Stormwater Management Report
For

Cornerstone at Weymouth
1197/1215 Washington Street
Weymouth, MA

July 1, 2022

Prepared for:
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1.1 EXECUTIVE SUMMARY

In accordance with the provisions of the Town of Weymouth Zoning Bylaws, the Applicant Elksy Development, LLC. (Elksy) proposes, Cornerstone at Weymouth, which is to be a three-story Senior Living Center, with 147 independent senior living units consisting of 5 studios, 122 one-bedroom units, and 20 two-bedroom units in 83,500±SF of floor area on the subject property at 1197 and 1215 Washington Street. There will also be several commercial services for the residents of including a pub, theater, salon, dining facilities, commercial kitchen, commercial laundry space, various administrative jobs, as well as a chapel and activity area for residents. An outdoor courtyard is proposed on the interior to the site, and an onsite walking path and recreational facilities are proposed for use by residents. A surface lot with 133 spaces for residents and staff is also proposed.

The project site is comprised of two (2) parcels identified as Assessors Map 35, Block 447, Lots 1 and 3. The combined parcels consists of 4.81 +/- acres of land and lies within three (3) underlying zoning districts Highway Transition (HT) Limited Business (B-1) and Residence (R-1) and the Commercial Corridor Overlay District (CCOD)- Low Density Subzone. The site is bound by Pleasant Street to the East, Washington Street to the North and a mixture of businesses and residential homes to the west and south. An ANR to merge the land into one parcel will follow.

1.2 APPROVALS BEING SOUGHT

A Notice of Intent (NOI) is being filed with the Town of Weymouth Conservation Commission and the Massachusetts Department of Environmental Protection (MA DEP) for the proposed work. The project is proposed to be permitted through a Special Permit process with Site Plan Review with the Board of Zoning Appeals (application has been filed) under the Commercial Corridor Overlay District (CCOD) as a Mixed-Use Development project.

The applicant requests that the permit approvals encompass the entirety of the scope listed below, and as shown in the accompanying plan set:

- The demolition of the existing buildings and structures on the Property
- The construction of one (1) new mixed use three-story building
- Amenity and support space
- Surface parking for vehicles
- Associated drainage and utilities

1.3 FEMA FLOODPLAIN SUMMARY

This site is not located within the mapped 100-year floodplain per FEMA Firm Panel 25021C0233E (please refer to Figure 3) with effective date of 7/17/2012.

1.4 ON-SITE SOIL INFORMATION

The Natural Resource Conservation Service (NRCS) maps the majority of on-site soil as Urban Land, 0 to 15 percent slopes, Soil Map Unit 602, classified as Hydrologic Soil Group (HSG) "A." This soil is primarily representative in the location of the proposed development. According to the NRCS mapping, there are also two (2) other soils present in the southern areas of the parcel; Swansea Muck, Soil Map Unit 51, and Merrimac-Urban Land Complex, Soil Map 626B.

Soil X, Corp. performed ten (10) borings on 8/31/21. A sketch of locations and boring logs are enclosed in Section 6.

In general, the soils within the area of the proposed development were a loamy sand and were representative of a hydrologic A soil with an infiltration rate of 2.41 in/hr. This rate was used for the drainage calculations and design enclosed with this permit submission.

Please refer to Section 6 for complete soil information.

1.5 WETLANDS AND ENVIRONMENTAL RESOURCE AREA ANALYSIS

The project contains two (2) jurisdictional wetland resources and therefore the project must be permitted through MA DEP and the Weymouth Conservation Commission. Work is proposed within the buffer zones of the Bordering Vegetated Wetlands (BVW) within the site.

The site does not contain any areas designated as Estimated or Priority Endangered Species Habitat, certified vernal pools or Areas of Critical Environmental Concern. The site does not contain areas classified as Estimated Habitats of Rare Wildlife by the Natural Heritage and Endangered Species Program of the Division of Fisheries and Wildlife. The project site is not within any "Critical Areas" (Per MassGIS Oliver Viewer) which would require enhanced water quality treatment per the Massachusetts Stormwater Standards.

The wetland resource areas throughout and bordering the property were delineated by South River Environmental on September 24, 2021 and field located by Crocker Design Group in February 2022. Within the site, he wetlands are flagged WF-A2 – WF-14 and WF-B1 – WF-B27, respectively.

The following is a summary of the buffer and protection zones that portions of the project are proposed within:

1) <u>100' Bordering Vegetated Wetland (BVW) Buffer (310 CMR 10.55).</u>

Portions of the proposed improvements, including, but not limited to a parking lot, a retaining wall, portions of the residential buildings, garages, a swimming pool/outdoor amenity space and related drainage and utilities are proposed within the 100' BVW buffer zone. The proposed construction will improve the quality and the peak flows of the runoff into the BVW from within the 100' BVW buffer. Please see the accompanying plan set and supporting information for more details on the work proposed within the 100' BVW.

2) 25' BVW No- Touch-Buffer (Weymouth Wetland Regulations, Part IX (2))

The Town of Weymouth does have Town by-laws for wetland protection, including a 25' "No-touch" Buffer to the BVW for residential projects. The majority of the project is outside the 25' buffer, however, there are a few small areas of encroachment. We note the existing developed property encroaches on the 25' buffer today as well.

1.6 BUFFER ZONE RESTORATION AND ENHANCEMENT

The Project does not propose any alterations to Bordering Vegetated Wetlands ("BVW") regulated under the Bylaw and Massachusetts Wetlands Protection Act regulations (310 CMR 10.55). The project does propose impacts to approximately 2,590 SF of 25' BVW No-Touch Buffer (Weymouth Wetland Regulations, Part IX (2)), however, 2,687 SF of the 25' BVW Buffer was already developed in the existing condition. The Project proposes to enhance and restore portions of the buffer zone that were developed in the existing conditions and where the proposed project pulls back the development from the BVW. The Buffer Zone restoration area proposes native plantings like those found in the surrounding area. Buffer zone enhancement is approximately 921 SF±. Please refer to the Landscape Sheets included in the plan set for more details on the Buffer Enhancement Area.

1.7 OBJECTIVE OF CALCULATIONS

The purpose of this stormwater analysis is to examine the stormwater runoff from the proposed site based upon the Massachusetts Department of Environmental Protection Stormwater Management Policy and the applicable provisions of the Town of Weymouth Bylaws and regulations.

The goal of the stormwater management system design on this project is to provide improved water quality, reduce post-development peak runoff rates below pre-development peak flow rates, maximize the opportunities for recharge and infiltration, and protect the surrounding area from any potential flooding and/or environmental impacts associated with the unmitigated condition. The following stormwater hydrology calculations were performed using the 2-year, 10-year, 25-year, and 100-year frequency,

NOAA-14 Precipitation data design storms and were compared for both pre-development and post-development conditions.

1.8 METHODOLOGY

We utilized the latest version of Hydro CAD for the overall stormwater hydrology/routing analysis to assess and compare peak rates of runoff at the various discharge points from the subject property. We then utilized the Hydraflow Storm Sewers Extension Pack through AutoCAD Civil 3d to analyze the pipe design and to select appropriate pipe sizing.

Refer to Section 3 – Hydrocad Model, which includes the detailed print-out of the HydroCAD Model Reports for the 2, 10, 25 and 100-year storms as well as Section 7 – Hydraulic Pipe Analysis / Sizing.

1.9 SITE HYDROLOGY

Existing Conditions

Please refer to the attached Existing Conditions Watershed Analysis Plan in Section 3 of this report. Almost the entire site is developed. The site topography peaks along Washington Street and in the South portion at approximately elevation 95+/- of the site and then slopes down towards the surrounding features including elevation 85 +/- along Pleasant Street. The site relies entirely on sheetflow drainage towards the south of the site.

For the purposes of this analysis, the pre- and post- development drainage conditions were analyzed at three (3) “design points” where stormwater runoff currently drains to under existing conditions. The design points are described below:

- Design Point #1 (PD1) is toward Wetland Series B, to the Southeast of the parcel.
- Design Point #2 (PD2) is Pleasant Street.
- Design Point #3 (PD3) is the southern property line.

The existing property has been divided into three subcatchments areas based on the existing site topography and flow paths.

- The E-1 subcatchment discharges toward the wetland resource area (PD1) along pleasant street and consists of the entire main parking lot and the main building.
- The E-2 sub catchment consists of some parking areas and buildings that are discharging towards Pleasant street (PD2).
- The sub catchment E-3 consists of small area of landscape discharging towards the southern property line (PD3).

The sub catchment areas have been analyzed and assigned an appropriate Curve Number to represent the existing impervious cover and underlying soils conditions. Time of concentration has been computed and the extent of pervious vs. impervious cover computed. This data was then input into HydroCAD to determine peak rates of runoff at the three design points (identified as "Points of Analysis") which provide the locations for which to compare existing versus proposed conditions to document compliance that the peak rates have been reduced in the regulatory storm events as required. A Summary table is provided in the Hydrology Model Results and Conclusions Section below.

Proposed Conditions

Please refer to the attached Proposed Conditions Watershed Analysis Plan in Section 3 of this report. The proposed development has been divided into multiple sub catchments based on grading and drainage system components and building roof collection systems. Appropriate Times of Concentration and Curve Numbers have been assigned for each catchment area. A Summary table is provided in the Hydrology Model Results and Conclusions Section below.

Hydrology Model Results and Conclusions

The goal of the stormwater design for the project is to fully comply with the Massachusetts Stormwater Policy and the Town of Weymouth Regulations. This analysis confirms that the stormwater system is receiving proper treatment and peak rates and volumes of runoff have been reduced to below pre-development rates and volumes and using stormwater Best Management Practices including deep sump hooded catch basins, and 3 infiltration basins. The results of the pre- and post-development hydrology calculations provided in Section 3 are summarized in the following tables:

Peak Rates									
Point of Analysis	2-Year Storm (cfs)			10-Year Storm (cfs)			100-Year Storm (cfs)		
	Pre	Post	% Reduction	Pre	Post	% Reduction	Pre	Post	% Reduction
PD1	7.23	4.57	-37%	15	11.5	-23%	28.1	27.11	-4%
PD2	0.52	0.07	-87%	1.06	0.27	-75%	1.96	0.66	-66%
PD3	0.00	0.00	N/A	0.00	0.00	N/A	0.00	0.00	N/A

Volumes									
Point of Analysis	2-Year Storm (cf)			10-Year Storm (cf)			100-Year Storm (cf)		
	Pre	Post	Δ	Pre	Post	Δ	Pre	Post	Δ
PD1	22,733	14,617	(8,116)	46,408	33,895	(12,513)	87,883	71,179	(16,704)
PD2	1,630	322	(1,308)	3,280	895	(2,385)	6,148	2,071	(4,077)
PD3	-	-	-	-	-	-	41	41	-
Total	24,363	14,939	(9,424)	49,688	34,790	(14,898)	94,072	73,291	(20,781)

As can be seen based on the above tables, the peak stormwater runoff rates and volumes generated by the development are the same or less in post development conditions versus the existing conditions in all cases. Refer to Section 3 for copies of the HydroCAD Analysis and pre and post development watershed plans.

1.6 STORMWATER MANAGEMENT

The following section describes each of the ten (10) Massachusetts Stormwater Management Standards and describes how the project complies with each.

Standard 1: No New Untreated Discharges – No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

All new stormwater system conveyances are treated prior to discharge and result in no erosion occurring on site. The drainage system has been designed to direct stormwater runoff from impervious areas through various stormwater systems designed to capture, convey, treat, detain, recharge and infiltrate (where appropriate) the runoff prior to discharge.

Standard 2: Peak Rate Attenuation – Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.

The stormwater system reduces peak rates of runoff to below pre-development levels.

Standard 3: Recharge – Loss of annual recharge to groundwater shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices, and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from pre-development conditions based on soil type. This standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.

The stormwater system has been designed to comply with the recharge requirements for both the MA Stormwater Management Regulations. Refer to Section 4.1 for a summary of the stormwater recharge calculations.

Standard 4: Water Quality – Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS).

The project utilizes deep sump hooded catch basins, water quality units and subsurface infiltration, to meet the requirements.

Standard 5: Land Uses with Higher Potential Pollutant Loads – For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable.

The project is not considered a LUHPPL (Land Use with Higher Potential Pollutant Load).

Standard 6: Critical Areas – Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply, and stormwater discharges near or to any other critical area, require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such areas, as provided in the Massachusetts Stormwater Handbook.

The project is not located in nor does it discharge to a critical area.

Standard 7: Redevelopment and Other Projects Subject to the Standards only to the maximum extent practicable – A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural best management practice requirements of Standards 4, 5, and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

The project qualifies as a redevelopment because the amount of impervious area is reduced from the existing condition.

Standard 8: Construction Period Pollution Prevention Plan and Erosion and Sedimentation Control – A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land

disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.

An Erosion and Sedimentation Controls Plan has been incorporated into the Site Plans.

Standard 9: Operation and Maintenance Plan – A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.

A long-term Operation and Maintenance Plan has been incorporated herein. See Section 5.

Standard 10: Prohibition of Illicit Discharges – All illicit discharges to the stormwater management system are prohibited.

An Illicit Discharge Compliance Statement is included as required, and will be signed and submitted as a requirement of the final Order of Conditions, prior to the discharge of stormwater runoff to post-construction stormwater BMP's.

1.7 BEST MANAGEMENT PRACTICES (BMP'S)

A system of deep sump hooded catch basins, water quality units and subsurface infiltration system will be used to treat stormwater runoff on the site. See Section 4.4: Total Suspended Solids (TSS) Calculations.

1.8 PIPE SIZING

The tributary area for each inlet/subcatchment area has been computed along with pipe length, slope and friction coefficient. The Rational Method is then utilized to determine the hydraulic grade line. For design purposes, this approach was used to size the pipes such that the 10-year storm event is contained within the pipe. The 100-year storm was then checked to confirm the hydraulic grade line for the pipe network does not exceed the rim elevations of the drainage structures. Refer to Section 7 for calculations.

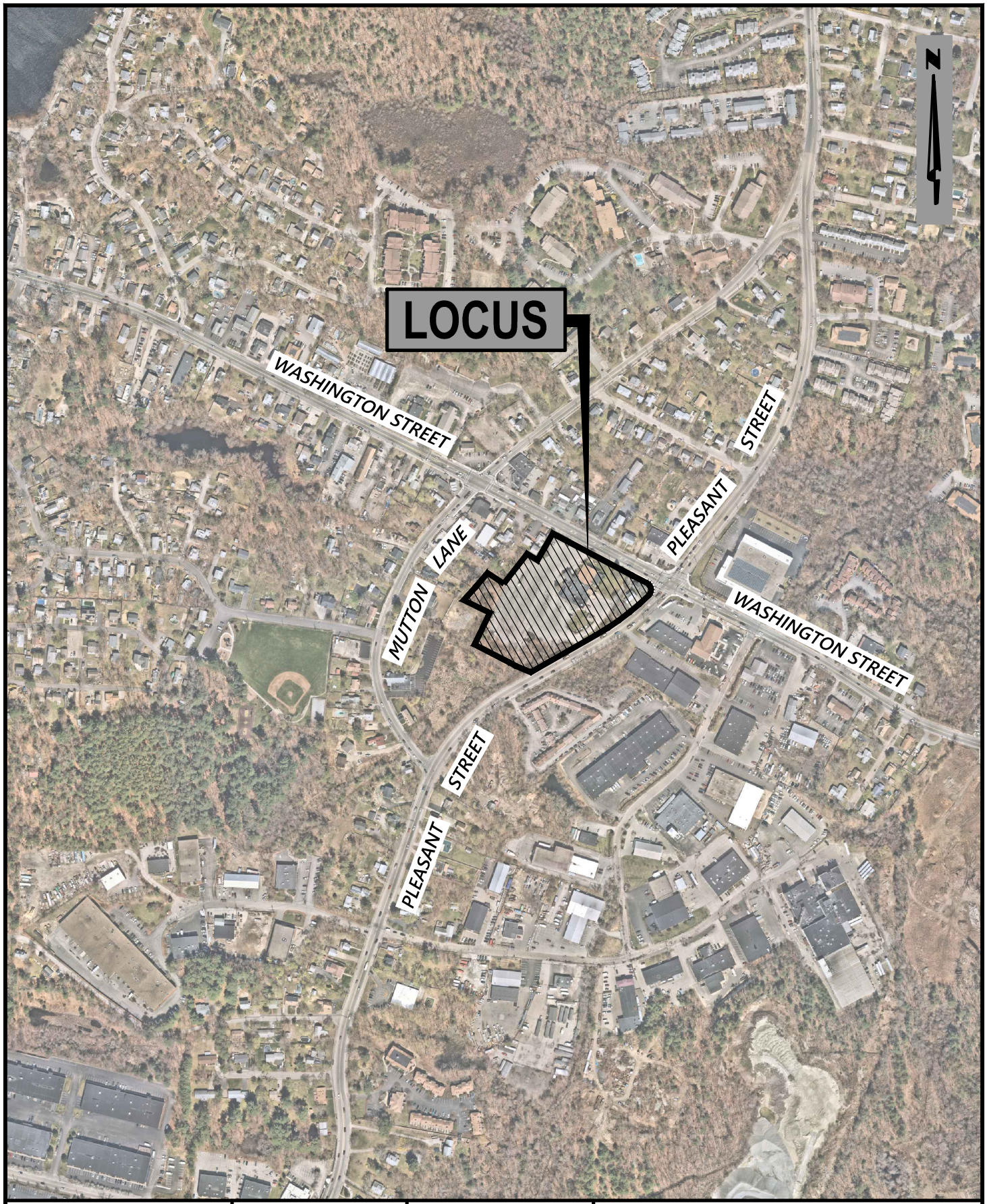
1.9 CONCLUSION

In conclusion, the project has been designed in accordance with the requirements of the MA DEP's Stormwater Management Standards and in compliance with the Town of Weymouth's Conservation Commission Wetland Regulations.

1.10 FIGURES

The following pages contain the following accompanying figures:

FIG 1 AERIAL MAP
FIG 2 MASSDEP WETLANDS MAP
FIG 3 FEMA FLOODPLAIN MAP
FIG 4 USGS MAP
FIG 5 NHESP HABITAT MAP



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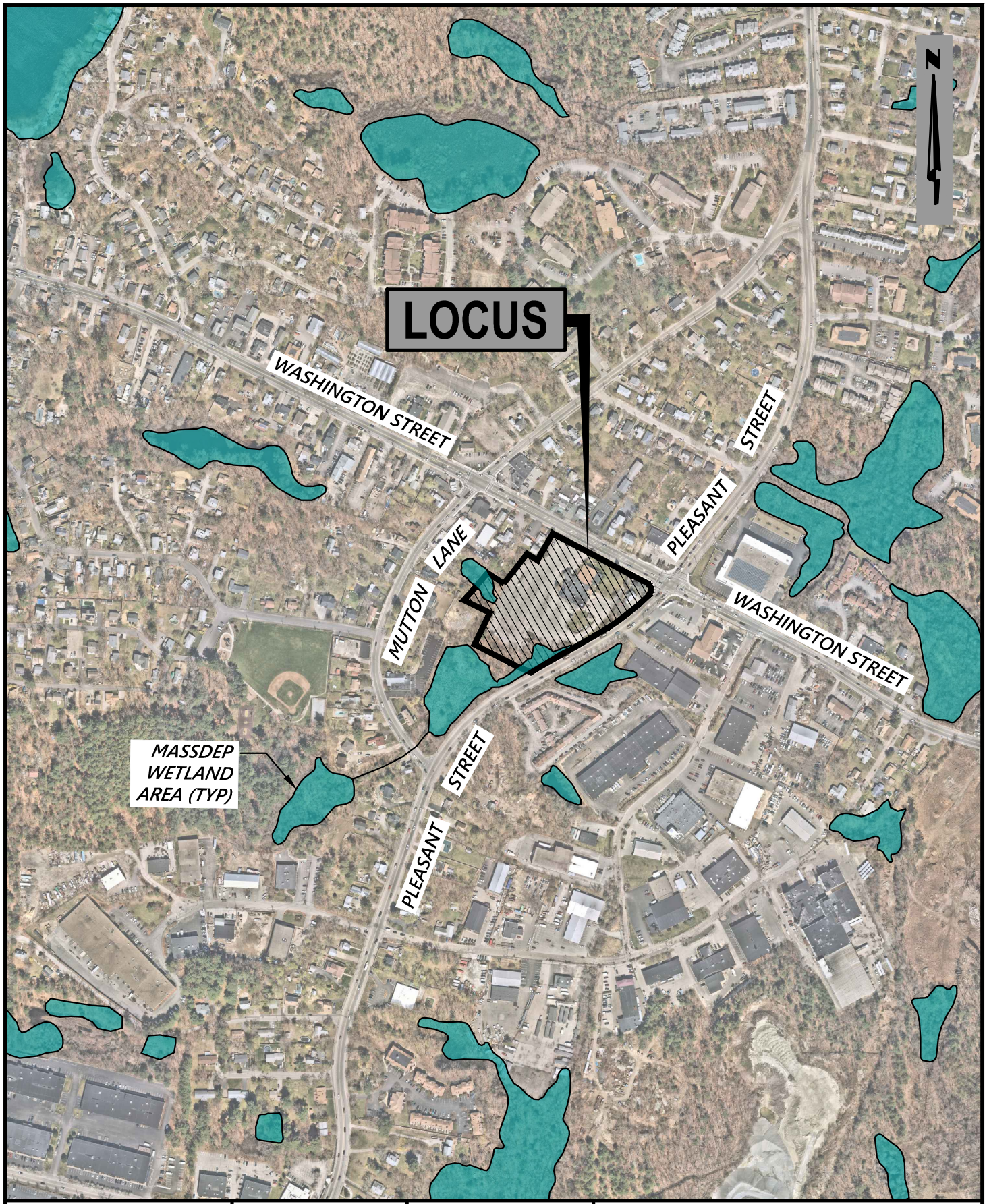

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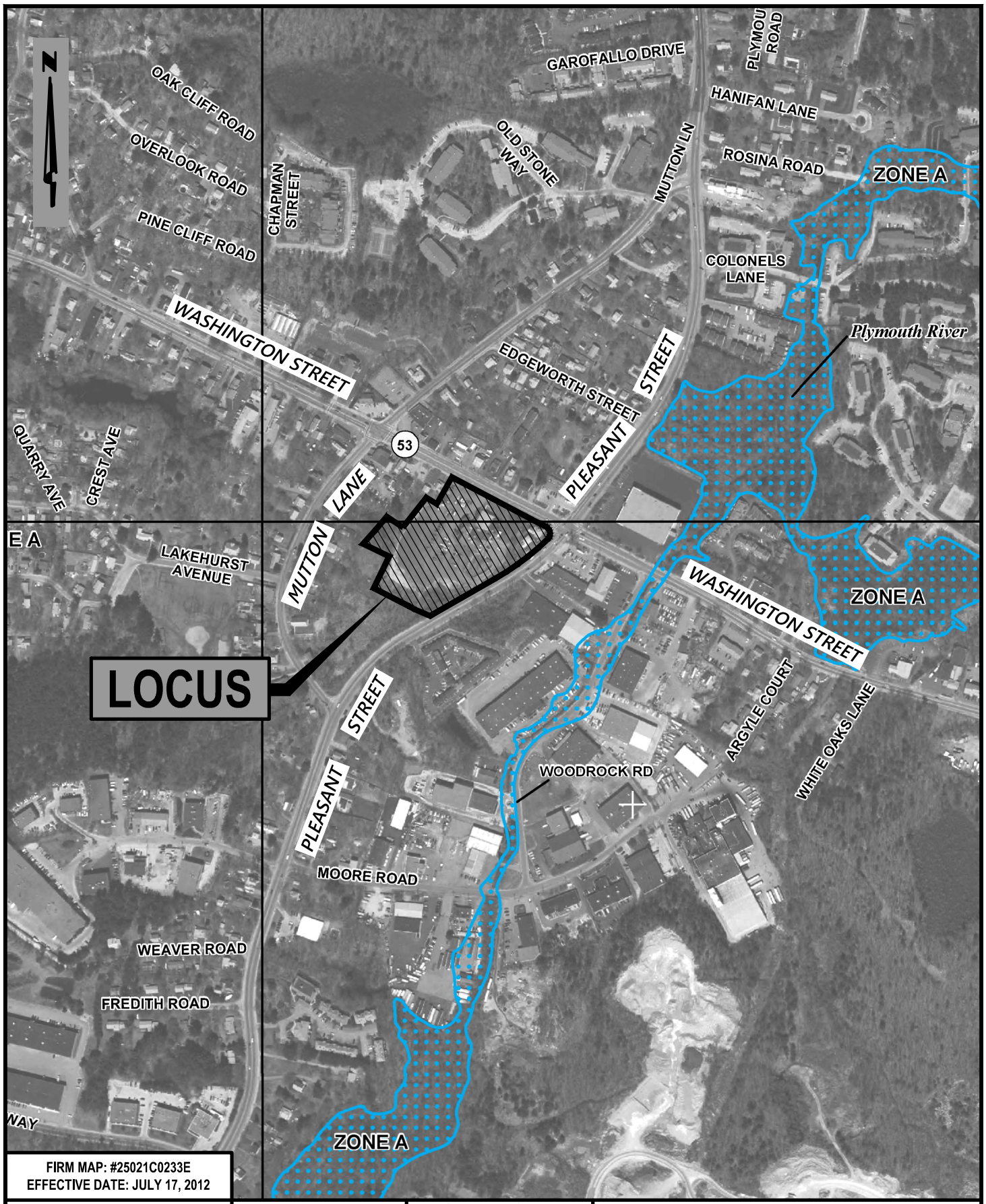

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EFFECTIVE DATE: JULY 17, 2012

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2 SHARP STREET, UNIT A
HINGHAM, MA 02043

Project
CORNERSTONE AT WEYMOUTH
WEYMOUTH , MA

Prepared for
ELKSY DEVELOPMENT
180 CANTON AVENUE
MILTON, MA 02186

Drawing Title
FEMA MAP

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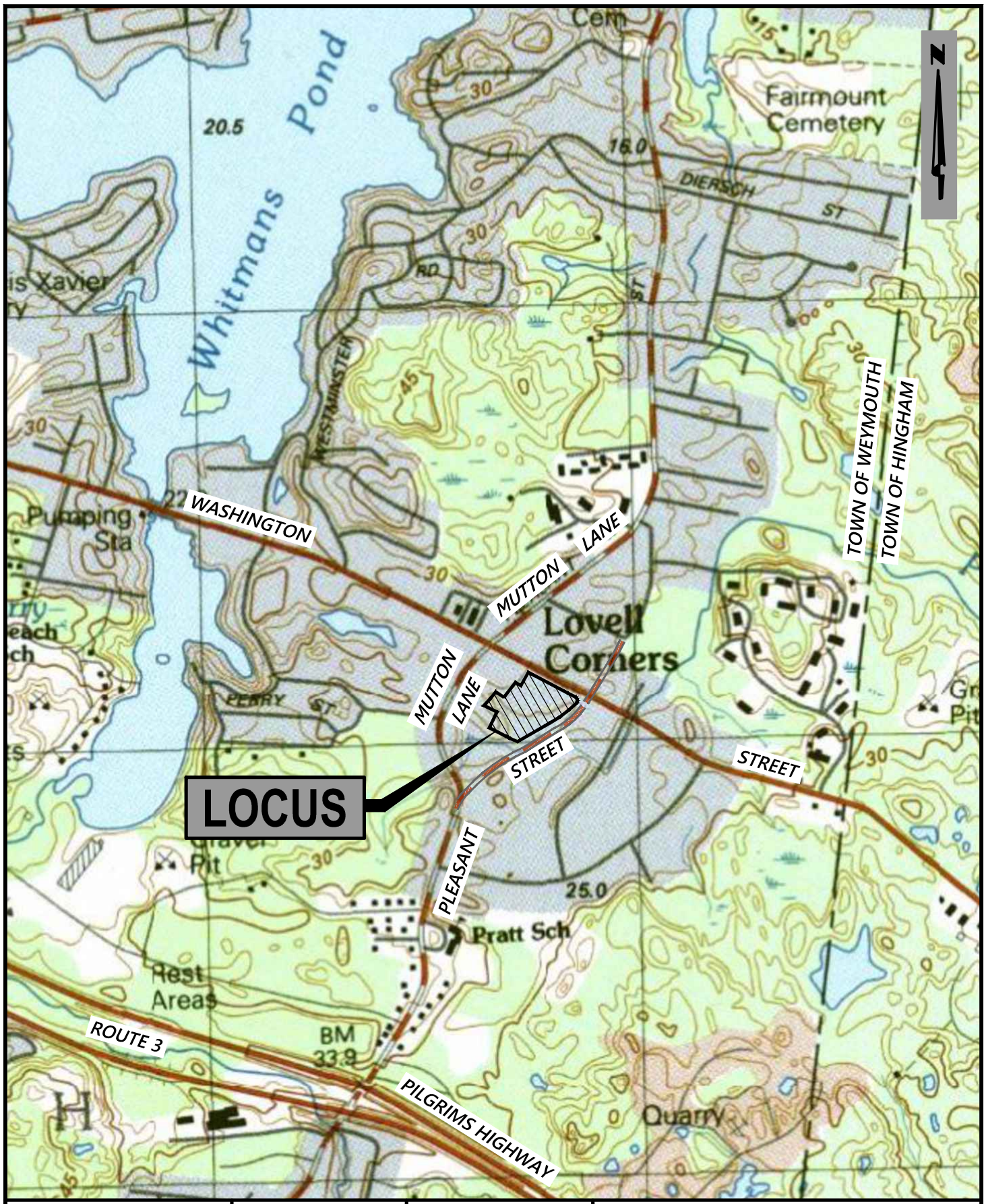

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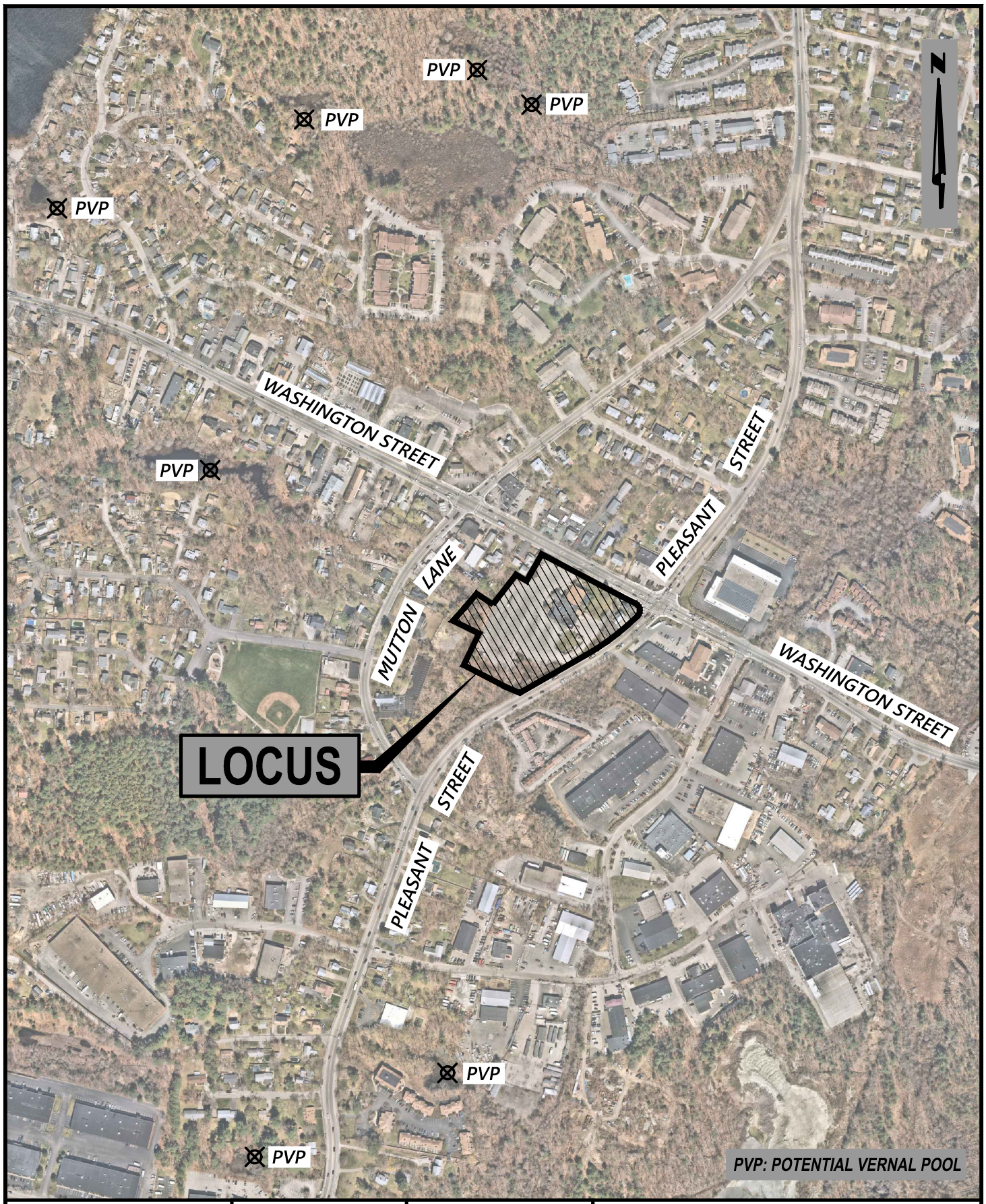

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SECTION 2 – STORMWATER CHECKLIST

Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands Program

Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.

A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.[1] This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8[2]
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

[1] The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

[2] For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.

Checklist for Stormwater Report

B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Long-term Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature

6/30/2022
Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

☐ New development

☒ Redevelopment

☐ Mix of New Development and Redevelopment

Checklist for Stormwater Report

Checklist (continued)

LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

- ☒ No disturbance to any Wetland Resource Areas
- ☐ Site Design Practices (e.g. clustered development, reduced frontage setbacks)
- ☐ Reduced Impervious Area (Redevelopment Only)
- ☐ Minimizing disturbance to existing trees and shrubs
- ☐ LID Site Design Credit Requested:
  - ☐ Credit 1
  - ☐ Credit 2
  - ☐ Credit 3
- ☐ Use of “country drainage” versus curb and gutter conveyance and pipe
- ☐ Bioretention Cells (includes Rain Gardens)
- ☐ Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
- ☐ Treebox Filter
- ☐ Water Quality Swale
- ☐ Grass Channel
- ☐ Green Roof
- ☐ Other (describe): _____

Standard 1: No New Untreated Discharges

- ☒ No new untreated discharges
- ☒ Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- ☒ Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.

Checklist for Stormwater Report

Checklist (continued)

Standard 2: Peak Rate Attenuation

☐ Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.

☐ Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

☒ Calculations provided to show that post-development peak discharge rates do not exceed pre-development rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24-hour storm.

Standard 3: Recharge

☒ Soil Analysis provided.

☒ Required Recharge Volume calculation provided.

☐ Required Recharge volume reduced through use of the LID site Design Credits.

☒ Sizing the infiltration, BMPs is based on the following method: Check the method used.

☐ Static ☒ Simple Dynamic ☐ Dynamic Field[1]

☐ Runoff from all impervious areas at the site discharging to the infiltration BMP.

☐ Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

☐ Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

☒ Recharge BMPs have been sized to infiltrate the Required Recharge Volume *only* to the maximum extent practicable for the following reason:

- ☐ Site is comprised solely of C and D soils and/or bedrock at the land surface
- ☐ M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- ☐ Solid Waste Landfill pursuant to 310 CMR 19.000
- ☒ Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.

☒ Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

☐ Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

[1] 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.

Checklist for Stormwater Report

Checklist (continued)

Standard 3: Recharge (continued)

☐ The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10-year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

☐ Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.

☒ A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.

☐ Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:

- ☐ is within the Zone II or Interim Wellhead Protection Area
- ☐ is near or to other critical areas
- ☐ is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
- ☐ involves runoff from land uses with higher potential pollutant loads.

☐ The Required Water Quality Volume is reduced through use of the LID site Design Credits.

☒ Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.

Checklist for Stormwater Report

Checklist (continued)

Standard 4: Water Quality (continued)

☒ The BMP is sized (and calculations provided) based on:

- ☒ The ½" or 1" Water Quality Volume or
- ☐ The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.

☒ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.

☐ A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

☐ The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.

☐ The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted ***prior to*** the discharge of stormwater to the post-construction stormwater BMPs.

☐ The NPDES Multi-Sector General Permit does ***not*** cover the land use.

☐ LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.

☐ All exposure has been eliminated.

☐ All exposure has ***not*** been eliminated and all BMPs selected are on MassDEP LUHPPL list.

☐ The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

☐ The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.

☐ Critical areas and BMPs are identified in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

☒ The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:

- ☐ Limited Project
- ☐ Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
- ☐ Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
- ☐ Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
- ☐ Bike Path and/or Foot Path
- ☒ Redevelopment Project
- ☐ Redevelopment portion of mix of new and redevelopment.

☐ Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.

☐ The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

☒ A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.

Checklist for Stormwater Report

Checklist (continued)

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has ***not*** been included in the Stormwater Report but will be submitted ***before*** land disturbance begins.

☐ The project is ***not*** covered by a NPDES Construction General Permit.

☐ The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.

☒ The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

☒ The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:

- ☒ Name of the stormwater management system owners;
- ☒ Party responsible for operation and maintenance;
- ☒ Schedule for implementation of routine and non-routine maintenance tasks;
- ☒ Plan showing the location of all stormwater BMPs maintenance access areas;
- ☒ Description and delineation of public safety features;
- ☒ Estimated operation and maintenance budget; and
- ☒ Operation and Maintenance Log Form.

☐ The responsible party is ***not*** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:

- ☐ A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
- ☐ A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

☒ The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;

☐ An Illicit Discharge Compliance Statement is attached;

☒ NO Illicit Discharge Compliance Statement is attached but will be submitted ***prior to*** the discharge of any stormwater to post-construction BMPs.

ILLICIT DISCHARGE COMPLIANCE STATEMENT

Standard 10: Massachusetts Stormwater Standards Handbook

Illicit discharges are defined as discharges into waters of the State or municipal separate stormwater system (MS4) that are not entirely comprised of stormwater. Exclusions for non-stormwater discharges into drainage systems include activities or facilities for firefighting, water line flushing, landscape irrigation, uncontaminated groundwater discharge, potable water sources, foundation drains, air conditioning condensation, footing drains, individual resident car washing, water used to clean residential buildings without detergents, water used for street washing, and flows from riparian habitats/wetlands. These exclusions are subject to change and are under the discretion of the local governing authority.

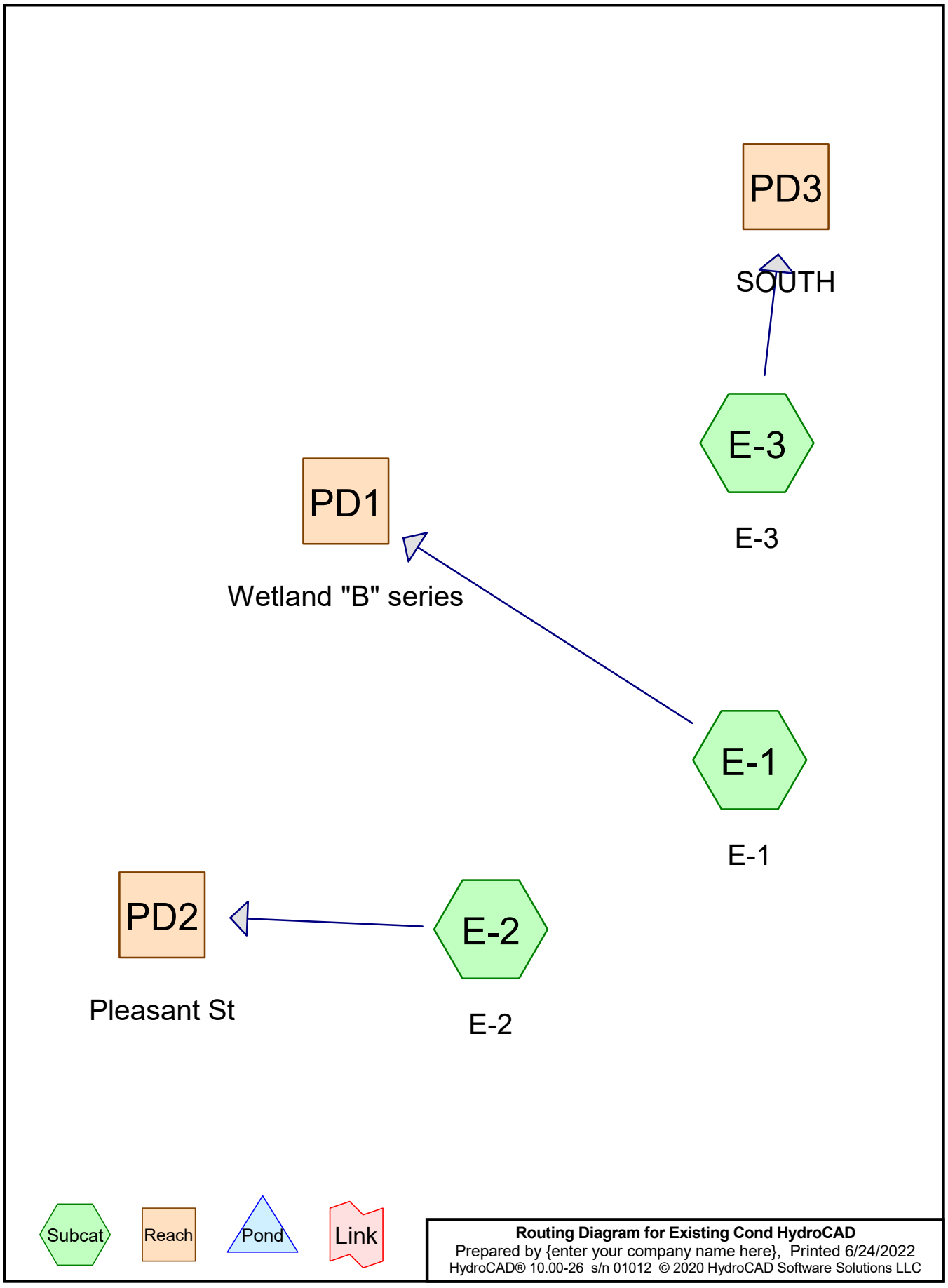
To the best of our knowledge and professional belief no illicit discharges to the stormwater system, surface waters, or wetland resource areas will remain on the site after construction. We will agree to implement a pollution prevention plan to prevent illicit discharges into the stormwater management system. The design of the site based on the plans entitled "SITE DEVELOPMENT PLANS: CORNERSTONE AT WEYMOUTH." prepared by Crocker Design Group, 2 Sharp Street, Unit A, Hingham, Massachusetts show a separation and no direct connection between the stormwater management systems and the wastewater and/ or groundwater on the site. To the maximum extent practicable, the design prevents entry of illicit discharges into the stormwater management system.

Engineer's Name: _____
(please print)

Engineer's Signature: _____ Date: _____

Company: Crocker Design Group, LLC.

SECTION 3 – STORMATER HYDROLOGY MODEL



Routing Diagram for Existing Cond HydroCAD
Prepared by {enter your company name here}, Printed 6/24/2022

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
32,008	39	>75% Grass cover, Good, HSG A (E-1, E-2)
120,811	98	Pavement and Roofs (E-1)
33,623	30	Woods, Good, HSG A (E-1, E-3)
8,983	98	roof and pavement (E-2)
14,030	98	wetland (E-1)
209,455	**78**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
65,631	HSG A	E-1, E-2, E-3
0	HSG B	
0	HSG C	
0	HSG D	
143,824	Other	E-1, E-2
209,455		**TOTAL AREA**

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 Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E-1: E-1 Runoff Area=194,951 sf 69.17% Impervious Runoff Depth=1.40"
Tc=6.0 min CN=78 Runoff=7.23 cfs 22,733 cf

Subcatchment E-2: E-2 Runoff Area=13,349 sf 67.29% Impervious Runoff Depth=1.47"
Tc=6.0 min CN=79 Runoff=0.52 cfs 1,630 cf

Subcatchment E-3: E-3 Runoff Area=1,155 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=30 Runoff=0.00 cfs 0 cf

Reach PD1: Wetland "B" series Inflow=7.23 cfs 22,733 cf
Outflow=7.23 cfs 22,733 cf

Reach PD2: Pleasant St Inflow=0.52 cfs 1,630 cf
Outflow=0.52 cfs 1,630 cf

Reach PD3: SOUTH Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Total Runoff Area = 209,455 sf Runoff Volume = 24,363 cf Average Runoff Depth = 1.40"
31.33% Pervious = 65,631 sf 68.67% Impervious = 143,824 sf

Summary for Subcatchment E-1: E-1

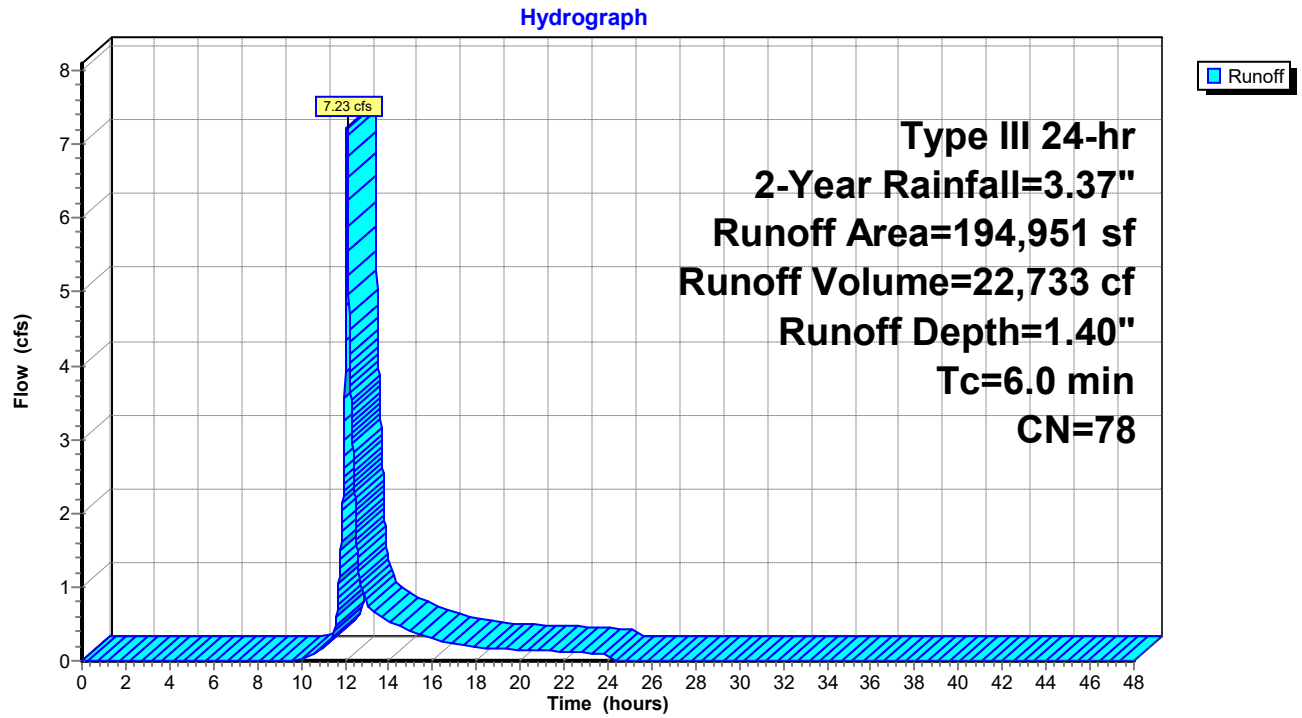
Runoff = 7.23 cfs @ 12.09 hrs, Volume= 22,733 cf, Depth= 1.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.37"

	Area (sf)	CN	Description
*	14,030	98	wetland
*	120,811	98	Pavement and Roofs
	32,468	30	Woods, Good, HSG A
	27,642	39	>75% Grass cover, Good, HSG A
	194,951	78	Weighted Average
	60,110	34	30.83% Pervious Area
	134,841	98	69.17% Impervious Area

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

Subcatchment E-1: E-1



Summary for Subcatchment E-2: E-2

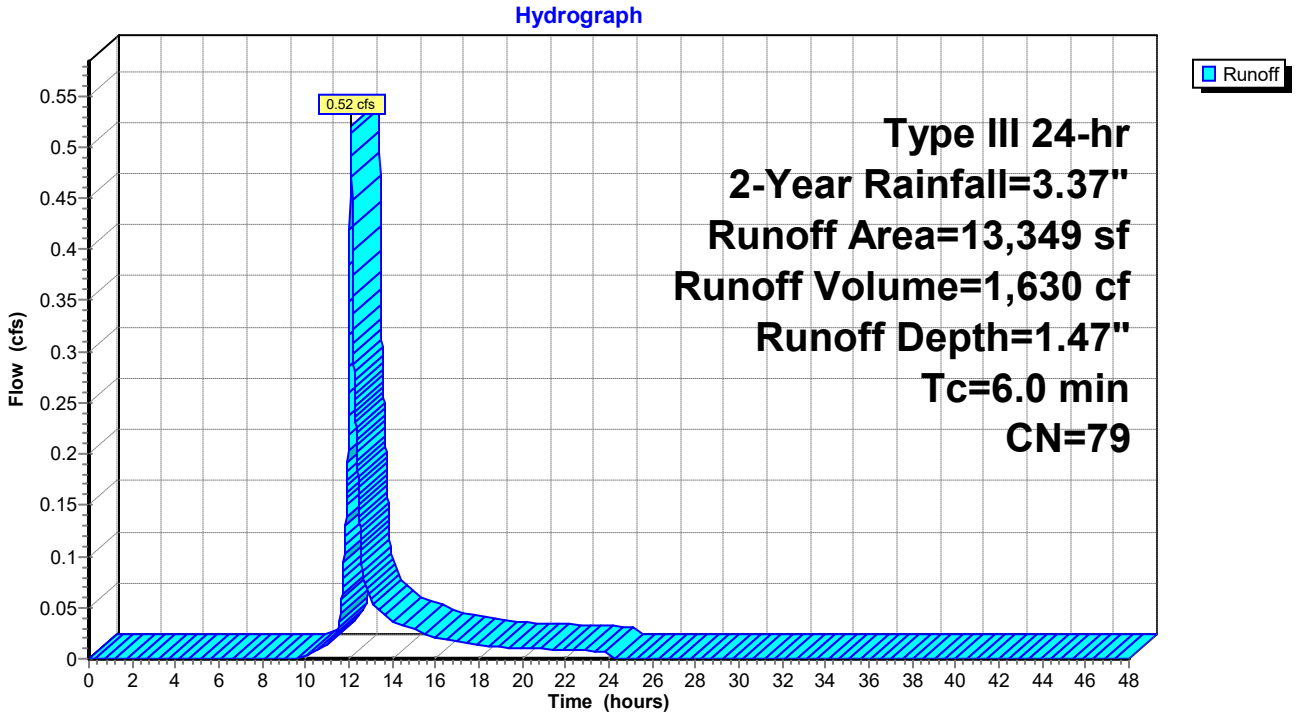
Runoff = 0.52 cfs @ 12.09 hrs, Volume= 1,630 cf, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.37"

	Area (sf)	CN	Description
	4,366	39	>75% Grass cover, Good, HSG A
*	8,983	98	roof and pavement
	13,349	79	Weighted Average
	4,366	39	32.71% Pervious Area
	8,983	98	67.29% Impervious Area

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

Subcatchment E-2: E-2



Summary for Subcatchment E-3: E-3

[45] Hint: Runoff=Zero

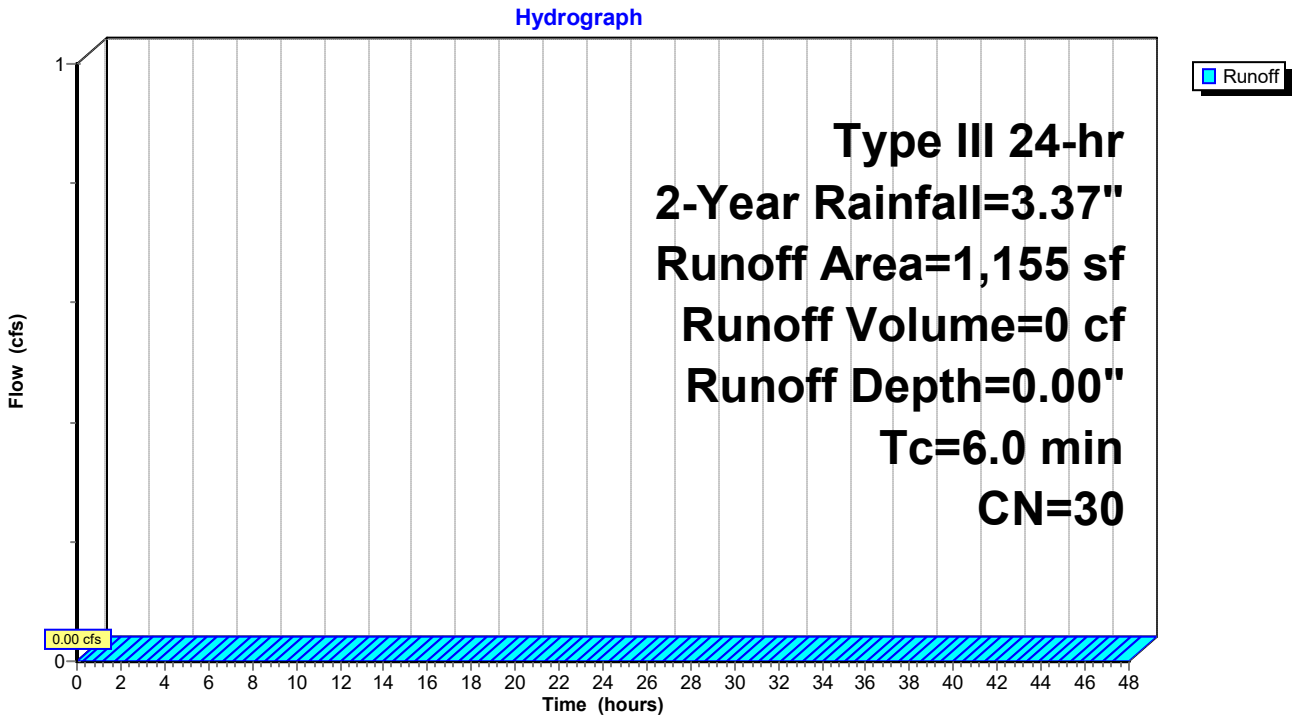
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.37"

Area (sf)	CN	Description
1,155	30	Woods, Good, HSG A
1,155	30	100.00% Pervious Area

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

Subcatchment E-3: E-3



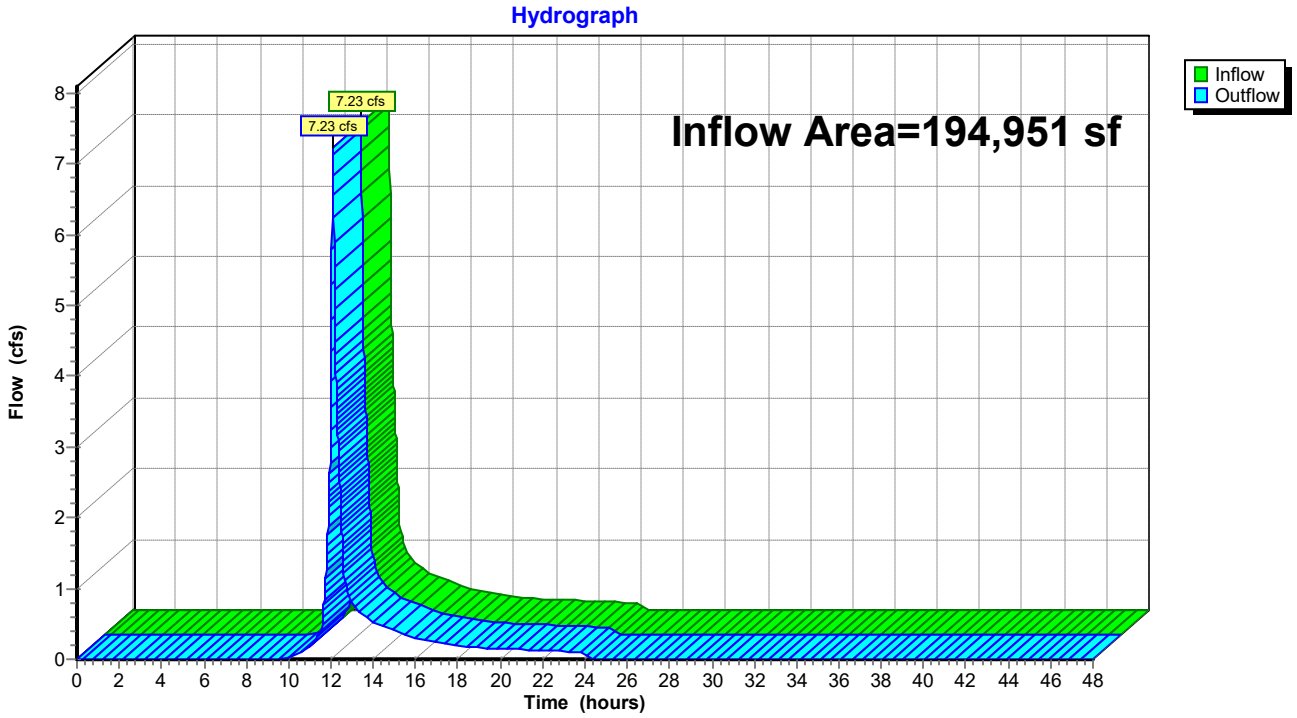
Summary for Reach PD1: Wetland "B" series

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 194,951 sf, 69.17% Impervious, Inflow Depth = 1.40" for 2-Year event
Inflow = 7.23 cfs @ 12.09 hrs, Volume= 22,733 cf
Outflow = 7.23 cfs @ 12.09 hrs, Volume= 22,733 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD1: Wetland "B" series



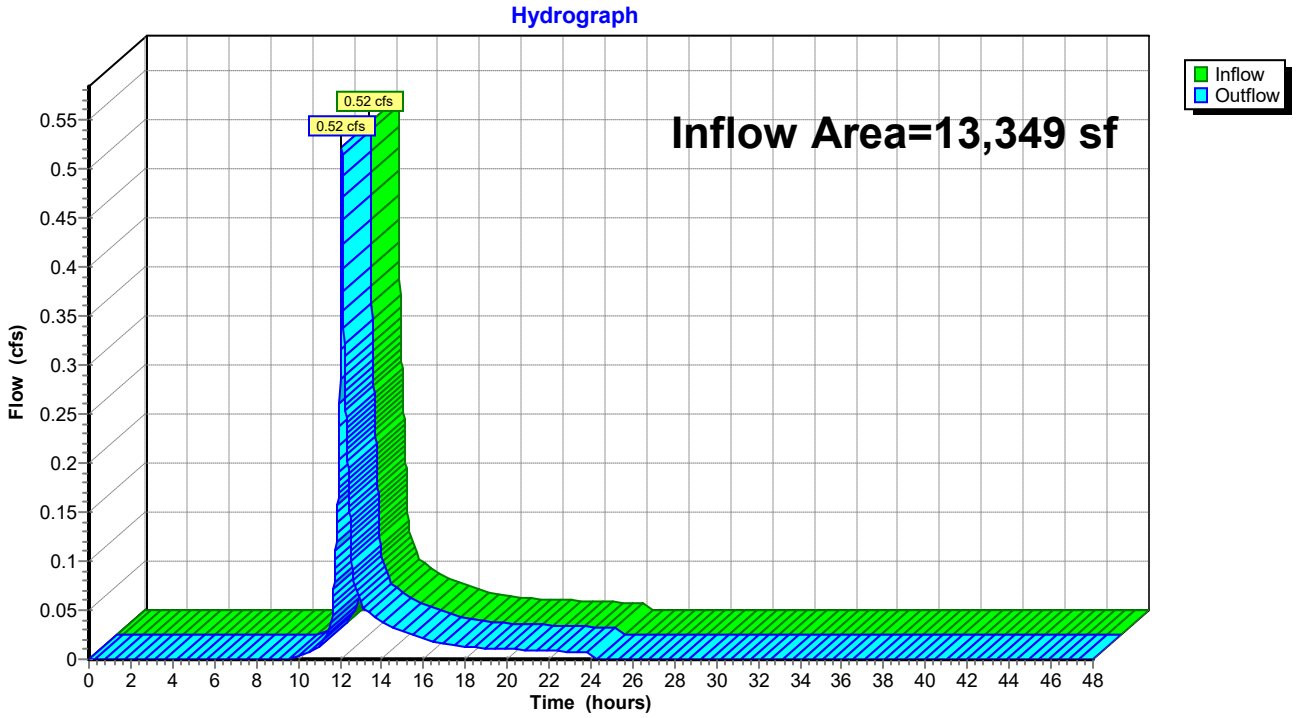
Summary for Reach PD2: Pleasant St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 13,349 sf, 67.29% Impervious, Inflow Depth = 1.47" for 2-Year event
Inflow = 0.52 cfs @ 12.09 hrs, Volume= 1,630 cf
Outflow = 0.52 cfs @ 12.09 hrs, Volume= 1,630 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD2: Pleasant St



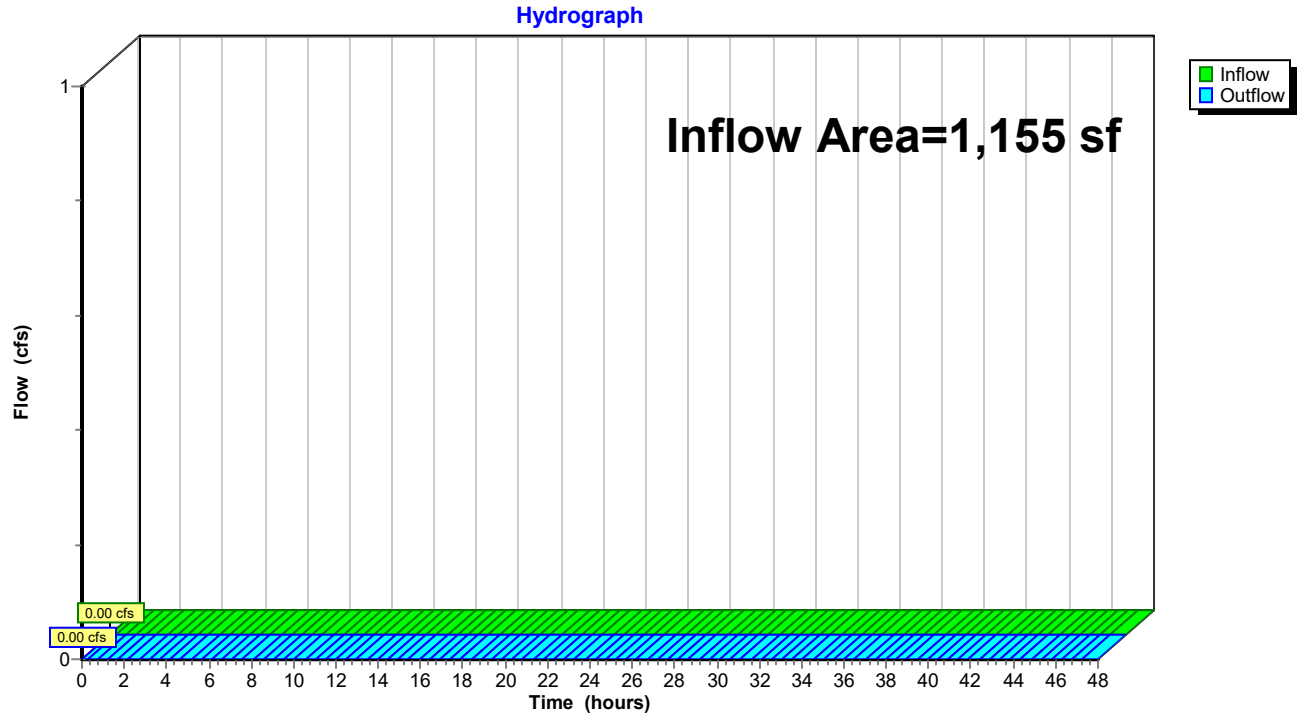
Summary for Reach PD3: SOUTH

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,155 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD3: SOUTH



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 Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E-1: E-1 Runoff Area=194,951 sf 69.17% Impervious Runoff Depth=2.86"
Tc=6.0 min CN=78 Runoff=15.00 cfs 46,408 cf

Subcatchment E-2: E-2 Runoff Area=13,349 sf 67.29% Impervious Runoff Depth=2.95"
Tc=6.0 min CN=79 Runoff=1.06 cfs 3,280 cf

Subcatchment E-3: E-3 Runoff Area=1,155 sf 0.00% Impervious Runoff Depth=0.01"
Tc=6.0 min CN=30 Runoff=0.00 cfs 1 cf

Reach PD1: Wetland "B" series Inflow=15.00 cfs 46,408 cf
Outflow=15.00 cfs 46,408 cf

Reach PD2: Pleasant St Inflow=1.06 cfs 3,280 cf
Outflow=1.06 cfs 3,280 cf

Reach PD3: SOUTH Inflow=0.00 cfs 1 cf
Outflow=0.00 cfs 1 cf

Total Runoff Area = 209,455 sf Runoff Volume = 49,689 cf Average Runoff Depth = 2.85"
31.33% Pervious = 65,631 sf 68.67% Impervious = 143,824 sf

Summary for Subcatchment E-1: E-1

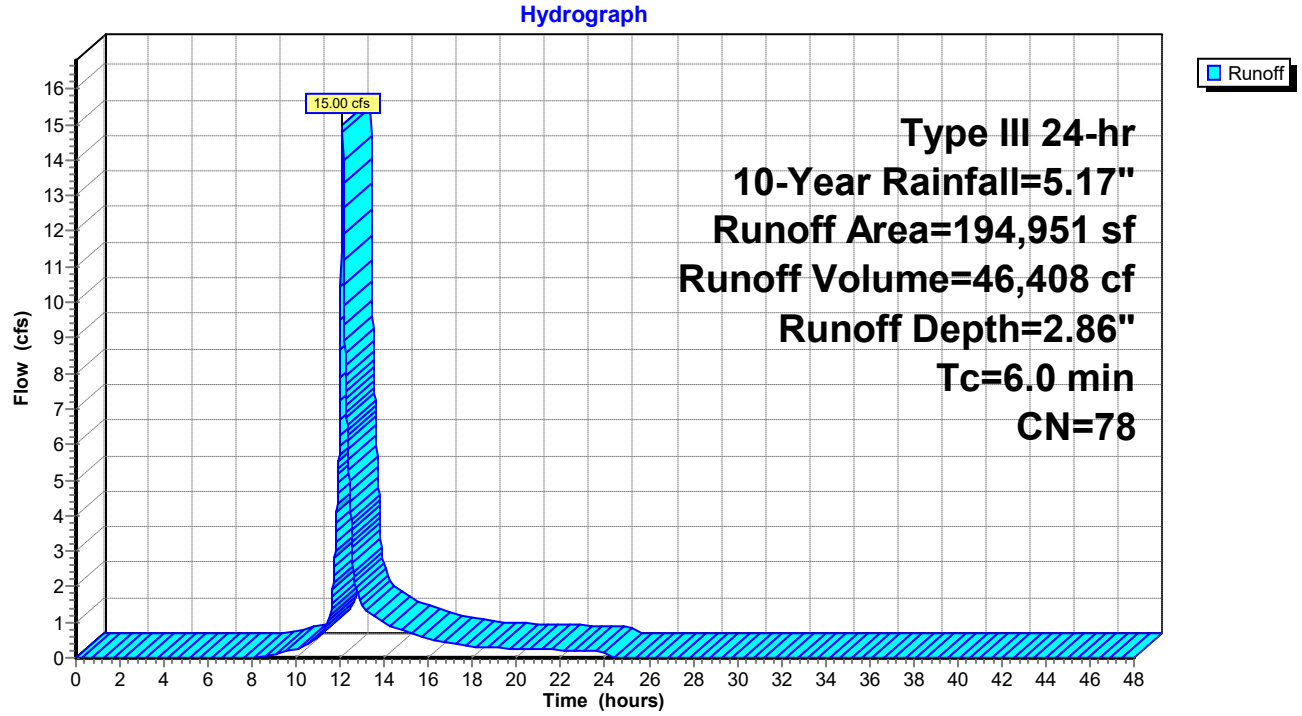
Runoff = 15.00 cfs @ 12.09 hrs, Volume= 46,408 cf, Depth= 2.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.17"

	Area (sf)	CN	Description
*	14,030	98	wetland
*	120,811	98	Pavement and Roofs
	32,468	30	Woods, Good, HSG A
	27,642	39	>75% Grass cover, Good, HSG A
	194,951	78	Weighted Average
	60,110	34	30.83% Pervious Area
	134,841	98	69.17% Impervious Area

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

Subcatchment E-1: E-1



Summary for Subcatchment E-2: E-2

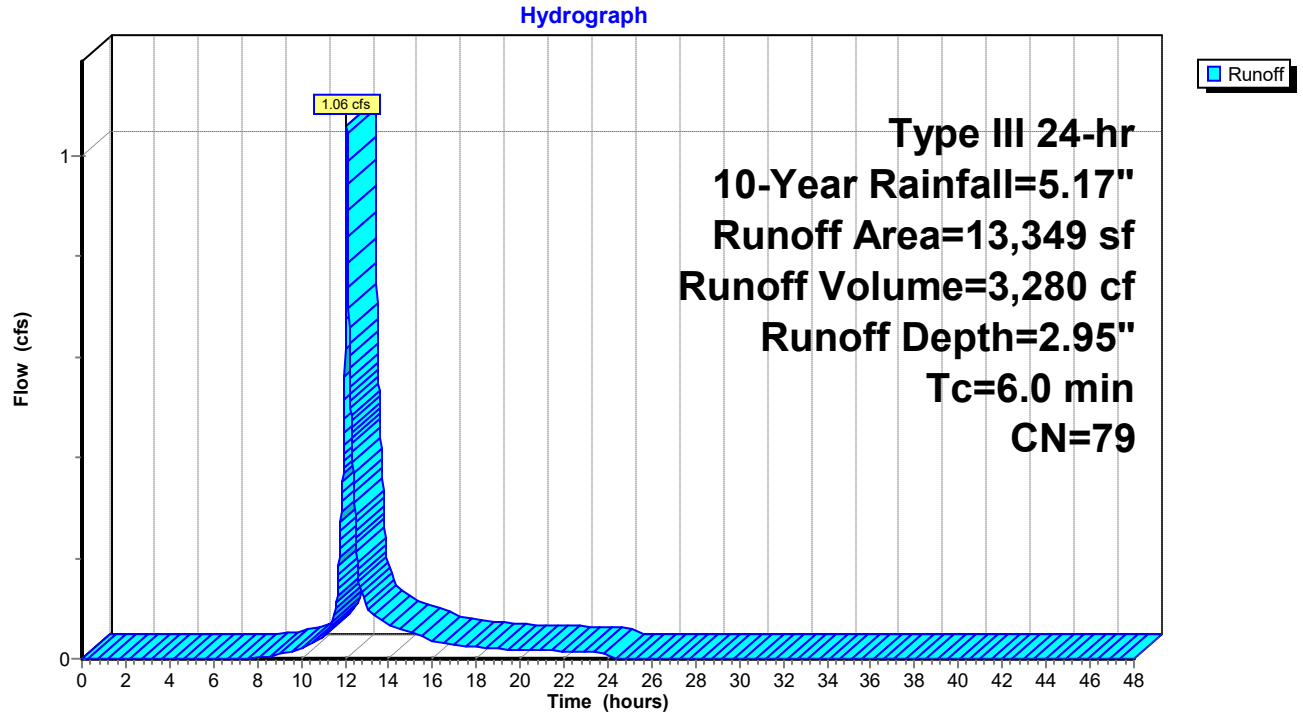
Runoff = 1.06 cfs @ 12.09 hrs, Volume= 3,280 cf, Depth= 2.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.17"

	Area (sf)	CN	Description
	4,366	39	>75% Grass cover, Good, HSG A
*	8,983	98	roof and pavement
	13,349	79	Weighted Average
	4,366	39	32.71% Pervious Area
	8,983	98	67.29% Impervious Area

