Project Narrative and Stormwater Management Report

Union Fire District of S. Kingstown
Station 7: Matunuck
5,500± Sq. Ft. Fire Station &
1,890± Sq. Ft. Emergency Medical Services Building

Located at

49 Matunuck School House Road
South Kingstown, Rhode Island
AP 86-2, Lot 32

Prepared for:
Union Fire District of South Kingstown
131 Asa Pond Road
Wakefield, RI 02879

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Submitted by:

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1 INTRODUCTION

On behalf of the Union Fire District of South Kingstown, Joe Casali Engineering, Inc. (JCE) has prepared the following Project Narrative and Stormwater Management Report to identify existing and proposed site conditions related to the design and construction of a new 5,500± square foot Fire Station and an auxiliary 1,890± square foot Emergency Medical Services Building to replace the existing Matunuck Fire Station (Station 7), located at 49 Matunuck School House Road in South Kingstown, Rhode Island.

2 SITE LOCATION AND PHYSICAL DESCRIPTION

According to a March 2014 Class I Property Line Survey and Class III Topographic Survey performed by Pinch Land Surveying of Wakefield, RI, the total area of AP 86-2, Lot 32 is approximately 31,718.75 square feet (0.73 acres). Lot 32 is comprised of the existing fire station and associated parking lot. The remainder of the parcel is undeveloped. The subject parcel is bound by Matunuck School House Road to the south, AP 80-3, Lot 11 to the east (vacant farmland), Lot 29 to the north (multiple residential dwellings), and Lot 28 to the west (single-family dwelling), as shown below in Figure 1 – Locus Map.

Figure 1 - Locus Map

NOT TO SCALE

2.1 Soil Classification

According to *Web Soil Survey (WSS)* operated by the US Department of Agriculture Natural Resources Conservation Service (NRCS*)*, produced by the National Cooperative Soil Survey, the soils on-site consist of Narragansett very stony silt loam, 0 to 8 percent slopes (NbB) and Ninigret fine sandy loam, 0 to 3 percent slopes (Nt). NbB soils generally consist of coarse-loamy eolian deposits over sandy and gravelly melt-out till derived from gneiss and/or schist and/or granite. These soils are generally well drained and have a hydrologic soil group B. Nt soils consist of coarse-loamy eolian deposits over sandy and gravelly glaciofluvial deposits derived from gneiss, granite, schist, and/or phyllite. These soils are also classified as prime farmland and a belong to hydrologic soil group C.

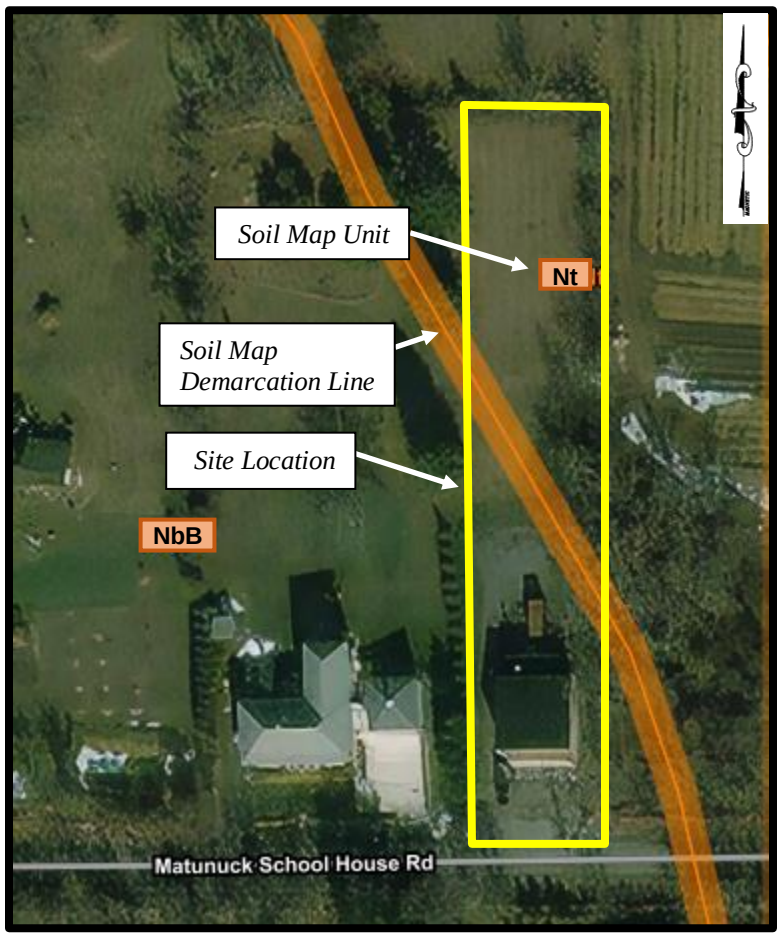

Figure 2 - Soils Map
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Soil evaluations, witnessed by RIDEM, were performed by Natural Resource Services, Inc. in September 2013. Test pits were advanced with an excavator and were observed and logged by a Class IV Soil Evaluator in addition to being witnessed by RIDEM. Three (3) test holes were completed at the approximate locations shown on the plan in Appendix A.

Soil evaluations revealed a water table depth at ten feet for two of the test holes. One test hole consisted of human transported material and therefore the seasonal high groundwater table could not be determined.

2.2 Flood Zone Classification

The site is located on the Flood Insurance Rate Map for the Washington County, Rhode Island, Map Number 44009C0193J, effective date October 16, 2013. Based on this FEMA Flood Insurance Rate Map, the subject property and all adjacent properties, are identified as lying within FEMA Flood Zone X - areas determined to be outside the 0.2% annual-chance flood elevation.

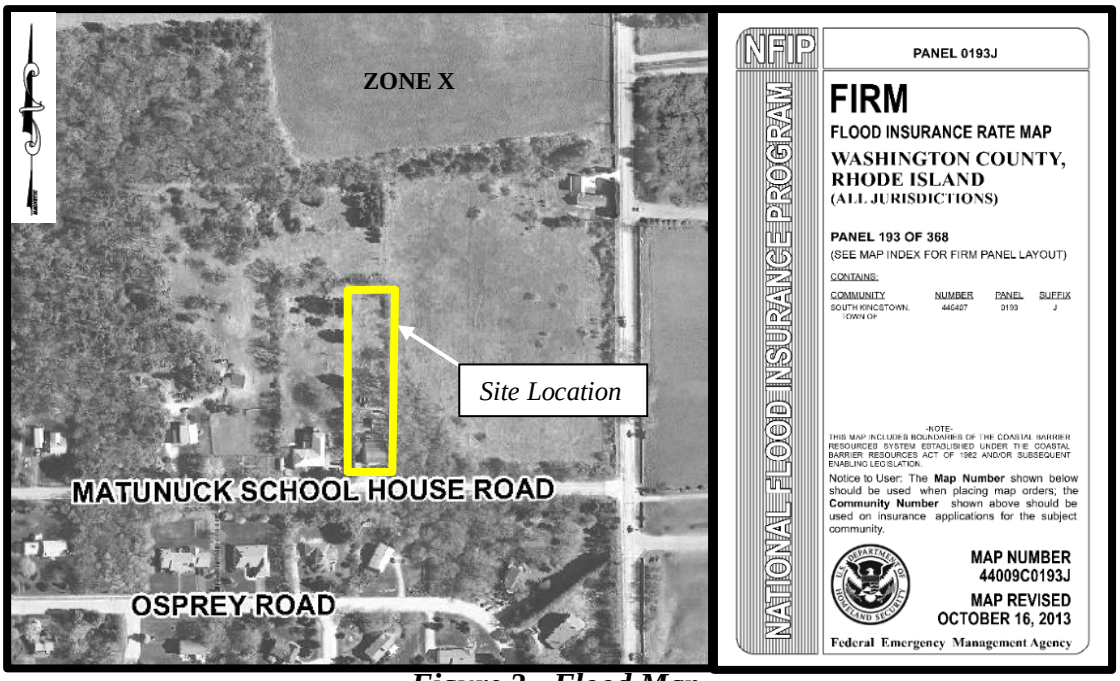

Figure 3 - Flood Map

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2.3 Wetland Resources

According to a Freshwater Wetland Site Inspection completed by Natural Resource Services, Inc. (NRS) on September 23, 2013 (Appendix B), there are no regulated wetland features present on the subject property or adjacent to the site that would incur any setbacks onto the lot.

2.4 Zoning

According to the Town of South Kingstown Zoning Maps, the site is currently zoned as GI (Government and Institutional) District. The purpose of this district is to recognize the extent of public and semipublic land holdings and to provide guidance to utilization of

these lands should they be sold or otherwise transferred to private ownership. In general, the GI Zoning District does not have any dimensional requirements.

2.5 Easements

Based on a March 2014 Class I Property Survey performed by Pinch Land Surveying, there are no known easements located on the subject parcel.

2.6 Utilities

Water: There is an existing 12" water main located within Matunuck School House Road, owned and maintained by South Kingstown Water Division.

Sewer: Public sewers are not available in this area.

Electric/Communications: Telephone and electric services run overhead along the north side of Matunuck School House Road.

3 PROPOSED DEVELOPMENT OF LAND

3.1 General

The proposed project includes the construction of a new 5,500± square foot Fire Station (Station 7 Matunuck) and an auxiliary 1,890± square foot Emergency Medical Services Building to replace the existing fire station with associated improvements to the property for parking, site drainage, and wastewater treatment. The fire station is proposed to include a 3,750 sq. ft. main floor, consisting of the fire truck bays, offices and sleeping quarters, and a 1,750 sq. ft. basement storage area. The existing on-site cesspool will be abandoned, and a new innovative/alternative septic system will be installed. Two (2) underground infiltration chamber systems are proposed to treat stormwater runoff to provide water quality treatment to impervious areas associated with the new parking lot areas and rooftop areas. In addition, a new domestic water service will be provided to each building.

Per the Town Zoning Ordinance, public service buildings require one parking spaces per 350 square feet of floor area. The proposed buildings consist of a total of 5,640 sq. ft. of floor area (excluding closet/storage and utility spaces). Accordingly, per Zoning, a total of 16 parking spaces are required to service the site. However, based on the programmatic needs of Union Fire, the proposed rescue facility will house two (2) employees max.; the proposed fire station will house six (6) employees max.; with two (2) visitor spaces for a total programmatic need of ten (10) parking spaces. As currently designed, twelve (12) total parking spaces are proposed, slightly exceeding the programmatic needs of UFD, but slightly less than required per the Town's Zoning Ordinance. In addition, driveway aisles

are slightly less in width than required per the South Kingstown Zoning Ordinance (24-feet required; 20-feet proposed). Given the tight geometry of the site and building code requirements, the building width has been minimized to the maximum extent practicable, to provide as much area for parking and travel aisles as possible. Parking stalls adjacent to the narrow driveway location have been widened to 10-feet to allow for added maneuvering area.

Given the awkward and tight geometry of the site, we have prepared several figures showing various vehicle turning templates navigating through the site. While we understand these are only models and may not necessarily represent real world conditions, it is important to note that this proposed facility is a public safety facility and most of the traffic navigating through the site is employees and staff of Union Fire District. There is generally little to no visitor traffic daily. Figures with the proposed site layout and various turning templates are included in Appendix C.

The site design has taken into consideration the neighboring property to the west by minimizing earthwork adjacent to the existing stand of mature arborvitae trees, maintaining the existing screening to the maximum extent practicable. In addition, the proposed fire station has been sited further back on the site when compared to the existing condition to reduce view of the station from the neighboring property. Landscaping has been provided through the site; however, given this is a public safety facility, the design generally does not meet the requirements of the South Kingstown Land Development Regulations. A detailed breakdown of landscaping waiver requests is provided on the Site Plans.

3.2 Utilities

Water: A new domestic water service will be provided to the new building from the existing 12-inch main within Matunuck School House Road.

Sewer: Sewer discharge will be handled by a new Onsite Wastewater Treatment System (OWTS). Each structure will discharge effluent to their own respective septic tank. The Fire Station building will have a 1,500 gallon two-compartment tank and the EMS building will have a 1,000 gallon two-compartment tank, each complete with an effluent filter within the outlet. Both septic tanks will direct effluent to a 1,000 gallon single compartment recirculation tank where effluent will be pumped through an Orenco Advantex Pre-Treatment Pod, reducing wastewater strength prior to dispersal. The pre-treatment system will also be configured to recirculate treated effluent back into the recirculation tank, creating an environment essential to promote nitrogen reduction. Final dispersal will be via a Geomatrix GST 6218 leach field system located under the pavement, north of the EMS building. Due to the leach field being beneath an impermeable surface, the system will incorporate the Geomatrix SoilAir System to enhance aeration.

Electric/Communications: Electric and telecommunications exist along Matunuck School House Road. Existing connections are proposed to be utilized to service the new buildings.

3.3 Drainage

Stormwater runoff from the new rooftops and pavement are proposed to be routed to one of two (2) underground infiltration systems that will ultimately discharge to an existing drainage system within Matunuck School House Road or offsite to the north, mimicking existing conditions. A small above-ground basin is proposed at the rear to treat and infiltrate runoff from the northern-most parking/paved area. Soil erosion and sedimentation controls are proposed throughout the duration of construction to protect the adjacent roadway and properties. Additional details are provided in Sections 5 and 6 below.

4 PERMIT REQUIREMENTS

4.1 Town of South Kingstown Permit Requirements

4.1.1 Planning Board of Review

The project will need to be reviewed and approved by the Planning Board of Review through the Development Plan Review process. The project will require two (2) stages of review: Technical Review Committee Meeting/Approval; and Development Plan Review Approval. Anticipated waiver requests include landscape relief, as detailed on the Landscape Plans.

4.1.2 Zoning Board

The project will require review and approval by the Zoning Board for several instances of dimensional relief from the requirements of the South Kingstown Zoning Ordinance, including the following:

- Article 7, Section 708: Width of Access Driveways: Access driveways…sall not be less than twenty-four feet wide for two-way traffic.
    - Required = 24-feet; Proposed = 20-feet.; **Relief Requested = 4 feet.**
- Article 7, Section 711: Minimum Off-Street Parking Requirements:
    - Required: 16 spaces; Proposed = 12 spaces; **Relief Requested = 4 spaces.**

4.1.3 South Kingstown Water Department

The proposed domestic water service design will require review and approval by the South Kingstown Water Department.

4.1.4 Building Permit

A Building Permit will be required from the Town of South Kingstown Building Official for construction of the proposed addition.

4.2 State of Rhode Island Permit Requirements

4.2.1 Rhode Island Department of Environmental Management (RIDEM)

The proposed OWTS system will need to be approved by the Rhode Island Department of Environmental Management's (RIDEM) Office of Water Resources, OWTS Division. In addition, the stormwater management design will require submission of a Construction Stormwater Application (also known as a Groundwater Discharge Permit) from RIDEM's Office of Water Resources.

4.2.2 Rhode Island Coastal Resources Management Council (RICRMC)

The project site lies within the RICRMC's Special Area Management Plan (SAMP) for the Salt Ponds Region. However, upon review of Title 650 – Coastal Resources Management Council, Chapter 20 – Coastal Management Program, Part 3 – Salt Pond Region Special Area Management Plan (650-RICR-20-00-3) and based on discussions with the RICRMC, the proposed project does not propose a "watershed activity" requiring an application with the RICRMC. Specifically, the development does not create more than 40,000 sq. ft. of total impervious surface and does not proposed a septic system discharging greater than 2,000 gallons per day. Accordingly, review and approval from the RICRMC is not required.

5 STORMWATER MANAGEMENT PLAN

5.1 General

The proposed development is subject to the requirements of the Rhode Island Stormwater Design and Installation Standards Manual (RISDISM), implemented in December 2010, amended March 2015, by both the Rhode Island Department of Environmental Management (RIDEM) and the Rhode Island Coastal Resources Management Council (CRMC). As the site currently lies, there is no stormwater management system servicing the site. In general, the majority of the stormwater runoff from the site sheet flows to the north towards grassed and wooded areas. A small portion of the front driveway sheet flows towards the Matunuck School House Road shoulder to the south and east of the project area.

The site's proposed stormwater management system has been designed to generally mimic existing conditions. The stormwater management design adheres to all State (RIDEM), and local (Town of South Kingstown) standards and provides attenuation of peak

stormwater runoff rates for the 1-, 2-, 10-, 25- and 100-year storm events while improving the quality of stormwater leaving the site. In addition, the design goes further and attenuates total stormwater runoff volumes for the 1-, 2-, 10-, 25- and 100-year storm events via implementation of infiltrating UICs and an above-ground infiltration basin.

The proposed Stormwater Management Plan improves the overall quality of stormwater leaving the site by using Best Management Practices (BMPs). These water quality BMPs incorporate low-impact development techniques, including two (2) underground infiltration systems and an above-ground infiltration basin. Pre-treatment has been included with the BMP designs to help reduce overall maintenance and to extend the design life of the BMPs. Pre-treatment practices include an isolator row within each individual Underground Infiltration Chamber (UIC) system and a pea gravel diaphragm and sediment forebay up-gradient of the infiltration basin.

5.2 Standard 1: LID Planning and Design Strategies

Low Impact Development (LID) site planning and design strategies must be used to the maximum extent practicable.

Standard Met

LID practices, which include installation of structural stormwater management systems including infiltration chambers and above-grade infiltration basins, have been included in the design. The proposed systems will provide the necessary water quality treatment using infiltration below the pavement and within landscaped areas. In addition, the proposed drainage patterns closely mimic that of the existing conditions.

5.3 Standard 2: Groundwater Recharge

Stormwater must be recharged within the same sub-watershed to maintain base flow at pre-development recharge levels to the maximum extent practicable.

Standard Met

Groundwater recharge is provided within the proposed underground infiltration systems and within the infiltration basin to be located on-site. All calculations were completed in accordance with Section 3.3.2 of the RISDISM using the following formula:

$$Re_v = (1")(F)(I)/12$$

Based on the results from the soil evaluations, a recharge factor of 0.35 was used for Hydrologic Soil Group B. As shown in Table 1 below, the required groundwater recharge volumes for the site are dramatically exceeded.

Table 1 - Recharge Requirements

Subwatershed	2B	1B/1C	1D/1E
Treatment System	UIC #1	UIC #2	Inf. Basin
Impervious Area (SF)	3,413	12,910	6,208
Recharge Factor (in)	0.35	0.35	0.35
Required Recharge Volume (CF)	100	377	181
Provided Recharge Volume (CF)	834	3,698	668
Recharge Requirement Met	Yes	Yes	Yes

Notes: 1. Refer to Proposed Watershed Map located in Appendix G for BMP locations.
2. Based on Routing Analysis of WQV, the entire volume is infiltrated.
3. Recharge Volumes are calculated as the Static Storage Volume.
4. Static Storage Volume (UIC)= Volume of Chambers + Volume of Voids in Stone.
5. Static Storage Volume (Basin) = Volume below Spillway

5.4 Standard 3: Water Quality

The stormwater runoff from the site must be treated prior to discharge.

Standard Met

Based on the RISDM, the site is not considered a redevelopment, therefore only 100% of all disturbed impervious areas must be treated for water quality. Stormwater runoff associated with the front and side driveways, parking lot area between the two buildings, and the fire station rooftop area are treated by two (2) UIC systems. Stormwater runoff from the rear parking lot area and the EMS building rooftop are treated by a proposed infiltration basin. Water Quality Volume (WQ_v) is met through isolator rows for the UIC systems and via a sediment forebay for the infiltration basin system. Calculations were completed in accordance with Section 3.3.3 of the RISDM using the following formula:

$$WQ_v = (1") (I) /12 \text{ in/ft}$$

Tables 2 and 3 below provide sizing calculations for the Water Quality Volume (WQ_V) of the pretreatment area and the treatment area, respectively. Water quality calculations are included in Appendix I. As shown in Tables 2 and 3 below, the required water quality volumes for the site are dramatically exceeded.

Table 2: Water Quality - Pretreatment Area Requirements

Subwatershed	2B	1B	1E
Treatment System	Isolator Row	Isolator Row	Sed. Forebay
Impervious Area (SF)	3,413	9,160 (no roof)	4,318 (no roof)
Required WQ_V (CF)	284	763	353
Required Static Volume (CF) for Pretreatment (25% of WQ_V)	71	191	88
Pretreatment Volume Provided (CF)	834	956	132
Provided Static Storage Volume for Infiltration System (CF)	834	3,698	668
Treatment Requirement Met	Yes	Yes	Yes

Notes: 1. Isolator Row added to Infiltration Chambers for Pretreatment.
2. Static Storage Volume = Volume of Chambers + Volume of Voids in Stone.
3. Static Storage Volume (Basin) = Volume below Spillway.

Table 3: Water Quality – Treatment Area Requirements

Subwatershed	2B	1B/1C	1D/1E
Treatment System	UIC #1	UIC #2	Inf. Basin
Impervious Area (SF)	3,413	12,910	6,208
Required Water Quality Volume (CF)	284	1,076	517
Provided Static Storage Volume for Treatment (CF)	834	3,698	668
Treatment Requirement Met	Yes	Yes	Yes

Notes: 1. Refer to Proposed Watershed Map located in Appendix G for watershed locations.

As shown in Tables 1 through 3 above, the site's proposed stormwater management system greatly exceeds the requirements for groundwater recharge volume, water quality pre-treatment volume and water quality treatment volume. This is in accordance with all RISDISM and Town of South Kingstown Standards, and ultimately helps eliminate or reduce impacts to down-gradient watershed areas and the Salt Pond Area SAMP for all design storm events.

5.5 Standard 4: Conveyance and Natural Channel Protection

This standard is designed to prevent erosive flow within natural channels and drainage ways.

Standard Met

The proposed project has been designed to reduce both peak stormwater rates and the volume of stormwater leaving the site and entering into the storm system for all storm events, up to and including the 100-yr design storm event. Accordingly, the design meets the requirements for conveyance and natural channel protection.

5.6 Standard 5: Overbank Flood Protection

Downstream overbank flood protection must be provided by attenuating the post-development peak discharge rate to the pre-development levels for the 1–, 10-, and 100-year, Type III design storm events.

Standard Met

As presented in Section 6 below, reductions in peak stormwater runoff rates and total stormwater runoff volumes have been achieved for all design storm events. By implementing a series of infiltrating stormwater management practices, a significant volume of stormwater is injected back into the groundwater table, resulting in significant reductions in rates and volumes leaving the project site. Backup calculations are provided in Appendices F and H.

5.7 Standard 6: Redevelopment and Infill Projects

For redevelopment sites with 40% or more existing impervious surface coverage and infill sites, only Standards 2, 3, and 7-11 must be addressed.

Standard Not Met

As shown below, the proposed site improvements are not considered a redevelopment:

Existing Site Area	Existing Impervious Area	Percent Impervious	Redevelopment?
31,719	9,365	29.5%	NO

5.8 Standard 7: Pollution Prevention

All development sites require the use of source control and pollution prevention measures to minimize the impact that the land use may have on stormwater runoff quality.

Standard Met

Soil erosion and pollution control measures including a straw wattle and a crushed stone construction accesses are proposed during construction.

5.9 Standard 8: Land Uses with Higher Potential Pollutant Loads

Stormwater discharges from land uses with higher potential pollutant loads (LUHPPLs) require the use of specific source control and pollution prevention measures and the specific stormwater BMPs approved for such use.

A stormwater LUHPPL is defined by the following land uses and activities:

1. Areas within an industrial site (as defined in RIPDES Rule 31(b)(15)) that are the location of activities subject to the RIPDES Multi-Sector General Permit (except where a No Exposure Certification for Exclusion from RIPDES Stormwater Permitting has been executed);
2. Auto fueling facilities (i.e., gas stations);
3. Exterior vehicle service, maintenance and equipment cleaning areas;
4. Road salt storage and loading areas (if exposed to rainfall); and
5. Outdoor storage and loading/unloading of hazardous substances.

Standard Not Met

The subject site does not meet the definition of a LUHPPL, as it does not maintain or require a RIPDES Multi-Sector General Permit.

5.10 Standard 9: Illicit Discharges

All illicit discharges to stormwater management systems are prohibited, including discharges from OWTS, and sub-drains and French drains near OWTSs that do not meet the State's OWTS Rules.

Standard Met

There are no known existing illicit discharges at the site nor are any proposed as part of this project.

5.11 Standard 10: Construction and Erosion Sedimentation Control

Erosion and sedimentation control (ESC) practices must be utilized during the construction phase as well as during any land disturbing activities

Standard Met

Erosion control practices have been employed to avoid and minimize impacts to abutting properties. Detailed notes have been included in the plans to ensure effective implementation of erosion and sedimentation controls, which include a straw wattle around the perimeter of the site and a crushed stone construction access at the entrances to the site. The soil erosion and sedimentation control measures will be installed prior to the initiation of construction activities and maintained throughout construction. Once established, these measures will be monitored daily until construction activities are complete. The silt fence line will serve as the strict limits of disturbance for the project. No alterations, including

vegetative clearing or surface disturbance, will occur beyond this line. The limits of clearing, grading, and disturbance will be kept to a minimum within the proposed area of construction. All areas outside of these limits, as depicted on the project site plans, will remain undisturbed, in a completely natural condition.

5.12 Standard 11: Stormwater Management System Operation and Maintenance

The stormwater management system, including all structural stormwater controls and conveyances, must have an Operation and Maintenance Plan to ensure that it continues to function as designed.

Standard Met

A long-term Stormwater Operation and Maintenance Plan has been prepared for the development in accordance with the Manual and is provided under separate cover.

6 DRAINAGE ANALYSIS

6.1 Methodology

A comparative pre- versus post-development hydrologic analysis was performed using the Soil Conservation Service, Technical Release 20 and 55 (TR-20 and TR-55) methodology. The 1-, 2-, 10-, 25-, and 100-year storm events were modeled for a 24-hour, Type III storm utilizing HydroCAD version 10.00. HydroCAD modeling reports for the existing and proposed conditions can be found in Appendices F and H, respectively.

As shown in the following sections, the proposed stormwater management system has been designed to attenuate peak stormwater runoff rates and reduce stormwater volumes leaving the site for the 1-, 2-, 10-, 25- and 100-year design storm events.

6.2 Existing Conditions

The existing site consists of two (2) subwatersheds discharging to two (2) off-site design points further described as a lower gradient wooded/grasses area (DP-1) and a drainage swale along the north side of Matunuck School House Road (DP-2). The existing site contains the Union Fire District Station 7 and associated paved parking lot. An Existing Conditions Watershed Map is included in Appendix E.

Design Point 1 – Lower Gradient

Watershed 1: Consists of the majority of the existing station's rooftop and a portion of the site's paved parking areas; the remainder of this watershed area consists of grassed/wooded areas to the north of the existing station. This watershed area consists of a total of 107,101

sq. ft. of area, primarily grassed/wooded and therefore has been assigned a T_C of 7.9 minutes and a composite CN Runoff Number of 66. Runoff from this area sheet flows to lower grade to the north and east of the project area (Design Point 1).

Design Point 2 – Matunuck School House Road

Watershed 2: Consists of a small portion of the existing station's rooftop and a portion of the site's paved parking areas; the remainder of this watershed area consists of grasses/wooded areas to the west and east of the existing station. This watershed area consists of a total of 31,405 sq. ft. of area, primarily impervious and therefore has been assigned a T_C of 6 minutes and a composite CN Runoff Number of 86. Runoff from this area sheet flows to a drainage swale along the north side of Matunuck School House Road (Design Point 2).

6.3 Proposed Conditions

Proposed drainage conditions very closely mimic existing conditions. Under proposed conditions stormwater runoff from the subject site will continue to discharge to the two (2) off-site design points further described as a lower gradient wooded/grasses area (DP-1) and a drainage swale along the north side of Matunuck School House Road (DP-2). The stormwater runoff associated with the proposed driveway to the south of the proposed fire station will also be directed to UIC #1. The stormwater runoff associated with the parking lot to the west and north of the proposed fire station will be conveyed to UIC #2. The roof drains associated with the proposed fire station will discharge via underground piping to the proposed UIC #2. Stormwater runoff associated with the remaining parking lot to the rear of the site will sheet flow to the north towards the proposed sediment forebay and infiltration basin. The roof drains associated with the proposed emergency medical services (EMS) building will discharge via underground piping to the proposed infiltration basin. The drainage systems will treat stormwater runoff pollutants and reduce peak stormwater runoff rates and volumes. These conditions are shown in detail on the Proposed Conditions Watershed Map included in Appendix G.

Design Point 1 – Lower Gradient

Subwatershed 1A: Consists of the 74,128 sq. ft. area containing a portion of the residential properties to the west of the site. This watershed area has been assigned a T_C of 7.9 minutes and a composite CN Runoff Number of 63. Runoff from this area sheet flows to lower grade to the north of the project area (Design Point 1).

Subwatershed 1B: Consists of the 13,552 sq. ft. area containing an access driveway, a portion of the parking lot area and a new landscaped area to the west and north of the new

fire station. Stormwater runoff associated with this subwatershed is captured within a double catch basin and conveyed to UIC #2. Excess stormwater from this system overflows and sheet flows to Design Point 1, mimicking existing conditions. Due to the improvements proposed, Subwatershed 1B has been assigned a minimum Time of Concentration (Tc) of 6.0 minutes and a Composite Runoff Number (CN) of 88.

Subwatershed 1C: Consists of the 3,750 sq. ft. area containing the rooftop area associated with the proposed fire station. Stormwater runoff associated with the new rooftop will discharge via underground piping to the proposed UIC #2. The UIC system has been designed to allow excess stormwater to overflow and sheet flows to Design Point 1, mimicking existing conditions. UIC #2 has been designed to completely capture up to and including the 100-yr design storm event; only overflowing during larger storm events. Subwatershed 1C has been assigned a minimum Time of Concentration (Tc) of 6.0 minutes and a Composite Runoff Number (CN) of 98.

Subwatershed 1D: Consists of the 1,890 sq. ft. area containing the rooftop area associated with the proposed EMS building. Stormwater runoff associated with the new rooftop will discharge via underground piping to the proposed infiltration basin. The system has been designed to allow excess stormwater to overflow and sheet flow to Design Point 1, mimicking existing conditions. The infiltration basin has been designed to completely capture up to and including the 100-yr design storm event; only overflowing during larger storm events. Subwatershed 1D has been assigned a minimum Time of Concentration (Tc) of 6.0 minutes and a Composite Runoff Number (CN) of 98.

Subwatershed 1E: Consists of the 12,230 sq. ft. area containing a portion of the rear parking lot area and the grassed area to the rear of the site. Stormwater runoff associated with this subwatershed is conveyed to the pea gravel diaphragm, the sediment forebay, and the infiltration basin. Excess stormwater from this system overflows and sheet flows to Design Point 1, mimicking existing conditions. Due to the improvements proposed, Subwatershed 1E has been assigned a minimum Time of Concentration (Tc) of 6.0 minutes and a Composite Runoff Number (CN) of 74.

Design Point 2 – Matunuck School House Road

Subwatershed 2A: Consists of 28,791 sq. ft. of grassed/wooded areas to the west of the project site. This watershed area has been assigned a minimum T_C of 6 minutes and a CN of 85. Runoff from this area sheet flows to a drainage swale along the north side of Matunuck School House Road (Design Point 2).

Subwatershed 2B: Consists of 4,165 sq. ft. of the driveway entrance for the project site. This watershed area has been assigned a minimum T_C of 6 minutes and a CN of 91. Runoff from this area is captured within a catch basin and conveyed to UIC #1. Excess stormwater overflows the system and sheet flows to a drainage swale along the north side of Matunuck School House Road (Design Point 2).

6.4 Results

A runoff analysis of the pre- and post-construction conditions was completed using the TR-20 methodology and is summarized in Table 4 below. Supporting calculations for the pre- and post-construction conditions are included in Appendices F and H respectively.

Table 4: Watershed Data

	Area (SF)	CN	Tc (min.)
Existing Conditions			
Watershed 1	107,101	66	7.9
Watershed 2	31,405	86	6.0
Existing Total	**138,506**	**71**	**--**
Proposed Conditions			
Subwatershed 1A	74,128	63	7.9
Subwatershed 1B	13,552	86	6.0
Subwatershed 1C	3,750	98	6.0
Subwatershed 1D	1,890	98	6.0
Subwatershed 1E	12,230	74	6.0
Subwatershed 2A	28,791	85	6.0
Subwatershed 2B	4,165	91	6.0
Proposed Total	**138,506**	**73**	**--**
Delta (Δ)	***0***	***+2***	**--**

Note: Minimum Tc = 6 minutes; CN averages are weighted averages.

As shown in Table 4 above, the overall watershed area remains unchanged when comparing existing to proposed conditions. However, due to the implementation of additional impervious area associated with the proposed fire station and EMS buildings, the CN value has increased slightly.

Table 5: Stormwater Runoff Discharge

	Peak Discharge (cfs) to Design Point				
	1-Year	2-Year	10-Year	25-Year	100-Year
Existing DP #1	0.73	1.51	4.21	6.58	12.22
Proposed DP #1	0.30	0.76	2.78	5.22	11.74
ΔQ	***-0.43***	***-0.75***	***-1.43***	***-1.36***	***-0.48***
Existing DP #2	1.17	1.59	2.75	3.63	5.52
Proposed DP #2	1.02	1.40	2.46	3.27	4.97
ΔQ	***-0.15***	***-0.19***	***-0.29***	***-0.36***	***-0.55***

As shown in Table 5, the peak stormwater runoff rates realized at Design Point 1 and 2 have been reduced for all design storm events. This has been achieved via the implementation of three infiltrating stormwater management practices and will ultimately ensure there are no negative impacts resulting to down-gradient properties.

Table 6: Stormwater Total Runoff Volume

	Total Runoff Volume (cf) to Design Point				
	1-yr	2-yr	10-yr	25-yr	100-yr
Existing DP #1	3,648	6,195	14,815	22,443	40,979
Proposed DP #1	1,943	3,489	9,877	17,136	34,889
ΔV	***-1,705***	***-2,706***	***-4,938***	***-5,307***	***-6,090***
Existing DP #2	3,687	5,031	8,829	11,789	18,350
Proposed DP #2	3,214	4,423	7,859	10,549	17,038
ΔV	***-473***	***-608***	***-970***	***-1,240***	***-1,312***

As shown in Table 6, the total stormwater runoff volumes realized at Design Point 1 and 2 have been reduced for all design storm events. This has been achieved via the implementation of three infiltrating stormwater management practices and will ultimately ensure there are no negative impacts resulting to down-gradient properties.

7 CONCLUSIONS

As shown in Tables 5 through 6 above, the proposed improvements have been designed to minimize impacts of the proposed site development by attenuating peak storm water runoff rates and volumes for the 1-, 2-, 10-, 25-, and 100-year design storm events. The stormwater management system design results in dramatic decreases in peak stormwater flows and total runoff volumes to the two (2) off-site design points further described as a lower gradient wooded/grasses area (DP-1) and a drainage swale along the north side of Matunuck School House Road (DP-2).

The proposed Stormwater Management Plan improves the overall quality of stormwater leaving the site by using Best Management Practices (BMPs). These water quality BMPs incorporate low-impact development techniques, including two (2) underground infiltration systems and an above-ground infiltration basin. Pre-treatment has been included with the BMP designs to help reduce overall maintenance and to extend the design life of the BMPs. Pre-treatment practices include an isolator row within each individual Underground Infiltration Chamber (UIC) system and a pea gravel diaphragm and sediment forebay up-gradient of the infiltration basin.

The proposed site's UIC #1 has been designed to infiltrate all stormwater generated from the site for up to and including the 25-year design storm event. UIC #2 has been designed to infiltrate all stormwater runoff generated from the site up to and including the 10-year design storm, while the infiltration basin infiltrates up to the 2-year design storm. In addition, the overall drainage system possesses enough capacity to reduce the peak flows and volumes for the 1-, 2-, 10-, 25- and 100-year design storm events. The result is a significant improvement in the quality of stormwater leaving the site and a dramatic reduction in stormwater runoff rates and volumes to down-gradient watershed areas and the Salt Pond Area SAMP for all design storm events.

Appendix A

Soil Evaluations
prepared by Natural Resource Services, Inc., September 2013

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources

Site Evaluation Form
Part A - Soil Profile Description

Application Number _____

Property Owner: The Union Fire District
Property Location: 49 Matunuck Schoolhouse Rd., South Kingstown, RI
Date of Test Hole: 9-23-13
Soil Evaluator: Edward J. Avizinis License Number: #4083
Weather: Sunny - 60's Shaded: Yes ☐ No ☑ Time: 12:00pm

TH 1 Horizon	Depth	Horizon Boundaries Dist	Topo	Soil Colors Matrix	Re-Dox Features	Re-Dox Description Ab. S. Con.	Texture	Structure	Consistence	Soil Category
HTM	0-3	g	S	—	—	—	—	—	—	
Ap1	3-7	C	S	10YR 3/3	—	—	SL	1 gr	vfri	3
Ap2	7-9	C	S	10YR 3/2	—	—	SL	1 gr	fri	3
Bw1	9-20	g	S	10YR 5/4	—	—	SL	1 sbk	fri	3
Bw2	20-33	g	S	10YR 6/3	10YR 5/8 10YR 6/1	f (2) p f (1) f	SL	2 sbk	fri	3
C	33-112	—	—	10YR 6/1	10YR 5/8 10YR 7/1	C (2) p C (1) f	LS	0 m	fri	3

TH 2 Horizon	Depth	Horizon Boundaries Dist	Topo	Soil Colors Matrix	Re-Dox Features	Re-Dox Description Ab. S. Con.	Texture	Structure	Consistence	Soil Category
Ap	0-8	C	S	10YR 3/2	—	—	SL	1 gr	vfri	3
Bw1	8-20	g	S	10YR 5/4	—	—	SL	1 sbk	fri	3
Bw2	20-33	g	S	10YR 6/2	—	—	SL	2 sbk	fri	3
C	33-42	g	S	10YR 6/2	10YR 5/6 10YR 7/1	C (2) p C (2) f	SL	0 m	fri	3
Cg	42-112	—	—	10YR 6/1	10YR 5/6	C (3) p	SL	0 m	fri	3

Soil Class: Ice Contact - D
Depth to Groundwater Seepage: >10'
Estimated Seasonal High Water Table: 1: 10', 2: 10"
Total Depth of each Test Hole: 112"
Depth to Impervious or Limiting Layer: >112"
Comments:

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Department of Environmental Management
Office of Water Resources

Site Evaluation Form
Part A - Soil Profile Description

Application Number _____

Property Owner: The Union Fire District
Property Location: 49 Matunuck Schoolhouse Rd., South Kingstown, RI
Date of Test Hole: 9-23-13
Soil Evaluator: Edward J. Avizinis License Number: D4083
Weather: Sunny 60's Shaded: Yes ☐ No ☒ Time: 12:00 pm

TH 3 Horizon	Depth	Horizon Boundaries: Dist	Horizon Boundaries: Topo	Soil Colors: Matrix	Soil Colors: Re-Dox Features	Re-Dox Description: Ab. S. Con.	Texture	Structure	Consistence	Soil Category
HTM	0-90	—	—	—	—	—	—	—	—	—

TH ____ Horizon	Depth	Horizon Boundaries: Dist	Horizon Boundaries: Topo	Soil Colors: Matrix	Soil Colors: Re-Dox Features	Re-Dox Description: Ab. S. Con.	Texture	Structure	Consistence	Soil Category

Soil Class: HTM
Depth to Groundwater Seepage: —
Estimated Seasonal High Water Table: —
Total Depth of each Test Hole: 90"
Depth to Impervious or Limiting Layer: > 90"
Comments: It appears the station was constructed on a fill pile

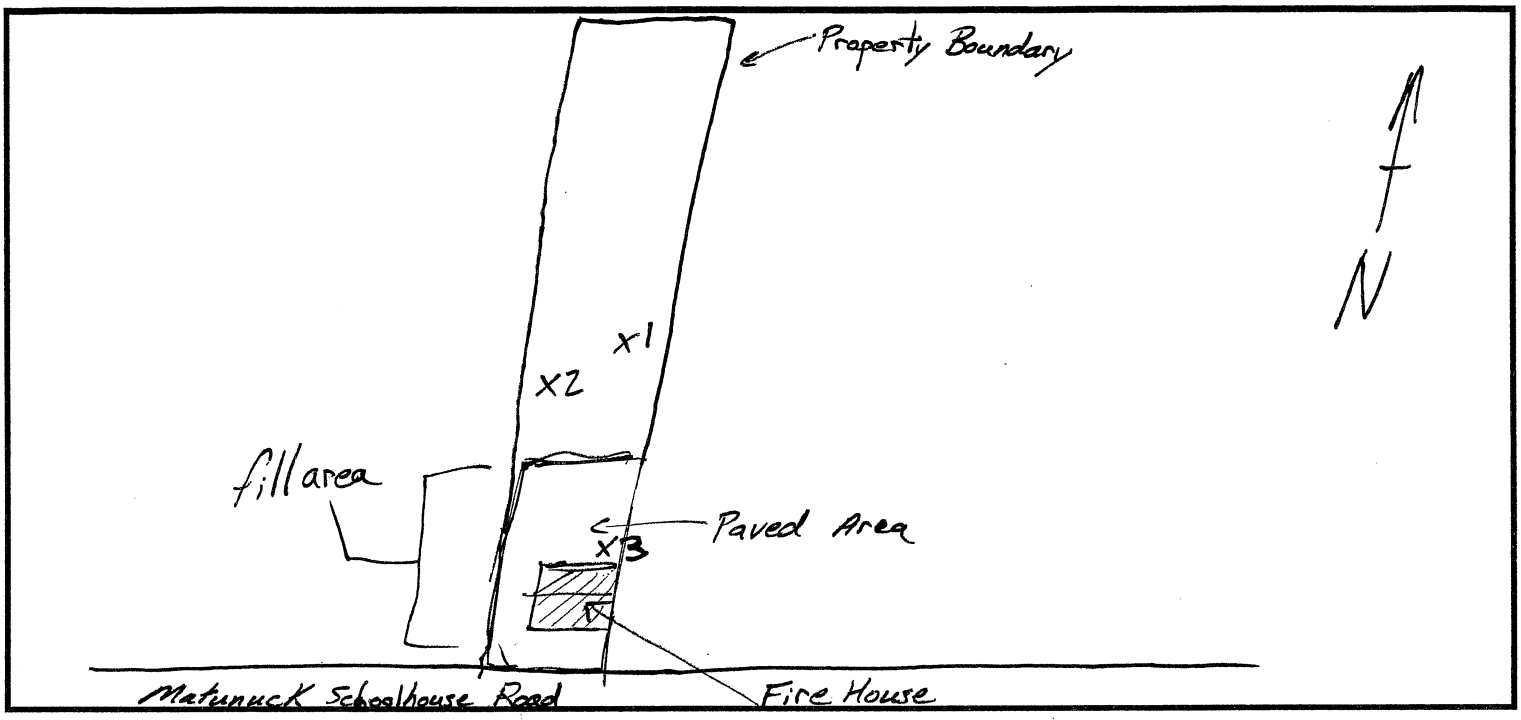
Part B

Key:
- Approximate location of test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

Site Evaluation - to be completed by Class II or III Designer or Soil Evaluator

Please use the area below to locate:

1. Test holes
2. Approximate direction of due north
3. Offsets from test holes to fixed points such as street, utility pole, or other permanent, marked object



1. Relief and Slope: 0–3%
2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes: YES☐ NO☑ If yes, locate on above sketch.
3. Presence of existing or proposed private drinking water wells within 200 feet of test holes: YES☐ NO☐ If yes, locate on above sketch.
4. Public drinking water wells within 500 feet of test holes: YES☐ NO☐ If yes, locate on above sketch.
5. Is site within the watershed of a public drinking water reservoir or other critical area defined in SD 19.00? YES☐ NO☐
6. Has soil been excavated from or fill deposited on site? YES☑ NO☐ If yes, locate on above sketch.
7. Site's potential for flooding or ponding: NONE☑ SLIGHT☐ MODERATE☐ SEVERE☐
8. Landscape position: Toe slope
9. Vegetation: lawn
10. Indicate approximate location of property lines and roadways.
11. Additional comments, site constraints or additional information regarding site:

Certification

The undersigned hereby certifies that all information on this application and accompanying forms, submittals and sketches are true and accurate and that I have been authorized by the owner(s) to conduct these necessary field investigations and submit this request.

Part A prepared by: D4083
Signature License #

Part B prepared by:
Signature License #

FOR OFFICE USE ONLY

Decision: Approved (SD 26.00(f)(1) ☐ Not in compliance, or more infomration required (SD 26.00(f)(2) • Disclaimed (SD 27.00(f)(3) ☐

Comments:

Signature Authorized Agent Date

revised 5/8/01

Rhode Island Department of Environmental Management

Onsite Wastewater Treatment System Program

Phone: 401-222-6820
Fax: 401-222-6177

INSPECTION REPORT

APPLICATION NUMBER: 1332-1133

STREET: ~~49 Matunuck Schoolhouse Road~~

CITY/TOWN: ~~South Kingstown~~

PLAT/LOT: ~~86-2 32~~

POLE NO:

OWTS INSTALLER: ~~No Installer XXXXX~~

Designer:

PHONE NO:

INSPECTION NUMBER:

INSPECTOR: ~~O'Rourke~~

INSPECTION DATE: 09/23/2013

ARRIVAL TIME:

WEATHER CONDITIONS:

TYPE OF INSPECTION:

Dry Season Inspection for Soil

scheduled @ 2:00 PM

FINDINGS/COMMENTS

TH 1 - 10' Eglin Ledge Contact

TH 2 - 10'

TH 3 - 0" Fill

RESULTS OF INSPECTION/ACTION REQUIRED

❑ **CONSTRUCTION - DESIGNER MUST INSPECT/APPROVE PRIOR TO DEM INSPECTION**

- ❑ Bottom inspected
- ❑ Cover inspected
- ❑ Correct items listed
- ❑ (RFA) Address items listed and call for re-inspection.
- ❑ (ASB) Designer must submit As-Builts
- ❑ (RPREQ) Redesign required. Submit new application.
- ❑ (RFAD) Stop Construction. Contact OWTS office. DO NOT CONTINUE.
- ❑ (COC) Designer submit COC
- ❑ (O&M) O&M agreement and permit must be recorded in Land Evidence Records.
- ❑ (Fee) A $100.00 fee is required before re-inspection.
- ❑ Inspection waived

Signature of Inspector _____

❑ **SITE TESTING**

- ☒ Soil Evaluation - Concur
- ❑ Soil Evaluation - Do not concur
- ❑ Soil Evaluation - Inconclusive
- ❑ Alteration Test Hole - Verified
- ❑ Alteration Test Hole - Unacceptable
- ❑ Ledge Test
- ❑ Fill Tests
- ❑ Repair Test Hole

DESIGNER COPY

Appendix B

Freshwater Wetland Determination Letter,
prepared by Natural Resource Services, Inc., October 2013

Natural Resource Services, Inc.

9 October 2013

Joe Casali Engineering, Inc.
300 Post Road
Warwick, RI 02888

RE: Wetland consulting services
A.P. 86-2, Lot 32
South Kingstown, RI

Dear Mr. Casali,

Natural Resource Services, Inc. (NRS) has completed its site inspection of the above referenced property. The purpose of this visit was to determine whether or not state regulated freshwater wetlands were present on or immediately adjacent to the subject property. The opinions expressed in this letter are based upon my site visit on September 23, 2013 and my professional understanding of the Rhode Island Coastal Resources Management Program. All opinions expressed by NRS are subject to review and confirmation from the CRMC before being considered final.

The property is currently the site of the local fire department which is located on the south side of the lot adjacent to Matunuck Schoolhouse Road. The remainder of the lot is maintained lawn. In my opinion, there are no regulated wetland features present on the lot or near the lot that would incur any setbacks onto the lot as determined by my site visit on September 23, 2013.

It is important to note however, that the lot is within the Salt Ponds Special Area Management Plan and classified as "Lands of Critical Concern". This may have implications in regards to the design of the potential OWTS. Please do not hesitate to contact me if you have any questions.

Truly yours,

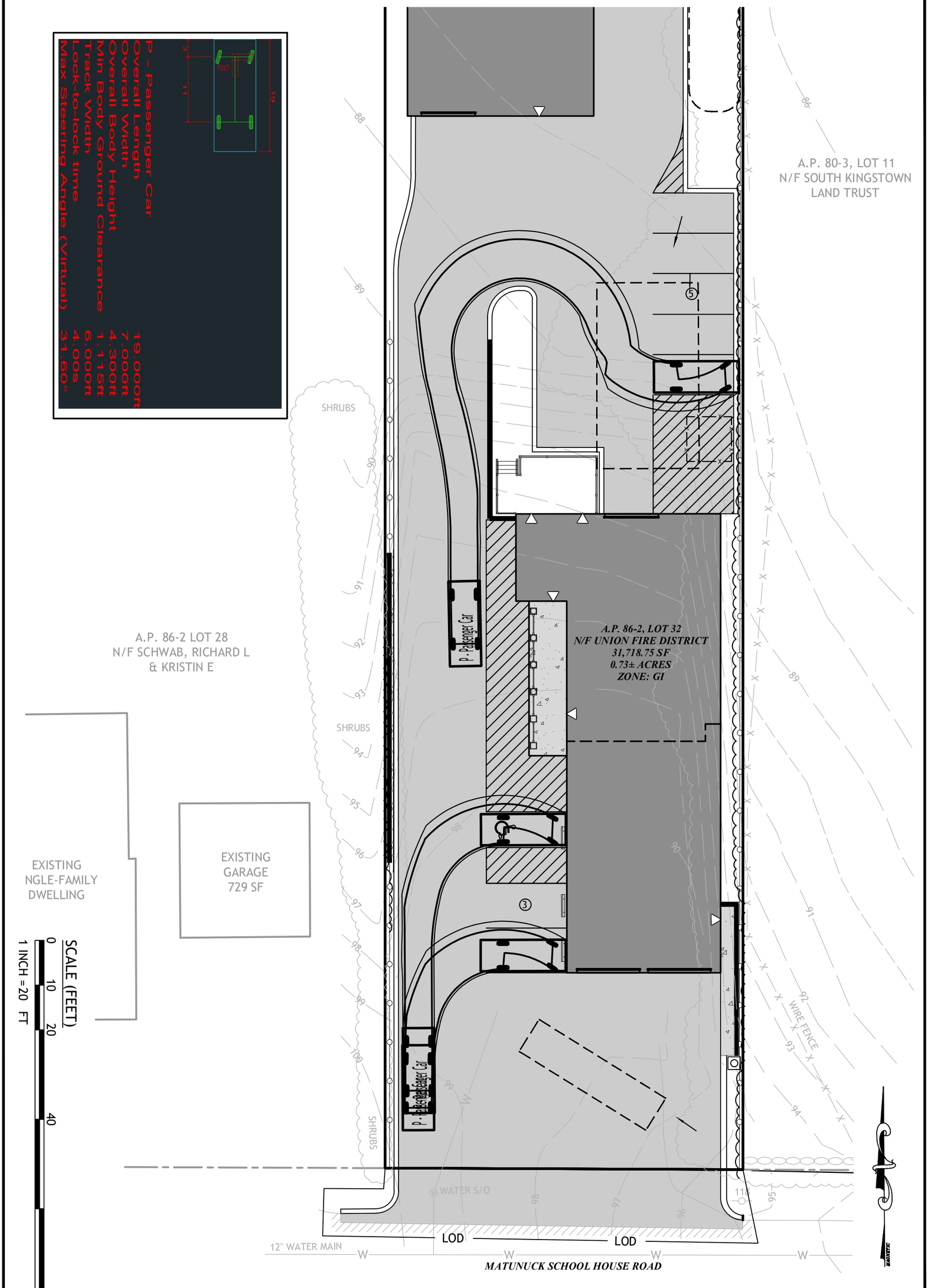
Edward J. Avizinis
Wetland Biologist/Soil Scientist

NRS file #13-177

P.O. Box 311 Harrisville, RI 02830 401-568-7390 FAX 401-568-7490

Appendix C

Site Layout with Vehicle Turning Templates



AUTOTURN MODELING PASSENGER CAR

SHEET 1 OF 3

PRELIMINARY, NOT FOR CONSTRUCTION

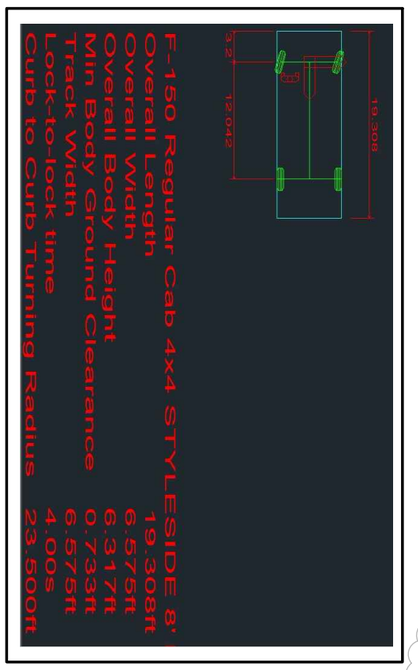
PROJECT NO. 09-31c
DATE JULY, 2021
CHECKED BY: JAC
DRAWN BY: DRD
DESIGNED BY: DRD

REVISIONS
NO. DATE DESCRIPTION

UNION FIRE DISTRICT OF S. KINGSTOWN
STATION 7 MATUNUCK

49 MATUNUCK SCHOOLHOUSE ROAD
S. KINGSTOWN, RHODE ISLAND
AP 86-2, LOT 32

JCE
JOE CASALI ENGINEERING, INC.
CIVIL · SITE DEVELOPMENT · TRANSPORTATION
DRAINAGE · WETLANDS · ISDS · TRAFFIC · FLOODPLAIN
300 POST ROAD, WARWICK, RI 02888
(401) 944-1300 (401)944-1313 FAX WWW.JOECASALI.COM



A.P. 80-3, LOT 11
N/F SOUTH KINGSTOWN
LAND TRUST

A.P. 86-2 LOT 28
N/F SCHWAB, RICHARD L
& KRISTIN E

EXISTING
NGLE-FAMILY
DWELLING

EXISTING
GARAGE
729 SF

A.P. 86-2, LOT 32
N/F UNION FIRE DISTRICT
31,718.75 SF
0.73± ACRES
ZONE: GI

TH-1
TH-2
TH-3

SHRUBS

WIRE FENCE

WATER S/O

LOD

LOD

12" WATER MAIN

MATUNUCK SCHOOL HOUSE ROAD

SCALE (FEET)
0 10 20 40 80
1 INCH = 20 FT

AUTOTURN MODELING FORD F-150

PRELIMINARY, NOT FOR CONSTRUCTION

DESIGNED BY: DRD
DRAWN BY: DRD
CHECKED BY: JAC
DATE: JULY, 2021
PROJECT NO. 09-31c

REVISIONS
NO. DATE DESCRIPTION

UNION FIRE DISTRICT OF S. KINGSTOWN
STATION 7 MATUNUCK
49 MATUNUCK SCHOOLHOUSE ROAD
S. KINGSTOWN, RHODE ISLAND
AP 86-2, LOT 32

JCE
JOE CASALI ENGINEERING, INC.
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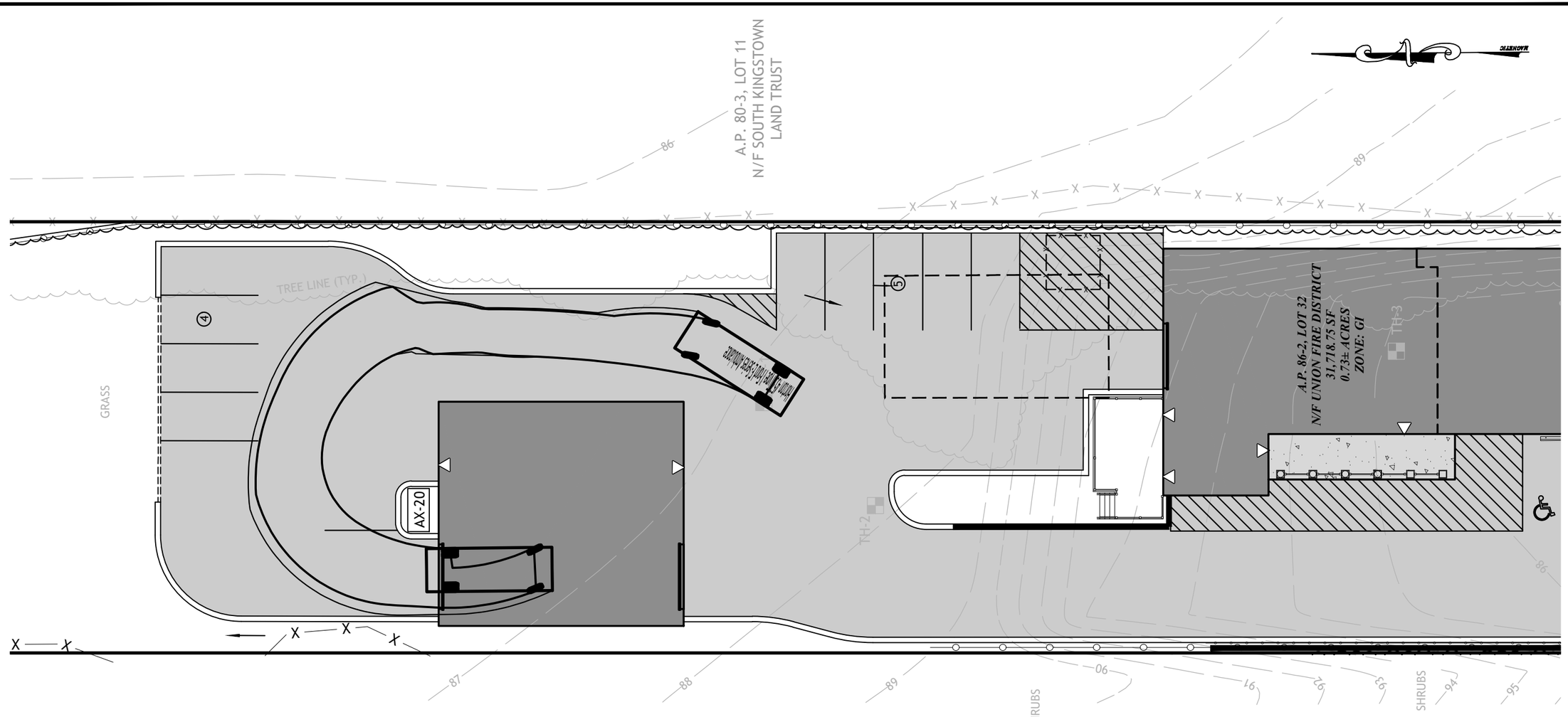
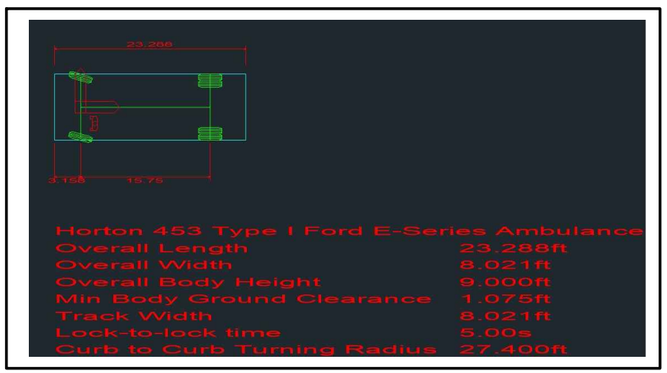
DRAINAGE · WETLANDS · ISDS · TRAFFIC · FLOODPLAIN
300 POST ROAD, WARWICK, RI 02888
(401) 944-1300 (401)944-1313 FAX WWW.JOECASALI.COM

SHEET 2 OF 3





SCALE (FEET)

0 10 20 40 80

1 INCH =20 FT

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300 POST ROAD, WARWICK, RI 02888
(401) 944-1300 (401) 944-1313 FAX WWW.JOECASALI.COM

UNION FIRE DISTRICT OF S. KINGSTOWN
STATION 7 MATUNUCK
49 MATUNUCK SCHOOLHOUSE ROAD
S. KINGSTOWN, RHODE ISLAND
AP 86-2, LOT 32

REVISIONS:

NO.	DATE.	DESCRIPTION

DESIGNED BY:	DRD
DRAWN BY:	DRD
CHECKED BY:	JAC
DATE:	JUNE 2021
PROJECT NO:	09-31c

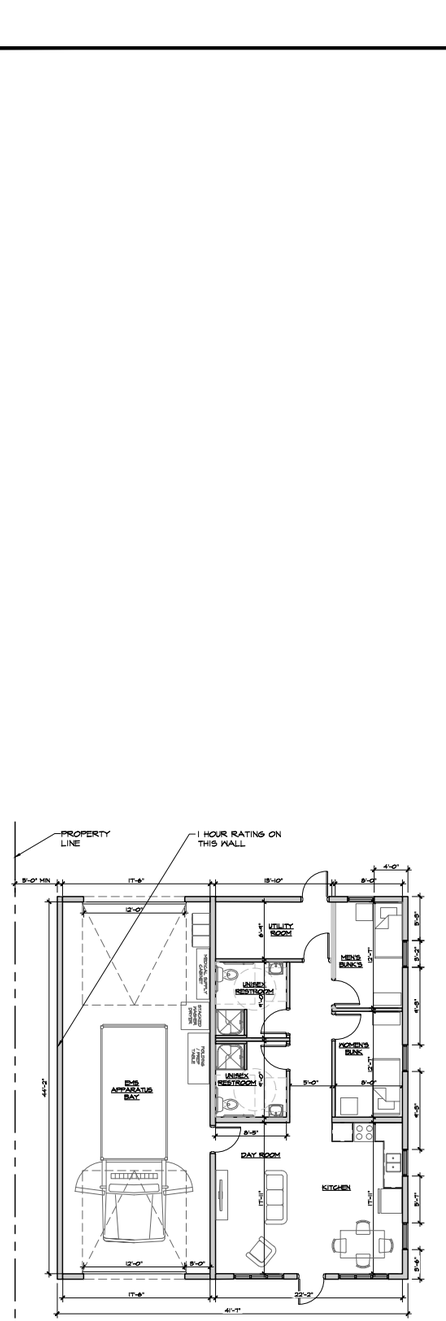
PRELIMINARY, NOT FOR CONSTRUCTION

AUTOTURN MODELING AMBULANCE

SHEET 3 OF 3

Appendix D

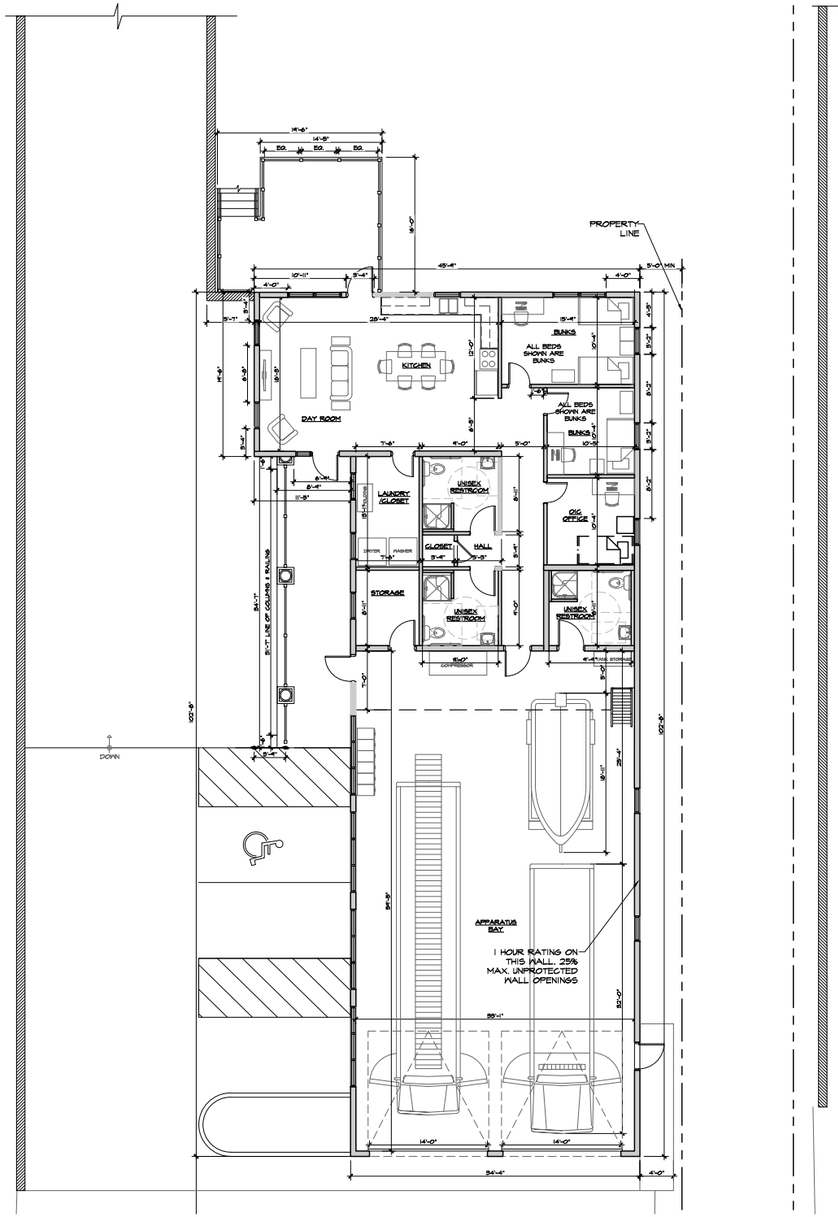
Architectural Plans, prepared by Aharonian and Associates, Inc.



