STORMWATER MANAGEMENT REPORT

CAROLINE HEIGHTS DEVELOPMENT
ELM GROVE, WI

December 21, 2020 (First Submittal)
April 27, 2021 (Second Submittal)
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July 17, 2024 (Updated Submittal)
September 4, 2024 (Updated Submittal)
September 13, 2024 (Updated Submittal)

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PROJECT #40380



09/13/2024

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Section I. Introduction

1.1 Project Overview

K. Singh & Associates, Inc. (KSingh) was retained to provide Civil Engineering design services for the planned Caroline Heights development located off Watertown Plank Road in the Village of Elm Grove. The site was formerly used by the School Sisters of Notre Dame. Please refer to Appendix A for a project overview, a proposed site plan and a topographic map.

The development includes razing of eleven structures, remodeling of the Notre Dame and Maria Halls, and construction of three new buildings with below grade parking. The project also includes a central courtyard with amenities surrounded by a roadway loop. The cemetery grounds to the west of the site will remain in place. The land along the east side of the site adjacent to Stephen Place and Red Barn Lane are planned for single family home development. Land at the south end abutting the railroad right of way is planned as a single-family home neighborhood. Connections to Watertown Plank Road and Green Meadow serve as vehicle access points for the site.

This report is being prepared as an update to the Village Permit Submittal. This is a ninth draft of the storm water report. The purpose of this submittal is to reflect changes made to the initial Village submittal. The corresponding plan updates are reflected in this submittal.

1.2 Code Compliance

This project is a new development of a partially developed site. Please see below for a summary of the proposed site activities:

- Total area of property = 29.56 acres
- Total area of stormwater analysis = 30.38 acres
- Impervious area before construction = 6.14 acres
- Impervious after construction = 8.31 acres

The following storm water-related permits / requirements are triggered:

- Village of Elm Grove Review
- MMSD Chapter 13 (via Village of Elm Grove)
- WDNR WRAPP (60% TSS Reduction Requirement, 30% Phosphorous Requirement)
- DSPS (via Elm Grove/Safe Built) Review of Private Exterior Site Plumbing

The Village Review technical requirements are as follows:

- Peak Discharge
    - MMSD Chapter 13 Requirements
- Total Suspended Solids
    - 60% Reduction (Phosphorous reduction 30%)

Please refer to the Appendix B for SWMP-1 to view the existing conditions drainage areas. Please refer to Appendix C for SWMP-2 which includes the proposed conditions drainage areas. Appendix D includes the WinSLAMM results.

1.3 Legal Description of the Property and Owner Information

- A topographic map with legal description by Chaput Land Surveys can be found in Appendix A
- The Owner for this development is Caroline Heights Apartments LLC

1.4 Report Organization

The following information presented in this report details the design assumptions, computations, conclusions, and recommendations for the proposed development. This report is organized into three sections. Section I provides an introduction for the proposed development. Section II provides a narrative of the stormwater management methodology for the development. Section III provides a certification of the site investigation, plans, designs, computations, and drawings.

1.5 Limitations of Assessment

The existing conditions were developed using a topographic map dated April 15, 2020 by Chaput Land Surveys. Please refer to Appendix A for the map.

The analysis and report were prepared using data from the Geotechnical Engineering Report dated June 3, 2020 by GZA GeoEnvironmental, Inc (GZA). GZA provided an Infiltration Memorandum dated February 4, 2021. GZA subsequently provided another Infiltration Memorandum dated April 7, 2023. Please refer to Appendix E for the report and memoranda.

Section II. Project Narrative

2.1 Pre-development Conditions

2.1.1 Pre-development Watershed Description

The existing site is currently a partially developed site formerly used by the School Sisters of Notre Dame for residential/institutional purposes. The remainder of the site is comprised of cemetery grounds, wooded/landscaped areas, parking lots, and walking paths. The total watershed area considered is 30.38 acres. Please refer to SWMP-1 in Appendix B for more details on the breakdown of the existing drainage areas.

2.1.2 Topography and Surface Water Drainage

The existing surface elevation of the site ranges from 775' in the northeastern portion of the site to 731 on the south end of the property. The overall topography of the site has a relatively significant relief from north to south. Drainage patterns are predominantly north to south and the outlet points are two existing depressed areas on the southwest and southeast corners of the site. These depressed areas are noted in NRCS Soil Survey Maps as "Gravel Pits". Please refer to Appendix A for the NRCS Soil Survey Map and Topographic Map.

In addition to the existing depressed areas on the south portion of the site, there is an infiltration area in the southeast corner of the site that receives a large sheet flow area and a 12-inch CMP from the northern campus area. This gravel area was installed to prevent conveyance of storm water from the SSND site to existing ditches between homes north of Green Meadow Place. This is a key drainage pattern that has been adjusted in the proposed plan. The proposed plan has swales, a berm and pipe systems to convey upstream run-off from the northern areas to the dry ponds on the interior of the site, and ultimately to the existing southeast basin.

2.1.3 Site Geology and Hydrogeology

The subsurface soil conditions of the site are described using geologic data gathered from twenty-one soil borings performed at the site. The Geotechnical Engineering Report can be found in Appendix E. Based on the report Type C soils were used when selecting curve numbers. Based on the report, ground water was reported at an elevation of 17-18 feet below ground surface (bgs).

Infiltration tests have been conducted and the Geotechnical Engineering Consultant has completed the field tests (double ring and single ring infiltrometer testing). Please refer to Appendix E for the infiltration test locations and results.

2.1.4 Wetlands & Floodplain

There are no floodplains present on site indicated by research on FEMA FIRM Panel Mapping. There are no mapped wetlands on site based on the WDNR Surface Water Data Viewer; however, there are wetland indicator soils on-site. A Wetland report was completed by Applied Ecological Services, Inc dated April 29, 2020. Please refer to Appendix A for more information.

2.2 Post-development Conditions

2.2.1 Post-development Watershed Description

The total analysis area for the site is 30.38 acres. Of the that, 10.29 acres are impervious, leaving 20.09 acres of pervious area. Of the total analysis area, only 1.02 acres are flowing off-site and this is primarily due to the feasibility

of match slope conditions to the surrounding land. Please refer to Appendix C, SWMP-2, for a visual representation and breakdown of the proposed site impervious and open space areas by lot.

2.2.2 Method of Analysis

The analysis of the pre and post-developed site was performed utilizing HydroCAD® Storm Water Analysis version 10.00-26. The analysis uses TR-55 methodology for hydrologic and hydraulic analysis. Please refer to Appendix C for the detailed hydrologic output.

2.2.3 Topography and Surface Water Drainage

The proposed overall drainage patterns flow from north to south which matches existing conditions. Within the courtyard there is an underground storage device. The underground storage is used to reduce peak flows from the buildings, roadways, and roofs, in the courtyard. The reduction in peak flows is required for downstream infiltration dry ponds to function per design intent. Please refer to combined civil set PDF for ADS Stormtech plans. It should be noted that ADS' system provides full live storage while also reducing TSS. Throughout the site, storm water is conveyed using storm piping and overland flow to swales located on the eastern and western edges of the site. The swales convey the stormwater to the ponds south of the buildings. The ponds outlet to different locations. Please refer to SWMP-2 for the outlet locations. The capacity of the swales exceeds the 100-year inflows. The majority of the pipes are sized for the 10-year, 24-hour event; however, there are instances where pipes will be sized for the 100-year event. The 100-year pipes are identified on SWMP-2 and are oversized based on restrictions in overland flow paths based on adjacent land constraints.

2.2.4 Proposed Drainage Patterns

The details of where each catchment drains can be found in a table on SWMP-2 for proposed drainage patterns. Below is a summary of the drainage patterns proposed for the development:

- Major Catchment Area Routing
    - Portion of Building Roofs and Interior Courtyard Drain to Underground Storage 1 located in the courtyard
    - Building 1 Roof not captured by Underground Storage 1 is conveyed via overland flow to the western swale and ultimately routed to Infiltration Basin
    - Building 2 Roof not captured by Underground Storage 1 is conveyed to the eastern swale and ultimately routed to Dry Pond 1
    - Building 3 Roof is not captured by Underground Storage 1 and is conveyed to Dry Pond 1
    - Eastern Single Family Lots conveyed to eastern swale and ultimately to Dry Pond 1
        - Southern 3 homes front yards conveyed to existing swale on Red Barn Lane
    - Existing Cemetery Grounds and Expanded Parking Lot conveyed to Infiltration Basin 1
    - Preserved tree area (Area I in SWMP-2) follows existing contours / drainage pattern south to north face of berm where a ditch conveys it west into Dry Pond 2
    - South Campus is conveyed to Existing Southeast Basin via roadside swales along the proposed Green Meadow Extension and is routed through Dry Pond 3 before outletting to the Existing Southeast Basin
    - Eastern Homes offsite flow is routed to existing Red Barn Lane West Swale, where this flow is taken back onsite by a 24" HDPE pipe to Dry Pond #2.

- BMP Routing
    - Underground Storage 1 outlet is 2 pipes (sized for 100-year) between Buildings 1 and 3 ultimately to Dry Pond 1
    - Infiltration Basin 1 is routed to Dry Pond 3 via pipe, but has an emergency flow route via weir that is outletted to a swale along the west and southern boundaries of the site which outlets to Dry Pond 3 and ultimately discharged to Existing Southeast Basin
    - Dry Pond 1 and Dry Pond 2 both outlet to pipes which discharge on the southeastern portion of the site and ultimately to the Existing Southeast Basin
    - Dry Pond 3 outlets to pipe which discharges to Existing Southeast Basin

A summary of existing and proposed discharges to the site outlets is provided in the Table below:

Table 1 – Ultimate Discharge Points Existing vs Proposed Flows at 100-Yr

Site Discharge Point	Existing Flow (cfs)	Proposed Flow (cfs)
Existing Southeast Basin	16.06	7.18
Off-site Untreated	70.08	6.39

Please note an analysis of the existing Southeast Basin using field measurement data and LiDAR data was performed. The water surface elevations at the 1, 2, 10, and 100 year event are contained in the Southeast Basin in the proposed conditions. The Southeast Basin can be referenced in Appendix B for Existing Conditions and Appendix C for Proposed conditions.

2.3 Site Hydrologic and Hydraulic Characteristics

Hydrologic and hydraulic analyses were required to determine peak storm water runoff rates from the site for existing and proposed post-developed conditions.

The following tables summarize the results of the analysis:

Table 2 – Storm Event Rainfall Depths

Storm Event (year)	Rainfall (inches) *
1	2.40
2	2.70
10	3.81
100	6.18

*Rainfall data is based on NRCS runoff modeling methodology volume 8 of Atlas 14, published by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, 2013.

Table 3 – Overall Site Existing vs. Proposed Peak Flows*

Storm Event (Year)	Existing (cfs)**	Proposed – With Detention (cfs)***	Proposed – Off-site Undetained****
1	20.47	1.36	1.11
2	25.58	1.75	1.46
10	46.38	3.37	2.91
100	94.43	7.18	6.39

*includes all sub-basins in Table 3

**Peak flows shown take into account infiltration prior to flowing offsite. Shown are to total quantities of water flowing offsite after infiltration (cfs-cubic feet per second).

***Peak flows shown are from areas releasing at Existing Southeast Basin. Detained areas going to Southeast Basin are fully infiltrated at the 100-year storm event.

****Peak Flows shown are un-detained areas flowing offsite

The unit release rate method is being utilized for the site and a breakdown of that is below:

Table 4 – Unit Release Rate Results

Storm Event (Year)	Required Release Rate (cfs)	Proposed – Release Rates (cfs)
2	4.49	1.46
100	14.96	6.39

*Unit release rate requirement determined by multiplying total site area by MMSD requirements (0.15 cfs/acre for 2 year, and 0.5 cfs/acre)

2.3.1 Proposed Condition Peak Flows & Infiltration

The proposed land slopes for the site will be 0.5% to 33%. The sizing of the ponds, swales, infiltration basin and Existing Southeast Basin were modeled using direct routing in HydroCAD. The Existing Southeast Basin was modeled as a pond in HydroCAD by utilizing LiDAR contours of the existing area. Reach modeling requires sizing for the 100-year storm event in order to allow all inflow to pass through each reach. Please note for infiltration, rates in inches/hour were established based on infiltration test results, consultation with the Geotechnical Engineer, and review of the infiltration table in NR 151. A factor of safety number of 2.5 for design infiltration rates was used for all ponds and infiltration basin. See Appendix E for design infiltration calculations. The locations of the infiltration tests and results can be referenced in Appendix E. The table below shows a summary of test results and design infiltration rates used:

Table 5 – Infiltration Summary

Test Pit	Pond Designation	Approx. Ground Elevation (FT)	Approx. Test Elevation (FT)	Stabilized Test Infiltration Rate (in/hr)	Design Infiltration Rate (in/hr)**
TP-1 / TP-2	Dry Pond 1	755.6 / 753.2	747	8.0 / 7.9	3.18
TP-3 / TP-4	Dry Pond 2	752.4 / 752.0	747	28.2 / 16.2	8.88
TP-6	Dry Pond 3	744.9	739	39.3	16.72
TP-5	Infiltration Basin 1	742.2	739	10.8	4.32
TP-7	Existing SE Basin	741.6	739	2.10	0.84

*The same infiltration rate was used for the Existing Southeast Basin in existing and proposed conditions.
Please refer to Appendix B for existing hydrologic inputs and output and Appendix C for the proposed hydrologic inputs and output.
**The design infiltration rate was calculated using the DNR correction factor method.

Tables 6-14 summarize the ponds, infiltration basin, Existing Southeast Basin and swale storage data:

Table 6 – Underground Storage 1

Storm Event	Discharge Rate (cfs)	Water Surface Elevation	BMP Top Elev.
1	1.28	752.41	756.75
2	1.38	752.55	
10	1.70	753.13	
100	2.32	754.57	

Table 7 – Dry Pond 1

Storm Event	Outflow (cfs)	Water Surface Elevation	BMP Top Elev.
1	0.00	748.00	754.00
2	0.00	748.28	
10	0.00	749.34	
100	0.00	751.50	

Table 8 – Dry Pond 2

Storm Event	Outflow (cfs)	Water Surface Elevation	BMP Top Elev.
1	0.00	747.32	752.00
2	0.00	747.51	
10	0.00	748.34	
100	0.22	750.20	

Table 9 – Dry Pond 3

Storm Event	Outflow (cfs)	Water Surface Elevation	BMP Top Elev.
1	0.00	739.08	743.00
2	0.00	739.16	
10	0.00	739.51	
100	0.00	740.64	

Table 10 – Infiltration Basin 1

Storm Event	Infiltration (cfs)	Outflow (cfs)	Water Surface Elevation	BMP Top Elev.
1	1.53	0.00	740.99	745.00
2	1.64	0.00	741.18	
10	2.12	0.00	741.96	
100	3.09	2.77	743.43	

The weirs in Dry Ponds 1-3 and the Infiltration Basin are not activated at the 100-year event.

Table 11 – Existing Southeast Basin

Storm Event	Ex. Water Surface Elevations	Prop. Water Surface Elevations	BMP Top Elev.
1	730.49	730.40	740
2	730.66	730.50	
10	731.27	730.87	
100	732.44	731.56	

*Detained areas going to infiltration basins are fully infiltrated at the 100-year storm event.

Table 12 – East Swale

Storm Event	Outflow (cfs)	Average Flow Depth (ft)	Total Swale Depth
1	7.91	0.39	1-ft
2	9.94	0.45	
10	17.99	0.62	
100	36.89	0.91	

Table 13 – West Swale

Storm Event	Outflow (cfs)	Average Flow Depth (ft)	Total Swale Depth
1	5.08	0.71	1.33-ft
2	6.30	0.77	
10	11.26	0.96	
100	23.70	1.27	

Table 14 – South Berm Swale

Storm Event	Outflow (cfs)	Average Flow Depth (ft)	Total Swale Depth
1	2.19	0.38	1-ft
2	2.84	0.43	
10	5.52	0.58	
100	11.92	0.81	

Table 15 – South Campus West Swale

Storm Event	Outflow (cfs)	Average Flow Depth (ft)	Total Swale Depth
1	0.57	0.28	1-ft
2	0.74	0.31	
10	1.42	0.40	
100	3.02	0.53	

Table 16 – Green Meadow Extension Swale

Storm Event	Outflow (cfs)	Average Flow Depth (ft)	Total Swale Depth
1	2.25	0.31	1-ft
2	2.74	0.35	
10	4.55	0.46	
100	8.49	0.63	

Table 17 – Southeast Basin vs Off-Site Untreated Volume

Site Discharge Point	Existing Volume (cf)	Proposed Volume (cf)
Existing Southeast Basin	43,501	15,965
Off-site Untreated	167,726	13,068

The existing southeast basin was modeled as a pond using survey data and LiDAR data. The existing area draining to the southeast basin is shown on SWMP-1, and the proposed drainage areas being routed to this area are shown on SWMP-2. Additionally, the infiltration of the existing south east basin was modeled in HydroCAD and was based on the double ring infiltrometer test performed adjacent to this area.

Also, please refer to combined civil set PDF for Civil Plans. The Civil Plans include plan and profiles for the swales, cross sections for the swales, and pond section details for the ponds and the infiltration basin.

2.4 Storm Water Quality Analysis

Storm water quality was analyzed using WinSLAMM. For the proposed condition, total suspended solids were reduced 91.66% utilizing a combination of BMPs including underground storage, swales, and filters. Phosphorous was reduced 91.39%. Please refer to Appendix D for the WinSLAMM results.

Based on coordination with WDNR, and Village of Elm Grove ordinance for TSS reduction, the goal for this project is 60%. Up-FLO filters are utilized in combination with other BMPs to achieve the required TSS reduction. The Up-FLO filter systems details can be found in the combined civil set PDF.

2.5 Pipe Capacities & Grate Capacities

Pipe capacities were calculated using manning's formula. For each pipe size, a minimum capacity (lowest slope) was used, with the greatest flow area going to that pipe was used to analyze capacity. All pipes were sized for at least the 10-year storm event. There are several 100-year pipes that are in place since they are part of the 100-year flow paths to BMPs. The 100-year storm pipes are shown on SWMP-2.

Table 18 – Pipe Sizing Table for 100-Yr Sized Pipes

Pipe Name	Pipe Size (in)	Slope (%)	Capacity (cfs)	100-Yr Flow (cfs)
P1	21	0.30	12.02	8.76
P2	24	1.00	31.34	3.07

*Pipe names can be found in Appendix C in the SWMP 2 Exhibit.

The 24” western pipe (with 15” restrictor plate) and downstream 15” pipe flowing into the underground storage system do not have sufficient capacity for the 100-year storm event. However, the flood elevation in the system does not exceed the rim elevation in the manhole upstream of the pipes and the flow stays inside the system. Refer to HydroCAD Proposed in Appendix C for details. The pipes are both sufficiently sized for the 10-year storm event.

Roof drainpipe capacities were calculated using the SEWRPC IDF Equation for Waukesha County. For each building, a minimum capacity (lowest slope) was used for that building. The roof drain and roof overflow locations and pipes were coordinated with the architect and plumbing designer.

Grate Capacities were calculated using weir flow for inlets. Q100 inflows for the grates receiving the most flow area were used to analyze capacities, along with a 1.25 factor of safety for clogging. Grate bypass flows were calculated using the Hydraulic Design Manual for grate inlets on-grade. There is no bypass flow for the Q100 conditions.

2.6 Maintenance Agreement & Easements

A Maintenance Agreement using the City of Brookfield template can be found in Appendix H. The maintenance agreement was edited to make it project specific and includes maintenance requirements on the infiltration basins, underground storage device, and storm filters. The maintenance requirements for the infiltration basins were derived from the City of Oconomowoc Requirements as infiltration basins are extremely common in that municipality. The maintenance requirements for the infiltration basin were also taken from the DNR Technical Standard. The requirements for the ADS products were taken from their specifications and maintenance brochures.

Section III. Certification of Plans, Designs, Computations, and Drawings

3.1 Certification of Report

All plans, designs, computations, and drawings are certified by a Wisconsin-licensed professional engineer prepared in accordance with accepted engineering practice and requirements of the ordinance.

Section IV. References

1. Web Page: http://hdsc.nws.noaa.gov/hdsc/pfds/ Location of “Precipitation Frequency Data Server”

APPENDIX A

PROJECT OVERVIEW, SITE MAP, TOPOGRAPHIC MAP & CSM, NRCS SOIL SURVEY MAP, FEMA & DNR MAPPING, WETLAND REPORT & NATURAL RESOURCES ASSESSMENT

GENERAL NOTES

1. SITE LOCATION: 13105 WATERTOWN PLANK ROAD ELM GROVE, WISCONSIN 53122. SEE PLAT OF SURVEY FOR EASEMENT/RESTRICTIONS. REFER TO PLAT OF SURVEY BY CHAPUT LAND SURVEYS, DATED 04/21/2021 AND CSM BY CHAPUT LAND SURVEYS DATED 10/01/2021 FOR INFORMATION ON COORDINATES AND SURVEY CONTROL.
2. THE UNDERGROUND UTILITY INFORMATION AS SHOWN HEREON IS BASED, IN PART, UPON INFORMATION FURNISHED BY UTILITY COMPANIES, LOCAL MUNICIPALITIES, AND CHAPUT LAND SURVEYS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, ITS ACCURACY AND COMPLETENESS CANNOT BE GUARANTEED NOR CERTIFIED TO.
3. ANY WORK OUTSIDE OF PROPERTY LINE AND IN RIGHT OF WAY SHALL CONFORM TO THE VILLAGE OF ELM GROVE STANDARD SPECIFICATIONS, PERMIT CONDITIONS AND ORDINANCES.
4. SEE LIGHTING PLAN FOR LIGHT FIXTURE DETAILS.
5. SEE LANDSCAPING PLANS FOR LANDSCAPING DETAILS.
6. PER PUBLIC WORKS COMMITTEE MEETING ON APRIL 12, 2021, THE GREEN MEADOW PLACE EXTENSION SHALL BE A PUBLIC STREET AND CONSTRUCTED IN ACCORDANCE WITH VILLAGE STANDARDS AND REQUIREMENTS.
7. REFER TO LANDSCAPE PLANS FOR DETAILS ON PERMANENT SEEDING, PERMANENT PLANTING, TREE PROTECTION AND TREE REMOVALS.
8. ACCESSIBLE ROUTES AND RAMPS MUST MEET ADAAG STANDARDS.
9. REFER TO MECHANICAL, ELECTRICAL AND PLUMBING (MEP) PLANS FOR FIRE PROTECTION, PLUMBING, HVAC & ELECTRICAL UTILITY LOCATIONS.

0 100 200
SCALE IS IN FEET

SIGN KEY:

1 STOP R1-1 30" X 30"

2 R7-8A 12"X18"

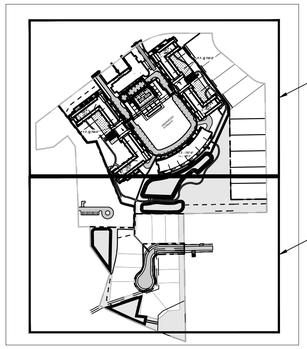
PLAN NOTES:

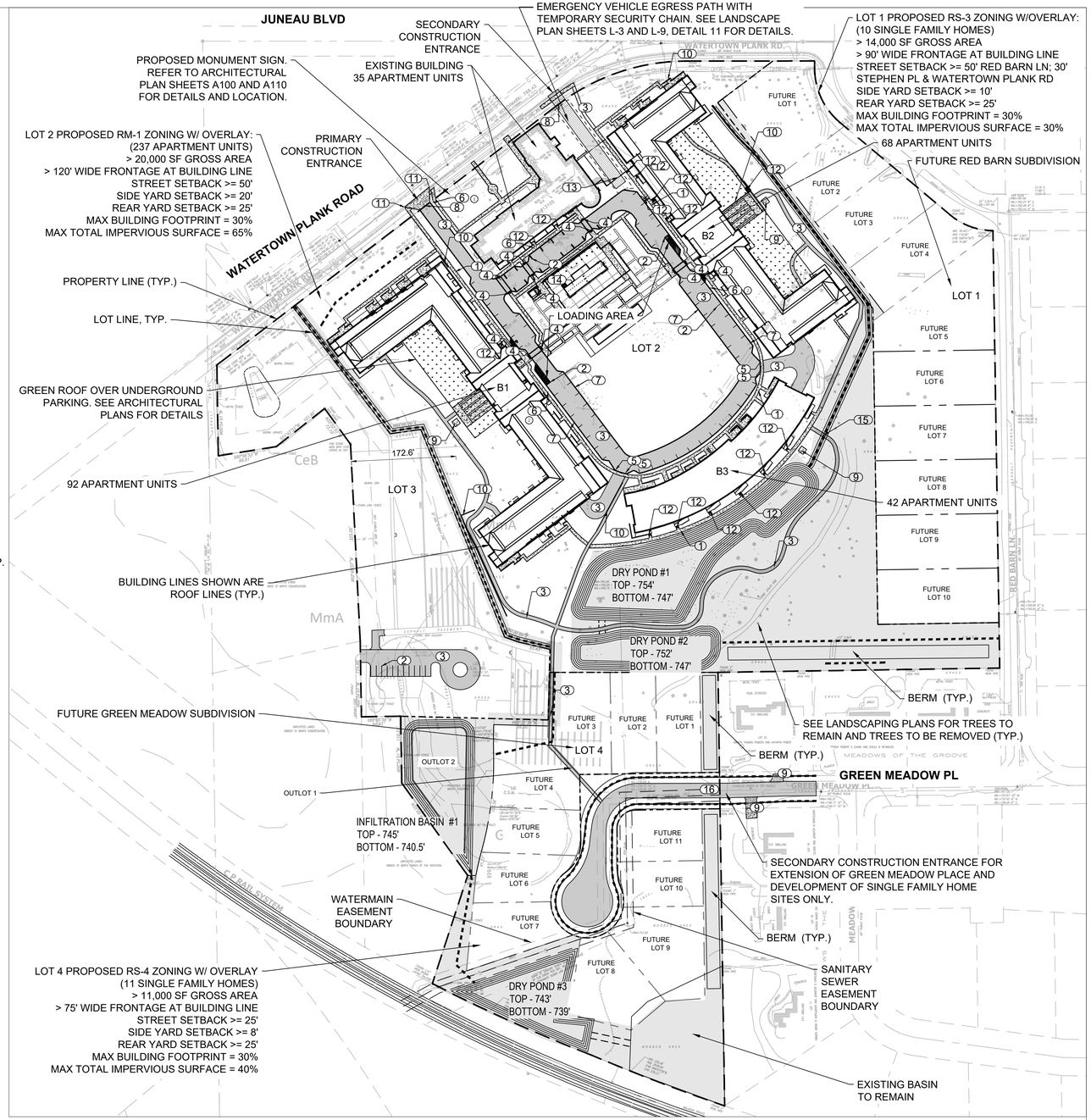
1. CONCRETE SIDEWALK, TYP. SEE DETAIL 1, SHEET C210.
2. PAVEMENT MARKING 4-INCH WHITE, TYP. SEE DETAIL 3, SHEET C211.
3. HMA PAVEMENT (PRIVATE ON-SITE IMPROVEMENTS), TYP. SEE DETAIL 6A, SHEET C210.
4. CURB RAMP DETAIL, SEE DETAILS 2 & 3, SHEET C210.
5. CURB END SECTION, SEE DETAIL 4, SHEET C210.
6. SIGN & TUBULAR STEEL POST, SEE DETAILS 1, 2 & 4, SHEET C211.
7. 12" CURB & GUTTER, SEE DETAILS 7A & 7B, SHEET C210.
8. DRIVEWAY APPROACH, SEE DETAIL 8, SHEET C210.
9. REINFORCED CONCRETE PAD, TYP., SEE DETAIL 9, SHEET C210. COORDINATE WITH WE ENERGIES.
10. MODULAR BLOCK RETAINING WALL, SEE DETAIL 10, SHEET C210.
11. 30" CURB & GUTTER, TYP. SEE DETAIL 11, SHEET C210.
12. STEPS, TYP. SEE DETAIL 12, SHEET C210.
13. GATE & LINK, SEE LANDSCAPE PLANS FOR DETAILS.
14. POOL AREA, SEE CATALYST PLANS FOR DETAILS.
15. PEDESTRIAN BRIDGE, CONTRACTOR TO DESIGN AND INSTALL.
16. HMA PAVEMENT (PUBLIC STREET - GREEN MEADOW PLACE), TYP. SEE DETAIL 6B, SHEET C210

LEGEND

- HMA PAVEMENT
- CONCRETE PAVEMENT/ SIDEWALK
- GREEN ROOF OVER UNDERGROUND PARKING
- PROPERTY BOUNDARY
- SWALE (4 / C112)
- STORMWATER DRAINAGE EASEMENT BOUNDARIES

SITE PLAN SHEETS KEY PLAN:





Southern Homes Lots (LOT 4, GREEN MEADOW PLACE SUBDIVISION)

Home Lot	Total Area (SF)	Post Construction Total Impervious (SF)	Proposed Percent Impervious Post Construction
1	17,077	3517	20.6%
2	12,538	3607	28.8%
3	14,949	3556	23.8%
4	17,338	3175	18.3%
5	12,087	3281	27.1%
6	11,423	3379	29.6%
7	12,330	3276	26.6%
8	15,718	3189	20.3%
9	23,093	3151	13.6%
10	12,657	3226	25.5%
11	14,314	3243	22.7%
Total	163,524	36,604	22.4%

Eastern Homes Lots (LOT 1, RED BARN LANE SUBDIVISION)

Home Lot	Total Area (SF)	Post Construction Total Impervious (SF)	Proposed Percent Impervious Post Construction
1	22,699	3,047	13.4%
2	15,173	3,400	22.4%
3	16,640	3,438	20.7%
4	19,065	2,934	15.4%
5	24,748	3,264	13.2%
6	18,000	3,541	19.7%
7	18,000	3,141	17.5%
8	18,000	3,812	21.2%
9	18,000	3,436	19.1%
10	18,000	3,141	17.5%
Total	188,325	33,154	17.6%

*BUILDING AREA:
TOTAL BUILDING AREA = 244,347 S.F.

BUILDING 1 = 52,114 S.F.
BUILDING 2 = 43,542 S.F.
BUILDING 3 = 22,686 S.F.

*PARKING DATA:
TOTAL SURFACE SPACES = 76
ADA SURFACE SPACES = 3
TOTAL GARAGE SPACES = 398
ADA GARAGE SPACES = 12
TOTAL PARKING SPACES = 474

PARCEL ADDRESS:
13105 ELM GROVE, WISCONSIN 53122.

Impervious & Pervious Data by Lot - WITHIN TOTAL AREA

Parcel	Pre Construction Zoning	Post Construction Zoning	Total Lot Area (SF)	Total Disturbed Area (SF)	Total Pre Construction Impervious (SF)*	Total Post Construction Impervious (SF)*	Pre Construction Impervious (SF)	Post Construction Impervious (SF)	Pre Construction Roof (SF)	Post Construction Roof (SF)	Pre Construction Pervious (SF)	Post Construction Pervious (SF)	Percent Roof Pre Construction	Percent Roof Post Construction	Percent Impervious Pre Construction*	Percent Impervious Post Construction*
Lot 1**	I-1	RS-3	188,325	188,325	13,189	33,153	13,189	13,791	-	19,362	175,136	155,172	0%	10%	7%	18%
Lot 2	I-1	RM-1	679,709	623,580	242,063	270,378	144,079	132,128	97,984	138,250	437,646	409,331	14%	20%	36%	40%
Lot 3	I-1	I-1	139,241	84,338	10,054	18,353	10,054	18,353	-	-	129,187	120,888	0%	0%	7%	13%
Lot 4**	I-1	RS-4	249,172	249,172	2,111	43,430	2,111	12,527	-	30,903	247,061	205,742	0%	12%	1%	17%
Total			1,256,447	1,145,415	267,417	365,314	169,433	176,799	97,984	188,515	989,030	891,133	8%	15%	21%	29%

Impervious & Pervious Data by Lot - WITHIN DISTURBED AREA

Parcel	Pre Construction Zoning	Post Construction Zoning	Total Lot Area (SF)	Total Disturbed Area (SF)	Total Pre Construction Impervious (SF)*	Total Post Construction Impervious (SF)*	Pre Construction Impervious (SF)	Post Construction Impervious (SF)	Pre Construction Roof (SF)	Post Construction Roof (SF)	Pre Construction Pervious (SF)	Post Construction Pervious (SF)	Percent Roof Pre Construction	Percent Roof Post Construction	Percent Impervious Pre Construction*	Percent Impervious Post Construction*
Lot 1**	I-1	RS-3	188,325	188,325	13,189	33,153	13,189	13,791	-	19,362	175,136	155,172	0%	10%	7%	18%
Lot 2	I-1	RM-1	679,709	623,580	242,063	270,378	144,079	132,128	97,984	138,250	381,517	353,202	14%	20%	39%	43%
Lot 3	I-1	I-1	139,241	84,338	6,533	14,832	6,533	14,832	-	-	77,805	69,506	0%	0%	8%	18%
Lot 4**	I-1	RS-4	249,172	249,172	2,111	43,430	2,111	12,527	-	30,903	247,061	205,742	0%	12%	1%	17%
Total			1,256,447	1,145,415	263,896	361,793	165,912	173,278	97,984	188,515	881,519	783,622	8%	15%	23%	32%

*INCLUDES ROOF AREA

**FUTURE SINGLE FAMILY HOME DEVELOPMENT OF LOTS 1 AND 4 TO BE CONSTRUCTED BY OTHERS. AREAS ARE FOR DEVELOPMENT OF SHARED STORM WATER MANAGEMENT FACILITIES ONLY

KSingh Engineers Scientists Consultants
3636 North 124th Street
Wauwatosa, WI 53222
262-821-1171
CONSULTANT

PROJECT TITLE: CAROLINE HEIGHTS DEVELOPMENT
CONSTRUCTION DOCUMENTS

CLIENT: MANDEL GROUP, INC.

PROJECT LOCATION: 13105 WATERTOWN PLANK RD.
ELM GROVE, WI 53122

REVISIONS	DATE	DESCRIPTION
1	07/31/23	ADDENDUM #3
2	08/11/23	ADDENDUM #4

DRAWN BY RGE — DATE 09/06/2023
CHECKED BY APS — DATE 09/06/2023

SITE TITLE

SITE PLAN OVERVIEW

C200

of SHEET XX

TOPOGRAPHIC MAP

CLIENT
Mandel Group

SITE ADDRESS
13105 Water Plank Road, Village of Elm Grove, Waukesha County, Wisconsin.

BASIS OF BEARINGS
Bearings are referenced to the Wisconsin State Plane Coordinate System (South Zone), in which the North line of the NE 1 /4 bears N89°58'52"E.

VERTICAL DATUM
Vertical datum is based on National Geodetic Vertical Datum of 1929.

STARTING BENCHMARK: 778.56
CONC. MON. WITH BRASS CAP NE COR. OF NE 1/4 SEC. 25, T7N, R20E.

LAND AREA
The Land Area of the subject property is 1,287,800 square feet or 29.5638 acres.

NOTE
Utility lines are shown from visible surface evidence, municipal plans and from plans and markings provided by Diggers Hotline, the One-call Utility Marking System (Wisconsin Statute 182.0175), Ticket Number 20200900446 & 20200900439.

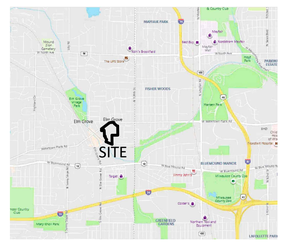
SITE BENCHMARK: 766.43
TOP NUT/LE ON HYDRANT

SITE BENCHMARK: 764.46
SANITARY MANHOLE RIM

SITE BENCHMARK: 758.74
STORM MANHOLE RIM

SITE BENCHMARK: 757.16
SANITARY MANHOLE RIM

SITE BENCHMARK: 752.04
CHISELED CROSS IN TOP NOZZLE

VICINITY MAP


LEGEND

- INDICATES FOUND 1" IRON PIPE
- INDICATES SET 1" IRON PIPE
- INDICATES FOUND CHISELED CROSS
- SANITARY MANHOLE
- SANITARY CLEANOUT OR VENT
- SEPTIC TANK ACCESS COVER
- M.I.S. MANHOLE
- UNKNOWN MANHOLE
- STORM MANHOLE
- INLET (ROUND)
- INLET (SQUARE)
- CURB INLET
- STORM SEWER END SECTION
- GAS VALVE
- GAS METER
- WATER VALVE
- HYDRANT
- WATER MANHOLE
- WATER SERVICE CURB STOP
- WELL HEAD
- STAND PIPE
- WALL INDICATOR VALVE
- POST INDICATOR VALVE
- LIGHT POLE
- SPOT/YARD LIGHT
- UTILITY POLE
- GUY POLE
- GUY WIRE
- ELECTRIC MANHOLE
- ELECTRIC PEDESTAL
- ELECTRIC METER
- TELEPHONE MANHOLE
- DOWNSPOUT

- TELEPHONE PEDESTAL
- CABLE PEDESTAL
- CONTROL BOX
- FIBER OPTIC PEDESTAL/SIGN
- TRAFFIC LIGHT
- COMMUNICATION MANHOLE
- BOLLARD
- SOIL BORING/MONITORING WELL
- WATER SURFACE
- WETLANDS FLAG
- MARSH
- FLAGPOLE
- PARKING METER
- SIGN
- MAILBOX
- RAILROAD CROSSING SIGNAL
- HANDICAP SPACE
- CONIFEROUS TREE
- DECIDUOUS TREE
- SANITARY SEWER
- STORM SEWER
- WATERLINE
- MARKED GAS MAIN
- MARKED ELECTRIC
- OVERHEAD WIRES
- MARKED TELEPHONE
- MARKED CABLE TV LINE
- MARKED FIBER OPTIC
- BURIED ELECTRIC SERVICE
- BOARD FENCE
- CHAIN LINK FENCE
- WIRE FENCE

GRAPHIC SCALE
40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

DATE
April 15, 2020

Date	Revision description	
May 1, 2020	Additional Inverts	far
Aug 6, 2020	Comments from KSingh	far
Nov 9, 2020	Adjoining Building & Elev.	far
Dec 15, 2020	Additional Topo & Inverts.	far
Nov 11, 2022	Additional Topo	dmb

CHAPUT LAND SURVEYS
234 W. Florida Street
Milwaukee, WI 53204
414-224-8068
www.chaputlandsurveys.com

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Drawing No. 20201215TOPO3454-far

Non-Wetland Determination Report

for
Mandel Group, Inc.
School Sisters of Notre Dame Campus
Elm Grove, WI 53122

(AES Project # 19-0708)

Prepared by:
Matthew C. Parsons, M.S.
Applied Ecological Services, Inc.
17921 Smith Road
Brodhead, WI53520
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Submitted to:
Phillip Aiello
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Milwaukee, WI 53202

Applied Ecological Services, Inc.™

April 29, 2020

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LIST OF ABBREVIATIONS

AES	Applied Ecological Services, Inc.
AOI	Area of Interest
DP	Data Point
FAC	Facultative Indicator Species
FACU	Facultative Upland Indicator Species
FACW	Facultative Wetland Indicator Species
GPS	Global Positioning System
NRCS	Natural Resources Conservation Service
NTCHS	National Technical Committee for Hydric Soils
NWI	National Wetland Inventory
OBL	Obligate Wetland Indicator Species
PI	Prevalence Index
Regional Supplement	Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0)
UPL	Upland Indicator Species
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
WDNR	Wisconsin Department of Natural Resources
WWI	Wisconsin Wetland Inventory

NON-WETLAND DETERMINATION REPORT

1.0 INTRODUCTION

Applied Ecological Services (AES) staff conducted a wetland delineation within an Area of Interest (AOI) of approximately 27.8 acres in the Village of Elm Grove, Waukesha County, Wisconsin (Appendix A, Figure 1). The AOI is located in the northeast 1/4 of Section 25, Township 7 North, Range 20 East and is contained within the limits of property owned by the School Sisters of Notre Dame. The AOI is bounded by residential development to the west, north, and east and by railroad tracks to the south.

This report was prepared based on AES's understanding and interpretation of the wetland delineation methods described in the U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual (Environmental Laboratory 1987), Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) (hereafter, Regional Supplement) (USACE 2010), and Guidance for Submittal of Delineation Reports to the St. Paul District Army Corps of Engineers and the Wisconsin Department of Natural Resources (USACE 2015).

The primary objective of this determination/delineation was to provide the spatial boundary of jurisdictional wetlands within the AOI, though no wetlands were found. AES Ecologist and Wisconsin Department of Natural Resources (WDNR) Assured Wetland Delineator, Matt Parsons, conducted the wetland delineation on April 16, 2020 and was lead investigator.

2.0 REGULATORY DEFINITIONS

2.1 Wetlands

Wetlands are areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

2.2 Waterways

Per the WDNR, a navigable waterway is defined as public lakes, rivers, and streams that have a bottom (bed) and side (bank), and enough water to float any boat, skiff, or canoe of the shallowest draft on a reoccurring basis.

3.0 METHODS

3.1 Background Information

Several information sources were consulted to evaluate the property and identify potential hydric soil units and potential wetlands on the site. The general topography of the site was reviewed using an online one-foot topographic map (Figure 2). Soil types were identified using the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey map for Waukesha County, WI (Figure 3). Potential wetlands were queried using Wisconsin Wetland Inventory (WWI) mapping website (Figure 4). Maps can only be used to establish the probability and approximate location of wetlands on the site; therefore, the USACE does not accept the use of these maps to make final wetland determinations. Final wetland determinations were made with onsite observations and fieldwork. Prior to the fieldwork, background information was reviewed to establish the probability and approximate location of wetlands on the site. The following maps were reviewed offsite or onsite as part of the wetland determination:

- Waukesha County Topographic Map – The County topographic map (Figure 2) shows the general topography and elevations of the site. Topography of the site is relatively flat with the highest elevation to the north along Watertown Plank Road at approximately 770 feet and the lowest in the woodland in the southeast corner at approximately 730 feet. The steepest topography exists in the woodland in the southern portion of the AOI.

- Soil Survey Map – The NRCS Web Soil Survey Map (Figure 3) identifies six soil map units within the AOI: Casco loam, 2-6% slopes (CeB); Clayey land (Cv); Gravel pit (GP); Matherton silt loam, 1-3% slopes (MaA); Ozaukee silt loam, high carbonate substratum, 2-6% slopes (OuB); and Sebewa silt loam, 0-2% slopes. Casco loams are not classified as hydric by the NRCS and do not have inclusions of other hydric soil map units. Clayey land, Matherton silt loams, and Ozaukee silt loams are not classified as hydric by the NRCS but could have inclusions of other hydric soil map units. Gravel pit soils are unranked in regard to hydric classification but could have inclusions of hydric soil map units. Sebewa silt loams are classified as hydric by the NRCS.

- WWI Map – The WWI Map of the area (Figure 4) shows no wetlands mapped within the AOI.

All figures are presented in Appendix A.

3.2 Wetland Delineation Methods

Wetlands

The Regional Supplement was used to provide technical guidance and procedures for identifying and delineating wetlands. The three essential characteristics of a wetland are hydrophytic vegetation, wetland hydrology, and hydric soils. All three characteristics must be present in order to be considered wetland.

1. **Vegetation:** The principal hydrophytic vegetation criteria to be met are when greater than 50% of the dominant plant species are hydrophytes (Lichvar et al. 2016). The indicator status of plant species is expressed in terms of the estimated probabilities of that species occurring in wetland conditions within a given region. Hydrophytes include all plants classified as "FAC", "FACW" or "OBL". If the plant community failed the dominance test but indicators of hydric soils and wetland hydrology were present, the prevalence index (PI) was calculated. The PI is a weighted average wetland indicator status of all species in a plot. Absolute percent cover for each species is weighted based on the species indicator status (OBL = 1, FACW = 2, FAC = 3, FACU = 4, UPL = 5). PI is the sum of the weighted absolute cover values divided by the sum of the absolute percent cover values. If PI is 3.0 or less, the plant community is considered hydrophytic.

2. **Hydrology:** In order for an area to have wetland hydrology, it must exhibit one or more "primary indicators" and/or two or more "secondary indicators" for USACE jurisdictional wetlands and isolated wetlands. Primary indicators include either the direct presence of water as inundation or saturation within the upper 12 inches of the soil profile, or direct evidence of recent inundation, such as water marks, drift lines, sediment deposits, or drainage patterns. Secondary indicators are conditions reflecting the presence of reducing or anaerobic conditions produced as a consequence of saturation or inundation. Examples of secondary indicators include conditions such as surface soil cracks, geomorphic position that could collect or concentrate water, and a positive "FAC neutral" test (i.e., the dominant vegetation is, on average, hydrophytic).

3. **Soils:** The National Technical Committee for Hydric Soils (NTCHS) defines a hydric soil as a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (NRCS 2018). Nearly all hydric soils exhibit characteristic morphologies that result from repeated periods of saturation or inundation for more than a few days. Saturation or inundation, when combined with microbial activity in the soil, causes the depletion of oxygen. This anaerobic condition promotes certain biogeochemical processes, such as the accumulation of organic matter and the reduction, translocation, or accumulation of iron and other reducible elements. These processes result in distinctive characteristics that persist in the soil during both wet and dry periods, making them particularly useful for identifying hydric soils in the field.

Some of the field indicators include dark color (low chroma), redoximorphic features, gleying, and/or the presence of a sulfurous odor. Although NRCS soil maps are useful for soil identification, they should be used only as general guides. Soils are evaluated directly by excavating a test pit at each of the Data Point (DP) locations. In this report, soil colors are described using the Munsell notation system.

Site Investigation

On April 16, 2020, AES searched for wetlands contained within the 27.8-acre AOI; however, no wetlands were found.

Four (4) soil test pits that were representative of the AOI were excavated and investigated for evidence of wetland conditions (Figure 5). At each of the soil pits a Midwest Region wetland delineation data form was prepared and a determination was made as to whether it was located in a wetland or upland based on the three criteria; vegetation, soils, and hydrology. The initial inspection of the AOI revealed that no wetlands were contained within the AOI.

Site Photographs

Photographs of the site are presented in Appendix B. These photographs are the visual documentation of site conditions at the time of the April 2020 inspection. The photographs are intended to provide representative visual samples of soil test pits, any wetlands delineated, uplands data points, or other special features found on or near the site investigated.

Routine Wetland Delineation Data Forms

Completed Routine Wetland Delineation Data Forms – Midwest Region for this delineation are in Appendix C. These forms are the written documentation of how the four Data Points do or do not meet all three of the wetland criteria.

4.0 RESULTS AND DISCUSSION

4.1 Site Investigation

On April 16, 2020, AES staff searched for wetlands contained within the 27.8-acre AOI; however, no wetlands were found.

4.2 Site Photographs

Photographs of the site are presented in Appendix B. The photographs are intended to provide representative visual samples of any wetlands, Data Points, or other special features found on the site. These photographs are the visual documentation of site conditions at the time of inspection. Photos were taken at each of the four Data Points. In addition, eight photo-point locations were established to lend further evidence to the lack of wetlands onsite.

4.3 Routine Wetland Delineation Data Forms

The Routine Wetland Delineation data forms used in the delineation process are presented in Appendix C. These forms are the written documentation of how representative Data Points meet or do not meet each of the wetland criteria. Four (4) Data Points (DP1-DP4) were selected to document the conditions of the site (Figure 5).

4.4 General Site Conditions

The AOI is a campus owned by the School Sisters of Notre Dame. The AOI is largely composed of various buildings and landscaped areas. Three areas of degraded, naturalized woodland vegetation are present on the campus. The AOI is bounded by residential development to the west, north, and east and by railroad tracks to the south.

4.5 Antecedent Precipitation

Average precipitation for February-April at the Oconomowoc, Wisconsin precipitation gauge is 6.14 inches (Table 1). At the time of the field investigation in mid-April 2020, precipitation from February-April was 5.18 inches. February exhibited normal precipitation, March precipitation was above average, and April precipitation was below average for this region based on the 30-year average. Completion of the rainfall documentation worksheet in Table 1 resulted in a weighted condition value sum of 11 indicating hydrologic conditions in mid-April 2020 were normal.

Table 1. Rainfall Documentation Worksheet

Long-term rainfall records (from WETS table)						Site determination				
	Month	3 years in 10 less than	Normal	3 years in 10 greater than		Site rainfall (in)	Condition Dry/Normal*/Wet	Condition Value**	Month Weight	Product
1st month prior	Apr	2.43	3.25	3.80		1.12	Dry	1	3	3
2nd month prior	Mar	1.25	1.96	2.36		2.98	Wet	3	2	6
3rd month prior	Feb	0.63	1.20	1.47		1.08	Normal	2	1	2
		Sum =	6.41		Sum =	5.18			Sum =	11

Determination:
Wet
Dry
X Normal

*Normal precipitation with 30-70% probability of occurrence

**Condition value

Dry = 1
Normal = 2
Wet = 3

**If sum is
6-9 then period is drier than normal
10-14 then period has been normal
15-18 then period has been wetter than normal

Precipitation data source: NOAA, OCONOMOWOC, WI

4.6 Wetlands

Field observations revealed that wetland conditions (i.e., positive indicators of wetland hydrology, vegetation, and soils) were not present on the day of inspection and; therefore, no wetlands were delineated.

4.7 Uplands

Representative Data Points were taken in areas of potential wetlands (low areas with concave relief) and all sample areas were found to be uplands. Upland Data Points include DP1-DP4 (Figure 5).

DP1 (Photo 1) and DP2 (Photo 2) were taken in an ephemeral stormwater swale in a wooded portion of the site. This swale lacked a defined bed and banks. Hydric soil indicators were absent from DP1. The hydric soil indicator Redox Dark Surface was observed at DP2. The primary wetland hydrology indicator, Drift Deposits (B3) and secondary indicator, Geomorphic Position (D2) were observed at DP1 and DP2. DP1 was dominated by boxelder (*Acer negundo*) (FAC) in the tree stratum and passed the dominance test for presence of hydrophytic vegetation. DP2 was dominated by boxelder in the tree stratum and creeping Charlie (*Glechoma hederacea*) (FACU), common blue violet (*Viola sororia*) (FAC), common burdock (*Arctium minus*) (FACU), and dame's rocket (*Hesperis matronalis*) (FACU) in the herb stratum and failed the dominance test and prevalence index for presence of hydrophytic vegetation. Additional photographs of the swale are presented in Appendix B (Photos 3-5).

It is our opinion that water flows within the swale and transports debris for brief periods of time during large precipitation events but does not reside long enough to create consistent indicators of hydric soil or hydrophytic vegetation (Photo 6). For these reasons, and the fact that the feature lacked a defined bed and banks, we determined that this swale feature does not meet the regulatory definitions of a wetland or waterway.

DP3 (Photo 7) was located at the bottom of a slope in a depressional landform in a wooded portion of the site. The hydric soil indicators Histosol (A1), Black Histic (A3), and 2 cm Muck (A10) were observed at DP3. Snail shells were present at a depth of 20 inches within the soil profile (Photo 8) and a light gray (10YR 7/1) layer of marl/weathered snail shells was present starting at a depth of 26 inches. The secondary indicator of wetland hydrology, Geomorphic Position (D2) was observed at DP3. No other evidence of prolonged inundation was observed at this location. DP3 was dominated by boxelder in the tree stratum, sugar maple (*Acer saccharum*) (FACU) in the sapling/shrub stratum, and garlic mustard (*Alliaria petiolata*) (FAC) and creeping Charlie in the herb stratum. Therefore, DP3 failed the dominance test and prevalence index for presence of hydrophytic vegetation.

DP4 (Photo 9) was located in a shallow swale in the eastern portion of the site that is composed of turf grass and landscape trees. Hydric soil indicators were absent form DP4. The secondary indicator of wetland hydrology, Geomorphic Position (D2) was observed at DP4, but no other evidence of prolonged inundation was observed at this location. DP4 was dominated by planted eastern white

pine (*Pinus strobus*) (FACU) and sugar maple in the tree stratum and planted Kentucky bluegrass (*Poa pratensis*) (FAC) in the herb stratum. This artificial plant community assemblage fails the dominance test and prevalence index for presence of hydrophytic vegetation. If only volunteer vegetation was considered for this analysis, the site would be dominated by species such as common dandelion (*Taraxacum officinale*) (FACU) and creeping Charlie and would likewise have failed the dominance test and prevalence index for presence of hydrophytic vegetation.

All Data Points lacked at least one of the three parameters (hydric soil, wetland hydrology, hydrophytic vegetation) required to be considered wetland, thus, all were considered uplands (Appendix C).

Photo-points 1-8, which show all remaining upland areas throughout the site, are presented in Appendix B (Photos 10-36).

5.0 JURISDICTIONAL ANALYSIS OPINION

Based on observations in 2020, it is AES's professional opinion that no jurisdictional wetlands are present within the AOI; however, the final decision and disposition of wetland boundaries lies with the jurisdictional agencies including the USACE and WDNR. As such, there could be adjustments to the non-wetland determination by a regulatory agency.

6.0 LITERATURE CITED

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

Lichvar, R.W., D.L. Banks, W.N. Kirchner & N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X.

[NRCS] Natural Resources Conservation Service. 2018. Field Indicators of Hydric Soils in the United States; Version 8.2. L.M. Vasilas, G.W. Hurt, and J.F. Berkowitz (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.

[USACE] U.S. Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0), ed. J.S. Wakeley, R. Lichvar and C.V. Noble ERDC/EL TR-10-16. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

[USACE] U.S. Army Corps of Engineers. 2015. Special Public Notice: Guidelines for Submittal of Delineation Reports to the St. Paul District Corps of Engineers and the Wisconsin Department of Natural Resources. U.S. Army Corps of Engineers, March 2015.

Appendix A. Figures

17-0908 Elm Grove Campus Wetland Delineation

Figure 1: Project Location

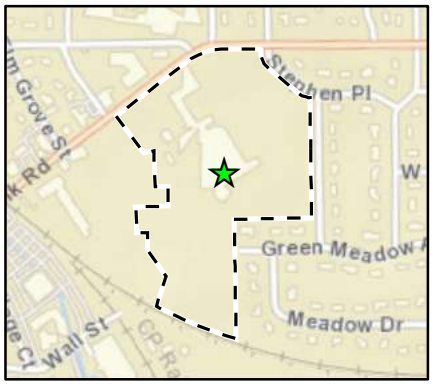


Legend

★ Project Location



Closeup View

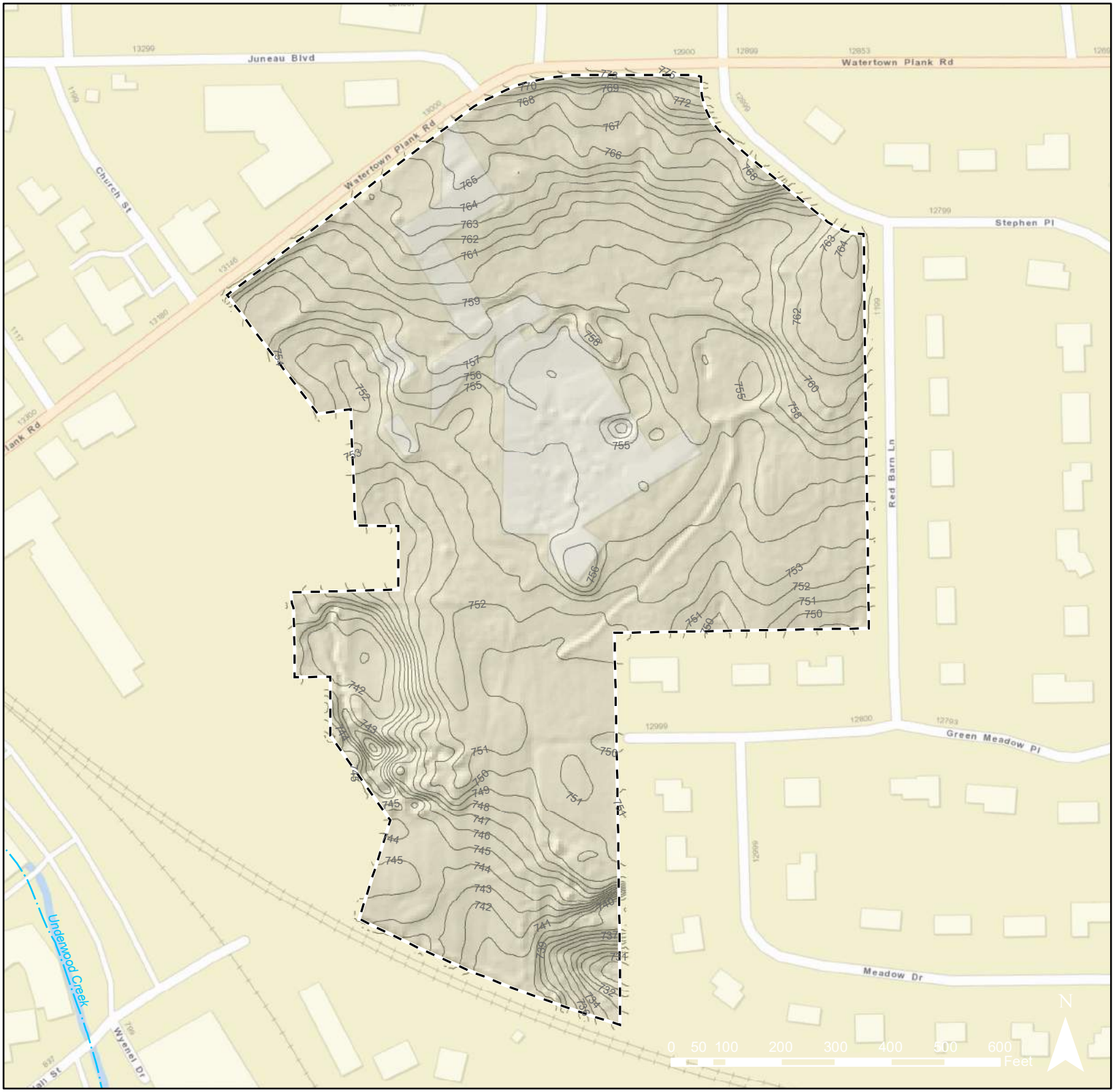


Project Location: Elm Grove, WI
AES Project #: 17-0908
Mapped by: tos
Map Date: Apr 29, 2020

APPLIED ECOLOGICAL SERVICES
17921 W Smith Rd
Brodhead, WI 53520
608.897.8641
www.appliedeco.com

17-0908 Elm Grove Campus Wetland Delineation

Figure 2: Topography



Legend

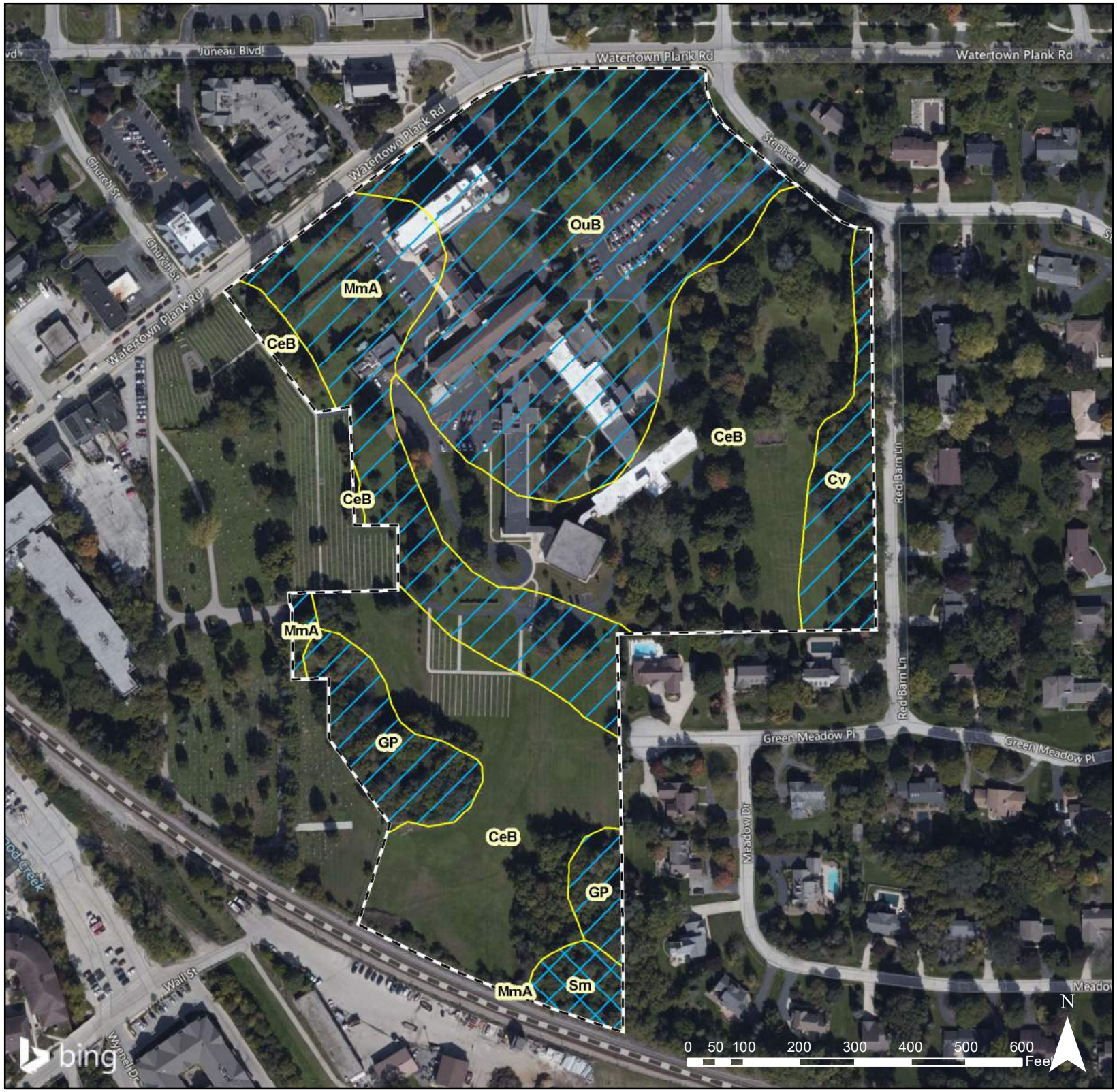
- Area of Interest
- Contour (1 ft)

Project Location: Elm Grove, WI
AES Project #: 17-0908
Mapped by: tos
Map Date: Apr 29, 2020

APPLIED ECOLOGICAL SERVICES
17921 W Smith Rd
Brodhead, WI 53520
608.897.8641
www.appliedeco.com

17-0908 Elm Grove Campus Wetland Delineation

Figure 3: Soils



Legend

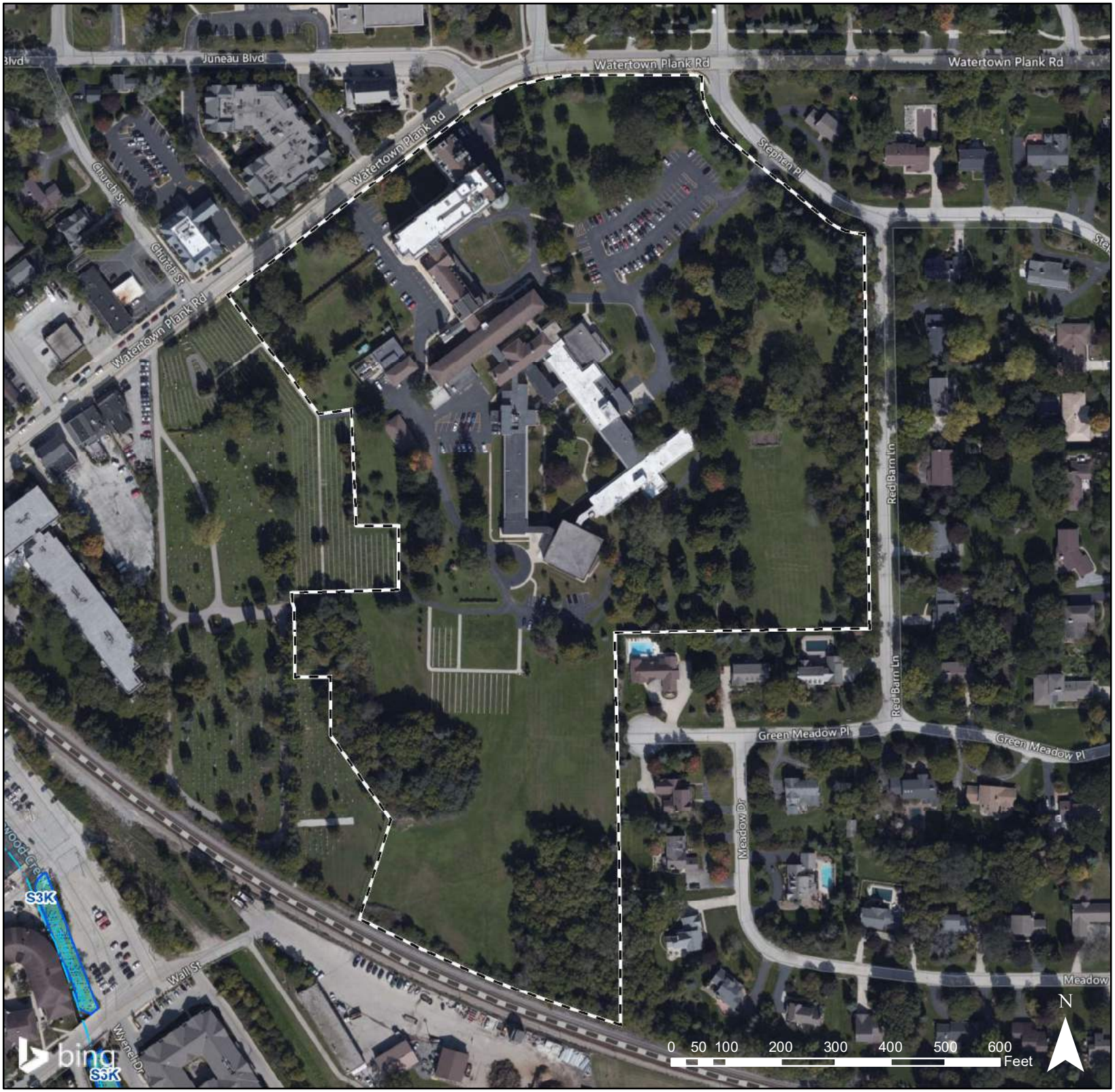
- Area of Interest
- CeB, Casco loam, 2 to 6 percent slopes, Hydric - No
- Cv, Clayey land, Hydric - Inclusions
- GP, Gravel pit, Hydric - Inclusions
- MmA, Matherton silt loam, 1 to 3 percent slopes, Hydric - Inclusions
- OuB, Ozaukee silt loam, high carbonate substratum, 2 to 6 percent slopes, Hydric - Inclusions
- Sm, Sebewa silt loam, 0 to 2 percent slopes, Hydric - Yes
- Hydric Soils
- Hydric Inclusions

Project Location: Elm Grove, WI
AES Project #: 17-0908
Mapped by: tos
Map Date: Apr 29, 2020

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17-0908 Elm Grove Campus Wetland Delineation

Figure 4: Wisconsin Wetland Inventory



Legend

- Area of Interest

Wisconsin Wetland Inventory

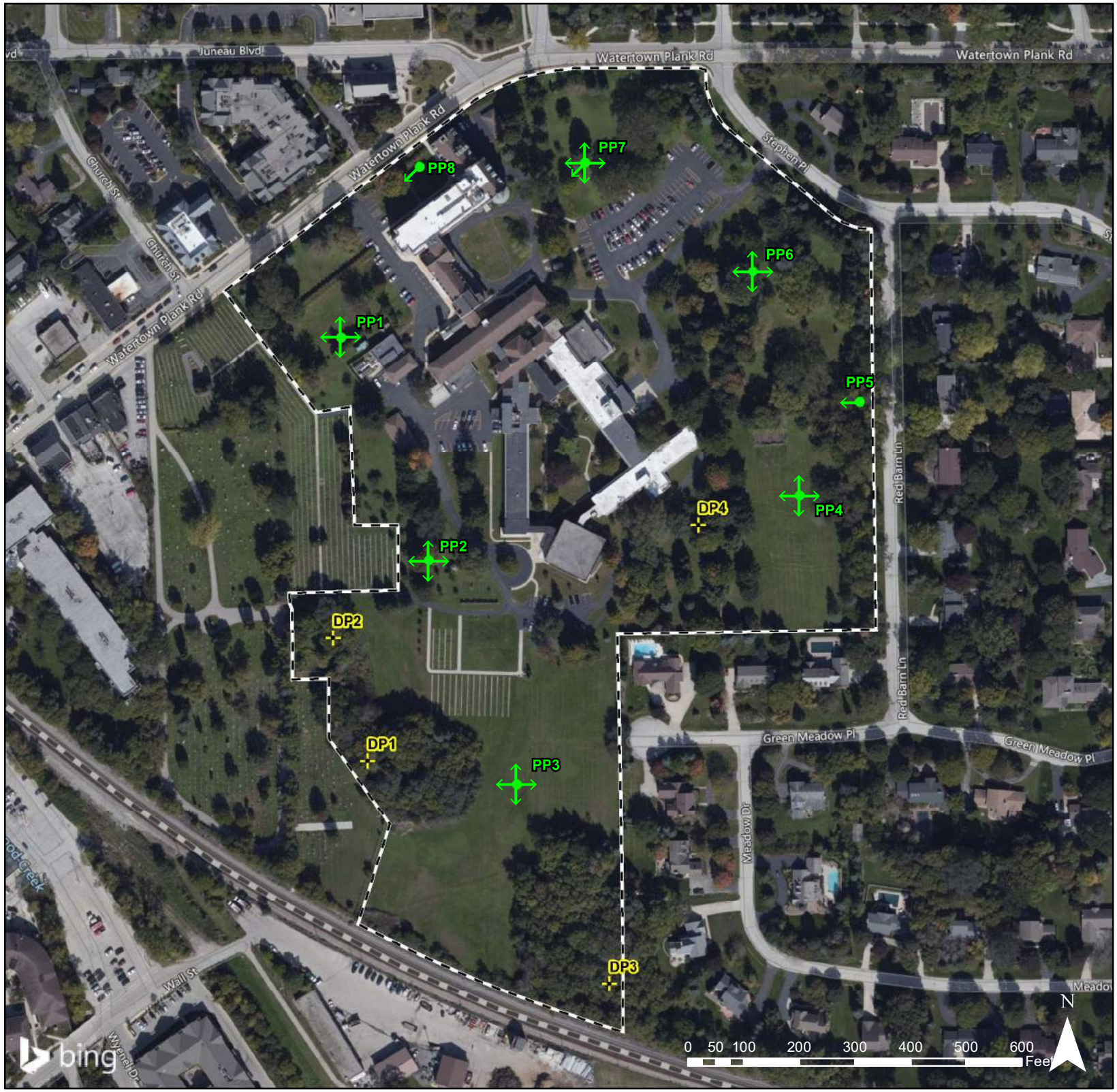
- Wisconsin Wetland Inventory
- Dammed/Filled or Excavated Pond
- Wetland too small to delineate

Project Location: Elm Grove, WI
AES Project #: 17-0908
Mapped by: tos
Map Date: Apr 29, 2020

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17-0908 Elm Grove Campus Wetland Delineation

Figure 5: Wetland Delineation



Legend

- Area of Interest
- Data Points With ID
- Delineated Wetlands (0.00 acres)
- Photo Reference Points

Project Location: Elm Grove, WI
AES Project #: 17-0908
Mapped by: tos
Map Date: Apr 29, 2020

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Appendix B. Site Photographs



Photo 1. Data Point 1 looking north (April 16, 2020)



Photo 2. Data Point 2 looking north (April 16, 2020)



Photo 3. Culvert that feeds stormwater to ephemeral swale feature (April 16, 2020)



Photo 4. Ephemeral swale looking south from culvert (April 16, 2020)



Photo 5. Ephemeral swale, mid-reach, looking downstream (April 16, 2020)



Photo 6. Typical upland herbaceous species occupying ephemeral swale (common burdock, creeping Charlie, and common blue violet) (April 16, 2020)



Photo 7. Data Point 3 looking south (April 16, 2020)



Photo 8. Subsurface soils at DP3 showing snail shells embedded in soil matrix (April 16, 2020)



Photo 9. Data Point 4 looking north (April 16, 2020)



Photo 10. Photo-point 1 looking north (April 16, 2020)



Photo 11. Photo-point 1 looking east (April 16, 2020)



Photo 12. Photo-point 1 looking south (April 16, 2020)



Photo 13. Photo-point 1 looking west (April 16, 2020)



Photo 14. Photo-point 2 looking north (April 16, 2020)



Photo 15. Photo-point 2 looking east (April 16, 2020)



Photo 16. Photo-point 2 looking south (April 16, 2020)



Photo 17. Photo-point 2 looking west (April 16, 2020)



Photo 18. Photo-point 3 looking north (April 16, 2020)



Photo 19. Photo-point 3 looking east (April 16, 2020)



Photo 20. Photo-point 3 looking south (April 16, 2020)



Photo 21. Photo-point 3 looking west (April 16, 2020)



Photo 22. Photo-point 4 looking north (April 16, 2020)



Photo 23. Photo-point 4 looking east (April 16, 2020)



Photo 24. Photo-point 4 looking south (April 16, 2020)



Photo 25. Photo-point 4 looking southwest (April 16, 2020)



Photo 26. Photo-point 4 looking west (April 16, 2020)



Photo 27. Photo-point 5 looking west at upland woodland (April 16, 2020)



Photo 28. Photo-point 6 looking north (April 16, 2020)



Photo 29. Photo-point 6 looking east (April 16, 2020)



Photo 30. Photo-point 6 looking south (April 16, 2020)



Photo 31. Photo-point 6 looking west (April 16, 2020)



Photo 32. Photo-point 7 looking north (April 16, 2020)



Photo 33. Photo-point 7 looking east (April 16, 2020)



Photo 34. Photo-point 7 looking south (April 16, 2020)



Photo 35. Photo-point 7 looking west (April 16, 2020)



Photo 36. Photo-point 8 looking southwest (April 16, 2020)

Appendix C. Data Forms

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: 17-0908/Elm Grove Campus Redevelopment City/County: Elm Grove/Waukesha Sampling Date: 4/16/2020

Applicant/Owner: Mandel Group/School Sisters of Notre Dame State: WI Sampling Point: DP1

Investigator(s): Matt Parsons Section, Township, Range: Sec. 25, T7N, R20E

Landform (hillside, terrace, etc.): depression Local relief (concave, convex, none): concave

Slope (%): 0-1 Lat: 43.04208329 Long: -88.07544873 Datum: WGS 84

Soil Map Unit Name: Gravel pit NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil X, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Antecedent rainfall documentation worksheet caculations resulted in a weighted condition value sum of 11 indicating precipitation is normal for this region and time period. Soils disturbed due to presence of potential fill material.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	80	Yes	FAC
2.			
3.			
4.			
5.			
	80 =Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	=Total Cover		
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/1	100					Loamy/Clayey	loam
6-10	10YR 3/1	100					Loamy/Clayey	gravelly loam - potential historic fill
10-26	10YR 3/4	100					Loamy/Clayey	gravelly loam - potential historic fill

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

[2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: 17-0908/Elm Grove Campus Redevelopment City/County: Elm Grove/Waukesha Sampling Date: 4/16/2020

Applicant/Owner: Mandel Group/School Sisters of Notre Dame State: WI Sampling Point: DP2

Investigator(s): Matt Parsons Section, Township, Range: Sec. 25, T7N, R20E

Landform (hillside, terrace, etc.): swale Local relief (concave, convex, none): concave

Slope (%): 1-2 Lat: 43.04269185 Long: -88.07565877 Datum: WGS 84

Soil Map Unit Name: Gravel pit NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Antecedent rainfall documentation worksheet caculations resulted in a weighted condition value sum of 11 indicating precipitation is normal for this region and time period. Data point taken in ephemeral stormwater swale.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	10	Yes	FAC
2.			
3.			
4.			
5.			
	10 =Total Cover		
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	=Total Cover		
Herb Stratum (Plot size: 5')			
1. *Glechoma hederacea*	7	Yes	FACU
2. *Viola sororia*	5	Yes	FAC
3. *Arctium minus*	5	Yes	FACU
4. *Hesperis matronalis*	5	Yes	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	22 =Total Cover		
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
	=Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	15	x 3 =	45
FACU species	17	x 4 =	68
UPL species	0	x 5 =	0
Column Totals:	32 (A)		113 (B)
Prevalence Index = B/A =			3.53

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/1	50	5YR 3/4	50	C	M	Loamy/Clayey	silt loam
12-20	10YR 3/1	85	5YR 3/4	15	C	M	Loamy/Clayey	silt loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- X Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Water flows within swale and transports debris likely for short periods of time during large precipitation events. Swale lacks defined bed and banks.

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: 17-0908/Elm Grove Campus Redevelopment City/County: Elm Grove/Waukesha Sampling Date: 4/16/2020

Applicant/Owner: Mandel Group/School Sisters of Notre Dame State: WI Sampling Point: DP3

Investigator(s): Matt Parsons Section, Township, Range: Sec. 25, T7N, R20E

Landform (hillside, terrace, etc.): swale Local relief (concave, convex, none): concave

Slope (%): 0-1 Lat: 43.04095662 Long: -88.07385907 Datum: WGS 84

Soil Map Unit Name: Sebewa silt loam, 0-2% slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Antecedent rainfall documentation worksheet caculations resulted in a weighted condition value sum of 11 indicating precipitation is normal for this region and time period.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Acer negundo*	50	Yes	FAC
2. *Populus deltoides*	10	No	FAC
3.			
4.			
5.			
	60	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. *Acer saccharum*	5	Yes	FACU
2.			
3.			
4.			
5.			
	5	=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Alliaria petiolata*	10	Yes	FAC
2. *Glechoma hederacea*	10	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	20	=Total Cover	
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	70	x 3 =	210
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	85 (A)		270 (B)

Prevalence Index = B/A = 3.18

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR 2/1	100					Muck	
20-26	10YR 2/1	85	5YR 3/4	15	C	M	Peat	decomposed OM, snail shells present
26-30	10YR 7/1	100					Loamy/Clayey	layer of marl/weathered snail shells

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- [X] Histosol (A1)
- [ ] Histic Epipedon (A2)
- [X] Black Histic (A3)
- [ ] Hydrogen Sulfide (A4)
- [ ] Stratified Layers (A5)
- [X] 2 cm Muck (A10)
- [ ] Depleted Below Dark Surface (A11)
- [ ] Thick Dark Surface (A12)
- [ ] Sandy Mucky Mineral (S1)
- [ ] 5 cm Mucky Peat or Peat (S3)
- [ ] Sandy Gleyed Matrix (S4)
- [ ] Sandy Redox (S5)
- [ ] Stripped Matrix (S6)
- [ ] Dark Surface (S7)
- [ ] Loamy Mucky Mineral (F1)
- [ ] Loamy Gleyed Matrix (F2)
- [ ] Depleted Matrix (F3)
- [ ] Redox Dark Surface (F6)
- [ ] Depleted Dark Surface (F7)
- [ ] Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- [ ] Coast Prairie Redox (A16)
- [ ] Iron-Manganese Masses (F12)
- [ ] Red Parent Material (F21)
- [ ] Very Shallow Dark Surface (F22)
- [ ] Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type:

Depth (inches):

Hydric Soil Present? **Yes** X **No**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [ ] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] True Aquatic Plants (B14)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres on Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Gauge or Well Data (D9)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Drainage Patterns (B10)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [ ] Stunted or Stressed Plants (D1)
- [X] Geomorphic Position (D2)
- [ ] FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes	No X	Depth (inches):
Water Table Present?	Yes	No X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes	No X	Depth (inches):

Wetland Hydrology Present? **Yes** **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: 17-0908/Elm Grove Campus Redevelopment City/County: Elm Grove/Waukesha Sampling Date: 4/16/2020

Applicant/Owner: Mandel Group/School Sisters of Notre Dame State: WI Sampling Point: DP4

Investigator(s): Matt Parsons Section, Township, Range: Sec. 25, T7N, R20E

Landform (hillside, terrace, etc.): swale Local relief (concave, convex, none): concave

Slope (%): 1-2 Lat: 43.04320779 Long: -88.07319069 Datum: WGS 84

Soil Map Unit Name: Casco loam, 2-6% slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation X , Soil X , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____ , Soil ____ , or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Antecedent rainfall documentation worksheet caculations resulted in a weighted condition value sum of 11 indicating precipitation is normal for this region and time period. Veg and soil significantly disturbed (see remarks).

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. *Pinus strobus*	35	Yes	FACU
2. *Acer saccharum*	15	Yes	FACU
3. *Populus alba*	10	No	UPL
4.			
5.			
	60	=Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Herb Stratum (Plot size: 5')			
1. *Poa pratensis*	50	Yes	FAC
2. *Taraxacum officinale*	10	No	FACU
3. *Glechoma hederacea*	3	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	63	=Total Cover	
Woody Vine Stratum (Plot size: 15')			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	63	x 4 =	252
UPL species	10	x 5 =	50
Column Totals:	123 (A)		452 (B)
Prevalence Index = B/A =			3.67

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation

____ 2 - Dominance Test is >50%

____ 3 - Prevalence Index is ≤3.0[1]

____ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)
Veg disturbed due to maintenance of artificial turfgrass/landscaped plant community.

SOIL

Sampling Point: DP4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	100					Loamy/Clayey	loam
5-20	10YR 3/4	100					Loamy/Clayey	likely historic fill

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ 2 cm Muck (A10)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 5 cm Mucky Peat or Peat (S3)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ Iron-Manganese Masses (F12)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

Soil disturbed due to presence of potential historic fill.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)

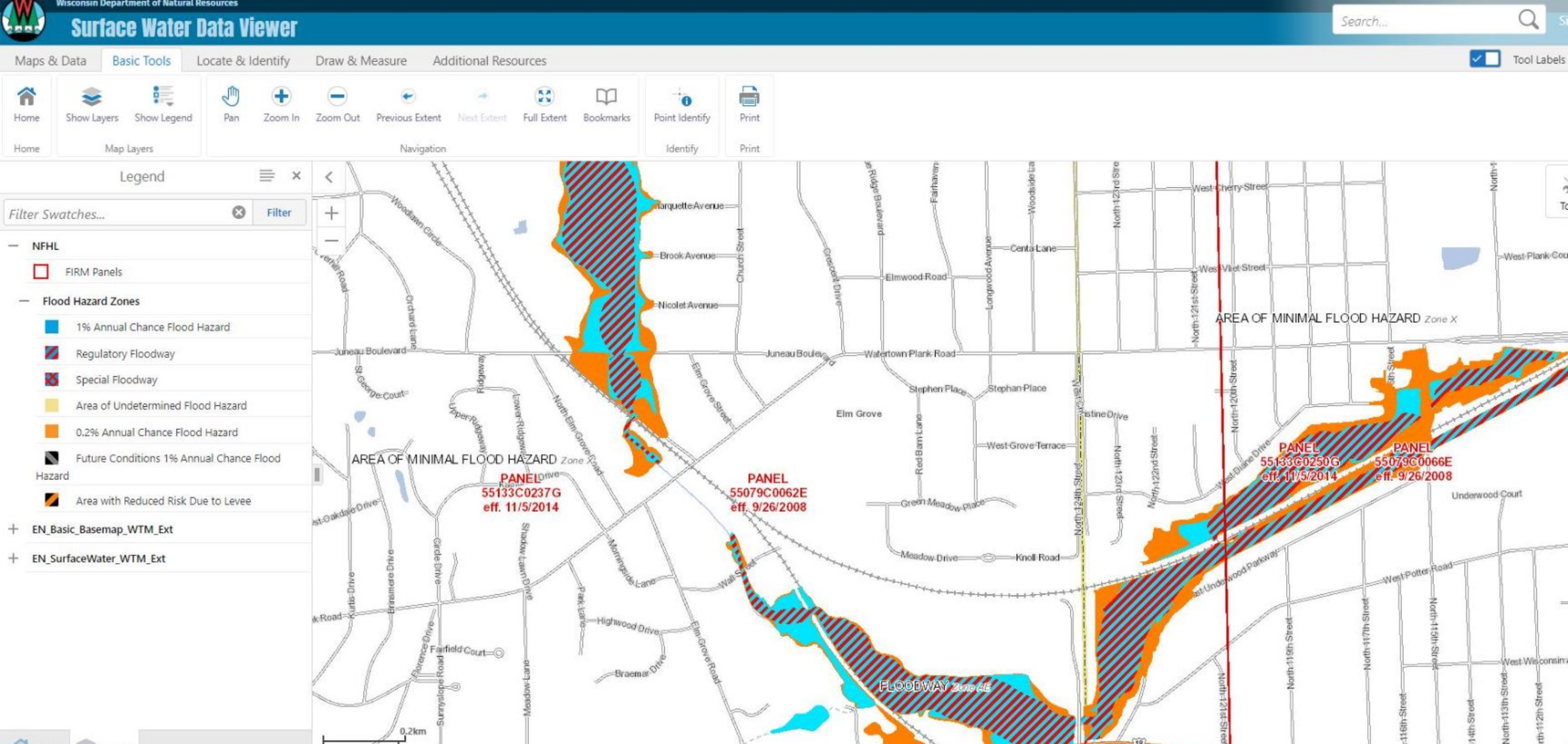
Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:


Wisconsin Department of Natural Resources
Surface Water Data Viewer
Search...
Maps & Data
Basic Tools
Locate & Identify
Draw & Measure
Additional Resources
Tool Labels
Home
Show Layers
Show Legend
Pan
Zoom In
Zoom Out
Previous Extent
Next Extent
Full Extent
Bookmarks
Point Identify
Print
Map Layers
Navigation
Identify
Legend
Filter Swatches...
Filter
NFHL
FIRM Panels
Flood Hazard Zones
1% Annual Chance Flood Hazard
Regulatory Floodway
Special Floodway
Area of Undetermined Flood Hazard
0.2% Annual Chance Flood Hazard
Future Conditions 1% Annual Chance Flood Hazard
Area with Reduced Risk Due to Levee
EN_Basic_Basemap_WTM_Ext
EN_SurfaceWater_WTM_Ext
AREA OF MINIMAL FLOOD HAZARD Zone X
AREA OF MINIMAL FLOOD HAZARD Zone X
PANEL 55133C0237G eff. 11/5/2014
PANEL 55079C0062E eff. 9/26/2008
PANEL 55133C0250G eff. 11/5/2014
PANEL 55079C0066E eff. 9/26/2008
FLOODWAY Zone AE
Marquette Avenue
Brook Avenue
Nicolet Avenue
Juneau Boulevard
Watertown Plank Road
Elmwood Road
Elm Grove
Stephen Place
Stephan Place
West Grove Terrace
Green Meadow Place
Meadow Drive
Knoll Road
West Cherry Street
West Vliet Street
West Plank Road
North 120th Street
North 124th Street
North 123rd Street
North 122nd Street
North 121st Street
Underwood Court
West Underwood Parkway
West Potter Road
North 119th Street
North 117th Street
North 116th Street
North 114th Street
North 113th Street
West Wisconsin
Church Street
Elm Grove Road
Longwood Avenue
Centa Lane
Woodside La
Farhaven
Ridge Boulevard
Crescent Drive
Woodlawn Circle
Orchard Lane
St George Court
Ridgeway
Upper Ridgeway
Lower Ridgeway
North Elm Grove Road
Elm Grove Street
Red Barn Lane
Christine Drive
West Blaine Drive
Wall Street
Shadow Lawn Drive
Meadow Lane
Monmouth Lane
Park Lane
Highwood Drive
Braemar Drive
Fairfield Court
Florence Drive
Sunnyslope Road
Curtis Drive
Brimmore Drive
Garde Drive
West Oakdale Drive
0.2km

United States Department of Agriculture

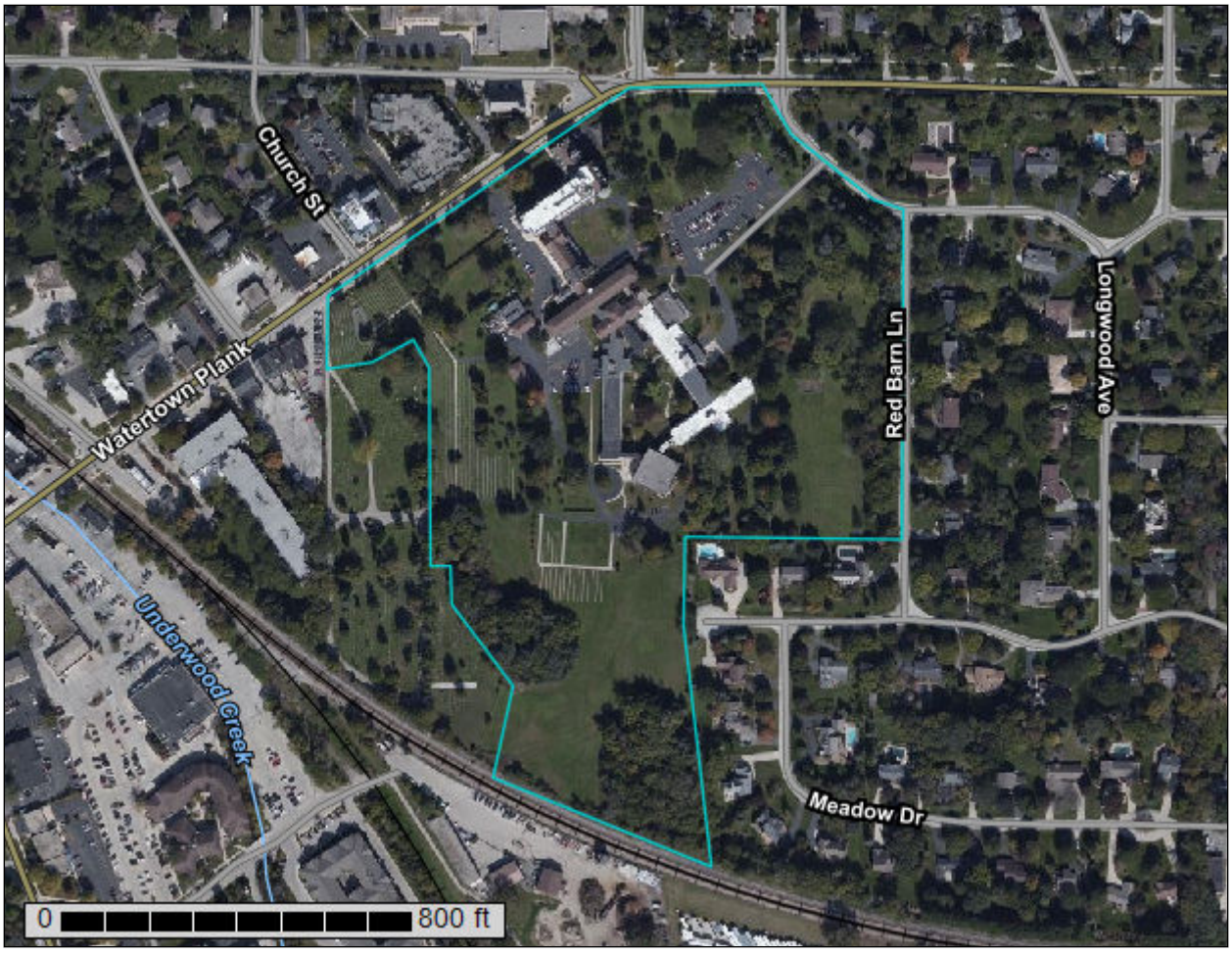
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Milwaukee and Waukesha Counties, Wisconsin

SSND Soil Map



November 17, 2020

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:3,180 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

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

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

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

Background
- Aerial Photography

MAP INFORMATION

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

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

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

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

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

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

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

Soil Survey Area: Milwaukee and Waukesha Counties, Wisconsin
Survey Area Data: Version 16, Jun 8, 2020

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

Date(s) aerial images were photographed: Aug 1, 2019—Oct 12, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CeB	Casco loam, 2 to 6 percent slopes	14.0	45.3%
Cv	Clayey land	1.8	5.9%
GP	Gravel pit	1.8	5.8%
MmA	Matherton silt loam, 1 to 3 percent slopes	4.2	13.5%
OuB	Ozaukee silt loam, high carbonate substratum, 2 to 6 percent slopes	8.5	27.5%
Sm	Sebewa silt loam, 0 to 2 percent slopes	0.6	2.1%
Totals for Area of Interest		**31.0**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it

was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Milwaukee and Waukesha Counties, Wisconsin

CeB—Casco loam, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2tjw7
Elevation: 800 to 1,140 feet
Mean annual precipitation: 29 to 35 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 134 to 192 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Casco and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Casco

Setting

Landform: Outwash plains
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy alluvium over calcareous, stratified sandy and gravelly outwash

Typical profile

Ap - 0 to 8 inches: loam
Bt - 8 to 17 inches: clay loam
2C - 17 to 79 inches: stratified sand to gravel

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 11 to 20 inches to strongly contrasting textural stratification
Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Forage suitability group: Low AWC, adequately drained (G095BY002WI)
Other vegetative classification: Low AWC, adequately drained (G095BY002WI)
Hydric soil rating: No

Minor Components

Fox

Percent of map unit: 8 percent
Landform: Outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Boyer

Percent of map unit: 7 percent
Landform: Outwash plains
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

Cv—Clayey land

Map Unit Setting

National map unit symbol: g936
Elevation: 670 to 1,100 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 37 to 55 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Clayey land and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Clayey Land

Setting

Parent material: Clayey mine spoil or earthy fill

Typical profile

H1 - 0 to 10 inches: clay loam

Properties and qualities

Slope: 1 to 12 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 12 to 80 inches
Frequency of flooding: None
Frequency of ponding: None

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Ashkum

Percent of map unit: 10 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

GP—Gravel pit

Map Unit Setting

National map unit symbol: sjky
Elevation: 660 to 980 feet
Mean annual precipitation: 30 to 38 inches
Mean annual air temperature: 43 to 48 degrees F
Frost-free period: 150 to 190 days
Farmland classification: Not prime farmland

Map Unit Composition

Pits, gravel: 99 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits, Gravel

Setting

Parent material: Gravelly outwash

Typical profile

H1 - 0 to 10 inches: stratified extremely gravelly coarse sand to very gravelly sand

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Other vegetative classification: Not Assigned (other map units) (Noth)
Hydric soil rating: Unranked

Minor Components

Aquents

Percent of map unit: 1 percent
Landform: Depressions

Landform position (three-dimensional): Dip
Hydric soil rating: Yes

MmA—Matherton silt loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: g950
Elevation: 670 to 1,100 feet
Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 37 to 55 degrees F
Frost-free period: 135 to 170 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Matherton and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Matherton

Setting

Landform: Drainageways
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy glaciofluvial deposits over stratified sandy and gravelly outwash

Typical profile

A,E - 0 to 11 inches: silt loam
EBg,Btg,Bt - 11 to 35 inches: sandy clay loam
2Cg - 35 to 60 inches: Error

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: Occasional
Calcium carbonate, maximum content: 25 percent
Available water capacity: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Forage suitability group: Mod AWC, high water table (G095BY004WI)
Other vegetative classification: Mod AWC, high water table (G095BY004WI)

Hydric soil rating: No

Minor Components

Sebewa

Percent of map unit: 7 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Concave
Hydric soil rating: Yes

Fox

Percent of map unit: 3 percent
Landform: Rises
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Convex
Hydric soil rating: No

OuB—Ozaukee silt loam, high carbonate substratum, 2 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2sn09
Elevation: 650 to 1,010 feet
Mean annual precipitation: 31 to 39 inches
Mean annual air temperature: 44 to 49 degrees F
Frost-free period: 125 to 185 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Ozaukee, high carbonate substratum, and similar soils: 96 percent
Minor components: 4 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ozaukee, High Carbonate Substratum

Setting

Landform: End moraines, ground moraines
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Thin mantle of loess over silty and clayey till

Typical profile

Ap - 0 to 8 inches: silt loam
E - 8 to 10 inches: silt loam
Bt1 - 10 to 13 inches: silty clay loam
2Bt2 - 13 to 23 inches: silty clay

2Bt3 - 23 to 29 inches: silty clay loam
2Cd - 29 to 60 inches: silty clay loam

Properties and qualities

Slope: 2 to 6 percent
Depth to restrictive feature: 23 to 40 inches to densic material
Drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 24 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 60 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Low (about 4.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: F110XY012IL - Moist Glacial Drift Upland Forest
Hydric soil rating: No

Minor Components

Ashkum, drained

Percent of map unit: 2 percent
Landform: Ground moraines, end moraines
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear
Across-slope shape: Concave
Ecological site: R110XY024IL - Ponded Depressional Sedge Meadow
Hydric soil rating: Yes

Orthents, clayey

Percent of map unit: 1 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Interfluve
Down-slope shape: Convex
Across-slope shape: Convex
Hydric soil rating: No

Urban land

Percent of map unit: 1 percent
Landform: Ground moraines
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Interfluve
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Sm—Sebewa silt loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: 2szfk
Elevation: 780 to 1,140 feet
Mean annual precipitation: 29 to 35 inches
Mean annual air temperature: 45 to 48 degrees F
Frost-free period: 124 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Sebewa and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sebewa

Setting

Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Loamy outwash over sandy and gravelly outwash

Typical profile

Ap - 0 to 11 inches: silt loam
Btg - 11 to 27 inches: clay loam
2Cg - 27 to 79 inches: coarse sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 24 to 30 inches to strongly contrasting textural stratification
Drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: About 0 to 12 inches
Frequency of flooding: NoneFrequent
Frequency of ponding: Frequent
Calcium carbonate, maximum content: 25 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Low (about 5.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: B/D
Hydric soil rating: Yes

Minor Components

Adrian

Percent of map unit: 6 percent
Landform: Lakebeds (relict)
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Ionia

Percent of map unit: 3 percent
Landform: Rises
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Linear
Hydric soil rating: No

Fox

Percent of map unit: 1 percent
Landform: Rises
Landform position (two-dimensional): Shoulder
Landform position (three-dimensional): Crest
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F110XY011IL - Dry Glacial Drift Upland Forest
Hydric soil rating: No

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NATURAL AND HISTORICAL RESOURCES ASSESSMENT

SCHOOL SISTERS OF NOTRE DAME CAMPUS
ELM GROVE, WISCONSIN





MAY 2020

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ELM GROVE, WISCONSIN

PREPARED FOR
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INTRODUCTION

The Mandel Group retained Applied Ecological Services, Inc. (AES) to evaluate the existing natural and historical resources of the 30-acre School Sisters of Notre Dame (SSND) campus as part of a due diligence process for a campus redevelopment proposal. The SSND campus is located to the south of Watertown Plank Road, immediately east of the village center of Elm Grove, Waukesha County, Wisconsin (Exhibit 1).

The SSND property consists of a series of eleven buildings, seven of which are registered as contributing elements under the National Register of Historic Places. The campus grounds consist of a historic cemetery, mowed turf grass lawn with scattered mature trees, and three small degraded wooded parcels.

NATURAL RESOURCES INVENTORY

On March 5 and March 11, 2020, AES ecologists visited the SSND site to conduct a Natural Resources Inventory (NRI) and to document existing conditions at the property. AES had previously visited and photographed the site on October 10, 2017 to rapidly assess existing vegetation zones and tree species present on site. A selection of the 2017 site photographs are found in Appendix B. Drawing from these on-site investigations, several landcover units are described and mapped along with dominant plant species. A cemetery located on the property, but outside of the project area, was not evaluated as part of this process.

According to the Waukesha County Soil Survey, the dominant soils occurring on the SSND property consist of silt loams. The site contains four major soil types; Ozaukee silt loam, Casco loam, Matherton silt loam, and Sehewa silt loam (Exhibit 2). Sehewa and Matherton soils are classified as hydric soils.

No wetlands are identified in either the National Wetland Inventory (Exhibit 3) or the Wisconsin Department of Natural Resources (WDNR) Wetland Inventory. AES completed a field investigation of the SSND property during the spring growing season to determine the existence and extent of wetlands. In our professional opinion, no jurisdictional wetlands exist on the SSND property (see Appendix D).

The topography of the School Sisters of Notre Dame property is relatively flat with the highest elevation to the north along Watertown Plank Road and the lowest in the woodland on the southeast corner (Exhibit 5). The two larger wooded areas have been previously classified as gravel pits. The entire property is located outside of a regulatory floodplain (Exhibit 6).

The project area is divided into 4 land cover units (LCU) consisting of open mown lawn areas with scattered mature trees and 3 degraded wooded areas dominated by low quality and invasive trees and shrubs. The landcover units are described below and on the landcover map at Appendix A.

LCU 1 - Lawn

The majority of the SSND project area consists of mowed turf grass lawns with a variety of mature evergreen and hardwood trees (Appendix A, B). Norway spruce (*Picea abies*), blue spruce (*Picea pungens*), and eastern white pine (*Pinus strobus*) comprise the majority of the evergreens and are planted in rows along the roadside in the northeast corner of the property as well as in scattered groups throughout. Hardwood trees including box elder (*Acer negundo*), silver maple (*Acer saccharinum*), red oak (*Quercus rubra*), sycamore (*Platanus occidentalis*), American elm (*Ulmus americana*), and American basswood (*Tilia americana*) have been planted throughout the lawns. Many of the American elms have been inoculated against Dutch Elm Disease, but several were noted to be in poor condition. Smaller trees including crab apple trees and landscape cultivars are also scattered throughout the property.

LCU 2 – Western Woodland

The western woodland is described as a gravel pit on the Waukesha County Soil Survey (Exhibit 2). It is bordered by a public cemetery to the west, the School Sister's cemetery to the north, and turf grass to the east and south (Appendix A, B). This area has been used to dispose of landscape debris with large piles of branches, leaves, and non-biodegradable debris such as bricks and a fishpond liner.

Vegetation within the woodland include low quality trees and shrubs such as box elder, common buckthorn (*Rhamnus cathartica*), and honeysuckle (*Lonicera tatarica*). Sparse creeping charlie

(*Glechoma hederacea*) and dame's rocket (*Hesperis matronalis*) are scattered throughout the nearly bare ground layer.

On the northern portion of the woodland, a drainage pipe empties into a narrow channel. The water flows south and terminates into a small depressional basin north of the debris piles. Vegetation in the drainageway is mostly upland, including creeping charlie and dame's rocket. Vegetation in the small basin where the drainage ends is comprised almost entirely of box elder. There is no evidence of prolonged ponding in the basin.

LCU 3 – Southeastern Woodland

The southeastern woodland is in the southeastern corner of the SSND property (Appendix A, B). It is bordered by mowed turf lawn on the west and north, railroad tracks to the south, and a residential neighborhood on the east.

Like the western woodland, the southeastern woodland is located on an old gravel pit. It was also once used for landscape dumping, but weedy woody species such as common buckthorn and honeysuckle have since grown on top of the debris piles. Additionally, box elder trees dominate the canopy and creeping charlie and dame's rocket are sparsely scattered throughout the ground layer. A few high-quality hackberry trees are also located in the northern portion of the woodland.

LCU 4 – Eastern Woodland

The eastern woodland is the smallest woodland and is located on the eastern edge of the property along Red Barn Lane. This woodland is bordered by mowed turf grass with mature planted trees and the School Sister's vegetable garden. Like the other two woodlands, this area has also been used to dump leaf and garden debris. Also like the other woodlands, this woodland is dominated by low quality tree species such as box elder, common buckthorn, and honeysuckle.

TREE SURVEY

On March 5 and March 11, 2020, AES conducted a tree survey of 1) all trees with a diameter at breast height (DBH) of twelve inches or greater and 2) of all high-quality trees over 6 inches DBH. A table summarizing the 400 trees by species is in Table 1. The complete inventory of surveyed trees and their locations is in Appendix C. All surveyed trees were marked with a metal number tag and geolocated with a Trimble submeter GPS unit. Most of the trees on the site are low quality or non-native, including box elders, green ash (*Fraxinus pennsylvanica*), Norway maple, and white cedar (*Thuja occidentalis*). There is also a variety of pine and spruce species such as Norway spruce, blue spruce, and eastern white pine.

AES recommends preserving 123 of 400 surveyed trees for preservation. Reasons include conditions and size of the tree, cultural significance, or ecological values such as wildlife habitat or pollinator benefits. For example, neighbors have reported owls in the south woodlands. AES ecologists noticed one owl, likely a Great-horned owl, while on site. AES has identified mature native trees that may serve as owl nesting sites or hunting perches ("wolf" trees). For cultural significance, at least one of the four large red oak trees are in the northeast portion of the site predates the establishment of the convent. American elm trees are culturally significant due to being Elm Grove's namesake, and many of the elm trees on the property have been inoculated against Dutch Elm Disease. However, 3 of the 22 American elm trees shows evidence of infection. Other tree species recommended for preservation include native hardwood species such as Black walnut and Ironwood. A complete schedule and map of recommended trees to preserve is also found in Appendix C.

Table 1. Summary List of Trees by Species

Count	Abbreviation	Scientific Name	Common Name
2	abicon	*Abies concolor*	White fir
103	aceneg	*Acer negundo*	Box elder
11	acepla	*Acer platanoides*	Norway maple
3	acesai	*Acer saccharinum*	Silver maple
23	acesau	*Acer saccharum*	Sugar maple
3	aesgla	*Aesculus glabra*	Ohio buckeye
4	apple	*Malus pumila*	Apple
1	betpap	*Betula papyrifera*	Paper birch
2	catspe	*Catalpa speciosa*	Northern Catalpa
4	celocc	*Celtis occidentalis*	Hackberry
1	crus sp	*Crataegus sp.*	Hawthorn
12	frapen	*Fraxinus pennsylvanica*	Green ash
6	gletri	*Gleditsia triacanthos*	Honey locust
11	jugnig	*Juglans nigra*	Black walnut
7	moralb	*Morus alba*	White mulberry
1	ostvir	*Ostrya virginiana*	Ironwood or Hop hornbeam
83	picabi	*Picea abies*	Norway spruce
7	picgla	*Picea glauca*	White spruce
36	picpun	*Picea pungens*	Blue spruce
4	pinres	*Pinus resinosa*	Red pine
11	pinstr	*Pinus strobus*	Eastern white pine
2	plaocc	*Platanus occidentalis*	Sycamore
1	popalb	*Populus alba*	White poplar
8	popdel	*Populus deltoides*	Cottonwood
1	popgra	*Populus grandidentata*	Big-tooth aspen
7	pruser	*Prunus serotina*	Wild black cherry
1	psemen	*Pseudostuga menziesii var. glauca*	Rocky Mountain Douglas-fir
4	querub	*Quercus rubra*	Red oak
1	robpse	*Robinia pseudoacacia*	Black locust
4	thuocc	*Thuja occidentalis*	Arbor vitae
9	tilame	*Tilia americana*	Basswood
22	ulmame	*Ulmus americana*	American elm
5	ulmrub	*Ulmus rubra*	Slippery elm

WETLAND DETERMINATION

On March 5, 2020, AES conducted a preliminary, off-season, wetland assessment at the SSND property. AES identified one small area in the western woodlands that had the potential to meet the regulatory definition of wetland. An AES ecologist certified as an Assured Wetland Delineator by the WDNR returned on April 16, 2020 to conduct a wetland determination/delineation during the growing season. From this investigation, it is the professional opinion of AES that no jurisdictional wetlands are present within the SSND property. However, note that the final decision

and disposition of the presence of wetlands, and their boundaries, lies with the regulatory agencies. The wetland investigation and professional opinion of AES are contained in the Non-Wetland Determination Report in Appendix D.



Figure 1: Surface topography and drainage (blue arrows) - SSND property.

SURFACE DRAINAGE

Surface topography of the SSND site shows a general drainage direction from north to south across the property, with distinct drainage pathways to the east and west of the buildings complex (Figure 1). An existing nearby series of hills to the northeast of the property act as a local drainage divide. Current drainage patterns are likely consistent with pre-development historic drainage patterns. The SSND property is within the drainage jurisdiction of the Milwaukee Metropolitan Sewerage District.

HISTORIC STREAM ASSESSMENT

AES analyzed historic records and aerial photographs to investigate the possible historic burying or relocation of surface water drainage features across the SSND site. The first analysis includes a review of the original Public Land Survey of Wisconsin records of the property. The SSND property is in the Northeast 1/4 of Section 25 of Township 7 North, Range 20 East (Figure 2). The Northwest corner of this Northeast 1/4 section is shown in a green dot on Figure 2.

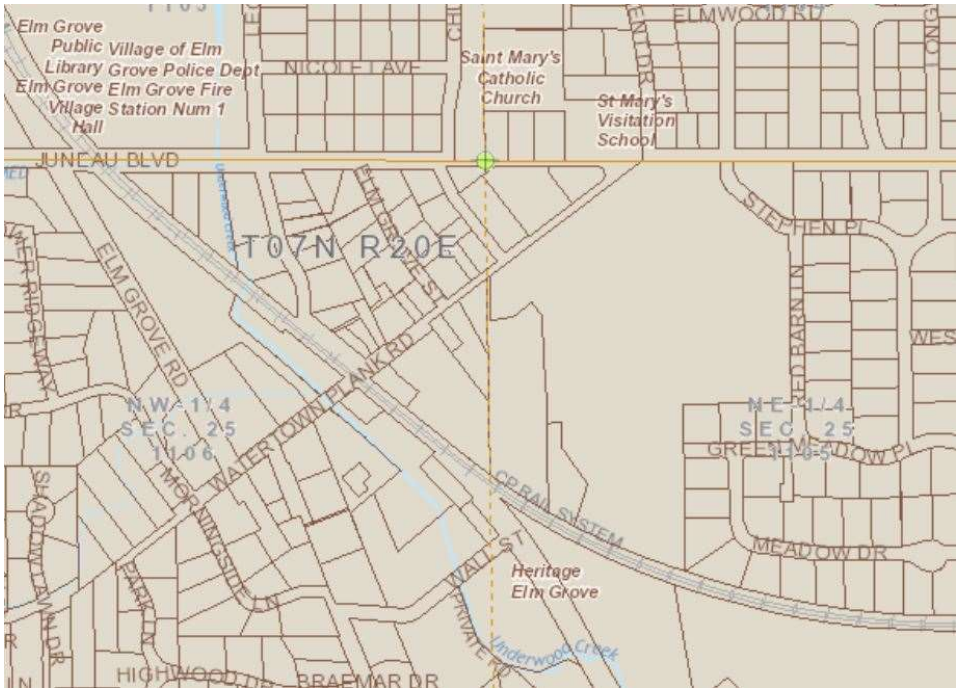


Figure 2. Public Land Survey location of SSND property.

The original Public Land Survey field notes were compiled by John H. Mullett in 1836. The survey map is shown in Figure 3. The notes describe significant natural or cultural features encountered either on or very near to section lines, such as streams and roads, but also includes noteworthy, large diameter “station trees.” The surveyors measured and marked these significant features by distance from the section corner-points, which were marked by driving in posts. Distances were measured in “chains and links.” One chain equals 66 feet, and there are 80 chains in one mile (the distance between section corner points).

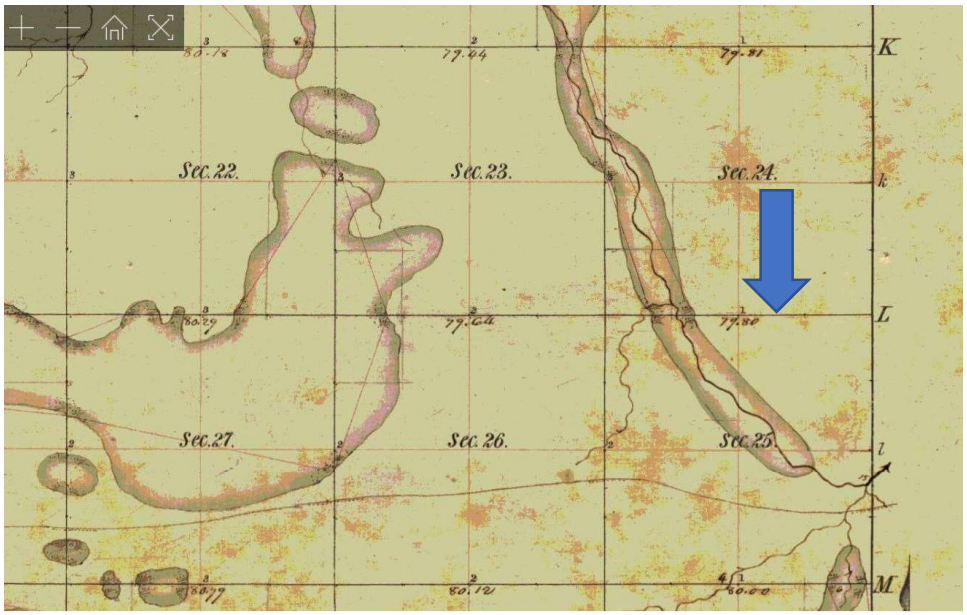
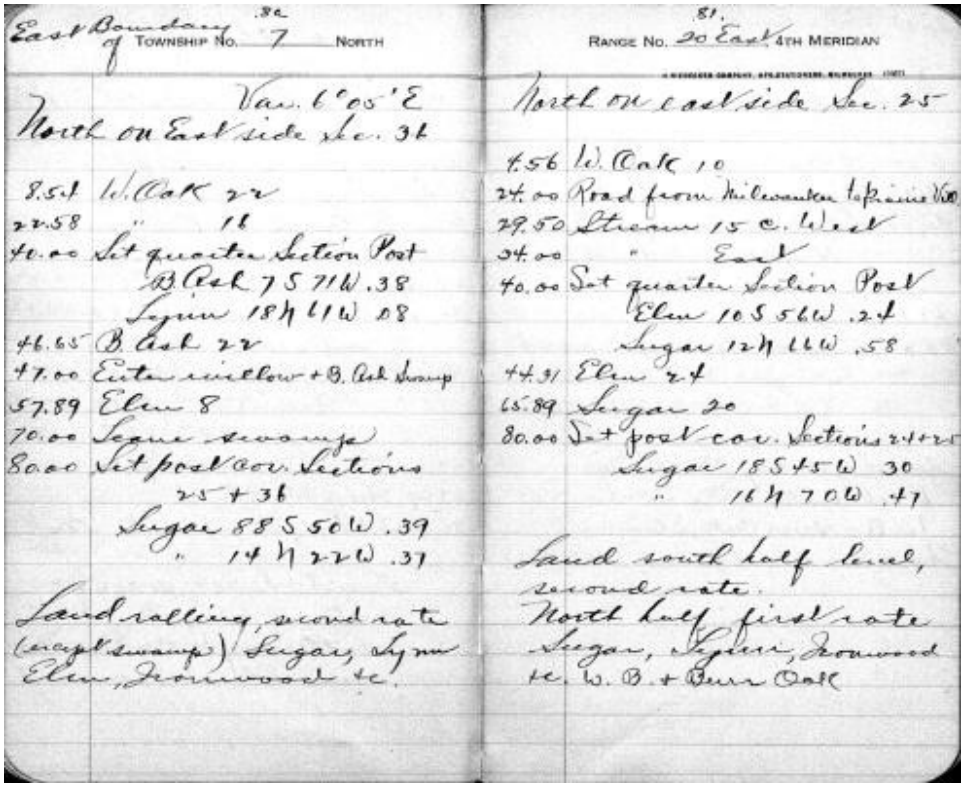


Figure 3: NE ¼ of Section 25 on survey cover map, with blue arrow showing approximate location of SSND property along Watertown Plank Road.

The field notes for the eastern boundary of Section 25 are shown on the right-hand page of Figure 4. The notes describe a “Stream” now known as Underwood Creek located along the eastern boundary of Section 25, going north from the capital letter “M” on the right side of the map, which can be seen on the survey map in Figure 3.


East Boundary of Township No. 7 North

Var. 6°05' E
North on East side Sec. 36
8.51 W. Oak 22
22.58 " 16
40.00 Set quarter Section Post
B Oak 7 S 71 W .38
Sugar 18 N 61 W .08
46.65 B Oak 22
47.00 Enter swallow + B. Oak Swamp
57.89 Elm 8
70.00 Segar swamp
80.00 Set post cor. Sections
25 + 36
Sugar 88 S 50 W .39
" 14 N 22 W .37

Land rolling, second rate (except swamp) Sugar, Hemlock Elm, Ironwood &c.

Range No. 20 East 4th Meridian

North on east side Sec. 25

4.56 W. Oak 10
24.00 Road from Milwaukee to Prairie Ville
29.50 Stream 15 c. West
34.00 " East
40.00 Set quarter Section Post
Elm 10 S 56 W .24
Sugar 12 N 66 W .58
44.31 Elm 24
65.89 Sugar 20
80.00 Set post cor. Sections 24+25
Sugar 18 S 45 W 30
" 16 N 70 W .47

Land south half level, second rate.
North half first rate
Sugar, Hemlock, Ironwood &c. W. B. + Burr Oak

Figure 4: Section 25 field notes: East boundary going north.

The public land survey notes for the northern boundary of Section 25 (left hand page of Figure 5) note that traveling east, the line crosses a “Spring course N.E.” followed by a “Creek S.E.”. These two features can be seen on Figure 3, both west of the blue arrow depicting the approximate location of the SSND property. The field notes add a “West Correction” in which the surveyor re-measured the line, this time traveling west from the eastern boundary of Section 25. In neither measurement does the surveyor note a spring or other surface water feature east of Underwood Creek. However, tree species adapted to hydric soil conditions are noted east of the creek, except for the red oak along the far eastern side of the Northern boundary of Section 25. The location of this red oak is east of the SSND property, and consistent with the topography along Watertown Plank Road as there is a ridge running across the road east of the SSDN property.

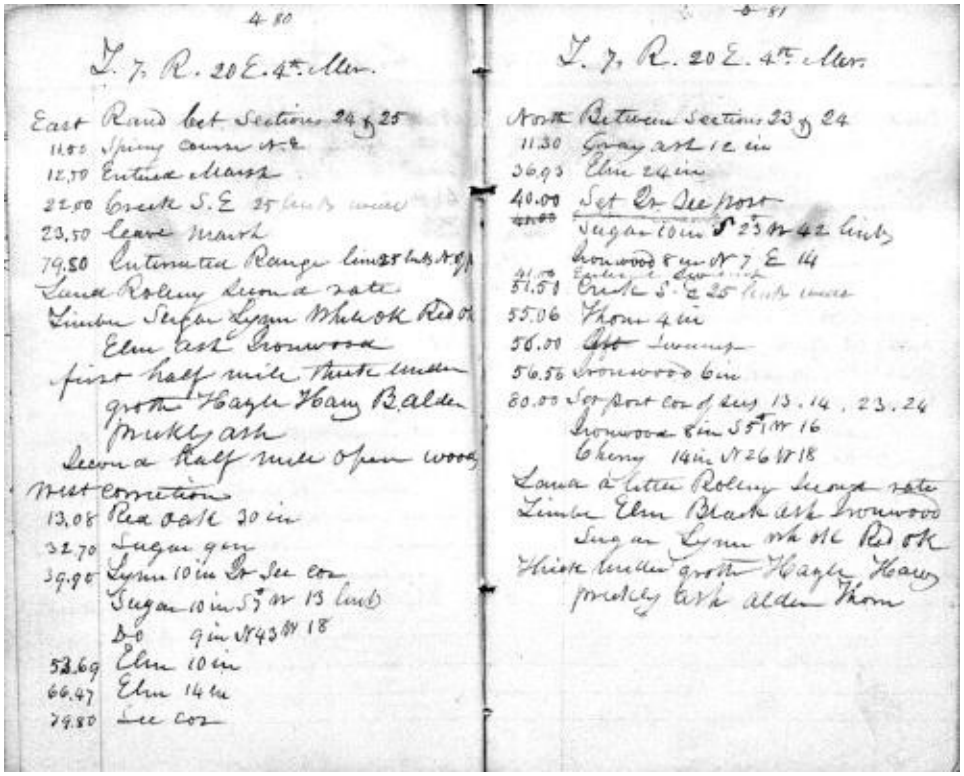


Figure 5: Section 25 field notes: North boundary corrected

AES also searched historic aerial imagery for the SSND property. An aerial image from 1937 with the approximate property boundary is shown in Figure 6. A known stream channel, Underwood Creek, is apparent as a dark squiggle running generally toward the southeast, in a location and direction consistent with the 1836 survey notes (see arrow A). While there is no readily apparent visual signature showing a permanent stream channel crossing the SSND site, there are subtle clues to historic drainage patterns and vegetation. Note also the darker signature of vegetation in the areas adjacent to Underwood Creek, as well as the random scattering of dark spots (trees) along the creek (see arrow B). These are the signatures of both wetter soil conditions present at the time of the photo was taken and pre-settlement patterns of tree locations on the landscape. These patterns can be used to recognize other similar, remnant conditions in the area.

Two other locations exhibit remnant feature patterning on the 1937 aerial image. First, note the random scattering of trees and darker vegetation northeast of the SSND property boundary and juxtaposed across the Watertown Plank Road from the rectilinear signature of an orchard (see arrow C). This pattern points in a southeast direction, consistent with the topographic drainage pattern of the site. Second, a signature of darker, wetter soil conditions runs to the southeast from

the southwest gravel pit area (see arrow D). Note that this darker linear feature points across the railroad tracks, directly at a bend in Underwood Creek. Again, this is consistent with current surface topography, and was likely the historic drainage pattern connecting to Underwood Creek before being bisected by the railroad tracks. This pattern is also consistent with the presence of hydric soils and soils with hydric inclusions in this area in the same location and orientation. See Exhibit 2: Soils and Appendix D Non-Wetland Determination Figure 3: Soils.

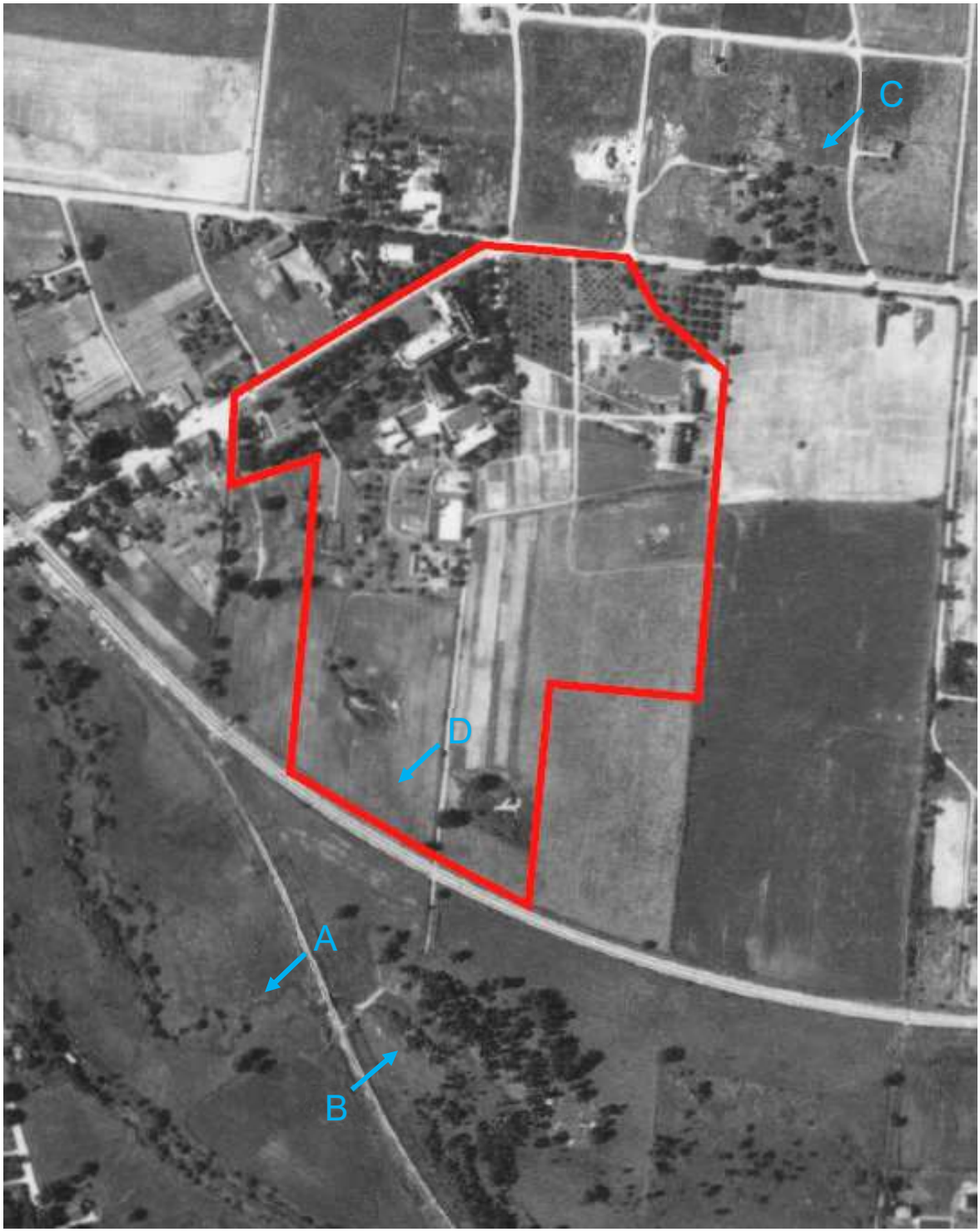


Figure 6: July 26, 1937 aerial image, approximate SSND property boundary in red.

Aerial images from 1937 and the show surface features adjacent to, and within, the SSND property which have modified the historic drainage patterns. These features include buildings, a historic gravel road running north to south through the property, and public roadways such as Watertown Plank Road and Stephen Place. Linear surface drainage off the shoulders of the old north-south gravel road were noted by AES during site visits.

Features beneath the surface may also be responsible for modifying hydrology across the site. Two sealed tunnels lead from Notre Dame Hall to the former farm buildings in the northeast portion of the site. Additionally, one village resident has indicated in private conversation that surface drainage across the property was captured in a below-ground storm sewer pipe in the 1970s. AES has not been able to locate a record of the location or size of such an underground storm sewer pipe. However, subsurface features including tunnels and pipes will need further investigation through the due diligence process.

AES will work with the project team to further investigate historic and current surface drainage and sub-surface drainage infrastructure. We will use the results of these investigations to inform the design of alternative stormwater management strategies throughout subsequent phases of the project.

ENDANGERED SPECIES ACT SECTION 7 REVIEW

Section 7 of the Endangered Species Act of 1973 was enacted to ensure that actions taken by the federal government (including approving permit applications) do not adversely impact listed endangered or threatened species. On March 4, 2020, AES conducted an on-line investigation following the United States Fish and Wildlife Service Section 7 Consultation website guidance (USFWSa) as described by the Information for Planning and Consultation project (USFWSb.) This investigation resulted in a list of four species which may have the potential to be affected by development activities at the SSND project site. The listed species include federally threatened Northern long-eared bat (*Myotis septentrionalis*), Poweshiek skipperling (*Oarism poweshiek*), Rusty-patched bumble bee (*Bombus affinis*), and Eastern prairie fringed orchid (*Platanthera leucophaea*). As described below, the listed species either do not occur on the SSND site, or any potential impacts can be avoided by adjusting the timing and location of construction activities in a few locations. AES concluded *no effect* to these species as a result of the project.

Northern long-eared bat (Myotis septentrionalis)

Northern long-eared bat (NLEB) typically roosts in trees from late spring through early fall and hibernates in caves and mines from late fall through early spring. Female NLEB and young are particularly vulnerable in June and July when the young are unable to fly. There are trees within the project footprint (some of which could provide roost sites for the NLEB) that will be removed as part of this project. Tree removal should take place outside of the June 1-July 31 NLEB pup season in order to avoid negative impacts.

Rusty patched bumble bee (Bombus affinis) (RPBB)

The project site is in a mapped High Potential Zone for the RPBB (Figure 7). However, the SSND site provides poor habitat for this species.

According to the USFWS' Interagency Cooperation Section 7 Voluntary Implementation Guidance for the RPBB (March 21, 2017), the RPBB is found in a variety of habitats such as prairie, woodlands and wetlands, but it "relies on diverse and abundant flowering plant species in proximity to areas that are predominantly free from ground-disturbing activities that may function as overwintering sites for hibernating queens." It also states that because overwinter queens

emerge early in the season, woodlands that support diverse early blooming spring flowers are an important habitat for the RPBB, especially when they are near open areas utilized for summer foraging. This species not only emerges early in the season but also goes into hibernation late in the season and requires a constant and diverse supply of flowers blooming throughout its long life cycle.

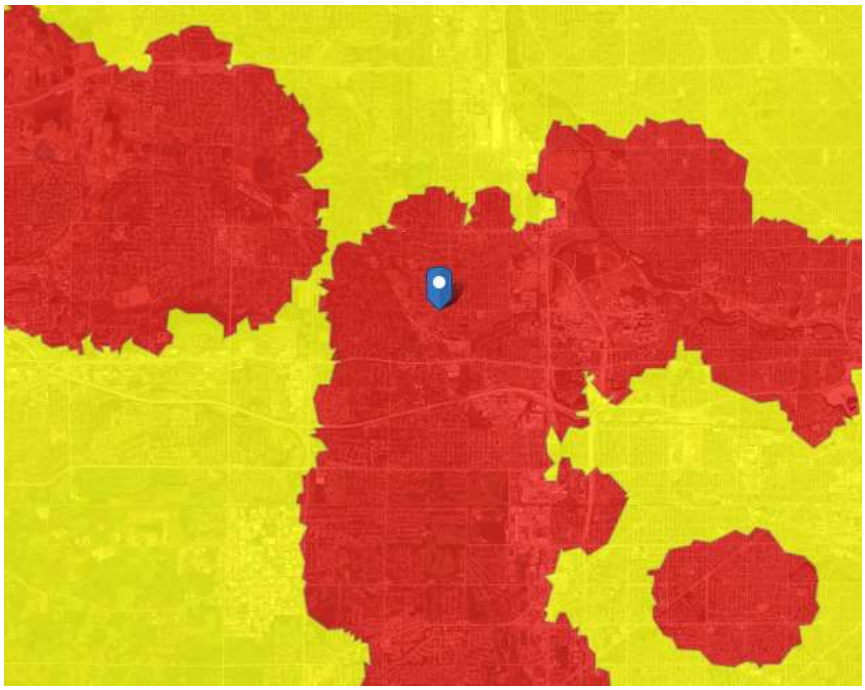


Figure 7. High potential zones for likely RPBB presence (USFWS, 2020)

The project area does not provide this type of habitat. Most of the site is mowed turf grass. The site also contains three degraded wooded areas with a variety of landscape fill and dominated by weedy and invasive woody species, such as box elder and common buckthorn. There is little to no flowering species within the project area to provide foraging habitat.

Poweshiek skipperling (Oarisma poweshiek)

Powershiek skipperling are found in native tallgrass prairies of north-central United States and south-central Canada. The USFWS identified 25,900 acres of critical habitat in the United States. No critical habitat for the Poweshiek skipperling is found within the SSND project area and tallgrass prairie habitat is not present.

Eastern prairie fringed orchid (Platanthera leucophaea)

Eastern prairie fringed orchid is found in high quality mesic to wet prairies, sedge meadows, marsh edges, and bogs. No high-quality habitat is found within the SSND project area. The project site consists of mowed turf grass and degraded wooded wetlands of low ecological quality.

WDNR ENDANGERED RESOURCES REVIEW

On April 13, 2020, AES conducted a certified Endangered Resources (ER) Review as required by the WDNR to ensure compliance with Wisconsin's Endangered Species Law. The review concluded that the project and a one-mile search buffer overlapped several state-listed species, including one rare plant community, four plants, two invertebrates, and two reptiles.

The WDNR agreed with the AES ER Certified Reviewer's conclusion that there is a lack of suitable habitat within the project boundary for the nine state-listed resources. However, the WDNR recommends voluntary habitat enhancement for the Rusty-patched bumblebee. This would include planting of spring ephemeral species of wildflowers as well as plants that flower throughout the growing season and late into the fall. To accomplish this, it would be necessary to develop a planting list and schematic of flowering species suitable for the Rusty-patched bumblebee. AES will take these recommendations into consideration while developing the native landscape design as part of this project.

NATIONALLY RECOGNIZED HISTORIC RESOURCES

The SSND property was purchased in 1856. By 1859 an orphanage/convent was completed, and a cemetery was established. The convent went through several periods of construction to accommodate the growing needs of the community.

The National Park Service's National Register of Historic Places (NRHP) is the official list of the Nation's historic places worthy of preservation. Authorized by the National Historic Preservation Act of 1966, the NRHP is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America's historic and archeological resources. (NPS 2020)

In 2011, the Visitation Convent Complex of the School Sisters of Notre Dame was registered with the NRHP. The boundary of the registered property includes all the buildings and the cemetery and encompasses *"the entire acreage of the parcel owned by the School Sisters of Notre Dame".*

Within this boundary, 7 buildings, 2 objects, 2 structures, and 1 site are listed as contributing elements to the significance of the property (Appendix E). The contributing historic buildings are as follows:

1. Visitation Convent/Notre Dame Hall (1899)
2. Marianum/Maria Hall (1921)
3. Guardian Angel Home (Orphanage)/ Andrina Hall (Circa 1903:1933)
4. The Bungalow/Mary Basil Hall (1921)
5. Boiler House/Caretaker's Residence (1920)
6. West Wing/ Caroline Hall (1955)
7. East Wing/ Theresa Hall (1959)

In addition to the buildings, 2 objects, 2 structures, and 1 site were registered as contributing elements to the NRHP application in 2011. These are briefly described below.

Our Lady of Lourdes Grotto (1926)
The grotto (Appendix B) was constructed in 1926 in dedication to Mary. The grotto is made out of rough fieldstone and houses statues of Mary and Bernadette.

Cemetery (Circa 1853) & Entrance Gates (Circa 1920s)
The cemetery at School Sisters of Notre Dame originated in 1853 and contains the graves of over 2,700 Sisters. Two stuccoed pillars framing and iron gate were added to the cemetery in the 1920s. (Appendix B)

Grape Arbor (1886)
The grape arbor (Appendix B) was built in 1886 and is comprised of rows of wooden posts and wires. The grapes were imported from Germany.

WORKS CITED

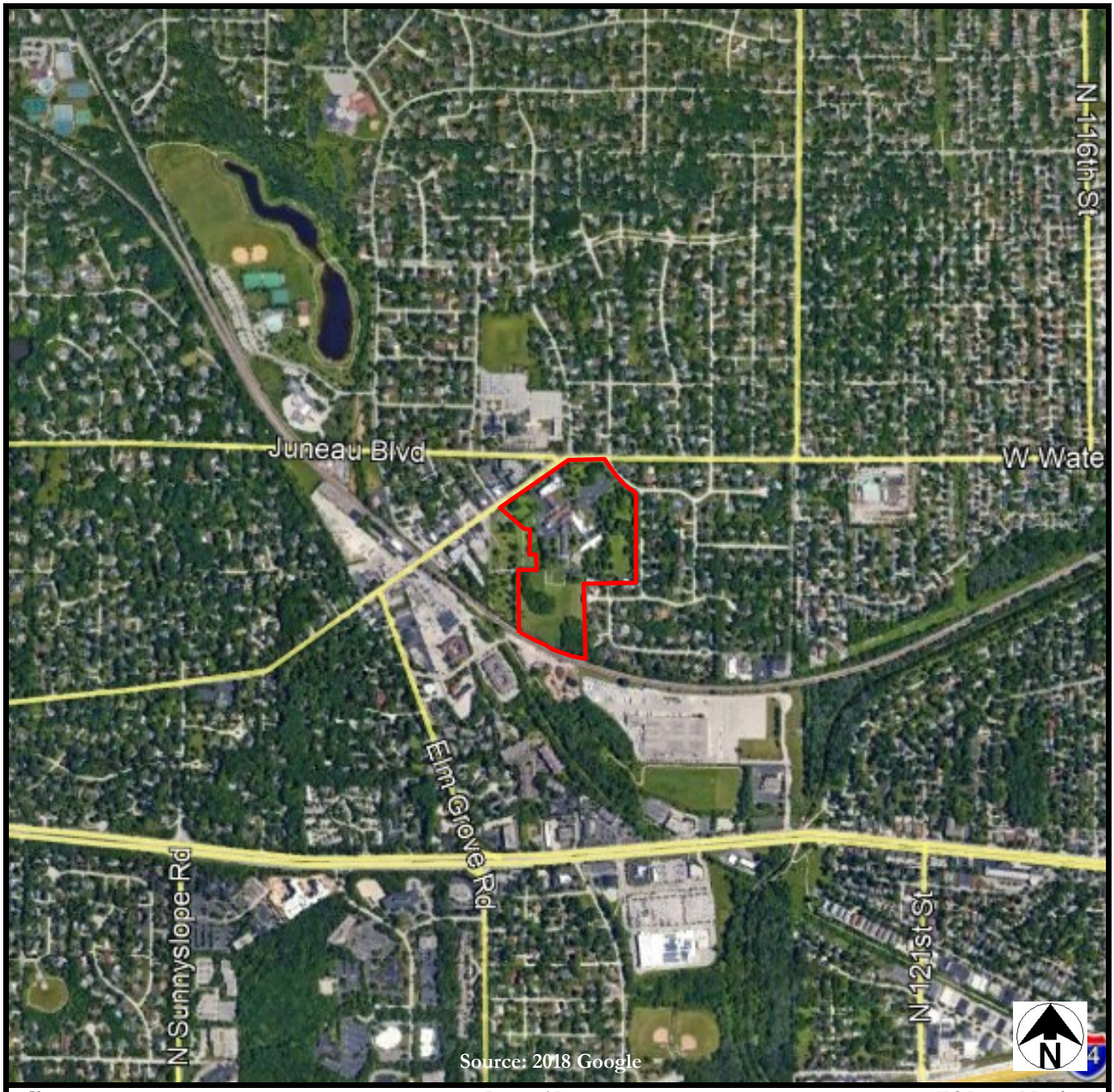
National Park Service (NPS). Register of Historic Places. Accessed March 25, 2019. https://www.nps.gov/subjects/nationalregister/database-research.htm#table

United States Department of Interior, National Park Service. Register of Historic Places Registration Form- Visitation Convent Complex. April, 2011

United States Fish and Wildlife Service (USFWSa). February 19, 2020. Rusty Patch Bumble Bee Map. Accessed March 25, 2020. https://www.fws.gov/midwest/endangered/insects/rpbb/rpbbmap.html

United States Fish and Wildlife Service (USFWSb) IPAC Information for Planning and Consultation. Accessed March 25, 2020. https://ecos.fws.gov/ipac/

EXHIBITS



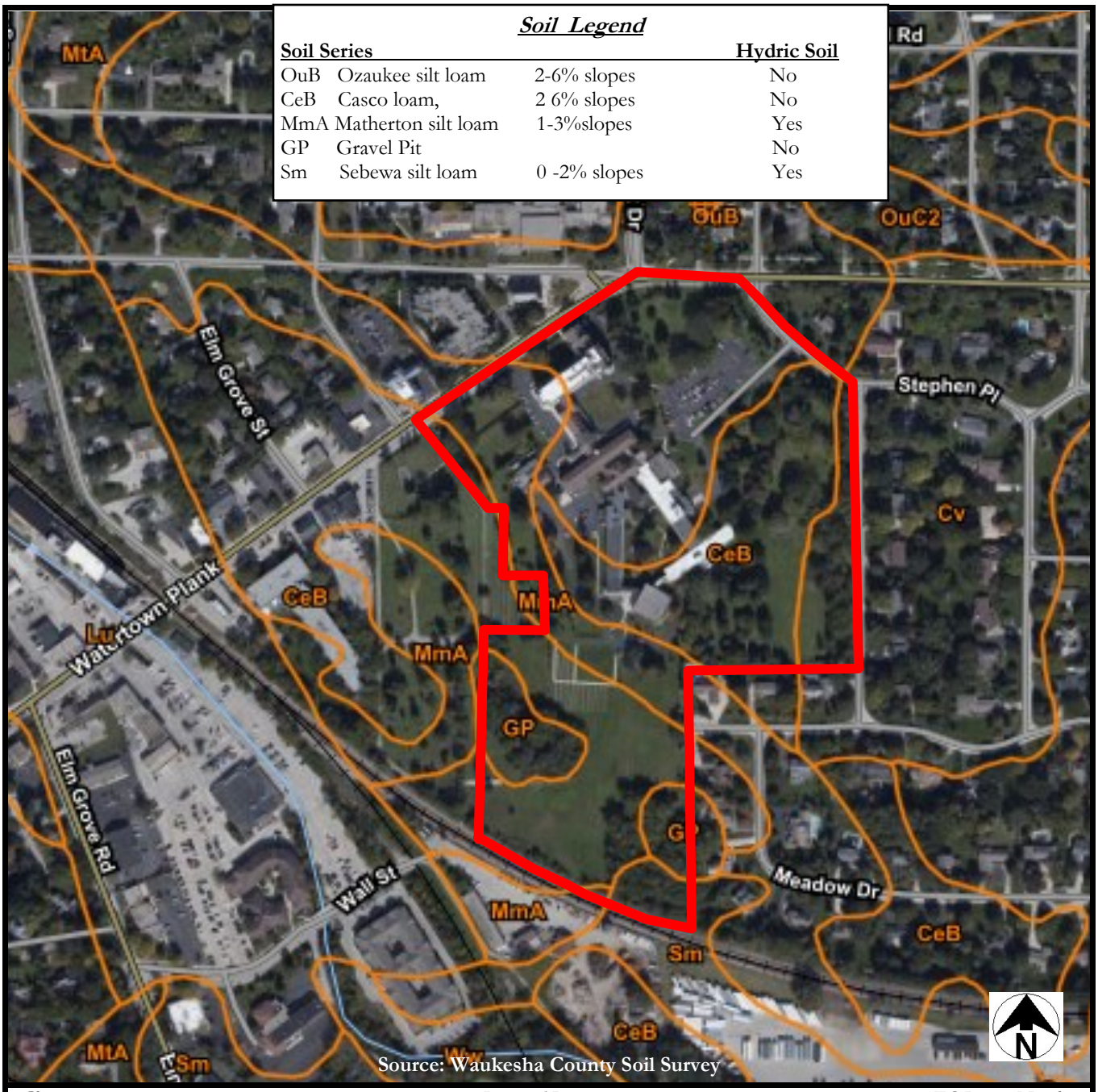
Client	*Proposed Project*	*AES Project Number*
Mandel Group	**Natural Resource Inventory**	**17-0908**

Site Identification	*County*	*State*
School Sisters of Notre Dame Elm Grove	**Waukesha**	**Wisconsin**

Applied Ecological Services, Inc.	*Scale* **Not to Scale** *Date* **3/17/2020**	***Exhibit Title*** **Location Map**	***Exhibit Number*** **1**

Soil Legend

Soil Series			Hydric Soil
OuB	Ozaukee silt loam	2-6% slopes	No
CeB	Casco loam,	2 6% slopes	No
MmA	Matherton silt loam	1-3%slopes	Yes
GP	Gravel Pit		No
Sm	Sebewa silt loam	0 -2% slopes	Yes



Client	*Proposed Project*	*AES Project Number*
Mandel Group	**Natural Resource Inventory**	**17-0908**

Site Identification	*County*	*State*
School Sisters of Notre Dame Elm Grove	**Waukesha**	**Wisconsin**

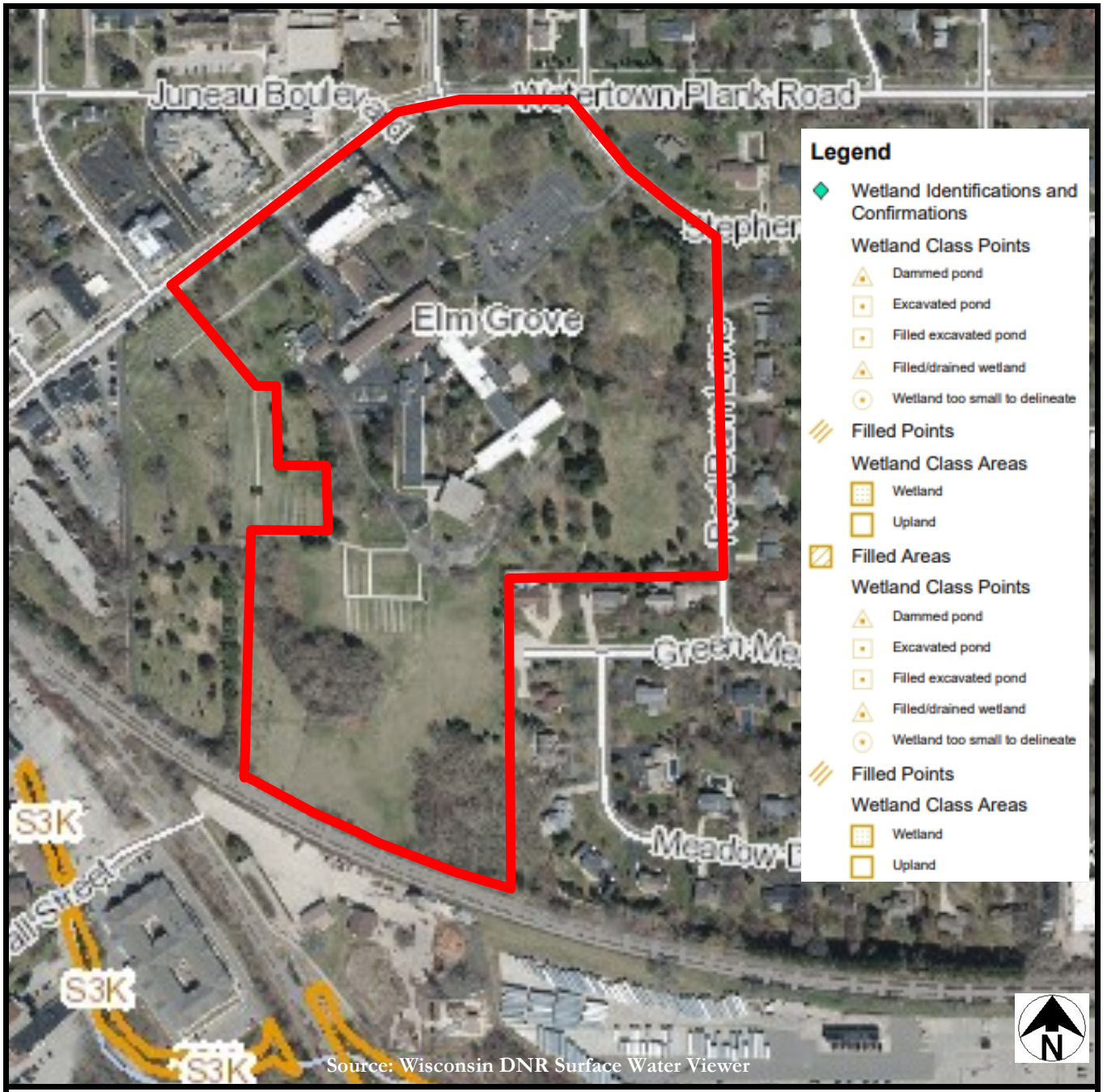
Applied Ecological Services, Inc.	*Scale* **Not to Scale** *Date* **3/17/2020**	***Exhibit Title*** **Waukesha County Soil Map**	***Exhibit Number*** **2**



Client	*Proposed Project*	*AES Project Number*
Mandel Group	**Natural Resource Inventory**	**17-0908**

Site Identification	*County*	*State*
School Sisters of Notre Dame Elm Grove	**Waukesha**	**Wisconsin**

	Scale	*Exhibit Title*	*Exhibit Number*
Applied Ecological Services, Inc.	**Not to Scale**	**USFWS NWI Map**	**3**
	Date **3/17/2020**		



Client	*Proposed Project*	*AES Project Number*
Mandel Group	**Natural Resource Inventory**	**17-0908**

Site Identification	*County*	*State*
School Sisters of Notre Dame Elm Grove	**Waukesha**	**Wisconsin**

Applied Ecological Services, Inc.	*Scale* **Not to Scale** *Date* **3/17/2020**	***Exhibit Title*** **Wisconsin DNR Wetland Inventory**	***Exhibit Number*** **4**

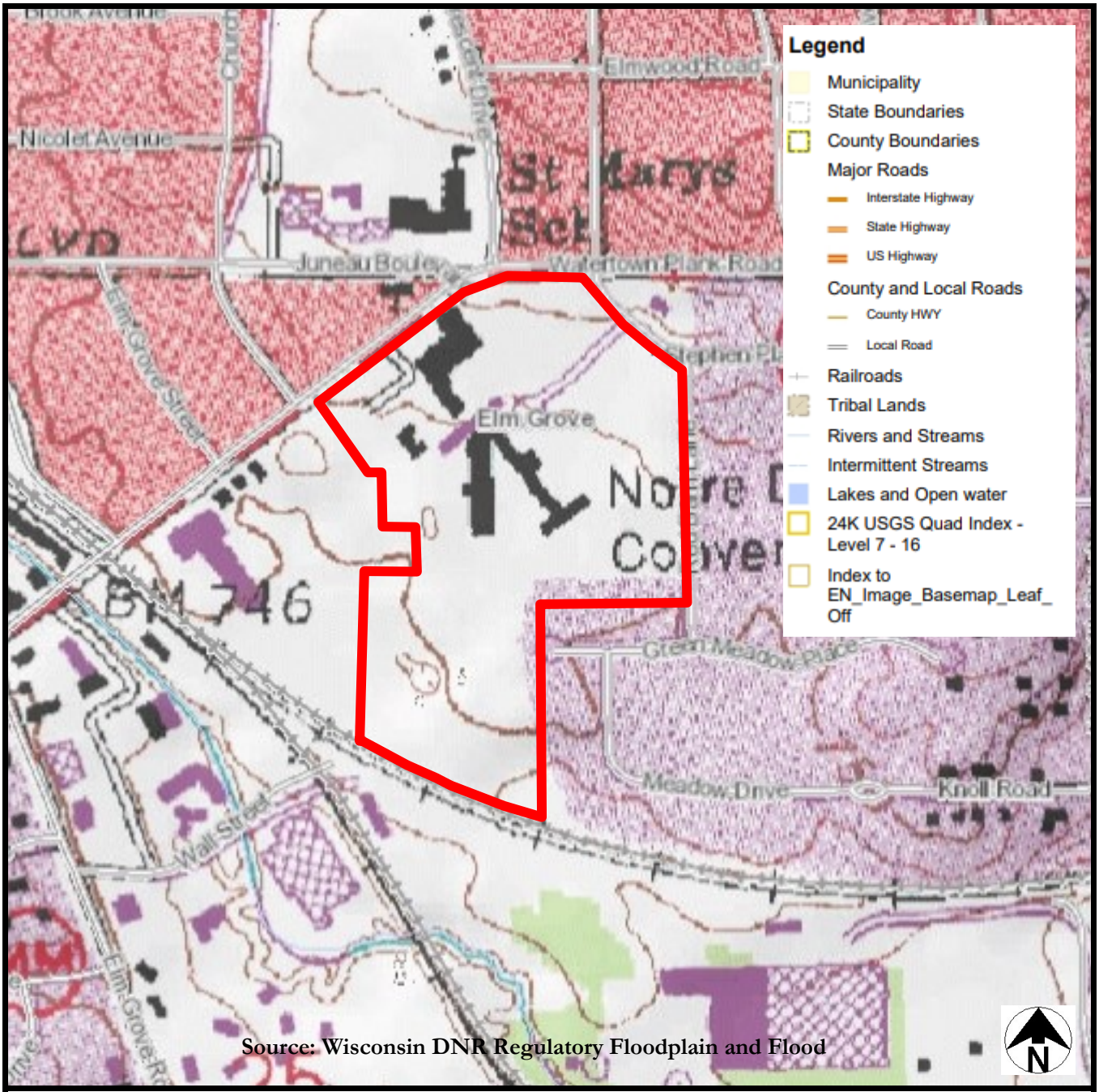


Source: Wisconsin DNR Regulatory Floodplain and

Client	*Proposed Project*	*AES Project Number*
Mandel Group	**Natural Resource Inventory**	**17-0908**

Site Identification	*County*	*State*
School Sisters of Notre Dame Elm Grove	**Waukesha**	**Wisconsin**

Applied Ecological Services, Inc.	*Scale* **Not to Scale** *Date* **3/17/2020**	***Exhibit Title*** **Wisconsin DNR Regulatory Floodplain and Flood Insurance Rate Map**	***Exhibit Number*** **5**

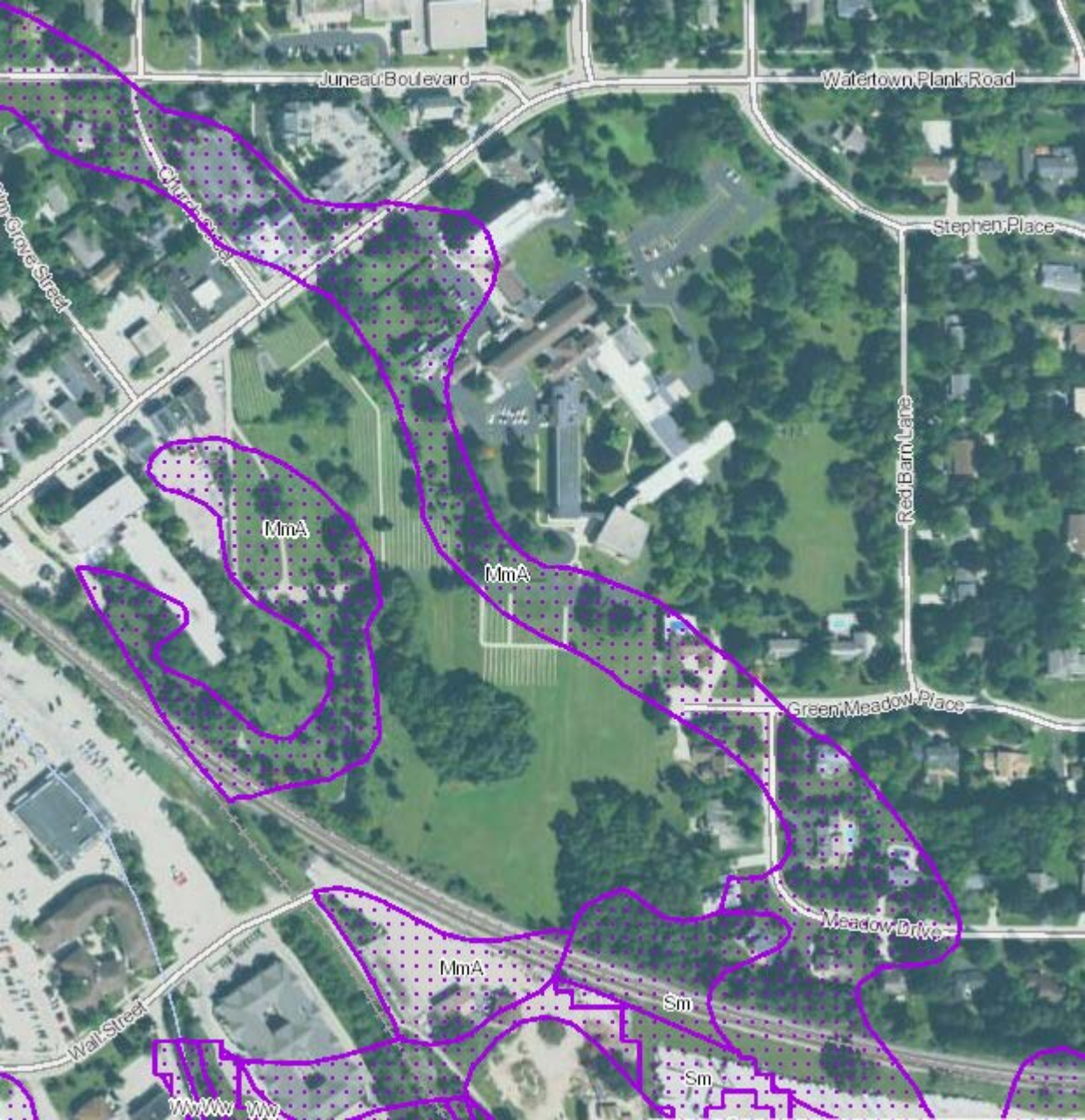


Source: Wisconsin DNR Regulatory Floodplain and Flood

Client	*Proposed Project*	*AES Project Number*
Mandel Group	**Natural Resource Inventory**	**17-0908**

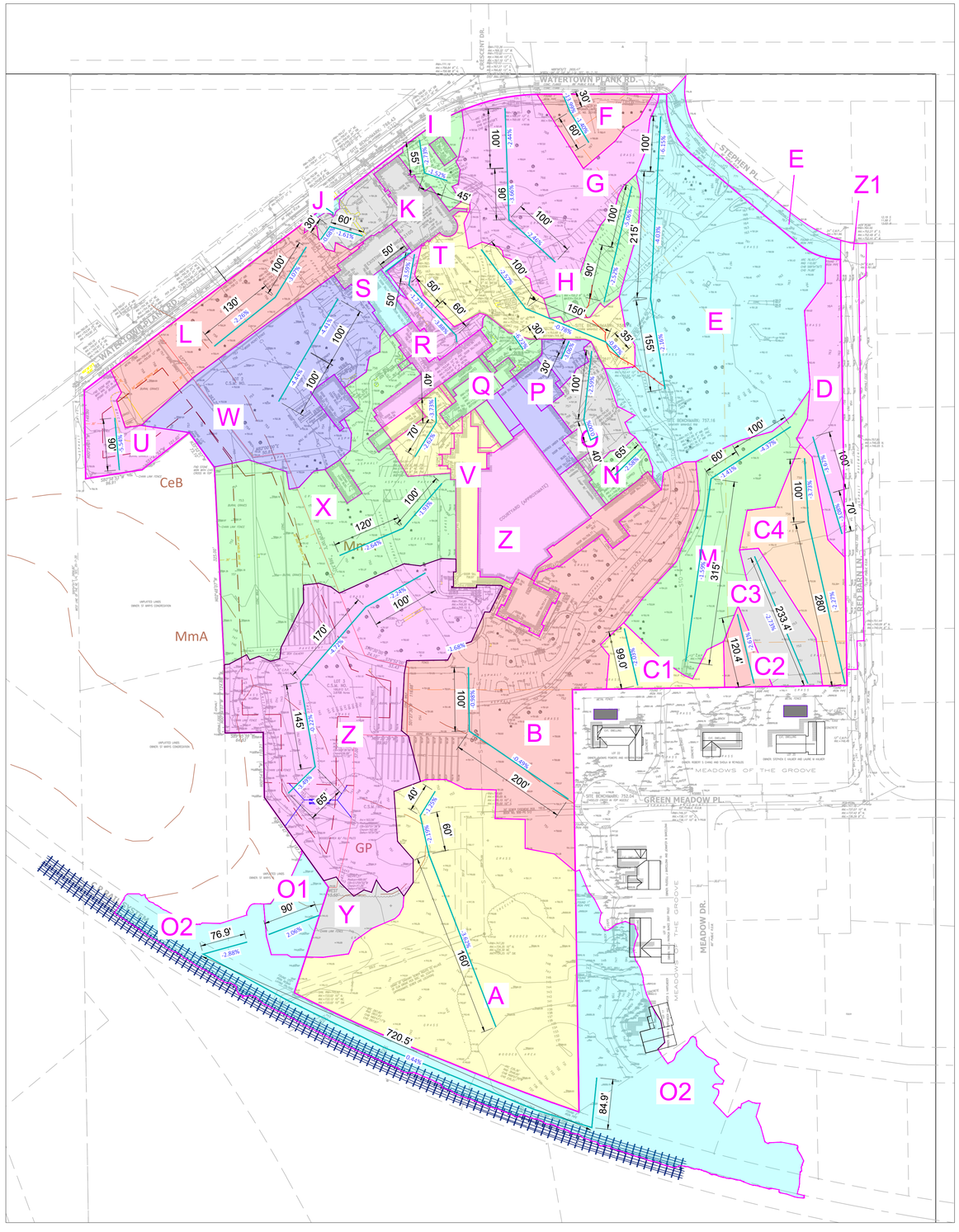
Site Identification	*County*	*State*
School Sisters of Notre Dame Elm Grove	**Waukesha**	**Wisconsin**

Applied Ecological Services, Inc.	*Scale* **Not to Scale** *Date* **5/30/19**	***Figure Title*** **Topography**	***Exhibit Number*** **6**


Juneau Boulevard
Watertown Plank Road
Stephen Place
Red Barn Lane
Green Meadow Place
Meadow Drive
Wall Street
MmA
MmA
MmA
Sm
Sm

APPENDIX B

EXISTING SWMP-1 AND HYDROLOGIC & HYDRAULIC OUTPUT



LEGEND

- CATCHMENT AREA BOUNDARY
- TC PATH
- 1.00% SLOPE OF TC PATH SEGMENT
- 880 EXISTING GRADING CONTOUR

NOTE: TC PATH EXHIBITS SHEET FLOW FIRST APROX. 100', THEN SHALLOW CONCENTRATED FLOW (FLOW DEPTH 0.1' - 0.5')

EXISTING DRAINAGE AREAS

DRAINAGE AREA	AREA PERVIOUS (SF)	AREA IMPERVIOUS (SF)	AREA ROOF (SF)	AREA TOTAL (SF)	AREA TOTAL (ACRES)	CN (WEIGHTED)	Tc (MIN)	DRAINAGE DIRECTION
A	156,438	-	-	156,438	3.59	74	13.7	SOUTHWEST INFILTRATION BASIN
B	104,065	22,056	15,016	141,137	3.24	80	8.5	GREEN MEADOW PL CUL DE SAC
C1	12,661	-	-	12,661	0.29	74	11.4	SWALE BETWEEN LOTS 21 & 22
C2	6,618	-	-	6,618	0.15	74	10.4	SWALE BETWEEN LOTS 20 & 21
C3	18,962	-	-	18,962	0.44	74	11.8	SWALE ON LOT 20
C4	33,221	-	-	33,221	0.76	74	13.6	SWALE ALONG RED BARN LN.
D	24,345	-	-	24,345	0.56	74	10.2	RED BARN LANE
E	124,051	28,052	-	152,103	3.49	78	10.6	DEPRESSION IN TREELINE (SOUTH OF EAST PARKING LOT)
F	13,305	-	-	13,305	0.31	74	7.4	DEPRESSION IN TREELINE (NORTH OF EAST PARKING LOT)
G	56,727	10,244	-	66,971	1.54	78	12.7	MIDDLE OF PARKING LOT
H	1,084	15,063	-	16,147	0.37	96	6.0	SOUTH OF PARKING LOT
I	4,275	5,059	1,148	10,482	0.24	88	6.0	LOWSPOT TO NORTHEAST OF BUILDING
J	798	40		838	0.02	75	6.0	WATERTOWN PLANK ROAD
K	9,600	1,816	17,190	28,606	0.66	90	11.3	BRICK PATH NORTH OF BUILDING
L	36,454	7,269	-	43,723	1.00	78	11.4	DEPRESSION NORTHWEST OF BUILDING
M	53,002			53,002	1.22	74	15.2	GRAVEL PIT
N	6,111	505	-	6,616	0.15	76	6.4	INLET EAST OF BUILDING
O	9,468	4,653	4,584	18,705	0.43	86	10.4	INLET EAST OF BUILDING
P	3,636	878	13,877	18,391	0.42	93	6.0	INLET EAST OF BUILDING
Q	6,396	1,162	7,365	14,923	0.34	88	6.0	INLET EAST OF BUILDING
R	4,279	5,420	11,025	20,724	0.48	93	10.5	INLET EAST OF BUILDING
S	-	808	4,491	5,299	0.12	98	6.0	INLET EAST OF BUILDING
T	21,454	14,191	-	35,645	0.82	84	11.4	DEPRESSION EAST OF INLETS
U	14,032	1,519	-	15,551	0.36	76	7.0	WATERTOWN PLANK ROAD/ O'DONOHUE'S
V	2,290	7,676	16,533	26,499	0.61	96	6.0	INLET WEST OF BUILDING
W	54,767	17,055	3,625	75,447	1.73	81	9.3	DEPRESSION WEST OF BUILDING
X	79,699	21,341	3,130	104,170	2.39	80	13.0	DEPRESSION WEST OF BUILDING
Y	12,489	-	-	12,489	0.29	74	6.0	LOW SPOT SOUTH OF TREE LINE
Z	157,056	11,071	-	168,127	3.86	76	15.8	SOUTHWEST INFILTRATION BASIN
Z1	12,887	9,160	-	22,047	0.51	84	6.0	EX. TO SWALE ALONG RED BARN LANE
O1*	11,697	-	-	11,697	0.27	74	6.0	SOUTHWEST INFILTRATION BASIN
O2*	129,638		3,040	132,678	3.05	75	12.2	SOUTHEAST INFILTRATION BASIN
TOTAL (SITE)	1,040,170	185,038	97,984	1,323,192	30.376			

NOTE: *DENOTES OFFSITE FLOW COMING ONSITE

KSingh Engineers Scientists Consultants
3636 North 124th Street
Wauwatosa, WI 53222
262-821-1171
CONSULTANT

PROJECT TITLE: CAROLINE HEIGHTS DEVELOPMENT
CONSTRUCTION DOCUMENTS

CLIENT: MANDEL GROUP, INC.