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

Subcatchment E-2: E-2



Summary for Subcatchment E-3: E-3

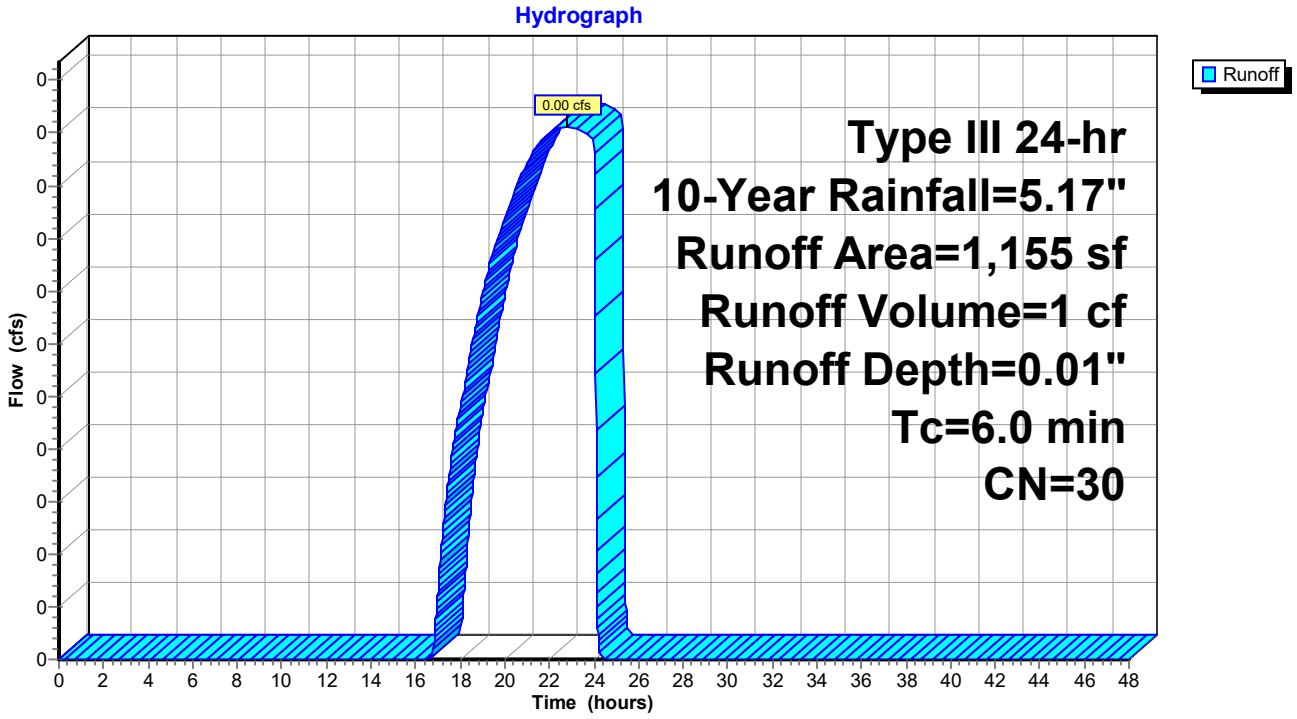
Runoff = 0.00 cfs @ 22.82 hrs, Volume= 1 cf, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.17"

Area (sf)	CN	Description
1,155	30	Woods, Good, HSG A
1,155	30	100.00% Pervious Area

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

Subcatchment E-3: E-3



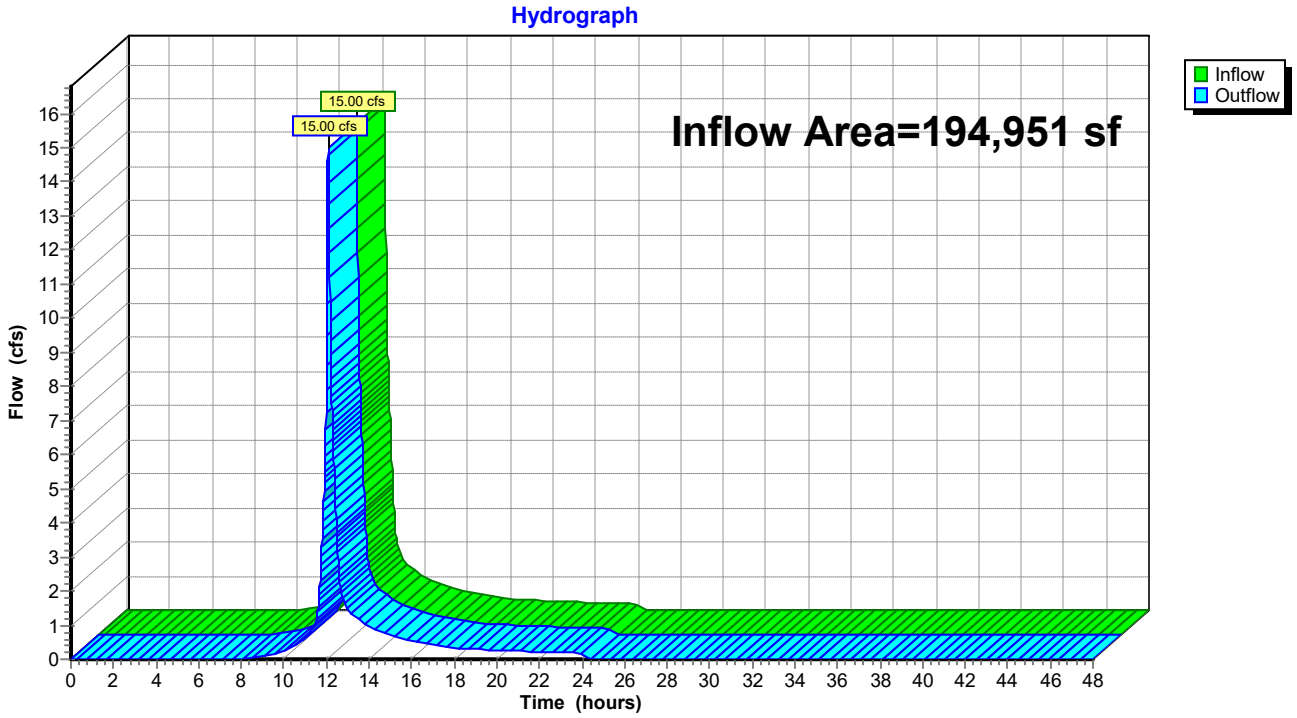
Summary for Reach PD1: Wetland "B" series

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 194,951 sf, 69.17% Impervious, Inflow Depth = 2.86" for 10-Year event
Inflow = 15.00 cfs @ 12.09 hrs, Volume= 46,408 cf
Outflow = 15.00 cfs @ 12.09 hrs, Volume= 46,408 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD1: Wetland "B" series



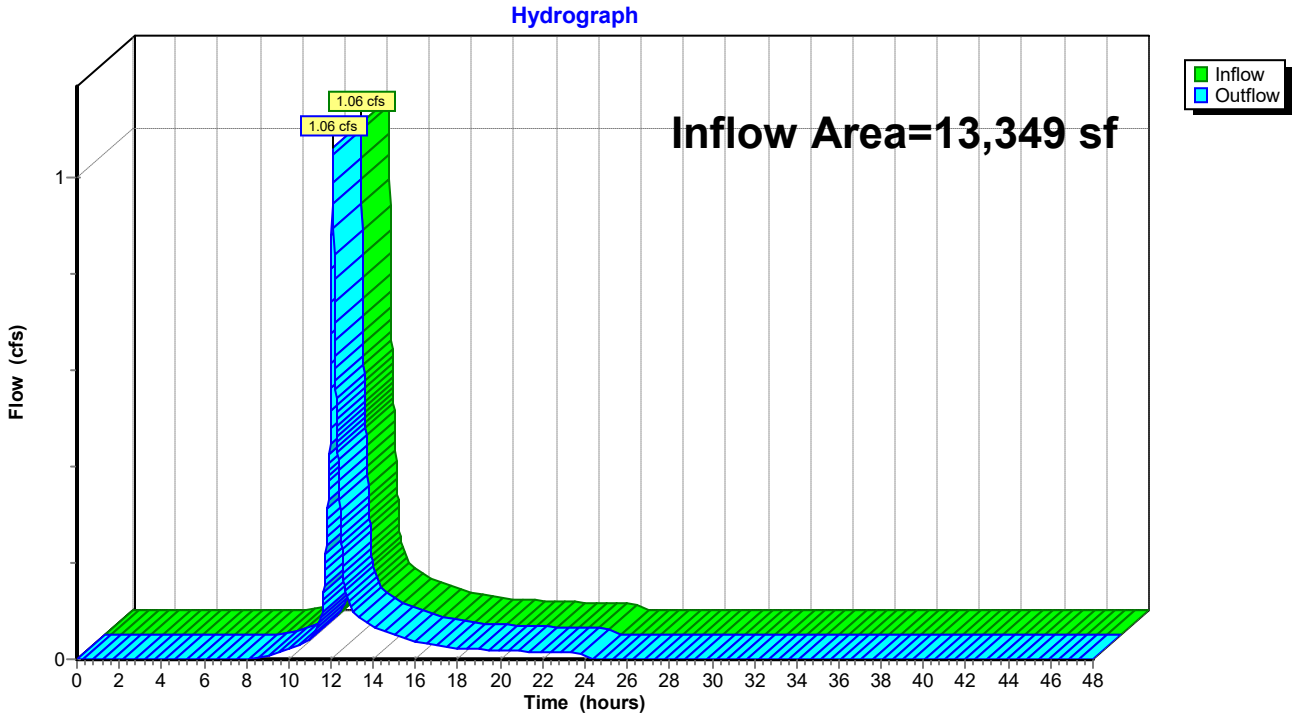
Summary for Reach PD2: Pleasant St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 13,349 sf, 67.29% Impervious, Inflow Depth = 2.95" for 10-Year event
Inflow = 1.06 cfs @ 12.09 hrs, Volume= 3,280 cf
Outflow = 1.06 cfs @ 12.09 hrs, Volume= 3,280 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD2: Pleasant St



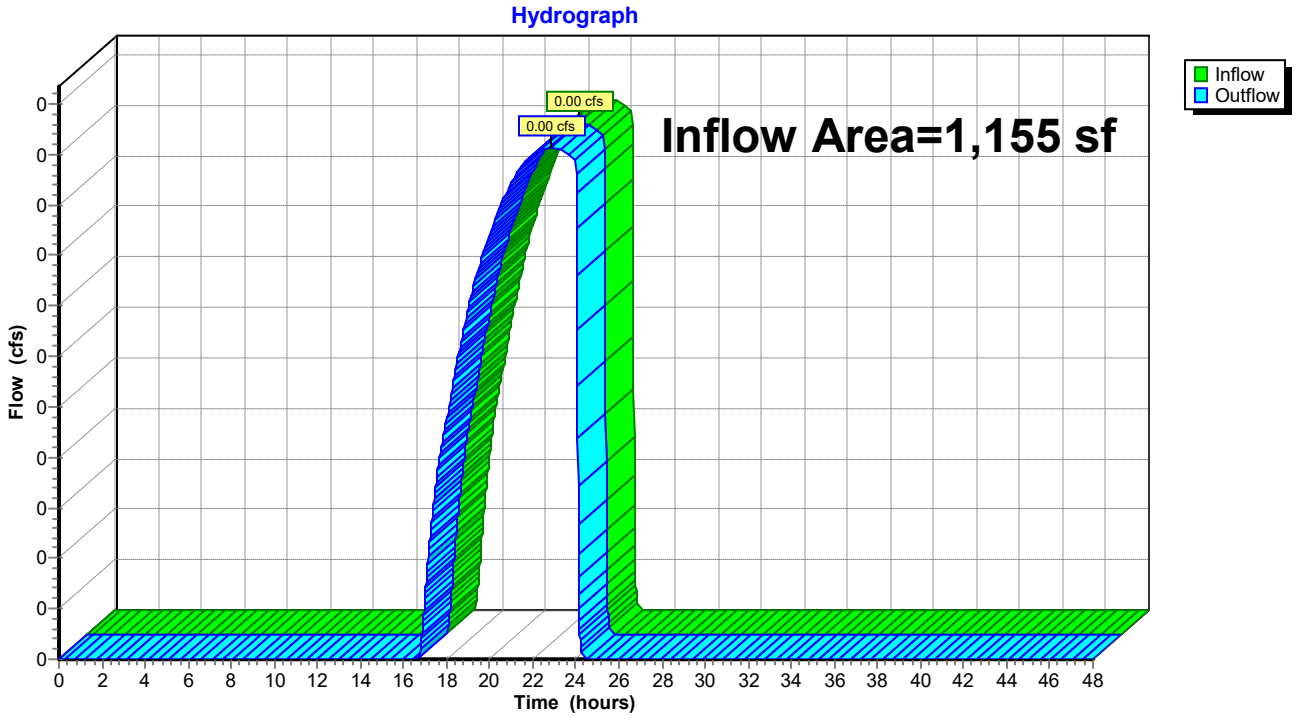
Summary for Reach PD3: SOUTH

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,155 sf, 0.00% Impervious, Inflow Depth = 0.01" for 10-Year event
Inflow = 0.00 cfs @ 22.82 hrs, Volume= 1 cf
Outflow = 0.00 cfs @ 22.82 hrs, Volume= 1 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD3: SOUTH



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 Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E-1: E-1 Runoff Area=194,951 sf 69.17% Impervious Runoff Depth=3.84"
Tc=6.0 min CN=78 Runoff=20.09 cfs 62,323 cf

Subcatchment E-2: E-2 Runoff Area=13,349 sf 67.29% Impervious Runoff Depth=3.94"
Tc=6.0 min CN=79 Runoff=1.41 cfs 4,383 cf

Subcatchment E-3: E-3 Runoff Area=1,155 sf 0.00% Impervious Runoff Depth=0.11"
Tc=6.0 min CN=30 Runoff=0.00 cfs 10 cf

Reach PD1: Wetland "B" series Inflow=20.09 cfs 62,323 cf
Outflow=20.09 cfs 62,323 cf

Reach PD2: Pleasant St Inflow=1.41 cfs 4,383 cf
Outflow=1.41 cfs 4,383 cf

Reach PD3: SOUTH Inflow=0.00 cfs 10 cf
Outflow=0.00 cfs 10 cf

Total Runoff Area = 209,455 sf Runoff Volume = 66,716 cf Average Runoff Depth = 3.82"
31.33% Pervious = 65,631 sf 68.67% Impervious = 143,824 sf

Summary for Subcatchment E-1: E-1

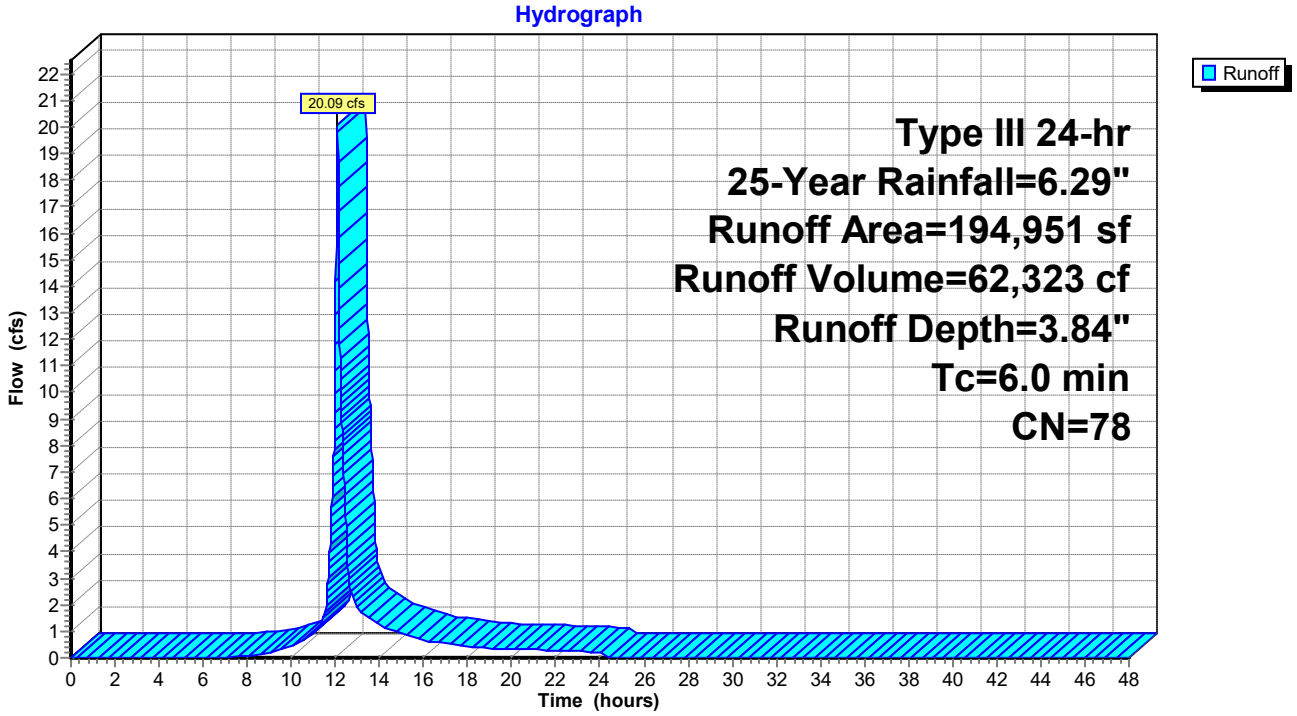
Runoff = 20.09 cfs @ 12.09 hrs, Volume= 62,323 cf, Depth= 3.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.29"

	Area (sf)	CN	Description
*	14,030	98	wetland
*	120,811	98	Pavement and Roofs
	32,468	30	Woods, Good, HSG A
	27,642	39	>75% Grass cover, Good, HSG A
	194,951	78	Weighted Average
	60,110	34	30.83% Pervious Area
	134,841	98	69.17% Impervious Area

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

Subcatchment E-1: E-1



Summary for Subcatchment E-2: E-2

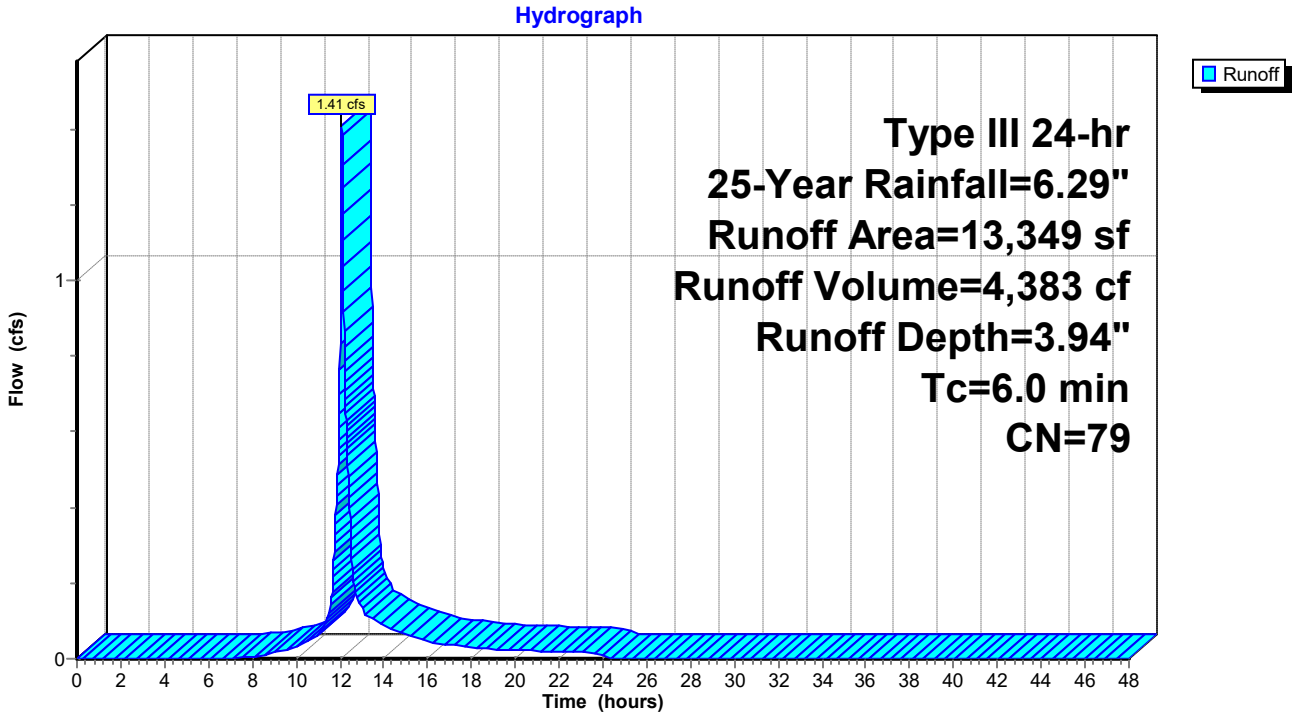
Runoff = 1.41 cfs @ 12.09 hrs, Volume= 4,383 cf, Depth= 3.94"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.29"

	Area (sf)	CN	Description
	4,366	39	>75% Grass cover, Good, HSG A
*	8,983	98	roof and pavement
	13,349	79	Weighted Average
	4,366	39	32.71% Pervious Area
	8,983	98	67.29% Impervious Area

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

Subcatchment E-2: E-2



Summary for Subcatchment E-3: E-3

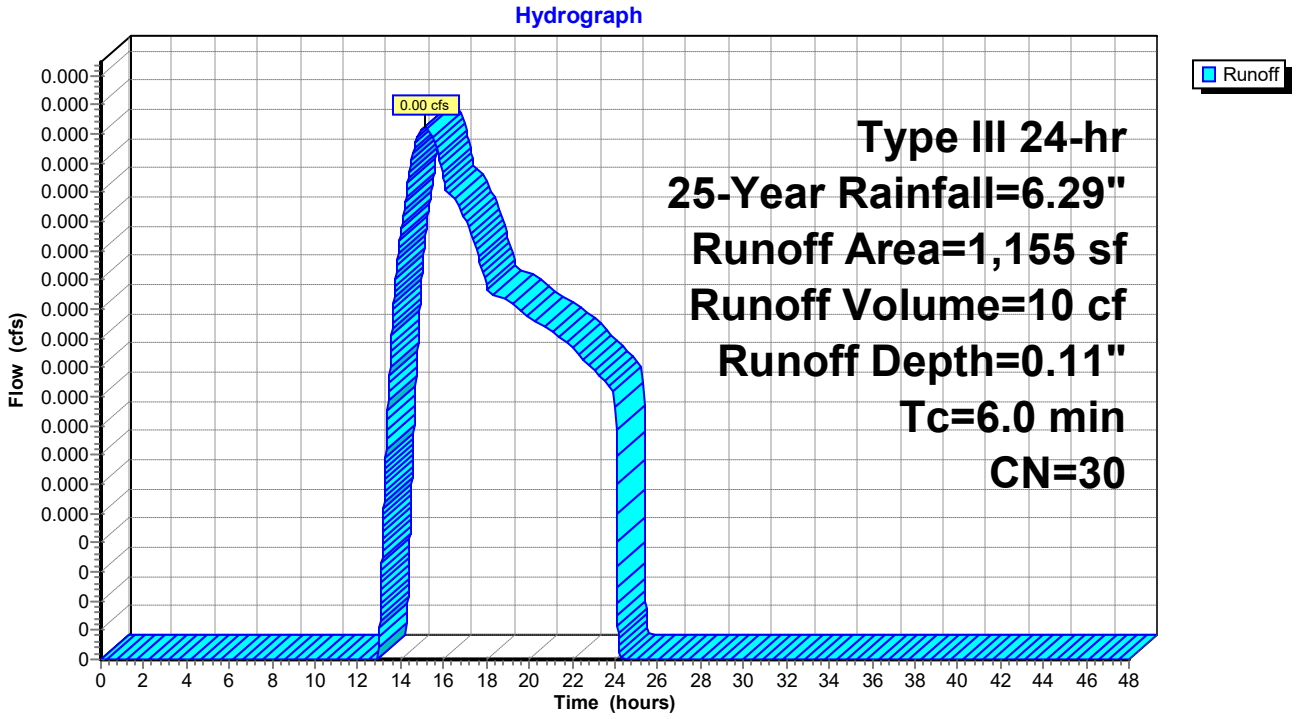
Runoff = 0.00 cfs @ 15.14 hrs, Volume= 10 cf, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.29"

Area (sf)	CN	Description
1,155	30	Woods, Good, HSG A
1,155	30	100.00% Pervious Area

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

Subcatchment E-3: E-3



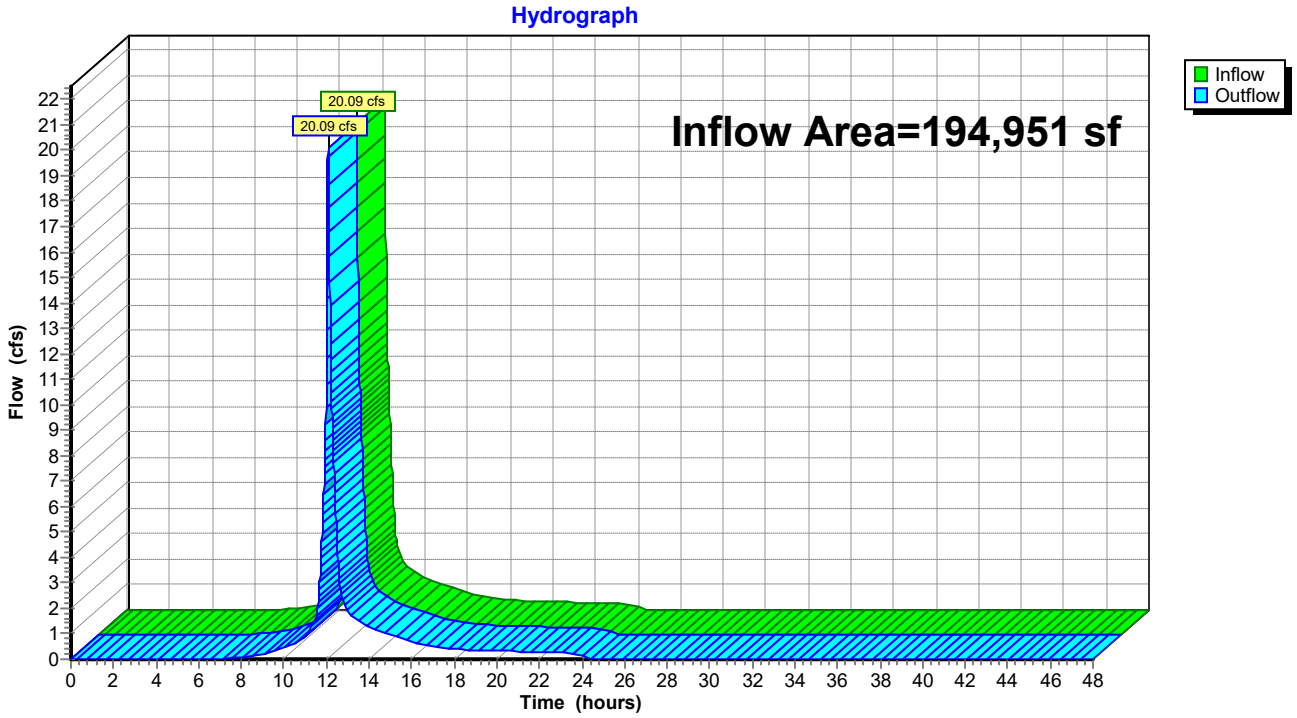
Summary for Reach PD1: Wetland "B" series

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 194,951 sf, 69.17% Impervious, Inflow Depth = 3.84" for 25-Year event
Inflow = 20.09 cfs @ 12.09 hrs, Volume= 62,323 cf
Outflow = 20.09 cfs @ 12.09 hrs, Volume= 62,323 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD1: Wetland "B" series



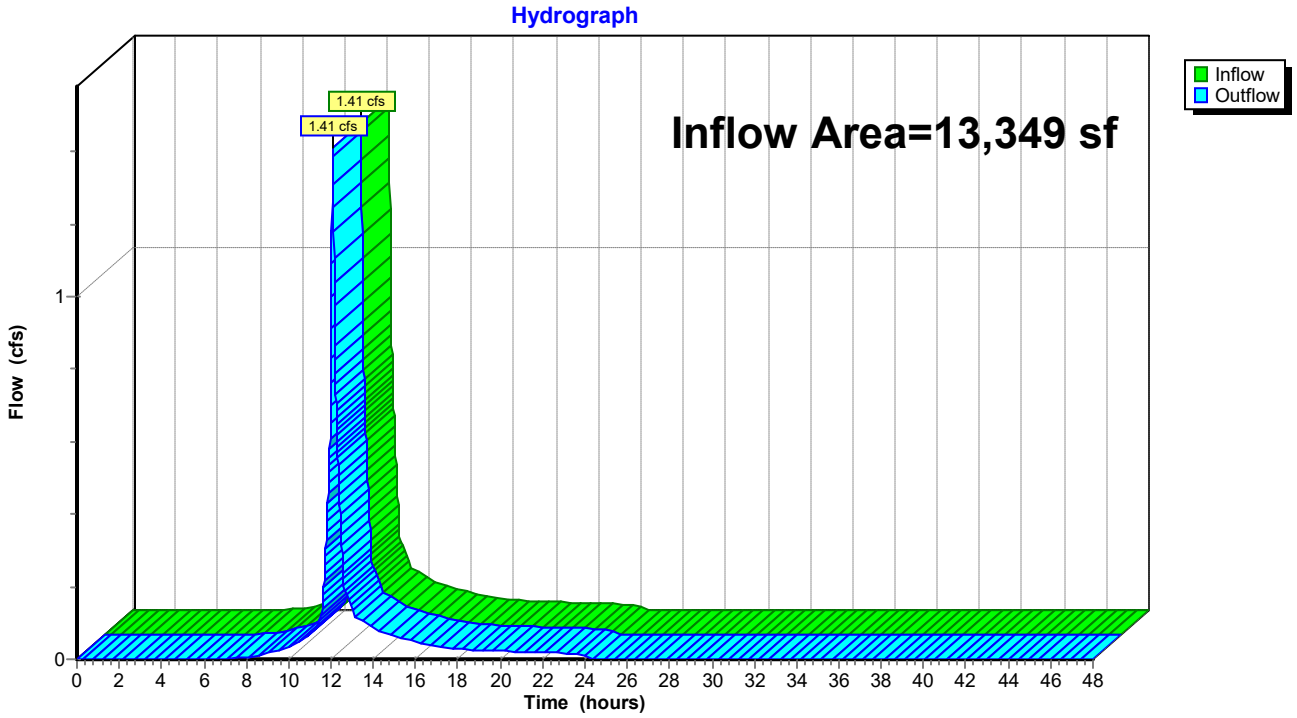
Summary for Reach PD2: Pleasant St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 13,349 sf, 67.29% Impervious, Inflow Depth = 3.94" for 25-Year event
Inflow = 1.41 cfs @ 12.09 hrs, Volume= 4,383 cf
Outflow = 1.41 cfs @ 12.09 hrs, Volume= 4,383 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD2: Pleasant St



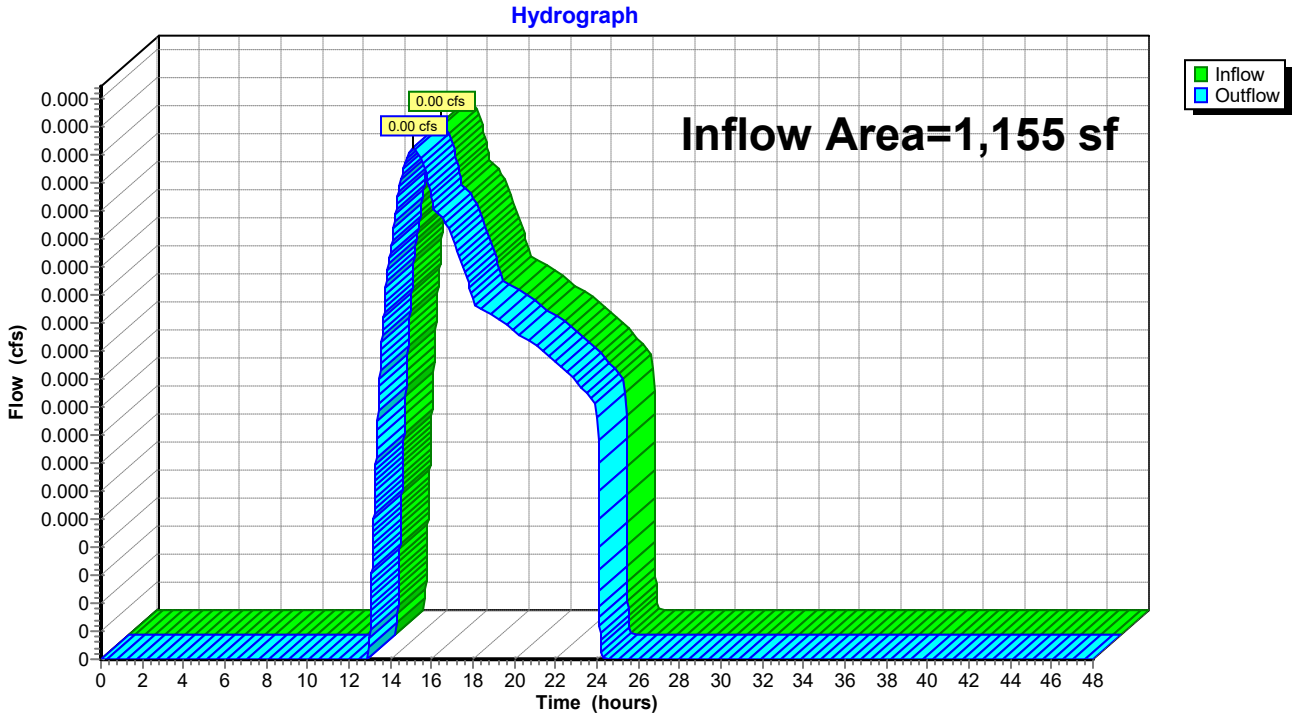
Summary for Reach PD3: SOUTH

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,155 sf, 0.00% Impervious, Inflow Depth = 0.11" for 25-Year event
Inflow = 0.00 cfs @ 15.14 hrs, Volume= 10 cf
Outflow = 0.00 cfs @ 15.14 hrs, Volume= 10 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD3: SOUTH



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 Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment E-1: E-1 Runoff Area=194,951 sf 69.17% Impervious Runoff Depth=5.41"
Tc=6.0 min CN=78 Runoff=28.10 cfs 87,883 cf

Subcatchment E-2: E-2 Runoff Area=13,349 sf 67.29% Impervious Runoff Depth=5.53"
Tc=6.0 min CN=79 Runoff=1.96 cfs 6,148 cf

Subcatchment E-3: E-3 Runoff Area=1,155 sf 0.00% Impervious Runoff Depth=0.42"
Tc=6.0 min CN=30 Runoff=0.00 cfs 41 cf

Reach PD1: Wetland "B" series Inflow=28.10 cfs 87,883 cf
Outflow=28.10 cfs 87,883 cf

Reach PD2: Pleasant St Inflow=1.96 cfs 6,148 cf
Outflow=1.96 cfs 6,148 cf

Reach PD3: SOUTH Inflow=0.00 cfs 41 cf
Outflow=0.00 cfs 41 cf

Total Runoff Area = 209,455 sf Runoff Volume = 94,071 cf Average Runoff Depth = 5.39"
31.33% Pervious = 65,631 sf 68.67% Impervious = 143,824 sf

Summary for Subcatchment E-1: E-1

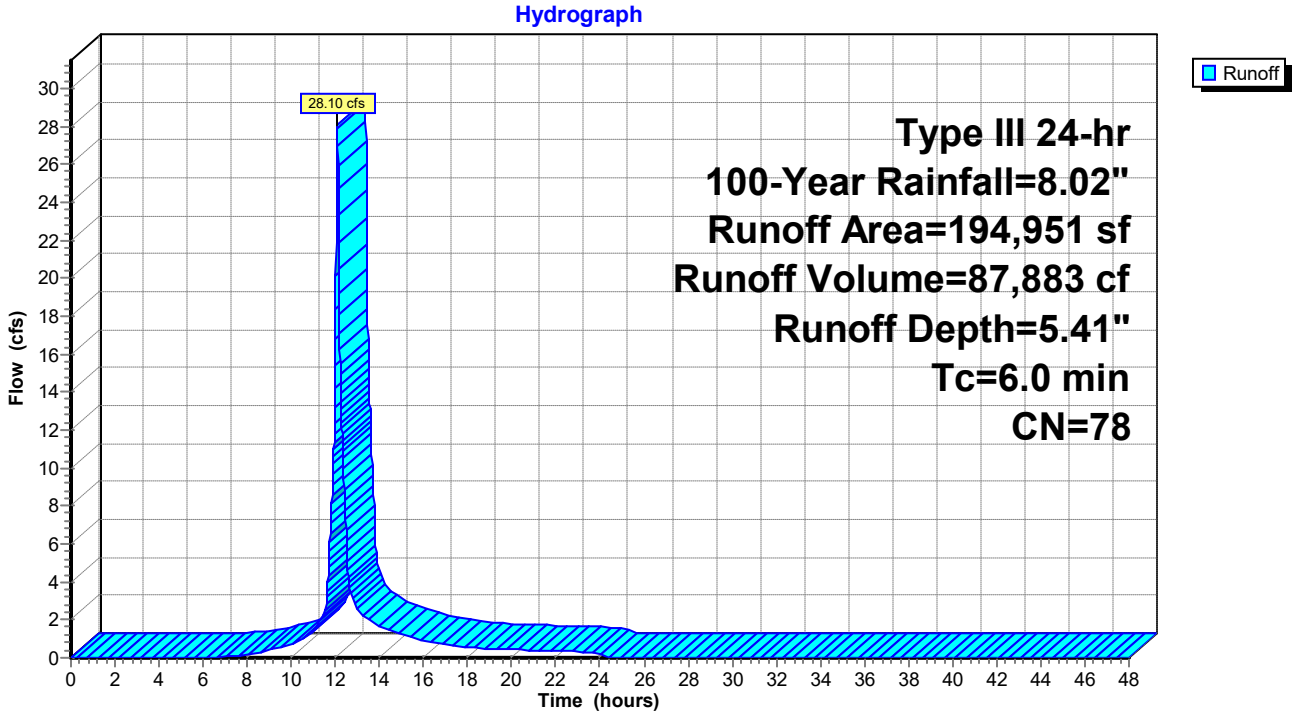
Runoff = 28.10 cfs @ 12.09 hrs, Volume= 87,883 cf, Depth= 5.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

	Area (sf)	CN	Description
*	14,030	98	wetland
*	120,811	98	Pavement and Roofs
	32,468	30	Woods, Good, HSG A
	27,642	39	>75% Grass cover, Good, HSG A
	194,951	78	Weighted Average
	60,110	34	30.83% Pervious Area
	134,841	98	69.17% Impervious Area

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

Subcatchment E-1: E-1



Summary for Subcatchment E-2: E-2

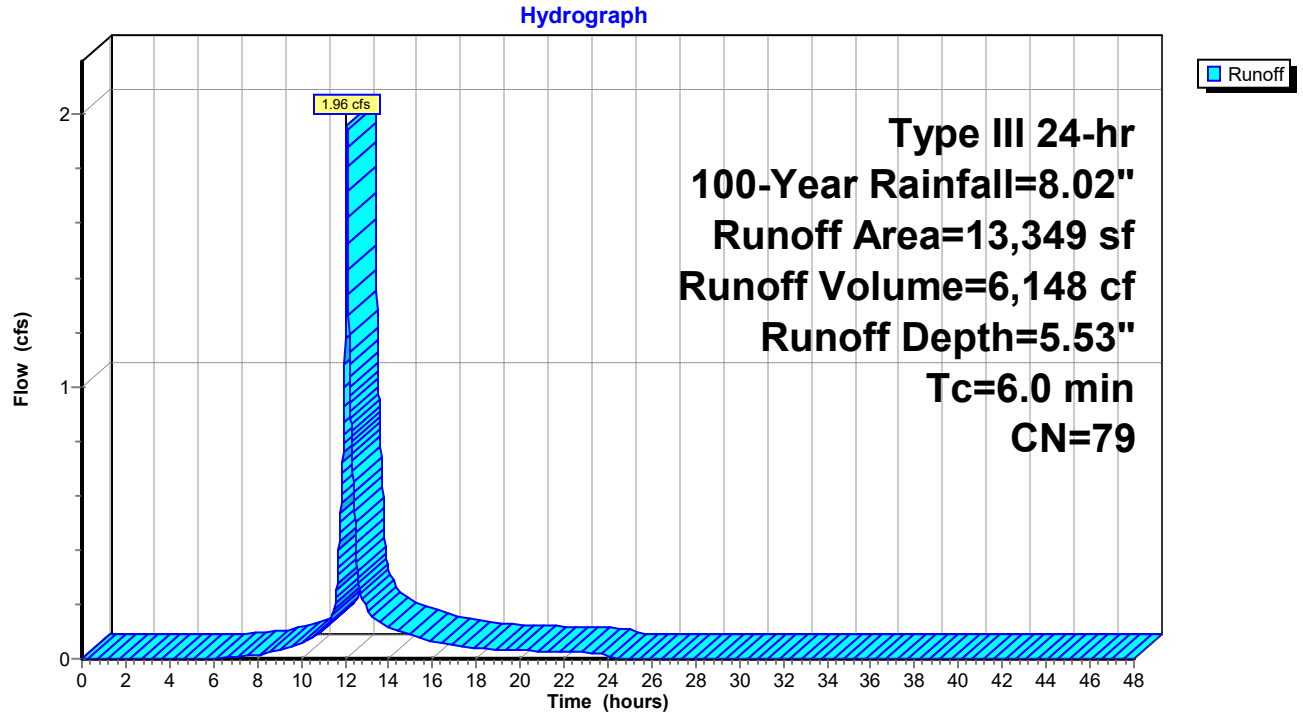
Runoff = 1.96 cfs @ 12.09 hrs, Volume= 6,148 cf, Depth= 5.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

	Area (sf)	CN	Description
	4,366	39	>75% Grass cover, Good, HSG A
*	8,983	98	roof and pavement
	13,349	79	Weighted Average
	4,366	39	32.71% Pervious Area
	8,983	98	67.29% Impervious Area

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

Subcatchment E-2: E-2



Summary for Subcatchment E-3: E-3

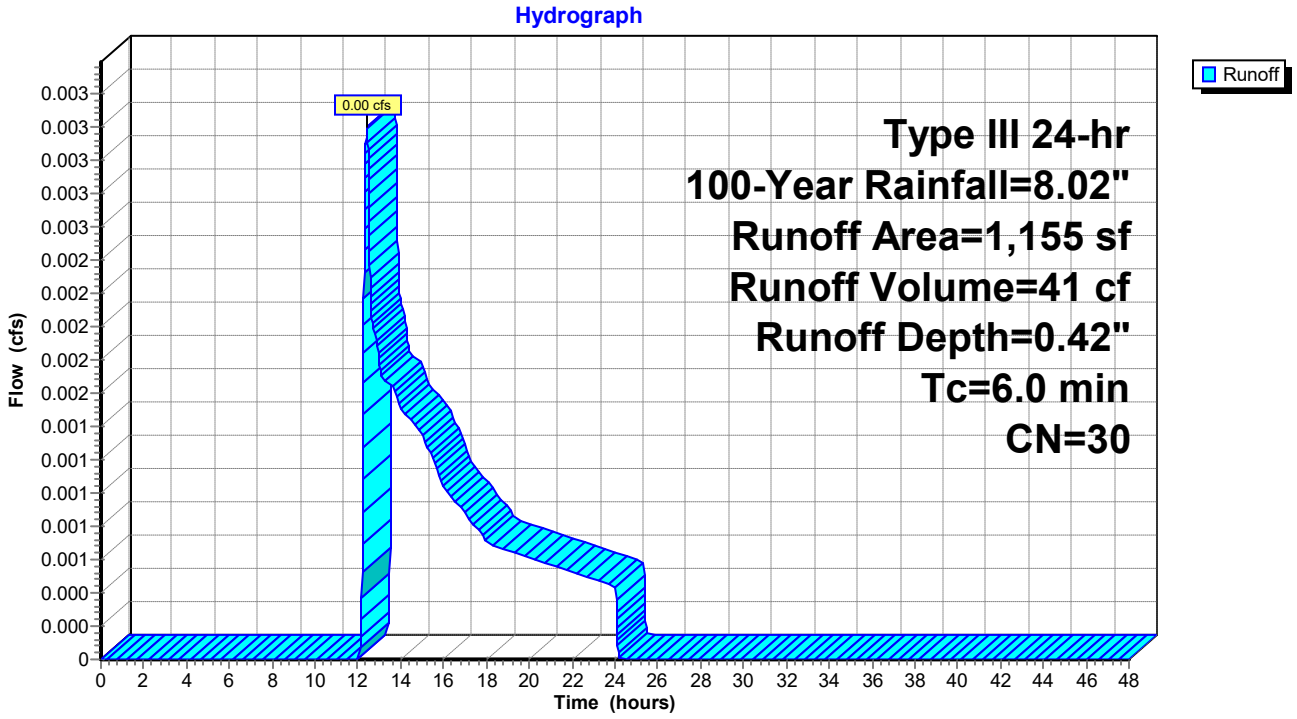
Runoff = 0.00 cfs @ 12.42 hrs, Volume= 41 cf, Depth= 0.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
1,155	30	Woods, Good, HSG A
1,155	30	100.00% Pervious Area

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

Subcatchment E-3: E-3



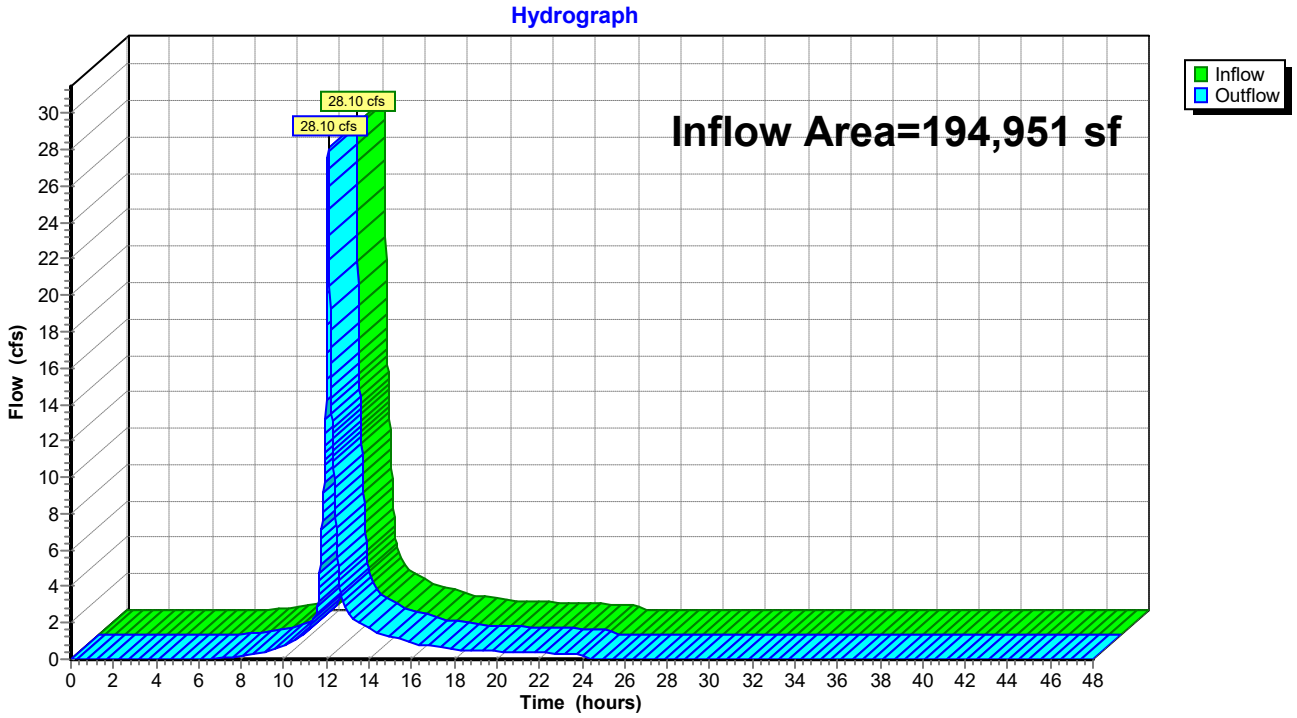
Summary for Reach PD1: Wetland "B" series

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 194,951 sf, 69.17% Impervious, Inflow Depth = 5.41" for 100-Year event
Inflow = 28.10 cfs @ 12.09 hrs, Volume= 87,883 cf
Outflow = 28.10 cfs @ 12.09 hrs, Volume= 87,883 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD1: Wetland "B" series



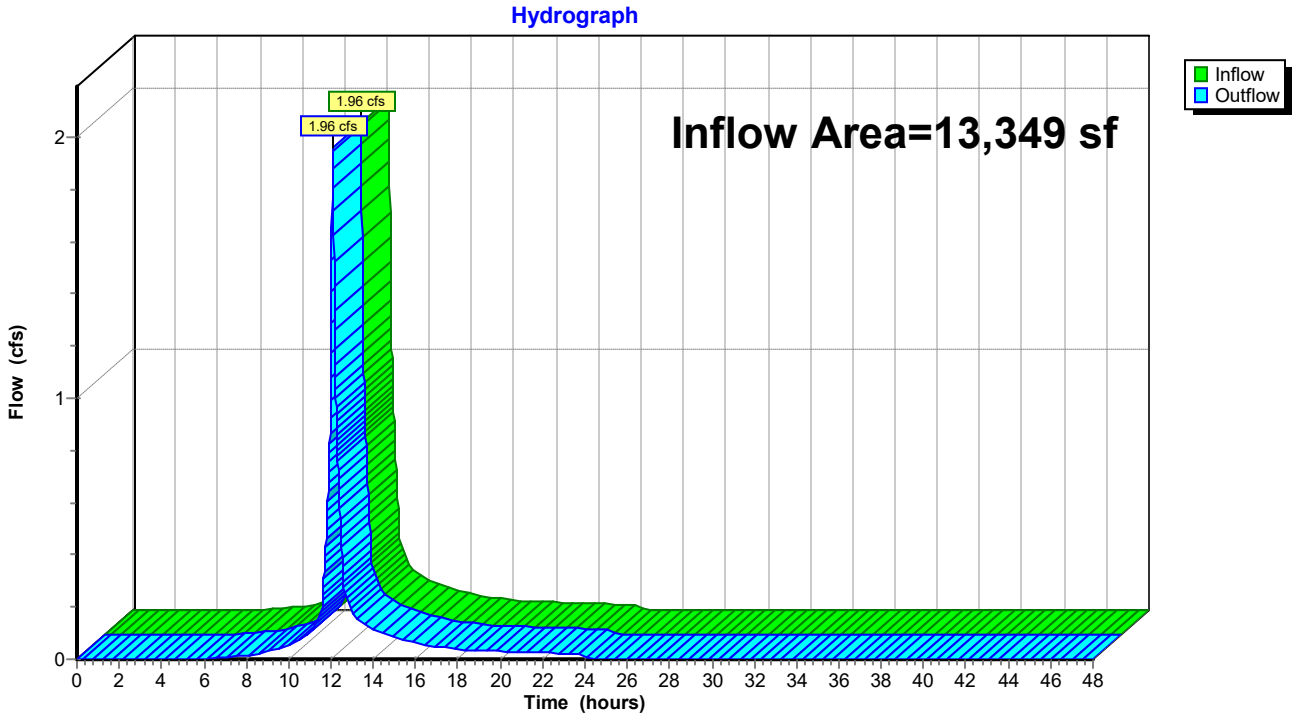
Summary for Reach PD2: Pleasant St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 13,349 sf, 67.29% Impervious, Inflow Depth = 5.53" for 100-Year event
Inflow = 1.96 cfs @ 12.09 hrs, Volume= 6,148 cf
Outflow = 1.96 cfs @ 12.09 hrs, Volume= 6,148 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD2: Pleasant St



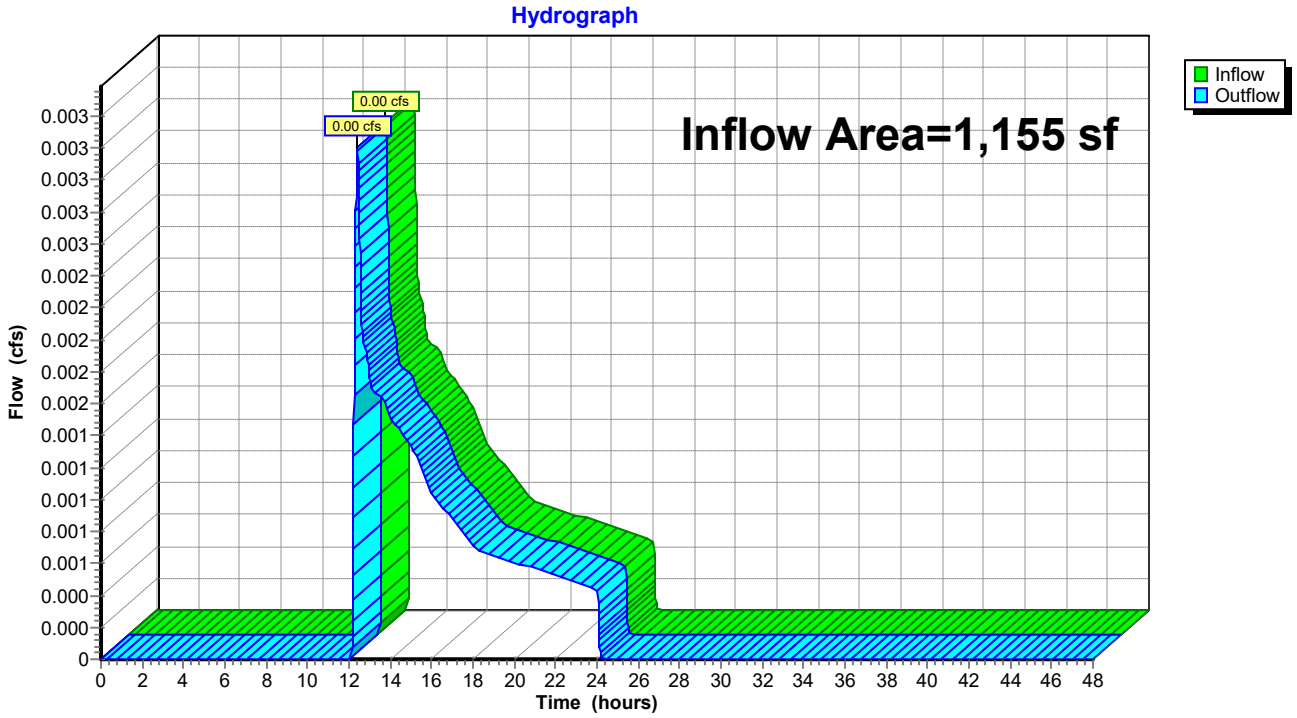
Summary for Reach PD3: SOUTH

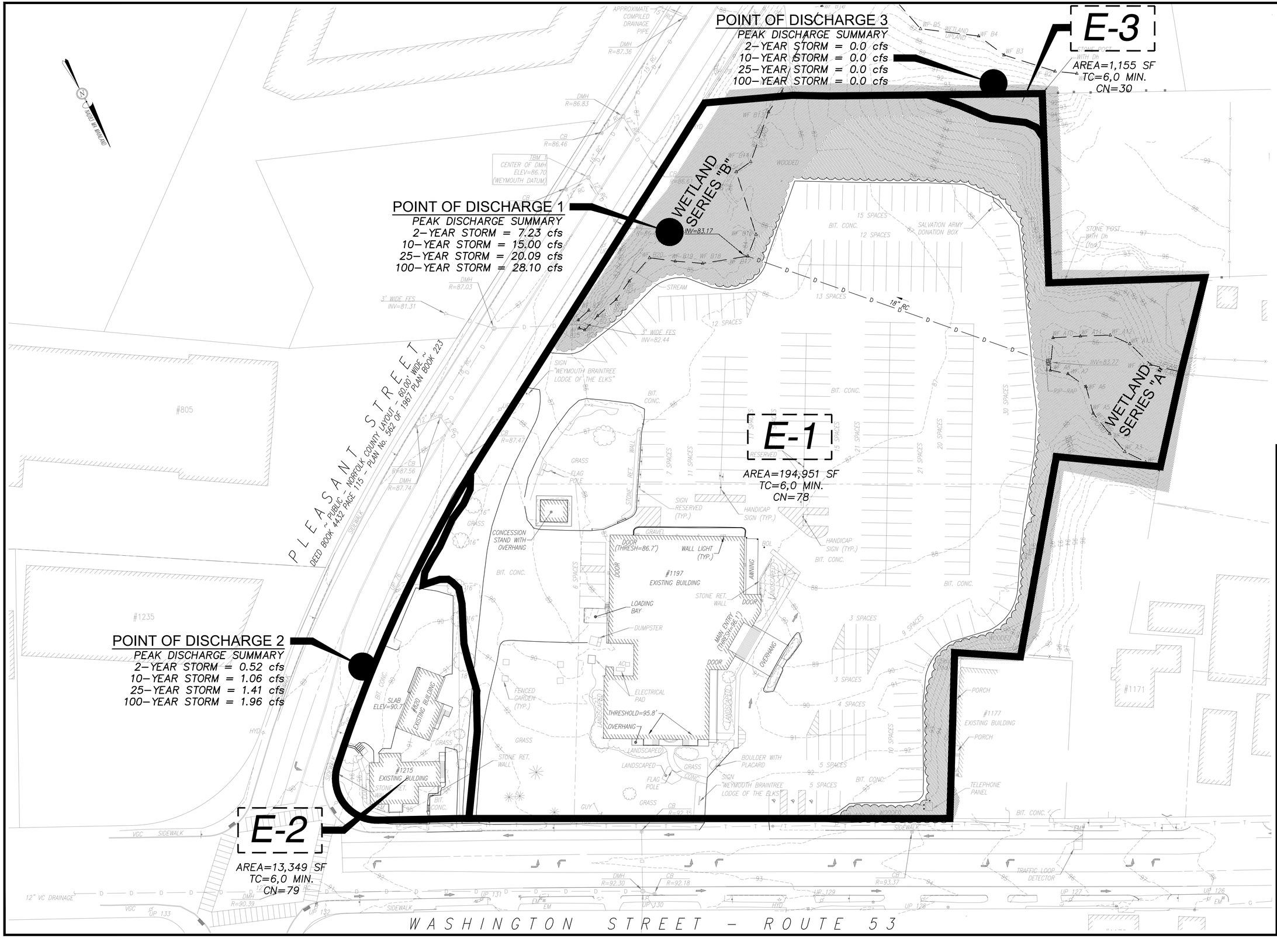
[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,155 sf, 0.00% Impervious, Inflow Depth = 0.42" for 100-Year event
Inflow = 0.00 cfs @ 12.42 hrs, Volume= 41 cf
Outflow = 0.00 cfs @ 12.42 hrs, Volume= 41 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD3: SOUTH





Date	Description	No.
	Revisions	

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Project
CORNERSTONE AT WEYMOUTH
#1197 WASHINGTON STREET
WEYMOUTH, MA

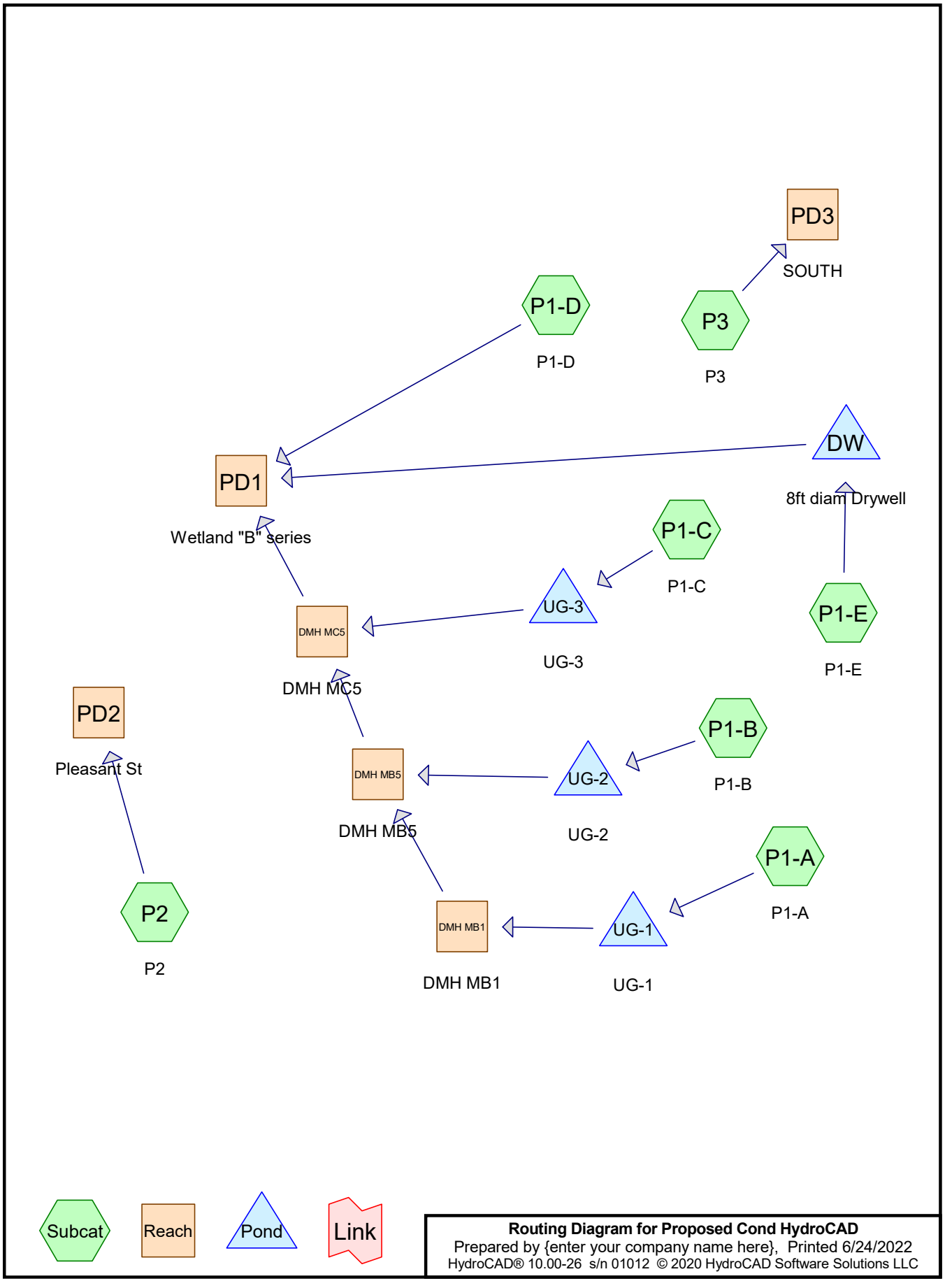
Prepared for
ELKSY DEVELOPMENT LLC
#180 CANTON AVENUE
MILTON, MA 02186

Drawing Title
EXISTING CONDITIONS WATERSHED MAP

Project No.	100-142
Date	7-1-2022
Scale	1"=30'
Drawn By	ASZ
Approved By	GC

Drawing No.
EH-1

C:\CDG\Crocker Design Group, LLC\Gabriel Crocker - Projects\100-142 Weymouth - Elk Club\dwg\Plot Sheets\Site Plan Application_EH-1 EXISTING WATERSHED MAP.dwg, Jun 24, 2022 08:46



Routing Diagram for Proposed Cond HydroCAD
Prepared by {enter your company name here}, Printed 6/24/2022

Project Notes

Rainfall events imported from "EXIST.hcp"

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
48,025	39	>75% Grass cover, Good, HSG A (P1-A, P1-D, P1-E, P2)
69,628	98	PAVEMENT (P1-A, P1-D, P1-E)
55,073	98	ROOF BLDG (P1-A, P1-B, P1-C, P1-D)
1,440	98	ROOF PORTA CACHER (P1-A)
18,555	30	Woods, Good, HSG A (P1-D, P3)
2,700	98	pavement (P2)
14,030	98	wetland (P1-D)
209,451	**78**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
66,580	HSG A	P1-A, P1-D, P1-E, P2, P3
0	HSG B	
0	HSG C	
0	HSG D	
142,871	Other	P1-A, P1-B, P1-C, P1-D, P1-E, P2
209,451		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Su Nu
48,025	0	0	0	0	48,025	>75% Grass cover, Good	
0	0	0	0	69,628	69,628	PAVEMENT	
0	0	0	0	55,073	55,073	ROOF BLDG	
0	0	0	0	1,440	1,440	ROOF PORTA CACHER	
18,555	0	0	0	0	18,555	Woods, Good	
0	0	0	0	2,700	2,700	pavement	
0	0	0	0	14,030	14,030	wetland	
66,580	**0**	**0**	**0**	**142,871**	**209,451**	**TOTAL AREA**	

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 Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P1-A: P1-A Runoff Area=22,183 sf 85.20% Impervious Runoff Depth=2.24"
Tc=6.0 min CN=89 Runoff=1.32 cfs 4,136 cf

Subcatchment P1-B: P1-B Runoff Area=10,025 sf 100.00% Impervious Runoff Depth=3.14"
Tc=6.0 min CN=98 Runoff=0.75 cfs 2,621 cf

Subcatchment P1-C: P1-C Runoff Area=20,963 sf 100.00% Impervious Runoff Depth=3.14"
Tc=6.0 min CN=98 Runoff=1.58 cfs 5,480 cf

Subcatchment P1-D: P1-D Runoff Area=137,299 sf 65.03% Impervious Runoff Depth=1.27"
Tc=6.0 min CN=76 Runoff=4.57 cfs 14,551 cf

Subcatchment P1-E: P1-E Runoff Area=10,868 sf 9.20% Impervious Runoff Depth=0.05"
Flow Length=95' Slope=0.0100 '/' Tc=8.3 min CN=44 Runoff=0.00 cfs 45 cf

Subcatchment P2: P2 Runoff Area=6,958 sf 38.80% Impervious Runoff Depth=0.56"
Tc=6.0 min CN=62 Runoff=0.07 cfs 322 cf

Subcatchment P3: P3 Runoff Area=1,155 sf 0.00% Impervious Runoff Depth=0.00"
Tc=6.0 min CN=30 Runoff=0.00 cfs 0 cf

Reach DMH MB1: DMH MB1 Inflow=0.05 cfs 66 cf
Outflow=0.05 cfs 66 cf

Reach DMH MB5: DMH MB5 Inflow=0.05 cfs 66 cf
Outflow=0.05 cfs 66 cf

Reach DMH MC5: DMH MC5 Inflow=0.05 cfs 66 cf
Outflow=0.05 cfs 66 cf

Reach PD1: Wetland "B" series Inflow=4.57 cfs 14,617 cf
Outflow=4.57 cfs 14,617 cf

Reach PD2: Pleasant St Inflow=0.07 cfs 322 cf
Outflow=0.07 cfs 322 cf

Reach PD3: SOUTH Inflow=0.00 cfs 0 cf
Outflow=0.00 cfs 0 cf

Pond DW: 8ft diam Drywell Peak Elev=86.33' Storage=2 cf Inflow=0.00 cfs 45 cf
Discarded=0.00 cfs 45 cf Primary=0.00 cfs 0 cf Outflow=0.00 cfs 45 cf

Pond UG-1: UG-1 Peak Elev=90.42' Storage=1,643 cf Inflow=1.32 cfs 4,136 cf
Discarded=0.11 cfs 4,070 cf Primary=0.05 cfs 66 cf Outflow=0.16 cfs 4,136 cf

Pond UG-2: UG-2 Peak Elev=90.10' Storage=941 cf Inflow=0.75 cfs 2,621 cf
Discarded=0.07 cfs 2,621 cf Primary=0.00 cfs 0 cf Outflow=0.07 cfs 2,621 cf

Pond UG-3: UG-3 Peak Elev=89.73' Storage=1,879 cf Inflow=1.58 cfs 5,480 cf
Discarded=0.15 cfs 5,480 cf Primary=0.00 cfs 0 cf Outflow=0.15 cfs 5,480 cf

Total Runoff Area = 209,451 sf Runoff Volume = 27,155 cf Average Runoff Depth = 1.56"
31.79% Pervious = 66,580 sf 68.21% Impervious = 142,871 sf

Summary for Subcatchment P1-A: P1-A

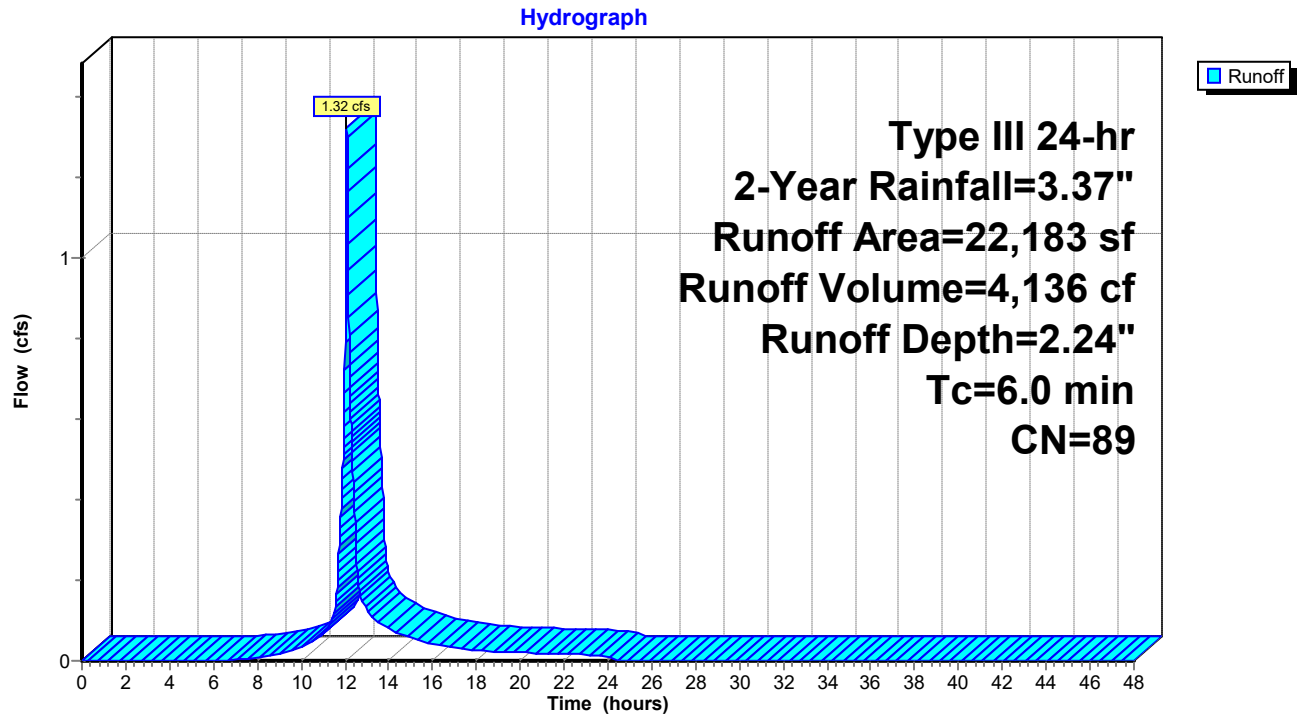
Runoff = 1.32 cfs @ 12.09 hrs, Volume= 4,136 cf, Depth= 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.37"

	Area (sf)	CN	Description
	3,283	39	>75% Grass cover, Good, HSG A
*	1,440	98	ROOF PORTA CACHER
*	10,300	98	ROOF BLDG
*	7,160	98	PAVEMENT
	22,183	89	Weighted Average
	3,283	39	14.80% Pervious Area
	18,900	98	85.20% Impervious Area