PROPOSED EMS STATION FLOOR PLAN

SCALE: 1/8"=1'-0"

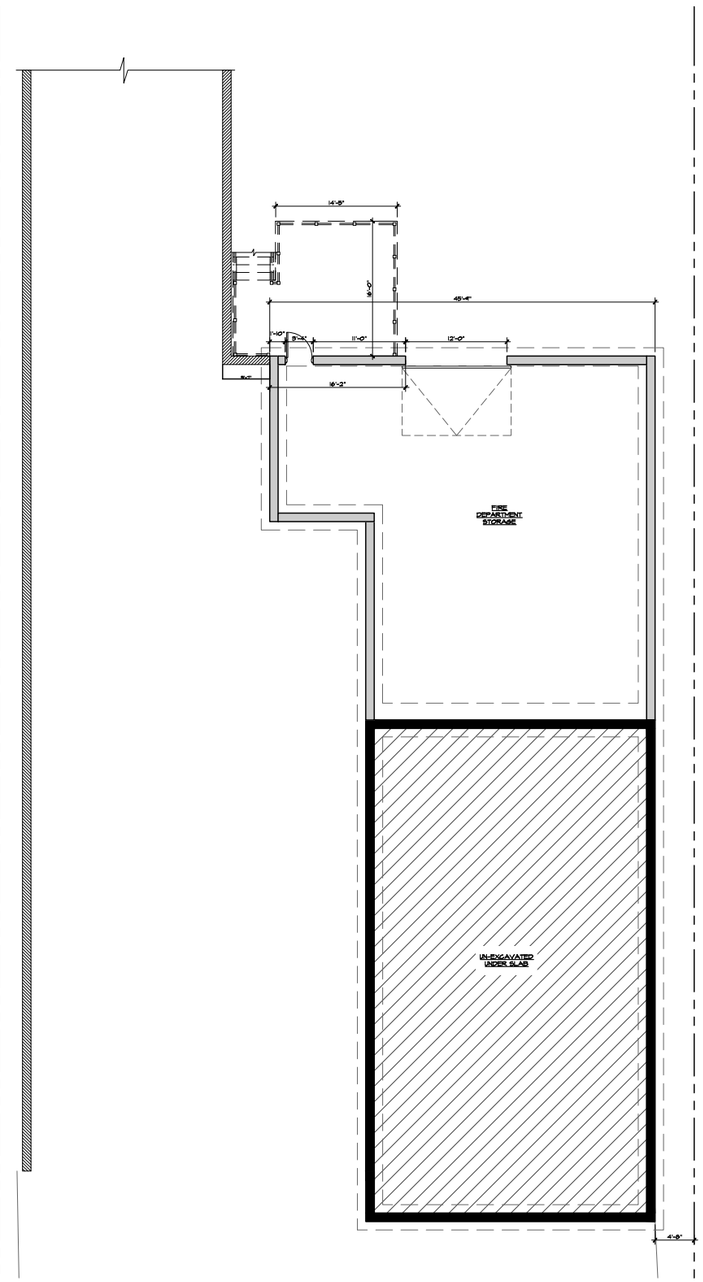
1,891 SQ.FT.



PROPOSED FIRE STATION FLOOR PLAN

SCALE: 1/8"=1'-0"

3,749 SQ.FT.



PROPOSED FIRE STATION BASEMENT PLAN

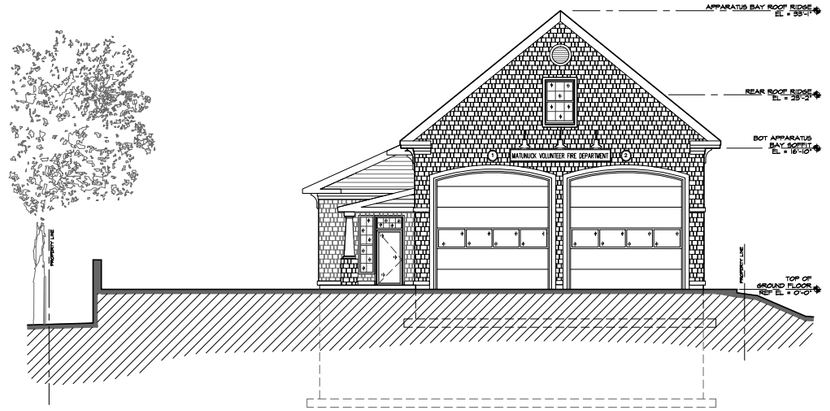
SCALE: 1/8"=1'-0"

1,708 SQ.FT.

PROPOSED PLANS

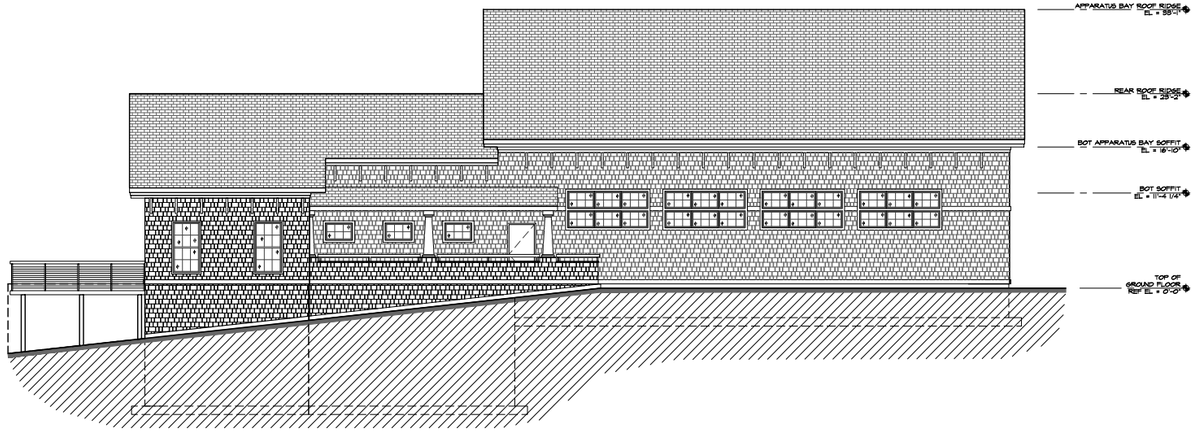
AHARONIAN & ASSOCIATES, INC.
Architects
401-232-5050
www.arch-org.com

UNION FIRE DISTRICT:
MATUNUCK STATION
49 MATUNUCK SCHOOL HOUSE ROAD
SOUTH KINGSTOWN, RI 02917
JUNE 4, 2021



SOUTH ELEVATION (STREET SIDE)

SCALE: 1/8"=1'-0"



WEST ELEVATION

SCALE: 1/8"=1'-0"

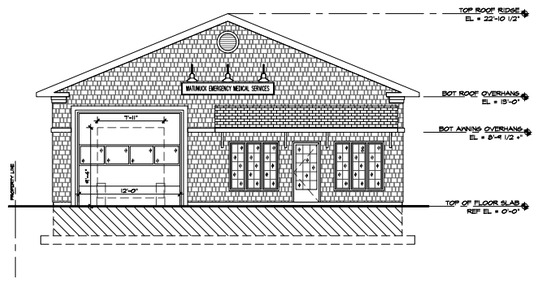
NORTH ELEVATION

SCALE: 1/8"=1'-0"

AHARONIAN
& ASSOCIATES, INC.
Architects
401-232-5010
www.arch-org.com

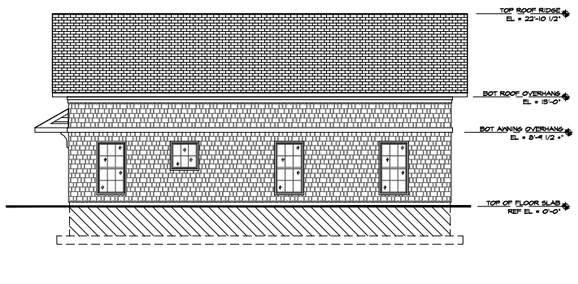
UNION FIRE DISTRICT - MATUNUCK FIRE
STATION EXTERIOR ELEVATIONS

UNION FIRE DISTRICT:
MATUNUCK STATION
49 MATUNUCK SCHOOL HOUSE ROAD
SOUTH KINGSTOWN, RI 02917
JUNE 30, 2021



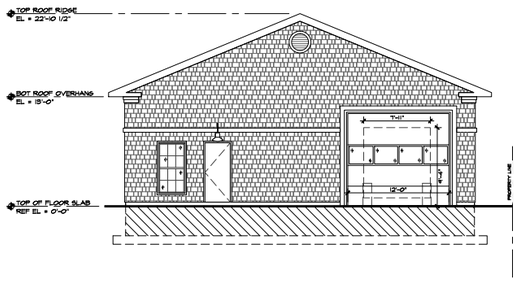
SOUTH ELEVATION

SCALE: 1/8"=1'-0"



EAST ELEVATION

SCALE: 1/8"=1'-0"



NORTH ELEVATION

SCALE: 1/8"=1'-0"

AHARONIAN
& ASSOCIATES, INC.
Architects
401-232-5010
www.arch-org.com

UNION FIRE DISTRICT - MATUNUCK EMS
STATION EXTERIOR ELEVATIONS

UNION FIRE DISTRICT:
MATUNUCK STATION
49 MATUNUCK SCHOOL HOUSE ROAD
SOUTH KINGSTOWN, RI 02917
JUNE 30, 2021

Appendix E

Existing Condition Watershed Map

LEGEND

WATERSHED BOUNDARY LINE
TIME OF CONCENTRATION LINE
UNDERGROUND TIME OF CONCENTRATION LINE

PROPERTY LINE (TYP.)

OVERALL WATERSHED AREA = 138,506 SF

TIME OF CONCENTRATION LINE (TYP.)

WATERSHED 1
AREA = 107,101 SF
TC = 7.9 MIN.
CN = 66

WATERSHED 2
AREA = 31,405 SF
TC = 6.0 MIN.
CN = 86

DP1

DP2

EXISTING CATCH BASIN

MATUNUCK BEACH ROAD

MATUNUCK SCHOOLHOUSE ROAD

Matunuck School House Rd

88 90 100 110 116 96 90 84

SCALE (FEET)

0 40 80 160 320

1 INCH = 80 FT

JCE
JOE CASALI ENGINEERING, INC.
CIVIL · SITE DEVELOPMENT · TRANSPORTATION
WATER SUPPLY · WASTEWATER · DRAINAGE · FLOOD PLAIN MANAGEMENT
300 POST ROAD, WARWICK, RI 02888
(401) 944-1300 (401) 944-1313 FAX WWW.JOECASALI.COM

UNION FIRE DISTRICT OF S. KINGSTOWN
STATION 7, MATUNUCK
49 MATUNUCK SCHOOLHOUSE ROAD
SOUTH KINGSTOWN, RHODE ISLAND
AP 86-2, LOT 32

REVISIONS:		
NO.	DATE.	DESCRIPTION

DESIGNED BY:	SD
DRAWN BY:	SD
CHECKED BY:	JAC
DATE:	JULY 2021
PROJECT NO:	09-31c

STORMWATER REPORT

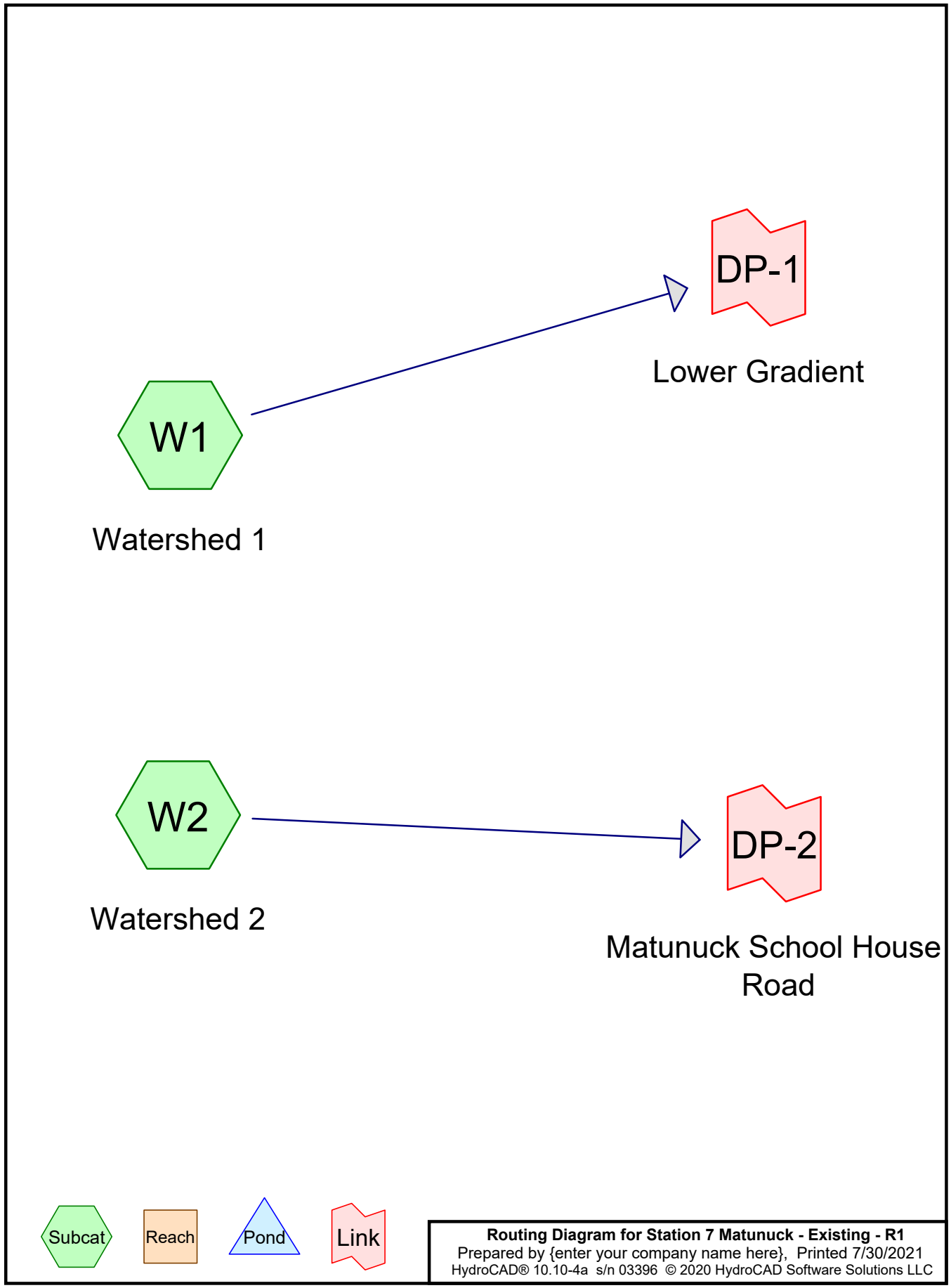
EXISTING CONDITIONS WATERSHED MAP

SHEET 1 OF 1

Q:\09-31 Union Fire Station\09-31c Station 7 - Matunuck\Drainage\Watershed Maps\Union Fire - Station 7 Matunuck [Watershed Map] - R1A.dwg Jul. 29, 2021 4:09pm

Appendix F

Existing Condition HydroCAD Calculations



Routing Diagram for Station 7 Matunuck - Existing - R1
Prepared by {enter your company name here}, Printed 7/30/2021

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-Year	Type III 24-hr		Default	24.00	1	2.70	2
2	2-Year	Type III 24-hr		Default	24.00	1	3.30	2
3	10-Year	Type III 24-hr		Default	24.00	1	4.90	2
4	25-Year	Type III 24-hr		Default	24.00	1	6.10	2
5	100-Year	Type III 24-hr		Default	24.00	1	8.70	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
103,489	61	>75% Grass cover, Good, HSG B (W1, W2)
20,154	98	Paved parking & Roadways, HSG B (W2)
7,404	98	Paved parking, HSG B (W1)
7,459	98	Roofs, HSG B (W1, W2)
138,506	**70**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
138,506	HSG B	W1, W2
0	HSG C	
0	HSG D	
0	Other	
138,506		**TOTAL AREA**

Summary for Subcatchment W1: Watershed 1

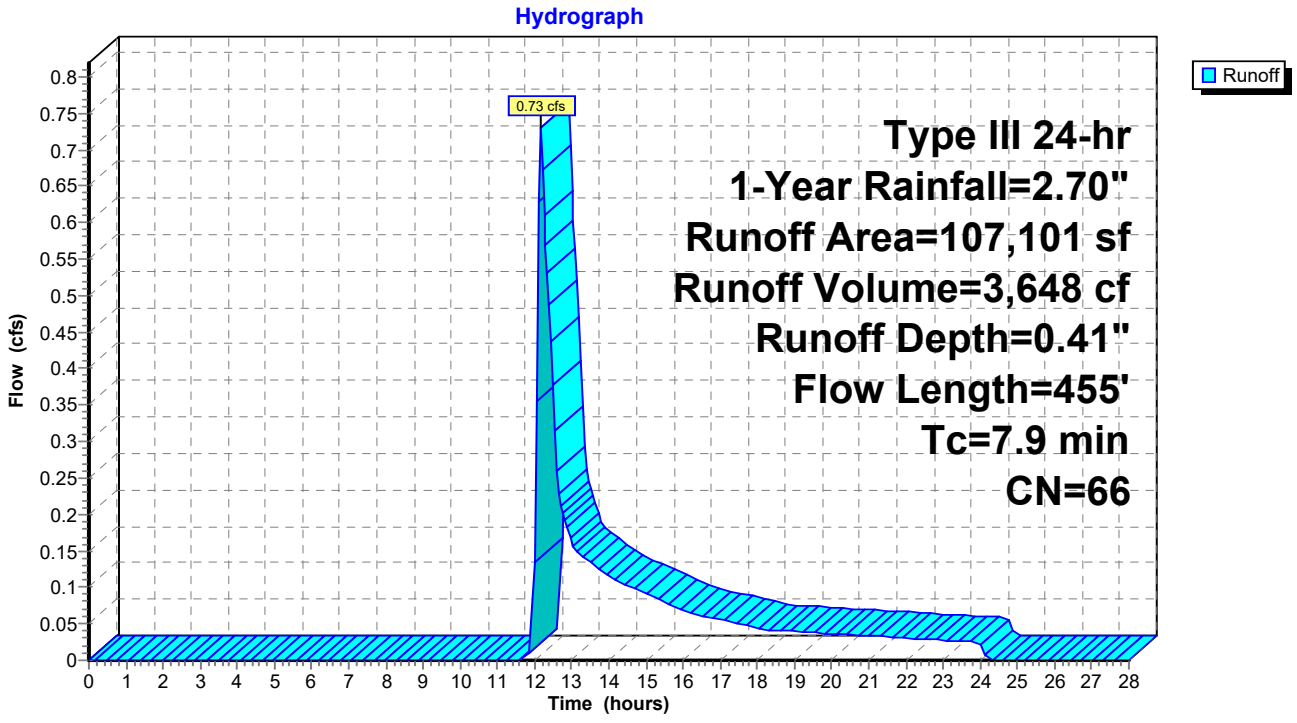
Runoff = 0.73 cfs @ 12.16 hrs, Volume= 3,648 cf, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Year Rainfall=2.70"

Area (sf)	CN	Description
6,411	98	Roofs, HSG B
7,404	98	Paved parking, HSG B
93,286	61	>75% Grass cover, Good, HSG B
107,101	66	Weighted Average
93,286	61	87.10% Pervious Area
13,815	98	12.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.0600	0.27		**Sheet Flow, SEG A** Grass: Short n= 0.150 P2= 3.30"
1.7	355	0.0560	3.55		**Shallow Concentrated Flow, SEG B** Grassed Waterway Kv= 15.0 fps
7.9	455	Total			

Subcatchment W1: Watershed 1



Summary for Subcatchment W2: Watershed 2

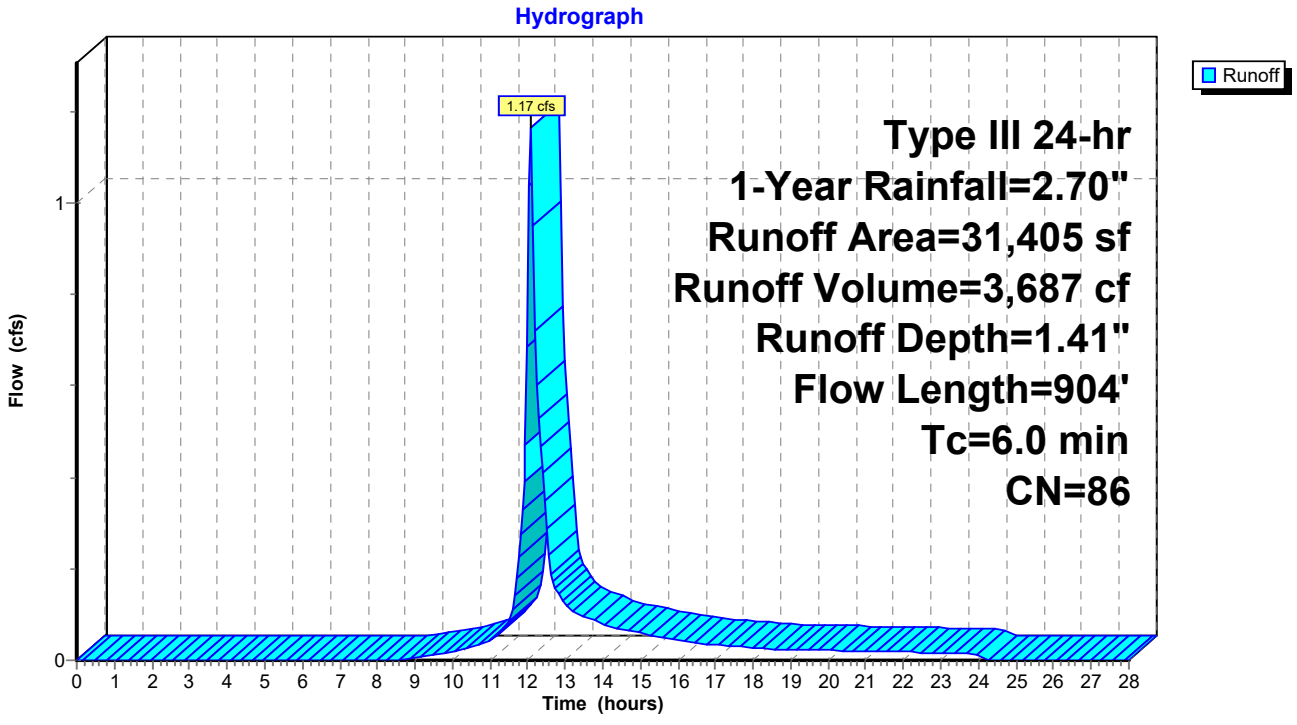
Runoff = 1.17 cfs @ 12.09 hrs, Volume= 3,687 cf, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Year Rainfall=2.70"

	Area (sf)	CN	Description
	1,048	98	Roofs, HSG B
*	20,154	98	Paved parking & Roadways, HSG B
	10,203	61	>75% Grass cover, Good, HSG B
	31,405	86	Weighted Average
	10,203	61	32.49% Pervious Area
	21,202	98	67.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	77	0.0200	1.33		**Sheet Flow, SEG A** Smooth surfaces n= 0.011 P2= 3.30"
3.5	827	0.0380	3.96		**Shallow Concentrated Flow, SEG B** Paved Kv= 20.3 fps
4.5	904	Total, Increased to minimum Tc = 6.0 min			

Subcatchment W2: Watershed 2

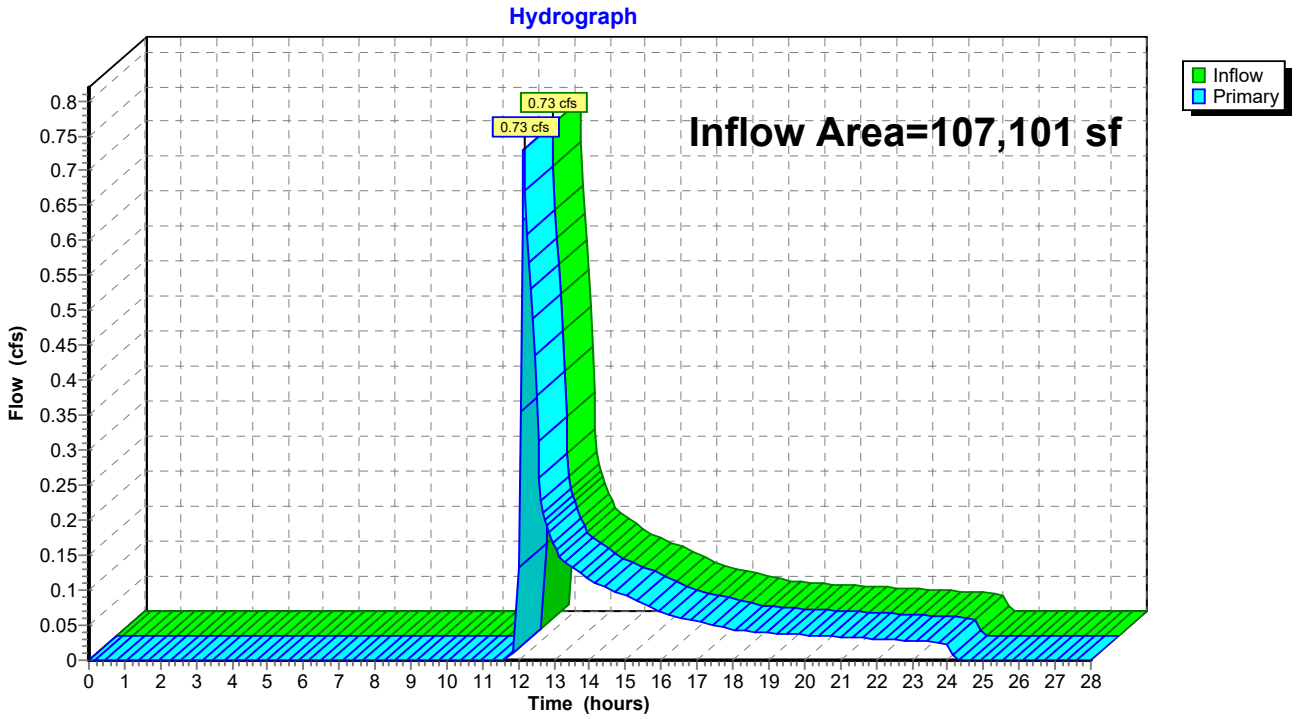


Summary for Link DP-1: Lower Gradient

Inflow Area = 107,101 sf, 12.90% Impervious, Inflow Depth = 0.41" for 1-Year event
Inflow = 0.73 cfs @ 12.16 hrs, Volume= 3,648 cf
Primary = 0.73 cfs @ 12.16 hrs, Volume= 3,648 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

Link DP-1: Lower Gradient

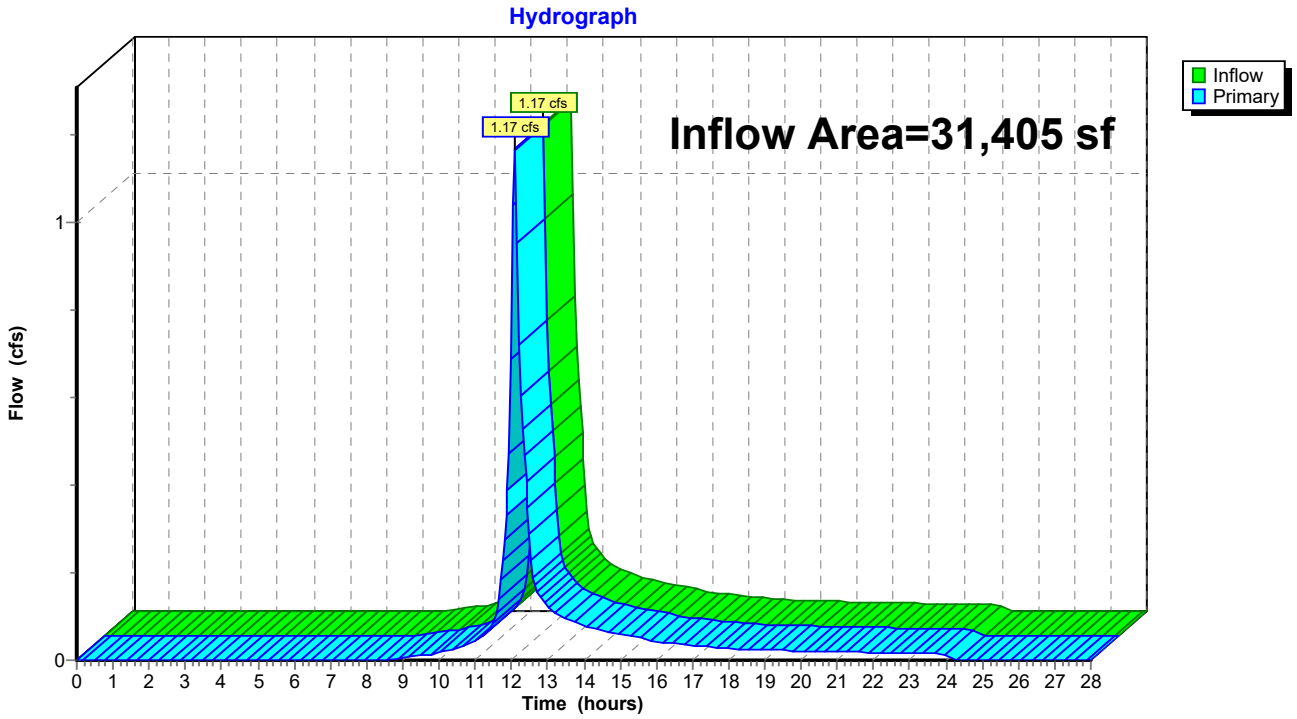


Summary for Link DP-2: Matunuck School House Road

Inflow Area = 31,405 sf, 67.51% Impervious, Inflow Depth = 1.41" for 1-Year event
Inflow = 1.17 cfs @ 12.09 hrs, Volume= 3,687 cf
Primary = 1.17 cfs @ 12.09 hrs, Volume= 3,687 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

Link DP-2: Matunuck School House Road



Summary for Subcatchment W1: Watershed 1

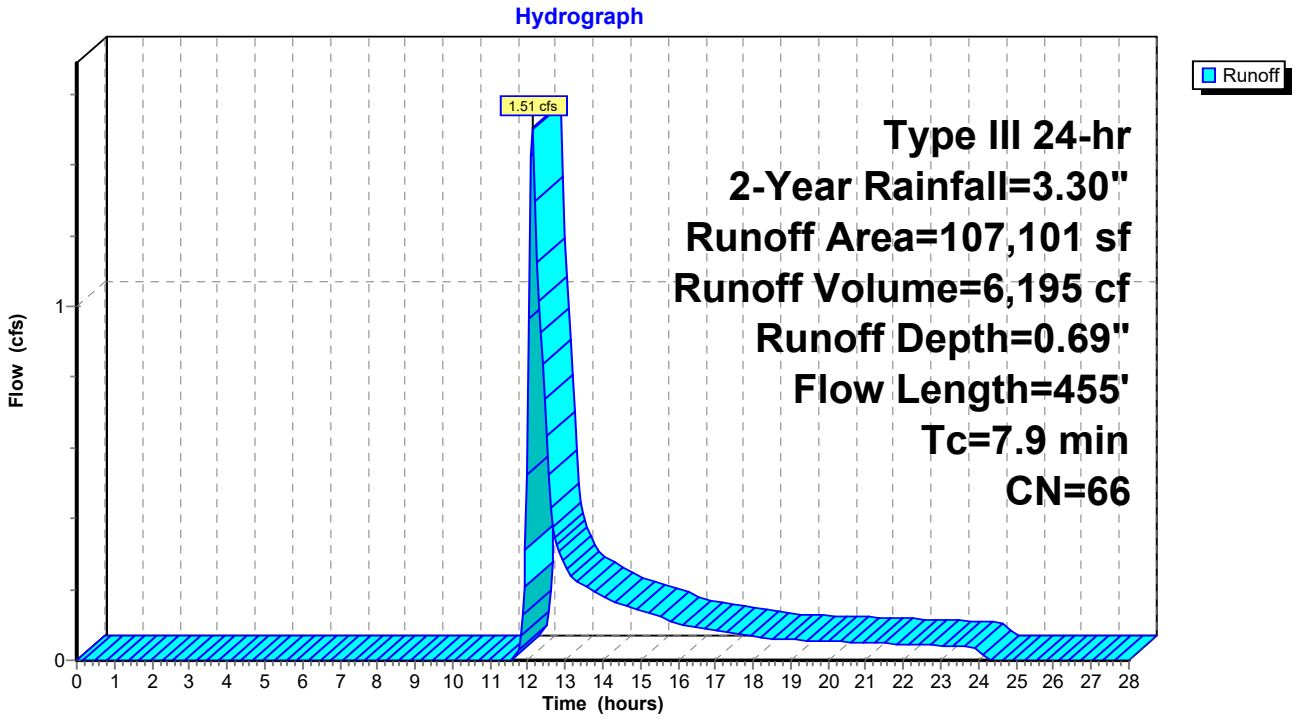
Runoff = 1.51 cfs @ 12.14 hrs, Volume= 6,195 cf, Depth= 0.69"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
6,411	98	Roofs, HSG B
7,404	98	Paved parking, HSG B
93,286	61	>75% Grass cover, Good, HSG B
107,101	66	Weighted Average
93,286	61	87.10% Pervious Area
13,815	98	12.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.0600	0.27		**Sheet Flow, SEG A** Grass: Short n= 0.150 P2= 3.30"
1.7	355	0.0560	3.55		**Shallow Concentrated Flow, SEG B** Grassed Waterway Kv= 15.0 fps
7.9	455	Total			

Subcatchment W1: Watershed 1



Summary for Subcatchment W2: Watershed 2

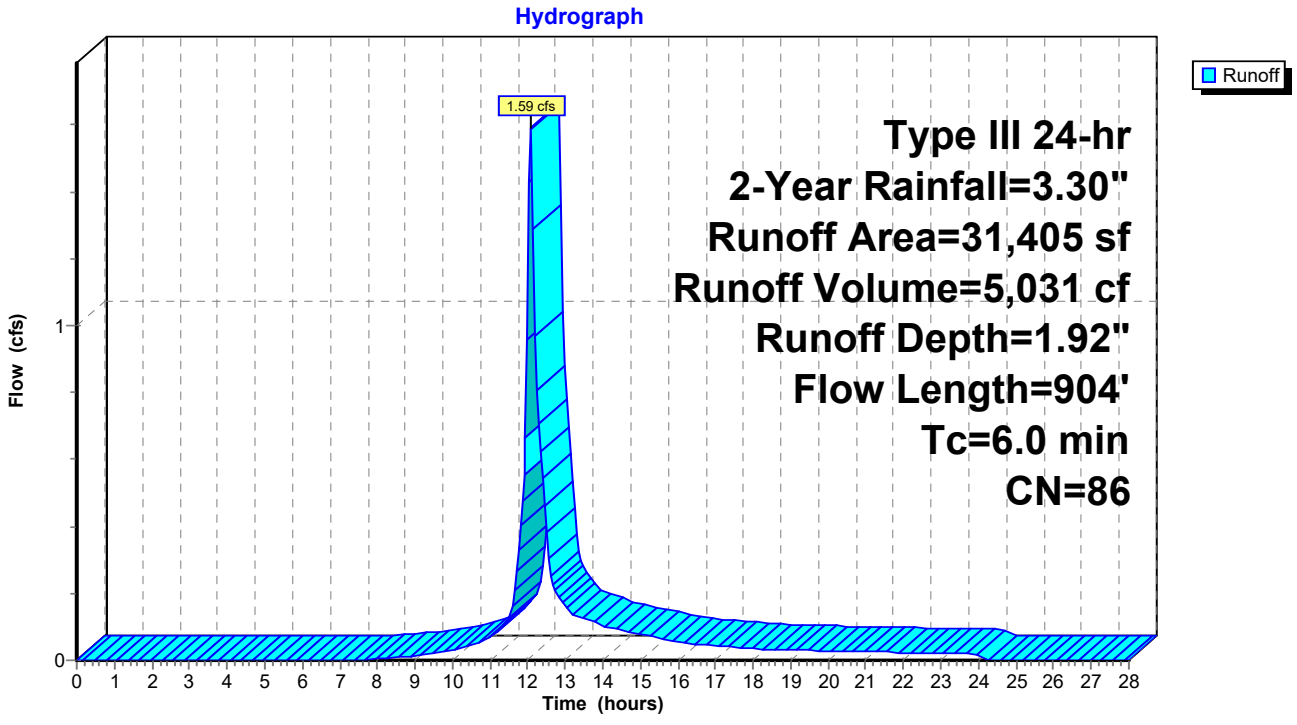
Runoff = 1.59 cfs @ 12.09 hrs, Volume= 5,031 cf, Depth= 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

	Area (sf)	CN	Description
	1,048	98	Roofs, HSG B
*	20,154	98	Paved parking & Roadways, HSG B
	10,203	61	>75% Grass cover, Good, HSG B
	31,405	86	Weighted Average
	10,203	61	32.49% Pervious Area
	21,202	98	67.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	77	0.0200	1.33		**Sheet Flow, SEG A** Smooth surfaces n= 0.011 P2= 3.30"
3.5	827	0.0380	3.96		**Shallow Concentrated Flow, SEG B** Paved Kv= 20.3 fps
4.5	904	Total, Increased to minimum Tc = 6.0 min			

Subcatchment W2: Watershed 2

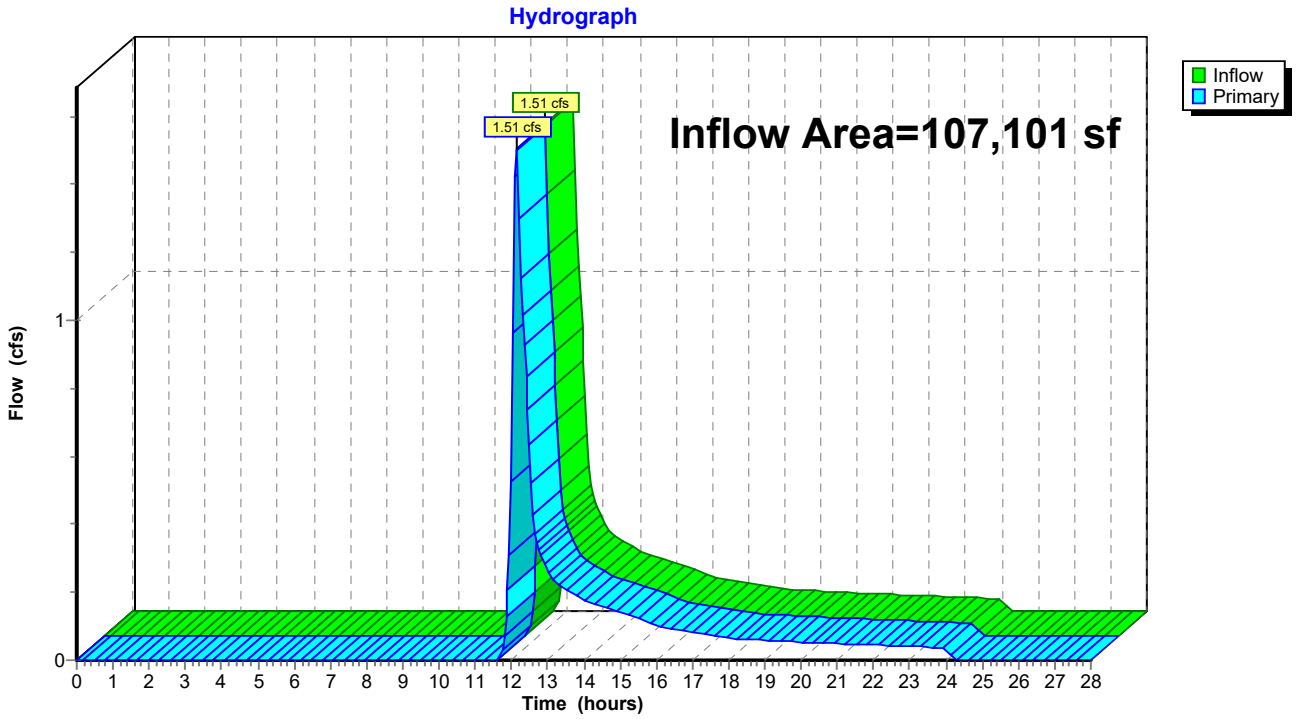


Summary for Link DP-1: Lower Gradient

Inflow Area = 107,101 sf, 12.90% Impervious, Inflow Depth = 0.69" for 2-Year event
Inflow = 1.51 cfs @ 12.14 hrs, Volume= 6,195 cf
Primary = 1.51 cfs @ 12.14 hrs, Volume= 6,195 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

Link DP-1: Lower Gradient

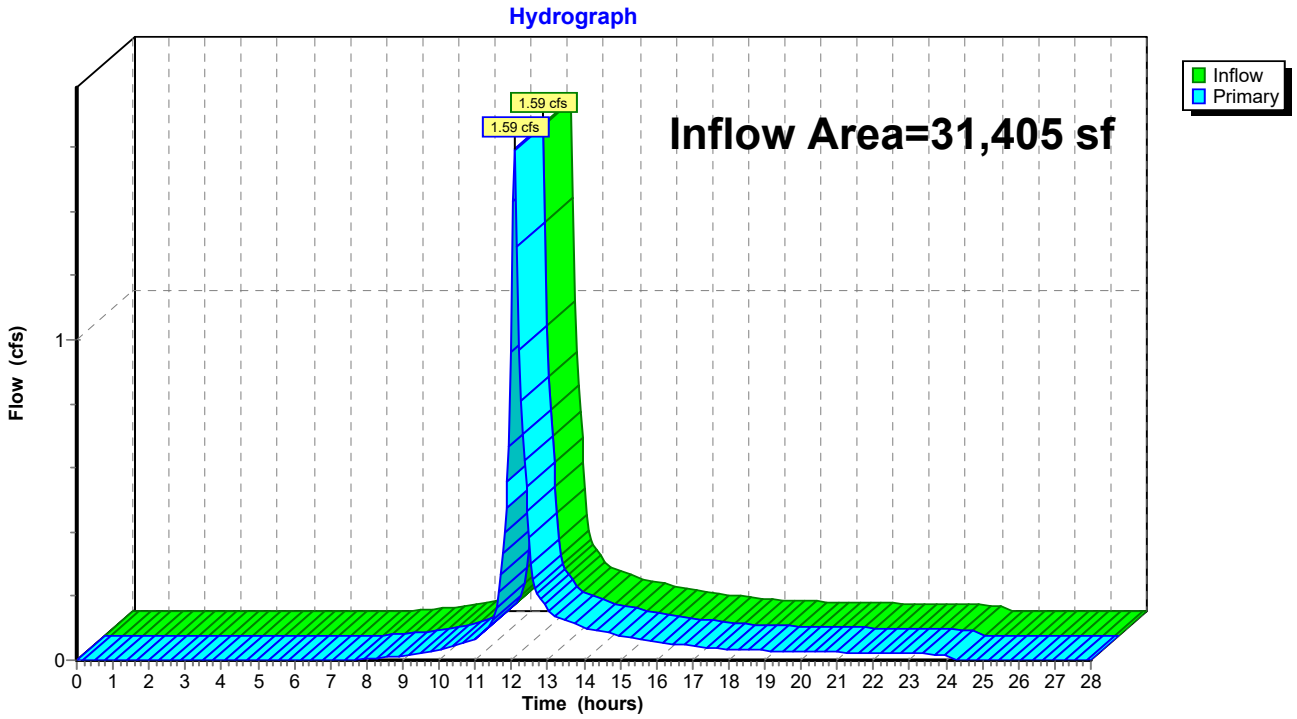


Summary for Link DP-2: Matunuck School House Road

Inflow Area = 31,405 sf, 67.51% Impervious, Inflow Depth = 1.92" for 2-Year event
Inflow = 1.59 cfs @ 12.09 hrs, Volume= 5,031 cf
Primary = 1.59 cfs @ 12.09 hrs, Volume= 5,031 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

Link DP-2: Matunuck School House Road



Summary for Subcatchment W1: Watershed 1

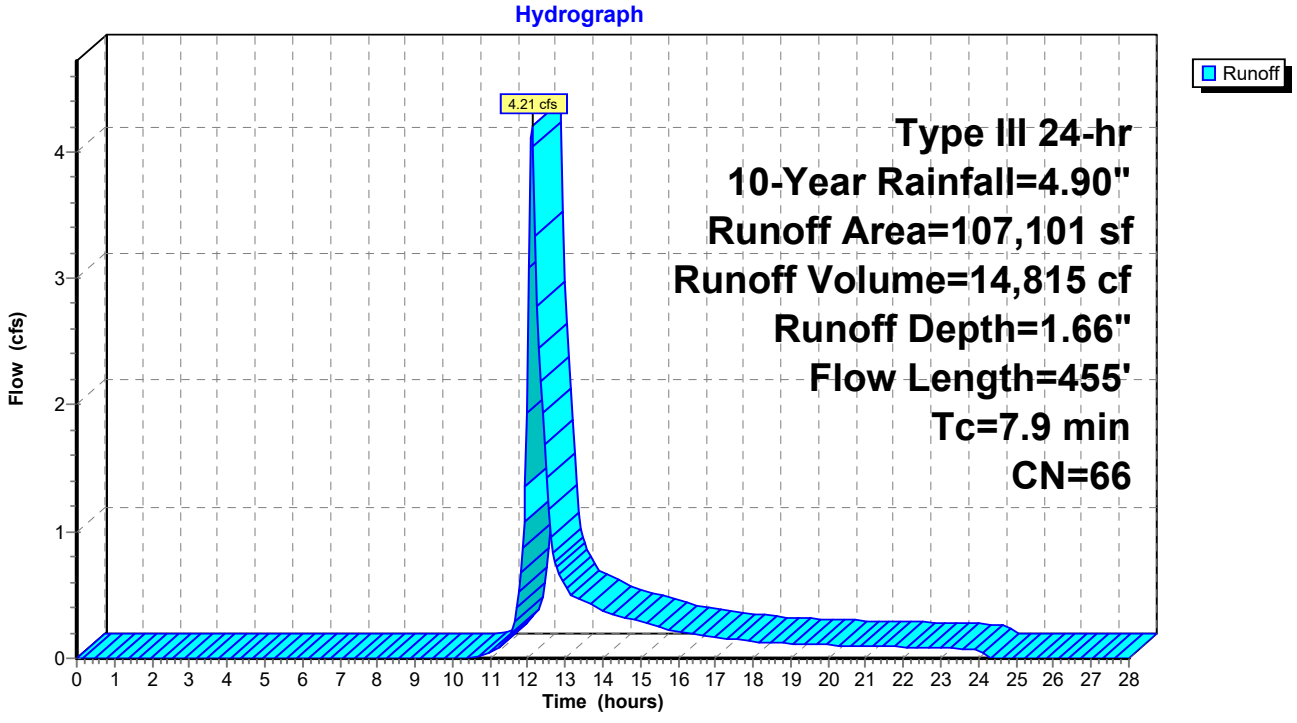
Runoff = 4.21 cfs @ 12.12 hrs, Volume= 14,815 cf, Depth= 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.90"

Area (sf)	CN	Description
6,411	98	Roofs, HSG B
7,404	98	Paved parking, HSG B
93,286	61	>75% Grass cover, Good, HSG B
107,101	66	Weighted Average
93,286	61	87.10% Pervious Area
13,815	98	12.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.0600	0.27		**Sheet Flow, SEG A** Grass: Short n= 0.150 P2= 3.30"
1.7	355	0.0560	3.55		**Shallow Concentrated Flow, SEG B** Grassed Waterway Kv= 15.0 fps
7.9	455	Total			

Subcatchment W1: Watershed 1



Summary for Subcatchment W2: Watershed 2

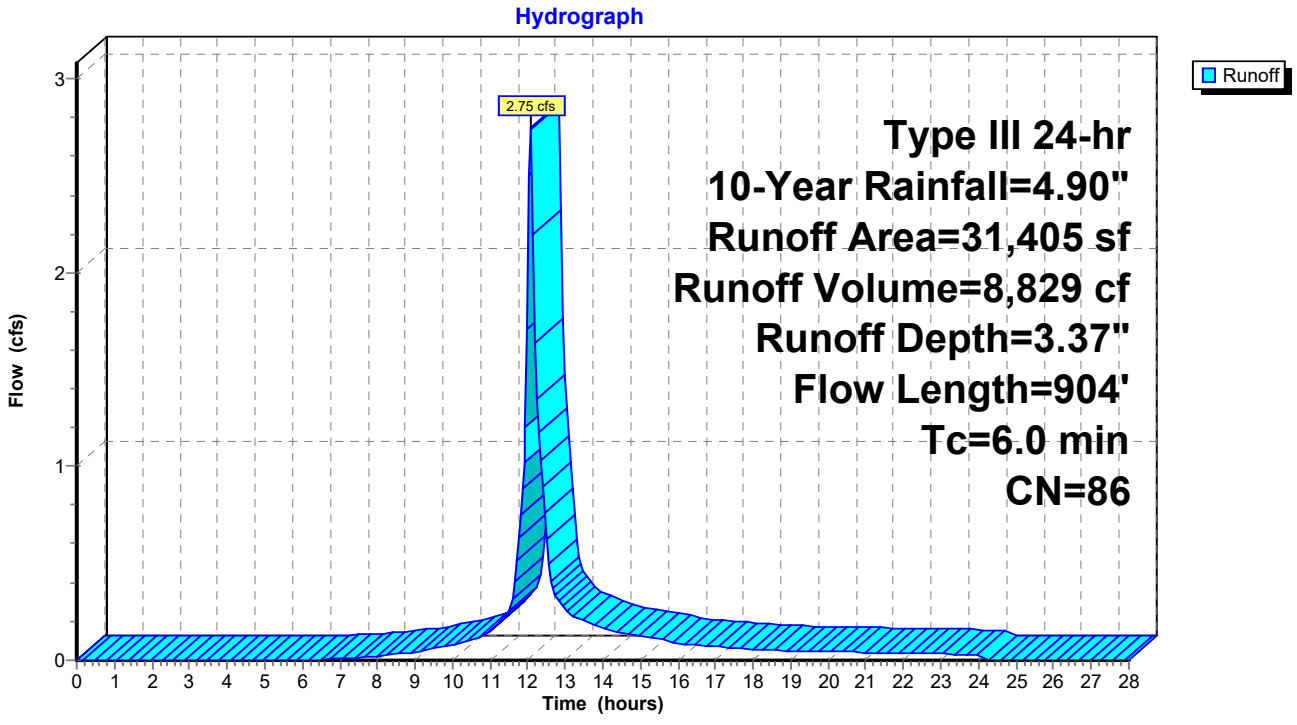
Runoff = 2.75 cfs @ 12.09 hrs, Volume= 8,829 cf, Depth= 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.90"

	Area (sf)	CN	Description
	1,048	98	Roofs, HSG B
*	20,154	98	Paved parking & Roadways, HSG B
	10,203	61	>75% Grass cover, Good, HSG B
	31,405	86	Weighted Average
	10,203	61	32.49% Pervious Area
	21,202	98	67.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	77	0.0200	1.33		**Sheet Flow, SEG A** Smooth surfaces n= 0.011 P2= 3.30"
3.5	827	0.0380	3.96		**Shallow Concentrated Flow, SEG B** Paved Kv= 20.3 fps
4.5	904	Total, Increased to minimum Tc = 6.0 min			

Subcatchment W2: Watershed 2

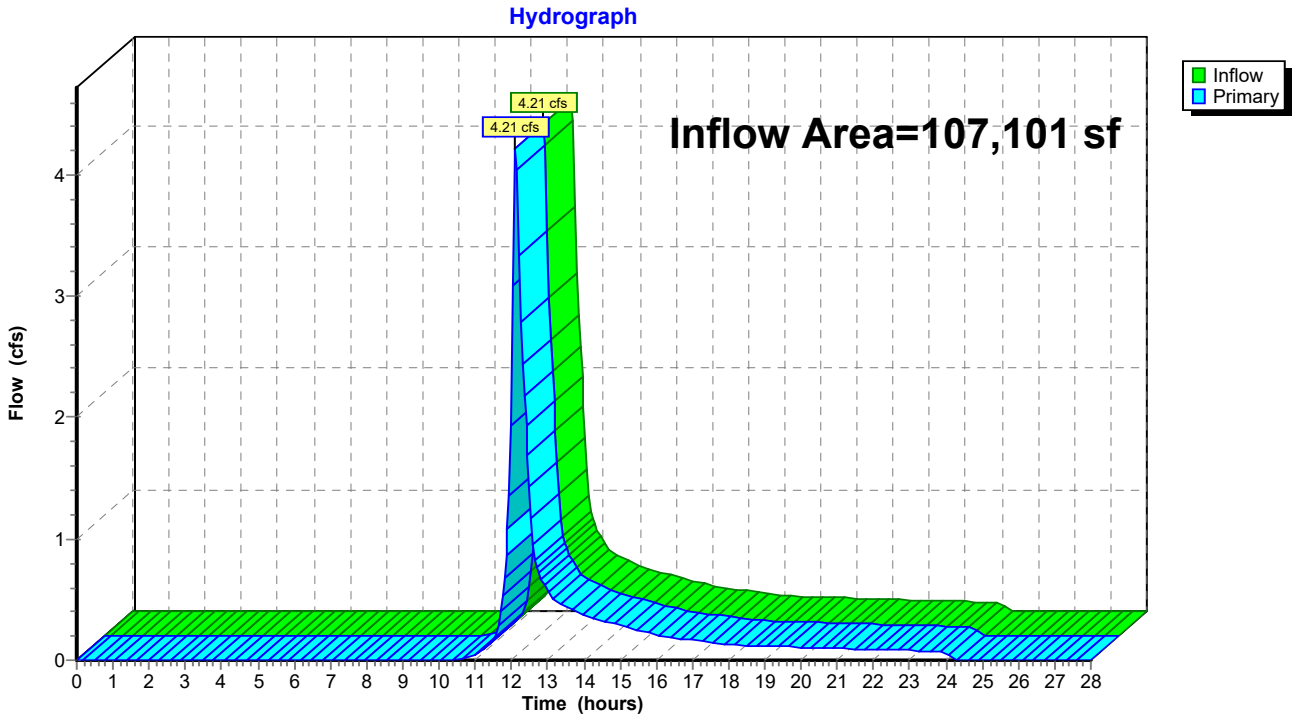


Summary for Link DP-1: Lower Gradient

Inflow Area = 107,101 sf, 12.90% Impervious, Inflow Depth = 1.66" for 10-Year event
Inflow = 4.21 cfs @ 12.12 hrs, Volume= 14,815 cf
Primary = 4.21 cfs @ 12.12 hrs, Volume= 14,815 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

Link DP-1: Lower Gradient

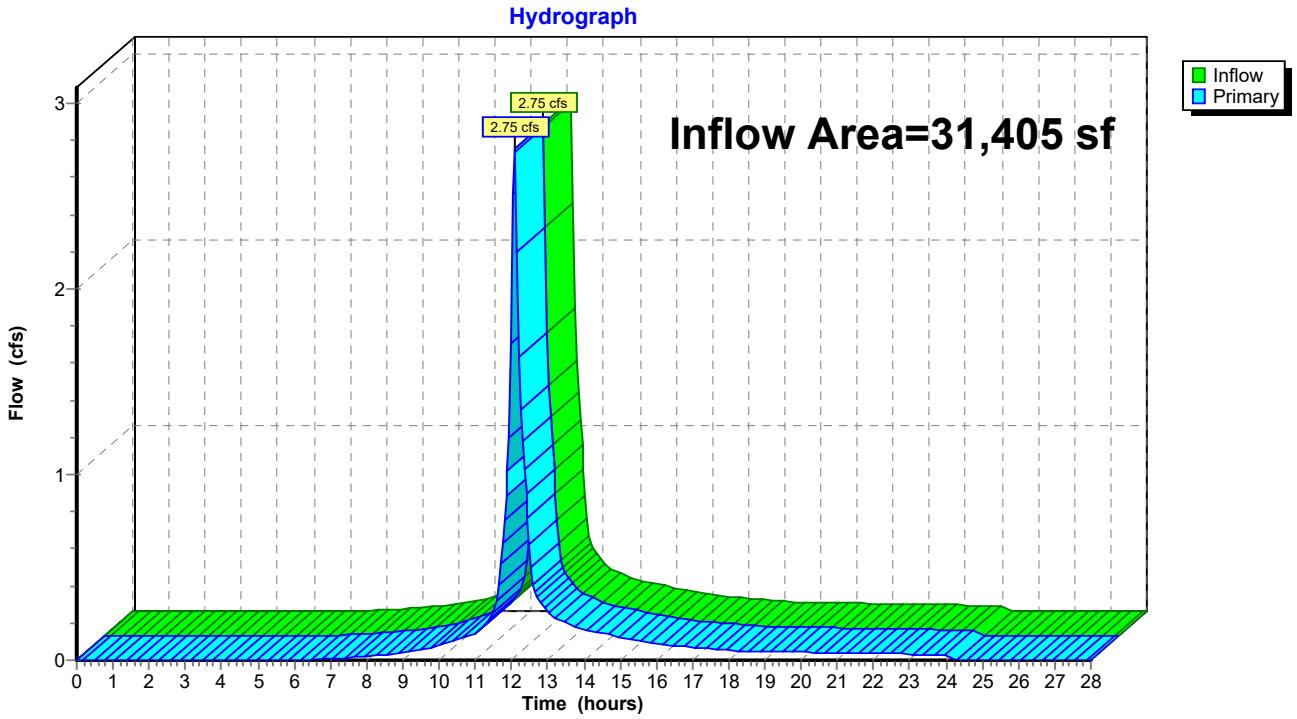


Summary for Link DP-2: Matunuck School House Road

Inflow Area = 31,405 sf, 67.51% Impervious, Inflow Depth = 3.37" for 10-Year event
Inflow = 2.75 cfs @ 12.09 hrs, Volume= 8,829 cf
Primary = 2.75 cfs @ 12.09 hrs, Volume= 8,829 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

Link DP-2: Matunuck School House Road



Summary for Subcatchment W1: Watershed 1

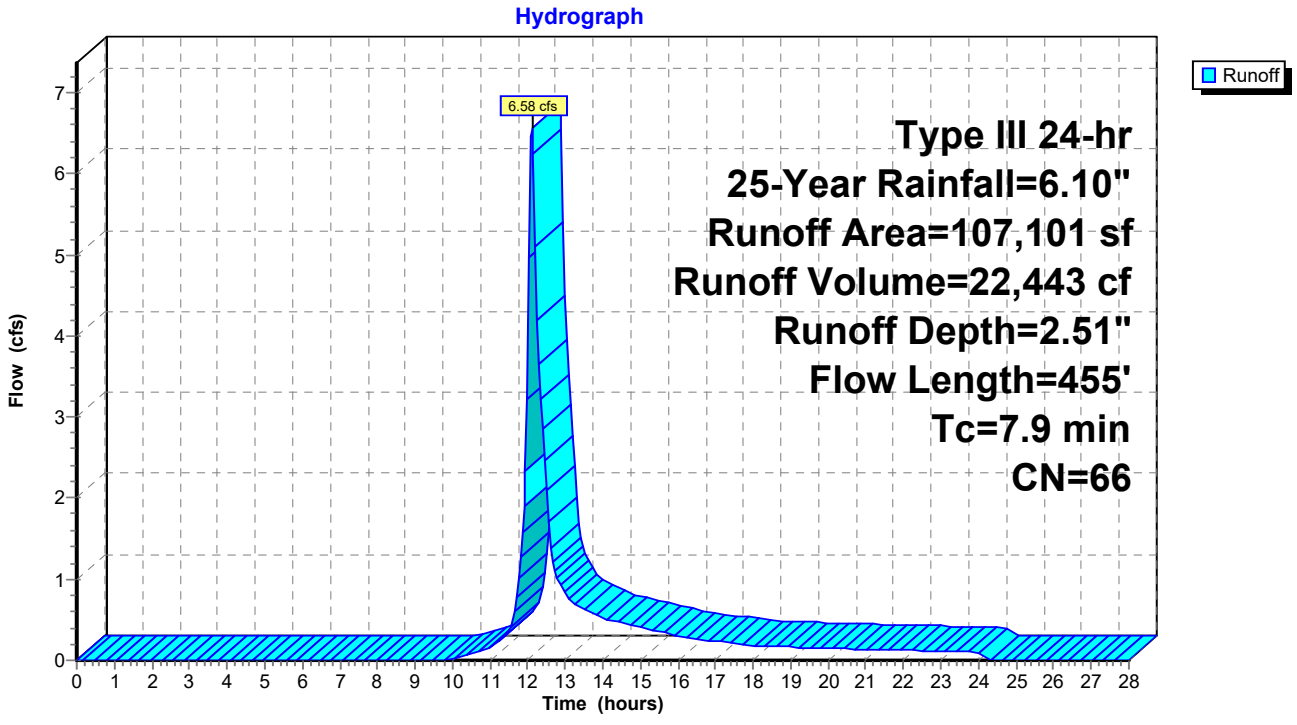
Runoff = 6.58 cfs @ 12.12 hrs, Volume= 22,443 cf, Depth= 2.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.10"

Area (sf)	CN	Description
6,411	98	Roofs, HSG B
7,404	98	Paved parking, HSG B
93,286	61	>75% Grass cover, Good, HSG B
107,101	66	Weighted Average
93,286	61	87.10% Pervious Area
13,815	98	12.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.0600	0.27		**Sheet Flow, SEG A** Grass: Short n= 0.150 P2= 3.30"
1.7	355	0.0560	3.55		**Shallow Concentrated Flow, SEG B** Grassed Waterway Kv= 15.0 fps
7.9	455	Total			

Subcatchment W1: Watershed 1



Summary for Subcatchment W2: Watershed 2

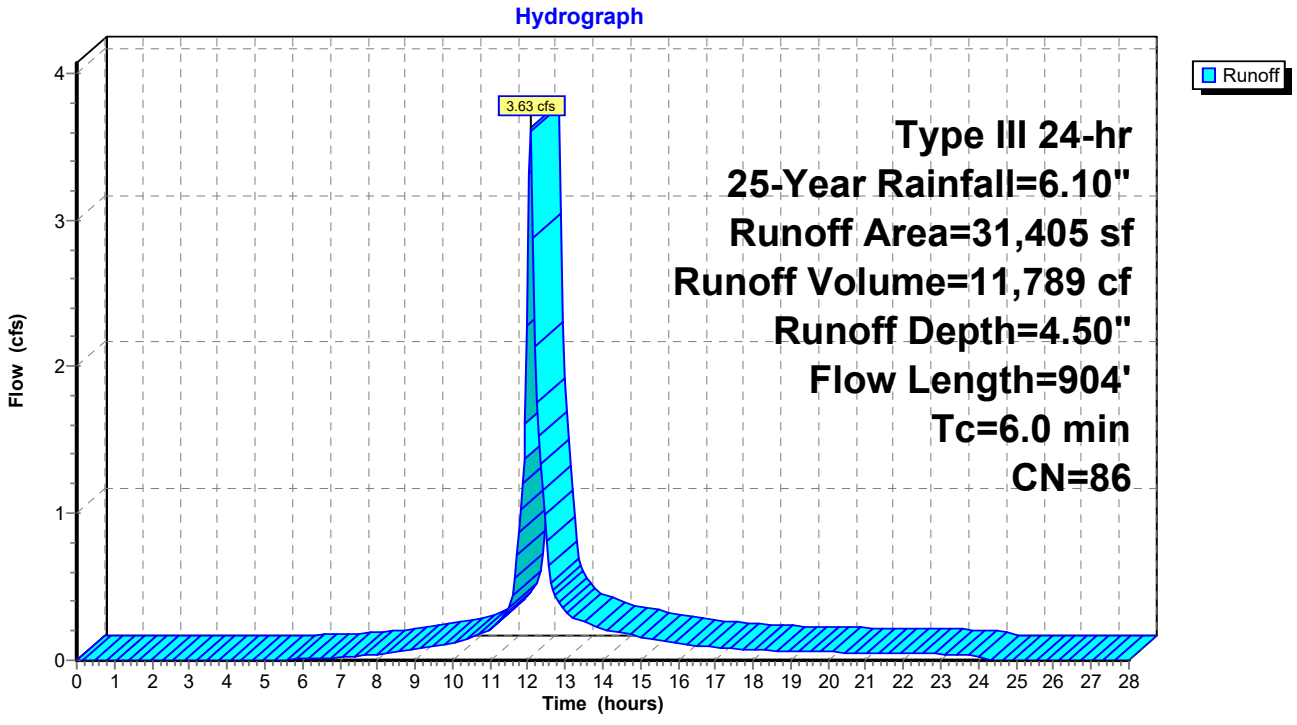
Runoff = 3.63 cfs @ 12.09 hrs, Volume= 11,789 cf, Depth= 4.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.10"