PROJECT LOCATION: 13105 WATERTOWN PLANK RD.
ELM GROVE, WI 53122

REVISIONS	DATE	DESCRIPTION
1	07/31/23	ADDENDUM #3
2	08/11/23	ADDENDUM #4

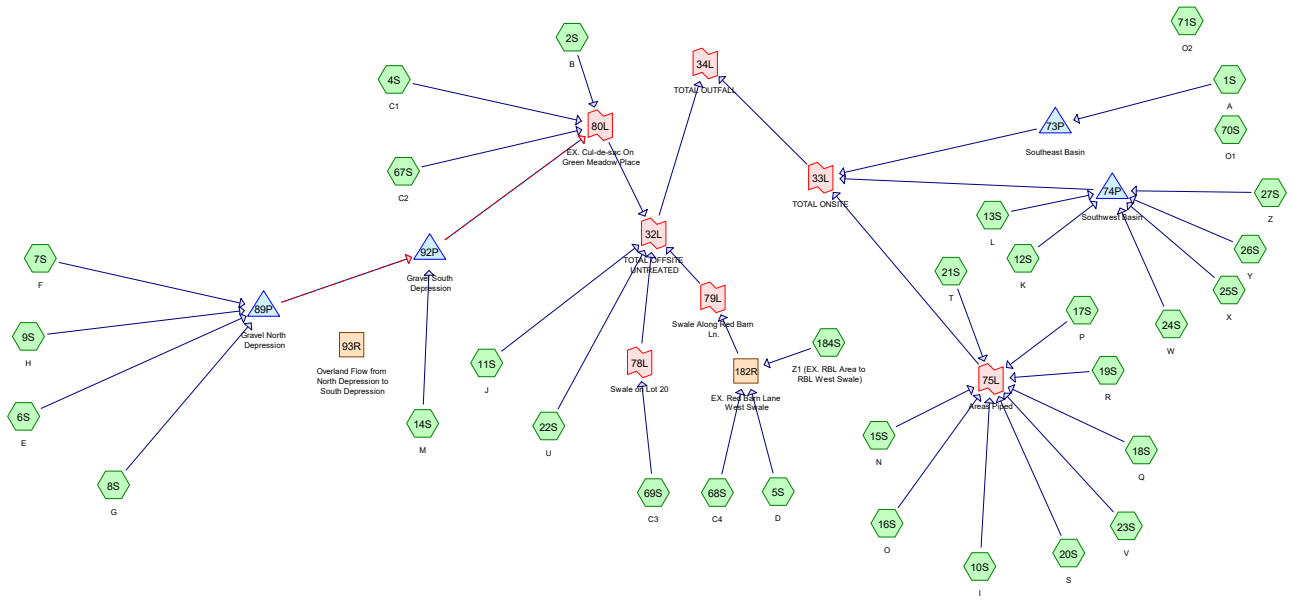
DRAWN BY RGE	DATE 09/06/2023
CHECKED BY APS	DATE 09/06/2023

SITE TITLE
STORM WATER MANAGEMENT PLAN
EXISTING CONDITIONS

SWMP - 1

of SHEET XX

EXISTING CONDITIONS



Subcat Reach Pond Link

Routing Diagram for Caroline Heights - Existing and Proposed Conditions Model_20240910

Prepared by K Singh & Associates Inc16530, Printed 9/12/2024

HydroCAD® 10.20-4b s/n 10175 © 2023 HydroCAD Software Solutions LLC

Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-Year	MSE 24-hr	3	Default	24.00	1	2.40	2
2	2-Year	MSE 24-hr	3	Default	24.00	1	2.70	2
3	10-Year	MSE 24-hr	3	Default	24.00	1	3.81	2
4	100-Year	MSE 24-hr	3	Default	24.00	1	6.18	2

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
169,433	98	IMP (2S, 6S, 8S, 9S, 10S, 11S, 12S, 13S, 15S, 16S, 17S, 18S, 19S, 20S, 21S, 22S, 23S, 24S, 25S, 27S)
6,445	98	IMP NEW RBL (6S)
3,040	98	IMPERV (71S)
1,020,383	74	PER (1S, 2S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18S, 19S, 21S, 22S, 23S, 24S, 25S, 26S, 27S, 67S, 68S, 69S)
6,900	74	PER NEW RBL (6S)
141,335	74	PERV (70S, 71S)
97,984	98	ROOF (2S, 10S, 12S, 16S, 17S, 18S, 19S, 20S, 23S, 24S, 25S)
12,887	74	landscape (184S)
9,160	98	road (184S)
1,467,567	**79**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
0	HSG C	
0	HSG D	
1,467,567	Other	1S, 2S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, 11S, 12S, 13S, 14S, 15S, 16S, 17S, 18S, 19S, 20S, 21S, 22S, 23S, 24S, 25S, 26S, 27S, 67S, 68S, 69S, 70S, 71S, 184S
1,467,567		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover	Subcatchme Numbers
0	0	0	0	169,433	169,433	IMP	
0	0	0	0	6,445	6,445	IMP NEW RBL	
0	0	0	0	3,040	3,040	IMPERV	
0	0	0	0	1,020,383	1,020,383	PER	
0	0	0	0	6,900	6,900	PER NEW RBL	
0	0	0	0	141,335	141,335	PERV	
0	0	0	0	97,984	97,984	ROOF	
0	0	0	0	12,887	12,887	landscape	
0	0	0	0	9,160	9,160	road	
0	**0**	**0**	**0**	**1,467,567**	**1,467,567**	**TOTAL AREA**	

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	89P	754.80	749.60	426.0	0.0122	0.025	0.0	12.0	0.0	

Time span=1.00-48.00 hrs, dt=0.05 hrs, 941 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: A Runoff Area=156,438 sf 0.00% Impervious Runoff Depth=0.55"
Flow Length=260' Tc=13.7 min CN=74 Runoff=2.36 cfs 7,207 cf

Subcatchment 2S: B Runoff Area=141,137 sf 26.27% Impervious Runoff Depth=0.82"
Flow Length=300' Slope=0.0071 '/' Tc=8.5 min CN=80 Runoff=4.24 cfs 9,650 cf

Subcatchment 4S: C1 Runoff Area=12,661 sf 0.00% Impervious Runoff Depth=0.55"
Flow Length=100' Slope=0.0193 '/' Tc=11.4 min CN=74 Runoff=0.21 cfs 583 cf

Subcatchment 5S: D Runoff Area=24,345 sf 0.00% Impervious Runoff Depth=0.55"
Flow Length=170' Tc=10.2 min CN=74 Runoff=0.42 cfs 1,122 cf

Subcatchment 6S: E Runoff Area=152,103 sf 18.44% Impervious Runoff Depth=0.72"
Flow Length=471' Tc=10.6 min CN=78 Runoff=3.63 cfs 9,175 cf

Subcatchment 7S: F Runoff Area=13,305 sf 0.00% Impervious Runoff Depth=0.55"
Flow Length=100' Slope=0.0583 '/' Tc=7.3 min CN=74 Runoff=0.27 cfs 613 cf

Subcatchment 8S: G Runoff Area=66,971 sf 15.30% Impervious Runoff Depth=0.72"
Flow Length=295' Tc=12.7 min CN=78 Runoff=1.48 cfs 4,040 cf

Subcatchment 9S: H Runoff Area=16,147 sf 93.29% Impervious Runoff Depth=1.96"
Flow Length=200' Tc=6.0 min CN=96 Runoff=1.20 cfs 2,642 cf

Subcatchment 10S: I Runoff Area=10,482 sf 59.22% Impervious Runoff Depth=1.30"
Flow Length=100' Slope=0.0244 '/' Tc=6.0 min CN=88 Runoff=0.56 cfs 1,132 cf

Subcatchment 11S: J Runoff Area=838 sf 4.77% Impervious Runoff Depth=0.59"
Flow Length=15' Slope=0.0122 '/' Tc=6.0 min CN=75 Runoff=0.02 cfs 41 cf

Subcatchment 12S: K Runoff Area=28,606 sf 66.44% Impervious Runoff Depth=1.44"
Flow Length=90' Slope=0.0161 '/' Tc=11.3 min CN=90 Runoff=1.38 cfs 3,438 cf

Subcatchment 13S: L Runoff Area=43,723 sf 16.63% Impervious Runoff Depth=0.72"
Flow Length=230' Tc=11.4 min CN=78 Runoff=1.01 cfs 2,637 cf

Subcatchment 14S: M Runoff Area=53,002 sf 0.00% Impervious Runoff Depth=0.55"
Flow Length=475' Tc=15.2 min CN=74 Runoff=0.76 cfs 2,442 cf

Subcatchment 15S: N Runoff Area=6,616 sf 7.63% Impervious Runoff Depth=0.63"
Flow Length=65' Slope=0.0344 '/' Tc=6.4 min CN=76 Runoff=0.16 cfs 350 cf

Subcatchment 16S: O Runoff Area=18,705 sf 49.38% Impervious Runoff Depth=1.16"
Flow Length=150' Tc=10.4 min CN=86 Runoff=0.75 cfs 1,812 cf

Subcatchment 17S: P Runoff Area=18,391 sf 80.23% Impervious Runoff Depth=1.69"
Flow Length=35' Slope=0.0866 '/' Tc=6.0 min CN=93 Runoff=1.23 cfs 2,583 cf

Subcatchment 18S: Q Runoff Area=14,923 sf 57.14% Impervious Runoff Depth=1.30"
Flow Length=30' Slope=0.0989 '/' Tc=6.0 min CN=88 Runoff=0.79 cfs 1,612 cf

Subcatchment 19S: R Runoff Area=20,724 sf 79.35% Impervious Runoff Depth=1.69"
Flow Length=170' Tc=10.5 min CN=93 Runoff=1.17 cfs 2,911 cf

Subcatchment 20S: S Runoff Area=5,299 sf 100.00% Impervious Runoff Depth=2.17"
Flow Length=50' Slope=0.0049 '/' Tc=6.0 min CN=98 Runoff=0.41 cfs 959 cf

Subcatchment 21S: T Runoff Area=35,645 sf 39.81% Impervious Runoff Depth=1.04"
Flow Length=280' Tc=11.4 min CN=84 Runoff=1.23 cfs 3,086 cf

Subcatchment 22S: U Runoff Area=15,551 sf 9.77% Impervious Runoff Depth=0.63"
Flow Length=90' Slope=0.0528 '/' Tc=7.0 min CN=76 Runoff=0.38 cfs 823 cf

Subcatchment 23S: V Runoff Area=26,499 sf 91.36% Impervious Runoff Depth=1.96"
Flow Length=115' Tc=6.0 min CN=96 Runoff=1.96 cfs 4,336 cf

Subcatchment 24S: W Runoff Area=75,447 sf 27.41% Impervious Runoff Depth=0.87"
Flow Length=200' Tc=9.3 min CN=81 Runoff=2.33 cfs 5,481 cf

Subcatchment 25S: X Runoff Area=104,170 sf 23.49% Impervious Runoff Depth=0.82"
Flow Length=215' Tc=13.0 min CN=80 Runoff=2.63 cfs 7,122 cf

Subcatchment 26S: Y Runoff Area=12,489 sf 0.00% Impervious Runoff Depth=0.55"
Tc=6.0 min CN=74 Runoff=0.27 cfs 575 cf

Subcatchment 27S: Z Runoff Area=168,127 sf 6.58% Impervious Runoff Depth=0.63"
Flow Length=480' Tc=15.8 min CN=76 Runoff=2.83 cfs 8,894 cf

Subcatchment 67S: C2 Runoff Area=6,618 sf 0.00% Impervious Runoff Depth=0.55"
Flow Length=120' Slope=0.0262 '/' Tc=10.4 min CN=74 Runoff=0.11 cfs 305 cf

Subcatchment 68S: C4 Runoff Area=33,221 sf 0.00% Impervious Runoff Depth=0.55"
Flow Length=380' Tc=13.6 min CN=74 Runoff=0.50 cfs 1,531 cf

Subcatchment 69S: C3 Runoff Area=18,962 sf 0.00% Impervious Runoff Depth=0.55"
Flow Length=233' Slope=0.0278 '/' Tc=11.8 min CN=74 Runoff=0.31 cfs 874 cf

Subcatchment 70S: O1 Runoff Area=11,697 sf 0.00% Impervious Runoff Depth=0.55"
Tc=6.0 min CN=74 Runoff=0.25 cfs 539 cf

Subcatchment 71S: O2 Runoff Area=132,678 sf 2.29% Impervious Runoff Depth=0.59"
Flow Length=377' Tc=12.2 min CN=75 Runoff=2.33 cfs 6,556 cf

Subcatchment 184S: Z1 (EX. RBL Area to Runoff Area=22,047 sf 41.55% Impervious Runoff Depth=1.04"
Tc=6.0 min CN=84 Runoff=0.94 cfs 1,909 cf

Reach 93R: Overland Flow from North Depression to South Avg. Flow Depth=0.00' Max Vel=0.00 fps
n=0.030 L=426.0' S=0.0127 '/' Capacity=108.75 cfs Outflow=0.00 cfs 0 cf

Reach 182R: EX. Red Barn Lane West Avg. Flow Depth=0.27' Max Vel=2.44 fps Inflow=1.66 cfs 4,561 cf
n=0.025 L=610.0' S=0.0179 '/' Capacity=87.96 cfs Outflow=1.47 cfs 4,561 cf

Pond 73P: Southeast Basin Peak Elev=730.49' Storage=2,004 cf Inflow=2.36 cfs 7,207 cf
Outflow=0.64 cfs 7,209 cf

Pond 74P: Southwest Basin Peak Elev=742.43' Storage=10,651 cf Inflow=9.88 cfs 28,148 cf
Outflow=2.27 cfs 28,153 cf

Pond 89P: Gravel North Depression Peak Elev=756.30' Storage=808 cf Inflow=6.09 cfs 16,470 cf
Discarded=0.44 cfs 6,172 cf Primary=1.80 cfs 7,392 cf Secondary=4.45 cfs 2,906 cf Outflow=6.59 cfs 16,470 cf

Pond 92P: Gravel South Depression Peak Elev=752.60' Storage=387 cf Inflow=6.66 cfs 12,740 cf
Primary=6.05 cfs 10,173 cf Secondary=0.10 cfs 2,567 cf Outflow=6.15 cfs 12,740 cf

Link 32L: TOTAL OFFSITE UNTREATED Inflow=12.57 cfs 29,576 cf
Primary=12.57 cfs 29,576 cf

Link 33L: TOTAL ONSITE Inflow=7.89 cfs 18,781 cf
Primary=7.89 cfs 18,781 cf

Link 34L: TOTAL OUTFALL Inflow=20.47 cfs 48,357 cf
Primary=20.47 cfs 48,357 cf

Link 75L: Areas Piped Inflow=7.89 cfs 18,781 cf
Primary=7.89 cfs 18,781 cf

Link 78L: Swale on Lot 20 Inflow=0.31 cfs 874 cf
Primary=0.31 cfs 874 cf

Link 79L: Swale Along Red Barn Ln. Inflow=1.47 cfs 4,561 cf
Primary=1.47 cfs 4,561 cf

Link 80L: EX. Cul-de-sac On Green Meadow Place Inflow=10.92 cfs 23,278 cf
Primary=10.92 cfs 23,278 cf

Total Runoff Area = 1,467,567 sf Runoff Volume = 96,979 cf Average Runoff Depth = 0.79"
80.51% Pervious = 1,181,505 sf 19.49% Impervious = 286,062 sf

Summary for Subcatchment 1S: A

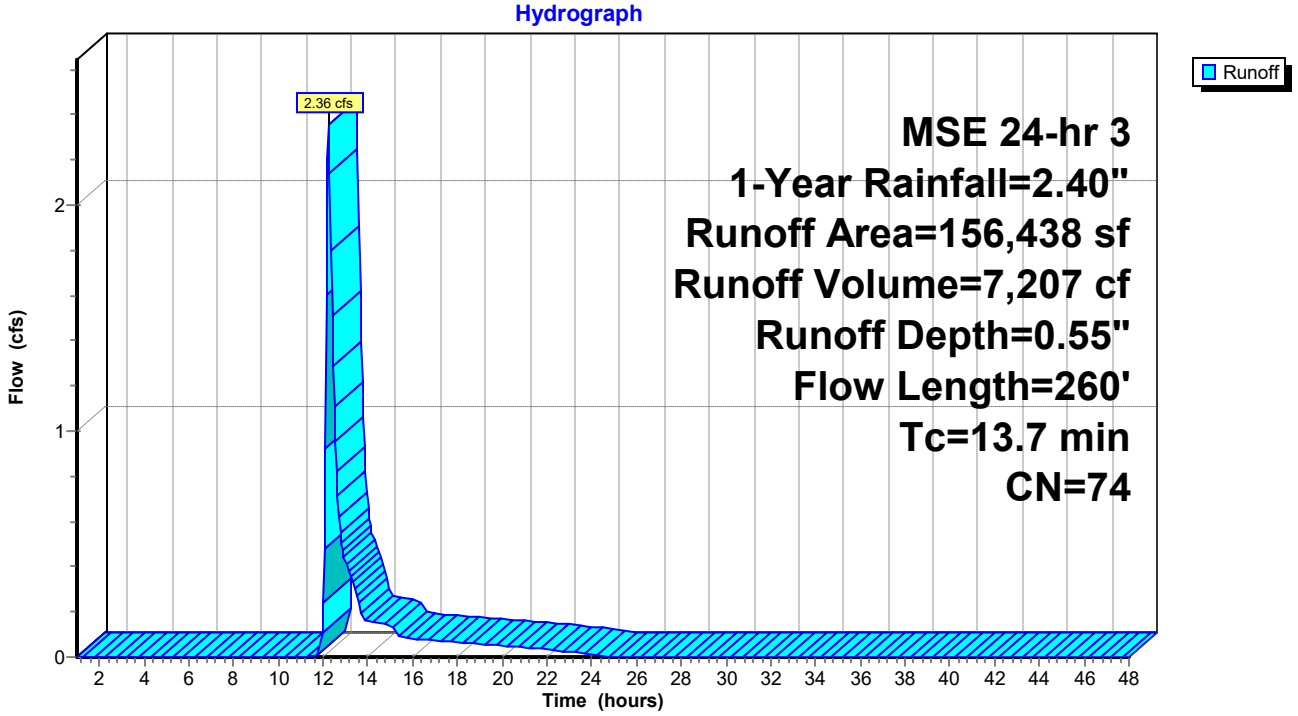
Runoff = 2.36 cfs @ 12.25 hrs, Volume= 7,207 cf, Depth= 0.55"
Routed to Pond 73P : Southeast Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	156,438	74	PER
	156,438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	100	0.0181	0.14		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
2.0	160	0.0362	1.33		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
13.7	260	Total			

Subcatchment 1S: A



Summary for Subcatchment 2S: B

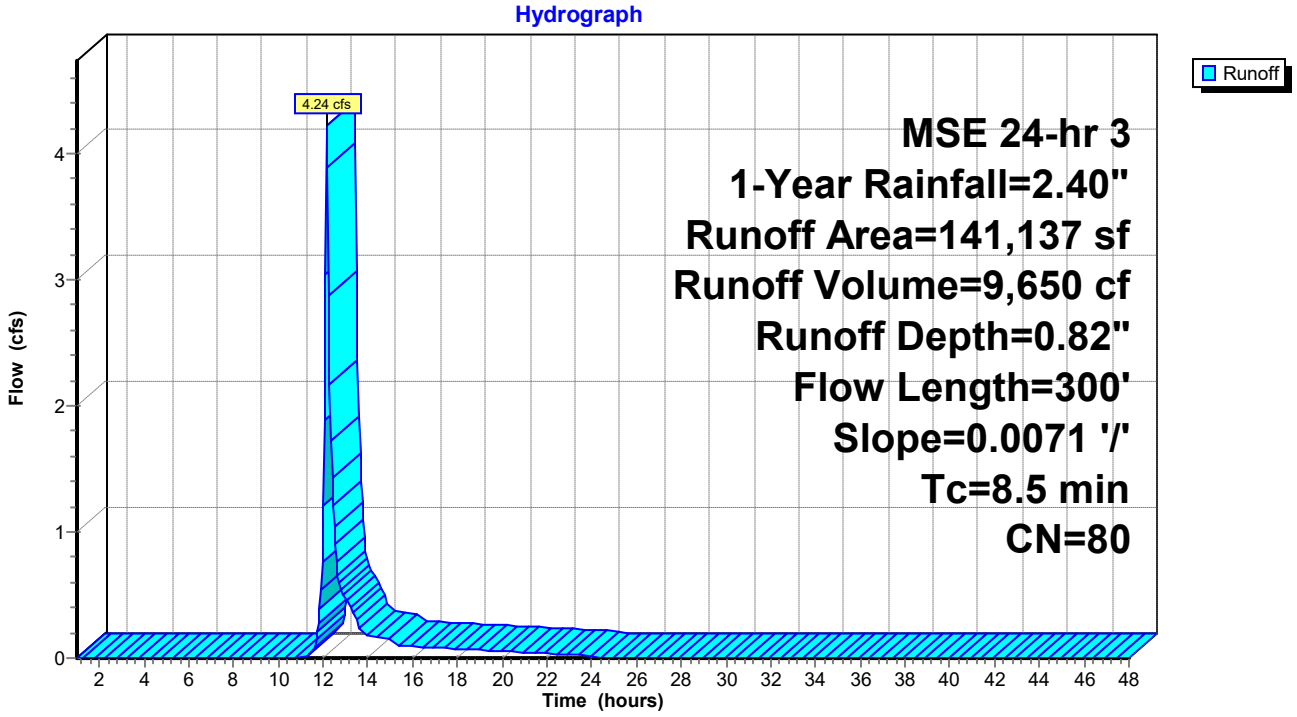
Runoff = 4.24 cfs @ 12.17 hrs, Volume= 9,650 cf, Depth= 0.82"
Routed to Link 80L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	104,065	74	PER
*	22,056	98	IMP
*	15,016	98	ROOF
	141,137	80	Weighted Average
	104,065		73.73% Pervious Area
	37,072		26.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	300	0.0071	0.59		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps

Subcatchment 2S: B



Summary for Subcatchment 4S: C1

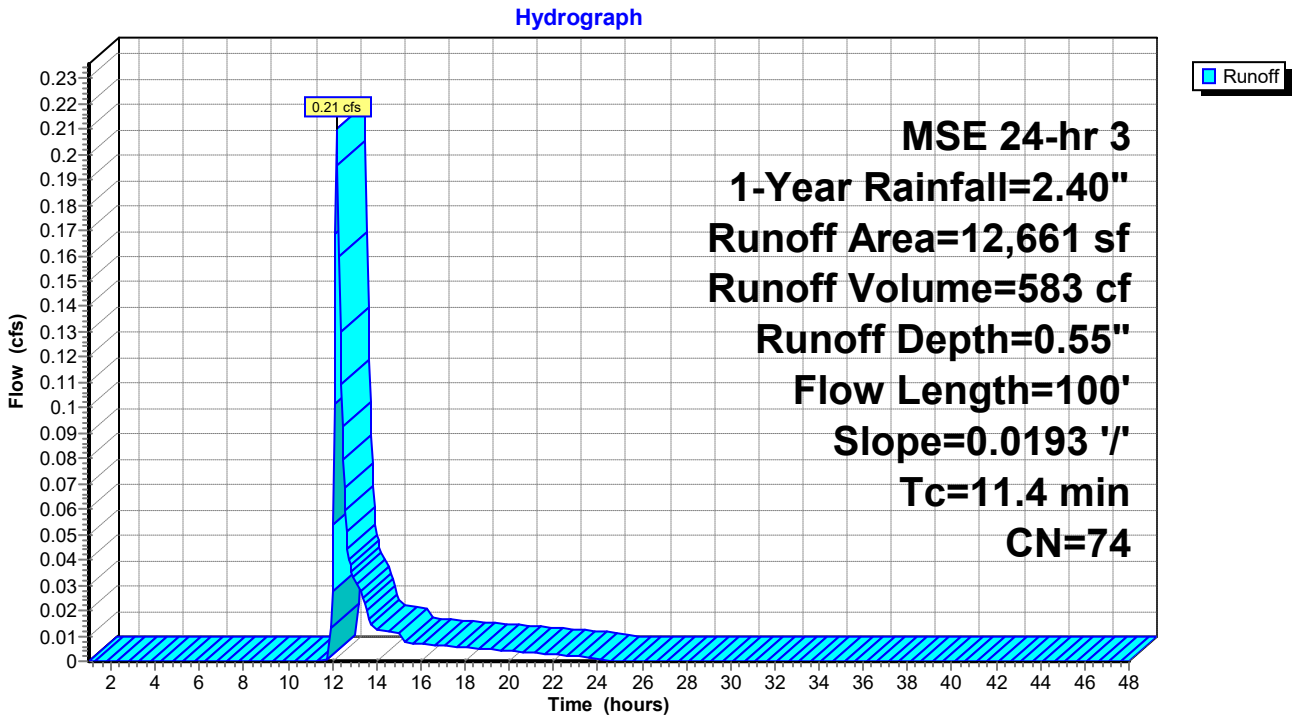
Runoff = 0.21 cfs @ 12.21 hrs, Volume= 583 cf, Depth= 0.55"
Routed to Link 80L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	12,661	74	PER
	12,661		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0193	0.15		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 4S: C1



Summary for Subcatchment 5S: D

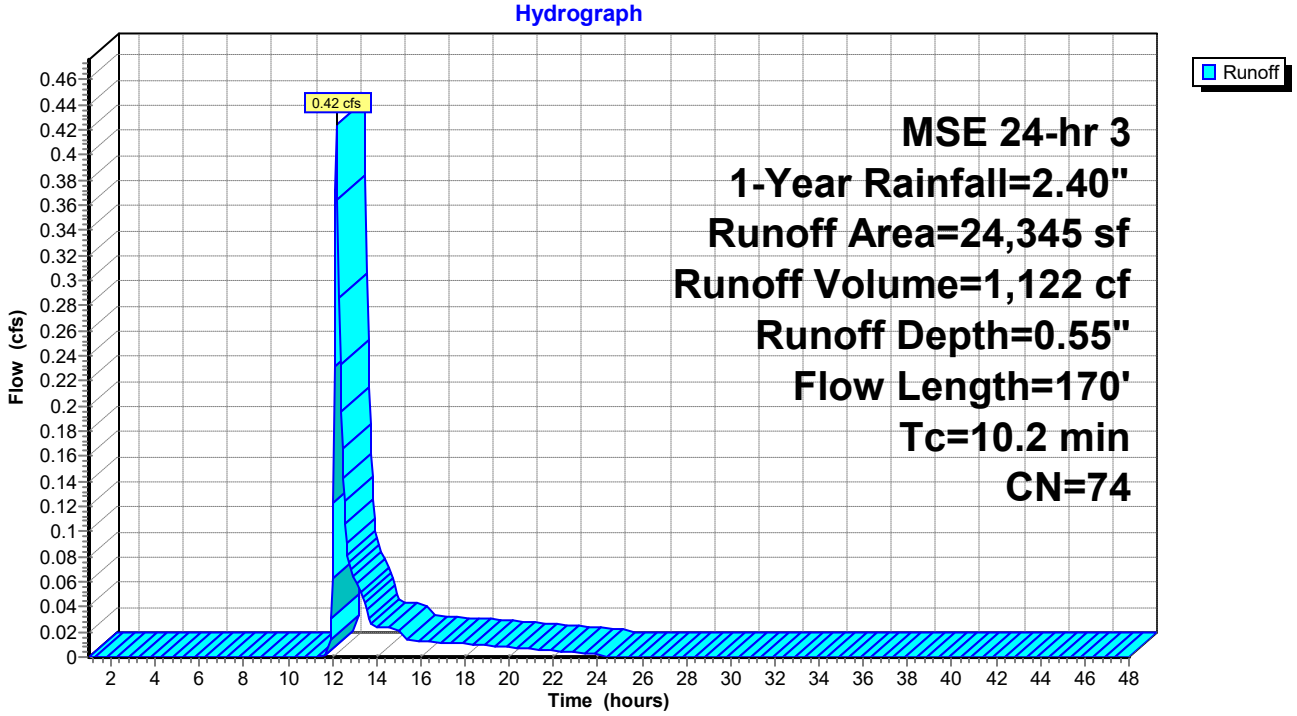
Runoff = 0.42 cfs @ 12.20 hrs, Volume= 1,122 cf, Depth= 0.55"
Routed to Reach 182R : EX. Red Barn Lane West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	24,345	74	PER
	24,345		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0319	0.18		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.9	70	0.0317	1.25		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
10.2	170	Total			

Subcatchment 5S: D



Summary for Subcatchment 6S: E

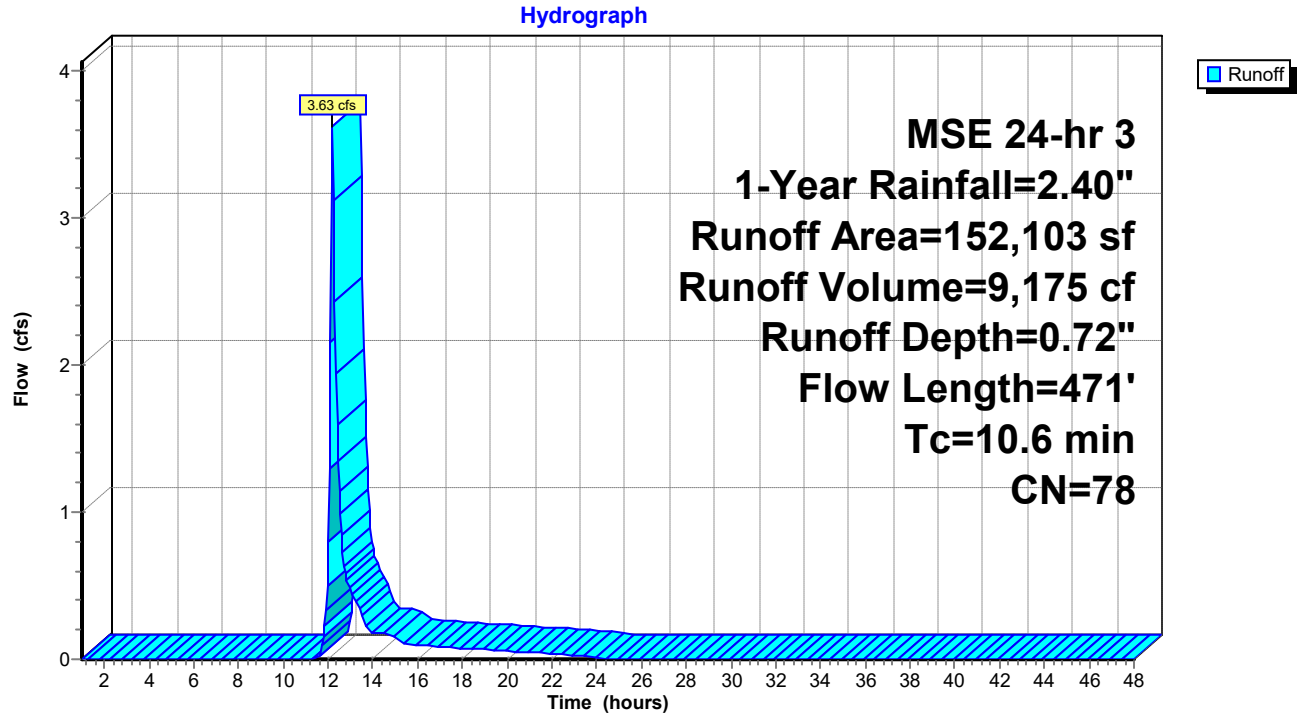
Runoff = 3.63 cfs @ 12.20 hrs, Volume= 9,175 cf, Depth= 0.72"
Routed to Pond 89P : Gravel North Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	117,151	74	PER
*	21,607	98	IMP
*	6,900	74	PER NEW RBL
*	6,445	98	IMP NEW RBL
	152,103	78	Weighted Average
	124,051		81.56% Pervious Area
	28,052		18.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0581	0.23		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.9	215	0.0405	4.09		**Shallow Concentrated Flow, SCF** Paved Kv= 20.3 fps
2.3	156	0.0259	1.13		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
10.6	471	Total			

Subcatchment 6S: E



Summary for Subcatchment 7S: F

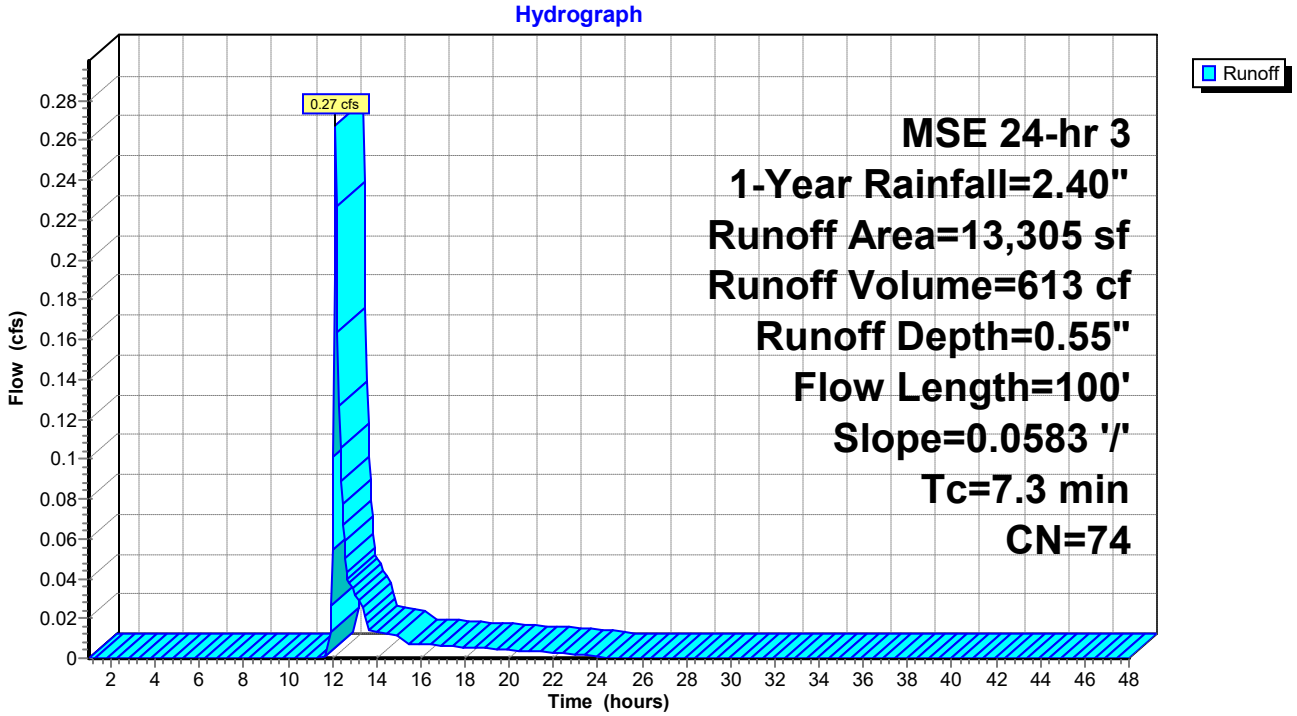
Runoff = 0.27 cfs @ 12.16 hrs, Volume= 613 cf, Depth= 0.55"
Routed to Pond 89P : Gravel North Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	13,305	74	PER
	13,305		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	100	0.0583	0.23		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 7S: F



Summary for Subcatchment 8S: G

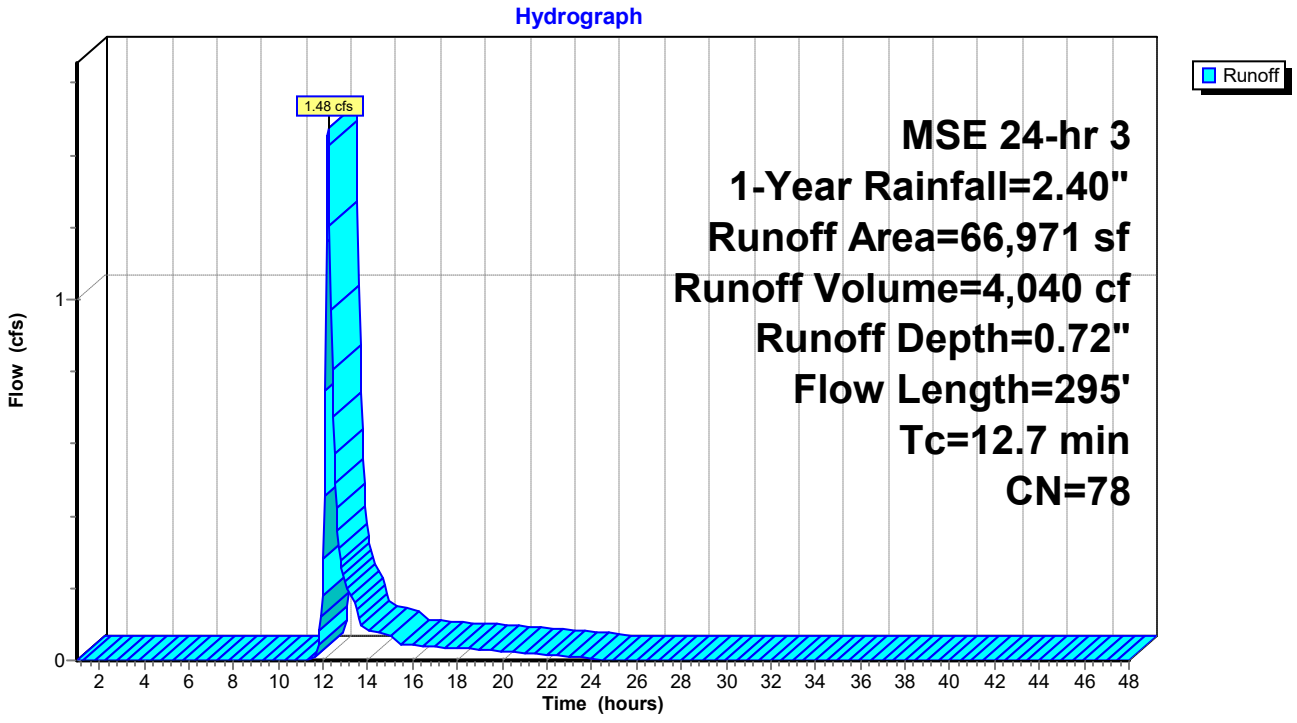
Runoff = 1.48 cfs @ 12.22 hrs, Volume= 4,040 cf, Depth= 0.72"
Routed to Pond 89P : Gravel North Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	56,727	74	PER
*	10,244	98	IMP
	66,971	78	Weighted Average
	56,727		84.70% Pervious Area
	10,244		15.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0269	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
2.7	195	0.0305	1.22		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
12.7	295	Total			

Subcatchment 8S: G



Summary for Subcatchment 9S: H

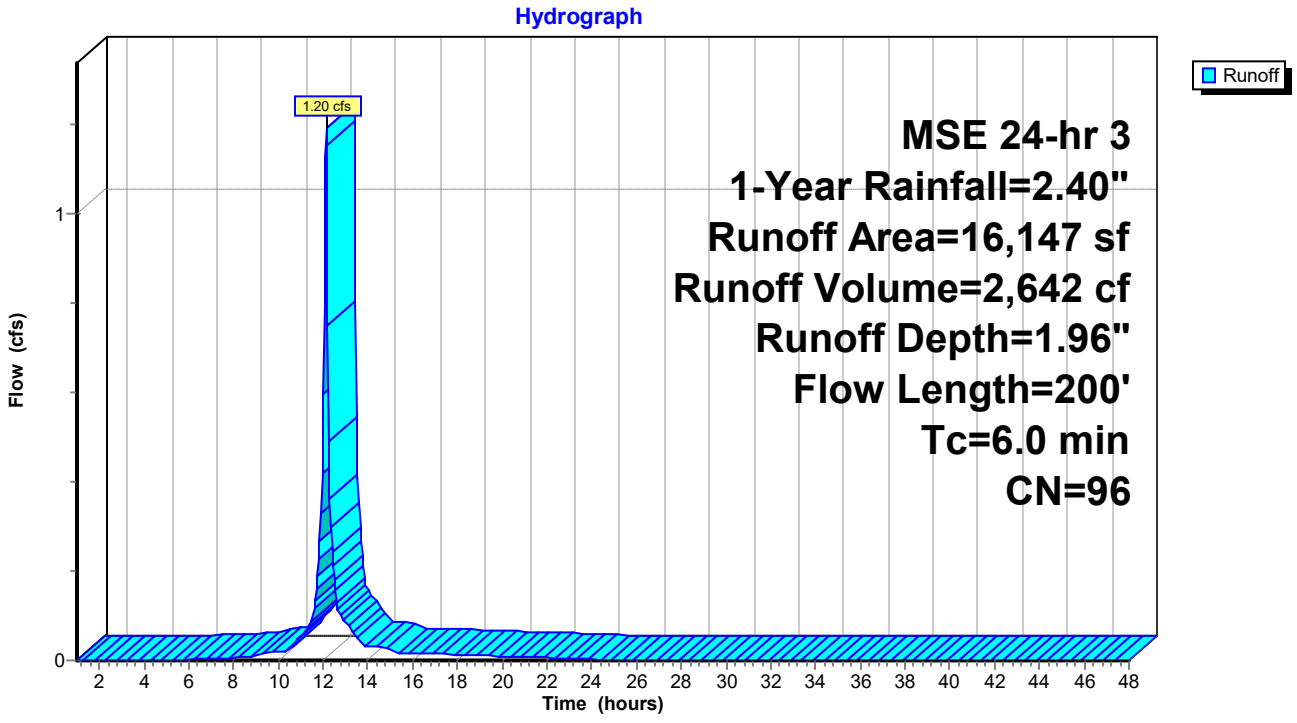
Runoff = 1.20 cfs @ 12.13 hrs, Volume= 2,642 cf, Depth= 1.96"
Routed to Pond 89P : Gravel North Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	1,084	74	PER
*	15,063	98	IMP
	16,147	96	Weighted Average
	1,084		6.71% Pervious Area
	15,063		93.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0502	1.73		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 2.42"
0.5	100	0.0263	3.29		**Shallow Concentrated Flow, SCF** Paved Kv= 20.3 fps
1.5	200	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 9S: H



Summary for Subcatchment 10S: I

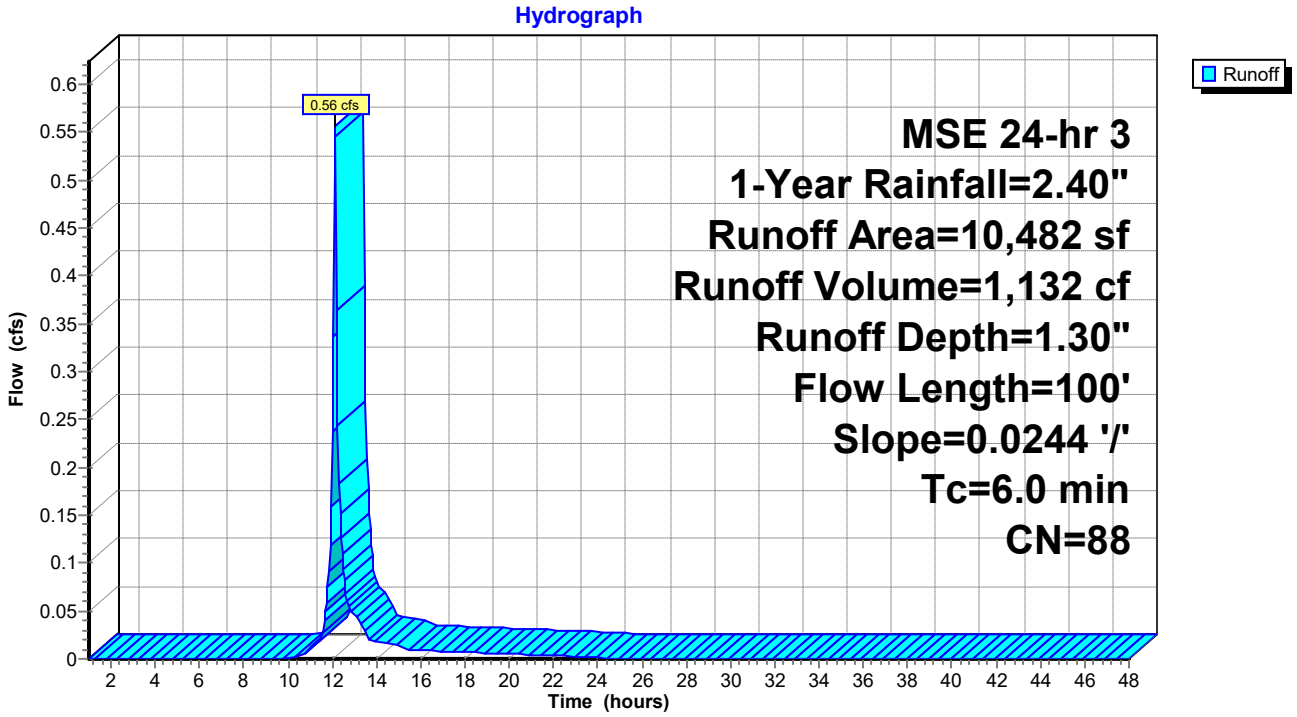
Runoff = 0.56 cfs @ 12.13 hrs, Volume= 1,132 cf, Depth= 1.30"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	4,275	74	PER
*	5,059	98	IMP
*	1,148	98	ROOF
	10,482	88	Weighted Average
	4,275		40.78% Pervious Area
	6,207		59.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0244	1.30		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 2.42"
1.3	100	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 10S: I



Summary for Subcatchment 11S: J

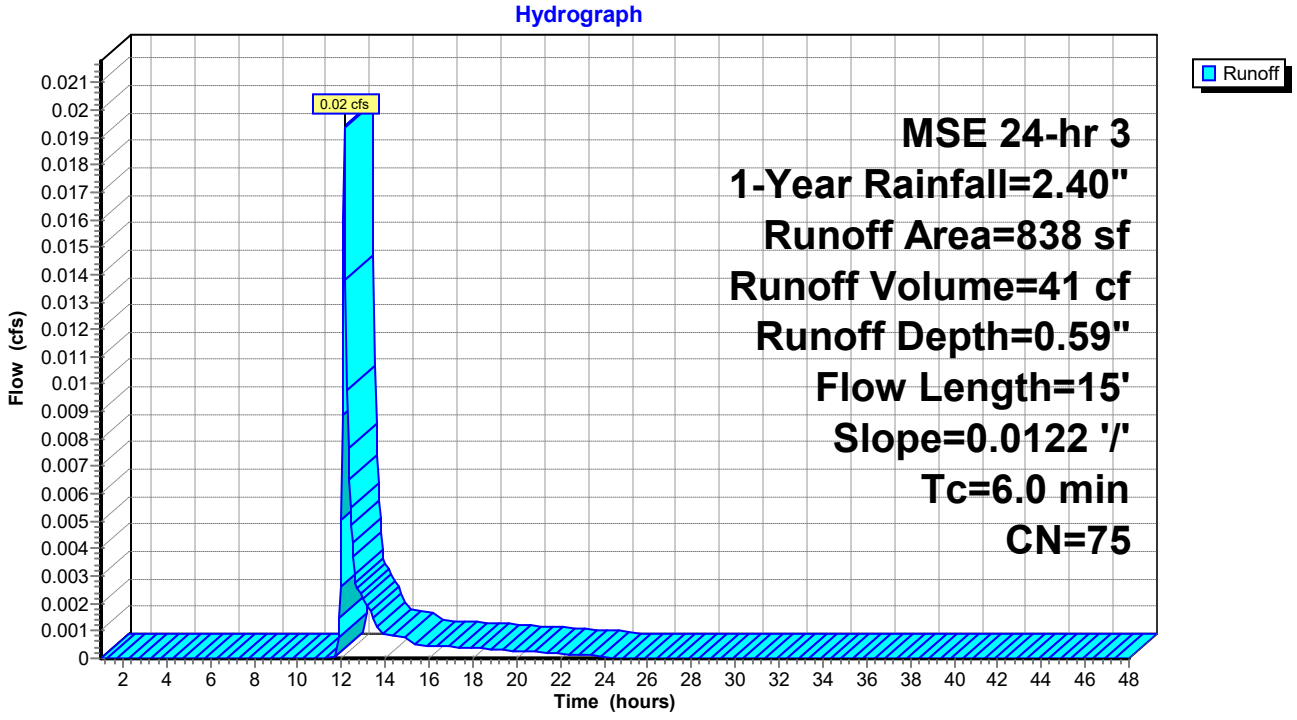
Runoff = 0.02 cfs @ 12.14 hrs, Volume= 41 cf, Depth= 0.59"
Routed to Link 32L : TOTAL OFFSITE UNTREATED

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	798	74	PER
*	40	98	IMP
	838	75	Weighted Average
	798		95.23% Pervious Area
	40		4.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	15	0.0122	0.08		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
3.0	15	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 11S: J



Summary for Subcatchment 12S: K

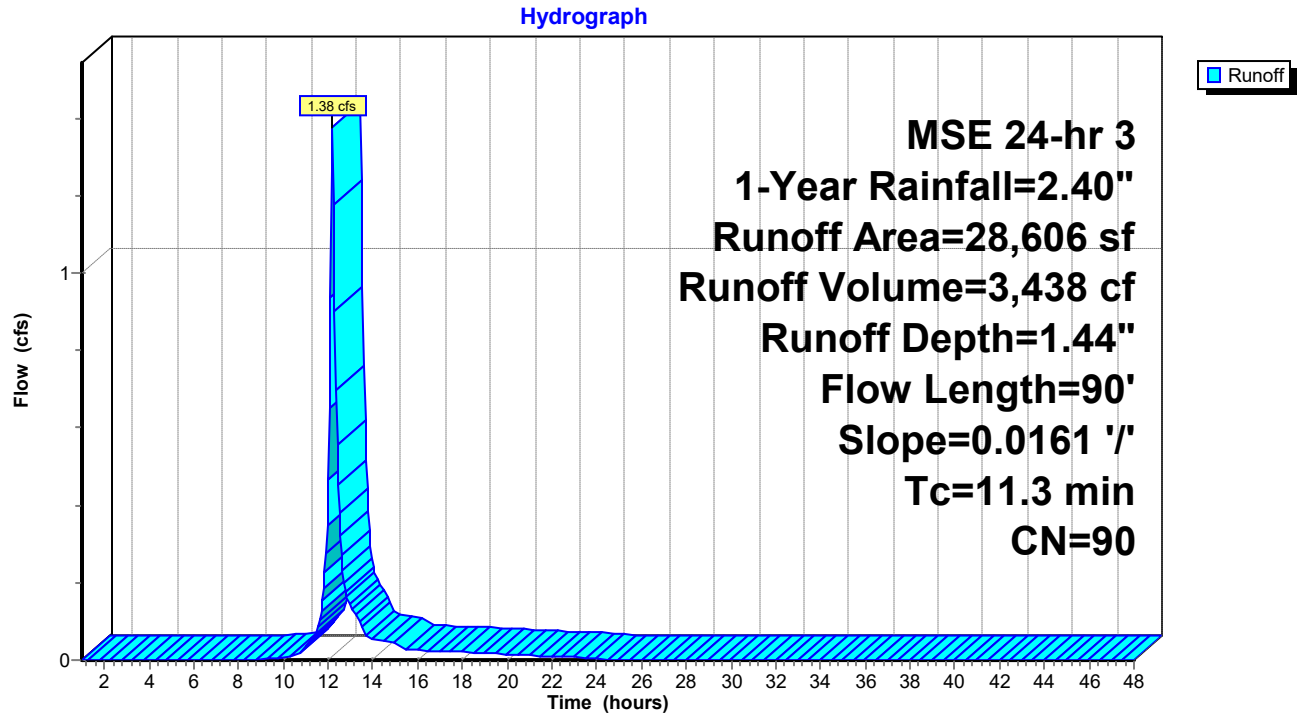
Runoff = 1.38 cfs @ 12.19 hrs, Volume= 3,438 cf, Depth= 1.44"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	9,600	74	PER
*	1,816	98	IMP
*	17,190	98	ROOF
	28,606	90	Weighted Average
	9,600		33.56% Pervious Area
	19,006		66.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	90	0.0161	0.13		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 12S: K



Summary for Subcatchment 13S: L

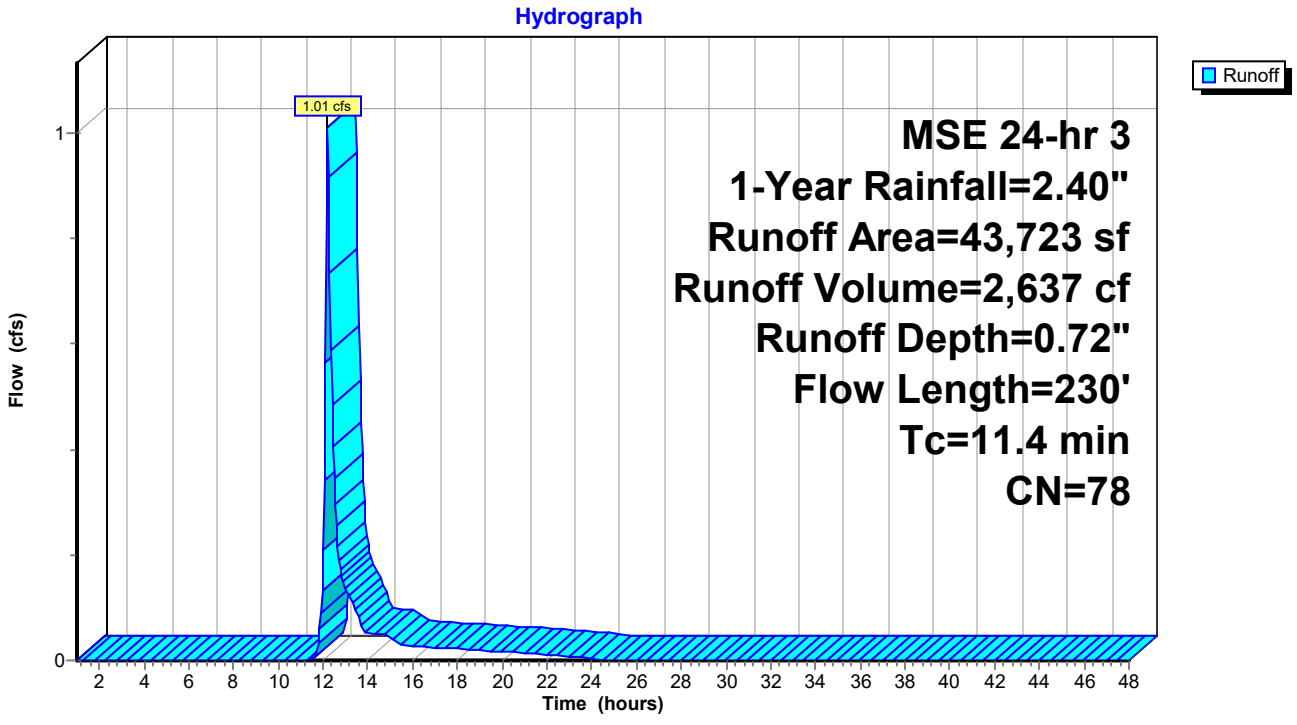
Runoff = 1.01 cfs @ 12.21 hrs, Volume= 2,637 cf, Depth= 0.72"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	36,454	74	PER
*	7,269	98	IMP
	43,723	78	Weighted Average
	36,454		83.37% Pervious Area
	7,269		16.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.0307	0.18		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
1.9	130	0.0267	1.14		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
11.4	230	Total			

Subcatchment 13S: L



Summary for Subcatchment 14S: M

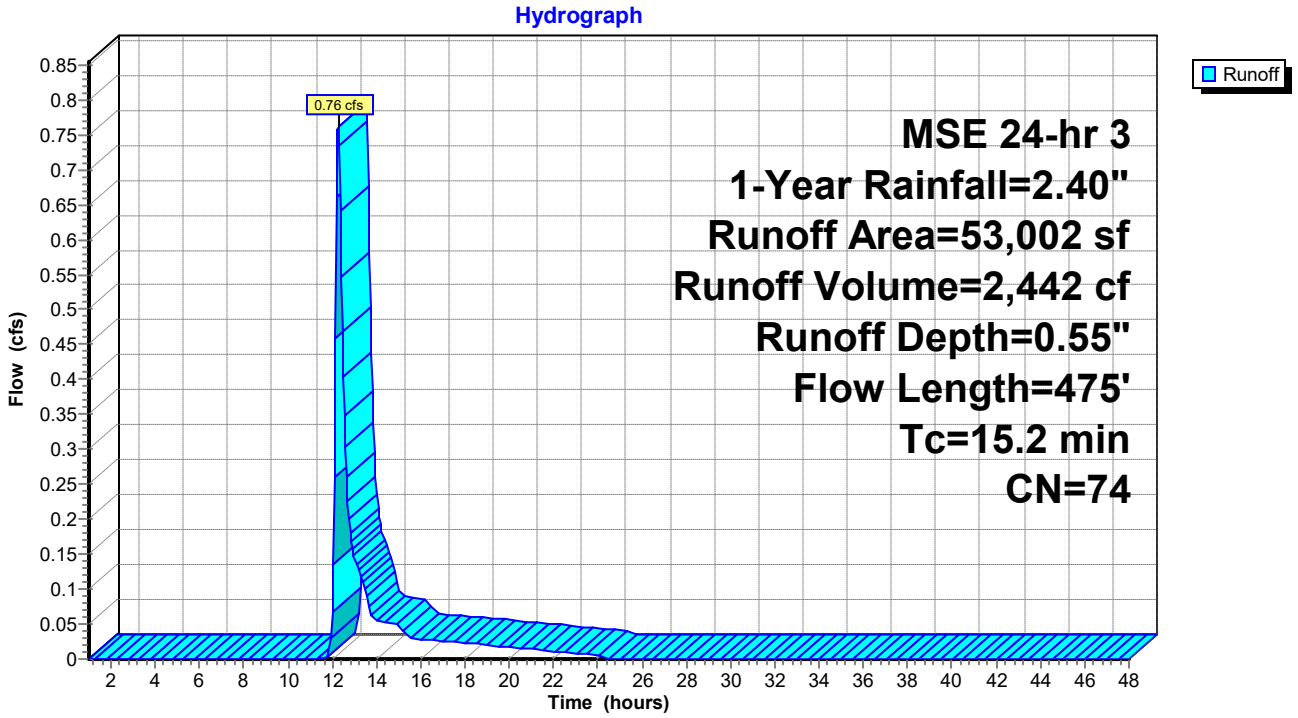
Runoff = 0.76 cfs @ 12.26 hrs, Volume= 2,442 cf, Depth= 0.55"
Routed to Pond 92P : Gravel South Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	53,002	74	PER
	53,002		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.0403	0.20		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
6.7	375	0.0180	0.94		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
15.2	475	Total			

Subcatchment 14S: M



Summary for Subcatchment 15S: N

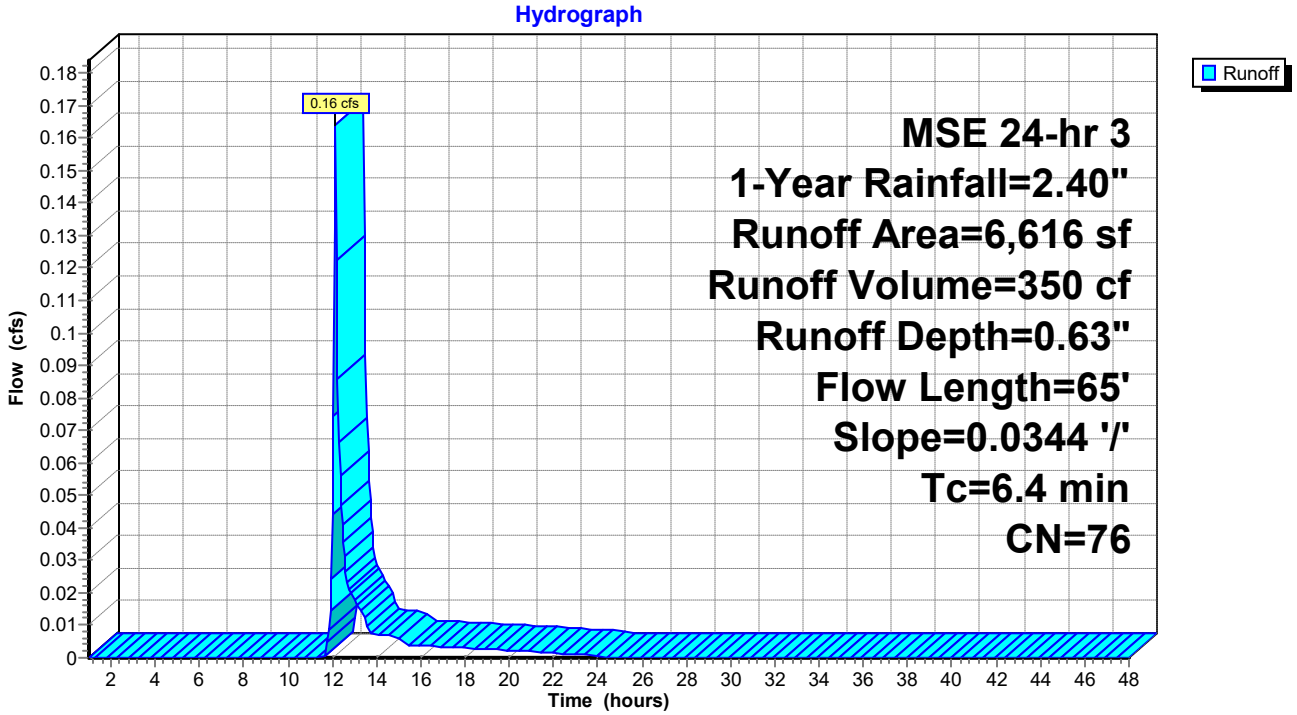
Runoff = 0.16 cfs @ 12.15 hrs, Volume= 350 cf, Depth= 0.63"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	6,111	74	PER
*	505	98	IMP
	6,616	76	Weighted Average
	6,111		92.37% Pervious Area
	505		7.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	65	0.0344	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 15S: N



Summary for Subcatchment 16S: O

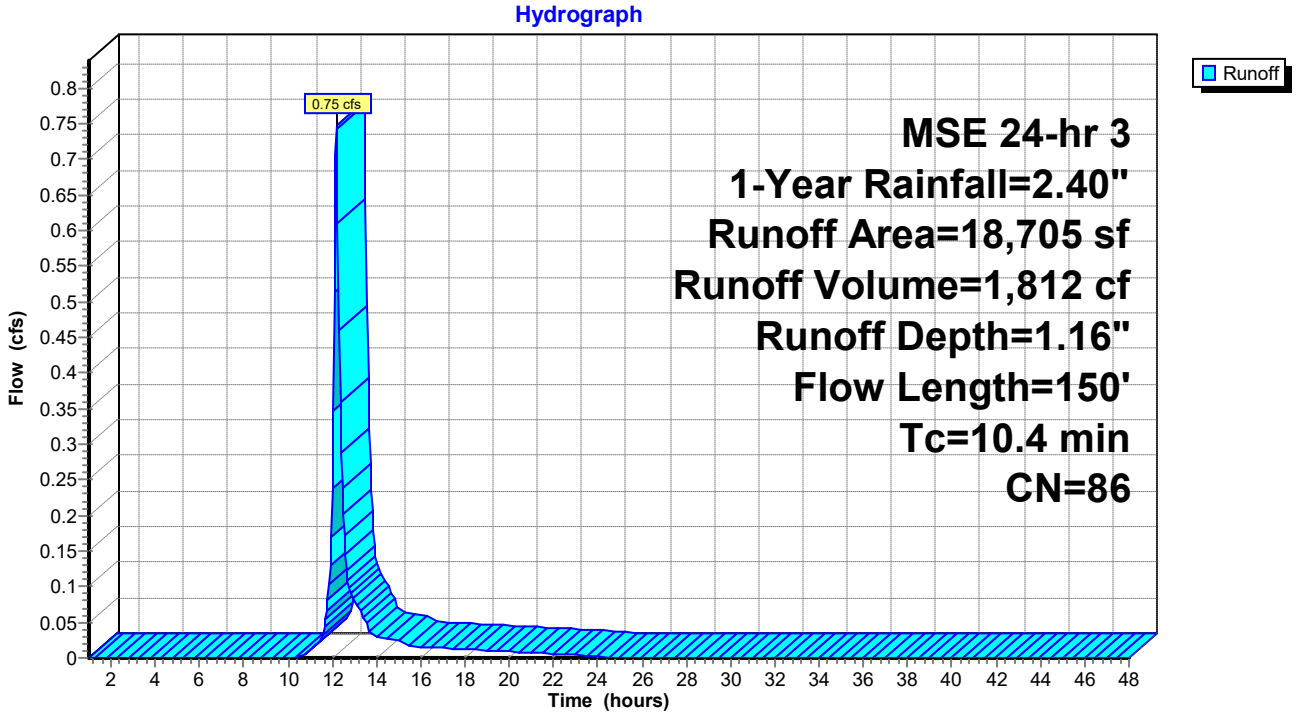
Runoff = 0.75 cfs @ 12.19 hrs, Volume= 1,812 cf, Depth= 1.16"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	9,468	74	PER
*	4,653	98	IMP
*	4,584	98	ROOF
	18,705	86	Weighted Average
	9,468		50.62% Pervious Area
	9,237		49.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.0274	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.5	50	0.0080	1.82		**Shallow Concentrated Flow, SCF** Paved Kv= 20.3 fps
10.4	150	Total			

Subcatchment 16S: O



Summary for Subcatchment 17S: P

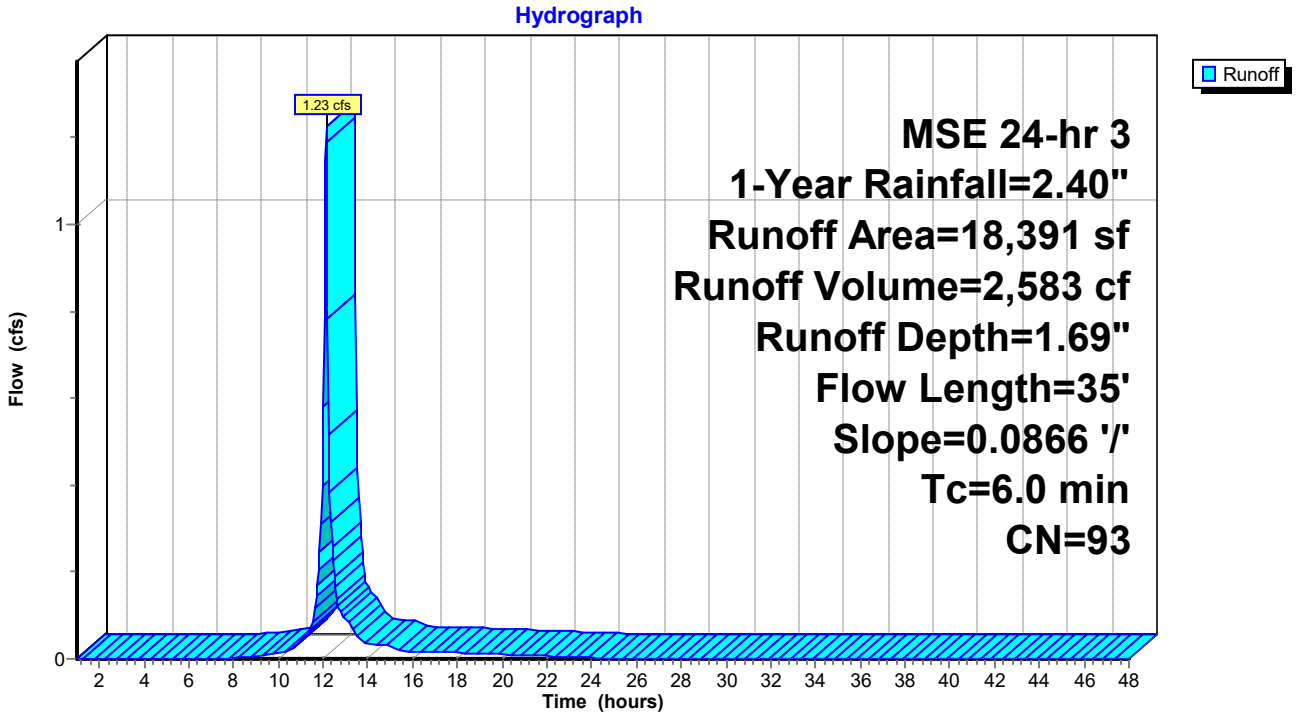
Runoff = 1.23 cfs @ 12.13 hrs, Volume= 2,583 cf, Depth= 1.69"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	3,636	74	PER
*	878	98	IMP
*	13,877	98	ROOF
	18,391	93	Weighted Average
	3,636		19.77% Pervious Area
	14,755		80.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	35	0.0866	0.22		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
2.7	35	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 17S: P



Summary for Subcatchment 18S: Q

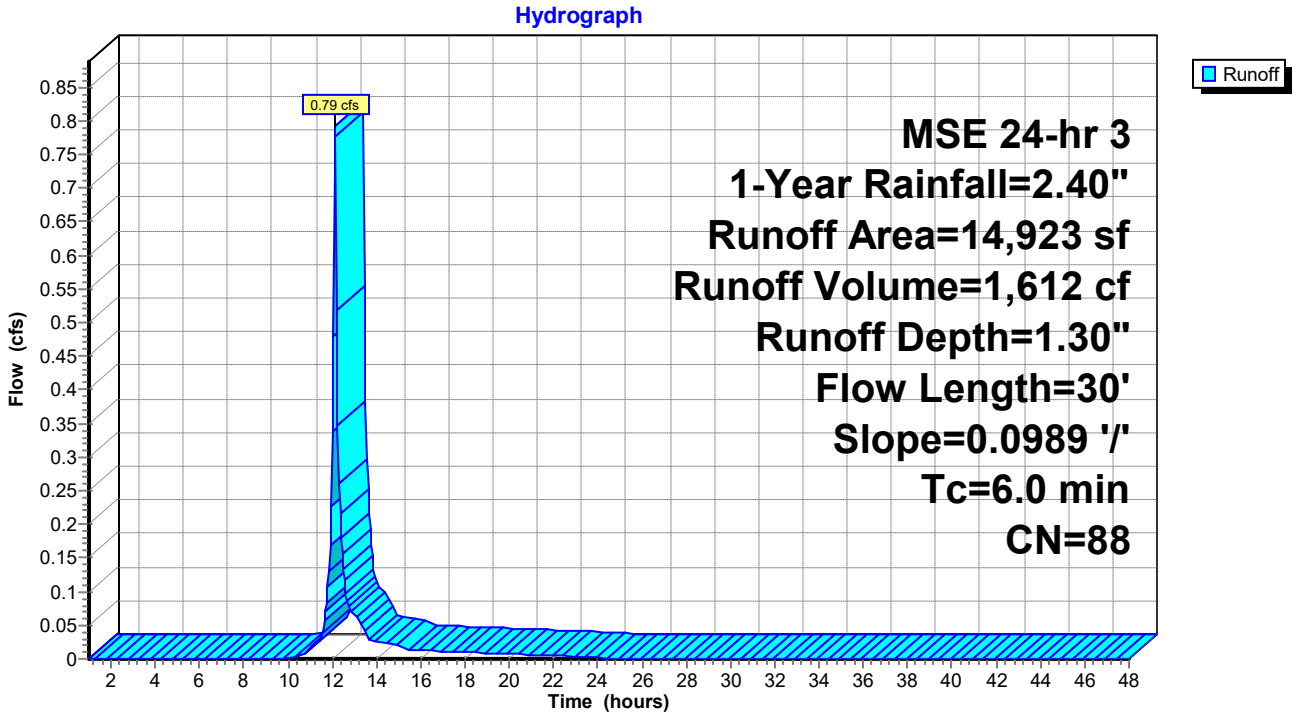
Runoff = 0.79 cfs @ 12.13 hrs, Volume= 1,612 cf, Depth= 1.30"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	6,396	74	PER
*	1,162	98	IMP
*	7,365	98	ROOF
	14,923	88	Weighted Average
	6,396		42.86% Pervious Area
	8,527		57.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	30	0.0989	0.22		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
2.3	30	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 18S: Q



Summary for Subcatchment 19S: R

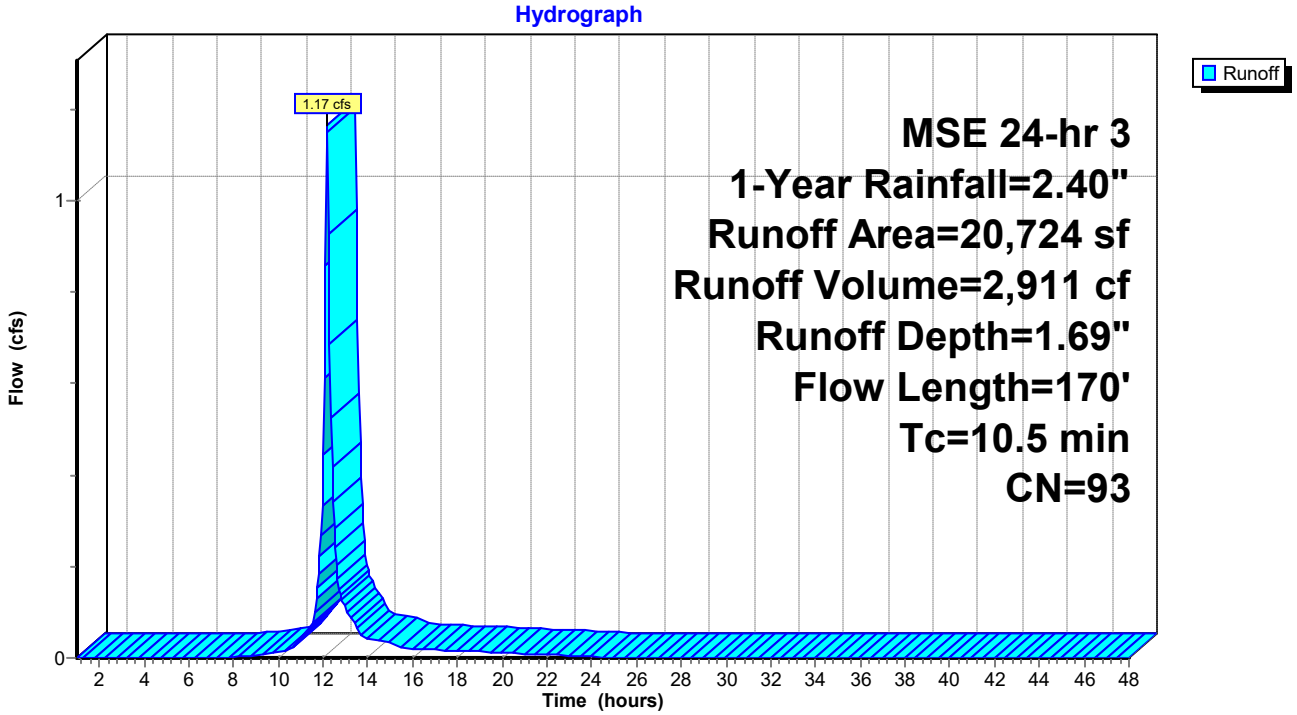
Runoff = 1.17 cfs @ 12.18 hrs, Volume= 2,911 cf, Depth= 1.69"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	4,279	74	PER
*	5,420	98	IMP
*	11,025	98	ROOF
	20,724	93	Weighted Average
	4,279		20.65% Pervious Area
	16,445		79.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0295	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.9	70	0.0320	1.25		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
10.5	170	Total			

Subcatchment 19S: R



Summary for Subcatchment 20S: S

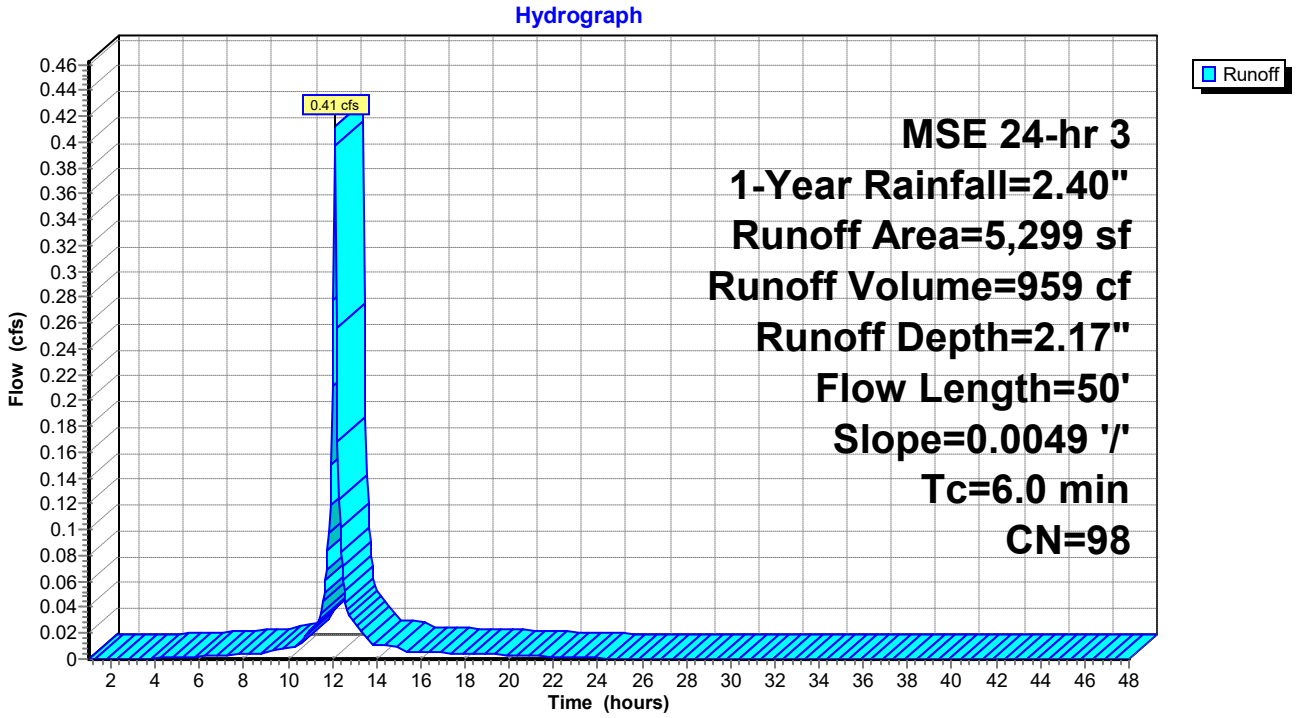
Runoff = 0.41 cfs @ 12.13 hrs, Volume= 959 cf, Depth= 2.17"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	808	98	IMP
*	4,491	98	ROOF
	5,299	98	Weighted Average
	5,299		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	50	0.0049	0.59		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 2.42"
1.4	50	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 20S: S



Summary for Subcatchment 21S: T

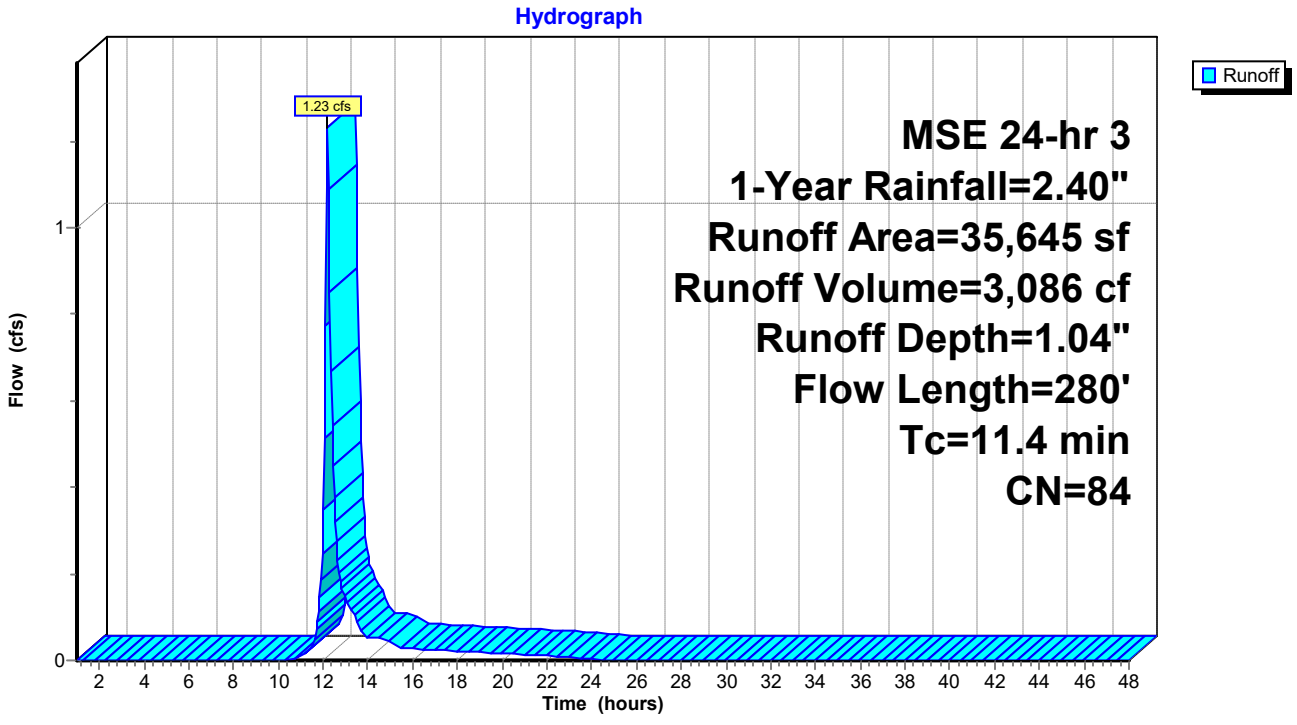
Runoff = 1.23 cfs @ 12.20 hrs, Volume= 3,086 cf, Depth= 1.04"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	21,454	74	PER
*	14,191	98	IMP
	35,645	84	Weighted Average
	21,454		60.19% Pervious Area
	14,191		39.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0272	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
1.4	180	0.0111	2.14		**Shallow Concentrated Flow, SCF** Paved Kv= 20.3 fps
11.4	280	Total			

Subcatchment 21S: T



Summary for Subcatchment 22S: U

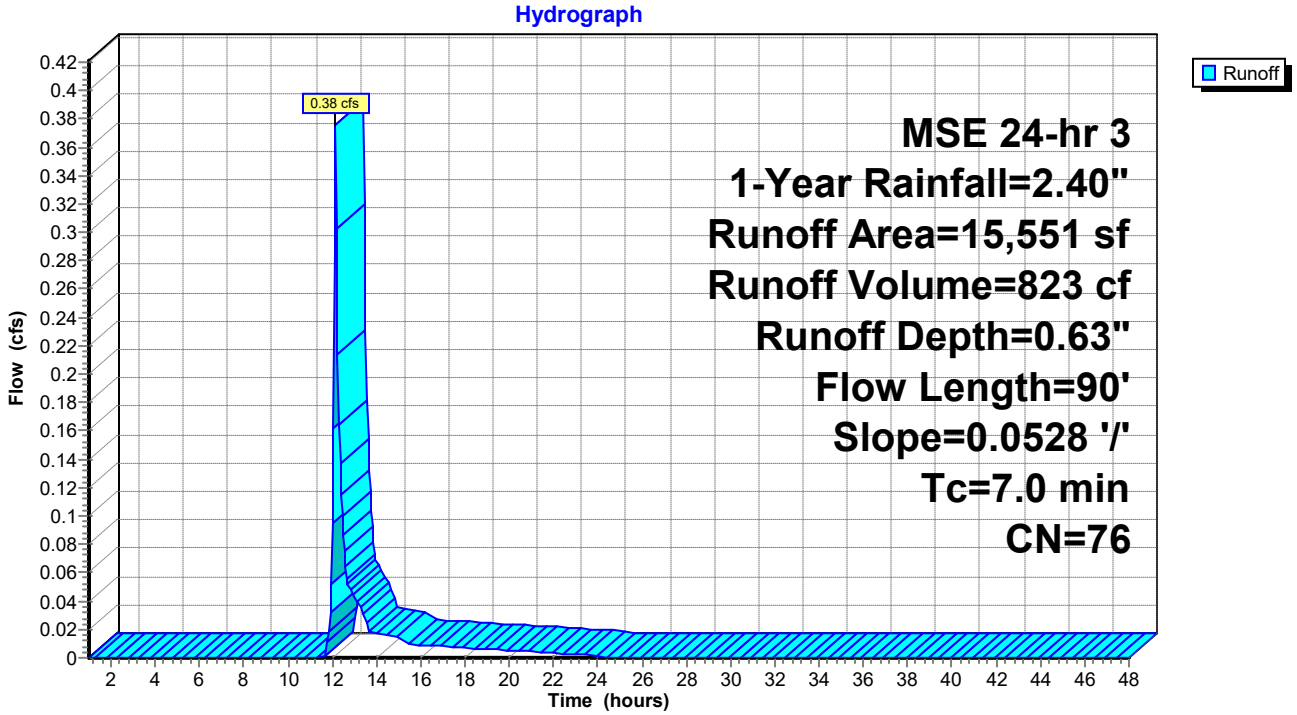
Runoff = 0.38 cfs @ 12.15 hrs, Volume= 823 cf, Depth= 0.63"
Routed to Link 32L : TOTAL OFFSITE UNTREATED

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	14,032	74	PER
*	1,519	98	IMP
	15,551	76	Weighted Average
	14,032		90.23% Pervious Area
	1,519		9.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	90	0.0528	0.21		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 22S: U



Summary for Subcatchment 23S: V

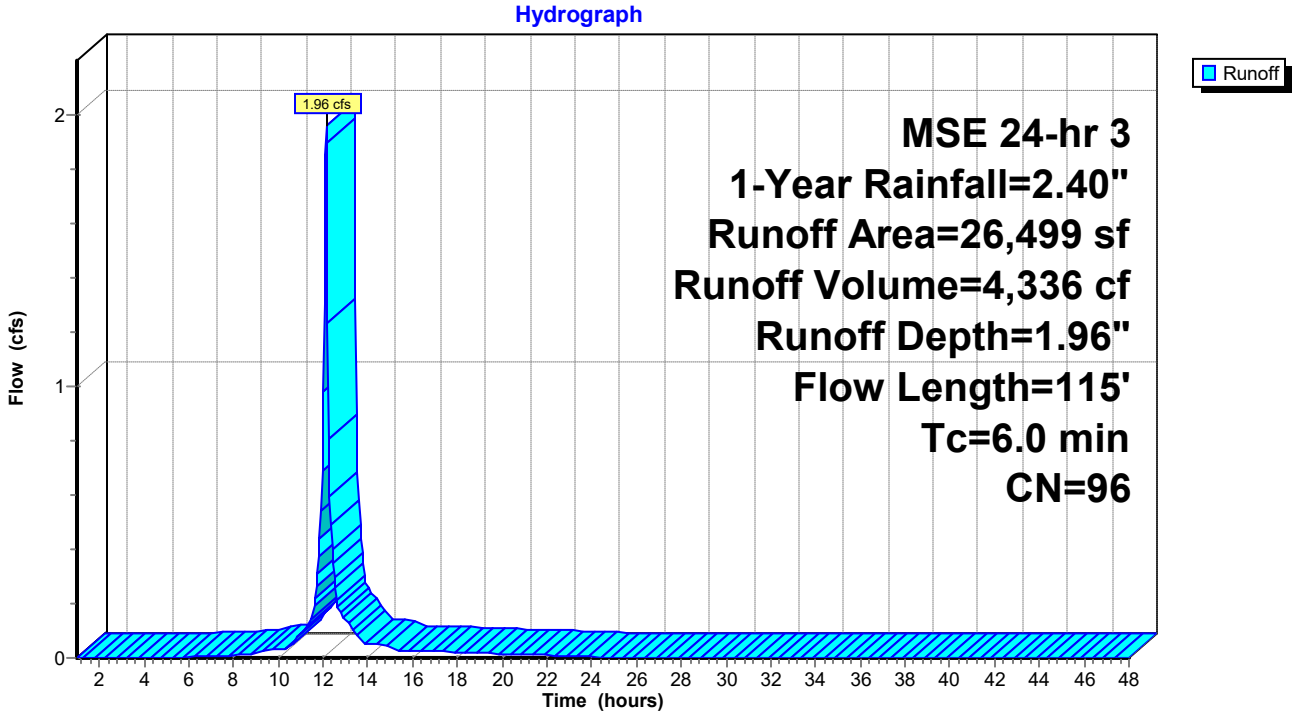
Runoff = 1.96 cfs @ 12.13 hrs, Volume= 4,336 cf, Depth= 1.96"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	2,290	74	PER
*	7,676	98	IMP
*	16,533	98	ROOF
	26,499	96	Weighted Average
	2,290		8.64% Pervious Area
	24,209		91.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	45	0.0345	0.16		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.9	70	0.0262	1.24		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 2.42"
5.7	115	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 23S: V



Summary for Subcatchment 24S: W

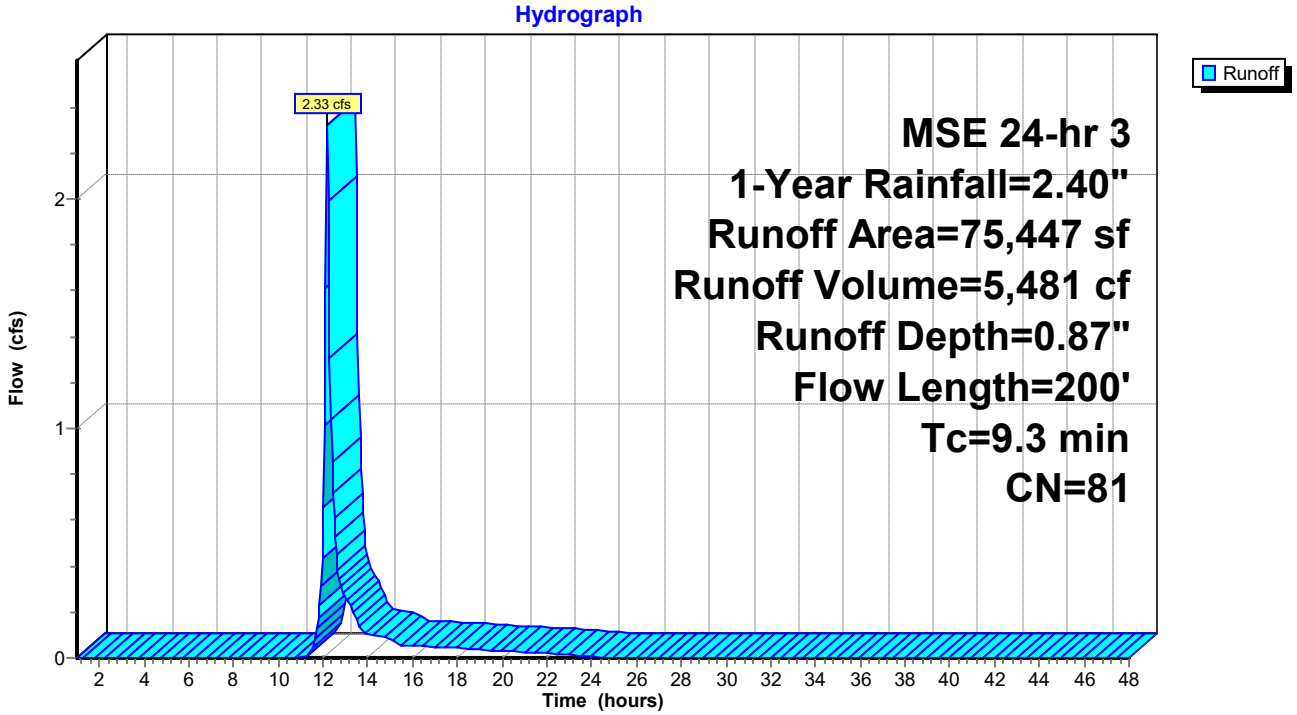
Runoff = 2.33 cfs @ 12.17 hrs, Volume= 5,481 cf, Depth= 0.87"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	54,767	74	PER
*	17,055	98	IMP
*	3,625	98	ROOF
	75,447	81	Weighted Average
	54,767		72.59% Pervious Area
	20,680		27.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0458	0.21		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
1.2	100	0.0428	1.45		**Shallow Concentrated Flow, SF** Short Grass Pasture Kv= 7.0 fps
9.3	200	Total			

Subcatchment 24S: W



Summary for Subcatchment 25S: X

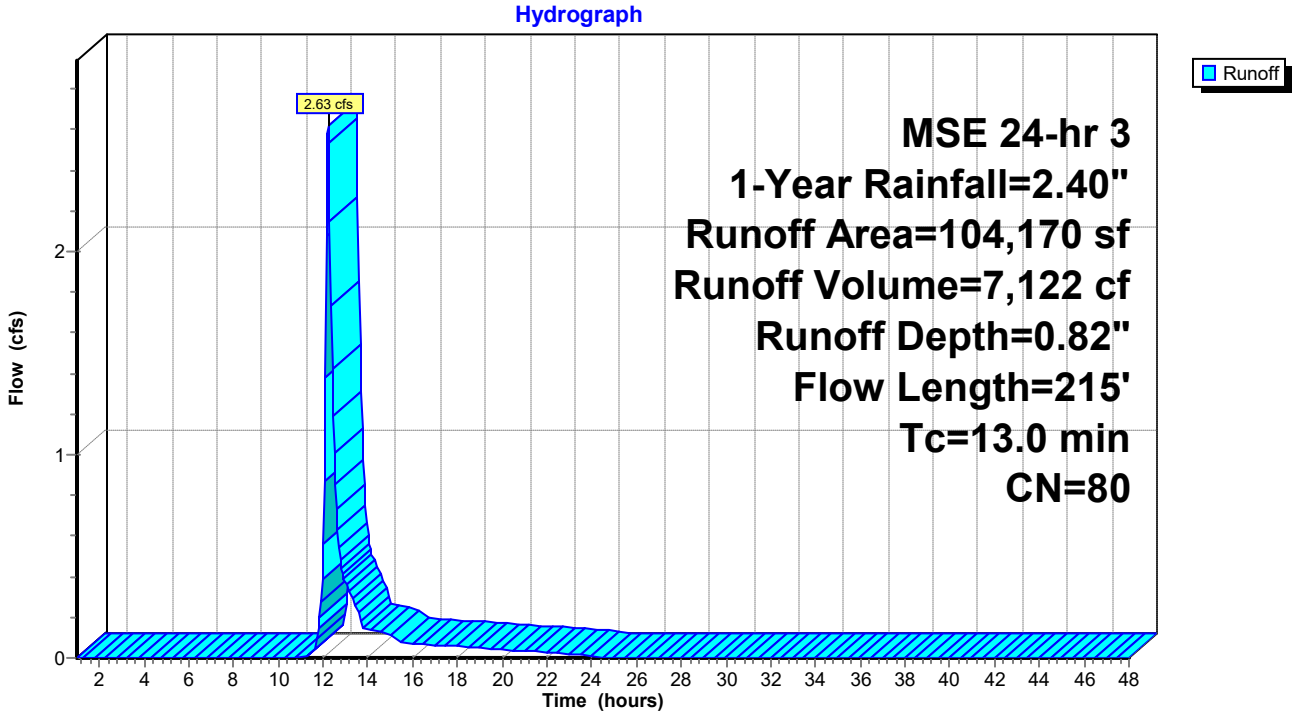
Runoff = 2.63 cfs @ 12.22 hrs, Volume= 7,122 cf, Depth= 0.82"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	79,699	74	PER
*	21,341	98	IMP
*	3,130	98	ROOF
	104,170	80	Weighted Average
	79,699		76.51% Pervious Area
	24,471		23.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0205	0.15		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
1.8	115	0.0234	1.07		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
13.0	215	Total			

Subcatchment 25S: X



Summary for Subcatchment 26S: Y

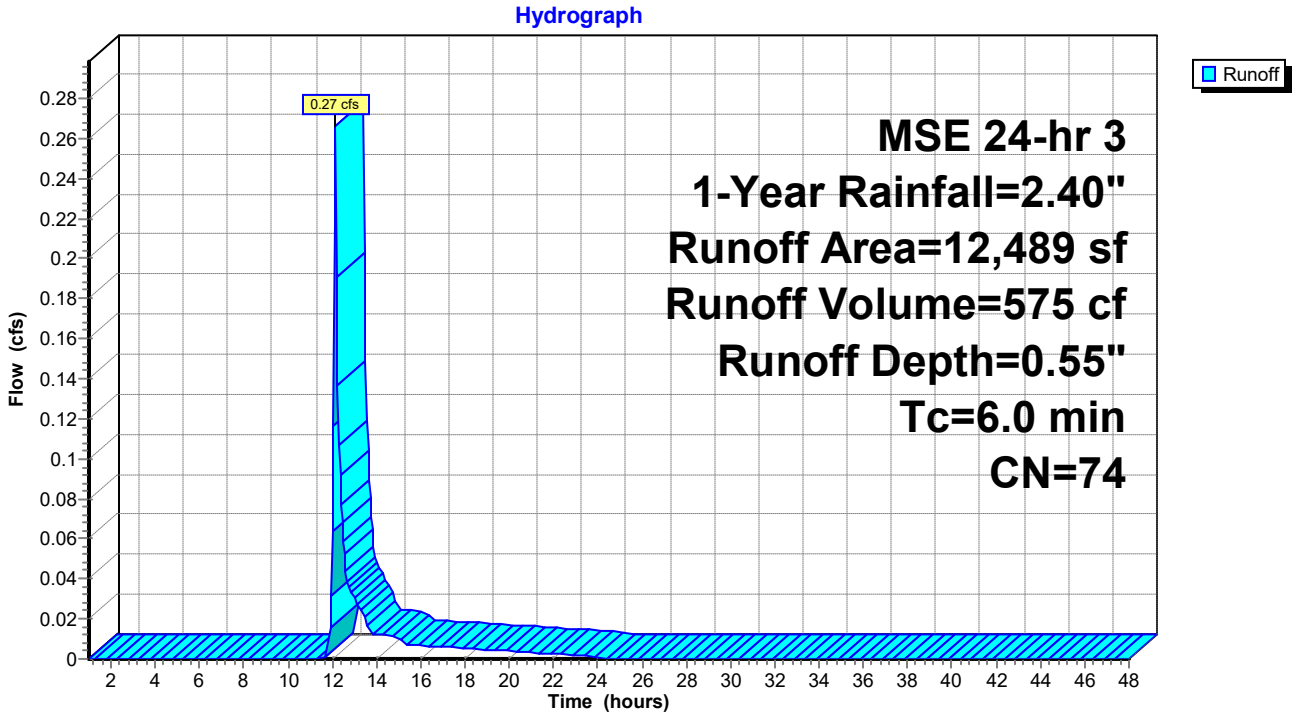
Runoff = 0.27 cfs @ 12.14 hrs, Volume= 575 cf, Depth= 0.55"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	12,489	74	PER
	12,489		100.00% Pervious Area

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

Subcatchment 26S: Y



Summary for Subcatchment 27S: Z

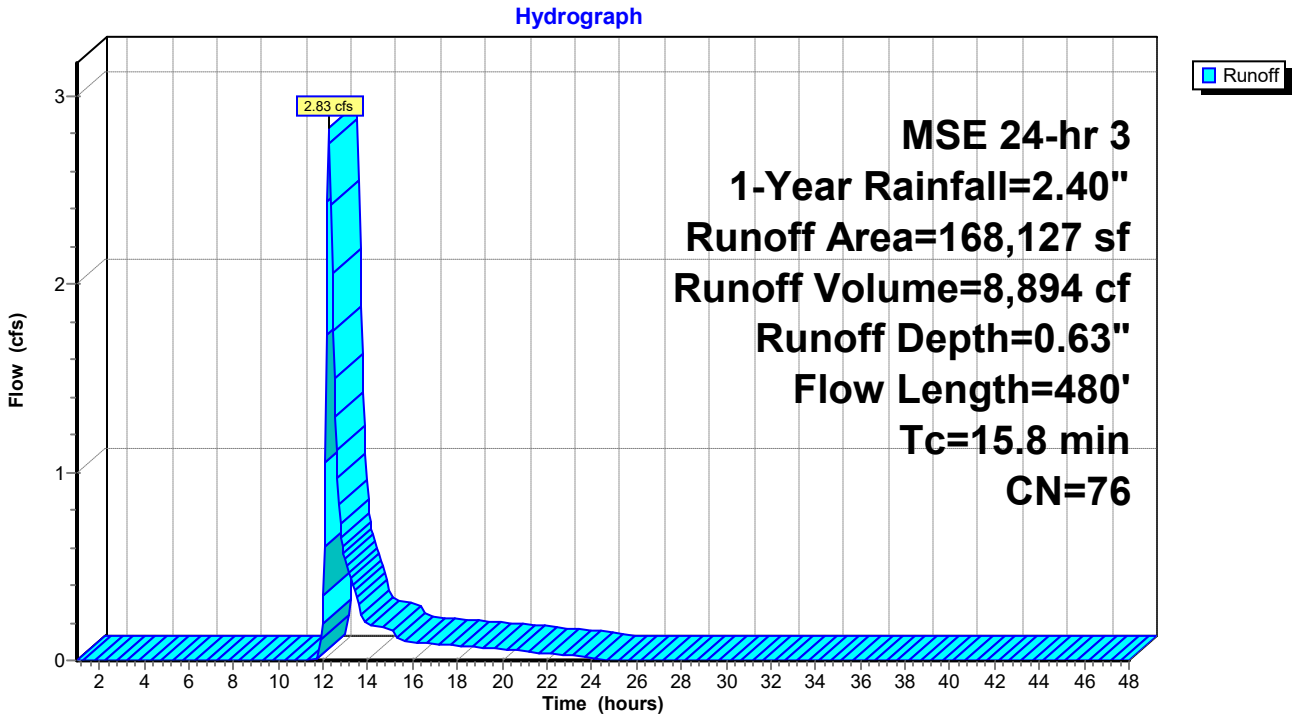
Runoff = 2.83 cfs @ 12.27 hrs, Volume= 8,894 cf, Depth= 0.63"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	157,056	74	PER
*	11,071	98	IMP
	168,127	76	Weighted Average
	157,056		93.42% Pervious Area
	11,071		6.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0237	0.16		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
5.3	380	0.0291	1.19		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
15.8	480	Total			

Subcatchment 27S: Z



Summary for Subcatchment 67S: C2

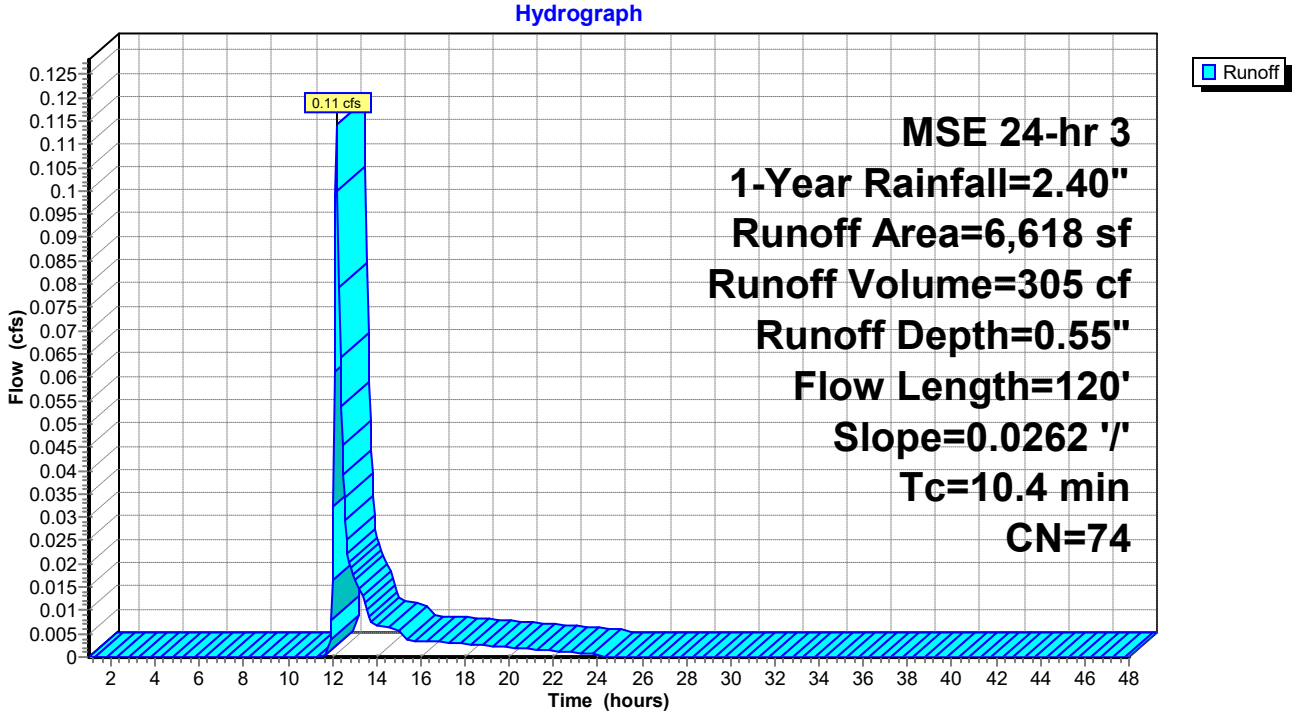
Runoff = 0.11 cfs @ 12.20 hrs, Volume= 305 cf, Depth= 0.55"
Routed to Link 80L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	6,618	74	PER
	6,618		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	100	0.0262	0.16		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.3	20	0.0262	1.13		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
10.4	120	Total			

Subcatchment 67S: C2



Summary for Subcatchment 68S: C4

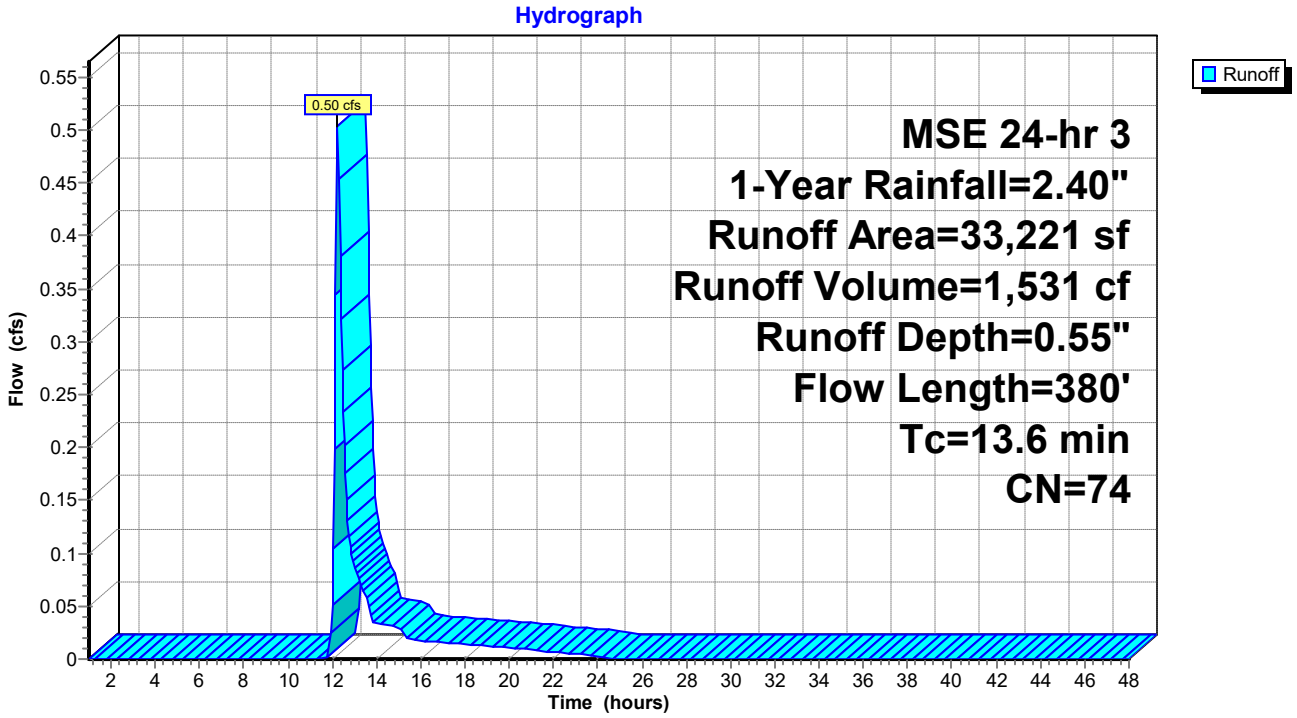
Runoff = 0.50 cfs @ 12.24 hrs, Volume= 1,531 cf, Depth= 0.55"
Routed to Reach 182R : EX. Red Barn Lane West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	33,221	74	PER
	33,221		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0319	0.18		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
4.3	280	0.0235	1.07		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
13.6	380	Total			

Subcatchment 68S: C4



Summary for Subcatchment 69S: C3

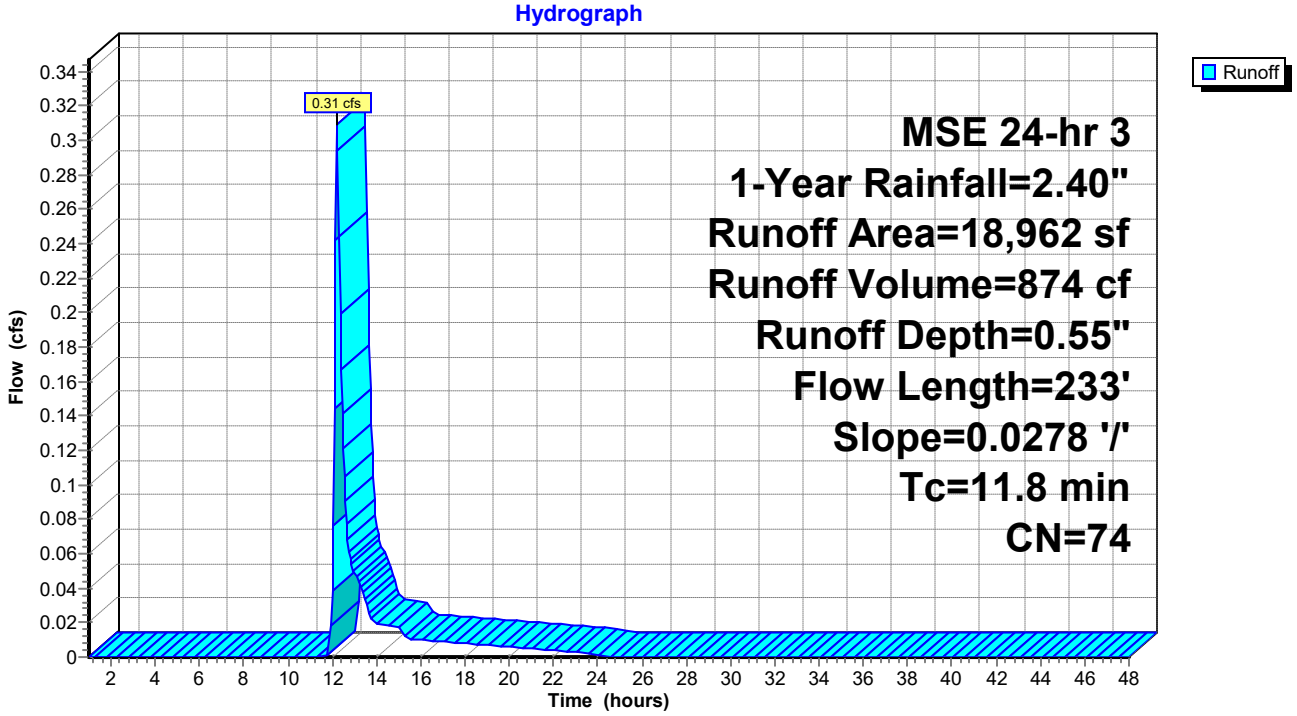
Runoff = 0.31 cfs @ 12.22 hrs, Volume= 874 cf, Depth= 0.55"
Routed to Link 78L : Swale on Lot 20

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	18,962	74	PER
	18,962		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.0278	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
1.9	133	0.0278	1.17		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
11.8	233	Total			

Subcatchment 69S: C3



Summary for Subcatchment 70S: O1

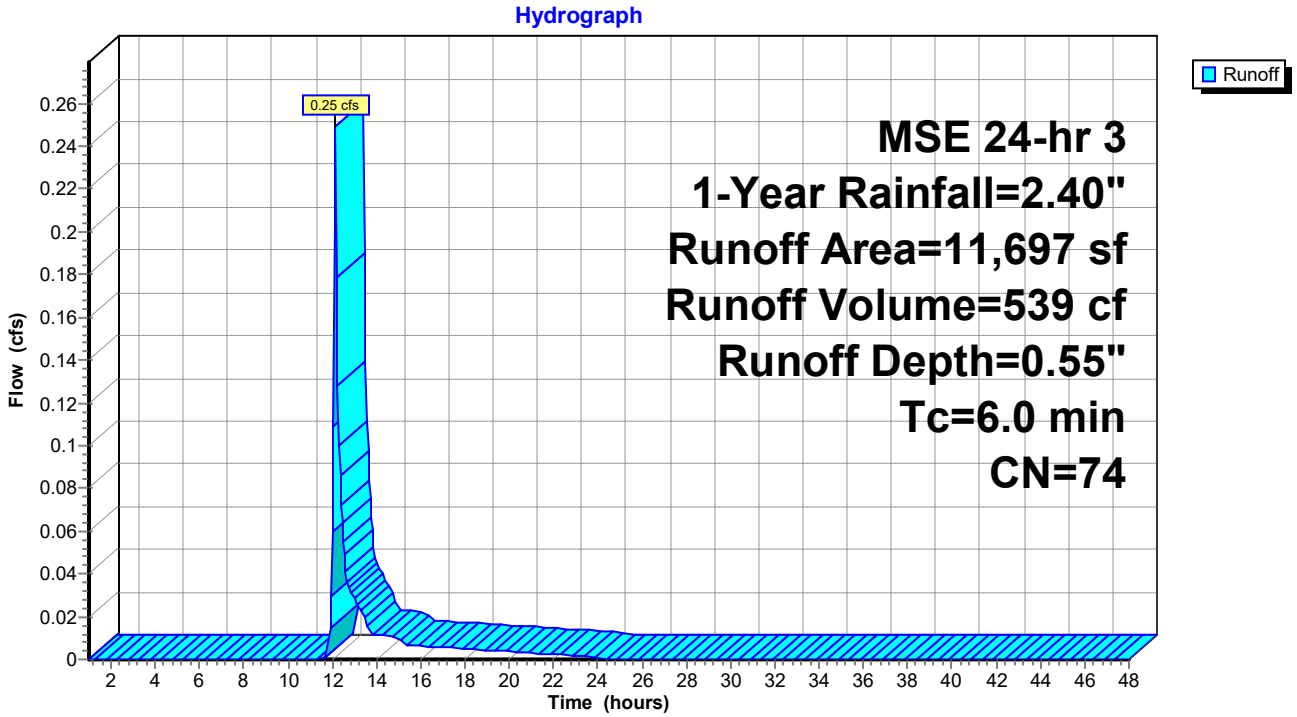
Runoff = 0.25 cfs @ 12.14 hrs, Volume= 539 cf, Depth= 0.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	11,697	74	PERV
	11,697		100.00% Pervious Area

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

Subcatchment 70S: O1



Summary for Subcatchment 71S: O2

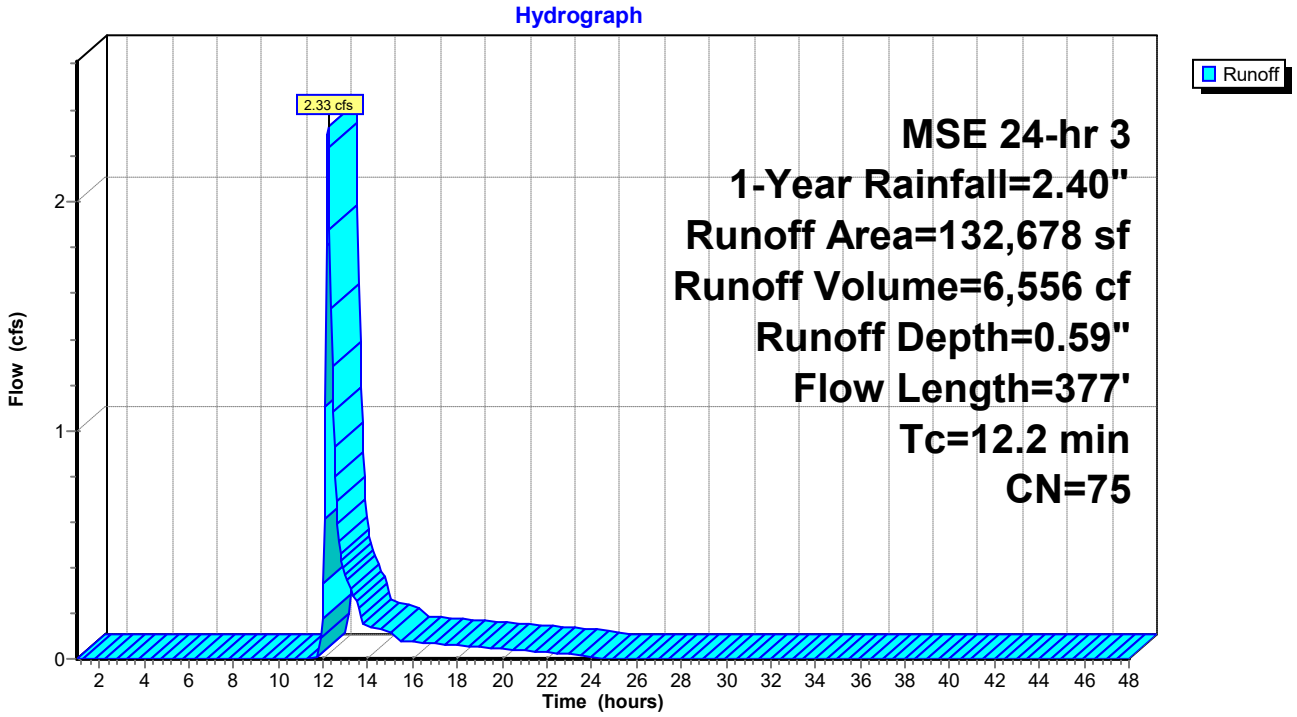
Runoff = 2.33 cfs @ 12.22 hrs, Volume= 6,556 cf, Depth= 0.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	129,638	74	PERV
*	3,040	98	IMPERV
	132,678	75	Weighted Average
	129,638		97.71% Pervious Area
	3,040		2.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	77	0.0288	0.16		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
4.3	300	0.0135	1.16		**Shallow Concentrated Flow, SHALLOW CONC** Nearly Bare & Untilled Kv= 10.0 fps
12.2	377	Total			

Subcatchment 71S: O2



Summary for Subcatchment 184S: Z1 (EX. RBL Area to RBL West Swale)

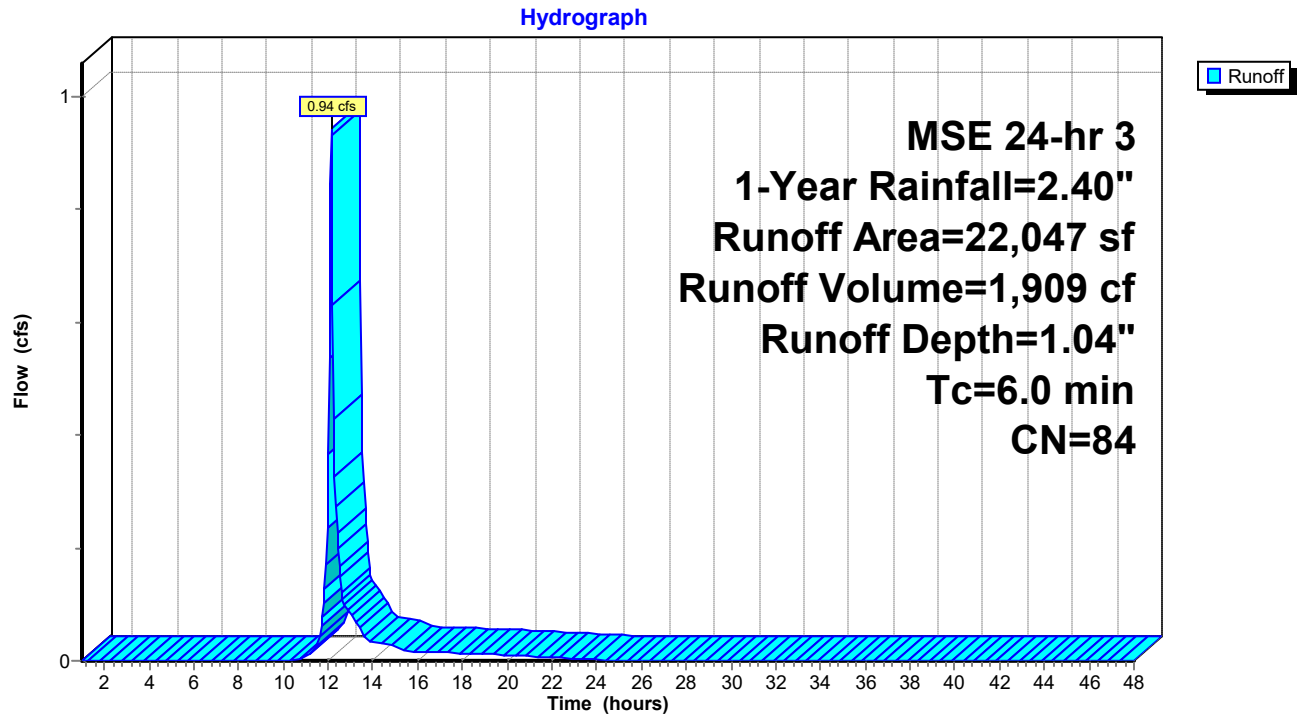
Runoff = 0.94 cfs @ 12.14 hrs, Volume= 1,909 cf, Depth= 1.04"
Routed to Reach 182R : EX. Red Barn Lane West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	12,014	74	landscape
*	9,160	98	road
*	873	74	landscape
	22,047	84	Weighted Average
	12,887		58.45% Pervious Area
	9,160		41.55% Impervious Area

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

Subcatchment 184S: Z1 (EX. RBL Area to RBL West Swale)



Summary for Reach 93R: Overland Flow from North Depression to South Depression

[43] Hint: Has no inflow (Outflow=Zero)

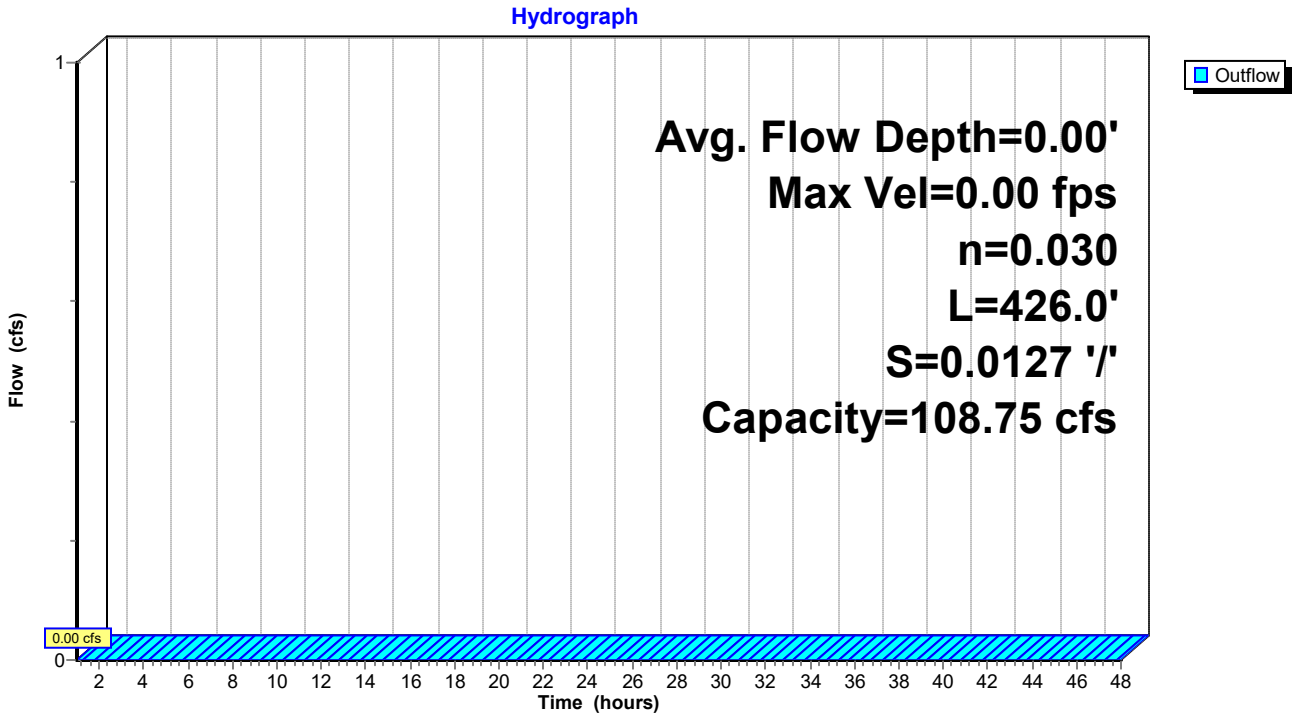
Bank-Full Depth= 0.50' Flow Area= 37.5 sf, Capacity= 108.75 cfs

50.00' x 0.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 50.0 '/' Top Width= 100.00'
Length= 426.0' Slope= 0.0127 '/'
Inlet Invert= 755.90', Outlet Invert= 750.50'



‡

Reach 93R: Overland Flow from North Depression to South Depression



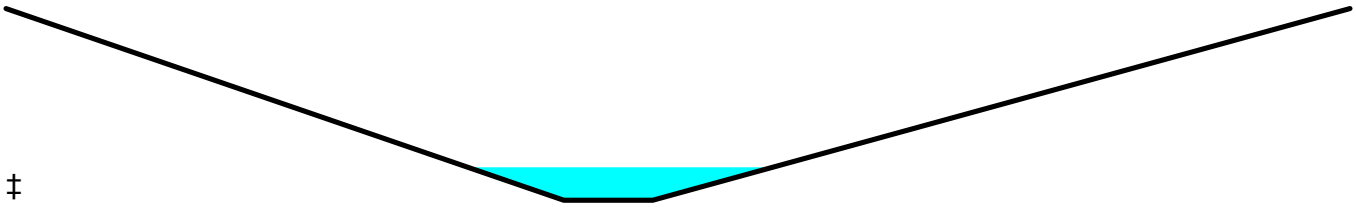
Summary for Reach 182R: EX. Red Barn Lane West Swale

Inflow Area = 79,613 sf, 11.51% Impervious, Inflow Depth = 0.69" for 1-Year event
Inflow = 1.66 cfs @ 12.16 hrs, Volume= 4,561 cf
Outflow = 1.47 cfs @ 12.22 hrs, Volume= 4,561 cf, Atten= 11%, Lag= 3.5 min
Routed to Link 79L : Swale Along Red Barn Ln.

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.44 fps, Min. Travel Time= 4.2 min
Avg. Velocity = 0.86 fps, Avg. Travel Time= 11.9 min

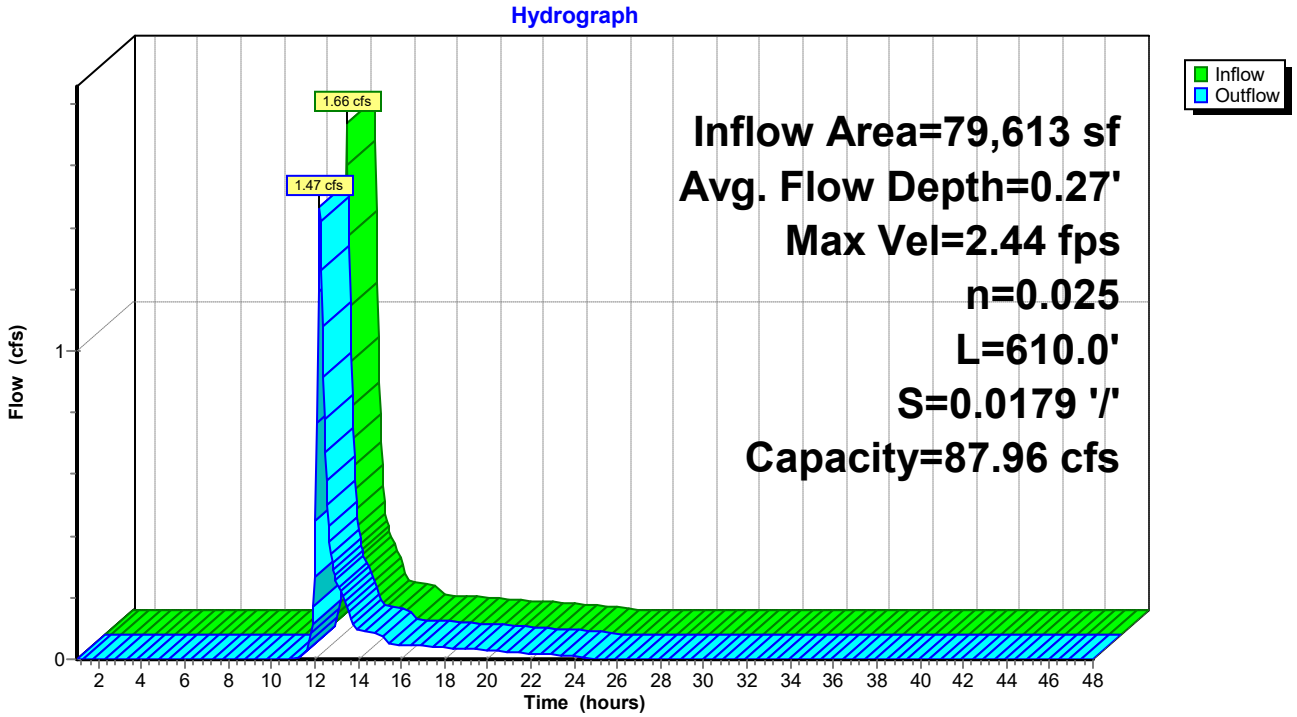
Peak Storage= 366 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.27' , Surface Width= 3.44'
Bank-Full Depth= 1.57' Flow Area= 12.7 sf, Capacity= 87.96 cfs

1.00' x 1.57' deep channel, n= 0.025
Side Slope Z-value= 4.0 5.0 '/' Top Width= 15.13'
Length= 610.0' Slope= 0.0179 '/'
Inlet Invert= 760.89', Outlet Invert= 750.00'



‡

Reach 182R: EX. Red Barn Lane West Swale



Summary for Pond 73P: Southeast Basin

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=92)

Inflow Area = 156,438 sf, 0.00% Impervious, Inflow Depth = 0.55" for 1-Year event
Inflow = 2.36 cfs @ 12.25 hrs, Volume= 7,207 cf
Outflow = 0.64 cfs @ 12.69 hrs, Volume= 7,209 cf, Atten= 73%, Lag= 26.5 min
Discarded = 0.64 cfs @ 12.69 hrs, Volume= 7,209 cf

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 730.49' @ 12.69 hrs Surf.Area= 5,378 sf Storage= 2,004 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 26.1 min (877.3 - 851.1)

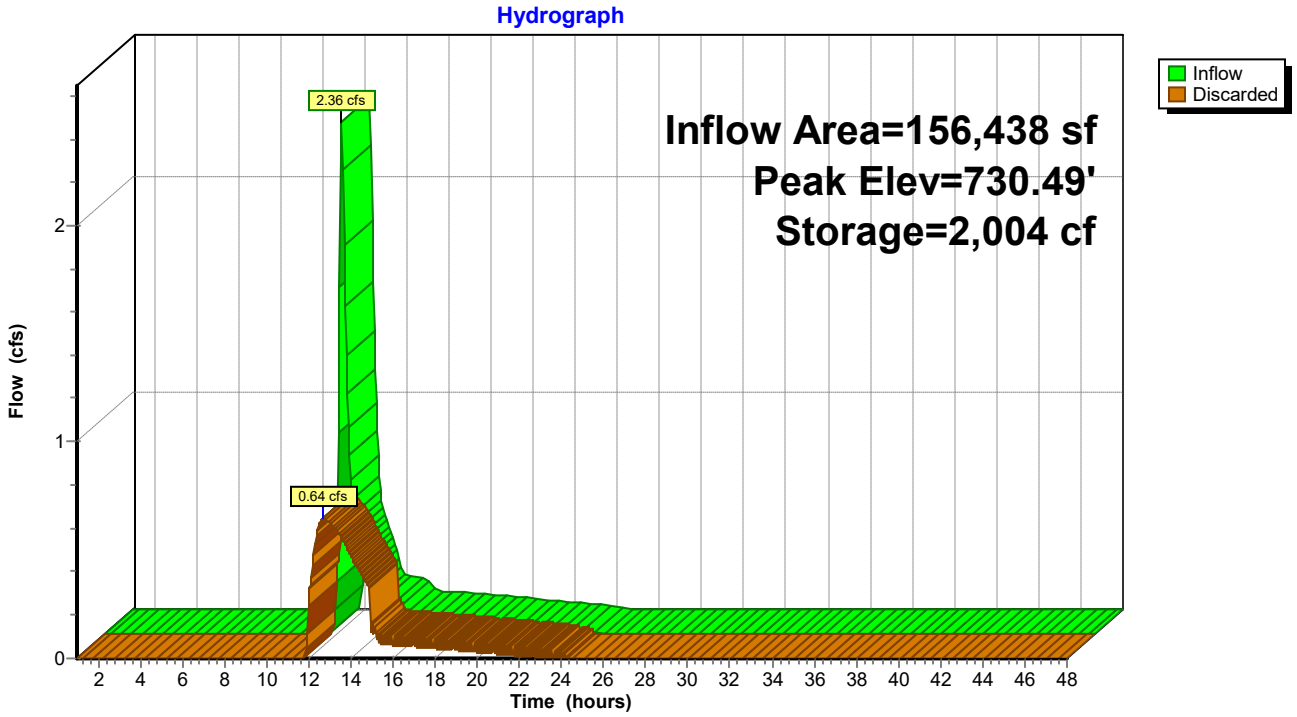
Volume	Invert	Avail.Storage	Storage Description
#1	730.00'	273,743 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
730.00	2,768	0	0
731.00	8,073	5,421	5,421
732.00	12,399	10,236	15,657
733.00	17,056	14,728	30,384
734.00	21,328	19,192	49,576
735.00	25,607	23,468	73,044
736.00	29,845	27,726	100,770
737.00	35,145	32,495	133,265
738.00	42,680	38,913	172,177
739.00	51,064	46,872	219,049
740.00	58,323	54,694	273,743

Device	Routing	Invert	Outlet Devices
#1	Discarded	730.00'	**5.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 720.00'

Discarded OutFlow Max=0.64 cfs @ 12.69 hrs HW=730.49' (Free Discharge)
1=Exfiltration (Controls 0.64 cfs)

Pond 73P: Southeast Basin



Summary for Pond 74P: Southwest Basin

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=45)

Inflow Area = 432,562 sf, 19.07% Impervious, Inflow Depth = 0.78" for 1-Year event
Inflow = 9.88 cfs @ 12.21 hrs, Volume= 28,148 cf
Outflow = 2.27 cfs @ 12.68 hrs, Volume= 28,153 cf, Atten= 77%, Lag= 28.2 min
Discarded = 2.27 cfs @ 12.68 hrs, Volume= 28,153 cf

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 742.43' @ 12.68 hrs Surf.Area= 11,740 sf Storage= 10,651 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 68.4 min (901.1 - 832.7)

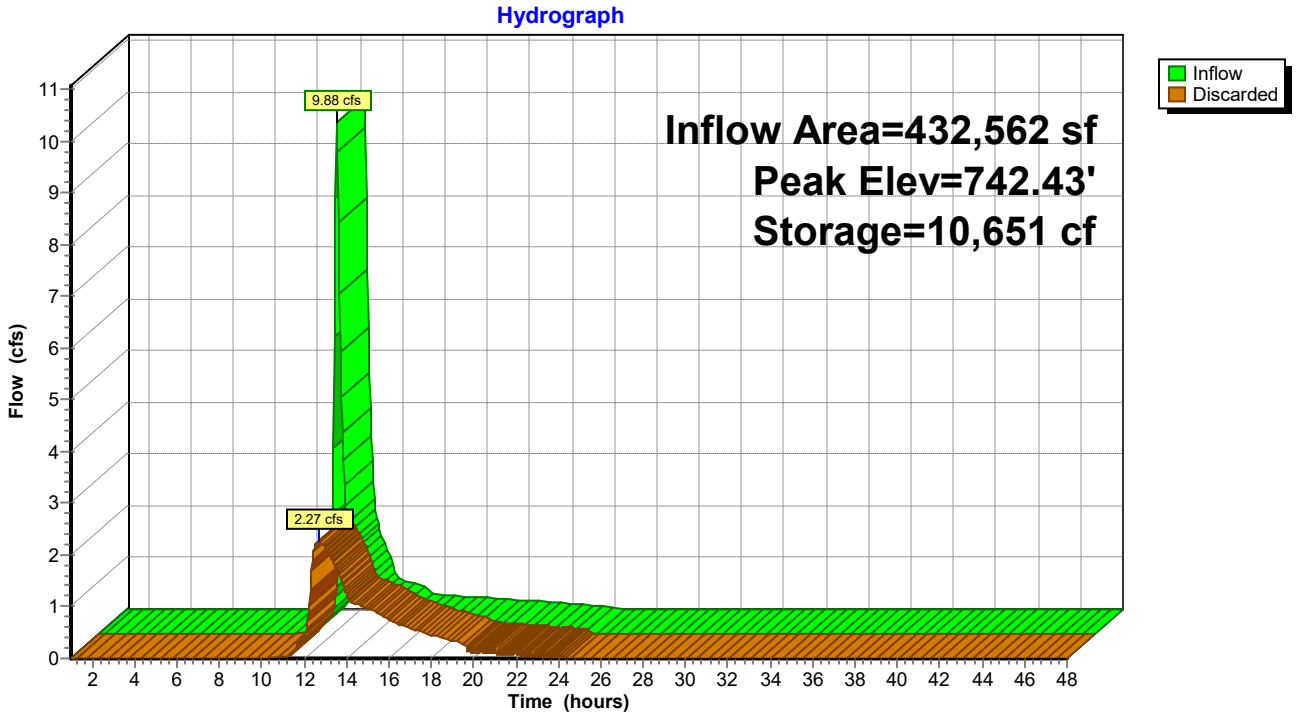
Volume	Invert	Avail.Storage	Storage Description
#1	740.00'	78,856 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
740.00	1,591	0	0
741.00	3,325	2,458	2,458
742.00	5,645	4,485	6,943
743.00	19,935	12,790	19,733
744.00	30,884	25,410	45,143
745.00	36,542	33,713	78,856

Device	Routing	Invert	Outlet Devices
#1	Discarded	740.00'	**8.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 720.00'

Discarded OutFlow Max=2.27 cfs @ 12.68 hrs HW=742.43' (Free Discharge)
1=Exfiltration (Controls 2.27 cfs)

Pond 74P: Southwest Basin



Summary for Pond 89P: Gravel North Depression

[93] Warning: Storage range exceeded by 0.30'
[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 248,526 sf, 21.47% Impervious, Inflow Depth = 0.80" for 1-Year event
Inflow = 6.09 cfs @ 12.19 hrs, Volume= 16,470 cf
Outflow = 6.59 cfs @ 12.17 hrs, Volume= 16,470 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.44 cfs @ 12.15 hrs, Volume= 6,172 cf
Primary = 1.80 cfs @ 12.34 hrs, Volume= 7,392 cf
Routed to Pond 92P : Gravel South Depression
Secondary = 4.45 cfs @ 12.17 hrs, Volume= 2,906 cf
Routed to Pond 92P : Gravel South Depression

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 756.30' @ 12.17 hrs Surf.Area= 1,161 sf Storage= 808 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 3.7 min (830.1 - 826.4)

Volume	Invert	Avail.Storage	Storage Description
#1	754.80'	808 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
754.80	237	0	0
755.50	725	337	337
756.00	1,161	472	808

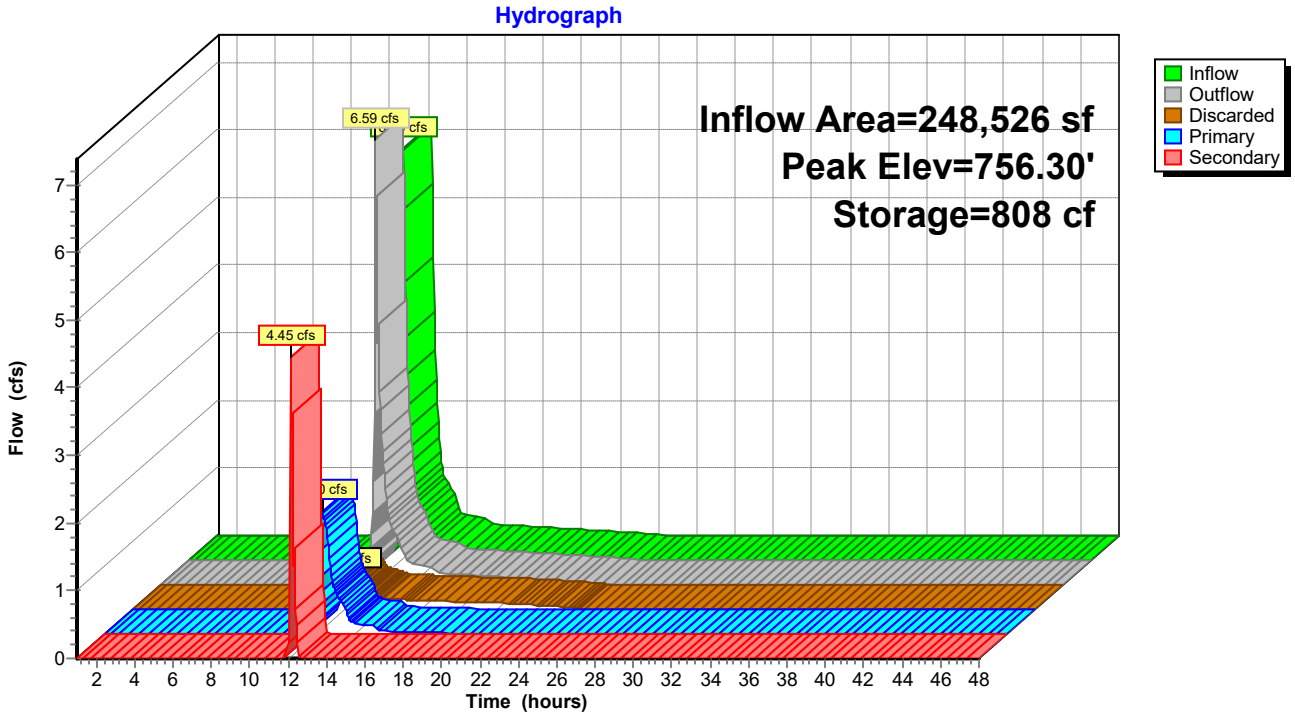
Device	Routing	Invert	Outlet Devices
#1	Primary	754.80'	**12.0" Round Culvert** L= 426.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 754.80' / 749.60' S= 0.0122 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	755.80'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#3	Discarded	754.80'	**16.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 725.00'

Discarded OutFlow Max=0.44 cfs @ 12.15 hrs HW=756.27' (Free Discharge)
3=Exfiltration (Controls 0.44 cfs)

Primary OutFlow Max=1.79 cfs @ 12.34 hrs HW=756.05' TW=752.43' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.79 cfs @ 2.35 fps)

Secondary OutFlow Max=3.95 cfs @ 12.17 hrs HW=756.25' TW=752.59' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Weir Controls 3.95 cfs @ 1.75 fps)

Pond 89P: Gravel North Depression



Summary for Pond 92P: Gravel South Depression

[92] Warning: Device #1 is above defined storage
[93] Warning: Storage range exceeded by 0.60'
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=24)

Inflow Area = 301,528 sf, 17.70% Impervious, Inflow Depth = 0.51" for 1-Year event
Inflow = 6.66 cfs @ 12.17 hrs, Volume= 12,740 cf
Outflow = 6.15 cfs @ 12.19 hrs, Volume= 12,740 cf, Atten= 8%, Lag= 1.3 min
Primary = 6.05 cfs @ 12.19 hrs, Volume= 10,173 cf
Routed to Link 80L : EX. Cul-de-sac On Green Meadow Place
Secondary = 0.10 cfs @ 12.19 hrs, Volume= 2,567 cf
Routed to Link 80L : EX. Cul-de-sac On Green Meadow Place

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 752.60' @ 12.19 hrs Surf.Area= 253 sf Storage= 387 cf

Plug-Flow detention time= 10.2 min calculated for 12,726 cf (100% of inflow)
Center-of-Mass det. time= 10.2 min (793.2 - 783.0)

Volume	Invert	Avail.Storage	Storage Description
#1	749.60'	387 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

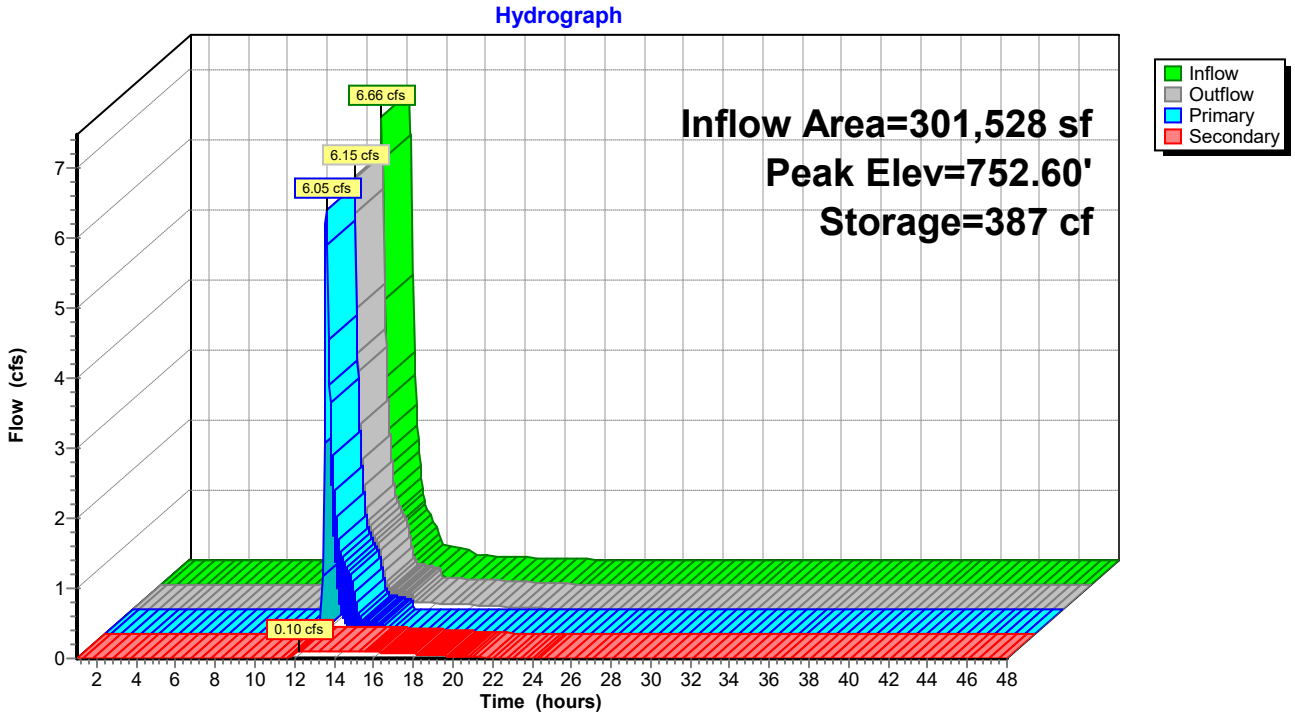
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
749.60	30	0	0
750.00	107	27	27
752.00	253	360	387

Device	Routing	Invert	Outlet Devices
#1	Primary	752.00'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Secondary	749.60'	**16.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 725.00'

Primary OutFlow Max=5.99 cfs @ 12.19 hrs HW=752.60' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 5.99 cfs @ 2.01 fps)

Secondary OutFlow Max=0.10 cfs @ 12.19 hrs HW=752.60' TW=0.00' (Dynamic Tailwater)
2=Exfiltration (Controls 0.10 cfs)

Pond 92P: Gravel South Depression

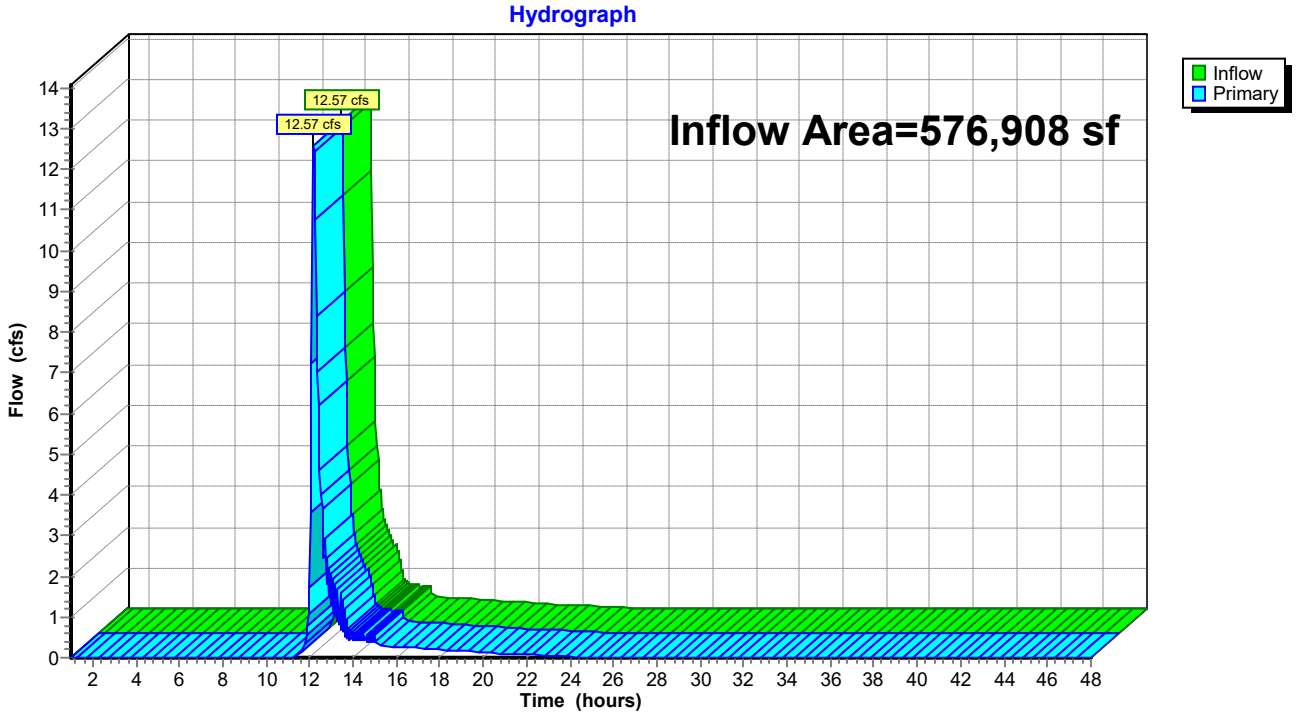


Summary for Link 32L: TOTAL OFFSITE UNTREATED

Inflow Area = 576,908 sf, 17.53% Impervious, Inflow Depth = 0.62" for 1-Year event
Inflow = 12.57 cfs @ 12.18 hrs, Volume= 29,576 cf
Primary = 12.57 cfs @ 12.18 hrs, Volume= 29,576 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 34L : TOTAL OUTFALL

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 32L: TOTAL OFFSITE UNTREATED

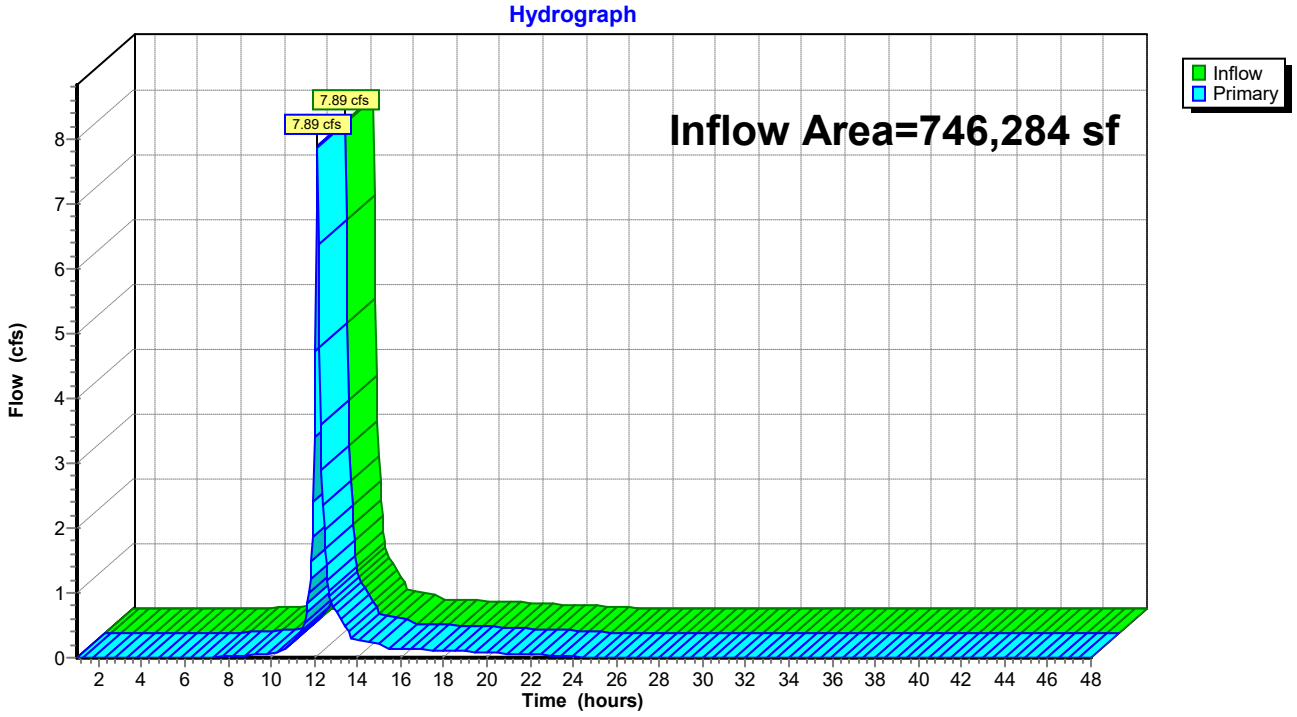


Summary for Link 33L: TOTAL ONSITE

Inflow Area = 746,284 sf, 24.37% Impervious, Inflow Depth = 0.30" for 1-Year event
Inflow = 7.89 cfs @ 12.14 hrs, Volume= 18,781 cf
Primary = 7.89 cfs @ 12.14 hrs, Volume= 18,781 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 34L : TOTAL OUTFALL

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 33L: TOTAL ONSITE

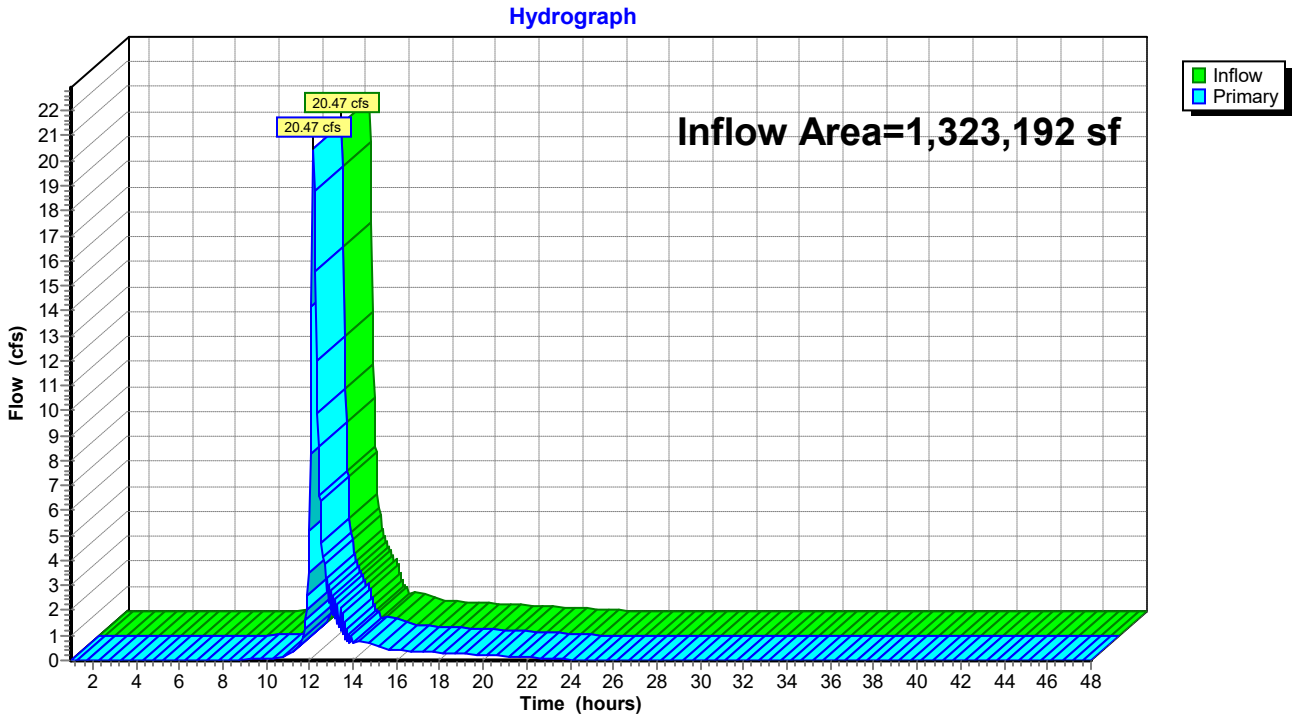


Summary for Link 34L: TOTAL OUTFALL

Inflow Area = 1,323,192 sf, 21.39% Impervious, Inflow Depth = 0.44" for 1-Year event
Inflow = 20.47 cfs @ 12.17 hrs, Volume= 48,357 cf
Primary = 20.47 cfs @ 12.17 hrs, Volume= 48,357 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 34L: TOTAL OUTFALL

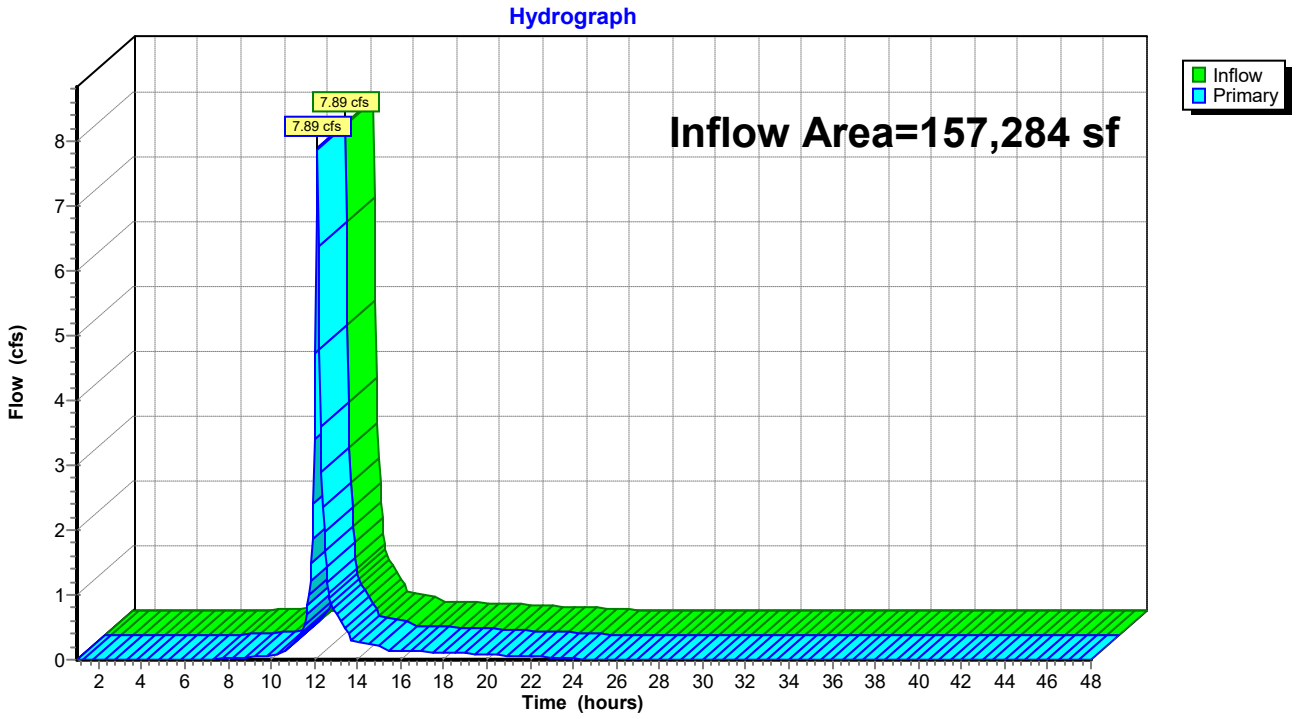


Summary for Link 75L: Areas Piped

Inflow Area = 157,284 sf, 63.18% Impervious, Inflow Depth = 1.43" for 1-Year event
Inflow = 7.89 cfs @ 12.14 hrs, Volume= 18,781 cf
Primary = 7.89 cfs @ 12.14 hrs, Volume= 18,781 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 33L : TOTAL ONSITE

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 75L: Areas Piped

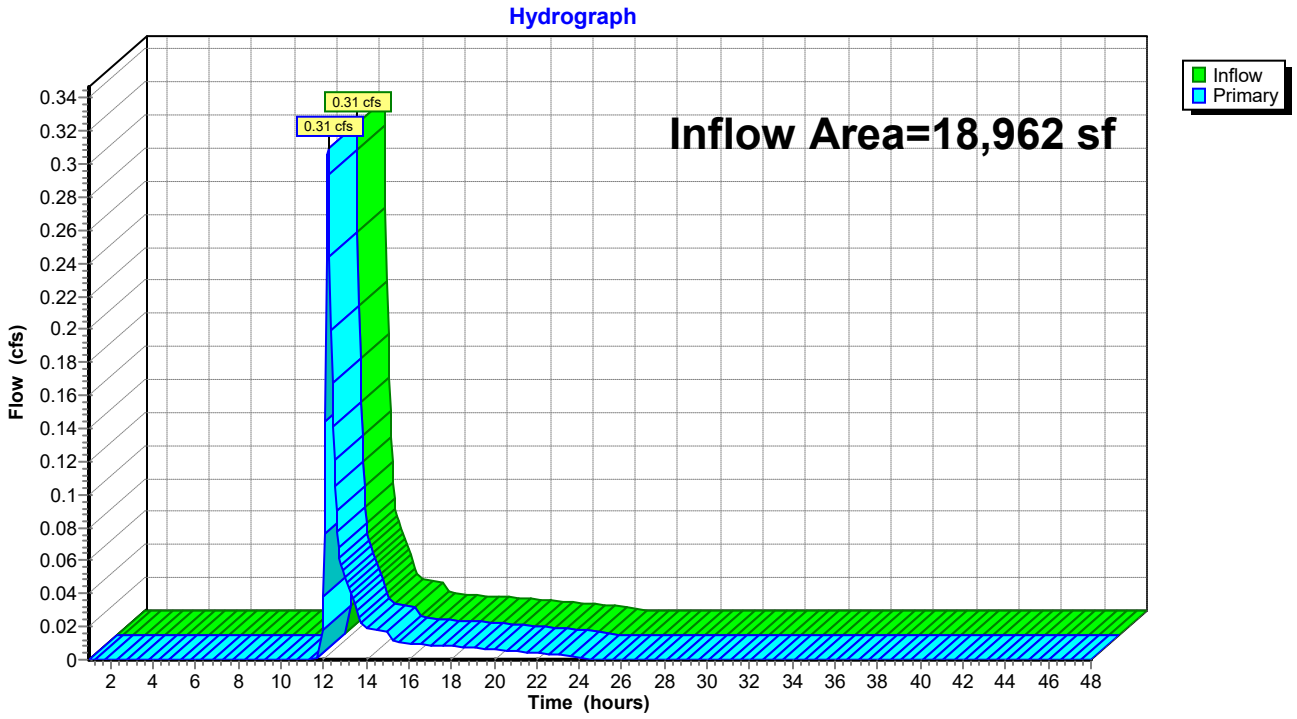


Summary for Link 78L: Swale on Lot 20

Inflow Area = 18,962 sf, 0.00% Impervious, Inflow Depth = 0.55" for 1-Year event
Inflow = 0.31 cfs @ 12.22 hrs, Volume= 874 cf
Primary = 0.31 cfs @ 12.22 hrs, Volume= 874 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 32L : TOTAL OFFSITE UNTREATED

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 78L: Swale on Lot 20

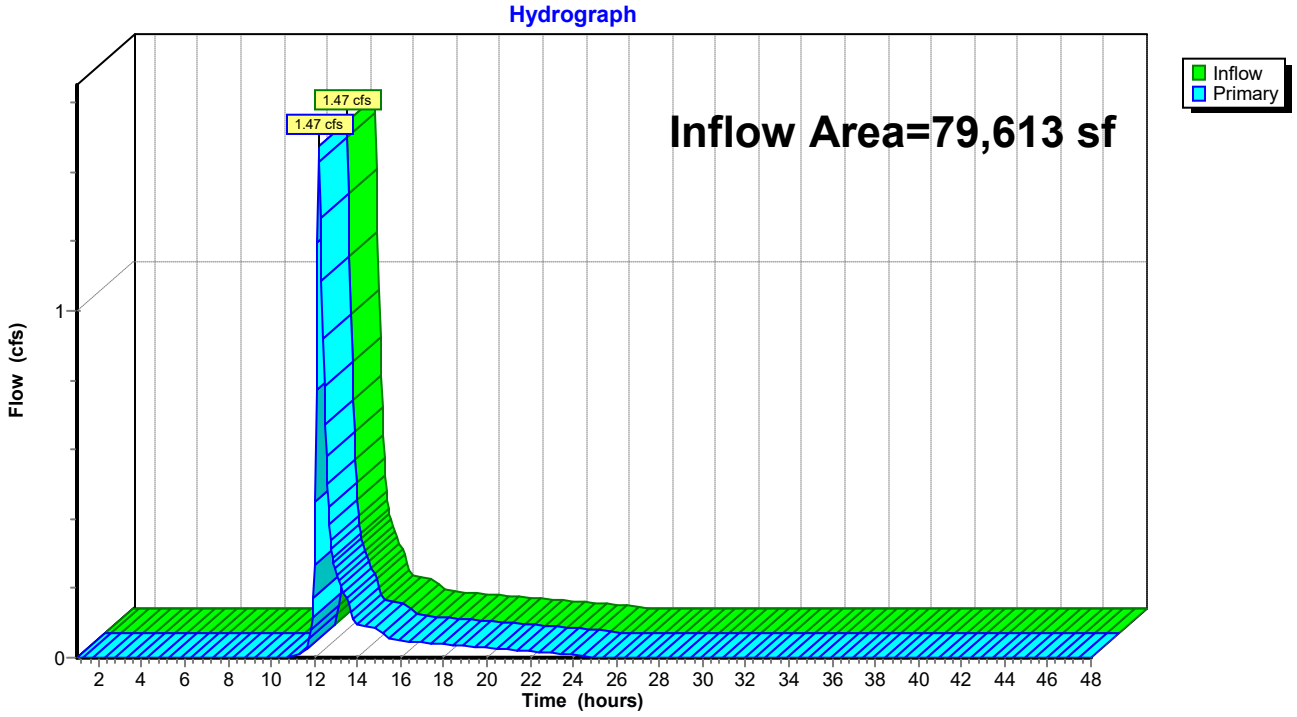


Summary for Link 79L: Swale Along Red Barn Ln.

Inflow Area = 79,613 sf, 11.51% Impervious, Inflow Depth = 0.69" for 1-Year event
Inflow = 1.47 cfs @ 12.22 hrs, Volume= 4,561 cf
Primary = 1.47 cfs @ 12.22 hrs, Volume= 4,561 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 32L : TOTAL OFFSITE UNTREATED

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 79L: Swale Along Red Barn Ln.