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

Subcatchment P1-A: P1-A



Summary for Subcatchment P1-B: P1-B

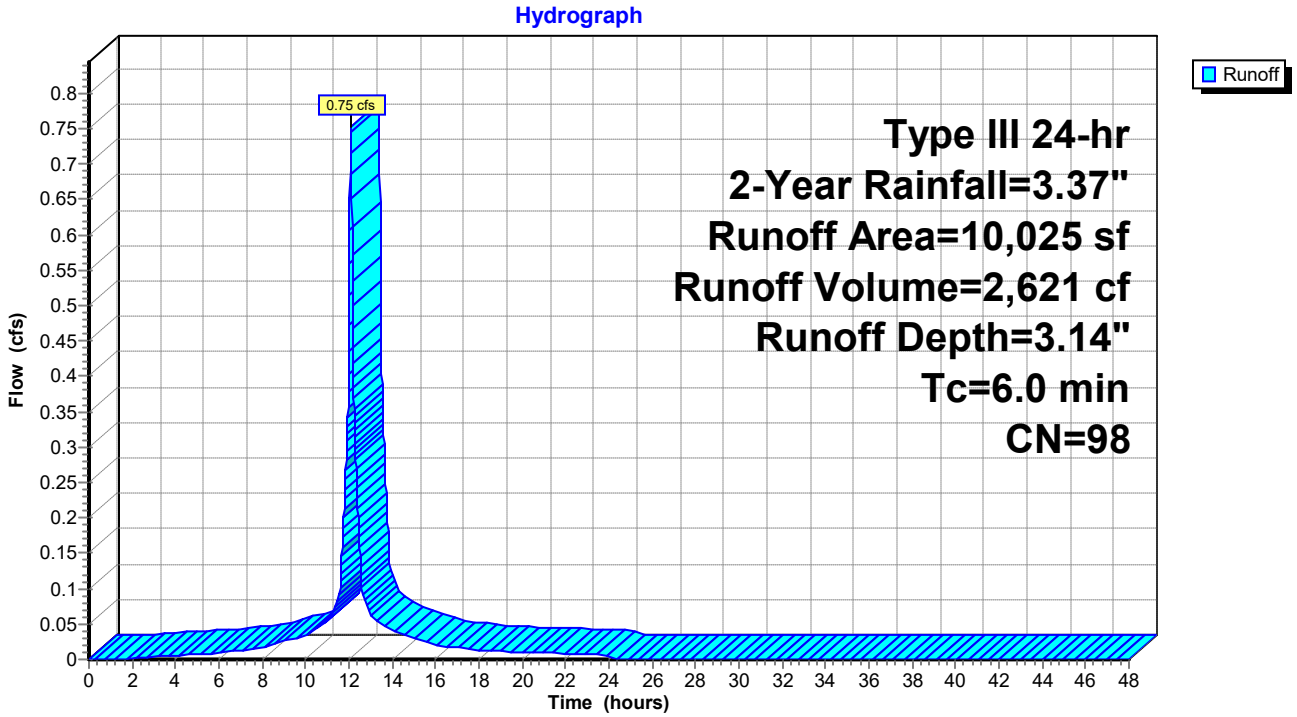
Runoff = 0.75 cfs @ 12.08 hrs, Volume= 2,621 cf, Depth= 3.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.37"

	Area (sf)	CN	Description
*	10,025	98	ROOF BLDG
	10,025	98	100.00% Impervious Area

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

Subcatchment P1-B: P1-B



Summary for Subcatchment P1-C: P1-C

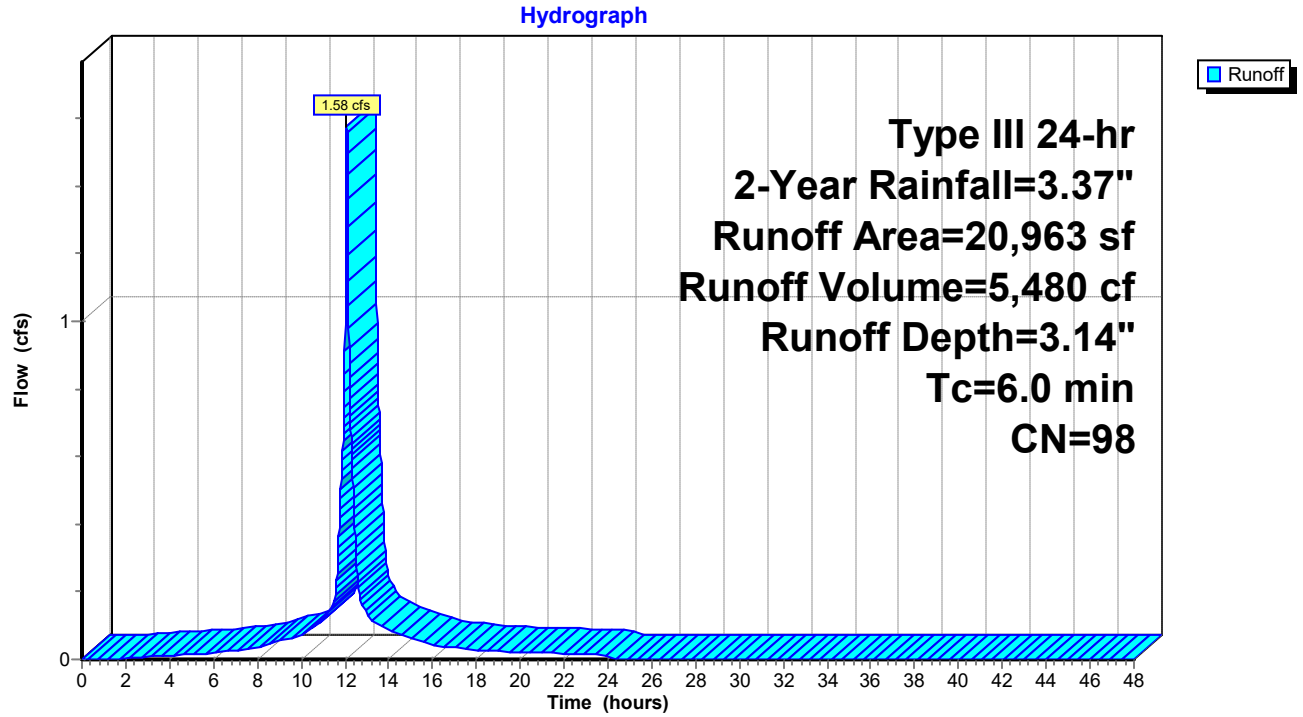
Runoff = 1.58 cfs @ 12.08 hrs, Volume= 5,480 cf, Depth= 3.14"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.37"

	Area (sf)	CN	Description
*	20,963	98	ROOF BLDG
	20,963	98	100.00% Impervious Area

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

Subcatchment P1-C: P1-C



Summary for Subcatchment P1-D: P1-D

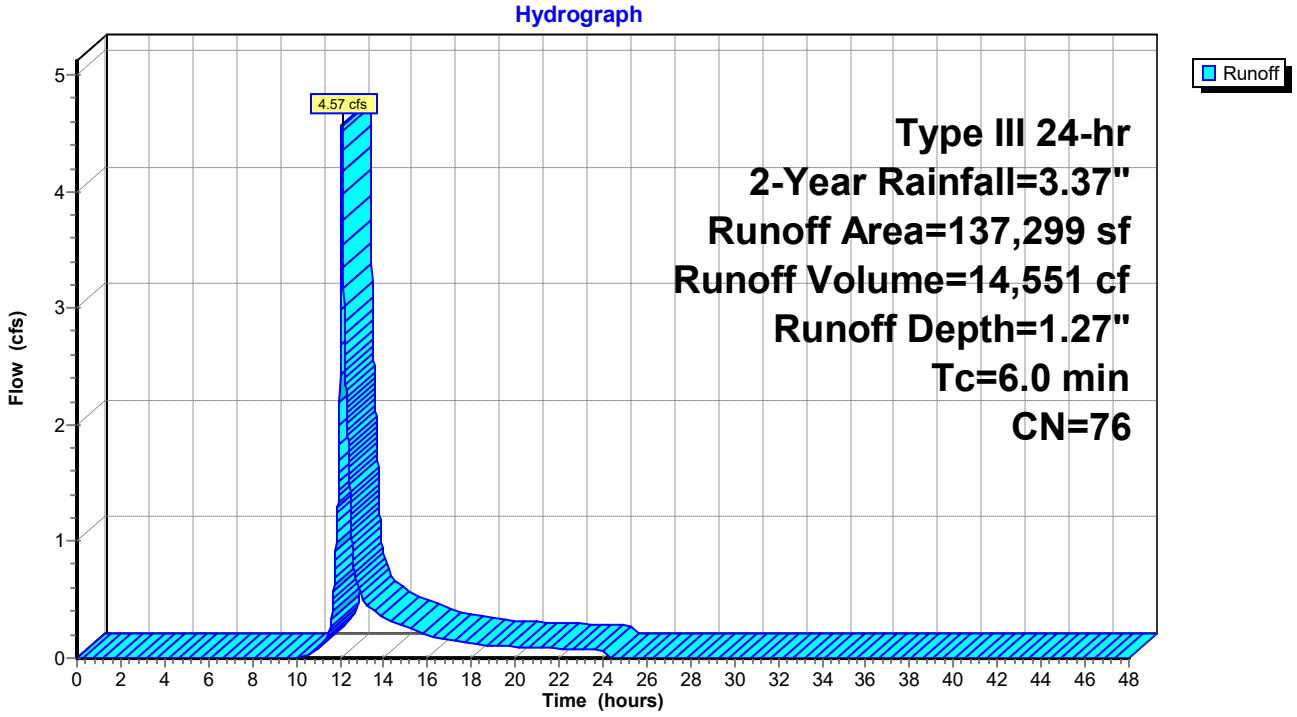
Runoff = 4.57 cfs @ 12.09 hrs, Volume= 14,551 cf, Depth= 1.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.37"

	Area (sf)	CN	Description
*	14,030	98	wetland
*	61,468	98	PAVEMENT
	17,400	30	Woods, Good, HSG A
	30,616	39	>75% Grass cover, Good, HSG A
*	13,785	98	ROOF BLDG
	137,299	76	Weighted Average
	48,016	36	34.97% Pervious Area
	89,283	98	65.03% Impervious Area

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

Subcatchment P1-D: P1-D



Summary for Subcatchment P1-E: P1-E

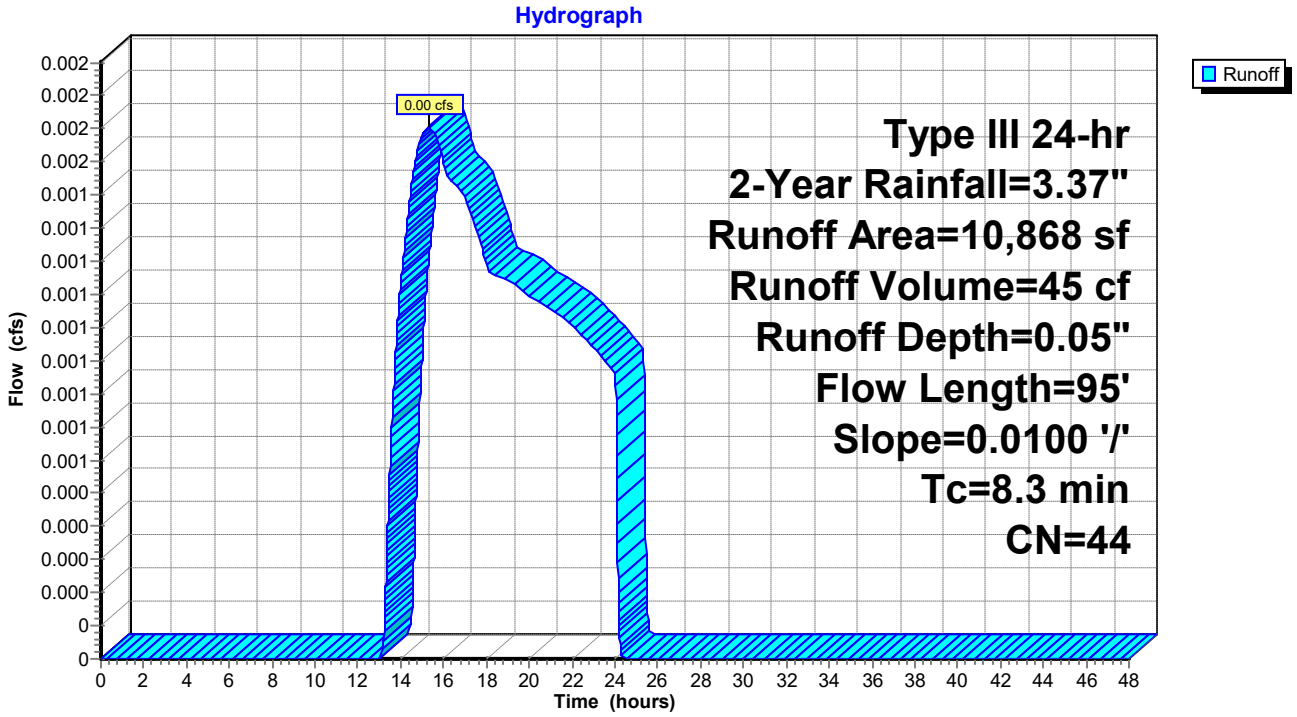
Runoff = 0.00 cfs @ 15.30 hrs, Volume= 45 cf, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.37"

	Area (sf)	CN	Description
*	1,000	98	PAVEMENT
	9,868	39	>75% Grass cover, Good, HSG A
	10,868	44	Weighted Average
	9,868	39	90.80% Pervious Area
	1,000	98	9.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.40"
1.1	45	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.3	95	Total			

Subcatchment P1-E: P1-E



Summary for Subcatchment P2: P2

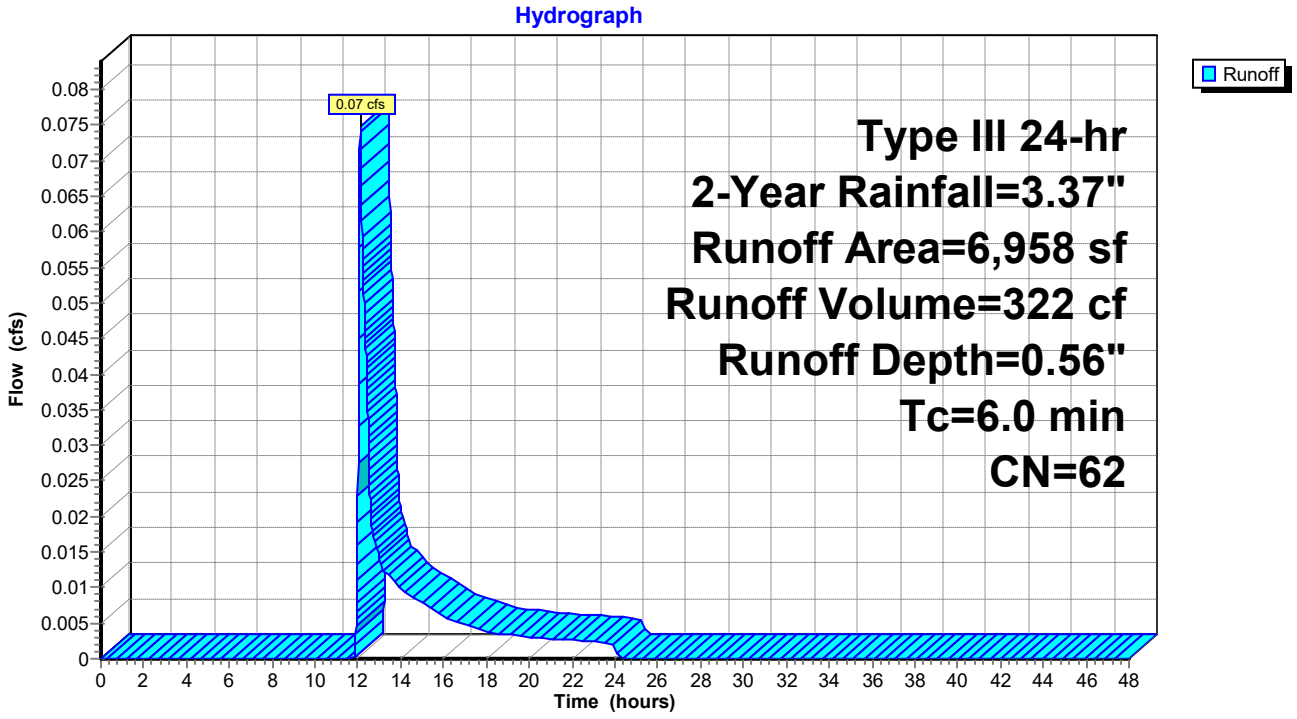
Runoff = 0.07 cfs @ 12.11 hrs, Volume= 322 cf, Depth= 0.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.37"

	Area (sf)	CN	Description
	4,258	39	>75% Grass cover, Good, HSG A
*	2,700	98	pavement
	6,958	62	Weighted Average
	4,258	39	61.20% Pervious Area
	2,700	98	38.80% Impervious Area

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

Subcatchment P2: P2



Summary for Subcatchment P3: P3

[45] Hint: Runoff=Zero

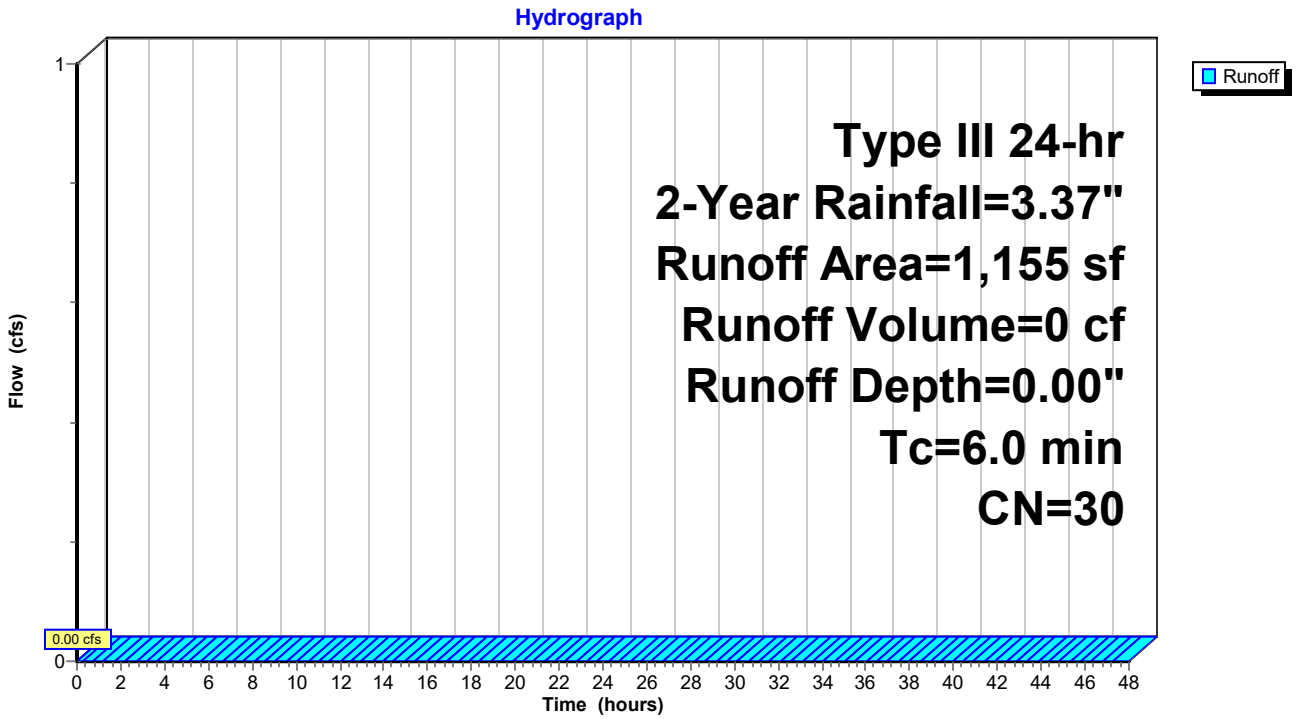
Runoff = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 2-Year Rainfall=3.37"

Area (sf)	CN	Description
1,155	30	Woods, Good, HSG A
1,155	30	100.00% Pervious Area

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

Subcatchment P3: P3



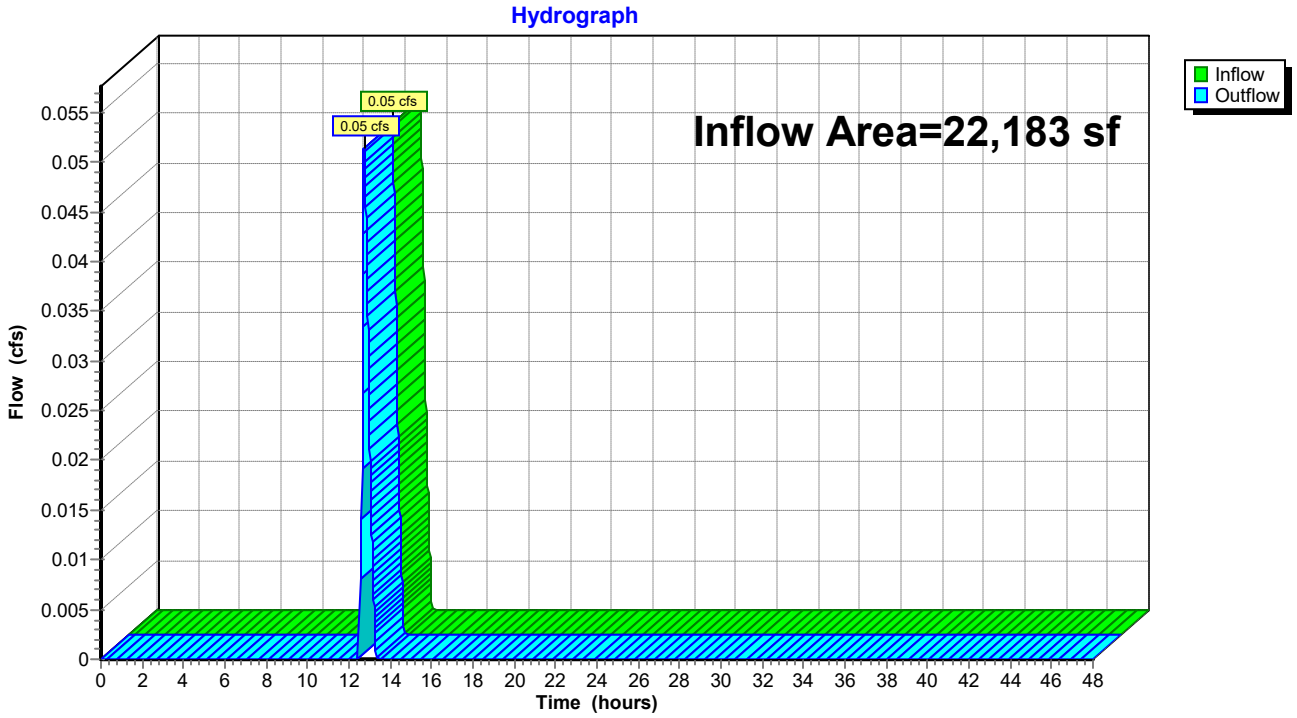
Summary for Reach DMH MB1: DMH MB1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 22,183 sf, 85.20% Impervious, Inflow Depth = 0.04" for 2-Year event
Inflow = 0.05 cfs @ 12.73 hrs, Volume= 66 cf
Outflow = 0.05 cfs @ 12.73 hrs, Volume= 66 cf, Atten= 0%, Lag= 0.0 min

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

Reach DMH MB1: DMH MB1



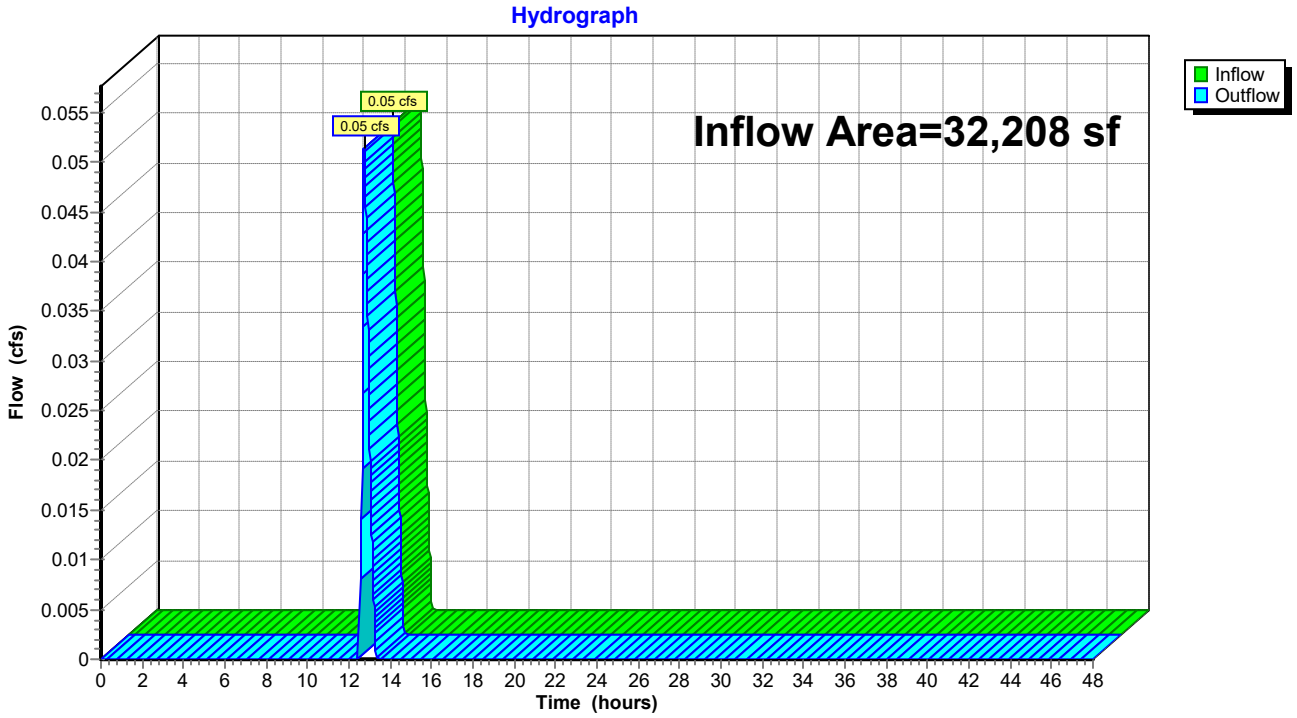
Summary for Reach DMH MB5: DMH MB5

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 32,208 sf, 89.81% Impervious, Inflow Depth = 0.02" for 2-Year event
Inflow = 0.05 cfs @ 12.73 hrs, Volume= 66 cf
Outflow = 0.05 cfs @ 12.73 hrs, Volume= 66 cf, Atten= 0%, Lag= 0.0 min

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

Reach DMH MB5: DMH MB5



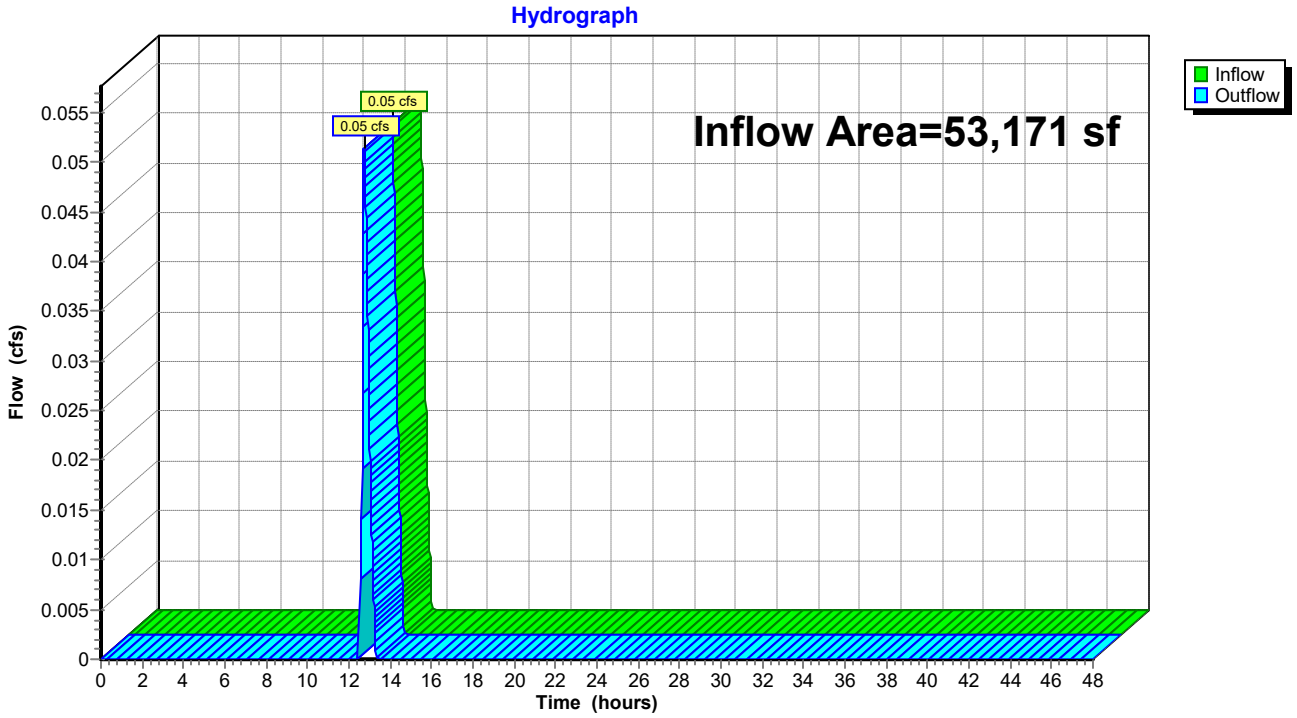
Summary for Reach DMH MC5: DMH MC5

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 53,171 sf, 93.83% Impervious, Inflow Depth = 0.01" for 2-Year event
Inflow = 0.05 cfs @ 12.73 hrs, Volume= 66 cf
Outflow = 0.05 cfs @ 12.73 hrs, Volume= 66 cf, Atten= 0%, Lag= 0.0 min

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

Reach DMH MC5: DMH MC5



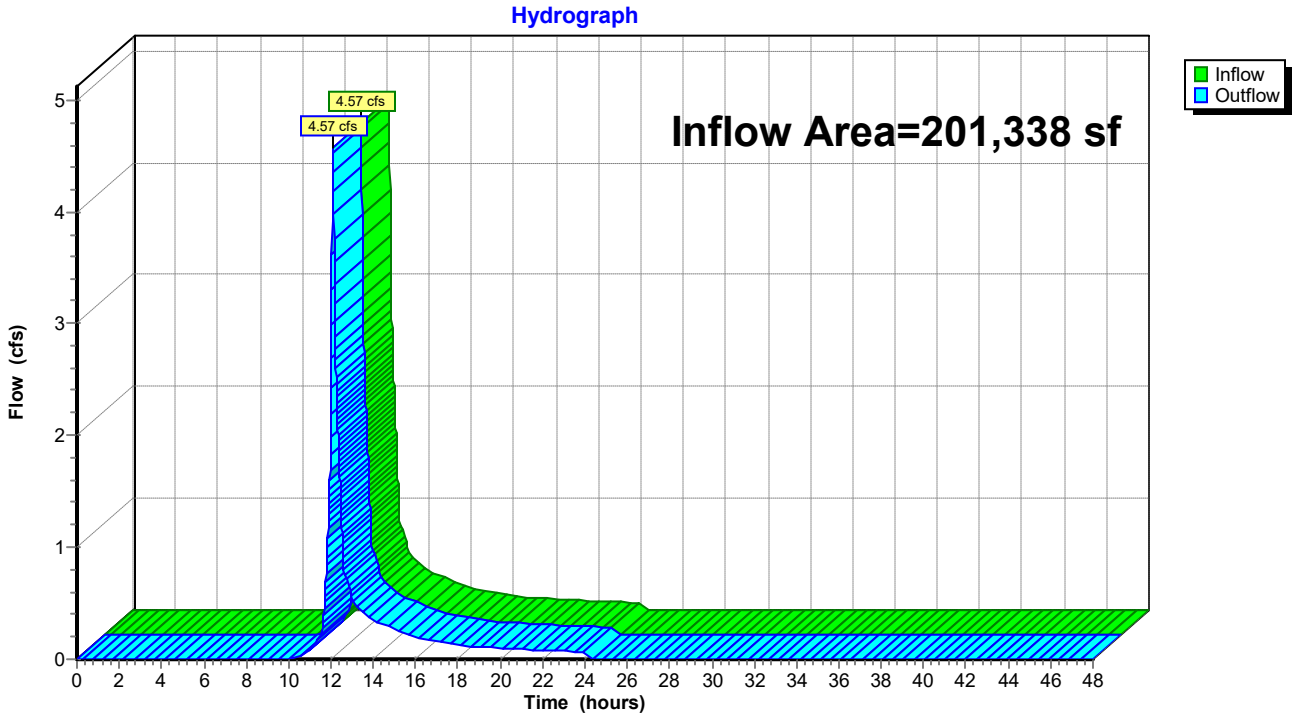
Summary for Reach PD1: Wetland "B" series

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 201,338 sf, 69.62% Impervious, Inflow Depth = 0.87" for 2-Year event
Inflow = 4.57 cfs @ 12.09 hrs, Volume= 14,617 cf
Outflow = 4.57 cfs @ 12.09 hrs, Volume= 14,617 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD1: Wetland "B" series



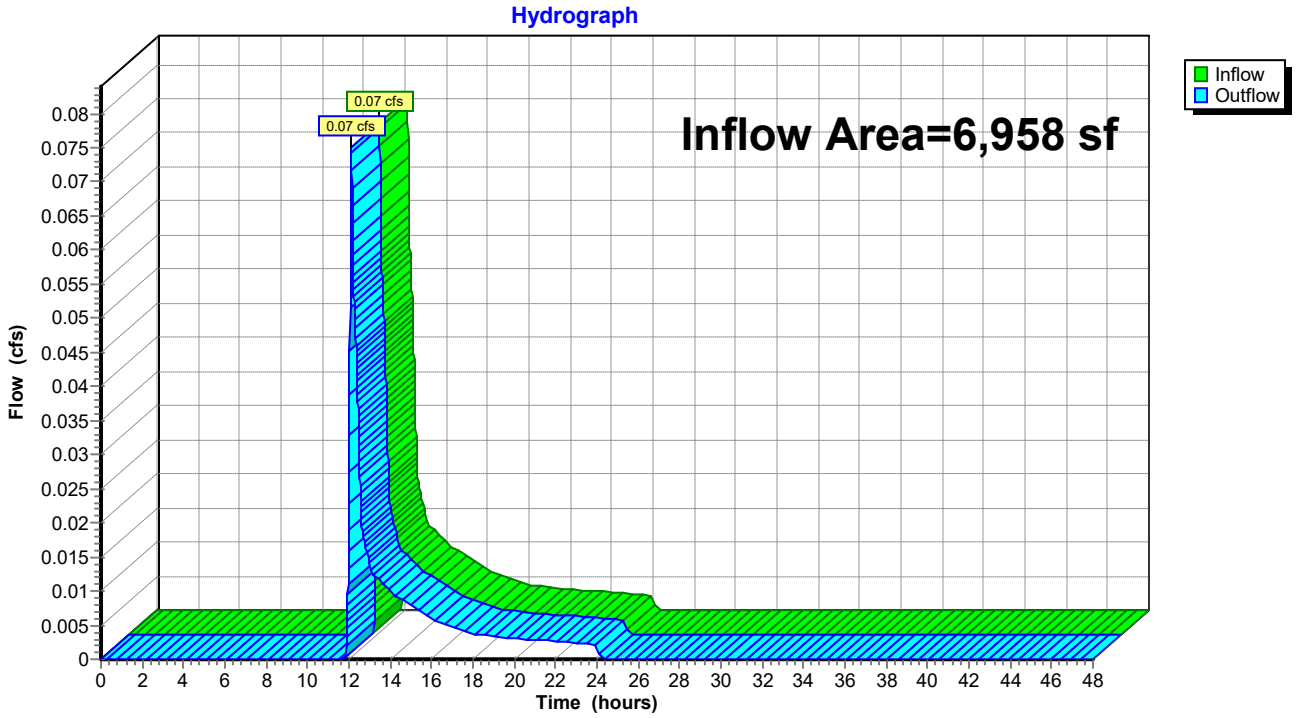
Summary for Reach PD2: Pleasant St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6,958 sf, 38.80% Impervious, Inflow Depth = 0.56" for 2-Year event
Inflow = 0.07 cfs @ 12.11 hrs, Volume= 322 cf
Outflow = 0.07 cfs @ 12.11 hrs, Volume= 322 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD2: Pleasant St



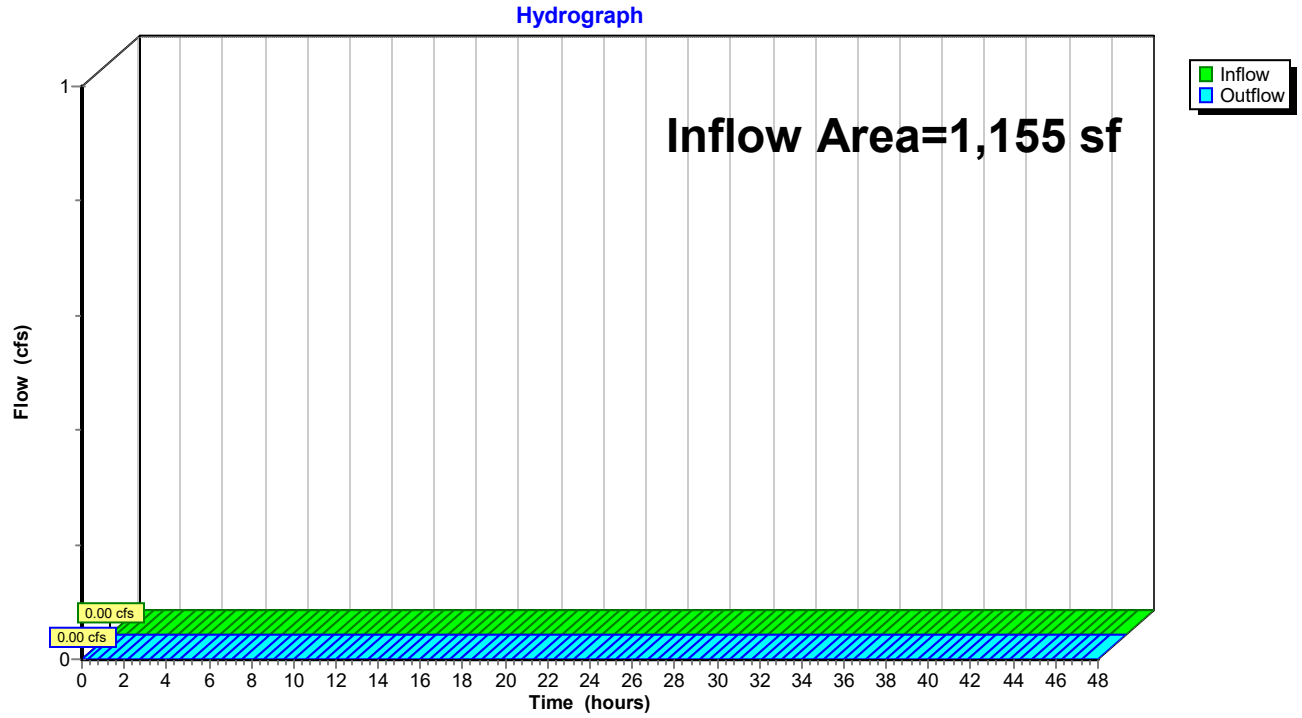
Summary for Reach PD3: SOUTH

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,155 sf, 0.00% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD3: SOUTH



Summary for Pond DW: 8ft diam Drywell

[42] Hint: Gap in defined storage above volume #1 at 90.30'

Inflow Area = 10,868 sf, 9.20% Impervious, Inflow Depth = 0.05" for 2-Year event
Inflow = 0.00 cfs @ 15.30 hrs, Volume= 45 cf
Outflow = 0.00 cfs @ 15.62 hrs, Volume= 45 cf, Atten= 2%, Lag= 18.9 min
Discarded = 0.00 cfs @ 15.62 hrs, Volume= 45 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 86.33' @ 15.62 hrs Surf.Area= 50 sf Storage= 2 cf

Plug-Flow detention time= 18.0 min calculated for 45 cf (100% of inflow)
Center-of-Mass det. time= 18.0 min (1,119.9 - 1,101.9)

Volume	Invert	Avail.Storage	Storage Description
#1	86.30'	201 cf	**8.00'D x 4.00'H Vertical Cone/Cylinder**
#2	90.31'	213 cf	**Custom Stage Data (Conic)** Listed below (Recalc)
		414 cf	Total Available Storage

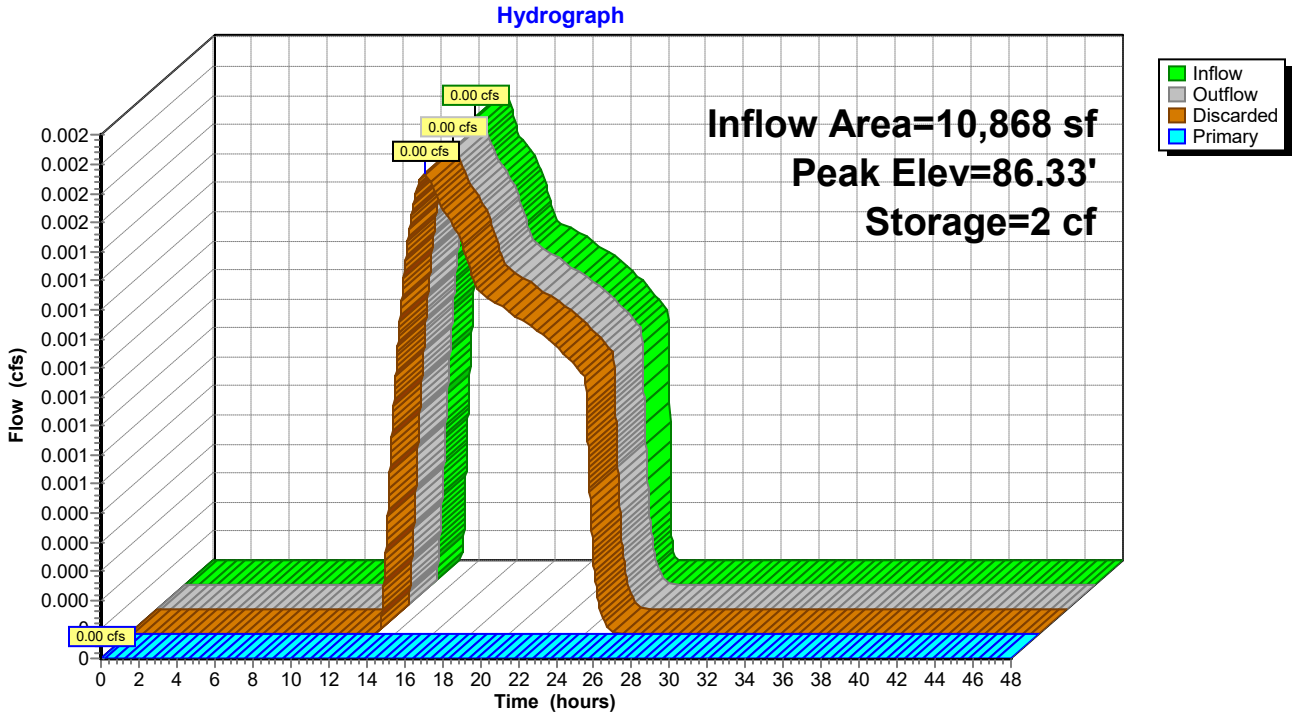
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
90.31	4	0	0	4
91.80	4	6	6	15
92.00	200	15	21	211
92.50	600	191	213	612

Device	Routing	Invert	Outlet Devices
#1	Discarded	86.30'	**2.410 in/hr Exfiltration over Wetted area**
#2	Primary	92.45'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.00 cfs @ 15.62 hrs HW=86.33' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=86.30' (Free Discharge)
↑—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond DW: 8ft diam Drywell



Summary for Pond UG-1: UG-1

Inflow Area = 22,183 sf, 85.20% Impervious, Inflow Depth = 2.24" for 2-Year event
Inflow = 1.32 cfs @ 12.09 hrs, Volume= 4,136 cf
Outflow = 0.16 cfs @ 12.73 hrs, Volume= 4,136 cf, Atten= 88%, Lag= 38.8 min
Discarded = 0.11 cfs @ 12.73 hrs, Volume= 4,070 cf
Primary = 0.05 cfs @ 12.73 hrs, Volume= 66 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 90.42' @ 12.73 hrs Surf.Area= 1,538 sf Storage= 1,643 cf

Plug-Flow detention time= 134.9 min calculated for 4,135 cf (100% of inflow)
Center-of-Mass det. time= 134.8 min (943.9 - 809.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	88.50'	1,128 cf	**88.17'W x 17.44'L x 2.33'H Field A** 3,588 cf Overall - 767 cf Embedded = 2,821 cf x 40.0% Voids
#2A	89.00'	767 cf	**ADS_StormTech RC-310 +Cap** x 52 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 52 Chambers in 26 Rows
		1,895 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	90.40'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Discarded	88.50'	**2.410 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.11 cfs @ 12.73 hrs HW=90.42' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=0.05 cfs @ 12.73 hrs HW=90.42' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Weir Controls 0.05 cfs @ 0.50 fps)

Pond UG-1: UG-1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech RC-310 +Cap (ADS StormTech® RC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

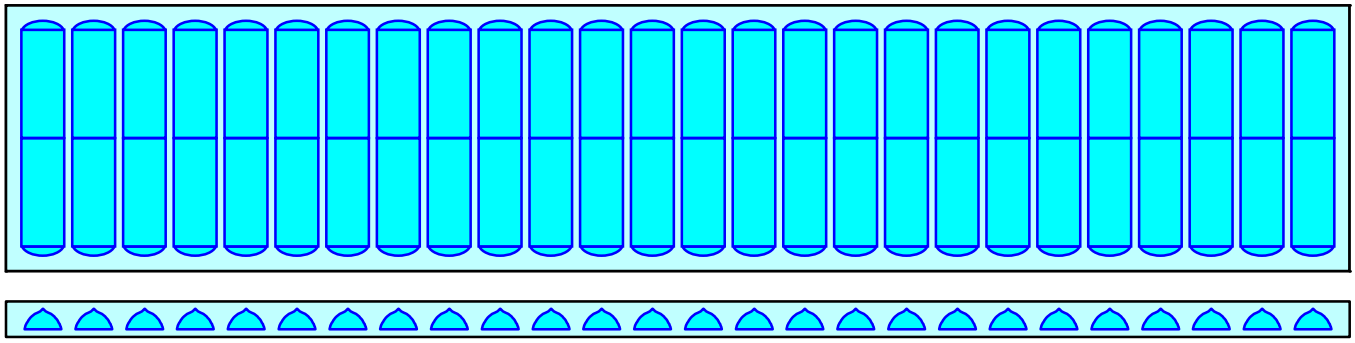
2 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 15.44' Row Length +12.0" End Stone x 2 = 17.44' Base Length
26 Rows x 34.0" Wide + 6.0" Spacing x 25 + 12.0" Side Stone x 2 = 88.17' Base Width
6.0" Base + 16.0" Chamber Height + 6.0" Cover = 2.33' Field Height

52 Chambers x 14.7 cf = 766.6 cf Chamber Storage

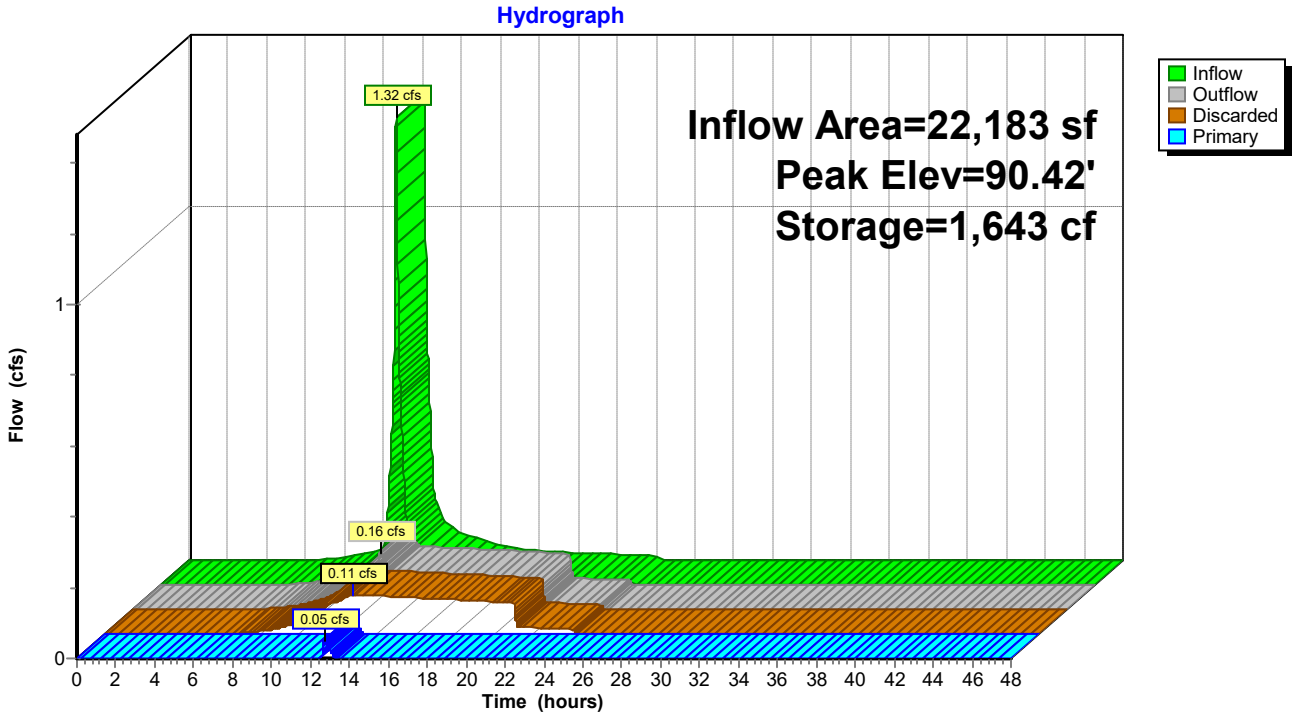
3,587.8 cf Field - 766.6 cf Chambers = 2,821.2 cf Stone x 40.0% Voids = 1,128.5 cf Stone Storage

Chamber Storage + Stone Storage = 1,895.1 cf = 0.044 af
Overall Storage Efficiency = 52.8%
Overall System Size = 17.44' x 88.17' x 2.33'

52 Chambers
132.9 cy Field
104.5 cy Stone



Pond UG-1: UG-1


Hydrograph
Inflow Area=22,183 sf
Peak Elev=90.42'
Storage=1,643 cf
1.32 cfs
0.16 cfs
0.11 cfs
0.05 cfs
Inflow
Outflow
Discarded
Primary
Flow (cfs)
0
1
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
Time (hours)

Summary for Pond UG-2: UG-2

Inflow Area = 10,025 sf,100.00% Impervious, Inflow Depth = 3.14" for 2-Year event
Inflow = 0.75 cfs @ 12.08 hrs, Volume= 2,621 cf
Outflow = 0.07 cfs @ 12.91 hrs, Volume= 2,621 cf, Atten= 91%, Lag= 49.4 min
Discarded = 0.07 cfs @ 12.91 hrs, Volume= 2,621 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 90.10' @ 12.91 hrs Surf.Area= 1,014 sf Storage= 941 cf

Plug-Flow detention time= 100.0 min calculated for 2,620 cf (100% of inflow)
Center-of-Mass det. time= 100.0 min (855.3 - 755.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	88.50'	746 cf	**58.17'W x 17.44'L x 2.33'H Field A** 2,367 cf Overall - 501 cf Embedded = 1,866 cf x 40.0% Voids
#2A	89.00'	501 cf	**ADS_StormTech RC-310 +Cap** x 34 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 34 Chambers in 17 Rows
		1,248 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	90.57'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Discarded	88.50'	**2.410 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.07 cfs @ 12.91 hrs HW=90.10' (Free Discharge)
↑**2=Exfiltration** (Exfiltration Controls 0.07 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=88.50' (Free Discharge)
↑**1=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond UG-2: UG-2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech RC-310 +Cap (ADS StormTech® RC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

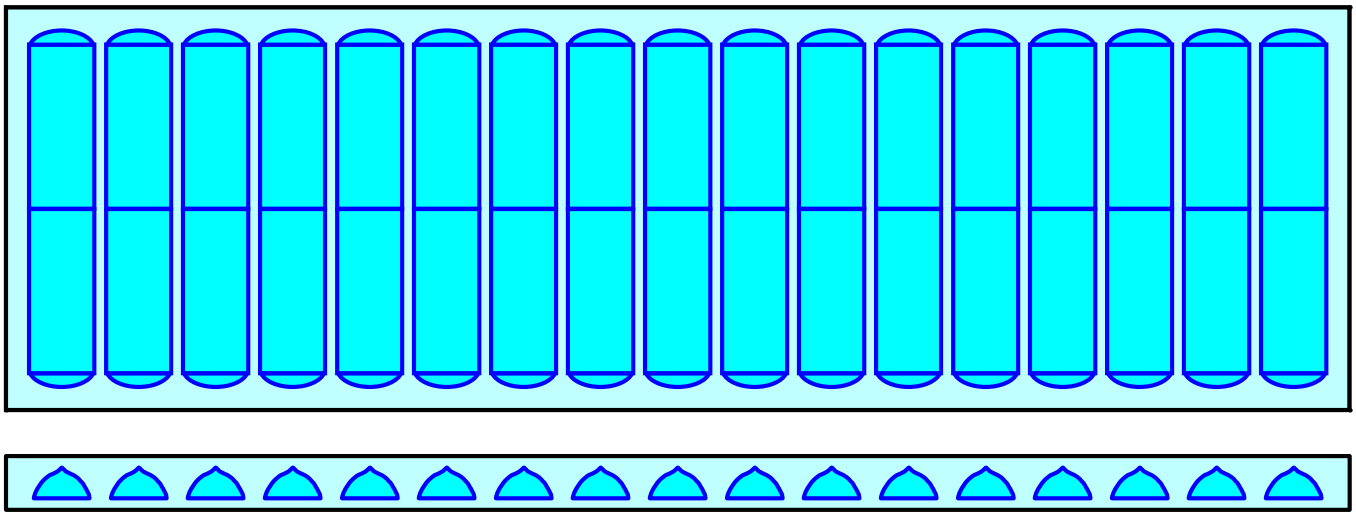
2 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 15.44' Row Length +12.0" End Stone x 2 = 17.44' Base Length
17 Rows x 34.0" Wide + 6.0" Spacing x 16 + 12.0" Side Stone x 2 = 58.17' Base Width
6.0" Base + 16.0" Chamber Height + 6.0" Cover = 2.33' Field Height

34 Chambers x 14.7 cf = 501.2 cf Chamber Storage

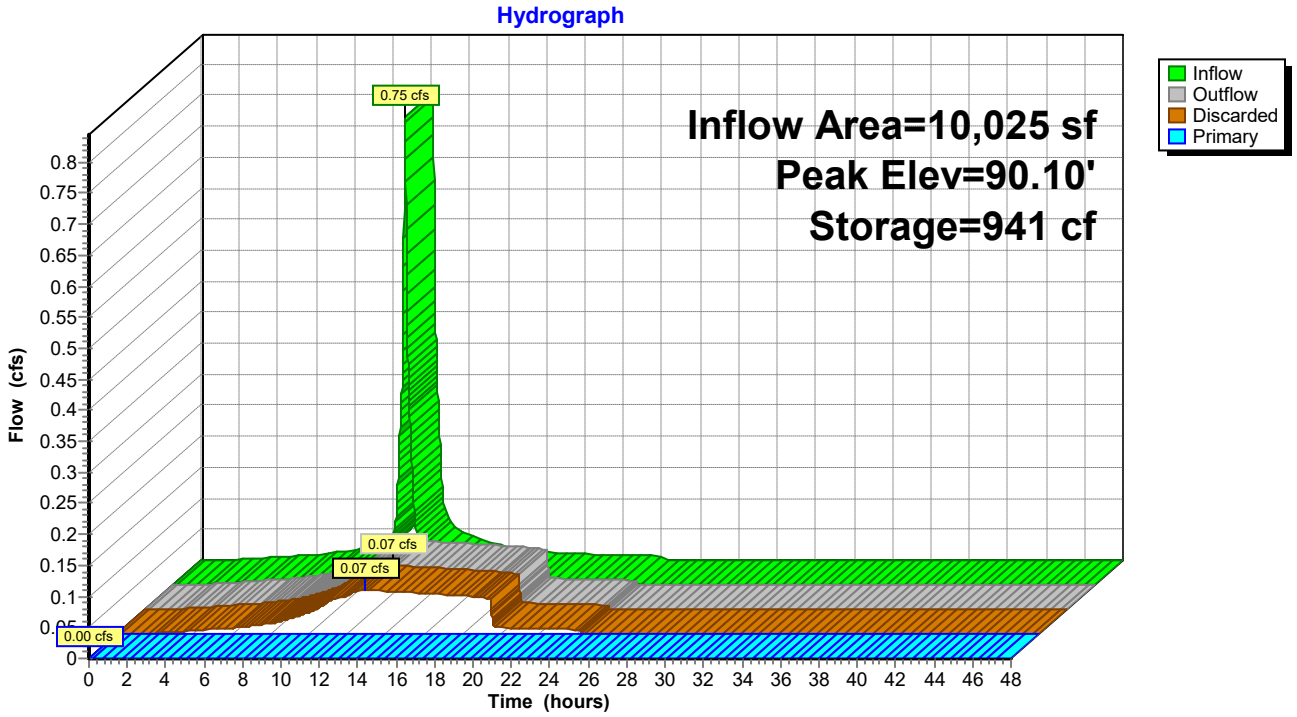
2,367.0 cf Field - 501.2 cf Chambers = 1,865.8 cf Stone x 40.0% Voids = 746.3 cf Stone Storage

Chamber Storage + Stone Storage = 1,247.5 cf = 0.029 af
Overall Storage Efficiency = 52.7%
Overall System Size = 17.44' x 58.17' x 2.33'

34 Chambers
87.7 cy Field
69.1 cy Stone



Pond UG-2: UG-2


Hydrograph
Inflow Area=10,025 sf
Peak Elev=90.10'
Storage=941 cf
Inflow
Outflow
Discarded
Primary
0.75 cfs
0.07 cfs
0.07 cfs
0.00 cfs
Flow (cfs)
Time (hours)

Summary for Pond UG-3: UG-3

Inflow Area = 20,963 sf,100.00% Impervious, Inflow Depth = 3.14" for 2-Year event
Inflow = 1.58 cfs @ 12.08 hrs, Volume= 5,480 cf
Outflow = 0.15 cfs @ 12.85 hrs, Volume= 5,480 cf, Atten= 90%, Lag= 46.3 min
Discarded = 0.15 cfs @ 12.85 hrs, Volume= 5,480 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 89.73' @ 12.85 hrs Surf.Area= 2,518 sf Storage= 1,879 cf

Plug-Flow detention time= 85.2 min calculated for 5,479 cf (100% of inflow)
Center-of-Mass det. time= 85.2 min (840.5 - 755.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	88.50'	1,784 cf	**54.83'W x 45.92'L x 2.33'H Field A** 5,875 cf Overall - 1,415 cf Embedded = 4,460 cf x 40.0% Voids
#2A	89.00'	1,415 cf	**ADS_StormTech RC-310 +Cap** x 96 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 96 Chambers in 16 Rows
		3,199 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	90.43'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Discarded	88.50'	**2.410 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.15 cfs @ 12.85 hrs HW=89.73' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.15 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=88.50' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond UG-3: UG-3 - Chamber Wizard Field A

Chamber Model = ADS_StormTech RC-310 +Cap (ADS StormTech® RC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

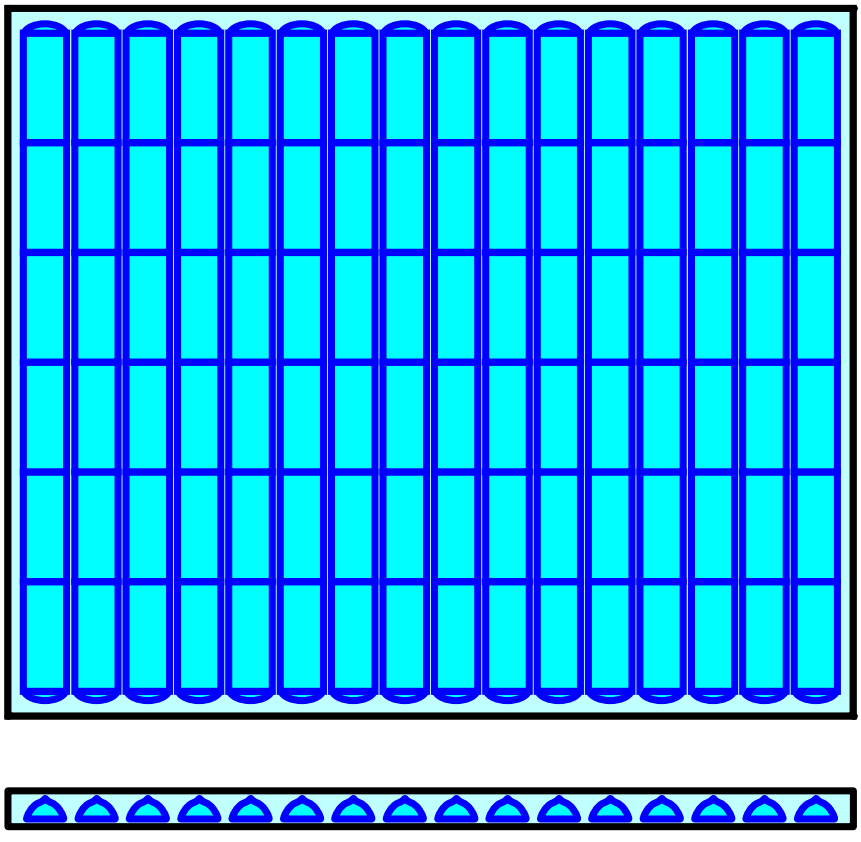
6 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 43.92' Row Length +12.0" End Stone x 2 = 45.92' Base Length
16 Rows x 34.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 54.83' Base Width
6.0" Base + 16.0" Chamber Height + 6.0" Cover = 2.33' Field Height

96 Chambers x 14.7 cf = 1,415.2 cf Chamber Storage

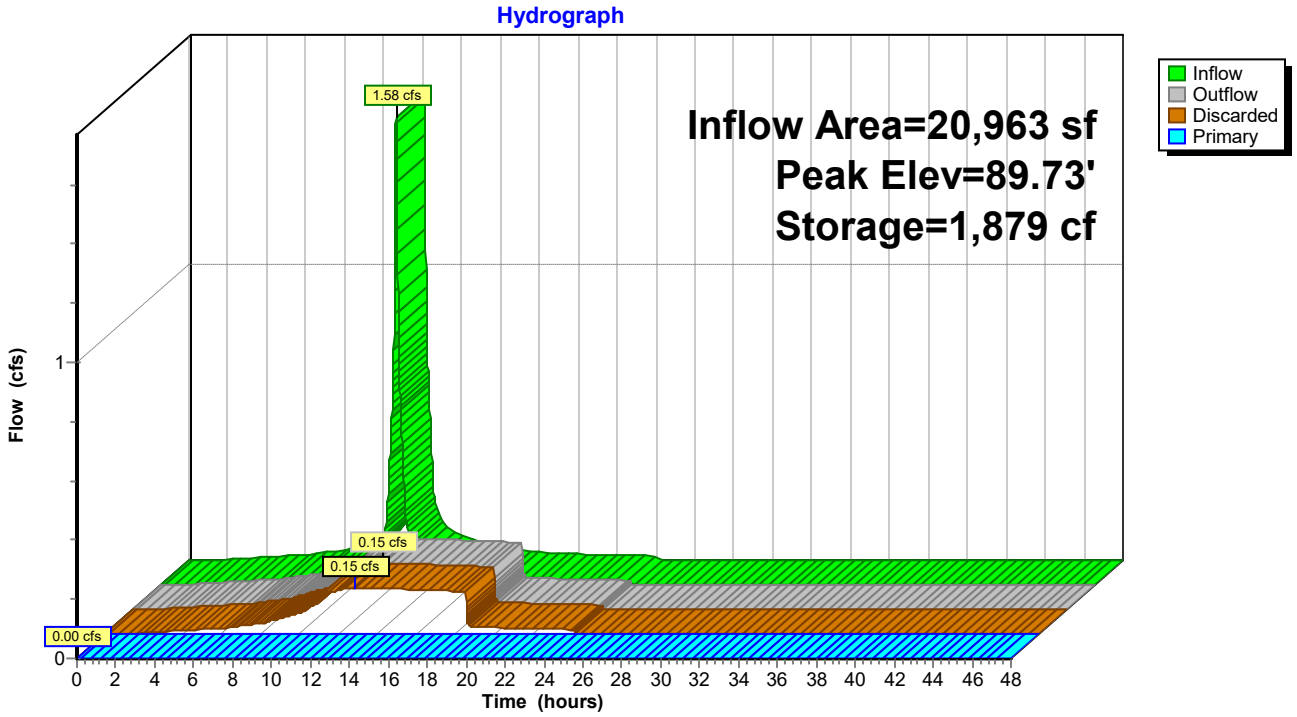
5,875.2 cf Field - 1,415.2 cf Chambers = 4,460.0 cf Stone x 40.0% Voids = 1,784.0 cf Stone Storage

Chamber Storage + Stone Storage = 3,199.2 cf = 0.073 af
Overall Storage Efficiency = 54.5%
Overall System Size = 45.92' x 54.83' x 2.33'

96 Chambers
217.6 cy Field
165.2 cy Stone



Pond UG-3: UG-3


Hydrograph
Inflow Area=20,963 sf
Peak Elev=89.73'
Storage=1,879 cf
Inflow
Outflow
Discarded
Primary
1.58 cfs
0.15 cfs
0.15 cfs
0.00 cfs
Flow (cfs)
0
1
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
Time (hours)

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 Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P1-A: P1-A Runoff Area=22,183 sf 85.20% Impervious Runoff Depth=3.93"
Tc=6.0 min CN=89 Runoff=2.28 cfs 7,274 cf

Subcatchment P1-B: P1-B Runoff Area=10,025 sf 100.00% Impervious Runoff Depth=4.93"
Tc=6.0 min CN=98 Runoff=1.16 cfs 4,121 cf

Subcatchment P1-C: P1-C Runoff Area=20,963 sf 100.00% Impervious Runoff Depth=4.93"
Tc=6.0 min CN=98 Runoff=2.43 cfs 8,617 cf

Subcatchment P1-D: P1-D Runoff Area=137,299 sf 65.03% Impervious Runoff Depth=2.68"
Tc=6.0 min CN=76 Runoff=9.89 cfs 30,621 cf

Subcatchment P1-E: P1-E Runoff Area=10,868 sf 9.20% Impervious Runoff Depth=0.45"
Flow Length=95' Slope=0.0100 '/' Tc=8.3 min CN=44 Runoff=0.05 cfs 406 cf

Subcatchment P2: P2 Runoff Area=6,958 sf 38.80% Impervious Runoff Depth=1.54"
Tc=6.0 min CN=62 Runoff=0.27 cfs 895 cf

Subcatchment P3: P3 Runoff Area=1,155 sf 0.00% Impervious Runoff Depth=0.01"
Tc=6.0 min CN=30 Runoff=0.00 cfs 1 cf

Reach DMH MB1: DMH MB1 Inflow=1.81 cfs 2,024 cf
Outflow=1.81 cfs 2,024 cf

Reach DMH MB5: DMH MB5 Inflow=1.92 cfs 2,612 cf
Outflow=1.92 cfs 2,612 cf

Reach DMH MC5: DMH MC5 Inflow=1.92 cfs 3,275 cf
Outflow=1.92 cfs 3,275 cf

Reach PD1: Wetland "B" series Inflow=11.05 cfs 33,895 cf
Outflow=11.05 cfs 33,895 cf

Reach PD2: Pleasant St Inflow=0.27 cfs 895 cf
Outflow=0.27 cfs 895 cf

Reach PD3: SOUTH Inflow=0.00 cfs 1 cf
Outflow=0.00 cfs 1 cf

Pond DW: 8ft diam Drywell Peak Elev=89.63' Storage=167 cf Inflow=0.05 cfs 406 cf
Discarded=0.01 cfs 406 cf Primary=0.00 cfs 0 cf Outflow=0.01 cfs 406 cf

Pond UG-1: UG-1 Peak Elev=90.67' Storage=1,795 cf Inflow=2.28 cfs 7,274 cf
Discarded=0.11 cfs 5,250 cf Primary=1.81 cfs 2,024 cf Outflow=1.92 cfs 7,274 cf

Pond UG-2: UG-2 Peak Elev=90.69' Storage=1,190 cf Inflow=1.16 cfs 4,121 cf
Discarded=0.08 cfs 3,533 cf Primary=0.55 cfs 588 cf Outflow=0.62 cfs 4,121 cf

Pond UG-3: UG-3 Peak Elev=90.55' Storage=2,916 cf Inflow=2.43 cfs 8,617 cf
Discarded=0.16 cfs 7,954 cf Primary=0.56 cfs 663 cf Outflow=0.72 cfs 8,617 cf

Total Runoff Area = 209,451 sf Runoff Volume = 51,936 cf Average Runoff Depth = 2.98"
31.79% Pervious = 66,580 sf 68.21% Impervious = 142,871 sf

Summary for Subcatchment P1-A: P1-A

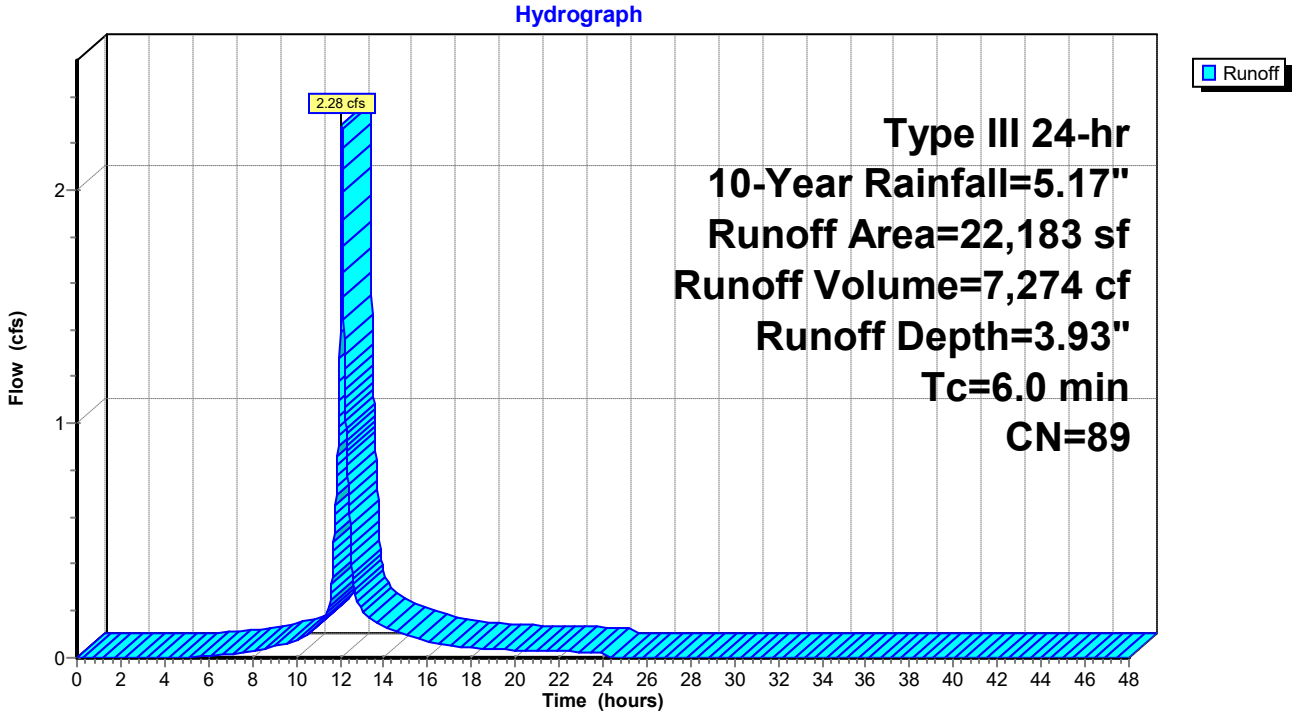
Runoff = 2.28 cfs @ 12.09 hrs, Volume= 7,274 cf, Depth= 3.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.17"