	Area (sf)	CN	Description
	1,048	98	Roofs, HSG B
*	20,154	98	Paved parking & Roadways, HSG B
	10,203	61	>75% Grass cover, Good, HSG B
	31,405	86	Weighted Average
	10,203	61	32.49% Pervious Area
	21,202	98	67.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	77	0.0200	1.33		**Sheet Flow, SEG A** Smooth surfaces n= 0.011 P2= 3.30"
3.5	827	0.0380	3.96		**Shallow Concentrated Flow, SEG B** Paved Kv= 20.3 fps
4.5	904	Total, Increased to minimum Tc = 6.0 min			

Subcatchment W2: Watershed 2

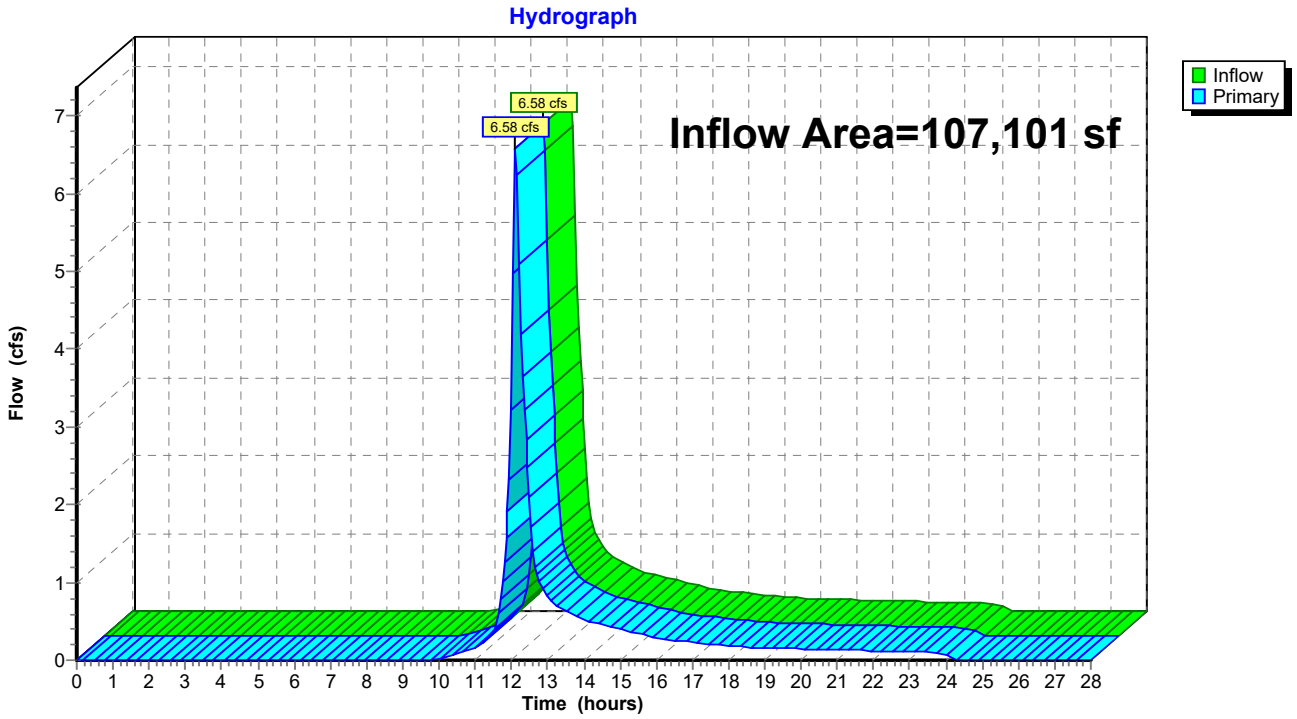


Summary for Link DP-1: Lower Gradient

Inflow Area = 107,101 sf, 12.90% Impervious, Inflow Depth = 2.51" for 25-Year event
Inflow = 6.58 cfs @ 12.12 hrs, Volume= 22,443 cf
Primary = 6.58 cfs @ 12.12 hrs, Volume= 22,443 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

Link DP-1: Lower Gradient

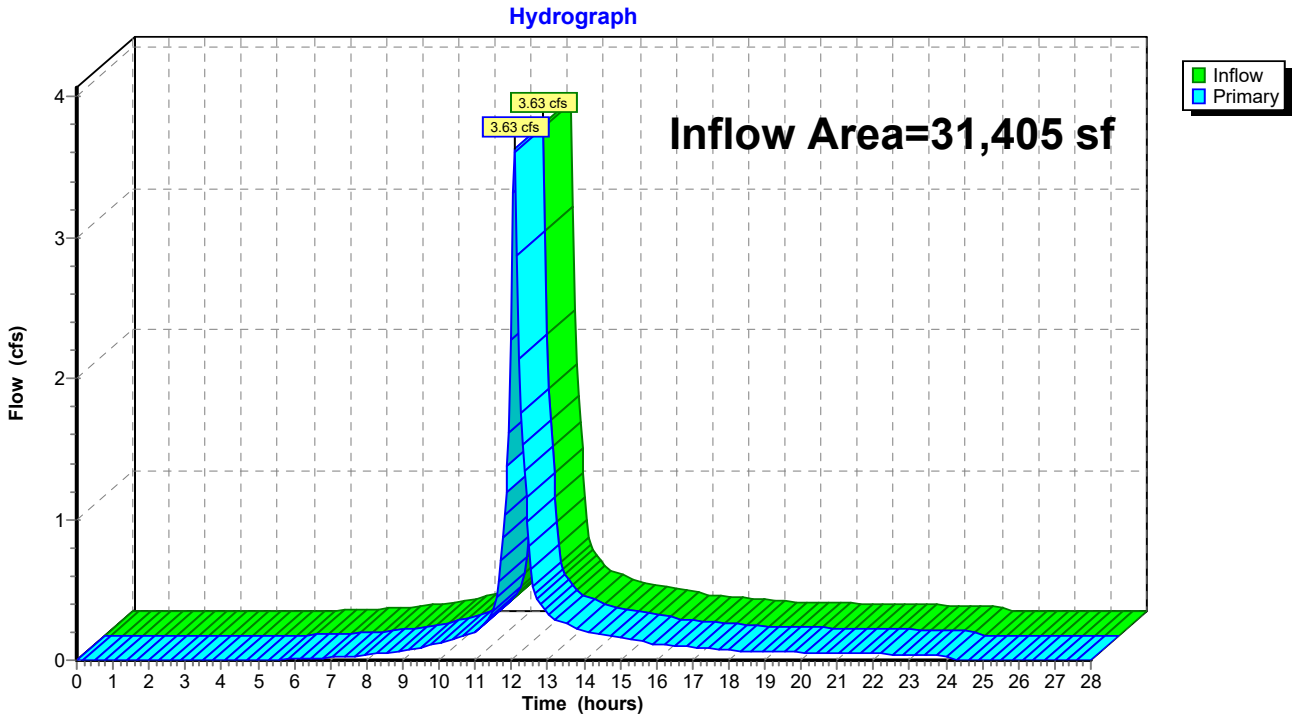


Summary for Link DP-2: Matunuck School House Road

Inflow Area = 31,405 sf, 67.51% Impervious, Inflow Depth = 4.50" for 25-Year event
Inflow = 3.63 cfs @ 12.09 hrs, Volume= 11,789 cf
Primary = 3.63 cfs @ 12.09 hrs, Volume= 11,789 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

Link DP-2: Matunuck School House Road



Summary for Subcatchment W1: Watershed 1

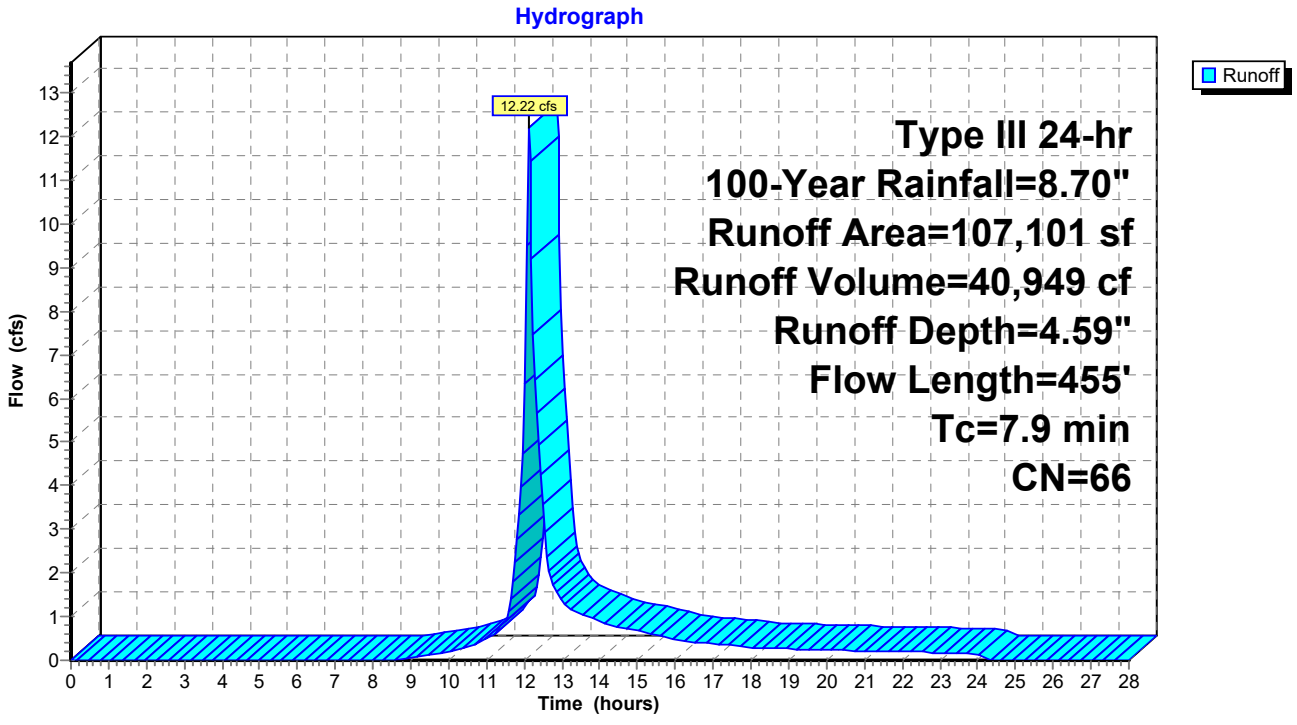
Runoff = 12.22 cfs @ 12.12 hrs, Volume= 40,949 cf, Depth= 4.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.70"

Area (sf)	CN	Description
6,411	98	Roofs, HSG B
7,404	98	Paved parking, HSG B
93,286	61	>75% Grass cover, Good, HSG B
107,101	66	Weighted Average
93,286	61	87.10% Pervious Area
13,815	98	12.90% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.0600	0.27		**Sheet Flow, SEG A** Grass: Short n= 0.150 P2= 3.30"
1.7	355	0.0560	3.55		**Shallow Concentrated Flow, SEG B** Grassed Waterway Kv= 15.0 fps
7.9	455	Total			

Subcatchment W1: Watershed 1



Summary for Subcatchment W2: Watershed 2

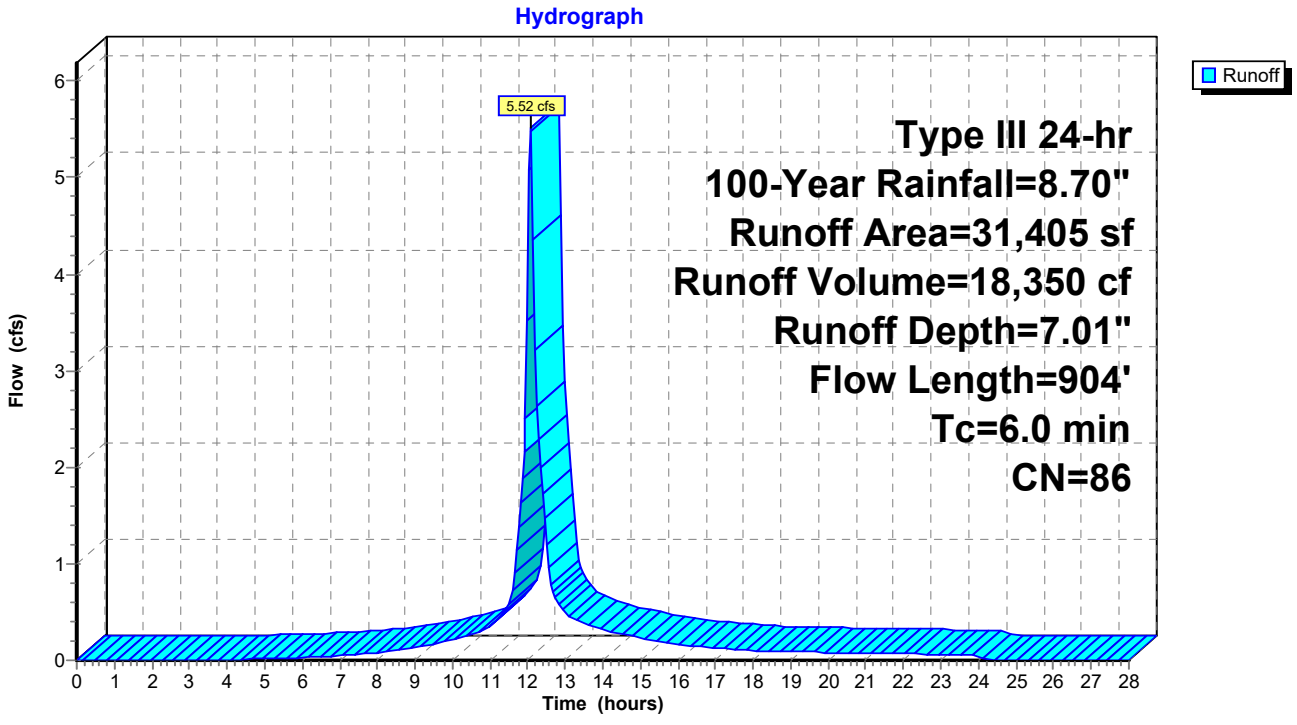
Runoff = 5.52 cfs @ 12.09 hrs, Volume= 18,350 cf, Depth= 7.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.70"

	Area (sf)	CN	Description
	1,048	98	Roofs, HSG B
*	20,154	98	Paved parking & Roadways, HSG B
	10,203	61	>75% Grass cover, Good, HSG B
	31,405	86	Weighted Average
	10,203	61	32.49% Pervious Area
	21,202	98	67.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	77	0.0200	1.33		**Sheet Flow, SEG A** Smooth surfaces n= 0.011 P2= 3.30"
3.5	827	0.0380	3.96		**Shallow Concentrated Flow, SEG B** Paved Kv= 20.3 fps
4.5	904	Total, Increased to minimum Tc = 6.0 min			

Subcatchment W2: Watershed 2

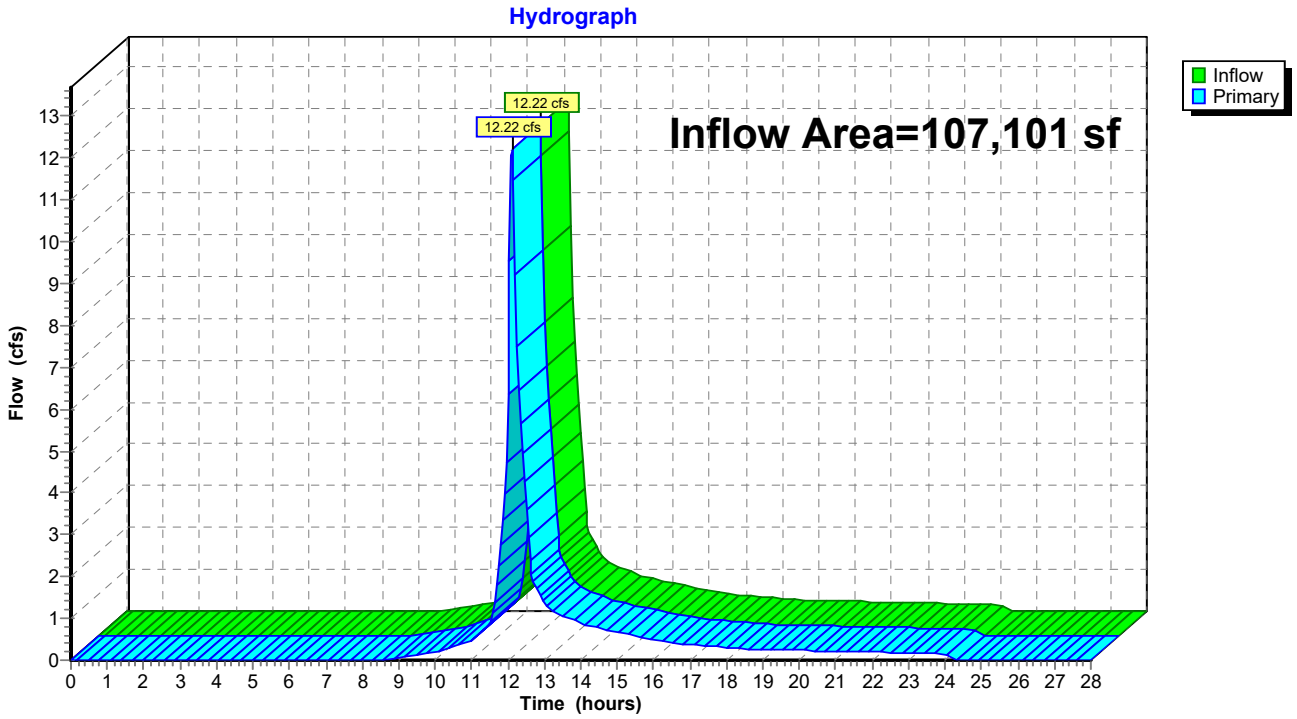


Summary for Link DP-1: Lower Gradient

Inflow Area = 107,101 sf, 12.90% Impervious, Inflow Depth = 4.59" for 100-Year event
Inflow = 12.22 cfs @ 12.12 hrs, Volume= 40,949 cf
Primary = 12.22 cfs @ 12.12 hrs, Volume= 40,949 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

Link DP-1: Lower Gradient

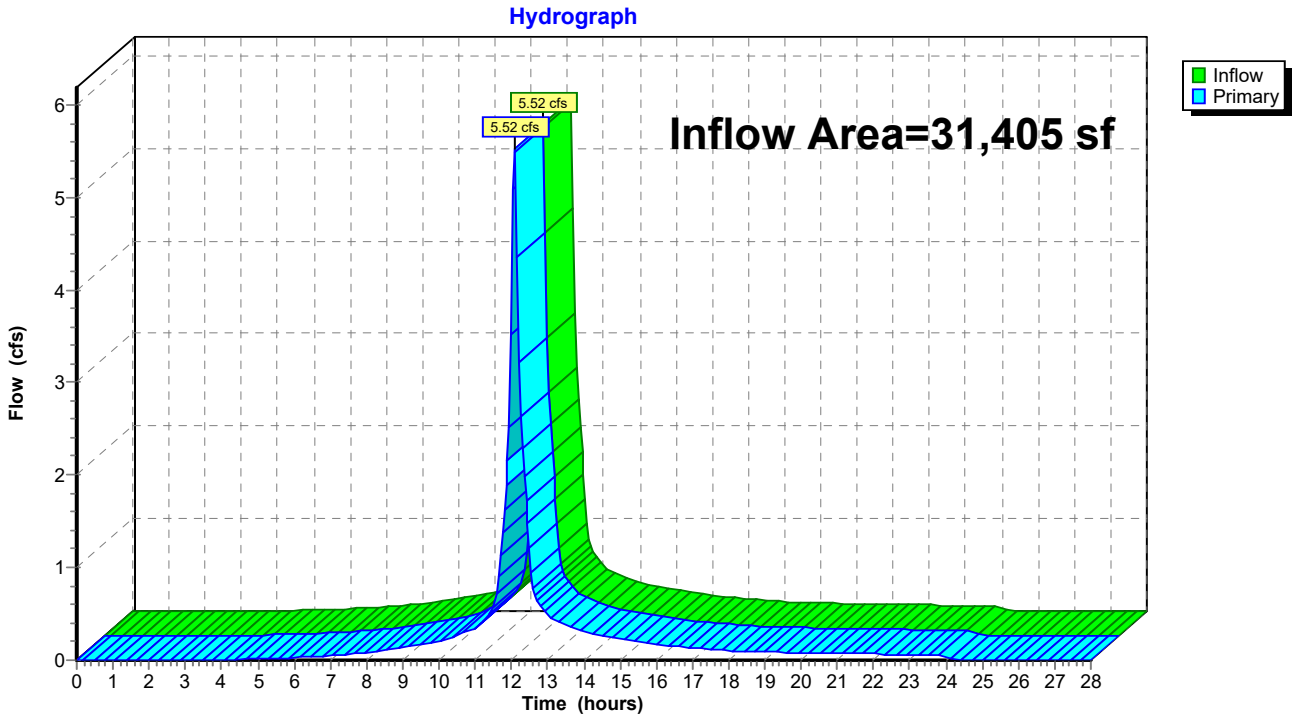


Summary for Link DP-2: Matunuck School House Road

Inflow Area = 31,405 sf, 67.51% Impervious, Inflow Depth = 7.01" for 100-Year event
Inflow = 5.52 cfs @ 12.09 hrs, Volume= 18,350 cf
Primary = 5.52 cfs @ 12.09 hrs, Volume= 18,350 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

Link DP-2: Matunuck School House Road



Appendix G

Proposed Condition Watershed Map

LEGEND

WATERSHED BOUNDARY LINE
TIME OF CONCENTRATION LINE
UNDERGROUND TIME OF CONCENTRATION LINE

PROPOSED EMERGENCY SPILLWAY

WATERSHED 1E
AREA = 12,230 SF
TC = 6.0 MIN.
CN = 74

PROPOSED INFILTRATION BASIN

PROPOSED SEDIMENT FOREBAY

WATERSHED 1D
AREA = 1,890 SF
TC = 6.0 MIN.
CN = 98

OVERALL WATERSHED
AREA = 138,506 SF

WATERSHED 1A
AREA = 74,128 SF
TC = 7.9 MIN.
CN = 63

DP1

WATERSHED 1B
AREA = 13,552 SF
TC = 6.0 MIN.
CN = 86

EMS BUILDING

PROPOSED UIC #2

WATERSHED 1C
AREA = 3,750 SF
TC = 6.0 MIN.
CN = 98

FIRE STATION

WATERSHED 2B
AREA = 4,165 SF
TC = 6.0 MIN.
CN = 91

EXISTING CATCH BASIN

MATUNUCK BEACH ROAD

MATUNUCK SCHOOLHOUSE ROAD

WATERSHED 2A
AREA = 28,791 SF
TC = 6.0 MIN.
CN = 85

PROPOSED UIC #1

DP2

SCALE (FEET)
0 40 80 160 320
1 INCH = 80 FT

JCE
JOE CASALI ENGINEERING, INC.
CIVIL · SITE DEVELOPMENT · TRANSPORTATION
DRAINAGE · WATER SUPPLY · WASTEWATER · PERMITTING
300 POST ROAD, WARWICK, RI 02888
(401) 944-1300 (401) 944-1313 FAX WWW.JOECASALI.COM

UNION FIRE DISTRICT OF S. KINGSTOWN
STATION 7, MATUNUCK
49 MATUNUCK SCHOOLHOUSE ROAD
SOUTH KINGSTOWN, RHODE ISLAND
AP 86-2, LOT 32

REVISIONS:
NO. DATE. DESCRIPTION

DESIGNED BY:	SD
DRAWN BY:	SD
CHECKED BY:	JAC
DATE:	JULY 2021
PROJECT NO:	09-31c

STORMWATER REPORT

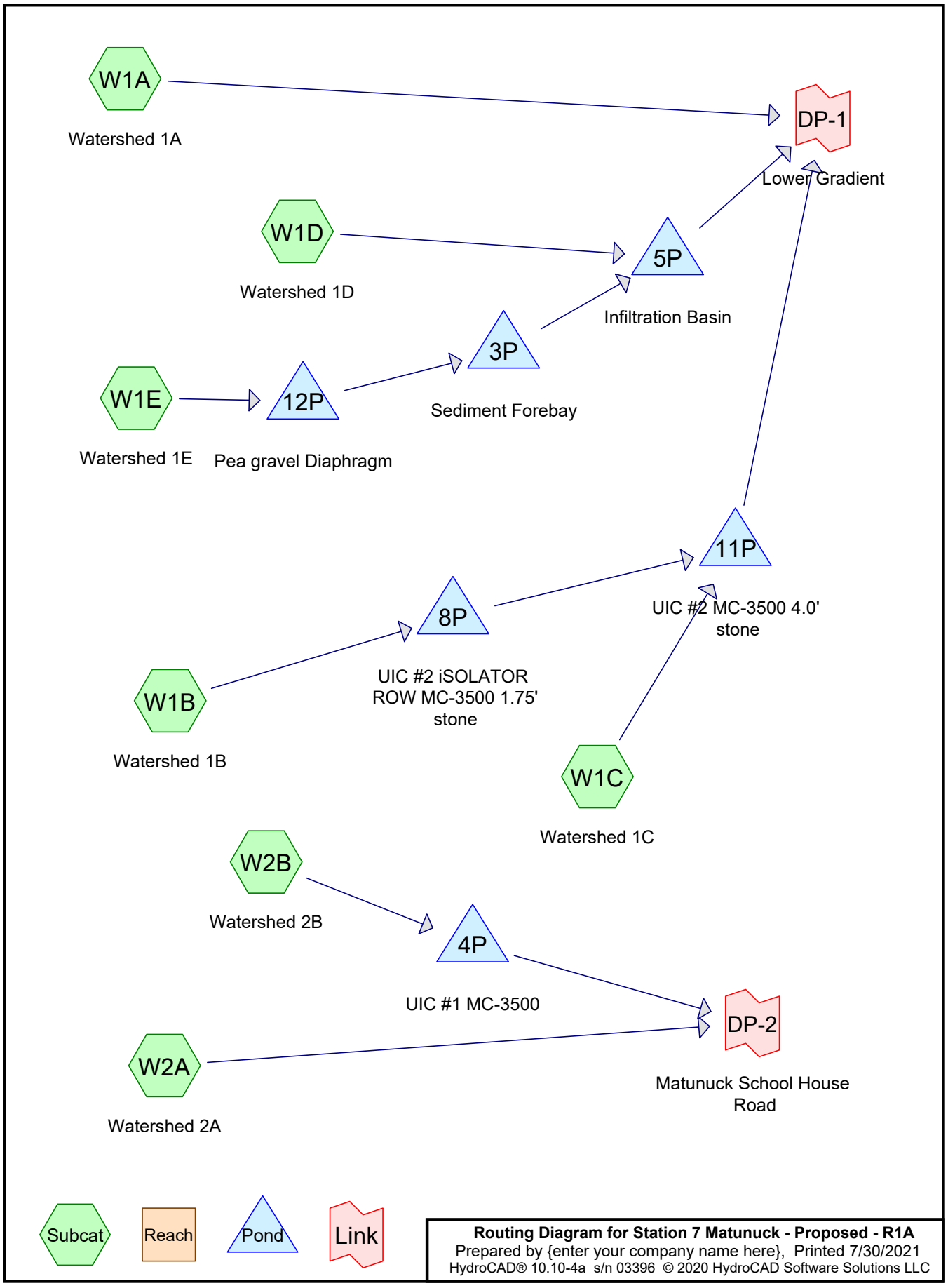
PROPOSED CONDITIONS WATERSHED MAP

SHEET 1 OF 1

Q:\09-31 Union Fire Station\09-31c Station 7 - Matunuck\Drainage\Watershed Maps\Union Fire - Station 7 Matunuck [Watershed Map] - R1A.dwg Jul. 29, 2021 4:09pm

Appendix H

Proposed Condition HydroCAD Calculations



Routing Diagram for Station 7 Matunuck - Proposed - R1A
Prepared by {enter your company name here}, Printed 7/30/2021

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-Year	Type III 24-hr		Default	24.00	1	2.70	2
2	2-Year	Type III 24-hr		Default	24.00	1	3.30	2
3	10-Year	Type III 24-hr		Default	24.00	1	4.90	2
4	25-Year	Type III 24-hr		Default	24.00	1	6.10	2
5	100-Year	Type III 24-hr		Default	24.00	1	8.70	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
93,551	61	>75% Grass cover, Good, HSG B (W1A, W1B, W1E, W2A, W2B)
20,953	98	Paved parking & Roadways, HSG B (W2A, W2B)
13,478	98	Paved parking, HSG B (W1B, W1E)
10,524	98	Roofs, HSG B (W1A, W1C, W1D, W2A)
138,506	**73**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
138,506	HSG B	W1A, W1B, W1C, W1D, W1E, W2A, W2B
0	HSG C	
0	HSG D	
0	Other	
138,506		**TOTAL AREA**

Summary for Subcatchment W1A: Watershed 1A

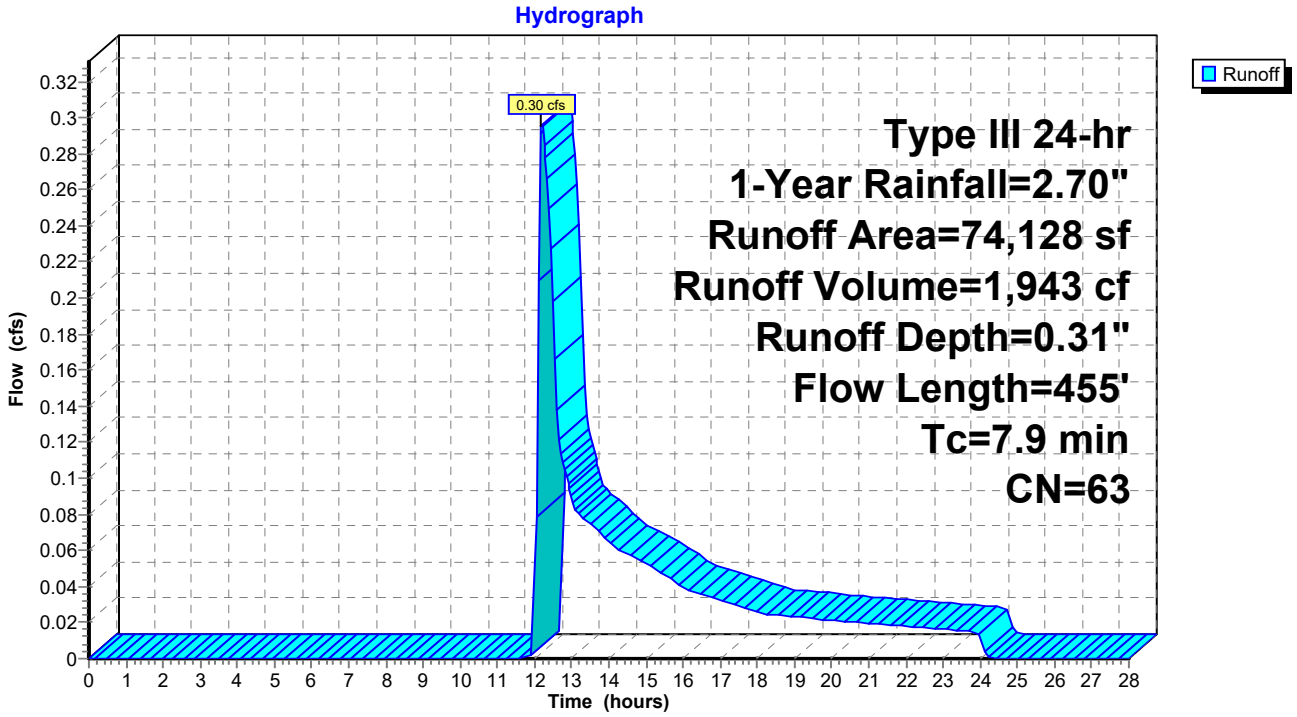
Runoff = 0.30 cfs @ 12.19 hrs, Volume= 1,943 cf, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Year Rainfall=2.70"

Area (sf)	CN	Description
3,836	98	Roofs, HSG B
70,292	61	>75% Grass cover, Good, HSG B
74,128	63	Weighted Average
70,292	61	94.83% Pervious Area
3,836	98	5.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.0600	0.27		**Sheet Flow, SEG A** Grass: Short n= 0.150 P2= 3.30"
1.7	355	0.0560	3.55		**Shallow Concentrated Flow, SEG B** Grassed Waterway Kv= 15.0 fps
7.9	455	Total			

Subcatchment W1A: Watershed 1A



Summary for Subcatchment W1B: Watershed 1B

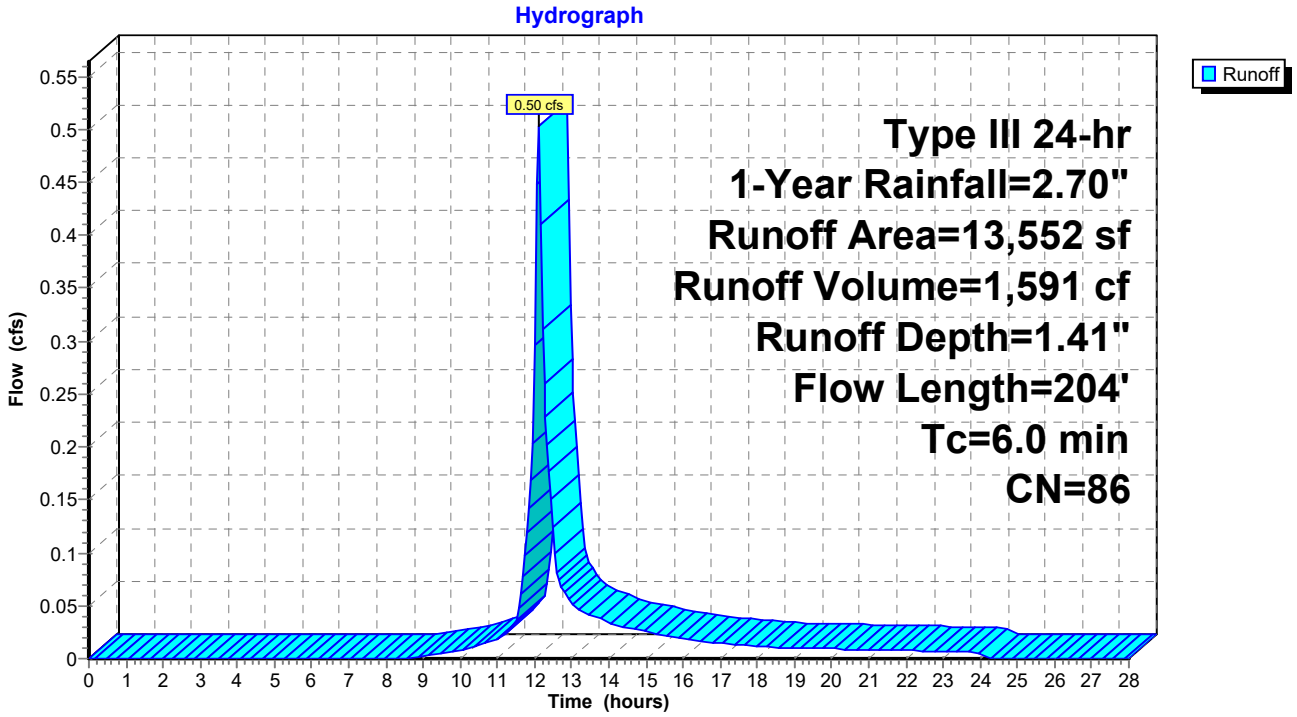
Runoff = 0.50 cfs @ 12.09 hrs, Volume= 1,591 cf, Depth= 1.41"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Year Rainfall=2.70"

Area (sf)	CN	Description
9,160	98	Paved parking, HSG B
4,392	61	>75% Grass cover, Good, HSG B
13,552	86	Weighted Average
4,392	61	32.41% Pervious Area
9,160	98	67.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0800	2.43		**Sheet Flow, SEG A** Smooth surfaces n= 0.011 P2= 3.30"
0.4	104	0.0500	4.54		**Shallow Concentrated Flow, SEG B** Paved Kv= 20.3 fps
1.1	204	Total, Increased to minimum Tc = 6.0 min			

Subcatchment W1B: Watershed 1B



Summary for Subcatchment W1C: Watershed 1C

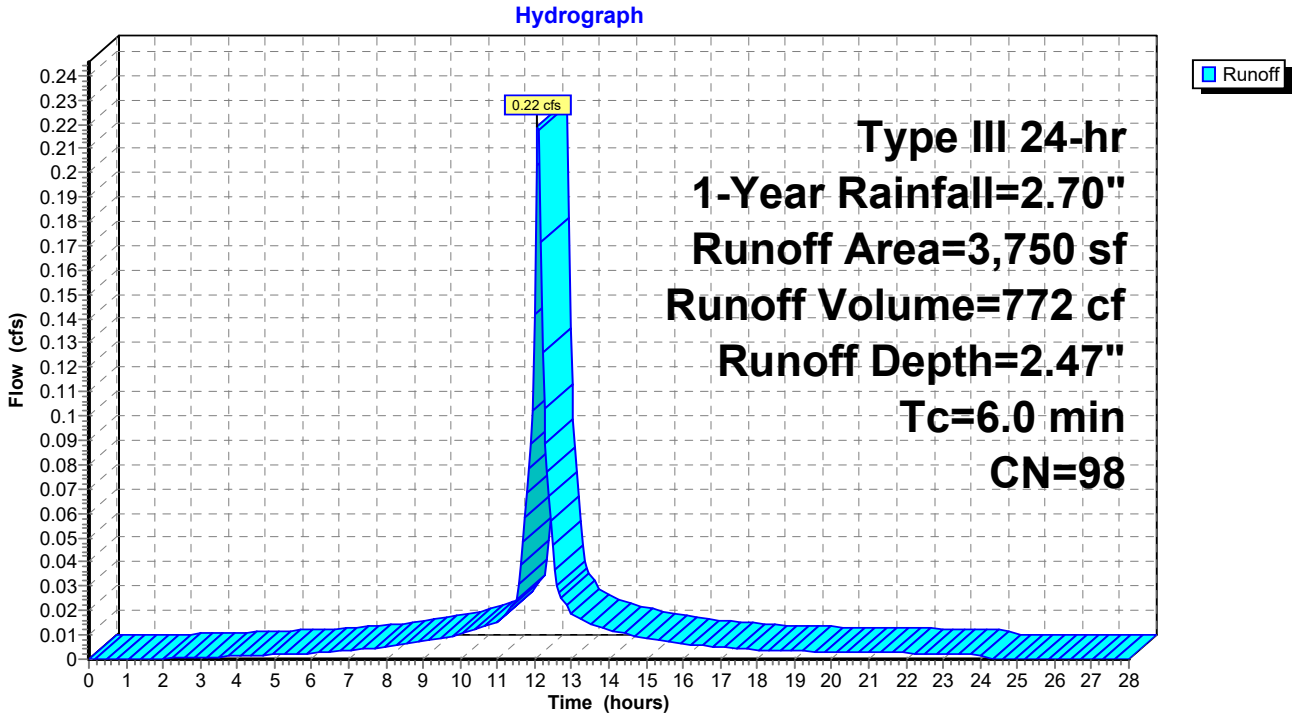
Runoff = 0.22 cfs @ 12.09 hrs, Volume= 772 cf, Depth= 2.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Year Rainfall=2.70"

Area (sf)	CN	Description
3,750	98	Roofs, HSG B
3,750	98	100.00% Impervious Area

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

Subcatchment W1C: Watershed 1C



Summary for Subcatchment W1D: Watershed 1D

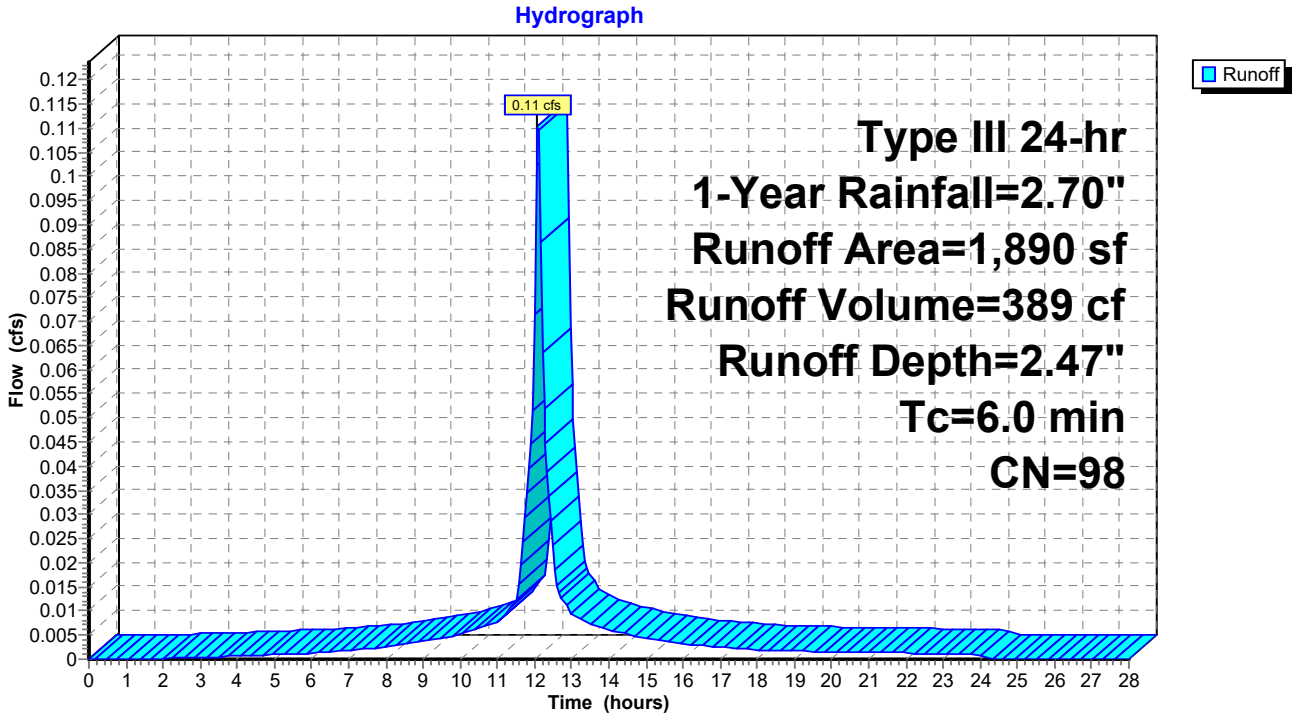
Runoff = 0.11 cfs @ 12.09 hrs, Volume= 389 cf, Depth= 2.47"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Year Rainfall=2.70"

Area (sf)	CN	Description
1,890	98	Roofs, HSG B
1,890	98	100.00% Impervious Area

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

Subcatchment W1D: Watershed 1D



Summary for Subcatchment W1E: Watershed 1E

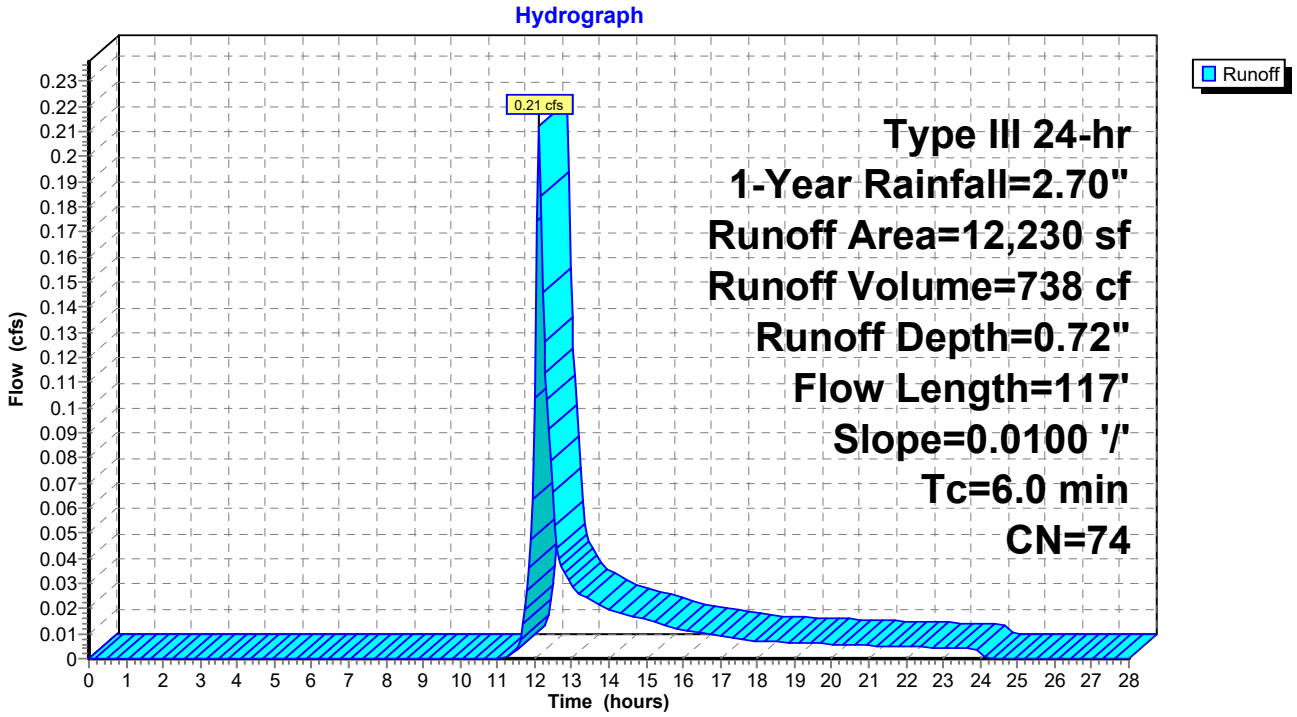
Runoff = 0.21 cfs @ 12.10 hrs, Volume= 738 cf, Depth= 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Year Rainfall=2.70"

Area (sf)	CN	Description
4,318	98	Paved parking, HSG B
7,912	61	>75% Grass cover, Good, HSG B
12,230	74	Weighted Average
7,912	61	64.69% Pervious Area
4,318	98	35.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, SEG A** Paved Kv= 20.3 fps
0.2	17	0.0100	1.50		**Shallow Concentrated Flow, SEG B** Grassed Waterway Kv= 15.0 fps
1.0	117	Total, Increased to minimum Tc = 6.0 min			

Subcatchment W1E: Watershed 1E



Summary for Subcatchment W2A: Watershed 2A

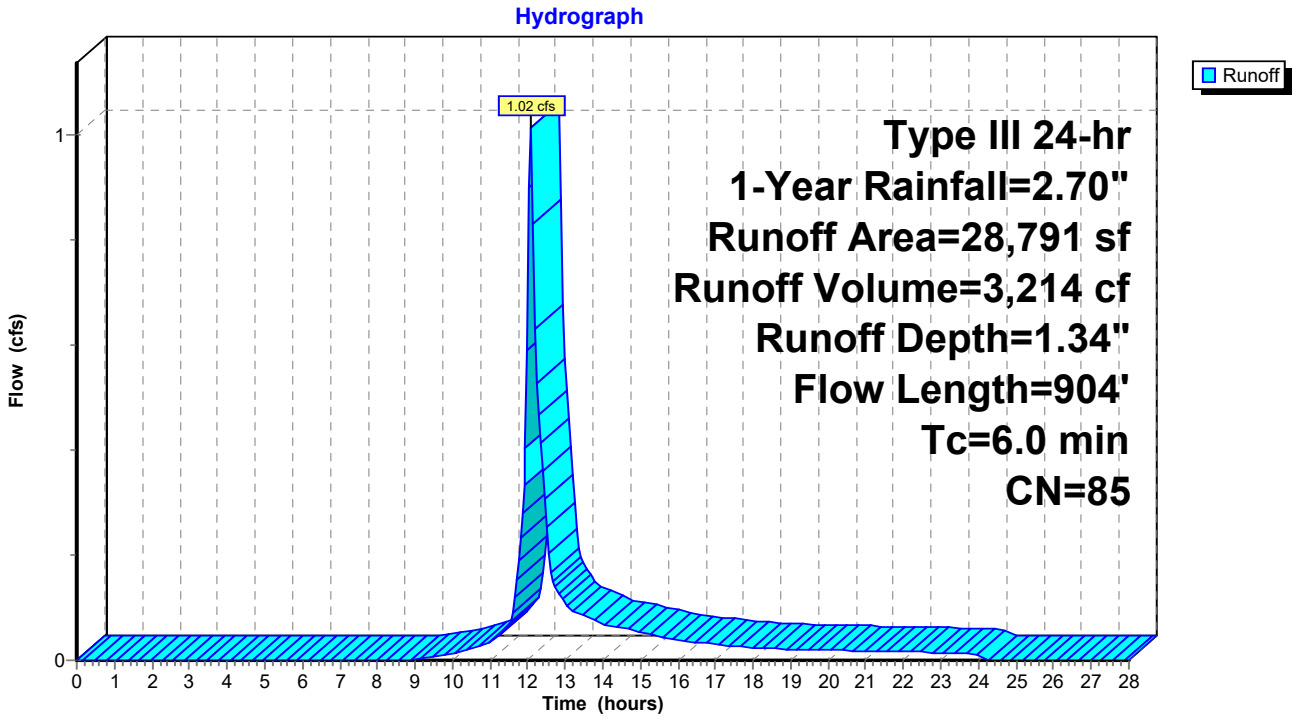
Runoff = 1.02 cfs @ 12.09 hrs, Volume= 3,214 cf, Depth= 1.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Year Rainfall=2.70"

	Area (sf)	CN	Description
	1,048	98	Roofs, HSG B
*	17,540	98	Paved parking & Roadways, HSG B
	10,203	61	>75% Grass cover, Good, HSG B
	28,791	85	Weighted Average
	10,203	61	35.44% Pervious Area
	18,588	98	64.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	77	0.0200	1.33		**Sheet Flow, SEG A** Smooth surfaces n= 0.011 P2= 3.30"
3.5	827	0.0380	3.96		**Shallow Concentrated Flow, SEG B** Paved Kv= 20.3 fps
4.5	904	Total, Increased to minimum Tc = 6.0 min			

Subcatchment W2A: Watershed 2A



Summary for Subcatchment W2B: Watershed 2B

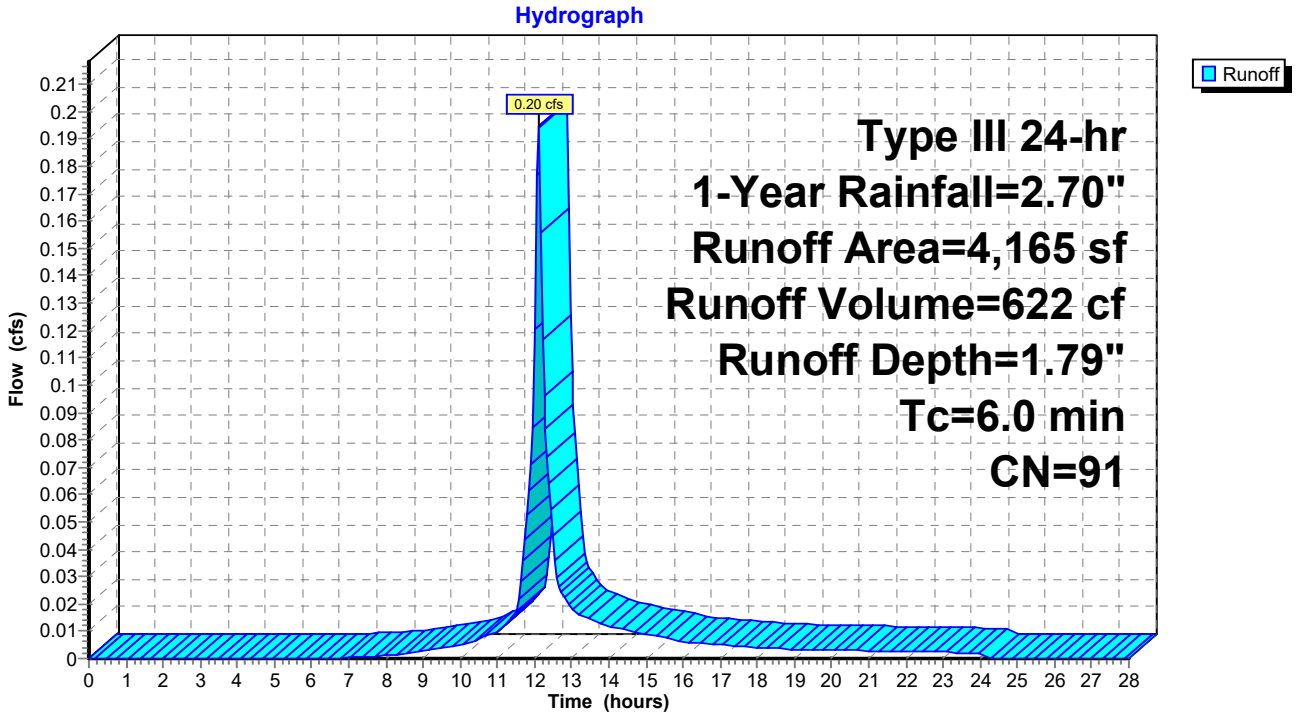
Runoff = 0.20 cfs @ 12.09 hrs, Volume= 622 cf, Depth= 1.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 1-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	3,413	98	Paved parking & Roadways, HSG B
	752	61	>75% Grass cover, Good, HSG B
	4,165	91	Weighted Average
	752	61	18.06% Pervious Area
	3,413	98	81.94% Impervious Area

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

Subcatchment W2B: Watershed 2B



Summary for Pond 3P: Sediment Forebay

Inflow Area = 12,230 sf, 35.31% Impervious, Inflow Depth = 0.58" for 1-Year event
Inflow = 0.14 cfs @ 12.11 hrs, Volume= 589 cf
Outflow = 0.07 cfs @ 12.47 hrs, Volume= 453 cf, Atten= 54%, Lag= 21.3 min
Primary = 0.07 cfs @ 12.47 hrs, Volume= 453 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 86.26' @ 12.45 hrs Surf.Area= 266 sf Storage= 137 cf

Plug-Flow detention time= 146.6 min calculated for 452 cf (77% of inflow)
Center-of-Mass det. time= 54.4 min (965.0 - 910.7)

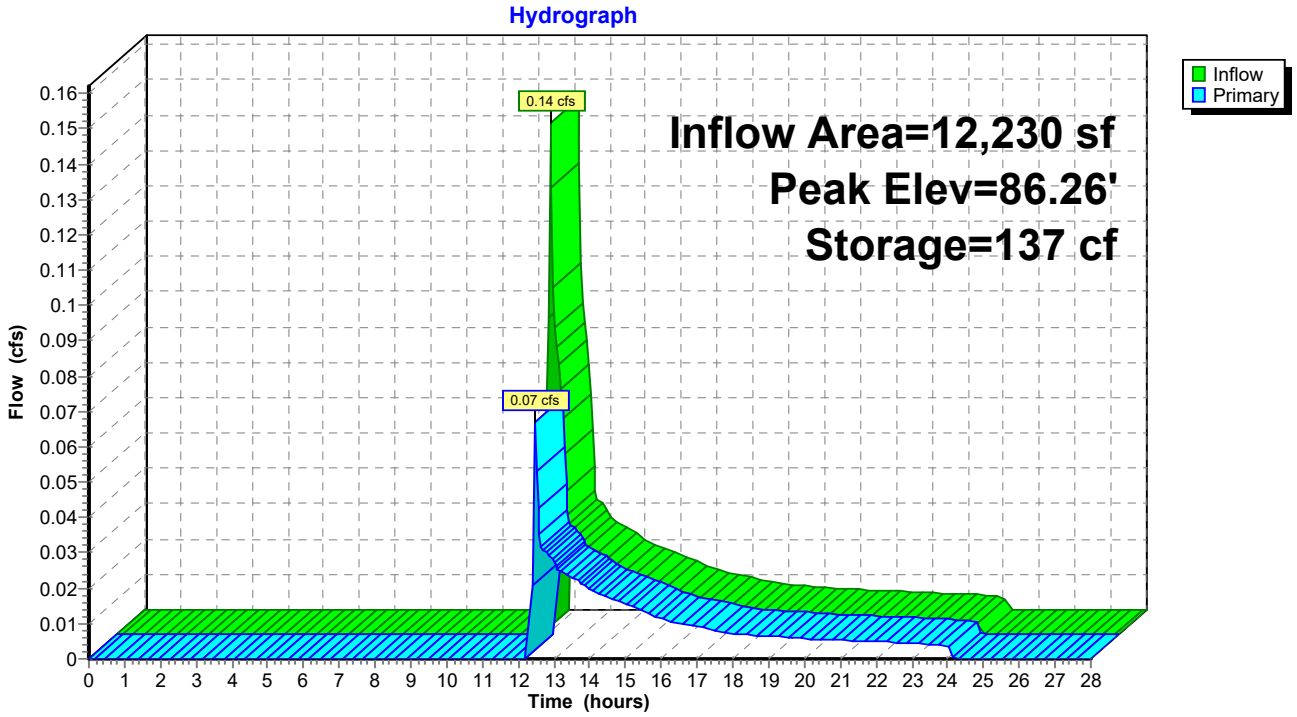
Volume	Invert	Avail.Storage	Storage Description
#1	85.50'	208 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.50	95	0	0
86.50	320	208	208

Device	Routing	Invert	Outlet Devices
#1	Primary	86.25'	**20.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.06 cfs @ 12.47 hrs HW=86.26' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Weir Controls 0.06 cfs @ 0.31 fps)

Pond 3P: Sediment Forebay



Summary for Pond 4P: UIC #1 MC-3500

Inflow Area = 4,165 sf, 81.94% Impervious, Inflow Depth = 1.79" for 1-Year event
Inflow = 0.20 cfs @ 12.09 hrs, Volume= 622 cf
Outflow = 0.02 cfs @ 12.77 hrs, Volume= 622 cf, Atten= 88%, Lag= 41.0 min
Discarded = 0.02 cfs @ 12.77 hrs, Volume= 622 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 91.98' @ 12.77 hrs Surf.Area= 289 sf Storage= 227 cf

Plug-Flow detention time= 81.3 min calculated for 621 cf (100% of inflow)
Center-of-Mass det. time= 81.1 min (890.1 - 809.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	90.50'	370 cf	**8.42'W x 34.38'L x 5.50'H Field A** 1,592 cf Overall - 470 cf Embedded = 1,122 cf x 33.0% Voids
#2A	91.25'	470 cf	**ADS_StormTech MC-3500 d +Cap** x 4 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		840 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	90.50'	**2.410 in/hr Exfiltration over Wetted area**
#2	Primary	95.95'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.02 cfs @ 12.77 hrs HW=91.98' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=90.50' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 4P: UIC #1 MC-3500 - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

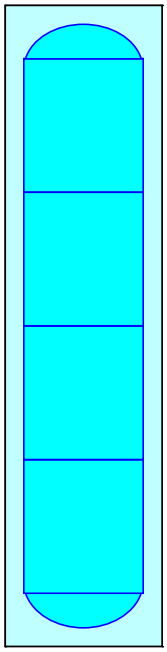
4 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 32.38' Row Length +12.0" End Stone x 2 = 34.38' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

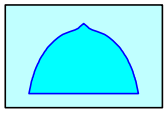
4 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 469.6 cf Chamber Storage

1,591.5 cf Field - 469.6 cf Chambers = 1,121.9 cf Stone x 33.0% Voids = 370.2 cf Stone Storage

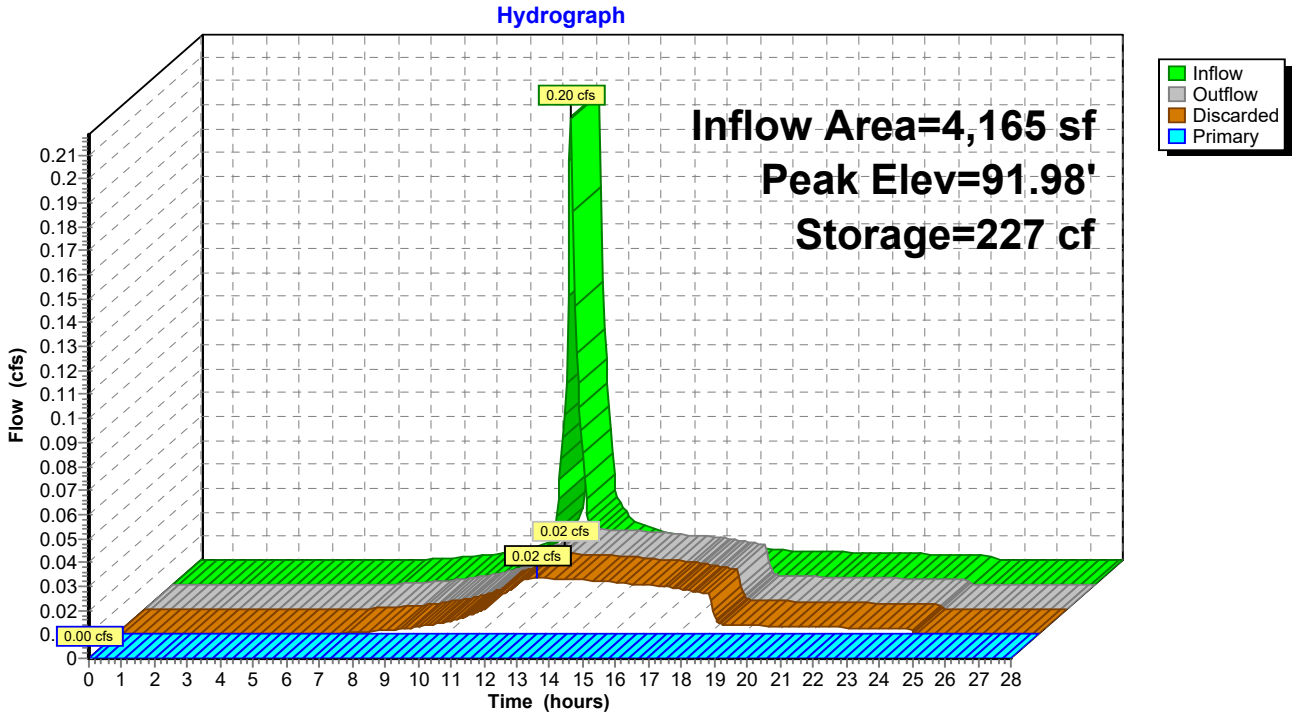
Chamber Storage + Stone Storage = 839.8 cf = 0.019 af
Overall Storage Efficiency = 52.8%
Overall System Size = 34.38' x 8.42' x 5.50'

4 Chambers
58.9 cy Field
41.6 cy Stone





Pond 4P: UIC #1 MC-3500



Summary for Pond 5P: Infiltration Basin

Inflow Area = 14,120 sf, 43.97% Impervious, Inflow Depth = 0.72" for 1-Year event
Inflow = 0.11 cfs @ 12.09 hrs, Volume= 842 cf
Outflow = 0.02 cfs @ 14.71 hrs, Volume= 842 cf, Atten= 80%, Lag= 157.4 min
Discarded = 0.02 cfs @ 14.71 hrs, Volume= 842 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 85.26' @ 14.71 hrs Surf.Area= 382 sf Storage= 222 cf

Plug-Flow detention time= 106.4 min calculated for 840 cf (100% of inflow)
Center-of-Mass det. time= 106.2 min (976.6 - 870.3)

Volume	Invert	Avail.Storage	Storage Description
#1	84.50'	905 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