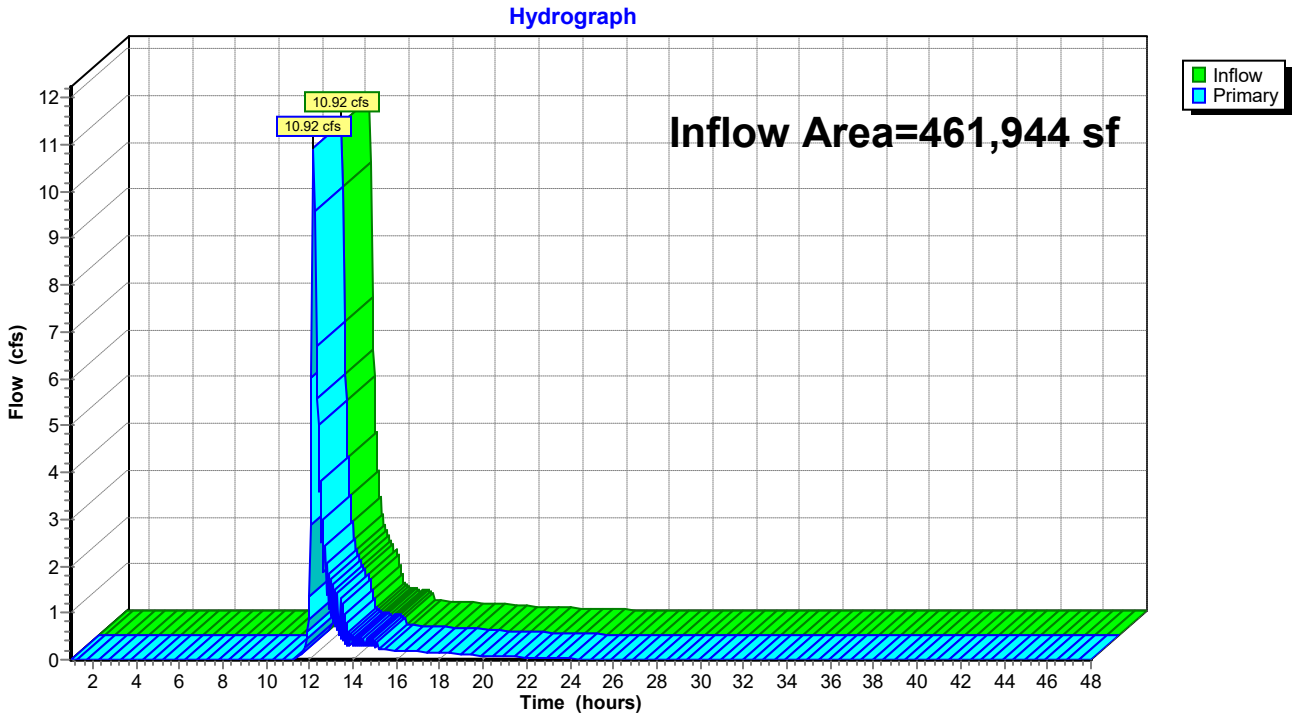


Summary for Link 80L: EX. Cul-de-sac On Green Meadow Place

Inflow Area = 461,944 sf, 19.58% Impervious, Inflow Depth = 0.60" for 1-Year event
Inflow = 10.92 cfs @ 12.17 hrs, Volume= 23,278 cf
Primary = 10.92 cfs @ 12.17 hrs, Volume= 23,278 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 32L : TOTAL OFFSITE UNTREATED

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 80L: EX. Cul-de-sac On Green Meadow Place



Time span=1.00-48.00 hrs, dt=0.05 hrs, 941 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: A Runoff Area=156,438 sf 0.00% Impervious Runoff Depth=0.72"
Flow Length=260' Tc=13.7 min CN=74 Runoff=3.22 cfs 9,437 cf

Subcatchment 2S: B Runoff Area=141,137 sf 26.27% Impervious Runoff Depth=1.03"
Flow Length=300' Slope=0.0071 '/' Tc=8.5 min CN=80 Runoff=5.37 cfs 12,112 cf

Subcatchment 4S: C1 Runoff Area=12,661 sf 0.00% Impervious Runoff Depth=0.72"
Flow Length=100' Slope=0.0193 '/' Tc=11.4 min CN=74 Runoff=0.29 cfs 764 cf

Subcatchment 5S: D Runoff Area=24,345 sf 0.00% Impervious Runoff Depth=0.72"
Flow Length=170' Tc=10.2 min CN=74 Runoff=0.58 cfs 1,469 cf

Subcatchment 6S: E Runoff Area=152,103 sf 18.44% Impervious Runoff Depth=0.92"
Flow Length=471' Tc=10.6 min CN=78 Runoff=4.69 cfs 11,667 cf

Subcatchment 7S: F Runoff Area=13,305 sf 0.00% Impervious Runoff Depth=0.72"
Flow Length=100' Slope=0.0583 '/' Tc=7.3 min CN=74 Runoff=0.36 cfs 803 cf

Subcatchment 8S: G Runoff Area=66,971 sf 15.30% Impervious Runoff Depth=0.92"
Flow Length=295' Tc=12.7 min CN=78 Runoff=1.91 cfs 5,137 cf

Subcatchment 9S: H Runoff Area=16,147 sf 93.29% Impervious Runoff Depth=2.26"
Flow Length=200' Tc=6.0 min CN=96 Runoff=1.36 cfs 3,037 cf

Subcatchment 10S: I Runoff Area=10,482 sf 59.22% Impervious Runoff Depth=1.55"
Flow Length=100' Slope=0.0244 '/' Tc=6.0 min CN=88 Runoff=0.66 cfs 1,358 cf

Subcatchment 11S: J Runoff Area=838 sf 4.77% Impervious Runoff Depth=0.77"
Flow Length=15' Slope=0.0122 '/' Tc=6.0 min CN=75 Runoff=0.03 cfs 54 cf

Subcatchment 12S: K Runoff Area=28,606 sf 66.44% Impervious Runoff Depth=1.71"
Flow Length=90' Slope=0.0161 '/' Tc=11.3 min CN=90 Runoff=1.62 cfs 4,078 cf

Subcatchment 13S: L Runoff Area=43,723 sf 16.63% Impervious Runoff Depth=0.92"
Flow Length=230' Tc=11.4 min CN=78 Runoff=1.31 cfs 3,354 cf

Subcatchment 14S: M Runoff Area=53,002 sf 0.00% Impervious Runoff Depth=0.72"
Flow Length=475' Tc=15.2 min CN=74 Runoff=1.04 cfs 3,197 cf

Subcatchment 15S: N Runoff Area=6,616 sf 7.63% Impervious Runoff Depth=0.82"
Flow Length=65' Slope=0.0344 '/' Tc=6.4 min CN=76 Runoff=0.22 cfs 451 cf

Subcatchment 16S: O Runoff Area=18,705 sf 49.38% Impervious Runoff Depth=1.41"
Flow Length=150' Tc=10.4 min CN=86 Runoff=0.91 cfs 2,196 cf

Subcatchment 17S: P Runoff Area=18,391 sf 80.23% Impervious Runoff Depth=1.97"
Flow Length=35' Slope=0.0866 '/' Tc=6.0 min CN=93 Runoff=1.42 cfs 3,017 cf

Subcatchment 18S: Q Runoff Area=14,923 sf 57.14% Impervious Runoff Depth=1.55"
Flow Length=30' Slope=0.0989 '/' Tc=6.0 min CN=88 Runoff=0.95 cfs 1,933 cf

Subcatchment 19S: R Runoff Area=20,724 sf 79.35% Impervious Runoff Depth=1.97"
Flow Length=170' Tc=10.5 min CN=93 Runoff=1.35 cfs 3,399 cf

Subcatchment 20S: S Runoff Area=5,299 sf 100.00% Impervious Runoff Depth=2.47"
Flow Length=50' Slope=0.0049 '/' Tc=6.0 min CN=98 Runoff=0.47 cfs 1,091 cf

Subcatchment 21S: T Runoff Area=35,645 sf 39.81% Impervious Runoff Depth=1.27"
Flow Length=280' Tc=11.4 min CN=84 Runoff=1.51 cfs 3,782 cf

Subcatchment 22S: U Runoff Area=15,551 sf 9.77% Impervious Runoff Depth=0.82"
Flow Length=90' Slope=0.0528 '/' Tc=7.0 min CN=76 Runoff=0.50 cfs 1,061 cf

Subcatchment 23S: V Runoff Area=26,499 sf 91.36% Impervious Runoff Depth=2.26"
Flow Length=115' Tc=6.0 min CN=96 Runoff=2.24 cfs 4,985 cf

Subcatchment 24S: W Runoff Area=75,447 sf 27.41% Impervious Runoff Depth=1.09"
Flow Length=200' Tc=9.3 min CN=81 Runoff=2.93 cfs 6,837 cf

Subcatchment 25S: X Runoff Area=104,170 sf 23.49% Impervious Runoff Depth=1.03"
Flow Length=215' Tc=13.0 min CN=80 Runoff=3.34 cfs 8,939 cf

Subcatchment 26S: Y Runoff Area=12,489 sf 0.00% Impervious Runoff Depth=0.72"
Tc=6.0 min CN=74 Runoff=0.36 cfs 753 cf

Subcatchment 27S: Z Runoff Area=168,127 sf 6.58% Impervious Runoff Depth=0.82"
Flow Length=480' Tc=15.8 min CN=76 Runoff=3.76 cfs 11,469 cf

Subcatchment 67S: C2 Runoff Area=6,618 sf 0.00% Impervious Runoff Depth=0.72"
Flow Length=120' Slope=0.0262 '/' Tc=10.4 min CN=74 Runoff=0.16 cfs 399 cf

Subcatchment 68S: C4 Runoff Area=33,221 sf 0.00% Impervious Runoff Depth=0.72"
Flow Length=380' Tc=13.6 min CN=74 Runoff=0.69 cfs 2,004 cf

Subcatchment 69S: C3 Runoff Area=18,962 sf 0.00% Impervious Runoff Depth=0.72"
Flow Length=233' Slope=0.0278 '/' Tc=11.8 min CN=74 Runoff=0.42 cfs 1,144 cf

Subcatchment 70S: O1 Runoff Area=11,697 sf 0.00% Impervious Runoff Depth=0.72"
Tc=6.0 min CN=74 Runoff=0.34 cfs 706 cf

Subcatchment 71S: O2 Runoff Area=132,678 sf 2.29% Impervious Runoff Depth=0.77"
Flow Length=377' Tc=12.2 min CN=75 Runoff=3.13 cfs 8,518 cf

Subcatchment 184S: Z1 (EX. RBL Area to Runoff Area=22,047 sf 41.55% Impervious Runoff Depth=1.27"
Tc=6.0 min CN=84 Runoff=1.16 cfs 2,339 cf

Reach 93R: Overland Flow from North Depression to South Avg. Flow Depth=0.00' Max Vel=0.00 fps
n=0.030 L=426.0' S=0.0127 '/' Capacity=108.75 cfs Outflow=0.00 cfs 0 cf

Reach 182R: EX. Red Barn Lane West Avg. Flow Depth=0.31' Max Vel=2.64 fps Inflow=2.17 cfs 5,812 cf
n=0.025 L=610.0' S=0.0179 '/' Capacity=87.96 cfs Outflow=1.95 cfs 5,812 cf

Pond 73P: Southeast Basin Peak Elev=730.66' Storage=3,006 cf Inflow=3.22 cfs 9,437 cf
Outflow=0.76 cfs 9,441 cf

Pond 74P: Southwest Basin Peak Elev=742.66' Storage=13,738 cf Inflow=12.63 cfs 35,431 cf
Outflow=2.90 cfs 35,437 cf

Pond 89P: Gravel North Depression Peak Elev=756.39' Storage=808 cf Inflow=7.79 cfs 20,644 cf
Discarded=0.45 cfs 6,838 cf Primary=1.76 cfs 8,959 cf Secondary=5.95 cfs 4,847 cf Outflow=8.07 cfs 20,643 cf

Pond 92P: Gravel South Depression Peak Elev=752.72' Storage=387 cf Inflow=8.39 cfs 17,003 cf
Primary=7.98 cfs 13,975 cf Secondary=0.10 cfs 3,029 cf Outflow=8.08 cfs 17,003 cf

Link 32L: TOTAL OFFSITE UNTREATED Inflow=16.38 cfs 38,348 cf
Primary=16.38 cfs 38,348 cf

Link 33L: TOTAL ONSITE Inflow=9.29 cfs 22,210 cf
Primary=9.29 cfs 22,210 cf

Link 34L: TOTAL OUTFALL Inflow=25.58 cfs 60,559 cf
Primary=25.58 cfs 60,559 cf

Link 75L: Areas Piped Inflow=9.29 cfs 22,210 cf
Primary=9.29 cfs 22,210 cf

Link 78L: Swale on Lot 20 Inflow=0.42 cfs 1,144 cf
Primary=0.42 cfs 1,144 cf

Link 79L: Swale Along Red Barn Ln. Inflow=1.95 cfs 5,812 cf
Primary=1.95 cfs 5,812 cf

Link 80L: EX. Cul-de-sac On Green Meadow Place Inflow=13.97 cfs 30,278 cf
Primary=13.97 cfs 30,278 cf

Total Runoff Area = 1,467,567 sf Runoff Volume = 121,488 cf Average Runoff Depth = 0.99"
80.51% Pervious = 1,181,505 sf 19.49% Impervious = 286,062 sf

Summary for Subcatchment 1S: A

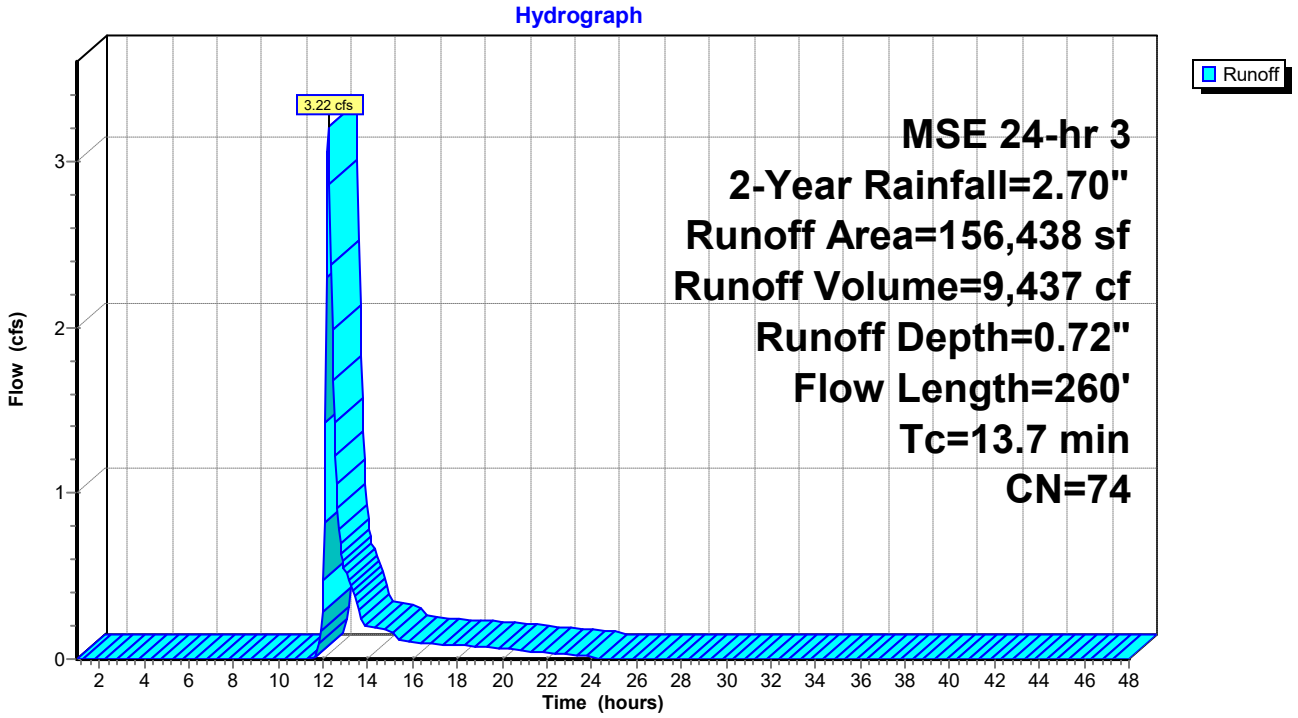
Runoff = 3.22 cfs @ 12.24 hrs, Volume= 9,437 cf, Depth= 0.72"
Routed to Pond 73P : Southeast Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	156,438	74	PER
	156,438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	100	0.0181	0.14		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
2.0	160	0.0362	1.33		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
13.7	260	Total			

Subcatchment 1S: A



Summary for Subcatchment 2S: B

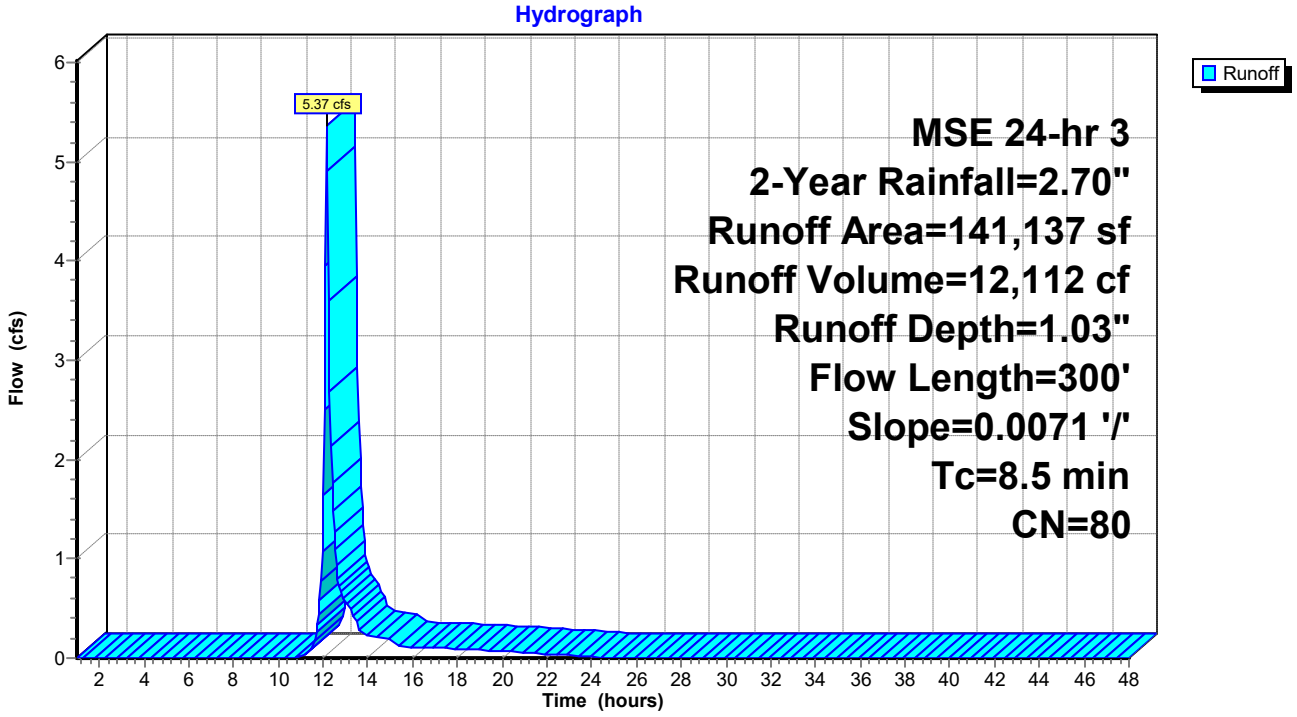
Runoff = 5.37 cfs @ 12.16 hrs, Volume= 12,112 cf, Depth= 1.03"
Routed to Link 80L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	104,065	74	PER
*	22,056	98	IMP
*	15,016	98	ROOF
	141,137	80	Weighted Average
	104,065		73.73% Pervious Area
	37,072		26.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	300	0.0071	0.59		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps

Subcatchment 2S: B



Summary for Subcatchment 4S: C1

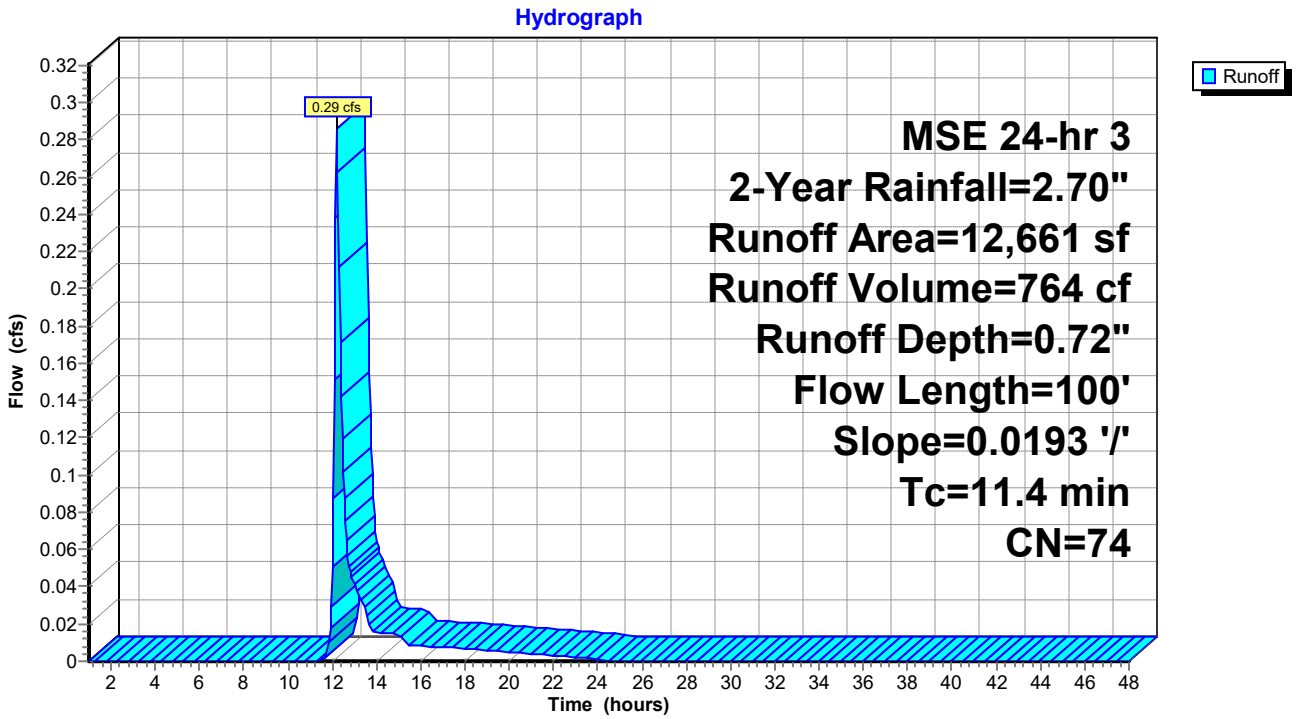
Runoff = 0.29 cfs @ 12.21 hrs, Volume= 764 cf, Depth= 0.72"
Routed to Link 80L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	12,661	74	PER
	12,661		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0193	0.15		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 4S: C1



Summary for Subcatchment 5S: D

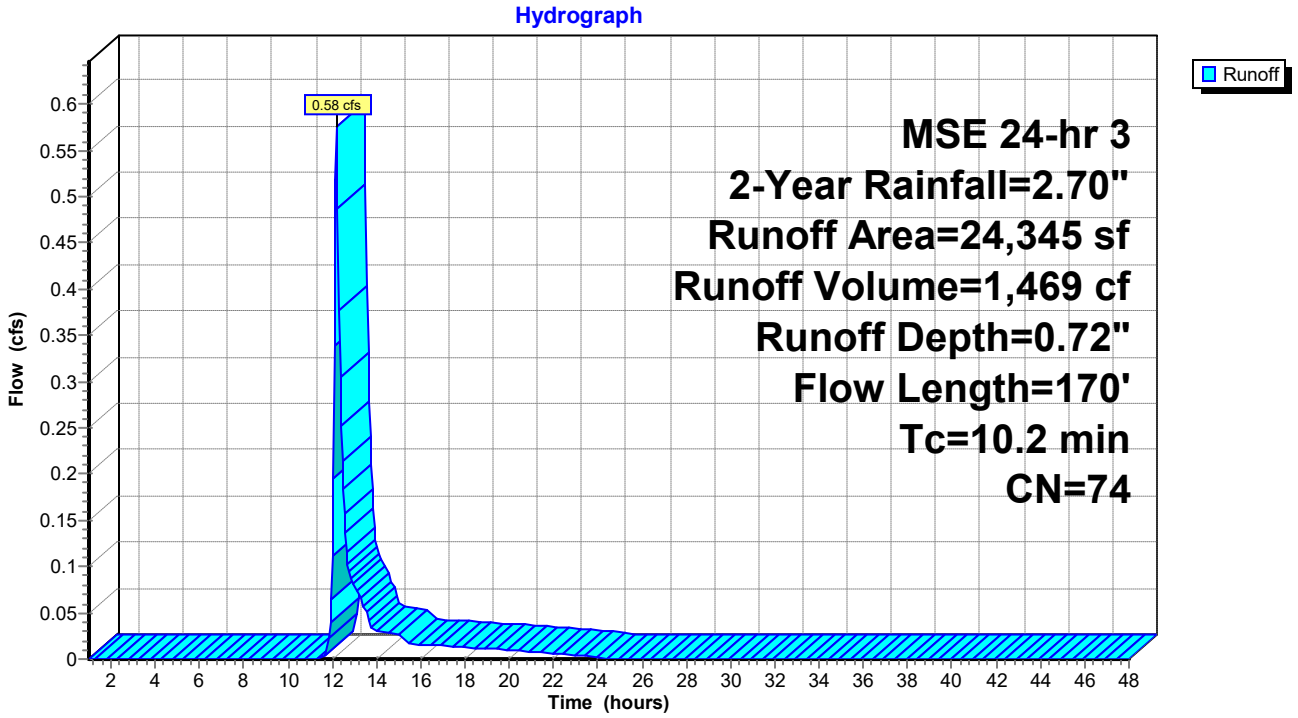
Runoff = 0.58 cfs @ 12.19 hrs, Volume= 1,469 cf, Depth= 0.72"
Routed to Reach 182R : EX. Red Barn Lane West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	24,345	74	PER
	24,345		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0319	0.18		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.9	70	0.0317	1.25		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
10.2	170	Total			

Subcatchment 5S: D



Summary for Subcatchment 6S: E

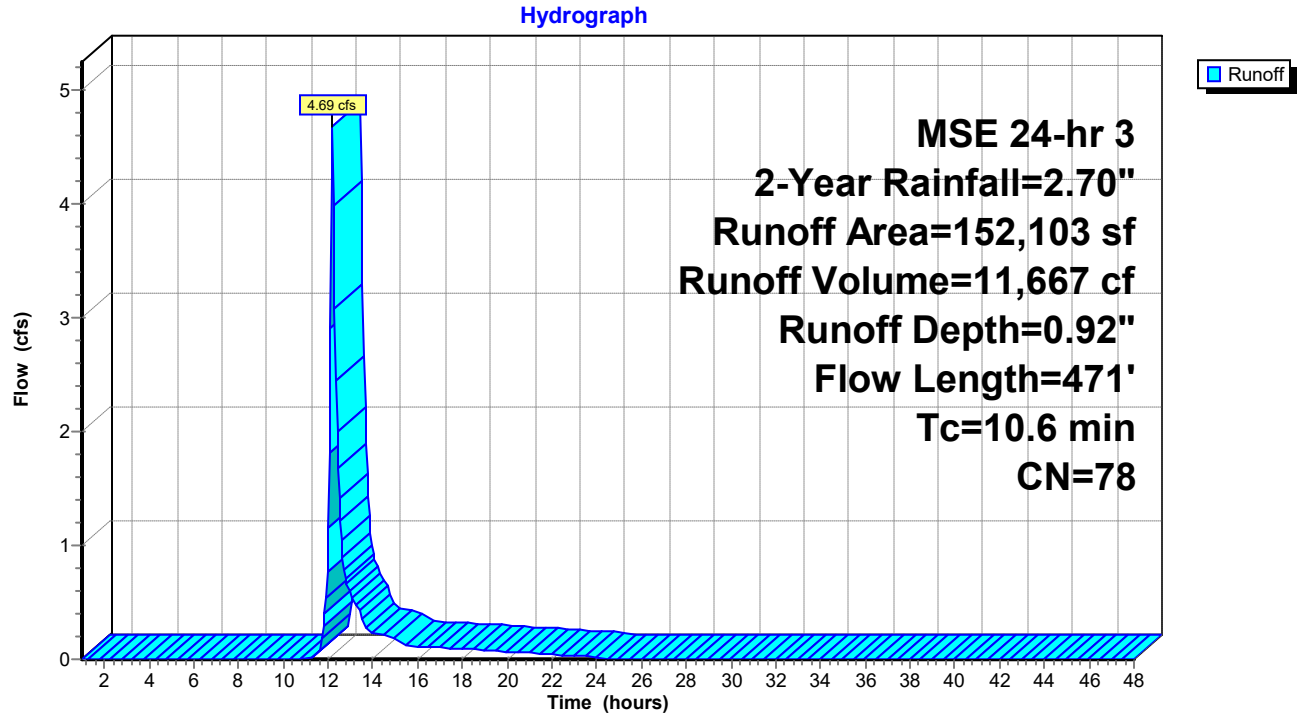
Runoff = 4.69 cfs @ 12.19 hrs, Volume= 11,667 cf, Depth= 0.92"
Routed to Pond 89P : Gravel North Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	117,151	74	PER
*	21,607	98	IMP
*	6,900	74	PER NEW RBL
*	6,445	98	IMP NEW RBL
	152,103	78	Weighted Average
	124,051		81.56% Pervious Area
	28,052		18.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0581	0.23		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.9	215	0.0405	4.09		**Shallow Concentrated Flow, SCF** Paved Kv= 20.3 fps
2.3	156	0.0259	1.13		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
10.6	471	Total			

Subcatchment 6S: E



Summary for Subcatchment 7S: F

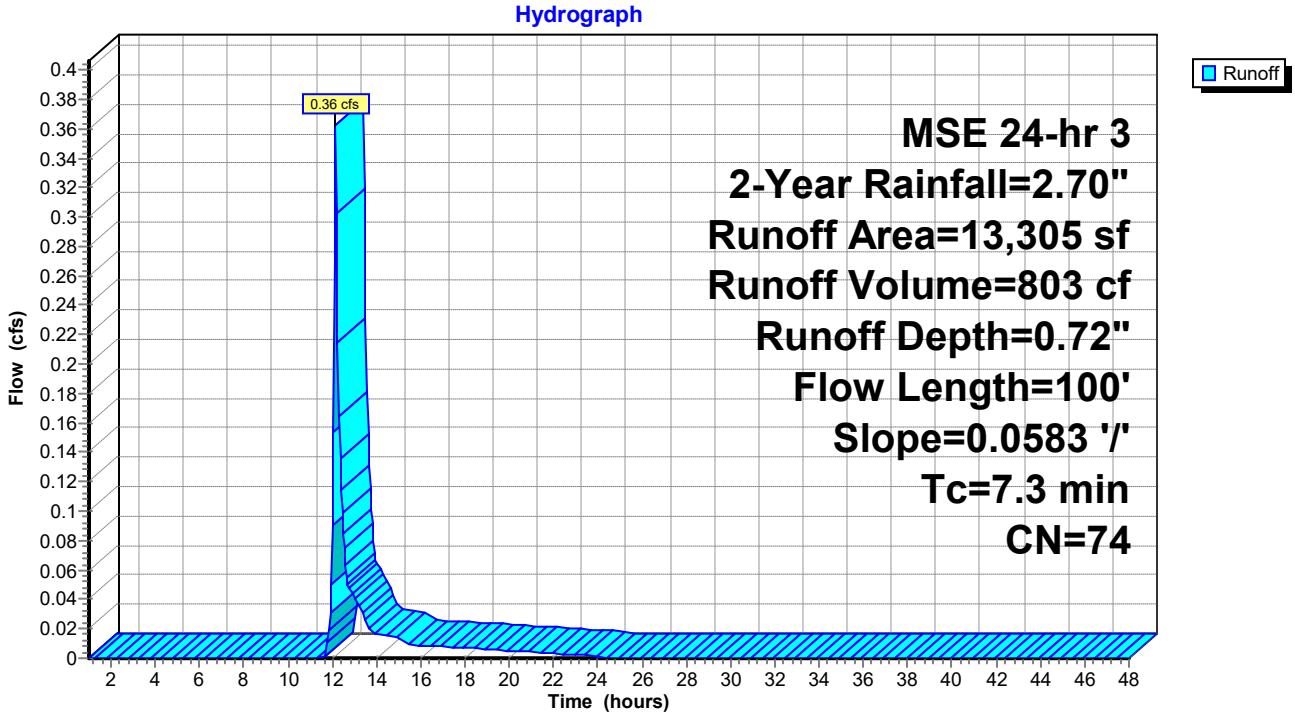
Runoff = 0.36 cfs @ 12.16 hrs, Volume= 803 cf, Depth= 0.72"
Routed to Pond 89P : Gravel North Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	13,305	74	PER
	13,305		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	100	0.0583	0.23		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 7S: F



Summary for Subcatchment 8S: G

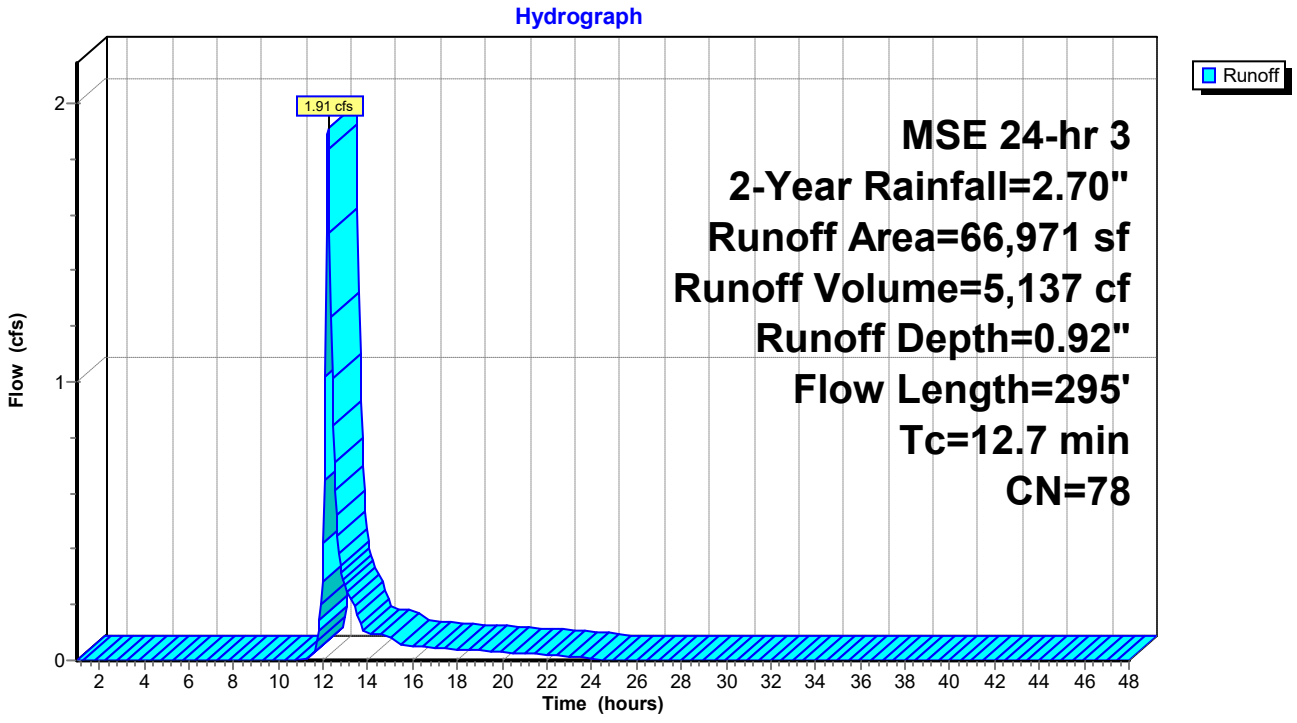
Runoff = 1.91 cfs @ 12.22 hrs, Volume= 5,137 cf, Depth= 0.92"
Routed to Pond 89P : Gravel North Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	56,727	74	PER
*	10,244	98	IMP
	66,971	78	Weighted Average
	56,727		84.70% Pervious Area
	10,244		15.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0269	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
2.7	195	0.0305	1.22		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
12.7	295	Total			

Subcatchment 8S: G



Summary for Subcatchment 9S: H

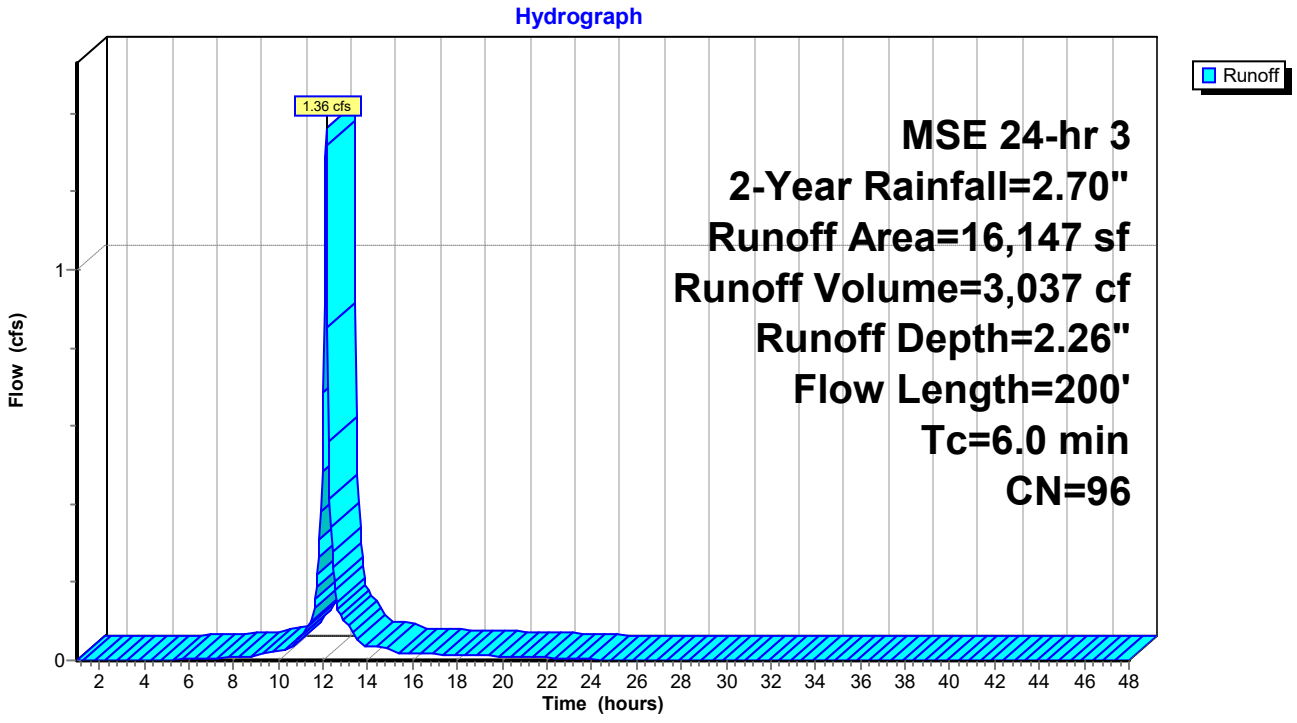
Runoff = 1.36 cfs @ 12.13 hrs, Volume= 3,037 cf, Depth= 2.26"
Routed to Pond 89P : Gravel North Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	1,084	74	PER
*	15,063	98	IMP
	16,147	96	Weighted Average
	1,084		6.71% Pervious Area
	15,063		93.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0502	1.73		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 2.42"
0.5	100	0.0263	3.29		**Shallow Concentrated Flow, SCF** Paved Kv= 20.3 fps
1.5	200	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 9S: H



Summary for Subcatchment 10S: I

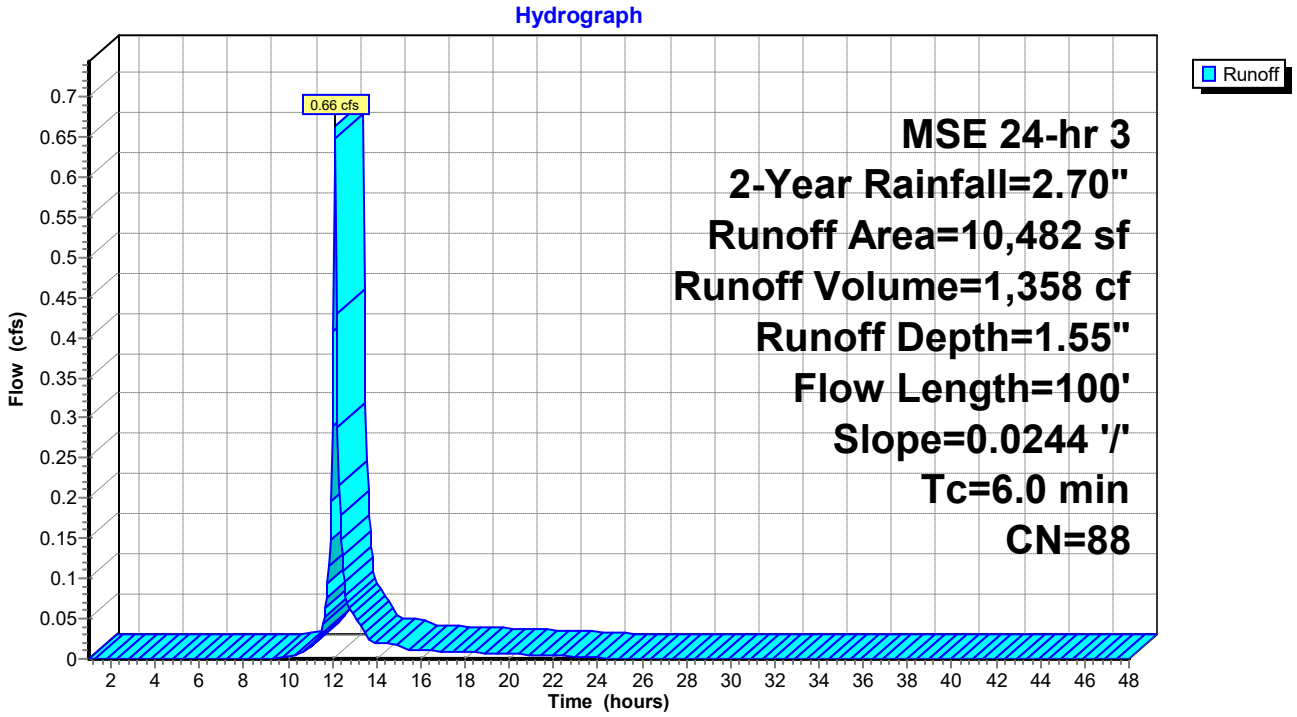
Runoff = 0.66 cfs @ 12.13 hrs, Volume= 1,358 cf, Depth= 1.55"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	4,275	74	PER
*	5,059	98	IMP
*	1,148	98	ROOF
	10,482	88	Weighted Average
	4,275		40.78% Pervious Area
	6,207		59.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0244	1.30		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 2.42"
1.3	100	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 10S: I



Summary for Subcatchment 11S: J

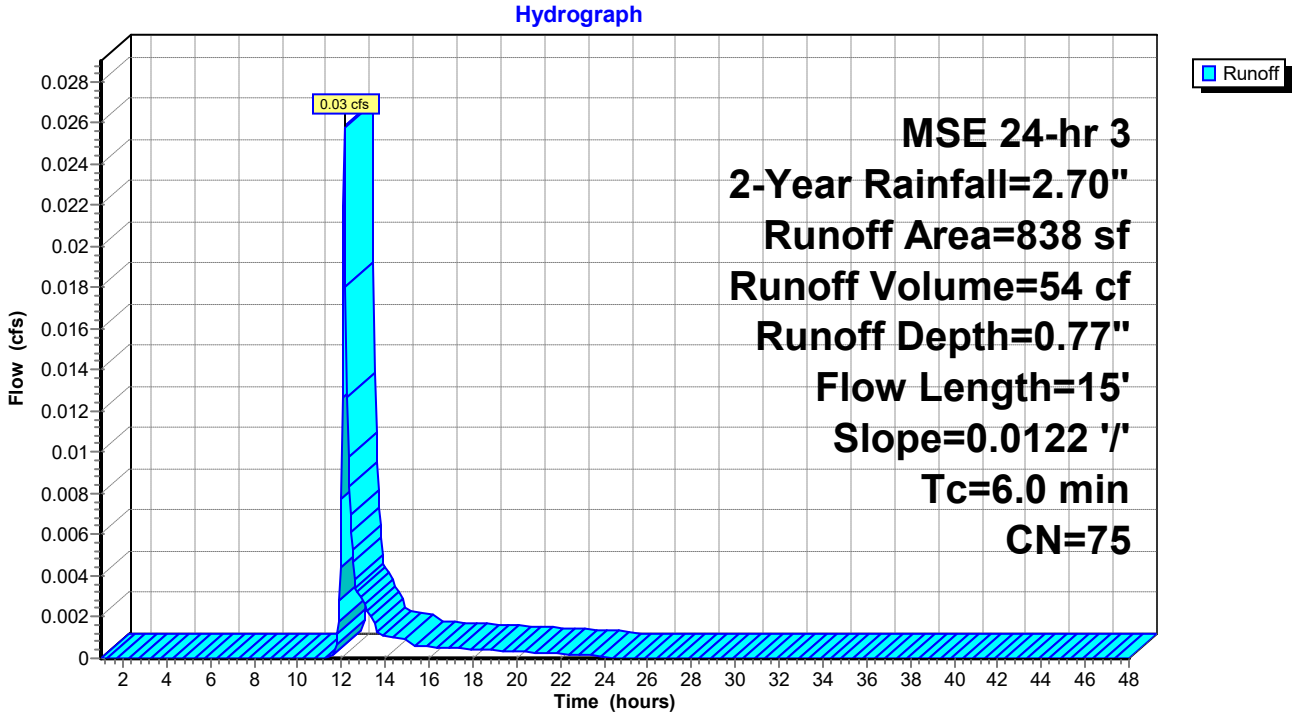
Runoff = 0.03 cfs @ 12.14 hrs, Volume= 54 cf, Depth= 0.77"
Routed to Link 32L : TOTAL OFFSITE UNTREATED

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	798	74	PER
*	40	98	IMP
	838	75	Weighted Average
	798		95.23% Pervious Area
	40		4.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	15	0.0122	0.08		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
3.0	15	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 11S: J



Summary for Subcatchment 12S: K

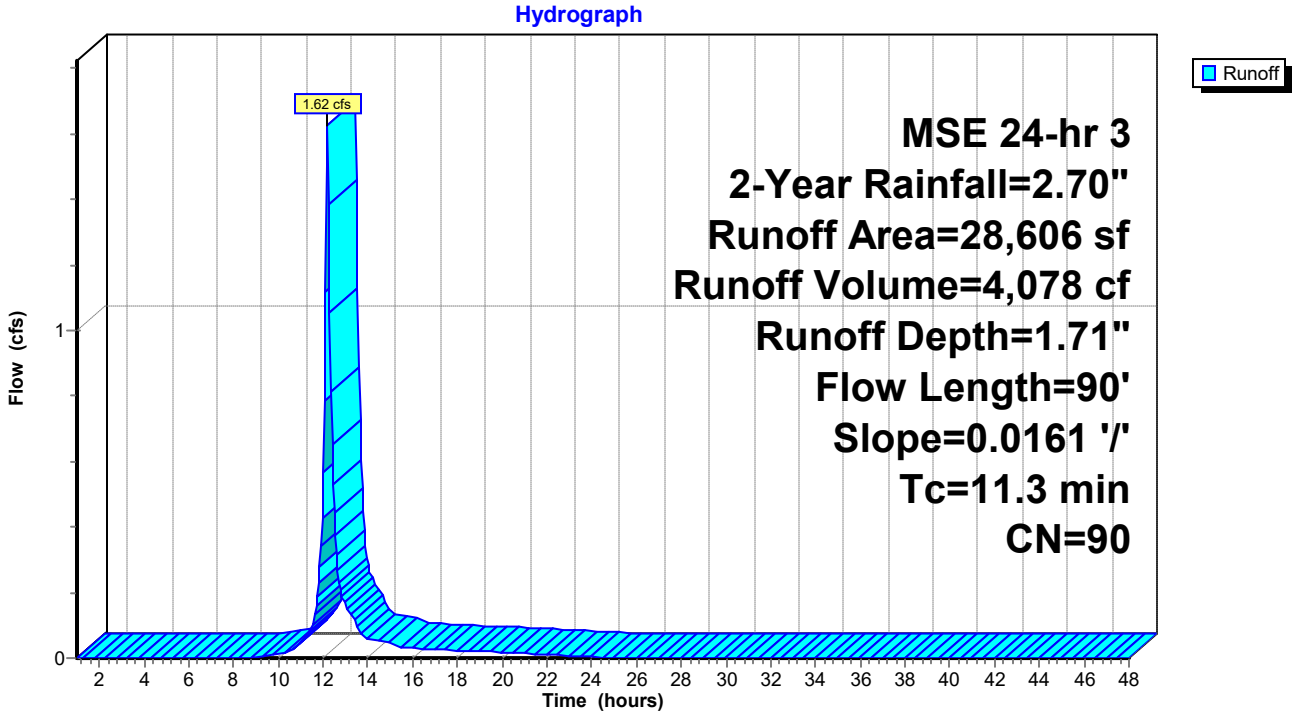
Runoff = 1.62 cfs @ 12.19 hrs, Volume= 4,078 cf, Depth= 1.71"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	9,600	74	PER
*	1,816	98	IMP
*	17,190	98	ROOF
	28,606	90	Weighted Average
	9,600		33.56% Pervious Area
	19,006		66.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	90	0.0161	0.13		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 12S: K



Summary for Subcatchment 13S: L

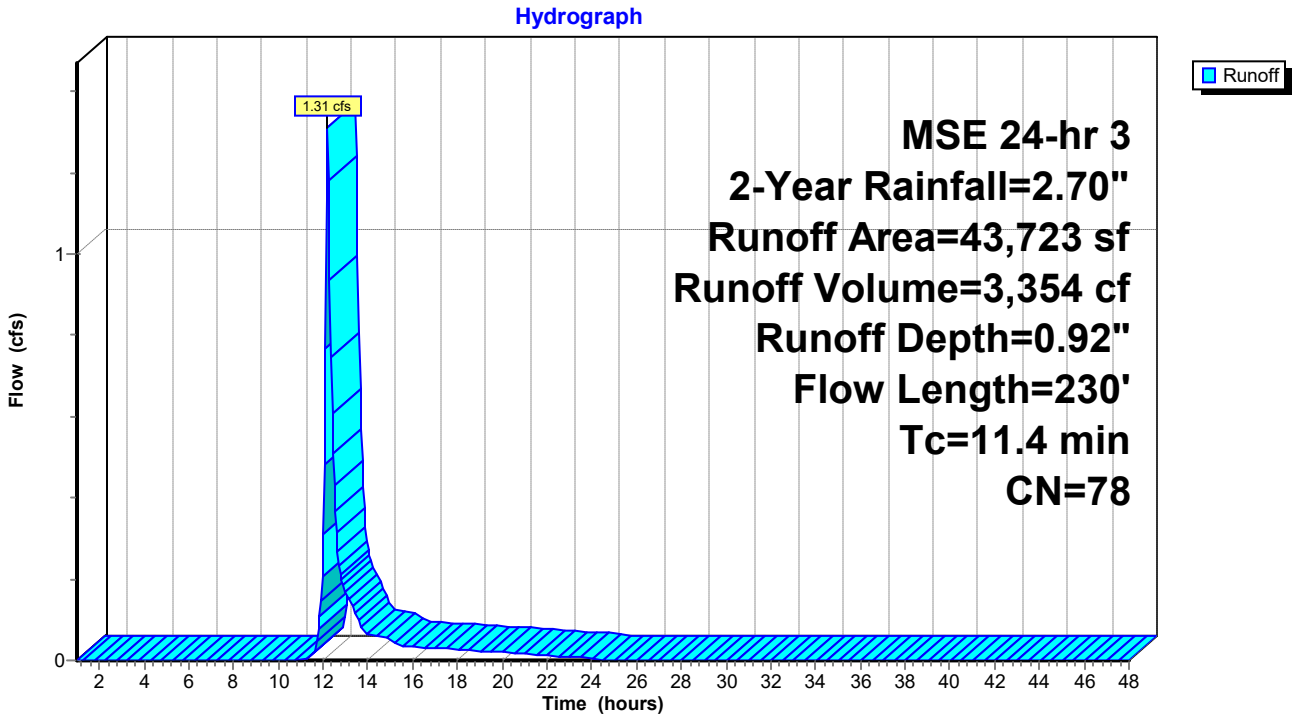
Runoff = 1.31 cfs @ 12.20 hrs, Volume= 3,354 cf, Depth= 0.92"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	36,454	74	PER
*	7,269	98	IMP
	43,723	78	Weighted Average
	36,454		83.37% Pervious Area
	7,269		16.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.0307	0.18		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
1.9	130	0.0267	1.14		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
11.4	230	Total			

Subcatchment 13S: L



Summary for Subcatchment 14S: M

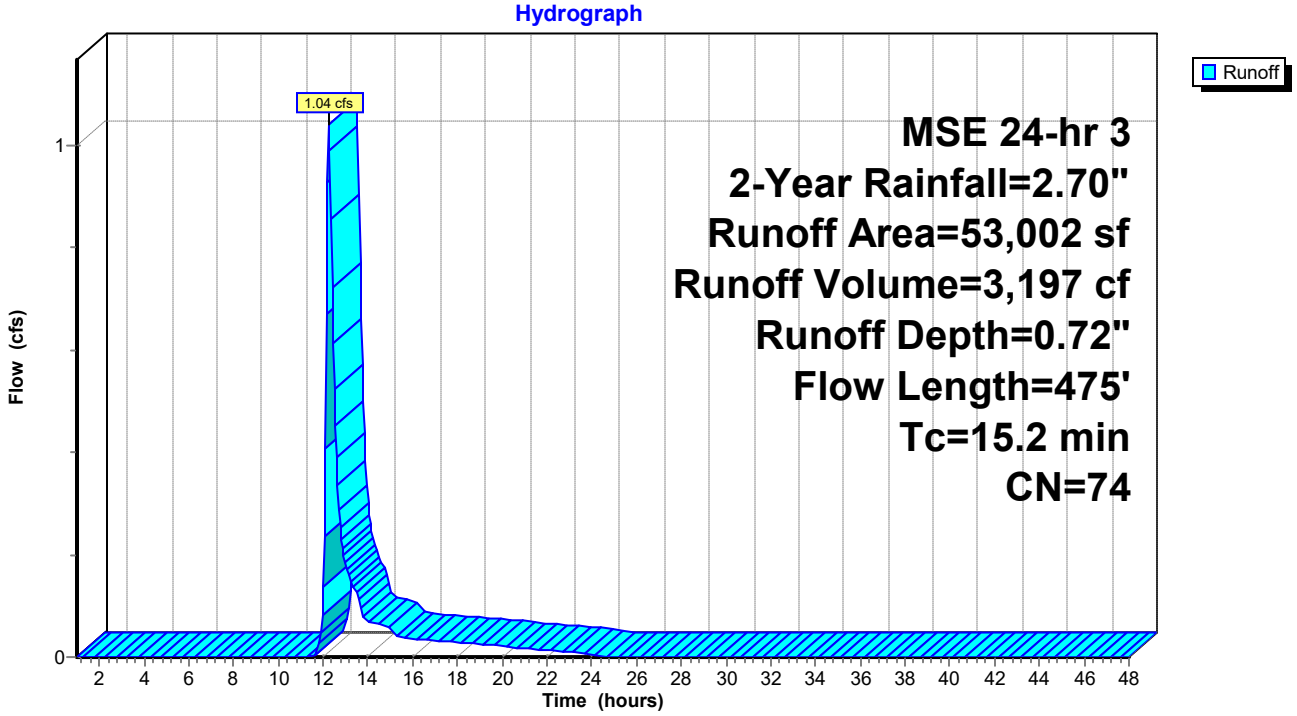
Runoff = 1.04 cfs @ 12.26 hrs, Volume= 3,197 cf, Depth= 0.72"
Routed to Pond 92P : Gravel South Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	53,002	74	PER
	53,002		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.0403	0.20		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
6.7	375	0.0180	0.94		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
15.2	475	Total			

Subcatchment 14S: M



Summary for Subcatchment 15S: N

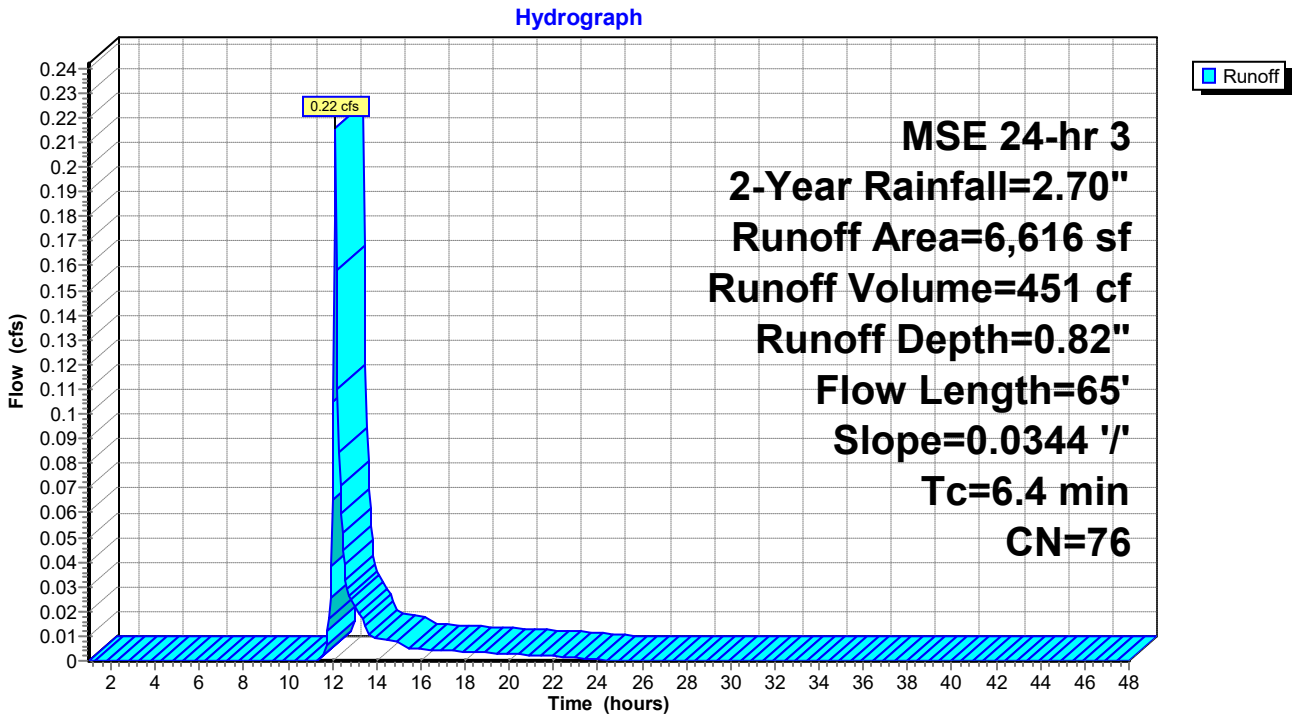
Runoff = 0.22 cfs @ 12.14 hrs, Volume= 451 cf, Depth= 0.82"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	6,111	74	PER
*	505	98	IMP
	6,616	76	Weighted Average
	6,111		92.37% Pervious Area
	505		7.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	65	0.0344	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 15S: N



Summary for Subcatchment 16S: O

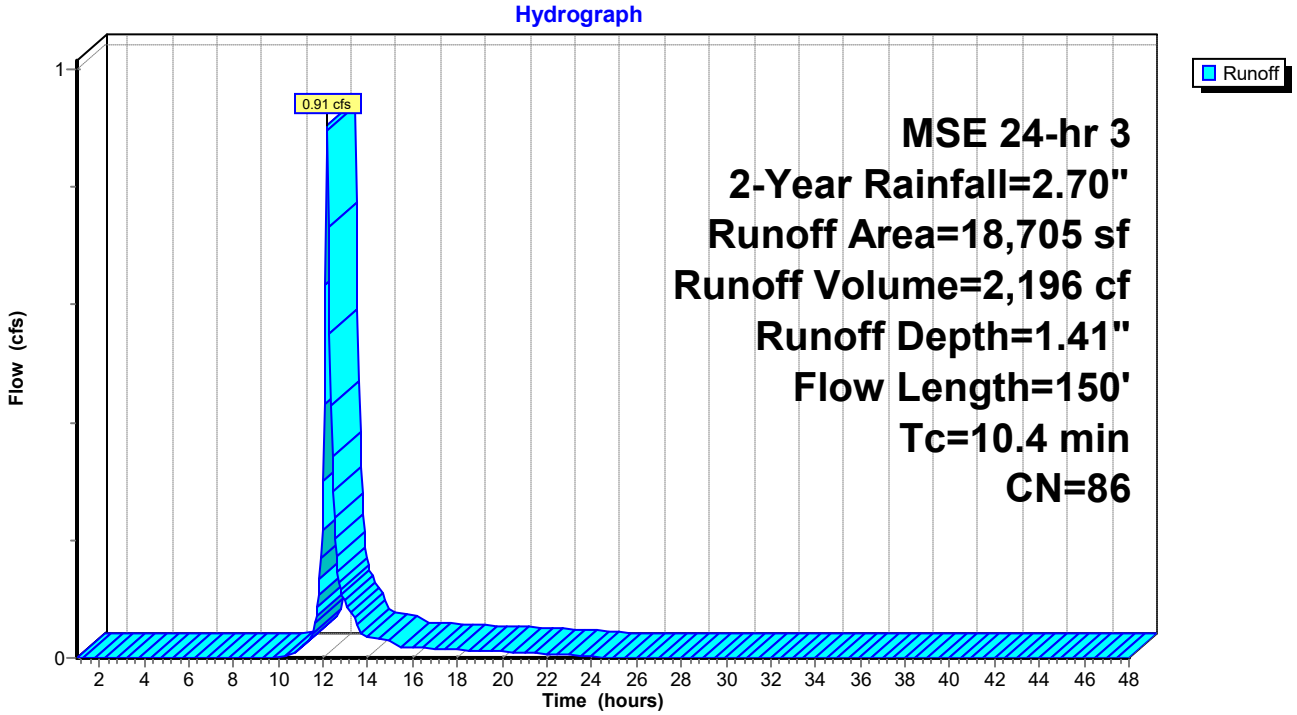
Runoff = 0.91 cfs @ 12.18 hrs, Volume= 2,196 cf, Depth= 1.41"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	9,468	74	PER
*	4,653	98	IMP
*	4,584	98	ROOF
	18,705	86	Weighted Average
	9,468		50.62% Pervious Area
	9,237		49.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.0274	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.5	50	0.0080	1.82		**Shallow Concentrated Flow, SCF** Paved Kv= 20.3 fps
10.4	150	Total			

Subcatchment 16S: O



Summary for Subcatchment 17S: P

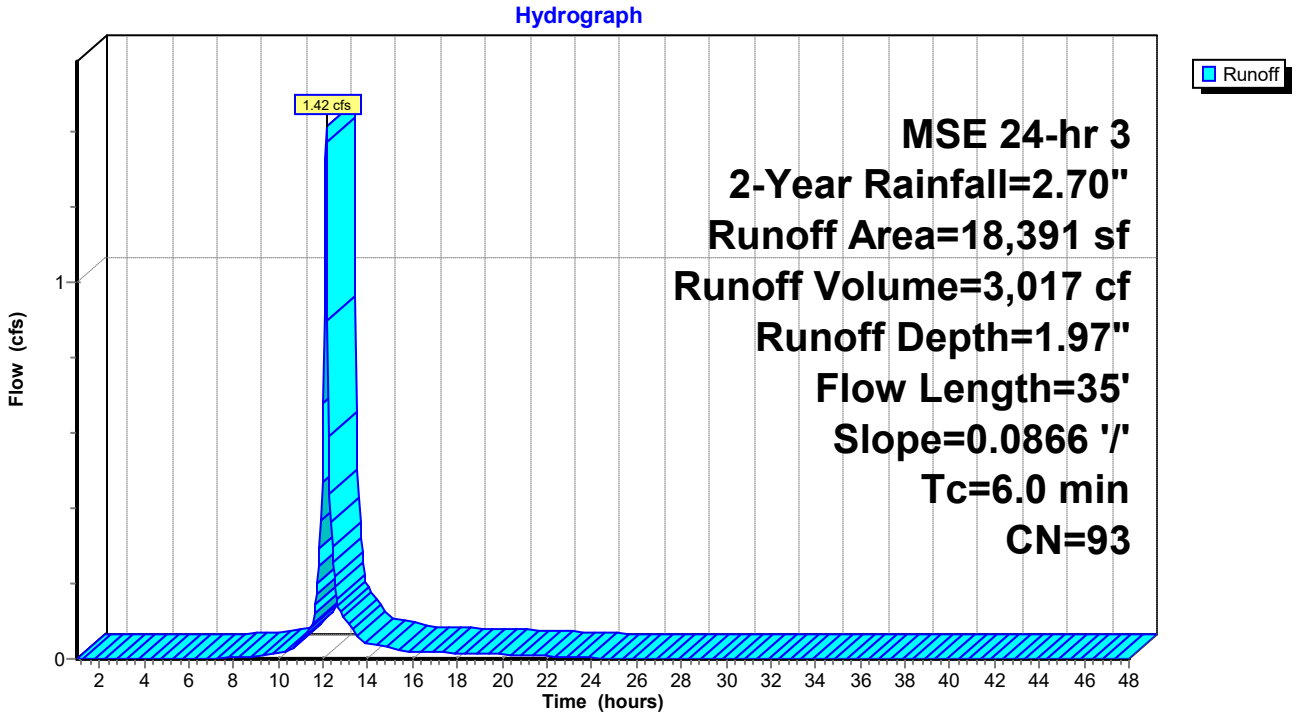
Runoff = 1.42 cfs @ 12.13 hrs, Volume= 3,017 cf, Depth= 1.97"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	3,636	74	PER
*	878	98	IMP
*	13,877	98	ROOF
	18,391	93	Weighted Average
	3,636		19.77% Pervious Area
	14,755		80.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	35	0.0866	0.22		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
2.7	35	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 17S: P



Summary for Subcatchment 18S: Q

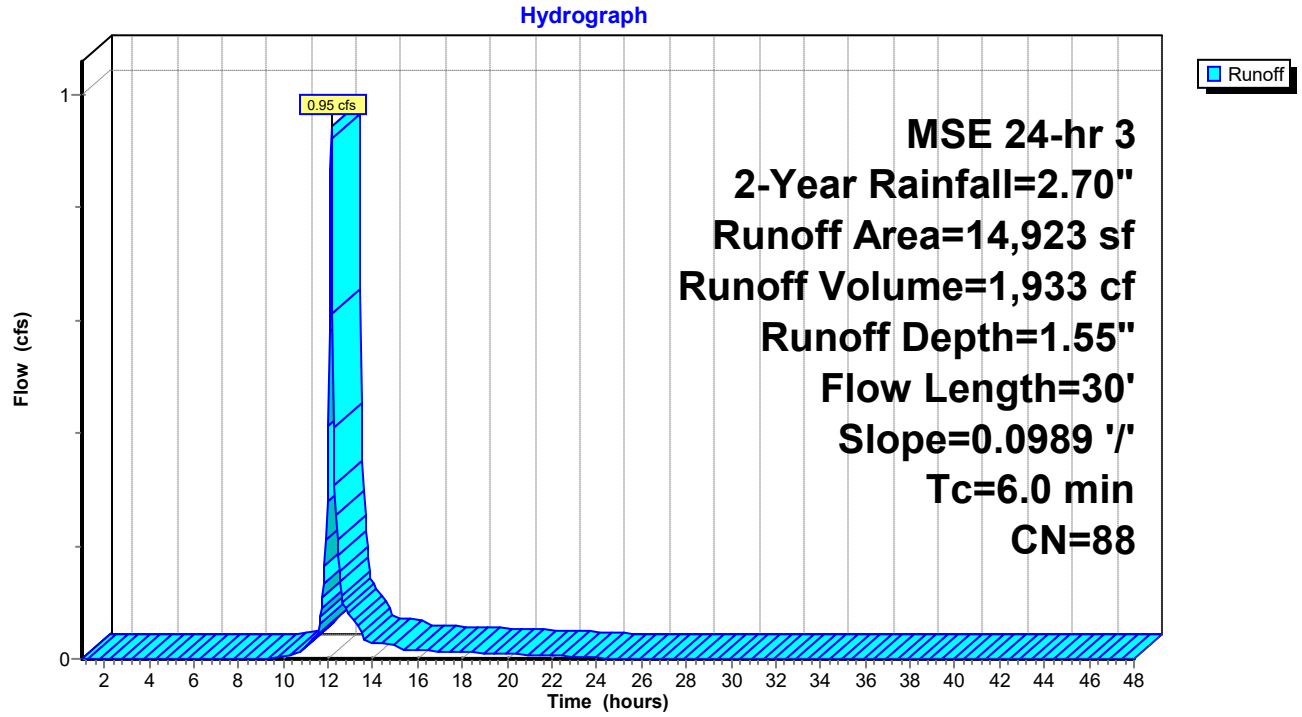
Runoff = 0.95 cfs @ 12.13 hrs, Volume= 1,933 cf, Depth= 1.55"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	6,396	74	PER
*	1,162	98	IMP
*	7,365	98	ROOF
	14,923	88	Weighted Average
	6,396		42.86% Pervious Area
	8,527		57.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	30	0.0989	0.22		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
2.3	30	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 18S: Q



Summary for Subcatchment 19S: R

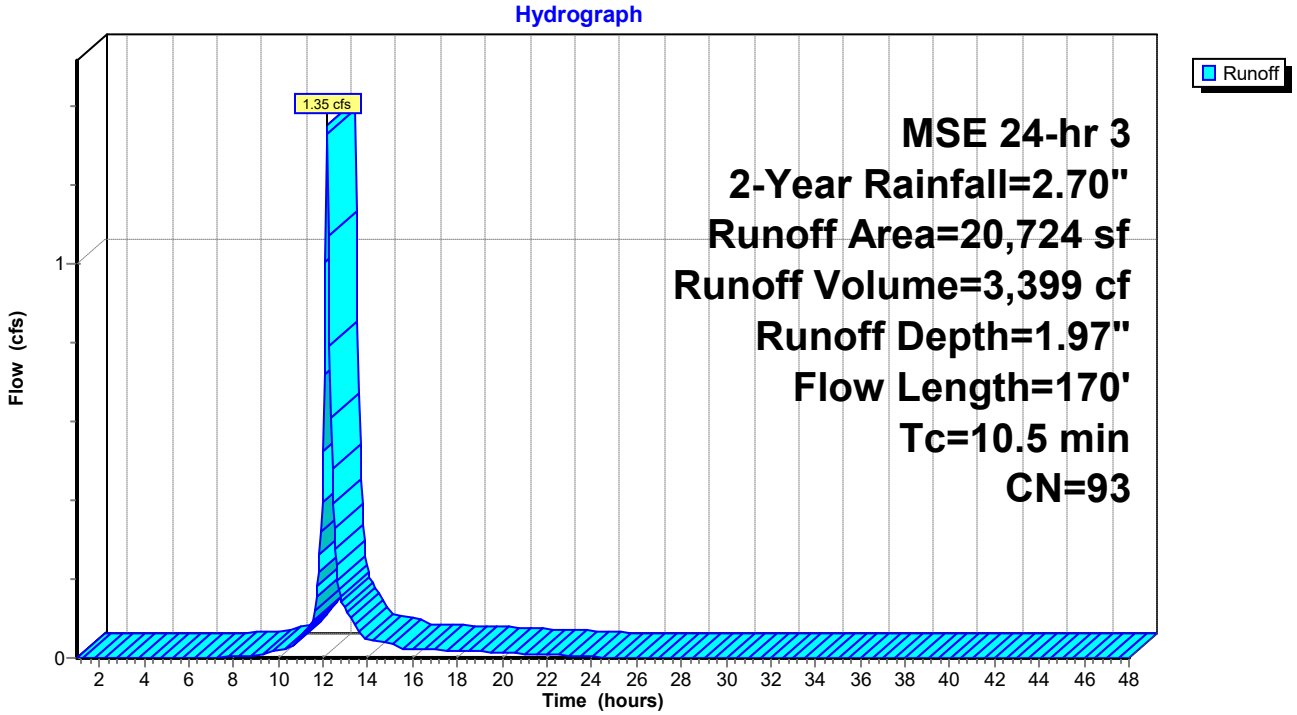
Runoff = 1.35 cfs @ 12.18 hrs, Volume= 3,399 cf, Depth= 1.97"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	4,279	74	PER
*	5,420	98	IMP
*	11,025	98	ROOF
	20,724	93	Weighted Average
	4,279		20.65% Pervious Area
	16,445		79.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0295	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.9	70	0.0320	1.25		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
10.5	170	Total			

Subcatchment 19S: R



Summary for Subcatchment 20S: S

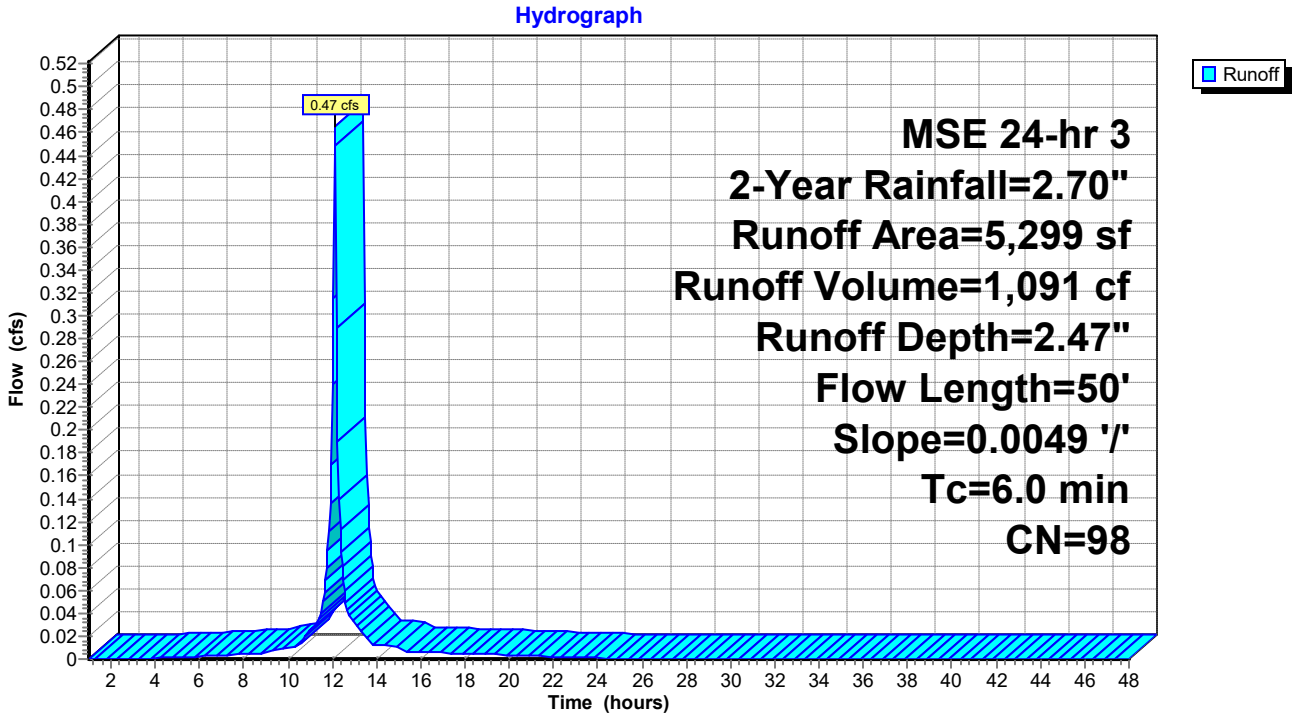
Runoff = 0.47 cfs @ 12.13 hrs, Volume= 1,091 cf, Depth= 2.47"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	808	98	IMP
*	4,491	98	ROOF
	5,299	98	Weighted Average
	5,299		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	50	0.0049	0.59		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 2.42"
1.4	50	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 20S: S



Summary for Subcatchment 21S: T

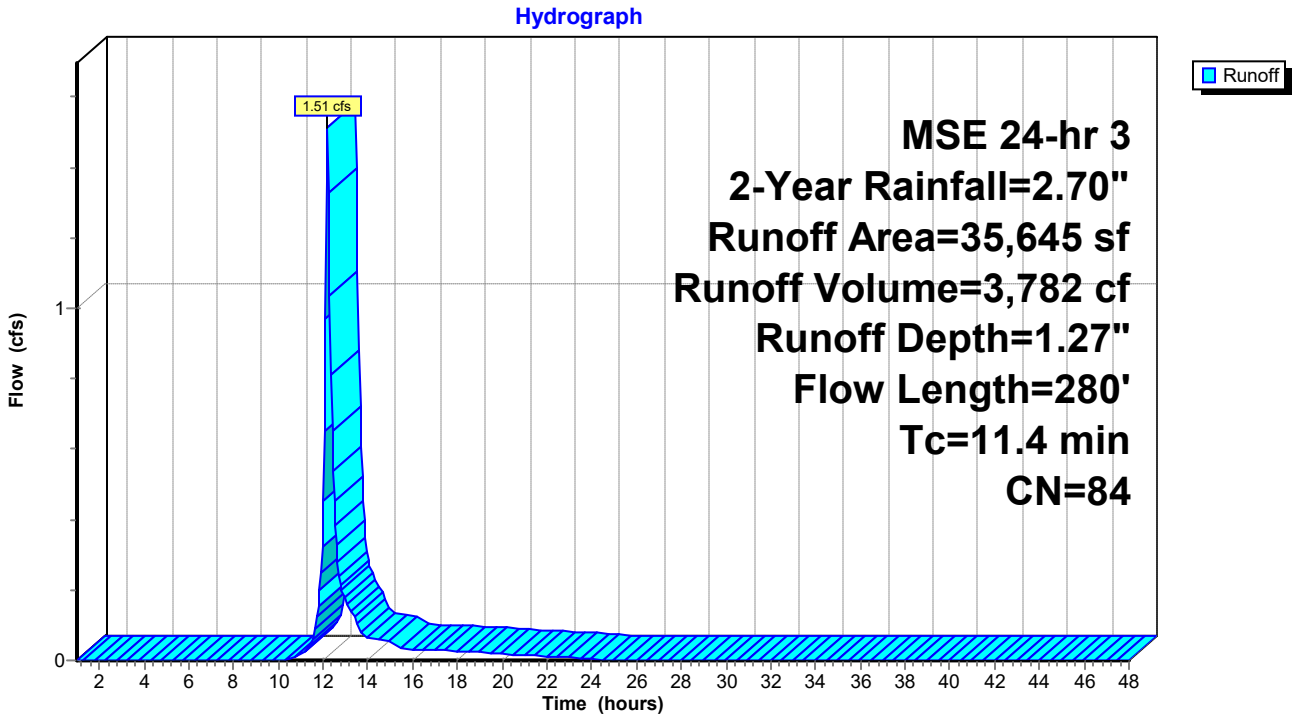
Runoff = 1.51 cfs @ 12.20 hrs, Volume= 3,782 cf, Depth= 1.27"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	21,454	74	PER
*	14,191	98	IMP
	35,645	84	Weighted Average
	21,454		60.19% Pervious Area
	14,191		39.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0272	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
1.4	180	0.0111	2.14		**Shallow Concentrated Flow, SCF** Paved Kv= 20.3 fps
11.4	280	Total			

Subcatchment 21S: T



Summary for Subcatchment 22S: U

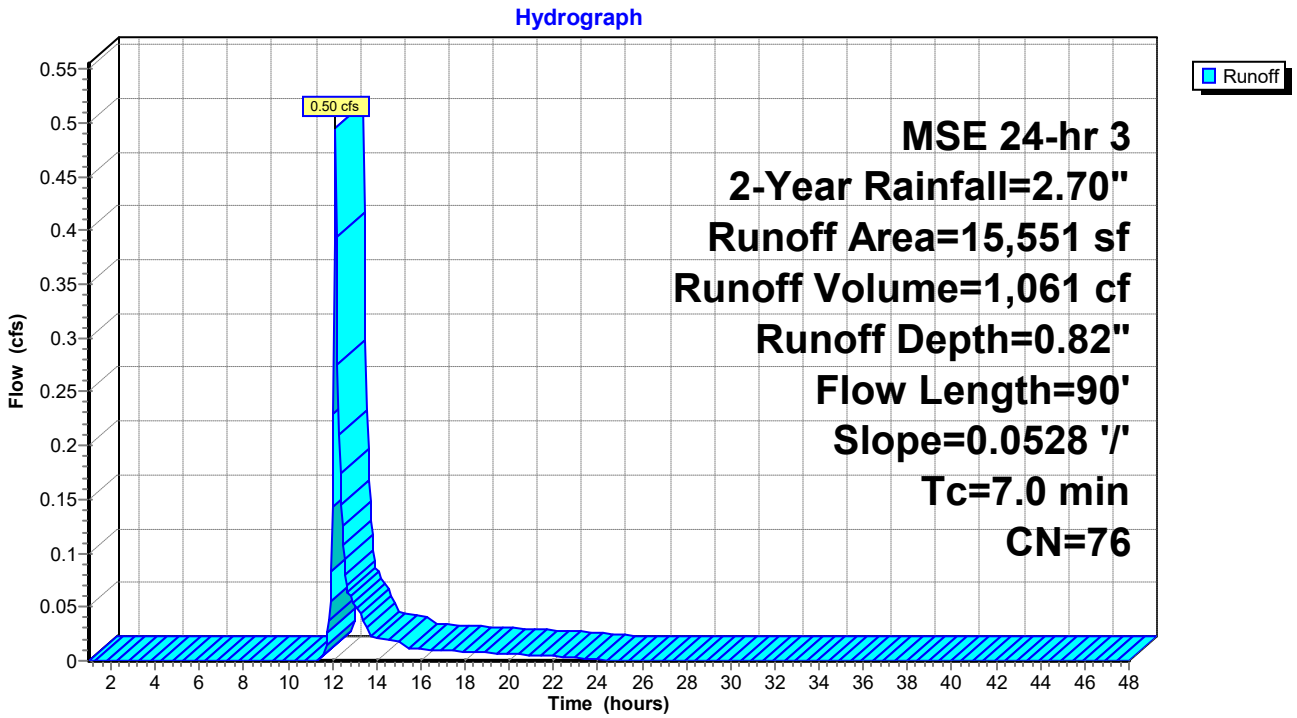
Runoff = 0.50 cfs @ 12.15 hrs, Volume= 1,061 cf, Depth= 0.82"
Routed to Link 32L : TOTAL OFFSITE UNTREATED

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	14,032	74	PER
*	1,519	98	IMP
	15,551	76	Weighted Average
	14,032		90.23% Pervious Area
	1,519		9.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	90	0.0528	0.21		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 22S: U



Summary for Subcatchment 23S: V

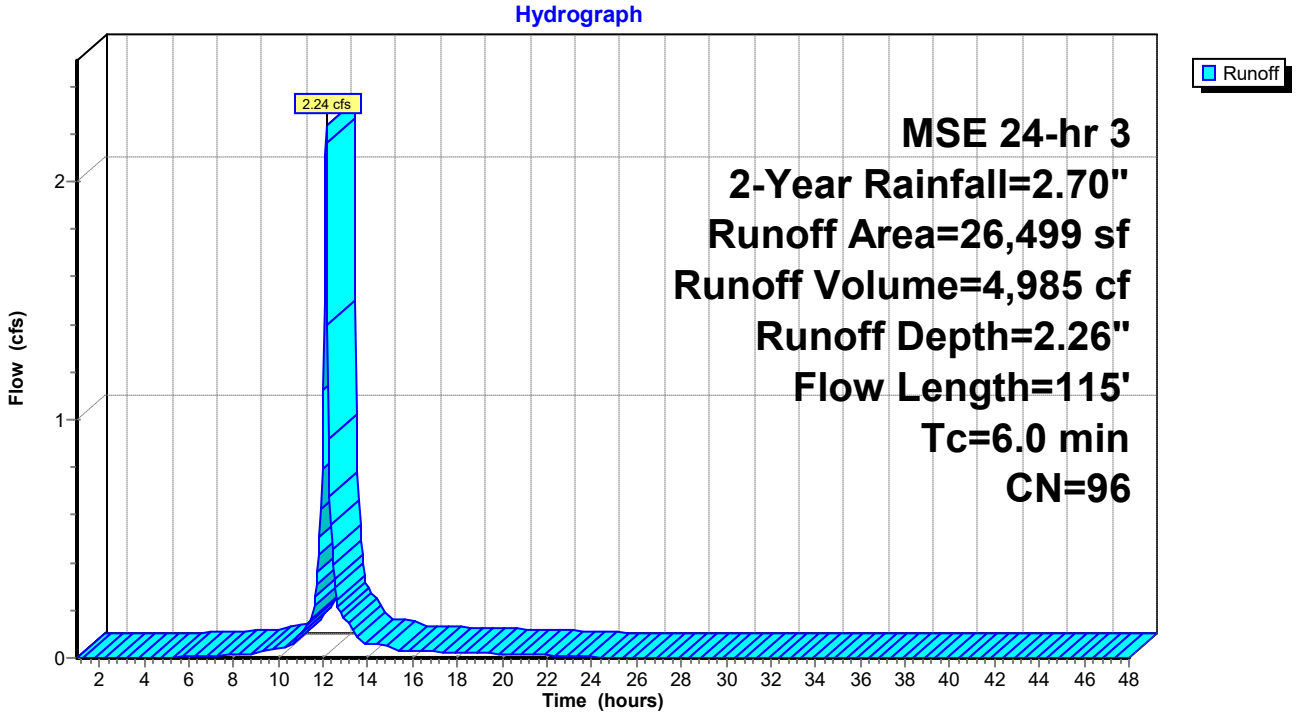
Runoff = 2.24 cfs @ 12.13 hrs, Volume= 4,985 cf, Depth= 2.26"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	2,290	74	PER
*	7,676	98	IMP
*	16,533	98	ROOF
	26,499	96	Weighted Average
	2,290		8.64% Pervious Area
	24,209		91.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	45	0.0345	0.16		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.9	70	0.0262	1.24		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 2.42"
5.7	115	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 23S: V



Summary for Subcatchment 24S: W

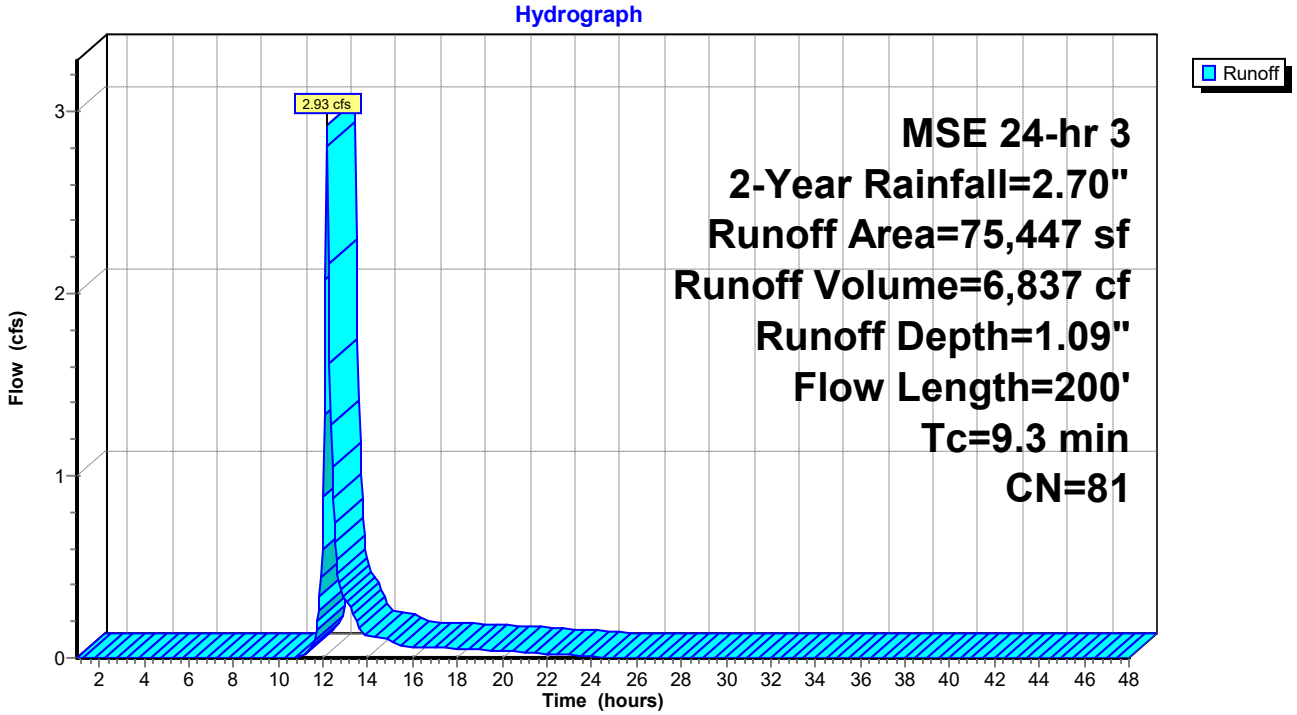
Runoff = 2.93 cfs @ 12.17 hrs, Volume= 6,837 cf, Depth= 1.09"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	54,767	74	PER
*	17,055	98	IMP
*	3,625	98	ROOF
	75,447	81	Weighted Average
	54,767		72.59% Pervious Area
	20,680		27.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0458	0.21		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
1.2	100	0.0428	1.45		**Shallow Concentrated Flow, SF** Short Grass Pasture Kv= 7.0 fps
9.3	200	Total			

Subcatchment 24S: W



Summary for Subcatchment 25S: X

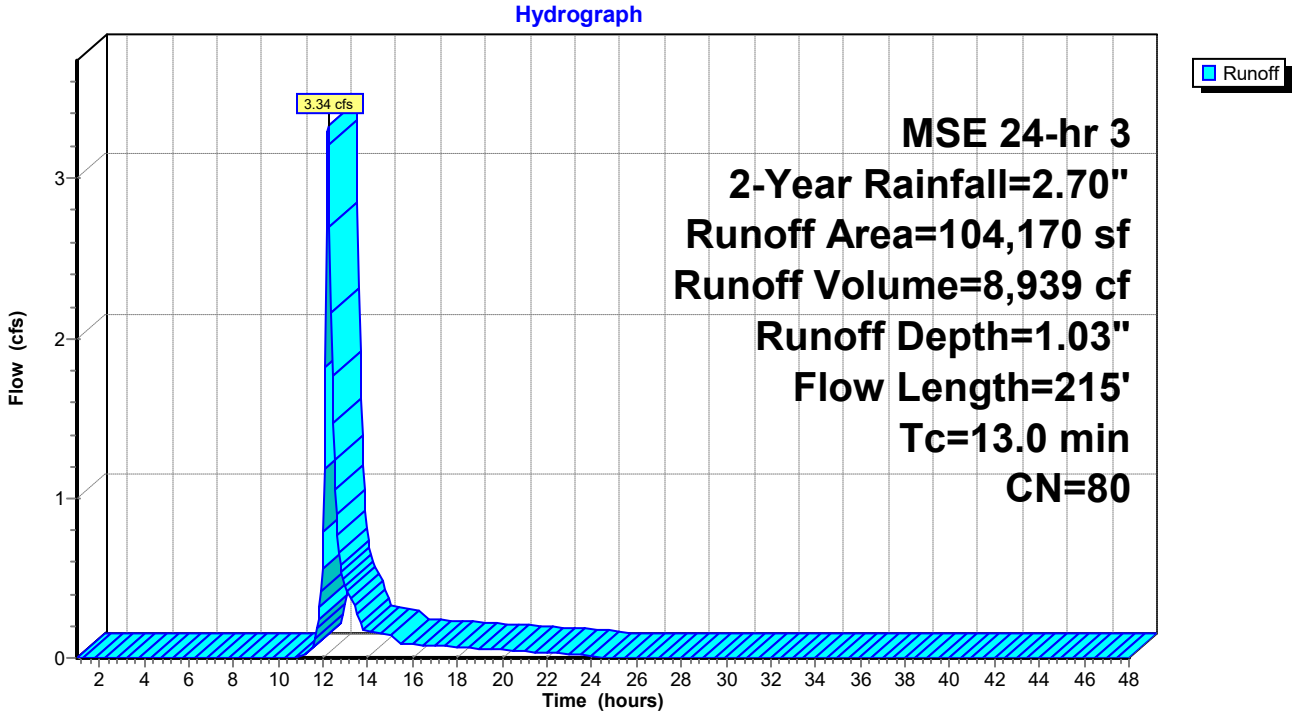
Runoff = 3.34 cfs @ 12.22 hrs, Volume= 8,939 cf, Depth= 1.03"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	79,699	74	PER
*	21,341	98	IMP
*	3,130	98	ROOF
	104,170	80	Weighted Average
	79,699		76.51% Pervious Area
	24,471		23.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0205	0.15		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
1.8	115	0.0234	1.07		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
13.0	215	Total			

Subcatchment 25S: X



Summary for Subcatchment 26S: Y

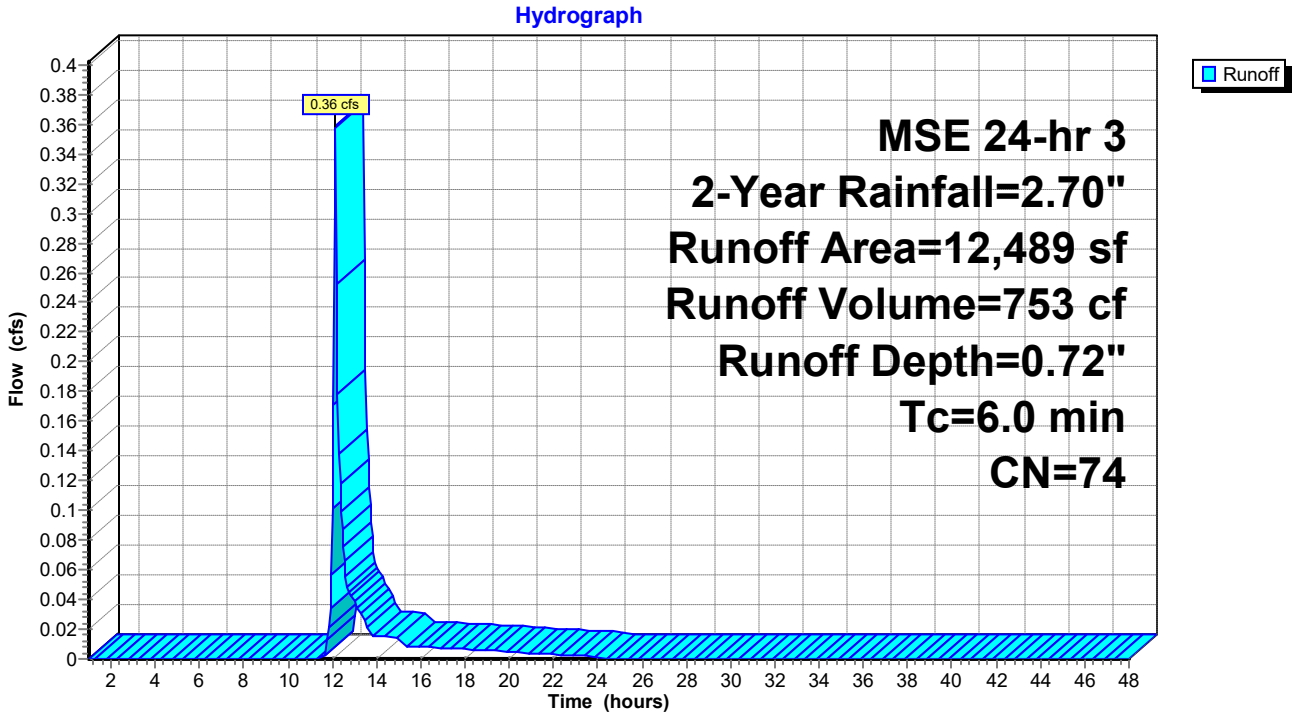
Runoff = 0.36 cfs @ 12.14 hrs, Volume= 753 cf, Depth= 0.72"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	12,489	74	PER
	12,489		100.00% Pervious Area

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

Subcatchment 26S: Y



Summary for Subcatchment 27S: Z

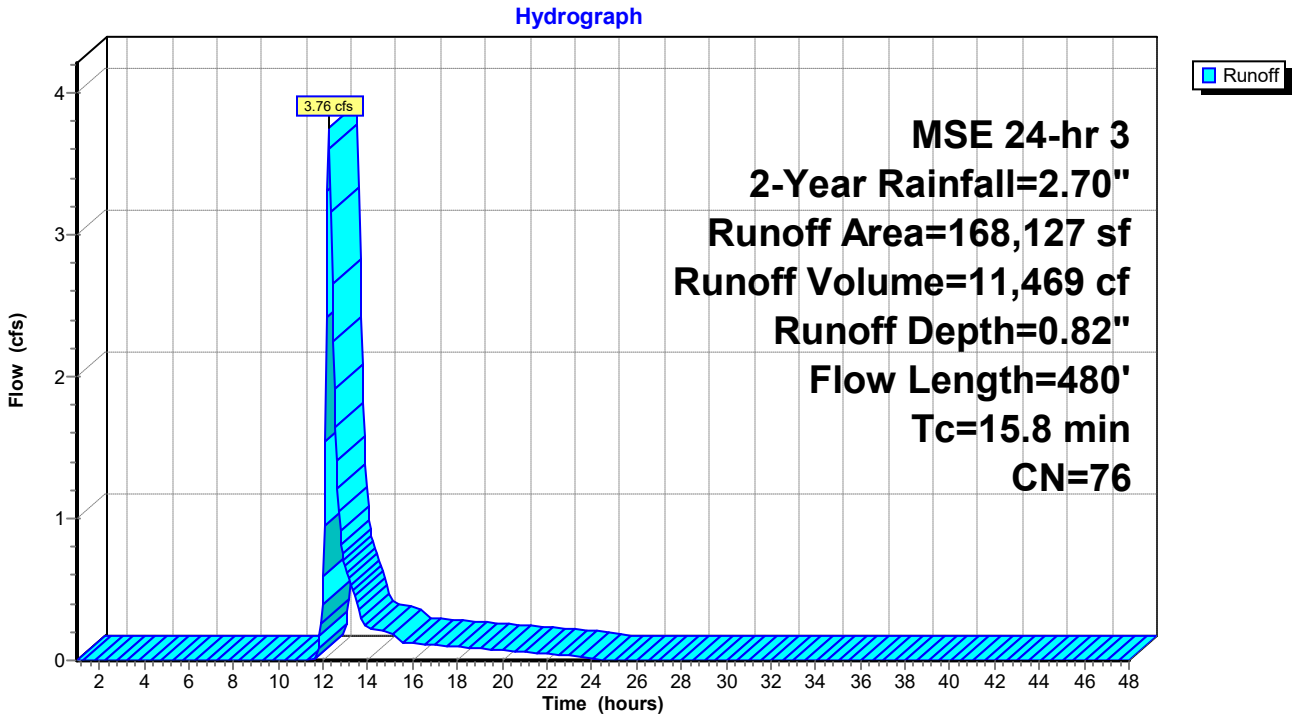
Runoff = 3.76 cfs @ 12.26 hrs, Volume= 11,469 cf, Depth= 0.82"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	157,056	74	PER
*	11,071	98	IMP
	168,127	76	Weighted Average
	157,056		93.42% Pervious Area
	11,071		6.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0237	0.16		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
5.3	380	0.0291	1.19		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
15.8	480	Total			

Subcatchment 27S: Z



Summary for Subcatchment 67S: C2

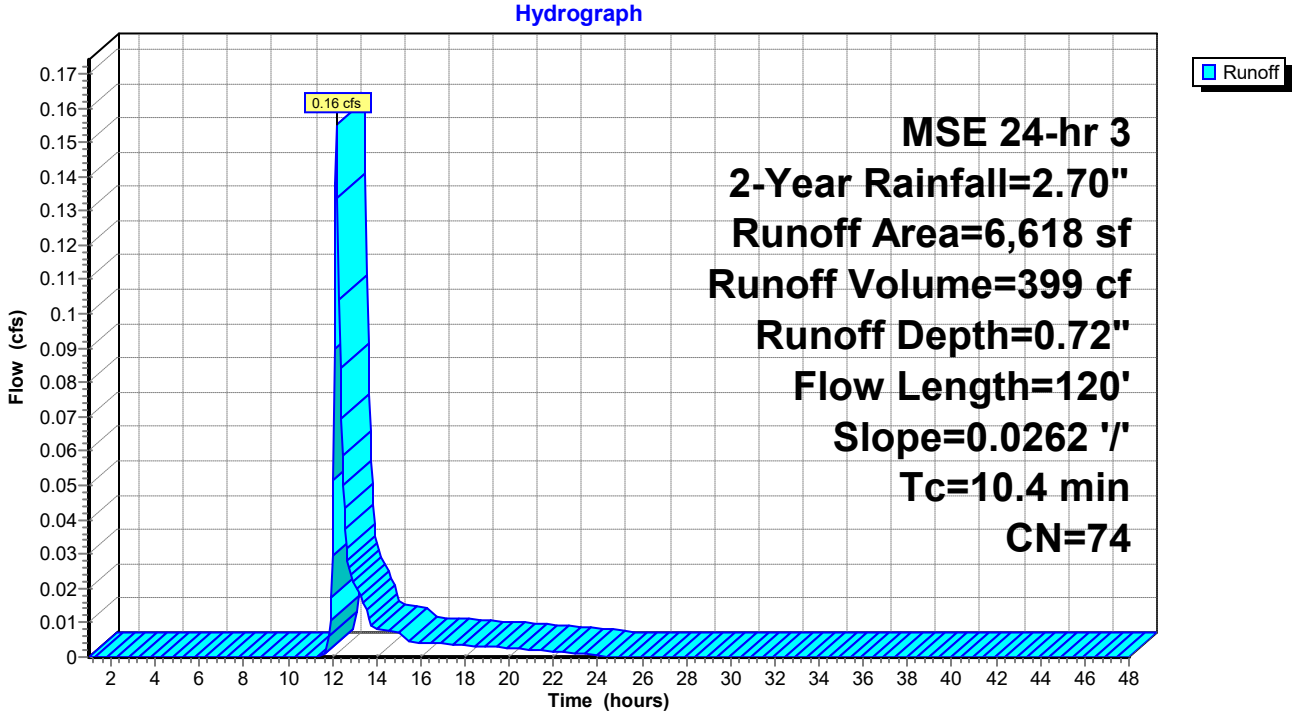
Runoff = 0.16 cfs @ 12.20 hrs, Volume= 399 cf, Depth= 0.72"
Routed to Link 80L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	6,618	74	PER
	6,618		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	100	0.0262	0.16		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.3	20	0.0262	1.13		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
10.4	120	Total			

Subcatchment 67S: C2



Summary for Subcatchment 68S: C4

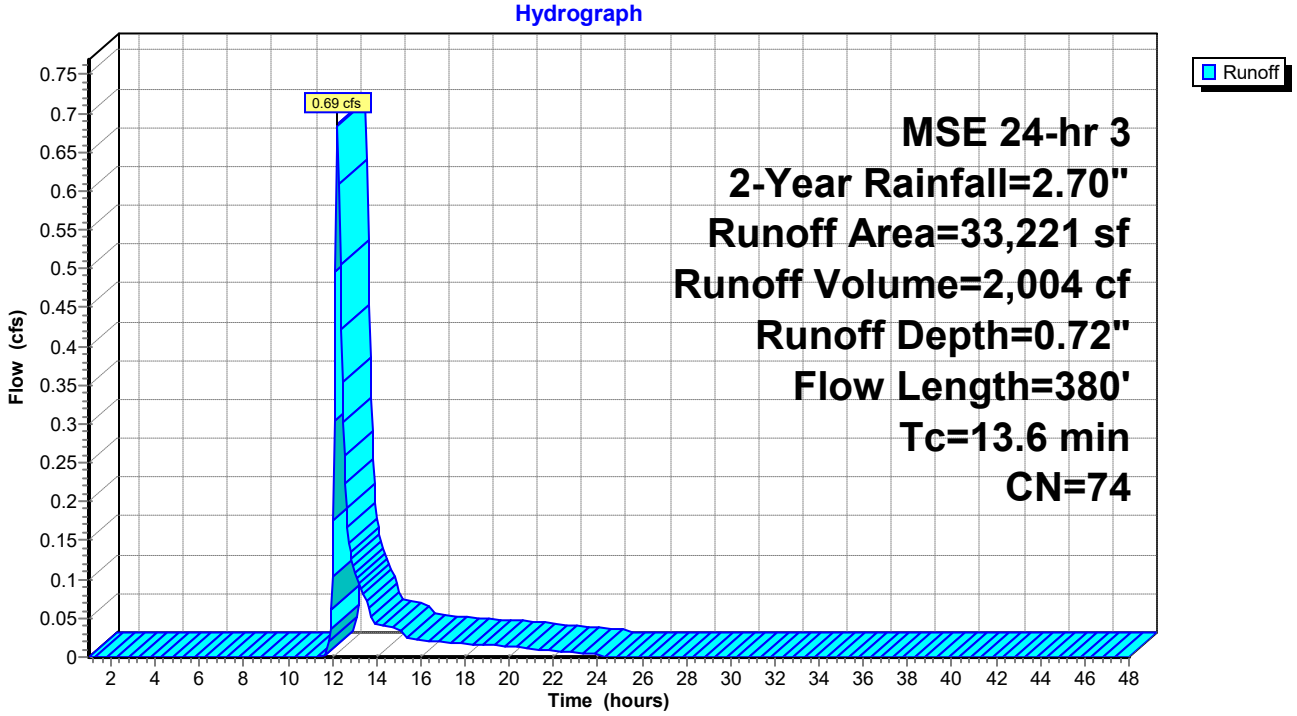
Runoff = 0.69 cfs @ 12.24 hrs, Volume= 2,004 cf, Depth= 0.72"
Routed to Reach 182R : EX. Red Barn Lane West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	33,221	74	PER
	33,221		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0319	0.18		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
4.3	280	0.0235	1.07		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
13.6	380	Total			

Subcatchment 68S: C4



Summary for Subcatchment 69S: C3

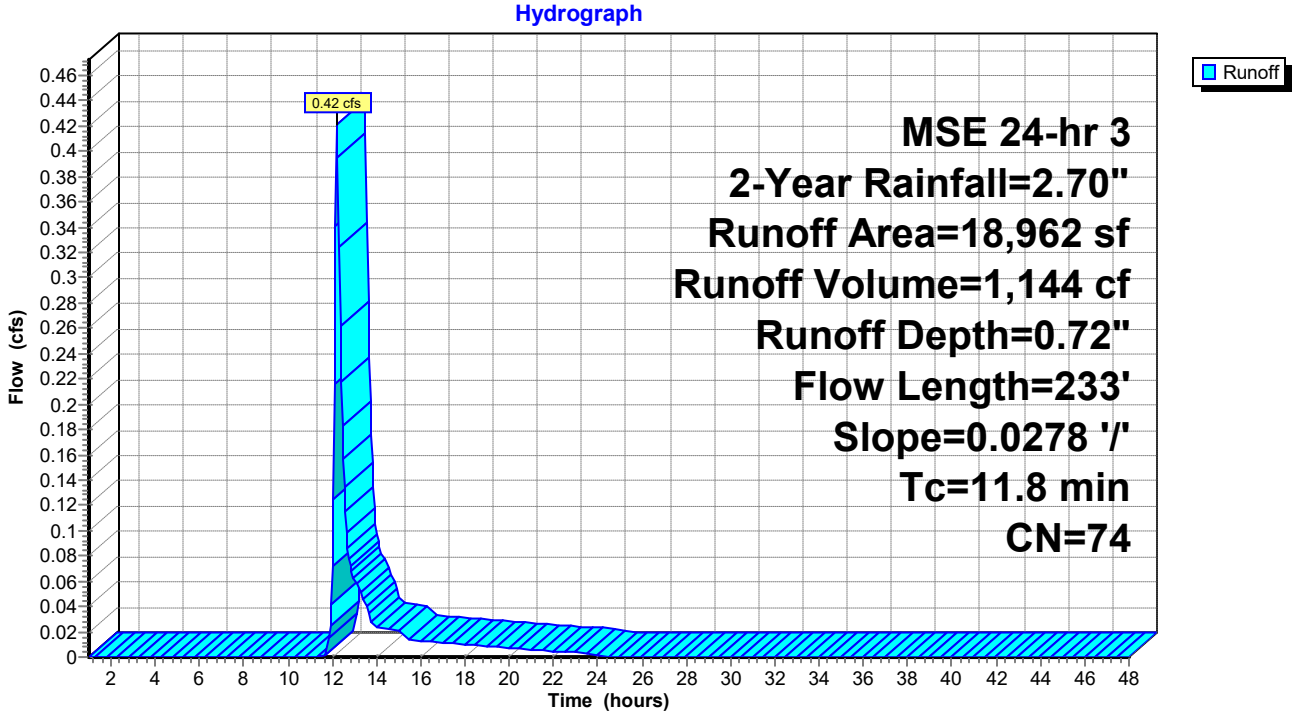
Runoff = 0.42 cfs @ 12.21 hrs, Volume= 1,144 cf, Depth= 0.72"
Routed to Link 78L : Swale on Lot 20

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	18,962	74	PER
	18,962		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.0278	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
1.9	133	0.0278	1.17		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
11.8	233	Total			

Subcatchment 69S: C3



Summary for Subcatchment 70S: O1

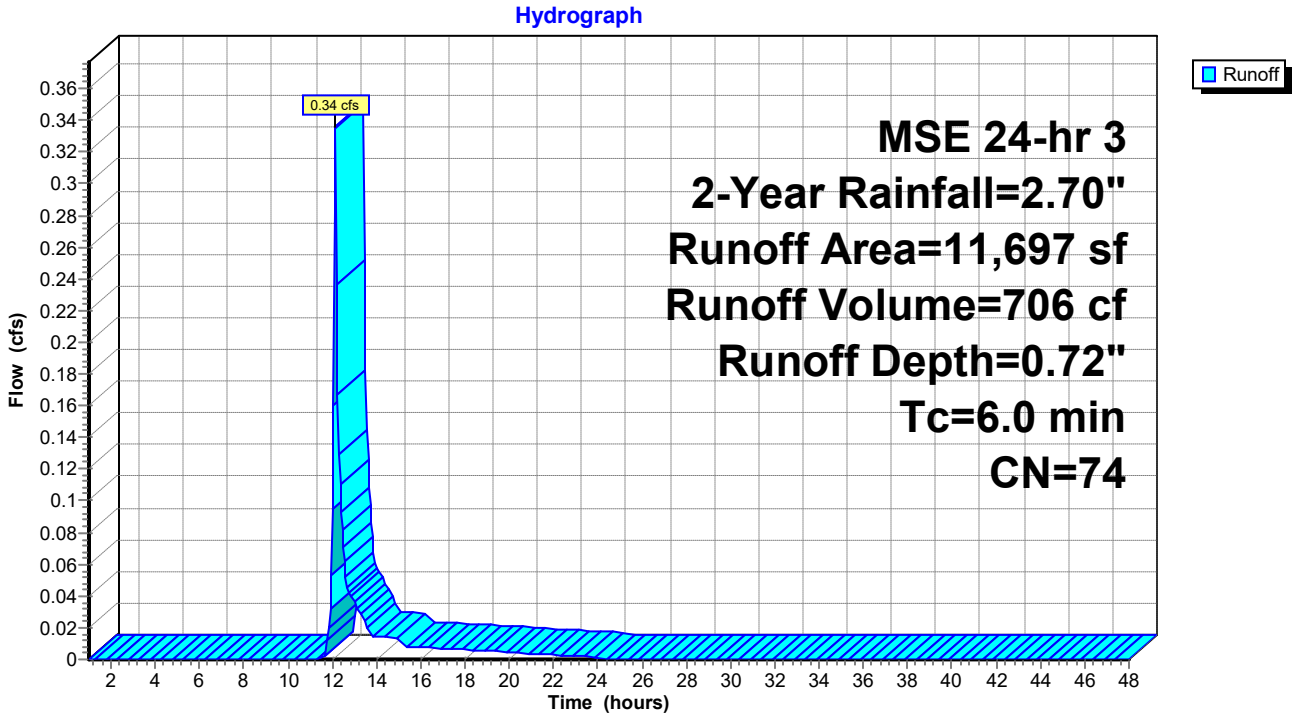
Runoff = 0.34 cfs @ 12.14 hrs, Volume= 706 cf, Depth= 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	11,697	74	PERV
	11,697		100.00% Pervious Area

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

Subcatchment 70S: O1



Summary for Subcatchment 71S: O2

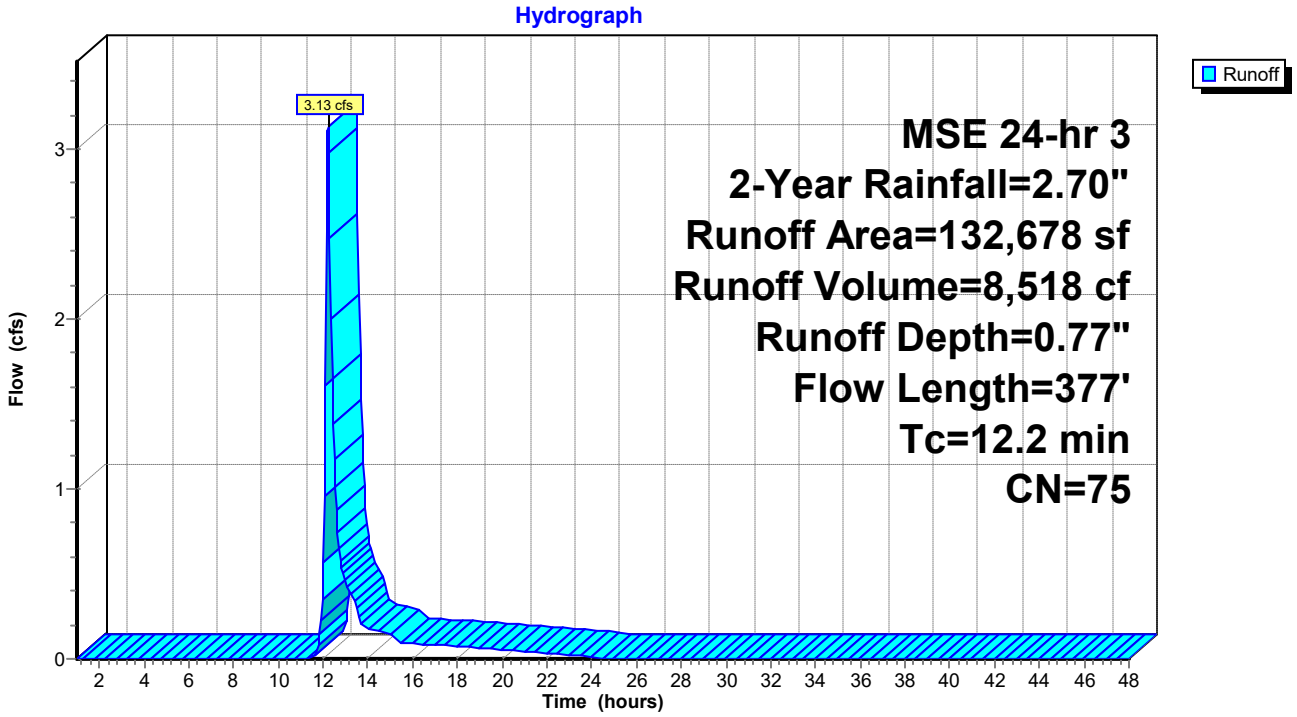
Runoff = 3.13 cfs @ 12.22 hrs, Volume= 8,518 cf, Depth= 0.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	129,638	74	PERV
*	3,040	98	IMPERV
	132,678	75	Weighted Average
	129,638		97.71% Pervious Area
	3,040		2.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	77	0.0288	0.16		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
4.3	300	0.0135	1.16		**Shallow Concentrated Flow, SHALLOW CONC** Nearly Bare & Untilled Kv= 10.0 fps
12.2	377	Total			

Subcatchment 71S: O2



Summary for Subcatchment 184S: Z1 (EX. RBL Area to RBL West Swale)

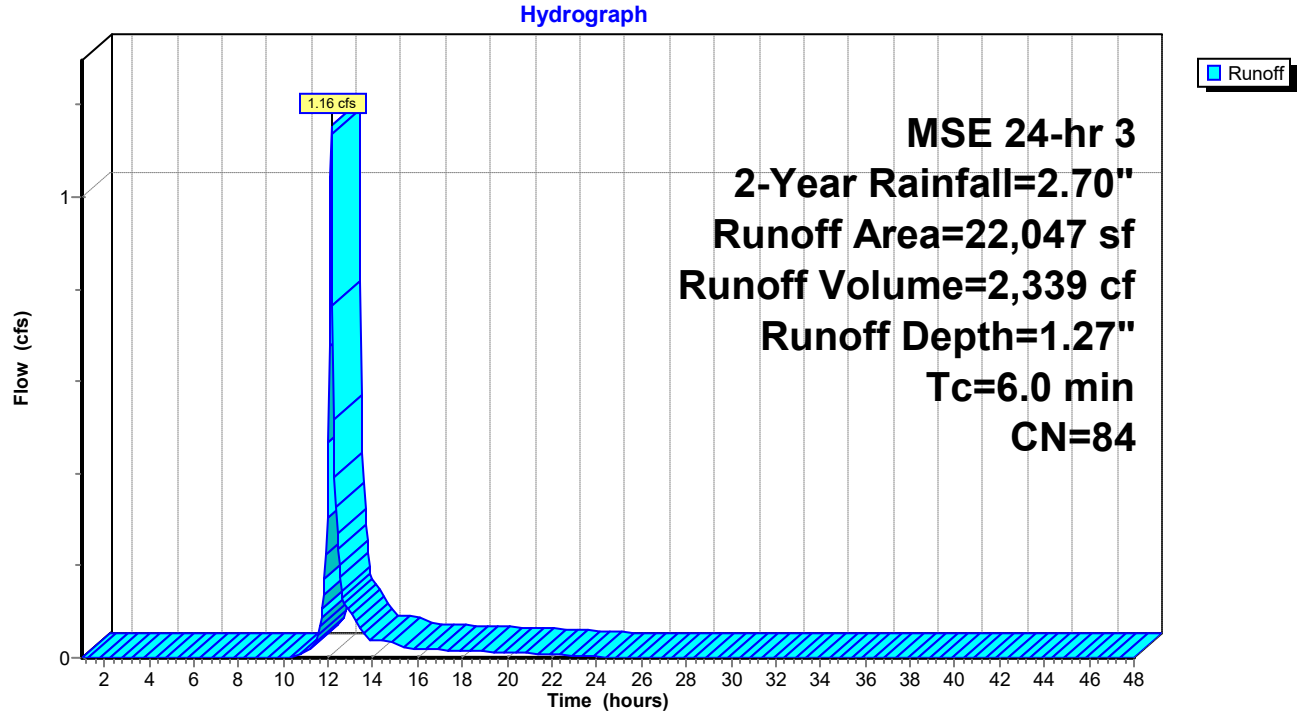
Runoff = 1.16 cfs @ 12.14 hrs, Volume= 2,339 cf, Depth= 1.27"
Routed to Reach 182R : EX. Red Barn Lane West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	12,014	74	landscape
*	9,160	98	road
*	873	74	landscape
	22,047	84	Weighted Average
	12,887		58.45% Pervious Area
	9,160		41.55% Impervious Area

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

Subcatchment 184S: Z1 (EX. RBL Area to RBL West Swale)



Summary for Reach 93R: Overland Flow from North Depression to South Depression

[43] Hint: Has no inflow (Outflow=Zero)

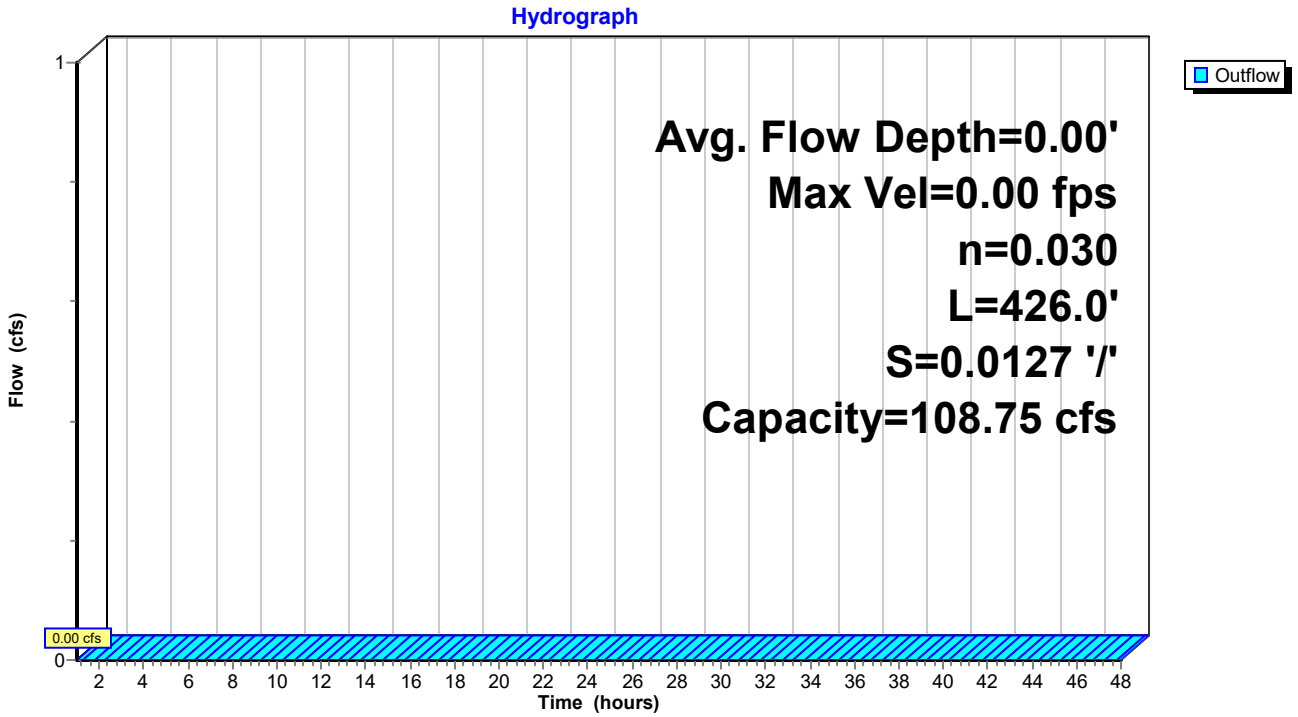
Bank-Full Depth= 0.50' Flow Area= 37.5 sf, Capacity= 108.75 cfs

50.00' x 0.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 50.0 '/' Top Width= 100.00'
Length= 426.0' Slope= 0.0127 '/'
Inlet Invert= 755.90', Outlet Invert= 750.50'



‡

Reach 93R: Overland Flow from North Depression to South Depression



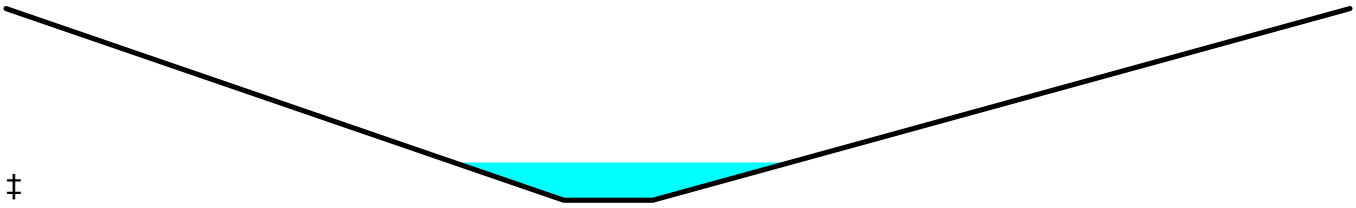
Summary for Reach 182R: EX. Red Barn Lane West Swale

Inflow Area = 79,613 sf, 11.51% Impervious, Inflow Depth = 0.88" for 2-Year event
Inflow = 2.17 cfs @ 12.16 hrs, Volume= 5,812 cf
Outflow = 1.95 cfs @ 12.22 hrs, Volume= 5,812 cf, Atten= 10%, Lag= 3.2 min
Routed to Link 79L : Swale Along Red Barn Ln.

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.64 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 0.90 fps, Avg. Travel Time= 11.3 min

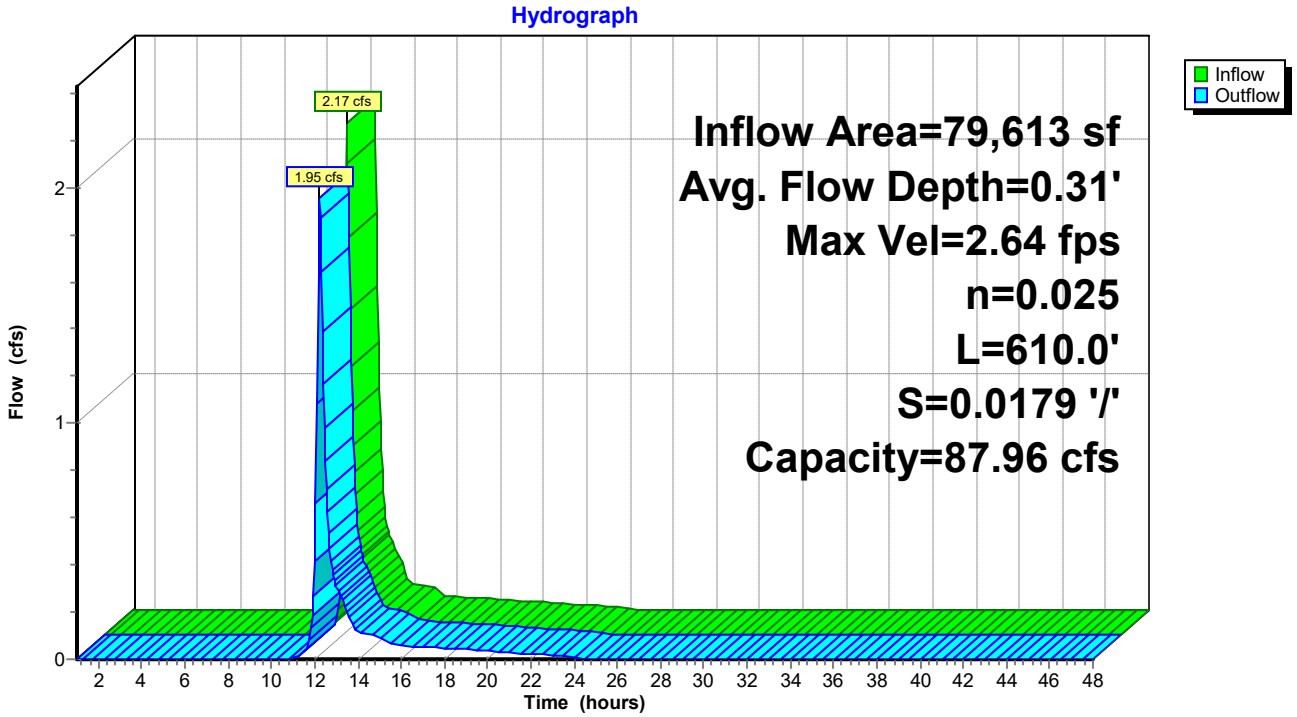
Peak Storage= 450 cf @ 12.22 hrs
Average Depth at Peak Storage= 0.31' , Surface Width= 3.78'
Bank-Full Depth= 1.57' Flow Area= 12.7 sf, Capacity= 87.96 cfs

1.00' x 1.57' deep channel, n= 0.025
Side Slope Z-value= 4.0 5.0 '/' Top Width= 15.13'
Length= 610.0' Slope= 0.0179 '/'
Inlet Invert= 760.89', Outlet Invert= 750.00'



‡

Reach 182R: EX. Red Barn Lane West Swale



Summary for Pond 73P: Southeast Basin

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=86)

Inflow Area = 156,438 sf, 0.00% Impervious, Inflow Depth = 0.72" for 2-Year event
Inflow = 3.22 cfs @ 12.24 hrs, Volume= 9,437 cf
Outflow = 0.76 cfs @ 12.72 hrs, Volume= 9,441 cf, Atten= 76%, Lag= 28.6 min
Discarded = 0.76 cfs @ 12.72 hrs, Volume= 9,441 cf

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 730.66' @ 12.72 hrs Surf.Area= 6,289 sf Storage= 3,006 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 35.9 min (880.1 - 844.2)

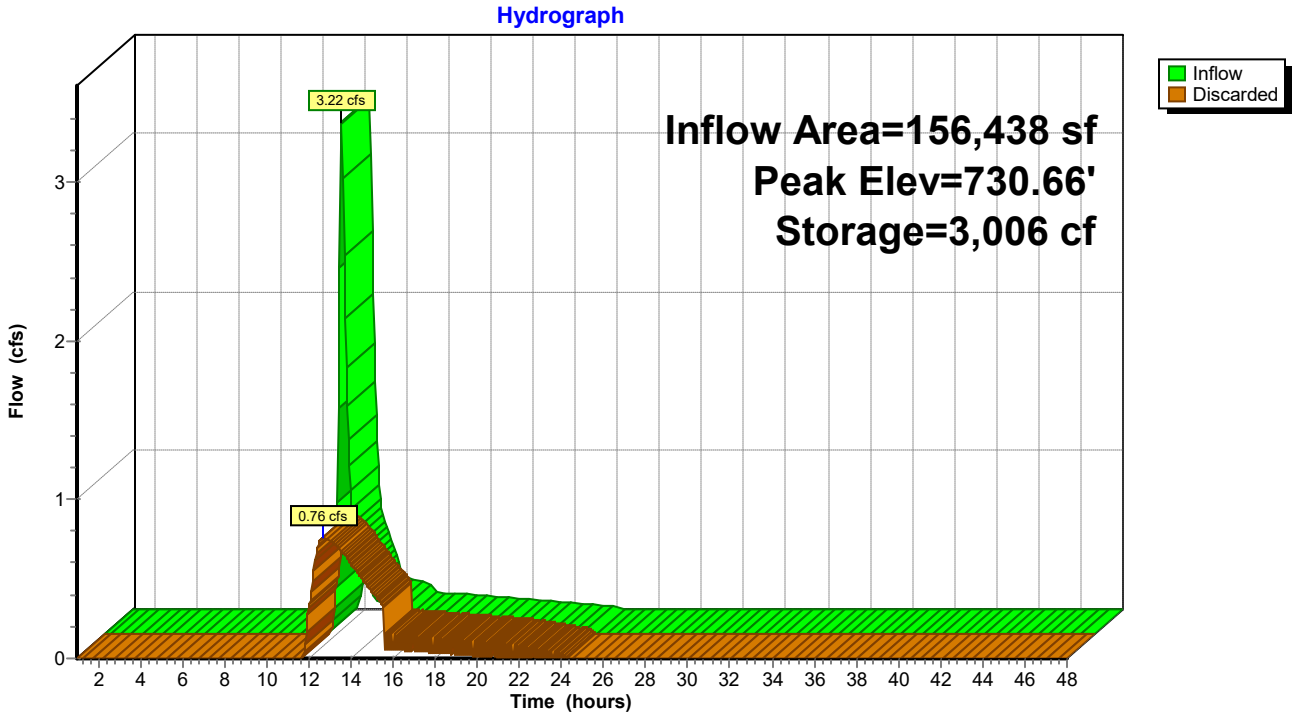
Volume	Invert	Avail.Storage	Storage Description
#1	730.00'	273,743 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
730.00	2,768	0	0
731.00	8,073	5,421	5,421
732.00	12,399	10,236	15,657
733.00	17,056	14,728	30,384
734.00	21,328	19,192	49,576
735.00	25,607	23,468	73,044
736.00	29,845	27,726	100,770
737.00	35,145	32,495	133,265
738.00	42,680	38,913	172,177
739.00	51,064	46,872	219,049
740.00	58,323	54,694	273,743

Device	Routing	Invert	Outlet Devices
#1	Discarded	730.00'	**5.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 720.00'

Discarded OutFlow Max=0.76 cfs @ 12.72 hrs HW=730.66' (Free Discharge)
1=Exfiltration (Controls 0.76 cfs)

Pond 73P: Southeast Basin



Summary for Pond 74P: Southwest Basin

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=37)

Inflow Area = 432,562 sf, 19.07% Impervious, Inflow Depth = 0.98" for 2-Year event
Inflow = 12.63 cfs @ 12.21 hrs, Volume= 35,431 cf
Outflow = 2.90 cfs @ 12.67 hrs, Volume= 35,437 cf, Atten= 77%, Lag= 27.4 min
Discarded = 2.90 cfs @ 12.67 hrs, Volume= 35,437 cf

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 742.66' @ 12.67 hrs Surf.Area= 15,035 sf Storage= 13,738 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 70.1 min (897.8 - 827.7)

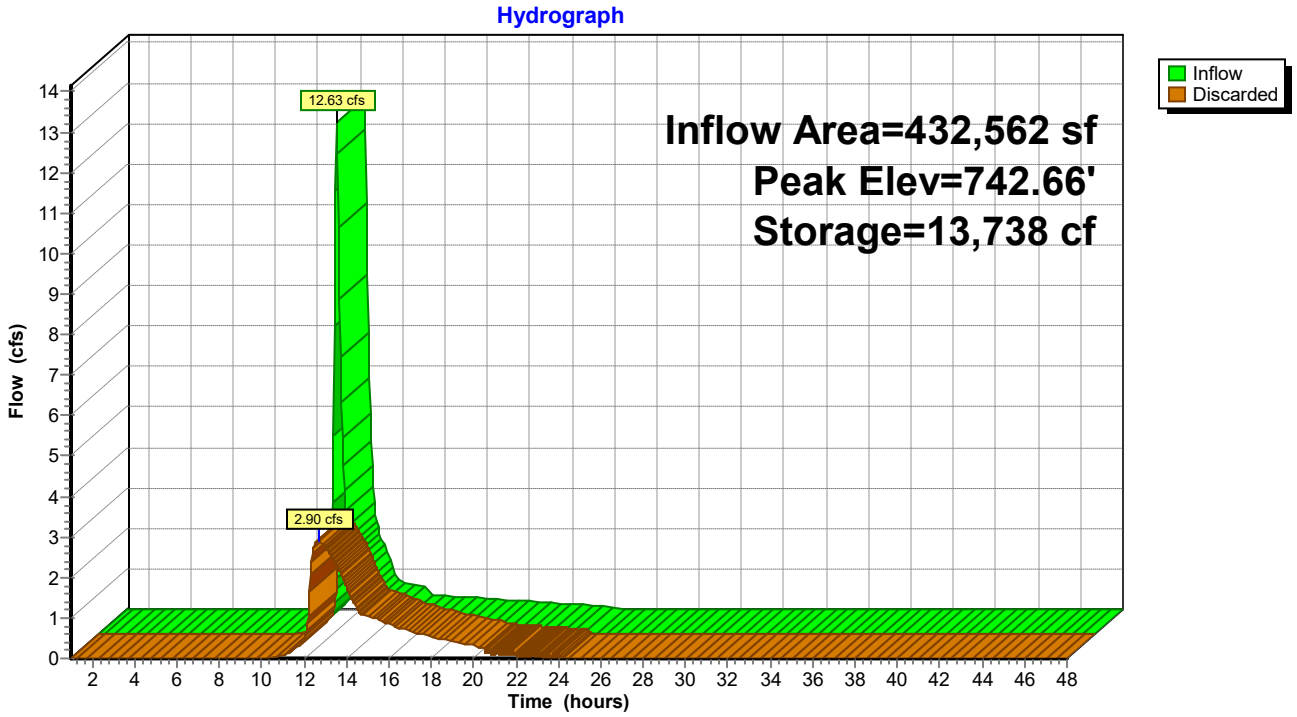
Volume	Invert	Avail.Storage	Storage Description
#1	740.00'	78,856 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
740.00	1,591	0	0
741.00	3,325	2,458	2,458
742.00	5,645	4,485	6,943
743.00	19,935	12,790	19,733
744.00	30,884	25,410	45,143
745.00	36,542	33,713	78,856

Device	Routing	Invert	Outlet Devices
#1	Discarded	740.00'	**8.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 720.00'

Discarded OutFlow Max=2.90 cfs @ 12.67 hrs HW=742.66' (Free Discharge)
↑**1=Exfiltration** (Controls 2.90 cfs)

Pond 74P: Southwest Basin



Summary for Pond 89P: Gravel North Depression

[93] Warning: Storage range exceeded by 0.39'
[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 248,526 sf, 21.47% Impervious, Inflow Depth = 1.00" for 2-Year event
Inflow = 7.79 cfs @ 12.18 hrs, Volume= 20,644 cf
Outflow = 8.07 cfs @ 12.17 hrs, Volume= 20,643 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.45 cfs @ 12.15 hrs, Volume= 6,838 cf
Primary = 1.76 cfs @ 12.43 hrs, Volume= 8,959 cf
Routed to Pond 92P : Gravel South Depression
Secondary = 5.95 cfs @ 12.17 hrs, Volume= 4,847 cf
Routed to Pond 92P : Gravel South Depression

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 756.39' @ 12.17 hrs Surf.Area= 1,161 sf Storage= 808 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 3.6 min (825.7 - 822.1)

Volume	Invert	Avail.Storage	Storage Description
#1	754.80'	808 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
754.80	237	0	0
755.50	725	337	337
756.00	1,161	472	808

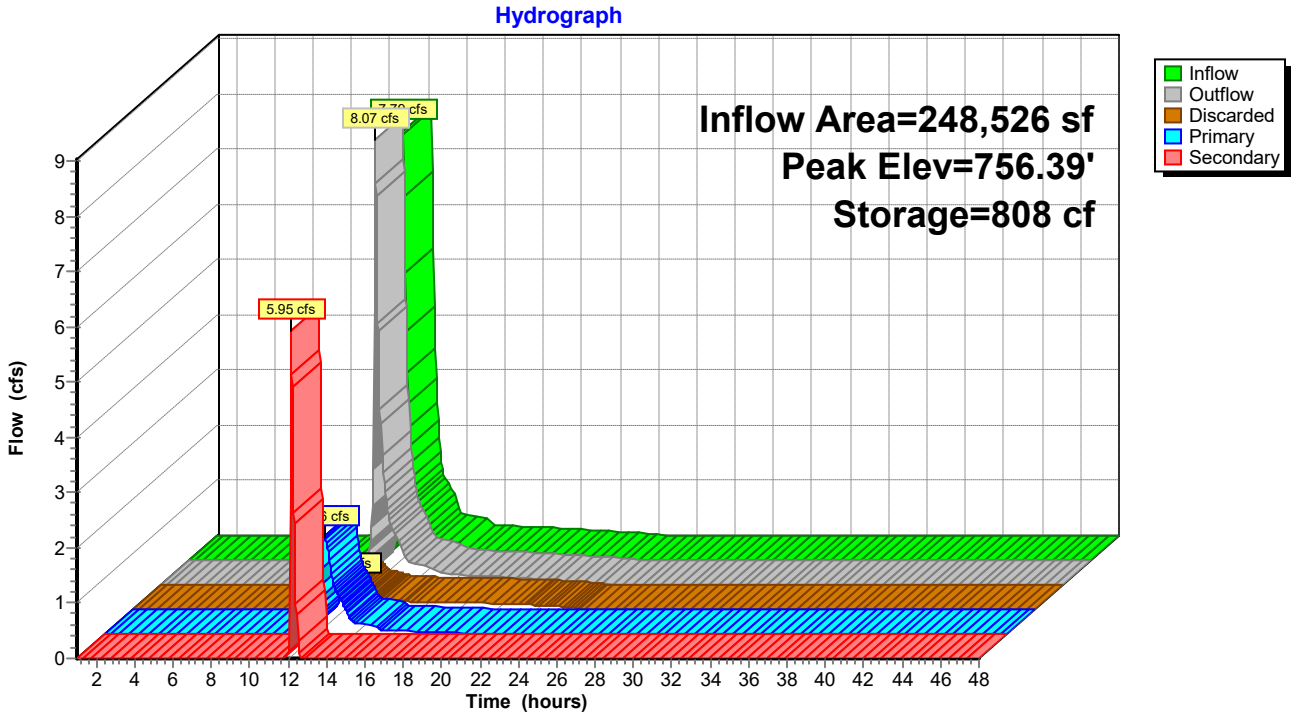
Device	Routing	Invert	Outlet Devices
#1	Primary	754.80'	**12.0" Round Culvert** L= 426.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 754.80' / 749.60' S= 0.0122 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	755.80'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#3	Discarded	754.80'	**16.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 725.00'

Discarded OutFlow Max=0.45 cfs @ 12.15 hrs HW=756.38' (Free Discharge)
3=Exfiltration (Controls 0.45 cfs)

Primary OutFlow Max=1.75 cfs @ 12.43 hrs HW=755.98' TW=752.39' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.75 cfs @ 2.38 fps)

Secondary OutFlow Max=5.56 cfs @ 12.17 hrs HW=756.37' TW=752.71' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Weir Controls 5.56 cfs @ 1.96 fps)

Pond 89P: Gravel North Depression



Summary for Pond 92P: Gravel South Depression

[92] Warning: Device #1 is above defined storage
[93] Warning: Storage range exceeded by 0.72'
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=27)

Inflow Area = 301,528 sf, 17.70% Impervious, Inflow Depth = 0.68" for 2-Year event
Inflow = 8.39 cfs @ 12.17 hrs, Volume= 17,003 cf
Outflow = 8.08 cfs @ 12.19 hrs, Volume= 17,003 cf, Atten= 4%, Lag= 1.1 min
Primary = 7.98 cfs @ 12.19 hrs, Volume= 13,975 cf
Routed to Link 80L : EX. Cul-de-sac On Green Meadow Place
Secondary = 0.10 cfs @ 12.19 hrs, Volume= 3,029 cf
Routed to Link 80L : EX. Cul-de-sac On Green Meadow Place

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 752.72' @ 12.19 hrs Surf.Area= 253 sf Storage= 387 cf

Plug-Flow detention time= 9.6 min calculated for 17,003 cf (100% of inflow)
Center-of-Mass det. time= 9.6 min (793.6 - 784.0)

Volume	Invert	Avail.Storage	Storage Description
#1	749.60'	387 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

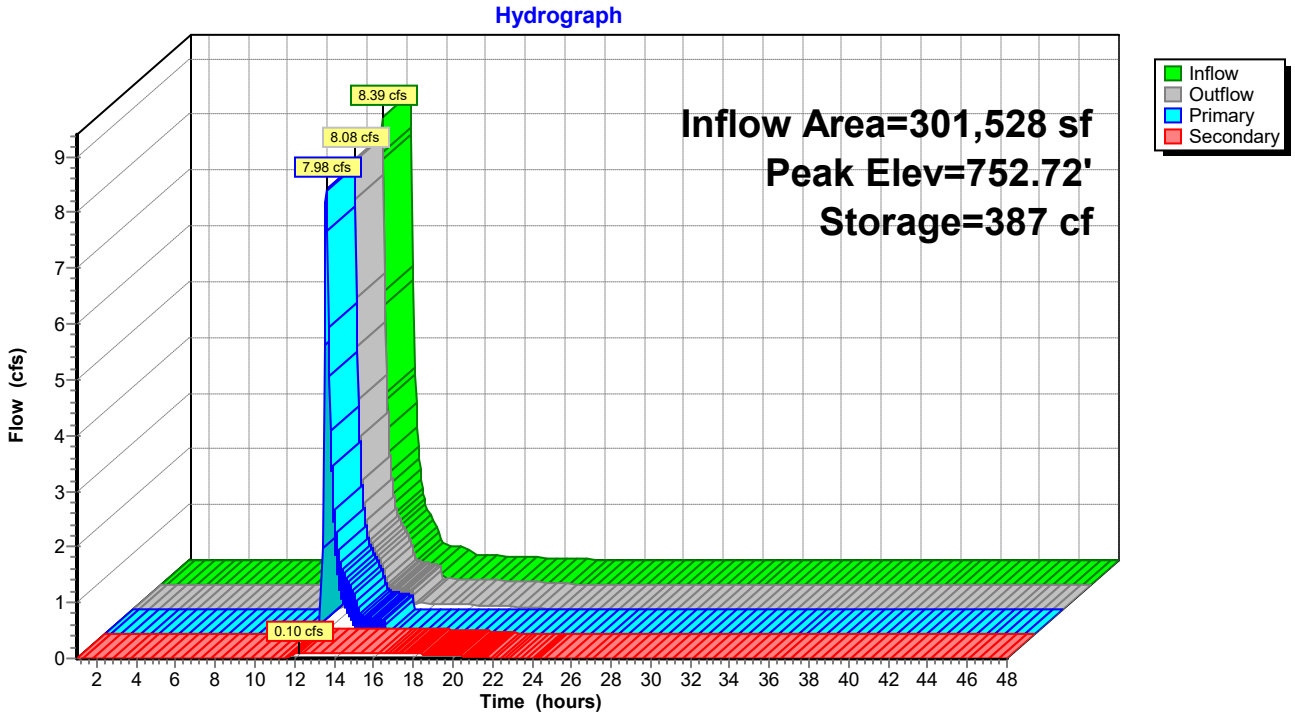
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
749.60	30	0	0
750.00	107	27	27
752.00	253	360	387

Device	Routing	Invert	Outlet Devices
#1	Primary	752.00'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Secondary	749.60'	**16.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 725.00'

Primary OutFlow Max=7.89 cfs @ 12.19 hrs HW=752.72' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 7.89 cfs @ 2.20 fps)

Secondary OutFlow Max=0.10 cfs @ 12.19 hrs HW=752.72' TW=0.00' (Dynamic Tailwater)
2=Exfiltration (Controls 0.10 cfs)

Pond 92P: Gravel South Depression

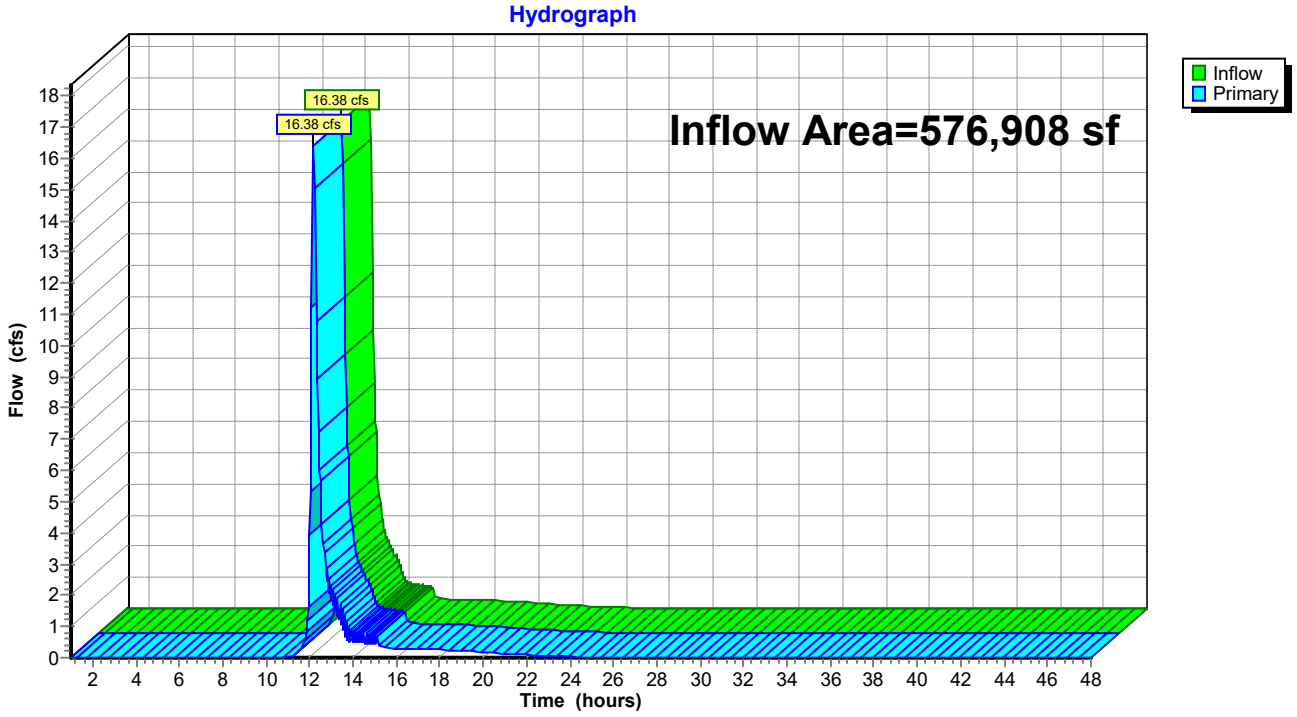


Summary for Link 32L: TOTAL OFFSITE UNTREATED

Inflow Area = 576,908 sf, 17.53% Impervious, Inflow Depth = 0.80" for 2-Year event
Inflow = 16.38 cfs @ 12.18 hrs, Volume= 38,348 cf
Primary = 16.38 cfs @ 12.18 hrs, Volume= 38,348 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 34L : TOTAL OUTFALL

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 32L: TOTAL OFFSITE UNTREATED

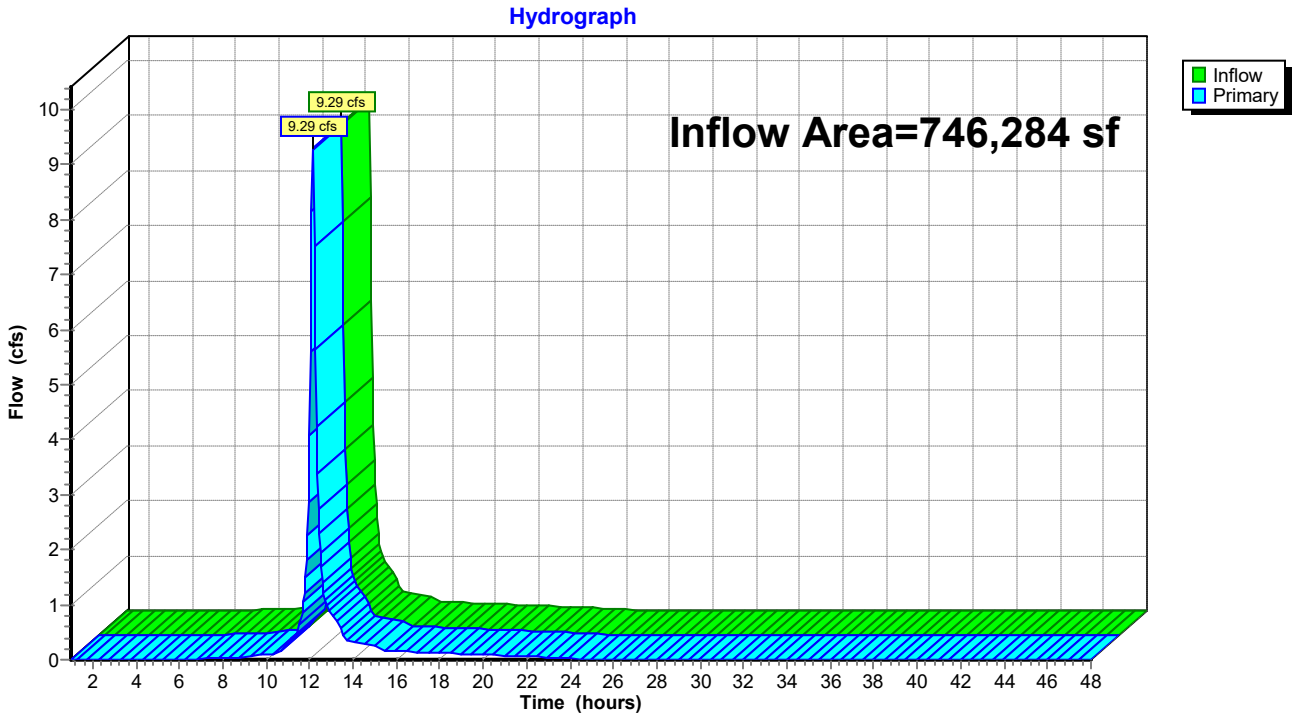


Summary for Link 33L: TOTAL ONSITE

Inflow Area = 746,284 sf, 24.37% Impervious, Inflow Depth = 0.36" for 2-Year event
Inflow = 9.29 cfs @ 12.14 hrs, Volume= 22,210 cf
Primary = 9.29 cfs @ 12.14 hrs, Volume= 22,210 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 34L : TOTAL OUTFALL

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 33L: TOTAL ONSITE

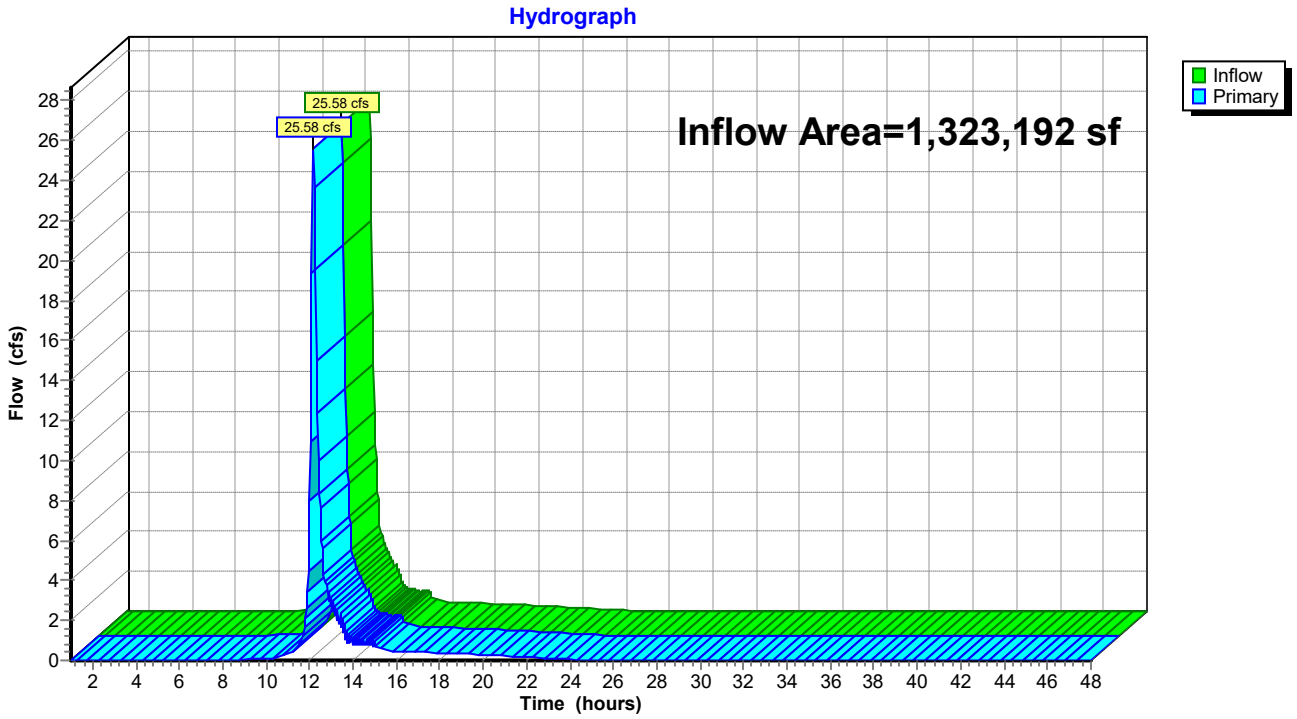


Summary for Link 34L: TOTAL OUTFALL

Inflow Area = 1,323,192 sf, 21.39% Impervious, Inflow Depth = 0.55" for 2-Year event
Inflow = 25.58 cfs @ 12.16 hrs, Volume= 60,559 cf
Primary = 25.58 cfs @ 12.16 hrs, Volume= 60,559 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 34L: TOTAL OUTFALL

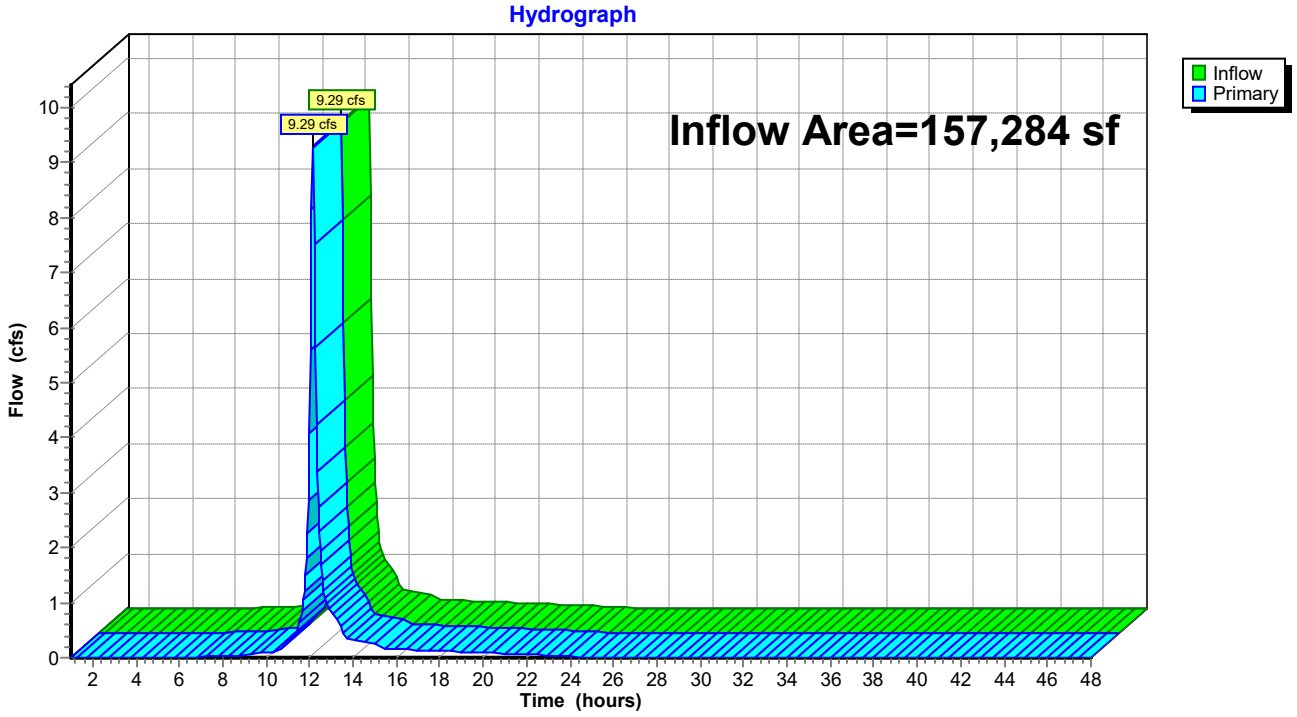


Summary for Link 75L: Areas Piped

Inflow Area = 157,284 sf, 63.18% Impervious, Inflow Depth = 1.69" for 2-Year event
Inflow = 9.29 cfs @ 12.14 hrs, Volume= 22,210 cf
Primary = 9.29 cfs @ 12.14 hrs, Volume= 22,210 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 33L : TOTAL ONSITE

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 75L: Areas Piped

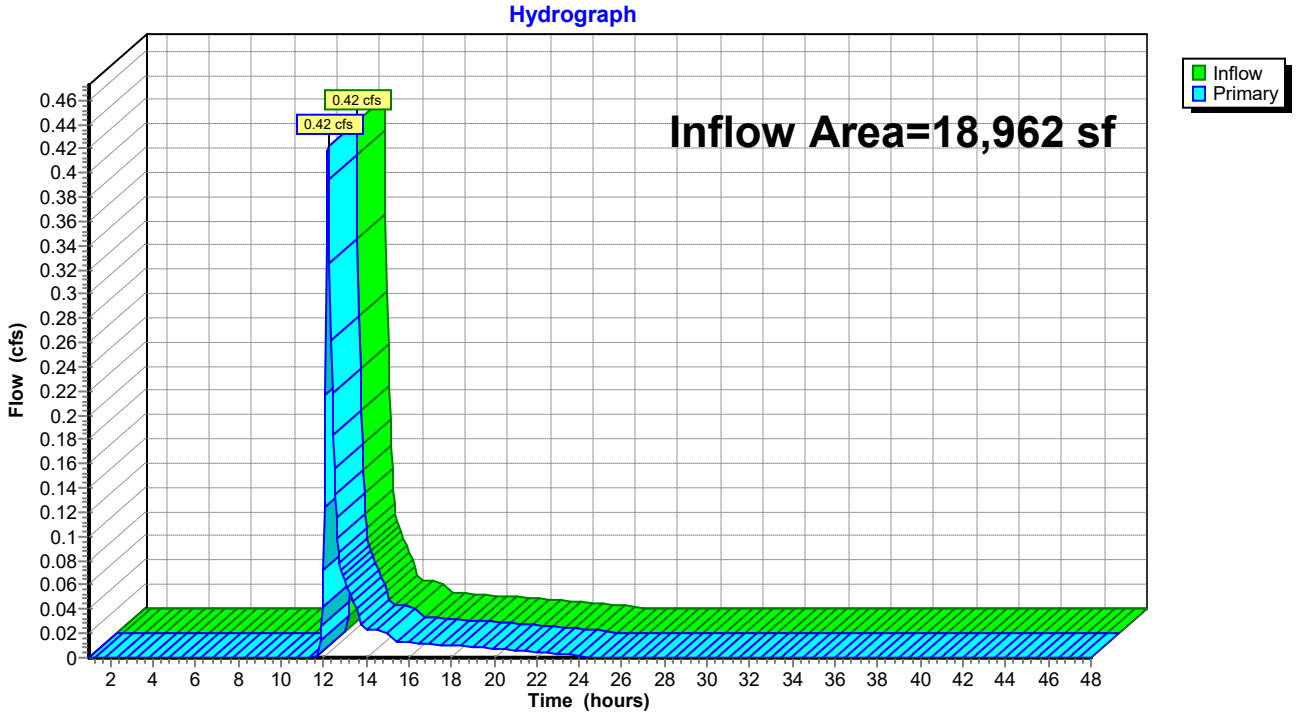


Summary for Link 78L: Swale on Lot 20

Inflow Area = 18,962 sf, 0.00% Impervious, Inflow Depth = 0.72" for 2-Year event
Inflow = 0.42 cfs @ 12.21 hrs, Volume= 1,144 cf
Primary = 0.42 cfs @ 12.21 hrs, Volume= 1,144 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 32L : TOTAL OFFSITE UNTREATED

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 78L: Swale on Lot 20

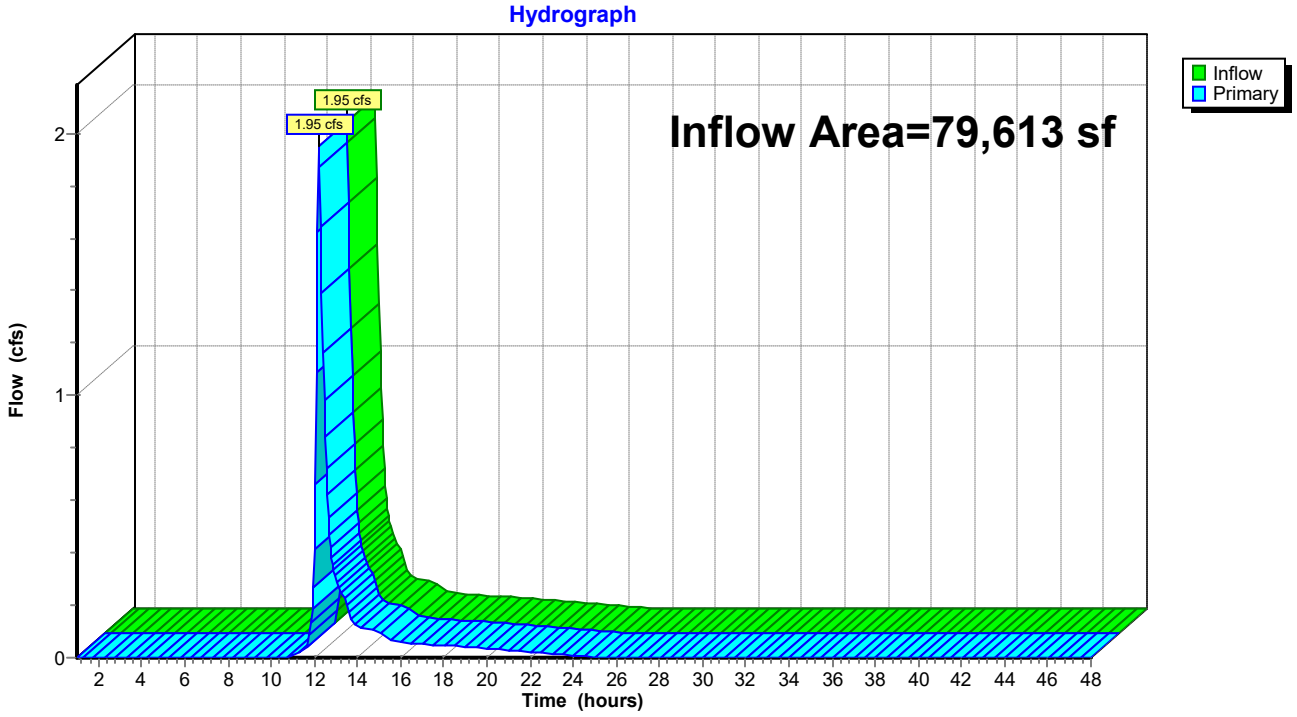


Summary for Link 79L: Swale Along Red Barn Ln.

Inflow Area = 79,613 sf, 11.51% Impervious, Inflow Depth = 0.88" for 2-Year event
Inflow = 1.95 cfs @ 12.22 hrs, Volume= 5,812 cf
Primary = 1.95 cfs @ 12.22 hrs, Volume= 5,812 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 32L : TOTAL OFFSITE UNTREATED

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 79L: Swale Along Red Barn Ln.

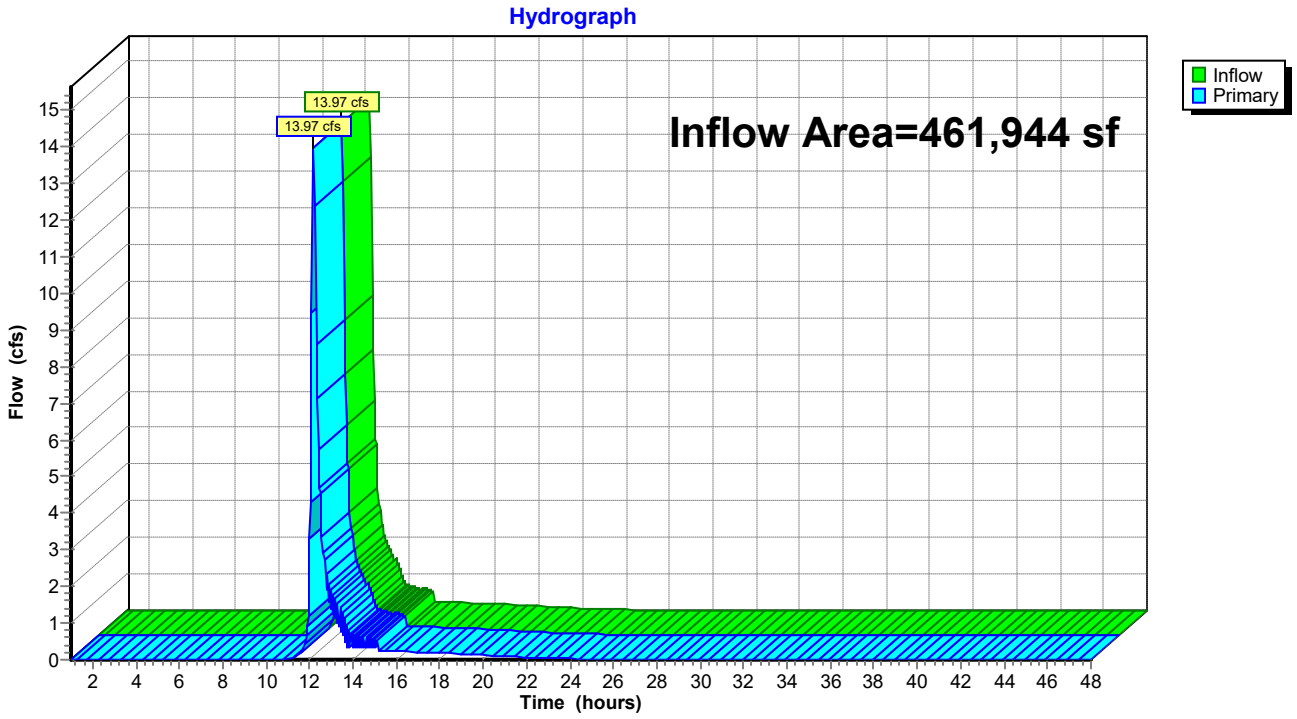


Summary for Link 80L: EX. Cul-de-sac On Green Meadow Place

Inflow Area = 461,944 sf, 19.58% Impervious, Inflow Depth = 0.79" for 2-Year event
Inflow = 13.97 cfs @ 12.17 hrs, Volume= 30,278 cf
Primary = 13.97 cfs @ 12.17 hrs, Volume= 30,278 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 32L : TOTAL OFFSITE UNTREATED

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 80L: EX. Cul-de-sac On Green Meadow Place



Time span=1.00-48.00 hrs, dt=0.05 hrs, 941 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: A Runoff Area=156,438 sf 0.00% Impervious Runoff Depth=1.46"
Flow Length=260' Tc=13.7 min CN=74 Runoff=6.87 cfs 19,011 cf

Subcatchment 2S: B Runoff Area=141,137 sf 26.27% Impervious Runoff Depth=1.89"
Flow Length=300' Slope=0.0071 '/' Tc=8.5 min CN=80 Runoff=9.94 cfs 22,179 cf

Subcatchment 4S: C1 Runoff Area=12,661 sf 0.00% Impervious Runoff Depth=1.46"
Flow Length=100' Slope=0.0193 '/' Tc=11.4 min CN=74 Runoff=0.61 cfs 1,539 cf

Subcatchment 5S: D Runoff Area=24,345 sf 0.00% Impervious Runoff Depth=1.46"
Flow Length=170' Tc=10.2 min CN=74 Runoff=1.22 cfs 2,959 cf

Subcatchment 6S: E Runoff Area=152,103 sf 18.44% Impervious Runoff Depth=1.74"
Flow Length=471' Tc=10.6 min CN=78 Runoff=9.03 cfs 22,014 cf

Subcatchment 7S: F Runoff Area=13,305 sf 0.00% Impervious Runoff Depth=1.46"
Flow Length=100' Slope=0.0583 '/' Tc=7.3 min CN=74 Runoff=0.76 cfs 1,617 cf

Subcatchment 8S: G Runoff Area=66,971 sf 15.30% Impervious Runoff Depth=1.74"
Flow Length=295' Tc=12.7 min CN=78 Runoff=3.70 cfs 9,693 cf

Subcatchment 9S: H Runoff Area=16,147 sf 93.29% Impervious Runoff Depth=3.35"
Flow Length=200' Tc=6.0 min CN=96 Runoff=1.97 cfs 4,510 cf

Subcatchment 10S: I Runoff Area=10,482 sf 59.22% Impervious Runoff Depth=2.55"
Flow Length=100' Slope=0.0244 '/' Tc=6.0 min CN=88 Runoff=1.07 cfs 2,230 cf

Subcatchment 11S: J Runoff Area=838 sf 4.77% Impervious Runoff Depth=1.53"
Flow Length=15' Slope=0.0122 '/' Tc=6.0 min CN=75 Runoff=0.05 cfs 107 cf

Subcatchment 12S: K Runoff Area=28,606 sf 66.44% Impervious Runoff Depth=2.74"
Flow Length=90' Slope=0.0161 '/' Tc=11.3 min CN=90 Runoff=2.55 cfs 6,530 cf

Subcatchment 13S: L Runoff Area=43,723 sf 16.63% Impervious Runoff Depth=1.74"
Flow Length=230' Tc=11.4 min CN=78 Runoff=2.53 cfs 6,328 cf

Subcatchment 14S: M Runoff Area=53,002 sf 0.00% Impervious Runoff Depth=1.46"
Flow Length=475' Tc=15.2 min CN=74 Runoff=2.23 cfs 6,441 cf

Subcatchment 15S: N Runoff Area=6,616 sf 7.63% Impervious Runoff Depth=1.59"
Flow Length=65' Slope=0.0344 '/' Tc=6.4 min CN=76 Runoff=0.43 cfs 879 cf

Subcatchment 16S: O Runoff Area=18,705 sf 49.38% Impervious Runoff Depth=2.37"
Flow Length=150' Tc=10.4 min CN=86 Runoff=1.51 cfs 3,702 cf

Subcatchment 17S: P Runoff Area=18,391 sf 80.23% Impervious Runoff Depth=3.04"
Flow Length=35' Slope=0.0866 '/' Tc=6.0 min CN=93 Runoff=2.13 cfs 4,652 cf

Subcatchment 18S: Q Runoff Area=14,923 sf 57.14% Impervious Runoff Depth=2.55"
Flow Length=30' Slope=0.0989 '/' Tc=6.0 min CN=88 Runoff=1.52 cfs 3,175 cf

Subcatchment 19S: R Runoff Area=20,724 sf 79.35% Impervious Runoff Depth=3.04"
Flow Length=170' Tc=10.5 min CN=93 Runoff=2.03 cfs 5,242 cf

Subcatchment 20S: S Runoff Area=5,299 sf 100.00% Impervious Runoff Depth=3.58"
Flow Length=50' Slope=0.0049 '/' Tc=6.0 min CN=98 Runoff=0.66 cfs 1,579 cf

Subcatchment 21S: T Runoff Area=35,645 sf 39.81% Impervious Runoff Depth=2.20"
Flow Length=280' Tc=11.4 min CN=84 Runoff=2.61 cfs 6,548 cf

Subcatchment 22S: U Runoff Area=15,551 sf 9.77% Impervious Runoff Depth=1.59"
Flow Length=90' Slope=0.0528 '/' Tc=7.0 min CN=76 Runoff=0.99 cfs 2,066 cf

Subcatchment 23S: V Runoff Area=26,499 sf 91.36% Impervious Runoff Depth=3.35"
Flow Length=115' Tc=6.0 min CN=96 Runoff=3.24 cfs 7,402 cf

Subcatchment 24S: W Runoff Area=75,447 sf 27.41% Impervious Runoff Depth=1.96"
Flow Length=200' Tc=9.3 min CN=81 Runoff=5.32 cfs 12,340 cf

Subcatchment 25S: X Runoff Area=104,170 sf 23.49% Impervious Runoff Depth=1.89"
Flow Length=215' Tc=13.0 min CN=80 Runoff=6.21 cfs 16,370 cf

Subcatchment 26S: Y Runoff Area=12,489 sf 0.00% Impervious Runoff Depth=1.46"
Tc=6.0 min CN=74 Runoff=0.75 cfs 1,518 cf

Subcatchment 27S: Z Runoff Area=168,127 sf 6.58% Impervious Runoff Depth=1.59"
Flow Length=480' Tc=15.8 min CN=76 Runoff=7.65 cfs 22,338 cf

Subcatchment 67S: C2 Runoff Area=6,618 sf 0.00% Impervious Runoff Depth=1.46"
Flow Length=120' Slope=0.0262 '/' Tc=10.4 min CN=74 Runoff=0.33 cfs 804 cf

Subcatchment 68S: C4 Runoff Area=33,221 sf 0.00% Impervious Runoff Depth=1.46"
Flow Length=380' Tc=13.6 min CN=74 Runoff=1.46 cfs 4,037 cf

Subcatchment 69S: C3 Runoff Area=18,962 sf 0.00% Impervious Runoff Depth=1.46"
Flow Length=233' Slope=0.0278 '/' Tc=11.8 min CN=74 Runoff=0.90 cfs 2,304 cf

Subcatchment 70S: O1 Runoff Area=11,697 sf 0.00% Impervious Runoff Depth=1.46"
Tc=6.0 min CN=74 Runoff=0.70 cfs 1,422 cf

Subcatchment 71S: O2 Runoff Area=132,678 sf 2.29% Impervious Runoff Depth=1.53"
Flow Length=377' Tc=12.2 min CN=75 Runoff=6.50 cfs 16,867 cf

Subcatchment 184S: Z1 (EX. RBL Area to Runoff Area=22,047 sf 41.55% Impervious Runoff Depth=2.20"
Tc=6.0 min CN=84 Runoff=1.98 cfs 4,050 cf

Reach 93R: Overland Flow from North Depression to South Avg. Flow Depth=0.00' Max Vel=0.00 fps
n=0.030 L=426.0' S=0.0127 '/' Capacity=108.75 cfs Outflow=0.00 cfs 0 cf

Reach 182R: EX. Red Barn Lane West Avg. Flow Depth=0.43' Max Vel=3.17 fps Inflow=4.25 cfs 11,046 cf
n=0.025 L=610.0' S=0.0179 '/' Capacity=87.96 cfs Outflow=3.94 cfs 11,046 cf

Pond 73P: Southeast Basin Peak Elev=731.27' Storage=7,764 cf Inflow=6.87 cfs 19,011 cf
Outflow=1.15 cfs 19,013 cf

Pond 74P: Southwest Basin Peak Elev=743.38' Storage=28,134 cf Inflow=23.79 cfs 65,424 cf
Outflow=4.70 cfs 65,431 cf

Pond 89P: Gravel North Depression Peak Elev=756.77' Storage=808 cf Inflow=14.68 cfs 37,834 cf
Discarded=0.45 cfs 8,887 cf Primary=1.78 cfs 15,017 cf Secondary=12.56 cfs 13,930 cf Outflow=14.69 cfs 37,834 cf

Pond 92P: Gravel South Depression Peak Elev=753.13' Storage=387 cf Inflow=16.21 cfs 35,388 cf
Primary=16.05 cfs 31,242 cf Secondary=0.10 cfs 4,146 cf Outflow=16.15 cfs 35,388 cf

Link 32L: TOTAL OFFSITE UNTREATED Inflow=32.11 cfs 75,433 cf
Primary=32.11 cfs 75,433 cf

Link 33L: TOTAL ONSITE Inflow=14.58 cfs 35,408 cf
Primary=14.58 cfs 35,408 cf

Link 34L: TOTAL OUTFALL Inflow=46.38 cfs 110,841 cf
Primary=46.38 cfs 110,841 cf

Link 75L: Areas Piped Inflow=14.58 cfs 35,408 cf
Primary=14.58 cfs 35,408 cf

Link 78L: Swale on Lot 20 Inflow=0.90 cfs 2,304 cf
Primary=0.90 cfs 2,304 cf

Link 79L: Swale Along Red Barn Ln. Inflow=3.94 cfs 11,046 cf
Primary=3.94 cfs 11,046 cf

Link 80L: EX. Cul-de-sac On Green Meadow Place Inflow=26.82 cfs 59,910 cf
Primary=26.82 cfs 59,910 cf

Total Runoff Area = 1,467,567 sf Runoff Volume = 222,452 cf Average Runoff Depth = 1.82"
80.51% Pervious = 1,181,505 sf 19.49% Impervious = 286,062 sf

Summary for Subcatchment 1S: A

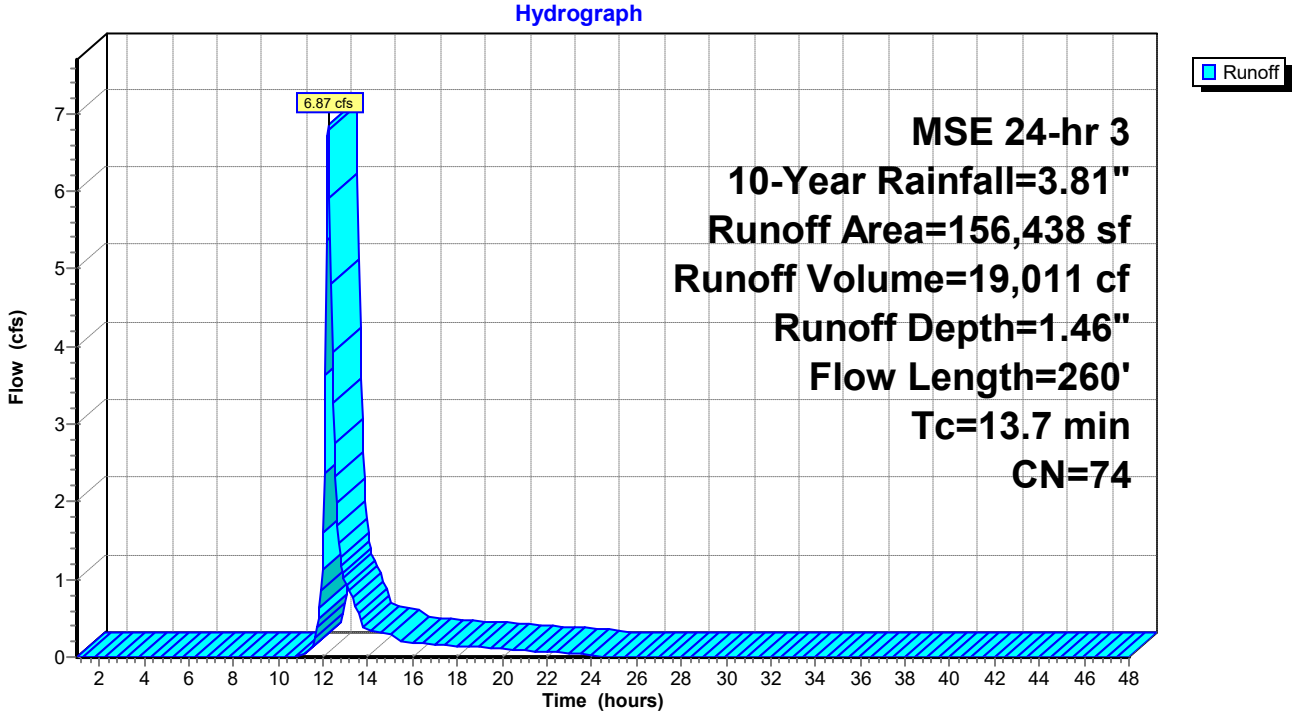
Runoff = 6.87 cfs @ 12.23 hrs, Volume= 19,011 cf, Depth= 1.46"
Routed to Pond 73P : Southeast Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	156,438	74	PER
	156,438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	100	0.0181	0.14		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
2.0	160	0.0362	1.33		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
13.7	260	Total			

Subcatchment 1S: A



Summary for Subcatchment 2S: B

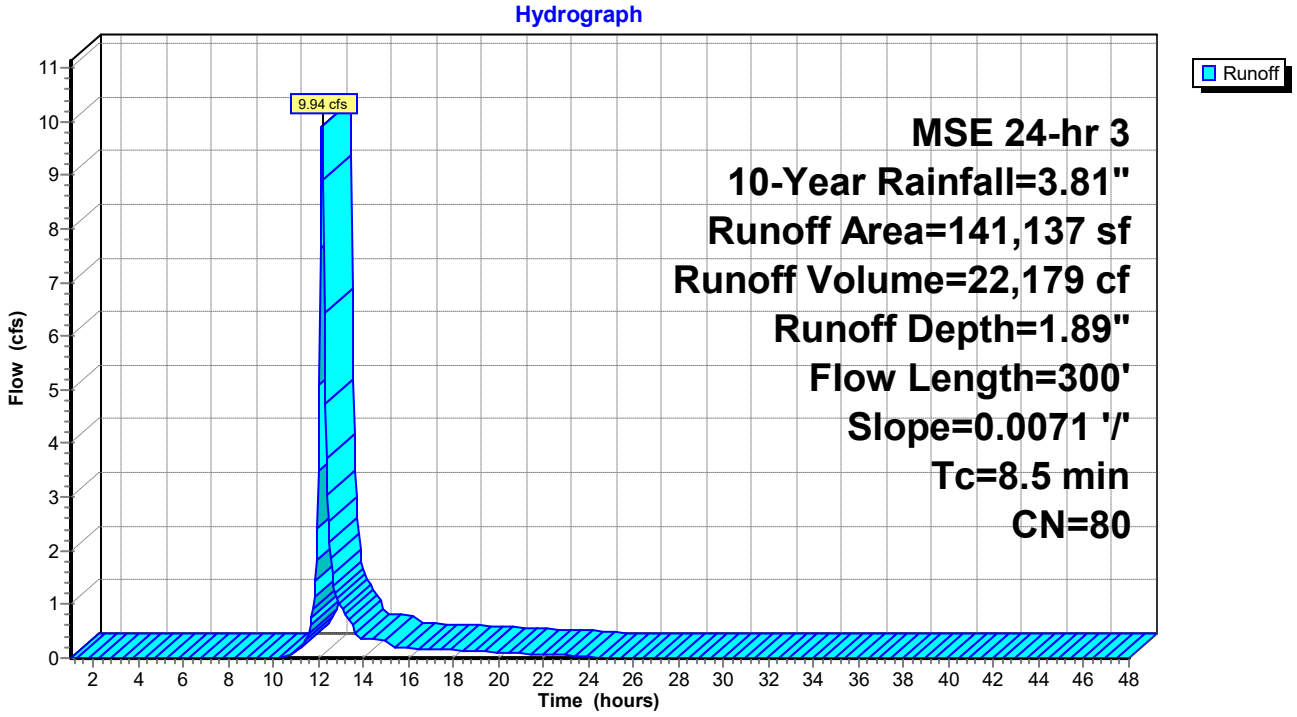
Runoff = 9.94 cfs @ 12.16 hrs, Volume= 22,179 cf, Depth= 1.89"
Routed to Link 80L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	104,065	74	PER
*	22,056	98	IMP
*	15,016	98	ROOF
	141,137	80	Weighted Average
	104,065		73.73% Pervious Area
	37,072		26.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	300	0.0071	0.59		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps

Subcatchment 2S: B



Summary for Subcatchment 4S: C1

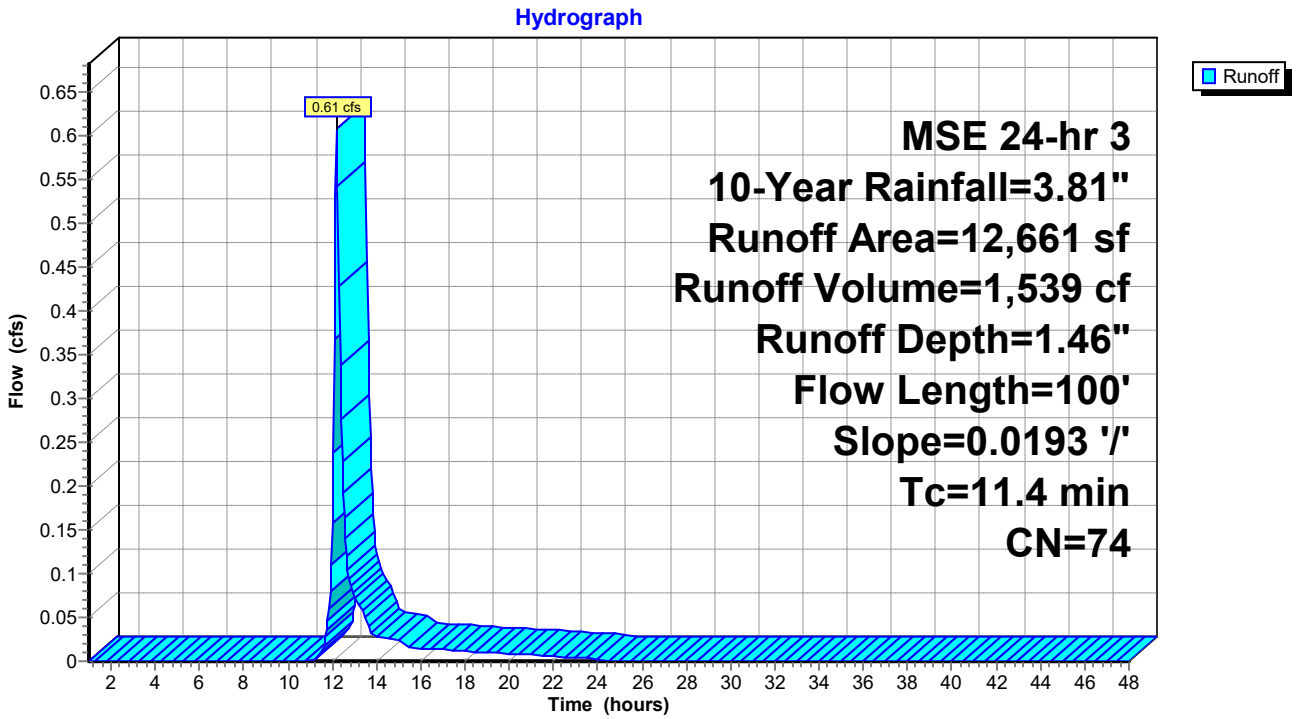
Runoff = 0.61 cfs @ 12.20 hrs, Volume= 1,539 cf, Depth= 1.46"
Routed to Link 80L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	12,661	74	PER
	12,661		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0193	0.15		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 4S: C1



Summary for Subcatchment 5S: D

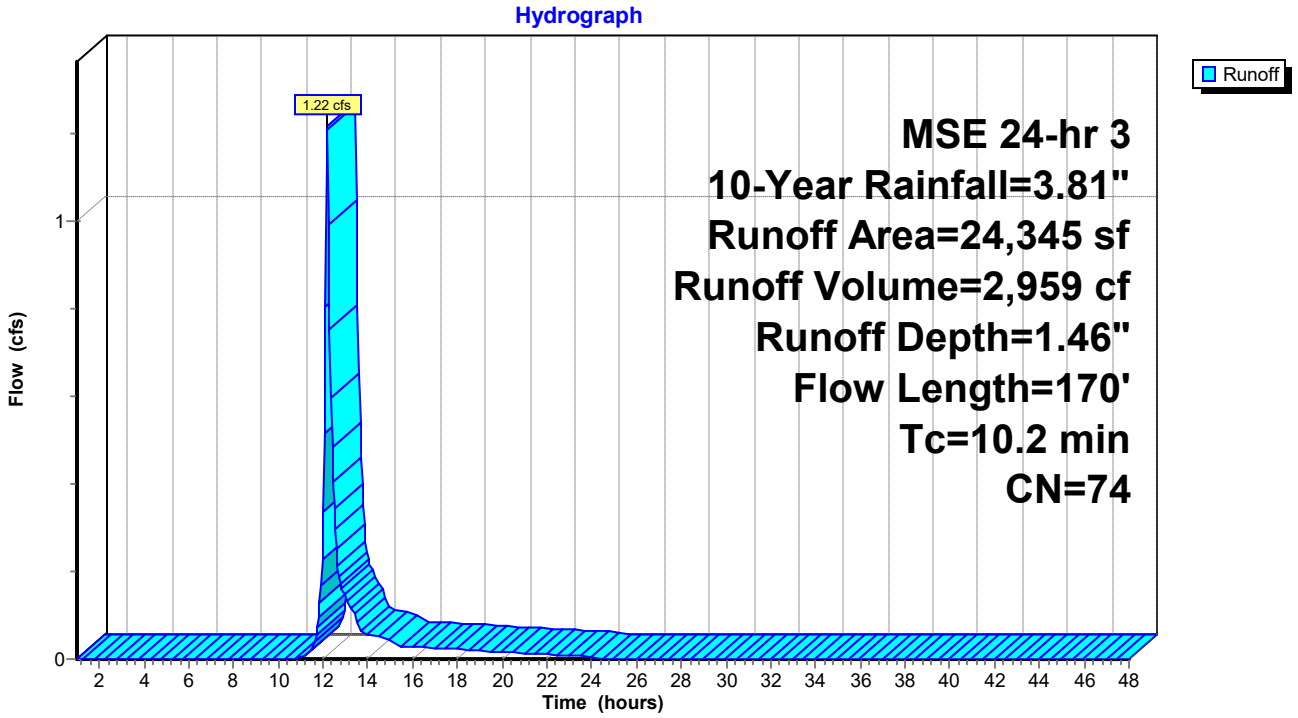
Runoff = 1.22 cfs @ 12.19 hrs, Volume= 2,959 cf, Depth= 1.46"
Routed to Reach 182R : EX. Red Barn Lane West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	24,345	74	PER
	24,345		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0319	0.18		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.9	70	0.0317	1.25		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
10.2	170	Total			

Subcatchment 5S: D



Summary for Subcatchment 6S: E

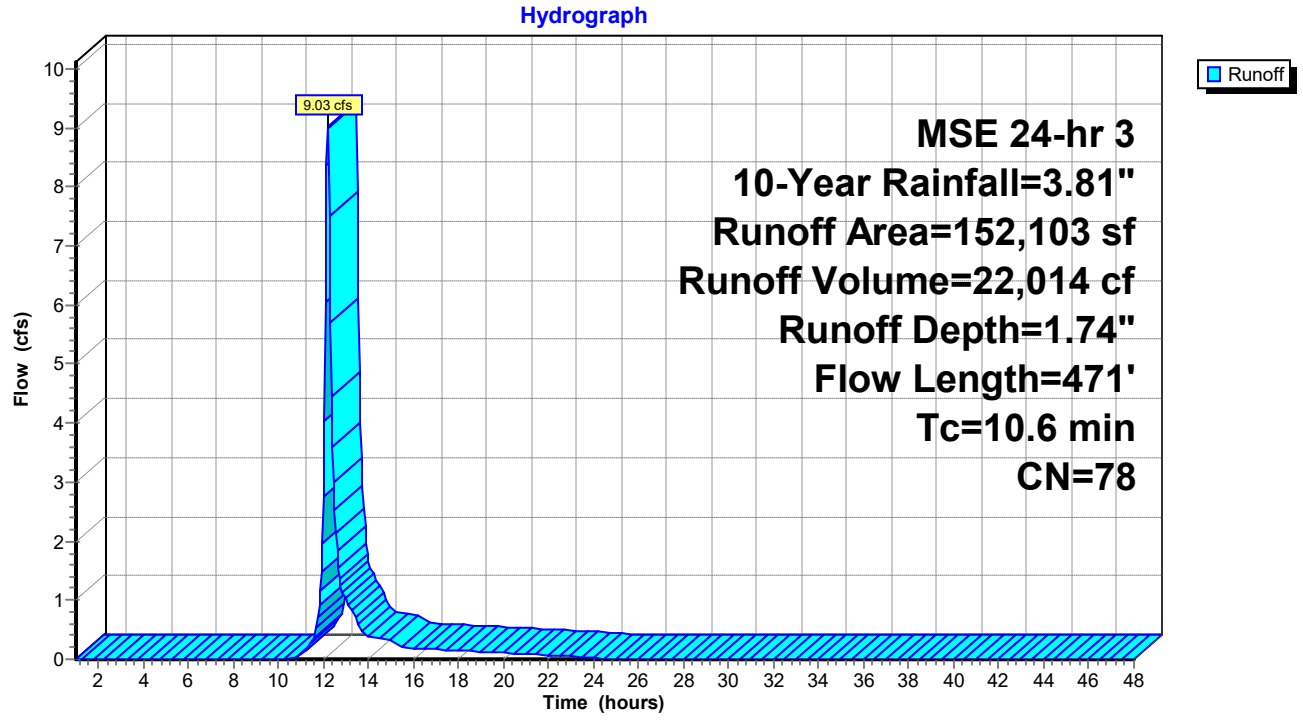
Runoff = 9.03 cfs @ 12.19 hrs, Volume= 22,014 cf, Depth= 1.74"
Routed to Pond 89P : Gravel North Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	117,151	74	PER
*	21,607	98	IMP
*	6,900	74	PER NEW RBL
*	6,445	98	IMP NEW RBL
	152,103	78	Weighted Average
	124,051		81.56% Pervious Area
	28,052		18.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0581	0.23		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.9	215	0.0405	4.09		**Shallow Concentrated Flow, SCF** Paved Kv= 20.3 fps
2.3	156	0.0259	1.13		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
10.6	471	Total			

Subcatchment 6S: E



Summary for Subcatchment 7S: F

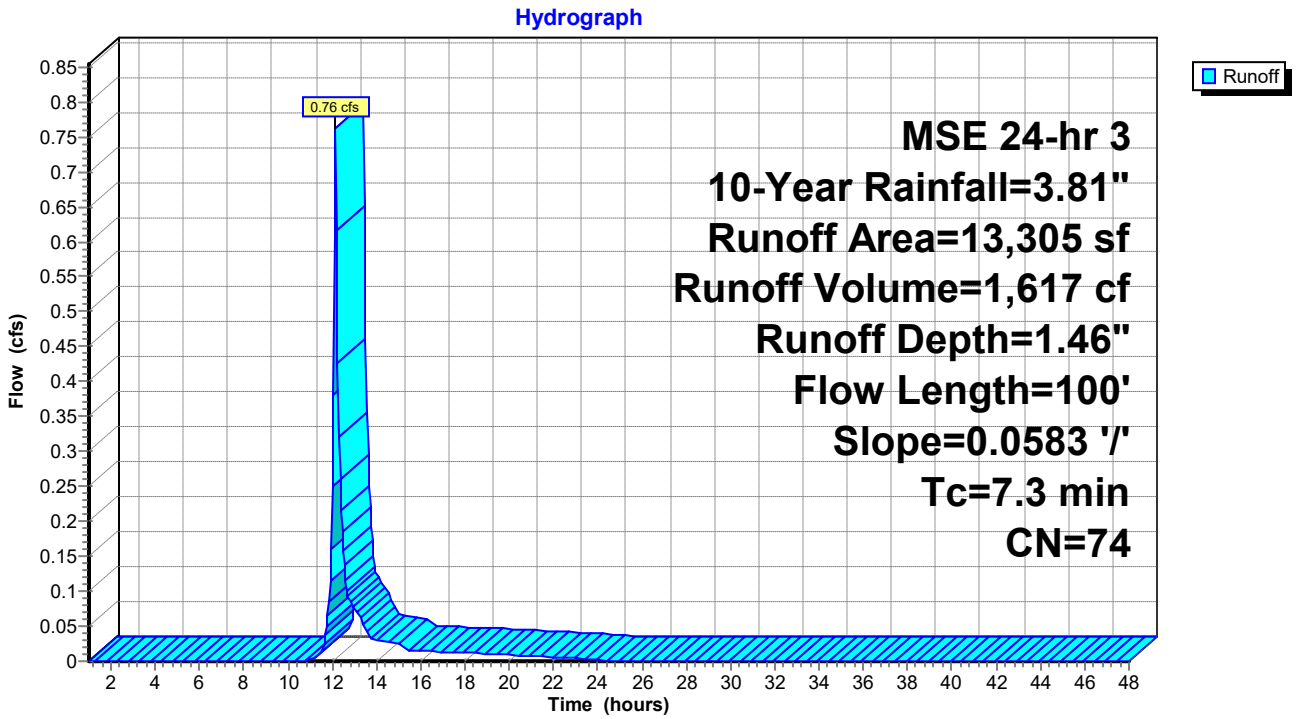
Runoff = 0.76 cfs @ 12.15 hrs, Volume= 1,617 cf, Depth= 1.46"
Routed to Pond 89P : Gravel North Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	13,305	74	PER
	13,305		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	100	0.0583	0.23		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 7S: F



Summary for Subcatchment 8S: G

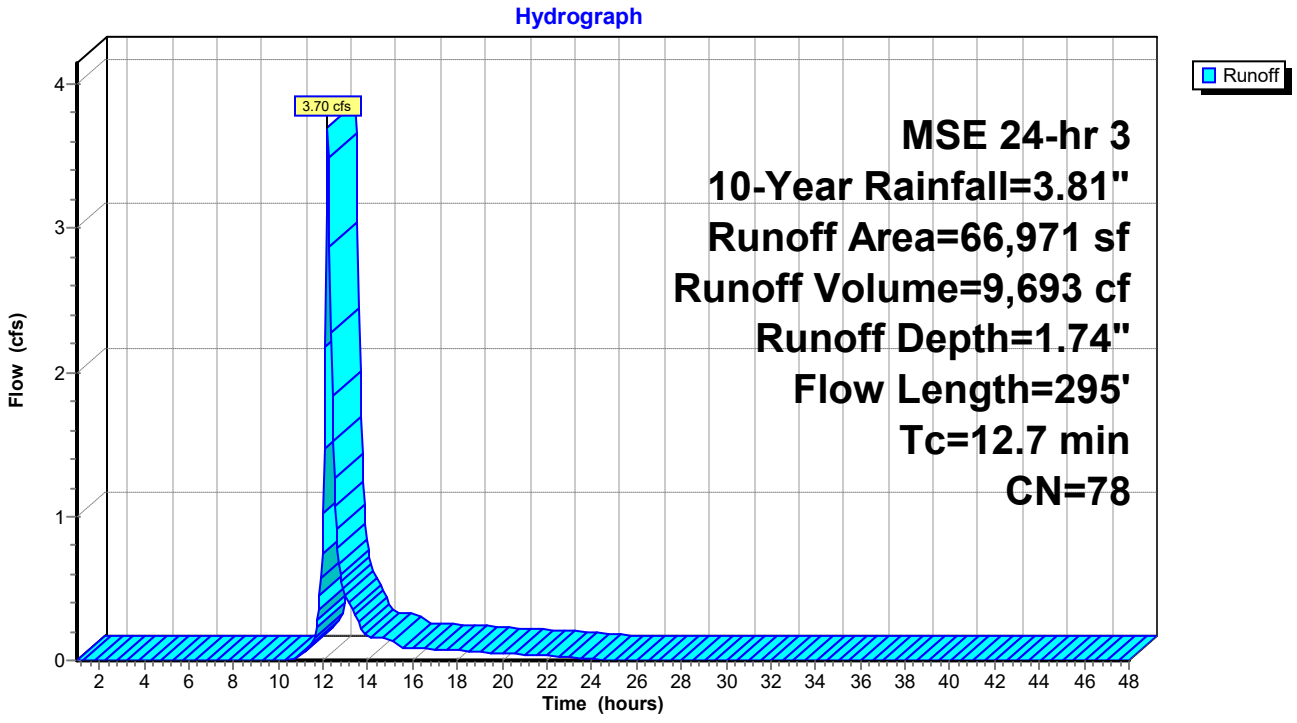
Runoff = 3.70 cfs @ 12.21 hrs, Volume= 9,693 cf, Depth= 1.74"
Routed to Pond 89P : Gravel North Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	56,727	74	PER
*	10,244	98	IMP
	66,971	78	Weighted Average
	56,727		84.70% Pervious Area
	10,244		15.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0269	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
2.7	195	0.0305	1.22		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
12.7	295	Total			

Subcatchment 8S: G



Summary for Subcatchment 9S: H

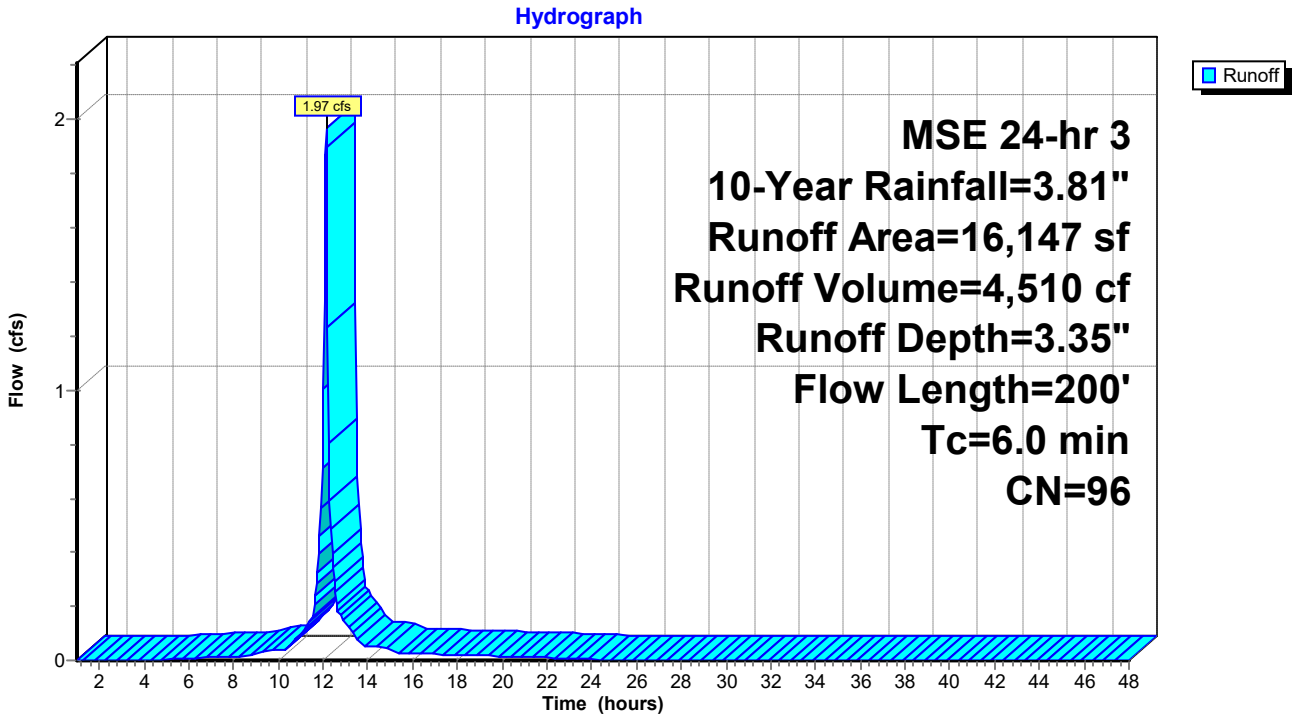
Runoff = 1.97 cfs @ 12.13 hrs, Volume= 4,510 cf, Depth= 3.35"
Routed to Pond 89P : Gravel North Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	1,084	74	PER
*	15,063	98	IMP
	16,147	96	Weighted Average
	1,084		6.71% Pervious Area
	15,063		93.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0502	1.73		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 2.42"
0.5	100	0.0263	3.29		**Shallow Concentrated Flow, SCF** Paved Kv= 20.3 fps
1.5	200	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 9S: H



