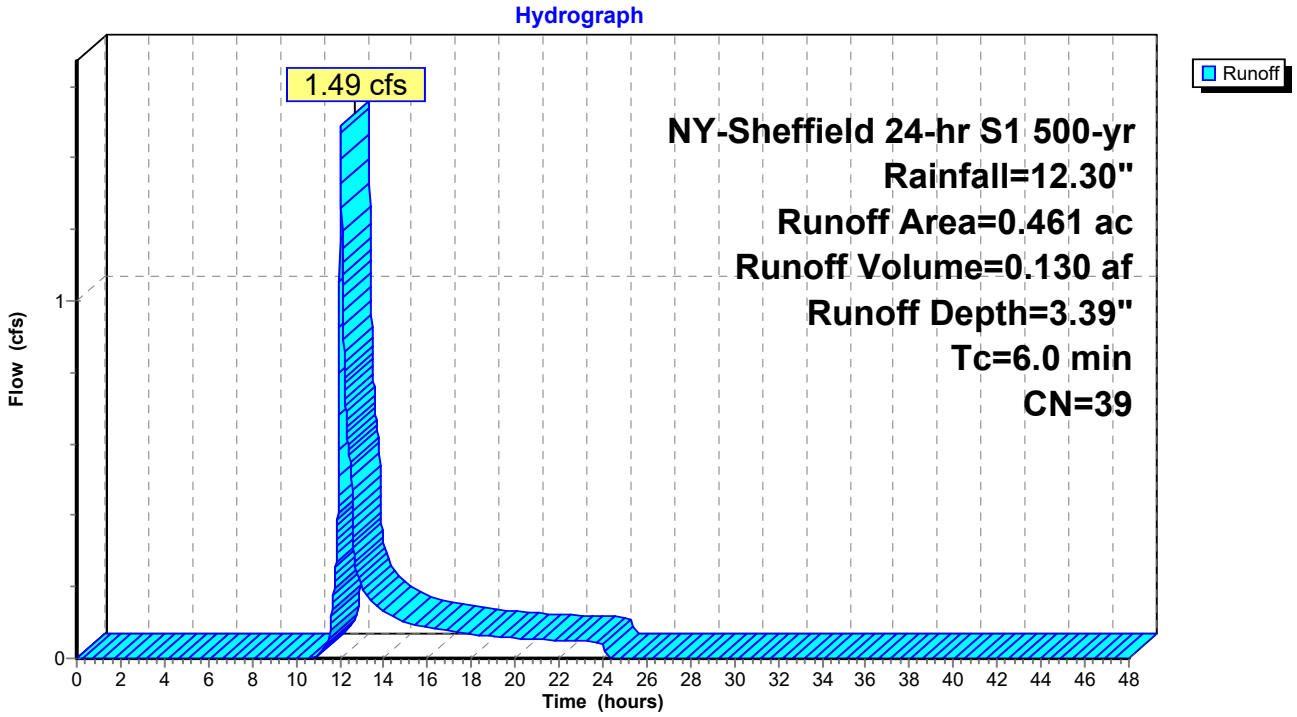
Subcatchment B1-A: PR-B1-A



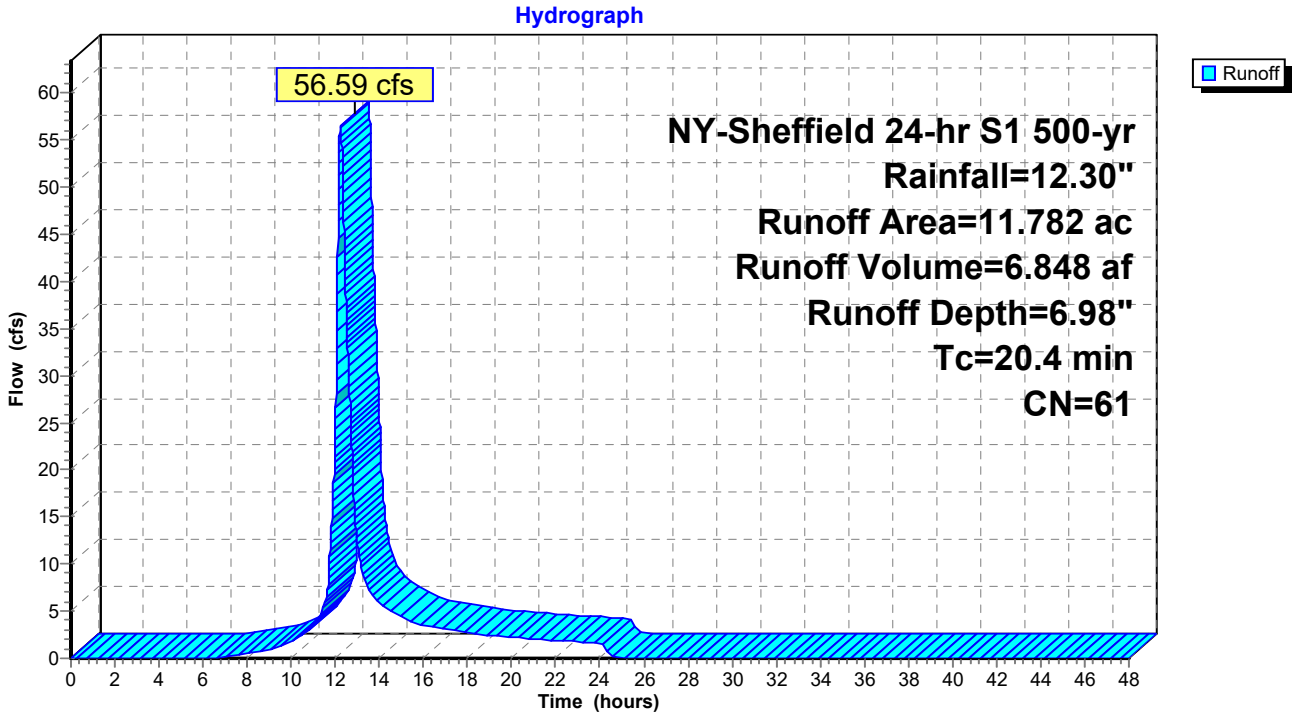
Subcatchment B1-B: PR-B1-B



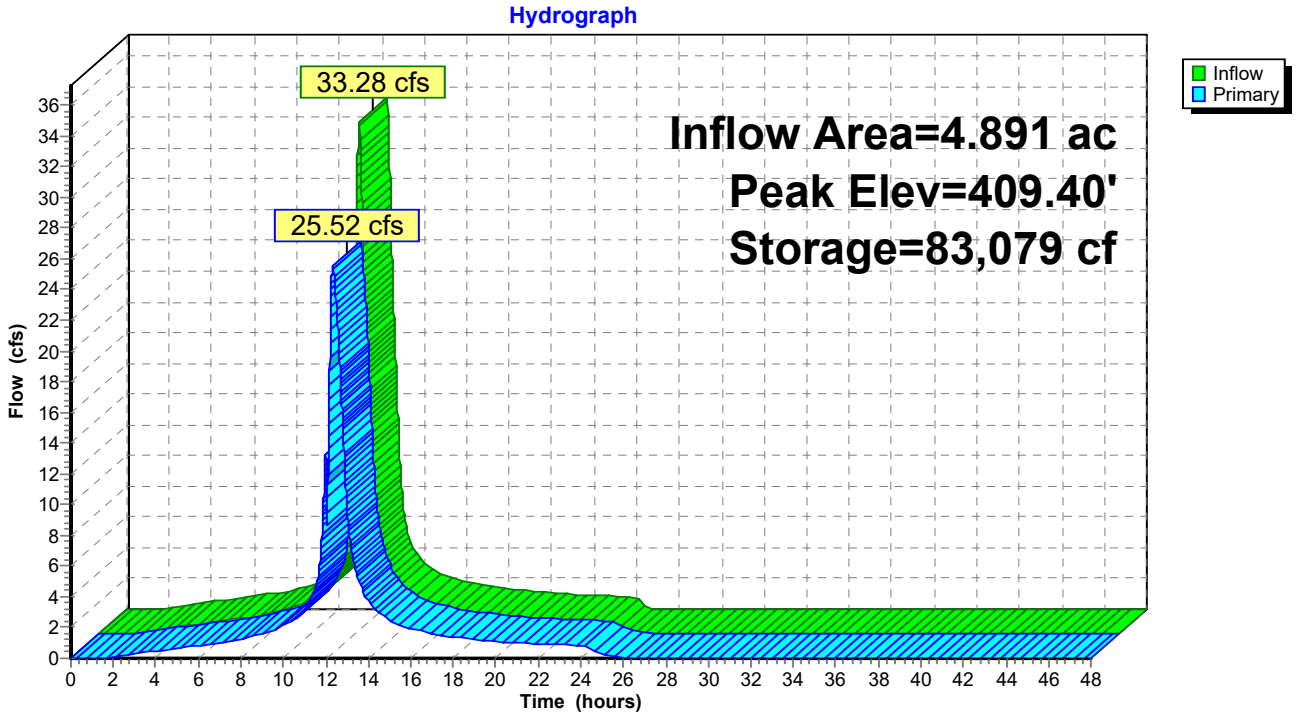
Subcatchment B1-C: PR-B1-C



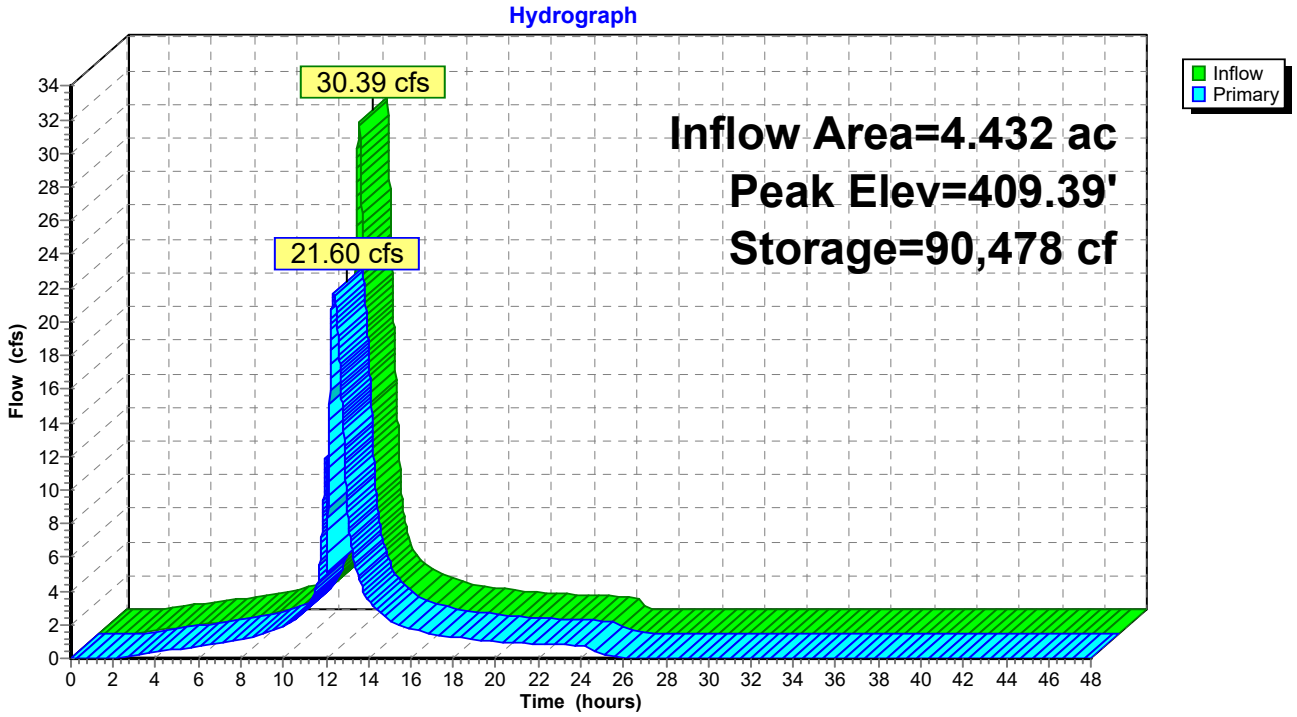
Subcatchment B2: PR-B2



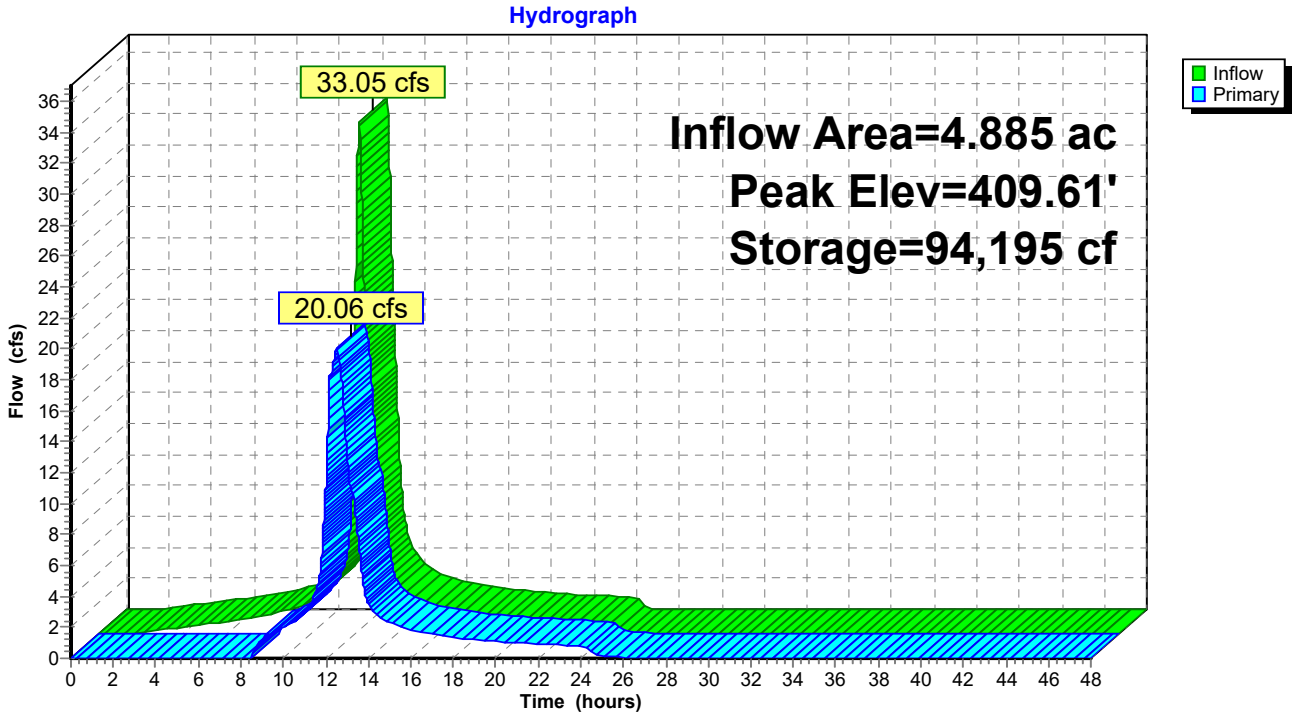
Pond 1P: Forebay & Bio A1-A



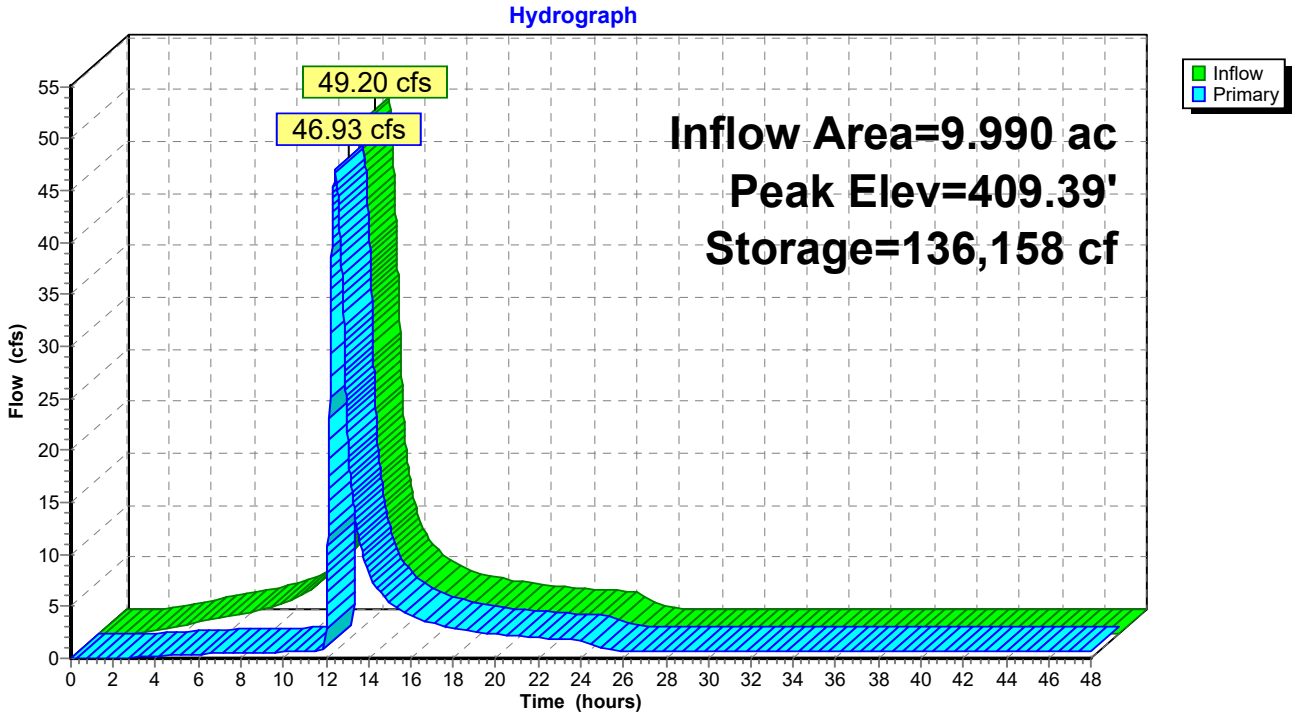
Pond 2P: Forebay & Bio A1-B



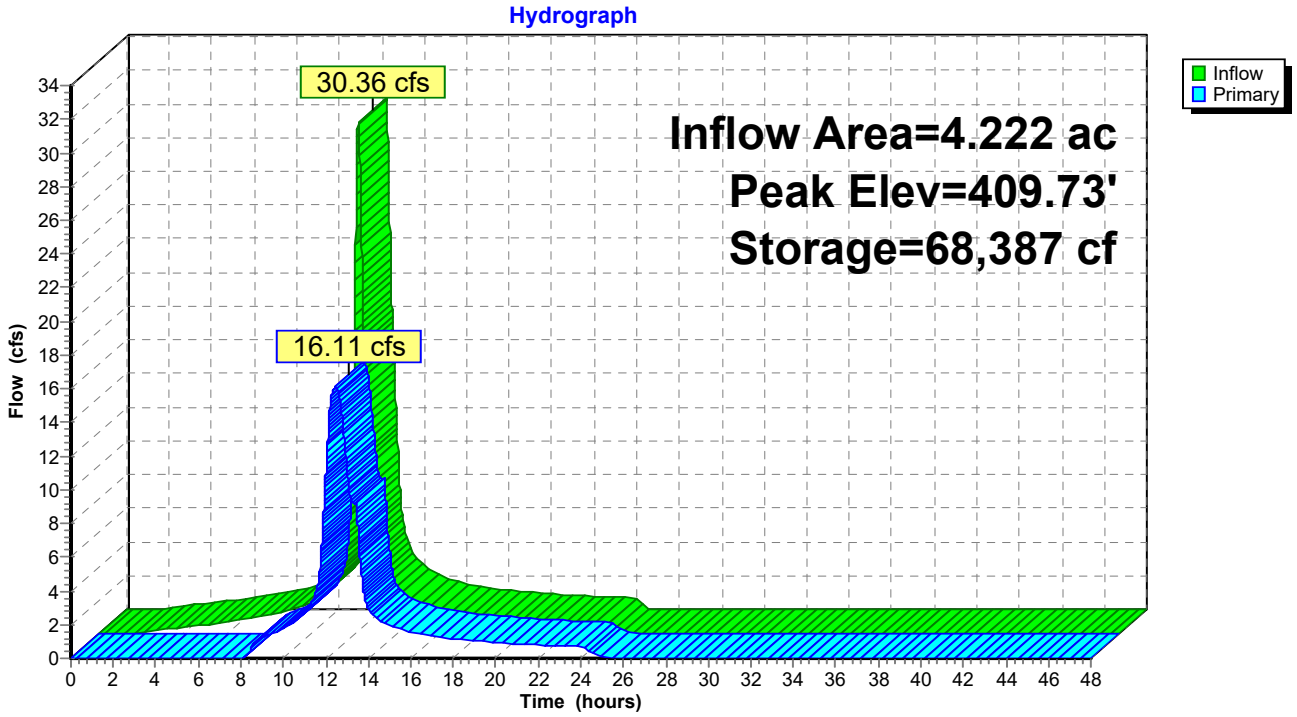
Pond 3P: Forebay & Bio B1-A



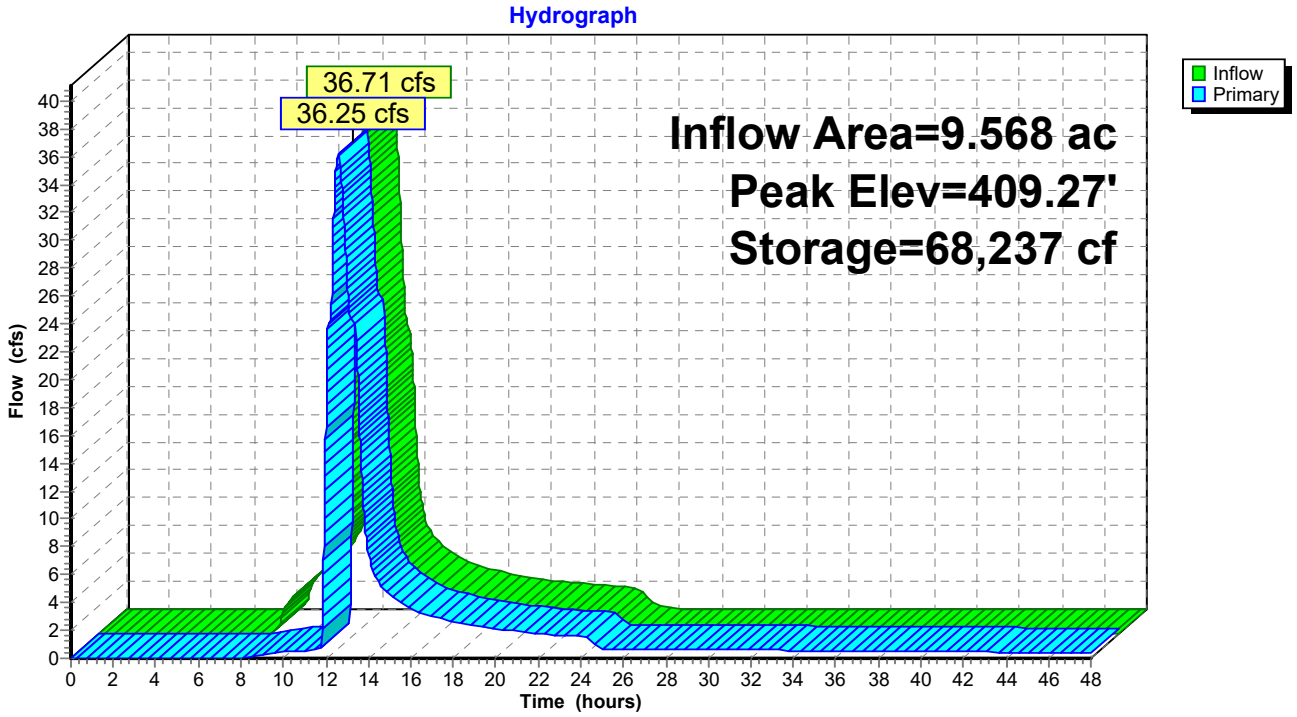
Pond 4P: Detention Basin A1



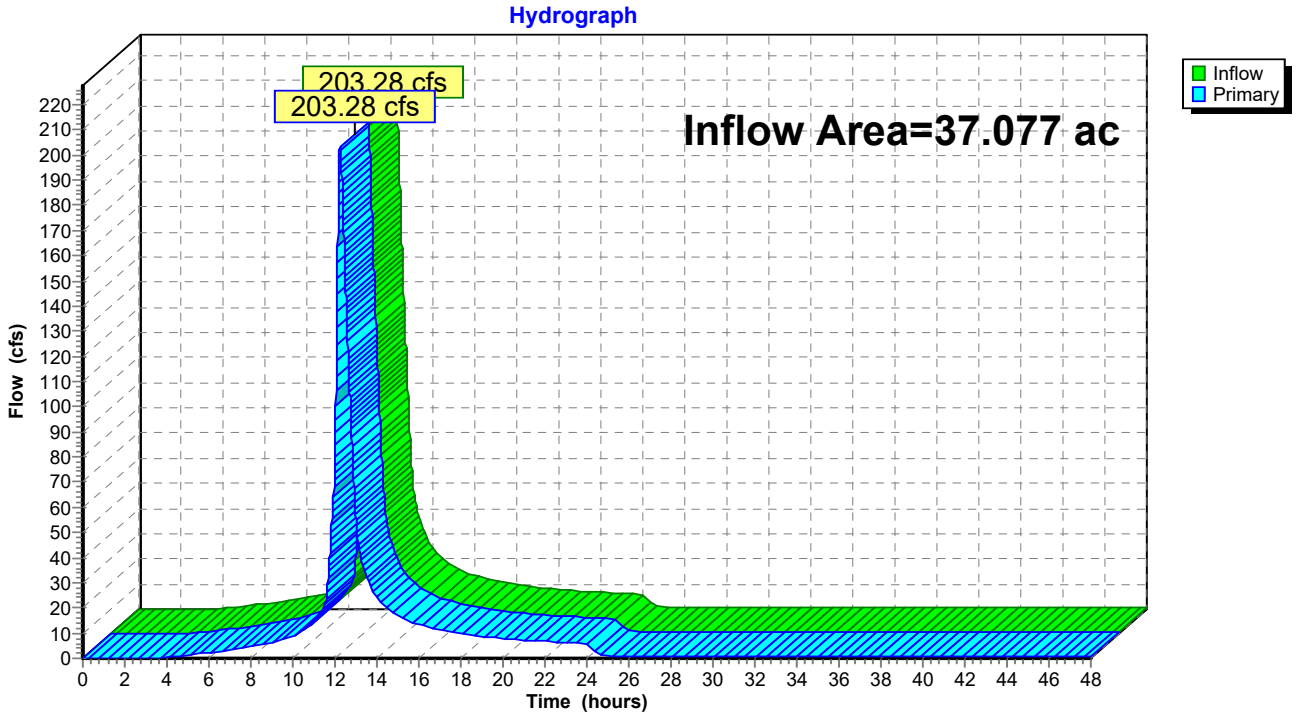
Pond 6P: Forebay & Bio B1-B



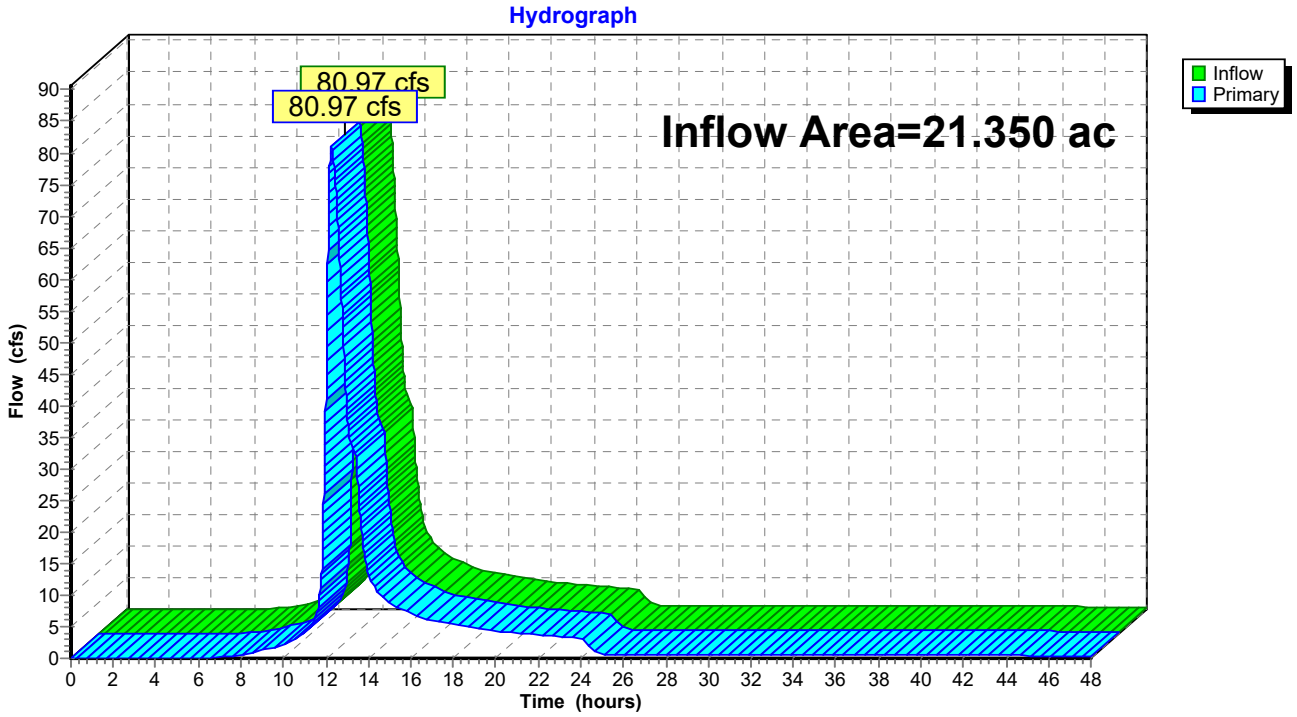
Pond 7P: Detention Basin B1



Pond PR-A: PR-A


Hydrograph
203.28 cfs
203.28 cfs
Inflow Area=37.077 ac
Inflow
Primary
Flow (cfs)
Time (hours)
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Pond PR-B: PR-B


Hydrograph
80.97 cfs
80.97 cfs
Inflow Area=21.350 ac
Inflow
Primary
Flow (cfs)
Time (hours)
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

APPENDIX 12

RESERVOIR REPORTS & CPV CALCULATIONS

Summary for Pond 1P: Forebay & Bio A1-A

Inflow Area = 4.891 ac, 54.92% Impervious, Inflow Depth = 1.64" for 1-yr event
Inflow = 6.11 cfs @ 12.26 hrs, Volume= 0.668 af
Outflow = 5.66 cfs @ 12.33 hrs, Volume= 0.668 af, Atten= 7%, Lag= 4.4 min
Primary = 5.66 cfs @ 12.33 hrs, Volume= 0.668 af
Routed to Pond 4P : Detention Basin A1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Automatic Starting Elev= 408.50' Surf.Area= 18,385 sf Storage= 66,328 cf
Peak Elev= 408.62' @ 12.33 hrs Surf.Area= 18,471 sf Storage= 68,551 cf (2,223 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 13.1 min (854.7 - 841.7)

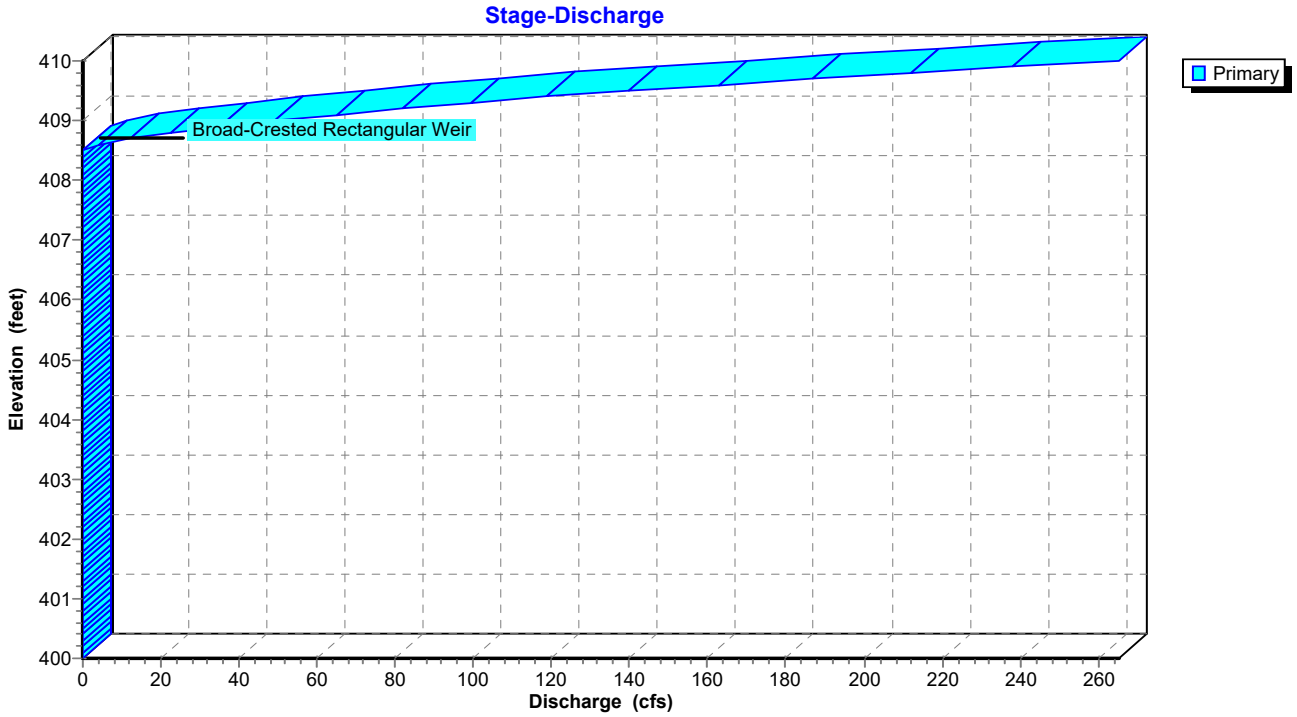
Volume	Invert	Avail.Storage	Storage Description
#1	400.00'	94,716 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
400.00	2,093	0	0	2,093
402.00	3,854	5,858	5,858	3,895
404.00	5,993	9,769	15,627	6,090
406.00	8,501	14,421	30,048	8,669
407.50	16,634	18,513	48,561	16,824
408.00	18,030	8,664	57,225	18,239
410.00	19,471	37,492	94,716	19,977

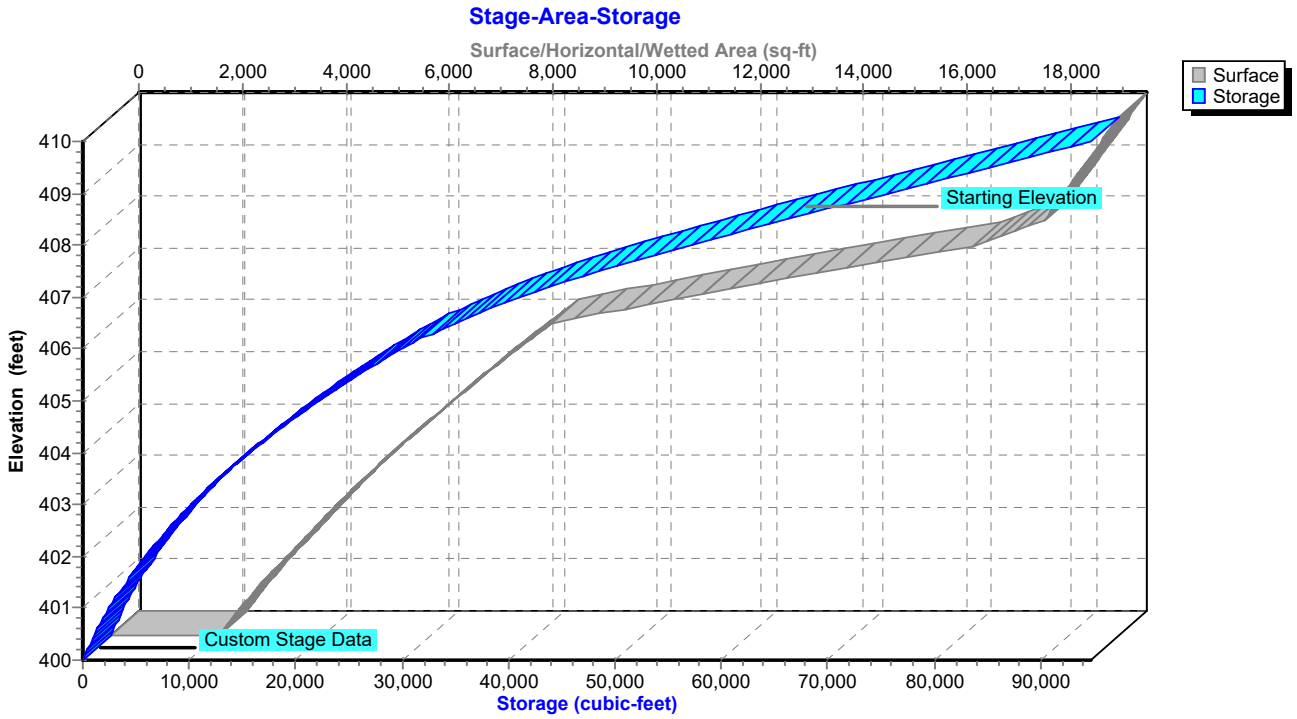
Device	Routing	Invert	Outlet Devices
#1	Primary	408.50'	**50.0' long + 4.0 '/' SideZ x 31.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=5.66 cfs @ 12.33 hrs HW=408.62' TW=401.99' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 5.66 cfs @ 0.93 fps)

Pond 1P: Forebay & Bio A1-A



Pond 1P: Forebay & Bio A1-A



Stage-Discharge for Pond 1P: Forebay & Bio A1-A

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
400.00	0.00	402.60	0.00	405.20	0.00	407.80	0.00
400.05	0.00	402.65	0.00	405.25	0.00	407.85	0.00
400.10	0.00	402.70	0.00	405.30	0.00	407.90	0.00
400.15	0.00	402.75	0.00	405.35	0.00	407.95	0.00
400.20	0.00	402.80	0.00	405.40	0.00	408.00	0.00
400.25	0.00	402.85	0.00	405.45	0.00	408.05	0.00
400.30	0.00	402.90	0.00	405.50	0.00	408.10	0.00
400.35	0.00	402.95	0.00	405.55	0.00	408.15	0.00
400.40	0.00	403.00	0.00	405.60	0.00	408.20	0.00
400.45	0.00	403.05	0.00	405.65	0.00	408.25	0.00
400.50	0.00	403.10	0.00	405.70	0.00	408.30	0.00
400.55	0.00	403.15	0.00	405.75	0.00	408.35	0.00
400.60	0.00	403.20	0.00	405.80	0.00	408.40	0.00
400.65	0.00	403.25	0.00	405.85	0.00	408.45	0.00
400.70	0.00	403.30	0.00	405.90	0.00	408.50	0.00
400.75	0.00	403.35	0.00	405.95	0.00	408.55	1.50
400.80	0.00	403.40	0.00	406.00	0.00	408.60	4.26
400.85	0.00	403.45	0.00	406.05	0.00	408.65	7.86
400.90	0.00	403.50	0.00	406.10	0.00	408.70	12.14
400.95	0.00	403.55	0.00	406.15	0.00	408.75	17.05
401.00	0.00	403.60	0.00	406.20	0.00	408.80	22.52
401.05	0.00	403.65	0.00	406.25	0.00	408.85	28.53
401.10	0.00	403.70	0.00	406.30	0.00	408.90	35.03
401.15	0.00	403.75	0.00	406.35	0.00	408.95	41.93
401.20	0.00	403.80	0.00	406.40	0.00	409.00	49.26
401.25	0.00	403.85	0.00	406.45	0.00	409.05	57.00
401.30	0.00	403.90	0.00	406.50	0.00	409.10	65.15
401.35	0.00	403.95	0.00	406.55	0.00	409.15	73.28
401.40	0.00	404.00	0.00	406.60	0.00	409.20	81.69
401.45	0.00	404.05	0.00	406.65	0.00	409.25	90.36
401.50	0.00	404.10	0.00	406.70	0.00	409.30	99.29
401.55	0.00	404.15	0.00	406.75	0.00	409.35	108.97
401.60	0.00	404.20	0.00	406.80	0.00	409.40	118.97
401.65	0.00	404.25	0.00	406.85	0.00	409.45	129.29
401.70	0.00	404.30	0.00	406.90	0.00	409.50	139.92
401.75	0.00	404.35	0.00	406.95	0.00	409.55	151.14
401.80	0.00	404.40	0.00	407.00	0.00	409.60	162.70
401.85	0.00	404.45	0.00	407.05	0.00	409.65	174.60
401.90	0.00	404.50	0.00	407.10	0.00	409.70	186.84
401.95	0.00	404.55	0.00	407.15	0.00	409.75	199.23
402.00	0.00	404.60	0.00	407.20	0.00	409.80	211.93
402.05	0.00	404.65	0.00	407.25	0.00	409.85	224.94
402.10	0.00	404.70	0.00	407.30	0.00	409.90	238.25
402.15	0.00	404.75	0.00	407.35	0.00	409.95	251.63
402.20	0.00	404.80	0.00	407.40	0.00	410.00	**265.28**
402.25	0.00	404.85	0.00	407.45	0.00		
402.30	0.00	404.90	0.00	407.50	0.00		
402.35	0.00	404.95	0.00	407.55	0.00		
402.40	0.00	405.00	0.00	407.60	0.00		
402.45	0.00	405.05	0.00	407.65	0.00		
402.50	0.00	405.10	0.00	407.70	0.00		
402.55	0.00	405.15	0.00	407.75	0.00		

Stage-Area-Storage for Pond 1P: Forebay & Bio A1-A

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
400.00	2,093	0
400.10	2,168	213
400.20	2,245	434
400.30	2,323	662
400.40	2,403	898
400.50	2,483	1,143
400.60	2,565	1,395
400.70	2,649	1,656
400.80	2,733	1,925
400.90	2,819	2,202
401.00	2,907	2,489
401.10	2,996	2,784
401.20	3,086	3,088
401.30	3,177	3,401
401.40	3,270	3,723
401.50	3,364	4,055
401.60	3,459	4,396
401.70	3,556	4,747
401.80	3,654	5,107
401.90	3,753	5,478
402.00	3,854	5,858
402.10	3,950	6,248
402.20	4,047	6,648
402.30	4,145	7,058
402.40	4,244	7,477
402.50	4,345	7,907
402.60	4,446	8,346
402.70	4,549	8,796
402.80	4,653	9,256
402.90	4,758	9,727
403.00	4,865	10,208
403.10	4,972	10,699
403.20	5,081	11,202
403.30	5,191	11,716
403.40	5,302	12,240
403.50	5,414	12,776
403.60	5,528	13,323
403.70	5,642	13,882
403.80	5,758	14,452
403.90	5,875	15,033
404.00	5,993	15,627
404.10	6,108	16,232
404.20	6,224	16,848
404.30	6,341	17,477
404.40	6,460	18,117
404.50	6,579	18,769
404.60	6,699	19,432
404.70	6,821	20,109
404.80	6,944	20,797
404.90	7,067	21,497
405.00	7,192	22,210
405.10	7,318	22,936
405.20	7,445	23,674
405.30	7,573	24,425
405.40	7,703	25,189
405.50	7,833	25,965
405.60	7,964	26,755
405.70	8,097	27,558
405.80	8,231	28,375
405.90	8,365	29,205
406.00	8,501	30,048
406.10	8,959	30,921
406.20	9,429	31,840
406.30	9,911	32,807
406.40	10,405	33,823
406.50	10,912	34,888
406.60	11,430	36,005
406.70	11,960	37,175
406.80	12,502	38,398
406.90	13,056	39,676
407.00	13,623	41,009
407.10	14,201	42,401
407.20	14,791	43,850
407.30	15,393	45,359
407.40	16,008	46,929
407.50	16,634	48,561
407.60	16,909	50,238
407.70	17,186	51,943
407.80	17,465	53,675
407.90	17,746	55,436
408.00	18,030	57,225
408.10	18,101	59,031
408.20	18,172	60,845
408.30	18,243	62,666
408.40	18,314	64,493
408.50	18,385	66,328
408.60	18,456	68,170
408.70	18,528	70,020
408.80	18,600	71,876
408.90	18,672	73,740
409.00	18,744	75,610
409.10	18,816	77,488
409.20	18,888	79,373
409.30	18,960	81,266
409.40	19,033	83,166
409.50	19,106	85,072
409.60	19,178	86,987
409.70	19,251	88,908
409.80	19,324	90,837
409.90	19,398	92,773
410.00	**19,471**	**94,716**

Summary for Pond 2P: Forebay & Bio A1-B

Inflow Area = 4.432 ac, 51.17% Impervious, Inflow Depth = 1.56" for 1-yr event
Inflow = 5.36 cfs @ 12.25 hrs, Volume= 0.576 af
Outflow = 4.88 cfs @ 12.33 hrs, Volume= 0.576 af, Atten= 9%, Lag= 4.8 min
Primary = 4.88 cfs @ 12.33 hrs, Volume= 0.576 af
Routed to Pond 4P : Detention Basin A1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Automatic Starting Elev= 408.50' Surf.Area= 19,240 sf Storage= 72,229 cf
Peak Elev= 408.61' @ 12.33 hrs Surf.Area= 19,528 sf Storage= 74,349 cf (2,119 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 14.3 min (860.7 - 846.4)

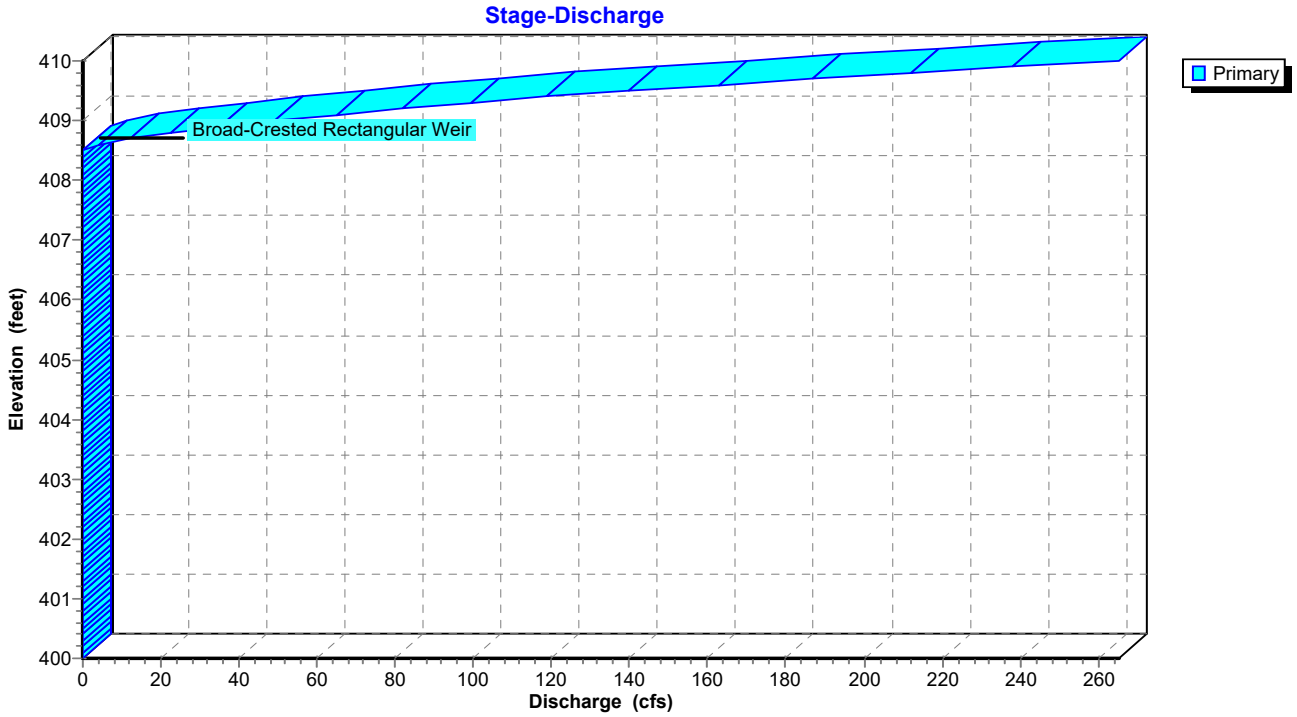
Volume	Invert	Avail.Storage	Storage Description
#1	400.00'	104,144 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
400.00	3,314	0	0	3,314
402.00	4,891	8,154	8,154	4,954
404.00	6,756	11,597	19,751	6,896
406.00	8,917	15,623	35,374	9,146
407.50	16,689	18,903	54,277	16,940
408.00	17,949	8,658	62,934	18,222
410.00	23,380	41,210	104,144	23,747

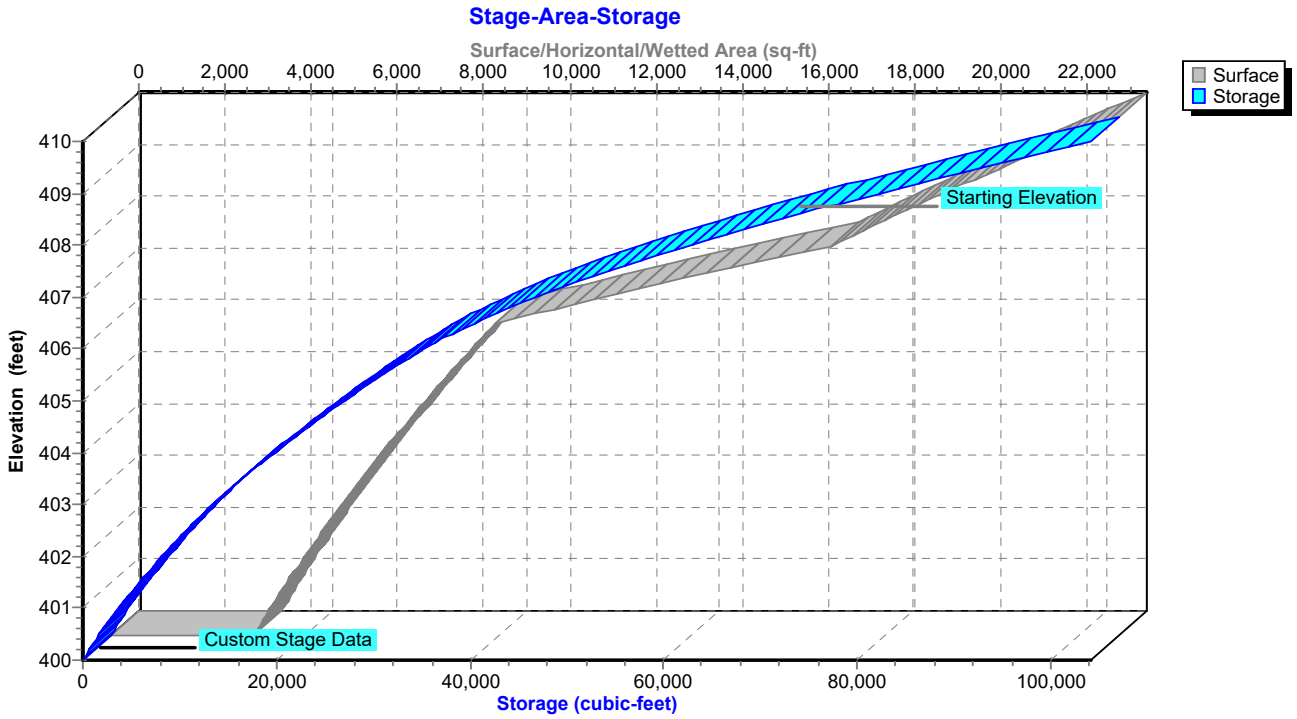
Device	Routing	Invert	Outlet Devices
#1	Primary	408.50'	**50.0' long + 4.0 '/' SideZ x 31.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=4.88 cfs @ 12.33 hrs HW=408.61' TW=401.99' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 4.88 cfs @ 0.88 fps)

Pond 2P: Forebay & Bio A1-B



Pond 2P: Forebay & Bio A1-B



Stage-Discharge for Pond 2P: Forebay & Bio A1-B

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
400.00	0.00	402.60	0.00	405.20	0.00	407.80	0.00
400.05	0.00	402.65	0.00	405.25	0.00	407.85	0.00
400.10	0.00	402.70	0.00	405.30	0.00	407.90	0.00
400.15	0.00	402.75	0.00	405.35	0.00	407.95	0.00
400.20	0.00	402.80	0.00	405.40	0.00	408.00	0.00
400.25	0.00	402.85	0.00	405.45	0.00	408.05	0.00
400.30	0.00	402.90	0.00	405.50	0.00	408.10	0.00
400.35	0.00	402.95	0.00	405.55	0.00	408.15	0.00
400.40	0.00	403.00	0.00	405.60	0.00	408.20	0.00
400.45	0.00	403.05	0.00	405.65	0.00	408.25	0.00
400.50	0.00	403.10	0.00	405.70	0.00	408.30	0.00
400.55	0.00	403.15	0.00	405.75	0.00	408.35	0.00
400.60	0.00	403.20	0.00	405.80	0.00	408.40	0.00
400.65	0.00	403.25	0.00	405.85	0.00	408.45	0.00
400.70	0.00	403.30	0.00	405.90	0.00	408.50	0.00
400.75	0.00	403.35	0.00	405.95	0.00	408.55	1.50
400.80	0.00	403.40	0.00	406.00	0.00	408.60	4.26
400.85	0.00	403.45	0.00	406.05	0.00	408.65	7.86
400.90	0.00	403.50	0.00	406.10	0.00	408.70	12.14
400.95	0.00	403.55	0.00	406.15	0.00	408.75	17.05
401.00	0.00	403.60	0.00	406.20	0.00	408.80	22.52
401.05	0.00	403.65	0.00	406.25	0.00	408.85	28.53
401.10	0.00	403.70	0.00	406.30	0.00	408.90	35.03
401.15	0.00	403.75	0.00	406.35	0.00	408.95	41.93
401.20	0.00	403.80	0.00	406.40	0.00	409.00	49.26
401.25	0.00	403.85	0.00	406.45	0.00	409.05	57.00
401.30	0.00	403.90	0.00	406.50	0.00	409.10	65.15
401.35	0.00	403.95	0.00	406.55	0.00	409.15	73.28
401.40	0.00	404.00	0.00	406.60	0.00	409.20	81.69
401.45	0.00	404.05	0.00	406.65	0.00	409.25	90.36
401.50	0.00	404.10	0.00	406.70	0.00	409.30	99.29
401.55	0.00	404.15	0.00	406.75	0.00	409.35	108.97
401.60	0.00	404.20	0.00	406.80	0.00	409.40	118.97
401.65	0.00	404.25	0.00	406.85	0.00	409.45	129.29
401.70	0.00	404.30	0.00	406.90	0.00	409.50	139.92
401.75	0.00	404.35	0.00	406.95	0.00	409.55	151.14
401.80	0.00	404.40	0.00	407.00	0.00	409.60	162.70
401.85	0.00	404.45	0.00	407.05	0.00	409.65	174.60
401.90	0.00	404.50	0.00	407.10	0.00	409.70	186.84
401.95	0.00	404.55	0.00	407.15	0.00	409.75	199.23
402.00	0.00	404.60	0.00	407.20	0.00	409.80	211.93
402.05	0.00	404.65	0.00	407.25	0.00	409.85	224.94
402.10	0.00	404.70	0.00	407.30	0.00	409.90	238.25
402.15	0.00	404.75	0.00	407.35	0.00	409.95	251.63
402.20	0.00	404.80	0.00	407.40	0.00	410.00	**265.28**
402.25	0.00	404.85	0.00	407.45	0.00		
402.30	0.00	404.90	0.00	407.50	0.00		
402.35	0.00	404.95	0.00	407.55	0.00		
402.40	0.00	405.00	0.00	407.60	0.00		
402.45	0.00	405.05	0.00	407.65	0.00		
402.50	0.00	405.10	0.00	407.70	0.00		
402.55	0.00	405.15	0.00	407.75	0.00		