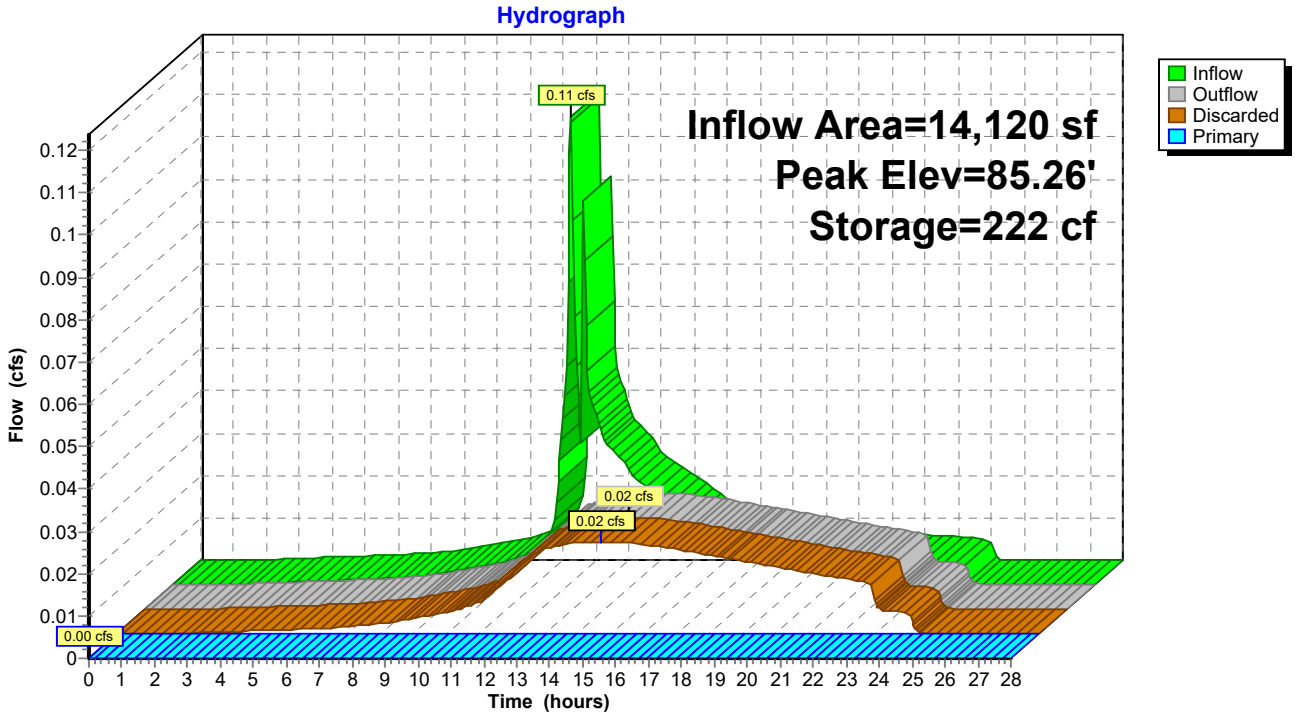
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
84.50	212	0	0	212
85.50	446	322	322	454
86.50	732	583	905	753

Device	Routing	Invert	Outlet Devices
#1	Discarded	84.50'	**2.410 in/hr Exfiltration over Wetted area**
#2	Primary	86.15'	**20.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.02 cfs @ 14.71 hrs HW=85.26' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=84.50' (Free Discharge)
↑—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: Infiltration Basin



Summary for Pond 8P: UIC #2 iSOLATOR ROW MC-3500 1.75' stone

Inflow Area = 13,552 sf, 67.59% Impervious, Inflow Depth = 1.41" for 1-Year event
Inflow = 0.50 cfs @ 12.09 hrs, Volume= 1,591 cf
Outflow = 0.05 cfs @ 13.05 hrs, Volume= 635 cf, Atten= 90%, Lag= 57.2 min
Primary = 0.05 cfs @ 13.05 hrs, Volume= 635 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 85.02' @ 13.05 hrs Surf.Area= 350 sf Storage= 959 cf

Plug-Flow detention time= 289.5 min calculated for 635 cf (40% of inflow)
Center-of-Mass det. time= 166.0 min (996.2 - 830.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	80.00'	617 cf	**8.42'W x 41.55'L x 7.00'H Field A** 2,448 cf Overall - 580 cf Embedded = 1,868 cf x 33.0% Voids
#2A	81.75'	580 cf	**ADS_StormTech MC-3500 d +Cap** x 5 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		1,196 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	85.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.03 cfs @ 13.05 hrs HW=85.02' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 0.03 cfs @ 0.45 fps)

Pond 8P: UIC #2 iSOLATOR ROW MC-3500 1.75' stone - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

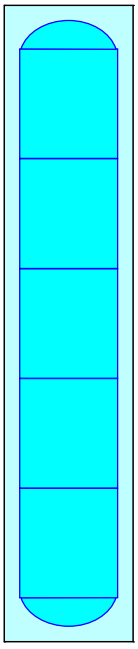
5 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 39.55' Row Length +12.0" End Stone x 2 = 41.55' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
21.0" Stone Base + 45.0" Chamber Height + 18.0" Stone Cover = 7.00' Field Height

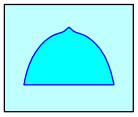
5 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 579.6 cf Chamber Storage

2,448.0 cf Field - 579.6 cf Chambers = 1,868.4 cf Stone x 33.0% Voids = 616.6 cf Stone Storage

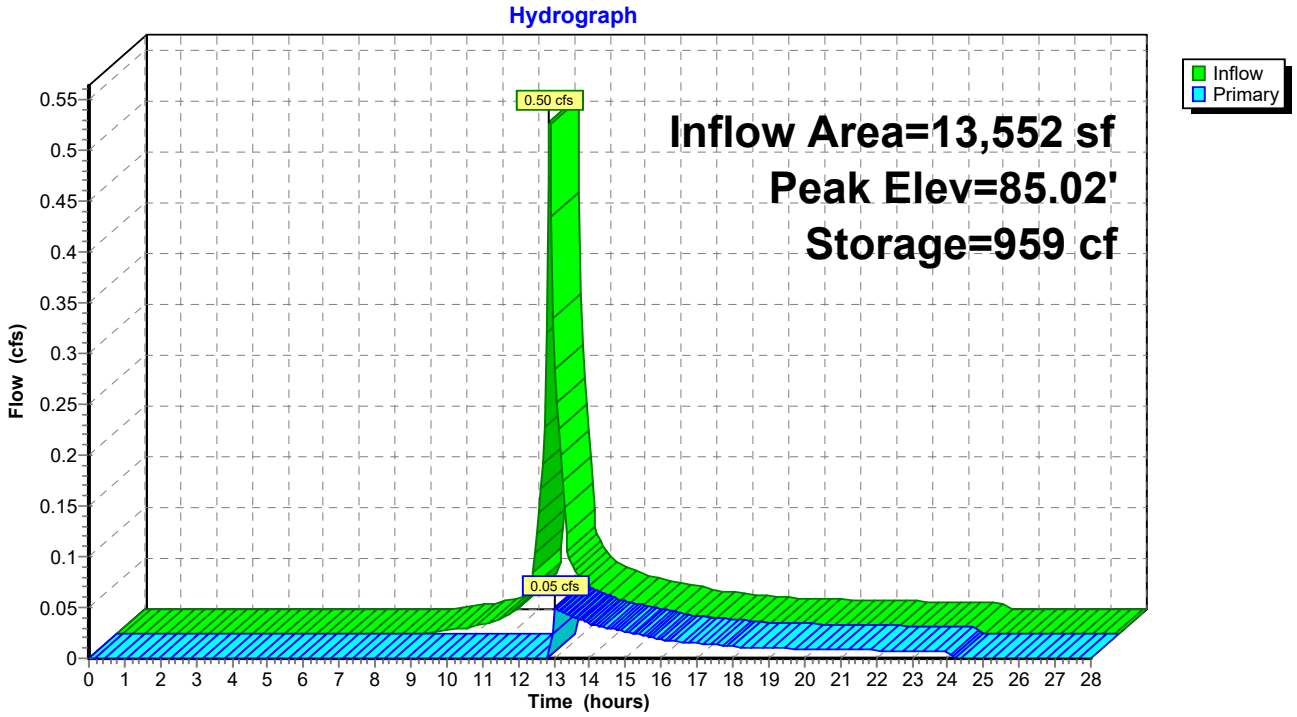
Chamber Storage + Stone Storage = 1,196.1 cf = 0.027 af
Overall Storage Efficiency = 48.9%
Overall System Size = 41.55' x 8.42' x 7.00'

5 Chambers
90.7 cy Field
69.2 cy Stone





Pond 8P: UIC #2 iSOLATOR ROW MC-3500 1.75' stone



Summary for Pond 11P: UIC #2 MC-3500 4.0' stone

Inflow Area = 17,302 sf, 74.62% Impervious, Inflow Depth = 0.98" for 1-Year event
Inflow = 0.22 cfs @ 12.09 hrs, Volume= 1,407 cf
Outflow = 0.04 cfs @ 11.75 hrs, Volume= 1,406 cf, Atten= 84%, Lag= 0.0 min
Discarded = 0.04 cfs @ 11.75 hrs, Volume= 1,406 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 4
Peak Elev= 78.63' @ 14.90 hrs Surf.Area= 647 sf Storage= 294 cf

Plug-Flow detention time= 71.5 min calculated for 1,404 cf (100% of inflow)
Center-of-Mass det. time= 71.4 min (938.0 - 866.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	77.25'	1,701 cf	**15.58'W x 41.55'L x 9.75'H Field A** 6,313 cf Overall - 1,159 cf Embedded = 5,154 cf x 33.0% Voids
#2A	81.25'	1,159 cf	**ADS_StormTech MC-3500 d +Cap**x 10 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 10 Chambers in 2 Rows Cap Storage= +14.9 cf x 2 x 2 rows = 59.6 cf
		2,860 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	77.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	86.45'	**4.0" x 18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.04 cfs @ 11.75 hrs HW=77.35' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=77.25' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 11P: UIC #2 MC-3500 4.0' stone - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 2 rows = 59.6 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

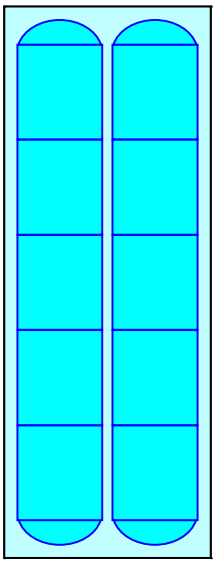
5 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 39.55' Row Length +12.0" End Stone x 2 = 41.55' Base Length
2 Rows x 77.0" Wide + 9.0" Spacing x 1 + 12.0" Side Stone x 2 = 15.58' Base Width
48.0" Stone Base + 45.0" Chamber Height + 24.0" Stone Cover = 9.75' Field Height

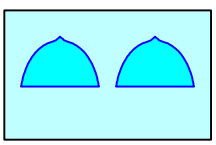
10 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 2 Rows = 1,159.1 cf Chamber Storage

6,313.0 cf Field - 1,159.1 cf Chambers = 5,153.9 cf Stone x 33.0% Voids = 1,700.8 cf Stone Storage

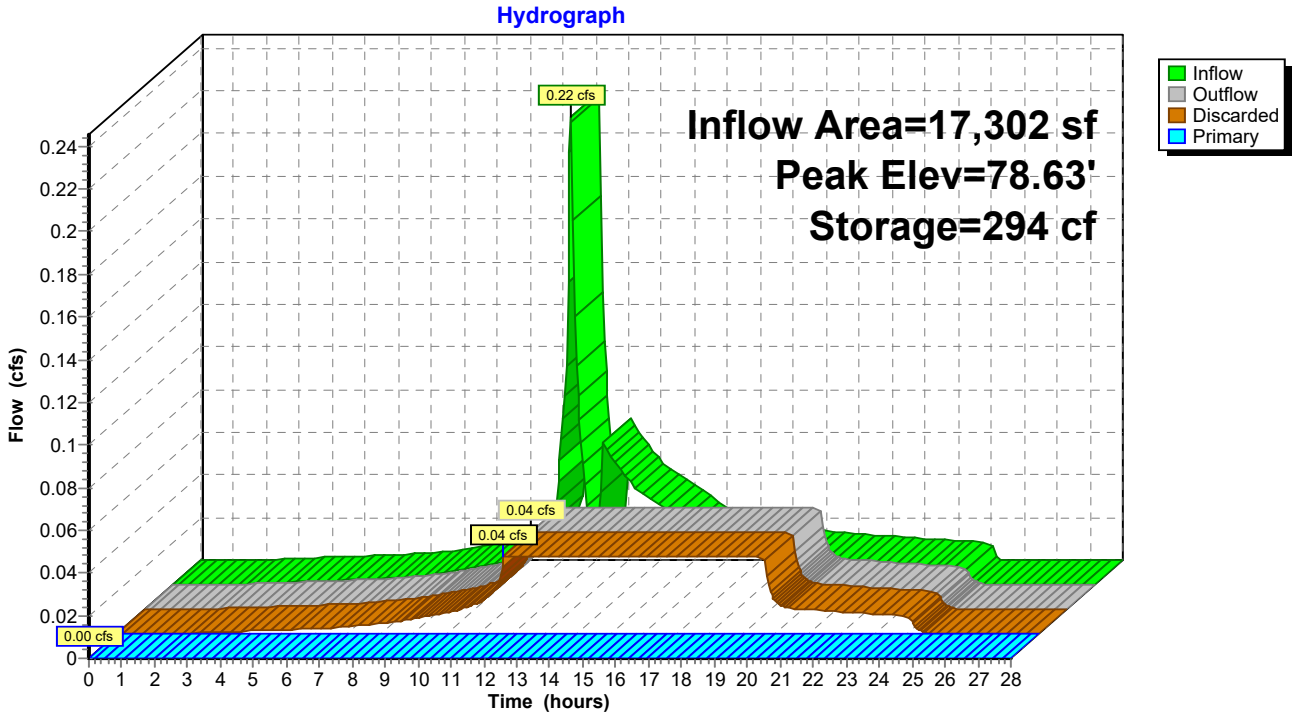
Chamber Storage + Stone Storage = 2,859.9 cf = 0.066 af
Overall Storage Efficiency = 45.3%
Overall System Size = 41.55' x 15.58' x 9.75'

10 Chambers
233.8 cy Field
190.9 cy Stone





Pond 11P: UIC #2 MC-3500 4.0' stone



Summary for Pond 12P: Pea gravel Diaphragm

Inflow Area = 12,230 sf, 35.31% Impervious, Inflow Depth = 0.72" for 1-Year event
Inflow = 0.21 cfs @ 12.10 hrs, Volume= 738 cf
Outflow = 0.14 cfs @ 12.11 hrs, Volume= 589 cf, Atten= 32%, Lag= 0.6 min
Primary = 0.14 cfs @ 12.11 hrs, Volume= 589 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 86.95' @ 12.10 hrs Surf.Area= 114 sf Storage= 73 cf

Plug-Flow detention time= 120.3 min calculated for 589 cf (80% of inflow)
Center-of-Mass det. time= 37.1 min (910.7 - 873.6)

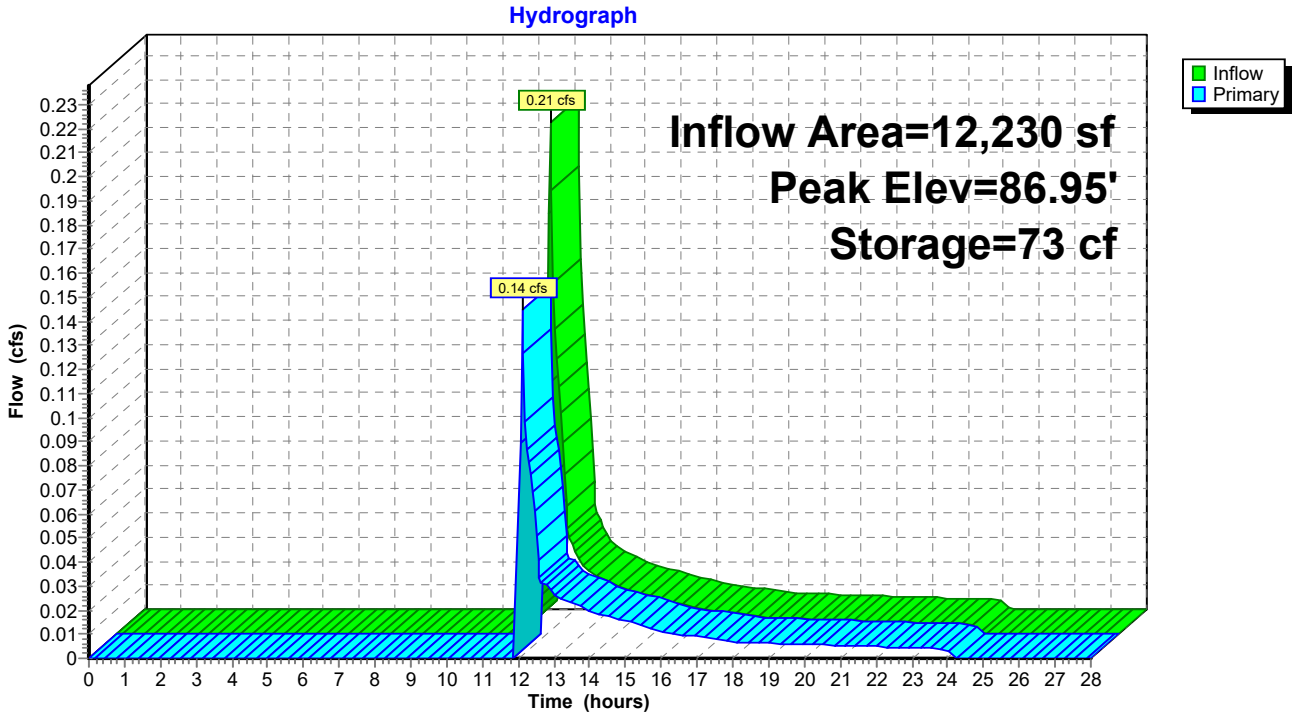
Volume	Invert	Avail.Storage	Storage Description
#1	85.00'	75 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 228 cf Overall x 33.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.00	114	0	0
87.00	114	228	228

Device	Routing	Invert	Outlet Devices
#1	Primary	86.94'	**38.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.09 cfs @ 12.11 hrs HW=86.95' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Weir Controls 0.09 cfs @ 0.29 fps)

Pond 12P: Pea gravel Diaphragm

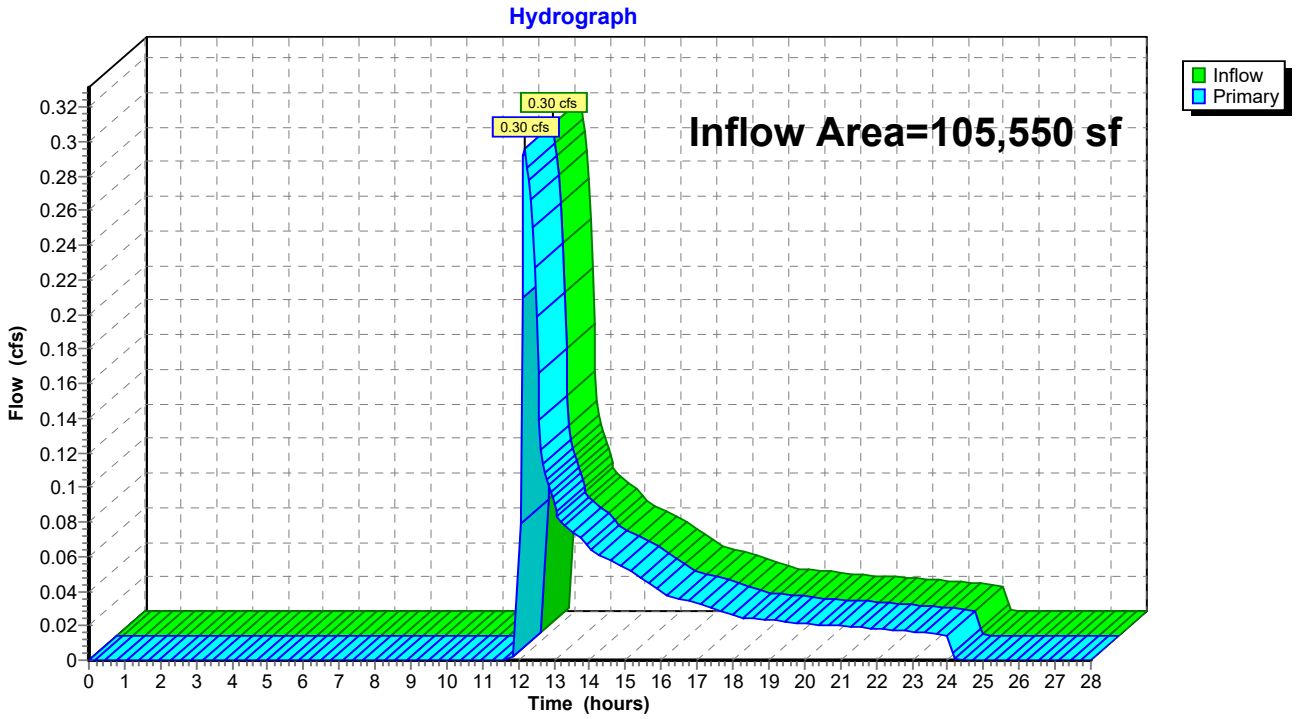


Summary for Link DP-1: Lower Gradient

Inflow Area = 105,550 sf, 21.75% Impervious, Inflow Depth = 0.22" for 1-Year event
Inflow = 0.30 cfs @ 12.19 hrs, Volume= 1,943 cf
Primary = 0.30 cfs @ 12.19 hrs, Volume= 1,943 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

Link DP-1: Lower Gradient

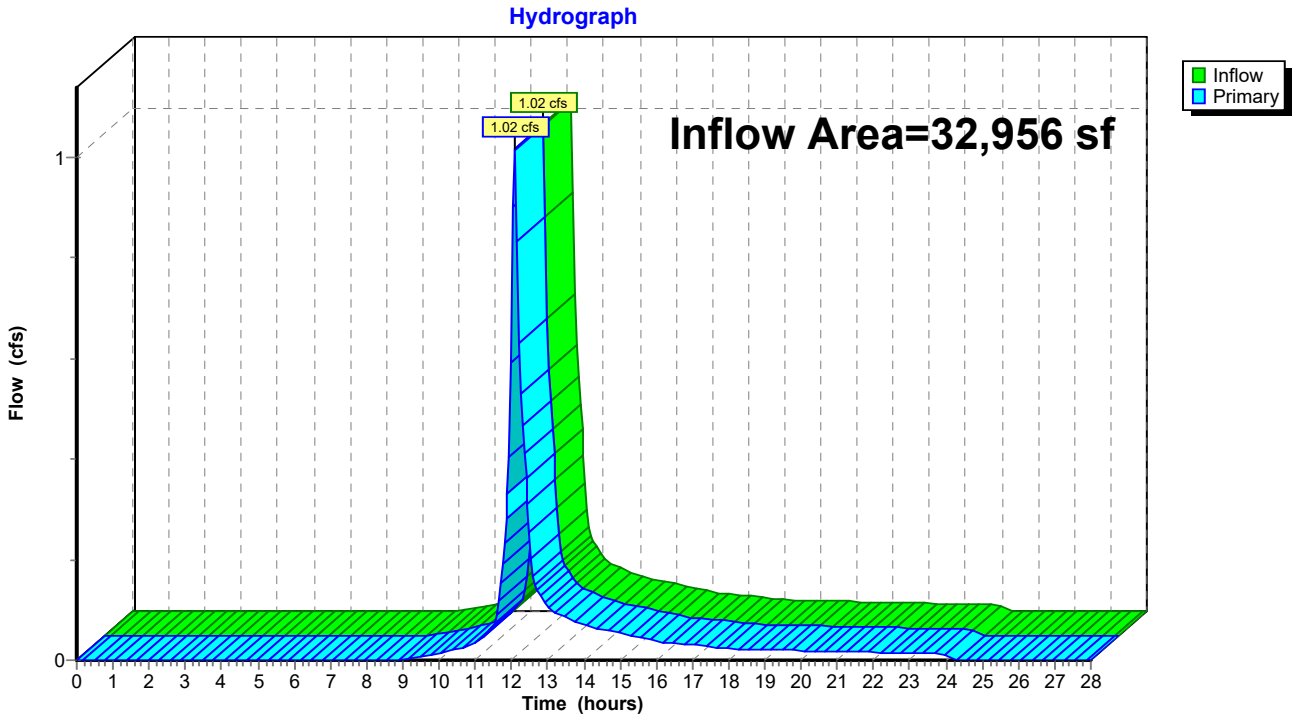


Summary for Link DP-2: Matunuck School House Road

Inflow Area = 32,956 sf, 66.76% Impervious, Inflow Depth = 1.17" for 1-Year event
Inflow = 1.02 cfs @ 12.09 hrs, Volume= 3,214 cf
Primary = 1.02 cfs @ 12.09 hrs, Volume= 3,214 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

Link DP-2: Matunuck School House Road



Summary for Subcatchment W1A: Watershed 1A

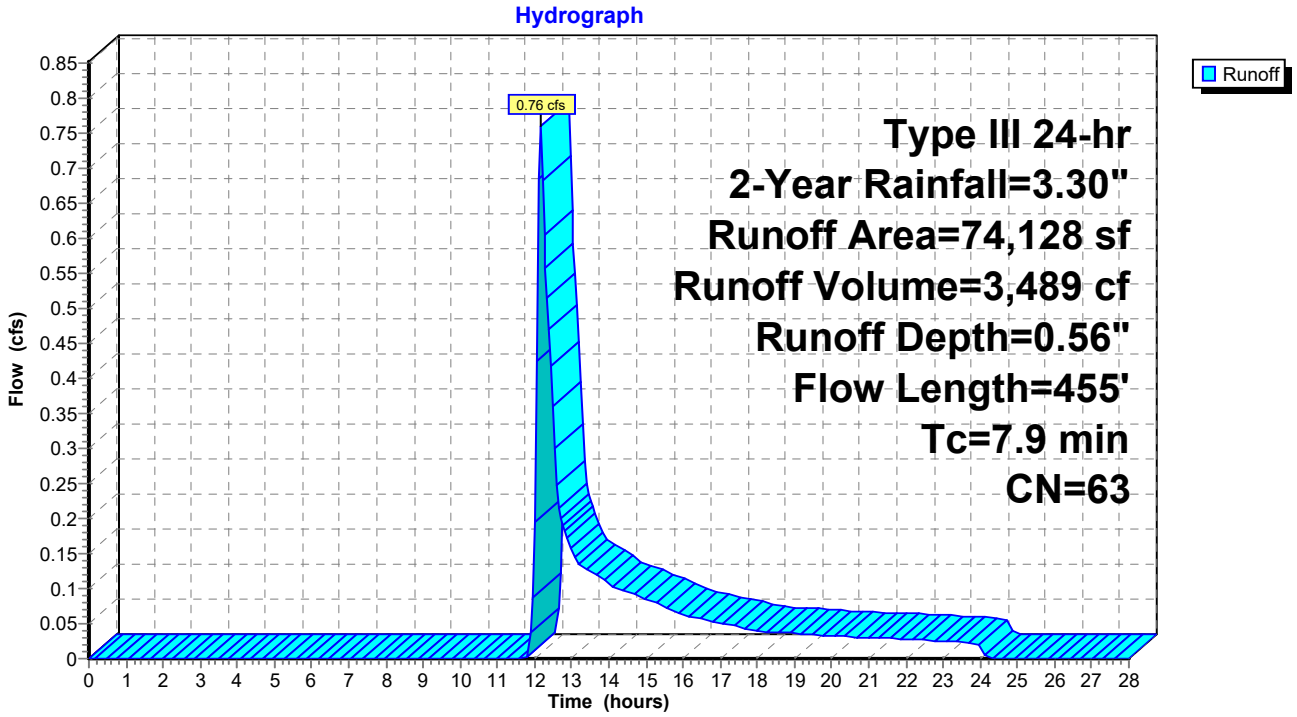
Runoff = 0.76 cfs @ 12.15 hrs, Volume= 3,489 cf, Depth= 0.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
3,836	98	Roofs, HSG B
70,292	61	>75% Grass cover, Good, HSG B
74,128	63	Weighted Average
70,292	61	94.83% Pervious Area
3,836	98	5.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.0600	0.27		**Sheet Flow, SEG A** Grass: Short n= 0.150 P2= 3.30"
1.7	355	0.0560	3.55		**Shallow Concentrated Flow, SEG B** Grassed Waterway Kv= 15.0 fps
7.9	455	Total			

Subcatchment W1A: Watershed 1A



Summary for Subcatchment W1B: Watershed 1B

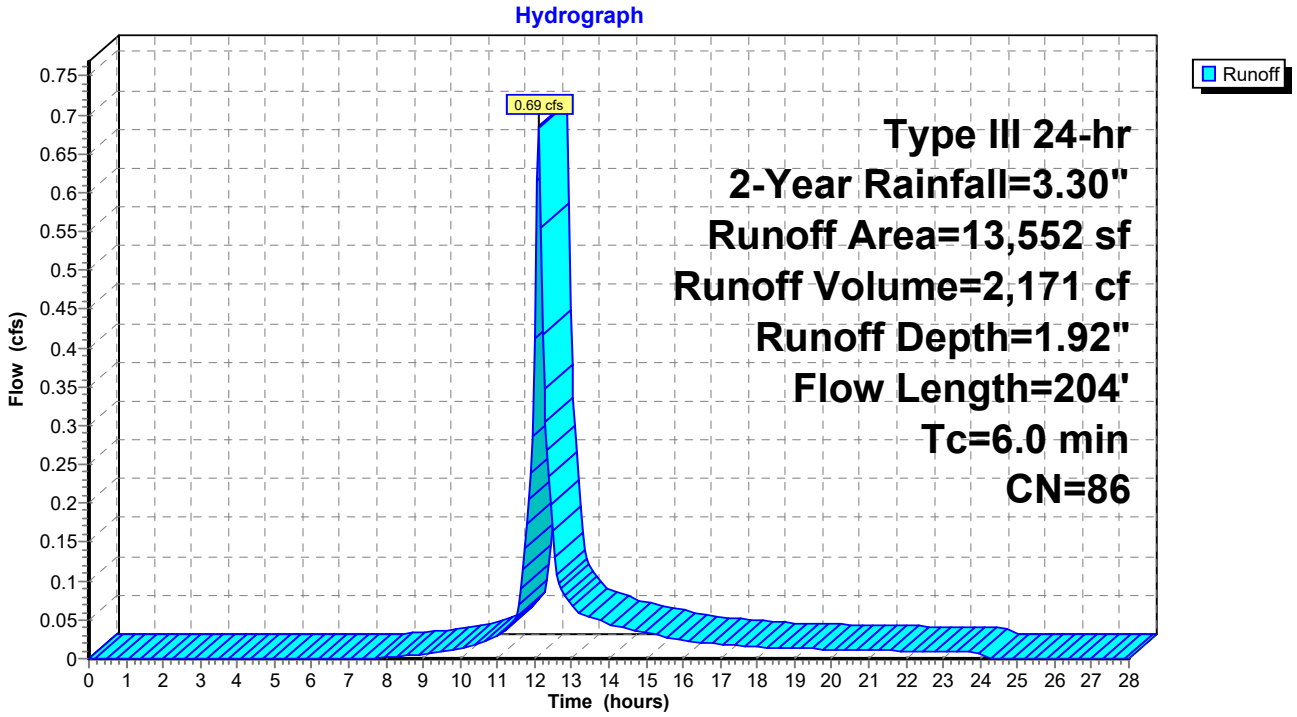
Runoff = 0.69 cfs @ 12.09 hrs, Volume= 2,171 cf, Depth= 1.92"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
9,160	98	Paved parking, HSG B
4,392	61	>75% Grass cover, Good, HSG B
13,552	86	Weighted Average
4,392	61	32.41% Pervious Area
9,160	98	67.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0800	2.43		**Sheet Flow, SEG A** Smooth surfaces n= 0.011 P2= 3.30"
0.4	104	0.0500	4.54		**Shallow Concentrated Flow, SEG B** Paved Kv= 20.3 fps
1.1	204	Total, Increased to minimum Tc = 6.0 min			

Subcatchment W1B: Watershed 1B



Summary for Subcatchment W1C: Watershed 1C

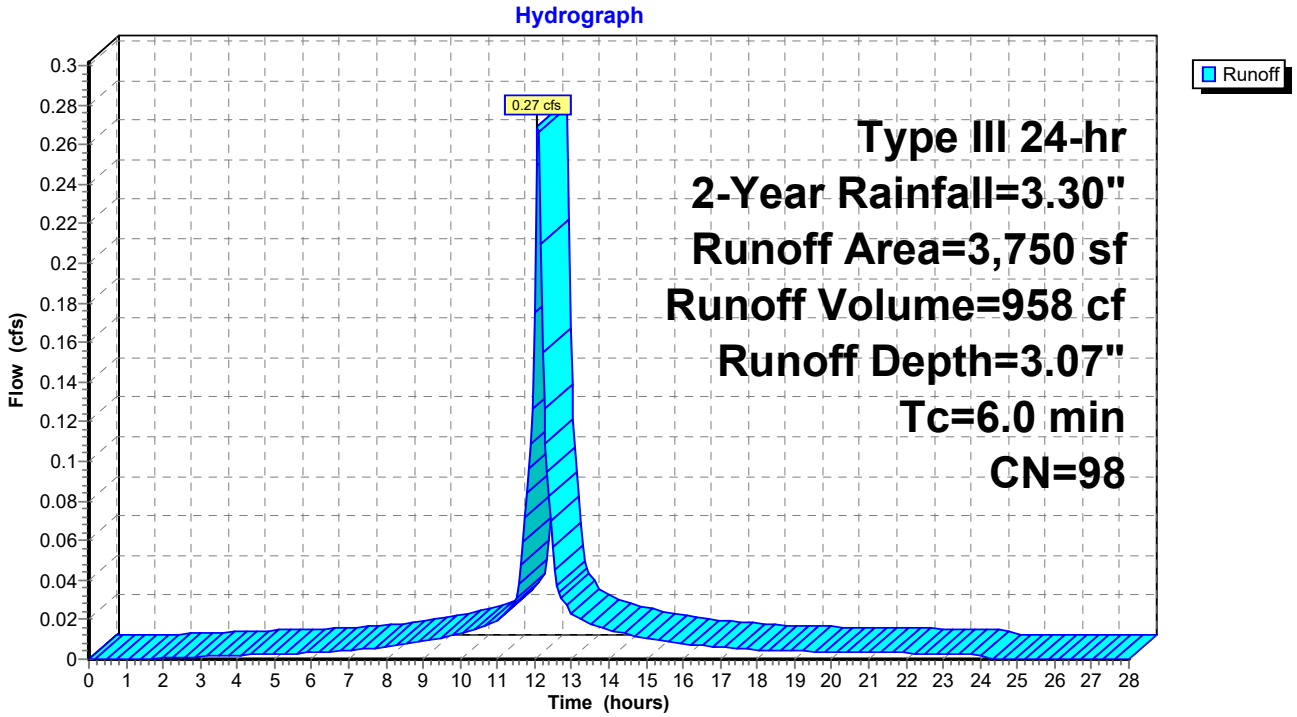
Runoff = 0.27 cfs @ 12.09 hrs, Volume= 958 cf, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
3,750	98	Roofs, HSG B
3,750	98	100.00% Impervious Area

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

Subcatchment W1C: Watershed 1C



Summary for Subcatchment W1D: Watershed 1D

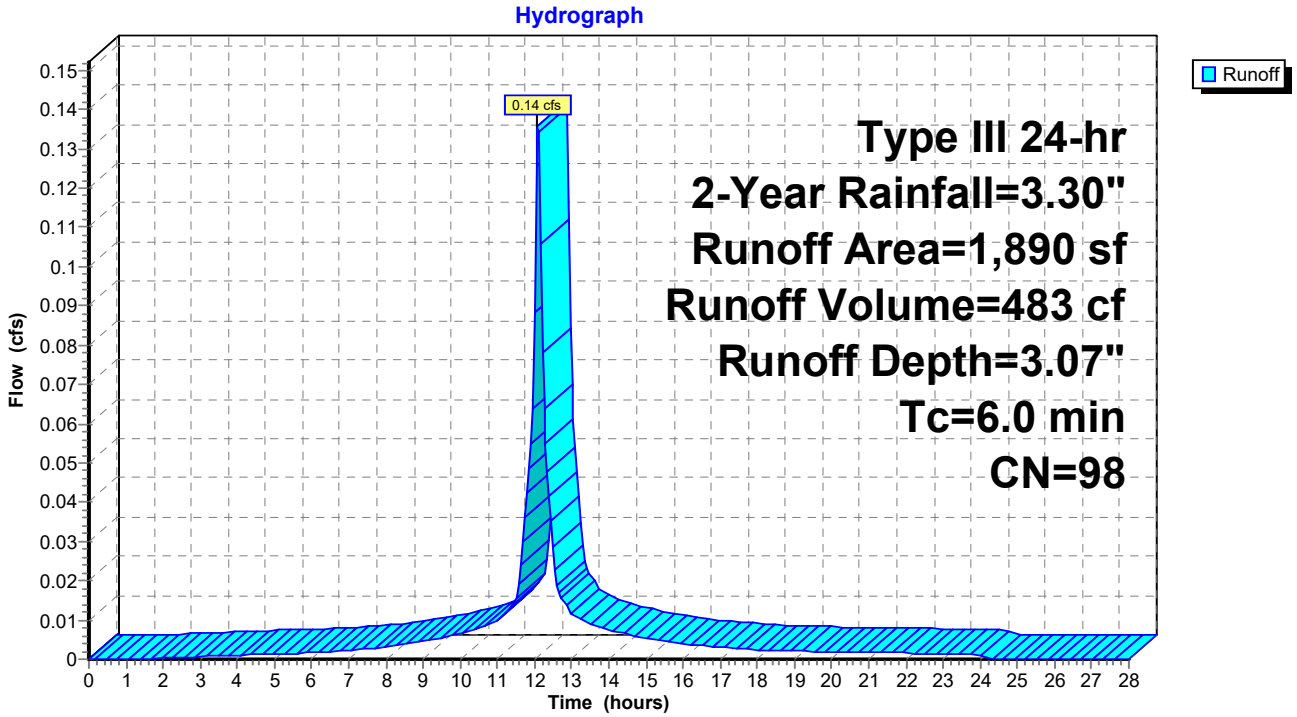
Runoff = 0.14 cfs @ 12.09 hrs, Volume= 483 cf, Depth= 3.07"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
1,890	98	Roofs, HSG B
1,890	98	100.00% Impervious Area

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

Subcatchment W1D: Watershed 1D



Summary for Subcatchment W1E: Watershed 1E

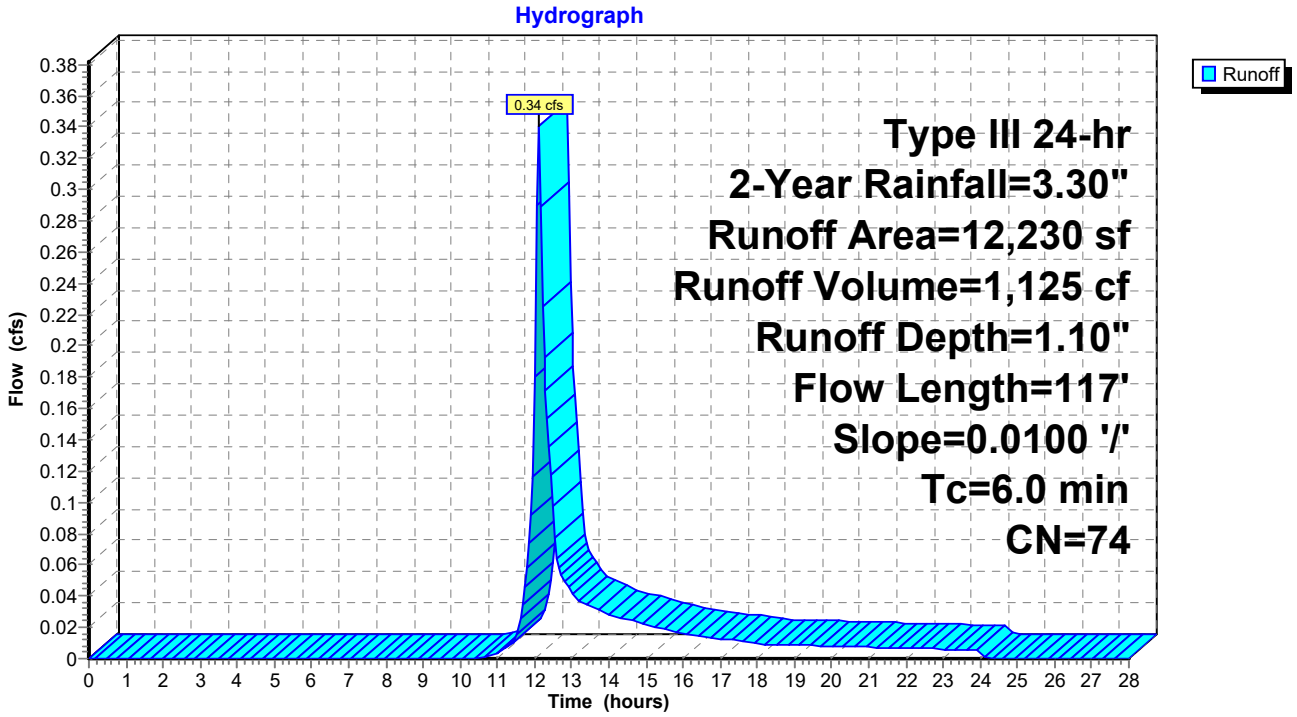
Runoff = 0.34 cfs @ 12.10 hrs, Volume= 1,125 cf, Depth= 1.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

Area (sf)	CN	Description
4,318	98	Paved parking, HSG B
7,912	61	>75% Grass cover, Good, HSG B
12,230	74	Weighted Average
7,912	61	64.69% Pervious Area
4,318	98	35.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, SEG A** Paved Kv= 20.3 fps
0.2	17	0.0100	1.50		**Shallow Concentrated Flow, SEG B** Grassed Waterway Kv= 15.0 fps
1.0	117	Total, Increased to minimum Tc = 6.0 min			

Subcatchment W1E: Watershed 1E



Summary for Subcatchment W2A: Watershed 2A

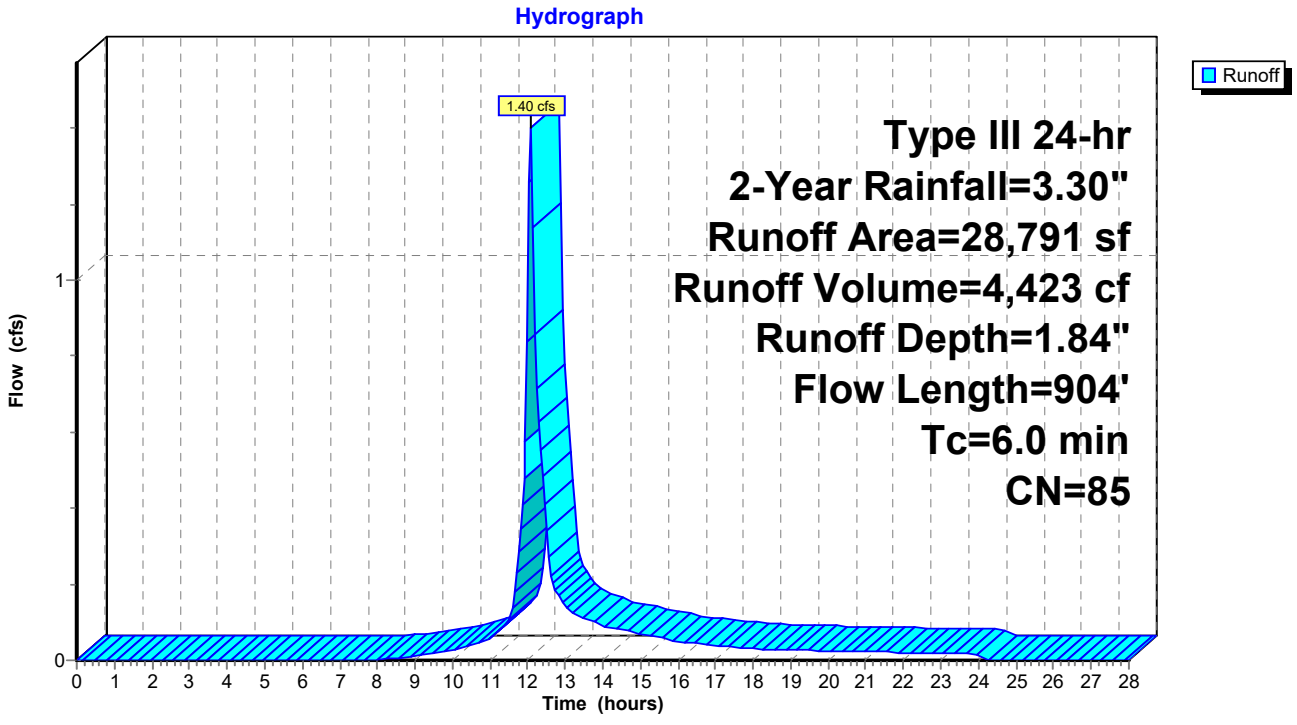
Runoff = 1.40 cfs @ 12.09 hrs, Volume= 4,423 cf, Depth= 1.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

	Area (sf)	CN	Description
	1,048	98	Roofs, HSG B
*	17,540	98	Paved parking & Roadways, HSG B
	10,203	61	>75% Grass cover, Good, HSG B
	28,791	85	Weighted Average
	10,203	61	35.44% Pervious Area
	18,588	98	64.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	77	0.0200	1.33		**Sheet Flow, SEG A** Smooth surfaces n= 0.011 P2= 3.30"
3.5	827	0.0380	3.96		**Shallow Concentrated Flow, SEG B** Paved Kv= 20.3 fps
4.5	904	Total, Increased to minimum Tc = 6.0 min			

Subcatchment W2A: Watershed 2A



Summary for Subcatchment W2B: Watershed 2B

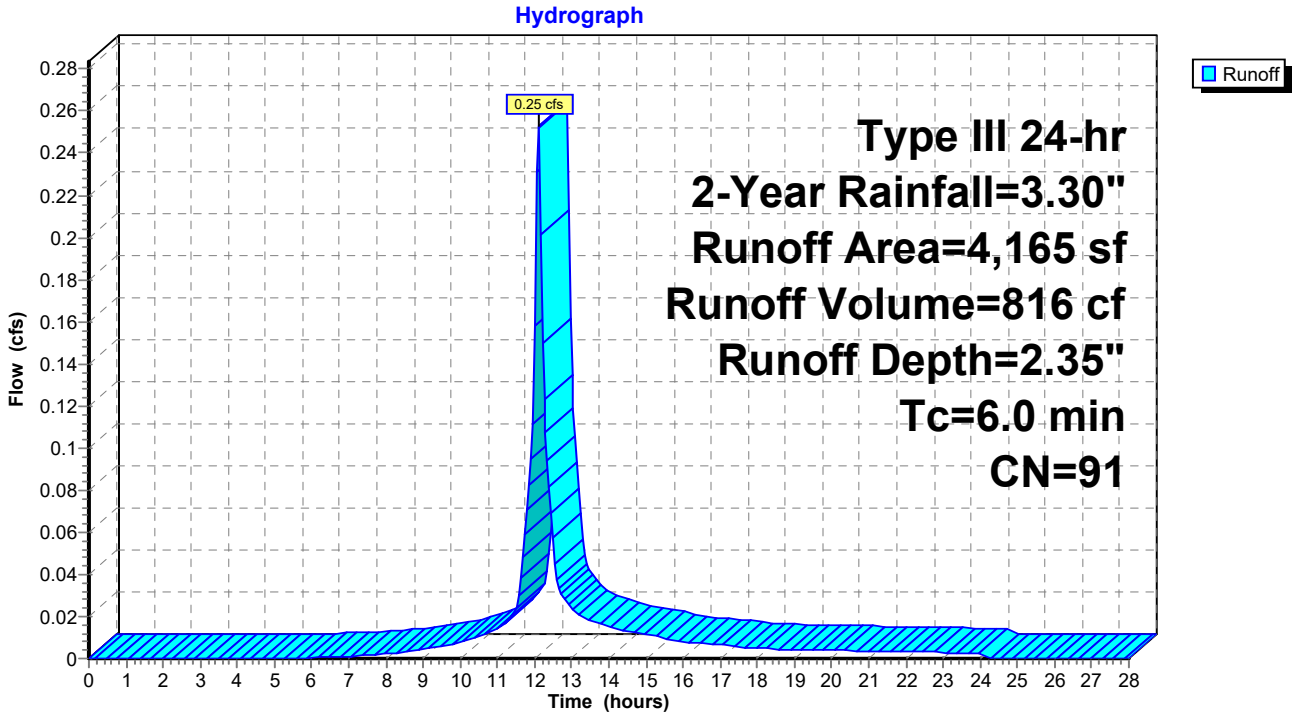
Runoff = 0.25 cfs @ 12.09 hrs, Volume= 816 cf, Depth= 2.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.30"

	Area (sf)	CN	Description
*	3,413	98	Paved parking & Roadways, HSG B
	752	61	>75% Grass cover, Good, HSG B
	4,165	91	Weighted Average
	752	61	18.06% Pervious Area
	3,413	98	81.94% Impervious Area

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

Subcatchment W2B: Watershed 2B



Summary for Pond 3P: Sediment Forebay

Inflow Area = 12,230 sf, 35.31% Impervious, Inflow Depth = 0.98" for 2-Year event
Inflow = 0.31 cfs @ 12.10 hrs, Volume= 1,000 cf
Outflow = 0.28 cfs @ 12.17 hrs, Volume= 859 cf, Atten= 12%, Lag= 3.9 min
Primary = 0.28 cfs @ 12.17 hrs, Volume= 859 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 86.27' @ 12.15 hrs Surf.Area= 269 sf Storage= 141 cf

Plug-Flow detention time= 90.3 min calculated for 859 cf (86% of inflow)
Center-of-Mass det. time= 26.4 min (905.1 - 878.7)

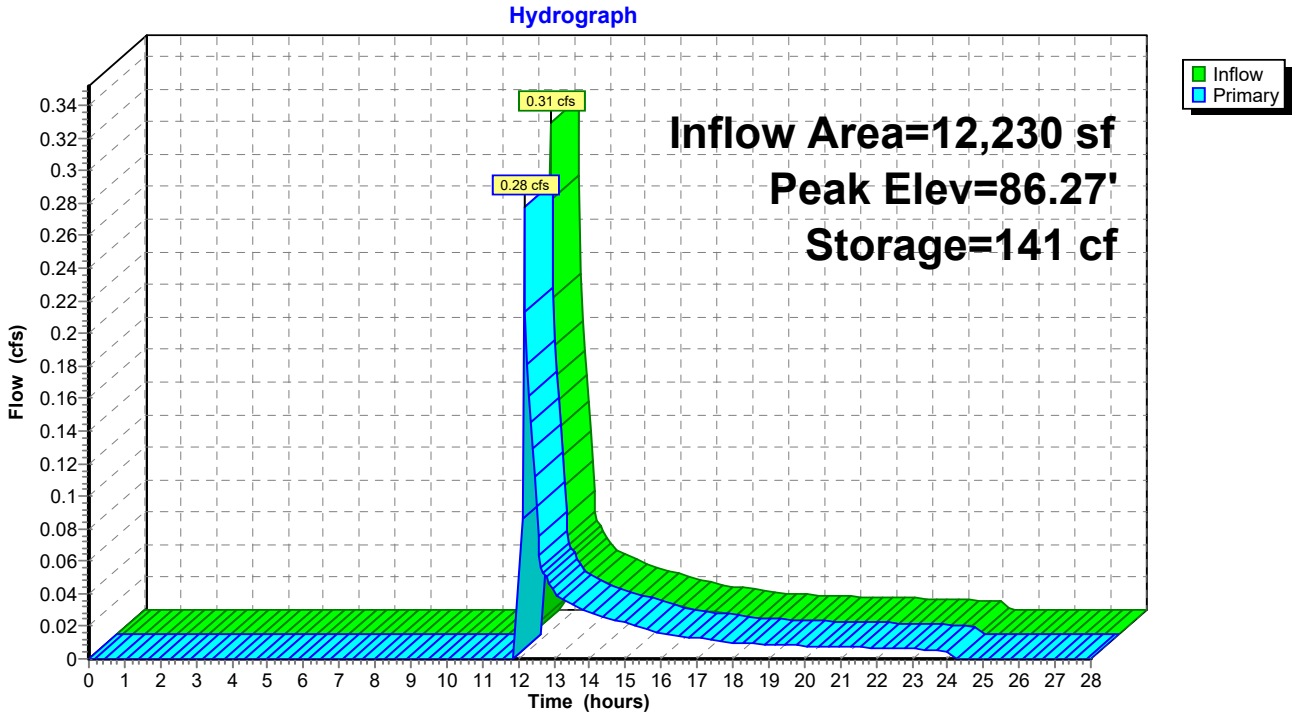
Volume	Invert	Avail.Storage	Storage Description
#1	85.50'	208 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.50	95	0	0
86.50	320	208	208

Device	Routing	Invert	Outlet Devices
#1	Primary	86.25'	**20.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.24 cfs @ 12.17 hrs HW=86.27' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Weir Controls 0.24 cfs @ 0.50 fps)

Pond 3P: Sediment Forebay



Summary for Pond 4P: UIC #1 MC-3500

Inflow Area = 4,165 sf, 81.94% Impervious, Inflow Depth = 2.35" for 2-Year event
Inflow = 0.25 cfs @ 12.09 hrs, Volume= 816 cf
Outflow = 0.03 cfs @ 12.93 hrs, Volume= 816 cf, Atten= 90%, Lag= 50.4 min
Discarded = 0.03 cfs @ 12.93 hrs, Volume= 816 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 92.43' @ 12.93 hrs Surf.Area= 289 sf Storage= 321 cf

Plug-Flow detention time= 111.8 min calculated for 815 cf (100% of inflow)
Center-of-Mass det. time= 111.7 min (913.0 - 801.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	90.50'	370 cf	**8.42'W x 34.38'L x 5.50'H Field A** 1,592 cf Overall - 470 cf Embedded = 1,122 cf x 33.0% Voids
#2A	91.25'	470 cf	**ADS_StormTech MC-3500 d +Cap** x 4 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		840 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	90.50'	**2.410 in/hr Exfiltration over Wetted area**
#2	Primary	95.95'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.03 cfs @ 12.93 hrs HW=92.43' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=90.50' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 4P: UIC #1 MC-3500 - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

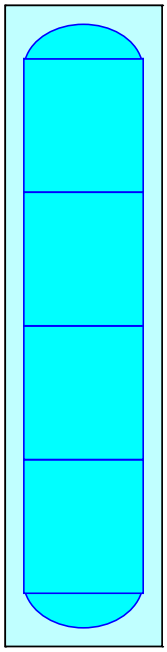
4 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 32.38' Row Length +12.0" End Stone x 2 = 34.38' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

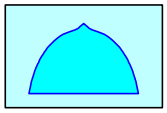
4 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 469.6 cf Chamber Storage

1,591.5 cf Field - 469.6 cf Chambers = 1,121.9 cf Stone x 33.0% Voids = 370.2 cf Stone Storage

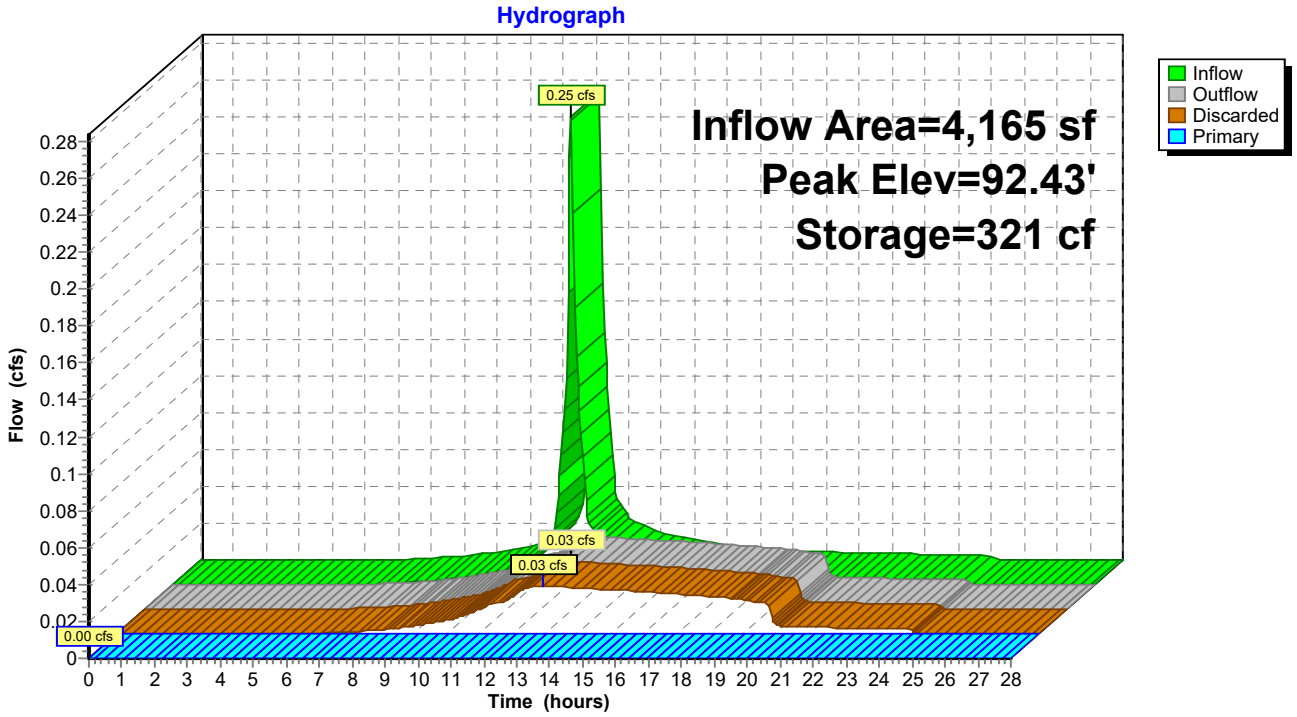
Chamber Storage + Stone Storage = 839.8 cf = 0.019 af
Overall Storage Efficiency = 52.8%
Overall System Size = 34.38' x 8.42' x 5.50'

4 Chambers
58.9 cy Field
41.6 cy Stone





Pond 4P: UIC #1 MC-3500



Summary for Pond 5P: Infiltration Basin

Inflow Area = 14,120 sf, 43.97% Impervious, Inflow Depth = 1.14" for 2-Year event
Inflow = 0.38 cfs @ 12.16 hrs, Volume= 1,342 cf
Outflow = 0.03 cfs @ 14.54 hrs, Volume= 1,342 cf, Atten= 92%, Lag= 142.9 min
Discarded = 0.03 cfs @ 14.54 hrs, Volume= 1,342 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 85.86' @ 14.54 hrs Surf.Area= 542 sf Storage= 501 cf

Plug-Flow detention time= 186.5 min calculated for 1,339 cf (100% of inflow)
Center-of-Mass det. time= 186.4 min (1,037.8 - 851.3)

Volume	Invert	Avail.Storage	Storage Description
#1	84.50'	905 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

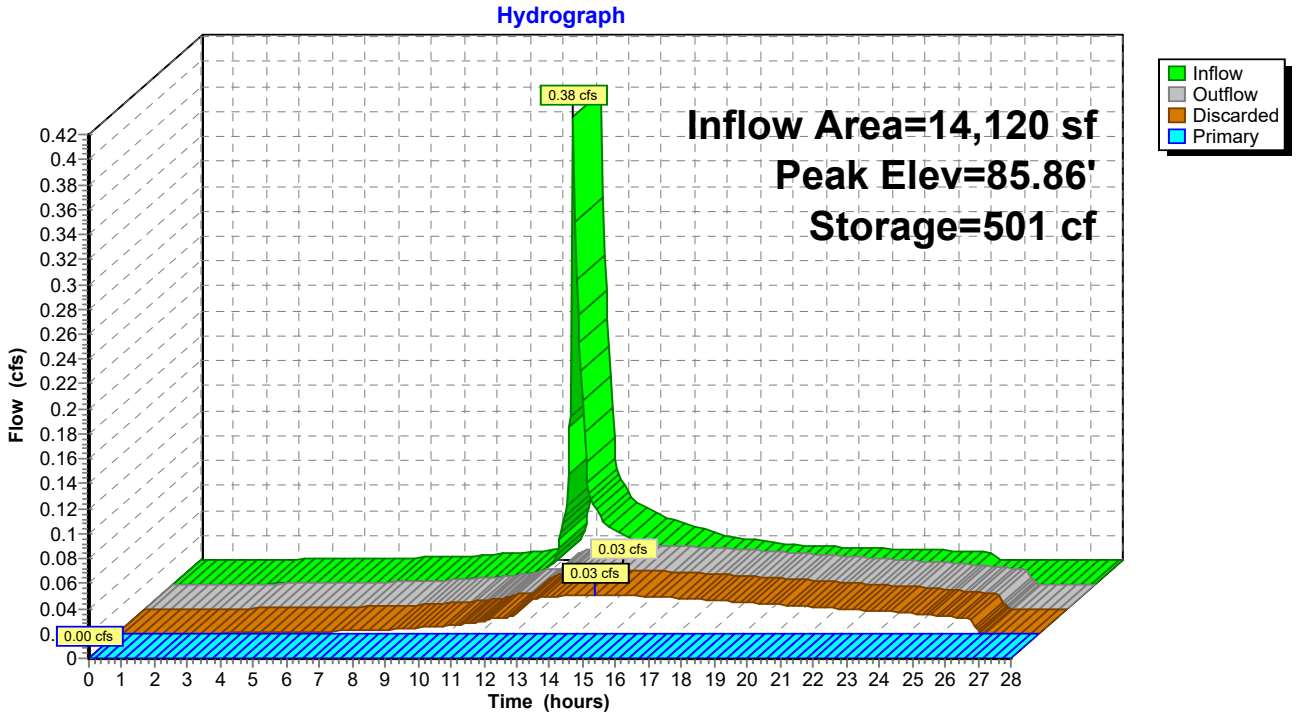
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
84.50	212	0	0	212
85.50	446	322	322	454
86.50	732	583	905	753

Device	Routing	Invert	Outlet Devices
#1	Discarded	84.50'	**2.410 in/hr Exfiltration over Wetted area**
#2	Primary	86.15'	**20.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.03 cfs @ 14.54 hrs HW=85.86' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=84.50' (Free Discharge)
↑—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: Infiltration Basin



Summary for Pond 8P: UIC #2 iSOLATOR ROW MC-3500 1.75' stone

Inflow Area = 13,552 sf, 67.59% Impervious, Inflow Depth = 1.92" for 2-Year event
Inflow = 0.69 cfs @ 12.09 hrs, Volume= 2,171 cf
Outflow = 0.32 cfs @ 12.32 hrs, Volume= 1,201 cf, Atten= 53%, Lag= 13.7 min
Primary = 0.32 cfs @ 12.32 hrs, Volume= 1,201 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 85.08' @ 12.30 hrs Surf.Area= 350 sf Storage= 969 cf

Plug-Flow detention time= 206.6 min calculated for 1,199 cf (55% of inflow)
Center-of-Mass det. time= 96.8 min (918.0 - 821.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	80.00'	617 cf	**8.42'W x 41.55'L x 7.00'H Field A** 2,448 cf Overall - 580 cf Embedded = 1,868 cf x 33.0% Voids
#2A	81.75'	580 cf	**ADS_StormTech MC-3500 d +Cap**x 5 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		1,196 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	85.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.29 cfs @ 12.32 hrs HW=85.08' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 0.29 cfs @ 0.91 fps)

Pond 8P: UIC #2 iSOLATOR ROW MC-3500 1.75' stone - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

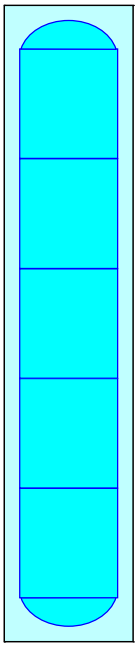
5 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 39.55' Row Length +12.0" End Stone x 2 = 41.55' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
21.0" Stone Base + 45.0" Chamber Height + 18.0" Stone Cover = 7.00' Field Height

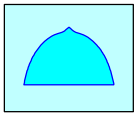
5 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 579.6 cf Chamber Storage

2,448.0 cf Field - 579.6 cf Chambers = 1,868.4 cf Stone x 33.0% Voids = 616.6 cf Stone Storage