Summary for Subcatchment 10S: I

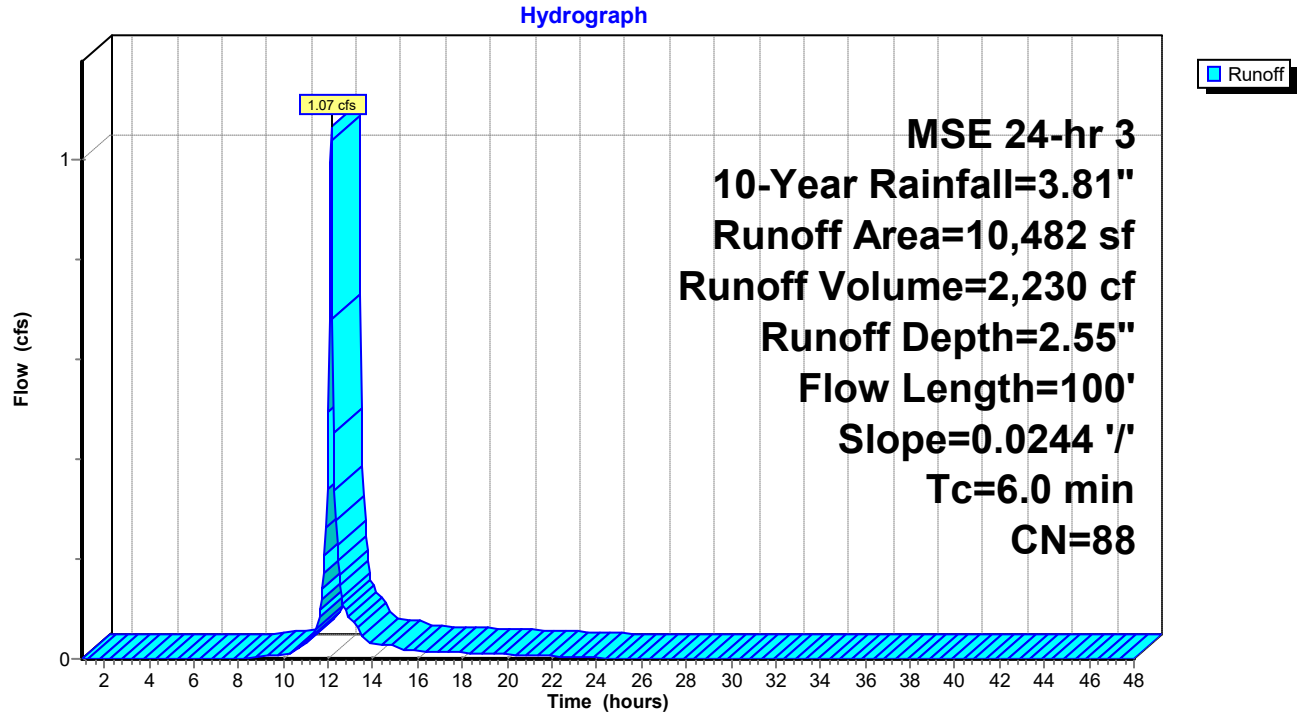
Runoff = 1.07 cfs @ 12.13 hrs, Volume= 2,230 cf, Depth= 2.55"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	4,275	74	PER
*	5,059	98	IMP
*	1,148	98	ROOF
	10,482	88	Weighted Average
	4,275		40.78% Pervious Area
	6,207		59.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0244	1.30		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 2.42"
1.3	100	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 10S: I



Summary for Subcatchment 11S: J

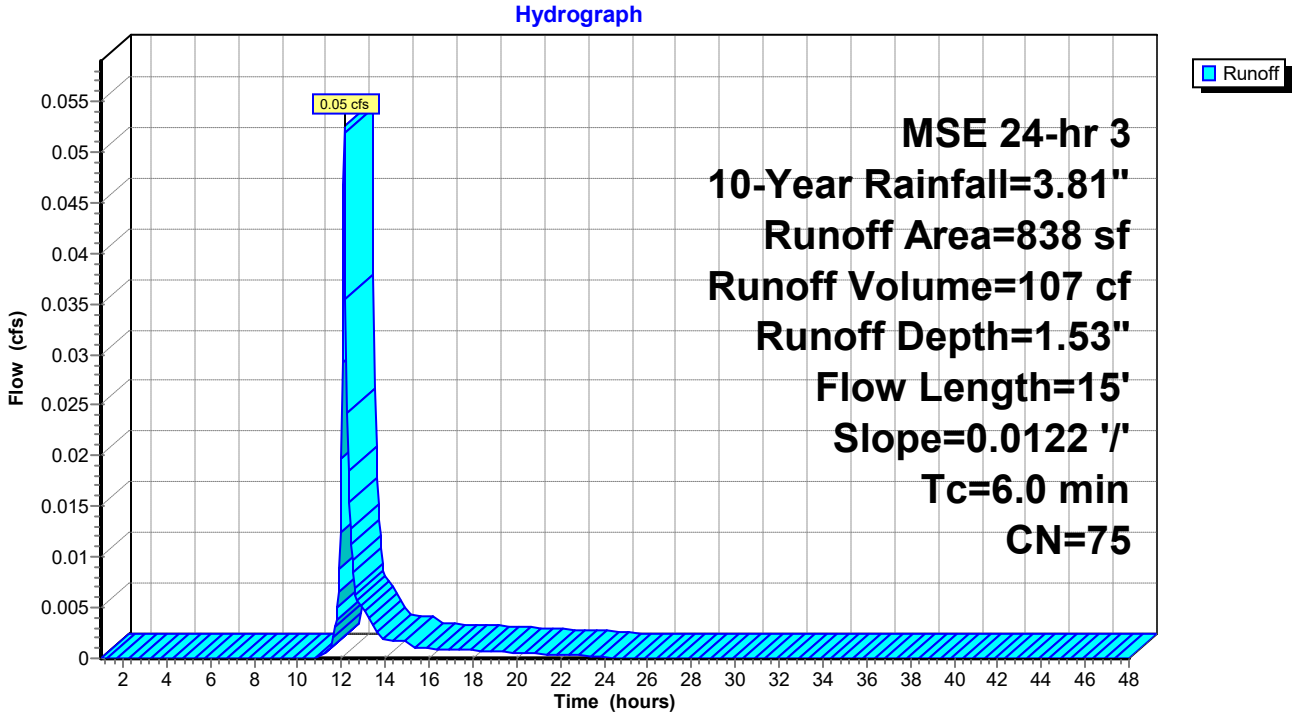
Runoff = 0.05 cfs @ 12.14 hrs, Volume= 107 cf, Depth= 1.53"
Routed to Link 32L : TOTAL OFFSITE UNTREATED

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	798	74	PER
*	40	98	IMP
	838	75	Weighted Average
	798		95.23% Pervious Area
	40		4.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	15	0.0122	0.08		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
3.0	15	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 11S: J



Summary for Subcatchment 12S: K

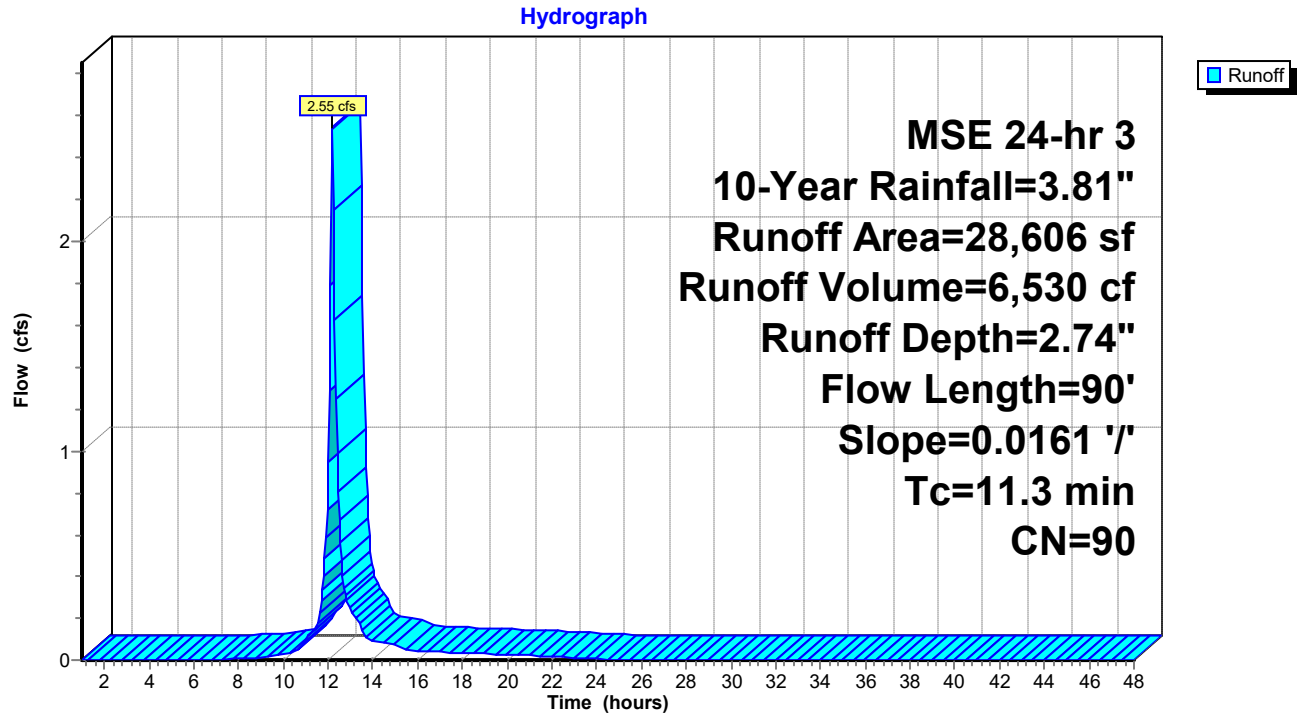
Runoff = 2.55 cfs @ 12.19 hrs, Volume= 6,530 cf, Depth= 2.74"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	9,600	74	PER
*	1,816	98	IMP
*	17,190	98	ROOF
	28,606	90	Weighted Average
	9,600		33.56% Pervious Area
	19,006		66.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	90	0.0161	0.13		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 12S: K



Summary for Subcatchment 13S: L

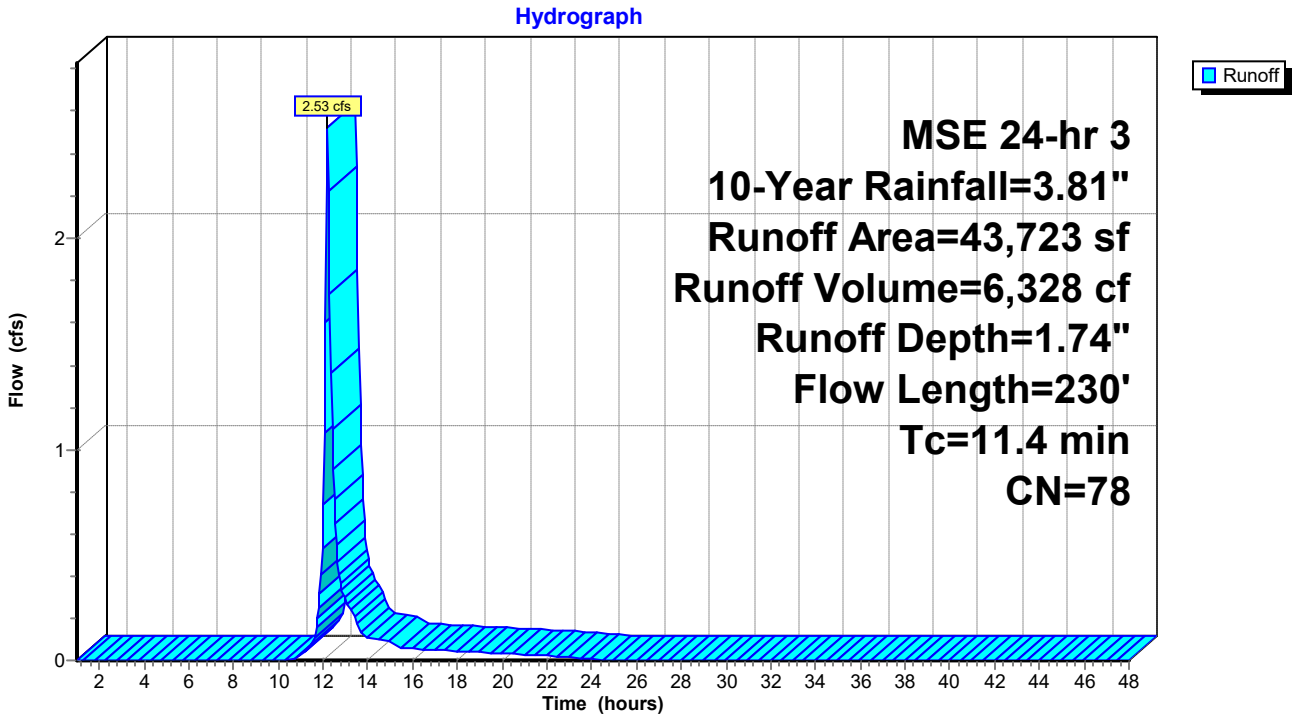
Runoff = 2.53 cfs @ 12.20 hrs, Volume= 6,328 cf, Depth= 1.74"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	36,454	74	PER
*	7,269	98	IMP
	43,723	78	Weighted Average
	36,454		83.37% Pervious Area
	7,269		16.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.0307	0.18		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
1.9	130	0.0267	1.14		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
11.4	230	Total			

Subcatchment 13S: L



Summary for Subcatchment 14S: M

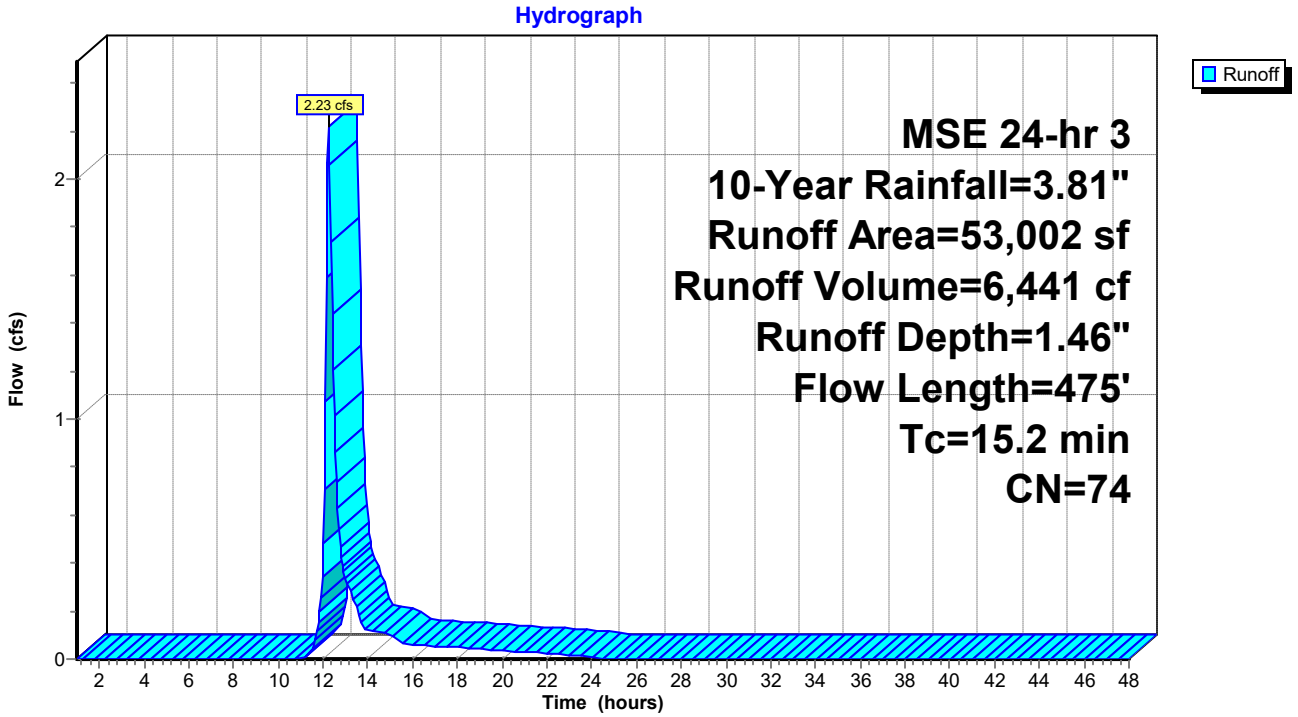
Runoff = 2.23 cfs @ 12.25 hrs, Volume= 6,441 cf, Depth= 1.46"
Routed to Pond 92P : Gravel South Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	53,002	74	PER
	53,002		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.0403	0.20		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
6.7	375	0.0180	0.94		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
15.2	475	Total			

Subcatchment 14S: M



Summary for Subcatchment 15S: N

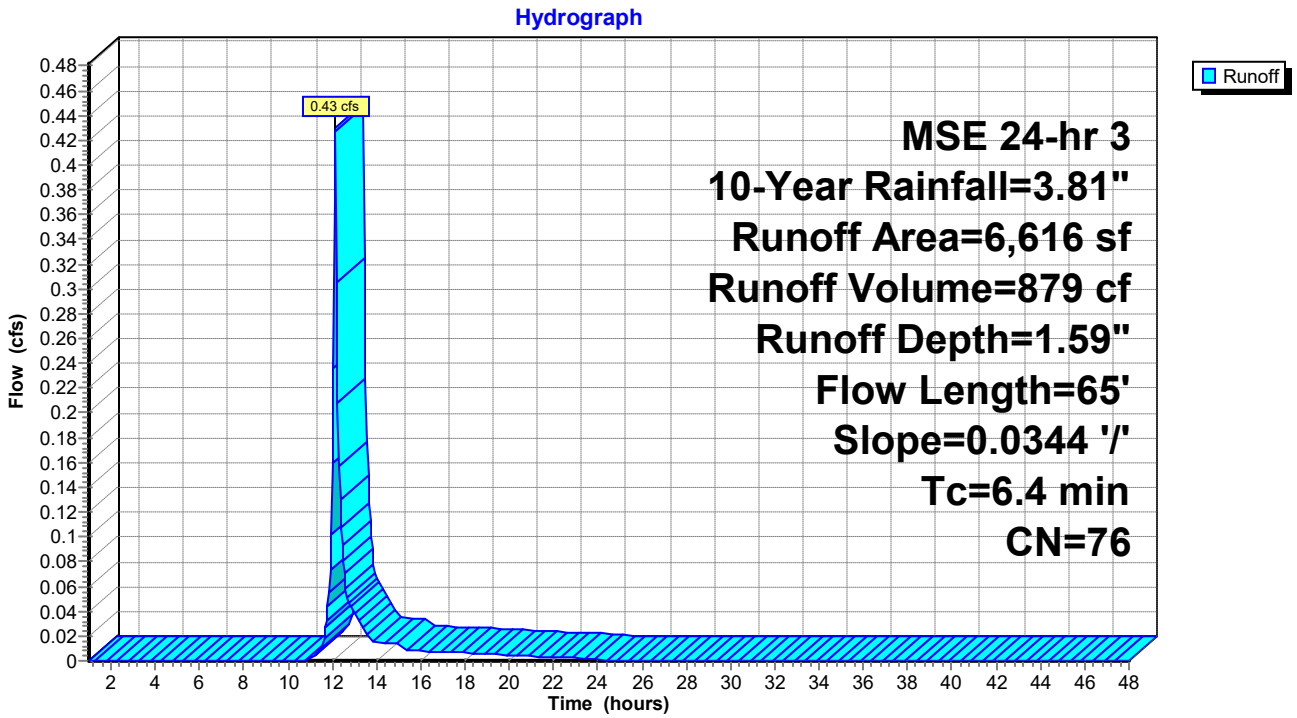
Runoff = 0.43 cfs @ 12.14 hrs, Volume= 879 cf, Depth= 1.59"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	6,111	74	PER
*	505	98	IMP
	6,616	76	Weighted Average
	6,111		92.37% Pervious Area
	505		7.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	65	0.0344	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 15S: N



Summary for Subcatchment 16S: O

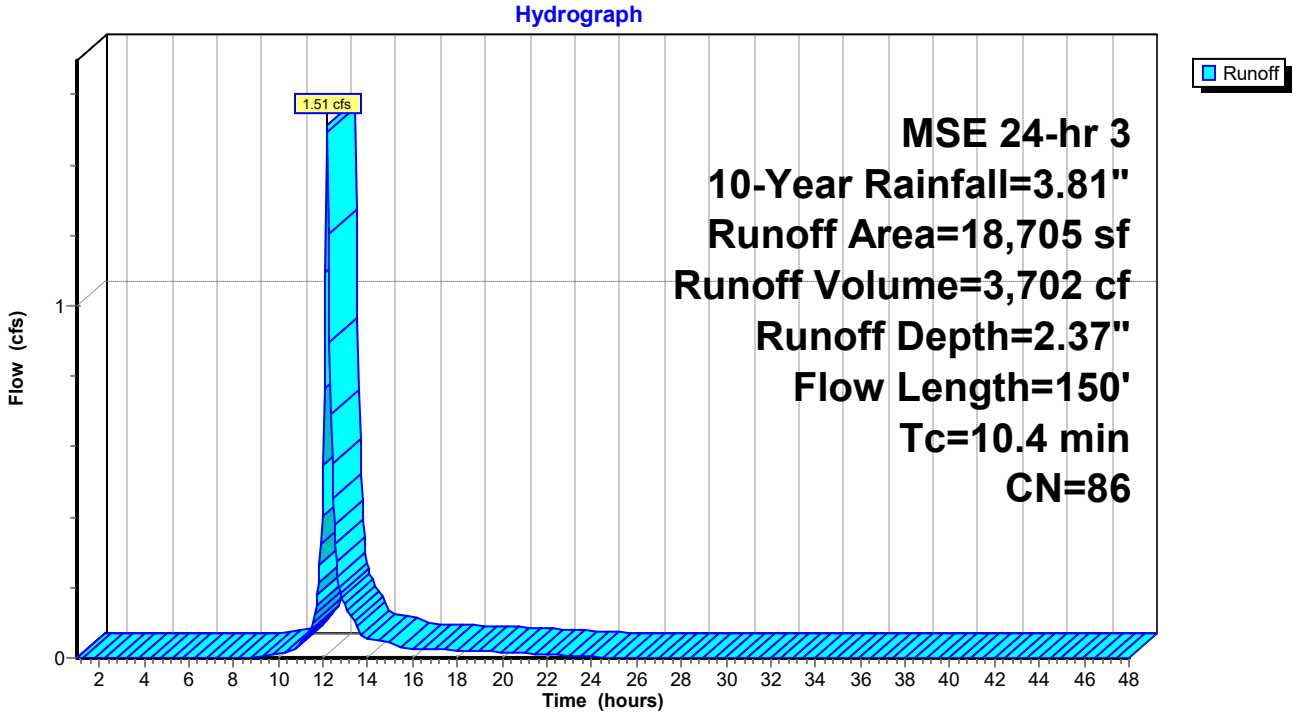
Runoff = 1.51 cfs @ 12.18 hrs, Volume= 3,702 cf, Depth= 2.37"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	9,468	74	PER
*	4,653	98	IMP
*	4,584	98	ROOF
	18,705	86	Weighted Average
	9,468		50.62% Pervious Area
	9,237		49.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.0274	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.5	50	0.0080	1.82		**Shallow Concentrated Flow, SCF** Paved Kv= 20.3 fps
10.4	150	Total			

Subcatchment 16S: O



Summary for Subcatchment 17S: P

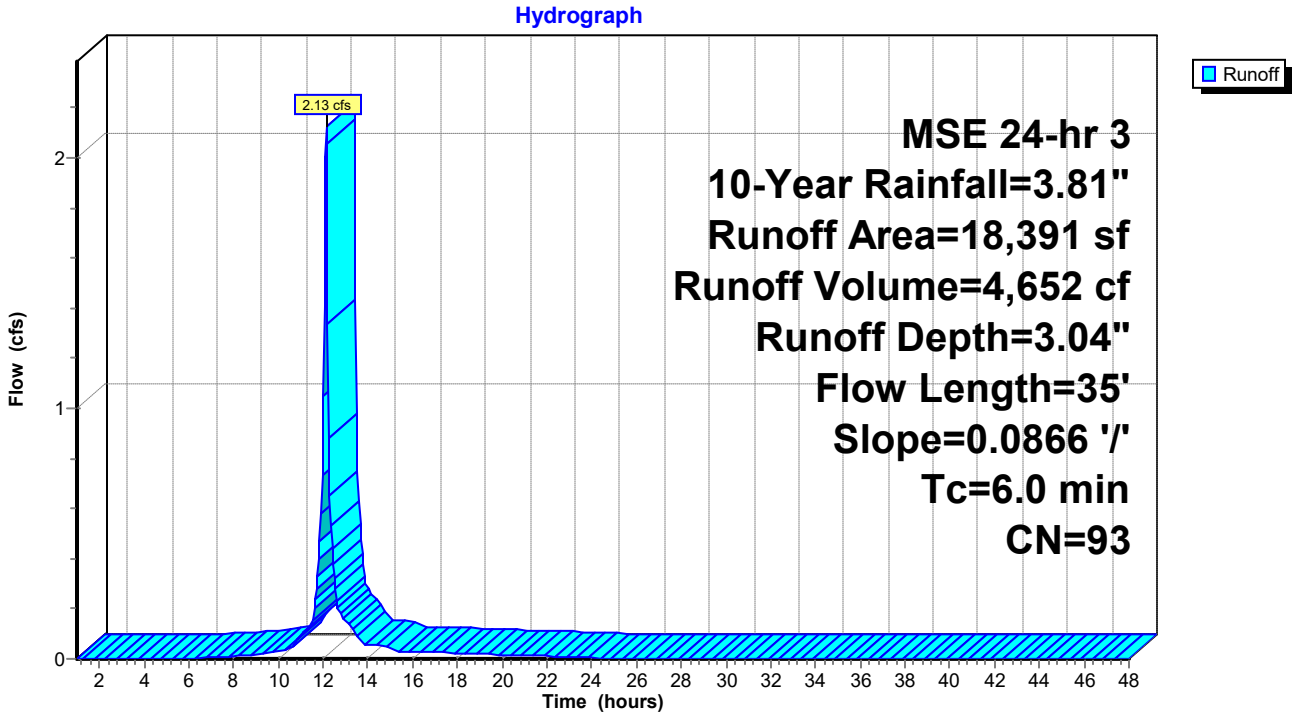
Runoff = 2.13 cfs @ 12.13 hrs, Volume= 4,652 cf, Depth= 3.04"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	3,636	74	PER
*	878	98	IMP
*	13,877	98	ROOF
	18,391	93	Weighted Average
	3,636		19.77% Pervious Area
	14,755		80.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	35	0.0866	0.22		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
2.7	35	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 17S: P



Summary for Subcatchment 18S: Q

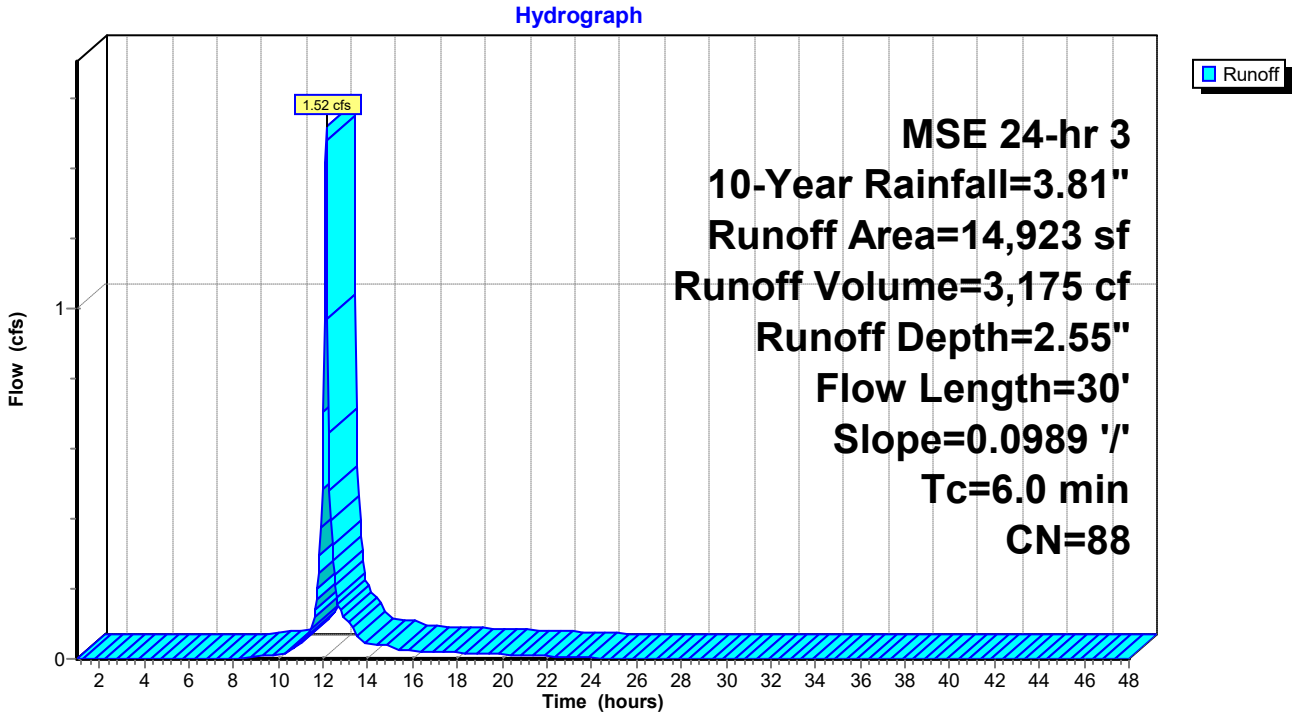
Runoff = 1.52 cfs @ 12.13 hrs, Volume= 3,175 cf, Depth= 2.55"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	6,396	74	PER
*	1,162	98	IMP
*	7,365	98	ROOF
	14,923	88	Weighted Average
	6,396		42.86% Pervious Area
	8,527		57.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	30	0.0989	0.22		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
2.3	30	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 18S: Q



Summary for Subcatchment 19S: R

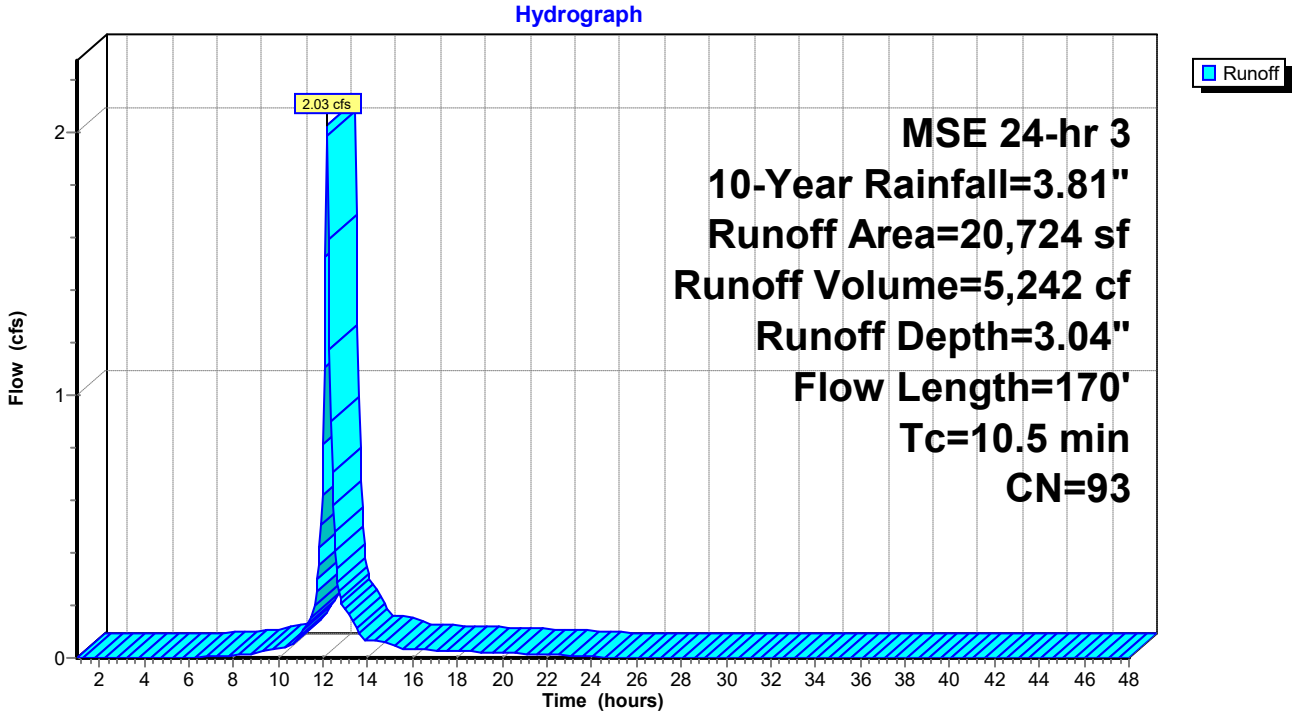
Runoff = 2.03 cfs @ 12.18 hrs, Volume= 5,242 cf, Depth= 3.04"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	4,279	74	PER
*	5,420	98	IMP
*	11,025	98	ROOF
	20,724	93	Weighted Average
	4,279		20.65% Pervious Area
	16,445		79.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0295	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.9	70	0.0320	1.25		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
10.5	170	Total			

Subcatchment 19S: R



Summary for Subcatchment 20S: S

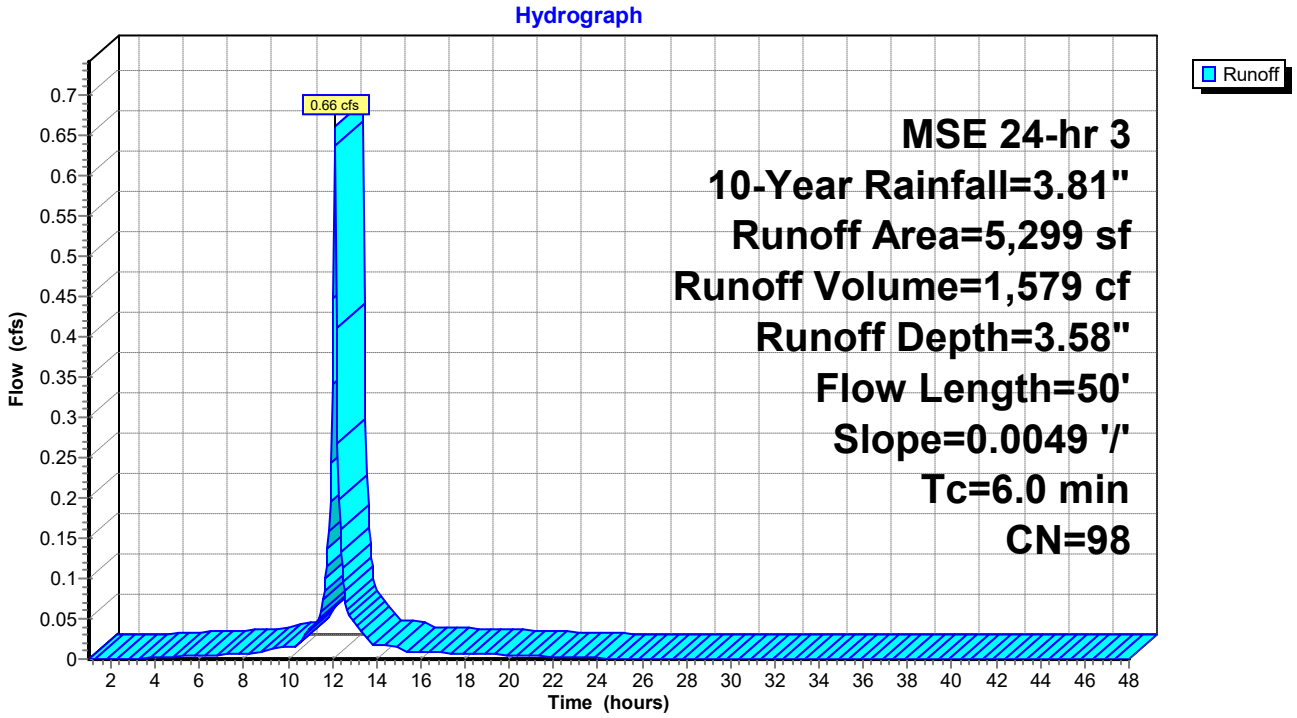
Runoff = 0.66 cfs @ 12.13 hrs, Volume= 1,579 cf, Depth= 3.58"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	808	98	IMP
*	4,491	98	ROOF
	5,299	98	Weighted Average
	5,299		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	50	0.0049	0.59		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 2.42"
1.4	50	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 20S: S



Summary for Subcatchment 21S: T

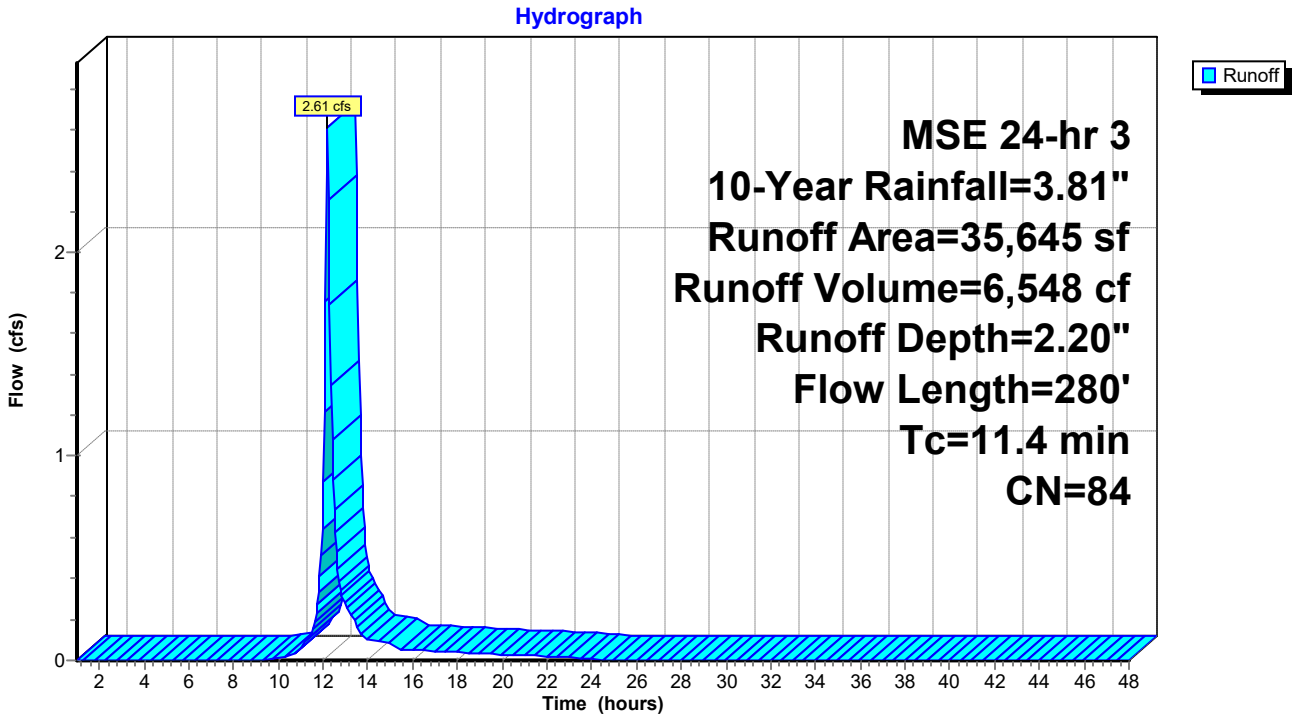
Runoff = 2.61 cfs @ 12.19 hrs, Volume= 6,548 cf, Depth= 2.20"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	21,454	74	PER
*	14,191	98	IMP
	35,645	84	Weighted Average
	21,454		60.19% Pervious Area
	14,191		39.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0272	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
1.4	180	0.0111	2.14		**Shallow Concentrated Flow, SCF** Paved Kv= 20.3 fps
11.4	280	Total			

Subcatchment 21S: T



Summary for Subcatchment 22S: U

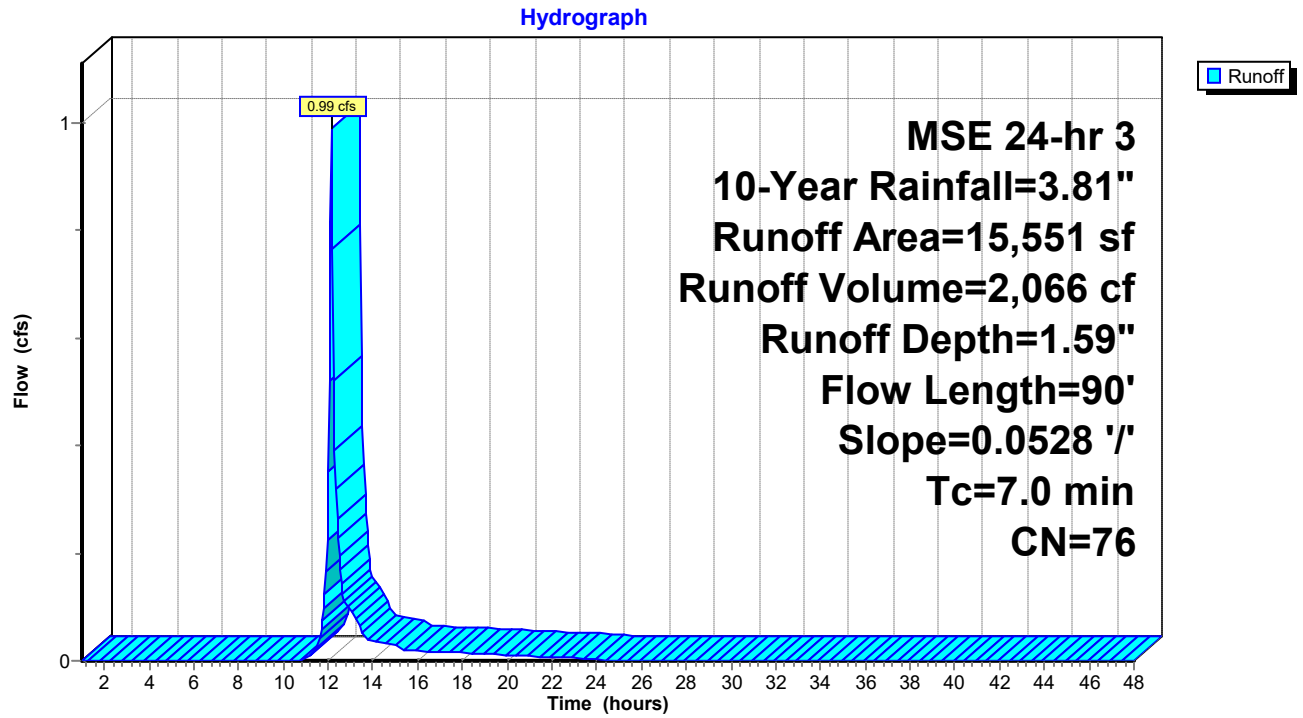
Runoff = 0.99 cfs @ 12.15 hrs, Volume= 2,066 cf, Depth= 1.59"
Routed to Link 32L : TOTAL OFFSITE UNTREATED

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	14,032	74	PER
*	1,519	98	IMP
	15,551	76	Weighted Average
	14,032		90.23% Pervious Area
	1,519		9.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	90	0.0528	0.21		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 22S: U



Summary for Subcatchment 23S: V

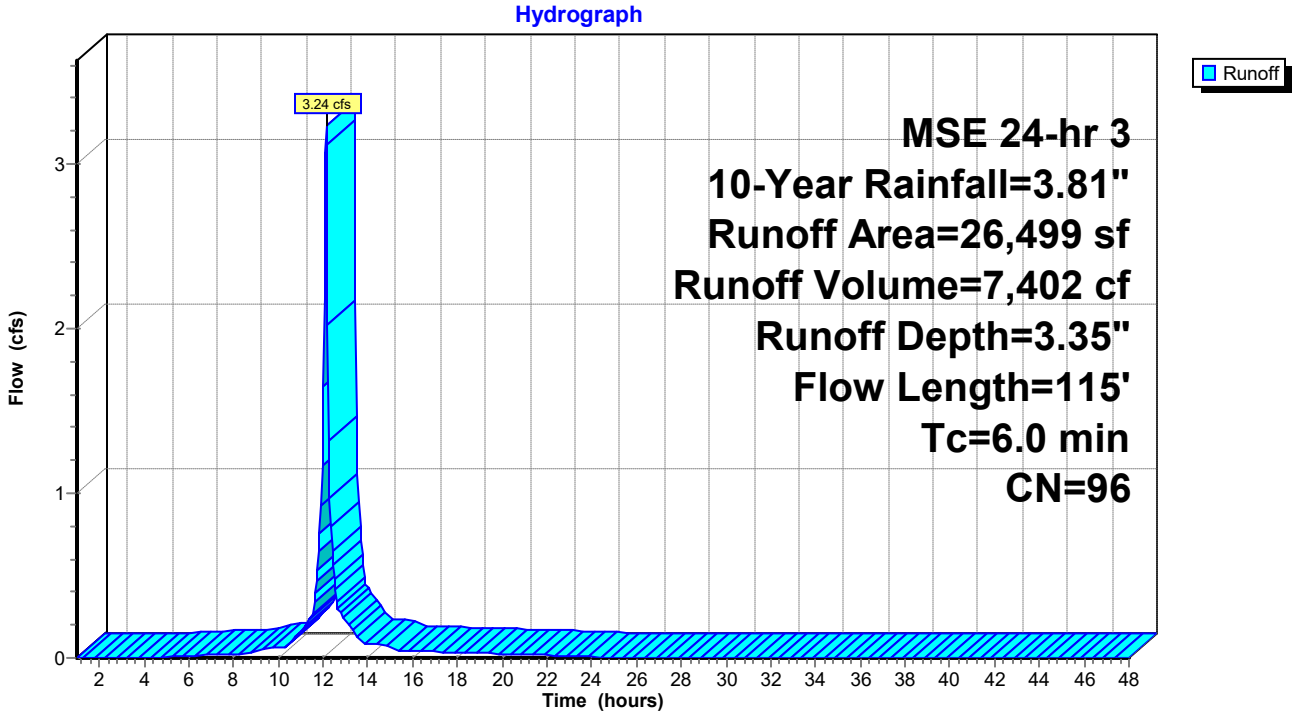
Runoff = 3.24 cfs @ 12.13 hrs, Volume= 7,402 cf, Depth= 3.35"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	2,290	74	PER
*	7,676	98	IMP
*	16,533	98	ROOF
	26,499	96	Weighted Average
	2,290		8.64% Pervious Area
	24,209		91.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	45	0.0345	0.16		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.9	70	0.0262	1.24		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 2.42"
5.7	115	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 23S: V



Summary for Subcatchment 24S: W

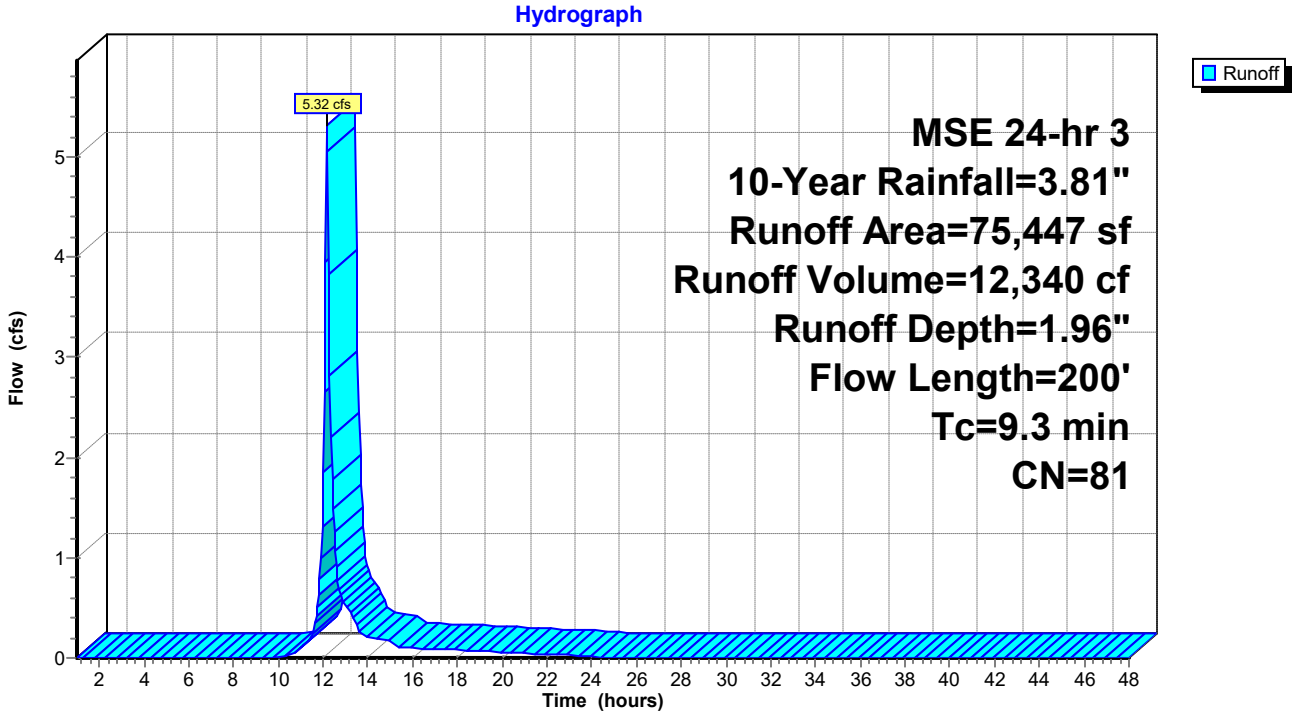
Runoff = 5.32 cfs @ 12.17 hrs, Volume= 12,340 cf, Depth= 1.96"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	54,767	74	PER
*	17,055	98	IMP
*	3,625	98	ROOF
	75,447	81	Weighted Average
	54,767		72.59% Pervious Area
	20,680		27.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0458	0.21		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
1.2	100	0.0428	1.45		**Shallow Concentrated Flow, SF** Short Grass Pasture Kv= 7.0 fps
9.3	200	Total			

Subcatchment 24S: W



Summary for Subcatchment 25S: X

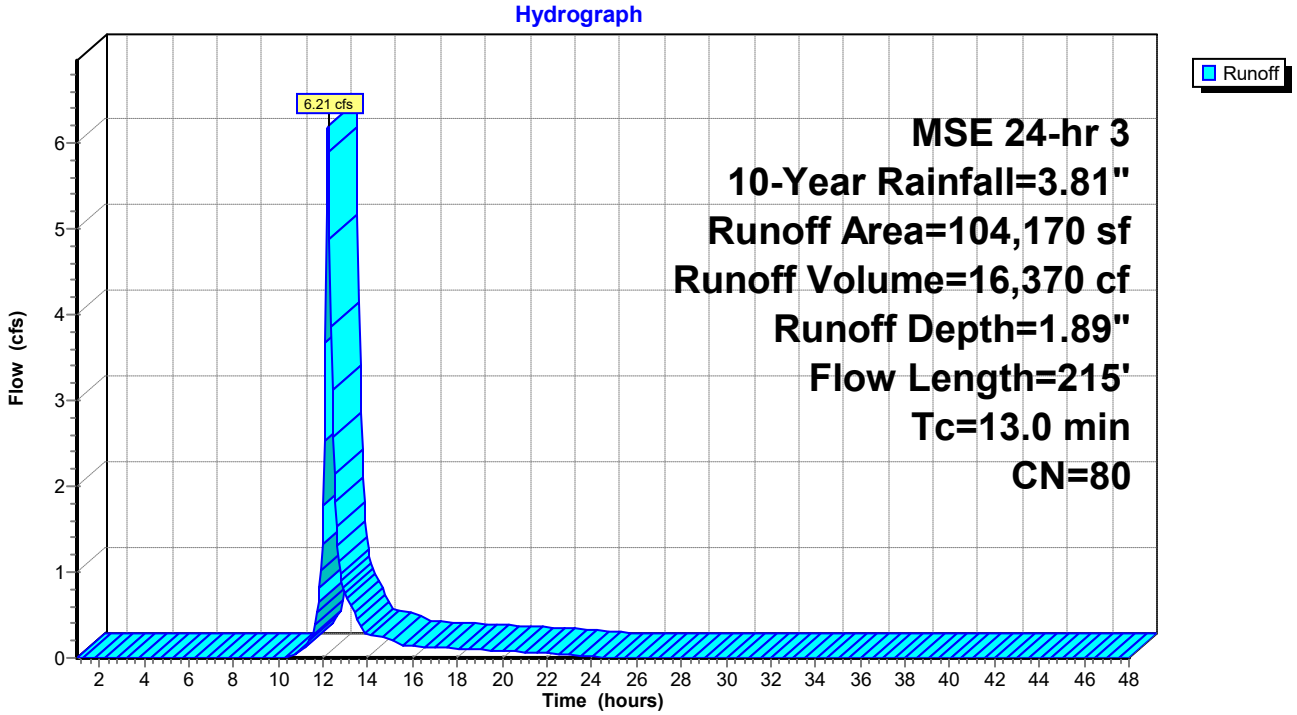
Runoff = 6.21 cfs @ 12.21 hrs, Volume= 16,370 cf, Depth= 1.89"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	79,699	74	PER
*	21,341	98	IMP
*	3,130	98	ROOF
	104,170	80	Weighted Average
	79,699		76.51% Pervious Area
	24,471		23.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0205	0.15		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
1.8	115	0.0234	1.07		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
13.0	215	Total			

Subcatchment 25S: X



Summary for Subcatchment 26S: Y

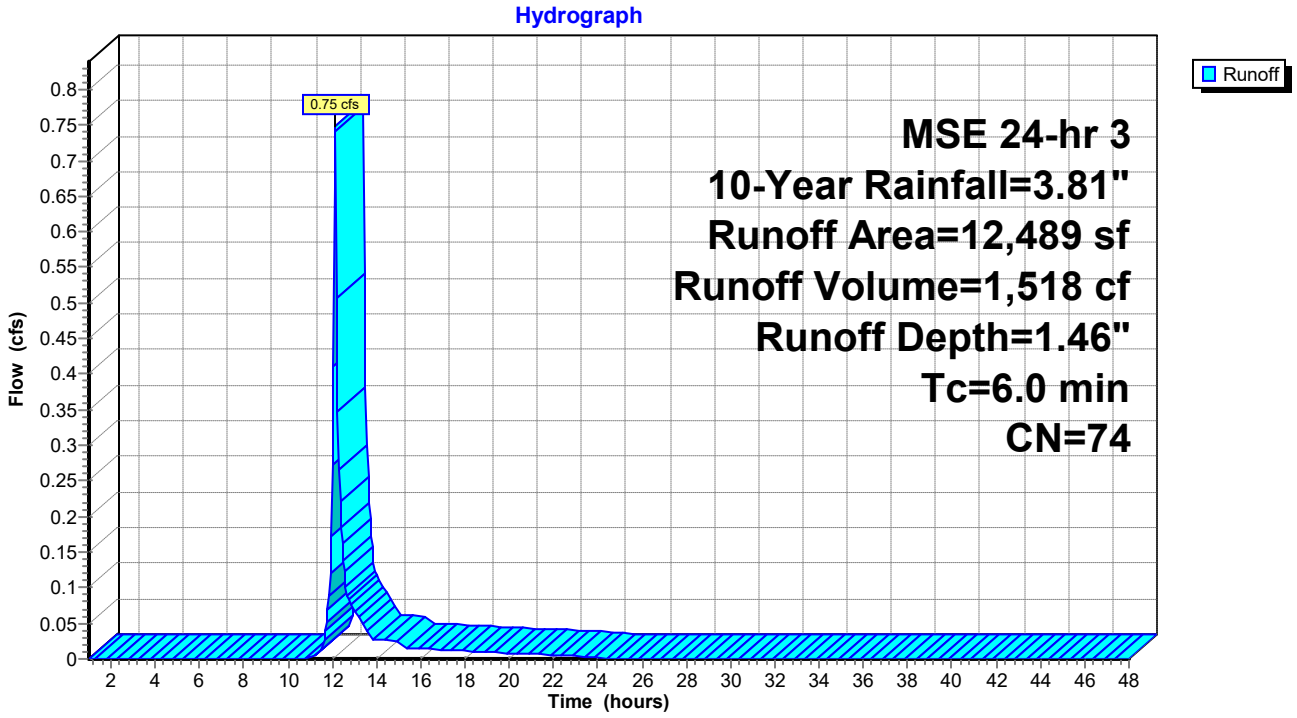
Runoff = 0.75 cfs @ 12.14 hrs, Volume= 1,518 cf, Depth= 1.46"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	12,489	74	PER
	12,489		100.00% Pervious Area

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

Subcatchment 26S: Y



Summary for Subcatchment 27S: Z

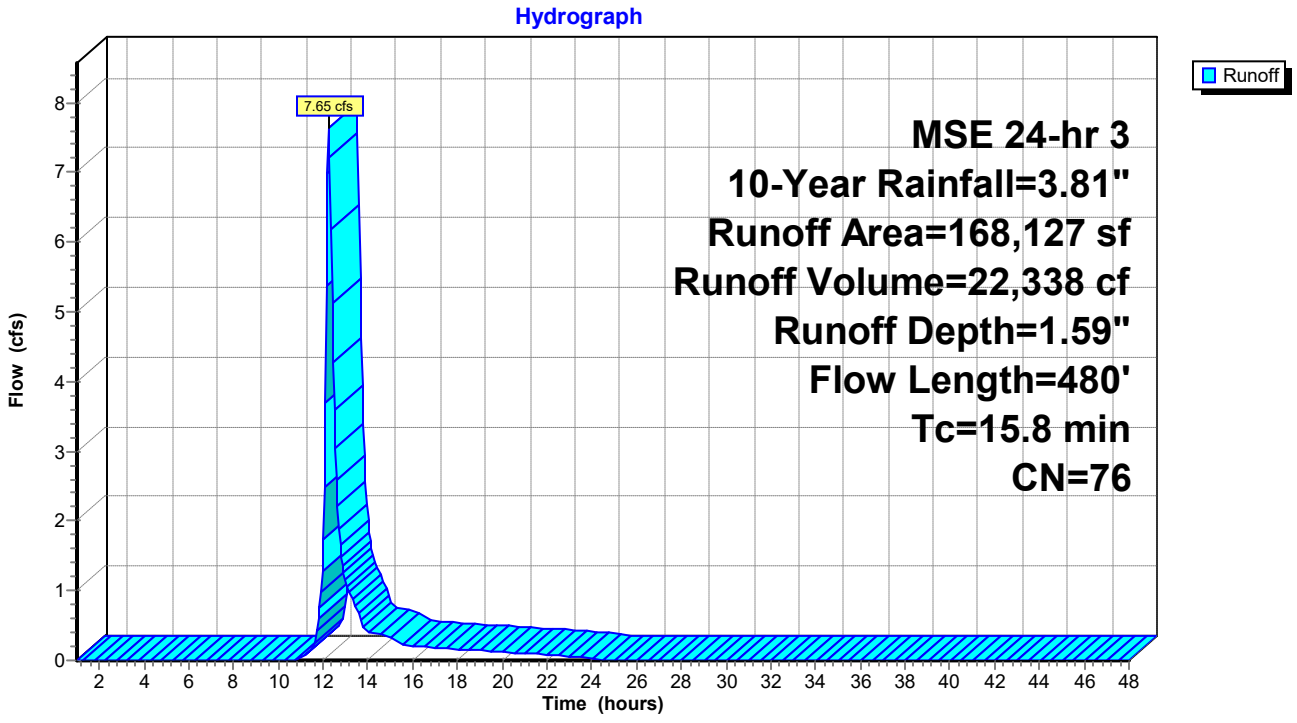
Runoff = 7.65 cfs @ 12.26 hrs, Volume= 22,338 cf, Depth= 1.59"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	157,056	74	PER
*	11,071	98	IMP
	168,127	76	Weighted Average
	157,056		93.42% Pervious Area
	11,071		6.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0237	0.16		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
5.3	380	0.0291	1.19		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
15.8	480	Total			

Subcatchment 27S: Z



Summary for Subcatchment 67S: C2

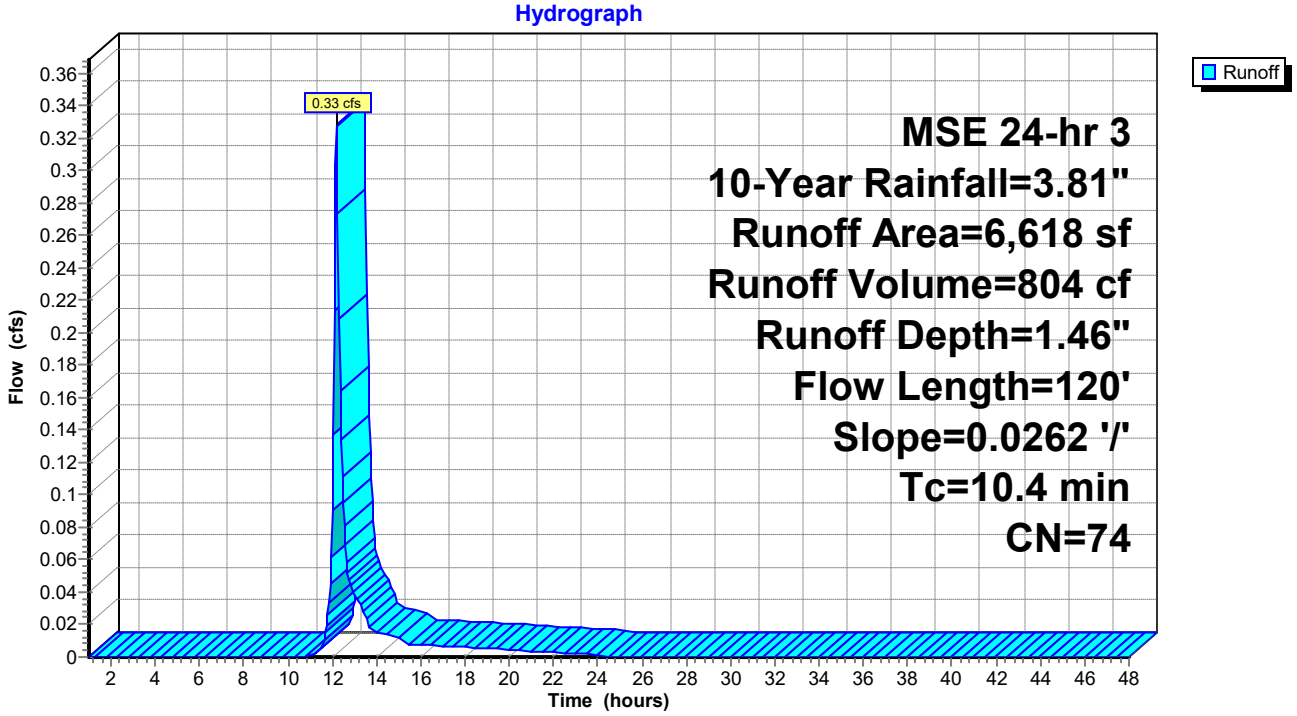
Runoff = 0.33 cfs @ 12.19 hrs, Volume= 804 cf, Depth= 1.46"
Routed to Link 80L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	6,618	74	PER
	6,618		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	100	0.0262	0.16		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.3	20	0.0262	1.13		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
10.4	120	Total			

Subcatchment 67S: C2



Summary for Subcatchment 68S: C4

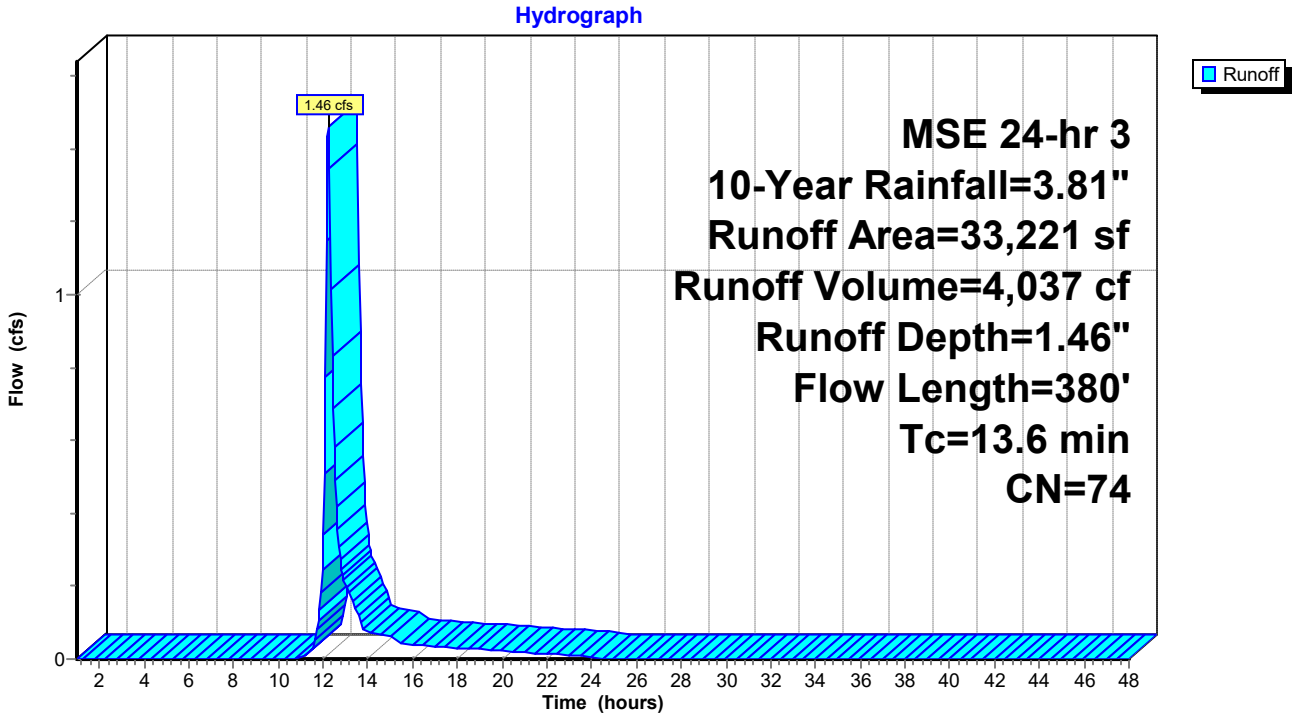
Runoff = 1.46 cfs @ 12.23 hrs, Volume= 4,037 cf, Depth= 1.46"
Routed to Reach 182R : EX. Red Barn Lane West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	33,221	74	PER
	33,221		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0319	0.18		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
4.3	280	0.0235	1.07		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
13.6	380	Total			

Subcatchment 68S: C4



Summary for Subcatchment 69S: C3

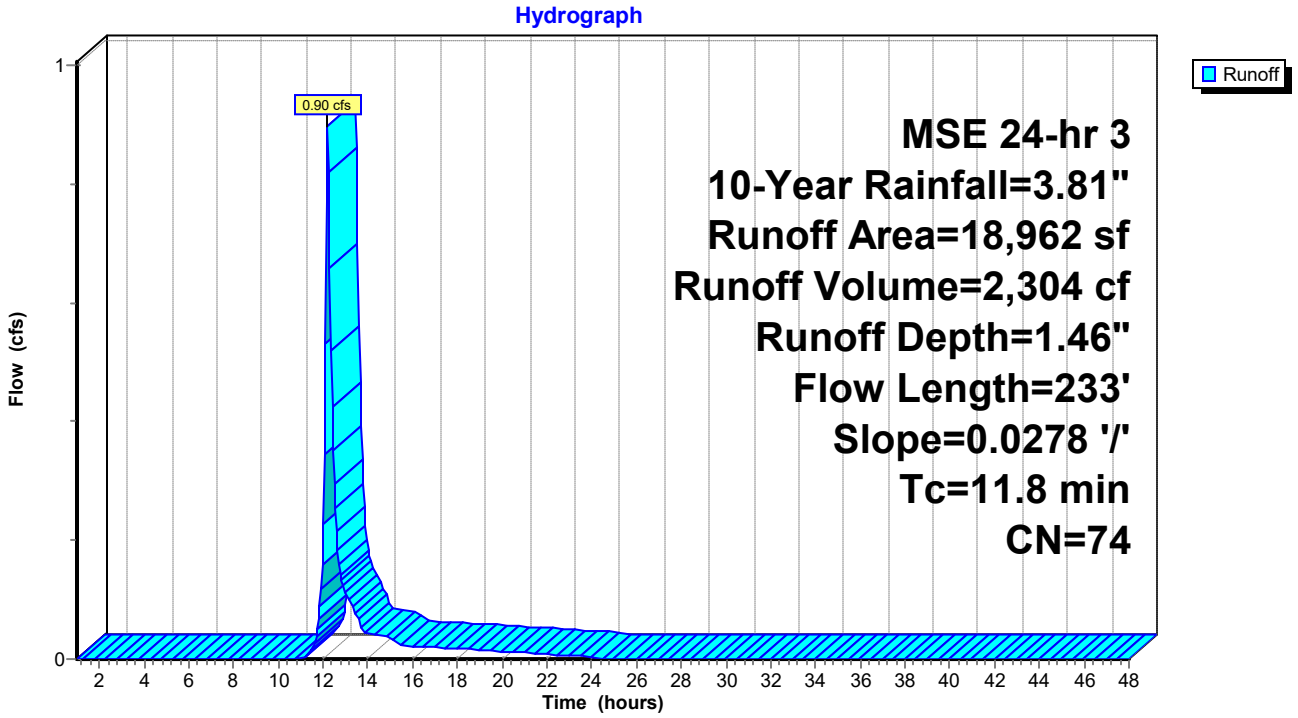
Runoff = 0.90 cfs @ 12.21 hrs, Volume= 2,304 cf, Depth= 1.46"
Routed to Link 78L : Swale on Lot 20

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	18,962	74	PER
	18,962		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.0278	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
1.9	133	0.0278	1.17		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
11.8	233	Total			

Subcatchment 69S: C3



Summary for Subcatchment 70S: O1

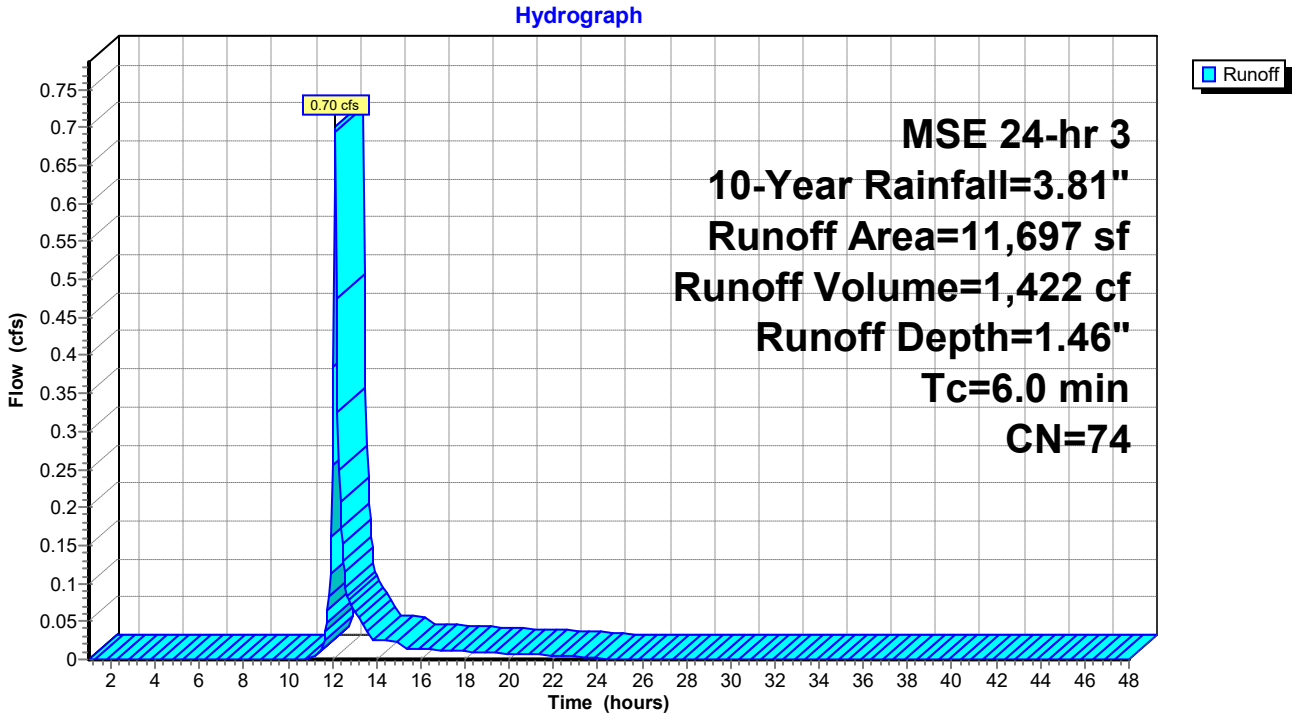
Runoff = 0.70 cfs @ 12.14 hrs, Volume= 1,422 cf, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	11,697	74	PERV
	11,697		100.00% Pervious Area

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

Subcatchment 70S: O1



Summary for Subcatchment 71S: O2

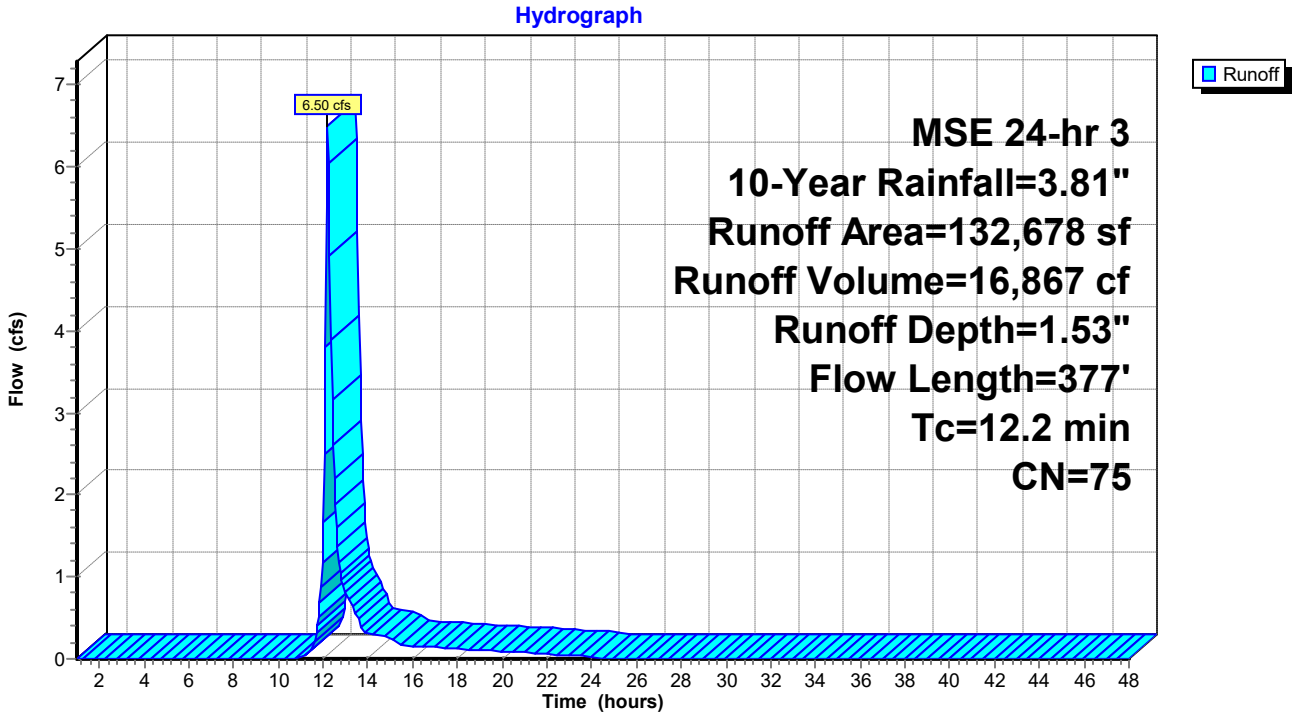
Runoff = 6.50 cfs @ 12.21 hrs, Volume= 16,867 cf, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	129,638	74	PERV
*	3,040	98	IMPERV
	132,678	75	Weighted Average
	129,638		97.71% Pervious Area
	3,040		2.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	77	0.0288	0.16		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
4.3	300	0.0135	1.16		**Shallow Concentrated Flow, SHALLOW CONC** Nearly Bare & Untilled Kv= 10.0 fps
12.2	377	Total			

Subcatchment 71S: O2



Summary for Subcatchment 184S: Z1 (EX. RBL Area to RBL West Swale)

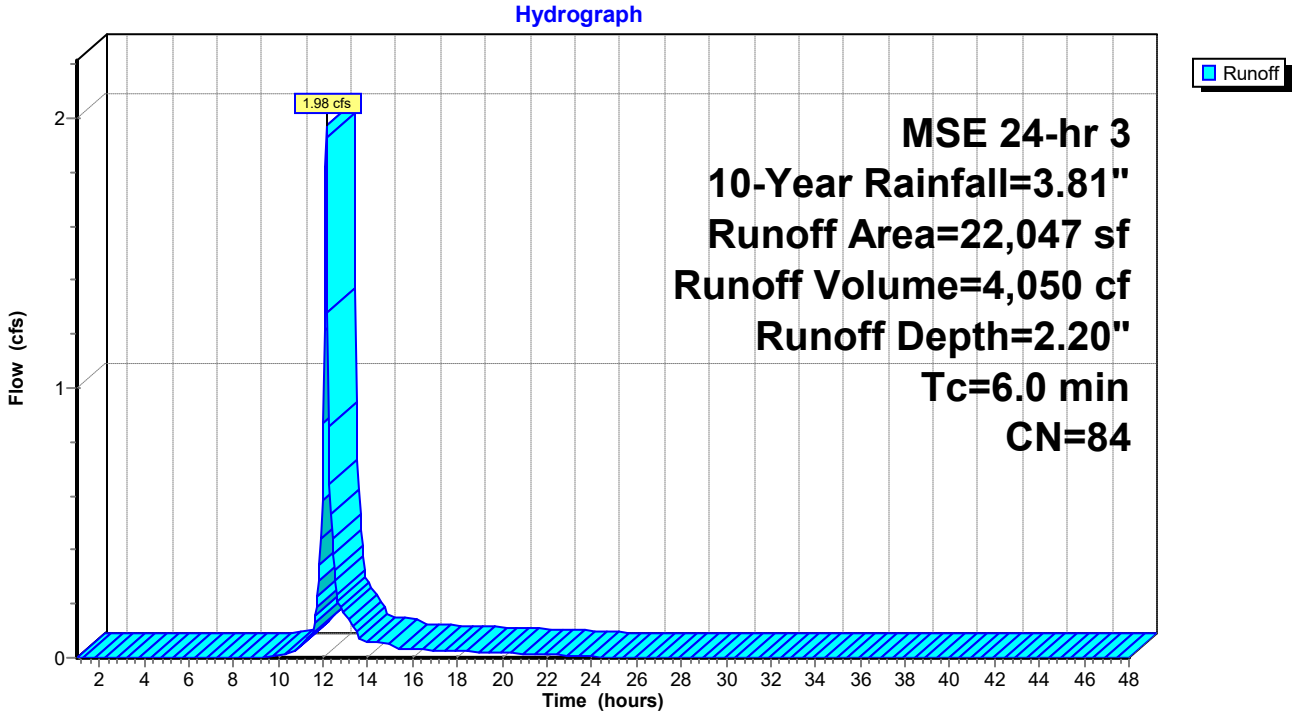
Runoff = 1.98 cfs @ 12.13 hrs, Volume= 4,050 cf, Depth= 2.20"
Routed to Reach 182R : EX. Red Barn Lane West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	12,014	74	landscape
*	9,160	98	road
*	873	74	landscape
	22,047	84	Weighted Average
	12,887		58.45% Pervious Area
	9,160		41.55% Impervious Area

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

Subcatchment 184S: Z1 (EX. RBL Area to RBL West Swale)



Summary for Reach 93R: Overland Flow from North Depression to South Depression

[43] Hint: Has no inflow (Outflow=Zero)

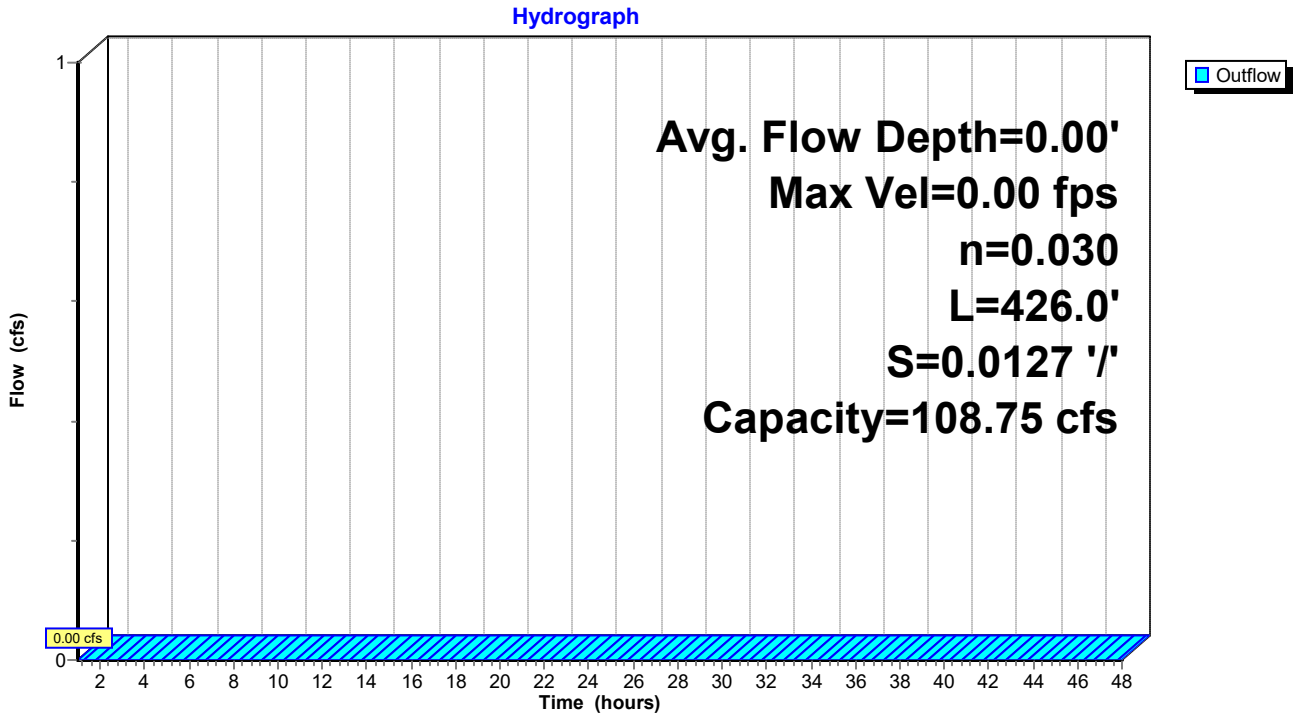
Bank-Full Depth= 0.50' Flow Area= 37.5 sf, Capacity= 108.75 cfs

50.00' x 0.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 50.0 '/' Top Width= 100.00'
Length= 426.0' Slope= 0.0127 '/'
Inlet Invert= 755.90', Outlet Invert= 750.50'



‡

Reach 93R: Overland Flow from North Depression to South Depression



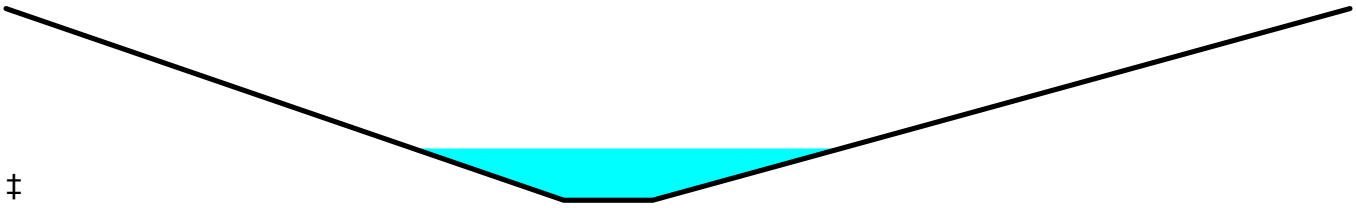
Summary for Reach 182R: EX. Red Barn Lane West Swale

Inflow Area = 79,613 sf, 11.51% Impervious, Inflow Depth = 1.66" for 10-Year event
Inflow = 4.25 cfs @ 12.16 hrs, Volume= 11,046 cf
Outflow = 3.94 cfs @ 12.21 hrs, Volume= 11,046 cf, Atten= 7%, Lag= 2.8 min
Routed to Link 79L : Swale Along Red Barn Ln.

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.17 fps, Min. Travel Time= 3.2 min
Avg. Velocity = 1.03 fps, Avg. Travel Time= 9.9 min

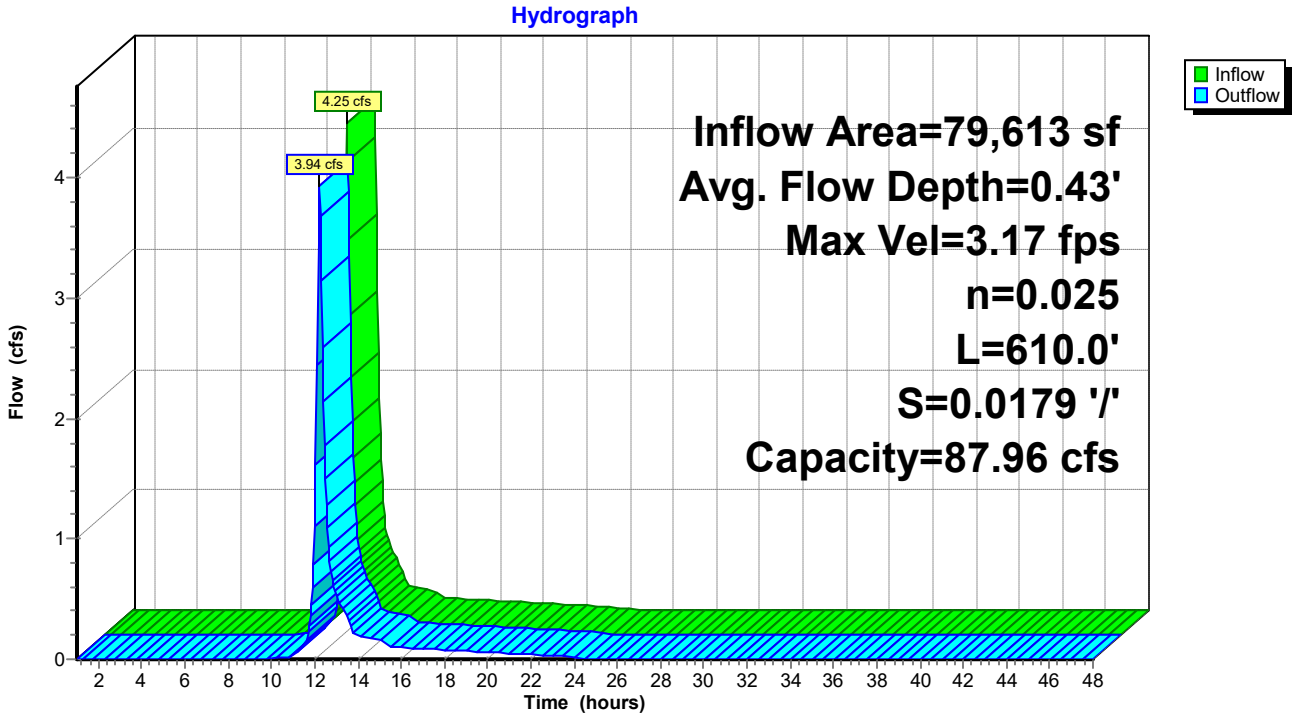
Peak Storage= 758 cf @ 12.21 hrs
Average Depth at Peak Storage= 0.43' , Surface Width= 4.83'
Bank-Full Depth= 1.57' Flow Area= 12.7 sf, Capacity= 87.96 cfs

1.00' x 1.57' deep channel, n= 0.025
Side Slope Z-value= 4.0 5.0 '/' Top Width= 15.13'
Length= 610.0' Slope= 0.0179 '/'
Inlet Invert= 760.89', Outlet Invert= 750.00'



‡

Reach 182R: EX. Red Barn Lane West Swale



Summary for Pond 73P: Southeast Basin

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=64)

Inflow Area = 156,438 sf, 0.00% Impervious, Inflow Depth = 1.46" for 10-Year event
Inflow = 6.87 cfs @ 12.23 hrs, Volume= 19,011 cf
Outflow = 1.15 cfs @ 12.81 hrs, Volume= 19,013 cf, Atten= 83%, Lag= 35.0 min
Discarded = 1.15 cfs @ 12.81 hrs, Volume= 19,013 cf

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 731.27' @ 12.81 hrs Surf.Area= 9,244 sf Storage= 7,764 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 68.4 min (896.3 - 827.9)

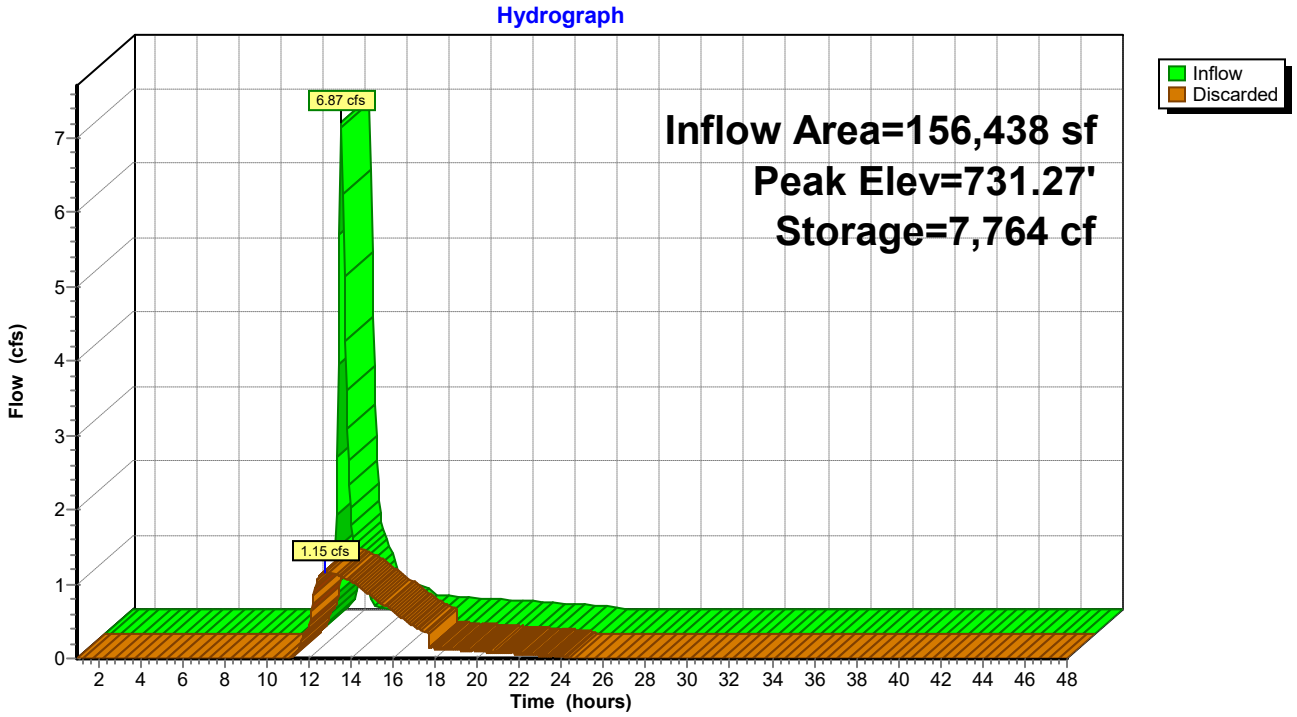
Volume	Invert	Avail.Storage	Storage Description
#1	730.00'	273,743 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
730.00	2,768	0	0
731.00	8,073	5,421	5,421
732.00	12,399	10,236	15,657
733.00	17,056	14,728	30,384
734.00	21,328	19,192	49,576
735.00	25,607	23,468	73,044
736.00	29,845	27,726	100,770
737.00	35,145	32,495	133,265
738.00	42,680	38,913	172,177
739.00	51,064	46,872	219,049
740.00	58,323	54,694	273,743

Device	Routing	Invert	Outlet Devices
#1	Discarded	730.00'	**5.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 720.00'

Discarded OutFlow Max=1.15 cfs @ 12.81 hrs HW=731.27' (Free Discharge)
1=Exfiltration (Controls 1.15 cfs)

Pond 73P: Southeast Basin



Summary for Pond 74P: Southwest Basin

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=14)

Inflow Area = 432,562 sf, 19.07% Impervious, Inflow Depth = 1.81" for 10-Year event
Inflow = 23.79 cfs @ 12.21 hrs, Volume= 65,424 cf
Outflow = 4.70 cfs @ 12.69 hrs, Volume= 65,431 cf, Atten= 80%, Lag= 29.1 min
Discarded = 4.70 cfs @ 12.69 hrs, Volume= 65,431 cf

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 743.38' @ 12.69 hrs Surf.Area= 24,111 sf Storage= 28,134 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 81.0 min (896.3 - 815.2)

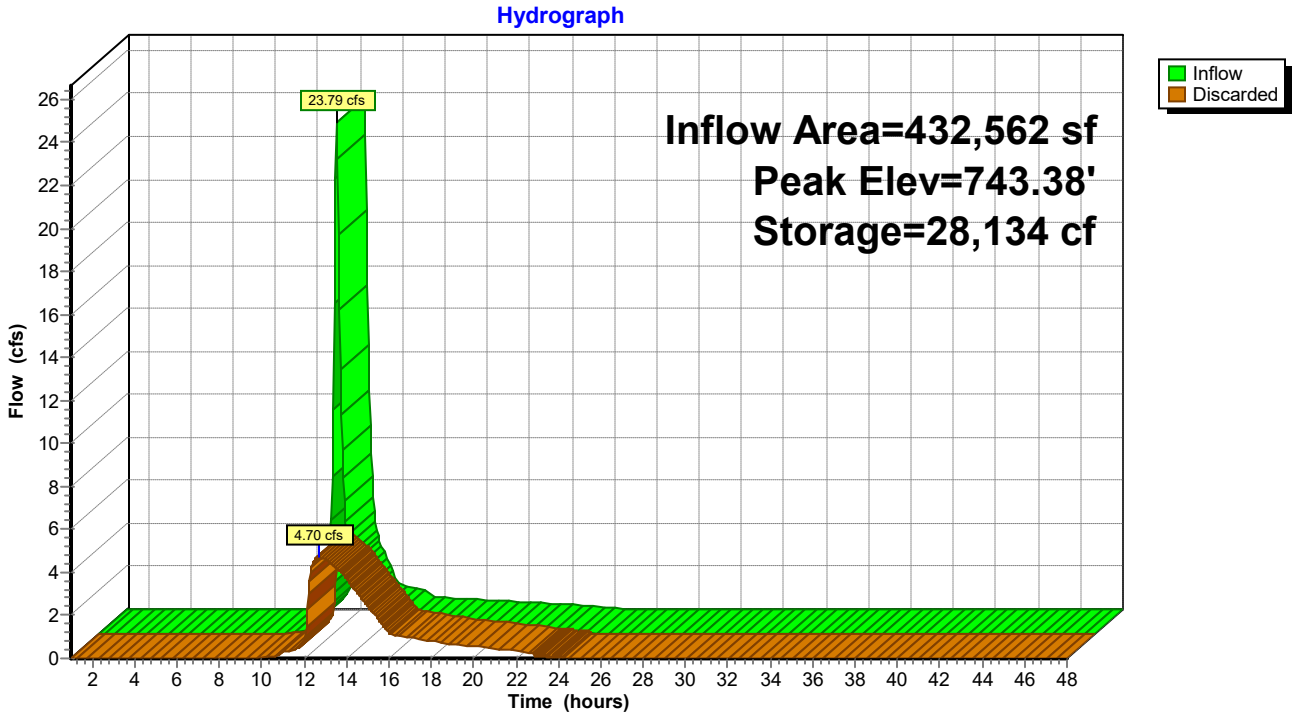
Volume	Invert	Avail.Storage	Storage Description
#1	740.00'	78,856 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
740.00	1,591	0	0
741.00	3,325	2,458	2,458
742.00	5,645	4,485	6,943
743.00	19,935	12,790	19,733
744.00	30,884	25,410	45,143
745.00	36,542	33,713	78,856

Device	Routing	Invert	Outlet Devices
#1	Discarded	740.00'	**8.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 720.00'

Discarded OutFlow Max=4.70 cfs @ 12.69 hrs HW=743.38' (Free Discharge)
↑**1=Exfiltration** (Controls 4.70 cfs)

Pond 74P: Southwest Basin



Summary for Pond 89P: Gravel North Depression

[93] Warning: Storage range exceeded by 0.77'
[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 248,526 sf, 21.47% Impervious, Inflow Depth = 1.83" for 10-Year event
Inflow = 14.68 cfs @ 12.18 hrs, Volume= 37,834 cf
Outflow = 14.69 cfs @ 12.18 hrs, Volume= 37,834 cf, Atten= 0%, Lag= 0.0 min
Discarded = 0.45 cfs @ 12.18 hrs, Volume= 8,887 cf
Primary = 1.78 cfs @ 12.54 hrs, Volume= 15,017 cf
Routed to Pond 92P : Gravel South Depression
Secondary = 12.56 cfs @ 12.18 hrs, Volume= 13,930 cf
Routed to Pond 92P : Gravel South Depression

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 756.77' @ 12.18 hrs Surf.Area= 1,161 sf Storage= 808 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 3.2 min (814.0 - 810.8)

Volume	Invert	Avail.Storage	Storage Description
#1	754.80'	808 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
754.80	237	0	0
755.50	725	337	337
756.00	1,161	472	808

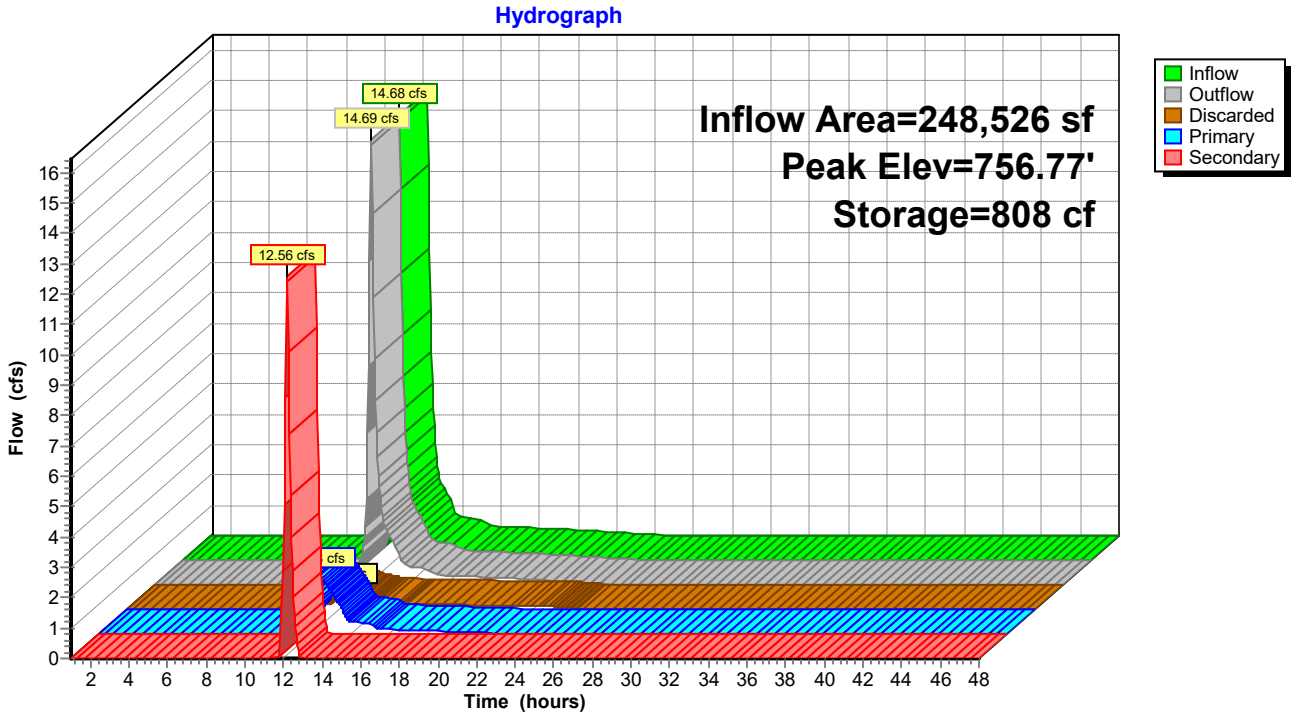
Device	Routing	Invert	Outlet Devices
#1	Primary	754.80'	**12.0" Round Culvert** L= 426.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 754.80' / 749.60' S= 0.0122 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	755.80'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#3	Discarded	754.80'	**16.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 725.00'

Discarded OutFlow Max=0.45 cfs @ 12.18 hrs HW=756.75' (Free Discharge)
3=Exfiltration (Controls 0.45 cfs)

Primary OutFlow Max=1.78 cfs @ 12.54 hrs HW=756.05' TW=752.47' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.78 cfs @ 2.33 fps)

Secondary OutFlow Max=12.25 cfs @ 12.18 hrs HW=756.75' TW=753.11' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Weir Controls 12.25 cfs @ 2.58 fps)

Pond 89P: Gravel North Depression



Summary for Pond 92P: Gravel South Depression

[92] Warning: Device #1 is above defined storage
[93] Warning: Storage range exceeded by 1.13'
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=42)

Inflow Area = 301,528 sf, 17.70% Impervious, Inflow Depth = 1.41" for 10-Year event
Inflow = 16.21 cfs @ 12.19 hrs, Volume= 35,388 cf
Outflow = 16.15 cfs @ 12.19 hrs, Volume= 35,388 cf, Atten= 0%, Lag= 0.0 min
Primary = 16.05 cfs @ 12.19 hrs, Volume= 31,242 cf
Routed to Link 80L : EX. Cul-de-sac On Green Meadow Place
Secondary = 0.10 cfs @ 12.19 hrs, Volume= 4,146 cf
Routed to Link 80L : EX. Cul-de-sac On Green Meadow Place

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 753.13' @ 12.19 hrs Surf.Area= 253 sf Storage= 387 cf

Plug-Flow detention time= 7.0 min calculated for 35,350 cf (100% of inflow)
Center-of-Mass det. time= 7.0 min (792.9 - 786.0)

Volume	Invert	Avail.Storage	Storage Description
#1	749.60'	387 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

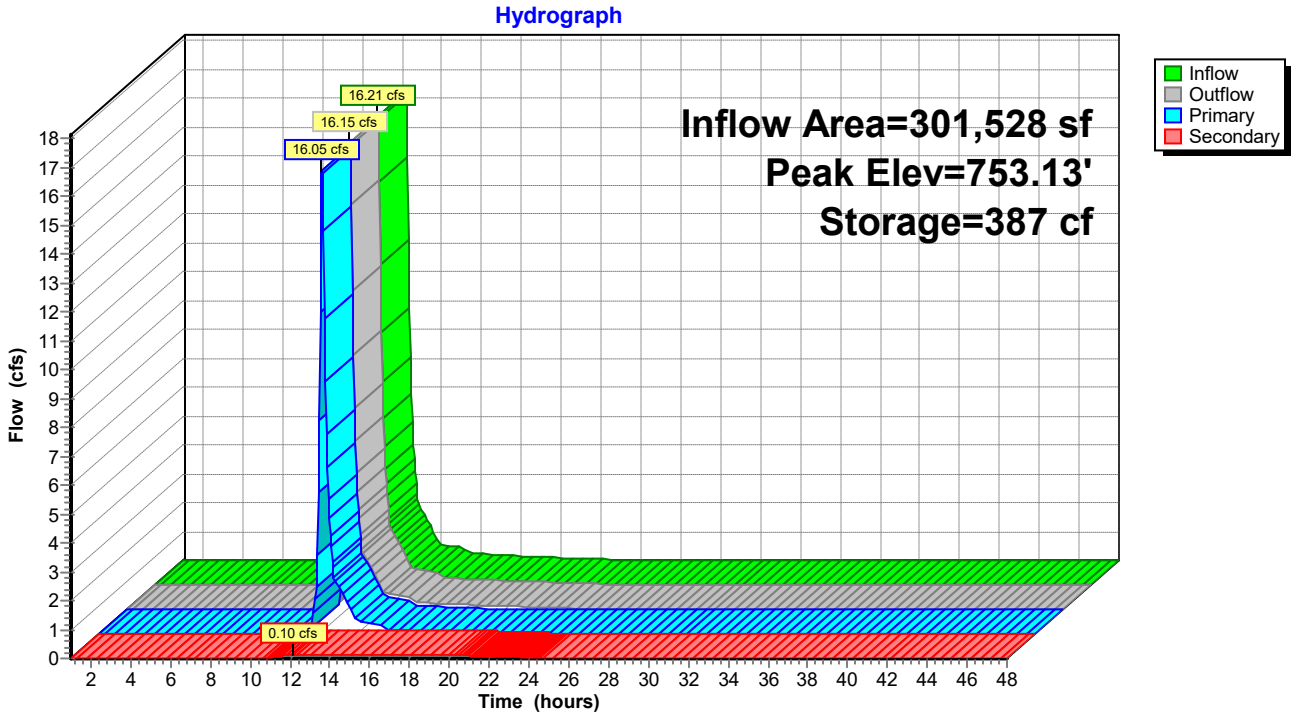
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
749.60	30	0	0
750.00	107	27	27
752.00	253	360	387

Device	Routing	Invert	Outlet Devices
#1	Primary	752.00'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Secondary	749.60'	**16.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 725.00'

Primary OutFlow Max=15.80 cfs @ 12.19 hrs HW=753.12' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 15.80 cfs @ 2.83 fps)

Secondary OutFlow Max=0.10 cfs @ 12.19 hrs HW=753.12' TW=0.00' (Dynamic Tailwater)
↑—**2=Exfiltration** (Controls 0.10 cfs)

Pond 92P: Gravel South Depression

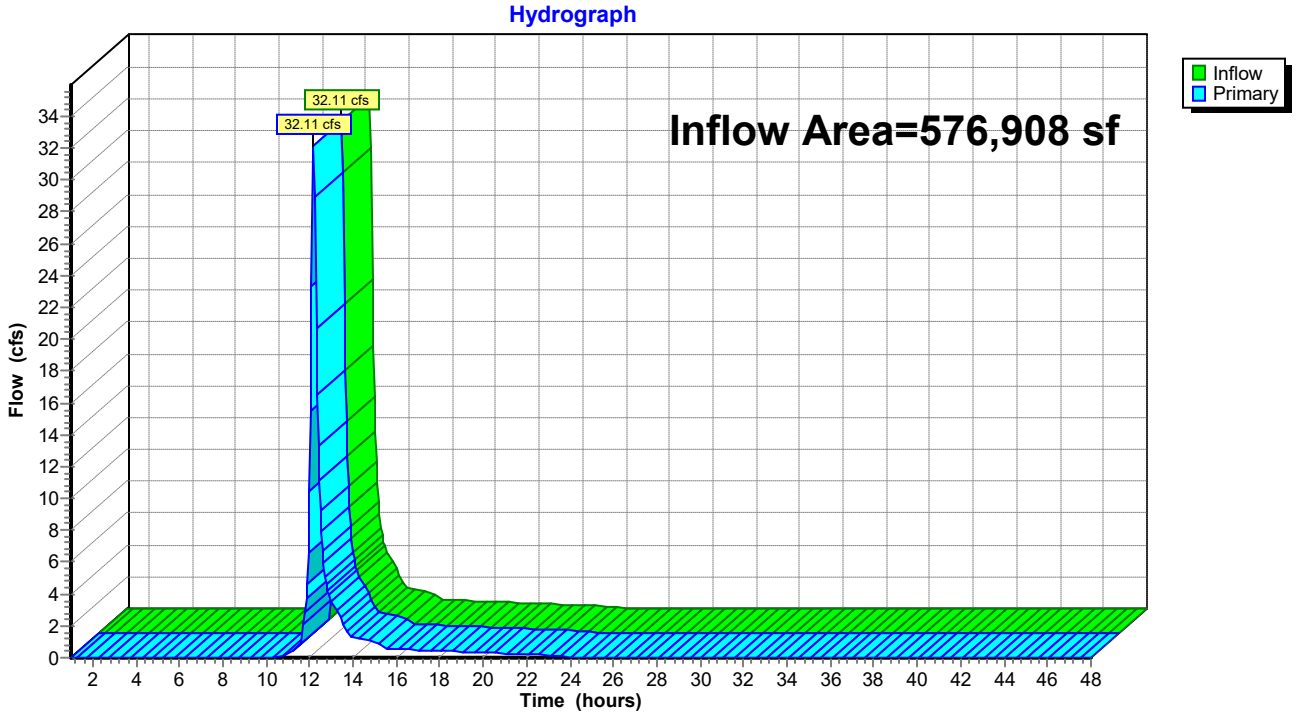


Summary for Link 32L: TOTAL OFFSITE UNTREATED

Inflow Area = 576,908 sf, 17.53% Impervious, Inflow Depth = 1.57" for 10-Year event
Inflow = 32.11 cfs @ 12.18 hrs, Volume= 75,433 cf
Primary = 32.11 cfs @ 12.18 hrs, Volume= 75,433 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 34L : TOTAL OUTFALL

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 32L: TOTAL OFFSITE UNTREATED

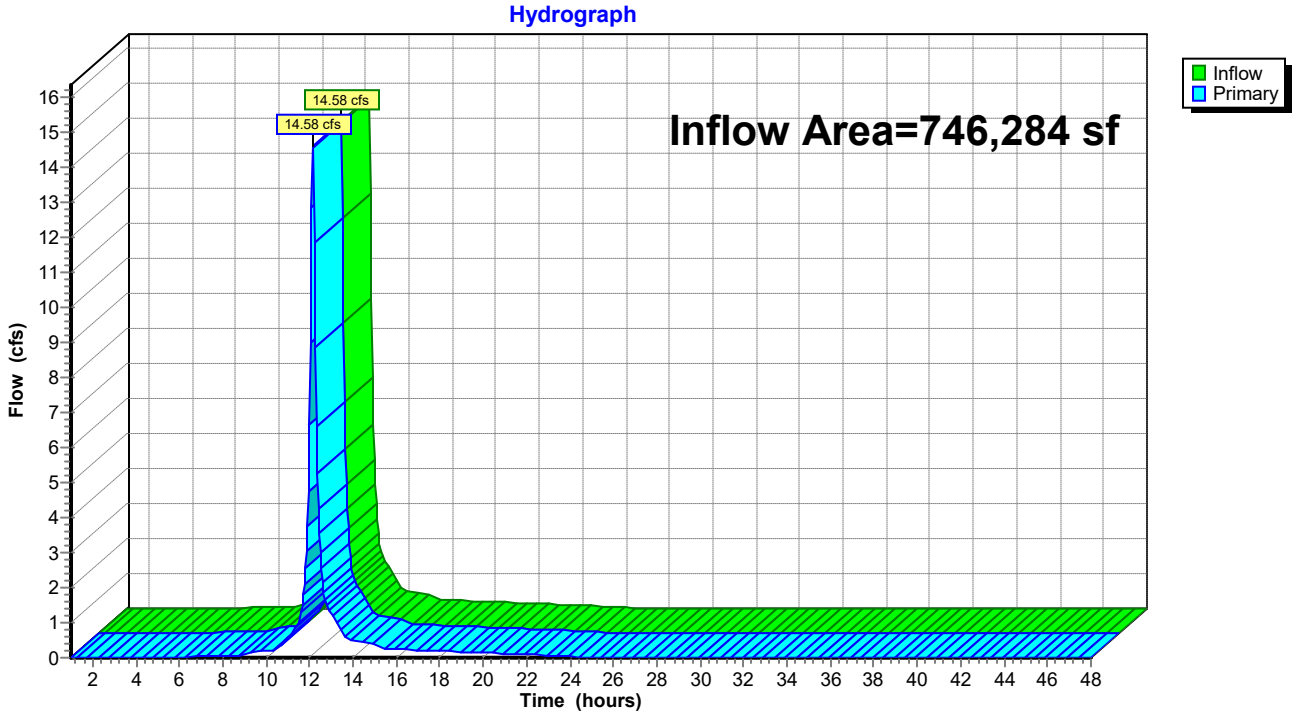


Summary for Link 33L: TOTAL ONSITE

Inflow Area = 746,284 sf, 24.37% Impervious, Inflow Depth = 0.57" for 10-Year event
Inflow = 14.58 cfs @ 12.14 hrs, Volume= 35,408 cf
Primary = 14.58 cfs @ 12.14 hrs, Volume= 35,408 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 34L : TOTAL OUTFALL

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 33L: TOTAL ONSITE

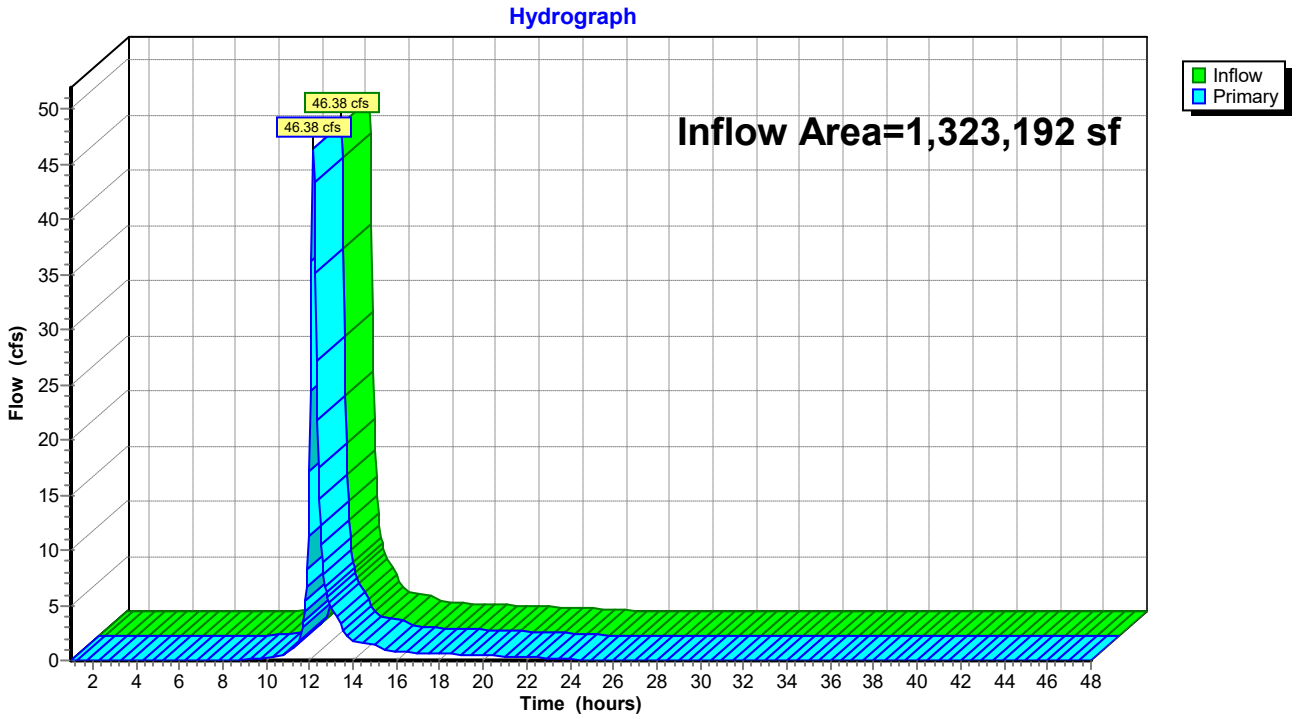


Summary for Link 34L: TOTAL OUTFALL

Inflow Area = 1,323,192 sf, 21.39% Impervious, Inflow Depth = 1.01" for 10-Year event
Inflow = 46.38 cfs @ 12.16 hrs, Volume= 110,841 cf
Primary = 46.38 cfs @ 12.16 hrs, Volume= 110,841 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 34L: TOTAL OUTFALL

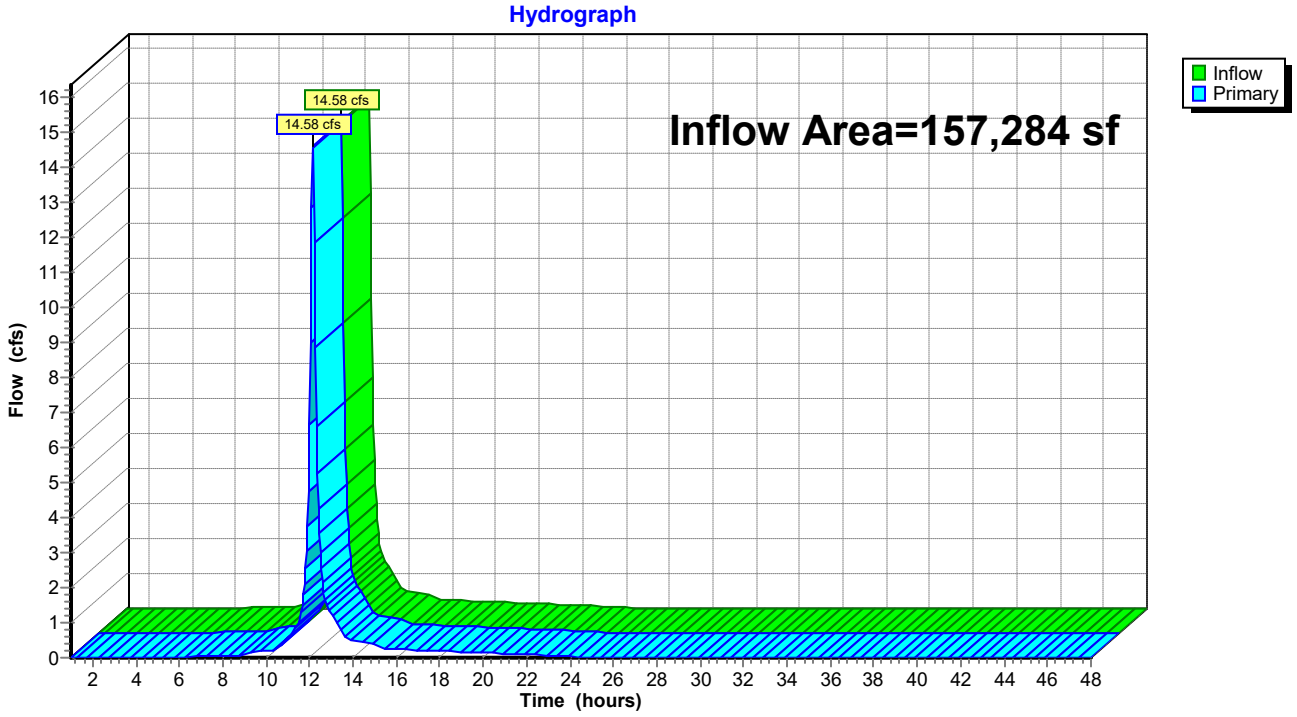


Summary for Link 75L: Areas Piped

Inflow Area = 157,284 sf, 63.18% Impervious, Inflow Depth = 2.70" for 10-Year event
Inflow = 14.58 cfs @ 12.14 hrs, Volume= 35,408 cf
Primary = 14.58 cfs @ 12.14 hrs, Volume= 35,408 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 33L : TOTAL ONSITE

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 75L: Areas Piped

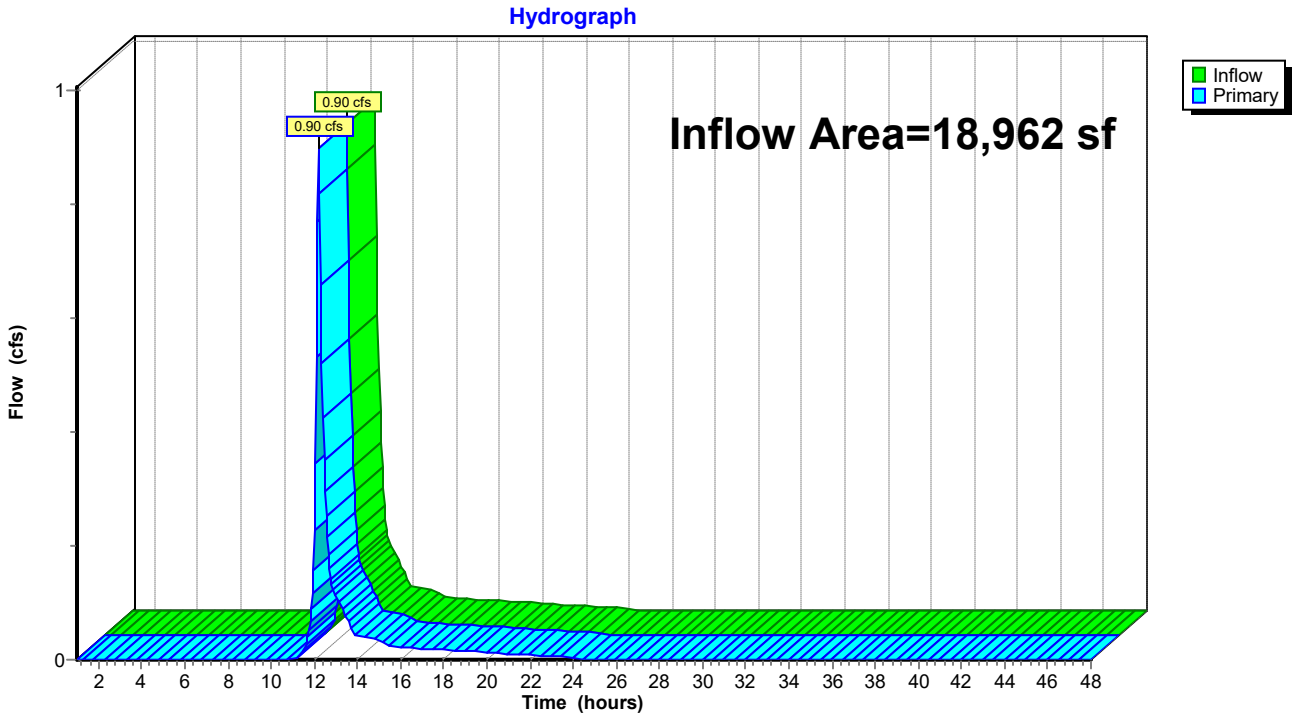


Summary for Link 78L: Swale on Lot 20

Inflow Area = 18,962 sf, 0.00% Impervious, Inflow Depth = 1.46" for 10-Year event
Inflow = 0.90 cfs @ 12.21 hrs, Volume= 2,304 cf
Primary = 0.90 cfs @ 12.21 hrs, Volume= 2,304 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 32L : TOTAL OFFSITE UNTREATED

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 78L: Swale on Lot 20

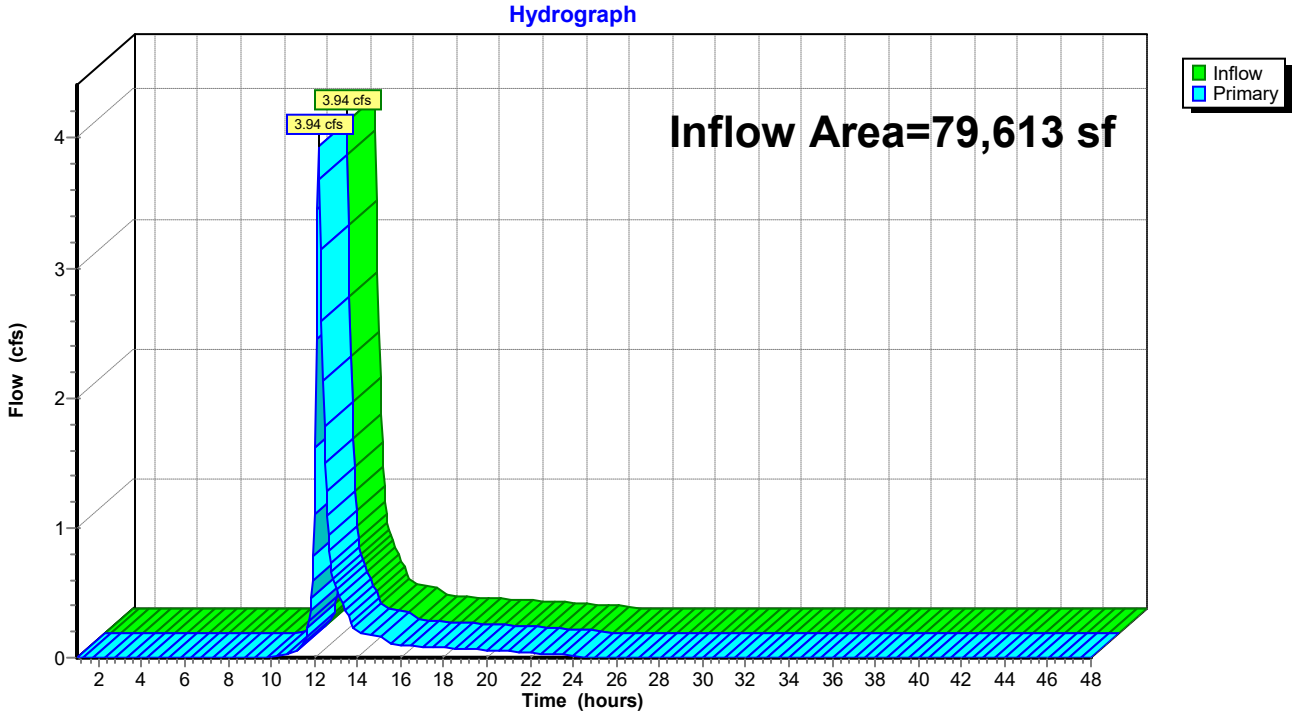


Summary for Link 79L: Swale Along Red Barn Ln.

Inflow Area = 79,613 sf, 11.51% Impervious, Inflow Depth = 1.66" for 10-Year event
Inflow = 3.94 cfs @ 12.21 hrs, Volume= 11,046 cf
Primary = 3.94 cfs @ 12.21 hrs, Volume= 11,046 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 32L : TOTAL OFFSITE UNTREATED

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 79L: Swale Along Red Barn Ln.

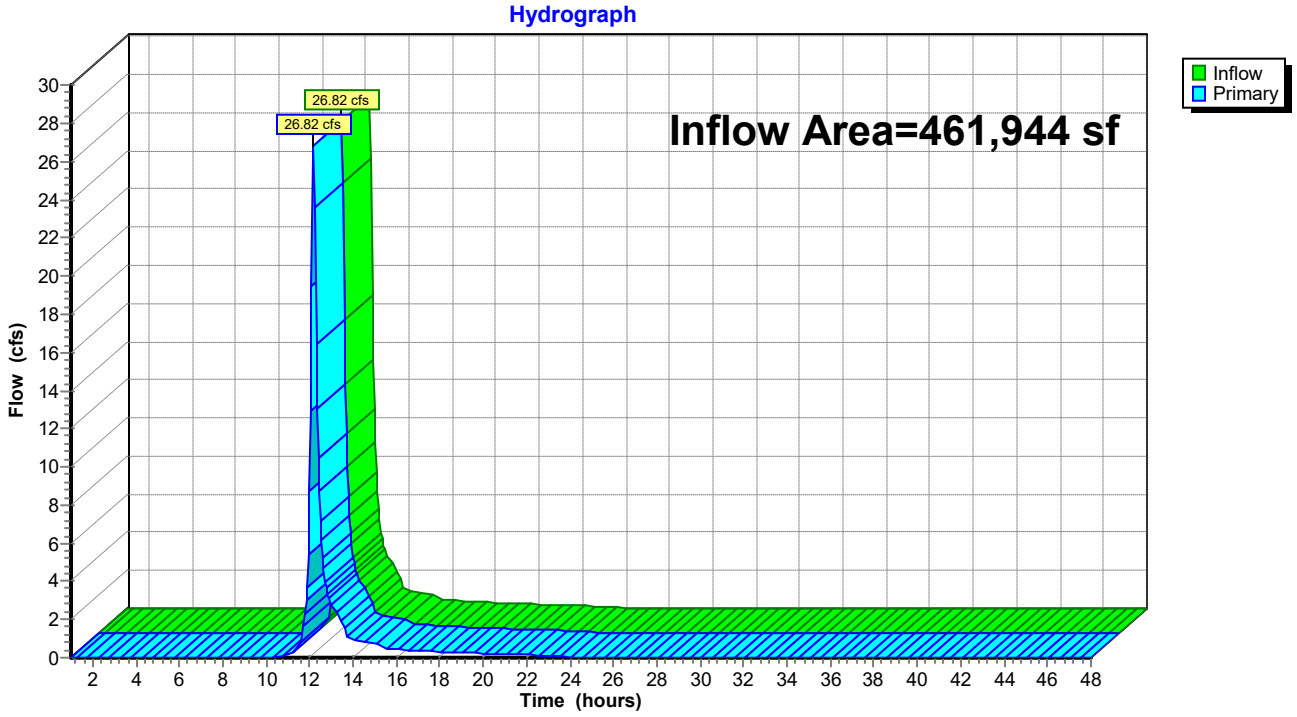


Summary for Link 80L: EX. Cul-de-sac On Green Meadow Place

Inflow Area = 461,944 sf, 19.58% Impervious, Inflow Depth = 1.56" for 10-Year event
Inflow = 26.82 cfs @ 12.17 hrs, Volume= 59,910 cf
Primary = 26.82 cfs @ 12.17 hrs, Volume= 59,910 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 32L : TOTAL OFFSITE UNTREATED

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 80L: EX. Cul-de-sac On Green Meadow Place



Time span=1.00-48.00 hrs, dt=0.05 hrs, 941 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: A Runoff Area=156,438 sf 0.00% Impervious Runoff Depth=3.34"
Flow Length=260' Tc=13.7 min CN=74 Runoff=16.06 cfs 43,501 cf

Subcatchment 2S: B Runoff Area=141,137 sf 26.27% Impervious Runoff Depth=3.94"
Flow Length=300' Slope=0.0071 '/' Tc=8.5 min CN=80 Runoff=20.47 cfs 46,388 cf

Subcatchment 4S: C1 Runoff Area=12,661 sf 0.00% Impervious Runoff Depth=3.34"
Flow Length=100' Slope=0.0193 '/' Tc=11.4 min CN=74 Runoff=1.41 cfs 3,521 cf

Subcatchment 5S: D Runoff Area=24,345 sf 0.00% Impervious Runoff Depth=3.34"
Flow Length=170' Tc=10.2 min CN=74 Runoff=2.81 cfs 6,770 cf

Subcatchment 6S: E Runoff Area=152,103 sf 18.44% Impervious Runoff Depth=3.74"
Flow Length=471' Tc=10.6 min CN=78 Runoff=19.29 cfs 47,385 cf

Subcatchment 7S: F Runoff Area=13,305 sf 0.00% Impervious Runoff Depth=3.34"
Flow Length=100' Slope=0.0583 '/' Tc=7.3 min CN=74 Runoff=1.75 cfs 3,700 cf

Subcatchment 8S: G Runoff Area=66,971 sf 15.30% Impervious Runoff Depth=3.74"
Flow Length=295' Tc=12.7 min CN=78 Runoff=7.95 cfs 20,863 cf

Subcatchment 9S: H Runoff Area=16,147 sf 93.29% Impervious Runoff Depth=5.71"
Flow Length=200' Tc=6.0 min CN=96 Runoff=3.26 cfs 7,679 cf

Subcatchment 10S: I Runoff Area=10,482 sf 59.22% Impervious Runoff Depth=4.80"
Flow Length=100' Slope=0.0244 '/' Tc=6.0 min CN=88 Runoff=1.93 cfs 4,192 cf

Subcatchment 11S: J Runoff Area=838 sf 4.77% Impervious Runoff Depth=3.44"
Flow Length=15' Slope=0.0122 '/' Tc=6.0 min CN=75 Runoff=0.12 cfs 240 cf

Subcatchment 12S: K Runoff Area=28,606 sf 66.44% Impervious Runoff Depth=5.02"
Flow Length=90' Slope=0.0161 '/' Tc=11.3 min CN=90 Runoff=4.52 cfs 11,970 cf

Subcatchment 13S: L Runoff Area=43,723 sf 16.63% Impervious Runoff Depth=3.74"
Flow Length=230' Tc=11.4 min CN=78 Runoff=5.41 cfs 13,621 cf

Subcatchment 14S: M Runoff Area=53,002 sf 0.00% Impervious Runoff Depth=3.34"
Flow Length=475' Tc=15.2 min CN=74 Runoff=5.18 cfs 14,738 cf

Subcatchment 15S: N Runoff Area=6,616 sf 7.63% Impervious Runoff Depth=3.54"
Flow Length=65' Slope=0.0344 '/' Tc=6.4 min CN=76 Runoff=0.94 cfs 1,949 cf

Subcatchment 16S: O Runoff Area=18,705 sf 49.38% Impervious Runoff Depth=4.58"
Flow Length=150' Tc=10.4 min CN=86 Runoff=2.83 cfs 7,140 cf

Subcatchment 17S: P Runoff Area=18,391 sf 80.23% Impervious Runoff Depth=5.36"
Flow Length=35' Slope=0.0866 '/' Tc=6.0 min CN=93 Runoff=3.62 cfs 8,215 cf

Subcatchment 18S: Q Runoff Area=14,923 sf 57.14% Impervious Runoff Depth=4.80"
Flow Length=30' Slope=0.0989 '/' Tc=6.0 min CN=88 Runoff=2.75 cfs 5,968 cf

Subcatchment 19S: R Runoff Area=20,724 sf 79.35% Impervious Runoff Depth=5.36"
Flow Length=170' Tc=10.5 min CN=93 Runoff=3.47 cfs 9,257 cf

Subcatchment 20S: S Runoff Area=5,299 sf 100.00% Impervious Runoff Depth=5.94"
Flow Length=50' Slope=0.0049 '/' Tc=6.0 min CN=98 Runoff=1.08 cfs 2,624 cf

Subcatchment 21S: T Runoff Area=35,645 sf 39.81% Impervious Runoff Depth=4.37"
Flow Length=280' Tc=11.4 min CN=84 Runoff=5.05 cfs 12,967 cf

Subcatchment 22S: U Runoff Area=15,551 sf 9.77% Impervious Runoff Depth=3.54"
Flow Length=90' Slope=0.0528 '/' Tc=7.0 min CN=76 Runoff=2.18 cfs 4,582 cf

Subcatchment 23S: V Runoff Area=26,499 sf 91.36% Impervious Runoff Depth=5.71"
Flow Length=115' Tc=6.0 min CN=96 Runoff=5.35 cfs 12,602 cf

Subcatchment 24S: W Runoff Area=75,447 sf 27.41% Impervious Runoff Depth=4.05"
Flow Length=200' Tc=9.3 min CN=81 Runoff=10.79 cfs 25,452 cf

Subcatchment 25S: X Runoff Area=104,170 sf 23.49% Impervious Runoff Depth=3.94"
Flow Length=215' Tc=13.0 min CN=80 Runoff=12.87 cfs 34,238 cf

Subcatchment 26S: Y Runoff Area=12,489 sf 0.00% Impervious Runoff Depth=3.34"
Tc=6.0 min CN=74 Runoff=1.71 cfs 3,473 cf

Subcatchment 27S: Z Runoff Area=168,127 sf 6.58% Impervious Runoff Depth=3.54"
Flow Length=480' Tc=15.8 min CN=76 Runoff=17.10 cfs 49,541 cf

Subcatchment 67S: C2 Runoff Area=6,618 sf 0.00% Impervious Runoff Depth=3.34"
Flow Length=120' Slope=0.0262 '/' Tc=10.4 min CN=74 Runoff=0.76 cfs 1,840 cf

Subcatchment 68S: C4 Runoff Area=33,221 sf 0.00% Impervious Runoff Depth=3.34"
Flow Length=380' Tc=13.6 min CN=74 Runoff=3.42 cfs 9,238 cf

Subcatchment 69S: C3 Runoff Area=18,962 sf 0.00% Impervious Runoff Depth=3.34"
Flow Length=233' Slope=0.0278 '/' Tc=11.8 min CN=74 Runoff=2.08 cfs 5,273 cf

Subcatchment 70S: O1 Runoff Area=11,697 sf 0.00% Impervious Runoff Depth=3.34"
Tc=6.0 min CN=74 Runoff=1.60 cfs 3,253 cf

Subcatchment 71S: O2 Runoff Area=132,678 sf 2.29% Impervious Runoff Depth=3.44"
Flow Length=377' Tc=12.2 min CN=75 Runoff=14.77 cfs 37,990 cf

Subcatchment 184S: Z1 (EX. RBL Area to Runoff Area=22,047 sf 41.55% Impervious Runoff Depth=4.37"
Tc=6.0 min CN=84 Runoff=3.80 cfs 8,020 cf

Reach 93R: Overland Flow from North Depression to South Avg. Flow Depth=0.00' Max Vel=0.00 fps
n=0.030 L=426.0' S=0.0127 '/' Capacity=108.75 cfs Outflow=0.00 cfs 0 cf

Reach 182R: EX. Red Barn Lane West Avg. Flow Depth=0.60' Max Vel=3.89 fps Inflow=9.25 cfs 24,027 cf
n=0.025 L=610.0' S=0.0179 '/' Capacity=87.96 cfs Outflow=8.75 cfs 24,027 cf

Pond 73P: Southeast Basin Peak Elev=732.44' Storage=21,516 cf Inflow=16.06 cfs 43,501 cf
Outflow=1.90 cfs 43,514 cf

Pond 74P: Southwest Basin Peak Elev=744.71' Storage=68,323 cf Inflow=49.96 cfs 138,294 cf
Outflow=7.02 cfs 138,317 cf

Pond 89P: Gravel North Depression Peak Elev=757.40' Storage=808 cf Inflow=30.93 cfs 79,627 cf
Discarded=0.46 cfs 12,195 cf Primary=1.79 cfs 26,894 cf Secondary=29.09 cfs 40,540 cf Outflow=31.21 cfs 79,629 cf

Pond 92P: Gravel South Depression Peak Elev=753.83' Storage=387 cf Inflow=35.49 cfs 82,172 cf
Primary=35.54 cfs 76,967 cf Secondary=0.11 cfs 5,206 cf Outflow=35.65 cfs 82,172 cf

Link 32L: TOTAL OFFSITE UNTREATED Inflow=69.62 cfs 168,043 cf
Primary=69.62 cfs 168,043 cf

Link 33L: TOTAL ONSITE Inflow=25.99 cfs 64,915 cf
Primary=25.99 cfs 64,915 cf

Link 34L: TOTAL OUTFALL Inflow=94.43 cfs 232,958 cf
Primary=94.43 cfs 232,958 cf

Link 75L: Areas Piped Inflow=25.99 cfs 64,915 cf
Primary=25.99 cfs 64,915 cf

Link 78L: Swale on Lot 20 Inflow=2.08 cfs 5,273 cf
Primary=2.08 cfs 5,273 cf

Link 79L: Swale Along Red Barn Ln. Inflow=8.75 cfs 24,027 cf
Primary=8.75 cfs 24,027 cf

Link 80L: EX. Cul-de-sac On Green Meadow Place Inflow=57.02 cfs 133,921 cf
Primary=57.02 cfs 133,921 cf

Total Runoff Area = 1,467,567 sf Runoff Volume = 468,187 cf Average Runoff Depth = 3.83"
80.51% Pervious = 1,181,505 sf 19.49% Impervious = 286,062 sf

Summary for Subcatchment 1S: A

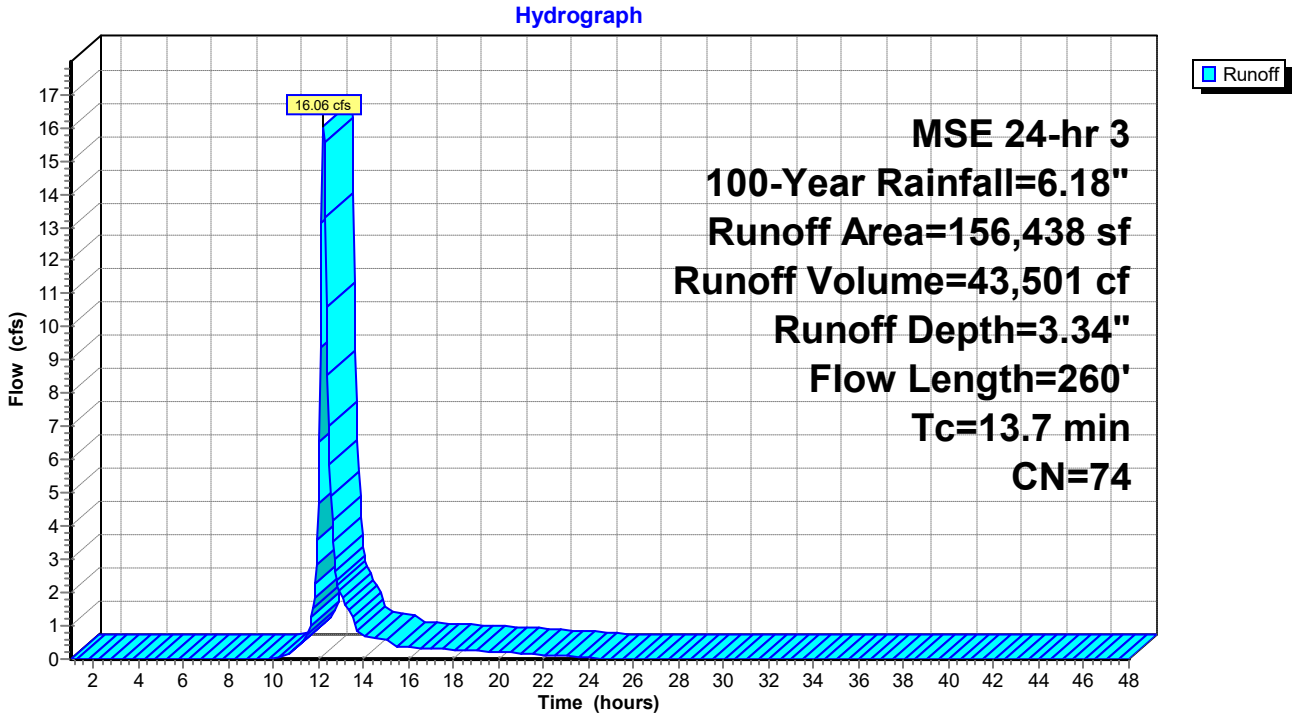
Runoff = 16.06 cfs @ 12.22 hrs, Volume= 43,501 cf, Depth= 3.34"
Routed to Pond 73P : Southeast Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	156,438	74	PER
	156,438		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.7	100	0.0181	0.14		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
2.0	160	0.0362	1.33		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
13.7	260	Total			

Subcatchment 1S: A



Summary for Subcatchment 2S: B

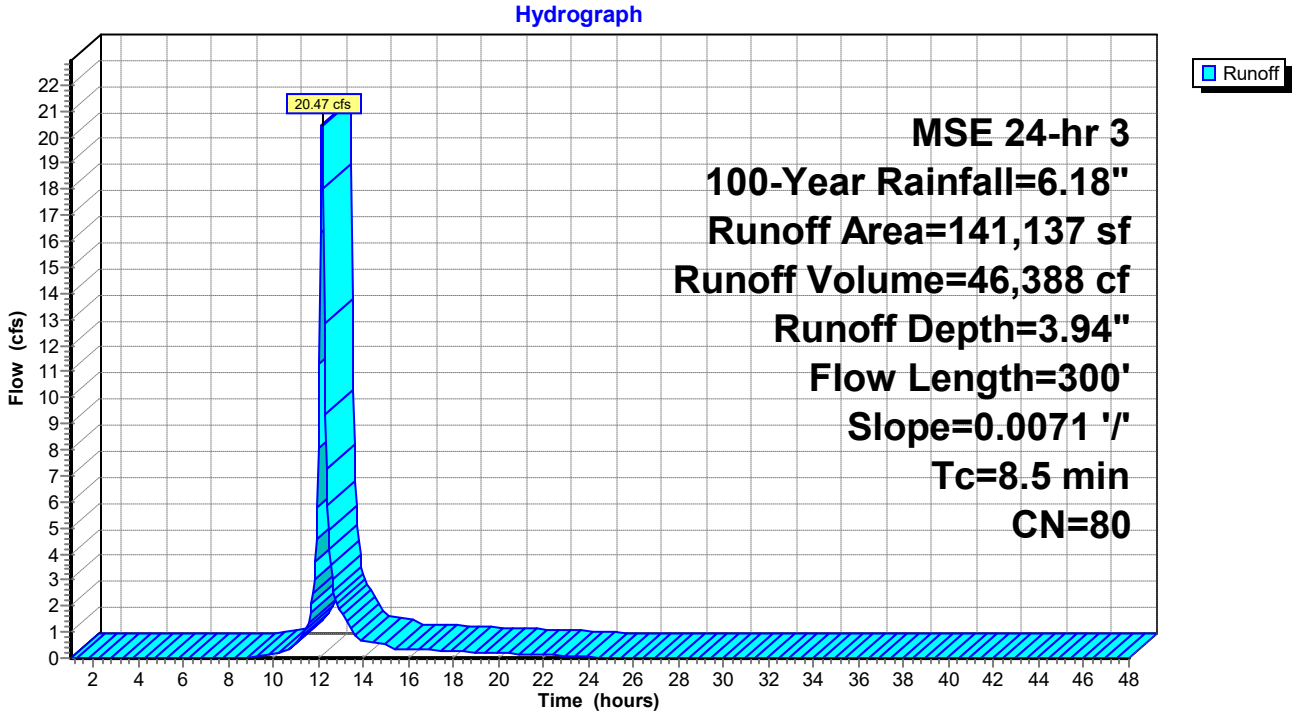
Runoff = 20.47 cfs @ 12.16 hrs, Volume= 46,388 cf, Depth= 3.94"
Routed to Link 80L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	104,065	74	PER
*	22,056	98	IMP
*	15,016	98	ROOF
	141,137	80	Weighted Average
	104,065		73.73% Pervious Area
	37,072		26.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	300	0.0071	0.59		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps

Subcatchment 2S: B



Summary for Subcatchment 4S: C1

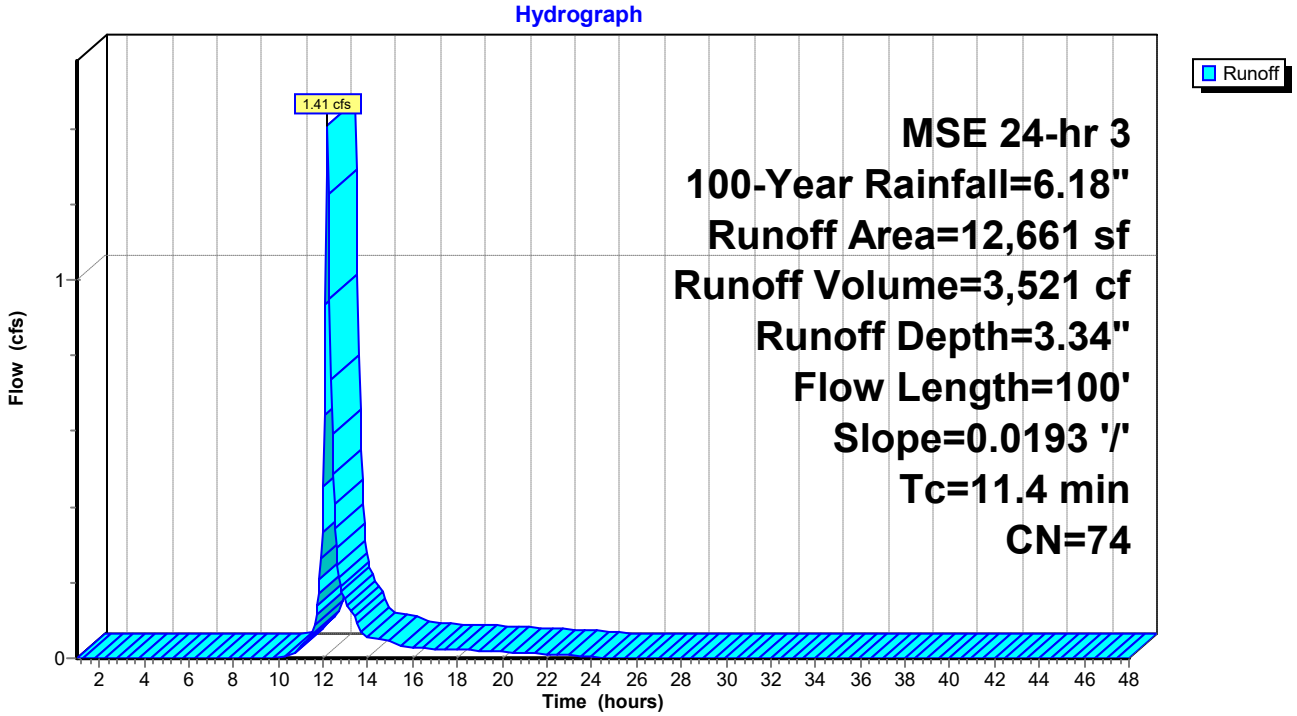
Runoff = 1.41 cfs @ 12.20 hrs, Volume= 3,521 cf, Depth= 3.34"
Routed to Link 80L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	12,661	74	PER
	12,661		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.4	100	0.0193	0.15		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 4S: C1



Summary for Subcatchment 5S: D

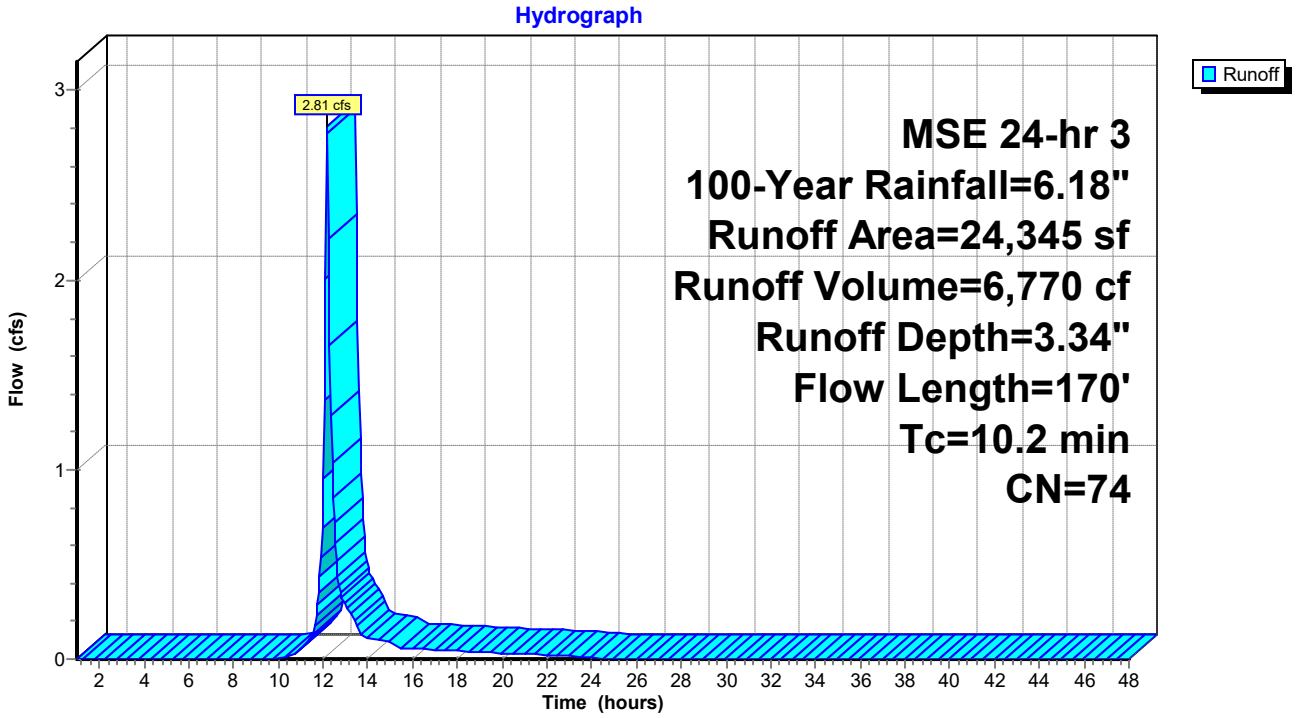
Runoff = 2.81 cfs @ 12.18 hrs, Volume= 6,770 cf, Depth= 3.34"
Routed to Reach 182R : EX. Red Barn Lane West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	24,345	74	PER
	24,345		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0319	0.18		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.9	70	0.0317	1.25		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
10.2	170	Total			

Subcatchment 5S: D



Summary for Subcatchment 6S: E

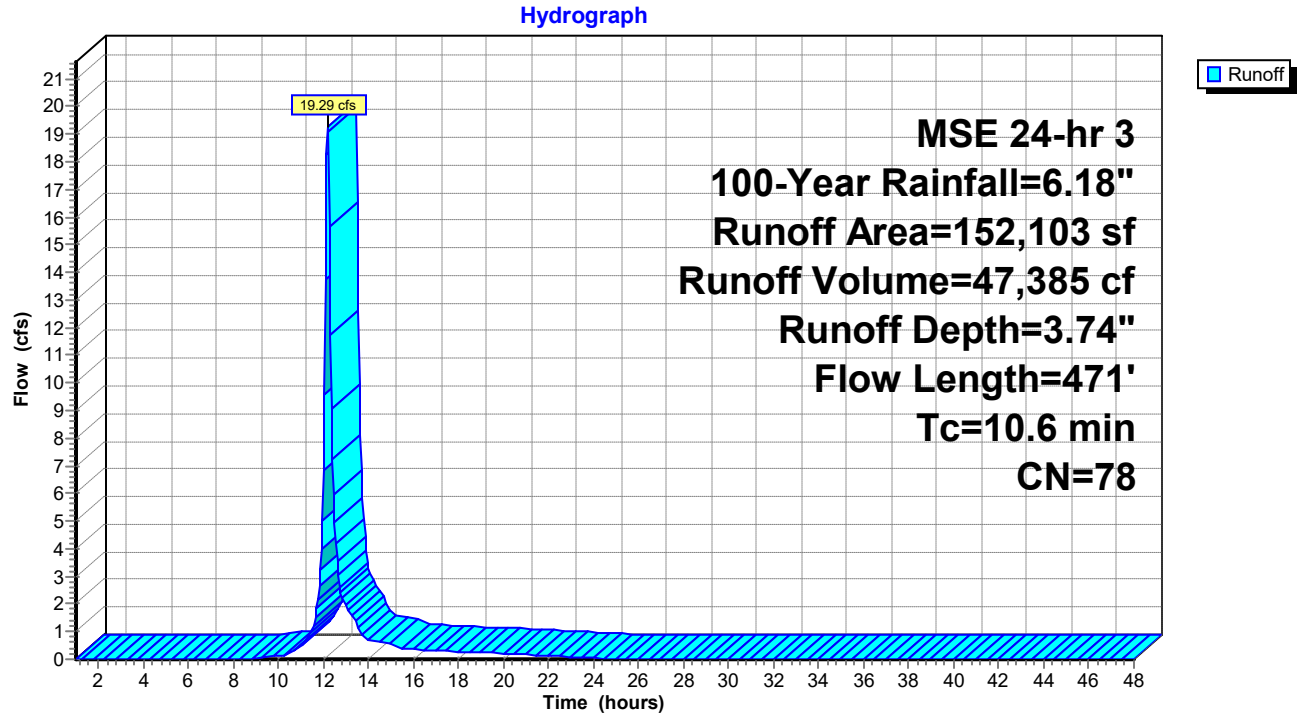
Runoff = 19.29 cfs @ 12.18 hrs, Volume= 47,385 cf, Depth= 3.74"
Routed to Pond 89P : Gravel North Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	117,151	74	PER
*	21,607	98	IMP
*	6,900	74	PER NEW RBL
*	6,445	98	IMP NEW RBL
	152,103	78	Weighted Average
	124,051		81.56% Pervious Area
	28,052		18.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	100	0.0581	0.23		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.9	215	0.0405	4.09		**Shallow Concentrated Flow, SCF** Paved Kv= 20.3 fps
2.3	156	0.0259	1.13		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
10.6	471	Total			

Subcatchment 6S: E



Summary for Subcatchment 7S: F

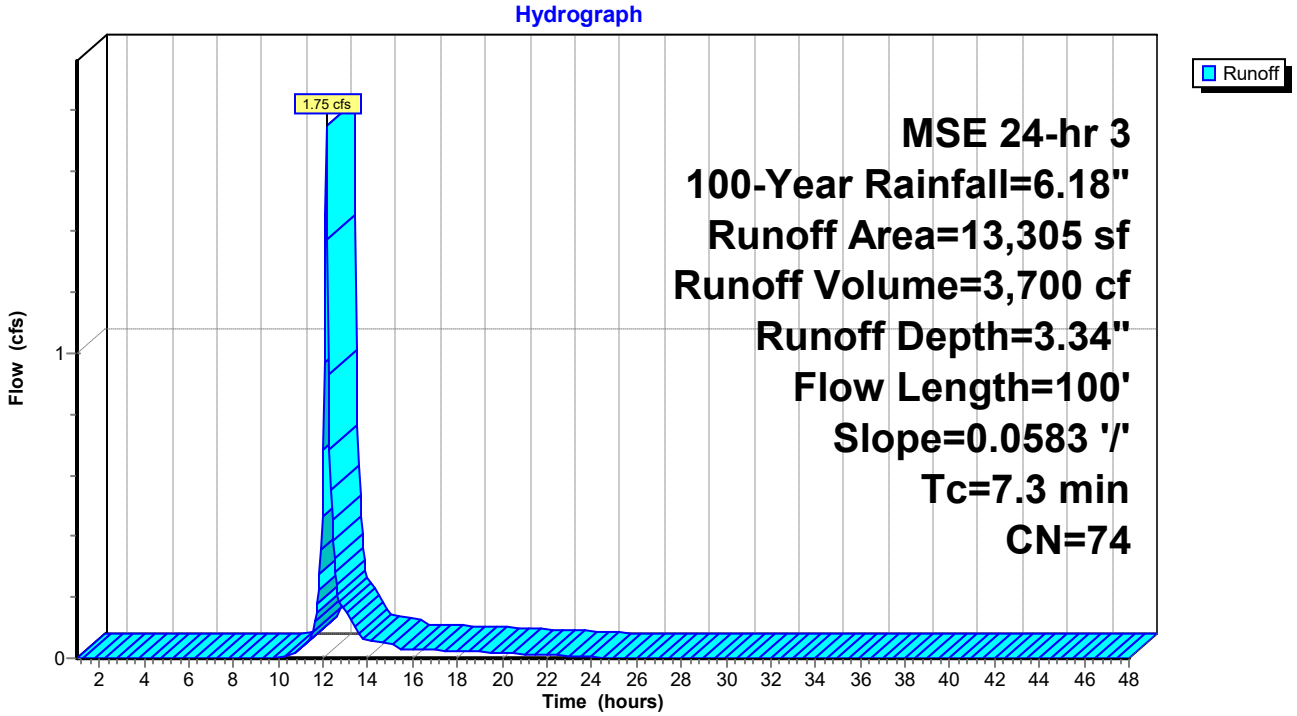
Runoff = 1.75 cfs @ 12.15 hrs, Volume= 3,700 cf, Depth= 3.34"
Routed to Pond 89P : Gravel North Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	13,305	74	PER
	13,305		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.3	100	0.0583	0.23		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 7S: F



Summary for Subcatchment 8S: G

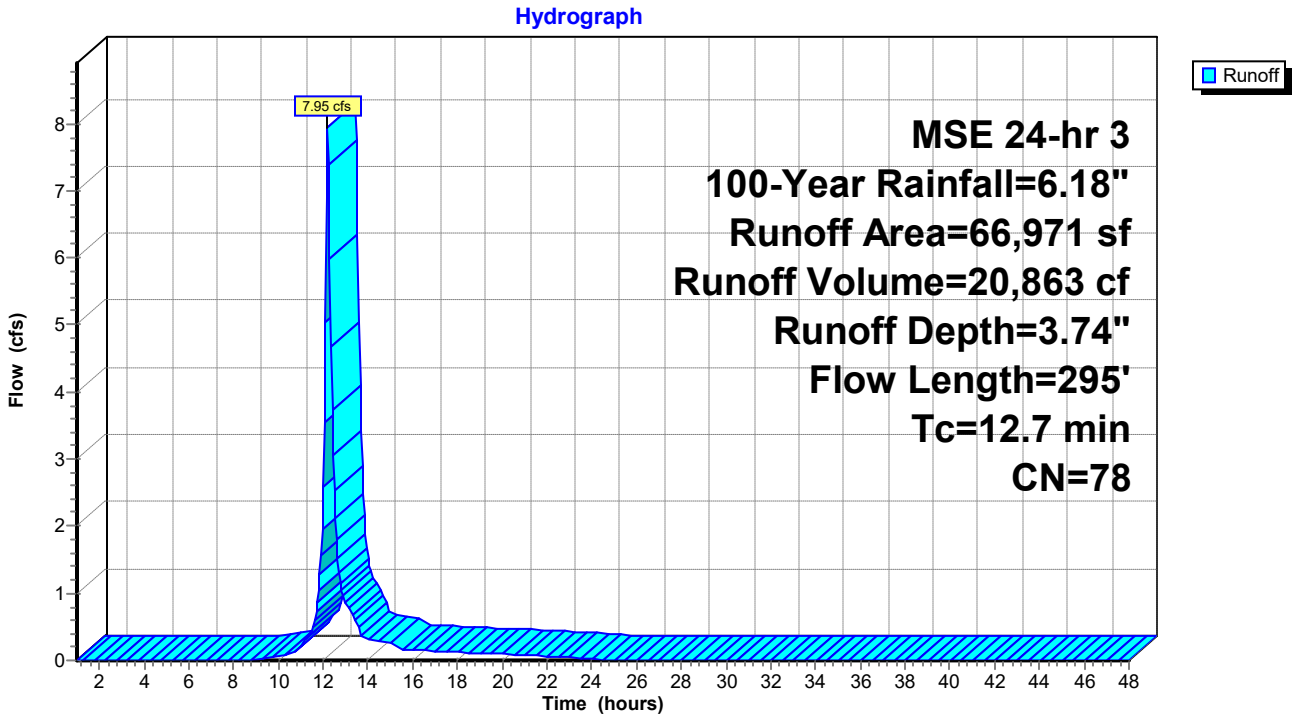
Runoff = 7.95 cfs @ 12.21 hrs, Volume= 20,863 cf, Depth= 3.74"
Routed to Pond 89P : Gravel North Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	56,727	74	PER
*	10,244	98	IMP
	66,971	78	Weighted Average
	56,727		84.70% Pervious Area
	10,244		15.30% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0269	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
2.7	195	0.0305	1.22		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
12.7	295	Total			

Subcatchment 8S: G



Summary for Subcatchment 9S: H

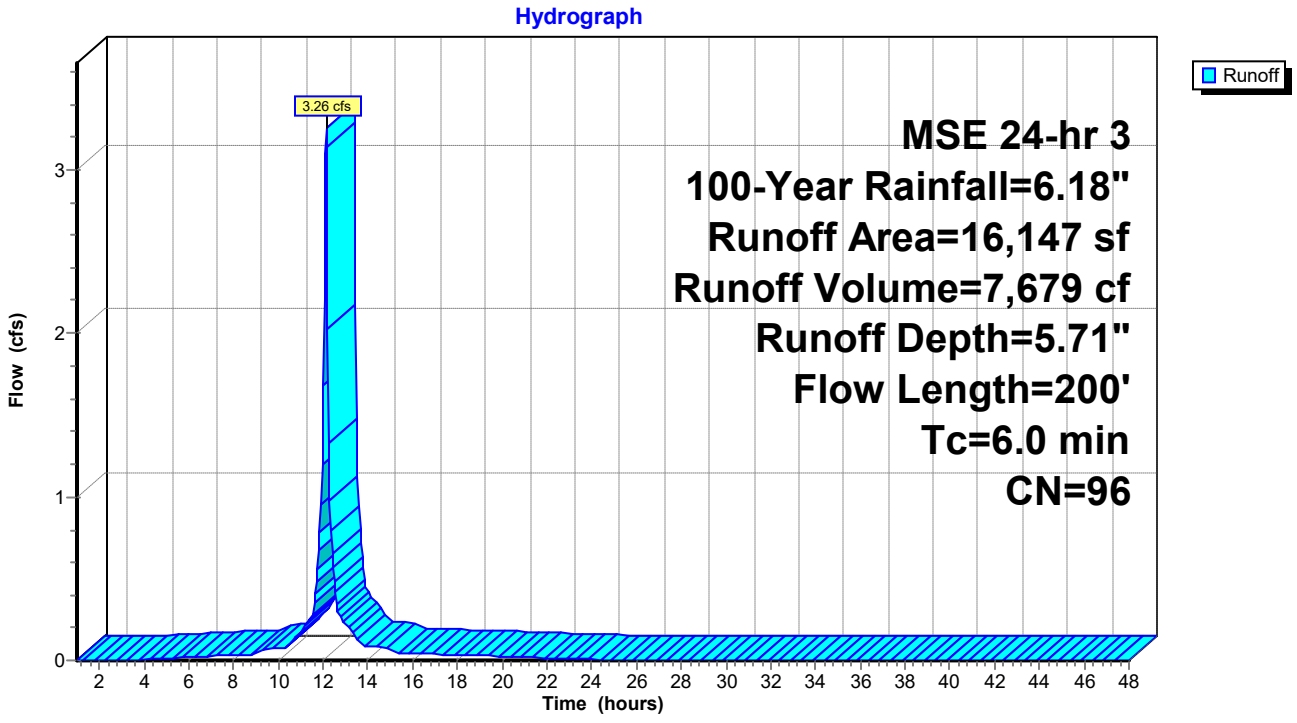
Runoff = 3.26 cfs @ 12.13 hrs, Volume= 7,679 cf, Depth= 5.71"
Routed to Pond 89P : Gravel North Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	1,084	74	PER
*	15,063	98	IMP
	16,147	96	Weighted Average
	1,084		6.71% Pervious Area
	15,063		93.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	100	0.0502	1.73		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 2.42"
0.5	100	0.0263	3.29		**Shallow Concentrated Flow, SCF** Paved Kv= 20.3 fps
1.5	200	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 9S: H



Summary for Subcatchment 10S: I

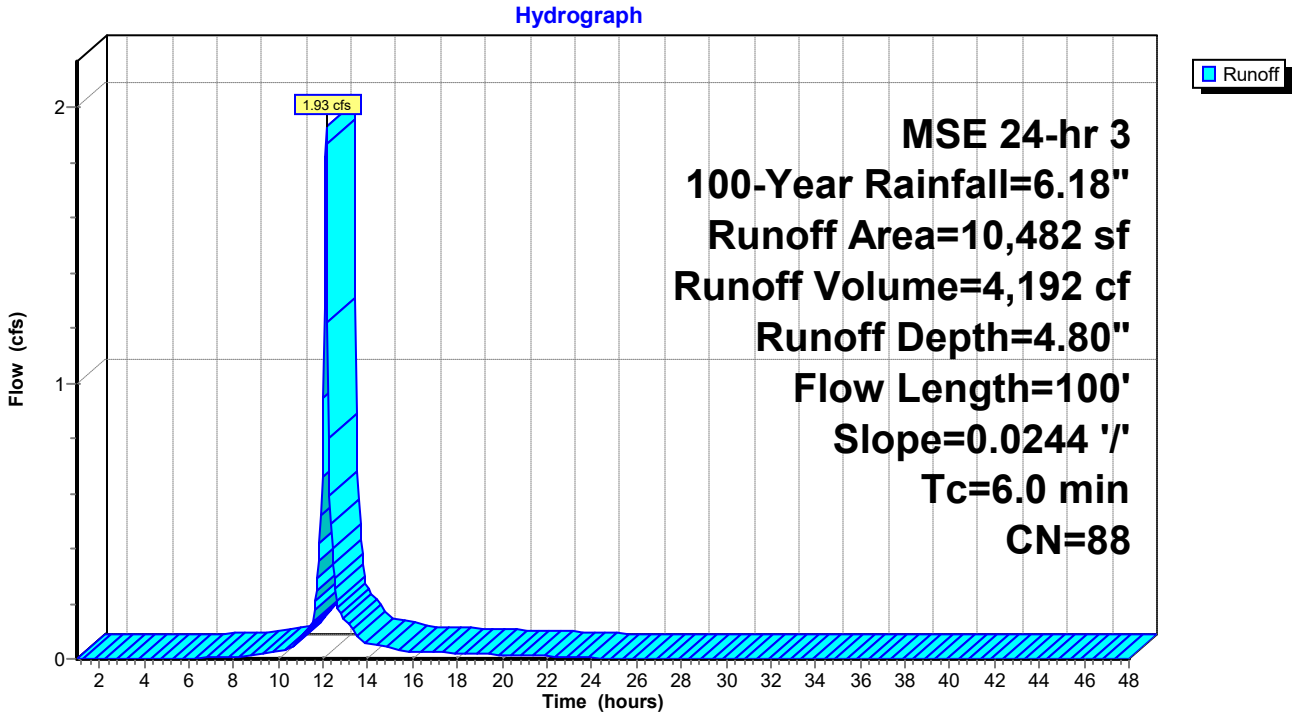
Runoff = 1.93 cfs @ 12.13 hrs, Volume= 4,192 cf, Depth= 4.80"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	4,275	74	PER
*	5,059	98	IMP
*	1,148	98	ROOF
	10,482	88	Weighted Average
	4,275		40.78% Pervious Area
	6,207		59.22% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	100	0.0244	1.30		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 2.42"
1.3	100	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 10S: I



Summary for Subcatchment 11S: J

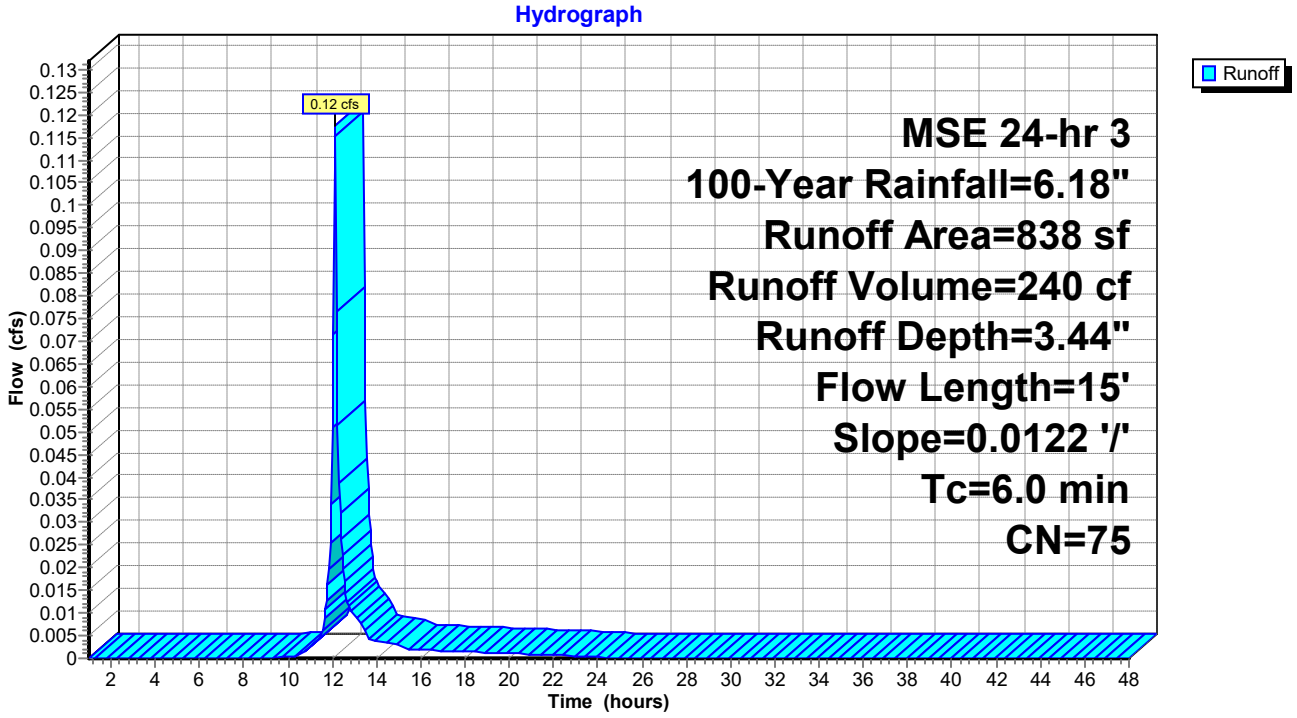
Runoff = 0.12 cfs @ 12.13 hrs, Volume= 240 cf, Depth= 3.44"
Routed to Link 32L : TOTAL OFFSITE UNTREATED

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	798	74	PER
*	40	98	IMP
	838	75	Weighted Average
	798		95.23% Pervious Area
	40		4.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.0	15	0.0122	0.08		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
3.0	15	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 11S: J



Summary for Subcatchment 12S: K

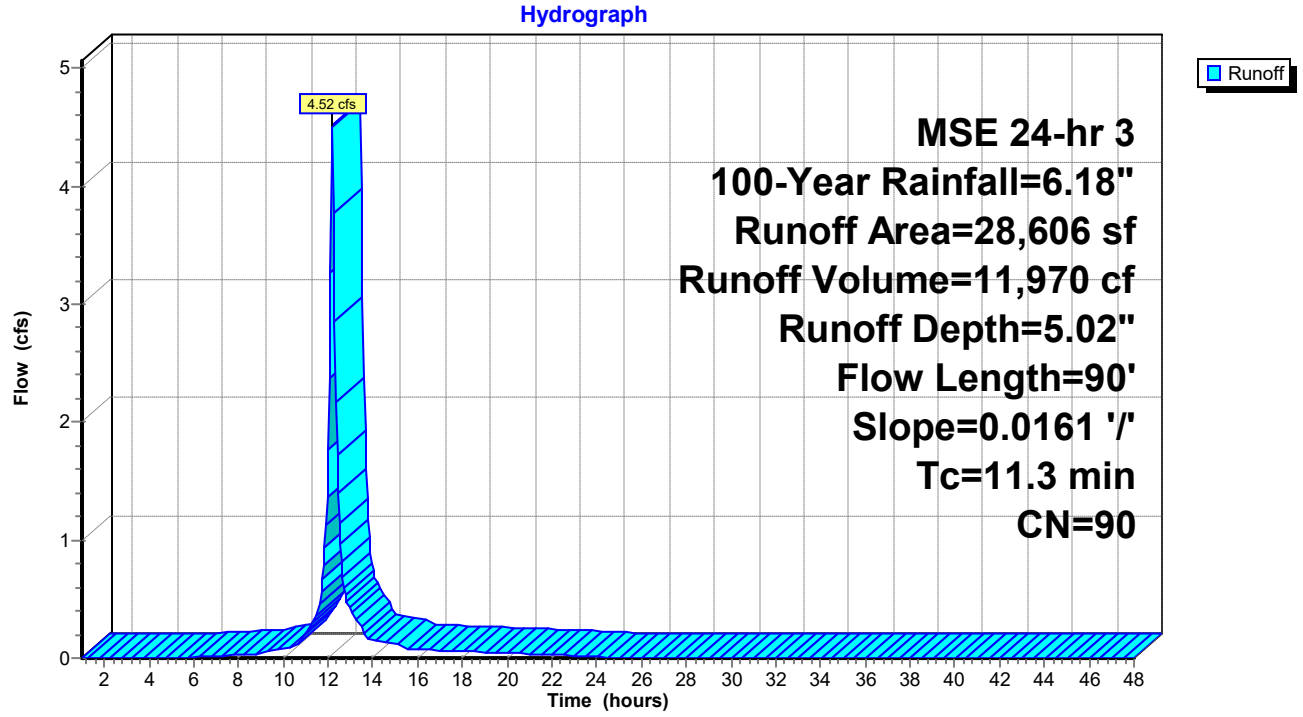
Runoff = 4.52 cfs @ 12.19 hrs, Volume= 11,970 cf, Depth= 5.02"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	9,600	74	PER
*	1,816	98	IMP
*	17,190	98	ROOF
	28,606	90	Weighted Average
	9,600		33.56% Pervious Area
	19,006		66.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.3	90	0.0161	0.13		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 12S: K



Summary for Subcatchment 13S: L

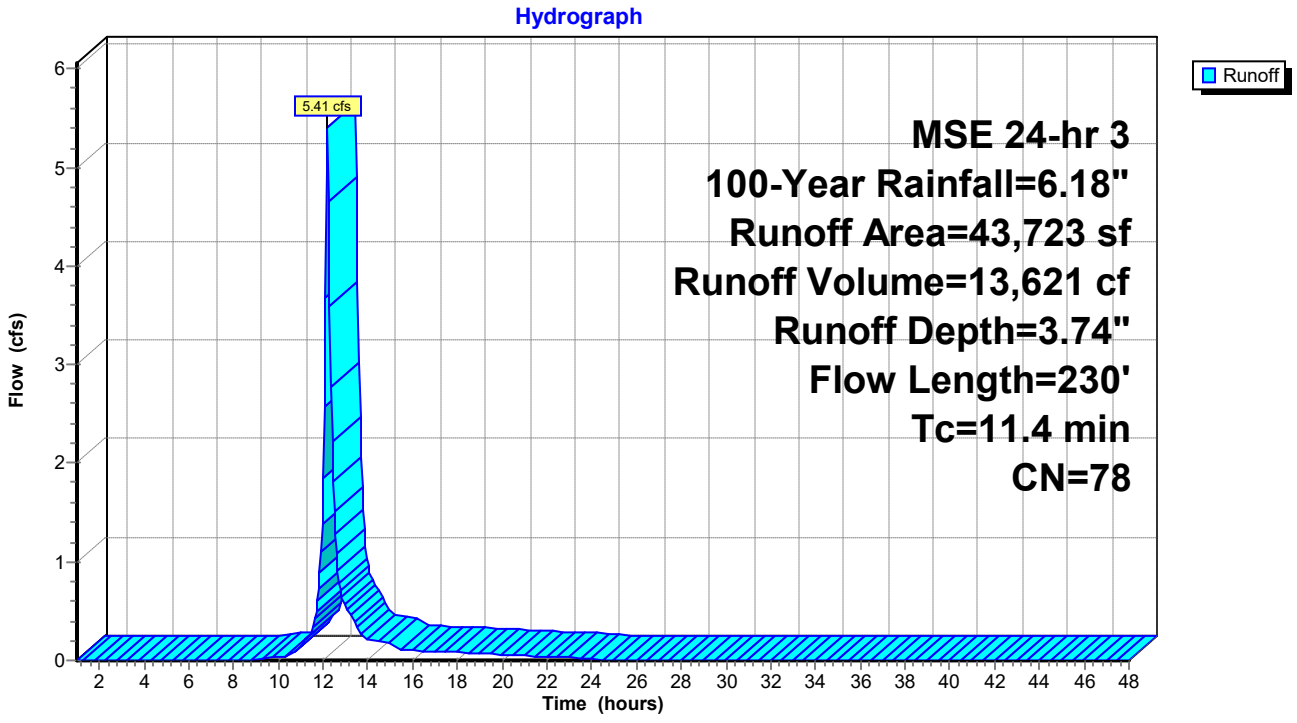
Runoff = 5.41 cfs @ 12.19 hrs, Volume= 13,621 cf, Depth= 3.74"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	36,454	74	PER
*	7,269	98	IMP
	43,723	78	Weighted Average
	36,454		83.37% Pervious Area
	7,269		16.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.5	100	0.0307	0.18		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
1.9	130	0.0267	1.14		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
11.4	230	Total			

