Engineers, Surveyors, Planners, Scientists

October 16, 2020

City of Columbus, Division of Sewerage & Drainage
Attn: Mr. Greg Fedner, P.E.
Private Development Section Manager
910 Dublin Road
Columbus, Ohio 43215

Subject: The Ohio State University Wexner Medical Center
Construction Staging Area
Type II Variance from Stormwater Drainage Manual

Dear Greg,

On behalf of The Ohio State University and Walsh/Turner Joint Venture, EMH&T is submitting an application for a Type II variance from the Columbus Stormwater Drainage Manual (SWDM) for the Wexner Medical Center Construction Staging Area project, (CC Plan Number pending), located at 527 West 10th Avenue, Columbus, Ohio 43210.

The project site is located within the Federal Emergency Management Agency (FEMA) 100-year floodplain boundary of the Olentangy River. A Type II variance is requested for approval of placement of stormwater management BMPs within the FEMA floodplain boundary (SWDM Section 3.1).

The following information is provided in support of the application:

- Project Name: The Ohio State University Wexner Medical Center Construction Staging Area
- Address, PID, Site Disturbance and Total Site Area:
  Address: 527 West 10th Avenue, Columbus, Ohio 43210
  PID: 010-067007-00 and 010-067017-00
  Site Disturbance: 1.52 acres
  Total Site Area: 1.52 acres (project only)
- Date Property Acquired: N/A
- Primary (Owner) Contact:
  The Ohio State University
  Facilities Operation and Development
  Attn: Ragan Fallang, Project Executive
  400 Enarson Classroom Building
  2009 Millikin Road, Columbus, OH 43210
  (614) 247-6150; Fallang.6@osu.edu

Additional information pertaining to the requested variance is included in the enclosed application document. Please contact me with any questions you may have at (614) 775-4210, or by email at sarden@emht.com.

Sincerely,

Shawn Arden, PE, CFM
Principal, Senior Water Resources Engineer

Cc: Ragan Fallang, The Ohio State University
Miles Hebert, PE, CFM, EMH&T
Nigel Carter, Walsh/Turner Joint Venture
Matt White, Walsh/Turner Joint Venture

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2020-0815

THE OHIO STATE UNIVERSITY
WEXNER MEDICAL CENTER
CONSTRUCTION STAGING AREA

City of Columbus SWDM Type II Variance Application

The Ohio State University and Walsh/Turner Joint Venture

October 16, 2020

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1.0 INTRODUCTION

The following report provides information pertaining to a requested variance from the City of Columbus Stormwater Drainage Manual (the Manual) for The Ohio State University Wexner Medical Center Construction Staging Area project (CC Plan Number pending).

The Ohio State University (University) with contractor Walsh/Turner Joint Venture (W/T) is currently redeveloping land east of Cannon Drive between 10th Avenue and 12th Avenue as part of the Wexner Medical Center. This work includes construction of an inpatient hospital tower representing an investment of $1.8 Billion Dollars and creating 1,800 new jobs within the City of Columbus. Construction of the inpatient tower project is currently scheduled for completion in 2025.

In order to facilitate construction of the inpatient hospital tower, the University and W/T desire to construct a temporary staging area in the vicinity of the Wexner Medical Center project. The staging area will be utilized for material storage, as well as queuing of material delivery vehicles (concrete trucks, flatbed trucks, etc.). Over the last 12 months, W/T evaluated numerous locations for construction of a temporary staging area to meet this need. These locations are shown below in Table 1.

Table 1: Alternate Locations Considered for Construction Staging Area

Location	Reason for Non-Selection
RPAC Athletic Fields	Unacceptable disruption to the athletic fields
Businesses at Lennox and Surrounding Areas	Private property, owners not interested.
Area south of New Cannon Drive Phase 1 Pump Station	Too small, also located in FEMA Floodplain
West of Cannon substation staging area	Already occupied, too small
Chiller Plant parking lot	Already occupied, too small
Parking lot south of Dodd	Conflicts with new parking garage
West campus	Too far away from site

Ultimately, W/T has determined the preferred location for the temporary staging area is in the existing green space on the west side of Cannon Drive between 10th Avenue and 12th Avenue. Refer to Figure 1 – Project Location Map on Page 3. The site, formerly the "Polo Fields" parking lot, was recently reconstructed into a park under the Cannon Drive Phase 1 project (plans 3269-E and CC-17287). W/T proposes to construct a temporary gravel staging area covering approximately 1.5 acres with a concrete approach apron to the existing Cannon Drive and 10th Avenue intersection. The staging area will be constructed immediately upon plan approval from the City. The staging area will be remain in place until 2025, when it will be removed and the site restored to current conditions (grade and vegetation).

The proposed staging area site is located within the current Federal Emergency Management Agency (FEMA) effective 100-year floodplain for the Olentangy River. The site is depicted on FEMA Flood Insurance Rate Map (FIRM) panel 39049C307K, dated June 17, 2008, and revised under Letter of Map Revision (LOMR) Case No. 15-05-3155P dated April 20, 2016 (following completion of the 5th Avenue Dam Removal Project). The FEMA effective floodplain mapping has not been revised following completion of the Cannon Drive Phase 1 project. The University intends to submit a LOMR application to FEMA to revise the flood hazard mapping for this area after

completion of construction of Cannon Drive Phase 2, once construction of the flood control levee is fully completed.

The project site is <u>not</u> located in any of the following features:

- the FEMA floodway,
- the Stream Corridor Protection Zone for the Olentangy River, nor
- the existing Environmental Covenant in place on the Olentangy River.

The University and W/T are proposing to comply with the stormwater and floodplain management provisions of the Manual for construction of the staging area as follows:

- Stormwater Quantity Control: Dry detention storage on the staging area surface and within an aggregate bed consisting of #2 stone.
- Stormwater Quality Control: Use of Water Quality Credits generated by the Cannon Drive Phase 1 Project (CC-17287). 21.27 acres of water quality credits are currently available; the University proposes to temporarily use 1.52 acres of credits for the staging area project. These credits will be returned when the staging area is removed in 2025.
- Floodplain Compensatory Storage: Use of Compensatory Storage Credits remaining for this reach of the Olentangy River. From the CC-17287 plan, 9,305 cubic yards of Floodplain Compensatory Storage Credits remain available for this reach of the Olentangy River. The University proposes to temporarily use 116 cubic yards of credits. These credits will be returned when the staging area is removed in 2025.

Having addressed the remaining provisions of the Manual, the University and W/T are seeking a Type II variance for the project for the placement of stormwater management BMPs within the FEMA floodplain boundary (SWDM Section 3.1).

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CITY OF COLUMBUS, FRANKLIN COUNTY, OHIO

Project Location Map
Figure 1

N

2.0 TYPE II VARIANCE REQUEST

The University and W/T are requesting a variance from certain aspects of the Manual for The Ohio State University Wexner Medical Center Construction Staging Area project. Specifically, the University and W/T seek approval to place stormwater management BMPs within the FEMA floodplain boundary (Manual Section 3.1). Additional details regarding this request for a variance are provided in the following sections.

2.1 Site Conditions

The proposed staging area site is located along the Olentangy River immediately west of Cannon Drive between 10th Avenue and 12th Avenue. The site is currently composed of park space constructed under the Cannon Drive Phase 1 project. The site is well suited for use as a temporary Construction Staging Area due to its location directly across Cannon Drive from the Wexner Medical Center construction project that necessitates this staging area. Access to the staging area site is readily available at the Cannon Drive and 10th Avenue intersection.

As shown in Exhibit 1, the majority of the project site and adjacent undeveloped land is located within the FEMA effective Zone AE 100-year floodplain. Areas mapped by FEMA as outside the 100-year floodplain limits are associated with a narrow earthen berm that was previously located along the Olentangy River Trail. This berm was removed as part of the Cannon Drive Phase 1 project, and this land is now located below the FEMA 100-year floodplain elevation. As discussed earlier in Section 1 - Introduction, the construction staging area site is not located in the FEMA floodway, Stream Corridor Protection Zone, nor the Environmental Covenant in place over the Olentangy River.

Per Section 3.1 of the Manual, "stormwater runoff generated from onsite areas shall be controlled before it is released from the development site" and "stormwater control facilities shall not be located within designated FEMA floodplain boundaries." For the project site, meeting both of these requirements is not possible. The entire staging area site is located within either the mapped floodplain or is currently below the FEMA floodplain elevation due to recent permitted construction activity, thus any post-construction stormwater BMPs required for the permanent development on this site must be positioned within the floodplain boundary.

2.2 Proposed Stormwater BMPs

The University and W/T propose to construct a dry detention area on the staging area site to provide post-construction stormwater quantity control to meet the requirements of the Manual. Stormwater detention will be provided through a combination of surface and aggregate bed storage. The detention area will manage the runoff from the proposed temporary staging area prior to discharging to existing stormwater infrastructure that ultimately discharges to the Olentangy River.

Stormwater quality control requirements will be addressed separately through the use of Water Quality Credits generated by the Cannon Drive Phase 1 stormwater basin. A total of 21.60 acres of Water Quality Credits were generated by the Cannon Drive project. The Dodd Parking Garage project (CC-19146) used 0.33 acres of credits, leaving 21.27 acres available. This staging area project proposes to use 1.52 acres of credit. The credits will be returned and

available for reuse by the University for other project needs after the staging area is removed and the site is restored to current conditions.

All of the site improvements, including the stormwater management area, are located within the FEMA-mapped 100-year floodplain. Additional details regarding the proposed stormwater basins are provided in the Stormwater Management Plan for the site (Appendix A), and the basin engineering plan sheets provided within Appendix B.

2.3 Impacts to Stormwater Detention and Water Quality

The proposed stormwater management area, along with the use of available Water Quality Credits, will provide stormwater quantity and quality control benefits for the project in alignment the requirements of the Manual. Further, the stormwater management area has been designed to be protected from floodwaters of the Olentangy River. A HESCO FLOODLINE barrier will be constructed to separate the construction staging area and stormwater detention area from the Olentangy River floodplain. Further, a backflow preventer is proposed to be installed on all discharge pipes from the staging area that are at an elevation below the FEMA 100-year flood elevation.

No degradation of water quantity or quality control benefits are expected with this project as designed.

2.4 Statement of Hardship

As shown in Exhibit 1, the vast majority of undeveloped land in the vicinity of the Wexner Medical Center project is currently mapped by FEMA as 100-year floodplain. Adequate land to build a suitable temporary construction staging area is not available nearby that is also located outside of the 100-year floodplain limits. As discussed in Section 1 – Introduction, the University and W/T have spent over 12 months evaluating other locations for the Construction Staging Area and determined that this site is the preferred option, despite the floodplain encumbrance and recent completion of the Cannon Drive Phase 1 project. The University and W/T have strived to develop a design concept that satisfies the overarching stormwater quality and quantity control requirements of the Manual, as well as protects the stormwater detention area from access by Olentangy River floodwaters. Further, this construction staging area project is a temporary activity. The staging area will be deconstructed in 2025, with the site restored to the current park conditions, including grade and vegetative cover.

Thus, the University and W/T respectfully ask for approval of the requested variance from Section 3.1 of the Manual to allow for placement of the proposed stormwater BMPs within the FEMA mapped 100-year floodplain.

3.0 SITE DEVELOPMENT ALTERNATIVES

In accordance with the requirements of the Manual and the City's Variance Guidance Policy, a Type II variance application must include three site development plans: full compliance, minimal impact and preferred alternative. The proposed construction staging area plan, as submitted, represents the Minimal Impact Alternative.

3.1 Full Compliance

The existing stormwater management basin constructed under Cannon Drive Phase 1 was reviewed for potential use as credit for both stormwater quantity control and quality control for The Ohio State University Wexner Medical Center Construction Staging Area project. Although this stormwater basin is also located within the current FEMA-mapped 100-year floodplain, prior approval was provided by the City for its construction; therefore, we anticipate that expansion of the basin would be allowed, if feasible.

The Stormwater Management Report for the Cannon Drive Phase 1 stormwater basin was filed with CC-17287. The CC-17287 plan indicates that construction of the dry basin creates 21.60 acres of water quality credits that can be applied to other University projects. Water Quality Credits can be applied at a 1:1 ratio for projects located north of King Avenue, south of Woody Hayes Drive, west of Neil Avenue, and east of the Olentangy River. The Dodd Parking Garage project (CC-19146) is using 0.33 acres of Water Quality Credits, leaving 21.27 acres of credits available. The Construction Staging Area project is located in this area, and proposes to use 1.52 acres of the 21.27 acres of available Water Quality Credits. As discussed earlier, the credits will be returned when the staging area is deconstructed and the site restored to current conditions. Note: the Water Quality Credits provided by the Cannon Drive Phase 1 basin, as well as the basin's design, were driven by the drainage area tributary to the basin. The excess water quality credits cannot be reallocated for use as water quantity credit.

The Stormwater Management Report for CC-17287 includes release rate performance information for the Cannon Drive Phase 1 stormwater basin, as shown below in Table 2, along with a summary of excess stormwater quantity control (credits) available for each storm recurrence interval. As shown in the Table, significant stormwater quantity control credit is available in the Cannon Drive Phase 1 basin for storm events except for the 100-year event.

Table 2: Cannon Drive Phase 1 Dry Basin Performance Information (CC-17287)

Storm Event (Recurrence Interval)	Peak Inflow (cfs)	Peak Outflow (cfs)	Reduction in Peak Flow Rate (cfs)	Required Reduction in Peak Flow Rate (cfs)	Stormwater Quantity Control Credit (cfs)
1-yr	26.61	4.74	21.87	3.16	18.71
2-yr	34.49	5.25	29.24	6.10	23.14
5-yr	50.09	5.90	44.19	4.12	40.07
10-yr	62.08	6.24	55.84	38.29	17.55
25-yr	77.59	6.51	71.08	43.09	27.99
50-yr	88.34	6.68	81.66	47.06	34.60
100-yr	101.05	7.01	94.04	93.39	0.65

Table 3 presents a summary of stormwater quantity control credits required for the construction staging area project for each storm event recurrence interval. The table also presents the available Stormwater Quantity Credits from the existing Cannon Drive Phase 1 basin. As shown in the Table, the existing Cannon Drive basin can provide adequate Stormwater Quantity Control Credits for all events except for the 100-year event, where an additional 7.47 cfs peak discharge reduction is required. Upon inspection of Table 2, the peak discharge from the existing Cannon Drive basin is only 7.01 cfs; therefore, it is not feasible to gain additional stormwater

quantity control benefits from this basin, even if the basin was taken to an undesirable zero discharge condition. This scenario is not feasible.

Table 3: Construction Staging Area Stormwater Quantity Control Credits Required

Storm Event (Recurrence Interval)	Construction Staging Area			Cannon Drive	
	Peak Outflow (Undetained) (cfs)*	Allowable Release Rate (cfs)	Required Reduction in Peak Flow Rate (cfs)	Stormwater Quantity Control Credit (cfs)	Stormwater Quantity Credit Deficit (cfs)
1-yr	4.93	1.72	3.21	18.71	-
2-yr	6.14	1.96	4.18	23.14	-
5-yr	7.87	2.34	5.53	40.07	-
10-yr	9.30	2.67	6.63	17.55	-
25-yr	11.30	3.14	8.16	27.99	-
50-yr	12.97	3.54	9.43	34.60	-
100-yr	14.72	6.60	8.12	0.65	7.47

*Calculations for total undetained peak outflow are included in Appendix C.

EMH&T reviewed additional options to address the Stormwater Quantity Credit deficit for the 100-year storm event, which are summarized in Table 4. In short, alternatives to address the Stormwater Quantity Credit deficit either did not provide adequate credits or created additional hardship for the University.

Table 4: Additional Full Compliance Options Considered

Option	Discussion
Use of Stormwater Quantity Credits from Other Recent OSU Projects in the Vicinity of the WMC Construction Staging Area project.	The Mirror Lake Renovation Project (CC-17779) was constructed in 2018 east of this location; however, review of the Stormwater Management Plan shows the project has surplus stormwater quantity control credit of only 0.09 cfs for the 100-year event. The Dodd Parking Garage (CC-19146) is currently planned on the east side of Cannon Drive and south of Medical Center Drive. The stormwater quantity control for this project is provided by an underground system that has already been designed. The Stormwater Management Plan for this project indicates the system, which has already been designed, has 2.16 cfs of surplus water quantity control credits for the 100-year event, which is not enough to also cover the requirements for the staging area project.
Construction of an Offsite Regional Stormwater Management Facility	The University has considered construction of regional stormwater management facilities in prior studies. However, the University is not prepared to undertake a project of this additional scope at this time. Development of an offsite regional stormwater management facility to facilitate a temporary construction staging area creates a separate hardship on the University.

Based on the above information, the University considers the Full Compliance options not feasible for implementation.

3.2 Minimal Degradation

The Minimal Degradation scenario for the Construction Staging Area project is currently shown in the enclosed Stormwater Management Plan (Appendix A) and engineering drawings (Appendix B) for the project. Stormwater quality control requirements are addressed using existing Water Quality Credits from the Cannon Drive Phase 1 basin. Again, the Construction Staging Area project proposes to use 1.52 acres of the 21.27 acres of available Water Quality Credits. The credits will be returned when the staging area is deconstructed and the site restored to current conditions. Stormwater quantity control requirements are addressed by a dry detention stormwater management facility to be constructed with the staging area project. Calculations for the dry detention facility are included in Appendix A. The detention facility will be removed when the staging area is deconstructed and the site restored to existing conditions. The only requirement of the Manual that is not satisfied by this scenario is that the proposed stormwater management facility is located in an area that is currently mapped by FEMA as within the 100-year floodplain. The University has taken design measures to protect the proposed stormwater management facility from Olentangy River floodwaters, as discussed in Section 2.3.

Based on the above information, the University considers the Minimal Degradation option as feasible and requests approval of this variance application for implementation.

3.3 Preferred Alternative

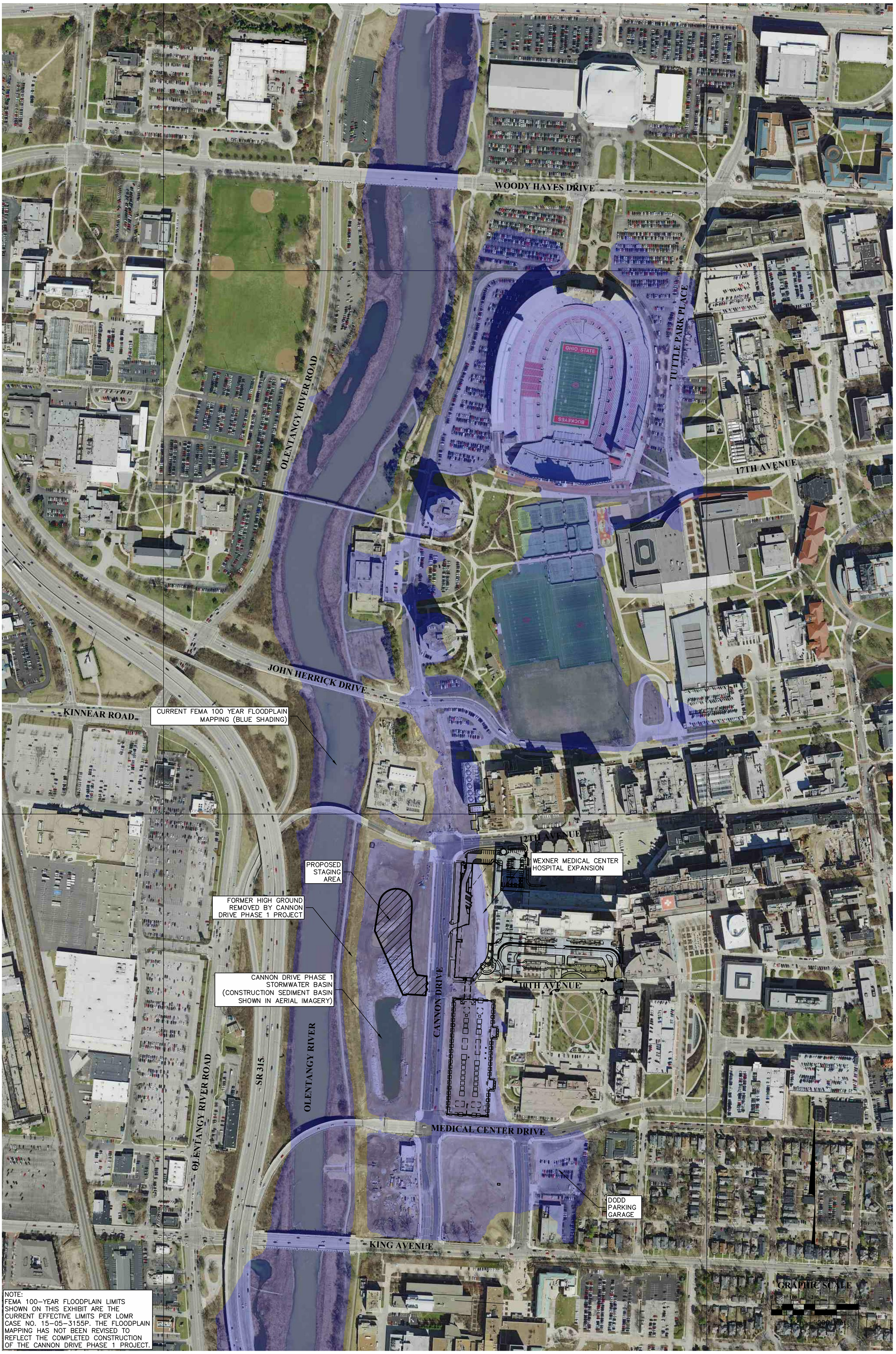
The Preferred Alternative scenario for the Construction Staging Area project is a modification of the Minimal Degradation scenario. Stormwater quality control requirements are addressed using existing Water Quality Credits from the Cannon Drive Phase 1 basin. Again, the Construction Staging Area project proposes to use 1.52 acres of the 21.27 acres of available Water Quality Credits. The credits will be returned when the staging area is deconstructed and the site restored to current conditions. Stormwater quantity control requirements are addressed by a dry detention stormwater management facility to be constructed with the staging area project. However, the excess Water Quantity Credits from the Cannon Drive Basin would be applied to eliminate the detention requirements for all storm recurrence intervals except for the 100-year event. This will in turn reduce the size and ponding frequency of the dry detention area. Similar to the Minimal Degradation scenario, the only requirement of the Manual that is not satisfied by the Preferred Alternative scenario is that the proposed stormwater management facility is located in an area that is currently mapped by FEMA as within the 100-year floodplain. The design measures proposed by the University to protect the proposed stormwater management facility from Olentangy River floodwaters, as discussed in Section 2.3, apply to this scenario as well.

Based on the above information, the University considers the Preferred Alternative option as feasible; however, the University is not asking for approval of the variance to implement this option.

4.0 CONCLUSIONS

The University and W/T seek approval of the Type II variance for the Minimal Degradation Plan for The Ohio State University Wexner Medical Center Construction Staging Area project in order to place required stormwater BMPs in the FEMA mapped 100-year floodplain of the Olentangy River (Section 3.1 of the Manual). The University has presented three alternatives to address the issue, as required by the Manual for a Type II variance application. The University considered both the Preferred Alternative and the Minimum Degradation options as feasible. The University is requesting approval of the variance application to implement the Minimum Degradation option.

EXHIBITS



NOTE:
FEMA 100-YEAR FLOODPLAIN LIMITS SHOWN ON THIS EXHIBIT ARE THE CURRENT EFFECTIVE LIMITS PER LOMR CASE NO. 15-05-3155P. THE FLOODPLAIN MAPPING HAS NOT BEEN REVISED TO REFLECT THE COMPLETED CONSTRUCTION OF THE CANNON DRIVE PHASE 1 PROJECT.

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CITY OF COLUMBUS, FRANKLIN COUNTY, OHIO
TYPE II VARIANCE APPLICATION
FOR

THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

CONSTRUCTION STAGING AREA
EXHIBIT 1 – PROJECT VICINITY MAP

Date	Job No.
October 2020	2020-0815
Scale: AS NOTED	Sheet: 1/1

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APPENDIX A

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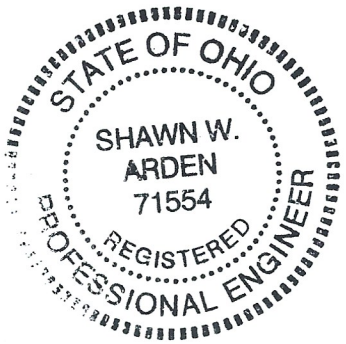
Job Number: 2020-0815

The Ohio State University
Wexner Medical Center
Construction Staging Area

Stormwater Management Plan (SWMP)

Prepared For: The Ohio State University and Walsh/Turner Joint Venture

October 15, 2020



10-15-2020

EMH&T

A legacy of **experience**. A reputation for **excellence**.

PROJECT SUMMARY

Project Name:	The Ohio State University Wexner Medical Center Construction Staging Area
Location:	City of Columbus, Franklin County, Ohio
Type:	Stormwater Management Plan
Reviewing Agency:	City of Columbus, Ohio EPA

HYDROLOGIC SUMMARY

Rainfall Data: NOAA Atlas 14, Volume 2, Version 3, 2004

1-yr	2.20”
2-yr	2.63”
5-yr	3.24”
10-yr	3.74”
25-yr	4.44”
50-yr	5.02”
100-yr	5.63”

Rainfall Distribution:	NRCS Type II 24 hour
Detention Policy:	City of Columbus
Water Quality:	City of Columbus, Ohio EPA
Hydrology Modeling Program:	HydroCAD 10.0

DESIGN SUMMARY

Detention:	Surface and Aggregate Bed Storage
Water Quality:	Use of Existing WQ Credits
Receiving Water Body:	Olentangy River

REVISIONS

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TABLES

APPENDICES

1.0 INTRODUCTION

The following report provides a detailed analysis and design of the Stormwater Management Plan for The Ohio State University Wexner Medical Center Construction Staging Area. The proposed site is located west of Cannon Drive between 10th Avenue and 12th Avenue. The proposed project area involves the development of a temporary gravel staging area. The staging area will be removed in June 2025 and the site restored to current conditions. The Stormwater Management Plan was prepared in accordance with the requirements of both the City of Columbus and the Ohio EPA. The runoff from this site will be detained at the west end of the staging area on the surface and in an aggregate bed consisting of #2 stone prior to controlled discharge to the Olentangy River. A HESCO FLOODLINE barrier will be constructed along the western edge of the staging area to facilitate runoff storage and attenuation.

Figure 1 – Site Location Map

2.0 HYDROLOGIC ANALYSIS

Hydrologic parameters such as Runoff Curve Number (RCN) and Time of Concentration were determined using standard Natural Resources Conservation Service (NRCS) methodology. The 1-, 2-, 5-, 10-, 25-, 50-, and 100-year storm event discharge amounts were calculated using the NRCS

TR-55 method. This analysis reflects the NRCS Type II distribution, 24-hr storm duration. Rainfall depths were obtained from NOAA Atlas 14, Volume 2, Version 3, 2004. The peak flow rates were computed using the HydroCAD 10.0 computer program.

3.0 PRE-DEVELOPED ANALYSIS

The pre-developed condition generally consists of park space in good condition, resulting from the recently constructed Cannon Drive Phase 1 project (CC-17287). Runoff Curve Number values used for the existing land cover are 74 for open space and 98 for impervious areas. A Runoff Curve Number of 96 was used for proposed gravel areas. Pre-developed areas 01 (onsite) and 03 (offsite) naturally drain to the west to an existing catch basin that discharges to the Olentangy River. Pre-developed 02 (onsite) naturally drains to Cannon Drive storm sewer system, which discharges to the Olentangy River.

All pre-developed subarea characteristics are summarized in Table 1. Pre-developed peak flow rates are provided in Table 2. All time of concentration calculations can be found in the HydroCAD output in Appendix A.

Table 1 -Pre-developed Subarea Characteristics

Subarea Identifier	Tributary Area (acres)	Land Usage	Runoff Curve Number	% Impervious (%)	Time of Concentration (min)	1-year Runoff Volume (ac-ft)
Onsite Areas						
Subarea 01	1.43	Open Space, Impervious cover	75	2%	5	0.051
Subarea 02	0.09	Open Space, Impervious cover	87	56%	5	0.007
Total	**1.52**	**-**	**75**	**5%**	**-**	**0.058**
Offsite Areas tributary to the site						
Subarea 03	0.51	Open Space, Impervious cover	80	25%	8	0.026
Total	**0.51**	**-**	**80**	**25%**	**-**	**0.026**

Table 2 -Pre-developed Peak Flow Rates

Storm Event (year)	Pre-developed 01 Peak Flow Rates (cfs)	Pre-developed 02 Peak Flow Rates (cfs)	Pre-developed 01 + 02 Peak Flow Rates (cfs)	Pre-developed 03 Peak Flow Rates (cfs)
1	1.16	0.17	1.33	0.56
2	1.82	0.23	2.04	0.80
5	2.87	0.31	3.18	1.18
10	3.79	0.38	4.17	1.51
25	5.16	0.48	5.64	1.98
50	6.34	0.56	6.90	2.38
100	7.61	0.64	8.25	2.81

4.0 POST-DEVELOPED ANALYSIS

Exhibit 2, provided within Appendix B, shows the post-developed condition. The Construction Staging Area will provide stormwater quantity control by detaining runoff on the surface as well as within the void space of an aggregate bed consisting of #2 stone. Runoff will be collected by a 4-inch perforated underdrain installed in the aggregate bed and connected to three 4-inch outlet pipes to regulate the discharge rate from the site. An additional two 4-inch outlet pipes are located at the staging area surface to discharge runoff (second stage outlet). A HESCO FLOODLINE barrier is provided along the west edge of the staging area to detain the stormwater runoff.

Subarea 01 and 03 will drain to stormwater detention area. Subarea 02 will bypass the proposed stormwater detention area, by will ultimately discharge to the same receiving water (Olentangy River) through the existing storm sewer system. The post-developed subarea characteristics are summarized in Table 3. The post-developed allowable release rates and proposed release rates can be found in Tables 4 and 5, respectively. Individual basin release rates and water surface elevations are provided in Table 6. Calculations supporting the runoff analysis are provided in the HydroCAD output in Appendix A.

Table 3 -Post-developed Subarea Characteristics

Subarea Identifier	Tributary Area (acres)	Land Usage	Runoff Curve Number	% Impervious (%)	Time of Concentration (min)	1-year Runoff Volume (ac-ft)
Onsite Areas						
Subarea 01	1.43	Gravel	96	100%	5	0.198
Subarea 02	0.09	Gravel, pavement	97	100%	5	0.013
Total	**1.52**		**96**	**100%**	**-**	**0.211**
Offsite Areas tributary to the Site						
Subarea 03	0.51	Open Space, Impervious cover	80	25%	8	0.026
Total	**0.51**	**-**	**80**	**25%**	**-**	**0.026**

The 1-year runoff volume for the post-developed site increases from 0.058 to 0.168 ac-ft, an increase of 190% from the existing condition, which results in 25-year critical storm event.

$$\% \text{ Increase} = [(0.211 - 0.058)/0.058] \times 100 = 264\%$$
50-Yr Critical Storm

In order to manage discharge to the Olentangy River, the 50-year post-developed runoff peak flow rate should be equal to or less than the 1-year pre-developed runoff peak flow rate. In addition, the 100-year post-developed runoff peak flow rate should be equal to or less than the 10-year pre-developed runoff peak flow rate.

Table 4 -Allowable Release Rates

Storm Event (yr.)	Pre-developed 01 Peak Flow Rates (cfs)	Pre-developed 03 (Offsite) Peak Flow Rates (cfs)	Allowable Release Rates (cfs)
1	1.16	0.56	1.72
2	1.82	0.80	1.96
5	2.87	1.18	2.34
10	3.79	1.51	2.67
25	5.16	1.98	3.14
50	6.34	2.38	3.54
100	7.61	2.81	6.60

*Discharge from Subarea 02 is not included in the Allowable Release Rate calculation.

Table 5 -Proposed Release Rates

Storm Event (yr.)	Post-developed 01+03 Peak Flow Rates (cfs)	Dry Basin 01 Proposed Release Rates (cfs)	Subarea 02 Bypass Proposed Flow Rates (cfs)	Project Total Proposed Release Rates (cfs)	Allowable Release Rates (cfs)
1	4.03	1.46	0.24	1.69	1.72
2	5.20	1.70	0.30	1.91	1.96
5	6.87	2.10	0.39	2.31	2.34
10	8.26	2.41	0.45	2.64	2.67
25	10.21	2.61	0.55	2.95	3.14
50	11.83	2.70	0.63	3.12	3.54
100	13.54	2.79	0.71	3.28	6.60

Table 6 -Proposed Detention Area Performance

Storm Event (yr.)	Dry Basin 01 Proposed Release Rates (cfs)	Maximum W.S.E., T.O.B. = 725.5 (feet)	Storage Volume Utilized (ac-ft)
1	1.52	724.34	0.066
2	1.74	724.53	0.087
5	2.16	724.80	0.117
10	2.43	725.01	0.143
25	2.56	725.13	0.181
50	2.66	725.23	0.214
100	2.75	725.34	0.250

Storage Utilized (100-yr event): 0.250 ac-ft
Storage Provided (Top of Bank = 725.50 ft.): 0.304 ac-ft

5.0 OUTLET DESIGN

The outlet structures for Dry Basin 01 will be located on the west and south sides of the staging area. The location of this structures can be seen on Exhibit 2 in Appendix B.

Dry Basin 01 - Outlet Control Structure

- Bottom of Basin – 722.00 ft.
- Top of Bank – 725.50 ft.
- 1st stage outlets
    - Outlet #1: 4-inch pipe, 7 LF invert at 723.05 ft.
    - Outlet #3: 4-inch pipe, 7 LF invert at 722.35 ft. This pipe has a backflow preventer (Tideflex TF-1) as the invert is below the base flood elevation for the Olentangy River. Manning's n value has been increased to 0.021 to account for the additional head loss due to the backflow preventer.
    - Outlet #5: 4-inch pipe, 7 LF invert at 723.11.
- 2nd stage outlets
    - Outlet #2: 4-inch pipe, 4 LF invert at 724.40 ft.
    - Outlet #4: 4-inch pipe, 4 LF invert at 724.10 ft.
- Tailwater – Assumed no tailwater due to discharge at surface.
- Leakage – A leakage rate for the HESCO barrier of approximately 0.04 cfs per vertical foot head was applied based on US Army Corps of Engineers testing data. Leakage accounts for less than 5% of the peak discharge rate from the storage area.

6.0 WATER QUALITY

The project proposes to address water quality requirements by use of credits generated from the existing Cannon Drive Phase 1 stormwater basin (CC-17287). The Cannon Drive Basin generated 21.60 acres of water quality credits. This Construction Staging Area project proposed to use 1.52 acres of credits temporarily. The credits will be restored when the staging area is deconstructed and the site restored to current conditions.

7.0 SEDIMENT BASIN CALCULATIONS

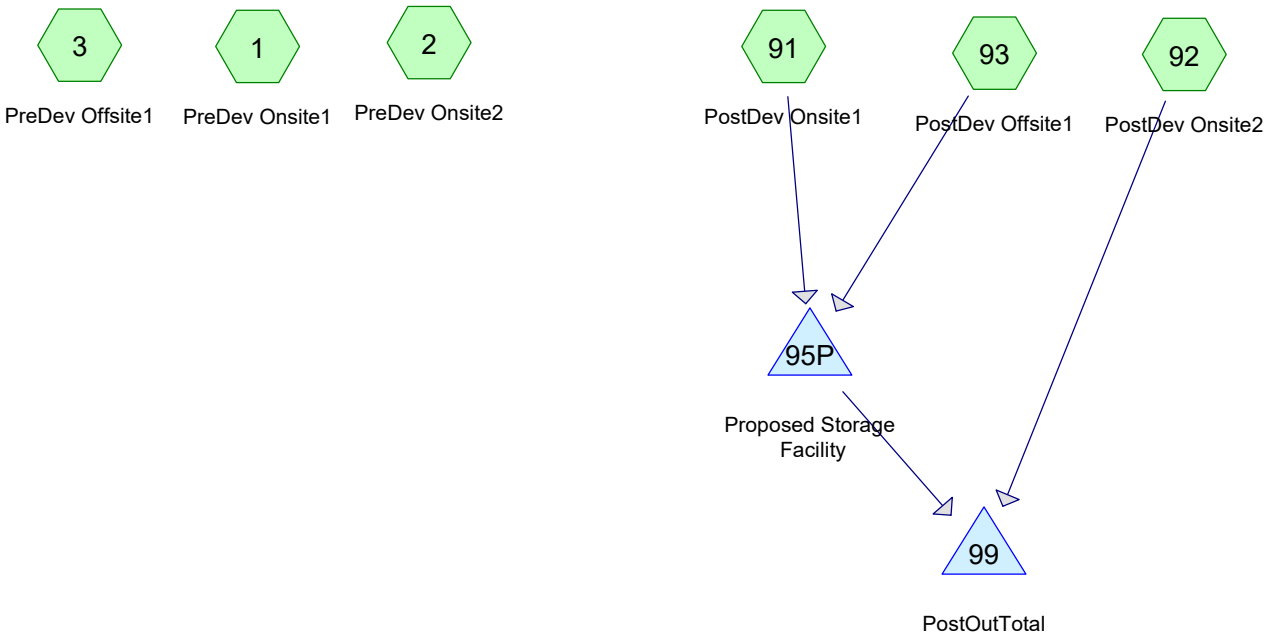
The Ohio EPA requires that during construction a site must provide a means by which to control the sediment laden runoff from the construction site. Sediment control for this project will be addressed using 24-inch diameter compost filter socks. Supporting calculations are shown on the CC plans.

8.0 CONCLUSION

The proposed stormwater management plan for The Ohio State University Wexner Medical Center Construction Staging Area all requirements for detention and water quality as set forth by the City of Columbus and the Ohio EPA.

APPENDIX A:

HydroCAD Output



Subcat Reach Pond Link

Routing Diagram for 20200815-r
Prepared by Symanetc, Printed 10/14/2020

Summary for Subcatchment 1: PreDev Onsite1

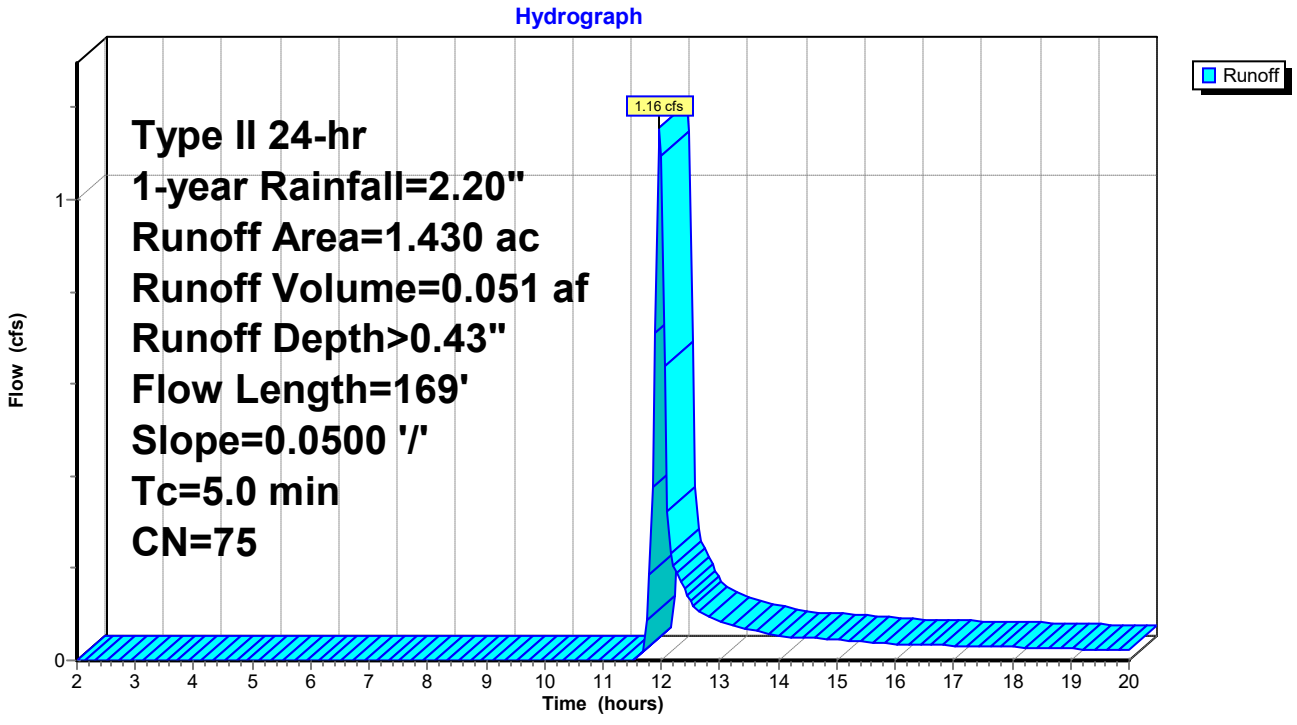
Runoff = 1.16 cfs @ 11.97 hrs, Volume= 0.051 af, Depth> 0.43"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-year Rainfall=2.20"

	Area (ac)	CN	Description
*	1.400	74	Green Space
*	0.030	98	Impervious
	1.430	75	Weighted Average
	1.400		97.90% Pervious Area
	0.030		2.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0500	0.19		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 2.63"
0.6	119	0.0500	3.60		**Shallow Concentrated Flow, Grass** Unpaved Kv= 16.1 fps
0.1					**Direct Entry,**
5.0	169	Total			

Subcatchment 1: PreDev Onsite1



Summary for Subcatchment 2: PreDev Onsite2

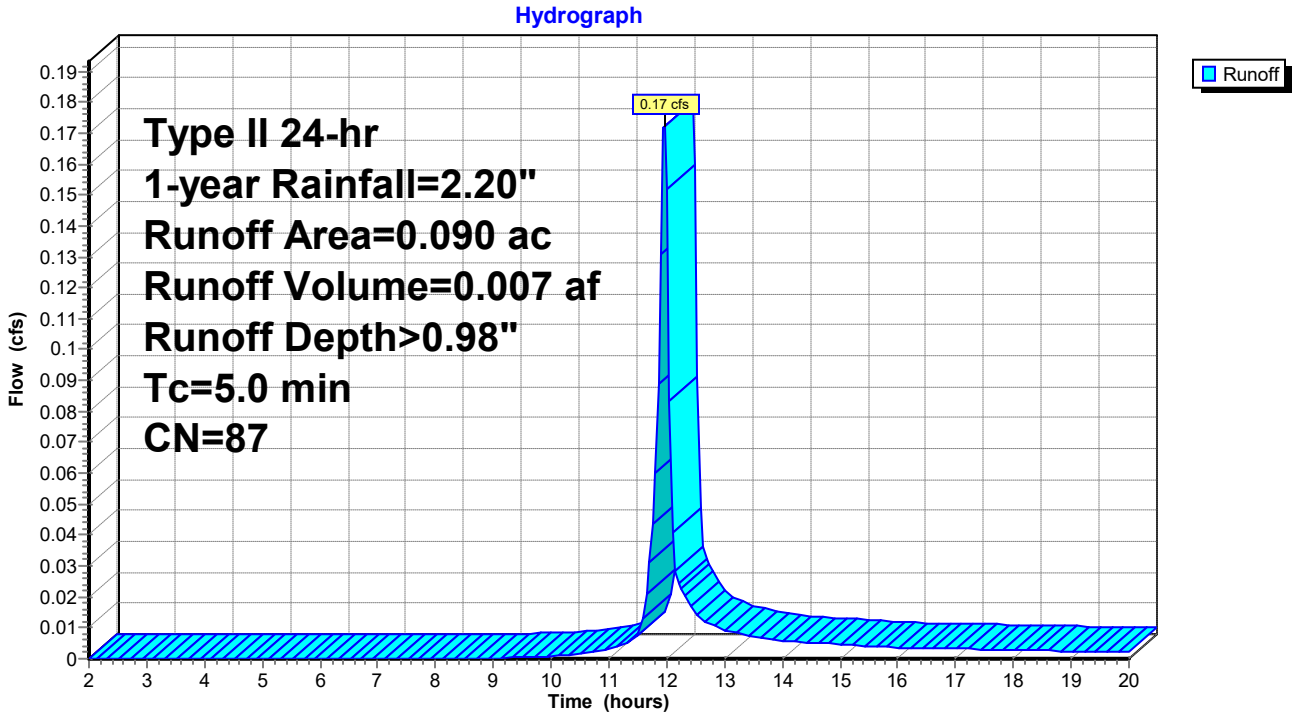
Runoff = 0.17 cfs @ 11.96 hrs, Volume= 0.007 af, Depth> 0.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-year Rainfall=2.20"

	Area (ac)	CN	Description
*	0.040	74	Green Space
*	0.050	98	Impervious
	0.090	87	Weighted Average
	0.040		44.44% Pervious Area
	0.050		55.56% Impervious Area

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

Subcatchment 2: PreDev Onsite2



Summary for Subcatchment 3: PreDev Offsite1

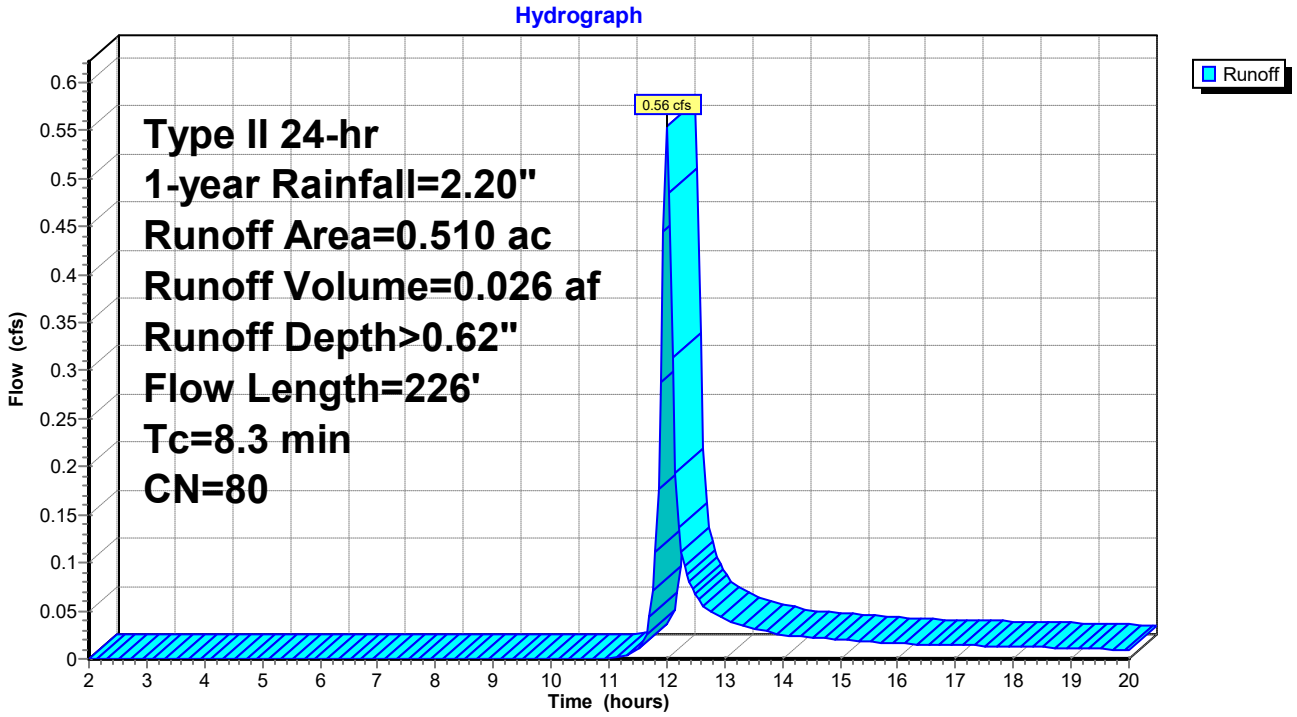
Runoff = 0.56 cfs @ 12.01 hrs, Volume= 0.026 af, Depth> 0.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-year Rainfall=2.20"

	Area (ac)	CN	Description
*	0.380	74	Green Space
*	0.130	98	Impervious
	0.510	80	Weighted Average
	0.380		74.51% Pervious Area
	0.130		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	57	0.0160	0.13		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.63"
0.8	169	0.0500	3.60		**Shallow Concentrated Flow, Slope** Unpaved Kv= 16.1 fps
8.3	226	Total			

Subcatchment 3: PreDev Offsite1



Summary for Subcatchment 91: PostDev Onsite1

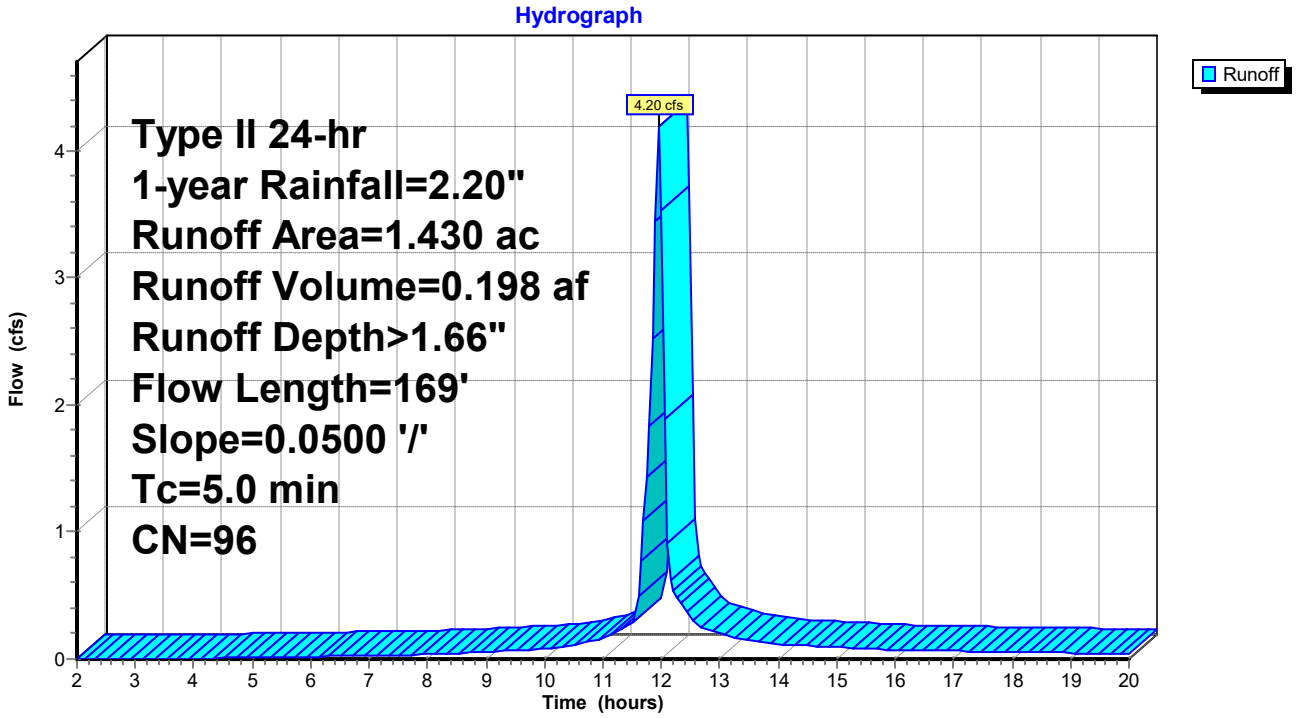
Runoff = 4.20 cfs @ 11.95 hrs, Volume= 0.198 af, Depth> 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-year Rainfall=2.20"

	Area (ac)	CN	Description
*	1.430	96	Gravel
	1.430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0500	1.57		**Sheet Flow, Gravel** Smooth surfaces n= 0.011 P2= 2.63"
0.4	119	0.0500	4.54		**Shallow Concentrated Flow, Gravel** Paved Kv= 20.3 fps
4.1					**Direct Entry, 5 minimum**
5.0	169	Total			

Subcatchment 91: PostDev Onsite1



Summary for Subcatchment 92: PostDev Onsite2

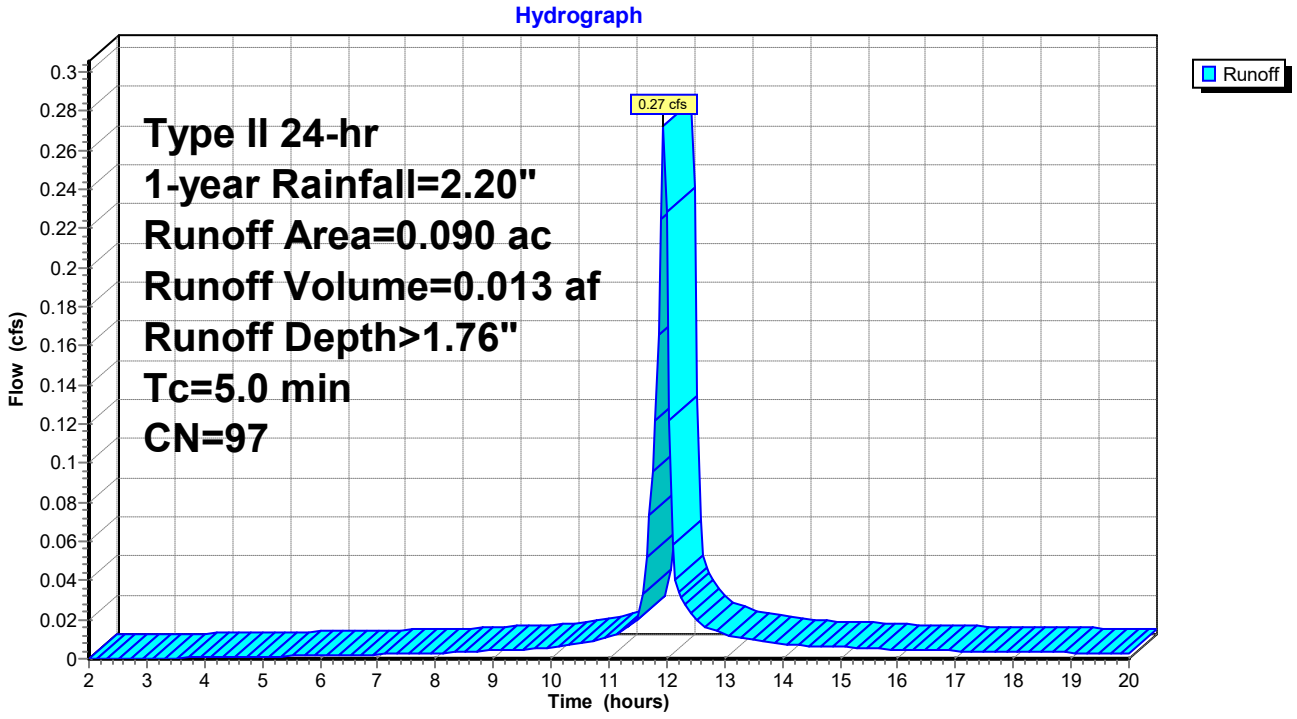
Runoff = 0.27 cfs @ 11.95 hrs, Volume= 0.013 af, Depth> 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-year Rainfall=2.20"

	Area (ac)	CN	Description
*	0.060	96	Gravel
*	0.030	98	Impervious
	0.090	97	Weighted Average
	0.060		66.67% Pervious Area
	0.030		33.33% Impervious Area

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

Subcatchment 92: PostDev Onsite2



Summary for Subcatchment 93: PostDev Offsite1

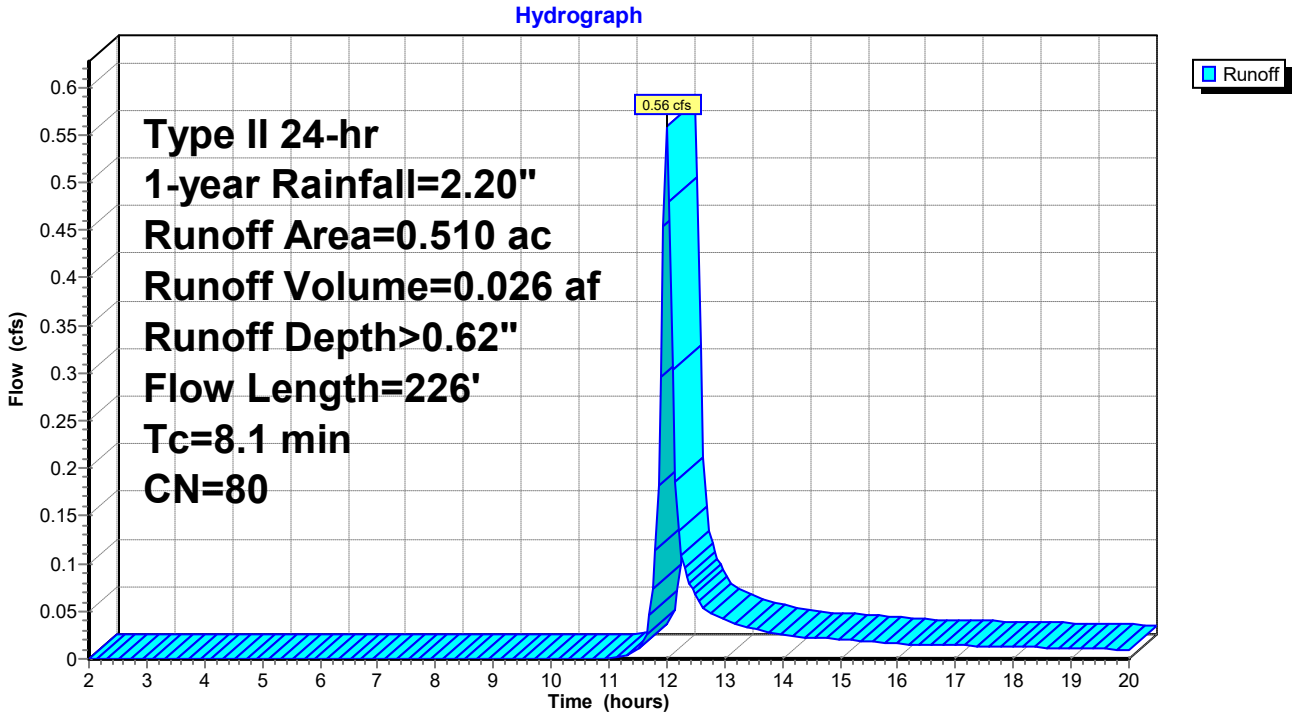
Runoff = 0.56 cfs @ 12.00 hrs, Volume= 0.026 af, Depth> 0.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-year Rainfall=2.20"

	Area (ac)	CN	Description
*	0.380	74	Green Space
*	0.130	98	Impervious
	0.510	80	Weighted Average
	0.380		74.51% Pervious Area
	0.130		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	57	0.0160	0.13		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.63"
0.6	169	0.0500	4.54		**Shallow Concentrated Flow, Slope** Paved Kv= 20.3 fps
8.1	226	Total			

Subcatchment 93: PostDev Offsite1



Summary for Pond 95P: Proposed Storage Facility

Inflow Area = 1.940 ac, 6.70% Impervious, Inflow Depth > 1.39" for 1-year event
Inflow = 4.66 cfs @ 11.96 hrs, Volume= 0.225 af
Outflow = 1.52 cfs @ 12.09 hrs, Volume= 0.224 af, Atten= 67%, Lag= 8.2 min
Primary = 1.52 cfs @ 12.09 hrs, Volume= 0.224 af

Routing by Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 722.35' Storage= 133 cf
Peak Elev= 724.34' @ 12.09 hrs Surf.Area= 2,998 sf Storage= 2,885 cf (2,752 cf above start)

Plug-Flow detention time= 29.5 min calculated for 0.220 af (98% of inflow)
Center-of-Mass det. time= 14.1 min (769.2 - 755.0)

Volume	Invert	Avail.Storage	Storage Description
#1	722.00'	2,616 cf	**Aggregate Bed** Listed below 8,721 cf Overall x 30.0% Voids
#2	724.00'	17,845 cf	**Surface Storage (Prismatic)** Listed below
		20,461 cf	Total Available Storage

Elevation (feet)	Cum.Store (cubic-feet)
722.00	0
723.00	1,269
724.00	4,320
725.00	6,426
726.00	8,721

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
724.00	739	0	0
725.00	7,477	4,108	4,108
726.00	19,996	13,737	17,845