Stage-Area-Storage for Pond 2P: Forebay & Bio A1-B

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
400.00	3,314	0
400.10	3,386	335
400.20	3,458	677
400.30	3,531	1,027
400.40	3,605	1,383
400.50	3,680	1,748
400.60	3,755	2,119
400.70	3,831	2,499
400.80	3,908	2,886
400.90	3,986	3,280
401.00	4,064	3,683
401.10	4,143	4,093
401.20	4,223	4,511
401.30	4,304	4,938
401.40	4,386	5,372
401.50	4,468	5,815
401.60	4,551	6,266
401.70	4,635	6,725
401.80	4,720	7,193
401.90	4,805	7,669
402.00	4,891	8,154
402.10	4,977	8,647
402.20	5,064	9,149
402.30	5,152	9,660
402.40	5,240	10,180
402.50	5,329	10,708
402.60	5,419	11,246
402.70	5,510	11,792
402.80	5,601	12,348
402.90	5,693	12,912
403.00	5,786	13,486
403.10	5,880	14,069
403.20	5,974	14,662
403.30	6,069	15,264
403.40	6,165	15,876
403.50	6,262	16,497
403.60	6,359	17,128
403.70	6,457	17,769
403.80	6,556	18,420
403.90	6,656	19,080
404.00	6,756	19,751
404.10	6,857	20,432
404.20	6,959	21,122
404.30	7,061	21,823
404.40	7,164	22,535
404.50	7,268	23,256
404.60	7,373	23,988
404.70	7,478	24,731
404.80	7,584	25,484
404.90	7,691	26,248
405.00	7,799	27,022
405.10	7,908	27,808
405.20	8,017	28,604
405.30	8,127	29,411
405.40	8,237	30,229
405.50	8,349	31,058
405.60	8,461	31,899
405.70	8,574	32,751
405.80	8,687	33,614
405.90	8,802	34,488
406.00	8,917	35,374
406.10	9,360	36,288
406.20	9,814	37,246
406.30	10,278	38,251
406.40	10,753	39,302
406.50	11,239	40,402
406.60	11,736	41,551
406.70	12,243	42,749
406.80	12,761	44,000
406.90	13,290	45,302
407.00	13,830	46,658
407.10	14,380	48,068
407.20	14,941	49,534
407.30	15,513	51,057
407.40	16,096	52,637
407.50	16,689	54,277
407.60	16,937	55,958
407.70	17,187	57,664
407.80	17,439	59,395
407.90	17,693	61,152
408.00	17,949	62,934
408.10	18,204	64,742
408.20	18,460	66,575
408.30	18,718	68,434
408.40	18,978	70,319
408.50	19,240	72,229
408.60	19,503	74,166
408.70	19,768	76,130
408.80	20,035	78,120
408.90	20,304	80,137
409.00	20,575	82,181
409.10	20,847	84,252
409.20	21,122	86,351
409.30	21,398	88,477
409.40	21,675	90,630
409.50	21,955	92,812
409.60	22,236	95,021
409.70	22,520	97,259
409.80	22,805	99,525
409.90	23,091	101,820
410.00	**23,380**	**104,144**

Summary for Pond 3P: Forebay & Bio B1-A

Inflow Area = 4.885 ac, 52.14% Impervious, Inflow Depth = 1.56" for 1-yr event
Inflow = 5.82 cfs @ 12.26 hrs, Volume= 0.635 af
Outflow = 0.64 cfs @ 13.61 hrs, Volume= 0.274 af, Atten= 89%, Lag= 81.0 min
Primary = 0.64 cfs @ 13.61 hrs, Volume= 0.274 af
Routed to Pond 7P : Detention Basin B1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 407.50' Surf.Area= 16,268 sf Storage= 53,756 cf
Peak Elev= 408.46' @ 13.61 hrs Surf.Area= 18,839 sf Storage= 70,569 cf (16,813 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 205.5 min (1,052.4 - 846.9)

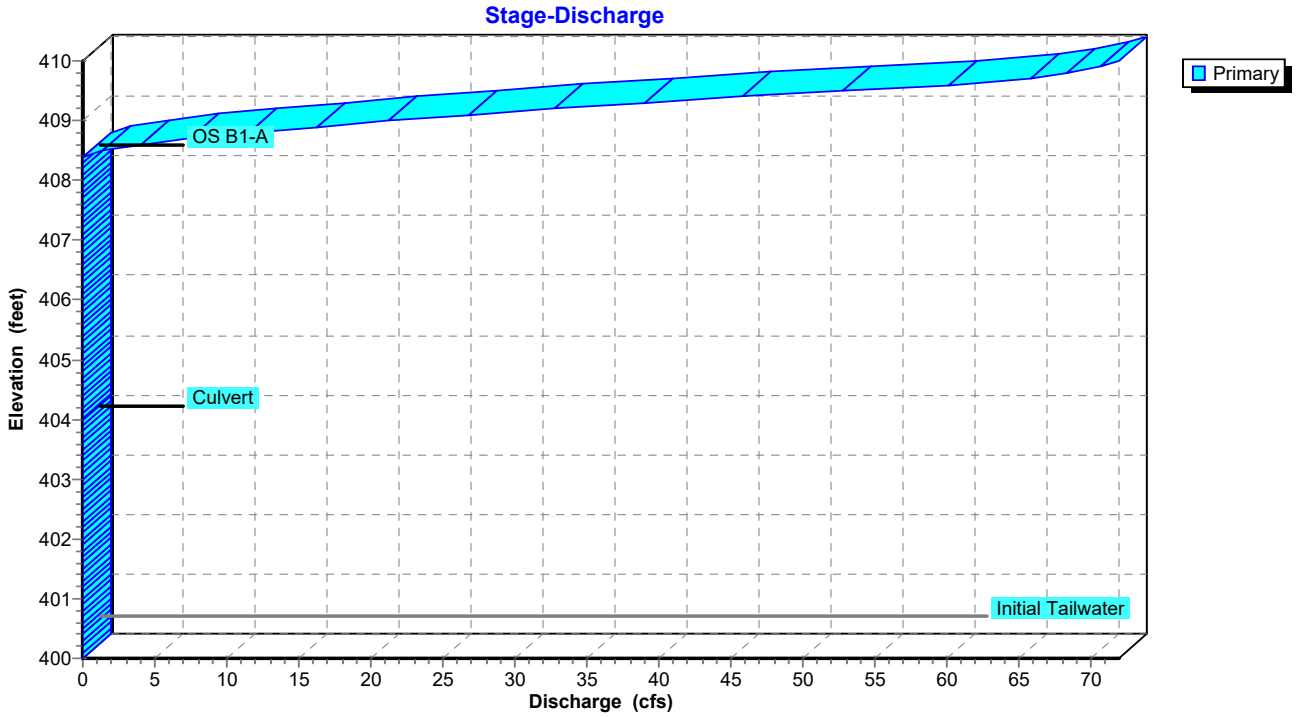
Volume	Invert	Avail.Storage	Storage Description
#1	400.00'	103,006 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
400.00	3,233	0	0	3,233
402.00	4,859	8,037	8,037	4,920
404.00	6,744	11,552	19,589	6,880
406.00	8,885	15,580	35,168	9,111
407.50	16,268	18,588	53,756	16,517
408.00	17,600	8,465	62,221	17,869
410.00	23,319	40,785	103,006	23,677

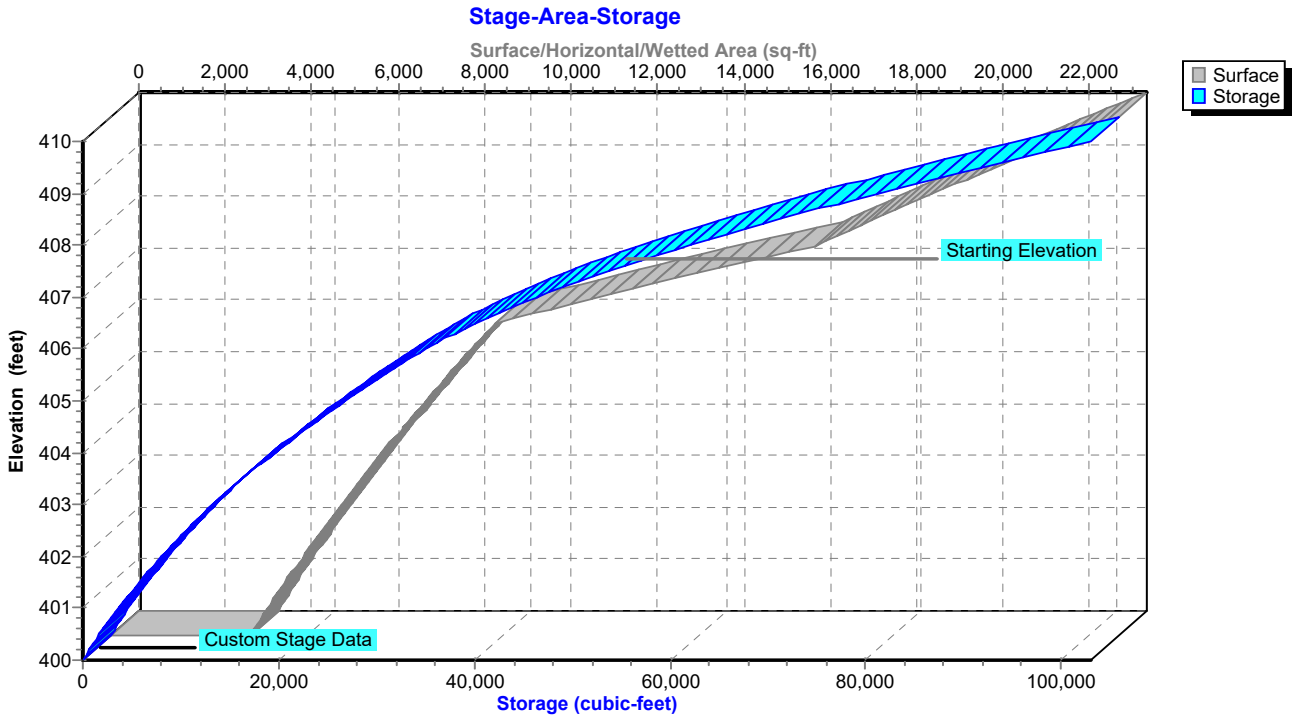
Device	Routing	Invert	Outlet Devices
#1	Primary	404.03'	**36.0" Round Culvert** L= 101.6' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 404.03' / 402.00' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 7.07 sf
#2	Device 1	408.40'	**36.0" x 48.0" Horiz. OS B1-A** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.64 cfs @ 13.61 hrs HW=408.46' TW=401.58' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.64 cfs of 58.24 cfs potential flow)
↑**2=OS B1-A** (Weir Controls 0.64 cfs @ 0.79 fps)

Pond 3P: Forebay & Bio B1-A



Pond 3P: Forebay & Bio B1-A



Stage-Discharge for Pond 3P: Forebay & Bio B1-A

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
400.00	0.00	402.60	0.00	405.20	0.00	407.80	0.00
400.05	0.00	402.65	0.00	405.25	0.00	407.85	0.00
400.10	0.00	402.70	0.00	405.30	0.00	407.90	0.00
400.15	0.00	402.75	0.00	405.35	0.00	407.95	0.00
400.20	0.00	402.80	0.00	405.40	0.00	408.00	0.00
400.25	0.00	402.85	0.00	405.45	0.00	408.05	0.00
400.30	0.00	402.90	0.00	405.50	0.00	408.10	0.00
400.35	0.00	402.95	0.00	405.55	0.00	408.15	0.00
400.40	0.00	403.00	0.00	405.60	0.00	408.20	0.00
400.45	0.00	403.05	0.00	405.65	0.00	408.25	0.00
400.50	0.00	403.10	0.00	405.70	0.00	408.30	0.00
400.55	0.00	403.15	0.00	405.75	0.00	408.35	0.00
400.60	0.00	403.20	0.00	405.80	0.00	408.40	0.00
400.65	0.00	403.25	0.00	405.85	0.00	408.45	0.51
400.70	0.00	403.30	0.00	405.90	0.00	408.50	1.45
400.75	0.00	403.35	0.00	405.95	0.00	408.55	2.66
400.80	0.00	403.40	0.00	406.00	0.00	408.60	4.09
400.85	0.00	403.45	0.00	406.05	0.00	408.65	5.72
400.90	0.00	403.50	0.00	406.10	0.00	408.70	7.52
400.95	0.00	403.55	0.00	406.15	0.00	408.75	9.48
401.00	0.00	403.60	0.00	406.20	0.00	408.80	11.58
401.05	0.00	403.65	0.00	406.25	0.00	408.85	13.82
401.10	0.00	403.70	0.00	406.30	0.00	408.90	16.19
401.15	0.00	403.75	0.00	406.35	0.00	408.95	18.67
401.20	0.00	403.80	0.00	406.40	0.00	409.00	21.28
401.25	0.00	403.85	0.00	406.45	0.00	409.05	23.99
401.30	0.00	403.90	0.00	406.50	0.00	409.10	26.81
401.35	0.00	403.95	0.00	406.55	0.00	409.15	29.73
401.40	0.00	404.00	0.00	406.60	0.00	409.20	32.76
401.45	0.00	404.05	0.00	406.65	0.00	409.25	35.88
401.50	0.00	404.10	0.00	406.70	0.00	409.30	39.09
401.55	0.00	404.15	0.00	406.75	0.00	409.35	42.39
401.60	0.00	404.20	0.00	406.80	0.00	409.40	45.78
401.65	0.00	404.25	0.00	406.85	0.00	409.45	49.26
401.70	0.00	404.30	0.00	406.90	0.00	409.50	52.82
401.75	0.00	404.35	0.00	406.95	0.00	409.55	56.46
401.80	0.00	404.40	0.00	407.00	0.00	409.60	60.18
401.85	0.00	404.45	0.00	407.05	0.00	409.65	63.98
401.90	0.00	404.50	0.00	407.10	0.00	409.70	65.88
401.95	0.00	404.55	0.00	407.15	0.00	409.75	67.13
402.00	0.00	404.60	0.00	407.20	0.00	409.80	68.37
402.05	0.00	404.65	0.00	407.25	0.00	409.85	69.58
402.10	0.00	404.70	0.00	407.30	0.00	409.90	70.77
402.15	0.00	404.75	0.00	407.35	0.00	409.95	71.55
402.20	0.00	404.80	0.00	407.40	0.00	410.00	**71.96**
402.25	0.00	404.85	0.00	407.45	0.00		
402.30	0.00	404.90	0.00	407.50	0.00		
402.35	0.00	404.95	0.00	407.55	0.00		
402.40	0.00	405.00	0.00	407.60	0.00		
402.45	0.00	405.05	0.00	407.65	0.00		
402.50	0.00	405.10	0.00	407.70	0.00		
402.55	0.00	405.15	0.00	407.75	0.00		

Stage-Area-Storage for Pond 3P: Forebay & Bio B1-A

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
400.00	3,233	0
400.10	3,306	327
400.20	3,381	661
400.30	3,456	1,003
400.40	3,532	1,353
400.50	3,609	1,710
400.60	3,686	2,074
400.70	3,765	2,447
400.80	3,844	2,827
400.90	3,924	3,216
401.00	4,005	3,612
401.10	4,086	4,017
401.20	4,169	4,429
401.30	4,252	4,850
401.40	4,337	5,280
401.50	4,422	5,718
401.60	4,507	6,164
401.70	4,594	6,619
401.80	4,682	7,083
401.90	4,770	7,556
402.00	4,859	8,037
402.10	4,946	8,527
402.20	5,034	9,026
402.30	5,122	9,534
402.40	5,211	10,051
402.50	5,301	10,576
402.60	5,392	11,111
402.70	5,484	11,655
402.80	5,576	12,208
402.90	5,669	12,770
403.00	5,763	13,342
403.10	5,858	13,923
403.20	5,953	14,513
403.30	6,049	15,113
403.40	6,146	15,723
403.50	6,244	16,342
403.60	6,342	16,972
403.70	6,442	17,611
403.80	6,542	18,260
403.90	6,642	18,919
404.00	6,744	19,589
404.10	6,844	20,268
404.20	6,945	20,957
404.30	7,046	21,657
404.40	7,149	22,367
404.50	7,252	23,087
404.60	7,355	23,817
404.70	7,460	24,558
404.80	7,565	25,309
404.90	7,671	26,071
405.00	7,778	26,843
405.10	7,885	27,626
405.20	7,993	28,420
405.30	8,102	29,225
405.40	8,212	30,041
405.50	8,322	30,867
405.60	8,433	31,705
405.70	8,545	32,554
405.80	8,658	33,414
405.90	8,771	34,286
406.00	8,885	35,168
406.10	9,308	36,078
406.20	9,741	37,030
406.30	10,184	38,027
406.40	10,637	39,068
406.50	11,100	40,154
406.60	11,572	41,288
406.70	12,055	42,469
406.80	12,547	43,699
406.90	13,049	44,979
407.00	13,561	46,309
407.10	14,083	47,691
407.20	14,614	49,126
407.30	15,156	50,615
407.40	15,707	52,158
407.50	16,268	53,756
407.60	16,530	55,396
407.70	16,795	57,062
407.80	17,061	58,755
407.90	17,329	60,475
408.00	17,600	62,221
408.10	17,867	63,994
408.20	18,136	65,795
408.30	18,407	67,622
408.40	18,680	69,476
408.50	18,954	71,358
408.60	19,231	73,267
408.70	19,510	75,204
408.80	19,791	77,169
408.90	20,074	79,162
409.00	20,359	81,184
409.10	20,646	83,234
409.20	20,935	85,313
409.30	21,226	87,421
409.40	21,519	89,558
409.50	21,814	91,725
409.60	22,111	93,921
409.70	22,410	96,147
409.80	22,711	98,403
409.90	23,014	100,690
410.00	**23,319**	**103,006**

Summary for Pond 4P: Detention Basin A1

Inflow Area = 9.990 ac, 49.59% Impervious, Inflow Depth = 1.56" for 1-yr event
Inflow = 10.78 cfs @ 12.33 hrs, Volume= 1.298 af
Outflow = 0.58 cfs @ 16.78 hrs, Volume= 1.295 af, Atten= 95%, Lag= 267.0 min
Primary = 0.58 cfs @ 16.78 hrs, Volume= 1.295 af
Routed to Pond PR-A : PR-A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Automatic Starting Elev= 398.50' Surf.Area= 2,907 sf Storage= 21,861 cf
Peak Elev= 404.52' @ 16.78 hrs Surf.Area= 10,678 sf Storage= 55,794 cf (33,933 cf above start)

Plug-Flow detention time= 1,160.9 min calculated for 0.793 af (61% of inflow)
Center-of-Mass det. time= 683.1 min (1,541.2 - 858.1)

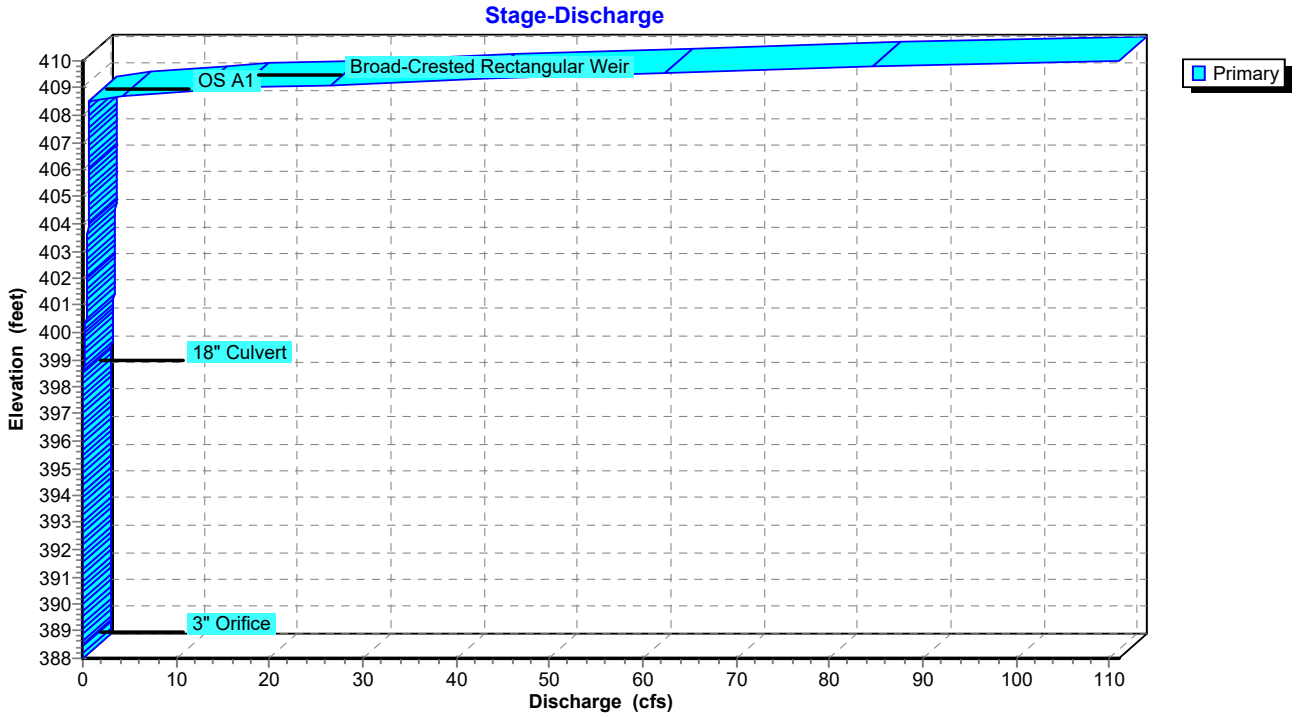
Volume	Invert	Avail.Storage	Storage Description
#1	388.00'	150,665 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
388.00	1,355	0	0	1,355
400.00	3,176	26,422	26,422	4,046
402.00	5,824	8,867	35,289	6,736
404.00	9,598	15,266	50,555	10,560
406.00	14,095	23,549	74,104	15,122
408.00	19,096	33,065	107,169	20,205
410.00	24,513	43,496	150,665	25,722

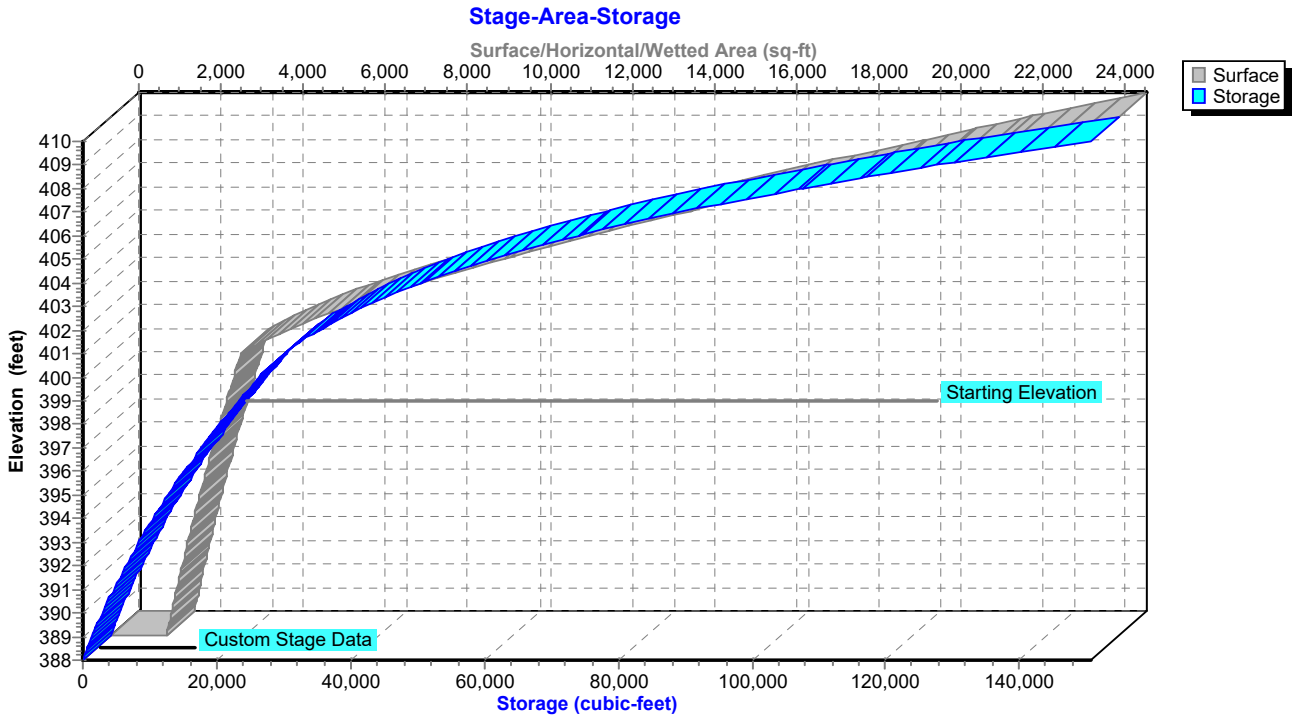
Device	Routing	Invert	Outlet Devices
#1	Primary	398.50'	**18.0" Round 18" Culvert** L= 56.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 398.50' / 397.94' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	388.50'	**3.0" Vert. 3" Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	408.50'	**36.0" x 48.0" Horiz. OS A1** C= 0.600 Limited to weir flow at low heads
#4	Primary	409.00'	**30.0' long + 2.0 '/' SideZ x 50.0' 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=0.58 cfs @ 16.78 hrs HW=404.52' TW=0.00' (Dynamic Tailwater)
- **1=18" Culvert** (Passes 0.58 cfs of 19.53 cfs potential flow)
  - **2=3" Orifice** (Orifice Controls 0.58 cfs @ 11.81 fps)
  - **3=OS A1** (Controls 0.00 cfs)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: Detention Basin A1



Pond 4P: Detention Basin A1



Stage-Discharge for Pond 4P: Detention Basin A1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
388.00	0.00	398.40	0.00	408.80	8.28
388.20	0.00	398.60	0.05	409.00	16.95
388.40	0.00	398.80	0.13	409.20	34.11
388.60	0.00	399.00	0.17	409.40	48.04
388.80	0.00	399.20	0.20	409.60	66.22
389.00	0.00	399.40	0.22	409.80	86.73
389.20	0.00	399.60	0.25	410.00	**111.01**
389.40	0.00	399.80	0.27		
389.60	0.00	400.00	0.29		
389.80	0.00	400.20	0.31		
390.00	0.00	400.40	0.33		
390.20	0.00	400.60	0.34		
390.40	0.00	400.80	0.36		
390.60	0.00	401.00	0.37		
390.80	0.00	401.20	0.39		
391.00	0.00	401.40	0.40		
391.20	0.00	401.60	0.42		
391.40	0.00	401.80	0.43		
391.60	0.00	402.00	0.44		
391.80	0.00	402.20	0.45		
392.00	0.00	402.40	0.47		
392.20	0.00	402.60	0.48		
392.40	0.00	402.80	0.49		
392.60	0.00	403.00	0.50		
392.80	0.00	403.20	0.51		
393.00	0.00	403.40	0.52		
393.20	0.00	403.60	0.53		
393.40	0.00	403.80	0.54		
393.60	0.00	404.00	0.55		
393.80	0.00	404.20	0.56		
394.00	0.00	404.40	0.57		
394.20	0.00	404.60	0.58		
394.40	0.00	404.80	0.59		
394.60	0.00	405.00	0.60		
394.80	0.00	405.20	0.61		
395.00	0.00	405.40	0.62		
395.20	0.00	405.60	0.63		
395.40	0.00	405.80	0.64		
395.60	0.00	406.00	0.65		
395.80	0.00	406.20	0.66		
396.00	0.00	406.40	0.66		
396.20	0.00	406.60	0.67		
396.40	0.00	406.80	0.68		
396.60	0.00	407.00	0.69		
396.80	0.00	407.20	0.70		
397.00	0.00	407.40	0.71		
397.20	0.00	407.60	0.71		
397.40	0.00	407.80	0.72		
397.60	0.00	408.00	0.73		
397.80	0.00	408.20	0.74		
398.00	0.00	408.40	0.74		
398.20	0.00	408.60	2.20		

Stage-Area-Storage for Pond 4P: Detention Basin A1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
388.00	1,355	0
388.50	1,416	693
389.00	1,478	1,416
389.50	1,541	2,170
390.00	1,605	2,957
390.50	1,671	3,776
391.00	1,739	4,628
391.50	1,807	5,515
392.00	1,877	6,436
392.50	1,948	7,392
393.00	2,021	8,384
393.50	2,095	9,413
394.00	2,170	10,479
394.50	2,247	11,584
395.00	2,324	12,726
395.50	2,404	13,908
396.00	2,484	15,130
396.50	2,566	16,392
397.00	2,649	17,696
397.50	2,734	19,042
398.00	2,819	20,430
398.50	2,907	21,861
399.00	2,995	23,337
399.50	3,085	24,857
400.00	3,176	26,422
400.50	3,763	28,155
401.00	4,400	30,194
401.50	5,087	32,563
402.00	5,824	35,289
402.50	6,680	38,413
403.00	7,594	41,978
403.50	8,567	46,016
404.00	9,598	50,555
404.50	10,641	55,612
405.00	11,739	61,205
405.50	12,890	67,360
406.00	14,095	74,104
406.50	15,274	81,445
407.00	16,501	89,386
407.50	17,775	97,953
408.00	19,096	107,169
408.50	20,387	117,038
409.00	21,720	127,563
409.50	23,095	138,765
410.00	**24,513**	**150,665**

Summary for Pond 6P: Forebay & Bio B1-B

Inflow Area = 4.222 ac, 52.11% Impervious, Inflow Depth = 1.56" for 1-yr event
Inflow = 5.41 cfs @ 12.22 hrs, Volume= 0.549 af
Outflow = 0.70 cfs @ 13.22 hrs, Volume= 0.253 af, Atten= 87%, Lag= 59.8 min
Primary = 0.70 cfs @ 13.22 hrs, Volume= 0.253 af
Routed to Pond 7P : Detention Basin B1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 407.50' Surf.Area= 13,168 sf Storage= 32,496 cf
Peak Elev= 408.46' @ 13.22 hrs Surf.Area= 15,673 sf Storage= 46,355 cf (13,859 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 184.3 min (1,028.4 - 844.2)

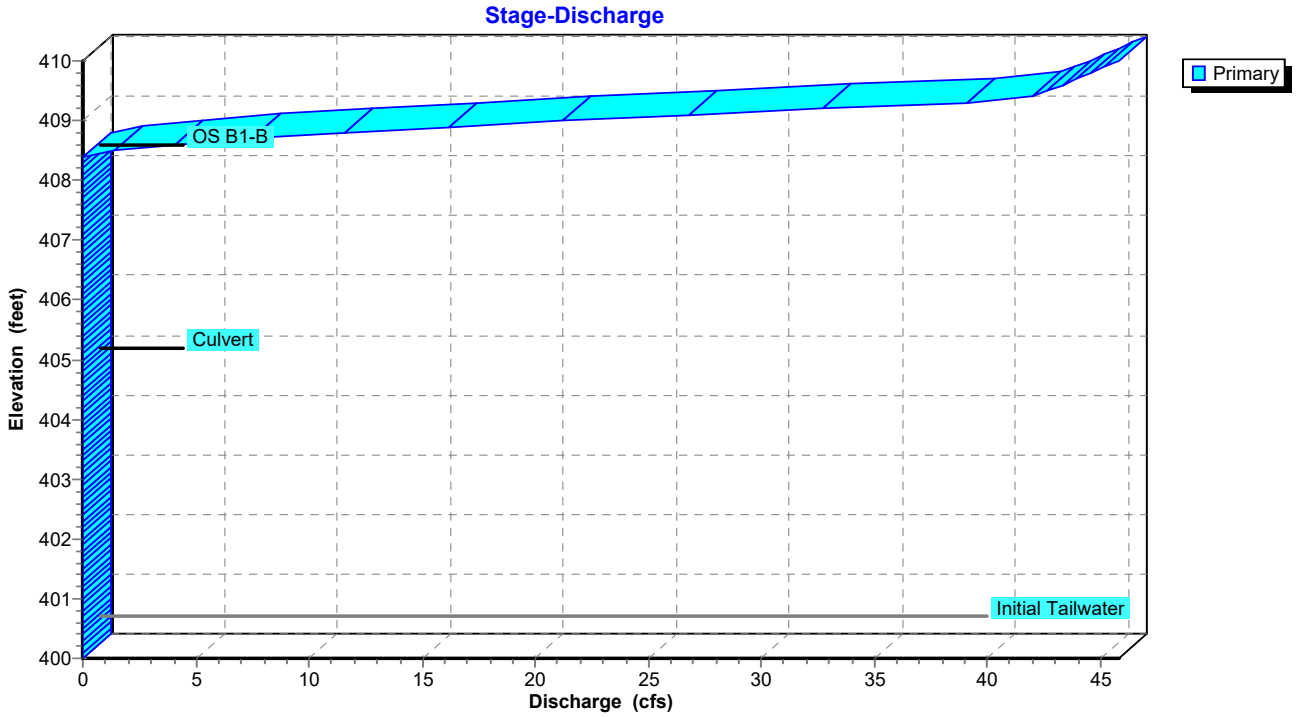
Volume	Invert	Avail.Storage	Storage Description
#1	400.00'	73,766 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
400.00	855	0	0	855
402.00	2,141	2,899	2,899	2,169
404.00	3,887	5,942	8,841	3,957
406.00	5,898	9,715	18,557	6,027
407.50	13,168	13,939	32,496	13,315
408.00	14,464	6,905	39,401	14,628
410.00	20,052	34,364	73,766	20,292

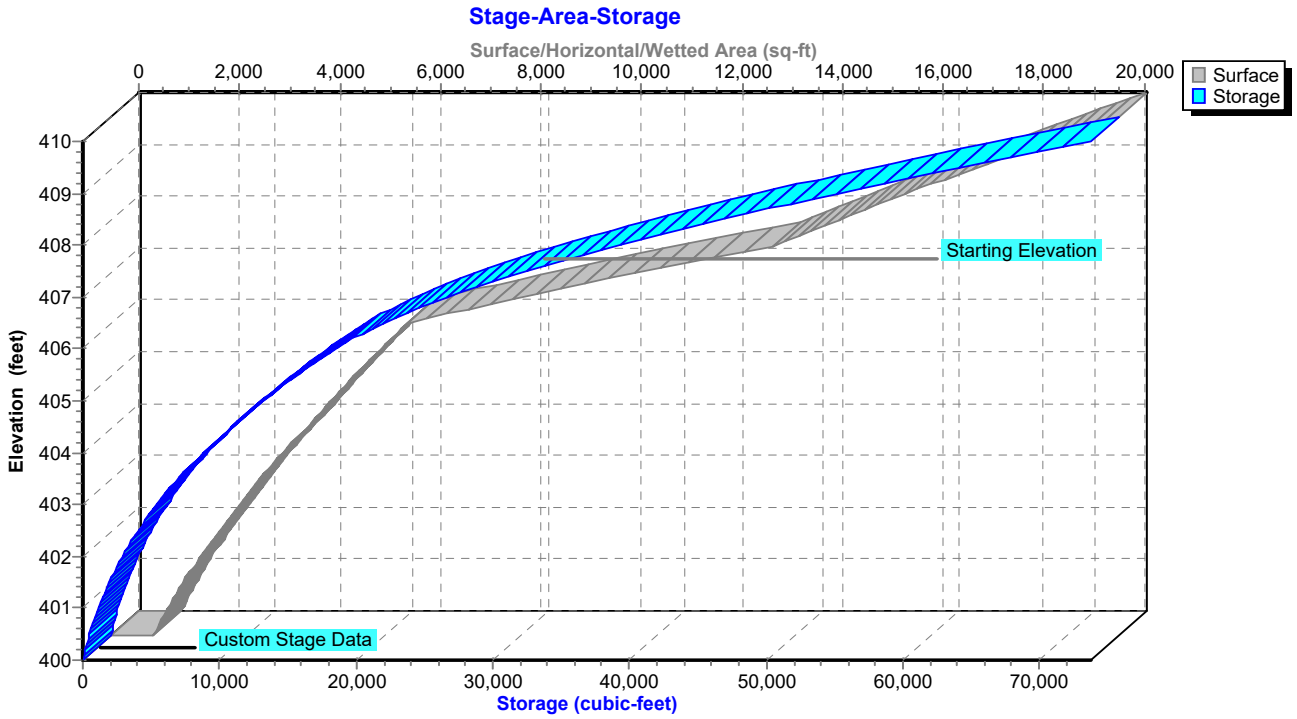
Device	Routing	Invert	Outlet Devices
#1	Primary	404.99'	**30.0" Round Culvert** L= 149.6' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 404.99' / 402.00' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 4.91 sf
#2	Device 1	408.40'	**36.0" x 48.0" Horiz. OS B1-B** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.70 cfs @ 13.22 hrs HW=408.46' TW=401.00' (Dynamic Tailwater)
↑**1=Culvert** (Passes 0.70 cfs of 35.23 cfs potential flow)
↑**2=OS B1-B** (Weir Controls 0.70 cfs @ 0.81 fps)

Pond 6P: Forebay & Bio B1-B



Pond 6P: Forebay & Bio B1-B



Stage-Discharge for Pond 6P: Forebay & Bio B1-B

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
400.00	0.00	402.60	0.00	405.20	0.00	407.80	0.00
400.05	0.00	402.65	0.00	405.25	0.00	407.85	0.00
400.10	0.00	402.70	0.00	405.30	0.00	407.90	0.00
400.15	0.00	402.75	0.00	405.35	0.00	407.95	0.00
400.20	0.00	402.80	0.00	405.40	0.00	408.00	0.00
400.25	0.00	402.85	0.00	405.45	0.00	408.05	0.00
400.30	0.00	402.90	0.00	405.50	0.00	408.10	0.00
400.35	0.00	402.95	0.00	405.55	0.00	408.15	0.00
400.40	0.00	403.00	0.00	405.60	0.00	408.20	0.00
400.45	0.00	403.05	0.00	405.65	0.00	408.25	0.00
400.50	0.00	403.10	0.00	405.70	0.00	408.30	0.00
400.55	0.00	403.15	0.00	405.75	0.00	408.35	0.00
400.60	0.00	403.20	0.00	405.80	0.00	408.40	0.00
400.65	0.00	403.25	0.00	405.85	0.00	408.45	0.51
400.70	0.00	403.30	0.00	405.90	0.00	408.50	1.45
400.75	0.00	403.35	0.00	405.95	0.00	408.55	2.66
400.80	0.00	403.40	0.00	406.00	0.00	408.60	4.09
400.85	0.00	403.45	0.00	406.05	0.00	408.65	5.72
400.90	0.00	403.50	0.00	406.10	0.00	408.70	7.52
400.95	0.00	403.55	0.00	406.15	0.00	408.75	9.48
401.00	0.00	403.60	0.00	406.20	0.00	408.80	11.58
401.05	0.00	403.65	0.00	406.25	0.00	408.85	13.82
401.10	0.00	403.70	0.00	406.30	0.00	408.90	16.19
401.15	0.00	403.75	0.00	406.35	0.00	408.95	18.67
401.20	0.00	403.80	0.00	406.40	0.00	409.00	21.28
401.25	0.00	403.85	0.00	406.45	0.00	409.05	23.99
401.30	0.00	403.90	0.00	406.50	0.00	409.10	26.81
401.35	0.00	403.95	0.00	406.55	0.00	409.15	29.73
401.40	0.00	404.00	0.00	406.60	0.00	409.20	32.76
401.45	0.00	404.05	0.00	406.65	0.00	409.25	35.88
401.50	0.00	404.10	0.00	406.70	0.00	409.30	39.09
401.55	0.00	404.15	0.00	406.75	0.00	409.35	41.68
401.60	0.00	404.20	0.00	406.80	0.00	409.40	42.02
401.65	0.00	404.25	0.00	406.85	0.00	409.45	42.35
401.70	0.00	404.30	0.00	406.90	0.00	409.50	42.67
401.75	0.00	404.35	0.00	406.95	0.00	409.55	43.00
401.80	0.00	404.40	0.00	407.00	0.00	409.60	43.32
401.85	0.00	404.45	0.00	407.05	0.00	409.65	43.65
401.90	0.00	404.50	0.00	407.10	0.00	409.70	43.96
401.95	0.00	404.55	0.00	407.15	0.00	409.75	44.28
402.00	0.00	404.60	0.00	407.20	0.00	409.80	44.60
402.05	0.00	404.65	0.00	407.25	0.00	409.85	44.91
402.10	0.00	404.70	0.00	407.30	0.00	409.90	45.22
402.15	0.00	404.75	0.00	407.35	0.00	409.95	45.53
402.20	0.00	404.80	0.00	407.40	0.00	410.00	**45.83**
402.25	0.00	404.85	0.00	407.45	0.00		
402.30	0.00	404.90	0.00	407.50	0.00		
402.35	0.00	404.95	0.00	407.55	0.00		
402.40	0.00	405.00	0.00	407.60	0.00		
402.45	0.00	405.05	0.00	407.65	0.00		
402.50	0.00	405.10	0.00	407.70	0.00		
402.55	0.00	405.15	0.00	407.75	0.00		

Stage-Area-Storage for Pond 6P: Forebay & Bio B1-B

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
400.00	855	0
400.10	906	88
400.20	957	181
400.30	1,011	280
400.40	1,066	383
400.50	1,122	493
400.60	1,180	608
400.70	1,239	729
400.80	1,300	856
400.90	1,362	989
401.00	1,425	1,128
401.10	1,491	1,274
401.20	1,557	1,426
401.30	1,625	1,585
401.40	1,694	1,751
401.50	1,765	1,924
401.60	1,837	2,104
401.70	1,911	2,292
401.80	1,986	2,487
401.90	2,063	2,689
402.00	2,141	2,899
402.10	2,216	3,117
402.20	2,292	3,343
402.30	2,370	3,576
402.40	2,449	3,817
402.50	2,529	4,065
402.60	2,611	4,322
402.70	2,693	4,588
402.80	2,777	4,861
402.90	2,863	5,143
403.00	2,949	5,434
403.10	3,037	5,733
403.20	3,127	6,041
403.30	3,217	6,358
403.40	3,309	6,685
403.50	3,402	7,020
403.60	3,496	7,365
403.70	3,592	7,720
403.80	3,689	8,084
403.90	3,787	8,457
404.00	3,887	8,841
404.10	3,978	9,234
404.20	4,069	9,637
404.30	4,162	10,048
404.40	4,256	10,469
404.50	4,351	10,899
404.60	4,446	11,339
404.70	4,543	11,789
404.80	4,641	12,248
404.90	4,740	12,717
405.00	4,840	13,196
405.10	4,941	13,685
405.20	5,043	14,184
405.30	5,147	14,694
405.40	5,251	15,214
405.50	5,356	15,744
405.60	5,462	16,285
405.70	5,570	16,837
405.80	5,678	17,399
405.90	5,788	17,972
406.00	5,898	18,557
406.10	6,293	19,166
406.20	6,701	19,816
406.30	7,122	20,507
406.40	7,555	21,240
406.50	8,001	22,018
406.60	8,460	22,841
406.70	8,932	23,711
406.80	9,417	24,628
406.90	9,914	25,594
407.00	10,425	26,611
407.10	10,948	27,680
407.20	11,484	28,801
407.30	12,032	29,977
407.40	12,594	31,208
407.50	13,168	32,496
407.60	13,422	33,825
407.70	13,679	35,180
407.80	13,938	36,561
407.90	14,200	37,968
408.00	14,464	39,401
408.10	14,722	40,861
408.20	14,982	42,346
408.30	15,244	43,857
408.40	15,509	45,395
408.50	15,776	46,959
408.60	16,045	48,550
408.70	16,316	50,168
408.80	16,590	51,813
408.90	16,866	53,486
409.00	17,144	55,187
409.10	17,425	56,915
409.20	17,708	58,672
409.30	17,993	60,457
409.40	18,280	62,270
409.50	18,570	64,113
409.60	18,862	65,984
409.70	19,156	67,885
409.80	19,452	69,815
409.90	19,751	71,775
410.00	**20,052**	**73,766**

Summary for Pond 7P: Detention Basin B1

Inflow Area = 9.568 ac, 49.61% Impervious, Inflow Depth = 0.66" for 1-yr event
Inflow = 1.28 cfs @ 13.45 hrs, Volume= 0.527 af
Outflow = 0.38 cfs @ 19.77 hrs, Volume= 0.526 af, Atten= 70%, Lag= 379.3 min
Primary = 0.38 cfs @ 19.77 hrs, Volume= 0.526 af
Routed to Pond PR-B : PR-B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Automatic Starting Elev= 400.50' Surf.Area= 1,825 sf Storage= 806 cf
Peak Elev= 403.21' @ 19.77 hrs Surf.Area= 4,882 sf Storage= 9,664 cf (8,858 cf above start)

Plug-Flow detention time= 348.3 min calculated for 0.508 af (96% of inflow)
Center-of-Mass det. time= 310.6 min (1,351.5 - 1,040.9)

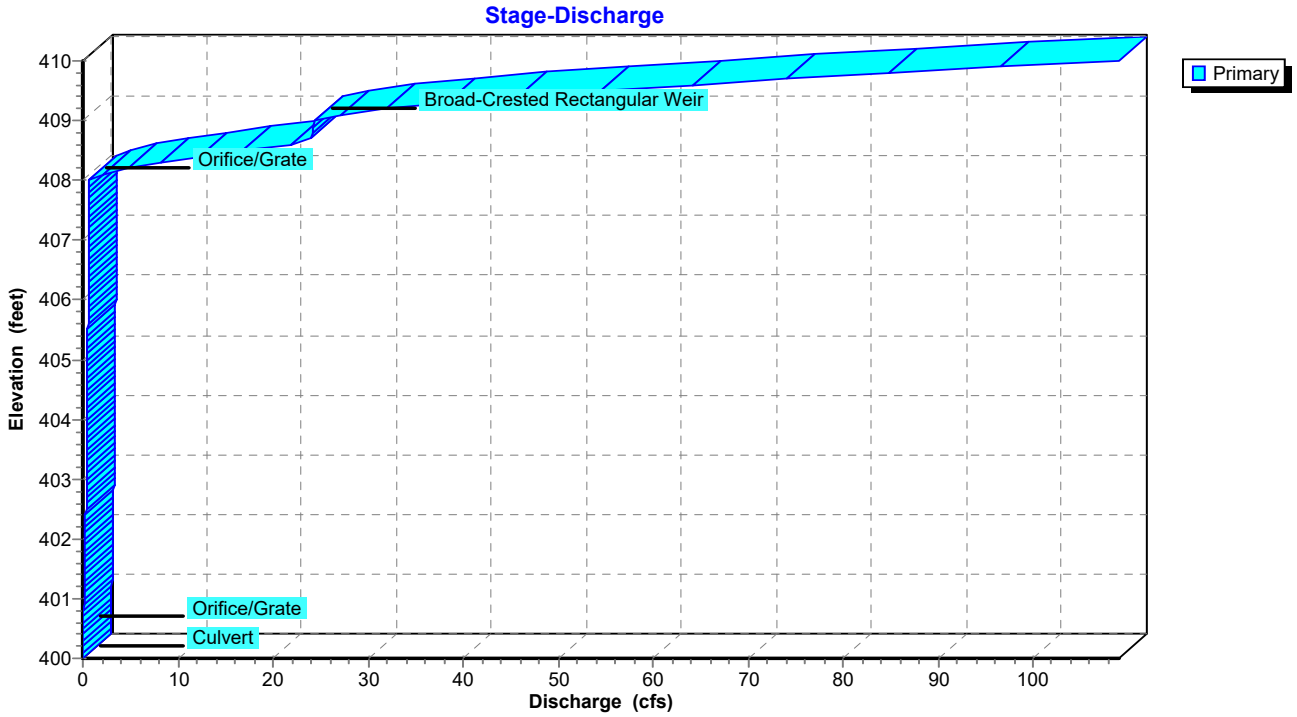
Volume	Invert	Avail.Storage	Storage Description
#1	400.00'	79,868 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
400.00	1,408	0	0	1,408
402.00	3,402	4,666	4,666	3,431
404.00	5,985	9,266	13,932	6,058
406.00	9,096	14,973	28,905	9,229
408.00	12,687	21,684	50,588	12,895
410.00	16,684	29,280	79,868	16,983

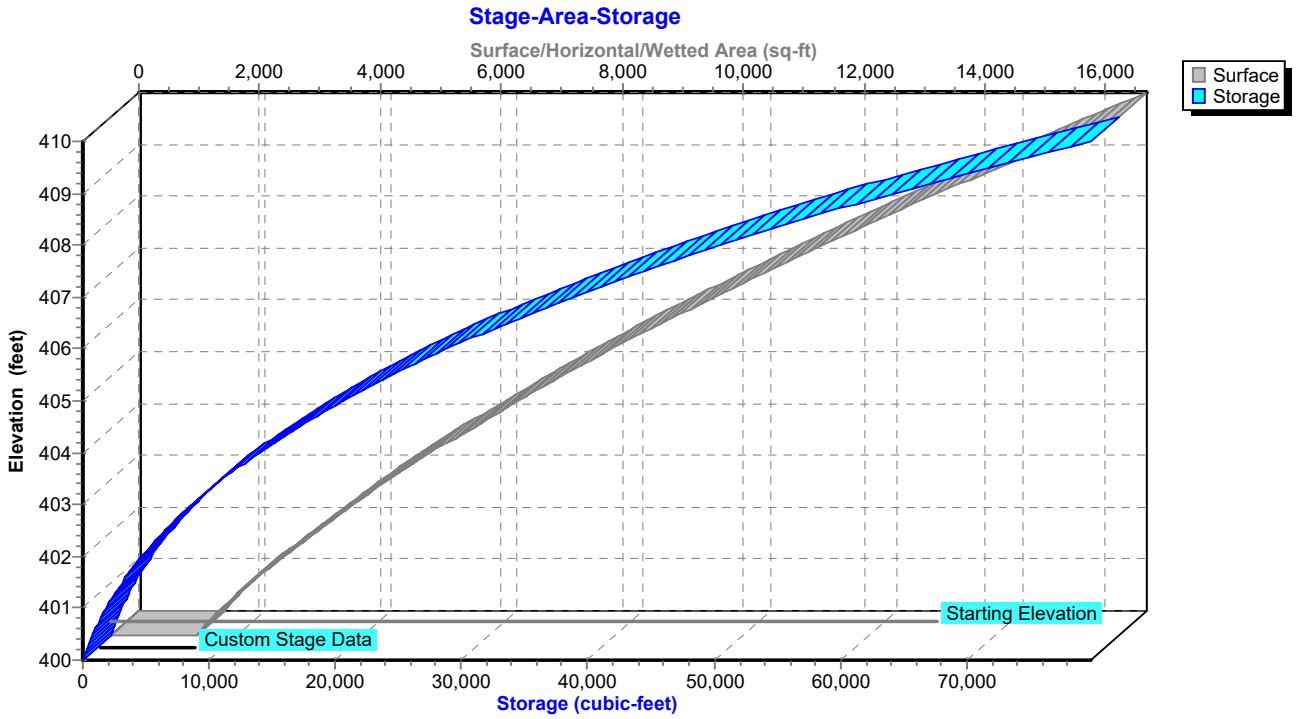
Device	Routing	Invert	Outlet Devices
#1	Primary	400.00'	**18.0" Round Culvert** L= 140.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 400.00' / 398.00' S= 0.0143 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	400.50'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	408.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	409.00'	**30.0' long + 2.0 '/' SideZ x 50.0' 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=0.38 cfs @ 19.77 hrs HW=403.21' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.38 cfs of 13.35 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.38 cfs @ 7.75 fps)
  - **3=Orifice/Grate** (Controls 0.00 cfs)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P: Detention Basin B1



Pond 7P: Detention Basin B1



Stage-Discharge for Pond 7P: Detention Basin B1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
400.00	0.00	402.60	0.33	405.20	0.51	407.80	0.63
400.05	0.00	402.65	0.34	405.25	0.51	407.85	0.64
400.10	0.00	402.70	0.34	405.30	0.51	407.90	0.64
400.15	0.00	402.75	0.34	405.35	0.51	407.95	0.64
400.20	0.00	402.80	0.35	405.40	0.52	408.00	0.64
400.25	0.00	402.85	0.35	405.45	0.52	408.05	1.16
400.30	0.00	402.90	0.36	405.50	0.52	408.10	2.09
400.35	0.00	402.95	0.36	405.55	0.52	408.15	3.31
400.40	0.00	403.00	0.36	405.60	0.53	408.20	4.75
400.45	0.00	403.05	0.37	405.65	0.53	408.25	6.38
400.50	0.00	403.10	0.37	405.70	0.53	408.30	8.18
400.55	0.01	403.15	0.38	405.75	0.54	408.35	10.14
400.60	0.02	403.20	0.38	405.80	0.54	408.40	12.24
400.65	0.04	403.25	0.38	405.85	0.54	408.45	14.48
400.70	0.06	403.30	0.39	405.90	0.54	408.50	16.85
400.75	0.08	403.35	0.39	405.95	0.55	408.55	19.34
400.80	0.10	403.40	0.39	406.00	0.55	408.60	21.94
400.85	0.11	403.45	0.40	406.05	0.55	408.65	23.92
400.90	0.12	403.50	0.40	406.10	0.55	408.70	23.99
400.95	0.13	403.55	0.40	406.15	0.56	408.75	24.07
401.00	0.14	403.60	0.41	406.20	0.56	408.80	24.14
401.05	0.15	403.65	0.41	406.25	0.56	408.85	24.22
401.10	0.16	403.70	0.41	406.30	0.56	408.90	24.29
401.15	0.17	403.75	0.42	406.35	0.57	408.95	24.37
401.20	0.18	403.80	0.42	406.40	0.57	409.00	24.44
401.25	0.19	403.85	0.42	406.45	0.57	409.05	25.41
401.30	0.19	403.90	0.43	406.50	0.57	409.10	27.14
401.35	0.20	403.95	0.43	406.55	0.58	409.15	29.37
401.40	0.21	404.00	0.43	406.60	0.58	409.20	32.00
401.45	0.21	404.05	0.44	406.65	0.58	409.25	35.01
401.50	0.22	404.10	0.44	406.70	0.58	409.30	38.35
401.55	0.23	404.15	0.44	406.75	0.58	409.35	42.01
401.60	0.23	404.20	0.45	406.80	0.59	409.40	45.95
401.65	0.24	404.25	0.45	406.85	0.59	409.45	50.14
401.70	0.25	404.30	0.45	406.90	0.59	409.50	54.57
401.75	0.25	404.35	0.46	406.95	0.59	409.55	59.25
401.80	0.26	404.40	0.46	407.00	0.60	409.60	64.16
401.85	0.26	404.45	0.46	407.05	0.60	409.65	69.06
401.90	0.27	404.50	0.47	407.10	0.60	409.70	74.12
401.95	0.27	404.55	0.47	407.15	0.60	409.75	79.33
402.00	0.28	404.60	0.47	407.20	0.61	409.80	84.69
402.05	0.28	404.65	0.47	407.25	0.61	409.85	90.49
402.10	0.29	404.70	0.48	407.30	0.61	409.90	96.47
402.15	0.29	404.75	0.48	407.35	0.61	409.95	102.64
402.20	0.30	404.80	0.48	407.40	0.62	410.00	**108.99**
402.25	0.30	404.85	0.49	407.45	0.62		
402.30	0.31	404.90	0.49	407.50	0.62		
402.35	0.31	404.95	0.49	407.55	0.62		
402.40	0.31	405.00	0.49	407.60	0.62		
402.45	0.32	405.05	0.50	407.65	0.63		
402.50	0.32	405.10	0.50	407.70	0.63		
402.55	0.33	405.15	0.50	407.75	0.63		