	Area (sf)	CN	Description
	3,283	39	>75% Grass cover, Good, HSG A
*	1,440	98	ROOF PORTA CACHER
*	10,300	98	ROOF BLDG
*	7,160	98	PAVEMENT
	22,183	89	Weighted Average
	3,283	39	14.80% Pervious Area
	18,900	98	85.20% Impervious Area

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

Subcatchment P1-A: P1-A



Summary for Subcatchment P1-B: P1-B

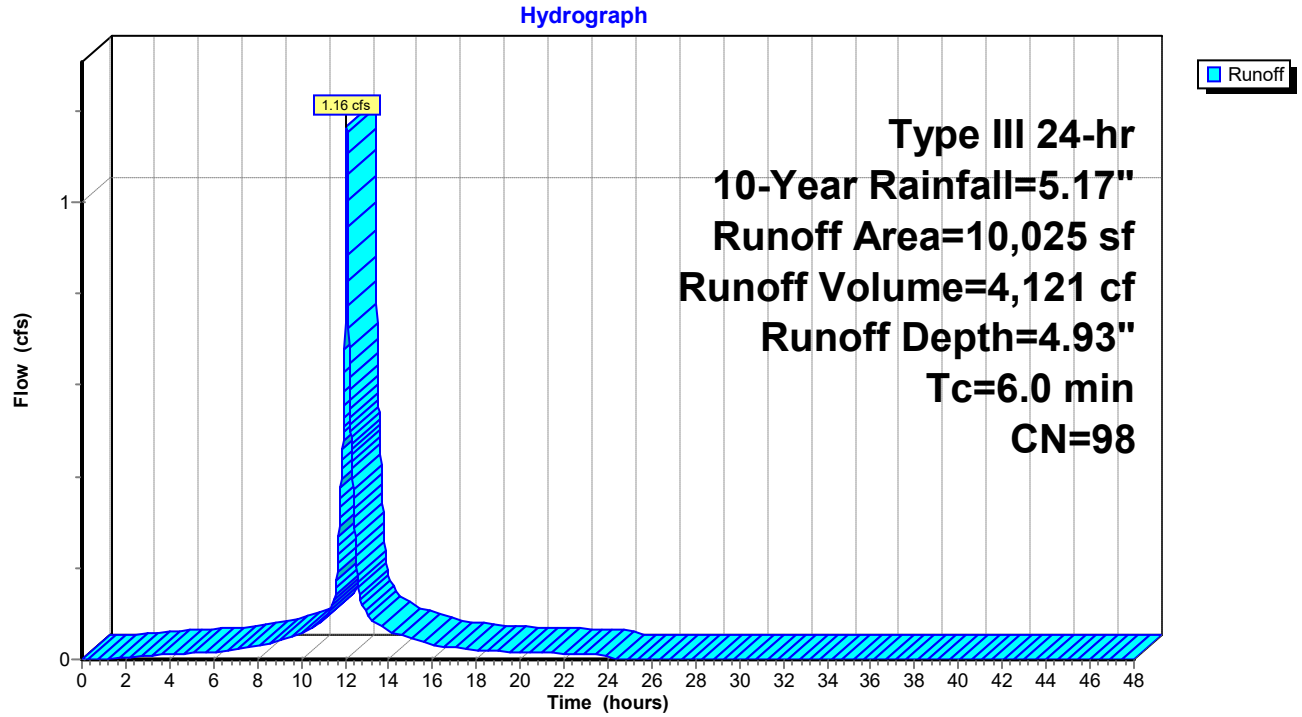
Runoff = 1.16 cfs @ 12.08 hrs, Volume= 4,121 cf, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.17"

	Area (sf)	CN	Description
*	10,025	98	ROOF BLDG
	10,025	98	100.00% Impervious Area

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

Subcatchment P1-B: P1-B



Summary for Subcatchment P1-C: P1-C

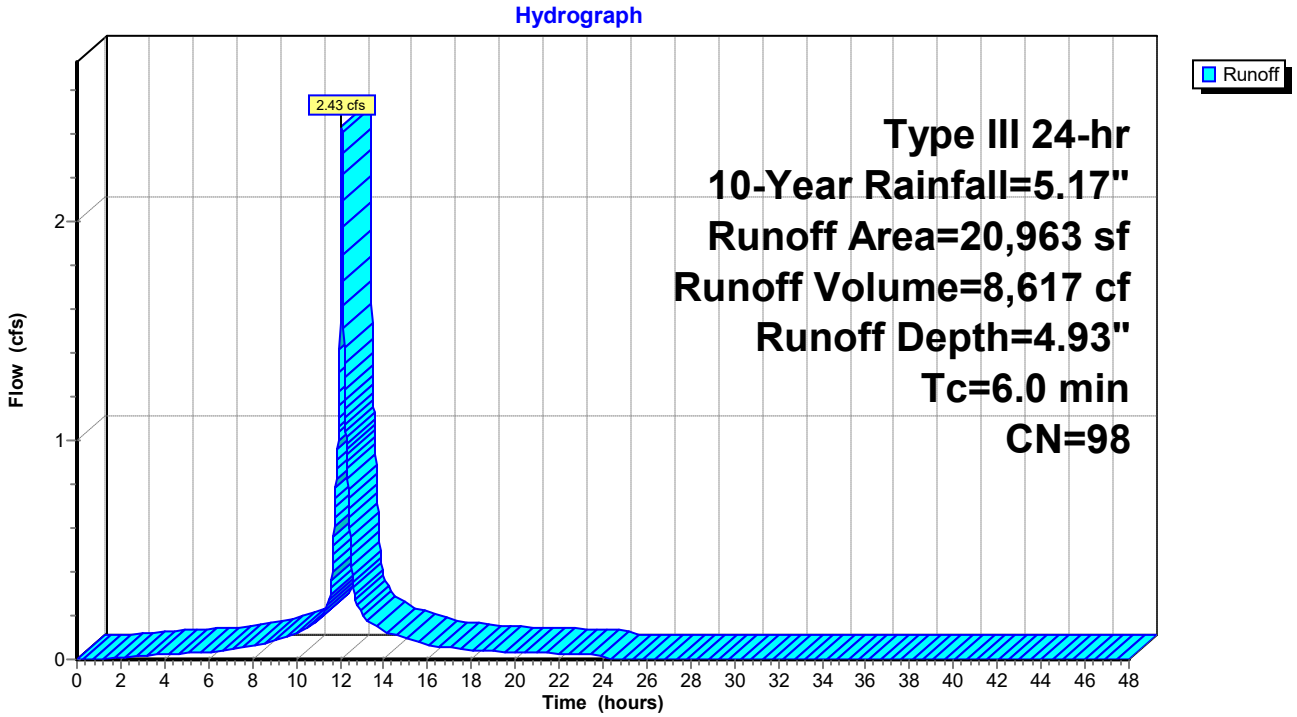
Runoff = 2.43 cfs @ 12.08 hrs, Volume= 8,617 cf, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.17"

	Area (sf)	CN	Description
*	20,963	98	ROOF BLDG
	20,963	98	100.00% Impervious Area

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

Subcatchment P1-C: P1-C



Summary for Subcatchment P1-D: P1-D

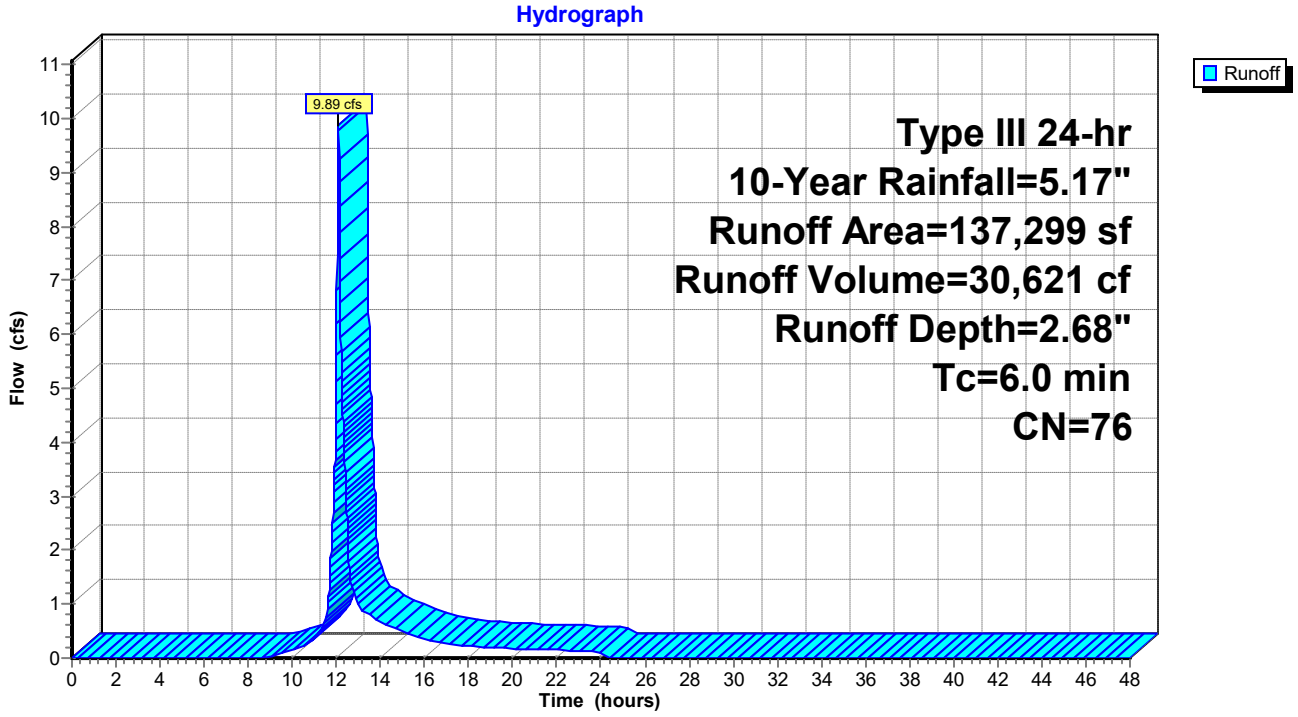
Runoff = 9.89 cfs @ 12.09 hrs, Volume= 30,621 cf, Depth= 2.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.17"

	Area (sf)	CN	Description
*	14,030	98	wetland
*	61,468	98	PAVEMENT
	17,400	30	Woods, Good, HSG A
	30,616	39	>75% Grass cover, Good, HSG A
*	13,785	98	ROOF BLDG
	137,299	76	Weighted Average
	48,016	36	34.97% Pervious Area
	89,283	98	65.03% Impervious Area

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

Subcatchment P1-D: P1-D



Summary for Subcatchment P1-E: P1-E

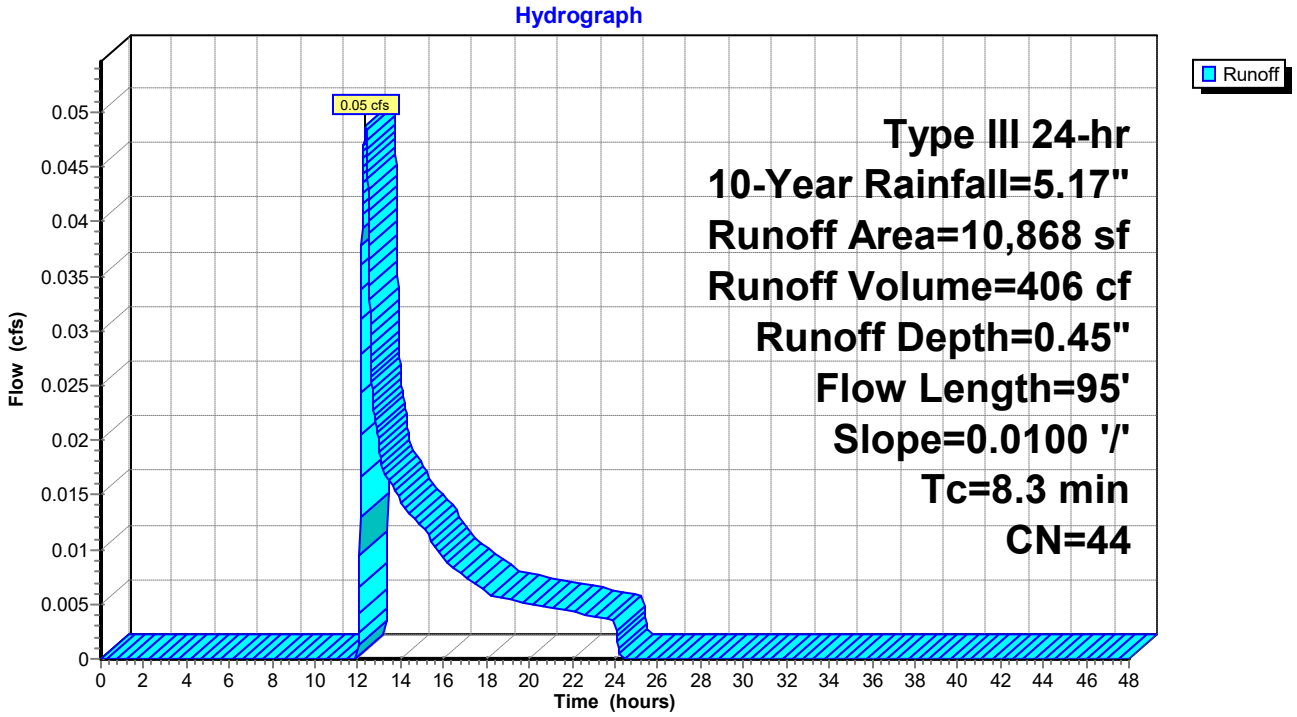
Runoff = 0.05 cfs @ 12.35 hrs, Volume= 406 cf, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.17"

	Area (sf)	CN	Description
*	1,000	98	PAVEMENT
	9,868	39	>75% Grass cover, Good, HSG A
	10,868	44	Weighted Average
	9,868	39	90.80% Pervious Area
	1,000	98	9.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.40"
1.1	45	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.3	95	Total			

Subcatchment P1-E: P1-E



Summary for Subcatchment P2: P2

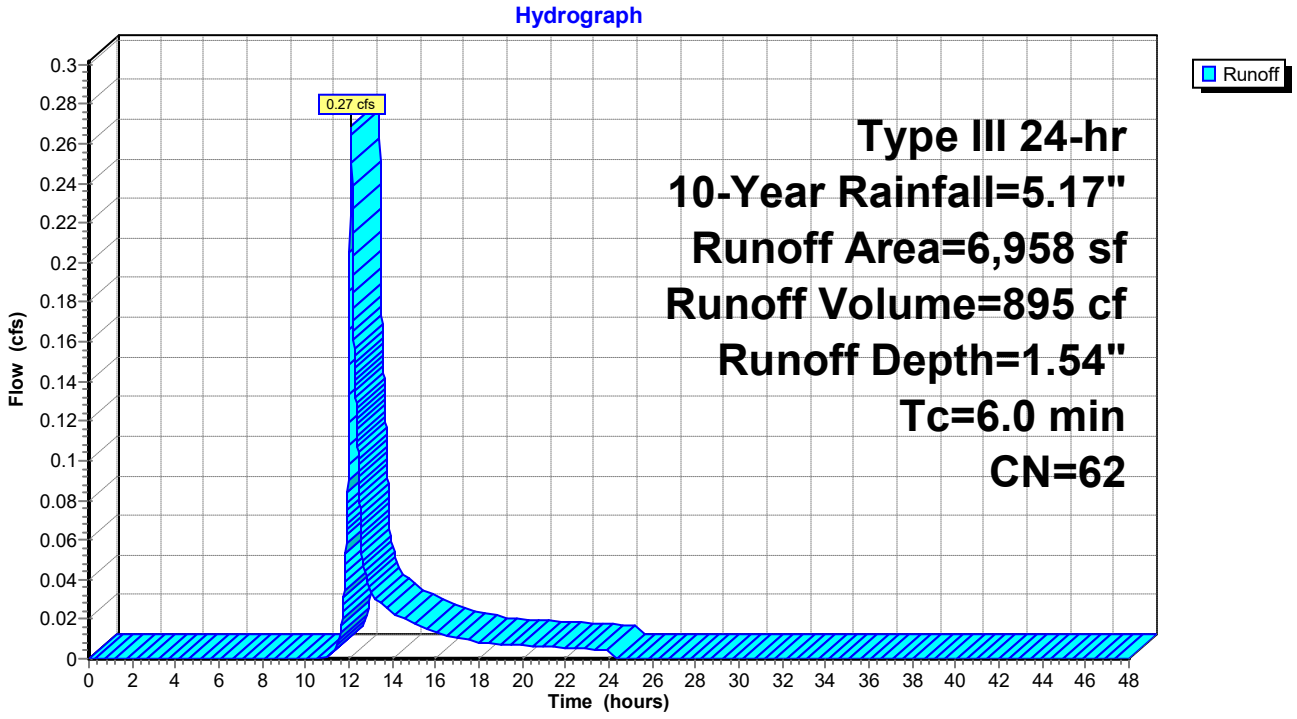
Runoff = 0.27 cfs @ 12.10 hrs, Volume= 895 cf, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.17"

	Area (sf)	CN	Description
	4,258	39	>75% Grass cover, Good, HSG A
*	2,700	98	pavement
	6,958	62	Weighted Average
	4,258	39	61.20% Pervious Area
	2,700	98	38.80% Impervious Area

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

Subcatchment P2: P2



Summary for Subcatchment P3: P3

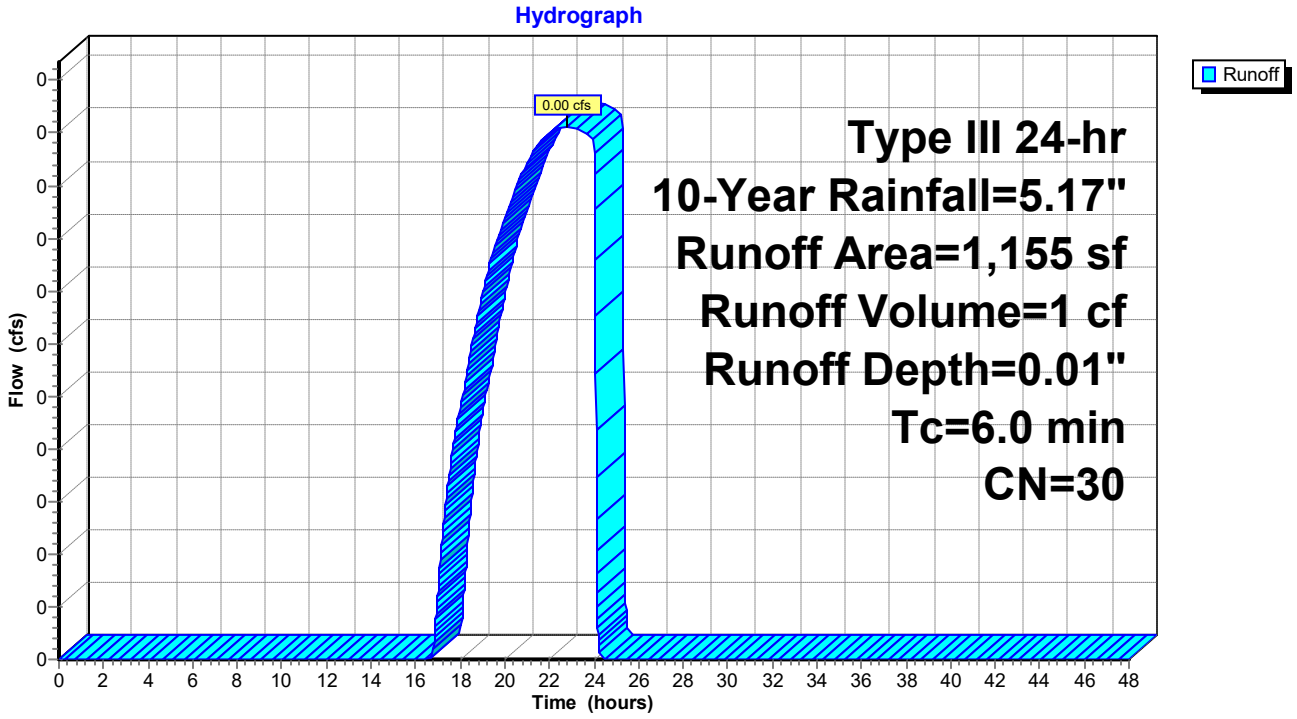
Runoff = 0.00 cfs @ 22.82 hrs, Volume= 1 cf, Depth= 0.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-Year Rainfall=5.17"

Area (sf)	CN	Description
1,155	30	Woods, Good, HSG A
1,155	30	100.00% Pervious Area

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

Subcatchment P3: P3



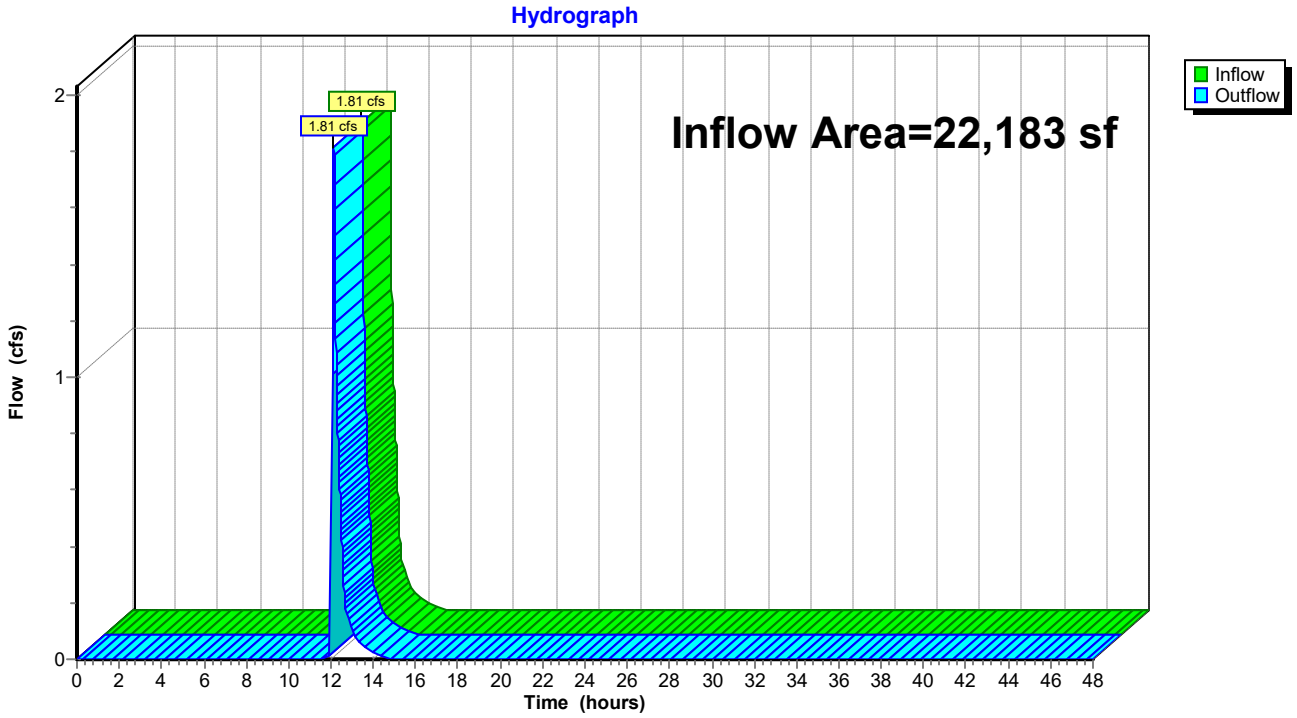
Summary for Reach DMH MB1: DMH MB1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 22,183 sf, 85.20% Impervious, Inflow Depth = 1.10" for 10-Year event
Inflow = 1.81 cfs @ 12.14 hrs, Volume= 2,024 cf
Outflow = 1.81 cfs @ 12.14 hrs, Volume= 2,024 cf, Atten= 0%, Lag= 0.0 min

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

Reach DMH MB1: DMH MB1



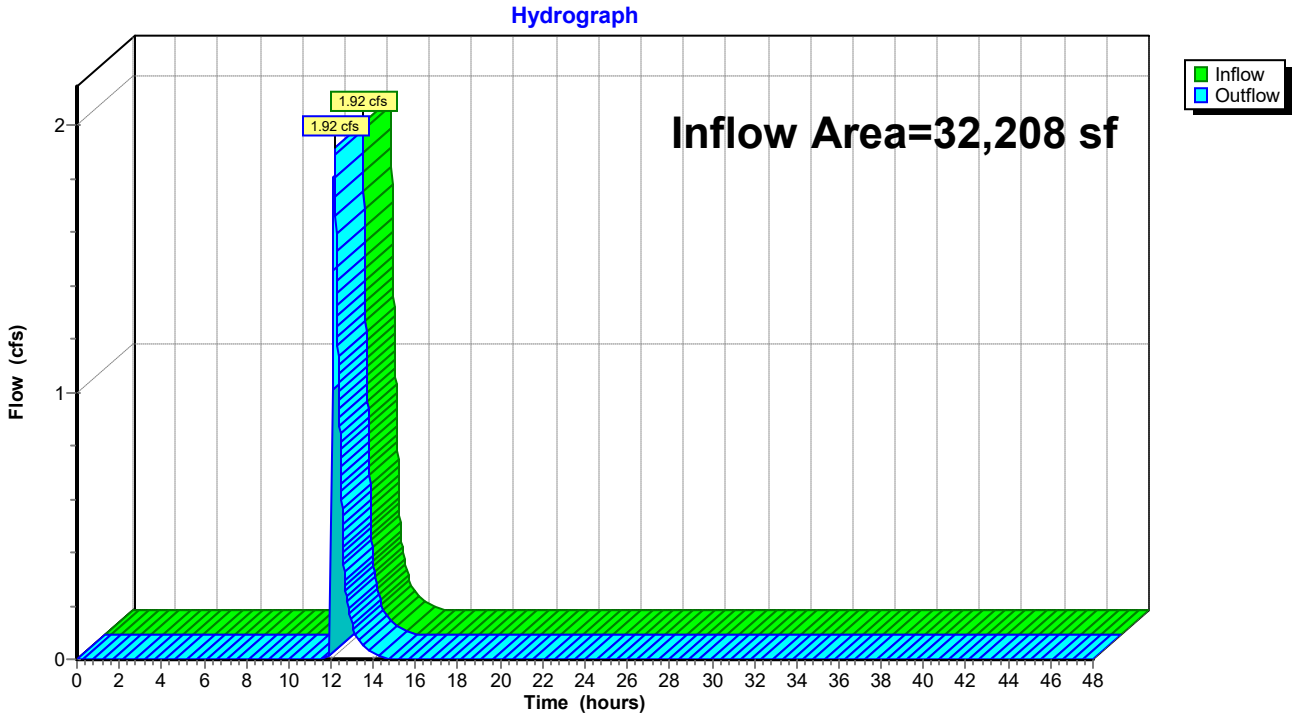
Summary for Reach DMH MB5: DMH MB5

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 32,208 sf, 89.81% Impervious, Inflow Depth = 0.97" for 10-Year event
Inflow = 1.92 cfs @ 12.19 hrs, Volume= 2,612 cf
Outflow = 1.92 cfs @ 12.19 hrs, Volume= 2,612 cf, Atten= 0%, Lag= 0.0 min

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

Reach DMH MB5: DMH MB5



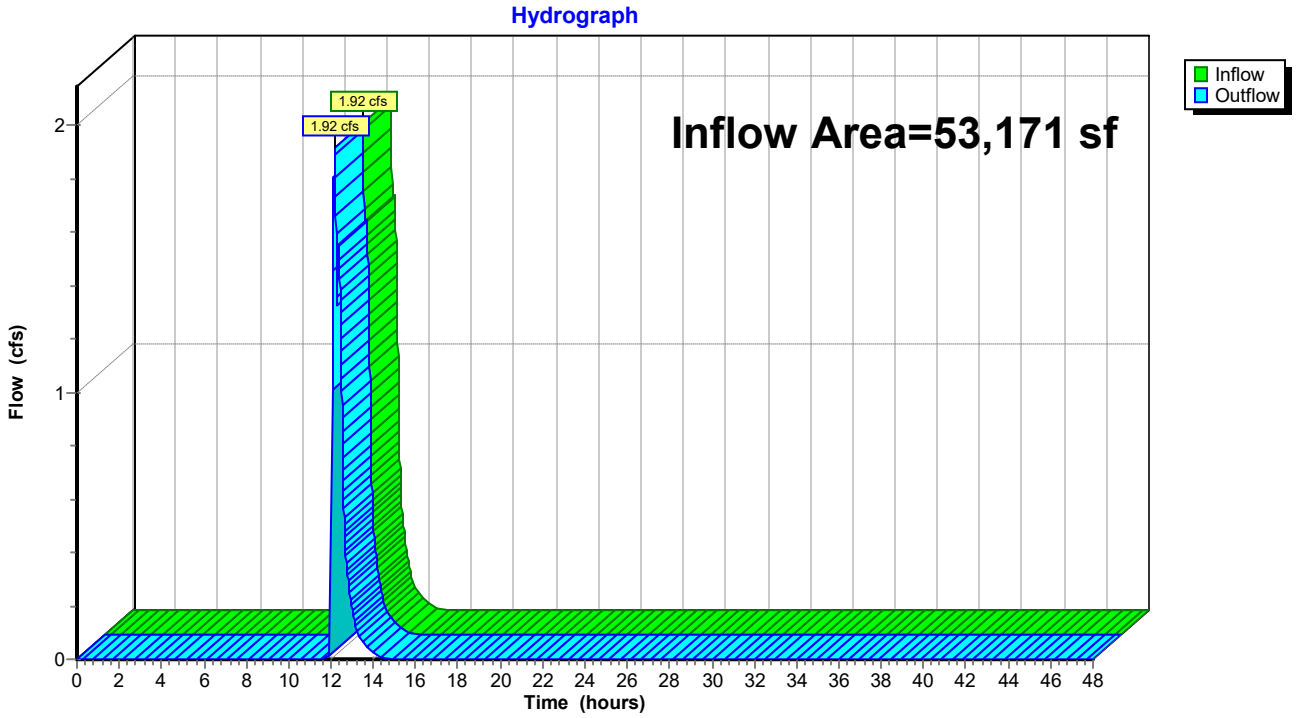
Summary for Reach DMH MC5: DMH MC5

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 53,171 sf, 93.83% Impervious, Inflow Depth = 0.74" for 10-Year event
Inflow = 1.92 cfs @ 12.19 hrs, Volume= 3,275 cf
Outflow = 1.92 cfs @ 12.19 hrs, Volume= 3,275 cf, Atten= 0%, Lag= 0.0 min

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

Reach DMH MC5: DMH MC5



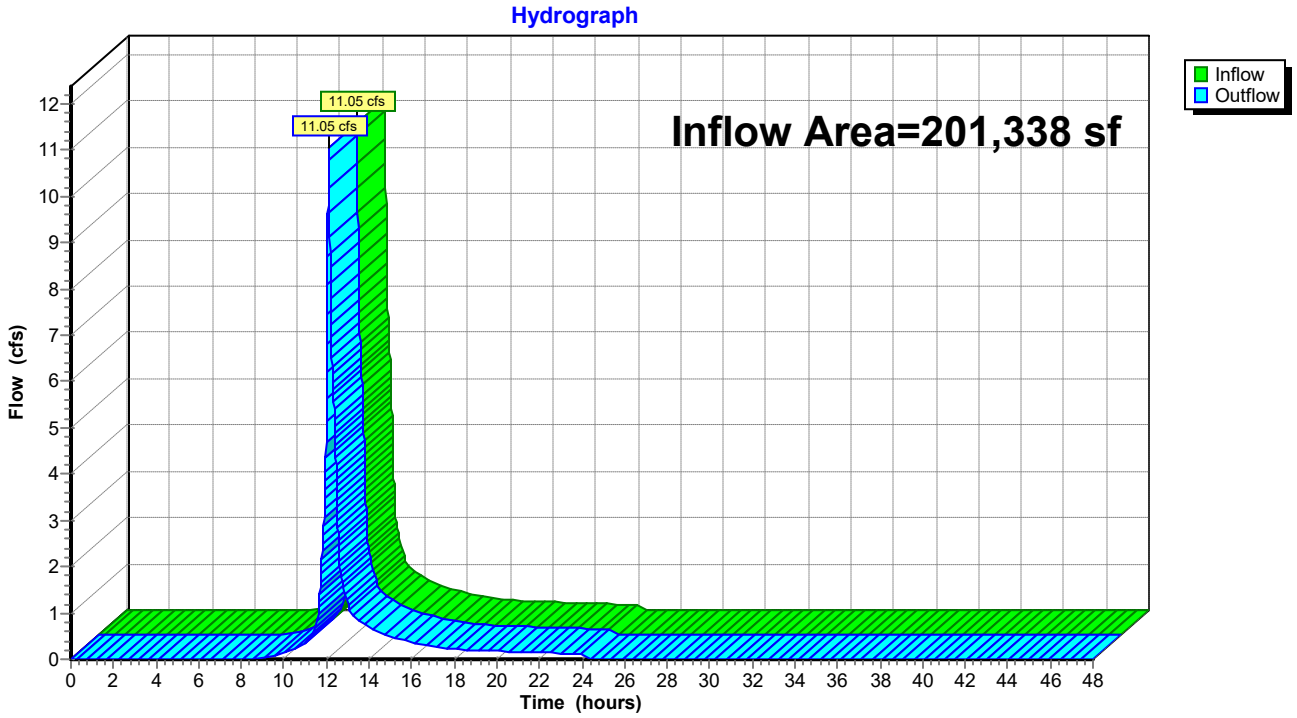
Summary for Reach PD1: Wetland "B" series

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 201,338 sf, 69.62% Impervious, Inflow Depth = 2.02" for 10-Year event
Inflow = 11.05 cfs @ 12.11 hrs, Volume= 33,895 cf
Outflow = 11.05 cfs @ 12.11 hrs, Volume= 33,895 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD1: Wetland "B" series



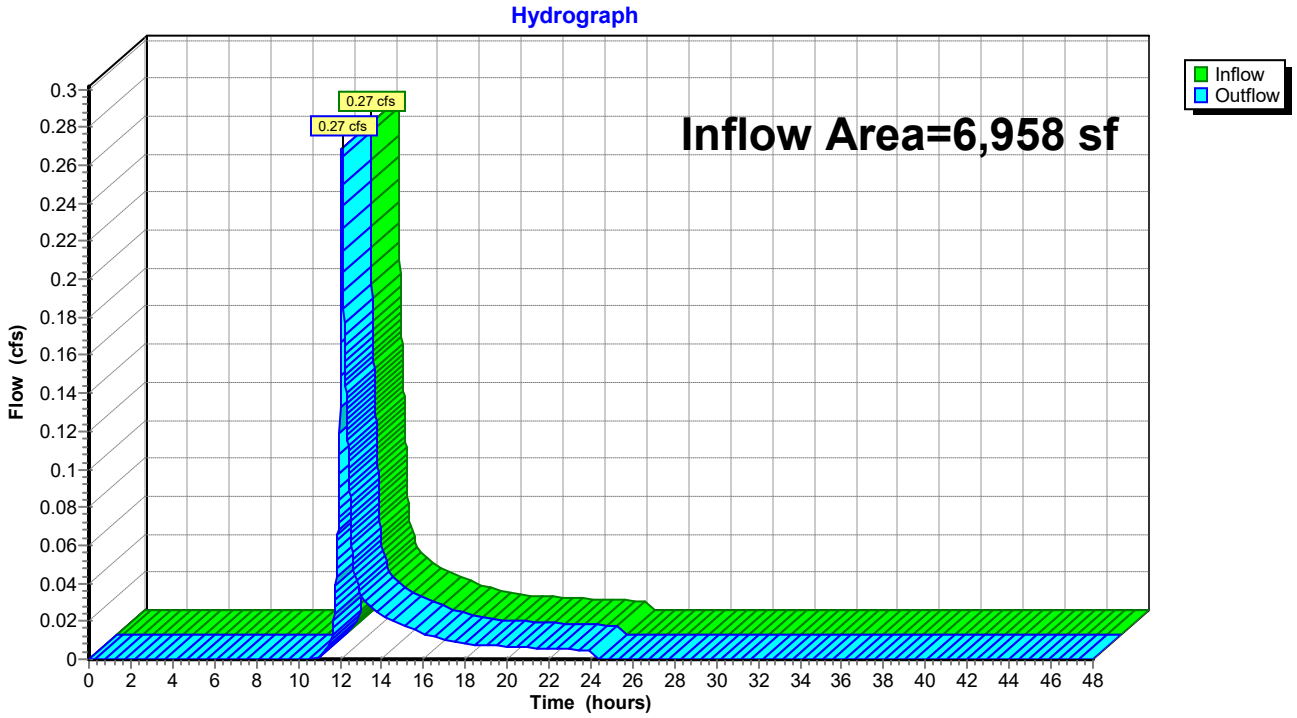
Summary for Reach PD2: Pleasant St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6,958 sf, 38.80% Impervious, Inflow Depth = 1.54" for 10-Year event
Inflow = 0.27 cfs @ 12.10 hrs, Volume= 895 cf
Outflow = 0.27 cfs @ 12.10 hrs, Volume= 895 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD2: Pleasant St



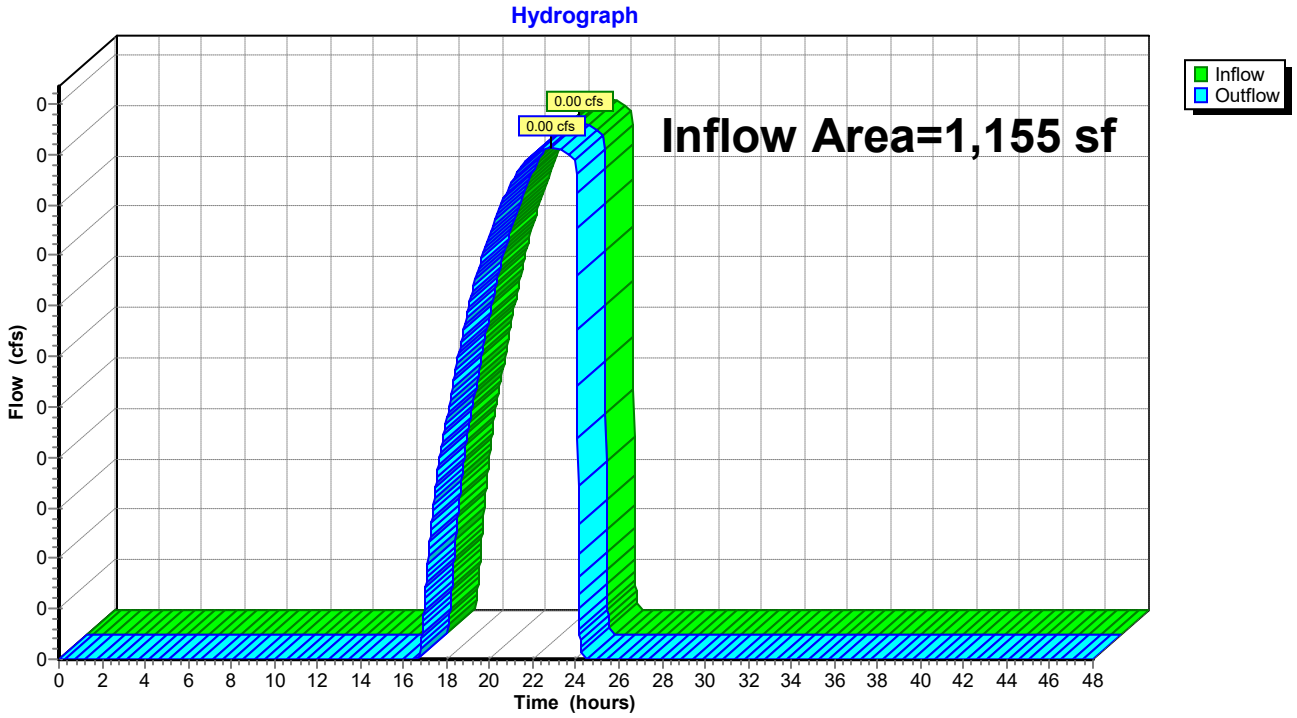
Summary for Reach PD3: SOUTH

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,155 sf, 0.00% Impervious, Inflow Depth = 0.01" for 10-Year event
Inflow = 0.00 cfs @ 22.82 hrs, Volume= 1 cf
Outflow = 0.00 cfs @ 22.82 hrs, Volume= 1 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD3: SOUTH



Summary for Pond DW: 8ft diam Drywell

[42] Hint: Gap in defined storage above volume #1 at 90.30'

Inflow Area = 10,868 sf, 9.20% Impervious, Inflow Depth = 0.45" for 10-Year event
Inflow = 0.05 cfs @ 12.35 hrs, Volume= 406 cf
Outflow = 0.01 cfs @ 17.04 hrs, Volume= 406 cf, Atten= 85%, Lag= 281.7 min
Discarded = 0.01 cfs @ 17.04 hrs, Volume= 406 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 89.63' @ 17.04 hrs Surf.Area= 50 sf Storage= 167 cf

Plug-Flow detention time= 304.8 min calculated for 406 cf (100% of inflow)
Center-of-Mass det. time= 304.8 min (1,254.7 - 949.9)

Volume	Invert	Avail.Storage	Storage Description
#1	86.30'	201 cf	**8.00'D x 4.00'H Vertical Cone/Cylinder**
#2	90.31'	213 cf	**Custom Stage Data (Conic)** Listed below (Recalc)
		414 cf	Total Available Storage

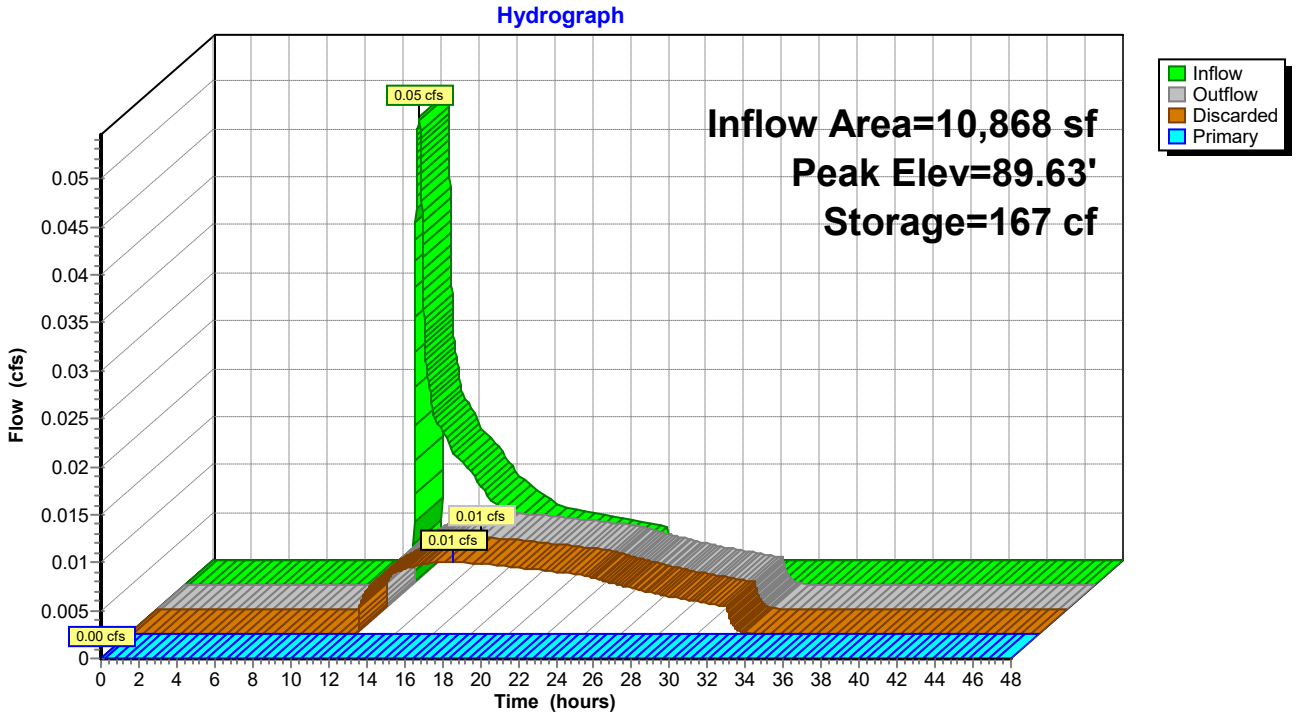
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
90.31	4	0	0	4
91.80	4	6	6	15
92.00	200	15	21	211
92.50	600	191	213	612

Device	Routing	Invert	Outlet Devices
#1	Discarded	86.30'	**2.410 in/hr Exfiltration over Wetted area**
#2	Primary	92.45'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.01 cfs @ 17.04 hrs HW=89.63' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=86.30' (Free Discharge)
↑—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond DW: 8ft diam Drywell



Summary for Pond UG-1: UG-1

Inflow Area = 22,183 sf, 85.20% Impervious, Inflow Depth = 3.93" for 10-Year event
Inflow = 2.28 cfs @ 12.09 hrs, Volume= 7,274 cf
Outflow = 1.92 cfs @ 12.14 hrs, Volume= 7,274 cf, Atten= 16%, Lag= 3.1 min
Discarded = 0.11 cfs @ 12.14 hrs, Volume= 5,250 cf
Primary = 1.81 cfs @ 12.14 hrs, Volume= 2,024 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 90.67' @ 12.14 hrs Surf.Area= 1,538 sf Storage= 1,795 cf

Plug-Flow detention time= 105.1 min calculated for 7,272 cf (100% of inflow)
Center-of-Mass det. time= 105.0 min (898.3 - 793.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	88.50'	1,128 cf	**88.17'W x 17.44'L x 2.33'H Field A** 3,588 cf Overall - 767 cf Embedded = 2,821 cf x 40.0% Voids
#2A	89.00'	767 cf	**ADS_StormTech RC-310 +Cap** x 52 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 52 Chambers in 26 Rows
		1,895 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	90.40'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Discarded	88.50'	**2.410 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.11 cfs @ 12.14 hrs HW=90.67' (Free Discharge)
↑**2=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=1.81 cfs @ 12.14 hrs HW=90.67' (Free Discharge)
↑**1=Sharp-Crested Rectangular Weir** (Weir Controls 1.81 cfs @ 1.70 fps)

Pond UG-1: UG-1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech RC-310 +Cap (ADS StormTech® RC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

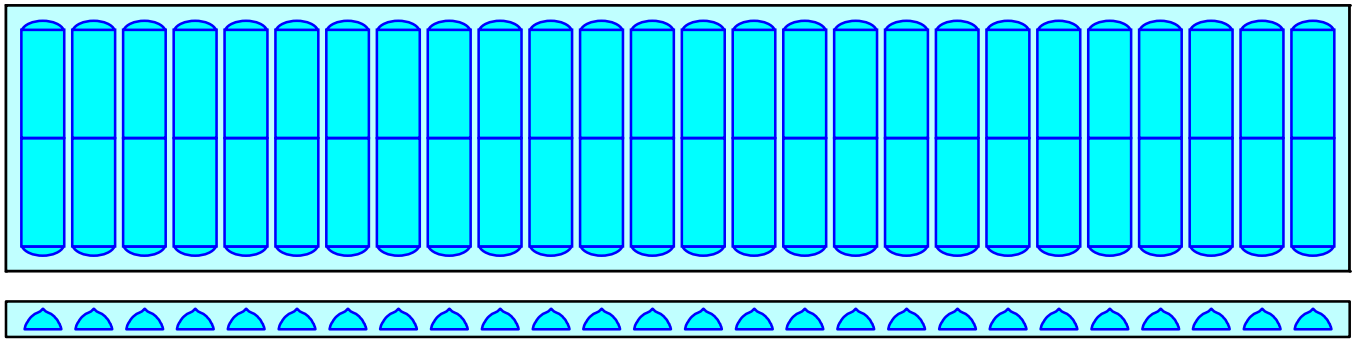
2 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 15.44' Row Length +12.0" End Stone x 2 = 17.44' Base Length
26 Rows x 34.0" Wide + 6.0" Spacing x 25 + 12.0" Side Stone x 2 = 88.17' Base Width
6.0" Base + 16.0" Chamber Height + 6.0" Cover = 2.33' Field Height

52 Chambers x 14.7 cf = 766.6 cf Chamber Storage

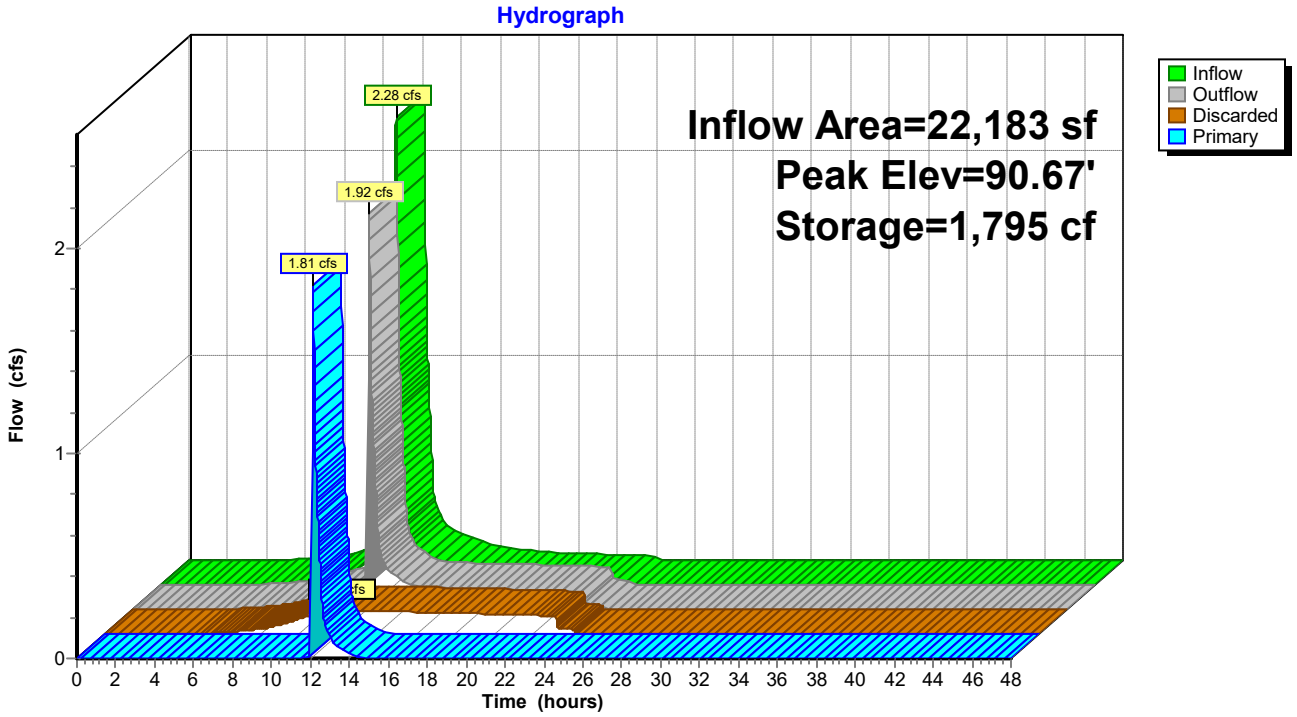
3,587.8 cf Field - 766.6 cf Chambers = 2,821.2 cf Stone x 40.0% Voids = 1,128.5 cf Stone Storage

Chamber Storage + Stone Storage = 1,895.1 cf = 0.044 af
Overall Storage Efficiency = 52.8%
Overall System Size = 17.44' x 88.17' x 2.33'

52 Chambers
132.9 cy Field
104.5 cy Stone



Pond UG-1: UG-1


Hydrograph
Inflow Area=22,183 sf
Peak Elev=90.67'
Storage=1,795 cf
2.28 cfs
1.92 cfs
1.81 cfs
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)
0
1
2
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

Summary for Pond UG-2: UG-2

Inflow Area = 10,025 sf,100.00% Impervious, Inflow Depth = 4.93" for 10-Year event
Inflow = 1.16 cfs @ 12.08 hrs, Volume= 4,121 cf
Outflow = 0.62 cfs @ 12.21 hrs, Volume= 4,121 cf, Atten= 47%, Lag= 7.6 min
Discarded = 0.08 cfs @ 12.21 hrs, Volume= 3,533 cf
Primary = 0.55 cfs @ 12.21 hrs, Volume= 588 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 90.69' @ 12.21 hrs Surf.Area= 1,014 sf Storage= 1,190 cf

Plug-Flow detention time= 108.2 min calculated for 4,120 cf (100% of inflow)
Center-of-Mass det. time= 108.1 min (855.6 - 747.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	88.50'	746 cf	**58.17'W x 17.44'L x 2.33'H Field A** 2,367 cf Overall - 501 cf Embedded = 1,866 cf x 40.0% Voids
#2A	89.00'	501 cf	**ADS_StormTech RC-310 +Cap** x 34 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 34 Chambers in 17 Rows
		1,248 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	90.57'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Discarded	88.50'	**2.410 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.08 cfs @ 12.21 hrs HW=90.69' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=0.55 cfs @ 12.21 hrs HW=90.69' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Weir Controls 0.55 cfs @ 1.14 fps)

Pond UG-2: UG-2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech RC-310 +Cap (ADS StormTech® RC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

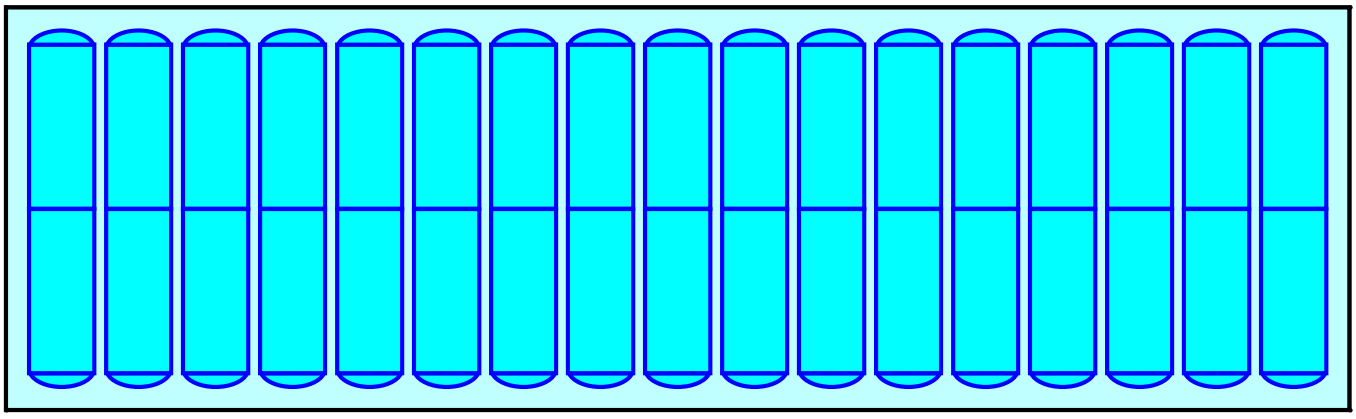
2 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 15.44' Row Length +12.0" End Stone x 2 = 17.44' Base Length
17 Rows x 34.0" Wide + 6.0" Spacing x 16 + 12.0" Side Stone x 2 = 58.17' Base Width
6.0" Base + 16.0" Chamber Height + 6.0" Cover = 2.33' Field Height

34 Chambers x 14.7 cf = 501.2 cf Chamber Storage

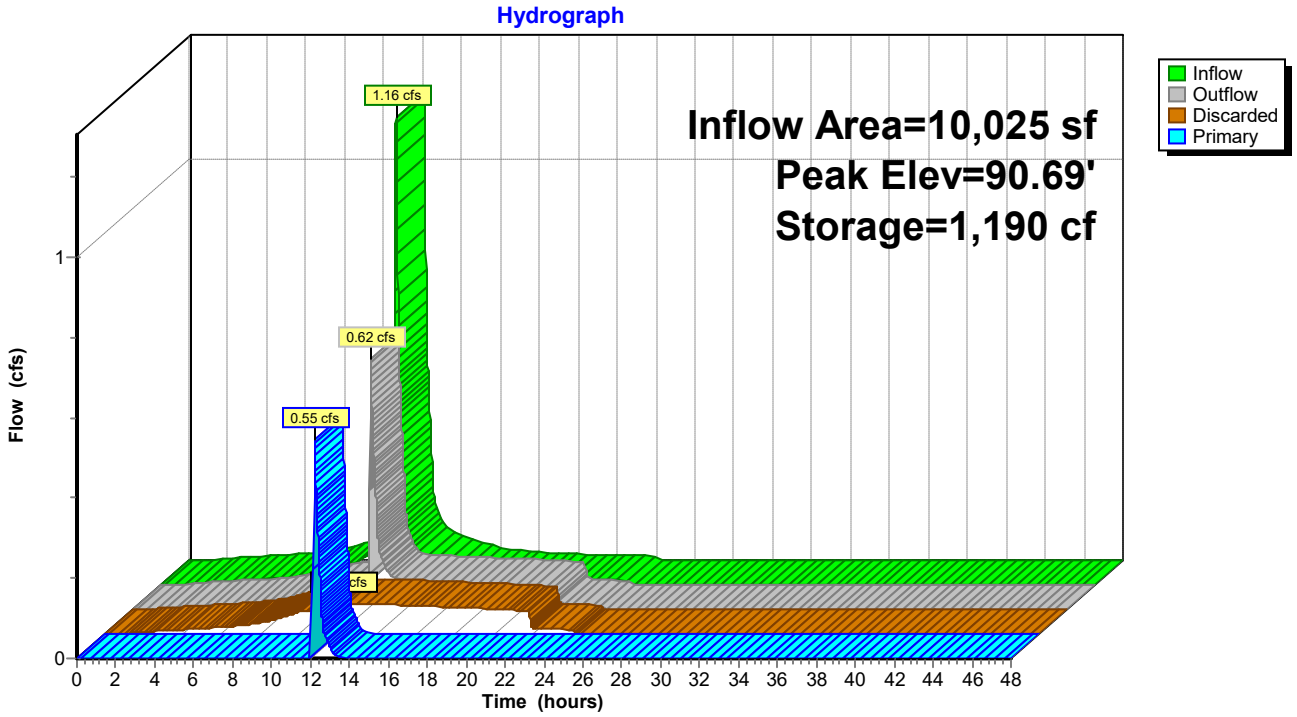
2,367.0 cf Field - 501.2 cf Chambers = 1,865.8 cf Stone x 40.0% Voids = 746.3 cf Stone Storage

Chamber Storage + Stone Storage = 1,247.5 cf = 0.029 af
Overall Storage Efficiency = 52.7%
Overall System Size = 17.44' x 58.17' x 2.33'

34 Chambers
87.7 cy Field
69.1 cy Stone



Pond UG-2: UG-2


Hydrograph
Inflow Area=10,025 sf
Peak Elev=90.69'
Storage=1,190 cf
1.16 cfs
0.62 cfs
0.55 cfs
cfs
Inflow
Outflow
Discarded
Primary
Flow (cfs)
0
1
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
Time (hours)

Summary for Pond UG-3: UG-3

Inflow Area = 20,963 sf,100.00% Impervious, Inflow Depth = 4.93" for 10-Year event
Inflow = 2.43 cfs @ 12.08 hrs, Volume= 8,617 cf
Outflow = 0.72 cfs @ 12.40 hrs, Volume= 8,617 cf, Atten= 70%, Lag= 19.1 min
Discarded = 0.16 cfs @ 12.40 hrs, Volume= 7,954 cf
Primary = 0.56 cfs @ 12.40 hrs, Volume= 663 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 90.55' @ 12.40 hrs Surf.Area= 2,518 sf Storage= 2,916 cf

Plug-Flow detention time= 124.9 min calculated for 8,616 cf (100% of inflow)
Center-of-Mass det. time= 124.9 min (872.4 - 747.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	88.50'	1,784 cf	**54.83'W x 45.92'L x 2.33'H Field A** 5,875 cf Overall - 1,415 cf Embedded = 4,460 cf x 40.0% Voids
#2A	89.00'	1,415 cf	**ADS_StormTech RC-310 +Cap** x 96 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 96 Chambers in 16 Rows
		3,199 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	90.43'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Discarded	88.50'	**2.410 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.16 cfs @ 12.40 hrs HW=90.55' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=0.56 cfs @ 12.40 hrs HW=90.55' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 0.56 cfs @ 1.14 fps)

Pond UG-3: UG-3 - Chamber Wizard Field A

Chamber Model = ADS_StormTech RC-310 +Cap (ADS StormTech® RC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

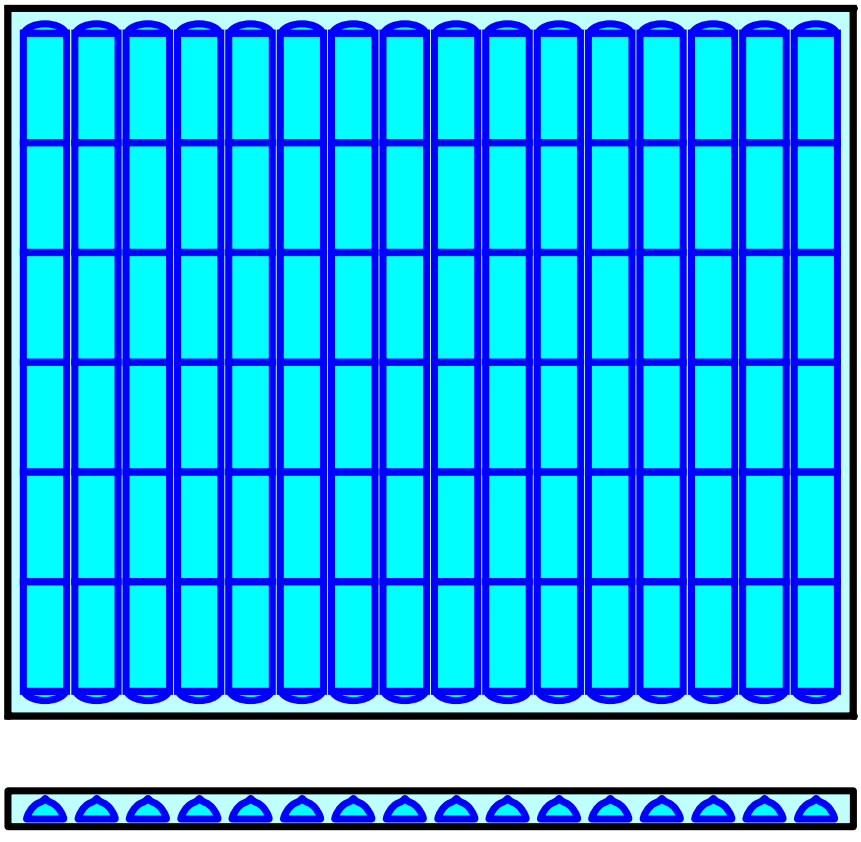
6 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 43.92' Row Length +12.0" End Stone x 2 = 45.92' Base Length
16 Rows x 34.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 54.83' Base Width
6.0" Base + 16.0" Chamber Height + 6.0" Cover = 2.33' Field Height

96 Chambers x 14.7 cf = 1,415.2 cf Chamber Storage

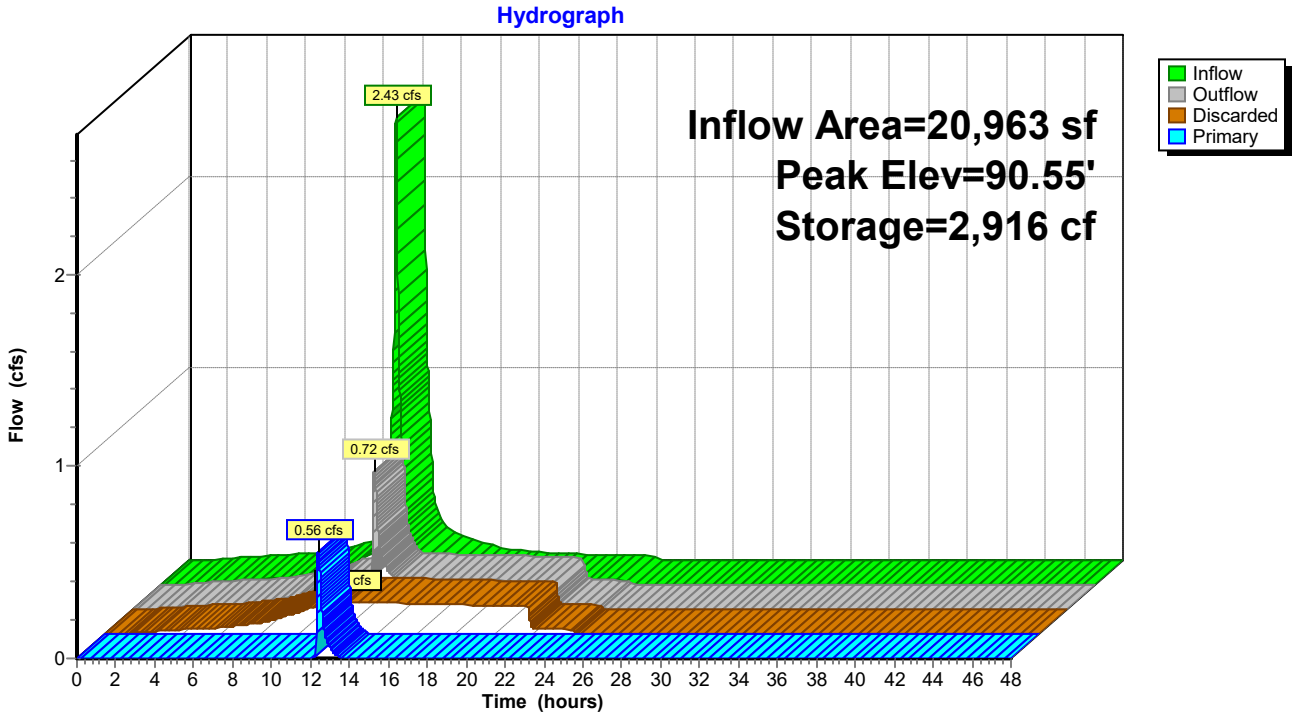
5,875.2 cf Field - 1,415.2 cf Chambers = 4,460.0 cf Stone x 40.0% Voids = 1,784.0 cf Stone Storage

Chamber Storage + Stone Storage = 3,199.2 cf = 0.073 af
Overall Storage Efficiency = 54.5%
Overall System Size = 45.92' x 54.83' x 2.33'

96 Chambers
217.6 cy Field
165.2 cy Stone



Pond UG-3: UG-3


Hydrograph
Inflow Area=20,963 sf
Peak Elev=90.55'
Storage=2,916 cf
2.43 cfs
0.72 cfs
0.56 cfs
cfs
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)
0
1
2
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

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 Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P1-A: P1-A Runoff Area=22,183 sf 85.20% Impervious Runoff Depth=5.02"
Tc=6.0 min CN=89 Runoff=2.87 cfs 9,274 cf

Subcatchment P1-B: P1-B Runoff Area=10,025 sf 100.00% Impervious Runoff Depth=6.05"
Tc=6.0 min CN=98 Runoff=1.42 cfs 5,056 cf

Subcatchment P1-C: P1-C Runoff Area=20,963 sf 100.00% Impervious Runoff Depth=6.05"
Tc=6.0 min CN=98 Runoff=2.97 cfs 10,572 cf

Subcatchment P1-D: P1-D Runoff Area=137,299 sf 65.03% Impervious Runoff Depth=3.63"
Tc=6.0 min CN=76 Runoff=13.42 cfs 41,552 cf

Subcatchment P1-E: P1-E Runoff Area=10,868 sf 9.20% Impervious Runoff Depth=0.85"
Flow Length=95' Slope=0.0100 '/' Tc=8.3 min CN=44 Runoff=0.14 cfs 771 cf

Subcatchment P2: P2 Runoff Area=6,958 sf 38.80% Impervious Runoff Depth=2.29"
Tc=6.0 min CN=62 Runoff=0.42 cfs 1,329 cf

Subcatchment P3: P3 Runoff Area=1,155 sf 0.00% Impervious Runoff Depth=0.11"
Tc=6.0 min CN=30 Runoff=0.00 cfs 10 cf

Reach DMH MB1: DMH MB1 Inflow=2.70 cfs 3,452 cf
Outflow=2.70 cfs 3,452 cf

Reach DMH MB5: DMH MB5 Inflow=3.84 cfs 4,616 cf
Outflow=3.84 cfs 4,616 cf

Reach DMH MC5: DMH MC5 Inflow=4.05 cfs 6,433 cf
Outflow=4.05 cfs 6,433 cf

Reach PD1: Wetland "B" series Inflow=16.95 cfs 47,985 cf
Outflow=16.95 cfs 47,985 cf

Reach PD2: Pleasant St Inflow=0.42 cfs 1,329 cf
Outflow=0.42 cfs 1,329 cf

Reach PD3: SOUTH Inflow=0.00 cfs 10 cf
Outflow=0.00 cfs 10 cf

Pond DW: 8ft diam Drywell Peak Elev=92.13' Storage=253 cf Inflow=0.14 cfs 771 cf
Discarded=0.02 cfs 771 cf Primary=0.00 cfs 0 cf Outflow=0.02 cfs 771 cf

Pond UG-1: UG-1 Peak Elev=90.75' Storage=1,846 cf Inflow=2.87 cfs 9,274 cf
Discarded=0.11 cfs 5,822 cf Primary=2.70 cfs 3,452 cf Outflow=2.81 cfs 9,274 cf

Pond UG-2: UG-2 Peak Elev=90.77' Storage=1,224 cf Inflow=1.42 cfs 5,056 cf
Discarded=0.08 cfs 3,892 cf Primary=1.20 cfs 1,164 cf Outflow=1.28 cfs 5,056 cf

Pond UG-3: UG-3 Peak Elev=90.66' Storage=3,023 cf Inflow=2.97 cfs 10,572 cf
Discarded=0.16 cfs 8,754 cf Primary=1.41 cfs 1,817 cf Outflow=1.57 cfs 10,572 cf

Total Runoff Area = 209,451 sf Runoff Volume = 68,562 cf Average Runoff Depth = 3.93"
31.79% Pervious = 66,580 sf 68.21% Impervious = 142,871 sf