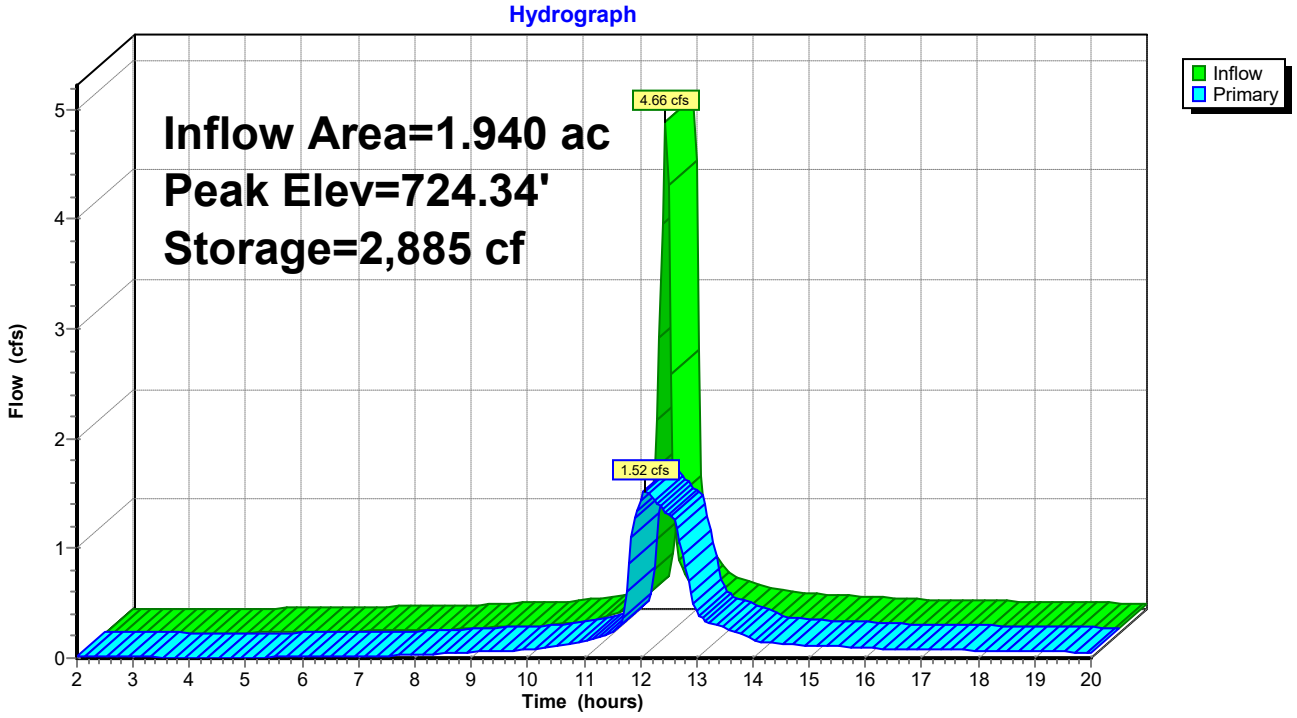
Device	Routing	Invert	Outlet Devices
#1	Primary	723.05'	**4.0" Round Outlet 1** L= 7.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 723.05' / 722.83' S= 0.0314 '/' Cc= 0.900 n= 0.013, Flow Area= 0.09 sf
#2	Primary	722.35'	**4.0" Round Outlet 3** L= 7.0' Ke= 0.500 Inlet / Outlet Invert= 722.35' / 722.15' S= 0.0286 '/' Cc= 0.900 n= 0.021, Flow Area= 0.09 sf
#3	Primary	723.11'	**4.0" Round Outlet 5** L= 7.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 723.11' / 722.78' S= 0.0471 '/' Cc= 0.900 n= 0.013, Flow Area= 0.09 sf
#4	Primary	722.00'	**Leakage** Head (feet) 0.00 1.00 2.00 3.00 4.00 Disch. (cfs) 0.000 0.040 0.090 0.130 0.170
#5	Primary	724.40'	**4.0" Round Upper Stage Outlet 2** L= 4.0' RCP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 724.40' / 724.40' S= 0.0000 '/' Cc= 0.900
n= 0.013, Flow Area= 0.09 sf

#6 Primary 724.10' **4.0" Round Upper Stage Outlet 4**
L= 4.0' RCP, square edge headwall, Ke= 0.500
Inlet / Outlet Invert= 724.10' / 724.10' S= 0.0000 '/' Cc= 0.900
n= 0.013, Flow Area= 0.09 sf

Primary OutFlow Max=1.52 cfs @ 12.09 hrs HW=724.33' (Free Discharge)
- **1=Outlet 1** (Inlet Controls 0.44 cfs @ 5.09 fps)
- **2=Outlet 3** (Barrel Controls 0.48 cfs @ 5.47 fps)
- **3=Outlet 5** (Inlet Controls 0.43 cfs @ 4.95 fps)
- **4=Leakage** (Custom Controls 0.10 cfs)
- **5=Upper Stage Outlet 2** (Controls 0.00 cfs)
- **6=Upper Stage Outlet 4** (Barrel Controls 0.06 cfs @ 1.36 fps)

Pond 95P: Proposed Storage Facility

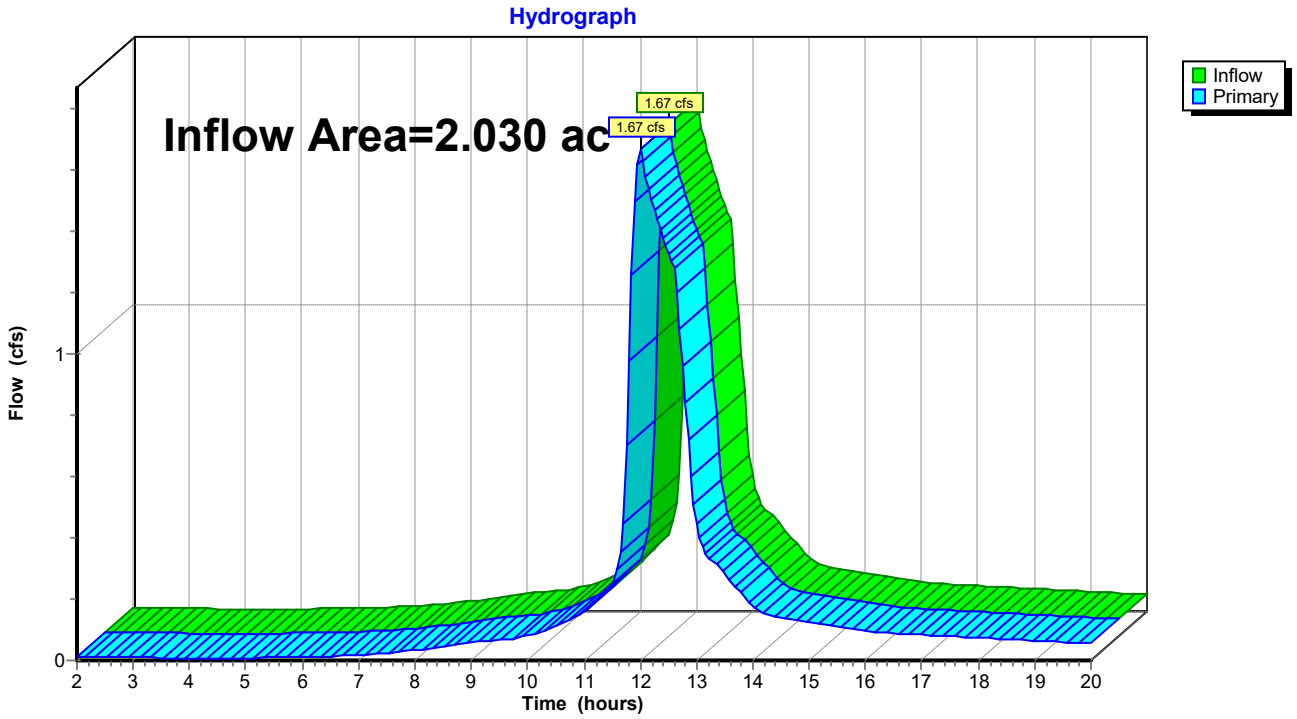


Summary for Pond 99: PostOutTotal

Inflow Area = 2.030 ac, 7.88% Impervious, Inflow Depth > 1.40" for 1-year event
Inflow = 1.67 cfs @ 12.00 hrs, Volume= 0.237 af
Primary = 1.67 cfs @ 12.00 hrs, Volume= 0.237 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

Pond 99: PostOutTotal



Summary for Subcatchment 1: PreDev Onsite1

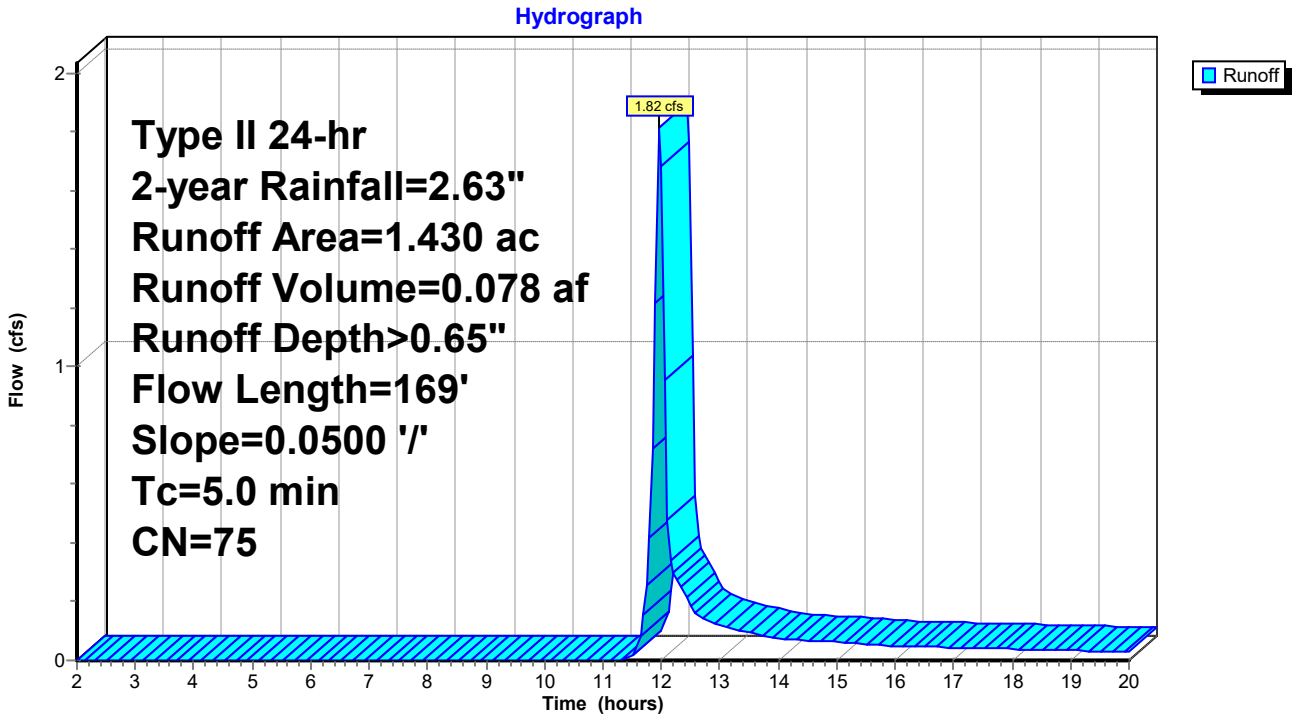
Runoff = 1.82 cfs @ 11.97 hrs, Volume= 0.078 af, Depth> 0.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-year Rainfall=2.63"

	Area (ac)	CN	Description
*	1.400	74	Green Space
*	0.030	98	Impervious
	1.430	75	Weighted Average
	1.400		97.90% Pervious Area
	0.030		2.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0500	0.19		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 2.63"
0.6	119	0.0500	3.60		**Shallow Concentrated Flow, Grass** Unpaved Kv= 16.1 fps
0.1					**Direct Entry,**
5.0	169	Total			

Subcatchment 1: PreDev Onsite1



Summary for Subcatchment 2: PreDev Onsite2

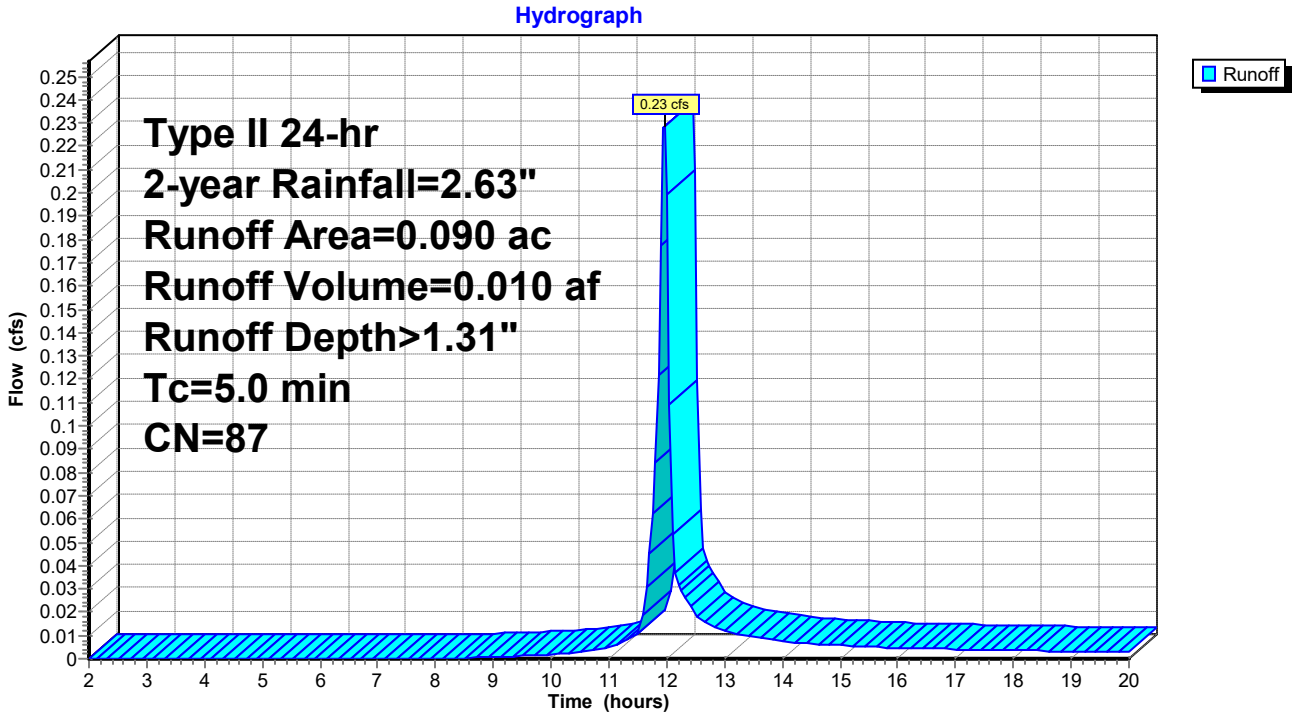
Runoff = 0.23 cfs @ 11.96 hrs, Volume= 0.010 af, Depth> 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-year Rainfall=2.63"

	Area (ac)	CN	Description
*	0.040	74	Green Space
*	0.050	98	Impervious
	0.090	87	Weighted Average
	0.040		44.44% Pervious Area
	0.050		55.56% Impervious Area

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

Subcatchment 2: PreDev Onsite2



Summary for Subcatchment 3: PreDev Offsite1

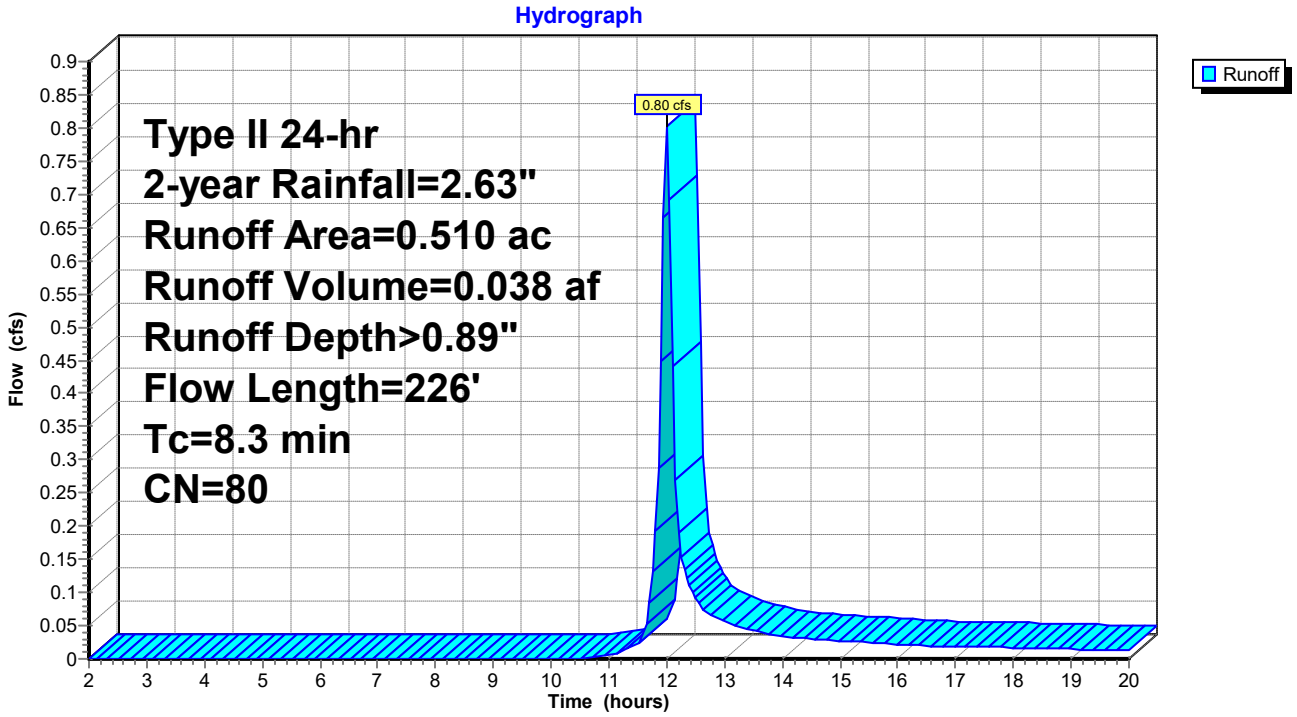
Runoff = 0.80 cfs @ 12.00 hrs, Volume= 0.038 af, Depth> 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-year Rainfall=2.63"

	Area (ac)	CN	Description
*	0.380	74	Green Space
*	0.130	98	Impervious
	0.510	80	Weighted Average
	0.380		74.51% Pervious Area
	0.130		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	57	0.0160	0.13		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.63"
0.8	169	0.0500	3.60		**Shallow Concentrated Flow, Slope** Unpaved Kv= 16.1 fps
8.3	226	Total			

Subcatchment 3: PreDev Offsite1



Summary for Subcatchment 91: PostDev Onsite1

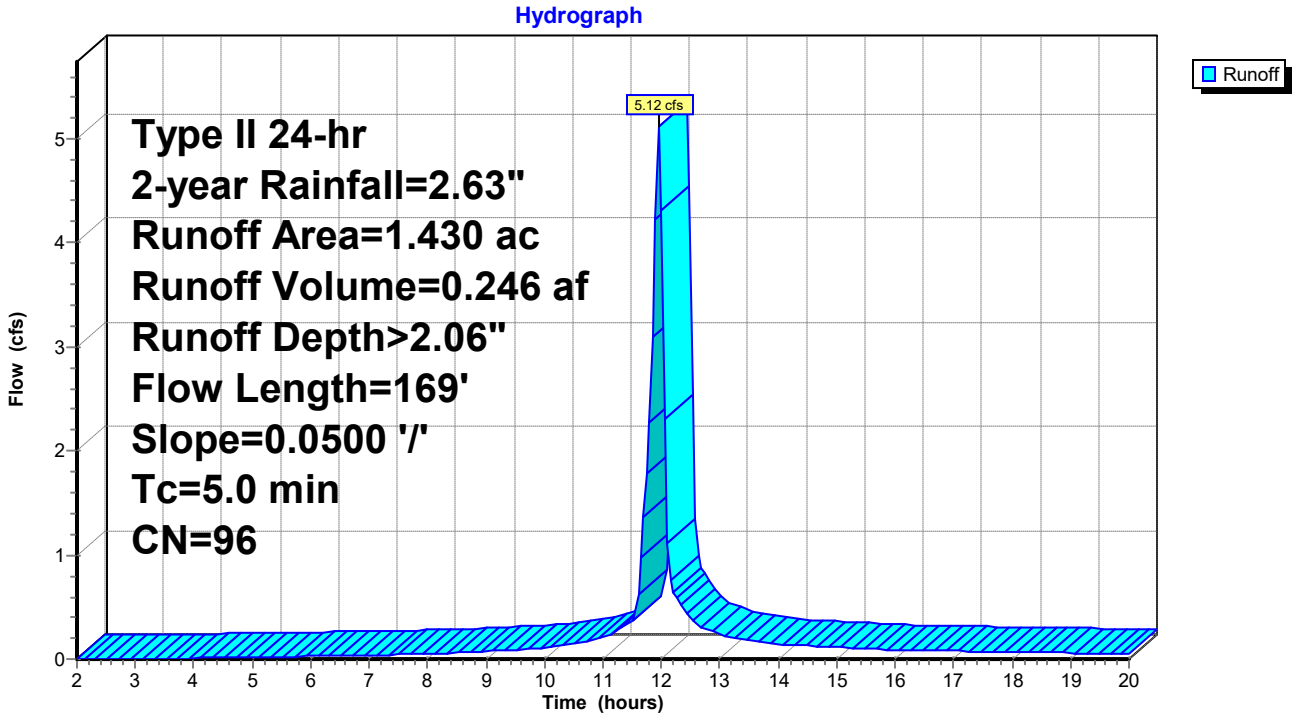
Runoff = 5.12 cfs @ 11.95 hrs, Volume= 0.246 af, Depth> 2.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-year Rainfall=2.63"

	Area (ac)	CN	Description
*	1.430	96	Gravel
	1.430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0500	1.57		**Sheet Flow, Gravel** Smooth surfaces n= 0.011 P2= 2.63"
0.4	119	0.0500	4.54		**Shallow Concentrated Flow, Gravel** Paved Kv= 20.3 fps
4.1					**Direct Entry, 5 minimum**
5.0	169	Total			

Subcatchment 91: PostDev Onsite1



Summary for Subcatchment 92: PostDev Onsite2

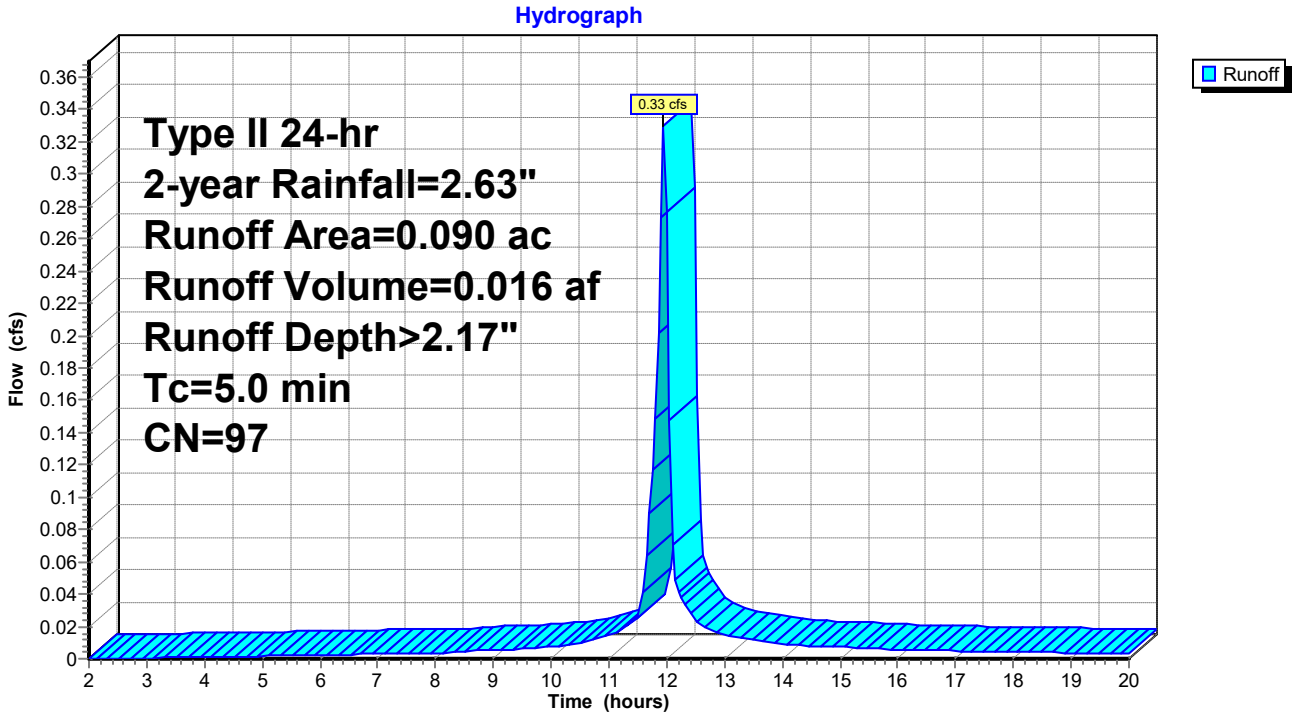
Runoff = 0.33 cfs @ 11.95 hrs, Volume= 0.016 af, Depth> 2.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-year Rainfall=2.63"

	Area (ac)	CN	Description
*	0.060	96	Gravel
*	0.030	98	Impervious
	0.090	97	Weighted Average
	0.060		66.67% Pervious Area
	0.030		33.33% Impervious Area

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

Subcatchment 92: PostDev Onsite2



Summary for Subcatchment 93: PostDev Offsite1

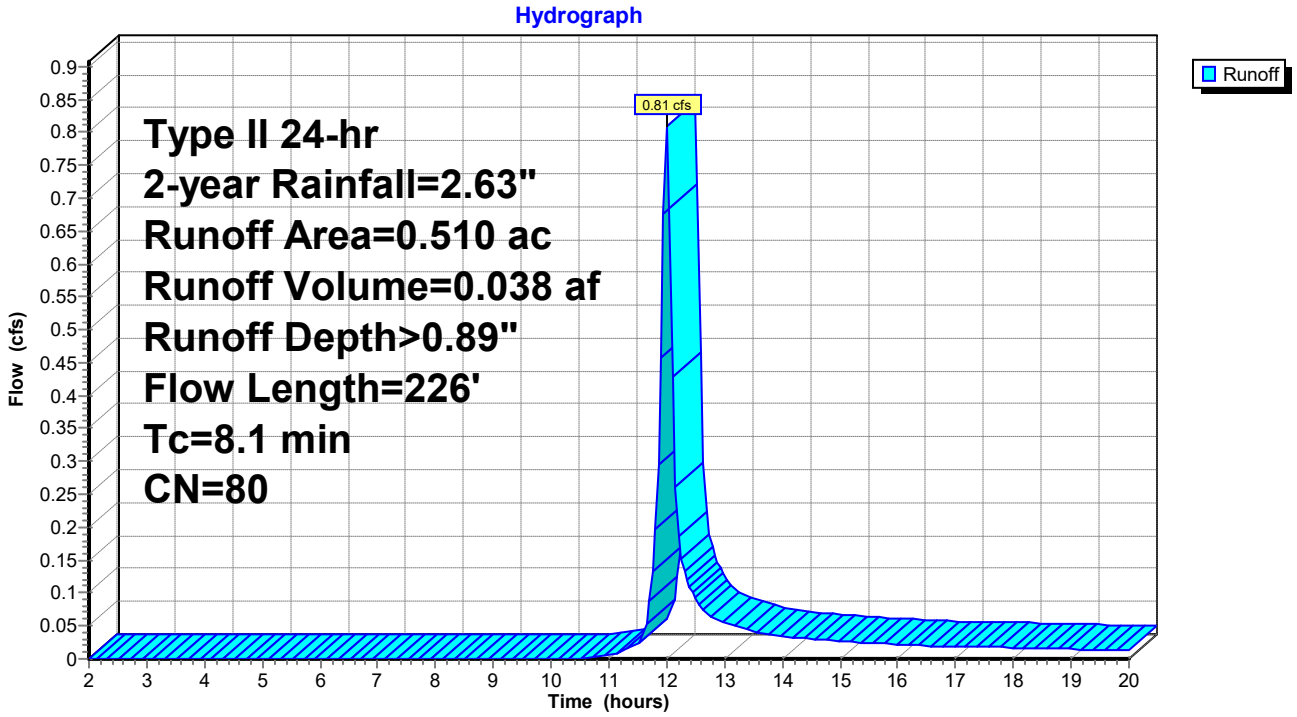
Runoff = 0.81 cfs @ 12.00 hrs, Volume= 0.038 af, Depth> 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-year Rainfall=2.63"

	Area (ac)	CN	Description
*	0.380	74	Green Space
*	0.130	98	Impervious
	0.510	80	Weighted Average
	0.380		74.51% Pervious Area
	0.130		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	57	0.0160	0.13		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.63"
0.6	169	0.0500	4.54		**Shallow Concentrated Flow, Slope** Paved Kv= 20.3 fps
8.1	226	Total			

Subcatchment 93: PostDev Offsite1



Summary for Pond 95P: Proposed Storage Facility

Inflow Area = 1.940 ac, 6.70% Impervious, Inflow Depth > 1.75" for 2-year event
Inflow = 5.81 cfs @ 11.96 hrs, Volume= 0.284 af
Outflow = 1.74 cfs @ 12.10 hrs, Volume= 0.282 af, Atten= 70%, Lag= 8.7 min
Primary = 1.74 cfs @ 12.10 hrs, Volume= 0.282 af

Routing by Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 722.35' Storage= 133 cf
Peak Elev= 724.53' @ 12.10 hrs Surf.Area= 4,285 sf Storage= 3,791 cf (3,657 cf above start)

Plug-Flow detention time= 29.8 min calculated for 0.279 af (98% of inflow)
Center-of-Mass det. time= 17.2 min (767.8 - 750.6)

Volume	Invert	Avail.Storage	Storage Description
#1	722.00'	2,616 cf	**Aggregate Bed** Listed below 8,721 cf Overall x 30.0% Voids
#2	724.00'	17,845 cf	**Surface Storage (Prismatic)** Listed below
		20,461 cf	Total Available Storage

Elevation (feet)	Cum.Store (cubic-feet)
722.00	0
723.00	1,269
724.00	4,320
725.00	6,426
726.00	8,721

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
724.00	739	0	0
725.00	7,477	4,108	4,108
726.00	19,996	13,737	17,845

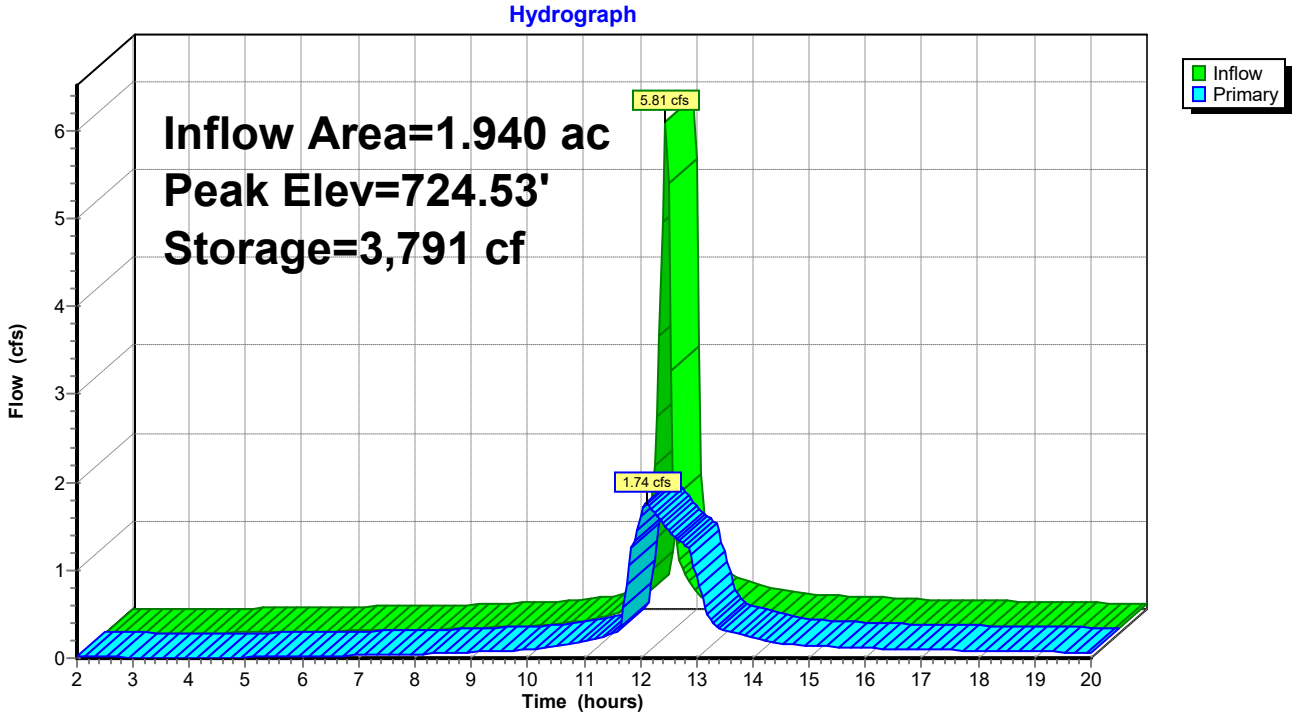
Device	Routing	Invert	Outlet Devices
#1	Primary	723.05'	**4.0" Round Outlet 1** L= 7.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 723.05' / 722.83' S= 0.0314 '/' Cc= 0.900 n= 0.013, Flow Area= 0.09 sf
#2	Primary	722.35'	**4.0" Round Outlet 3** L= 7.0' Ke= 0.500 Inlet / Outlet Invert= 722.35' / 722.15' S= 0.0286 '/' Cc= 0.900 n= 0.021, Flow Area= 0.09 sf
#3	Primary	723.11'	**4.0" Round Outlet 5** L= 7.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 723.11' / 722.78' S= 0.0471 '/' Cc= 0.900 n= 0.013, Flow Area= 0.09 sf
#4	Primary	722.00'	**Leakage** Head (feet) 0.00 1.00 2.00 3.00 4.00 Disch. (cfs) 0.000 0.040 0.090 0.130 0.170
#5	Primary	724.40'	**4.0" Round Upper Stage Outlet 2** L= 4.0' RCP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 724.40' / 724.40' S= 0.0000 '/' Cc= 0.900
n= 0.013, Flow Area= 0.09 sf

#6 Primary 724.10' **4.0" Round Upper Stage Outlet 4**
L= 4.0' RCP, square edge headwall, Ke= 0.500
Inlet / Outlet Invert= 724.10' / 724.10' S= 0.0000 '/' Cc= 0.900
n= 0.013, Flow Area= 0.09 sf

Primary OutFlow Max=1.74 cfs @ 12.10 hrs HW=724.53' (Free Discharge)
- **1=Outlet 1** (Inlet Controls 0.48 cfs @ 5.51 fps)
- **2=Outlet 3** (Barrel Controls 0.50 cfs @ 5.75 fps)
- **3=Outlet 5** (Inlet Controls 0.47 cfs @ 5.38 fps)
- **4=Leakage** (Custom Controls 0.11 cfs)
- **5=Upper Stage Outlet 2** (Barrel Controls 0.02 cfs @ 0.91 fps)
- **6=Upper Stage Outlet 4** (Barrel Controls 0.16 cfs @ 1.87 fps)

Pond 95P: Proposed Storage Facility

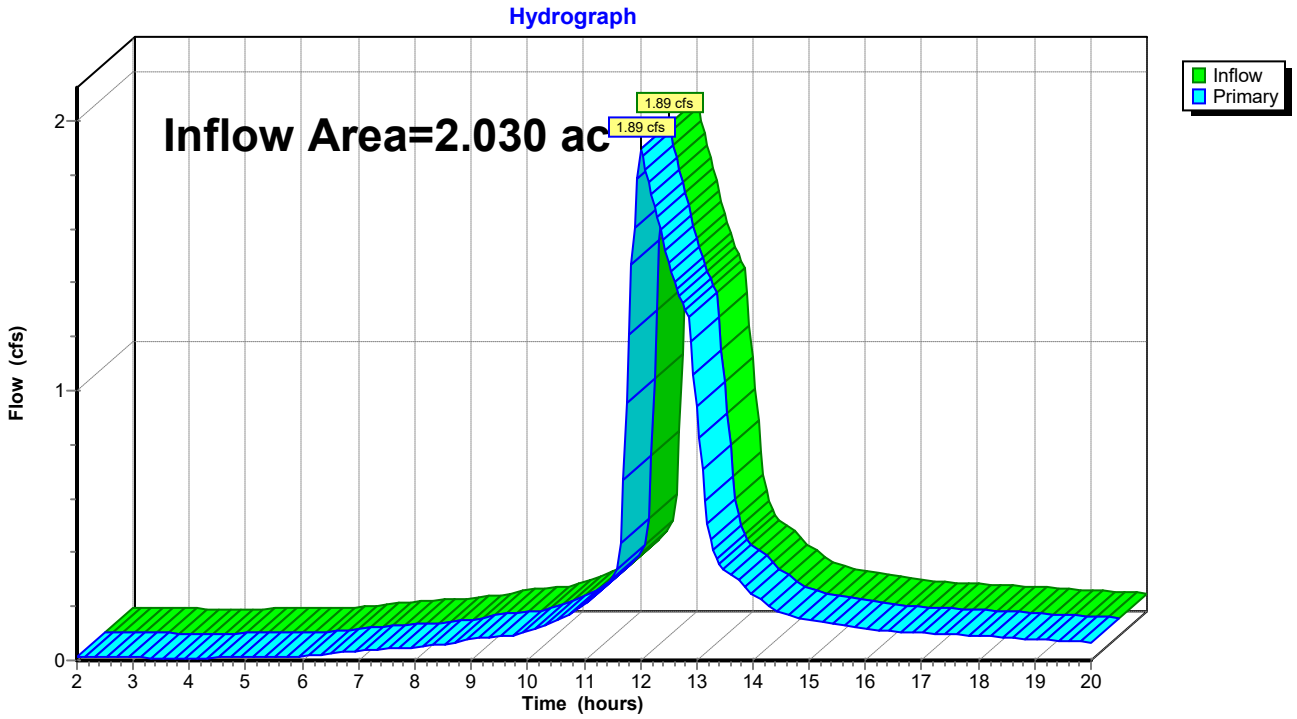


Summary for Pond 99: PostOutTotal

Inflow Area = 2.030 ac, 7.88% Impervious, Inflow Depth > 1.77" for 2-year event
Inflow = 1.89 cfs @ 12.02 hrs, Volume= 0.299 af
Primary = 1.89 cfs @ 12.02 hrs, Volume= 0.299 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

Pond 99: PostOutTotal



Summary for Subcatchment 1: PreDev Onsite1

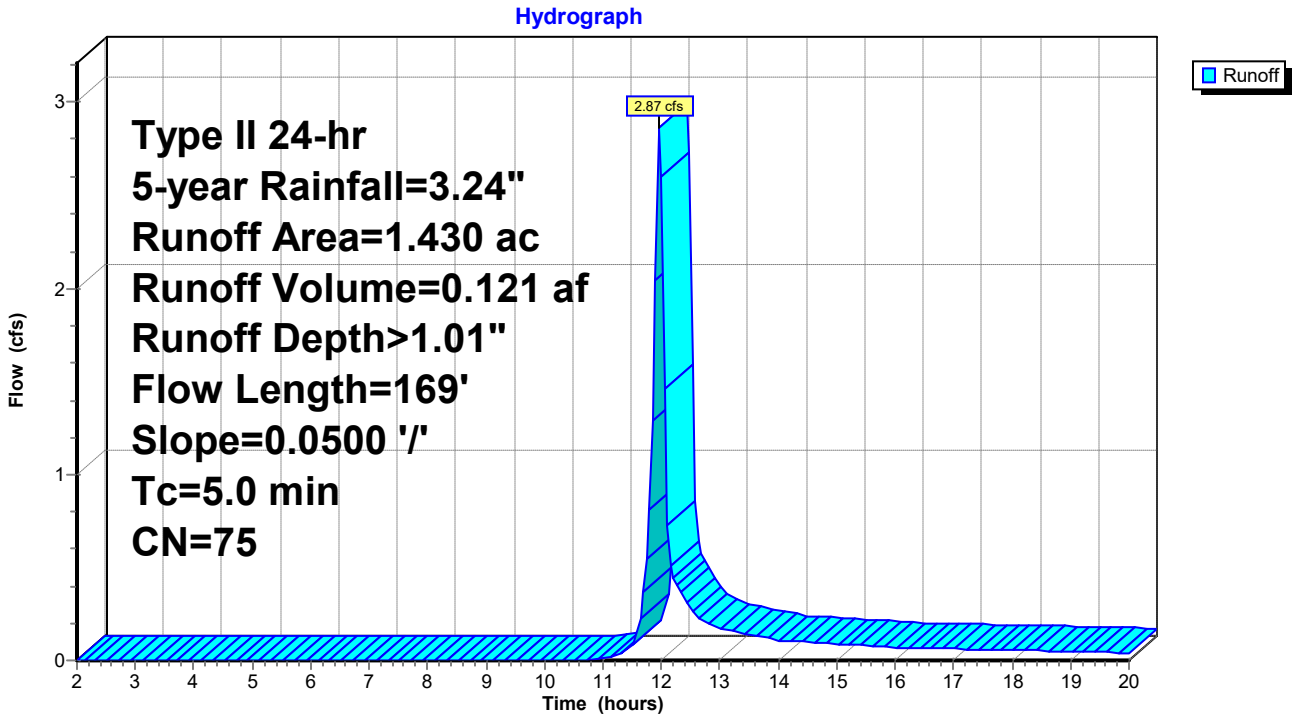
Runoff = 2.87 cfs @ 11.96 hrs, Volume= 0.121 af, Depth> 1.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-year Rainfall=3.24"

	Area (ac)	CN	Description
*	1.400	74	Green Space
*	0.030	98	Impervious
	1.430	75	Weighted Average
	1.400		97.90% Pervious Area
	0.030		2.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0500	0.19		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 2.63"
0.6	119	0.0500	3.60		**Shallow Concentrated Flow, Grass** Unpaved Kv= 16.1 fps
0.1					**Direct Entry,**
5.0	169	Total			

Subcatchment 1: PreDev Onsite1



Summary for Subcatchment 2: PreDev Onsite2

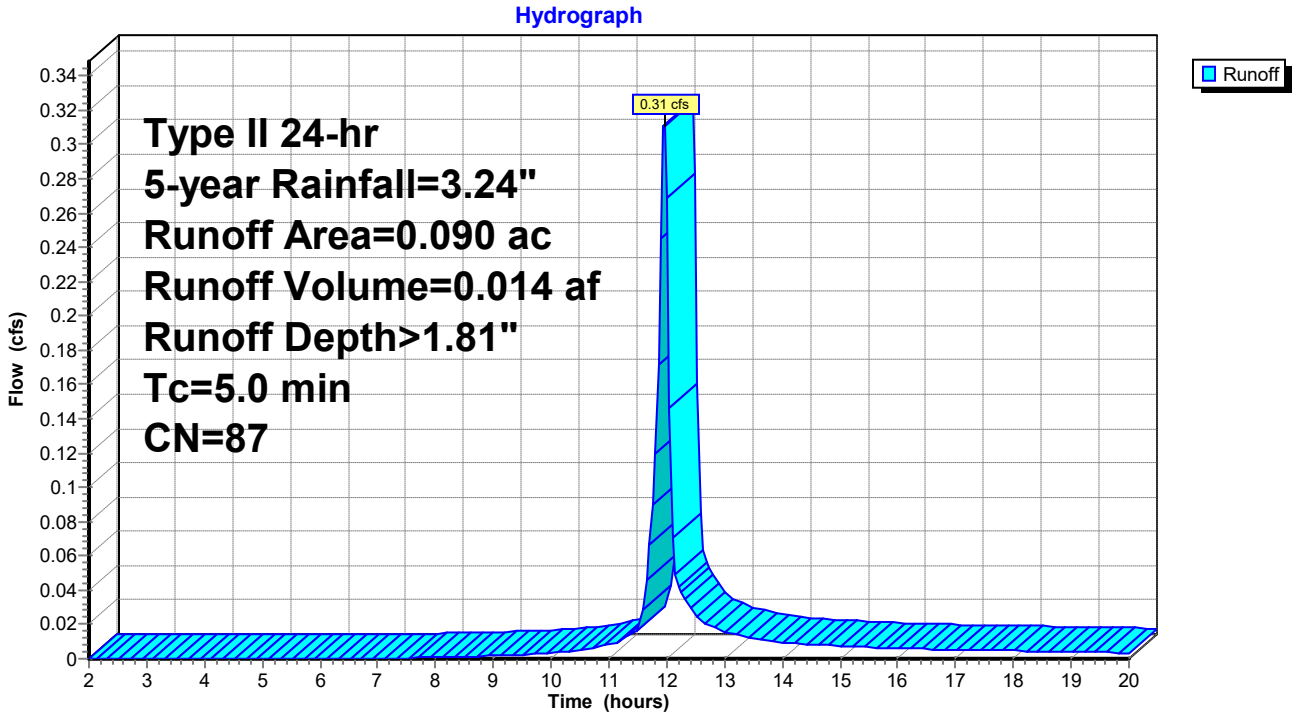
Runoff = 0.31 cfs @ 11.96 hrs, Volume= 0.014 af, Depth> 1.81"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-year Rainfall=3.24"

	Area (ac)	CN	Description
*	0.040	74	Green Space
*	0.050	98	Impervious
	0.090	87	Weighted Average
	0.040		44.44% Pervious Area
	0.050		55.56% Impervious Area

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

Subcatchment 2: PreDev Onsite2



Summary for Subcatchment 3: PreDev Offsite1

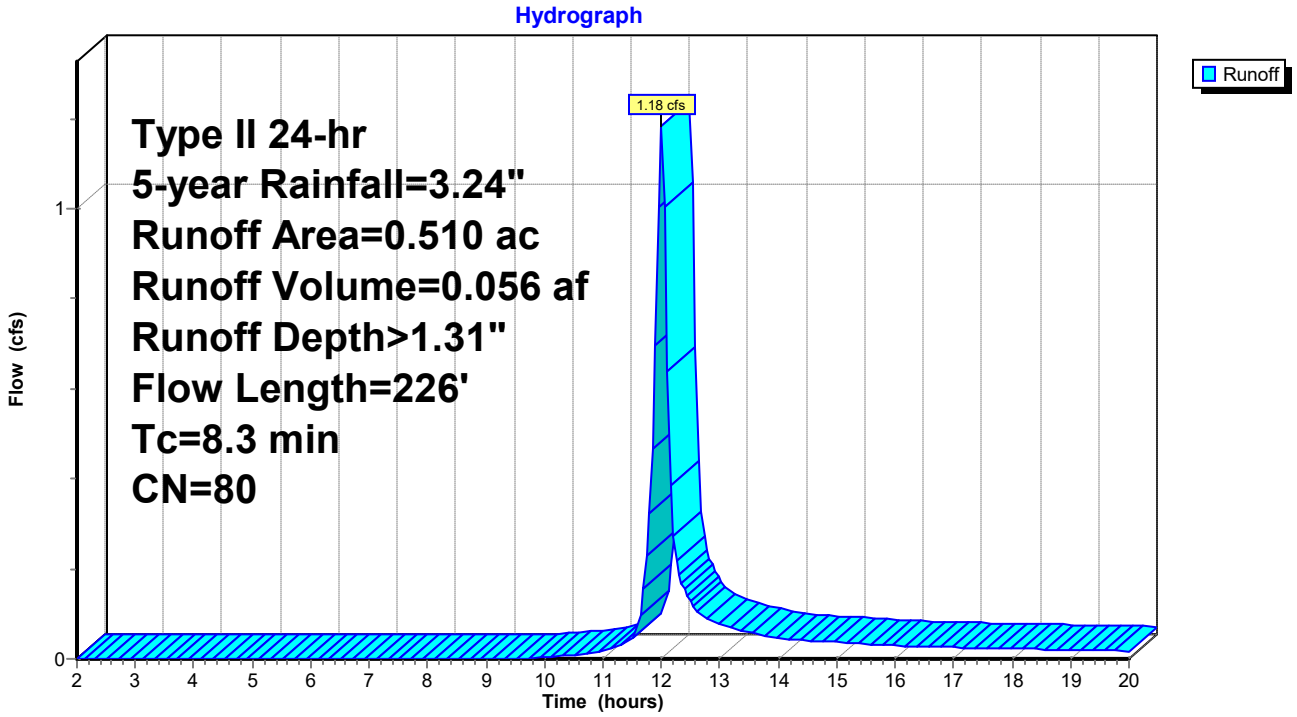
Runoff = 1.18 cfs @ 12.00 hrs, Volume= 0.056 af, Depth> 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-year Rainfall=3.24"

	Area (ac)	CN	Description
*	0.380	74	Green Space
*	0.130	98	Impervious
	0.510	80	Weighted Average
	0.380		74.51% Pervious Area
	0.130		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	57	0.0160	0.13		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.63"
0.8	169	0.0500	3.60		**Shallow Concentrated Flow, Slope** Unpaved Kv= 16.1 fps
8.3	226	Total			

Subcatchment 3: PreDev Offsite1



Summary for Subcatchment 91: PostDev Onsite1

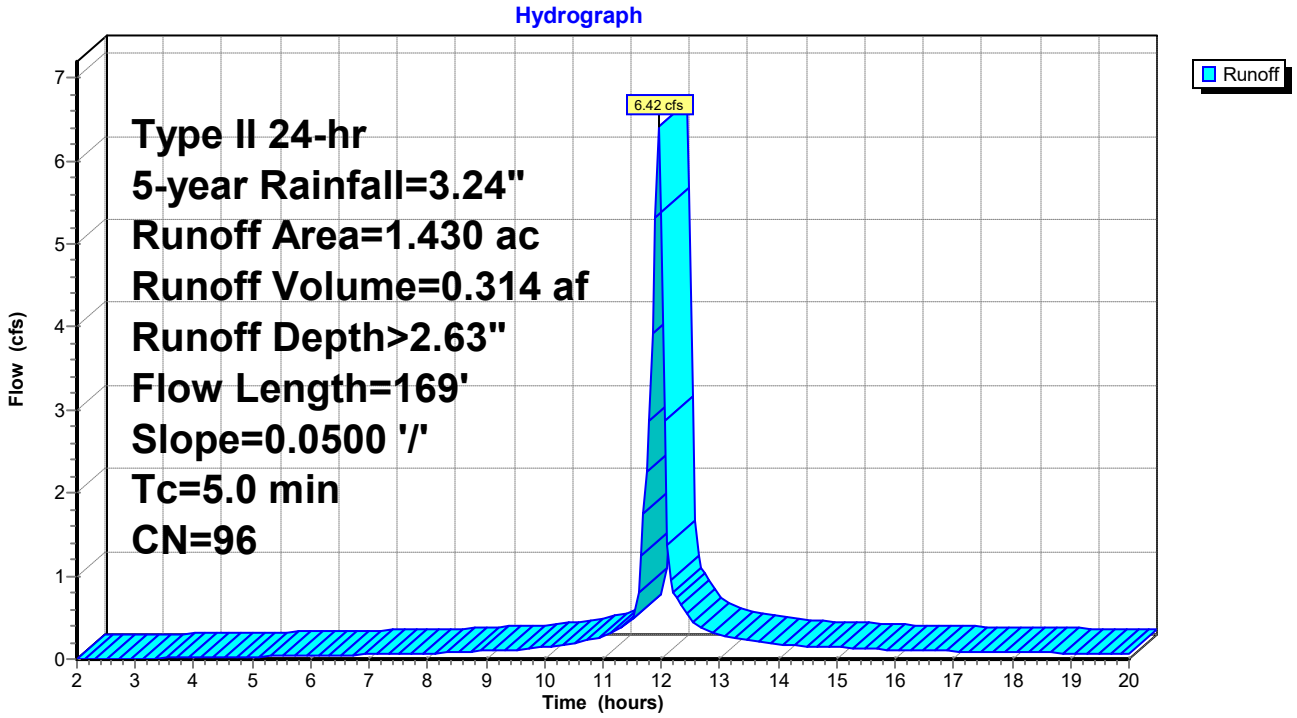
Runoff = 6.42 cfs @ 11.95 hrs, Volume= 0.314 af, Depth> 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-year Rainfall=3.24"

	Area (ac)	CN	Description
*	1.430	96	Gravel
	1.430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0500	1.57		**Sheet Flow, Gravel** Smooth surfaces n= 0.011 P2= 2.63"
0.4	119	0.0500	4.54		**Shallow Concentrated Flow, Gravel** Paved Kv= 20.3 fps
4.1					**Direct Entry, 5 minimum**
5.0	169	Total			

Subcatchment 91: PostDev Onsite1



Summary for Subcatchment 92: PostDev Onsite2

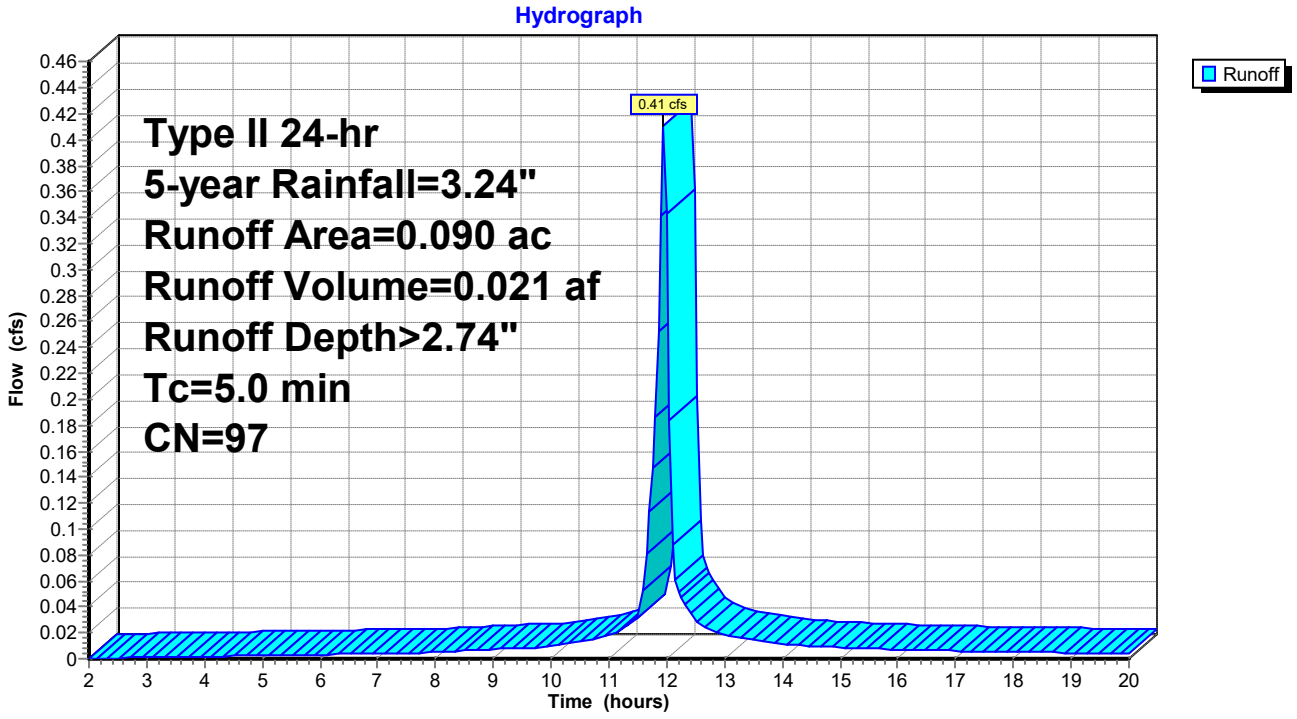
Runoff = 0.41 cfs @ 11.95 hrs, Volume= 0.021 af, Depth> 2.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-year Rainfall=3.24"

	Area (ac)	CN	Description
*	0.060	96	Gravel
*	0.030	98	Impervious
	0.090	97	Weighted Average
	0.060		66.67% Pervious Area
	0.030		33.33% Impervious Area

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

Subcatchment 92: PostDev Onsite2



Summary for Subcatchment 93: PostDev Offsite1

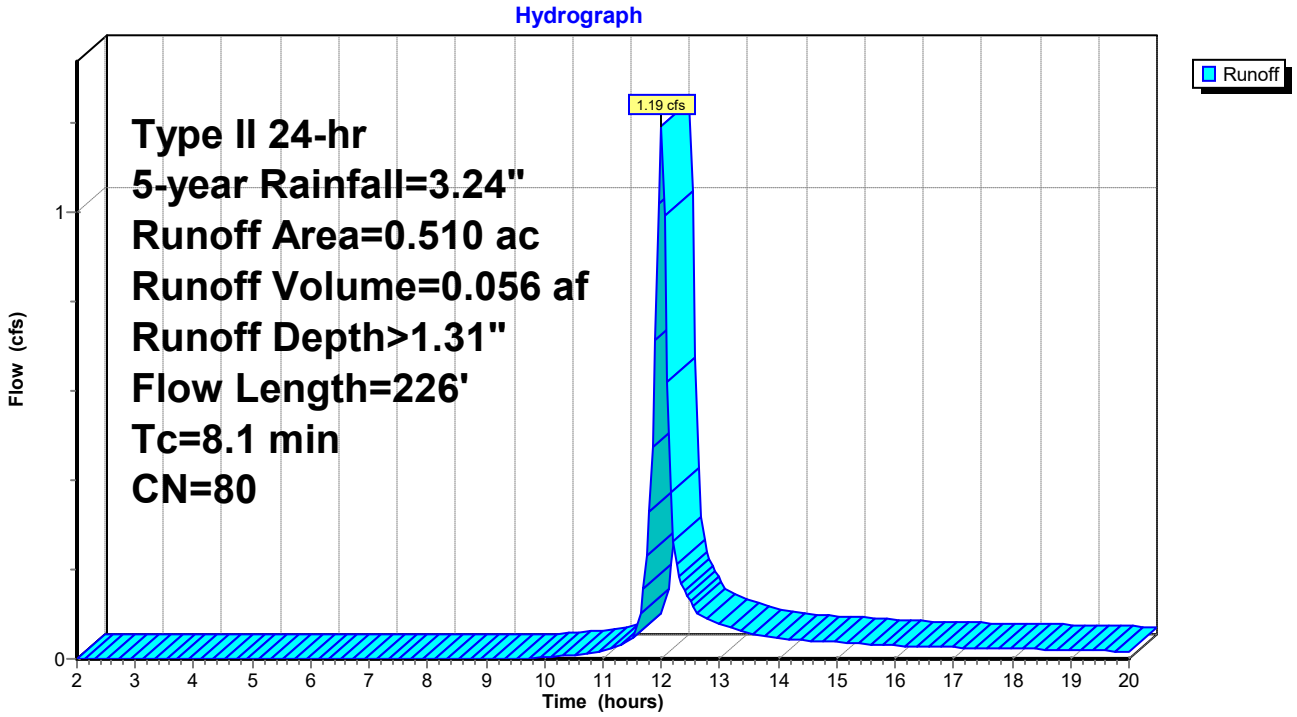
Runoff = 1.19 cfs @ 12.00 hrs, Volume= 0.056 af, Depth> 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-year Rainfall=3.24"

	Area (ac)	CN	Description
*	0.380	74	Green Space
*	0.130	98	Impervious
	0.510	80	Weighted Average
	0.380		74.51% Pervious Area
	0.130		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	57	0.0160	0.13		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.63"
0.6	169	0.0500	4.54		**Shallow Concentrated Flow, Slope** Paved Kv= 20.3 fps
8.1	226	Total			

Subcatchment 93: PostDev Offsite1



Summary for Pond 95P: Proposed Storage Facility

Inflow Area = 1.940 ac, 6.70% Impervious, Inflow Depth > 2.29" for 5-year event
Inflow = 7.46 cfs @ 11.96 hrs, Volume= 0.369 af
Outflow = 2.16 cfs @ 12.11 hrs, Volume= 0.368 af, Atten= 71%, Lag= 9.0 min
Primary = 2.16 cfs @ 12.11 hrs, Volume= 0.368 af

Routing by Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 722.35' Storage= 133 cf
Peak Elev= 724.80' @ 12.11 hrs Surf.Area= 6,151 sf Storage= 5,103 cf (4,970 cf above start)

Plug-Flow detention time= 30.4 min calculated for 0.365 af (99% of inflow)
Center-of-Mass det. time= 20.3 min (766.0 - 745.7)

Volume	Invert	Avail.Storage	Storage Description
#1	722.00'	2,616 cf	**Aggregate Bed** Listed below 8,721 cf Overall x 30.0% Voids
#2	724.00'	17,845 cf	**Surface Storage (Prismatic)** Listed below
		20,461 cf	Total Available Storage

Elevation (feet)	Cum.Store (cubic-feet)
722.00	0
723.00	1,269
724.00	4,320
725.00	6,426
726.00	8,721

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
724.00	739	0	0
725.00	7,477	4,108	4,108
726.00	19,996	13,737	17,845