Stage-Area-Storage for Pond 7P: Detention Basin B1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
400.00	1,408	0
400.10	1,487	145
400.20	1,568	298
400.30	1,652	459
400.40	1,738	628
400.50	1,825	806
400.60	1,915	993
400.70	2,007	1,189
400.80	2,102	1,395
400.90	2,198	1,610
401.00	2,297	1,834
401.10	2,398	2,069
401.20	2,501	2,314
401.30	2,606	2,569
401.40	2,713	2,835
401.50	2,822	3,112
401.60	2,934	3,400
401.70	3,048	3,699
401.80	3,164	4,009
401.90	3,282	4,332
402.00	3,402	4,666
402.10	3,514	5,012
402.20	3,628	5,369
402.30	3,743	5,737
402.40	3,861	6,117
402.50	3,980	6,509
402.60	4,101	6,913
402.70	4,224	7,330
402.80	4,348	7,758
402.90	4,475	8,199
403.00	4,603	8,653
403.10	4,733	9,120
403.20	4,865	9,600
403.30	4,999	10,093
403.40	5,134	10,600
403.50	5,271	11,120
403.60	5,410	11,654
403.70	5,551	12,202
403.80	5,694	12,764
403.90	5,839	13,341
404.00	5,985	13,932
404.10	6,125	14,537
404.20	6,267	15,157
404.30	6,410	15,791
404.40	6,555	16,439
404.50	6,702	17,102
404.60	6,850	17,780
404.70	7,000	18,472
404.80	7,152	19,180
404.90	7,305	19,902
405.00	7,459	20,641
405.10	7,616	21,394
405.20	7,774	22,164
405.30	7,933	22,949
405.40	8,095	23,751
405.50	8,257	24,568
405.60	8,422	25,402
405.70	8,588	26,253
405.80	8,756	27,120
405.90	8,925	28,004
406.00	9,096	28,905
406.10	9,261	29,823
406.20	9,428	30,757
406.30	9,597	31,708
406.40	9,767	32,677
406.50	9,938	33,662
406.60	10,111	34,664
406.70	10,285	35,684
406.80	10,461	36,721
406.90	10,638	37,776
407.00	10,817	38,849
407.10	10,997	39,940
407.20	11,179	41,048
407.30	11,362	42,175
407.40	11,547	43,321
407.50	11,733	44,485
407.60	11,921	45,668
407.70	12,110	46,869
407.80	12,301	48,090
407.90	12,493	49,329
408.00	12,687	50,588
408.10	12,874	51,867
408.20	13,062	53,163
408.30	13,252	54,479
408.40	13,443	55,814
408.50	13,635	57,168
408.60	13,829	58,541
408.70	14,024	59,933
408.80	14,220	61,346
408.90	14,418	62,777
409.00	14,617	64,229
409.10	14,818	65,701
409.20	15,020	67,193
409.30	15,223	68,705
409.40	15,428	70,237
409.50	15,634	71,790
409.60	15,841	73,364
409.70	16,050	74,959
409.80	16,260	76,574
409.90	16,471	78,211
410.00	**16,684**	**79,868**

Summary for Pond PR-A: PR-A

Inflow Area = 37.077 ac, 36.05% Impervious, Inflow Depth > 0.98" for 1-yr event
Inflow = 15.36 cfs @ 12.26 hrs, Volume= 3.029 af
Primary = 15.36 cfs @ 12.26 hrs, Volume= 3.029 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond PR-B: PR-B

Inflow Area = 21.350 ac, 28.46% Impervious, Inflow Depth > 0.42" for 1-yr event
Inflow = 0.86 cfs @ 12.53 hrs, Volume= 0.755 af
Primary = 0.86 cfs @ 12.53 hrs, Volume= 0.755 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond 1P: Forebay & Bio A1-A

Inflow Area = 4.891 ac, 54.92% Impervious, Inflow Depth = 3.58" for 10-yr event
Inflow = 12.46 cfs @ 12.26 hrs, Volume= 1.458 af
Outflow = 11.90 cfs @ 12.31 hrs, Volume= 1.458 af, Atten= 5%, Lag= 3.3 min
Primary = 11.90 cfs @ 12.31 hrs, Volume= 1.458 af
Routed to Pond 4P : Detention Basin A1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Automatic Starting Elev= 408.50' Surf.Area= 18,385 sf Storage= 66,328 cf
Peak Elev= 408.70' @ 12.31 hrs Surf.Area= 18,526 sf Storage= 69,971 cf (3,642 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 10.4 min (826.5 - 816.1)

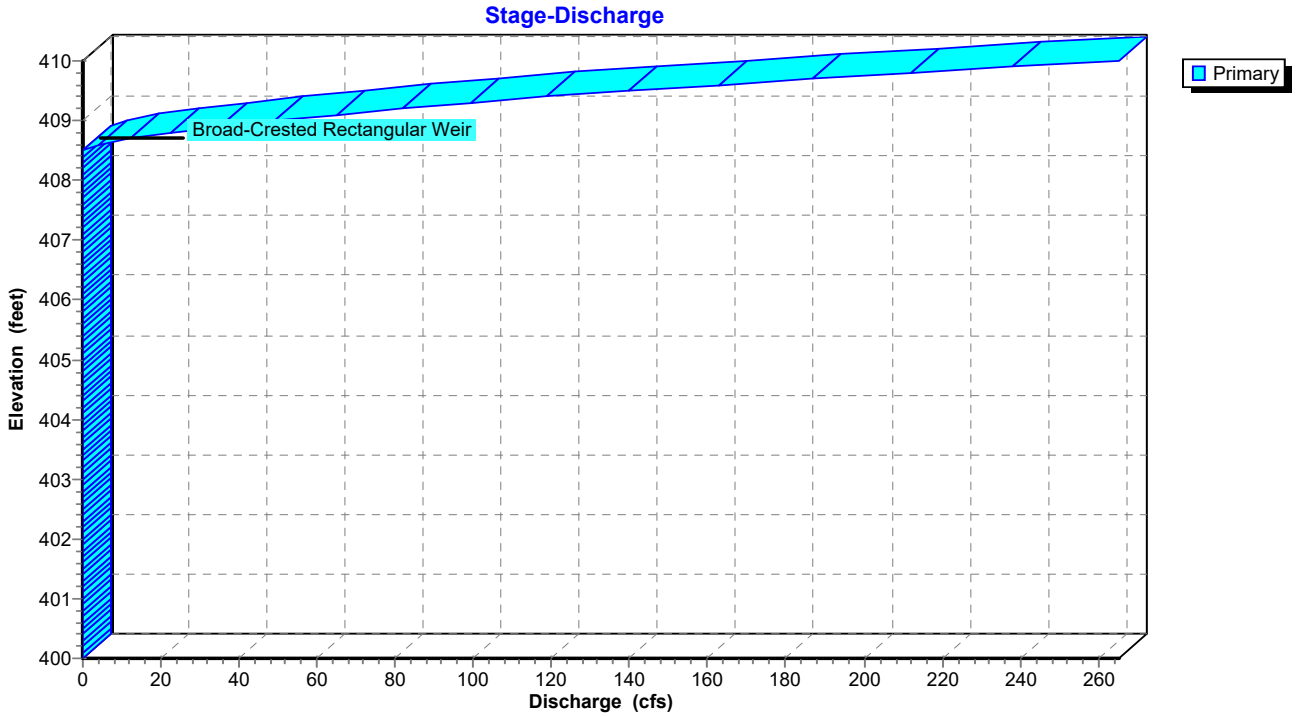
Volume	Invert	Avail.Storage	Storage Description
#1	400.00'	94,716 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
400.00	2,093	0	0	2,093
402.00	3,854	5,858	5,858	3,895
404.00	5,993	9,769	15,627	6,090
406.00	8,501	14,421	30,048	8,669
407.50	16,634	18,513	48,561	16,824
408.00	18,030	8,664	57,225	18,239
410.00	19,471	37,492	94,716	19,977

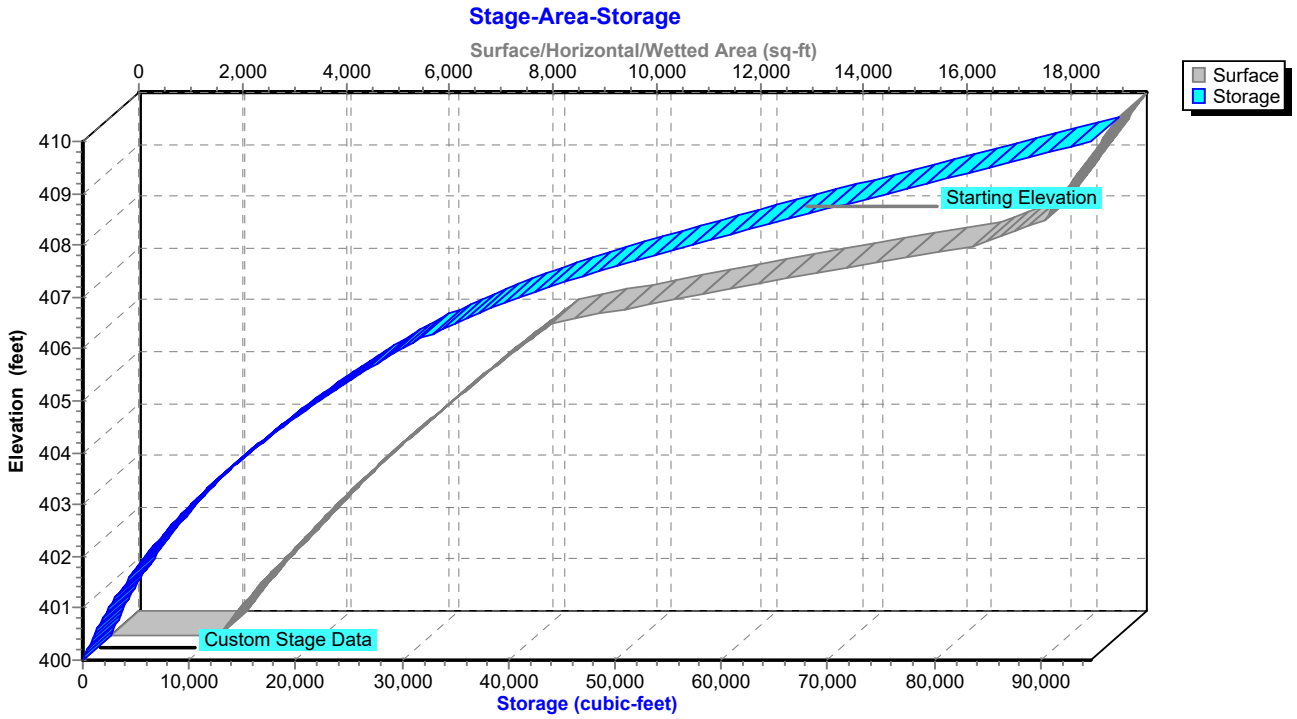
Device	Routing	Invert	Outlet Devices
#1	Primary	408.50'	**50.0' long + 4.0 '/' SideZ x 31.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=11.90 cfs @ 12.31 hrs HW=408.70' TW=404.81' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 11.90 cfs @ 1.19 fps)

Pond 1P: Forebay & Bio A1-A



Pond 1P: Forebay & Bio A1-A



Stage-Discharge for Pond 1P: Forebay & Bio A1-A

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
400.00	0.00	402.60	0.00	405.20	0.00	407.80	0.00
400.05	0.00	402.65	0.00	405.25	0.00	407.85	0.00
400.10	0.00	402.70	0.00	405.30	0.00	407.90	0.00
400.15	0.00	402.75	0.00	405.35	0.00	407.95	0.00
400.20	0.00	402.80	0.00	405.40	0.00	408.00	0.00
400.25	0.00	402.85	0.00	405.45	0.00	408.05	0.00
400.30	0.00	402.90	0.00	405.50	0.00	408.10	0.00
400.35	0.00	402.95	0.00	405.55	0.00	408.15	0.00
400.40	0.00	403.00	0.00	405.60	0.00	408.20	0.00
400.45	0.00	403.05	0.00	405.65	0.00	408.25	0.00
400.50	0.00	403.10	0.00	405.70	0.00	408.30	0.00
400.55	0.00	403.15	0.00	405.75	0.00	408.35	0.00
400.60	0.00	403.20	0.00	405.80	0.00	408.40	0.00
400.65	0.00	403.25	0.00	405.85	0.00	408.45	0.00
400.70	0.00	403.30	0.00	405.90	0.00	408.50	0.00
400.75	0.00	403.35	0.00	405.95	0.00	408.55	1.50
400.80	0.00	403.40	0.00	406.00	0.00	408.60	4.26
400.85	0.00	403.45	0.00	406.05	0.00	408.65	7.86
400.90	0.00	403.50	0.00	406.10	0.00	408.70	12.14
400.95	0.00	403.55	0.00	406.15	0.00	408.75	17.05
401.00	0.00	403.60	0.00	406.20	0.00	408.80	22.52
401.05	0.00	403.65	0.00	406.25	0.00	408.85	28.53
401.10	0.00	403.70	0.00	406.30	0.00	408.90	35.03
401.15	0.00	403.75	0.00	406.35	0.00	408.95	41.93
401.20	0.00	403.80	0.00	406.40	0.00	409.00	49.26
401.25	0.00	403.85	0.00	406.45	0.00	409.05	57.00
401.30	0.00	403.90	0.00	406.50	0.00	409.10	65.15
401.35	0.00	403.95	0.00	406.55	0.00	409.15	73.28
401.40	0.00	404.00	0.00	406.60	0.00	409.20	81.69
401.45	0.00	404.05	0.00	406.65	0.00	409.25	90.36
401.50	0.00	404.10	0.00	406.70	0.00	409.30	99.29
401.55	0.00	404.15	0.00	406.75	0.00	409.35	108.97
401.60	0.00	404.20	0.00	406.80	0.00	409.40	118.97
401.65	0.00	404.25	0.00	406.85	0.00	409.45	129.29
401.70	0.00	404.30	0.00	406.90	0.00	409.50	139.92
401.75	0.00	404.35	0.00	406.95	0.00	409.55	151.14
401.80	0.00	404.40	0.00	407.00	0.00	409.60	162.70
401.85	0.00	404.45	0.00	407.05	0.00	409.65	174.60
401.90	0.00	404.50	0.00	407.10	0.00	409.70	186.84
401.95	0.00	404.55	0.00	407.15	0.00	409.75	199.23
402.00	0.00	404.60	0.00	407.20	0.00	409.80	211.93
402.05	0.00	404.65	0.00	407.25	0.00	409.85	224.94
402.10	0.00	404.70	0.00	407.30	0.00	409.90	238.25
402.15	0.00	404.75	0.00	407.35	0.00	409.95	251.63
402.20	0.00	404.80	0.00	407.40	0.00	410.00	**265.28**
402.25	0.00	404.85	0.00	407.45	0.00		
402.30	0.00	404.90	0.00	407.50	0.00		
402.35	0.00	404.95	0.00	407.55	0.00		
402.40	0.00	405.00	0.00	407.60	0.00		
402.45	0.00	405.05	0.00	407.65	0.00		
402.50	0.00	405.10	0.00	407.70	0.00		
402.55	0.00	405.15	0.00	407.75	0.00		

Stage-Area-Storage for Pond 1P: Forebay & Bio A1-A

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
400.00	2,093	0
400.10	2,168	213
400.20	2,245	434
400.30	2,323	662
400.40	2,403	898
400.50	2,483	1,143
400.60	2,565	1,395
400.70	2,649	1,656
400.80	2,733	1,925
400.90	2,819	2,202
401.00	2,907	2,489
401.10	2,996	2,784
401.20	3,086	3,088
401.30	3,177	3,401
401.40	3,270	3,723
401.50	3,364	4,055
401.60	3,459	4,396
401.70	3,556	4,747
401.80	3,654	5,107
401.90	3,753	5,478
402.00	3,854	5,858
402.10	3,950	6,248
402.20	4,047	6,648
402.30	4,145	7,058
402.40	4,244	7,477
402.50	4,345	7,907
402.60	4,446	8,346
402.70	4,549	8,796
402.80	4,653	9,256
402.90	4,758	9,727
403.00	4,865	10,208
403.10	4,972	10,699
403.20	5,081	11,202
403.30	5,191	11,716
403.40	5,302	12,240
403.50	5,414	12,776
403.60	5,528	13,323
403.70	5,642	13,882
403.80	5,758	14,452
403.90	5,875	15,033
404.00	5,993	15,627
404.10	6,108	16,232
404.20	6,224	16,848
404.30	6,341	17,477
404.40	6,460	18,117
404.50	6,579	18,769
404.60	6,699	19,432
404.70	6,821	20,109
404.80	6,944	20,797
404.90	7,067	21,497
405.00	7,192	22,210
405.10	7,318	22,936
405.20	7,445	23,674
405.30	7,573	24,425
405.40	7,703	25,189
405.50	7,833	25,965
405.60	7,964	26,755
405.70	8,097	27,558
405.80	8,231	28,375
405.90	8,365	29,205
406.00	8,501	30,048
406.10	8,959	30,921
406.20	9,429	31,840
406.30	9,911	32,807
406.40	10,405	33,823
406.50	10,912	34,888
406.60	11,430	36,005
406.70	11,960	37,175
406.80	12,502	38,398
406.90	13,056	39,676
407.00	13,623	41,009
407.10	14,201	42,401
407.20	14,791	43,850
407.30	15,393	45,359
407.40	16,008	46,929
407.50	16,634	48,561
407.60	16,909	50,238
407.70	17,186	51,943
407.80	17,465	53,675
407.90	17,746	55,436
408.00	18,030	57,225
408.10	18,101	59,031
408.20	18,172	60,845
408.30	18,243	62,666
408.40	18,314	64,493
408.50	18,385	66,328
408.60	18,456	68,170
408.70	18,528	70,020
408.80	18,600	71,876
408.90	18,672	73,740
409.00	18,744	75,610
409.10	18,816	77,488
409.20	18,888	79,373
409.30	18,960	81,266
409.40	19,033	83,166
409.50	19,106	85,072
409.60	19,178	86,987
409.70	19,251	88,908
409.80	19,324	90,837
409.90	19,398	92,773
410.00	**19,471**	**94,716**

Summary for Pond 2P: Forebay & Bio A1-B

Inflow Area = 4.432 ac, 51.17% Impervious, Inflow Depth = 3.48" for 10-yr event
Inflow = 11.19 cfs @ 12.24 hrs, Volume= 1.284 af
Outflow = 10.58 cfs @ 12.31 hrs, Volume= 1.284 af, Atten= 5%, Lag= 4.0 min
Primary = 10.58 cfs @ 12.31 hrs, Volume= 1.284 af
Routed to Pond 4P : Detention Basin A1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Automatic Starting Elev= 408.50' Surf.Area= 19,240 sf Storage= 72,229 cf
Peak Elev= 408.68' @ 12.31 hrs Surf.Area= 19,722 sf Storage= 75,787 cf (3,558 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 11.3 min (831.3 - 820.0)

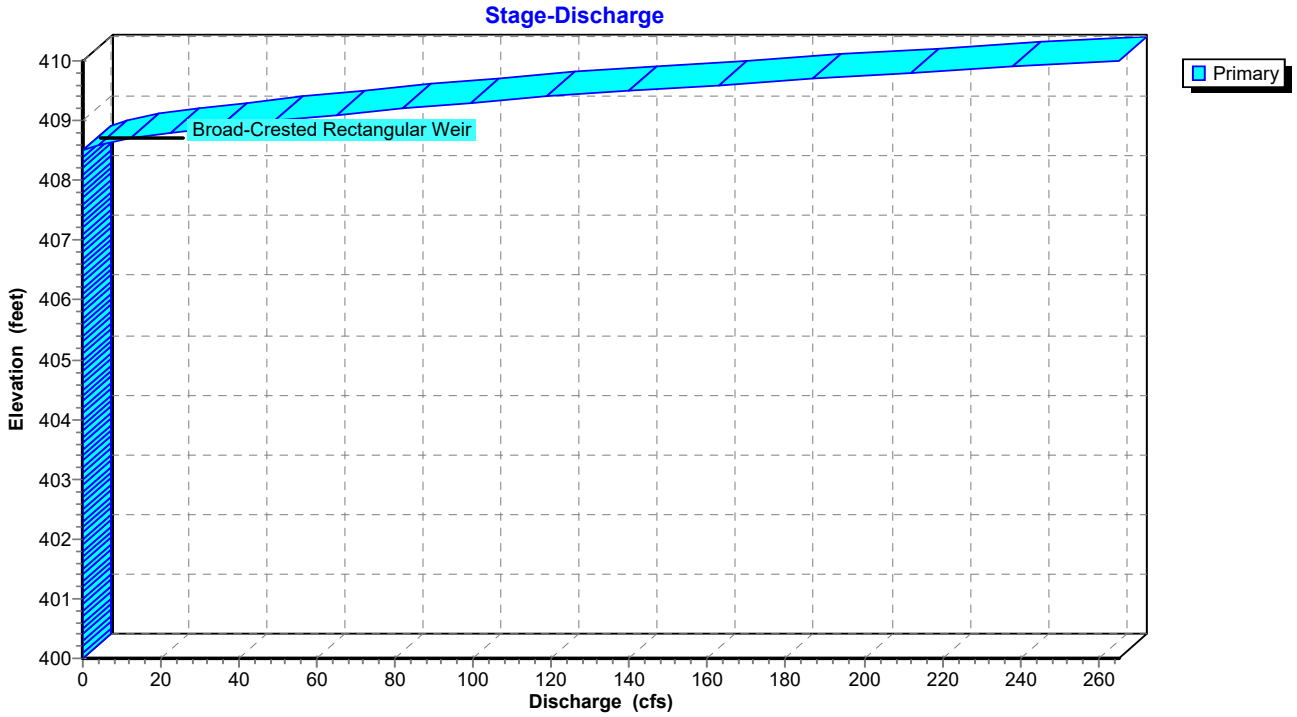
Volume	Invert	Avail.Storage	Storage Description
#1	400.00'	104,144 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
400.00	3,314	0	0	3,314
402.00	4,891	8,154	8,154	4,954
404.00	6,756	11,597	19,751	6,896
406.00	8,917	15,623	35,374	9,146
407.50	16,689	18,903	54,277	16,940
408.00	17,949	8,658	62,934	18,222
410.00	23,380	41,210	104,144	23,747

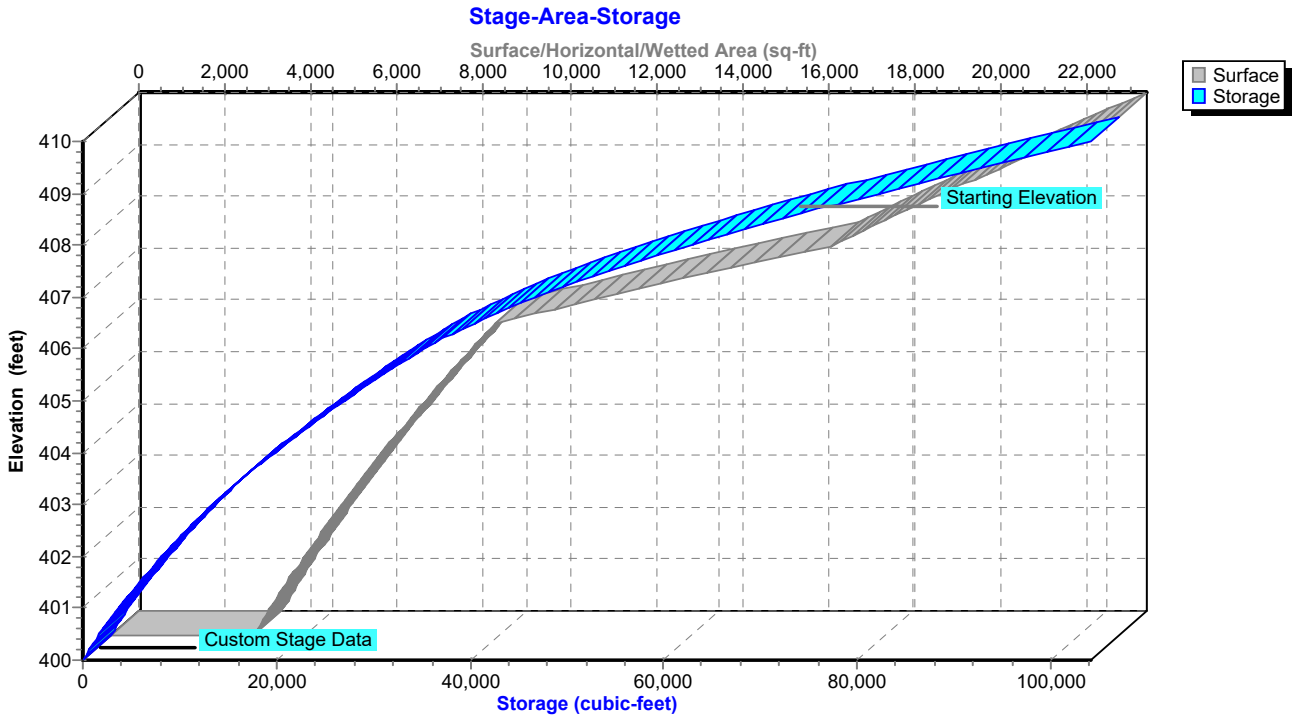
Device	Routing	Invert	Outlet Devices
#1	Primary	408.50'	**50.0' long + 4.0 '/' SideZ x 31.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=10.58 cfs @ 12.31 hrs HW=408.68' TW=404.79' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 10.58 cfs @ 1.14 fps)

Pond 2P: Forebay & Bio A1-B



Pond 2P: Forebay & Bio A1-B



Stage-Discharge for Pond 2P: Forebay & Bio A1-B

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
400.00	0.00	402.60	0.00	405.20	0.00	407.80	0.00
400.05	0.00	402.65	0.00	405.25	0.00	407.85	0.00
400.10	0.00	402.70	0.00	405.30	0.00	407.90	0.00
400.15	0.00	402.75	0.00	405.35	0.00	407.95	0.00
400.20	0.00	402.80	0.00	405.40	0.00	408.00	0.00
400.25	0.00	402.85	0.00	405.45	0.00	408.05	0.00
400.30	0.00	402.90	0.00	405.50	0.00	408.10	0.00
400.35	0.00	402.95	0.00	405.55	0.00	408.15	0.00
400.40	0.00	403.00	0.00	405.60	0.00	408.20	0.00
400.45	0.00	403.05	0.00	405.65	0.00	408.25	0.00
400.50	0.00	403.10	0.00	405.70	0.00	408.30	0.00
400.55	0.00	403.15	0.00	405.75	0.00	408.35	0.00
400.60	0.00	403.20	0.00	405.80	0.00	408.40	0.00
400.65	0.00	403.25	0.00	405.85	0.00	408.45	0.00
400.70	0.00	403.30	0.00	405.90	0.00	408.50	0.00
400.75	0.00	403.35	0.00	405.95	0.00	408.55	1.50
400.80	0.00	403.40	0.00	406.00	0.00	408.60	4.26
400.85	0.00	403.45	0.00	406.05	0.00	408.65	7.86
400.90	0.00	403.50	0.00	406.10	0.00	408.70	12.14
400.95	0.00	403.55	0.00	406.15	0.00	408.75	17.05
401.00	0.00	403.60	0.00	406.20	0.00	408.80	22.52
401.05	0.00	403.65	0.00	406.25	0.00	408.85	28.53
401.10	0.00	403.70	0.00	406.30	0.00	408.90	35.03
401.15	0.00	403.75	0.00	406.35	0.00	408.95	41.93
401.20	0.00	403.80	0.00	406.40	0.00	409.00	49.26
401.25	0.00	403.85	0.00	406.45	0.00	409.05	57.00
401.30	0.00	403.90	0.00	406.50	0.00	409.10	65.15
401.35	0.00	403.95	0.00	406.55	0.00	409.15	73.28
401.40	0.00	404.00	0.00	406.60	0.00	409.20	81.69
401.45	0.00	404.05	0.00	406.65	0.00	409.25	90.36
401.50	0.00	404.10	0.00	406.70	0.00	409.30	99.29
401.55	0.00	404.15	0.00	406.75	0.00	409.35	108.97
401.60	0.00	404.20	0.00	406.80	0.00	409.40	118.97
401.65	0.00	404.25	0.00	406.85	0.00	409.45	129.29
401.70	0.00	404.30	0.00	406.90	0.00	409.50	139.92
401.75	0.00	404.35	0.00	406.95	0.00	409.55	151.14
401.80	0.00	404.40	0.00	407.00	0.00	409.60	162.70
401.85	0.00	404.45	0.00	407.05	0.00	409.65	174.60
401.90	0.00	404.50	0.00	407.10	0.00	409.70	186.84
401.95	0.00	404.55	0.00	407.15	0.00	409.75	199.23
402.00	0.00	404.60	0.00	407.20	0.00	409.80	211.93
402.05	0.00	404.65	0.00	407.25	0.00	409.85	224.94
402.10	0.00	404.70	0.00	407.30	0.00	409.90	238.25
402.15	0.00	404.75	0.00	407.35	0.00	409.95	251.63
402.20	0.00	404.80	0.00	407.40	0.00	410.00	**265.28**
402.25	0.00	404.85	0.00	407.45	0.00		
402.30	0.00	404.90	0.00	407.50	0.00		
402.35	0.00	404.95	0.00	407.55	0.00		
402.40	0.00	405.00	0.00	407.60	0.00		
402.45	0.00	405.05	0.00	407.65	0.00		
402.50	0.00	405.10	0.00	407.70	0.00		
402.55	0.00	405.15	0.00	407.75	0.00		

Stage-Area-Storage for Pond 2P: Forebay & Bio A1-B

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
400.00	3,314	0
400.10	3,386	335
400.20	3,458	677
400.30	3,531	1,027
400.40	3,605	1,383
400.50	3,680	1,748
400.60	3,755	2,119
400.70	3,831	2,499
400.80	3,908	2,886
400.90	3,986	3,280
401.00	4,064	3,683
401.10	4,143	4,093
401.20	4,223	4,511
401.30	4,304	4,938
401.40	4,386	5,372
401.50	4,468	5,815
401.60	4,551	6,266
401.70	4,635	6,725
401.80	4,720	7,193
401.90	4,805	7,669
402.00	4,891	8,154
402.10	4,977	8,647
402.20	5,064	9,149
402.30	5,152	9,660
402.40	5,240	10,180
402.50	5,329	10,708
402.60	5,419	11,246
402.70	5,510	11,792
402.80	5,601	12,348
402.90	5,693	12,912
403.00	5,786	13,486
403.10	5,880	14,069
403.20	5,974	14,662
403.30	6,069	15,264
403.40	6,165	15,876
403.50	6,262	16,497
403.60	6,359	17,128
403.70	6,457	17,769
403.80	6,556	18,420
403.90	6,656	19,080
404.00	6,756	19,751
404.10	6,857	20,432
404.20	6,959	21,122
404.30	7,061	21,823
404.40	7,164	22,535
404.50	7,268	23,256
404.60	7,373	23,988
404.70	7,478	24,731
404.80	7,584	25,484
404.90	7,691	26,248
405.00	7,799	27,022
405.10	7,908	27,808
405.20	8,017	28,604
405.30	8,127	29,411
405.40	8,237	30,229
405.50	8,349	31,058
405.60	8,461	31,899
405.70	8,574	32,751
405.80	8,687	33,614
405.90	8,802	34,488
406.00	8,917	35,374
406.10	9,360	36,288
406.20	9,814	37,246
406.30	10,278	38,251
406.40	10,753	39,302
406.50	11,239	40,402
406.60	11,736	41,551
406.70	12,243	42,749
406.80	12,761	44,000
406.90	13,290	45,302
407.00	13,830	46,658
407.10	14,380	48,068
407.20	14,941	49,534
407.30	15,513	51,057
407.40	16,096	52,637
407.50	16,689	54,277
407.60	16,937	55,958
407.70	17,187	57,664
407.80	17,439	59,395
407.90	17,693	61,152
408.00	17,949	62,934
408.10	18,204	64,742
408.20	18,460	66,575
408.30	18,718	68,434
408.40	18,978	70,319
408.50	19,240	72,229
408.60	19,503	74,166
408.70	19,768	76,130
408.80	20,035	78,120
408.90	20,304	80,137
409.00	20,575	82,181
409.10	20,847	84,252
409.20	21,122	86,351
409.30	21,398	88,477
409.40	21,675	90,630
409.50	21,955	92,812
409.60	22,236	95,021
409.70	22,520	97,259
409.80	22,805	99,525
409.90	23,091	101,820
410.00	**23,380**	**104,144**

Summary for Pond 3P: Forebay & Bio B1-A

Inflow Area = 4.885 ac, 52.14% Impervious, Inflow Depth = 3.48" for 10-yr event
Inflow = 12.16 cfs @ 12.26 hrs, Volume= 1.415 af
Outflow = 9.01 cfs @ 12.43 hrs, Volume= 1.054 af, Atten= 26%, Lag= 10.3 min
Primary = 9.01 cfs @ 12.43 hrs, Volume= 1.054 af
Routed to Pond 7P : Detention Basin B1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 407.50' Surf.Area= 16,268 sf Storage= 53,756 cf
Peak Elev= 408.74' @ 12.43 hrs Surf.Area= 19,618 sf Storage= 75,954 cf (22,197 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 84.6 min (905.1 - 820.6)

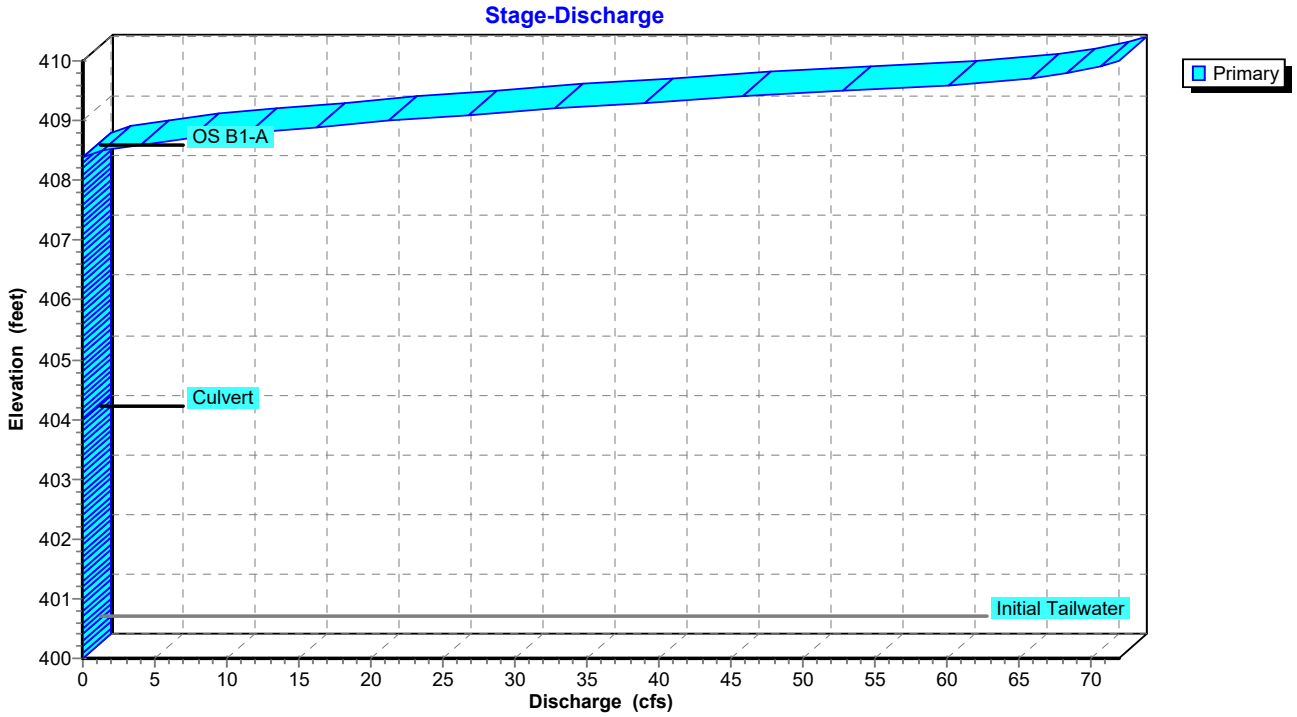
Volume	Invert	Avail.Storage	Storage Description
#1	400.00'	103,006 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
400.00	3,233	0	0	3,233
402.00	4,859	8,037	8,037	4,920
404.00	6,744	11,552	19,589	6,880
406.00	8,885	15,580	35,168	9,111
407.50	16,268	18,588	53,756	16,517
408.00	17,600	8,465	62,221	17,869
410.00	23,319	40,785	103,006	23,677

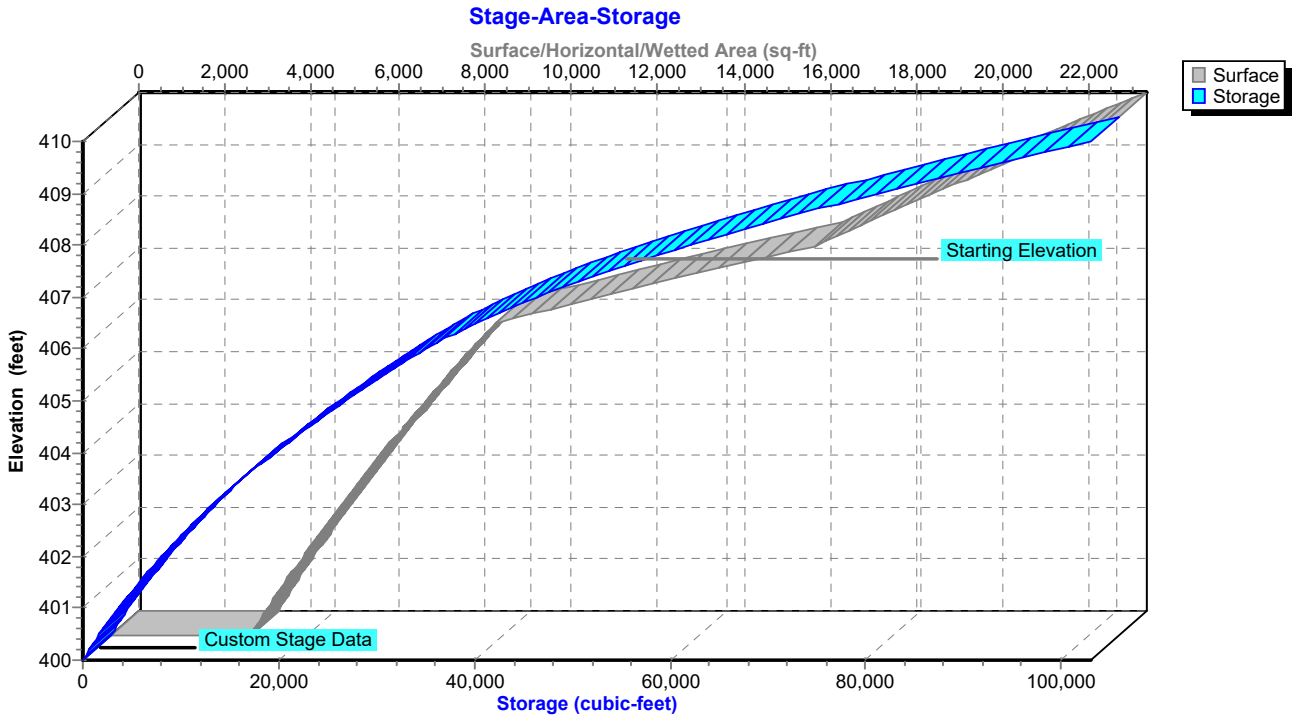
Device	Routing	Invert	Outlet Devices
#1	Primary	404.03'	**36.0" Round Culvert** L= 101.6' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 404.03' / 402.00' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 7.07 sf
#2	Device 1	408.40'	**36.0" x 48.0" Horiz. OS B1-A** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=9.01 cfs @ 12.43 hrs HW=408.74' TW=404.11' (Dynamic Tailwater)
└─**1=Culvert** (Passes 9.01 cfs of 60.96 cfs potential flow)
└─**2=OS B1-A** (Weir Controls 9.01 cfs @ 1.90 fps)

Pond 3P: Forebay & Bio B1-A



Pond 3P: Forebay & Bio B1-A



Stage-Discharge for Pond 3P: Forebay & Bio B1-A

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
400.00	0.00	402.60	0.00	405.20	0.00	407.80	0.00
400.05	0.00	402.65	0.00	405.25	0.00	407.85	0.00
400.10	0.00	402.70	0.00	405.30	0.00	407.90	0.00
400.15	0.00	402.75	0.00	405.35	0.00	407.95	0.00
400.20	0.00	402.80	0.00	405.40	0.00	408.00	0.00
400.25	0.00	402.85	0.00	405.45	0.00	408.05	0.00
400.30	0.00	402.90	0.00	405.50	0.00	408.10	0.00
400.35	0.00	402.95	0.00	405.55	0.00	408.15	0.00
400.40	0.00	403.00	0.00	405.60	0.00	408.20	0.00
400.45	0.00	403.05	0.00	405.65	0.00	408.25	0.00
400.50	0.00	403.10	0.00	405.70	0.00	408.30	0.00
400.55	0.00	403.15	0.00	405.75	0.00	408.35	0.00
400.60	0.00	403.20	0.00	405.80	0.00	408.40	0.00
400.65	0.00	403.25	0.00	405.85	0.00	408.45	0.51
400.70	0.00	403.30	0.00	405.90	0.00	408.50	1.45
400.75	0.00	403.35	0.00	405.95	0.00	408.55	2.66
400.80	0.00	403.40	0.00	406.00	0.00	408.60	4.09
400.85	0.00	403.45	0.00	406.05	0.00	408.65	5.72
400.90	0.00	403.50	0.00	406.10	0.00	408.70	7.52
400.95	0.00	403.55	0.00	406.15	0.00	408.75	9.48
401.00	0.00	403.60	0.00	406.20	0.00	408.80	11.58
401.05	0.00	403.65	0.00	406.25	0.00	408.85	13.82
401.10	0.00	403.70	0.00	406.30	0.00	408.90	16.19
401.15	0.00	403.75	0.00	406.35	0.00	408.95	18.67
401.20	0.00	403.80	0.00	406.40	0.00	409.00	21.28
401.25	0.00	403.85	0.00	406.45	0.00	409.05	23.99
401.30	0.00	403.90	0.00	406.50	0.00	409.10	26.81
401.35	0.00	403.95	0.00	406.55	0.00	409.15	29.73
401.40	0.00	404.00	0.00	406.60	0.00	409.20	32.76
401.45	0.00	404.05	0.00	406.65	0.00	409.25	35.88
401.50	0.00	404.10	0.00	406.70	0.00	409.30	39.09
401.55	0.00	404.15	0.00	406.75	0.00	409.35	42.39
401.60	0.00	404.20	0.00	406.80	0.00	409.40	45.78
401.65	0.00	404.25	0.00	406.85	0.00	409.45	49.26
401.70	0.00	404.30	0.00	406.90	0.00	409.50	52.82
401.75	0.00	404.35	0.00	406.95	0.00	409.55	56.46
401.80	0.00	404.40	0.00	407.00	0.00	409.60	60.18
401.85	0.00	404.45	0.00	407.05	0.00	409.65	63.98
401.90	0.00	404.50	0.00	407.10	0.00	409.70	65.88
401.95	0.00	404.55	0.00	407.15	0.00	409.75	67.13
402.00	0.00	404.60	0.00	407.20	0.00	409.80	68.37
402.05	0.00	404.65	0.00	407.25	0.00	409.85	69.58
402.10	0.00	404.70	0.00	407.30	0.00	409.90	70.77
402.15	0.00	404.75	0.00	407.35	0.00	409.95	71.55
402.20	0.00	404.80	0.00	407.40	0.00	410.00	**71.96**
402.25	0.00	404.85	0.00	407.45	0.00		
402.30	0.00	404.90	0.00	407.50	0.00		
402.35	0.00	404.95	0.00	407.55	0.00		
402.40	0.00	405.00	0.00	407.60	0.00		
402.45	0.00	405.05	0.00	407.65	0.00		
402.50	0.00	405.10	0.00	407.70	0.00		
402.55	0.00	405.15	0.00	407.75	0.00		

Stage-Area-Storage for Pond 3P: Forebay & Bio B1-A

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
400.00	3,233	0
400.10	3,306	327
400.20	3,381	661
400.30	3,456	1,003
400.40	3,532	1,353
400.50	3,609	1,710
400.60	3,686	2,074
400.70	3,765	2,447
400.80	3,844	2,827
400.90	3,924	3,216
401.00	4,005	3,612
401.10	4,086	4,017
401.20	4,169	4,429
401.30	4,252	4,850
401.40	4,337	5,280
401.50	4,422	5,718
401.60	4,507	6,164
401.70	4,594	6,619
401.80	4,682	7,083
401.90	4,770	7,556
402.00	4,859	8,037
402.10	4,946	8,527
402.20	5,034	9,026
402.30	5,122	9,534
402.40	5,211	10,051
402.50	5,301	10,576
402.60	5,392	11,111
402.70	5,484	11,655
402.80	5,576	12,208
402.90	5,669	12,770
403.00	5,763	13,342
403.10	5,858	13,923
403.20	5,953	14,513
403.30	6,049	15,113
403.40	6,146	15,723
403.50	6,244	16,342
403.60	6,342	16,972
403.70	6,442	17,611
403.80	6,542	18,260
403.90	6,642	18,919
404.00	6,744	19,589
404.10	6,844	20,268
404.20	6,945	20,957
404.30	7,046	21,657
404.40	7,149	22,367
404.50	7,252	23,087
404.60	7,355	23,817
404.70	7,460	24,558
404.80	7,565	25,309
404.90	7,671	26,071
405.00	7,778	26,843
405.10	7,885	27,626
405.20	7,993	28,420
405.30	8,102	29,225
405.40	8,212	30,041
405.50	8,322	30,867
405.60	8,433	31,705
405.70	8,545	32,554
405.80	8,658	33,414
405.90	8,771	34,286
406.00	8,885	35,168
406.10	9,308	36,078
406.20	9,741	37,030
406.30	10,184	38,027
406.40	10,637	39,068
406.50	11,100	40,154
406.60	11,572	41,288
406.70	12,055	42,469
406.80	12,547	43,699
406.90	13,049	44,979
407.00	13,561	46,309
407.10	14,083	47,691
407.20	14,614	49,126
407.30	15,156	50,615
407.40	15,707	52,158
407.50	16,268	53,756
407.60	16,530	55,396
407.70	16,795	57,062
407.80	17,061	58,755
407.90	17,329	60,475
408.00	17,600	62,221
408.10	17,867	63,994
408.20	18,136	65,795
408.30	18,407	67,622
408.40	18,680	69,476
408.50	18,954	71,358
408.60	19,231	73,267
408.70	19,510	75,204
408.80	19,791	77,169
408.90	20,074	79,162
409.00	20,359	81,184
409.10	20,646	83,234
409.20	20,935	85,313
409.30	21,226	87,421
409.40	21,519	89,558
409.50	21,814	91,725
409.60	22,111	93,921
409.70	22,410	96,147
409.80	22,711	98,403
409.90	23,014	100,690
410.00	**23,319**	**103,006**

Summary for Pond 4P: Detention Basin A1

Inflow Area = 9.990 ac, 49.59% Impervious, Inflow Depth = 3.47" for 10-yr event
Inflow = 23.13 cfs @ 12.31 hrs, Volume= 2.888 af
Outflow = 0.74 cfs @ 20.69 hrs, Volume= 2.155 af, Atten= 97%, Lag= 502.7 min
Primary = 0.74 cfs @ 20.69 hrs, Volume= 2.155 af
Routed to Pond PR-A : PR-A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Automatic Starting Elev= 398.50' Surf.Area= 2,907 sf Storage= 21,861 cf
Peak Elev= 408.18' @ 20.69 hrs Surf.Area= 19,562 sf Storage= 110,692 cf (88,831 cf above start)

Plug-Flow detention time= 1,252.2 min calculated for 1.653 af (57% of inflow)
Center-of-Mass det. time= 863.2 min (1,692.5 - 829.3)

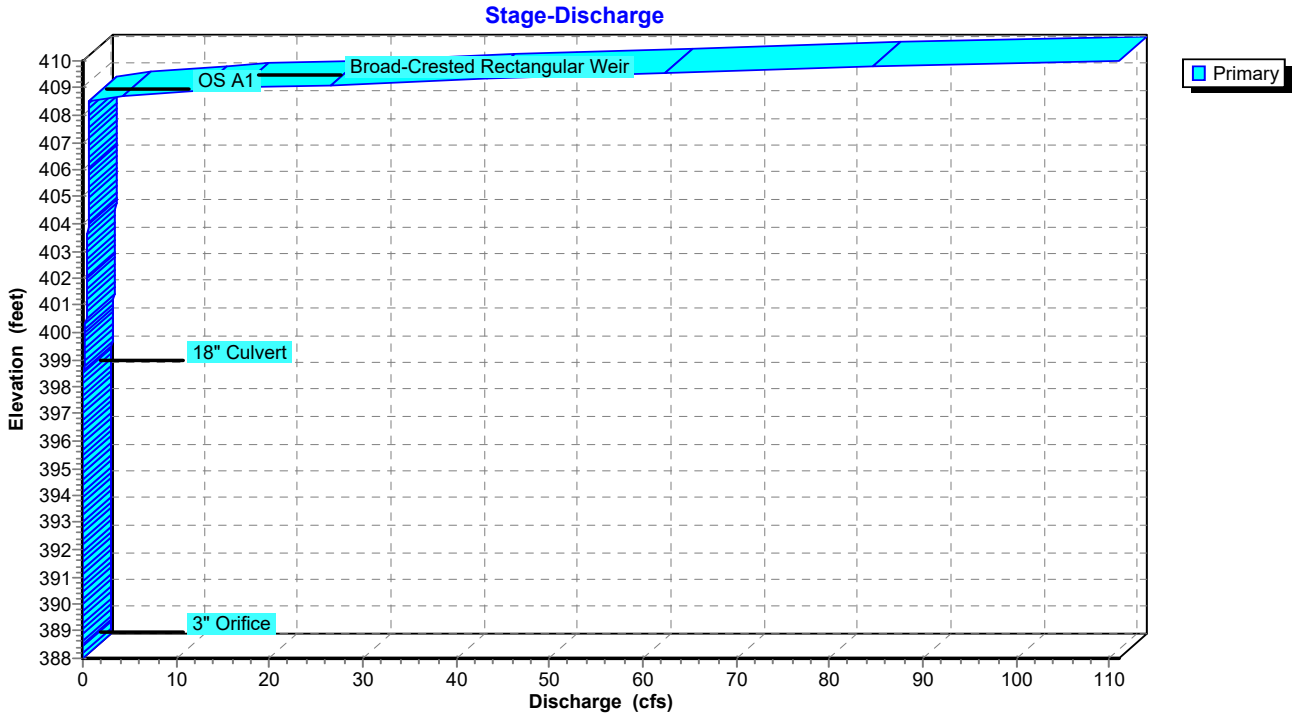
Volume	Invert	Avail.Storage	Storage Description
#1	388.00'	150,665 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
388.00	1,355	0	0	1,355
400.00	3,176	26,422	26,422	4,046
402.00	5,824	8,867	35,289	6,736
404.00	9,598	15,266	50,555	10,560
406.00	14,095	23,549	74,104	15,122
408.00	19,096	33,065	107,169	20,205
410.00	24,513	43,496	150,665	25,722

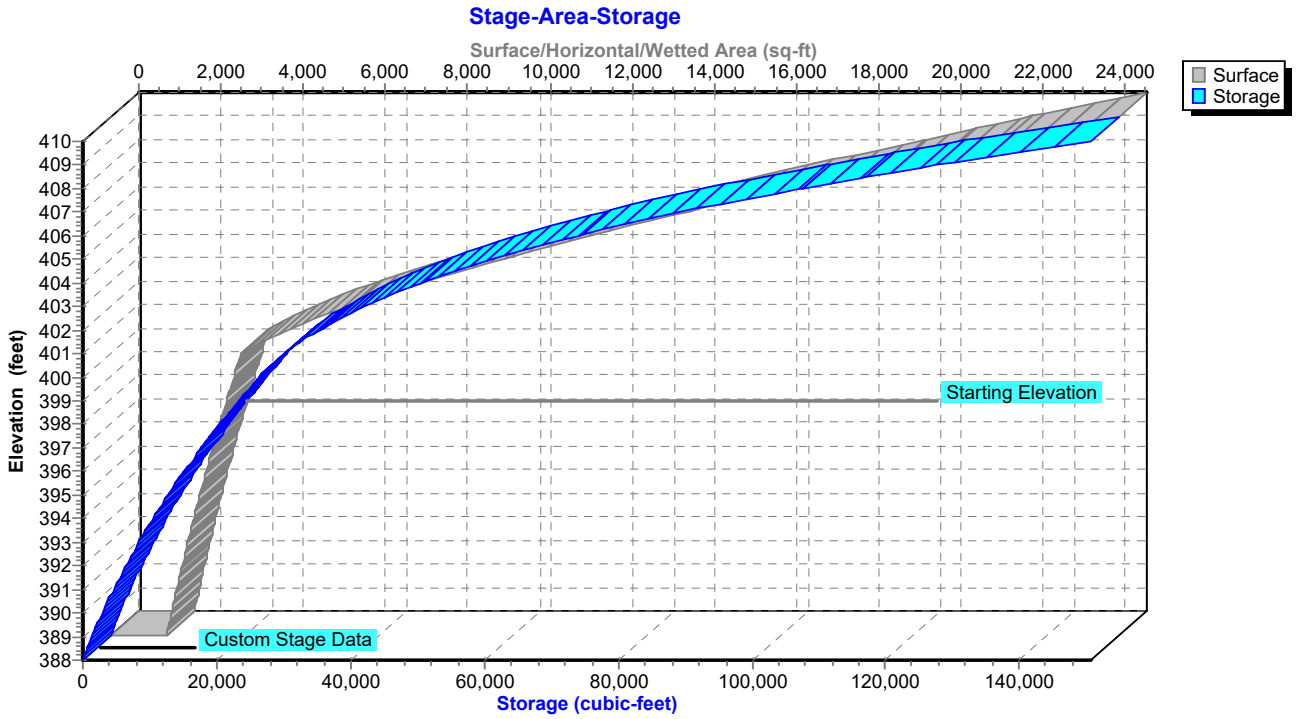
Device	Routing	Invert	Outlet Devices
#1	Primary	398.50'	**18.0" Round 18" Culvert** L= 56.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 398.50' / 397.94' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	388.50'	**3.0" Vert. 3" Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	408.50'	**36.0" x 48.0" Horiz. OS A1** C= 0.600 Limited to weir flow at low heads
#4	Primary	409.00'	**30.0' long + 2.0 '/' SideZ x 50.0' 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=0.74 cfs @ 20.69 hrs HW=408.18' TW=0.00' (Dynamic Tailwater)
- **1=18" Culvert** (Passes 0.74 cfs of 25.43 cfs potential flow)
  - **2=3" Orifice** (Orifice Controls 0.74 cfs @ 14.98 fps)
  - **3=OS A1** (Controls 0.00 cfs)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: Detention Basin A1



Pond 4P: Detention Basin A1



Stage-Discharge for Pond 4P: Detention Basin A1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
388.00	0.00	398.40	0.00	408.80	8.28
388.20	0.00	398.60	0.05	409.00	16.95
388.40	0.00	398.80	0.13	409.20	34.11
388.60	0.00	399.00	0.17	409.40	48.04
388.80	0.00	399.20	0.20	409.60	66.22
389.00	0.00	399.40	0.22	409.80	86.73
389.20	0.00	399.60	0.25	410.00	**111.01**
389.40	0.00	399.80	0.27		
389.60	0.00	400.00	0.29		
389.80	0.00	400.20	0.31		
390.00	0.00	400.40	0.33		
390.20	0.00	400.60	0.34		
390.40	0.00	400.80	0.36		
390.60	0.00	401.00	0.37		
390.80	0.00	401.20	0.39		
391.00	0.00	401.40	0.40		
391.20	0.00	401.60	0.42		
391.40	0.00	401.80	0.43		
391.60	0.00	402.00	0.44		
391.80	0.00	402.20	0.45		
392.00	0.00	402.40	0.47		
392.20	0.00	402.60	0.48		
392.40	0.00	402.80	0.49		
392.60	0.00	403.00	0.50		
392.80	0.00	403.20	0.51		
393.00	0.00	403.40	0.52		
393.20	0.00	403.60	0.53		
393.40	0.00	403.80	0.54		
393.60	0.00	404.00	0.55		
393.80	0.00	404.20	0.56		
394.00	0.00	404.40	0.57		
394.20	0.00	404.60	0.58		
394.40	0.00	404.80	0.59		
394.60	0.00	405.00	0.60		
394.80	0.00	405.20	0.61		
395.00	0.00	405.40	0.62		
395.20	0.00	405.60	0.63		
395.40	0.00	405.80	0.64		
395.60	0.00	406.00	0.65		
395.80	0.00	406.20	0.66		
396.00	0.00	406.40	0.66		
396.20	0.00	406.60	0.67		
396.40	0.00	406.80	0.68		
396.60	0.00	407.00	0.69		
396.80	0.00	407.20	0.70		
397.00	0.00	407.40	0.71		
397.20	0.00	407.60	0.71		
397.40	0.00	407.80	0.72		
397.60	0.00	408.00	0.73		
397.80	0.00	408.20	0.74		
398.00	0.00	408.40	0.74		
398.20	0.00	408.60	2.20		