Summary for Subcatchment P1-A: P1-A

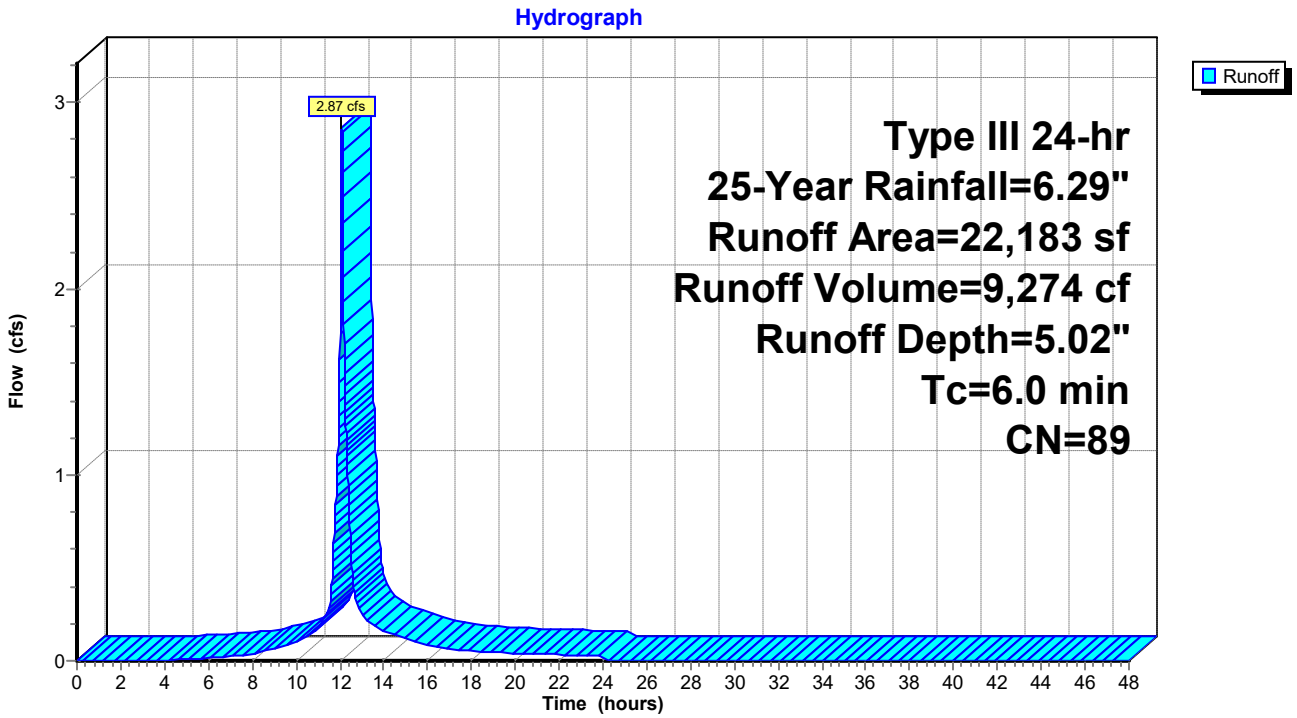
Runoff = 2.87 cfs @ 12.08 hrs, Volume= 9,274 cf, Depth= 5.02"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.29"

	Area (sf)	CN	Description
	3,283	39	>75% Grass cover, Good, HSG A
*	1,440	98	ROOF PORTA CACHER
*	10,300	98	ROOF BLDG
*	7,160	98	PAVEMENT
	22,183	89	Weighted Average
	3,283	39	14.80% Pervious Area
	18,900	98	85.20% Impervious Area

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

Subcatchment P1-A: P1-A



Summary for Subcatchment P1-B: P1-B

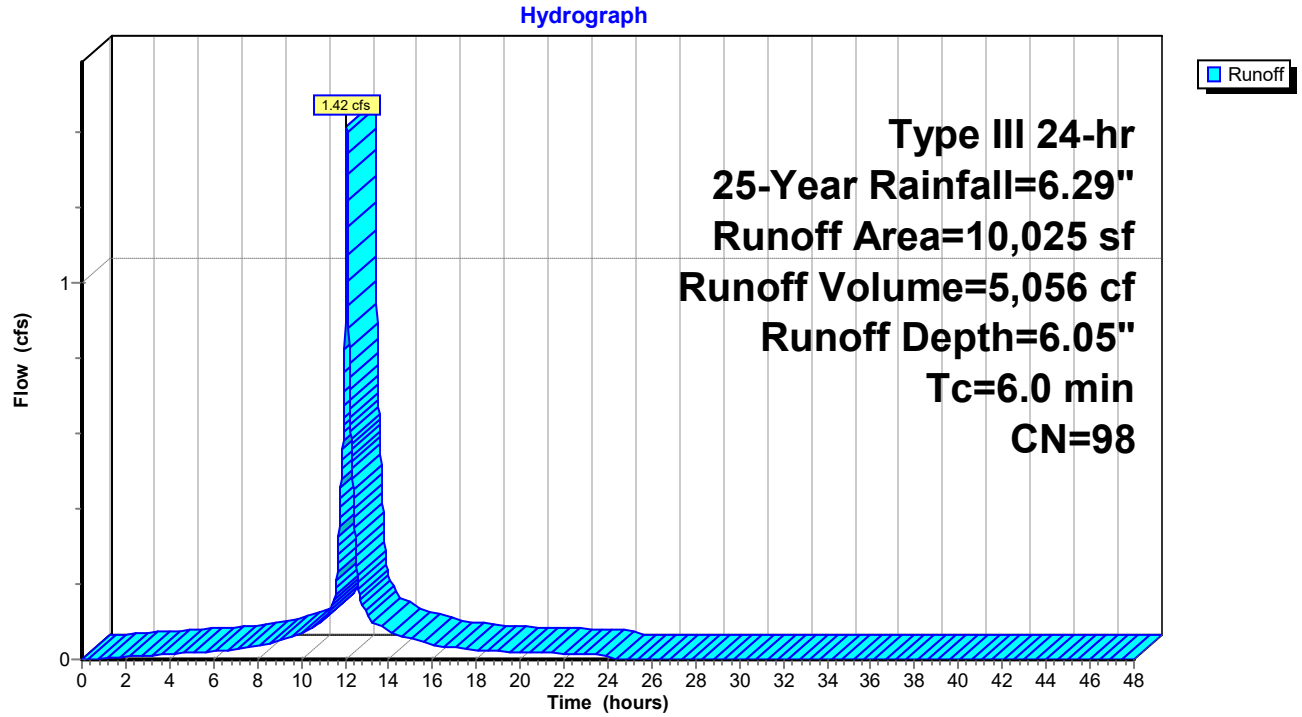
Runoff = 1.42 cfs @ 12.08 hrs, Volume= 5,056 cf, Depth= 6.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.29"

	Area (sf)	CN	Description
*	10,025	98	ROOF BLDG
	10,025	98	100.00% Impervious Area

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

Subcatchment P1-B: P1-B



Summary for Subcatchment P1-C: P1-C

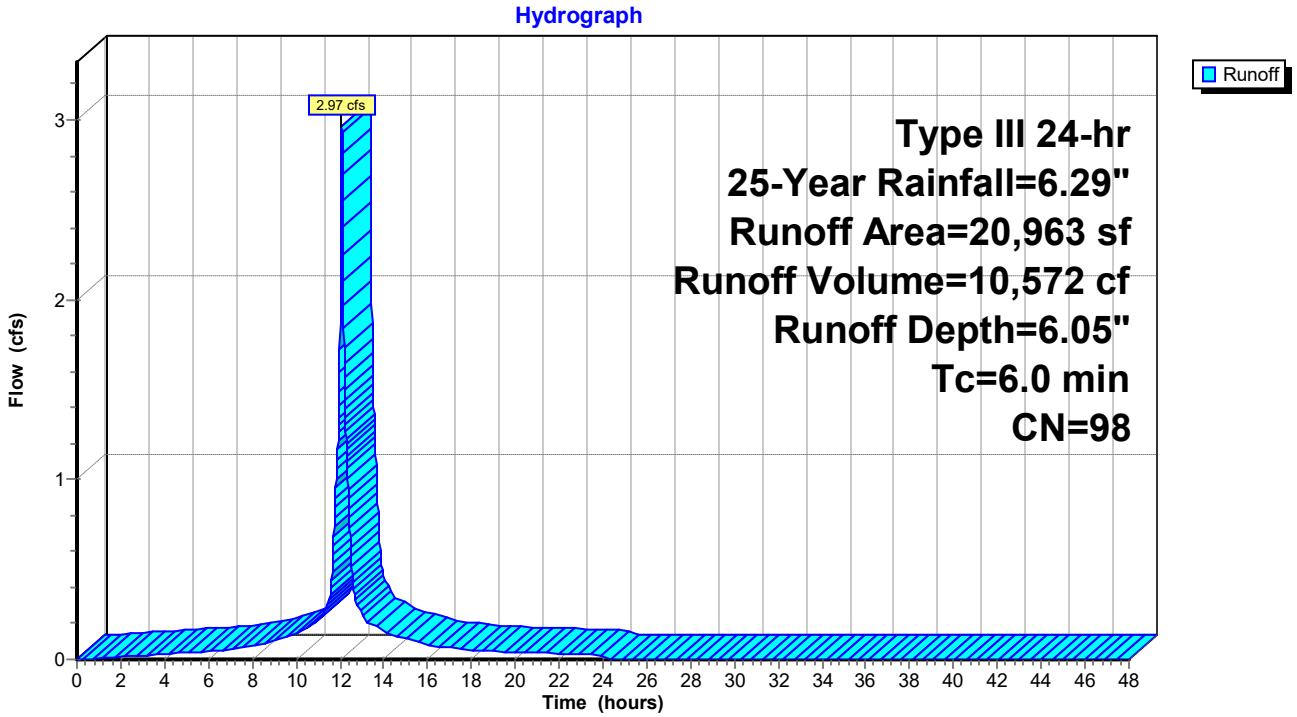
Runoff = 2.97 cfs @ 12.08 hrs, Volume= 10,572 cf, Depth= 6.05"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.29"

	Area (sf)	CN	Description
*	20,963	98	ROOF BLDG
	20,963	98	100.00% Impervious Area

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

Subcatchment P1-C: P1-C



Summary for Subcatchment P1-D: P1-D

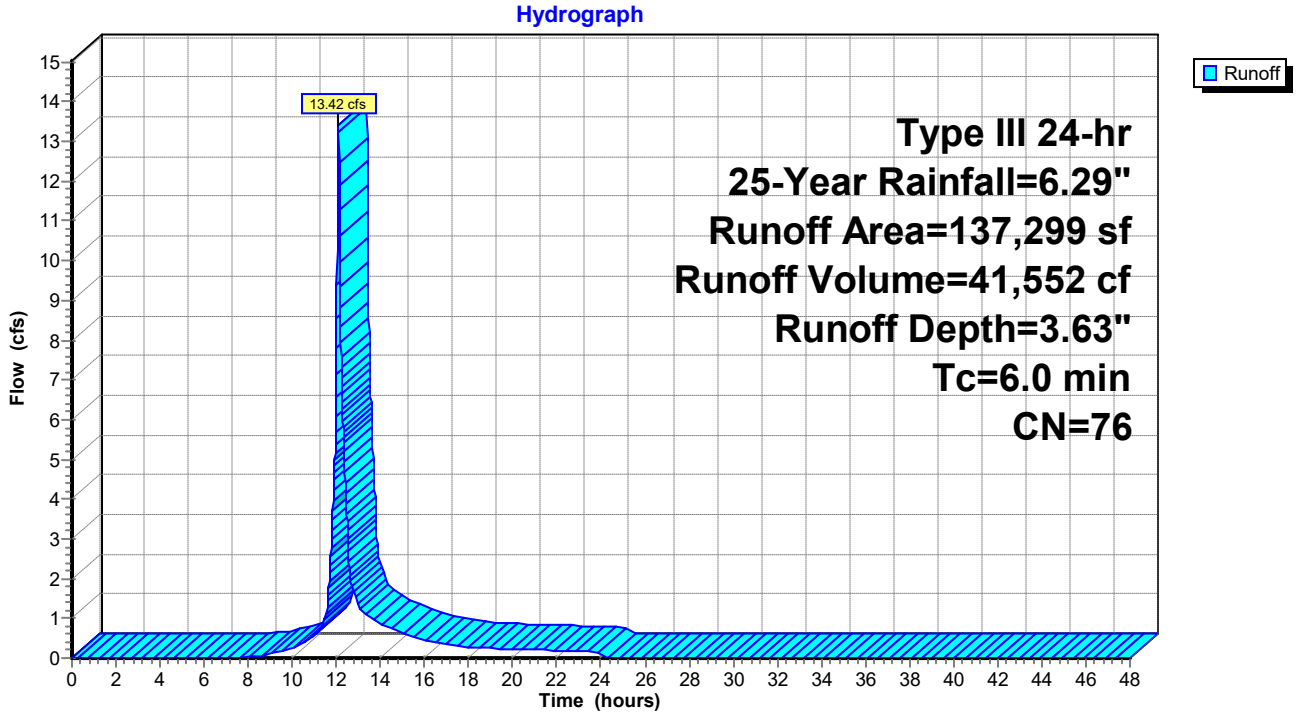
Runoff = 13.42 cfs @ 12.09 hrs, Volume= 41,552 cf, Depth= 3.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.29"

	Area (sf)	CN	Description
*	14,030	98	wetland
*	61,468	98	PAVEMENT
	17,400	30	Woods, Good, HSG A
	30,616	39	>75% Grass cover, Good, HSG A
*	13,785	98	ROOF BLDG
	137,299	76	Weighted Average
	48,016	36	34.97% Pervious Area
	89,283	98	65.03% Impervious Area

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

Subcatchment P1-D: P1-D



Summary for Subcatchment P1-E: P1-E

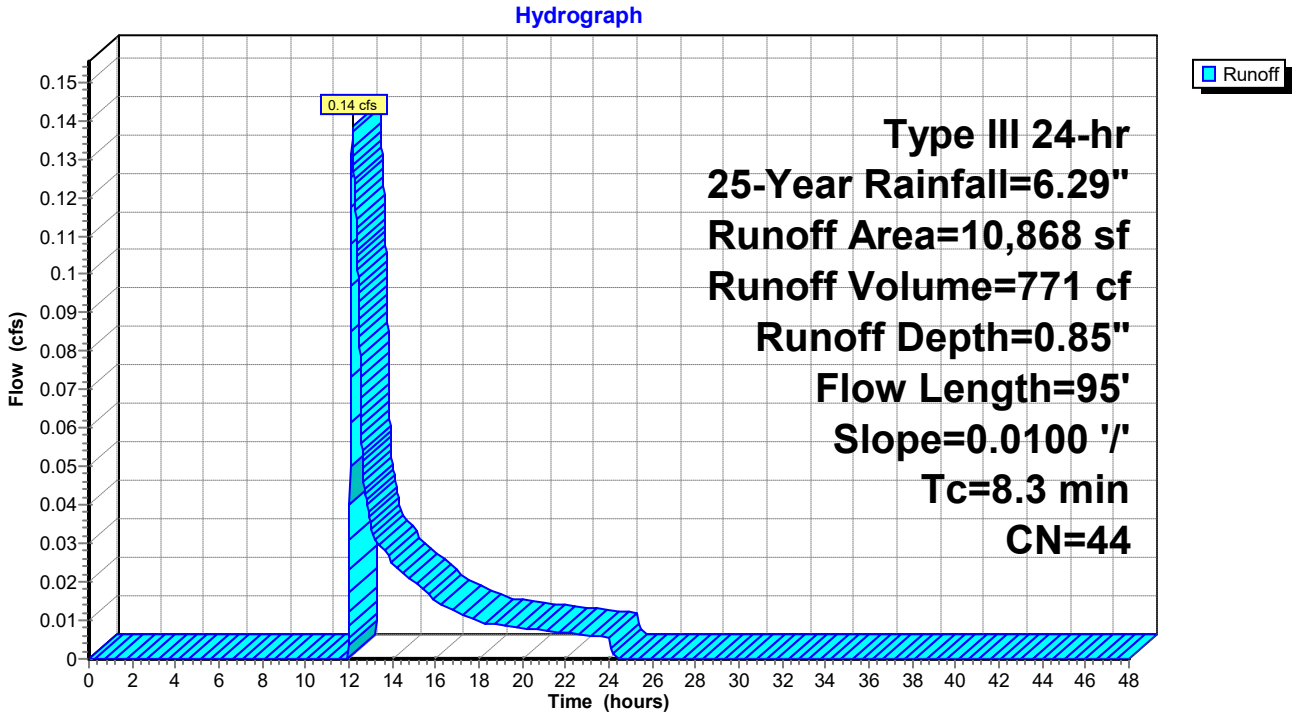
Runoff = 0.14 cfs @ 12.16 hrs, Volume= 771 cf, Depth= 0.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.29"

	Area (sf)	CN	Description
*	1,000	98	PAVEMENT
	9,868	39	>75% Grass cover, Good, HSG A
	10,868	44	Weighted Average
	9,868	39	90.80% Pervious Area
	1,000	98	9.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.40"
1.1	45	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.3	95	Total			

Subcatchment P1-E: P1-E



Summary for Subcatchment P2: P2

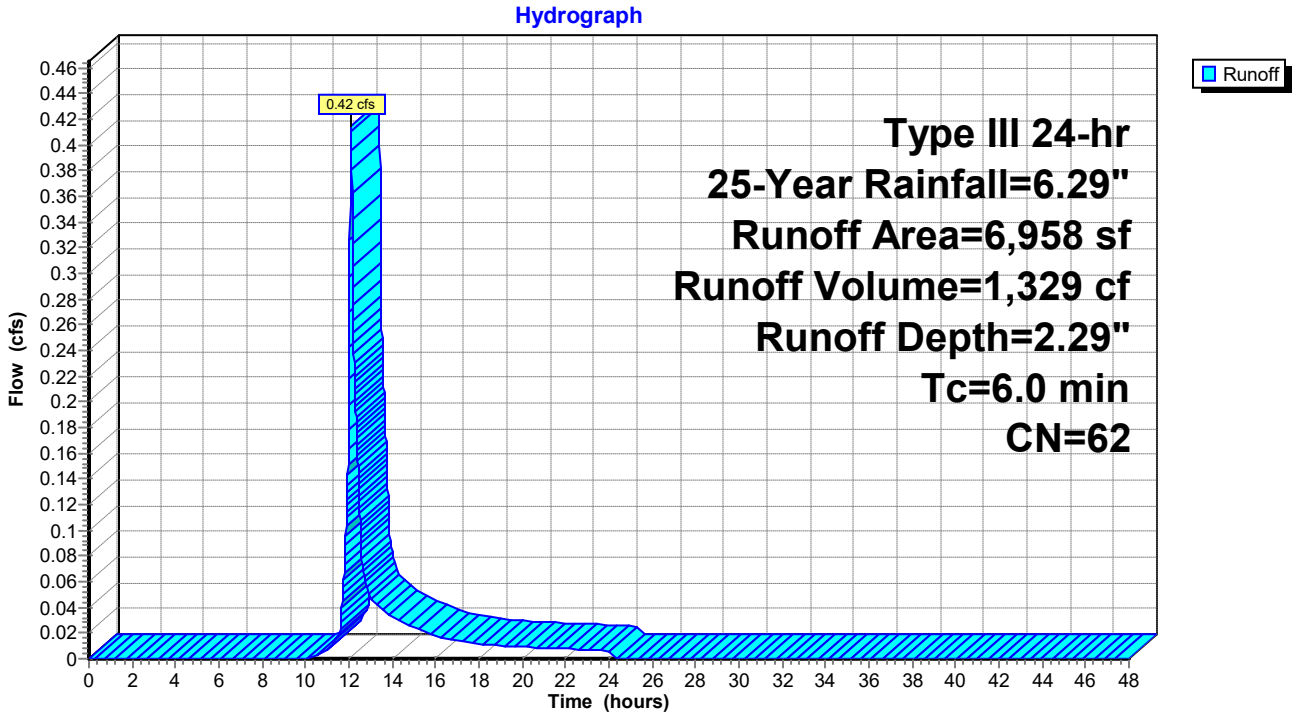
Runoff = 0.42 cfs @ 12.09 hrs, Volume= 1,329 cf, Depth= 2.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.29"

	Area (sf)	CN	Description
	4,258	39	>75% Grass cover, Good, HSG A
*	2,700	98	pavement
	6,958	62	Weighted Average
	4,258	39	61.20% Pervious Area
	2,700	98	38.80% Impervious Area

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

Subcatchment P2: P2



Summary for Subcatchment P3: P3

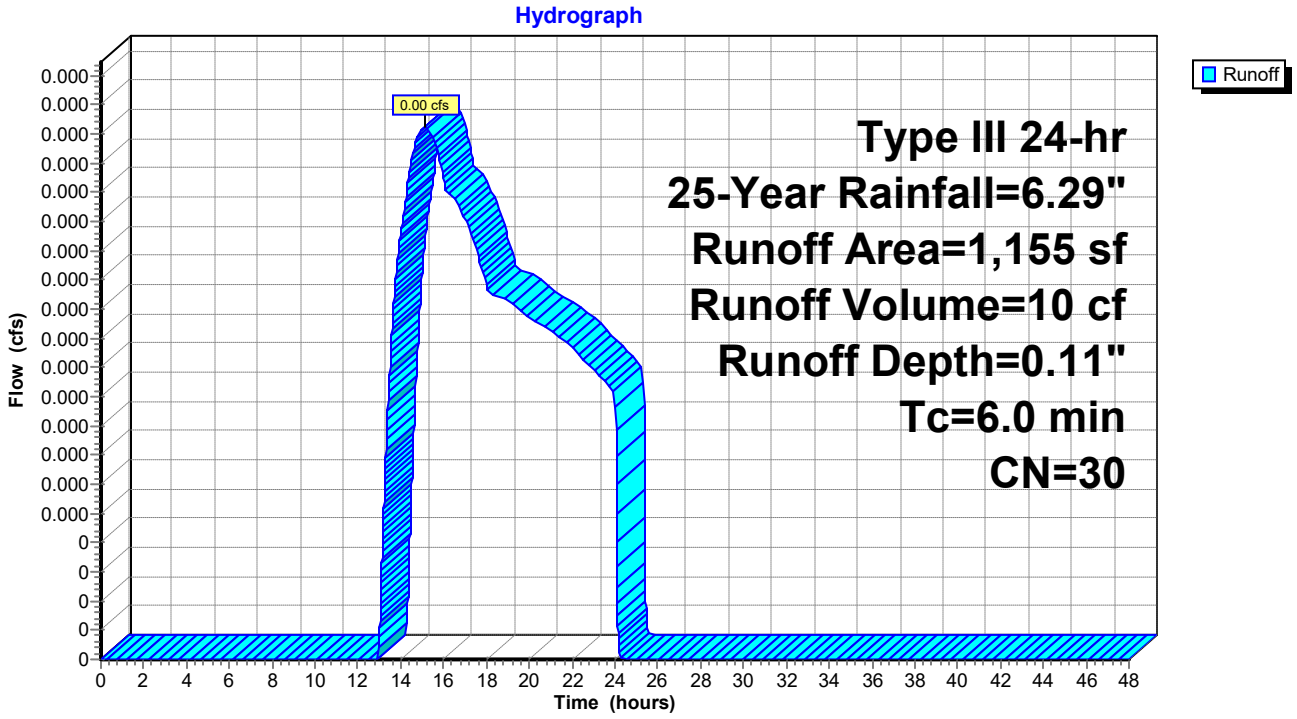
Runoff = 0.00 cfs @ 15.14 hrs, Volume= 10 cf, Depth= 0.11"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 25-Year Rainfall=6.29"

Area (sf)	CN	Description
1,155	30	Woods, Good, HSG A
1,155	30	100.00% Pervious Area

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

Subcatchment P3: P3



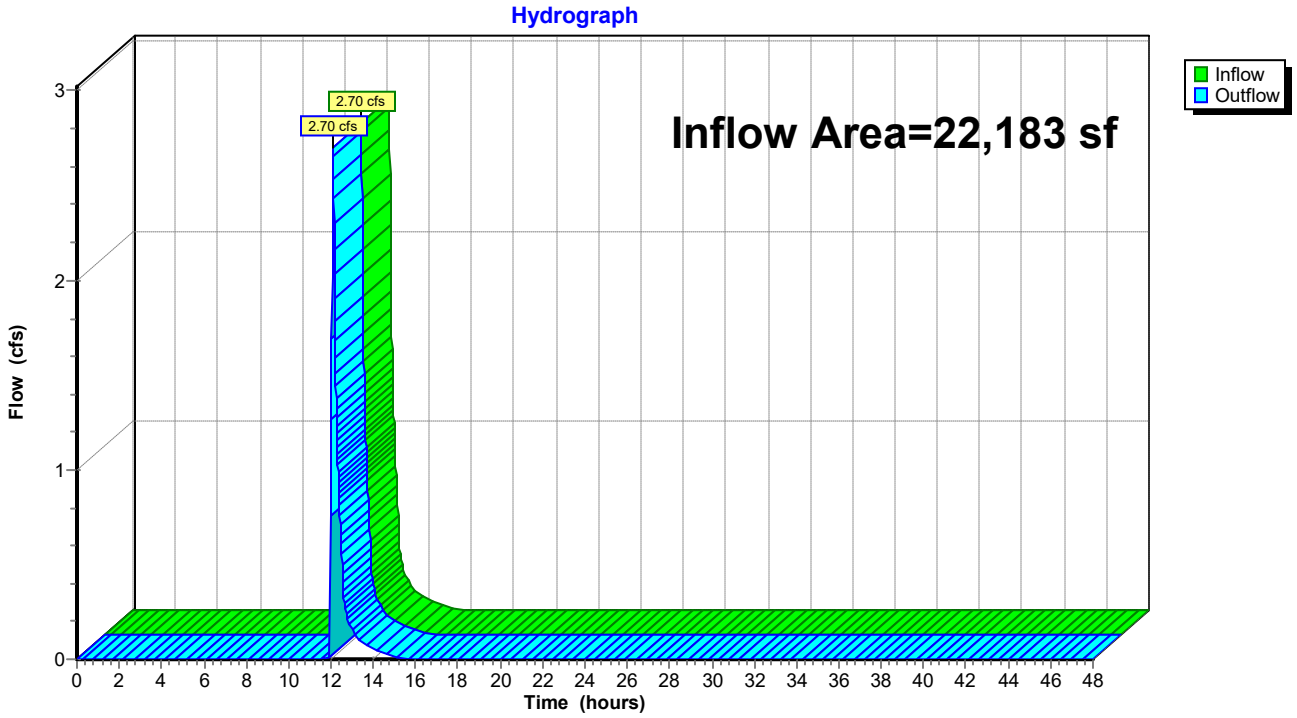
Summary for Reach DMH MB1: DMH MB1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 22,183 sf, 85.20% Impervious, Inflow Depth = 1.87" for 25-Year event
Inflow = 2.70 cfs @ 12.10 hrs, Volume= 3,452 cf
Outflow = 2.70 cfs @ 12.10 hrs, Volume= 3,452 cf, Atten= 0%, Lag= 0.0 min

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

Reach DMH MB1: DMH MB1



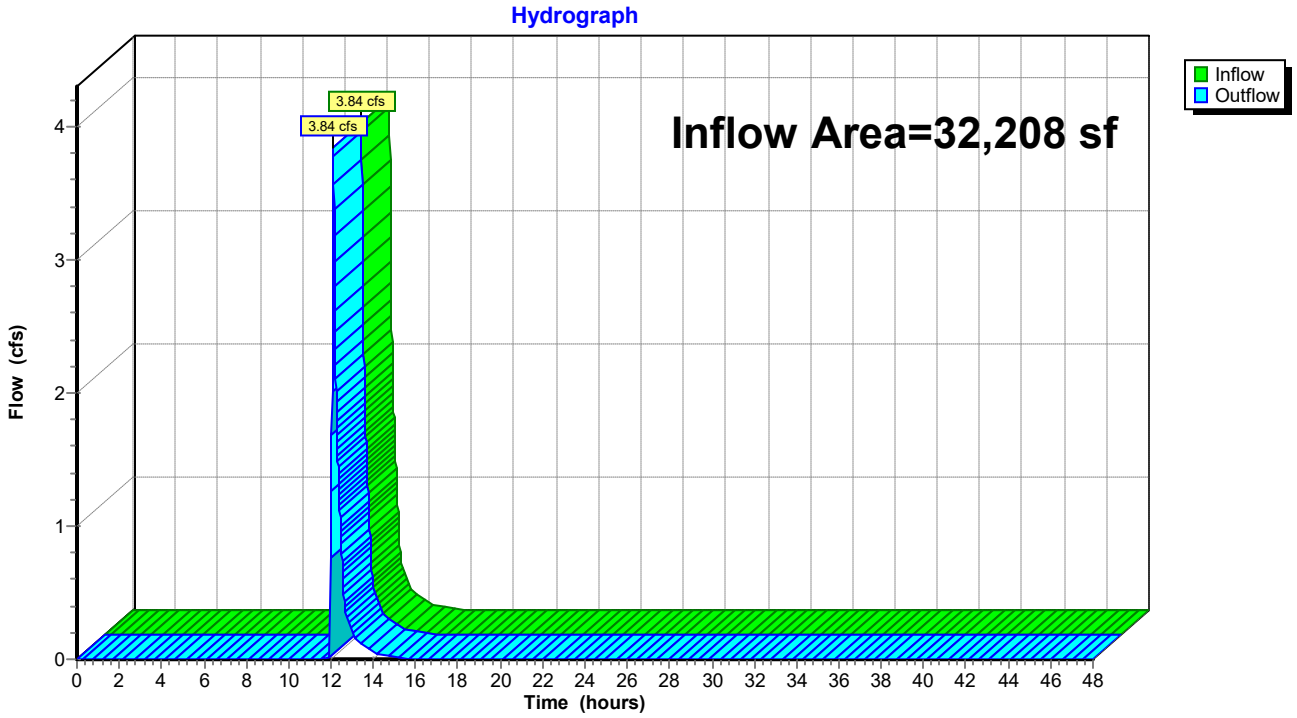
Summary for Reach DMH MB5: DMH MB5

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 32,208 sf, 89.81% Impervious, Inflow Depth = 1.72" for 25-Year event
Inflow = 3.84 cfs @ 12.11 hrs, Volume= 4,616 cf
Outflow = 3.84 cfs @ 12.11 hrs, Volume= 4,616 cf, Atten= 0%, Lag= 0.0 min

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

Reach DMH MB5: DMH MB5



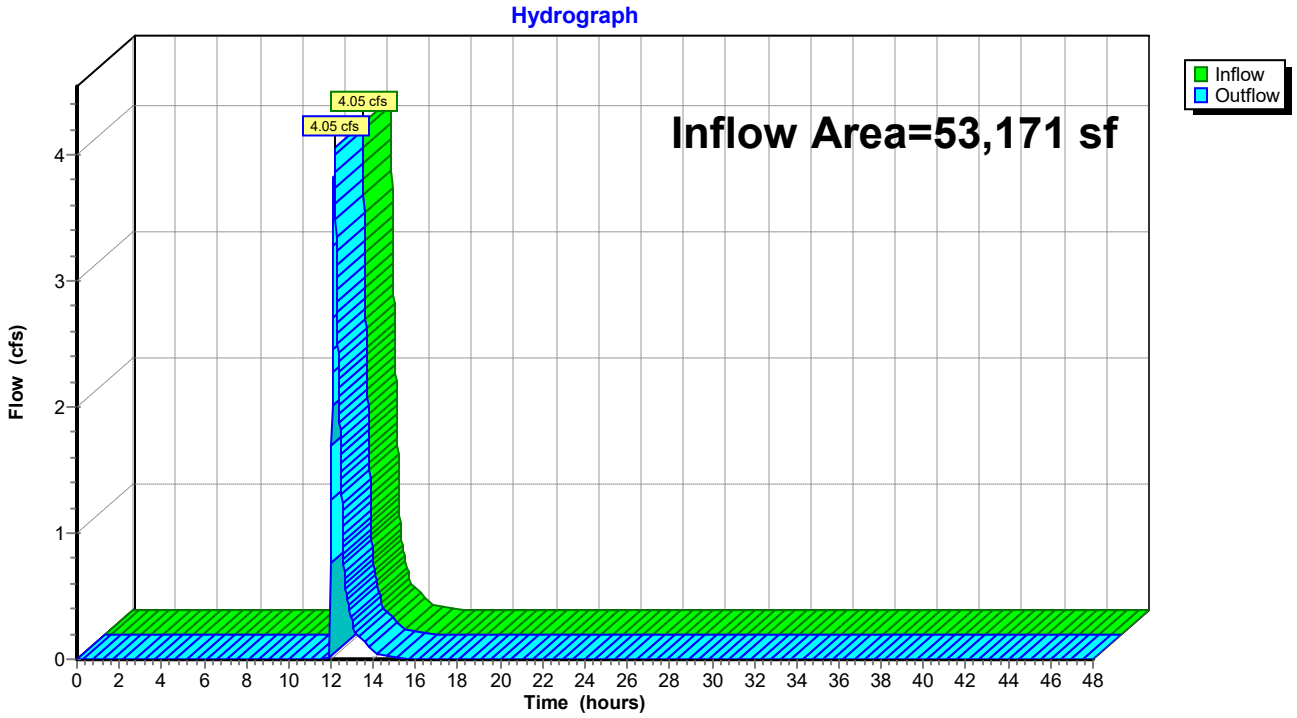
Summary for Reach DMH MC5: DMH MC5

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 53,171 sf, 93.83% Impervious, Inflow Depth = 1.45" for 25-Year event
Inflow = 4.05 cfs @ 12.17 hrs, Volume= 6,433 cf
Outflow = 4.05 cfs @ 12.17 hrs, Volume= 6,433 cf, Atten= 0%, Lag= 0.0 min

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

Reach DMH MC5: DMH MC5



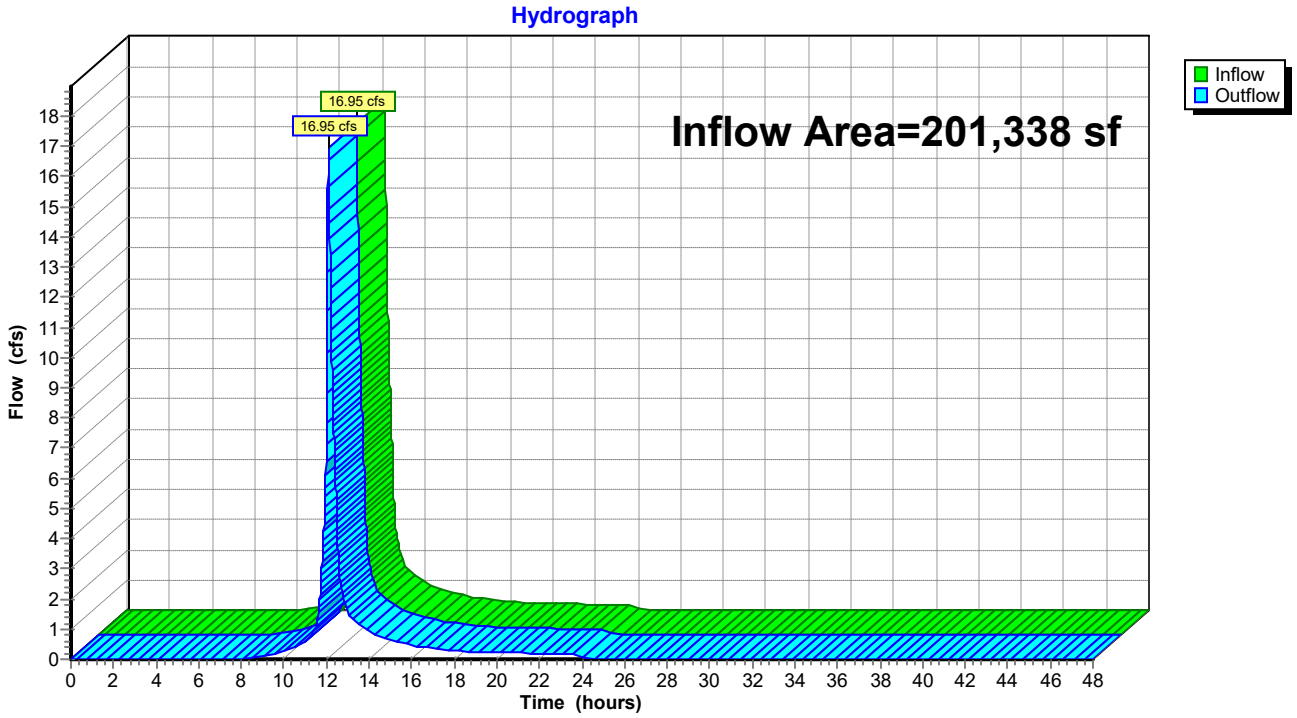
Summary for Reach PD1: Wetland "B" series

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 201,338 sf, 69.62% Impervious, Inflow Depth = 2.86" for 25-Year event
Inflow = 16.95 cfs @ 12.10 hrs, Volume= 47,985 cf
Outflow = 16.95 cfs @ 12.10 hrs, Volume= 47,985 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD1: Wetland "B" series



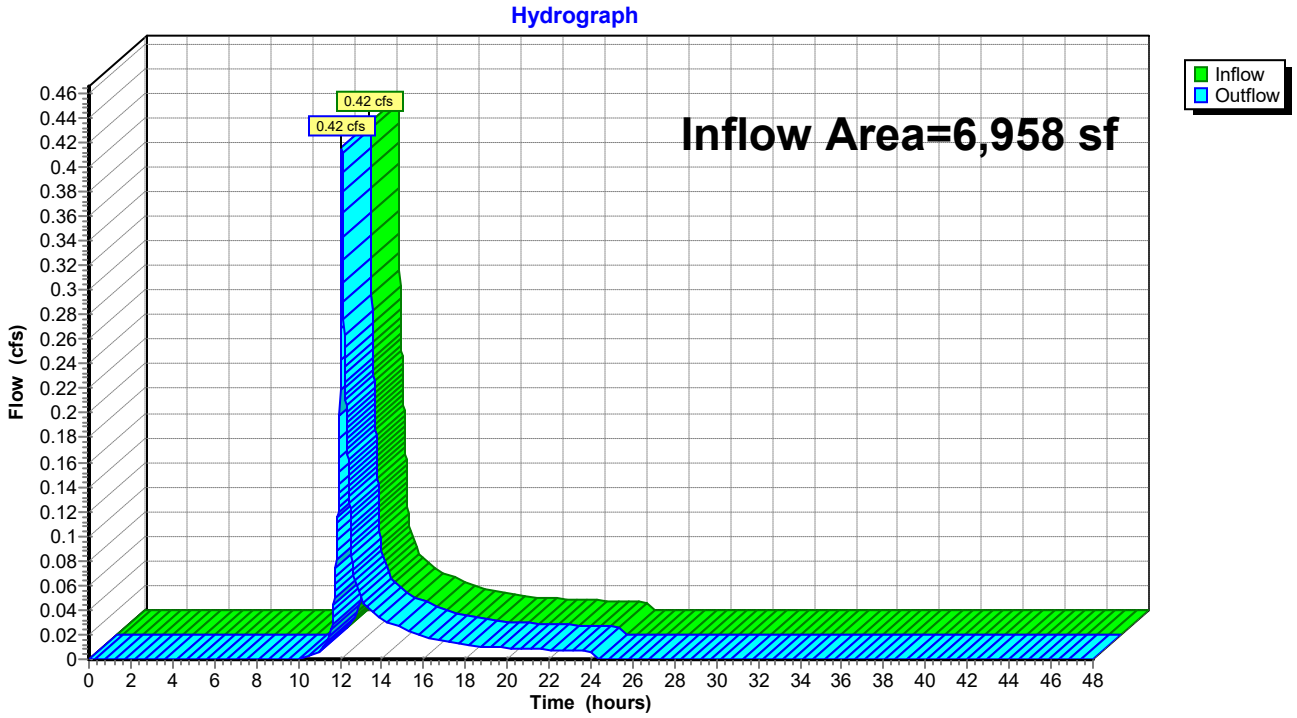
Summary for Reach PD2: Pleasant St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6,958 sf, 38.80% Impervious, Inflow Depth = 2.29" for 25-Year event
Inflow = 0.42 cfs @ 12.09 hrs, Volume= 1,329 cf
Outflow = 0.42 cfs @ 12.09 hrs, Volume= 1,329 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD2: Pleasant St



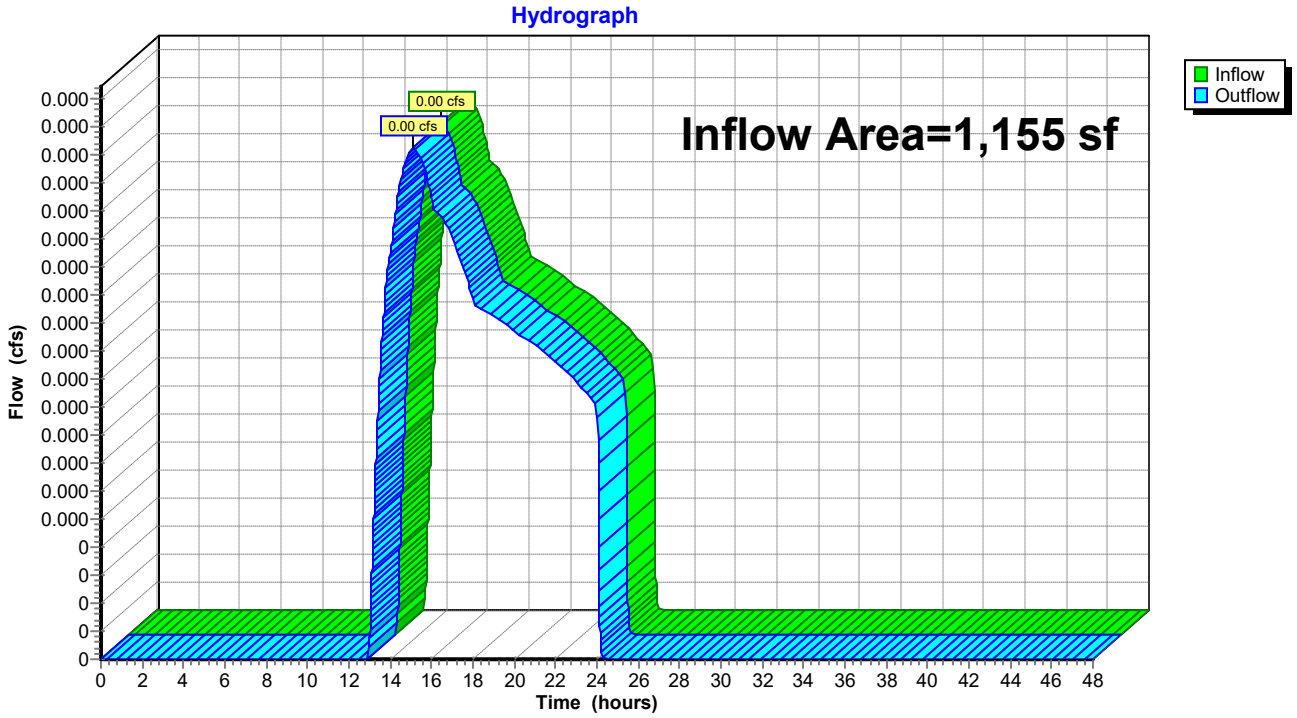
Summary for Reach PD3: SOUTH

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,155 sf, 0.00% Impervious, Inflow Depth = 0.11" for 25-Year event
Inflow = 0.00 cfs @ 15.14 hrs, Volume= 10 cf
Outflow = 0.00 cfs @ 15.14 hrs, Volume= 10 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD3: SOUTH



Summary for Pond DW: 8ft diam Drywell

[42] Hint: Gap in defined storage above volume #1 at 90.30'

Inflow Area = 10,868 sf, 9.20% Impervious, Inflow Depth = 0.85" for 25-Year event
Inflow = 0.14 cfs @ 12.16 hrs, Volume= 771 cf
Outflow = 0.02 cfs @ 14.03 hrs, Volume= 771 cf, Atten= 82%, Lag= 111.9 min
Discarded = 0.02 cfs @ 14.03 hrs, Volume= 771 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 92.13' @ 14.03 hrs Surf.Area= 331 sf Storage= 253 cf

Plug-Flow detention time= 256.7 min calculated for 771 cf (100% of inflow)
Center-of-Mass det. time= 256.7 min (1,175.2 - 918.6)

Volume	Invert	Avail.Storage	Storage Description
#1	86.30'	201 cf	**8.00'D x 4.00'H Vertical Cone/Cylinder**
#2	90.31'	213 cf	**Custom Stage Data (Conic)** Listed below (Recalc)
		414 cf	Total Available Storage

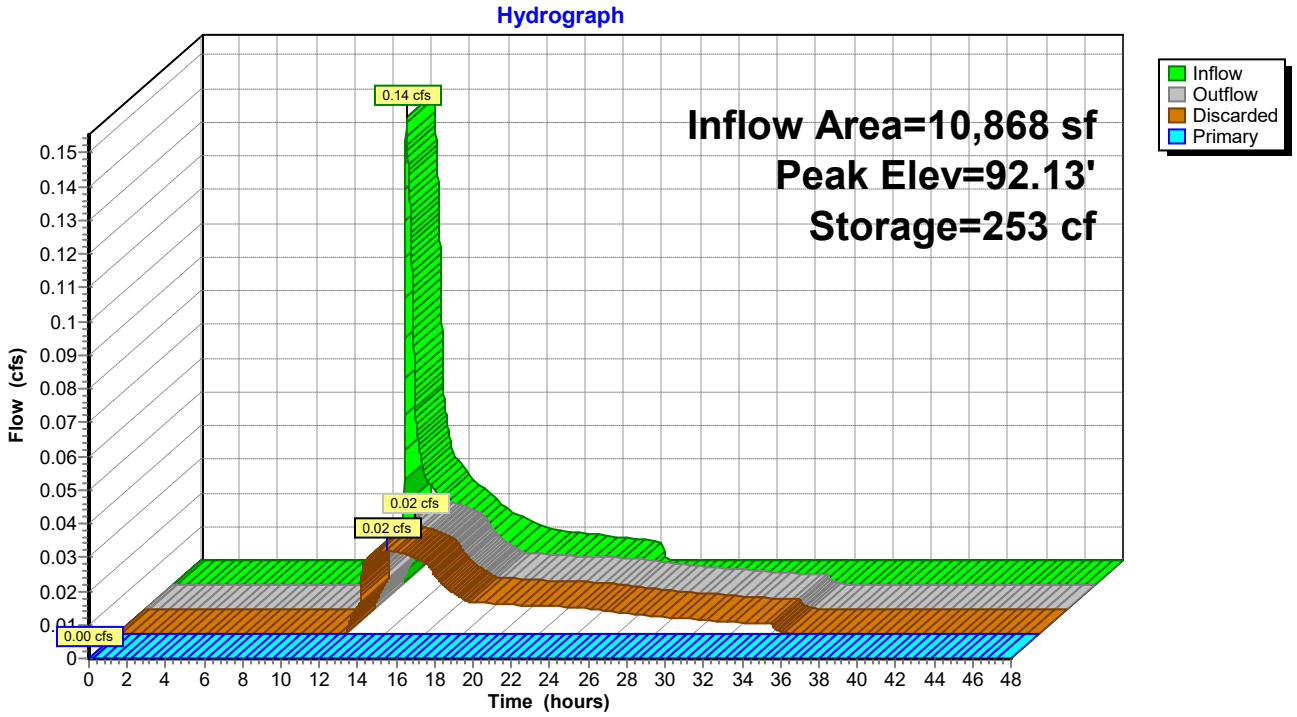
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
90.31	4	0	0	4
91.80	4	6	6	15
92.00	200	15	21	211
92.50	600	191	213	612

Device	Routing	Invert	Outlet Devices
#1	Discarded	86.30'	**2.410 in/hr Exfiltration over Wetted area**
#2	Primary	92.45'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.02 cfs @ 14.03 hrs HW=92.13' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=86.30' (Free Discharge)
↑—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond DW: 8ft diam Drywell



Summary for Pond UG-1: UG-1

Inflow Area = 22,183 sf, 85.20% Impervious, Inflow Depth = 5.02" for 25-Year event
Inflow = 2.87 cfs @ 12.08 hrs, Volume= 9,274 cf
Outflow = 2.81 cfs @ 12.10 hrs, Volume= 9,274 cf, Atten= 2%, Lag= 1.0 min
Discarded = 0.11 cfs @ 12.10 hrs, Volume= 5,822 cf
Primary = 2.70 cfs @ 12.10 hrs, Volume= 3,452 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 90.75' @ 12.10 hrs Surf.Area= 1,538 sf Storage= 1,846 cf

Plug-Flow detention time= 94.4 min calculated for 9,272 cf (100% of inflow)
Center-of-Mass det. time= 94.3 min (881.0 - 786.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	88.50'	1,128 cf	**88.17'W x 17.44'L x 2.33'H Field A** 3,588 cf Overall - 767 cf Embedded = 2,821 cf x 40.0% Voids
#2A	89.00'	767 cf	**ADS_StormTech RC-310 +Cap** x 52 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 52 Chambers in 26 Rows
		1,895 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	90.40'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Discarded	88.50'	**2.410 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.11 cfs @ 12.10 hrs HW=90.75' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=2.69 cfs @ 12.10 hrs HW=90.75' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 2.69 cfs @ 1.94 fps)

Pond UG-1: UG-1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech RC-310 +Cap (ADS StormTech® RC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

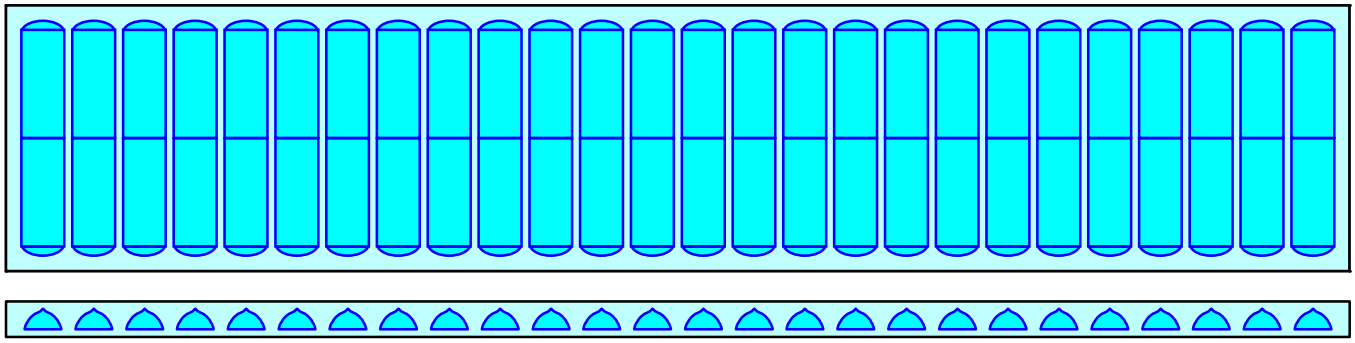
2 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 15.44' Row Length +12.0" End Stone x 2 = 17.44' Base Length
26 Rows x 34.0" Wide + 6.0" Spacing x 25 + 12.0" Side Stone x 2 = 88.17' Base Width
6.0" Base + 16.0" Chamber Height + 6.0" Cover = 2.33' Field Height

52 Chambers x 14.7 cf = 766.6 cf Chamber Storage

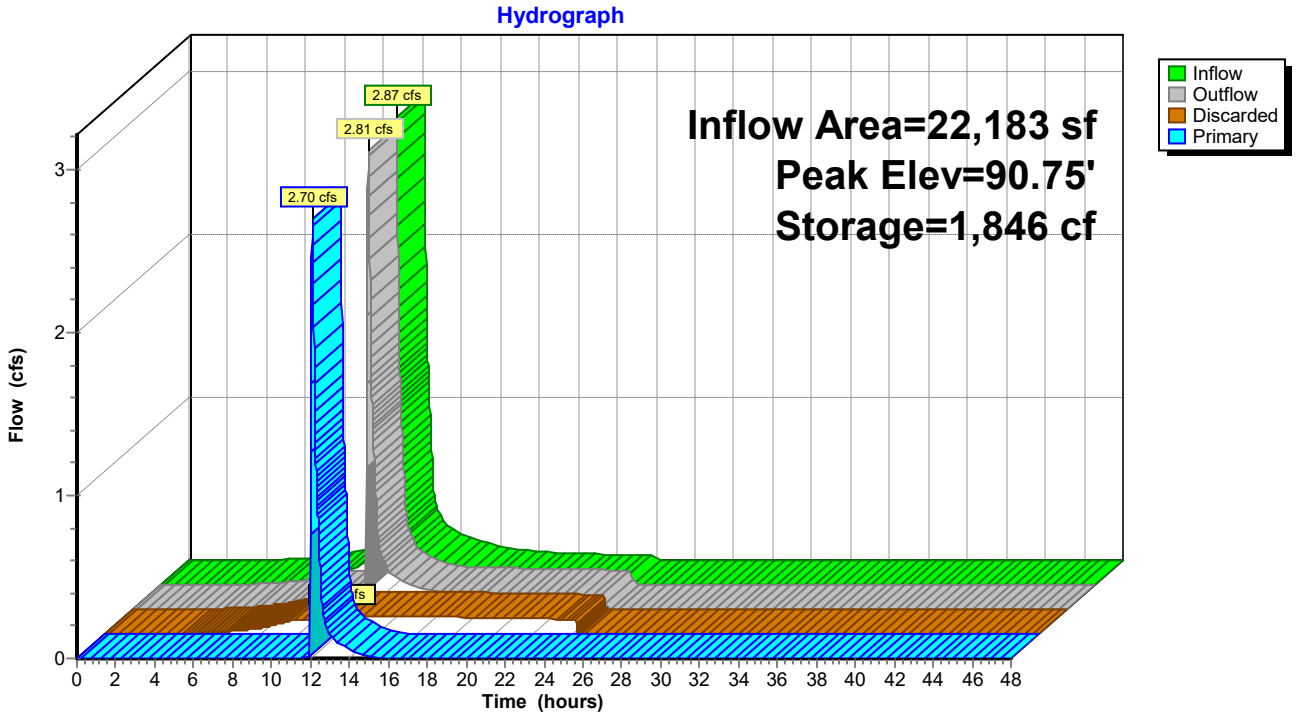
3,587.8 cf Field - 766.6 cf Chambers = 2,821.2 cf Stone x 40.0% Voids = 1,128.5 cf Stone Storage

Chamber Storage + Stone Storage = 1,895.1 cf = 0.044 af
Overall Storage Efficiency = 52.8%
Overall System Size = 17.44' x 88.17' x 2.33'

52 Chambers
132.9 cy Field
104.5 cy Stone



Pond UG-1: UG-1


Hydrograph
Inflow Area=22,183 sf
Peak Elev=90.75'
Storage=1,846 cf
2.87 cfs
2.81 cfs
2.70 cfs
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)
0
1
2
3
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

Summary for Pond UG-2: UG-2

Inflow Area = 10,025 sf,100.00% Impervious, Inflow Depth = 6.05" for 25-Year event
Inflow = 1.42 cfs @ 12.08 hrs, Volume= 5,056 cf
Outflow = 1.28 cfs @ 12.12 hrs, Volume= 5,056 cf, Atten= 10%, Lag= 2.4 min
Discarded = 0.08 cfs @ 12.12 hrs, Volume= 3,892 cf
Primary = 1.20 cfs @ 12.12 hrs, Volume= 1,164 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 90.77' @ 12.12 hrs Surf.Area= 1,014 sf Storage= 1,224 cf

Plug-Flow detention time= 100.3 min calculated for 5,055 cf (100% of inflow)
Center-of-Mass det. time= 100.2 min (844.7 - 744.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	88.50'	746 cf	**58.17'W x 17.44'L x 2.33'H Field A** 2,367 cf Overall - 501 cf Embedded = 1,866 cf x 40.0% Voids
#2A	89.00'	501 cf	**ADS_StormTech RC-310 +Cap** x 34 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 34 Chambers in 17 Rows
		1,248 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	90.57'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Discarded	88.50'	**2.410 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.08 cfs @ 12.12 hrs HW=90.77' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=1.19 cfs @ 12.12 hrs HW=90.77' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 1.19 cfs @ 1.48 fps)

Pond UG-2: UG-2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech RC-310 +Cap (ADS StormTech® RC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

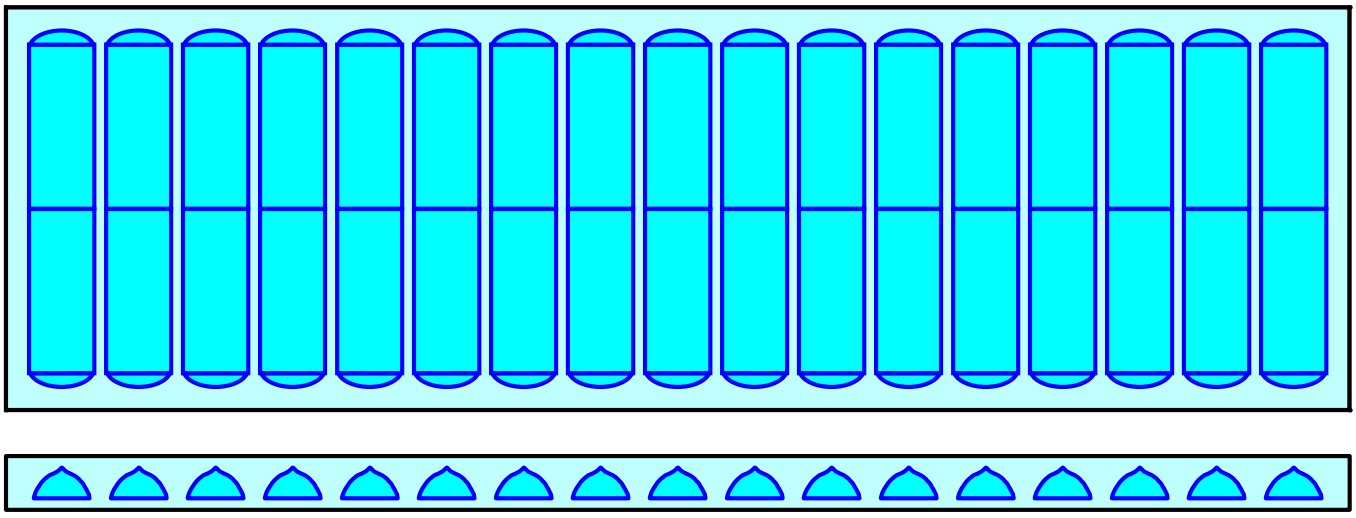
2 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 15.44' Row Length +12.0" End Stone x 2 = 17.44' Base Length
17 Rows x 34.0" Wide + 6.0" Spacing x 16 + 12.0" Side Stone x 2 = 58.17' Base Width
6.0" Base + 16.0" Chamber Height + 6.0" Cover = 2.33' Field Height

34 Chambers x 14.7 cf = 501.2 cf Chamber Storage

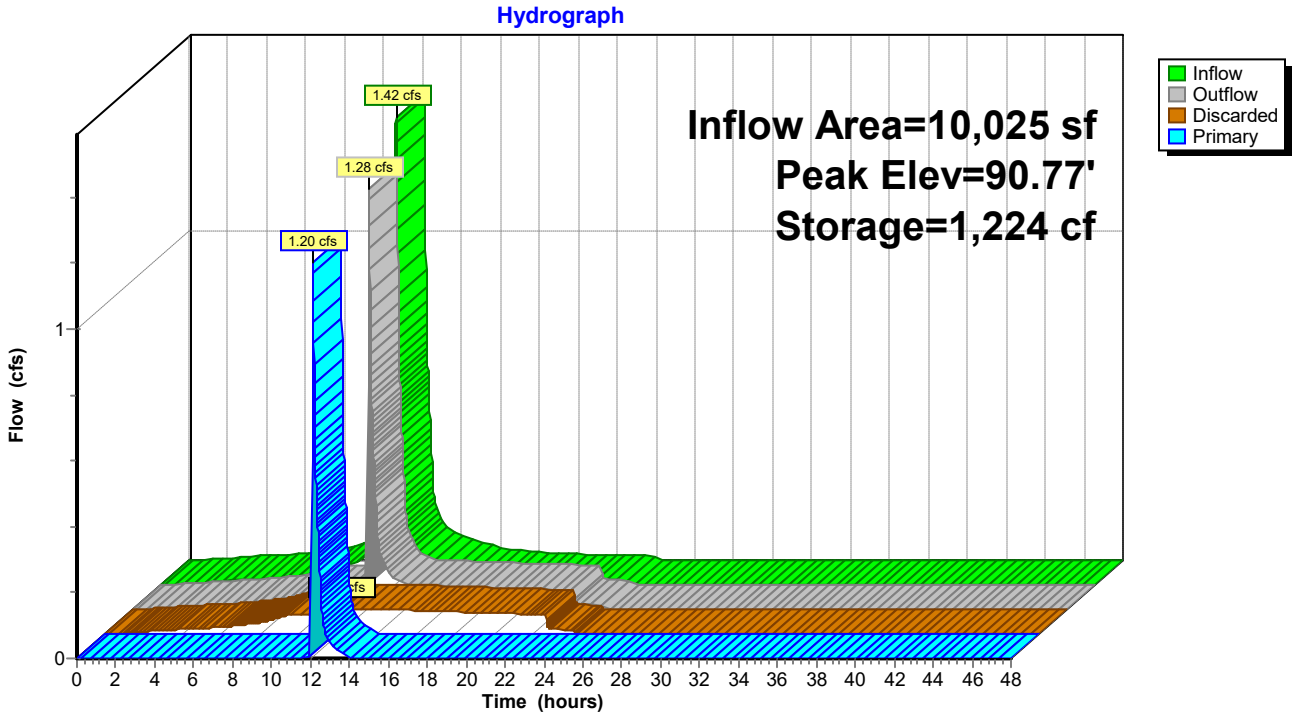
2,367.0 cf Field - 501.2 cf Chambers = 1,865.8 cf Stone x 40.0% Voids = 746.3 cf Stone Storage

Chamber Storage + Stone Storage = 1,247.5 cf = 0.029 af
Overall Storage Efficiency = 52.7%
Overall System Size = 17.44' x 58.17' x 2.33'

34 Chambers
87.7 cy Field
69.1 cy Stone



Pond UG-2: UG-2


Hydrograph
Inflow Area=10,025 sf
Peak Elev=90.77'
Storage=1,224 cf
1.42 cfs
1.28 cfs
1.20 cfs
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)
0
1
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

Summary for Pond UG-3: UG-3

Inflow Area = 20,963 sf,100.00% Impervious, Inflow Depth = 6.05" for 25-Year event
Inflow = 2.97 cfs @ 12.08 hrs, Volume= 10,572 cf
Outflow = 1.57 cfs @ 12.21 hrs, Volume= 10,572 cf, Atten= 47%, Lag= 7.6 min
Discarded = 0.16 cfs @ 12.21 hrs, Volume= 8,754 cf
Primary = 1.41 cfs @ 12.21 hrs, Volume= 1,817 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 90.66' @ 12.21 hrs Surf.Area= 2,518 sf Storage= 3,023 cf

Plug-Flow detention time= 115.2 min calculated for 10,569 cf (100% of inflow)
Center-of-Mass det. time= 115.2 min (859.6 - 744.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	88.50'	1,784 cf	**54.83'W x 45.92'L x 2.33'H Field A** 5,875 cf Overall - 1,415 cf Embedded = 4,460 cf x 40.0% Voids
#2A	89.00'	1,415 cf	**ADS_StormTech RC-310 +Cap** x 96 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 96 Chambers in 16 Rows
		3,199 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	90.43'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Discarded	88.50'	**2.410 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.16 cfs @ 12.21 hrs HW=90.66' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.16 cfs)

Primary OutFlow Max=1.41 cfs @ 12.21 hrs HW=90.66' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 1.41 cfs @ 1.56 fps)

Pond UG-3: UG-3 - Chamber Wizard Field A

Chamber Model = ADS_StormTech RC-310 +Cap (ADS StormTech® RC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

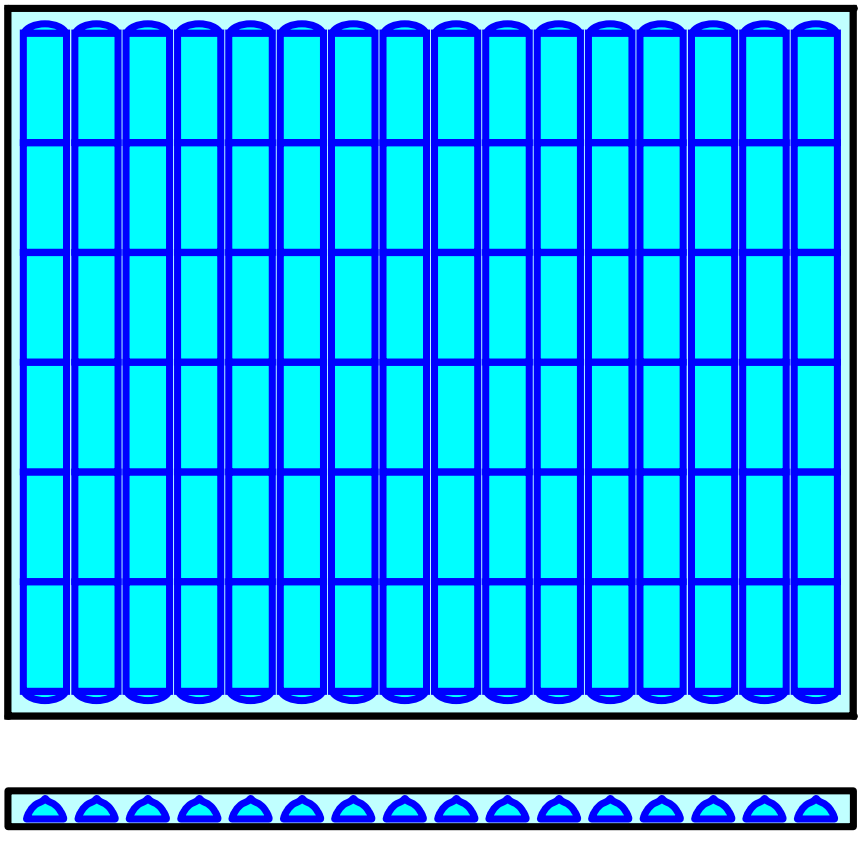
6 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 43.92' Row Length +12.0" End Stone x 2 = 45.92' Base Length
16 Rows x 34.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 54.83' Base Width
6.0" Base + 16.0" Chamber Height + 6.0" Cover = 2.33' Field Height

96 Chambers x 14.7 cf = 1,415.2 cf Chamber Storage

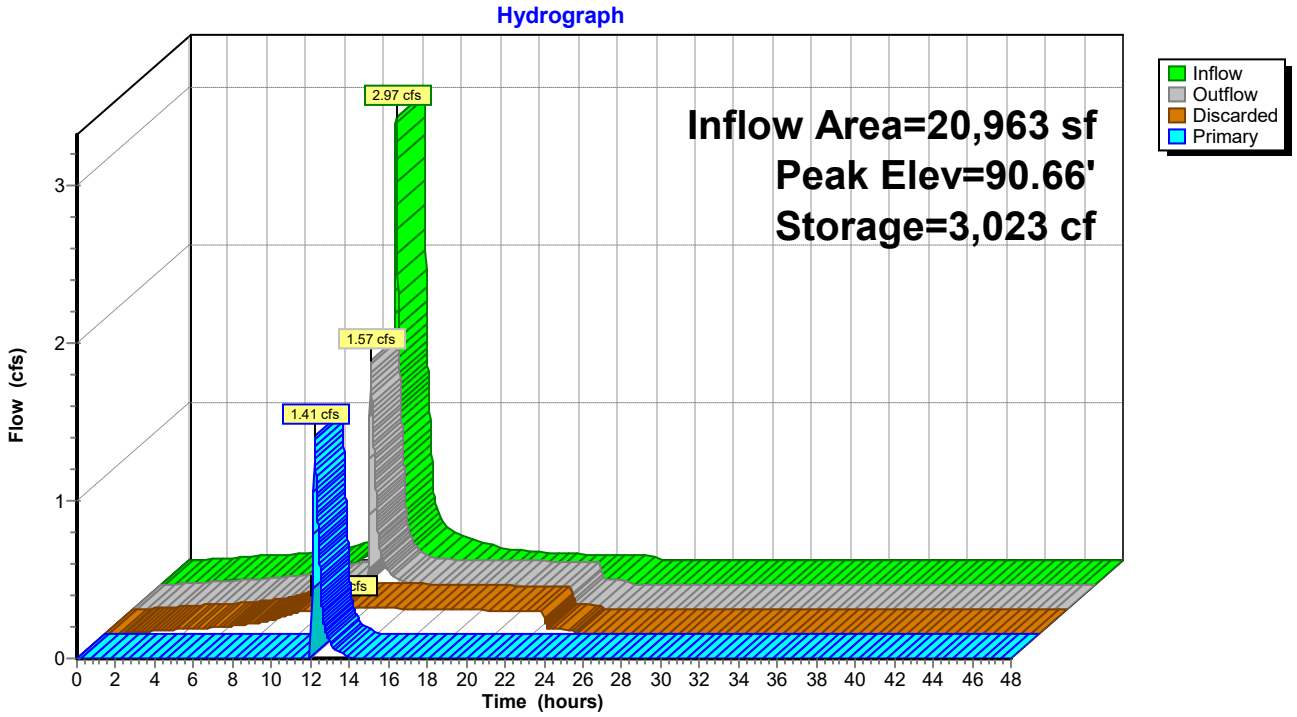
5,875.2 cf Field - 1,415.2 cf Chambers = 4,460.0 cf Stone x 40.0% Voids = 1,784.0 cf Stone Storage

Chamber Storage + Stone Storage = 3,199.2 cf = 0.073 af
Overall Storage Efficiency = 54.5%
Overall System Size = 45.92' x 54.83' x 2.33'

96 Chambers
217.6 cy Field
165.2 cy Stone



Pond UG-3: UG-3


Hydrograph
Inflow Area=20,963 sf
Peak Elev=90.66'
Storage=3,023 cf
2.97 cfs
1.57 cfs
1.41 cfs
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)
0
1
2
3
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

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 Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment P1-A: P1-A Runoff Area=22,183 sf 85.20% Impervious Runoff Depth=6.71"
Tc=6.0 min CN=89 Runoff=3.77 cfs 12,397 cf

Subcatchment P1-B: P1-B Runoff Area=10,025 sf 100.00% Impervious Runoff Depth=7.78"
Tc=6.0 min CN=98 Runoff=1.81 cfs 6,500 cf

Subcatchment P1-C: P1-C Runoff Area=20,963 sf 100.00% Impervious Runoff Depth=7.78"
Tc=6.0 min CN=98 Runoff=3.79 cfs 13,591 cf

Subcatchment P1-D: P1-D Runoff Area=137,299 sf 65.03% Impervious Runoff Depth=5.18"
Tc=6.0 min CN=76 Runoff=19.02 cfs 59,223 cf

Subcatchment P1-E: P1-E Runoff Area=10,868 sf 9.20% Impervious Runoff Depth=1.65"
Flow Length=95' Slope=0.0100 '/' Tc=8.3 min CN=44 Runoff=0.36 cfs 1,491 cf

Subcatchment P2: P2 Runoff Area=6,958 sf 38.80% Impervious Runoff Depth=3.57"
Tc=6.0 min CN=62 Runoff=0.66 cfs 2,071 cf

Subcatchment P3: P3 Runoff Area=1,155 sf 0.00% Impervious Runoff Depth=0.42"
Tc=6.0 min CN=30 Runoff=0.00 cfs 41 cf

Reach DMH MB1: DMH MB1 Inflow=3.60 cfs 5,833 cf
Outflow=3.60 cfs 5,833 cf

Reach DMH MB5: DMH MB5 Inflow=5.32 cfs 7,974 cf
Outflow=5.32 cfs 7,974 cf

Reach DMH MC5: DMH MC5 Inflow=8.42 cfs 11,770 cf
Outflow=8.42 cfs 11,770 cf

Reach PD1: Wetland "B" series Inflow=27.11 cfs 71,179 cf
Outflow=27.11 cfs 71,179 cf

Reach PD2: Pleasant St Inflow=0.66 cfs 2,071 cf
Outflow=0.66 cfs 2,071 cf

Reach PD3: SOUTH Inflow=0.00 cfs 41 cf
Outflow=0.00 cfs 41 cf

Pond DW: 8ft diam Drywell Peak Elev=92.48' Storage=401 cf Inflow=0.36 cfs 1,491 cf
Discarded=0.04 cfs 1,306 cf Primary=0.13 cfs 186 cf Outflow=0.17 cfs 1,491 cf

Pond UG-1: UG-1 Peak Elev=90.83' Storage=1,893 cf Inflow=3.77 cfs 12,397 cf
Discarded=0.11 cfs 6,564 cf Primary=3.60 cfs 5,833 cf Outflow=3.72 cfs 12,397 cf

Pond UG-2: UG-2 Peak Elev=90.83' Storage=1,246 cf Inflow=1.81 cfs 6,500 cf
Discarded=0.08 cfs 4,359 cf Primary=1.72 cfs 2,141 cf Outflow=1.79 cfs 6,500 cf

Pond UG-3: UG-3 Peak Elev=90.83' Storage=3,195 cf Inflow=3.79 cfs 13,591 cf
Discarded=0.17 cfs 9,795 cf Primary=3.23 cfs 3,797 cf Outflow=3.40 cfs 13,591 cf

Total Runoff Area = 209,451 sf Runoff Volume = 95,314 cf Average Runoff Depth = 5.46"
31.79% Pervious = 66,580 sf 68.21% Impervious = 142,871 sf