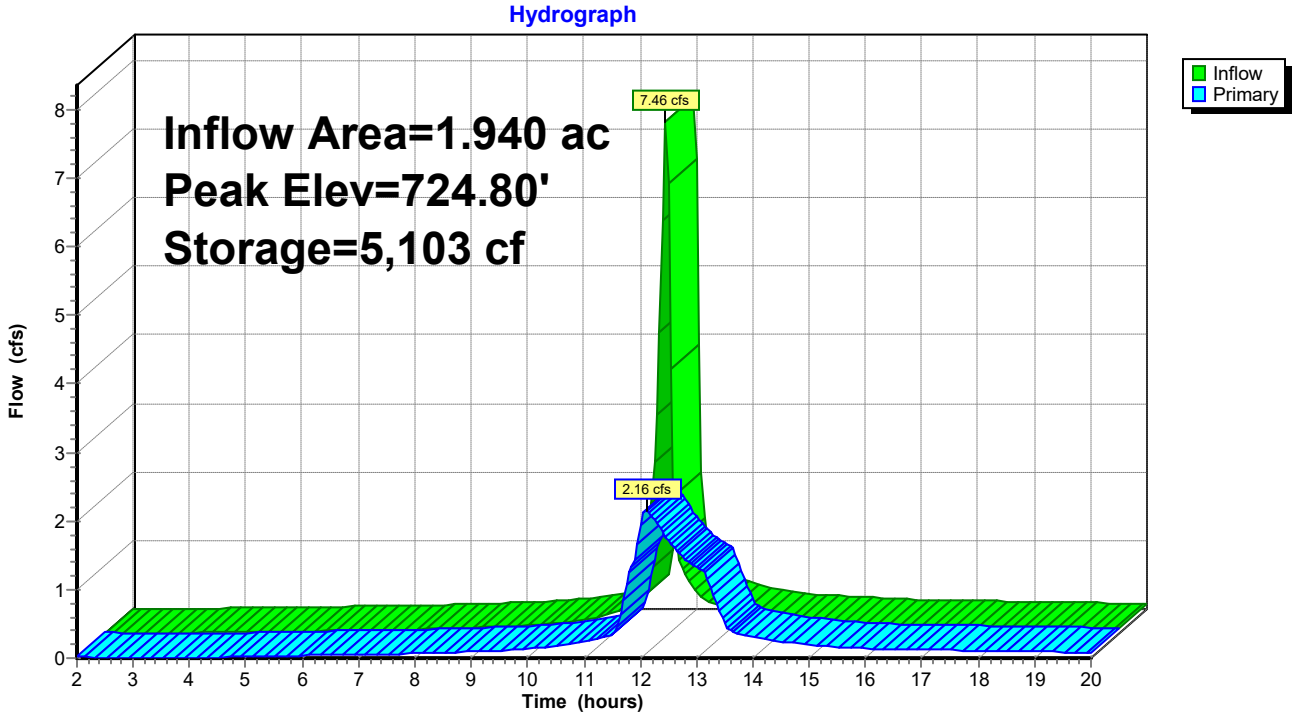
Device	Routing	Invert	Outlet Devices
#1	Primary	723.05'	**4.0" Round Outlet 1** L= 7.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 723.05' / 722.83' S= 0.0314 '/' Cc= 0.900 n= 0.013, Flow Area= 0.09 sf
#2	Primary	722.35'	**4.0" Round Outlet 3** L= 7.0' Ke= 0.500 Inlet / Outlet Invert= 722.35' / 722.15' S= 0.0286 '/' Cc= 0.900 n= 0.021, Flow Area= 0.09 sf
#3	Primary	723.11'	**4.0" Round Outlet 5** L= 7.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 723.11' / 722.78' S= 0.0471 '/' Cc= 0.900 n= 0.013, Flow Area= 0.09 sf
#4	Primary	722.00'	**Leakage** Head (feet) 0.00 1.00 2.00 3.00 4.00 Disch. (cfs) 0.000 0.040 0.090 0.130 0.170
#5	Primary	724.40'	**4.0" Round Upper Stage Outlet 2** L= 4.0' RCP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 724.40' / 724.40' S= 0.0000 '/' Cc= 0.900
n= 0.013, Flow Area= 0.09 sf

#6 Primary 724.10' **4.0" Round Upper Stage Outlet 4**
L= 4.0' RCP, square edge headwall, Ke= 0.500
Inlet / Outlet Invert= 724.10' / 724.10' S= 0.0000 '/' Cc= 0.900
n= 0.013, Flow Area= 0.09 sf

Primary OutFlow Max=2.15 cfs @ 12.11 hrs HW=724.80' (Free Discharge)
- **1=Outlet 1** (Inlet Controls 0.53 cfs @ 6.06 fps)
- **2=Outlet 3** (Barrel Controls 0.53 cfs @ 6.12 fps)
- **3=Outlet 5** (Inlet Controls 0.52 cfs @ 5.94 fps)
- **4=Leakage** (Custom Controls 0.12 cfs)
- **5=Upper Stage Outlet 2** (Barrel Controls 0.15 cfs @ 1.83 fps)
- **6=Upper Stage Outlet 4** (Barrel Controls 0.30 cfs @ 3.40 fps)

Pond 95P: Proposed Storage Facility

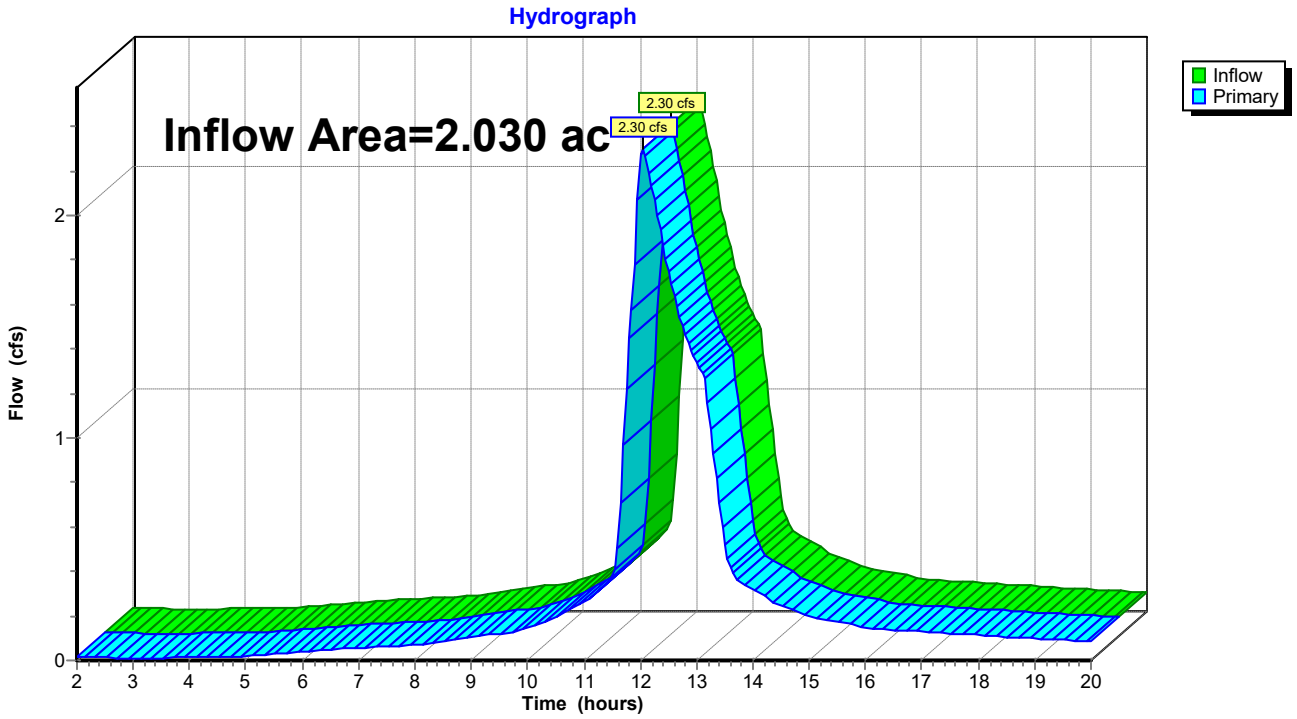


Summary for Pond 99: PostOutTotal

Inflow Area = 2.030 ac, 7.88% Impervious, Inflow Depth > 2.30" for 5-year event
Inflow = 2.30 cfs @ 12.04 hrs, Volume= 0.389 af
Primary = 2.30 cfs @ 12.04 hrs, Volume= 0.389 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

Pond 99: PostOutTotal



Summary for Subcatchment 1: PreDev Onsite1

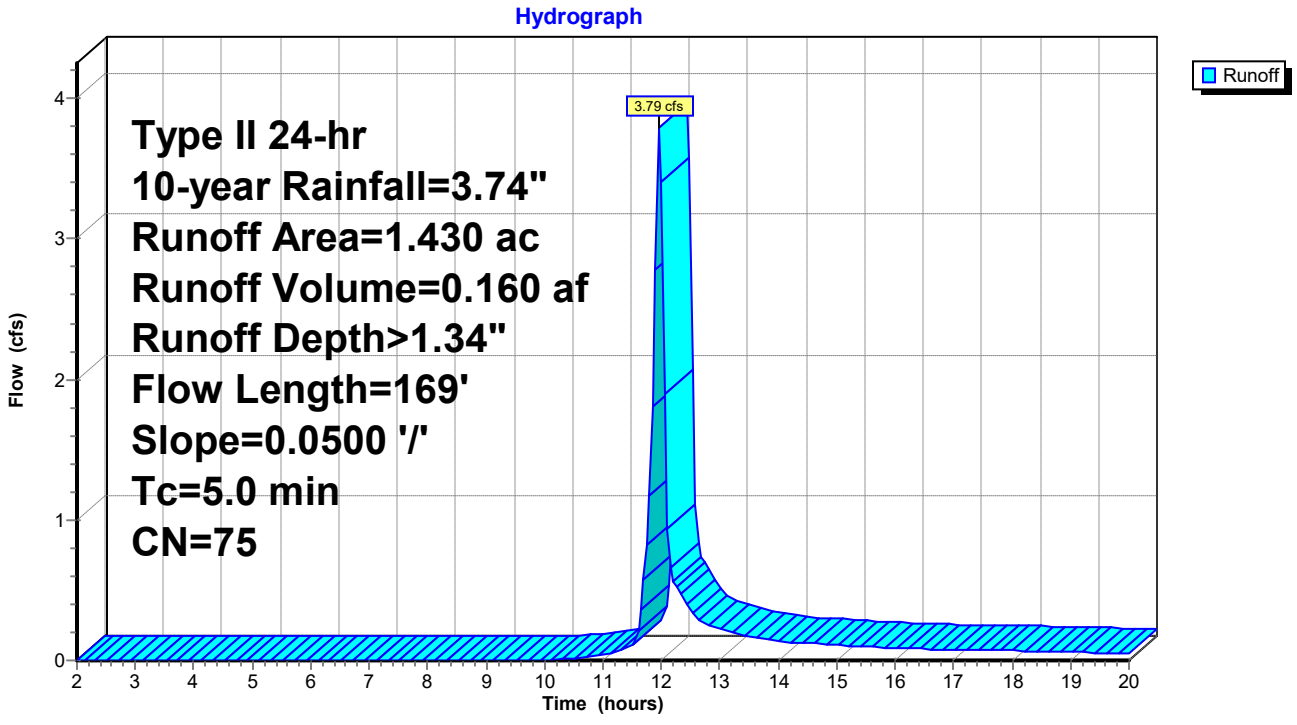
Runoff = 3.79 cfs @ 11.96 hrs, Volume= 0.160 af, Depth> 1.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=3.74"

	Area (ac)	CN	Description
*	1.400	74	Green Space
*	0.030	98	Impervious
	1.430	75	Weighted Average
	1.400		97.90% Pervious Area
	0.030		2.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0500	0.19		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 2.63"
0.6	119	0.0500	3.60		**Shallow Concentrated Flow, Grass** Unpaved Kv= 16.1 fps
0.1					**Direct Entry,**
5.0	169	Total			

Subcatchment 1: PreDev Onsite1



Summary for Subcatchment 2: PreDev Onsite2

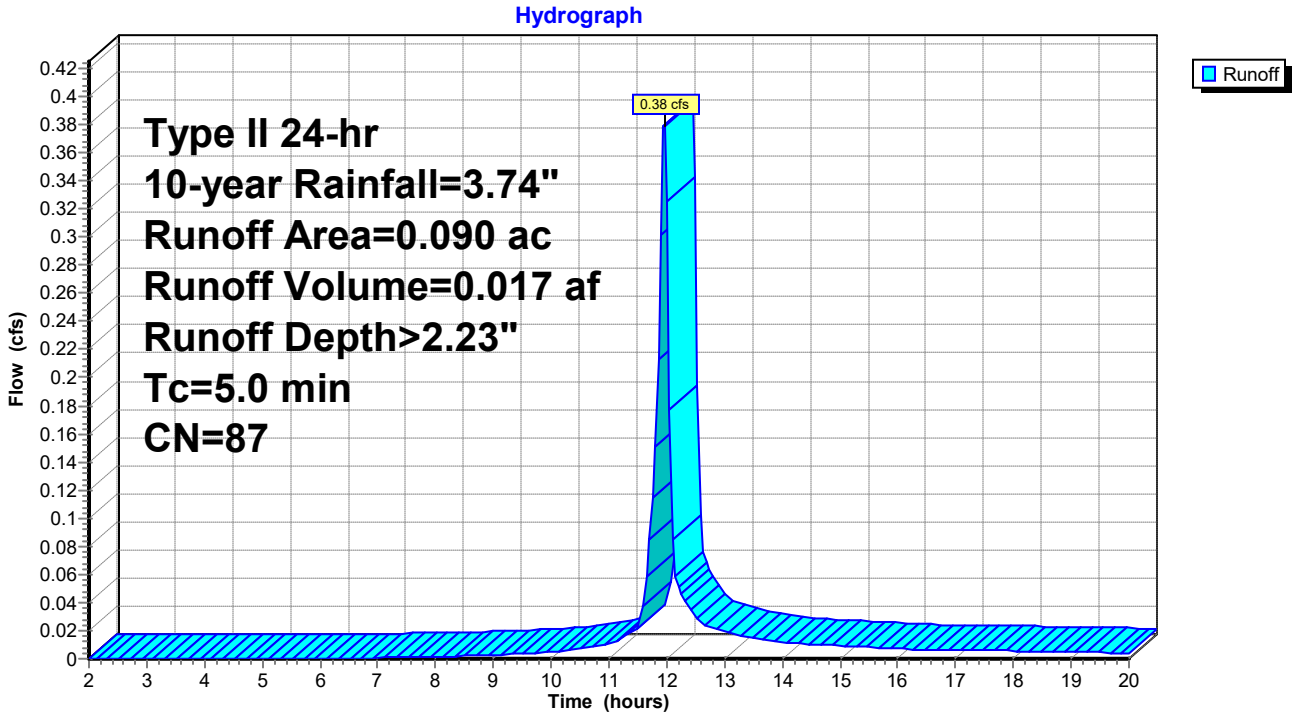
Runoff = 0.38 cfs @ 11.95 hrs, Volume= 0.017 af, Depth> 2.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=3.74"

	Area (ac)	CN	Description
*	0.040	74	Green Space
*	0.050	98	Impervious
	0.090	87	Weighted Average
	0.040		44.44% Pervious Area
	0.050		55.56% Impervious Area

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

Subcatchment 2: PreDev Onsite2



Summary for Subcatchment 3: PreDev Offsite1

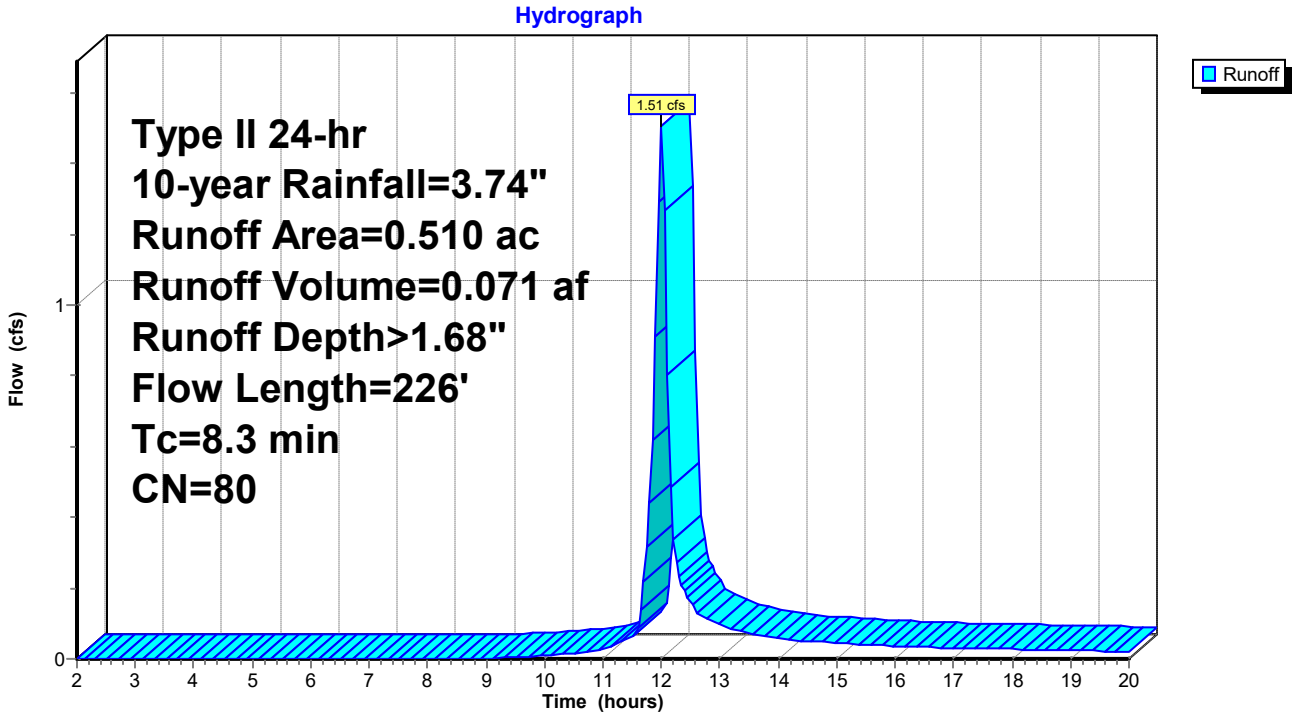
Runoff = 1.51 cfs @ 12.00 hrs, Volume= 0.071 af, Depth> 1.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=3.74"

	Area (ac)	CN	Description
*	0.380	74	Green Space
*	0.130	98	Impervious
	0.510	80	Weighted Average
	0.380		74.51% Pervious Area
	0.130		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	57	0.0160	0.13		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.63"
0.8	169	0.0500	3.60		**Shallow Concentrated Flow, Slope** Unpaved Kv= 16.1 fps
8.3	226	Total			

Subcatchment 3: PreDev Offsite1



Summary for Subcatchment 91: PostDev Onsite1

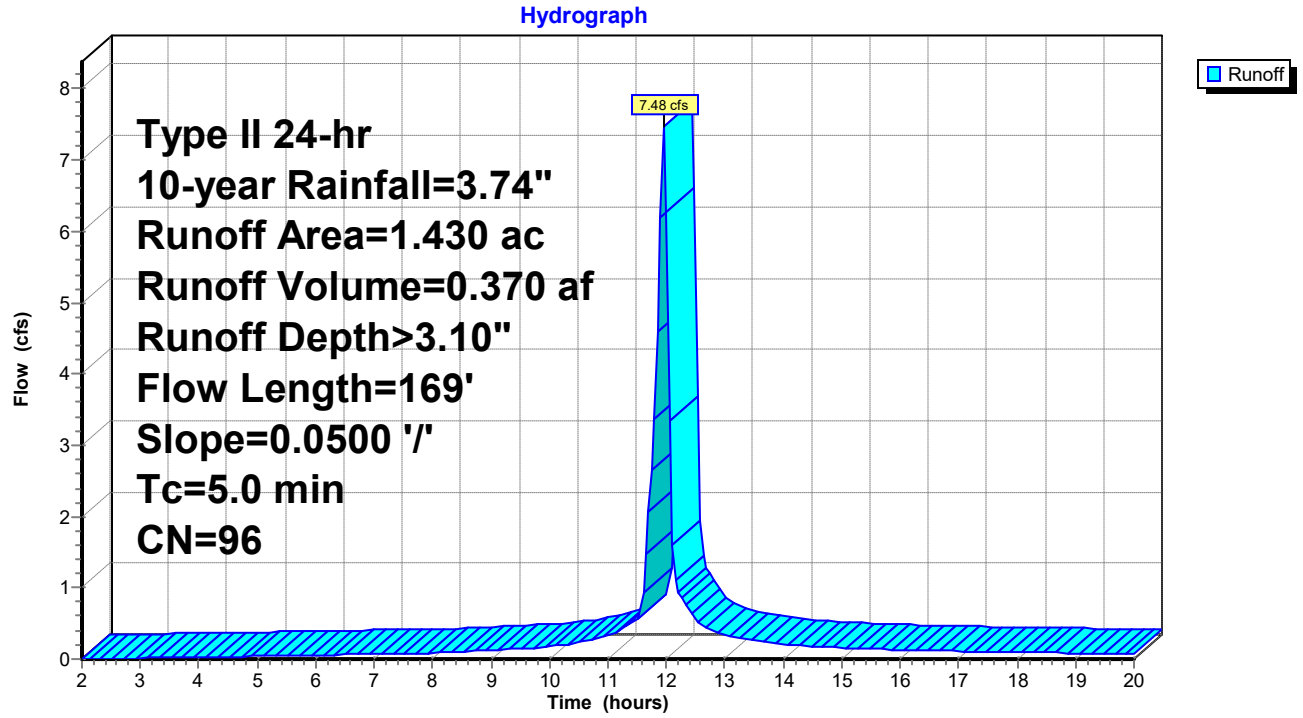
Runoff = 7.48 cfs @ 11.95 hrs, Volume= 0.370 af, Depth> 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=3.74"

	Area (ac)	CN	Description
*	1.430	96	Gravel
	1.430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0500	1.57		**Sheet Flow, Gravel** Smooth surfaces n= 0.011 P2= 2.63"
0.4	119	0.0500	4.54		**Shallow Concentrated Flow, Gravel** Paved Kv= 20.3 fps
4.1					**Direct Entry, 5 minimum**
5.0	169	Total			

Subcatchment 91: PostDev Onsite1



Summary for Subcatchment 92: PostDev Onsite2

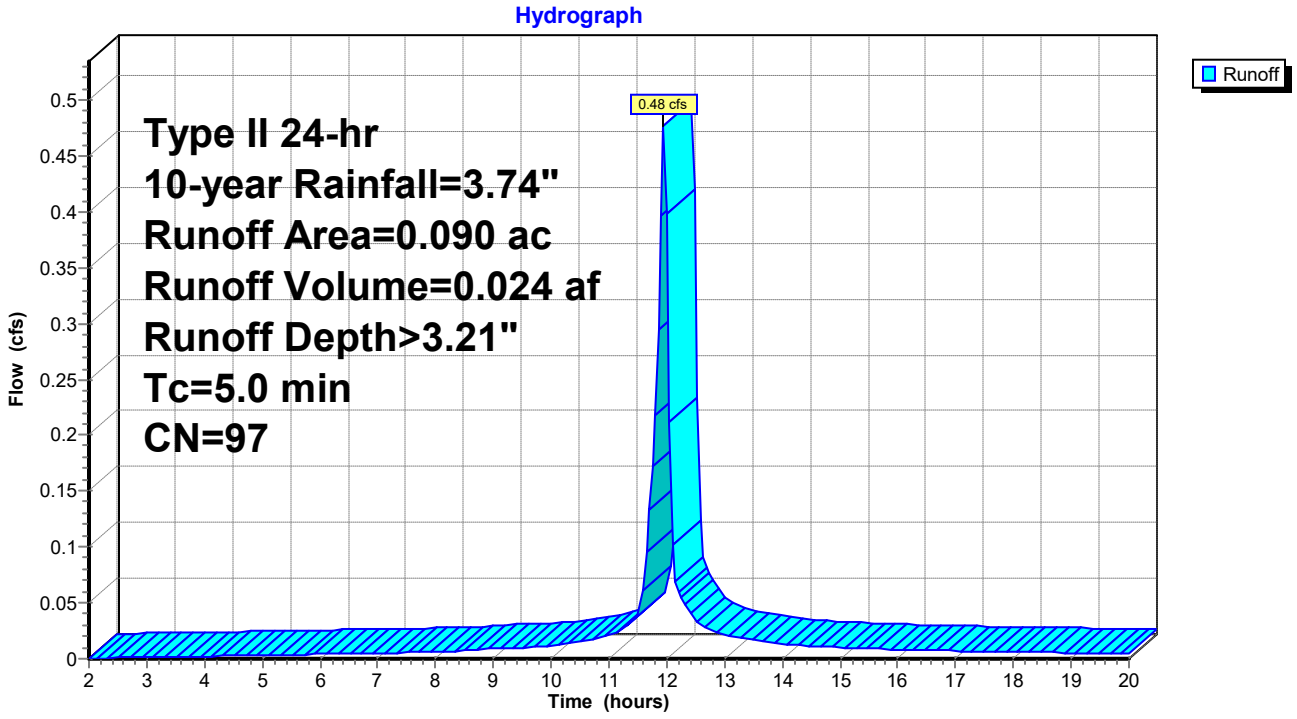
Runoff = 0.48 cfs @ 11.95 hrs, Volume= 0.024 af, Depth> 3.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=3.74"

	Area (ac)	CN	Description
*	0.060	96	Gravel
*	0.030	98	Impervious
	0.090	97	Weighted Average
	0.060		66.67% Pervious Area
	0.030		33.33% Impervious Area

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

Subcatchment 92: PostDev Onsite2



Summary for Subcatchment 93: PostDev Offsite1

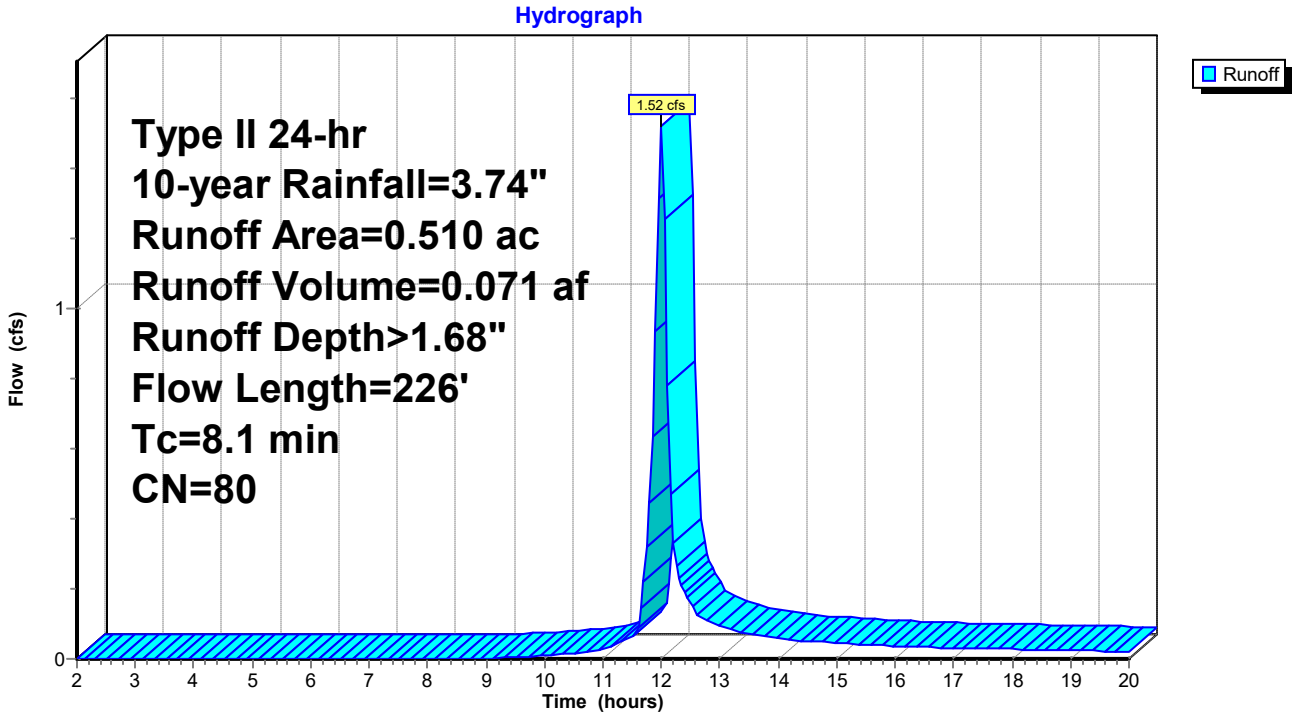
Runoff = 1.52 cfs @ 12.00 hrs, Volume= 0.071 af, Depth> 1.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=3.74"

	Area (ac)	CN	Description
*	0.380	74	Green Space
*	0.130	98	Impervious
	0.510	80	Weighted Average
	0.380		74.51% Pervious Area
	0.130		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	57	0.0160	0.13		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.63"
0.6	169	0.0500	4.54		**Shallow Concentrated Flow, Slope** Paved Kv= 20.3 fps
8.1	226	Total			

Subcatchment 93: PostDev Offsite1



Summary for Pond 95P: Proposed Storage Facility

Inflow Area = 1.940 ac, 6.70% Impervious, Inflow Depth > 2.73" for 10-year event
Inflow = 8.82 cfs @ 11.96 hrs, Volume= 0.441 af
Outflow = 2.43 cfs @ 12.11 hrs, Volume= 0.439 af, Atten= 72%, Lag= 9.4 min
Primary = 2.43 cfs @ 12.11 hrs, Volume= 0.439 af

Routing by Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 722.35' Storage= 133 cf
Peak Elev= 725.01' @ 12.11 hrs Surf.Area= 7,631 sf Storage= 6,213 cf (6,080 cf above start)

Plug-Flow detention time= 31.0 min calculated for 0.435 af (99% of inflow)
Center-of-Mass det. time= 22.3 min (764.7 - 742.4)

Volume	Invert	Avail.Storage	Storage Description
#1	722.00'	2,616 cf	**Aggregate Bed** Listed below 8,721 cf Overall x 30.0% Voids
#2	724.00'	17,845 cf	**Surface Storage (Prismatic)** Listed below
		20,461 cf	Total Available Storage

Elevation (feet)	Cum.Store (cubic-feet)
722.00	0
723.00	1,269
724.00	4,320
725.00	6,426
726.00	8,721

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
724.00	739	0	0
725.00	7,477	4,108	4,108
726.00	19,996	13,737	17,845

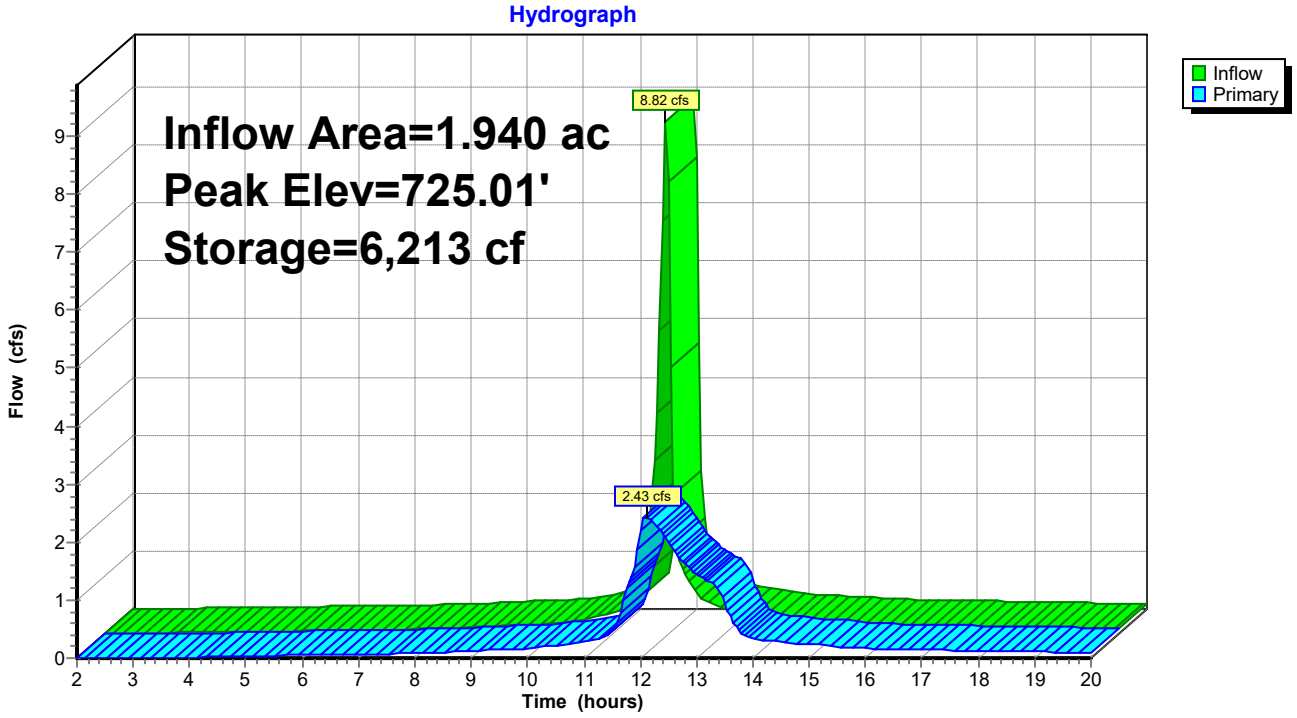
Device	Routing	Invert	Outlet Devices
#1	Primary	723.05'	**4.0" Round Outlet 1** L= 7.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 723.05' / 722.83' S= 0.0314 '/' Cc= 0.900 n= 0.013, Flow Area= 0.09 sf
#2	Primary	722.35'	**4.0" Round Outlet 3** L= 7.0' Ke= 0.500 Inlet / Outlet Invert= 722.35' / 722.15' S= 0.0286 '/' Cc= 0.900 n= 0.021, Flow Area= 0.09 sf
#3	Primary	723.11'	**4.0" Round Outlet 5** L= 7.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 723.11' / 722.78' S= 0.0471 '/' Cc= 0.900 n= 0.013, Flow Area= 0.09 sf
#4	Primary	722.00'	**Leakage** Head (feet) 0.00 1.00 2.00 3.00 4.00 Disch. (cfs) 0.000 0.040 0.090 0.130 0.170
#5	Primary	724.40'	**4.0" Round Upper Stage Outlet 2** L= 4.0' RCP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 724.40' / 724.40' S= 0.0000 '/' Cc= 0.900
n= 0.013, Flow Area= 0.09 sf

#6 Primary 724.10' **4.0" Round Upper Stage Outlet 4**
L= 4.0' RCP, square edge headwall, Ke= 0.500
Inlet / Outlet Invert= 724.10' / 724.10' S= 0.0000 '/' Cc= 0.900
n= 0.013, Flow Area= 0.09 sf

Primary OutFlow Max=2.42 cfs @ 12.11 hrs HW=725.01' (Free Discharge)
- **1=Outlet 1** (Inlet Controls 0.56 cfs @ 6.45 fps)
- **2=Outlet 3** (Barrel Controls 0.56 cfs @ 6.39 fps)
- **3=Outlet 5** (Inlet Controls 0.55 cfs @ 6.34 fps)
- **4=Leakage** (Custom Controls 0.13 cfs)
- **5=Upper Stage Outlet 2** (Barrel Controls 0.26 cfs @ 2.95 fps)
- **6=Upper Stage Outlet 4** (Inlet Controls 0.36 cfs @ 4.15 fps)

Pond 95P: Proposed Storage Facility

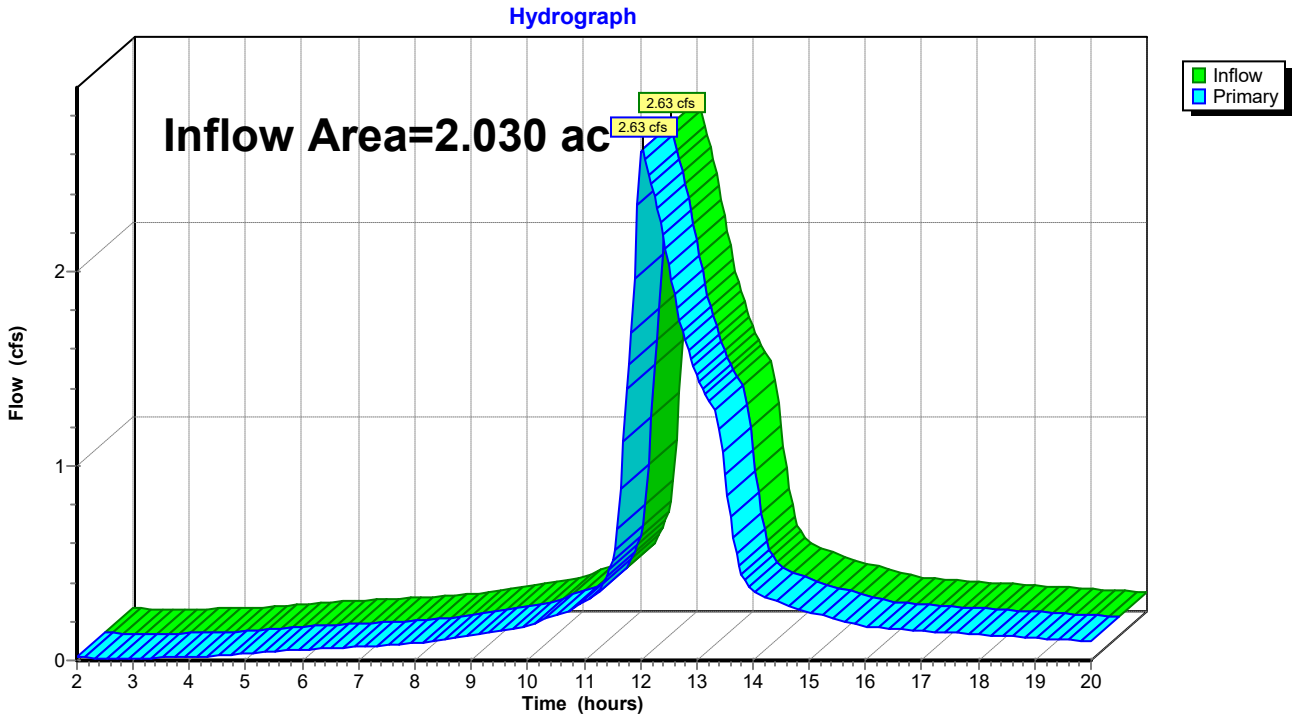


Summary for Pond 99: PostOutTotal

Inflow Area = 2.030 ac, 7.88% Impervious, Inflow Depth > 2.74" for 10-year event
Inflow = 2.63 cfs @ 12.03 hrs, Volume= 0.464 af
Primary = 2.63 cfs @ 12.03 hrs, Volume= 0.464 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

Pond 99: PostOutTotal



Summary for Subcatchment 1: PreDev Onsite1

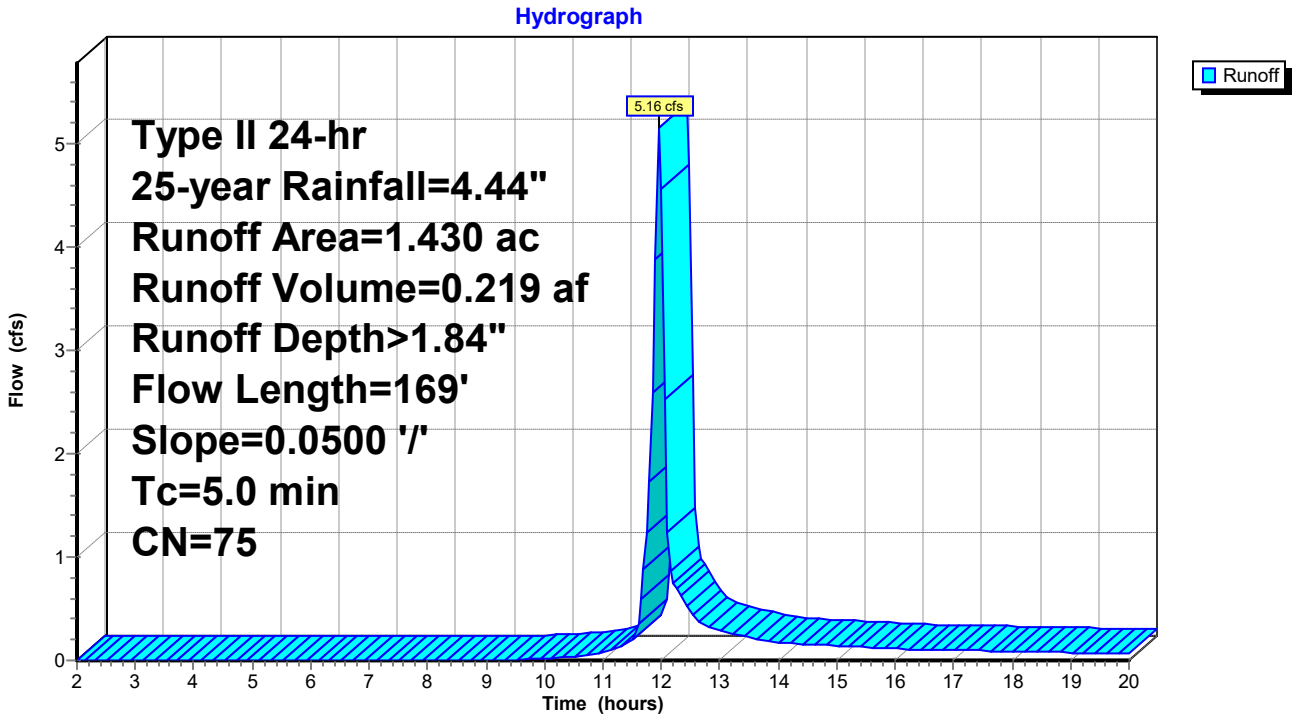
Runoff = 5.16 cfs @ 11.96 hrs, Volume= 0.219 af, Depth> 1.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.44"

	Area (ac)	CN	Description
*	1.400	74	Green Space
*	0.030	98	Impervious
	1.430	75	Weighted Average
	1.400		97.90% Pervious Area
	0.030		2.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0500	0.19		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 2.63"
0.6	119	0.0500	3.60		**Shallow Concentrated Flow, Grass** Unpaved Kv= 16.1 fps
0.1					**Direct Entry,**
5.0	169	Total			

Subcatchment 1: PreDev Onsite1



Summary for Subcatchment 2: PreDev Onsite2

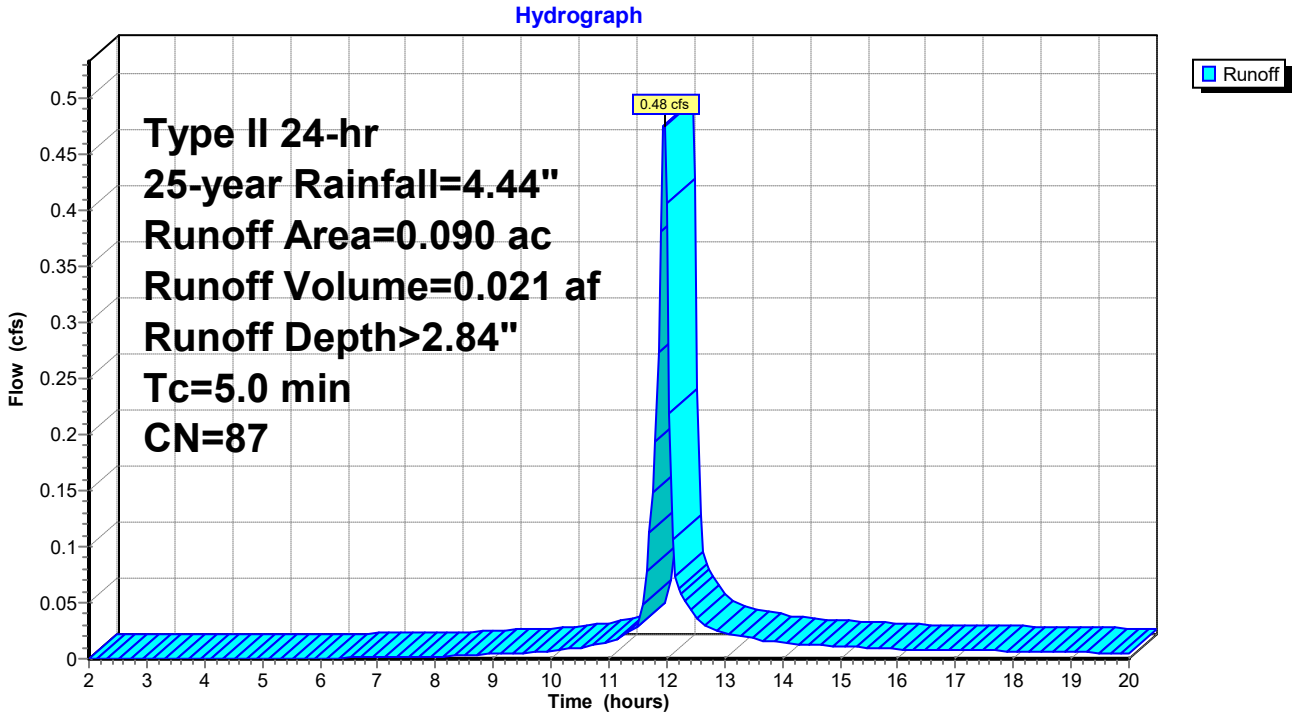
Runoff = 0.48 cfs @ 11.95 hrs, Volume= 0.021 af, Depth> 2.84"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.44"

	Area (ac)	CN	Description
*	0.040	74	Green Space
*	0.050	98	Impervious
	0.090	87	Weighted Average
	0.040		44.44% Pervious Area
	0.050		55.56% Impervious Area

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

Subcatchment 2: PreDev Onsite2



Summary for Subcatchment 3: PreDev Offsite1

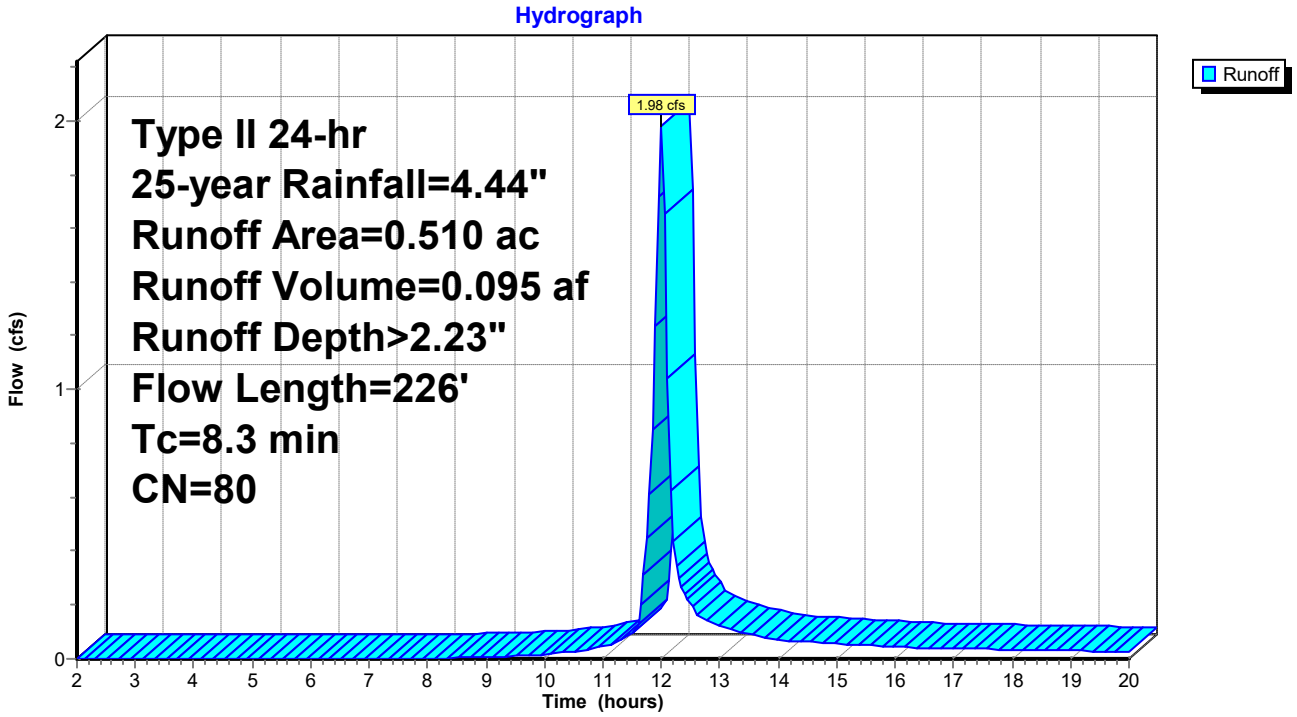
Runoff = 1.98 cfs @ 12.00 hrs, Volume= 0.095 af, Depth> 2.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.44"

	Area (ac)	CN	Description
*	0.380	74	Green Space
*	0.130	98	Impervious
	0.510	80	Weighted Average
	0.380		74.51% Pervious Area
	0.130		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	57	0.0160	0.13		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.63"
0.8	169	0.0500	3.60		**Shallow Concentrated Flow, Slope** Unpaved Kv= 16.1 fps
8.3	226	Total			

Subcatchment 3: PreDev Offsite1



Summary for Subcatchment 91: PostDev Onsite1

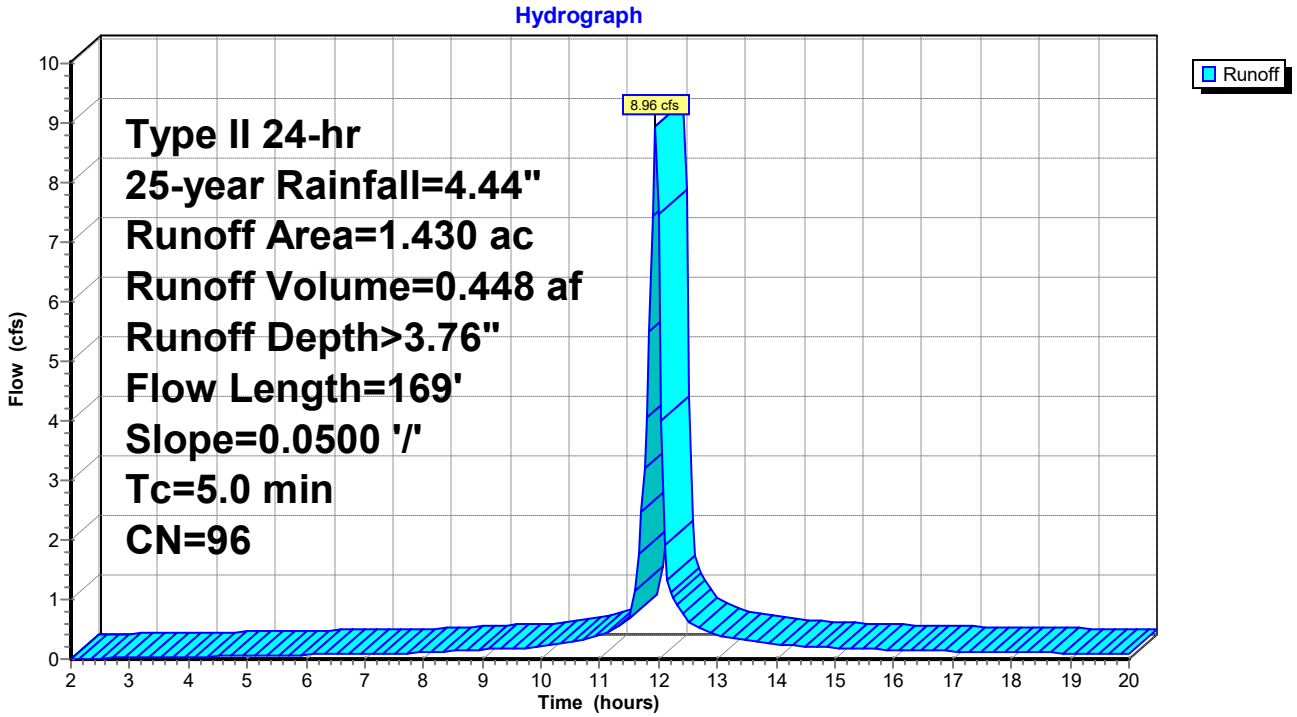
Runoff = 8.96 cfs @ 11.95 hrs, Volume= 0.448 af, Depth> 3.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.44"

	Area (ac)	CN	Description
*	1.430	96	Gravel
	1.430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0500	1.57		**Sheet Flow, Gravel** Smooth surfaces n= 0.011 P2= 2.63"
0.4	119	0.0500	4.54		**Shallow Concentrated Flow, Gravel** Paved Kv= 20.3 fps
4.1					**Direct Entry, 5 minimum**
5.0	169	Total			

Subcatchment 91: PostDev Onsite1



Summary for Subcatchment 92: PostDev Onsite2

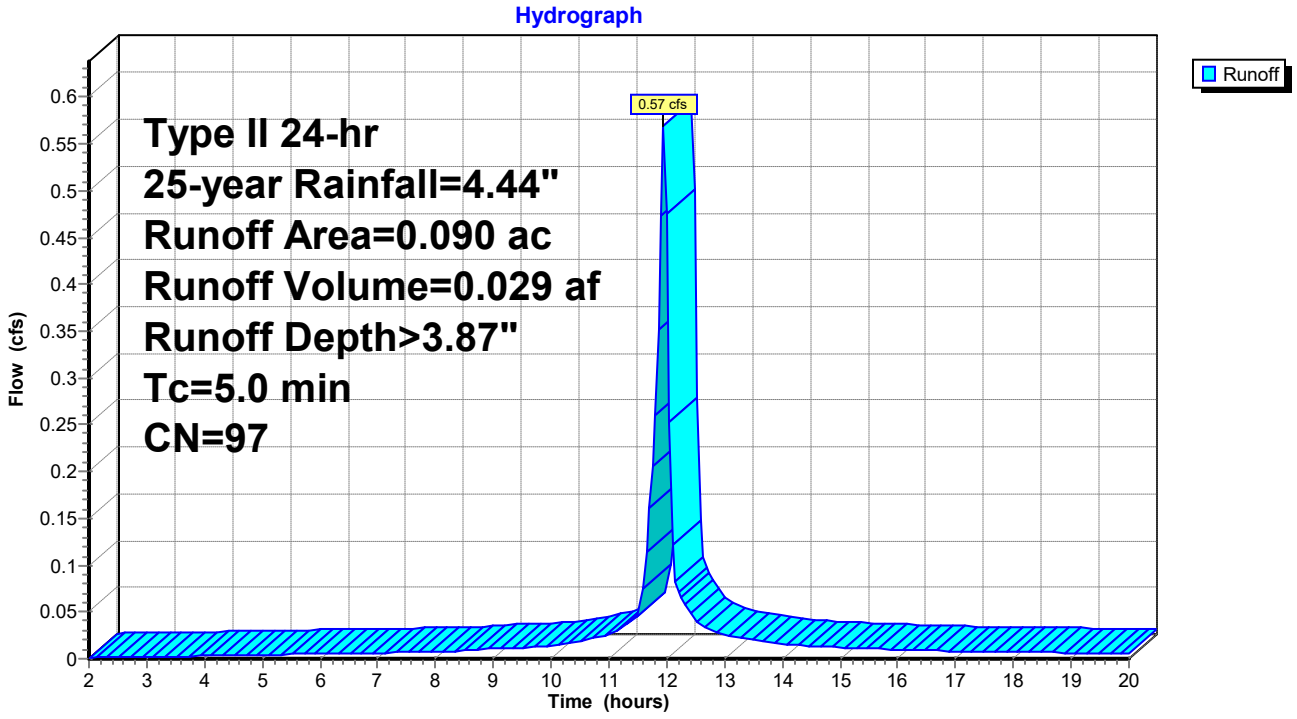
Runoff = 0.57 cfs @ 11.95 hrs, Volume= 0.029 af, Depth> 3.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.44"

	Area (ac)	CN	Description
*	0.060	96	Gravel
*	0.030	98	Impervious
	0.090	97	Weighted Average
	0.060		66.67% Pervious Area
	0.030		33.33% Impervious Area

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

Subcatchment 92: PostDev Onsite2



Summary for Subcatchment 93: PostDev Offsite1

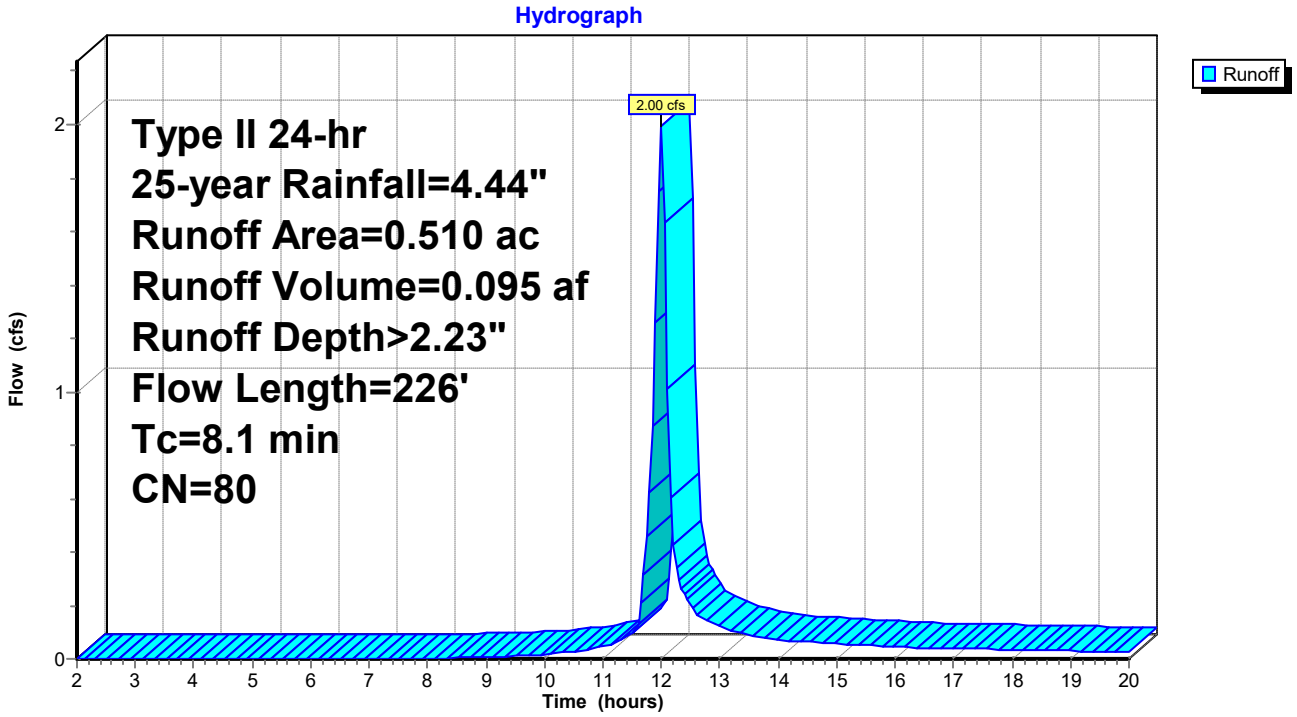
Runoff = 2.00 cfs @ 12.00 hrs, Volume= 0.095 af, Depth> 2.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.44"

	Area (ac)	CN	Description
*	0.380	74	Green Space
*	0.130	98	Impervious
	0.510	80	Weighted Average
	0.380		74.51% Pervious Area
	0.130		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	57	0.0160	0.13		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.63"
0.6	169	0.0500	4.54		**Shallow Concentrated Flow, Slope** Paved Kv= 20.3 fps
8.1	226	Total			

Subcatchment 93: PostDev Offsite1



Summary for Pond 95P: Proposed Storage Facility

Inflow Area = 1.940 ac, 6.70% Impervious, Inflow Depth > 3.36" for 25-year event
Inflow = 10.73 cfs @ 11.96 hrs, Volume= 0.543 af
Outflow = 2.56 cfs @ 12.12 hrs, Volume= 0.541 af, Atten= 76%, Lag= 9.9 min
Primary = 2.56 cfs @ 12.12 hrs, Volume= 0.541 af

Routing by Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 722.35' Storage= 133 cf
Peak Elev= 725.13' @ 12.12 hrs Surf.Area= 9,087 sf Storage= 7,891 cf (7,758 cf above start)

Plug-Flow detention time= 32.9 min calculated for 0.536 af (99% of inflow)
Center-of-Mass det. time= 25.5 min (764.0 - 738.6)

Volume	Invert	Avail.Storage	Storage Description
#1	722.00'	2,616 cf	**Aggregate Bed** Listed below 8,721 cf Overall x 30.0% Voids
#2	724.00'	17,845 cf	**Surface Storage (Prismatic)** Listed below
		20,461 cf	Total Available Storage