Stage-Area-Storage for Pond 4P: Detention Basin A1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
388.00	1,355	0
388.50	1,416	693
389.00	1,478	1,416
389.50	1,541	2,170
390.00	1,605	2,957
390.50	1,671	3,776
391.00	1,739	4,628
391.50	1,807	5,515
392.00	1,877	6,436
392.50	1,948	7,392
393.00	2,021	8,384
393.50	2,095	9,413
394.00	2,170	10,479
394.50	2,247	11,584
395.00	2,324	12,726
395.50	2,404	13,908
396.00	2,484	15,130
396.50	2,566	16,392
397.00	2,649	17,696
397.50	2,734	19,042
398.00	2,819	20,430
398.50	2,907	21,861
399.00	2,995	23,337
399.50	3,085	24,857
400.00	3,176	26,422
400.50	3,763	28,155
401.00	4,400	30,194
401.50	5,087	32,563
402.00	5,824	35,289
402.50	6,680	38,413
403.00	7,594	41,978
403.50	8,567	46,016
404.00	9,598	50,555
404.50	10,641	55,612
405.00	11,739	61,205
405.50	12,890	67,360
406.00	14,095	74,104
406.50	15,274	81,445
407.00	16,501	89,386
407.50	17,775	97,953
408.00	19,096	107,169
408.50	20,387	117,038
409.00	21,720	127,563
409.50	23,095	138,765
410.00	**24,513**	**150,665**

Summary for Pond 6P: Forebay & Bio B1-B

Inflow Area = 4.222 ac, 52.11% Impervious, Inflow Depth = 3.48" for 10-yr event
Inflow = 11.25 cfs @ 12.22 hrs, Volume= 1.223 af
Outflow = 8.78 cfs @ 12.35 hrs, Volume= 0.927 af, Atten= 22%, Lag= 7.9 min
Primary = 8.78 cfs @ 12.35 hrs, Volume= 0.927 af
Routed to Pond 7P : Detention Basin B1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 407.50' Surf.Area= 13,168 sf Storage= 32,496 cf
Peak Elev= 408.73' @ 12.35 hrs Surf.Area= 16,405 sf Storage= 50,699 cf (18,203 cf above start)

Plug-Flow detention time= 682.7 min calculated for 0.181 af (15% of inflow)
Center-of-Mass det. time= 78.7 min (896.5 - 817.8)

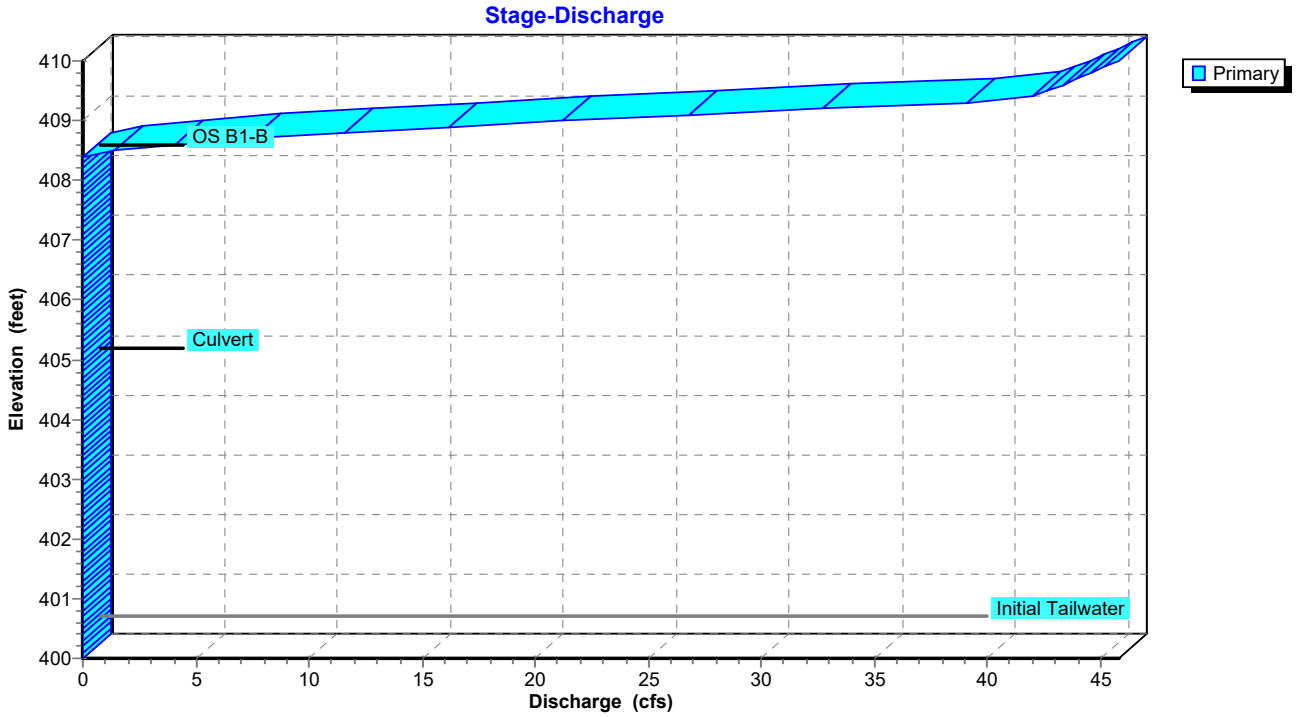
Volume	Invert	Avail.Storage	Storage Description
#1	400.00'	73,766 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
400.00	855	0	0	855
402.00	2,141	2,899	2,899	2,169
404.00	3,887	5,942	8,841	3,957
406.00	5,898	9,715	18,557	6,027
407.50	13,168	13,939	32,496	13,315
408.00	14,464	6,905	39,401	14,628
410.00	20,052	34,364	73,766	20,292

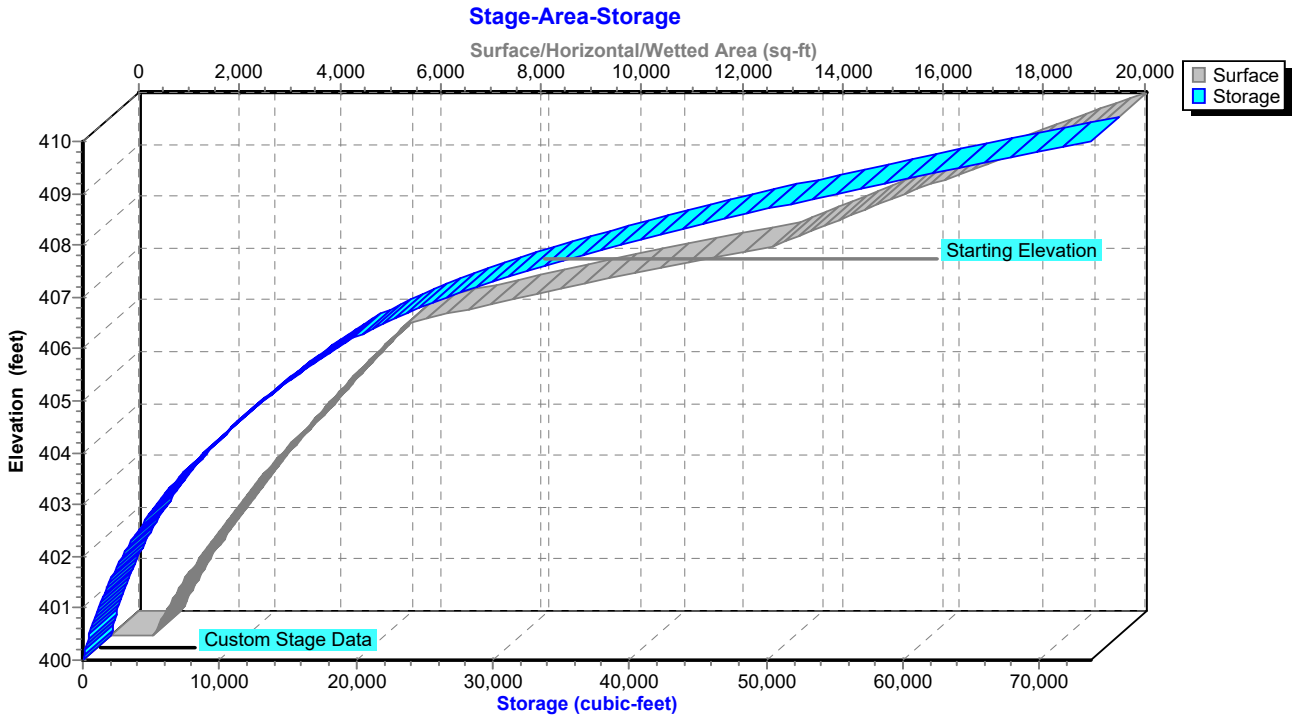
Device	Routing	Invert	Outlet Devices
#1	Primary	404.99'	**30.0" Round Culvert** L= 149.6' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 404.99' / 402.00' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 4.91 sf
#2	Device 1	408.40'	**36.0" x 48.0" Horiz. OS B1-B** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=8.77 cfs @ 12.35 hrs HW=408.73' TW=403.23' (Dynamic Tailwater)
└─**1=Culvert** (Passes 8.77 cfs of 37.31 cfs potential flow)
└─**2=OS B1-B** (Weir Controls 8.77 cfs @ 1.89 fps)

Pond 6P: Forebay & Bio B1-B



Pond 6P: Forebay & Bio B1-B



Stage-Discharge for Pond 6P: Forebay & Bio B1-B

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
400.00	0.00	402.60	0.00	405.20	0.00	407.80	0.00
400.05	0.00	402.65	0.00	405.25	0.00	407.85	0.00
400.10	0.00	402.70	0.00	405.30	0.00	407.90	0.00
400.15	0.00	402.75	0.00	405.35	0.00	407.95	0.00
400.20	0.00	402.80	0.00	405.40	0.00	408.00	0.00
400.25	0.00	402.85	0.00	405.45	0.00	408.05	0.00
400.30	0.00	402.90	0.00	405.50	0.00	408.10	0.00
400.35	0.00	402.95	0.00	405.55	0.00	408.15	0.00
400.40	0.00	403.00	0.00	405.60	0.00	408.20	0.00
400.45	0.00	403.05	0.00	405.65	0.00	408.25	0.00
400.50	0.00	403.10	0.00	405.70	0.00	408.30	0.00
400.55	0.00	403.15	0.00	405.75	0.00	408.35	0.00
400.60	0.00	403.20	0.00	405.80	0.00	408.40	0.00
400.65	0.00	403.25	0.00	405.85	0.00	408.45	0.51
400.70	0.00	403.30	0.00	405.90	0.00	408.50	1.45
400.75	0.00	403.35	0.00	405.95	0.00	408.55	2.66
400.80	0.00	403.40	0.00	406.00	0.00	408.60	4.09
400.85	0.00	403.45	0.00	406.05	0.00	408.65	5.72
400.90	0.00	403.50	0.00	406.10	0.00	408.70	7.52
400.95	0.00	403.55	0.00	406.15	0.00	408.75	9.48
401.00	0.00	403.60	0.00	406.20	0.00	408.80	11.58
401.05	0.00	403.65	0.00	406.25	0.00	408.85	13.82
401.10	0.00	403.70	0.00	406.30	0.00	408.90	16.19
401.15	0.00	403.75	0.00	406.35	0.00	408.95	18.67
401.20	0.00	403.80	0.00	406.40	0.00	409.00	21.28
401.25	0.00	403.85	0.00	406.45	0.00	409.05	23.99
401.30	0.00	403.90	0.00	406.50	0.00	409.10	26.81
401.35	0.00	403.95	0.00	406.55	0.00	409.15	29.73
401.40	0.00	404.00	0.00	406.60	0.00	409.20	32.76
401.45	0.00	404.05	0.00	406.65	0.00	409.25	35.88
401.50	0.00	404.10	0.00	406.70	0.00	409.30	39.09
401.55	0.00	404.15	0.00	406.75	0.00	409.35	41.68
401.60	0.00	404.20	0.00	406.80	0.00	409.40	42.02
401.65	0.00	404.25	0.00	406.85	0.00	409.45	42.35
401.70	0.00	404.30	0.00	406.90	0.00	409.50	42.67
401.75	0.00	404.35	0.00	406.95	0.00	409.55	43.00
401.80	0.00	404.40	0.00	407.00	0.00	409.60	43.32
401.85	0.00	404.45	0.00	407.05	0.00	409.65	43.65
401.90	0.00	404.50	0.00	407.10	0.00	409.70	43.96
401.95	0.00	404.55	0.00	407.15	0.00	409.75	44.28
402.00	0.00	404.60	0.00	407.20	0.00	409.80	44.60
402.05	0.00	404.65	0.00	407.25	0.00	409.85	44.91
402.10	0.00	404.70	0.00	407.30	0.00	409.90	45.22
402.15	0.00	404.75	0.00	407.35	0.00	409.95	45.53
402.20	0.00	404.80	0.00	407.40	0.00	410.00	**45.83**
402.25	0.00	404.85	0.00	407.45	0.00		
402.30	0.00	404.90	0.00	407.50	0.00		
402.35	0.00	404.95	0.00	407.55	0.00		
402.40	0.00	405.00	0.00	407.60	0.00		
402.45	0.00	405.05	0.00	407.65	0.00		
402.50	0.00	405.10	0.00	407.70	0.00		
402.55	0.00	405.15	0.00	407.75	0.00		

Stage-Area-Storage for Pond 6P: Forebay & Bio B1-B

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
400.00	855	0
400.10	906	88
400.20	957	181
400.30	1,011	280
400.40	1,066	383
400.50	1,122	493
400.60	1,180	608
400.70	1,239	729
400.80	1,300	856
400.90	1,362	989
401.00	1,425	1,128
401.10	1,491	1,274
401.20	1,557	1,426
401.30	1,625	1,585
401.40	1,694	1,751
401.50	1,765	1,924
401.60	1,837	2,104
401.70	1,911	2,292
401.80	1,986	2,487
401.90	2,063	2,689
402.00	2,141	2,899
402.10	2,216	3,117
402.20	2,292	3,343
402.30	2,370	3,576
402.40	2,449	3,817
402.50	2,529	4,065
402.60	2,611	4,322
402.70	2,693	4,588
402.80	2,777	4,861
402.90	2,863	5,143
403.00	2,949	5,434
403.10	3,037	5,733
403.20	3,127	6,041
403.30	3,217	6,358
403.40	3,309	6,685
403.50	3,402	7,020
403.60	3,496	7,365
403.70	3,592	7,720
403.80	3,689	8,084
403.90	3,787	8,457
404.00	3,887	8,841
404.10	3,978	9,234
404.20	4,069	9,637
404.30	4,162	10,048
404.40	4,256	10,469
404.50	4,351	10,899
404.60	4,446	11,339
404.70	4,543	11,789
404.80	4,641	12,248
404.90	4,740	12,717
405.00	4,840	13,196
405.10	4,941	13,685
405.20	5,043	14,184
405.30	5,147	14,694
405.40	5,251	15,214
405.50	5,356	15,744
405.60	5,462	16,285
405.70	5,570	16,837
405.80	5,678	17,399
405.90	5,788	17,972
406.00	5,898	18,557
406.10	6,293	19,166
406.20	6,701	19,816
406.30	7,122	20,507
406.40	7,555	21,240
406.50	8,001	22,018
406.60	8,460	22,841
406.70	8,932	23,711
406.80	9,417	24,628
406.90	9,914	25,594
407.00	10,425	26,611
407.10	10,948	27,680
407.20	11,484	28,801
407.30	12,032	29,977
407.40	12,594	31,208
407.50	13,168	32,496
407.60	13,422	33,825
407.70	13,679	35,180
407.80	13,938	36,561
407.90	14,200	37,968
408.00	14,464	39,401
408.10	14,722	40,861
408.20	14,982	42,346
408.30	15,244	43,857
408.40	15,509	45,395
408.50	15,776	46,959
408.60	16,045	48,550
408.70	16,316	50,168
408.80	16,590	51,813
408.90	16,866	53,486
409.00	17,144	55,187
409.10	17,425	56,915
409.20	17,708	58,672
409.30	17,993	60,457
409.40	18,280	62,270
409.50	18,570	64,113
409.60	18,862	65,984
409.70	19,156	67,885
409.80	19,452	69,815
409.90	19,751	71,775
410.00	**20,052**	**73,766**

Summary for Pond 7P: Detention Basin B1

Inflow Area = 9.568 ac, 49.61% Impervious, Inflow Depth = 2.49" for 10-yr event
Inflow = 17.50 cfs @ 12.39 hrs, Volume= 1.986 af
Outflow = 1.50 cfs @ 15.16 hrs, Volume= 1.843 af, Atten= 91%, Lag= 165.9 min
Primary = 1.50 cfs @ 15.16 hrs, Volume= 1.843 af
Routed to Pond PR-B : PR-B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Automatic Starting Elev= 400.50' Surf.Area= 1,825 sf Storage= 806 cf
Peak Elev= 408.07' @ 15.16 hrs Surf.Area= 12,818 sf Storage= 51,487 cf (50,681 cf above start)

Plug-Flow detention time= 792.7 min calculated for 1.825 af (92% of inflow)
Center-of-Mass det. time= 739.7 min (1,641.3 - 901.6)

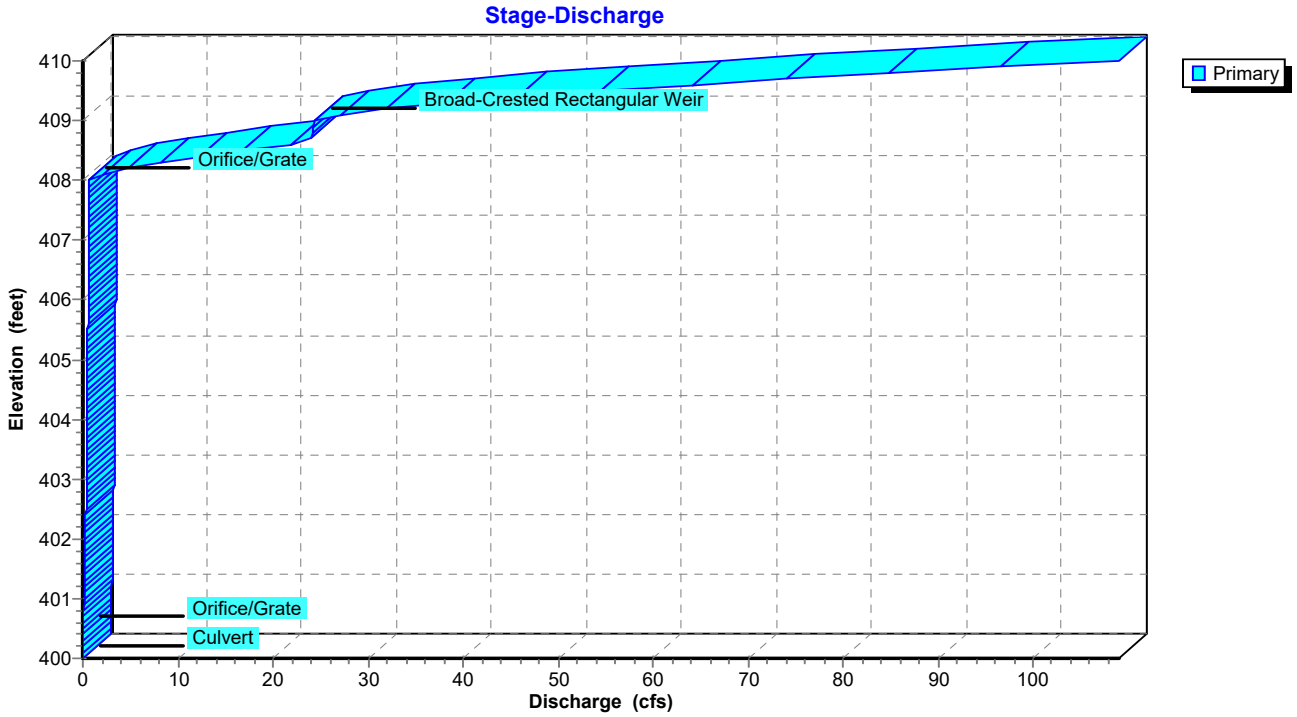
Volume	Invert	Avail.Storage	Storage Description
#1	400.00'	79,868 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
400.00	1,408	0	0	1,408
402.00	3,402	4,666	4,666	3,431
404.00	5,985	9,266	13,932	6,058
406.00	9,096	14,973	28,905	9,229
408.00	12,687	21,684	50,588	12,895
410.00	16,684	29,280	79,868	16,983

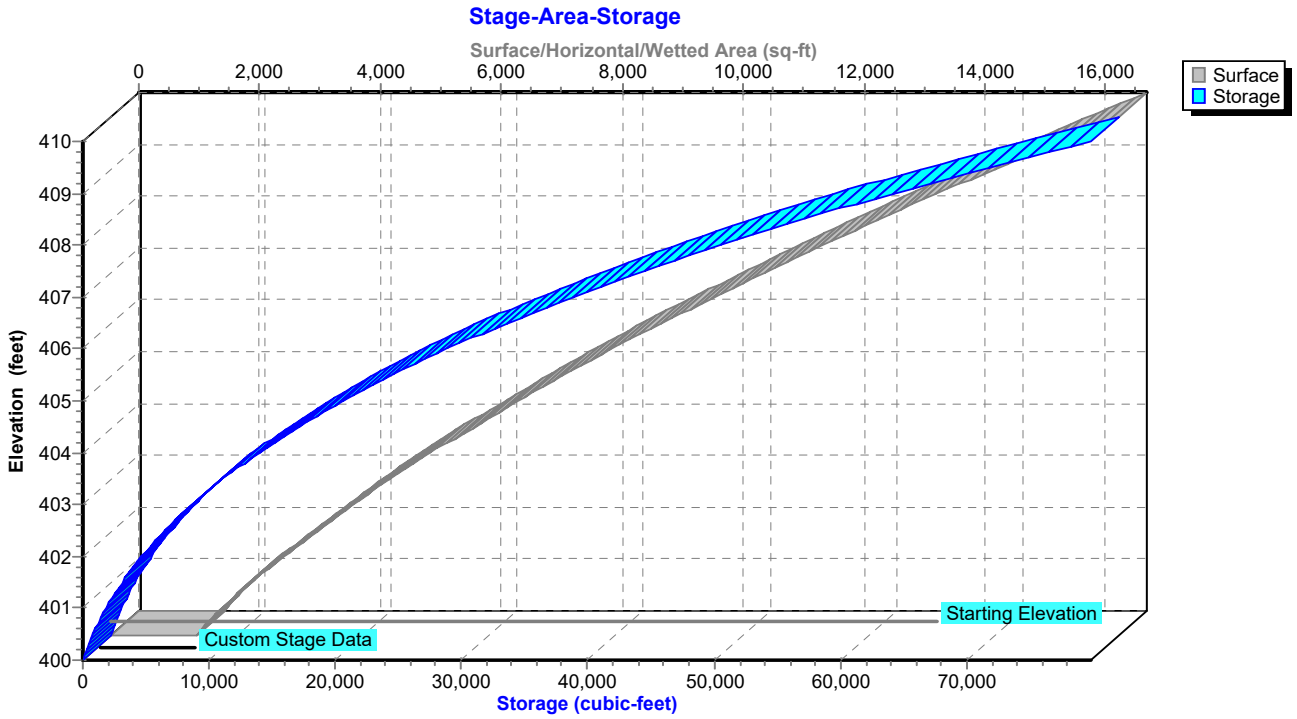
Device	Routing	Invert	Outlet Devices
#1	Primary	400.00'	**18.0" Round Culvert** L= 140.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 400.00' / 398.00' S= 0.0143 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	400.50'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	408.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	409.00'	**30.0' long + 2.0 '/' SideZ x 50.0' 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=1.50 cfs @ 15.16 hrs HW=408.07' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.50 cfs of 23.02 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.64 cfs @ 13.14 fps)
  - **3=Orifice/Grate** (Weir Controls 0.86 cfs @ 0.87 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P: Detention Basin B1



Pond 7P: Detention Basin B1



Stage-Discharge for Pond 7P: Detention Basin B1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
400.00	0.00	402.60	0.33	405.20	0.51	407.80	0.63
400.05	0.00	402.65	0.34	405.25	0.51	407.85	0.64
400.10	0.00	402.70	0.34	405.30	0.51	407.90	0.64
400.15	0.00	402.75	0.34	405.35	0.51	407.95	0.64
400.20	0.00	402.80	0.35	405.40	0.52	408.00	0.64
400.25	0.00	402.85	0.35	405.45	0.52	408.05	1.16
400.30	0.00	402.90	0.36	405.50	0.52	408.10	2.09
400.35	0.00	402.95	0.36	405.55	0.52	408.15	3.31
400.40	0.00	403.00	0.36	405.60	0.53	408.20	4.75
400.45	0.00	403.05	0.37	405.65	0.53	408.25	6.38
400.50	0.00	403.10	0.37	405.70	0.53	408.30	8.18
400.55	0.01	403.15	0.38	405.75	0.54	408.35	10.14
400.60	0.02	403.20	0.38	405.80	0.54	408.40	12.24
400.65	0.04	403.25	0.38	405.85	0.54	408.45	14.48
400.70	0.06	403.30	0.39	405.90	0.54	408.50	16.85
400.75	0.08	403.35	0.39	405.95	0.55	408.55	19.34
400.80	0.10	403.40	0.39	406.00	0.55	408.60	21.94
400.85	0.11	403.45	0.40	406.05	0.55	408.65	23.92
400.90	0.12	403.50	0.40	406.10	0.55	408.70	23.99
400.95	0.13	403.55	0.40	406.15	0.56	408.75	24.07
401.00	0.14	403.60	0.41	406.20	0.56	408.80	24.14
401.05	0.15	403.65	0.41	406.25	0.56	408.85	24.22
401.10	0.16	403.70	0.41	406.30	0.56	408.90	24.29
401.15	0.17	403.75	0.42	406.35	0.57	408.95	24.37
401.20	0.18	403.80	0.42	406.40	0.57	409.00	24.44
401.25	0.19	403.85	0.42	406.45	0.57	409.05	25.41
401.30	0.19	403.90	0.43	406.50	0.57	409.10	27.14
401.35	0.20	403.95	0.43	406.55	0.58	409.15	29.37
401.40	0.21	404.00	0.43	406.60	0.58	409.20	32.00
401.45	0.21	404.05	0.44	406.65	0.58	409.25	35.01
401.50	0.22	404.10	0.44	406.70	0.58	409.30	38.35
401.55	0.23	404.15	0.44	406.75	0.58	409.35	42.01
401.60	0.23	404.20	0.45	406.80	0.59	409.40	45.95
401.65	0.24	404.25	0.45	406.85	0.59	409.45	50.14
401.70	0.25	404.30	0.45	406.90	0.59	409.50	54.57
401.75	0.25	404.35	0.46	406.95	0.59	409.55	59.25
401.80	0.26	404.40	0.46	407.00	0.60	409.60	64.16
401.85	0.26	404.45	0.46	407.05	0.60	409.65	69.06
401.90	0.27	404.50	0.47	407.10	0.60	409.70	74.12
401.95	0.27	404.55	0.47	407.15	0.60	409.75	79.33
402.00	0.28	404.60	0.47	407.20	0.61	409.80	84.69
402.05	0.28	404.65	0.47	407.25	0.61	409.85	90.49
402.10	0.29	404.70	0.48	407.30	0.61	409.90	96.47
402.15	0.29	404.75	0.48	407.35	0.61	409.95	102.64
402.20	0.30	404.80	0.48	407.40	0.62	410.00	**108.99**
402.25	0.30	404.85	0.49	407.45	0.62		
402.30	0.31	404.90	0.49	407.50	0.62		
402.35	0.31	404.95	0.49	407.55	0.62		
402.40	0.31	405.00	0.49	407.60	0.62		
402.45	0.32	405.05	0.50	407.65	0.63		
402.50	0.32	405.10	0.50	407.70	0.63		
402.55	0.33	405.15	0.50	407.75	0.63		

Stage-Area-Storage for Pond 7P: Detention Basin B1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
400.00	1,408	0
400.10	1,487	145
400.20	1,568	298
400.30	1,652	459
400.40	1,738	628
400.50	1,825	806
400.60	1,915	993
400.70	2,007	1,189
400.80	2,102	1,395
400.90	2,198	1,610
401.00	2,297	1,834
401.10	2,398	2,069
401.20	2,501	2,314
401.30	2,606	2,569
401.40	2,713	2,835
401.50	2,822	3,112
401.60	2,934	3,400
401.70	3,048	3,699
401.80	3,164	4,009
401.90	3,282	4,332
402.00	3,402	4,666
402.10	3,514	5,012
402.20	3,628	5,369
402.30	3,743	5,737
402.40	3,861	6,117
402.50	3,980	6,509
402.60	4,101	6,913
402.70	4,224	7,330
402.80	4,348	7,758
402.90	4,475	8,199
403.00	4,603	8,653
403.10	4,733	9,120
403.20	4,865	9,600
403.30	4,999	10,093
403.40	5,134	10,600
403.50	5,271	11,120
403.60	5,410	11,654
403.70	5,551	12,202
403.80	5,694	12,764
403.90	5,839	13,341
404.00	5,985	13,932
404.10	6,125	14,537
404.20	6,267	15,157
404.30	6,410	15,791
404.40	6,555	16,439
404.50	6,702	17,102
404.60	6,850	17,780
404.70	7,000	18,472
404.80	7,152	19,180
404.90	7,305	19,902
405.00	7,459	20,641
405.10	7,616	21,394
405.20	7,774	22,164
405.30	7,933	22,949
405.40	8,095	23,751
405.50	8,257	24,568
405.60	8,422	25,402
405.70	8,588	26,253
405.80	8,756	27,120
405.90	8,925	28,004
406.00	9,096	28,905
406.10	9,261	29,823
406.20	9,428	30,757
406.30	9,597	31,708
406.40	9,767	32,677
406.50	9,938	33,662
406.60	10,111	34,664
406.70	10,285	35,684
406.80	10,461	36,721
406.90	10,638	37,776
407.00	10,817	38,849
407.10	10,997	39,940
407.20	11,179	41,048
407.30	11,362	42,175
407.40	11,547	43,321
407.50	11,733	44,485
407.60	11,921	45,668
407.70	12,110	46,869
407.80	12,301	48,090
407.90	12,493	49,329
408.00	12,687	50,588
408.10	12,874	51,867
408.20	13,062	53,163
408.30	13,252	54,479
408.40	13,443	55,814
408.50	13,635	57,168
408.60	13,829	58,541
408.70	14,024	59,933
408.80	14,220	61,346
408.90	14,418	62,777
409.00	14,617	64,229
409.10	14,818	65,701
409.20	15,020	67,193
409.30	15,223	68,705
409.40	15,428	70,237
409.50	15,634	71,790
409.60	15,841	73,364
409.70	16,050	74,959
409.80	16,260	76,574
409.90	16,471	78,211
410.00	**16,684**	**79,868**

Summary for Pond PR-A: PR-A

Inflow Area = 37.077 ac, 36.05% Impervious, Inflow Depth > 2.37" for 10-yr event
Inflow = 46.90 cfs @ 12.24 hrs, Volume= 7.307 af
Primary = 46.90 cfs @ 12.24 hrs, Volume= 7.307 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond PR-B: PR-B

Inflow Area = 21.350 ac, 28.46% Impervious, Inflow Depth > 1.69" for 10-yr event
Inflow = 9.39 cfs @ 12.27 hrs, Volume= 3.009 af
Primary = 9.39 cfs @ 12.27 hrs, Volume= 3.009 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond 1P: Forebay & Bio A1-A

Inflow Area = 4.891 ac, 54.92% Impervious, Inflow Depth = 7.05" for 100-yr event
Inflow = 22.54 cfs @ 12.26 hrs, Volume= 2.874 af
Outflow = 21.90 cfs @ 12.30 hrs, Volume= 2.874 af, Atten= 3%, Lag= 2.5 min
Primary = 21.90 cfs @ 12.30 hrs, Volume= 2.874 af
Routed to Pond 4P : Detention Basin A1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Automatic Starting Elev= 408.50' Surf.Area= 18,385 sf Storage= 66,328 cf
Peak Elev= 408.99' @ 12.74 hrs Surf.Area= 18,740 sf Storage= 75,512 cf (9,184 cf above start)

Plug-Flow detention time= 329.5 min calculated for 1.351 af (47% of inflow)
Center-of-Mass det. time= 17.4 min (812.7 - 795.3)

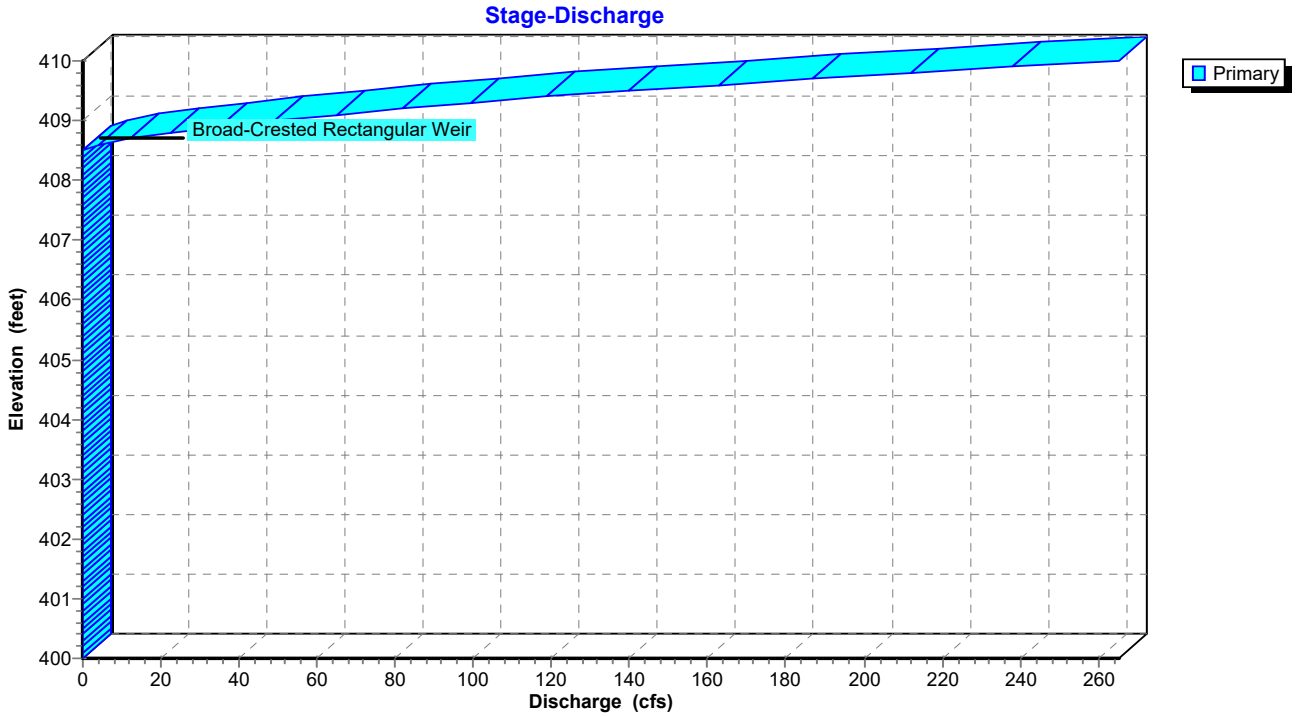
Volume	Invert	Avail.Storage	Storage Description
#1	400.00'	94,716 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
400.00	2,093	0	0	2,093
402.00	3,854	5,858	5,858	3,895
404.00	5,993	9,769	15,627	6,090
406.00	8,501	14,421	30,048	8,669
407.50	16,634	18,513	48,561	16,824
408.00	18,030	8,664	57,225	18,239
410.00	19,471	37,492	94,716	19,977

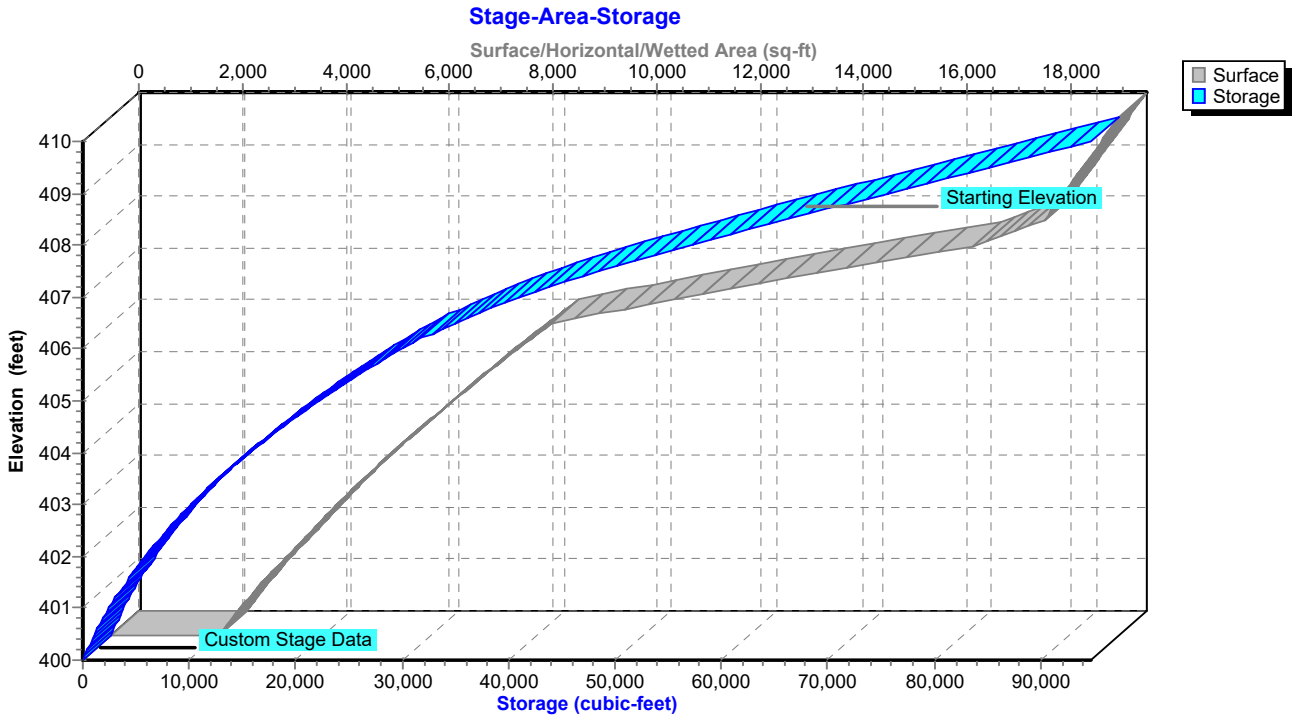
Device	Routing	Invert	Outlet Devices
#1	Primary	408.50'	**50.0' long + 4.0 '/' SideZ x 31.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=21.89 cfs @ 12.30 hrs HW=408.79' TW=408.06' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 21.89 cfs @ 1.45 fps)

Pond 1P: Forebay & Bio A1-A



Pond 1P: Forebay & Bio A1-A



Stage-Discharge for Pond 1P: Forebay & Bio A1-A

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
400.00	0.00	402.60	0.00	405.20	0.00	407.80	0.00
400.05	0.00	402.65	0.00	405.25	0.00	407.85	0.00
400.10	0.00	402.70	0.00	405.30	0.00	407.90	0.00
400.15	0.00	402.75	0.00	405.35	0.00	407.95	0.00
400.20	0.00	402.80	0.00	405.40	0.00	408.00	0.00
400.25	0.00	402.85	0.00	405.45	0.00	408.05	0.00
400.30	0.00	402.90	0.00	405.50	0.00	408.10	0.00
400.35	0.00	402.95	0.00	405.55	0.00	408.15	0.00
400.40	0.00	403.00	0.00	405.60	0.00	408.20	0.00
400.45	0.00	403.05	0.00	405.65	0.00	408.25	0.00
400.50	0.00	403.10	0.00	405.70	0.00	408.30	0.00
400.55	0.00	403.15	0.00	405.75	0.00	408.35	0.00
400.60	0.00	403.20	0.00	405.80	0.00	408.40	0.00
400.65	0.00	403.25	0.00	405.85	0.00	408.45	0.00
400.70	0.00	403.30	0.00	405.90	0.00	408.50	0.00
400.75	0.00	403.35	0.00	405.95	0.00	408.55	1.50
400.80	0.00	403.40	0.00	406.00	0.00	408.60	4.26
400.85	0.00	403.45	0.00	406.05	0.00	408.65	7.86
400.90	0.00	403.50	0.00	406.10	0.00	408.70	12.14
400.95	0.00	403.55	0.00	406.15	0.00	408.75	17.05
401.00	0.00	403.60	0.00	406.20	0.00	408.80	22.52
401.05	0.00	403.65	0.00	406.25	0.00	408.85	28.53
401.10	0.00	403.70	0.00	406.30	0.00	408.90	35.03
401.15	0.00	403.75	0.00	406.35	0.00	408.95	41.93
401.20	0.00	403.80	0.00	406.40	0.00	409.00	49.26
401.25	0.00	403.85	0.00	406.45	0.00	409.05	57.00
401.30	0.00	403.90	0.00	406.50	0.00	409.10	65.15
401.35	0.00	403.95	0.00	406.55	0.00	409.15	73.28
401.40	0.00	404.00	0.00	406.60	0.00	409.20	81.69
401.45	0.00	404.05	0.00	406.65	0.00	409.25	90.36
401.50	0.00	404.10	0.00	406.70	0.00	409.30	99.29
401.55	0.00	404.15	0.00	406.75	0.00	409.35	108.97
401.60	0.00	404.20	0.00	406.80	0.00	409.40	118.97
401.65	0.00	404.25	0.00	406.85	0.00	409.45	129.29
401.70	0.00	404.30	0.00	406.90	0.00	409.50	139.92
401.75	0.00	404.35	0.00	406.95	0.00	409.55	151.14
401.80	0.00	404.40	0.00	407.00	0.00	409.60	162.70
401.85	0.00	404.45	0.00	407.05	0.00	409.65	174.60
401.90	0.00	404.50	0.00	407.10	0.00	409.70	186.84
401.95	0.00	404.55	0.00	407.15	0.00	409.75	199.23
402.00	0.00	404.60	0.00	407.20	0.00	409.80	211.93
402.05	0.00	404.65	0.00	407.25	0.00	409.85	224.94
402.10	0.00	404.70	0.00	407.30	0.00	409.90	238.25
402.15	0.00	404.75	0.00	407.35	0.00	409.95	251.63
402.20	0.00	404.80	0.00	407.40	0.00	410.00	**265.28**
402.25	0.00	404.85	0.00	407.45	0.00		
402.30	0.00	404.90	0.00	407.50	0.00		
402.35	0.00	404.95	0.00	407.55	0.00		
402.40	0.00	405.00	0.00	407.60	0.00		
402.45	0.00	405.05	0.00	407.65	0.00		
402.50	0.00	405.10	0.00	407.70	0.00		
402.55	0.00	405.15	0.00	407.75	0.00		

Stage-Area-Storage for Pond 1P: Forebay & Bio A1-A

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
400.00	2,093	0
400.10	2,168	213
400.20	2,245	434
400.30	2,323	662
400.40	2,403	898
400.50	2,483	1,143
400.60	2,565	1,395
400.70	2,649	1,656
400.80	2,733	1,925
400.90	2,819	2,202
401.00	2,907	2,489
401.10	2,996	2,784
401.20	3,086	3,088
401.30	3,177	3,401
401.40	3,270	3,723
401.50	3,364	4,055
401.60	3,459	4,396
401.70	3,556	4,747
401.80	3,654	5,107
401.90	3,753	5,478
402.00	3,854	5,858
402.10	3,950	6,248
402.20	4,047	6,648
402.30	4,145	7,058
402.40	4,244	7,477
402.50	4,345	7,907
402.60	4,446	8,346
402.70	4,549	8,796
402.80	4,653	9,256
402.90	4,758	9,727
403.00	4,865	10,208
403.10	4,972	10,699
403.20	5,081	11,202
403.30	5,191	11,716
403.40	5,302	12,240
403.50	5,414	12,776
403.60	5,528	13,323
403.70	5,642	13,882
403.80	5,758	14,452
403.90	5,875	15,033
404.00	5,993	15,627
404.10	6,108	16,232
404.20	6,224	16,848
404.30	6,341	17,477
404.40	6,460	18,117
404.50	6,579	18,769
404.60	6,699	19,432
404.70	6,821	20,109
404.80	6,944	20,797
404.90	7,067	21,497
405.00	7,192	22,210
405.10	7,318	22,936
405.20	7,445	23,674
405.30	7,573	24,425
405.40	7,703	25,189
405.50	7,833	25,965
405.60	7,964	26,755
405.70	8,097	27,558
405.80	8,231	28,375
405.90	8,365	29,205
406.00	8,501	30,048
406.10	8,959	30,921
406.20	9,429	31,840
406.30	9,911	32,807
406.40	10,405	33,823
406.50	10,912	34,888
406.60	11,430	36,005
406.70	11,960	37,175
406.80	12,502	38,398
406.90	13,056	39,676
407.00	13,623	41,009
407.10	14,201	42,401
407.20	14,791	43,850
407.30	15,393	45,359
407.40	16,008	46,929
407.50	16,634	48,561
407.60	16,909	50,238
407.70	17,186	51,943
407.80	17,465	53,675
407.90	17,746	55,436
408.00	18,030	57,225
408.10	18,101	59,031
408.20	18,172	60,845
408.30	18,243	62,666
408.40	18,314	64,493
408.50	18,385	66,328
408.60	18,456	68,170
408.70	18,528	70,020
408.80	18,600	71,876
408.90	18,672	73,740
409.00	18,744	75,610
409.10	18,816	77,488
409.20	18,888	79,373
409.30	18,960	81,266
409.40	19,033	83,166
409.50	19,106	85,072
409.60	19,178	86,987
409.70	19,251	88,908
409.80	19,324	90,837
409.90	19,398	92,773
410.00	**19,471**	**94,716**

Summary for Pond 2P: Forebay & Bio A1-B

Inflow Area = 4.432 ac, 51.17% Impervious, Inflow Depth = 6.93" for 100-yr event
Inflow = 20.50 cfs @ 12.24 hrs, Volume= 2.560 af
Outflow = 19.78 cfs @ 12.29 hrs, Volume= 2.560 af, Atten= 3%, Lag= 3.2 min
Primary = 19.78 cfs @ 12.29 hrs, Volume= 2.560 af
Routed to Pond 4P : Detention Basin A1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Automatic Starting Elev= 408.50' Surf.Area= 19,240 sf Storage= 72,229 cf
Peak Elev= 408.99' @ 12.74 hrs Surf.Area= 20,558 sf Storage= 82,052 cf (9,823 cf above start)

Plug-Flow detention time= 426.3 min calculated for 0.902 af (35% of inflow)
Center-of-Mass det. time= 20.1 min (818.6 - 798.5)

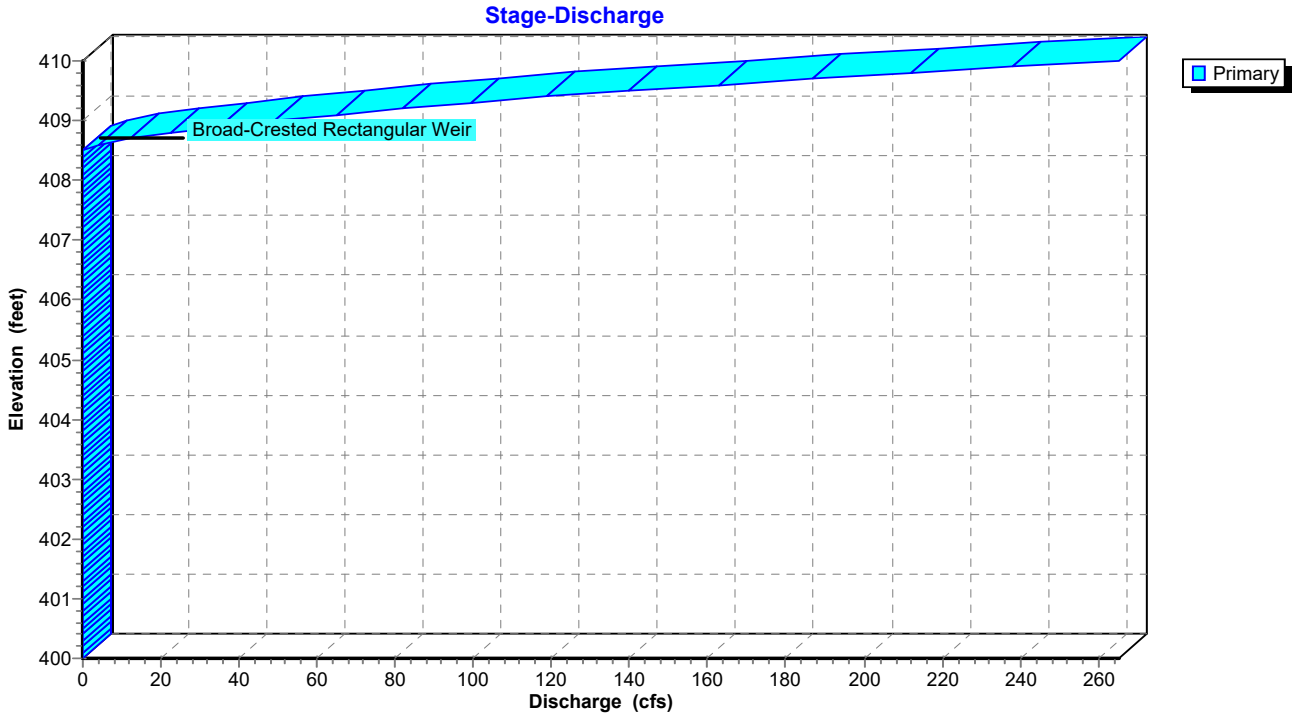
Volume	Invert	Avail.Storage	Storage Description
#1	400.00'	104,144 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
400.00	3,314	0	0	3,314
402.00	4,891	8,154	8,154	4,954
404.00	6,756	11,597	19,751	6,896
406.00	8,917	15,623	35,374	9,146
407.50	16,689	18,903	54,277	16,940
408.00	17,949	8,658	62,934	18,222
410.00	23,380	41,210	104,144	23,747

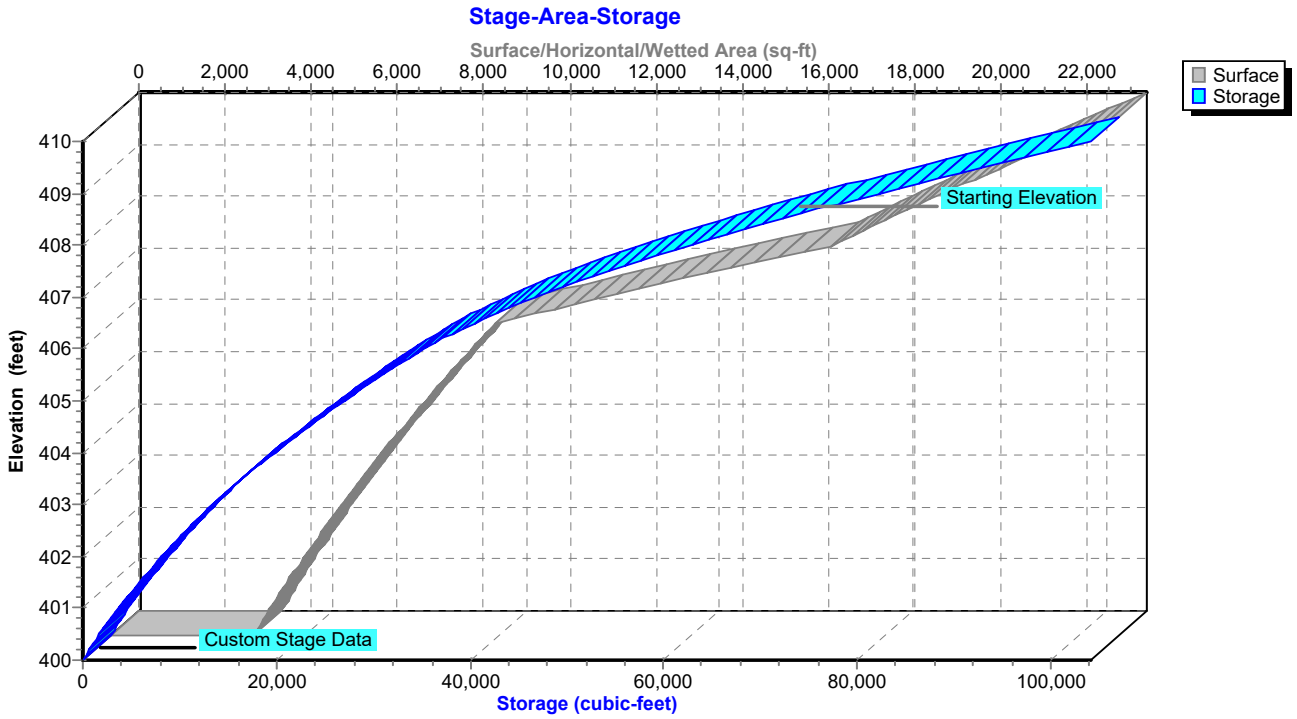
Device	Routing	Invert	Outlet Devices
#1	Primary	408.50'	**50.0' long + 4.0 '/' SideZ x 31.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=19.78 cfs @ 12.29 hrs HW=408.78' TW=408.03' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 19.78 cfs @ 1.40 fps)

Pond 2P: Forebay & Bio A1-B



Pond 2P: Forebay & Bio A1-B



Stage-Discharge for Pond 2P: Forebay & Bio A1-B

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
400.00	0.00	402.60	0.00	405.20	0.00	407.80	0.00
400.05	0.00	402.65	0.00	405.25	0.00	407.85	0.00
400.10	0.00	402.70	0.00	405.30	0.00	407.90	0.00
400.15	0.00	402.75	0.00	405.35	0.00	407.95	0.00
400.20	0.00	402.80	0.00	405.40	0.00	408.00	0.00
400.25	0.00	402.85	0.00	405.45	0.00	408.05	0.00
400.30	0.00	402.90	0.00	405.50	0.00	408.10	0.00
400.35	0.00	402.95	0.00	405.55	0.00	408.15	0.00
400.40	0.00	403.00	0.00	405.60	0.00	408.20	0.00
400.45	0.00	403.05	0.00	405.65	0.00	408.25	0.00
400.50	0.00	403.10	0.00	405.70	0.00	408.30	0.00
400.55	0.00	403.15	0.00	405.75	0.00	408.35	0.00
400.60	0.00	403.20	0.00	405.80	0.00	408.40	0.00
400.65	0.00	403.25	0.00	405.85	0.00	408.45	0.00
400.70	0.00	403.30	0.00	405.90	0.00	408.50	0.00
400.75	0.00	403.35	0.00	405.95	0.00	408.55	1.50
400.80	0.00	403.40	0.00	406.00	0.00	408.60	4.26
400.85	0.00	403.45	0.00	406.05	0.00	408.65	7.86
400.90	0.00	403.50	0.00	406.10	0.00	408.70	12.14
400.95	0.00	403.55	0.00	406.15	0.00	408.75	17.05
401.00	0.00	403.60	0.00	406.20	0.00	408.80	22.52
401.05	0.00	403.65	0.00	406.25	0.00	408.85	28.53
401.10	0.00	403.70	0.00	406.30	0.00	408.90	35.03
401.15	0.00	403.75	0.00	406.35	0.00	408.95	41.93
401.20	0.00	403.80	0.00	406.40	0.00	409.00	49.26
401.25	0.00	403.85	0.00	406.45	0.00	409.05	57.00
401.30	0.00	403.90	0.00	406.50	0.00	409.10	65.15
401.35	0.00	403.95	0.00	406.55	0.00	409.15	73.28
401.40	0.00	404.00	0.00	406.60	0.00	409.20	81.69
401.45	0.00	404.05	0.00	406.65	0.00	409.25	90.36
401.50	0.00	404.10	0.00	406.70	0.00	409.30	99.29
401.55	0.00	404.15	0.00	406.75	0.00	409.35	108.97
401.60	0.00	404.20	0.00	406.80	0.00	409.40	118.97
401.65	0.00	404.25	0.00	406.85	0.00	409.45	129.29
401.70	0.00	404.30	0.00	406.90	0.00	409.50	139.92
401.75	0.00	404.35	0.00	406.95	0.00	409.55	151.14
401.80	0.00	404.40	0.00	407.00	0.00	409.60	162.70
401.85	0.00	404.45	0.00	407.05	0.00	409.65	174.60
401.90	0.00	404.50	0.00	407.10	0.00	409.70	186.84
401.95	0.00	404.55	0.00	407.15	0.00	409.75	199.23
402.00	0.00	404.60	0.00	407.20	0.00	409.80	211.93
402.05	0.00	404.65	0.00	407.25	0.00	409.85	224.94
402.10	0.00	404.70	0.00	407.30	0.00	409.90	238.25
402.15	0.00	404.75	0.00	407.35	0.00	409.95	251.63
402.20	0.00	404.80	0.00	407.40	0.00	410.00	**265.28**
402.25	0.00	404.85	0.00	407.45	0.00		
402.30	0.00	404.90	0.00	407.50	0.00		
402.35	0.00	404.95	0.00	407.55	0.00		
402.40	0.00	405.00	0.00	407.60	0.00		
402.45	0.00	405.05	0.00	407.65	0.00		
402.50	0.00	405.10	0.00	407.70	0.00		
402.55	0.00	405.15	0.00	407.75	0.00		