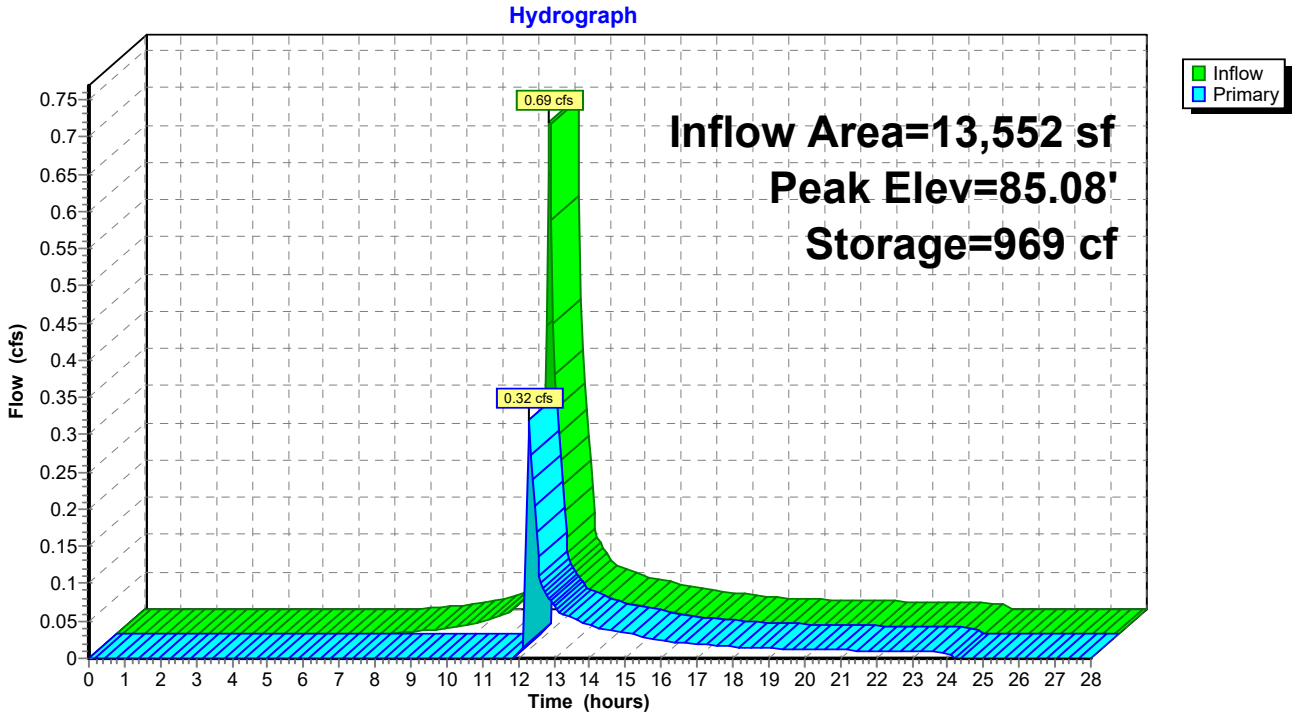
Chamber Storage + Stone Storage = 1,196.1 cf = 0.027 af
Overall Storage Efficiency = 48.9%
Overall System Size = 41.55' x 8.42' x 7.00'

5 Chambers
90.7 cy Field
69.2 cy Stone





Pond 8P: UIC #2 iSOLATOR ROW MC-3500 1.75' stone



Summary for Pond 11P: UIC #2 MC-3500 4.0' stone

Inflow Area = 17,302 sf, 74.62% Impervious, Inflow Depth = 1.50" for 2-Year event
Inflow = 0.42 cfs @ 12.32 hrs, Volume= 2,159 cf
Outflow = 0.04 cfs @ 11.70 hrs, Volume= 2,159 cf, Atten= 91%, Lag= 0.0 min
Discarded = 0.04 cfs @ 11.70 hrs, Volume= 2,159 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 4
Peak Elev= 81.28' @ 15.67 hrs Surf.Area= 647 sf Storage= 868 cf

Plug-Flow detention time= 234.0 min calculated for 2,155 cf (100% of inflow)
Center-of-Mass det. time= 233.9 min (1,079.8 - 846.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	77.25'	1,701 cf	**15.58'W x 41.55'L x 9.75'H Field A** 6,313 cf Overall - 1,159 cf Embedded = 5,154 cf x 33.0% Voids
#2A	81.25'	1,159 cf	**ADS_StormTech MC-3500 d +Cap**x 10 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 10 Chambers in 2 Rows Cap Storage= +14.9 cf x 2 x 2 rows = 59.6 cf
		2,860 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	77.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	86.45'	**4.0" x 18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.04 cfs @ 11.70 hrs HW=77.36' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=77.25' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 11P: UIC #2 MC-3500 4.0' stone - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 2 rows = 59.6 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

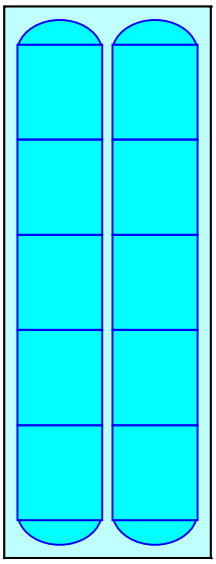
5 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 39.55' Row Length +12.0" End Stone x 2 = 41.55' Base Length
2 Rows x 77.0" Wide + 9.0" Spacing x 1 + 12.0" Side Stone x 2 = 15.58' Base Width
48.0" Stone Base + 45.0" Chamber Height + 24.0" Stone Cover = 9.75' Field Height

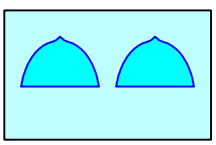
10 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 2 Rows = 1,159.1 cf Chamber Storage

6,313.0 cf Field - 1,159.1 cf Chambers = 5,153.9 cf Stone x 33.0% Voids = 1,700.8 cf Stone Storage

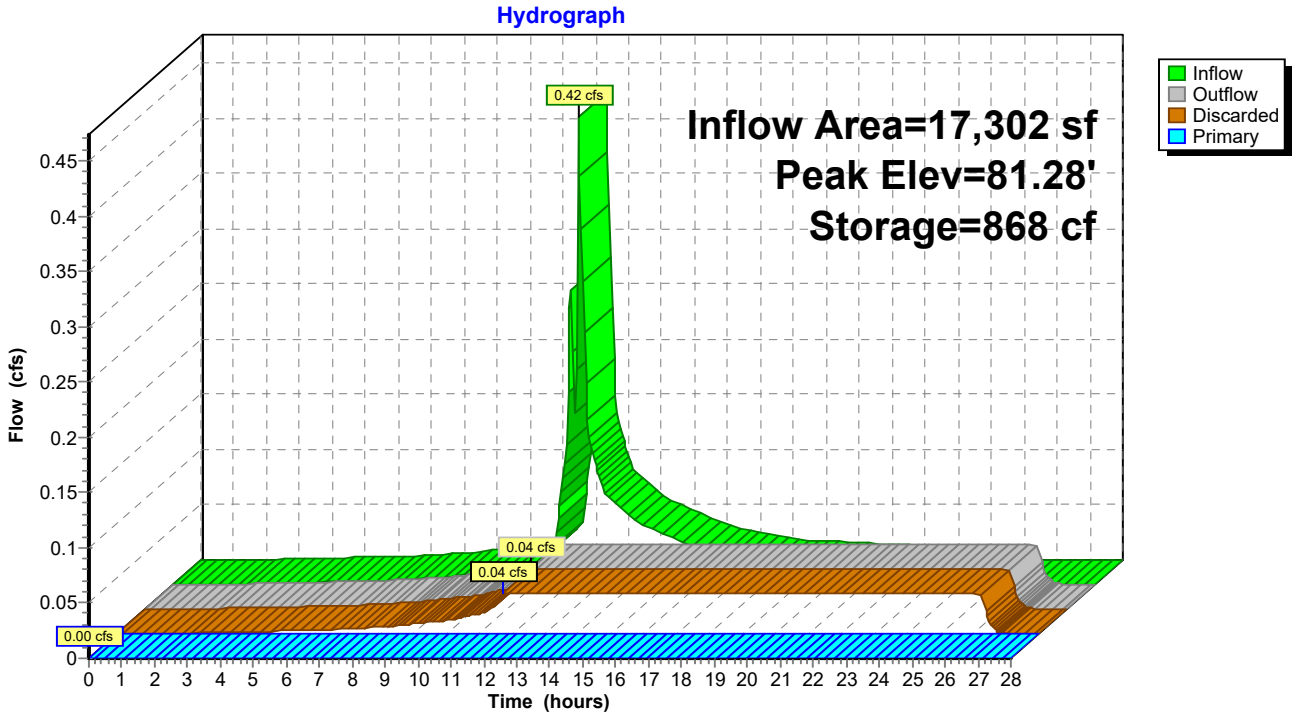
Chamber Storage + Stone Storage = 2,859.9 cf = 0.066 af
Overall Storage Efficiency = 45.3%
Overall System Size = 41.55' x 15.58' x 9.75'

10 Chambers
233.8 cy Field
190.9 cy Stone





Pond 11P: UIC #2 MC-3500 4.0' stone



Summary for Pond 12P: Pea gravel Diaphragm

Inflow Area = 12,230 sf, 35.31% Impervious, Inflow Depth = 1.10" for 2-Year event
Inflow = 0.34 cfs @ 12.10 hrs, Volume= 1,125 cf
Outflow = 0.31 cfs @ 12.10 hrs, Volume= 1,000 cf, Atten= 8%, Lag= 0.1 min
Primary = 0.31 cfs @ 12.10 hrs, Volume= 1,000 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 86.96' @ 12.10 hrs Surf.Area= 114 sf Storage= 74 cf

Plug-Flow detention time= 71.1 min calculated for 998 cf (89% of inflow)
Center-of-Mass det. time= 18.6 min (878.7 - 860.2)

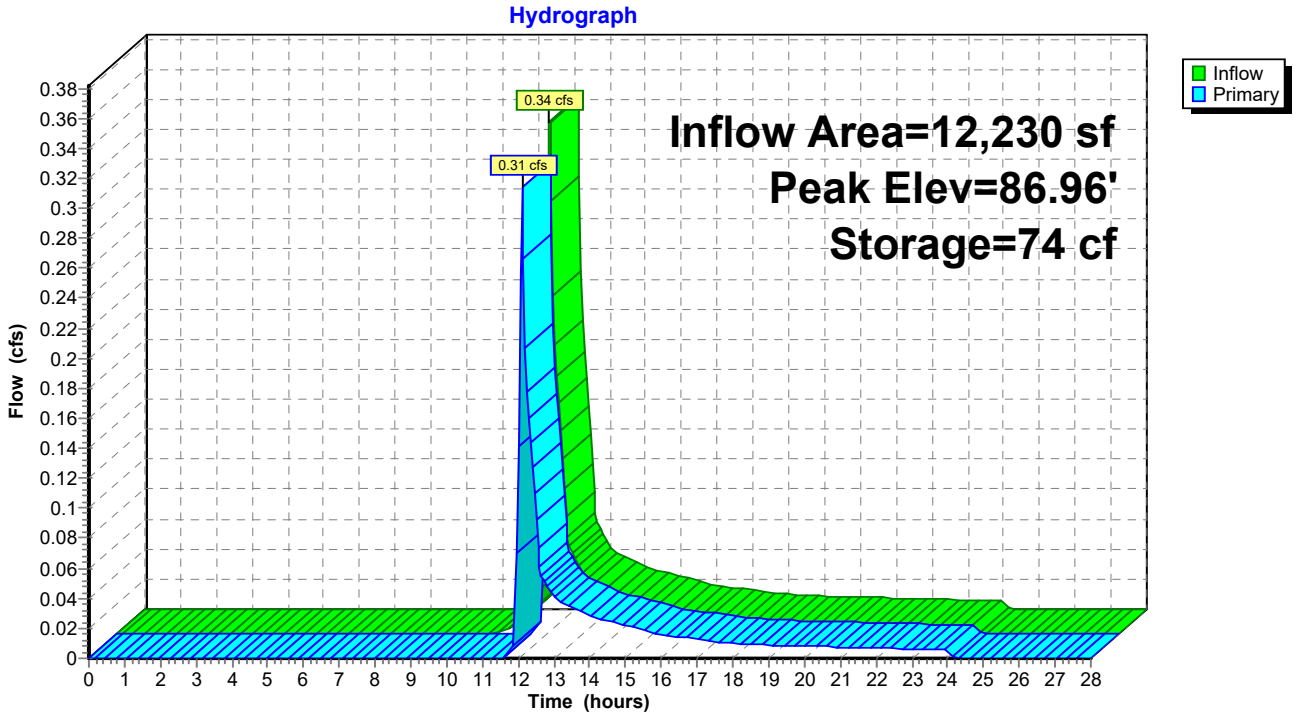
Volume	Invert	Avail.Storage	Storage Description
#1	85.00'	75 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 228 cf Overall x 33.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.00	114	0	0
87.00	114	228	228

Device	Routing	Invert	Outlet Devices
#1	Primary	86.94'	**38.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.29 cfs @ 12.10 hrs HW=86.96' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Weir Controls 0.29 cfs @ 0.44 fps)

Pond 12P: Pea gravel Diaphragm

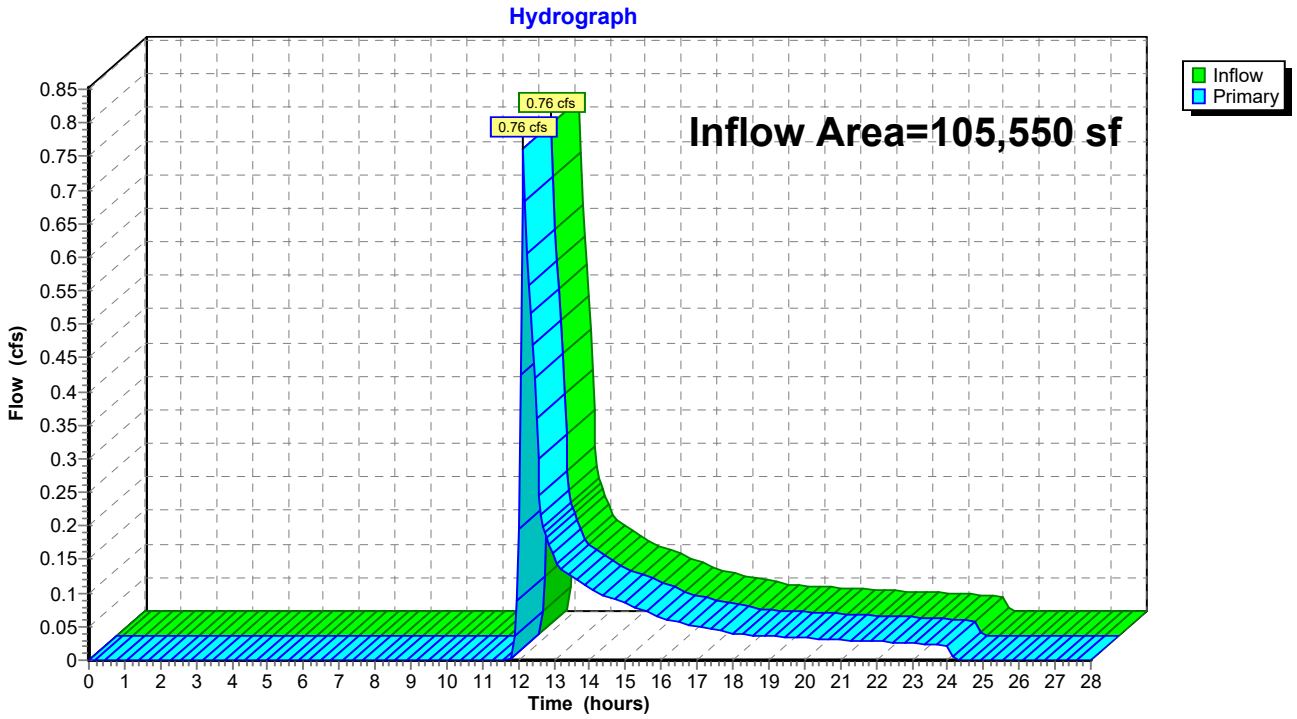


Summary for Link DP-1: Lower Gradient

Inflow Area = 105,550 sf, 21.75% Impervious, Inflow Depth = 0.40" for 2-Year event
Inflow = 0.76 cfs @ 12.15 hrs, Volume= 3,489 cf
Primary = 0.76 cfs @ 12.15 hrs, Volume= 3,489 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

Link DP-1: Lower Gradient

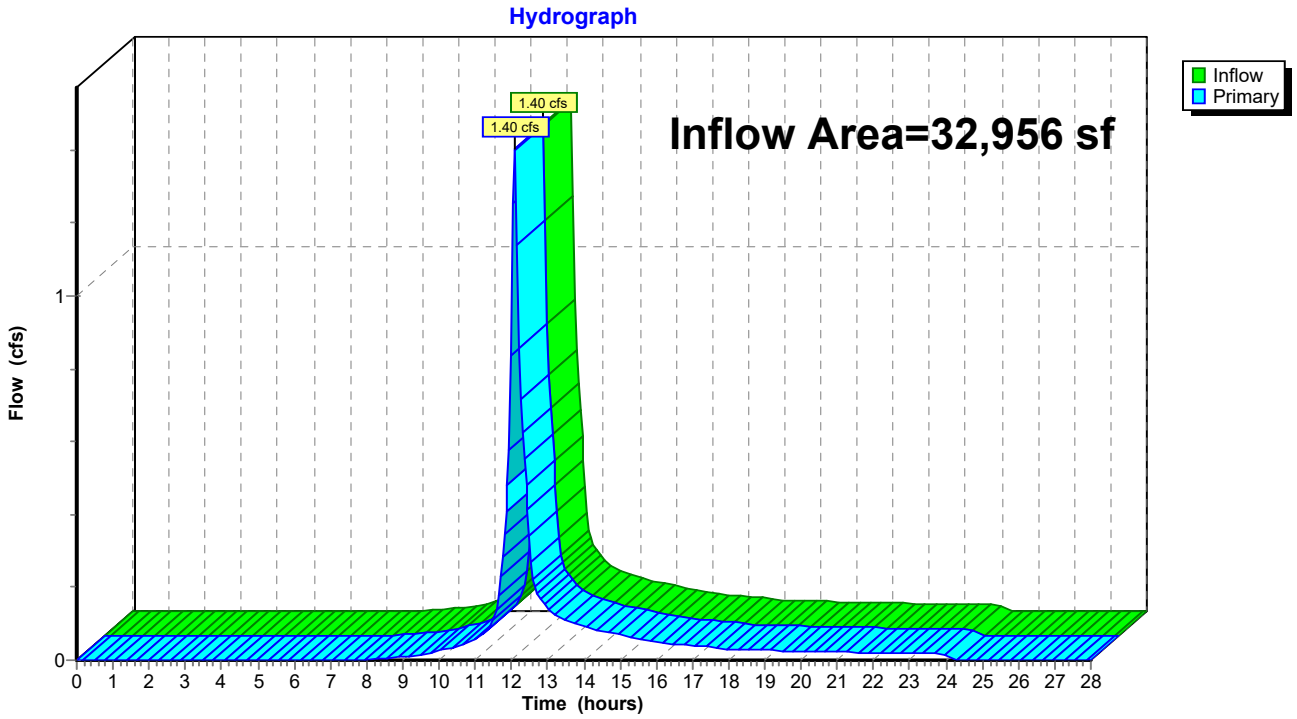


Summary for Link DP-2: Matunuck School House Road

Inflow Area = 32,956 sf, 66.76% Impervious, Inflow Depth = 1.61" for 2-Year event
Inflow = 1.40 cfs @ 12.09 hrs, Volume= 4,423 cf
Primary = 1.40 cfs @ 12.09 hrs, Volume= 4,423 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

Link DP-2: Matunuck School House Road



Summary for Subcatchment W1A: Watershed 1A

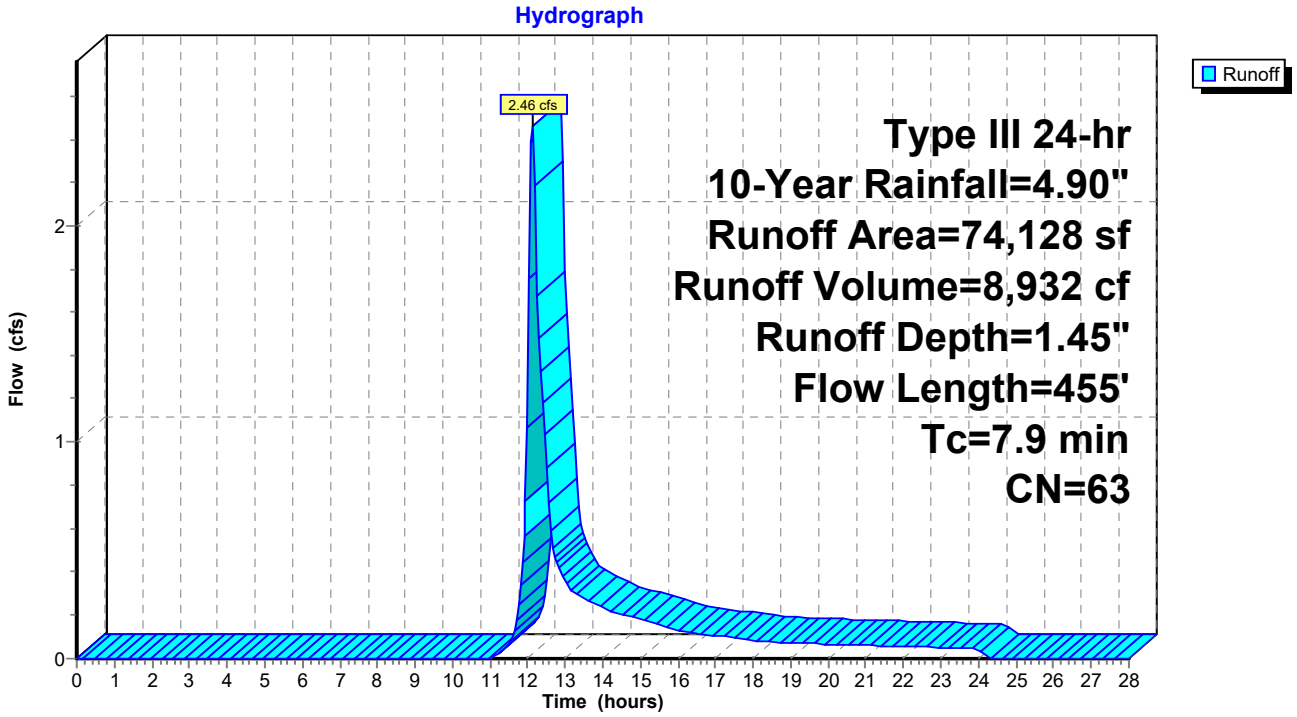
Runoff = 2.46 cfs @ 12.12 hrs, Volume= 8,932 cf, Depth= 1.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.90"

Area (sf)	CN	Description
3,836	98	Roofs, HSG B
70,292	61	>75% Grass cover, Good, HSG B
74,128	63	Weighted Average
70,292	61	94.83% Pervious Area
3,836	98	5.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.0600	0.27		**Sheet Flow, SEG A** Grass: Short n= 0.150 P2= 3.30"
1.7	355	0.0560	3.55		**Shallow Concentrated Flow, SEG B** Grassed Waterway Kv= 15.0 fps
7.9	455	Total			

Subcatchment W1A: Watershed 1A



Summary for Subcatchment W1B: Watershed 1B

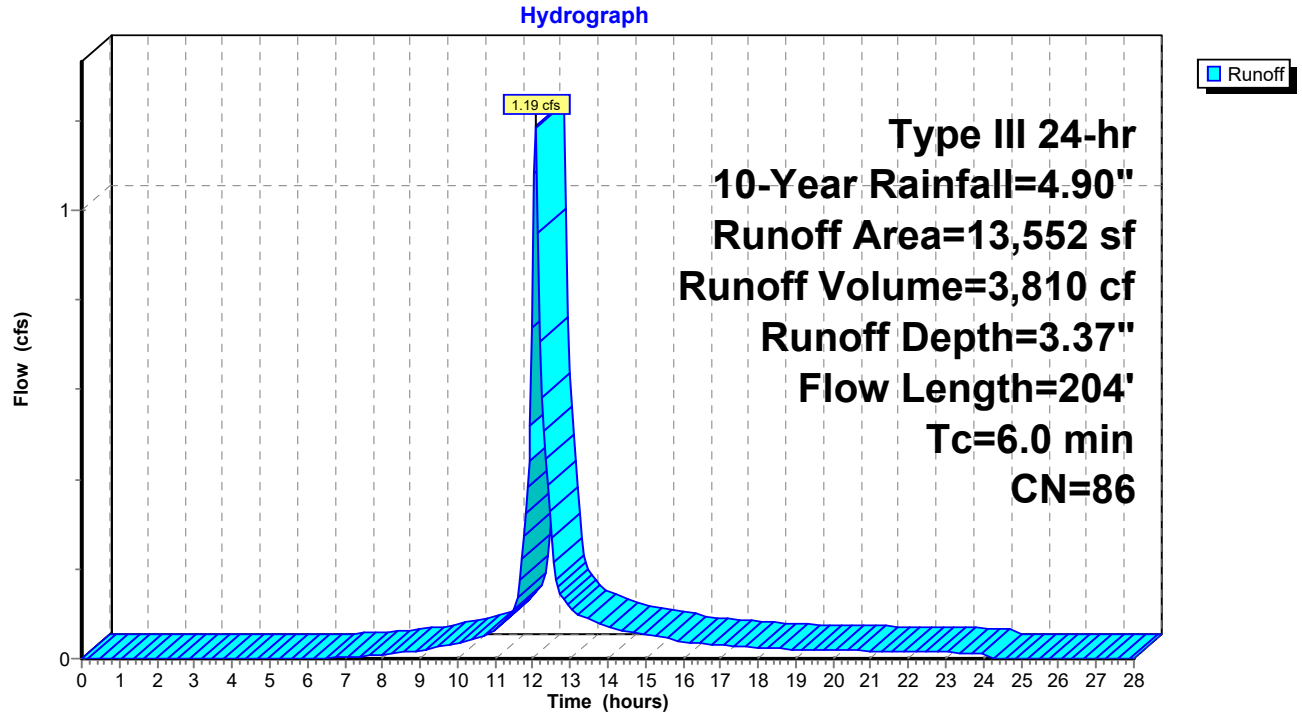
Runoff = 1.19 cfs @ 12.09 hrs, Volume= 3,810 cf, Depth= 3.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.90"

Area (sf)	CN	Description
9,160	98	Paved parking, HSG B
4,392	61	>75% Grass cover, Good, HSG B
13,552	86	Weighted Average
4,392	61	32.41% Pervious Area
9,160	98	67.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0800	2.43		**Sheet Flow, SEG A** Smooth surfaces n= 0.011 P2= 3.30"
0.4	104	0.0500	4.54		**Shallow Concentrated Flow, SEG B** Paved Kv= 20.3 fps
1.1	204	Total, Increased to minimum Tc = 6.0 min			

Subcatchment W1B: Watershed 1B



Summary for Subcatchment W1C: Watershed 1C

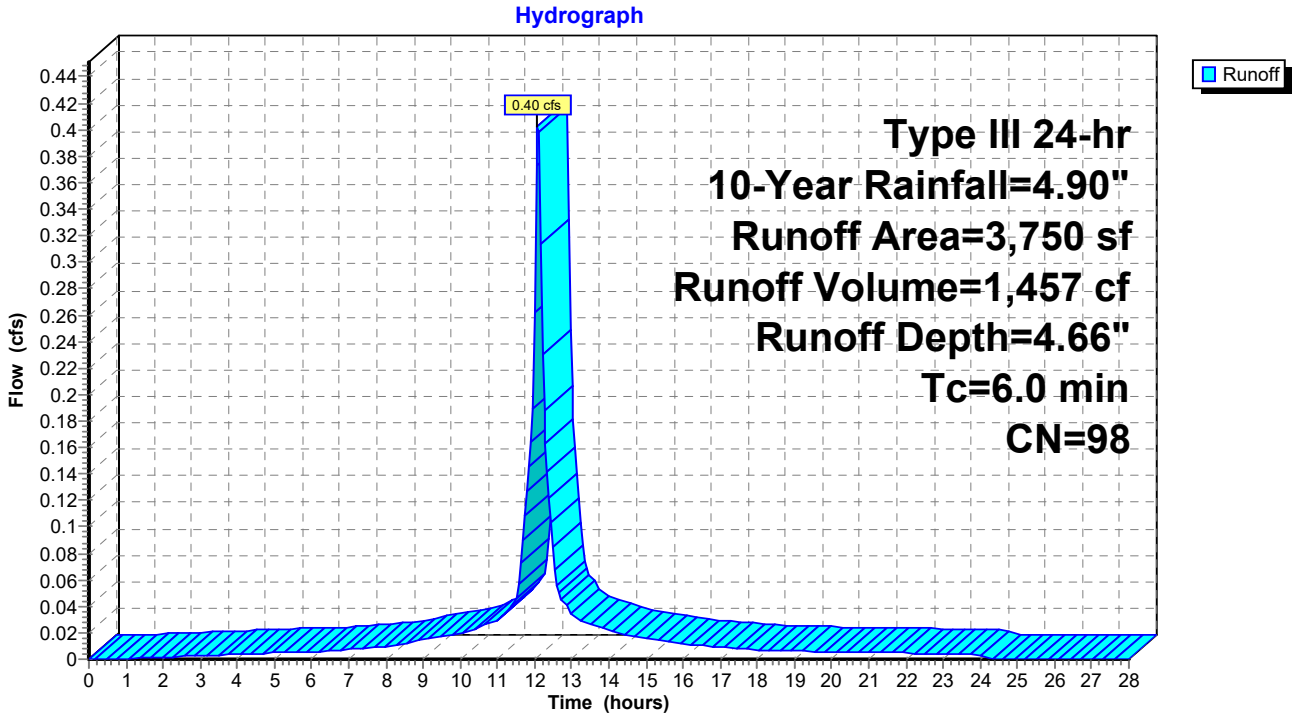
Runoff = 0.40 cfs @ 12.09 hrs, Volume= 1,457 cf, Depth= 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.90"

Area (sf)	CN	Description
3,750	98	Roofs, HSG B
3,750	98	100.00% Impervious Area

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

Subcatchment W1C: Watershed 1C



Summary for Subcatchment W1D: Watershed 1D

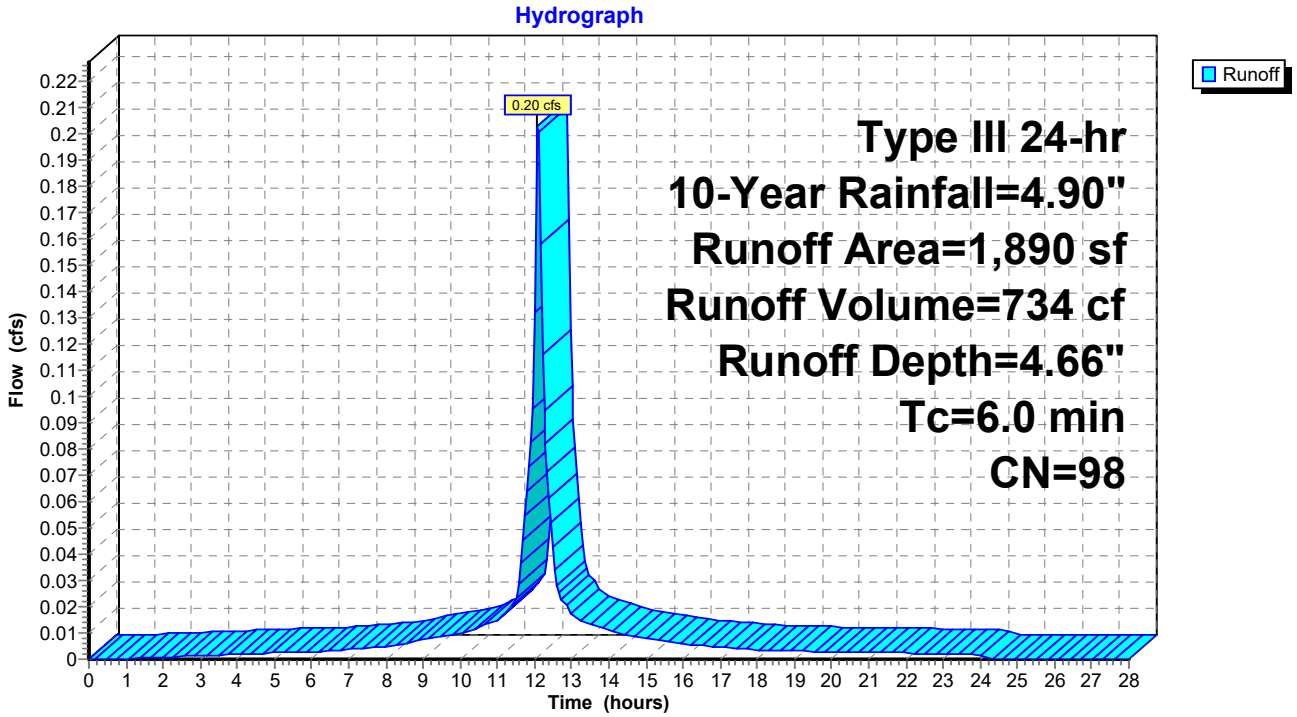
Runoff = 0.20 cfs @ 12.09 hrs, Volume= 734 cf, Depth= 4.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.90"

Area (sf)	CN	Description
1,890	98	Roofs, HSG B
1,890	98	100.00% Impervious Area

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

Subcatchment W1D: Watershed 1D



Summary for Subcatchment W1E: Watershed 1E

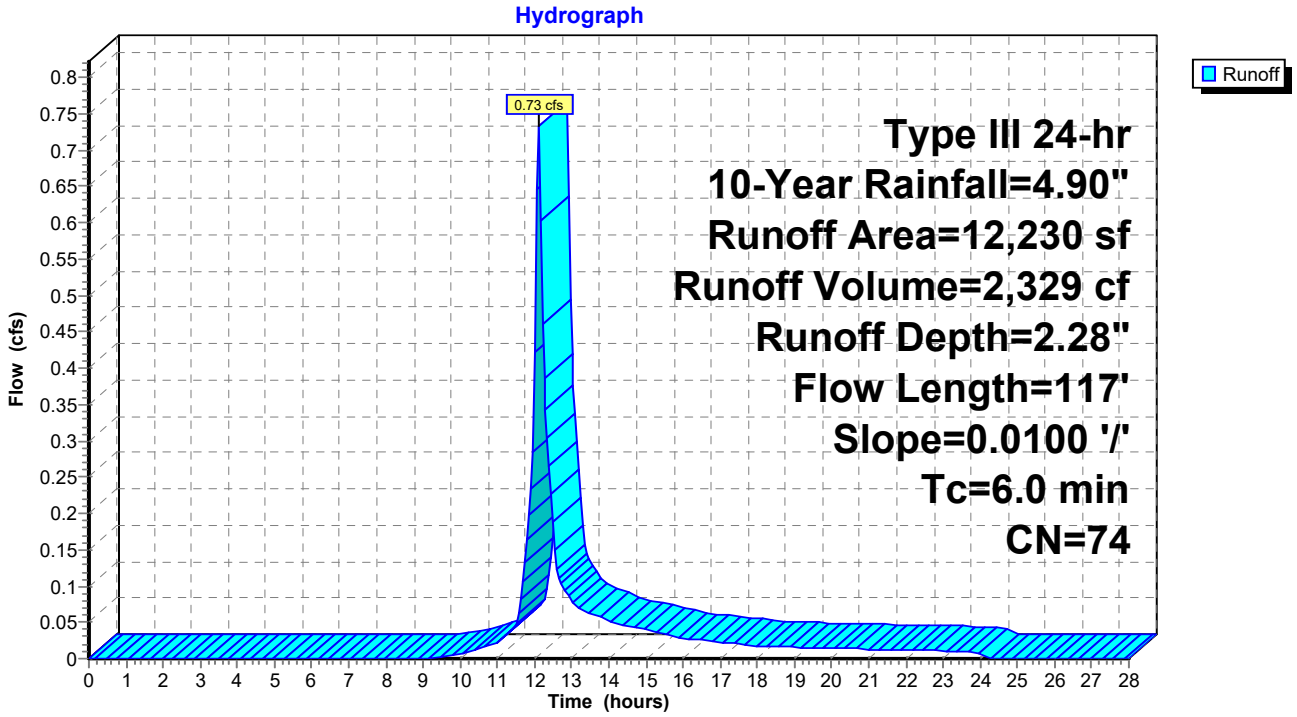
Runoff = 0.73 cfs @ 12.10 hrs, Volume= 2,329 cf, Depth= 2.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.90"

Area (sf)	CN	Description
4,318	98	Paved parking, HSG B
7,912	61	>75% Grass cover, Good, HSG B
12,230	74	Weighted Average
7,912	61	64.69% Pervious Area
4,318	98	35.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, SEG A** Paved Kv= 20.3 fps
0.2	17	0.0100	1.50		**Shallow Concentrated Flow, SEG B** Grassed Waterway Kv= 15.0 fps
1.0	117	Total, Increased to minimum Tc = 6.0 min			

Subcatchment W1E: Watershed 1E



Summary for Subcatchment W2A: Watershed 2A

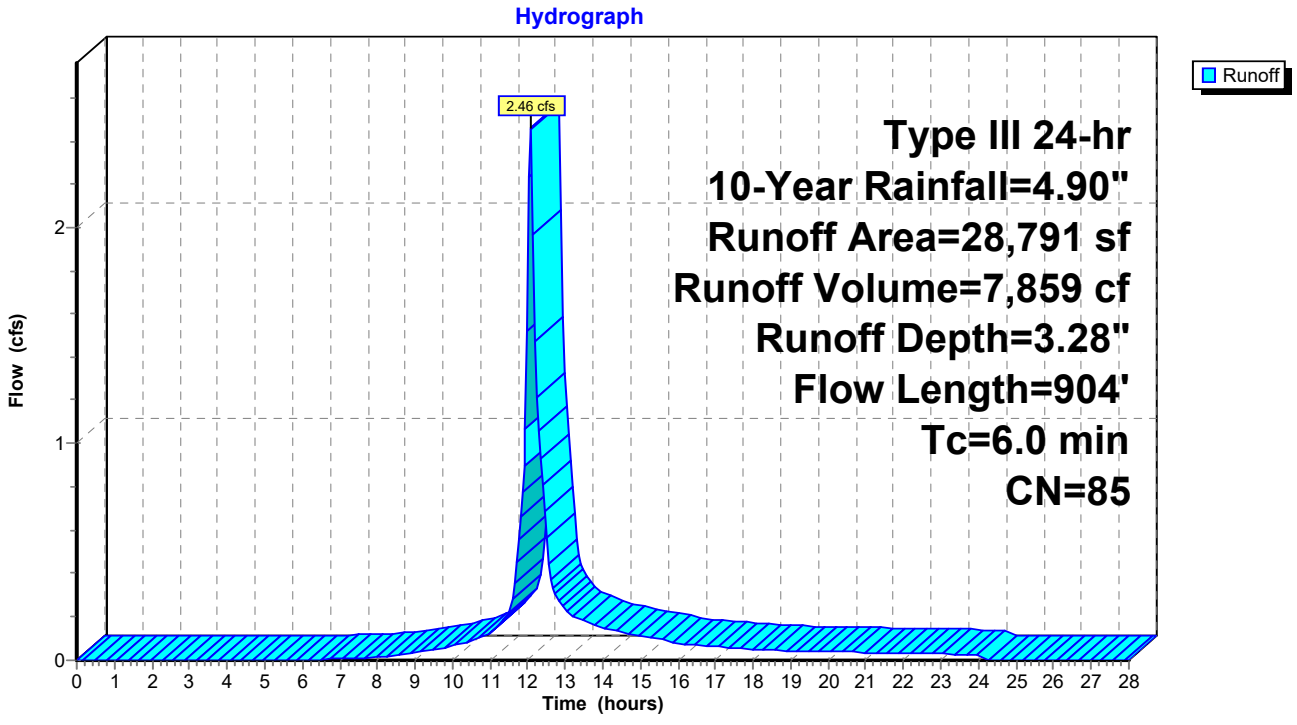
Runoff = 2.46 cfs @ 12.09 hrs, Volume= 7,859 cf, Depth= 3.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.90"

	Area (sf)	CN	Description
	1,048	98	Roofs, HSG B
*	17,540	98	Paved parking & Roadways, HSG B
	10,203	61	>75% Grass cover, Good, HSG B
	28,791	85	Weighted Average
	10,203	61	35.44% Pervious Area
	18,588	98	64.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	77	0.0200	1.33		**Sheet Flow, SEG A** Smooth surfaces n= 0.011 P2= 3.30"
3.5	827	0.0380	3.96		**Shallow Concentrated Flow, SEG B** Paved Kv= 20.3 fps
4.5	904	Total, Increased to minimum Tc = 6.0 min			

Subcatchment W2A: Watershed 2A



Summary for Subcatchment W2B: Watershed 2B

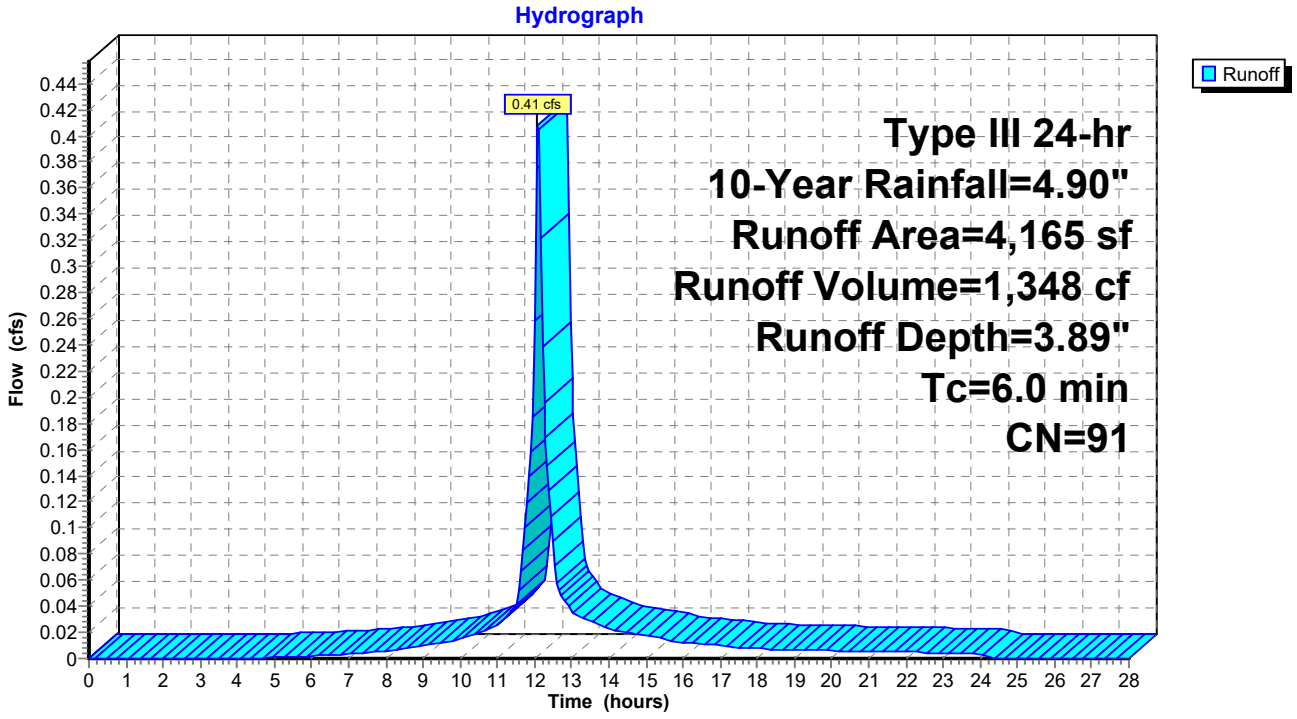
Runoff = 0.41 cfs @ 12.09 hrs, Volume= 1,348 cf, Depth= 3.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.90"

	Area (sf)	CN	Description
*	3,413	98	Paved parking & Roadways, HSG B
	752	61	>75% Grass cover, Good, HSG B
	4,165	91	Weighted Average
	752	61	18.06% Pervious Area
	3,413	98	81.94% Impervious Area

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

Subcatchment W2B: Watershed 2B



Summary for Pond 3P: Sediment Forebay

Inflow Area = 12,230 sf, 35.31% Impervious, Inflow Depth = 2.22" for 10-Year event
Inflow = 0.73 cfs @ 12.09 hrs, Volume= 2,262 cf
Outflow = 0.73 cfs @ 12.10 hrs, Volume= 2,135 cf, Atten= 1%, Lag= 0.2 min
Primary = 0.73 cfs @ 12.10 hrs, Volume= 2,135 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 86.30' @ 12.10 hrs Surf.Area= 275 sf Storage= 148 cf

Plug-Flow detention time= 39.3 min calculated for 2,135 cf (94% of inflow)
Center-of-Mass det. time= 9.6 min (854.4 - 844.7)

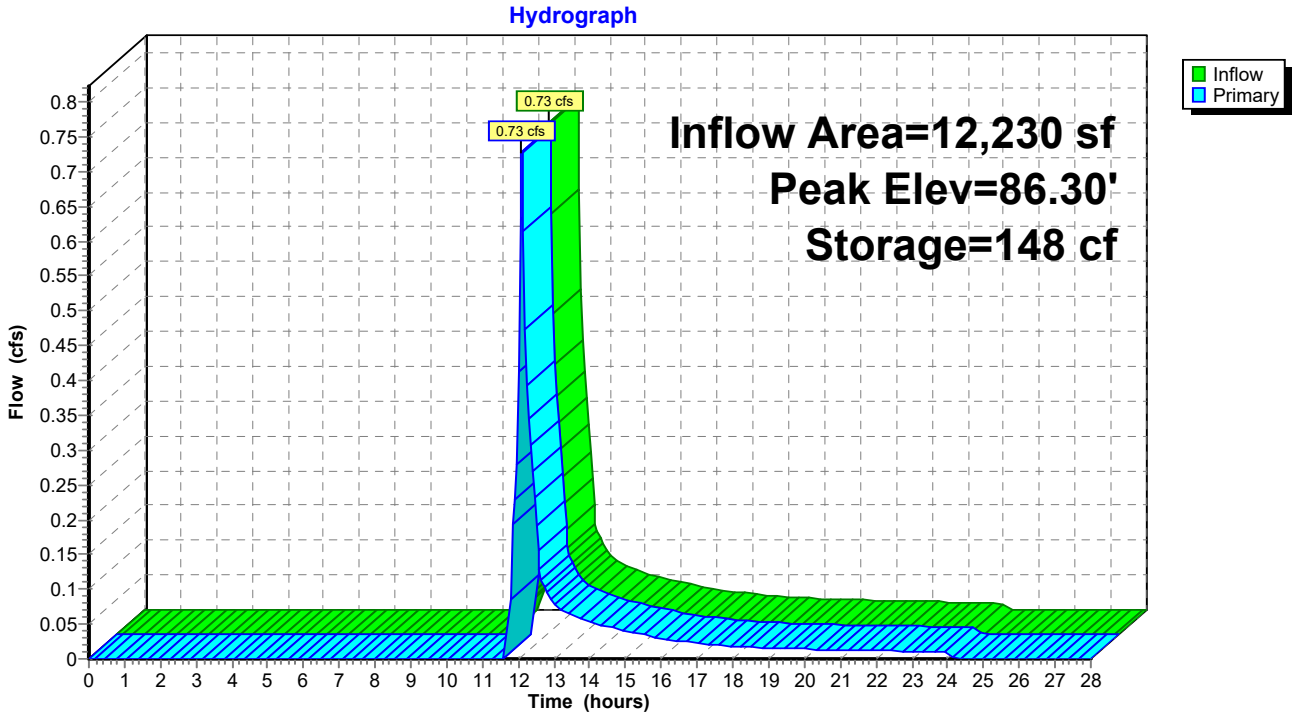
Volume	Invert	Avail.Storage	Storage Description
#1	85.50'	208 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.50	95	0	0
86.50	320	208	208

Device	Routing	Invert	Outlet Devices
#1	Primary	86.25'	**20.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.72 cfs @ 12.10 hrs HW=86.30' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Weir Controls 0.72 cfs @ 0.73 fps)

Pond 3P: Sediment Forebay



Summary for Pond 4P: UIC #1 MC-3500

Inflow Area = 4,165 sf, 81.94% Impervious, Inflow Depth = 3.89" for 10-Year event
Inflow = 0.41 cfs @ 12.09 hrs, Volume= 1,348 cf
Outflow = 0.03 cfs @ 13.15 hrs, Volume= 1,348 cf, Atten= 92%, Lag= 63.7 min
Discarded = 0.03 cfs @ 13.15 hrs, Volume= 1,348 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 93.90' @ 13.15 hrs Surf.Area= 289 sf Storage= 597 cf

Plug-Flow detention time= 184.3 min calculated for 1,346 cf (100% of inflow)
Center-of-Mass det. time= 184.0 min (971.5 - 787.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	90.50'	370 cf	**8.42'W x 34.38'L x 5.50'H Field A** 1,592 cf Overall - 470 cf Embedded = 1,122 cf x 33.0% Voids
#2A	91.25'	470 cf	**ADS_StormTech MC-3500 d +Cap** x 4 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		840 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	90.50'	**2.410 in/hr Exfiltration over Wetted area**
#2	Primary	95.95'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.03 cfs @ 13.15 hrs HW=93.90' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=90.50' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 4P: UIC #1 MC-3500 - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

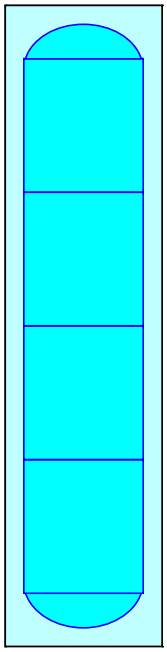
4 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 32.38' Row Length +12.0" End Stone x 2 = 34.38' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

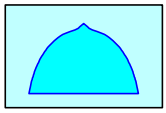
4 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 469.6 cf Chamber Storage

1,591.5 cf Field - 469.6 cf Chambers = 1,121.9 cf Stone x 33.0% Voids = 370.2 cf Stone Storage

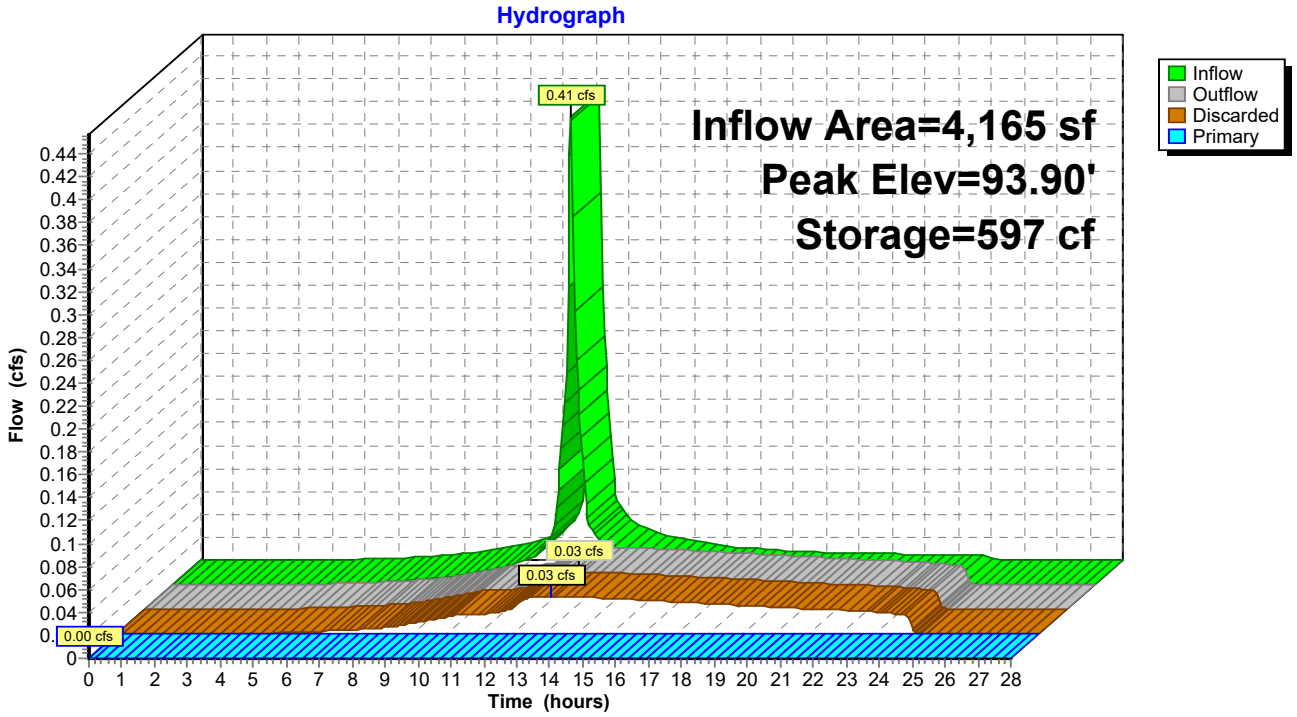
Chamber Storage + Stone Storage = 839.8 cf = 0.019 af
Overall Storage Efficiency = 52.8%
Overall System Size = 34.38' x 8.42' x 5.50'

4 Chambers
58.9 cy Field
41.6 cy Stone





Pond 4P: UIC #1 MC-3500



Summary for Pond 5P: Infiltration Basin

Inflow Area = 14,120 sf, 43.97% Impervious, Inflow Depth = 2.44" for 10-Year event
Inflow = 0.93 cfs @ 12.10 hrs, Volume= 2,870 cf
Outflow = 0.61 cfs @ 12.21 hrs, Volume= 2,827 cf, Atten= 34%, Lag= 6.7 min
Discarded = 0.04 cfs @ 12.20 hrs, Volume= 1,882 cf
Primary = 0.58 cfs @ 12.21 hrs, Volume= 945 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 86.19' @ 12.20 hrs Surf.Area= 636 sf Storage= 694 cf

Plug-Flow detention time= 155.2 min calculated for 2,822 cf (98% of inflow)
Center-of-Mass det. time= 146.6 min (973.8 - 827.2)

Volume	Invert	Avail.Storage	Storage Description
#1	84.50'	905 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

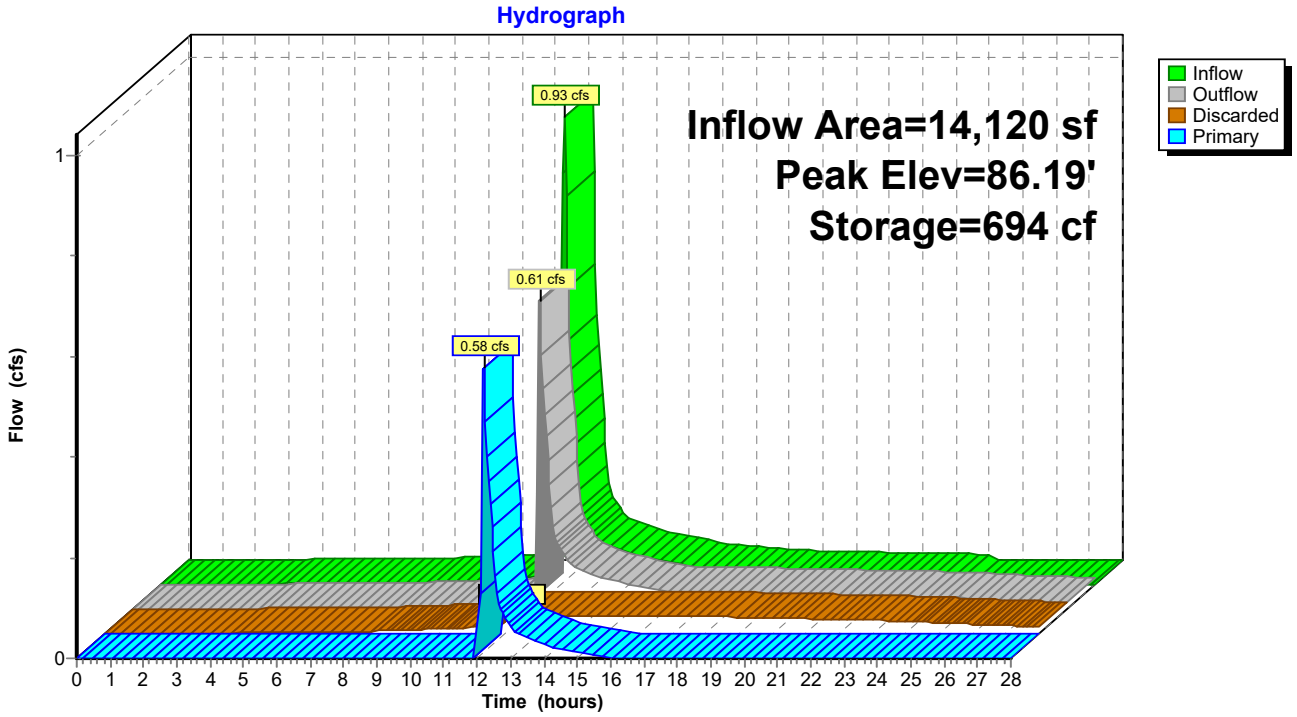
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
84.50	212	0	0	212
85.50	446	322	322	454
86.50	732	583	905	753

Device	Routing	Invert	Outlet Devices
#1	Discarded	84.50'	**2.410 in/hr Exfiltration over Wetted area**
#2	Primary	86.15'	**20.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.04 cfs @ 12.20 hrs HW=86.19' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.55 cfs @ 12.21 hrs HW=86.19' (Free Discharge)
↑—**2=Sharp-Crested Rectangular Weir** (Weir Controls 0.55 cfs @ 0.66 fps)

Pond 5P: Infiltration Basin



Summary for Pond 8P: UIC #2 iSOLATOR ROW MC-3500 1.75' stone

Inflow Area = 13,552 sf, 67.59% Impervious, Inflow Depth = 3.37" for 10-Year event
Inflow = 1.19 cfs @ 12.09 hrs, Volume= 3,810 cf
Outflow = 1.18 cfs @ 12.09 hrs, Volume= 2,893 cf, Atten= 1%, Lag= 0.0 min
Primary = 1.18 cfs @ 12.09 hrs, Volume= 2,893 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 85.20' @ 12.09 hrs Surf.Area= 350 sf Storage= 986 cf

Plug-Flow detention time= 131.1 min calculated for 2,887 cf (76% of inflow)
Center-of-Mass det. time= 48.1 min (853.4 - 805.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	80.00'	617 cf	**8.42'W x 41.55'L x 7.00'H Field A** 2,448 cf Overall - 580 cf Embedded = 1,868 cf x 33.0% Voids
#2A	81.75'	580 cf	**ADS_StormTech MC-3500 d +Cap** x 5 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		1,196 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	85.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=1.15 cfs @ 12.09 hrs HW=85.20' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 1.15 cfs @ 1.46 fps)

Pond 8P: UIC #2 iSOLATOR ROW MC-3500 1.75' stone - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

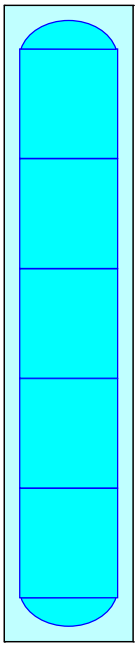
5 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 39.55' Row Length +12.0" End Stone x 2 = 41.55' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
21.0" Stone Base + 45.0" Chamber Height + 18.0" Stone Cover = 7.00' Field Height

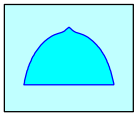
5 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 579.6 cf Chamber Storage

2,448.0 cf Field - 579.6 cf Chambers = 1,868.4 cf Stone x 33.0% Voids = 616.6 cf Stone Storage

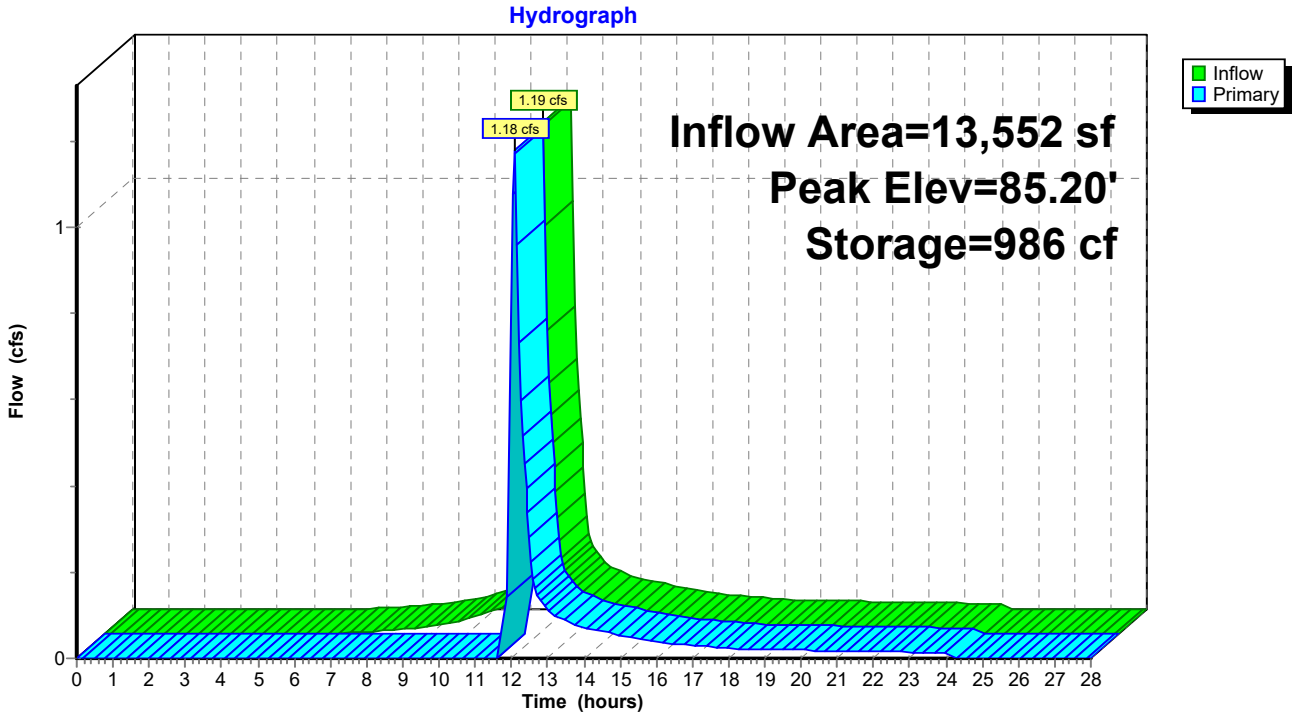
Chamber Storage + Stone Storage = 1,196.1 cf = 0.027 af
Overall Storage Efficiency = 48.9%
Overall System Size = 41.55' x 8.42' x 7.00'

5 Chambers
90.7 cy Field
69.2 cy Stone





Pond 8P: UIC #2 iSOLATOR ROW MC-3500 1.75' stone



Summary for Pond 11P: UIC #2 MC-3500 4.0' stone

Inflow Area = 17,302 sf, 74.62% Impervious, Inflow Depth = 3.02" for 10-Year event
Inflow = 1.58 cfs @ 12.09 hrs, Volume= 4,350 cf
Outflow = 0.04 cfs @ 11.40 hrs, Volume= 2,497 cf, Atten= 98%, Lag= 0.0 min
Discarded = 0.04 cfs @ 11.40 hrs, Volume= 2,497 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 4
Peak Elev= 86.12' @ 17.38 hrs Surf.Area= 647 sf Storage= 2,672 cf

Plug-Flow detention time= 392.8 min calculated for 2,497 cf (57% of inflow)
Center-of-Mass det. time= 275.5 min (1,093.7 - 818.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	77.25'	1,701 cf	**15.58'W x 41.55'L x 9.75'H Field A** 6,313 cf Overall - 1,159 cf Embedded = 5,154 cf x 33.0% Voids
#2A	81.25'	1,159 cf	**ADS_StormTech MC-3500 d +Cap**x 10 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 10 Chambers in 2 Rows Cap Storage= +14.9 cf x 2 x 2 rows = 59.6 cf
		2,860 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	77.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	86.45'	**4.0" x 18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.04 cfs @ 11.40 hrs HW=77.35' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=77.25' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 11P: UIC #2 MC-3500 4.0' stone - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 2 rows = 59.6 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

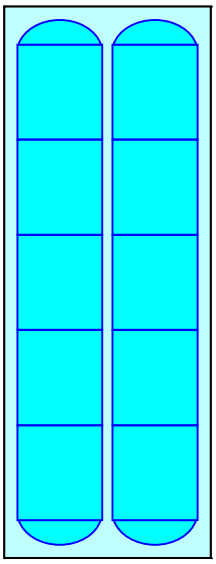
5 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 39.55' Row Length +12.0" End Stone x 2 = 41.55' Base Length
2 Rows x 77.0" Wide + 9.0" Spacing x 1 + 12.0" Side Stone x 2 = 15.58' Base Width
48.0" Stone Base + 45.0" Chamber Height + 24.0" Stone Cover = 9.75' Field Height

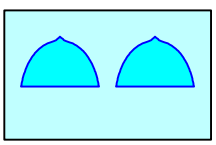
10 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 2 Rows = 1,159.1 cf Chamber Storage

6,313.0 cf Field - 1,159.1 cf Chambers = 5,153.9 cf Stone x 33.0% Voids = 1,700.8 cf Stone Storage