Elevation (feet)	Cum.Store (cubic-feet)
722.00	0
723.00	1,269
724.00	4,320
725.00	6,426
726.00	8,721

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
724.00	739	0	0
725.00	7,477	4,108	4,108
726.00	19,996	13,737	17,845

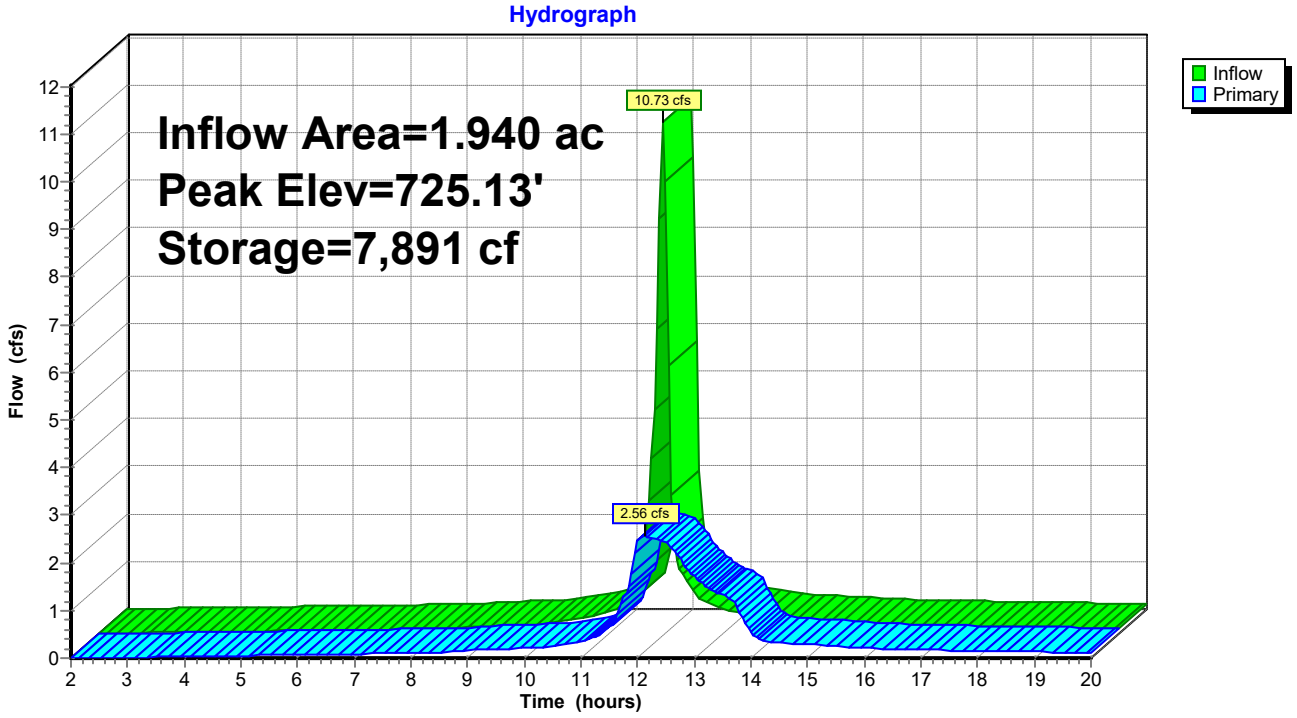
Device	Routing	Invert	Outlet Devices
#1	Primary	723.05'	**4.0" Round Outlet 1** L= 7.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 723.05' / 722.83' S= 0.0314 '/' Cc= 0.900 n= 0.013, Flow Area= 0.09 sf
#2	Primary	722.35'	**4.0" Round Outlet 3** L= 7.0' Ke= 0.500 Inlet / Outlet Invert= 722.35' / 722.15' S= 0.0286 '/' Cc= 0.900 n= 0.021, Flow Area= 0.09 sf
#3	Primary	723.11'	**4.0" Round Outlet 5** L= 7.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 723.11' / 722.78' S= 0.0471 '/' Cc= 0.900 n= 0.013, Flow Area= 0.09 sf
#4	Primary	722.00'	**Leakage** Head (feet) 0.00 1.00 2.00 3.00 4.00 Disch. (cfs) 0.000 0.040 0.090 0.130 0.170
#5	Primary	724.40'	**4.0" Round Upper Stage Outlet 2** L= 4.0' RCP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 724.40' / 724.40' S= 0.0000 '/' Cc= 0.900
n= 0.013, Flow Area= 0.09 sf

#6 Primary 724.10' **4.0" Round Upper Stage Outlet 4**
L= 4.0' RCP, square edge headwall, Ke= 0.500
Inlet / Outlet Invert= 724.10' / 724.10' S= 0.0000 '/' Cc= 0.900
n= 0.013, Flow Area= 0.09 sf

Primary OutFlow Max=2.55 cfs @ 12.12 hrs HW=725.13' (Free Discharge)
- **1=Outlet 1** (Inlet Controls 0.58 cfs @ 6.65 fps)
- **2=Outlet 3** (Barrel Controls 0.57 cfs @ 6.54 fps)
- **3=Outlet 5** (Inlet Controls 0.57 cfs @ 6.55 fps)
- **4=Leakage** (Custom Controls 0.14 cfs)
- **5=Upper Stage Outlet 2** (Barrel Controls 0.31 cfs @ 3.52 fps)
- **6=Upper Stage Outlet 4** (Inlet Controls 0.39 cfs @ 4.46 fps)

Pond 95P: Proposed Storage Facility

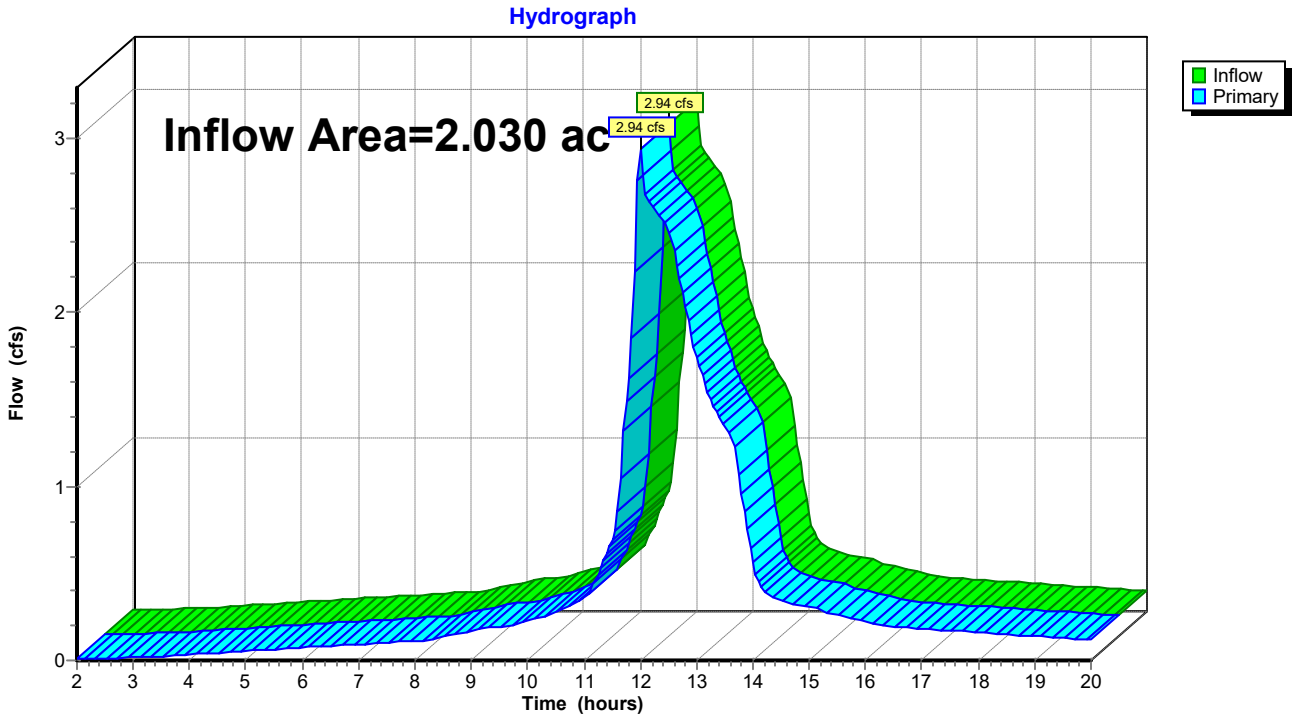


Summary for Pond 99: PostOutTotal

Inflow Area = 2.030 ac, 7.88% Impervious, Inflow Depth > 3.37" for 25-year event
Inflow = 2.94 cfs @ 12.00 hrs, Volume= 0.570 af
Primary = 2.94 cfs @ 12.00 hrs, Volume= 0.570 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

Pond 99: PostOutTotal



Summary for Subcatchment 1: PreDev Onsite1

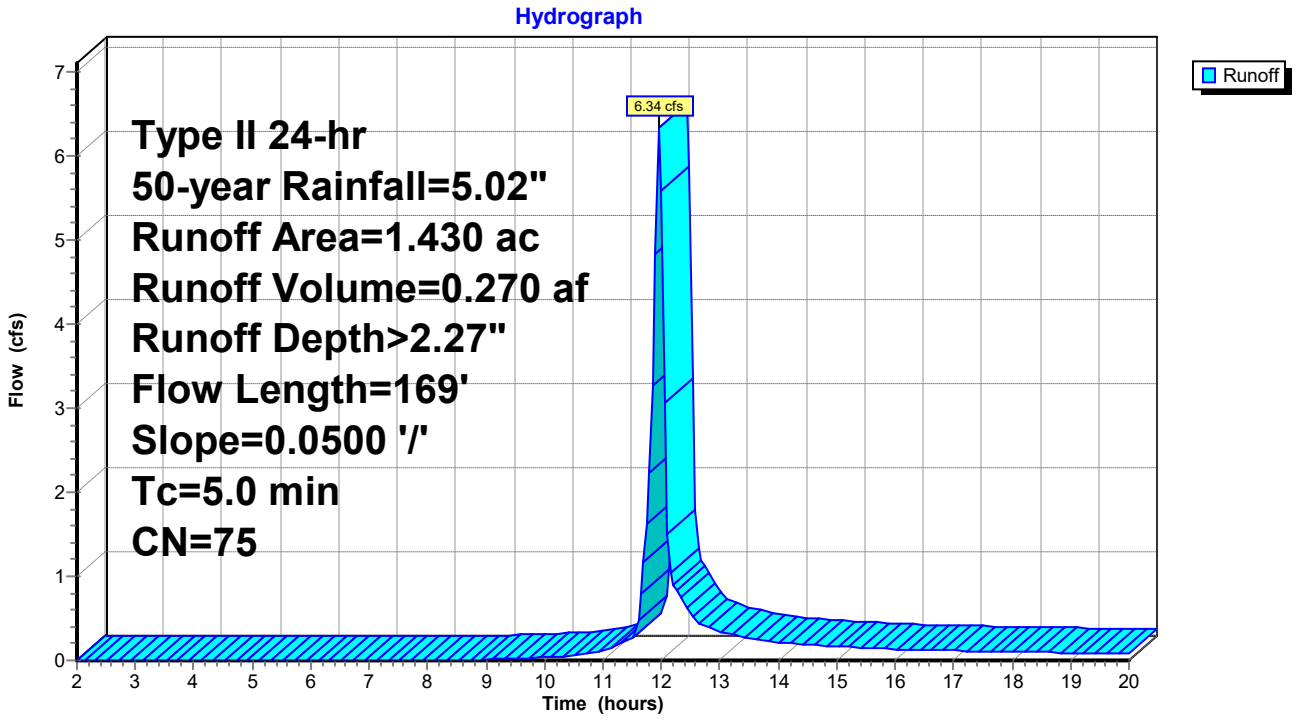
Runoff = 6.34 cfs @ 11.96 hrs, Volume= 0.270 af, Depth> 2.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-year Rainfall=5.02"

	Area (ac)	CN	Description
*	1.400	74	Green Space
*	0.030	98	Impervious
	1.430	75	Weighted Average
	1.400		97.90% Pervious Area
	0.030		2.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0500	0.19		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 2.63"
0.6	119	0.0500	3.60		**Shallow Concentrated Flow, Grass** Unpaved Kv= 16.1 fps
0.1					**Direct Entry,**
5.0	169	Total			

Subcatchment 1: PreDev Onsite1



Summary for Subcatchment 2: PreDev Onsite2

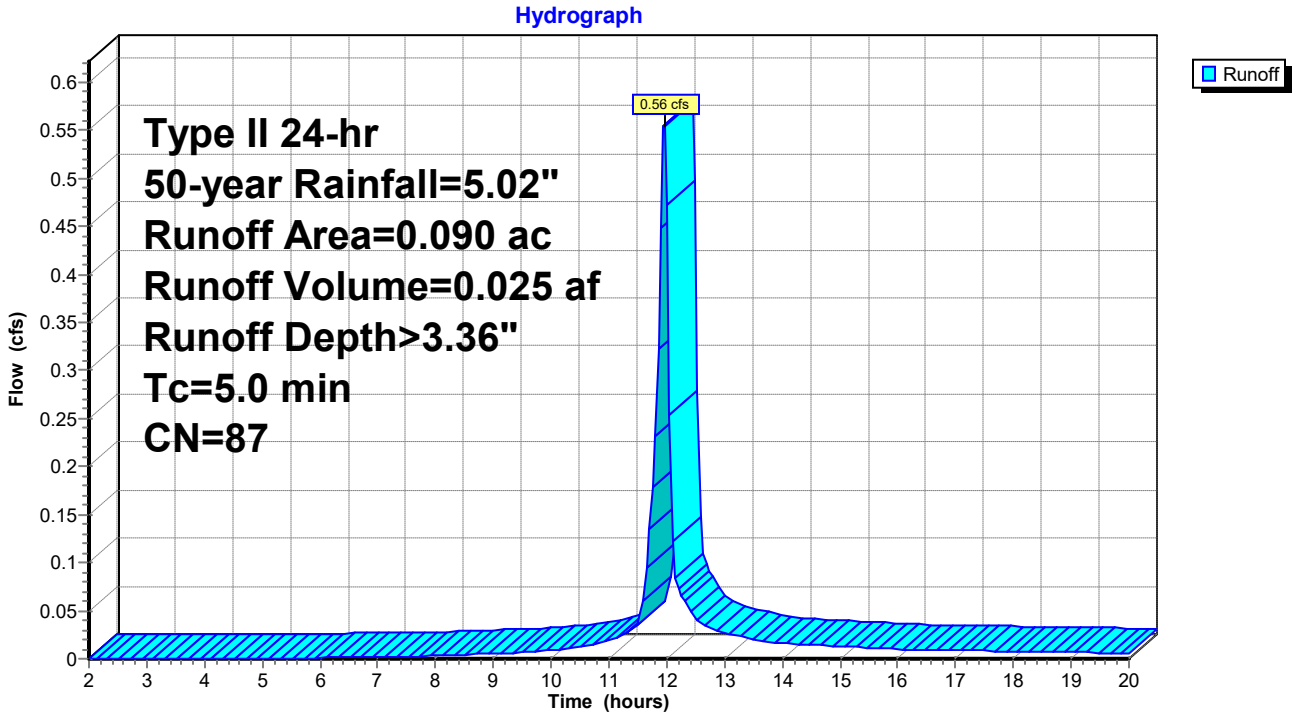
Runoff = 0.56 cfs @ 11.95 hrs, Volume= 0.025 af, Depth> 3.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-year Rainfall=5.02"

	Area (ac)	CN	Description
*	0.040	74	Green Space
*	0.050	98	Impervious
	0.090	87	Weighted Average
	0.040		44.44% Pervious Area
	0.050		55.56% Impervious Area

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

Subcatchment 2: PreDev Onsite2



Summary for Subcatchment 3: PreDev Offsite1

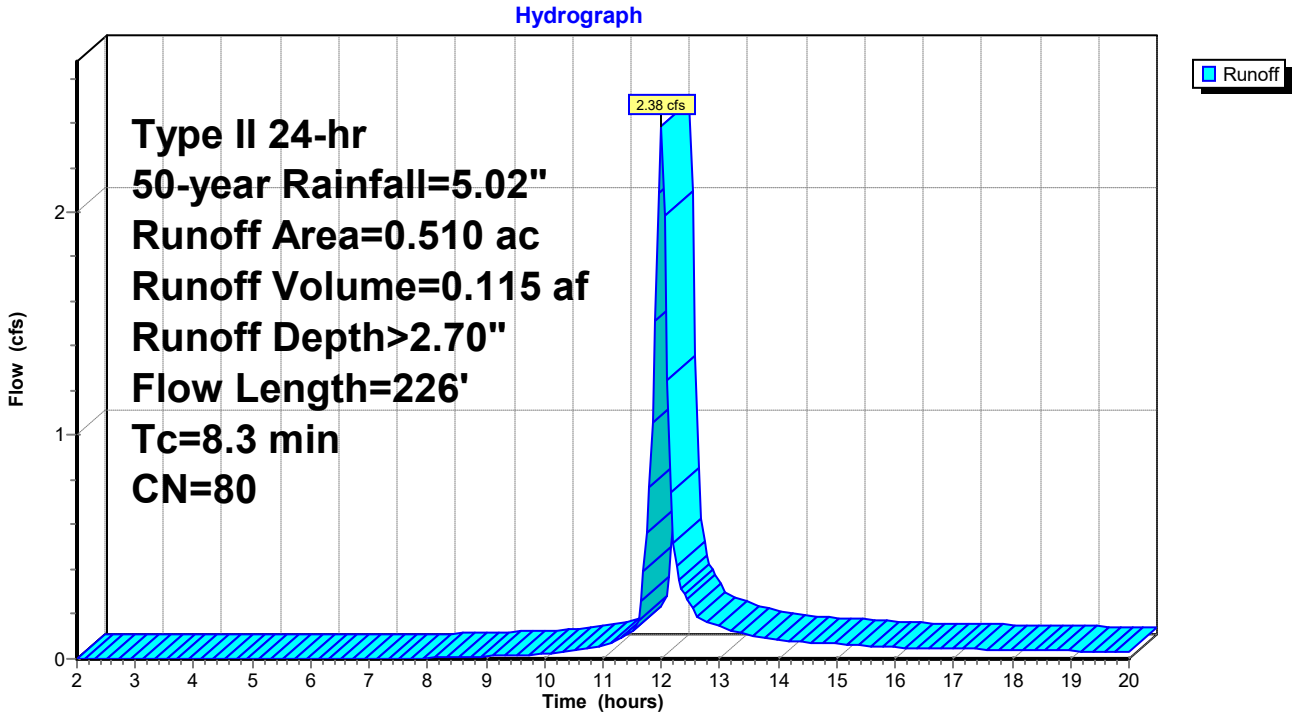
Runoff = 2.38 cfs @ 12.00 hrs, Volume= 0.115 af, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-year Rainfall=5.02"

	Area (ac)	CN	Description
*	0.380	74	Green Space
*	0.130	98	Impervious
	0.510	80	Weighted Average
	0.380		74.51% Pervious Area
	0.130		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	57	0.0160	0.13		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.63"
0.8	169	0.0500	3.60		**Shallow Concentrated Flow, Slope** Unpaved Kv= 16.1 fps
8.3	226	Total			

Subcatchment 3: PreDev Offsite1



Summary for Subcatchment 91: PostDev Onsite1

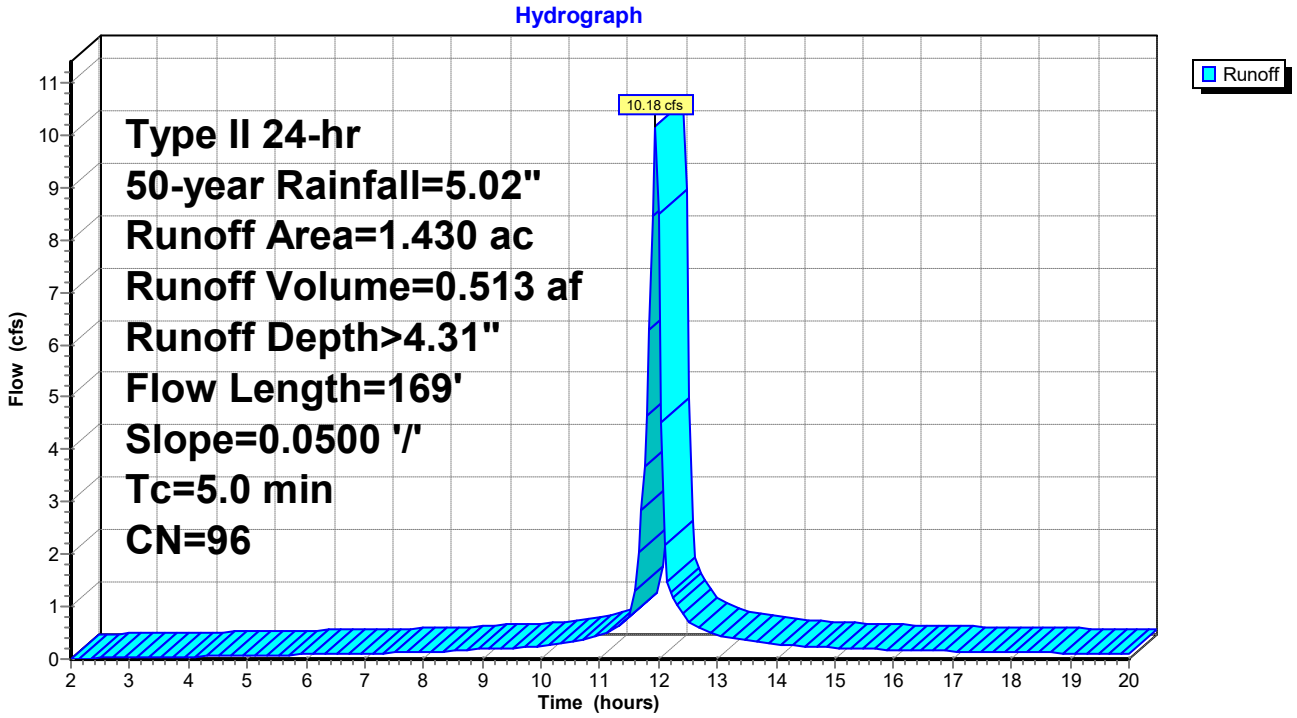
Runoff = 10.18 cfs @ 11.95 hrs, Volume= 0.513 af, Depth> 4.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-year Rainfall=5.02"

	Area (ac)	CN	Description
*	1.430	96	Gravel
	1.430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0500	1.57		**Sheet Flow, Gravel** Smooth surfaces n= 0.011 P2= 2.63"
0.4	119	0.0500	4.54		**Shallow Concentrated Flow, Gravel** Paved Kv= 20.3 fps
4.1					**Direct Entry, 5 minimum**
5.0	169	Total			

Subcatchment 91: PostDev Onsite1



Summary for Subcatchment 92: PostDev Onsite2

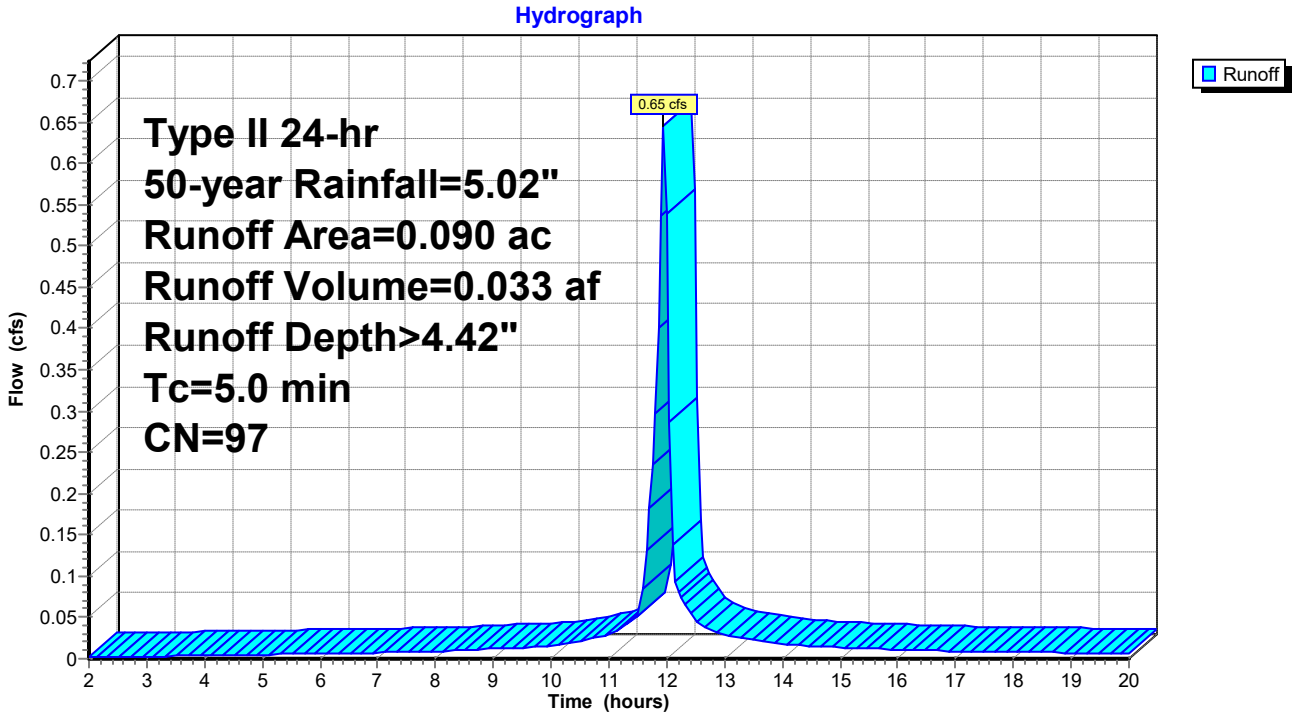
Runoff = 0.65 cfs @ 11.95 hrs, Volume= 0.033 af, Depth> 4.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-year Rainfall=5.02"

	Area (ac)	CN	Description
*	0.060	96	Gravel
*	0.030	98	Impervious
	0.090	97	Weighted Average
	0.060		66.67% Pervious Area
	0.030		33.33% Impervious Area

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

Subcatchment 92: PostDev Onsite2



Summary for Subcatchment 93: PostDev Offsite1

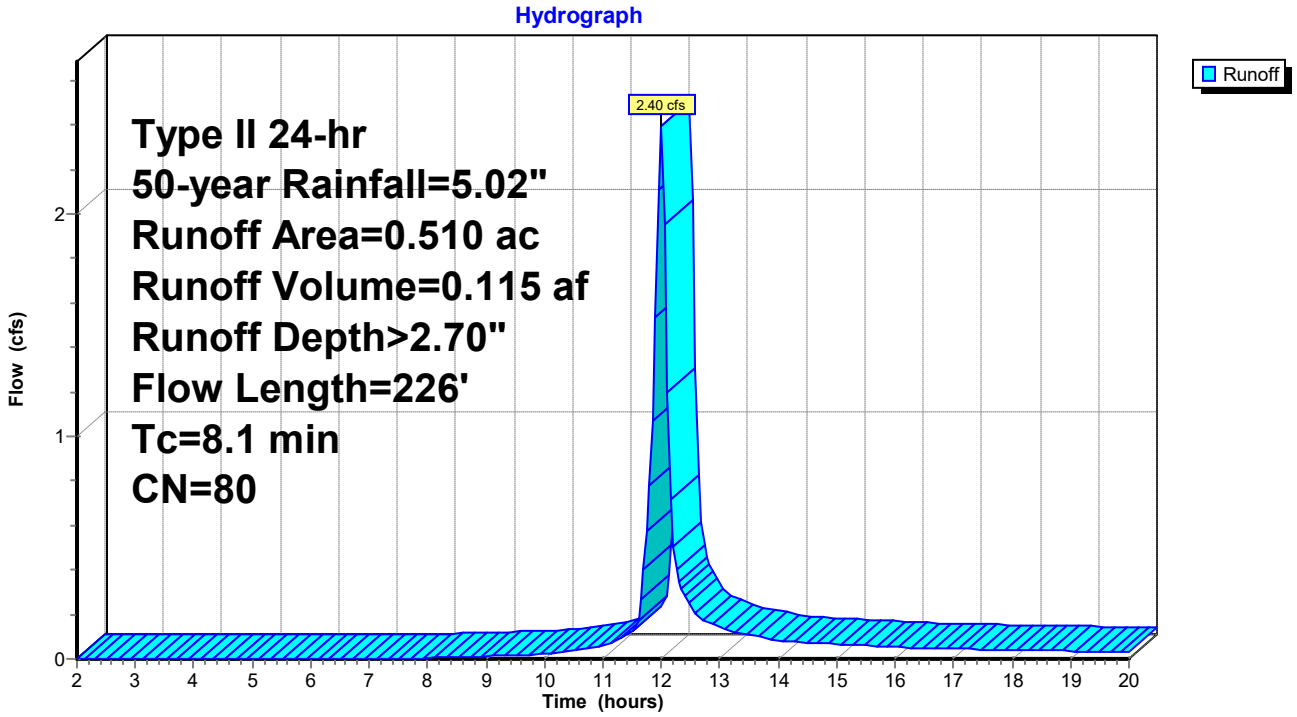
Runoff = 2.40 cfs @ 11.99 hrs, Volume= 0.115 af, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-year Rainfall=5.02"

	Area (ac)	CN	Description
*	0.380	74	Green Space
*	0.130	98	Impervious
	0.510	80	Weighted Average
	0.380		74.51% Pervious Area
	0.130		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	57	0.0160	0.13		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.63"
0.6	169	0.0500	4.54		**Shallow Concentrated Flow, Slope** Paved Kv= 20.3 fps
8.1	226	Total			

Subcatchment 93: PostDev Offsite1



Summary for Pond 95P: Proposed Storage Facility

Inflow Area = 1.940 ac, 6.70% Impervious, Inflow Depth > 3.88" for 50-year event
Inflow = 12.32 cfs @ 11.96 hrs, Volume= 0.628 af
Outflow = 2.66 cfs @ 12.13 hrs, Volume= 0.626 af, Atten= 78%, Lag= 10.6 min
Primary = 2.66 cfs @ 12.13 hrs, Volume= 0.626 af

Routing by Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 722.35' Storage= 133 cf
Peak Elev= 725.23' @ 12.13 hrs Surf.Area= 10,313 sf Storage= 9,303 cf (9,170 cf above start)

Plug-Flow detention time= 34.9 min calculated for 0.623 af (99% of inflow)
Center-of-Mass det. time= 28.3 min (764.3 - 736.0)

Volume	Invert	Avail.Storage	Storage Description
#1	722.00'	2,616 cf	**Aggregate Bed** Listed below 8,721 cf Overall x 30.0% Voids
#2	724.00'	17,845 cf	**Surface Storage (Prismatic)** Listed below
		20,461 cf	Total Available Storage

Elevation (feet)	Cum.Store (cubic-feet)
722.00	0
723.00	1,269
724.00	4,320
725.00	6,426
726.00	8,721

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
724.00	739	0	0
725.00	7,477	4,108	4,108
726.00	19,996	13,737	17,845

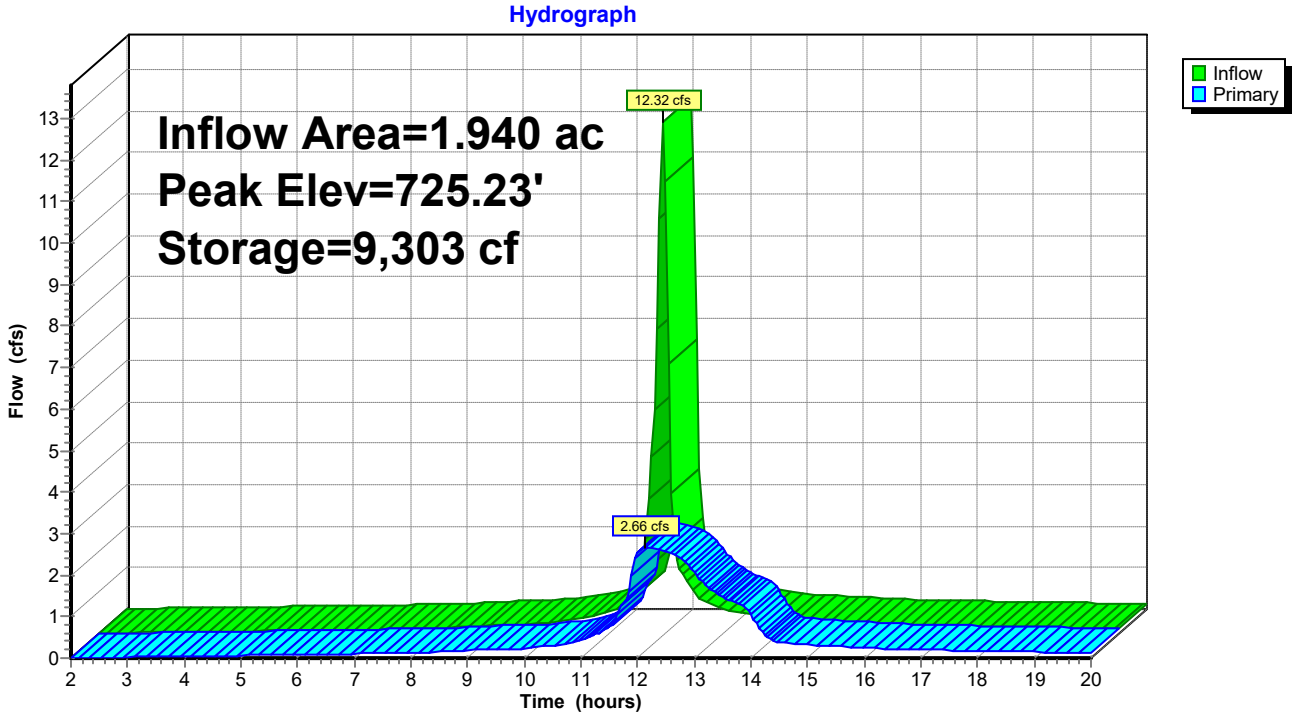
Device	Routing	Invert	Outlet Devices
#1	Primary	723.05'	**4.0" Round Outlet 1** L= 7.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 723.05' / 722.83' S= 0.0314 '/' Cc= 0.900 n= 0.013, Flow Area= 0.09 sf
#2	Primary	722.35'	**4.0" Round Outlet 3** L= 7.0' Ke= 0.500 Inlet / Outlet Invert= 722.35' / 722.15' S= 0.0286 '/' Cc= 0.900 n= 0.021, Flow Area= 0.09 sf
#3	Primary	723.11'	**4.0" Round Outlet 5** L= 7.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 723.11' / 722.78' S= 0.0471 '/' Cc= 0.900 n= 0.013, Flow Area= 0.09 sf
#4	Primary	722.00'	**Leakage** Head (feet) 0.00 1.00 2.00 3.00 4.00 Disch. (cfs) 0.000 0.040 0.090 0.130 0.170
#5	Primary	724.40'	**4.0" Round Upper Stage Outlet 2** L= 4.0' RCP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 724.40' / 724.40' S= 0.0000 '/' Cc= 0.900
n= 0.013, Flow Area= 0.09 sf

#6 Primary 724.10' **4.0" Round Upper Stage Outlet 4**
L= 4.0' RCP, square edge headwall, Ke= 0.500
Inlet / Outlet Invert= 724.10' / 724.10' S= 0.0000 '/' Cc= 0.900
n= 0.013, Flow Area= 0.09 sf

Primary OutFlow Max=2.65 cfs @ 12.13 hrs HW=725.23' (Free Discharge)
- **1=Outlet 1** (Inlet Controls 0.60 cfs @ 6.82 fps)
- **2=Outlet 3** (Barrel Controls 0.58 cfs @ 6.66 fps)
- **3=Outlet 5** (Inlet Controls 0.59 cfs @ 6.72 fps)
- **4=Leakage** (Custom Controls 0.14 cfs)
- **5=Upper Stage Outlet 2** (Inlet Controls 0.34 cfs @ 3.91 fps)
- **6=Upper Stage Outlet 4** (Inlet Controls 0.41 cfs @ 4.71 fps)

Pond 95P: Proposed Storage Facility

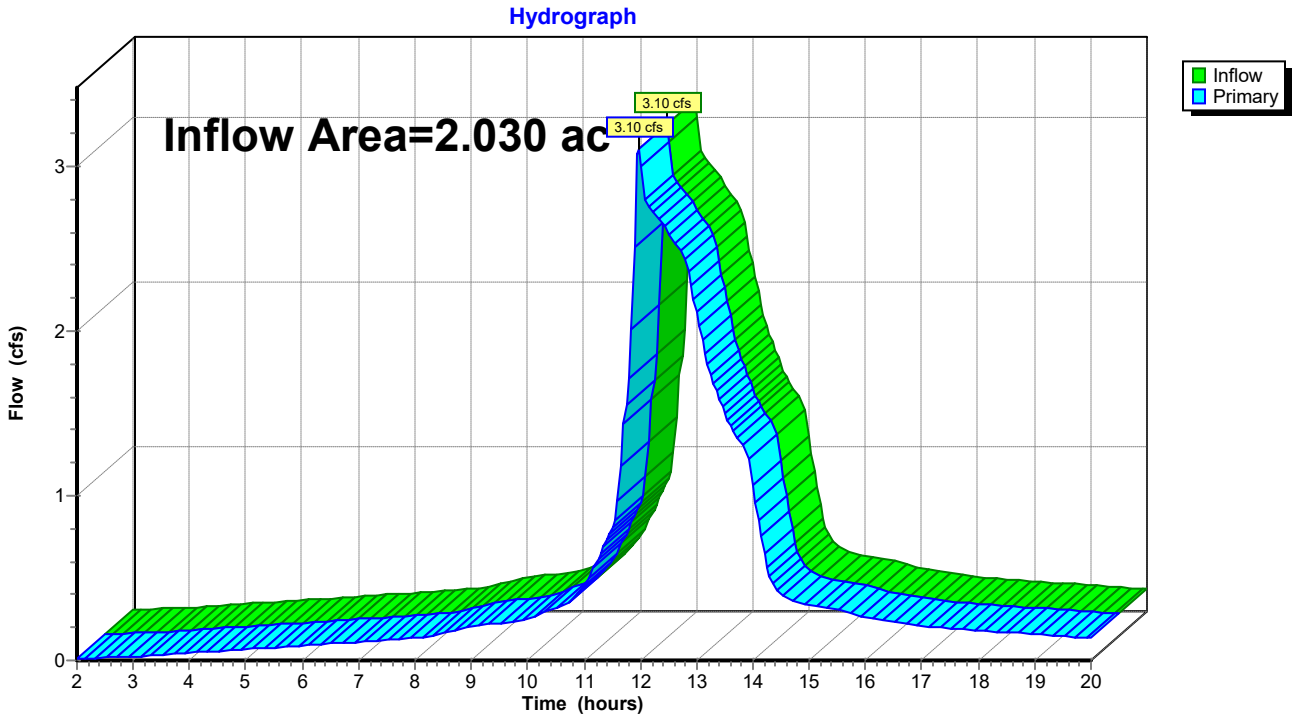


Summary for Pond 99: PostOutTotal

Inflow Area = 2.030 ac, 7.88% Impervious, Inflow Depth > 3.90" for 50-year event
Inflow = 3.10 cfs @ 11.98 hrs, Volume= 0.659 af
Primary = 3.10 cfs @ 11.98 hrs, Volume= 0.659 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

Pond 99: PostOutTotal



Summary for Subcatchment 1: PreDev Onsite1

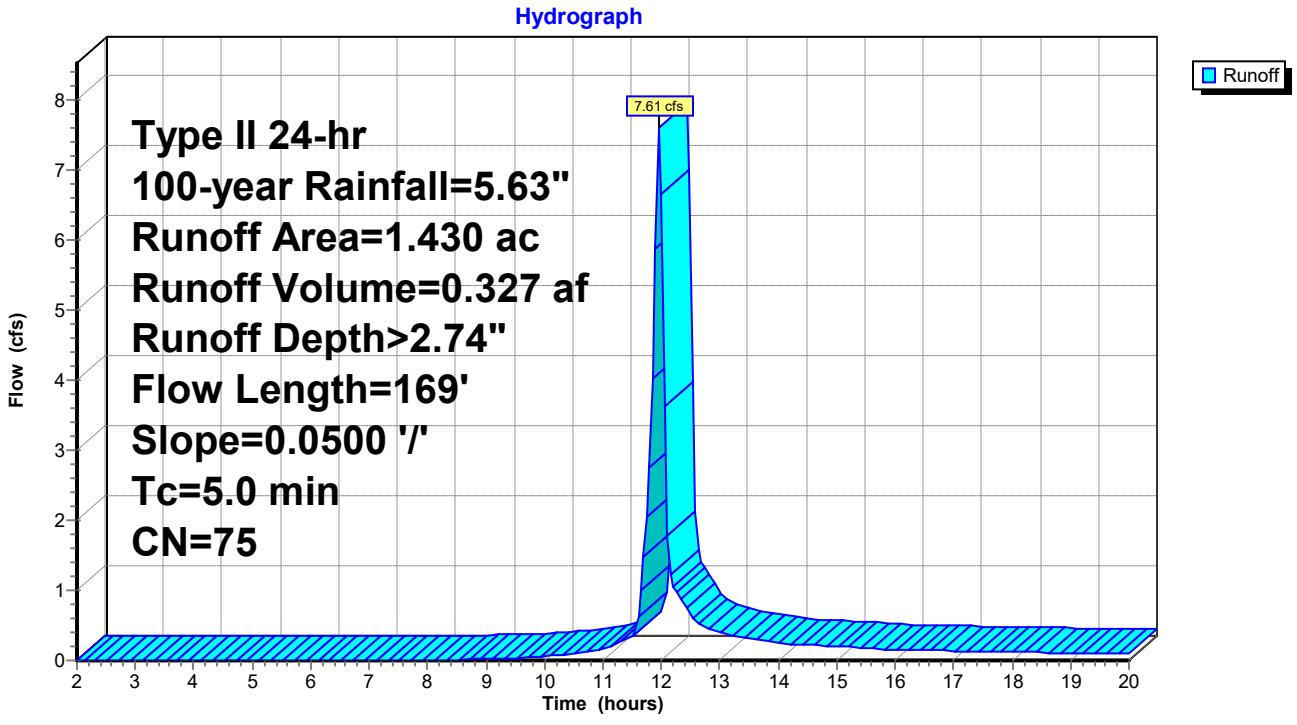
Runoff = 7.61 cfs @ 11.96 hrs, Volume= 0.327 af, Depth> 2.74"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year Rainfall=5.63"

	Area (ac)	CN	Description
*	1.400	74	Green Space
*	0.030	98	Impervious
	1.430	75	Weighted Average
	1.400		97.90% Pervious Area
	0.030		2.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.3	50	0.0500	0.19		**Sheet Flow, Grass** Grass: Short n= 0.150 P2= 2.63"
0.6	119	0.0500	3.60		**Shallow Concentrated Flow, Grass** Unpaved Kv= 16.1 fps
0.1					**Direct Entry,**
5.0	169	Total			

Subcatchment 1: PreDev Onsite1



Summary for Subcatchment 2: PreDev Onsite2

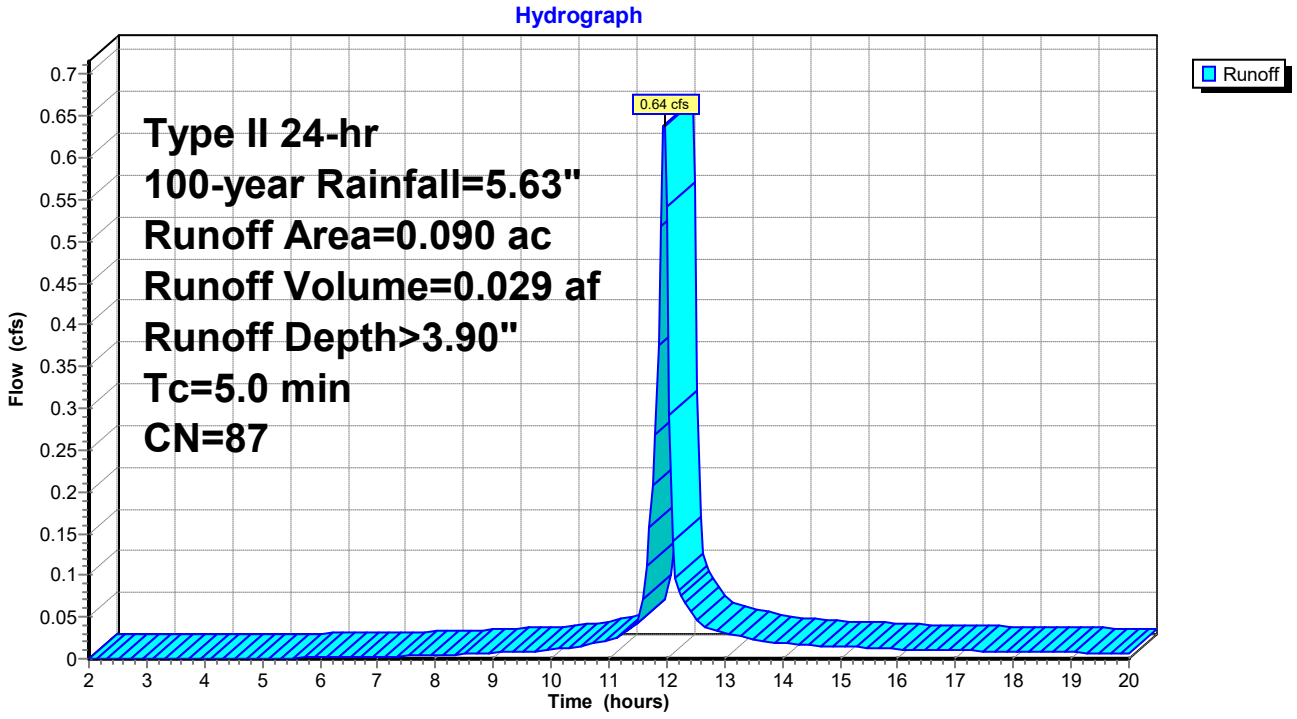
Runoff = 0.64 cfs @ 11.95 hrs, Volume= 0.029 af, Depth> 3.90"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year Rainfall=5.63"

	Area (ac)	CN	Description
*	0.040	74	Green Space
*	0.050	98	Impervious
	0.090	87	Weighted Average
	0.040		44.44% Pervious Area
	0.050		55.56% Impervious Area

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

Subcatchment 2: PreDev Onsite2



Summary for Subcatchment 3: PreDev Offsite1

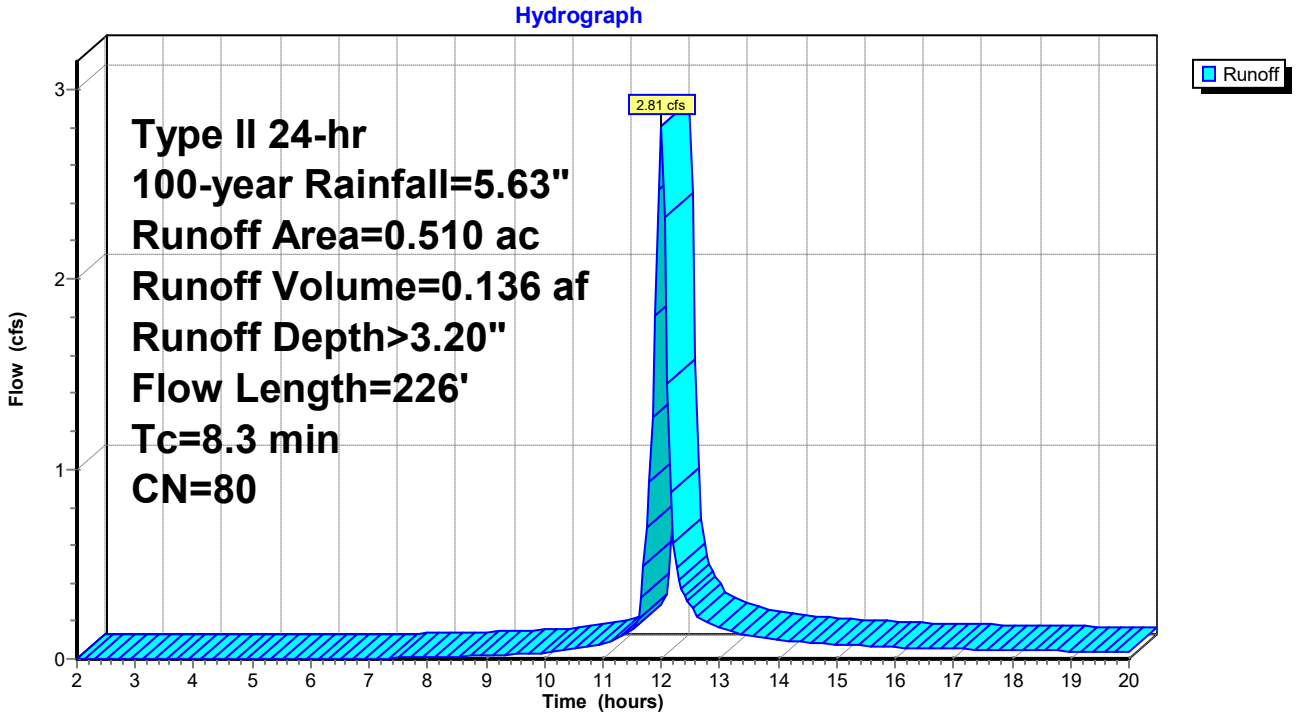
Runoff = 2.81 cfs @ 12.00 hrs, Volume= 0.136 af, Depth> 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year Rainfall=5.63"

	Area (ac)	CN	Description
*	0.380	74	Green Space
*	0.130	98	Impervious
	0.510	80	Weighted Average
	0.380		74.51% Pervious Area
	0.130		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	57	0.0160	0.13		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.63"
0.8	169	0.0500	3.60		**Shallow Concentrated Flow, Slope** Unpaved Kv= 16.1 fps
8.3	226	Total			

Subcatchment 3: PreDev Offsite1



Summary for Subcatchment 91: PostDev Onsite1

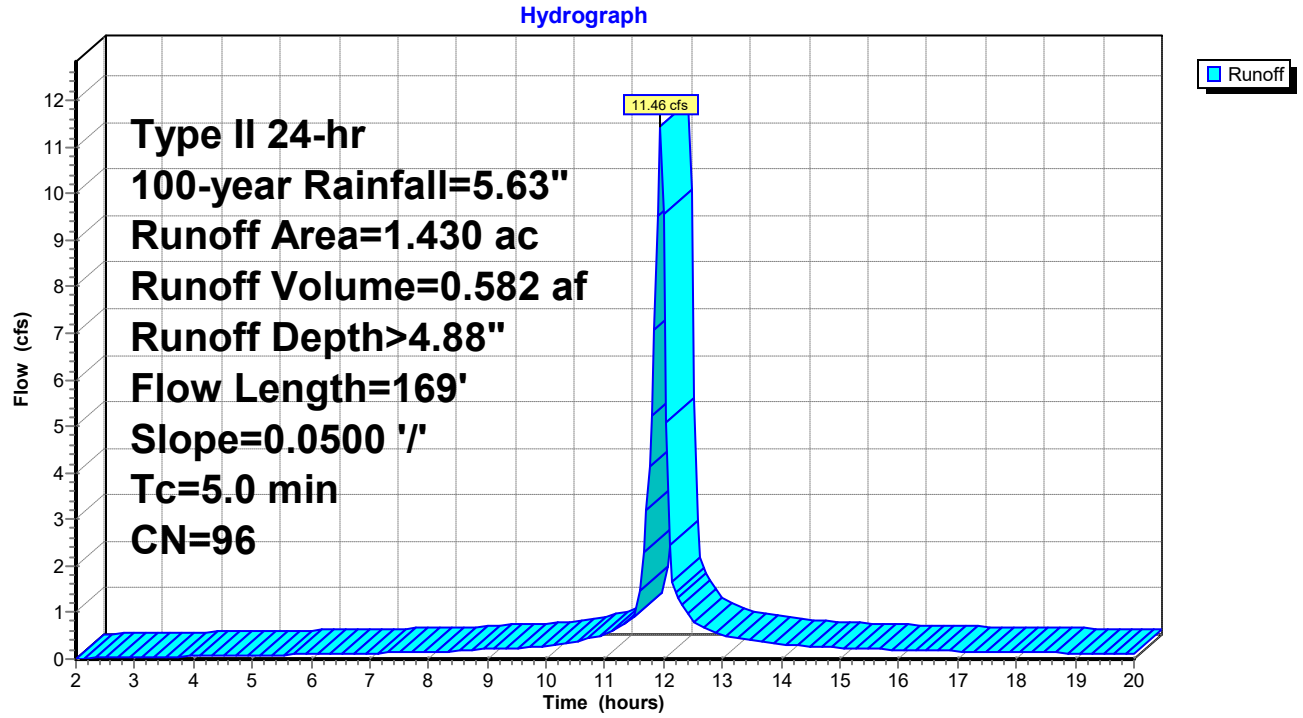
Runoff = 11.46 cfs @ 11.95 hrs, Volume= 0.582 af, Depth> 4.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year Rainfall=5.63"

	Area (ac)	CN	Description
*	1.430	96	Gravel
	1.430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0500	1.57		**Sheet Flow, Gravel** Smooth surfaces n= 0.011 P2= 2.63"
0.4	119	0.0500	4.54		**Shallow Concentrated Flow, Gravel** Paved Kv= 20.3 fps
4.1					**Direct Entry, 5 minimum**
5.0	169	Total			

Subcatchment 91: PostDev Onsite1



Summary for Subcatchment 92: PostDev Onsite2

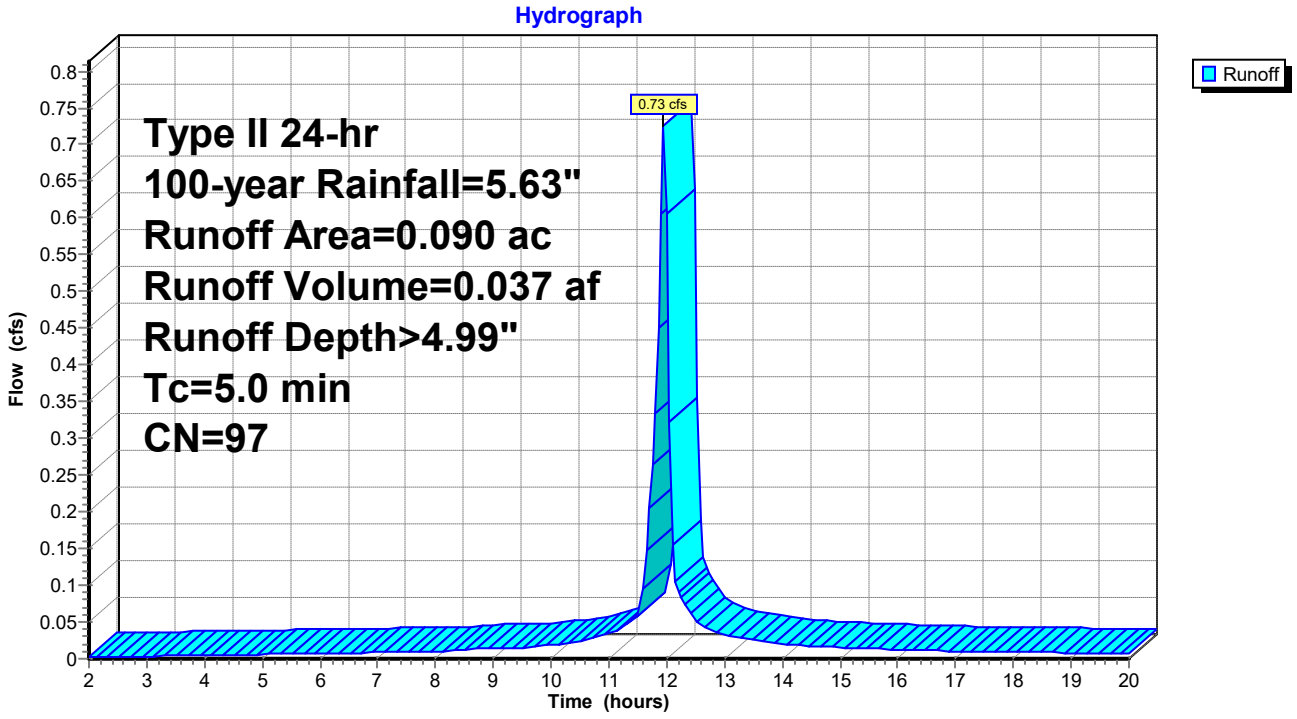
Runoff = 0.73 cfs @ 11.95 hrs, Volume= 0.037 af, Depth> 4.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year Rainfall=5.63"

	Area (ac)	CN	Description
*	0.060	96	Gravel
*	0.030	98	Impervious
	0.090	97	Weighted Average
	0.060		66.67% Pervious Area
	0.030		33.33% Impervious Area

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

Subcatchment 92: PostDev Onsite2



Summary for Subcatchment 93: PostDev Offsite1

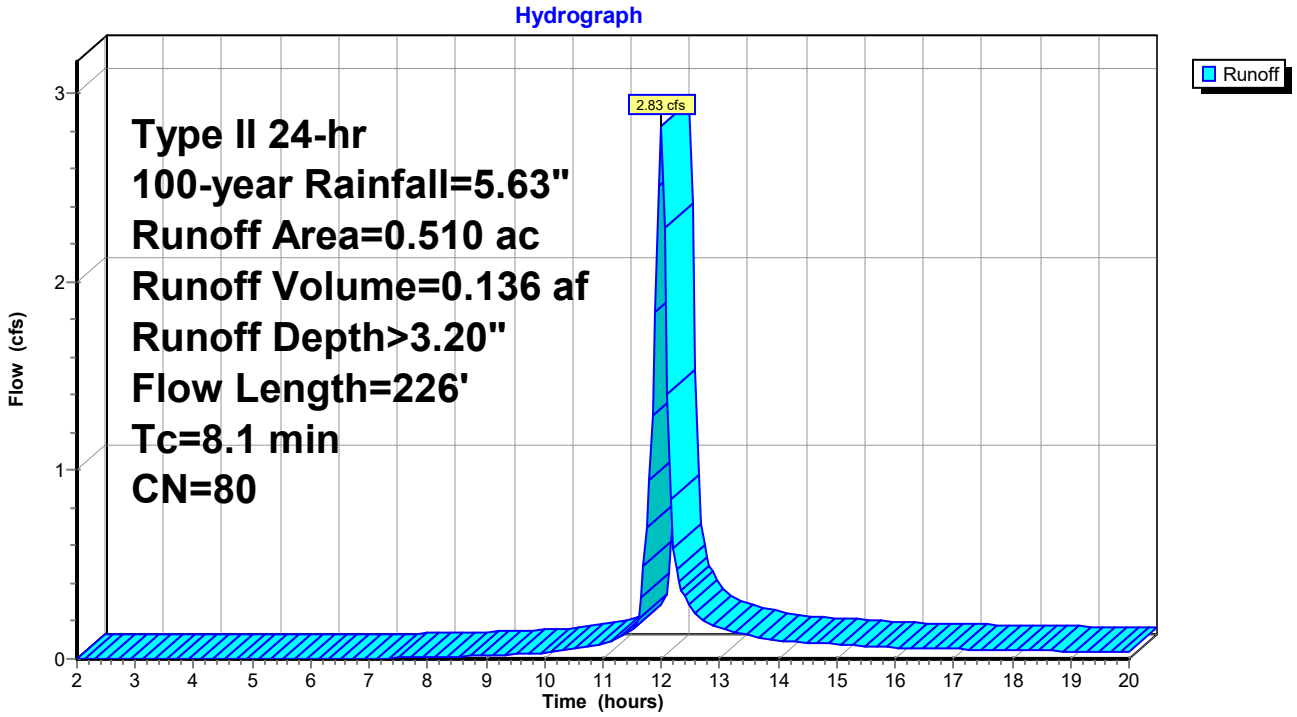
Runoff = 2.83 cfs @ 11.99 hrs, Volume= 0.136 af, Depth> 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year Rainfall=5.63"

	Area (ac)	CN	Description
*	0.380	74	Green Space
*	0.130	98	Impervious
	0.510	80	Weighted Average
	0.380		74.51% Pervious Area
	0.130		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	57	0.0160	0.13		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.63"
0.6	169	0.0500	4.54		**Shallow Concentrated Flow, Slope** Paved Kv= 20.3 fps
8.1	226	Total			

Subcatchment 93: PostDev Offsite1



Summary for Pond 95P: Proposed Storage Facility

Inflow Area = 1.940 ac, 6.70% Impervious, Inflow Depth > 4.44" for 100-year event
Inflow = 14.00 cfs @ 11.96 hrs, Volume= 0.718 af
Outflow = 2.75 cfs @ 12.15 hrs, Volume= 0.716 af, Atten= 80%, Lag= 11.5 min
Primary = 2.75 cfs @ 12.15 hrs, Volume= 0.716 af