Subcatchment 13S: L



Summary for Subcatchment 14S: M

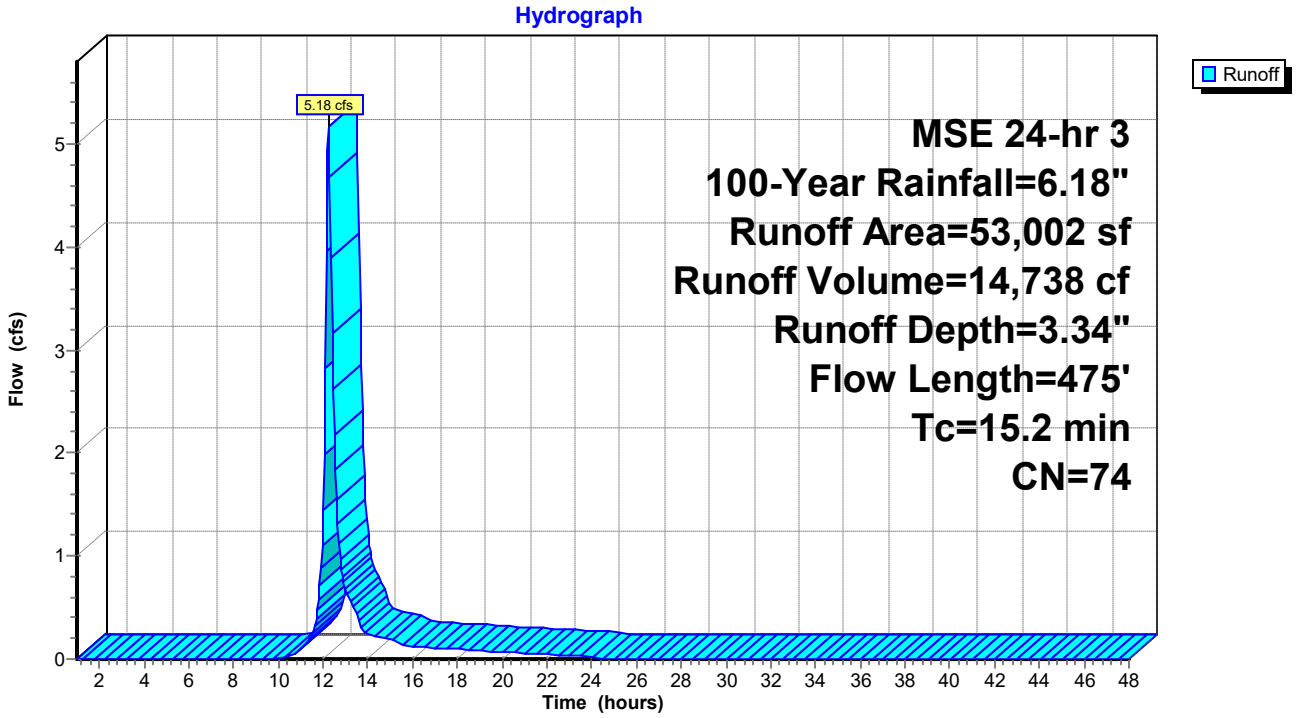
Runoff = 5.18 cfs @ 12.24 hrs, Volume= 14,738 cf, Depth= 3.34"
Routed to Pond 92P : Gravel South Depression

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	53,002	74	PER
	53,002		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.5	100	0.0403	0.20		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
6.7	375	0.0180	0.94		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
15.2	475	Total			

Subcatchment 14S: M



Summary for Subcatchment 15S: N

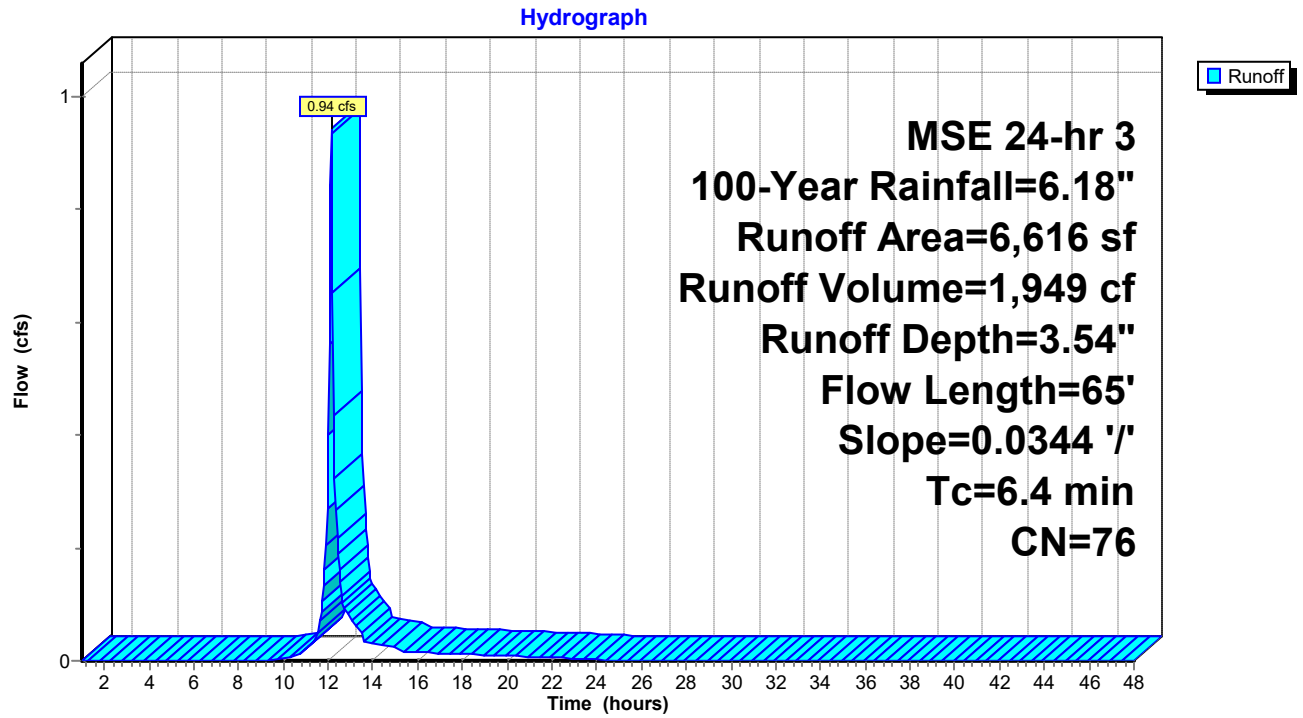
Runoff = 0.94 cfs @ 12.14 hrs, Volume= 1,949 cf, Depth= 3.54"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	6,111	74	PER
*	505	98	IMP
	6,616	76	Weighted Average
	6,111		92.37% Pervious Area
	505		7.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.4	65	0.0344	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 15S: N



Summary for Subcatchment 16S: O

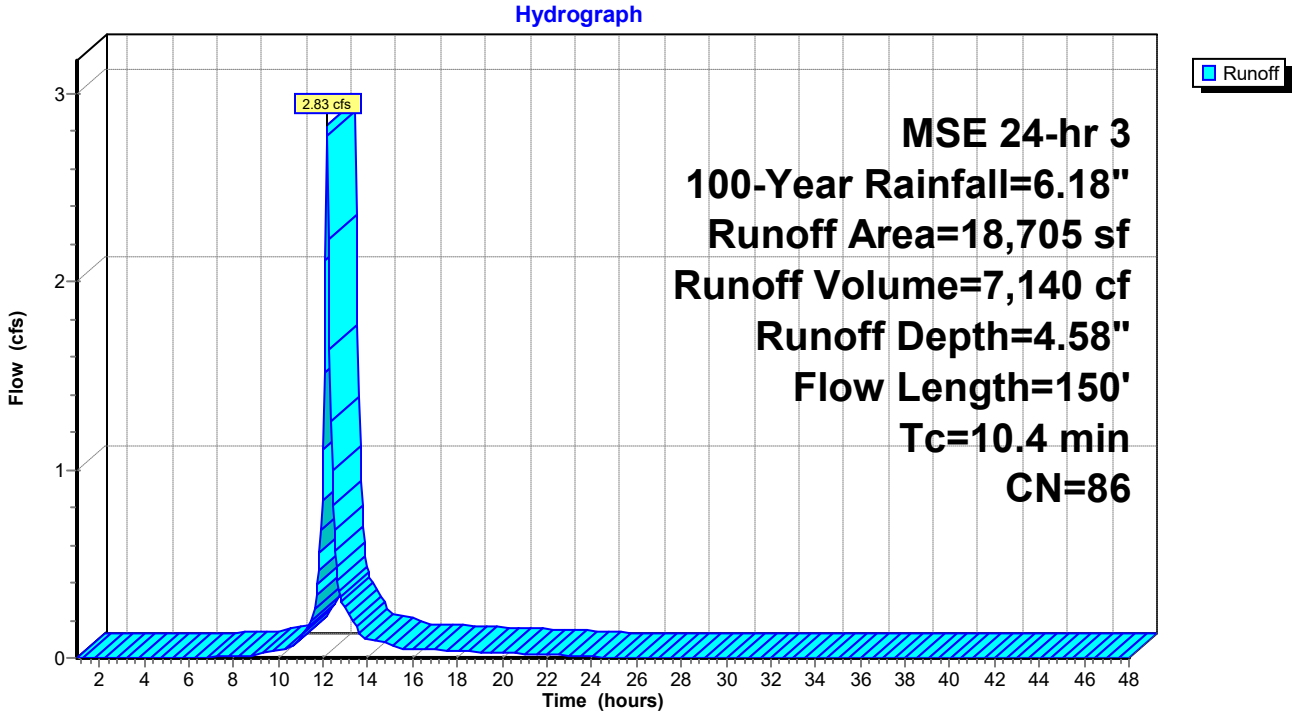
Runoff = 2.83 cfs @ 12.18 hrs, Volume= 7,140 cf, Depth= 4.58"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	9,468	74	PER
*	4,653	98	IMP
*	4,584	98	ROOF
	18,705	86	Weighted Average
	9,468		50.62% Pervious Area
	9,237		49.38% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.0274	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.5	50	0.0080	1.82		**Shallow Concentrated Flow, SCF** Paved Kv= 20.3 fps
10.4	150	Total			

Subcatchment 16S: O



Summary for Subcatchment 17S: P

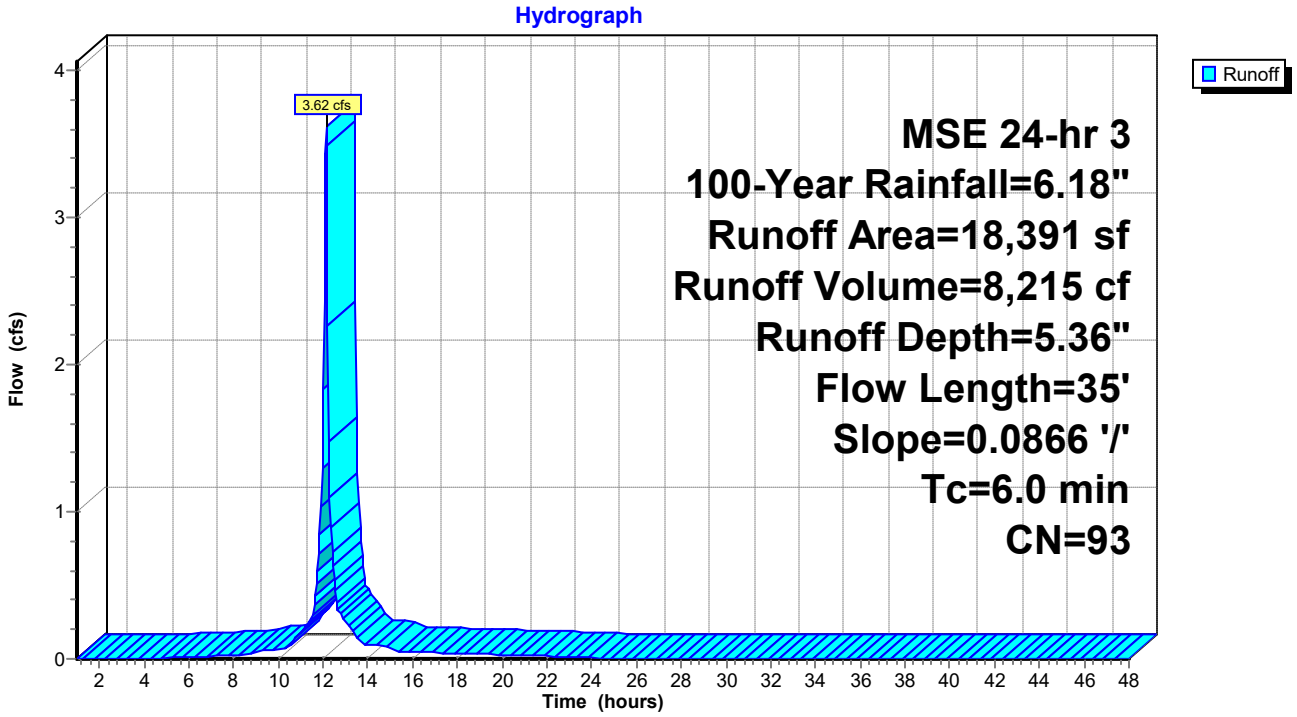
Runoff = 3.62 cfs @ 12.13 hrs, Volume= 8,215 cf, Depth= 5.36"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	3,636	74	PER
*	878	98	IMP
*	13,877	98	ROOF
	18,391	93	Weighted Average
	3,636		19.77% Pervious Area
	14,755		80.23% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.7	35	0.0866	0.22		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
2.7	35	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 17S: P



Summary for Subcatchment 18S: Q

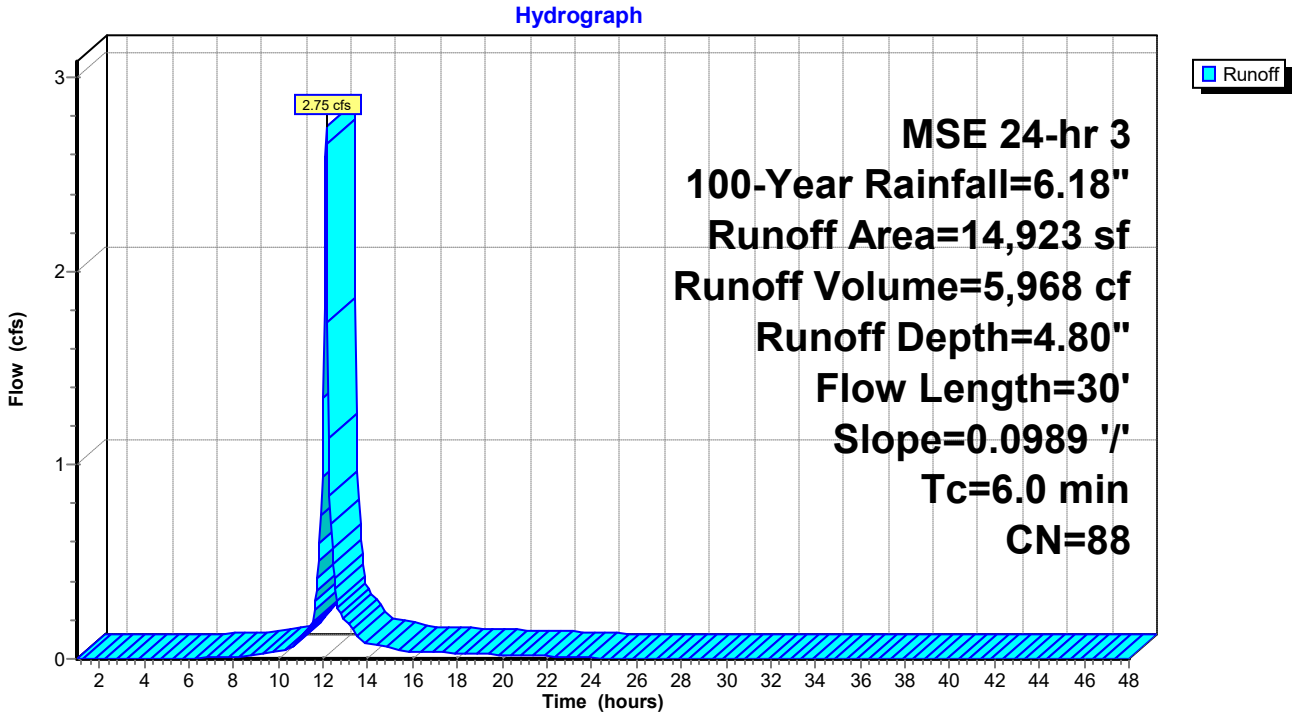
Runoff = 2.75 cfs @ 12.13 hrs, Volume= 5,968 cf, Depth= 4.80"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	6,396	74	PER
*	1,162	98	IMP
*	7,365	98	ROOF
	14,923	88	Weighted Average
	6,396		42.86% Pervious Area
	8,527		57.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.3	30	0.0989	0.22		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
2.3	30	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 18S: Q



Summary for Subcatchment 19S: R

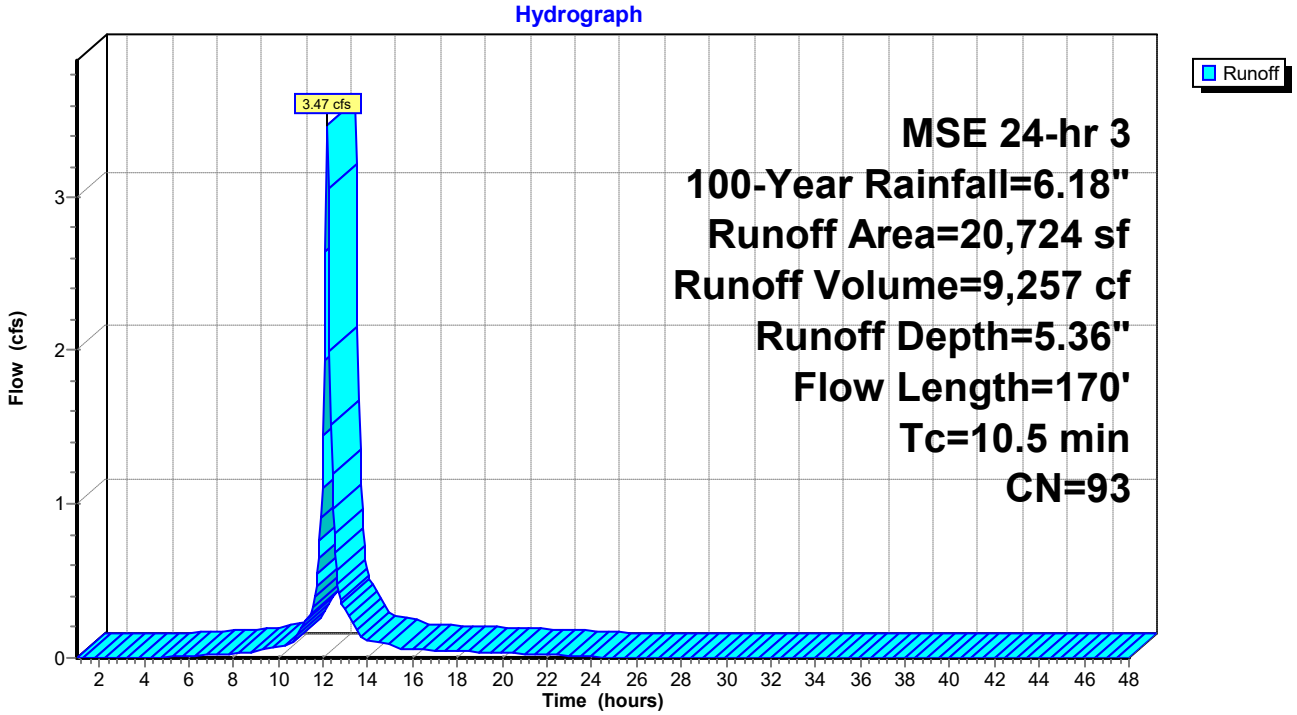
Runoff = 3.47 cfs @ 12.18 hrs, Volume= 9,257 cf, Depth= 5.36"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	4,279	74	PER
*	5,420	98	IMP
*	11,025	98	ROOF
	20,724	93	Weighted Average
	4,279		20.65% Pervious Area
	16,445		79.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0295	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.9	70	0.0320	1.25		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
10.5	170	Total			

Subcatchment 19S: R



Summary for Subcatchment 20S: S

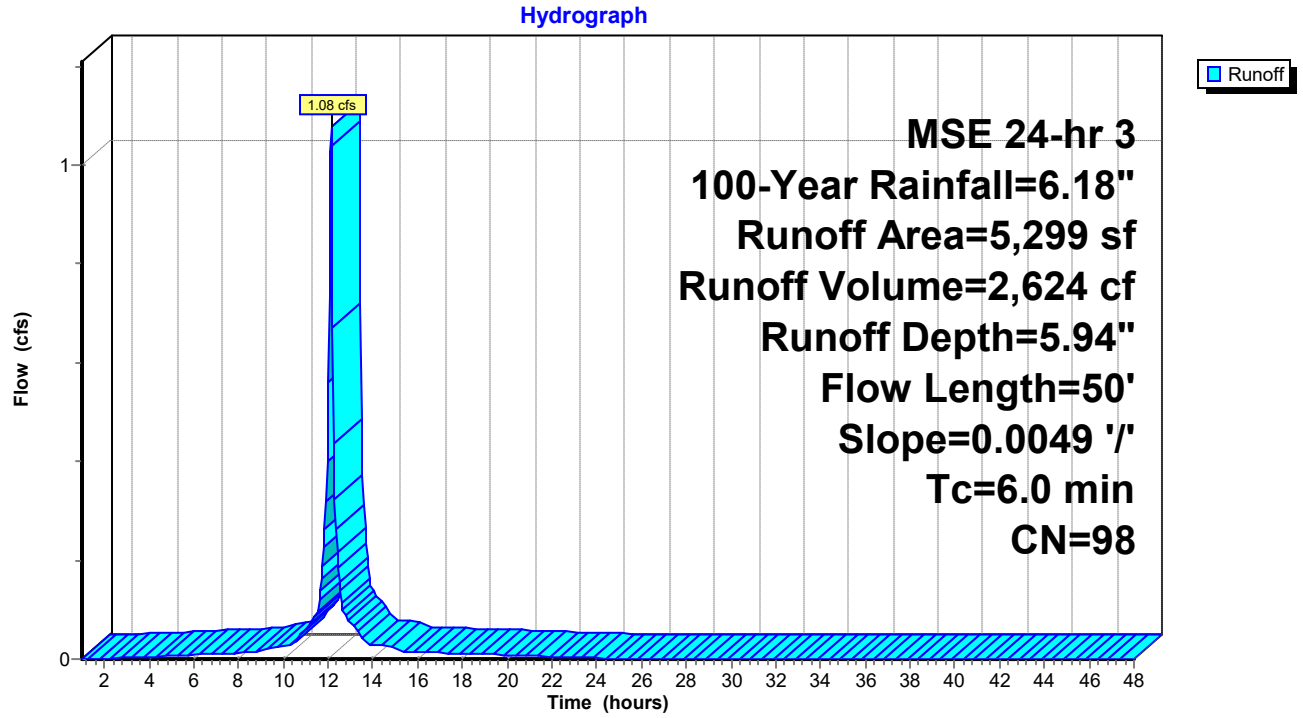
Runoff = 1.08 cfs @ 12.13 hrs, Volume= 2,624 cf, Depth= 5.94"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	808	98	IMP
*	4,491	98	ROOF
	5,299	98	Weighted Average
	5,299		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	50	0.0049	0.59		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 2.42"
1.4	50	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 20S: S



Summary for Subcatchment 21S: T

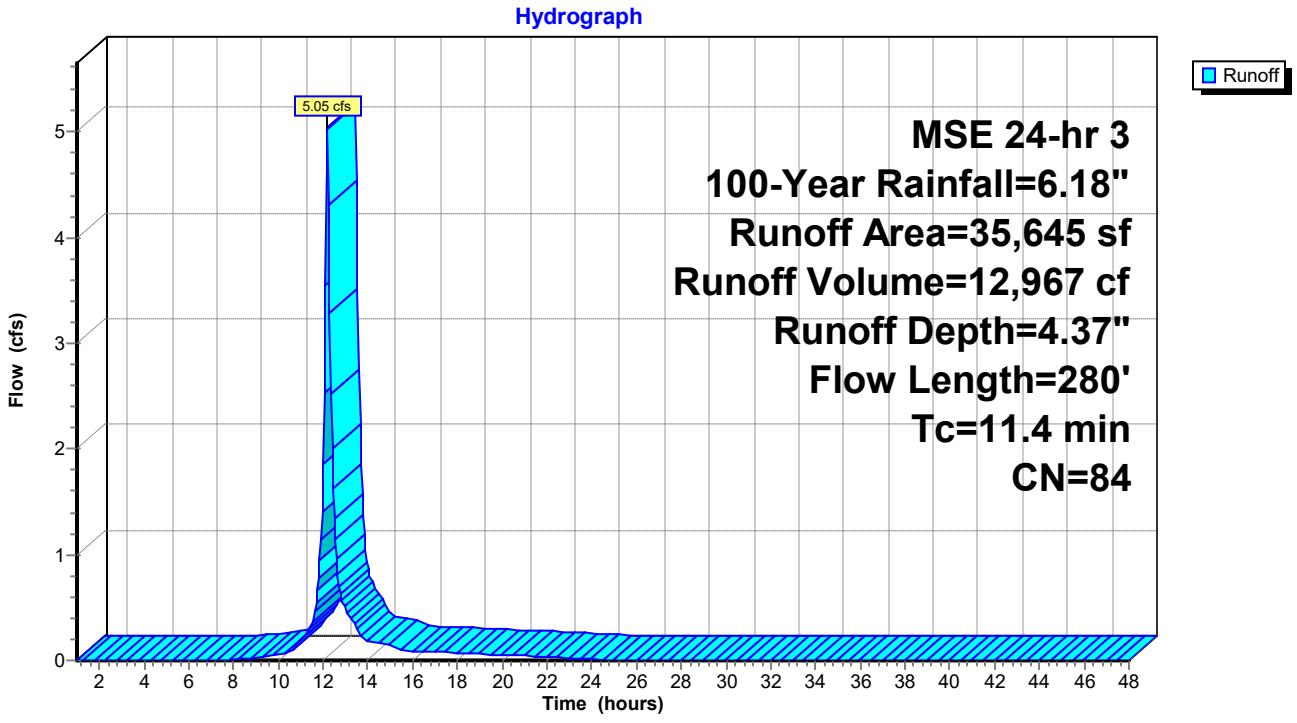
Runoff = 5.05 cfs @ 12.19 hrs, Volume= 12,967 cf, Depth= 4.37"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	21,454	74	PER
*	14,191	98	IMP
	35,645	84	Weighted Average
	21,454		60.19% Pervious Area
	14,191		39.81% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0	100	0.0272	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
1.4	180	0.0111	2.14		**Shallow Concentrated Flow, SCF** Paved Kv= 20.3 fps
11.4	280	Total			

Subcatchment 21S: T



Summary for Subcatchment 22S: U

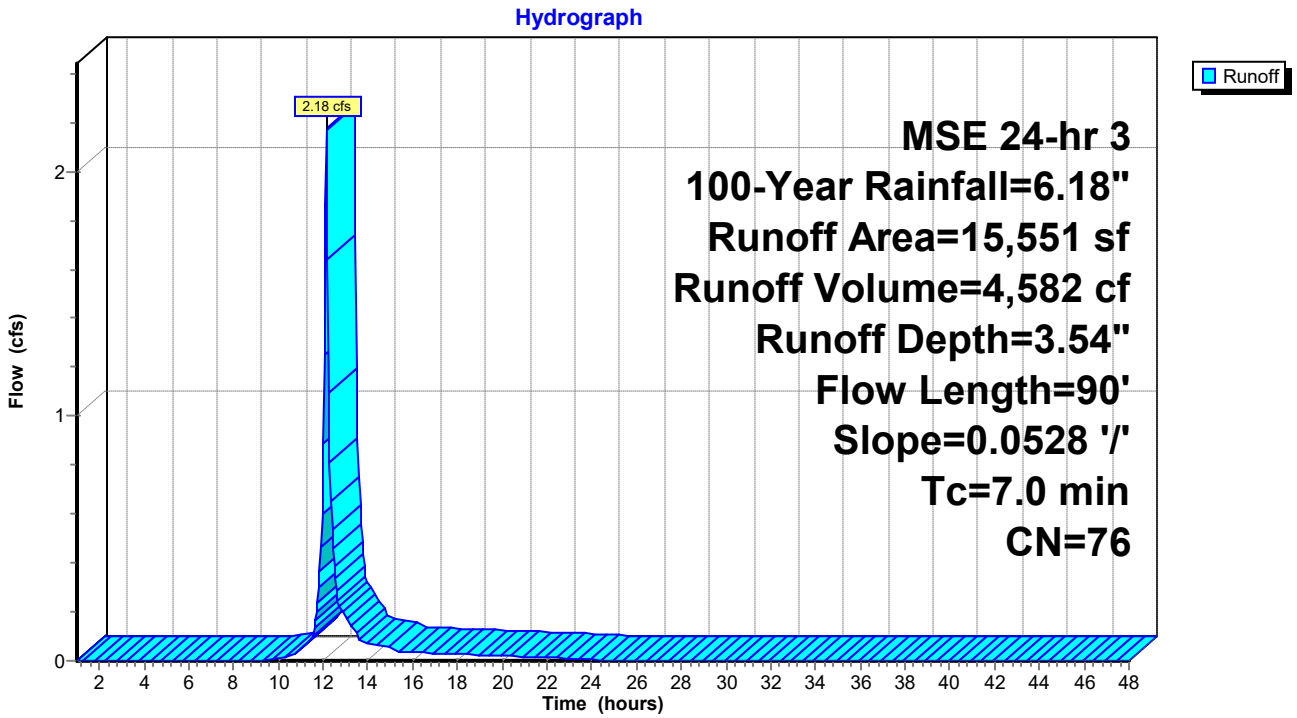
Runoff = 2.18 cfs @ 12.14 hrs, Volume= 4,582 cf, Depth= 3.54"
Routed to Link 32L : TOTAL OFFSITE UNTREATED

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	14,032	74	PER
*	1,519	98	IMP
	15,551	76	Weighted Average
	14,032		90.23% Pervious Area
	1,519		9.77% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0	90	0.0528	0.21		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 22S: U



Summary for Subcatchment 23S: V

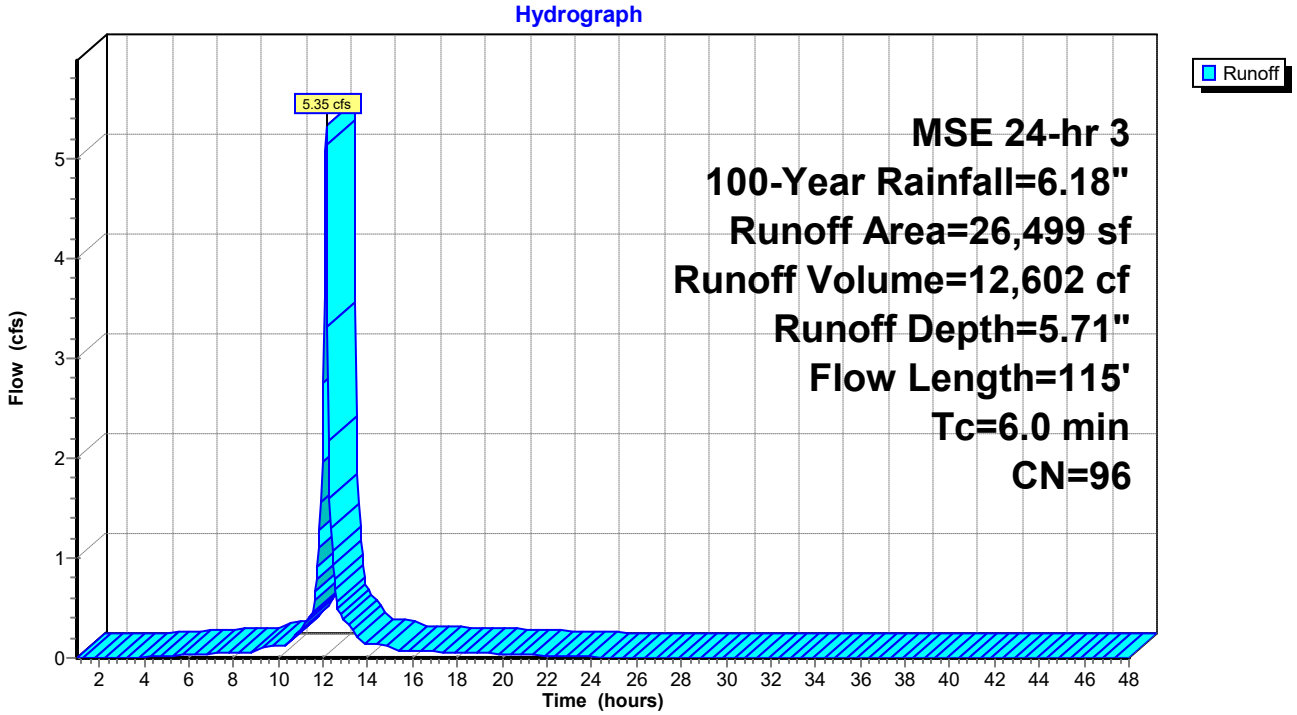
Runoff = 5.35 cfs @ 12.13 hrs, Volume= 12,602 cf, Depth= 5.71"
Routed to Link 75L : Areas Piped

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	2,290	74	PER
*	7,676	98	IMP
*	16,533	98	ROOF
	26,499	96	Weighted Average
	2,290		8.64% Pervious Area
	24,209		91.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	45	0.0345	0.16		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.9	70	0.0262	1.24		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 2.42"
5.7	115	Total, Increased to minimum Tc = 6.0 min			

Subcatchment 23S: V



Summary for Subcatchment 24S: W

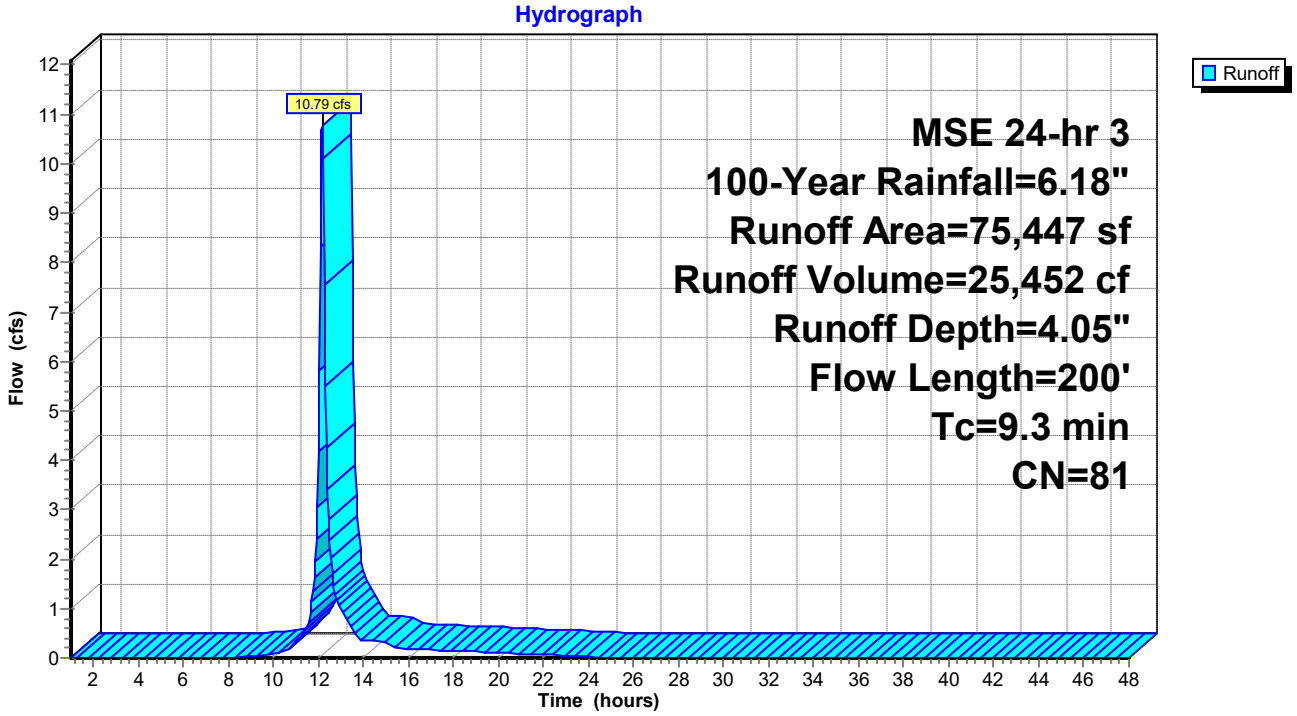
Runoff = 10.79 cfs @ 12.17 hrs, Volume= 25,452 cf, Depth= 4.05"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	54,767	74	PER
*	17,055	98	IMP
*	3,625	98	ROOF
	75,447	81	Weighted Average
	54,767		72.59% Pervious Area
	20,680		27.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.1	100	0.0458	0.21		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
1.2	100	0.0428	1.45		**Shallow Concentrated Flow, SF** Short Grass Pasture Kv= 7.0 fps
9.3	200	Total			

Subcatchment 24S: W



Summary for Subcatchment 25S: X

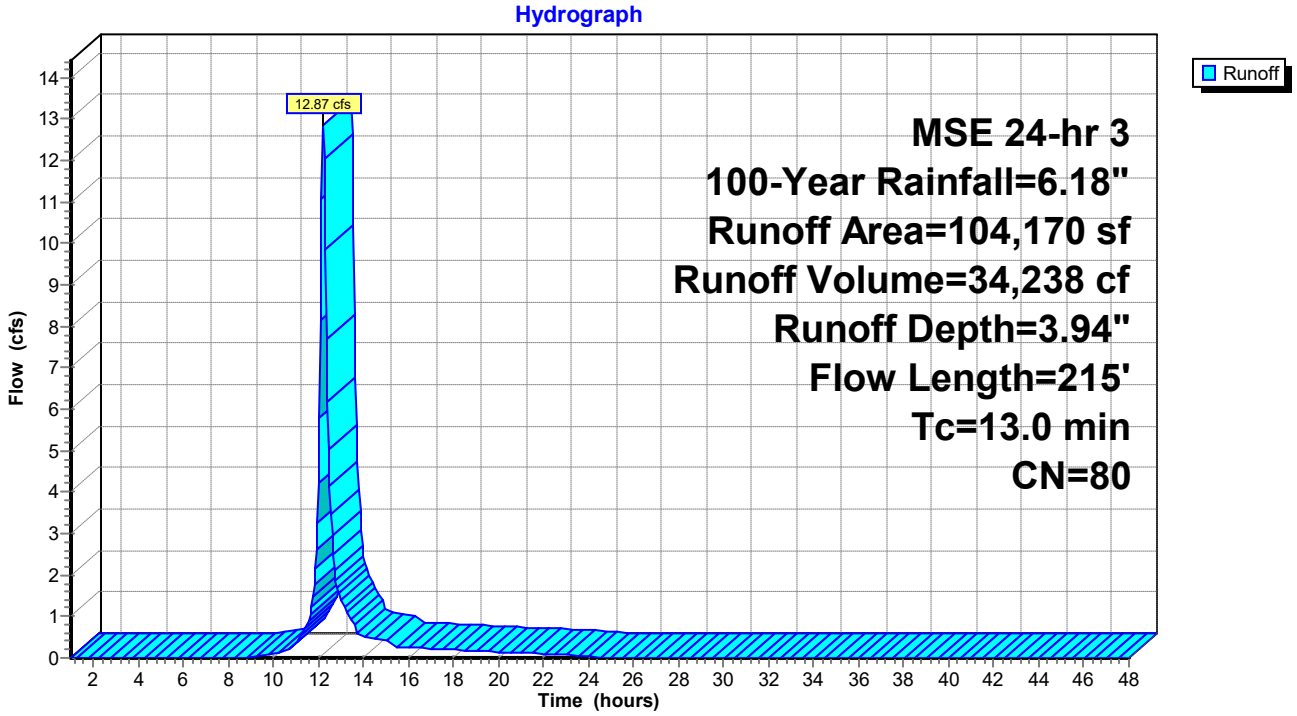
Runoff = 12.87 cfs @ 12.21 hrs, Volume= 34,238 cf, Depth= 3.94"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	79,699	74	PER
*	21,341	98	IMP
*	3,130	98	ROOF
	104,170	80	Weighted Average
	79,699		76.51% Pervious Area
	24,471		23.49% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.2	100	0.0205	0.15		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
1.8	115	0.0234	1.07		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
13.0	215	Total			

Subcatchment 25S: X



Summary for Subcatchment 26S: Y

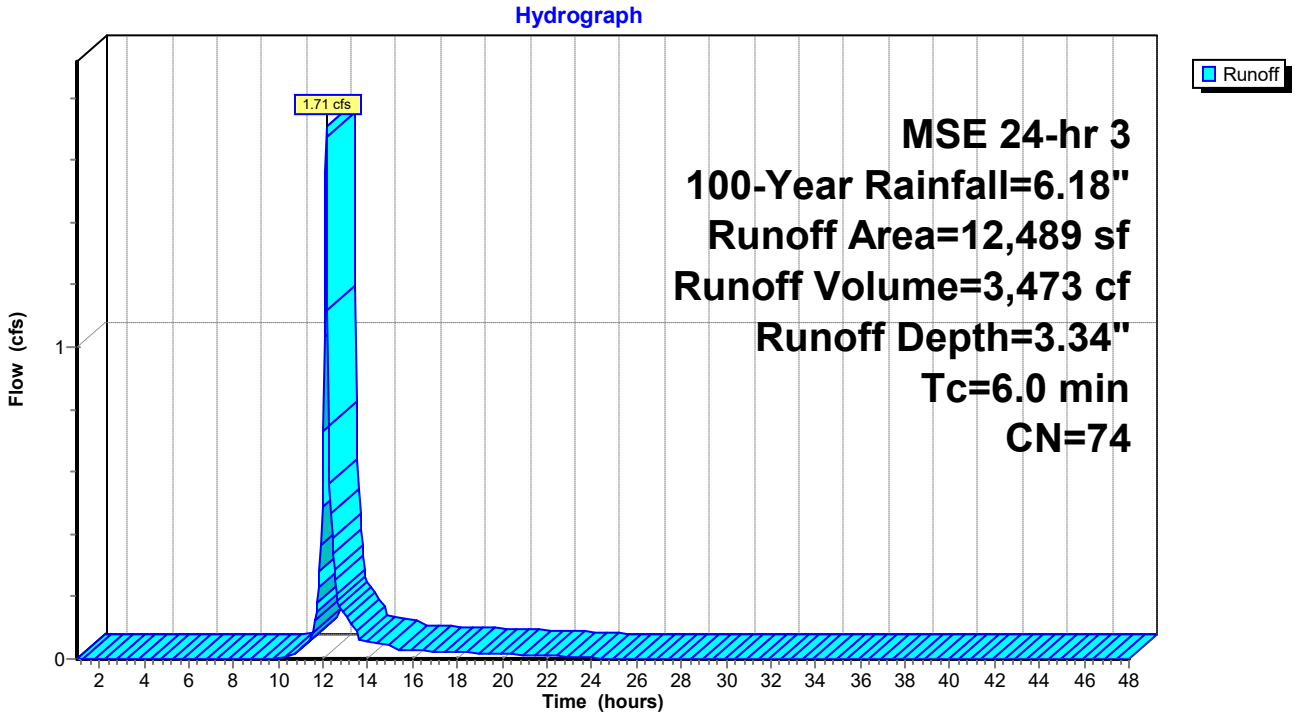
Runoff = 1.71 cfs @ 12.13 hrs, Volume= 3,473 cf, Depth= 3.34"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	12,489	74	PER
	12,489		100.00% Pervious Area

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

Subcatchment 26S: Y



Summary for Subcatchment 27S: Z

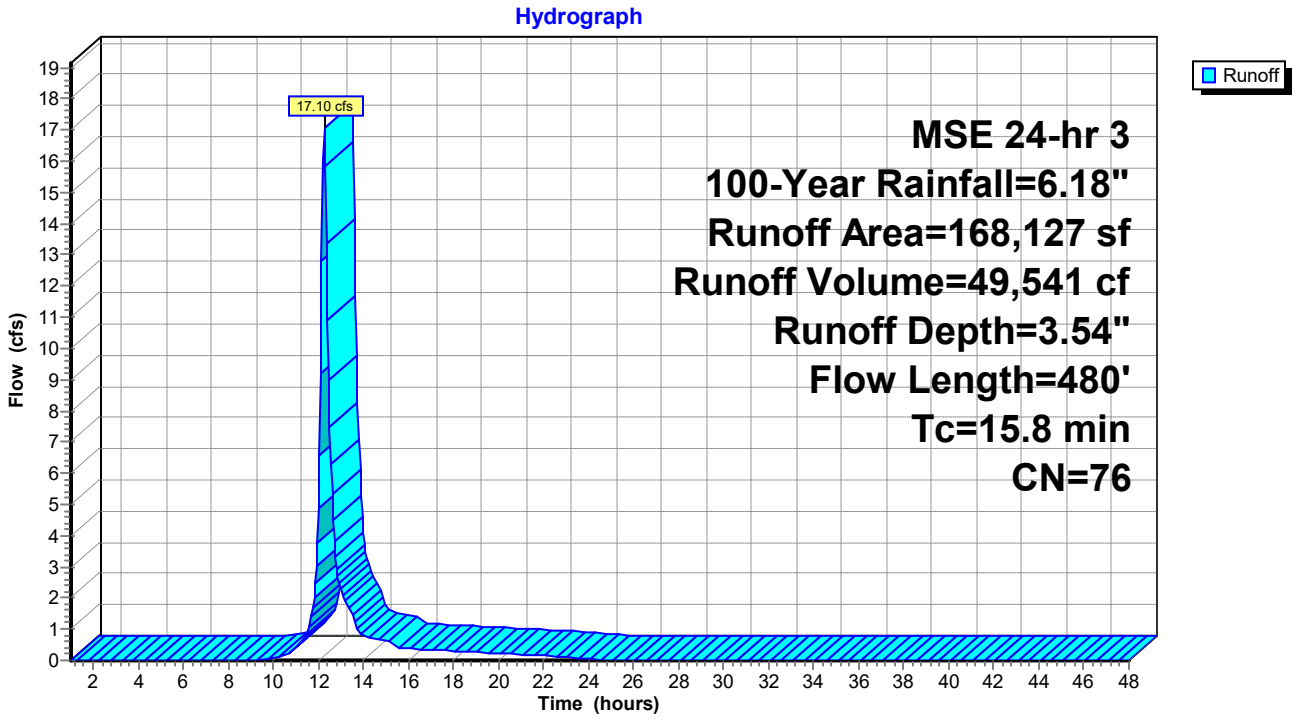
Runoff = 17.10 cfs @ 12.25 hrs, Volume= 49,541 cf, Depth= 3.54"
Routed to Pond 74P : Southwest Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	157,056	74	PER
*	11,071	98	IMP
	168,127	76	Weighted Average
	157,056		93.42% Pervious Area
	11,071		6.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0237	0.16		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
5.3	380	0.0291	1.19		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
15.8	480	Total			

Subcatchment 27S: Z



Summary for Subcatchment 67S: C2

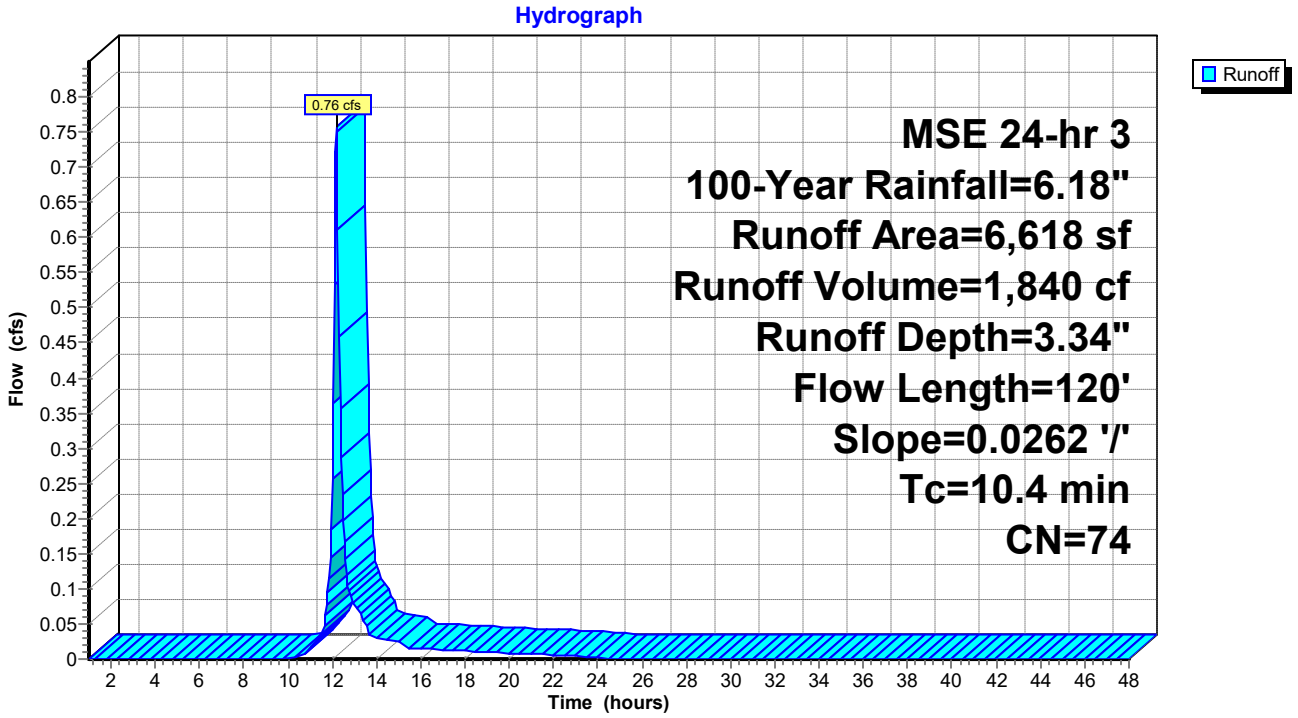
Runoff = 0.76 cfs @ 12.18 hrs, Volume= 1,840 cf, Depth= 3.34"
Routed to Link 80L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	6,618	74	PER
	6,618		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.1	100	0.0262	0.16		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
0.3	20	0.0262	1.13		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
10.4	120	Total			

Subcatchment 67S: C2



Summary for Subcatchment 68S: C4

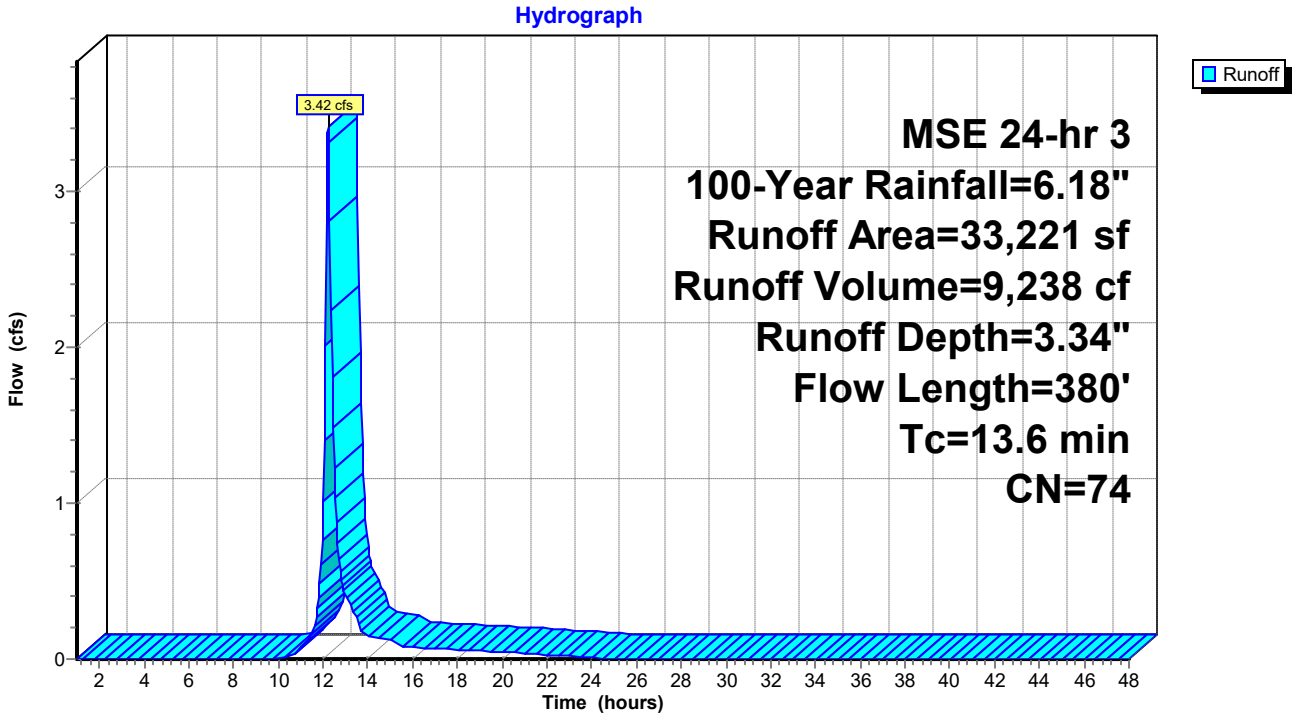
Runoff = 3.42 cfs @ 12.22 hrs, Volume= 9,238 cf, Depth= 3.34"
Routed to Reach 182R : EX. Red Barn Lane West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	33,221	74	PER
	33,221		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0319	0.18		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
4.3	280	0.0235	1.07		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
13.6	380	Total			

Subcatchment 68S: C4



Summary for Subcatchment 69S: C3

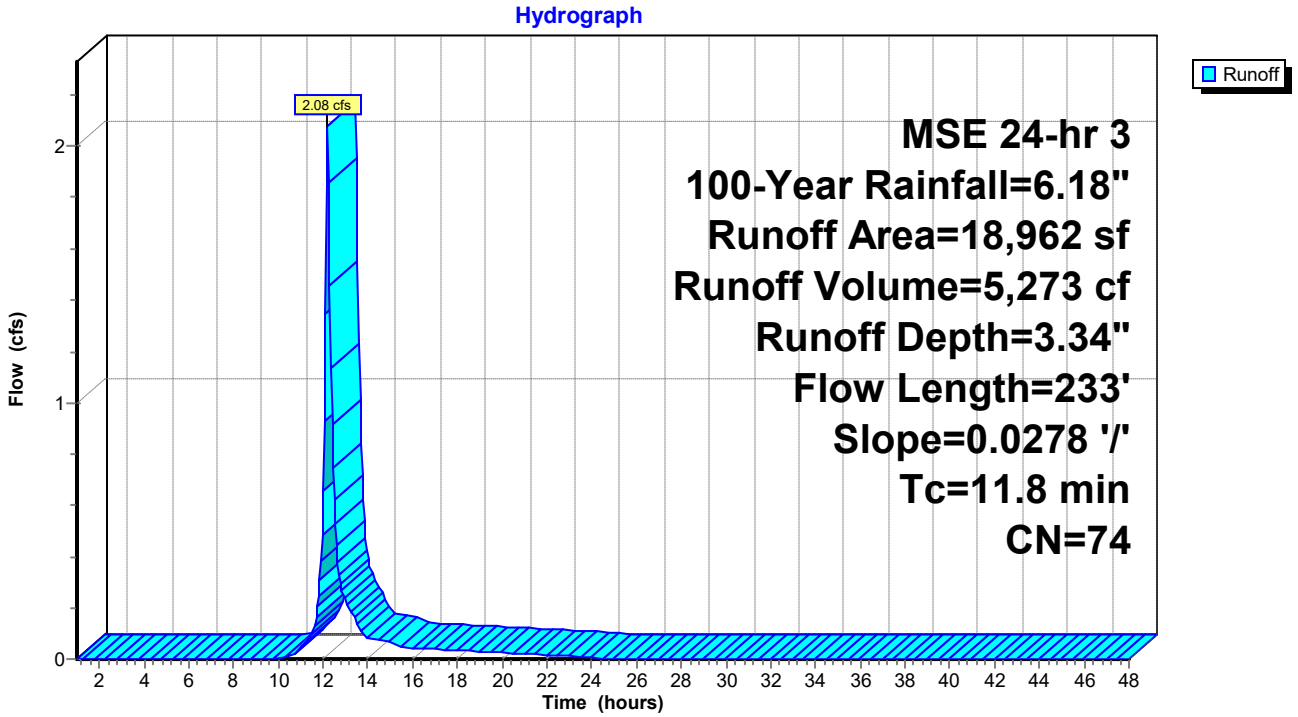
Runoff = 2.08 cfs @ 12.20 hrs, Volume= 5,273 cf, Depth= 3.34"
Routed to Link 78L : Swale on Lot 20

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	18,962	74	PER
	18,962		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9	100	0.0278	0.17		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
1.9	133	0.0278	1.17		**Shallow Concentrated Flow, SCF** Short Grass Pasture Kv= 7.0 fps
11.8	233	Total			

Subcatchment 69S: C3



Summary for Subcatchment 70S: O1

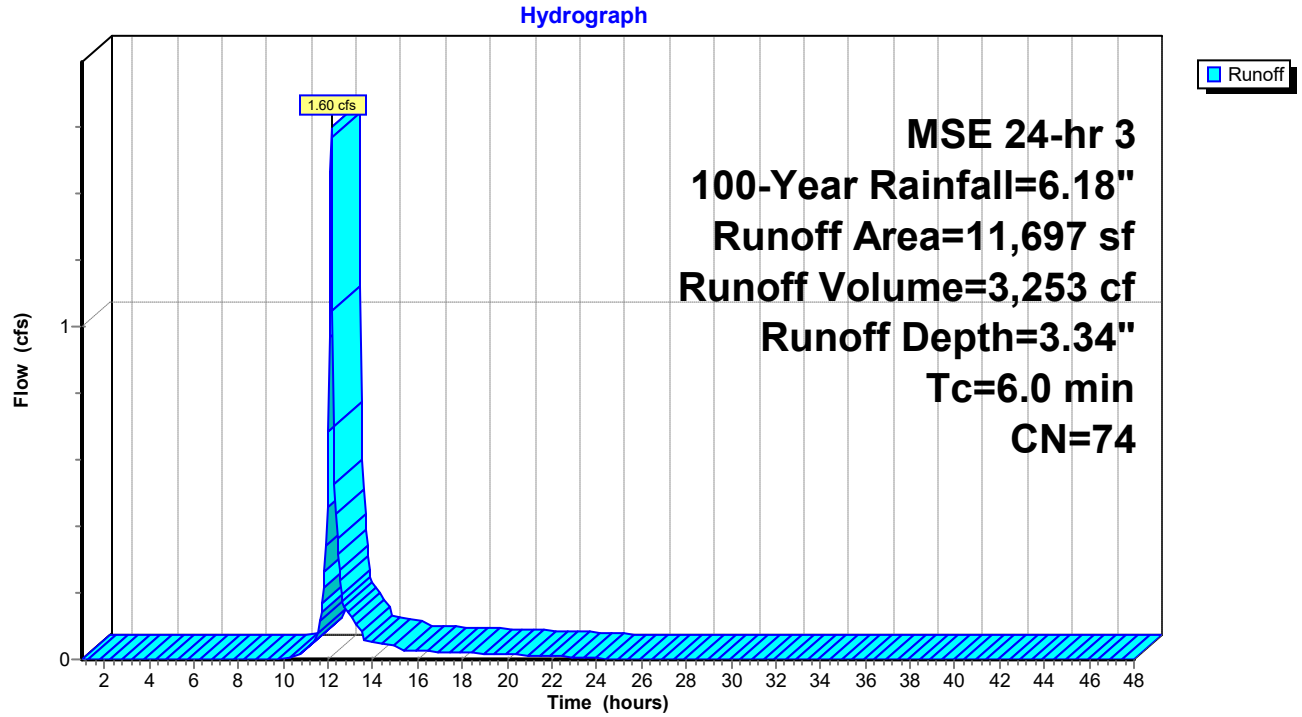
Runoff = 1.60 cfs @ 12.13 hrs, Volume= 3,253 cf, Depth= 3.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	11,697	74	PERV
	11,697		100.00% Pervious Area

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

Subcatchment 70S: O1



Summary for Subcatchment 71S: O2

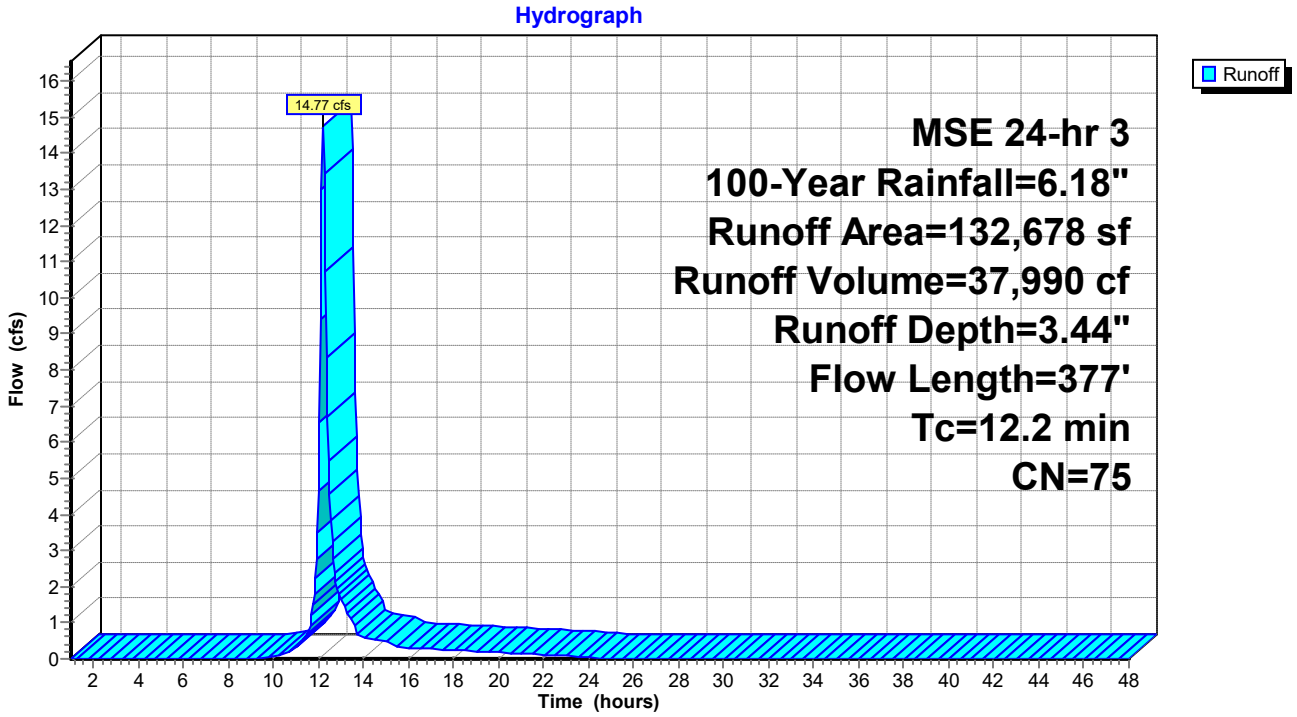
Runoff = 14.77 cfs @ 12.20 hrs, Volume= 37,990 cf, Depth= 3.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	129,638	74	PERV
*	3,040	98	IMPERV
	132,678	75	Weighted Average
	129,638		97.71% Pervious Area
	3,040		2.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	77	0.0288	0.16		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
4.3	300	0.0135	1.16		**Shallow Concentrated Flow, SHALLOW CONC** Nearly Bare & Untilled Kv= 10.0 fps
12.2	377	Total			

Subcatchment 71S: O2



Summary for Subcatchment 184S: Z1 (EX. RBL Area to RBL West Swale)

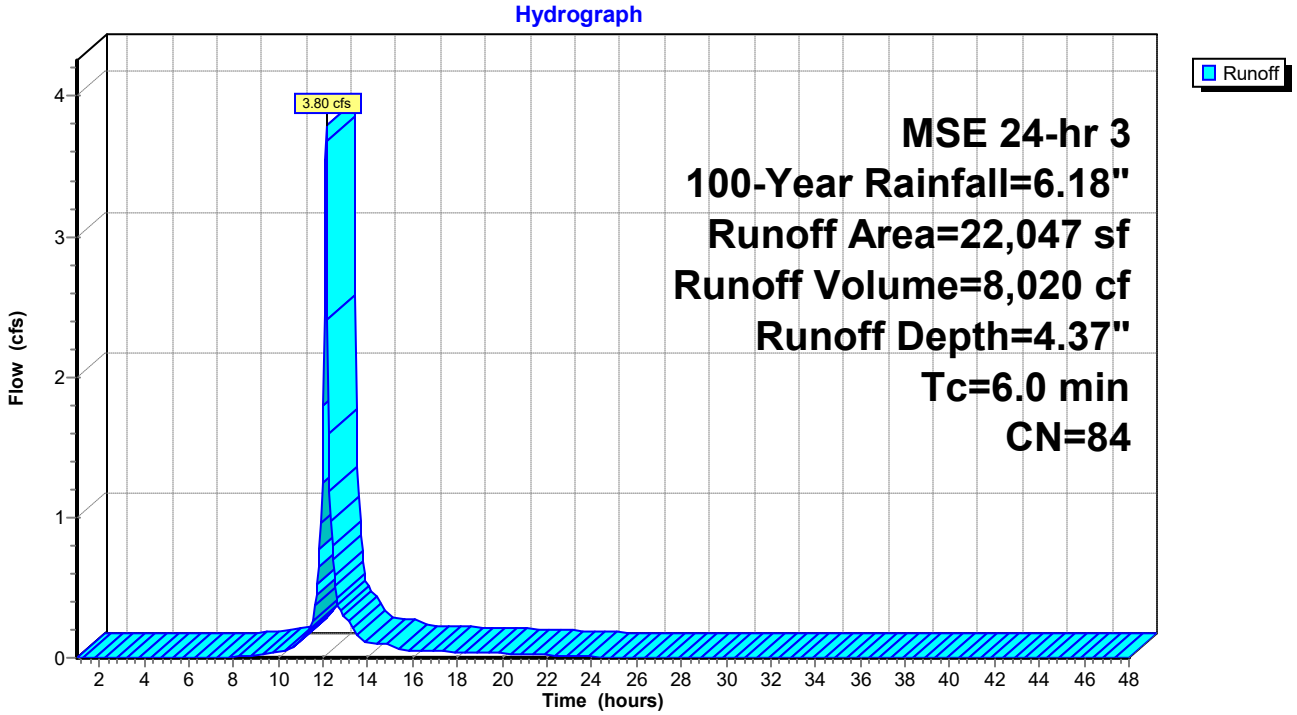
Runoff = 3.80 cfs @ 12.13 hrs, Volume= 8,020 cf, Depth= 4.37"
Routed to Reach 182R : EX. Red Barn Lane West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	12,014	74	landscape
*	9,160	98	road
*	873	74	landscape
	22,047	84	Weighted Average
	12,887		58.45% Pervious Area
	9,160		41.55% Impervious Area

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

Subcatchment 184S: Z1 (EX. RBL Area to RBL West Swale)



Summary for Reach 93R: Overland Flow from North Depression to South Depression

[43] Hint: Has no inflow (Outflow=Zero)

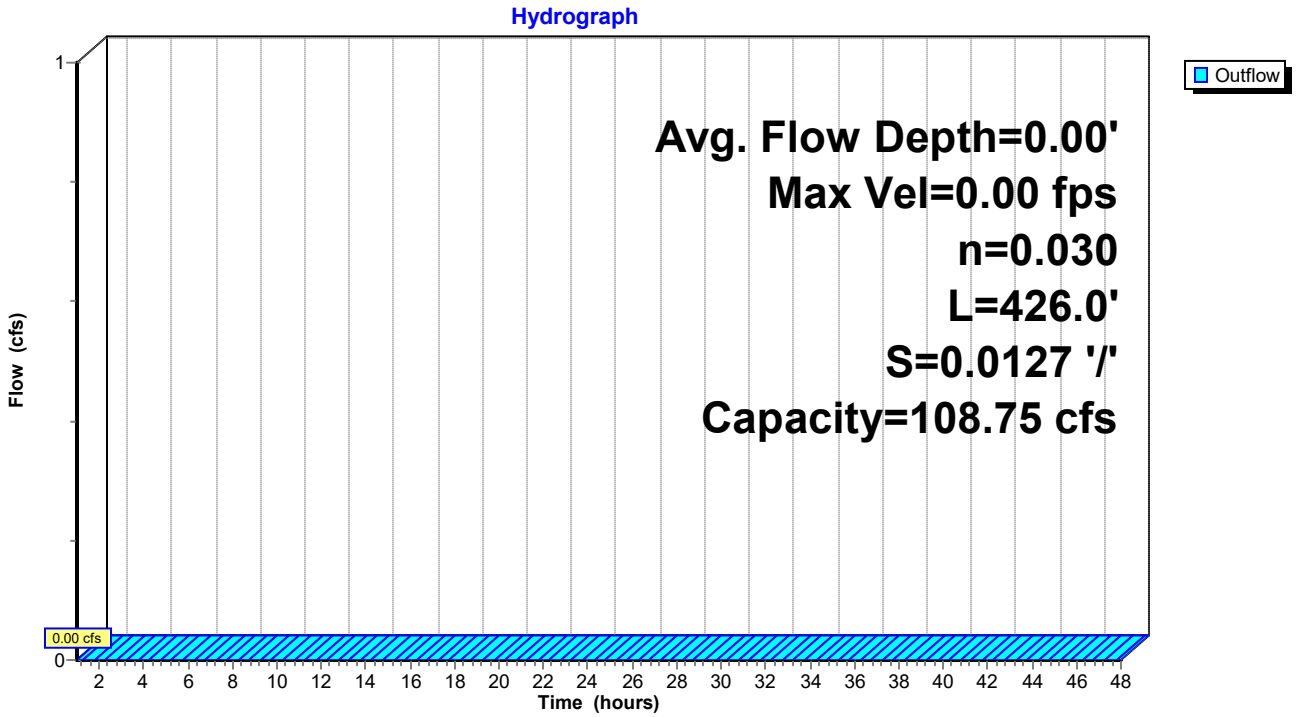
Bank-Full Depth= 0.50' Flow Area= 37.5 sf, Capacity= 108.75 cfs

50.00' x 0.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 50.0 '/' Top Width= 100.00'
Length= 426.0' Slope= 0.0127 '/'
Inlet Invert= 755.90', Outlet Invert= 750.50'



‡

Reach 93R: Overland Flow from North Depression to South Depression



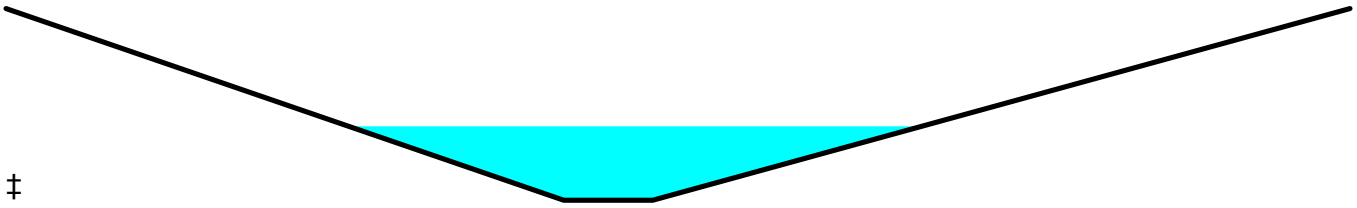
Summary for Reach 182R: EX. Red Barn Lane West Swale

Inflow Area = 79,613 sf, 11.51% Impervious, Inflow Depth = 3.62" for 100-Year event
Inflow = 9.25 cfs @ 12.16 hrs, Volume= 24,027 cf
Outflow = 8.75 cfs @ 12.20 hrs, Volume= 24,027 cf, Atten= 5%, Lag= 2.3 min
Routed to Link 79L : Swale Along Red Barn Ln.

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.89 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 1.19 fps, Avg. Travel Time= 8.5 min

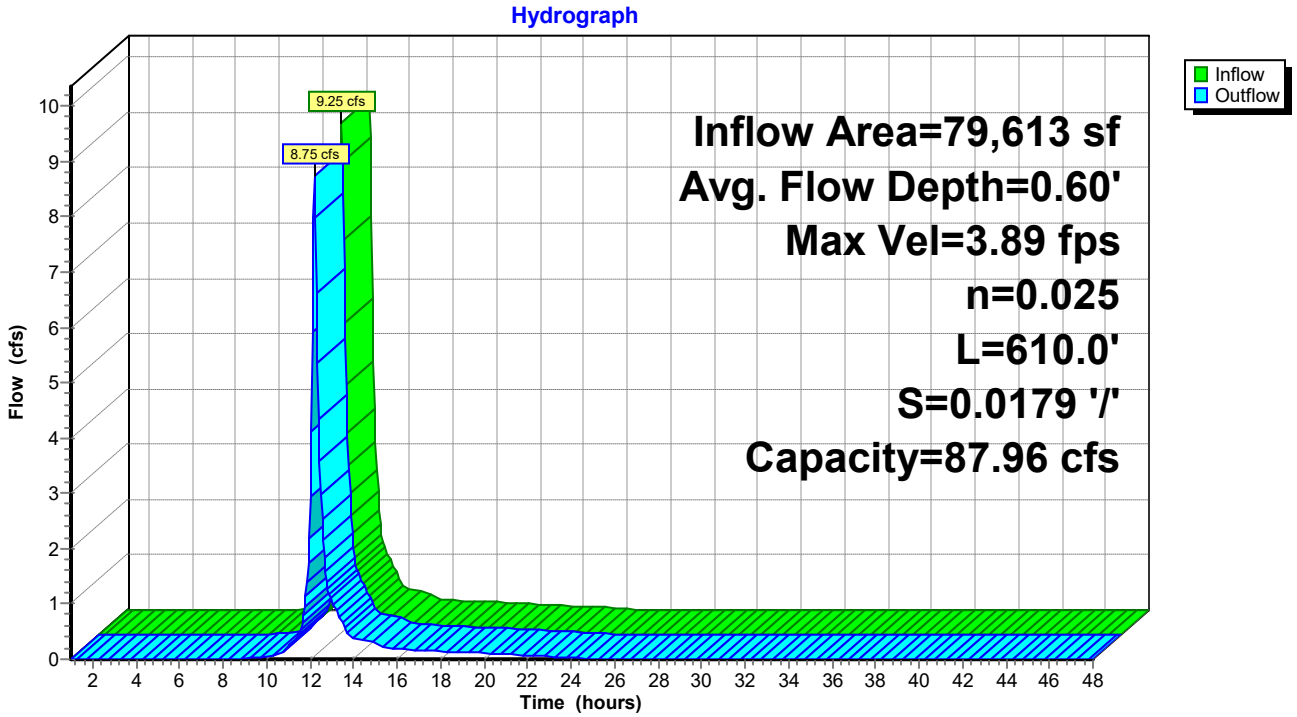
Peak Storage= 1,374 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.60' , Surface Width= 6.44'
Bank-Full Depth= 1.57' Flow Area= 12.7 sf, Capacity= 87.96 cfs

1.00' x 1.57' deep channel, n= 0.025
Side Slope Z-value= 4.0 5.0 '/' Top Width= 15.13'
Length= 610.0' Slope= 0.0179 '/'
Inlet Invert= 760.89', Outlet Invert= 750.00'



‡

Reach 182R: EX. Red Barn Lane West Swale



Summary for Pond 73P: Southeast Basin

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=26)

Inflow Area = 156,438 sf, 0.00% Impervious, Inflow Depth = 3.34" for 100-Year event
Inflow = 16.06 cfs @ 12.22 hrs, Volume= 43,501 cf
Outflow = 1.90 cfs @ 13.02 hrs, Volume= 43,514 cf, Atten= 88%, Lag= 47.7 min
Discarded = 1.90 cfs @ 13.02 hrs, Volume= 43,514 cf

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 732.44' @ 13.02 hrs Surf.Area= 14,433 sf Storage= 21,516 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 127.6 min (938.2 - 810.6)

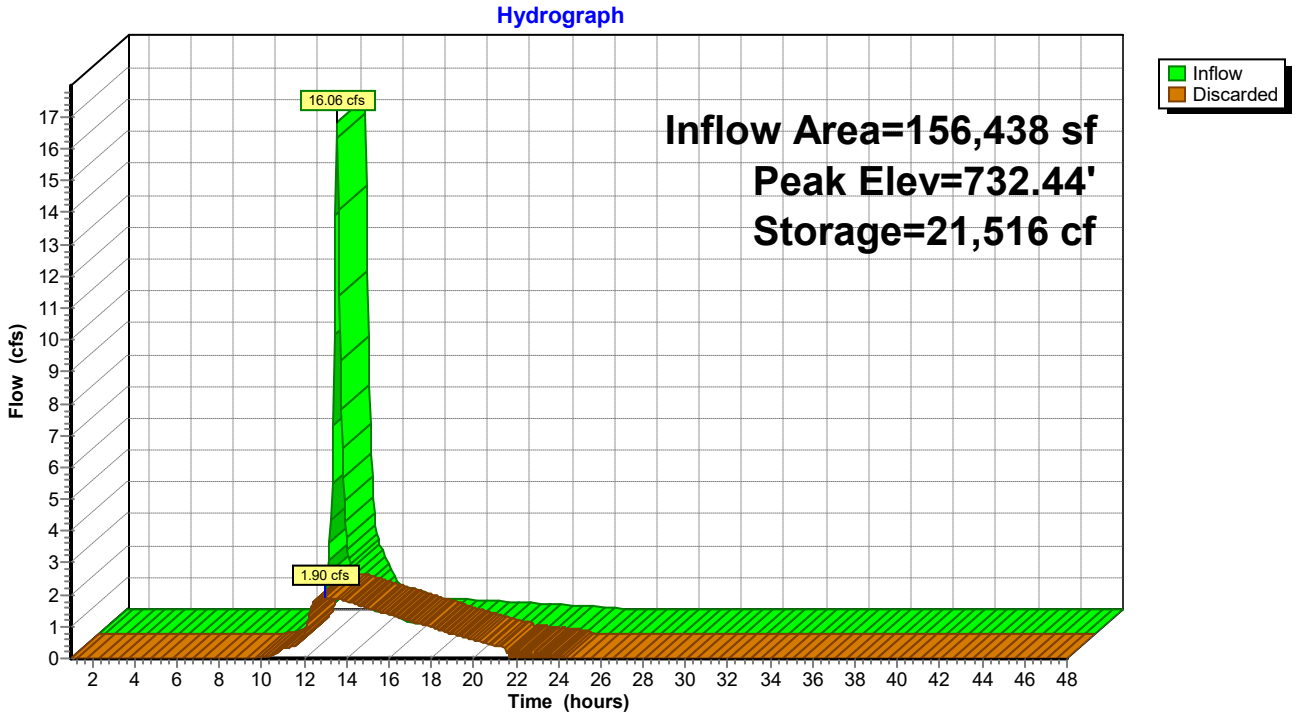
Volume	Invert	Avail.Storage	Storage Description
#1	730.00'	273,743 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
730.00	2,768	0	0
731.00	8,073	5,421	5,421
732.00	12,399	10,236	15,657
733.00	17,056	14,728	30,384
734.00	21,328	19,192	49,576
735.00	25,607	23,468	73,044
736.00	29,845	27,726	100,770
737.00	35,145	32,495	133,265
738.00	42,680	38,913	172,177
739.00	51,064	46,872	219,049
740.00	58,323	54,694	273,743

Device	Routing	Invert	Outlet Devices
#1	Discarded	730.00'	**5.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 720.00'

Discarded OutFlow Max=1.90 cfs @ 13.02 hrs HW=732.44' (Free Discharge)
1=Exfiltration (Controls 1.90 cfs)

Pond 73P: Southeast Basin



Summary for Pond 74P: Southwest Basin

Inflow Area = 432,562 sf, 19.07% Impervious, Inflow Depth = 3.84" for 100-Year event
Inflow = 49.96 cfs @ 12.20 hrs, Volume= 138,294 cf
Outflow = 7.02 cfs @ 12.81 hrs, Volume= 138,317 cf, Atten= 86%, Lag= 36.5 min
Discarded = 7.02 cfs @ 12.81 hrs, Volume= 138,317 cf

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 744.71' @ 12.81 hrs Surf.Area= 34,873 sf Storage= 68,323 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 115.0 min (915.6 - 800.6)

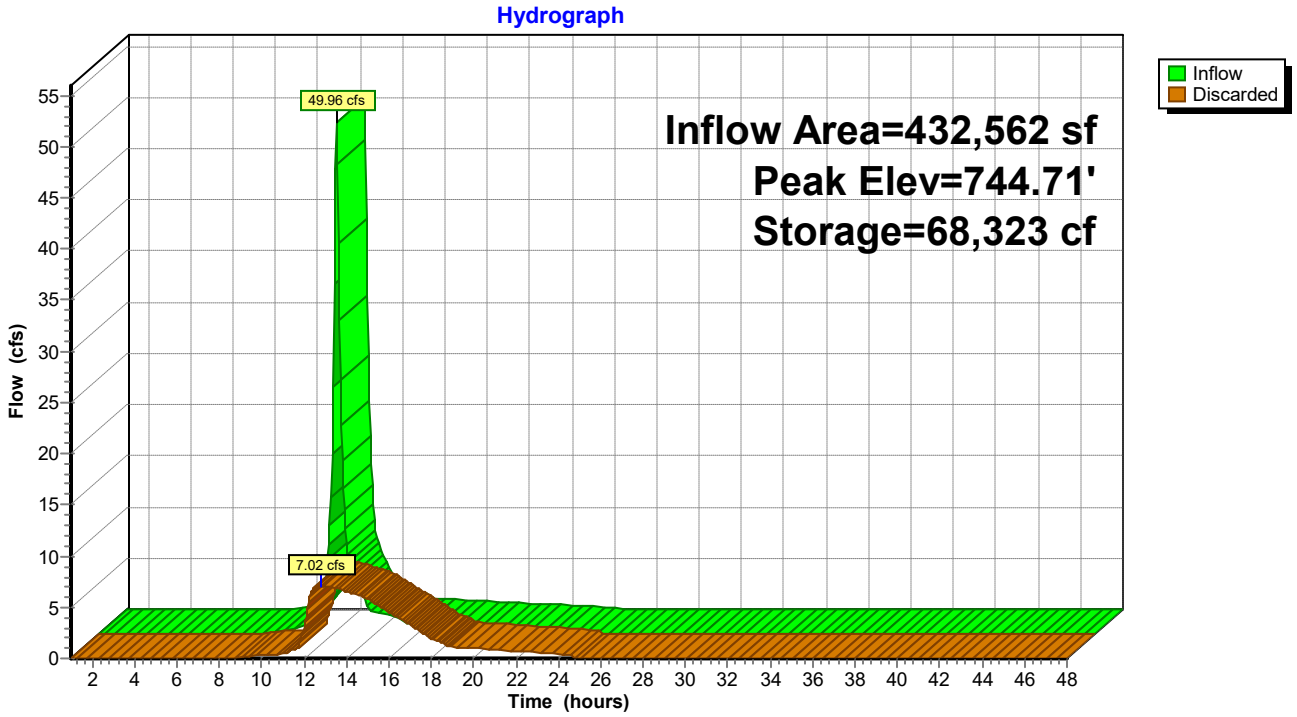
Volume	Invert	Avail.Storage	Storage Description
#1	740.00'	78,856 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
740.00	1,591	0	0
741.00	3,325	2,458	2,458
742.00	5,645	4,485	6,943
743.00	19,935	12,790	19,733
744.00	30,884	25,410	45,143
745.00	36,542	33,713	78,856

Device	Routing	Invert	Outlet Devices
#1	Discarded	740.00'	**8.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 720.00'

Discarded OutFlow Max=7.02 cfs @ 12.81 hrs HW=744.70' (Free Discharge)
1=Exfiltration (Controls 7.02 cfs)

Pond 74P: Southwest Basin



Summary for Pond 89P: Gravel North Depression

[93] Warning: Storage range exceeded by 1.40'
[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 248,526 sf, 21.47% Impervious, Inflow Depth = 3.84" for 100-Year event
Inflow = 30.93 cfs @ 12.18 hrs, Volume= 79,627 cf
Outflow = 31.21 cfs @ 12.18 hrs, Volume= 79,629 cf, Atten= 0%, Lag= 0.3 min
Discarded = 0.46 cfs @ 12.18 hrs, Volume= 12,195 cf
Primary = 1.79 cfs @ 12.77 hrs, Volume= 26,894 cf
Routed to Pond 92P : Gravel South Depression
Secondary = 29.09 cfs @ 12.18 hrs, Volume= 40,540 cf
Routed to Pond 92P : Gravel South Depression

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 757.40' @ 12.18 hrs Surf.Area= 1,161 sf Storage= 808 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 2.6 min (799.7 - 797.1)

Volume	Invert	Avail.Storage	Storage Description
#1	754.80'	808 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
754.80	237	0	0
755.50	725	337	337
756.00	1,161	472	808

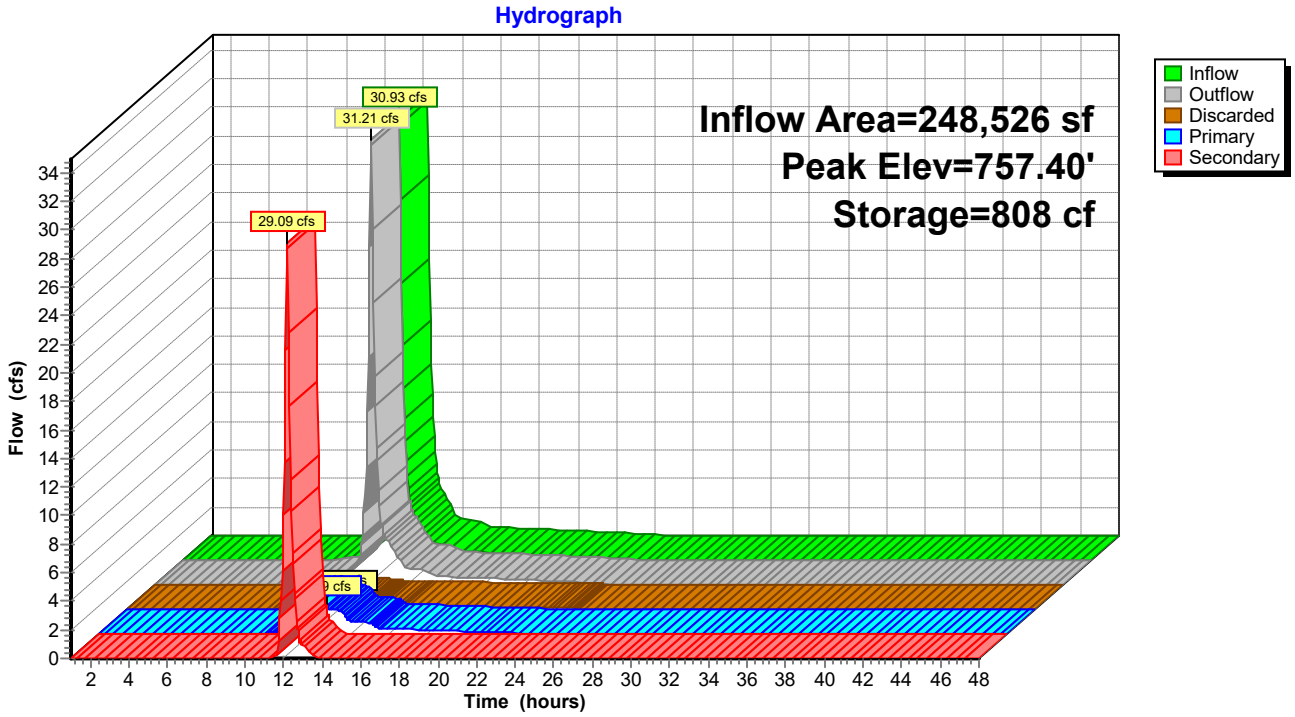
Device	Routing	Invert	Outlet Devices
#1	Primary	754.80'	**12.0" Round Culvert** L= 426.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 754.80' / 749.60' S= 0.0122 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 0.79 sf
#2	Secondary	755.80'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#3	Discarded	754.80'	**16.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 725.00'

Discarded OutFlow Max=0.46 cfs @ 12.18 hrs HW=757.37' (Free Discharge)
3=Exfiltration (Controls 0.46 cfs)

Primary OutFlow Max=1.78 cfs @ 12.77 hrs HW=756.05' TW=752.47' (Dynamic Tailwater)
1=Culvert (Outlet Controls 1.78 cfs @ 2.33 fps)

Secondary OutFlow Max=28.30 cfs @ 12.18 hrs HW=757.37' TW=753.79' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Weir Controls 28.30 cfs @ 3.60 fps)

Pond 89P: Gravel North Depression



Summary for Pond 92P: Gravel South Depression

[92] Warning: Device #1 is above defined storage
[93] Warning: Storage range exceeded by 1.83'
[90] Warning: Qout>Qin may require smaller dt or Finer Routing
[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=87)

Inflow Area = 301,528 sf, 17.70% Impervious, Inflow Depth = 3.27" for 100-Year event
Inflow = 35.49 cfs @ 12.19 hrs, Volume= 82,172 cf
Outflow = 35.65 cfs @ 12.19 hrs, Volume= 82,172 cf, Atten= 0%, Lag= 0.1 min
Primary = 35.54 cfs @ 12.19 hrs, Volume= 76,967 cf
Routed to Link 80L : EX. Cul-de-sac On Green Meadow Place
Secondary = 0.11 cfs @ 12.19 hrs, Volume= 5,206 cf
Routed to Link 80L : EX. Cul-de-sac On Green Meadow Place

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 753.83' @ 12.19 hrs Surf.Area= 253 sf Storage= 387 cf

Plug-Flow detention time= 3.8 min calculated for 82,085 cf (100% of inflow)
Center-of-Mass det. time= 3.9 min (788.4 - 784.5)

Volume	Invert	Avail.Storage	Storage Description
#1	749.60'	387 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

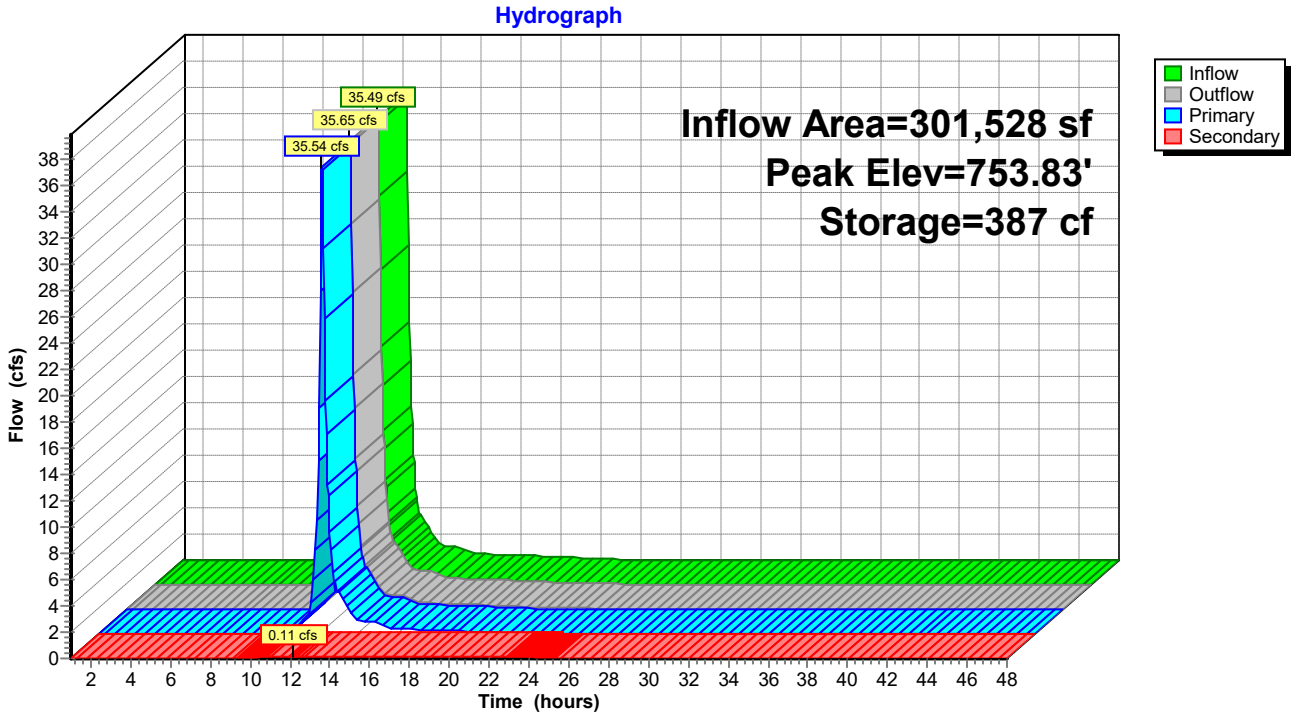
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
749.60	30	0	0
750.00	107	27	27
752.00	253	360	387

Device	Routing	Invert	Outlet Devices
#1	Primary	752.00'	**5.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#2	Secondary	749.60'	**16.000 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 725.00'

Primary OutFlow Max=34.85 cfs @ 12.19 hrs HW=753.80' TW=0.00' (Dynamic Tailwater)
└**1=Broad-Crested Rectangular Weir** (Weir Controls 34.85 cfs @ 3.87 fps)

Secondary OutFlow Max=0.11 cfs @ 12.19 hrs HW=753.80' TW=0.00' (Dynamic Tailwater)
└**2=Exfiltration** (Controls 0.11 cfs)

Pond 92P: Gravel South Depression

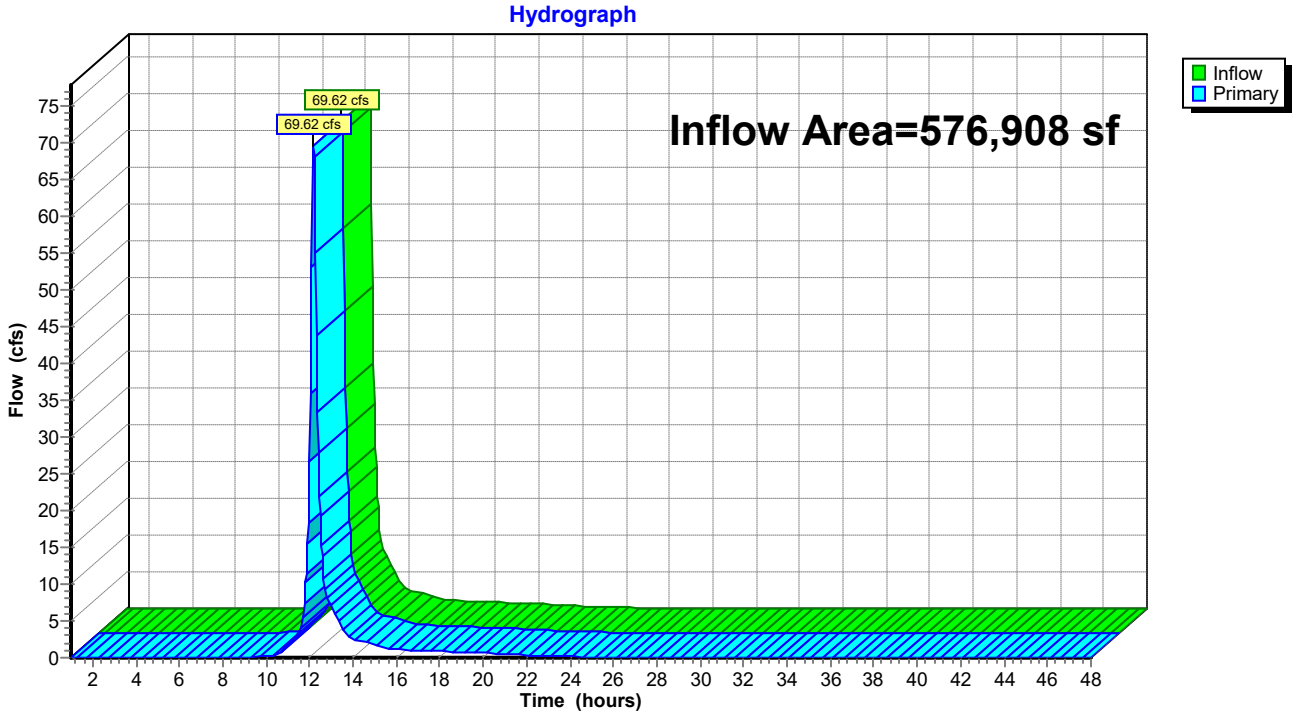


Summary for Link 32L: TOTAL OFFSITE UNTREATED

Inflow Area = 576,908 sf, 17.53% Impervious, Inflow Depth = 3.50" for 100-Year event
Inflow = 69.62 cfs @ 12.18 hrs, Volume= 168,043 cf
Primary = 69.62 cfs @ 12.18 hrs, Volume= 168,043 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 34L : TOTAL OUTFALL

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 32L: TOTAL OFFSITE UNTREATED

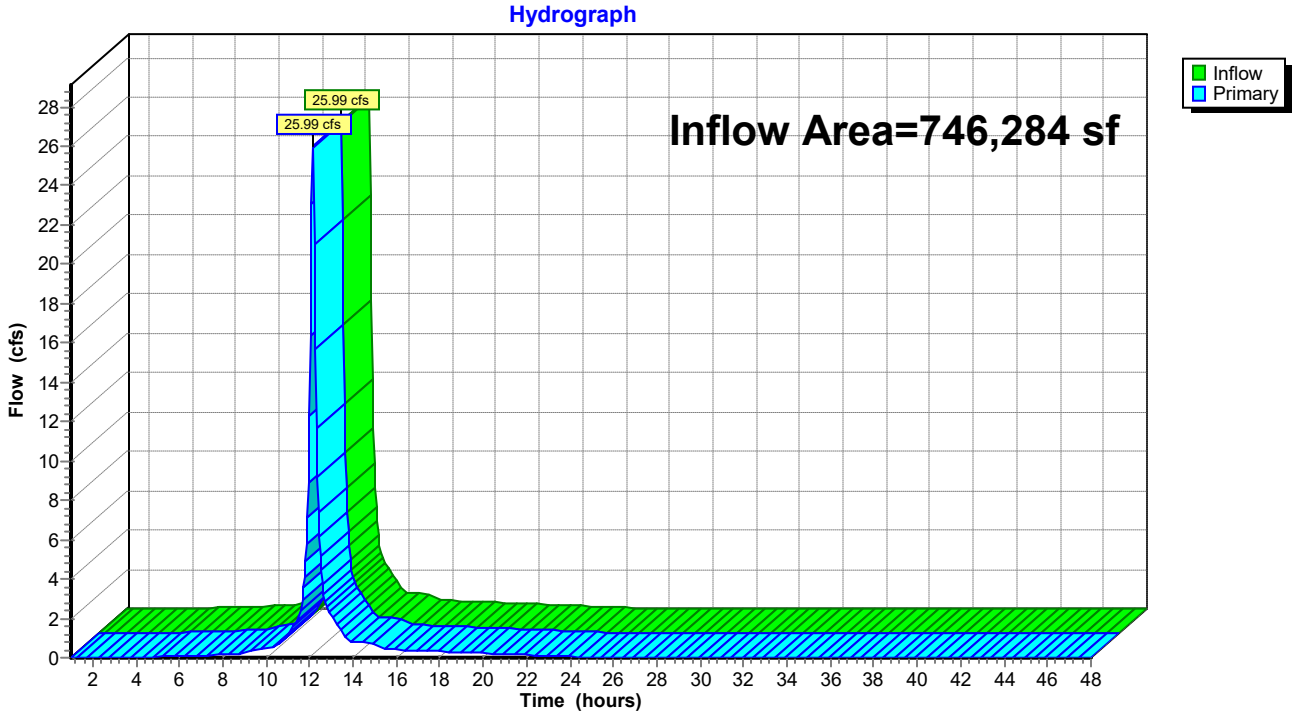


Summary for Link 33L: TOTAL ONSITE

Inflow Area = 746,284 sf, 24.37% Impervious, Inflow Depth = 1.04" for 100-Year event
Inflow = 25.99 cfs @ 12.14 hrs, Volume= 64,915 cf
Primary = 25.99 cfs @ 12.14 hrs, Volume= 64,915 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 34L : TOTAL OUTFALL

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 33L: TOTAL ONSITE

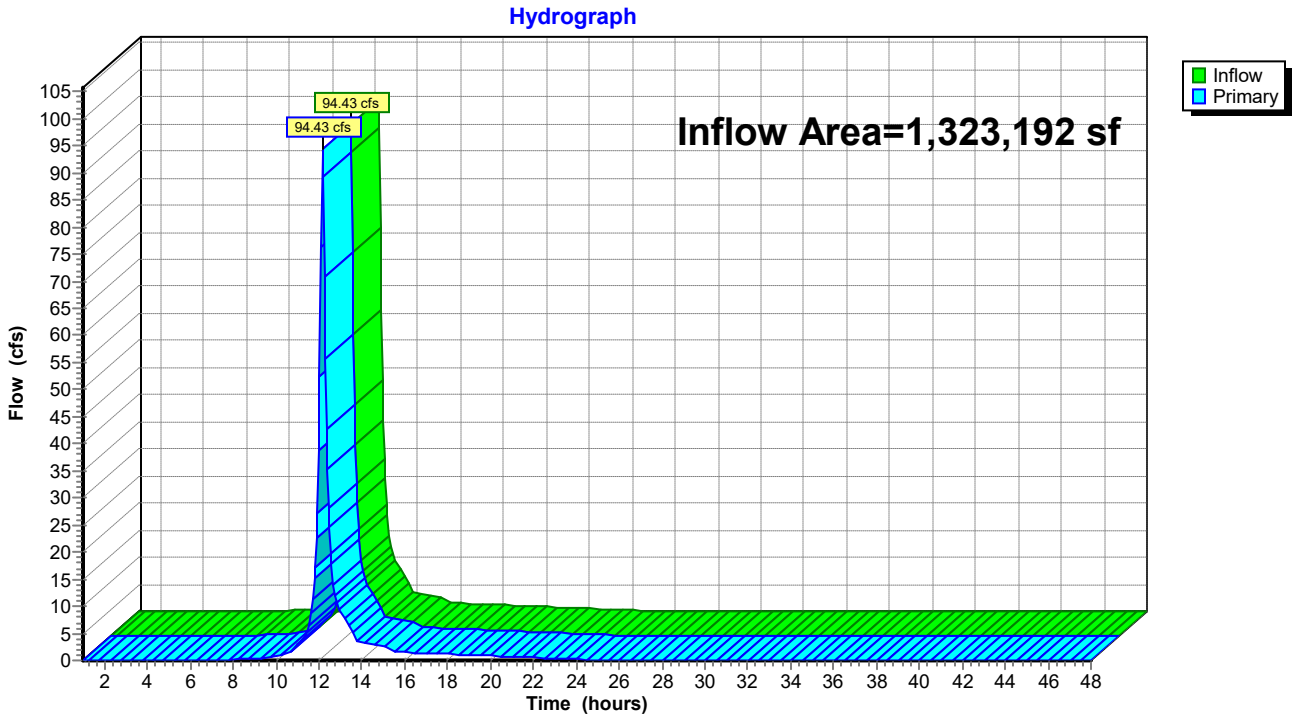


Summary for Link 34L: TOTAL OUTFALL

Inflow Area = 1,323,192 sf, 21.39% Impervious, Inflow Depth = 2.11" for 100-Year event
Inflow = 94.43 cfs @ 12.17 hrs, Volume= 232,958 cf
Primary = 94.43 cfs @ 12.17 hrs, Volume= 232,958 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 34L: TOTAL OUTFALL

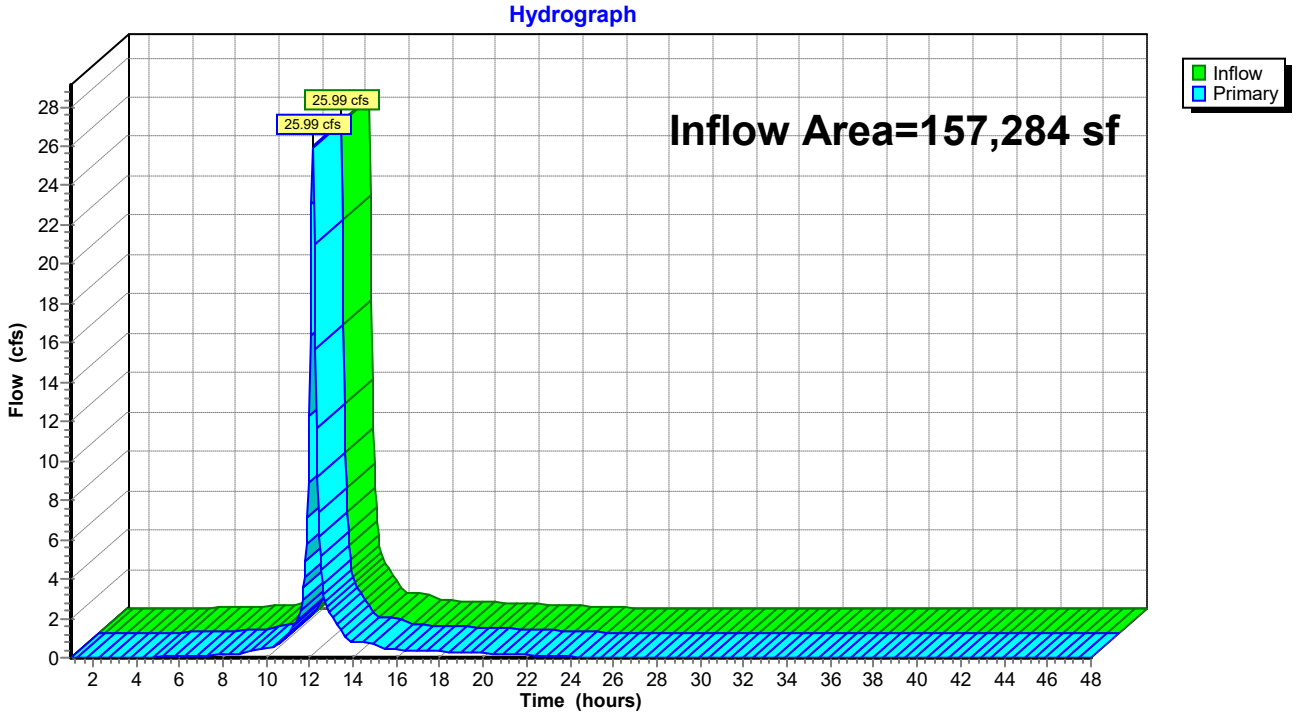


Summary for Link 75L: Areas Piped

Inflow Area = 157,284 sf, 63.18% Impervious, Inflow Depth = 4.95" for 100-Year event
Inflow = 25.99 cfs @ 12.14 hrs, Volume= 64,915 cf
Primary = 25.99 cfs @ 12.14 hrs, Volume= 64,915 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 33L : TOTAL ONSITE

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 75L: Areas Piped

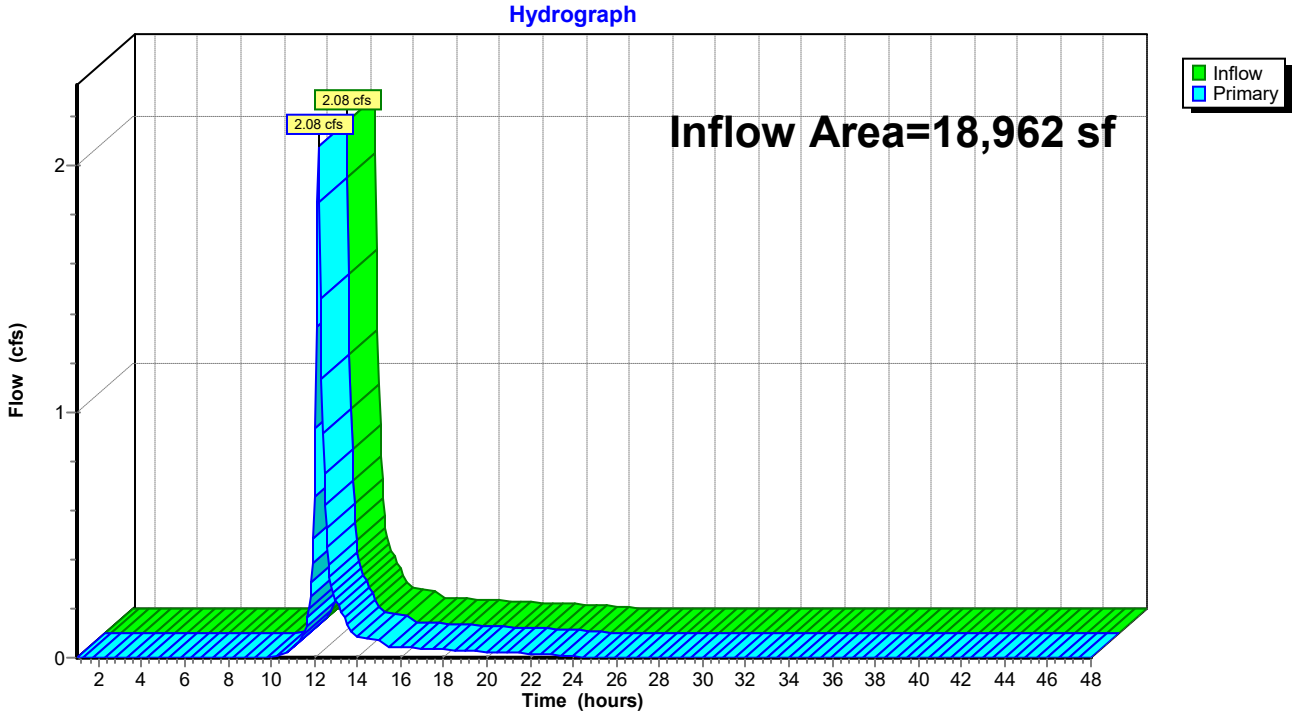


Summary for Link 78L: Swale on Lot 20

Inflow Area = 18,962 sf, 0.00% Impervious, Inflow Depth = 3.34" for 100-Year event
Inflow = 2.08 cfs @ 12.20 hrs, Volume= 5,273 cf
Primary = 2.08 cfs @ 12.20 hrs, Volume= 5,273 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 32L : TOTAL OFFSITE UNTREATED

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 78L: Swale on Lot 20

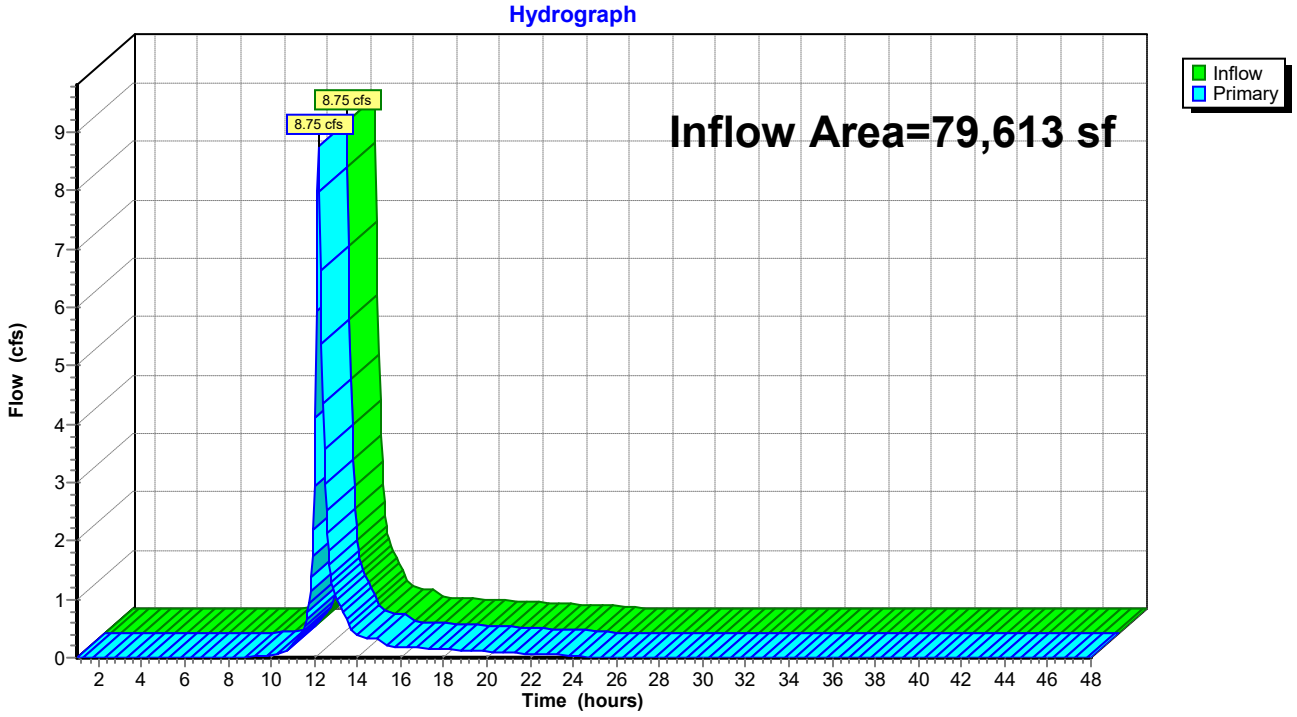


Summary for Link 79L: Swale Along Red Barn Ln.

Inflow Area = 79,613 sf, 11.51% Impervious, Inflow Depth = 3.62" for 100-Year event
Inflow = 8.75 cfs @ 12.20 hrs, Volume= 24,027 cf
Primary = 8.75 cfs @ 12.20 hrs, Volume= 24,027 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 32L : TOTAL OFFSITE UNTREATED

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 79L: Swale Along Red Barn Ln.

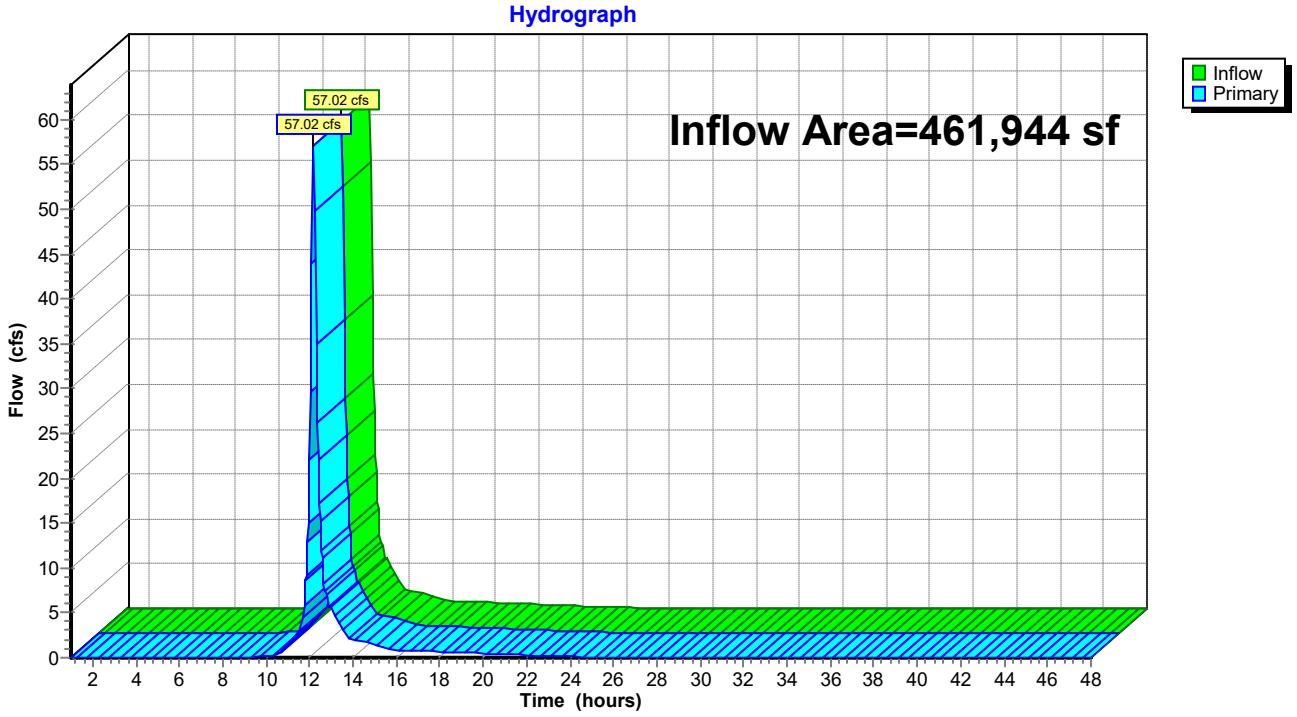


Summary for Link 80L: EX. Cul-de-sac On Green Meadow Place

Inflow Area = 461,944 sf, 19.58% Impervious, Inflow Depth = 3.48" for 100-Year event
Inflow = 57.02 cfs @ 12.18 hrs, Volume= 133,921 cf
Primary = 57.02 cfs @ 12.18 hrs, Volume= 133,921 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 32L : TOTAL OFFSITE UNTREATED

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 80L: EX. Cul-de-sac On Green Meadow Place



APPENDIX C

PROPOSED SWMP-2 AND HYDROLOGIC & HYDRAULIC OUTPUT



SUB CATCHMENT	BMP	TOTAL AREA (SF)	TOTAL AREA (AC)	WALKS (SF)	WALKS (AC)	PARKING/ROADS (SF)	PARKING/ROADS (AC)	ROOFS (SF)	ROOFS (AC)	LANDSCAPE (SF)	LANDSCAPE (AC)
A	MARIA/NOTRE DAME ROOF	18,869	0.433	-		-		18,869	0.433	-	
A1	EAST TRENCH DRAINS	11,792	0.271	295	0.007	3,348	0.077	1,063	0.024	7,086	0.163
A2	WEST TRENCH DRAIN	5,968	0.137	388	0.009	2,129	0.049	924	0.021	2,527	0.058
A3	COURTYARD CURB INLET	3,136	0.072	452	0.010	994	0.023	924	0.021	766	0.018
A4	COURTYARD CURB INLET	7,573	0.174	401	0.009	1,086	0.025	-		6,086	0.140
A5	COURTYARD CURB INLET	2,978	0.068	489	0.011	875	0.020	924	0.021	690	0.016
A6	COURTYARD CURB INLET	2,888	0.066	316	0.007	875	0.020	-		1,697	0.039
A7	COURTYARD CURB INLET	4,839	0.111	939	0.022	1,710	0.039	924	0.021	1,266	0.029
A8	COURTYARD CURB INLET	5,293	0.122	688	0.016	1,478	0.034	-		3,127	0.072
A9	COURTYARD CURB INLET	1,940	0.045	424	0.010	321	0.007	924	0.021	271	0.006
A10	COURTYARD CURB INLET	4,344	0.100	665	0.015	1,415	0.032	-		2,264	0.052
A11	COURTYARD CURB INLET	6,149	0.141	1,109	0.025	1,910	0.044	1,848	0.042	1,282	0.029
A12	COURTYARD CURB INLET	3,208	0.074	216	0.005	1,455	0.033	924	0.021	613	0.014
A13	COURTYARD FIELD INLET	1,947	0.045	288	0.007	-		924	0.021	735	0.017
A14	COURTYARD CURB INLET	16,514	0.379	3,919	0.090	5,040	0.116	-		7,555	0.173
A15	COURTYARD FIELD INLET	8,786	0.202	2,261	0.052	-		-		6,525	0.150
A16	COURTYARD CURB INLET	4,885	0.112	1,314	0.030	2,788	0.064	-		783	0.018
A17	COURTYARD CURB INLET	1,182	0.027	70	0.002	461	0.011	-		651	0.015
A18	COURTYARD CURB INLET	1,381	0.032	353	0.008	747	0.017	-		281	0.006
A19	GREEN ROOF DRAINAGE	5,006	0.115	390	0.009	-		1,063	0.024	3,553	0.082
A20	COURTYARD CURB INLET	705	0.016	204	0.005	-		-		501	0.012
A21	COURTYARD CURB INLET	1,801	0.041	338	0.008	35	0.001	1,063	0.024	365	0.008
A22	COURTYARD CURB INLET	4,627	0.106	891	0.020	1,814	0.042	-		1,922	0.044
A23	COURTYARD CURB INLET	5,903	0.136	995	0.023	1,695	0.039	2,125	0.049	1,088	0.025
A24	COURTYARD CURB INLET	6,769	0.155	1,331	0.031	1,714	0.039	-		3,724	0.085
A25	COURTYARD CURB INLET	6,995	0.161	1,096	0.025	2,036	0.047	2,125	0.049	1,738	0.040
A26	COURTYARD CURB INLET	6,827	0.157	314	0.007	860	0.020	-		5,653	0.130
A27	COURTYARD CURB INLET	3,218	0.074	532	0.012	927	0.021	1,063	0.024	696	0.016
A28	COURTYARD CURB INLET	4,119	0.095	364	0.008	968	0.022	-		2,787	0.064
A29	COURTYARD CURB INLET	3,109	0.071	367	0.008	921	0.021	1,063	0.024	758	0.017
A30	COURTYARD CURB INLET	14,121	0.324	1,025	0.024	1,563	0.036	-		11,533	0.265
A31	COURTYARD CURB INLET	6,189	0.142	1,844	0.042	2,869	0.066	-		1,476	0.034
A32	COURTYARD CURB INLET	13,562	0.311	808	0.019	1,224	0.028	-		11,530	0.265
A33	COURTYARD CURB INLET	6,798	0.156	2,246	0.052	2,695	0.062	-		1,857	0.043
A34	COURTYARD CURB INLET	387	0.009	-	-	387	0.009	-		-	-
A35	TO POOL DRAINAGE (SANITARY)	28,355	0.651	28,355	0.651	-	-	-		-	
A36	COURTYARD FIELD INLET	1,118	0.026	401	0.009	-	-	-		717	0.016
B	INFILTRATION BASIN #1	86,467	1.985	9,317	0.214	-	-	924	0.021	76,226	1.750
B1	DRY POND #1	42,864	0.984	-	-	-	-	42,864	0.984	-	-
C	DRY POND #1	92,785	2.130	8,648	0.199	-	-	32,913	0.756	51,224	1.176
C1	DRY POND #1	19,337	0.444	2,210	0.051	1,774	0.041	1,063	0.024	14,290	0.328
C2	DRY POND #1	99,572	2.286	9,728	0.223	-	-	23,739	0.545	66,105	1.518
D1	DRY POND #2	20,886	0.479	-	-	-	-	-	-	20,886	0.479
D2	DRY POND #2	16,605	0.381	-	-	-	-	8,902	0.204	7,703	0.177
D3	INFILTRATION BASIN #1	8,222	0.189	1,062	0.024	-	-	-	-	7,160	0.164
E1*	INFILTRATION BASIN #1	39,552	0.908	2,161	0.050	-	-	-	-	37,391	0.858
E2	INFILTRATION BASIN #1	18,820	0.432	-	-	-	-	7,360	0.169	11,460	0.263
E3	INFILTRATION BASIN #1	109,219	2.507	6,532	0.150	8,300	0.191	-	-	94,387	2.167
F	DRY POND #3	41,695	0.957	-	-	7,467	0.171	17,550	0.403	16,678	0.383
F1	DRY POND #3	50,859	1.168	244	0.006	10,158	0.233	18,836	0.432	21,621	0.496
F2	SOUTHERN HOMES EAST SWALE	12,659	0.291	-	-	-	-	6,697	0.154	5,962	0.137
F3	DRY POND #3	20,215	0.464	-	-	-	-	4,099	0.094	16,116	0.370
F4	DRY POND #3	25,539	0.586	-	-	-	-	2,077	0.048	23,462	0.539
F5	EXISTING SOUTHEAST BASIN	31,282	0.718	-	-	-	-	-	-	31,282	0.718
F6	EXISTING SOUTHEAST BASIN	8,341	0.191	-	-	-	-	-	-	8,341	0.191
G	OFFSITE	4,482	0.103	-	-	-	-	-	-	4,482	0.103
H1	DRY POND #1	124,005	2.847	-	-	14,926	0.343	24,942	0.573	84,137	1.932
H2	SOUTHERN HOMES EAST SWALE	54,034	1.240	-	-	1,333	0.031	14,758	0.339	37,943	0.871
H3	DRY POND #2	29,836	0.685	865	0.020	4,676	0.107	-	-	24,295	0.558
H4	SOUTHERN HOMES EAST SWALE	6,658	0.153	-	-	-	-	-	-	6,658	0.153
H5	SOUTHERN HOMES EAST SWALE	14,502	0.333	-	-	-	-	-	-	14,502	0.333
H6-a	OFFSITE GREEN MEADOW (VIA SWALE)	9,604	0.220	-	-	1,133	0.026	-	-	8,471	0.194
H6-b	OFFSITE GREEN MEADOW (VIA SWALE)	4,256	0.098	-	-	1,013	0.023	-	-	3,243	0.074
H6-c	OFFSITE GREEN MEADOW (DIRECT)	4,091	0.094	-	-	-	-	-	-	4,091	0.094
I*	DRY POND #2	56,129	1.289	-	-	-	-	-	-	56,129	1.289
J*	OFFSITE	15,351	0.352	1,360	0.031	-	-	-	-	13,991	0.321
O1**	INFILTRATION BASIN #1	11,697	0.269	-	-	-	-	-	-	11,697	0.269
O2**	EXISTING SOUTHEAST BASIN	132,678	3.046	-	-	-	-	3,040	0.070	129,638	2.976
X	OFFSITE TO DRY POND #2	22,047	0.506	-	-	9,160	0.210	-		12,887	0.296
TOTAL WITHOUT O1 & O2	-	1,323,192	30.376	98,215	2.255	106,280	2.440	243,471	5.589	875,226	20.092

TOTAL SWMP AREA INCLUDING UNDISTURBED AREAS = 1,322,319, without E1, I & J TOTAL AREA = 1,211,287

TOTAL SWMP AREA INCLUDING GREEN MEADOW EXTENSION = 1,322,319

* WITHIN PROPERTY BOUNDARY BUT UNDISTURBED

** OFFSITE COMING ONSITE

*** CONSERVATIVE Tc OF 6 MINUTES WERE USED FOR MAJORITY OF AREAS ON THE PROPERTY

**** CN VALUES OF 98 WERE USED FOR ALL IMPERVIOUS AREAS AND CN OF 74 WAS USED FOR LANDSCAPED AREAS

LEGEND

- CATCHMENT AREA BOUNDARY
- 880 EXISTING GRADING CONTOUR
- APPROXIMATE GRAVEL PIT LOCATIONS PER NRCS WEB SOIL SURVEY
- WALKS
- ROADS
- ROOFS*
- PONDS
- AREA LEAVING SITE UNTREATED
- UNDERGROUND DETENTION FOOTPRINT
- LANDSCAPING
- EXISTING AREA TO EXISTING RED BARN LANE EASTERN DITCH - FOR INFORMATIONAL PURPOSES ONLY
- SWALE
- SS STORM SEWER
- STORM MANHOLE
- OVERLAND FLOW ROUTE

*NOTE: ROOF AREAS FOR SINGLE FAMILY HOMES WERE CALCULATED TO BE THE REMAINDER OF THE MAX IMPERVIOUS AREA FOR EACH LOT (40% FOR LOT 4 SOUTH, 30% FOR LOT 1 EAST). NOT SHOWN VISUALLY, BUT AREAS APPEAR IN TABLE AND IN MODELING.

KSingh Engineers Scientists Consultants
3636 North 124th Street
Wauwatosa, WI 53222
262-821-1171

CONSULTANT

PROJECT TITLE: CAROLINE HEIGHTS DEVELOPMENT
CONSTRUCTION DOCUMENTS

CLIENT: MANDEL GROUP, INC.

PROJECT LOCATION: 13105 WATERTOWN PLANK RD.
ELM GROVE, WI 53122

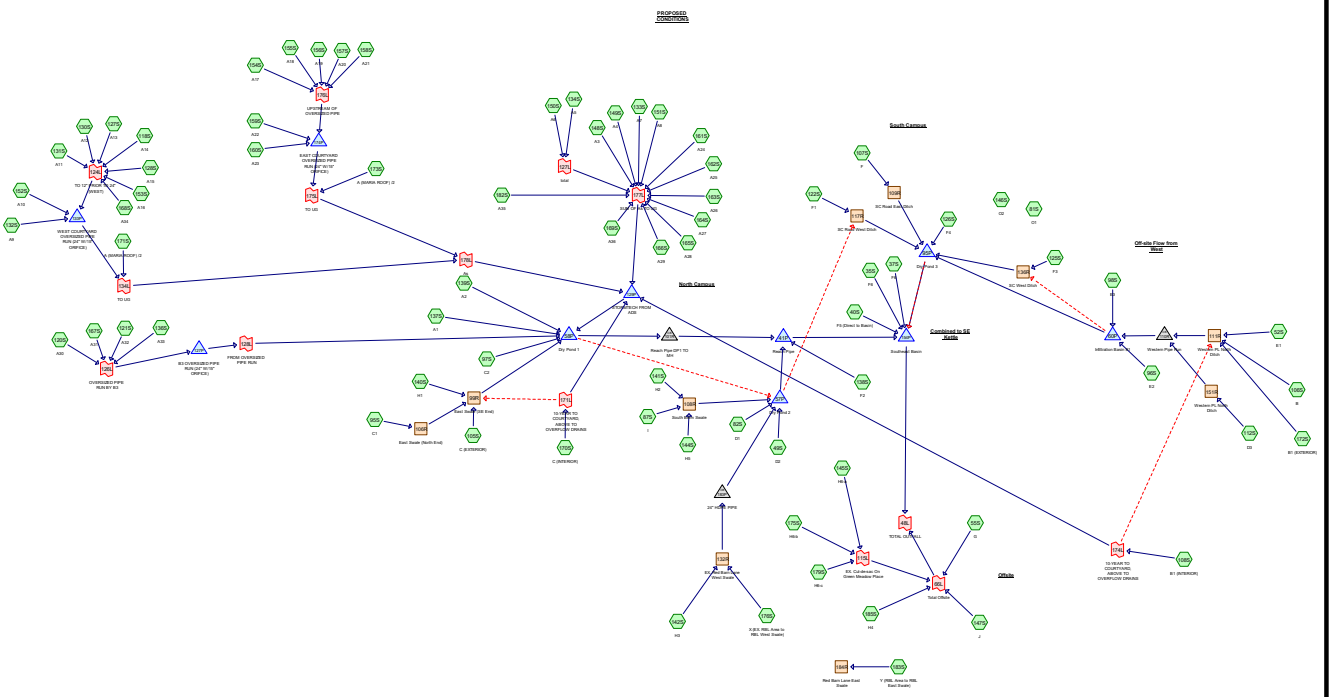
REVISIONS	DATE	DESCRIPTION
1	07/31/23	ADDENDUM #3
2	08/11/23	ADDENDUM #4

DRAWN BY RGE	DATE 09/06/2023
CHECKED BY APS	DATE 09/06/2023

SITE TITLE
STORM WATER MANAGEMENT PLAN
PROPOSED CONDITIONS

SWMP - 2

of SHEET XX



Subcat Reach Pond Link

Routing Diagram for Caroline Heights - Existing and Proposed Conditions Model_20240910

Prepared by K Singh & Associates Inc16530, Printed 9/12/2024

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Rainfall Events Listing (selected events)

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	1-Year	MSE 24-hr	3	Default	24.00	1	2.40	2
2	2-Year	MSE 24-hr	3	Default	24.00	1	2.70	2
3	10-Year	MSE 24-hr	3	Default	24.00	1	3.81	2
4	100-Year	MSE 24-hr	3	Default	24.00	1	6.18	2

Area Listing (selected nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
37,391	74	>75% Grass cover, Good, HSG C (52S)
3,040	98	IMPERV (146S)
94,103	74	LANDSCAPING (118S, 120S, 121S, 127S, 128S, 130S, 131S, 132S, 133S, 134S, 136S, 137S, 139S, 148S, 149S, 150S, 151S, 152S, 153S, 154S, 155S, 156S, 157S, 158S, 159S, 160S, 161S, 162S, 163S, 164S, 165S, 166S, 167S, 169S)
5,962	74	Landscape (138S)
141,335	74	PERV (81S, 146S)
46,340	98	ROADS (118S, 120S, 121S, 130S, 131S, 132S, 133S, 134S, 136S, 137S, 139S, 148S, 149S, 150S, 151S, 152S, 153S, 154S, 155S, 158S, 159S, 160S, 161S, 162S, 163S, 164S, 165S, 166S, 167S, 168S)
17,881	98	ROOF (127S, 130S, 131S, 132S, 133S, 134S, 137S, 139S, 148S, 156S, 158S, 160S, 162S, 164S, 166S)
8,300	98	Roads (98S)
18,869	98	Roofs (171S, 173S)
56,086	98	WALKS (118S, 120S, 121S, 127S, 128S, 130S, 131S, 132S, 133S, 134S, 136S, 137S, 139S, 148S, 149S, 150S, 151S, 152S, 153S, 154S, 155S, 156S, 157S, 158S, 159S, 160S, 161S, 162S, 163S, 164S, 165S, 166S, 167S, 169S, 182S)
2,161	98	Walks (52S)
5,445	98	driveways and road NEW RBL (140S)
7,060	74	from H4 (142S)
766,007	74	landscape (35S, 37S, 40S, 49S, 55S, 82S, 87S, 95S, 96S, 97S, 98S, 105S, 106S, 107S, 112S, 122S, 125S, 126S, 140S, 142S, 144S, 145S, 147S, 175S, 176S, 183S, 185S)
14,669	74	landscape NEW RBL (140S, 142S)
37,943	74	landscape minus NEW RBL (141S)
4,091	74	per (179S)
22,543	98	road (145S, 175S, 176S, 183S)
29,921	98	roads (95S, 107S, 122S, 140S, 142S)
4,500	98	roads + roof NEW RBL (142S)
1,333	98	roads minus NEW RBL (141S)
142,712	98	roof (49S, 95S, 106S, 107S, 108S, 122S, 125S, 126S, 138S, 140S, 141S, 172S)
64,012	98	roofs (96S, 97S, 105S, 170S)
20,725	98	walks (95S, 98S, 106S, 112S, 122S, 147S)
18,376	98	walks and patios (97S, 105S)
1,570,805	**81**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
37,391	HSG C	52S
0	HSG D	
1,533,414	Other	35S, 37S, 40S, 49S, 52S, 55S, 81S, 82S, 87S, 95S, 96S, 97S, 98S, 105S, 106S, 107S, 108S, 112S, 118S, 120S, 121S, 122S, 125S, 126S, 127S, 128S, 130S, 131S, 132S, 133S, 134S, 136S, 137S, 138S, 139S, 140S, 141S, 142S, 144S, 145S, 146S, 147S, 148S, 149S, 150S, 151S, 152S, 153S, 154S, 155S, 156S, 157S, 158S, 159S, 160S, 161S, 162S, 163S, 164S, 165S, 166S, 167S, 168S, 169S, 170S, 171S, 172S, 173S, 175S, 176S, 179S, 182S, 183S, 185S
1,570,805		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
0	0	37,391	0	0	37,391	>75% Grass cover, Good
0	0	0	0	3,040	3,040	IMPERV
0	0	0	0	94,103	94,103	LANDSCAPING
0	0	0	0	5,962	5,962	Landscape
0	0	0	0	141,335	141,335	PERV
0	0	0	0	46,340	46,340	ROADS
0	0	0	0	17,881	17,881	ROOF
0	0	0	0	8,300	8,300	Roads
0	0	0	0	18,869	18,869	Roofs
0	0	0	0	56,086	56,086	WALKS
0	0	0	0	2,161	2,161	Walks
0	0	0	0	5,445	5,445	driveways and road NEW RBL
0	0	0	0	7,060	7,060	from H4
0	0	0	0	766,007	766,007	landscape
0	0	0	0	14,669	14,669	landscape NEW RBL
0	0	0	0	37,943	37,943	landscape minus NEW RBL
0	0	0	0	4,091	4,091	per
0	0	0	0	22,543	22,543	road
0	0	0	0	29,921	29,921	roads
0	0	0	0	4,500	4,500	roads + roof NEW RBL
0	0	0	0	1,333	1,333	roads minus NEW RBL
0	0	0	0	142,712	142,712	roof
0	0	0	0	64,012	64,012	roofs
0	0	0	0	20,725	20,725	walks
0	0	0	0	18,376	18,376	walks and patios
0	**0**	**37,391**	**0**	**1,533,414**	**1,570,805**	**TOTAL AREA**

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Width (inches)	Diam/Height (inches)	Inside-Fill (inches)	Node Name
1	57P	750.00	749.50	25.0	0.0200	0.011	0.0	12.0	0.0	
2	57P	750.44	750.01	214.0	0.0020	0.011	0.0	12.0	0.0	
3	58P	750.50	747.00	373.0	0.0094	0.011	0.0	15.0	0.0	
4	60P	742.00	741.00	205.0	0.0049	0.013	0.0	12.0	0.0	
5	95P	741.00	738.00	84.0	0.0357	0.013	0.0	6.0	0.0	
6	101R	750.50	747.00	373.0	0.0094	0.011	0.0	15.0	0.0	
7	110R	745.06	743.00	514.0	0.0040	0.011	0.0	24.0	0.0	
8	129P	751.25	750.65	200.0	0.0030	0.011	0.0	10.0	0.0	
9	183P	749.00	747.00	475.0	0.0042	0.010	0.0	24.0	0.0	

Time span=1.00-48.00 hrs, dt=0.05 hrs, 941 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 35S: F6 Runoff Area=3,950 sf 0.00% Impervious Runoff Depth=0.55"
Tc=6.0 min CN=74 Runoff=0.08 cfs 182 cf

Subcatchment 37S: F6 Runoff Area=4,391 sf 0.00% Impervious Runoff Depth=0.55"
Tc=6.0 min CN=74 Runoff=0.09 cfs 202 cf

Subcatchment 40S: F5 (Direct to Basin) Runoff Area=31,282 sf 0.00% Impervious Runoff Depth=0.55"
Tc=6.0 min CN=74 Runoff=0.67 cfs 1,441 cf

Subcatchment 49S: D2 Runoff Area=16,605 sf 53.61% Impervious Runoff Depth=1.23"
Flow Length=393' Slope=0.0076 '/' Tc=10.7 min CN=87 Runoff=0.70 cfs 1,699 cf

Subcatchment 52S: E1 Runoff Area=39,552 sf 5.46% Impervious Runoff Depth=0.59"
Flow Length=100' Slope=0.0300 '/' Tc=9.6 min CN=75 Runoff=0.77 cfs 1,954 cf

Subcatchment 55S: G Runoff Area=4,482 sf 0.00% Impervious Runoff Depth=0.55"
Tc=6.0 min CN=74 Runoff=0.10 cfs 206 cf

Subcatchment 81S: O1 Runoff Area=11,697 sf 0.00% Impervious Runoff Depth=0.55"
Tc=6.0 min CN=74 Runoff=0.25 cfs 539 cf

Subcatchment 82S: D1 Runoff Area=20,886 sf 0.00% Impervious Runoff Depth=0.55"
Flow Length=400' Slope=0.0100 '/' Tc=22.0 min CN=74 Runoff=0.25 cfs 962 cf

Subcatchment 87S: I Runoff Area=56,129 sf 0.00% Impervious Runoff Depth=0.55"
Flow Length=750' Slope=0.0100 '/' Tc=30.4 min CN=74 Runoff=0.55 cfs 2,586 cf

Subcatchment 95S: C1 Runoff Area=19,337 sf 26.10% Impervious Runoff Depth=0.82"
Tc=6.0 min CN=80 Runoff=0.65 cfs 1,322 cf

Subcatchment 96S: E2 Runoff Area=18,820 sf 39.11% Impervious Runoff Depth=0.98"
Flow Length=400' Slope=0.0300 '/' Tc=13.7 min CN=83 Runoff=0.56 cfs 1,538 cf

Subcatchment 97S: C2 Runoff Area=99,572 sf 33.61% Impervious Runoff Depth=0.93"
Tc=6.0 min CN=82 Runoff=3.79 cfs 7,677 cf

Subcatchment 98S: E3 Runoff Area=109,219 sf 13.58% Impervious Runoff Depth=0.68"
Flow Length=200' Tc=16.3 min CN=77 Runoff=1.97 cfs 6,175 cf

Subcatchment 105S: C (EXTERIOR) Runoff Area=83,930 sf 38.97% Impervious Runoff Depth=0.98"
Tc=6.0 min CN=83 Runoff=3.39 cfs 6,861 cf

Subcatchment 106S: B Runoff Area=86,466 sf 11.84% Impervious Runoff Depth=0.68"
Tc=6.0 min CN=77 Runoff=2.35 cfs 4,888 cf

Subcatchment 107S: F Runoff Area=41,695 sf 60.00% Impervious Runoff Depth=1.30"
Tc=6.0 min CN=88 Runoff=2.21 cfs 4,504 cf

Subcatchment 108S: B1 (INTERIOR) Runoff Area=10,526 sf 100.00% Impervious Runoff Depth=2.17"
Tc=6.0 min CN=98 Runoff=0.82 cfs 1,905 cf

Subcatchment 112S: D3 Runoff Area=8,222 sf 12.92% Impervious Runoff Depth=0.68"
Tc=6.0 min CN=77 Runoff=0.22 cfs 465 cf

Subcatchment 118S: A14 Runoff Area=16,514 sf 54.25% Impervious Runoff Depth=1.23"
Tc=6.0 min CN=87 Runoff=0.83 cfs 1,690 cf

Subcatchment 120S: A30 Runoff Area=14,121 sf 18.33% Impervious Runoff Depth=0.72"
Tc=6.0 min CN=78 Runoff=0.41 cfs 852 cf

Subcatchment 121S: A32 Runoff Area=13,562 sf 14.98% Impervious Runoff Depth=0.72"
Tc=6.0 min CN=78 Runoff=0.40 cfs 818 cf

Subcatchment 122S: F1 Runoff Area=50,859 sf 57.49% Impervious Runoff Depth=1.30"
Tc=6.0 min CN=88 Runoff=2.70 cfs 5,494 cf

Subcatchment 125S: F3 Runoff Area=20,215 sf 20.28% Impervious Runoff Depth=0.77"
Tc=6.0 min CN=79 Runoff=0.63 cfs 1,299 cf

Subcatchment 126S: F4 Runoff Area=25,539 sf 8.13% Impervious Runoff Depth=0.63"
Tc=6.0 min CN=76 Runoff=0.64 cfs 1,351 cf

Subcatchment 127S: A13 Runoff Area=1,947 sf 62.25% Impervious Runoff Depth=1.37"
Tc=6.0 min CN=89 Runoff=0.11 cfs 222 cf

Subcatchment 128S: A15 Runoff Area=8,786 sf 25.73% Impervious Runoff Depth=0.82"
Tc=6.0 min CN=80 Runoff=0.29 cfs 601 cf

Subcatchment 130S: A12 Runoff Area=3,208 sf 80.89% Impervious Runoff Depth=1.69"
Tc=6.0 min CN=93 Runoff=0.21 cfs 451 cf

Subcatchment 131S: A11 Runoff Area=6,149 sf 79.15% Impervious Runoff Depth=1.69"
Tc=6.0 min CN=93 Runoff=0.41 cfs 864 cf

Subcatchment 132S: A9 Runoff Area=1,940 sf 86.03% Impervious Runoff Depth=1.87"
Tc=6.0 min CN=95 Runoff=0.14 cfs 302 cf

Subcatchment 133S: A7 Runoff Area=4,839 sf 73.84% Impervious Runoff Depth=1.60"
Tc=6.0 min CN=92 Runoff=0.31 cfs 646 cf

Subcatchment 134S: A5 Runoff Area=2,978 sf 76.83% Impervious Runoff Depth=1.60"
Tc=6.0 min CN=92 Runoff=0.19 cfs 397 cf

Subcatchment 136S: A33 Runoff Area=6,798 sf 72.68% Impervious Runoff Depth=1.52"
Tc=6.0 min CN=91 Runoff=0.42 cfs 861 cf

Subcatchment 137S: A1 Runoff Area=11,792 sf 39.91% Impervious Runoff Depth=1.04"
Tc=6.0 min CN=84 Runoff=0.51 cfs 1,021 cf

Subcatchment 138S: F2 Runoff Area=12,659 sf 52.90% Impervious Runoff Depth=1.23"
Tc=10.0 min CN=87 Runoff=0.54 cfs 1,295 cf

Subcatchment 139S: A2 Runoff Area=5,968 sf 57.66% Impervious Runoff Depth=1.30"
Tc=6.0 min CN=88 Runoff=0.32 cfs 645 cf

Subcatchment 140S: H1 Runoff Area=124,005 sf 32.15% Impervious Runoff Depth=0.93"
Tc=6.0 min CN=82 Runoff=4.72 cfs 9,561 cf

Subcatchment 141S: H2 Runoff Area=54,034 sf 29.78% Impervious Runoff Depth=0.87"
Tc=6.0 min CN=81 Runoff=1.93 cfs 3,926 cf

Subcatchment 142S: H3 Runoff Area=29,836 sf 18.57% Impervious Runoff Depth=0.72"
Tc=6.0 min CN=78 Runoff=0.87 cfs 1,800 cf

Subcatchment 144S: H5 Runoff Area=14,502 sf 0.00% Impervious Runoff Depth=0.55"
Tc=6.0 min CN=74 Runoff=0.31 cfs 668 cf

Subcatchment 145S: H6-a Runoff Area=9,604 sf 11.80% Impervious Runoff Depth=0.68"
Tc=6.0 min CN=77 Runoff=0.26 cfs 543 cf

Subcatchment 146S: O2 Runoff Area=132,678 sf 2.29% Impervious Runoff Depth=0.59"
Flow Length=377' Tc=12.2 min CN=75 Runoff=2.33 cfs 6,556 cf

Subcatchment 147S: J Runoff Area=15,351 sf 8.86% Impervious Runoff Depth=0.63"
Tc=6.0 min CN=76 Runoff=0.39 cfs 812 cf

Subcatchment 148S: A3 Runoff Area=3,136 sf 75.57% Impervious Runoff Depth=1.60"
Tc=6.0 min CN=92 Runoff=0.20 cfs 418 cf

Subcatchment 149S: A4 Runoff Area=7,573 sf 19.64% Impervious Runoff Depth=0.77"
Tc=6.0 min CN=79 Runoff=0.24 cfs 487 cf

Subcatchment 150S: A6 Runoff Area=2,888 sf 41.24% Impervious Runoff Depth=1.04"
Tc=6.0 min CN=84 Runoff=0.12 cfs 250 cf

Subcatchment 151S: A8 Runoff Area=5,293 sf 40.92% Impervious Runoff Depth=1.04"
Tc=6.0 min CN=84 Runoff=0.23 cfs 458 cf

Subcatchment 152S: A10 Runoff Area=4,344 sf 47.88% Impervious Runoff Depth=1.10"
Tc=6.0 min CN=85 Runoff=0.20 cfs 398 cf

Subcatchment 153S: A16 Runoff Area=4,885 sf 83.97% Impervious Runoff Depth=1.77"
Tc=6.0 min CN=94 Runoff=0.34 cfs 722 cf

Subcatchment 154S: A17 Runoff Area=1,182 sf 44.92% Impervious Runoff Depth=1.10"
Tc=6.0 min CN=85 Runoff=0.05 cfs 108 cf

Subcatchment 155S: A18 Runoff Area=1,381 sf 79.65% Impervious Runoff Depth=1.69"
Tc=6.0 min CN=93 Runoff=0.09 cfs 194 cf

Subcatchment 156S: A19 Runoff Area=5,006 sf 29.03% Impervious Runoff Depth=0.87"
Tc=6.0 min CN=81 Runoff=0.18 cfs 364 cf

Subcatchment 157S: A20 Runoff Area=705 sf 28.94% Impervious Runoff Depth=0.87"
Tc=6.0 min CN=81 Runoff=0.03 cfs 51 cf

Subcatchment 158S: A21 Runoff Area=1,801 sf 79.73% Impervious Runoff Depth=1.69"
Tc=6.0 min CN=93 Runoff=0.12 cfs 253 cf

Subcatchment 159S: A22 Runoff Area=4,627 sf 58.46% Impervious Runoff Depth=1.30"
Tc=6.0 min CN=88 Runoff=0.25 cfs 500 cf

Subcatchment 160S: A23 Runoff Area=5,903 sf 81.57% Impervious Runoff Depth=1.77"
Tc=6.0 min CN=94 Runoff=0.41 cfs 873 cf

Subcatchment 161S: A24 Runoff Area=6,769 sf 44.98% Impervious Runoff Depth=1.10"
Tc=6.0 min CN=85 Runoff=0.31 cfs 620 cf

Subcatchment 162S: A25 Runoff Area=6,995 sf 75.15% Impervious Runoff Depth=1.60"
Tc=6.0 min CN=92 Runoff=0.45 cfs 933 cf

Subcatchment 163S: A26 Runoff Area=6,827 sf 17.20% Impervious Runoff Depth=0.72"
Tc=6.0 min CN=78 Runoff=0.20 cfs 412 cf

Subcatchment 164S: A27 Runoff Area=3,218 sf 78.37% Impervious Runoff Depth=1.69"
Tc=6.0 min CN=93 Runoff=0.21 cfs 452 cf

Subcatchment 165S: A28 Runoff Area=4,119 sf 32.34% Impervious Runoff Depth=0.93"
Tc=6.0 min CN=82 Runoff=0.16 cfs 318 cf

Subcatchment 166S: A29 Runoff Area=3,109 sf 75.62% Impervious Runoff Depth=1.60"
Tc=6.0 min CN=92 Runoff=0.20 cfs 415 cf

Subcatchment 167S: A31 Runoff Area=6,189 sf 76.15% Impervious Runoff Depth=1.60"
Tc=6.0 min CN=92 Runoff=0.40 cfs 826 cf

Subcatchment 168S: A34 Runoff Area=387 sf 100.00% Impervious Runoff Depth=2.17"
Tc=6.0 min CN=98 Runoff=0.03 cfs 70 cf

Subcatchment 169S: A36 Runoff Area=1,118 sf 35.87% Impervious Runoff Depth=0.98"
Tc=6.0 min CN=83 Runoff=0.05 cfs 91 cf

Subcatchment 170S: C (INTERIOR) Runoff Area=8,855 sf 100.00% Impervious Runoff Depth=2.17"
Tc=6.0 min CN=98 Runoff=0.69 cfs 1,602 cf

Subcatchment 171S: A (MARIA ROOF) /2 Runoff Area=9,435 sf 100.00% Impervious Runoff Depth=2.17"
Tc=0.0 min CN=98 Runoff=0.85 cfs 1,707 cf

Subcatchment 172S: B1 (EXTERIOR) Runoff Area=32,338 sf 100.00% Impervious Runoff Depth=2.17"
Tc=6.0 min CN=98 Runoff=2.52 cfs 5,851 cf

Subcatchment 173S: A (MARIA ROOF) /2 Runoff Area=9,434 sf 100.00% Impervious Runoff Depth=2.17"
Tc=0.0 min CN=98 Runoff=0.85 cfs 1,707 cf

Subcatchment 175S: H6-b Runoff Area=4,256 sf 23.80% Impervious Runoff Depth=0.82"
Tc=6.0 min CN=80 Runoff=0.14 cfs 291 cf

Subcatchment 176S: X (EX. RBL Area to Runoff Area=22,047 sf 41.55% Impervious Runoff Depth=1.04"
Tc=6.0 min CN=84 Runoff=0.94 cfs 1,909 cf

Subcatchment 179S: H6-c Runoff Area=4,091 sf 0.00% Impervious Runoff Depth=0.55"
Tc=6.0 min CN=74 Runoff=0.09 cfs 188 cf

Subcatchment 182S: A35 Runoff Area=28,353 sf 100.00% Impervious Runoff Depth=2.17"
Tc=6.0 min CN=98 Runoff=2.21 cfs 5,130 cf

Subcatchment 183S: Y (RBL Area to RBL Runoff Area=103,238 sf 10.88% Impervious Runoff Depth=0.68"
Tc=6.0 min CN=77 Runoff=2.80 cfs 5,837 cf

Subcatchment 185S: H4 Runoff Area=6,658 sf 0.00% Impervious Runoff Depth=0.55"
Tc=6.0 min CN=74 Runoff=0.14 cfs 307 cf

Reach 99R: East Swale (SE End) Avg. Flow Depth=0.39' Max Vel=3.24 fps Inflow=8.75 cfs 17,744 cf
n=0.018 L=570.0' S=0.0070 '/' Capacity=43.88 cfs Outflow=7.91 cfs 17,744 cf

Reach 106R: East Swale (North End) Avg. Flow Depth=0.12' Max Vel=2.37 fps Inflow=0.65 cfs 1,322 cf
n=0.018 L=140.0' S=0.0179 '/' Capacity=39.35 cfs Outflow=0.64 cfs 1,322 cf

Reach 108R: South Berm Swale Avg. Flow Depth=0.38' Max Vel=2.24 fps Inflow=2.33 cfs 7,180 cf
n=0.025 L=265.0' S=0.0100 '/' Capacity=19.73 cfs Outflow=2.19 cfs 7,180 cf

Reach 109R: SC Road East Ditch Avg. Flow Depth=0.28' Max Vel=1.67 fps Inflow=2.21 cfs 4,504 cf
n=0.022 L=415.0' S=0.0048 '/' Capacity=23.93 cfs Outflow=1.91 cfs 4,504 cf

Reach 111R: Western PL North Ditch Avg. Flow Depth=0.71' Max Vel=3.32 fps Inflow=5.51 cfs 12,694 cf
n=0.025 L=480.0' S=0.0133 '/' Capacity=26.79 cfs Outflow=5.08 cfs 12,694 cf

Reach 117R: SC Road West Ditch Avg. Flow Depth=0.31' Max Vel=1.68 fps Inflow=2.70 cfs 5,494 cf
n=0.022 L=475.0' S=0.0042 '/' Capacity=22.37 cfs Outflow=2.25 cfs 5,494 cf

Reach 132R: EX. Red Barn Lane West Avg. Flow Depth=0.27' Max Vel=2.46 fps Inflow=1.82 cfs 3,708 cf
n=0.025 L=610.0' S=0.0179 '/' Capacity=87.96 cfs Outflow=1.51 cfs 3,708 cf

Reach 136R: SC West Ditch Avg. Flow Depth=0.28' Max Vel=1.42 fps Inflow=0.63 cfs 1,299 cf
n=0.025 L=218.0' S=0.0080 '/' Capacity=16.56 cfs Outflow=0.57 cfs 1,299 cf

Reach 151R: Western PL North Ditch Avg. Flow Depth=0.22' Max Vel=1.35 fps Inflow=0.22 cfs 465 cf
n=0.025 L=227.0' S=0.0107 '/' Capacity=24.06 cfs Outflow=0.20 cfs 465 cf

Reach 184R: Red Barn Lane East Swale Avg. Flow Depth=0.30' Max Vel=2.53 fps Inflow=2.80 cfs 5,837 cf
n=0.025 L=945.0' S=0.0180 '/' Capacity=36.63 cfs Outflow=2.08 cfs 5,837 cf

Pond 41P: Reach Pipe Peak Elev=738.39' Storage=5 cf Inflow=0.54 cfs 1,295 cf
Outflow=0.54 cfs 1,295 cf

Pond 57P: Dry Pond 2 Peak Elev=747.32' Storage=2,382 cf Inflow=4.49 cfs 13,549 cf
Discarded=1.62 cfs 13,549 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=1.62 cfs 13,549 cf

Pond 58P: Dry Pond 1 Peak Elev=748.00' Storage=19,370 cf Inflow=15.04 cfs 55,907 cf
Discarded=1.58 cfs 55,906 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=1.58 cfs 55,906 cf

Pond 60P: Infiltration Basin #1 Peak Elev=740.99' Storage=6,351 cf Inflow=7.20 cfs 20,872 cf
Discarded=1.53 cfs 20,872 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=1.53 cfs 20,872 cf

Pond 95P: Dry Pond 3 Peak Elev=739.08' Storage=0.018 af Inflow=5.34 cfs 12,648 cf
Discarded=3.56 cfs 12,648 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=3.56 cfs 12,648 cf

Pond 101R: Reach Pipe DP1 TO MH Peak Elev=750.50' Inflow=0.00 cfs 0 cf
15.0" Round Culvert n=0.011 L=373.0' S=0.0094 '/' Outflow=0.00 cfs 0 cf

Pond 110R: Western Pipe Run Peak Elev=746.12' Inflow=5.28 cfs 13,159 cf
24.0" Round Culvert n=0.011 L=514.0' S=0.0040 '/' Outflow=5.28 cfs 13,159 cf

Pond 127P: B3 OVERSIZED PIPE RUN (24" Peak Elev=751.73' Storage=75 cf Inflow=1.62 cfs 3,356 cf
Outflow=1.59 cfs 3,356 cf

Pond 129P: STORMTECH FROM ADS Peak Elev=752.41' Storage=13,012 cf Inflow=10.77 cfs 25,610 cf
Outflow=1.28 cfs 25,463 cf

Pond 133P: WEST COURTYARD OVERSIZED Peak Elev=755.70' Storage=127 cf Inflow=2.56 cfs 5,319 cf
Outflow=2.51 cfs 5,319 cf

Pond 154P: Southeast Basin Peak Elev=730.40' Storage=1,526 cf Inflow=1.36 cfs 3,121 cf
Outflow=0.10 cfs 3,124 cf

Pond 174P: EAST COURTYARD OVERSIZED Peak Elev=755.40' Storage=49 cf Inflow=1.12 cfs 2,343 cf
Outflow=1.10 cfs 2,343 cf

Pond 183P: 24" HDPE PIPE Peak Elev=749.57' Inflow=1.51 cfs 3,708 cf
24.0" Round Culvert n=0.010 L=475.0' S=0.0042 '/' Outflow=1.51 cfs 3,708 cf

Link 48L: TOTAL OUTFALL Inflow=1.11 cfs 2,348 cf
Primary=1.11 cfs 2,348 cf

Link 66L: Total Offsite Inflow=1.11 cfs 2,348 cf
Primary=1.11 cfs 2,348 cf

Link 115L: EX. Cul-de-sac On Green Meadow Place Inflow=0.49 cfs 1,022 cf
Primary=0.49 cfs 1,022 cf

Link 124L: TO 12" PRIOR TO 24" (WEST) Inflow=2.23 cfs 4,619 cf
Primary=2.23 cfs 4,619 cf

Link 126L: OVERSIZED PIPE RUN BY B3 Inflow=1.62 cfs 3,356 cf
Primary=1.62 cfs 3,356 cf

Link 127L: total Inflow=0.31 cfs 647 cf
Primary=0.31 cfs 647 cf

Link 128L: FROM OVERSIZED PIPE RUN Inflow=1.59 cfs 3,356 cf
Primary=1.59 cfs 3,356 cf

Link 134L: TO UG Inflow=2.79 cfs 7,026 cf
Primary=2.79 cfs 7,026 cf

Link 171L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW below 1.11 cfs Inflow=0.69 cfs 1,602 cf
Primary=0.69 cfs 1,602 cf Secondary=0.00 cfs 0 cf

Link 174L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW below 1.32 cfs Inflow=0.82 cfs 1,905 cf
Primary=0.82 cfs 1,905 cf Secondary=0.00 cfs 0 cf

Link 175L: TO UG Inflow=1.53 cfs 4,050 cf
Primary=1.53 cfs 4,050 cf

Link 176L: UPSTREAM OF OVERSIZED PIPE Inflow=0.47 cfs 970 cf
Primary=0.47 cfs 970 cf

Link 177L: SUM OF As TO UG Inflow=5.06 cfs 11,027 cf
Primary=5.06 cfs 11,027 cf

Link 178L: As Inflow=4.21 cfs 11,076 cf
Primary=4.21 cfs 11,076 cf

Total Runoff Area = 1,570,805 sf Runoff Volume = 121,523 cf Average Runoff Depth = 0.93"
70.57% Pervious = 1,108,561 sf 29.43% Impervious = 462,244 sf

Summary for Subcatchment 35S: F6

3/3/21
Undetained portion of SE corner of SC that goes direct to SE low area (back yards of 3 home lots SE corner)

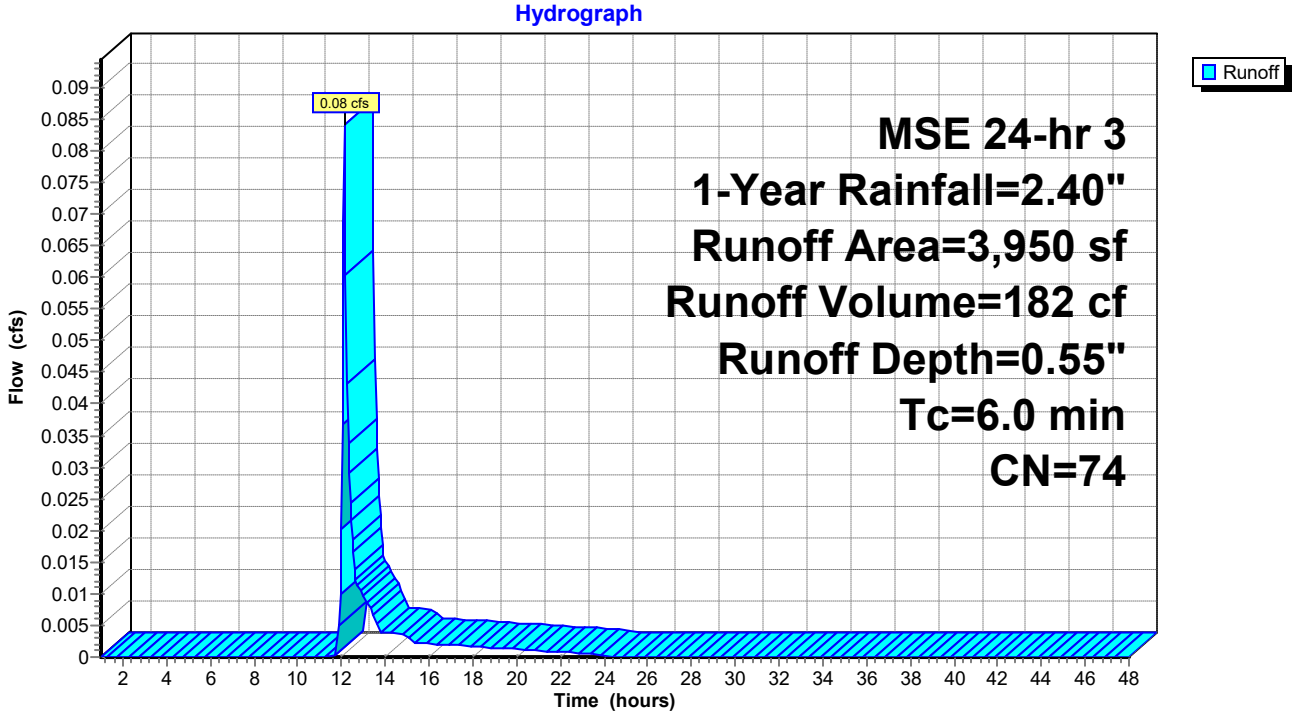
Runoff = 0.08 cfs @ 12.14 hrs, Volume= 182 cf, Depth= 0.55"
Routed to Pond 154P : Southeast Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	3,950	74	landscape
	3,950		100.00% Pervious Area

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

Subcatchment 35S: F6



Summary for Subcatchment 37S: F6

3/3/21
Undetained portion of SE corner of SC that goes direct to SE low area (back yards of 3 home lots SE corner)

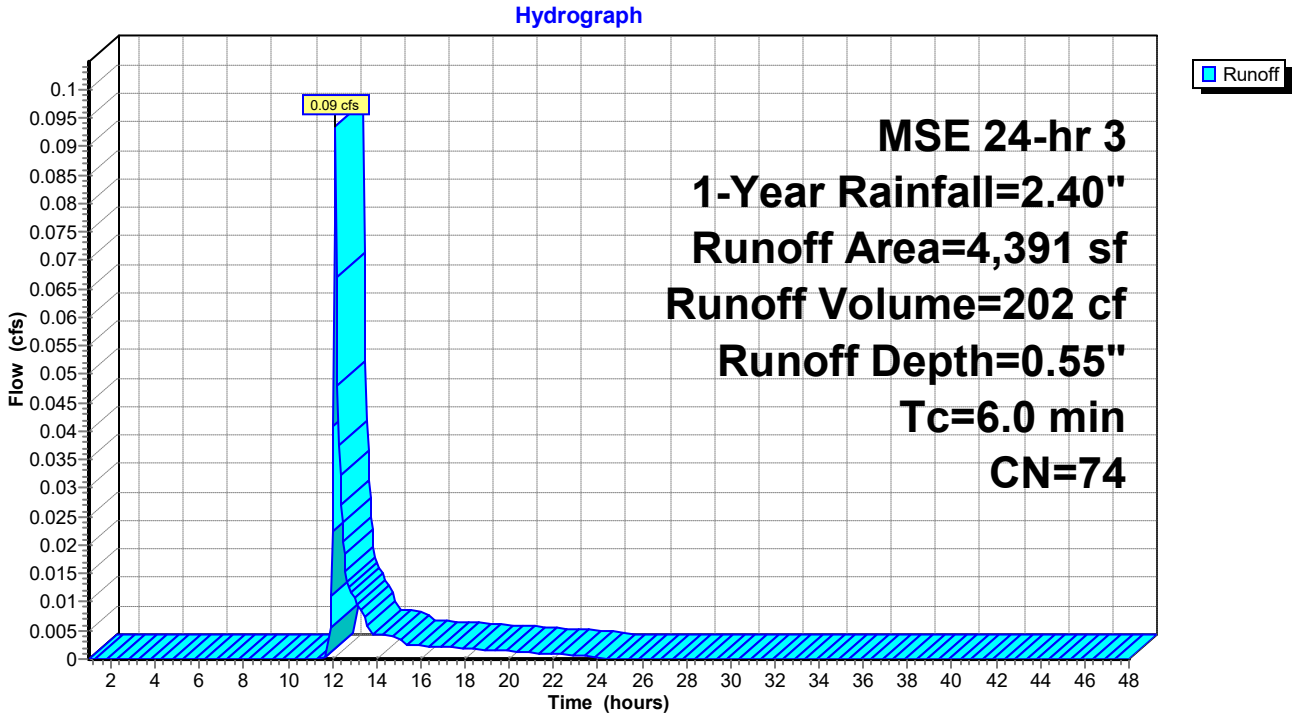
Runoff = 0.09 cfs @ 12.14 hrs, Volume= 202 cf, Depth= 0.55"
Routed to Pond 154P : Southeast Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	4,391	74	landscape
	4,391		100.00% Pervious Area

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

Subcatchment 37S: F6



Summary for Subcatchment 40S: F5 (Direct to Basin)

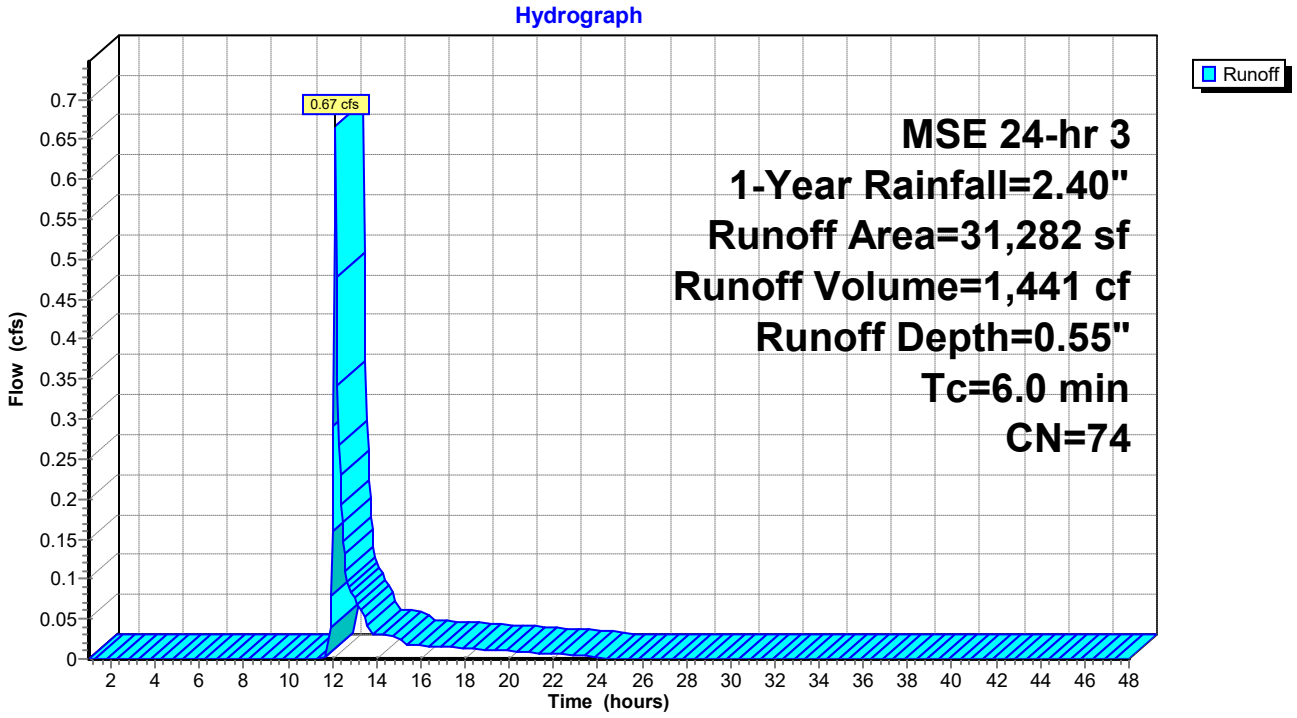
Runoff = 0.67 cfs @ 12.14 hrs, Volume= 1,441 cf, Depth= 0.55"
Routed to Pond 154P : Southeast Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	31,282	74	landscape
	31,282		100.00% Pervious Area

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

Subcatchment 40S: F5 (Direct to Basin)



Summary for Subcatchment 49S: D2

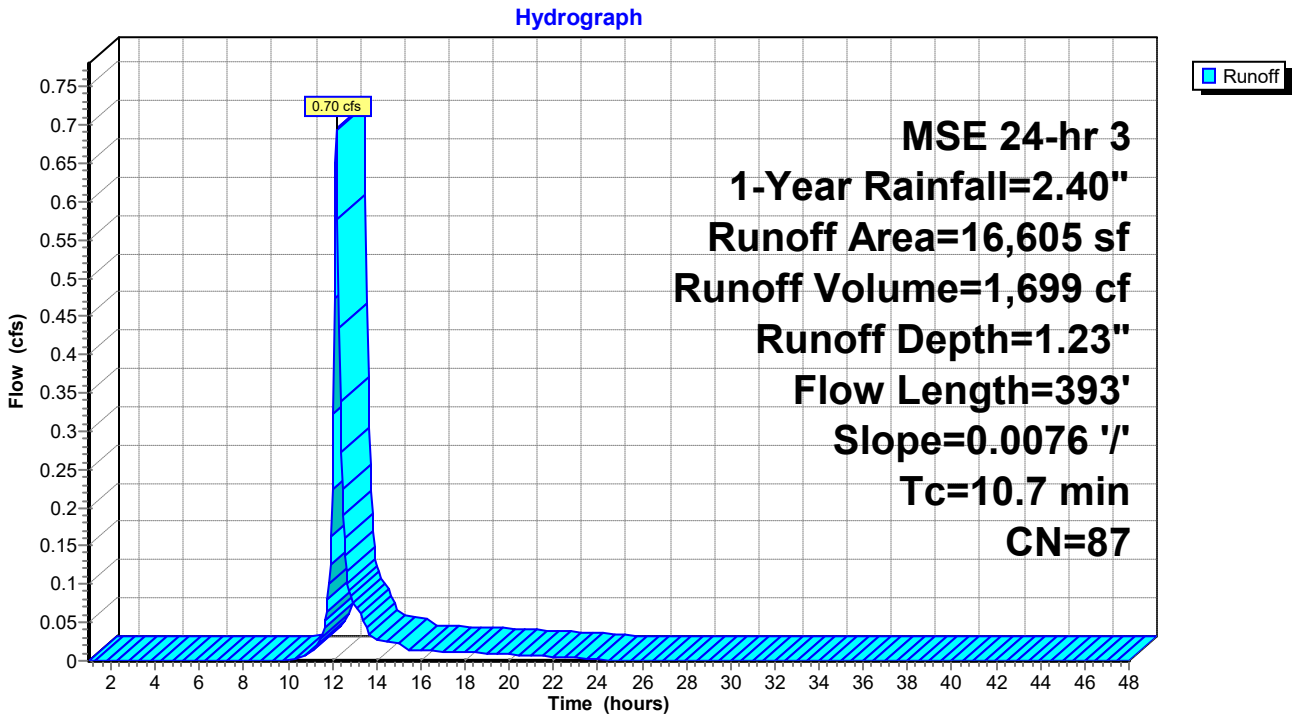
Runoff = 0.70 cfs @ 12.19 hrs, Volume= 1,699 cf, Depth= 1.23"
Routed to Pond 57P : Dry Pond 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	8,902	98	roof
*	7,703	74	landscape
	16,605	87	Weighted Average
	7,703		46.39% Pervious Area
	8,902		53.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	393	0.0076	0.61		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps

Subcatchment 49S: D2



Summary for Subcatchment 52S: E1

3/3/21
Delineation NOT updated based on Justin's waterdrops, needs finalization, it routes to western property ditch that goes ultimately to IB. We are using Joe's SWMP2 Figure from December 2020.