Summary for Subcatchment P1-A: P1-A

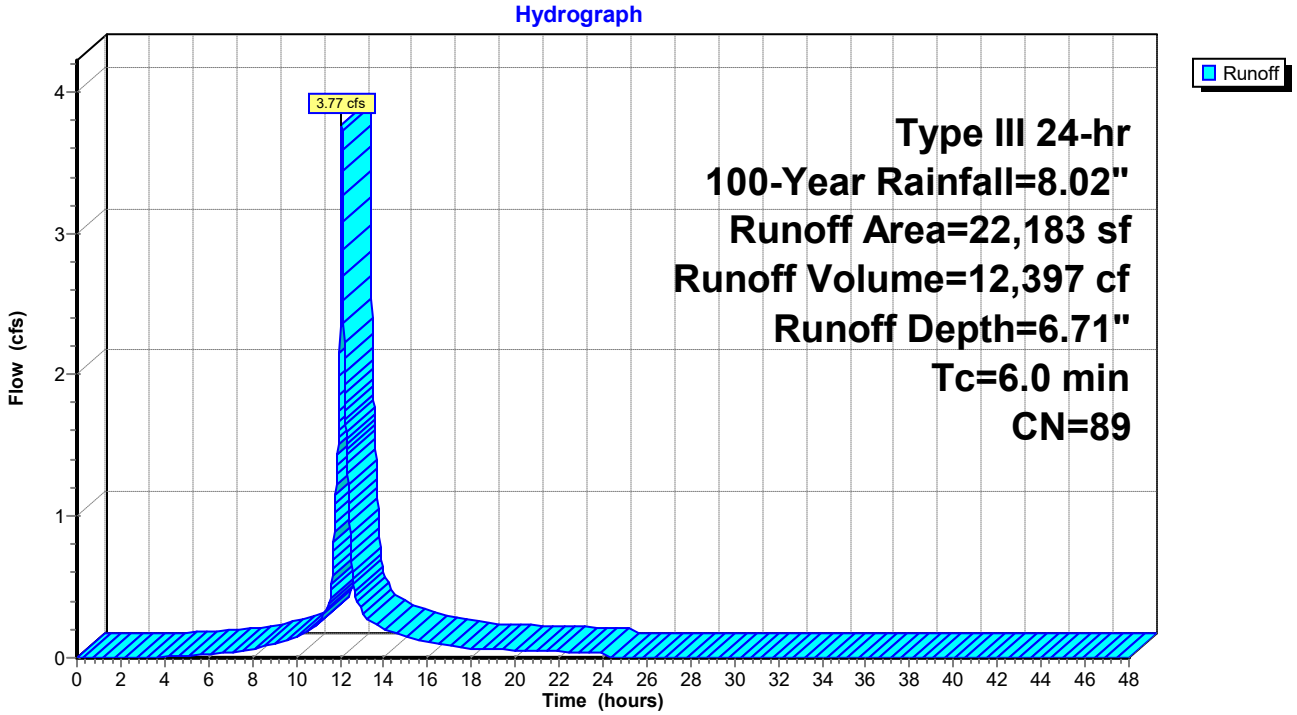
Runoff = 3.77 cfs @ 12.08 hrs, Volume= 12,397 cf, Depth= 6.71"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

	Area (sf)	CN	Description
	3,283	39	>75% Grass cover, Good, HSG A
*	1,440	98	ROOF PORTA CACHER
*	10,300	98	ROOF BLDG
*	7,160	98	PAVEMENT
	22,183	89	Weighted Average
	3,283	39	14.80% Pervious Area
	18,900	98	85.20% Impervious Area

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

Subcatchment P1-A: P1-A



Summary for Subcatchment P1-B: P1-B

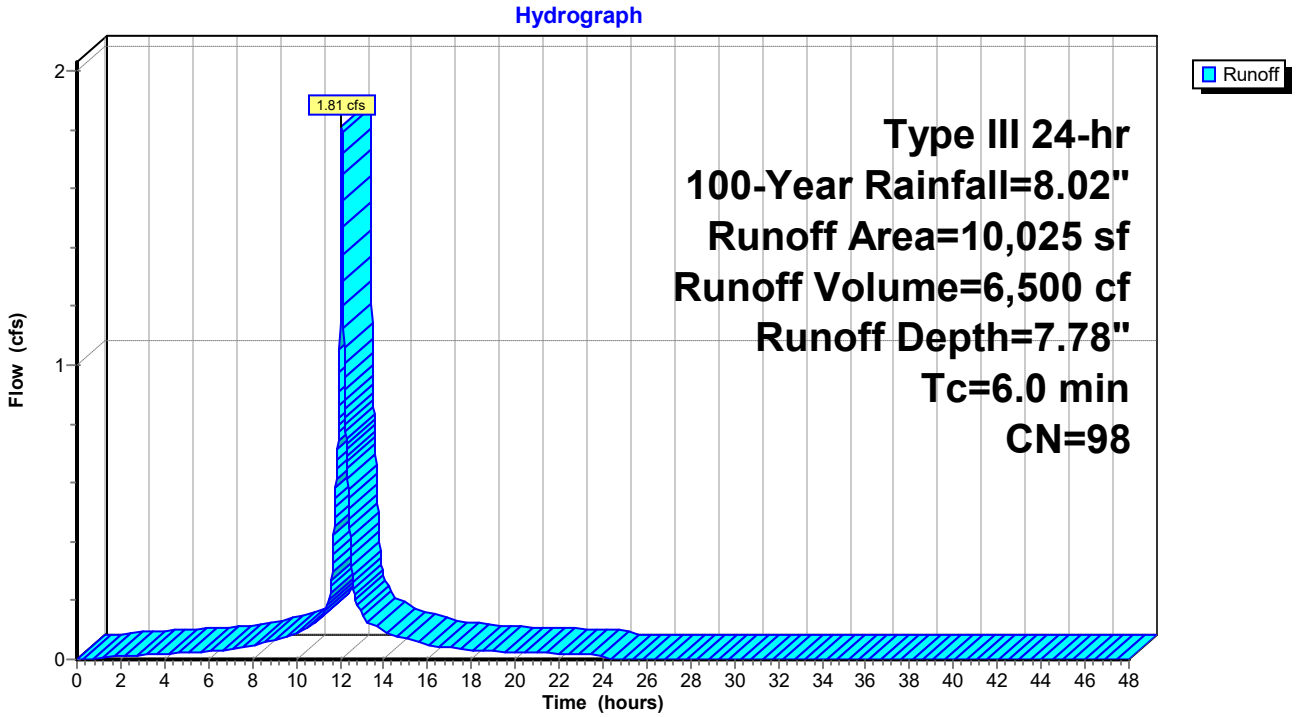
Runoff = 1.81 cfs @ 12.08 hrs, Volume= 6,500 cf, Depth= 7.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

	Area (sf)	CN	Description
*	10,025	98	ROOF BLDG
	10,025	98	100.00% Impervious Area

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

Subcatchment P1-B: P1-B



Summary for Subcatchment P1-C: P1-C

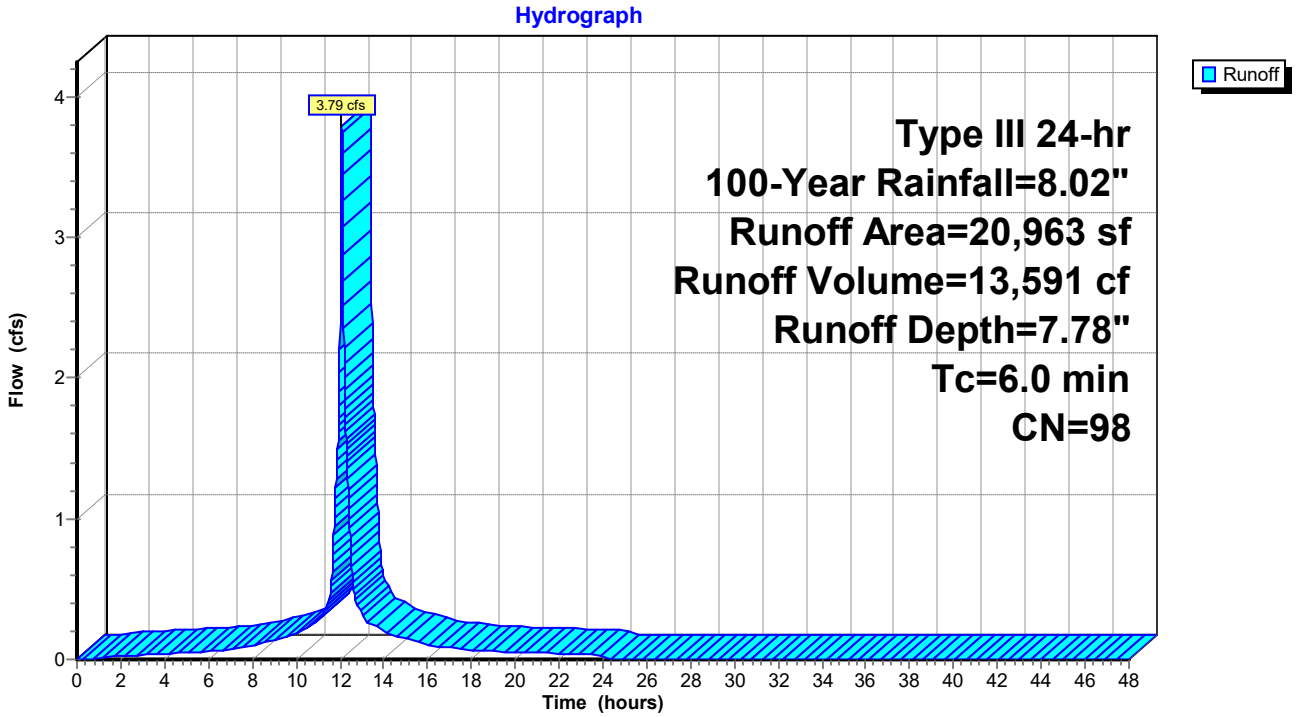
Runoff = 3.79 cfs @ 12.08 hrs, Volume= 13,591 cf, Depth= 7.78"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

	Area (sf)	CN	Description
*	20,963	98	ROOF BLDG
	20,963	98	100.00% Impervious Area

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

Subcatchment P1-C: P1-C



Summary for Subcatchment P1-D: P1-D

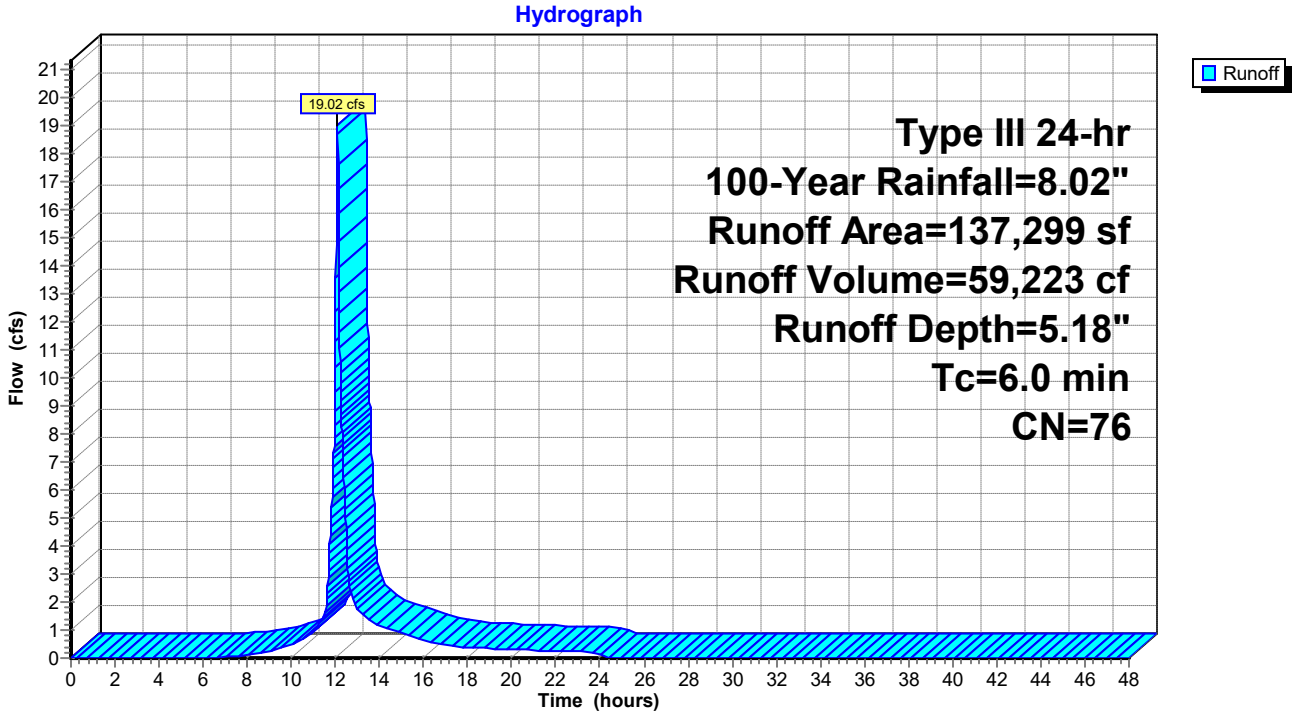
Runoff = 19.02 cfs @ 12.09 hrs, Volume= 59,223 cf, Depth= 5.18"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

	Area (sf)	CN	Description
*	14,030	98	wetland
*	61,468	98	PAVEMENT
	17,400	30	Woods, Good, HSG A
	30,616	39	>75% Grass cover, Good, HSG A
*	13,785	98	ROOF BLDG
	137,299	76	Weighted Average
	48,016	36	34.97% Pervious Area
	89,283	98	65.03% Impervious Area

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

Subcatchment P1-D: P1-D



Summary for Subcatchment P1-E: P1-E

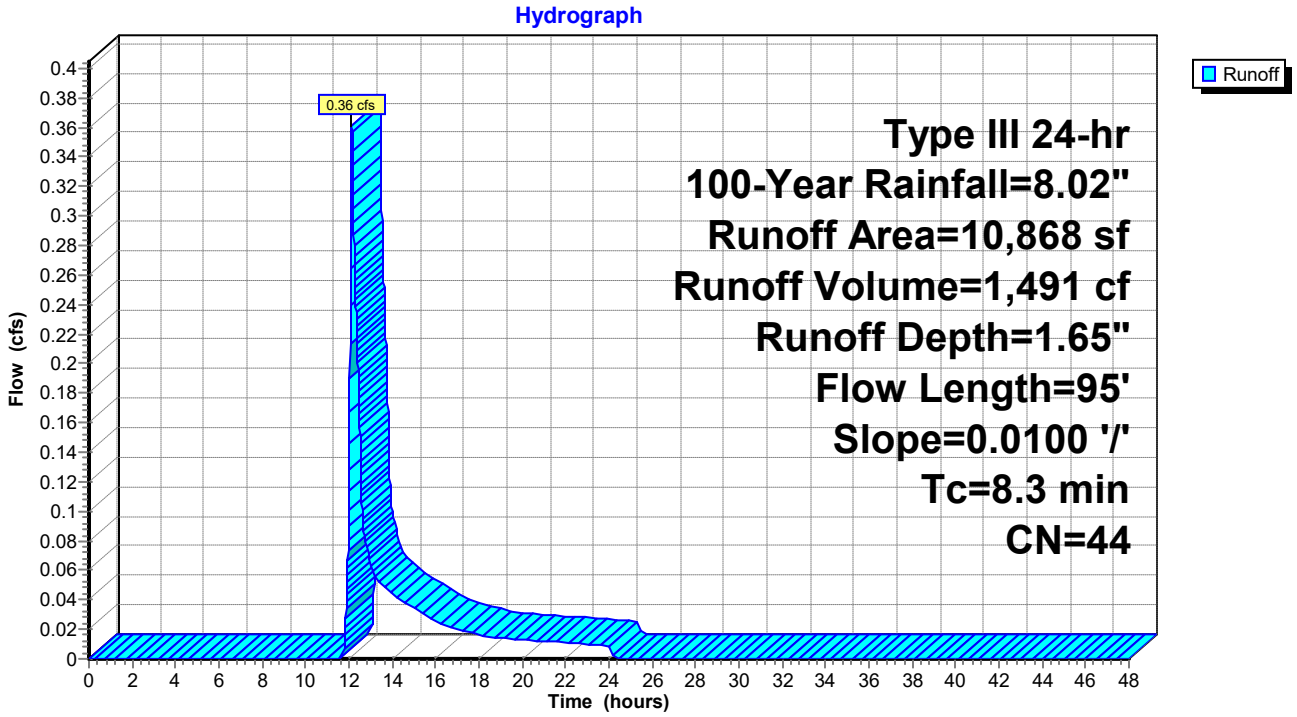
Runoff = 0.36 cfs @ 12.14 hrs, Volume= 1,491 cf, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

	Area (sf)	CN	Description
*	1,000	98	PAVEMENT
	9,868	39	>75% Grass cover, Good, HSG A
	10,868	44	Weighted Average
	9,868	39	90.80% Pervious Area
	1,000	98	9.20% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.2	50	0.0100	0.12		**Sheet Flow,** Grass: Short n= 0.150 P2= 3.40"
1.1	45	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
8.3	95	Total			

Subcatchment P1-E: P1-E



Summary for Subcatchment P2: P2

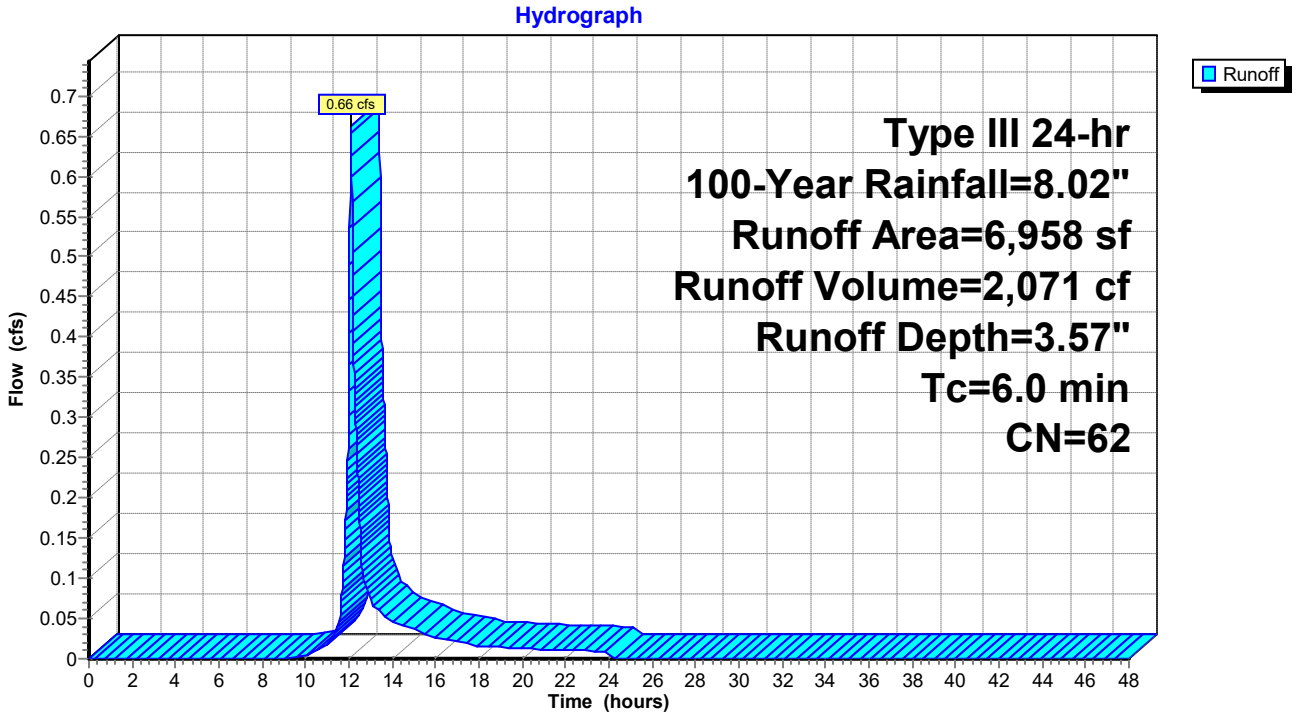
Runoff = 0.66 cfs @ 12.09 hrs, Volume= 2,071 cf, Depth= 3.57"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

	Area (sf)	CN	Description
	4,258	39	>75% Grass cover, Good, HSG A
*	2,700	98	pavement
	6,958	62	Weighted Average
	4,258	39	61.20% Pervious Area
	2,700	98	38.80% Impervious Area

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

Subcatchment P2: P2



Summary for Subcatchment P3: P3

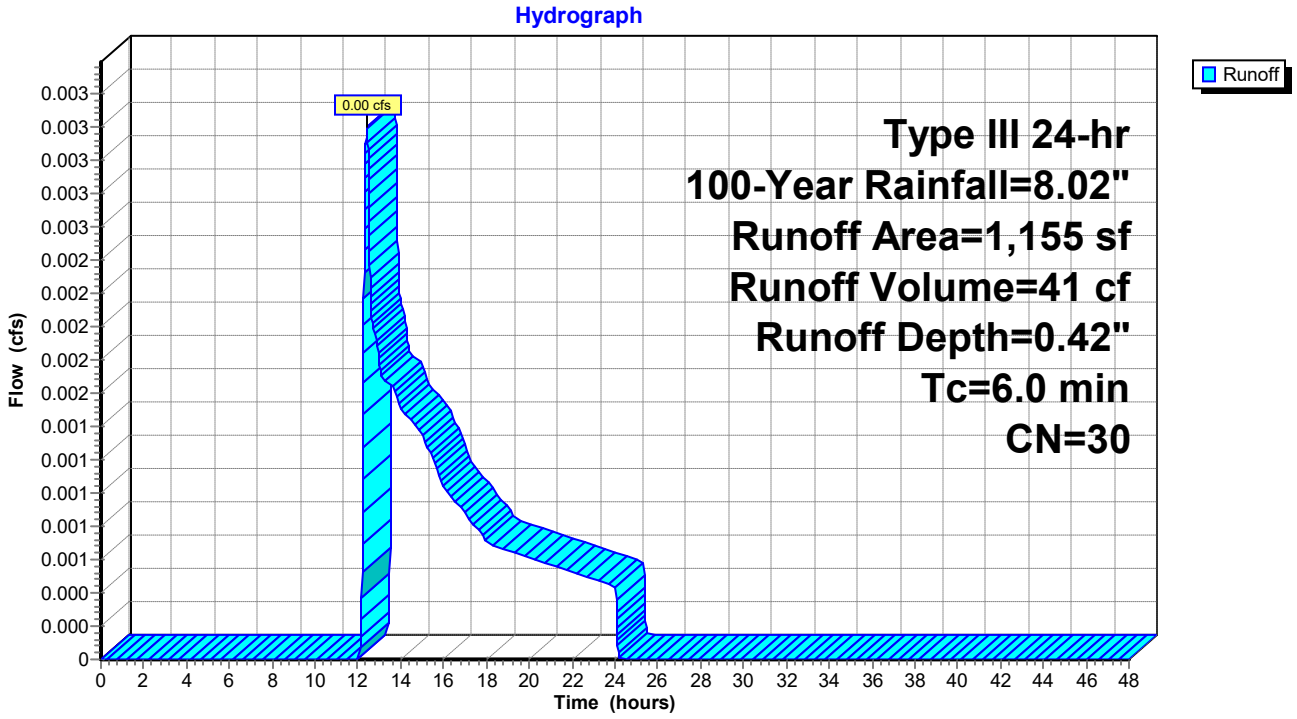
Runoff = 0.00 cfs @ 12.42 hrs, Volume= 41 cf, Depth= 0.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-Year Rainfall=8.02"

Area (sf)	CN	Description
1,155	30	Woods, Good, HSG A
1,155	30	100.00% Pervious Area

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

Subcatchment P3: P3



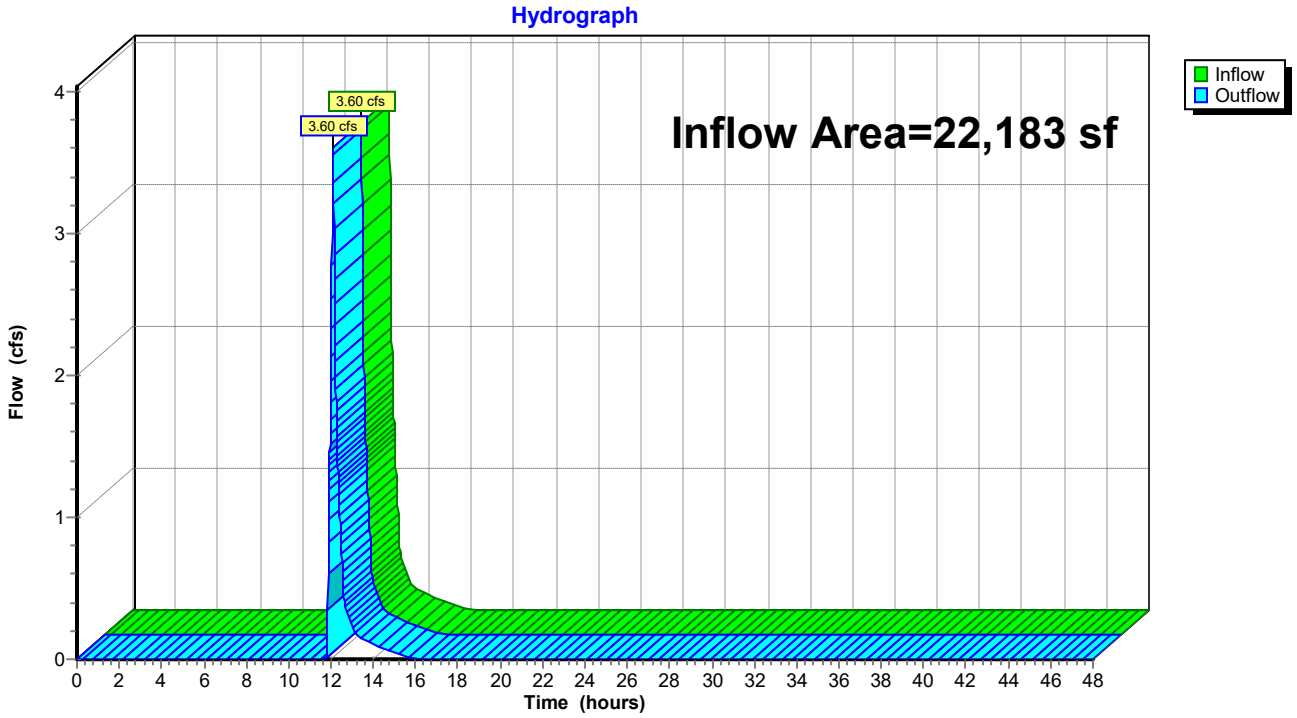
Summary for Reach DMH MB1: DMH MB1

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 22,183 sf, 85.20% Impervious, Inflow Depth = 3.16" for 100-Year event
Inflow = 3.60 cfs @ 12.10 hrs, Volume= 5,833 cf
Outflow = 3.60 cfs @ 12.10 hrs, Volume= 5,833 cf, Atten= 0%, Lag= 0.0 min

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

Reach DMH MB1: DMH MB1



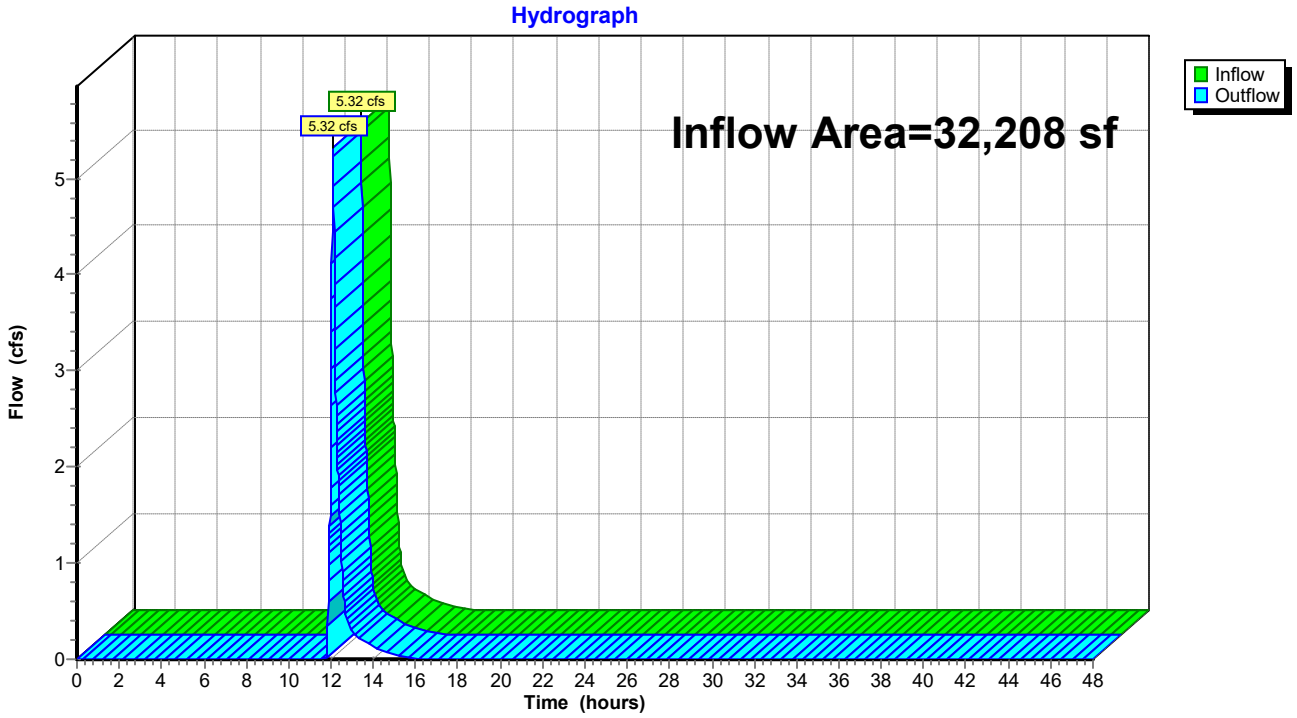
Summary for Reach DMH MB5: DMH MB5

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 32,208 sf, 89.81% Impervious, Inflow Depth = 2.97" for 100-Year event
Inflow = 5.32 cfs @ 12.10 hrs, Volume= 7,974 cf
Outflow = 5.32 cfs @ 12.10 hrs, Volume= 7,974 cf, Atten= 0%, Lag= 0.0 min

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

Reach DMH MB5: DMH MB5



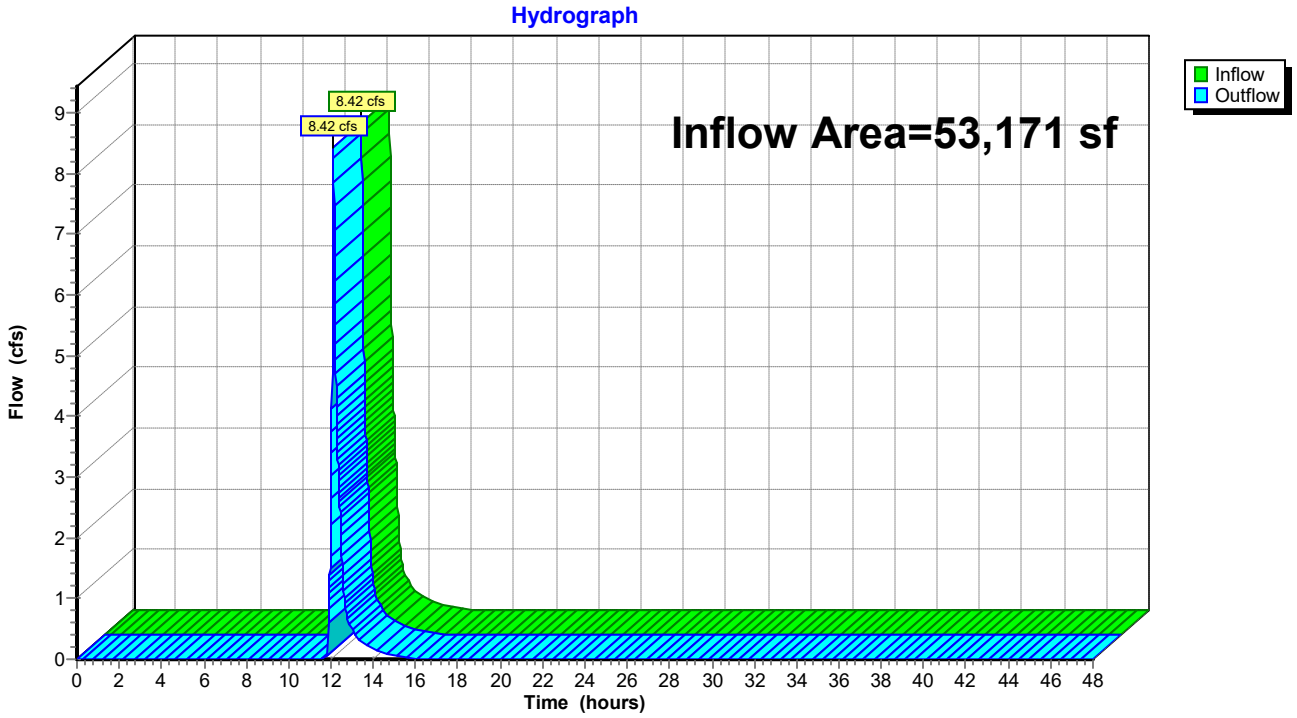
Summary for Reach DMH MC5: DMH MC5

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 53,171 sf, 93.83% Impervious, Inflow Depth = 2.66" for 100-Year event
Inflow = 8.42 cfs @ 12.11 hrs, Volume= 11,770 cf
Outflow = 8.42 cfs @ 12.11 hrs, Volume= 11,770 cf, Atten= 0%, Lag= 0.0 min

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

Reach DMH MC5: DMH MC5



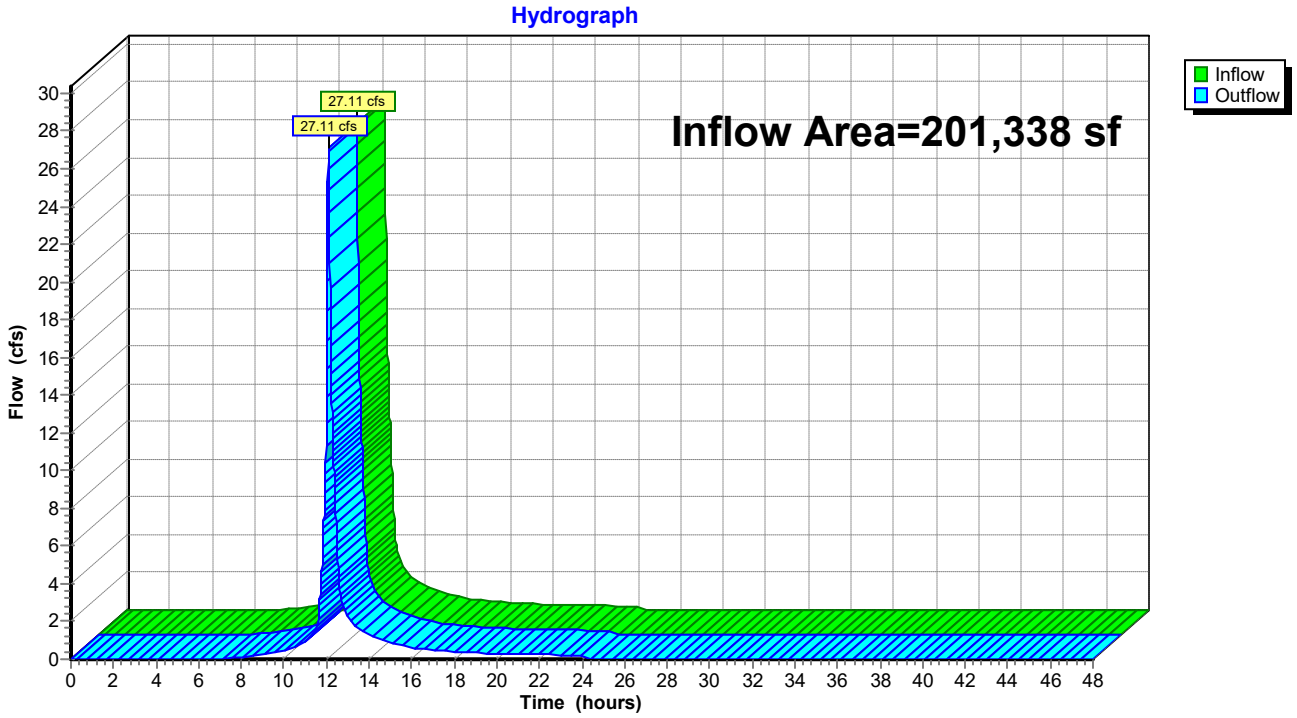
Summary for Reach PD1: Wetland "B" series

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 201,338 sf, 69.62% Impervious, Inflow Depth = 4.24" for 100-Year event
Inflow = 27.11 cfs @ 12.10 hrs, Volume= 71,179 cf
Outflow = 27.11 cfs @ 12.10 hrs, Volume= 71,179 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD1: Wetland "B" series



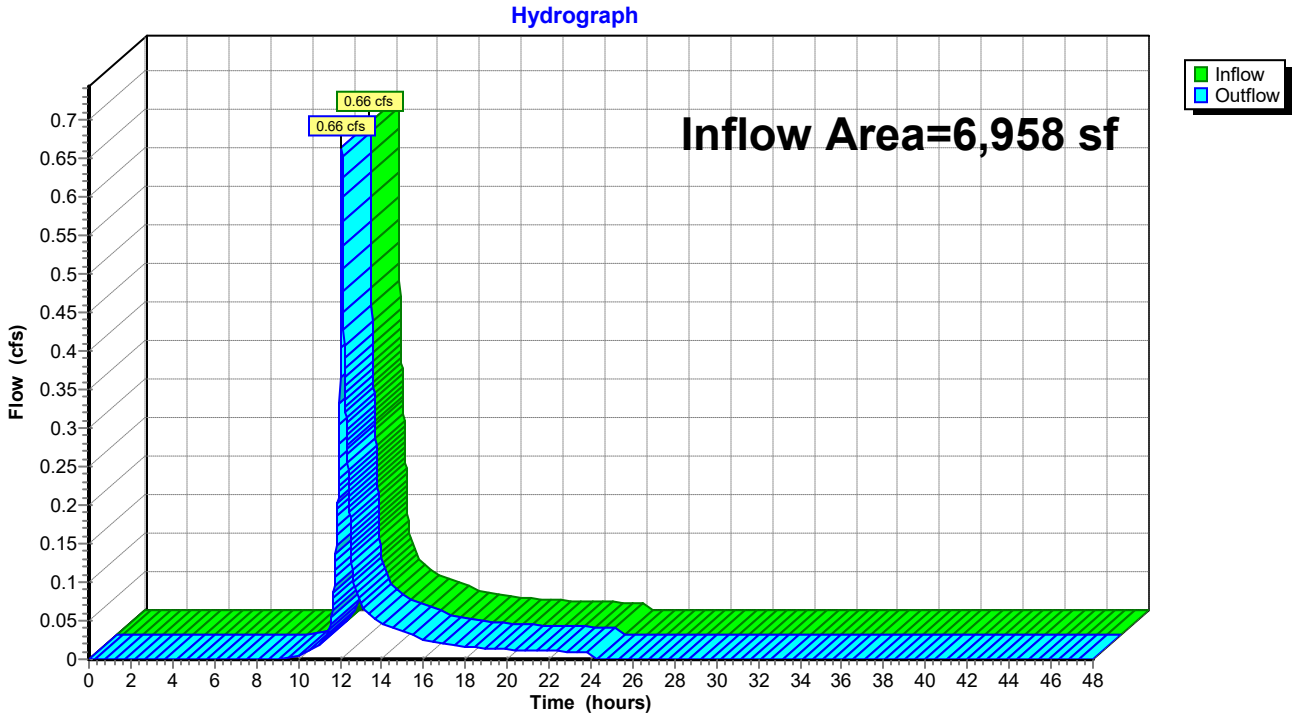
Summary for Reach PD2: Pleasant St

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 6,958 sf, 38.80% Impervious, Inflow Depth = 3.57" for 100-Year event
Inflow = 0.66 cfs @ 12.09 hrs, Volume= 2,071 cf
Outflow = 0.66 cfs @ 12.09 hrs, Volume= 2,071 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD2: Pleasant St



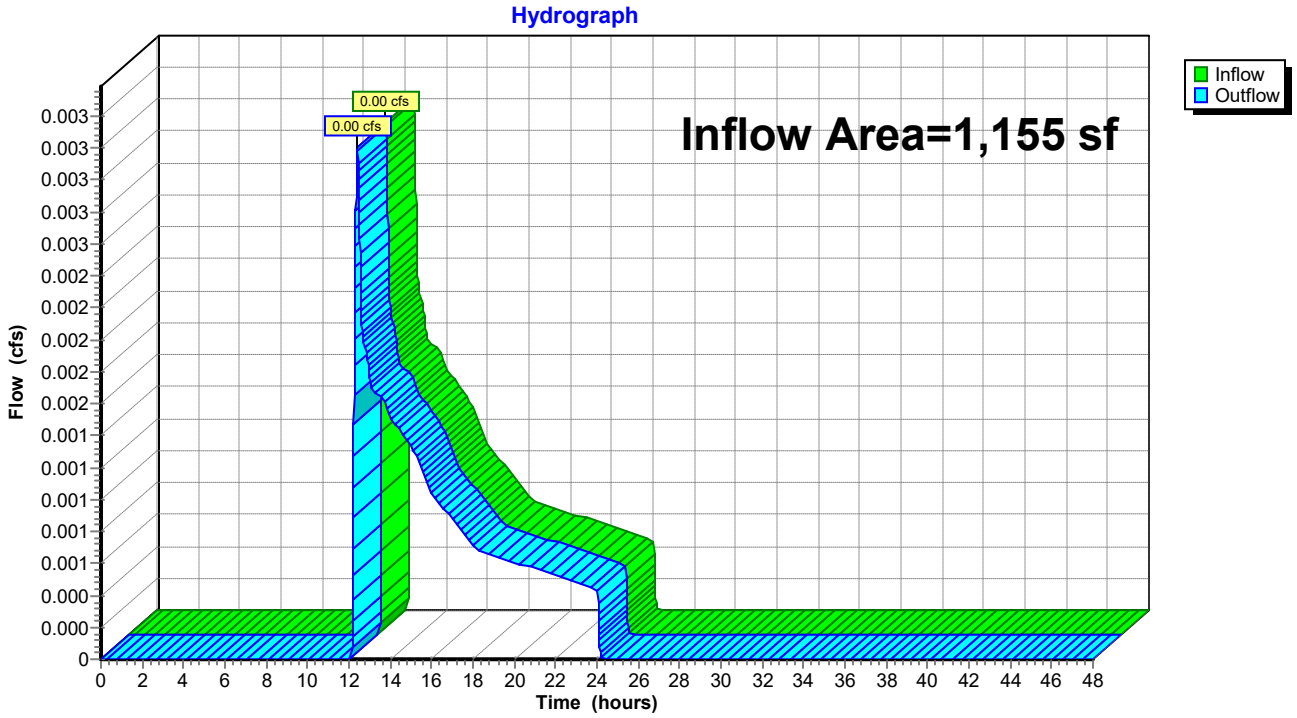
Summary for Reach PD3: SOUTH

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1,155 sf, 0.00% Impervious, Inflow Depth = 0.42" for 100-Year event
Inflow = 0.00 cfs @ 12.42 hrs, Volume= 41 cf
Outflow = 0.00 cfs @ 12.42 hrs, Volume= 41 cf, Atten= 0%, Lag= 0.0 min

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

Reach PD3: SOUTH



Summary for Pond DW: 8ft diam Drywell

[42] Hint: Gap in defined storage above volume #1 at 90.30'

Inflow Area = 10,868 sf, 9.20% Impervious, Inflow Depth = 1.65" for 100-Year event
Inflow = 0.36 cfs @ 12.14 hrs, Volume= 1,491 cf
Outflow = 0.17 cfs @ 12.48 hrs, Volume= 1,491 cf, Atten= 54%, Lag= 20.4 min
Discarded = 0.04 cfs @ 12.48 hrs, Volume= 1,306 cf
Primary = 0.13 cfs @ 12.48 hrs, Volume= 186 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 92.48' @ 12.48 hrs Surf.Area= 629 sf Storage= 401 cf

Plug-Flow detention time= 175.4 min calculated for 1,491 cf (100% of inflow)
Center-of-Mass det. time= 175.4 min (1,067.3 - 891.9)

Volume	Invert	Avail.Storage	Storage Description
#1	86.30'	201 cf	**8.00'D x 4.00'H Vertical Cone/Cylinder**
#2	90.31'	213 cf	**Custom Stage Data (Conic)** Listed below (Recalc)
		414 cf	Total Available Storage

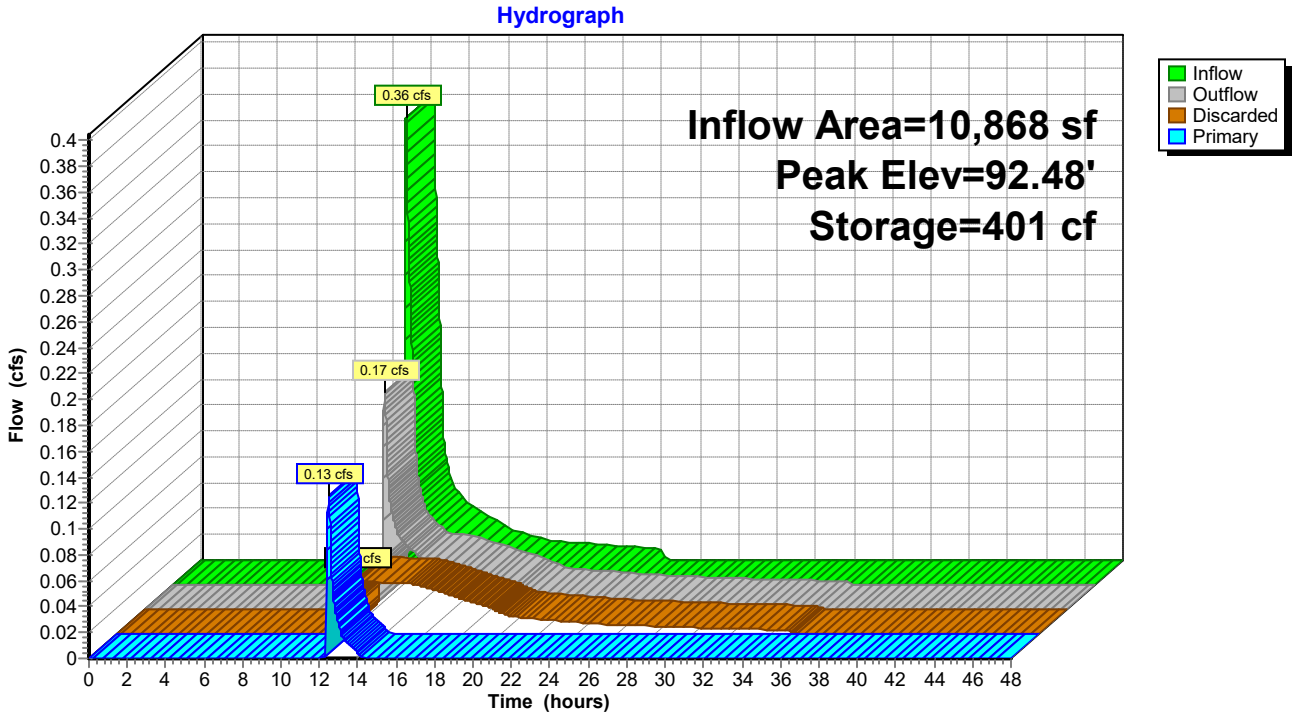
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
90.31	4	0	0	4
91.80	4	6	6	15
92.00	200	15	21	211
92.50	600	191	213	612

Device	Routing	Invert	Outlet Devices
#1	Discarded	86.30'	**2.410 in/hr Exfiltration over Wetted area**
#2	Primary	92.45'	**6.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.04 cfs @ 12.48 hrs HW=92.48' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.10 cfs @ 12.48 hrs HW=92.48' (Free Discharge)
↑—**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.10 cfs @ 0.55 fps)

Pond DW: 8ft diam Drywell



Summary for Pond UG-1: UG-1

Inflow Area = 22,183 sf, 85.20% Impervious, Inflow Depth = 6.71" for 100-Year event
Inflow = 3.77 cfs @ 12.08 hrs, Volume= 12,397 cf
Outflow = 3.72 cfs @ 12.10 hrs, Volume= 12,397 cf, Atten= 1%, Lag= 0.8 min
Discarded = 0.11 cfs @ 12.10 hrs, Volume= 6,564 cf
Primary = 3.60 cfs @ 12.10 hrs, Volume= 5,833 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 90.83' @ 12.10 hrs Surf.Area= 1,538 sf Storage= 1,893 cf

Plug-Flow detention time= 84.0 min calculated for 12,395 cf (100% of inflow)
Center-of-Mass det. time= 84.0 min (863.0 - 779.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	88.50'	1,128 cf	**88.17'W x 17.44'L x 2.33'H Field A** 3,588 cf Overall - 767 cf Embedded = 2,821 cf x 40.0% Voids
#2A	89.00'	767 cf	**ADS_StormTech RC-310 +Cap** x 52 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 52 Chambers in 26 Rows
		1,895 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	90.40'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Discarded	88.50'	**2.410 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.11 cfs @ 12.10 hrs HW=90.83' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.11 cfs)

Primary OutFlow Max=3.60 cfs @ 12.10 hrs HW=90.83' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 3.60 cfs @ 2.14 fps)

Pond UG-1: UG-1 - Chamber Wizard Field A

Chamber Model = ADS_StormTech RC-310 +Cap (ADS StormTech® RC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

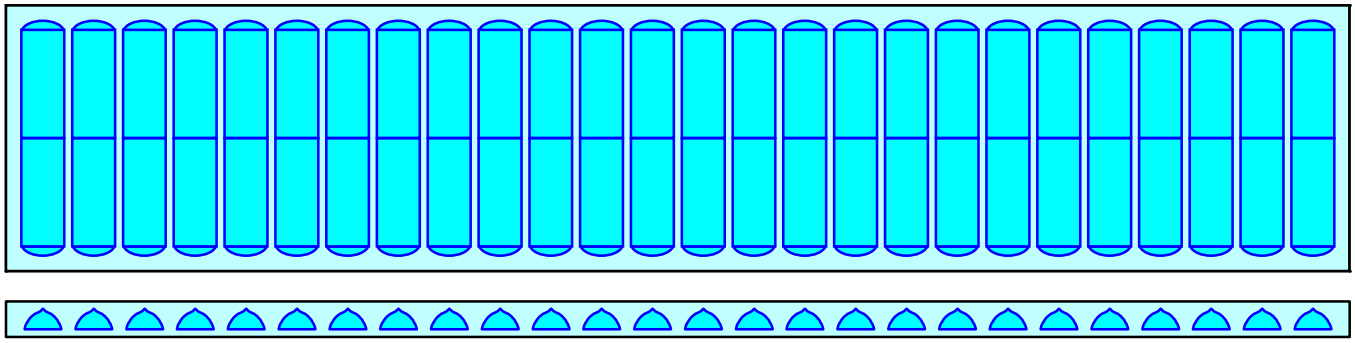
2 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 15.44' Row Length +12.0" End Stone x 2 = 17.44' Base Length
26 Rows x 34.0" Wide + 6.0" Spacing x 25 + 12.0" Side Stone x 2 = 88.17' Base Width
6.0" Base + 16.0" Chamber Height + 6.0" Cover = 2.33' Field Height

52 Chambers x 14.7 cf = 766.6 cf Chamber Storage

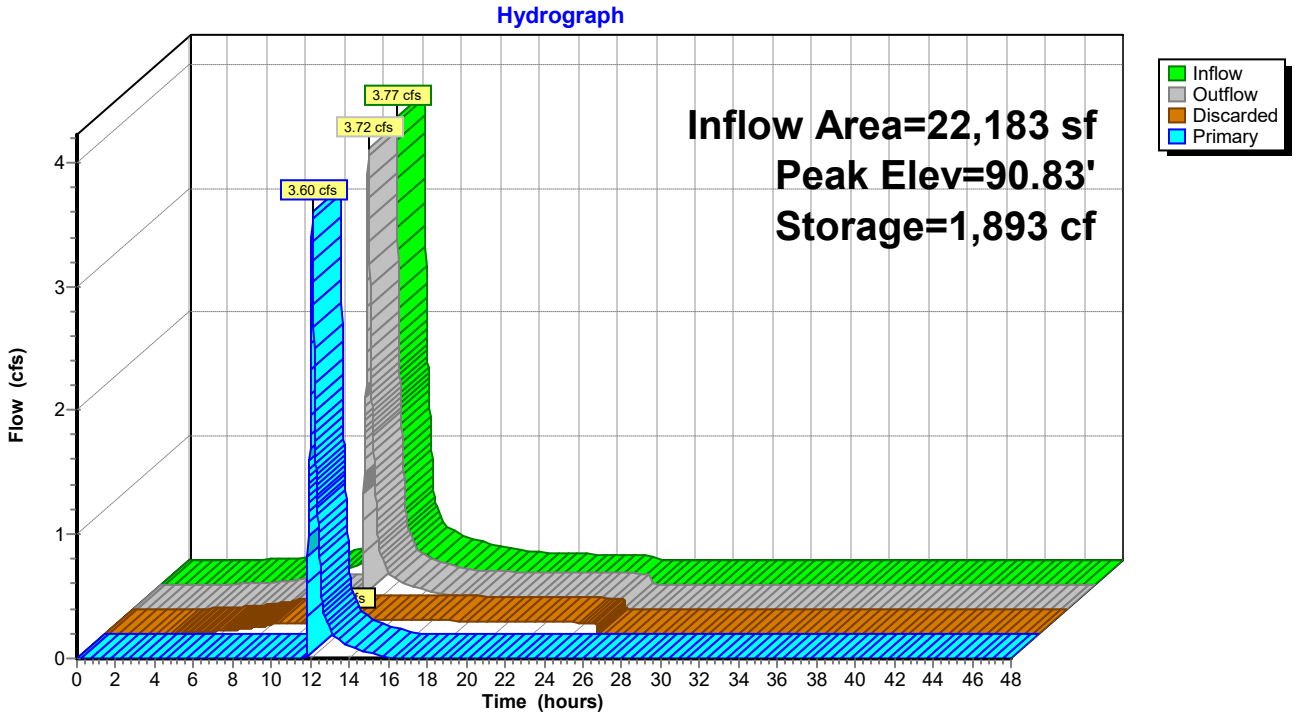
3,587.8 cf Field - 766.6 cf Chambers = 2,821.2 cf Stone x 40.0% Voids = 1,128.5 cf Stone Storage

Chamber Storage + Stone Storage = 1,895.1 cf = 0.044 af
Overall Storage Efficiency = 52.8%
Overall System Size = 17.44' x 88.17' x 2.33'

52 Chambers
132.9 cy Field
104.5 cy Stone



Pond UG-1: UG-1


Hydrograph
Inflow Area=22,183 sf
Peak Elev=90.83'
Storage=1,893 cf
3.77 cfs
3.72 cfs
3.60 cfs
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
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

Summary for Pond UG-2: UG-2

Inflow Area = 10,025 sf,100.00% Impervious, Inflow Depth = 7.78" for 100-Year event
Inflow = 1.81 cfs @ 12.08 hrs, Volume= 6,500 cf
Outflow = 1.79 cfs @ 12.09 hrs, Volume= 6,500 cf, Atten= 1%, Lag= 0.7 min
Discarded = 0.08 cfs @ 12.09 hrs, Volume= 4,359 cf
Primary = 1.72 cfs @ 12.09 hrs, Volume= 2,141 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 90.83' @ 12.09 hrs Surf.Area= 1,014 sf Storage= 1,246 cf

Plug-Flow detention time= 92.0 min calculated for 6,498 cf (100% of inflow)
Center-of-Mass det. time= 92.0 min (833.1 - 741.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	88.50'	746 cf	**58.17'W x 17.44'L x 2.33'H Field A** 2,367 cf Overall - 501 cf Embedded = 1,866 cf x 40.0% Voids
#2A	89.00'	501 cf	**ADS_StormTech RC-310 +Cap** x 34 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 34 Chambers in 17 Rows
		1,248 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	90.57'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Discarded	88.50'	**2.410 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.08 cfs @ 12.09 hrs HW=90.83' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.08 cfs)

Primary OutFlow Max=1.71 cfs @ 12.09 hrs HW=90.83' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 1.71 cfs @ 1.67 fps)

Pond UG-2: UG-2 - Chamber Wizard Field A

Chamber Model = ADS_StormTech RC-310 +Cap (ADS StormTech® RC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

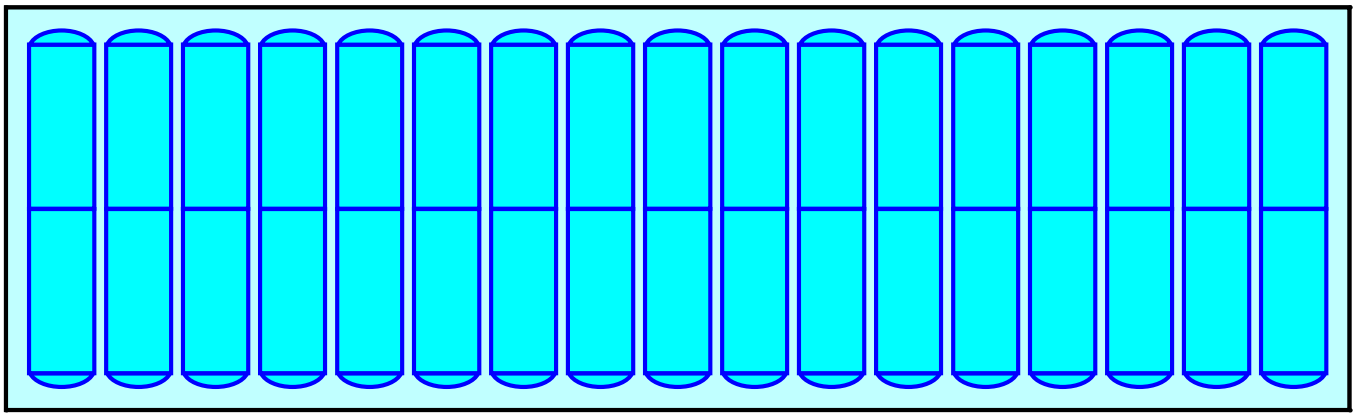
2 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 15.44' Row Length +12.0" End Stone x 2 = 17.44' Base Length
17 Rows x 34.0" Wide + 6.0" Spacing x 16 + 12.0" Side Stone x 2 = 58.17' Base Width
6.0" Base + 16.0" Chamber Height + 6.0" Cover = 2.33' Field Height

34 Chambers x 14.7 cf = 501.2 cf Chamber Storage

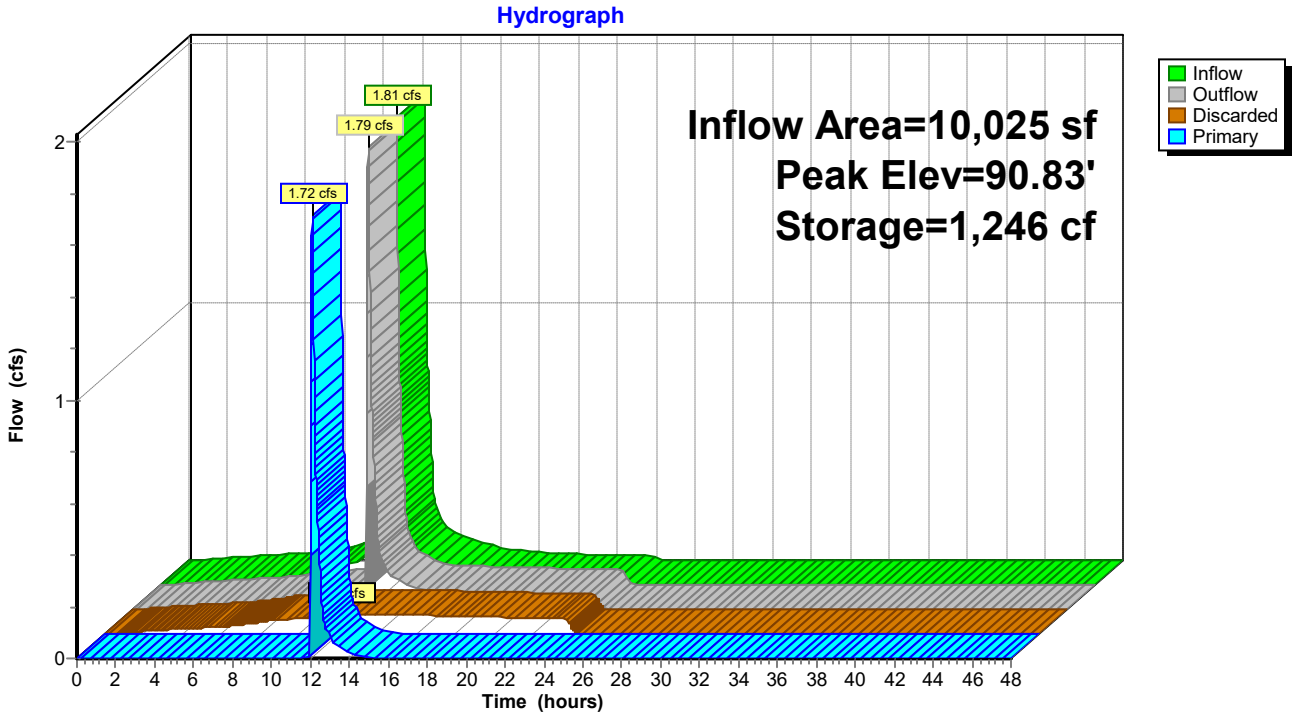
2,367.0 cf Field - 501.2 cf Chambers = 1,865.8 cf Stone x 40.0% Voids = 746.3 cf Stone Storage

Chamber Storage + Stone Storage = 1,247.5 cf = 0.029 af
Overall Storage Efficiency = 52.7%
Overall System Size = 17.44' x 58.17' x 2.33'

34 Chambers
87.7 cy Field
69.1 cy Stone



Pond UG-2: UG-2


Hydrograph
Inflow Area=10,025 sf
Peak Elev=90.83'
Storage=1,246 cf
1.81 cfs
1.79 cfs
1.72 cfs
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)
0
1
2
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

Summary for Pond UG-3: UG-3

Inflow Area = 20,963 sf,100.00% Impervious, Inflow Depth = 7.78" for 100-Year event
Inflow = 3.79 cfs @ 12.08 hrs, Volume= 13,591 cf
Outflow = 3.40 cfs @ 12.12 hrs, Volume= 13,591 cf, Atten= 10%, Lag= 2.4 min
Discarded = 0.17 cfs @ 12.12 hrs, Volume= 9,795 cf
Primary = 3.23 cfs @ 12.12 hrs, Volume= 3,797 cf

Routing by Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.01 hrs
Peak Elev= 90.83' @ 12.12 hrs Surf.Area= 2,518 sf Storage= 3,195 cf

Plug-Flow detention time= 104.9 min calculated for 13,589 cf (100% of inflow)
Center-of-Mass det. time= 104.9 min (846.0 - 741.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	88.50'	1,784 cf	**54.83'W x 45.92'L x 2.33'H Field A** 5,875 cf Overall - 1,415 cf Embedded = 4,460 cf x 40.0% Voids
#2A	89.00'	1,415 cf	**ADS_StormTech RC-310 +Cap** x 96 Inside #1 Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap 96 Chambers in 16 Rows
		3,199 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	90.43'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)
#2	Discarded	88.50'	**2.410 in/hr Exfiltration over Wetted area**

Discarded OutFlow Max=0.17 cfs @ 12.12 hrs HW=90.83' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.17 cfs)

Primary OutFlow Max=3.23 cfs @ 12.12 hrs HW=90.83' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Weir Controls 3.23 cfs @ 2.06 fps)

Pond UG-3: UG-3 - Chamber Wizard Field A

Chamber Model = ADS_StormTech RC-310 +Cap (ADS StormTech® RC-310 with cap length)
Effective Size= 28.9"W x 16.0"H => 2.07 sf x 7.12'L = 14.7 cf
Overall Size= 34.0"W x 16.0"H x 7.56'L with 0.44' Overlap

34.0" Wide + 6.0" Spacing = 40.0" C-C Row Spacing

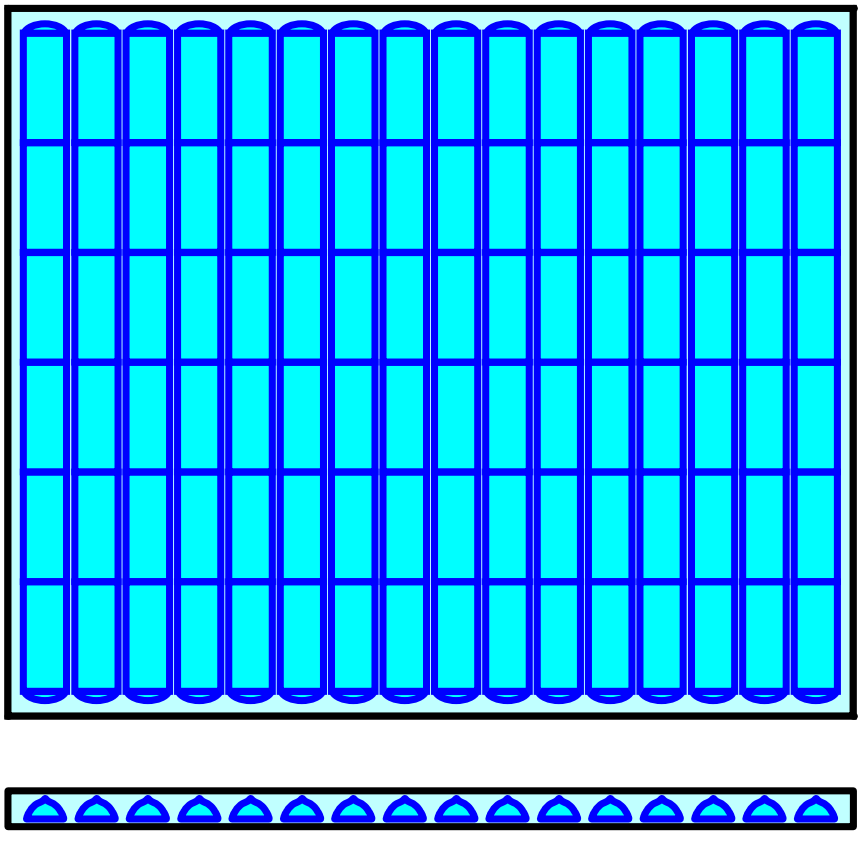
6 Chambers/Row x 7.12' Long +0.60' Cap Length x 2 = 43.92' Row Length +12.0" End Stone x 2 = 45.92' Base Length
16 Rows x 34.0" Wide + 6.0" Spacing x 15 + 12.0" Side Stone x 2 = 54.83' Base Width
6.0" Base + 16.0" Chamber Height + 6.0" Cover = 2.33' Field Height

96 Chambers x 14.7 cf = 1,415.2 cf Chamber Storage

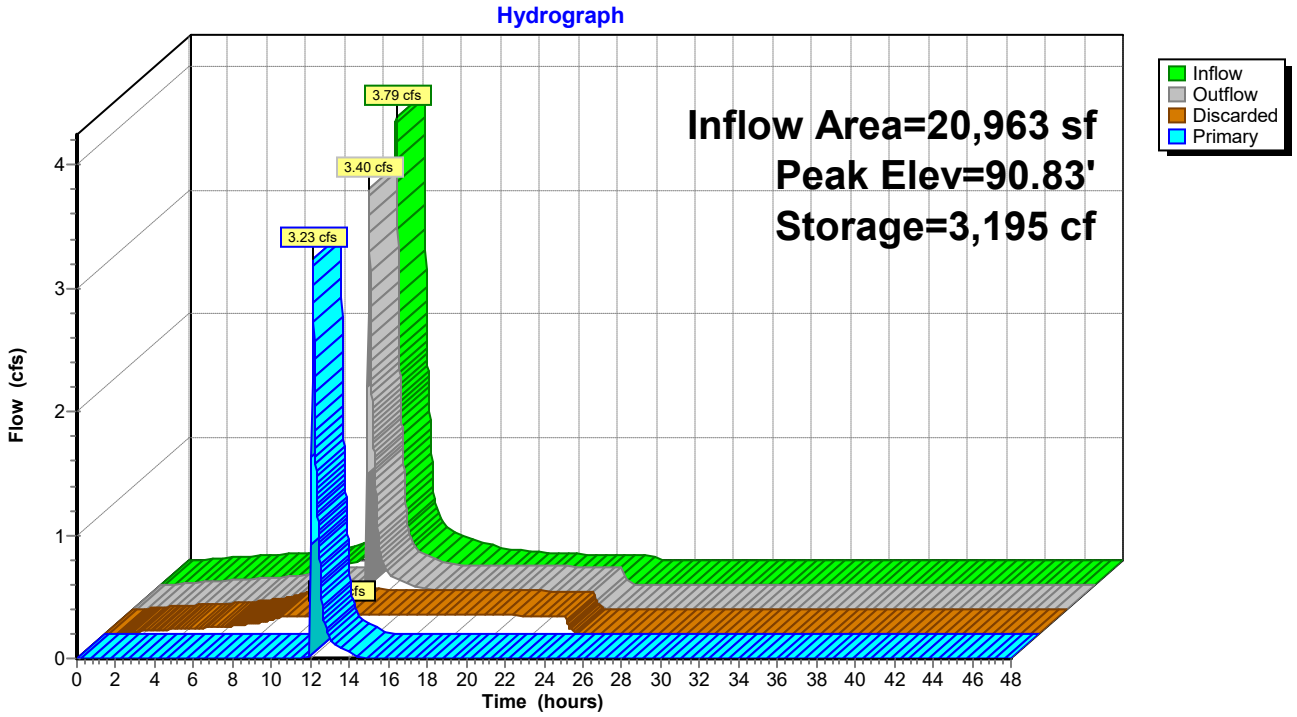
5,875.2 cf Field - 1,415.2 cf Chambers = 4,460.0 cf Stone x 40.0% Voids = 1,784.0 cf Stone Storage

Chamber Storage + Stone Storage = 3,199.2 cf = 0.073 af
Overall Storage Efficiency = 54.5%
Overall System Size = 45.92' x 54.83' x 2.33'

96 Chambers
217.6 cy Field
165.2 cy Stone



Pond UG-3: UG-3


Hydrograph
Inflow Area=20,963 sf
Peak Elev=90.83'
Storage=3,195 cf
3.79 cfs
3.40 cfs
3.23 cfs
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
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

POINT OF DISCHARGE 3
PEAK DISCHARGE SUMMARY
2-YEAR STORM = 0.00 cfs
10-YEAR STORM = 0.00 cfs
25-YEAR STORM = 0.00 cfs
100-YEAR STORM = 0.00 cfs

P3
AREA=1,155 SF
TC=6.0 MIN.
CN=XX

POINT OF DISCHARGE 1
PEAK DISCHARGE SUMMARY
2-YEAR STORM = 4.57 cfs
10-YEAR STORM = 11.05 cfs
25-YEAR STORM = 16.95 cfs
100-YEAR STORM = 27.11 cfs

POINT OF DISCHARGE 2
PEAK DISCHARGE SUMMARY
2-YEAR STORM = 0.07 cfs
10-YEAR STORM = 0.27 cfs
25-YEAR STORM = 0.42 cfs
100-YEAR STORM = 0.66 cfs

WETLAND SERIES "B"

WETLAND SERIES "A"

P1-D
AREA=137,299 SF
TC=6.0 MIN.
CN=76

P1-C
AREA=20,963 SF
TC=6.0 MIN.
CN=98

P1-B
AREA=10,025 SF
TC=6.0 MIN.
CN=98

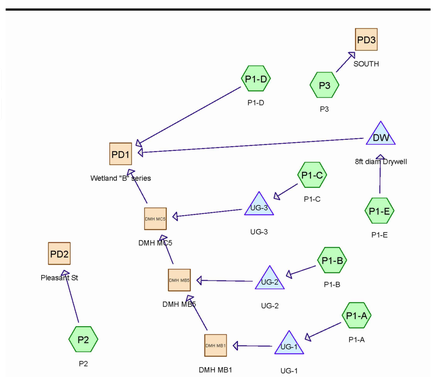
P1-A
AREA=22,183 SF
TC=6.0 MIN.
CN=89

P1-E
AREA=10,868 SF
TC=8.3 MIN.
CN=44

P2
AREA=6,958 SF
TC=6.0 MIN.
CN=62

UG1
UG2
UG3

DW



30 15 0 30 60

Date	Description	No.
	Revisions	

7-1-2022
GABRIEL R. CROCKER
CIVIL
No. 47917
COMMONWEALTH OF MASSACHUSETTS
REGISTERED PROFESSIONAL ENGINEER

GABRIEL R. CROCKER
PROFESSIONAL ENGINEER, MA REGISTRATION #47917

Crocker Design Group
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HINGHAM, MA 02043
P: 781-919-0808

Project
CORNERSTONE AT WEYMOUTH
#1197 WASHINGTON STREET
WEYMOUTH, MA

Prepared for
ELKSY DEVELOPMENT LLC
#180 CANTON AVENUE
MILTON, MA 02186

Drawing Title
PROPOSED CONDITIONS WATERSHED MAP

Project No.	100-142
Date	7-1-2022
Scale	1"=30'
Drawn By	ASZ
Approved By	GC

Drawing No.
PH-1

SECTION 4 – STORMWATER MANAGEMENT CALCS

Recharge Volume BMP Table

TOTAL RECHARGE VOLUME			
Infiltration BMP	***Infiltration Rate (in/hr) k***	***Storage (Recharge) Volume (CF) Rv***	***Bottom Area (SF)***
UG-1	*2.41*	*1,629*	*1,538*
UG-2	*2.41*	*1,133*	*1,014*
UG-3	*2.41*	*2,763*	*2,518*
Totals		***5,525***	
k = saturdated hydraulic conductivity (in/hr) *Rv = storage volume (CF)* *Bottom Area (SF)* *Volume 3, Chapter 1 of the MA Stormwater Handbook*			

TOTAL RECHARGE VOLUME PROVIDED = 5,525CF

The Storage Recharge volume numbers provided in the table above have been derived utilizing the HydroCAD output for stage storage.