Routing by Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs
Starting Elev= 722.35' Storage= 133 cf
Peak Elev= 725.34' @ 12.15 hrs Surf.Area= 11,688 sf Storage= 10,888 cf (10,754 cf above start)

Plug-Flow detention time= 37.4 min calculated for 0.713 af (99% of inflow)
Center-of-Mass det. time= 31.4 min (765.1 - 733.7)

Volume	Invert	Avail.Storage	Storage Description
#1	722.00'	2,616 cf	**Aggregate Bed** Listed below 8,721 cf Overall x 30.0% Voids
#2	724.00'	17,845 cf	**Surface Storage (Prismatic)** Listed below
		20,461 cf	Total Available Storage

Elevation (feet)	Cum.Store (cubic-feet)
722.00	0
723.00	1,269
724.00	4,320
725.00	6,426
726.00	8,721

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
724.00	739	0	0
725.00	7,477	4,108	4,108
726.00	19,996	13,737	17,845

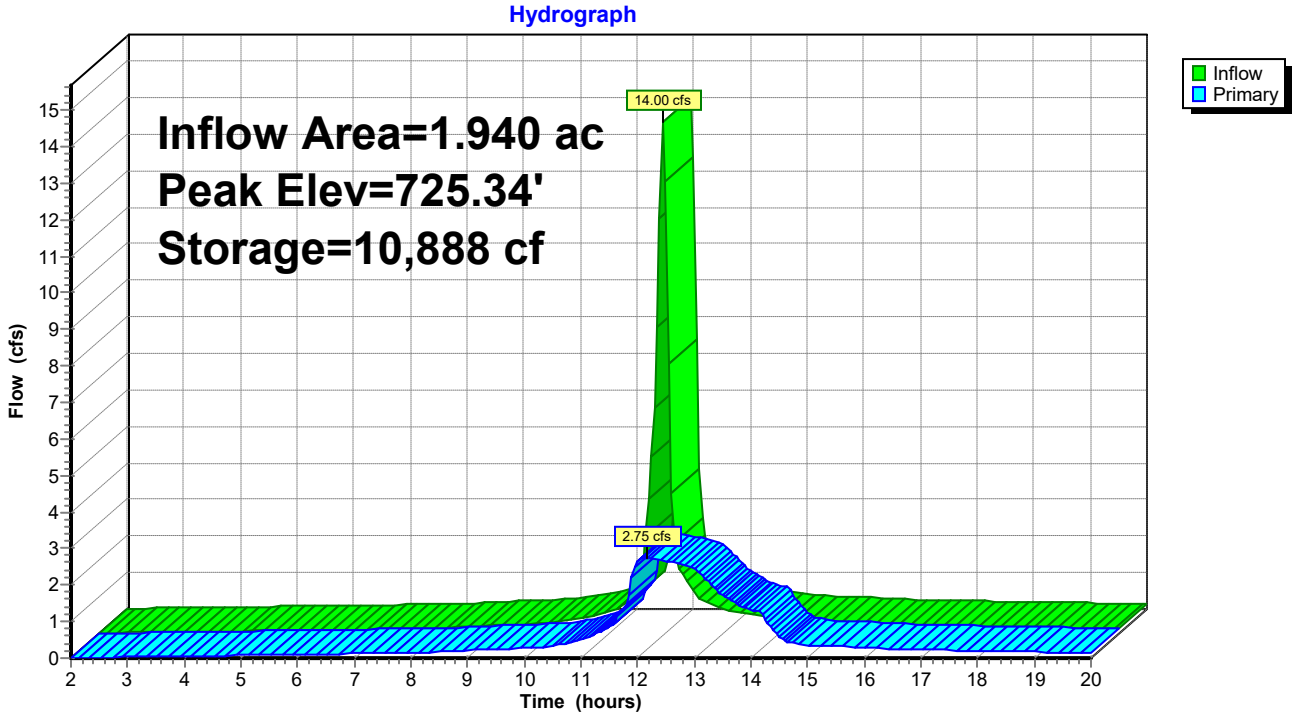
Device	Routing	Invert	Outlet Devices
#1	Primary	723.05'	**4.0" Round Outlet 1** L= 7.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 723.05' / 722.83' S= 0.0314 '/' Cc= 0.900 n= 0.013, Flow Area= 0.09 sf
#2	Primary	722.35'	**4.0" Round Outlet 3** L= 7.0' Ke= 0.500 Inlet / Outlet Invert= 722.35' / 722.15' S= 0.0286 '/' Cc= 0.900 n= 0.021, Flow Area= 0.09 sf
#3	Primary	723.11'	**4.0" Round Outlet 5** L= 7.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 723.11' / 722.78' S= 0.0471 '/' Cc= 0.900 n= 0.013, Flow Area= 0.09 sf
#4	Primary	722.00'	**Leakage** Head (feet) 0.00 1.00 2.00 3.00 4.00 Disch. (cfs) 0.000 0.040 0.090 0.130 0.170
#5	Primary	724.40'	**4.0" Round Upper Stage Outlet 2** L= 4.0' RCP, square edge headwall, Ke= 0.500

Inlet / Outlet Invert= 724.40' / 724.40' S= 0.0000 '/' Cc= 0.900
n= 0.013, Flow Area= 0.09 sf

#6 Primary 724.10' **4.0" Round Upper Stage Outlet 4**
L= 4.0' RCP, square edge headwall, Ke= 0.500
Inlet / Outlet Invert= 724.10' / 724.10' S= 0.0000 '/' Cc= 0.900
n= 0.013, Flow Area= 0.09 sf

Primary OutFlow Max=2.75 cfs @ 12.15 hrs HW=725.34' (Free Discharge)
- **1=Outlet 1** (Inlet Controls 0.61 cfs @ 7.01 fps)
- **2=Outlet 3** (Barrel Controls 0.59 cfs @ 6.79 fps)
- **3=Outlet 5** (Inlet Controls 0.60 cfs @ 6.91 fps)
- **4=Leakage** (Custom Controls 0.14 cfs)
- **5=Upper Stage Outlet 2** (Inlet Controls 0.37 cfs @ 4.22 fps)
- **6=Upper Stage Outlet 4** (Inlet Controls 0.43 cfs @ 4.98 fps)

Pond 95P: Proposed Storage Facility

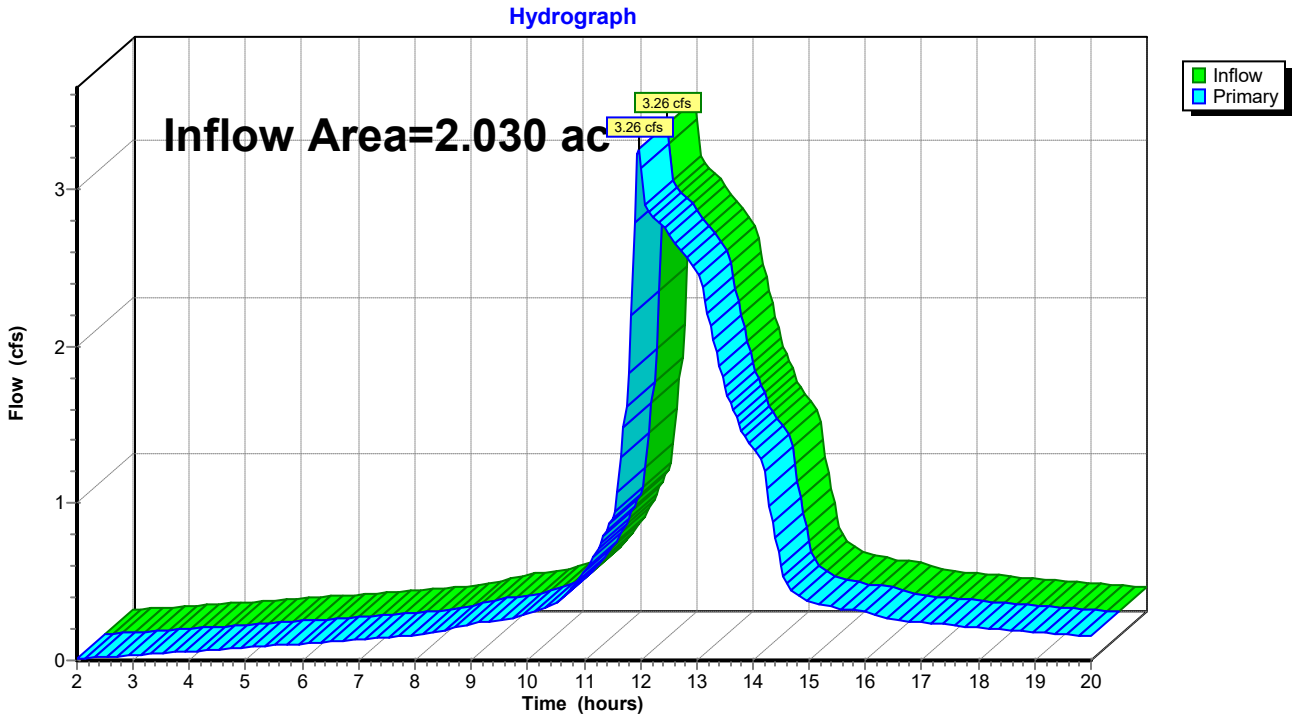


Summary for Pond 99: PostOutTotal

Inflow Area = 2.030 ac, 7.88% Impervious, Inflow Depth > 4.45" for 100-year event
Inflow = 3.26 cfs @ 11.98 hrs, Volume= 0.753 af
Primary = 3.26 cfs @ 11.98 hrs, Volume= 0.753 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 2.00-20.00 hrs, dt= 0.05 hrs

Pond 99: PostOutTotal



Events for Subcatchment 1: PreDev Onsite1

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-year	2.20	1.16	0.051	0.43
2-year	2.63	1.82	0.078	0.65
5-year	3.24	2.87	0.121	1.01
10-year	3.74	3.79	0.160	1.34
25-year	4.44	5.16	0.219	1.84
50-year	5.02	6.34	0.270	2.27
100-year	**5.63**	**7.61**	**0.327**	**2.74**

Events for Subcatchment 2: PreDev Onsite2

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-year	2.20	0.17	0.007	0.98
2-year	2.63	0.23	0.010	1.31
5-year	3.24	0.31	0.014	1.81
10-year	3.74	0.38	0.017	2.23
25-year	4.44	0.48	0.021	2.84
50-year	5.02	0.56	0.025	3.36
100-year	**5.63**	**0.64**	**0.029**	**3.90**

Events for Subcatchment 3: PreDev Offsite1

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-year	2.20	0.56	0.026	0.62
2-year	2.63	0.80	0.038	0.89
5-year	3.24	1.18	0.056	1.31
10-year	3.74	1.51	0.071	1.68
25-year	4.44	1.98	0.095	2.23
50-year	5.02	2.38	0.115	2.70
100-year	**5.63**	**2.81**	**0.136**	**3.20**

Events for Subcatchment 91: PostDev Onsite1

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-year	2.20	4.20	0.198	1.66
2-year	2.63	5.12	0.246	2.06
5-year	3.24	6.42	0.314	2.63
10-year	3.74	7.48	0.370	3.10
25-year	4.44	8.96	0.448	3.76
50-year	5.02	10.18	0.513	4.31
100-year	**5.63**	**11.46**	**0.582**	**4.88**

Events for Subcatchment 92: PostDev Onsite2

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-year	2.20	0.27	0.013	1.76
2-year	2.63	0.33	0.016	2.17
5-year	3.24	0.41	0.021	2.74
10-year	3.74	0.48	0.024	3.21
25-year	4.44	0.57	0.029	3.87
50-year	5.02	0.65	0.033	4.42
100-year	**5.63**	**0.73**	**0.037**	**4.99**

Events for Subcatchment 93: PostDev Offsite1

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-year	2.20	0.56	0.026	0.62
2-year	2.63	0.81	0.038	0.89
5-year	3.24	1.19	0.056	1.31
10-year	3.74	1.52	0.071	1.68
25-year	4.44	2.00	0.095	2.23
50-year	5.02	2.40	0.115	2.70
100-year	**5.63**	**2.83**	**0.136**	**3.20**

Events for Pond 95P: Proposed Storage Facility

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (cubic-feet)
1-year	4.66	1.52	724.34	2,885
2-year	5.81	1.74	724.53	3,791
5-year	7.46	2.16	724.80	5,103
10-year	8.82	2.43	725.01	6,213
25-year	10.73	2.56	725.13	7,891
50-year	12.32	2.66	725.23	9,303
100-year	**14.00**	**2.75**	**725.34**	**10,888**

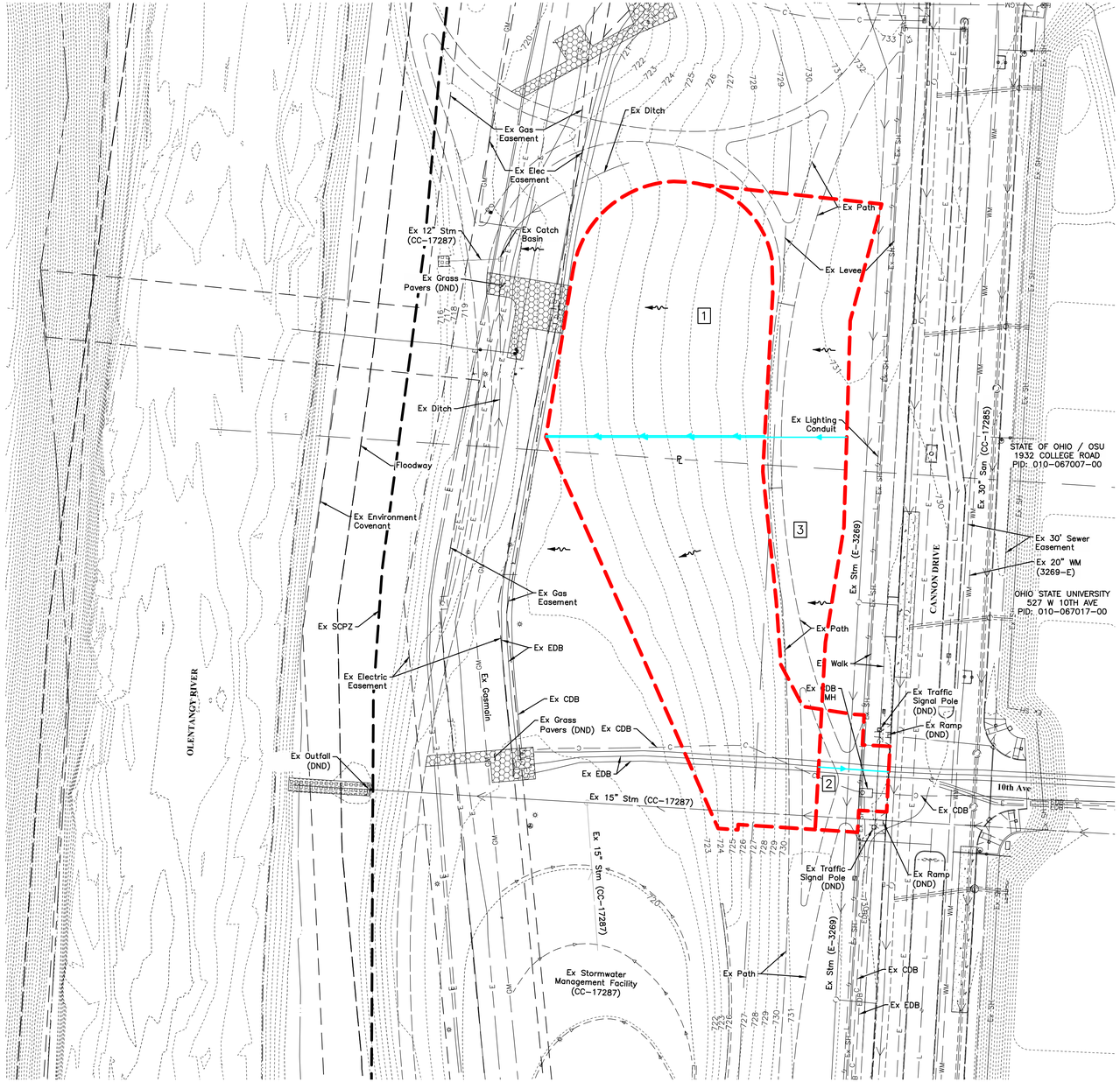
Events for Pond 99: PostOutTotal

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
1-year	1.67	1.67	**0.00**	**0.000**
2-year	1.89	1.89	0.00	0.000
5-year	2.30	2.30	0.00	0.000
10-year	2.63	2.63	0.00	0.000
25-year	2.94	2.94	0.00	0.000
50-year	3.10	3.10	0.00	0.000
100-year	**3.26**	**3.26**	0.00	0.000

TABLE OF CONTENTS

APPENDIX B:

Exhibits



GRAPHIC SCALE

0 25 50 100

1 inch = 50 feet

LEGEND

EXISTING

- Building
- Curb
- Sidewalk/Curb Ramp
- Center Line Swale
- Fence/Handrail
- Water Main
- Water Service
- Domestic Water Service
- Fire Water Service
- Sanitary Sewer Main
- Sanitary Sewer Service
- Storm Sewer
- Roof Drain
- Underdrain
- Underground Electric Service
- Electric Duct Bank
- Overhead Electric
- Overhead Electric & Communications
- Site Lighting
- Communications Service
- Communications Duct Bank
- Natural Gas Main
- Natural Gas Service
- Tree Row
- Minor Contour
- Major Contour
- Flow Arrow
- Catch Basin
- Curb & Gutter Inlet
- Headwall w/ Rock Channel Protection
- Manhole
- Cleanout
- Fire Hydrant
- Fire Department Connection
- Valve
- Reducer
- Detectable Warning Plate
- Sign
- Wheel Block
- Handicap Pavement Symbol
- Bollard
- Light Pole
- Transformer
- Gas Meter
- Pull Box
- DND Do Not Disturb

PROP TRIBUTARY BOUNDARY

TIME OF CONCENTRATION

1 SUBAREA 01 (Onsite)
TRIBUTARY AREA = 1.43 AC
RCN = 75
TC = 5.0 MIN

2 SUBAREA 02 (Onsite)
TRIBUTARY AREA = 0.09 AC
RCN = 87
TC = 5.0 MIN

3 SUBAREA 03 (Offsite 1)
TRIBUTARY AREA = 0.51 AC
RCN = 80
TC = 8.3 MIN

REVISIONS

MARK	DATE	DESCRIPTION

CONSTRUCTION STAGING AREA

CITY OF COLUMBUS, FRANKLIN COUNTY, OHIO

THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

EXHIBIT 1 - PRE-DEVELOPMENT WATERSHED MAP

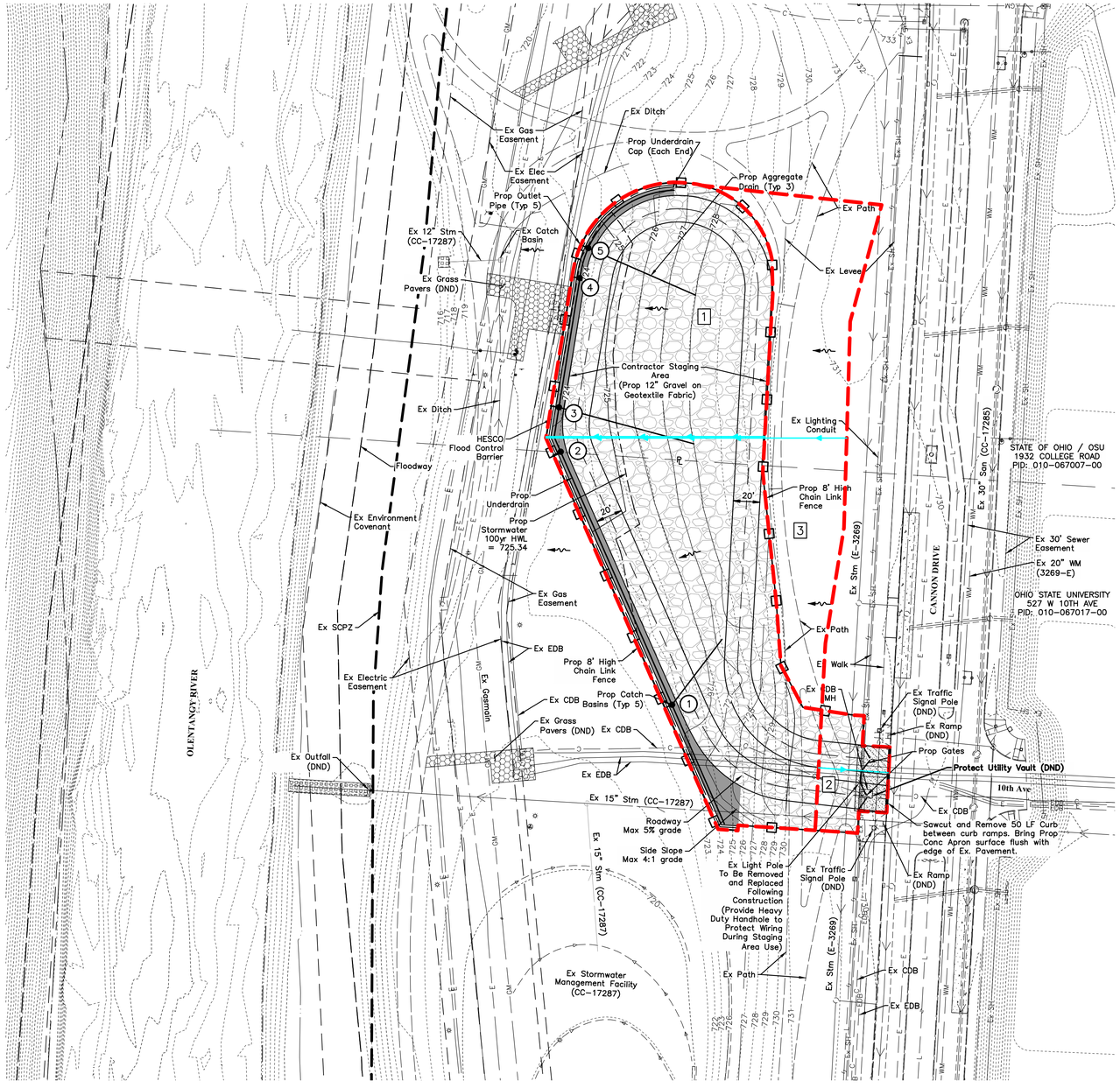
EMHT
Evans, Mechwart, Hambleton & Tilton, Inc.
Engineers • Surveyors • Planners • Scientists
5500 New Albany Road, Columbus, OH 43054
Phone: 614.775.4500 Fax: 614.775.4800
emht.com

DATE
September 2020

SCALE
1" = 50'

JOB NO.
2020-0815

SHEET
1/2



GRAPHIC SCALE

0 25 50 100

1 inch = 50 feet

LEGEND

EXISTING

- Building
- Curb
- Sidewalk/Curb Ramp
- Center Line Swale
- Fence/Handrail
- Water Main
- Water Service
- Domestic Water Service
- Fire Water Service
- Sanitary Sewer Main
- Sanitary Sewer Service
- Storm Sewer
- Roof Drain
- Underdrain
- Underground Electric Service
- Electric Duct Bank
- Overhead Electric
- Overhead Electric & Communications
- Site Lighting
- Communications Service
- Communications Duct Bank
- Natural Gas Main
- Natural Gas Service
- Tree Row
- Minor Contour
- Major Contour
- Flow Arrow
- Catch Basin
- Curb & Gutter Inlet
- Headwall w/ Rock Channel Protection
- Manhole
- Cleanout
- Fire Hydrant
- Fire Department Connection
- Valve
- Reducer
- Detectable Warning Plate
- Sign
- Wheel Block
- Handicap Pavement Symbol
- Bollard
- Light Pole
- Transformer
- Gas Meter
- Pull Box
- DND Do Not Disturb

PROPOSED

- Concrete Drive Apron
- Staging Area Gravel Pad 12" of Gravel on Geotextile Fabric
- #2 Stone on Geotextile Fabric
- PROP TRIBUTARY BOUNDARY
- TIME OF CONCENTRATION

1 SUBAREA 01 (Onsite)
TRIBUTARY AREA = 1.43 AC
RCN = 96
TC = 5.0 MIN

2 SUBAREA 02 (Onsite)
TRIBUTARY AREA = 0.09 AC
RCN = 97
TC = 5.0 MIN

3 SUBAREA 03 (Offsite 1)
TRIBUTARY AREA = 0.51 AC
RCN = 80
TC = 8.1 MIN

REVISIONS

MARK	DATE	DESCRIPTION

CONSTRUCTION STAGING AREA

CITY OF COLUMBUS, FRANKLIN COUNTY, OHIO

THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

EXHIBIT 2 - POST-DEVELOPMENT WATERSHED MAP

EMHT
Evans, Mechwart, Hambleton & Tilton, Inc.
Engineers • Surveyors • Planners • Scientists
5500 New Albany Road, Columbus, OH 43054
Phone 614.775.4500 Fax 614.775.4800
emht.com

DATE
September 2020

SCALE
1" = 50'

JOB NO.
2020-0815

SHEET
2/2

APPENDIX B

ESTIMATE OF QUANTITIES

The Quantities Have Been Established As A Means For The City To Estimate The Necessary Development Fees. The Contractor Shall Be Solely Responsible For Determining The Required Bid Quantities Necessary For The Completion Of The Plan Improvements.

ITEM	QUANTITY	UNIT	DESCRIPTION
201	1	LS	Clearing and Grubbing
202	1	EA	Light Pole Removed, Stored, and Replaced
202	50	LF	Concrete Curb Removed
202	602	SF	Concrete Walk Removed
203	740	CYD	Excavation
203	420	CYD	Granular Embankment
204	7650	SYD	Subgrade Compaction
207	1	EA	Stabilized Construction Entrance
207	570	LF	Compost Filter Sock, 24"
207	1	EA	Concrete Washout Area
207	1	LS	Storm Water Pollution Prevention Plan Compliance
255	300	SYD	Asphalt Path Removed and Replaced
304	1175	CYD	Aggregate Base
452	135	SYD	Non-Reinforced Concrete Pavement, 8"
601	1	CYD	Rock Channel Protection, Type D
601	17	SYD	Tied Concrete Block Mat, Type 1
604	5	EA	Catch Basin (AA-S133A)
605	546	LF	4" Pipe Underdrain, Perforated PVC (720.07)
605	29	LF	4" Pipe Underdrain, Special, Ductile Iron Class 52, As Per Plan
605	255	LF	Aggregate Drain, As Per Plan
608	602	SF	Concrete Walk
609	66	LF	Curb, Straight 18"
614	1	LS	Path Closed Sign
623	1	LS	Construction Layout Stakes
624	1	LS	Mobilization
653	811	CYD	Topsoil, Furnished and Placed, As Per Plan
659	7260	SYD	Seeding and Mulching, As Per Plan
659	1450	SYD	Repair Seeding and Mulching
660	45	SYD	Sodding, Unstaked
Spec	1250	LF	Temporary Construction Fence, 8ft Chain Link, with Barbed Wire Top, As Per Plan
Spec	570	LF	HESCO Floodline Barrier, As Per Plan
Spec	1	EA	Backflow Preventer, As Per Plan
Spec	1450	CYD	#2 Stone on Geotextile Fabric, As Per Plan
Spec	1	LS	Staging Area Demolition, As Per Plan
Spec	1	EA	Remove and Replace Levee Crest Survey Monument, As Per Plan
Spec	2	EA	Remove and Replace Levee Boundary Marker, As Per Plan
Spec	1	LS	As-Built Survey, Post Staging Area Construction, As Per Plan
Spec	1	LS	As-Built Survey, Post Site Restoration, As Per Plan

BENCH MARKS

All benchmarks and elevations shown upon this plan are based on the (NAVD 88) North American Vertical Datum of 1988 (U.S. Survey Feet):

Source BM Aluminum disk in concrete monument on the main oval of the Ohio State University main campus, east of the main library, approximately 450 feet west of College Road 132.7 feet southeast of a 60 inch sycamore tree, 41.2 feet southeast corner of a catch basin, 22.7 feet northwest of a light pole, 12.8 feet northeast of the northeast intersection of sidewalks, 8 inches below the ground, access through an aluminum access cover

Elev. = 745.621

BM#19 Aluminum cap in concrete monument, on the Ohio State University Main Campus, on top of the east levee bank of the Olentangy River, south of the entrance ramp to State Route 315, 130 feet south of the concrete barrier for the bridge on the entrance ramp, 37 feet west of the west edge of a parking lot, flush with the ground.

Elev. = 731.57

BM#2 Chiseled triangle on the south rim of a sanitary manhole located in the sidewalk on the north side of W. 12th Avenue, being 90 feet northwest of the northwest corner of the Dorothy M. Davis Heart and Lung Research Institute.

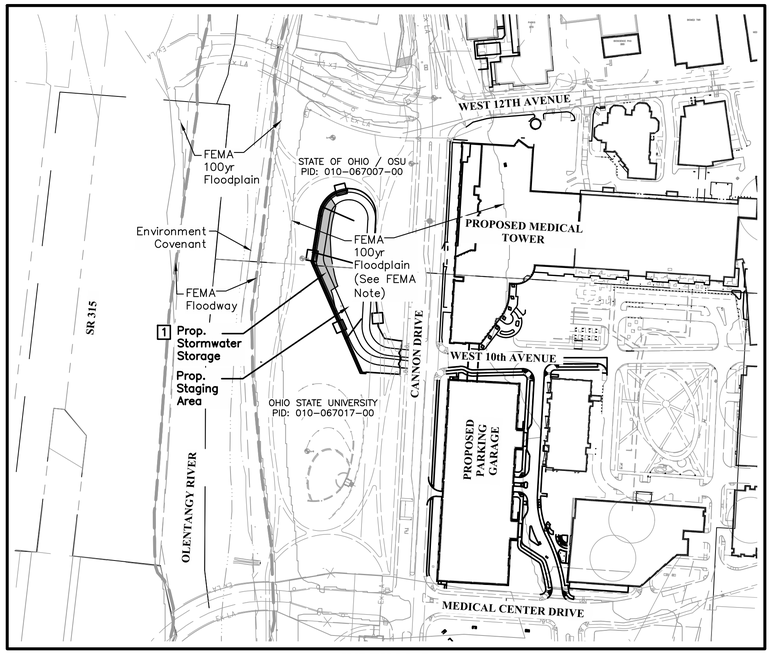
Elev. = 725.38

FEMA NOTE:

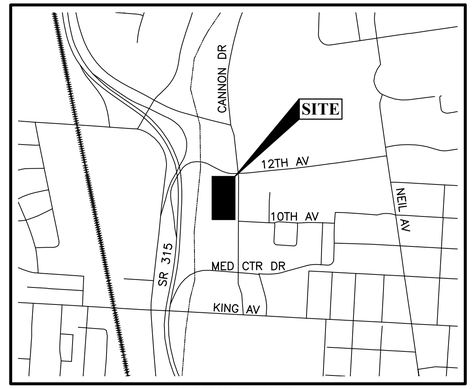
The FEMA 100yr Floodplain limits shown on this plan represent the effective floodplain based on LOMR Case No. 15-05-3155P effective date April 20th. 2016. The FEMA floodplain limits have not been officially revised to reflect the current grading following completion of the Cannon Drive Phase 1 project nor the proposed Cannon Drive Phase 2 project.

SITE DATA TABLE

Site Total (Project Area Only):	1.52 Ac
Disturbed Area:	1.52 Ac
Pre-Developed Impervious:	0.08 Ac
Post-Developed Impervious:	1.52 Ac



INDEX MAP
Scale: 1" = 200'



VICINITY MAP
Not to Scale

GRAPHIC SCALE
0 100 200 400
1 inch = 200 feet

SHEET INDEX

100 YEAR DETENTION TABLE

LOCATION	VOLUME REQUIRED AC-FT	VOLUME PROVIDED AC-FT	ELEVATION	REMARKS
1	0.25	0.30	725.34	*

*See Storm Water Management Plan/Report for Details

*Storm Water Management Facility shall be owned and maintained by The Ohio State University

WATER QUALITY BMP NOTE:

A Water Quality BMP is not proposed for this project. Water Quality requirements will be addressed by using Water Quality Credits generated by the Cannon Drive Phase 1 Stormwater Basin (CC-17287). The Water Quality Credits will be returned for reuse by other projects when this project is demolished in 2025 and the site is restored to pre-project conditions.

Water Quality Credits Generated by CC-17287:	21.60 Acres
Water Quality Credits Used by Dodd Parking Garage (CC-19146)	0.33 Acres
Water Quality Credits to be Used by This Project:	1.52 Acres
Water Quality Credits Remaining:	19.75 Acres

SUMMARY OF POST-CONSTRUCTION STORMWATER CONTROL FACILITIES - (BMPs REQUIRED)

CONTROL/ OUTLET STRUCTURE NO.	PLAN VIEW & DETAIL PAGE NUMBERS FOR BMP	CONTROL FUNCTION	DRAINAGE AREA TO CONTROL FACILITY (ACRES)	FACILITY TYPE	GREEN INFRASTRUCTURE (SQUARE FEET)
1	5 and 6	Water Quantity Only	1.94 Acres	Surface Storage and Aggregate Bed	N/A
2					
3					
4					
5					

ASSOCIATED PLANS

Final SCP	XXXX-XXXX
Public Improvement Plan No.:	3269 E
Sanitary Sewer Plan No.:	CC-17285, CC-17286, CC-18971
Storm Sewer Plan No.:	CC-17287, CC-18432
Franklin Main Relocation, Phase 2	CC-18983

FLOODPLAIN COMPENSATORY CUT/FILL SUMMARY

PROJECT	COMPENSATORY FLOODPLAIN VOLUME CREDIT to OSU (CY)	COMPENSATORY FLOODPLAIN VOLUME USED by OSU (CY)	COMPENSATORY FLOODPLAIN VOLUME CREDIT REMAINING (CY)
5th Avenue Dam Alotment, CC-15943	90,000	n/a	90,000
CANNON DRIVE CC-17287 & E-3269	0.00	80,657	9,343
TRANSIT CENTER CC-17760	0.00	38	9,305
WMC Construction Staging Area CC-XXXXX	0.00	116*	9,189*

* Note: Compensatory Floodplain Volume Credits Used by the WMC Staging Area project will be returned upon removal of the Staging Area and restoration of the site to pre-project elevations.

DEVELOPER/OWNER
The Ohio State University
Facilities Operation and Development
Design and Construction
400 Enarson Classroom Building
Ragan Fallang
2009 Millikin Road
Columbus, Ohio 43210
Tel: (614) 247-6150
Email: fallang.6@osu.edu

ENGINEER
EMHT Inc.
Shawn Arden
5500 New Albany Road
Columbus, Ohio 43054
Tel: (614) 775-4210
sarden@emht.com

STANDARD CONSTRUCTION DRAWINGS

The Standard Drawings listed on these plans shall be considered a part thereof:

City of Columbus

AA-S133A, AA-S141, 2000, 2230, 2300

OHIO811.org Before You Dig

PM - ###

EASEMENT REFERENCE

CITY NO.	COUNTY RECORDER VOL.	COUNTY RECORDER PAGE	GRANTOR

REVISIONS

NO.	DESCRIPTION	APPROVAL/DATE

PLAN PREPARED BY:

EMHT
Evans, Mechwart, Hambleton & Tilton, Inc.
Engineers • Surveyors • Planners • Scientists
5500 New Albany Road, Columbus, OH 43054
Phone: 614.775.4500 Toll Free: 888.775.3648
emht.com

REGISTERED ENGINEER NO. DATE

APPROVALS:

SIGNATURES BELOW SIGNIFY ONLY CONCURRENCE WITH THE GENERAL PURPOSES AND GENERAL LOCATIONS OF THE PROJECT. ALL TECHNICAL DETAILS REMAIN THE RESPONSIBILITY OF THE ENGINEER PREPARING THE PLANS. APPROVAL FOR STORM SEWERS ONLY.

CITY ENGINEER/ADMINISTRATOR, DIVISION OF DESIGN & CONSTRUCTION — DATE

ADMINISTRATOR, DIVISION OF POWER — DATE

ADMINISTRATOR, DIVISION OF SEWERAGE & DRAINAGE — DATE

ADMINISTRATOR, DIVISION OF WATER — DATE

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION
PLAN SET DATE
October 13, 2020

PROJECT TITLE: PRIVATE STORM SEWER IMPROVEMENT PLAN FOR
THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER CONSTRUCTION STAGING AREA
TITLE SHEET

DIVISION USE ONLY	OWNER
	CONTRACTOR
	INSPECTOR
	AGREEMENT / COMPLETED
	RPD / CKD / CID / CON.DR.
	INDEX DETAIL / RECORD FILE

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF SEWERAGE AND DRAINAGE
DIVISION USE ONLY

SCALE: AS NOTED
SHEET: 1 / 9
CONTRACT DRAWING NO.: CC-00000
RECORD PLAN NO.:

J:\20200815\Dwg\04Sheets\CC Plan\20200815 01 Title Sheet.dwg, Last Saved By: sarden, 10/15/2020 5:53 PM Last Printed By: Arden, Shawn, 10/16/2020 2:14 PM (No Xrefs)

GENERAL NOTES

The City of Columbus Construction and Materials Specifications (CMSC), 2018 edition, Revision (04/01/2020), including all revisions and supplements thereto, shall govern all construction items that are a part of this plan unless noted otherwise.

Any modifications to the specifications or changes to the work as shown on the drawings, must have prior written approval by the Administrator, Division of Sewerage and Drainage and the owner.

The sewers shown on this plan shall be constructed as a private storm system. Therefore, the City will not assume maintenance thereof after completion. Stand by inspection is mandatory during construction.

The ponding/detention areas as shown on this plan are part of the storm sewer facilities. The Developer/Owner will assume responsibility to maintain ponding/detention areas in a way as not to reduce the capacity of the water storage area. If the Developer/Owner will not maintain the detention areas, the plan becomes void and the City will plug the sewer at the outlet.

All items of work called for on the plans for which no specific method of payment is provided shall be performed by the Contractor and the cost shall be included in the various unit prices bid for the project improvement.

The Contractor shall carefully preserve bench marks, property corners, reference points, stakes and other survey reference monuments or markers. In cases of willful or careless destruction, the Contractor shall be responsible for restorations. Resetting of markers shall be performed by an Ohio Professional Surveyor as approved by the City Engineer.

INSPECTION

Stand by inspection by the Division of Design and Construction is mandatory during construction.

The Contractor shall, prior to starting any construction operation, deposit with the City the total estimated cost for inspection and, where required, a re-paving guarantee.

The Contractor shall ensure there is a surveyor's level and rod on the project for use in performing grade checks whenever sewer line structures or pipe are being installed. The Contractor shall make this equipment available for use and assist the City Inspector in performing grade checks when requested by the Inspector. The Inspector will make all reasonable attempts to confine requests for assistance in performing grade checks to times convenient to the Contractor.

These checks will be performed to ensure the following:

a. Proper placement of each structure.
b. Proper installation of pipe runs.
c. Grade, after an overnight or longer shutdown.
d. Grade, at any other time the Inspector has reason to question grade of installation.

Grade checks performed by the City Inspector in no way relieve the Contractor of the ultimate responsibility to ensure construction to the plan grade.

The Contractor shall notify the following Divisions at least 24 hours in advance of the anticipated start of construction and/or demolition:

a. Division of Sewerage and Drainage (614) 645-7102
b. Division of Design and Construction (Construction) (614) 645-0433

NOTIFICATIONS

The Contractor shall be responsible for the notification of all adjacent landowners at least seven working days prior to construction near or on their property.

SAFETY REQUIREMENTS

The Contractor and Sub-Contractor shall be solely responsible for complying with all federal, state, and local safety requirements, together with exercising precautions at all times for the protection of persons (including employees) and property. It is also the sole responsibility of the Contractor and Sub-Contractor to initiate, maintain, and supervise safety requirements, precautions, and programs in connection with the work.

CONFINED SPACE ENTRY

The Contractor shall be solely responsible for following the OSHA requirements for "Confined Space Entry" (CSE), Title #29 of the Code of Federal Regulations, Part 1910.146, while performing work inside any manhole or other confined space requiring a permit. Copies of all CSE permits shall be given to the City upon project completion.

FEES

The appropriate fees for the following shall be provided by the Contractor, as applicable:

a. Standby inspection fee for the applicable plan improvements.
b. System capacity and meter fees associated with the installation of the fire protection and domestic waterline service taps.
c. Sanitary capacity and tap fees associated with the installation of the sanitary services.

TESTING

The Contractor shall coordinate all work with the Testing Agency, and allow the Testing Agency free access to the work. The Owner shall receive a copy of all test reports the day the tests are performed.

All subgrade compaction shall conform to Item 203. If compaction cannot be obtained, the Contractor shall remove the unsuitable soil and replace it with suitable soil or granular material. Removal and replacement shall be performed only as directed by the Testing Agency and shall be ordered only with the permission of the Engineer.

At all points of crossing water mains or other sewers, the backfill shall be of granular material between the deeper and shallower pipes.

PERMITS

The Contractor is to obtain all necessary permits and licenses needed for construction of this project. An original permit with red signatures shall be kept onsite at all times.

When occupying or excavating within public rights of way limits, the Contractor shall obtain an excavation permit from the City of Columbus, Department of Public Service – Permit Office between the hours of 7:30 am and 4:00 pm Monday through Friday. Phone: (614) 645-7497; Fax: (614) 645-1876; Email: ColsPermits@columbus.gov

CONTRACT WORK PERFORMED BY THE CITY

In the event that it becomes necessary for the City to perform work of an immediate nature (such as the placement of barricades or replacement of signs or other warning or protective devices) required of the Contractor by this contract because of failure or refusal of the Contractor to perform such work, the Contractor shall reimburse the City at the rate of 2.5 times the actual cost of labor, materials and equipment necessary to perform such work. If the Contractor refuses or fails within a reasonable time to perform or cause the performance of such work, The City shall be reimbursed by the Contractor by way of a deduction from the Contractor's net payment under the Contract. Reasonable time for all streets involved on this Contract is a maximum of 4 hours from the time of notification by the City.

STORAGE OF EQUIPMENT AND MATERIALS

Equipment, Materials, including pipe, shall NOT at any time (working or non-working hours) be stored within the right-of-way or within one hundred (100) feet of any intersecting street or driveway, without prior written approval from the City of Columbus. Compliance with this requirement along with additional provisions of the Contract Specifications shall not in any way relieve the Contractor of his legal responsibilities or liabilities for the safety of the public.

SITE VISIT

The Contractor shall perform field reconnaissance to become acquainted with the existing site conditions and the potential effects upon the work scope. Any performance of additional site subsurface investigations (test holes) shall be coordinated in advance with the Owner as warranted. Excavated material shall be replaced in a controlled manner to minimize impact on field earthwork operations.

CONSTRUCTION LAYOUT

All construction layout services for this project shall be provided by the Contractor in accordance with the project specifications.

RIGHTS-OF-WAY

In addition to direct requirements of the contract specifications, the Contractor shall observe and conform to the specific requirements of all rights-of-way including easements, court entries, rights-of-entry or action filed in court in accordance with the code of applicable governing agency. The cost of the operations necessary to fulfill such requirements shall be included in the price bid for the storm sewer improvement.

Excavated materials shall not be stored on existing roadway pavement.

WORK LIMITS

The Contractor is responsible for containing all performed work and all equipment, materials, vehicles, etc., used to carry out the work within the right-of-way of the streets, roadways and permanent storm sewer easements as shown on these plans.

The Contractor is responsible for cost of restoration for any area outside of the right-of-way or permanent easement to former condition and to the satisfaction of the Property Owner.

CONVENIENCE FACILITIES

The Contractor shall furnish and maintain sanitary convenience facilities for the workmen and inspectors for the duration of the work. Cost shall be included in the price bid for the storm sewer and grading improvements.

CONSTRUCTION DEBRIS

The Contractor shall be responsible for the immediate cleanup of any debris, mud or dirt tracked or spilled on City and/or public streets or private drives whether inside or outside the project area. The Contractor is responsible for the cost of any services contracted and/or completed by the City of Columbus in the cleanup of any tracking or spillage anytime during project construction.

SIGNS, MAILBOXES, FENCES, ETC.

The Contractor shall be responsible for restoring all signs, mailboxes, fences, guardrail, shrubs, drainage structures, or other physical features disturbed or damaged during construction whether shown on the plans or not to their former location and condition. Cost to be included in the price bid for the various items.

OPEN EXCAVATION IN ROADWAYS - STEEL PLATES

Excavations and trenches over 24 inches deep shall be securely plated, or backfilled with Item 304 during non-working hours.

All excavations shall be maintained as safe as possible by the Contractor at all times and backfilled at the end of each work day. Open excavations over 24 inches after work hours require traffic plates, and/or lighted barricades and construction fence.

NON-RUBBER TIRED VEHICLES

Non-rubber tired vehicles shall not be moved on public streets, existing private roadways, or parking lots. Exceptions may be granted by the City where short distances and special circumstances are involved. Granting of exceptions must be in writing and any resulting damage must be repaired to the satisfaction of the City, and at the Contractor's expense.

UTILITY POLE SUPPORT

Utility poles within influence of the construction operations shall be reinforced by the utility company prior to these construction activities. Notification of the utility company prior to construction shall be the responsibility of the Contractor. Cost of said reinforcement shall be included in the bid items associated with the work.

ABANDONMENT OF UNDERGROUND STRUCTURES

Provisions for abandonment of any underground structure (septic tank. cistern, etc.) shall be considered at warranted. The work shall conform with all applicable federal, state and local requirements and shall include plugging/sealing of any outlet pipes, pumping out and disposing of contents, along with the placement of suitable backfill to fill the structure. (At 100% Standard Proctor Density unless otherwise specified by the Site Soil Engineer).

STORM SEWER AND STRUCTURES

Pipe specification for the plan improvements may be in accordance with the following (except as designated within the profiles) or as listed on the City of Columbus Approved Sewer Pipe Consignment List, latest edition.

a. Reinforced concrete pipe ASTM C-76, Item 706.02. Concrete classification shall be in conformance with the following unless otherwise referenced by the profiles.

12" – 15" diameter pipe	Class IV
18" – 24" diameter pipe	Class III
30" – 48" diameter pipe	Class II
60" – 72" diameter pipe	Class II

b. PVC sewer pipe, Item 720.08, ASTM D3034 with joints as per ASTM D3212. PVC sewer pipe placement shall be limited to sewers thru 15" diameter.

c. Corrugated polyethylene smooth lined pipe, Item 720.12, shall be limited to sewers thru 60" diameter. PVC large sewer pipe, Item 720.09, shall be limited to sewer diameters 18"-36'.

d. Cost of compacted backfill shall be included in unit bid price for Item 901. Backfill shall be in accordance with the specifications shown on the storm sewer profiles. Recycled crushed concrete meeting the requirements of Item 912-Compacted Granular Material will be permitted for use for trench backfill.

All concrete pipe and storm sewer structures shall be stamped or have such identification noting that said pipe and storm structures have been inspected by the City of Columbus and meet their specifications. Pipe and structures without proper identification will not be permitted for installation.

The Contractor shall provide written certification to the Engineer reflecting the pipe material to be used along with the current City consignment list identifying the approved pipe material specification.

All manholes and inlets shall be channeled.

Openings shall be provided in the drainage structures to accommodate underdrain outlets as detailed by the plan specifications.

The Contractor shall make allowances in his bid for possible adjustment on level of proposed manhole/inlet tops and shall receive no additional compensation because of any such adjustments that are required to be made.

Excavation and backfilling for sewer shall comply w/Item 901 unless otherwise noted.

Cost of compacted backfill shall be included in unit price bid for Item 901.

Concrete encasement in accordance with Item 910 shall be used with PVC sewer pipe and with corrugated polyethylene pipe for all public sewer runs that have less than 36" of cover (top of finished grade to outside top of pipe) and all private storm sewer runs that have less than 24" of cover (top of finished grade to outside top of pipe). Concrete Encasement shall extend from structure to structure along the entire length of the pipe run. Cost to be included in the price bid for Item 901.

All bedding shall be in accordance with Standard Drawing AA-S151 for rigid pipe sewer and in accordance with Standard Drawing AA-S149 for flexible pipe sewer.

Contractor shall provide a detailed schedule of the work related to the proposed storm sewer installation prior to the start of any activity on the project. Work shall be arranged to minimize disruptive flow of stormwater runoff in the existing storm sewer system as much feasible.

All plastic sewer lines shall be deflection tested after installation in conformance with the requirements of item 901 of the City of Columbus, Construction and Material Specifications, current version.

All existing inverts along with proposed top of casting elevations shall be verified by the Contractor prior to construction of the sewer.

Extend underdrains to the nearest storm structure. Slope to drain. Provide underdrains in accordance with the details on these plans.

All new conduits, inlets, catch basins and manholes constructed as a part of the project shall be free of all foreign matter and in a clean condition before the project will be accepted by the Owner.

All existing manholes, catch basins, drains, sewers and appurtenances shall be inspected initially by the Contractor and the City and shall be maintained and left in a condition reasonably comparable to that determined by the original inspection records. Any change in the condition resulting from the Contractor's operations shall be corrected by the Contractor to the satisfaction of the Engineer. The above is not applicable for structures to be abandoned. The Contractor shall remove, debris, silt, etc. from the existing manholes, catch basins, drains, sewers and appurtenances which have been affected by construction operations. The Contractor shall maintain service in existing sewers during construction and keep record copies of all inspections on site.

If it is determined that the elevation of the existing sewer, or existing appurtenance to be connected, differs from the plan elevation or results in a change in the plan sewer slope, the Engineer shall be notified before starting construction of any portion of the proposed sewer which will affected by the variance in the existing elevation.

Immediately after placement of any conduits, the contractor shall construct the end treatments required by the plans at both the outlet and inlet ends. This shall include headwalls, concrete, rip rap, rock channel protection, sodding, pouring bottoms, mudding lift holes, etc.

MAINTAIN DRAINAGE

The flow in all sewers, drains, field tiles, surface routing, and watercourses encountered shall be maintained by the Contractor at his own expense, and whenever such watercourses and drains are disturbed or destroyed during the prosecution of the work, they shall be restored by the Contractor at his own expense to a condition satisfactory to the owner.

All drain tile and storm sewers damaged, disturbed, or removed as a result of the Contractor's operations shall be replaced with the same quality pipe or better, maintaining the same gradient as existing. Work to be performed during backfill operations.

Any drain tile and/or storm sewer encountered by construction, not shown on plans, shall be connected with the curb underdrain, storm sewer system or provided with an outlet into the roadway ditch as applicable. Replaced drain tile/storm sewer shall be laid on compacted bedding equal in density to surrounding stratum. Replacement shall be done at the time of the backfill operation. Cost of this work to be included in the price bid for the storm sewer improvements.

BUILDING/SITE UTILITY CONNECTIONS

Contractor shall coordinate the final locations of the private utility service connection points at the building perimeter with the most current approved building mechanical system drawings. The routing of the private utility services shall be field adjusted as needed to meet the proposed connection points. Contractor shall provide any necessary fittings to adjust routing at no additional cost to the project.

Contractor shall extend all utilities to within 5'-0" of the building perimeter and cap and mark each utility for final connection by the plumbing contractor, unless otherwise noted on the plan drawings.

EXISTING UTILITIES

The identity and location of the existing underground utility facilities known to be located in the construction area have been shown on the plans as accurately as provided by owner of the underground utility. The City of Columbus and/or Design Engineer assumes no responsibility as to the accuracy of the location or depths of the underground facilities shown on the plans.

The Contractor is responsible for the investigation, location, support, protection, and restoration of all existing utilities and appurtenances whether shown on these plans or not. The Contractor shall expose all utilities and structures prior to construction to verify the vertical and horizontal effect on the proposed construction. The Contractor shall call, toll free, the Ohio Utilities Protection Service (1-800-362-2764) and to the owners of underground utility facilities shown on the plans who are not members of a registered underground protection services in a accordance with section 153.64 of the revised code 72 hours prior to construction and shall notify all utility companies at least 48 hours prior to work in the vicinity of their underground lines.

Mechanical digging equipment shall not be used to exposing any underground utility, only hand tools may be used to uncover the utility and the utility company shall be notified and have a representative present when the utility is exposed.

The Contractor shall be responsible for coordinating the relocation and/or protection of any utilities as required by the plan with the owner of the affected utility. Private utility manholes within the limits of the work shall be adjusted to grade by the respective utility company at the Contractor's expense.

Where potential grade conflicts might occur with existing utilities and at locations noted thus, expose, the Contractor will be required to uncover such utilities sufficiently in advance of laying pipe or duct and provide the Engineer the location and elevation of said utility so the Engineer can determine if any adjustments are necessary.

In all conflicts in grade between water mains and gravity sewers, the water main shall be lowered during construction. All existing water mains shall be located at least 10' horizontally and at least 18" vertically from storm sewers, unless otherwise approved by the City.

The Contractor shall locate existing underground utilities in the areas of work. If utilities are to remain in place, provide adequate means of protecting during excavation operations.

Should uncharted or incorrectly charted piping or other utilities be encountered during excavation, consult the Engineer immediately for directions. Cooperate with the owner and public utility companies in keeping their respective services and facilities in operation. Repair damaged utilities to the satisfaction of the utility Owner.

Do not interrupt existing utilities serving facilities occupied and owned by the Owner except when permitted in writing by the Owner and then only after acceptable temporary utility services have been provided.

The following utilities may be located within the work limits of this project and subscribe to the Ohio Utilities Protection Service (OUPS).

Support and protection of all utilities and appurtenances shall be the responsibility of the Contractor. Costs for repair and restoration of existing utilities damage by the Contractor shall be the responsibility of the Contractor. The City of Columbus utilities will only locate and mark main line facilities. The Contractor is responsible for locating all service laterals and lines. Costs associated with the above work and responsibilities shall be included in the price bid of various items.

Listed below are utility companies that have facilities located within the work limits of this project and subscribe to OUPS:

City of Columbus
Department of Public Service
Traffic Management
1820 East 17th Ave
Columbus, Ohio 43219
Email: trafficlocator@columbus.gov
Office: (614) 645-7393

American Electric Power Distribution
Attn: Rod Sloneker
850 Tech Center Dr.
Gahanna, Ohio 43230
Phone: (614) 883-6817
Fax: (614) 883-6868
AEP Solution Center: (800) 277-2177

American Electric Power Transmission
Attn: Barb Dunlap
700 Morrison Road
Gahanna, Ohio 43230
Phone: (614) 552-1893
Fax: (614) 552-1818

Columbia Gas of Ohio
Attn: Rob Caldwell
3550 Johnny Appleseed Ct.
Columbus, OH 43231
Phone: (614) 818-2104
Cell: (614) 370-1906
Customer Service: 1-800-344-4077
Damage Prevention: 1-866-632-6243
Also copy Rob Caldwell at
rcaldwell@nisource.com

City of Columbus
Division of Sewerage and Drainage
1250 Fairwood Avenue
Columbus, Ohio 43206
Phone: 645-8460

City of Columbus
Department of Technology
1355 McKinley Aveue
Building C
Columbus, Ohio 43222
Contractor Line: (614) 645-7756

City of Columbus
Support Services
Division-Communications
4211 Groves Road
Columbus, Ohio 43232
Telephone: (614) 724-7047
Radio Room (614) 724-4006

City of Columbus
Department of Public Utilities
Division of Power
3500 Indianola Avenue
Columbus, Ohio 43214
Dispatch (614) 645-7627

City of Columbus
Division of Water
910 Dublin Road
Phone: 645-7788

OSU Utilities
Central Service Building
2003 Millikin Road
Columbus, Ohio 43210
614-247-7093

UNIVERSITY WATER

The Contractor must obtain approval from The Ohio State University Facilities Operation and Development office approval prior to connection of their water supply lines to any University fire hydrant. The Contractor shall provide all the necessary gate valves, back flow preventers, and flow meter for each hydrant location. All equipment, fittings, and valves shall be in accordance with City of Columbus Division of Water Standards. The Contractor shall pay for water at the current City Rates. Use of water from fire hydrants and associated fees are outlined in the City of Columbus Rule and Regulation No. 01-01. A copy of this regulation is available from the City of Columbus Division of Water, Permit Office, (614) 645-7695. No attached hoses shall be left unattended.

Fire hydrant permits may not be available within project limits. Contractor shall contact OSU FOD staff to locate available hydrants prior to bidding. All costs associated with trucking water to the site shall be included in related items.

EROSION AND SEDIMENT CONTROL

Erosion and sediment control measures are required as part of this project. Erosion and Sediment Control measures specific to this site may be found on Sheet No. #8 and 9 of this plan. Land-disturbing activities must comply with all provisions of the Division of Sewerage and Drainage EROSION AND SEDIMENT POLLUTION CONTROL REGULATION. All land-disturbing activities shall be subject to inspection and site investigation by the City of Columbus and/or the Ohio EPA.

All Erosion Sedimentation Control Practices are subject to field modifications at the discretion of the City of Columbus, Project Engineer and/or the Ohio EPA.

It is the responsibility of the Contractor to notify the City of Columbus two (2) working days prior to commencement of initial site land disturbance on any site of one (1) or more acres. This includes site clearing, grubbing and any earth moving. Primary erosion and sediment control practices are mandated by regulations to be in place from the beginning of the construction activity. Please contact The Stormwater Management Office @ (614) 645-6700 or fax @ (614) 645-1506. Details of this requirement may be found in the EROSION AND SEDIMENT POLLUTION CONTROL REGULATION (adopted June 1, 1994). Failure to comply may result in enforcement action as detailed in the Columbus City Codes Section 1145.80.

The NPDES permit holder shall provide qualified personnel to conduct site inspections ensuring proper functionality of the erosion and sedimentation controls. All erosion and sedimentation controls are to be inspected once every seven (7) calendar days and within 24 hours of a 1/2 inch storm event or greater that occurs over a 24 hour period. Records of the site inspections shall be kept by the Contractor and made available to jurisdictional agencies if requested.

This plan must be posted on-site. A copy of the SWPPP plan and the approved EPA Stormwater Permit (with the site-specific NOI number) shall be kept on-site at all times.

SEEDING

All areas that are disturbed by the project shall be restored to original or better condition, per Item 659 (Seeding and Mulching) or the applicable specifications.

RESTORATION AND CLEAN UP

Inconvenience to the adjacent property owners and to the traveling public shall be kept to an absolute minimum. All work is to continue on a uniform basis and on schedule, particularly the restoration and clean up of disturbed areas after construction.

Contractor shall provide at a minimum daily street cleaning and immediately for specific events described in "Construction Debris" general note. Cleaning shall be performed on adjacent public roadways at the end of each day.

All fences, signs, drainage structures, valves, landscaping, etc. removed, disturbed or damaged during work within PUBLIC RIGHT-OF-WAYS, EASEMENT AREAS and/or under the project improvements shall be restored to their original condition by the Contractor unless otherwise specified. Payment for same shall be included in the price bid for the various improvement items.

All Existing pavement markings, including raised pavement markers, removed, rendered unserviceable or destroyed shall be replaced in like kind.

DEWATERING

In the event that dewatering is necessary, the Contractor is required to prepare a dewatering plan that will describe how the dewatering operation will be completed and how the pump effluent will be managed. Reference the soils report for discussion of groundwater consideration. The cost for dewatering operations shall be included in the price bid for the storm sewer improvement. This plan will be presented to the City for review prior to any dewatering operations. The Contractor shall be solely responsible to the O.D.N.R. for the registry, maintenance and abandonment of any withdrawal device used in the construction of this project.

Installation of any well, well point pit, or other withdrawal device used for the purpose of removing groundwater from any aquifer shall be in accordance with the applicable requirements of the Ohio Department of Natural Resources.

Installation of any well, well point, pit or other device used for the purpose of lowering the groundwater level to facilitate construction of this project shall be properly abandoned in the provisions of Section 3745-9-10 of the Ohio Administrative Code or as directed by the Ohio Department of Natural Resources Director or his representatives. The Contractor is solely responsible to the Ohio Department of Natural Resources (O.D.N.R.) for registry, maintenance, and abandonment of any withdrawal devices used in the construction of this project.

The Contractor shall be required to complete and file a Well Log and a Drilling Report Form with O.D.N.R., Division of Water, within 30 days of the completion of installation of any well, well point, pit or other device used for the purpose of removing groundwater from an aquifer. This in accordance with Sections 1521.01 and 1521.05 of the Ohio Kinley Revised Code. In addition, any such facility that has a capacity to withdraw waters of the state in an amount greater than 100,000 gallons per day from all sources shall be registered, on forms with the Chief of the O.D.N.R., Division of Water, within three months of the completion of the facility in accordance with Section 1521.16 of the Ohio Revised Code. Copies of the necessary paperwork can be obtained at O.D.N.R., Division of Water, Fountain Square, Columbus, Ohio, 43224-1387, Phone: (614)265-6717.

The Contractor shall furnish and operate suitable pumping equipment of such capacity adequate to dewater the trench should water be encountered. The trench shall be sufficiently dewatered so that the placement of bedding and the laying and joining of pipe is made on firm, dry ground. If dewatering cannot produce acceptable subgrade, and only as directed by the Engineer, unsuitable materials shall be removed and replaced by Item 906, stone foundation and shall be included in the price bid for the various sewer items.