Stage-Area-Storage for Pond 2P: Forebay & Bio A1-B

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
400.00	3,314	0
400.10	3,386	335
400.20	3,458	677
400.30	3,531	1,027
400.40	3,605	1,383
400.50	3,680	1,748
400.60	3,755	2,119
400.70	3,831	2,499
400.80	3,908	2,886
400.90	3,986	3,280
401.00	4,064	3,683
401.10	4,143	4,093
401.20	4,223	4,511
401.30	4,304	4,938
401.40	4,386	5,372
401.50	4,468	5,815
401.60	4,551	6,266
401.70	4,635	6,725
401.80	4,720	7,193
401.90	4,805	7,669
402.00	4,891	8,154
402.10	4,977	8,647
402.20	5,064	9,149
402.30	5,152	9,660
402.40	5,240	10,180
402.50	5,329	10,708
402.60	5,419	11,246
402.70	5,510	11,792
402.80	5,601	12,348
402.90	5,693	12,912
403.00	5,786	13,486
403.10	5,880	14,069
403.20	5,974	14,662
403.30	6,069	15,264
403.40	6,165	15,876
403.50	6,262	16,497
403.60	6,359	17,128
403.70	6,457	17,769
403.80	6,556	18,420
403.90	6,656	19,080
404.00	6,756	19,751
404.10	6,857	20,432
404.20	6,959	21,122
404.30	7,061	21,823
404.40	7,164	22,535
404.50	7,268	23,256
404.60	7,373	23,988
404.70	7,478	24,731
404.80	7,584	25,484
404.90	7,691	26,248
405.00	7,799	27,022
405.10	7,908	27,808
405.20	8,017	28,604
405.30	8,127	29,411
405.40	8,237	30,229
405.50	8,349	31,058
405.60	8,461	31,899
405.70	8,574	32,751
405.80	8,687	33,614
405.90	8,802	34,488
406.00	8,917	35,374
406.10	9,360	36,288
406.20	9,814	37,246
406.30	10,278	38,251
406.40	10,753	39,302
406.50	11,239	40,402
406.60	11,736	41,551
406.70	12,243	42,749
406.80	12,761	44,000
406.90	13,290	45,302
407.00	13,830	46,658
407.10	14,380	48,068
407.20	14,941	49,534
407.30	15,513	51,057
407.40	16,096	52,637
407.50	16,689	54,277
407.60	16,937	55,958
407.70	17,187	57,664
407.80	17,439	59,395
407.90	17,693	61,152
408.00	17,949	62,934
408.10	18,204	64,742
408.20	18,460	66,575
408.30	18,718	68,434
408.40	18,978	70,319
408.50	19,240	72,229
408.60	19,503	74,166
408.70	19,768	76,130
408.80	20,035	78,120
408.90	20,304	80,137
409.00	20,575	82,181
409.10	20,847	84,252
409.20	21,122	86,351
409.30	21,398	88,477
409.40	21,675	90,630
409.50	21,955	92,812
409.60	22,236	95,021
409.70	22,520	97,259
409.80	22,805	99,525
409.90	23,091	101,820
410.00	**23,380**	**104,144**

Summary for Pond 3P: Forebay & Bio B1-A

Inflow Area = 4.885 ac, 52.14% Impervious, Inflow Depth = 6.93" for 100-yr event
Inflow = 22.28 cfs @ 12.26 hrs, Volume= 2.822 af
Outflow = 19.78 cfs @ 12.35 hrs, Volume= 2.461 af, Atten= 11%, Lag= 5.4 min
Primary = 19.78 cfs @ 12.35 hrs, Volume= 2.461 af
Routed to Pond 7P : Detention Basin B1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 407.50' Surf.Area= 16,268 sf Storage= 53,756 cf
Peak Elev= 408.97' @ 12.36 hrs Surf.Area= 20,277 sf Storage= 80,602 cf (26,846 cf above start)

Plug-Flow detention time= 345.7 min calculated for 1.227 af (43% of inflow)
Center-of-Mass det. time= 63.1 min (862.1 - 799.1)

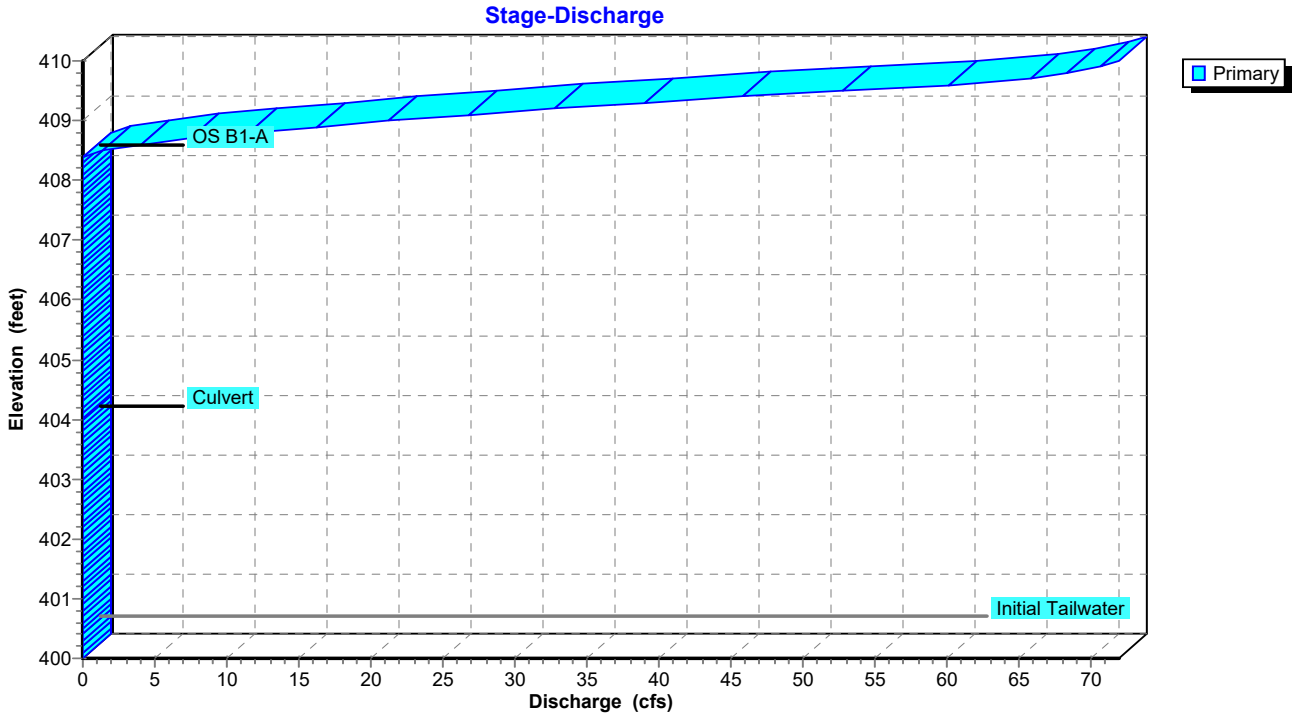
Volume	Invert	Avail.Storage	Storage Description
#1	400.00'	103,006 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
400.00	3,233	0	0	3,233
402.00	4,859	8,037	8,037	4,920
404.00	6,744	11,552	19,589	6,880
406.00	8,885	15,580	35,168	9,111
407.50	16,268	18,588	53,756	16,517
408.00	17,600	8,465	62,221	17,869
410.00	23,319	40,785	103,006	23,677

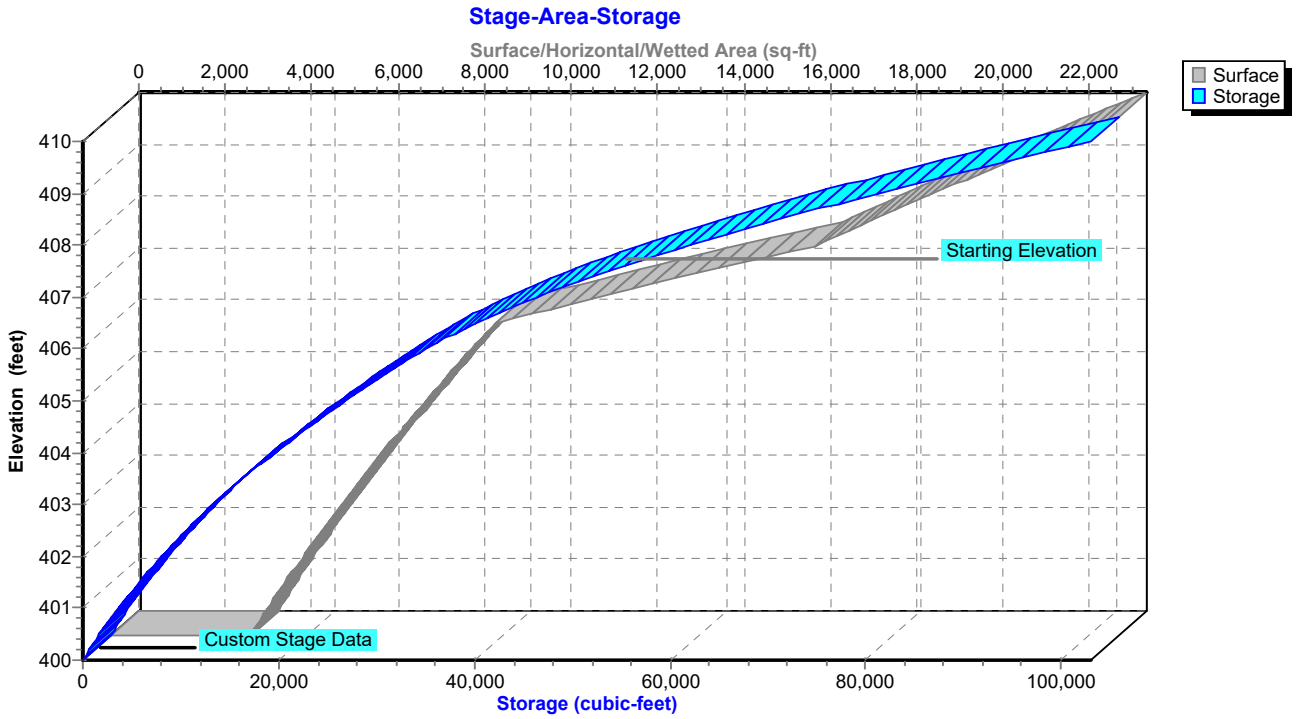
Device	Routing	Invert	Outlet Devices
#1	Primary	404.03'	**36.0" Round Culvert** L= 101.6' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 404.03' / 402.00' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 7.07 sf
#2	Device 1	408.40'	**36.0" x 48.0" Horiz. OS B1-A** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=19.71 cfs @ 12.35 hrs HW=408.97' TW=408.42' (Dynamic Tailwater)
↑**1=Culvert** (Passes 19.71 cfs of 25.29 cfs potential flow)
↑**2=OS B1-A** (Weir Controls 19.71 cfs @ 2.47 fps)

Pond 3P: Forebay & Bio B1-A



Pond 3P: Forebay & Bio B1-A



Stage-Discharge for Pond 3P: Forebay & Bio B1-A

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
400.00	0.00	402.60	0.00	405.20	0.00	407.80	0.00
400.05	0.00	402.65	0.00	405.25	0.00	407.85	0.00
400.10	0.00	402.70	0.00	405.30	0.00	407.90	0.00
400.15	0.00	402.75	0.00	405.35	0.00	407.95	0.00
400.20	0.00	402.80	0.00	405.40	0.00	408.00	0.00
400.25	0.00	402.85	0.00	405.45	0.00	408.05	0.00
400.30	0.00	402.90	0.00	405.50	0.00	408.10	0.00
400.35	0.00	402.95	0.00	405.55	0.00	408.15	0.00
400.40	0.00	403.00	0.00	405.60	0.00	408.20	0.00
400.45	0.00	403.05	0.00	405.65	0.00	408.25	0.00
400.50	0.00	403.10	0.00	405.70	0.00	408.30	0.00
400.55	0.00	403.15	0.00	405.75	0.00	408.35	0.00
400.60	0.00	403.20	0.00	405.80	0.00	408.40	0.00
400.65	0.00	403.25	0.00	405.85	0.00	408.45	0.51
400.70	0.00	403.30	0.00	405.90	0.00	408.50	1.45
400.75	0.00	403.35	0.00	405.95	0.00	408.55	2.66
400.80	0.00	403.40	0.00	406.00	0.00	408.60	4.09
400.85	0.00	403.45	0.00	406.05	0.00	408.65	5.72
400.90	0.00	403.50	0.00	406.10	0.00	408.70	7.52
400.95	0.00	403.55	0.00	406.15	0.00	408.75	9.48
401.00	0.00	403.60	0.00	406.20	0.00	408.80	11.58
401.05	0.00	403.65	0.00	406.25	0.00	408.85	13.82
401.10	0.00	403.70	0.00	406.30	0.00	408.90	16.19
401.15	0.00	403.75	0.00	406.35	0.00	408.95	18.67
401.20	0.00	403.80	0.00	406.40	0.00	409.00	21.28
401.25	0.00	403.85	0.00	406.45	0.00	409.05	23.99
401.30	0.00	403.90	0.00	406.50	0.00	409.10	26.81
401.35	0.00	403.95	0.00	406.55	0.00	409.15	29.73
401.40	0.00	404.00	0.00	406.60	0.00	409.20	32.76
401.45	0.00	404.05	0.00	406.65	0.00	409.25	35.88
401.50	0.00	404.10	0.00	406.70	0.00	409.30	39.09
401.55	0.00	404.15	0.00	406.75	0.00	409.35	42.39
401.60	0.00	404.20	0.00	406.80	0.00	409.40	45.78
401.65	0.00	404.25	0.00	406.85	0.00	409.45	49.26
401.70	0.00	404.30	0.00	406.90	0.00	409.50	52.82
401.75	0.00	404.35	0.00	406.95	0.00	409.55	56.46
401.80	0.00	404.40	0.00	407.00	0.00	409.60	60.18
401.85	0.00	404.45	0.00	407.05	0.00	409.65	63.98
401.90	0.00	404.50	0.00	407.10	0.00	409.70	65.88
401.95	0.00	404.55	0.00	407.15	0.00	409.75	67.13
402.00	0.00	404.60	0.00	407.20	0.00	409.80	68.37
402.05	0.00	404.65	0.00	407.25	0.00	409.85	69.58
402.10	0.00	404.70	0.00	407.30	0.00	409.90	70.77
402.15	0.00	404.75	0.00	407.35	0.00	409.95	71.55
402.20	0.00	404.80	0.00	407.40	0.00	410.00	**71.96**
402.25	0.00	404.85	0.00	407.45	0.00		
402.30	0.00	404.90	0.00	407.50	0.00		
402.35	0.00	404.95	0.00	407.55	0.00		
402.40	0.00	405.00	0.00	407.60	0.00		
402.45	0.00	405.05	0.00	407.65	0.00		
402.50	0.00	405.10	0.00	407.70	0.00		
402.55	0.00	405.15	0.00	407.75	0.00		

Stage-Area-Storage for Pond 3P: Forebay & Bio B1-A

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
400.00	3,233	0
400.10	3,306	327
400.20	3,381	661
400.30	3,456	1,003
400.40	3,532	1,353
400.50	3,609	1,710
400.60	3,686	2,074
400.70	3,765	2,447
400.80	3,844	2,827
400.90	3,924	3,216
401.00	4,005	3,612
401.10	4,086	4,017
401.20	4,169	4,429
401.30	4,252	4,850
401.40	4,337	5,280
401.50	4,422	5,718
401.60	4,507	6,164
401.70	4,594	6,619
401.80	4,682	7,083
401.90	4,770	7,556
402.00	4,859	8,037
402.10	4,946	8,527
402.20	5,034	9,026
402.30	5,122	9,534
402.40	5,211	10,051
402.50	5,301	10,576
402.60	5,392	11,111
402.70	5,484	11,655
402.80	5,576	12,208
402.90	5,669	12,770
403.00	5,763	13,342
403.10	5,858	13,923
403.20	5,953	14,513
403.30	6,049	15,113
403.40	6,146	15,723
403.50	6,244	16,342
403.60	6,342	16,972
403.70	6,442	17,611
403.80	6,542	18,260
403.90	6,642	18,919
404.00	6,744	19,589
404.10	6,844	20,268
404.20	6,945	20,957
404.30	7,046	21,657
404.40	7,149	22,367
404.50	7,252	23,087
404.60	7,355	23,817
404.70	7,460	24,558
404.80	7,565	25,309
404.90	7,671	26,071
405.00	7,778	26,843
405.10	7,885	27,626
405.20	7,993	28,420
405.30	8,102	29,225
405.40	8,212	30,041
405.50	8,322	30,867
405.60	8,433	31,705
405.70	8,545	32,554
405.80	8,658	33,414
405.90	8,771	34,286
406.00	8,885	35,168
406.10	9,308	36,078
406.20	9,741	37,030
406.30	10,184	38,027
406.40	10,637	39,068
406.50	11,100	40,154
406.60	11,572	41,288
406.70	12,055	42,469
406.80	12,547	43,699
406.90	13,049	44,979
407.00	13,561	46,309
407.10	14,083	47,691
407.20	14,614	49,126
407.30	15,156	50,615
407.40	15,707	52,158
407.50	16,268	53,756
407.60	16,530	55,396
407.70	16,795	57,062
407.80	17,061	58,755
407.90	17,329	60,475
408.00	17,600	62,221
408.10	17,867	63,994
408.20	18,136	65,795
408.30	18,407	67,622
408.40	18,680	69,476
408.50	18,954	71,358
408.60	19,231	73,267
408.70	19,510	75,204
408.80	19,791	77,169
408.90	20,074	79,162
409.00	20,359	81,184
409.10	20,646	83,234
409.20	20,935	85,313
409.30	21,226	87,421
409.40	21,519	89,558
409.50	21,814	91,725
409.60	22,111	93,921
409.70	22,410	96,147
409.80	22,711	98,403
409.90	23,014	100,690
410.00	**23,319**	**103,006**

Summary for Pond 4P: Detention Basin A1

Inflow Area = 9.990 ac, 49.59% Impervious, Inflow Depth = 6.92" for 100-yr event
Inflow = 43.11 cfs @ 12.29 hrs, Volume= 5.760 af
Outflow = 16.53 cfs @ 12.73 hrs, Volume= 4.863 af, Atten= 62%, Lag= 26.4 min
Primary = 16.53 cfs @ 12.73 hrs, Volume= 4.863 af
Routed to Pond PR-A : PR-A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Automatic Starting Elev= 398.50' Surf.Area= 2,907 sf Storage= 21,861 cf
Peak Elev= 408.99' @ 12.73 hrs Surf.Area= 21,696 sf Storage= 127,372 cf (105,511 cf above start)

Plug-Flow detention time= 609.2 min calculated for 4.360 af (76% of inflow)
Center-of-Mass det. time= 436.4 min (1,251.7 - 815.3)

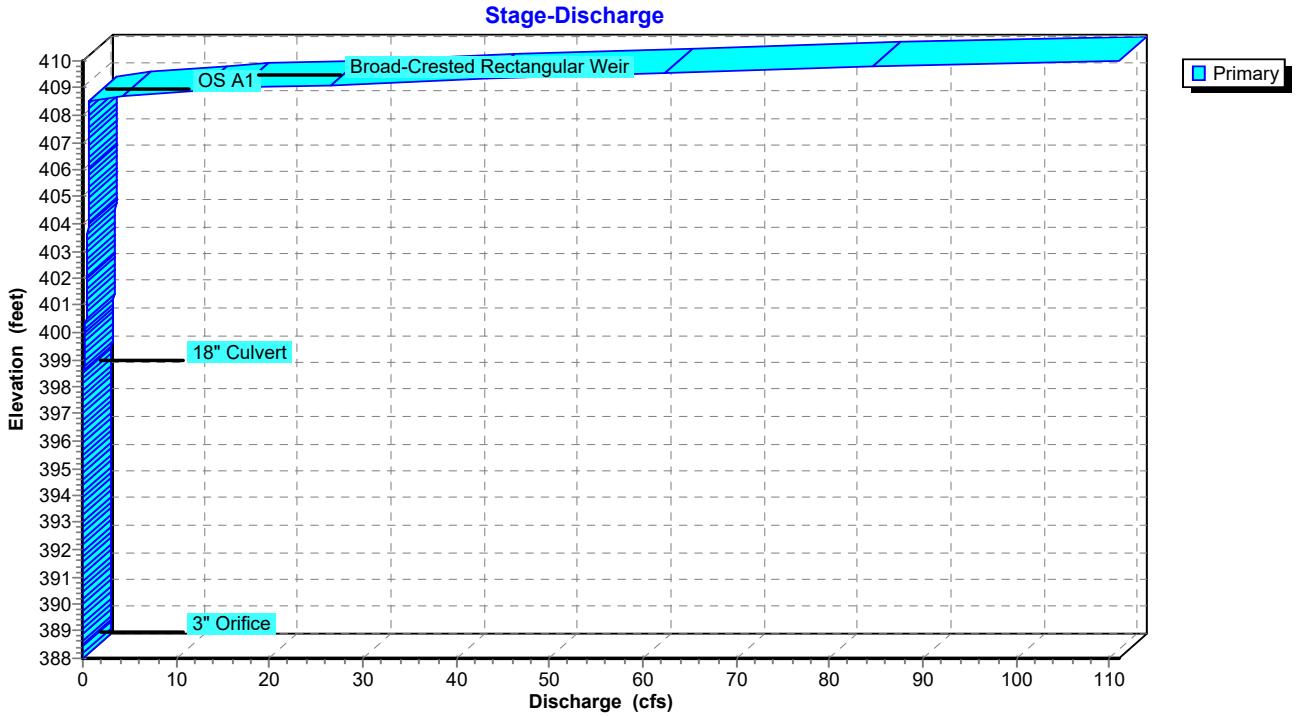
Volume	Invert	Avail.Storage	Storage Description
#1	388.00'	150,665 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
388.00	1,355	0	0	1,355
400.00	3,176	26,422	26,422	4,046
402.00	5,824	8,867	35,289	6,736
404.00	9,598	15,266	50,555	10,560
406.00	14,095	23,549	74,104	15,122
408.00	19,096	33,065	107,169	20,205
410.00	24,513	43,496	150,665	25,722

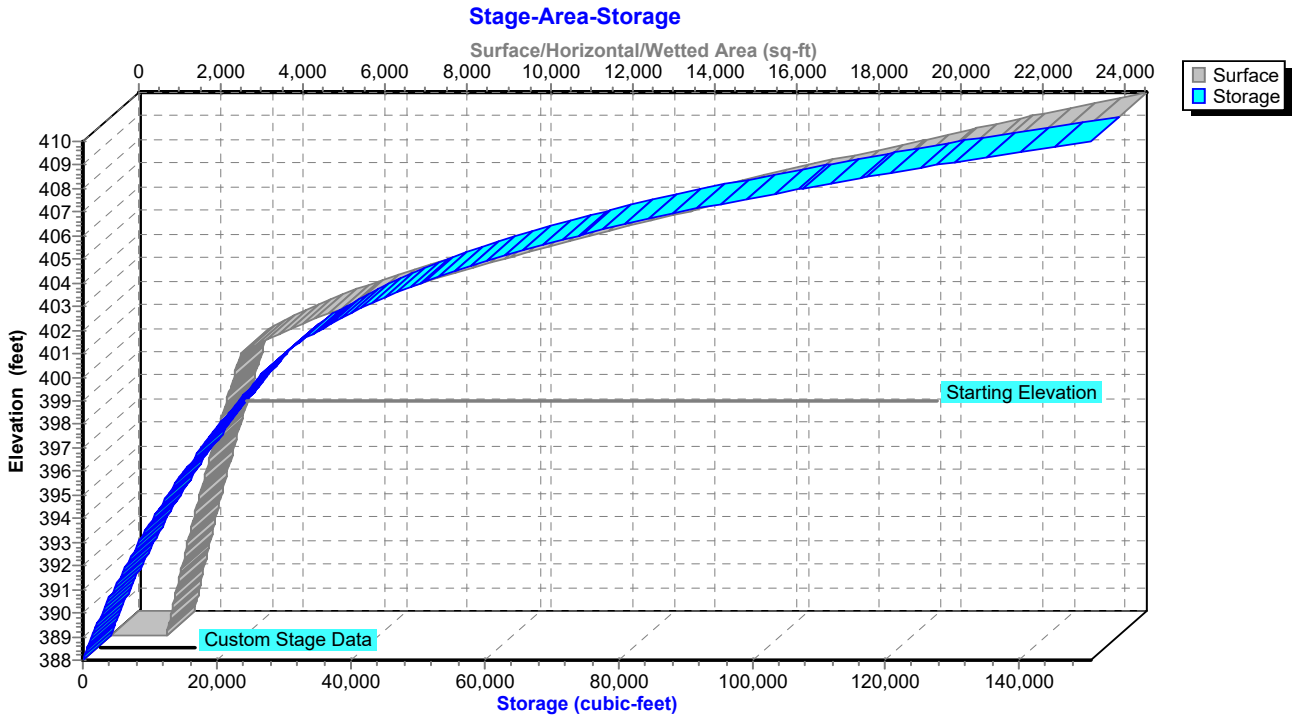
Device	Routing	Invert	Outlet Devices
#1	Primary	398.50'	**18.0" Round 18" Culvert** L= 56.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 398.50' / 397.94' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	388.50'	**3.0" Vert. 3" Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	408.50'	**36.0" x 48.0" Horiz. OS A1** C= 0.600 Limited to weir flow at low heads
#4	Primary	409.00'	**30.0' long + 2.0 '/' SideZ x 50.0' 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=16.53 cfs @ 12.73 hrs HW=408.99' TW=0.00' (Dynamic Tailwater)
- **1=18" Culvert** (Passes 16.53 cfs of 26.56 cfs potential flow)
  - **2=3" Orifice** (Orifice Controls 0.77 cfs @ 15.60 fps)
  - **3=OS A1** (Weir Controls 15.76 cfs @ 2.29 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 4P: Detention Basin A1



Pond 4P: Detention Basin A1



Stage-Discharge for Pond 4P: Detention Basin A1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
388.00	0.00	398.40	0.00	408.80	8.28
388.20	0.00	398.60	0.05	409.00	16.95
388.40	0.00	398.80	0.13	409.20	34.11
388.60	0.00	399.00	0.17	409.40	48.04
388.80	0.00	399.20	0.20	409.60	66.22
389.00	0.00	399.40	0.22	409.80	86.73
389.20	0.00	399.60	0.25	410.00	**111.01**
389.40	0.00	399.80	0.27		
389.60	0.00	400.00	0.29		
389.80	0.00	400.20	0.31		
390.00	0.00	400.40	0.33		
390.20	0.00	400.60	0.34		
390.40	0.00	400.80	0.36		
390.60	0.00	401.00	0.37		
390.80	0.00	401.20	0.39		
391.00	0.00	401.40	0.40		
391.20	0.00	401.60	0.42		
391.40	0.00	401.80	0.43		
391.60	0.00	402.00	0.44		
391.80	0.00	402.20	0.45		
392.00	0.00	402.40	0.47		
392.20	0.00	402.60	0.48		
392.40	0.00	402.80	0.49		
392.60	0.00	403.00	0.50		
392.80	0.00	403.20	0.51		
393.00	0.00	403.40	0.52		
393.20	0.00	403.60	0.53		
393.40	0.00	403.80	0.54		
393.60	0.00	404.00	0.55		
393.80	0.00	404.20	0.56		
394.00	0.00	404.40	0.57		
394.20	0.00	404.60	0.58		
394.40	0.00	404.80	0.59		
394.60	0.00	405.00	0.60		
394.80	0.00	405.20	0.61		
395.00	0.00	405.40	0.62		
395.20	0.00	405.60	0.63		
395.40	0.00	405.80	0.64		
395.60	0.00	406.00	0.65		
395.80	0.00	406.20	0.66		
396.00	0.00	406.40	0.66		
396.20	0.00	406.60	0.67		
396.40	0.00	406.80	0.68		
396.60	0.00	407.00	0.69		
396.80	0.00	407.20	0.70		
397.00	0.00	407.40	0.71		
397.20	0.00	407.60	0.71		
397.40	0.00	407.80	0.72		
397.60	0.00	408.00	0.73		
397.80	0.00	408.20	0.74		
398.00	0.00	408.40	0.74		
398.20	0.00	408.60	2.20		

Stage-Area-Storage for Pond 4P: Detention Basin A1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
388.00	1,355	0
388.50	1,416	693
389.00	1,478	1,416
389.50	1,541	2,170
390.00	1,605	2,957
390.50	1,671	3,776
391.00	1,739	4,628
391.50	1,807	5,515
392.00	1,877	6,436
392.50	1,948	7,392
393.00	2,021	8,384
393.50	2,095	9,413
394.00	2,170	10,479
394.50	2,247	11,584
395.00	2,324	12,726
395.50	2,404	13,908
396.00	2,484	15,130
396.50	2,566	16,392
397.00	2,649	17,696
397.50	2,734	19,042
398.00	2,819	20,430
398.50	2,907	21,861
399.00	2,995	23,337
399.50	3,085	24,857
400.00	3,176	26,422
400.50	3,763	28,155
401.00	4,400	30,194
401.50	5,087	32,563
402.00	5,824	35,289
402.50	6,680	38,413
403.00	7,594	41,978
403.50	8,567	46,016
404.00	9,598	50,555
404.50	10,641	55,612
405.00	11,739	61,205
405.50	12,890	67,360
406.00	14,095	74,104
406.50	15,274	81,445
407.00	16,501	89,386
407.50	17,775	97,953
408.00	19,096	107,169
408.50	20,387	117,038
409.00	21,720	127,563
409.50	23,095	138,765
410.00	**24,513**	**150,665**

Summary for Pond 6P: Forebay & Bio B1-B

Inflow Area = 4.222 ac, 52.11% Impervious, Inflow Depth = 6.93" for 100-yr event
Inflow = 20.54 cfs @ 12.22 hrs, Volume= 2.439 af
Outflow = 18.34 cfs @ 12.30 hrs, Volume= 2.143 af, Atten= 11%, Lag= 5.0 min
Primary = 18.34 cfs @ 12.30 hrs, Volume= 2.143 af
Routed to Pond 7P : Detention Basin B1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 407.50' Surf.Area= 13,168 sf Storage= 32,496 cf
Peak Elev= 408.95' @ 12.53 hrs Surf.Area= 17,002 sf Storage= 54,319 cf (21,823 cf above start)

Plug-Flow detention time= 262.5 min calculated for 1.397 af (57% of inflow)
Center-of-Mass det. time= 59.6 min (855.9 - 796.3)

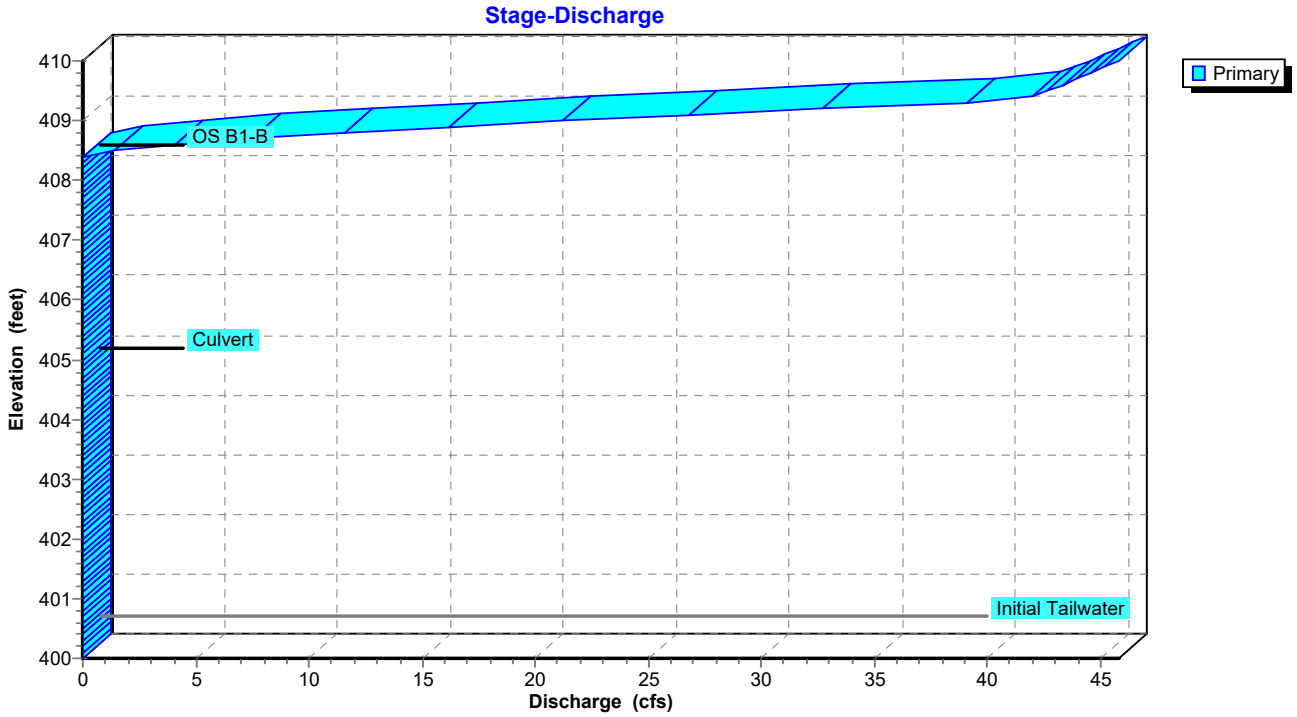
Volume	Invert	Avail.Storage	Storage Description
#1	400.00'	73,766 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
400.00	855	0	0	855
402.00	2,141	2,899	2,899	2,169
404.00	3,887	5,942	8,841	3,957
406.00	5,898	9,715	18,557	6,027
407.50	13,168	13,939	32,496	13,315
408.00	14,464	6,905	39,401	14,628
410.00	20,052	34,364	73,766	20,292

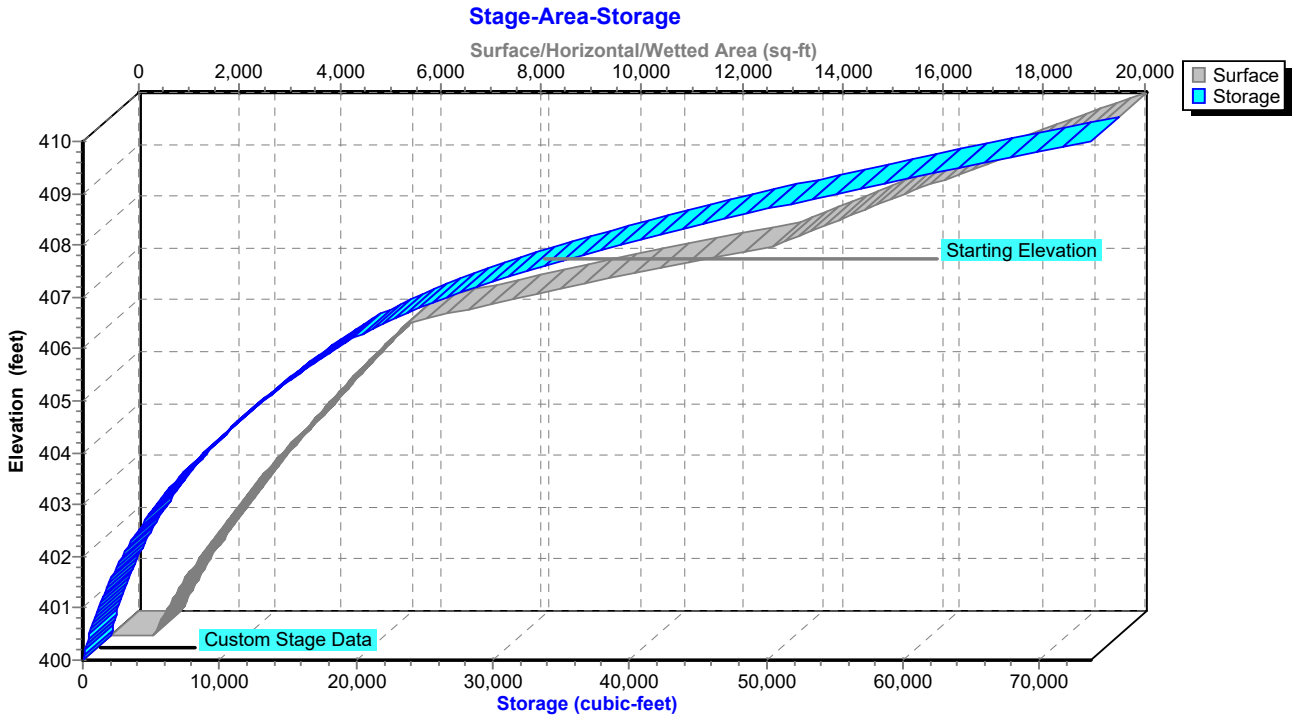
Device	Routing	Invert	Outlet Devices
#1	Primary	404.99'	**30.0" Round Culvert** L= 149.6' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 404.99' / 402.00' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 4.91 sf
#2	Device 1	408.40'	**36.0" x 48.0" Horiz. OS B1-B** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=18.34 cfs @ 12.30 hrs HW=408.94' TW=408.00' (Dynamic Tailwater)
↑**1=Culvert** (Passes 18.34 cfs of 22.93 cfs potential flow)
↑**2=OS B1-B** (Weir Controls 18.34 cfs @ 2.41 fps)

Pond 6P: Forebay & Bio B1-B



Pond 6P: Forebay & Bio B1-B



Stage-Discharge for Pond 6P: Forebay & Bio B1-B

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
400.00	0.00	402.60	0.00	405.20	0.00	407.80	0.00
400.05	0.00	402.65	0.00	405.25	0.00	407.85	0.00
400.10	0.00	402.70	0.00	405.30	0.00	407.90	0.00
400.15	0.00	402.75	0.00	405.35	0.00	407.95	0.00
400.20	0.00	402.80	0.00	405.40	0.00	408.00	0.00
400.25	0.00	402.85	0.00	405.45	0.00	408.05	0.00
400.30	0.00	402.90	0.00	405.50	0.00	408.10	0.00
400.35	0.00	402.95	0.00	405.55	0.00	408.15	0.00
400.40	0.00	403.00	0.00	405.60	0.00	408.20	0.00
400.45	0.00	403.05	0.00	405.65	0.00	408.25	0.00
400.50	0.00	403.10	0.00	405.70	0.00	408.30	0.00
400.55	0.00	403.15	0.00	405.75	0.00	408.35	0.00
400.60	0.00	403.20	0.00	405.80	0.00	408.40	0.00
400.65	0.00	403.25	0.00	405.85	0.00	408.45	0.51
400.70	0.00	403.30	0.00	405.90	0.00	408.50	1.45
400.75	0.00	403.35	0.00	405.95	0.00	408.55	2.66
400.80	0.00	403.40	0.00	406.00	0.00	408.60	4.09
400.85	0.00	403.45	0.00	406.05	0.00	408.65	5.72
400.90	0.00	403.50	0.00	406.10	0.00	408.70	7.52
400.95	0.00	403.55	0.00	406.15	0.00	408.75	9.48
401.00	0.00	403.60	0.00	406.20	0.00	408.80	11.58
401.05	0.00	403.65	0.00	406.25	0.00	408.85	13.82
401.10	0.00	403.70	0.00	406.30	0.00	408.90	16.19
401.15	0.00	403.75	0.00	406.35	0.00	408.95	18.67
401.20	0.00	403.80	0.00	406.40	0.00	409.00	21.28
401.25	0.00	403.85	0.00	406.45	0.00	409.05	23.99
401.30	0.00	403.90	0.00	406.50	0.00	409.10	26.81
401.35	0.00	403.95	0.00	406.55	0.00	409.15	29.73
401.40	0.00	404.00	0.00	406.60	0.00	409.20	32.76
401.45	0.00	404.05	0.00	406.65	0.00	409.25	35.88
401.50	0.00	404.10	0.00	406.70	0.00	409.30	39.09
401.55	0.00	404.15	0.00	406.75	0.00	409.35	41.68
401.60	0.00	404.20	0.00	406.80	0.00	409.40	42.02
401.65	0.00	404.25	0.00	406.85	0.00	409.45	42.35
401.70	0.00	404.30	0.00	406.90	0.00	409.50	42.67
401.75	0.00	404.35	0.00	406.95	0.00	409.55	43.00
401.80	0.00	404.40	0.00	407.00	0.00	409.60	43.32
401.85	0.00	404.45	0.00	407.05	0.00	409.65	43.65
401.90	0.00	404.50	0.00	407.10	0.00	409.70	43.96
401.95	0.00	404.55	0.00	407.15	0.00	409.75	44.28
402.00	0.00	404.60	0.00	407.20	0.00	409.80	44.60
402.05	0.00	404.65	0.00	407.25	0.00	409.85	44.91
402.10	0.00	404.70	0.00	407.30	0.00	409.90	45.22
402.15	0.00	404.75	0.00	407.35	0.00	409.95	45.53
402.20	0.00	404.80	0.00	407.40	0.00	410.00	**45.83**
402.25	0.00	404.85	0.00	407.45	0.00		
402.30	0.00	404.90	0.00	407.50	0.00		
402.35	0.00	404.95	0.00	407.55	0.00		
402.40	0.00	405.00	0.00	407.60	0.00		
402.45	0.00	405.05	0.00	407.65	0.00		
402.50	0.00	405.10	0.00	407.70	0.00		
402.55	0.00	405.15	0.00	407.75	0.00		

Stage-Area-Storage for Pond 6P: Forebay & Bio B1-B

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
400.00	855	0
400.10	906	88
400.20	957	181
400.30	1,011	280
400.40	1,066	383
400.50	1,122	493
400.60	1,180	608
400.70	1,239	729
400.80	1,300	856
400.90	1,362	989
401.00	1,425	1,128
401.10	1,491	1,274
401.20	1,557	1,426
401.30	1,625	1,585
401.40	1,694	1,751
401.50	1,765	1,924
401.60	1,837	2,104
401.70	1,911	2,292
401.80	1,986	2,487
401.90	2,063	2,689
402.00	2,141	2,899
402.10	2,216	3,117
402.20	2,292	3,343
402.30	2,370	3,576
402.40	2,449	3,817
402.50	2,529	4,065
402.60	2,611	4,322
402.70	2,693	4,588
402.80	2,777	4,861
402.90	2,863	5,143
403.00	2,949	5,434
403.10	3,037	5,733
403.20	3,127	6,041
403.30	3,217	6,358
403.40	3,309	6,685
403.50	3,402	7,020
403.60	3,496	7,365
403.70	3,592	7,720
403.80	3,689	8,084
403.90	3,787	8,457
404.00	3,887	8,841
404.10	3,978	9,234
404.20	4,069	9,637
404.30	4,162	10,048
404.40	4,256	10,469
404.50	4,351	10,899
404.60	4,446	11,339
404.70	4,543	11,789
404.80	4,641	12,248
404.90	4,740	12,717
405.00	4,840	13,196
405.10	4,941	13,685
405.20	5,043	14,184
405.30	5,147	14,694
405.40	5,251	15,214
405.50	5,356	15,744
405.60	5,462	16,285
405.70	5,570	16,837
405.80	5,678	17,399
405.90	5,788	17,972
406.00	5,898	18,557
406.10	6,293	19,166
406.20	6,701	19,816
406.30	7,122	20,507
406.40	7,555	21,240
406.50	8,001	22,018
406.60	8,460	22,841
406.70	8,932	23,711
406.80	9,417	24,628
406.90	9,914	25,594
407.00	10,425	26,611
407.10	10,948	27,680
407.20	11,484	28,801
407.30	12,032	29,977
407.40	12,594	31,208
407.50	13,168	32,496
407.60	13,422	33,825
407.70	13,679	35,180
407.80	13,938	36,561
407.90	14,200	37,968
408.00	14,464	39,401
408.10	14,722	40,861
408.20	14,982	42,346
408.30	15,244	43,857
408.40	15,509	45,395
408.50	15,776	46,959
408.60	16,045	48,550
408.70	16,316	50,168
408.80	16,590	51,813
408.90	16,866	53,486
409.00	17,144	55,187
409.10	17,425	56,915
409.20	17,708	58,672
409.30	17,993	60,457
409.40	18,280	62,270
409.50	18,570	64,113
409.60	18,862	65,984
409.70	19,156	67,885
409.80	19,452	69,815
409.90	19,751	71,775
410.00	**20,052**	**73,766**

Summary for Pond 7P: Detention Basin B1

Inflow Area = 9.568 ac, 49.61% Impervious, Inflow Depth = 5.84" for 100-yr event
Inflow = 38.04 cfs @ 12.33 hrs, Volume= 4.652 af
Outflow = 24.09 cfs @ 12.57 hrs, Volume= 4.493 af, Atten= 37%, Lag= 14.7 min
Primary = 24.09 cfs @ 12.57 hrs, Volume= 4.493 af
Routed to Pond PR-B : PR-B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Automatic Starting Elev= 400.50' Surf.Area= 1,825 sf Storage= 806 cf
Peak Elev= 408.76' @ 12.57 hrs Surf.Area= 14,148 sf Storage= 60,825 cf (60,019 cf above start)

Plug-Flow detention time= 347.0 min calculated for 4.475 af (96% of inflow)
Center-of-Mass det. time= 322.1 min (1,182.2 - 860.0)

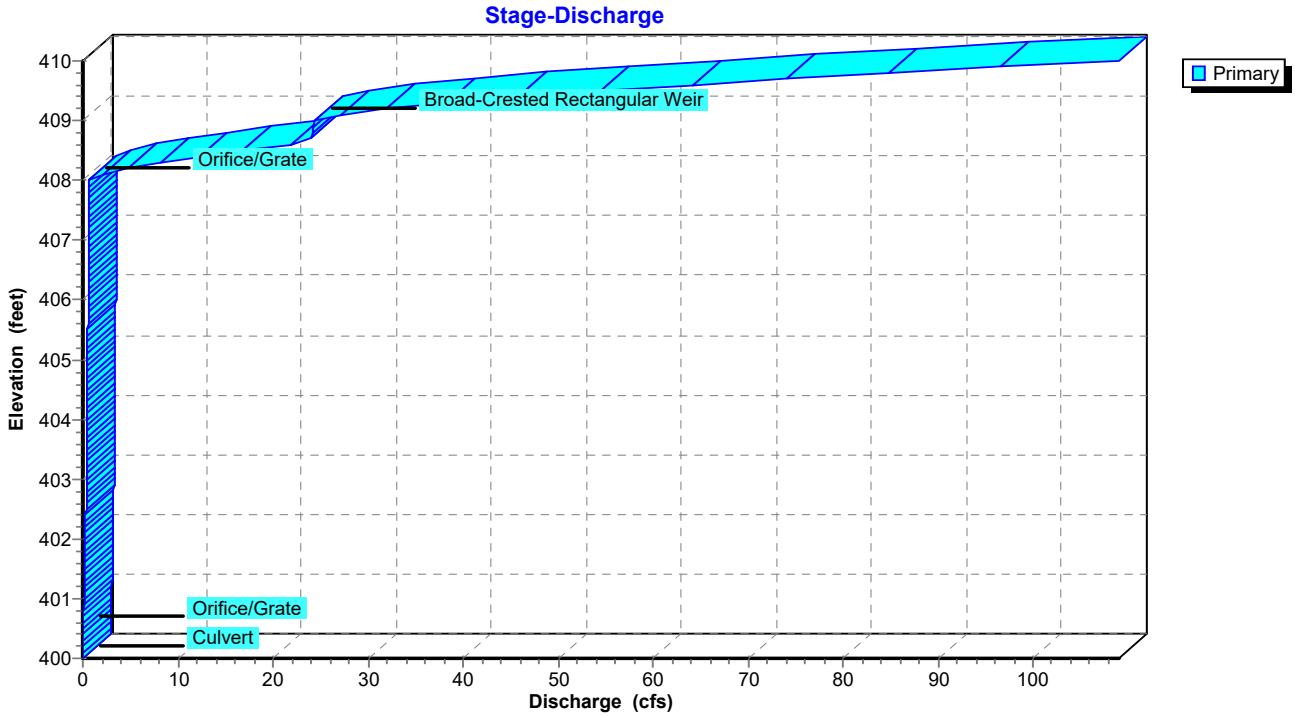
Volume	Invert	Avail.Storage	Storage Description
#1	400.00'	79,868 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
400.00	1,408	0	0	1,408
402.00	3,402	4,666	4,666	3,431
404.00	5,985	9,266	13,932	6,058
406.00	9,096	14,973	28,905	9,229
408.00	12,687	21,684	50,588	12,895
410.00	16,684	29,280	79,868	16,983

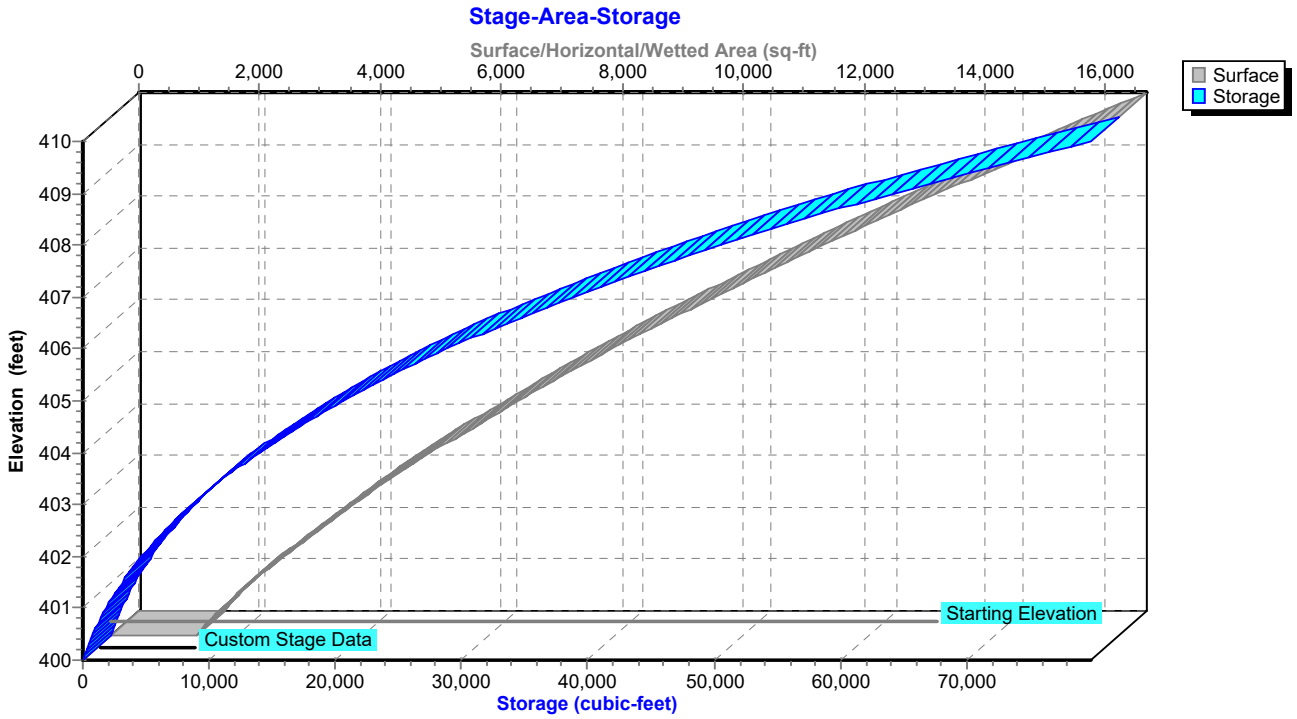
Device	Routing	Invert	Outlet Devices
#1	Primary	400.00'	**18.0" Round Culvert** L= 140.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 400.00' / 398.00' S= 0.0143 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	400.50'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	408.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	409.00'	**30.0' long + 2.0 '/' SideZ x 50.0' 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=24.09 cfs @ 12.57 hrs HW=408.76' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Inlet Controls 24.09 cfs @ 13.63 fps)
  - **2=Orifice/Grate** (Passes < 0.67 cfs potential flow)
  - **3=Orifice/Grate** (Passes < 30.53 cfs potential flow)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 7P: Detention Basin B1



Pond 7P: Detention Basin B1



Stage-Discharge for Pond 7P: Detention Basin B1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
400.00	0.00	402.60	0.33	405.20	0.51	407.80	0.63
400.05	0.00	402.65	0.34	405.25	0.51	407.85	0.64
400.10	0.00	402.70	0.34	405.30	0.51	407.90	0.64
400.15	0.00	402.75	0.34	405.35	0.51	407.95	0.64
400.20	0.00	402.80	0.35	405.40	0.52	408.00	0.64
400.25	0.00	402.85	0.35	405.45	0.52	408.05	1.16
400.30	0.00	402.90	0.36	405.50	0.52	408.10	2.09
400.35	0.00	402.95	0.36	405.55	0.52	408.15	3.31
400.40	0.00	403.00	0.36	405.60	0.53	408.20	4.75
400.45	0.00	403.05	0.37	405.65	0.53	408.25	6.38
400.50	0.00	403.10	0.37	405.70	0.53	408.30	8.18
400.55	0.01	403.15	0.38	405.75	0.54	408.35	10.14
400.60	0.02	403.20	0.38	405.80	0.54	408.40	12.24
400.65	0.04	403.25	0.38	405.85	0.54	408.45	14.48
400.70	0.06	403.30	0.39	405.90	0.54	408.50	16.85
400.75	0.08	403.35	0.39	405.95	0.55	408.55	19.34
400.80	0.10	403.40	0.39	406.00	0.55	408.60	21.94
400.85	0.11	403.45	0.40	406.05	0.55	408.65	23.92
400.90	0.12	403.50	0.40	406.10	0.55	408.70	23.99
400.95	0.13	403.55	0.40	406.15	0.56	408.75	24.07
401.00	0.14	403.60	0.41	406.20	0.56	408.80	24.14
401.05	0.15	403.65	0.41	406.25	0.56	408.85	24.22
401.10	0.16	403.70	0.41	406.30	0.56	408.90	24.29
401.15	0.17	403.75	0.42	406.35	0.57	408.95	24.37
401.20	0.18	403.80	0.42	406.40	0.57	409.00	24.44
401.25	0.19	403.85	0.42	406.45	0.57	409.05	25.41
401.30	0.19	403.90	0.43	406.50	0.57	409.10	27.14
401.35	0.20	403.95	0.43	406.55	0.58	409.15	29.37
401.40	0.21	404.00	0.43	406.60	0.58	409.20	32.00
401.45	0.21	404.05	0.44	406.65	0.58	409.25	35.01
401.50	0.22	404.10	0.44	406.70	0.58	409.30	38.35
401.55	0.23	404.15	0.44	406.75	0.58	409.35	42.01
401.60	0.23	404.20	0.45	406.80	0.59	409.40	45.95
401.65	0.24	404.25	0.45	406.85	0.59	409.45	50.14
401.70	0.25	404.30	0.45	406.90	0.59	409.50	54.57
401.75	0.25	404.35	0.46	406.95	0.59	409.55	59.25
401.80	0.26	404.40	0.46	407.00	0.60	409.60	64.16
401.85	0.26	404.45	0.46	407.05	0.60	409.65	69.06
401.90	0.27	404.50	0.47	407.10	0.60	409.70	74.12
401.95	0.27	404.55	0.47	407.15	0.60	409.75	79.33
402.00	0.28	404.60	0.47	407.20	0.61	409.80	84.69
402.05	0.28	404.65	0.47	407.25	0.61	409.85	90.49
402.10	0.29	404.70	0.48	407.30	0.61	409.90	96.47
402.15	0.29	404.75	0.48	407.35	0.61	409.95	102.64
402.20	0.30	404.80	0.48	407.40	0.62	410.00	**108.99**
402.25	0.30	404.85	0.49	407.45	0.62		
402.30	0.31	404.90	0.49	407.50	0.62		
402.35	0.31	404.95	0.49	407.55	0.62		
402.40	0.31	405.00	0.49	407.60	0.62		
402.45	0.32	405.05	0.50	407.65	0.63		
402.50	0.32	405.10	0.50	407.70	0.63		
402.55	0.33	405.15	0.50	407.75	0.63		