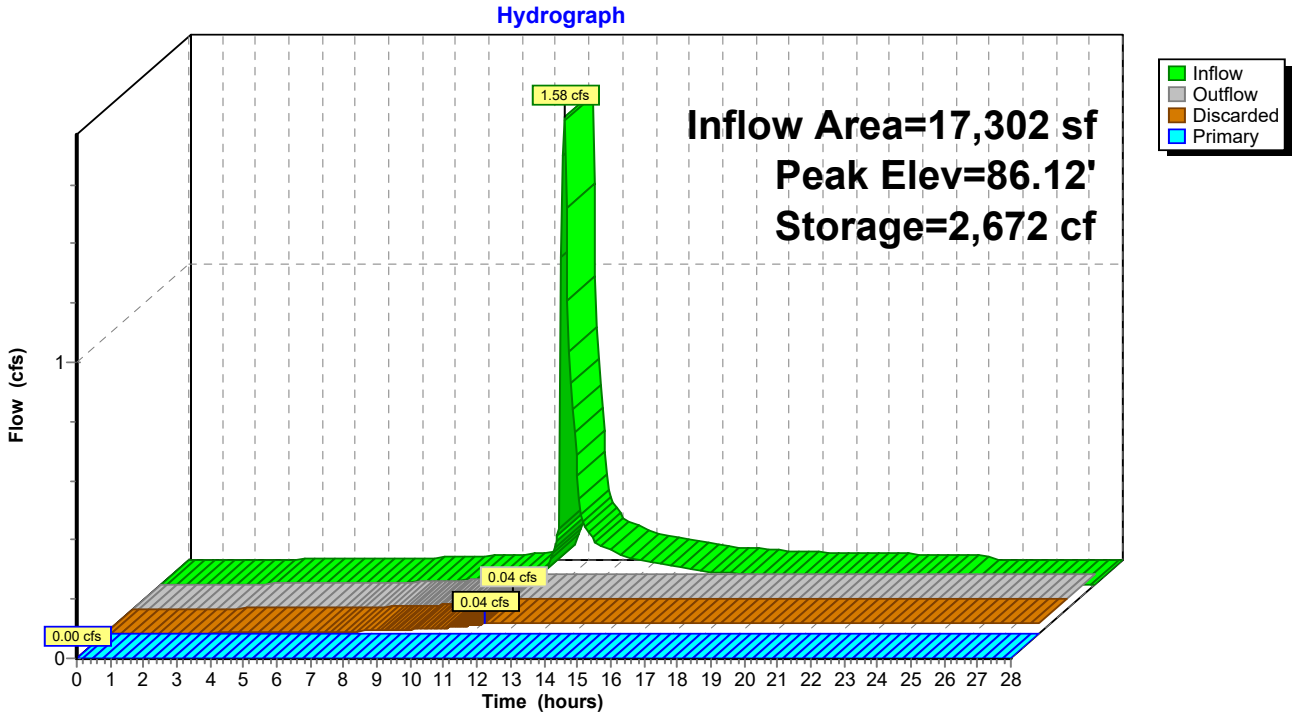
Chamber Storage + Stone Storage = 2,859.9 cf = 0.066 af
Overall Storage Efficiency = 45.3%
Overall System Size = 41.55' x 15.58' x 9.75'

10 Chambers
233.8 cy Field
190.9 cy Stone





Pond 11P: UIC #2 MC-3500 4.0' stone



Summary for Pond 12P: Pea gravel Diaphragm

Inflow Area = 12,230 sf, 35.31% Impervious, Inflow Depth = 2.28" for 10-Year event
Inflow = 0.73 cfs @ 12.10 hrs, Volume= 2,329 cf
Outflow = 0.73 cfs @ 12.09 hrs, Volume= 2,262 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.73 cfs @ 12.09 hrs, Volume= 2,262 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 86.97' @ 12.09 hrs Surf.Area= 114 sf Storage= 74 cf

Plug-Flow detention time= 22.3 min calculated for 2,258 cf (97% of inflow)
Center-of-Mass det. time= 6.3 min (844.7 - 838.4)

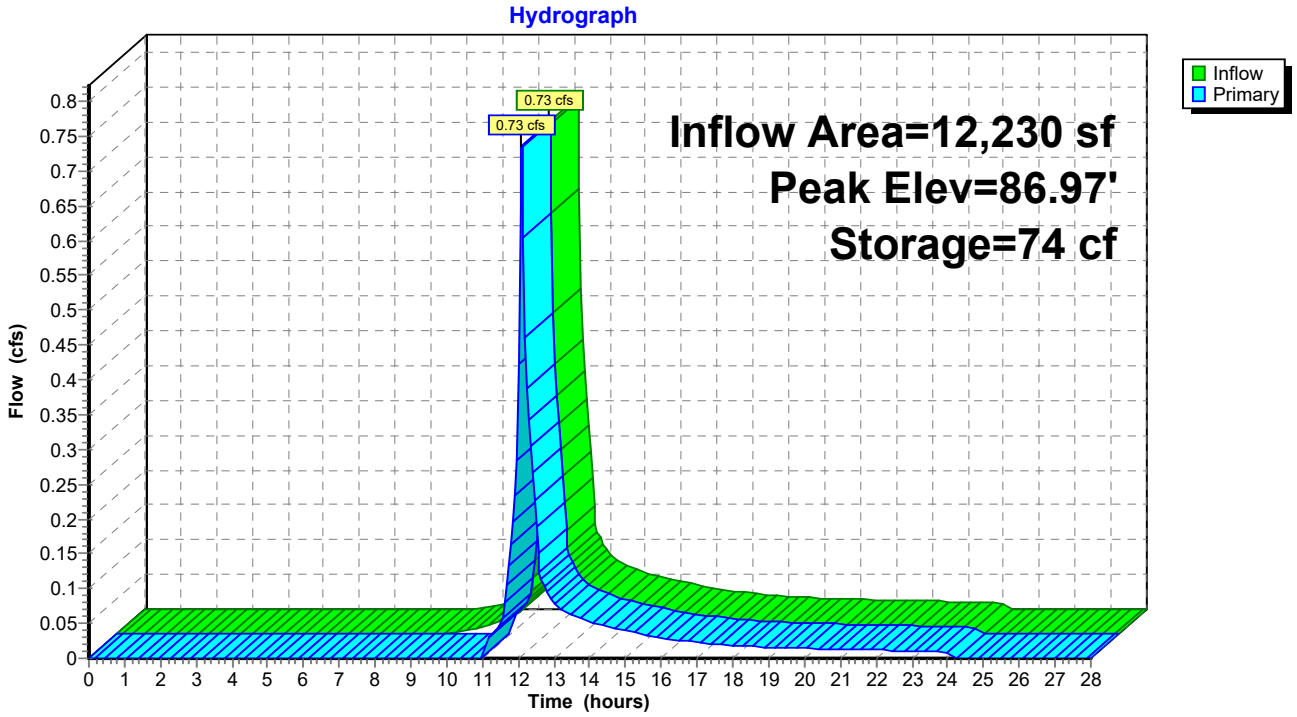
Volume	Invert	Avail.Storage	Storage Description
#1	85.00'	75 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 228 cf Overall x 33.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.00	114	0	0
87.00	114	228	228

Device	Routing	Invert	Outlet Devices
#1	Primary	86.94'	**38.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.70 cfs @ 12.09 hrs HW=86.97' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Weir Controls 0.70 cfs @ 0.58 fps)

Pond 12P: Pea gravel Diaphragm

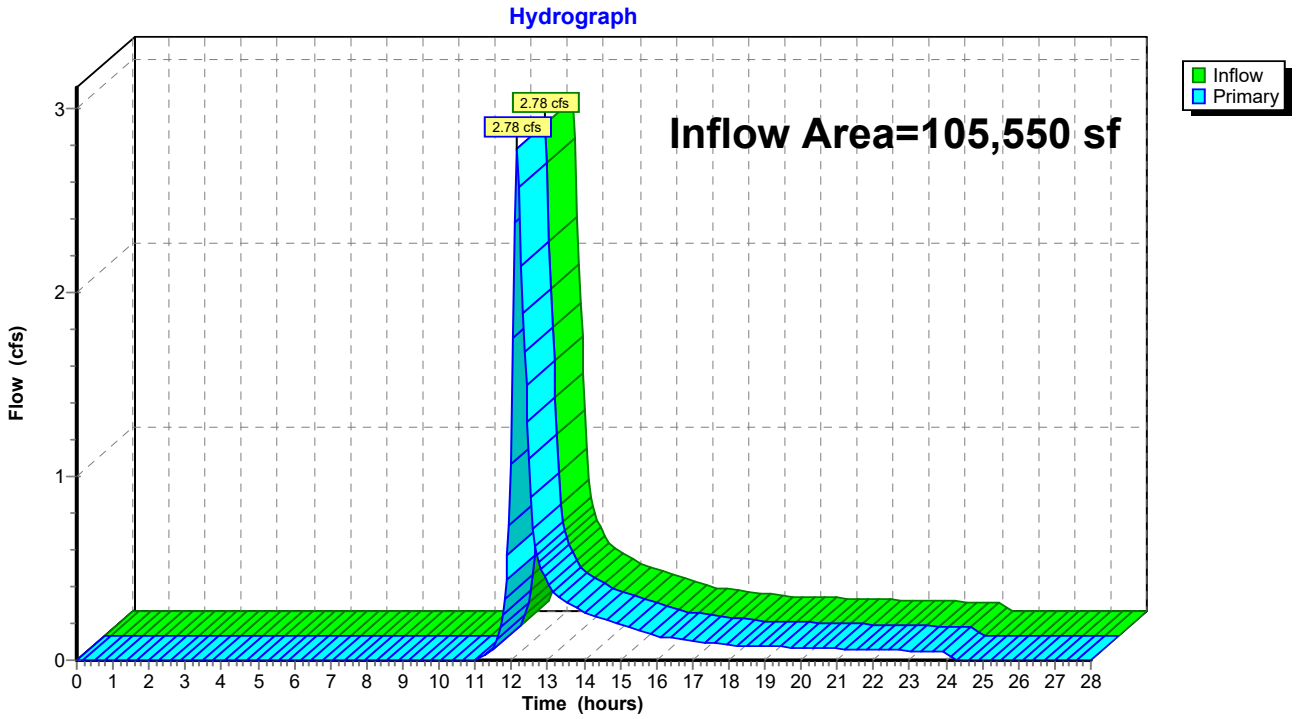


Summary for Link DP-1: Lower Gradient

Inflow Area = 105,550 sf, 21.75% Impervious, Inflow Depth = 1.12" for 10-Year event
Inflow = 2.78 cfs @ 12.16 hrs, Volume= 9,877 cf
Primary = 2.78 cfs @ 12.16 hrs, Volume= 9,877 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

Link DP-1: Lower Gradient

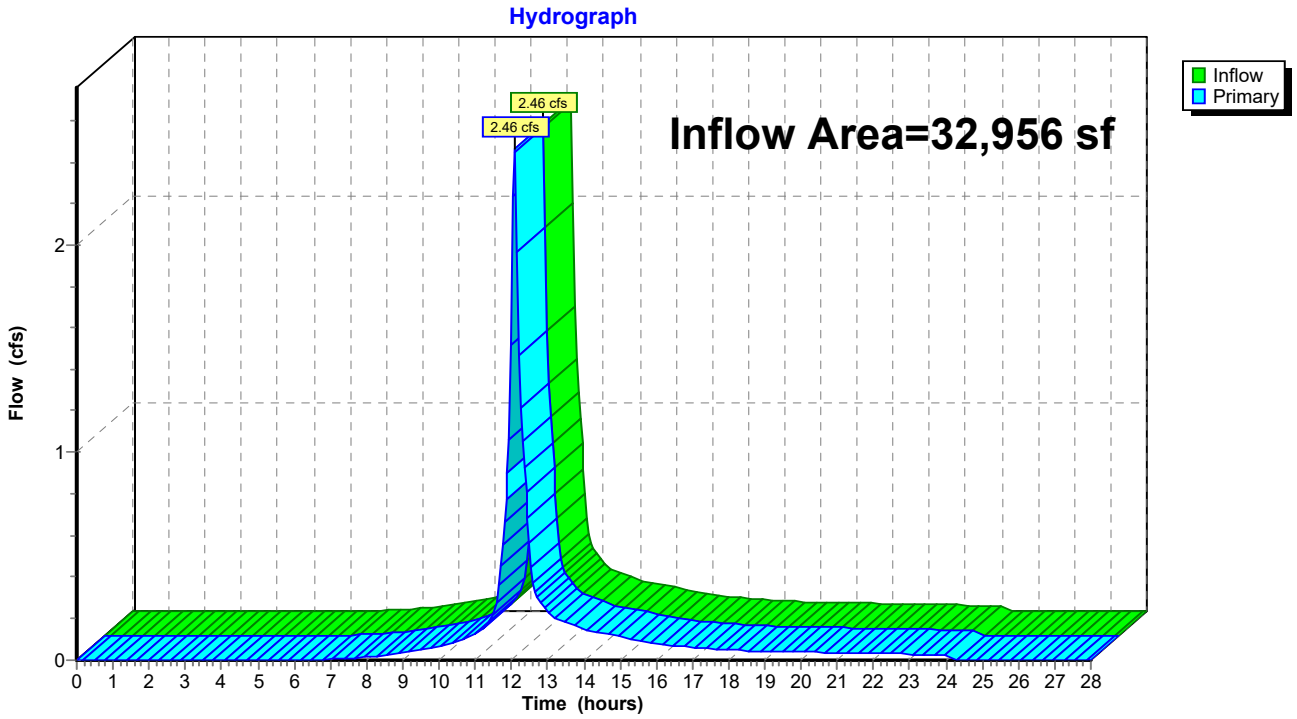


Summary for Link DP-2: Matunuck School House Road

Inflow Area = 32,956 sf, 66.76% Impervious, Inflow Depth = 2.86" for 10-Year event
Inflow = 2.46 cfs @ 12.09 hrs, Volume= 7,859 cf
Primary = 2.46 cfs @ 12.09 hrs, Volume= 7,859 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

Link DP-2: Matunuck School House Road



Summary for Subcatchment W1A: Watershed 1A

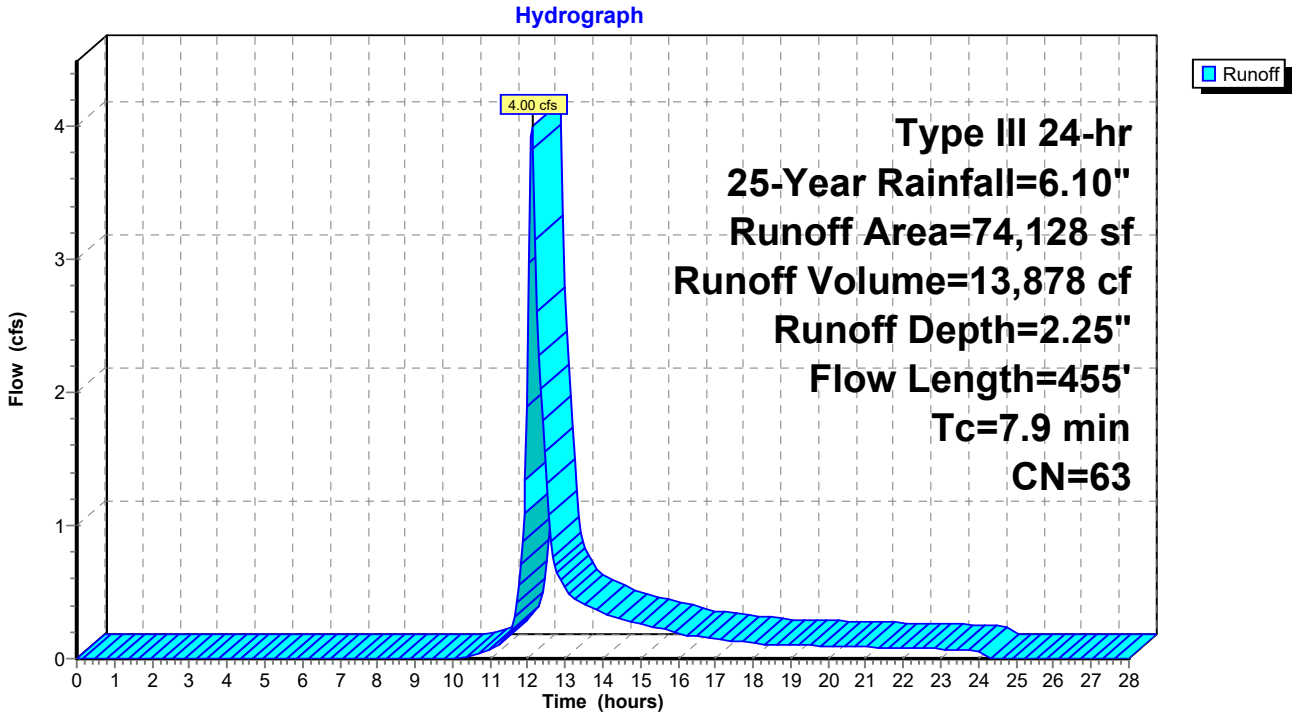
Runoff = 4.00 cfs @ 12.12 hrs, Volume= 13,878 cf, Depth= 2.25"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.10"

Area (sf)	CN	Description
3,836	98	Roofs, HSG B
70,292	61	>75% Grass cover, Good, HSG B
74,128	63	Weighted Average
70,292	61	94.83% Pervious Area
3,836	98	5.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.0600	0.27		**Sheet Flow, SEG A** Grass: Short n= 0.150 P2= 3.30"
1.7	355	0.0560	3.55		**Shallow Concentrated Flow, SEG B** Grassed Waterway Kv= 15.0 fps
7.9	455	Total			

Subcatchment W1A: Watershed 1A



Summary for Subcatchment W1B: Watershed 1B

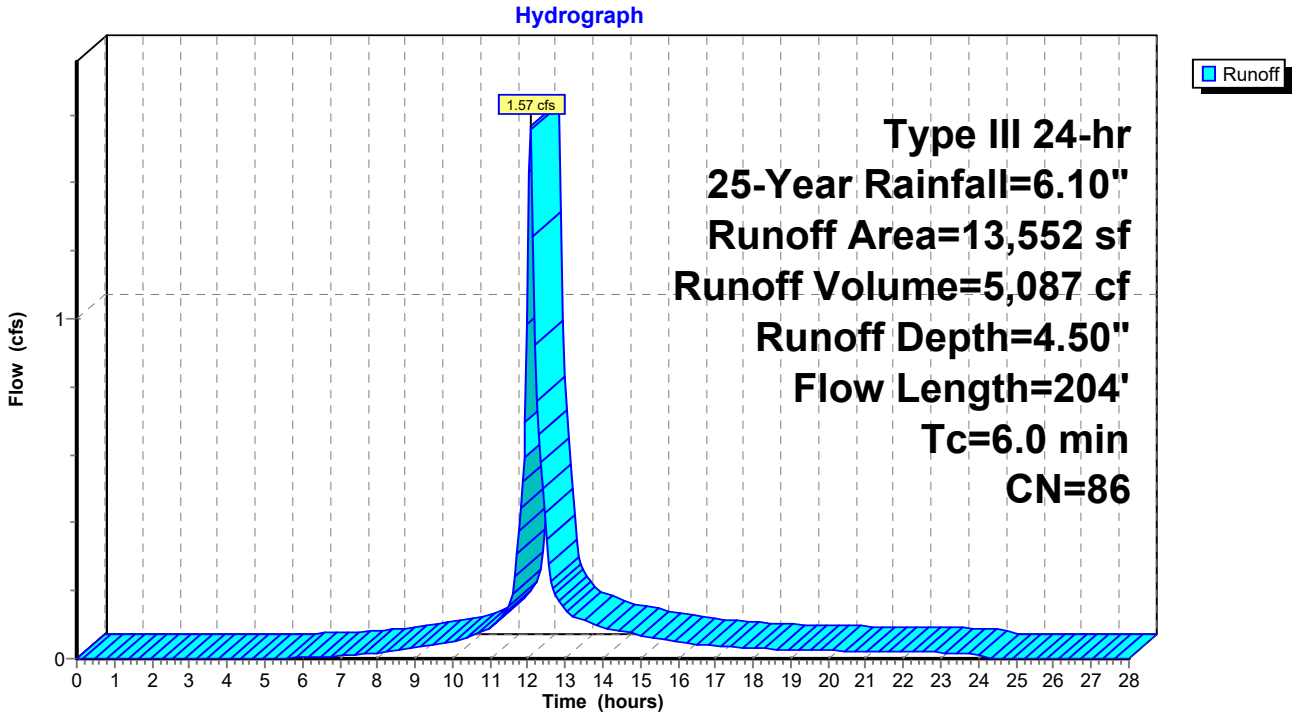
Runoff = 1.57 cfs @ 12.09 hrs, Volume= 5,087 cf, Depth= 4.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.10"

Area (sf)	CN	Description
9,160	98	Paved parking, HSG B
4,392	61	>75% Grass cover, Good, HSG B
13,552	86	Weighted Average
4,392	61	32.41% Pervious Area
9,160	98	67.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0800	2.43		**Sheet Flow, SEG A** Smooth surfaces n= 0.011 P2= 3.30"
0.4	104	0.0500	4.54		**Shallow Concentrated Flow, SEG B** Paved Kv= 20.3 fps
1.1	204	Total, Increased to minimum Tc = 6.0 min			

Subcatchment W1B: Watershed 1B



Summary for Subcatchment W1C: Watershed 1C

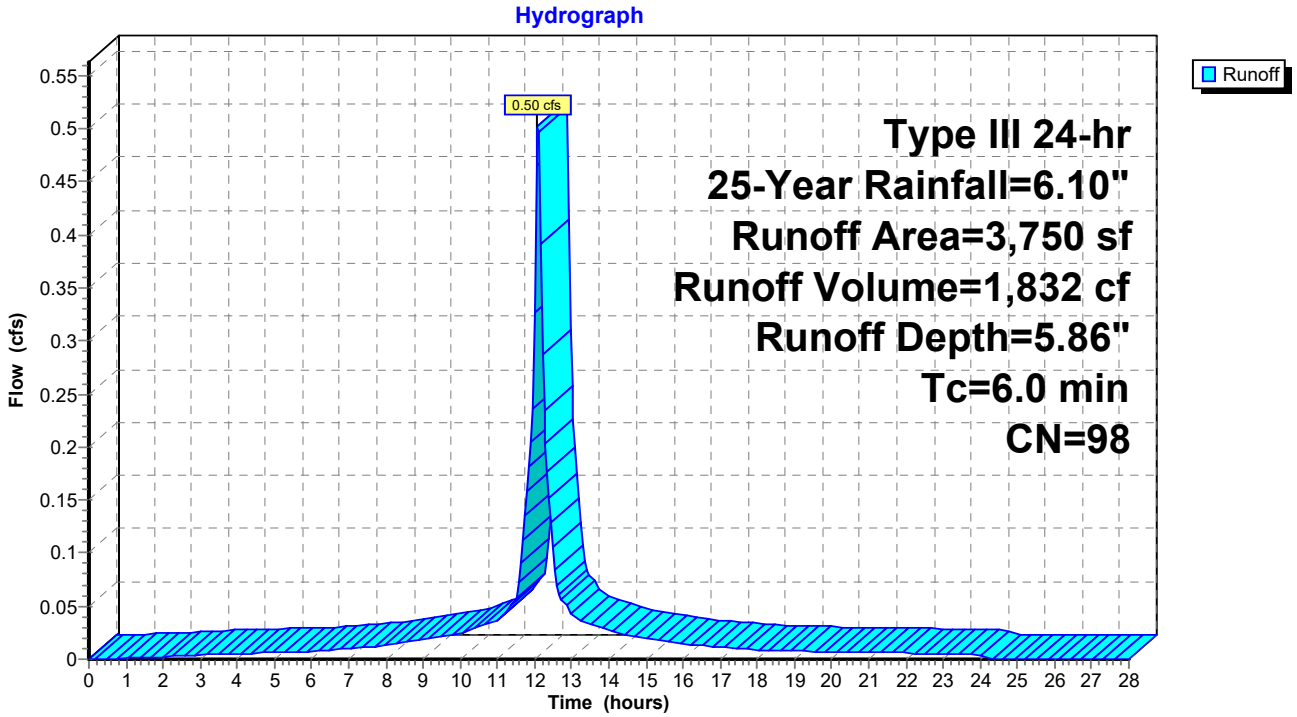
Runoff = 0.50 cfs @ 12.09 hrs, Volume= 1,832 cf, Depth= 5.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.10"

Area (sf)	CN	Description
3,750	98	Roofs, HSG B
3,750	98	100.00% Impervious Area

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

Subcatchment W1C: Watershed 1C



Summary for Subcatchment W1D: Watershed 1D

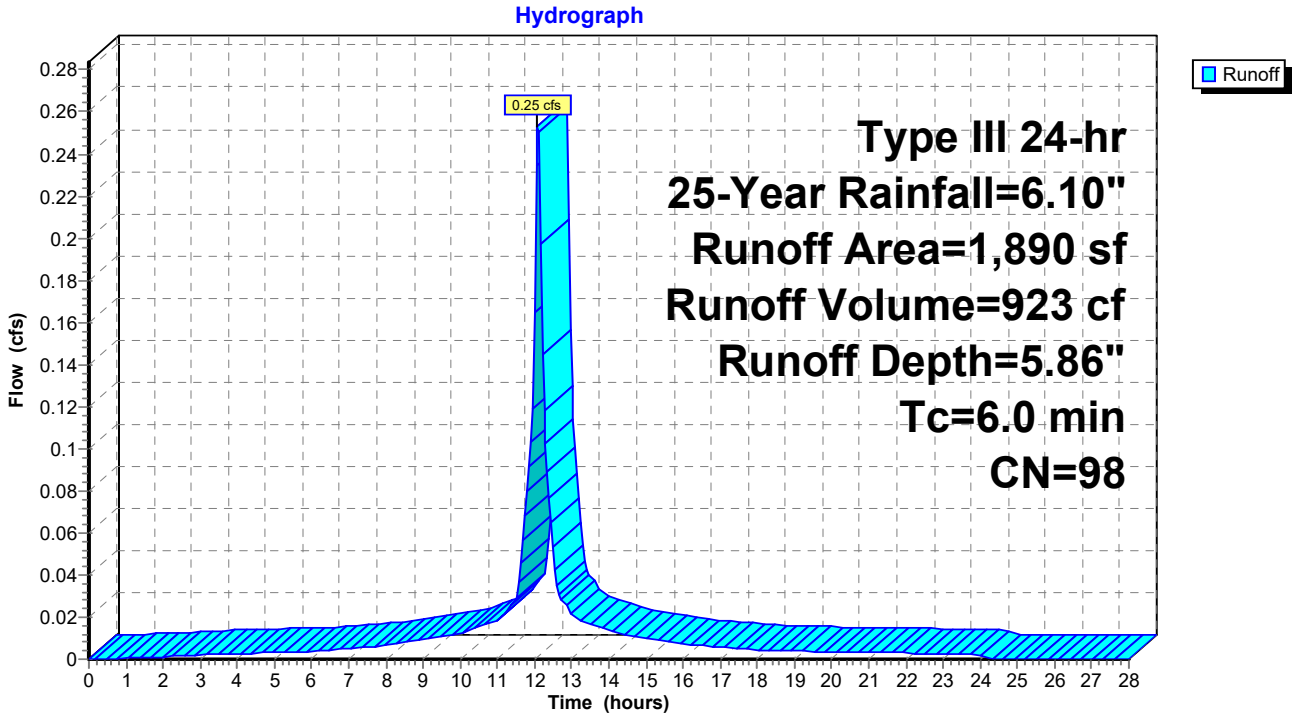
Runoff = 0.25 cfs @ 12.09 hrs, Volume= 923 cf, Depth= 5.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.10"

Area (sf)	CN	Description
1,890	98	Roofs, HSG B
1,890	98	100.00% Impervious Area

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

Subcatchment W1D: Watershed 1D



Summary for Subcatchment W1E: Watershed 1E

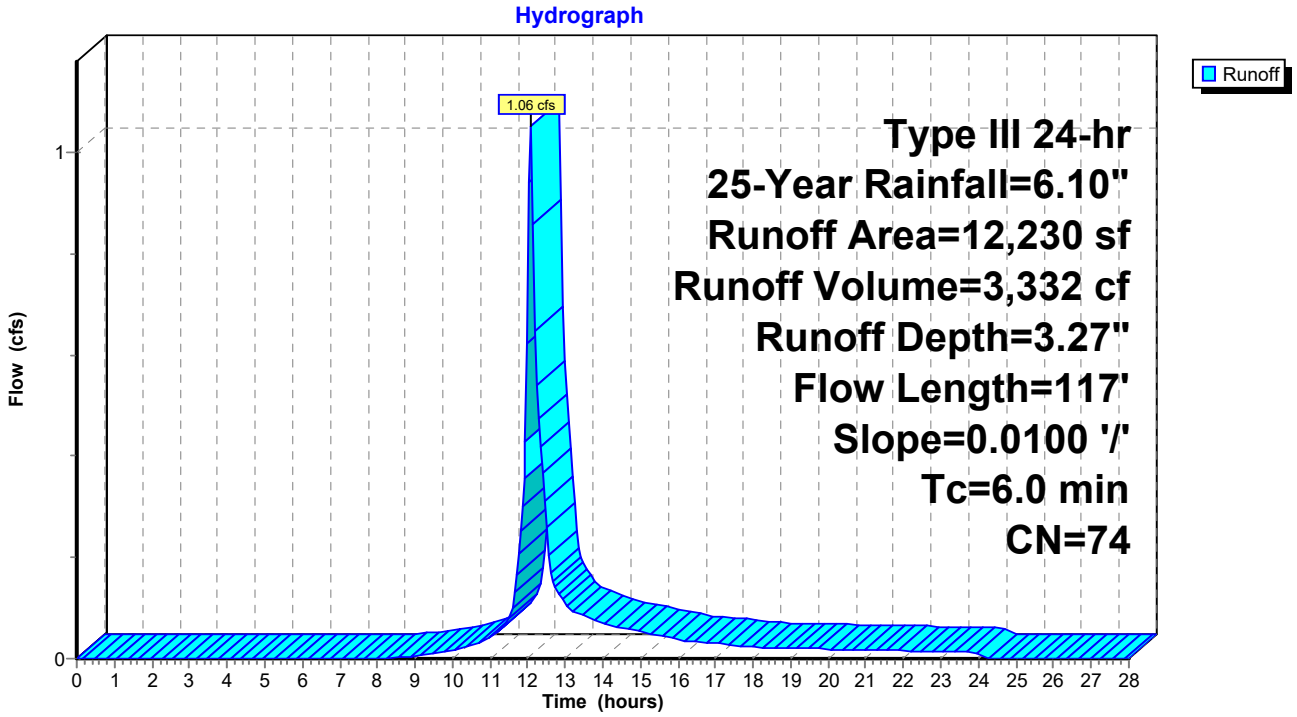
Runoff = 1.06 cfs @ 12.09 hrs, Volume= 3,332 cf, Depth= 3.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.10"

Area (sf)	CN	Description
4,318	98	Paved parking, HSG B
7,912	61	>75% Grass cover, Good, HSG B
12,230	74	Weighted Average
7,912	61	64.69% Pervious Area
4,318	98	35.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, SEG A** Paved Kv= 20.3 fps
0.2	17	0.0100	1.50		**Shallow Concentrated Flow, SEG B** Grassed Waterway Kv= 15.0 fps
1.0	117	Total, Increased to minimum Tc = 6.0 min			

Subcatchment W1E: Watershed 1E



Summary for Subcatchment W2A: Watershed 2A

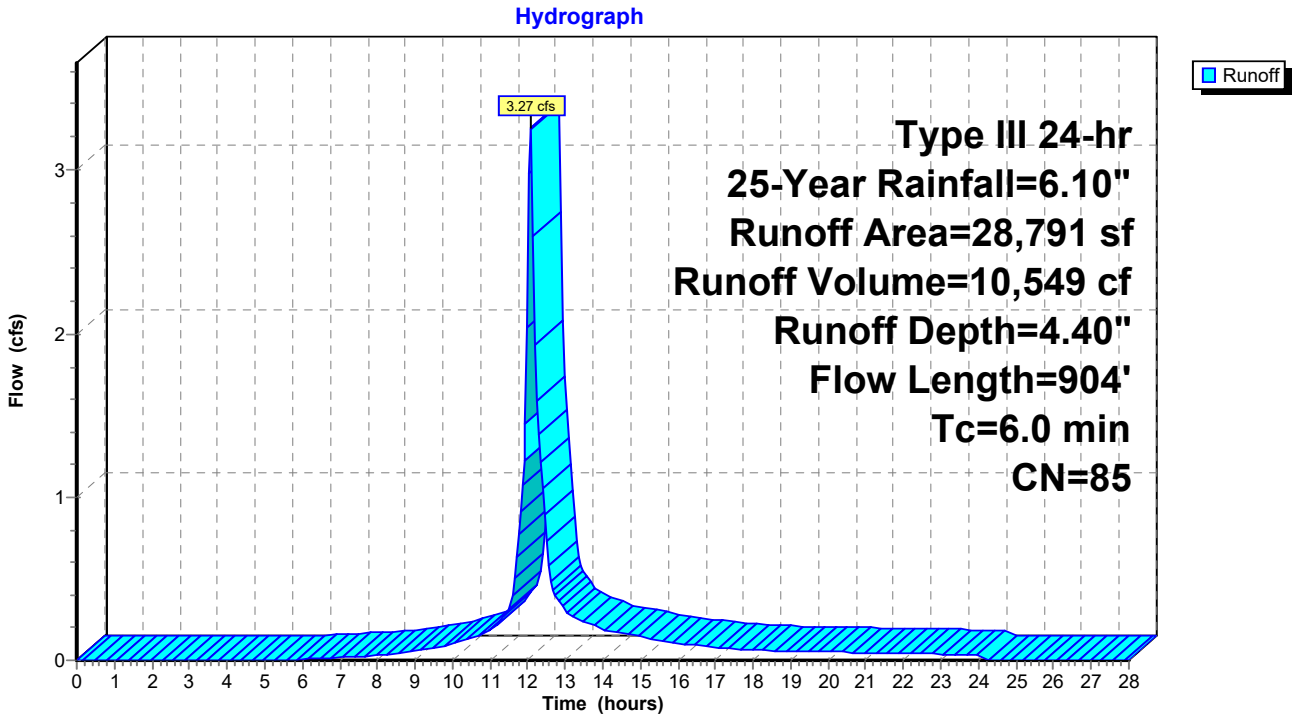
Runoff = 3.27 cfs @ 12.09 hrs, Volume= 10,549 cf, Depth= 4.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.10"

	Area (sf)	CN	Description
	1,048	98	Roofs, HSG B
*	17,540	98	Paved parking & Roadways, HSG B
	10,203	61	>75% Grass cover, Good, HSG B
	28,791	85	Weighted Average
	10,203	61	35.44% Pervious Area
	18,588	98	64.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	77	0.0200	1.33		**Sheet Flow, SEG A** Smooth surfaces n= 0.011 P2= 3.30"
3.5	827	0.0380	3.96		**Shallow Concentrated Flow, SEG B** Paved Kv= 20.3 fps
4.5	904	Total, Increased to minimum Tc = 6.0 min			

Subcatchment W2A: Watershed 2A



Summary for Subcatchment W2B: Watershed 2B

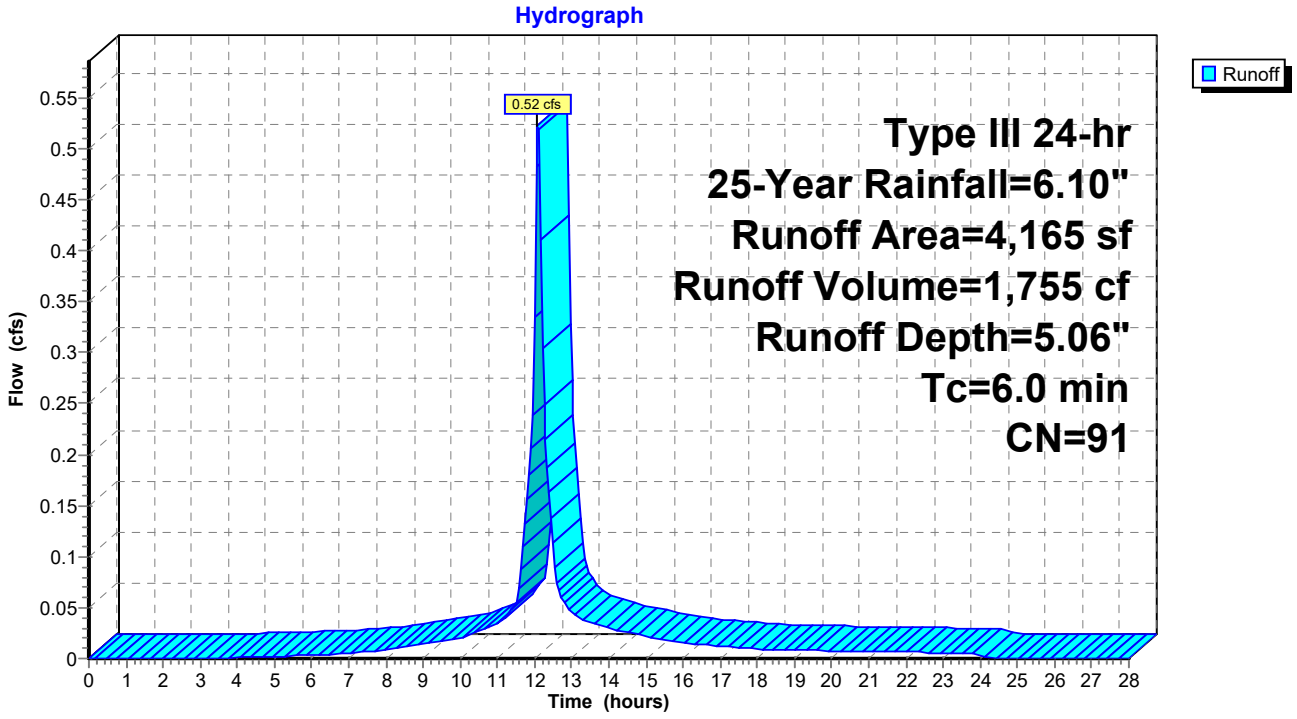
Runoff = 0.52 cfs @ 12.09 hrs, Volume= 1,755 cf, Depth= 5.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=6.10"

	Area (sf)	CN	Description
*	3,413	98	Paved parking & Roadways, HSG B
	752	61	>75% Grass cover, Good, HSG B
	4,165	91	Weighted Average
	752	61	18.06% Pervious Area
	3,413	98	81.94% Impervious Area

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

Subcatchment W2B: Watershed 2B



Summary for Pond 3P: Sediment Forebay

Inflow Area = 12,230 sf, 35.31% Impervious, Inflow Depth = 3.21" for 25-Year event
Inflow = 1.05 cfs @ 12.09 hrs, Volume= 3,271 cf
Outflow = 1.05 cfs @ 12.10 hrs, Volume= 3,136 cf, Atten= 1%, Lag= 0.2 min
Primary = 1.05 cfs @ 12.10 hrs, Volume= 3,136 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 86.31' @ 12.10 hrs Surf.Area= 278 sf Storage= 152 cf

Plug-Flow detention time= 31.1 min calculated for 3,136 cf (96% of inflow)
Center-of-Mass det. time= 8.3 min (841.1 - 832.9)

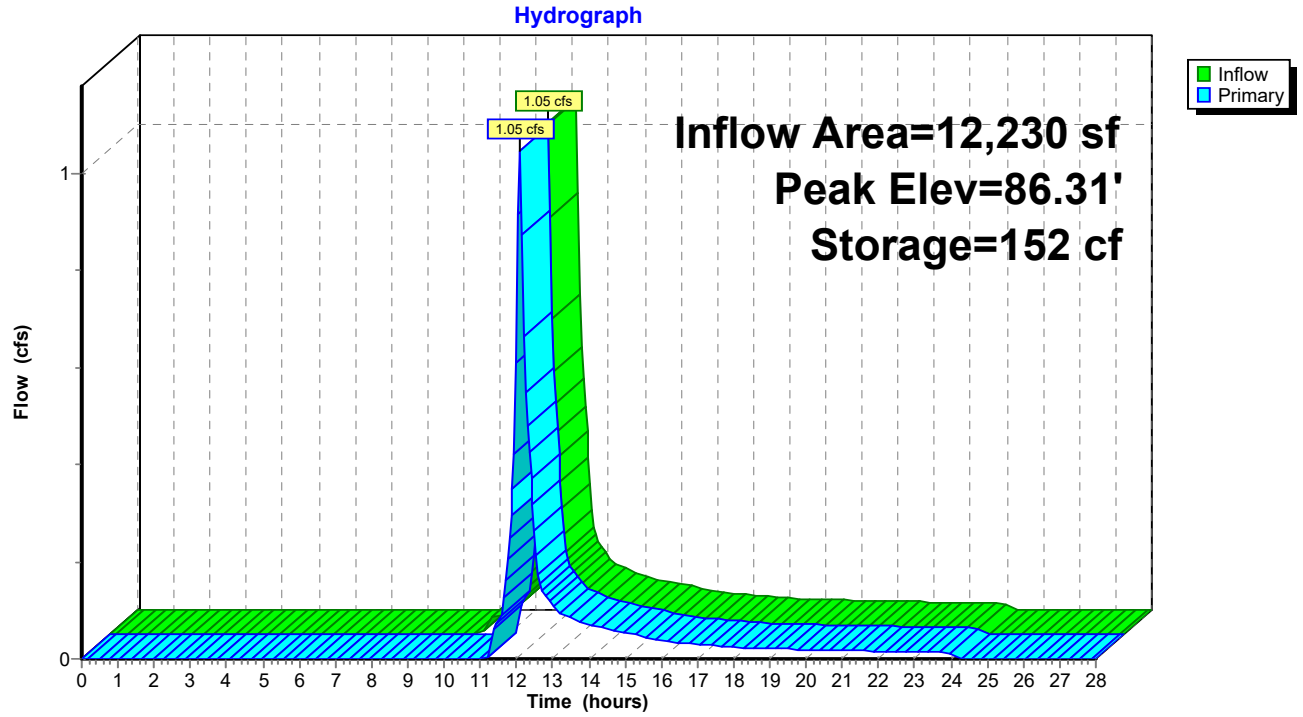
Volume	Invert	Avail.Storage	Storage Description
#1	85.50'	208 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.50	95	0	0
86.50	320	208	208

Device	Routing	Invert	Outlet Devices
#1	Primary	86.25'	**20.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=1.03 cfs @ 12.10 hrs HW=86.31' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Weir Controls 1.03 cfs @ 0.82 fps)

Pond 3P: Sediment Forebay



Summary for Pond 4P: UIC #1 MC-3500

Inflow Area = 4,165 sf, 81.94% Impervious, Inflow Depth = 5.06" for 25-Year event
Inflow = 0.52 cfs @ 12.09 hrs, Volume= 1,755 cf
Outflow = 0.04 cfs @ 13.15 hrs, Volume= 1,755 cf, Atten= 92%, Lag= 63.6 min
Discarded = 0.04 cfs @ 13.15 hrs, Volume= 1,755 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 95.70' @ 13.15 hrs Surf.Area= 289 sf Storage= 811 cf

Plug-Flow detention time= 220.2 min calculated for 1,751 cf (100% of inflow)
Center-of-Mass det. time= 220.1 min (1,000.6 - 780.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	90.50'	370 cf	**8.42'W x 34.38'L x 5.50'H Field A** 1,592 cf Overall - 470 cf Embedded = 1,122 cf x 33.0% Voids
#2A	91.25'	470 cf	**ADS_StormTech MC-3500 d +Cap** x 4 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		840 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	90.50'	**2.410 in/hr Exfiltration over Wetted area**
#2	Primary	95.95'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.04 cfs @ 13.15 hrs HW=95.70' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=90.50' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 4P: UIC #1 MC-3500 - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

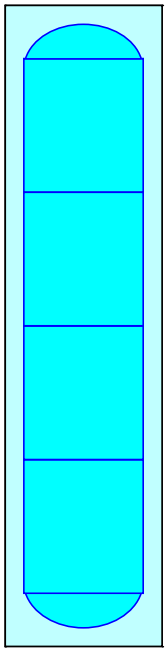
4 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 32.38' Row Length +12.0" End Stone x 2 = 34.38' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

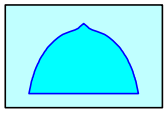
4 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 469.6 cf Chamber Storage

1,591.5 cf Field - 469.6 cf Chambers = 1,121.9 cf Stone x 33.0% Voids = 370.2 cf Stone Storage

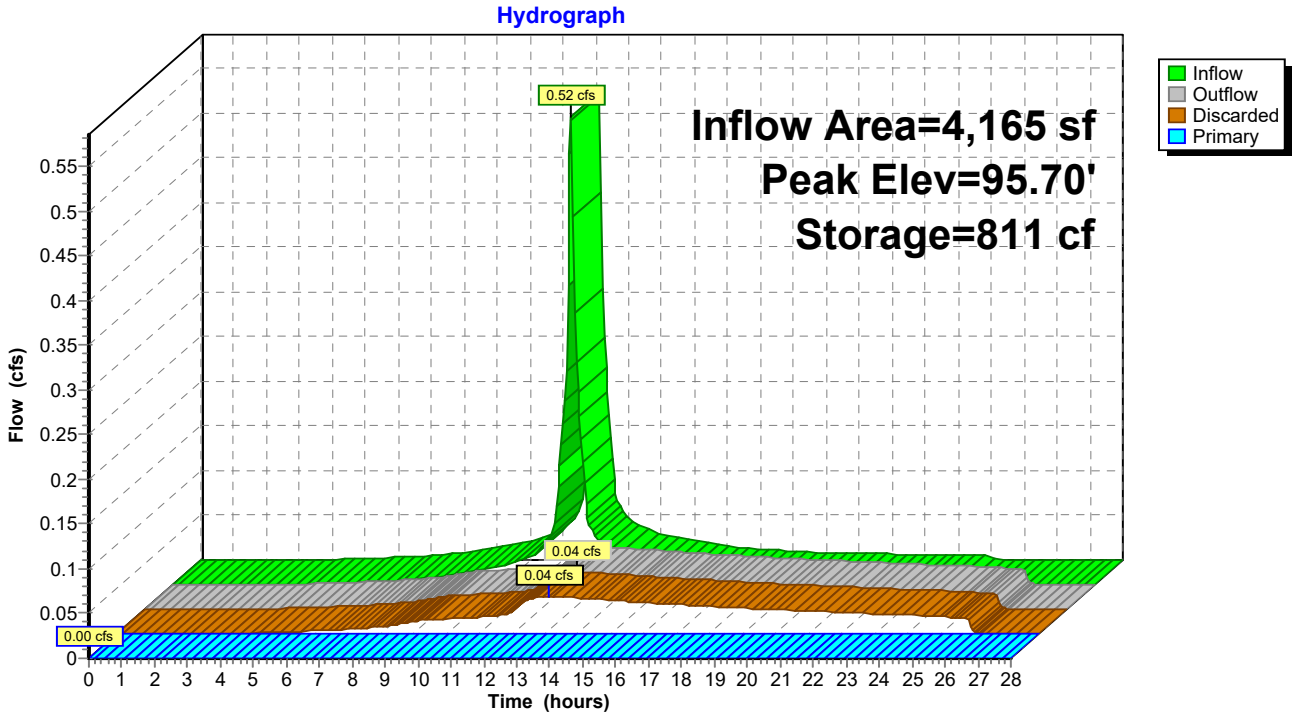
Chamber Storage + Stone Storage = 839.8 cf = 0.019 af
Overall Storage Efficiency = 52.8%
Overall System Size = 34.38' x 8.42' x 5.50'

4 Chambers
58.9 cy Field
41.6 cy Stone





Pond 4P: UIC #1 MC-3500



Summary for Pond 5P: Infiltration Basin

Inflow Area = 14,120 sf, 43.97% Impervious, Inflow Depth = 3.45" for 25-Year event
Inflow = 1.30 cfs @ 12.09 hrs, Volume= 4,060 cf
Outflow = 1.28 cfs @ 12.10 hrs, Volume= 4,013 cf, Atten= 2%, Lag= 0.2 min
Discarded = 0.04 cfs @ 12.10 hrs, Volume= 2,036 cf
Primary = 1.24 cfs @ 12.10 hrs, Volume= 1,977 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 86.22' @ 12.10 hrs Surf.Area= 645 sf Storage= 713 cf

Plug-Flow detention time= 111.0 min calculated for 4,006 cf (99% of inflow)
Center-of-Mass det. time= 104.4 min (923.6 - 819.2)

Volume	Invert	Avail.Storage	Storage Description
#1	84.50'	905 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

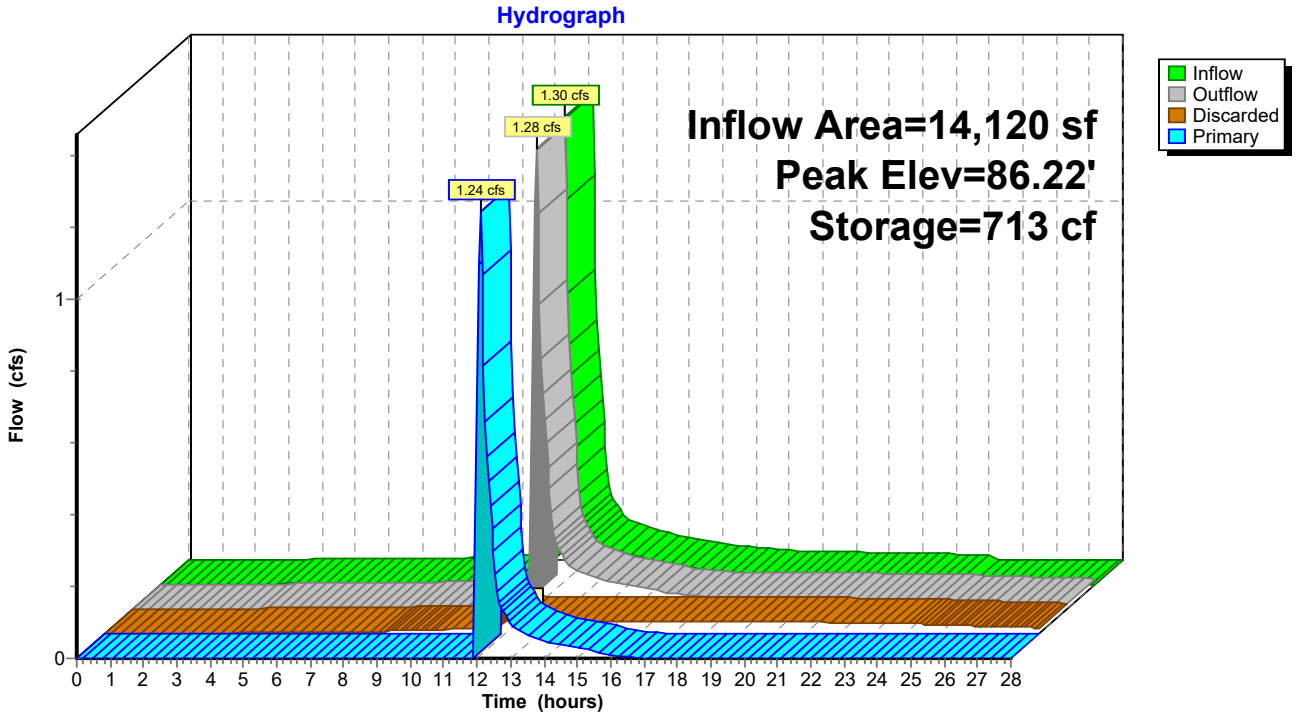
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
84.50	212	0	0	212
85.50	446	322	322	454
86.50	732	583	905	753

Device	Routing	Invert	Outlet Devices
#1	Discarded	84.50'	**2.410 in/hr Exfiltration over Wetted area**
#2	Primary	86.15'	**20.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.04 cfs @ 12.10 hrs HW=86.22' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=1.23 cfs @ 12.10 hrs HW=86.22' (Free Discharge)
↑—**2=Sharp-Crested Rectangular Weir** (Weir Controls 1.23 cfs @ 0.87 fps)

Pond 5P: Infiltration Basin



Summary for Pond 8P: UIC #2 iSOLATOR ROW MC-3500 1.75' stone

Inflow Area = 13,552 sf, 67.59% Impervious, Inflow Depth = 4.50" for 25-Year event
Inflow = 1.57 cfs @ 12.09 hrs, Volume= 5,087 cf
Outflow = 1.55 cfs @ 12.09 hrs, Volume= 4,115 cf, Atten= 1%, Lag= 0.2 min
Primary = 1.55 cfs @ 12.09 hrs, Volume= 4,115 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 85.24' @ 12.09 hrs Surf.Area= 350 sf Storage= 991 cf

Plug-Flow detention time= 114.6 min calculated for 4,108 cf (81% of inflow)
Center-of-Mass det. time= 41.9 min (839.0 - 797.1)

Volume	Invert	Avail.Storage	Storage Description
#1A	80.00'	617 cf	**8.42'W x 41.55'L x 7.00'H Field A** 2,448 cf Overall - 580 cf Embedded = 1,868 cf x 33.0% Voids
#2A	81.75'	580 cf	**ADS_StormTech MC-3500 d +Cap** x 5 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		1,196 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	85.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=1.51 cfs @ 12.09 hrs HW=85.24' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 1.51 cfs @ 1.60 fps)

Pond 8P: UIC #2 iSOLATOR ROW MC-3500 1.75' stone - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

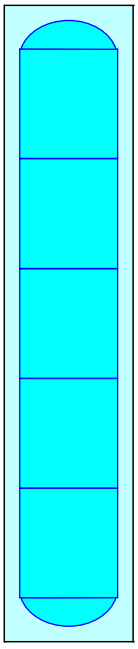
5 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 39.55' Row Length +12.0" End Stone x 2 = 41.55' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
21.0" Stone Base + 45.0" Chamber Height + 18.0" Stone Cover = 7.00' Field Height

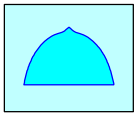
5 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 579.6 cf Chamber Storage

2,448.0 cf Field - 579.6 cf Chambers = 1,868.4 cf Stone x 33.0% Voids = 616.6 cf Stone Storage

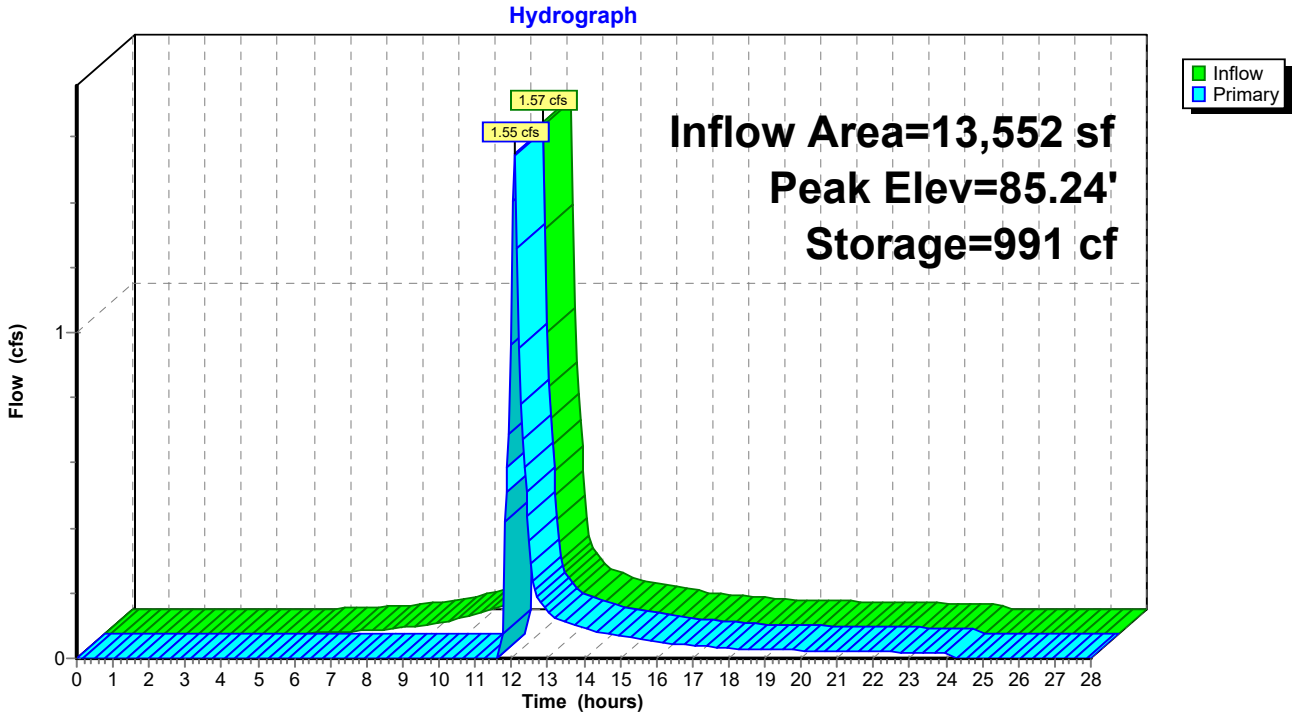
Chamber Storage + Stone Storage = 1,196.1 cf = 0.027 af
Overall Storage Efficiency = 48.9%
Overall System Size = 41.55' x 8.42' x 7.00'

5 Chambers
90.7 cy Field
69.2 cy Stone





Pond 8P: UIC #2 iSOLATOR ROW MC-3500 1.75' stone



Summary for Pond 11P: UIC #2 MC-3500 4.0' stone

Inflow Area = 17,302 sf, 74.62% Impervious, Inflow Depth = 4.12" for 25-Year event
Inflow = 2.05 cfs @ 12.09 hrs, Volume= 5,947 cf
Outflow = 0.41 cfs @ 12.57 hrs, Volume= 3,870 cf, Atten= 80%, Lag= 28.6 min
Discarded = 0.04 cfs @ 11.10 hrs, Volume= 2,589 cf
Primary = 0.38 cfs @ 12.57 hrs, Volume= 1,282 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 4
Peak Elev= 86.54' @ 12.55 hrs Surf.Area= 647 sf Storage= 2,762 cf

Plug-Flow detention time= 286.0 min calculated for 3,864 cf (65% of inflow)
Center-of-Mass det. time= 183.7 min (993.8 - 810.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	77.25'	1,701 cf	**15.58'W x 41.55'L x 9.75'H Field A** 6,313 cf Overall - 1,159 cf Embedded = 5,154 cf x 33.0% Voids
#2A	81.25'	1,159 cf	**ADS_StormTech MC-3500 d +Cap**x 10 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 10 Chambers in 2 Rows Cap Storage= +14.9 cf x 2 x 2 rows = 59.6 cf
		2,860 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	77.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	86.45'	**4.0" x 18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.04 cfs @ 11.10 hrs HW=77.35' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.30 cfs @ 12.57 hrs HW=86.54' (Free Discharge)
↑—**2=Orifice/Grate** (Weir Controls 0.30 cfs @ 0.96 fps)

Pond 11P: UIC #2 MC-3500 4.0' stone - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 2 rows = 59.6 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

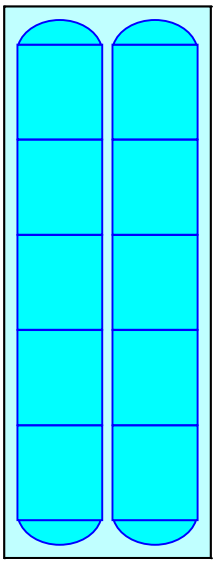
5 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 39.55' Row Length +12.0" End Stone x 2 = 41.55' Base Length
2 Rows x 77.0" Wide + 9.0" Spacing x 1 + 12.0" Side Stone x 2 = 15.58' Base Width
48.0" Stone Base + 45.0" Chamber Height + 24.0" Stone Cover = 9.75' Field Height

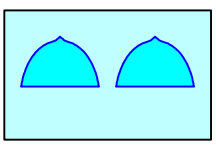
10 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 2 Rows = 1,159.1 cf Chamber Storage

6,313.0 cf Field - 1,159.1 cf Chambers = 5,153.9 cf Stone x 33.0% Voids = 1,700.8 cf Stone Storage

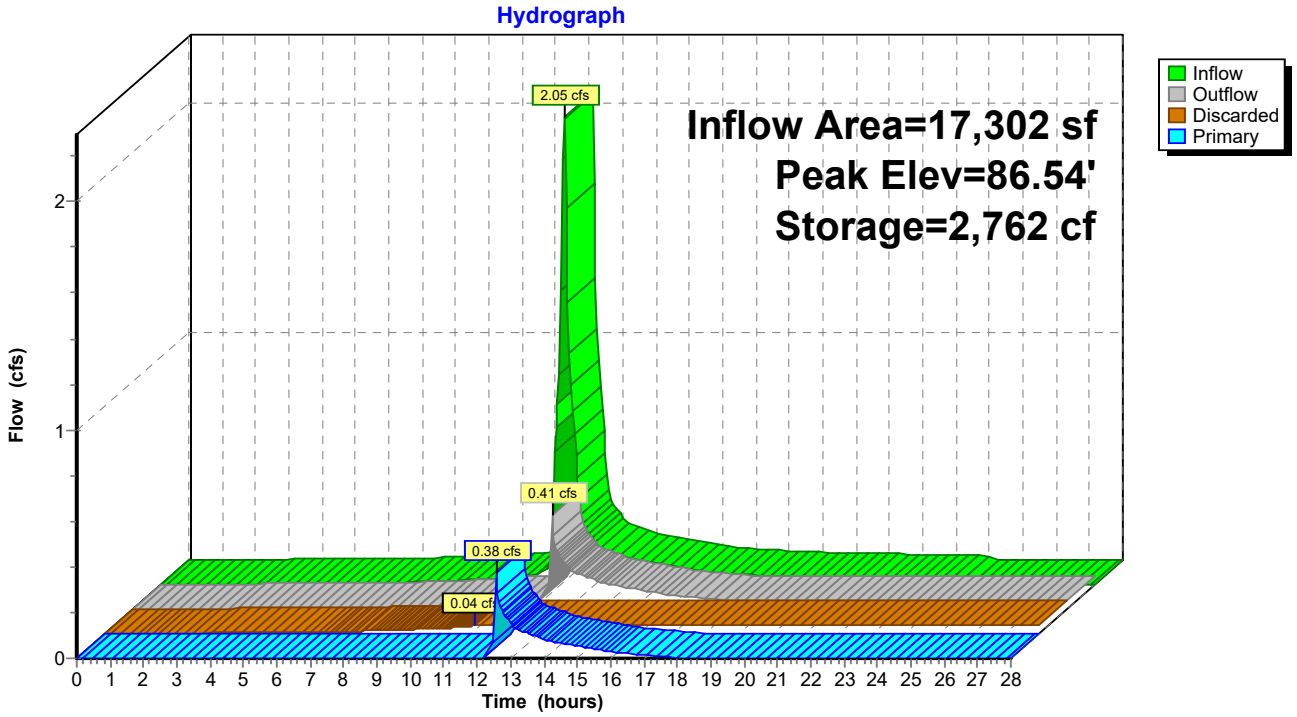
Chamber Storage + Stone Storage = 2,859.9 cf = 0.066 af
Overall Storage Efficiency = 45.3%
Overall System Size = 41.55' x 15.58' x 9.75'

10 Chambers
233.8 cy Field
190.9 cy Stone





Pond 11P: UIC #2 MC-3500 4.0' stone



Summary for Pond 12P: Pea gravel Diaphragm

Inflow Area = 12,230 sf, 35.31% Impervious, Inflow Depth = 3.27" for 25-Year event
Inflow = 1.06 cfs @ 12.09 hrs, Volume= 3,332 cf
Outflow = 1.05 cfs @ 12.09 hrs, Volume= 3,271 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.05 cfs @ 12.09 hrs, Volume= 3,271 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 86.98' @ 12.09 hrs Surf.Area= 114 sf Storage= 75 cf

Plug-Flow detention time= 15.4 min calculated for 3,271 cf (98% of inflow)
Center-of-Mass det. time= 4.8 min (832.9 - 828.1)