The Contractor shall convey all trench water to a natural drainage channel or storm sewer without damage to property. The Contractor shall be responsible to place and maintain the necessary sediment control measures to filter the dewatering discharge. Direct Discharge of sediment laden water to the City's sewer system or a receiving stream is a violation of Ohio EPA and City of Columbus regulations; the Contractor will be held liable for the violation and subsequent fines.

The cost of any dewatering operations required for the construction of the storm sewer shall be included in the price bid for the various sewer items.

If during construction of the sewer, the water wells belonging to nearby residences are dewatered, the Contractor shall provide potable water to the residents and if the well is unable to be recommissioned after construction, a tap to a waterline shall be provided if available or another well dug, at no extra cost to the residents.

SOILS REPORT

No Subsurface Investigation Report has been prepared for this project. The contractor may engage a soils engineer to develop details necessary for construction. This may include digging test pits on the site. The engineer assumes no liability for subsurface conditions encountered during construction activities.

EARTHWORK - GENERAL

The Contractor shall be responsible for the suitability of soils to be used for embankments.

Stockpiling of top soil and/or excess material for these improvements or offsite hauling of topsoil/suitable material, etc. shall be coordinated with the Owner. Appropriate means for sedimentation control of the onsite stockpiles shall be provided as a matter of general practice in accordance with the required standards referenced as a part of the details shown on Sheet 9. It is the Contractors responsibility to assure that a sufficient amount of topsoil remains as shown on the plans.

Grading shown on the approved grading plan is necessary to provide surface drainage of the proposed development and shall be maintained during construction.

The Contractor shall strip topsoil from all grading areas prior to construction. The Contractor shall be responsible for rough grading the topsoil stockpile as required to maintain positive drainage of and around the stockpile.

All fill shall be placed in uniform 8-inch lifts and compacted in a controlled manner to at least 98% of the maximum dry unit weight obtained in the laboratory by the "standard" proctor compaction test (ASTM D 698). Moisture content of the new fill shall be in the range of +/-2 percent of the optimum moisture content determined by ASTM D 698. Fill shall not be placed in a frozen condition or upon a frozen subgrade. The Contractor shall endeavor to separate topsoil and unsuitable material from suitable fill material.

The proposed elevations/contours shown on the plans are finished grade.

All work shall be monitored and observed by a registered soils engineer employed and paid for by the Owner. It shall be the Contractors responsibility to contact the soils engineer prior to commencement of any fill placement. The Contractor shall contact the soils engineer as many times as necessary during construction to ensure the soils engineer is on-site during all fill operations.

CLEARING LIMITS

Clearing and Grubbing within the designated work limits shall be completed as a part of this contract. The Contractor is encouraged to visit the site to verify extent of clearing and grubbing limits. Additional clearing and/or grubbing shall be performed at the direction of the Construction Manager in accordance with Item 202 during construction operations. No burning is permitted unless appropriate permits are obtained by the Contractor. Cost for the above shall be included in the price bid for Item 201.

SANITARY SEWER NOTE

Connection to Sanitary Sewer cannot be made until permit is obtained from Sewer Permit Office at 111 North Front Street, 1st Floor. (614) 645-7490.

FOR THE DIVISION OF POWER

The Division of Power (DOP) may have overhead primary, secondary, and proposed street lighting at this work location. The contractor is hereby required to contact OUPS at 811 or 1-800-362-2764 forty-eight hours prior to conducting any activity within the construction area.

Any required relocation, support, protection, or any other activity concerned with the City's electrical facilities in the construction area is to be performed by the contractor under the direction of DOP personnel and at the expense of the project. DOP shall make all final connections to DOP's existing electrical system at the expense of the project. The contractor shall use material and make repairs to a City of Columbus street lighting system by following DOP's "Material and Installation Specifications" (MIS) and the City of Columbus "Construction and Material Specifications" (CMS). Any new or re-installed underground streetlight system shall require testing as referred to in section 1000.18 of the CMS manual. The contractor shall conform to DOP's existing Conductor Safety Policy and Hold Card System, MIS-95, copies of which are available from DOP.

If any electric facility belonging to DOP is damaged in any manner by the contractor, its agents, servants, or employees, and requires emergency repairs, the DOP Dispatch Office should be contacted immediately at (614) 645-7627. DOP shall make all necessary repairs, and the expense of such repairs and other related costs shall be paid by the contractor to the Division of Power, City of Columbus, Ohio.

EASEMENT REFERENCE			
CITY NO.	COUNTY RECORDER		GRANTOR
	VOL.	PAGE	

REVISIONS		
NO.	DESCRIPTION	APPROVAL/DATE

PLAN PREPARED BY:

EMH&T
Evans, Mechwart, Hambleton & Tilton, Inc.
Engineers • Surveyors • Planners • Scientists
5500 New Albany Road, Columbus, OH 43054
Phone: 614.775.4500 Toll Free: 888.775.3648
emht.com

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

PLAN SET DATE
October 13, 2020

PROJECT TITLE: PRIVATE STORM SEWER IMPROVEMENT PLAN FOR
THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER CONSTRUCTION STAGING AREA
GENERAL NOTES

DIVISION USE ONLY	OWNER
	CONTRACTOR
	INSPECTOR
	AGREEMENT / COMPLETED
	RPD / CKD / CID / CON.DR.
	INDEX DETAIL / RECORD FILE

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF SEWERAGE AND DRAINAGE
DIVISION USE ONLY

SCALE: AS NOTED	SHEET 2 / 9
CONTRACT DRAWING NO. CC-00000	RECORD PLAN NO.

J:\20200815\Dwg\04Sheets\CC Plan\20200815 02 GN.dwg, Last Saved By: sarden, 10/13/2020 11:09 PM Last Printed By: Arden, Shawn, 10/16/2020 2:14 PM (No Xrefs)

DRIVE APPROACH, PEDESTRIAN FACILITY, AND CURB RAMPS

All drive approaches, pedestrian facility, curbs, and ramps constructed with this project shall meet the requirements of the City of Columbus standards and ADA compliance. It is the sole responsibility of the Contractor to meet these construction standards.

TREE PROTECTION DURING CONSTRUCTION

All trees will be protected against injury or damage to branches, trunks, or roots from construction and excavation. City of Columbus Forestry Section can be contacted @ 614-645-6640.

All pruning and removal must be done in accordance to ANSI A300 and ANSI Z133.1 standards. The Contractor performing the work must be a professional tree care company with certified arborist on staff and available to direct the on-site crew.

Heavy equipment will not be allowed over (or to compact the soil over) the root zone of existing trees. Restricted equipment access routes will be established before work has begun. Temporary paving materials such as plywood, lumber, or rubber matting spread over the root zone may be required to prevent compaction.

Installation of utilities under the dripline of existing trees must be directionally bored or drilled below the root zone. The top of the bore or tunnel should be no less than 3 feet deep. Open trenches within the root zone must be avoided.

Where grade change is required within the root zone of public trees, a sufficient residual root zone to provide for the good health of the trees should remain undisturbed and protected by either a dry well or retaining wall if the grade is to be raised or lowered.

Construction materials, excavation debris, chemicals, fuel, equipment, or vehicles are not to be stockpiled, stored, dumped, or parked within the area of the dripline of any tree.

Fires are not permitted within the dripline of any trees.

All existing trees designated for preservation will be protected with a good, substantial fence, frame or box not less than four feet high and as far from the tree as possible. Dripline is preferable, however, actual location will be determined by site limitations.

Fencing will be installed before commencing site preparation work. Fence must be maintained during the full construction period.

Interfering branches of trees may be removed when acceptable to the City Forester and shall be pruned in accordance with the City Forester's standards.

Any trees damaged or destroyed due to the Contractor's negligence will be treated or removed at the contractor's expense. If damaged beyond repair, the City will require reimbursement for the value of the tree as determined by the current edition of the "Guide for Plant Appraisal," published by the International Society of Arboriculture.

TRAFFIC

All temporary traffic control devices shall be furnished, erected, maintained, and removed by the Contractor in accordance with the "Ohio Manual of Uniform Traffic Control Devices", copies of which are available from the Ohio Department of Transportation, Bureau of Traffic, 1980 W. Broad Street, Columbus, Ohio 43223.

All permanent traffic controls not in conflict with the temporary traffic controls shall be maintained throughout this project by the CONTRACTOR. Permanent traffic controls may be temporarily relocated, as approved by the ENGINEER. The CONTRACTOR shall assume all liability for missing, damaged, and improperly placed signs.

Any work done by the Division of Planning and Operations or by the Division of Design and Construction, include installation, relocation, removal and/or replacement of the temporary or permanent traffic control devices as a result of work done by the CONTRACTOR or as a result of NEGLIGENCE of the CONTRACTOR shall be at the expense of the CONTRACTOR.

The CONTRACTOR shall be responsible for the reinstallation and/or replacement of all permanent traffic control devices damaged or removed during the construction. Permanent traffic control no longer in conflict with temporary traffic control shall be replaced immediately.

Steady-burning, Type 'C' lights shall be required on all barricades, drums, and other similar traffic control devices used at night.

Ingress and Egress shall be maintained at all times to public and private property.

Payment for all traffic maintenance items shall be included within the price bid for the storm sewer improvement.

PEDESTRIAN TRAFFIC

The safety of pedestrian traffic shall be considered at all times in the provision of traffic control devices required by these plans and notes. It shall be the Contractor's responsibility to provide lights, signs, barricades, and other devices to warn of and physically separate the pedestrian from hazards incidental to the construction and demolition operations. The Contractor shall be responsible for the protection and safe movement of pedestrians through, around, or detoured away from the construction site. Traffic control for pedestrian movement shall be as per figures TA-28 and TA-29 of Part VI of the Federal Manual of Uniform Traffic Control Devices.

DUST CONTROL

The Contractor shall be responsible for providing dust control measures in accordance with Item 616. Dust control operations shall be performed on a periodic basis and/or as directed by the Owner/Engineer to alleviate or prevent the dust nuisance originating within the project work limits. Calcium chloride on areas to be seeded and mulched will not be permitted. The cost for all dust control measures shall be included in the price bid for the storm sewer improvements.

PAVEMENT CUTTING, SAWING AND EXCAVATION OPERATIONS

All public agencies and private contractors performing pavement-cutting operations on City of Columbus streets and roadways shall protect the environment from discharges created by their pavement cutting operations. Note that Columbus City Code 1145 prohibits non-stormwater discharge into the City of Columbus sewer system, curb inlets and any part of its MS4 (municipal separate storm sewer system).

The requirement includes but is not limited to wet or dry saw-cutting, jack hammering, excavation equipment use, etc. The public agency and/or private contractor work crews shall recover and dispose of detritus, polluted waters, or other such discharges resulting from their pavement cutting operations and protect all storm sewer inlets from receiving any discharges from the construction operations. The agency or contractor responsible for each pavement cutting activity shall be solely liable for Notice of Violations (NOV/s) and fines issued by City of Columbus and/or State of Ohio Authorities.

Equipment, materials and methods shall be provided by the responsible public agency and/or private contractor to work crews performing the pavement cutting activity and made available to work crews for use in cleaning up discharges resulting from such cutting activities and preventing runoff. All work crews shall be trained to exercise and employ equipment, materials, and environmental protective measures to prevent polluted discharges from entering the City of Columbus storm sewer system and waters of the State of Ohio.

The public agency and/or private contractor is solely responsible for ensuring that the inlet protection is adequate. The most stringent project plans, notes and/or drawings including Stormwater Pollution Prevention Plan (SWP3) or Spill Prevention/Remediation Plan shall apply to all pavement cutting, sawing or excavation operations.

COOPERATION WITH OSU MAPPING AND SURVEYING

The Contractor is responsible for all layout services. The Contractor shall make every effort to cooperate with the OSU Mapping and Surveying Department during the course of this improvement. University surveyors will need to field locate all exposed existing utilities as well as all newly installed utilities and facilities. This Coordination effort will require that the Contractor keep the Surveyor up-to-date as to the project schedule and anticipated work. No additional compensation will be given to the Contractor for compliance with this requirement. The University survey contact is Harry Martin. He can be reached at 614-292-8146. The Contractor is responsible to maintain their independent as-built surveys throughout the construction process on a monthly basis. This shall be submitted with each pay application.

CONSTRUCTION INITIATION

The Contractor will advise the University Facilities Operations and Development seven (7) days prior to the start of construction activities. The project engineer will provide assistance and clarification for any questions

COLUMBIA GAS DAMAGE PREVENTION CENTER

For information concerning Columbia Gas lines or equipment, or if damage occurs to gas lines or equipment the contractor can call the Columbia Gas Damage Prevention Center at (614) 280-7372 or toll free at (866) 632-6243.

AS-BUILT DRAWINGS

In addition to the requirements set forth by the City of Columbus and those listed in the Supplemental Specifications, the Contractor shall fully cooperate with the University's contracted inspector on producing a set of as-built drawings. The Contractor shall be responsible for maintaining a set of as-builts throughout the duration of the project.

Upon final completion of the work, the Contractor shall organize the as-built documents into manageable sets, bind the sets with durable paper cover sheets, and deliver the as-built documents to the A/E.

By submitting the as-built documents to the A/E, the Contractor certifies that the as-built documents are complete, correct, and accurate.

The A/E shall revise the original contract documents and related electronic files with the information contained on the as-built documents. The A/E shall label the revised original contract documents and related electronic files as "record documents" and reflect the date of the A/E's incorporation of the as-built documents.

The University may thereafter use the record documents for any purpose relating to the project including, but not limited to, additions to or completion of the project.

SUPPLEMENTAL SPECIFICATIONS:

ITEM 605, 4" PIPE UNDERDRAIN, SPECIAL, DUCTILE IRON CLASS 52, AS PER PLAN

This work includes all labor, material, and equipment required to install 4 inch diameter solid underdrain piping as shown on the plans. Underdrain piping shall be ductile iron, thickness Class 52, in accordance with CMSC 801.03. Underdrain piping shall be joined to the catch basin with a watertight, flexible connection.

ITEM 605, AGGREGATE UNDERDRAIN, AS PER PLAN

This work includes all labor, material, and equipment required to install aggregate underdrains as shown on the plans. Aggregate underdrains shall consist of six inches of #57 stone on six inches of #2 stone on filter fabric, as shown in the detail on Sheet 6. .

ITEM 653, TOPSOIL, FURNISHED AND PLACED, AS PER PLAN

Submittals. For each soil component: Submit supplier name and contact information, location of material sources, agricultural soil testing laboratory name and contact information, and test results for the following:

1) Topsoil: include particle size analysis (% Sand, Silt and Clay) and USDA texture class, pH, soluble salts content, and organic matter content

2) Organic amendment: product certificate

3) Product certificates for each chemical soil amendment and fertilizer material

4) Written plan for, transporting, storing, placing and settling installed materials including wheel load data for earthwork equipment. Plan to be submitted two weeks in advance of soil delivery and installation.

Pre-Installation Conferences: Conduct conference at Project site. Before commencing Soils Work and associated work, meet at project site, or other mutually agreed location, with Installer, installers of related work, and other entities concerned with Soils Work, including the Engineer, Architect and Owner's representative. Record discussions and agreements and furnish copy to each participant. Provide at least 72 hours advance notice to participants prior to convening Pre-Construction.

Materials.

A loamy, friable mineral soil essentially free from heavy or stiff clay lumps, stones, cinders, concrete, brick, roots, sticks brush, litter, plastics, metals, refuse or other deleterious materials in accordance with ASTM D 5286-92. The soil shall be free of herbicides, petroleum-based materials or other substances of a hazardous or toxic nature which may inhibit plant growth. The soil shall be free of noxious weeds, seeds or vegetative parts of weedy plants that cannot be selectively controlled in the planting.

The soil shall be taken from the A Horizon of a well-drained site and have a USDA soil texture classification of a Clay Loam or Loam. The topsoil shall have the following particle size distribution:

USDA Particle Name	Size (mm)	Allowable Limit
Gravel	2.00-4.75	Less than 8%
Sand	0.05-2.00	25 - 40%
	0.002-0.05	25 - 50%
Clay	minus 0.002	20 - 35%

The topsoil component shall meet the following specifications. Perform the following tests and submit test reports showing the following criteria are met:

a) The particle size analysis as defined above.

b) The pH shall be 5.8 to 8.0

c) The soluble salts test shall be less than 2.0 mmoh/cm

d) The organic matter content shall be 3.0 to 10.0%

e) Phosphorus of the topsoil shall fall between 15 and 60 mg/kg(ppm) as determined by the Mehlich III test.

Provide certification from the supplier that the topsoil does not contain any toxic substances harmful to plant growth.

Organic Amendment: City of Columbus Com-Til® Compost (preferred) or a stable, mature aerobically composted green-waste compost with feedstocks of chipped wood, brush, leaves, grass clipping and other yardwaste debris. The compost must meet the requirements of the Ohio EPA Composting Regulations (OAC 3745-560-230/3745-560-330, Tables 1, 2, 3 and 4) for a mixed green-waste compost. Com-Til® may only be used if the mix meets the other criteria for texture, organic content, pH, phosphorus, and conductivity.

Construction Requirements.

- Prep areas to receive topsoil as specified in 659.10 and place topsoil as listed below
- At existing trees, place soils as a top dressing, max 1" depth, to allow for the laying of sod.
- Required Planting Soil depths shall be as indicated on the drawings with a total depth to be a minimum per the drawings as measured in place in a settled position.
- Place a six (6) inch lift and carefully settle soils to eliminate air pockets and to minimize future settling. Lightly scarify previously placed surface prior to placing subsequent lifts. Method of settlement shall be as previously approved by the Landscape Architect. Method may include, but is not limited to light land-tamp, light rolling or use of a light weight plate compactor with a number of passes approved by the Landscape Architect. Do not over compact Planting Areas. Compact to a 80-85% proctor as measured with a nuclear densitometer to ASTM D698 (latest version) standard. Testing shall be conducted for every 700 cubic yard lift.
- After settlement has occurred add mix to maintain finished grades. If for any reason the soil is left exposed for a long duration prior to planting add soil and re-grade as required if erosion occurs. Fills shall not be compacted as to in anyway restrict the flow water or air through the soil.
- Do not compact soils within Tree Protection Fencing.
- Grading Tolerances: Planting areas shall be fine graded within +/- 1/10 (0.10) feet of grades indicated on the drawings. Maintain all flat areas and slopes to allow free flow of surface drainage without ponding.
- When seeding is specified, open (rake) the topsoil to receive seed.

Method of Measurement.

The measurement will be based on the number of square feet of material furnished and compacted on site per the directed depth, including excavation and disposal of in-situ soils. Any additional soil needed for compaction or as a result of over excavation shall be included in the soil cost. The Contractor is responsible for determining the truck hauling conversion rates between loose versus compacted material. The excavation and disposal of in-situ soils as necessary for the placed of the proposed topsoil shall be included within the unit bid costs of the soils and has not been separately itemized. Basis of Payment, accepted quantities per square foot per 4" depth, As Per Plan.

ITEM 659, SEEDING AND MULCHING, AS PER PLAN

All of the applicable standards of CMSC 659 shall apply except the following:

Topsoil:

See Item 653, Topsoil, Furnished and Placed, As Per Plan.

Seeds:

Furnish grass seed from a grass seed dealer or grower whose brands are grades registered or licensed by the State of Ohio Department of Agriculture or from the approved list of grass seed dealers or growers on file with the Ohio Department of Transportation. Refer to the Restoration Plan for specific seed mixes and project specific notes.

Weeding:

Weeding shall occur at a frequency and intensity as to completely rid the planted and mulched areas of weeds. Application of chemicals is acceptable, but Contractor shall not apply chemicals until written approval by the University. Certain chemicals may require a State Licensed Operator for application.

Mowing:

For permanent seeding areas, the University/Engineer will direct the Contractor to mow the grass areas until the University has accepted the final turf conditions in accordance with the Contract.

ITEM SPEC. TEMPORARY CONSTRUCTION FENCE, 8 FT CHAIN LINK, WITH BARBED WIRE TOP, AS PER PLAN

This work includes all labor, material, and equipment required to install and maintain temporary construction fencing along the perimeter of the staging area site. Contractor shall be responsible for selecting fencing materials and installation methods suitable for the project site. At a minimum, construction fencing shall consist of 8 ft tall chain link fence, barbed wire top, and privacy screening consisting of either slats or fabric mesh. Swing gates shall be provided for access to the staging area at 10th Avenue.

ITEM SPEC. HESCO FLOODLINE BARRIER, AS PER PLAN

This work includes all labor, material, and equipment required to install and maintain the HESCO barrier as shown on the plans. The HESCO barrier is an integral component of the project's stormwater management system, as required by the City of Columbus. Contractor shall maintain the HESCO barrier in full working order throughout the life of the project. The HESCO barrier shall be installed as shown on the plans and in accordance with Manufacturer's recommendations (refer to HESCO FLOODLINE Assembly Guide manual). This work includes backfill for the HESCO barrier consisting of either manual compacted cement sand (CMSC 703.02) or Concrete Class COC 6 or 8 (CMSC 499) as shown on the plan details.

HESCO Barrier Manufacturer's Information (Partial):

Geotextile lined (STORM LINED) welded mesh barrier coated to ASTM A856. All wires conform to BS EN 10218-2:2012. Zinc-Aluminum coatings are to BS EN 10244-2:2009 where appropriate. The geotextile is a heavy-duty, non-woven, permeable, polypropylene fabric (provide in green).

- Barrier system has a functional life of 5 years, per Manufacturer. Contractor shall assume maintenance of the barrier system will be required over its life span and shall perform all such maintenance to keep the barrier system in full working order.
- Barrier system has been tested by the US Army Corps of Engineers for leakage. Barrier is expected to allow leakage of 1.24L/min/m (0.0002 cfs/ft) with three feet of hydrostatic pressure.
- Contractor to install all joining pins, coil hinges, nylon cable ties, and other appertenances as required by the Manufacturer.

BACKFLOW PREVENTER, AS PER PLAN

This work includes all labor, material, and equipment required to install and maintain backflow preventers on the underdrain outfalls on the river side of the HESCO barrier. Backflow preventers shall be Tideflex TF-1 or approved equal, suitable for installation over the outer diameter of the underdrain pipe (note 5" O.D. size required).

#2" STONE ON GEOTEXTILE FABRIC, AS PER PLAN

This work includes all labor, material, and equipment required to install and maintain #2 size aggregate material, compacted and placed on geotextile fabric. Aggregate material shall be clean and free of deleterious material in accordance with CMSC 703. Geotextile fabric (CMSC 712.09, Type D) shall be installed on existing grade following subgrade compaction. Aggregate material shall be installed in a manner as to not damage the geotextile fabric.

STAGING AREA DEMOLITION, AS PER PLAN

This work includes all labor, material, and equipment required to remove the staging area and prepare the site for restoration to pre-project conditions. This work includes, but is not limited to removal of temporary construction fencing, erosion and sediment controls, aggregate materials, geotextile fabric, underdrain piping with backflow preventers, catch basins, HESCO barrier with backfill material, concrete drive apron, temporary concrete curbs, and tied concrete block mats. All material removed from the project shall be legally disposed at an offsite location. This work also includes all earthwork, including import of suitable fill material and excavation and export of surplus soil materials to prepare the site subgrade, at the appropriate elevation, to receive topsoil..

REMOVE AND REPLACE LEVEE CREST SURVEY MONUMENT, AS PER PLAN

This work includes all labor, material, and equipment required to remove existing and install new levee crest survey monuments as shown on the plans and details. Existing monument shall be inspected by University and Design Engineer after the staging area is removed to determine if removal and replacement of the monument is required. Monument shall be surveyed as part of the as-built survey work regardless of if it is replaced or not.

REMOVE AND REPLACE LEVEE BOUNDARY MARKERS, AS PER PLAN

This work includes all labor, material, and equipment required to remove existing and install new levee boundary markers as shown on the plans and details. New boundary markers shall be installed after the staging area is removed. Markers shall be surveyed as part of the as-built survey work.

AS-BUILT SURVEY, POST STAGING AREA CONSTRUCTION, AS PER PLAN

This work includes all labor, material, and equipment required to perform an as-built survey of the constructed staging area. Survey shall be performed under the supervision of a licensed State of Ohio Professional Surveyor. Contractor shall provide the as-built survey to Owner in both CAD and hard copy format (with Professional Surveyor signature and seal) within 30 days of staging area completion.

Survey shall identify the constructed features and finished elevations. Drain basins shall be surveyed for location, rim and invert elevations. Underdrain piping shall be surveyed for pipe size, material, location and invert elevations. Collect surface elevation prior to installing aggregate materials, between different aggregate materials, and finished grade. This information is important to demonstrate to the City that the required stormwater detention volume was provided. Contractor will be required to rework the site at his own expense if the required stormwater detention volume is not provided as per plan.

Grading tolerances:

Drainage structure and pipe rim and invert elevations: -0.10 feet to +0.10 feet

At interfaces with existing paved surfaces: meet existing grade

All other locations: -0.25 feet to +0.25 feet

AS-BUILT SURVEY, POST SITE RESTORATION, AS PER PLAN

This work includes all labor, material, and equipment required to perform an as-built survey of the restored site following removal of the staging area. Survey shall be performed under the supervision of a licensed State of Ohio Professional Surveyor. Contractor shall provide the as-built survey to Owner in both CAD and hard copy format (with Professional Surveyor signature and seal) within 30 days of site restoration.

Survey shall identify the constructed features and finished elevations. Reconstructed paths, walks, and curb and gutter shall be surveyed for location and surface elevation. Collect surface elevation prior to installing topsoil and at finished grade to confirm depth of topsoil provided. Collect location and elevation of installed levee boundary markers and levee crest survey monuments.

Grading tolerances:

At interfaces with existing paved surfaces: meet existing grade

Within Levee: -0.00 feet to +0.25 feet

All other locations: -0.25 feet to +0.25 feet

DRY BASIN (WITHOUT WATER QUALITY) INSPECTION & MAINTENANCE

Inspection Item	Maintenance Procedures	Frequency of Inspection
Outlet Structure & Side Slopes	Do not fertilize vegetation surrounding basin. Remove accumulated sediment and debris from catch basins and outlet pipes. Mow side slopes (by Cannon Drive).	Monthly
Basin Embankment/HESCO Barrier	Repair undercut/eroded areas and stabilize.	Every 6 months
Underdrain System	Remove debris from the underdrain system to ensure positive flow through the system.	Every 6 months
Stormwater Basin	Inspect for damage, paying particular attention to the outlet control structures. Check for signs of eutrophic conditions (algae buildup) Note signs of hydrocarbon build-up, remove appropriately. Monitor sediment accumulation in facility. Examine to ensure inlet and outlet devices are free of debris and operational.	Annually

The Owner shall be responsible for the inspection and maintenance of the stormwater basin, associated outlet structures and all other maintenance procedures listed above. Inspections and maintenance that are conducted shall be documented and filed for future reviews by the City of Columbus.

EASEMENT REFERENCE

CITY NO.	COUNTY RECORDER VOL.	COUNTY RECORDER PAGE	GRANTOR

REVISIONS

NO.	DESCRIPTION	APPROVAL/DATE

PLAN PREPARED BY:

EMH&T
Evans, Mechwart, Hambleton & Tilton, Inc.
Engineers • Surveyors • Planners • Scientists
5500 New Albany Road, Columbus, OH 43054
Phone: 614.775.4500 Toll Free: 888.775.3648
emht.com

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

PLAN SET DATE
October 13, 2020

PROJECT TITLE: PRIVATE STORM SEWER IMPROVEMENT PLAN FOR
THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER CONSTRUCTION STAGING AREA
GENERAL NOTES

DIVISION USE ONLY	OWNER
	CONTRACTOR
	INSPECTOR
	AGREEMENT / COMPLETED
	RPD / CKD / CID / CON.DR.
	INDEX DETAIL / RECORD FILE

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF SEWERAGE AND DRAINAGE
DIVISION USE ONLY

SCALE: AS NOTED
SHEET: 3 / 9
CONTRACT DRAWING NO.: CC-00000
RECORD PLAN NO.:

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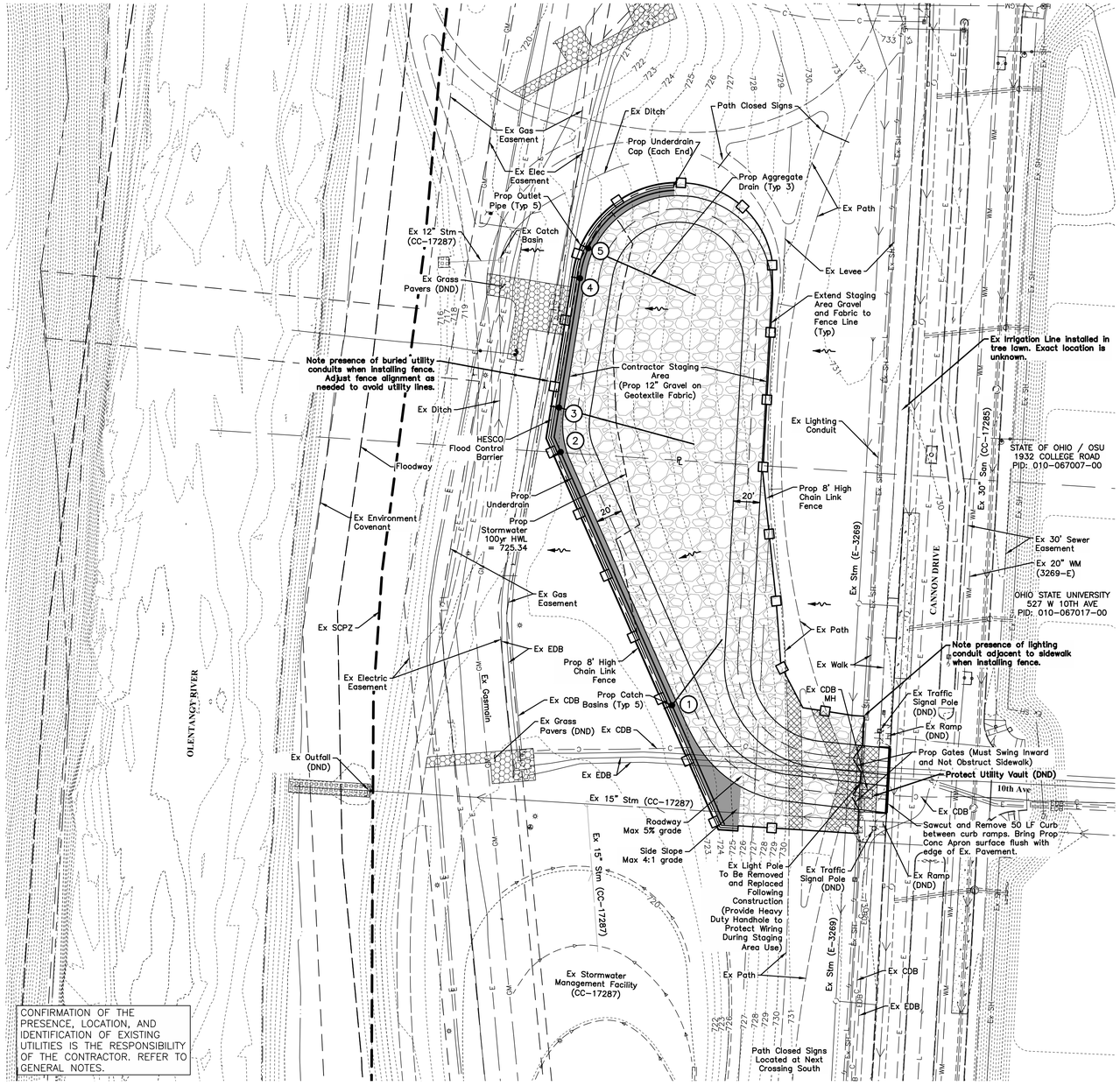

GRAPHIC SCALE

0 25 50 100

1 inch = 50 feet

LEGEND

EXISTING

- Building
- Curb
- Sidewalk/Curb Ramp
- Center Line Swale
- Fence/Handrail
- Water Main
- Water Service
- Domestic Water Service
- Fire Water Service
- Sanitary Sewer Main
- Sanitary Sewer Service
- Storm Sewer
- Roof Drain
- Underdrain
- Underground Electric Service
- Electric Duct Bank
- Overhead Electric
- Overhead Electric & Communications
- Site Lighting
- Communications Service
- Communications Duct Bank
- Natural Gas Main
- Natural Gas Service
- Tree Row
- Minor Contour
- Major Contour
- Flow Arrow
- Catch Basin
- Curb & Gutter Inlet
- Headwall w/ Rock Channel Protection
- Manhole
- Cleanout
- Fire Hydrant
- Fire Department Connection
- Valve
- Reducer
- Detectable Warning Plate
- Sign
- Wheel Block
- Handicap Pavement Symbol
- Bollard
- Light Pole
- Transformer
- Gas Meter
- Pull Box
- DND Do Not Disturb

PROPOSED

- Existing Path/Walk To be Removed and Replaced Following Construction
- Staging Area Gravel Pad 12" of Gravel on Geotextile Fabric
- #2 Stone on Geotextile Fabric

LEVEE PROTECTION NOTE:

Existing Levee shall not be undermined by Contractor during construction of the staging area nor during site restoration.

NOTES:

Refer to Sheet 5 for Grading and Drainage Plan.

Refer to Sheet 6 for Details.

EASEMENT REFERENCE			
CITY NO.	COUNTY RECORDER VOL.	COUNTY RECORDER PAGE	GRANTOR

REVISIONS		
NO.	DESCRIPTION	APPROVAL/DATE

PLAN PREPARED BY:

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PRELIMINARY
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PLAN SET DATE
October 13, 2020

PROJECT TITLE: PRIVATE STORM SEWER IMPROVEMENT PLAN FOR
THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER CONSTRUCTION STAGING AREA
SITE PLAN

DIVISION USE ONLY	OWNER
	CONTRACTOR
	INSPECTOR
	AGREEMENT / COMPLETED
RPD / CKD / CID / CON.DR.	
INDEX DETAIL	RECORD FILE

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF SEWERAGE AND DRAINAGE
DIVISION USE ONLY

SCALE: AS NOTED

SHEET 4 / 9

CONTRACT DRAWING NO. CC-00000

RECORD PLAN NO.

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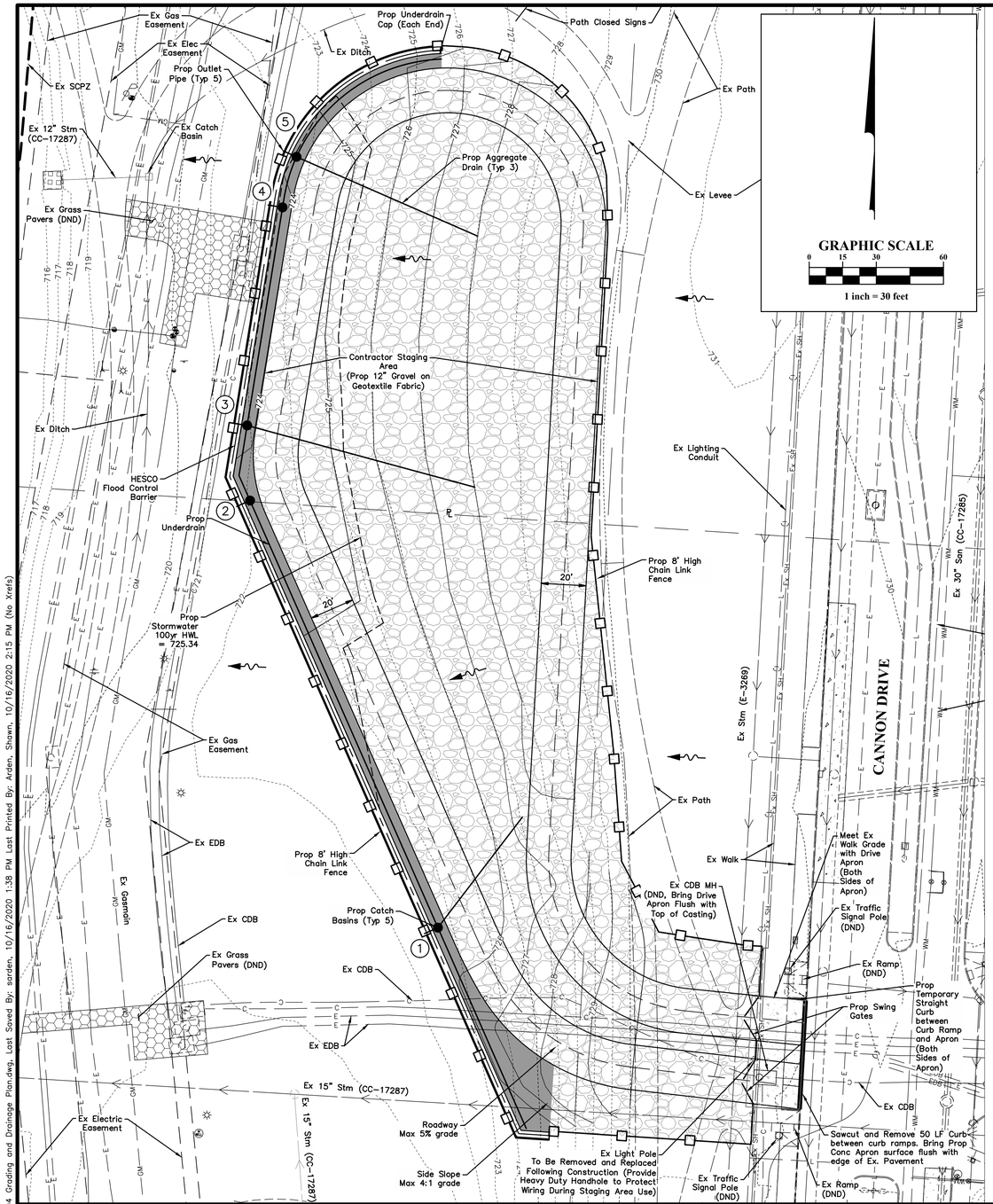

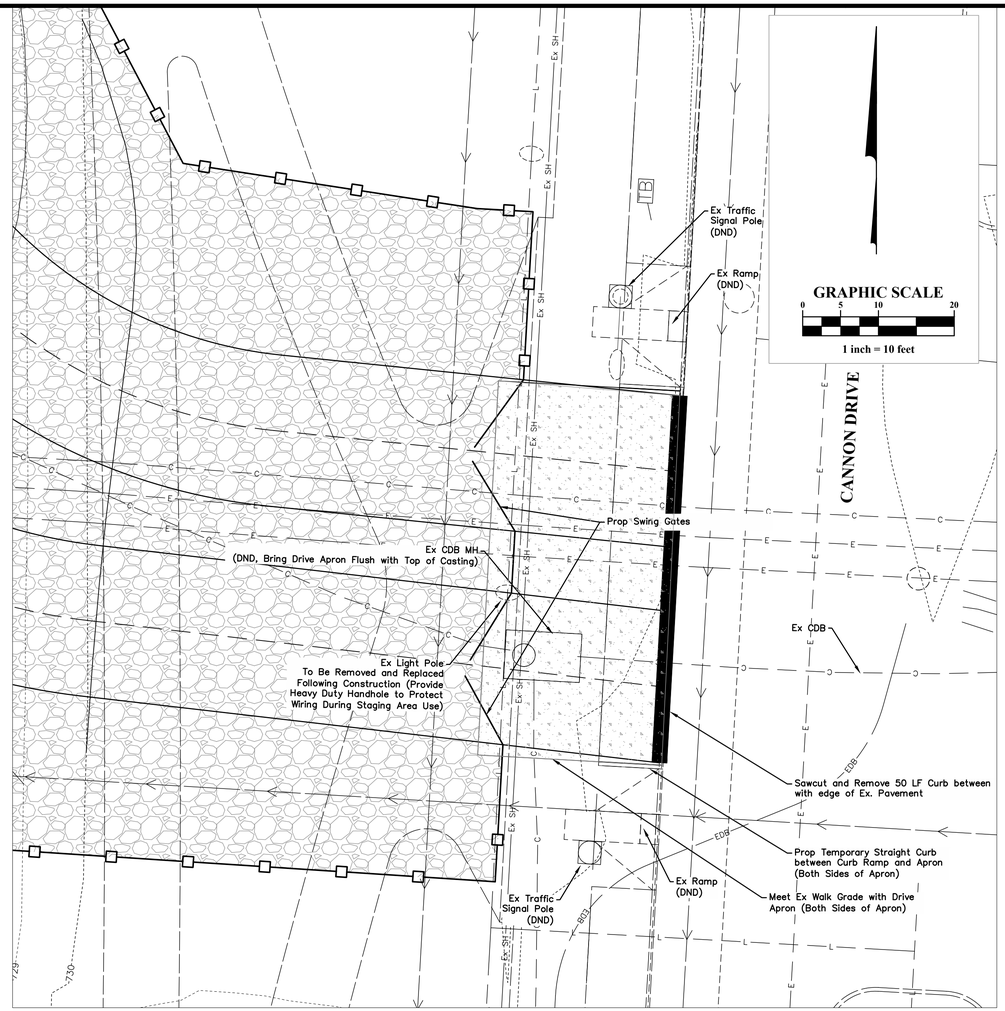

DETAIL GRADING AT 10TH AVE INTERSECTION

LEGEND

EXISTING

- Building
- Curb
- Sidewalk/Curb Ramp
- Center Line Swale
- Fence/Handrail
- Water Main
- Water Service
- Domestic Water Service
- Fire Water Service
- Sanitary Sewer Main
- Sanitary Sewer Service
- Storm Sewer
- Roof Drain
- Underdrain
- Underground Electric Service
- Electric Duct Bank
- Overhead Electric
- Overhead Electric & Communications
- Site Lighting
- Communications Service
- Communications Duct Bank
- Natural Gas Main
- Natural Gas Service
- Tree Row
- Minor Contour
- Major Contour
- Flow Arrow
- Catch Basin
- Curb & Gutter Inlet
- Headwall w/ Rock Channel Protection
- Manhole
- Cleanout
- Fire Hydrant
- Fire Department Connection
- Valve
- Reducer
- Detectable Warning Plate
- Sign
- Wheel Block
- Handicap Pavement Symbol
- Bollard
- Light Pole
- Transformer
- Gas Meter
- Pull Box
- DND Do Not Disturb

PROPOSED

- Staging Area Gravel Pad 12" of Gravel on Geotextile Fabric
- #2 Stone on Geotextile Fabric
- Item 452 – Non-Reinforced Concrete Pavement, 8"

NOTE:

Refer to Sheet 6 for Details.

LEVEE PROTECTION NOTE:

Existing Levee shall not be undermined by Contractor during construction of the staging area nor during site restoration.

CATCH BASIN SCHEDULE

STRUCTURE #	NORTHING	EASTING	RIM	INV
1	726762.27	1822066.98	725.58	723.05
2	726952.99	1821983.07	724.25	722.46
3	726986.54	1821981.78	724.00	722.35
4	727083.90	1821997.60	724.00	723.01
5	727106.49	1822003.81	724.25	723.11

EASEMENT REFERENCE

CITY NO.	COUNTY RECORDER VOL.	COUNTY RECORDER PAGE	GRANTOR

REVISIONS

NO.	DESCRIPTION	APPROVAL/DATE

PLAN PREPARED BY:

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PRELIMINARY
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PLAN SET DATE
October 13, 2020

PROJECT TITLE:
PRIVATE STORM SEWER IMPROVEMENT PLAN
FOR
THE OHIO STATE UNIVERSITY
WEXNER MEDICAL CENTER
CONSTRUCTION STAGING AREA
GRADING AND DRAINAGE PLAN

DIVISION USE ONLY	OWNER
	CONTRACTOR
	INSPECTOR
	AGREEMENT / COMPLETED
RPD / CKD / CID / CON.DR.	
INDEX DETAIL	RECORD FILE

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF SEWERAGE AND DRAINAGE
DIVISION USE ONLY

SCALE: AS NOTED
SHEET: 5 / 9
CONTRACT DRAWING NO.: CC-00000
RECORD PLAN NO.:

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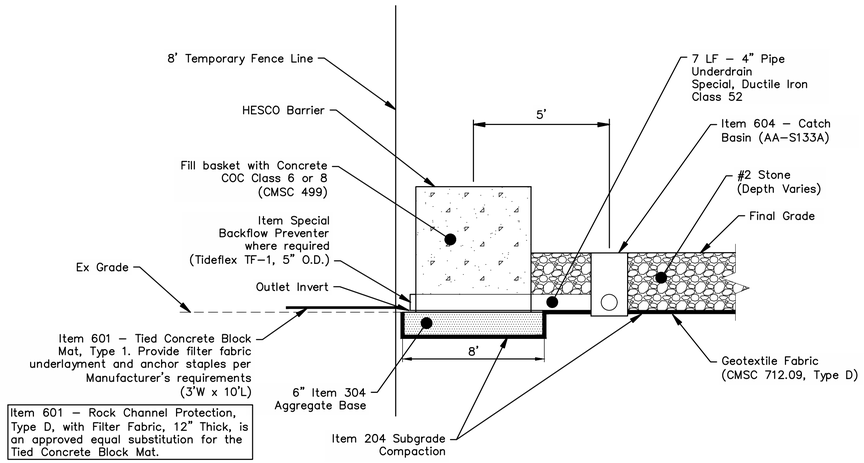


CATCH BASIN / OUTLET ID	OUTLET PIPE		
	UPSTREAM INV	DOWNSTREAM INV	BACKFLOW PREVENTER*
1	723.05	722.83	NO
3	722.35	722.15	YES
5	723.11	722.78	NO

*Backflow preventer specified where Base Flood Elevation (722.87) exceeds upstream outlet pipe invert.

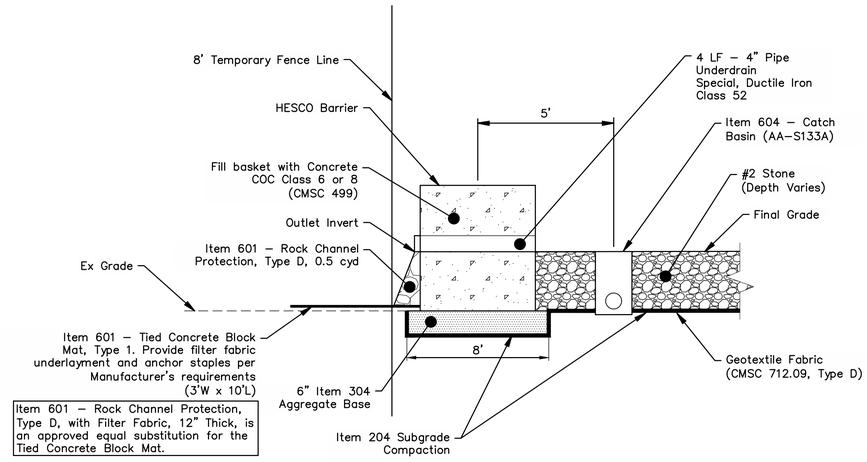
DETAIL
HESCO BARRIER TYPICAL SECTION AT OUTLET STRUCTURE Not to Scale

HESCO Barrier Pipe Penetration Notes:
1. Remove a single "cross" of wire mesh to create a six inch by six inch square opening for the outlet pipe. Cut out minimum amount of geotextile within the wire mesh opening to allow the pipe to pass through the material.
2. Place and thoroughly compact concrete material as bedding beneath the pipe installation elevation.
3. After installing pipe through the barrier and confirming pipe installation elevations, place and thoroughly compact remaining concrete to fill the basket.
4. After concrete fill material has cured, install bentonite collar to seal pipe penetrations through the barrier. Install collar on both upstream and downstream face of the barrier.

Contractor must install HESCO FLOODLINE Barrier in full compliance with Manufacturer's recommendations.

Refer to the HESCO FLOODLINE Assembly Guide manual.

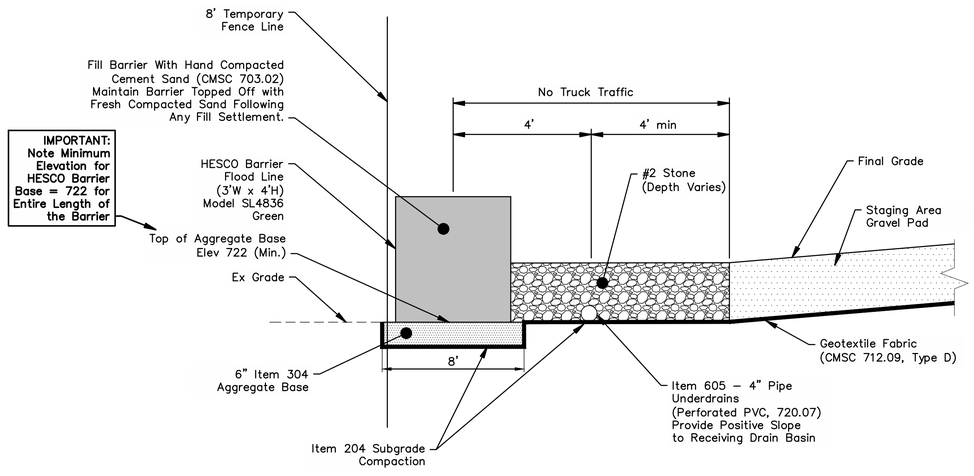
Contact HESCO for additional technical assistance: 1–985–345–7332.



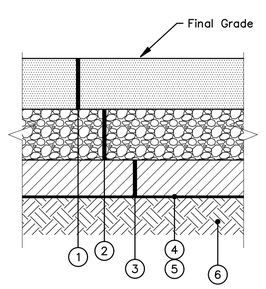
CATCH BASIN / OUTLET ID	OUTLET PIPE		
	UPSTREAM INV	DOWNSTREAM INV	BACKFLOW PREVENTER*
2	724.22	724.22	NO
4	724.00	724.00	NO

*Backflow preventer specified where Base Flood Elevation (722.87) exceeds upstream outlet pipe invert.

DETAIL
HESCO BARRIER TYPICAL SECTION AT UPPER STAGE OUTLETS Not to Scale

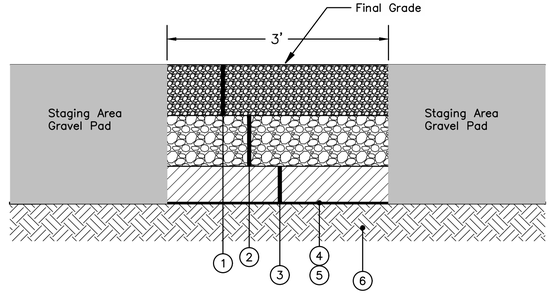


DETAIL
HESCO BARRIER TYPICAL SECTION Not to Scale



1. Item 304, 6" Aggregate Base
2. Item Spec., 6" #2 Stone
3. Item 203 Granular Embankment (Depth Varies)
4. Geotextile Fabric (CMSC 712.09 Type D)
5. Item 204 Subgrade Compaction
6. Existing Soil

DETAIL
STAGING AREA GRAVEL PAD Not to Scale



1. Item Spec., 6" #57 Stone
2. Item Spec., 6" #2 Stone
3. Item 203 Granular Embankment (Depth Varies)
4. Geotextile Fabric (CMSC 712.09 Type D)
5. Item 204 Subgrade Compaction
6. Existing Soil

DETAIL
AGGREGATE DRAIN Not to Scale

EASEMENT REFERENCE			
CITY NO.	COUNTY RECORDER VOL.	COUNTY RECORDER PAGE	GRANTOR

REVISIONS		
NO.	DESCRIPTION	APPROVAL/DATE

PLAN PREPARED BY:

EMH&T
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Engineers • Surveyors • Planners • Scientists
5500 New Albany Road, Columbus, OH 43054
Phone: 614.775.4500 Toll Free: 888.775.3648
emht.com

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

PLAN SET DATE
October 13, 2020

PROJECT TITLE: PRIVATE STORM SEWER IMPROVEMENT PLAN FOR
THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER CONSTRUCTION STAGING AREA
DETAILS

DIVISION USE ONLY		OWNER	
		CONTRACTOR	
		INSPECTOR	
		AGREEMENT	COMPLETED
		RPD / CKD / CID / CON.DR.	
		INDEX DETAIL	RECORD FILE

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF SEWERAGE AND DRAINAGE
DIVISION USE ONLY

SCALE: AS NOTED
SHEET: 6 / 9
CONTRACT DRAWING NO.: CC-00000
RECORD PLAN NO.:

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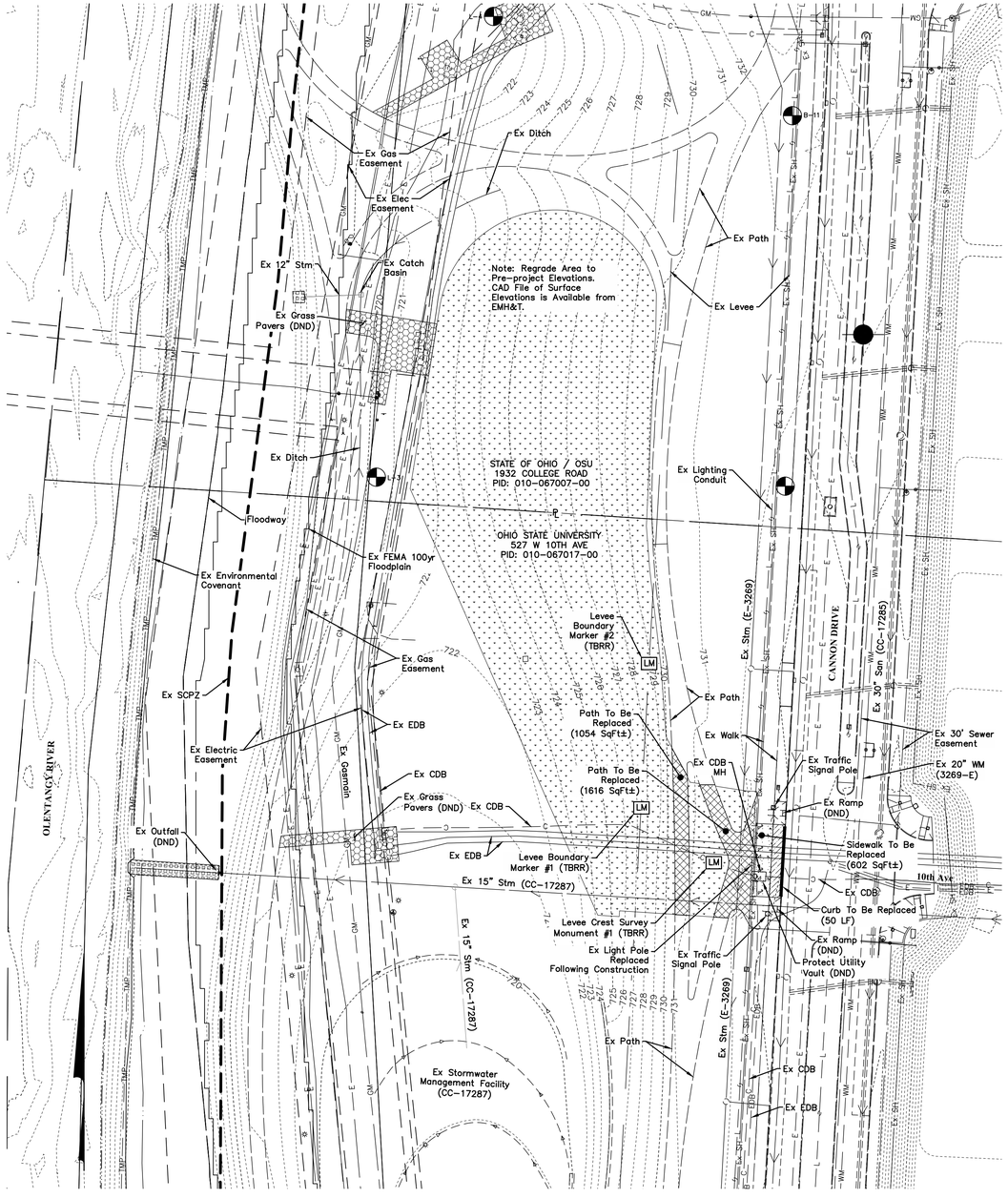
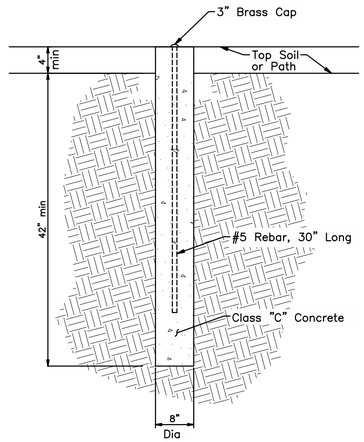


GRAPHIC SCALE

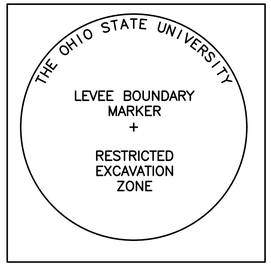
0 # ## ##

1 inch = ## feet

LEVEE MARKER SCHEDULE		
TYPE	NORTHING	EASTING
CREST MONUMENT #1	726704.71	1822182.68
BOUNDARY MARKER #1	726742.60	1822131.70
BOUNDARY MARKER #2	726842.44	1822137.25



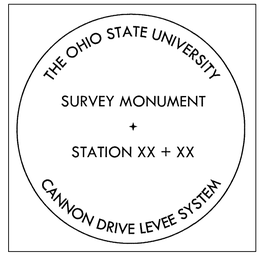
ELEVATION



CAP PLAN VIEW

LEVEE LANDSCAPE EXCLUSION ZONE BOUNDARY MARKER DETAIL

ELEVATION



CAP PLAN VIEW

LEVEE SURVEY MONUMENT DETAIL

LEGEND

EXISTING

- Building
- Curb
- Sidewalk/Curb Ramp
- Center Line Swale
- Fence/Handrail
- Water Main
- Water Service
- Domestic Water Service
- Fire Water Service
- Sanitary Sewer Main
- Sanitary Sewer Service
- Storm Sewer
- Roof Drain
- Underdrain
- Underground Electric Service
- Electric Duct Bank
- Overhead Electric
- Overhead Electric & Communications
- Site Lighting
- Communications Service
- Communications Duct Bank
- Natural Gas Main
- Natural Gas Service
- Tree Row
- Minor Contour
- Major Contour
- Flow Arrow
- Catch Basin
- Curb & Gutter Inlet
- Headwall w/ Rock Channel Protection
- Manhole
- Cleanout
- Fire Hydrant
- Fire Department Connection
- Valve
- Reducer
- Detectable Warning Plate
- Sign
- Wheel Block
- Handicap Pavement Symbol
- Bollard
- Light Pole
- Transformer
- Gas Meter
- Pull Box

PROPOSED

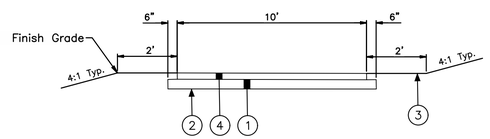
- Path To Be Replaced
- Sidewalk To Be Replaced
- Seeding To Be Replaced
- Sod To Be Replaced
- LM — Levee Monument/Marker To Be Removed and Replaced

NOTE:

Refer to Sheet 3 for Restoration Notes Associated With Site Regrading, Topsoil, and Seeding Requirements.

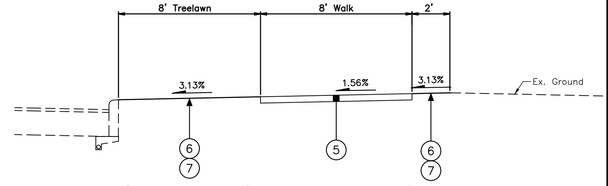
LEVEE PROTECTION NOTE:

Existing Levee shall not be undermined by Contractor during construction of the staging area nor during site restoration.