Stage-Area-Storage for Pond 7P: Detention Basin B1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
400.00	1,408	0
400.10	1,487	145
400.20	1,568	298
400.30	1,652	459
400.40	1,738	628
400.50	1,825	806
400.60	1,915	993
400.70	2,007	1,189
400.80	2,102	1,395
400.90	2,198	1,610
401.00	2,297	1,834
401.10	2,398	2,069
401.20	2,501	2,314
401.30	2,606	2,569
401.40	2,713	2,835
401.50	2,822	3,112
401.60	2,934	3,400
401.70	3,048	3,699
401.80	3,164	4,009
401.90	3,282	4,332
402.00	3,402	4,666
402.10	3,514	5,012
402.20	3,628	5,369
402.30	3,743	5,737
402.40	3,861	6,117
402.50	3,980	6,509
402.60	4,101	6,913
402.70	4,224	7,330
402.80	4,348	7,758
402.90	4,475	8,199
403.00	4,603	8,653
403.10	4,733	9,120
403.20	4,865	9,600
403.30	4,999	10,093
403.40	5,134	10,600
403.50	5,271	11,120
403.60	5,410	11,654
403.70	5,551	12,202
403.80	5,694	12,764
403.90	5,839	13,341
404.00	5,985	13,932
404.10	6,125	14,537
404.20	6,267	15,157
404.30	6,410	15,791
404.40	6,555	16,439
404.50	6,702	17,102
404.60	6,850	17,780
404.70	7,000	18,472
404.80	7,152	19,180
404.90	7,305	19,902
405.00	7,459	20,641
405.10	7,616	21,394
405.20	7,774	22,164
405.30	7,933	22,949
405.40	8,095	23,751
405.50	8,257	24,568
405.60	8,422	25,402
405.70	8,588	26,253
405.80	8,756	27,120
405.90	8,925	28,004
406.00	9,096	28,905
406.10	9,261	29,823
406.20	9,428	30,757
406.30	9,597	31,708
406.40	9,767	32,677
406.50	9,938	33,662
406.60	10,111	34,664
406.70	10,285	35,684
406.80	10,461	36,721
406.90	10,638	37,776
407.00	10,817	38,849
407.10	10,997	39,940
407.20	11,179	41,048
407.30	11,362	42,175
407.40	11,547	43,321
407.50	11,733	44,485
407.60	11,921	45,668
407.70	12,110	46,869
407.80	12,301	48,090
407.90	12,493	49,329
408.00	12,687	50,588
408.10	12,874	51,867
408.20	13,062	53,163
408.30	13,252	54,479
408.40	13,443	55,814
408.50	13,635	57,168
408.60	13,829	58,541
408.70	14,024	59,933
408.80	14,220	61,346
408.90	14,418	62,777
409.00	14,617	64,229
409.10	14,818	65,701
409.20	15,020	67,193
409.30	15,223	68,705
409.40	15,428	70,237
409.50	15,634	71,790
409.60	15,841	73,364
409.70	16,050	74,959
409.80	16,260	76,574
409.90	16,471	78,211
410.00	**16,684**	**79,868**

Summary for Pond PR-A: PR-A

Inflow Area = 37.077 ac, 36.05% Impervious, Inflow Depth > 5.51" for 100-yr event
Inflow = 104.90 cfs @ 12.23 hrs, Volume= 17.021 af
Primary = 104.90 cfs @ 12.23 hrs, Volume= 17.021 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond PR-B: PR-B

Inflow Area = 21.350 ac, 28.46% Impervious, Inflow Depth > 4.53" for 100-yr event
Inflow = 47.71 cfs @ 12.40 hrs, Volume= 8.064 af
Primary = 47.71 cfs @ 12.40 hrs, Volume= 8.064 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond 1P: Forebay & Bio A1-A

Inflow Area = 4.891 ac, 54.92% Impervious, Inflow Depth = 11.06" for 500-yr event
Inflow = 33.28 cfs @ 12.26 hrs, Volume= 4.508 af
Outflow = 25.52 cfs @ 12.34 hrs, Volume= 4.508 af, Atten= 23%, Lag= 5.2 min
Primary = 25.52 cfs @ 12.34 hrs, Volume= 4.508 af
Routed to Pond 4P : Detention Basin A1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Automatic Starting Elev= 408.50' Surf.Area= 18,385 sf Storage= 66,328 cf
Peak Elev= 409.40' @ 12.46 hrs Surf.Area= 19,030 sf Storage= 83,079 cf (16,750 cf above start)

Plug-Flow detention time= 239.7 min calculated for 2.985 af (66% of inflow)
Center-of-Mass det. time= 17.0 min (799.9 - 782.9)

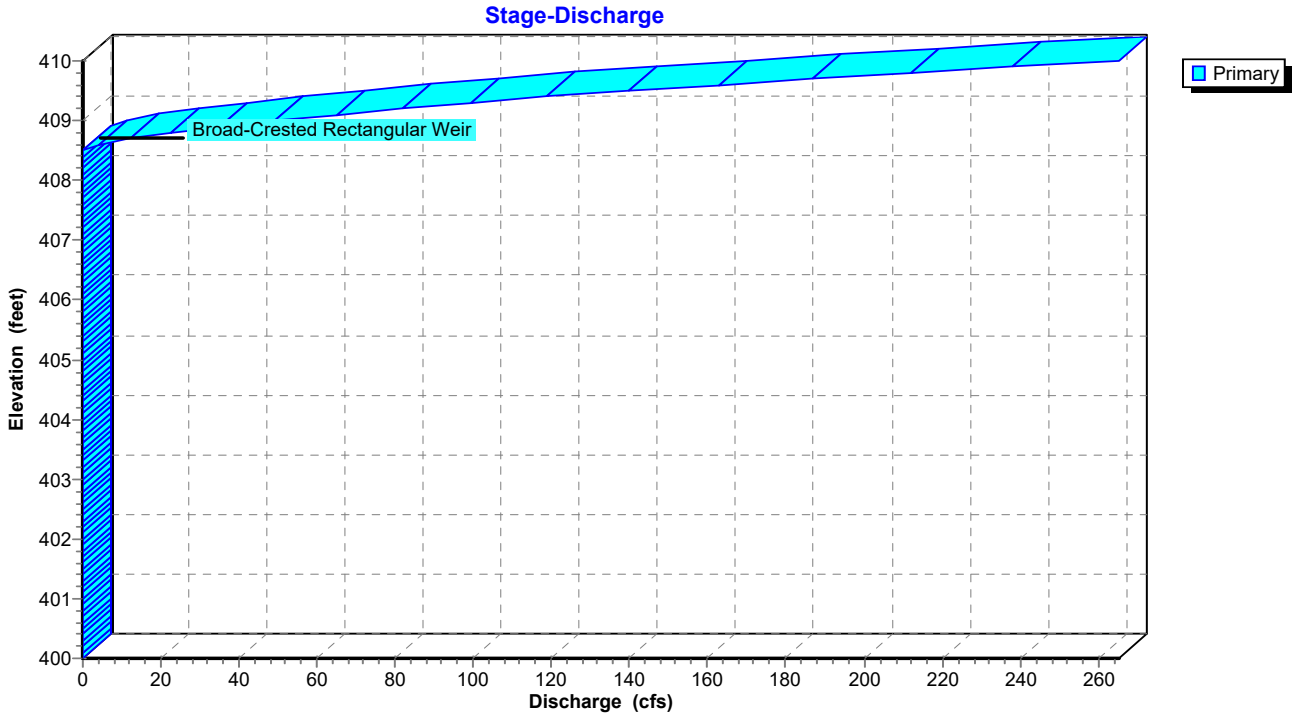
Volume	Invert	Avail.Storage	Storage Description
#1	400.00'	94,716 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
400.00	2,093	0	0	2,093
402.00	3,854	5,858	5,858	3,895
404.00	5,993	9,769	15,627	6,090
406.00	8,501	14,421	30,048	8,669
407.50	16,634	18,513	48,561	16,824
408.00	18,030	8,664	57,225	18,239
410.00	19,471	37,492	94,716	19,977

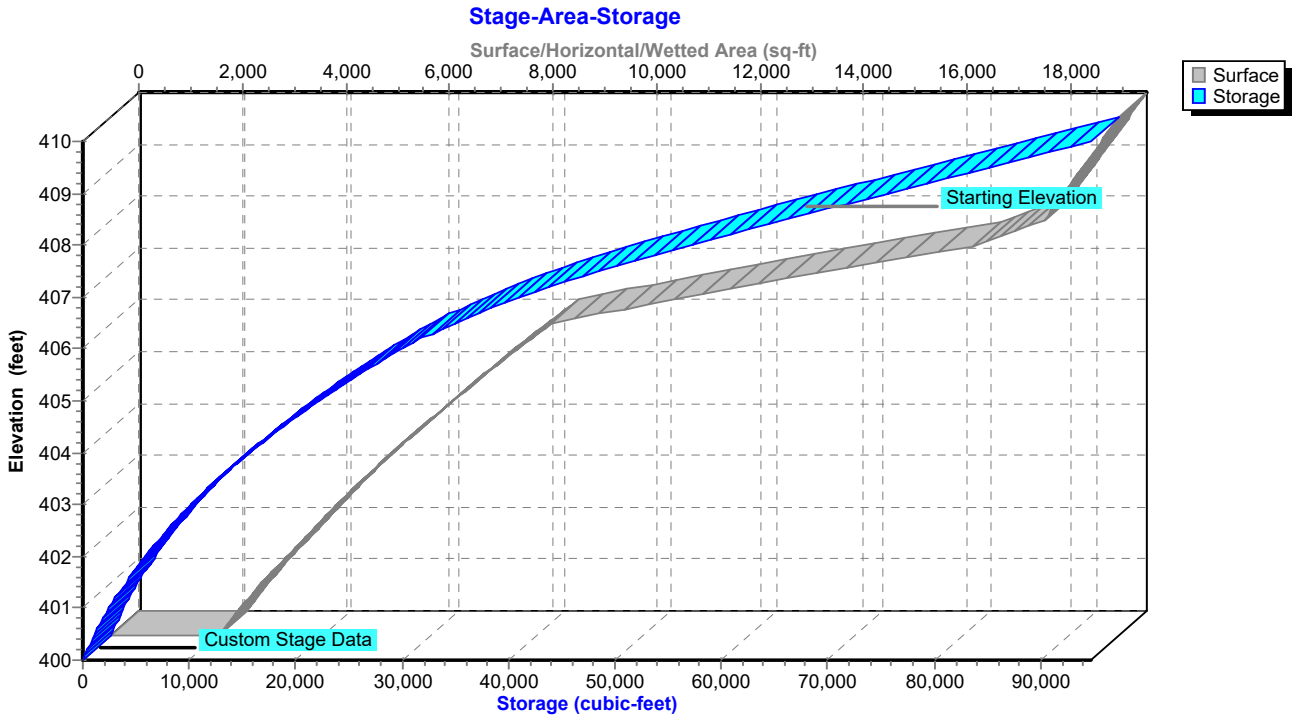
Device	Routing	Invert	Outlet Devices
#1	Primary	408.50'	**50.0' long + 4.0 '/' SideZ x 31.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=15.97 cfs @ 12.34 hrs HW=409.35' TW=409.35' (Dynamic Tailwater)
↑**1=Broad-Crested Rectangular Weir** (Weir Controls 15.97 cfs @ 0.35 fps)

Pond 1P: Forebay & Bio A1-A



Pond 1P: Forebay & Bio A1-A



Stage-Discharge for Pond 1P: Forebay & Bio A1-A

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
400.00	0.00	402.60	0.00	405.20	0.00	407.80	0.00
400.05	0.00	402.65	0.00	405.25	0.00	407.85	0.00
400.10	0.00	402.70	0.00	405.30	0.00	407.90	0.00
400.15	0.00	402.75	0.00	405.35	0.00	407.95	0.00
400.20	0.00	402.80	0.00	405.40	0.00	408.00	0.00
400.25	0.00	402.85	0.00	405.45	0.00	408.05	0.00
400.30	0.00	402.90	0.00	405.50	0.00	408.10	0.00
400.35	0.00	402.95	0.00	405.55	0.00	408.15	0.00
400.40	0.00	403.00	0.00	405.60	0.00	408.20	0.00
400.45	0.00	403.05	0.00	405.65	0.00	408.25	0.00
400.50	0.00	403.10	0.00	405.70	0.00	408.30	0.00
400.55	0.00	403.15	0.00	405.75	0.00	408.35	0.00
400.60	0.00	403.20	0.00	405.80	0.00	408.40	0.00
400.65	0.00	403.25	0.00	405.85	0.00	408.45	0.00
400.70	0.00	403.30	0.00	405.90	0.00	408.50	0.00
400.75	0.00	403.35	0.00	405.95	0.00	408.55	1.50
400.80	0.00	403.40	0.00	406.00	0.00	408.60	4.26
400.85	0.00	403.45	0.00	406.05	0.00	408.65	7.86
400.90	0.00	403.50	0.00	406.10	0.00	408.70	12.14
400.95	0.00	403.55	0.00	406.15	0.00	408.75	17.05
401.00	0.00	403.60	0.00	406.20	0.00	408.80	22.52
401.05	0.00	403.65	0.00	406.25	0.00	408.85	28.53
401.10	0.00	403.70	0.00	406.30	0.00	408.90	35.03
401.15	0.00	403.75	0.00	406.35	0.00	408.95	41.93
401.20	0.00	403.80	0.00	406.40	0.00	409.00	49.26
401.25	0.00	403.85	0.00	406.45	0.00	409.05	57.00
401.30	0.00	403.90	0.00	406.50	0.00	409.10	65.15
401.35	0.00	403.95	0.00	406.55	0.00	409.15	73.28
401.40	0.00	404.00	0.00	406.60	0.00	409.20	81.69
401.45	0.00	404.05	0.00	406.65	0.00	409.25	90.36
401.50	0.00	404.10	0.00	406.70	0.00	409.30	99.29
401.55	0.00	404.15	0.00	406.75	0.00	409.35	108.97
401.60	0.00	404.20	0.00	406.80	0.00	409.40	118.97
401.65	0.00	404.25	0.00	406.85	0.00	409.45	129.29
401.70	0.00	404.30	0.00	406.90	0.00	409.50	139.92
401.75	0.00	404.35	0.00	406.95	0.00	409.55	151.14
401.80	0.00	404.40	0.00	407.00	0.00	409.60	162.70
401.85	0.00	404.45	0.00	407.05	0.00	409.65	174.60
401.90	0.00	404.50	0.00	407.10	0.00	409.70	186.84
401.95	0.00	404.55	0.00	407.15	0.00	409.75	199.23
402.00	0.00	404.60	0.00	407.20	0.00	409.80	211.93
402.05	0.00	404.65	0.00	407.25	0.00	409.85	224.94
402.10	0.00	404.70	0.00	407.30	0.00	409.90	238.25
402.15	0.00	404.75	0.00	407.35	0.00	409.95	251.63
402.20	0.00	404.80	0.00	407.40	0.00	410.00	**265.28**
402.25	0.00	404.85	0.00	407.45	0.00		
402.30	0.00	404.90	0.00	407.50	0.00		
402.35	0.00	404.95	0.00	407.55	0.00		
402.40	0.00	405.00	0.00	407.60	0.00		
402.45	0.00	405.05	0.00	407.65	0.00		
402.50	0.00	405.10	0.00	407.70	0.00		
402.55	0.00	405.15	0.00	407.75	0.00		

Stage-Area-Storage for Pond 1P: Forebay & Bio A1-A

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
400.00	2,093	0
400.10	2,168	213
400.20	2,245	434
400.30	2,323	662
400.40	2,403	898
400.50	2,483	1,143
400.60	2,565	1,395
400.70	2,649	1,656
400.80	2,733	1,925
400.90	2,819	2,202
401.00	2,907	2,489
401.10	2,996	2,784
401.20	3,086	3,088
401.30	3,177	3,401
401.40	3,270	3,723
401.50	3,364	4,055
401.60	3,459	4,396
401.70	3,556	4,747
401.80	3,654	5,107
401.90	3,753	5,478
402.00	3,854	5,858
402.10	3,950	6,248
402.20	4,047	6,648
402.30	4,145	7,058
402.40	4,244	7,477
402.50	4,345	7,907
402.60	4,446	8,346
402.70	4,549	8,796
402.80	4,653	9,256
402.90	4,758	9,727
403.00	4,865	10,208
403.10	4,972	10,699
403.20	5,081	11,202
403.30	5,191	11,716
403.40	5,302	12,240
403.50	5,414	12,776
403.60	5,528	13,323
403.70	5,642	13,882
403.80	5,758	14,452
403.90	5,875	15,033
404.00	5,993	15,627
404.10	6,108	16,232
404.20	6,224	16,848
404.30	6,341	17,477
404.40	6,460	18,117
404.50	6,579	18,769
404.60	6,699	19,432
404.70	6,821	20,109
404.80	6,944	20,797
404.90	7,067	21,497
405.00	7,192	22,210
405.10	7,318	22,936
405.20	7,445	23,674
405.30	7,573	24,425
405.40	7,703	25,189
405.50	7,833	25,965
405.60	7,964	26,755
405.70	8,097	27,558
405.80	8,231	28,375
405.90	8,365	29,205
406.00	8,501	30,048
406.10	8,959	30,921
406.20	9,429	31,840
406.30	9,911	32,807
406.40	10,405	33,823
406.50	10,912	34,888
406.60	11,430	36,005
406.70	11,960	37,175
406.80	12,502	38,398
406.90	13,056	39,676
407.00	13,623	41,009
407.10	14,201	42,401
407.20	14,791	43,850
407.30	15,393	45,359
407.40	16,008	46,929
407.50	16,634	48,561
407.60	16,909	50,238
407.70	17,186	51,943
407.80	17,465	53,675
407.90	17,746	55,436
408.00	18,030	57,225
408.10	18,101	59,031
408.20	18,172	60,845
408.30	18,243	62,666
408.40	18,314	64,493
408.50	18,385	66,328
408.60	18,456	68,170
408.70	18,528	70,020
408.80	18,600	71,876
408.90	18,672	73,740
409.00	18,744	75,610
409.10	18,816	77,488
409.20	18,888	79,373
409.30	18,960	81,266
409.40	19,033	83,166
409.50	19,106	85,072
409.60	19,178	86,987
409.70	19,251	88,908
409.80	19,324	90,837
409.90	19,398	92,773
410.00	**19,471**	**94,716**

Summary for Pond 2P: Forebay & Bio A1-B

Inflow Area = 4.432 ac, 51.17% Impervious, Inflow Depth = 10.93" for 500-yr event
Inflow = 30.39 cfs @ 12.24 hrs, Volume= 4.037 af
Outflow = 21.60 cfs @ 12.37 hrs, Volume= 4.037 af, Atten= 29%, Lag= 7.9 min
Primary = 21.60 cfs @ 12.37 hrs, Volume= 4.037 af
Routed to Pond 4P : Detention Basin A1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Automatic Starting Elev= 408.50' Surf.Area= 19,240 sf Storage= 72,229 cf
Peak Elev= 409.39' @ 12.46 hrs Surf.Area= 21,656 sf Storage= 90,478 cf (18,249 cf above start)

Plug-Flow detention time= 274.5 min calculated for 2.379 af (59% of inflow)
Center-of-Mass det. time= 19.8 min (805.3 - 785.5)

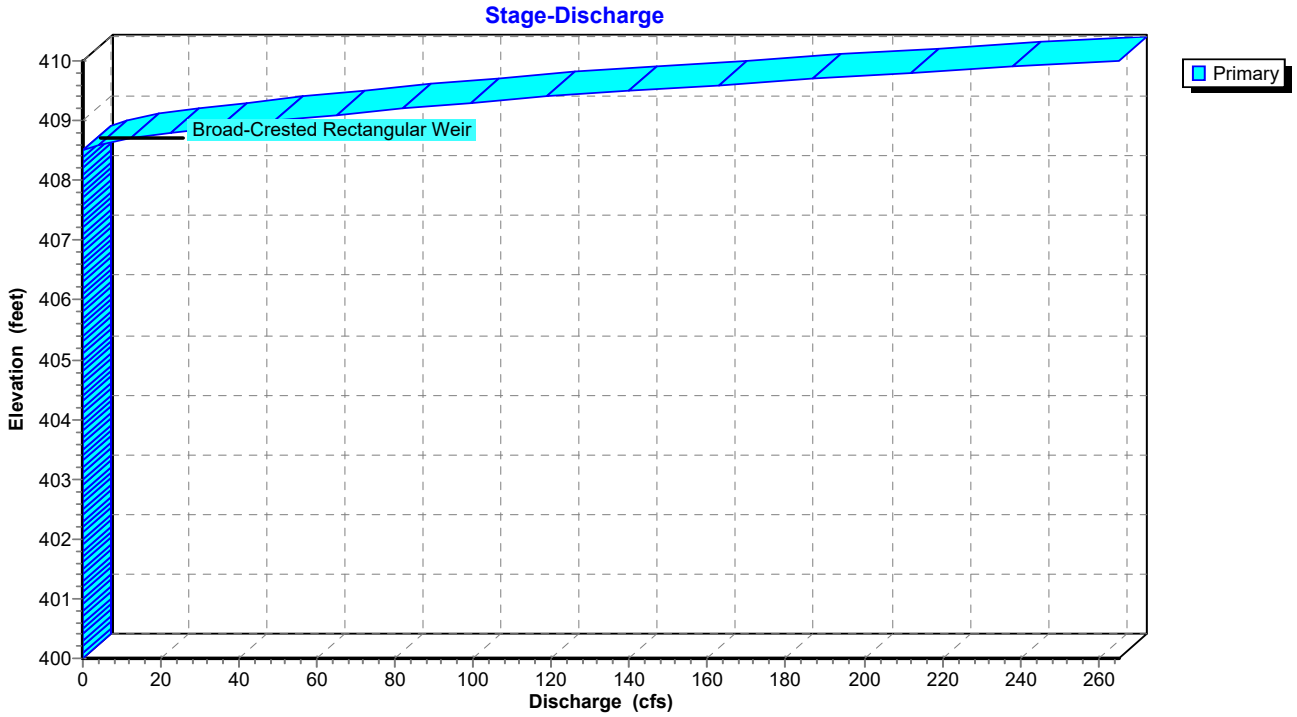
Volume	Invert	Avail.Storage	Storage Description
#1	400.00'	104,144 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
400.00	3,314	0	0	3,314
402.00	4,891	8,154	8,154	4,954
404.00	6,756	11,597	19,751	6,896
406.00	8,917	15,623	35,374	9,146
407.50	16,689	18,903	54,277	16,940
408.00	17,949	8,658	62,934	18,222
410.00	23,380	41,210	104,144	23,747

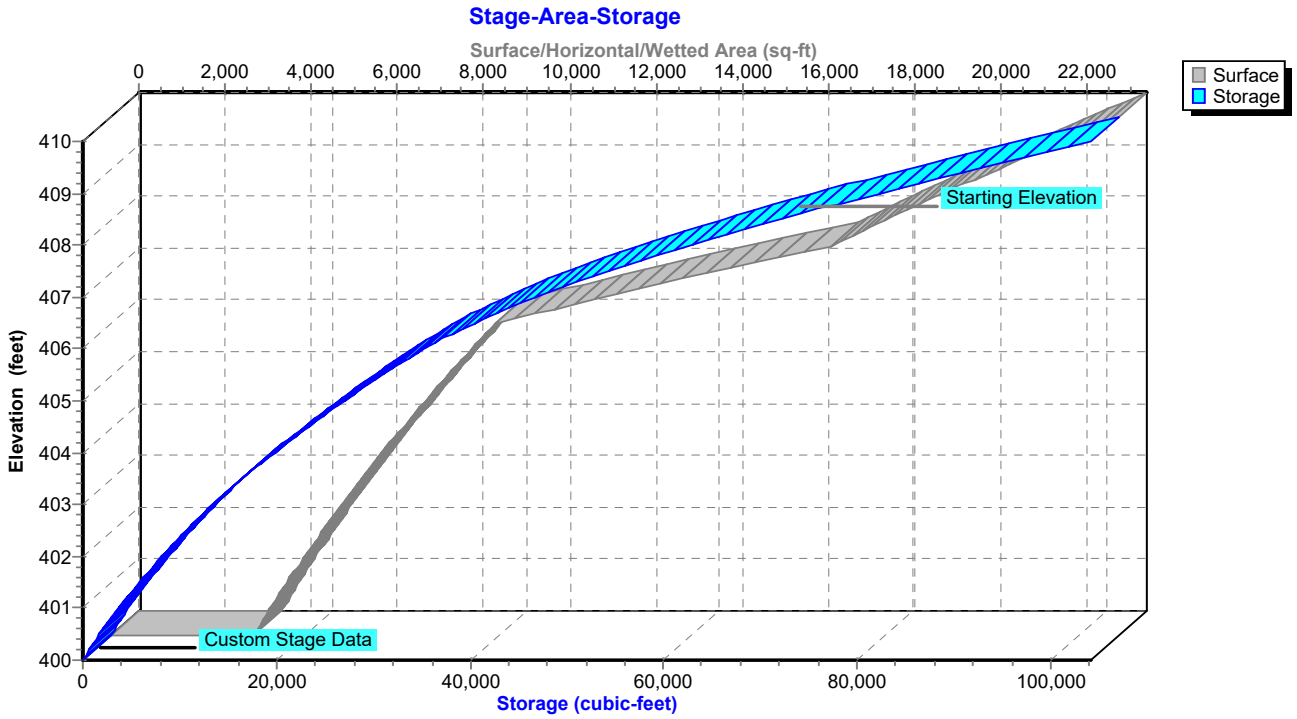
Device	Routing	Invert	Outlet Devices
#1	Primary	408.50'	**50.0' long + 4.0 '/' SideZ x 31.0' breadth Broad-Crested Rectangular Weir**
			Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60
			Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=11.93 cfs @ 12.37 hrs HW=409.37' TW=409.37' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 11.93 cfs @ 0.26 fps)

Pond 2P: Forebay & Bio A1-B



Pond 2P: Forebay & Bio A1-B



Stage-Discharge for Pond 2P: Forebay & Bio A1-B

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
400.00	0.00	402.60	0.00	405.20	0.00	407.80	0.00
400.05	0.00	402.65	0.00	405.25	0.00	407.85	0.00
400.10	0.00	402.70	0.00	405.30	0.00	407.90	0.00
400.15	0.00	402.75	0.00	405.35	0.00	407.95	0.00
400.20	0.00	402.80	0.00	405.40	0.00	408.00	0.00
400.25	0.00	402.85	0.00	405.45	0.00	408.05	0.00
400.30	0.00	402.90	0.00	405.50	0.00	408.10	0.00
400.35	0.00	402.95	0.00	405.55	0.00	408.15	0.00
400.40	0.00	403.00	0.00	405.60	0.00	408.20	0.00
400.45	0.00	403.05	0.00	405.65	0.00	408.25	0.00
400.50	0.00	403.10	0.00	405.70	0.00	408.30	0.00
400.55	0.00	403.15	0.00	405.75	0.00	408.35	0.00
400.60	0.00	403.20	0.00	405.80	0.00	408.40	0.00
400.65	0.00	403.25	0.00	405.85	0.00	408.45	0.00
400.70	0.00	403.30	0.00	405.90	0.00	408.50	0.00
400.75	0.00	403.35	0.00	405.95	0.00	408.55	1.50
400.80	0.00	403.40	0.00	406.00	0.00	408.60	4.26
400.85	0.00	403.45	0.00	406.05	0.00	408.65	7.86
400.90	0.00	403.50	0.00	406.10	0.00	408.70	12.14
400.95	0.00	403.55	0.00	406.15	0.00	408.75	17.05
401.00	0.00	403.60	0.00	406.20	0.00	408.80	22.52
401.05	0.00	403.65	0.00	406.25	0.00	408.85	28.53
401.10	0.00	403.70	0.00	406.30	0.00	408.90	35.03
401.15	0.00	403.75	0.00	406.35	0.00	408.95	41.93
401.20	0.00	403.80	0.00	406.40	0.00	409.00	49.26
401.25	0.00	403.85	0.00	406.45	0.00	409.05	57.00
401.30	0.00	403.90	0.00	406.50	0.00	409.10	65.15
401.35	0.00	403.95	0.00	406.55	0.00	409.15	73.28
401.40	0.00	404.00	0.00	406.60	0.00	409.20	81.69
401.45	0.00	404.05	0.00	406.65	0.00	409.25	90.36
401.50	0.00	404.10	0.00	406.70	0.00	409.30	99.29
401.55	0.00	404.15	0.00	406.75	0.00	409.35	108.97
401.60	0.00	404.20	0.00	406.80	0.00	409.40	118.97
401.65	0.00	404.25	0.00	406.85	0.00	409.45	129.29
401.70	0.00	404.30	0.00	406.90	0.00	409.50	139.92
401.75	0.00	404.35	0.00	406.95	0.00	409.55	151.14
401.80	0.00	404.40	0.00	407.00	0.00	409.60	162.70
401.85	0.00	404.45	0.00	407.05	0.00	409.65	174.60
401.90	0.00	404.50	0.00	407.10	0.00	409.70	186.84
401.95	0.00	404.55	0.00	407.15	0.00	409.75	199.23
402.00	0.00	404.60	0.00	407.20	0.00	409.80	211.93
402.05	0.00	404.65	0.00	407.25	0.00	409.85	224.94
402.10	0.00	404.70	0.00	407.30	0.00	409.90	238.25
402.15	0.00	404.75	0.00	407.35	0.00	409.95	251.63
402.20	0.00	404.80	0.00	407.40	0.00	410.00	**265.28**
402.25	0.00	404.85	0.00	407.45	0.00		
402.30	0.00	404.90	0.00	407.50	0.00		
402.35	0.00	404.95	0.00	407.55	0.00		
402.40	0.00	405.00	0.00	407.60	0.00		
402.45	0.00	405.05	0.00	407.65	0.00		
402.50	0.00	405.10	0.00	407.70	0.00		
402.55	0.00	405.15	0.00	407.75	0.00		

Stage-Area-Storage for Pond 2P: Forebay & Bio A1-B

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
400.00	3,314	0
400.10	3,386	335
400.20	3,458	677
400.30	3,531	1,027
400.40	3,605	1,383
400.50	3,680	1,748
400.60	3,755	2,119
400.70	3,831	2,499
400.80	3,908	2,886
400.90	3,986	3,280
401.00	4,064	3,683
401.10	4,143	4,093
401.20	4,223	4,511
401.30	4,304	4,938
401.40	4,386	5,372
401.50	4,468	5,815
401.60	4,551	6,266
401.70	4,635	6,725
401.80	4,720	7,193
401.90	4,805	7,669
402.00	4,891	8,154
402.10	4,977	8,647
402.20	5,064	9,149
402.30	5,152	9,660
402.40	5,240	10,180
402.50	5,329	10,708
402.60	5,419	11,246
402.70	5,510	11,792
402.80	5,601	12,348
402.90	5,693	12,912
403.00	5,786	13,486
403.10	5,880	14,069
403.20	5,974	14,662
403.30	6,069	15,264
403.40	6,165	15,876
403.50	6,262	16,497
403.60	6,359	17,128
403.70	6,457	17,769
403.80	6,556	18,420
403.90	6,656	19,080
404.00	6,756	19,751
404.10	6,857	20,432
404.20	6,959	21,122
404.30	7,061	21,823
404.40	7,164	22,535
404.50	7,268	23,256
404.60	7,373	23,988
404.70	7,478	24,731
404.80	7,584	25,484
404.90	7,691	26,248
405.00	7,799	27,022
405.10	7,908	27,808
405.20	8,017	28,604
405.30	8,127	29,411
405.40	8,237	30,229
405.50	8,349	31,058
405.60	8,461	31,899
405.70	8,574	32,751
405.80	8,687	33,614
405.90	8,802	34,488
406.00	8,917	35,374
406.10	9,360	36,288
406.20	9,814	37,246
406.30	10,278	38,251
406.40	10,753	39,302
406.50	11,239	40,402
406.60	11,736	41,551
406.70	12,243	42,749
406.80	12,761	44,000
406.90	13,290	45,302
407.00	13,830	46,658
407.10	14,380	48,068
407.20	14,941	49,534
407.30	15,513	51,057
407.40	16,096	52,637
407.50	16,689	54,277
407.60	16,937	55,958
407.70	17,187	57,664
407.80	17,439	59,395
407.90	17,693	61,152
408.00	17,949	62,934
408.10	18,204	64,742
408.20	18,460	66,575
408.30	18,718	68,434
408.40	18,978	70,319
408.50	19,240	72,229
408.60	19,503	74,166
408.70	19,768	76,130
408.80	20,035	78,120
408.90	20,304	80,137
409.00	20,575	82,181
409.10	20,847	84,252
409.20	21,122	86,351
409.30	21,398	88,477
409.40	21,675	90,630
409.50	21,955	92,812
409.60	22,236	95,021
409.70	22,520	97,259
409.80	22,805	99,525
409.90	23,091	101,820
410.00	**23,380**	**104,144**

Summary for Pond 3P: Forebay & Bio B1-A

Inflow Area = 4.885 ac, 52.14% Impervious, Inflow Depth = 10.93" for 500-yr event
Inflow = 33.05 cfs @ 12.26 hrs, Volume= 4.450 af
Outflow = 20.06 cfs @ 12.50 hrs, Volume= 4.089 af, Atten= 39%, Lag= 14.7 min
Primary = 20.06 cfs @ 12.50 hrs, Volume= 4.089 af
Routed to Pond 7P : Detention Basin B1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 407.50' Surf.Area= 16,268 sf Storage= 53,756 cf
Peak Elev= 409.61' @ 12.54 hrs Surf.Area= 22,148 sf Storage= 94,195 cf (40,439 cf above start)

Plug-Flow detention time= 246.0 min calculated for 2.855 af (64% of inflow)
Center-of-Mass det. time= 55.5 min (841.6 - 786.0)

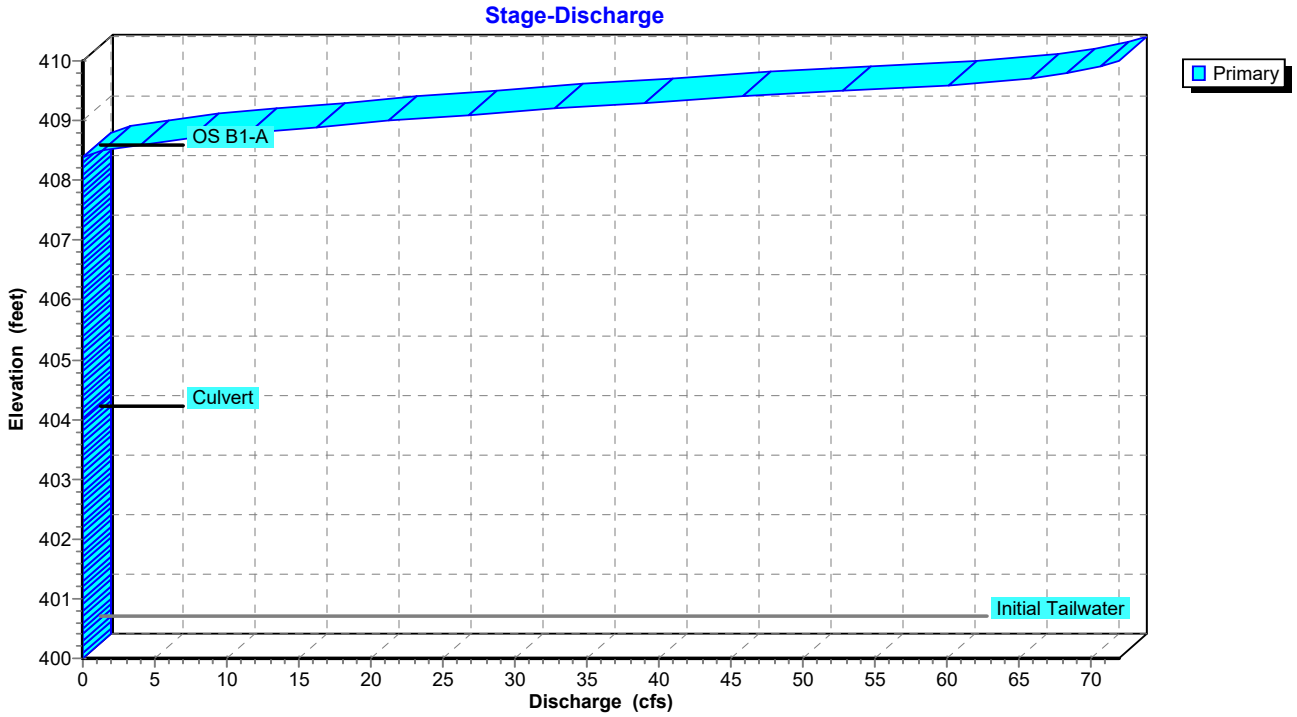
Volume	Invert	Avail.Storage	Storage Description
#1	400.00'	103,006 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
400.00	3,233	0	0	3,233
402.00	4,859	8,037	8,037	4,920
404.00	6,744	11,552	19,589	6,880
406.00	8,885	15,580	35,168	9,111
407.50	16,268	18,588	53,756	16,517
408.00	17,600	8,465	62,221	17,869
410.00	23,319	40,785	103,006	23,677

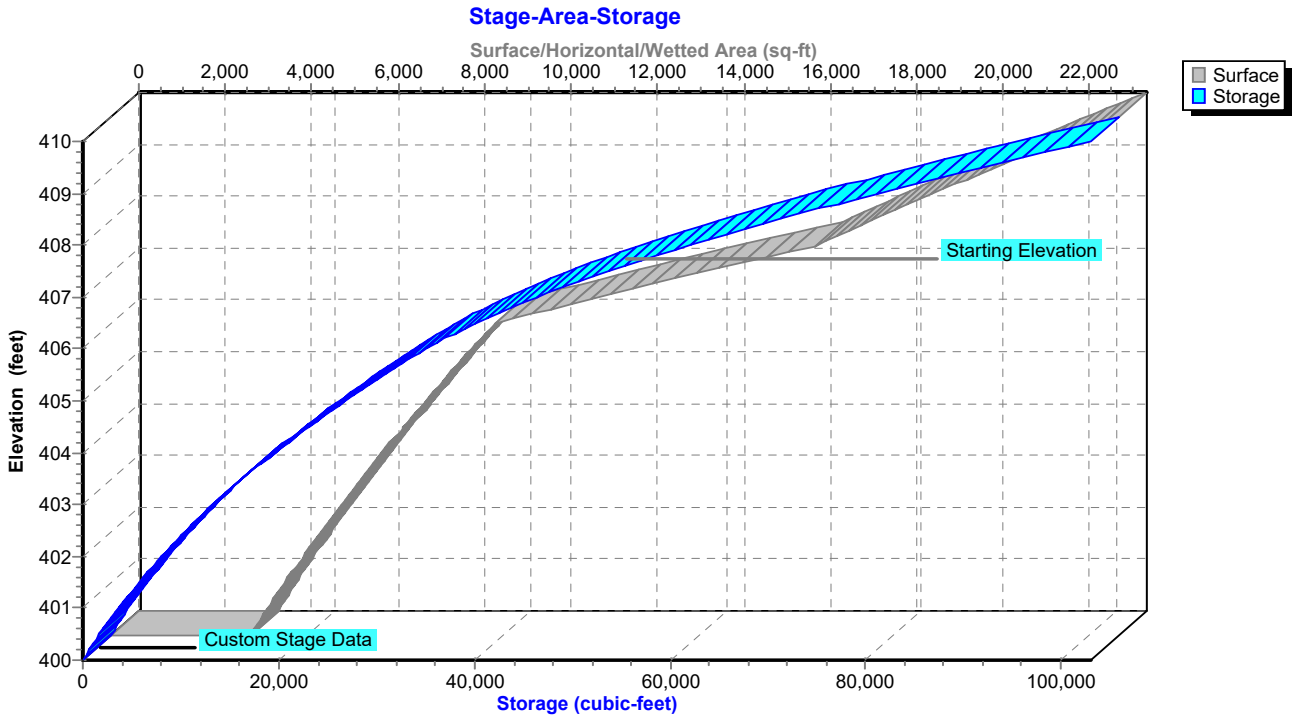
Device	Routing	Invert	Outlet Devices
#1	Primary	404.03'	**36.0" Round Culvert** L= 101.6' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 404.03' / 402.00' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 7.07 sf
#2	Device 1	408.40'	**36.0" x 48.0" Horiz. OS B1-A** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=20.00 cfs @ 12.50 hrs HW=409.61' TW=409.26' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 20.00 cfs @ 2.83 fps)
↑**2=OS B1-A** (Passes 20.00 cfs of 33.95 cfs potential flow)

Pond 3P: Forebay & Bio B1-A



Pond 3P: Forebay & Bio B1-A



Stage-Discharge for Pond 3P: Forebay & Bio B1-A

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
400.00	0.00	402.60	0.00	405.20	0.00	407.80	0.00
400.05	0.00	402.65	0.00	405.25	0.00	407.85	0.00
400.10	0.00	402.70	0.00	405.30	0.00	407.90	0.00
400.15	0.00	402.75	0.00	405.35	0.00	407.95	0.00
400.20	0.00	402.80	0.00	405.40	0.00	408.00	0.00
400.25	0.00	402.85	0.00	405.45	0.00	408.05	0.00
400.30	0.00	402.90	0.00	405.50	0.00	408.10	0.00
400.35	0.00	402.95	0.00	405.55	0.00	408.15	0.00
400.40	0.00	403.00	0.00	405.60	0.00	408.20	0.00
400.45	0.00	403.05	0.00	405.65	0.00	408.25	0.00
400.50	0.00	403.10	0.00	405.70	0.00	408.30	0.00
400.55	0.00	403.15	0.00	405.75	0.00	408.35	0.00
400.60	0.00	403.20	0.00	405.80	0.00	408.40	0.00
400.65	0.00	403.25	0.00	405.85	0.00	408.45	0.51
400.70	0.00	403.30	0.00	405.90	0.00	408.50	1.45
400.75	0.00	403.35	0.00	405.95	0.00	408.55	2.66
400.80	0.00	403.40	0.00	406.00	0.00	408.60	4.09
400.85	0.00	403.45	0.00	406.05	0.00	408.65	5.72
400.90	0.00	403.50	0.00	406.10	0.00	408.70	7.52
400.95	0.00	403.55	0.00	406.15	0.00	408.75	9.48
401.00	0.00	403.60	0.00	406.20	0.00	408.80	11.58
401.05	0.00	403.65	0.00	406.25	0.00	408.85	13.82
401.10	0.00	403.70	0.00	406.30	0.00	408.90	16.19
401.15	0.00	403.75	0.00	406.35	0.00	408.95	18.67
401.20	0.00	403.80	0.00	406.40	0.00	409.00	21.28
401.25	0.00	403.85	0.00	406.45	0.00	409.05	23.99
401.30	0.00	403.90	0.00	406.50	0.00	409.10	26.81
401.35	0.00	403.95	0.00	406.55	0.00	409.15	29.73
401.40	0.00	404.00	0.00	406.60	0.00	409.20	32.76
401.45	0.00	404.05	0.00	406.65	0.00	409.25	35.88
401.50	0.00	404.10	0.00	406.70	0.00	409.30	39.09
401.55	0.00	404.15	0.00	406.75	0.00	409.35	42.39
401.60	0.00	404.20	0.00	406.80	0.00	409.40	45.78
401.65	0.00	404.25	0.00	406.85	0.00	409.45	49.26
401.70	0.00	404.30	0.00	406.90	0.00	409.50	52.82
401.75	0.00	404.35	0.00	406.95	0.00	409.55	56.46
401.80	0.00	404.40	0.00	407.00	0.00	409.60	60.18
401.85	0.00	404.45	0.00	407.05	0.00	409.65	63.98
401.90	0.00	404.50	0.00	407.10	0.00	409.70	65.88
401.95	0.00	404.55	0.00	407.15	0.00	409.75	67.13
402.00	0.00	404.60	0.00	407.20	0.00	409.80	68.37
402.05	0.00	404.65	0.00	407.25	0.00	409.85	69.58
402.10	0.00	404.70	0.00	407.30	0.00	409.90	70.77
402.15	0.00	404.75	0.00	407.35	0.00	409.95	71.55
402.20	0.00	404.80	0.00	407.40	0.00	410.00	**71.96**
402.25	0.00	404.85	0.00	407.45	0.00		
402.30	0.00	404.90	0.00	407.50	0.00		
402.35	0.00	404.95	0.00	407.55	0.00		
402.40	0.00	405.00	0.00	407.60	0.00		
402.45	0.00	405.05	0.00	407.65	0.00		
402.50	0.00	405.10	0.00	407.70	0.00		
402.55	0.00	405.15	0.00	407.75	0.00		

Stage-Area-Storage for Pond 3P: Forebay & Bio B1-A

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
400.00	3,233	0
400.10	3,306	327
400.20	3,381	661
400.30	3,456	1,003
400.40	3,532	1,353
400.50	3,609	1,710
400.60	3,686	2,074
400.70	3,765	2,447
400.80	3,844	2,827
400.90	3,924	3,216
401.00	4,005	3,612
401.10	4,086	4,017
401.20	4,169	4,429
401.30	4,252	4,850
401.40	4,337	5,280
401.50	4,422	5,718
401.60	4,507	6,164
401.70	4,594	6,619
401.80	4,682	7,083
401.90	4,770	7,556
402.00	4,859	8,037
402.10	4,946	8,527
402.20	5,034	9,026
402.30	5,122	9,534
402.40	5,211	10,051
402.50	5,301	10,576
402.60	5,392	11,111
402.70	5,484	11,655
402.80	5,576	12,208
402.90	5,669	12,770
403.00	5,763	13,342
403.10	5,858	13,923
403.20	5,953	14,513
403.30	6,049	15,113
403.40	6,146	15,723
403.50	6,244	16,342
403.60	6,342	16,972
403.70	6,442	17,611
403.80	6,542	18,260
403.90	6,642	18,919
404.00	6,744	19,589
404.10	6,844	20,268
404.20	6,945	20,957
404.30	7,046	21,657
404.40	7,149	22,367
404.50	7,252	23,087
404.60	7,355	23,817
404.70	7,460	24,558
404.80	7,565	25,309
404.90	7,671	26,071
405.00	7,778	26,843
405.10	7,885	27,626
405.20	7,993	28,420
405.30	8,102	29,225
405.40	8,212	30,041
405.50	8,322	30,867
405.60	8,433	31,705
405.70	8,545	32,554
405.80	8,658	33,414
405.90	8,771	34,286
406.00	8,885	35,168
406.10	9,308	36,078
406.20	9,741	37,030
406.30	10,184	38,027
406.40	10,637	39,068
406.50	11,100	40,154
406.60	11,572	41,288
406.70	12,055	42,469
406.80	12,547	43,699
406.90	13,049	44,979
407.00	13,561	46,309
407.10	14,083	47,691
407.20	14,614	49,126
407.30	15,156	50,615
407.40	15,707	52,158
407.50	16,268	53,756
407.60	16,530	55,396
407.70	16,795	57,062
407.80	17,061	58,755
407.90	17,329	60,475
408.00	17,600	62,221
408.10	17,867	63,994
408.20	18,136	65,795
408.30	18,407	67,622
408.40	18,680	69,476
408.50	18,954	71,358
408.60	19,231	73,267
408.70	19,510	75,204
408.80	19,791	77,169
408.90	20,074	79,162
409.00	20,359	81,184
409.10	20,646	83,234
409.20	20,935	85,313
409.30	21,226	87,421
409.40	21,519	89,558
409.50	21,814	91,725
409.60	22,111	93,921
409.70	22,410	96,147
409.80	22,711	98,403
409.90	23,014	100,690
410.00	**23,319**	**103,006**

Summary for Pond 4P: Detention Basin A1

Inflow Area = 9.990 ac, 49.59% Impervious, Inflow Depth = 10.91" for 500-yr event
Inflow = 49.20 cfs @ 12.34 hrs, Volume= 9.087 af
Outflow = 46.93 cfs @ 12.45 hrs, Volume= 8.170 af, Atten= 5%, Lag= 6.3 min
Primary = 46.93 cfs @ 12.45 hrs, Volume= 8.170 af
Routed to Pond PR-A : PR-A

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Automatic Starting Elev= 398.50' Surf.Area= 2,907 sf Storage= 21,861 cf
Peak Elev= 409.39' @ 12.45 hrs Surf.Area= 22,779 sf Storage= 136,158 cf (114,297 cf above start)

Plug-Flow detention time= 393.8 min calculated for 7.668 af (84% of inflow)
Center-of-Mass det. time= 281.6 min (1,083.6 - 802.1)

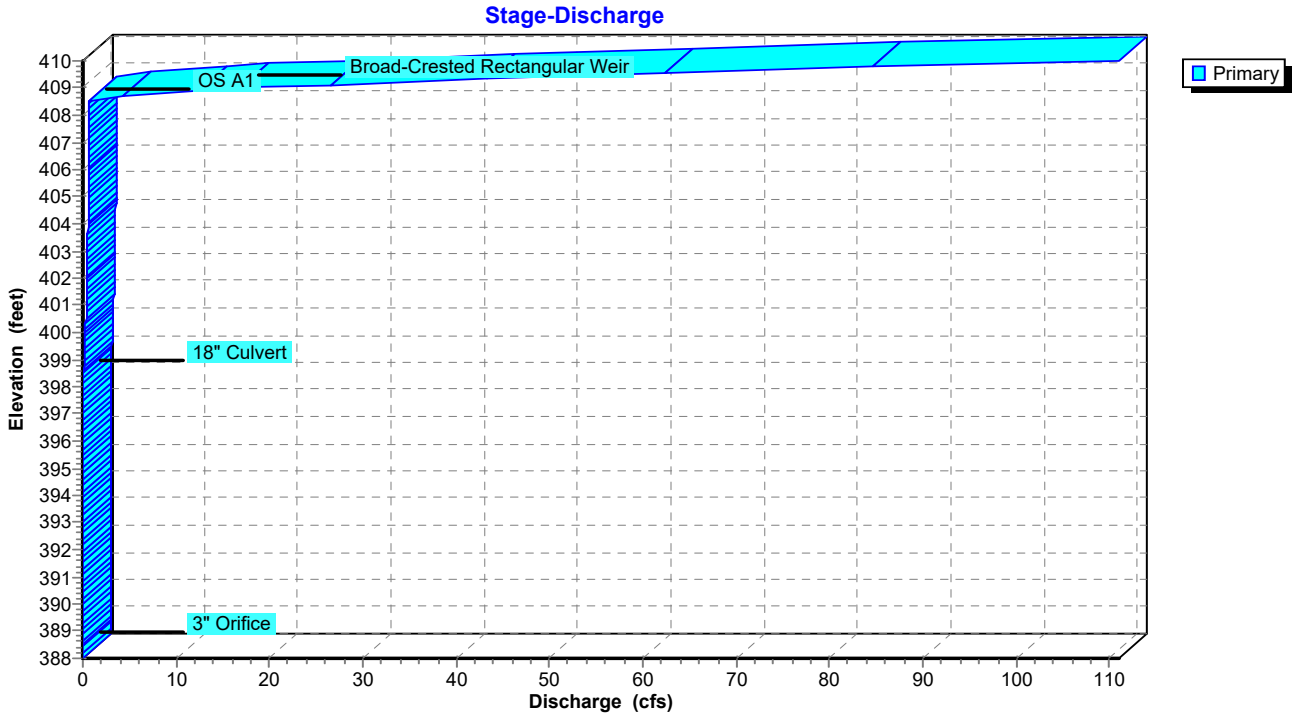
Volume	Invert	Avail.Storage	Storage Description
#1	388.00'	150,665 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
388.00	1,355	0	0	1,355
400.00	3,176	26,422	26,422	4,046
402.00	5,824	8,867	35,289	6,736
404.00	9,598	15,266	50,555	10,560
406.00	14,095	23,549	74,104	15,122
408.00	19,096	33,065	107,169	20,205
410.00	24,513	43,496	150,665	25,722

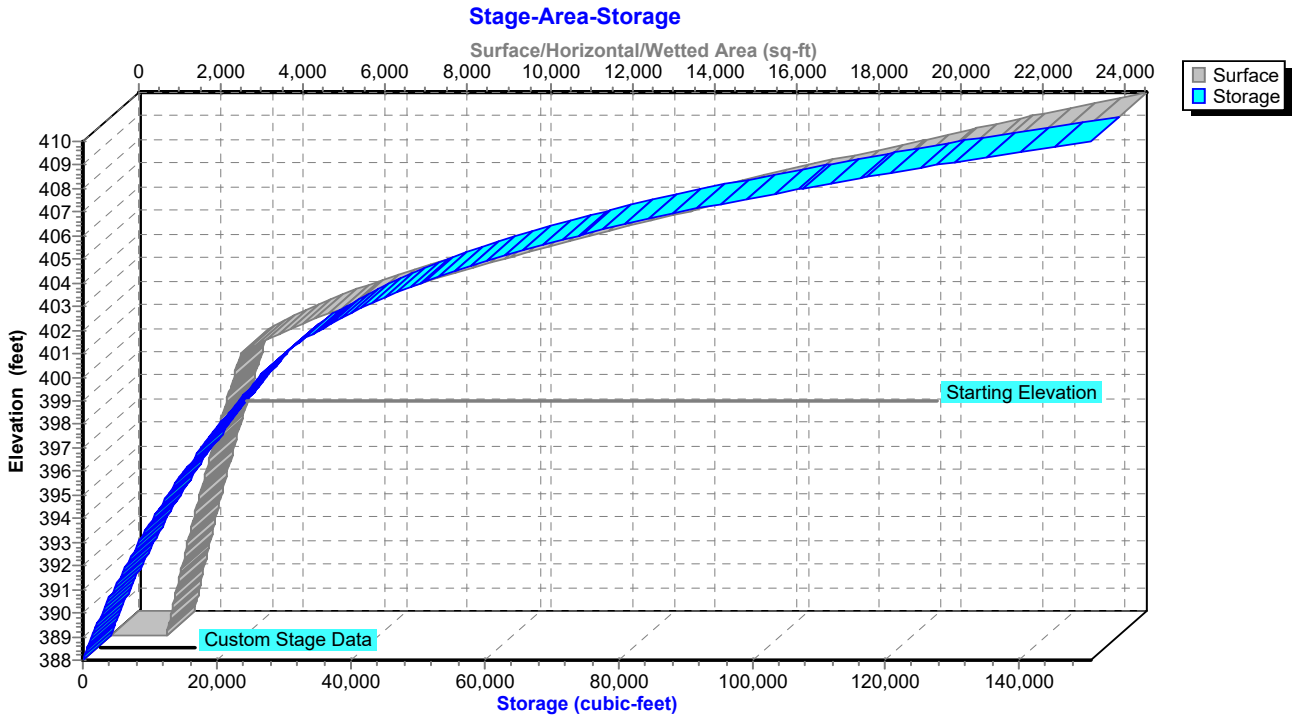
Device	Routing	Invert	Outlet Devices
#1	Primary	398.50'	**18.0" Round 18" Culvert** L= 56.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 398.50' / 397.94' S= 0.0100 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	388.50'	**3.0" Vert. 3" Orifice** C= 0.600 Limited to weir flow at low heads
#3	Device 1	408.50'	**36.0" x 48.0" Horiz. OS A1** C= 0.600 Limited to weir flow at low heads
#4	Primary	409.00'	**30.0' long + 2.0 '/' SideZ x 50.0' 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=46.93 cfs @ 12.45 hrs HW=409.39' TW=0.00' (Dynamic Tailwater)
- **1=18" Culvert** (Inlet Controls 27.09 cfs @ 15.33 fps)
- **2=3" Orifice** (Passes < 0.78 cfs potential flow)
- **3=OS A1** (Passes < 38.20 cfs potential flow)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 19.84 cfs @ 1.67 fps)