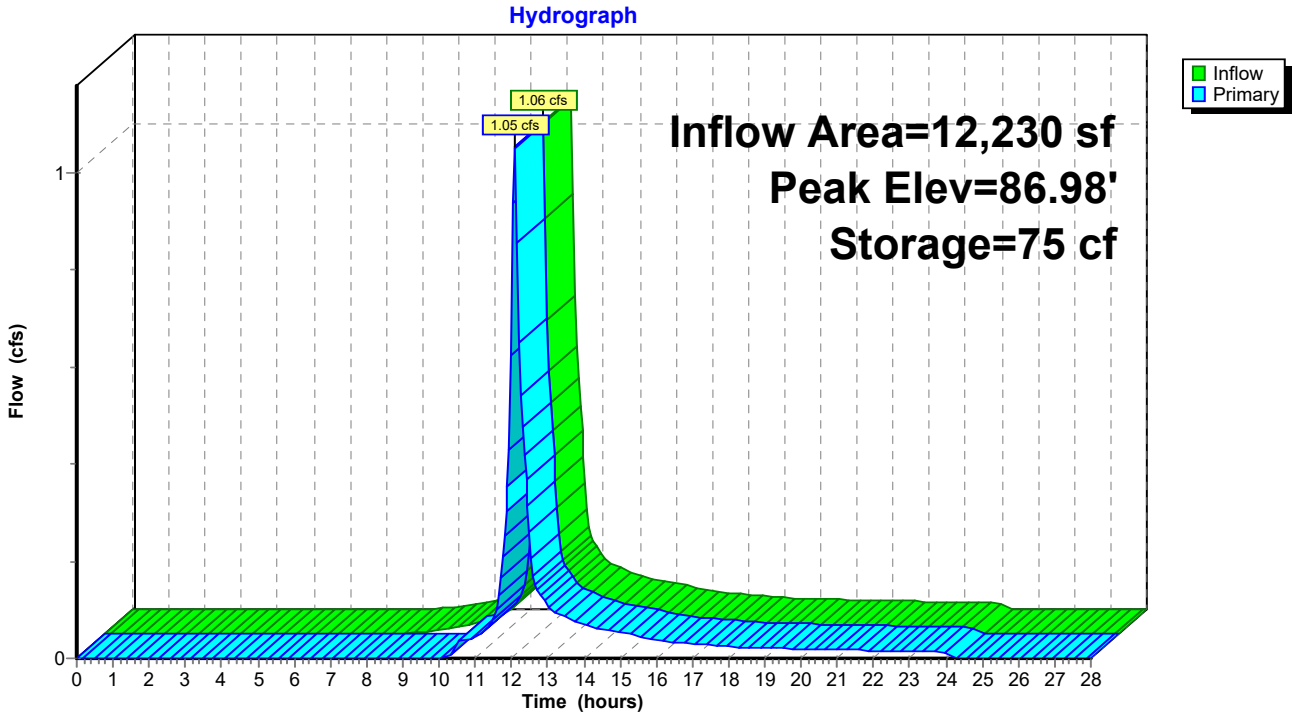
Volume	Invert	Avail.Storage	Storage Description
#1	85.00'	75 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 228 cf Overall x 33.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.00	114	0	0
87.00	114	228	228

Device	Routing	Invert	Outlet Devices
#1	Primary	86.94'	**38.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=1.03 cfs @ 12.09 hrs HW=86.98' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Weir Controls 1.03 cfs @ 0.66 fps)

Pond 12P: Pea gravel Diaphragm

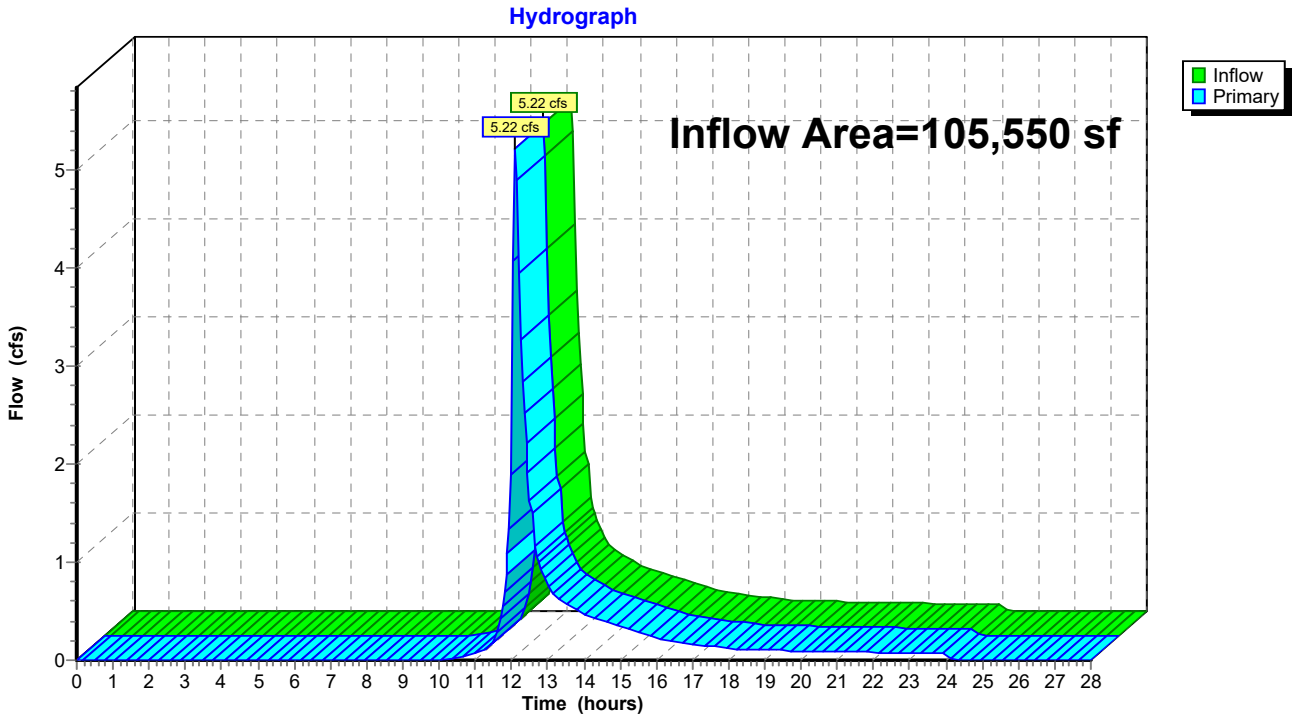


Summary for Link DP-1: Lower Gradient

Inflow Area = 105,550 sf, 21.75% Impervious, Inflow Depth = 1.95" for 25-Year event
Inflow = 5.22 cfs @ 12.12 hrs, Volume= 17,136 cf
Primary = 5.22 cfs @ 12.12 hrs, Volume= 17,136 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

Link DP-1: Lower Gradient

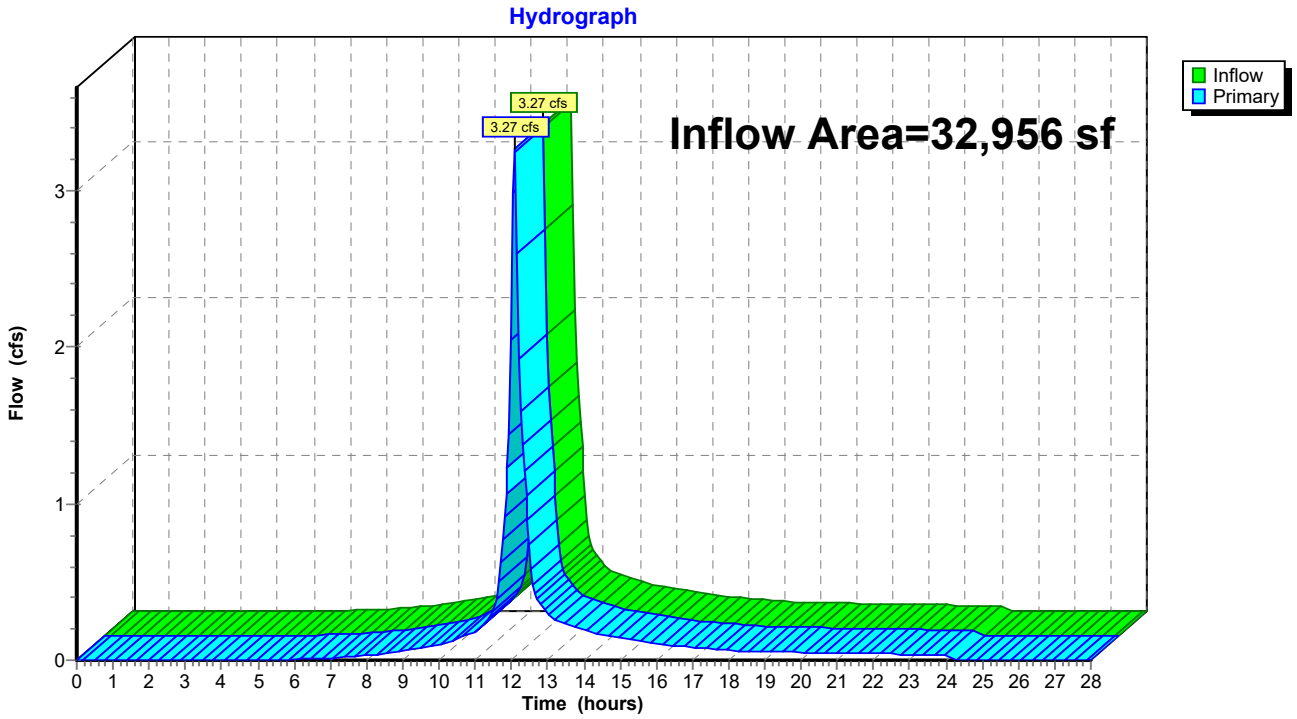


Summary for Link DP-2: Matunuck School House Road

Inflow Area = 32,956 sf, 66.76% Impervious, Inflow Depth = 3.84" for 25-Year event
Inflow = 3.27 cfs @ 12.09 hrs, Volume= 10,549 cf
Primary = 3.27 cfs @ 12.09 hrs, Volume= 10,549 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

Link DP-2: Matunuck School House Road



Summary for Subcatchment W1A: Watershed 1A

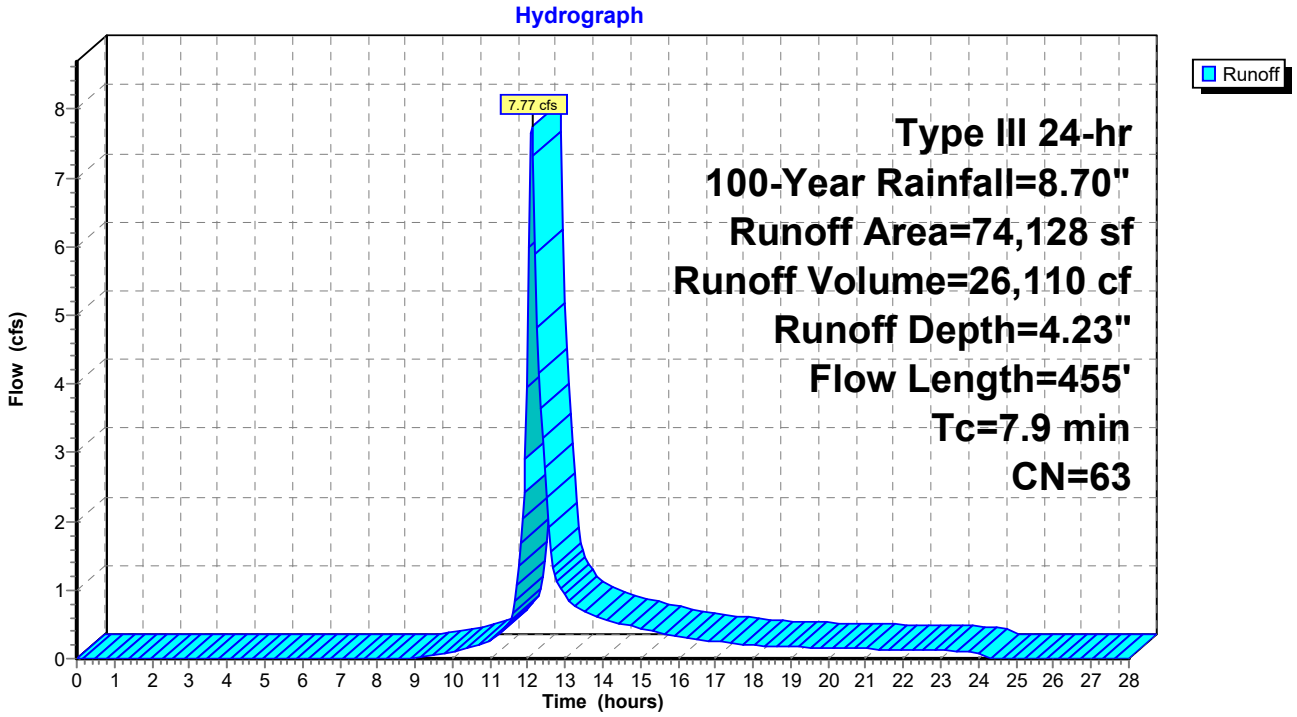
Runoff = 7.77 cfs @ 12.12 hrs, Volume= 26,110 cf, Depth= 4.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.70"

Area (sf)	CN	Description
3,836	98	Roofs, HSG B
70,292	61	>75% Grass cover, Good, HSG B
74,128	63	Weighted Average
70,292	61	94.83% Pervious Area
3,836	98	5.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.0600	0.27		**Sheet Flow, SEG A** Grass: Short n= 0.150 P2= 3.30"
1.7	355	0.0560	3.55		**Shallow Concentrated Flow, SEG B** Grassed Waterway Kv= 15.0 fps
7.9	455	Total			

Subcatchment W1A: Watershed 1A



Summary for Subcatchment W1B: Watershed 1B

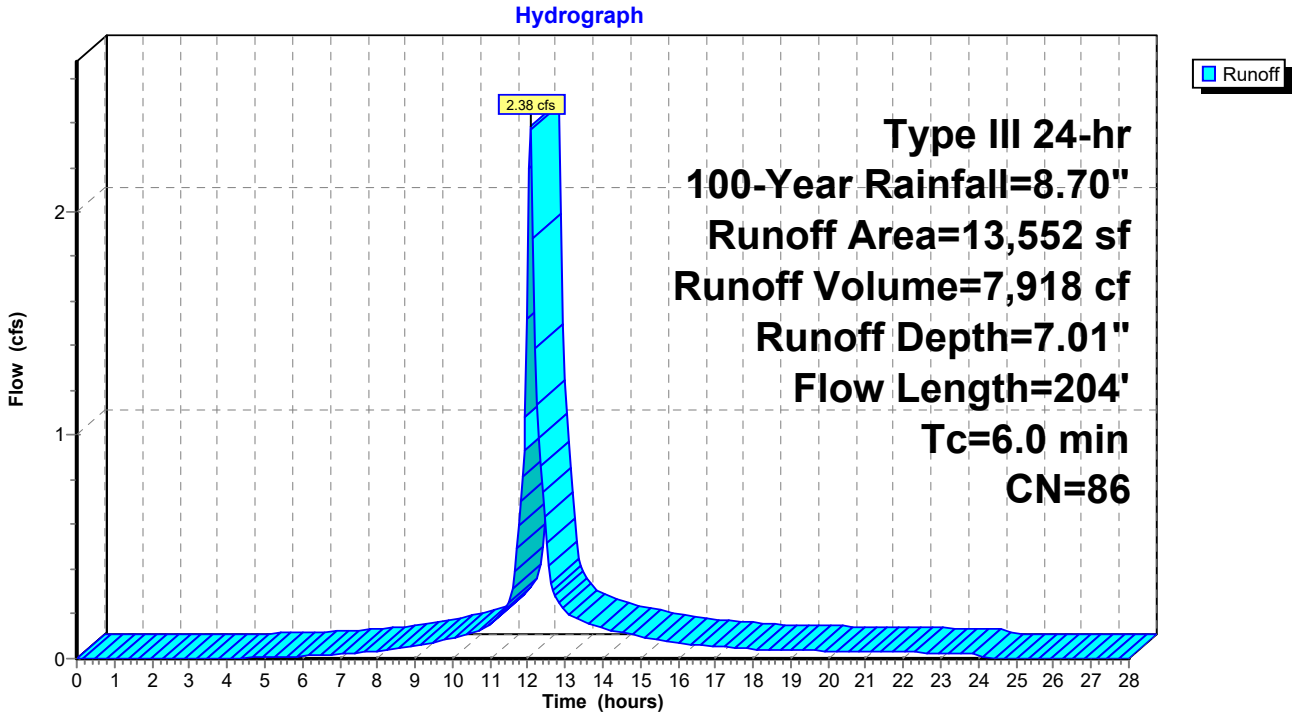
Runoff = 2.38 cfs @ 12.09 hrs, Volume= 7,918 cf, Depth= 7.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.70"

Area (sf)	CN	Description
9,160	98	Paved parking, HSG B
4,392	61	>75% Grass cover, Good, HSG B
13,552	86	Weighted Average
4,392	61	32.41% Pervious Area
9,160	98	67.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0800	2.43		**Sheet Flow, SEG A** Smooth surfaces n= 0.011 P2= 3.30"
0.4	104	0.0500	4.54		**Shallow Concentrated Flow, SEG B** Paved Kv= 20.3 fps
1.1	204	Total, Increased to minimum Tc = 6.0 min			

Subcatchment W1B: Watershed 1B



Summary for Subcatchment W1C: Watershed 1C

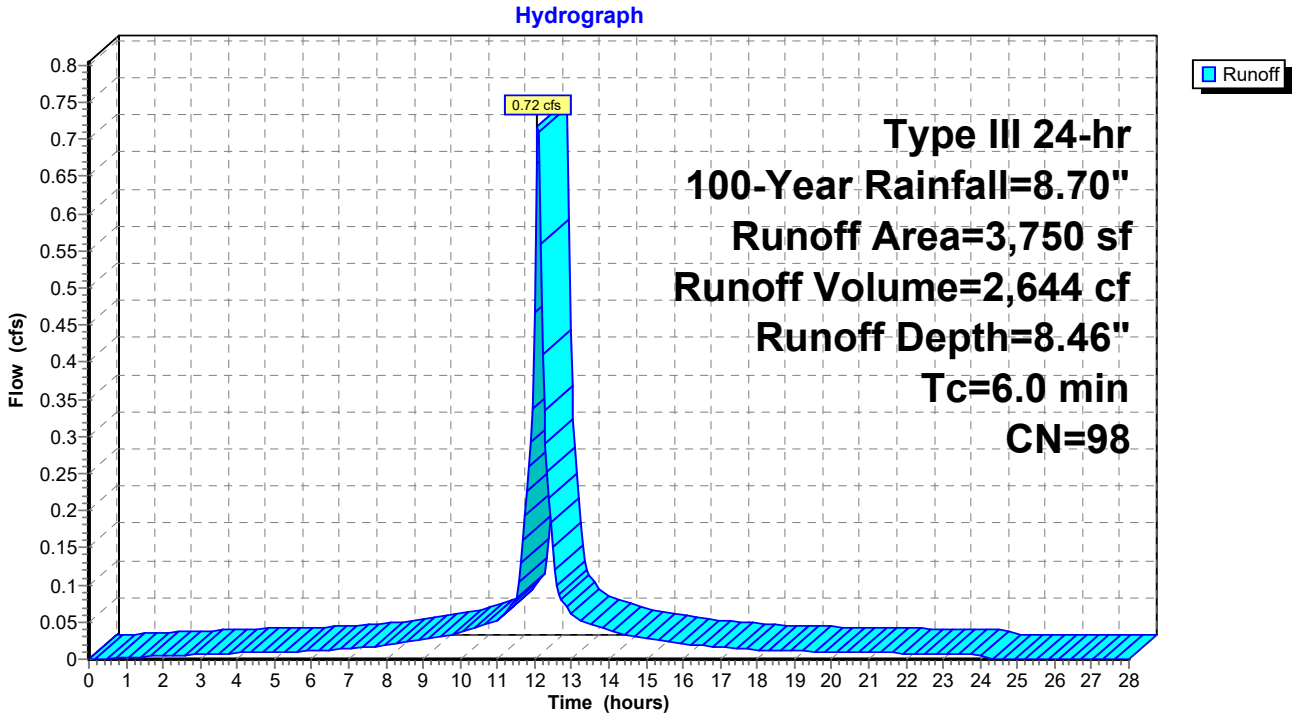
Runoff = 0.72 cfs @ 12.09 hrs, Volume= 2,644 cf, Depth= 8.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.70"

Area (sf)	CN	Description
3,750	98	Roofs, HSG B
3,750	98	100.00% Impervious Area

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

Subcatchment W1C: Watershed 1C



Summary for Subcatchment W1D: Watershed 1D

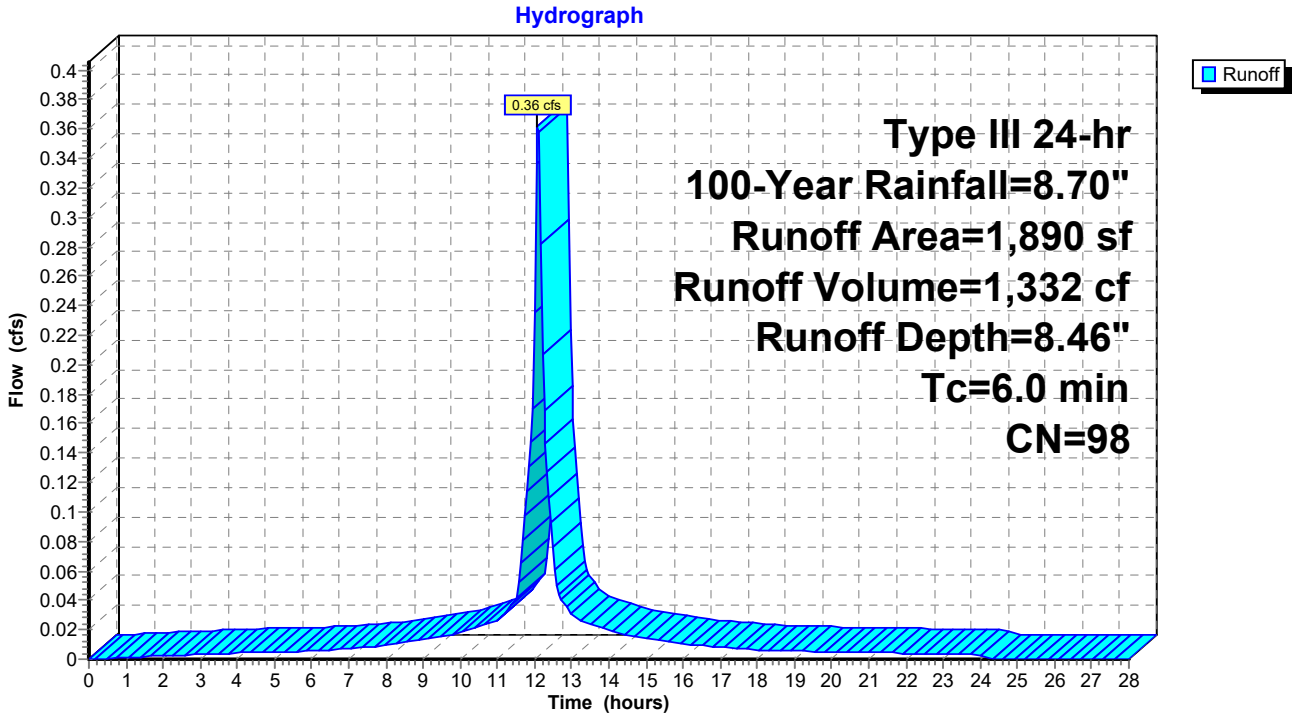
Runoff = 0.36 cfs @ 12.09 hrs, Volume= 1,332 cf, Depth= 8.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.70"

Area (sf)	CN	Description
1,890	98	Roofs, HSG B
1,890	98	100.00% Impervious Area

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

Subcatchment W1D: Watershed 1D



Summary for Subcatchment W1E: Watershed 1E

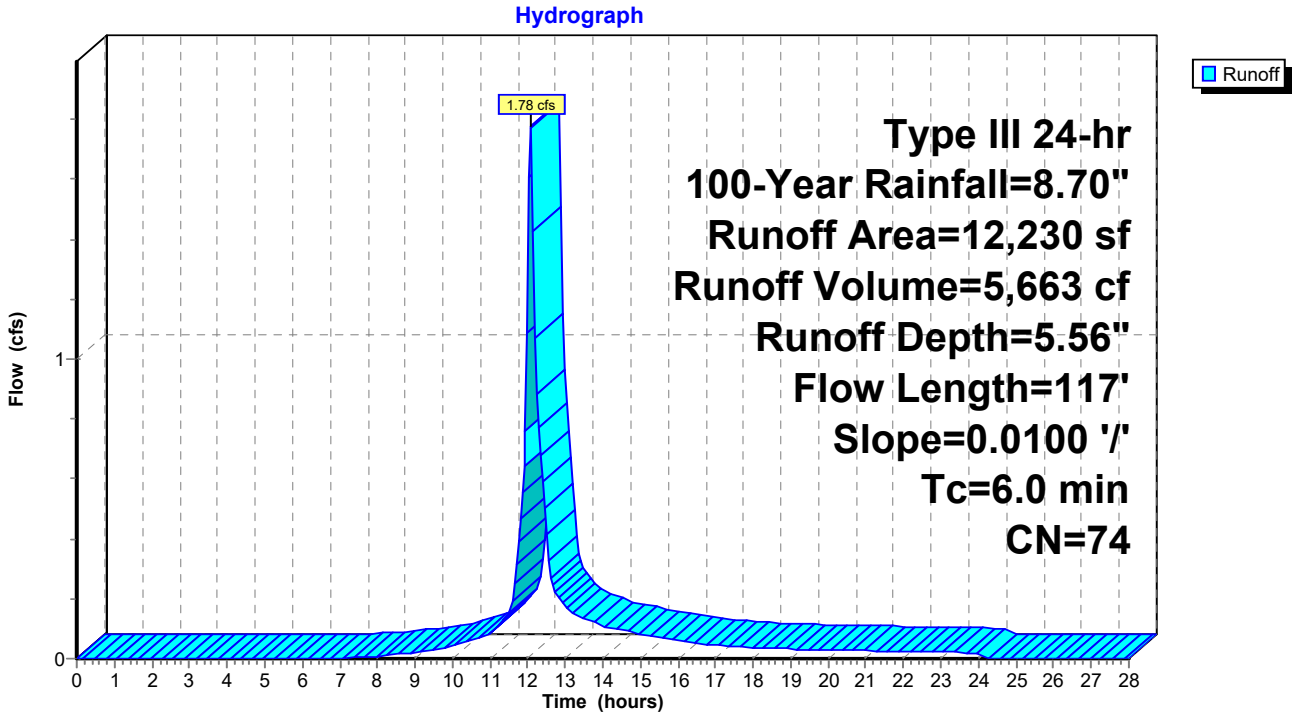
Runoff = 1.78 cfs @ 12.09 hrs, Volume= 5,663 cf, Depth= 5.56"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.70"

Area (sf)	CN	Description
4,318	98	Paved parking, HSG B
7,912	61	>75% Grass cover, Good, HSG B
12,230	74	Weighted Average
7,912	61	64.69% Pervious Area
4,318	98	35.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, SEG A** Paved Kv= 20.3 fps
0.2	17	0.0100	1.50		**Shallow Concentrated Flow, SEG B** Grassed Waterway Kv= 15.0 fps
1.0	117	Total, Increased to minimum Tc = 6.0 min			

Subcatchment W1E: Watershed 1E



Summary for Subcatchment W2A: Watershed 2A

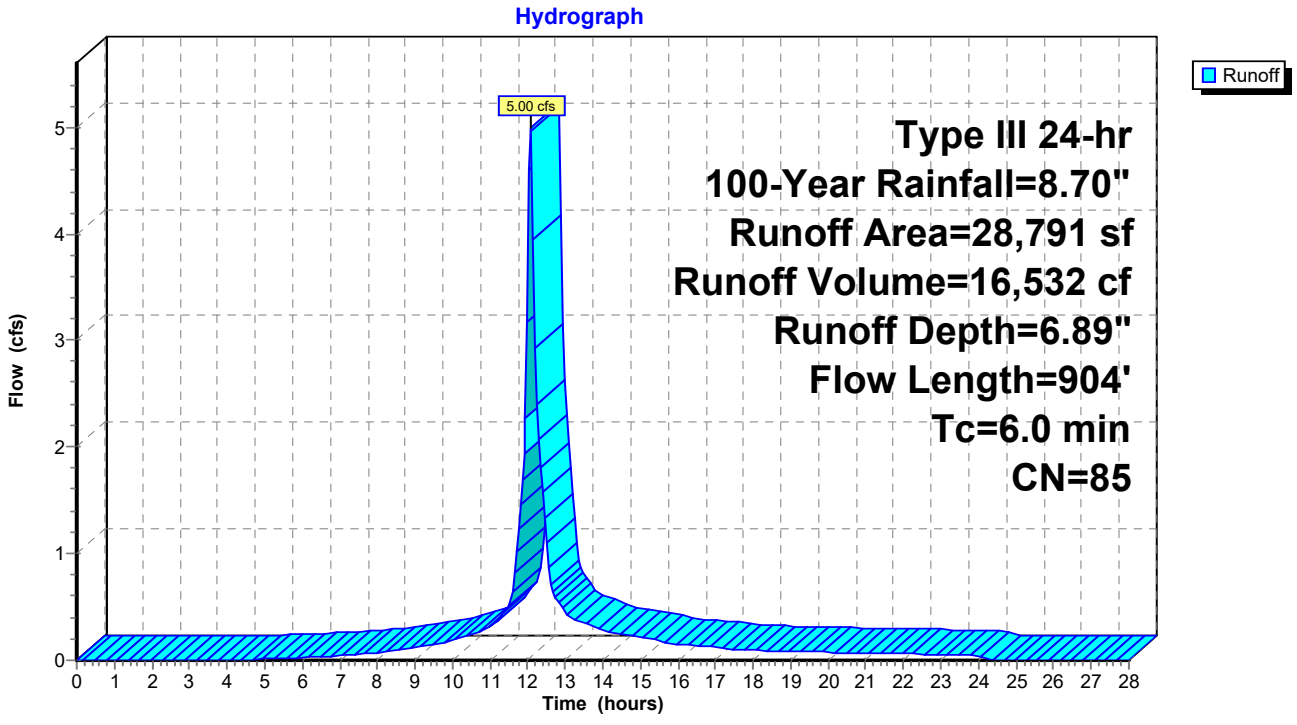
Runoff = 5.00 cfs @ 12.09 hrs, Volume= 16,532 cf, Depth= 6.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.70"

	Area (sf)	CN	Description
	1,048	98	Roofs, HSG B
*	17,540	98	Paved parking & Roadways, HSG B
	10,203	61	>75% Grass cover, Good, HSG B
	28,791	85	Weighted Average
	10,203	61	35.44% Pervious Area
	18,588	98	64.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	77	0.0200	1.33		**Sheet Flow, SEG A** Smooth surfaces n= 0.011 P2= 3.30"
3.5	827	0.0380	3.96		**Shallow Concentrated Flow, SEG B** Paved Kv= 20.3 fps
4.5	904	Total, Increased to minimum Tc = 6.0 min			

Subcatchment W2A: Watershed 2A



Summary for Subcatchment W2B: Watershed 2B

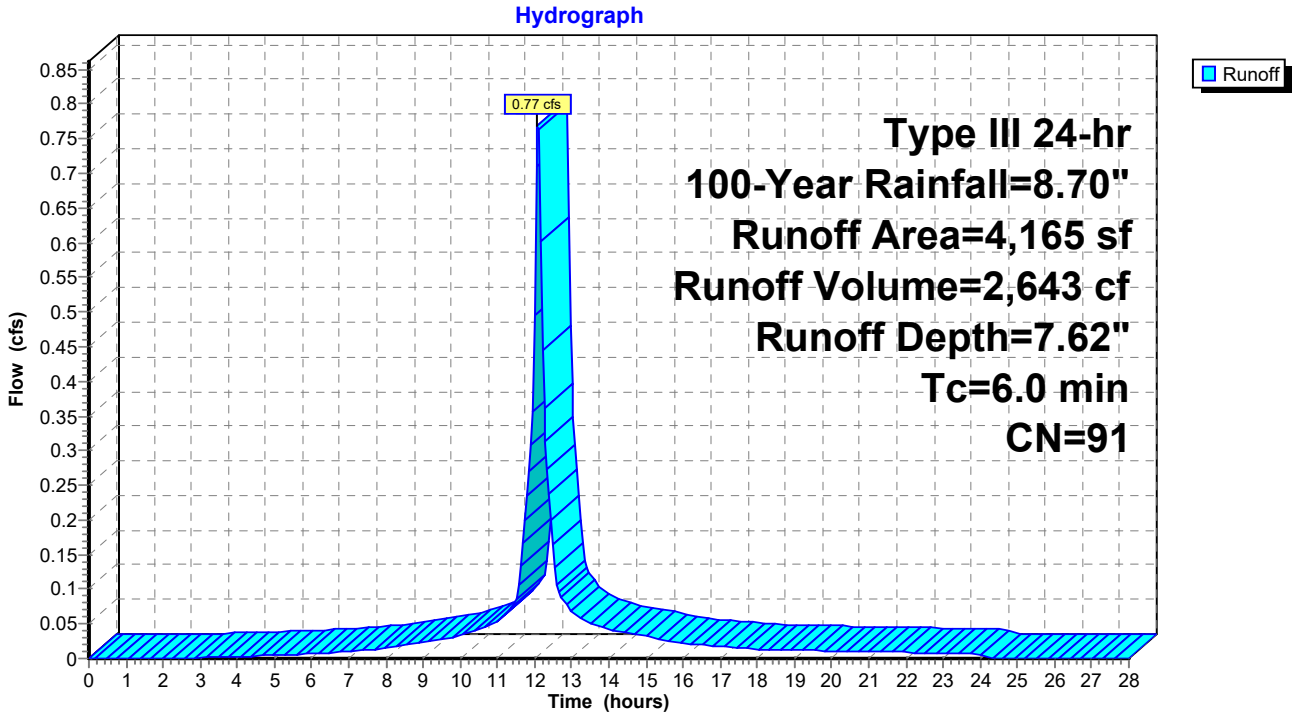
Runoff = 0.77 cfs @ 12.09 hrs, Volume= 2,643 cf, Depth= 7.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=8.70"

	Area (sf)	CN	Description
*	3,413	98	Paved parking & Roadways, HSG B
	752	61	>75% Grass cover, Good, HSG B
	4,165	91	Weighted Average
	752	61	18.06% Pervious Area
	3,413	98	81.94% Impervious Area

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

Subcatchment W2B: Watershed 2B



Summary for Pond 3P: Sediment Forebay

Inflow Area = 12,230 sf, 35.31% Impervious, Inflow Depth = 5.48" for 100-Year event
Inflow = 1.78 cfs @ 12.09 hrs, Volume= 5,587 cf
Outflow = 1.77 cfs @ 12.09 hrs, Volume= 5,452 cf, Atten= 1%, Lag= 0.2 min
Primary = 1.77 cfs @ 12.09 hrs, Volume= 5,452 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 86.34' @ 12.09 hrs Surf.Area= 284 sf Storage= 159 cf

Plug-Flow detention time= 20.3 min calculated for 5,442 cf (97% of inflow)
Center-of-Mass det. time= 6.3 min (823.6 - 817.2)

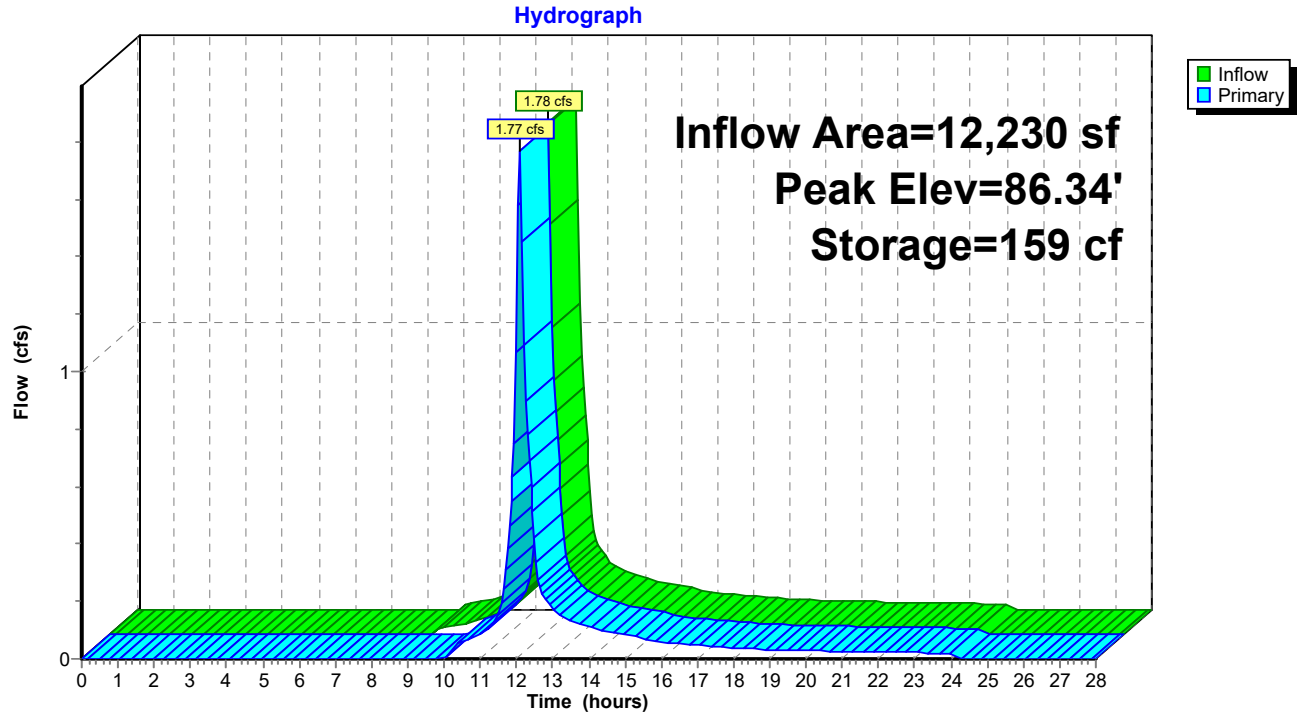
Volume	Invert	Avail.Storage	Storage Description
#1	85.50'	208 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.50	95	0	0
86.50	320	208	208

Device	Routing	Invert	Outlet Devices
#1	Primary	86.25'	**20.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=1.74 cfs @ 12.09 hrs HW=86.34' (Free Discharge)
└**1=Sharp-Crested Rectangular Weir** (Weir Controls 1.74 cfs @ 0.98 fps)

Pond 3P: Sediment Forebay



Summary for Pond 4P: UIC #1 MC-3500

Inflow Area = 4,165 sf, 81.94% Impervious, Inflow Depth = 7.62" for 100-Year event
Inflow = 0.77 cfs @ 12.09 hrs, Volume= 2,643 cf
Outflow = 0.52 cfs @ 12.19 hrs, Volume= 2,612 cf, Atten= 32%, Lag= 6.2 min
Discarded = 0.04 cfs @ 12.20 hrs, Volume= 2,105 cf
Primary = 0.48 cfs @ 12.19 hrs, Volume= 506 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 95.97' @ 12.20 hrs Surf.Area= 289 sf Storage= 837 cf

Plug-Flow detention time= 193.7 min calculated for 2,607 cf (99% of inflow)
Center-of-Mass det. time= 186.0 min (956.3 - 770.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	90.50'	370 cf	**8.42'W x 34.38'L x 5.50'H Field A** 1,592 cf Overall - 470 cf Embedded = 1,122 cf x 33.0% Voids
#2A	91.25'	470 cf	**ADS_StormTech MC-3500 d +Cap** x 4 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		840 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	90.50'	**2.410 in/hr Exfiltration over Wetted area**
#2	Primary	95.95'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.04 cfs @ 12.20 hrs HW=95.97' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.30 cfs @ 12.19 hrs HW=95.97' (Free Discharge)
↑—**2=Orifice/Grate** (Weir Controls 0.30 cfs @ 0.47 fps)

Pond 4P: UIC #1 MC-3500 - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

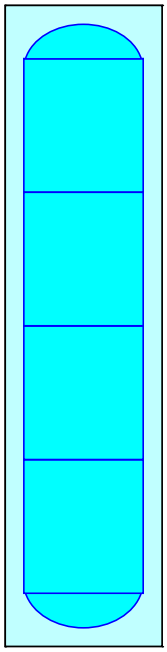
4 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 32.38' Row Length +12.0" End Stone x 2 = 34.38' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

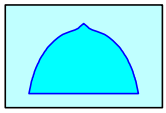
4 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 469.6 cf Chamber Storage

1,591.5 cf Field - 469.6 cf Chambers = 1,121.9 cf Stone x 33.0% Voids = 370.2 cf Stone Storage

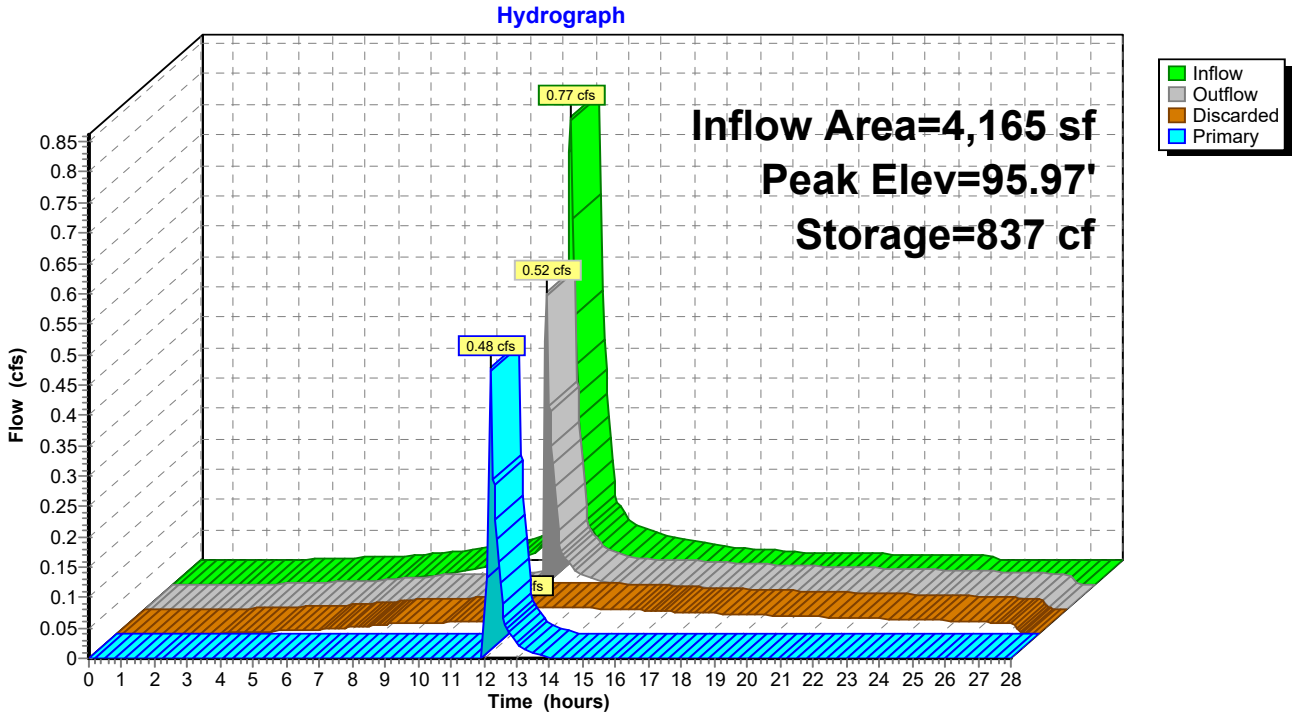
Chamber Storage + Stone Storage = 839.8 cf = 0.019 af
Overall Storage Efficiency = 52.8%
Overall System Size = 34.38' x 8.42' x 5.50'

4 Chambers
58.9 cy Field
41.6 cy Stone





Pond 4P: UIC #1 MC-3500



Summary for Pond 5P: Infiltration Basin

Inflow Area = 14,120 sf, 43.97% Impervious, Inflow Depth = 5.77" for 100-Year event
Inflow = 2.13 cfs @ 12.09 hrs, Volume= 6,784 cf
Outflow = 2.10 cfs @ 12.10 hrs, Volume= 6,588 cf, Atten= 2%, Lag= 0.3 min
Discarded = 0.04 cfs @ 12.10 hrs, Volume= 2,290 cf
Primary = 2.06 cfs @ 12.10 hrs, Volume= 4,298 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 86.25' @ 12.10 hrs Surf.Area= 654 sf Storage= 731 cf

Plug-Flow detention time= 82.6 min calculated for 6,588 cf (97% of inflow)
Center-of-Mass det. time= 65.5 min (872.7 - 807.2)

Volume	Invert	Avail.Storage	Storage Description
#1	84.50'	905 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

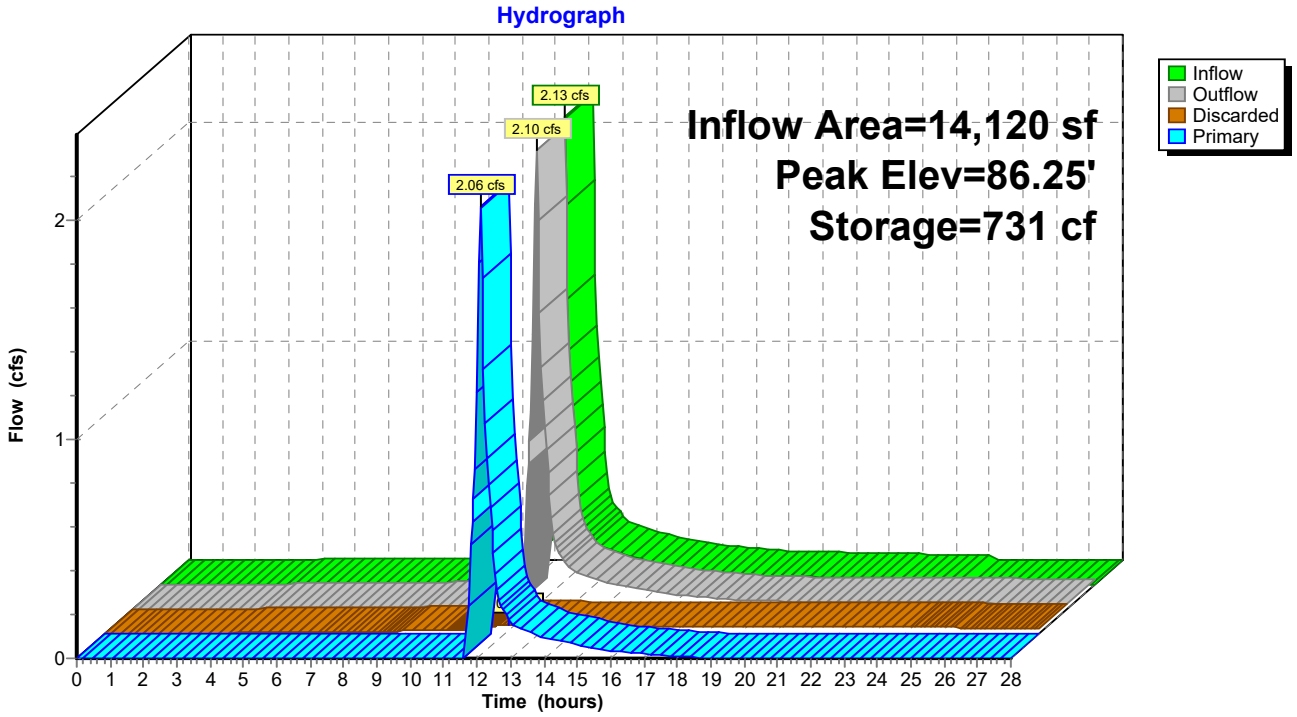
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
84.50	212	0	0	212
85.50	446	322	322	454
86.50	732	583	905	753

Device	Routing	Invert	Outlet Devices
#1	Discarded	84.50'	**2.410 in/hr Exfiltration over Wetted area**
#2	Primary	86.15'	**20.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.04 cfs @ 12.10 hrs HW=86.25' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=2.03 cfs @ 12.10 hrs HW=86.25' (Free Discharge)
↑—**2=Sharp-Crested Rectangular Weir** (Weir Controls 2.03 cfs @ 1.03 fps)

Pond 5P: Infiltration Basin



Summary for Pond 8P: UIC #2 iSOLATOR ROW MC-3500 1.75' stone

Inflow Area = 13,552 sf, 67.59% Impervious, Inflow Depth = 7.01" for 100-Year event
Inflow = 2.38 cfs @ 12.09 hrs, Volume= 7,918 cf
Outflow = 2.36 cfs @ 12.09 hrs, Volume= 6,960 cf, Atten= 1%, Lag= 0.1 min
Primary = 2.36 cfs @ 12.09 hrs, Volume= 6,960 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 85.32' @ 12.09 hrs Surf.Area= 350 sf Storage= 1,002 cf

Plug-Flow detention time= 88.5 min calculated for 6,948 cf (88% of inflow)
Center-of-Mass det. time= 33.9 min (819.0 - 785.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	80.00'	617 cf	**8.42'W x 41.55'L x 7.00'H Field A** 2,448 cf Overall - 580 cf Embedded = 1,868 cf x 33.0% Voids
#2A	81.75'	580 cf	**ADS_StormTech MC-3500 d +Cap**x 5 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		1,196 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	85.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=2.30 cfs @ 12.09 hrs HW=85.32' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 2.30 cfs @ 1.84 fps)

Pond 8P: UIC #2 iSOLATOR ROW MC-3500 1.75' stone - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

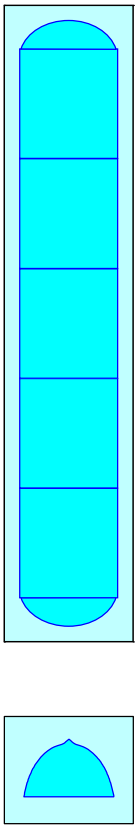
5 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 39.55' Row Length +12.0" End Stone x 2 = 41.55' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
21.0" Stone Base + 45.0" Chamber Height + 18.0" Stone Cover = 7.00' Field Height

5 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 579.6 cf Chamber Storage

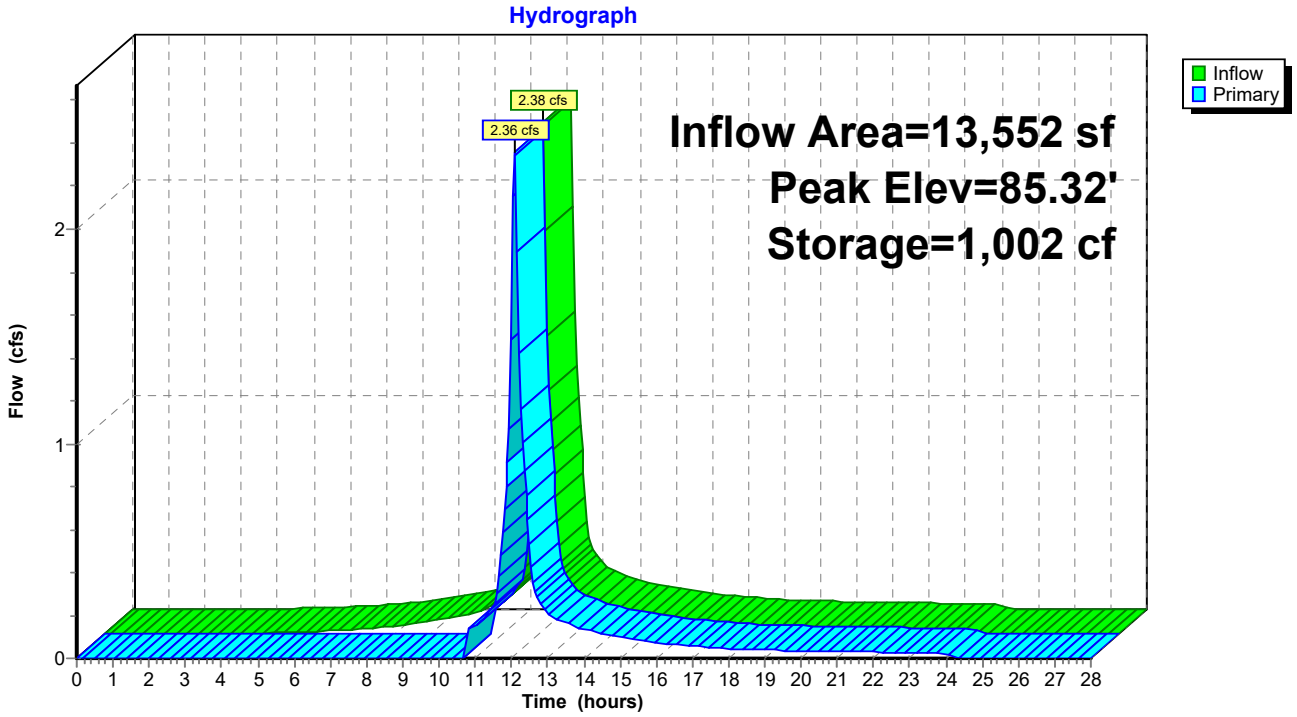
2,448.0 cf Field - 579.6 cf Chambers = 1,868.4 cf Stone x 33.0% Voids = 616.6 cf Stone Storage

Chamber Storage + Stone Storage = 1,196.1 cf = 0.027 af
Overall Storage Efficiency = 48.9%
Overall System Size = 41.55' x 8.42' x 7.00'

5 Chambers
90.7 cy Field
69.2 cy Stone



Pond 8P: UIC #2 iSOLATOR ROW MC-3500 1.75' stone



Summary for Pond 11P: UIC #2 MC-3500 4.0' stone

Inflow Area = 17,302 sf, 74.62% Impervious, Inflow Depth = 6.66" for 100-Year event
Inflow = 3.08 cfs @ 12.09 hrs, Volume= 9,604 cf
Outflow = 1.80 cfs @ 12.10 hrs, Volume= 7,237 cf, Atten= 42%, Lag= 0.7 min
Discarded = 0.04 cfs @ 10.20 hrs, Volume= 2,756 cf
Primary = 1.76 cfs @ 12.10 hrs, Volume= 4,481 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 4
Peak Elev= 86.99' @ 12.10 hrs Surf.Area= 647 sf Storage= 2,857 cf

Plug-Flow detention time= 178.0 min calculated for 7,237 cf (75% of inflow)
Center-of-Mass det. time= 93.7 min (890.9 - 797.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	77.25'	1,701 cf	**15.58'W x 41.55'L x 9.75'H Field A** 6,313 cf Overall - 1,159 cf Embedded = 5,154 cf x 33.0% Voids
#2A	81.25'	1,159 cf	**ADS_StormTech MC-3500 d +Cap**x 10 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 10 Chambers in 2 Rows Cap Storage= +14.9 cf x 2 x 2 rows = 59.6 cf
		2,860 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	77.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	86.45'	**4.0" x 18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.04 cfs @ 10.20 hrs HW=77.35' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=1.76 cfs @ 12.10 hrs HW=86.99' (Free Discharge)
↑—**2=Orifice/Grate** (Orifice Controls 1.76 cfs @ 3.52 fps)

Pond 11P: UIC #2 MC-3500 4.0' stone - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 2 rows = 59.6 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

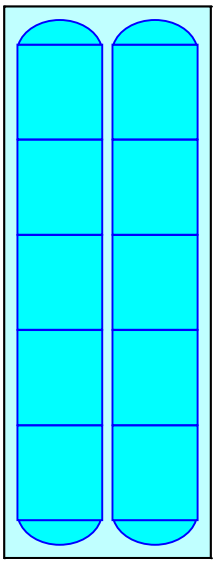
5 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 39.55' Row Length +12.0" End Stone x 2 = 41.55' Base Length
2 Rows x 77.0" Wide + 9.0" Spacing x 1 + 12.0" Side Stone x 2 = 15.58' Base Width
48.0" Stone Base + 45.0" Chamber Height + 24.0" Stone Cover = 9.75' Field Height

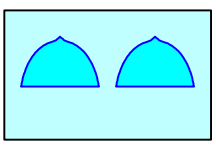
10 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 2 Rows = 1,159.1 cf Chamber Storage

6,313.0 cf Field - 1,159.1 cf Chambers = 5,153.9 cf Stone x 33.0% Voids = 1,700.8 cf Stone Storage

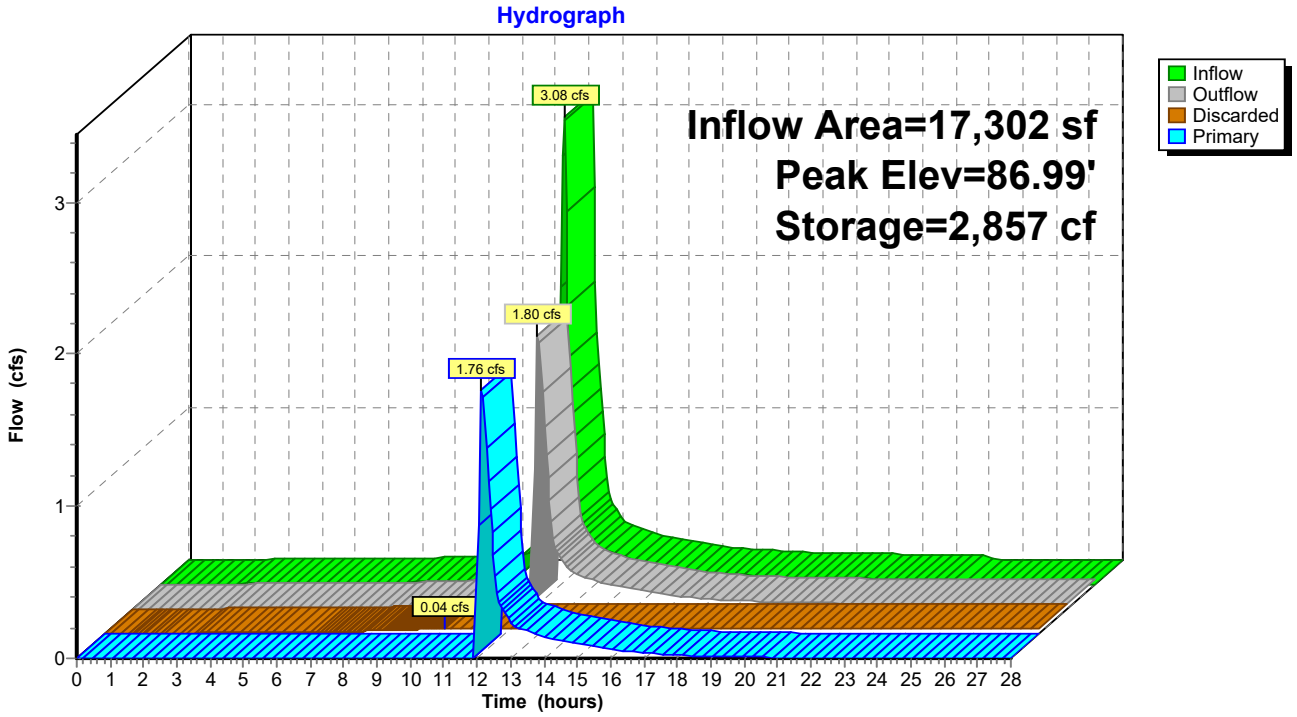
Chamber Storage + Stone Storage = 2,859.9 cf = 0.066 af
Overall Storage Efficiency = 45.3%
Overall System Size = 41.55' x 15.58' x 9.75'

10 Chambers
233.8 cy Field
190.9 cy Stone





Pond 11P: UIC #2 MC-3500 4.0' stone



Summary for Pond 12P: Pea gravel Diaphragm

Inflow Area = 12,230 sf, 35.31% Impervious, Inflow Depth = 5.56" for 100-Year event
Inflow = 1.78 cfs @ 12.09 hrs, Volume= 5,663 cf
Outflow = 1.78 cfs @ 12.09 hrs, Volume= 5,587 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.78 cfs @ 12.09 hrs, Volume= 5,587 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 87.00' @ 12.09 hrs Surf.Area= 114 sf Storage= 75 cf

Plug-Flow detention time= 12.4 min calculated for 5,577 cf (98% of inflow)
Center-of-Mass det. time= 4.4 min (817.2 - 812.9)

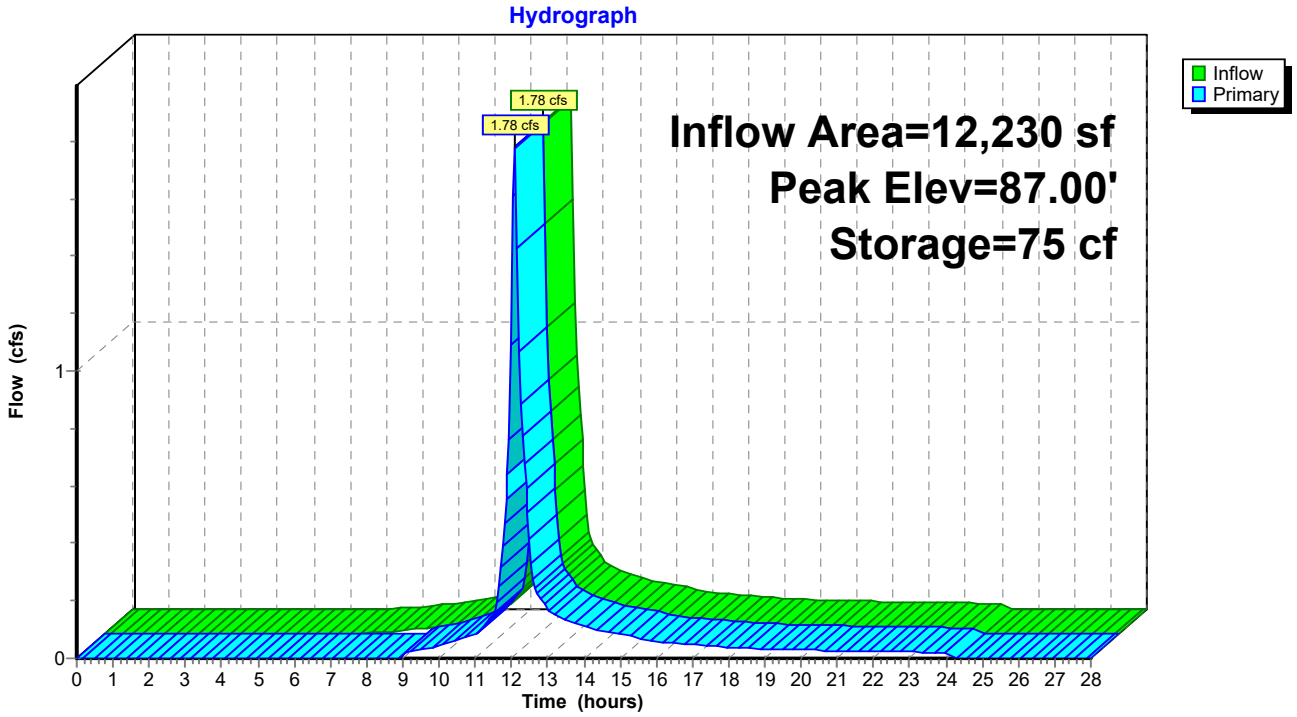
Volume	Invert	Avail.Storage	Storage Description
#1	85.00'	75 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 228 cf Overall x 33.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.00	114	0	0
87.00	114	228	228

Device	Routing	Invert	Outlet Devices
#1	Primary	86.94'	**38.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=1.74 cfs @ 12.09 hrs HW=87.00' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Weir Controls 1.74 cfs @ 0.79 fps)

Pond 12P: Pea gravel Diaphragm

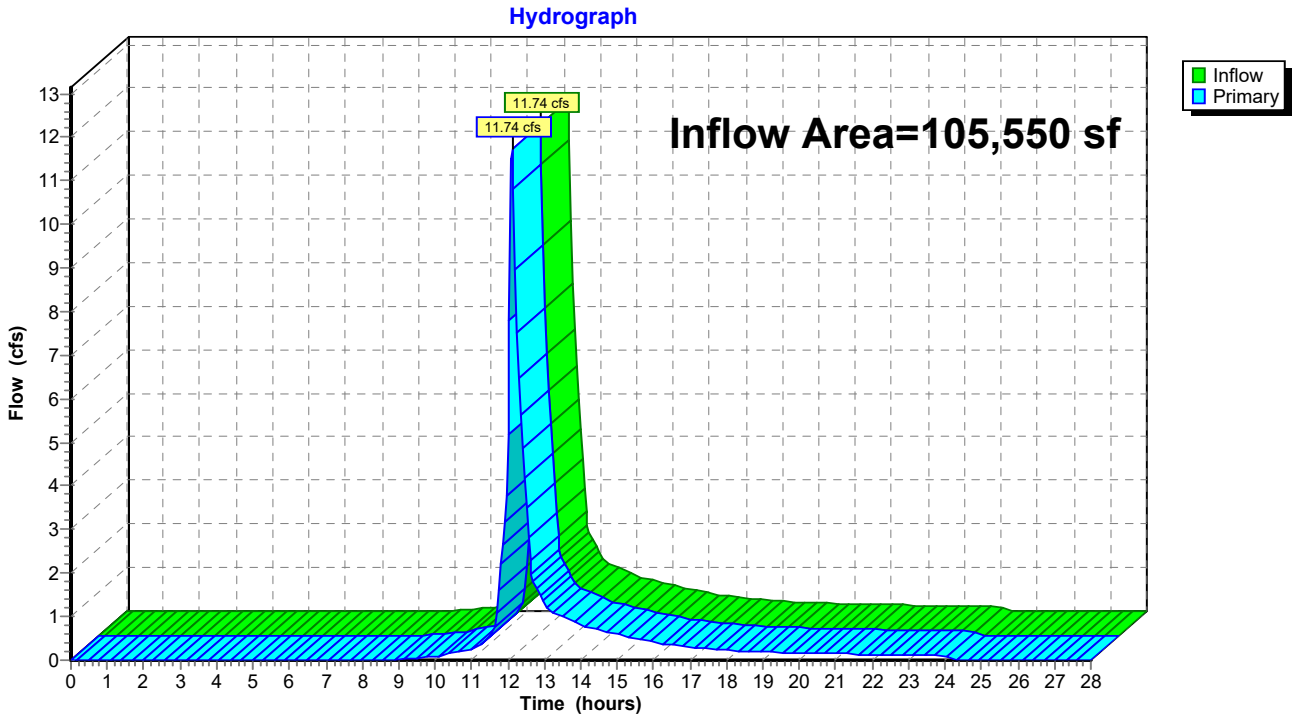


Summary for Link DP-1: Lower Gradient

Inflow Area = 105,550 sf, 21.75% Impervious, Inflow Depth = 3.97" for 100-Year event
Inflow = 11.74 cfs @ 12.12 hrs, Volume= 34,889 cf
Primary = 11.74 cfs @ 12.12 hrs, Volume= 34,889 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