Park Path Typical Section

Not to Scale



Sidewalk Along Cannon Drive Typical Section

Not to Scale

LEGEND

1. Item 304 – 6" Aggregate Base
2. Item 204 – Subgrade Compaction
3. Item 659 – Seeding and Mulching, As Per Plan
4. Item 448 – 2.5" Asphalt Concrete Surface Course (Light Traffic) PG64-22 [2 – 1 ¼" Lifts]
5. Item 608 – 5.5" Concrete Walk (Ref. Std. 2300)
6. Item 663 – Topsoil Furnished and Placed, As Per Plan (T=4")
7. Item 660 – Sodding, Unstaked

EASEMENT REFERENCE

CITY NO.	COUNTY RECORDER VOL.	COUNTY RECORDER PAGE	GRANTOR

REVISIONS

NO.	DESCRIPTION	APPROVAL/DATE

PLAN PREPARED BY:

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Phone: 614.775.4500 Toll Free: 888.775.3648
emht.com

PRELIMINARY

NOT TO BE USED FOR CONSTRUCTION

PLAN SET DATE
October 13, 2020

PROJECT TITLE: PRIVATE STORM SEWER IMPROVEMENT PLAN FOR
THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER CONSTRUCTION STAGING AREA
RESTORATION PLAN

DIVISION USE ONLY	OWNER
	CONTRACTOR
	INSPECTOR

AGREEMENT		COMPLETED		
		RPD	CKD	CID / CON.DR.
INDEX DETAIL		RECORD FILE		

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF SEWERAGE AND DRAINAGE
DIVISION USE ONLY

SCALE:	SHEET
AS NOTED	7 / 9
CONTRACT DRAWING NO.	RECORD PLAN NO.
CC-00000	

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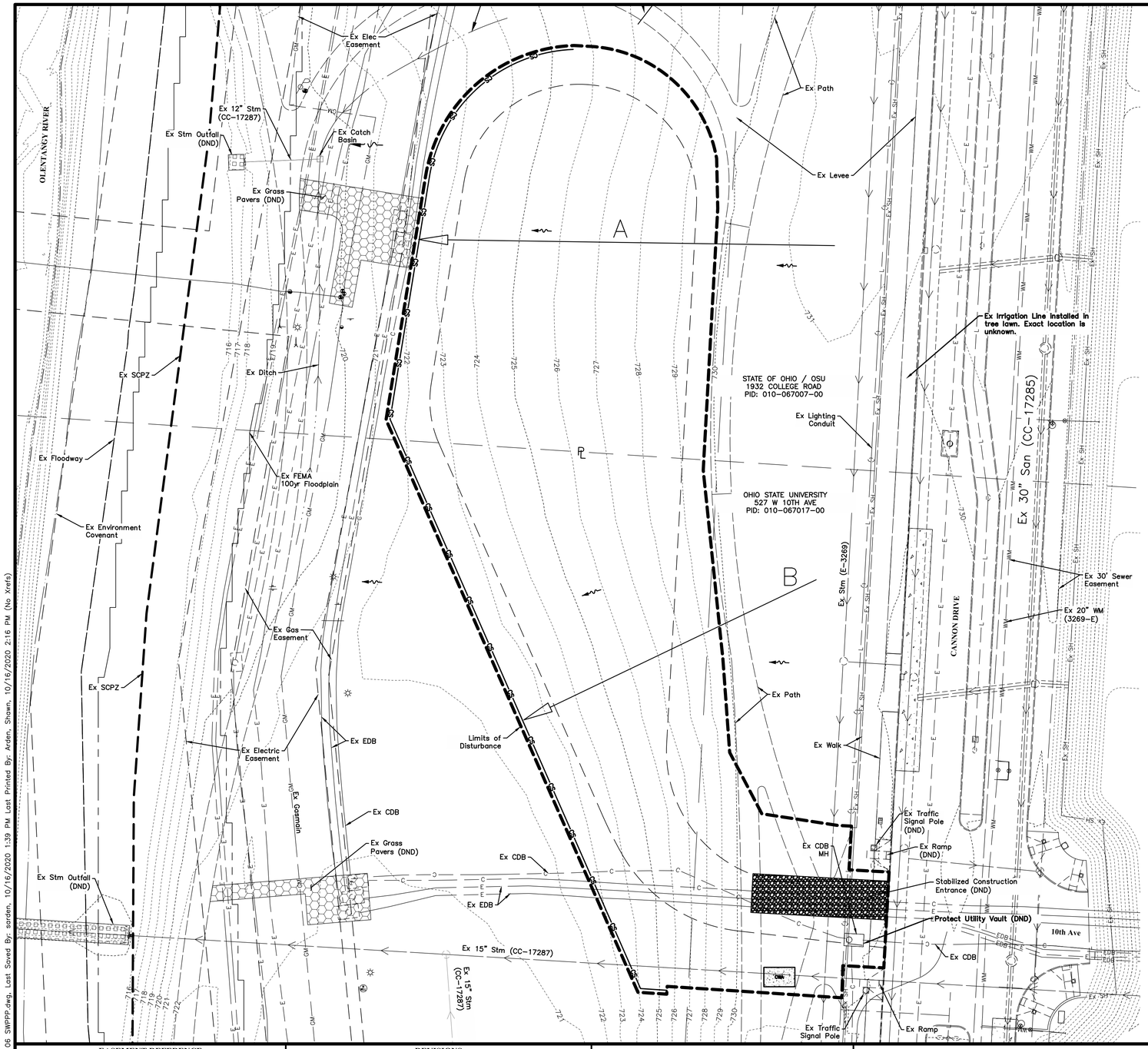


GRAPHIC SCALE

0 15 30 60

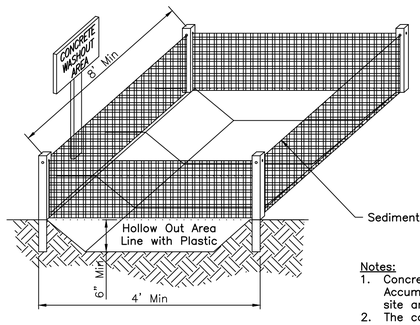
1 inch = 30 feet

COMPOST FILTER SOCK CALCULATIONS

FLOW LENGTH ID	SLOPE LENGTH	SLOPE PERCENT	FILTER SOCK DIA	MAXIMUM ALLOWABLE SLOPE LENGTH
A	215'	3.7%	24 IN	250 FT
B	165'	5.2%	24 IN	250 FT

LEGEND

	Flow Arrow
XX1 / XX5	Existing Contours
	Limits of Disturbance
CS	Filter Sock (See Detail, Sheet 9)
	Stabilized Construction Entrance (See COC Std Dwg 2230)
CWA	Concrete Washout Area (See Detail, Sheet 9)
	Runoff Flow Length to Compost Filter Sock



Notes:

1. Concrete trucks shall utilize areas to washout trucks. Accumulated concrete shall be removed from the site and disposed of properly.
2. The cost associated with excavating, placement of fence, maintaining and removing the concrete washout area shall be included in the price bid for Item 207 – Concrete Washout Area for the project. A quantity of 1 Each has been carried to the General Summary.
3. As an alternative, contractor shall use a roll off box with liner.

CONCRETE WASHOUT AREA
SCALE: Not to Scale

EASEMENT REFERENCE			
CITY NO.	COUNTY RECORDER VOL.	COUNTY RECORDER PAGE	GRANTOR

REVISIONS		
NO.	DESCRIPTION	APPROVAL/DATE

PLAN PREPARED BY:

EMH&T
Evans, Mechwart, Hambleton & Tilton, Inc.
Engineers • Surveyors • Planners • Scientists
5500 New Albany Road, Columbus, OH 43054
Phone: 614.775.4500 Toll Free: 888.775.3648
emht.com

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

PLAN SET DATE
October 13, 2020

PROJECT TITLE: PRIVATE STORM SEWER IMPROVEMENT PLAN FOR
THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER CONSTRUCTION STAGING AREA
STORMWATER POLLUTION PREVENTION PLAN & DETAILS

DIVISION USE ONLY			OWNER	
			CONTRACTOR	
			INSPECTOR	
			AGREEMENT	COMPLETED
			RPD / CKD / CID / CON.DR.	
			INDEX DETAIL	RECORD FILE

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF SEWERAGE AND DRAINAGE
DIVISION USE ONLY

SCALE:	AS NOTED	SHEET	8 / 9
CONTRACT DRAWING NO.	CC-00000	RECORD PLAN NO.	

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SITE NARRATIVE

PLAN DESIGNER:	EMHT Inc. Shawn Arden 5500 New Albany Road Columbus, Ohio 43054 Tel: (614) 775–4210 Email: sarden@emht.com
OWNER/DEVELOPER:	The Ohio State University Facilities Operation and Development Design and Construction Ragan Fallang 400 Enarson Classroom Building 2009 Millikin Road Columbus, OH 43210 Tel: (614) 247–6150 Email: fallang.6@osu.edu
PROJECT DESCRIPTION:	The project consists of the construction of a temporary contractor staging area in support of the construction of the Ohio State University Wexner Medical Center. An estimated 1.5 acres will be disturbed as a result of the proposed improvements.
EXISTING SITE CONDITIONS:	Current site conditions consist of an open vegetated area that was constructed with the Cannon Drive Phase 1 site improvements (CC–17287).
RECEIVING STREAM:	Stormwater runoff flows from the east to the west towards an existing storm sewer inlet located to the northwest of the staging area and to the southwest towards the existing stormwater management facility constructed per CC–17287. Runoff from both of these features is tributary to the Olentangy River.
ADJACENT AREAS:	The site is bordered by Cannon Drive to the east, the Olentangy river and pedestrian paths to the west, Rt. 315 entrance ramp to the north, and the stormwater management facility constructed per CC–17287 to the south.
EROSION AND SEDIMENT MEASURES:	Stormwater runoff during grading activities shall be managed by 24–inch diameter compost filter socks. The disturbed area will be stabilized with stone cover. Upon removal of the staging area, the area will be converted back to an open space with permanent vegetated cover.
PERMANENT STABILIZATION:	The disturbed area will be stabilized with stone cover. Upon removal of the staging area, the area will be converted back to an open space with permanent vegetated cover.
MAINTENANCE:	During grading activities, the contractor shall inspect and maintain the compost filter sock. The filter sock is to be maintained within 3–days of the inspection.
CONSTRUCTION SEQUENCE:	1. Establish a stabilized construction entrance. 2. Install the compost filter socks. 3. Commence with demolition and grading activities. 4. Construct the proposed stormwater management features and staging area. 5. Stabilize the staging area with stone cover. 6. Remove the compost filter socks. Staging Area Removal 1. Install compost filter socks. 2. Remove stone cover and stormwater management features. 3. Respread topsoil and permanently seed. 4. Upon the establishment of permanent vegetation, remove filter socks. 5. Submit the Notice of Termination to the Ohio EPA.
SCHEDULE:	The Contractor shall provide a schedule of operations to the owner. Sedimentation and erosion control features shall be placed in accordance with this schedule.
OHIO EPA NPDES FACILITY PERMIT NUMBER	#
SITE CONTACT:	Ragan Fallang The Ohio State University Facilities Operation and Development Design and Construction 400 Enarson Classroom Building 2009 Millikin Road Columbus, OH 43210 Tel: (614) 247–6150 Email: fallang.6@osu.edu

BMP Installation	Ragan Fallang	Tel: (614) 247–6150	Email: fallang.6@osu.edu
BMP Maintenance	Same as above	Same as above	Same as above
Site Stabilization and BMP Removal	Same as above	Same as above	Same as above

SEDIMENT AND EROSION CONTROL NOTES

MAINTENANCE:
It is the Contractor's responsibility to maintain the sedimentation and erosion control features on this project. Any sediment or debris which has reduced the efficiency of a control shall be removed immediately. Should a structure or feature become damaged, the Contractor shall repair or replace at no additional cost to the Owner.

INSPECTIONS:
The NPDES permit holder along with the Contractor shall provide qualified personnel to conduct site inspections ensuring proper functionality of the erosion and sedimentation controls. All erosion and sedimentation controls are to be inspected once per every seven calendar days and within 24 hours of a 0.5" storm event or greater that occurs over a 24 hour period. Records of the site inspections shall be kept and made available to jurisdictional agencies if requested.

CONTRACTORS RESPONSIBILITIES:
Details have been provided on the plans in an effort to help the Contractor provide erosion and sedimentation control. The details shown on the plan shall be considered a minimum. Additional or alternate details may be found in the Ohio EPA Manual "Rainwater and Land Development". The Contractor shall be solely responsible for providing necessary and adequate measures for proper control of erosion and sediment runoff from the site along with proper maintenance and inspection in compliance with the NPDES General Permit for Storm Discharges Associated with Construction Activity.

The Contractor shall provide a schedule of operations to the Owner. The schedule should include a sequence of the placement of the sedimentation and erosion control measures that provides for continual protection of the site throughout the earth moving activities.

Prior to construction operations in a particular area, all sedimentation and erosion control features shall be in place. Field adjustments with respect to locations and dimensions may be made by the Engineer, City of Columbus and the Ohio EPA.

It may become necessary to remove portions of sedimentation controls during construction to facilitate the grading operations in certain areas. However, the controls shall be replaced upon grading or during any inclement weather.

The Contractor shall be responsible to have the current Storm Water Pollution Prevention Plan immediately available or posted on site.

The contractor is responsible for ensuring that offsite soil borrow and export areas have Ohio EPA NPDES permit coverage and that appropriate erosion and sediment controls are properly installed and maintained.

Street cleaning (on an as–needed basis) is required through the duration of this construction project. This includes sweeping, power cleaning and (if necessary) manual removal of dirt or mud in the street gutters.

The Contractor shall be responsible to ensure that no solid or liquid waste is discharged into storm water runoff. Untreated sediment–laden runoff shall not flow off of site without being directed through a control practice.

Direct discharge of sediment laden water to the City's sewer system or a receiving stream is a violation of Ohio EPA and City of Columbus regulation; the Contractor will be held liable for the violation and subsequent fines.

This plan must be posted on–site. A copy of the SWPPP plan and the approved EPA Stormwater Permit (with the site–specific NOI number) shall be kept on–site at all times.

PERMANENT AND TEMPORARY SEEDING

The limits of seeding and mulching are as shown within the plan as indicated by the limits of disturbance. All areas not designated to be seeded shall remain under natural ground cover. Those areas disturbed outside the seeding limits shall be seeded and mulched at the Contractor's expense.

Seeding Provided Per Item 659.

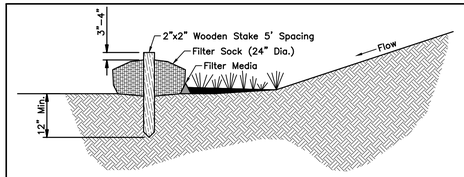
Note: Disturbed areas associated with the staging area shall be stabilized with stone cover. Upon removal of the staging area, the stone cover shall be removed and the area shall be permanently stabilized with vegetation.

TABLE 1: PERMANENT STABILIZATION

AREA REQUIRING PERMANENT STABILIZATION	TIME FRAME TO APPLY EROSION CONTROL
Any areas that will lie dorment for one year or more	Within seven days of the most recent disturbance
Any areas within 50 feet of a surface water of the state and at final grade	Within two days of reaching final grade
Any areas at final grade	Within seven days of reaching final grade within that area

TABLE 2: TEMPORARY STABILIZATION

AREA REQUIRING PERMANENT STABILIZATION	TIME FRAME TO APPLY EROSION CONTROL
Any areas within 50 feet of a surface water of the state and at final grade	Within two days of the most recent disturbance if the area will remain idle for more than fourteen days
For all construction activities, any disturbed areas that will be dormant for more than 14 days but less than one year, and not within 50 feet of a surface water of the state	Within seven days of the most recent disturbance within the area For residential subdivisions, disturbed areas must be stabilized at least seven days prior to transfer of permit coverage for the individual lot(s)
Disturbed areas that will be idle over winter	Prior to the onset of winter weather



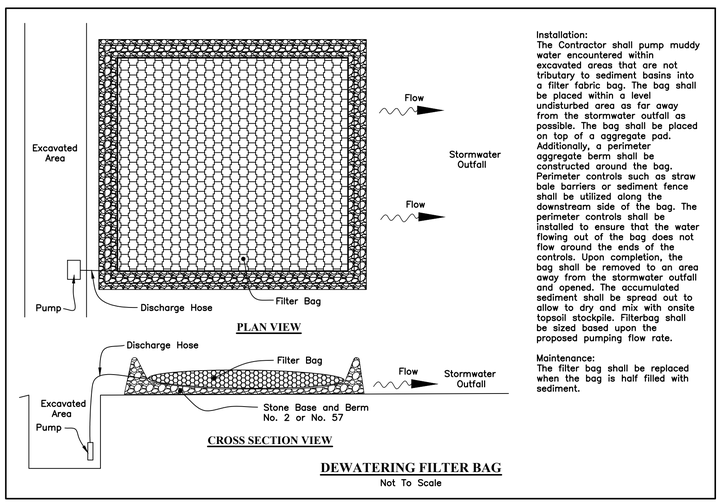
Note:
Three 12–inch diameter compost filter socks stacked in a pyramid or prism shape will be considered an equal substitution to a single 24–inch compost filter sock.

1. Materials – Compost used for filter socks shall be weed, pathogen and insect free and free of any refuse, contaminants or other materials toxic to plant growth. They shall be derived from a well–decomposed source of organic matter and consist of a particles ranging from 3/8" to 2".
2. Filter socks shall be 3 or 5 mil continuous, tubular, HDPE 3/8" knitted mesh netting material, filled with compost passing the above specifications for compost products.

Installation:
3. Filter socks will be placed on a level line across slopes, generally parallel to the base of the slope or other affected area. On slopes approaching 2:1, additional socks shall be provided at the top and as needed midslope.
4. Upon installation of the filter sock, additional filter media (matching the media inside of the sock) shall be placed on the upland side of the filter sock. Filter media shall extend halfway up the sock and slope at a maximum of 45 degrees to existing ground elevation.
5. Filter socks intended to be left as a permanent filter or part of the natural landscape, shall be seeded at the time of installation for establishment of permanent vegetation.
6. Filter socks are not to be used in concentrated flow situations or in runoff channels.

Maintenance:
7. Routinely inspect filter socks after each significant rain, maintaining filter socks in a functional condition at all times.
8. Remove sediments collected at the base of the filter socks when they reach 1/3 of the exposed height of the practice.
9. Where the filter sock deteriorates or fails, it will be repaired or replaced with a more effective alternative.
10. Removal – Filter socks will be dispersed on site when no longer required in such as way as to facilitate and not obstruct seedings.

COMPOST FILTER SOCK (24-INCH DIAMETER)
Not To Scale



Installation:
The Contractor shall pump muddy water encountered within excavated areas that are not tributary to sediment basins into a filter fabric bag. The bag shall be placed within a level undisturbed area as far away from the stormwater outfall as possible. The bag shall be placed on top of a aggregate pad. Additionally, a perimeter aggregate berm shall be constructed around the bag. Perimeter controls such as straw bale barriers or sediment fence shall be utilized along the downstream side of the bag. The perimeter controls shall be installed to ensure that the water flowing out of the bag does not flow around the ends of the controls. Upon completion, the bag shall be removed to an area away from the stormwater outfall and opened. The accumulated sediment shall be spread out to allow to dry and mix with onsite topsoil stockpile. Filterbag shall be sized based upon the proposed pumping flow rate.

Maintenance:
The filter bag shall be replaced when the bag is half filled with sediment.

DEWATERING FILTER BAG
Not To Scale

EASEMENT REFERENCE

CITY NO.	COUNTY RECORDER VOL.	COUNTY RECORDER PAGE	GRANTOR

REVISIONS

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PLAN PREPARED BY:

EMHT
Evans, Mechwart, Hambleton & Tilton, Inc.
Engineers • Surveyors • Planners • Scientists
5500 New Albany Road, Columbus, OH 43054
Phone: 614.775.4500 Toll Free: 888.775.3648
emht.com

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PLAN SET DATE
October 13, 2020

PROJECT TITLE:
PRIVATE STORM SEWER IMPROVEMENT PLAN
FOR
THE OHIO STATE UNIVERSITY
WEXNER MEDICAL CENTER
CONSTRUCTION STAGING AREA
STORMWATER POLLUTION PREVENTION PLAN NOTES & DETAILS

DIVISION USE ONLY	OWNER
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RPD / CKD / CID / CON.DR.	
INDEX DETAIL	RECORD FILE

CITY OF COLUMBUS, OHIO
DEPARTMENT OF PUBLIC UTILITIES
DIVISION OF SEWERAGE AND DRAINAGE
DIVISION USE ONLY

SCALE: AS NOTED
SHEET 9 / 9
CONTRACT DRAWING NO. CC-00000
RECORD PLAN NO.

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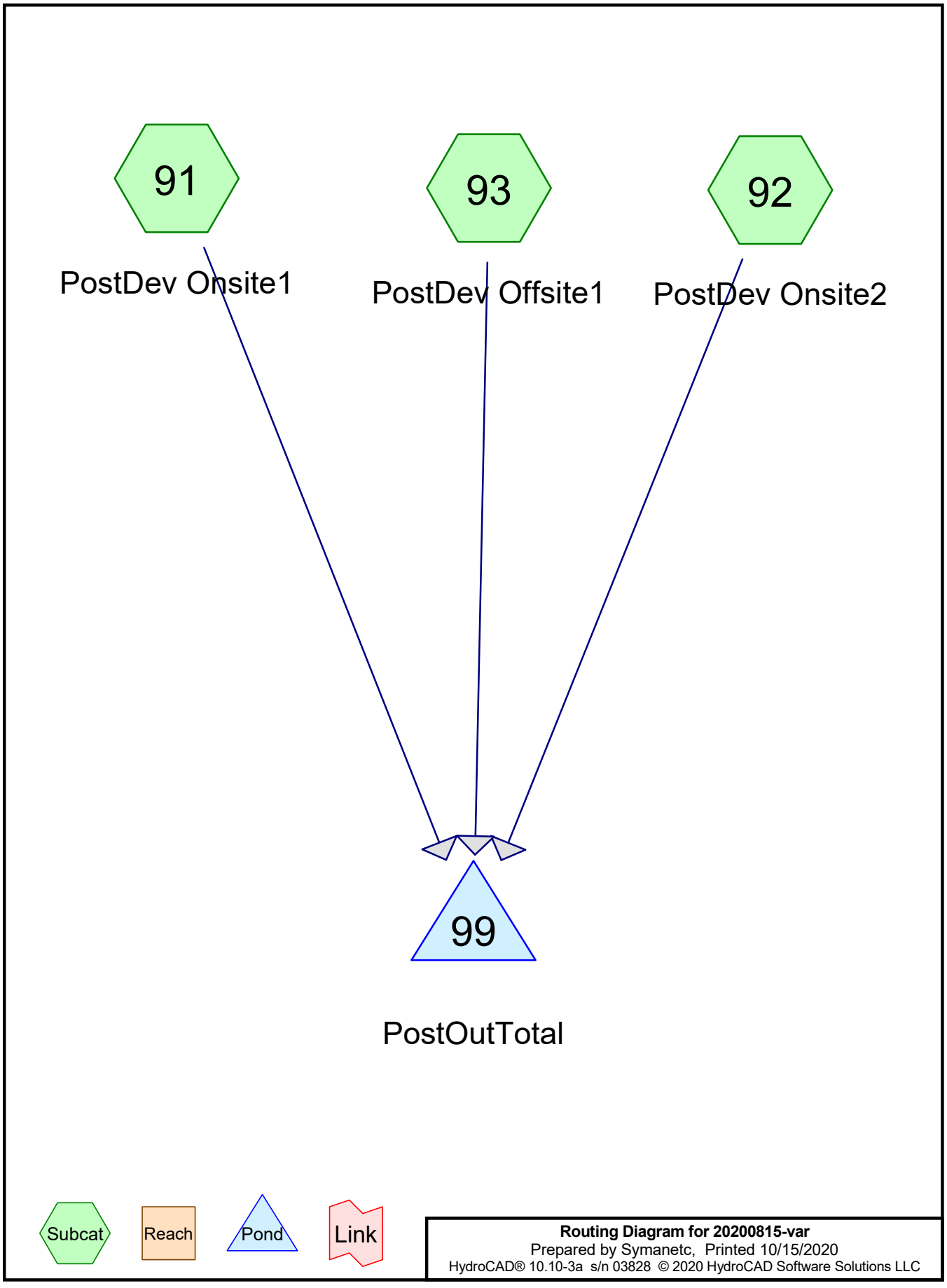
APPENDIX C



Routing Diagram for 20200815-var
Prepared by Symanetc, Printed 10/15/2020

Summary for Subcatchment 91: PostDev Onsite1

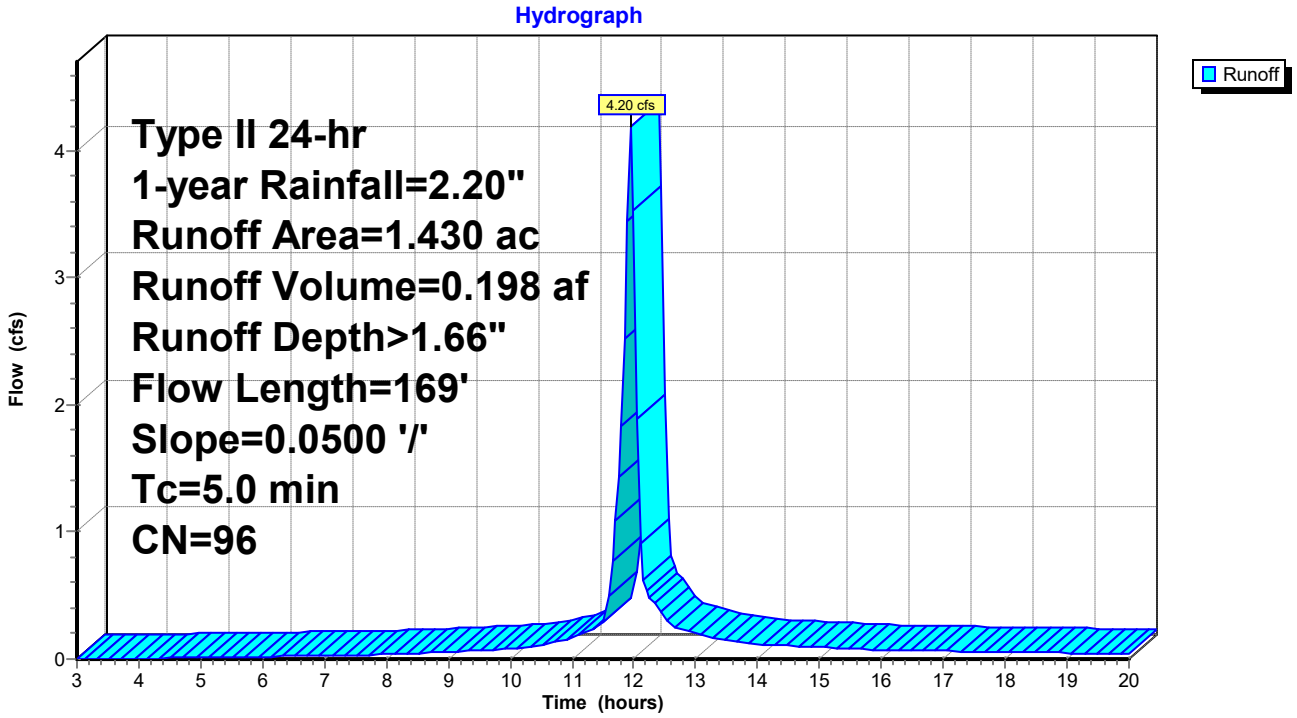
Runoff = 4.20 cfs @ 11.95 hrs, Volume= 0.198 af, Depth> 1.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-year Rainfall=2.20"

	Area (ac)	CN	Description
*	1.430	96	Gravel
	1.430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0500	1.57		**Sheet Flow, Gravel** Smooth surfaces n= 0.011 P2= 2.63"
0.4	119	0.0500	4.54		**Shallow Concentrated Flow, Gravel** Paved Kv= 20.3 fps
4.1					**Direct Entry, 5 minimum**
5.0	169	Total			

Subcatchment 91: PostDev Onsite1



Summary for Subcatchment 92: PostDev Onsite2

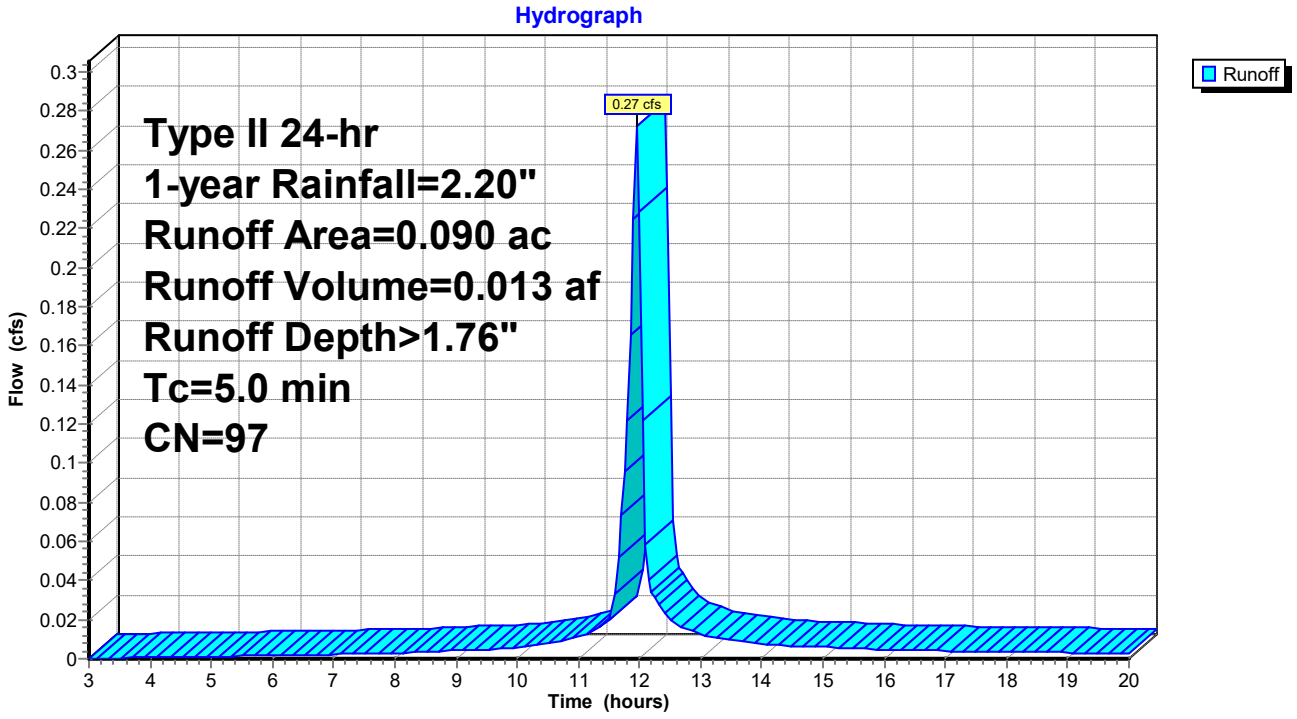
Runoff = 0.27 cfs @ 11.95 hrs, Volume= 0.013 af, Depth> 1.76"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-year Rainfall=2.20"

	Area (ac)	CN	Description
*	0.060	96	Gravel
*	0.030	98	Impervious
	0.090	97	Weighted Average
	0.060		66.67% Pervious Area
	0.030		33.33% Impervious Area

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

Subcatchment 92: PostDev Onsite2



Summary for Subcatchment 93: PostDev Offsite1

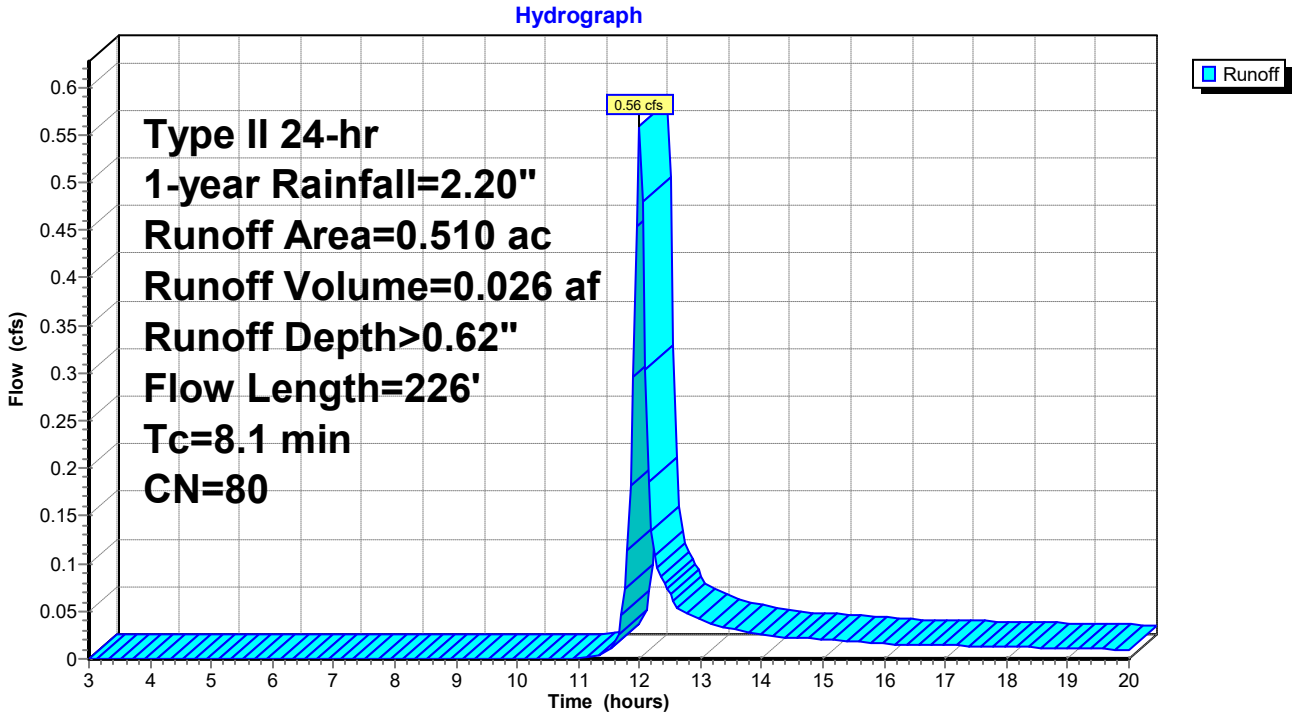
Runoff = 0.56 cfs @ 12.00 hrs, Volume= 0.026 af, Depth> 0.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 1-year Rainfall=2.20"

	Area (ac)	CN	Description
*	0.380	74	Green Space
*	0.130	98	Impervious
	0.510	80	Weighted Average
	0.380		74.51% Pervious Area
	0.130		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	57	0.0160	0.13		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.63"
0.6	169	0.0500	4.54		**Shallow Concentrated Flow, Slope** Paved Kv= 20.3 fps
8.1	226	Total			

Subcatchment 93: PostDev Offsite1

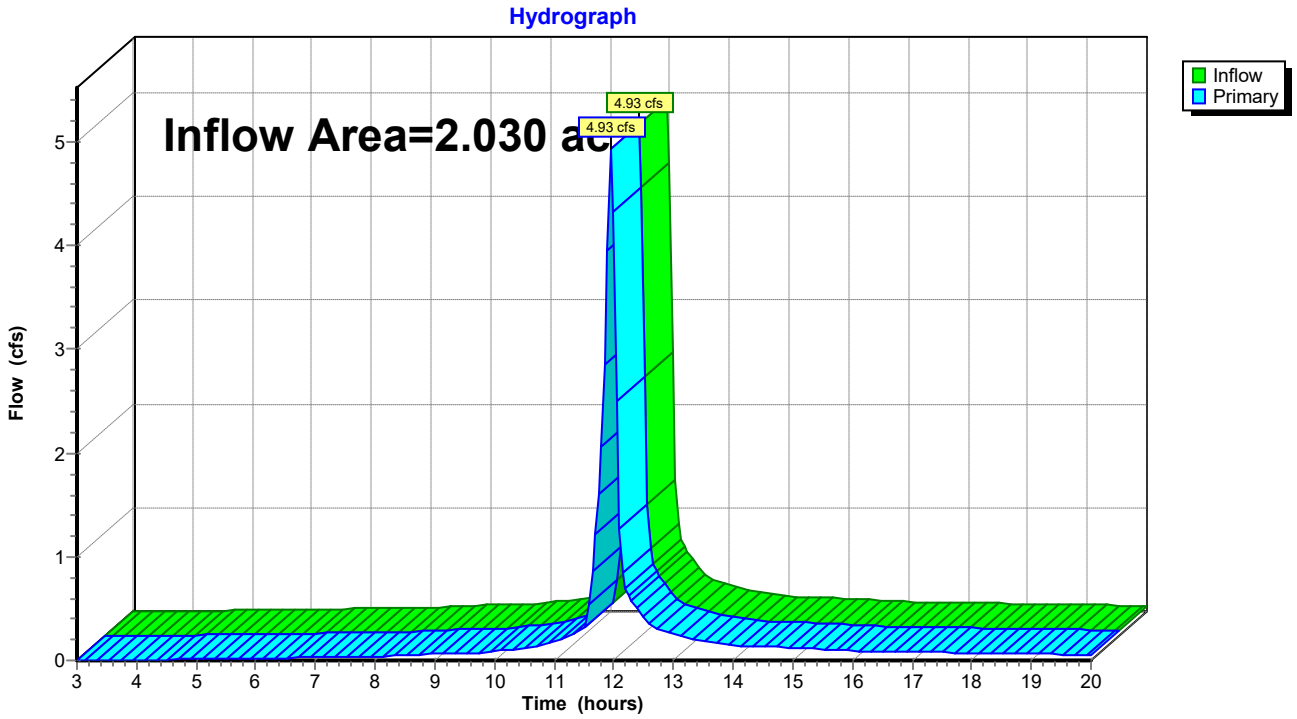


Summary for Pond 99: PostOutTotal

Inflow Area = 2.030 ac, 7.88% Impervious, Inflow Depth > 1.41" for 1-year event
Inflow = 4.93 cfs @ 11.96 hrs, Volume= 0.238 af
Primary = 4.93 cfs @ 11.96 hrs, Volume= 0.238 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Pond 99: PostOutTotal



Summary for Subcatchment 91: PostDev Onsite1

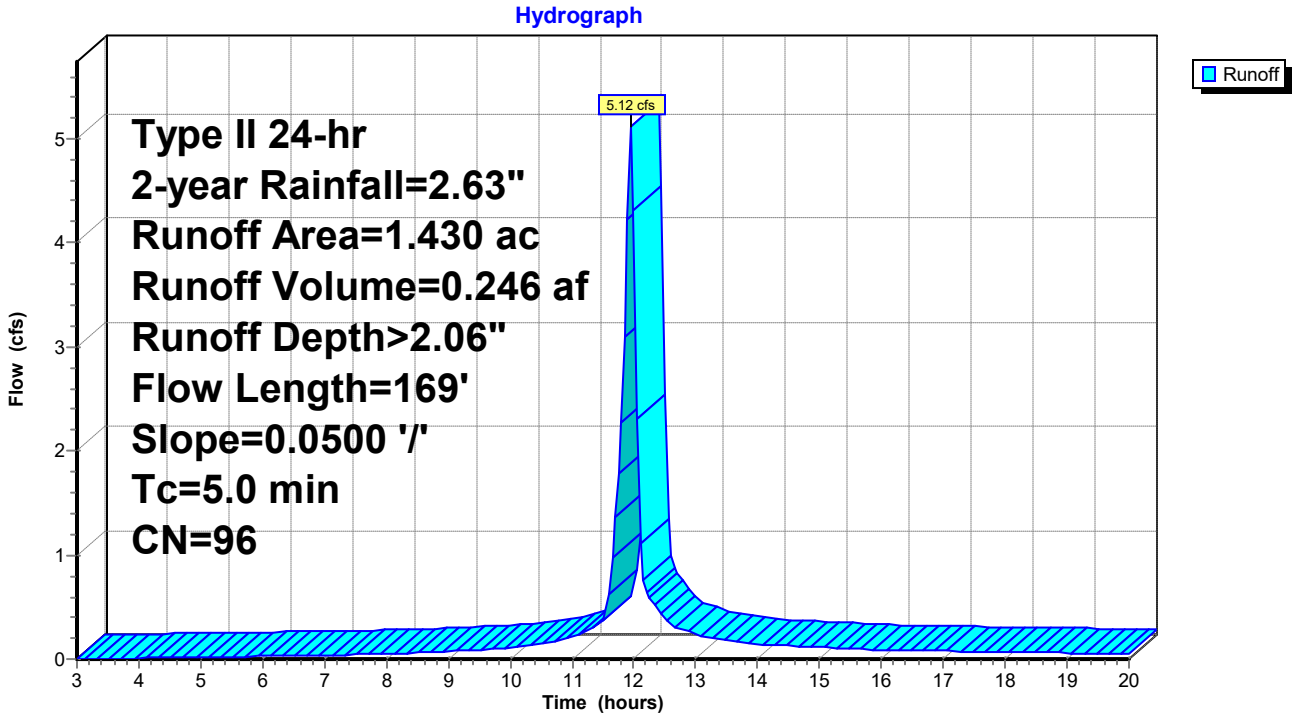
Runoff = 5.12 cfs @ 11.95 hrs, Volume= 0.246 af, Depth> 2.06"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-year Rainfall=2.63"

	Area (ac)	CN	Description
*	1.430	96	Gravel
	1.430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0500	1.57		**Sheet Flow, Gravel** Smooth surfaces n= 0.011 P2= 2.63"
0.4	119	0.0500	4.54		**Shallow Concentrated Flow, Gravel** Paved Kv= 20.3 fps
4.1					**Direct Entry, 5 minimum**
5.0	169	Total			

Subcatchment 91: PostDev Onsite1



Summary for Subcatchment 92: PostDev Onsite2

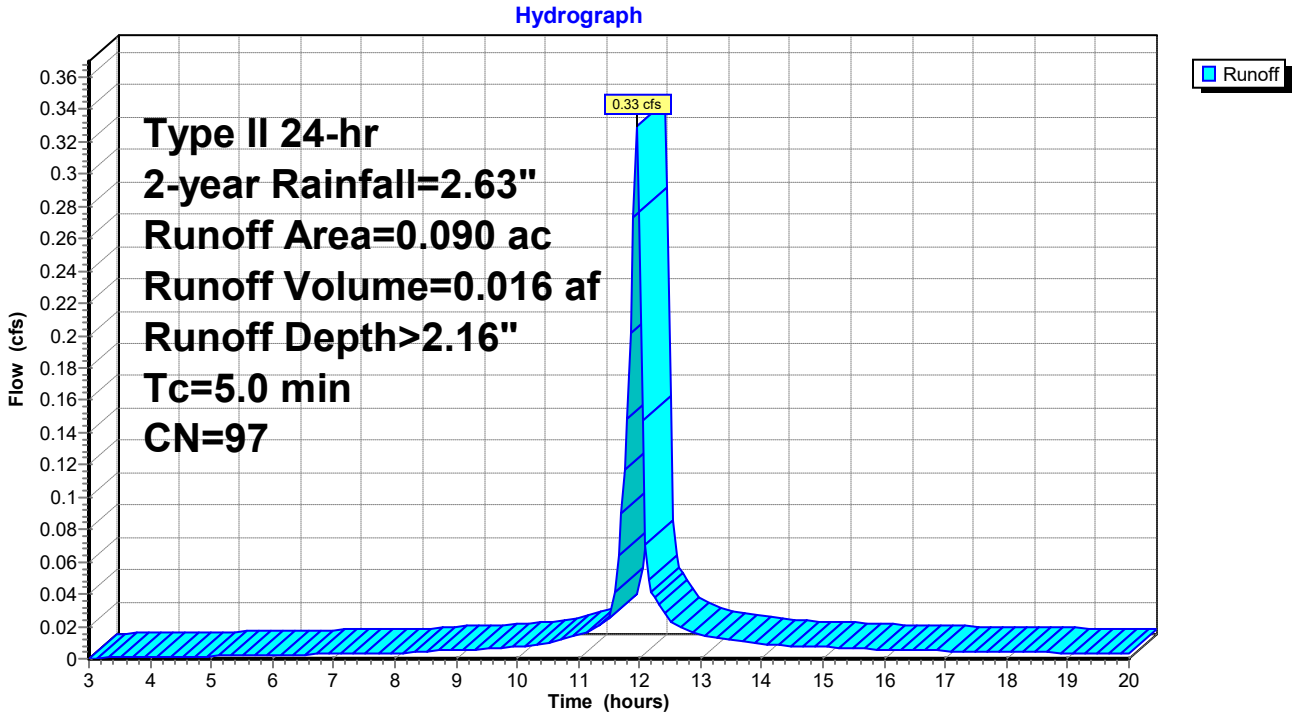
Runoff = 0.33 cfs @ 11.95 hrs, Volume= 0.016 af, Depth> 2.16"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-year Rainfall=2.63"

	Area (ac)	CN	Description
*	0.060	96	Gravel
*	0.030	98	Impervious
	0.090	97	Weighted Average
	0.060		66.67% Pervious Area
	0.030		33.33% Impervious Area

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

Subcatchment 92: PostDev Onsite2



Summary for Subcatchment 93: PostDev Offsite1

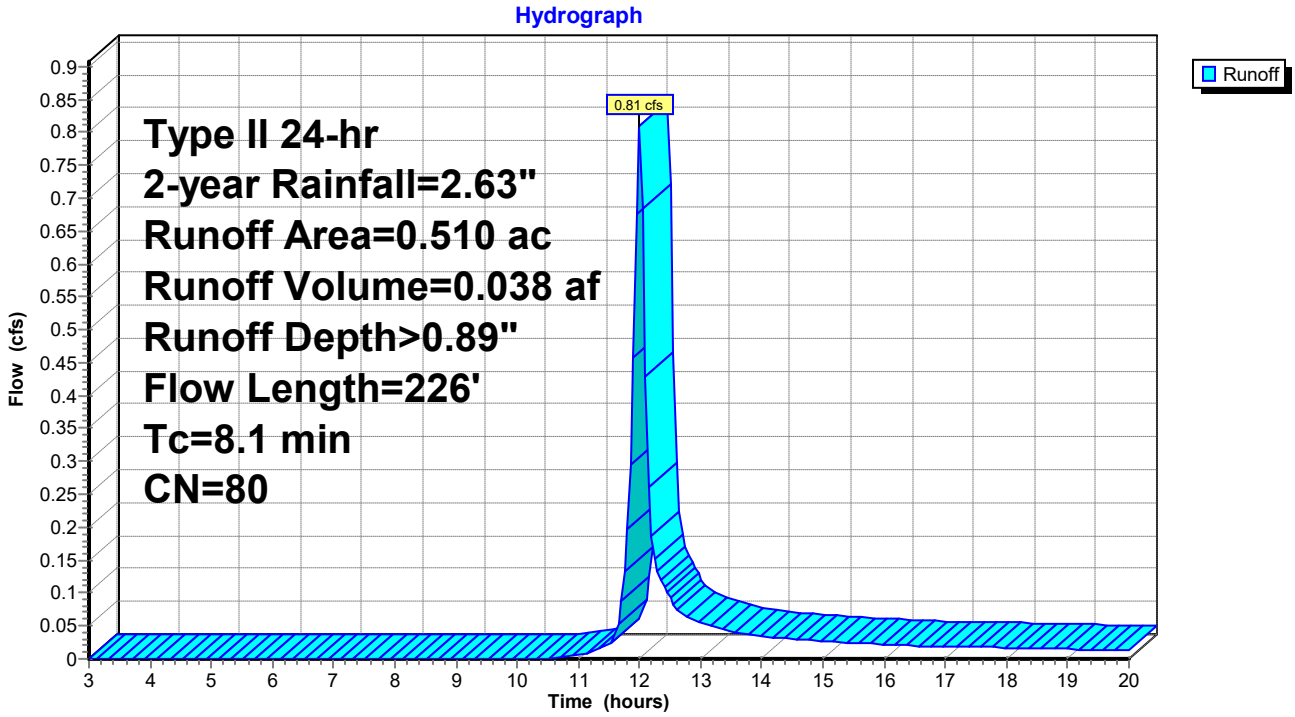
Runoff = 0.81 cfs @ 12.00 hrs, Volume= 0.038 af, Depth> 0.89"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 2-year Rainfall=2.63"

	Area (ac)	CN	Description
*	0.380	74	Green Space
*	0.130	98	Impervious
	0.510	80	Weighted Average
	0.380		74.51% Pervious Area
	0.130		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	57	0.0160	0.13		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.63"
0.6	169	0.0500	4.54		**Shallow Concentrated Flow, Slope** Paved Kv= 20.3 fps
8.1	226	Total			

Subcatchment 93: PostDev Offsite1

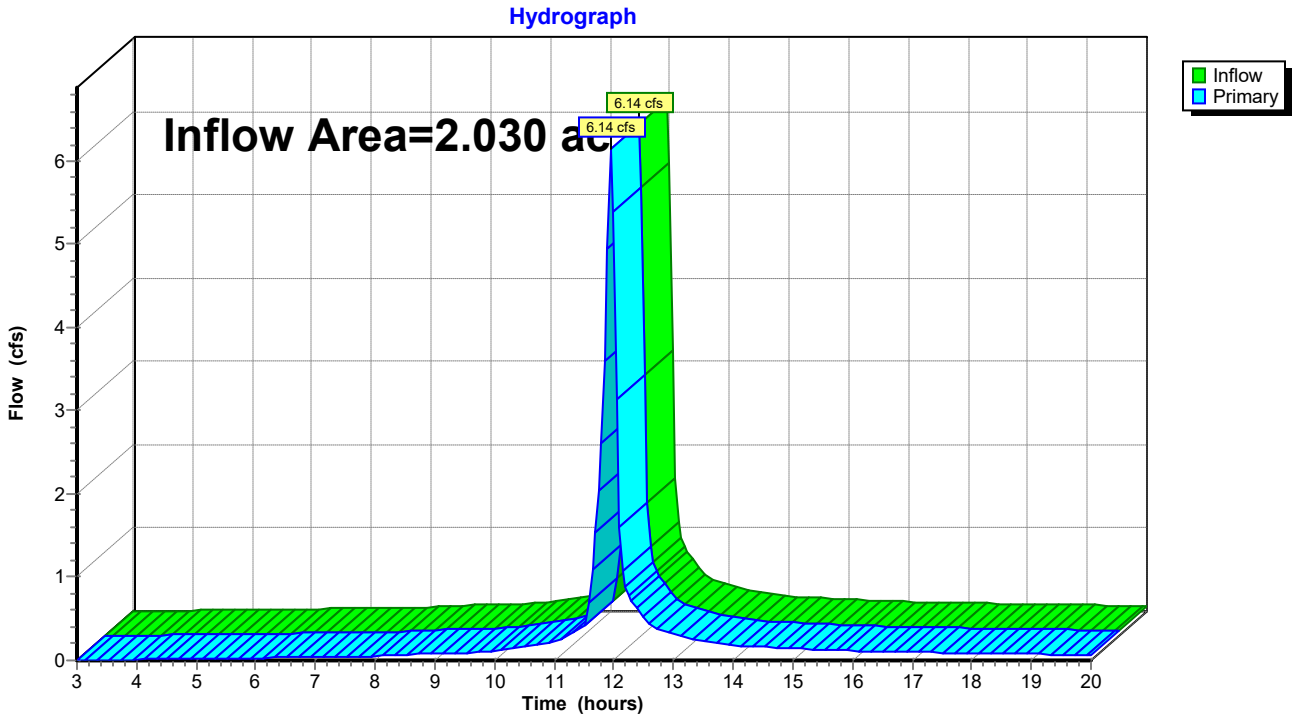


Summary for Pond 99: PostOutTotal

Inflow Area = 2.030 ac, 7.88% Impervious, Inflow Depth > 1.77" for 2-year event
Inflow = 6.14 cfs @ 11.96 hrs, Volume= 0.300 af
Primary = 6.14 cfs @ 11.96 hrs, Volume= 0.300 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Pond 99: PostOutTotal



Summary for Subcatchment 91: PostDev Onsite1

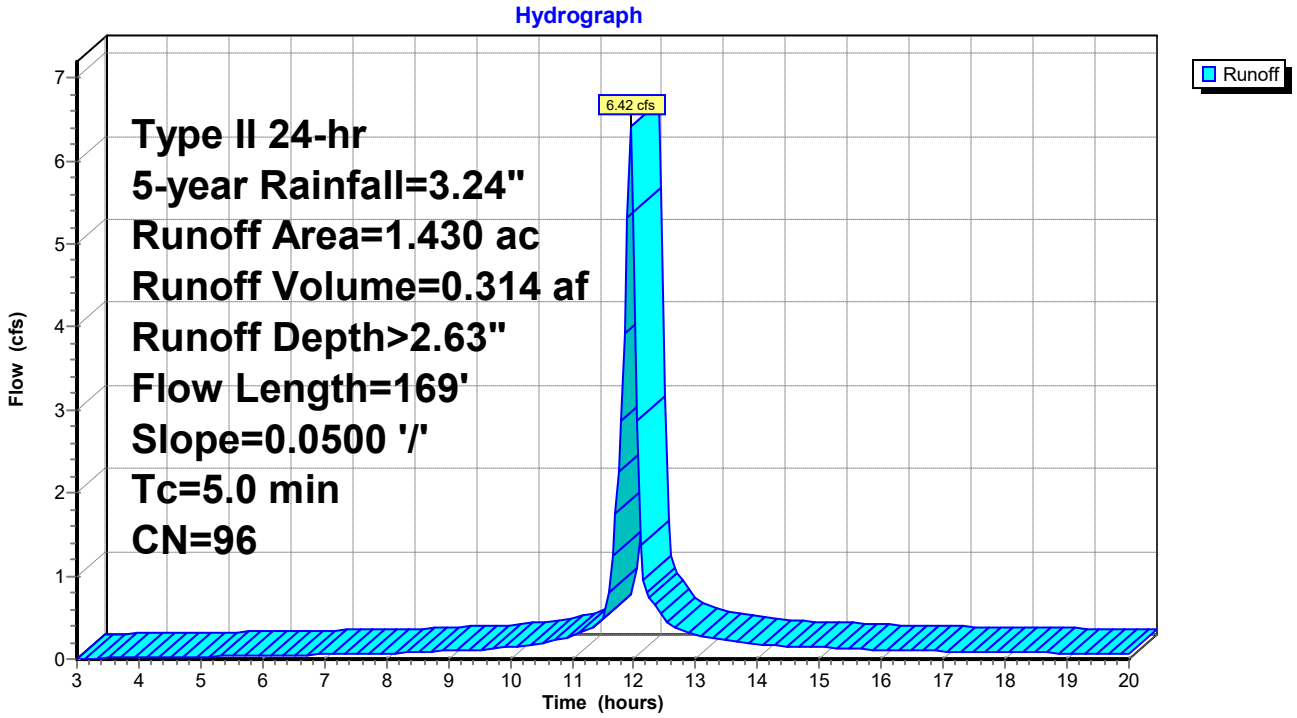
Runoff = 6.42 cfs @ 11.95 hrs, Volume= 0.314 af, Depth> 2.63"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-year Rainfall=3.24"

	Area (ac)	CN	Description
*	1.430	96	Gravel
	1.430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0500	1.57		**Sheet Flow, Gravel** Smooth surfaces n= 0.011 P2= 2.63"
0.4	119	0.0500	4.54		**Shallow Concentrated Flow, Gravel** Paved Kv= 20.3 fps
4.1					**Direct Entry, 5 minimum**
5.0	169	Total			

Subcatchment 91: PostDev Onsite1



Summary for Subcatchment 92: PostDev Onsite2

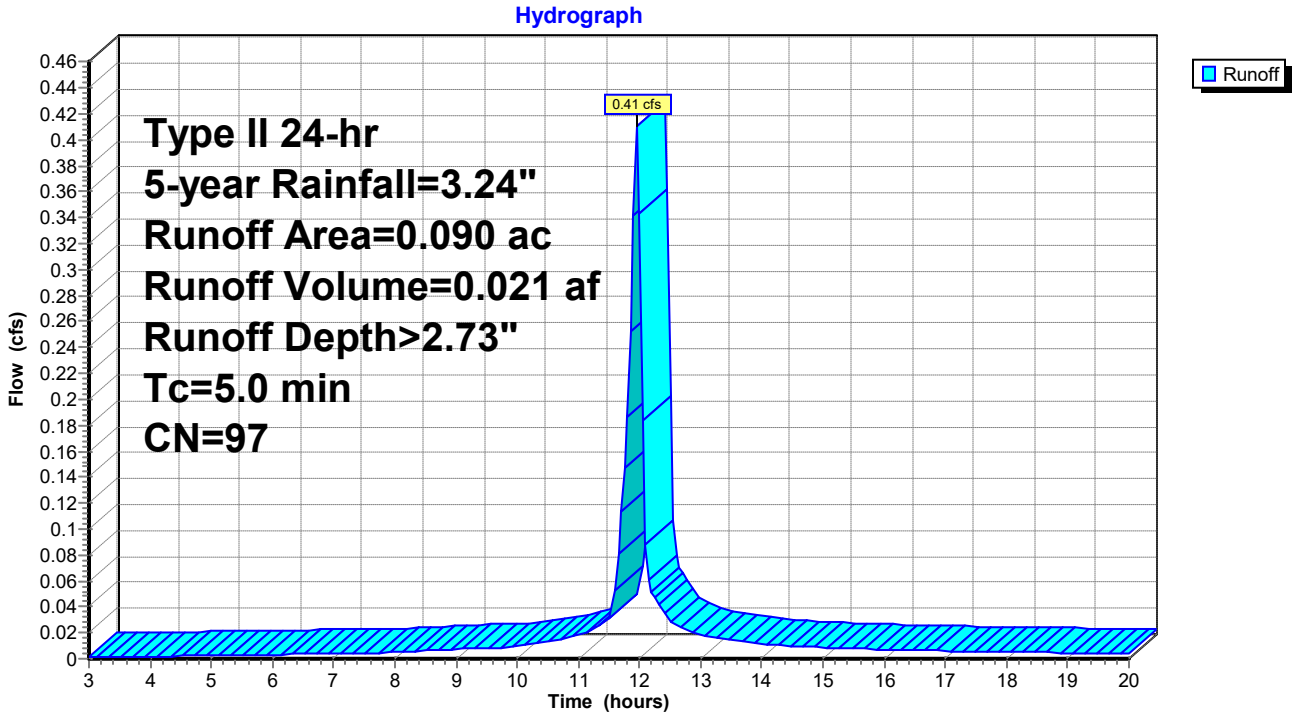
Runoff = 0.41 cfs @ 11.95 hrs, Volume= 0.021 af, Depth> 2.73"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-year Rainfall=3.24"

	Area (ac)	CN	Description
*	0.060	96	Gravel
*	0.030	98	Impervious
	0.090	97	Weighted Average
	0.060		66.67% Pervious Area
	0.030		33.33% Impervious Area

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

Subcatchment 92: PostDev Onsite2



Summary for Subcatchment 93: PostDev Offsite1

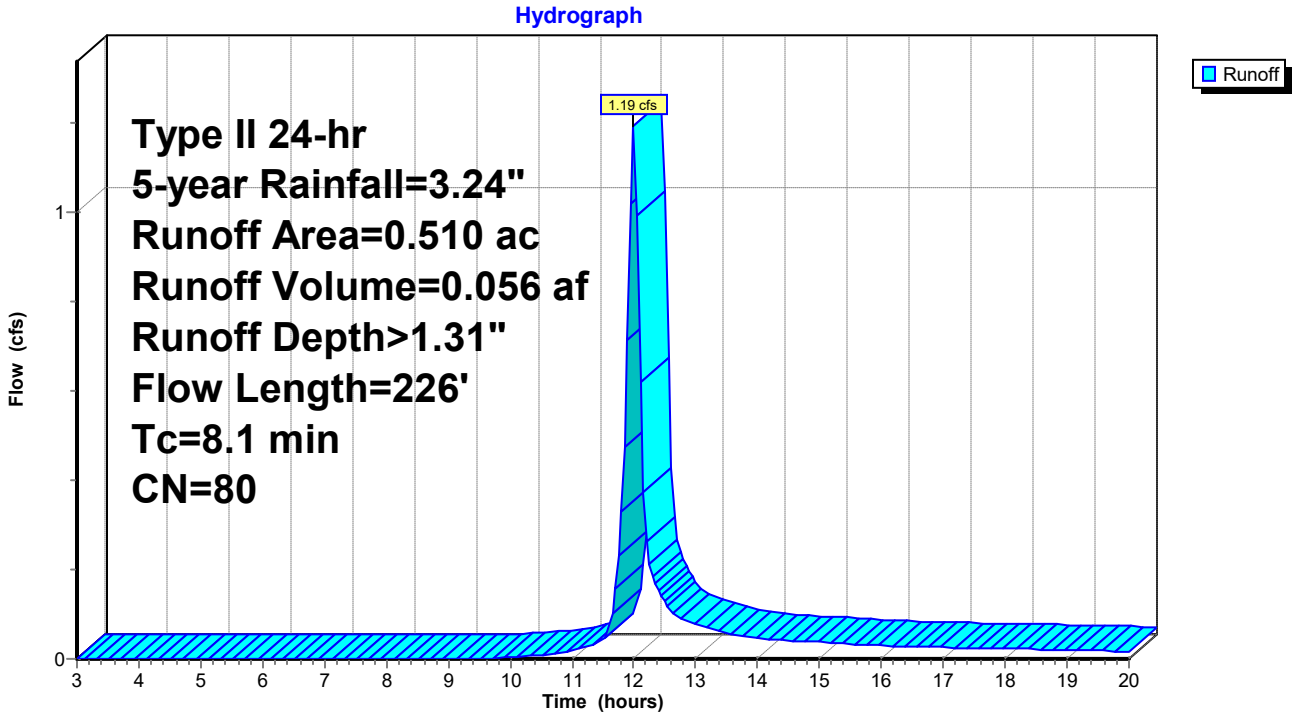
Runoff = 1.19 cfs @ 12.00 hrs, Volume= 0.056 af, Depth> 1.31"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 5-year Rainfall=3.24"