Pond 4P: Detention Basin A1



Pond 4P: Detention Basin A1



Stage-Discharge for Pond 4P: Detention Basin A1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
388.00	0.00	398.40	0.00	408.80	8.28
388.20	0.00	398.60	0.05	409.00	16.95
388.40	0.00	398.80	0.13	409.20	34.11
388.60	0.00	399.00	0.17	409.40	48.04
388.80	0.00	399.20	0.20	409.60	66.22
389.00	0.00	399.40	0.22	409.80	86.73
389.20	0.00	399.60	0.25	410.00	**111.01**
389.40	0.00	399.80	0.27		
389.60	0.00	400.00	0.29		
389.80	0.00	400.20	0.31		
390.00	0.00	400.40	0.33		
390.20	0.00	400.60	0.34		
390.40	0.00	400.80	0.36		
390.60	0.00	401.00	0.37		
390.80	0.00	401.20	0.39		
391.00	0.00	401.40	0.40		
391.20	0.00	401.60	0.42		
391.40	0.00	401.80	0.43		
391.60	0.00	402.00	0.44		
391.80	0.00	402.20	0.45		
392.00	0.00	402.40	0.47		
392.20	0.00	402.60	0.48		
392.40	0.00	402.80	0.49		
392.60	0.00	403.00	0.50		
392.80	0.00	403.20	0.51		
393.00	0.00	403.40	0.52		
393.20	0.00	403.60	0.53		
393.40	0.00	403.80	0.54		
393.60	0.00	404.00	0.55		
393.80	0.00	404.20	0.56		
394.00	0.00	404.40	0.57		
394.20	0.00	404.60	0.58		
394.40	0.00	404.80	0.59		
394.60	0.00	405.00	0.60		
394.80	0.00	405.20	0.61		
395.00	0.00	405.40	0.62		
395.20	0.00	405.60	0.63		
395.40	0.00	405.80	0.64		
395.60	0.00	406.00	0.65		
395.80	0.00	406.20	0.66		
396.00	0.00	406.40	0.66		
396.20	0.00	406.60	0.67		
396.40	0.00	406.80	0.68		
396.60	0.00	407.00	0.69		
396.80	0.00	407.20	0.70		
397.00	0.00	407.40	0.71		
397.20	0.00	407.60	0.71		
397.40	0.00	407.80	0.72		
397.60	0.00	408.00	0.73		
397.80	0.00	408.20	0.74		
398.00	0.00	408.40	0.74		
398.20	0.00	408.60	2.20		

Stage-Area-Storage for Pond 4P: Detention Basin A1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
388.00	1,355	0
388.50	1,416	693
389.00	1,478	1,416
389.50	1,541	2,170
390.00	1,605	2,957
390.50	1,671	3,776
391.00	1,739	4,628
391.50	1,807	5,515
392.00	1,877	6,436
392.50	1,948	7,392
393.00	2,021	8,384
393.50	2,095	9,413
394.00	2,170	10,479
394.50	2,247	11,584
395.00	2,324	12,726
395.50	2,404	13,908
396.00	2,484	15,130
396.50	2,566	16,392
397.00	2,649	17,696
397.50	2,734	19,042
398.00	2,819	20,430
398.50	2,907	21,861
399.00	2,995	23,337
399.50	3,085	24,857
400.00	3,176	26,422
400.50	3,763	28,155
401.00	4,400	30,194
401.50	5,087	32,563
402.00	5,824	35,289
402.50	6,680	38,413
403.00	7,594	41,978
403.50	8,567	46,016
404.00	9,598	50,555
404.50	10,641	55,612
405.00	11,739	61,205
405.50	12,890	67,360
406.00	14,095	74,104
406.50	15,274	81,445
407.00	16,501	89,386
407.50	17,775	97,953
408.00	19,096	107,169
408.50	20,387	117,038
409.00	21,720	127,563
409.50	23,095	138,765
410.00	**24,513**	**150,665**

Summary for Pond 6P: Forebay & Bio B1-B

Inflow Area = 4.222 ac, 52.11% Impervious, Inflow Depth = 10.93" for 500-yr event
Inflow = 30.36 cfs @ 12.22 hrs, Volume= 3.846 af
Outflow = 16.11 cfs @ 12.47 hrs, Volume= 3.550 af, Atten= 47%, Lag= 15.2 min
Primary = 16.11 cfs @ 12.47 hrs, Volume= 3.550 af
Routed to Pond 7P : Detention Basin B1

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Starting Elev= 407.50' Surf.Area= 13,168 sf Storage= 32,496 cf
Peak Elev= 409.73' @ 12.53 hrs Surf.Area= 19,233 sf Storage= 68,387 cf (35,891 cf above start)

Plug-Flow detention time= 209.0 min calculated for 2.804 af (73% of inflow)
Center-of-Mass det. time= 53.4 min (836.7 - 783.3)

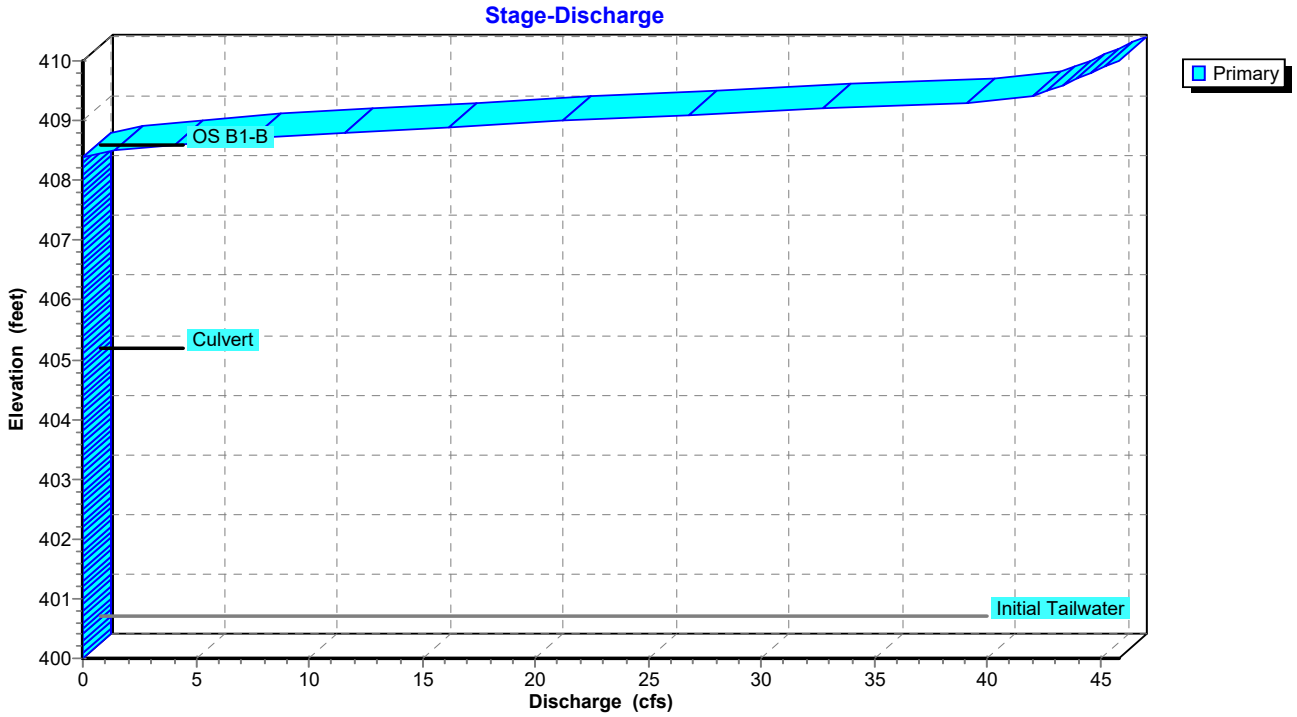
Volume	Invert	Avail.Storage	Storage Description
#1	400.00'	73,766 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
400.00	855	0	0	855
402.00	2,141	2,899	2,899	2,169
404.00	3,887	5,942	8,841	3,957
406.00	5,898	9,715	18,557	6,027
407.50	13,168	13,939	32,496	13,315
408.00	14,464	6,905	39,401	14,628
410.00	20,052	34,364	73,766	20,292

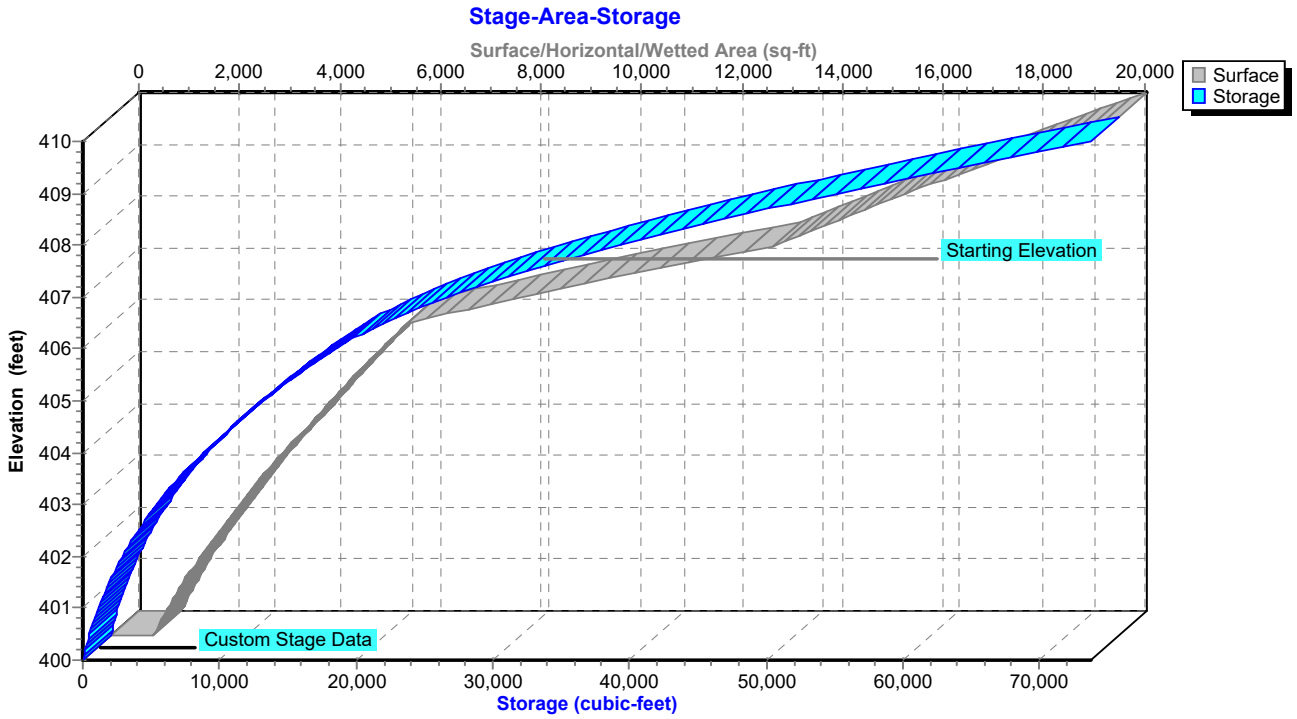
Device	Routing	Invert	Outlet Devices
#1	Primary	404.99'	**30.0" Round Culvert** L= 149.6' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 404.99' / 402.00' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 4.91 sf
#2	Device 1	408.40'	**36.0" x 48.0" Horiz. OS B1-B** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=16.05 cfs @ 12.47 hrs HW=409.71' TW=409.25' (Dynamic Tailwater)
↑**1=Culvert** (Inlet Controls 16.05 cfs @ 3.27 fps)
↑**2=OS B1-B** (Passes 16.05 cfs of 39.24 cfs potential flow)

Pond 6P: Forebay & Bio B1-B



Pond 6P: Forebay & Bio B1-B



Stage-Discharge for Pond 6P: Forebay & Bio B1-B

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
400.00	0.00	402.60	0.00	405.20	0.00	407.80	0.00
400.05	0.00	402.65	0.00	405.25	0.00	407.85	0.00
400.10	0.00	402.70	0.00	405.30	0.00	407.90	0.00
400.15	0.00	402.75	0.00	405.35	0.00	407.95	0.00
400.20	0.00	402.80	0.00	405.40	0.00	408.00	0.00
400.25	0.00	402.85	0.00	405.45	0.00	408.05	0.00
400.30	0.00	402.90	0.00	405.50	0.00	408.10	0.00
400.35	0.00	402.95	0.00	405.55	0.00	408.15	0.00
400.40	0.00	403.00	0.00	405.60	0.00	408.20	0.00
400.45	0.00	403.05	0.00	405.65	0.00	408.25	0.00
400.50	0.00	403.10	0.00	405.70	0.00	408.30	0.00
400.55	0.00	403.15	0.00	405.75	0.00	408.35	0.00
400.60	0.00	403.20	0.00	405.80	0.00	408.40	0.00
400.65	0.00	403.25	0.00	405.85	0.00	408.45	0.51
400.70	0.00	403.30	0.00	405.90	0.00	408.50	1.45
400.75	0.00	403.35	0.00	405.95	0.00	408.55	2.66
400.80	0.00	403.40	0.00	406.00	0.00	408.60	4.09
400.85	0.00	403.45	0.00	406.05	0.00	408.65	5.72
400.90	0.00	403.50	0.00	406.10	0.00	408.70	7.52
400.95	0.00	403.55	0.00	406.15	0.00	408.75	9.48
401.00	0.00	403.60	0.00	406.20	0.00	408.80	11.58
401.05	0.00	403.65	0.00	406.25	0.00	408.85	13.82
401.10	0.00	403.70	0.00	406.30	0.00	408.90	16.19
401.15	0.00	403.75	0.00	406.35	0.00	408.95	18.67
401.20	0.00	403.80	0.00	406.40	0.00	409.00	21.28
401.25	0.00	403.85	0.00	406.45	0.00	409.05	23.99
401.30	0.00	403.90	0.00	406.50	0.00	409.10	26.81
401.35	0.00	403.95	0.00	406.55	0.00	409.15	29.73
401.40	0.00	404.00	0.00	406.60	0.00	409.20	32.76
401.45	0.00	404.05	0.00	406.65	0.00	409.25	35.88
401.50	0.00	404.10	0.00	406.70	0.00	409.30	39.09
401.55	0.00	404.15	0.00	406.75	0.00	409.35	41.68
401.60	0.00	404.20	0.00	406.80	0.00	409.40	42.02
401.65	0.00	404.25	0.00	406.85	0.00	409.45	42.35
401.70	0.00	404.30	0.00	406.90	0.00	409.50	42.67
401.75	0.00	404.35	0.00	406.95	0.00	409.55	43.00
401.80	0.00	404.40	0.00	407.00	0.00	409.60	43.32
401.85	0.00	404.45	0.00	407.05	0.00	409.65	43.65
401.90	0.00	404.50	0.00	407.10	0.00	409.70	43.96
401.95	0.00	404.55	0.00	407.15	0.00	409.75	44.28
402.00	0.00	404.60	0.00	407.20	0.00	409.80	44.60
402.05	0.00	404.65	0.00	407.25	0.00	409.85	44.91
402.10	0.00	404.70	0.00	407.30	0.00	409.90	45.22
402.15	0.00	404.75	0.00	407.35	0.00	409.95	45.53
402.20	0.00	404.80	0.00	407.40	0.00	410.00	**45.83**
402.25	0.00	404.85	0.00	407.45	0.00		
402.30	0.00	404.90	0.00	407.50	0.00		
402.35	0.00	404.95	0.00	407.55	0.00		
402.40	0.00	405.00	0.00	407.60	0.00		
402.45	0.00	405.05	0.00	407.65	0.00		
402.50	0.00	405.10	0.00	407.70	0.00		
402.55	0.00	405.15	0.00	407.75	0.00		

Stage-Area-Storage for Pond 6P: Forebay & Bio B1-B

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
400.00	855	0
400.10	906	88
400.20	957	181
400.30	1,011	280
400.40	1,066	383
400.50	1,122	493
400.60	1,180	608
400.70	1,239	729
400.80	1,300	856
400.90	1,362	989
401.00	1,425	1,128
401.10	1,491	1,274
401.20	1,557	1,426
401.30	1,625	1,585
401.40	1,694	1,751
401.50	1,765	1,924
401.60	1,837	2,104
401.70	1,911	2,292
401.80	1,986	2,487
401.90	2,063	2,689
402.00	2,141	2,899
402.10	2,216	3,117
402.20	2,292	3,343
402.30	2,370	3,576
402.40	2,449	3,817
402.50	2,529	4,065
402.60	2,611	4,322
402.70	2,693	4,588
402.80	2,777	4,861
402.90	2,863	5,143
403.00	2,949	5,434
403.10	3,037	5,733
403.20	3,127	6,041
403.30	3,217	6,358
403.40	3,309	6,685
403.50	3,402	7,020
403.60	3,496	7,365
403.70	3,592	7,720
403.80	3,689	8,084
403.90	3,787	8,457
404.00	3,887	8,841
404.10	3,978	9,234
404.20	4,069	9,637
404.30	4,162	10,048
404.40	4,256	10,469
404.50	4,351	10,899
404.60	4,446	11,339
404.70	4,543	11,789
404.80	4,641	12,248
404.90	4,740	12,717
405.00	4,840	13,196
405.10	4,941	13,685
405.20	5,043	14,184
405.30	5,147	14,694
405.40	5,251	15,214
405.50	5,356	15,744
405.60	5,462	16,285
405.70	5,570	16,837
405.80	5,678	17,399
405.90	5,788	17,972
406.00	5,898	18,557
406.10	6,293	19,166
406.20	6,701	19,816
406.30	7,122	20,507
406.40	7,555	21,240
406.50	8,001	22,018
406.60	8,460	22,841
406.70	8,932	23,711
406.80	9,417	24,628
406.90	9,914	25,594
407.00	10,425	26,611
407.10	10,948	27,680
407.20	11,484	28,801
407.30	12,032	29,977
407.40	12,594	31,208
407.50	13,168	32,496
407.60	13,422	33,825
407.70	13,679	35,180
407.80	13,938	36,561
407.90	14,200	37,968
408.00	14,464	39,401
408.10	14,722	40,861
408.20	14,982	42,346
408.30	15,244	43,857
408.40	15,509	45,395
408.50	15,776	46,959
408.60	16,045	48,550
408.70	16,316	50,168
408.80	16,590	51,813
408.90	16,866	53,486
409.00	17,144	55,187
409.10	17,425	56,915
409.20	17,708	58,672
409.30	17,993	60,457
409.40	18,280	62,270
409.50	18,570	64,113
409.60	18,862	65,984
409.70	19,156	67,885
409.80	19,452	69,815
409.90	19,751	71,775
410.00	**20,052**	**73,766**

Summary for Pond 7P: Detention Basin B1

Inflow Area = 9.568 ac, 49.61% Impervious, Inflow Depth = 9.74" for 500-yr event
Inflow = 36.71 cfs @ 12.49 hrs, Volume= 7.770 af
Outflow = 36.25 cfs @ 12.57 hrs, Volume= 7.606 af, Atten= 1%, Lag= 4.8 min
Primary = 36.25 cfs @ 12.57 hrs, Volume= 7.606 af
Routed to Pond PR-B : PR-B

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Automatic Starting Elev= 400.50' Surf.Area= 1,825 sf Storage= 806 cf
Peak Elev= 409.27' @ 12.57 hrs Surf.Area= 15,160 sf Storage= 68,237 cf (67,430 cf above start)

Plug-Flow detention time= 220.7 min calculated for 7.587 af (98% of inflow)
Center-of-Mass det. time= 204.7 min (1,045.0 - 840.3)

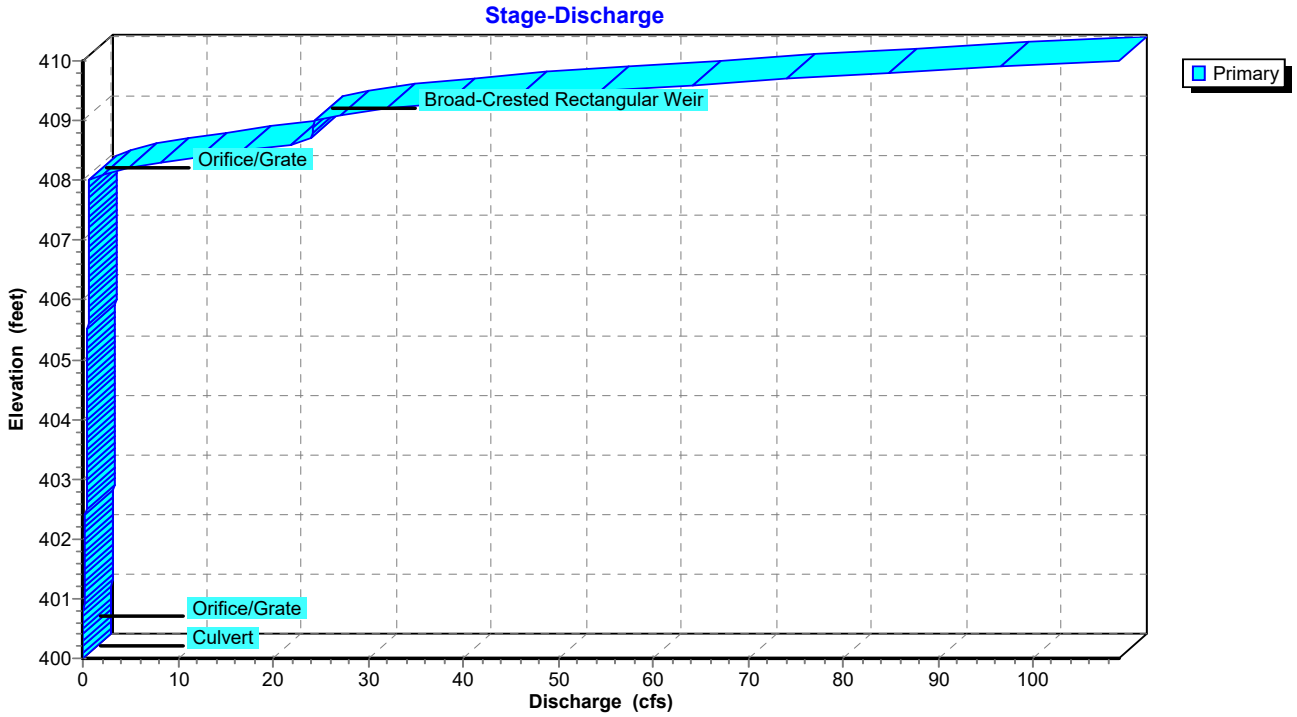
Volume	Invert	Avail.Storage	Storage Description
#1	400.00'	79,868 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
400.00	1,408	0	0	1,408
402.00	3,402	4,666	4,666	3,431
404.00	5,985	9,266	13,932	6,058
406.00	9,096	14,973	28,905	9,229
408.00	12,687	21,684	50,588	12,895
410.00	16,684	29,280	79,868	16,983

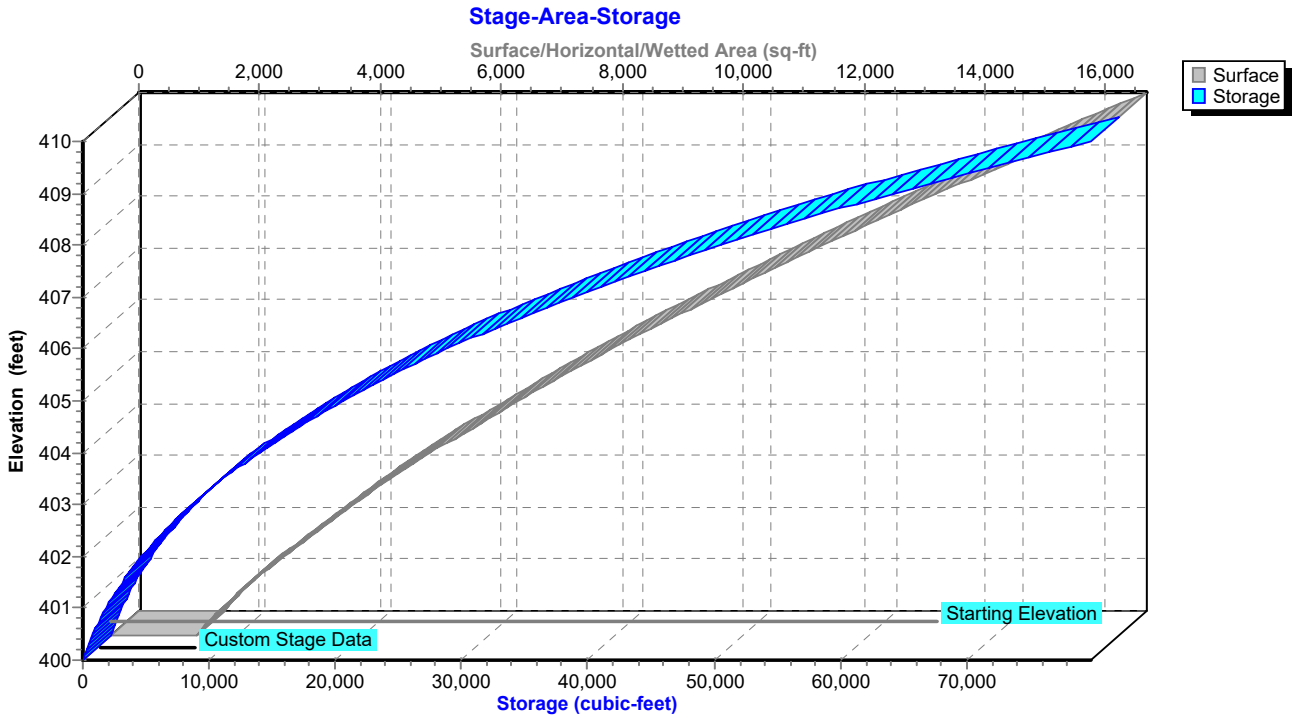
Device	Routing	Invert	Outlet Devices
#1	Primary	400.00'	**18.0" Round Culvert** L= 140.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 400.00' / 398.00' S= 0.0143 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 1.77 sf
#2	Device 1	400.50'	**3.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	408.00'	**36.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	409.00'	**30.0' long + 2.0 '/' SideZ x 50.0' 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=36.25 cfs @ 12.57 hrs HW=409.27' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Inlet Controls 24.84 cfs @ 14.05 fps)
  - **2=Orifice/Grate** (Passes < 0.69 cfs potential flow)
  - **3=Orifice/Grate** (Passes < 65.09 cfs potential flow)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 11.42 cfs @ 1.39 fps)

Pond 7P: Detention Basin B1



Pond 7P: Detention Basin B1



Stage-Discharge for Pond 7P: Detention Basin B1

Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)	Elevation (feet)	Primary (cfs)
400.00	0.00	402.60	0.33	405.20	0.51	407.80	0.63
400.05	0.00	402.65	0.34	405.25	0.51	407.85	0.64
400.10	0.00	402.70	0.34	405.30	0.51	407.90	0.64
400.15	0.00	402.75	0.34	405.35	0.51	407.95	0.64
400.20	0.00	402.80	0.35	405.40	0.52	408.00	0.64
400.25	0.00	402.85	0.35	405.45	0.52	408.05	1.16
400.30	0.00	402.90	0.36	405.50	0.52	408.10	2.09
400.35	0.00	402.95	0.36	405.55	0.52	408.15	3.31
400.40	0.00	403.00	0.36	405.60	0.53	408.20	4.75
400.45	0.00	403.05	0.37	405.65	0.53	408.25	6.38
400.50	0.00	403.10	0.37	405.70	0.53	408.30	8.18
400.55	0.01	403.15	0.38	405.75	0.54	408.35	10.14
400.60	0.02	403.20	0.38	405.80	0.54	408.40	12.24
400.65	0.04	403.25	0.38	405.85	0.54	408.45	14.48
400.70	0.06	403.30	0.39	405.90	0.54	408.50	16.85
400.75	0.08	403.35	0.39	405.95	0.55	408.55	19.34
400.80	0.10	403.40	0.39	406.00	0.55	408.60	21.94
400.85	0.11	403.45	0.40	406.05	0.55	408.65	23.92
400.90	0.12	403.50	0.40	406.10	0.55	408.70	23.99
400.95	0.13	403.55	0.40	406.15	0.56	408.75	24.07
401.00	0.14	403.60	0.41	406.20	0.56	408.80	24.14
401.05	0.15	403.65	0.41	406.25	0.56	408.85	24.22
401.10	0.16	403.70	0.41	406.30	0.56	408.90	24.29
401.15	0.17	403.75	0.42	406.35	0.57	408.95	24.37
401.20	0.18	403.80	0.42	406.40	0.57	409.00	24.44
401.25	0.19	403.85	0.42	406.45	0.57	409.05	25.41
401.30	0.19	403.90	0.43	406.50	0.57	409.10	27.14
401.35	0.20	403.95	0.43	406.55	0.58	409.15	29.37
401.40	0.21	404.00	0.43	406.60	0.58	409.20	32.00
401.45	0.21	404.05	0.44	406.65	0.58	409.25	35.01
401.50	0.22	404.10	0.44	406.70	0.58	409.30	38.35
401.55	0.23	404.15	0.44	406.75	0.58	409.35	42.01
401.60	0.23	404.20	0.45	406.80	0.59	409.40	45.95
401.65	0.24	404.25	0.45	406.85	0.59	409.45	50.14
401.70	0.25	404.30	0.45	406.90	0.59	409.50	54.57
401.75	0.25	404.35	0.46	406.95	0.59	409.55	59.25
401.80	0.26	404.40	0.46	407.00	0.60	409.60	64.16
401.85	0.26	404.45	0.46	407.05	0.60	409.65	69.06
401.90	0.27	404.50	0.47	407.10	0.60	409.70	74.12
401.95	0.27	404.55	0.47	407.15	0.60	409.75	79.33
402.00	0.28	404.60	0.47	407.20	0.61	409.80	84.69
402.05	0.28	404.65	0.47	407.25	0.61	409.85	90.49
402.10	0.29	404.70	0.48	407.30	0.61	409.90	96.47
402.15	0.29	404.75	0.48	407.35	0.61	409.95	102.64
402.20	0.30	404.80	0.48	407.40	0.62	410.00	**108.99**
402.25	0.30	404.85	0.49	407.45	0.62		
402.30	0.31	404.90	0.49	407.50	0.62		
402.35	0.31	404.95	0.49	407.55	0.62		
402.40	0.31	405.00	0.49	407.60	0.62		
402.45	0.32	405.05	0.50	407.65	0.63		
402.50	0.32	405.10	0.50	407.70	0.63		
402.55	0.33	405.15	0.50	407.75	0.63		

Stage-Area-Storage for Pond 7P: Detention Basin B1

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
400.00	1,408	0
400.10	1,487	145
400.20	1,568	298
400.30	1,652	459
400.40	1,738	628
400.50	1,825	806
400.60	1,915	993
400.70	2,007	1,189
400.80	2,102	1,395
400.90	2,198	1,610
401.00	2,297	1,834
401.10	2,398	2,069
401.20	2,501	2,314
401.30	2,606	2,569
401.40	2,713	2,835
401.50	2,822	3,112
401.60	2,934	3,400
401.70	3,048	3,699
401.80	3,164	4,009
401.90	3,282	4,332
402.00	3,402	4,666
402.10	3,514	5,012
402.20	3,628	5,369
402.30	3,743	5,737
402.40	3,861	6,117
402.50	3,980	6,509
402.60	4,101	6,913
402.70	4,224	7,330
402.80	4,348	7,758
402.90	4,475	8,199
403.00	4,603	8,653
403.10	4,733	9,120
403.20	4,865	9,600
403.30	4,999	10,093
403.40	5,134	10,600
403.50	5,271	11,120
403.60	5,410	11,654
403.70	5,551	12,202
403.80	5,694	12,764
403.90	5,839	13,341
404.00	5,985	13,932
404.10	6,125	14,537
404.20	6,267	15,157
404.30	6,410	15,791
404.40	6,555	16,439
404.50	6,702	17,102
404.60	6,850	17,780
404.70	7,000	18,472
404.80	7,152	19,180
404.90	7,305	19,902
405.00	7,459	20,641
405.10	7,616	21,394
405.20	7,774	22,164
405.30	7,933	22,949
405.40	8,095	23,751
405.50	8,257	24,568
405.60	8,422	25,402
405.70	8,588	26,253
405.80	8,756	27,120
405.90	8,925	28,004
406.00	9,096	28,905
406.10	9,261	29,823
406.20	9,428	30,757
406.30	9,597	31,708
406.40	9,767	32,677
406.50	9,938	33,662
406.60	10,111	34,664
406.70	10,285	35,684
406.80	10,461	36,721
406.90	10,638	37,776
407.00	10,817	38,849
407.10	10,997	39,940
407.20	11,179	41,048
407.30	11,362	42,175
407.40	11,547	43,321
407.50	11,733	44,485
407.60	11,921	45,668
407.70	12,110	46,869
407.80	12,301	48,090
407.90	12,493	49,329
408.00	12,687	50,588
408.10	12,874	51,867
408.20	13,062	53,163
408.30	13,252	54,479
408.40	13,443	55,814
408.50	13,635	57,168
408.60	13,829	58,541
408.70	14,024	59,933
408.80	14,220	61,346
408.90	14,418	62,777
409.00	14,617	64,229
409.10	14,818	65,701
409.20	15,020	67,193
409.30	15,223	68,705
409.40	15,428	70,237
409.50	15,634	71,790
409.60	15,841	73,364
409.70	16,050	74,959
409.80	16,260	76,574
409.90	16,471	78,211
410.00	**16,684**	**79,868**

Summary for Pond PR-A: PR-A

Inflow Area = 37.077 ac, 36.05% Impervious, Inflow Depth > 9.35" for 500-yr event
Inflow = 203.28 cfs @ 12.26 hrs, Volume= 28.899 af
Primary = 203.28 cfs @ 12.26 hrs, Volume= 28.899 af, Atten= 0%, Lag= 0.0 min

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

Summary for Pond PR-B: PR-B

Inflow Area = 21.350 ac, 28.46% Impervious, Inflow Depth > 8.12" for 500-yr event
Inflow = 80.97 cfs @ 12.24 hrs, Volume= 14.454 af
Primary = 80.97 cfs @ 12.24 hrs, Volume= 14.454 af, Atten= 0%, Lag= 0.0 min

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

APPENDIX 13

FOREBAY & WQV

CALCULATIONS

ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

WQv Provided in SMP

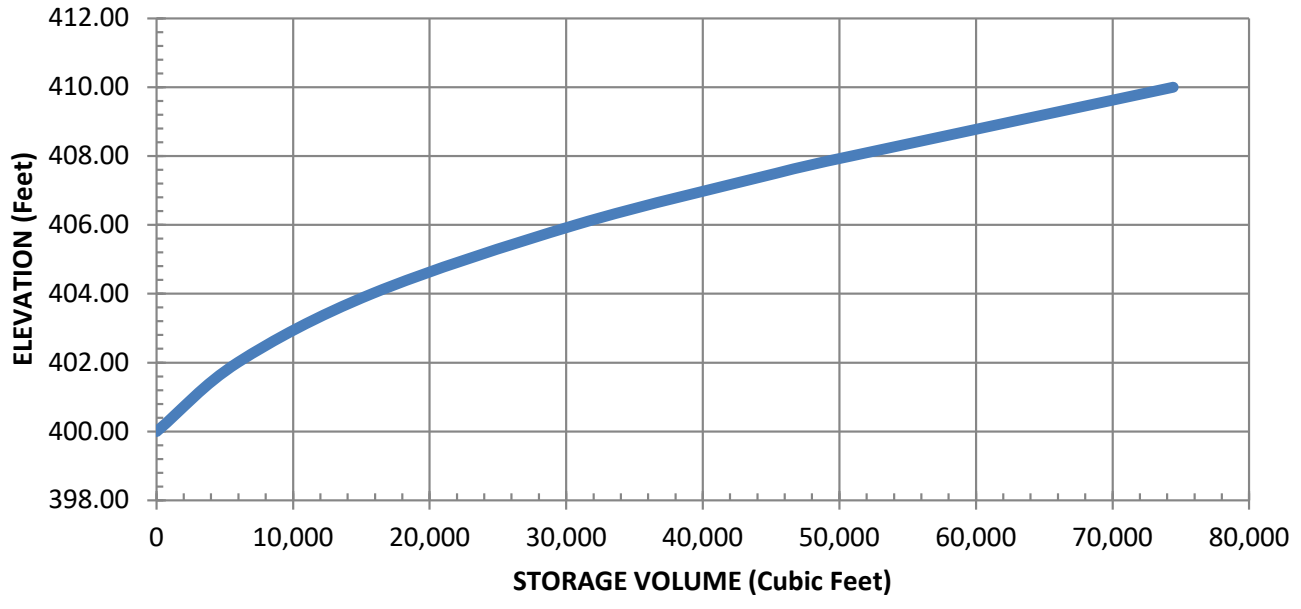
WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**Jan '24**	**Dec '25**	**1**	**8**

PROJECT TITLE	LOCATION
Sheffield Gardens	**Town of Montgomery**
CALCULATED BY: **ZS** / APPROVED BY: **RW**	REF DRAWING(S)

Basin **Forebay A1-A** WQv provided: 1.041 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)
400.00	2,093.0	--	--	--	0.0
402.00	3,854.0	2,973.5	2.0	5,947.0	5,947.0
404.00	5,993.0	4,923.5	2.0	9,847.0	15,794.0
406.00	8,917.0	7,455.0	2.0	14,910.0	30,704.0
407.50	10,633.0	9,775.0	1.5	14,662.5	45,366.5
408.00	11,395.0	11,014.0	0.5	5,507.0	50,873.5
410.00	12,177.0	11,786.0	2.0	23,572.0	74,445.5

Stage Storage Curve



ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

WQv Provided in SMP

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**Jan '24**	**Dec '25**	**2**	**8**

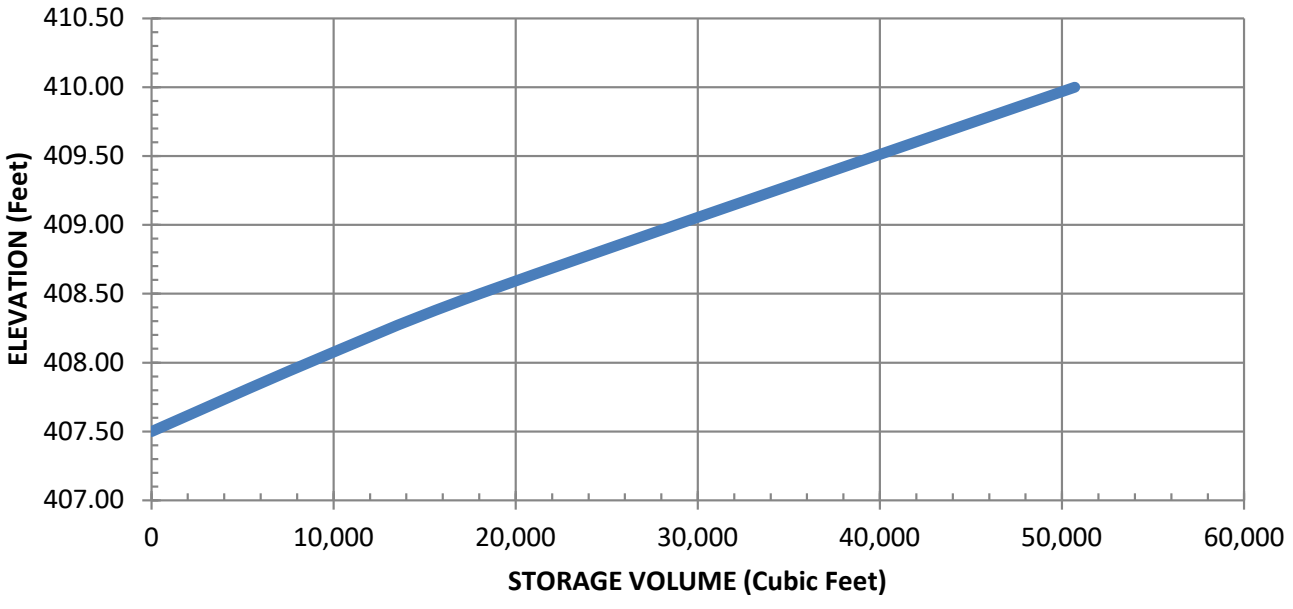
PROJECT TITLE	LOCATION
Sheffield Gardens	**Town of Montgomery**

CALCULATED BY	APPROVED BY	REF DRAWING(S)
ZS	**RW**	

Basin **Bio-Ret A1-A** WQv provided: 0.414 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)
407.50	16,634.0	--	--	--	0.0
408.00	18,030.0	17,332.0	0.5	8,666.0	8,666.0
408.50	19,471.0	18,750.5	0.5	9,375.3	18,041.3
410.00	24,063.0	21,767.0	1.5	32,650.5	50,691.8

Stage Storage Curve



ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

WQv Provided in SMP

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**Jan '24**	**Dec '25**	**3**	**8**

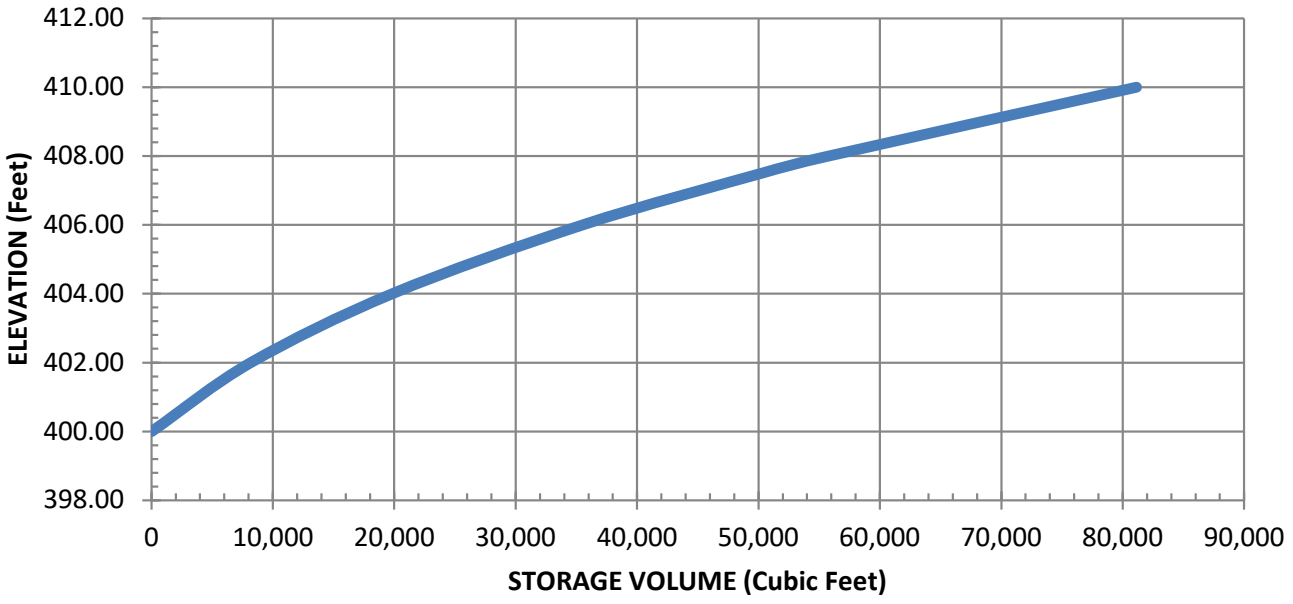
PROJECT TITLE	LOCATION
Sheffield Gardens	**Town of Montgomery**

CALCULATED BY	APPROVED BY	REF DRAWING(S)
ZS	**RW**	

Basin **Forebay A1-B** WQv provided: 1.154 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)
400.00	3,314.0	--	--	--	0.0
402.00	4,891.0	4,102.5	2.0	8,205.0	8,205.0
404.00	6,756.0	5,823.5	2.0	11,647.0	19,852.0
406.00	8,917.0	7,836.5	2.0	15,673.0	35,525.0
407.50	10,720.0	9,818.5	1.5	14,727.8	50,252.8
408.00	11,349.0	11,034.5	0.5	5,517.3	55,770.0
410.00	14,008.0	12,678.5	2.0	25,357.0	81,127.0

Stage Storage Curve



ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

WQv Provided in SMP

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**Jan '24**	**Dec '25**	**4**	**8**

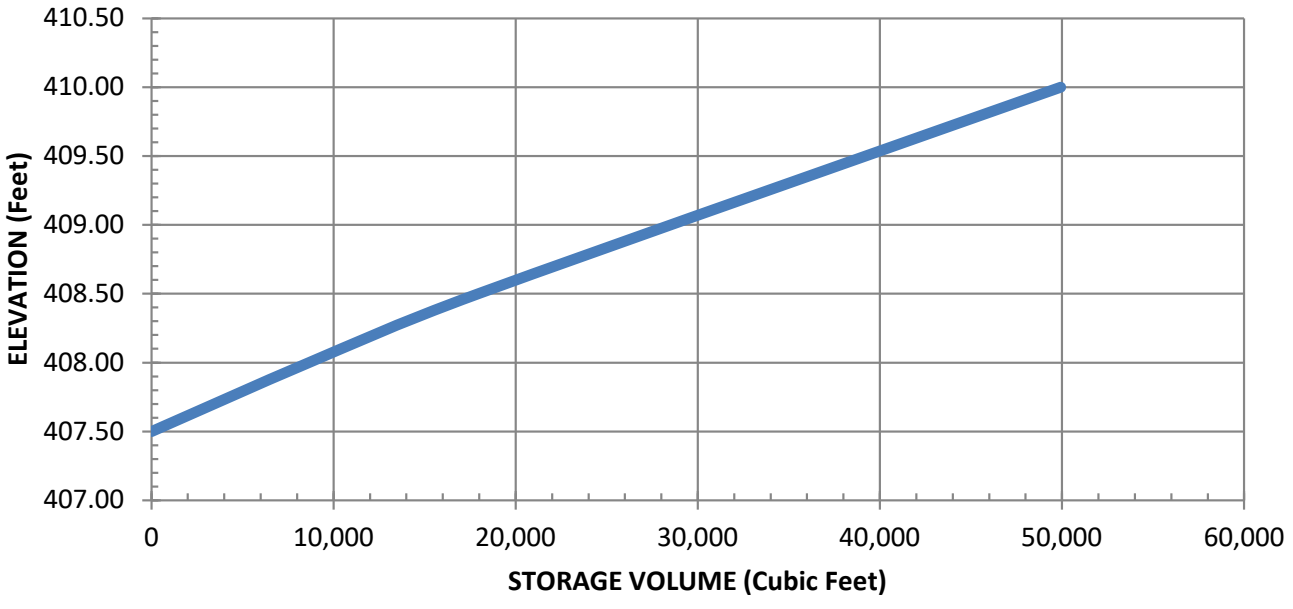
PROJECT TITLE	LOCATION
Sheffield Gardens	**Town of Montgomery**

CALCULATED BY	APPROVED BY	REF DRAWING(S)
ZS	**RW**	

Basin **Bio-Ret A1-B** WQv provided: 0.412 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)
407.50	16,689.0	--	--	--	0.0
408.00	17,949.0	17,319.0	0.5	8,659.5	8,659.5
408.50	19,248.0	18,598.5	0.5	9,299.3	17,958.8
410.00	23,380.0	21,314.0	1.5	31,971.0	49,929.8

Stage Storage Curve



ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

WQv Provided in SMP

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**Jan '24**	**Dec '25**	**5**	**8**

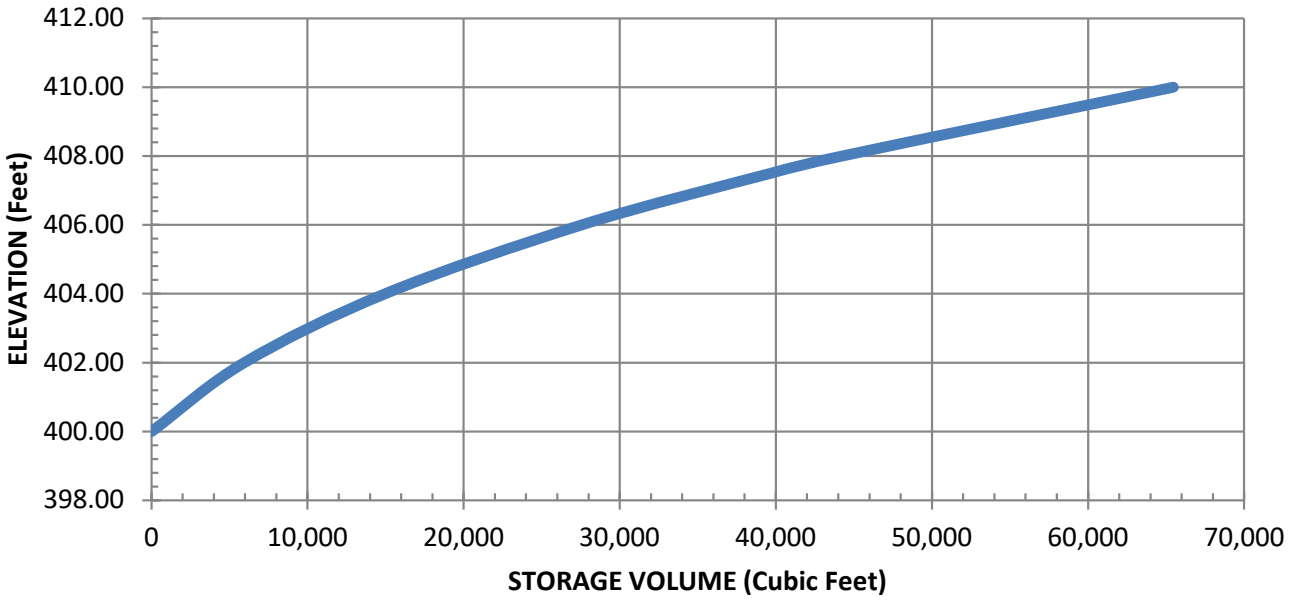
PROJECT TITLE	LOCATION
Sheffield Gardens	**Town of Montgomery**

CALCULATED BY	APPROVED BY	REF DRAWING(S)
ZS	**RW**	

Basin **Forebay B1-A** WQv provided: 0.911 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)
400.00	2,277.0	--	--	--	0.0
402.00	3,680.0	2,978.5	2.0	5,957.0	5,957.0
404.00	5,342.0	4,511.0	2.0	9,022.0	14,979.0
406.00	7,258.0	6,300.0	2.0	12,600.0	27,579.0
407.50	8,858.0	8,058.0	1.5	12,087.0	39,666.0
408.00	9,420.0	9,139.0	0.5	4,569.5	44,235.5
410.00	11,808.0	10,614.0	2.0	21,228.0	65,463.5

Stage Storage Curve



ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

WQv Provided in SMP

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**Jan '24**	**Dec '25**	**6**	**8**

PROJECT TITLE
Sheffield Gardens

LOCATION
Town of Montgomery

CALCULATED BY
ZS

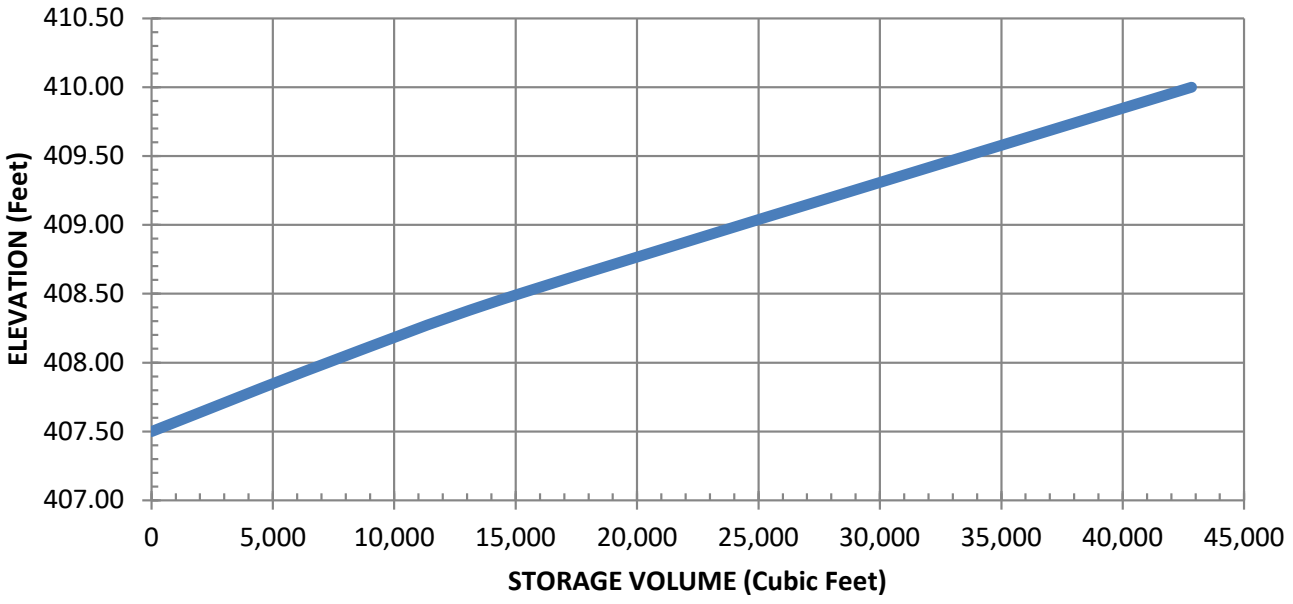
APPROVED BY
RW

REF DRAWING(S)

Basin **Bio-Ret B1-A** WQv provided: 0.348 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)
407.50	13,943.0	--	--	--	0.0
408.00	15,166.0	14,554.5	0.5	7,277.3	7,277.3
408.50	16,427.0	15,796.5	0.5	7,898.3	15,175.5
410.00	20,447.0	18,437.0	1.5	27,655.5	42,831.0

Stage Storage Curve



ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

WQv Provided in SMP

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**Jan '24**	**Dec '25**	**7**	**8**

PROJECT TITLE
Sheffield Gardens

LOCATION
Town of Montgomery

CALCULATED BY
ZS

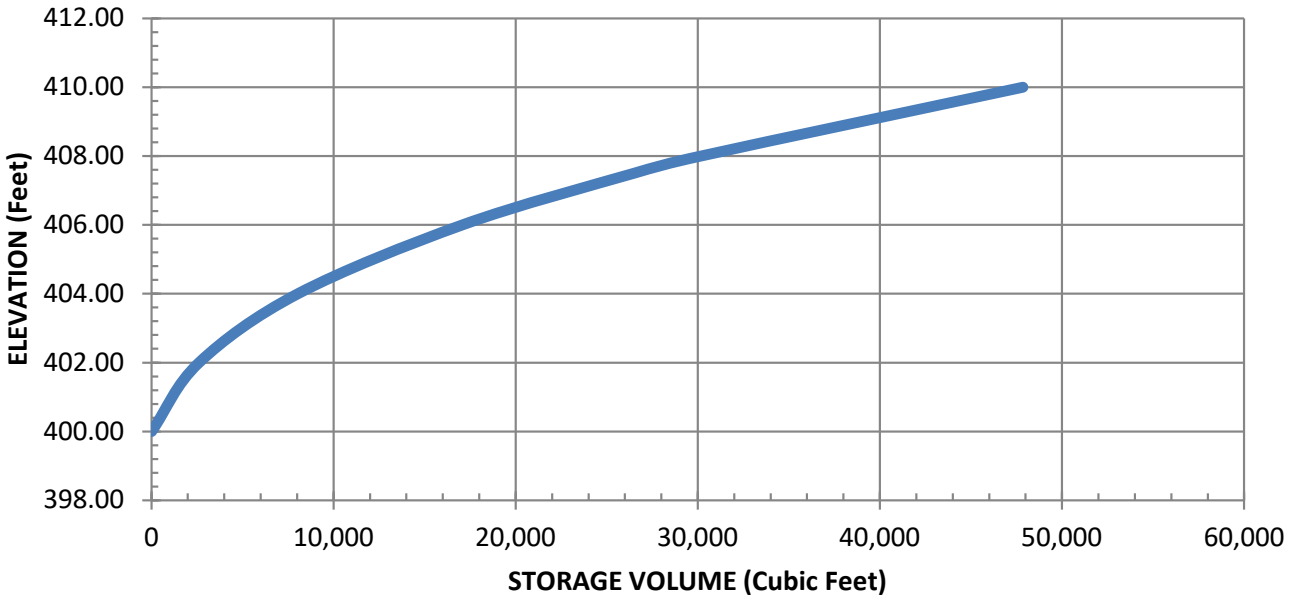
APPROVED BY
RW

REF DRAWING(S)