Conclusion:

The recharge provided by the proposed underground system exceeds the recharge requirements outlined in Standard 3 of the Massachusetts DEP Stormwater .

4.2 DRAWDOWN TIME

Below are the drawdown time calculations for the infiltration systems proposed on the site. The calculation uses estimated hydraulic conductivity values *"K"* in accordance with the Rawls Rates table. The formula below utilized the recommended formula per the MA Stormwater Handbook as follows:

Drawdown Time = Rv / [(K*Bottom Area)*(1FT/12IN)]

- Rv = Storage Volume (CF)
- K = Saturated Hydraulic Conductivity per Rawls Rate Table (IN/HR)
- Bottom Area = Area of Bottom of Proposed Recharge Structure (SF)

Below is a summary table of the drawdown calculations:

BASIN DRAWDOWN CALCULATIONS				
Infiltration BMP	***Infiltration Rate (IN/HR) k***	***Storage (Recharge) Volume (CF) Rv***	***Bottom Area (SF)***	***Draw Down Time(hours)***
UG-1	*2.41*	*1,629*	*1,538*	5.3
UG-2	*2.41*	*1,133*	*1,014*	5.6
UG-3	*2.41*	*2,763*	*2,518*	5.5
Totals		***5,525***		
k = saturdated hydraulic conductivity (in/hr) *Rv = storage volume (c.f.)* *Bottom Area (s.f.)* *Volume 3, Chapter 1 of the MA Stormwater Handbook*				

Conclusion:

The calculations above show that the infiltration BMP draw down in less than 72 hours, at each recharge system, as required by Standard 3.

4.3 STANDARD 4: WATER QUALITY

The BMP's have been designed to treat 1.0" of water quality volume (WQV), which exceeds the required 0.5" of WQV. A table has been provided below that provides the sizing of CDS Water quality units (WQU).

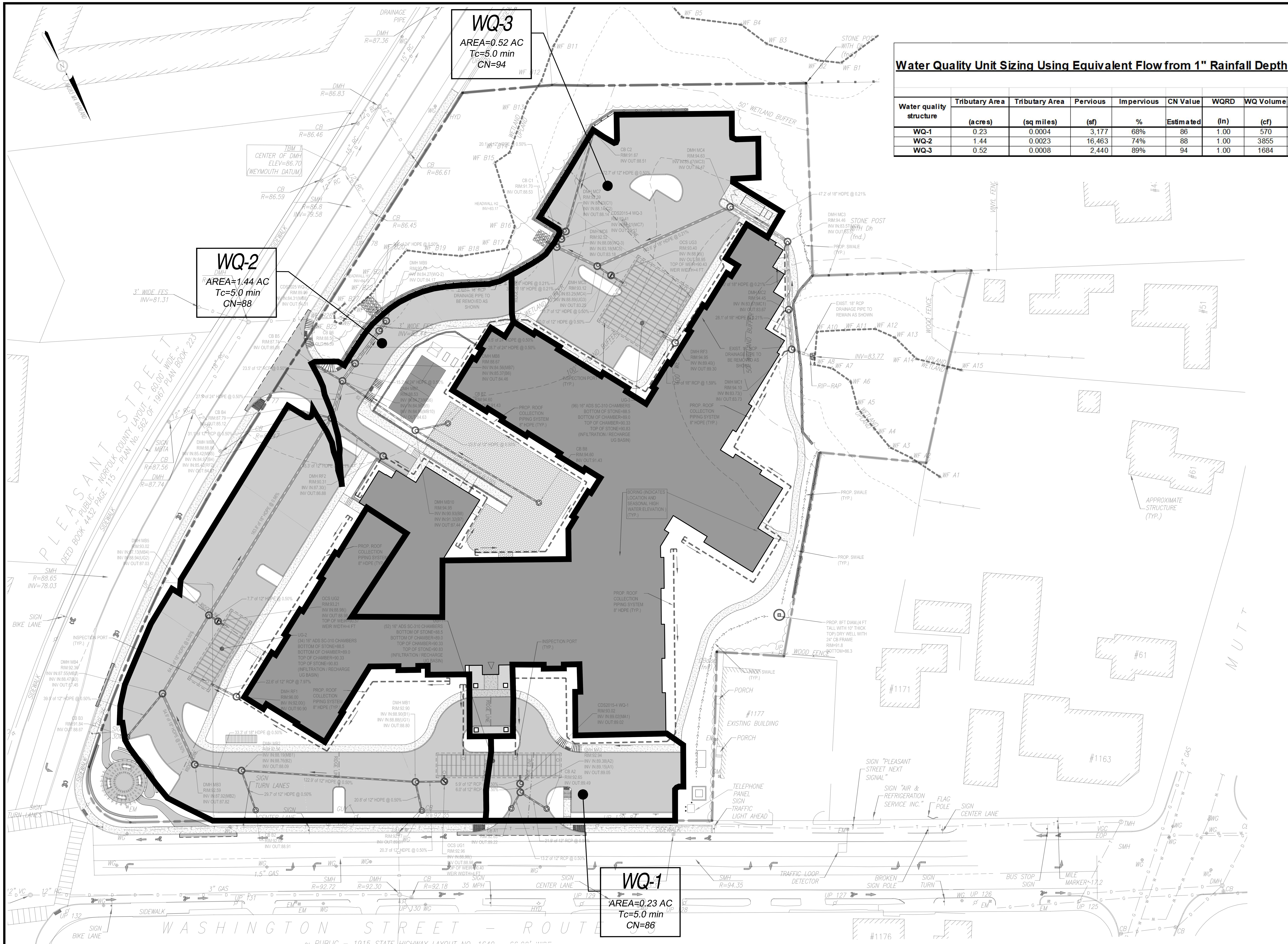
Water Quality Unit Sizing Using Equivalent Flow from 1" Rainfall Depth

Water quality structure	Tributary Area (acres)	Tributary Area (sq miles)	Pervious (sf)	Impervious %	CN Value Estimated	WQRD (In)	WQ Volume (cf)	Tc (min)	qu csm/in	WQF = qu A Q (cfs)
WQ-1	0.23	0.0004	3,177	68%	86	1.00	570	5	795	0.20
WQ-2	1.44	0.0023	16,463	74%	88	1.00	3855	5	795	1.32
WQ-3	0.52	0.0008	2,440	89%	94	1.00	1684	5	795	0.58

The WQU's proposed are two (2) CDS2015 and one (1) CDS2025.

TABLE 1

CDS Model	Treatment Capacity (cfs)/(L/s)	Minimum Sump Storage Capacity (yd^3)/(m^3)	Minimum Oil Storage Capacity (gal)/(L)
CDS2015-G	0.7 (19.8)	0.5 (0.4)	70 (265)
CDS2015-4	0.7 (19.8)	0.5 (1.4)	70 (265)
CDS2015	0.7(19.8)	1.3 (1.0)	92 (348)
CDS2020	1.1 (31.2)	1.3 (1.0)	131 (496)
CDS2025	1.6 (45.3)	1.3 (1.0)	143 (541)
CDS3020	2.0 (56.6)	2.1 (1.6)	146 (552)
CDS3030	3.0 (85.0)	2.1 (1.6)	205 (776)
CDS3035	3.8 (106.2)	2.1 (1.6)	234 (885)
CDS4030	4.5 (127.4)	5.6 (4.3)	407 (1540)
CDS4040	6.0 (169.9)	5.6 (4.3)	492 (1862)
CDS4045	7.5 (212.4)	5.6 (4.3)	534 (2012)



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30 15 0 30 60

Date	Description	No.

Revisions

7-1-2022

GABRIEL R. CROCKER
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Project
CORNERSTONE AT WEYMOUTH
#1197 WASHINGTON STREET
WEYMOUTH, MA

Prepared for
ELKSY DEVELOPMENT LLC
#180 CANTON AVENUE
MILTON, MA 02186

Drawing Title
PROPOSED WATER QUALITY CATCHMENT AREA MAP

Project No.	100-142	Drawing No.
Date	7-1-2022	**PH-3**
Scale	1"=40'	
Drawn By	ASZ	
Approved By	GC	

4.4 RIP RAP SPLASH PAD

Rip rap splash pads are designed to dissipate energy, prevent scour at the stormwater outlet, and minimize the potential for downstream erosion. A LEVEL SPREADER / PLUNGE POOLE was sized for each of the outlets of the drainage system. The calculations below are in accordance with the methodology of the "2002 Connecticut Guidelines for Soil Erosion and Sediment Control" produced by The Connecticut Council on Soil and Water Conservation.

Preformed Scour Hole Calculations

	Q (25Y)	Do	TW	Depression	C	3Sp	B	2Sp	d50	
	(cfs)	(ft.)	(ft.)	(ft.)	(ft.)	(ft.)	(ft.)	(ft.)	(ft.)	(in.)
HEADWALL H1	9.3	2.0	0.30	1.00	12.00	6.00	10.00	4.00	0.32	3.85
HEADWALL H2	7.0	1.5	0.30	0.75	9.00	4.50	7.50	3.00	0.33	3.91

Conclusion:

As identified above, the discharge points have been designed to accommodate and exceed the required minimum Preformed scour hole sizing.

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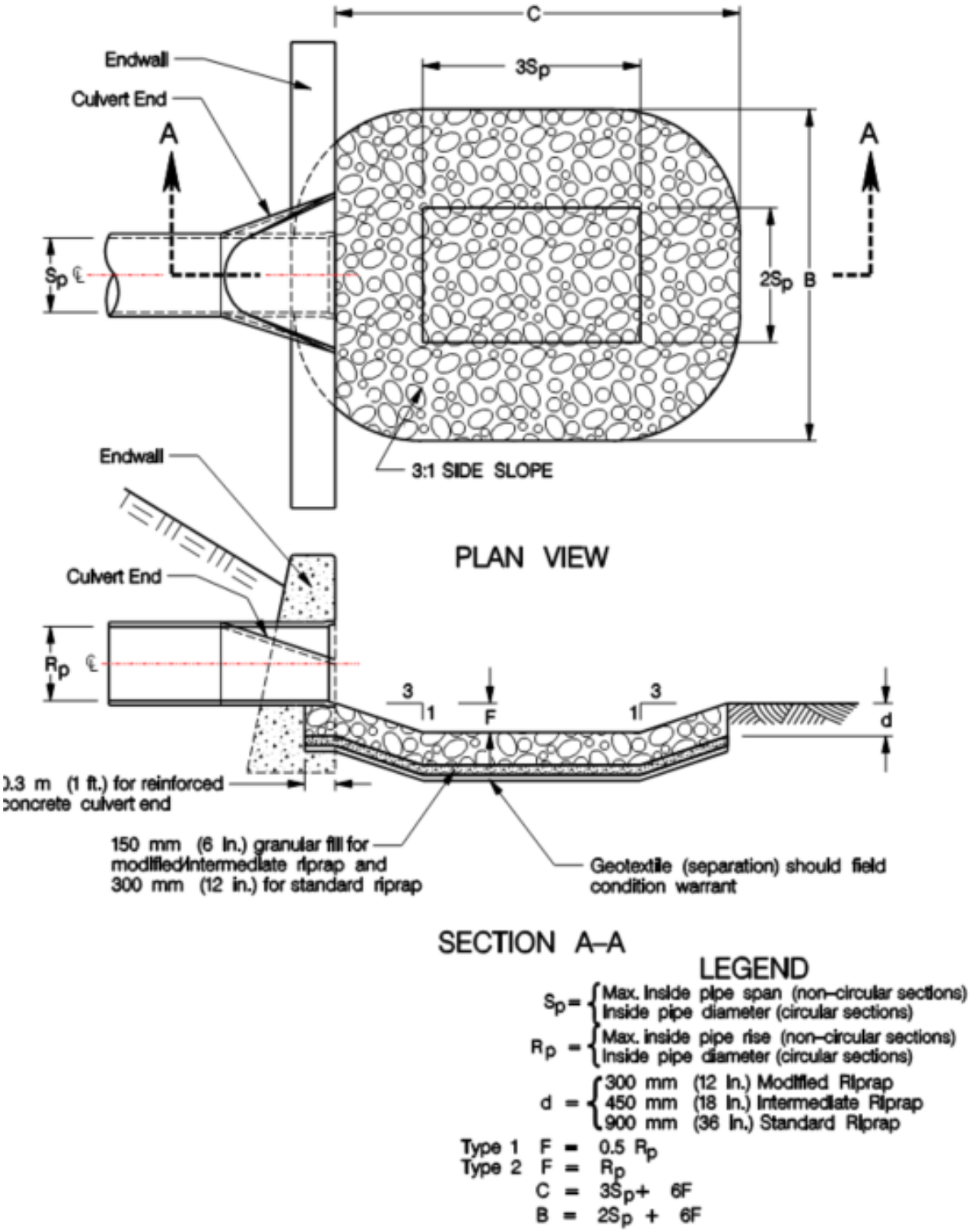

Figure 11-15 Preformed Scour Hole Type 1 and Type 2

4.5 TSS REMOVAL

The project has been designed to comply with the required 80% TSS (minimum) removal per the Massachusetts Stormwater Regulations. Various combinations of stormwater BMPs including deep sump hooded catch basins, proprietary water quality units and subsurface infiltration basins are utilized.

Please refer to the attached TSS calculation sheets that follow:

INSTRUCTIONS:

Non-automated: Mar. 4, 2008

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
2. The calculations must be completed using the Column Headings specified in Chart and Not the Excel Column Headings
3. To complete Chart Column D, multiple Column B value within Row x Column C value within Row
4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: **WQ-1 (via CB, WQU, INFILTR BASIN)**

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Deep Sump and Hooded Catch Basin	**0.25**	**1.00**	**0.25**	**0.75**
CDS2015	**0.80**	**0.75**	**0.60**	**0.15**
UG-1 INFILTRATION BASIN	**0.80**	**0.15**	**0.12**	**0.03**
	0.00	**0.00**	**0.00**	**0.03**
	0.00	**0.00**	**0.00**	**0.03**

Total TSS Removal = **97%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **ELKS, WEYMOUTH**

Prepared By: **ASZ**

Date: **6.24.2022**

*Equals remaining load from previous BMP (E) which enters the BMP

INSTRUCTIONS:

Non-automated: Mar. 4, 2008

1. Sheet is nonautomated. Print sheet and complete using hand calculations. Column A and B: See MassDEP Structural BMP Table
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4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: **WQ-2 (via CB, WQU CDS2025)**

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Deep Sump and Hooded Catch Basin	**0.25**	**1.00**	**0.25**	**0.75**
CDS2025	**0.80**	**0.75**	**0.60**	**0.15**
	0.00	**0.00**	**0.00**	**0.00**
	0.00	**0.00**	**0.00**	**0.00**
	0.00	**0.00**	**0.00**	**0.00**

Total TSS Removal = **85%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **ELKS, WEYMOUTH**

Prepared By: **ASZ**

Date: **6.24.2022**

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4. To complete Chart Column E value, subtract Column D value within Row from Column C within Row
5. Total TSS Removal = Sum All Values in Column D

Location: **WQ-3 (via CB, WQU CDS2015)**

TSS Removal Calculation Worksheet

A BMP[1]	B TSS Removal Rate[1]	C Starting TSS Load*	D Amount Removed (B*C)	E Remaining Load (C-D)
Deep Sump and Hooded Catch Basin	**0.25**	**1.00**	**0.25**	**0.75**
CDS2015	**0.80**	**0.75**	**0.60**	**0.15**
	0.00	**0.00**	**0.00**	**0.00**
	0.00	**0.04**	**0.00**	**0.00**
	0.00	**0.40**	**0.00**	**0.00**

Total TSS Removal = **85%**

Separate Form Needs to be Completed for Each Outlet or BMP Train

Project: **ELKS, WEYMOUTH**

Prepared By: **ASZ**

Date: **6.24.2022**

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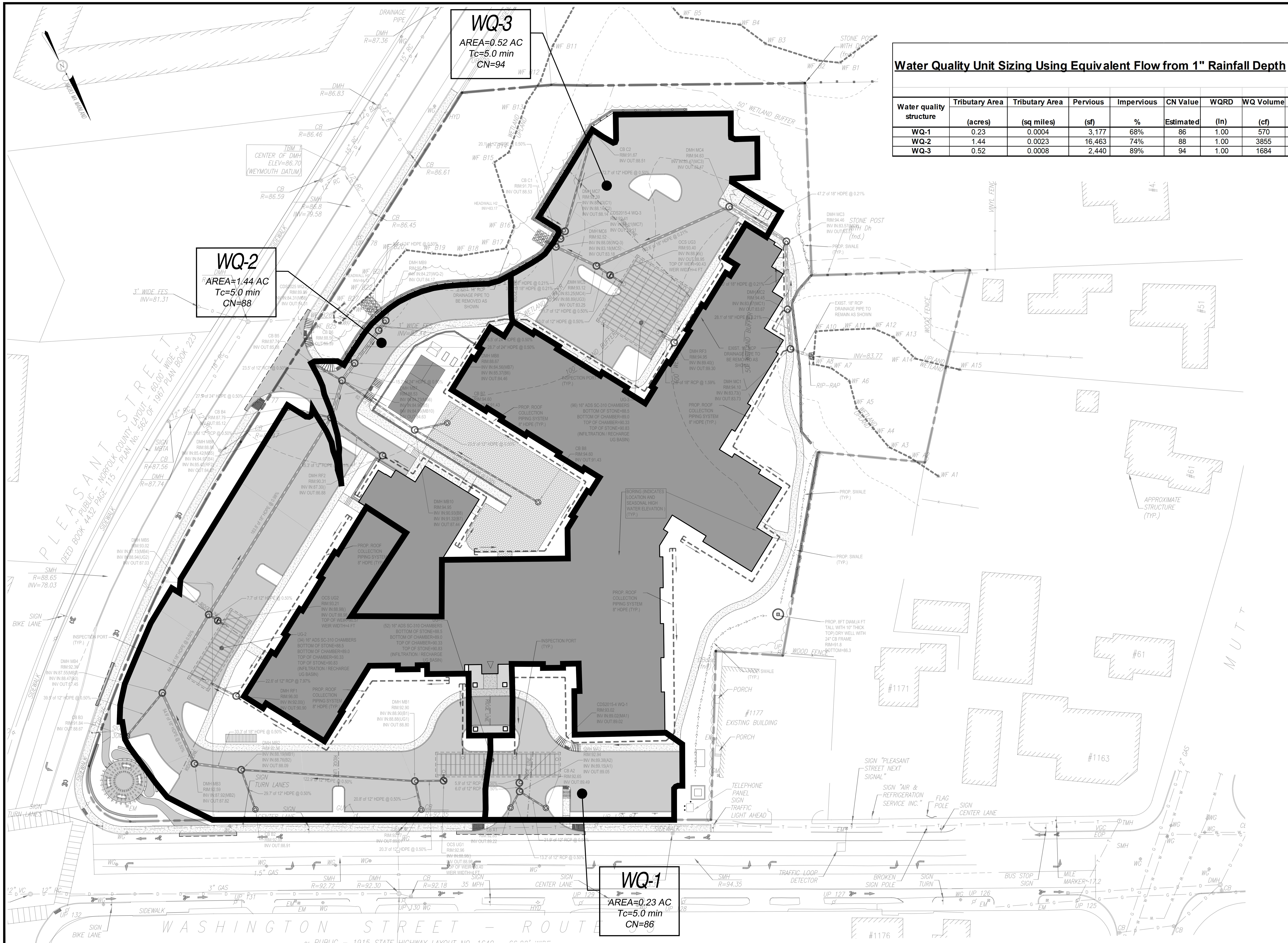

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Project

CORNERSTONE AT WEYMOUTH

#1197 WASHINGTON STREET
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Prepared for

ELKSY DEVELOPMENT LLC

#180 CANTON AVENUE
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PROPOSED WATER QUALITY CATCHMENT AREA MAP

Project No.	100-142	Drawing No.
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SECTION 5 – LONG TERM OPERATION & MAINTENANCE

LONG-TERM STORMWATER OPERATION & MAINTENANCE PLAN
Elksy Development

PROJECT OVERVIEW:

The proposed project consists of the construction of 320 +/- subdivision right of way and two (2) lots. The project has been designed to comply with the Massachusetts Stormwater Management Regulations.

Appended to this document is a sample maintenance form and a chart describing the anticipated frequency of tasks.

OWNER AND RESPONSIBLE PARTY:

Current Land Owners:
Weymouth Lodge 2232 Benevolent & Protect &
Patricia A Faiella, Treasure
1197 Washington Street
Weymouth, MA 02189

Proposed Owner:
Elksy Development
180 Canton Avenue
Milton, MA 02186

Contractor should have facilities maintenance personnel on-staff. For any service beyond their service ability, the contractor should subcontract to the appropriate vendors such as street sweeping, catch basin and water quality unit cleaning, etc.

Ultimately, the owner will take over long-term O&M Responsibilities upon project completion and turnover from the contractor to the owner.

CONSTRUCTION MANAGEMENT:

A construction manager with adequate knowledge and experience on projects of similar size and scope shall be employed to oversee all site work related construction. The contractor shall incorporate the appropriate techniques to control sediment and erosion pollution during construction in accordance with the *Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas* and any conditions of approval from the local conservation commission.

Care should be taken when constructing stormwater control structures. Light earth-moving equipment shall be used to excavate in the vicinity of the infiltration areas. Use of heavy-equipment causes excessive compaction of the soils beneath the basin resulting in reduced infiltration capacity. At no time shall temporary infiltration areas or settling basins be constructed in the vicinity of the proposed infiltration basins in order to prevent the soils from becoming clogged with sediment.

ON-GOING MAINTENANCE CONTRACT

The non-structural and structural approaches recommended below, as well as the required BMP maintenance, will be completed by the selected contractor. Adequate personnel with appropriate training and access to proper equipment will be available to complete the tasks. Future responsible parties must be notified of their responsibility to operate and maintain the system in perpetuity.

MAINTENANCE LOG

The Responsible Party shall develop and maintain a log of inspections, maintenance, repairs, and disposal (including location of disposal) during the life of the project. Records will be maintained for at least 3 years and be made available to the Massachusetts Department of Environmental Protection or the Town of Weymouth in accordance with the provisions of the Massachusetts Stormwater Handbook. A sample of such a maintenance log is provided.

STORMWATER BMP MAINTENANCE

The proposed stormwater management system has been designed with appropriate BMPs aimed at reducing the pollutants discharge based upon the intended use of the property. All BMPs require regular maintenance to function as intended. Some management measures have simple maintenance requirements; others are more involved. The Responsible Party must have all BMPs regularly inspected to ensure they are operating properly on an as needed basis, including during runoff events exceeding 0.5 inches of rainfall.

A description of the non-structural and structural approaches to be incorporated is indicated below. The following best management practices are proposed to be incorporated into the stormwater management design to reduce source runoff and improve stormwater runoff discharge quality. The Responsible Party will regularly inspect all BMPs to ensure they are operating properly. If any deficiencies are identified during these inspections, action to resolve it will be initiated and documented on the maintenance log.

STRUCTURAL BMPs

Deep Sump Hooded Catch Basins/Yard Drains

On a regular basis the inlet pipe and outlet pipe shall be checked for debris and removed as necessary to ensure unobstructed flow of water. Inspections shall occur at least twice annually, once in the fall and then in the spring after the snow melts. Inspections shall

verify the tees are secure and free flowing. Depth of sediment below water line. Basins are to be cleaned whenever sediment and hydrocarbons are observed. Basins shall be cleaned using a vacuum pump. All liquid shall be pumped from the sump of each basin at least once per year. All sediments and hydrocarbons should be properly handled and disposed of in accordance with local, state and federal guidelines and regulations.

Proprietary Water Quality Units

Hydrodynamic Separators shall be maintained in accordance with the manufacturer's recommendations. Refer to the enclosed "CDS Inspection and Maintenance Guide". Typically, a vacuum truck removes accumulated sediment and oil most efficiently. See maintenance documentation from the manufacturer. Inspection should occur at least twice annually, once in the fall and then in the spring after the snow melts. All sediment and hydrocarbons should be properly handled and disposed of in accordance with local, state and federal guidelines and regulations. Cleaning will take place at the completion of construction and as deemed necessary based on the inspections and manufacturer's requirements.

Subsurface Infiltration System

The subsurface systems (Stormtech ADS SC-310 Chambers) have been designed with riser structures at grade to aid the removal of sediment and debris accumulating in the structure. Preventative maintenance shall be performed in accordance with manufacturer's instructions. Inspection should occur twice annually, once in the fall and then in the spring after the snow melts. Cleaning will take place at the completion of construction and as deemed necessary based on the inspections.

Stone/Pipe Trenches

Inspect and remove debris every 6 months and after every major storm.

NON-STRUCTURAL BMPs

Pavement Sweeping

As street sweeping is a BMP under DEP guidelines, this non-structural BMP is an effective removal of Total Suspended Solids (TSS) in a comprehensive stormwater management program. Litter and debris is to be regularly picked up and removed from the pavement. Paved areas are to be swept a minimum of two times per year, at least once during April and again in September. This BMP is not needed to meet the 80% TSS removal requirement.

Pervious Areas and Slopes

Wherever possible, runoff from paved areas and snowmelt shall be directed over vegetated areas to promote settlement of suspended solids before entering a wetland or

resource area. Steep pervious slopes will be permanently vegetated to dissipate energy and reduce potential erosion. No constructed vegetated slopes should exceed 2H:1V. Slopes exceeding 2:1 shall be stabilized with rip-rap or other similar measures to minimize the potential for future erosion. Irrigation system(s) shall be designed and maintained such that water is not applied to/or allowed to run off onto any impervious surfaces. Although overspray or runoff may be unavoidable during periods of high winds. In the event of accidental damage to system components or other unusual circumstances the system components shall be promptly corrected. Maximum of 1 inch of irrigation water will be applied to irrigated areas per week.

Conveyance Swale

Inspect conveyance swales the first few months after construction to make sure that there is no rilling or gullying and that vegetation in the channels is adequate. Thereafter, inspect the channel twice a year for slope integrity, soil moisture, vegetative health, soil stability, soil compaction, soil erosion, ponding and sediment accumulation. Regular maintenance tasks include mowing, fertilizing, liming, watering, prunin, weeding, and pest control. Mow at least once per year but do no cut the grass shorter than three to four inches. Keep grass height under 6 inches to maintain the design depth necessary to serve as a conveyance. Do not mow excessively, because it may increase the design flow velocity. Remove sediment and debris manually at least once per year. Reseed periodically to maintain the dense growth of grass vegetation.

Drainage Control Structures, Flared End Sections, Trash Racks, Riprap Pads, Swales, and/or Level Spreader Splash Pads

Basin control structures, flared end sections, trash racks, riprap pads and level spreader splash pads shall be inspected and any debris or growth surrounding or within these structures shall be removed. Any/all debris or vegetation encroaching on the control structures our outfall components shall be removed or appropriately trimmed back to maintain the designed control elevation and flow patterns/cross section without impediment. Inspection should occur twice annually, once in the fall and then in the spring after the snow melts. Cleaning will take place at the completion of construction and as deemed necessary based on the inspections and manufacturer's requirements.

Fertilizers

Use of fertilizers shall follow the requirements of 330 CMR 31.0.

Waste Management

Solid waste and recycling will be contained in garbage cans maintained at each residence for routine and regular trash pickup. Waste deposition in the receptacles will be consistent with state and local regulations.

Snow Removal

There shall be no plowing of stockpiling of snow within any resource areas or buffers. Typically, a combination of plowing and/or snow blowing is utilized on the individual driveways and a snow blowing “bobcat” is used to clear the sidewalks. Deicing compounds must be stored or sheltered on impervious pads (i.e. in residential garages and the maintenance facility). Snow that is plowed from the paved driveway surfaces shall be plowed to the edges of the pavement. If capacity of these areas is exceeded, accumulated snow shall be removed.

Stormwater BMP Inspection and Maintenance Log

Facility Name	
Address	
Begin Date	End Date

Date	BMP ID#	BMP Description	Inspected by:	Cause for Inspection	Exceptions Noted	Comments and Actions Taken

Instructions: Record all inspections and maintenance for all treatment BMPs on this form. Use additional log sheets and/or attach extended comments or documentation as necessary. Submit a copy of the completed log with the annual independent inspectors' report to the municipality and start a new log at that time.

BMP ID# — Always use ID# from the Operation and Maintenance Manual.

Inspected by — Note all inspections and maintenance on this form, including the required independent annual inspection.

Cause for inspection — Note if the inspection is routine, pre-rainy-season, post-storm, annual, or in response to a noted problem or complaint.

Exceptions noted — Note any condition that requires correction or indicates a need for maintenance.

Comments and actions taken — Describe any maintenance done and need for follow-up.

Stormwater BMP Inspection Matrix

Conventional & LID Best Management Practices	**Inspection & Maintenance Frequency**	**Erosion& Scour**	**Obstructions**	**Trash & Debris**	**Sediment Build-Up Removal**	**Vegetation Cover**	**Remove/Reset Filter Fabric & Stone As Required**	**Vac Truck Sediment & Contaminants**	**Remove/Reset Riprap as Required**
Catch Basins/Area & Yard Drains	Four times per year								
Pavement Sweeping	Four times per year								
Stone Trench	Twice-Annually (Spring and Fall)								
Subsurface Infiltration Chambers	Twice-Annually (Spring and Fall)								
Conveyance Swale	Twice-Annually (Spring and Fall)								
Proprietary Water Quality Separators	Twice-Annually (Spring and Fall)								
Outlets (FES, Rip Rap Pad, Level Spreaders)	Twice-Annually (Spring and Fall)								

CONTECH®
CONSTRUCTION PRODUCTS INC.

CDS® Inspection and Maintenance Guide

CDS TECHNOLOGIES

Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit. For example, unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet and separation screen. The inspection should also quantify the accumulation of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (cylinder and screen) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained outside the screen. For deep units, a single manhole access point would allows both sump cleanout and access outside the screen.

The CDS system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. If absorbent material is used, it should be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Particles at the top of the pile typically offer less resistance to the end of the rod than consolidated particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine weather the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump.

Cleaning

Cleaning of a CDS systems should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be cleaned out if pollutant build-up exists in this area.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill should be cleaned out immediately. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. The screen should be power washed to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure that proper safety precautions have been followed. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the CDS system should be done in accordance with local regulations. In many jurisdictions, disposal of the sediments may be handled in the same manner as the disposal of sediments removed from catch basins or deep sump manholes.

CDS Model	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	yd3	m3
CDS2015-4	4	1.2	3.0	0.9	0.5	0.4
CDS2015	5	1.5	3.0	0.9	1.3	1.0
CDS2020	5	1.5	3.5	1.1	1.3	1.0
CDS2025	5	1.5	4.0	1.2	1.3	1.0
CDS3020	6	1.8	4.0	1.2	2.1	1.6
CDS3030	6	1.8	4.6	1.4	2.1	1.6
CDS3035	6	1.8	5.0	1.5	2.1	1.6
CDS4030	8	2.4	4.6	1.4	5.6	4.3
CDS4040	8	2.4	5.7	1.7	5.6	4.3
CDS4045	8	2.4	6.2	1.9	5.6	4.3

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities

Support

- Drawings and specifications are available at www.contechstormwater.com.
- Site-specific design support is available from our engineers.

CONTECH Construction Products Inc. provides site solutions for the civil engineering industry. CONTECH's portfolio includes bridges, drainage, sanitary sewer, stormwater and earth stabilization products. For information on other CONTECH division offerings, visit contech-cpi.com or call 800.338.1122

CONTECH® CONSTRUCTION PRODUCTS INC.
800.925.5240
contechstormwater.com

CDS Inspection & Maintenance Log

CDS Model: _____ Location: _____

Date	Water depth to sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than eighteen inches the system should be cleaned out. **Note: To avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.**

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.

OPERATION AND MAINTENANCE BMP MAP

CORNERSTONE AT WEYMOUT

1197 WASHINGTON STREET
WEYMOUTH, MA

WQ **CDS WATER QUALITY UNIT**

DRAINAGE SYSTEM

ROOF DRAIN

SUBSURFACE INFILTRATION SYSTEM

SNOW STORAGE:

1. DRIVE AISLE TO BE PLOWED TO EACH EDGE OF PAVEMENT MAINTAINING MIN 20' WIDE ACCESS AT ALL TIMES
2. NO SNOW STORAGE SHALL OCCUR WITHIN WETLAND RESOURCE AREAS.
3. SNOW TO BE HAULED FROM SITE TO A TO-BE-DETERMINED LOCATION BY OWNER FOR REMOVAL PROCESS.

SECTION 6 – SOILS TESTING DATA

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Norfolk and Suffolk Counties, Massachusetts

June 8, 2022

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Map Scale: 1:1,670 if printed on A landscape (11" x 8.5") sheet.

N

Meters
0 20 40 80 120

Feet
0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

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

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 1:25,000.

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: Norfolk and Suffolk Counties, Massachusetts
Survey Area Data: Version 17, Sep 3, 2021

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

Date(s) aerial images were photographed: Sep 26, 2020—Oct 15, 2020

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
51	Swansea muck, 0 to 1 percent slopes	2.0	30.7%
602	Urban land, 0 to 15 percent slopes	3.2	50.2%
626B	Merrimac-Urban land complex, 0 to 8 percent slopes	1.2	19.1%
Totals for Area of Interest		**6.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or

landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Norfolk and Suffolk Counties, Massachusetts

51—Swansea muck, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2trl2
Elevation: 0 to 1,140 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 240 days
Farmland classification: Not prime farmland

Map Unit Composition

Swansea and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Swansea

Setting

Landform: Bogs, swamps
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Highly decomposed organic material over loose sandy and gravelly glaciofluvial deposits

Typical profile

Oa1 - 0 to 24 inches: muck
Oa2 - 24 to 34 inches: muck
Cg - 34 to 79 inches: coarse sand

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.14 to 14.17 in/hr)
Depth to water table: About 0 to 6 inches
Frequency of flooding: Rare
Frequency of ponding: Frequent
Available water supply, 0 to 60 inches: Very high (about 16.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8w
Hydrologic Soil Group: B/D
Ecological site: F144AY043MA - Acidic Organic Wetlands
Hydric soil rating: Yes

Minor Components

Freetown

Percent of map unit: 10 percent
Landform: Bogs, swamps

Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Whitman

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Scarboro

Percent of map unit: 5 percent
Landform: Drainageways, depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope, tread, dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

602—Urban land, 0 to 15 percent slopes

Map Unit Setting

National map unit symbol: vkyj
Mean annual precipitation: 32 to 50 inches
Mean annual air temperature: 45 to 50 degrees F
Frost-free period: 120 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 99 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Setting

Parent material: Excavated and filled land

Minor Components

Rock outcrops

Percent of map unit: 1 percent
Hydric soil rating: Unranked

626B—Merrimac-Urban land complex, 0 to 8 percent slopes

Map Unit Setting

National map unit symbol: 2tyr9
Elevation: 0 to 820 feet
Mean annual precipitation: 36 to 71 inches
Mean annual air temperature: 39 to 55 degrees F
Frost-free period: 140 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Merrimac and similar soils: 45 percent
Urban land: 40 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Merrimac

Setting

Landform: Outwash plains, outwash terraces, moraines, eskers, kames
Landform position (two-dimensional): Summit, shoulder, backslope, footslope
Landform position (three-dimensional): Side slope, crest, riser, tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loamy glaciofluvial deposits derived from granite, schist, and gneiss over sandy and gravelly glaciofluvial deposits derived from granite, schist, and gneiss

Typical profile

Ap - 0 to 10 inches: fine sandy loam
Bw1 - 10 to 22 inches: fine sandy loam
Bw2 - 22 to 26 inches: stratified gravel to gravelly loamy sand
2C - 26 to 65 inches: stratified gravel to very gravelly sand

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to very high (1.42 to 99.90 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 2 percent
Maximum salinity: Nonsaline (0.0 to 1.4 mmhos/cm)
Sodium adsorption ratio, maximum: 1.0
Available water supply, 0 to 60 inches: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: A
Ecological site: F144AY022MA - Dry Outwash
Hydric soil rating: No

Description of Urban Land

Typical profile

M - 0 to 10 inches: cemented material

Properties and qualities

Slope: 0 to 8 percent
Depth to restrictive feature: 0 inches to manufactured layer
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Available water supply, 0 to 60 inches: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: D
Hydric soil rating: Unranked

Minor Components

Hinckley

Percent of map unit: 5 percent
Landform: Deltas, kames, eskers, outwash plains
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Head slope, nose slope, side slope, crest, rise
Down-slope shape: Convex
Across-slope shape: Convex, linear
Hydric soil rating: No

Windsor

Percent of map unit: 5 percent
Landform: Outwash terraces, dunes, outwash plains, deltas
Landform position (three-dimensional): Tread, riser
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Hydric soil rating: No

Sudbury

Percent of map unit: 5 percent
Landform: Deltas, terraces, outwash plains
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

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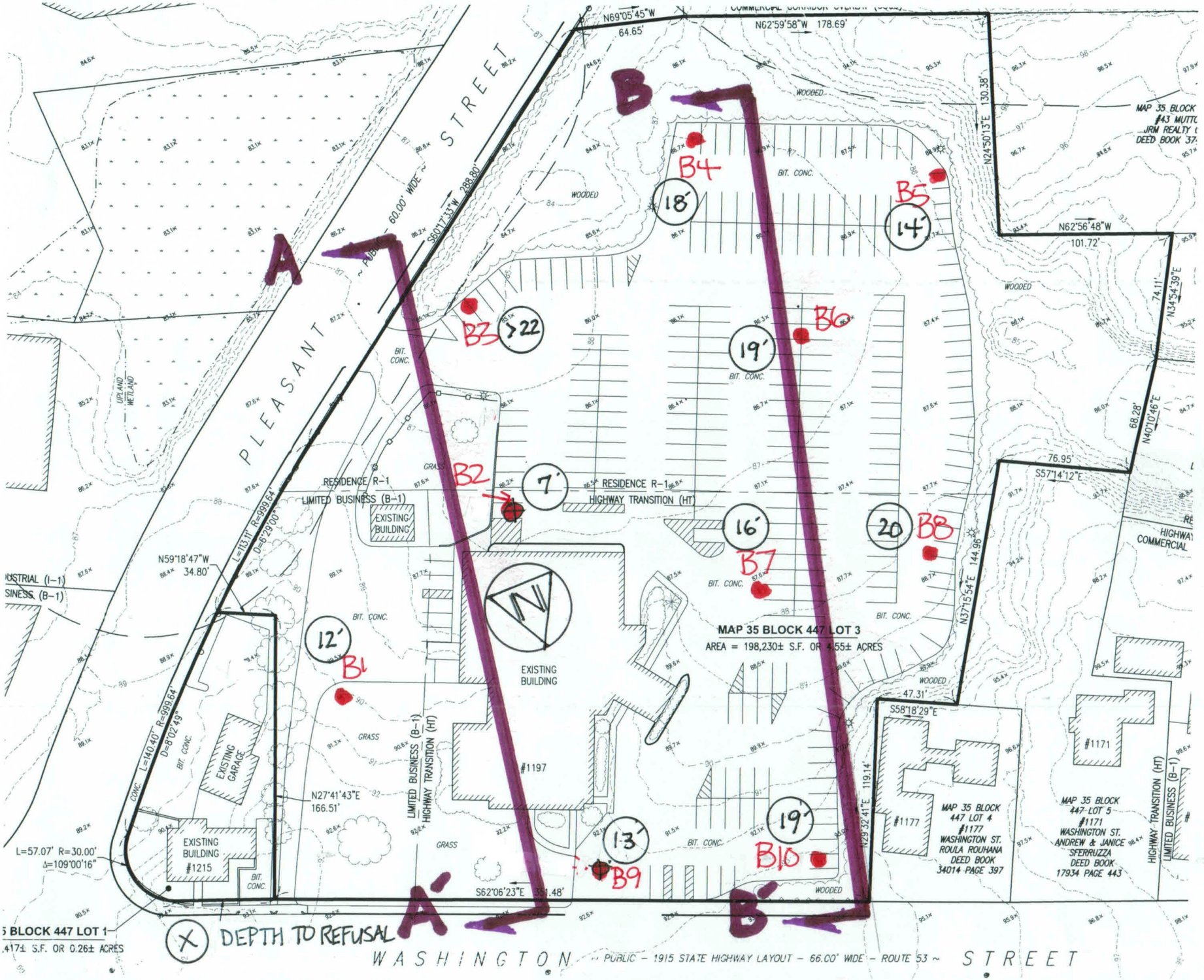
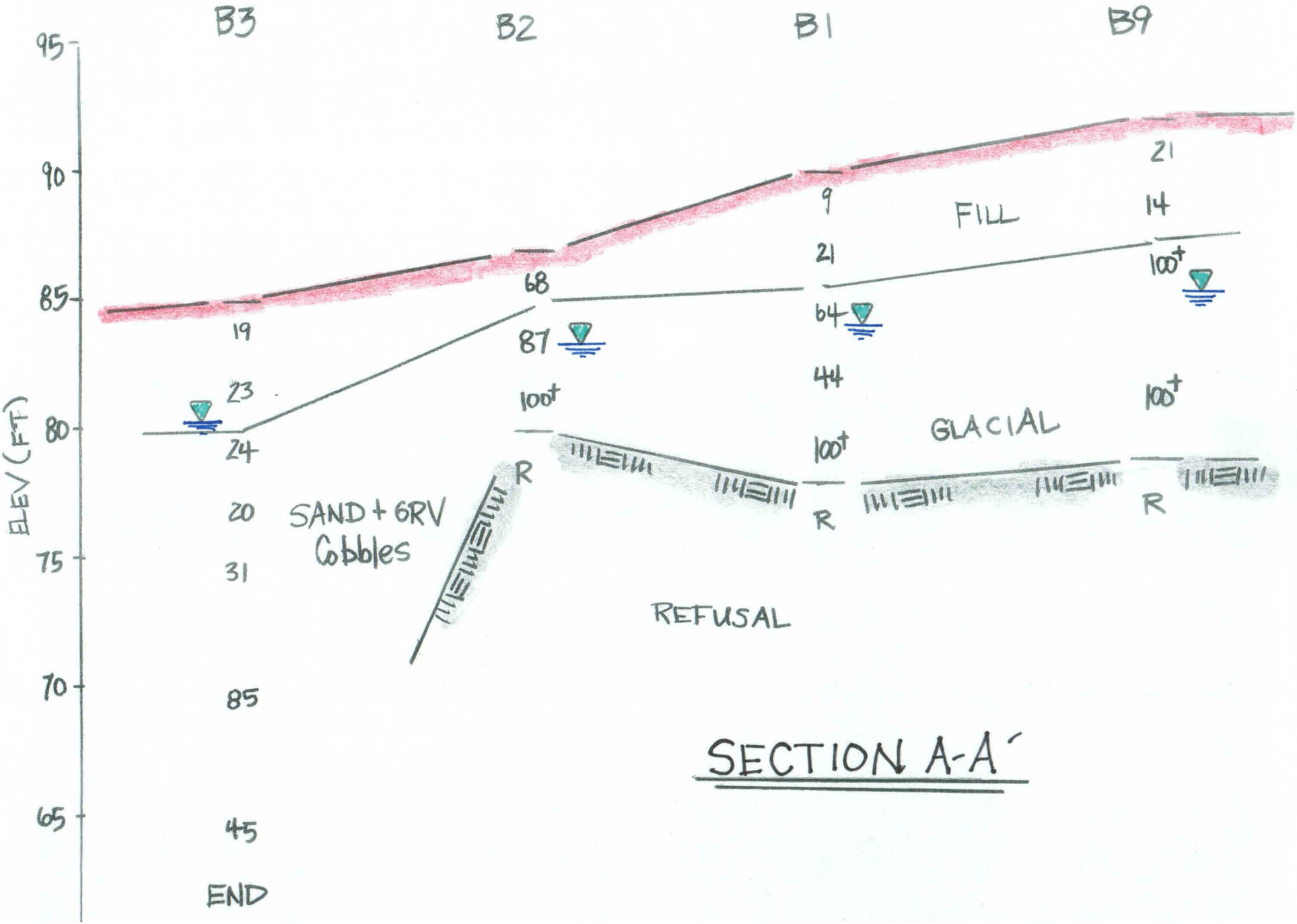
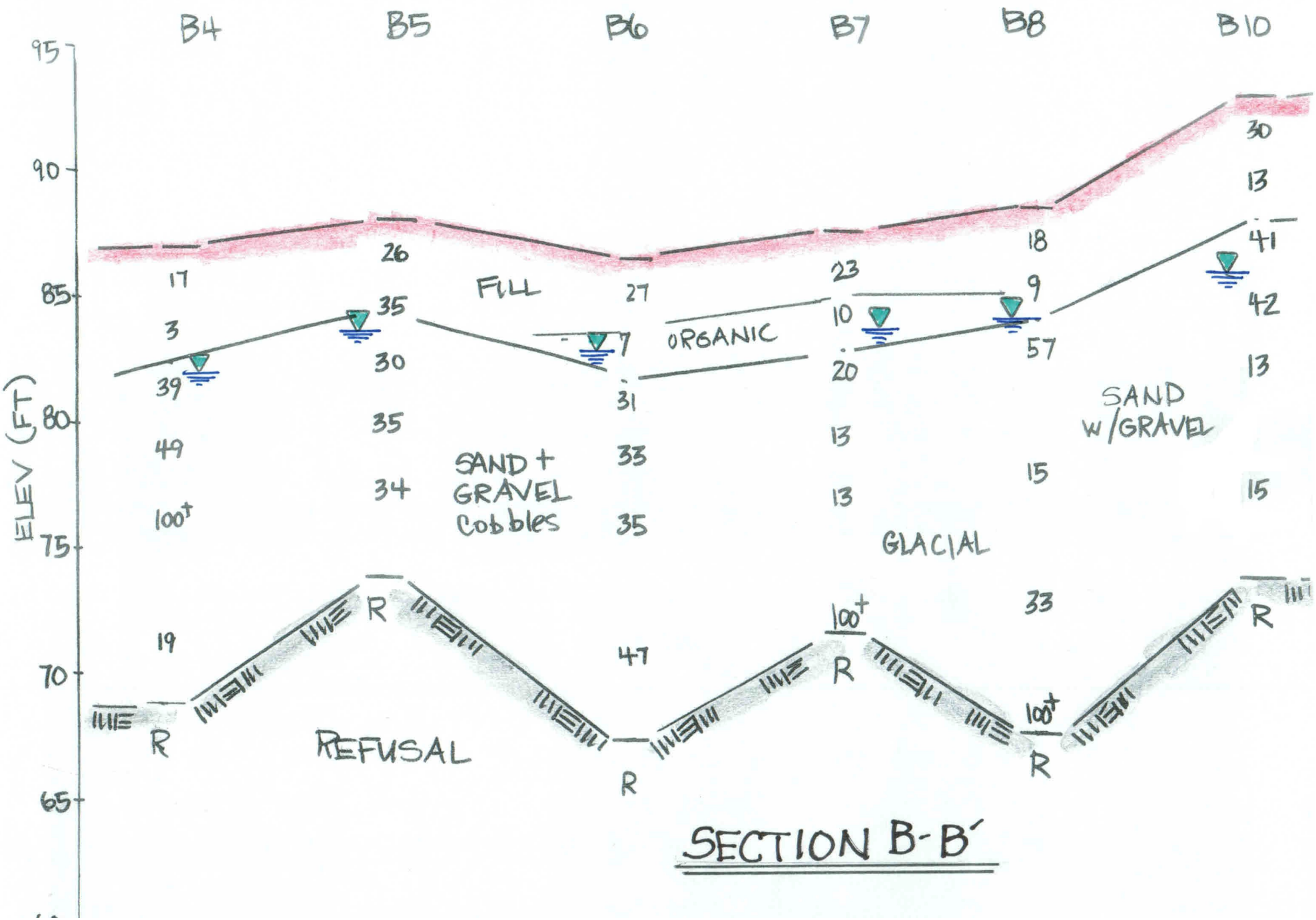

PLEASANT STREET ~ PUBLIC - 60.00' WIDE ~
WASHINGTON STREET ~ PUBLIC - 1915 STATE HIGHWAY LAYOUT - 66.00' WIDE - ROUTE 53 ~
N69°05'45"W 64.65'
N62°59'58"W 178.69'
N24°50'13"E 130.38'
N62°56'48"W 101.72'
N34°54'39"E 74.11'
N40°10'46"E 68.28'
S57°14'12"E 76.95'
N37°15'54"E 144.96'
S58°18'29"E 47.31'
N29°32'41"E 119.14'
S60°17'33"W 288.80'
S62°06'23"E 251.48'
N59°18'47"W 34.80'
N27°41'43"E 166.51'
L=113.11' R=999.64' D=6°29'00"
L=140.40' R=999.64' D=8°02'49"
L=57.07' R=30.00' Δ=109°00'16"
MAP 35 BLOCK 447 LOT 3
AREA = 198,230± S.F. OR 4.55± ACRES
MAP 35 BLOCK 447 LOT 1
,417± S.F. OR 0.26± ACRES
MAP 35 BLOCK #43 MUTTC JRM REALTY (DEED BOOK 37
MAP 35 BLOCK 447 LOT 4 #1177 WASHINGTON ST. ROULA ROUHANA DEED BOOK 34014 PAGE 397
MAP 35 BLOCK 447 LOT 5 #1171 WASHINGTON ST. ANDREW & JANICE SFERRUZZA DEED BOOK 17934 PAGE 443
RESIDENCE R-1
LIMITED BUSINESS (B-1)
RESIDENCE R-1
HIGHWAY TRANSITION (HT)
LIMITED BUSINESS (B-1)
HIGHWAY TRANSITION (HT)
HIGHWAY TRANSITION (HT)
LIMITED BUSINESS (B-1)
HIGHWAY COMMERCIAL
EXISTING BUILDING
EXISTING BUILDING
EXISTING BUILDING #1215
EXISTING GARAGE
#1197
#1177
#1171
UPLAND WETLAND
BIT. CONC.
GRASS
WOODED
A
A'
B
B'
B1
B2
B3
B4
B5
B6
B7
B8
B9
B10
12'
7'
>22
18'
14'
19'
16'
20
13'
19'
DEPTH TO REFUSAL


B3
B2
B1
B9
95
90
85
80
75
70
65
ELEV (FT)
19
23
24
20
31
85
45
END
68
87
100+
R
9
21
64
44
100+
R
21
14
100+
100+
R
FILL
GLACIAL
SAND + GRV
Cobbles
REFUSAL

SECTION A-A´


B4
B5
B6
B7
B8
B10
95
90
85
80
75
70
65
ELEV (FT)
17
3
39
49
100+
26
35
30
35
34
27
7
31
33
35
47
23
10
20
13
13
18
9
57
13
15
33
100+
30
13
41
42
13
15
33
100+
FILL
ORGANIC
SAND + GRAVEL Cobbles
GLACIAL
SAND W/GRAVEL
R
REFUSAL
SECTION B-B'

TEST BORING LOG

SOIL X, Corp.
148 Pioneer Drive
Leominster, MA 01453

Proposed Building
1197 Washington St
Weymouth, MA

B-1

21-08030

Ground Elevation: 90 ft+/-
Date Started: 8/31/2021
Date Finished: 8/31/2021
Driller: GG
Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING AT	STABILIZATION
8/31/21	6 ft	n/a	

Depth Ft.	Casing bl/ft	Sample No.	Sample Pen/Rec	Sample Depth	Sample Blows/6"	Strata Break	Visual Identification of Soil and / or Rock Sample
1		1	13"	0'0"-2'0"	4-4-5-6		Dark Brown, silty Sand w/ gravel, minor loam
		2	13"	2'0"-4'0"	4-6-15-19	3'	Brown, fine to coarse Sand & Gravel, trace silt, dry (FILL)
5		3	18"	5'0"-7'0"	30-32-32-41		
		4	5"	7'0"-9'0"	11-21-23-24		Brown, fine to coarse Sand & Gravel, trace silt, cobbles, wet
10		5	10"	10'0"-11'1"	14-37-50/1"	12'	Brown, f-c Sand & Gravel, little silt, wet
							Refusal at 12 ft
							Ground Water encountered 6 ft at completion
15							
20							
25							

Notes: Hollow Stem Auger 4 ¼

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.

Trace	0 to 10%
Little	10 to 20%
Some	20 to 35%
And	35% to 50%

	CASING	SAMPLE	CORE TYPE
ID SIZE (IN)		SS	
HAMMER WGT (LB)		140 lb.	
HAMMER FALL (IN)		30"	

TEST BORING LOG

SOIL X, Corp.
148 Pioneer Drive
Leominster, MA 01453

Proposed Building
1197 Washington St
Weymouth, MA

B-2

21-08030

Ground Elevation: 87 ft+/-
Date Started: 8/31/2021
Date Finished: 8/31/2021
Driller: GG
Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING AT	STABILIZATION
8/31/21	3 ft		

Depth Ft.	Casing bl/ft	Sample No.	Sample Pen/Rec	Sample Depth	Sample Blows/6"	Strata Break	Visual Identification of Soil and / or Rock Sample
						4"	ASPHALT
1		1	15"	0'5"-2'5"	10-27-41-25		
		2	18"	2'5"-4'5"	32-40-47-41		Brown, fine to coarse Sand & Gravel, trace silt, cobbles
5		3	6"	5'0"-5'8"	18-50/2"		
						6'6"	Refusal at 6'6"
							2nd Attempt Refusal at 7 ft
							Ground Water encountered 3 ft at completion
10							
15							
20							
25							

Notes: Hollow Stem Auger 4 ¼

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.

Trace	0 to 10%
Little	10 to 20%
Some	20 to 35%
And	35% to 50%

	CASING	SAMPLE	CORE TYPE
ID SIZE (IN)		SS	
HAMMER WGT (LB)		140 lb.	
HAMMER FALL (IN)		30"	

TEST BORING LOG

SOIL X, Corp.
148 Pioneer Drive
Leominster, MA 01453

Proposed Building
1197 Washington St
Weymouth, MA

B-3

21-08030

Ground Elevation: 85 ft+/-
Date Started: 8/31/2021
Date Finished: 8/31/2021
Driller: GG
Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING AT	STABILIZATION
8/31/21	4 ft		

Depth Ft.	Casing bl/ft	Sample No.	Pen/ Rec	Depth	Blows/6"	Strata Break	Visual Identification of Soil and / or Rock Sample
						4"	ASPHALT
1		1	11"	0'5"-2'5"	10-10-9-7		Grey, f-c Sand & Gravel, trace silt, dry (GRAVEL BASE)
						2'	
		2	11"	2'5"-4'5"	6-10-13-15		Dark Brown, loamy, silty Sand, trace gravel, trace organics, dry (FILL)
						4'6"	
5		3	15"	5'0"-7'0"	7-12-12-11		Brown, f-c Sand & Gravel, trace silt, wet
		4	13"	7'0"-9'0"	8-11-9-9		
10		5	16"	10'0"-12'0"	16-15-16-23		Brown, fine to coarse Sand & Gravel, trace silt, cobbles, wet
15		6	17"	15'0"-17'0"	20-23-52-57		Same
20		7	17"	20'0"-22'0"	18-21-24-33		Same
							End of Exploration at 22 ft Ground Water encountered 4 ft at completion
25							
30							

Notes: Hollow Stem Auger 4 ¼

			CASING	SAMPLE	CORE TYPE
Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose,	Trace 0 to 10%	ID SIZE (IN)		SS	
10 -30 M Dense, 30 -50 Dense, 50+ V Dense.	Little 10 to 20%	HAMMER WGT (LB)		140 lb.	
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff	Some 20 to 35%	HAMMER FALL (IN)		30"	
8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.	And 35% to 50%				

TEST BORING LOG

SOIL X, Corp.
148 Pioneer Drive
Leominster, MA 01453

Proposed Building
1197 Washington St
Weymouth, MA

B-4

21-08030

Ground Elevation: 87 ft+/-
Date Started: 8/31/2021
Date Finished: 8/31/2021
Driller: GG
Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING AT	STABILIZATION
8/31/21	4 ft		

Depth Ft.	Casing bl/ft	Sample No.	Sample Pen/ Rec	Sample Depth	Sample Blows/6"	Strata Break	Visual Identification of Soil and / or Rock Sample
1		1	15"	0'0"-2'0"	4-7-10-20		Dark Brown, Sand, Gravel, asphalt, cinders (FILL)
		2	3"	2'0"-4'0"	4-2-1-1		Sand/ Cinders/ Clinkers, dry (FILL)
						5'	_____
5		3	18"	5'0"-7'0"	16-18-21-22		Brown, f-c Sand & Gravel, trace silt, wet
		4	21"	7'0"-9'0"	21-22-27-20		Brown, f-c Sand & Gravel, little silt, cobbles, wet
10		5	10"	10'0"-11'5"	14-24-100/5"		
							Brown, fine to coarse Sand & Gravel, trace silt, cobbles, wet
15		6	18"	15'0"-17'0"	6-9-10-9		
						18'	_____
							Refusal at 18 ft
							Ground Water encountered 4 ft at completion
20							
25							
30							

Notes: Hollow Stem Auger 4 ¼

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.

Trace	0 to 10%
Little	10 to 20%
Some	20 to 35%
And	35% to 50%

	CASING	SAMPLE	CORE TYPE
ID SIZE (IN)		SS	
HAMMER WGT (LB)		140 lb.	
HAMMER FALL (IN)		30"	

TEST BORING LOG

SOIL X, Corp.
148 Pioneer Drive
Leominster, MA 01453

Proposed Building
1197 Washington St
Weymouth, MA

B-5

21-08030

Ground Elevation: 88 ft+/-
Date Started: 8/31/2021
Date Finished: 8/31/2021
Driller: GG
Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING AT	STABILIZATION
8/31/21	3 ft		

Depth Ft.	Casing bl/ft	Sample No.	Sample Pen/Rec	Sample Depth	Sample Blows/6"	Strata Break	Visual Identification of Soil and / or Rock Sample
						4"	ASPHALT
1		1	16"	0'5"-2'5"	8-12-14-14		Brown, f-c Sand & Gravel, trace silt, dry
		2	18"	2'5"-4'5"	13-17-18-24		Same, wet
5		3	13"	5'0"-7'0"	12-15-15-21		Brown, fine to coarse Sand & Gravel, trace/little silt, cobbles
		4	17"	7'0"-9'0"	14-15-20-21		
10		5	16"	10'0"-12'0"	10-14-20-25		
						14'	Refusal at 14 ft
15							Ground Water encountered 3 ft at completion
20							
25							

Notes: Hollow Stem Auger 4 ¼

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.

Trace 0 to 10%
Little 10 to 20%
Some 20 to 35%
And 35% to 50%

	CASING	SAMPLE	CORE TYPE
ID SIZE (IN)		SS	
HAMMER WGT (LB)		140 lb.	
HAMMER FALL (IN)		30"	

TEST BORING LOG

SOIL X, Corp.
148 Pioneer Drive
Leominster, MA 01453

Proposed Building
1197 Washington St
Weymouth, MA

B-6

21-08030

Ground Elevation: 86.5 ft+/-
Date Started: 8/31/2021
Date Finished: 8/31/2021
Driller: GG
Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING AT	STABILIZATION
8/31/21	3 ft		

Depth Ft.	Casing bl/ft	Sample No.	Pen/ Rec	Depth	Blows/6"	Strata Break	Visual Identification of Soil and / or Rock Sample
						4"	ASPHALT
1		1	14"	0'5"-2'5"	8-12-15-17		Black, fine to coarse Sand & Gravel, little silt (FILL)
		2	11"	2'5"-4'5"	5-4-3-3	2'5"	Dark Brown, Organic Silt, wet (ORGANIC)
						4'6"	
5		3	15"	5'0"-7'0"	10-14-17-20		
		4	16"	7'0"-9'0"	11-15-18-21		
10		5	16"	10'0"-12'0"	12-15-20-31		Brown, fine to coarse Sand & Gravel, trace silt, cobbles, wet
15		6	17"	15'0"-17'0"	14-21-26-32		
						19'	Refusal at 19 ft
20							Ground Water encountered 3 ft at completion
25							

Notes: Hollow Stem Auger 4 ¼

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.

Trace 0 to 10%
Little 10 to 20%
Some 20 to 35%
And 35% to 50%

	CASING	SAMPLE	CORE TYPE
ID SIZE (IN)		SS	
HAMMER WGT (LB)		140 lb.	
HAMMER FALL (IN)		30"	

TEST BORING LOG

SOIL X, Corp.
148 Pioneer Drive
Leominster, MA 01453

Proposed Building
1197 Washington St
Weymouth, MA

B-7

21-08030

Ground Elevation: 87.5 ft+/-
Date Started: 8/31/2021
Date Finished: 8/31/2021
Driller: GG
Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING AT	STABILIZATION
8/31/21	3 ft		

Depth Ft.	Casing bl/ft	Sample No.	Pen/ Rec	Depth	Blows/6"	Strata Break	Visual Identification of Soil and / or Rock Sample
						3"	ASPHALT
1		1	10"	0'3"-2'3"	7-12-11-11		Dark Brown, fine to medium Sand & Gravel, trace silt (FILL)
						2'	
		2	12"	2'3"-4'3"	6-5-5-6		Dark Brown, loamy, Sand & Silt, trace gravel, wet (SUBSOIL)
						5'	
5		3	10"	5'0"-7'0"	7-8-12-8		Brown, f-c Sand & Gravel, trace silt, wet
		4	15"	7'0"-9'0"	5-6-7-6		Brown, fine to coarse Sand w/ Gravel, trace silt, wet
10		5	11"	10'0"-12'0"	6-6-7-6		Same
						14'	
15		6	3"	15'0"-15'3"	100/3"	16'	Tan, fine to coarse Sand, some silt, little gravel, wet Refusal at 16 ft Ground Water encountered 3 ft at completion
20							
25							

Notes: Hollow Stem Auger 4 ¼

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.

Trace	0 to 10%
Little	10 to 20%
Some	20 to 35%
And	35% to 50%

	CASING	SAMPLE	CORE TYPE
ID SIZE (IN)		SS	
HAMMER WGT (LB)		140 lb.	
HAMMER FALL (IN)		30"	

TEST BORING LOG

SOIL X, Corp.
148 Pioneer Drive
Leominster, MA 01453

Proposed Building
1197 Washington St
Weymouth, MA

B-8

21-08030

Ground Elevation: 88.5 ft+/-
Date Started: 8/31/2021
Date Finished: 8/31/2021
Driller: GG
Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING AT	STABILIZATION
8/31/21	4 ft		

Depth Ft.	Casing bl/ft	Sample No.	Sample Pen/Rec	Sample Depth	Sample Blows/6"	Strata Break	Visual Identification of Soil and / or Rock Sample
						3"	ASPHALT
1		1	7"	0'3"-2'3"	7-8-10-10		Dark Brown, Sand & Gravel, little silt, minor organic (FILL)
		2	7"	2'3"-4'3"	8-5-4-4		
						5'	
5		3	15"	5'0"-6'11"	22-27-30-100/5"		Dark Brown, f-c Sand & Gravel, trace silt, cobbles, bldrs, wet
10		4	12"	10'0"-12'0"	5-7-8-15		Brown, fine to medium Sand, little silt, little gravel, wet
15		5	15"	15'0"-17'0"	12-18-15-12		Brown, f-c Sand & Gravel, trace silt, cobbles, wet
20		6	3"	20'0"-20'3"	100/3"	20'3"	Refusal at 20'3" Ground Water encountered 4 ft at completion
25							
30							

Notes: Hollow Stem Auger 4 ¼

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.

Trace 0 to 10%
Little 10 to 20%
Some 20 to 35%
And 35% to 50%

	CASING	SAMPLE	CORE TYPE
ID SIZE (IN)		SS	
HAMMER WGT (LB)		140 lb.	
HAMMER FALL (IN)		30"	

TEST BORING LOG

SOIL X, Corp.
148 Pioneer Drive
Leominster, MA 01453

Proposed Building
1197 Washington St
Weymouth, MA

B-9

21-08030

Ground Elevation: 92 ft+/-
Date Started: 8/31/2021
Date Finished: 8/31/2021
Driller: GG
Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING AT	STABILIZATION
8/31/21	7 ft		

Depth Ft.	Casing bl/ft	Sample No.	Sample Pen/Rec	Sample Depth	Sample Blows/6"	Strata Break	Visual Identification of Soil and / or Rock Sample
						3"	ASPHALT
1		1	10"	0'3"-2'3"	7-11-10-11		Brown, f-m Sand & Gravel, trace silt, dry (FILL)
		2	9"	2'3"-4'3"	7-9-5-6	4'	Dark Brown, Sand & Gravel, dry (FILL)
5		3	10"	5'0"-6'1"	27-33-100/1"		Tan, fine to coarse Sand, little gravel, trace silt, cobbles, dry
10		4	15"	10'0"-11'10"	8-18-23-100/4"		Brown, f-c Sand & Gravel, trace silt, cobbles, wet
						13'	Refusal at 13 ft
15							Ground Water encountered 7 ft at completion
20							
25							

Notes: Hollow Stem Auger 4 ¼

Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.

Trace	0 to 10%
Little	10 to 20%
Some	20 to 35%
And	35% to 50%

	CASING	SAMPLE	CORE TYPE
ID SIZE (IN)		SS	
HAMMER WGT (LB)		140 lb.	
HAMMER FALL (IN)		30"	

TEST BORING LOG

SOIL X, Corp.
148 Pioneer Drive
Leominster, MA 01453

Proposed Building
1197 Washington St
Weymouth, MA

B-10

21-08030

Ground Elevation: 93 ft+/-
Date Started: 8/31/2021
Date Finished: 8/31/2021
Driller: GG
Soil Engineer/Geologist:

GROUNDWATER OBSERVATIONS

DATE	DEPTH	CASING AT	STABILIZATION
8/31/21	7 ft		

Depth Ft.	Casing bl/ft	Sample No.	Sample Pen/Rec	Sample Depth	Sample Blows/6"	Strata Break	Visual Identification of Soil and / or Rock Sample
						3"	ASPHALT
1		1	11"	0'3"-2'3"	17-20-10-10		Brown, f-m Sand & Gravel, trace silt, dry
						2'	
		2	5"	2'3"-4'3"	8-7-6-6		Rust Brown, silty Sand, little gravel, trace organic silt, dry (SUBSOIL)
						5'	
5		3	10"	5'0"-7'0"	15-18-23-30		Brown, f-m Sand, little gravel, trace silt, dry
		4	6"	7'0"-9'0"	16-21-21-30		Brown, fine to coarse Sand & Gravel, trace silt, wet
10		5	15"	10'0"-12'0"	7-7-6-6		Brown, Fine Sand, some silt, wet
15		6	8"	15'0"-17'0"	5-6-9-9		Brown, f-c Sand, trace gravel, trace silt, wet
						19'	Refusal at 19 ft Ground Water encountered 7 ft at completion
20							
25							

Notes: Hollow Stem Auger 4 ¼

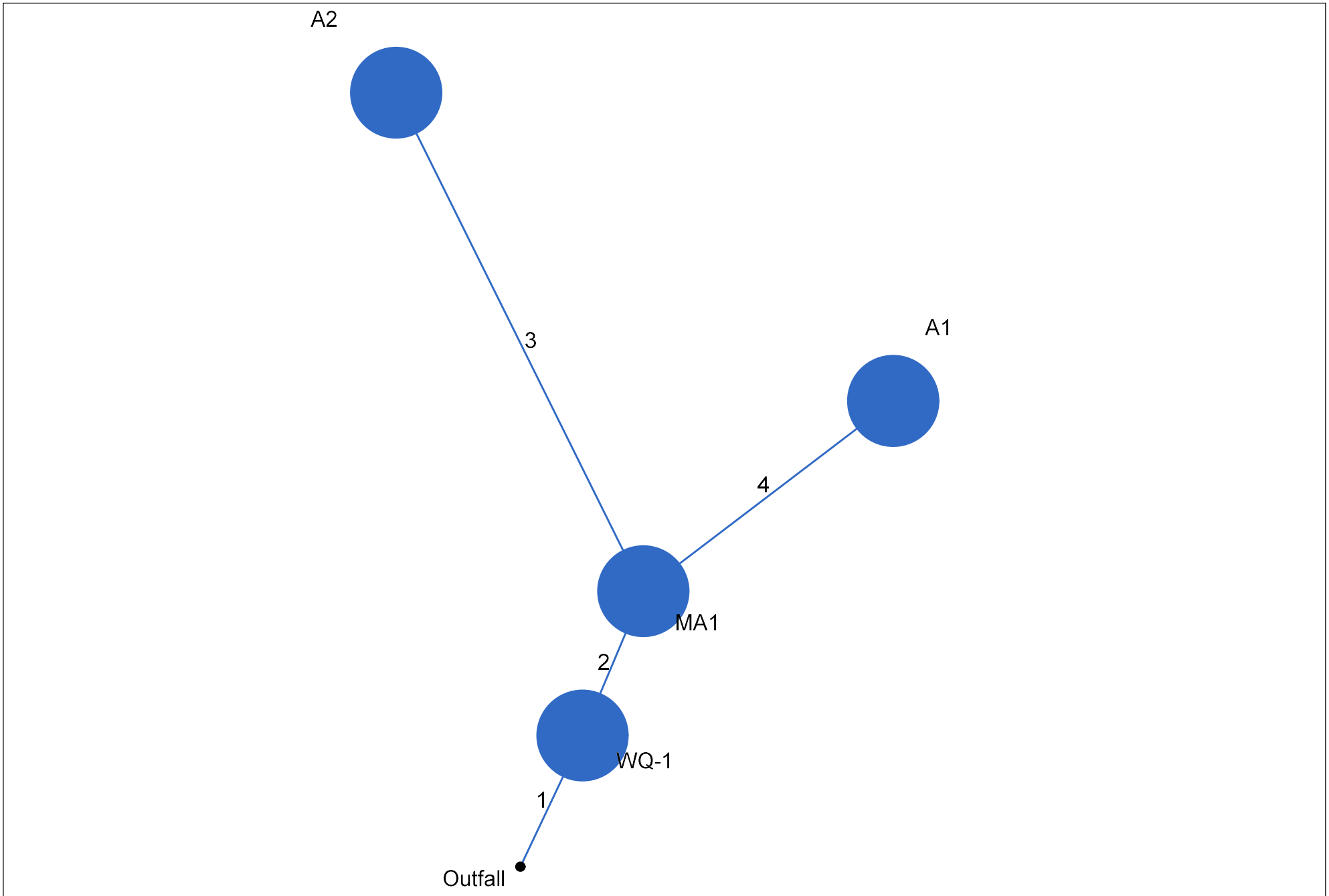
Cohesionless: 0 - 4 V. Loose, 4 - 10 Loose, 10 -30 M Dense, 30 -50 Dense, 50+ V Dense.
Cohesive: 0 -2 V Soft, 2 -4 Soft, 4 -8 M Stiff 8 -15 Stiff, 15 -30 V. Stiff, 30 + Hard.