Link DP-1: Lower Gradient

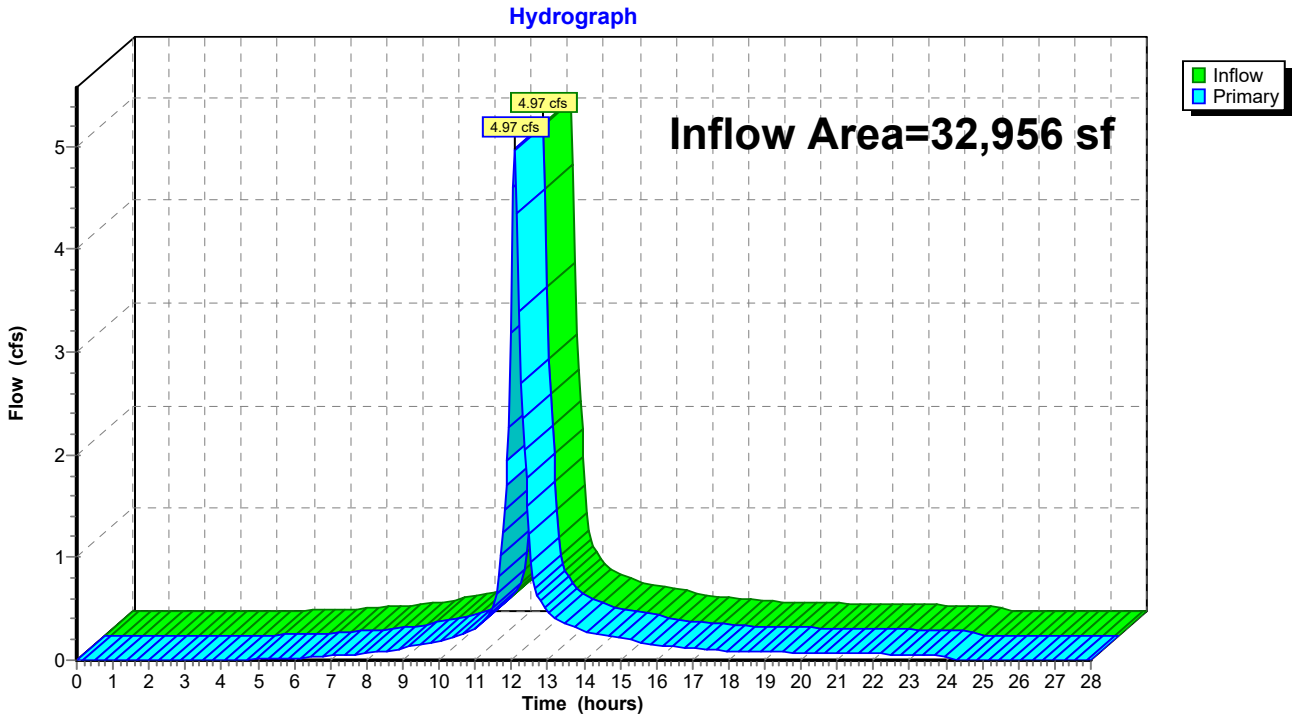


Summary for Link DP-2: Matunuck School House Road

Inflow Area = 32,956 sf, 66.76% Impervious, Inflow Depth = 6.20" for 100-Year event
Inflow = 4.97 cfs @ 12.09 hrs, Volume= 17,038 cf
Primary = 4.97 cfs @ 12.09 hrs, Volume= 17,038 cf, Atten= 0%, Lag= 0.0 min

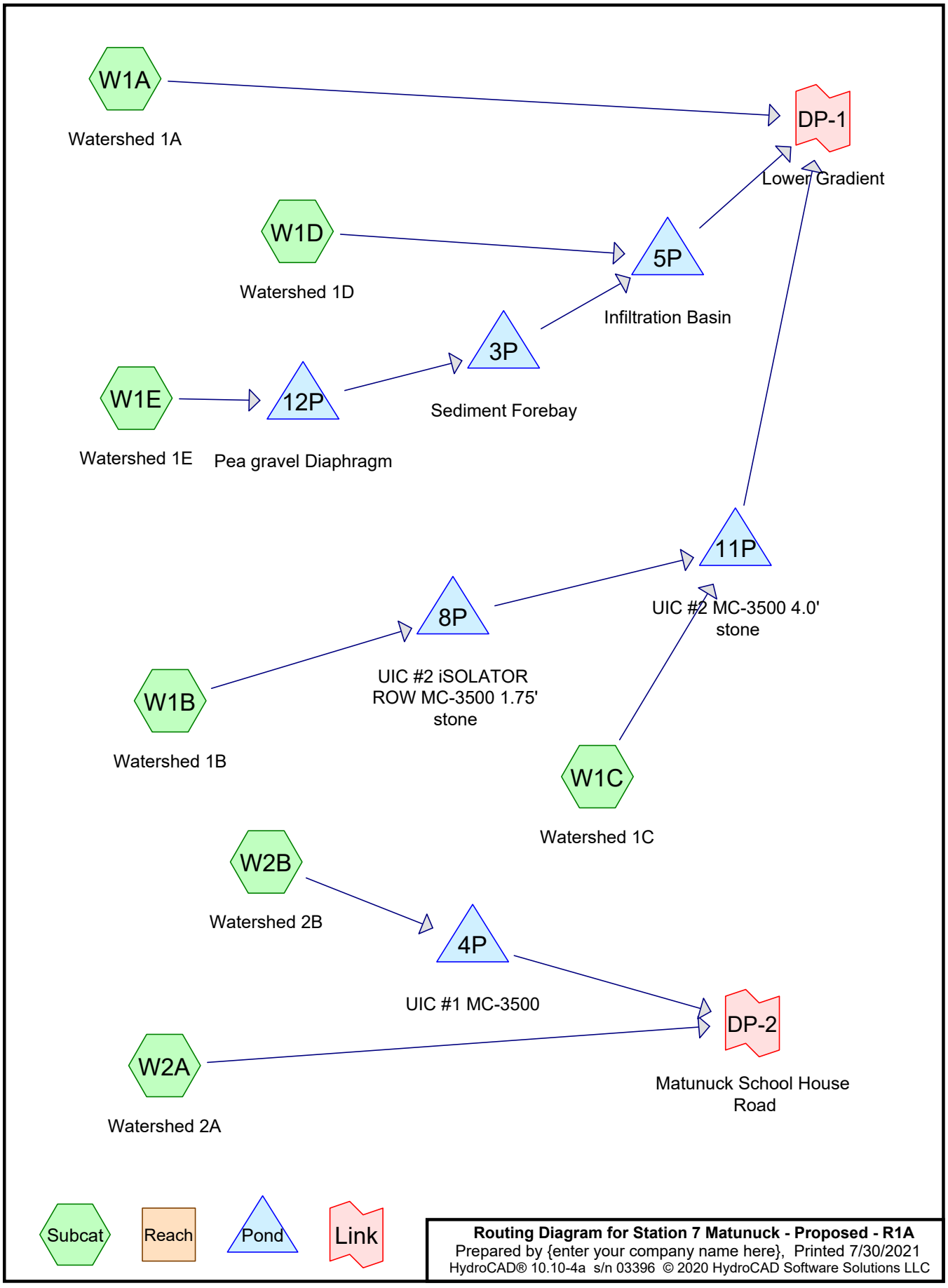
Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

Link DP-2: Matunuck School House Road



Appendix I

Water Quality HydroCAD Calculations



Routing Diagram for Station 7 Matunuck - Proposed - R1A
Prepared by {enter your company name here}, Printed 7/30/2021

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	WQV	Type III 24-hr		Default	24.00	1	1.20	2

Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
93,551	61	>75% Grass cover, Good, HSG B (W1A, W1B, W1E, W2A, W2B)
20,953	98	Paved parking & Roadways, HSG B (W2A, W2B)
13,478	98	Paved parking, HSG B (W1B, W1E)
10,524	98	Roofs, HSG B (W1A, W1C, W1D, W2A)
138,506	**73**	**TOTAL AREA**

Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
138,506	HSG B	W1A, W1B, W1C, W1D, W1E, W2A, W2B
0	HSG C	
0	HSG D	
0	Other	
138,506		**TOTAL AREA**

Summary for Subcatchment W1A: Watershed 1A

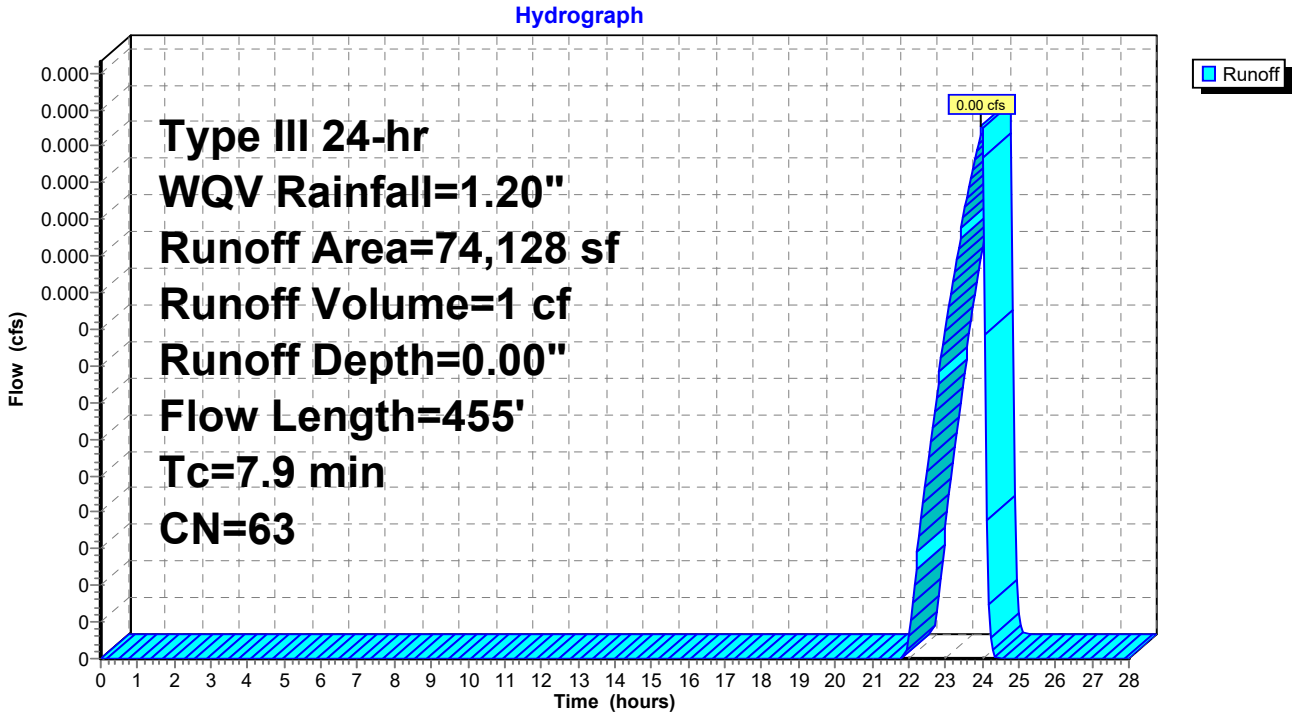
Runoff = 0.00 cfs @ 23.99 hrs, Volume= 1 cf, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr WQV Rainfall=1.20"

Area (sf)	CN	Description
3,836	98	Roofs, HSG B
70,292	61	>75% Grass cover, Good, HSG B
74,128	63	Weighted Average
70,292	61	94.83% Pervious Area
3,836	98	5.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.2	100	0.0600	0.27		**Sheet Flow, SEG A** Grass: Short n= 0.150 P2= 3.30"
1.7	355	0.0560	3.55		**Shallow Concentrated Flow, SEG B** Grassed Waterway Kv= 15.0 fps
7.9	455	Total			

Subcatchment W1A: Watershed 1A



Summary for Subcatchment W1B: Watershed 1B

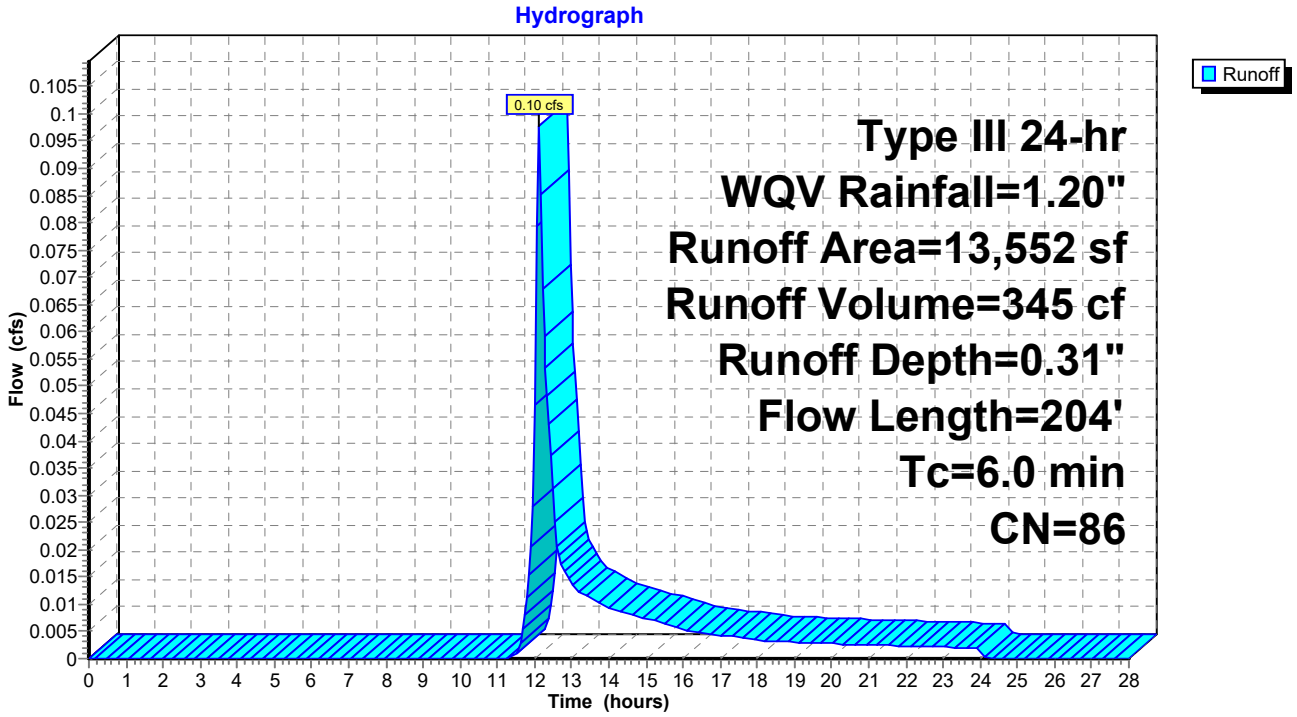
Runoff = 0.10 cfs @ 12.10 hrs, Volume= 345 cf, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr WQV Rainfall=1.20"

Area (sf)	CN	Description
9,160	98	Paved parking, HSG B
4,392	61	>75% Grass cover, Good, HSG B
13,552	86	Weighted Average
4,392	61	32.41% Pervious Area
9,160	98	67.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	100	0.0800	2.43		**Sheet Flow, SEG A** Smooth surfaces n= 0.011 P2= 3.30"
0.4	104	0.0500	4.54		**Shallow Concentrated Flow, SEG B** Paved Kv= 20.3 fps
1.1	204	Total, Increased to minimum Tc = 6.0 min			

Subcatchment W1B: Watershed 1B



Summary for Subcatchment W1C: Watershed 1C

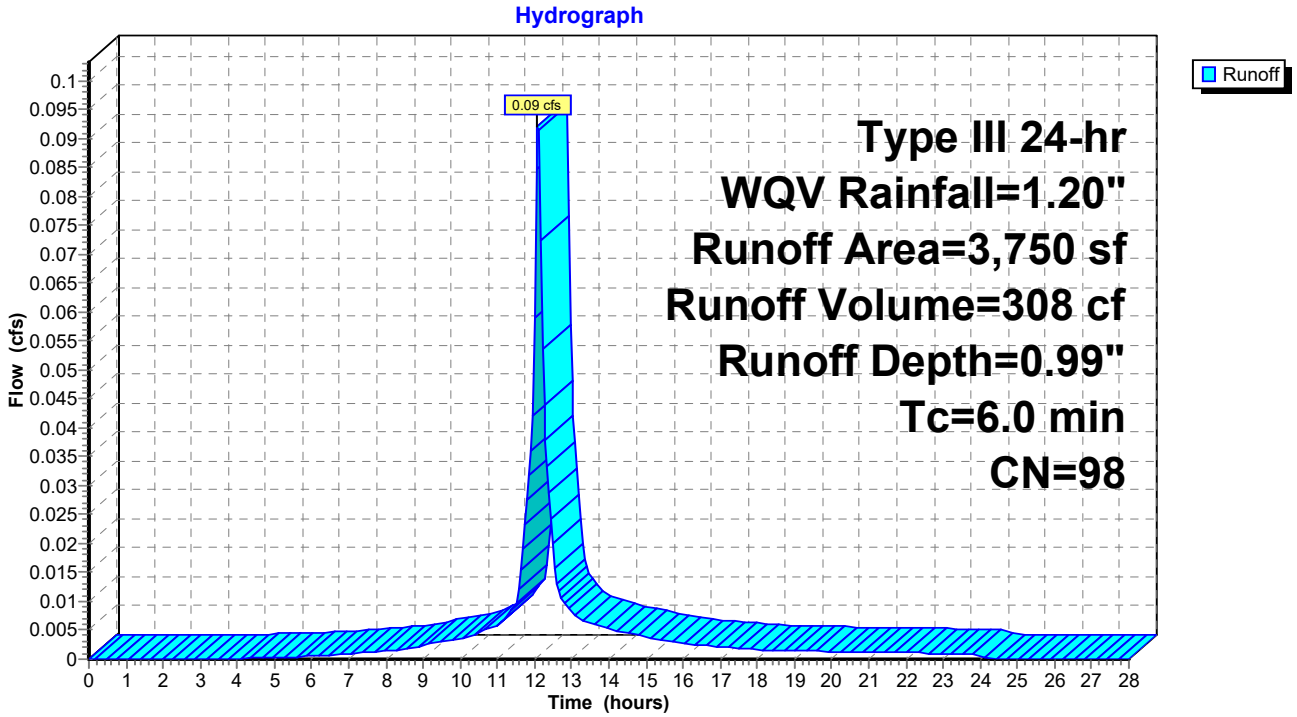
Runoff = 0.09 cfs @ 12.09 hrs, Volume= 308 cf, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr WQV Rainfall=1.20"

Area (sf)	CN	Description
3,750	98	Roofs, HSG B
3,750	98	100.00% Impervious Area

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

Subcatchment W1C: Watershed 1C



Summary for Subcatchment W1D: Watershed 1D

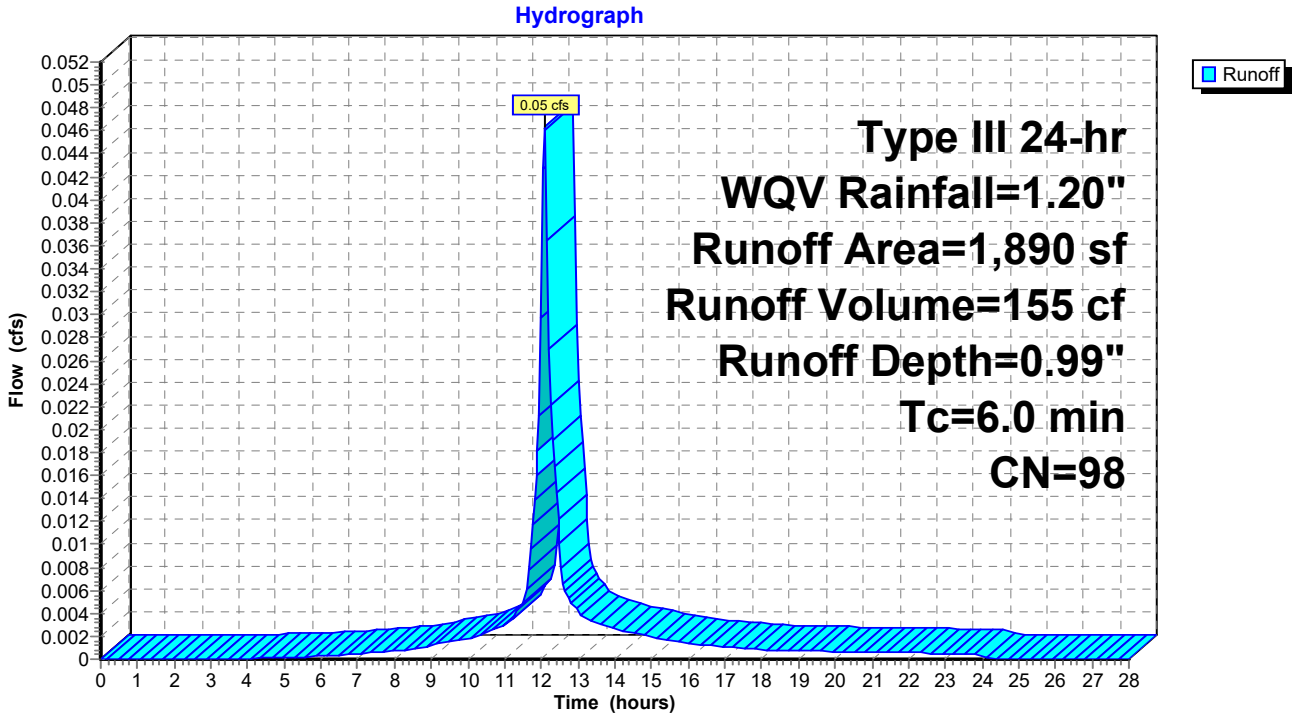
Runoff = 0.05 cfs @ 12.09 hrs, Volume= 155 cf, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr WQV Rainfall=1.20"

Area (sf)	CN	Description
1,890	98	Roofs, HSG B
1,890	98	100.00% Impervious Area

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

Subcatchment W1D: Watershed 1D



Summary for Subcatchment W1E: Watershed 1E

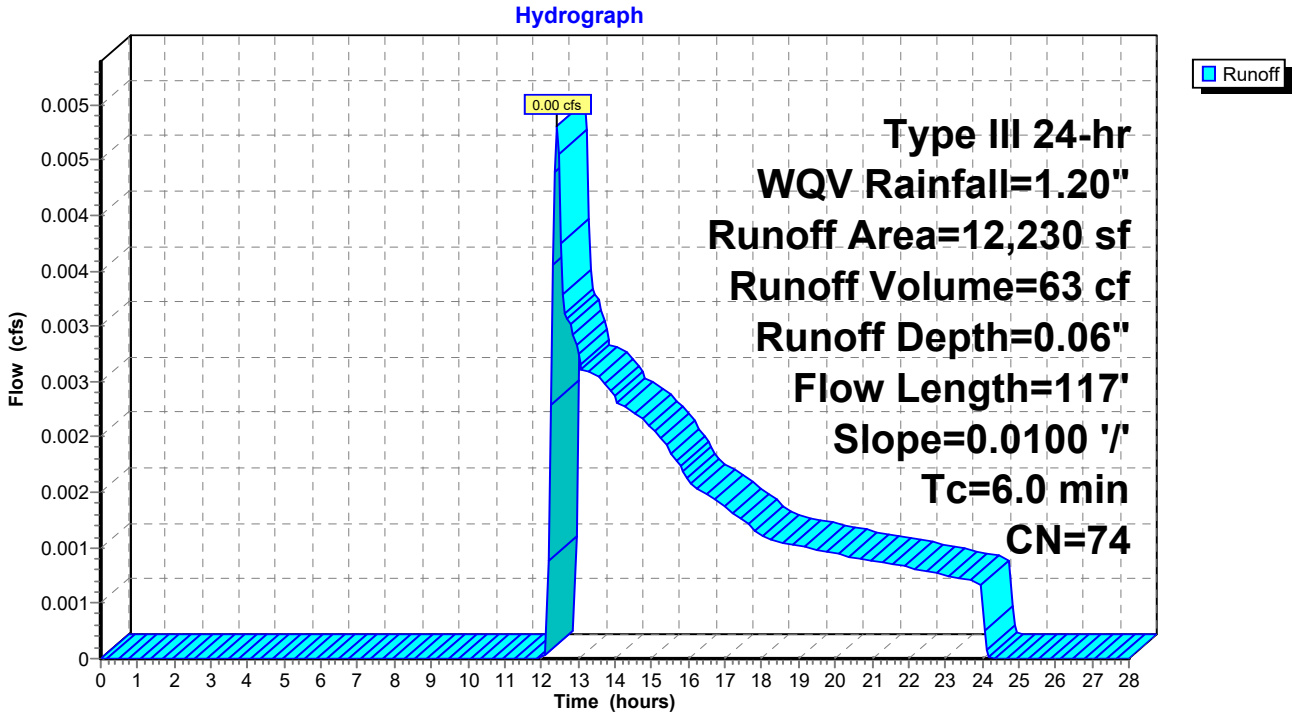
Runoff = 0.00 cfs @ 12.42 hrs, Volume= 63 cf, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr WQV Rainfall=1.20"

Area (sf)	CN	Description
4,318	98	Paved parking, HSG B
7,912	61	>75% Grass cover, Good, HSG B
12,230	74	Weighted Average
7,912	61	64.69% Pervious Area
4,318	98	35.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	100	0.0100	2.03		**Shallow Concentrated Flow, SEG A** Paved Kv= 20.3 fps
0.2	17	0.0100	1.50		**Shallow Concentrated Flow, SEG B** Grassed Waterway Kv= 15.0 fps
1.0	117	Total, Increased to minimum Tc = 6.0 min			

Subcatchment W1E: Watershed 1E



Summary for Subcatchment W2A: Watershed 2A

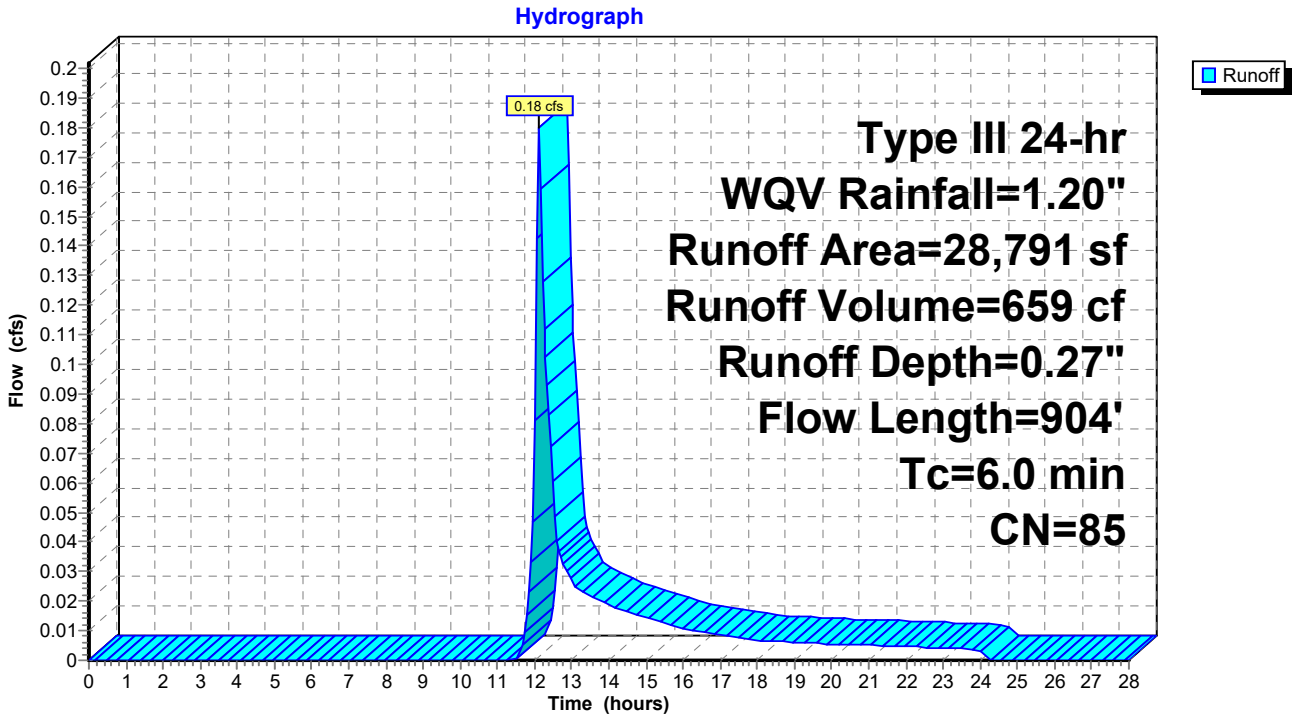
Runoff = 0.18 cfs @ 12.11 hrs, Volume= 659 cf, Depth= 0.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr WQV Rainfall=1.20"

	Area (sf)	CN	Description
	1,048	98	Roofs, HSG B
*	17,540	98	Paved parking & Roadways, HSG B
	10,203	61	>75% Grass cover, Good, HSG B
	28,791	85	Weighted Average
	10,203	61	35.44% Pervious Area
	18,588	98	64.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	77	0.0200	1.33		**Sheet Flow, SEG A** Smooth surfaces n= 0.011 P2= 3.30"
3.5	827	0.0380	3.96		**Shallow Concentrated Flow, SEG B** Paved Kv= 20.3 fps
4.5	904	Total, Increased to minimum Tc = 6.0 min			

Subcatchment W2A: Watershed 2A



Summary for Subcatchment W2B: Watershed 2B

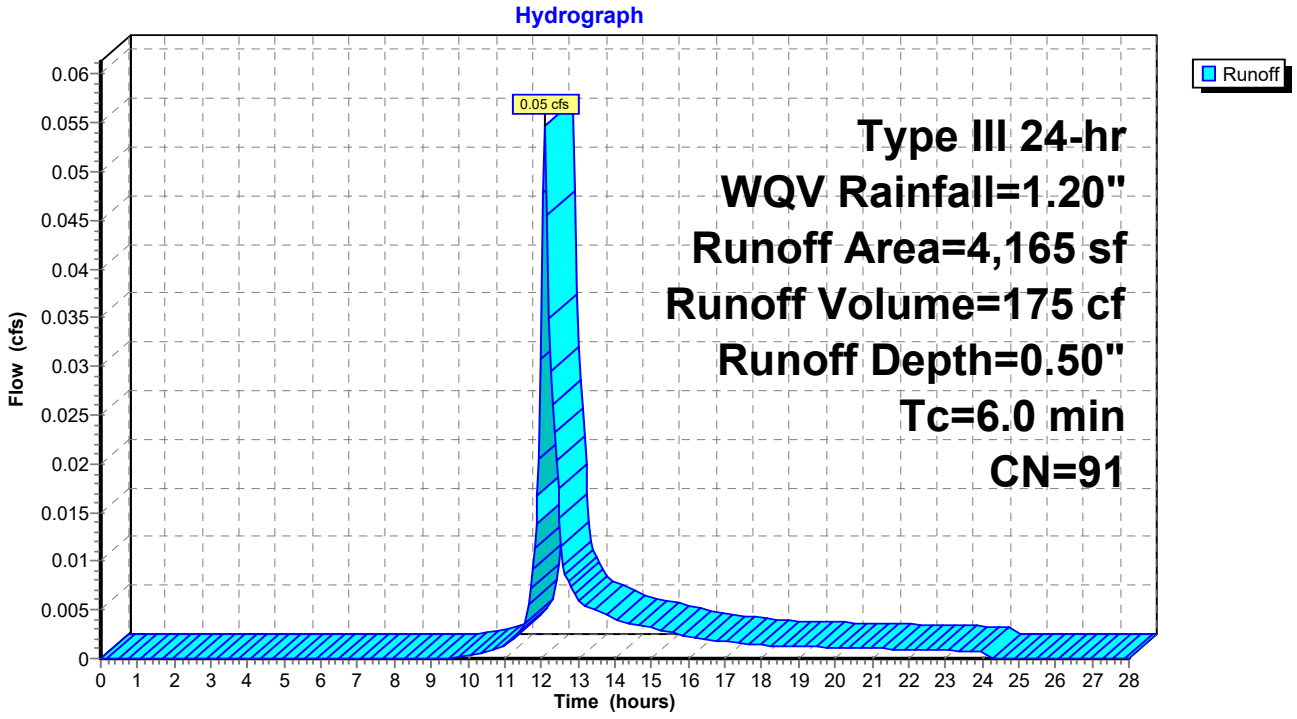
Runoff = 0.05 cfs @ 12.10 hrs, Volume= 175 cf, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs
Type III 24-hr WQV Rainfall=1.20"

	Area (sf)	CN	Description
*	3,413	98	Paved parking & Roadways, HSG B
	752	61	>75% Grass cover, Good, HSG B
	4,165	91	Weighted Average
	752	61	18.06% Pervious Area
	3,413	98	81.94% Impervious Area

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

Subcatchment W2B: Watershed 2B



Summary for Pond 3P: Sediment Forebay

Inflow Area = 12,230 sf, 35.31% Impervious, Inflow Depth = 0.00" for WQV 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
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 85.50' @ 0.00 hrs Surf.Area= 95 sf Storage= 0 cf

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

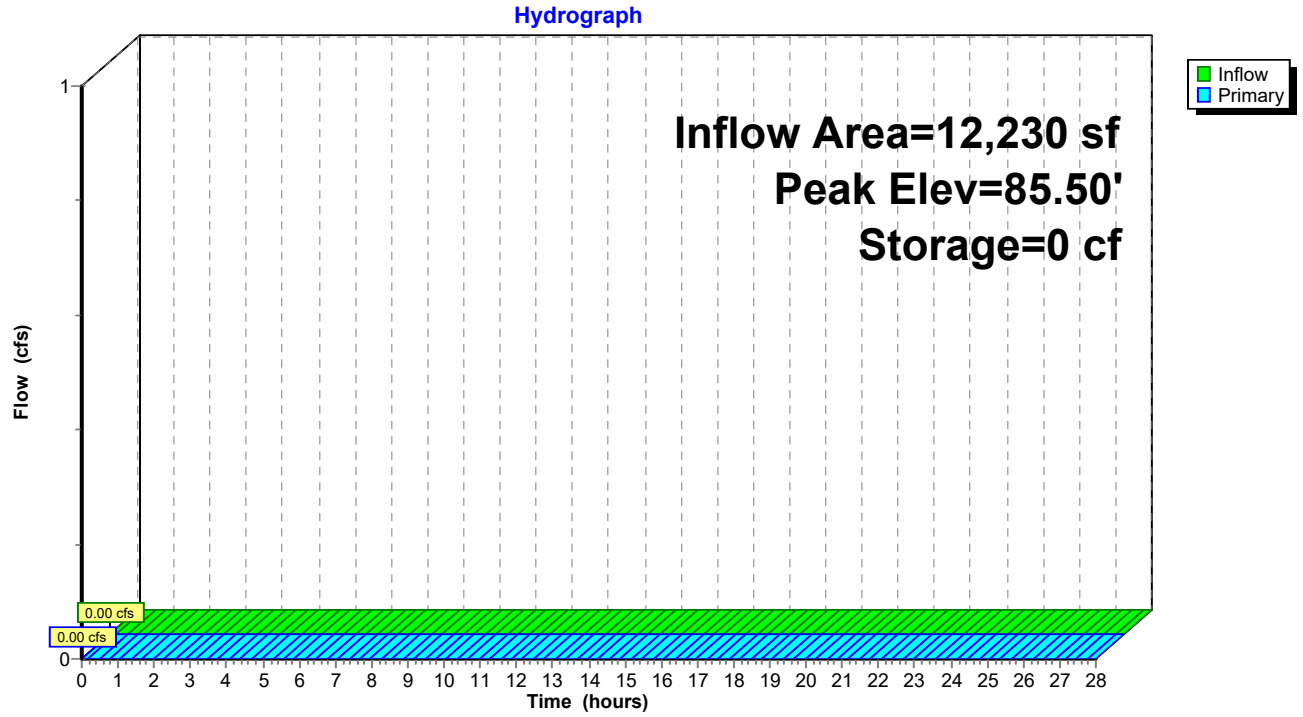
Volume	Invert	Avail.Storage	Storage Description
#1	85.50'	208 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.50	95	0	0
86.50	320	208	208

Device	Routing	Invert	Outlet Devices
#1	Primary	86.25'	**20.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=85.50' (Free Discharge)
1=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 3P: Sediment Forebay



Summary for Pond 4P: UIC #1 MC-3500

Inflow Area = 4,165 sf, 81.94% Impervious, Inflow Depth = 0.50" for WQV event
Inflow = 0.05 cfs @ 12.10 hrs, Volume= 175 cf
Outflow = 0.02 cfs @ 12.44 hrs, Volume= 175 cf, Atten= 67%, Lag= 20.8 min
Discarded = 0.02 cfs @ 12.44 hrs, Volume= 175 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 90.85' @ 12.44 hrs Surf.Area= 289 sf Storage= 33 cf

Plug-Flow detention time= 13.1 min calculated for 175 cf (100% of inflow)
Center-of-Mass det. time= 12.8 min (858.4 - 845.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	90.50'	370 cf	**8.42'W x 34.38'L x 5.50'H Field A** 1,592 cf Overall - 470 cf Embedded = 1,122 cf x 33.0% Voids
#2A	91.25'	470 cf	**ADS_StormTech MC-3500 d +Cap** x 4 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		840 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	90.50'	**2.410 in/hr Exfiltration over Wetted area**
#2	Primary	95.95'	**2.5" x 2.5" Horiz. Orifice/Grate X 6.00 columns** X 6 rows C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.02 cfs @ 12.44 hrs HW=90.85' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=90.50' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 4P: UIC #1 MC-3500 - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

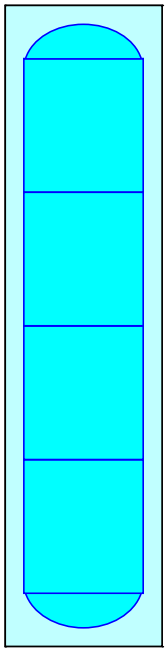
4 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 32.38' Row Length +12.0" End Stone x 2 = 34.38' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

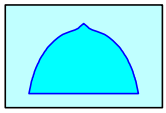
4 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 469.6 cf Chamber Storage

1,591.5 cf Field - 469.6 cf Chambers = 1,121.9 cf Stone x 33.0% Voids = 370.2 cf Stone Storage

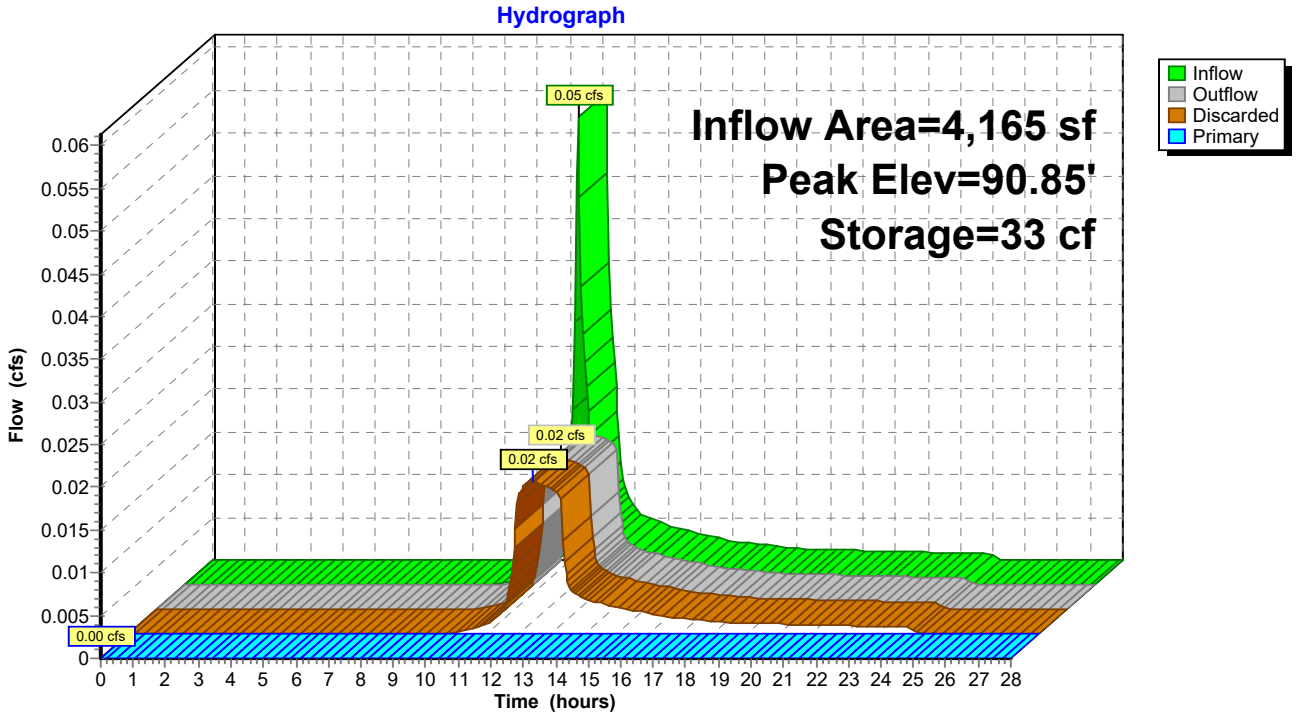
Chamber Storage + Stone Storage = 839.8 cf = 0.019 af
Overall Storage Efficiency = 52.8%
Overall System Size = 34.38' x 8.42' x 5.50'

4 Chambers
58.9 cy Field
41.6 cy Stone





Pond 4P: UIC #1 MC-3500



Summary for Pond 5P: Infiltration Basin

Inflow Area = 14,120 sf, 43.97% Impervious, Inflow Depth = 0.13" for WQV event
Inflow = 0.05 cfs @ 12.09 hrs, Volume= 155 cf
Outflow = 0.01 cfs @ 12.42 hrs, Volume= 155 cf, Atten= 71%, Lag= 20.1 min
Discarded = 0.01 cfs @ 12.42 hrs, Volume= 155 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 84.64' @ 12.42 hrs Surf.Area= 240 sf Storage= 32 cf

Plug-Flow detention time= 15.2 min calculated for 155 cf (100% of inflow)
Center-of-Mass det. time= 15.3 min (797.3 - 782.0)

Volume	Invert	Avail.Storage	Storage Description
#1	84.50'	905 cf	**Custom Stage Data (Conic)** Listed below (Recalc)

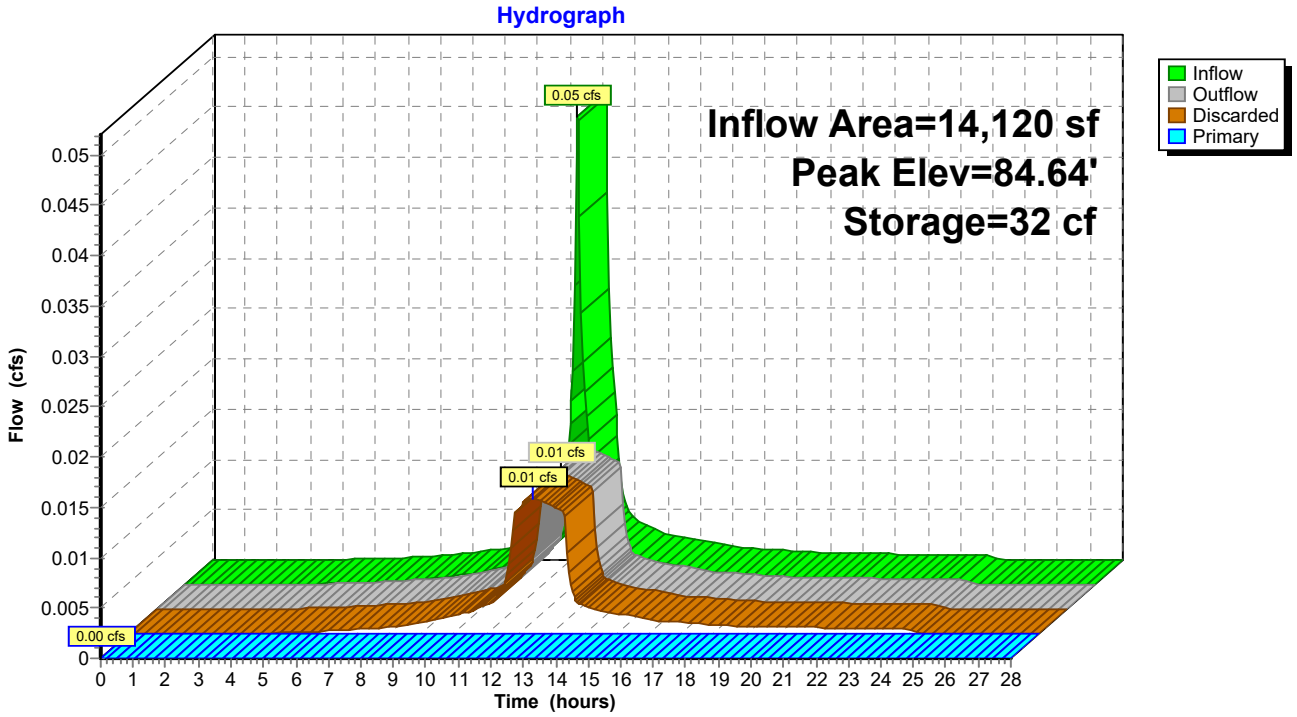
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
84.50	212	0	0	212
85.50	446	322	322	454
86.50	732	583	905	753

Device	Routing	Invert	Outlet Devices
#1	Discarded	84.50'	**2.410 in/hr Exfiltration over Wetted area**
#2	Primary	86.15'	**20.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Discarded OutFlow Max=0.01 cfs @ 12.42 hrs HW=84.64' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.01 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=84.50' (Free Discharge)
↑—**2=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 5P: Infiltration Basin



Summary for Pond 8P: UIC #2 iSOLATOR ROW MC-3500 1.75' stone

Inflow Area = 13,552 sf, 67.59% Impervious, Inflow Depth = 0.31" for WQV event
Inflow = 0.10 cfs @ 12.10 hrs, Volume= 345 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 82.30' @ 24.40 hrs Surf.Area= 350 sf Storage= 345 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1A	80.00'	617 cf	**8.42'W x 41.55'L x 7.00'H Field A** 2,448 cf Overall - 580 cf Embedded = 1,868 cf x 33.0% Voids
#2A	81.75'	580 cf	**ADS_StormTech MC-3500 d +Cap**x 5 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf
		1,196 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	85.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=80.00' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 8P: UIC #2 iSOLATOR ROW MC-3500 1.75' stone - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 1 rows = 29.8 cf

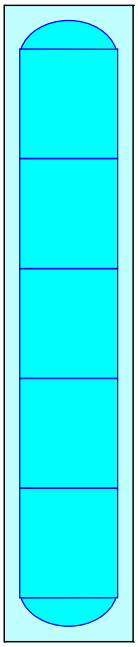
5 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 39.55' Row Length +12.0" End Stone x 2 = 41.55' Base Length
1 Rows x 77.0" Wide + 12.0" Side Stone x 2 = 8.42' Base Width
21.0" Stone Base + 45.0" Chamber Height + 18.0" Stone Cover = 7.00' Field Height

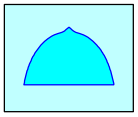
5 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 1 Rows = 579.6 cf Chamber Storage

2,448.0 cf Field - 579.6 cf Chambers = 1,868.4 cf Stone x 33.0% Voids = 616.6 cf Stone Storage

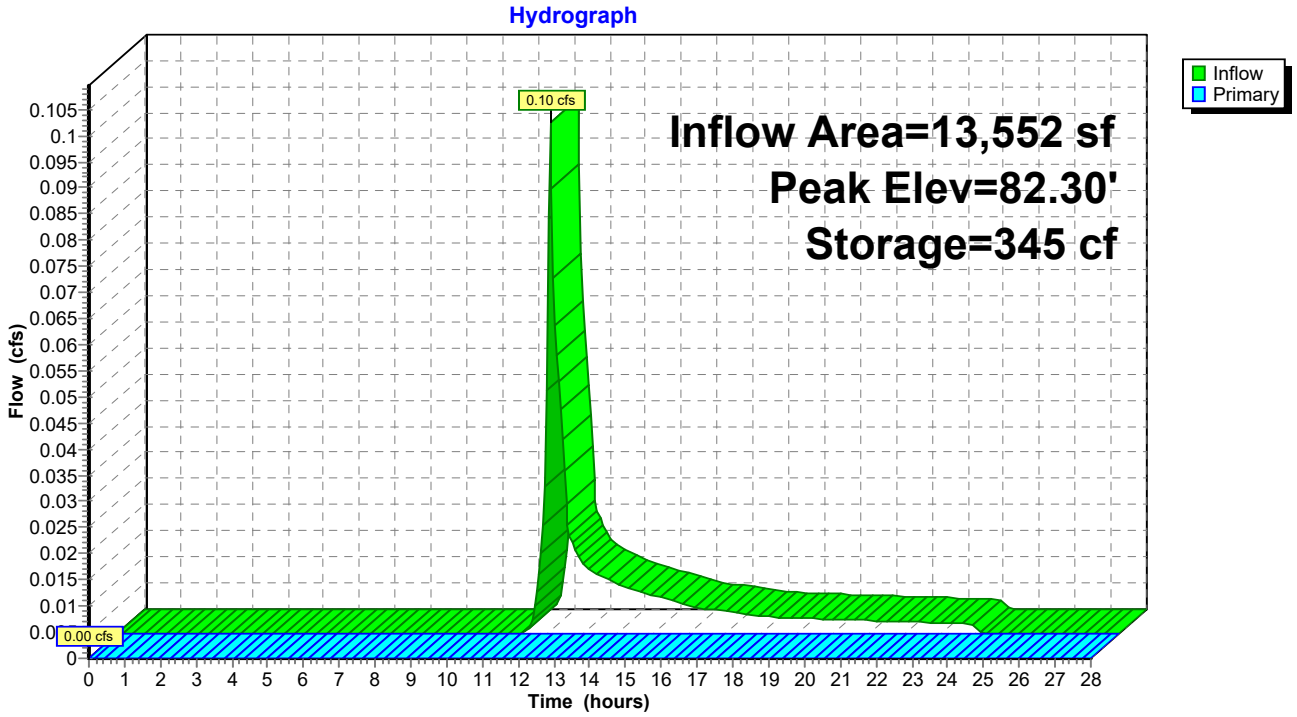
Chamber Storage + Stone Storage = 1,196.1 cf = 0.027 af
Overall Storage Efficiency = 48.9%
Overall System Size = 41.55' x 8.42' x 7.00'

5 Chambers
90.7 cy Field
69.2 cy Stone





Pond 8P: UIC #2 iSOLATOR ROW MC-3500 1.75' stone



Summary for Pond 11P: UIC #2 MC-3500 4.0' stone

Inflow Area = 17,302 sf, 74.62% Impervious, Inflow Depth = 0.21" for WQV event
Inflow = 0.09 cfs @ 12.09 hrs, Volume= 308 cf
Outflow = 0.04 cfs @ 12.05 hrs, Volume= 308 cf, Atten= 61%, Lag= 0.0 min
Discarded = 0.04 cfs @ 12.05 hrs, Volume= 308 cf
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 4
Peak Elev= 77.49' @ 12.32 hrs Surf.Area= 647 sf Storage= 52 cf

Plug-Flow detention time= 12.6 min calculated for 308 cf (100% of inflow)
Center-of-Mass det. time= 12.7 min (794.7 - 782.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	77.25'	1,701 cf	**15.58'W x 41.55'L x 9.75'H Field A** 6,313 cf Overall - 1,159 cf Embedded = 5,154 cf x 33.0% Voids
#2A	81.25'	1,159 cf	**ADS_StormTech MC-3500 d +Cap**x 10 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 10 Chambers in 2 Rows Cap Storage= +14.9 cf x 2 x 2 rows = 59.6 cf
		2,860 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	77.25'	**2.410 in/hr Exfiltration over Surface area**
#2	Primary	86.45'	**4.0" x 18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Discarded OutFlow Max=0.04 cfs @ 12.05 hrs HW=77.37' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=77.25' (Free Discharge)
↑—**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 11P: UIC #2 MC-3500 4.0' stone - Chamber Wizard Field A

Chamber Model = ADS_StormTechMC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= +14.9 cf x 2 x 2 rows = 59.6 cf

77.0" Wide + 9.0" Spacing = 86.0" C-C Row Spacing

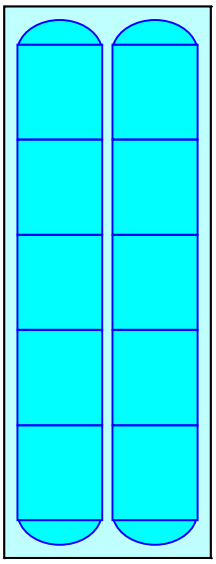
5 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 39.55' Row Length +12.0" End Stone x 2 = 41.55' Base Length
2 Rows x 77.0" Wide + 9.0" Spacing x 1 + 12.0" Side Stone x 2 = 15.58' Base Width
48.0" Stone Base + 45.0" Chamber Height + 24.0" Stone Cover = 9.75' Field Height

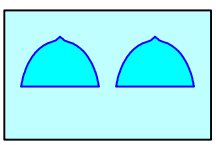
10 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 2 Rows = 1,159.1 cf Chamber Storage

6,313.0 cf Field - 1,159.1 cf Chambers = 5,153.9 cf Stone x 33.0% Voids = 1,700.8 cf Stone Storage

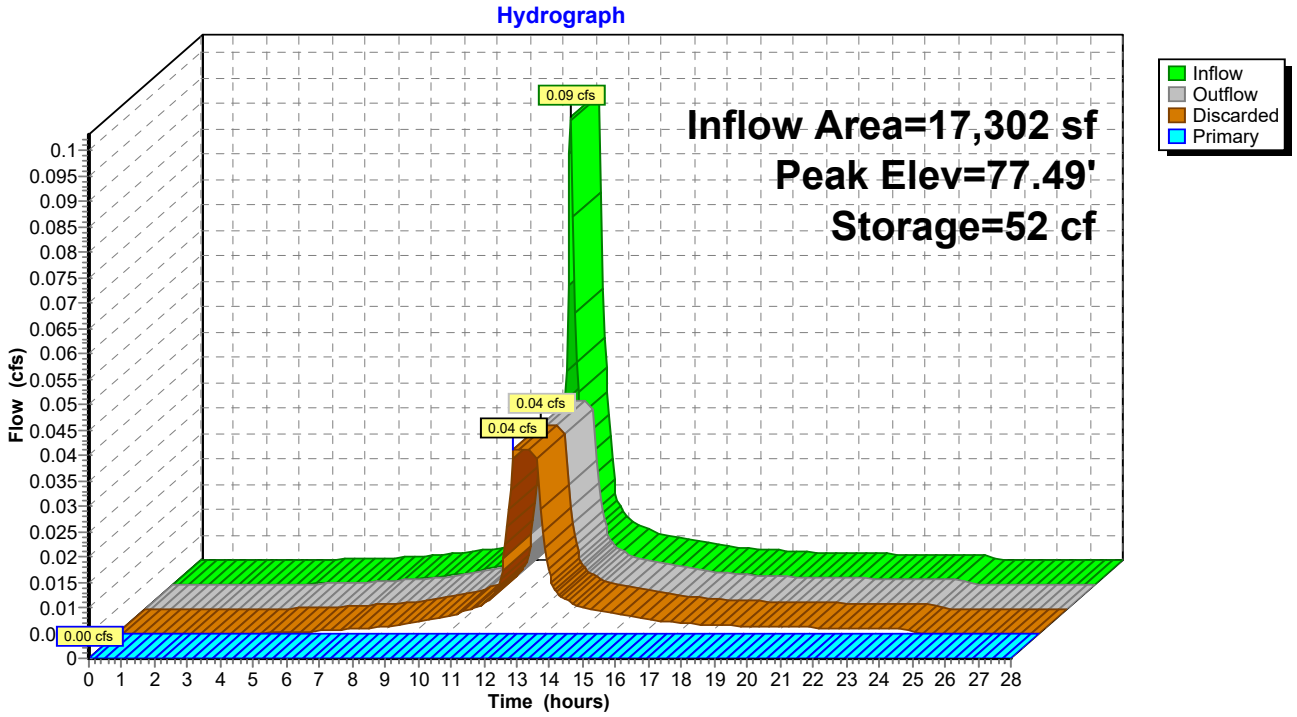
Chamber Storage + Stone Storage = 2,859.9 cf = 0.066 af
Overall Storage Efficiency = 45.3%
Overall System Size = 41.55' x 15.58' x 9.75'

10 Chambers
233.8 cy Field
190.9 cy Stone





Pond 11P: UIC #2 MC-3500 4.0' stone



Summary for Pond 12P: Pea gravel Diaphragm

Inflow Area = 12,230 sf, 35.31% Impervious, Inflow Depth = 0.06" for WQV event
Inflow = 0.00 cfs @ 12.42 hrs, Volume= 63 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Stor-Ind method, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 86.67' @ 24.40 hrs Surf.Area= 114 sf Storage= 63 cf

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

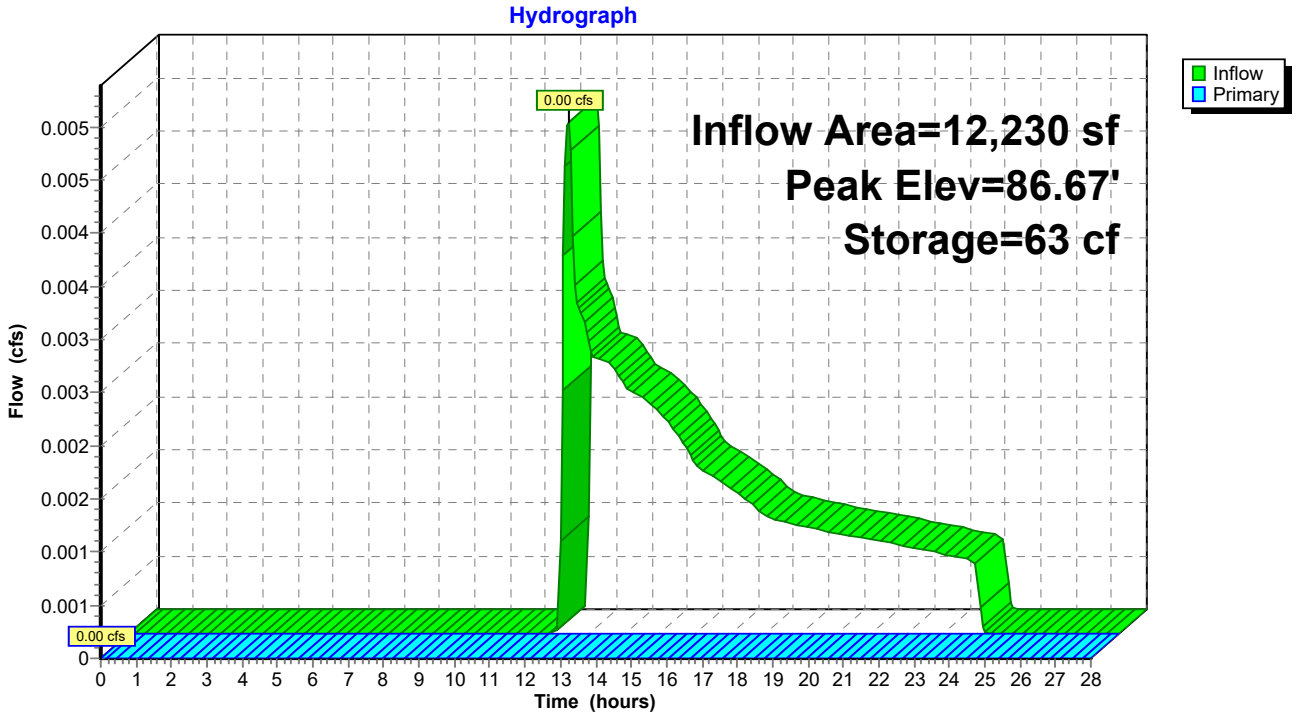
Volume	Invert	Avail.Storage	Storage Description
#1	85.00'	75 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 228 cf Overall x 33.0% Voids

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
85.00	114	0	0
87.00	114	228	228

Device	Routing	Invert	Outlet Devices
#1	Primary	86.94'	**38.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=85.00' (Free Discharge)
↑—**1=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 12P: Pea gravel Diaphragm

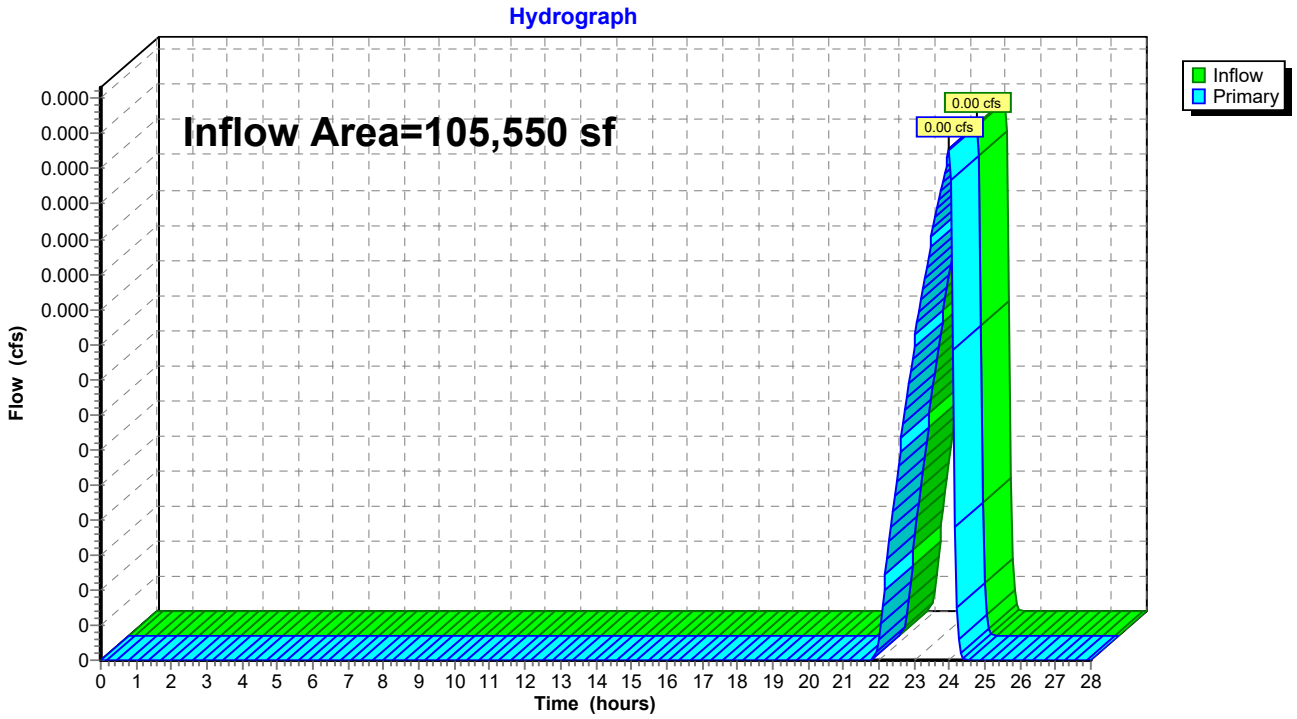


Summary for Link DP-1: Lower Gradient

Inflow Area = 105,550 sf, 21.75% Impervious, Inflow Depth = 0.00" for WQV event
Inflow = 0.00 cfs @ 23.99 hrs, Volume= 1 cf
Primary = 0.00 cfs @ 23.99 hrs, Volume= 1 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

Link DP-1: Lower Gradient



Summary for Link DP-2: Matunuck School House Road

Inflow Area = 32,956 sf, 66.76% Impervious, Inflow Depth = 0.24" for WQV event
Inflow = 0.18 cfs @ 12.11 hrs, Volume= 659 cf
Primary = 0.18 cfs @ 12.11 hrs, Volume= 659 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-28.00 hrs, dt= 0.05 hrs

Link DP-2: Matunuck School House Road