Basin **Forebay B1-B** WQv provided: 0.608 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)
400.00	713.0	--	--	--	0.0
402.00	1,896.0	1,304.5	2.0	2,609.0	2,609.0
404.00	3,550.0	2,723.0	2.0	5,446.0	8,055.0
406.00	5,471.0	4,510.5	2.0	9,021.0	17,076.0
407.50	7,078.0	6,274.5	1.5	9,411.8	26,487.8
408.00	7,642.0	7,360.0	0.5	3,680.0	30,167.8
410.00	10,040.0	8,841.0	2.0	17,682.0	47,849.8

Stage Storage Curve



ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

WQv Provided in SMP

WO. NO.	DATE	REVISED	SHEET	OF
1146.01	**Jan '24**	**Dec '25**	**8**	**8**

PROJECT TITLE
Sheffield Gardens

LOCATION
Town of Montgomery

CALCULATED BY
ZS

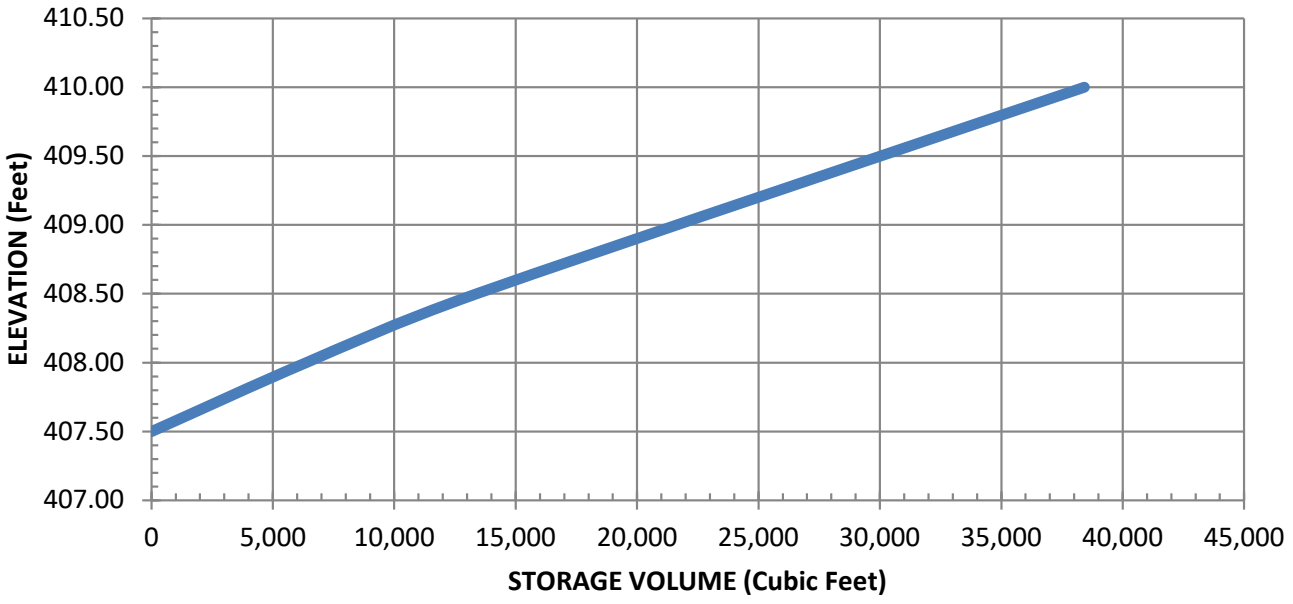
APPROVED BY
RW

REF DRAWING(S)

Basin **Bio-Ret B1-B** WQv provided: 0.308 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)
407.50	12,169.0	--	--	--	0.0
408.00	13,395.0	12,782.0	0.5	6,391.0	6,391.0
408.50	14,660.0	14,027.5	0.5	7,013.8	13,404.8
410.00	18,691.0	16,675.5	1.5	25,013.3	38,418.0

Stage Storage Curve



ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

WATER QUALITY VOLUME CALCULATIONS

WO. NO.	DATE	REVISED	SHEET	OF
103.0301	**Jan '24**	**May '26**	**1**	**1**

PROJECT TITLE
Sheffield Gardens

LOCATION
Town of Montgomery

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	2.686	4.891	0.544	13,529 0.311
PR - A1-B	1.40	2.268	4.432	0.511	11,500 0.264
PR - A1-C	1.40	0.000	0.667	0.050	170 0.004
PR - A2	1.40	1.295	27.087	0.093	12,806 0.294
PR - B1-A	1.40	2.547	4.885	0.519	12,891 0.296
PR - B1-B	1.40	2.200	4.222	0.519	11,136 0.256
PR - B1-C	1.40	0.000	0.461	0.050	118 0.003
PR - B2	1.40	0.390	11.782	0.080	4,778 0.110

APPENDIX 14

DRAINAGE PIPE

CALCULATIONS

ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

STORM DRAINAGE PIPE DESIGN WORKSHEET

WO. NO.	DATE	REVISED	SHEET
103.0301	09/17/24	12/08/25	1 OF 4

PROJECT TITLE	LOCATION	STORM FREQUENCY	PIPE TYPE
Sheffield Gardens	**Town of Montgomery**	**10 Year**	**HDPE**

CALCULATED BY	APPROVED BY	REF DRAWING(S)	RAINFALL CURVE
ZS	**RW**	**DWG LAST REV. 12/2025**	**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
CB11	CB12		0.12 0.05	0.17	0.90 0.30	0.12	0.12	5.00	-	5.00	6.78	0.8	8.40	0.010	15		4.3	6.8	1.00%	48	0.48	0.00	420.21	419.73	423.77	3.56	2.31	2.00
CB12	CB13		0.34 0.24	0.75	0.90 0.30	0.38	0.50	5.00	0.18	5.18	6.78	3.4	8.40	0.010	15		6.5	6.8	1.00%	87	0.87	0.00	419.73	418.86	422.98	3.25	2.00	2.87
CB13	DMH14		0.28 0.25	1.29	0.90 0.30	0.33	0.83	5.18	0.22	5.41	6.73	5.6	8.40	0.010	15		7.3	6.8	1.00%	60	0.60	0.00	418.86	418.26	422.98	4.12	2.87	4.35
DMH14	DMH15		- -	1.29	0.90 0.30	-	0.83	5.41	0.14	5.55	6.66	5.5	9.61	0.010	15		8.1	7.8	1.31%	208	2.72	0.00	418.26	415.49	423.86	5.60	4.35	6.82
DMH15	CB16		- -	1.29	0.90 0.30	-	1.82	5.55	0.43	5.98	6.63	12.0	13.66	0.010	18		8.7	7.7	1.00%	71	0.71	0.25	415.24	414.53	423.56	8.32	6.82	6.07
CB16	CB17		0.35 0.09	1.72	0.90 0.30	0.34	2.16	5.98	0.14	6.11	6.51	14.0	29.41	0.010	24		9.2	9.4	1.00%	247	2.47	0.50	414.03	411.56	422.10	8.07	6.07	8.11
CB17	CB18		0.36 0.07	2.14	0.90 0.30	0.34	2.50	6.11	0.45	6.56	6.48	16.2	29.41	0.010	24		9.5	9.4	1.00%	58	0.58	0.00	411.56	410.98	421.67	10.11	8.11	9.34
CB18	CB19		0.20 0.02	2.36	0.90 0.30	0.19	2.69	6.56	0.10	6.66	6.36	17.1	29.41	0.010	24		9.7	9.4	1.00%	127	1.27	0.00	410.98	409.71	422.32	11.34	9.34	10.97
CB19	ES3		0.19 0.02	2.57	0.90 0.30	0.17	2.86	6.66	0.22	6.88	6.34	18.1	57.18	0.010	24		16.0	18.2	3.78%	83	3.14	0.00	409.71	406.57	422.68	12.97	10.97	**-408.57**
CB20	CB21		0.57 0.40	0.97	0.90 0.30	0.63	0.63	-	-	-	8.63	5.4	8.40	0.010	15		7.3	6.8	1.00%	247	2.47	1.25	418.92	416.45	422.17	3.25	2.00	4.90
CB21	DMH15		0.35 0.15	1.46	0.90 0.30	0.36	0.99	-	0.57	0.57	8.63	8.5	13.66	0.010	18		8.1	7.7	1.00%	71	0.71	0.25	416.20	415.49	422.60	6.40	4.90	**-416.99**

ENGINEERING & SURVEYING PROPERTIES
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STORM DRAINAGE PIPE DESIGN WORKSHEET

WO. NO.	DATE	REVISED	SHEET
103.0301	09/17/24	12/08/25	2 OF 4

PROJECT TITLE	LOCATION	STORM FREQUENCY	PIPE TYPE
Sheffield Gardens	Town of Montgomery	10 Year	HDPE

CALCULATED BY	APPROVED BY	REF DRAWING(S)	RAINFALL CURVE
ZS	RW	DWG LAST REV. 12/2025	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
CB1	CB2		0.27 0.26	0.54	0.90 0.30	0.33	0.33	5.00	-	5.00	6.78	2.2	8.40	0.010	15		5.8	6.8	1.00%	87	0.87	0.00	419.23	418.36	422.48	3.25	2.00	2.87
CB2	CB3		0.36 0.22	1.12	0.90 0.30	0.39	0.72	5.00	0.25	5.25	6.78	4.9	8.40	0.010	15		7.1	6.8	1.00%	49	0.49	0.00	418.36	417.87	422.48	4.12	2.87	4.15
CB3	CB4		0.13 0.04	1.29	0.90 0.30	0.13	0.85	5.25	0.12	5.37	6.71	5.7	8.40	0.010	15		7.3	6.8	1.00%	55	0.55	0.00	417.87	417.32	423.27	5.40	4.15	4.70
CB4	CB5		0.13 0.04	1.46	0.90 0.30	0.13	0.98	5.37	0.12	5.49	6.68	6.5	8.40	0.010	15		7.6	6.8	1.00%	49	0.49	0.00	417.32	416.83	423.27	5.95	4.70	4.40
CB5	CB6		0.36 0.22	2.04	0.90 0.30	0.39	1.37	5.49	0.11	5.60	6.64	9.1	13.66	0.010	18		8.2	7.7	1.00%	87	0.87	0.25	416.58	415.71	422.48	5.90	4.40	5.27
CB6	DMH7		0.30 0.24	2.59	0.90 0.30	0.34	1.71	5.60	0.18	5.78	6.61	11.3	13.66	0.010	18		8.6	7.7	1.00%	89	0.89	0.00	415.71	414.82	422.48	6.77	5.27	8.17
DMH7	DMH8		- -	2.59	0.90 0.30	-	1.71	5.78	0.17	5.95	6.57	11.2	13.66	0.010	18		8.6	7.7	1.00%	159	1.59	0.00	414.82	413.23	424.49	9.67	8.17	7.27
DMH8	ES 1			2.59	0.90 0.30	-	1.87	5.95	0.31	6.26	6.52	12.2	13.66	0.010	18		9.9	7.7	1.00%	79	0.79	0.00	413.23	412.44	422.00	8.77	7.27	**-413.94**
CB7	CB8		0.05 -	0.05	0.90 0.30	0.04	0.041	-	-	-	8.63	0.4	8.40	0.010	15		3.2	6.8	1.00%	21	0.21	1.25	414.93	414.72	418.18	3.25	2.00	2.21
CB8	DMH8		0.12 0.03	0.20	0.90 0.30	0.12	0.16	-	0.11	0.11	8.63	1.4	8.40	0.010	15		5.0	6.8	1.00%	113	1.13	0.00	414.72	413.59	418.18	3.46	2.21	**-414.84**
CB9	CB10		0.28 0.05	0.33	0.90 0.30	0.27	0.27	-	-	-	8.63	2.3	8.40	0.010	15		5.8	6.8	1.00%	257	2.57	1.25	418.93	416.36	422.18	3.25	2.00	4.90
CB10	ES2		0.21 0.05	0.60	0.90 0.30	0.21	0.47	-	0.74	0.74	8.63	4.1	8.40	0.010	15		6.8	6.8	1.00%	113	1.13	0.00	416.36	415.23	422.51	6.15	4.90	**-416.48**

ENGINEERING & SURVEYING PROPERTIES
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STORM DRAINAGE PIPE DESIGN WORKSHEET

WO. NO.	DATE	REVISED	SHEET
103.0301	09/17/24	12/08/25	3 OF 4

PROJECT TITLE	LOCATION	STORM FREQUENCY	PIPE TYPE
Sheffield Gardens	Town of Montgomery	10 Year	HDPE

CALCULATED BY	APPROVED BY	REF DRAWING(S)	RAINFALL CURVE
ZS	RW	DWG LAST REV. 12/2025	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
CB22	CB23		0.11 0.06	0.17	0.90 0.30	0.12	0.12	5.00	-	5.00	6.78	0.8	8.40	0.010	15		4.2	6.8	1.00%	48	0.48	0.00	420.21	419.73	423.77	3.56	2.31	2.00
CB23	CB24		0.33 0.25	0.75	0.90 0.30	0.37	0.49	5.00	0.19	5.19	6.78	3.3	8.40	0.010	15		6.4	6.8	1.00%	87	0.87	0.00	419.73	418.86	422.98	3.25	2.00	2.87
CB24	DMH25		0.28 0.26	1.29	0.90 0.30	0.33	0.82	5.19	0.23	5.42	6.73	5.5	8.40	0.010	15		7.3	6.8	1.00%	64	0.64	0.00	418.86	418.22	422.98	4.12	2.87	4.21
DMH25	DMH26		- -	1.29	0.90 0.30	-	0.82	5.42	0.15	5.56	6.66	5.4	9.39	0.010	15		7.9	7.7	1.25%	224	2.80	0.00	418.22	415.42	423.68	5.46	4.21	5.34
DMH26	CB27		- -	1.29	0.90 0.30	-	1.90	5.56	0.47	6.04	6.62	12.6	13.66	0.010	18		8.8	7.7	1.00%	26	0.26	0.25	415.17	414.91	422.01	6.84	5.34	5.29
CB27	CB28		0.34 0.10	1.72	0.90 0.30	0.33	2.23	6.04	0.05	6.09	6.50	14.5	29.41	0.010	24		9.3	9.4	1.00%	269	2.69	0.50	414.41	411.72	421.70	7.29	5.29	8.14
CB28	CB29		0.29 0.04	2.05	0.90 0.30	0.28	2.51	6.09	0.48	6.57	6.48	16.3	29.41	0.010	24		9.6	9.4	1.00%	68	0.68	0.00	411.72	411.04	421.86	10.14	8.14	9.71
CB29	ES4		0.18 0.02	2.25	0.90 0.30	0.17	2.67	6.57	0.12	6.69	6.36	17.0	29.41	0.010	24		9.7	9.4	1.00%	127	1.27	0.00	411.04	409.77	422.75	11.71	9.71	**-411.77**
ES4																												
CB30	CB31		0.58 0.69	1.27	0.90 0.30	0.73	0.73	-	-	-	8.63	6.3	8.40	0.010	15		7.5	6.8	1.00%	226	2.26	1.25	418.92	416.66	422.17	3.25	2.00	4.90
CB31	CB32		0.21 0.07	1.55	0.90 0.30	0.21	0.94	-	0.50	0.50	8.63	8.1	8.40	0.010	15		7.8	6.8	1.00%	63	0.63	0.00	416.66	416.03	422.81	6.15	4.90	5.18
CB32	DMH26		0.13 0.08	1.76	0.90 0.30	0.14	1.08	0.50	0.13	0.64	8.40	9.1	13.66	0.010	18		8.2	7.7	1.00%	36	0.36	0.25	415.78	415.42	422.46	6.68	5.18	**-416.92**

ENGINEERING & SURVEYING PROPERTIES
Achieving Successful Results with Innovative Designs

STORM DRAINAGE PIPE DESIGN WORKSHEET

WO. NO.	DATE	REVISED	SHEET
103.0301	09/17/24	12/08/25	4 OF 4

PROJECT TITLE	LOCATION	STORM FREQUENCY	PIPE TYPE
Sheffield Gardens	Town of Montgomery	10 Year	HDPE

CALCULATED BY	APPROVED BY	REF DRAWING(S)	RAINFALL CURVE
ZS	RW	DWG LAST REV. 12/2025	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
CB33	CB34		0.29 0.25	0.54	0.90 0.30	0.34	0.34	5.00	-	5.00	6.78	2.3	8.40	0.010	15		5.8	6.8	1.00%	87	0.87	0.00	419.23	418.36	422.48	3.25	2.00	2.87
CB34	CB35		0.33 0.25	1.12	0.90 0.30	0.37	0.71	5.00	0.25	5.25	6.78	4.8	8.40	0.010	15		7.1	6.8	1.00%	49	0.49	0.00	418.36	417.87	422.48	4.12	2.87	4.15
CB35	CB36		0.09 0.07	1.29	0.90 0.30	0.11	0.81	5.25	0.12	5.37	6.71	5.5	8.40	0.010	15		7.3	6.8	1.00%	55	0.55	0.00	417.87	417.32	423.27	5.40	4.15	4.70
CB36	CB37		0.09 0.08	1.46	0.90 0.30	0.11	0.92	5.37	0.13	5.49	6.68	6.1	8.40	0.010	15		7.4	6.8	1.00%	49	0.49	0.00	417.32	416.83	423.27	5.95	4.70	4.40
CB37	CB38		0.32 0.26	2.04	0.90 0.30	0.37	1.29	5.49	0.11	5.60	6.64	8.6	13.66	0.010	18		8.1	7.7	1.00%	87	0.87	0.25	416.58	415.71	422.48	5.90	4.40	5.27
CB38	DMH39		0.29 0.26	2.59	0.90 0.30	0.34	1.62	5.60	0.18	5.78	6.61	10.7	13.66	0.010	18		8.5	7.7	1.00%	91	0.91	0.00	415.71	414.80	422.48	6.77	5.27	8.19
DMH39	CB40		- -	2.59	0.90 0.30	-	1.62	5.78	0.18	5.96	6.56	10.7	13.66	0.010	18		8.5	7.7	1.00%	127	1.27	0.00	414.80	413.53	424.49	9.69	8.19	7.48
CB40	CB41		0.27 0.08	2.94	0.90 0.30	0.27	1.89	5.96	0.25	6.21	6.52	12.3	13.66	0.010	18		8.7	7.7	1.00%	258	2.58	0.00	413.53	410.95	422.51	8.98	7.48	9.73
CB41	CB42		0.28 0.05	3.27	0.90 0.30	0.27	2.16	6.21	0.49	6.70	6.45	13.9	29.41	0.010	24		9.2	9.4	1.00%	44	0.44	0.50	410.45	410.01	422.18	11.73	9.73	10.74
CB42	ES5		0.17 0.01	3.45	0.90 0.30	0.15	2.31	6.70	0.08	6.78	6.33	14.6	29.41	0.010	24		9.3	9.4	1.00%	XX	#VALUE!	0.00	410.01	#VALUE!	422.75	12.74	10.74	#VALUE!
ES5																												

APPENDIX 15

CONSTRUCTION SITE INSPECTION FORM, NOTICE OF INTENT & MS4 ACCEPTANCE

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 _____

0644089821

RESET

NOTICE OF INTENT

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

NYR _____ (for DEC use only)

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-20-001

All sections must be completed unless otherwise noted. Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this General Permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan prior to submitting this NOI. Applicants are responsible for identifying and obtaining other DEC permits that may be required.

-IMPORTANT-
RETURN THIS FORM TO THE ADDRESS ABOVE

OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

Owner/Operator (Company Name/Private Owner Name/Municipality Name)

Owner/Operator Contact Person Last Name (NOT CONSULTANT)

Owner/Operator Contact Person First Name

Owner/Operator Mailing Address

City

State

Zip -

Phone (Owner/Operator) - -

Fax (Owner/Operator) - -

Email (Owner/Operator)

FED TAX ID - (not required for individuals)

Project Site Information

Project/Site Name

Street Address (NOT P.O. BOX)

Side of Street

○ **North** ○ **South** ○ **East** ○ **West**

City/Town/Village (THAT ISSUES BUILDING PERMIT)

State N Y Zip - County DEC Region

Name of Nearest Cross Street

Distance to Nearest Cross Street (Feet)

Project In Relation to Cross Street

○ **North** ○ **South** ○ **East** ○ **West**

Tax Map Numbers
Section-Block-Parcel

Tax Map Numbers

1. Provide the Geographic Coordinates for the project site. To do this, go to the NYSDEC Stormwater Interactive Map on the DEC website at:

https://gisservices.dec.ny.gov/gis/stormwater/

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located the centroid of your project site, go to the bottom right hand corner of the map for the X, Y coordinates. Enter the coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting)

-7

Ex. -73.749

Y Coordinates (Northing)

4

Ex. 42.652

2. What is the nature of this construction project?

○ **New Construction**

○ **Redevelopment with increase in impervious area**

○ **Redevelopment with no increase in impervious area**

3. Select the predominant land use for both pre and post development conditions.
SELECT ONLY ONE CHOICE FOR EACH

Pre-Development Existing Land Use

- ○ FOREST
- ○ PASTURE/OPEN LAND
- ○ CULTIVATED LAND
- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY
- ○ PARKING LOT
- ○ OTHER

Post-Development Future Land Use

- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION — Number of Lots
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ MUNICIPAL
- ○ ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY (water, sewer, gas, etc.)
- ○ PARKING LOT
- ○ CLEARING/GRADING ONLY
- ○ DEMOLITION, NO REDEVELOPMENT
- ○ WELL DRILLING ACTIVITY *(Oil, Gas, etc.)
- ○ OTHER

***Note**: for gas well drilling, non-high volume hydraulic fractured wells only

4. In accordance with the larger common plan of development or sale, enter the total project site area; the total area to be disturbed; existing impervious area to be disturbed (for redevelopment activities); and the future impervious area constructed within the disturbed area. (Round to the nearest tenth of an acre.)

Total Site Area	**Total Area To Be Disturbed**	**Existing Impervious Area To Be Disturbed**	**Future Impervious Area Within Disturbed Area**
.	.	.	.

5. Do you plan to disturb more than 5 acres of soil at any one time? ○ **Yes** ○ **No**

6. Indicate the percentage of each Hydrologic Soil Group(HSG) at the site.

A	**B**	**C**	**D**
%	%	%	%

7. Is this a phased project? ○ **Yes** ○ **No**

8. Enter the planned start and end dates of the disturbance activities.

Start Date / / - **End Date** / /

9. Identify the nearest surface waterbody(ies) to which construction site runoff will discharge.

Name

9a. Type of waterbody identified in Question 9?

- ○ Wetland / State Jurisdiction On Site (Answer 9b)
- ○ Wetland / State Jurisdiction Off Site
- ○ Wetland / Federal Jurisdiction On Site (Answer 9b)
- ○ Wetland / Federal Jurisdiction Off Site
- ○ Stream / Creek On Site
- ○ Stream / Creek Off Site
- ○ River On Site
- ○ River Off Site
- ○ Lake On Site
- ○ Lake Off Site
- ○ Other Type On Site
- ○ Other Type Off Site

9b. How was the wetland identified?

- ○ Regulatory Map
- ○ Delineated by Consultant
- ○ Delineated by Army Corps of Engineers
- ○ Other (identify)

10. Has the surface waterbody(ies) in question 9 been identified as a 303(d) segment in Appendix E of GP-0-20-001? ○ **Yes** ○ **No**

11. Is this project located in one of the Watersheds identified in Appendix C of GP-0-20-001? ○ **Yes** ○ **No**

12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? ○ **Yes** ○ **No**
If no, skip question 13.

13. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey? ○ **Yes** ○ **No**
If Yes, what is the acreage to be disturbed?

.

14. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area? ○ **Yes** ○ **No**

15. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)? ○ **Yes** ○ **No** ○ **Unknown**

16. What is the name of the municipality/entity that owns the separate storm sewer system?

17. Does any runoff from the site enter a sewer classified as a Combined Sewer? ○ **Yes** ○ **No** ○ **Unknown**

18. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law? ○ **Yes** ○ **No**

19. Is this property owned by a state authority, state agency, federal government or local government? ○ **Yes** ○ **No**

20. Is this a remediation project being done under a Department approved work plan? (i.e. CERCLA, RCRA, Voluntary Cleanup Agreement, etc.) ○ **Yes** ○ **No**

21. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book)? ○ **Yes** ○ **No**

22. Does this construction activity require the development of a SWPPP that includes the post-construction stormwater management practice component (i.e. Runoff Reduction, Water Quality and Quantity Control practices/techniques)? ○ **Yes** ○ **No**
If No, skip questions 23 and 27-39.

23. Has the post-construction stormwater management practice component of the SWPPP been developed in conformance with the current NYS Stormwater Management Design Manual? ○ **Yes** ○ **No**

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:

- ○ **Professional Engineer (P.E.)**
- ○ **Soil and Water Conservation District (SWCD)**
- ○ **Registered Landscape Architect (R.L.A)**
- ○ **Certified Professional in Erosion and Sediment Control (CPESC)**
- ○ **Owner/Operator**
- ○ **Other**

SWPPP Preparer

Contact Name (Last, Space, First)

Mailing Address

City

State Zip -

Phone - -

Fax - -

Email

SWPPP Preparer Certification

I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-20-001. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

First Name **MI**

Last Name

Signature

Date / /

25. Has a construction sequence schedule for the planned management practices been prepared? ○ Yes ○ No

26. Select **all** of the erosion and sediment control practices that will be employed on the project site:

Temporary Structural

- ○ Check Dams
- ○ Construction Road Stabilization
- ○ Dust Control
- ○ Earth Dike
- ○ Level Spreader
- ○ Perimeter Dike/Swale
- ○ Pipe Slope Drain
- ○ Portable Sediment Tank
- ○ Rock Dam
- ○ Sediment Basin
- ○ Sediment Traps
- ○ Silt Fence
- ○ Stabilized Construction Entrance
- ○ Storm Drain Inlet Protection
- ○ Straw/Hay Bale Dike
- ○ Temporary Access Waterway Crossing
- ○ Temporary Stormdrain Diversion
- ○ Temporary Swale
- ○ Turbidity Curtain
- ○ Water bars

Biotechnical

- ○ Brush Matting
- ○ Wattling

Vegetative Measures

- ○ Brush Matting
- ○ Dune Stabilization
- ○ Grassed Waterway
- ○ Mulching
- ○ Protecting Vegetation
- ○ Recreation Area Improvement
- ○ Seeding
- ○ Sodding
- ○ Straw/Hay Bale Dike
- ○ Streambank Protection
- ○ Temporary Swale
- ○ Topsoiling
- ○ Vegetating Waterways

Permanent Structural

- ○ Debris Basin
- ○ Diversion
- ○ Grade Stabilization Structure
- ○ Land Grading
- ○ Lined Waterway (Rock)
- ○ Paved Channel (Concrete)
- ○ Paved Flume
- ○ Retaining Wall
- ○ Riprap Slope Protection
- ○ Rock Outlet Protection
- ○ Streambank Protection

Other

Post-construction Stormwater Management Practice (SMP) Requirements

Important: Completion of Questions 27-39 is not required if response to Question 22 is No.

27. Identify all site planning practices that were used to prepare the final site plan/layout for the project.

- ○ **Preservation of Undisturbed Areas**
- ○ **Preservation of Buffers**
- ○ **Reduction of Clearing and Grading**
- ○ **Locating Development in Less Sensitive Areas**
- ○ **Roadway Reduction**
- ○ **Sidewalk Reduction**
- ○ **Driveway Reduction**
- ○ **Cul-de-sac Reduction**
- ○ **Building Footprint Reduction**
- ○ **Parking Reduction**

27a. Indicate which of the following soil restoration criteria was used to address the requirements in Section 5.1.6("Soil Restoration") of the Design Manual (2010 version).

- ○ All disturbed areas will be restored in accordance with the Soil Restoration requirements in Table 5.3 of the Design Manual (see page 5-22).
- ○ Compacted areas were considered as impervious cover when calculating the **WQv Required**, and the compacted areas were assigned a post-construction Hydrologic Soil Group (HSG) designation that is one level less permeable than existing conditions for the hydrology analysis.

28. Provide the total Water Quality Volume (WQv) required for this project (based on final site plan/layout).

Total WQv Required

			.				**acre-feet**

29. Identify the RR techniques (Area Reduction), RR techniques(Volume Reduction) and Standard SMPs with RRv Capacity in Table 1 (See Page 9) that were used to reduce the Total WQv Required(#28).

Also, provide in Table 1 the total impervious area that contributes runoff to each technique/practice selected. For the Area Reduction Techniques, provide the total contributing area (includes pervious area) and, if applicable, the total impervious area that contributes runoff to the technique/practice.

Note: Redevelopment projects shall use Tables 1 and 2 to identify the SMPs used to treat and/or reduce the WQv required. If runoff reduction techniques will not be used to reduce the required WQv, skip to question 33a after identifying the SMPs.

Table 1 - Runoff Reduction (RR) Techniques and Standard Stormwater Management Practices (SMPs)

	Total Contributing Area (acres)		Total Contributing Impervious Area(acres)
RR Techniques (Area Reduction)			
○ Conservation of Natural Areas (RR-1)	___.___	and/or	___.___
○ Sheetflow to Riparian Buffers/Filters Strips (RR-2)	___.___	and/or	___.___
○ Tree Planting/Tree Pit (RR-3)	___.___	and/or	___.___
○ Disconnection of Rooftop Runoff (RR-4)	___.___	and/or	___.___
RR Techniques (Volume Reduction)			
○ Vegetated Swale (RR-5)			___.___
○ Rain Garden (RR-6)			___.___
○ Stormwater Planter (RR-7)			___.___
○ Rain Barrel/Cistern (RR-8)			___.___
○ Porous Pavement (RR-9)			___.___
○ Green Roof (RR-10)			___.___
Standard SMPs with RRv Capacity			
○ Infiltration Trench (I-1)			___.___
○ Infiltration Basin (I-2)			___.___
○ Dry Well (I-3)			___.___
○ Underground Infiltration System (I-4)			___.___
○ Bioretention (F-5)			___.___
○ Dry Swale (O-1)			___.___
Standard SMPs			
○ Micropool Extended Detention (P-1)			___.___
○ Wet Pond (P-2)			___.___
○ Wet Extended Detention (P-3)			___.___
○ Multiple Pond System (P-4)			___.___
○ Pocket Pond (P-5)			___.___
○ Surface Sand Filter (F-1)			___.___
○ Underground Sand Filter (F-2)			___.___
○ Perimeter Sand Filter (F-3)			___.___
○ Organic Filter (F-4)			___.___
○ Shallow Wetland (W-1)			___.___
○ Extended Detention Wetland (W-2)			___.___
○ Pond/Wetland System (W-3)			___.___
○ Pocket Wetland (W-4)			___.___
○ Wet Swale (O-2)			___.___

Table 2 - Alternative SMPs (DO NOT INCLUDE PRACTICES BEING USED FOR PRETREATMENT ONLY)

Alternative SMP	Total Contributing Impervious Area(acres)
○ **Hydrodynamic**	
○ **Wet Vault**	
○ **Media Filter**	
○ **Other**	

Provide the name and manufacturer of the Alternative SMPs (i.e. proprietary practice(s)) being used for WQv treatment.

Name

Manufacturer

Note: Redevelopment projects which do not use RR techniques, shall use questions 28, 29, 33 and 33a to provide SMPs used, total WQv required and total WQv provided for the project.

30. Indicate the Total RRv provided by the RR techniques (Area/Volume Reduction) and Standard SMPs with RRv capacity identified in question 29.

Total RRv provided

. **acre-feet**

31. Is the Total RRv provided (#30) greater than or equal to the total WQv required (#28).

○ **Yes** ○ **No**

If Yes, go to question 36.
If No, go to question 32.

32. Provide the Minimum RRv required based on HSG.
[Minimum RRv Required = (P)(0.95)(Ai)/12, Ai=(S)(Aic)]

Minimum RRv Required

. **acre-feet**

32a. Is the Total RRv provided (#30) greater than or equal to the Minimum RRv Required (#32)?

○ **Yes** ○ **No**

If Yes, go to question 33.
Note: Use the space provided in question #39 to summarize the specific site limitations and justification for not reducing 100% of WQv required (#28). A detailed evaluation of the specific site limitations and justification for not reducing 100% of the WQv required (#28) must also be included in the SWPPP.
If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

33. Identify the Standard SMPs in Table 1 and, if applicable, the Alternative SMPs in Table 2 that were used to treat the remaining total WQv(=Total WQv Required in 28 - Total RRv Provided in 30).

Also, provide in Table 1 and 2 the total impervious area that contributes runoff to each practice selected.

Note: Use Tables 1 and 2 to identify the SMPs used on Redevelopment projects.

33a. Indicate the Total WQv provided (i.e. WQv treated) by the SMPs identified in question #33 and Standard SMPs with RRv Capacity identified in question 29.

WQv Provided

[ ][ ][ ].[ ][ ][ ] **acre-feet**

Note: For the standard SMPs with RRv capacity, the WQv provided by each practice = the WQv calculated using the contributing drainage area to the practice - RRv provided by the practice. (See Table 3.5 in Design Manual)

34. Provide the sum of the Total RRv provided (#30) and the WQv provided (#33a). [ ][ ][ ].[ ][ ][ ]

35. Is the sum of the RRv provided (#30) and the WQv provided (#33a) greater than or equal to the total WQv required (#28)? ○ **Yes** ○ **No**

If Yes, go to question 36.
If No, sizing criteria has not been met, so NOI can not be processed. SWPPP preparer must modify design to meet sizing criteria.

36. Provide the total Channel Protection Storage Volume (CPv) required and provided or select waiver (36a), if applicable.

CPv Required

[ ][ ][ ].[ ][ ][ ] **acre-feet**

CPv Provided

[ ][ ][ ].[ ][ ][ ] **acre-feet**

36a. The need to provide channel protection has been waived because:

○ Site discharges directly to tidal waters or a fifth order or larger stream.

○ Reduction of the total CPv is achieved on site through runoff reduction techniques or infiltration systems.

37. Provide the Overbank Flood (Qp) and Extreme Flood (Qf) control criteria or select waiver (37a), if applicable.

Total Overbank Flood Control Criteria (Qp)

Pre-Development

[ ][ ][ ].[ ][ ][ ] **CFS**

Post-development

[ ][ ][ ].[ ][ ][ ] **CFS**

Total Extreme Flood Control Criteria (Qf)

Pre-Development

[ ][ ][ ].[ ][ ][ ] **CFS**

Post-development

[ ][ ][ ].[ ][ ][ ] **CFS**

37a. The need to meet the Qp and Qf criteria has been waived because:

- ○ Site discharges directly to tidal waters or a fifth order or larger stream.
- ○ Downstream analysis reveals that the Qp and Qf controls are not required

38. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed? ○ **Yes** ○ **No**

If Yes, Identify the entity responsible for the long term Operation and Maintenance

39. Use this space to summarize the specific site limitations and justification for not reducing 100% of WQv required(#28). (See question 32a) This space can also be used for other pertinent project information.

40. Identify other DEC permits, existing and new, that are required for this project/facility.

- ○ Air Pollution Control
- ○ Coastal Erosion
- ○ Hazardous Waste
- ○ Long Island Wells
- ○ Mined Land Reclamation
- ○ Solid Waste
- ○ Navigable Waters Protection / Article 15
- ○ Water Quality Certificate
- ○ Dam Safety
- ○ Water Supply
- ○ Freshwater Wetlands/Article 24
- ○ Tidal Wetlands
- ○ Wild, Scenic and Recreational Rivers
- ○ Stream Bed or Bank Protection / Article 15
- ○ Endangered or Threatened Species(Incidental Take Permit)
- ○ Individual SPDES
- ○ SPDES Multi-Sector GP [N][Y][R][ ][ ][ ][ ][ ][ ]
- ○ Other [ ]
- ○ None

41. Does this project require a US Army Corps of Engineers Wetland Permit? ○ **Yes** ○ **No**
If Yes, Indicate Size of Impact. [ ][ ][ ][ ][ ].[ ]

42. Is this project subject to the requirements of a regulated, traditional land use control MS4? ○ **Yes** ○ **No**
(If No, skip question 43)

43. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI? ○ **Yes** ○ **No**

44. If this NOI is being submitted for the purpose of continuing or transferring coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned. [N][Y][R][ ][ ][ ][ ][ ][ ]

Owner/Operator Certification

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Print First Name **MI**

Print Last Name

Owner/Operator Signature

Date / /

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 16

CONSTRUCTION WASTE MANAGEMENT & SPILL PREVENTION PLANS

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 17

NEW YORK STATE

RECREATION AND HISTORIC

PRESERVATION

DETERMINATION

New York State
Parks, Recreation and
Historic Preservation

KATHY HOCHUL
Governor

ERIK KULLESEID
Commissioner

December 4, 2023

Jane Samuelson
Professional Engineer
Engineering & Surveying Properties
71 Clinton Street
Montgomery, NY 12549

Re: SEQRA
Sheffield Gardens: Subdivision and Multi-use Development
State Route 17K, Montgomery, NY 12549
23PR02059

Dear Jane Samuelson:

Thank you for requesting the comments of the Division for Historic Preservation of the Office of Parks, Recreation and Historic Preservation (OPRHP). We have reviewed the submitted materials in accordance with the New York State Historic Preservation Act of 1980 (section 14.09 of the New York Parks, Recreation and Historic Preservation Law). These comments are those of the Division for Historic Preservation and relate only to Historic/Cultural resources. They do not include potential environmental impacts to New York State Parkland that may be involved in or near your project.

OPRHP has reviewed the Phase IB Archaeological Survey report for the Sheffield Gardens: Subdivision and Multi-use Development project (23PR02059) prepared by TRACKER Archaeology, Inc., Consulting Archaeologists (August 2023; 23SR00607). OPRHP concurs with the report recommendation that no additional archaeological investigation is warranted.

Based upon this review, it is OPRHP's opinion that no properties, including archaeological and/or historic resources, listed in or eligible for the New York State and National Registers of Historic Places will be impacted by this project.

If you have any questions, I can be reached at Bradley.Russell@parks.ny.gov.

Sincerely,

Brad Russell

Bradley W. Russell, Ph.D.
Historic Preservation Specialist - Archaeology

APPENDIX 18

TOWN OF MONTGOMERY

GENERAL ENHANCED

EROSION AND SEDIMENT

CONTROL PLAN FOR LARGE

PROJECTS

GENERAL ENHANCED EROSION AND SEDIMENT CONTROL PLAN FOR LARGE PROJECTS

Jay Beaumont PE, Vice-Chairman of the Town of Montgomery Planning Board

Stormwater Pollution Prevention Plan

This Enhanced Erosion and Sediment Control Plan shall be incorporated into the project Stormwater Pollution Prevention Plan. Most of the recommended erosion and sediment control measures are presented in the NYS Standards and Specifications for Erosion and Sediment Control (Bluebook). The recommended measures are more "durable" and better able to withstand rainfall, runoff, and wind.

Five-Acre Disturbance Waiver

The Town of Montgomery Planning Board expects to require that the following measures be incorporated in the plans in connection with any waiver the Planning Board may elect to grant in this regard. The Town of Montgomery does not allow more than 18 acres to be disturbed at any one time. Eighteen acres is the maximum disturbance limit recommended by NYSDEC.

Site Soil Conditions

The Town of Montgomery has extremely silty soils. Many soil types appear to be almost entirely very small silt particles. The silt particles tend to remain suspended in water for long periods of time; making removal in sediment ponds marginally successful at best. In addition, the particles are so small that some of the particles pass through many sediment collection measures; such as hay/straw bales, terra tubes, riprap, jute mats, and vegetated areas. The particles that do not pass through must be removed periodically to prevent clogging of the measures. Furthermore, if the sediment is not removed, the measure may become filled, and sediment laden runoff water will be able to bypass the measure.

Enhanced Erosion and Sediment Control Measures

Intermediate Erosion and Sediment Control Plans

The applicant's engineer should recognize that the fine silt soils on the site require extra erosion and sediment control measures to protect the streams, wetlands and floodplains downstream of the site.

The applicant's engineer should prepare intermediate grading plans and erosion and sediment control plans with specifications for each phase of the earthmoving work on the project. The intermediate grading plans should address the amounts of rock and soil to be moved during the phase. In addition, the location of the material to be moved and the location of where the material will be placed should be outlined on site intermediate grading plans.

The intermediate grading plans should show the locations of the resulting stock piles, soil slopes, drainage ditches, slope diversion pipes, check dams, haul roads, sedimentation ponds, and other erosion and sediment control measures.

The erosion and sediment control measures should include:

- Design erosion and sediment control measures as per the NYS Standards and Specifications for Erosion and Sediment Control (Bluebook), BUT the drainage area used to design the measure should be 100% larger than the actual drainage area in anticipation of wetter than normal weather conditions and the difficulty of dealing with very silty soils. Examples include, but are not limited to:
    - Wider ditches
    - Higher and stronger check dams
    - Larger sediment ponds configured with length:width ratio equal to 2:1 ratio or greater
- Apply slope protection measures within 7 days after earthmoving on a particular slope is complete.
- Install more numerous sediment fences with hay bales
- Install bonded fiber matrix hydraulically applied mulch as manufactured by Profile Products or approved equal (hay/straw mulch and unbonded hydraulically applied mulches are not acceptable)
- Perform equipment (cat) tracking for bare slopes to be protected. Slopes must be tracked from top of the slope to the bottom of the slope. (See page 4.56 of the Bluebook)
- Install flexible growth medium with seed, soil amendment, and fertilizer
- Install Hydraulically-Applied Erosion Control Bonded Fiber Matrix available from Profile Products or approved equal. (See page 4.38 of the Bluebook)
- Install slope crest protection (perimeter dike/swale) measures to divert flow from going down the slope. (See page 3.36 of the Bluebook)
- Install pipe slope drains. (See page 3.37 of the Bluebook)
- Install reverse slope bench on the long slopes to convey water to a stable outlet. (See page 4.24 of the Bluebook)
- Install Geosynthetic Turf Reinforcement Mats available from Profile Products or approved equal on the embankments of sediment basins; immediately following construction. (See pages 5.19 to 5.41 of the Bluebook)
- Install Geosynthetic Turf Reinforcement Mats available from Profile Products or approved equal in constructed ditches within two days of construction to stabilize the ditch.
- Test soils on slopes to be revegetated to get characteristics for soil amendments. Soils testing to be performed by Profile Products or acceptable equal soils testing laboratory.
- Install Hydraulically-Applied Erosion Control Flexible Growth Medium with seed, soil amendments and fertilizer available from Profile Products or approved equal on final slopes. (See page 4.8 of the Bluebook)
- Install water skimmers connected to the outlet riser pipe in sedimentation ponds (See Appendix B of the Bluebook and attached diagrams)
- Install sediment filter bags on the downstream end of the outlet pipe. (See page 5.16 of the Bluebook)
- Design sedimentation pond to maximize the sediment residence time. (See pages 5.19 to 5.41 of the Bluebook)
- Address the disposal or storage of sediment cleaned from sediment control devices, sediment ponds, ditches, and drainage inlets.
- Stabilize roads with gravel
- Assign a dedicated and trained crew to maintain and repair erosion and sediment control measures

- The Town will hire a dedicated erosion and sediment control consultant to be on site or on call during all earthmoving activities and after all rain events. The cost of the consultant is to be borne by the applicant.
- Stop earthmoving work after a turbid discharge; meet with consultants and the building inspector or his designatee; develop a plan to fix the problems; fix the problems; get building inspector's or his designatee's approval to resume work; and resume work.
- There should be an acceptable security (i.e. Letter of Credit) to guaranty the work and to indemnify the Town from regulatory proceedings, lawsuits, legal fees, and any potential judgements.

Experiences at Other Construction Sites in Orange County

Other large construction sites in Orange County have silty soils. Lessons learned from those sites are presented below.

Sediment Problems

The sediment that leaves the ponds/control devices settles in the low wet areas; and then is agitated in the next storm making the discharge appear turbid even if it may not be coming off the site in that instance. Turbid water discharges must be inspected at the point of discharge from the site.

Sediment settles in culverts leading off-site, and it is resuspended in the water of subsequent rain events.

Large sites, which must obtain an exemption to disturb more than 5 acres, often have such large areas disturbed that it is very difficult to contain and prevent erosion and sediment laden runoff. In addition, the sheer volume of earth being moved dictates the need to install temporary sediment control measures in newly cut or filled areas.

There often is so much sediment in the runoff, that the check dams must be cleaned after each rain event.

A well designed and constructed sediment pond with: discharge thru skimmer, filter bag at end of skimmer, silt sock, silt fence, and hay bale still had discharge that was still cloudy/gray.

Cloudy/gray runoff water is common on the sites. Wetlands often have cloudy/gray ponding.

Many earthmoving contractors have not seen the NYS Standards and Specifications for Erosion and Sediment Control (Bluebook) about erosion and sediment control.

Road Sediment Problems

Construction access roads become extremely muddy and wet, with runoff forming eroded swales along the edges. Intermittent stabilization of construction roads using stone should be considered, regardless of the roads expected life span.

Many of the silt fences around the site become clogged and filled with silt; especially along roads. Maintenance is a constant battle.

Site Sediment Control Problems

Sites employ a crew of at least 2 full time people to go around the site and clean and repair silt fences, check dams, and other erosion control devices.

Slope Protection

Sites using hay/straw mulch and jute matting for temporary stabilization found that these products were not very durable or effective. Slopes washed out below jute matting, even after some grass had germinated and begun to grow. Hay/straw mulch is easily blown away or washed away. It has no mechanical properties to hold the soil in place.

Hydraulically-applied erosion control bonded fiber matrix products for both intermittent and final stabilization of open soil areas and slopes have shown very good results as opposed to hay/straw mulch and various mattings.

Slope Revegetation

The water from the sediment ponds may be used to water the grass seed and get it to grow faster.

Overland Flow

Pipes are used to convey overland flow if possible. Sheet flow picks up fines from soil. Pipes are used to change elevation where possible.

Sediment Ponds

Ponds fill with sediment quickly. It is often difficult to remove sediment, because pond sides are too deep and steep. In addition, there is nowhere to put the muck; as it would just end up washing back into the basin. Also, muck is difficult to transport; since it just sloshes out of the dump trucks. It might be possible to use vacuum excavation trucks to empty the ponds.

Ponds are difficult to maintain, because massive amounts of earth are being moved. Ponds must be moved often as the site is being filled. Intermittent erosion control plans are necessary. Often, plans only show existing and finished conditions with ponds in areas of 40 feet of fill or more.

Sediment Pond Skimmers

Silty sediment settles very slowly in sedimentation ponds. One very effective technique is to slowly decant the clear water off of the top of the sediment pond. Floating skimmers have been used on sediment ponds to remove the clear water.

Site experience has shown that floating skimmers were the only device to give a noticeable reduction in the turbidity of the discharge.

Floating skimmers are very expensive to buy, much cheaper and very easy to make themselves with PVC. See attached sketches.

Sediment Pond Design

Often the temporary sediment ponds are mostly round, and not shaped with 2:1 length to width ratio as recommended by Bluebook. The 2:1 length to width ratio is needed to increase the residence time in the pond to give the sediment time to settle. Also, ponds often had sheet flow into pond from 75% of perimeter. The flow into the pond should be controlled channeled into one end with the outlet at the opposite end. Slope crest protection (perimeter dike/swale) measures should be used to divert flow from going down the slope.

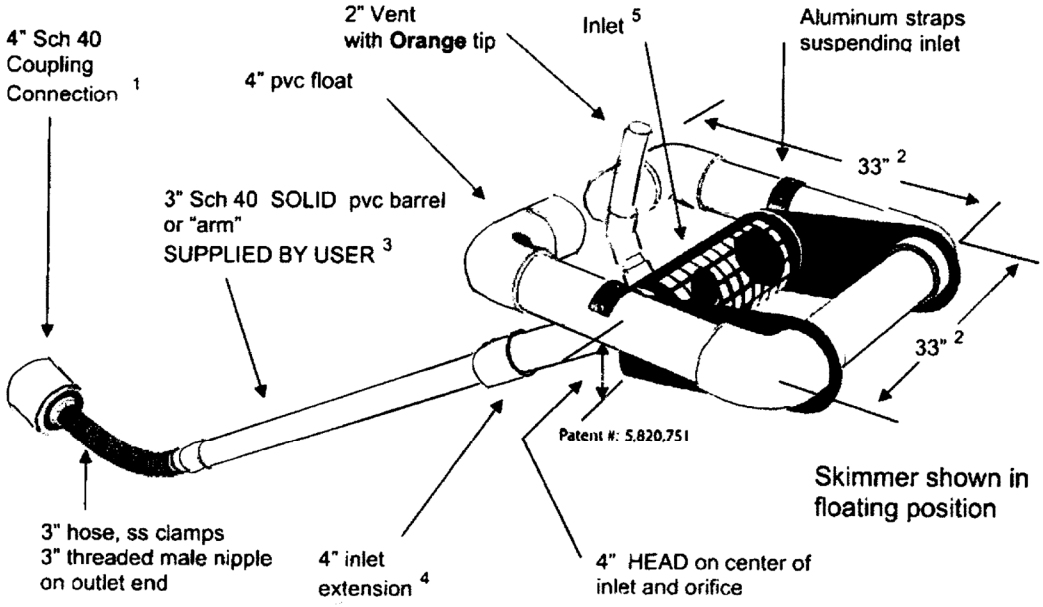
Topsoil

Sites have excess topsoil from stripping entire site. Topsoil will not be used in new building or parking areas, therefore topsoil must be exported if they cannot find a place to dump it on site.

4" *Faircloth Skimmer®* Surface Drain Cut Sheet

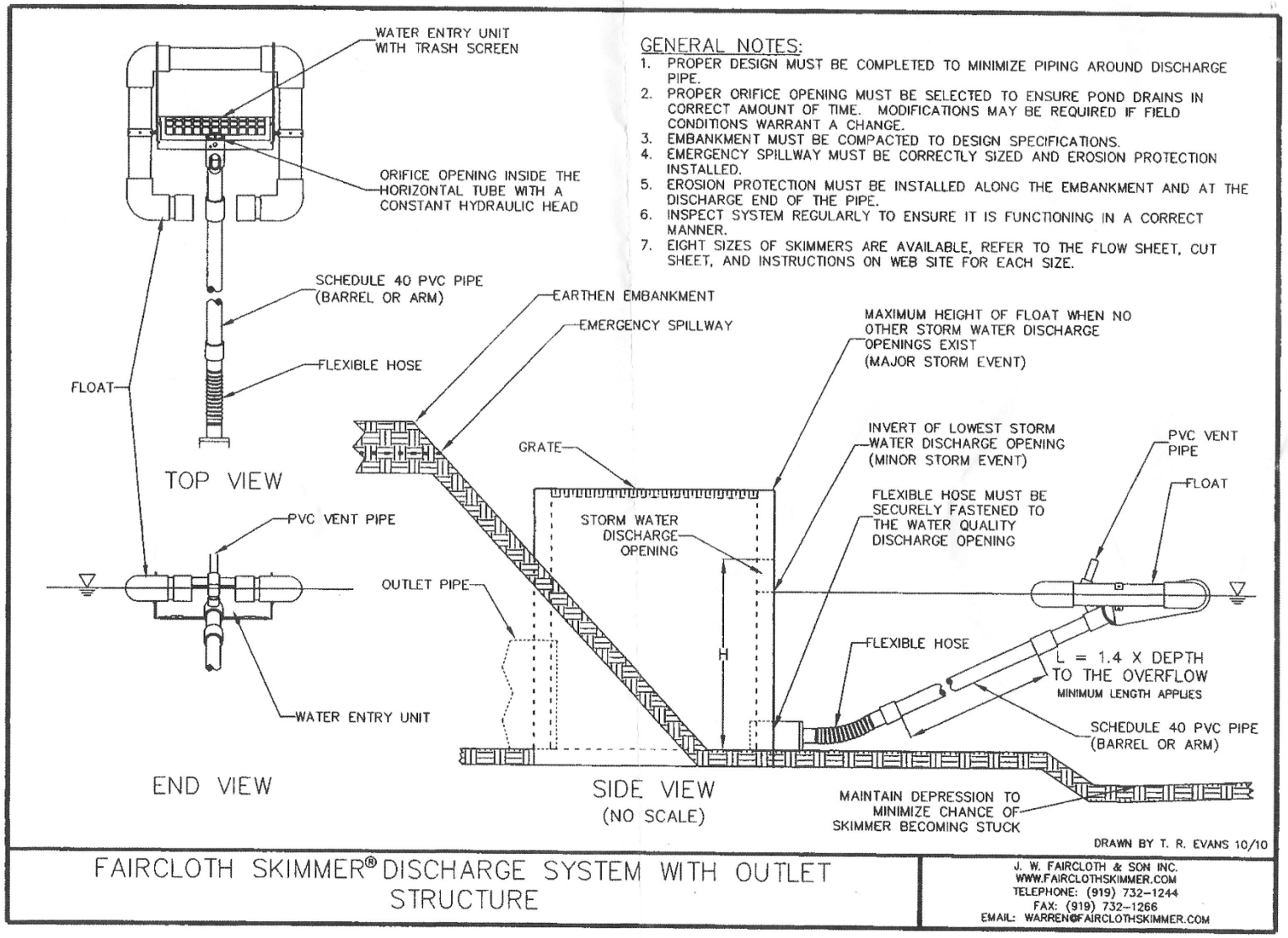
J. W. Faircloth & Son, Inc.

www.FairclothSkimmer.com



1. Coupling can be removed and hose attached to outlet using the threaded 3" nipple. Typical methods used: on a metal structure a steel stubout welded on the side at the bottom with a 3" threaded coupling or reducers; on a concrete structure with a hole or orifice at the bottom, use a steel plate with a hole cut in it and coupling welded to it that will fit over the hole in the concrete and bolted to the structure with sealant. It is possible to grout a 4" pvc pipe in a hole in the concrete to connect the skimmer but this is less secure than other methods.
2. Dimensions are approximate, not intended as plans for construction.
3. Barrel (solid, not foam core pipe) should be 1.4 times the depth of water with a minimum length of 8' so the inlet can be pulled to the side for maintenance. If more than 10' long weight may have to be added to inlet to counter the increased buoyancy.
4. Inlet tapers down from 4" maximum inlet to a 3" barrel and hose. Barrel is smaller to reduce buoyancy and tendency to lift inlet but is sufficient for flow through inlet because of slope. The inlet orifice can be reduced using the plug and cutter provided to control the outflow rate.
5. Inlet is 8" pipe between the straps with slots cut in the inlet and aluminum screen door (smaller than shown in illustration) for access to the 4" inlet and orifice inside.
6. **Capacity** 20,109 cubic feet per day maximum with 4" inlet and 4" head. Inlet can be reduced by installing a smaller orifice using the plug and cutter provided to adjust flow rate for the particular basin volume and drawdown time required.
7. Shipped assembled. User glues inlet extension and barrel, installs vent, cuts orifice in plug and attaches to outlet pipe or structure. Includes flexible hose, rope, orifice cutter, etc.

4inchCut TM 11-07 November 14, 2007



FAIRCLOTH SKIMMER® DISCHARGE SYSTEM WITH OUTLET STRUCTURE

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EMAIL: WARREN@FAIRCLOTHSKIMMER.COM