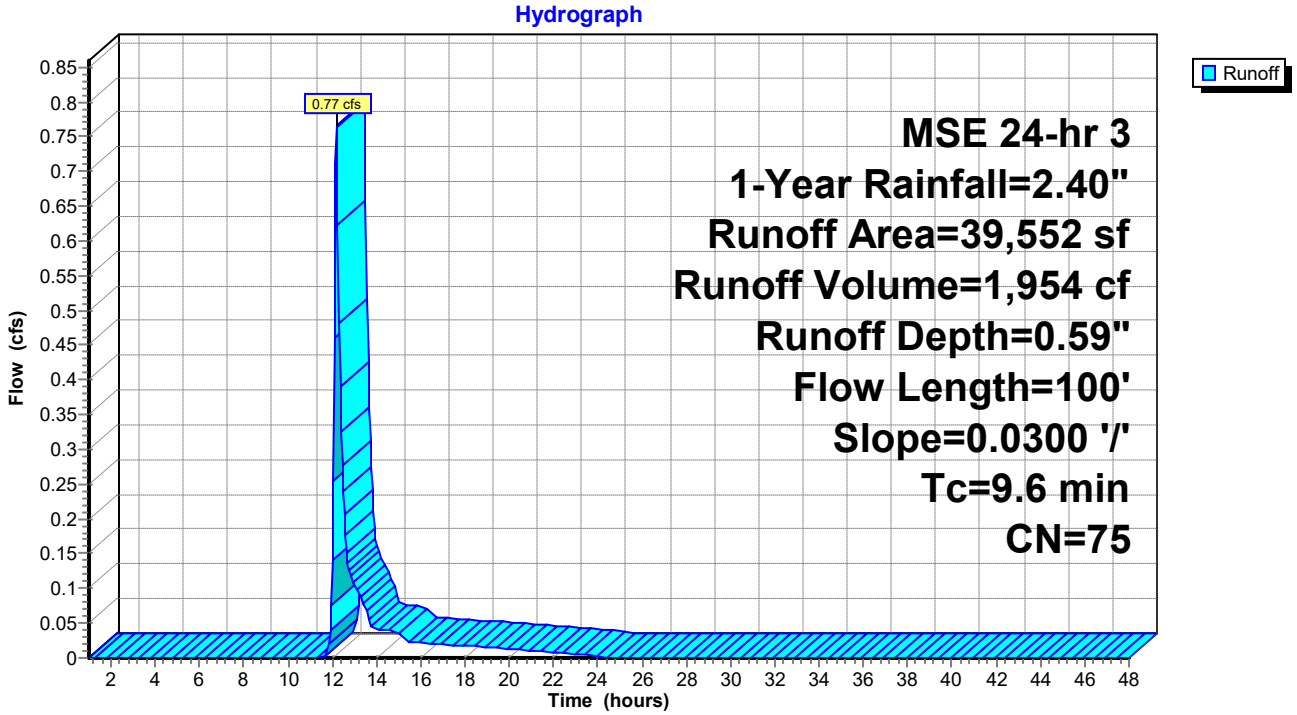
Runoff = 0.77 cfs @ 12.19 hrs, Volume= 1,954 cf, Depth= 0.59"
Routed to Reach 111R : Western PL North Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	2,161	98	Walks
	37,391	74	>75% Grass cover, Good, HSG C
	39,552	75	Weighted Average
	37,391		94.54% Pervious Area
	2,161		5.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0300	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 52S: E1



Summary for Subcatchment 55S: G

3/3/21
Needs to be delineated, this is from Joe's SWMP2

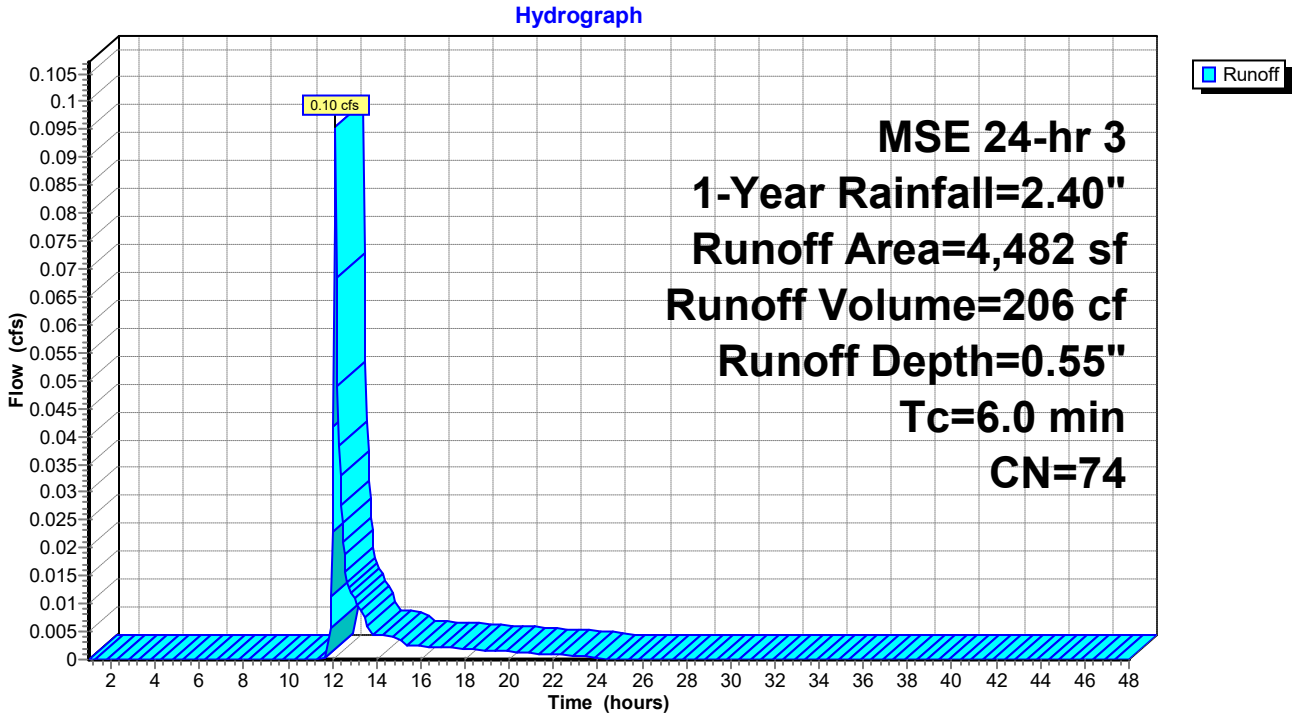
Runoff = 0.10 cfs @ 12.14 hrs, Volume= 206 cf, Depth= 0.55"
Routed to Link 66L : Total Offsite

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	4,482	74	landscape
	4,482		100.00% Pervious Area

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

Subcatchment 55S: G



Summary for Subcatchment 81S: O1

3/3/21
SW portion off-site flowing into IB

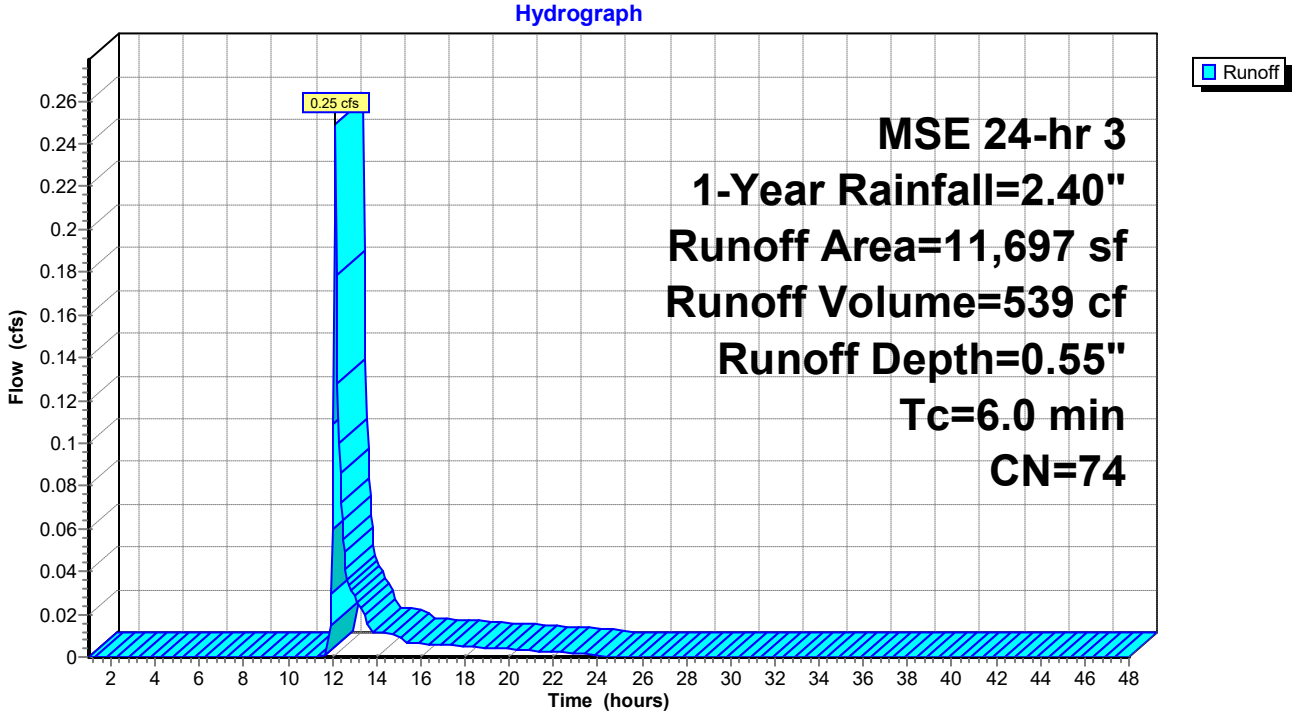
Runoff = 0.25 cfs @ 12.14 hrs, Volume= 539 cf, Depth= 0.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	11,697	74	PERV
	11,697		100.00% Pervious Area

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

Subcatchment 81S: O1



Summary for Subcatchment 82S: D1

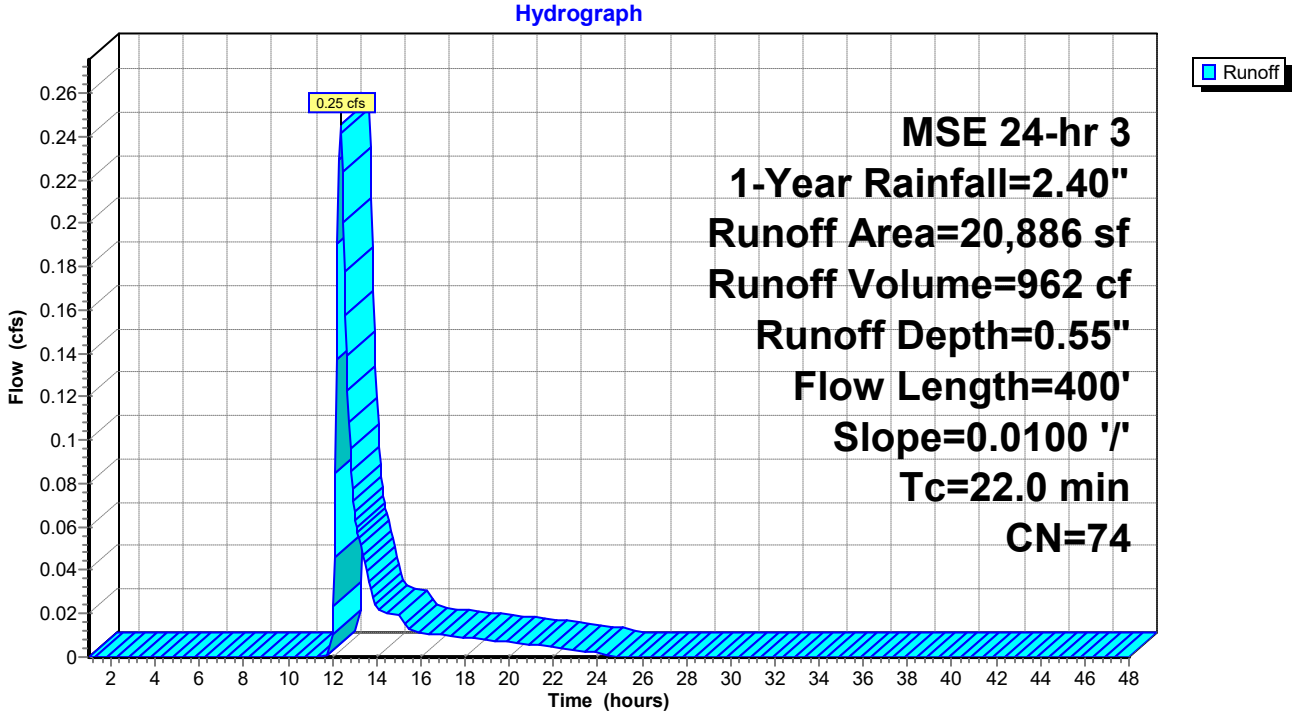
Runoff = 0.25 cfs @ 12.37 hrs, Volume= 962 cf, Depth= 0.55"
Routed to Pond 57P : Dry Pond 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	20,886	74	landscape
	20,886		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	100	0.0100	0.11		**Sheet Flow, BUILDING TO SWALE** Grass: Short n= 0.150 P2= 2.42"
7.1	300	0.0100	0.70		**Shallow Concentrated Flow, SWALE ALONG BACK** Short Grass Pasture Kv= 7.0 fps
22.0	400	Total			

Subcatchment 82S: D1



Summary for Subcatchment 87S: I

3/3/21
Wooded area

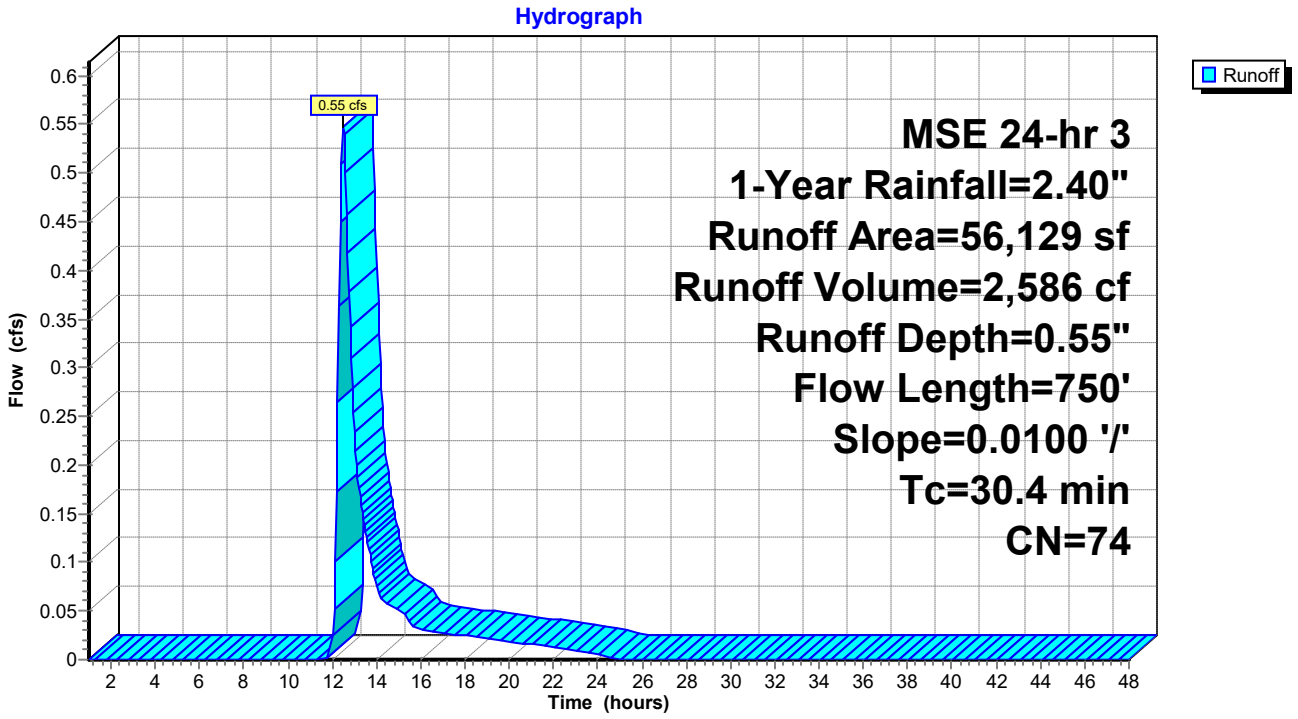
Runoff = 0.55 cfs @ 12.49 hrs, Volume= 2,586 cf, Depth= 0.55"
Routed to Reach 108R : South Berm Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	56,129	74	landscape
	56,129		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	100	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.42"
15.5	650	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
30.4	750	Total			

Subcatchment 87S: I



Summary for Subcatchment 95S: C1

Area actually draining to east swale
3/3/21
Northern portion of East Roof, exterior east courtyard, 7 home lots

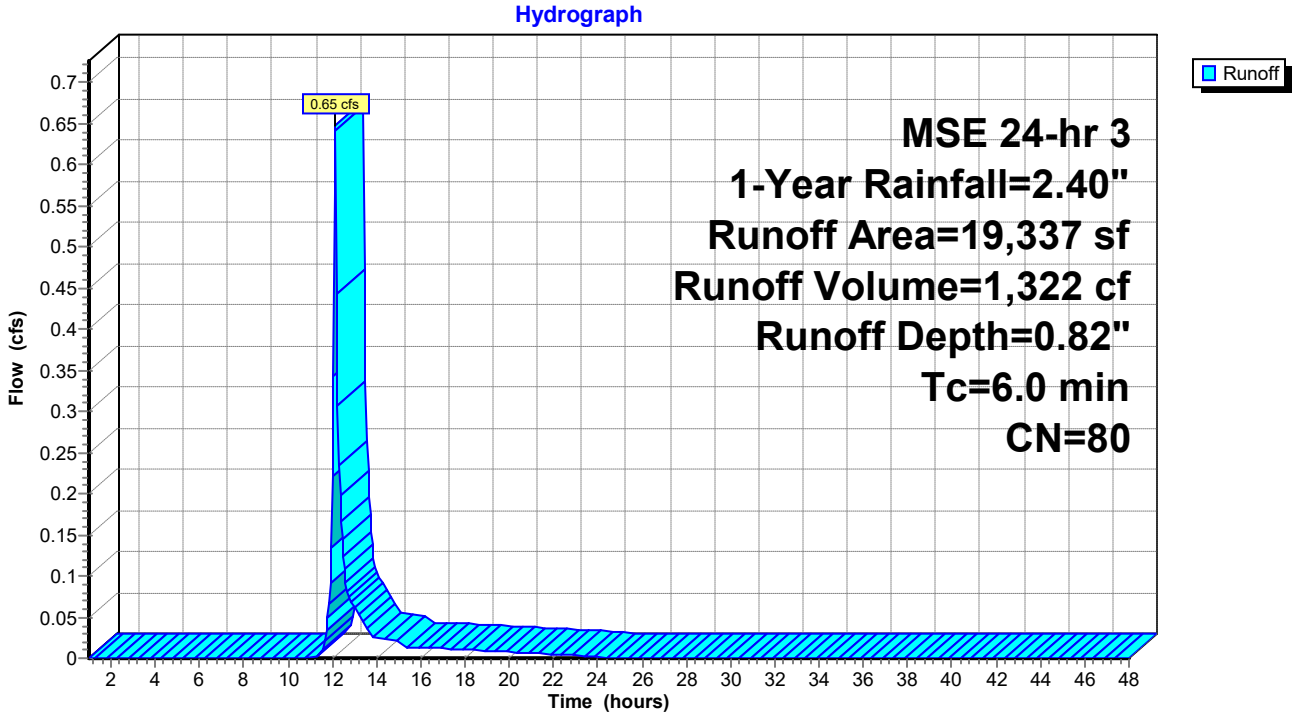
Runoff = 0.65 cfs @ 12.14 hrs, Volume= 1,322 cf, Depth= 0.82"
Routed to Reach 106R : East Swale (North End)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	2,210	98	walks
*	1,774	98	roads
*	14,290	74	landscape
*	1,063	98	roof
	19,337	80	Weighted Average
	14,290		73.90% Pervious Area
	5,047		26.10% Impervious Area

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

Subcatchment 95S: C1



Summary for Subcatchment 96S: E2

3/3/21
Delineation needs updating, but it does route to IB
Portion of cemetary site that flows from north to south into IB

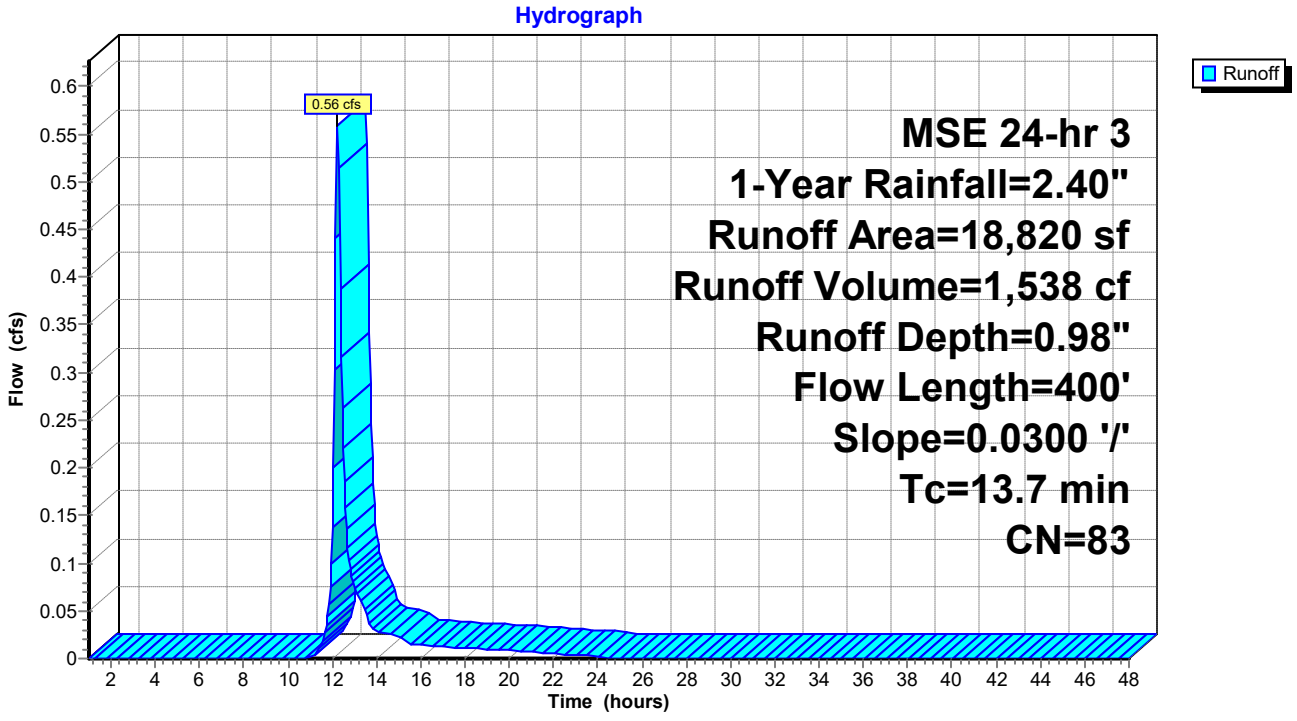
Runoff = 0.56 cfs @ 12.23 hrs, Volume= 1,538 cf, Depth= 0.98"
Routed to Pond 60P : Infiltration Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	11,460	74	landscape
*	7,360	98	roofs
	18,820	83	Weighted Average
	11,460		60.89% Pervious Area
	7,360		39.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0300	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.42"
4.1	300	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.7	400	Total			

Subcatchment 96S: E2



Summary for Subcatchment 97S: C2

Subset C - C1
3/3/21
Southern portion of East Building Roof, Southern Building (Middle one) roof, pond area
pipe from roofs not sized yet

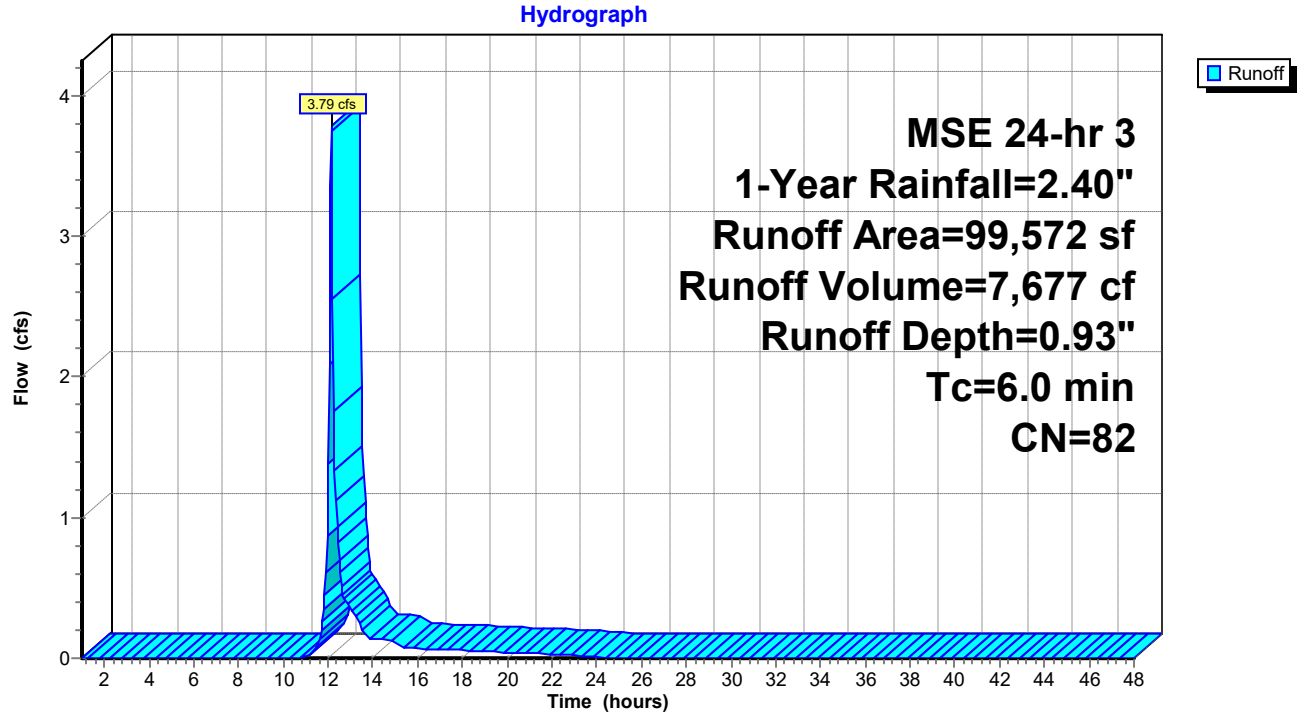
Runoff = 3.79 cfs @ 12.14 hrs, Volume= 7,677 cf, Depth= 0.93"
Routed to Pond 58P : Dry Pond 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	9,728	98	walks and patios
*	23,739	98	roofs
*	66,105	74	landscape
	99,572	82	Weighted Average
	66,105		66.39% Pervious Area
	33,467		33.61% Impervious Area

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

Subcatchment 97S: C2



Summary for Subcatchment 98S: E3

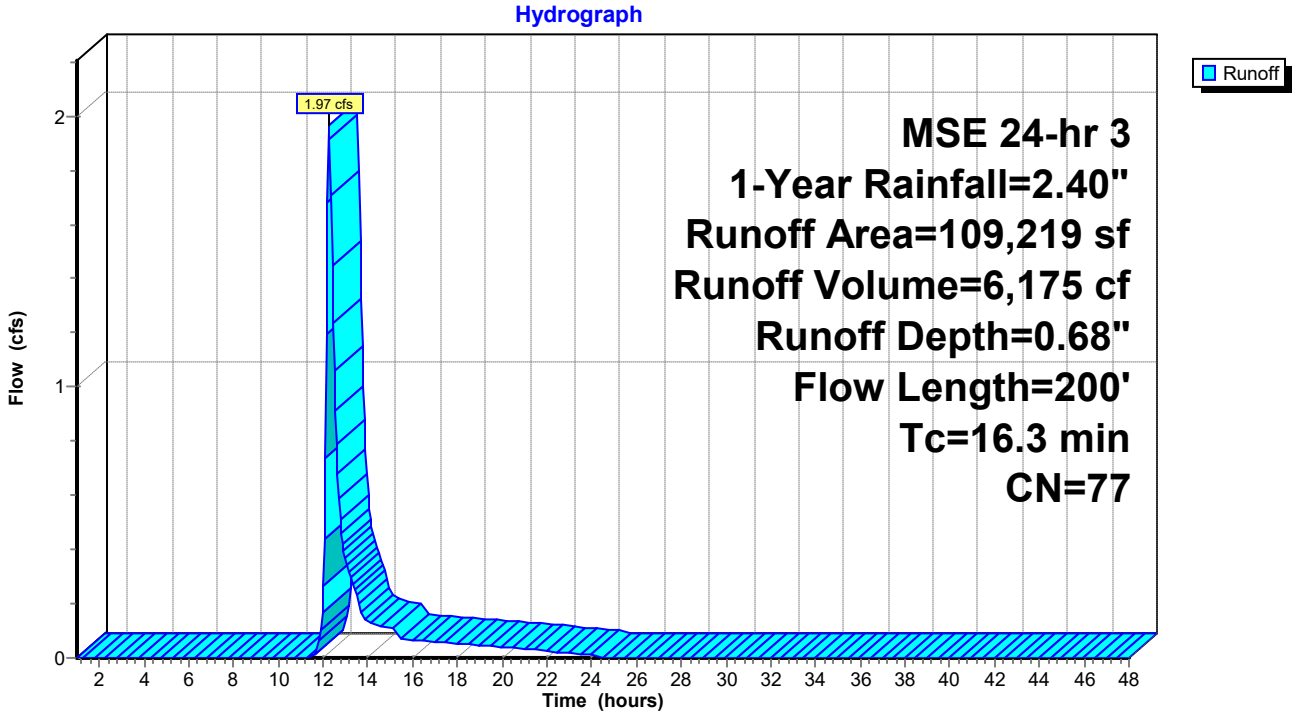
Runoff = 1.97 cfs @ 12.27 hrs, Volume= 6,175 cf, Depth= 0.68"
Routed to Pond 60P : Infiltration Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	6,532	98	walks
*	8,300	98	Roads
*	94,387	74	landscape
	109,219	77	Weighted Average
	94,387		86.42% Pervious Area
	14,832		13.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	100	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.42"
1.4	100	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
16.3	200	Total			

Subcatchment 98S: E3



Summary for Subcatchment 105S: C (EXTERIOR)

Subset C - C1
3/3/21
Southern portion of East Building Roof, Southern Building (Middle one) roof, pond area
pipe from roofs not sized yet

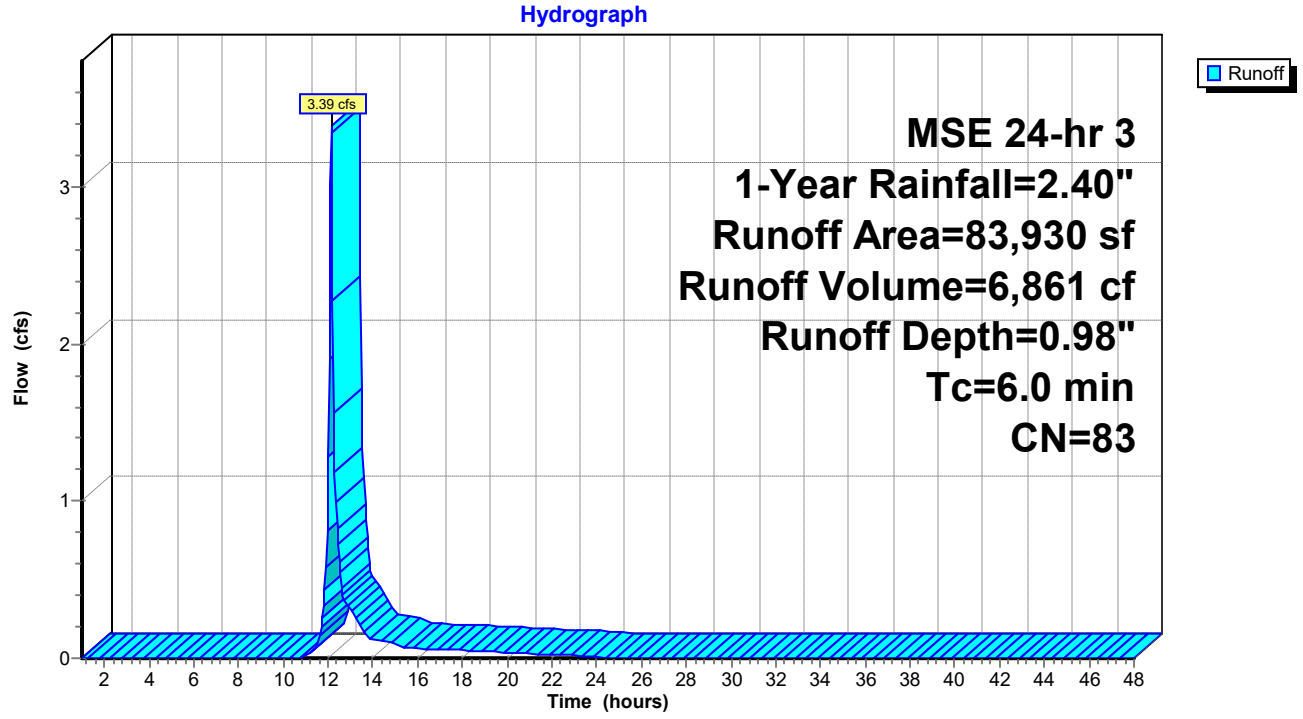
Runoff = 3.39 cfs @ 12.14 hrs, Volume= 6,861 cf, Depth= 0.98"
Routed to Reach 99R : East Swale (SE End)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	8,648	98	walks and patios
*	24,058	98	roofs
*	51,224	74	landscape
	83,930	83	Weighted Average
	51,224		61.03% Pervious Area
	32,706		38.97% Impervious Area

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

Subcatchment 105S: C (EXTERIOR)



Summary for Subcatchment 106S: B

3/3/21
North face of West Building, Lawn Area south of WTP, Patios

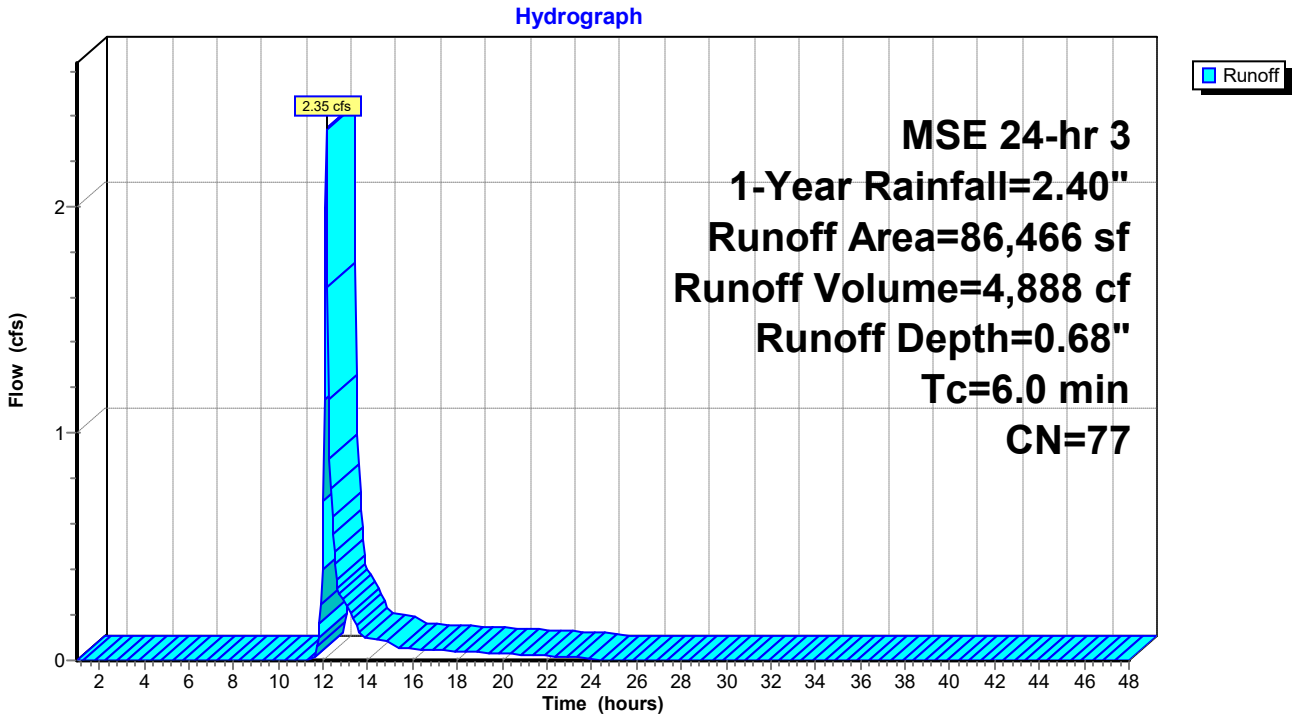
Runoff = 2.35 cfs @ 12.14 hrs, Volume= 4,888 cf, Depth= 0.68"
Routed to Reach 111R : Western PL North Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	76,225	74	landscape
*	9,317	98	walks
*	924	98	roof
	86,466	77	Weighted Average
	76,225		88.16% Pervious Area
	10,241		11.84% Impervious Area

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

Subcatchment 106S: B



Summary for Subcatchment 107S: F

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

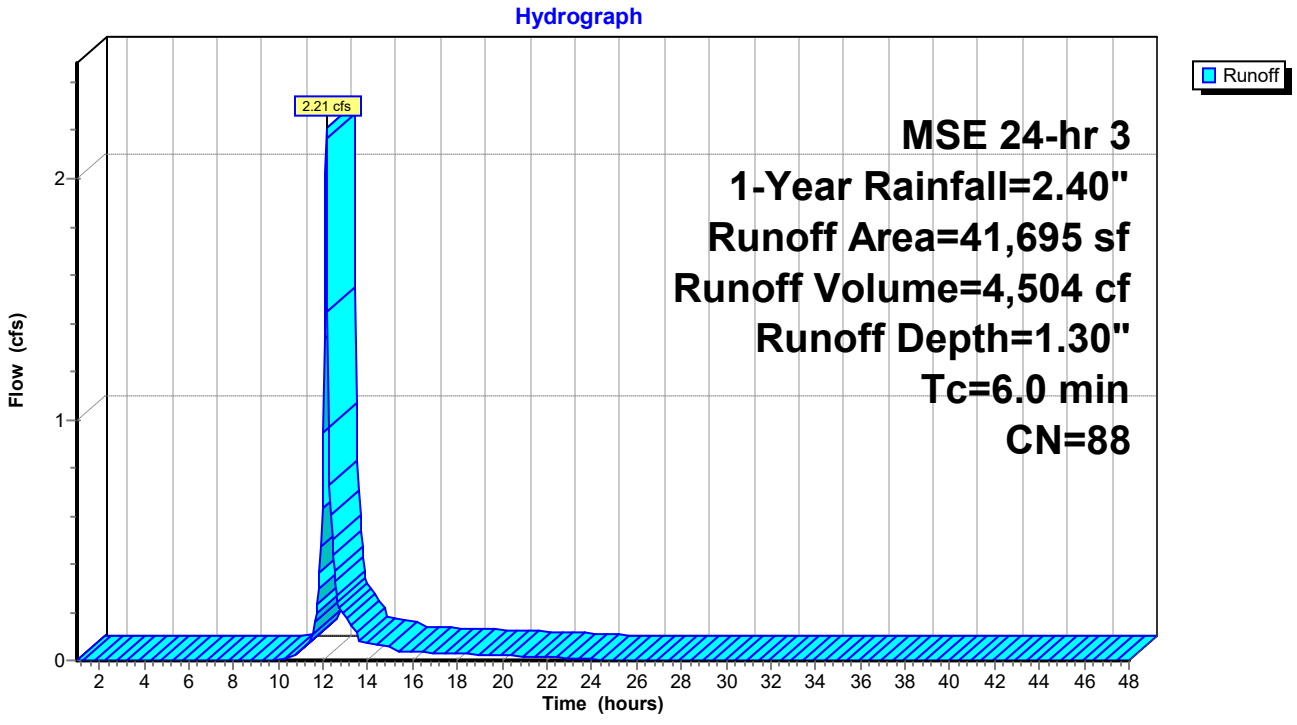
Runoff = 2.21 cfs @ 12.13 hrs, Volume= 4,504 cf, Depth= 1.30"
Routed to Reach 109R : SC Road East Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	7,467	98	roads
*	17,550	98	roof
*	16,678	74	landscape
	41,695	88	Weighted Average
	16,678		40.00% Pervious Area
	25,017		60.00% Impervious Area

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

Subcatchment 107S: F



Summary for Subcatchment 108S: B1 (INTERIOR)

3/3/21
Northern portion of W building roof

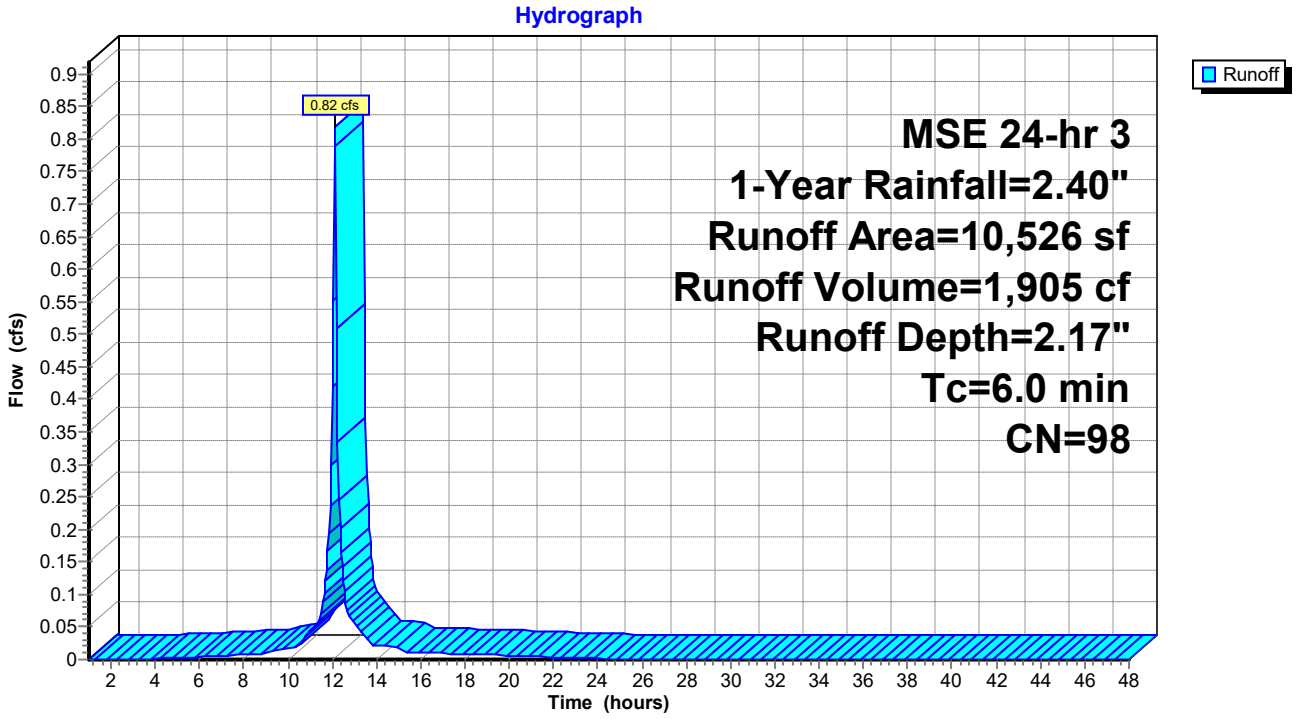
Runoff = 0.82 cfs @ 12.13 hrs, Volume= 1,905 cf, Depth= 2.17"
Routed to Link 174L : 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	10,526	98	roof
	10,526		100.00% Impervious Area

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

Subcatchment 108S: B1 (INTERIOR)



Summary for Subcatchment 112S: D3

3/3/21
Western Building Courtyard (need to check that Joe's overall B works with B1-B4 in our update

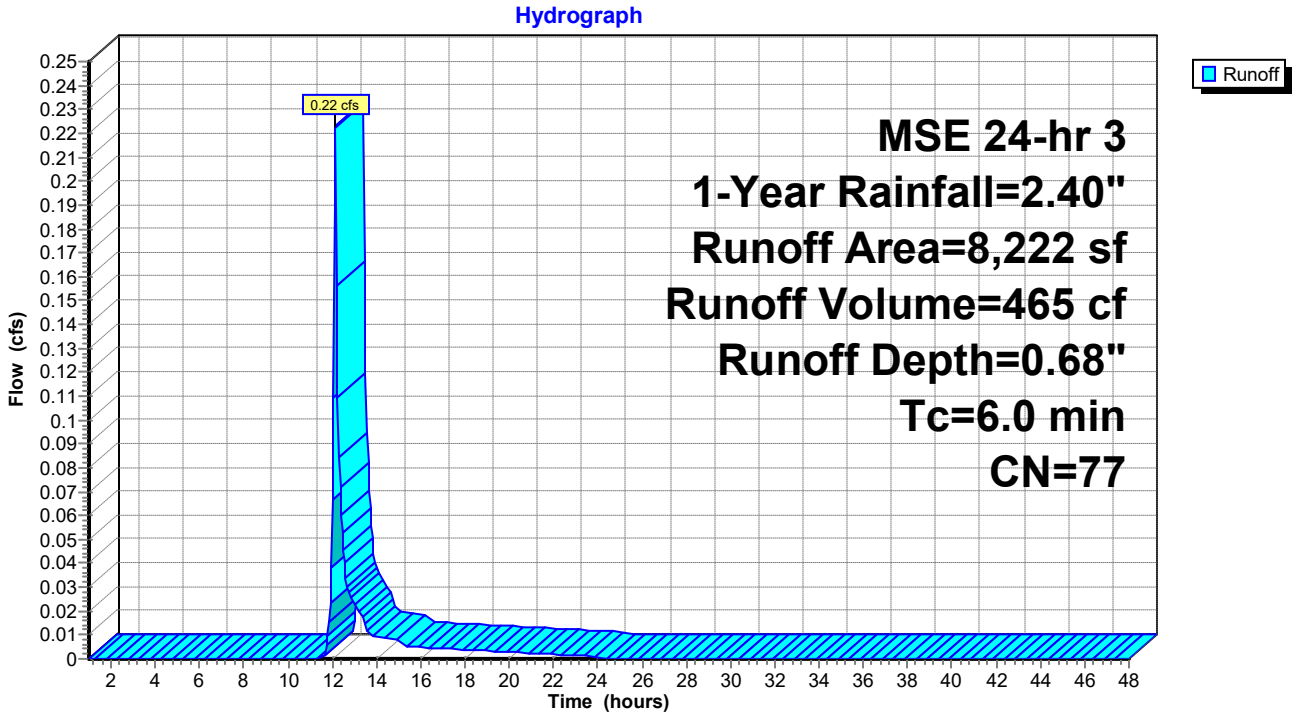
Runoff = 0.22 cfs @ 12.14 hrs, Volume= 465 cf, Depth= 0.68"
Routed to Reach 151R : Western PL North Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	1,062	98	walks
*	7,160	74	landscape
	8,222	77	Weighted Average
	7,160		87.08% Pervious Area
	1,062		12.92% Impervious Area

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

Subcatchment 112S: D3



Summary for Subcatchment 118S: A14

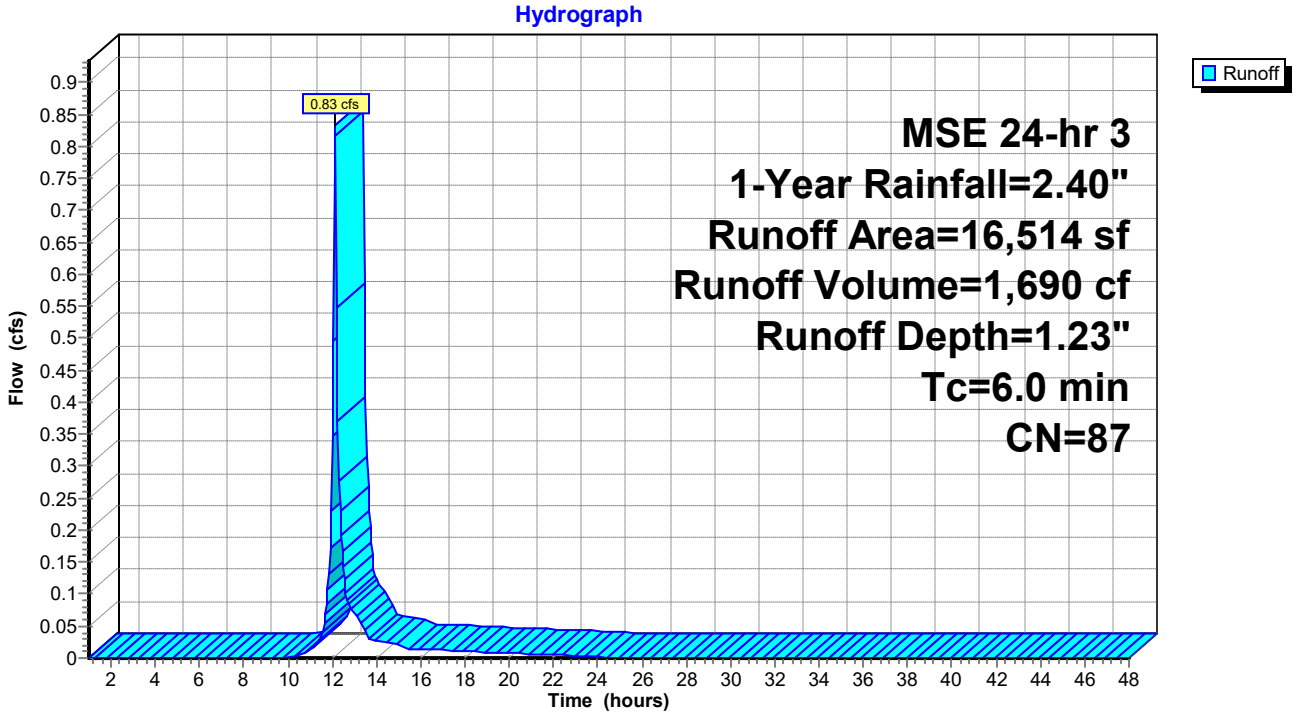
Runoff = 0.83 cfs @ 12.13 hrs, Volume= 1,690 cf, Depth= 1.23"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	3,919	98	WALKS
*	5,040	98	ROADS
*	0	98	ROOF
*	7,555	74	LANDSCAPING
	16,514	87	Weighted Average
	7,555		45.75% Pervious Area
	8,959		54.25% Impervious Area

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

Subcatchment 118S: A14



Summary for Subcatchment 120S: A30

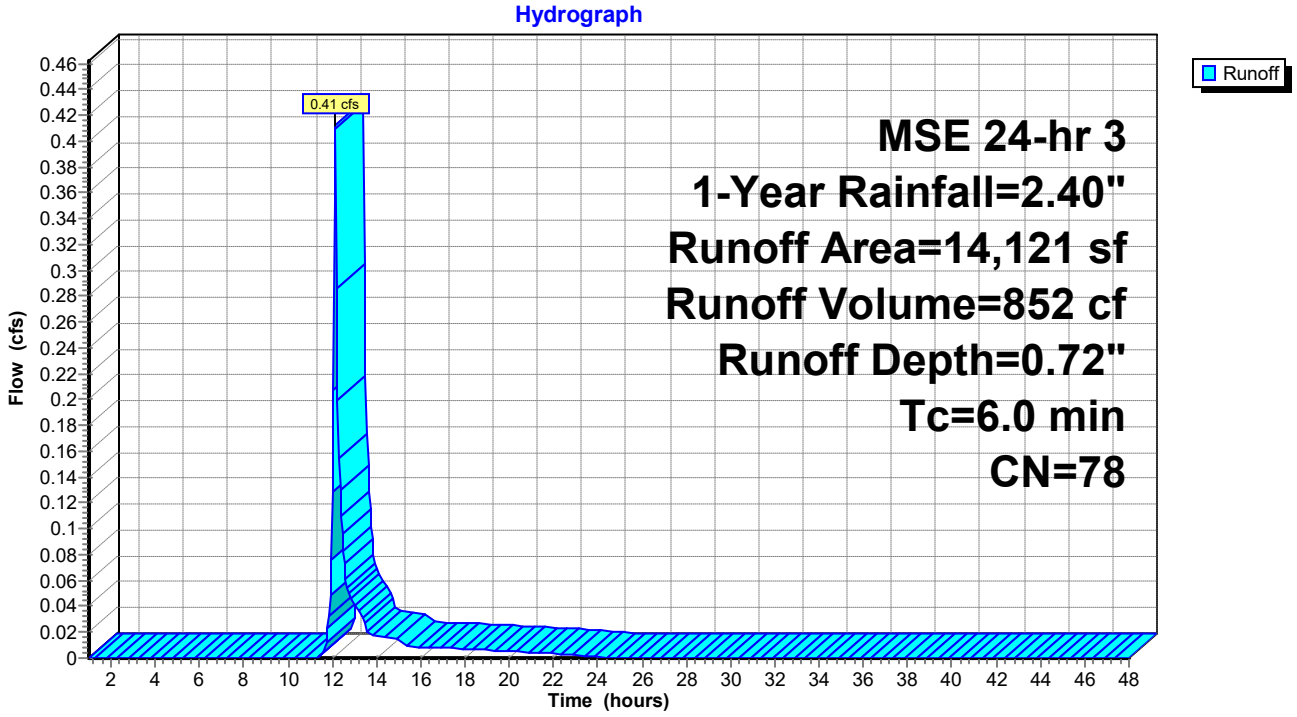
Runoff = 0.41 cfs @ 12.14 hrs, Volume= 852 cf, Depth= 0.72"
Routed to Link 126L : OVERSIZED PIPE RUN BY B3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	1,025	98	WALKS
*	1,563	98	ROADS
*	0	98	ROOF
*	11,533	74	LANDSCAPING
	14,121	78	Weighted Average
	11,533		81.67% Pervious Area
	2,588		18.33% Impervious Area

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

Subcatchment 120S: A30



Summary for Subcatchment 121S: A32

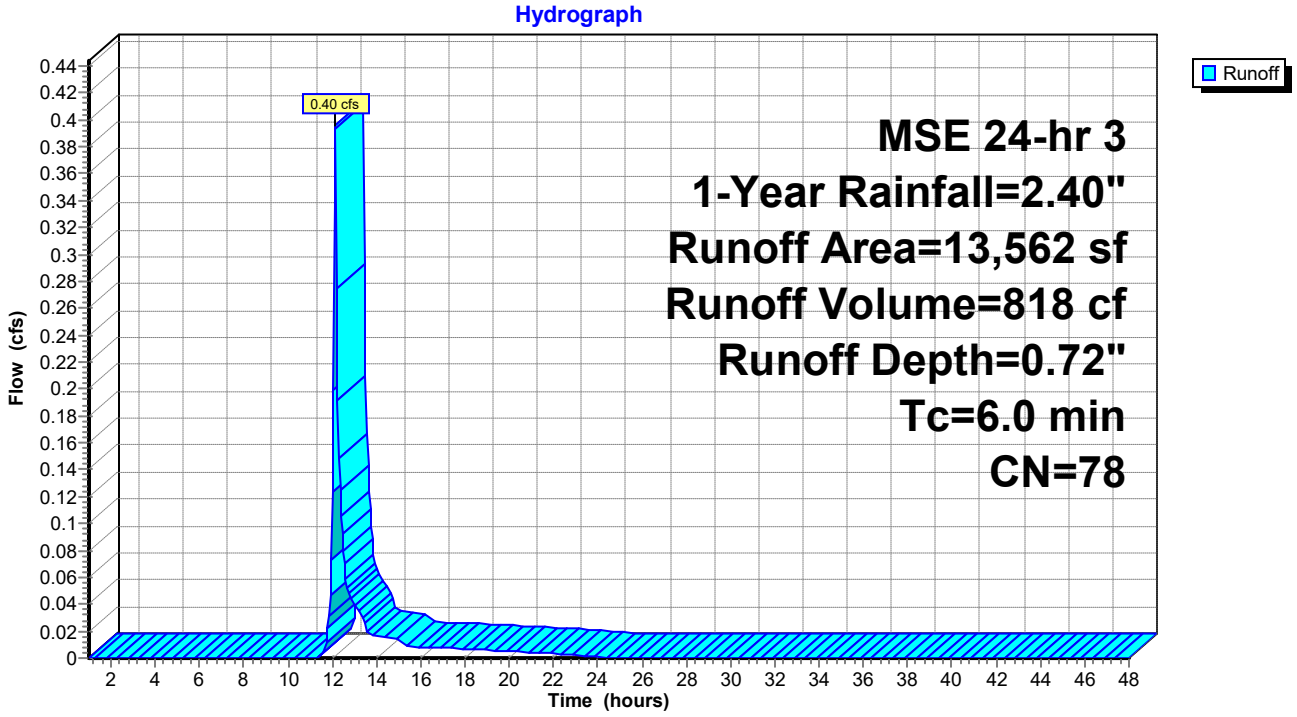
Runoff = 0.40 cfs @ 12.14 hrs, Volume= 818 cf, Depth= 0.72"
Routed to Link 126L : OVERSIZED PIPE RUN BY B3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	808	98	WALKS
*	1,224	98	ROADS
*	0	98	ROOF
*	11,530	74	LANDSCAPING
	13,562	78	Weighted Average
	11,530		85.02% Pervious Area
	2,032		14.98% Impervious Area

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

Subcatchment 121S: A32



Summary for Subcatchment 122S: F1

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

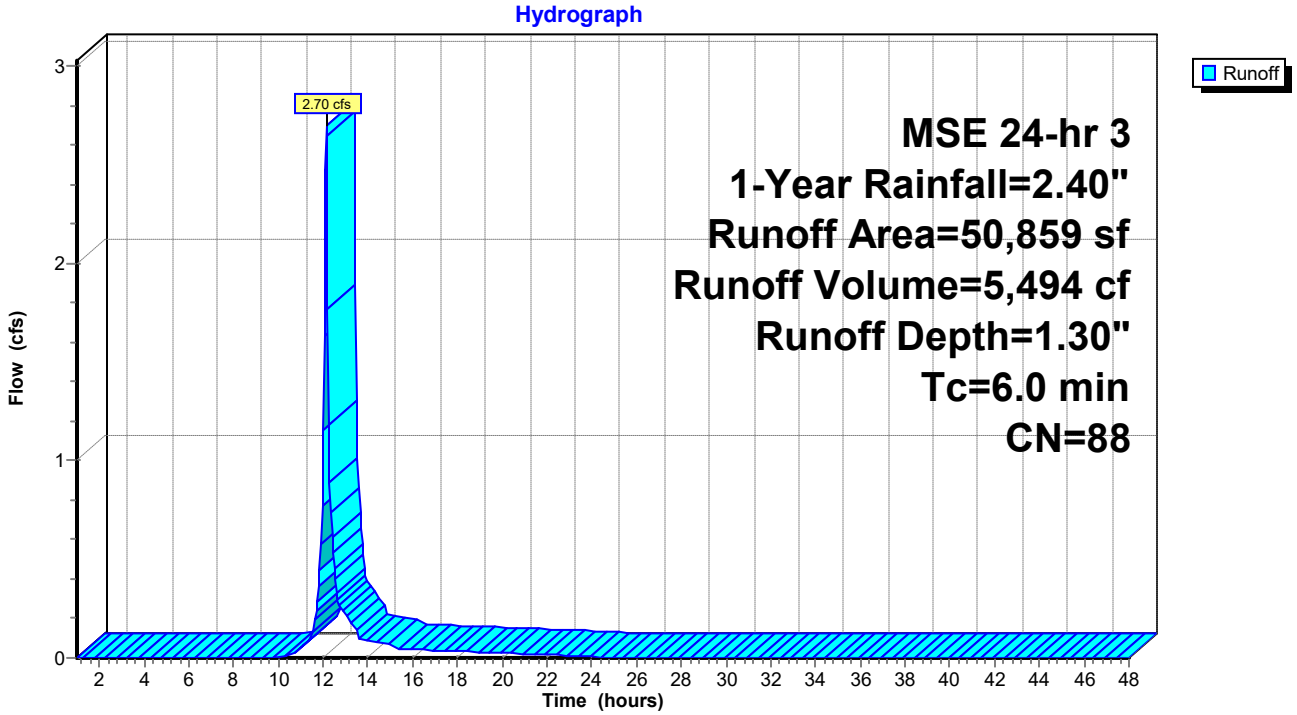
Runoff = 2.70 cfs @ 12.13 hrs, Volume= 5,494 cf, Depth= 1.30"
Routed to Reach 117R : SC Road West Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	244	98	walks
*	10,158	98	roads
*	18,836	98	roof
*	21,621	74	landscape
	50,859	88	Weighted Average
	21,621		42.51% Pervious Area
	29,238		57.49% Impervious Area

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

Subcatchment 122S: F1



Summary for Subcatchment 125S: F3

3/3/21
SW Lot that drains direct to SC Pond

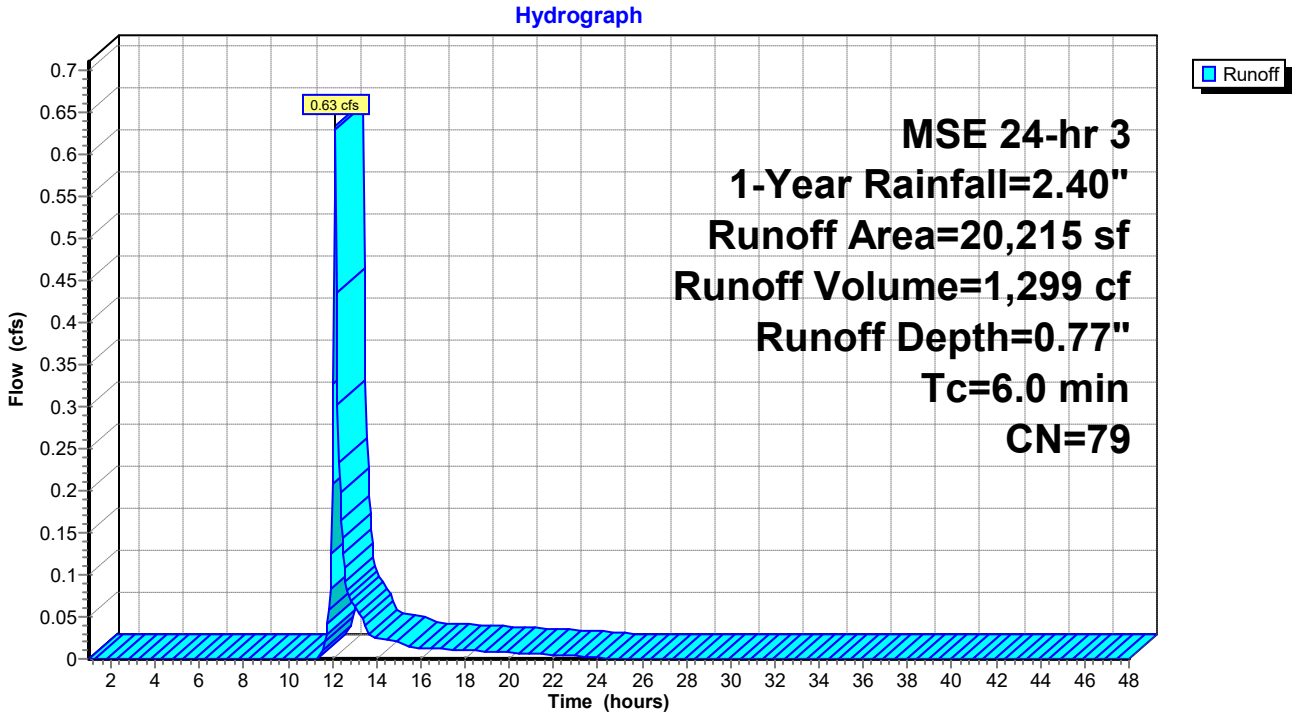
Runoff = 0.63 cfs @ 12.14 hrs, Volume= 1,299 cf, Depth= 0.77"
Routed to Reach 136R : SC West Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	4,099	98	roof
*	16,116	74	landscape
	20,215	79	Weighted Average
	16,116		79.72% Pervious Area
	4,099		20.28% Impervious Area

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

Subcatchment 125S: F3



Summary for Subcatchment 126S: F4

3/3/21
SC Pond itself

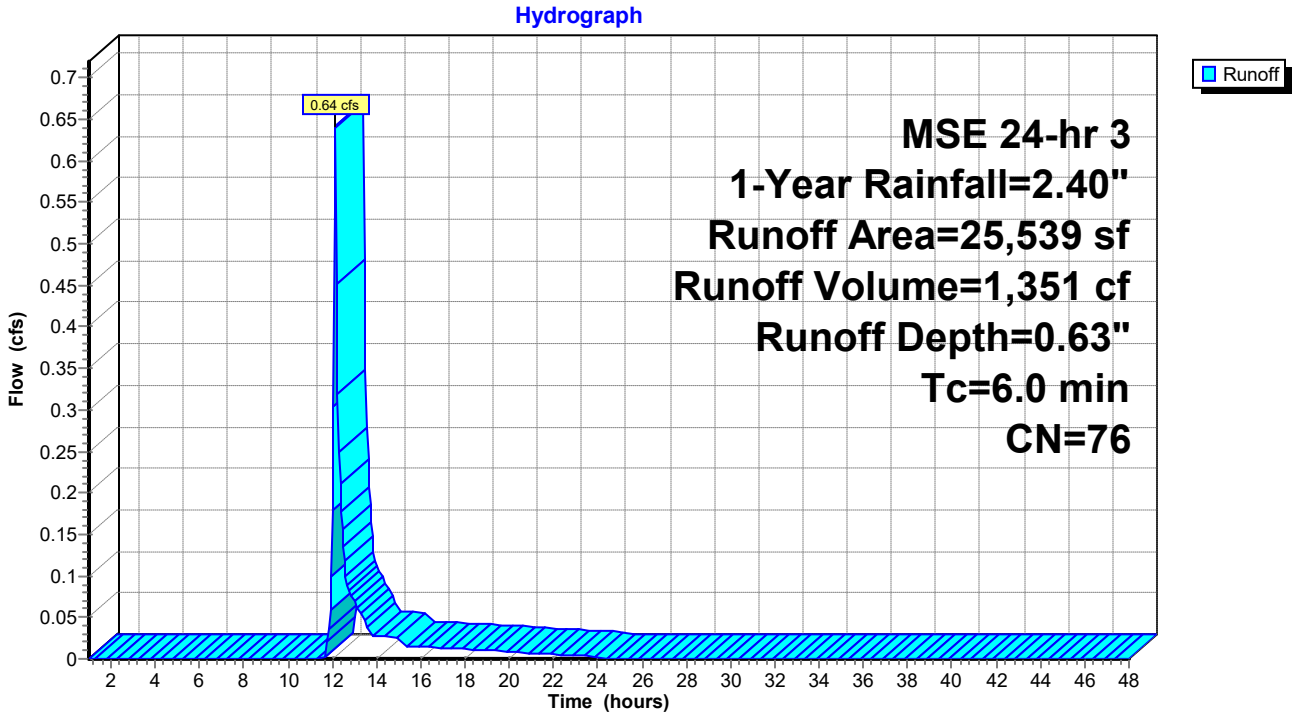
Runoff = 0.64 cfs @ 12.14 hrs, Volume= 1,351 cf, Depth= 0.63"
Routed to Pond 95P : Dry Pond 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	23,462	74	landscape
*	2,077	98	roof
	25,539	76	Weighted Average
	23,462		91.87% Pervious Area
	2,077		8.13% Impervious Area

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

Subcatchment 126S: F4



Summary for Subcatchment 127S: A13

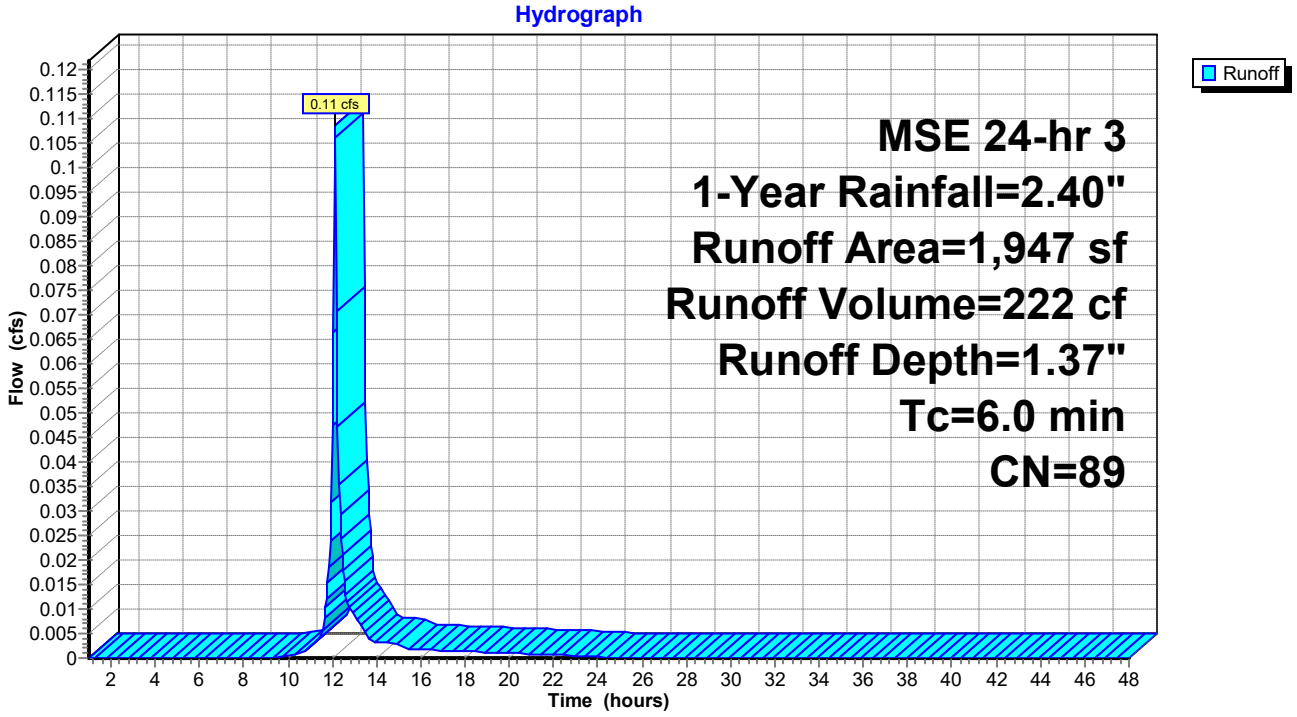
Runoff = 0.11 cfs @ 12.13 hrs, Volume= 222 cf, Depth= 1.37"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	288	98	WALKS
*	0	98	ROADS
*	924	98	ROOF
*	735	74	LANDSCAPING
	1,947	89	Weighted Average
	735		37.75% Pervious Area
	1,212		62.25% Impervious Area

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

Subcatchment 127S: A13



Summary for Subcatchment 128S: A15

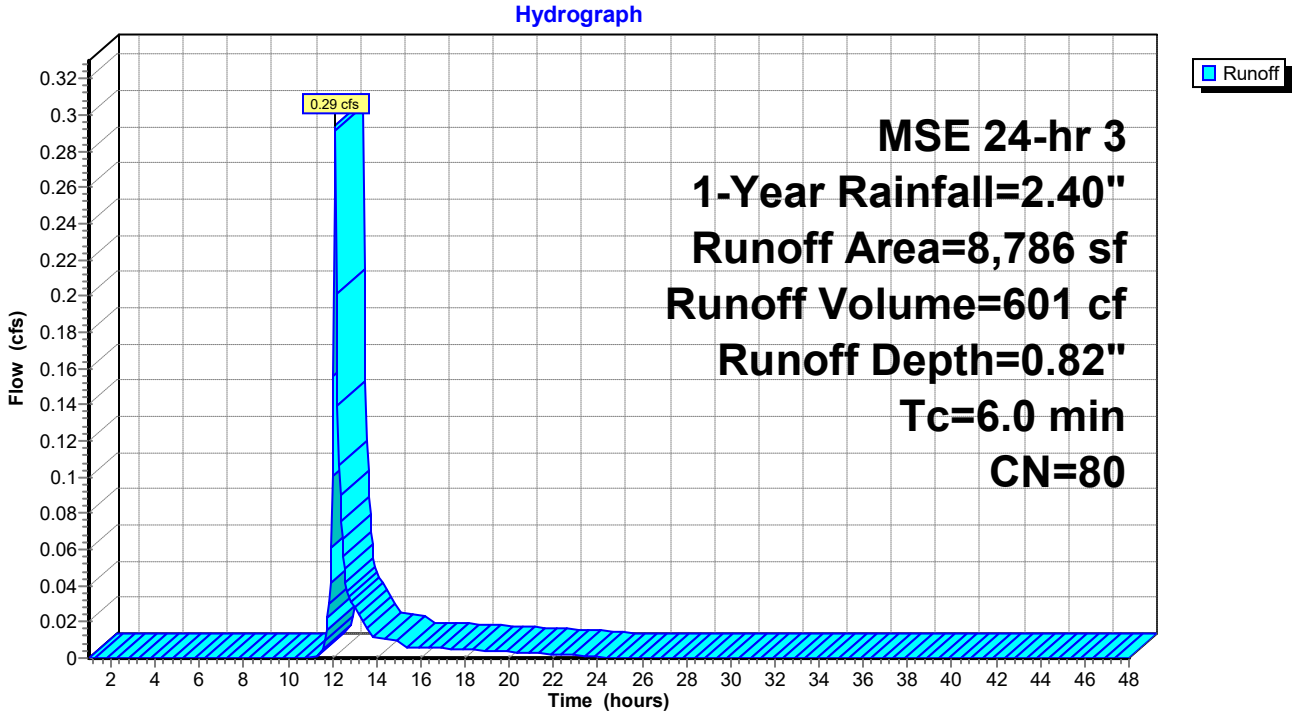
Runoff = 0.29 cfs @ 12.14 hrs, Volume= 601 cf, Depth= 0.82"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	2,261	98	WALKS
*	0	98	ROADS
*	0	98	ROOF
*	6,525	74	LANDSCAPING
	8,786	80	Weighted Average
	6,525		74.27% Pervious Area
	2,261		25.73% Impervious Area

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

Subcatchment 128S: A15



Summary for Subcatchment 130S: A12

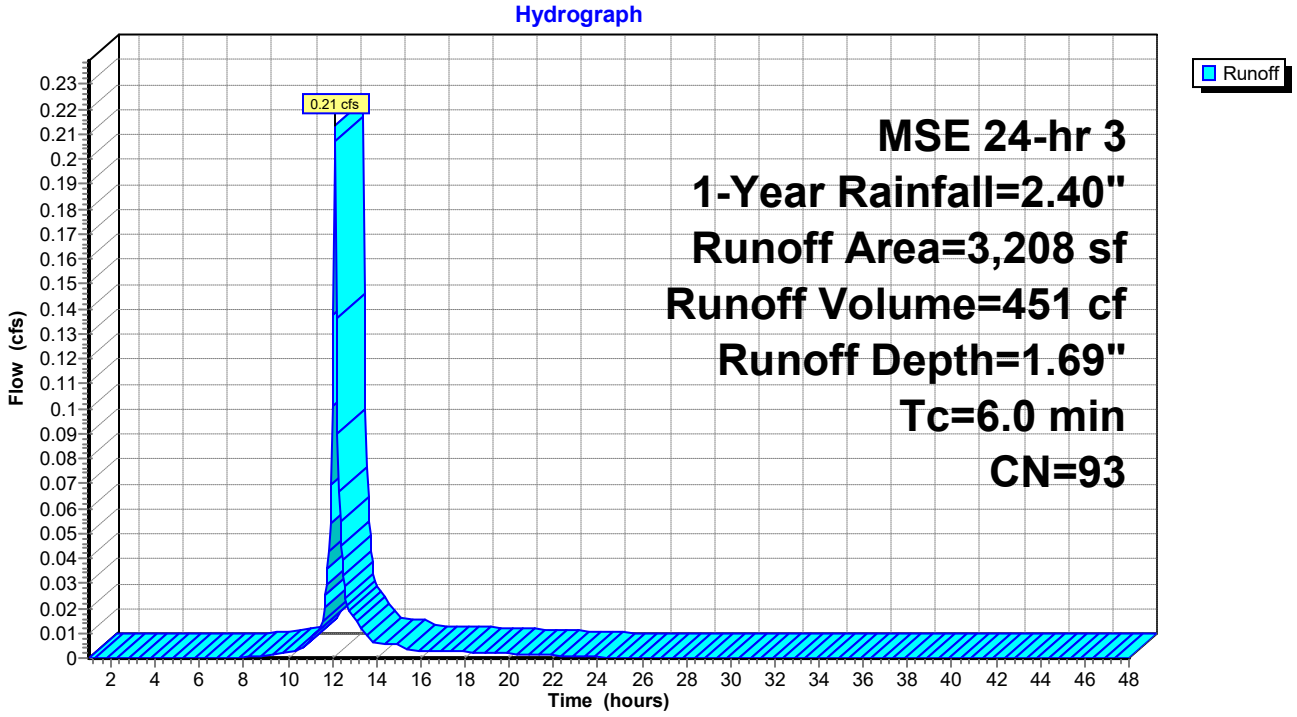
Runoff = 0.21 cfs @ 12.13 hrs, Volume= 451 cf, Depth= 1.69"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	216	98	WALKS
*	1,455	98	ROADS
*	924	98	ROOF
*	613	74	LANDSCAPING
	3,208	93	Weighted Average
	613		19.11% Pervious Area
	2,595		80.89% Impervious Area

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

Subcatchment 130S: A12



Summary for Subcatchment 131S: A11

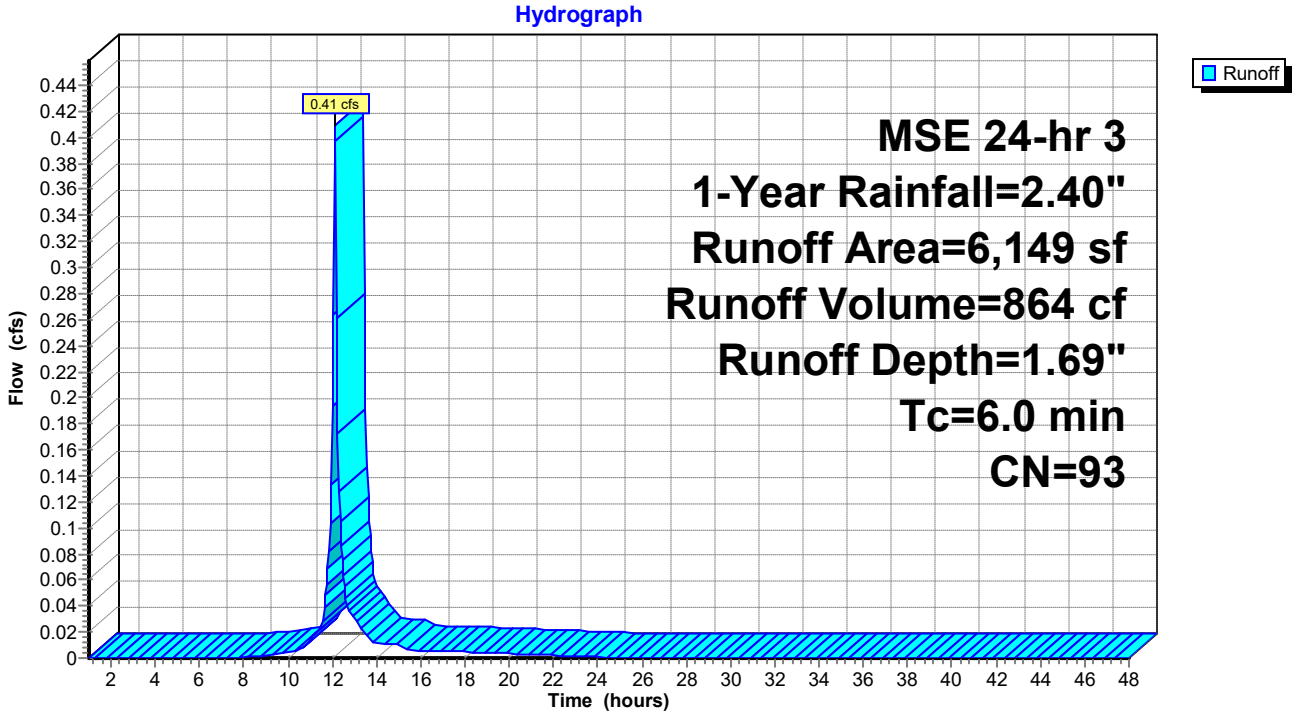
Runoff = 0.41 cfs @ 12.13 hrs, Volume= 864 cf, Depth= 1.69"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	1,109	98	WALKS
*	1,910	98	ROADS
*	1,848	98	ROOF
*	1,282	74	LANDSCAPING
	6,149	93	Weighted Average
	1,282		20.85% Pervious Area
	4,867		79.15% Impervious Area

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

Subcatchment 131S: A11



Summary for Subcatchment 132S: A9

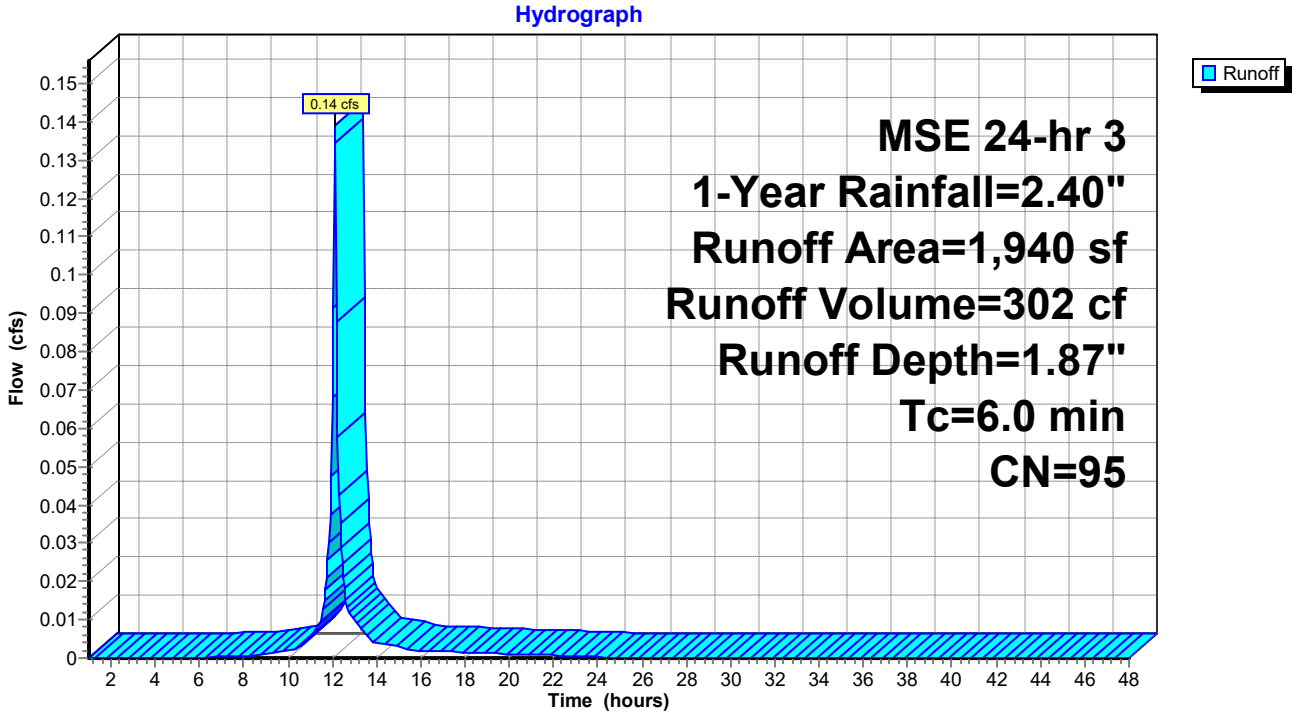
Runoff = 0.14 cfs @ 12.13 hrs, Volume= 302 cf, Depth= 1.87"
Routed to Pond 133P : WEST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	424	98	WALKS
*	321	98	ROADS
*	924	98	ROOF
*	271	74	LANDSCAPING
	1,940	95	Weighted Average
	271		13.97% Pervious Area
	1,669		86.03% Impervious Area

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

Subcatchment 132S: A9



Summary for Subcatchment 133S: A7

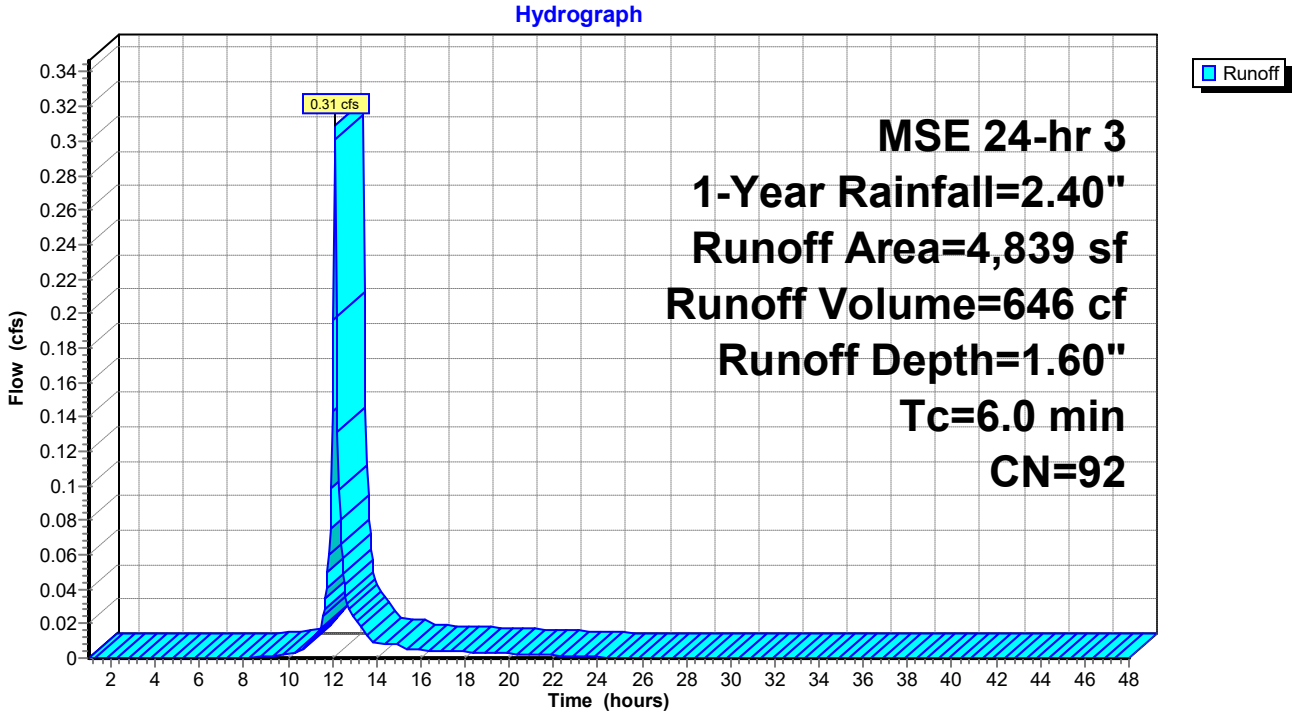
Runoff = 0.31 cfs @ 12.13 hrs, Volume= 646 cf, Depth= 1.60"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	939	98	WALKS
*	1,710	98	ROADS
*	924	98	ROOF
*	1,266	74	LANDSCAPING
	4,839	92	Weighted Average
	1,266		26.16% Pervious Area
	3,573		73.84% Impervious Area

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

Subcatchment 133S: A7



Summary for Subcatchment 134S: A5

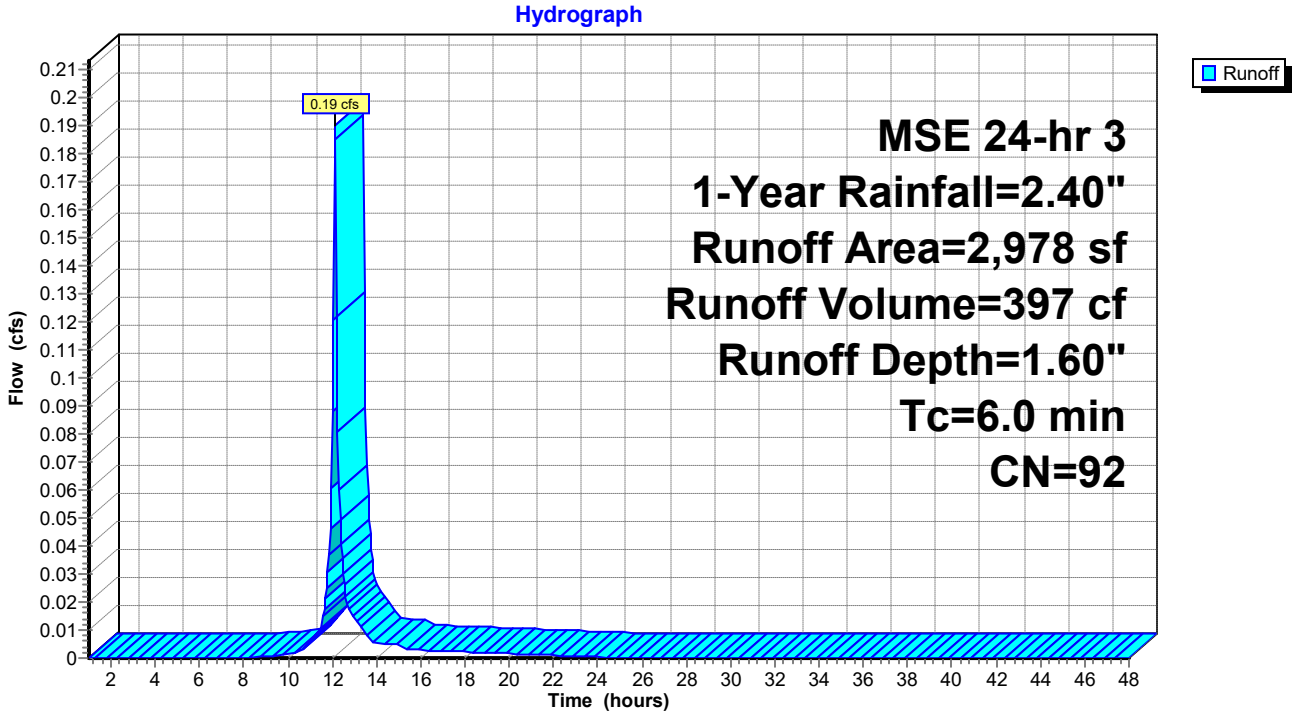
Runoff = 0.19 cfs @ 12.13 hrs, Volume= 397 cf, Depth= 1.60"
Routed to Link 127L : total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	489	98	WALKS
*	875	98	ROADS
*	924	98	ROOF
*	690	74	LANDSCAPING
	2,978	92	Weighted Average
	690		23.17% Pervious Area
	2,288		76.83% Impervious Area

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

Subcatchment 134S: A5



Summary for Subcatchment 136S: A33

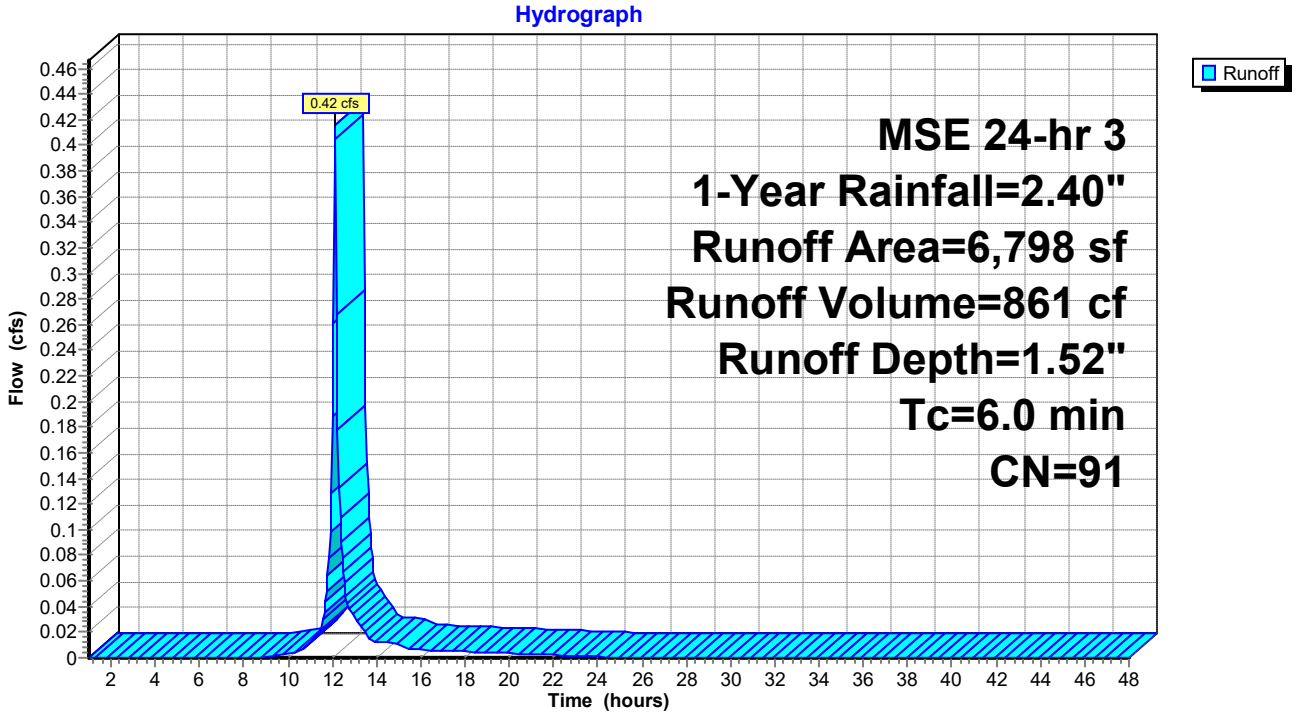
Runoff = 0.42 cfs @ 12.13 hrs, Volume= 861 cf, Depth= 1.52"
Routed to Link 126L : OVERSIZED PIPE RUN BY B3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	2,246	98	WALKS
*	2,695	98	ROADS
*	1,857	74	LANDSCAPING
	6,798	91	Weighted Average
	1,857		27.32% Pervious Area
	4,941		72.68% Impervious Area

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

Subcatchment 136S: A33



Summary for Subcatchment 137S: A1

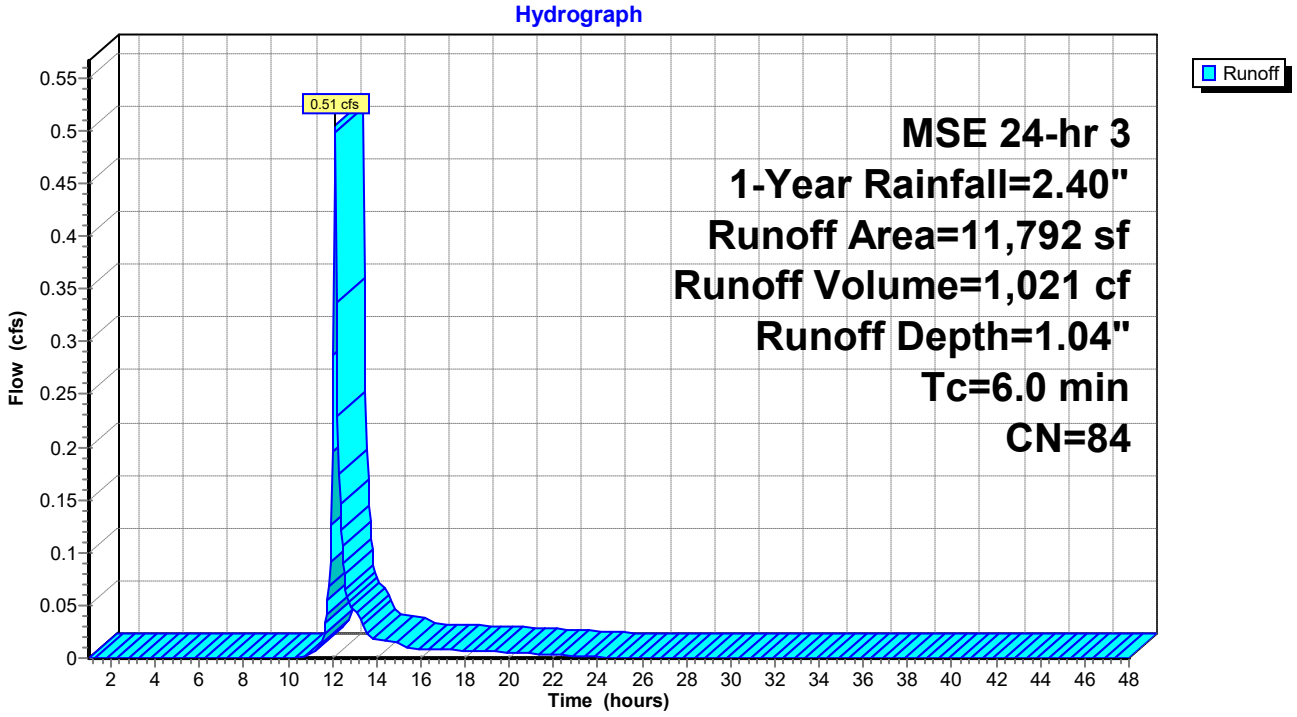
Runoff = 0.51 cfs @ 12.14 hrs, Volume= 1,021 cf, Depth= 1.04"
Routed to Pond 58P : Dry Pond 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	295	98	WALKS
*	3,348	98	ROADS
*	1,063	98	ROOF
*	7,086	74	LANDSCAPING
	11,792	84	Weighted Average
	7,086		60.09% Pervious Area
	4,706		39.91% Impervious Area

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

Subcatchment 137S: A1



Summary for Subcatchment 138S: F2

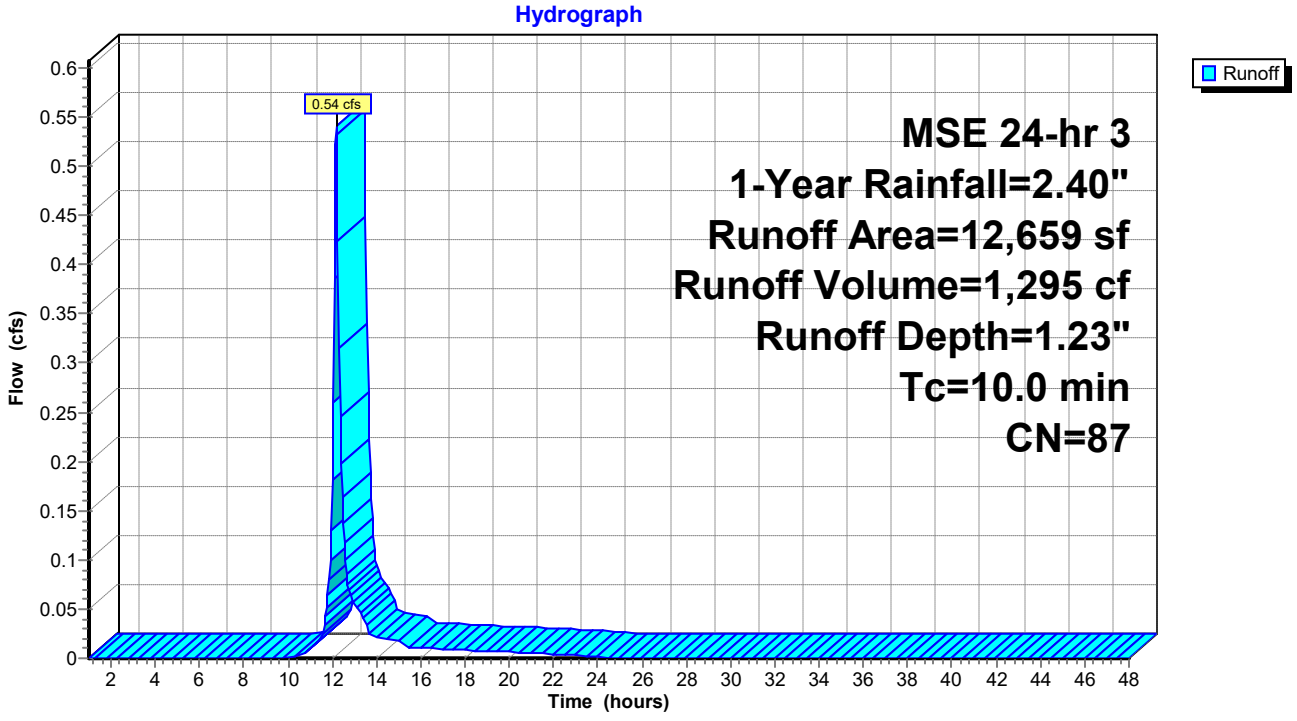
Runoff = 0.54 cfs @ 12.18 hrs, Volume= 1,295 cf, Depth= 1.23"
Routed to Pond 41P : Reach Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	5,962	74	Landscape
*	6,697	98	roof
	12,659	87	Weighted Average
	5,962		47.10% Pervious Area
	6,697		52.90% Impervious Area

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

Subcatchment 138S: F2



Summary for Subcatchment 139S: A2

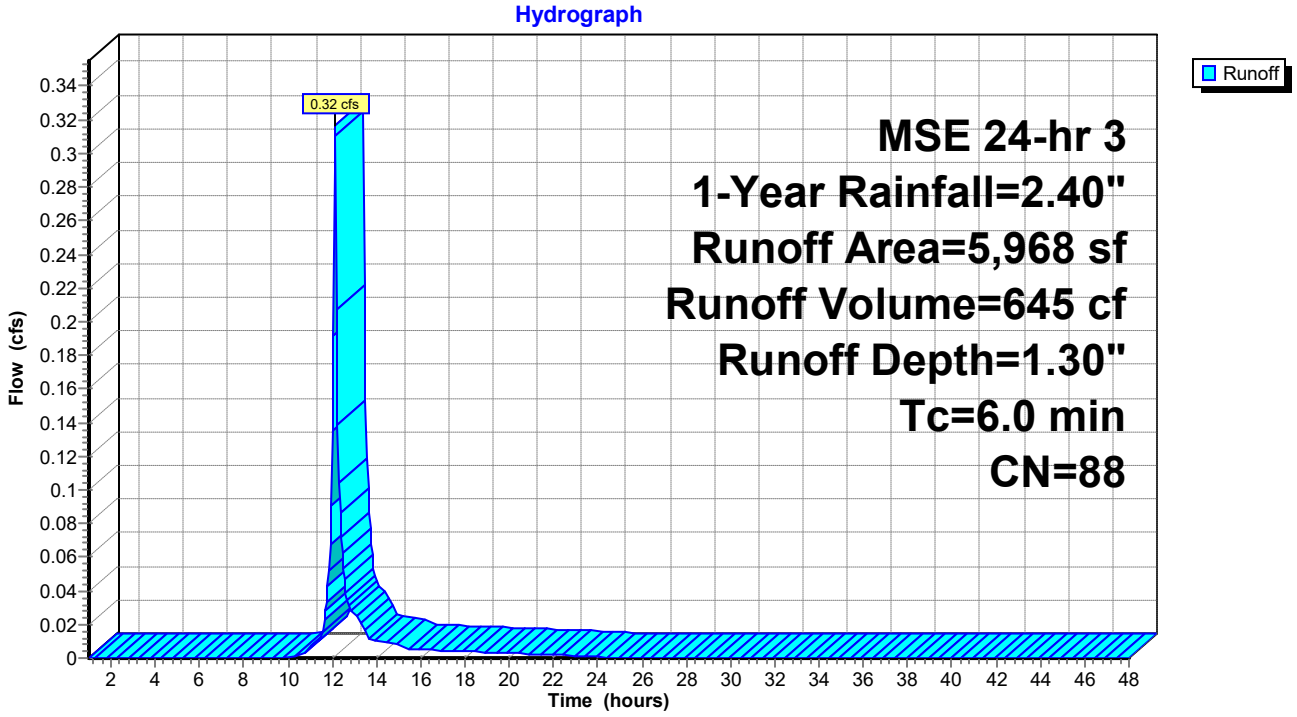
Runoff = 0.32 cfs @ 12.13 hrs, Volume= 645 cf, Depth= 1.30"
Routed to Pond 58P : Dry Pond 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	388	98	WALKS
*	2,129	98	ROADS
*	924	98	ROOF
*	2,527	74	LANDSCAPING
	5,968	88	Weighted Average
	2,527		42.34% Pervious Area
	3,441		57.66% Impervious Area

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

Subcatchment 139S: A2



Summary for Subcatchment 140S: H1

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

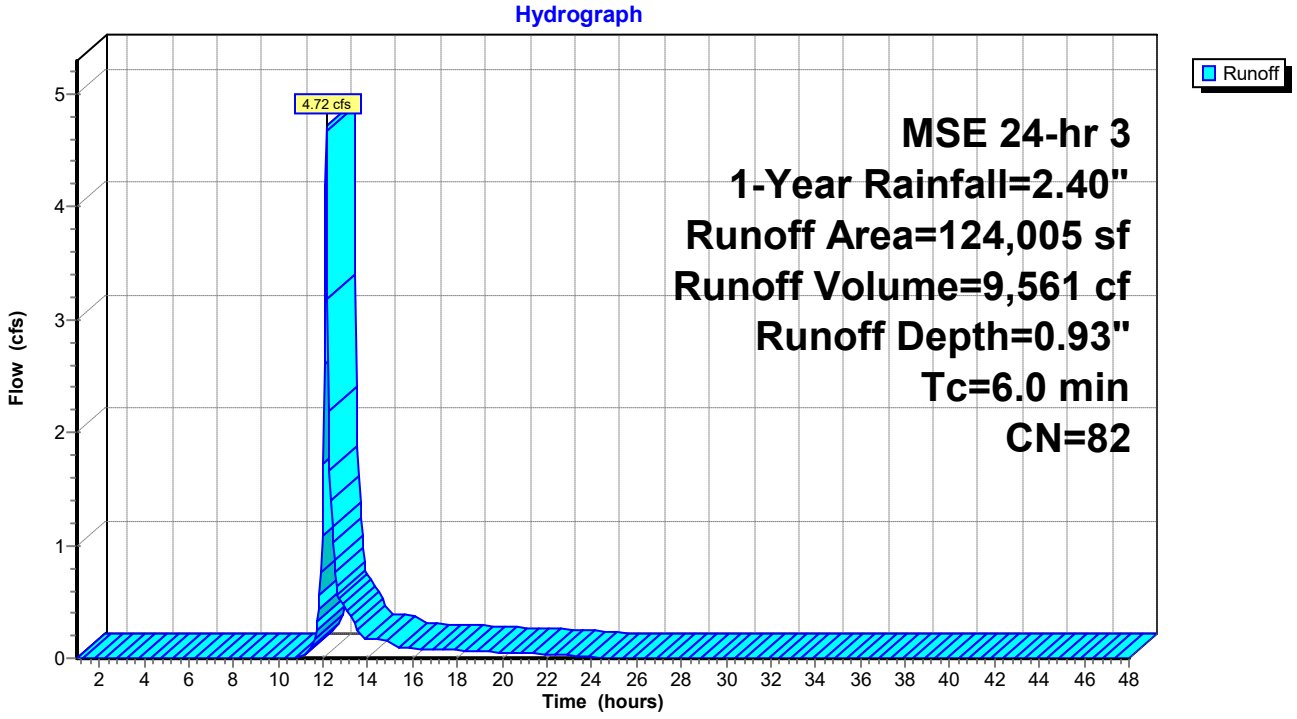
Runoff = 4.72 cfs @ 12.14 hrs, Volume= 9,561 cf, Depth= 0.93"
Routed to Reach 99R : East Swale (SE End)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	9,481	98	roads
*	24,942	98	roof
*	80,320	74	landscape
*	5,445	98	driveways and road NEW RBL
*	3,817	74	landscape NEW RBL
	124,005	82	Weighted Average
	84,137		67.85% Pervious Area
	39,868		32.15% Impervious Area

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

Subcatchment 140S: H1



Summary for Subcatchment 141S: H2

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

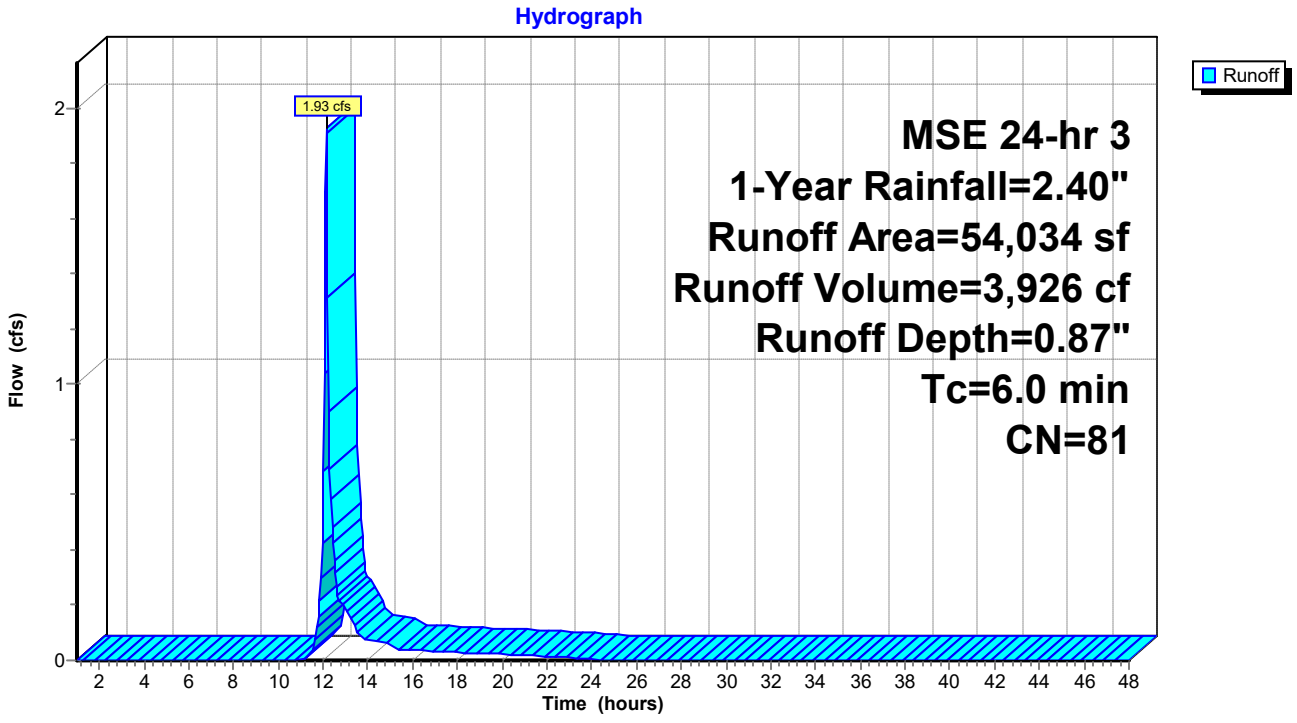
Runoff = 1.93 cfs @ 12.14 hrs, Volume= 3,926 cf, Depth= 0.87"
Routed to Reach 108R : South Berm Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	1,333	98	roads minus NEW RBL
*	14,758	98	roof
*	37,943	74	landscape minus NEW RBL
	54,034	81	Weighted Average
	37,943		70.22% Pervious Area
	16,091		29.78% Impervious Area

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

Subcatchment 141S: H2



Summary for Subcatchment 142S: H3

3/3/21
Needs to be delineated, this is from Joe's SWMP2

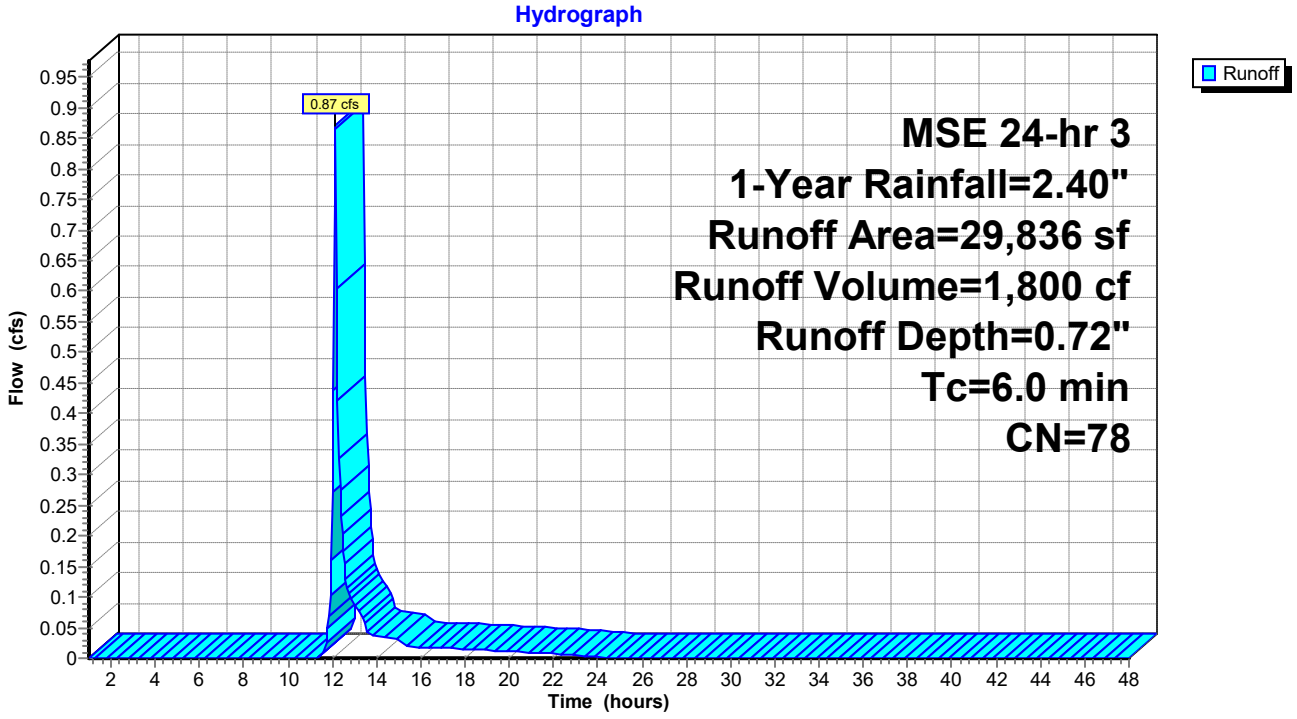
Runoff = 0.87 cfs @ 12.14 hrs, Volume= 1,800 cf, Depth= 0.72"
Routed to Reach 132R : EX. Red Barn Lane West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	1,041	98	roads
*	6,383	74	landscape
*	4,500	98	roads + roof NEW RBL
*	10,852	74	landscape NEW RBL
*	7,060	74	from H4
	29,836	78	Weighted Average
	24,295		81.43% Pervious Area
	5,541		18.57% Impervious Area

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

Subcatchment 142S: H3



Summary for Subcatchment 144S: H5

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

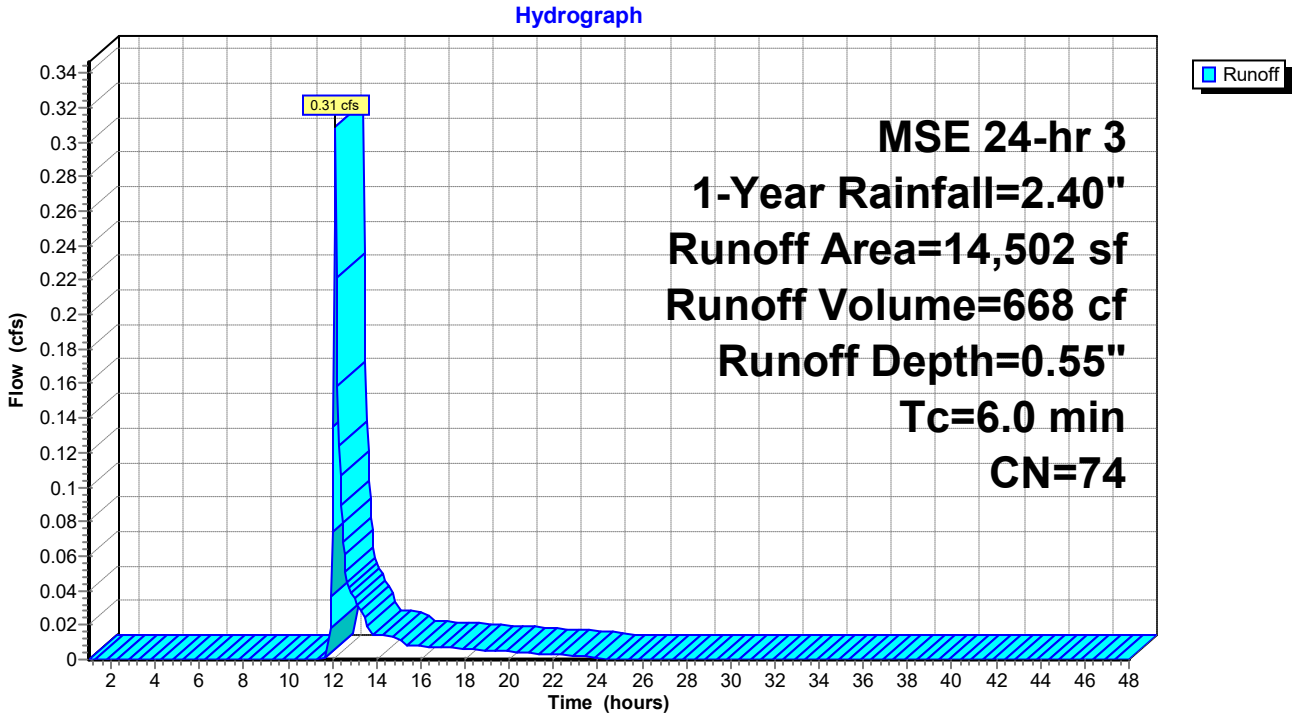
Runoff = 0.31 cfs @ 12.14 hrs, Volume= 668 cf, Depth= 0.55"
Routed to Reach 108R : South Berm Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	14,502	74	landscape
	14,502		100.00% Pervious Area

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

Subcatchment 144S: H5



Summary for Subcatchment 145S: H6-a

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

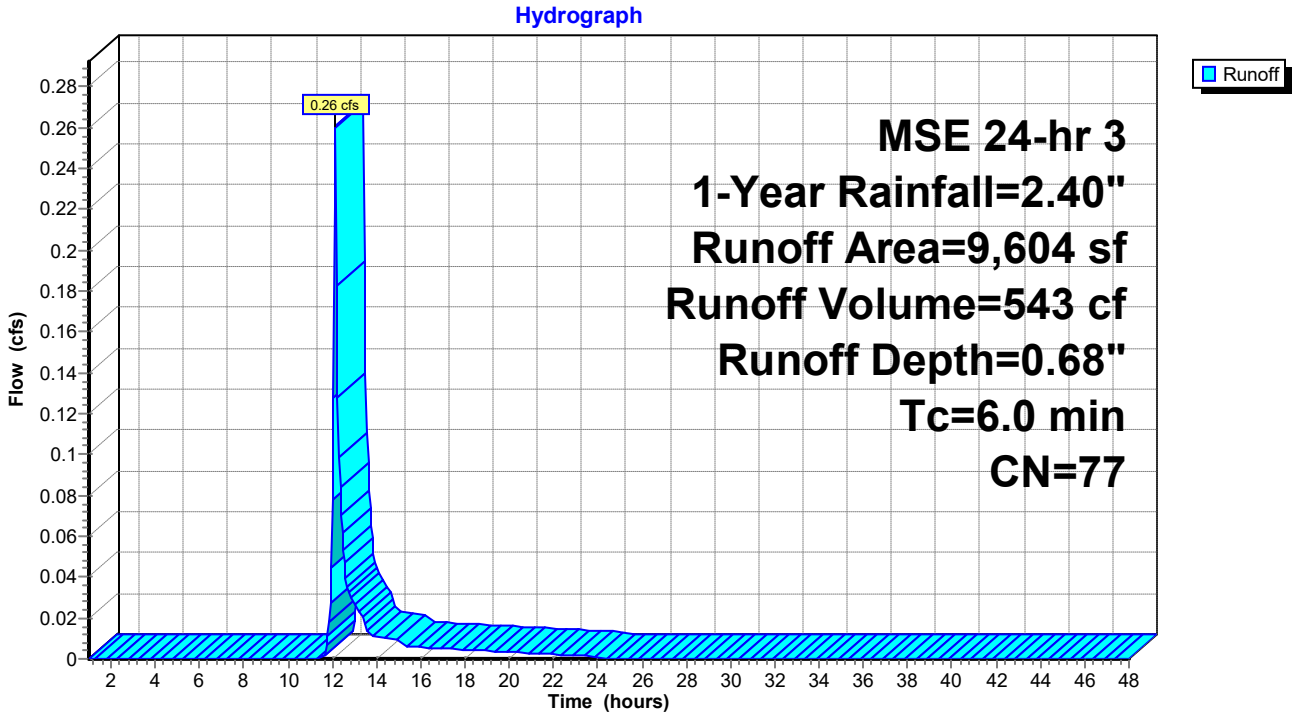
Runoff = 0.26 cfs @ 12.14 hrs, Volume= 543 cf, Depth= 0.68"
Routed to Link 115L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	8,471	74	landscape
*	1,133	98	road
	9,604	77	Weighted Average
	8,471		88.20% Pervious Area
	1,133		11.80% Impervious Area

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

Subcatchment 145S: H6-a



Summary for Subcatchment 146S: O2

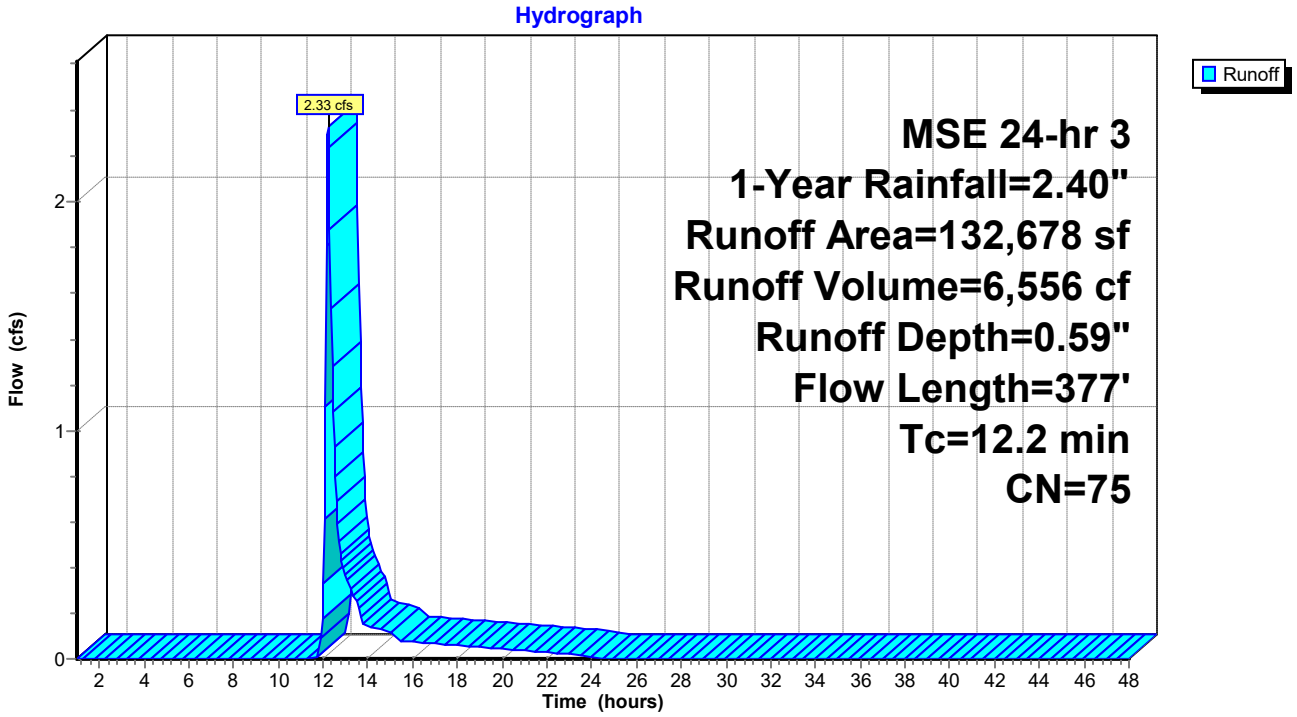
Runoff = 2.33 cfs @ 12.22 hrs, Volume= 6,556 cf, Depth= 0.59"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	129,638	74	PERV
*	3,040	98	IMPERV
	132,678	75	Weighted Average
	129,638		97.71% Pervious Area
	3,040		2.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	77	0.0288	0.16		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
4.3	300	0.0135	1.16		**Shallow Concentrated Flow, SHALLOW CONC** Nearly Bare & Untilled Kv= 10.0 fps
12.2	377	Total			

Subcatchment 146S: O2



Summary for Subcatchment 147S: J

3/3/21
Needs to be delineated, this is from Joe's SWMP2

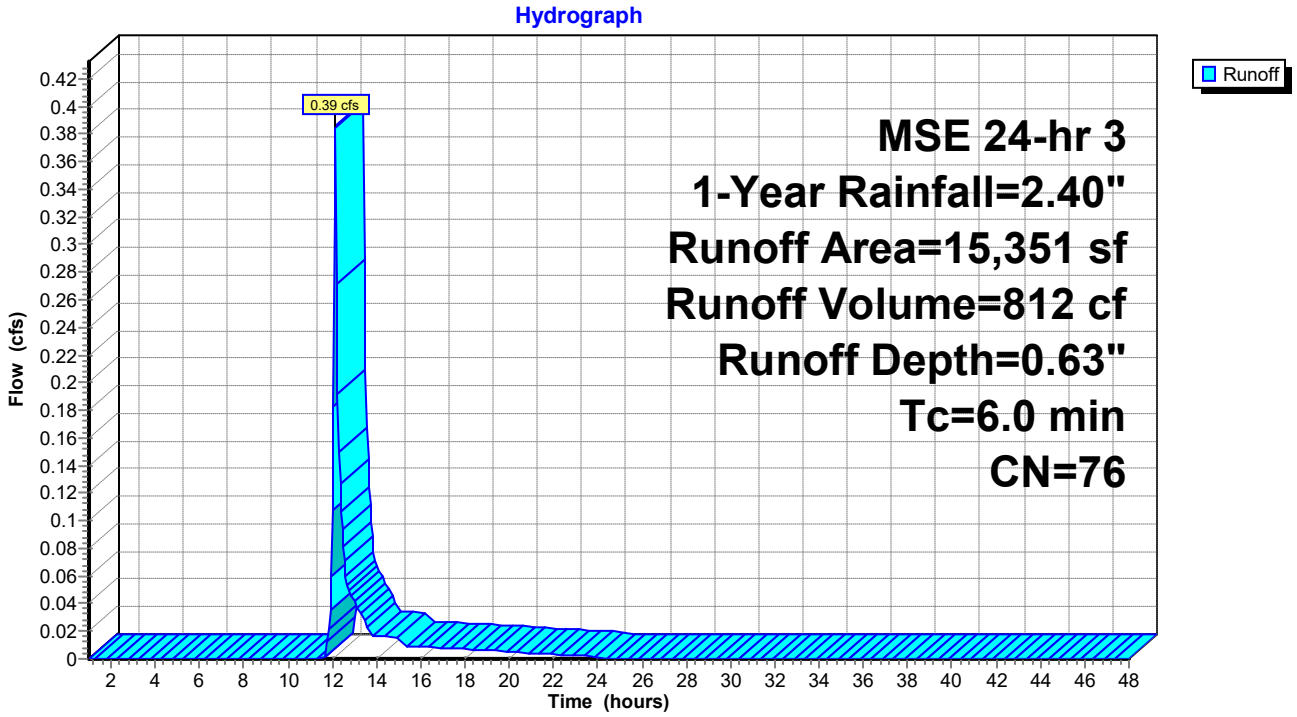
Runoff = 0.39 cfs @ 12.14 hrs, Volume= 812 cf, Depth= 0.63"
Routed to Link 66L : Total Offsite

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	1,360	98	walks
*	13,991	74	landscape
	15,351	76	Weighted Average
	13,991		91.14% Pervious Area
	1,360		8.86% Impervious Area

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

Subcatchment 147S: J



Summary for Subcatchment 148S: A3

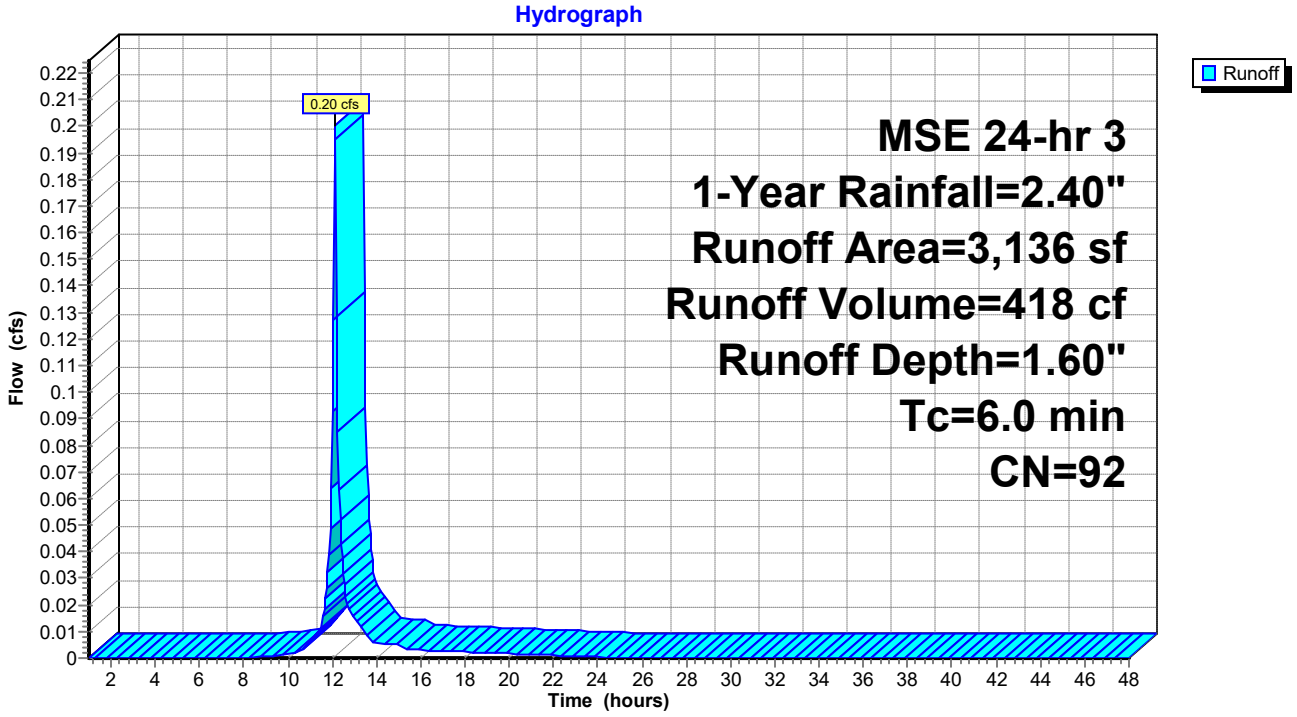
Runoff = 0.20 cfs @ 12.13 hrs, Volume= 418 cf, Depth= 1.60"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	452	98	WALKS
*	994	98	ROADS
*	924	98	ROOF
*	766	74	LANDSCAPING
	3,136	92	Weighted Average
	766		24.43% Pervious Area
	2,370		75.57% Impervious Area

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

Subcatchment 148S: A3



Summary for Subcatchment 149S: A4

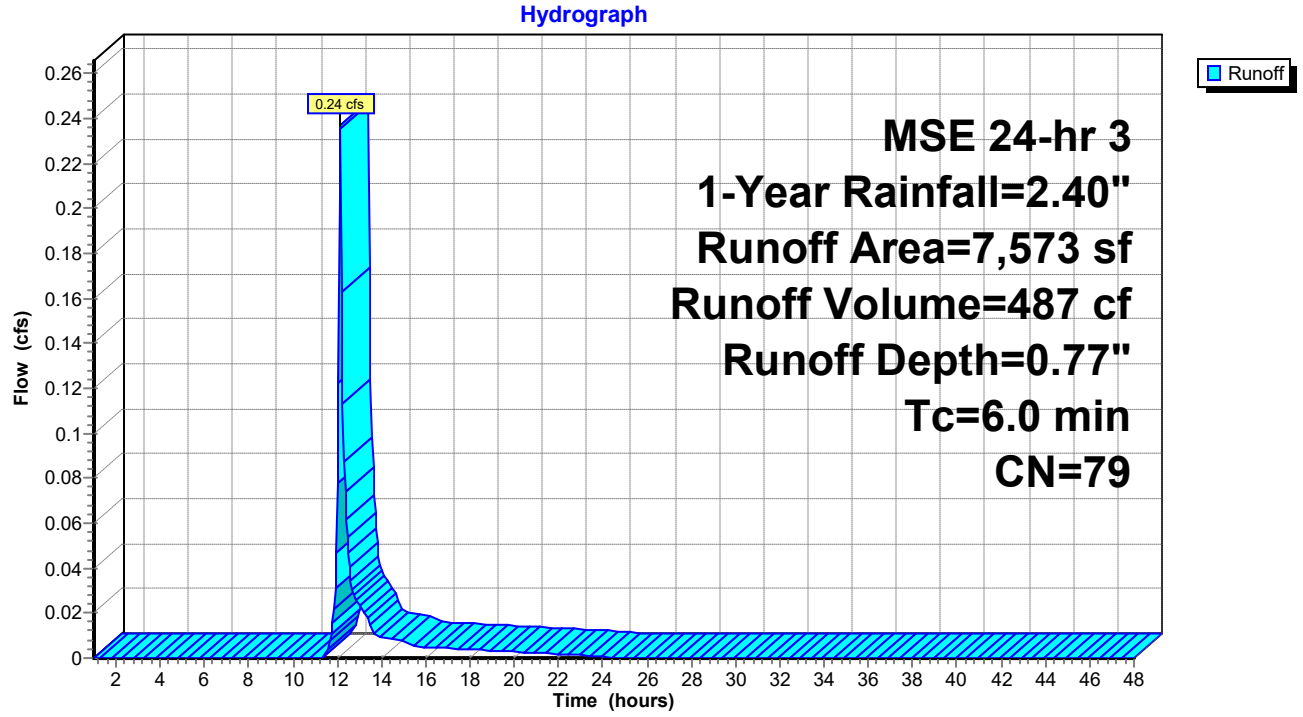
Runoff = 0.24 cfs @ 12.14 hrs, Volume= 487 cf, Depth= 0.77"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	401	98	WALKS
*	1,086	98	ROADS
*	0	98	ROOF
*	6,086	74	LANDSCAPING
	7,573	79	Weighted Average
	6,086		80.36% Pervious Area
	1,487		19.64% Impervious Area

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

Subcatchment 149S: A4



Summary for Subcatchment 150S: A6

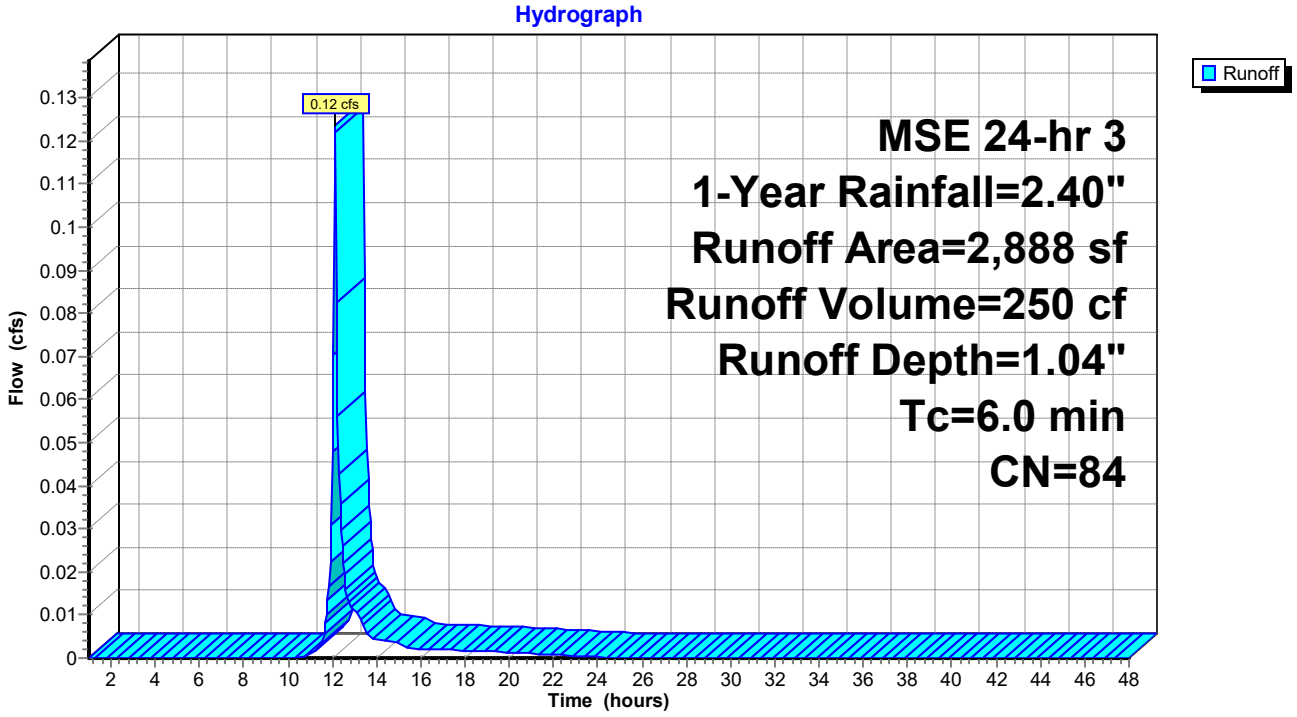
Runoff = 0.12 cfs @ 12.14 hrs, Volume= 250 cf, Depth= 1.04"
Routed to Link 127L : total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	316	98	WALKS
*	875	98	ROADS
*	0	98	ROOF
*	1,697	74	LANDSCAPING
	2,888	84	Weighted Average
	1,697		58.76% Pervious Area
	1,191		41.24% Impervious Area

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

Subcatchment 150S: A6



Summary for Subcatchment 151S: A8

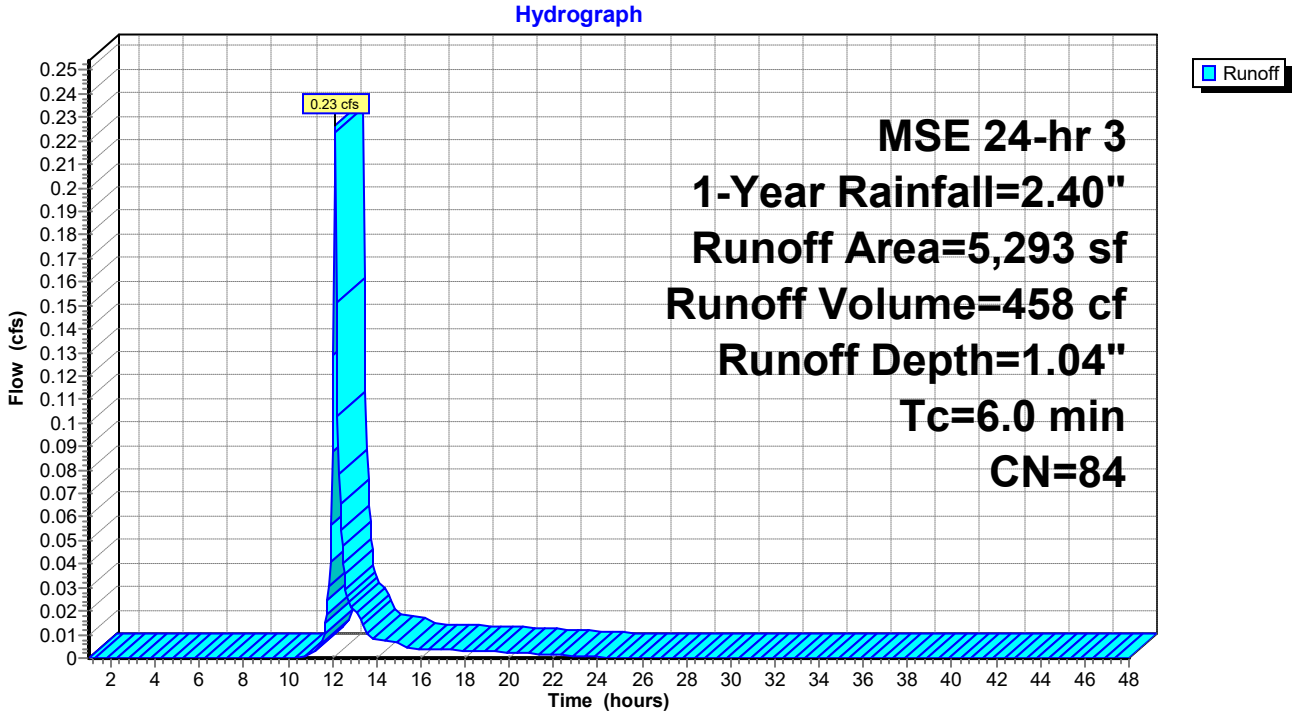
Runoff = 0.23 cfs @ 12.14 hrs, Volume= 458 cf, Depth= 1.04"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	688	98	WALKS
*	1,478	98	ROADS
*	0	98	ROOF
*	3,127	74	LANDSCAPING
	5,293	84	Weighted Average
	3,127		59.08% Pervious Area
	2,166		40.92% Impervious Area

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

Subcatchment 151S: A8



Summary for Subcatchment 152S: A10

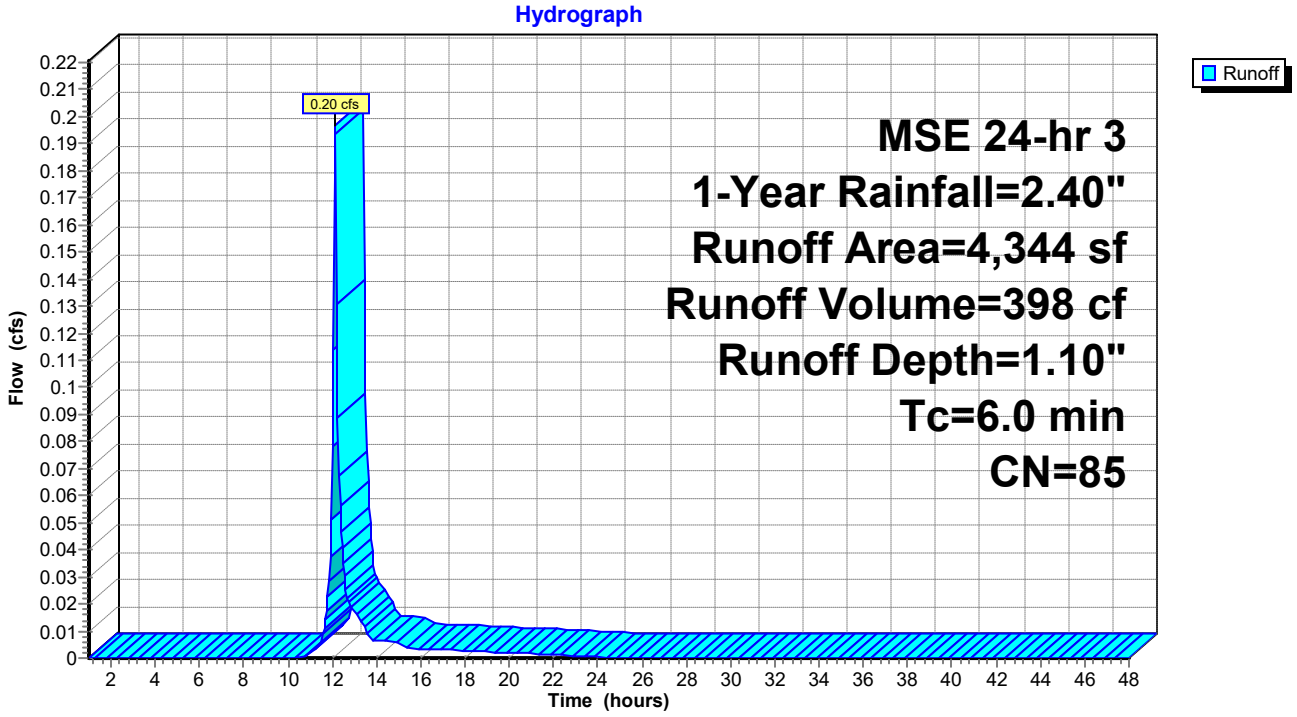
Runoff = 0.20 cfs @ 12.14 hrs, Volume= 398 cf, Depth= 1.10"
Routed to Pond 133P : WEST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	665	98	WALKS
*	1,415	98	ROADS
*	0	98	ROOF
*	2,264	74	LANDSCAPING
	4,344	85	Weighted Average
	2,264		52.12% Pervious Area
	2,080		47.88% Impervious Area

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

Subcatchment 152S: A10



Summary for Subcatchment 153S: A16

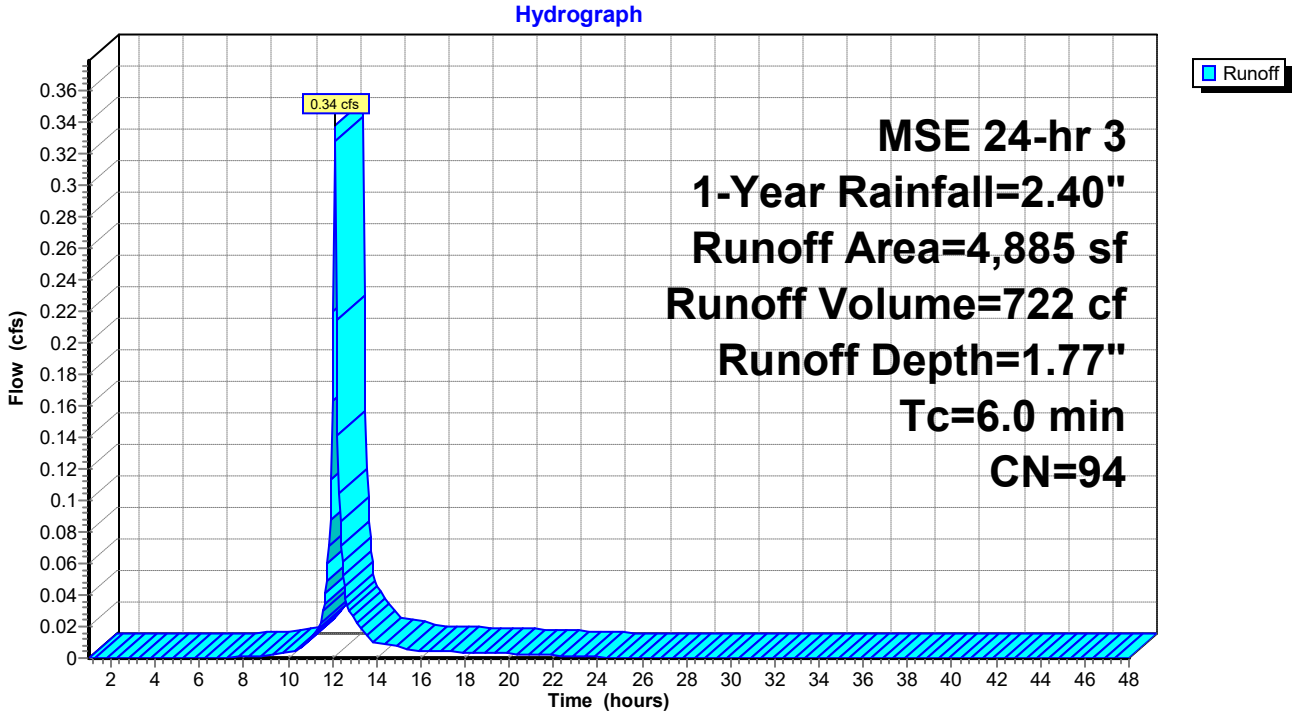
Runoff = 0.34 cfs @ 12.13 hrs, Volume= 722 cf, Depth= 1.77"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	1,314	98	WALKS
*	2,788	98	ROADS
*	0	98	ROOF
*	783	74	LANDSCAPING
	4,885	94	Weighted Average
	783		16.03% Pervious Area
	4,102		83.97% Impervious Area

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

Subcatchment 153S: A16



Summary for Subcatchment 154S: A17

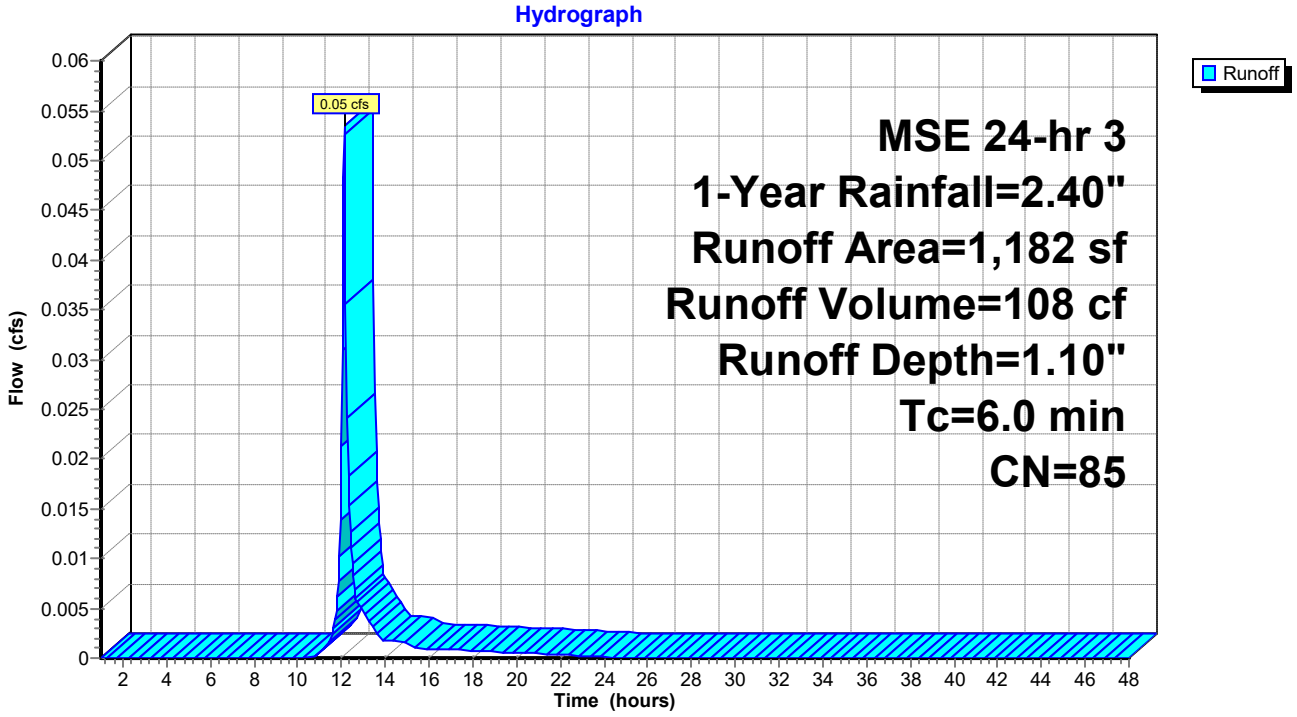
Runoff = 0.05 cfs @ 12.14 hrs, Volume= 108 cf, Depth= 1.10"
Routed to Link 176L : UPSTREAM OF OVERSIZED PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	70	98	WALKS
*	461	98	ROADS
*	0	98	ROOF
*	651	74	LANDSCAPING
	1,182	85	Weighted Average
	651		55.08% Pervious Area
	531		44.92% Impervious Area

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

Subcatchment 154S: A17



Summary for Subcatchment 155S: A18

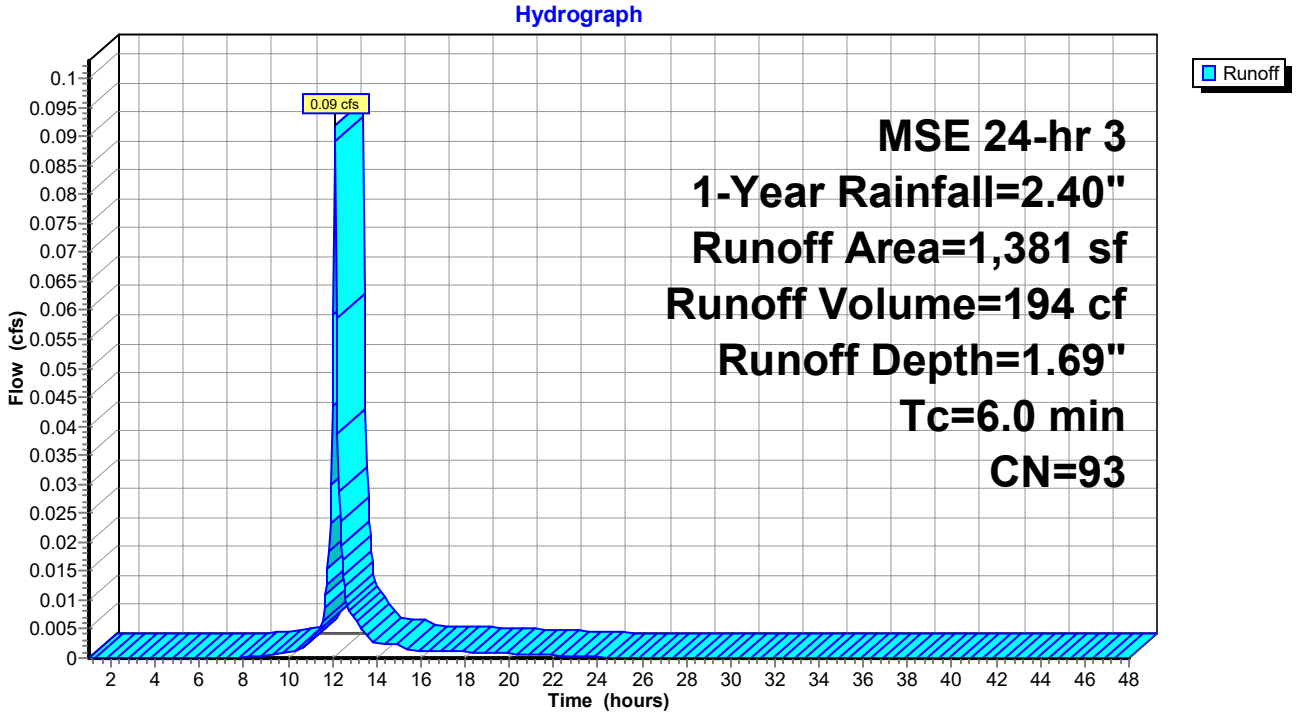
Runoff = 0.09 cfs @ 12.13 hrs, Volume= 194 cf, Depth= 1.69"
Routed to Link 176L : UPSTREAM OF OVERSIZED PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	353	98	WALKS
*	747	98	ROADS
*	0	98	ROOF
*	281	74	LANDSCAPING
	1,381	93	Weighted Average
	281		20.35% Pervious Area
	1,100		79.65% Impervious Area

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

Subcatchment 155S: A18



Summary for Subcatchment 156S: A19

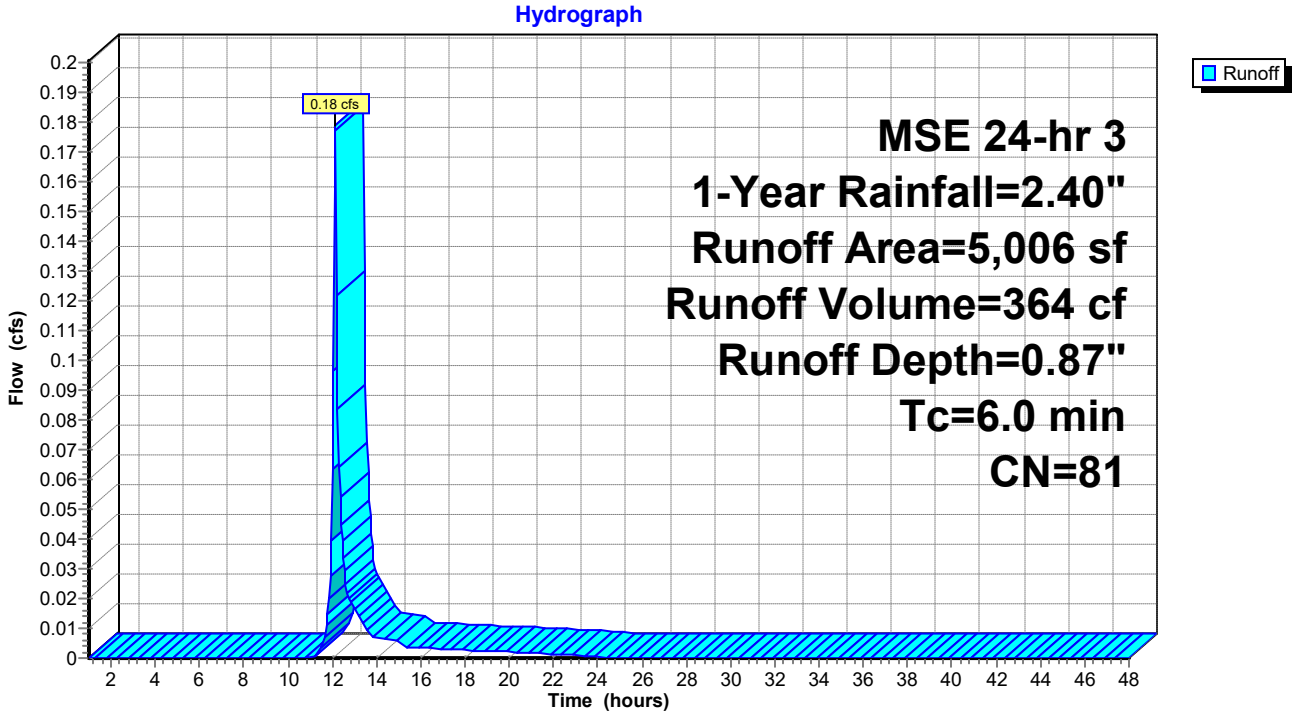
Runoff = 0.18 cfs @ 12.14 hrs, Volume= 364 cf, Depth= 0.87"
Routed to Link 176L : UPSTREAM OF OVERSIZED PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	390	98	WALKS
*	0	98	ROADS
*	1,063	98	ROOF
*	3,553	74	LANDSCAPING
	5,006	81	Weighted Average
	3,553		70.97% Pervious Area
	1,453		29.03% Impervious Area

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

Subcatchment 156S: A19



Summary for Subcatchment 157S: A20

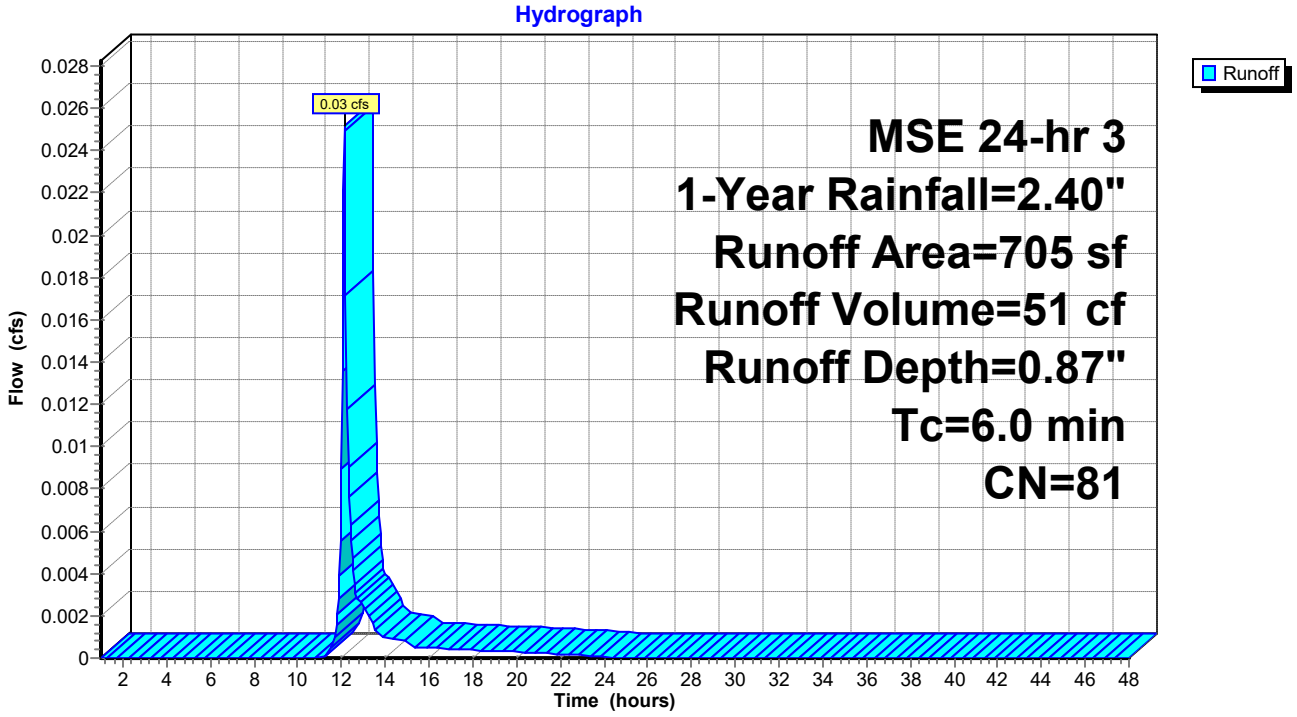
Runoff = 0.03 cfs @ 12.14 hrs, Volume= 51 cf, Depth= 0.87"
Routed to Link 176L : UPSTREAM OF OVERSIZED PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	204	98	WALKS
*	0	98	ROADS
*	0	98	ROOF
*	501	74	LANDSCAPING
	705	81	Weighted Average
	501		71.06% Pervious Area
	204		28.94% Impervious Area

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

Subcatchment 157S: A20



Summary for Subcatchment 158S: A21

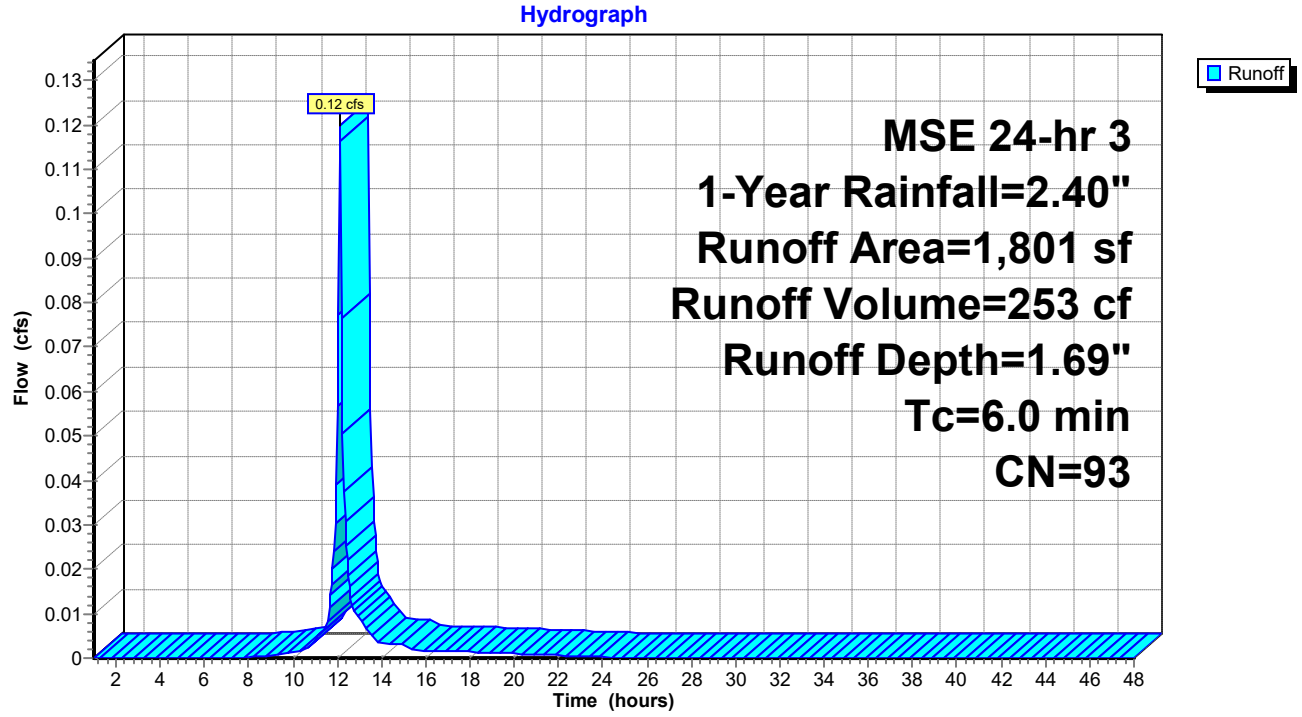
Runoff = 0.12 cfs @ 12.13 hrs, Volume= 253 cf, Depth= 1.69"
Routed to Link 176L : UPSTREAM OF OVERSIZED PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	338	98	WALKS
*	35	98	ROADS
*	1,063	98	ROOF
*	365	74	LANDSCAPING
	1,801	93	Weighted Average
	365		20.27% Pervious Area
	1,436		79.73% Impervious Area

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

Subcatchment 158S: A21



Summary for Subcatchment 159S: A22

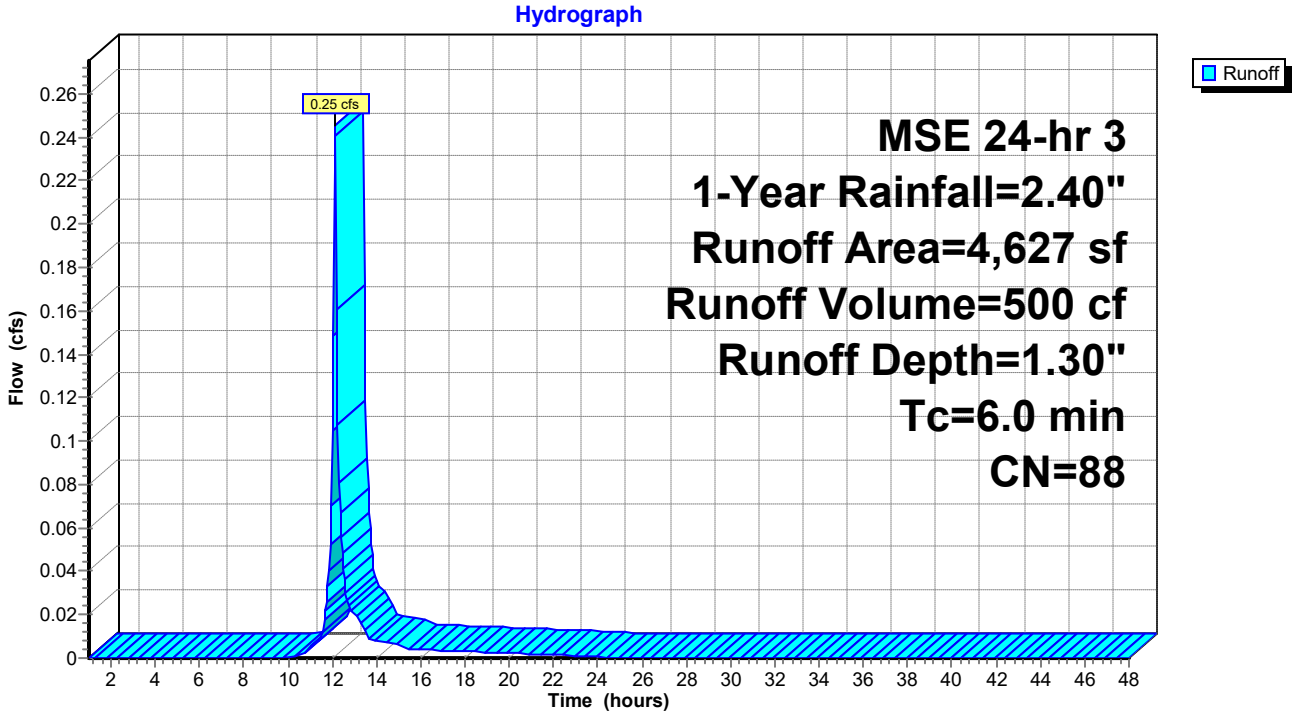
Runoff = 0.25 cfs @ 12.13 hrs, Volume= 500 cf, Depth= 1.30"
Routed to Pond 174P : EAST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	891	98	WALKS
*	1,814	98	ROADS
*	0	98	ROOF
*	1,922	74	LANDSCAPING
	4,627	88	Weighted Average
	1,922		41.54% Pervious Area
	2,705		58.46% Impervious Area

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

Subcatchment 159S: A22



Summary for Subcatchment 160S: A23

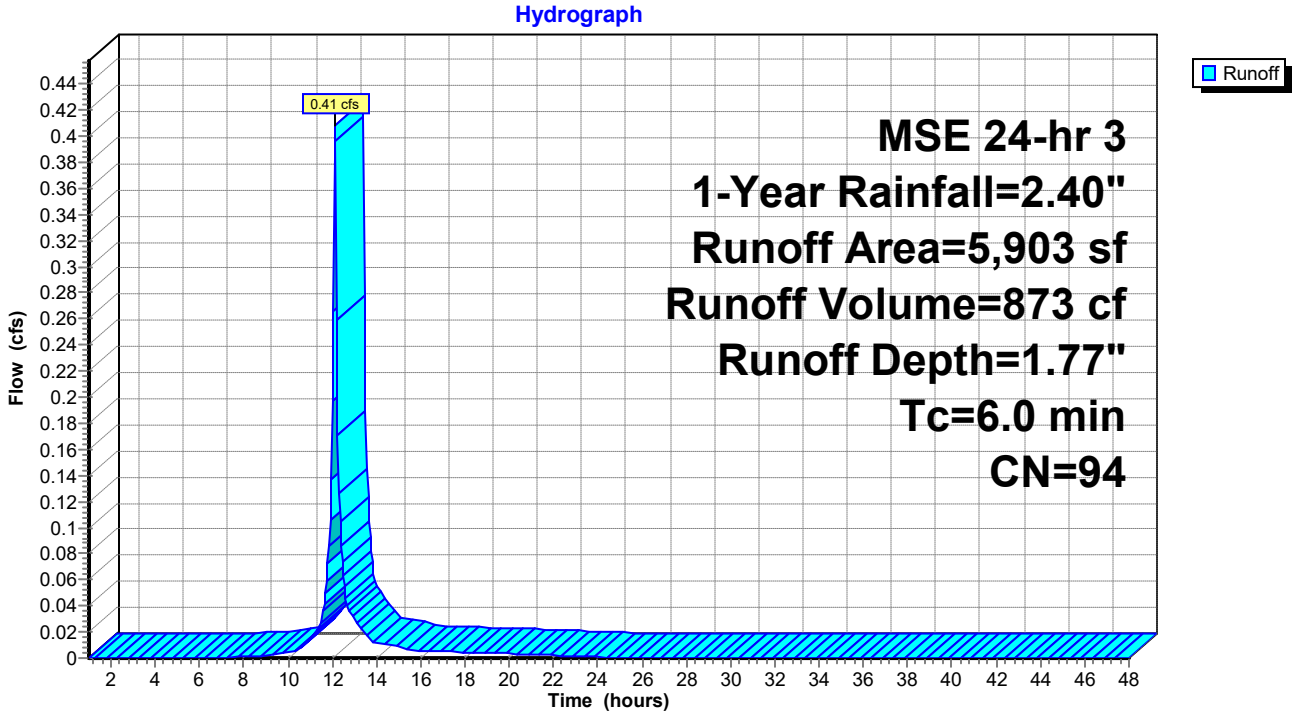
Runoff = 0.41 cfs @ 12.13 hrs, Volume= 873 cf, Depth= 1.77"
Routed to Pond 174P : EAST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	995	98	WALKS
*	1,695	98	ROADS
*	2,125	98	ROOF
*	1,088	74	LANDSCAPING
	5,903	94	Weighted Average
	1,088		18.43% Pervious Area
	4,815		81.57% Impervious Area

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

Subcatchment 160S: A23



Summary for Subcatchment 161S: A24

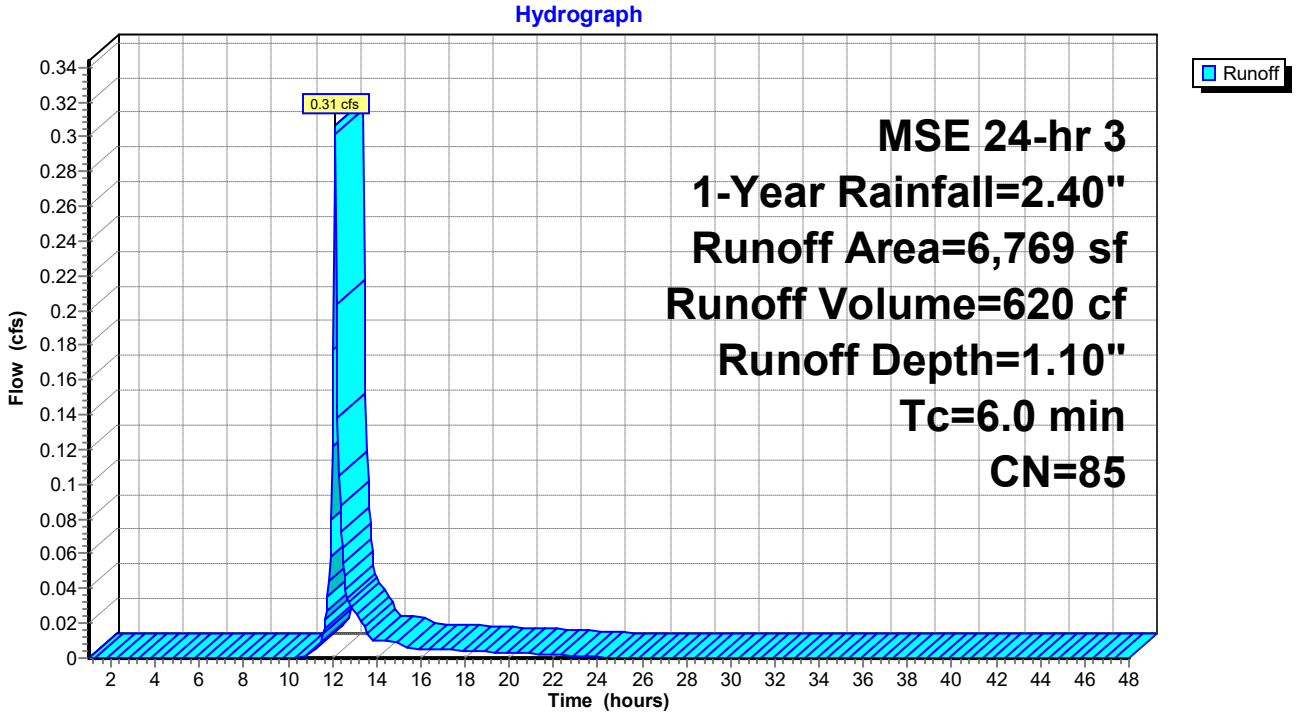
Runoff = 0.31 cfs @ 12.14 hrs, Volume= 620 cf, Depth= 1.10"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	1,331	98	WALKS
*	1,714	98	ROADS
*	0	98	ROOF
*	3,724	74	LANDSCAPING
	6,769	85	Weighted Average
	3,724		55.02% Pervious Area
	3,045		44.98% Impervious Area

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

Subcatchment 161S: A24



Summary for Subcatchment 162S: A25

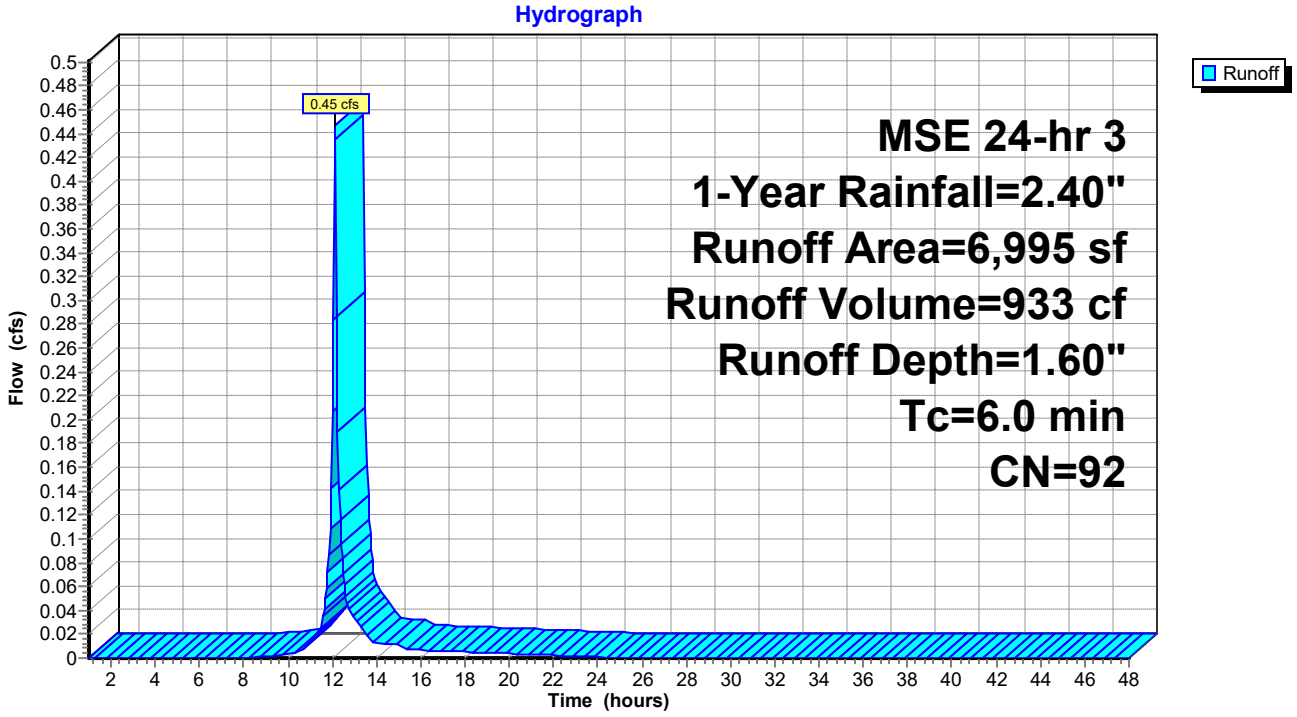
Runoff = 0.45 cfs @ 12.13 hrs, Volume= 933 cf, Depth= 1.60"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	1,096	98	WALKS
*	2,036	98	ROADS
*	2,125	98	ROOF
*	1,738	74	LANDSCAPING
	6,995	92	Weighted Average
	1,738		24.85% Pervious Area
	5,257		75.15% Impervious Area

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

Subcatchment 162S: A25



Summary for Subcatchment 163S: A26

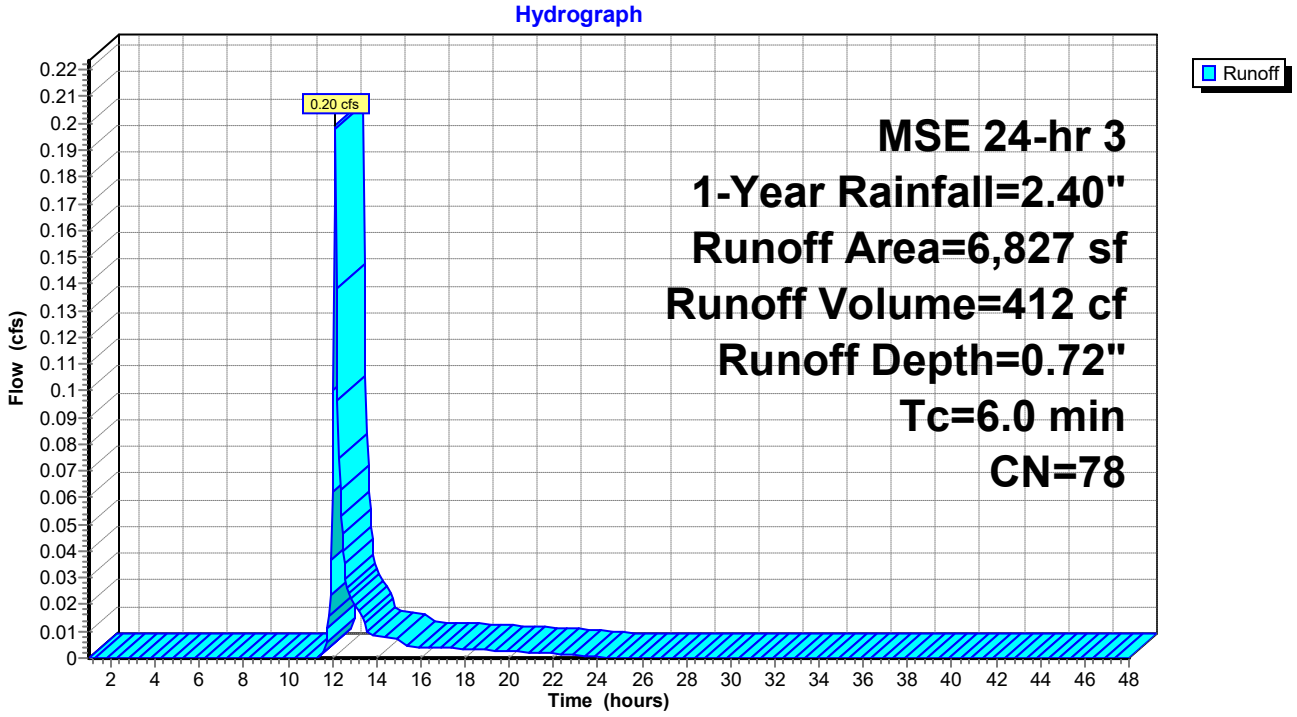
Runoff = 0.20 cfs @ 12.14 hrs, Volume= 412 cf, Depth= 0.72"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	314	98	WALKS
*	860	98	ROADS
*	0	98	ROOF
*	5,653	74	LANDSCAPING
	6,827	78	Weighted Average
	5,653		82.80% Pervious Area
	1,174		17.20% Impervious Area

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

Subcatchment 163S: A26



Summary for Subcatchment 164S: A27

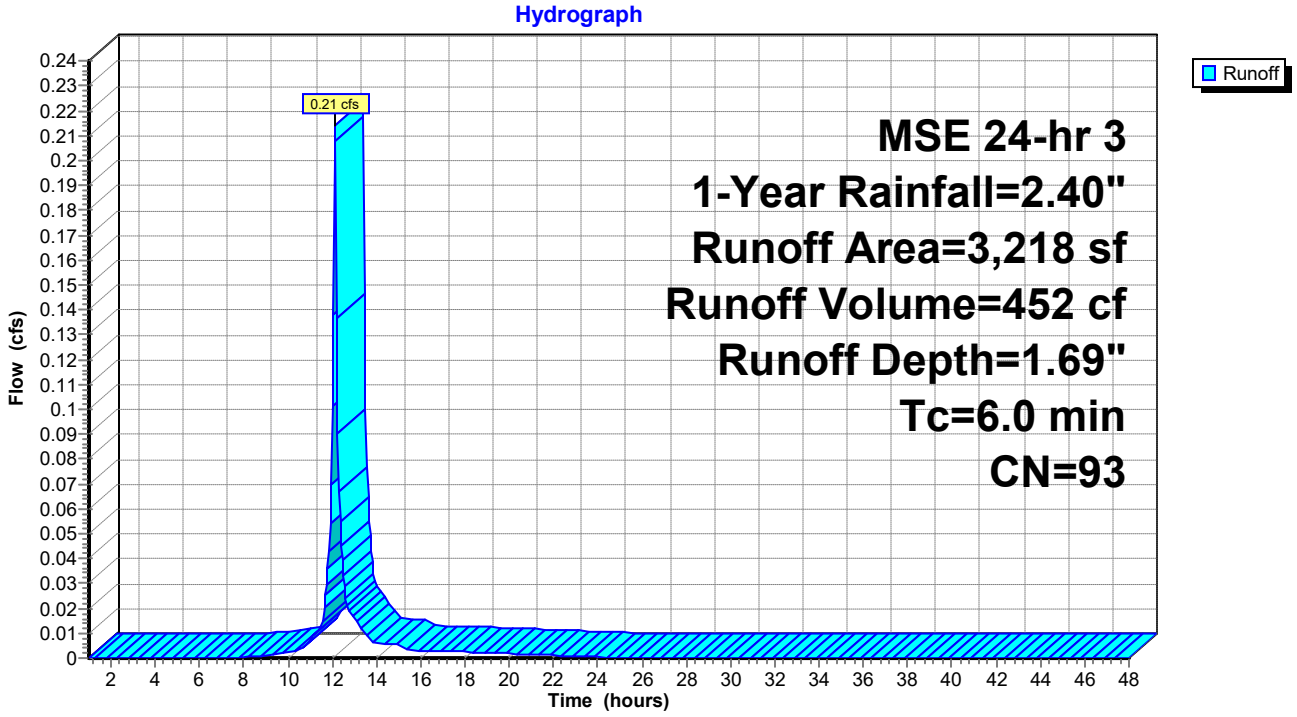
Runoff = 0.21 cfs @ 12.13 hrs, Volume= 452 cf, Depth= 1.69"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	532	98	WALKS
*	927	98	ROADS
*	1,063	98	ROOF
*	696	74	LANDSCAPING
	3,218	93	Weighted Average
	696		21.63% Pervious Area
	2,522		78.37% Impervious Area