	Area (ac)	CN	Description
*	0.380	74	Green Space
*	0.130	98	Impervious
	0.510	80	Weighted Average
	0.380		74.51% Pervious Area
	0.130		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	57	0.0160	0.13		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.63"
0.6	169	0.0500	4.54		**Shallow Concentrated Flow, Slope** Paved Kv= 20.3 fps
8.1	226	Total			

Subcatchment 93: PostDev Offsite1

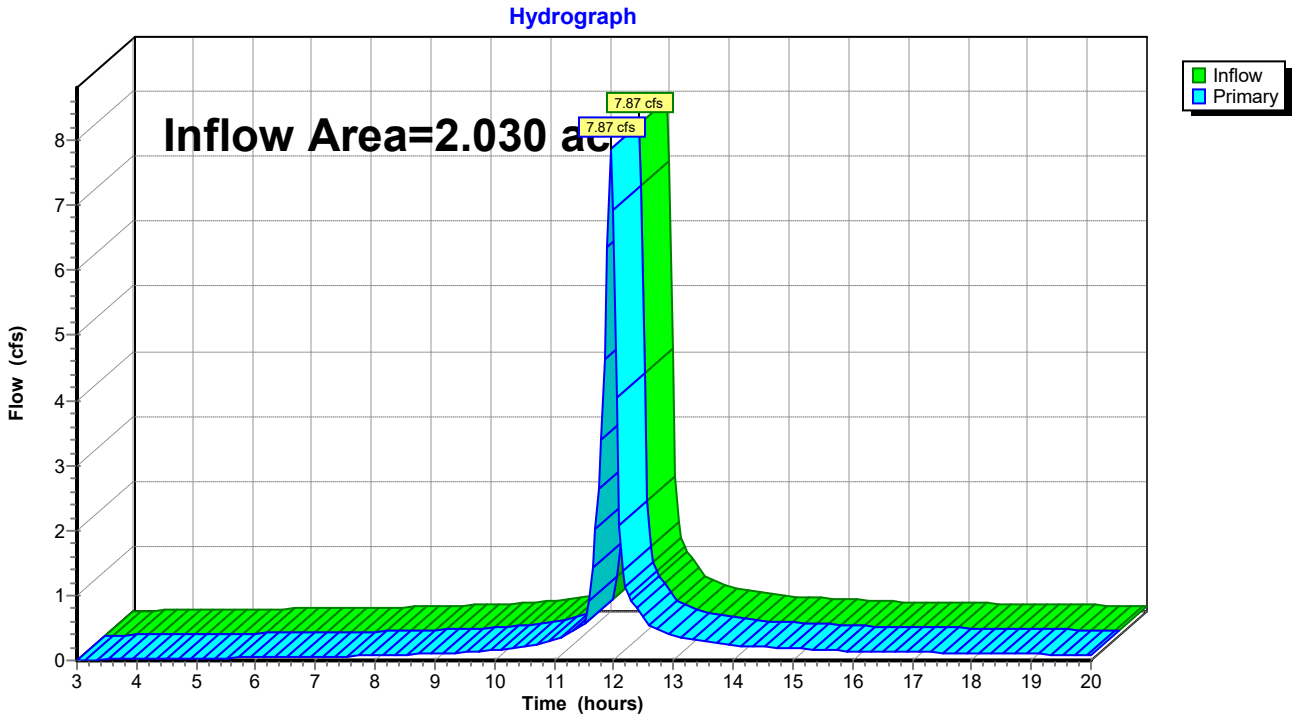


Summary for Pond 99: PostOutTotal

Inflow Area = 2.030 ac, 7.88% Impervious, Inflow Depth > 2.30" for 5-year event
Inflow = 7.87 cfs @ 11.96 hrs, Volume= 0.390 af
Primary = 7.87 cfs @ 11.96 hrs, Volume= 0.390 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Pond 99: PostOutTotal



Summary for Subcatchment 91: PostDev Onsite1

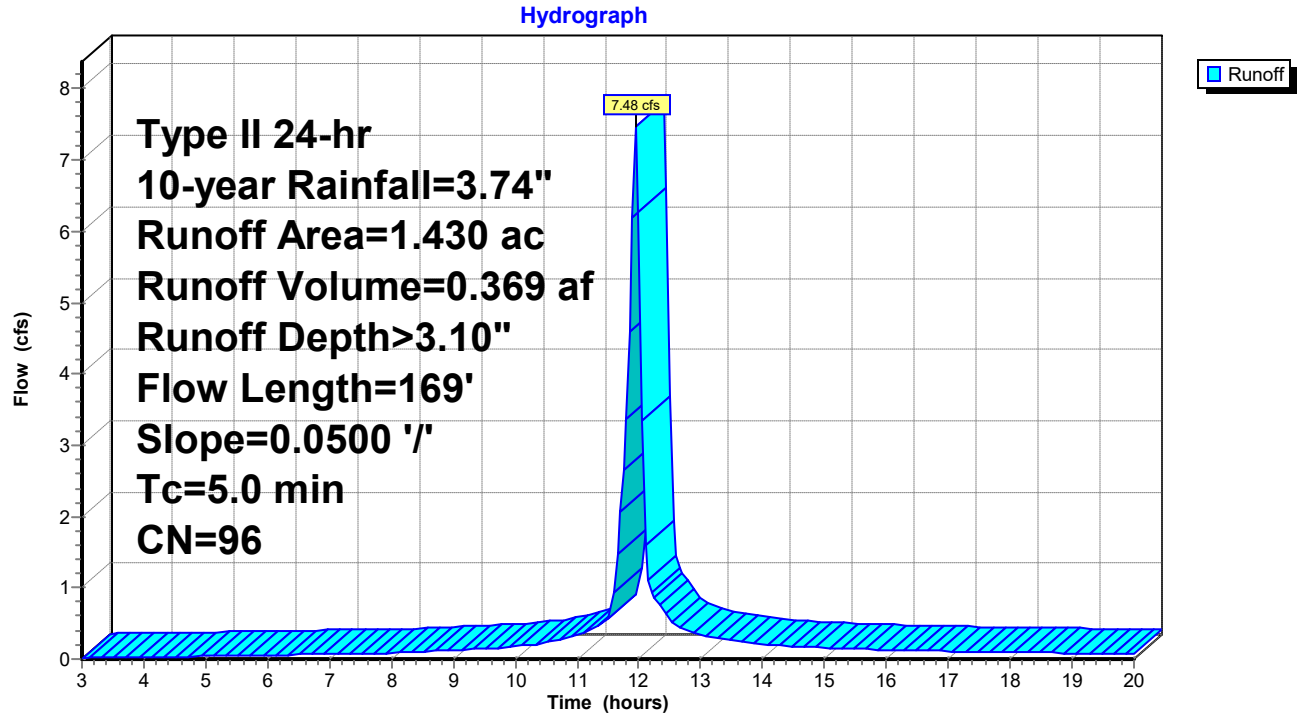
Runoff = 7.48 cfs @ 11.95 hrs, Volume= 0.369 af, Depth> 3.10"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=3.74"

	Area (ac)	CN	Description
*	1.430	96	Gravel
	1.430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0500	1.57		**Sheet Flow, Gravel** Smooth surfaces n= 0.011 P2= 2.63"
0.4	119	0.0500	4.54		**Shallow Concentrated Flow, Gravel** Paved Kv= 20.3 fps
4.1					**Direct Entry, 5 minimum**
5.0	169	Total			

Subcatchment 91: PostDev Onsite1



Summary for Subcatchment 92: PostDev Onsite2

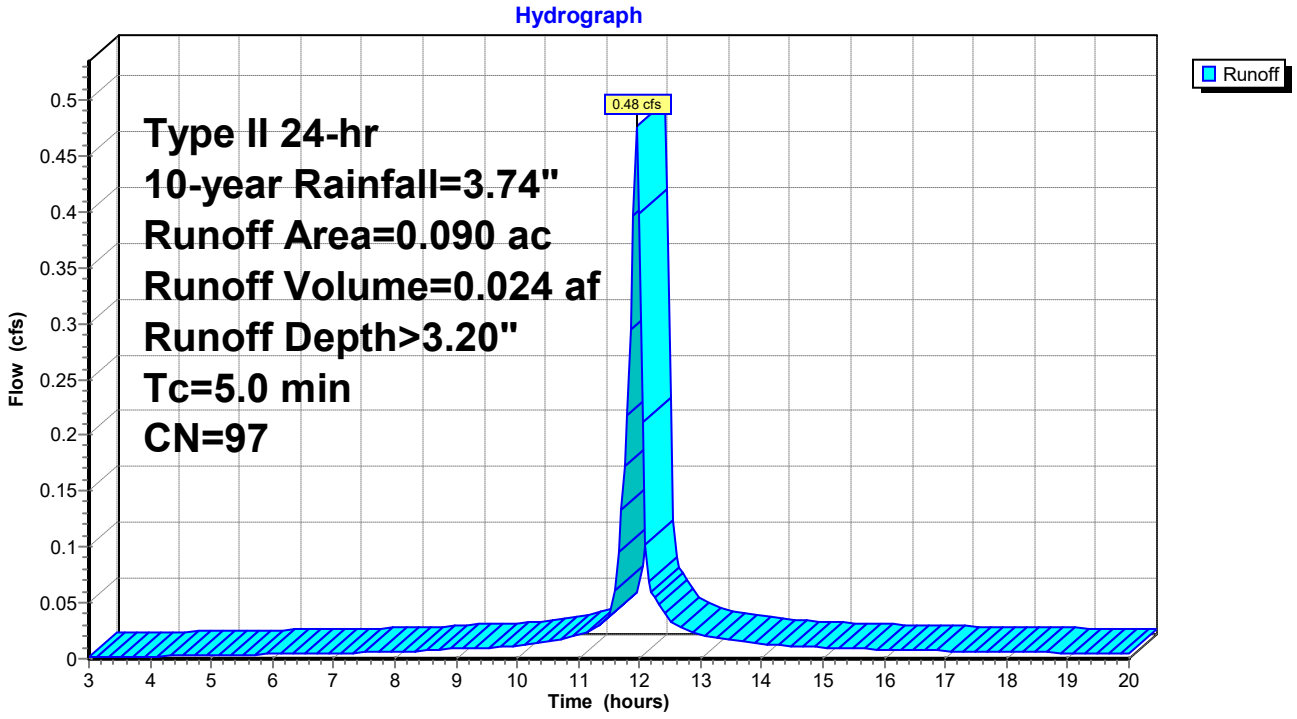
Runoff = 0.48 cfs @ 11.95 hrs, Volume= 0.024 af, Depth> 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=3.74"

	Area (ac)	CN	Description
*	0.060	96	Gravel
*	0.030	98	Impervious
	0.090	97	Weighted Average
	0.060		66.67% Pervious Area
	0.030		33.33% Impervious Area

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

Subcatchment 92: PostDev Onsite2



Summary for Subcatchment 93: PostDev Offsite1

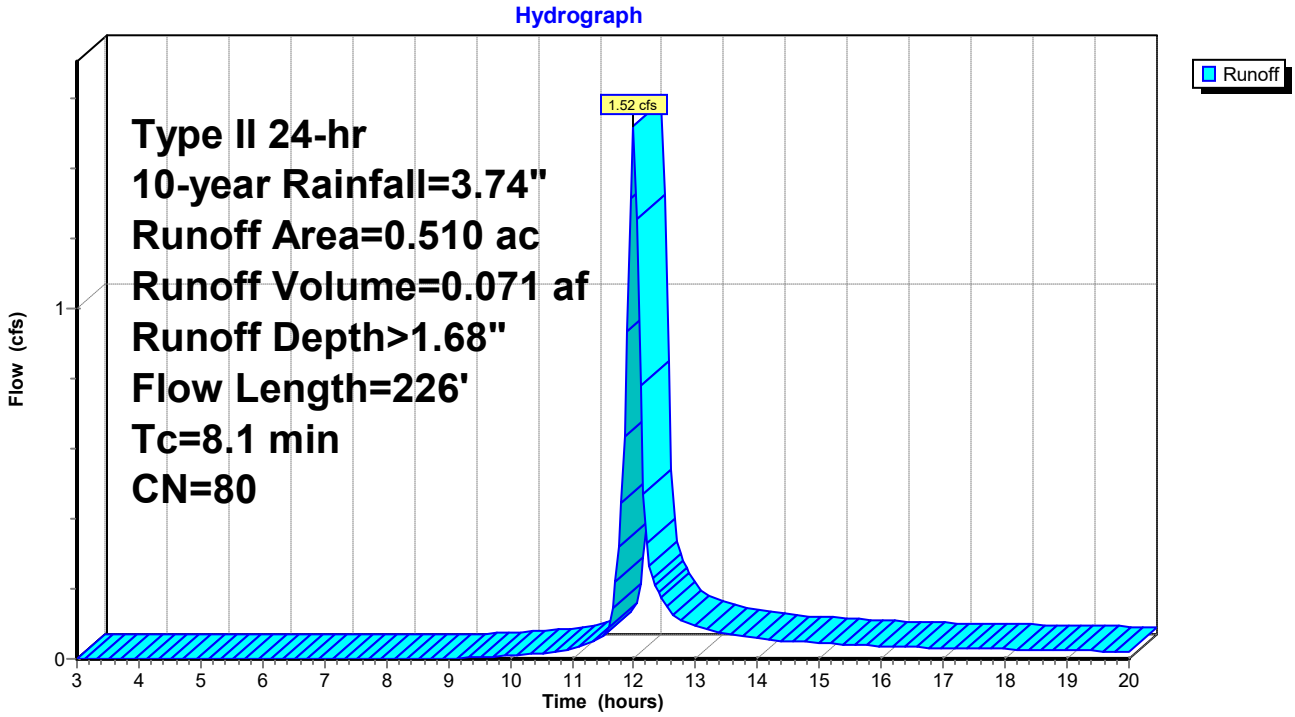
Runoff = 1.52 cfs @ 12.00 hrs, Volume= 0.071 af, Depth> 1.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 10-year Rainfall=3.74"

	Area (ac)	CN	Description
*	0.380	74	Green Space
*	0.130	98	Impervious
	0.510	80	Weighted Average
	0.380		74.51% Pervious Area
	0.130		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	57	0.0160	0.13		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.63"
0.6	169	0.0500	4.54		**Shallow Concentrated Flow, Slope** Paved Kv= 20.3 fps
8.1	226	Total			

Subcatchment 93: PostDev Offsite1

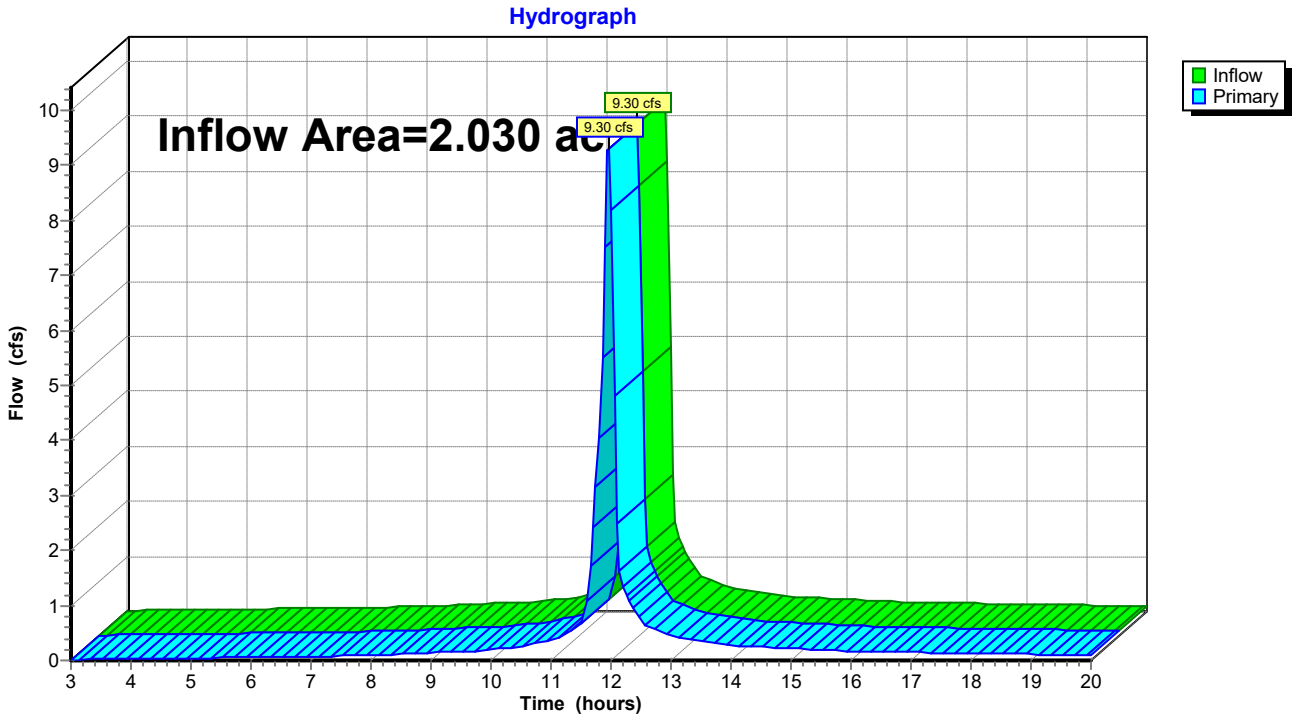


Summary for Pond 99: PostOutTotal

Inflow Area = 2.030 ac, 7.88% Impervious, Inflow Depth > 2.75" for 10-year event
Inflow = 9.30 cfs @ 11.96 hrs, Volume= 0.465 af
Primary = 9.30 cfs @ 11.96 hrs, Volume= 0.465 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Pond 99: PostOutTotal



Summary for Subcatchment 91: PostDev Onsite1

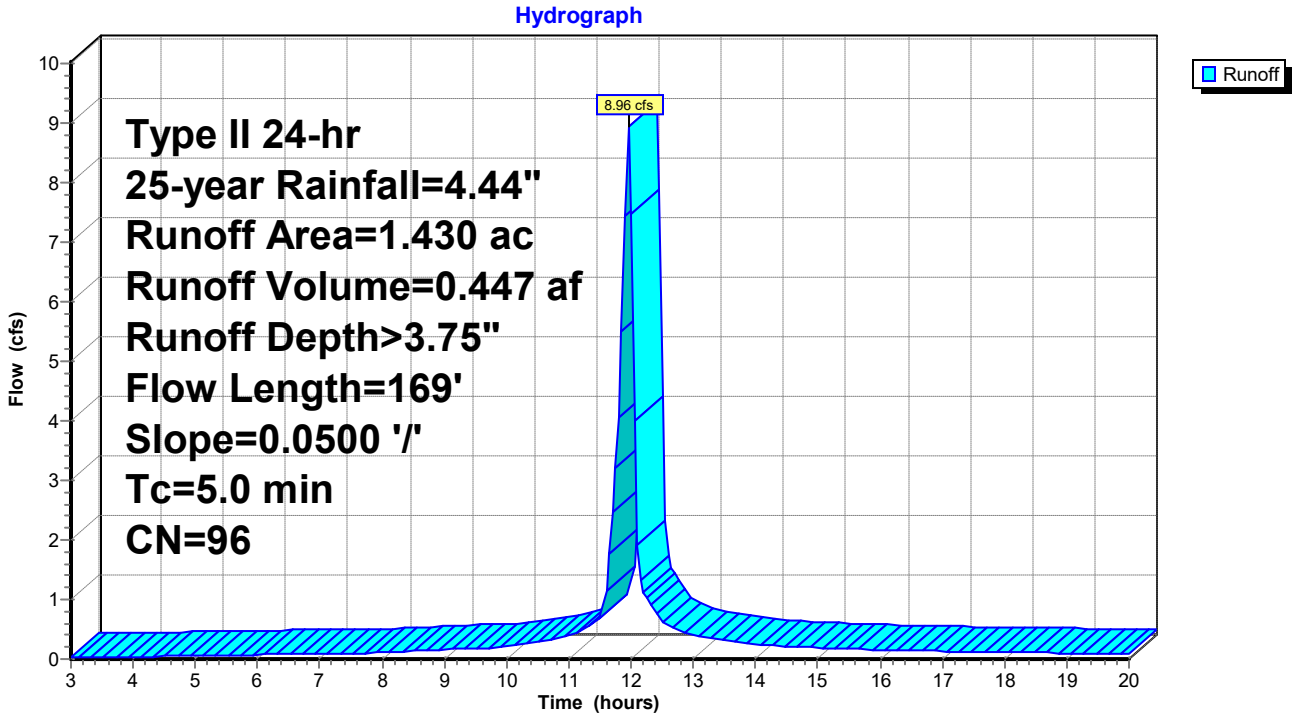
Runoff = 8.96 cfs @ 11.95 hrs, Volume= 0.447 af, Depth> 3.75"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.44"

	Area (ac)	CN	Description
*	1.430	96	Gravel
	1.430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0500	1.57		**Sheet Flow, Gravel** Smooth surfaces n= 0.011 P2= 2.63"
0.4	119	0.0500	4.54		**Shallow Concentrated Flow, Gravel** Paved Kv= 20.3 fps
4.1					**Direct Entry, 5 minimum**
5.0	169	Total			

Subcatchment 91: PostDev Onsite1



Summary for Subcatchment 92: PostDev Onsite2

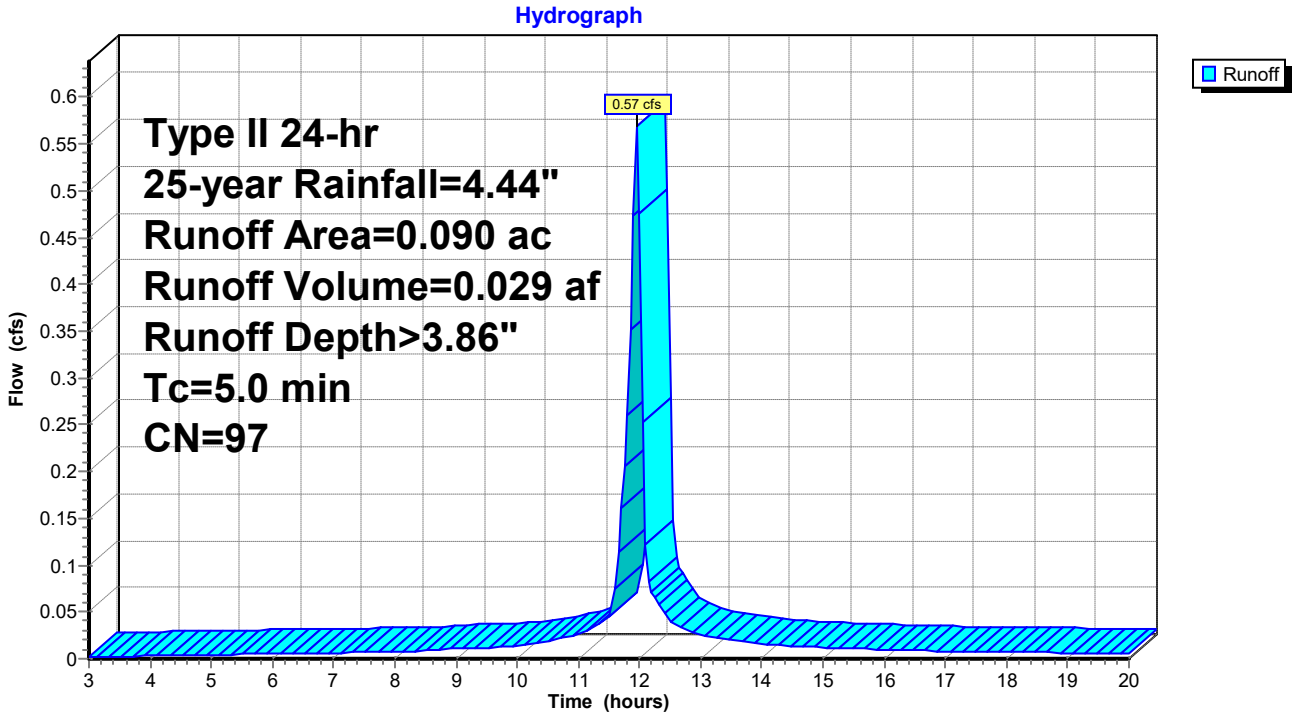
Runoff = 0.57 cfs @ 11.95 hrs, Volume= 0.029 af, Depth> 3.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.44"

	Area (ac)	CN	Description
*	0.060	96	Gravel
*	0.030	98	Impervious
	0.090	97	Weighted Average
	0.060		66.67% Pervious Area
	0.030		33.33% Impervious Area

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

Subcatchment 92: PostDev Onsite2



Summary for Subcatchment 93: PostDev Offsite1

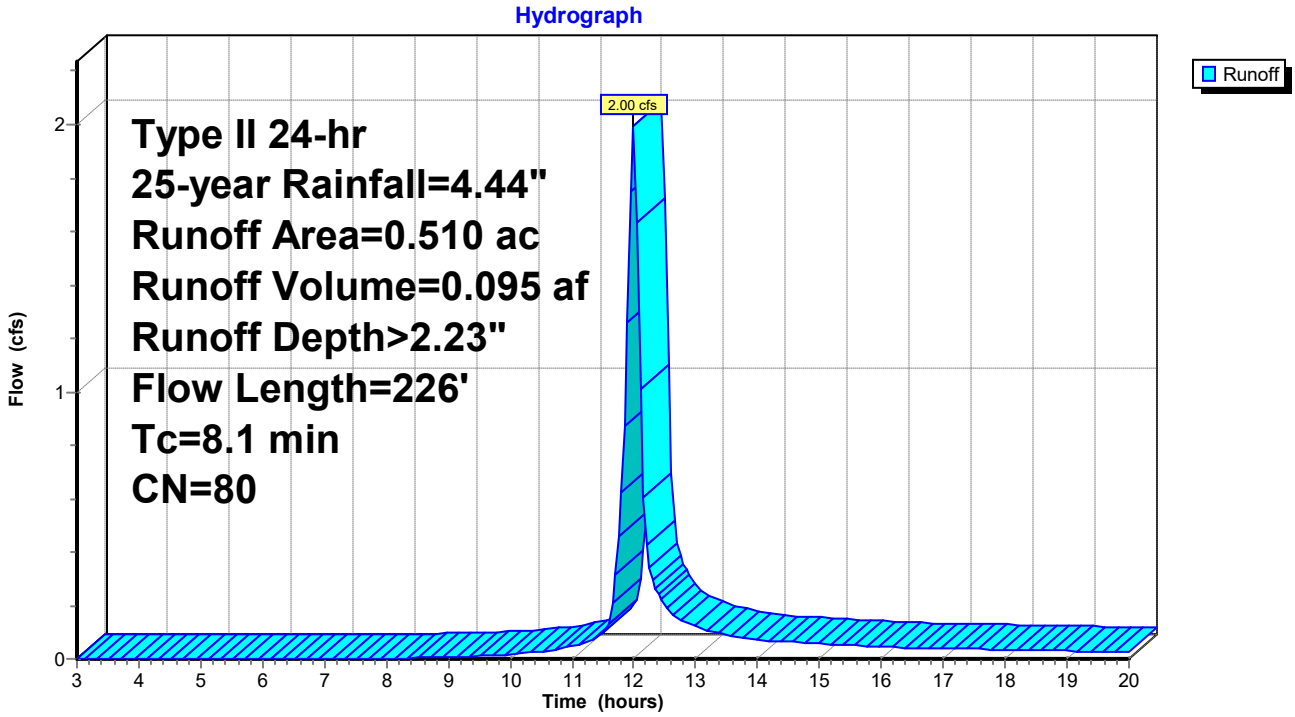
Runoff = 2.00 cfs @ 12.00 hrs, Volume= 0.095 af, Depth> 2.23"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 25-year Rainfall=4.44"

	Area (ac)	CN	Description
*	0.380	74	Green Space
*	0.130	98	Impervious
	0.510	80	Weighted Average
	0.380		74.51% Pervious Area
	0.130		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	57	0.0160	0.13		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.63"
0.6	169	0.0500	4.54		**Shallow Concentrated Flow, Slope** Paved Kv= 20.3 fps
8.1	226	Total			

Subcatchment 93: PostDev Offsite1

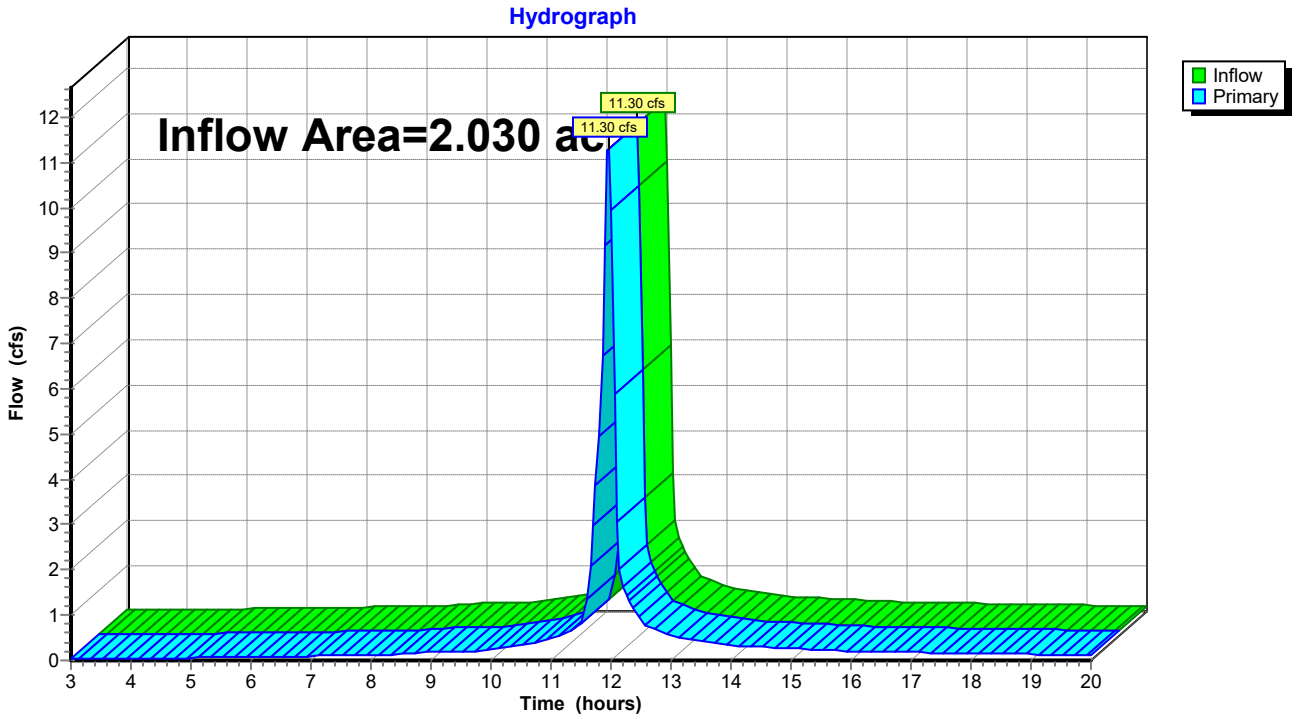


Summary for Pond 99: PostOutTotal

Inflow Area = 2.030 ac, 7.88% Impervious, Inflow Depth > 3.37" for 25-year event
Inflow = 11.30 cfs @ 11.96 hrs, Volume= 0.571 af
Primary = 11.30 cfs @ 11.96 hrs, Volume= 0.571 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Pond 99: PostOutTotal



Summary for Subcatchment 91: PostDev Onsite1

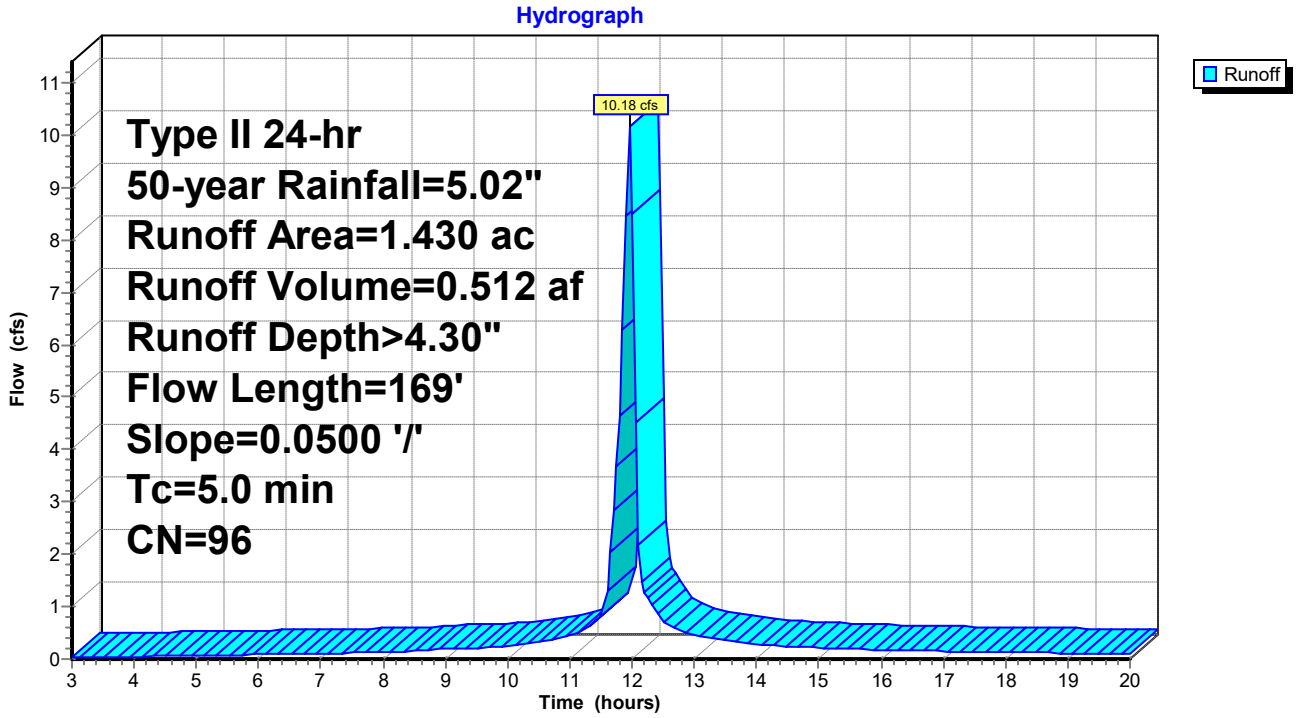
Runoff = 10.18 cfs @ 11.95 hrs, Volume= 0.512 af, Depth> 4.30"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-year Rainfall=5.02"

	Area (ac)	CN	Description
*	1.430	96	Gravel
	1.430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0500	1.57		**Sheet Flow, Gravel** Smooth surfaces n= 0.011 P2= 2.63"
0.4	119	0.0500	4.54		**Shallow Concentrated Flow, Gravel** Paved Kv= 20.3 fps
4.1					**Direct Entry, 5 minimum**
5.0	169	Total			

Subcatchment 91: PostDev Onsite1



Summary for Subcatchment 92: PostDev Onsite2

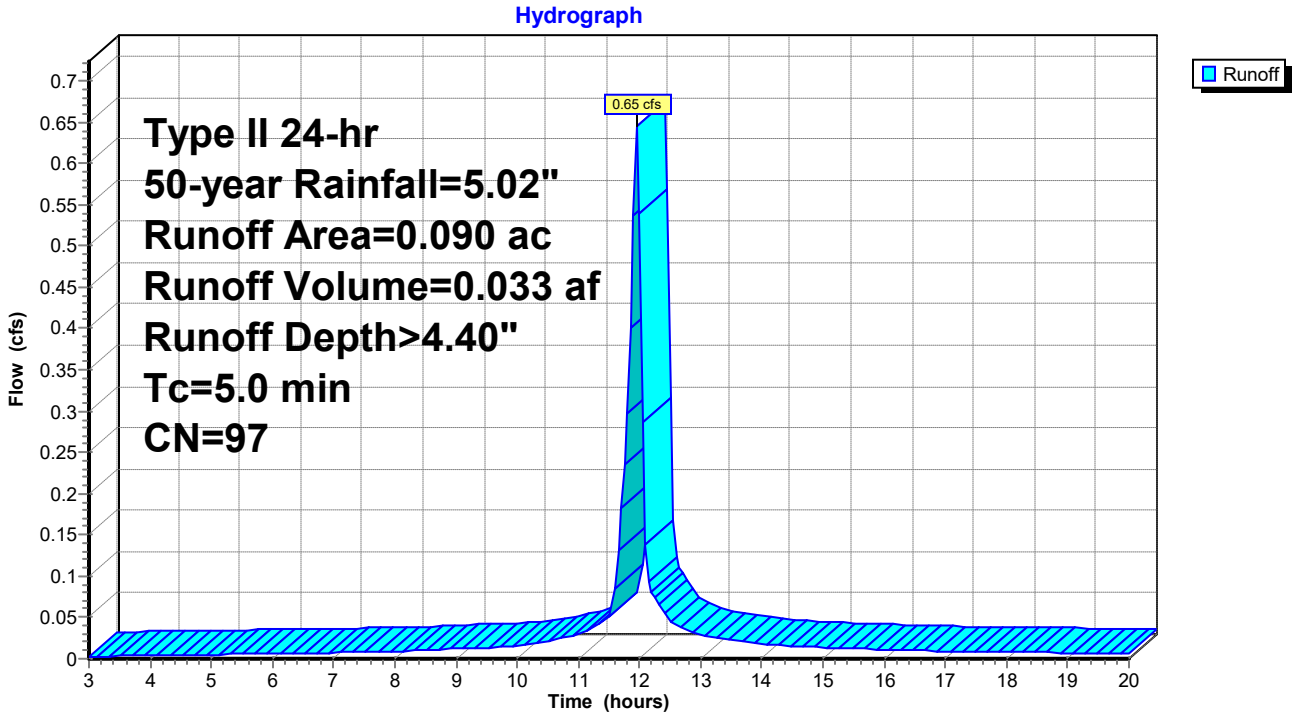
Runoff = 0.65 cfs @ 11.95 hrs, Volume= 0.033 af, Depth> 4.40"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-year Rainfall=5.02"

	Area (ac)	CN	Description
*	0.060	96	Gravel
*	0.030	98	Impervious
	0.090	97	Weighted Average
	0.060		66.67% Pervious Area
	0.030		33.33% Impervious Area

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

Subcatchment 92: PostDev Onsite2



Summary for Subcatchment 93: PostDev Offsite1

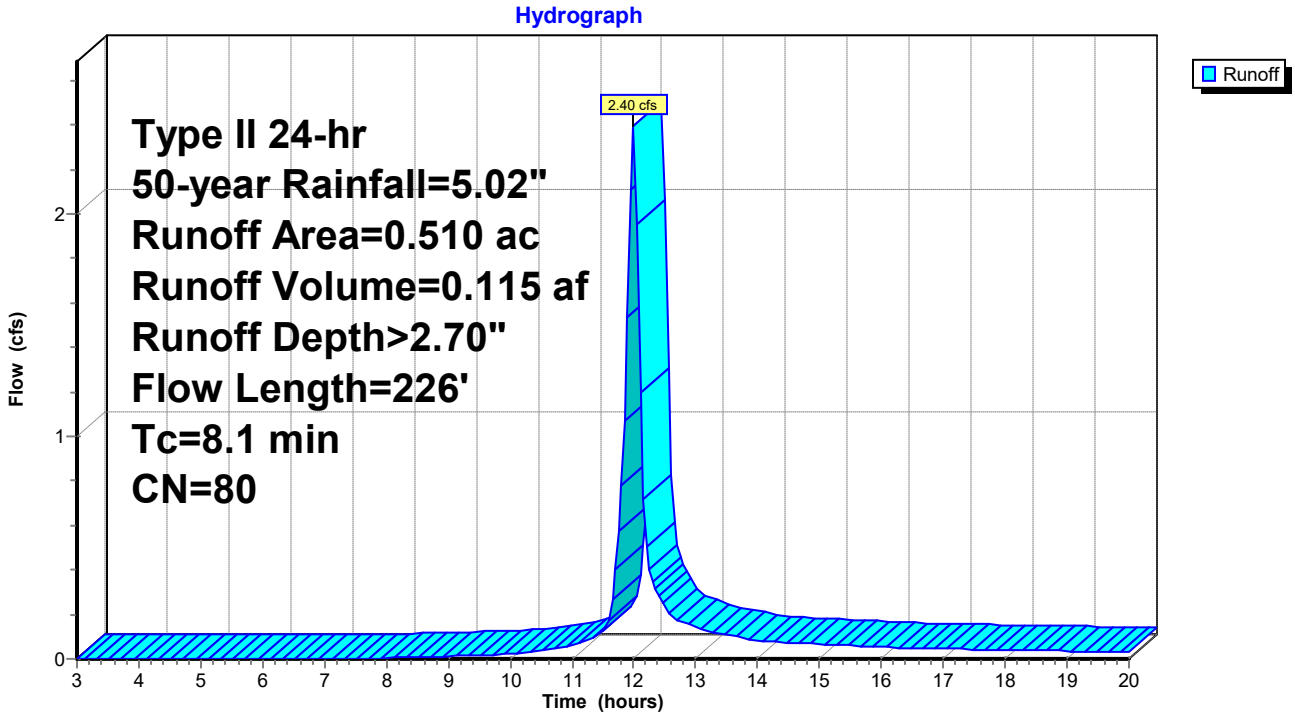
Runoff = 2.40 cfs @ 11.99 hrs, Volume= 0.115 af, Depth> 2.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 50-year Rainfall=5.02"

	Area (ac)	CN	Description
*	0.380	74	Green Space
*	0.130	98	Impervious
	0.510	80	Weighted Average
	0.380		74.51% Pervious Area
	0.130		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	57	0.0160	0.13		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.63"
0.6	169	0.0500	4.54		**Shallow Concentrated Flow, Slope** Paved Kv= 20.3 fps
8.1	226	Total			

Subcatchment 93: PostDev Offsite1

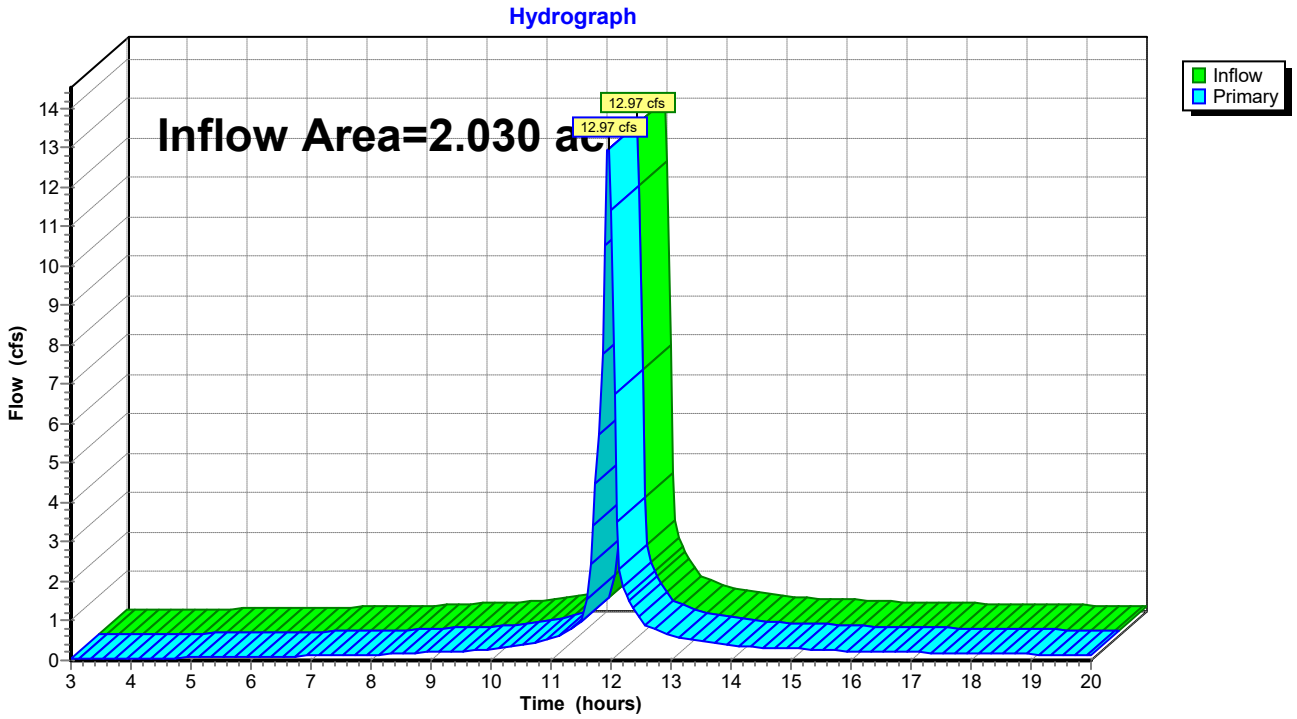


Summary for Pond 99: PostOutTotal

Inflow Area = 2.030 ac, 7.88% Impervious, Inflow Depth > 3.90" for 50-year event
Inflow = 12.97 cfs @ 11.96 hrs, Volume= 0.659 af
Primary = 12.97 cfs @ 11.96 hrs, Volume= 0.659 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Pond 99: PostOutTotal



Summary for Subcatchment 91: PostDev Onsite1

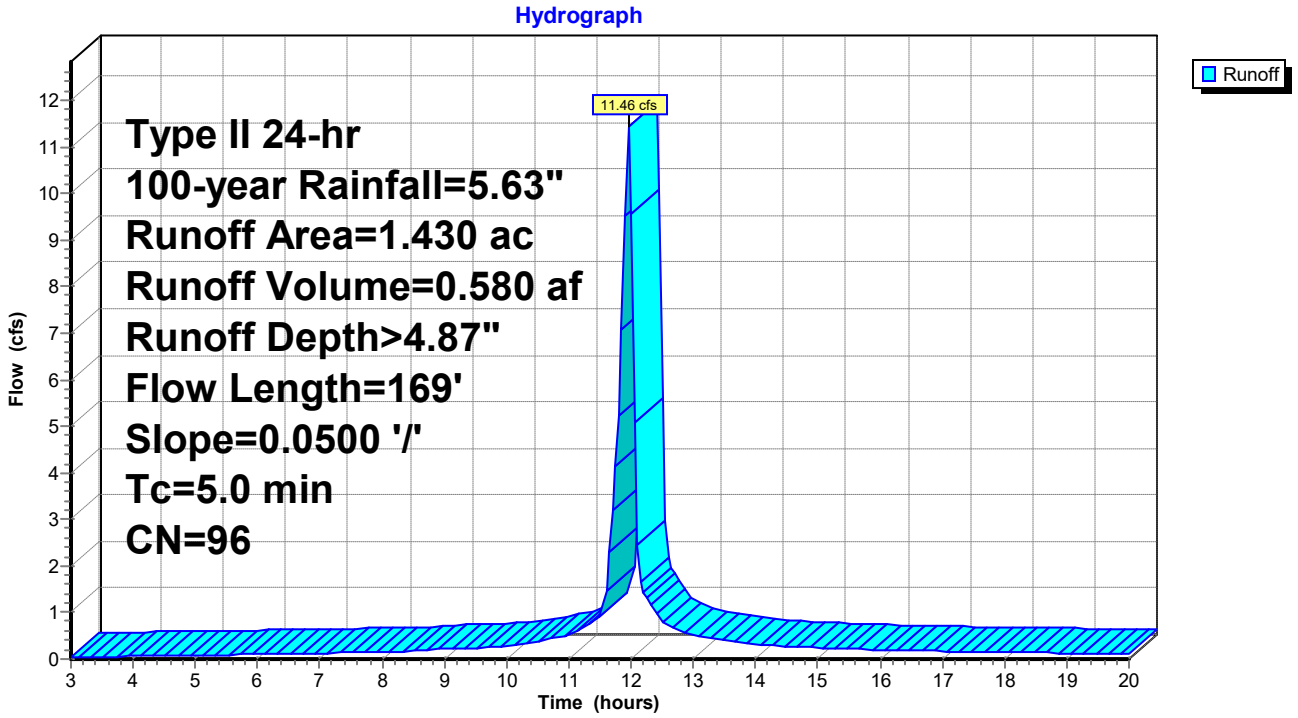
Runoff = 11.46 cfs @ 11.95 hrs, Volume= 0.580 af, Depth> 4.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year Rainfall=5.63"

	Area (ac)	CN	Description
*	1.430	96	Gravel
	1.430		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	50	0.0500	1.57		**Sheet Flow, Gravel** Smooth surfaces n= 0.011 P2= 2.63"
0.4	119	0.0500	4.54		**Shallow Concentrated Flow, Gravel** Paved Kv= 20.3 fps
4.1					**Direct Entry, 5 minimum**
5.0	169	Total			

Subcatchment 91: PostDev Onsite1



Summary for Subcatchment 92: PostDev Onsite2

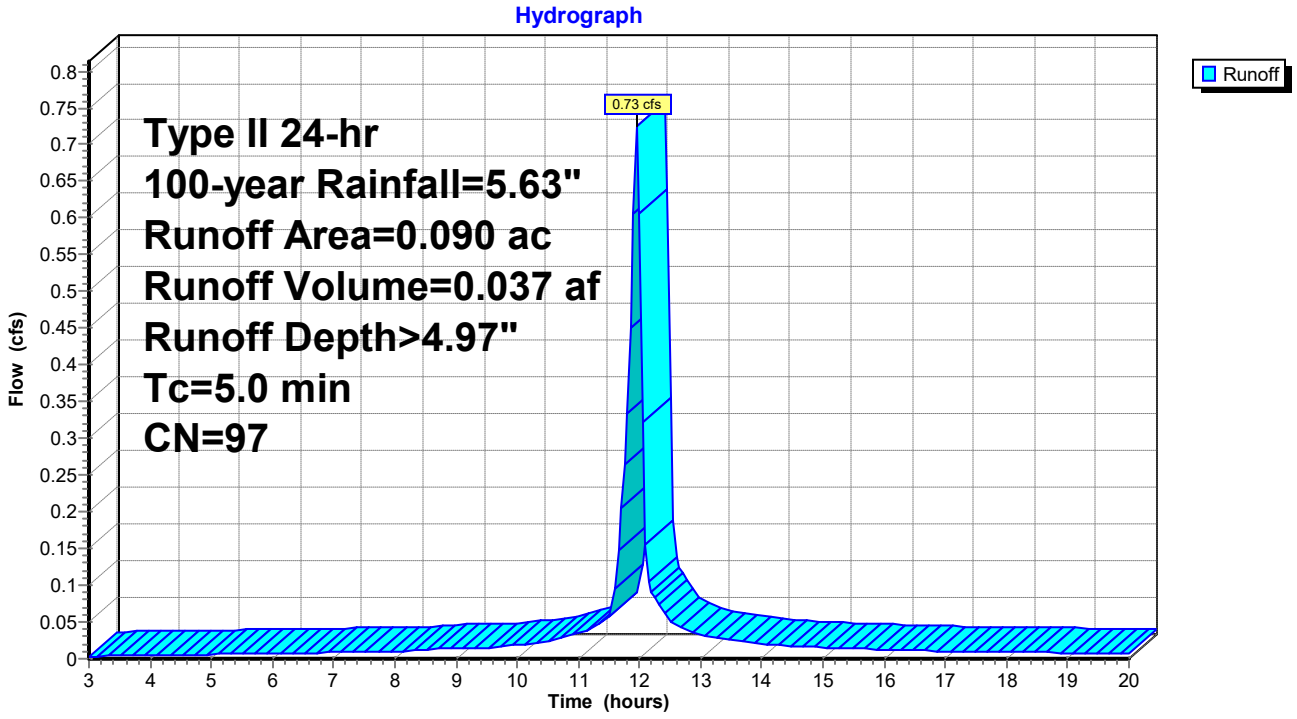
Runoff = 0.73 cfs @ 11.95 hrs, Volume= 0.037 af, Depth> 4.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year Rainfall=5.63"

	Area (ac)	CN	Description
*	0.060	96	Gravel
*	0.030	98	Impervious
	0.090	97	Weighted Average
	0.060		66.67% Pervious Area
	0.030		33.33% Impervious Area

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

Subcatchment 92: PostDev Onsite2



Summary for Subcatchment 93: PostDev Offsite1

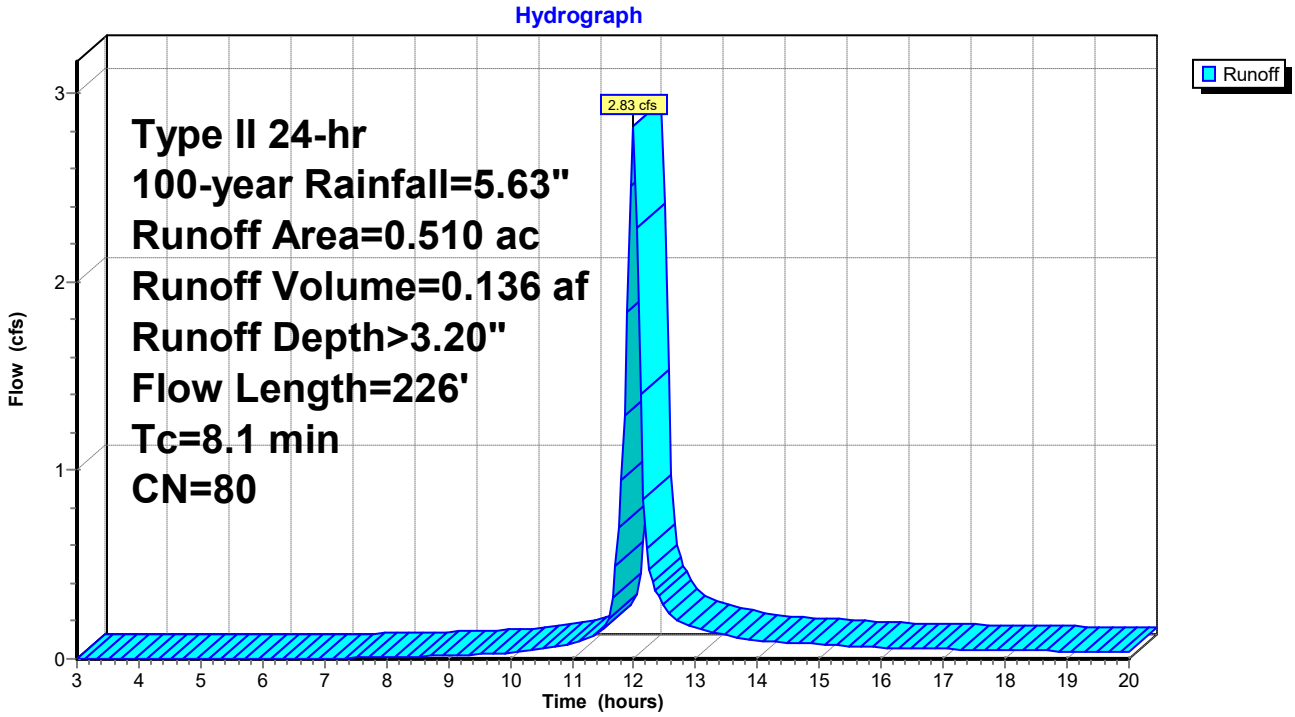
Runoff = 2.83 cfs @ 11.99 hrs, Volume= 0.136 af, Depth> 3.20"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs
Type II 24-hr 100-year Rainfall=5.63"

	Area (ac)	CN	Description
*	0.380	74	Green Space
*	0.130	98	Impervious
	0.510	80	Weighted Average
	0.380		74.51% Pervious Area
	0.130		25.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.5	57	0.0160	0.13		**Sheet Flow, Sheet** Grass: Short n= 0.150 P2= 2.63"
0.6	169	0.0500	4.54		**Shallow Concentrated Flow, Slope** Paved Kv= 20.3 fps
8.1	226	Total			

Subcatchment 93: PostDev Offsite1

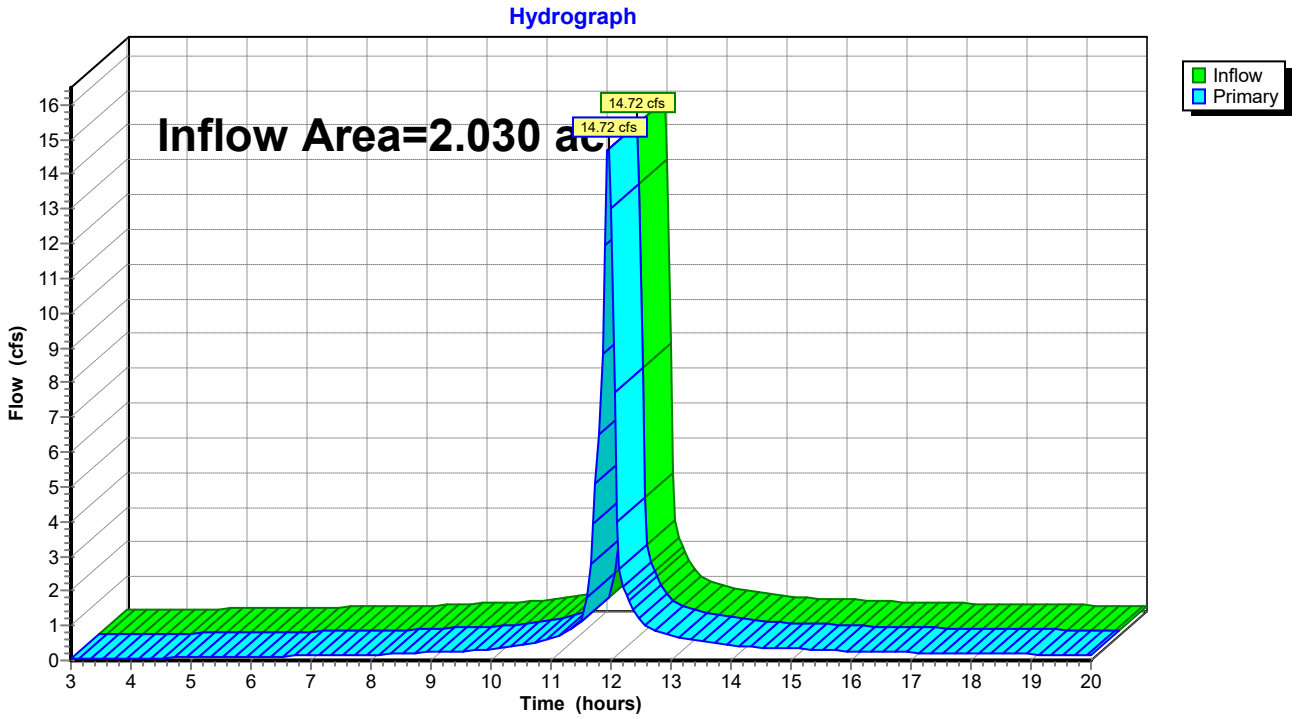


Summary for Pond 99: PostOutTotal

Inflow Area = 2.030 ac, 7.88% Impervious, Inflow Depth > 4.45" for 100-year event
Inflow = 14.72 cfs @ 11.96 hrs, Volume= 0.753 af
Primary = 14.72 cfs @ 11.96 hrs, Volume= 0.753 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 3.00-20.00 hrs, dt= 0.05 hrs

Pond 99: PostOutTotal



Events for Subcatchment 91: PostDev Onsite1

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-year	2.20	4.20	0.198	1.66
2-year	2.63	5.12	0.246	2.06
5-year	3.24	6.42	0.314	2.63
10-year	3.74	7.48	0.369	3.10
25-year	4.44	8.96	0.447	3.75
50-year	5.02	10.18	0.512	4.30
100-year	**5.63**	**11.46**	**0.580**	**4.87**

Events for Subcatchment 92: PostDev Onsite2

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-year	2.20	0.27	0.013	1.76
2-year	2.63	0.33	0.016	2.16
5-year	3.24	0.41	0.021	2.73
10-year	3.74	0.48	0.024	3.20
25-year	4.44	0.57	0.029	3.86
50-year	5.02	0.65	0.033	4.40
100-year	**5.63**	**0.73**	**0.037**	**4.97**

Events for Subcatchment 93: PostDev Offsite1

Event	Rainfall (inches)	Runoff (cfs)	Volume (acre-feet)	Depth (inches)
1-year	2.20	0.56	0.026	0.62
2-year	2.63	0.81	0.038	0.89
5-year	3.24	1.19	0.056	1.31
10-year	3.74	1.52	0.071	1.68
25-year	4.44	2.00	0.095	2.23
50-year	5.02	2.40	0.115	2.70
100-year	**5.63**	**2.83**	**0.136**	**3.20**

Events for Pond 99: PostOutTotal

Event	Inflow (cfs)	Primary (cfs)	Elevation (feet)	Storage (acre-feet)
1-year	4.93	4.93	**0.00**	**0.000**
2-year	6.14	6.14	0.00	0.000
5-year	7.87	7.87	0.00	0.000
10-year	9.30	9.30	0.00	0.000
25-year	11.30	11.30	0.00	0.000
50-year	12.97	12.97	0.00	0.000
100-year	**14.72**	**14.72**	0.00	0.000

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