Trace	0 to 10%
Little	10 to 20%
Some	20 to 35%
And	35% to 50%

	CASING	SAMPLE	CORE TYPE
ID SIZE (IN)		SS	
HAMMER WGT (LB)		140 lb.	
HAMMER FALL (IN)		30"	

SECTION 7 – HYDRAULIC PIPE SIZING

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



Project File: network A.stm	Number of lines: 4	Date: 6/23/2022

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	5.856	0.00	0.23	0.00	0.00	0.15	0.0	7.1	5.3	0.80	2.57	1.02	12	0.52	88.99	89.02	89.99	89.99	0.00	93.02	Pipe - (570)
2	1	6.021	0.00	0.23	0.00	0.00	0.15	0.0	7.0	5.3	0.80	2.52	1.03	12	0.50	89.02	89.05	89.99	90.00	93.02	92.94	Pipe - (569) (1)
3	2	21.948	0.19	0.19	0.65	0.12	0.12	6.0	6.0	5.6	0.69	2.52	1.48	12	0.50	89.38	89.49	90.01	90.02	92.94	92.65	Pipe - (569)
4	2	13.189	0.04	0.04	0.66	0.03	0.03	6.0	6.0	5.6	0.15	2.59	0.21	12	0.53	89.15	89.22	90.01	90.01	92.94	92.65	Pipe - (545)

Project File: network A.stm

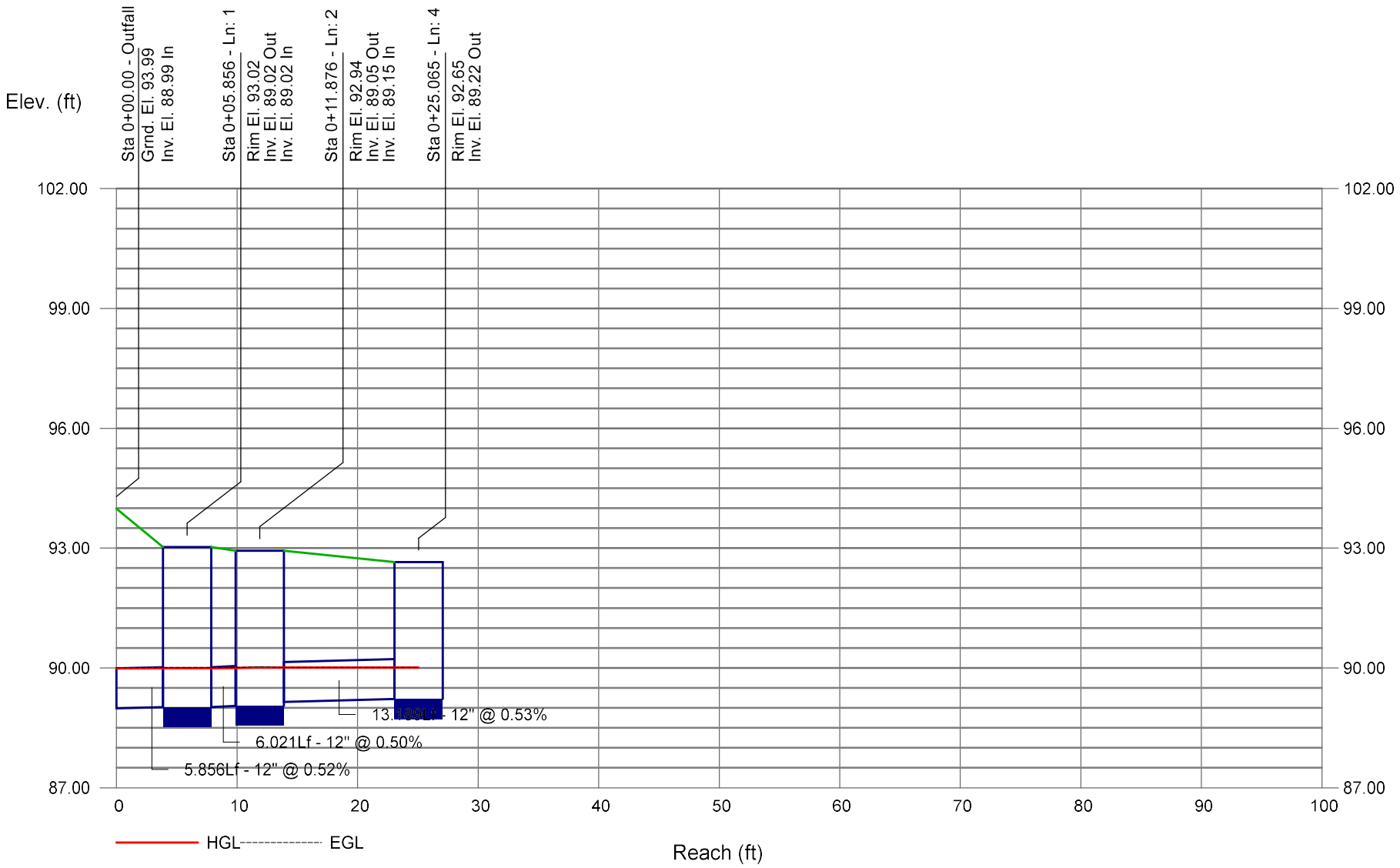
Number of lines: 4

Run Date: 6/23/2022

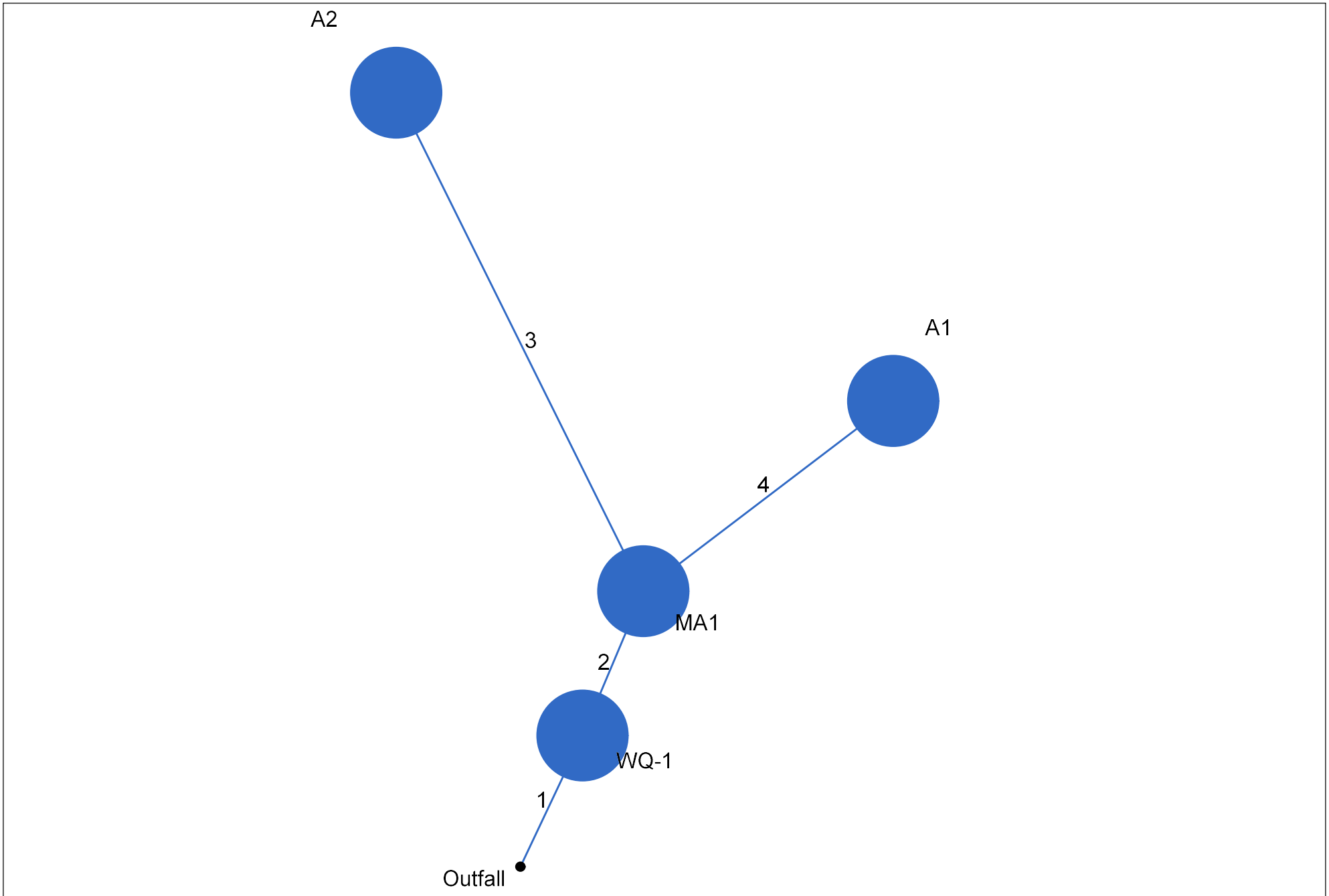
NOTES:Intensity = 59.21 / (Inlet time + 12.50) ^ 0.81; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Profile

Proj. file: network A.stm



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



Project File: network A.stm	Number of lines: 4	Date: 6/23/2022

Storm Sewer Tabulation

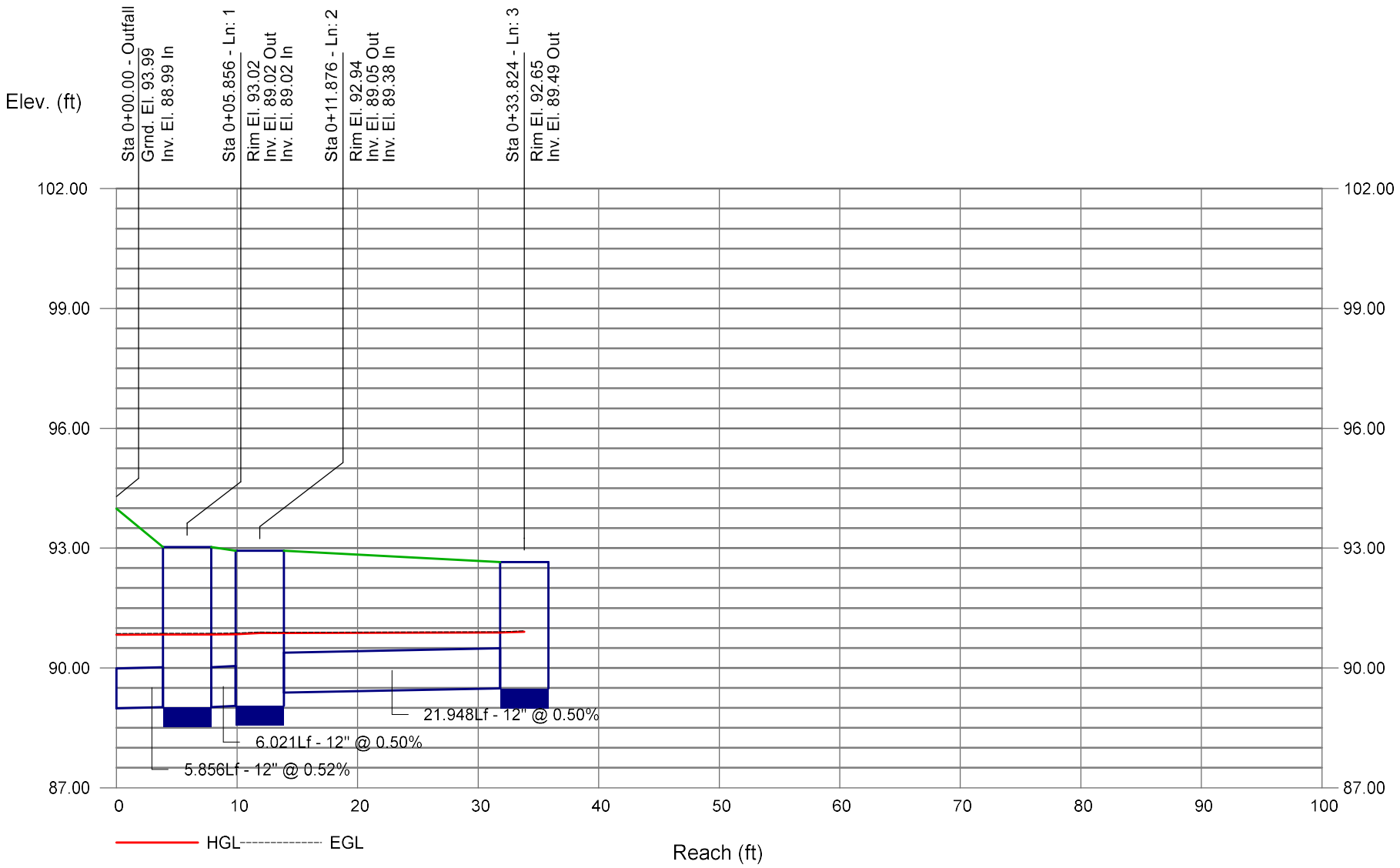
Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	5.856	0.00	0.23	0.00	0.00	0.15	0.0	6.9	7.3	1.09	2.57	1.39	12	0.52	88.99	89.02	90.83	90.84	0.00	93.02	Pipe - (570)
2	1	6.021	0.00	0.23	0.00	0.00	0.15	0.0	6.9	7.3	1.10	2.52	1.40	12	0.50	89.02	89.05	90.84	90.85	93.02	92.94	Pipe - (569) (1)
3	2	21.948	0.19	0.19	0.65	0.12	0.12	6.0	6.0	7.5	0.93	2.52	1.18	12	0.50	89.38	89.49	90.87	90.89	92.94	92.65	Pipe - (569)
4	2	13.189	0.04	0.04	0.66	0.03	0.03	6.0	6.0	7.5	0.20	2.59	0.25	12	0.53	89.15	89.22	90.87	90.87	92.94	92.65	Pipe - (545)

Project File: network A.stm | Number of lines: 4 | Run Date: 6/23/2022

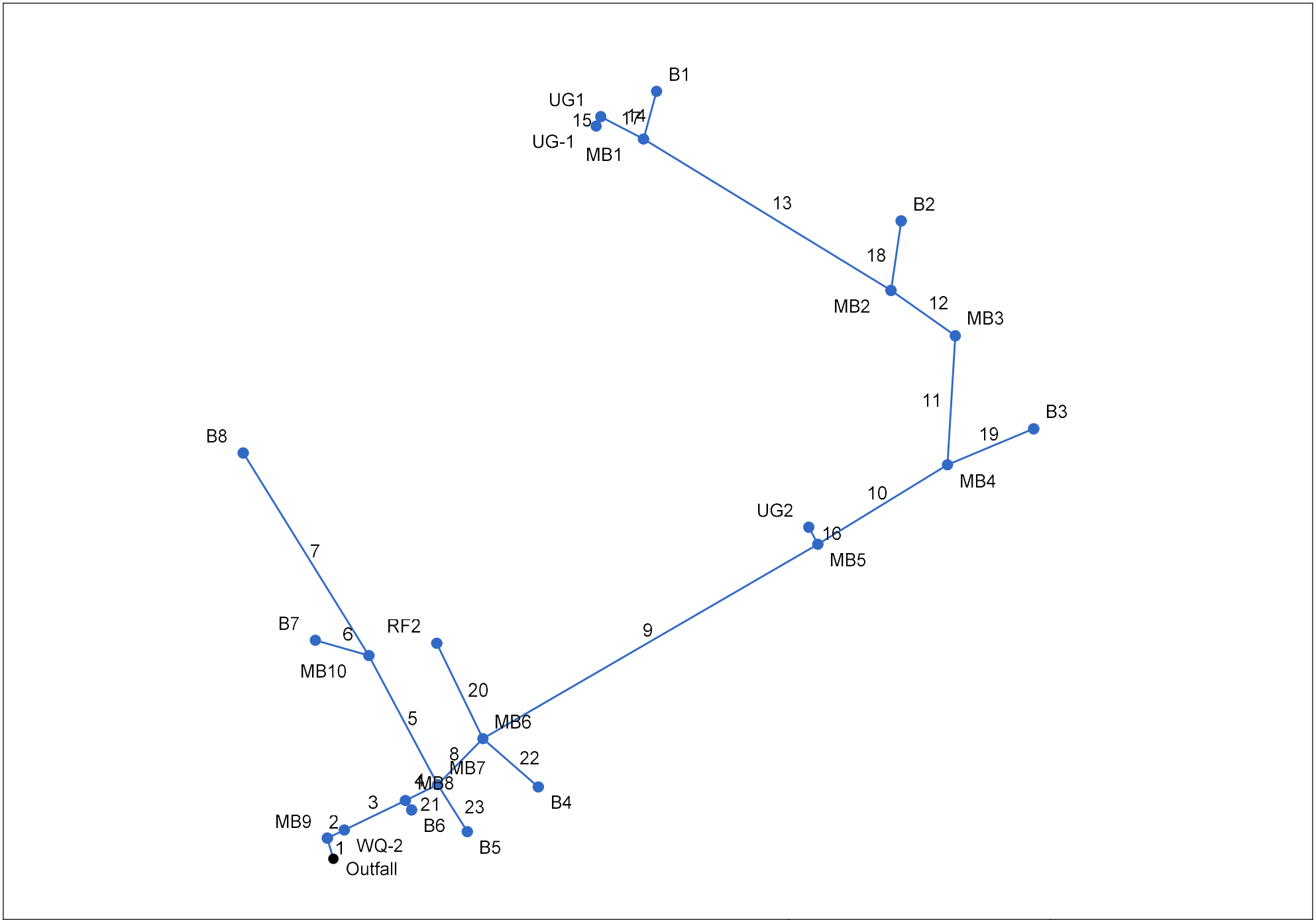
NOTES:Intensity = 197.93 / (Inlet time + 22.50) ^ 0.98; Return period =Yrs. 100 ; c = cir e = ellip b = box

Storm Sewer Profile

Proj. file: network A.stm



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



Project File: network B 10 YEAR.stm	Number of lines: 23	Date: 6/23/2022

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	9.000	0.00	1.44	0.00	0.00	1.00	0.0	8.4	5.1	7.39	16.86	5.06	24	0.56	84.12	84.17	85.05	85.14	86.06	90.18	Pipe - (552)
2	1	8.000	0.00	1.44	0.00	0.00	1.00	0.0	8.4	5.1	7.40	15.99	4.96	24	0.50	84.27	84.31	85.23	85.28	90.18	89.89	Pipe - (551) (2)
3	2	28.707	0.00	1.44	0.00	0.00	1.00	0.0	8.3	5.1	7.41	16.35	4.93	24	0.52	84.31	84.46	85.28	85.43	89.89	88.67	Pipe - (551)
4	3	15.164	0.00	1.35	0.00	0.00	0.93	0.0	8.3	5.1	7.09	15.37	4.79	24	0.46	84.56	84.63	85.51	85.58	88.67	88.53	Pipe - (551) (1)
5	4	62.082	0.00	0.18	0.00	0.00	0.12	0.0	6.7	5.4	0.64	7.12	1.81	12	4.00	84.96	87.44	85.94	87.78	88.53	94.95	Pipe - (585)
6	5	23.500	0.06	0.06	0.71	0.04	0.04	6.0	6.0	5.6	0.24	2.44	1.97	12	0.47	91.32	91.43	91.53	91.64	94.95	94.60	Pipe - (588)
7	5	101.009	0.12	0.12	0.63	0.08	0.08	6.0	6.0	5.6	0.42	2.51	2.37	12	0.50	90.93	91.43	91.21	91.71	94.95	94.60	Pipe - (587)
8	4	27.304	0.00	0.99	0.00	0.00	0.70	0.0	8.1	5.1	5.92	16.20	3.78	24	0.51	84.73	84.87	85.94	85.73	88.53	88.86	Pipe - (550)
9	8	164.000	0.00	0.59	0.00	0.00	0.38	0.0	7.6	5.2	4.35	10.40	5.08	18	0.98	85.42	87.03	86.10	87.83	88.86	93.02	Pipe - (549)
10	9	64.275	0.00	0.59	0.00	0.00	0.38	0.0	7.3	5.3	3.82	7.41	4.23	18	0.50	87.13	87.45	87.89	88.21	93.02	92.36	Pipe - (548)
11	10	54.903	0.00	0.40	0.00	0.00	0.24	0.0	7.1	5.3	3.10	7.36	3.34	18	0.49	87.55	87.82	88.45	88.52	92.36	92.59	Pipe - (547)
12	11	33.300	0.00	0.40	0.00	0.00	0.24	0.0	6.9	5.4	3.11	7.50	3.65	18	0.51	87.92	88.09	88.72	88.76	92.59	92.56	Pipe - (547) (1)
13	12	122.865	0.00	0.23	0.00	0.00	0.13	0.0	6.4	5.5	2.51	2.51	3.64	12	0.50	88.19	88.80	89.01	89.62	92.56	93.15	Pipe - (546)
14	13	20.312	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.81	2.50	2.42	12	0.49	88.88	88.98	89.82	89.86	93.15	92.96	Pipe - (545) (1) (1)
15	14	4.300	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.81	2.43	2.33	12	0.47	88.98	89.00	89.95	89.96	92.96	93.00	Pipe - (545) (1) (1)
16	9	8.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.55	2.52	2.57	12	0.50	88.94	88.98	89.26	89.30	93.02	93.21	Pipe - (555) (1)
17	13	20.819	0.23	0.23	0.55	0.13	0.13	6.0	6.0	5.6	0.71	2.59	0.98	12	0.53	88.90	89.01	89.82	89.82	93.15	92.17	Pipe - (553)
18	12	29.724	0.17	0.17	0.68	0.12	0.12	6.0	6.0	5.6	0.65	2.53	2.70	12	0.50	88.76	88.91	89.10	89.25	92.56	92.08	Pipe - (554)
19	10	39.529	0.19	0.19	0.73	0.14	0.14	6.0	6.0	5.6	0.77	2.53	2.83	12	0.51	88.47	88.67	88.85	89.05	92.36	91.84	Pipe - (555)
20	8	45.000	0.12	0.12	0.90	0.11	0.11	6.0	6.0	5.6	0.60	6.41	2.84	12	3.24	85.42	86.88	85.73	87.20	88.86	90.31	Pipe - (550) (1)
21	3	4.784	0.09	0.09	0.73	0.07	0.07	6.0	6.0	5.6	0.37	2.30	2.15	12	0.42	85.37	85.39	85.64	85.66	88.67	88.56	Pipe - (558) (1)
22	8	31.053	0.28	0.28	0.74	0.21	0.21	6.0	6.0	5.6	1.16	2.48	2.01	12	0.48	84.97	85.12	85.73	85.75	88.86	87.79	Pipe - (556)

Project File: network B 10 YEAR.stm

Number of lines: 23

Run Date: 6/23/2022

NOTES:Intensity = 59.21 / (Inlet time + 12.50) ^ 0.81; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Tabulation

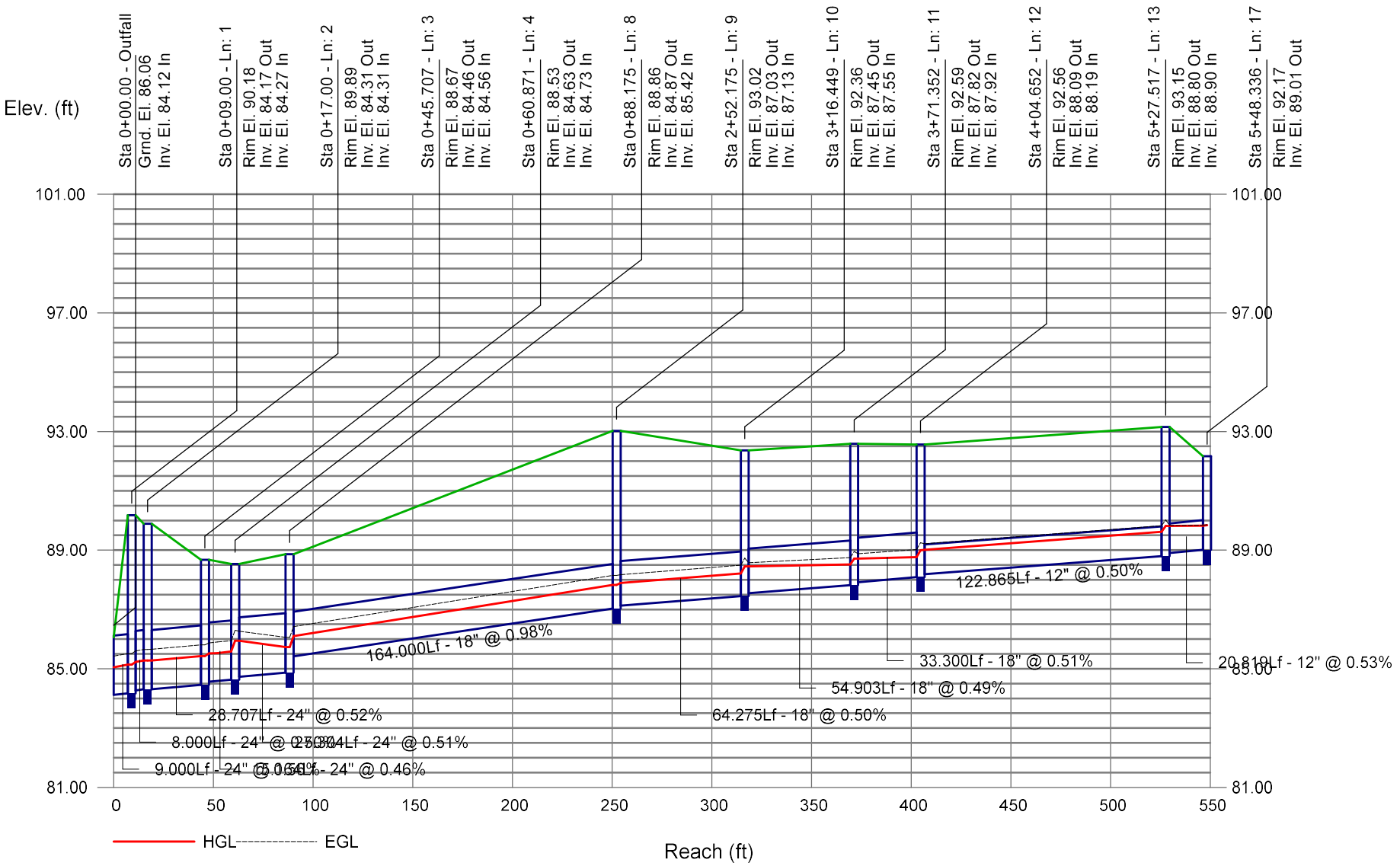
Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
23	4	23.550	0.18	0.18	0.64	0.12	0.12	6.0	6.0	5.6	0.64	2.54	0.86	12	0.51	84.96	85.08	85.94	85.95	88.53	87.74	Pipe - (558)

Project File: network B 10 YEAR.stm | Number of lines: 23 | Run Date: 6/23/2022

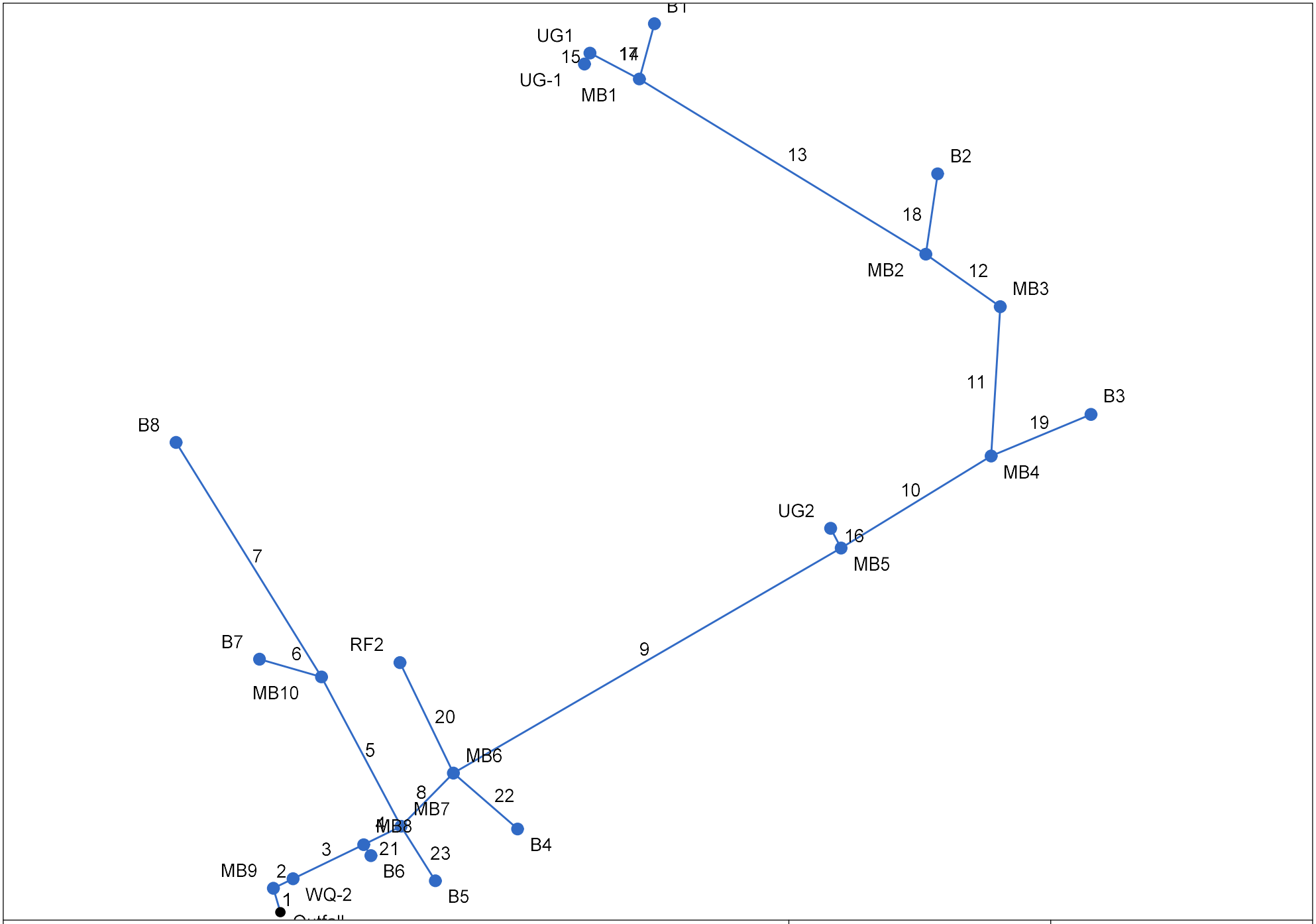
NOTES:Intensity = 59.21 / (Inlet time + 12.50) ^ 0.81; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Profile

Proj. file: network B 10 YEAR.stm



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



Project File: network B 100 YEAR.stm	Number of lines: 23	Date: 6/23/2022

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	9.000	0.00	1.44	0.00	0.00	1.00	0.0	8.3	7.0	12.27	16.86	3.91	24	0.56	84.12	84.17	86.12	86.14	86.06	90.18	Pipe - (552)
2	1	8.000	0.00	1.44	0.00	0.00	1.00	0.0	8.3	7.0	12.28	15.99	3.91	24	0.50	84.27	84.31	86.38	86.40	90.18	89.89	Pipe - (551) (2)
3	2	28.707	0.00	1.44	0.00	0.00	1.00	0.0	8.1	7.0	12.31	16.35	3.92	24	0.52	84.31	84.46	86.44	86.53	89.89	88.67	Pipe - (551)
4	3	15.164	0.00	1.35	0.00	0.00	0.93	0.0	8.1	7.0	11.86	15.37	3.78	24	0.46	84.56	84.63	86.76	86.80	88.67	88.53	Pipe - (551) (1)
5	4	62.082	0.00	0.18	0.00	0.00	0.12	0.0	6.7	7.4	0.87	7.12	2.09	12	4.00	84.96	87.44	87.02	87.83	88.53	94.95	Pipe - (585)
6	5	23.500	0.06	0.06	0.71	0.04	0.04	6.0	6.0	7.5	0.32	2.44	2.14	12	0.47	91.32	91.43	91.57	91.68	94.95	94.60	Pipe - (588)
7	5	101.009	0.12	0.12	0.63	0.08	0.08	6.0	6.0	7.5	0.57	2.51	2.58	12	0.50	90.93	91.43	91.25	91.75	94.95	94.60	Pipe - (587)
8	4	27.304	0.00	0.99	0.00	0.00	0.70	0.0	7.9	7.1	10.24	16.20	3.26	24	0.51	84.73	84.87	87.02	87.08	88.53	88.86	Pipe - (550)
9	8	164.000	0.00	0.59	0.00	0.00	0.38	0.0	7.4	7.2	8.06	10.40	5.16	18	0.98	85.42	87.03	87.25	88.14	88.86	93.02	Pipe - (549)
10	9	64.275	0.00	0.59	0.00	0.00	0.38	0.0	7.1	7.3	6.36	7.41	3.64	18	0.50	87.13	87.45	88.65	88.86	93.02	92.36	Pipe - (548)
11	10	54.903	0.00	0.40	0.00	0.00	0.24	0.0	6.8	7.3	5.37	7.36	3.14	18	0.49	87.55	87.82	89.04	89.16	92.36	92.59	Pipe - (547)
12	11	33.300	0.00	0.40	0.00	0.00	0.24	0.0	6.6	7.4	5.38	7.50	3.27	18	0.51	87.92	88.09	89.30	89.36	92.59	92.56	Pipe - (547) (1)
13	12	122.865	0.00	0.23	0.00	0.00	0.13	0.0	6.3	7.5	4.54	2.51	5.79	12	0.50	88.19	88.80	89.52	91.52	92.56	93.15	Pipe - (546)
14	13	20.312	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	3.60	2.50	4.58	12	0.49	88.88	88.98	92.03	92.23	93.15	92.96	Pipe - (545) (1) (1)
15	14	4.300	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	3.60	2.43	4.58	12	0.47	88.98	89.00	92.56	92.60	92.96	93.00	Pipe - (545) (1) (1)
16	9	8.000	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	1.72	2.52	3.45	12	0.50	88.94	88.98	89.55	89.59	93.02	93.21	Pipe - (555) (1)
17	13	20.819	0.23	0.23	0.55	0.13	0.13	6.0	6.0	7.5	0.95	2.59	1.21	12	0.53	88.90	89.01	92.03	92.04	93.15	92.17	Pipe - (553)
18	12	29.724	0.17	0.17	0.68	0.12	0.12	6.0	6.0	7.5	0.87	2.53	1.53	12	0.50	88.76	88.91	89.52	89.53	92.56	92.08	Pipe - (554)
19	10	39.529	0.19	0.19	0.73	0.14	0.14	6.0	6.0	7.5	1.04	2.53	2.65	12	0.51	88.47	88.67	89.04	89.12	92.36	91.84	Pipe - (555)
20	8	45.000	0.12	0.12	0.90	0.11	0.11	6.0	6.0	7.5	0.81	6.41	1.99	12	3.24	85.42	86.88	87.25	87.26	88.86	90.31	Pipe - (550) (1)
21	3	4.784	0.09	0.09	0.73	0.07	0.07	6.0	6.0	7.5	0.49	2.30	0.63	12	0.42	85.37	85.39	86.76	86.76	88.67	88.56	Pipe - (558) (1)
22	8	31.053	0.28	0.28	0.74	0.21	0.21	6.0	6.0	7.5	1.56	2.48	1.99	12	0.48	84.97	85.12	87.25	87.31	88.86	87.79	Pipe - (556)

Project File: network B 100 YEAR.stm

Number of lines: 23

Run Date: 6/23/2022

NOTES:Intensity = 197.93 / (Inlet time + 22.50) ^ 0.98; Return period =Yrs. 100 ; c = cir e = ellip b = box

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
23	4	23.550	0.18	0.18	0.64	0.12	0.12	6.0	6.0	7.5	0.87	2.54	1.10	12	0.51	84.96	85.08	87.02	87.04	88.53	87.74	Pipe - (558)

Project File: network B 100 YEAR.stm

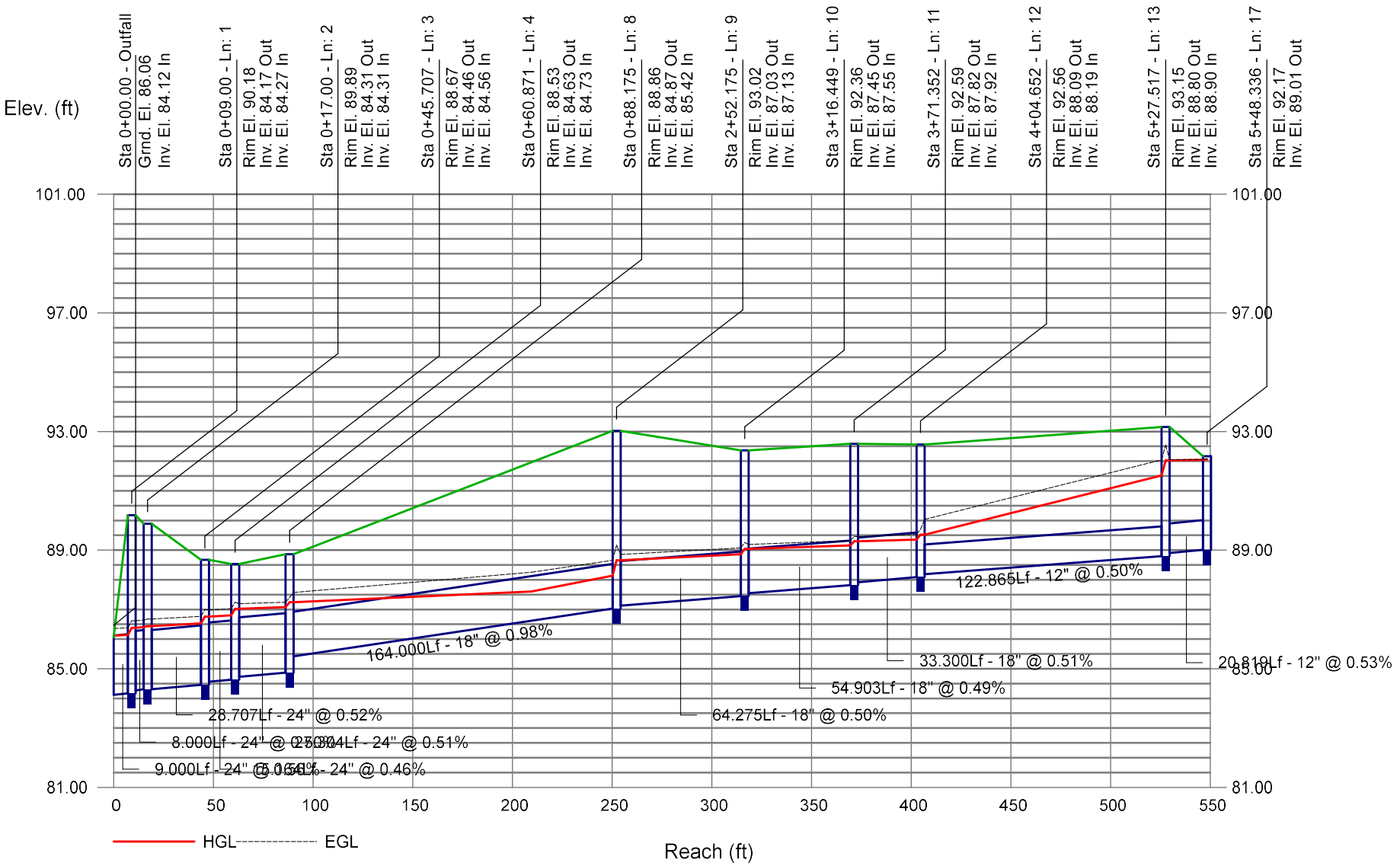
Number of lines: 23

Run Date: 6/23/2022

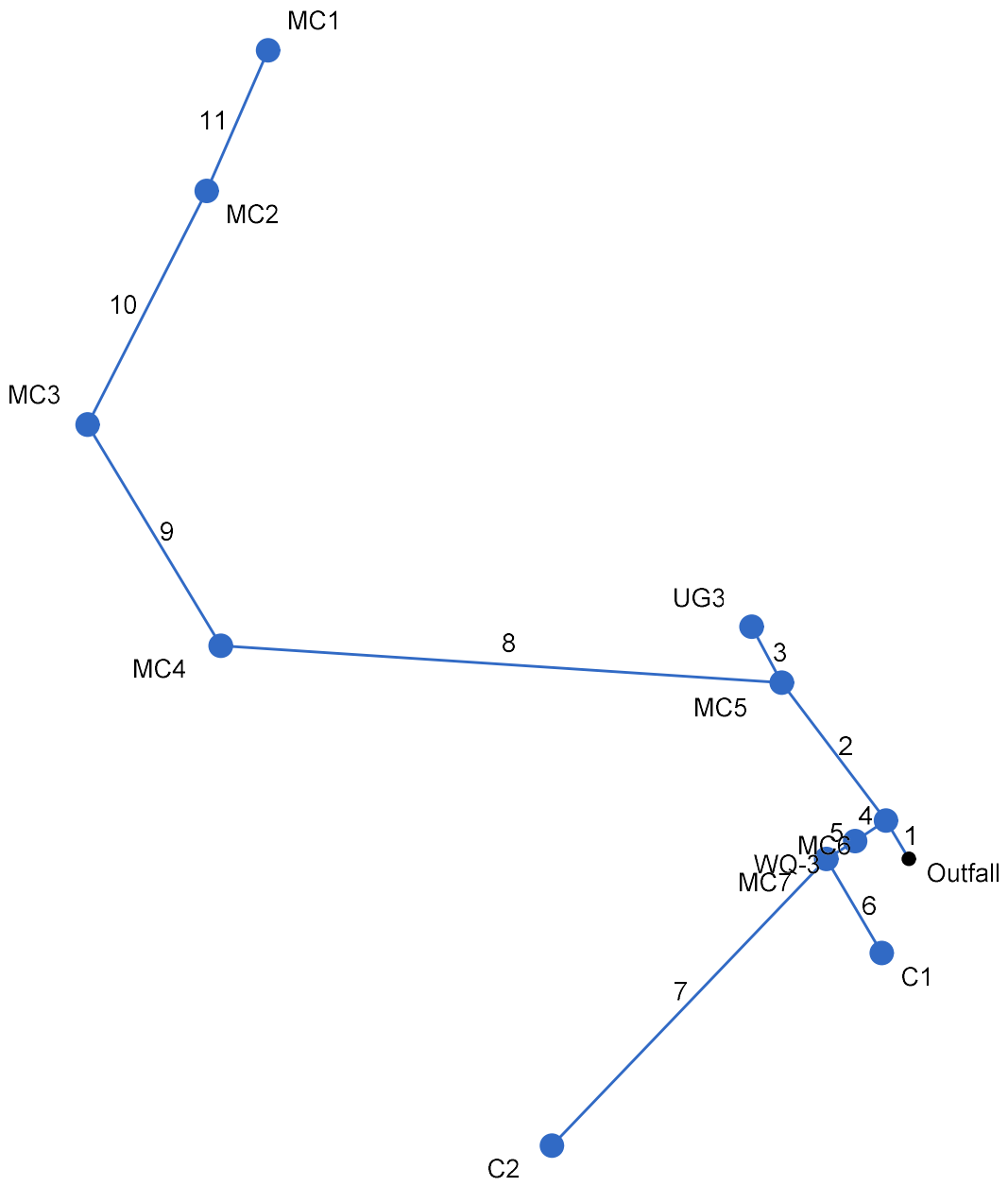
NOTES:Intensity = 197.93 / (Inlet time + 22.50) ^ 0.98; Return period =Yrs. 100 ; c = cir e = ellip b = box

Storm Sewer Profile

Proj. file: network B 100 YEAR.stm



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



Project File: network C 10 YEAR.stm	Number of lines: 11	Date: 6/23/2022

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	8.076	0.00	0.53	0.00	0.00	0.43	0.0	6.7	5.4	5.90	5.23	3.34	18	0.25	83.16	83.18	84.66	84.68	84.83	92.52	Pipe - (562)
2	1	31.621	0.00	0.00	0.00	0.00	0.00	0.0	2.2	0.0	3.56	4.85	2.01	18	0.21	83.18	83.25	84.85	84.89	92.52	93.12	Pipe - (562) (1)
3	2	11.713	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	0.56	2.55	2.61	12	0.51	88.89	88.95	89.21	89.27	93.12	93.40	Pipe - (562) (1) (1)
4	1	6.642	0.00	0.53	0.00	0.00	0.43	0.0	6.7	5.4	2.35	2.52	3.64	12	0.50	88.08	88.11	88.84	88.88	92.52	92.41	Pipe - (561)
5	4	6.186	0.00	0.53	0.00	0.00	0.43	0.0	6.6	5.4	2.35	2.52	3.52	12	0.50	88.11	88.14	88.91	88.93	92.41	92.39	Pipe - (561) (1)
6	5	20.079	0.26	0.26	0.79	0.21	0.21	6.0	6.0	5.6	1.15	2.51	2.12	12	0.50	88.43	88.53	89.13	89.14	92.39	91.70	Pipe - (560)
7	5	72.663	0.27	0.27	0.84	0.23	0.23	6.0	6.0	5.6	1.27	2.54	1.90	12	0.51	88.14	88.51	89.13	89.20	92.39	91.67	Pipe - (563)
8	2	102.620	0.00	0.00	0.00	0.00	0.00	0.0	1.2	0.0	3.00	4.85	1.70	18	0.21	83.25	83.47	84.94	85.02	93.12	94.63	Pipe - (567)
9	8	47.236	0.00	0.00	0.00	0.00	0.00	0.0	0.7	0.0	3.00	4.85	1.70	18	0.21	83.47	83.57	85.06	85.07	94.63	94.46	Pipe - (566)
10	9	47.987	0.00	0.00	0.00	0.00	0.00	0.0	0.3	0.0	3.00	4.85	1.70	18	0.21	83.57	83.67	85.11	85.14	94.46	94.45	Pipe - (565)
11	10	28.060	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	3.00	4.86	1.71	18	0.21	83.67	83.73	85.15	85.17	94.45	94.10	Pipe - (564)

Project File: network C 10 YEAR.stm

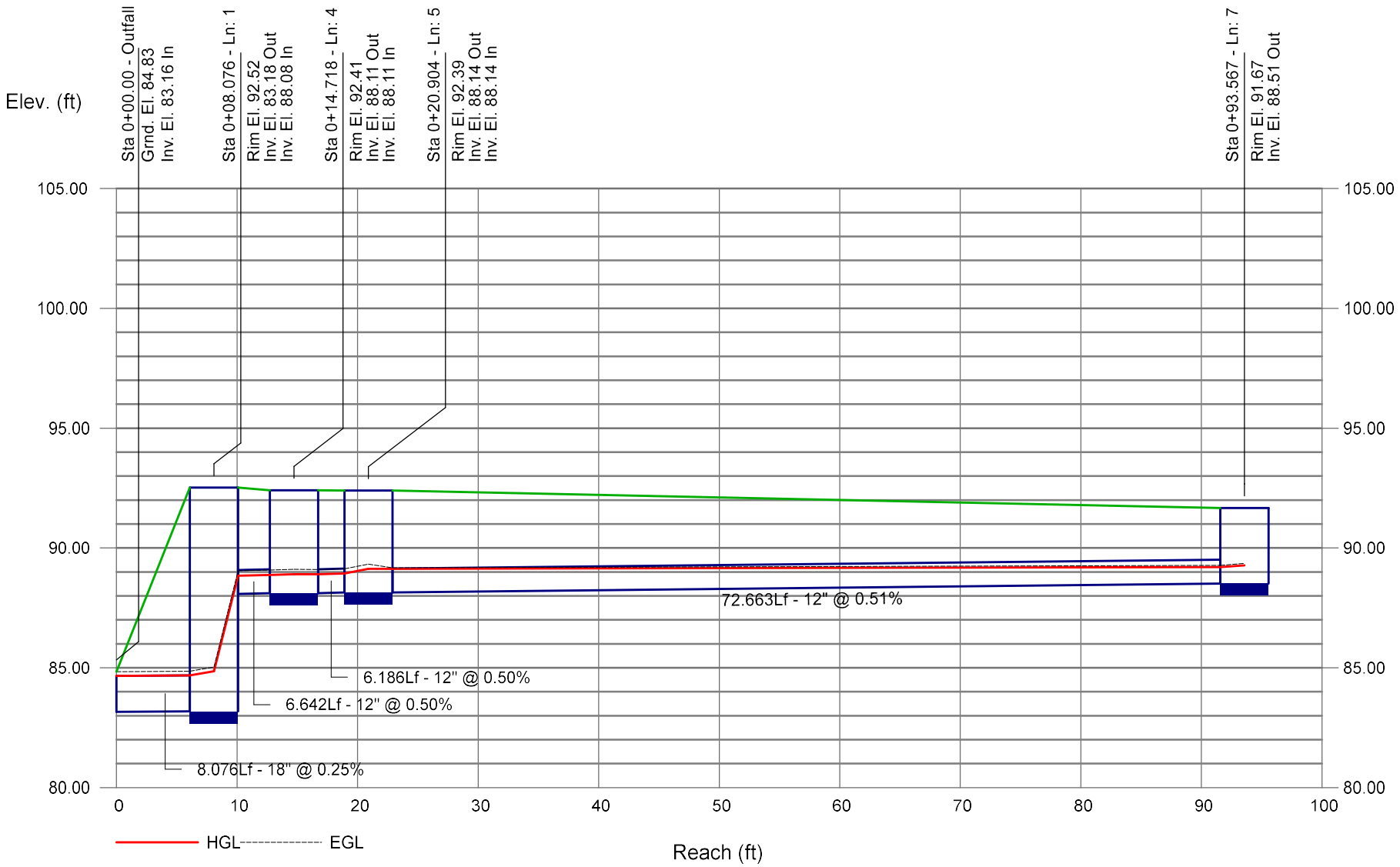
Number of lines: 11

Run Date: 6/23/2022

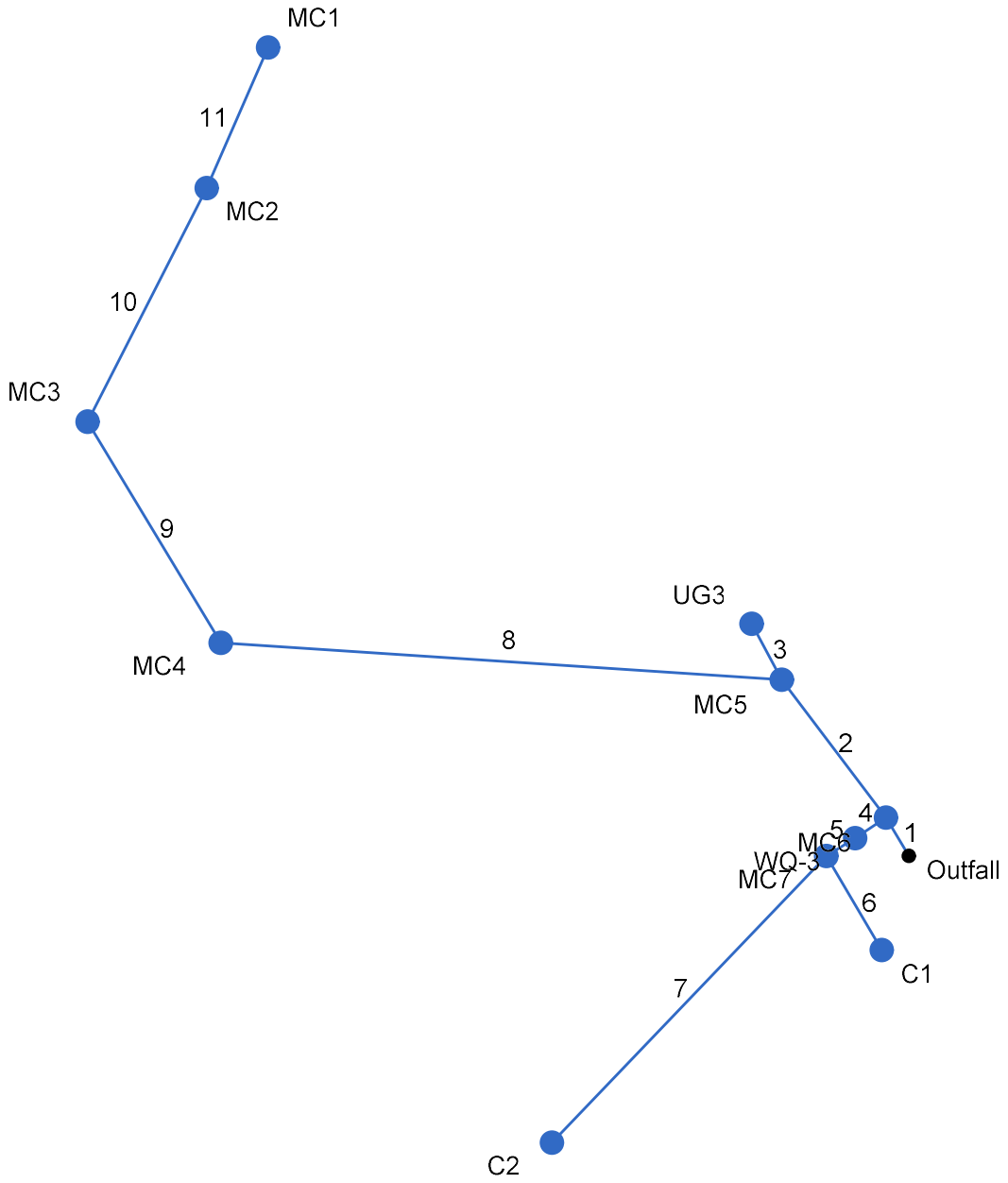
NOTES:Intensity = 59.21 / (Inlet time + 12.50) ^ 0.81; Return period =Yrs. 10 ; c = cir e = ellip b = box

Storm Sewer Profile

Proj. file: network C 10 YEAR.stm



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



Project File: network C 100 YEAR.stm	Number of lines: 11	Date: 6/23/2022

Storm Sewer Tabulation

Station		Len	Drng Area		Rnoff coeff	Area x C		Tc		Rain (I)	Total flow	Cap full	Vel	Pipe		Invert Elev		HGL Elev		Grnd / Rim Elev		Line ID
Line	To Line	(ft)	Incr (ac)	Total (ac)	(C)	Incr	Total	Inlet (min)	Syst (min)	(in/hr)	(cfs)	(cfs)	(ft/s)	Size (in)	Slope (%)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	
1	End	8.076	0.00	0.53	0.00	0.00	0.43	0.0	6.6	7.4	12.42	5.23	7.03	18	0.25	83.16	83.18	84.66	84.77	84.83	92.52	Pipe - (562)
2	1	31.621	0.00	0.00	0.00	0.00	0.00	0.0	1.1	0.0	9.23	4.85	5.22	18	0.21	83.18	83.25	85.54	85.79	92.52	93.12	Pipe - (562) (1)
3	2	11.713	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	3.23	2.55	4.11	12	0.51	88.89	88.95	89.89	89.95	93.12	93.40	Pipe - (562) (1) (1)
4	1	6.642	0.00	0.53	0.00	0.00	0.43	0.0	6.6	7.4	3.19	2.52	4.06	12	0.50	88.08	88.11	89.08	89.11	92.52	92.41	Pipe - (561)
5	4	6.186	0.00	0.53	0.00	0.00	0.43	0.0	6.6	7.4	3.19	2.52	4.07	12	0.50	88.11	88.14	89.15	89.20	92.41	92.39	Pipe - (561) (1)
6	5	20.079	0.26	0.26	0.79	0.21	0.21	6.0	6.0	7.5	1.55	2.51	1.98	12	0.50	88.43	88.53	89.46	89.49	92.39	91.70	Pipe - (560)
7	5	72.663	0.27	0.27	0.84	0.23	0.23	6.0	6.0	7.5	1.71	2.54	2.18	12	0.51	88.14	88.51	89.46	89.62	92.39	91.67	Pipe - (563)
8	2	102.620	0.00	0.00	0.00	0.00	0.00	0.0	0.6	0.0	6.00	4.85	3.40	18	0.21	83.25	83.47	86.12	86.46	93.12	94.63	Pipe - (567)
9	8	47.236	0.00	0.00	0.00	0.00	0.00	0.0	0.4	0.0	6.00	4.85	3.40	18	0.21	83.47	83.57	86.61	86.76	94.63	94.46	Pipe - (566)
10	9	47.987	0.00	0.00	0.00	0.00	0.00	0.0	0.1	0.0	6.00	4.85	3.40	18	0.21	83.57	83.67	86.92	87.08	94.46	94.45	Pipe - (565)
11	10	28.060	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	6.00	4.86	3.40	18	0.21	83.67	83.73	87.10	87.19	94.45	94.10	Pipe - (564)

Project File: network C 100 YEAR.stm

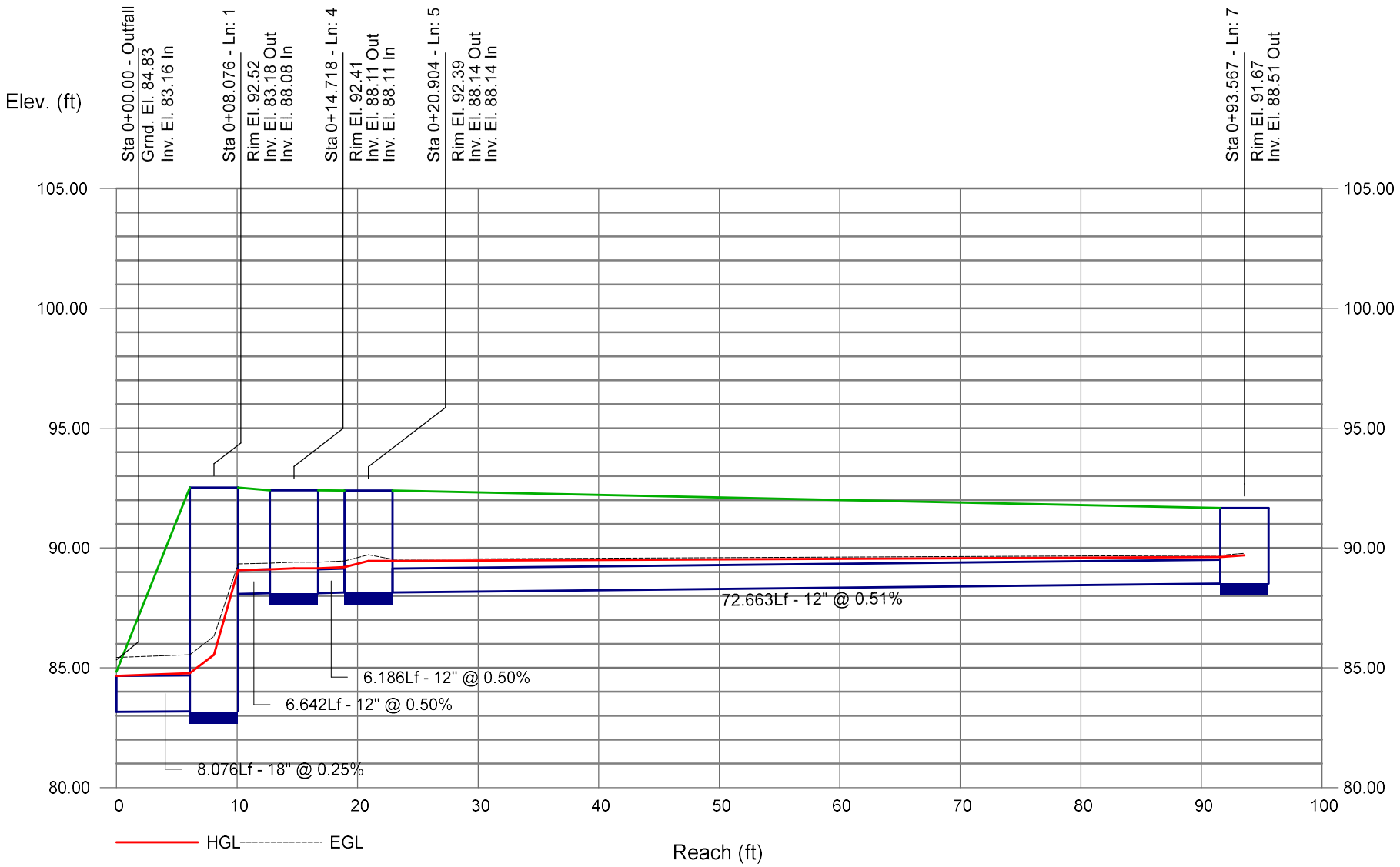
Number of lines: 11

Run Date: 6/23/2022

NOTES:Intensity = 197.93 / (Inlet time + 22.50) ^ 0.98; Return period =Yrs. 100 ; c = cir e = ellip b = box

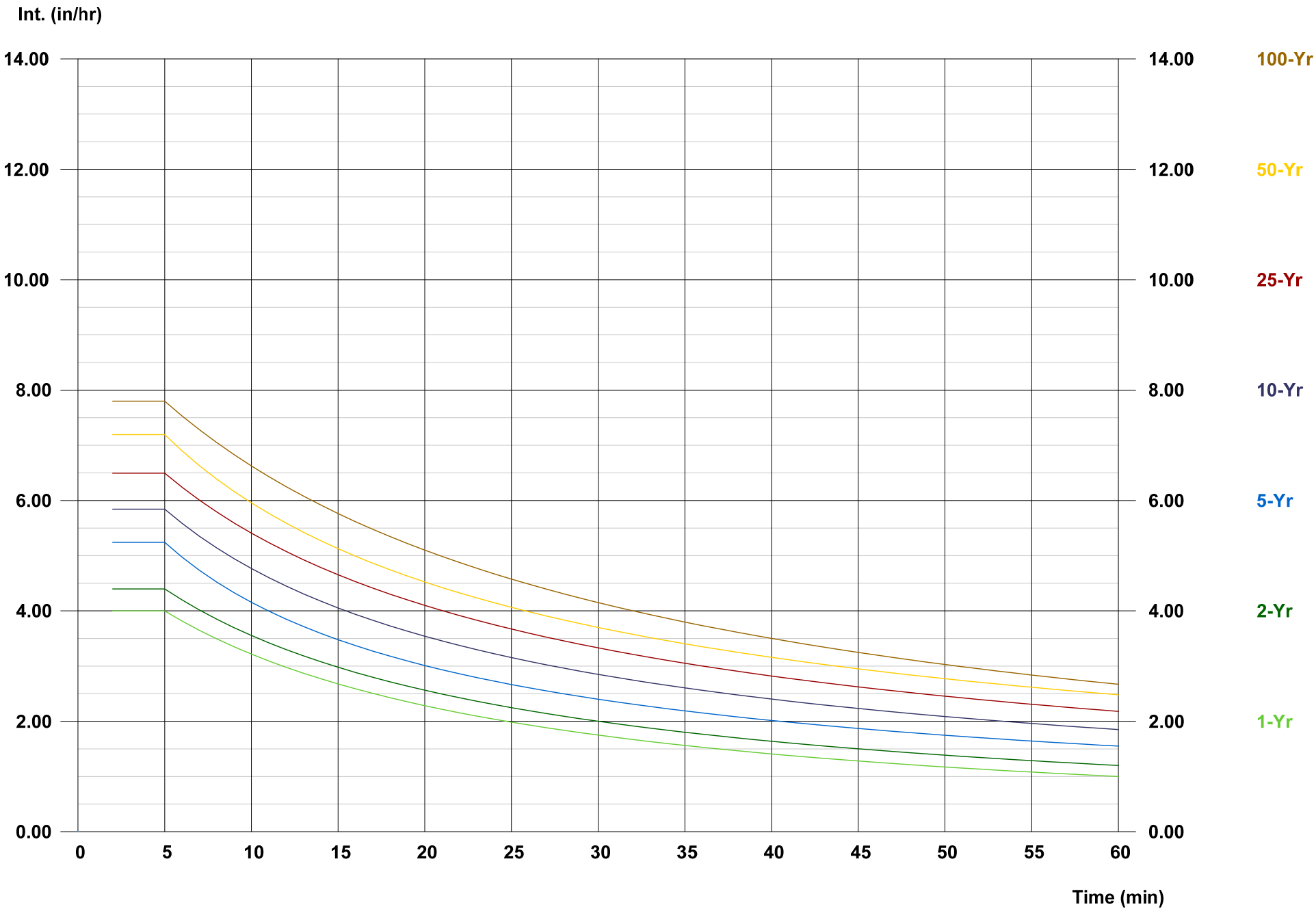
Storm Sewer Profile

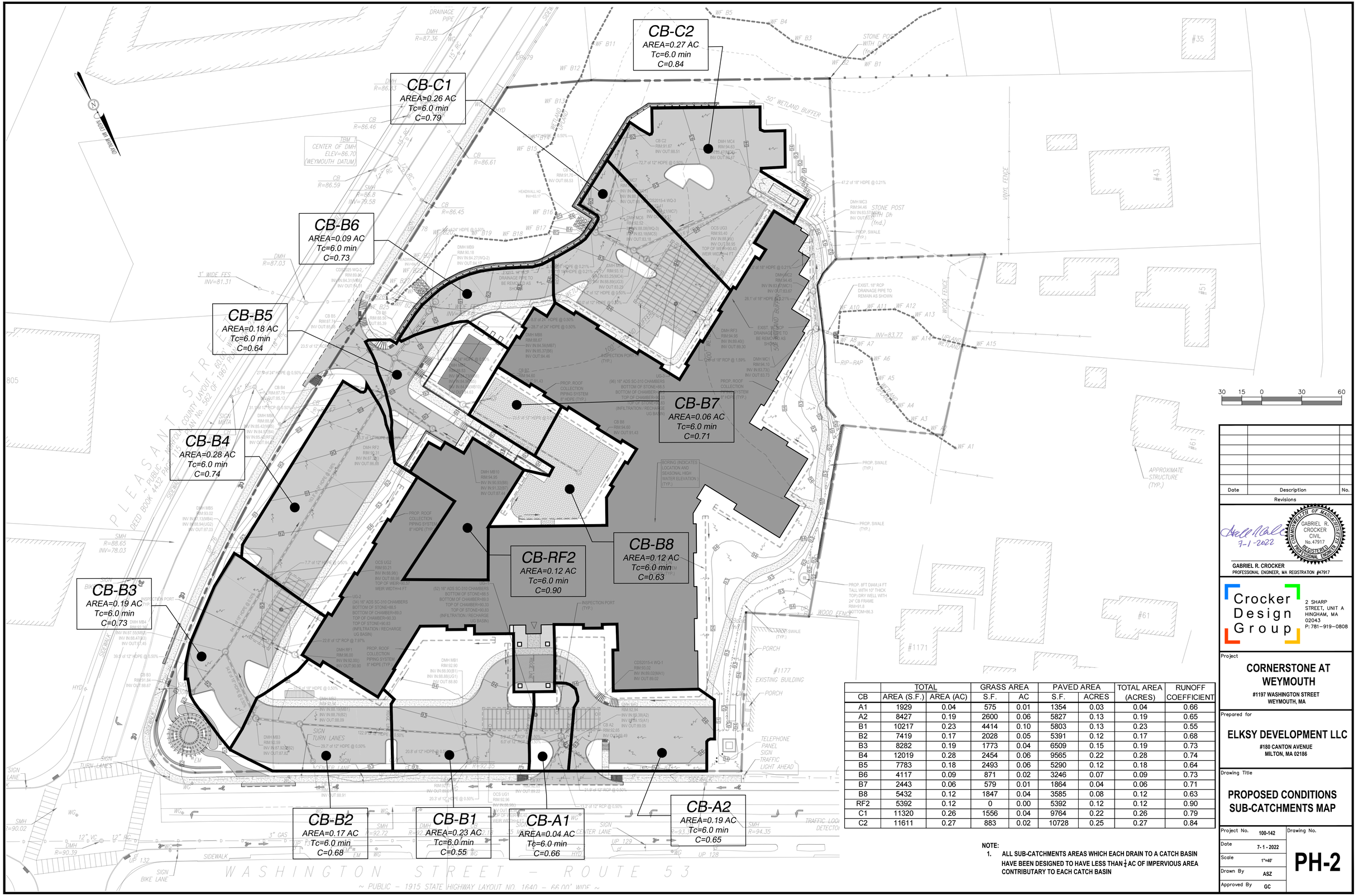
Proj. file: network C 100 YEAR.stm



Storm Sewer IDF Curves

IDF file: quincy idf curve.IDF





CB	TOTAL AREA (S.F.)	TOTAL AREA (AC)	GRASS AREA S.F.	GRASS AREA AC	PAVED AREA S.F.	PAVED AREA ACRES	TOTAL AREA (ACRES)	RUNOFF COEFFICIENT
A1	1929	0.04	575	0.01	1354	0.03	0.04	0.66
A2	8427	0.19	2600	0.06	5827	0.13	0.19	0.65
B1	10217	0.23	4414	0.10	5803	0.13	0.23	0.55
B2	7419	0.17	2028	0.05	5391	0.12	0.17	0.68
B3	8282	0.19	1773	0.04	6509	0.15	0.19	0.73
B4	12019	0.28	2454	0.06	9565	0.22	0.28	0.74
B5	7783	0.18	2493	0.06	5290	0.12	0.18	0.64
B6	4117	0.09	871	0.02	3246	0.07	0.09	0.73
B7	2443	0.06	579	0.01	1864	0.04	0.06	0.71
B8	5432	0.12	1847	0.04	3585	0.08	0.12	0.63
RF2	5392	0.12	0	0.00	5392	0.12	0.12	0.90
C1	11320	0.26	1556	0.04	9764	0.22	0.26	0.79
C2	11611	0.27	883	0.02	10728	0.25	0.27	0.84

NOTE:

1. **ALL SUB-CATCHMENTS AREAS WHICH EACH DRAIN TO A CATCH BASIN HAVE BEEN DESIGNED TO HAVE LESS THAN ½ AC OF IMPERVIOUS AREA CONTRIBUTARY TO EACH CATCH BASIN**

30 15 0 30 60

Date	Description	No.
	Revisions	

7-1-2022

COMMONWEALTH OF MASSACHUSETTS
GABRIEL R. CROCKER
CIVIL
No. 47917
REGISTERED PROFESSIONAL ENGINEER

GABRIEL R. CROCKER
PROFESSIONAL ENGINEER, MA REGISTRATION #47917

Crocker Design Group
2 SHARP STREET, UNIT A
HINGHAM, MA 02043
P: 781-919-0808

Project
CORNERSTONE AT WEYMOUTH
#1197 WASHINGTON STREET
WEYMOUTH, MA

Prepared for
ELKSY DEVELOPMENT LLC
#180 CANTON AVENUE
MILTON, MA 02186

Drawing Title
PROPOSED CONDITIONS SUB-CATCHMENTS MAP

Project No.	100-142
Date	7- 1 - 2022
Scale	1"=40'
Drawn By	ASZ
Approved By	GC

Drawing No.
PH-2

C:\2021\Crocker Design Group, LLC\Gabriel Crocker - Projects\100-142 Weymouth - Ek Club\dwg\Plot Sheets\Site Plan Application_ PH-1 PROP WATERSHED MAP.dwg, 07-PROP SUBWATERSHED MAP, Jun 24, 2022 11:54

SECTION 8 - PROJECT PLANS
(Under Separate Cover)