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

Subcatchment 164S: A27



Summary for Subcatchment 165S: A28

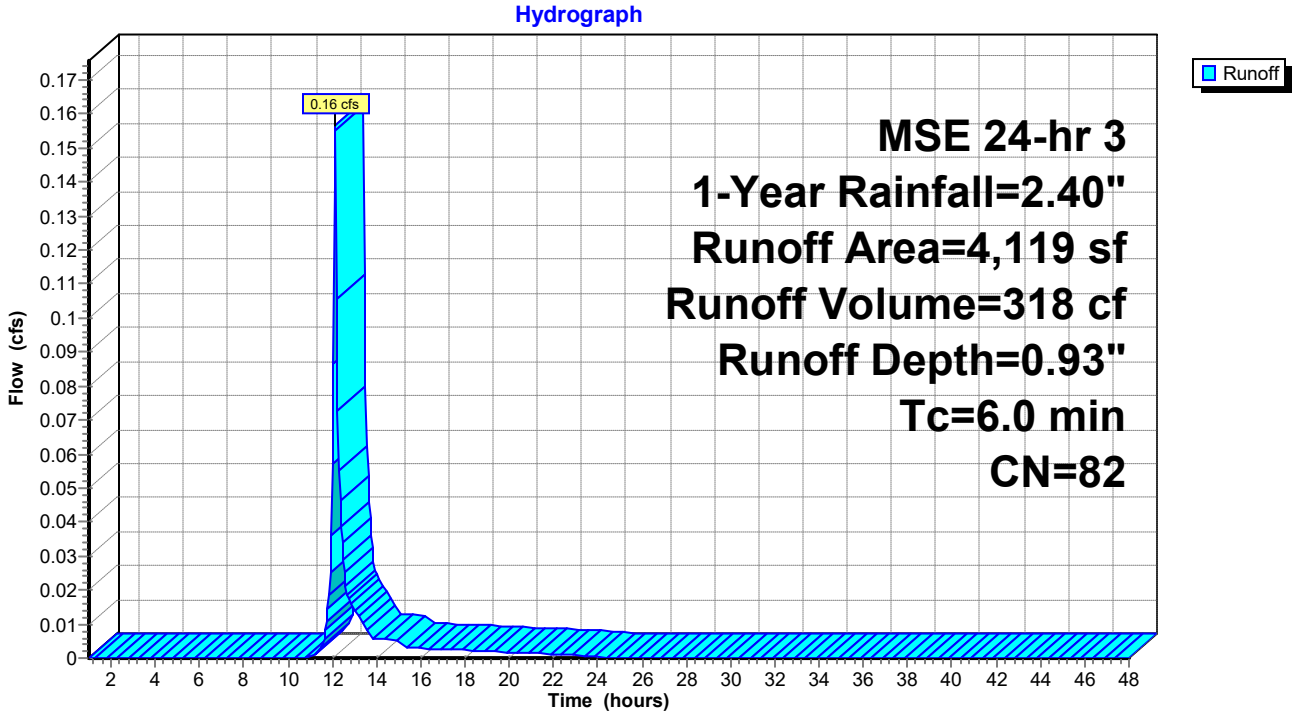
Runoff = 0.16 cfs @ 12.14 hrs, Volume= 318 cf, Depth= 0.93"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	364	98	WALKS
*	968	98	ROADS
*	0	98	ROOF
*	2,787	74	LANDSCAPING
	4,119	82	Weighted Average
	2,787		67.66% Pervious Area
	1,332		32.34% Impervious Area

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

Subcatchment 165S: A28



Summary for Subcatchment 166S: A29

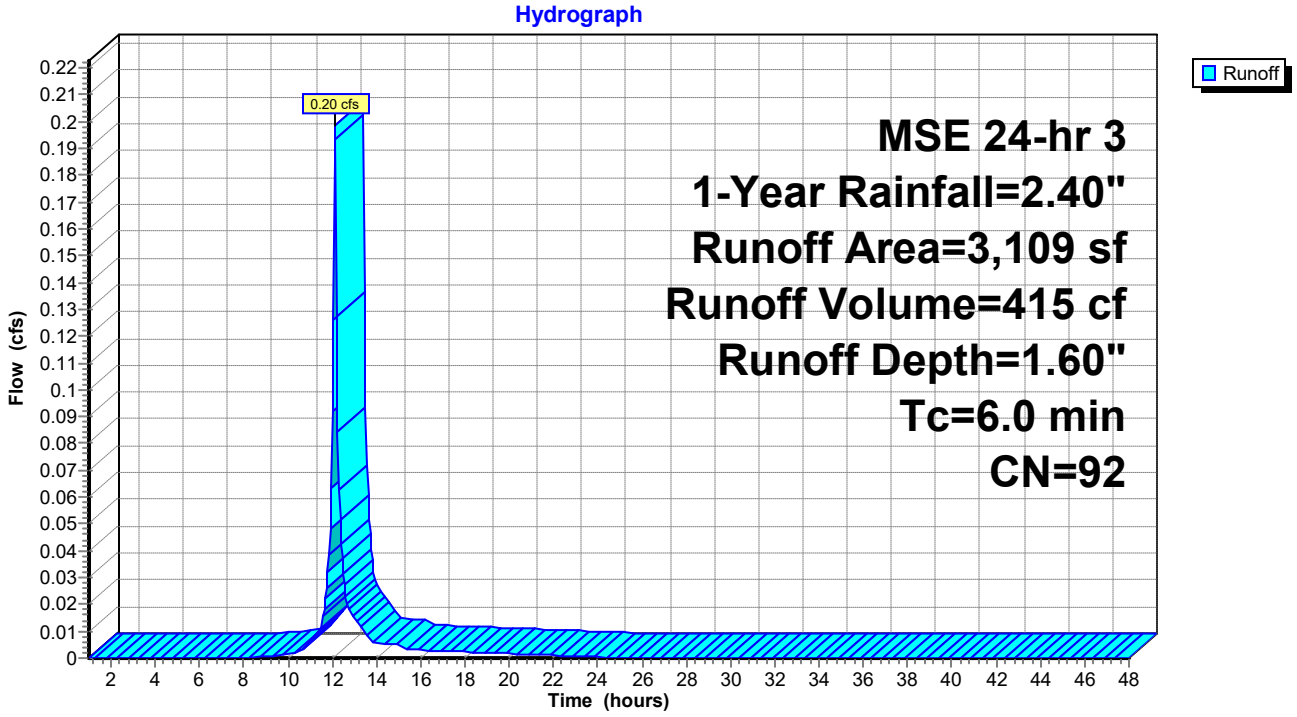
Runoff = 0.20 cfs @ 12.13 hrs, Volume= 415 cf, Depth= 1.60"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	367	98	WALKS
*	921	98	ROADS
*	1,063	98	ROOF
*	758	74	LANDSCAPING
	3,109	92	Weighted Average
	758		24.38% Pervious Area
	2,351		75.62% Impervious Area

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

Subcatchment 166S: A29



Summary for Subcatchment 167S: A31

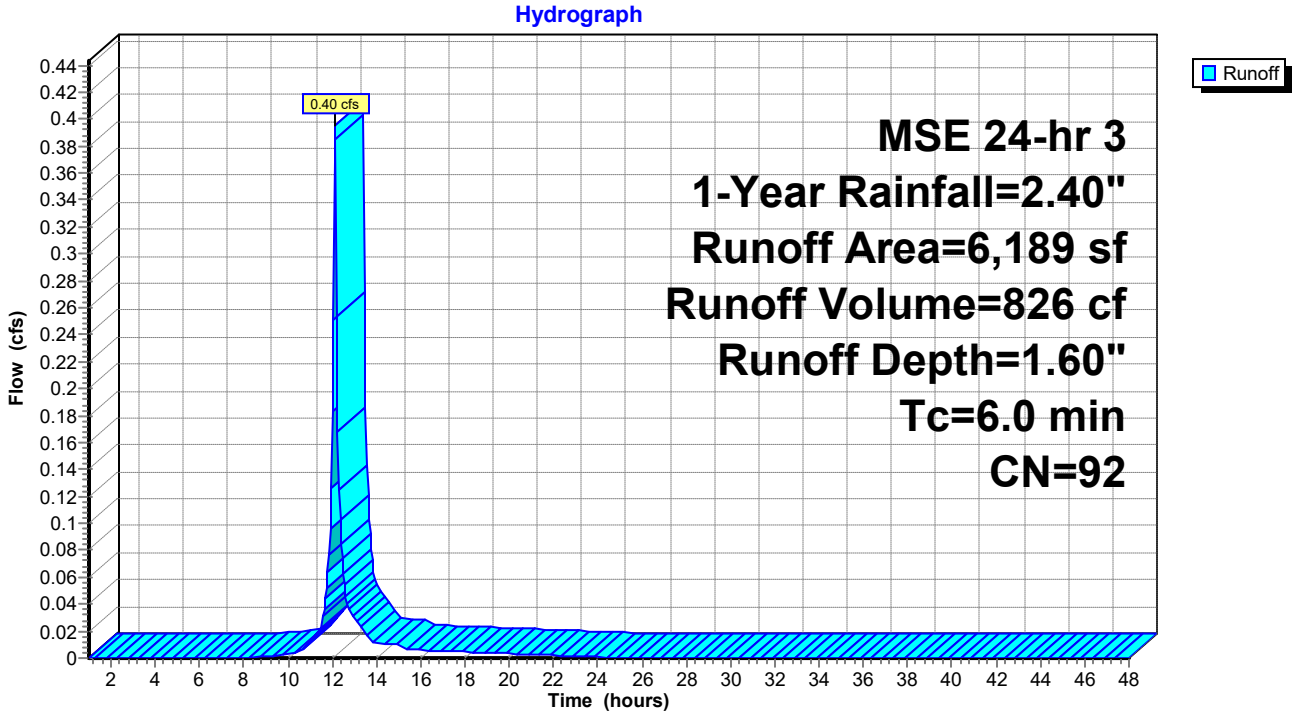
Runoff = 0.40 cfs @ 12.13 hrs, Volume= 826 cf, Depth= 1.60"
Routed to Link 126L : OVERSIZED PIPE RUN BY B3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	1,844	98	WALKS
*	2,869	98	ROADS
*	0	98	ROOF
*	1,476	74	LANDSCAPING
	6,189	92	Weighted Average
	1,476		23.85% Pervious Area
	4,713		76.15% Impervious Area

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

Subcatchment 167S: A31



Summary for Subcatchment 168S: A34

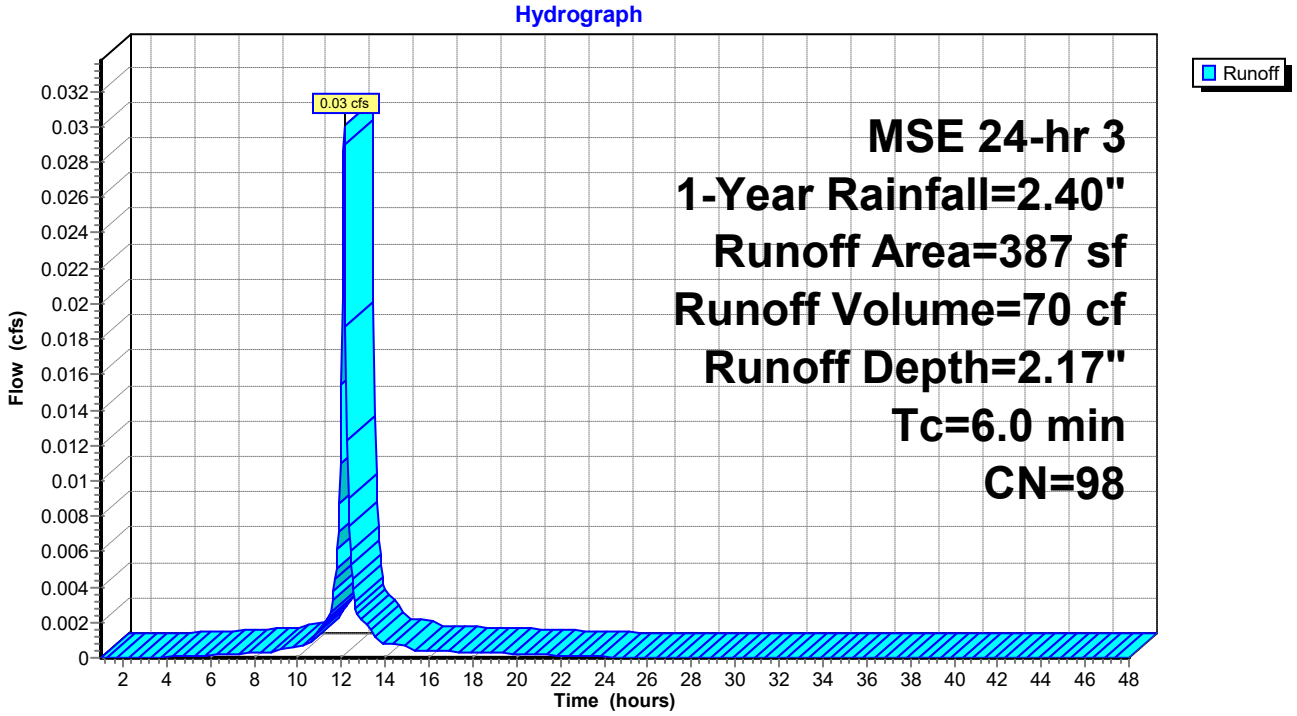
Runoff = 0.03 cfs @ 12.13 hrs, Volume= 70 cf, Depth= 2.17"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	0	98	WALKS
*	387	98	ROADS
*	0	98	ROOF
*	0	74	LANDSCAPING
	387	98	Weighted Average
	387		100.00% Impervious Area

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

Subcatchment 168S: A34



Summary for Subcatchment 169S: A36

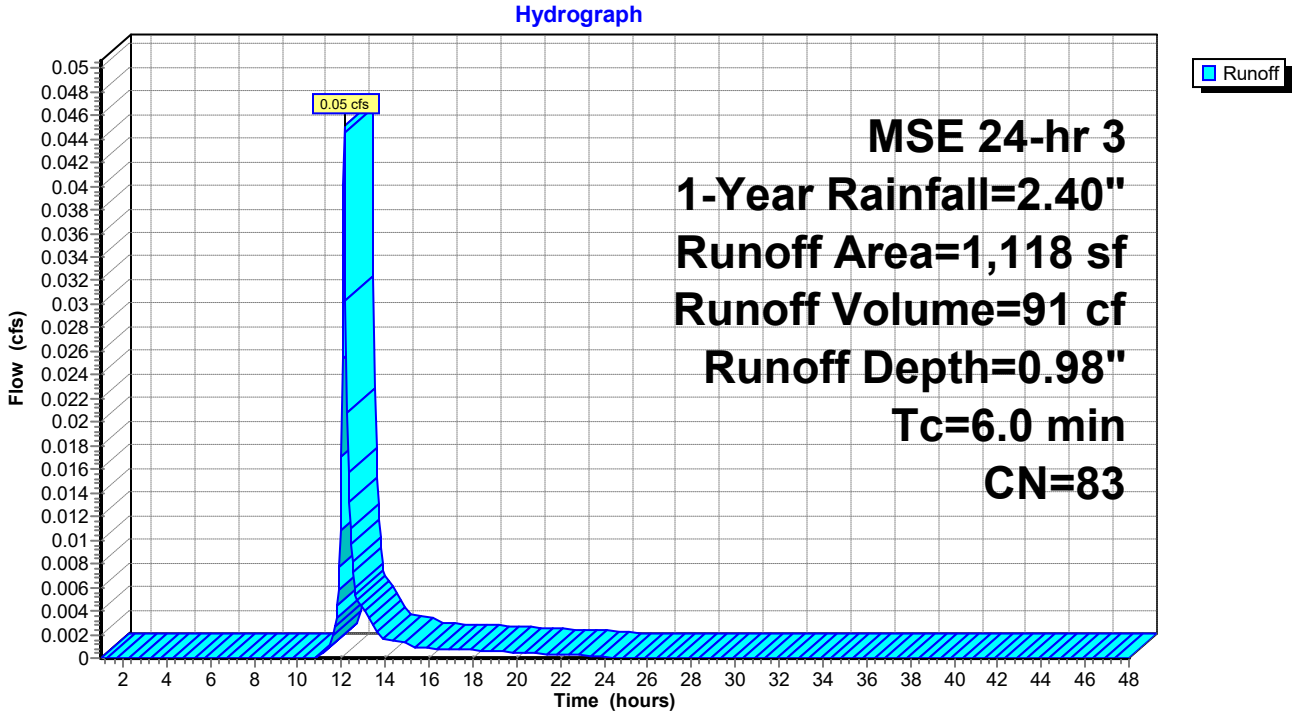
Runoff = 0.05 cfs @ 12.14 hrs, Volume= 91 cf, Depth= 0.98"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	401	98	WALKS
*	0	98	ROADS
*	0	98	ROOF
*	717	74	LANDSCAPING
	1,118	83	Weighted Average
	717		64.13% Pervious Area
	401		35.87% Impervious Area

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

Subcatchment 169S: A36



Summary for Subcatchment 170S: C (INTERIOR)

Subset C - C1
3/3/21
Southern portion of East Building Roof, Southern Building (Middle one) roof, pond area
pipe from roofs not sized yet

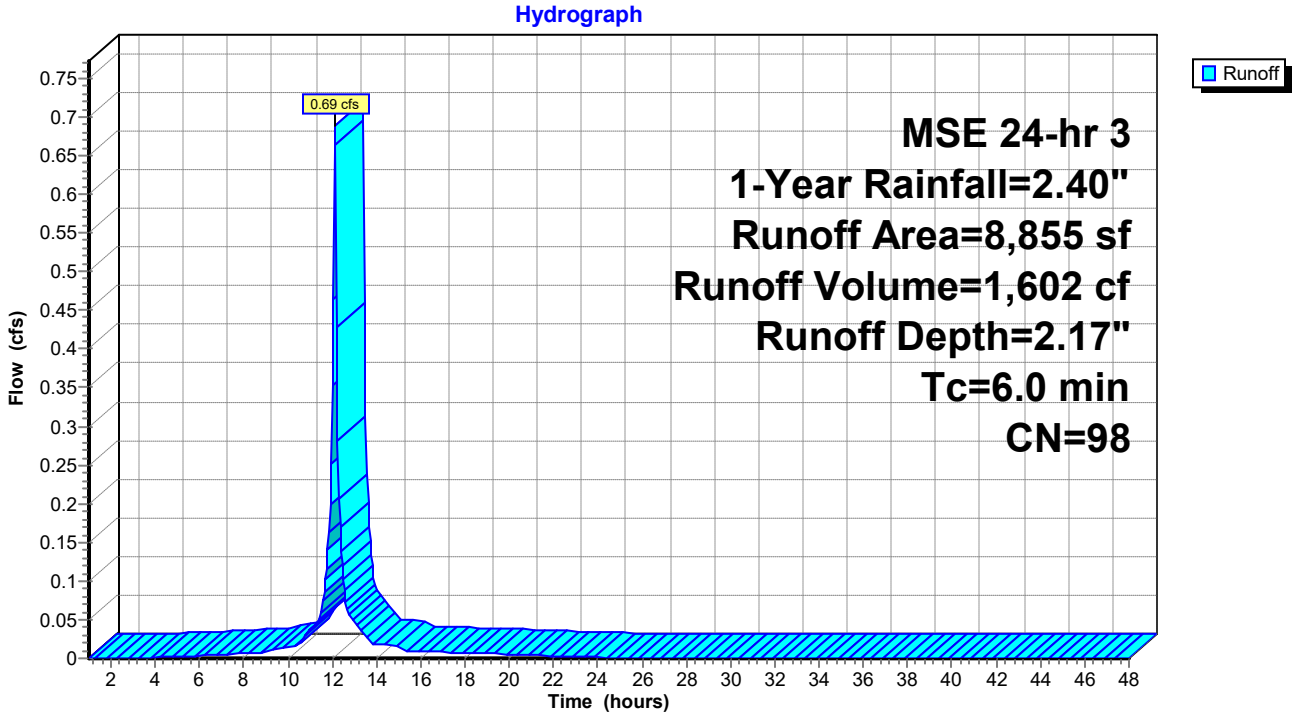
Runoff = 0.69 cfs @ 12.13 hrs, Volume= 1,602 cf, Depth= 2.17"
Routed to Link 171L : 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	8,855	98	roofs
	8,855		100.00% Impervious Area

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

Subcatchment 170S: C (INTERIOR)



Summary for Subcatchment 171S: A (MARIA ROOF) /2

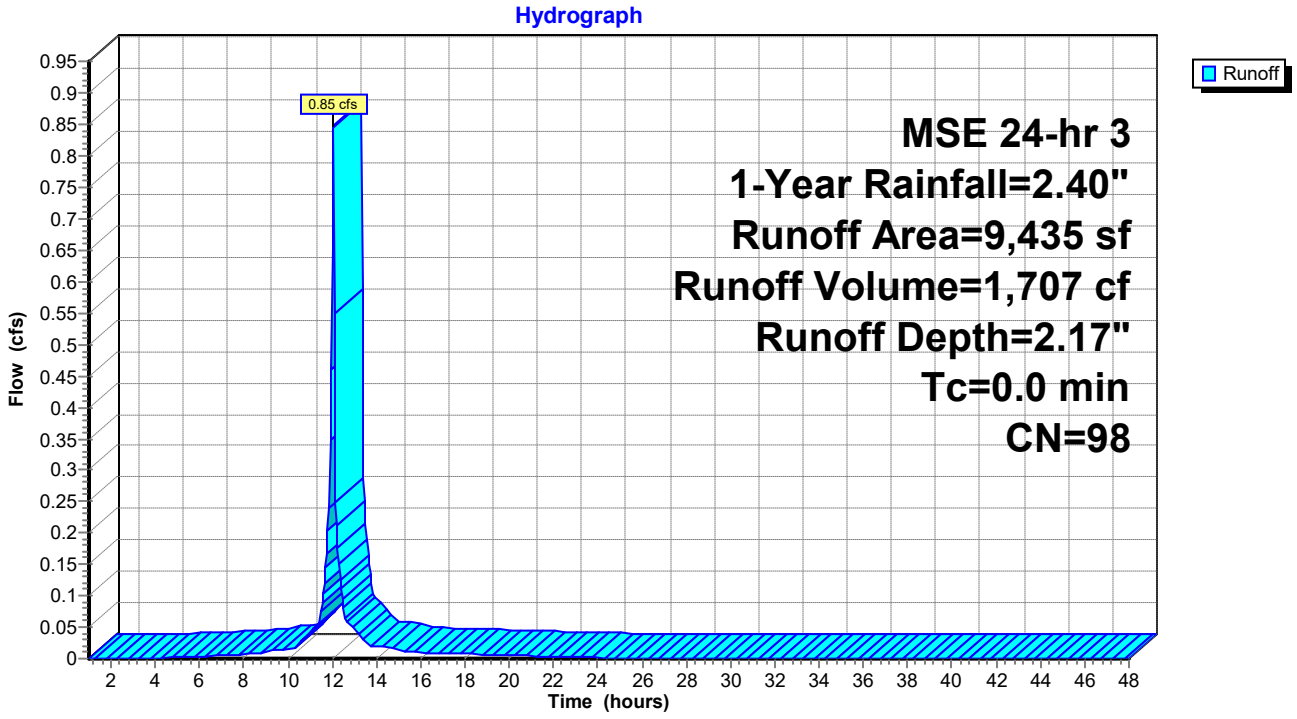
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.85 cfs @ 12.04 hrs, Volume= 1,707 cf, Depth= 2.17"
Routed to Link 134L : TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	9,435	98	Roofs
	9,435		100.00% Impervious Area

Subcatchment 171S: A (MARIA ROOF) /2



Summary for Subcatchment 172S: B1 (EXTERIOR)

3/3/21
Northern portion of W building roof

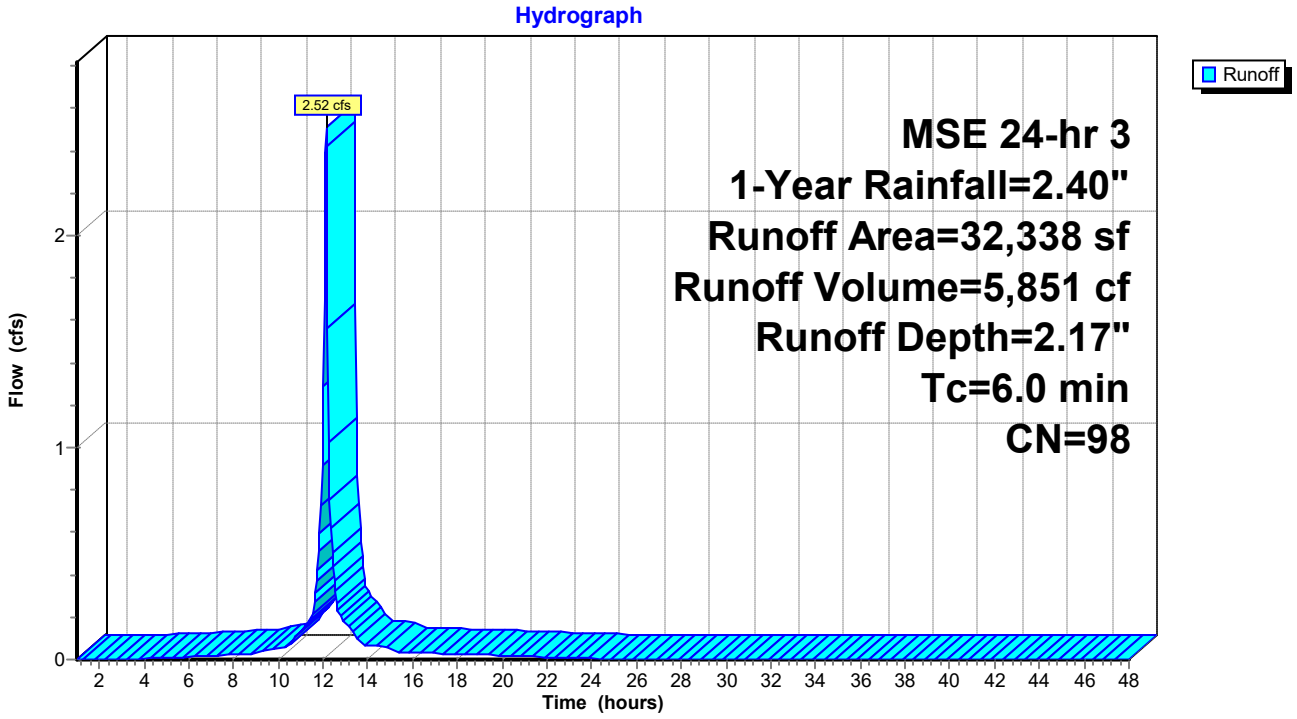
Runoff = 2.52 cfs @ 12.13 hrs, Volume= 5,851 cf, Depth= 2.17"
Routed to Reach 111R : Western PL North Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	32,338	98	roof
	32,338		100.00% Impervious Area

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

Subcatchment 172S: B1 (EXTERIOR)



Summary for Subcatchment 173S: A (MARIA ROOF) /2

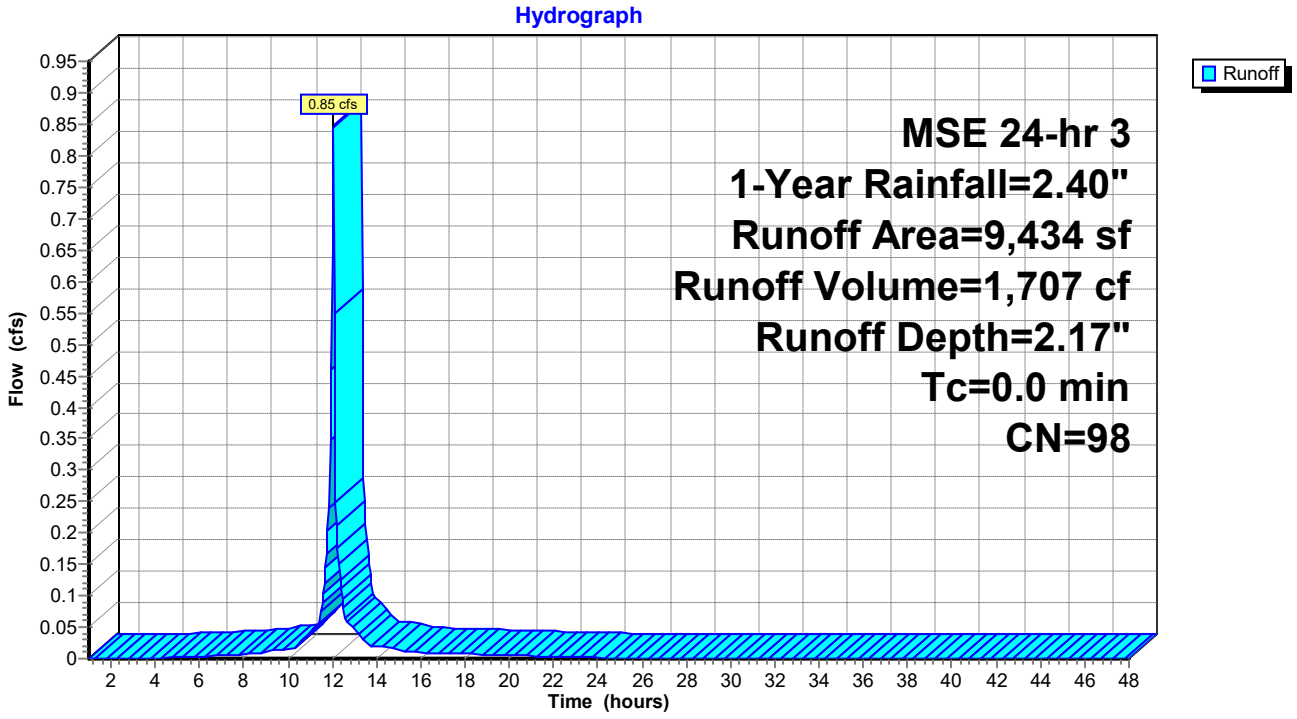
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.85 cfs @ 12.04 hrs, Volume= 1,707 cf, Depth= 2.17"
Routed to Link 175L : TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	9,434	98	Roofs
	9,434		100.00% Impervious Area

Subcatchment 173S: A (MARIA ROOF) /2



Summary for Subcatchment 175S: H6-b

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

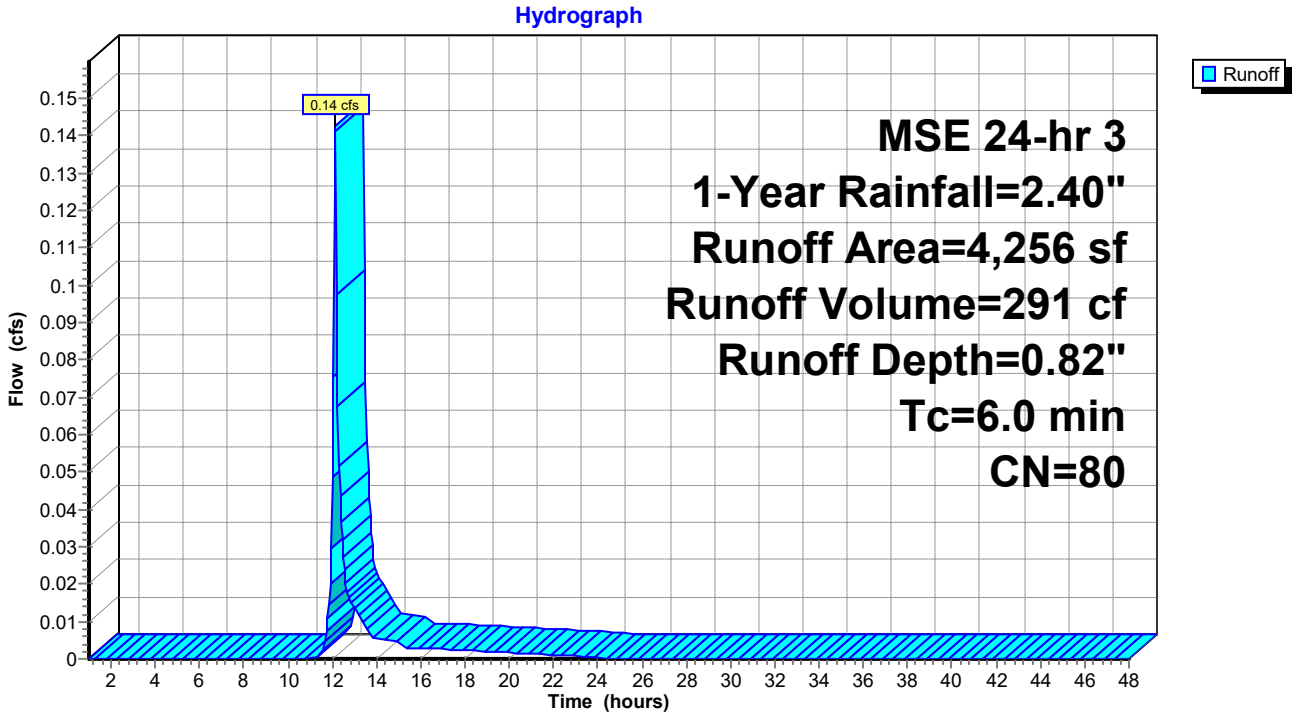
Runoff = 0.14 cfs @ 12.14 hrs, Volume= 291 cf, Depth= 0.82"
Routed to Link 115L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	3,243	74	landscape
*	1,013	98	road
	4,256	80	Weighted Average
	3,243		76.20% Pervious Area
	1,013		23.80% Impervious Area

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

Subcatchment 175S: H6-b



Summary for Subcatchment 176S: X (EX. RBL Area to RBL West Swale)

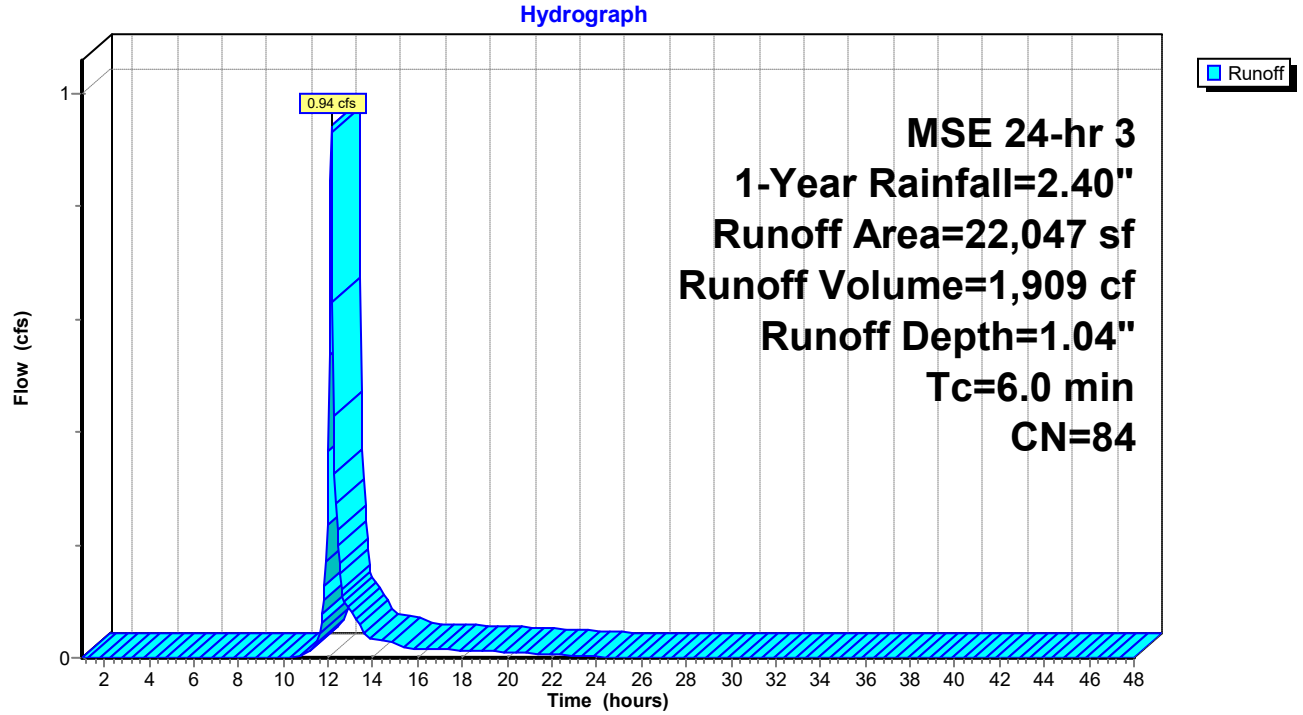
Runoff = 0.94 cfs @ 12.14 hrs, Volume= 1,909 cf, Depth= 1.04"
Routed to Reach 132R : EX. Red Barn Lane West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	12,014	74	landscape
*	9,160	98	road
*	873	74	landscape
	22,047	84	Weighted Average
	12,887		58.45% Pervious Area
	9,160		41.55% Impervious Area

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

Subcatchment 176S: X (EX. RBL Area to RBL West Swale)



Summary for Subcatchment 179S: H6-c

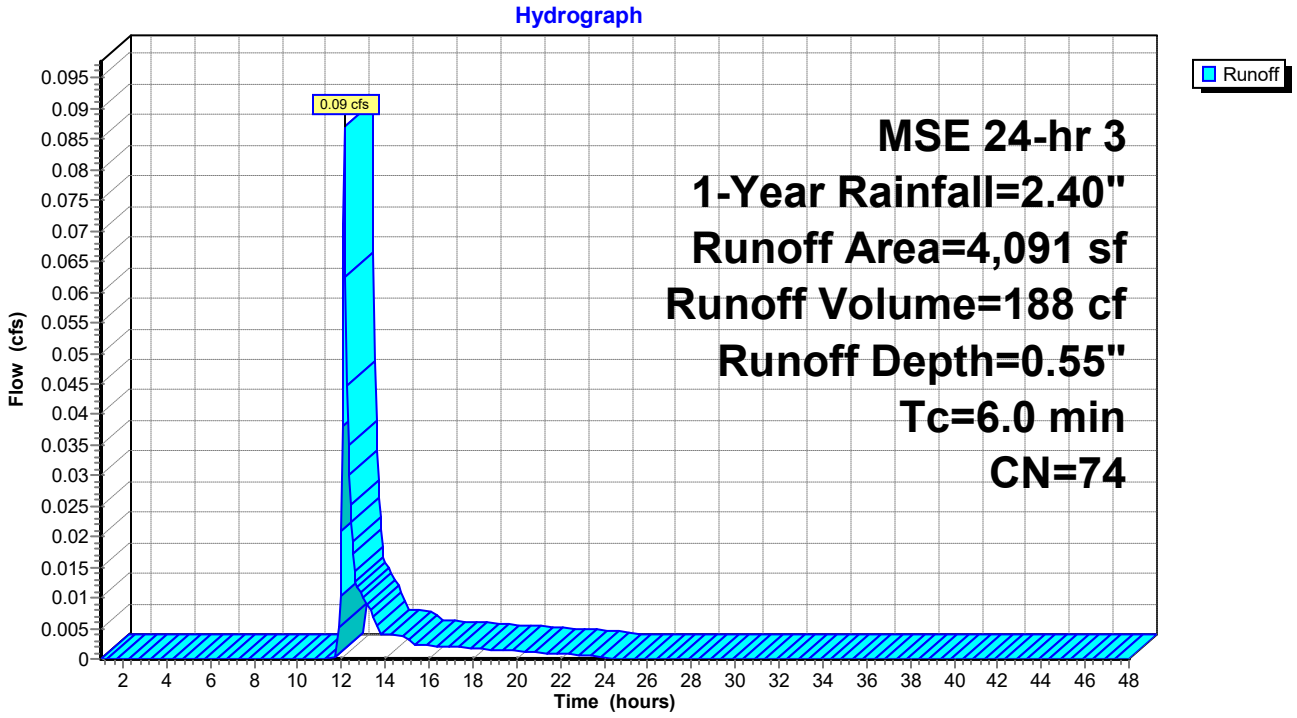
Runoff = 0.09 cfs @ 12.14 hrs, Volume= 188 cf, Depth= 0.55"
Routed to Link 115L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	4,091	74	per
	4,091		100.00% Pervious Area

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

Subcatchment 179S: H6-c



Summary for Subcatchment 182S: A35

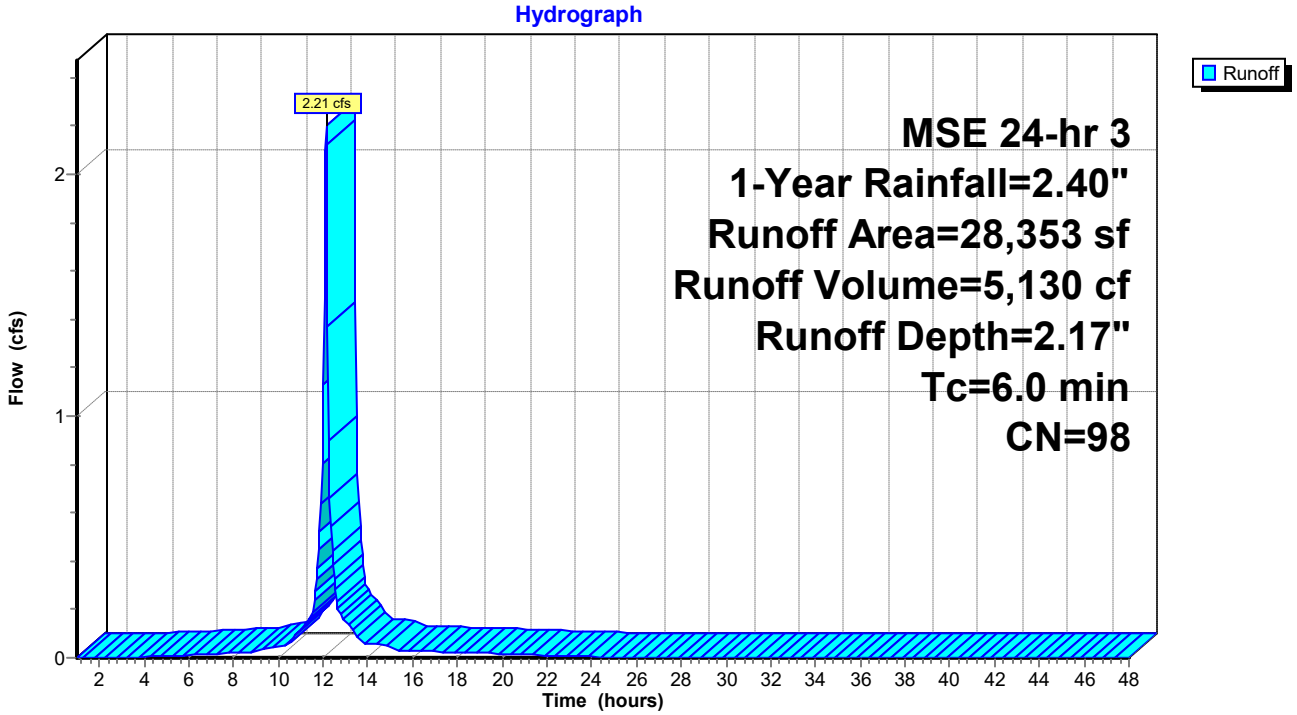
Runoff = 2.21 cfs @ 12.13 hrs, Volume= 5,130 cf, Depth= 2.17"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	28,353	98	WALKS
*	0	98	ROADS
*	0	98	ROOF
*	0	74	LANDSCAPING
	28,353	98	Weighted Average
	28,353		100.00% Impervious Area

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

Subcatchment 182S: A35



Summary for Subcatchment 183S: Y (RBL Area to RBL East Swale)

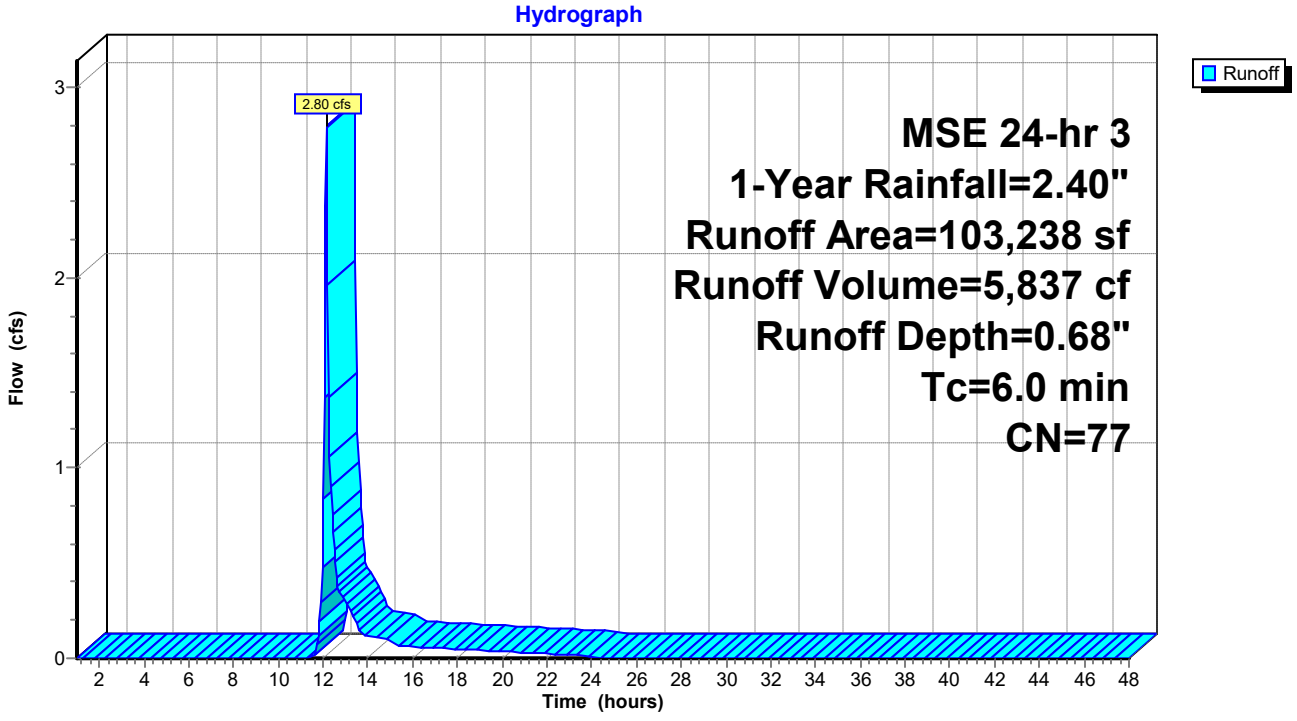
Runoff = 2.80 cfs @ 12.14 hrs, Volume= 5,837 cf, Depth= 0.68"
Routed to Reach 184R : Red Barn Lane East Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	92,001	74	landscape
*	11,237	98	road
	103,238	77	Weighted Average
	92,001		89.12% Pervious Area
	11,237		10.88% Impervious Area

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

Subcatchment 183S: Y (RBL Area to RBL East Swale)



Summary for Subcatchment 185S: H4

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

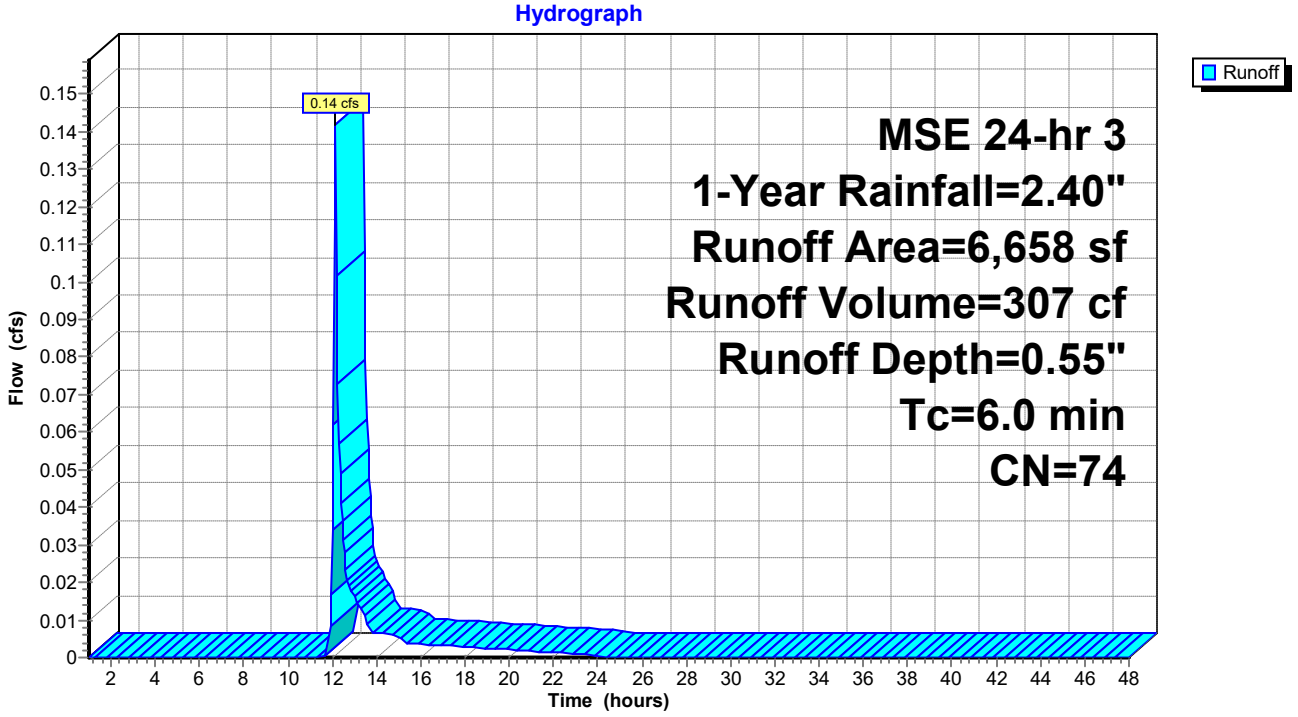
Runoff = 0.14 cfs @ 12.14 hrs, Volume= 307 cf, Depth= 0.55"
Routed to Link 66L : Total Offsite

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 1-Year Rainfall=2.40"

	Area (sf)	CN	Description
*	6,658	74	landscape
	6,658		100.00% Pervious Area

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

Subcatchment 185S: H4



Summary for Reach 99R: East Swale (SE End)

[62] Hint: Exceeded Reach 106R OUTLET depth by 0.28' @ 12.20 hrs

Inflow Area = 227,272 sf, 34.15% Impervious, Inflow Depth = 0.94" for 1-Year event
Inflow = 8.75 cfs @ 12.14 hrs, Volume= 17,744 cf
Outflow = 7.91 cfs @ 12.17 hrs, Volume= 17,744 cf, Atten= 10%, Lag= 1.7 min
Routed to Pond 58P : Dry Pond 1

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.24 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 0.75 fps, Avg. Travel Time= 12.7 min

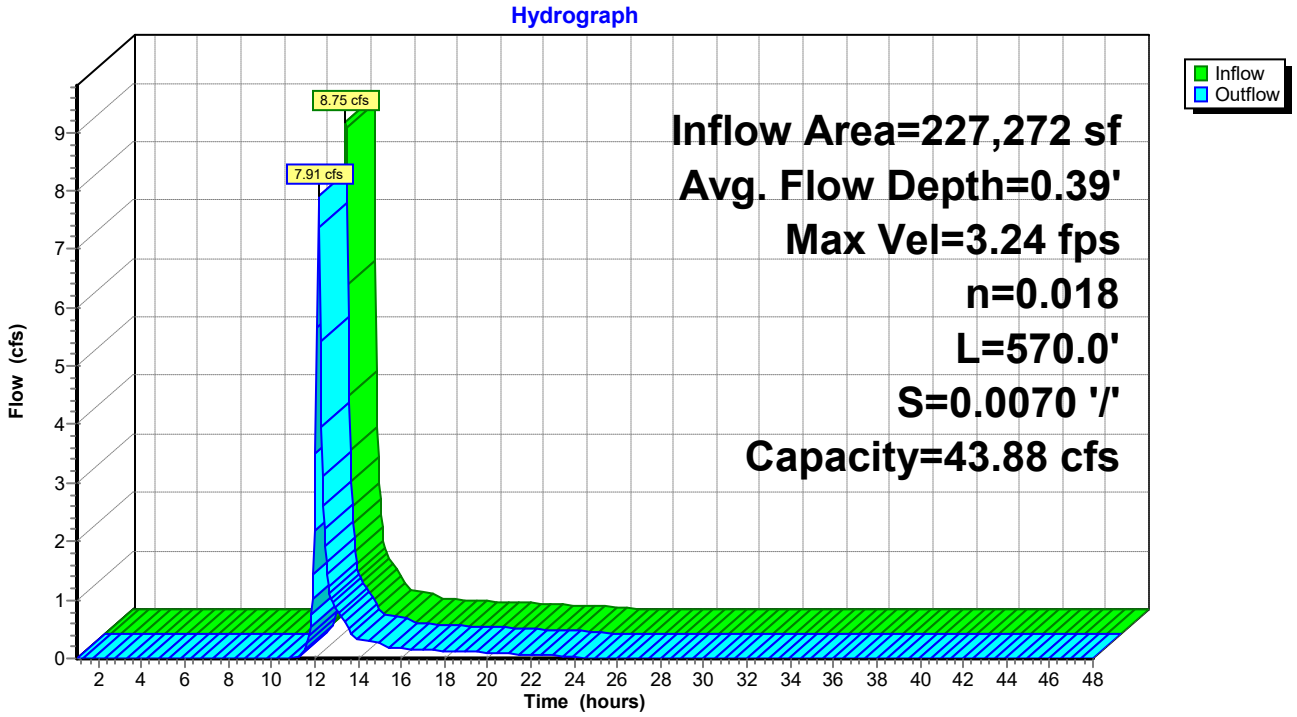
Peak Storage= 1,384 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.39' , Surface Width= 7.36'
Bank-Full Depth= 1.00' Flow Area= 8.0 sf, Capacity= 43.88 cfs

5.00' x 1.00' deep channel, n= 0.018
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 570.0' Slope= 0.0070 '/'
Inlet Invert= 757.00', Outlet Invert= 753.00'



‡

Reach 99R: East Swale (SE End)



Summary for Reach 106R: East Swale (North End)

3/2/21
Slope Calc - (140' x 4.64%)

Inflow Area = 19,337 sf, 26.10% Impervious, Inflow Depth = 0.82" for 1-Year event
Inflow = 0.65 cfs @ 12.14 hrs, Volume= 1,322 cf
Outflow = 0.64 cfs @ 12.15 hrs, Volume= 1,322 cf, Atten= 1%, Lag= 0.7 min
Routed to Reach 99R : East Swale (SE End)

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.37 fps, Min. Travel Time= 1.0 min
Avg. Velocity = 0.65 fps, Avg. Travel Time= 3.6 min

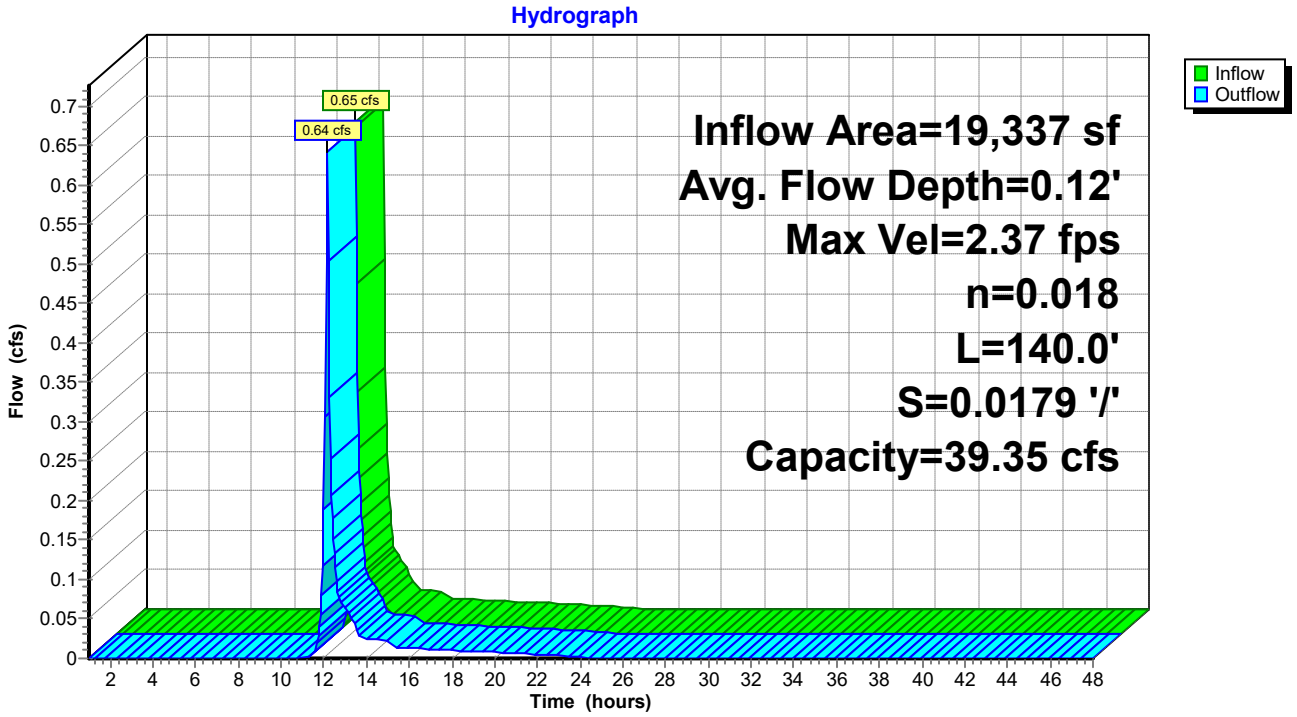
Peak Storage= 38 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.12' , Surface Width= 2.69'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 39.35 cfs

2.00' x 1.00' deep channel, n= 0.018 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 8.00'
Length= 140.0' Slope= 0.0179 '/'
Inlet Invert= 759.51', Outlet Invert= 757.00'



‡

Reach 106R: East Swale (North End)



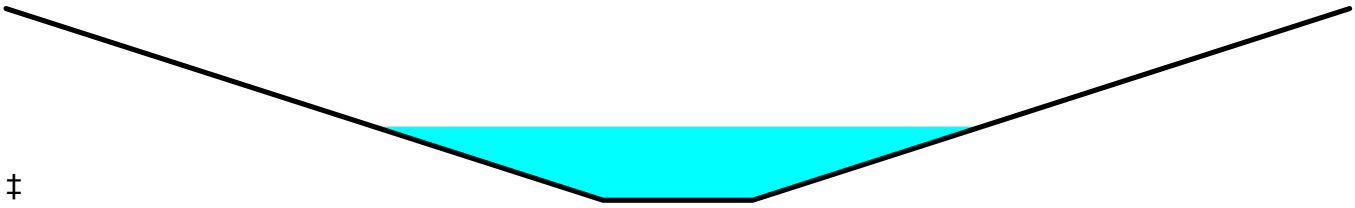
Summary for Reach 108R: South Berm Swale

Inflow Area = 124,665 sf, 12.91% Impervious, Inflow Depth = 0.69" for 1-Year event
Inflow = 2.33 cfs @ 12.14 hrs, Volume= 7,180 cf
Outflow = 2.19 cfs @ 12.17 hrs, Volume= 7,180 cf, Atten= 6%, Lag= 1.4 min
Routed to Pond 57P : Dry Pond 2

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.24 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 0.81 fps, Avg. Travel Time= 5.5 min

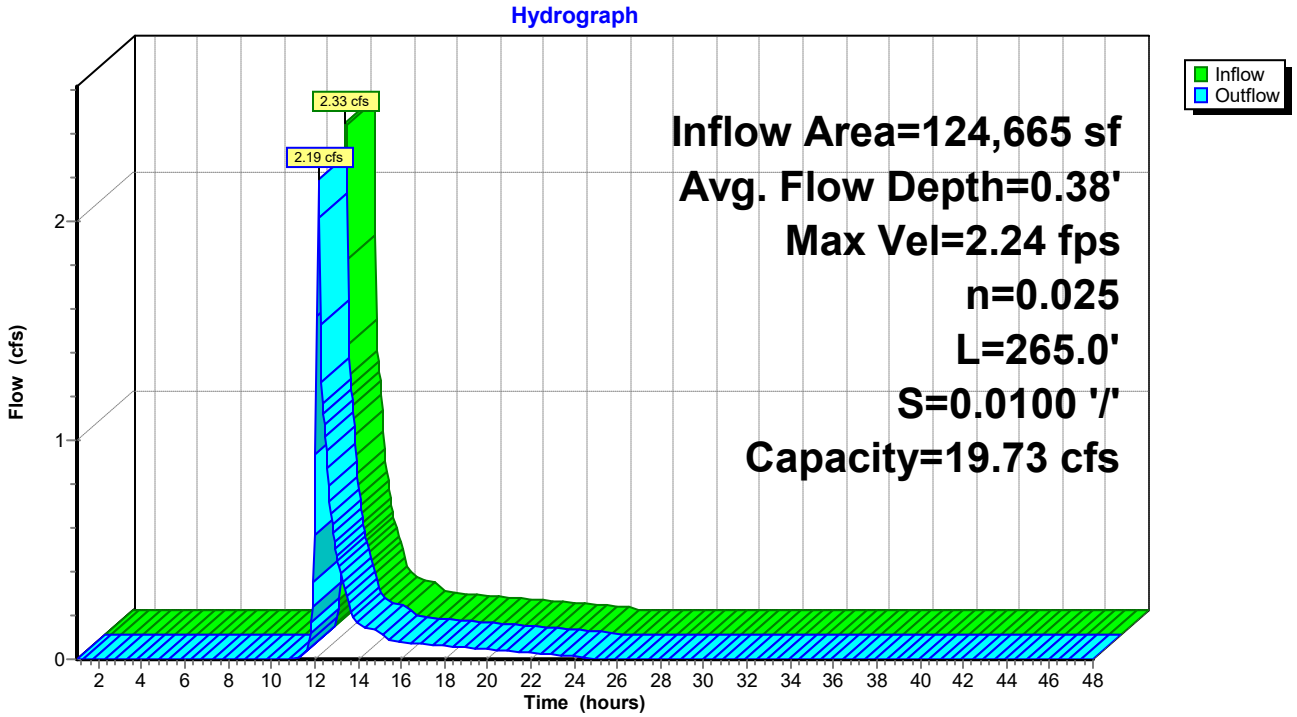
Peak Storage= 258 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.38' , Surface Width= 4.07'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 19.73 cfs

1.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 4.0 '/' Top Width= 9.00'
Length= 265.0' Slope= 0.0100 '/'
Inlet Invert= 754.00', Outlet Invert= 751.35'



‡

Reach 108R: South Berm Swale



Summary for Reach 109R: SC Road East Ditch

3/3/21
Ditch on north and west side of cul-de-sac road

Inflow Area = 41,695 sf, 60.00% Impervious, Inflow Depth = 1.30" for 1-Year event
Inflow = 2.21 cfs @ 12.13 hrs, Volume= 4,504 cf
Outflow = 1.91 cfs @ 12.17 hrs, Volume= 4,504 cf, Atten= 14%, Lag= 2.3 min
Routed to Pond 95P : Dry Pond 3

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.67 fps, Min. Travel Time= 4.1 min
Avg. Velocity = 0.41 fps, Avg. Travel Time= 17.0 min

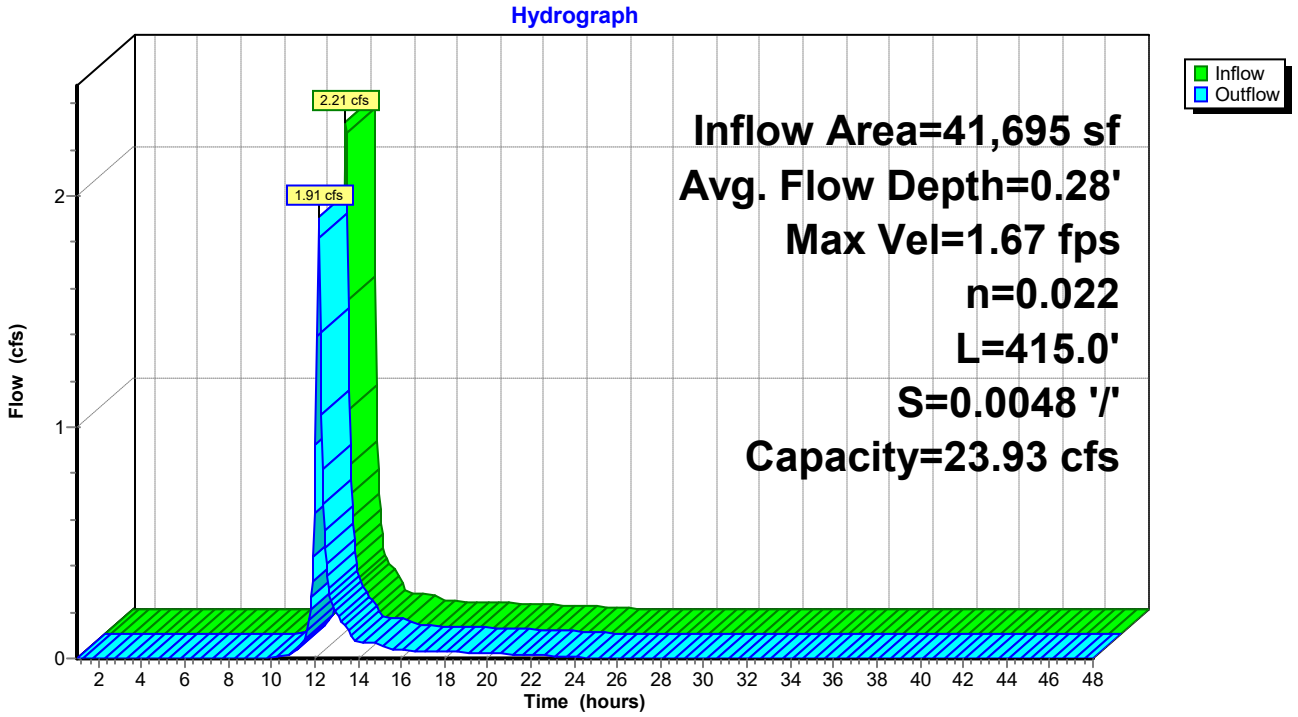
Peak Storage= 471 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.28' , Surface Width= 5.21'
Bank-Full Depth= 1.00' Flow Area= 7.0 sf, Capacity= 23.93 cfs

3.00' x 1.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 '/' Top Width= 11.00'
Length= 415.0' Slope= 0.0048 '/'
Inlet Invert= 747.00', Outlet Invert= 745.00'



‡

Reach 109R: SC Road East Ditch



Summary for Reach 111R: Western PL North Ditch

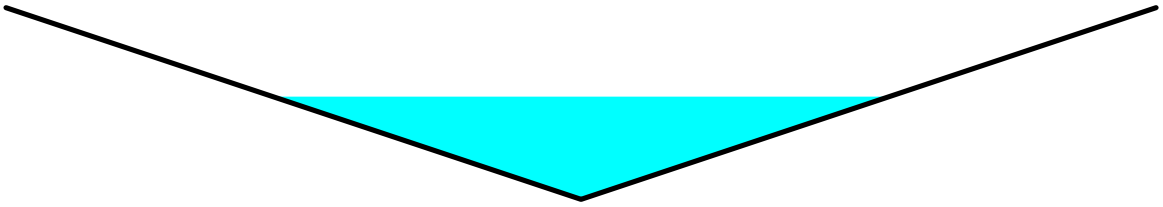
3/3/21
This is the western property line ditch that takes offsite flow and western building courtyard flow to IB
update length we shortened in screen share

Inflow Area = 158,356 sf, 28.25% Impervious, Inflow Depth = 0.96" for 1-Year event
Inflow = 5.51 cfs @ 12.14 hrs, Volume= 12,694 cf
Outflow = 5.08 cfs @ 12.17 hrs, Volume= 12,694 cf, Atten= 8%, Lag= 1.6 min
Routed to Pond 110R : Western Pipe Run

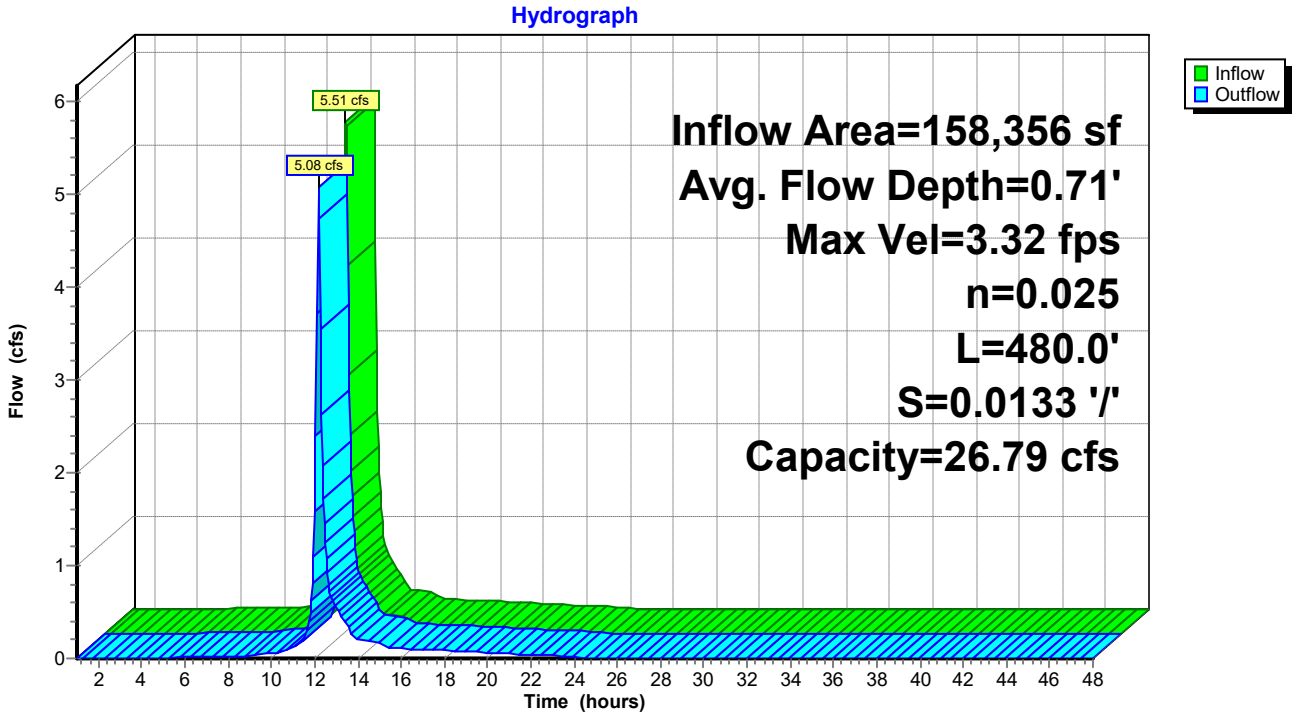
Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.32 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 1.06 fps, Avg. Travel Time= 7.6 min

Peak Storage= 732 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.71' , Surface Width= 4.28'
Bank-Full Depth= 1.33' Flow Area= 5.3 sf, Capacity= 26.79 cfs

0.00' x 1.33' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 7.98'
Length= 480.0' Slope= 0.0133 '/'
Inlet Invert= 755.50', Outlet Invert= 749.10'



Reach 111R: Western PL North Ditch



Summary for Reach 117R: SC Road West Ditch

3/3/21
Ditch on north and west side of cul-de-sac road

Inflow Area = 50,859 sf, 57.49% Impervious, Inflow Depth = 1.30" for 1-Year event
Inflow = 2.70 cfs @ 12.13 hrs, Volume= 5,494 cf
Outflow = 2.25 cfs @ 12.18 hrs, Volume= 5,494 cf, Atten= 17%, Lag= 2.5 min
Routed to Pond 95P : Dry Pond 3

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.68 fps, Min. Travel Time= 4.7 min
Avg. Velocity = 0.40 fps, Avg. Travel Time= 19.6 min

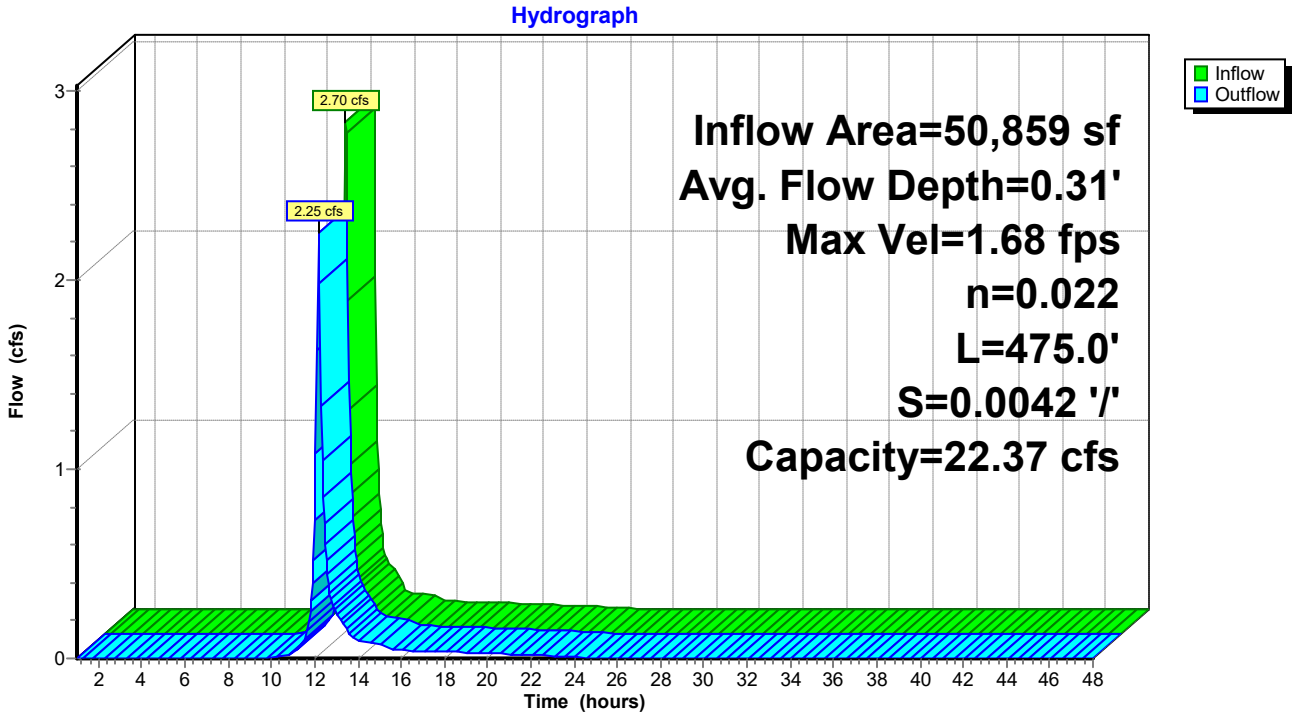
Peak Storage= 634 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.31' , Surface Width= 5.51'
Bank-Full Depth= 1.00' Flow Area= 7.0 sf, Capacity= 22.37 cfs

3.00' x 1.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 '/' Top Width= 11.00'
Length= 475.0' Slope= 0.0042 '/'
Inlet Invert= 747.00', Outlet Invert= 745.00'



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Reach 117R: SC Road West Ditch



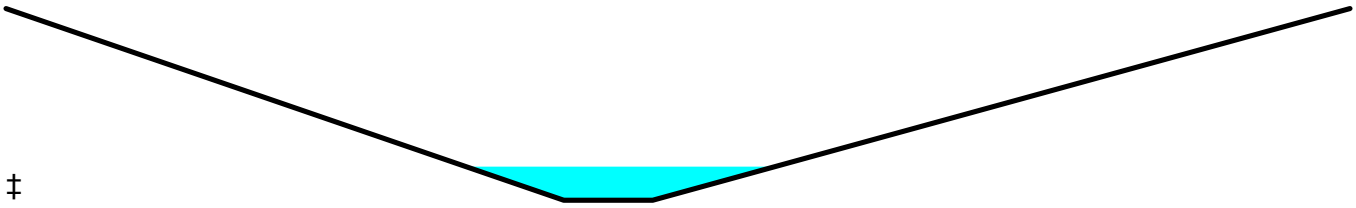
Summary for Reach 132R: EX. Red Barn Lane West Swale

Inflow Area = 51,883 sf, 28.33% Impervious, Inflow Depth = 0.86" for 1-Year event
Inflow = 1.82 cfs @ 12.14 hrs, Volume= 3,708 cf
Outflow = 1.51 cfs @ 12.18 hrs, Volume= 3,708 cf, Atten= 17%, Lag= 2.6 min
Routed to Pond 183P : 24" HDPE PIPE

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.46 fps, Min. Travel Time= 4.1 min
Avg. Velocity = 0.80 fps, Avg. Travel Time= 12.8 min

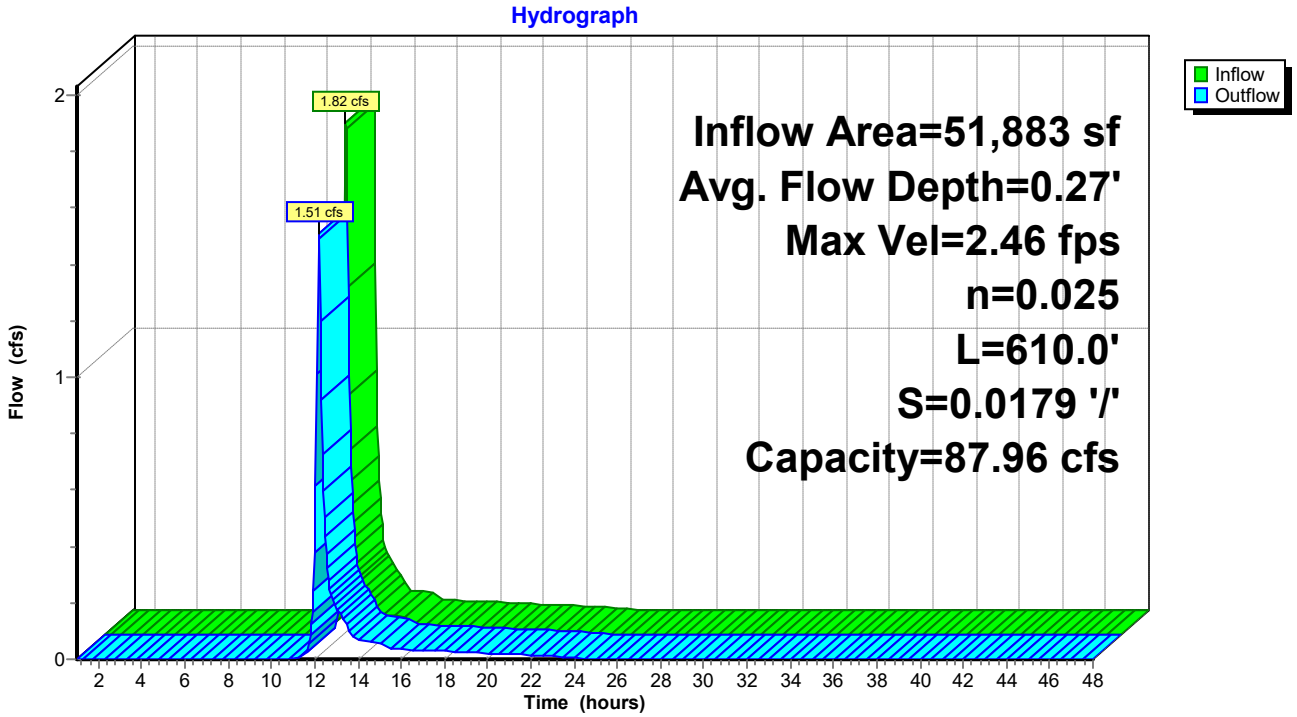
Peak Storage= 374 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.27' , Surface Width= 3.47'
Bank-Full Depth= 1.57' Flow Area= 12.7 sf, Capacity= 87.96 cfs

1.00' x 1.57' deep channel, n= 0.025
Side Slope Z-value= 4.0 5.0 '/' Top Width= 15.13'
Length= 610.0' Slope= 0.0179 '/'
Inlet Invert= 760.89', Outlet Invert= 750.00'



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Reach 132R: EX. Red Barn Lane West Swale



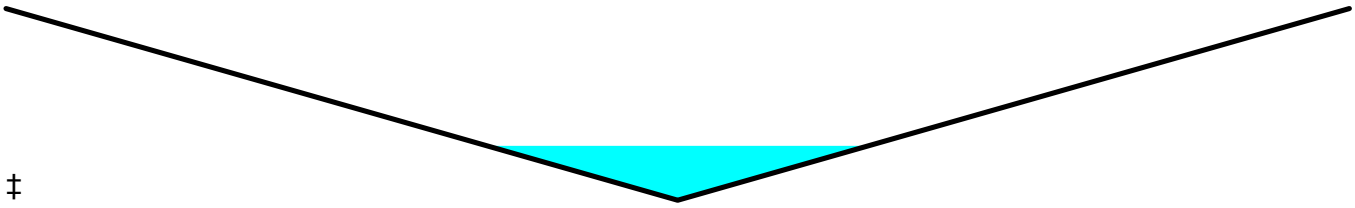
Summary for Reach 136R: SC West Ditch

Inflow Area = 20,215 sf, 20.28% Impervious, Inflow Depth = 0.77" for 1-Year event
Inflow = 0.63 cfs @ 12.14 hrs, Volume= 1,299 cf
Outflow = 0.57 cfs @ 12.17 hrs, Volume= 1,299 cf, Atten= 10%, Lag= 1.7 min
Routed to Pond 95P : Dry Pond 3

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.42 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 0.53 fps, Avg. Travel Time= 6.8 min

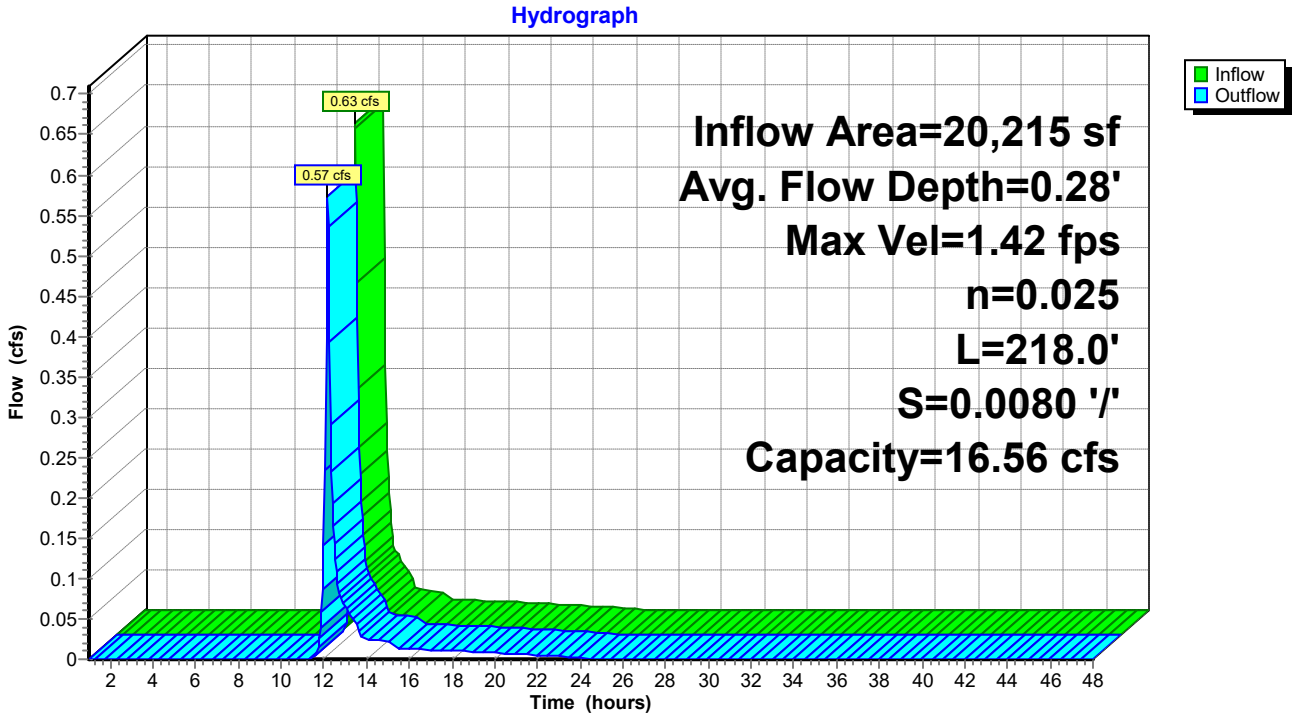
Peak Storage= 88 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.28' , Surface Width= 2.84'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 16.56 cfs

0.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 5.0 '/' Top Width= 10.00'
Length= 218.0' Slope= 0.0080 '/'
Inlet Invert= 743.75', Outlet Invert= 742.00'



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Reach 136R: SC West Ditch



Summary for Reach 151R: Western PL North Ditch

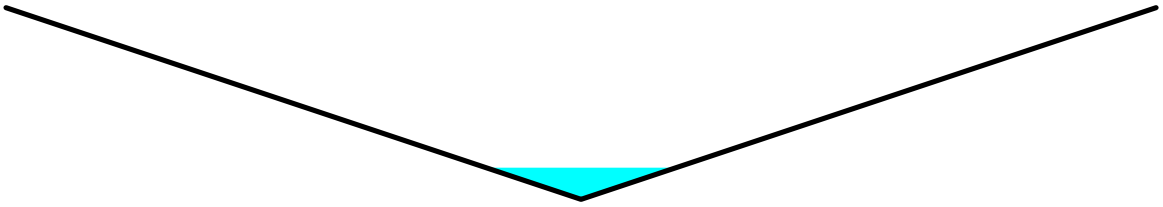
3/3/21
This is the western property line ditch that takes offsite flow and western building courtyard flow to IB
update length we shortened in screen share

Inflow Area = 8,222 sf, 12.92% Impervious, Inflow Depth = 0.68" for 1-Year event
Inflow = 0.22 cfs @ 12.14 hrs, Volume= 465 cf
Outflow = 0.20 cfs @ 12.17 hrs, Volume= 465 cf, Atten= 11%, Lag= 1.9 min
Routed to Pond 110R : Western Pipe Run

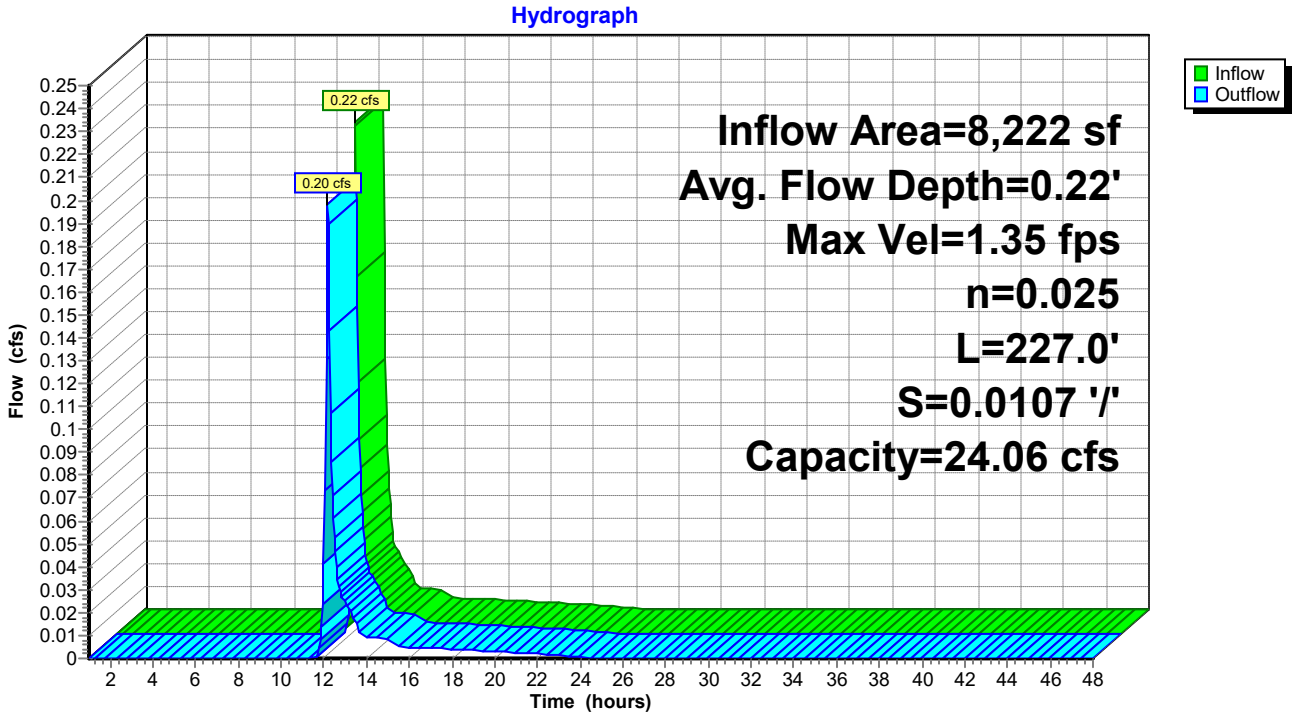
Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.35 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 0.54 fps, Avg. Travel Time= 7.1 min

Peak Storage= 33 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.22' , Surface Width= 1.32'
Bank-Full Depth= 1.33' Flow Area= 5.3 sf, Capacity= 24.06 cfs

0.00' x 1.33' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 7.98'
Length= 227.0' Slope= 0.0107 '/'
Inlet Invert= 751.54', Outlet Invert= 749.10'



Reach 151R: Western PL North Ditch



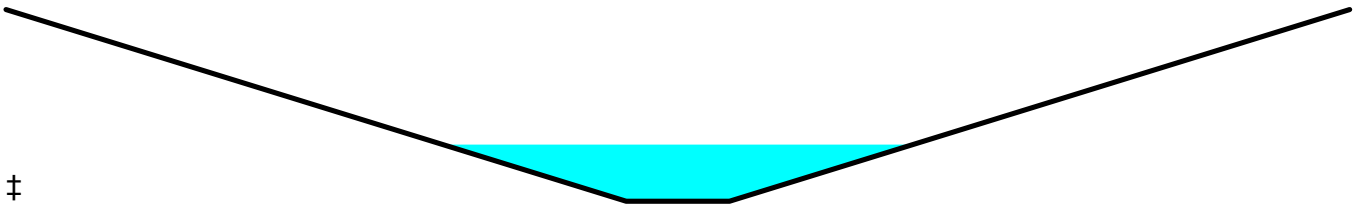
Summary for Reach 184R: Red Barn Lane East Swale

Inflow Area = 103,238 sf, 10.88% Impervious, Inflow Depth = 0.68" for 1-Year event
Inflow = 2.80 cfs @ 12.14 hrs, Volume= 5,837 cf
Outflow = 2.08 cfs @ 12.20 hrs, Volume= 5,837 cf, Atten= 26%, Lag= 3.8 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.53 fps, Min. Travel Time= 6.2 min
Avg. Velocity = 0.83 fps, Avg. Travel Time= 19.0 min

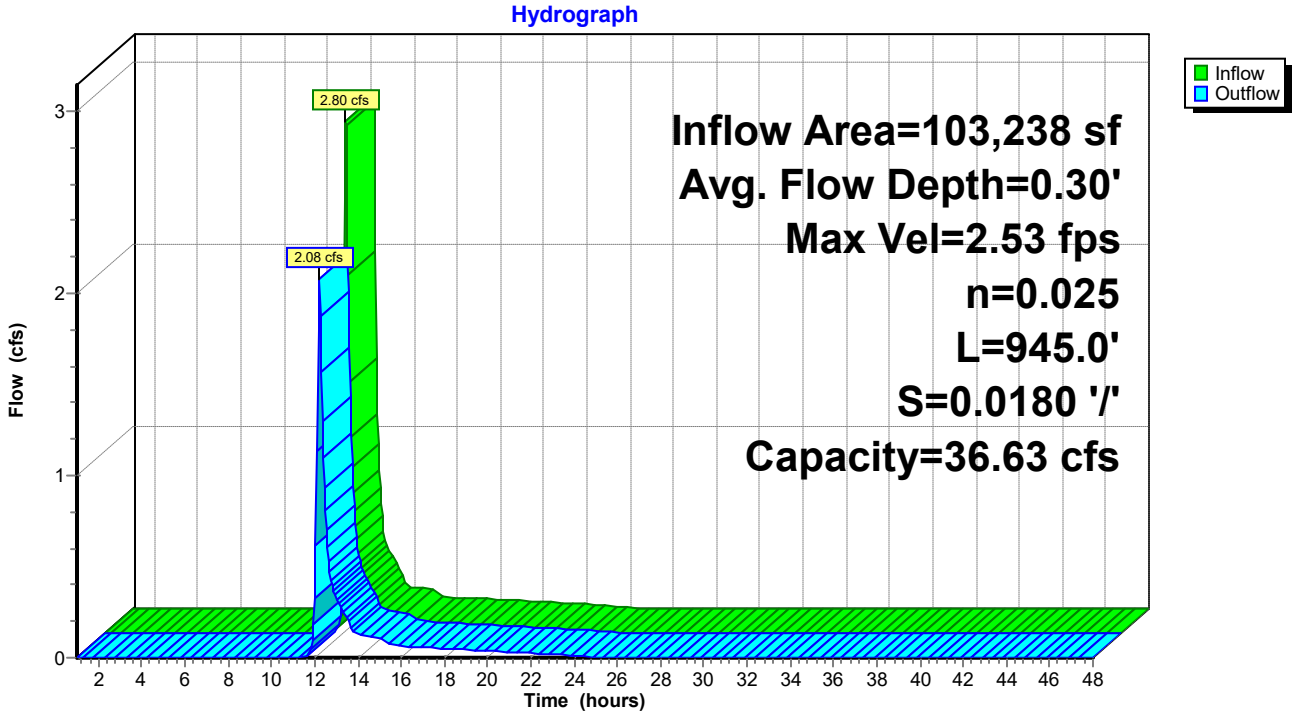
Peak Storage= 776 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.30' , Surface Width= 4.55'
Bank-Full Depth= 1.00' Flow Area= 7.0 sf, Capacity= 36.63 cfs

1.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 6.0 '/' Top Width= 13.00'
Length= 945.0' Slope= 0.0180 '/'
Inlet Invert= 763.00', Outlet Invert= 746.00'



‡

Reach 184R: Red Barn Lane East Swale



Summary for Pond 41P: Reach Pipe

Inflow Area = 806,202 sf, 39.20% Impervious, Inflow Depth = 0.02" for 1-Year event
Inflow = 0.54 cfs @ 12.18 hrs, Volume= 1,295 cf
Outflow = 0.54 cfs @ 12.18 hrs, Volume= 1,295 cf, Atten= 0%, Lag= 0.3 min
Primary = 0.54 cfs @ 12.18 hrs, Volume= 1,295 cf
Routed to Pond 154P : Southeast Basin

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 738.39' @ 12.18 hrs Surf.Area= 29 sf Storage= 5 cf

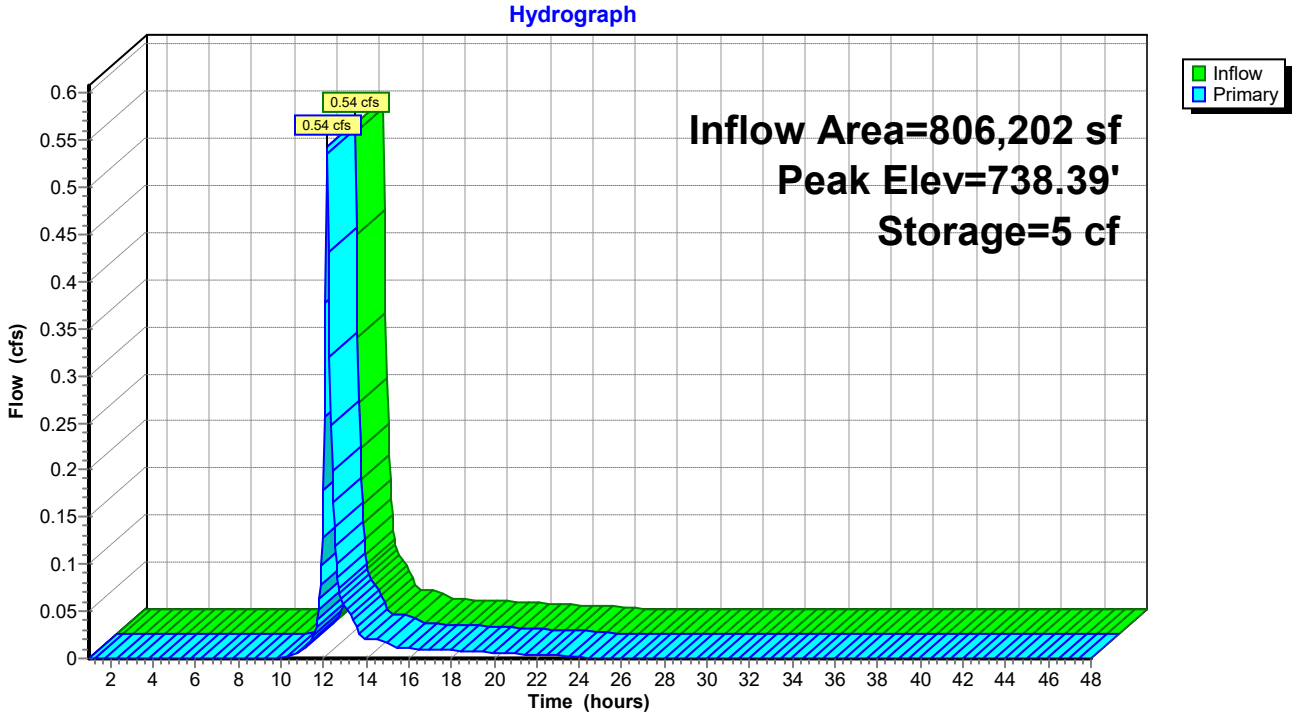
Plug-Flow detention time= 0.1 min calculated for 1,294 cf (100% of inflow)
Center-of-Mass det. time= 0.1 min (810.2 - 810.1)

Volume	Invert	Avail.Storage	Storage Description
#1	738.00'	1,587 cf	**24.0" Round Pipe Storage** L= 505.0' S= 0.0150 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	738.00'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.53 cfs @ 12.18 hrs HW=738.39' TW=730.20' (Dynamic Tailwater)
↑—**1=Orifice/Grate** (Orifice Controls 0.53 cfs @ 2.12 fps)

Pond 41P: Reach Pipe



Summary for Pond 57P: Dry Pond 2

Inflow Area = 214,039 sf, 18.55% Impervious, Inflow Depth = 0.76" for 1-Year event
Inflow = 4.49 cfs @ 12.17 hrs, Volume= 13,549 cf
Outflow = 1.62 cfs @ 12.56 hrs, Volume= 13,549 cf, Atten= 64%, Lag= 23.4 min
Discarded = 1.62 cfs @ 12.56 hrs, Volume= 13,549 cf
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 41P : Reach Pipe
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Reach 117R : SC Road West Ditch

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 747.32' @ 12.56 hrs Surf.Area= 7,770 sf Storage= 2,382 cf

Plug-Flow detention time= 9.8 min calculated for 13,535 cf (100% of inflow)
Center-of-Mass det. time= 9.8 min (847.2 - 837.4)

Volume	Invert	Avail.Storage	Storage Description
#1	747.00'	55,955 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
747.00	7,300	0	0
748.00	8,788	8,044	8,044
749.00	10,334	9,561	17,605
750.00	11,935	11,135	28,740
751.00	13,594	12,765	41,504
752.00	15,308	14,451	55,955

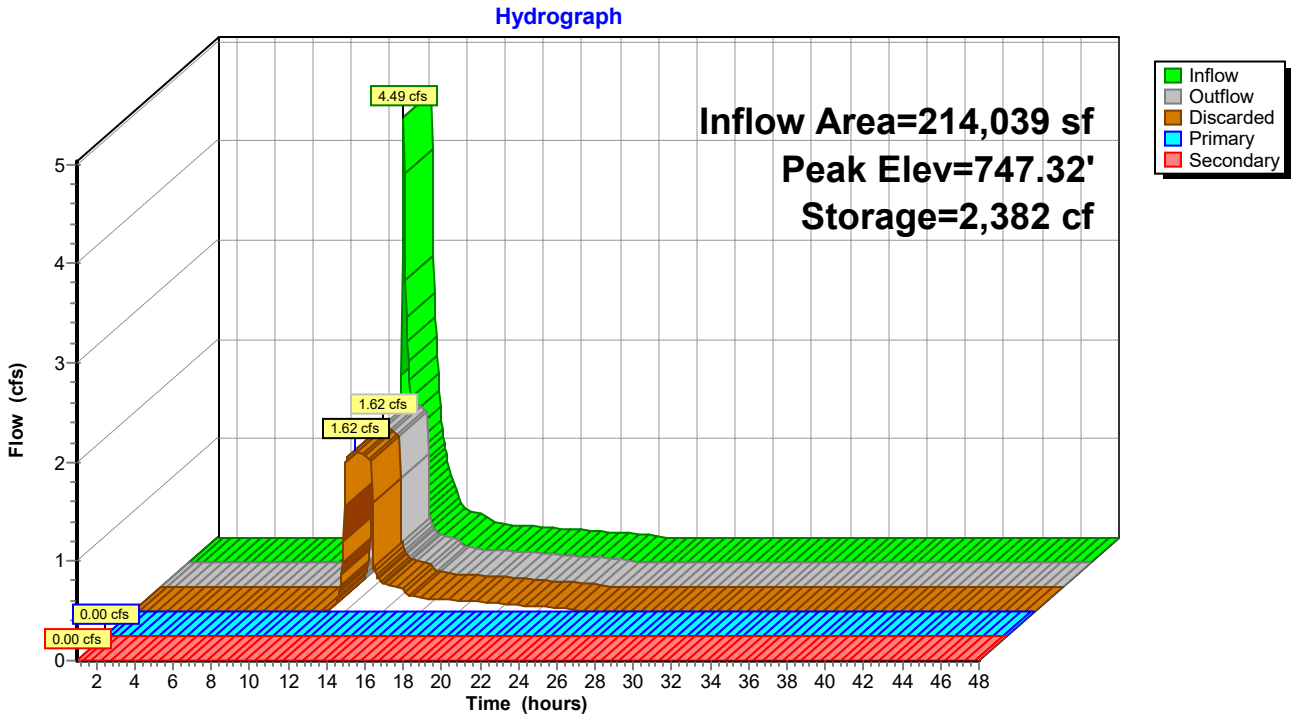
Device	Routing	Invert	Outlet Devices
#1	Primary	750.00'	**12.0" Round Culvert** L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 750.00' / 749.50' S= 0.0200 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#2	Device 1	750.33'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	751.66'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	750.44'	**12.0" Round Culvert** L= 214.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 750.44' / 750.01' S= 0.0020 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#5	Device 4	750.44'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Device 4	751.93'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#7	Discarded	747.00'	**8.880 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 720.00' Phase-In= 0.01'

Discarded OutFlow Max=1.62 cfs @ 12.56 hrs HW=747.32' (Free Discharge)
└**7=Exfiltration** (Controls 1.62 cfs)

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=747.00' TW=738.00' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)
  └**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=747.00' TW=747.00' (Dynamic Tailwater)
└**4=Culvert** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Pond 57P: Dry Pond 2



Summary for Pond 58P: Dry Pond 1

Inflow Area = 579,504 sf, 46.53% Impervious, Inflow Depth = 1.16" for 1-Year event
Inflow = 15.04 cfs @ 12.15 hrs, Volume= 55,907 cf
Outflow = 1.58 cfs @ 14.68 hrs, Volume= 55,906 cf, Atten= 89%, Lag= 151.8 min
Discarded = 1.58 cfs @ 14.68 hrs, Volume= 55,906 cf
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 101R : Reach Pipe DP1 TO MH
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 57P : Dry Pond 2

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 748.00' @ 14.68 hrs Surf.Area= 20,801 sf Storage= 19,370 cf

Plug-Flow detention time= 131.8 min calculated for 55,906 cf (100% of inflow)
Center-of-Mass det. time= 131.8 min (998.1 - 866.3)

Volume	Invert	Avail.Storage	Storage Description
#1	747.00'	197,389 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
747.00	17,995	0	0
748.00	20,805	19,400	19,400
749.00	23,672	22,239	41,639
750.00	26,595	25,134	66,772
751.00	29,575	28,085	94,857
752.00	32,612	31,094	125,951
753.00	35,705	34,159	160,109
754.00	38,855	37,280	197,389

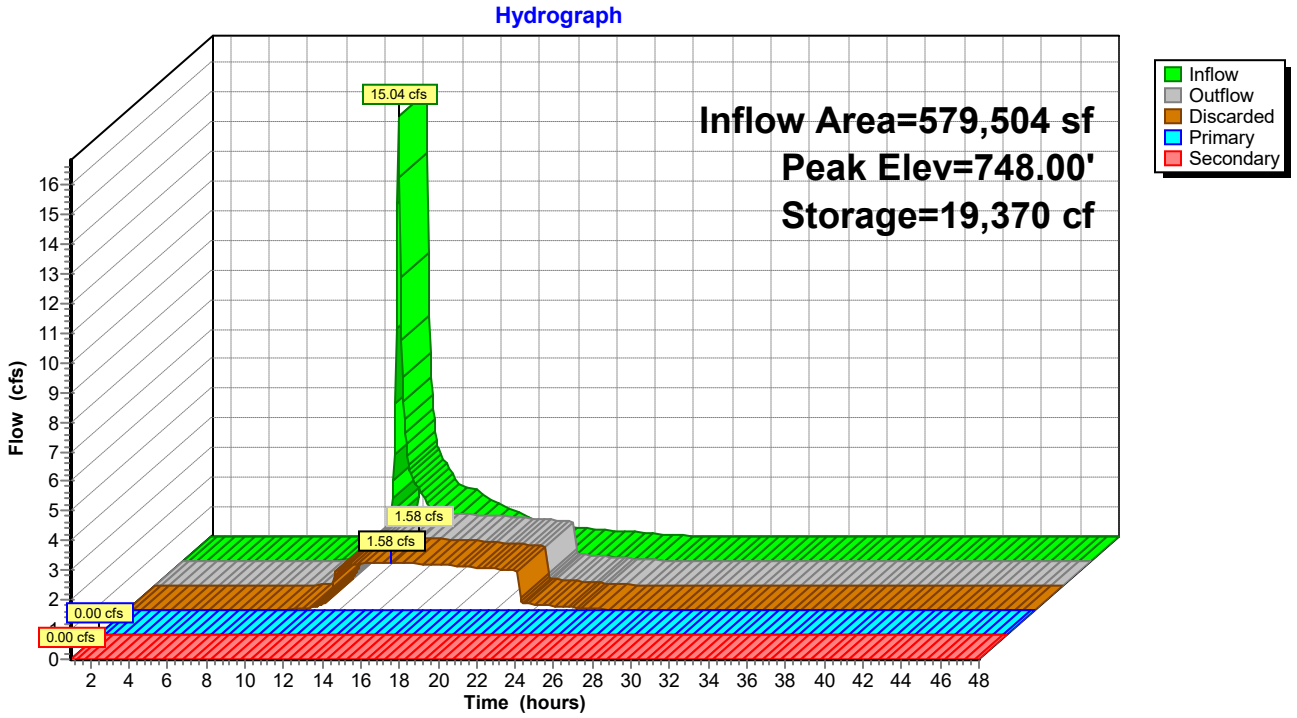
Device	Routing	Invert	Outlet Devices
#1	Primary	750.50'	**15.0" Round Culvert** L= 373.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 750.50' / 747.00' S= 0.0094 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf
#2	Device 1	752.91'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	752.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#4	Discarded	747.00'	**3.180 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 720.00' Phase-In= 0.01'

Discarded OutFlow Max=1.58 cfs @ 14.68 hrs HW=748.00' (Free Discharge)
└**4=Exfiltration** (Controls 1.58 cfs)

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=747.00' TW=750.50' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=747.00' TW=747.00' (Dynamic Tailwater)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 58P: Dry Pond 1



Summary for Pond 60P: Infiltration Basin #1

Inflow Area = 294,617 sf, 23.08% Impervious, Inflow Depth = 0.85" for 1-Year event
Inflow = 7.20 cfs @ 12.19 hrs, Volume= 20,872 cf
Outflow = 1.53 cfs @ 12.68 hrs, Volume= 20,872 cf, Atten= 79%, Lag= 29.5 min
Discarded = 1.53 cfs @ 12.68 hrs, Volume= 20,872 cf
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 95P : Dry Pond 3
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Reach 136R : SC West Ditch

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 740.99' @ 12.68 hrs Surf.Area= 13,282 sf Storage= 6,351 cf

Plug-Flow detention time= 31.5 min calculated for 20,850 cf (100% of inflow)
Center-of-Mass det. time= 31.5 min (850.1 - 818.6)

Volume	Invert	Avail.Storage	Storage Description
#1	740.50'	73,217 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
740.50	12,516	0	0
741.00	13,294	6,453	6,453
742.00	14,915	14,105	20,557
743.00	16,625	15,770	36,327
744.00	18,423	17,524	53,851
745.00	20,309	19,366	73,217

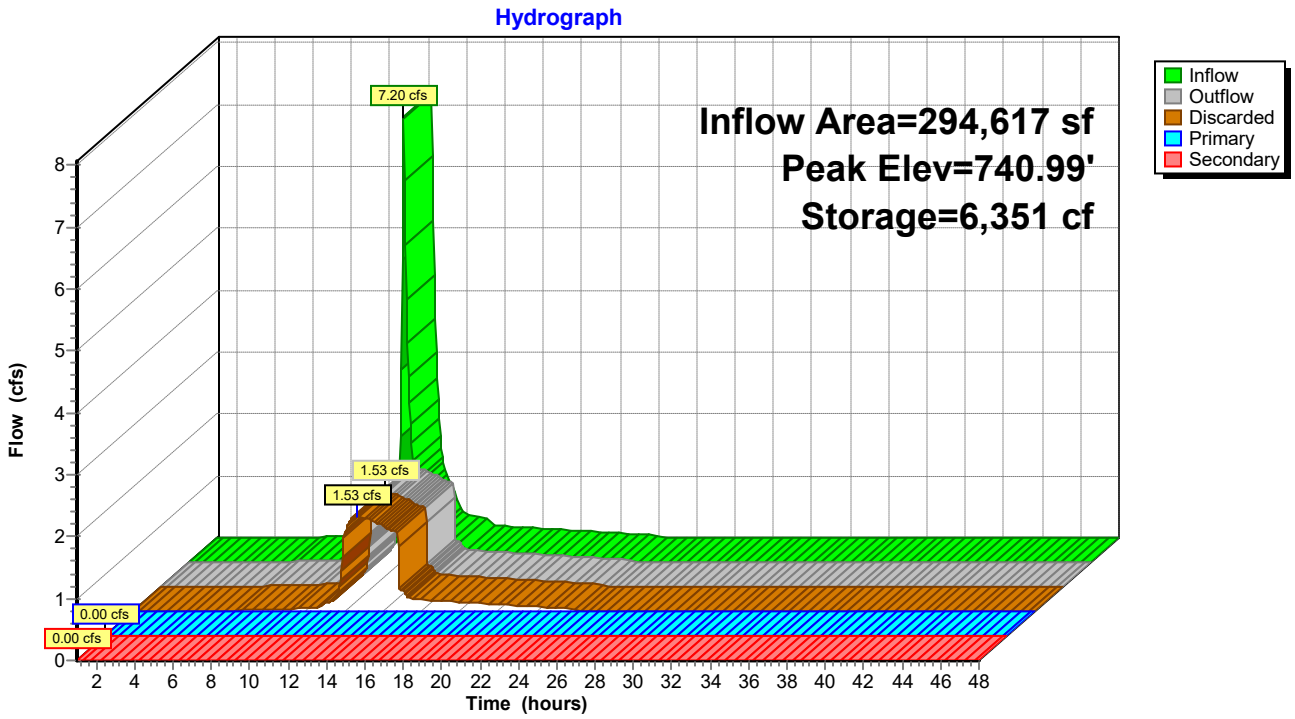
Device	Routing	Invert	Outlet Devices
#1	Primary	742.00'	**12.0" Round Culvert** L= 205.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 742.00' / 741.00' S= 0.0049 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	744.75'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#3	Discarded	740.50'	**4.320 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 737.40' Phase-In= 0.01'

Discarded OutFlow Max=1.53 cfs @ 12.68 hrs HW=740.99' (Free Discharge)
3=Exfiltration (Controls 1.53 cfs)

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=740.50' TW=739.00' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=740.50' TW=743.75' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 60P: Infiltration Basin #1



Summary for Pond 95P: Dry Pond 3

Inflow Area = 432,925 sf, 29.66% Impervious, Inflow Depth = 0.35" for 1-Year event
Inflow = 5.34 cfs @ 12.17 hrs, Volume= 12,648 cf
Outflow = 3.56 cfs @ 12.27 hrs, Volume= 12,648 cf, Atten= 33%, Lag= 6.0 min
Discarded = 3.56 cfs @ 12.27 hrs, Volume= 12,648 cf
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 154P : Southeast Basin
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 154P : Southeast Basin

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 739.08' @ 12.27 hrs Surf.Area= 0.223 ac Storage= 0.018 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 1.1 min (819.0 - 817.9)

Volume	Invert	Avail.Storage	Storage Description
#1	739.00'	1.214 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
739.00	0.220	0.000	0.000
740.00	0.260	0.240	0.240
741.00	0.302	0.281	0.521
742.00	0.346	0.324	0.845
743.00	0.392	0.369	1.214

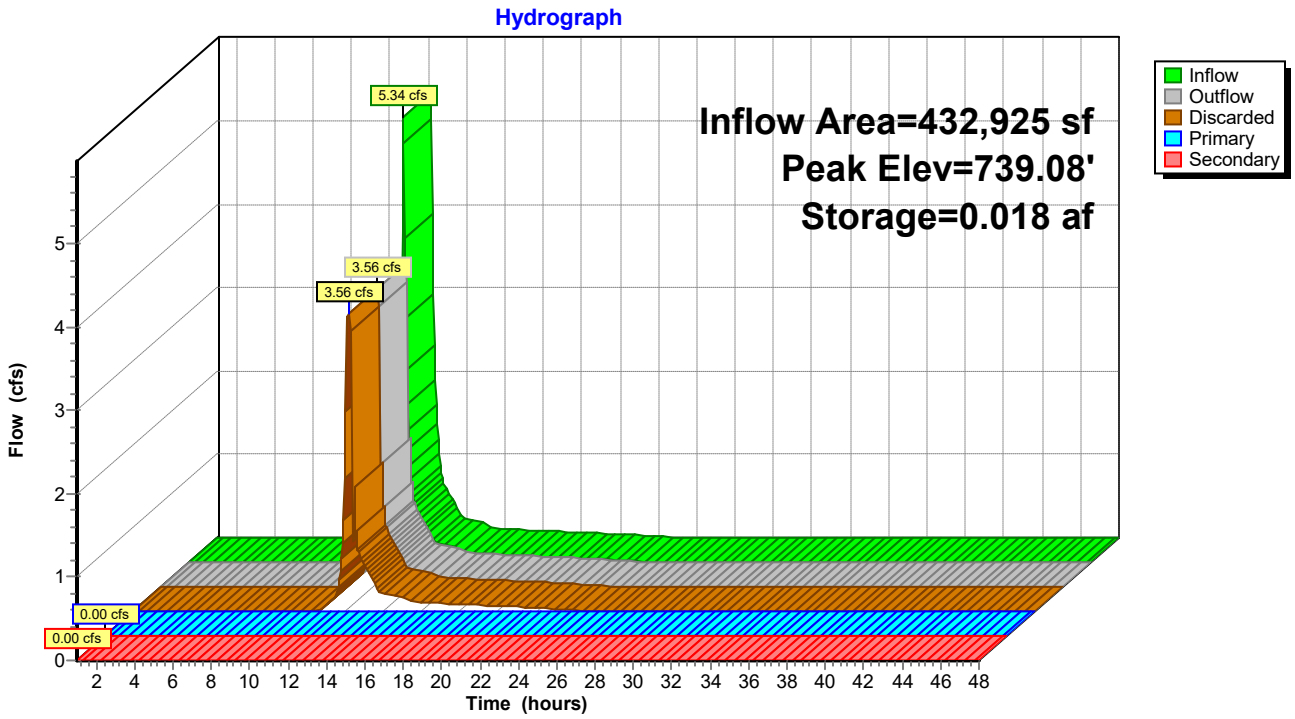
Device	Routing	Invert	Outlet Devices
#1	Primary	741.00'	**6.0" Round Culvert** L= 84.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 741.00' / 738.00' S= 0.0357 '/' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#2	Secondary	742.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Discarded	739.00'	**15.720 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 726.55' Phase-In= 0.01'

Discarded OutFlow Max=3.56 cfs @ 12.27 hrs HW=739.08' (Free Discharge)
3=Exfiltration (Controls 3.56 cfs)

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=739.00' TW=730.00' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=739.00' TW=730.00' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 95P: Dry Pond 3



Summary for Pond 101R: Reach Pipe DP1 TO MH

3/2/21
Reach Pipe 4

[57] Hint: Peaked at 750.50' (Flood elevation advised)

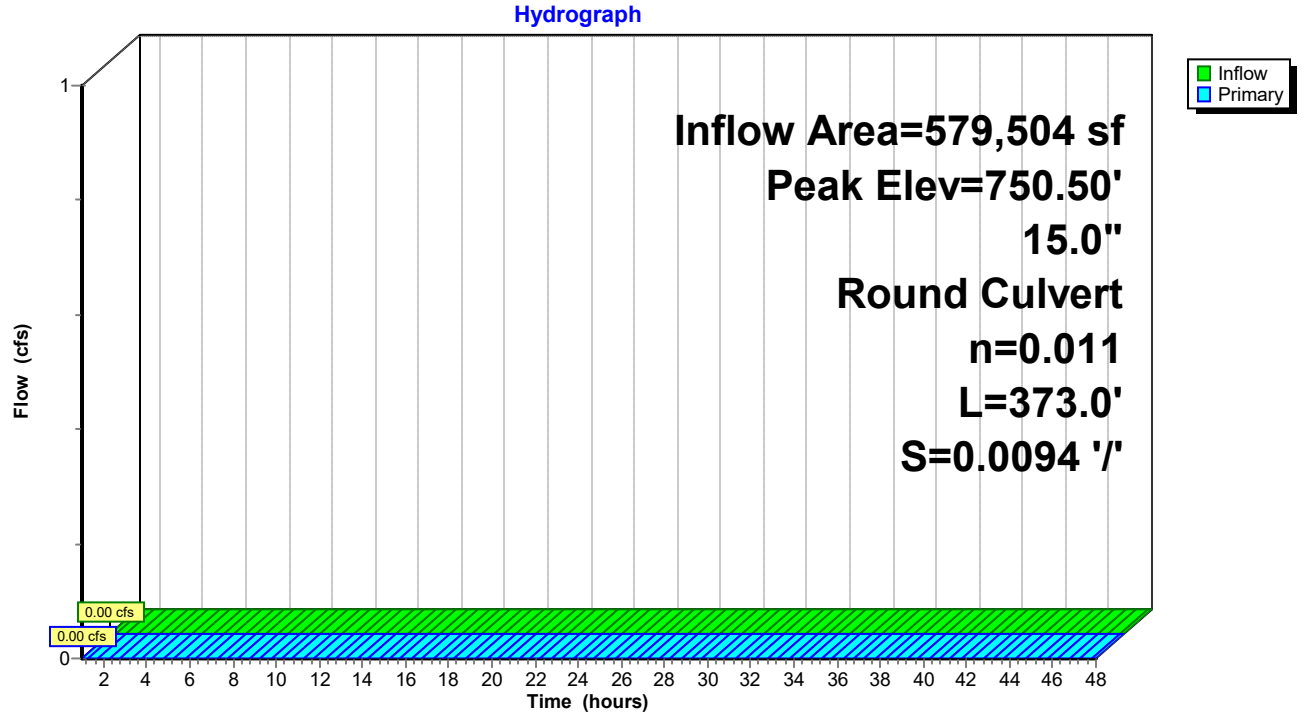
Inflow Area = 579,504 sf, 46.53% Impervious, Inflow Depth = 0.00" for 1-Year event
Inflow = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 1.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 41P : Reach Pipe

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 750.50' @ 1.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	750.50'	**15.0" Round Culvert** L= 373.0' Ke= 0.500 Inlet / Outlet Invert= 750.50' / 747.00' S= 0.0094 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=750.50' TW=738.00' (Dynamic Tailwater)
↳**1=Culvert** (Controls 0.00 cfs)

Pond 101R: Reach Pipe DP1 TO MH



Summary for Pond 110R: Western Pipe Run

3/3/21
Pipe that cuts through western exterior courtyard to collect ditch north of west building and northern portion of west building roof and conveys to DP1

[57] Hint: Peaked at 746.12' (Flood elevation advised)

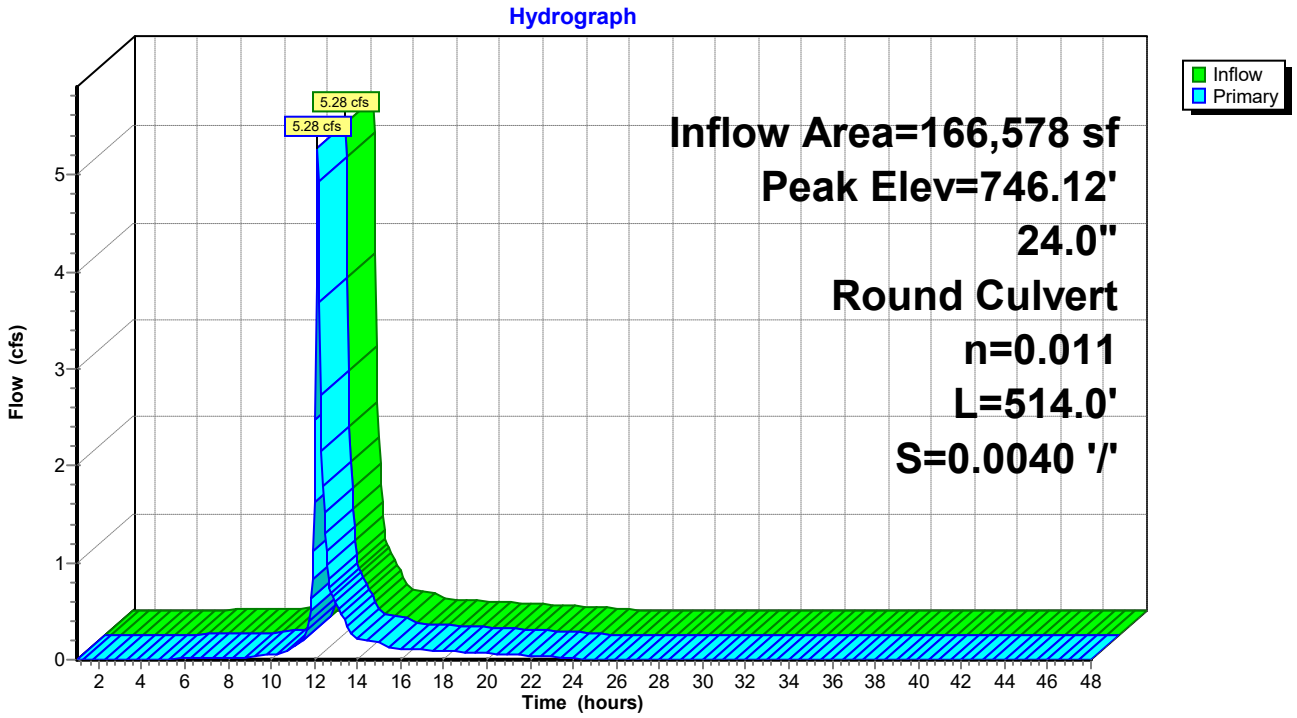
Inflow Area = 166,578 sf, 27.50% Impervious, Inflow Depth = 0.95" for 1-Year event
Inflow = 5.28 cfs @ 12.17 hrs, Volume= 13,159 cf
Outflow = 5.28 cfs @ 12.17 hrs, Volume= 13,159 cf, Atten= 0%, Lag= 0.0 min
Primary = 5.28 cfs @ 12.17 hrs, Volume= 13,159 cf
Routed to Pond 60P : Infiltration Basin #1

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 746.12' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	745.06'	**24.0" Round Culvert** L= 514.0' Ke= 0.500 Inlet / Outlet Invert= 745.06' / 743.00' S= 0.0040 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf

Primary OutFlow Max=5.10 cfs @ 12.17 hrs HW=746.10' TW=740.67' (Dynamic Tailwater)
1=Culvert (Barrel Controls 5.10 cfs @ 4.52 fps)

Pond 110R: Western Pipe Run



Summary for Pond 127P: B3 OVERSIZED PIPE RUN (24" W/15" ORIFICE)

3/3/21
Pipe that cuts through western exterior courtyard to collect ditch north of west building and northern portion of west building roof and conveys to DP1

Inflow Area = 40,670 sf, 35.10% Impervious, Inflow Depth = 0.99" for 1-Year event
Inflow = 1.62 cfs @ 12.14 hrs, Volume= 3,356 cf
Outflow = 1.59 cfs @ 12.15 hrs, Volume= 3,356 cf, Atten= 2%, Lag= 0.8 min
Primary = 1.59 cfs @ 12.15 hrs, Volume= 3,356 cf
Routed to Link 128L : FROM OVERSIZED PIPE RUN

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 751.73' @ 12.15 hrs Surf.Area= 226 sf Storage= 75 cf

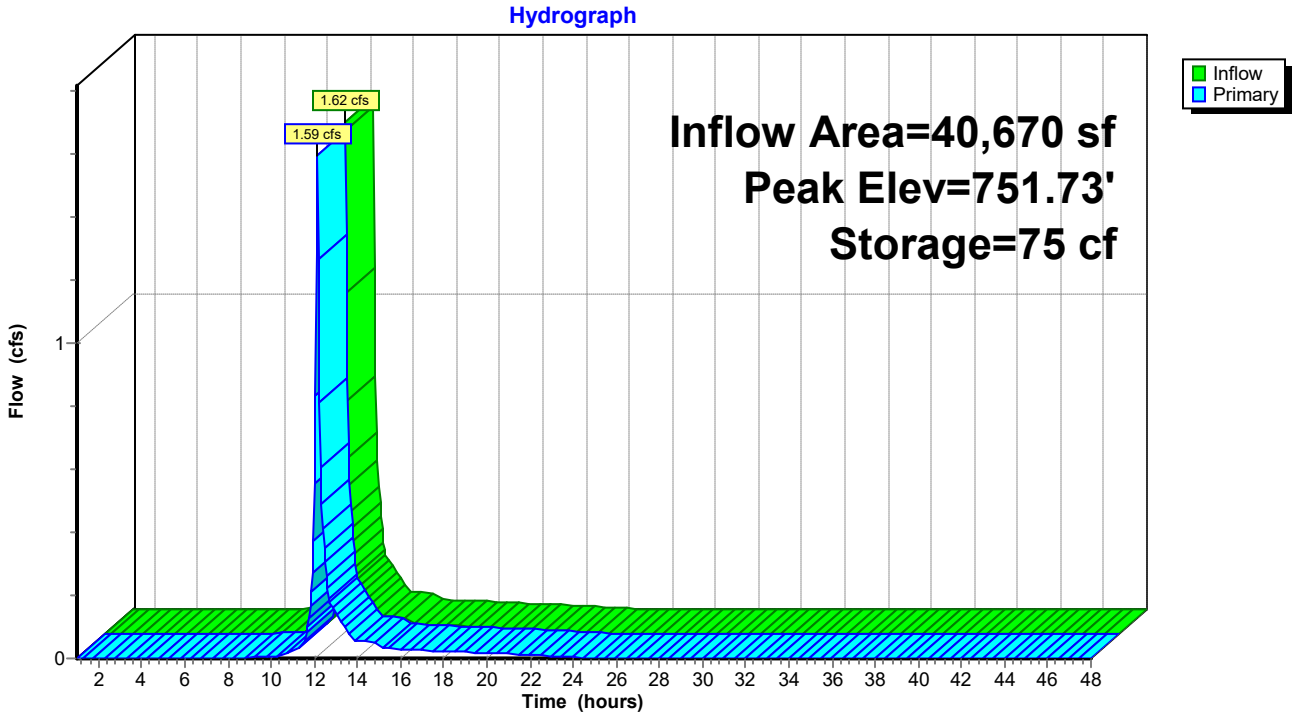
Plug-Flow detention time= 0.6 min calculated for 3,353 cf (100% of inflow)
Center-of-Mass det. time= 0.6 min (812.3 - 811.8)

Volume	Invert	Avail.Storage	Storage Description
#1	751.12'	424 cf	**24.0" Round Pipe Storage** L= 135.0' S= 0.0022 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	751.12'	**15.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.58 cfs @ 12.15 hrs HW=751.73' TW=0.00' (Dynamic Tailwater)
↑—**1=Orifice/Grate** (Orifice Controls 1.58 cfs @ 2.66 fps)

Pond 127P: B3 OVERSIZED PIPE RUN (24" W/15" ORIFICE)



Summary for Pond 129P: STORMTECH FROM ADS

Inflow Area = 194,230 sf, 70.09% Impervious, Inflow Depth = 1.58" for 1-Year event
Inflow = 10.77 cfs @ 12.13 hrs, Volume= 25,610 cf
Outflow = 1.28 cfs @ 12.62 hrs, Volume= 25,463 cf, Atten= 88%, Lag= 29.3 min
Primary = 1.28 cfs @ 12.62 hrs, Volume= 25,463 cf
Routed to Pond 58P : Dry Pond 1

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 752.41' @ 12.62 hrs Surf.Area= 19,777 sf Storage= 13,012 cf

Plug-Flow detention time= 141.5 min calculated for 25,436 cf (99% of inflow)
Center-of-Mass det. time= 139.2 min (918.4 - 779.2)

Volume	Invert	Avail.Storage	Storage Description
#1B	751.25'	27,133 cf	**115.92'W x 170.61'L x 5.50'H Field B** 108,771 cf Overall - 40,939 cf Embedded = 67,832 cf x 40.0% Voids
#2B	752.00'	40,939 cf	**ADS_StormTech MC-3500 d +Cap** x 368 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 368 Chambers in 16 Rows Cap Storage= 14.9 cf x 2 x 16 rows = 476.8 cf
		68,072 cf	Total Available Storage

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	751.25'	**10.0" Round Culvert X 2.00** L= 200.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 751.25' / 750.65' S= 0.0030 '/' Cc= 0.900 n= 0.011, Flow Area= 0.55 sf
#2	Device 1	751.25'	**5.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.28 cfs @ 12.62 hrs HW=752.41' TW=747.80' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 1.28 cfs of 3.05 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 1.28 cfs @ 4.70 fps)

Pond 129P: STORMTECH FROM ADS - Chamber Wizard Field B

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= 14.9 cf x 2 x 16 rows = 476.8 cf

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

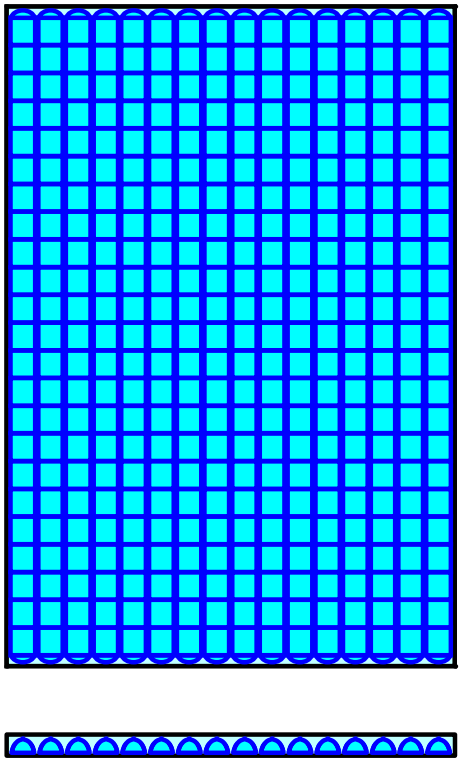
23 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 168.61' Row Length +12.0" End Stone x 2 = 170.61' Base Length
16 Rows x 77.0" Wide + 9.0" Spacing x 15 + 12.0" Side Stone x 2 = 115.92' Base Width
9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

368 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 16 Rows = 40,939.1 cf Chamber Storage

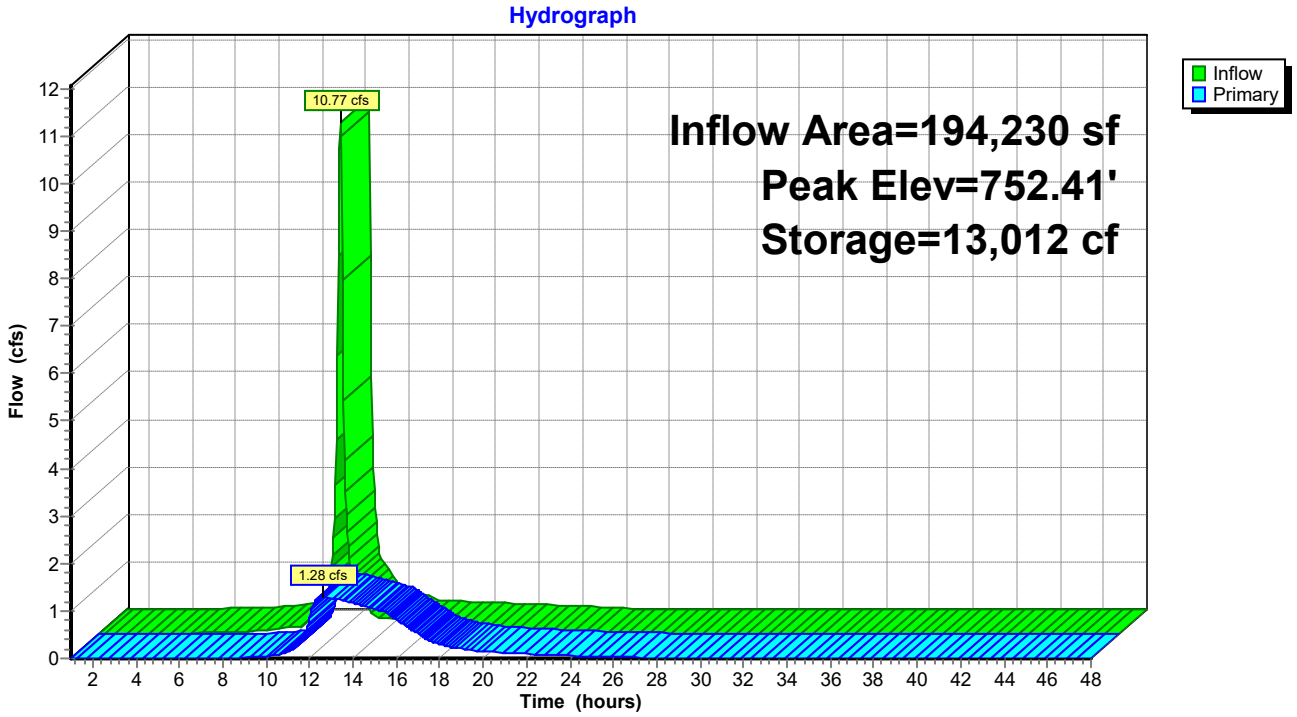
108,771.0 cf Field - 40,939.1 cf Chambers = 67,831.9 cf Stone x 40.0% Voids = 27,132.7 cf Stone Storage

Chamber Storage + Stone Storage = 68,071.9 cf = 1.563 af
Overall Storage Efficiency = 62.6%
Overall System Size = 170.61' x 115.92' x 5.50'

368 Chambers
4,028.6 cy Field
2,512.3 cy Stone



Pond 129P: STORMTECH FROM ADS



Summary for Pond 133P: WEST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

3/3/21
Pipe that cuts through western exterior courtyard to collect ditch north of west building and northern portion of west building roof and conveys to DP1

Inflow Area = 48,160 sf, 58.41% Impervious, Inflow Depth = 1.33" for 1-Year event
Inflow = 2.56 cfs @ 12.13 hrs, Volume= 5,319 cf
Outflow = 2.51 cfs @ 12.15 hrs, Volume= 5,319 cf, Atten= 2%, Lag= 0.9 min
Primary = 2.51 cfs @ 12.15 hrs, Volume= 5,319 cf
Routed to Link 134L : TO UG

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 755.70' @ 12.15 hrs Surf.Area= 290 sf Storage= 127 cf

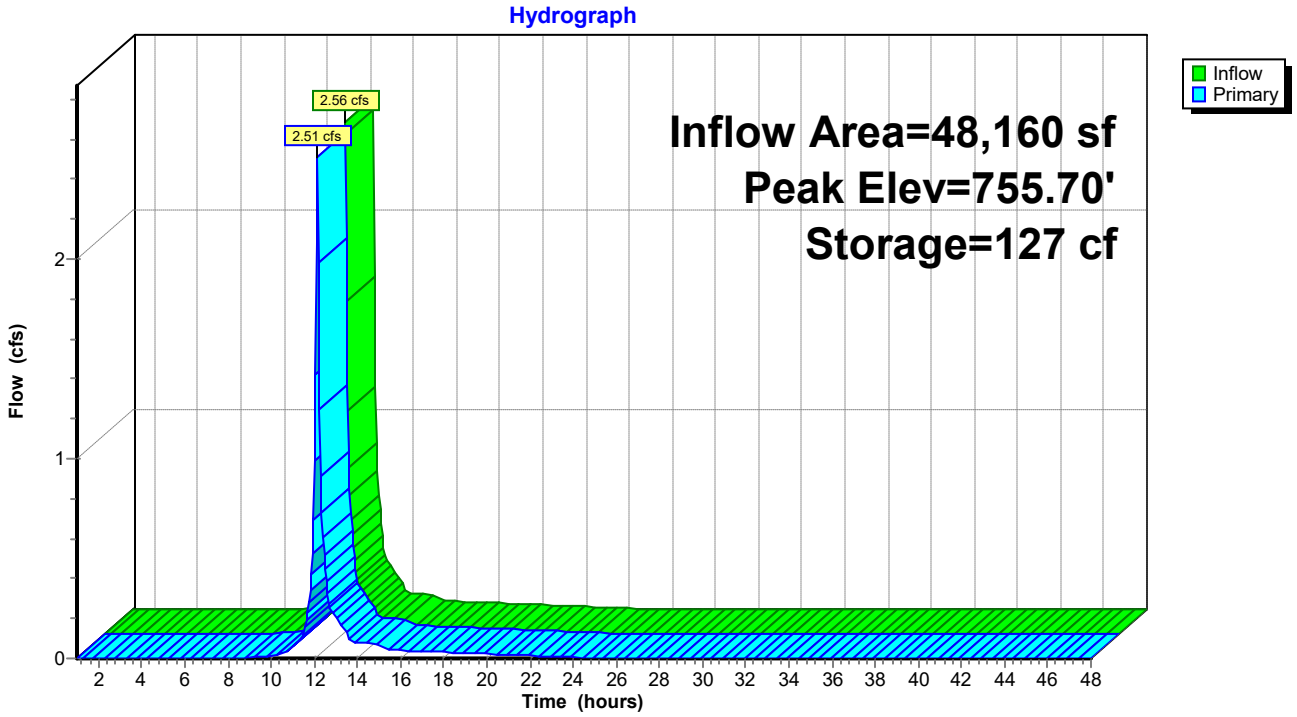
Plug-Flow detention time= 0.6 min calculated for 5,313 cf (100% of inflow)
Center-of-Mass det. time= 0.6 min (798.8 - 798.2)

Volume	Invert	Avail.Storage	Storage Description
#1	754.90'	503 cf	**24.0" Round Pipe Storage** L= 160.0' S= 0.0025 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	754.90'	**15.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.49 cfs @ 12.15 hrs HW=755.69' TW=0.00' (Dynamic Tailwater)
1=Orifice/Grate (Orifice Controls 2.49 cfs @ 3.03 fps)

Pond 133P: WEST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)



Summary for Pond 154P: Southeast Basin

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=17)

Inflow Area = 1,278,750 sf, 34.76% Impervious, Inflow Depth = 0.03" for 1-Year event
Inflow = 1.36 cfs @ 12.15 hrs, Volume= 3,121 cf
Outflow = 0.10 cfs @ 13.50 hrs, Volume= 3,124 cf, Atten= 93%, Lag= 81.0 min
Discarded = 0.10 cfs @ 13.50 hrs, Volume= 3,124 cf

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 730.40' @ 13.50 hrs Surf.Area= 4,884 sf Storage= 1,526 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 166.9 min (996.9 - 830.0)

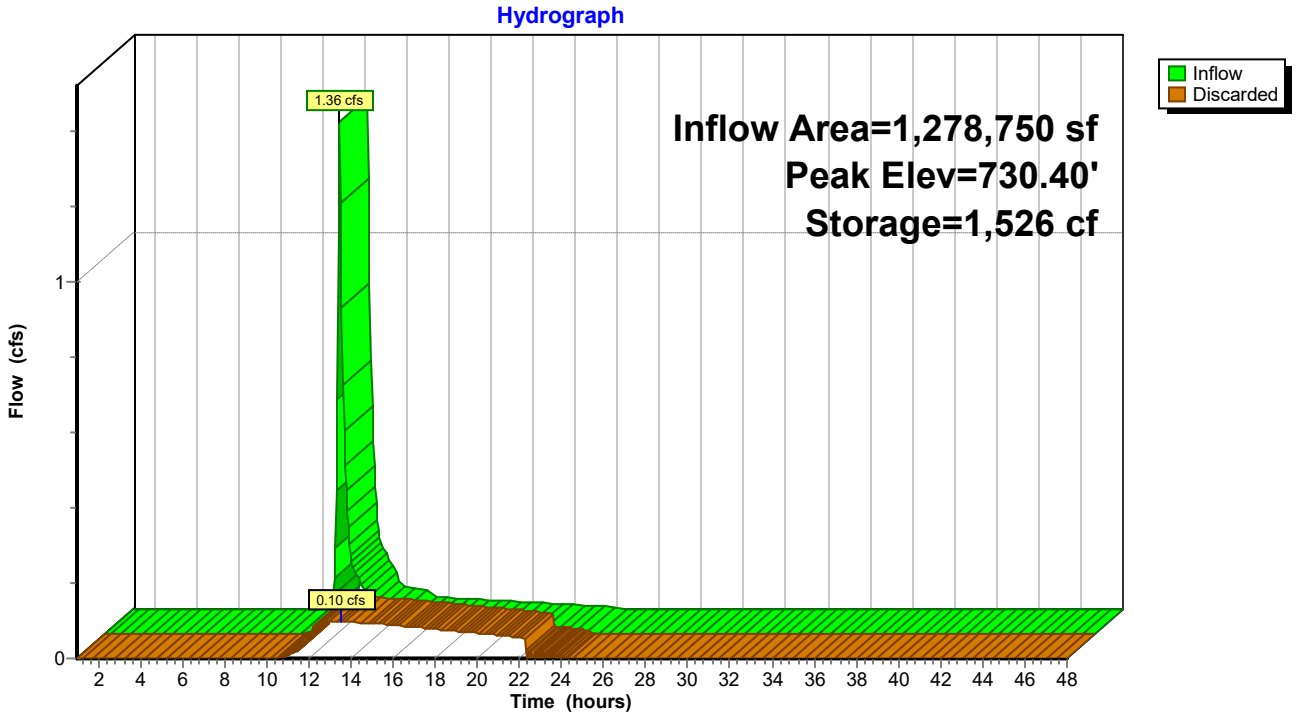
Volume	Invert	Avail.Storage	Storage Description
#1	730.00'	273,743 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
730.00	2,768	0	0
731.00	8,073	5,421	5,421
732.00	12,399	10,236	15,657
733.00	17,056	14,728	30,384
734.00	21,328	19,192	49,576
735.00	25,607	23,468	73,044
736.00	29,845	27,726	100,770
737.00	35,145	32,495	133,265
738.00	42,680	38,913	172,177
739.00	51,064	46,872	219,049
740.00	58,323	54,694	273,743

Device	Routing	Invert	Outlet Devices
#1	Discarded	730.00'	**0.840 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 720.00'

Discarded OutFlow Max=0.10 cfs @ 13.50 hrs HW=730.40' (Free Discharge)
1=Exfiltration (Controls 0.10 cfs)

Pond 154P: Southeast Basin



Summary for Pond 174P: EAST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

3/3/21
Pipe that cuts through western exterior courtyard to collect ditch north of west building and northern portion of west building roof and conveys to DP1

Inflow Area = 20,605 sf, 59.42% Impervious, Inflow Depth = 1.36" for 1-Year event
Inflow = 1.12 cfs @ 12.13 hrs, Volume= 2,343 cf
Outflow = 1.10 cfs @ 12.15 hrs, Volume= 2,343 cf, Atten= 2%, Lag= 0.9 min
Primary = 1.10 cfs @ 12.15 hrs, Volume= 2,343 cf
Routed to Link 175L : TO UG

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 755.40' @ 12.15 hrs Surf.Area= 222 sf Storage= 49 cf

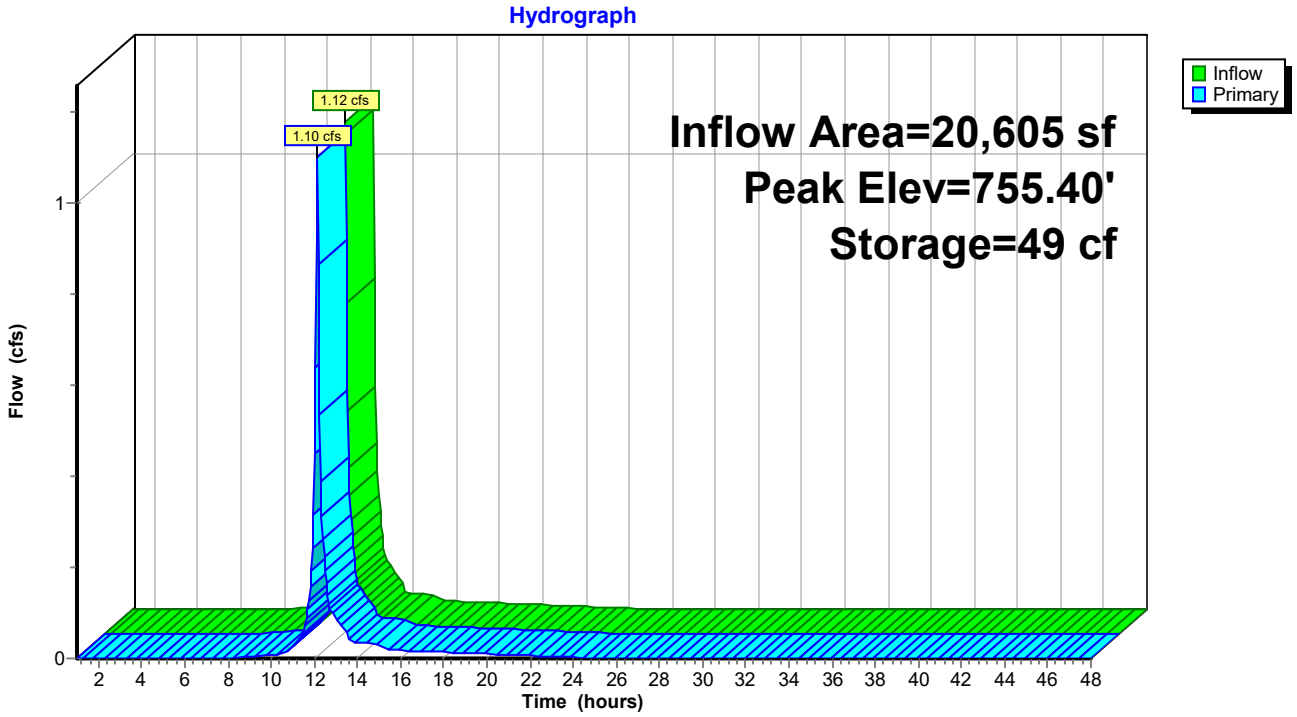
Plug-Flow detention time= 0.5 min calculated for 2,340 cf (100% of inflow)
Center-of-Mass det. time= 0.5 min (796.6 - 796.1)

Volume	Invert	Avail.Storage	Storage Description
#1	754.90'	503 cf	**24.0" Round Pipe Storage** L= 160.0' S= 0.0025 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	754.90'	**15.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.09 cfs @ 12.15 hrs HW=755.40' TW=0.00' (Dynamic Tailwater)
↑—**1=Orifice/Grate** (Orifice Controls 1.09 cfs @ 2.40 fps)

Pond 174P: EAST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)



Summary for Pond 183P: 24" HDPE PIPE

[57] Hint: Peaked at 749.57' (Flood elevation advised)

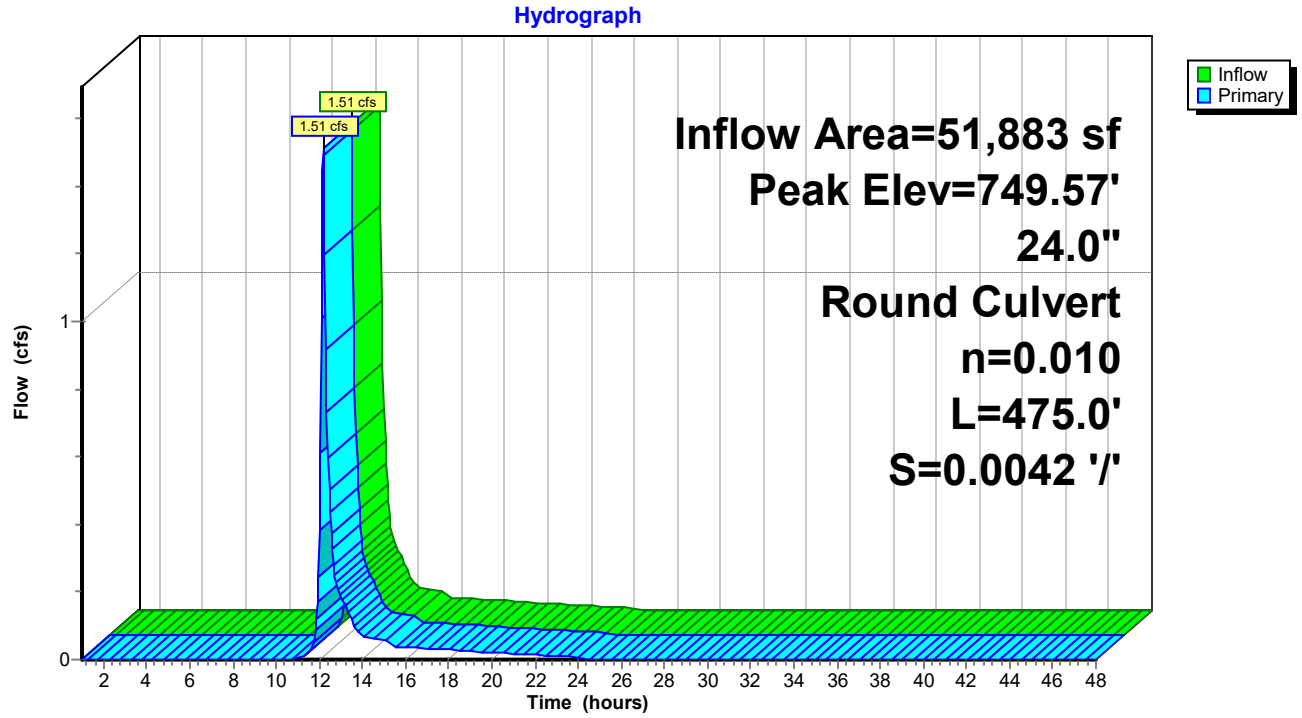
Inflow Area = 51,883 sf, 28.33% Impervious, Inflow Depth = 0.86" for 1-Year event
Inflow = 1.51 cfs @ 12.18 hrs, Volume= 3,708 cf
Outflow = 1.51 cfs @ 12.18 hrs, Volume= 3,708 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.51 cfs @ 12.18 hrs, Volume= 3,708 cf
Routed to Pond 57P : Dry Pond 2

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 749.57' @ 12.18 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	749.00'	**24.0" Round Culvert** L= 475.0' Ke= 0.900 Inlet / Outlet Invert= 749.00' / 747.00' S= 0.0042 '/' Cc= 0.900 n= 0.010, Flow Area= 3.14 sf

Primary OutFlow Max=1.48 cfs @ 12.18 hrs HW=749.57' TW=747.13' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.48 cfs @ 2.02 fps)

Pond 183P: 24" HDPE PIPE

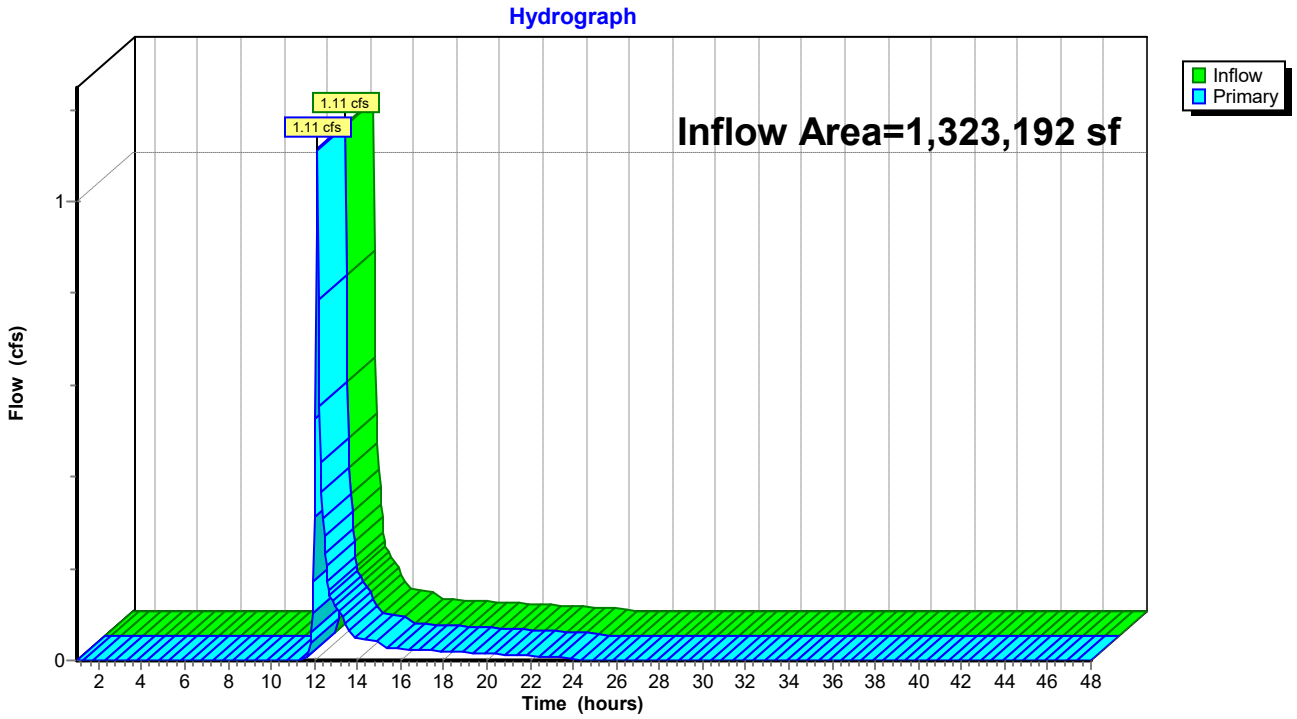


Summary for Link 48L: TOTAL OUTFALL

Inflow Area = 1,323,192 sf, 33.86% Impervious, Inflow Depth = 0.02" for 1-Year event
Inflow = 1.11 cfs @ 12.14 hrs, Volume= 2,348 cf
Primary = 1.11 cfs @ 12.14 hrs, Volume= 2,348 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 48L: TOTAL OUTFALL

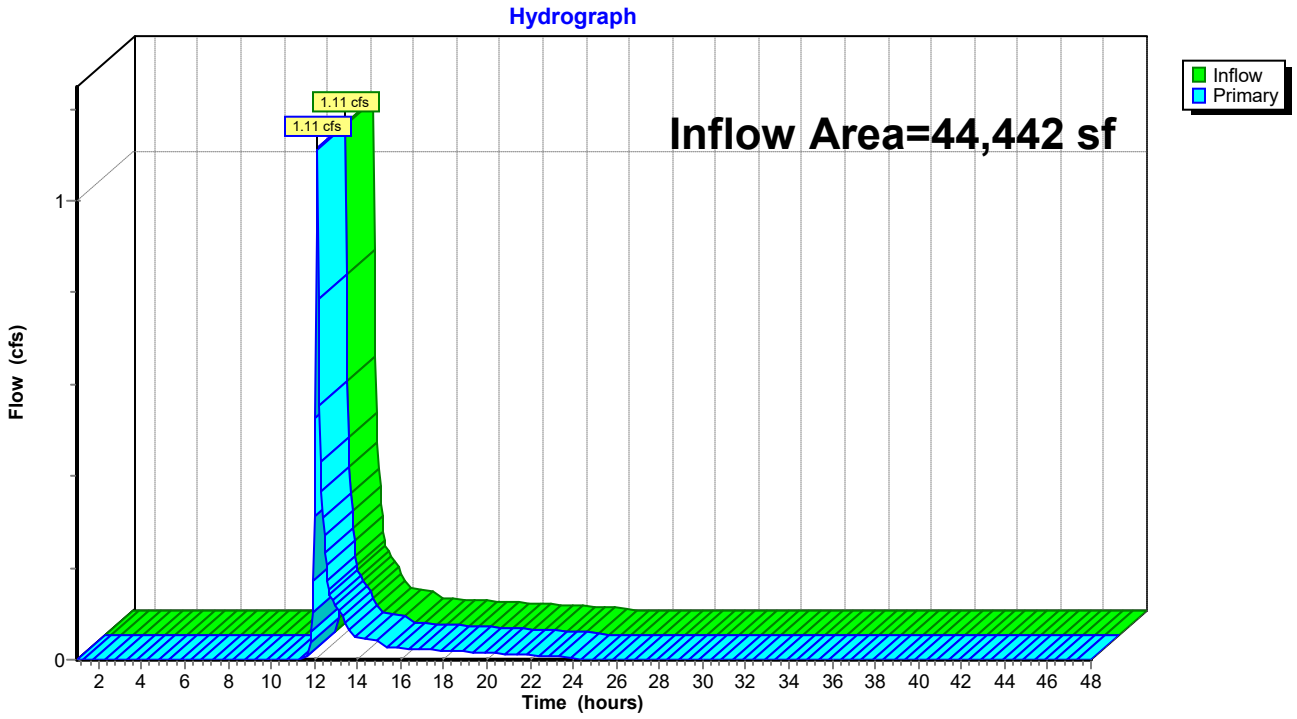


Summary for Link 66L: Total Offsite

Inflow Area = 44,442 sf, 7.89% Impervious, Inflow Depth = 0.63" for 1-Year event
Inflow = 1.11 cfs @ 12.14 hrs, Volume= 2,348 cf
Primary = 1.11 cfs @ 12.14 hrs, Volume= 2,348 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 48L : TOTAL OUTFALL

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 66L: Total Offsite

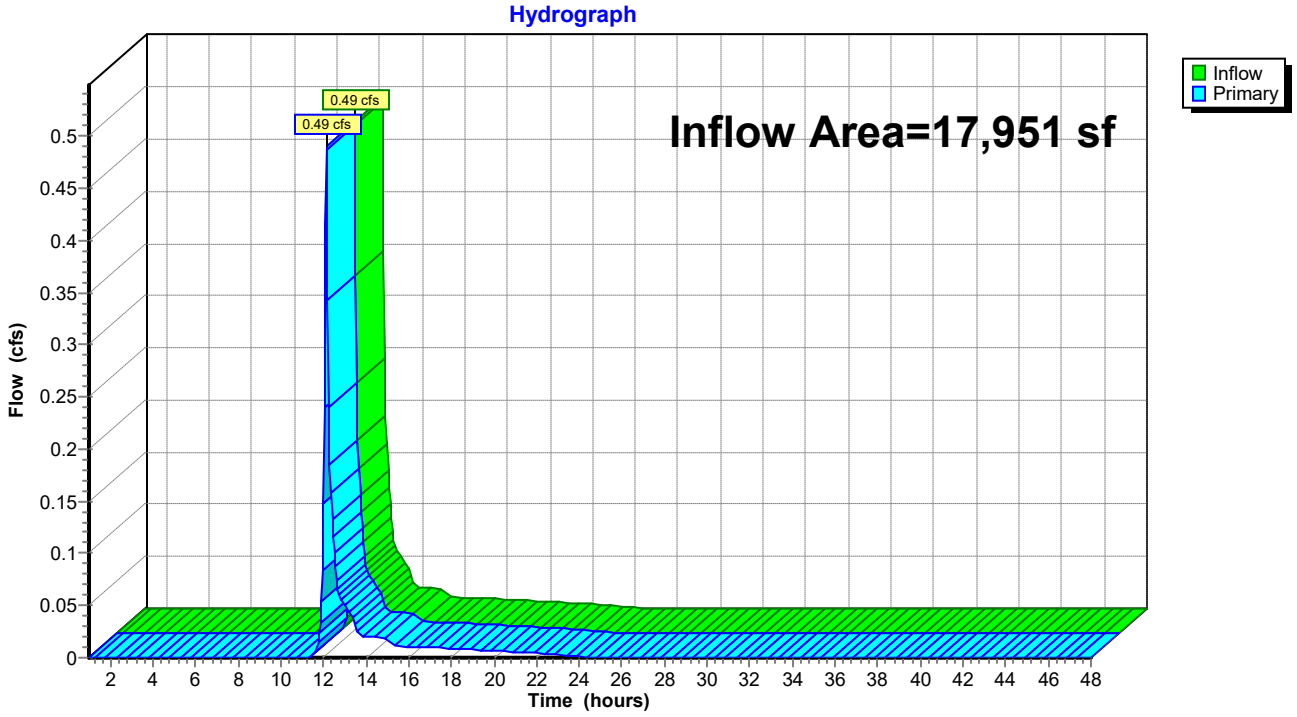


Summary for Link 115L: EX. Cul-de-sac On Green Meadow Place

Inflow Area = 17,951 sf, 11.95% Impervious, Inflow Depth = 0.68" for 1-Year event
Inflow = 0.49 cfs @ 12.14 hrs, Volume= 1,022 cf
Primary = 0.49 cfs @ 12.14 hrs, Volume= 1,022 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 66L : Total Offsite

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 115L: EX. Cul-de-sac On Green Meadow Place

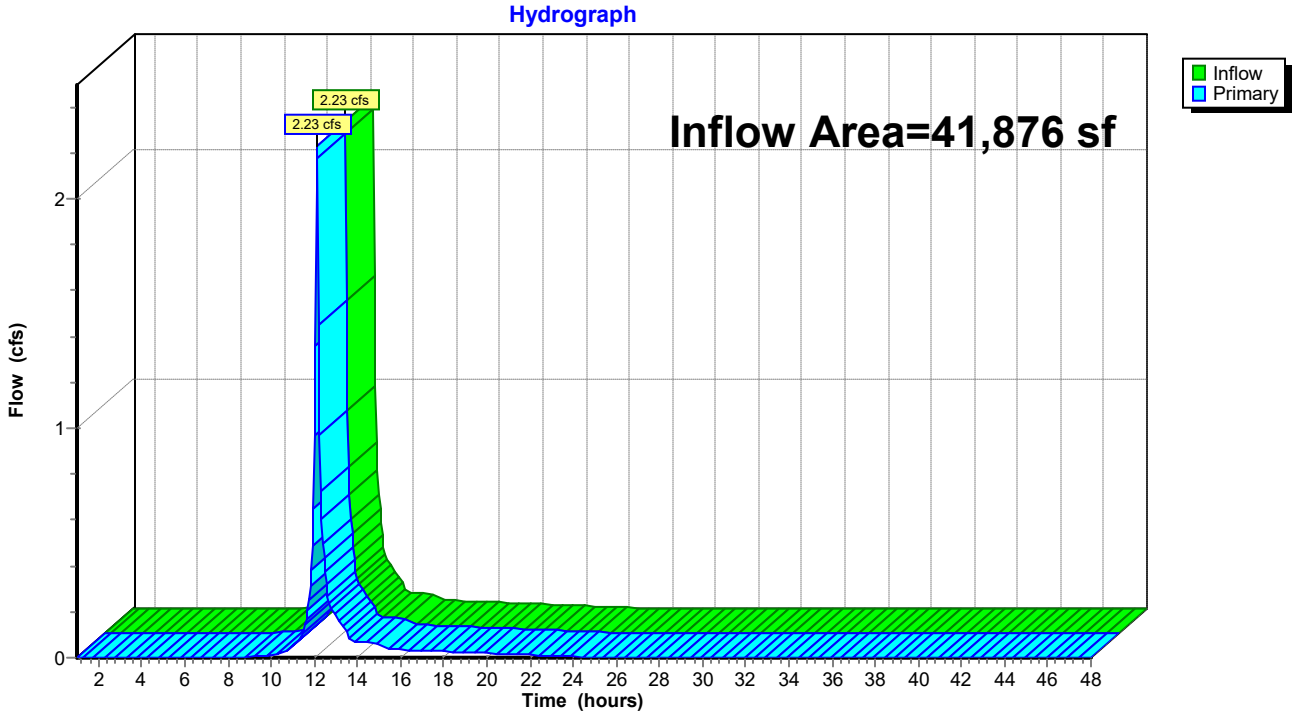


Summary for Link 124L: TO 12" PRIOR TO 24" (WEST)

Inflow Area = 41,876 sf, 58.23% Impervious, Inflow Depth = 1.32" for 1-Year event
Inflow = 2.23 cfs @ 12.13 hrs, Volume= 4,619 cf
Primary = 2.23 cfs @ 12.13 hrs, Volume= 4,619 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 133P : WEST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 124L: TO 12" PRIOR TO 24" (WEST)

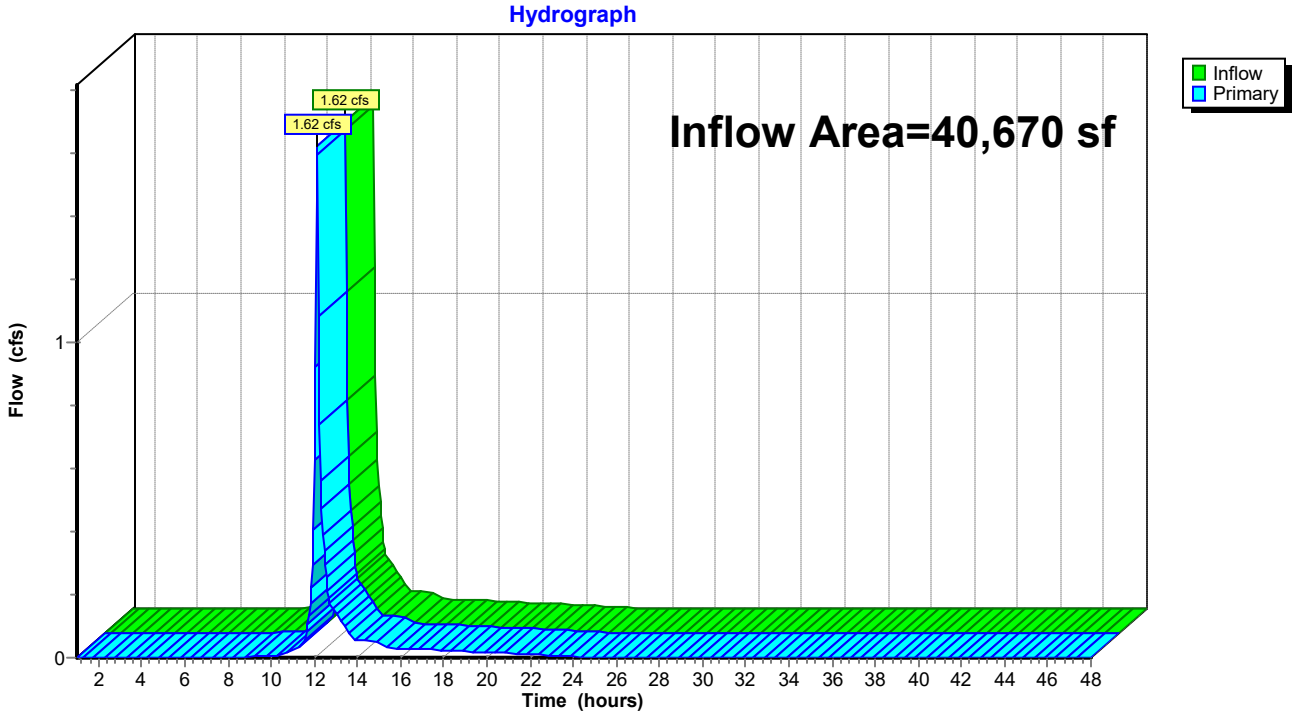


Summary for Link 126L: OVERSIZED PIPE RUN BY B3

Inflow Area = 40,670 sf, 35.10% Impervious, Inflow Depth = 0.99" for 1-Year event
Inflow = 1.62 cfs @ 12.14 hrs, Volume= 3,356 cf
Primary = 1.62 cfs @ 12.14 hrs, Volume= 3,356 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 127P : B3 OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 126L: OVERSIZED PIPE RUN BY B3

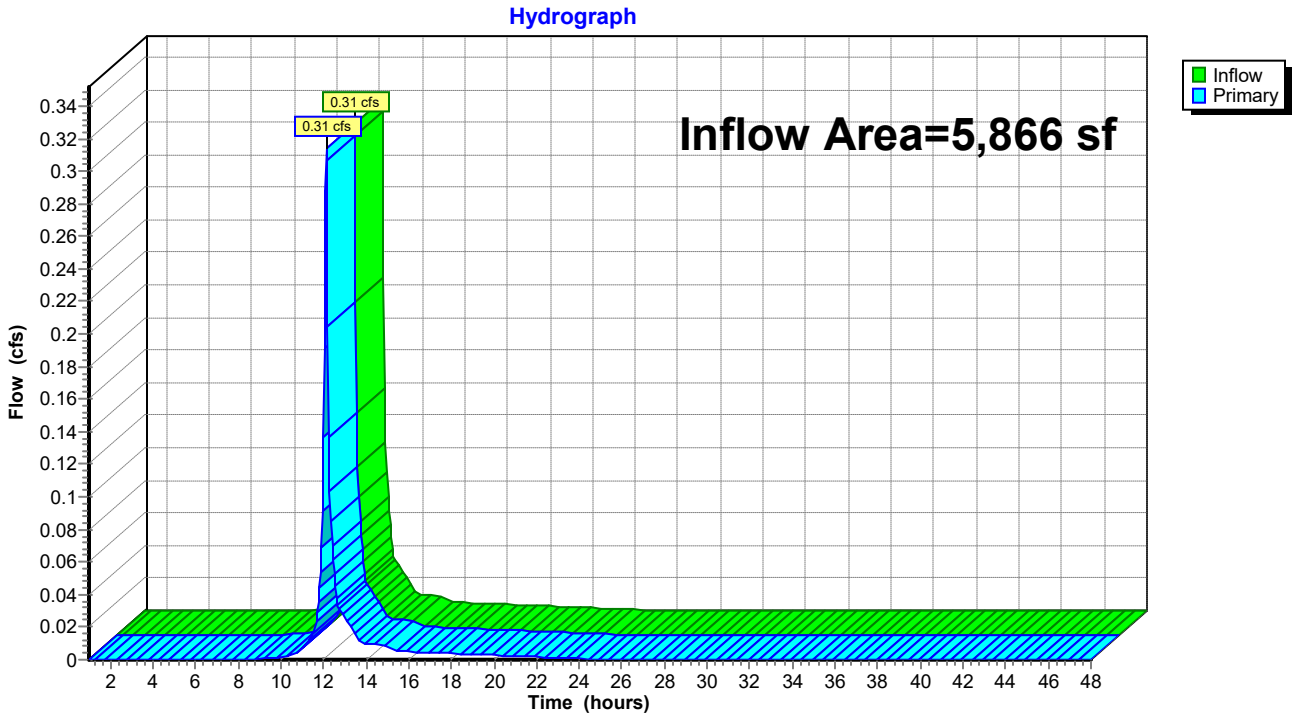


Summary for Link 127L: total

Inflow Area = 5,866 sf, 59.31% Impervious, Inflow Depth = 1.32" for 1-Year event
Inflow = 0.31 cfs @ 12.13 hrs, Volume= 647 cf
Primary = 0.31 cfs @ 12.13 hrs, Volume= 647 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 177L : SUM OF As TO UG

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 127L: total

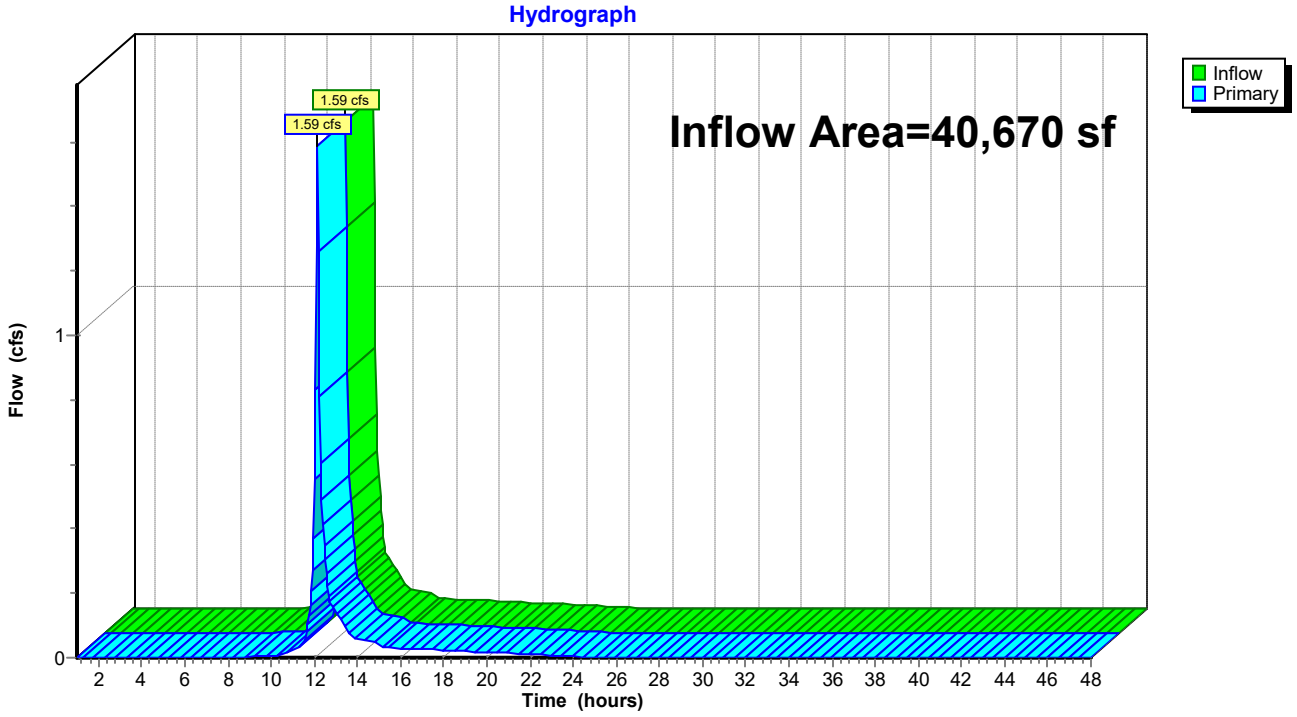


Summary for Link 128L: FROM OVERSIZED PIPE RUN

Inflow Area = 40,670 sf, 35.10% Impervious, Inflow Depth = 0.99" for 1-Year event
Inflow = 1.59 cfs @ 12.15 hrs, Volume= 3,356 cf
Primary = 1.59 cfs @ 12.15 hrs, Volume= 3,356 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 58P : Dry Pond 1

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 128L: FROM OVERSIZED PIPE RUN

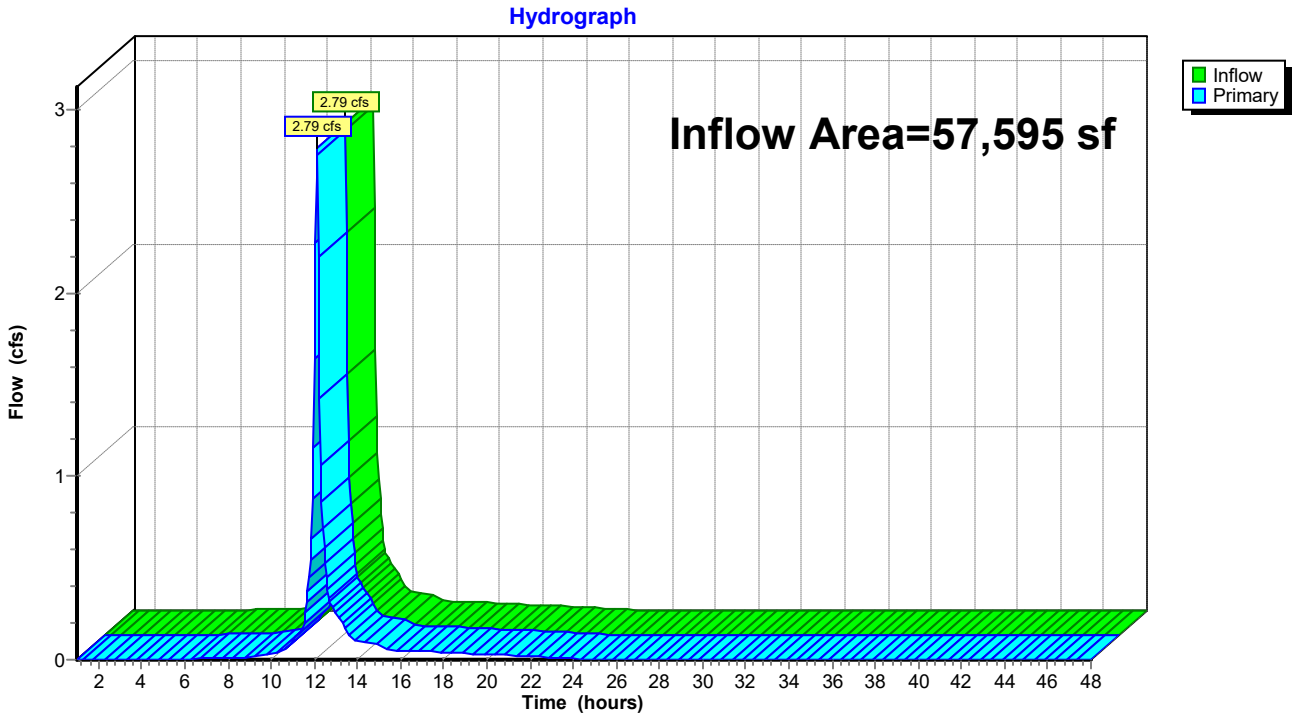


Summary for Link 134L: TO UG

Inflow Area = 57,595 sf, 65.23% Impervious, Inflow Depth = 1.46" for 1-Year event
Inflow = 2.79 cfs @ 12.13 hrs, Volume= 7,026 cf
Primary = 2.79 cfs @ 12.13 hrs, Volume= 7,026 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 178L : As

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 134L: TO UG

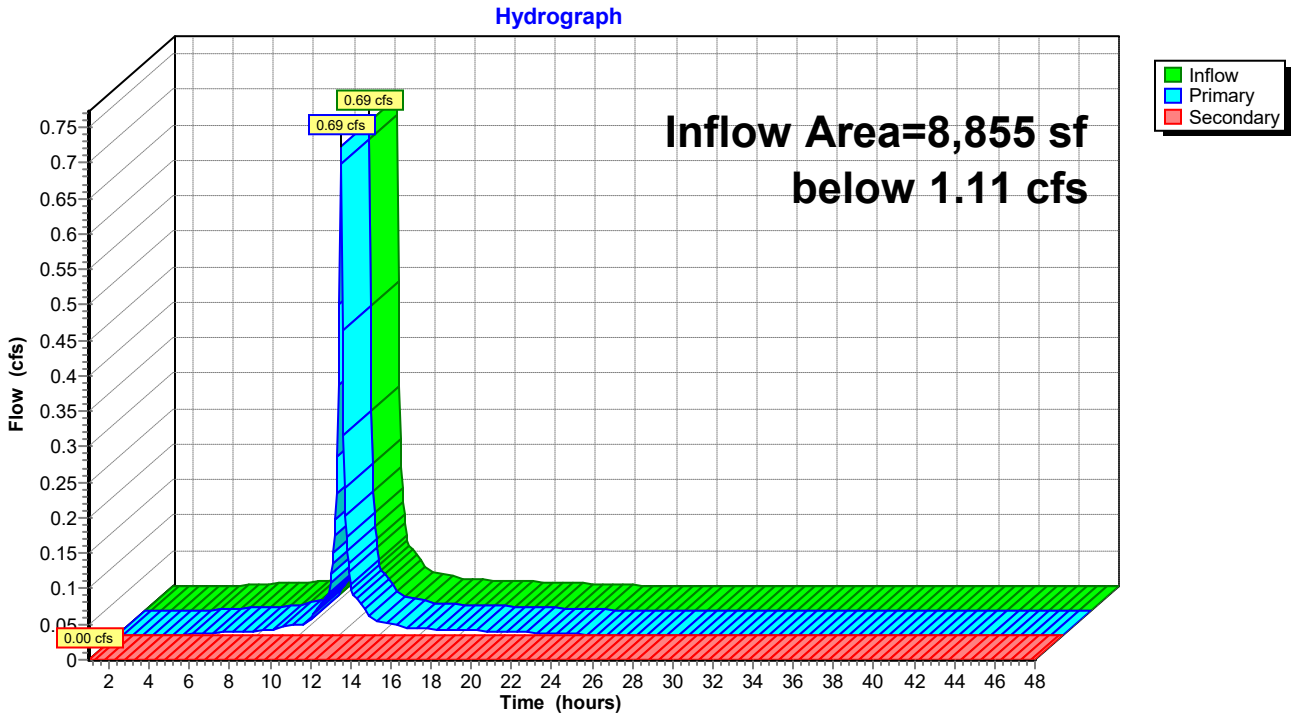


Summary for Link 171L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

Inflow Area = 8,855 sf,100.00% Impervious, Inflow Depth = 2.17" for 1-Year event
Inflow = 0.69 cfs @ 12.13 hrs, Volume= 1,602 cf
Primary = 0.69 cfs @ 12.13 hrs, Volume= 1,602 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 129P : STORMTECH FROM ADS
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Reach 99R : East Swale (SE End)

Primary outflow = Inflow below 1.11 cfs, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 171L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

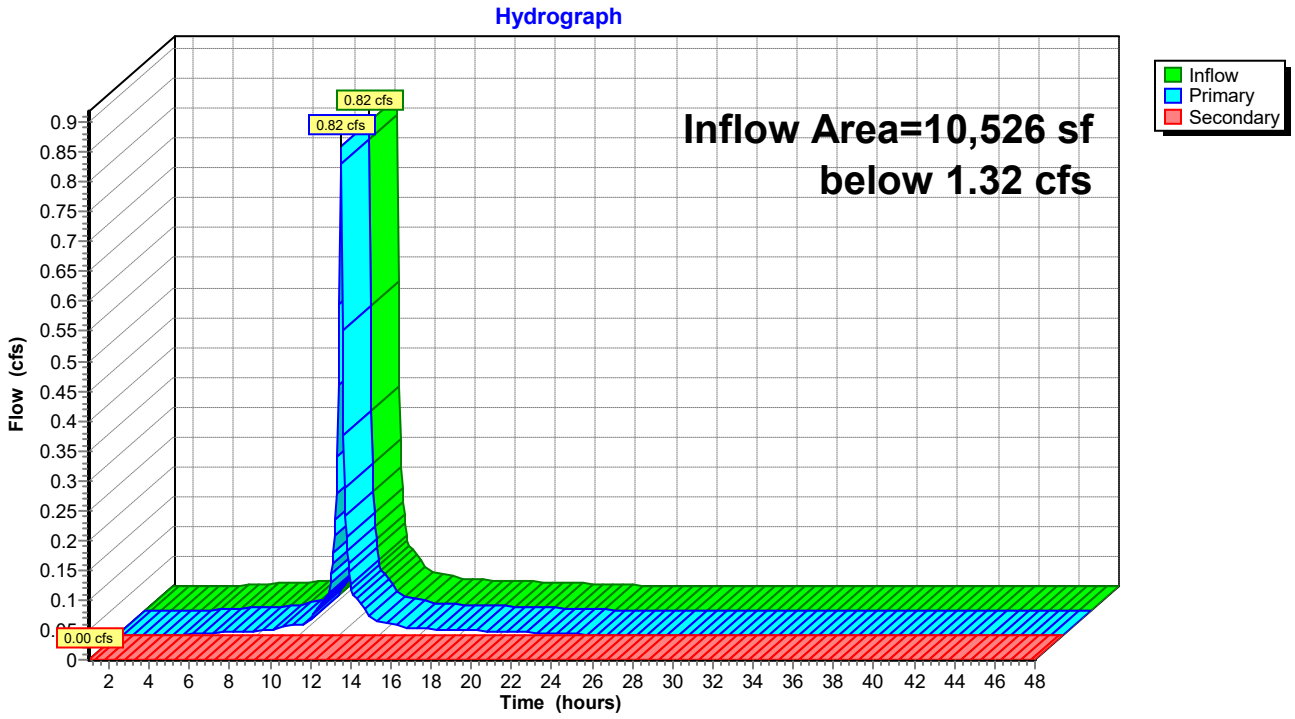


Summary for Link 174L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

Inflow Area = 10,526 sf,100.00% Impervious, Inflow Depth = 2.17" for 1-Year event
Inflow = 0.82 cfs @ 12.13 hrs, Volume= 1,905 cf
Primary = 0.82 cfs @ 12.13 hrs, Volume= 1,905 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 129P : STORMTECH FROM ADS
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Reach 111R : Western PL North Ditch

Primary outflow = Inflow below 1.32 cfs, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 174L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

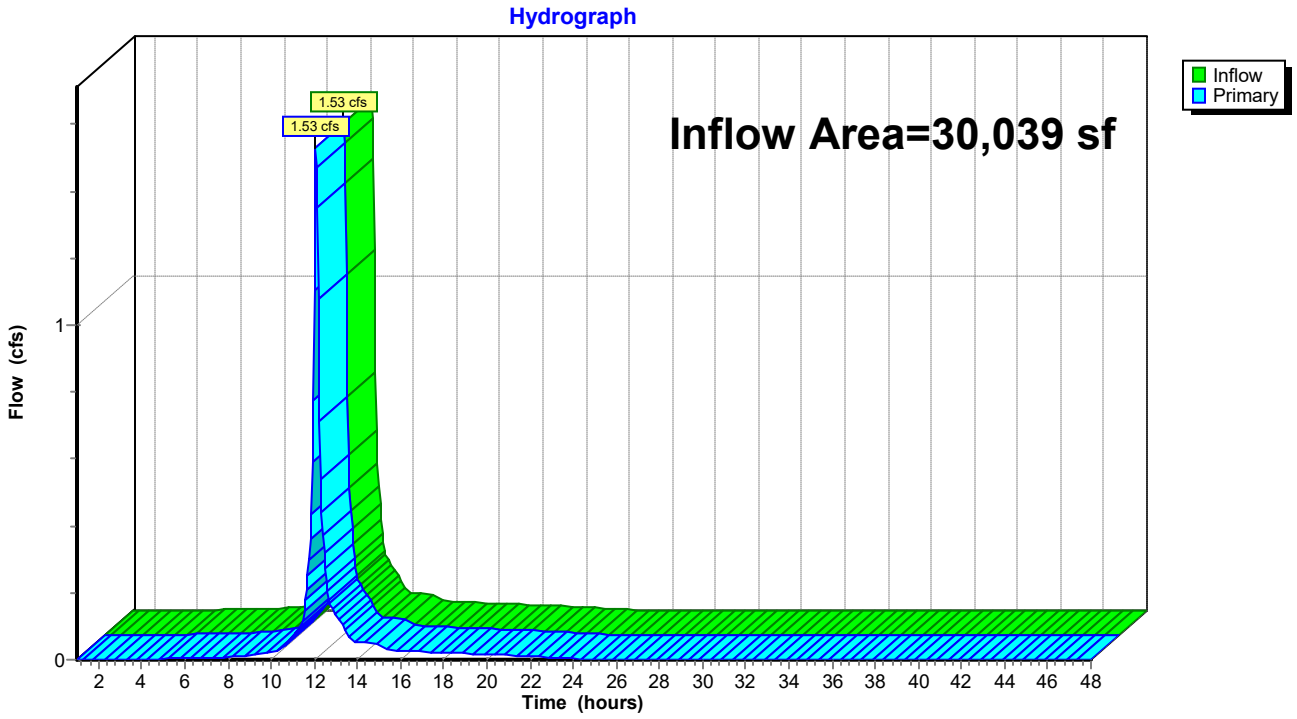


Summary for Link 175L: TO UG

Inflow Area = 30,039 sf, 72.17% Impervious, Inflow Depth = 1.62" for 1-Year event
Inflow = 1.53 cfs @ 12.07 hrs, Volume= 4,050 cf
Primary = 1.53 cfs @ 12.07 hrs, Volume= 4,050 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 178L : As

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 175L: TO UG

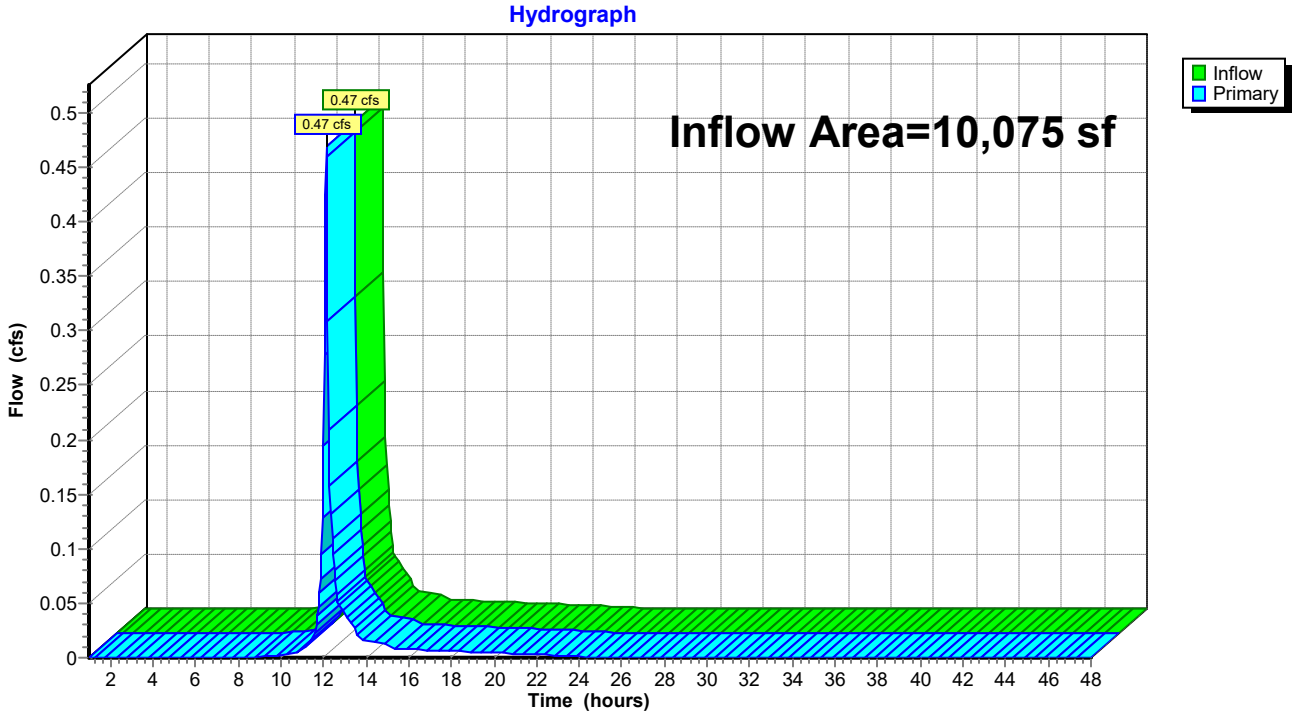


Summary for Link 176L: UPSTREAM OF OVERSIZED PIPE

Inflow Area = 10,075 sf, 46.89% Impervious, Inflow Depth = 1.16" for 1-Year event
Inflow = 0.47 cfs @ 12.13 hrs, Volume= 970 cf
Primary = 0.47 cfs @ 12.13 hrs, Volume= 970 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 174P : EAST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 176L: UPSTREAM OF OVERSIZED PIPE

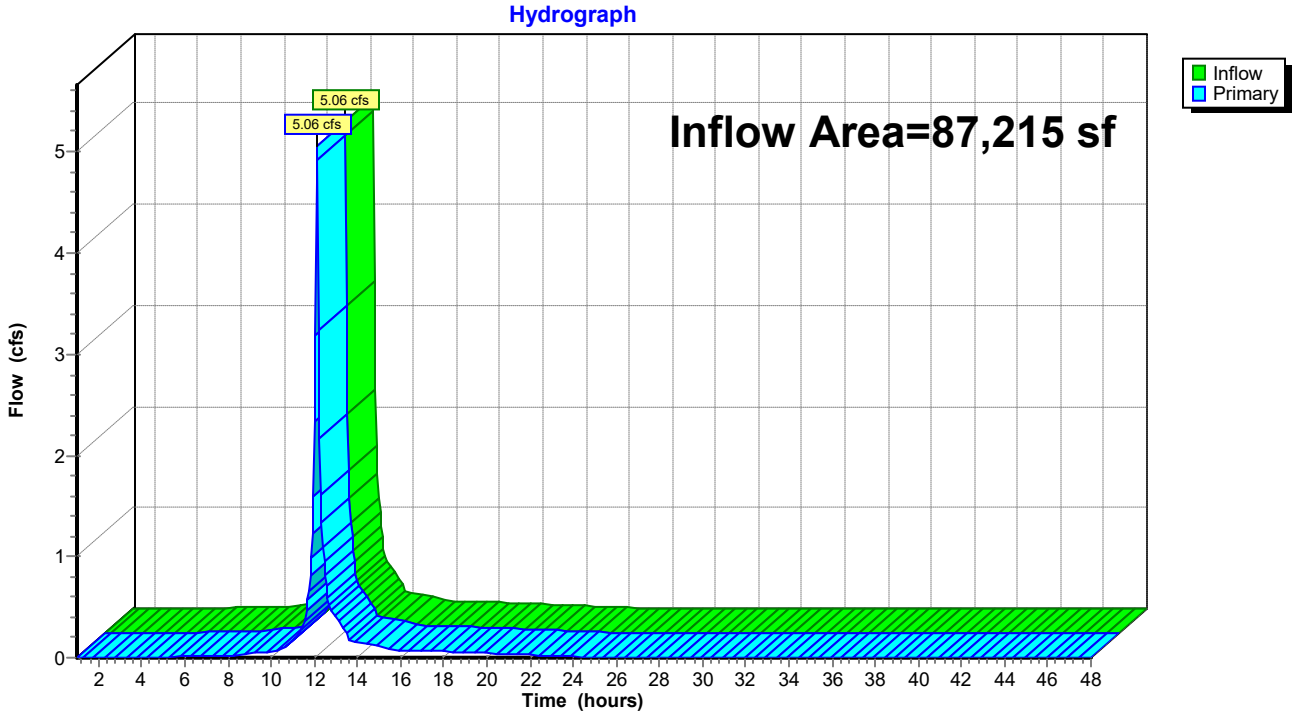


Summary for Link 177L: SUM OF As TO UG

Inflow Area = 87,215 sf, 65.94% Impervious, Inflow Depth = 1.52" for 1-Year event
Inflow = 5.06 cfs @ 12.13 hrs, Volume= 11,027 cf
Primary = 5.06 cfs @ 12.13 hrs, Volume= 11,027 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 129P : STORMTECH FROM ADS

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 177L: SUM OF As TO UG

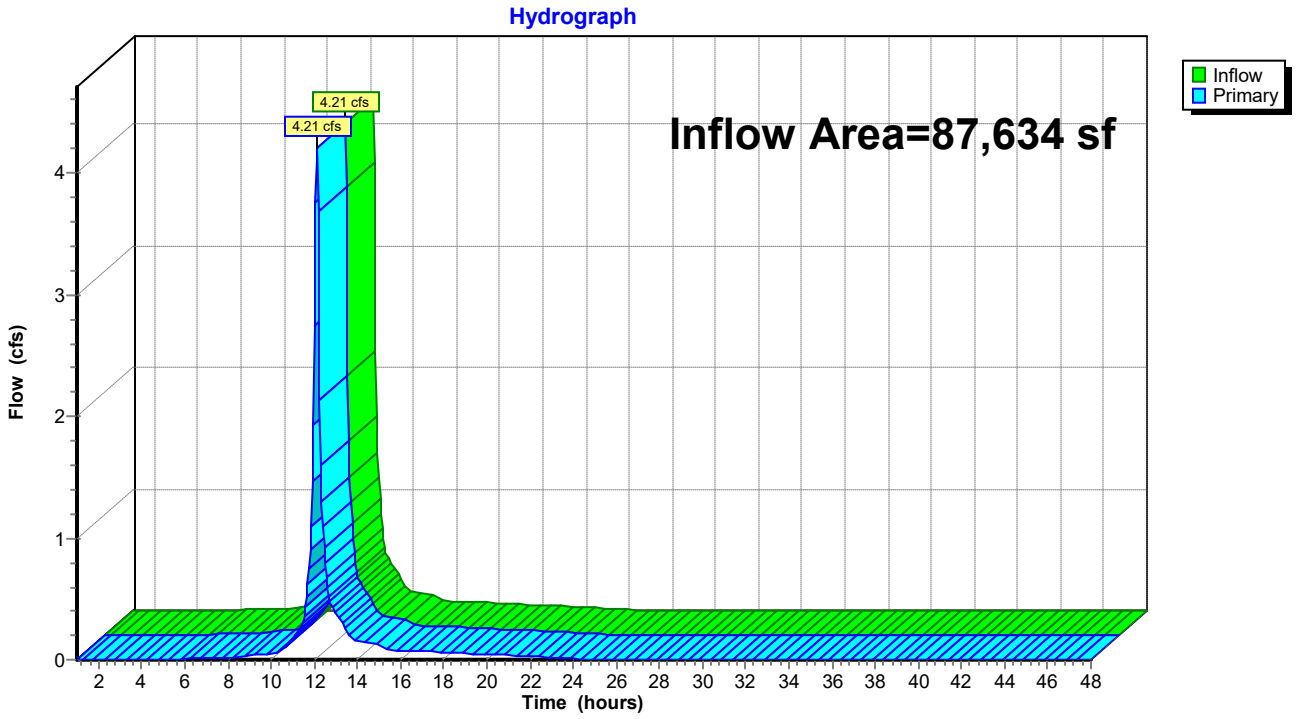


Summary for Link 178L: As

Inflow Area = 87,634 sf, 67.61% Impervious, Inflow Depth = 1.52" for 1-Year event
Inflow = 4.21 cfs @ 12.13 hrs, Volume= 11,076 cf
Primary = 4.21 cfs @ 12.13 hrs, Volume= 11,076 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 129P : STORMTECH FROM ADS

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 178L: As



Time span=1.00-48.00 hrs, dt=0.05 hrs, 941 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 35S: F6 Runoff Area=3,950 sf 0.00% Impervious Runoff Depth=0.72"
Tc=6.0 min CN=74 Runoff=0.11 cfs 238 cf

Subcatchment 37S: F6 Runoff Area=4,391 sf 0.00% Impervious Runoff Depth=0.72"
Tc=6.0 min CN=74 Runoff=0.13 cfs 265 cf

Subcatchment 40S: F5 (Direct to Basin) Runoff Area=31,282 sf 0.00% Impervious Runoff Depth=0.72"
Tc=6.0 min CN=74 Runoff=0.90 cfs 1,887 cf

Subcatchment 49S: D2 Runoff Area=16,605 sf 53.61% Impervious Runoff Depth=1.48"
Flow Length=393' Slope=0.0076 '/' Tc=10.7 min CN=87 Runoff=0.84 cfs 2,048 cf

Subcatchment 52S: E1 Runoff Area=39,552 sf 5.46% Impervious Runoff Depth=0.77"
Flow Length=100' Slope=0.0300 '/' Tc=9.6 min CN=75 Runoff=1.03 cfs 2,539 cf

Subcatchment 55S: G Runoff Area=4,482 sf 0.00% Impervious Runoff Depth=0.72"
Tc=6.0 min CN=74 Runoff=0.13 cfs 270 cf

Subcatchment 81S: O1 Runoff Area=11,697 sf 0.00% Impervious Runoff Depth=0.72"
Tc=6.0 min CN=74 Runoff=0.34 cfs 706 cf

Subcatchment 82S: D1 Runoff Area=20,886 sf 0.00% Impervious Runoff Depth=0.72"
Flow Length=400' Slope=0.0100 '/' Tc=22.0 min CN=74 Runoff=0.34 cfs 1,260 cf

Subcatchment 87S: I Runoff Area=56,129 sf 0.00% Impervious Runoff Depth=0.72"
Flow Length=750' Slope=0.0100 '/' Tc=30.4 min CN=74 Runoff=0.75 cfs 3,386 cf

Subcatchment 95S: C1 Runoff Area=19,337 sf 26.10% Impervious Runoff Depth=1.03"
Tc=6.0 min CN=80 Runoff=0.82 cfs 1,659 cf

Subcatchment 96S: E2 Runoff Area=18,820 sf 39.11% Impervious Runoff Depth=1.21"
Flow Length=400' Slope=0.0300 '/' Tc=13.7 min CN=83 Runoff=0.69 cfs 1,896 cf

Subcatchment 97S: C2 Runoff Area=99,572 sf 33.61% Impervious Runoff Depth=1.15"
Tc=6.0 min CN=82 Runoff=4.71 cfs 9,519 cf

Subcatchment 98S: E3 Runoff Area=109,219 sf 13.58% Impervious Runoff Depth=0.87"
Flow Length=200' Tc=16.3 min CN=77 Runoff=2.59 cfs 7,906 cf

Subcatchment 105S: C (EXTERIOR) Runoff Area=83,930 sf 38.97% Impervious Runoff Depth=1.21"
Tc=6.0 min CN=83 Runoff=4.19 cfs 8,457 cf

Subcatchment 106S: B Runoff Area=86,466 sf 11.84% Impervious Runoff Depth=0.87"
Tc=6.0 min CN=77 Runoff=3.05 cfs 6,259 cf

Subcatchment 107S: F Runoff Area=41,695 sf 60.00% Impervious Runoff Depth=1.55"
Tc=6.0 min CN=88 Runoff=2.64 cfs 5,400 cf

Subcatchment 108S: B1 (INTERIOR) Runoff Area=10,526 sf 100.00% Impervious Runoff Depth=2.47"
Tc=6.0 min CN=98 Runoff=0.93 cfs 2,166 cf

Subcatchment 112S: D3 Runoff Area=8,222 sf 12.92% Impervious Runoff Depth=0.87"
Tc=6.0 min CN=77 Runoff=0.29 cfs 595 cf

Subcatchment 118S: A14 Runoff Area=16,514 sf 54.25% Impervious Runoff Depth=1.48"
Tc=6.0 min CN=87 Runoff=1.00 cfs 2,037 cf

Subcatchment 120S: A30 Runoff Area=14,121 sf 18.33% Impervious Runoff Depth=0.92"
Tc=6.0 min CN=78 Runoff=0.53 cfs 1,083 cf

Subcatchment 121S: A32 Runoff Area=13,562 sf 14.98% Impervious Runoff Depth=0.92"
Tc=6.0 min CN=78 Runoff=0.51 cfs 1,040 cf

Subcatchment 122S: F1 Runoff Area=50,859 sf 57.49% Impervious Runoff Depth=1.55"
Tc=6.0 min CN=88 Runoff=3.22 cfs 6,587 cf

Subcatchment 125S: F3 Runoff Area=20,215 sf 20.28% Impervious Runoff Depth=0.97"
Tc=6.0 min CN=79 Runoff=0.81 cfs 1,641 cf

Subcatchment 126S: F4 Runoff Area=25,539 sf 8.13% Impervious Runoff Depth=0.82"
Tc=6.0 min CN=76 Runoff=0.84 cfs 1,742 cf

Subcatchment 127S: A13 Runoff Area=1,947 sf 62.25% Impervious Runoff Depth=1.63"
Tc=6.0 min CN=89 Runoff=0.13 cfs 265 cf

Subcatchment 128S: A15 Runoff Area=8,786 sf 25.73% Impervious Runoff Depth=1.03"
Tc=6.0 min CN=80 Runoff=0.37 cfs 754 cf

Subcatchment 130S: A12 Runoff Area=3,208 sf 80.89% Impervious Runoff Depth=1.97"
Tc=6.0 min CN=93 Runoff=0.25 cfs 526 cf

Subcatchment 131S: A11 Runoff Area=6,149 sf 79.15% Impervious Runoff Depth=1.97"
Tc=6.0 min CN=93 Runoff=0.47 cfs 1,009 cf

Subcatchment 132S: A9 Runoff Area=1,940 sf 86.03% Impervious Runoff Depth=2.16"
Tc=6.0 min CN=95 Runoff=0.16 cfs 349 cf

Subcatchment 133S: A7 Runoff Area=4,839 sf 73.84% Impervious Runoff Depth=1.88"
Tc=6.0 min CN=92 Runoff=0.36 cfs 758 cf

Subcatchment 134S: A5 Runoff Area=2,978 sf 76.83% Impervious Runoff Depth=1.88"
Tc=6.0 min CN=92 Runoff=0.22 cfs 466 cf

Subcatchment 136S: A33 Runoff Area=6,798 sf 72.68% Impervious Runoff Depth=1.79"
Tc=6.0 min CN=91 Runoff=0.49 cfs 1,016 cf

Subcatchment 137S: A1 Runoff Area=11,792 sf 39.91% Impervious Runoff Depth=1.27"
Tc=6.0 min CN=84 Runoff=0.62 cfs 1,251 cf

Subcatchment 138S: F2 Runoff Area=12,659 sf 52.90% Impervious Runoff Depth=1.48"
Tc=10.0 min CN=87 Runoff=0.65 cfs 1,561 cf

Subcatchment 139S: A2 Runoff Area=5,968 sf 57.66% Impervious Runoff Depth=1.55"
Tc=6.0 min CN=88 Runoff=0.38 cfs 773 cf

Subcatchment 140S: H1 Runoff Area=124,005 sf 32.15% Impervious Runoff Depth=1.15"
Tc=6.0 min CN=82 Runoff=5.87 cfs 11,855 cf

Subcatchment 141S: H2 Runoff Area=54,034 sf 29.78% Impervious Runoff Depth=1.09"
Tc=6.0 min CN=81 Runoff=2.42 cfs 4,897 cf

Subcatchment 142S: H3 Runoff Area=29,836 sf 18.57% Impervious Runoff Depth=0.92"
Tc=6.0 min CN=78 Runoff=1.12 cfs 2,289 cf

Subcatchment 144S: H5 Runoff Area=14,502 sf 0.00% Impervious Runoff Depth=0.72"
Tc=6.0 min CN=74 Runoff=0.42 cfs 875 cf

Subcatchment 145S: H6-a Runoff Area=9,604 sf 11.80% Impervious Runoff Depth=0.87"
Tc=6.0 min CN=77 Runoff=0.34 cfs 695 cf

Subcatchment 146S: O2 Runoff Area=132,678 sf 2.29% Impervious Runoff Depth=0.77"
Flow Length=377' Tc=12.2 min CN=75 Runoff=3.13 cfs 8,518 cf

Subcatchment 147S: J Runoff Area=15,351 sf 8.86% Impervious Runoff Depth=0.82"
Tc=6.0 min CN=76 Runoff=0.51 cfs 1,047 cf

Subcatchment 148S: A3 Runoff Area=3,136 sf 75.57% Impervious Runoff Depth=1.88"
Tc=6.0 min CN=92 Runoff=0.23 cfs 491 cf

Subcatchment 149S: A4 Runoff Area=7,573 sf 19.64% Impervious Runoff Depth=0.97"
Tc=6.0 min CN=79 Runoff=0.30 cfs 615 cf

Subcatchment 150S: A6 Runoff Area=2,888 sf 41.24% Impervious Runoff Depth=1.27"
Tc=6.0 min CN=84 Runoff=0.15 cfs 306 cf

Subcatchment 151S: A8 Runoff Area=5,293 sf 40.92% Impervious Runoff Depth=1.27"
Tc=6.0 min CN=84 Runoff=0.28 cfs 562 cf

Subcatchment 152S: A10 Runoff Area=4,344 sf 47.88% Impervious Runoff Depth=1.34"
Tc=6.0 min CN=85 Runoff=0.24 cfs 485 cf

Subcatchment 153S: A16 Runoff Area=4,885 sf 83.97% Impervious Runoff Depth=2.06"
Tc=6.0 min CN=94 Runoff=0.39 cfs 839 cf

Subcatchment 154S: A17 Runoff Area=1,182 sf 44.92% Impervious Runoff Depth=1.34"
Tc=6.0 min CN=85 Runoff=0.07 cfs 132 cf

Subcatchment 155S: A18 Runoff Area=1,381 sf 79.65% Impervious Runoff Depth=1.97"
Tc=6.0 min CN=93 Runoff=0.11 cfs 227 cf

Subcatchment 156S: A19 Runoff Area=5,006 sf 29.03% Impervious Runoff Depth=1.09"
Tc=6.0 min CN=81 Runoff=0.22 cfs 454 cf

Subcatchment 157S: A20 Runoff Area=705 sf 28.94% Impervious Runoff Depth=1.09"
Tc=6.0 min CN=81 Runoff=0.03 cfs 64 cf

Subcatchment 158S: A21 Runoff Area=1,801 sf 79.73% Impervious Runoff Depth=1.97"
Tc=6.0 min CN=93 Runoff=0.14 cfs 295 cf

Subcatchment 159S: A22 Runoff Area=4,627 sf 58.46% Impervious Runoff Depth=1.55"
Tc=6.0 min CN=88 Runoff=0.29 cfs 599 cf

Subcatchment 160S: A23 Runoff Area=5,903 sf 81.57% Impervious Runoff Depth=2.06"
Tc=6.0 min CN=94 Runoff=0.47 cfs 1,014 cf

Subcatchment 161S: A24 Runoff Area=6,769 sf 44.98% Impervious Runoff Depth=1.34"
Tc=6.0 min CN=85 Runoff=0.37 cfs 756 cf

Subcatchment 162S: A25 Runoff Area=6,995 sf 75.15% Impervious Runoff Depth=1.88"
Tc=6.0 min CN=92 Runoff=0.52 cfs 1,095 cf

Subcatchment 163S: A26 Runoff Area=6,827 sf 17.20% Impervious Runoff Depth=0.92"
Tc=6.0 min CN=78 Runoff=0.26 cfs 524 cf

Subcatchment 164S: A27 Runoff Area=3,218 sf 78.37% Impervious Runoff Depth=1.97"
Tc=6.0 min CN=93 Runoff=0.25 cfs 528 cf

Subcatchment 165S: A28 Runoff Area=4,119 sf 32.34% Impervious Runoff Depth=1.15"
Tc=6.0 min CN=82 Runoff=0.19 cfs 394 cf

Subcatchment 166S: A29 Runoff Area=3,109 sf 75.62% Impervious Runoff Depth=1.88"
Tc=6.0 min CN=92 Runoff=0.23 cfs 487 cf

Subcatchment 167S: A31 Runoff Area=6,189 sf 76.15% Impervious Runoff Depth=1.88"
Tc=6.0 min CN=92 Runoff=0.46 cfs 969 cf

Subcatchment 168S: A34 Runoff Area=387 sf 100.00% Impervious Runoff Depth=2.47"
Tc=6.0 min CN=98 Runoff=0.03 cfs 80 cf

Subcatchment 169S: A36 Runoff Area=1,118 sf 35.87% Impervious Runoff Depth=1.21"
Tc=6.0 min CN=83 Runoff=0.06 cfs 113 cf

Subcatchment 170S: C (INTERIOR) Runoff Area=8,855 sf 100.00% Impervious Runoff Depth=2.47"
Tc=6.0 min CN=98 Runoff=0.78 cfs 1,822 cf

Subcatchment 171S: A (MARIA ROOF) /2 Runoff Area=9,435 sf 100.00% Impervious Runoff Depth=2.47"
Tc=0.0 min CN=98 Runoff=0.96 cfs 1,942 cf

Subcatchment 172S: B1 (EXTERIOR) Runoff Area=32,338 sf 100.00% Impervious Runoff Depth=2.47"
Tc=6.0 min CN=98 Runoff=2.84 cfs 6,655 cf

Subcatchment 173S: A (MARIA ROOF) /2 Runoff Area=9,434 sf 100.00% Impervious Runoff Depth=2.47"
Tc=0.0 min CN=98 Runoff=0.96 cfs 1,942 cf

Subcatchment 175S: H6-b Runoff Area=4,256 sf 23.80% Impervious Runoff Depth=1.03"
Tc=6.0 min CN=80 Runoff=0.18 cfs 365 cf

Subcatchment 176S: X (EX. RBL Area to Runoff Area=22,047 sf 41.55% Impervious Runoff Depth=1.27"
Tc=6.0 min CN=84 Runoff=1.16 cfs 2,339 cf

Subcatchment 179S: H6-c Runoff Area=4,091 sf 0.00% Impervious Runoff Depth=0.72"
Tc=6.0 min CN=74 Runoff=0.12 cfs 247 cf

Subcatchment 182S: A35 Runoff Area=28,353 sf 100.00% Impervious Runoff Depth=2.47"
Tc=6.0 min CN=98 Runoff=2.49 cfs 5,835 cf

Subcatchment 183S: Y (RBL Area to RBL Runoff Area=103,238 sf 10.88% Impervious Runoff Depth=0.87"
Tc=6.0 min CN=77 Runoff=3.64 cfs 7,473 cf

Subcatchment 185S: H4 Runoff Area=6,658 sf 0.00% Impervious Runoff Depth=0.72"
Tc=6.0 min CN=74 Runoff=0.19 cfs 402 cf

Reach 99R: East Swale (SE End) Avg. Flow Depth=0.45' Max Vel=3.50 fps Inflow=10.86 cfs 21,971 cf
n=0.018 L=570.0' S=0.0070 '/' Capacity=43.88 cfs Outflow=9.94 cfs 21,971 cf

Reach 106R: East Swale (North End) Avg. Flow Depth=0.13' Max Vel=2.56 fps Inflow=0.82 cfs 1,659 cf
n=0.018 L=140.0' S=0.0179 '/' Capacity=39.35 cfs Outflow=0.81 cfs 1,659 cf

Reach 108R: South Berm Swale Avg. Flow Depth=0.43' Max Vel=2.40 fps Inflow=2.99 cfs 9,157 cf
n=0.025 L=265.0' S=0.0100 '/' Capacity=19.73 cfs Outflow=2.84 cfs 9,157 cf

Reach 109R: SC Road East Ditch Avg. Flow Depth=0.31' Max Vel=1.77 fps Inflow=2.64 cfs 5,400 cf
n=0.022 L=415.0' S=0.0048 '/' Capacity=23.93 cfs Outflow=2.30 cfs 5,400 cf

Reach 111R: Western PL North Ditch Avg. Flow Depth=0.77' Max Vel=3.50 fps Inflow=6.79 cfs 15,453 cf
n=0.025 L=480.0' S=0.0133 '/' Capacity=26.79 cfs Outflow=6.30 cfs 15,453 cf

Reach 117R: SC Road West Ditch Avg. Flow Depth=0.35' Max Vel=1.77 fps Inflow=3.22 cfs 6,587 cf
n=0.022 L=475.0' S=0.0042 '/' Capacity=22.37 cfs Outflow=2.74 cfs 6,587 cf

Reach 132R: EX. Red Barn Lane West Avg. Flow Depth=0.31' Max Vel=2.62 fps Inflow=2.28 cfs 4,628 cf
n=0.025 L=610.0' S=0.0179 '/' Capacity=87.96 cfs Outflow=1.93 cfs 4,628 cf

Reach 136R: SC West Ditch Avg. Flow Depth=0.31' Max Vel=1.52 fps Inflow=0.81 cfs 1,641 cf
n=0.025 L=218.0' S=0.0080 '/' Capacity=16.56 cfs Outflow=0.74 cfs 1,641 cf

Reach 151R: Western PL North Ditch Avg. Flow Depth=0.24' Max Vel=1.46 fps Inflow=0.29 cfs 595 cf
n=0.025 L=227.0' S=0.0107 '/' Capacity=24.06 cfs Outflow=0.26 cfs 595 cf

Reach 184R: Red Barn Lane East Swale Avg. Flow Depth=0.34' Max Vel=2.73 fps Inflow=3.64 cfs 7,473 cf
n=0.025 L=945.0' S=0.0180 '/' Capacity=36.63 cfs Outflow=2.79 cfs 7,473 cf

Pond 41P: Reach Pipe Peak Elev=738.44' Storage=6 cf Inflow=0.65 cfs 1,561 cf
Outflow=0.65 cfs 1,561 cf

Pond 57P: Dry Pond 2 Peak Elev=747.51' Storage=3,888 cf Inflow=5.75 cfs 17,093 cf
Discarded=1.68 cfs 17,093 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=1.68 cfs 17,093 cf

Pond 58P: Dry Pond 1 Peak Elev=748.28' Storage=25,415 cf Inflow=18.58 cfs 67,403 cf
Discarded=1.66 cfs 67,403 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=1.66 cfs 67,403 cf

Pond 60P: Infiltration Basin #1 Peak Elev=741.18' Storage=8,868 cf Inflow=9.09 cfs 25,851 cf
Discarded=1.64 cfs 25,851 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=1.64 cfs 25,851 cf

Pond 95P: Dry Pond 3 Peak Elev=739.16' Storage=0.035 af Inflow=6.57 cfs 15,370 cf
Discarded=3.63 cfs 15,370 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=3.63 cfs 15,370 cf

Pond 101R: Reach Pipe DP1 TO MH Peak Elev=750.50' Inflow=0.00 cfs 0 cf
15.0" Round Culvert n=0.011 L=373.0' S=0.0094 '/' Outflow=0.00 cfs 0 cf

Pond 110R: Western Pipe Run Peak Elev=746.26' Inflow=6.57 cfs 16,048 cf
24.0" Round Culvert n=0.011 L=514.0' S=0.0040 '/' Outflow=6.57 cfs 16,048 cf

Pond 127P: B3 OVERSIZED PIPE RUN (24" Peak Elev=751.81' Storage=93 cf Inflow=1.99 cfs 4,109 cf
Outflow=1.95 cfs 4,109 cf

Pond 129P: STORMTECH FROM ADS Peak Elev=752.55' Storage=15,440 cf Inflow=12.57 cfs 29,928 cf
Outflow=1.38 cfs 29,781 cf

Pond 133P: WEST COURTYARD OVERSIZED Peak Elev=755.79' Storage=153 cf Inflow=3.04 cfs 6,343 cf
Outflow=2.98 cfs 6,343 cf

Pond 154P: Southeast Basin Peak Elev=730.50' Storage=2,064 cf Inflow=1.75 cfs 3,952 cf
Outflow=0.11 cfs 3,953 cf

Pond 174P: EAST COURTYARD OVERSIZED Peak Elev=755.45' Storage=60 cf Inflow=1.33 cfs 2,785 cf
Outflow=1.30 cfs 2,785 cf

Pond 183P: 24" HDPE PIPE Peak Elev=749.65' Inflow=1.93 cfs 4,628 cf
24.0" Round Culvert n=0.010 L=475.0' S=0.0042 '/' Outflow=1.93 cfs 4,628 cf

Link 48L: TOTAL OUTFALL Inflow=1.46 cfs 3,026 cf
Primary=1.46 cfs 3,026 cf

Link 66L: Total Offsite Inflow=1.46 cfs 3,026 cf
Primary=1.46 cfs 3,026 cf

Link 115L: EX. Cul-de-sac On Green Meadow Place Inflow=0.64 cfs 1,307 cf
Primary=0.64 cfs 1,307 cf

Link 124L: TO 12" PRIOR TO 24" (WEST) Inflow=2.64 cfs 5,509 cf
Primary=2.64 cfs 5,509 cf

Link 126L: OVERSIZED PIPE RUN BY B3 Inflow=1.99 cfs 4,109 cf
Primary=1.99 cfs 4,109 cf

Link 127L: total Inflow=0.37 cfs 773 cf
Primary=0.37 cfs 773 cf

Link 128L: FROM OVERSIZED PIPE RUN Inflow=1.95 cfs 4,109 cf
Primary=1.95 cfs 4,109 cf

Link 134L: TO UG Inflow=3.30 cfs 8,284 cf
Primary=3.30 cfs 8,284 cf

Link 171L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW below 1.11 cfs Inflow=0.78 cfs 1,822 cf
Primary=0.78 cfs 1,822 cf Secondary=0.00 cfs 0 cf

Link 174L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW below 1.32 cfs Inflow=0.93 cfs 2,166 cf
Primary=0.93 cfs 2,166 cf Secondary=0.00 cfs 0 cf

Link 175L: TO UG Inflow=1.77 cfs 4,726 cf
Primary=1.77 cfs 4,726 cf

Link 176L: UPSTREAM OF OVERSIZED PIPE Inflow=0.57 cfs 1,171 cf
Primary=0.57 cfs 1,171 cf

Link 177L: SUM OF As TO UG Inflow=5.91 cfs 12,929 cf
Primary=5.91 cfs 12,929 cf

Link 178L: As Inflow=4.96 cfs 13,010 cf
Primary=4.96 cfs 13,010 cf

Total Runoff Area = 1,570,805 sf Runoff Volume = 149,539 cf Average Runoff Depth = 1.14"
70.57% Pervious = 1,108,561 sf 29.43% Impervious = 462,244 sf

Summary for Subcatchment 35S: F6

3/3/21
Undetained portion of SE corner of SC that goes direct to SE low area (back yards of 3 home lots SE corner)

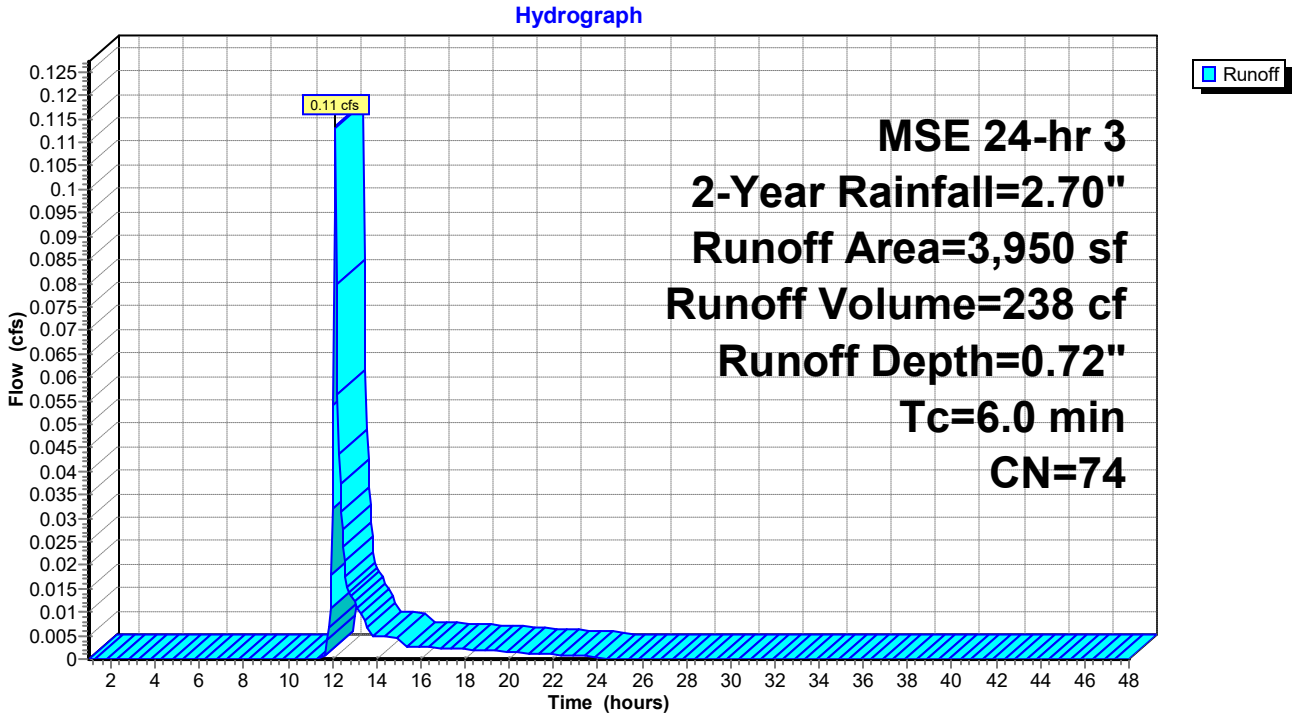
Runoff = 0.11 cfs @ 12.14 hrs, Volume= 238 cf, Depth= 0.72"
Routed to Pond 154P : Southeast Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	3,950	74	landscape
	3,950		100.00% Pervious Area

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

Subcatchment 35S: F6



Summary for Subcatchment 37S: F6

3/3/21
Undetained portion of SE corner of SC that goes direct to SE low area (back yards of 3 home lots SE corner)

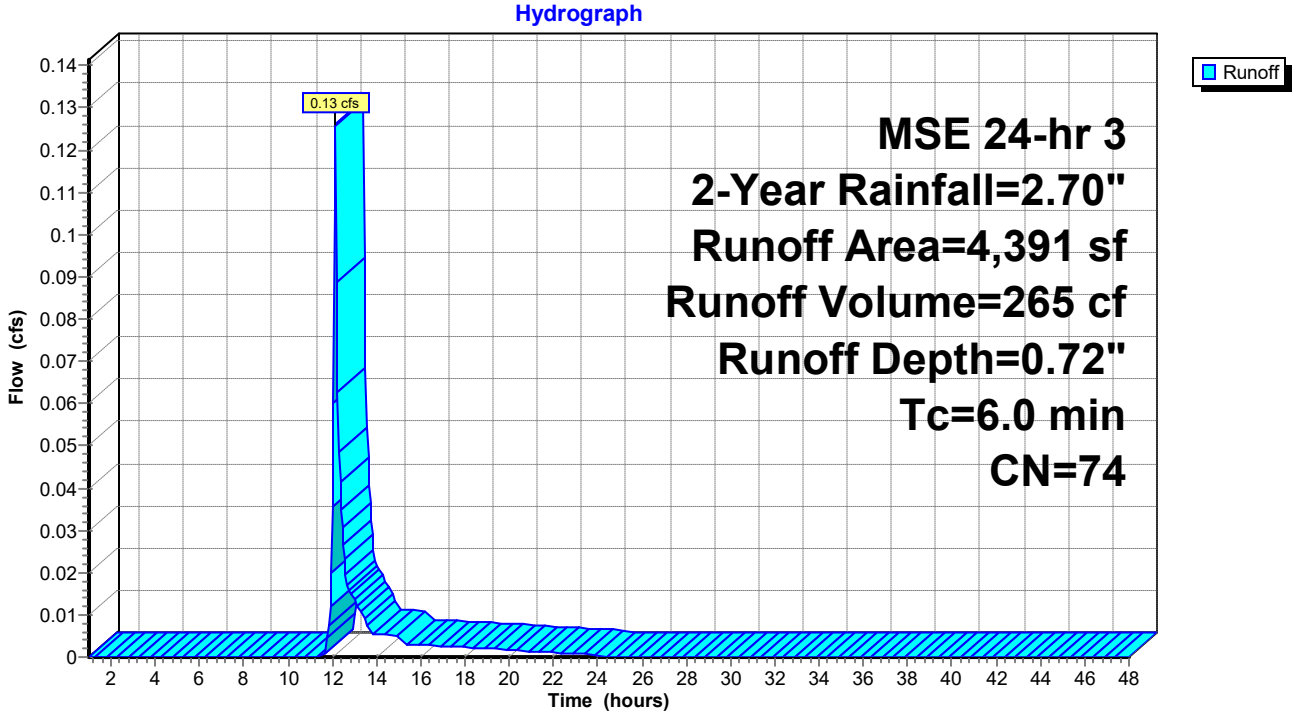
Runoff = 0.13 cfs @ 12.14 hrs, Volume= 265 cf, Depth= 0.72"
Routed to Pond 154P : Southeast Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	4,391	74	landscape
	4,391		100.00% Pervious Area

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

Subcatchment 37S: F6



Summary for Subcatchment 40S: F5 (Direct to Basin)

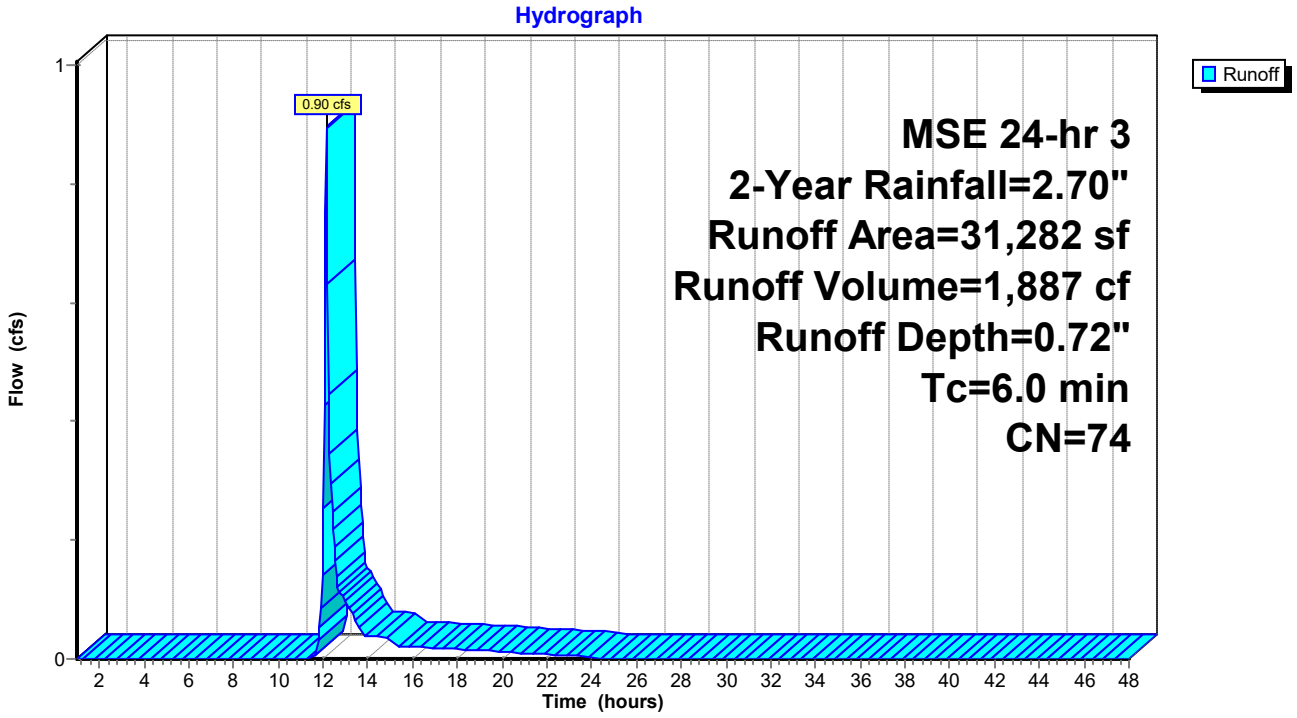
Runoff = 0.90 cfs @ 12.14 hrs, Volume= 1,887 cf, Depth= 0.72"
Routed to Pond 154P : Southeast Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	31,282	74	landscape
	31,282		100.00% Pervious Area

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

Subcatchment 40S: F5 (Direct to Basin)



Summary for Subcatchment 49S: D2

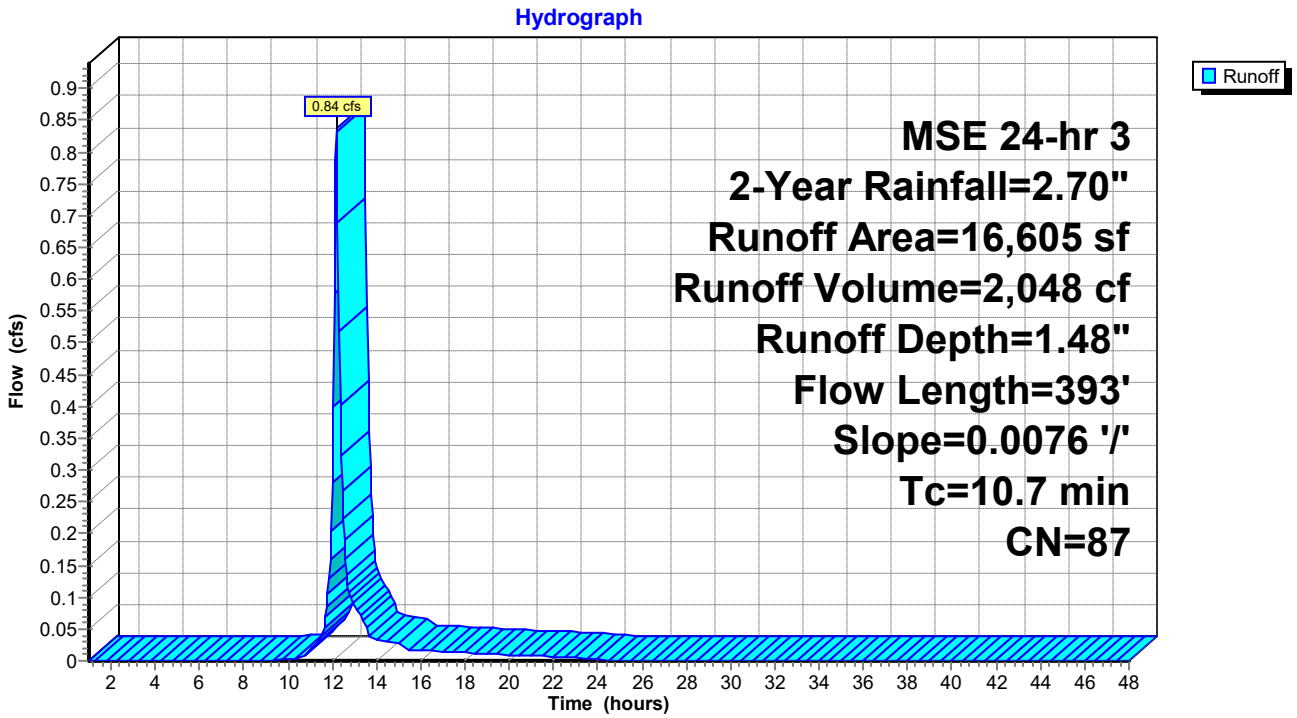
Runoff = 0.84 cfs @ 12.19 hrs, Volume= 2,048 cf, Depth= 1.48"
Routed to Pond 57P : Dry Pond 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	8,902	98	roof
*	7,703	74	landscape
	16,605	87	Weighted Average
	7,703		46.39% Pervious Area
	8,902		53.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	393	0.0076	0.61		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps

Subcatchment 49S: D2



Summary for Subcatchment 52S: E1

3/3/21
Delineation NOT updated based on Justin's waterdrops, needs finalization, it routes to western property ditch that goes ultimately to IB. We are using Joe's SWMP2 Figure from December 2020.

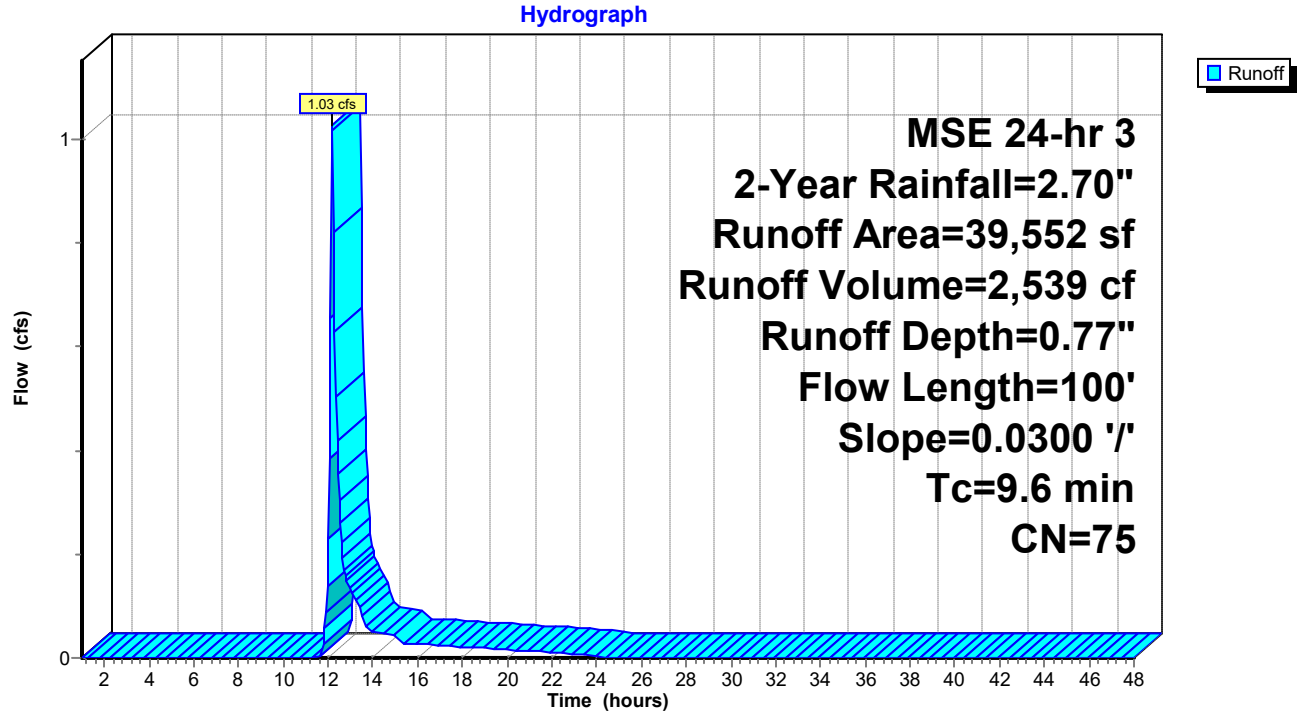
Runoff = 1.03 cfs @ 12.19 hrs, Volume= 2,539 cf, Depth= 0.77"
Routed to Reach 111R : Western PL North Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	2,161	98	Walks
	37,391	74	>75% Grass cover, Good, HSG C
	39,552	75	Weighted Average
	37,391		94.54% Pervious Area
	2,161		5.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0300	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 52S: E1



Summary for Subcatchment 55S: G

3/3/21
Needs to be delineated, this is from Joe's SWMP2

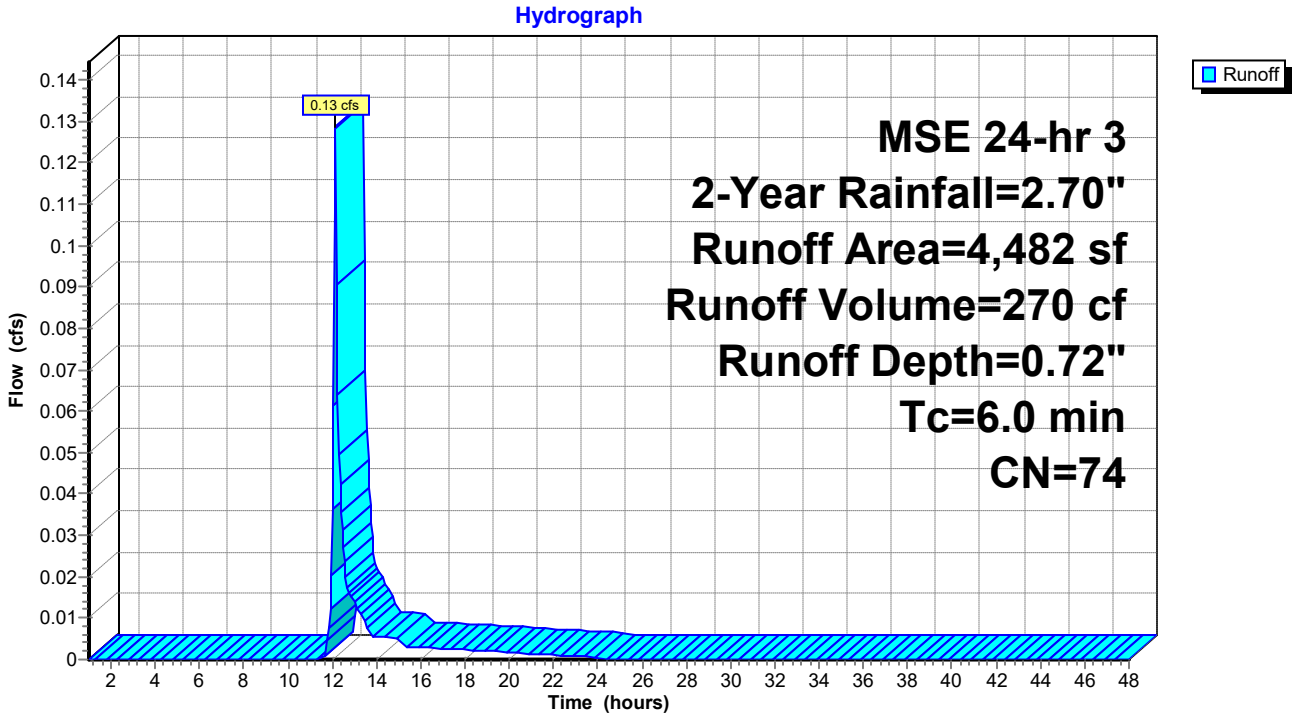
Runoff = 0.13 cfs @ 12.14 hrs, Volume= 270 cf, Depth= 0.72"
Routed to Link 66L : Total Offsite

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	4,482	74	landscape
	4,482		100.00% Pervious Area

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

Subcatchment 55S: G



Summary for Subcatchment 81S: O1

3/3/21
SW portion off-site flowing into IB

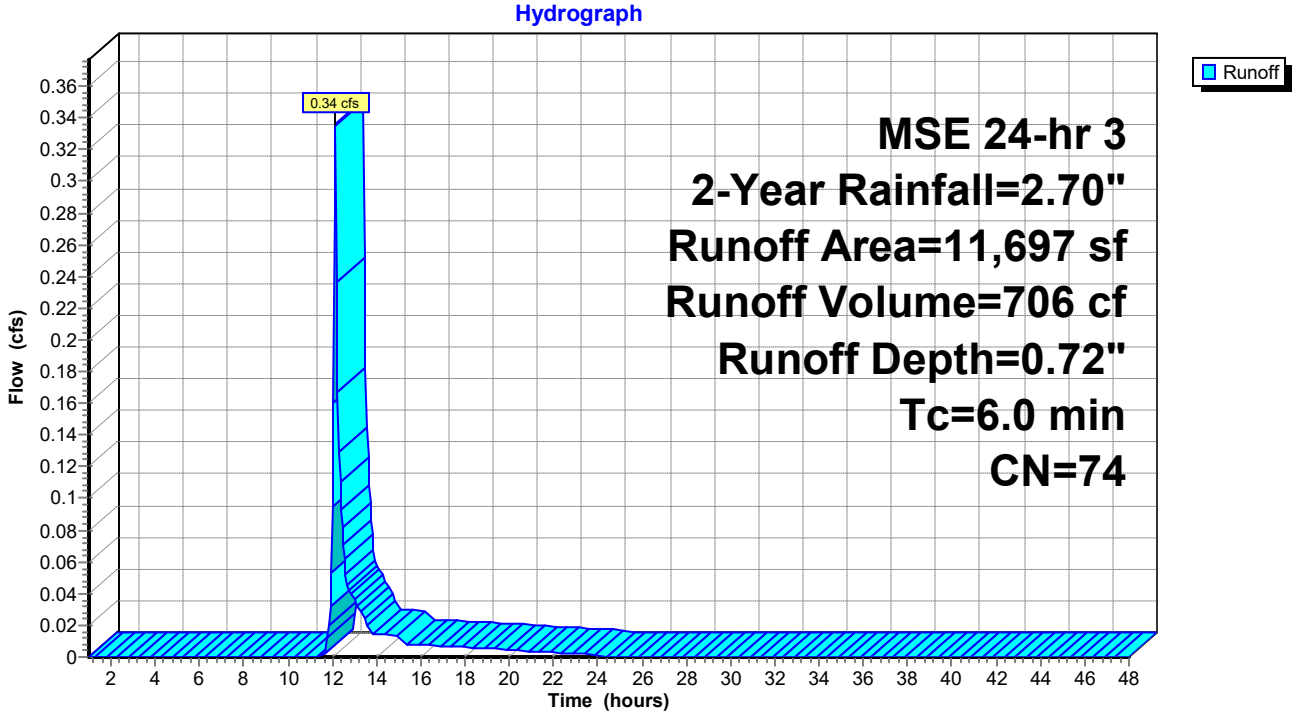
Runoff = 0.34 cfs @ 12.14 hrs, Volume= 706 cf, Depth= 0.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	11,697	74	PERV
	11,697		100.00% Pervious Area

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

Subcatchment 81S: O1



Summary for Subcatchment 82S: D1

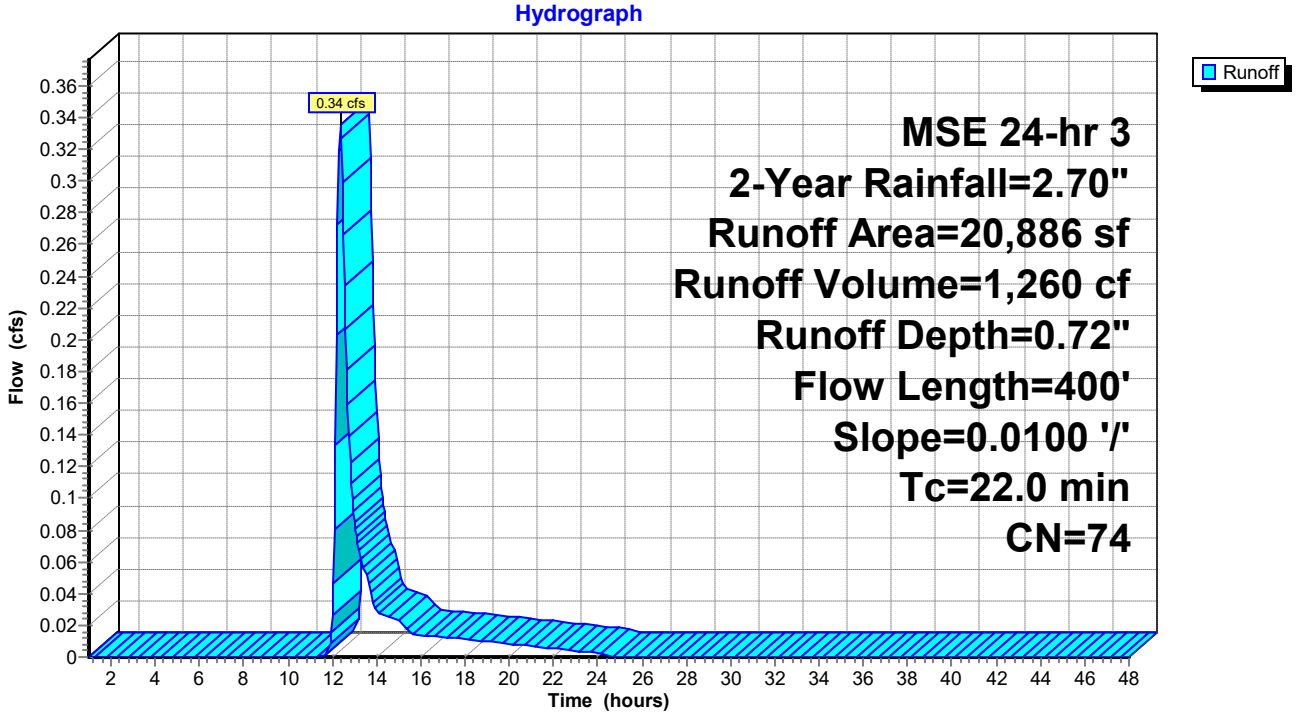
Runoff = 0.34 cfs @ 12.36 hrs, Volume= 1,260 cf, Depth= 0.72"
Routed to Pond 57P : Dry Pond 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	20,886	74	landscape
	20,886		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	100	0.0100	0.11		**Sheet Flow, BUILDING TO SWALE** Grass: Short n= 0.150 P2= 2.42"
7.1	300	0.0100	0.70		**Shallow Concentrated Flow, SWALE ALONG BACK** Short Grass Pasture Kv= 7.0 fps
22.0	400	Total			

Subcatchment 82S: D1



Summary for Subcatchment 87S: I

3/3/21
Wooded area

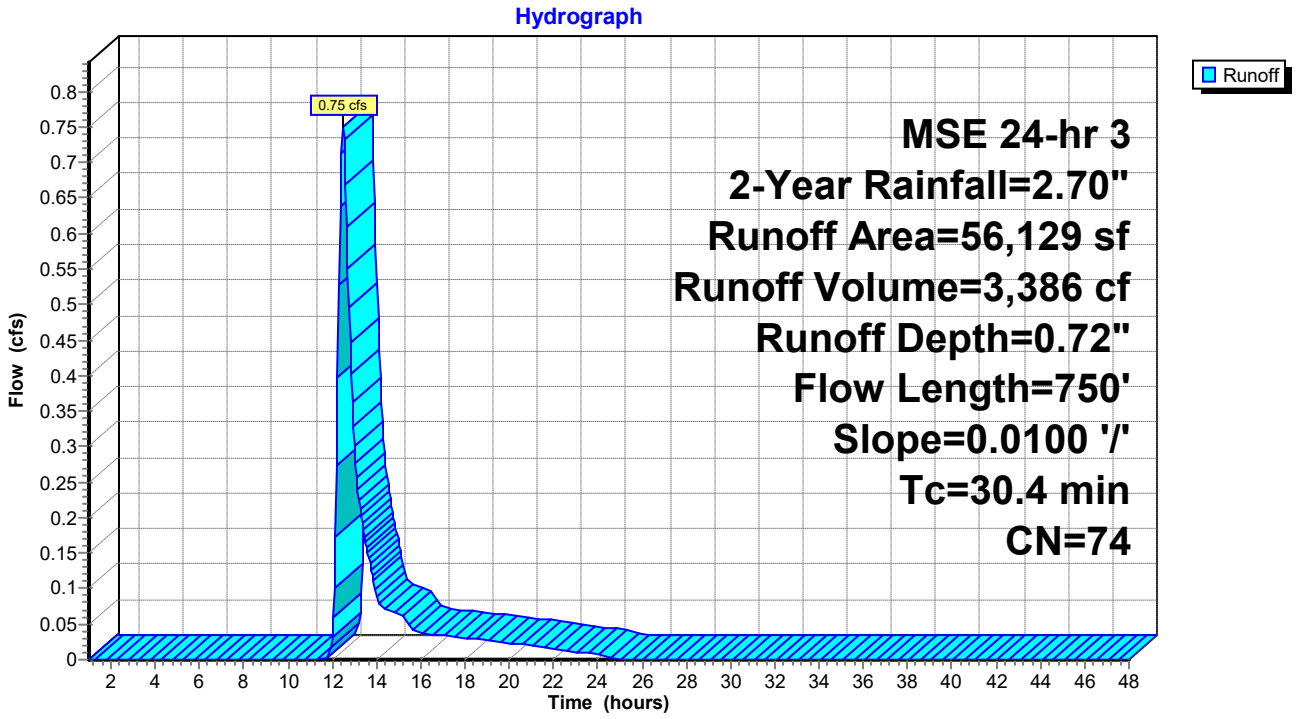
Runoff = 0.75 cfs @ 12.47 hrs, Volume= 3,386 cf, Depth= 0.72"
Routed to Reach 108R : South Berm Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	56,129	74	landscape
	56,129		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	100	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.42"
15.5	650	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
30.4	750	Total			

Subcatchment 87S: I



Summary for Subcatchment 95S: C1

Area actually draining to east swale
3/3/21
Northern portion of East Roof, exterior east courtyard, 7 home lots

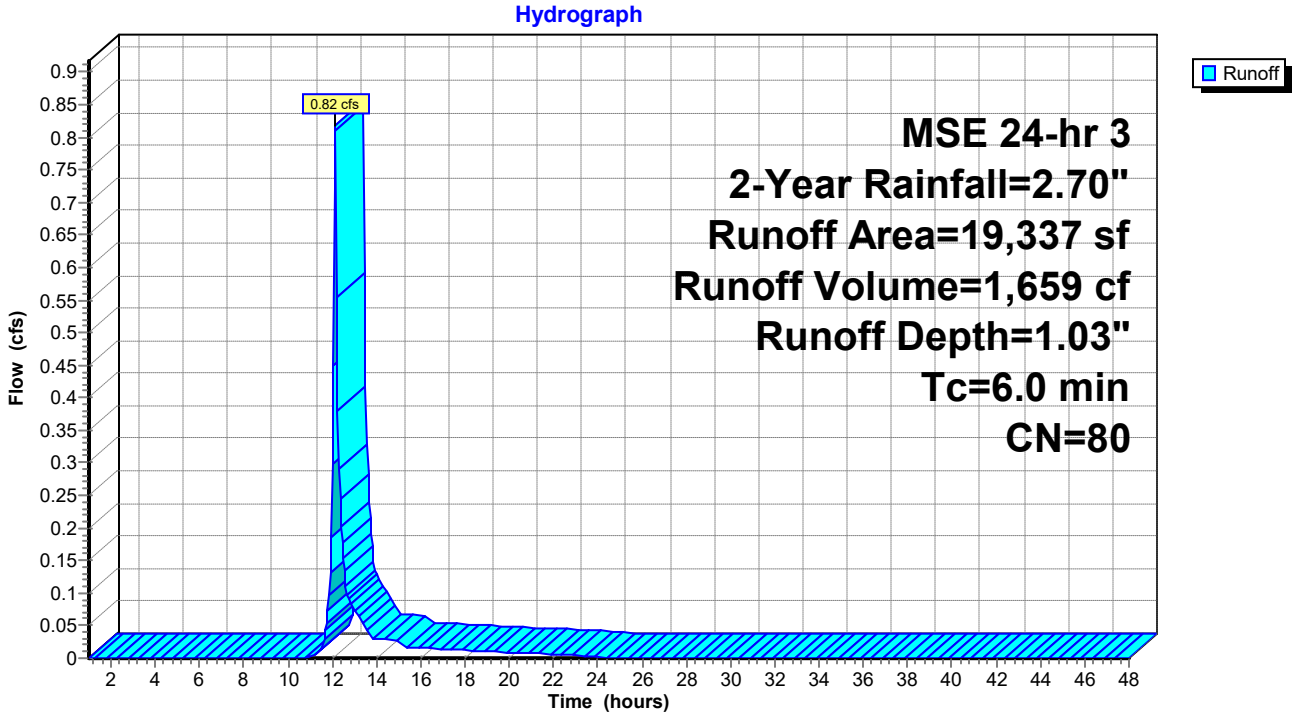
Runoff = 0.82 cfs @ 12.14 hrs, Volume= 1,659 cf, Depth= 1.03"
Routed to Reach 106R : East Swale (North End)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	2,210	98	walks
*	1,774	98	roads
*	14,290	74	landscape
*	1,063	98	roof
	19,337	80	Weighted Average
	14,290		73.90% Pervious Area
	5,047		26.10% Impervious Area

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

Subcatchment 95S: C1



Summary for Subcatchment 96S: E2

3/3/21
Delineation needs updating, but it does route to IB
Portion of cemetary site that flows from north to south into IB

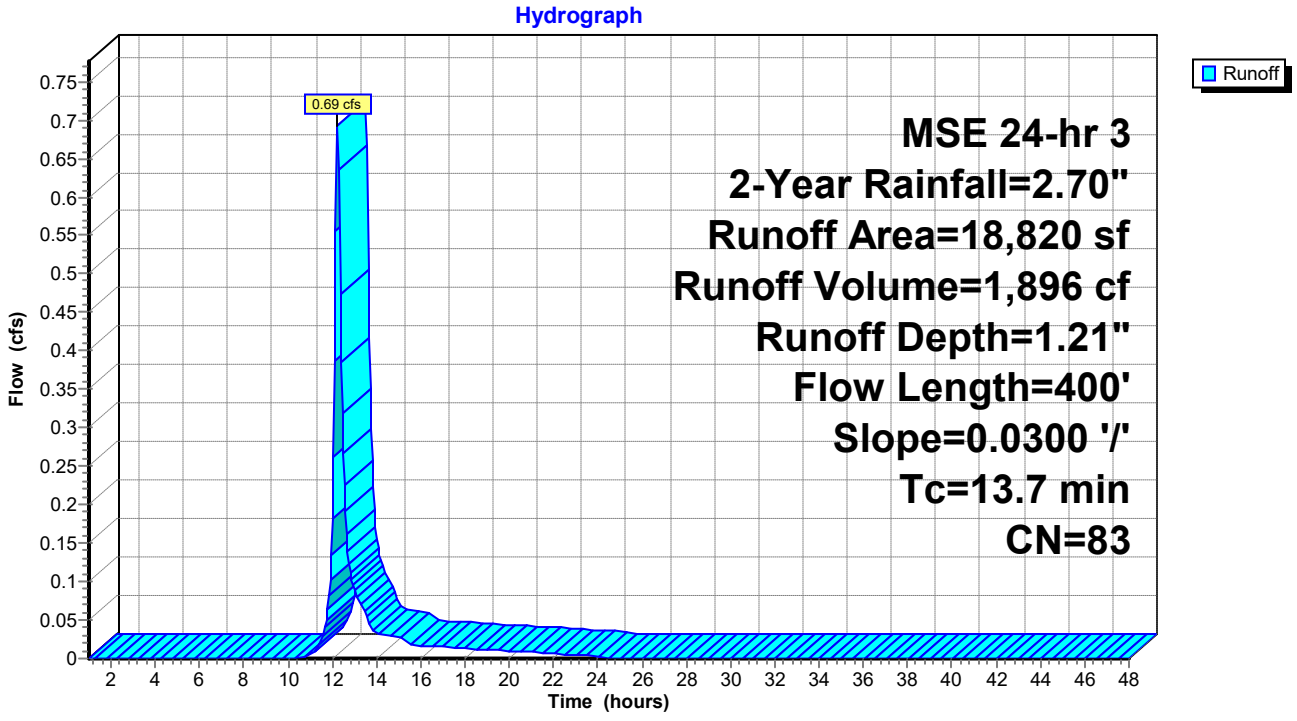
Runoff = 0.69 cfs @ 12.23 hrs, Volume= 1,896 cf, Depth= 1.21"
Routed to Pond 60P : Infiltration Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	11,460	74	landscape
*	7,360	98	roofs
	18,820	83	Weighted Average
	11,460		60.89% Pervious Area
	7,360		39.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0300	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.42"
4.1	300	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.7	400	Total			

Subcatchment 96S: E2



Summary for Subcatchment 97S: C2

Subset C - C1
3/3/21
Southern portion of East Building Roof, Southern Building (Middle one) roof, pond area
pipe from roofs not sized yet

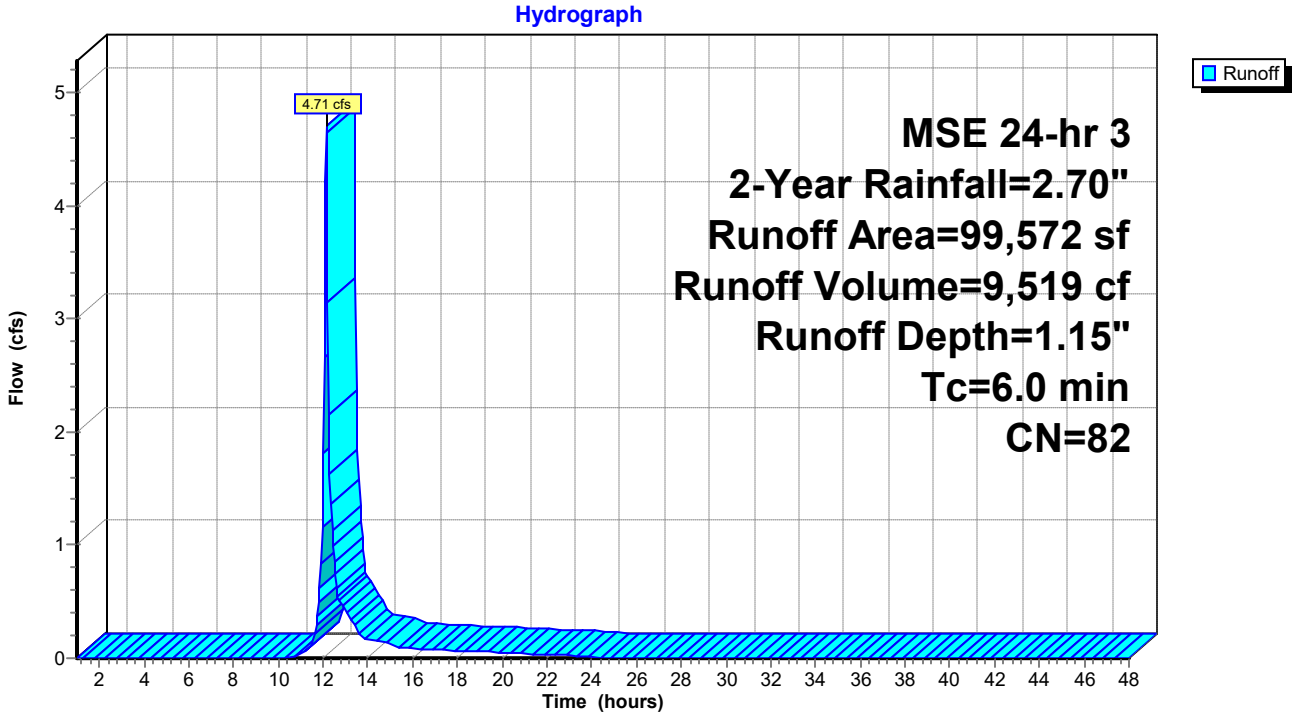
Runoff = 4.71 cfs @ 12.14 hrs, Volume= 9,519 cf, Depth= 1.15"
Routed to Pond 58P : Dry Pond 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	9,728	98	walks and patios
*	23,739	98	roofs
*	66,105	74	landscape
	99,572	82	Weighted Average
	66,105		66.39% Pervious Area
	33,467		33.61% Impervious Area

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

Subcatchment 97S: C2



Summary for Subcatchment 98S: E3

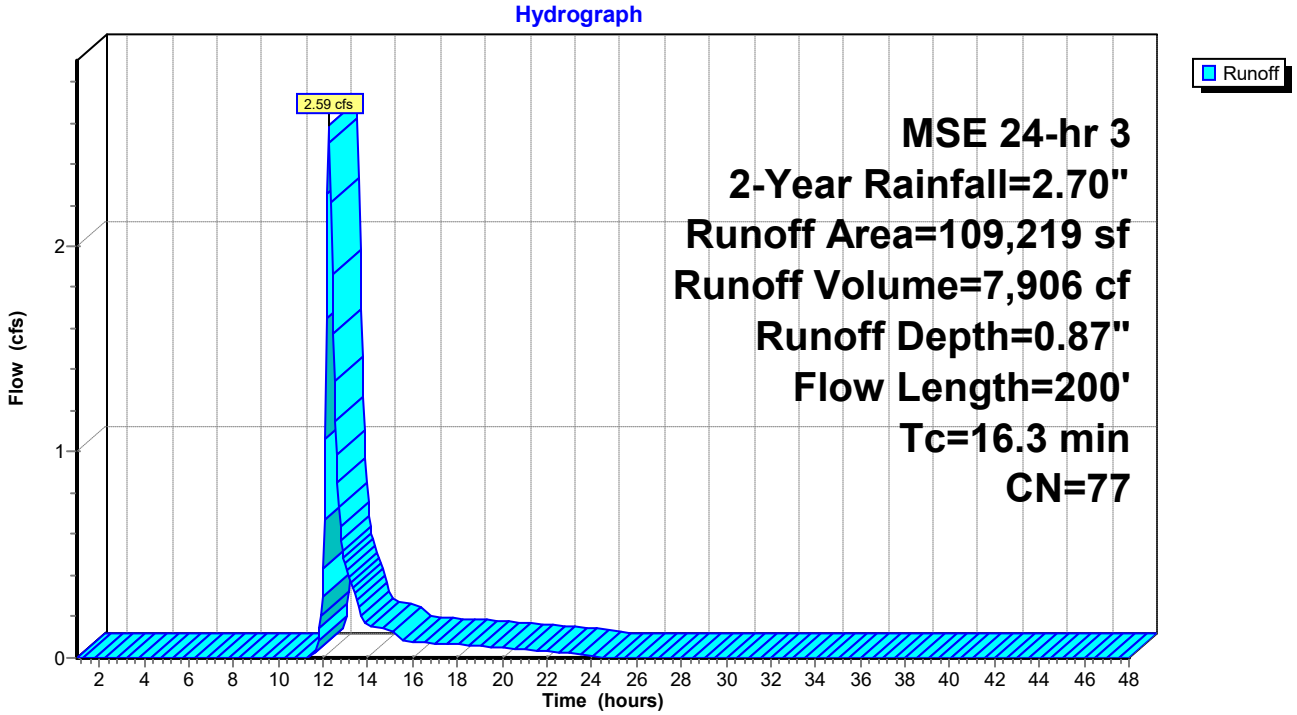
Runoff = 2.59 cfs @ 12.27 hrs, Volume= 7,906 cf, Depth= 0.87"
Routed to Pond 60P : Infiltration Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	6,532	98	walks
*	8,300	98	Roads
*	94,387	74	landscape
	109,219	77	Weighted Average
	94,387		86.42% Pervious Area
	14,832		13.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	100	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.42"
1.4	100	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
16.3	200	Total			

Subcatchment 98S: E3



Summary for Subcatchment 105S: C (EXTERIOR)

Subset C - C1
3/3/21
Southern portion of East Building Roof, Southern Building (Middle one) roof, pond area
pipe from roofs not sized yet

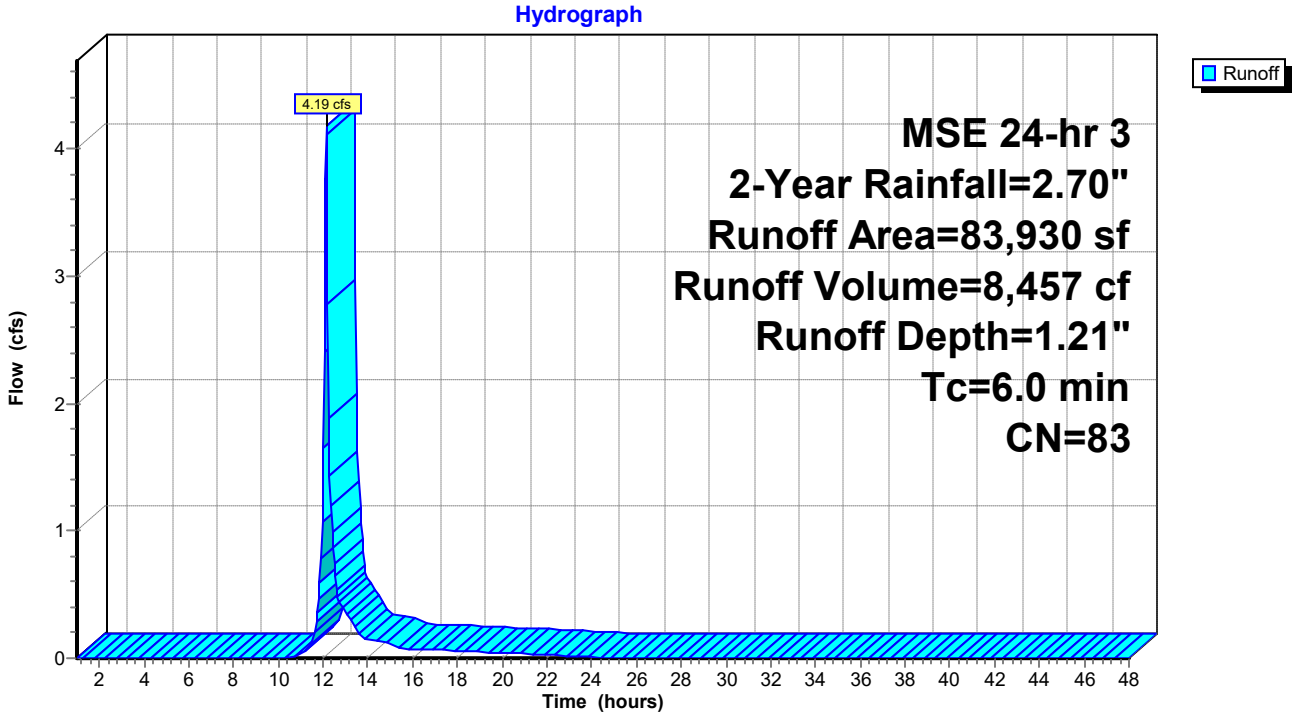
Runoff = 4.19 cfs @ 12.14 hrs, Volume= 8,457 cf, Depth= 1.21"
Routed to Reach 99R : East Swale (SE End)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	8,648	98	walks and patios
*	24,058	98	roofs
*	51,224	74	landscape
	83,930	83	Weighted Average
	51,224		61.03% Pervious Area
	32,706		38.97% Impervious Area

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

Subcatchment 105S: C (EXTERIOR)



Summary for Subcatchment 106S: B

3/3/21
North face of West Building, Lawn Area south of WTP, Patios

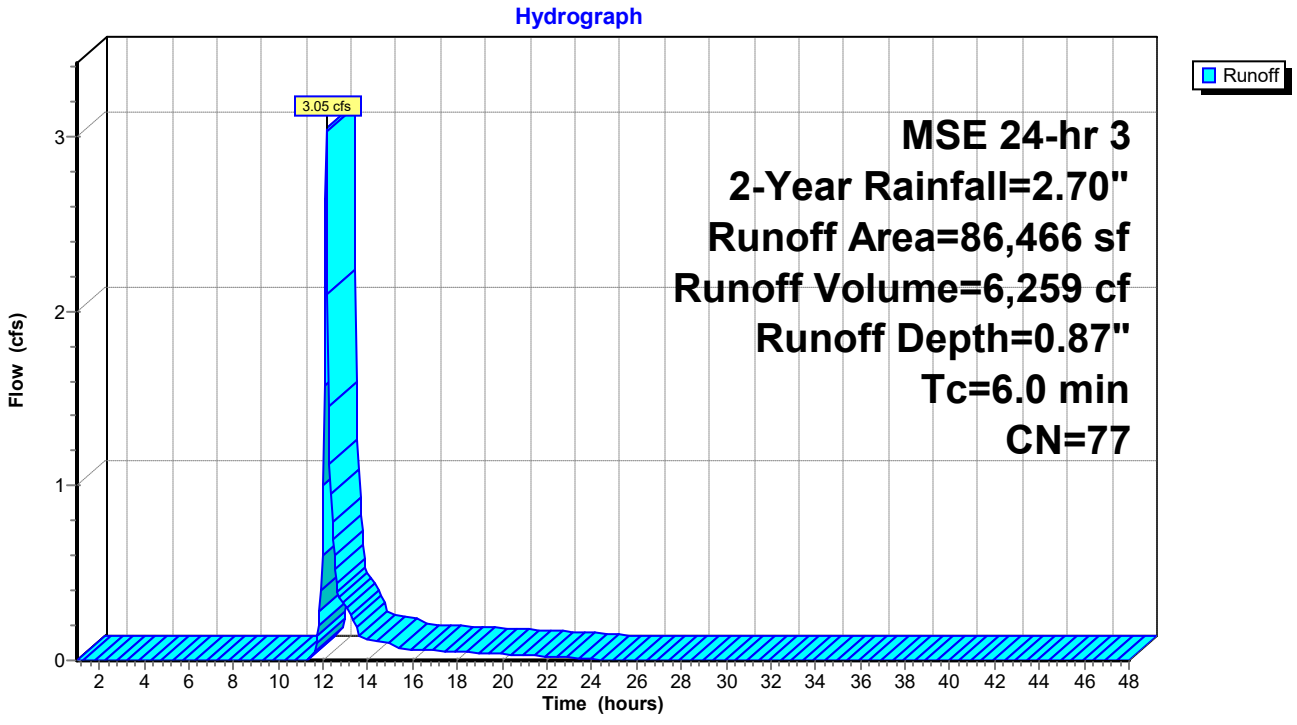
Runoff = 3.05 cfs @ 12.14 hrs, Volume= 6,259 cf, Depth= 0.87"
Routed to Reach 111R : Western PL North Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	76,225	74	landscape
*	9,317	98	walks
*	924	98	roof
	86,466	77	Weighted Average
	76,225		88.16% Pervious Area
	10,241		11.84% Impervious Area

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

Subcatchment 106S: B



Summary for Subcatchment 107S: F

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

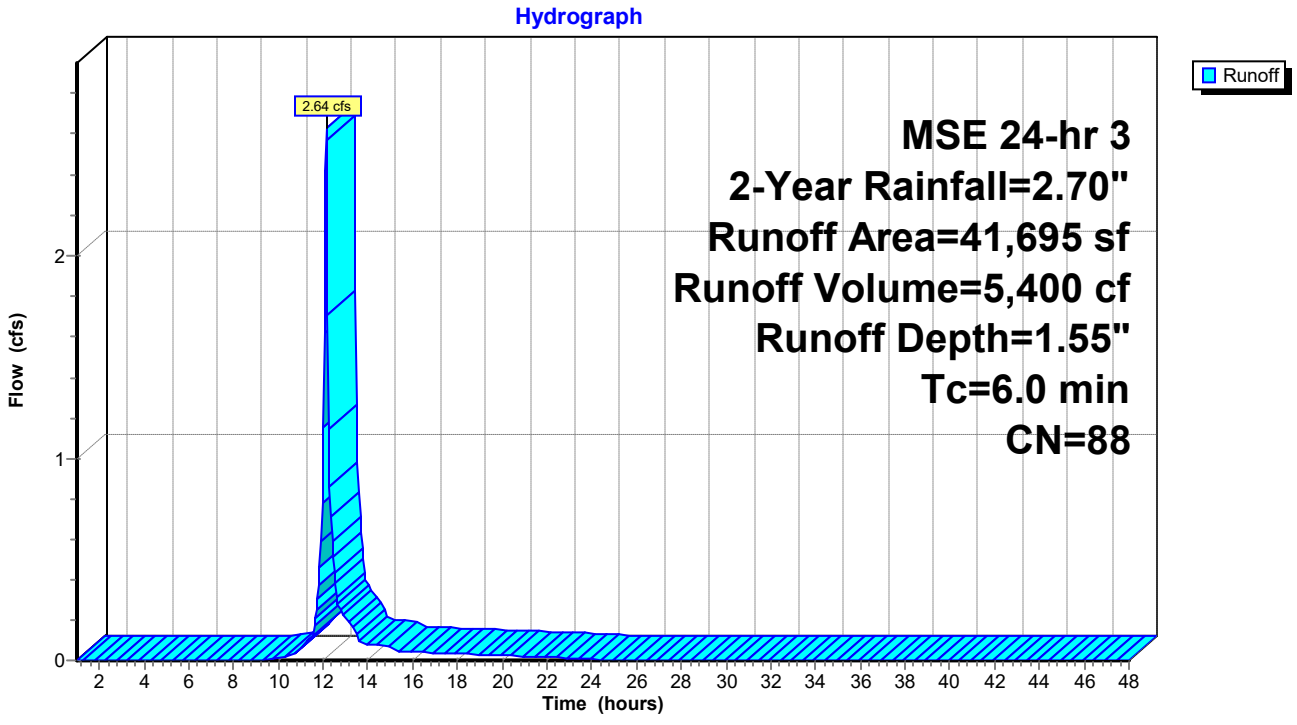
Runoff = 2.64 cfs @ 12.13 hrs, Volume= 5,400 cf, Depth= 1.55"
Routed to Reach 109R : SC Road East Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	7,467	98	roads
*	17,550	98	roof
*	16,678	74	landscape
	41,695	88	Weighted Average
	16,678		40.00% Pervious Area
	25,017		60.00% Impervious Area

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

Subcatchment 107S: F



Summary for Subcatchment 108S: B1 (INTERIOR)

3/3/21
Northern portion of W building roof

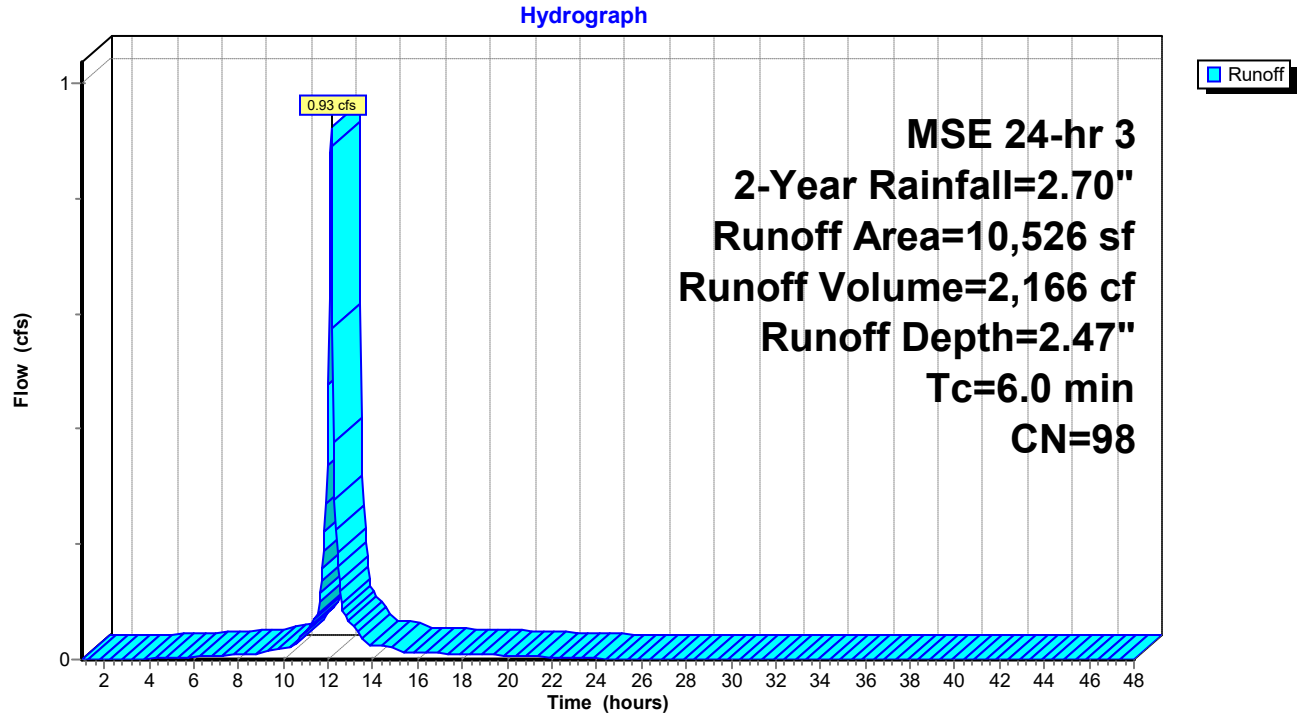
Runoff = 0.93 cfs @ 12.13 hrs, Volume= 2,166 cf, Depth= 2.47"
Routed to Link 174L : 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	10,526	98	roof
	10,526		100.00% Impervious Area

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

Subcatchment 108S: B1 (INTERIOR)



Summary for Subcatchment 112S: D3

3/3/21
Western Building Courtyard (need to check that Joe's overall B works with B1-B4 in our update

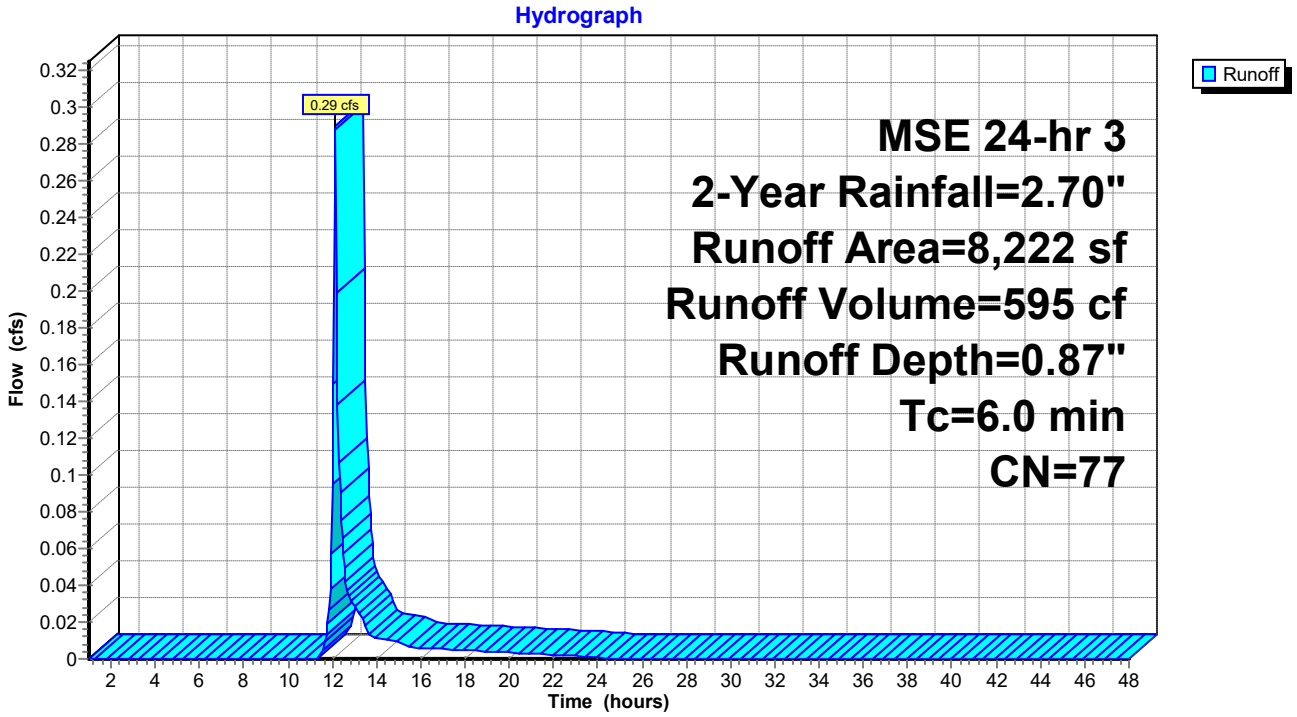
Runoff = 0.29 cfs @ 12.14 hrs, Volume= 595 cf, Depth= 0.87"
Routed to Reach 151R : Western PL North Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	1,062	98	walks
*	7,160	74	landscape
	8,222	77	Weighted Average
	7,160		87.08% Pervious Area
	1,062		12.92% Impervious Area

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

Subcatchment 112S: D3



Summary for Subcatchment 118S: A14

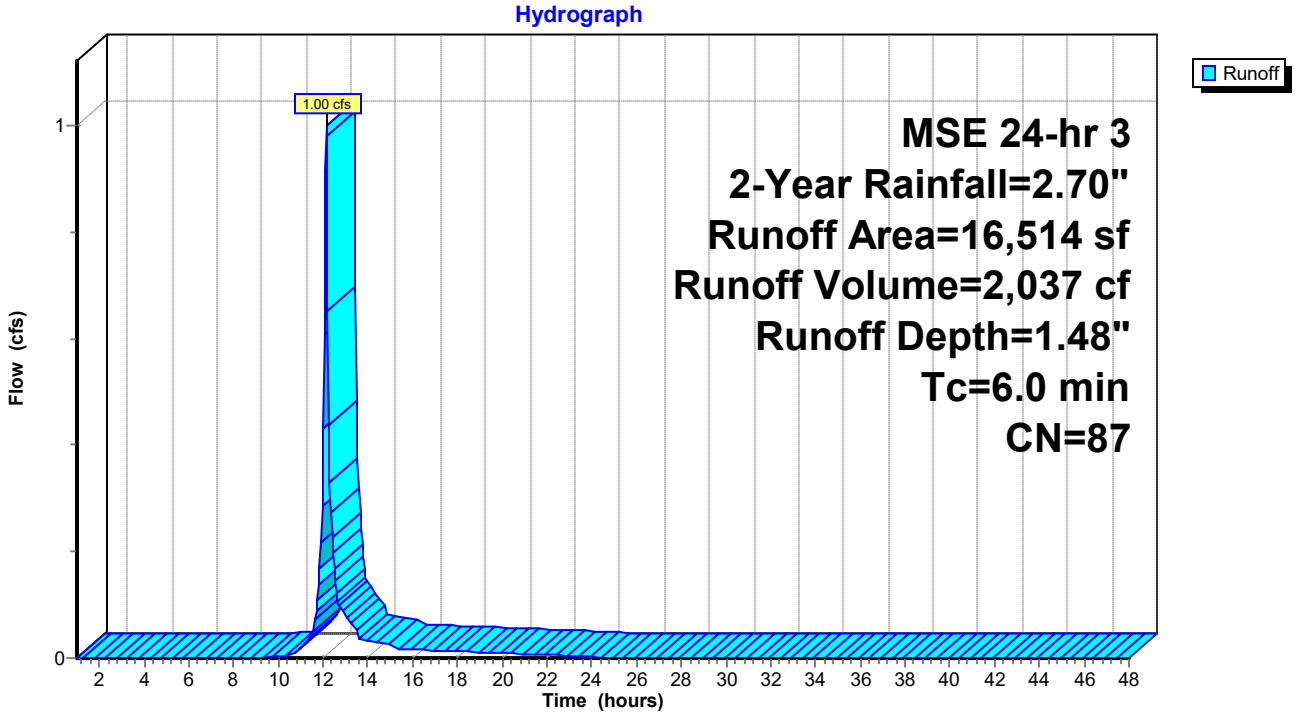
Runoff = 1.00 cfs @ 12.13 hrs, Volume= 2,037 cf, Depth= 1.48"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	3,919	98	WALKS
*	5,040	98	ROADS
*	0	98	ROOF
*	7,555	74	LANDSCAPING
	16,514	87	Weighted Average
	7,555		45.75% Pervious Area
	8,959		54.25% Impervious Area

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

Subcatchment 118S: A14



Summary for Subcatchment 120S: A30

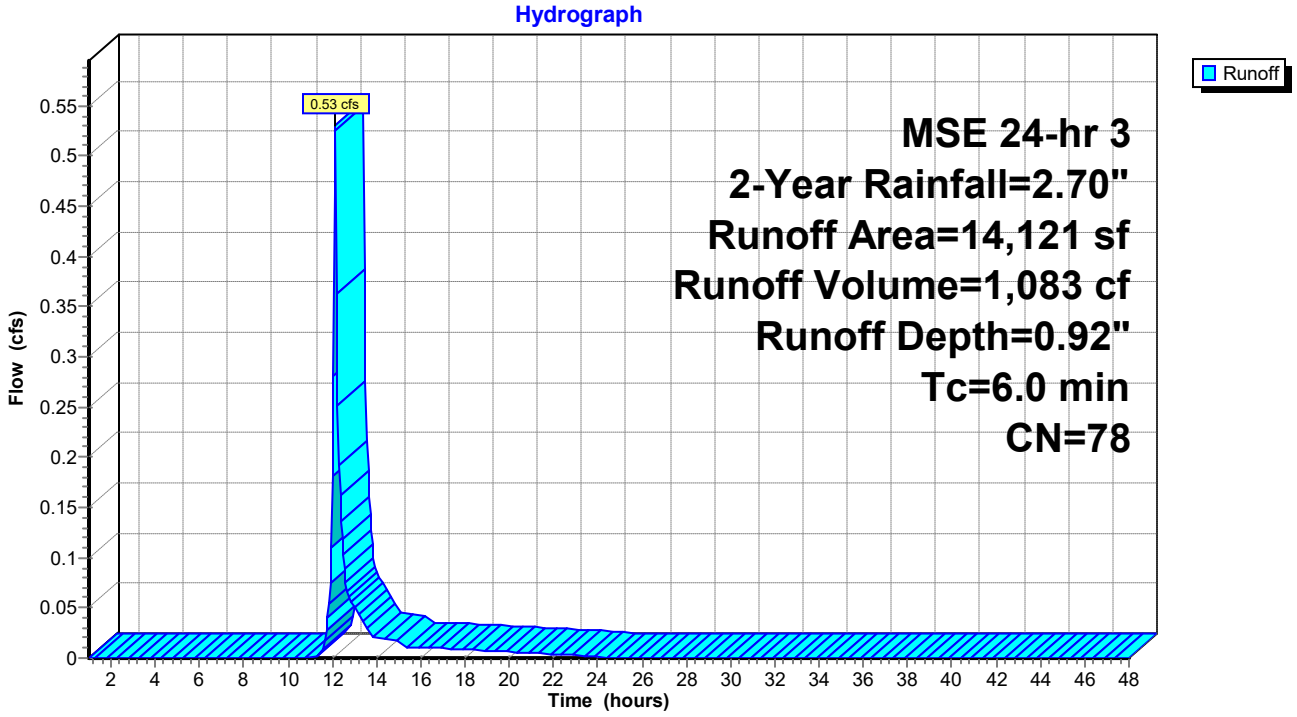
Runoff = 0.53 cfs @ 12.14 hrs, Volume= 1,083 cf, Depth= 0.92"
Routed to Link 126L : OVERSIZED PIPE RUN BY B3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	1,025	98	WALKS
*	1,563	98	ROADS
*	0	98	ROOF
*	11,533	74	LANDSCAPING
	14,121	78	Weighted Average
	11,533		81.67% Pervious Area
	2,588		18.33% Impervious Area

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

Subcatchment 120S: A30



Summary for Subcatchment 121S: A32

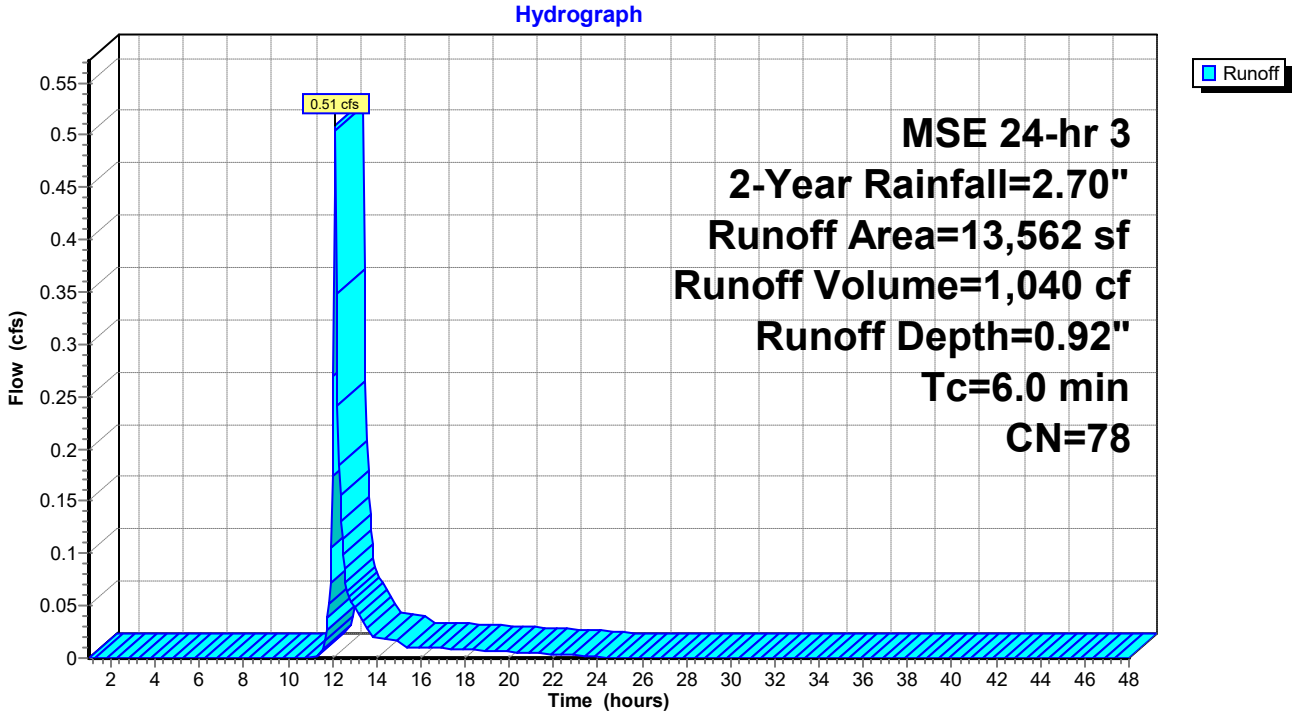
Runoff = 0.51 cfs @ 12.14 hrs, Volume= 1,040 cf, Depth= 0.92"
Routed to Link 126L : OVERSIZED PIPE RUN BY B3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	808	98	WALKS
*	1,224	98	ROADS
*	0	98	ROOF
*	11,530	74	LANDSCAPING
	13,562	78	Weighted Average
	11,530		85.02% Pervious Area
	2,032		14.98% Impervious Area

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

Subcatchment 121S: A32



Summary for Subcatchment 122S: F1

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

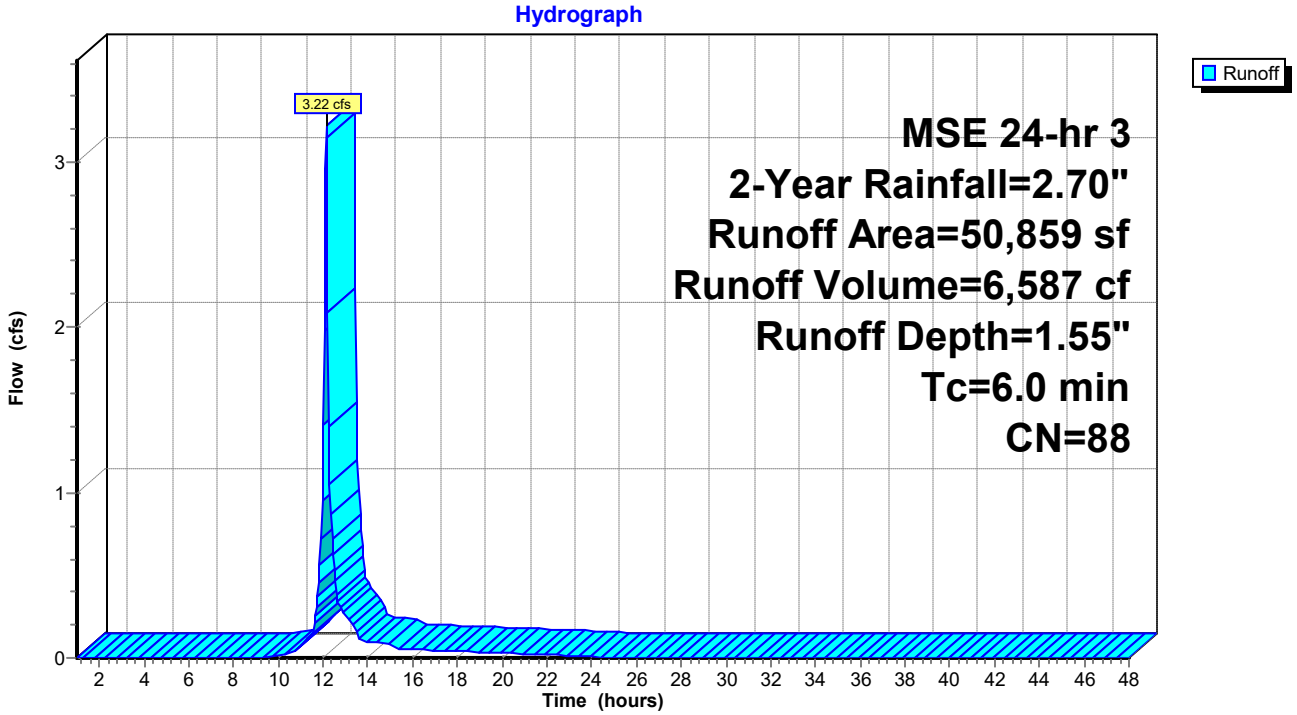
Runoff = 3.22 cfs @ 12.13 hrs, Volume= 6,587 cf, Depth= 1.55"
Routed to Reach 117R : SC Road West Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	244	98	walks
*	10,158	98	roads
*	18,836	98	roof
*	21,621	74	landscape
	50,859	88	Weighted Average
	21,621		42.51% Pervious Area
	29,238		57.49% Impervious Area

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

Subcatchment 122S: F1



Summary for Subcatchment 125S: F3

3/3/21
SW Lot that drains direct to SC Pond

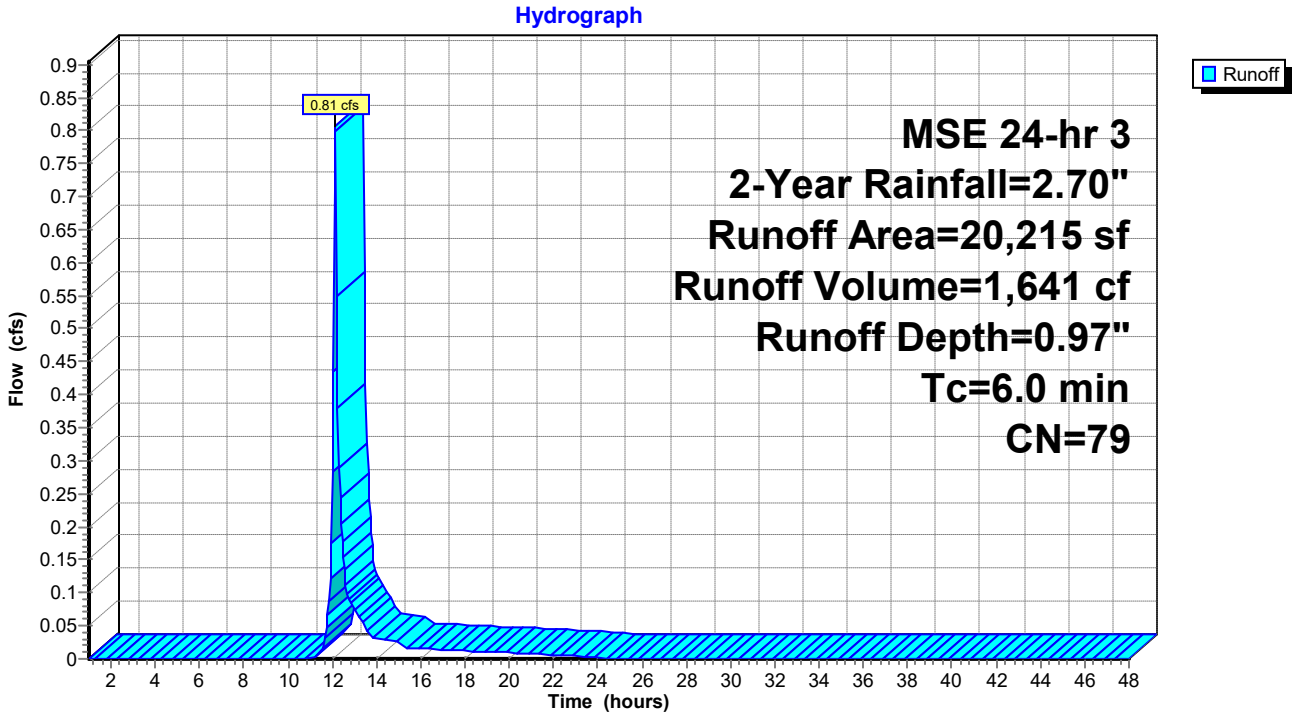
Runoff = 0.81 cfs @ 12.14 hrs, Volume= 1,641 cf, Depth= 0.97"
Routed to Reach 136R : SC West Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	4,099	98	roof
*	16,116	74	landscape
	20,215	79	Weighted Average
	16,116		79.72% Pervious Area
	4,099		20.28% Impervious Area

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

Subcatchment 125S: F3



Summary for Subcatchment 126S: F4

3/3/21
SC Pond itself

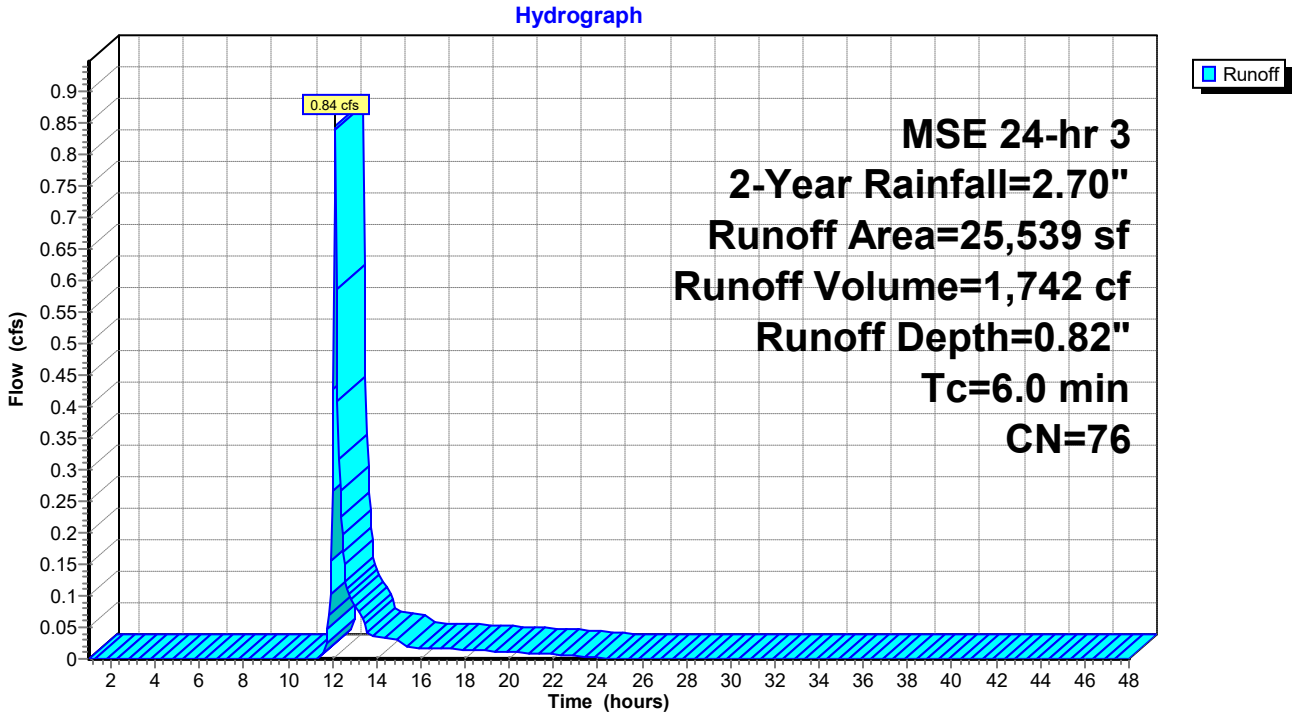
Runoff = 0.84 cfs @ 12.14 hrs, Volume= 1,742 cf, Depth= 0.82"
Routed to Pond 95P : Dry Pond 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	23,462	74	landscape
*	2,077	98	roof
	25,539	76	Weighted Average
	23,462		91.87% Pervious Area
	2,077		8.13% Impervious Area

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

Subcatchment 126S: F4



Summary for Subcatchment 127S: A13

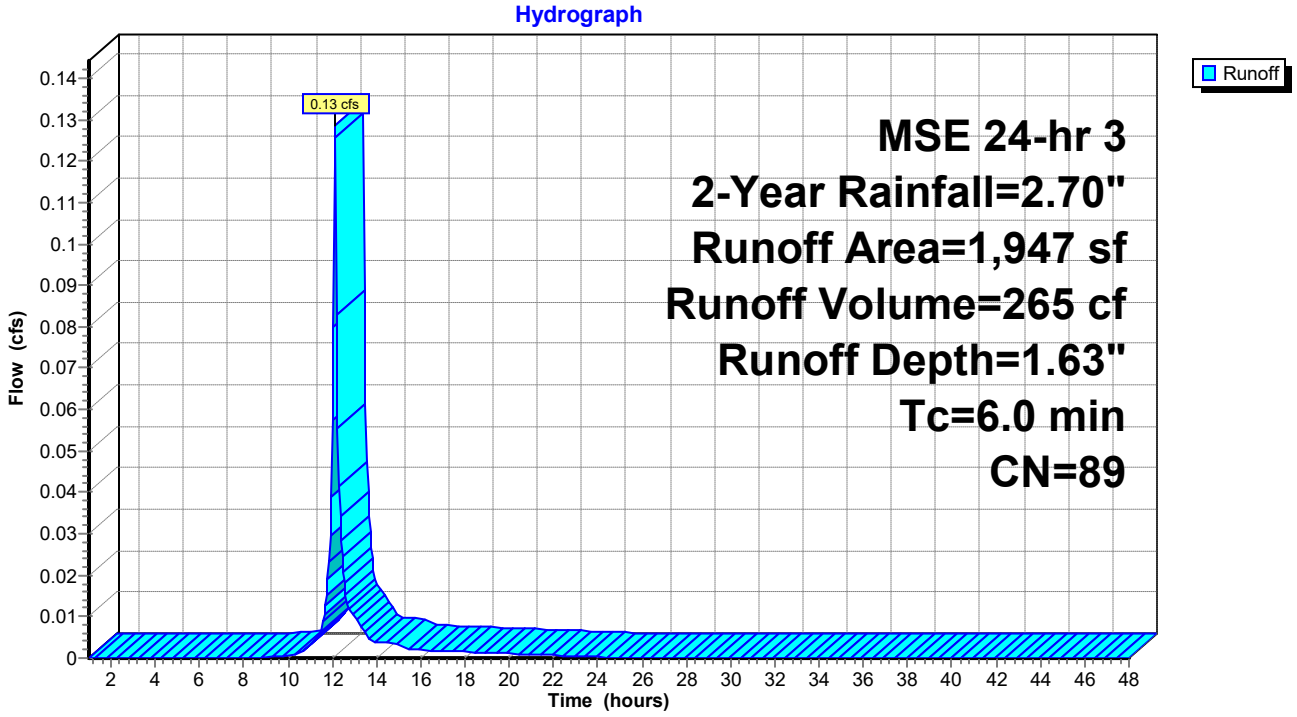
Runoff = 0.13 cfs @ 12.13 hrs, Volume= 265 cf, Depth= 1.63"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	288	98	WALKS
*	0	98	ROADS
*	924	98	ROOF
*	735	74	LANDSCAPING
	1,947	89	Weighted Average
	735		37.75% Pervious Area
	1,212		62.25% Impervious Area

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

Subcatchment 127S: A13



Summary for Subcatchment 128S: A15

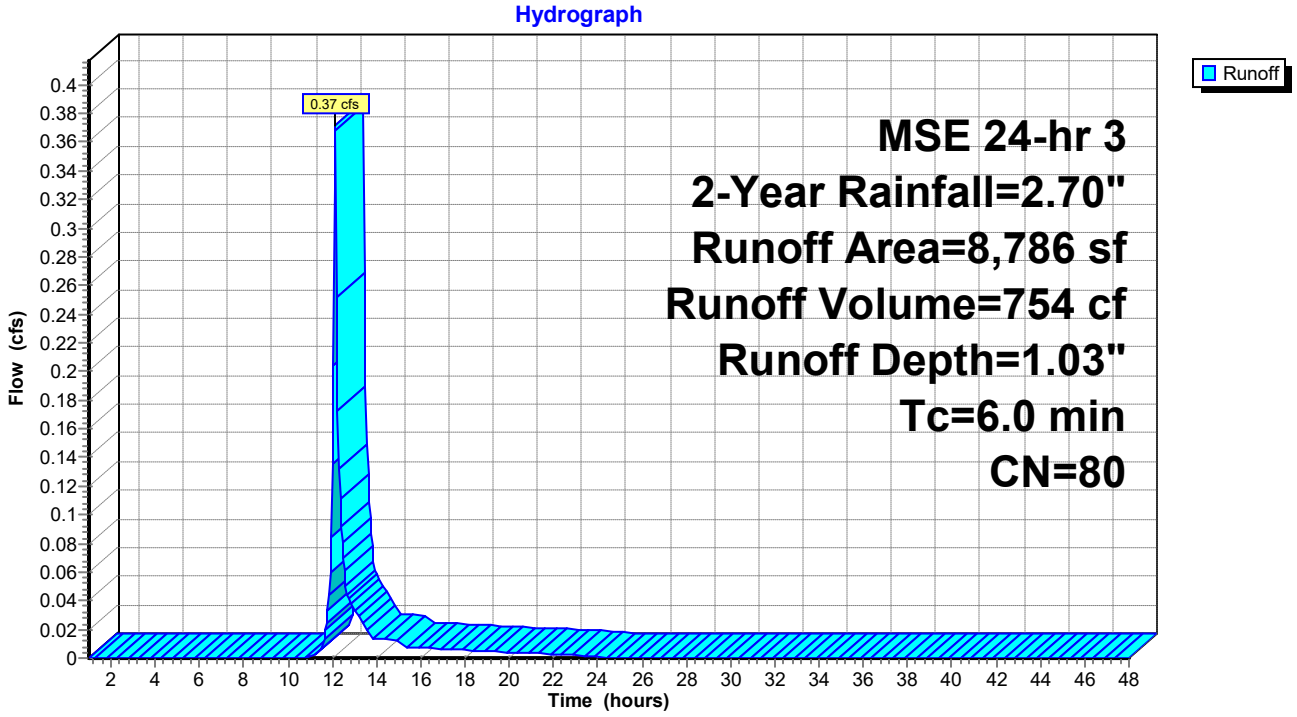
Runoff = 0.37 cfs @ 12.14 hrs, Volume= 754 cf, Depth= 1.03"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	2,261	98	WALKS
*	0	98	ROADS
*	0	98	ROOF
*	6,525	74	LANDSCAPING
	8,786	80	Weighted Average
	6,525		74.27% Pervious Area
	2,261		25.73% Impervious Area

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

Subcatchment 128S: A15



Summary for Subcatchment 130S: A12

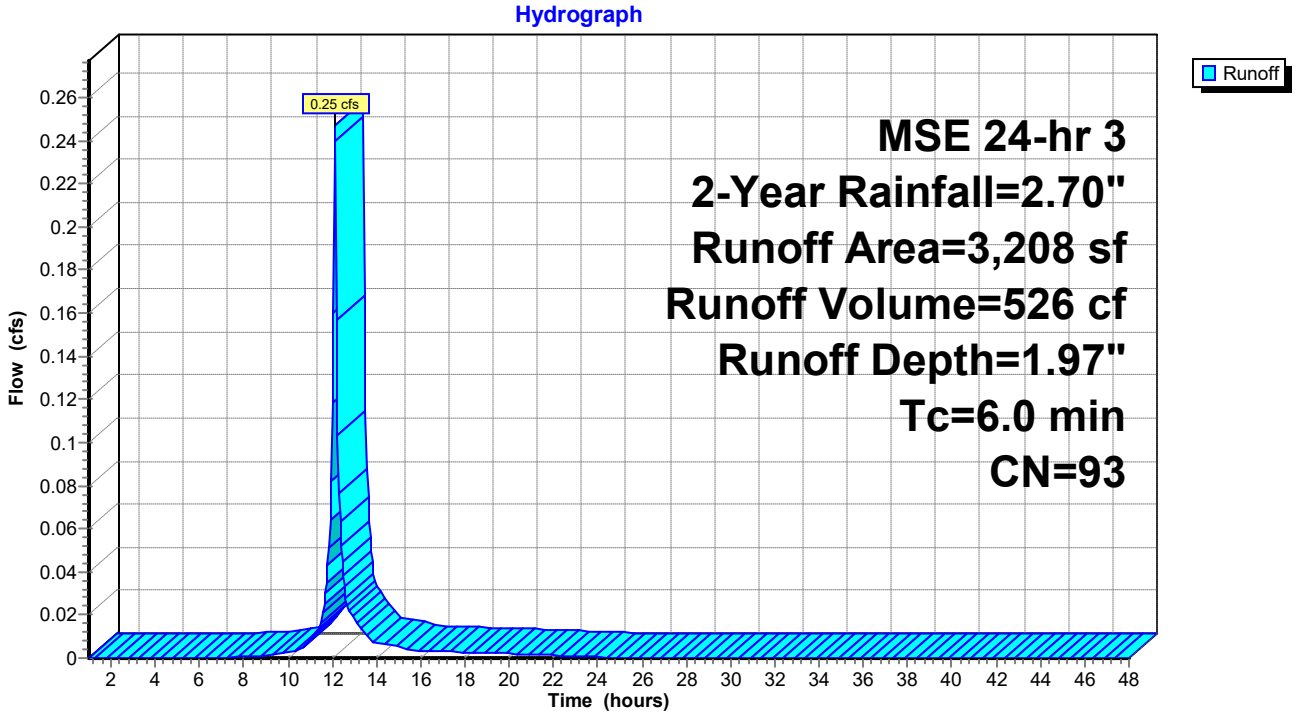
Runoff = 0.25 cfs @ 12.13 hrs, Volume= 526 cf, Depth= 1.97"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	216	98	WALKS
*	1,455	98	ROADS
*	924	98	ROOF
*	613	74	LANDSCAPING
	3,208	93	Weighted Average
	613		19.11% Pervious Area
	2,595		80.89% Impervious Area

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

Subcatchment 130S: A12



Summary for Subcatchment 131S: A11

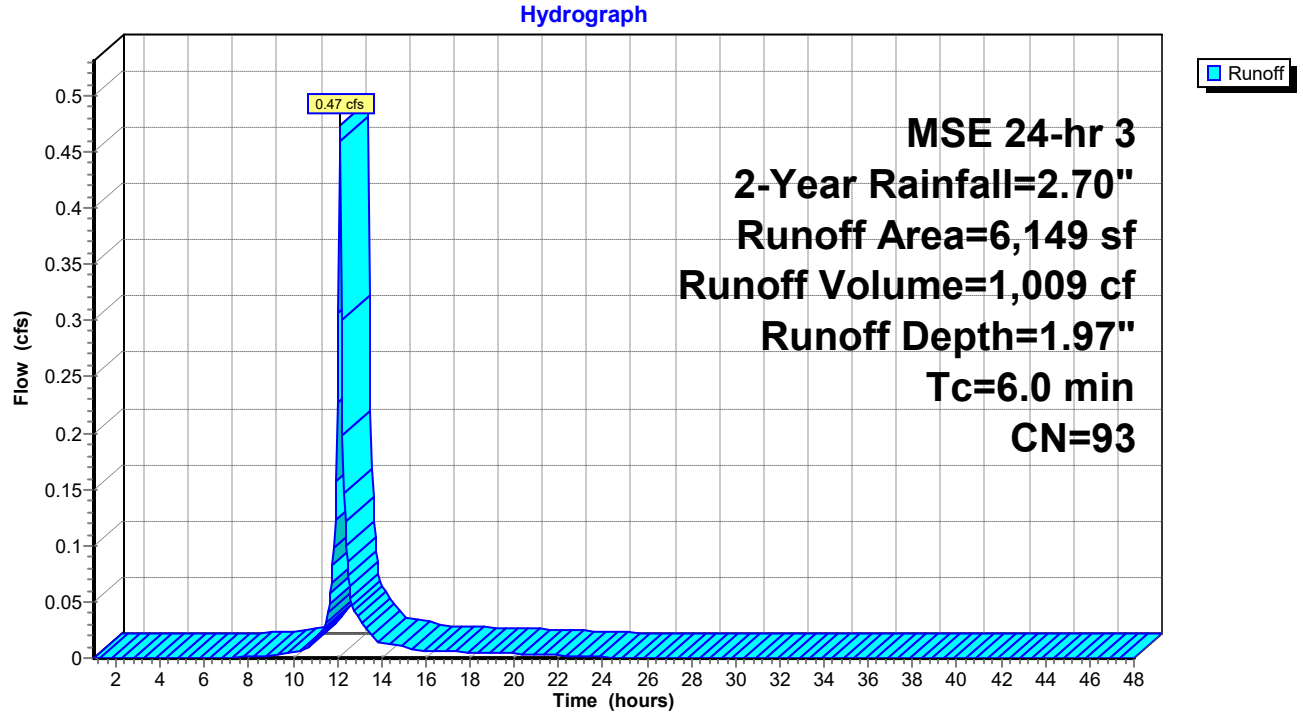
Runoff = 0.47 cfs @ 12.13 hrs, Volume= 1,009 cf, Depth= 1.97"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	1,109	98	WALKS
*	1,910	98	ROADS
*	1,848	98	ROOF
*	1,282	74	LANDSCAPING
	6,149	93	Weighted Average
	1,282		20.85% Pervious Area
	4,867		79.15% Impervious Area

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

Subcatchment 131S: A11



Summary for Subcatchment 132S: A9

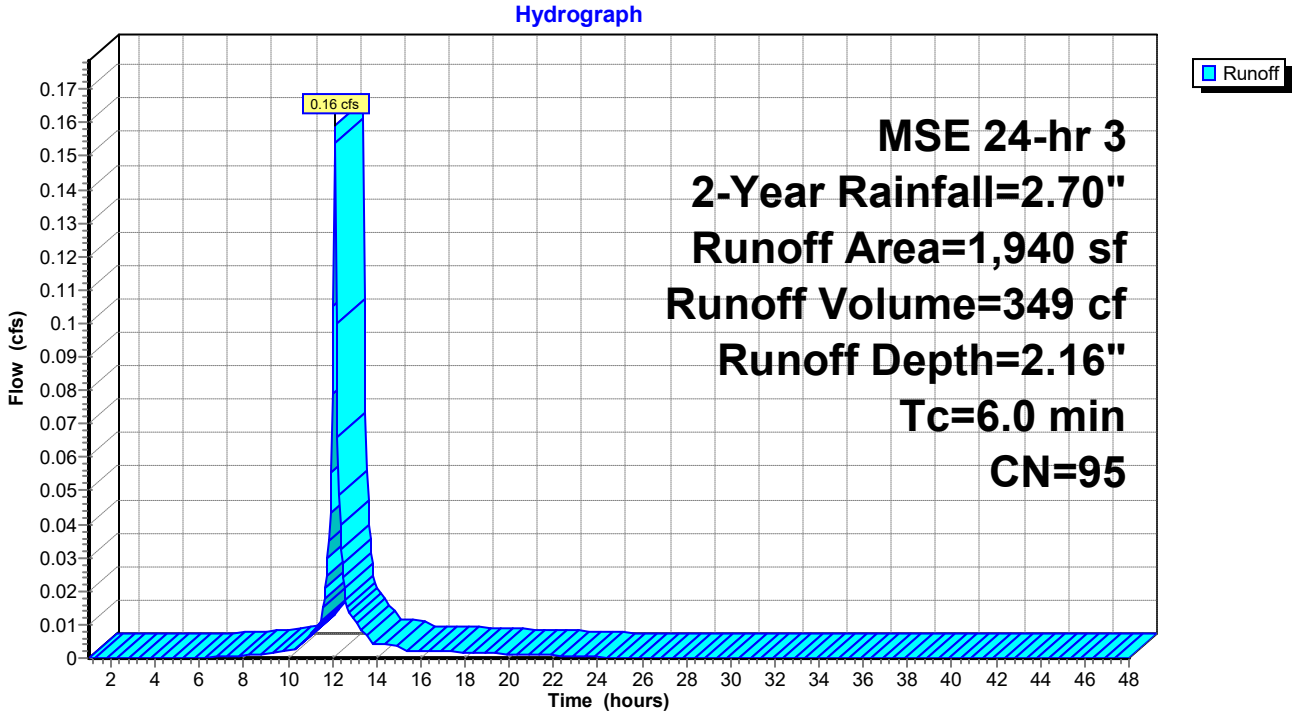
Runoff = 0.16 cfs @ 12.13 hrs, Volume= 349 cf, Depth= 2.16"
Routed to Pond 133P : WEST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	424	98	WALKS
*	321	98	ROADS
*	924	98	ROOF
*	271	74	LANDSCAPING
	1,940	95	Weighted Average
	271		13.97% Pervious Area
	1,669		86.03% Impervious Area

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

Subcatchment 132S: A9



Summary for Subcatchment 133S: A7

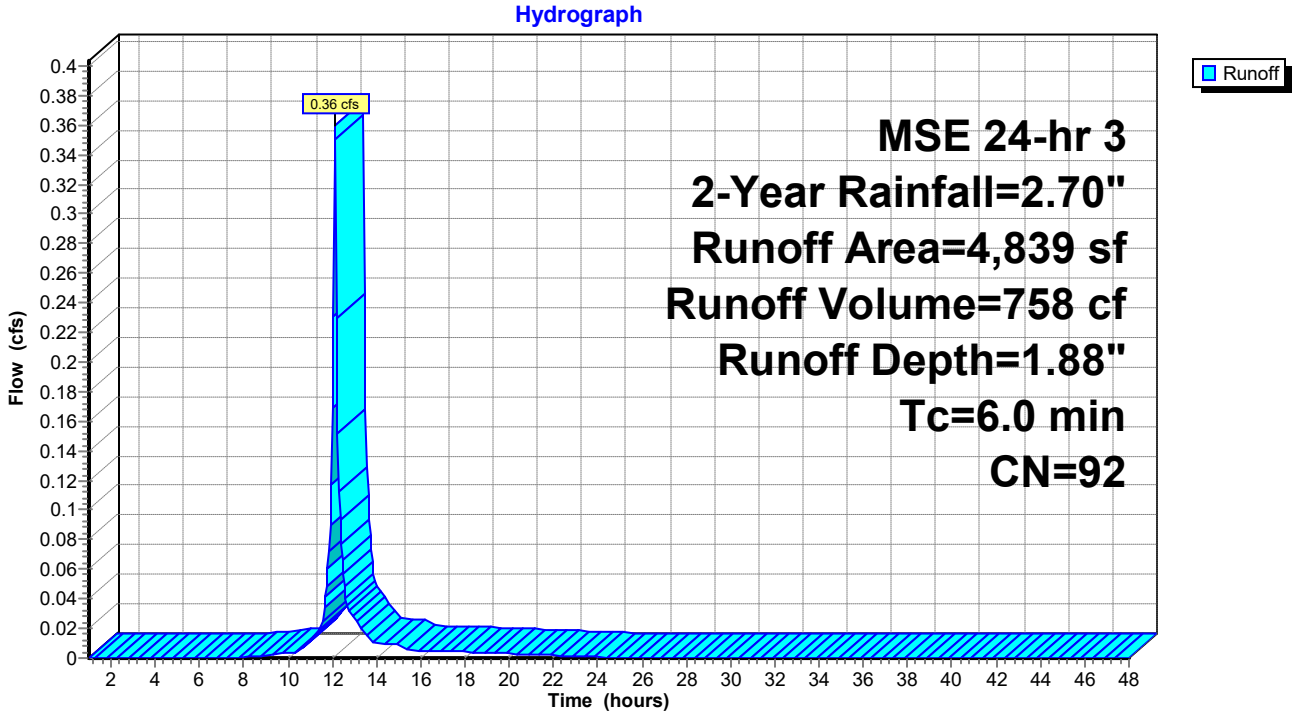
Runoff = 0.36 cfs @ 12.13 hrs, Volume= 758 cf, Depth= 1.88"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	939	98	WALKS
*	1,710	98	ROADS
*	924	98	ROOF
*	1,266	74	LANDSCAPING
	4,839	92	Weighted Average
	1,266		26.16% Pervious Area
	3,573		73.84% Impervious Area

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

Subcatchment 133S: A7



Summary for Subcatchment 134S: A5

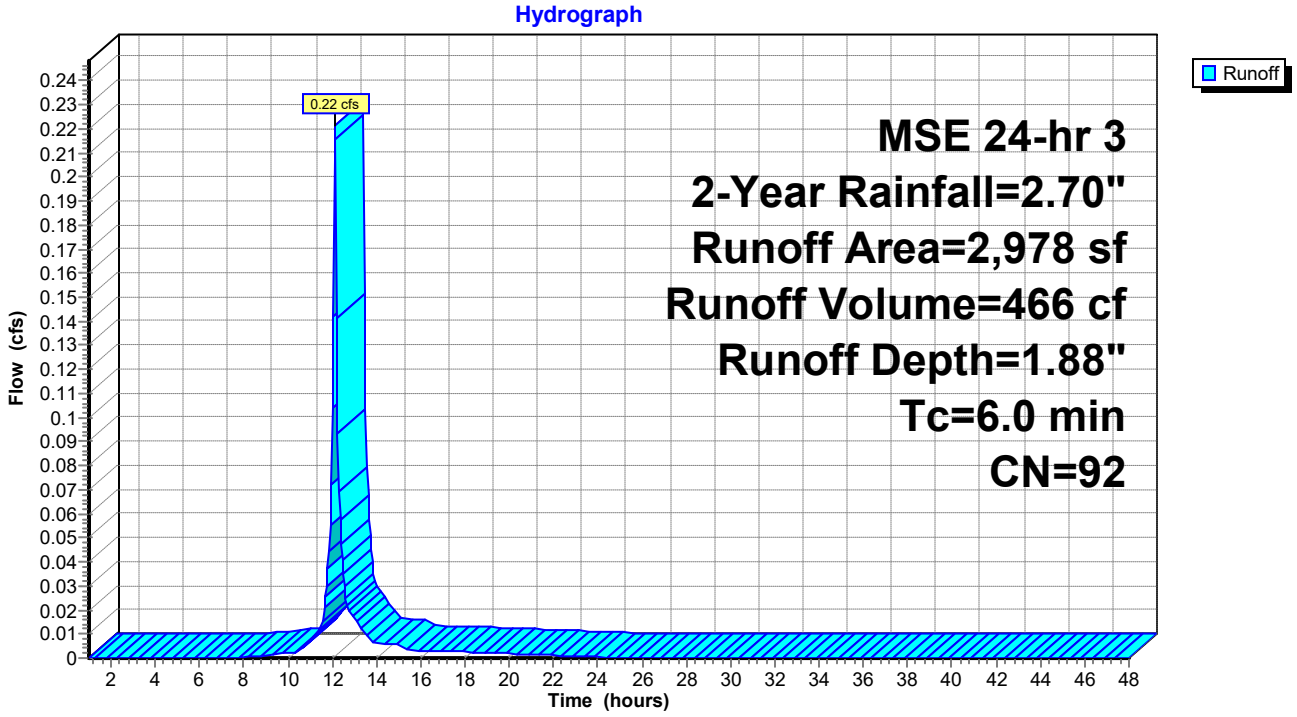
Runoff = 0.22 cfs @ 12.13 hrs, Volume= 466 cf, Depth= 1.88"
Routed to Link 127L : total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	489	98	WALKS
*	875	98	ROADS
*	924	98	ROOF
*	690	74	LANDSCAPING
	2,978	92	Weighted Average
	690		23.17% Pervious Area
	2,288		76.83% Impervious Area

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

Subcatchment 134S: A5



Summary for Subcatchment 136S: A33

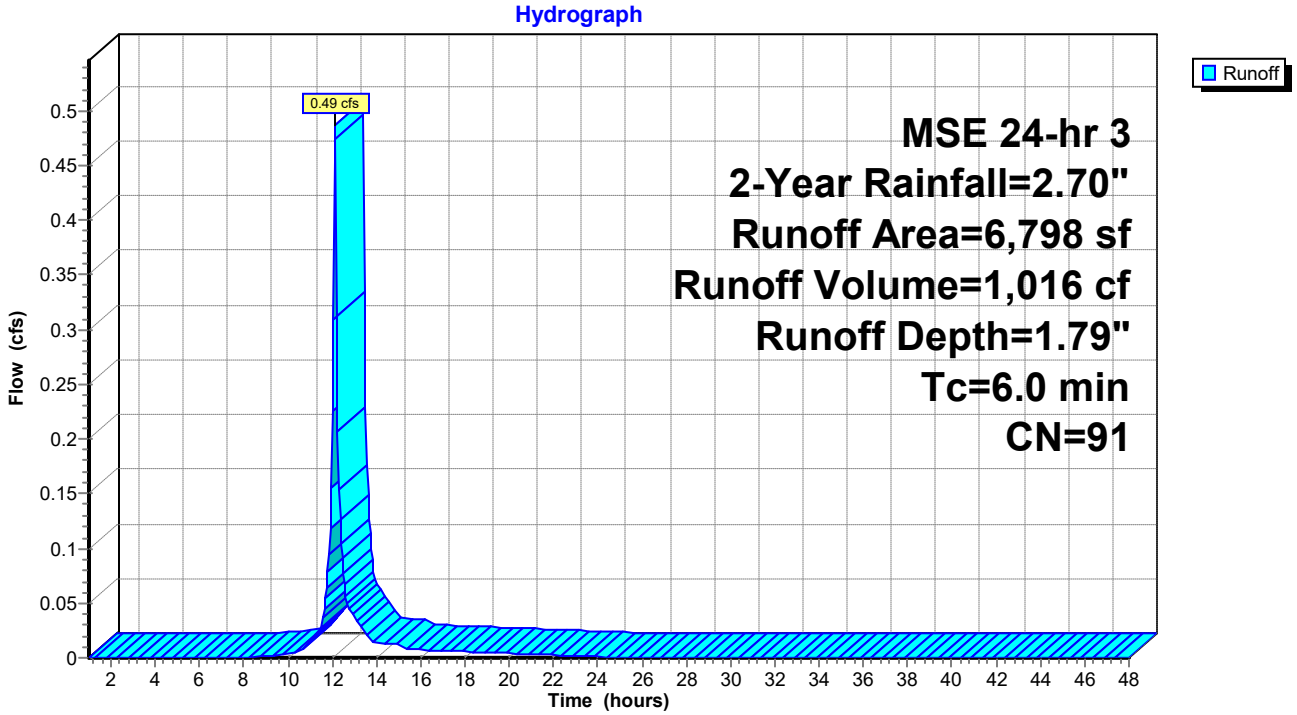
Runoff = 0.49 cfs @ 12.13 hrs, Volume= 1,016 cf, Depth= 1.79"
Routed to Link 126L : OVERSIZED PIPE RUN BY B3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	2,246	98	WALKS
*	2,695	98	ROADS
*	1,857	74	LANDSCAPING
	6,798	91	Weighted Average
	1,857		27.32% Pervious Area
	4,941		72.68% Impervious Area

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

Subcatchment 136S: A33



Summary for Subcatchment 137S: A1

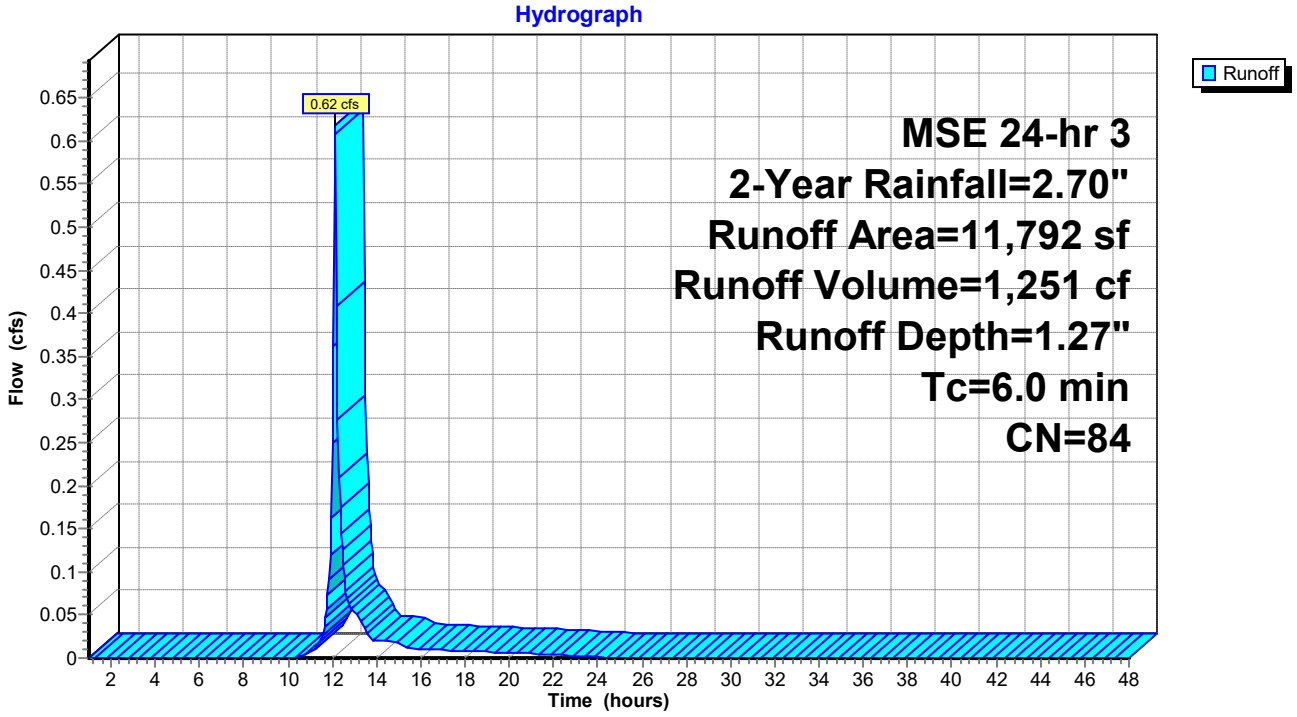
Runoff = 0.62 cfs @ 12.14 hrs, Volume= 1,251 cf, Depth= 1.27"
Routed to Pond 58P : Dry Pond 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	295	98	WALKS
*	3,348	98	ROADS
*	1,063	98	ROOF
*	7,086	74	LANDSCAPING
	11,792	84	Weighted Average
	7,086		60.09% Pervious Area
	4,706		39.91% Impervious Area

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

Subcatchment 137S: A1



Summary for Subcatchment 138S: F2

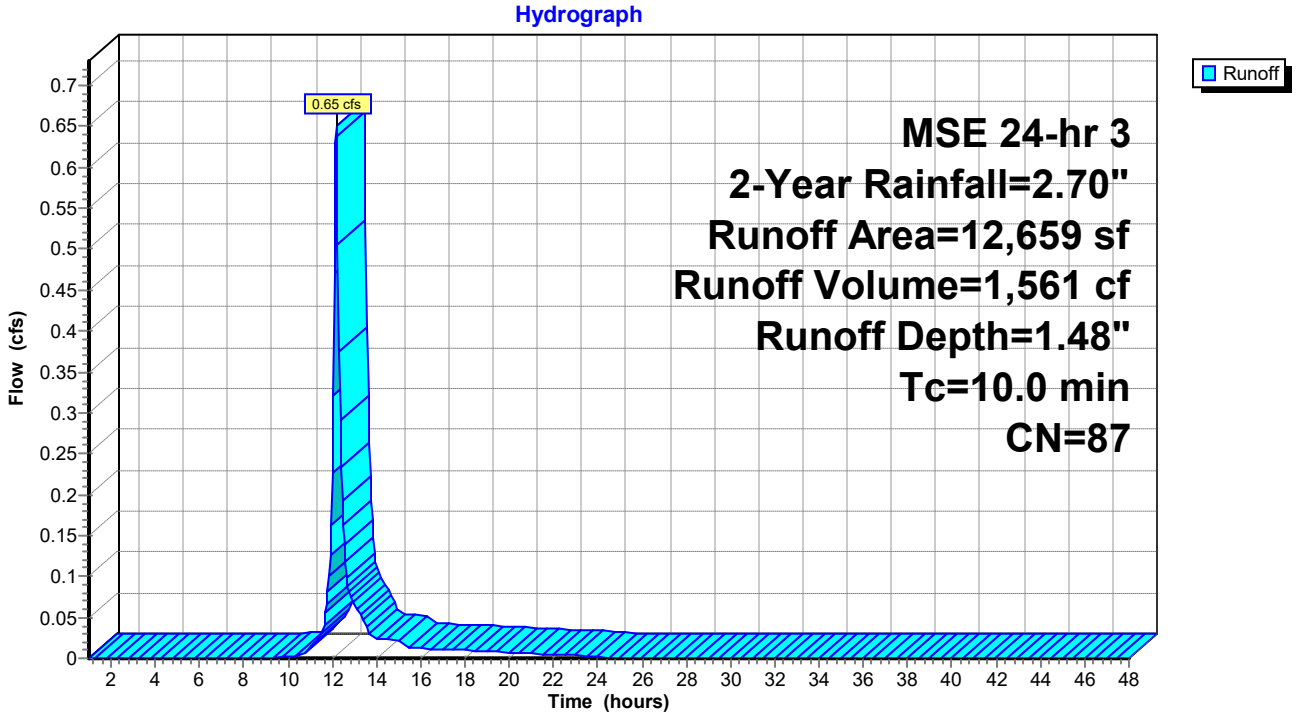
Runoff = 0.65 cfs @ 12.18 hrs, Volume= 1,561 cf, Depth= 1.48"
Routed to Pond 41P : Reach Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	5,962	74	Landscape
*	6,697	98	roof
	12,659	87	Weighted Average
	5,962		47.10% Pervious Area
	6,697		52.90% Impervious Area

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

Subcatchment 138S: F2



Summary for Subcatchment 139S: A2

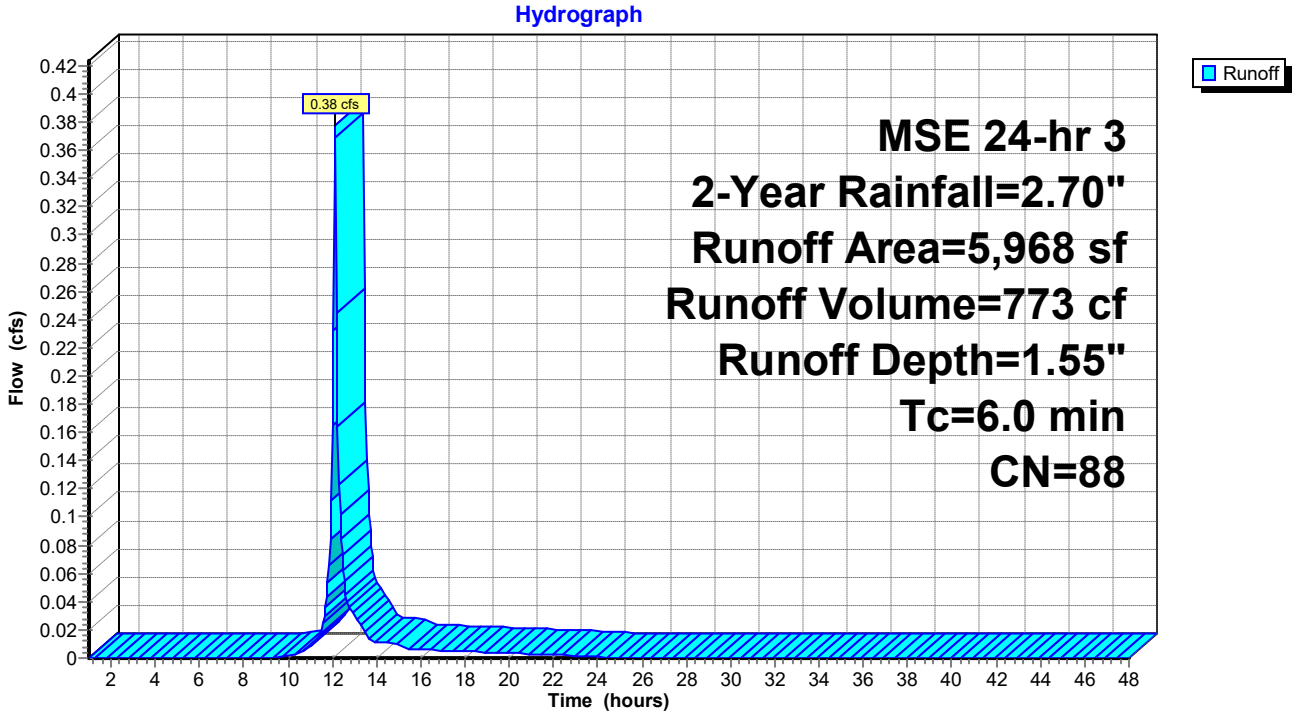
Runoff = 0.38 cfs @ 12.13 hrs, Volume= 773 cf, Depth= 1.55"
Routed to Pond 58P : Dry Pond 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	388	98	WALKS
*	2,129	98	ROADS
*	924	98	ROOF
*	2,527	74	LANDSCAPING
	5,968	88	Weighted Average
	2,527		42.34% Pervious Area
	3,441		57.66% Impervious Area

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

Subcatchment 139S: A2



Summary for Subcatchment 140S: H1

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

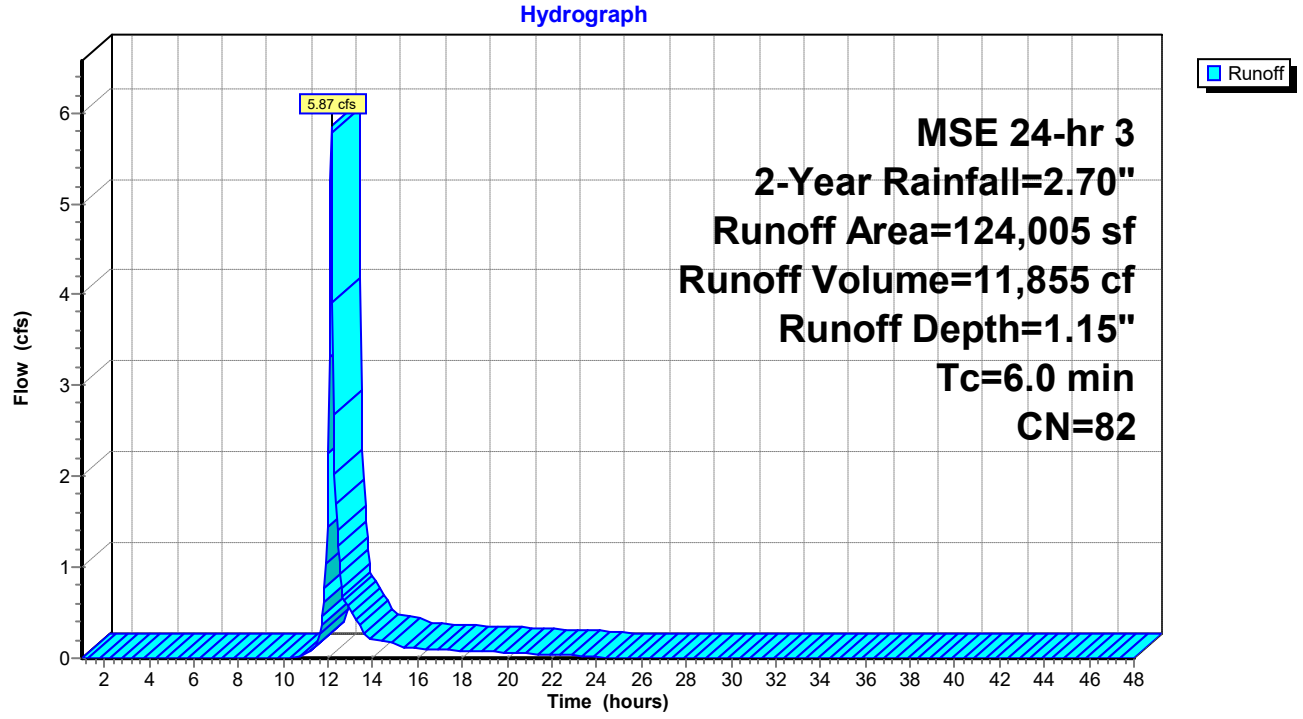
Runoff = 5.87 cfs @ 12.14 hrs, Volume= 11,855 cf, Depth= 1.15"
Routed to Reach 99R : East Swale (SE End)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	9,481	98	roads
*	24,942	98	roof
*	80,320	74	landscape
*	5,445	98	driveways and road NEW RBL
*	3,817	74	landscape NEW RBL
	124,005	82	Weighted Average
	84,137		67.85% Pervious Area
	39,868		32.15% Impervious Area

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

Subcatchment 140S: H1



Summary for Subcatchment 141S: H2

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

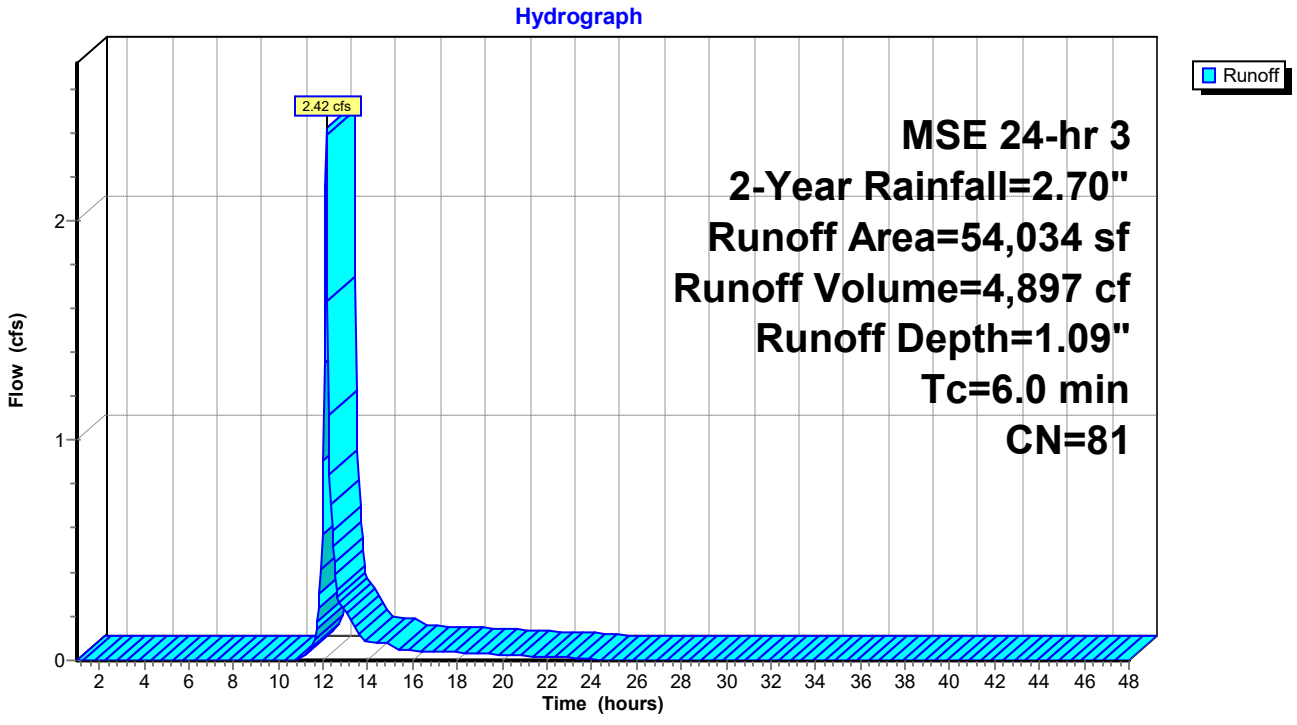
Runoff = 2.42 cfs @ 12.14 hrs, Volume= 4,897 cf, Depth= 1.09"
Routed to Reach 108R : South Berm Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	1,333	98	roads minus NEW RBL
*	14,758	98	roof
*	37,943	74	landscape minus NEW RBL
	54,034	81	Weighted Average
	37,943		70.22% Pervious Area
	16,091		29.78% Impervious Area

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

Subcatchment 141S: H2



Summary for Subcatchment 142S: H3

3/3/21
Needs to be delineated, this is from Joe's SWMP2

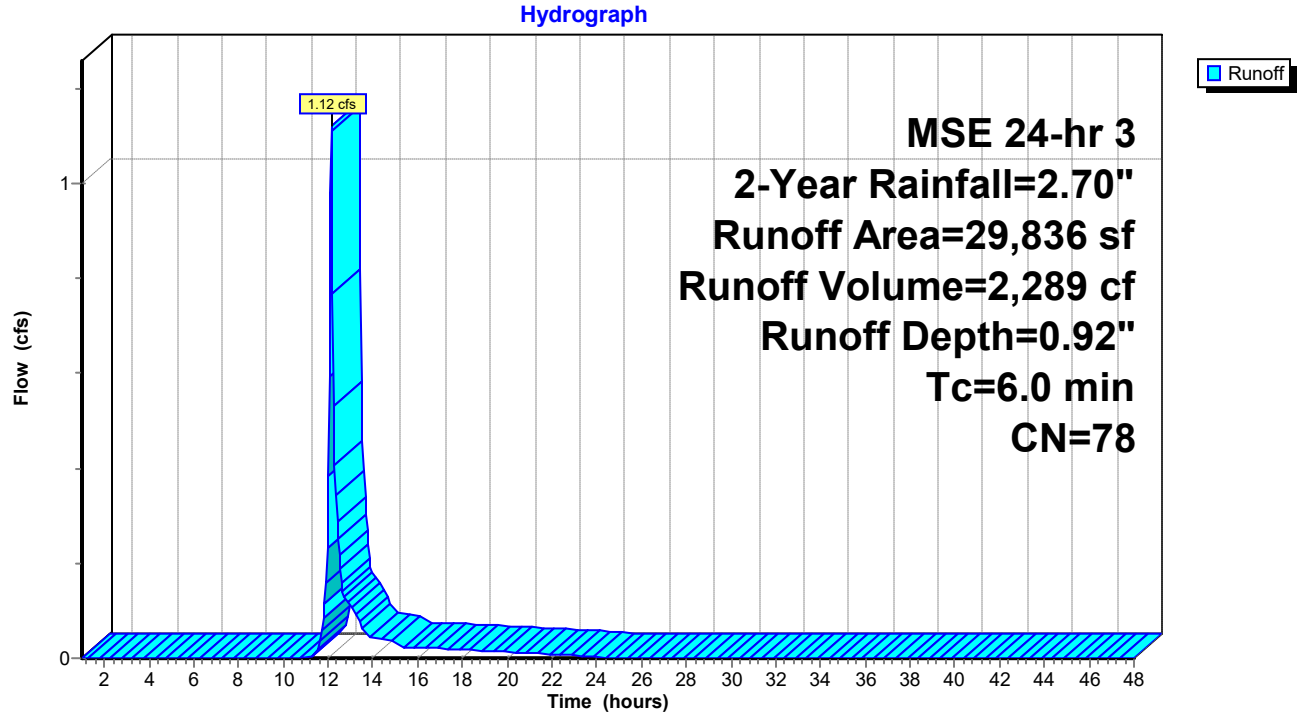
Runoff = 1.12 cfs @ 12.14 hrs, Volume= 2,289 cf, Depth= 0.92"
Routed to Reach 132R : EX. Red Barn Lane West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	1,041	98	roads
*	6,383	74	landscape
*	4,500	98	roads + roof NEW RBL
*	10,852	74	landscape NEW RBL
*	7,060	74	from H4
	29,836	78	Weighted Average
	24,295		81.43% Pervious Area
	5,541		18.57% Impervious Area

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

Subcatchment 142S: H3



Summary for Subcatchment 144S: H5

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

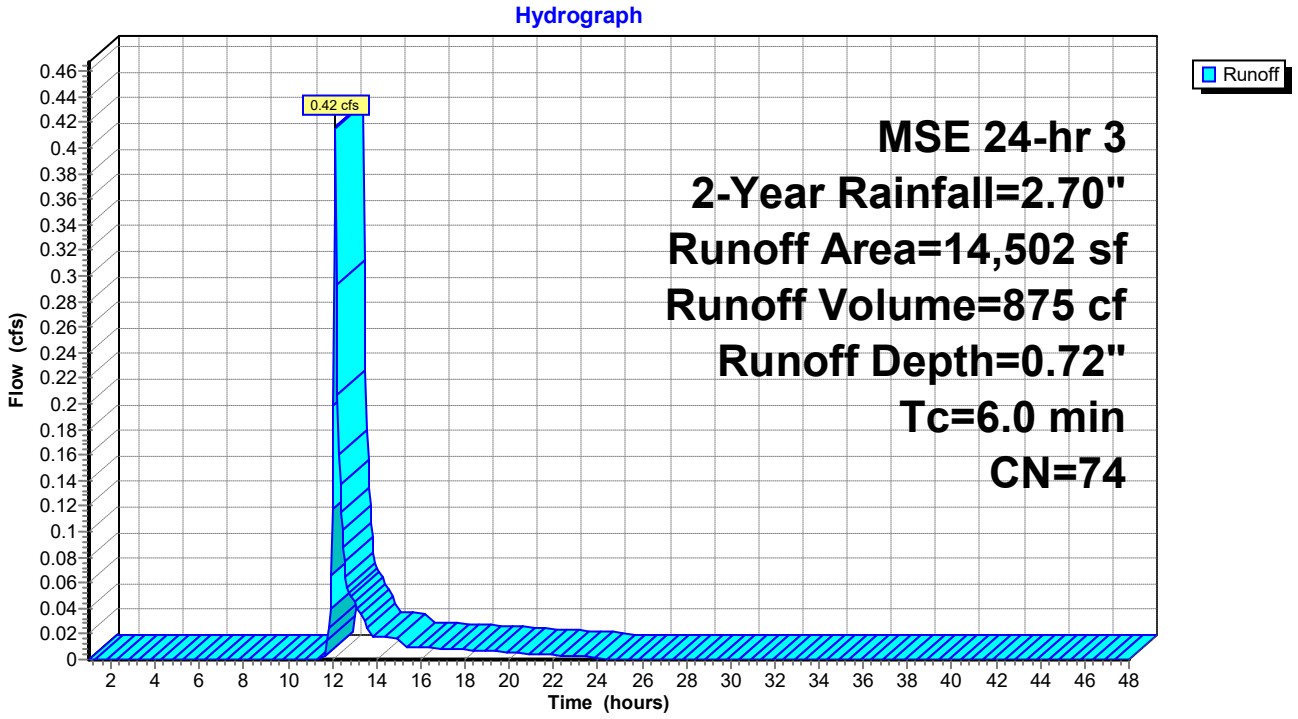
Runoff = 0.42 cfs @ 12.14 hrs, Volume= 875 cf, Depth= 0.72"
Routed to Reach 108R : South Berm Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	14,502	74	landscape
	14,502		100.00% Pervious Area

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

Subcatchment 144S: H5



Summary for Subcatchment 145S: H6-a

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

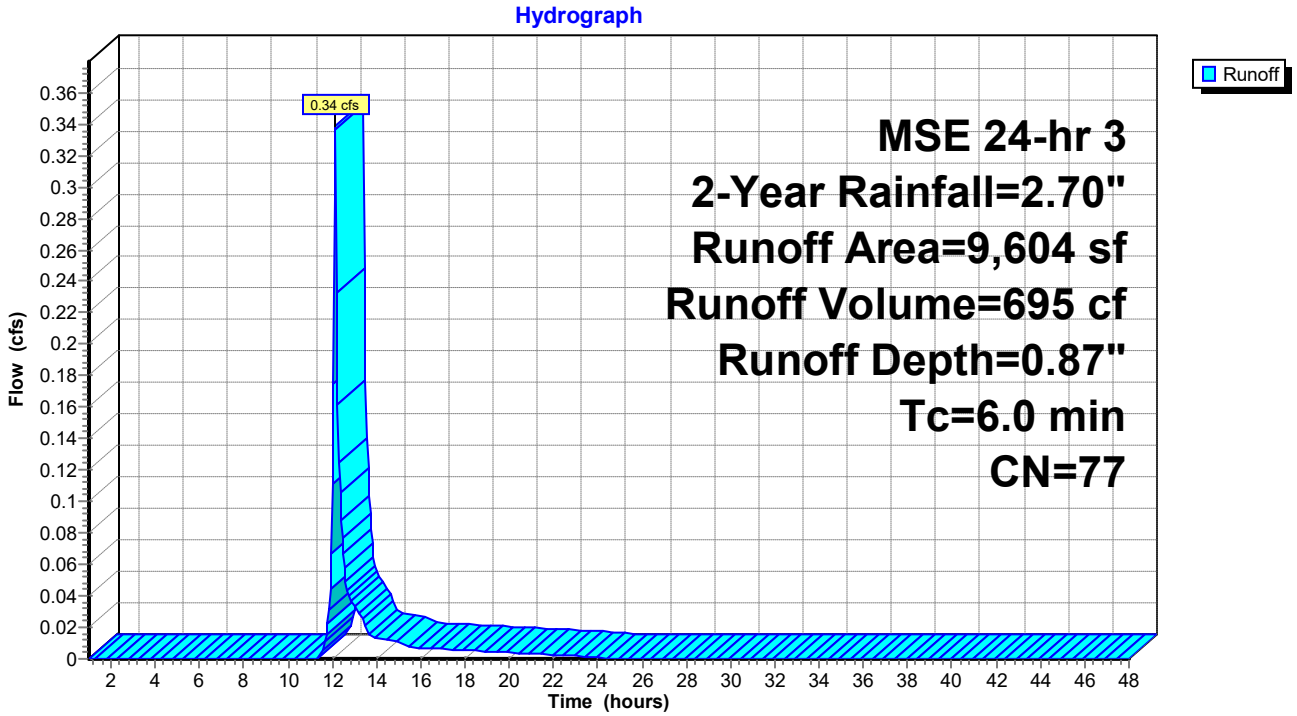
Runoff = 0.34 cfs @ 12.14 hrs, Volume= 695 cf, Depth= 0.87"
Routed to Link 115L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	8,471	74	landscape
*	1,133	98	road
	9,604	77	Weighted Average
	8,471		88.20% Pervious Area
	1,133		11.80% Impervious Area

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

Subcatchment 145S: H6-a



Summary for Subcatchment 146S: O2

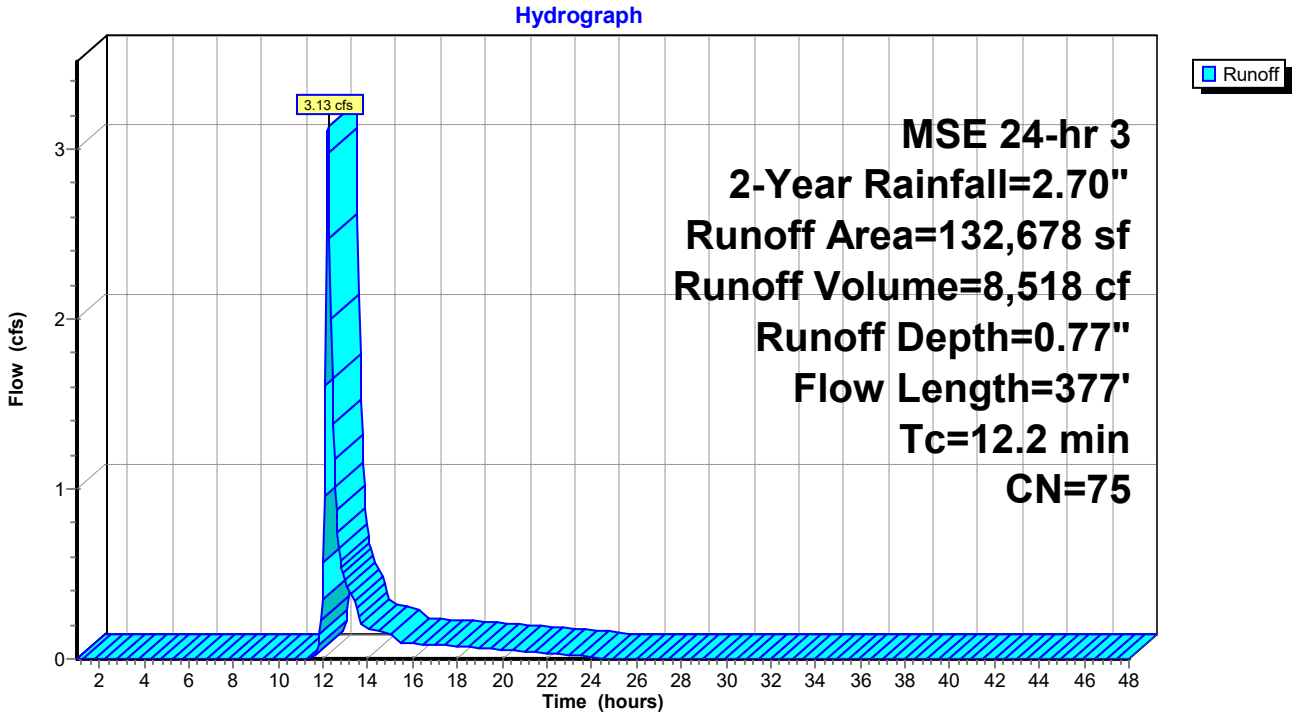
Runoff = 3.13 cfs @ 12.22 hrs, Volume= 8,518 cf, Depth= 0.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	129,638	74	PERV
*	3,040	98	IMPERV
	132,678	75	Weighted Average
	129,638		97.71% Pervious Area
	3,040		2.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	77	0.0288	0.16		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
4.3	300	0.0135	1.16		**Shallow Concentrated Flow, SHALLOW CONC** Nearly Bare & Untilled Kv= 10.0 fps
12.2	377	Total			

Subcatchment 146S: O2



Summary for Subcatchment 147S: J

3/3/21
Needs to be delineated, this is from Joe's SWMP2

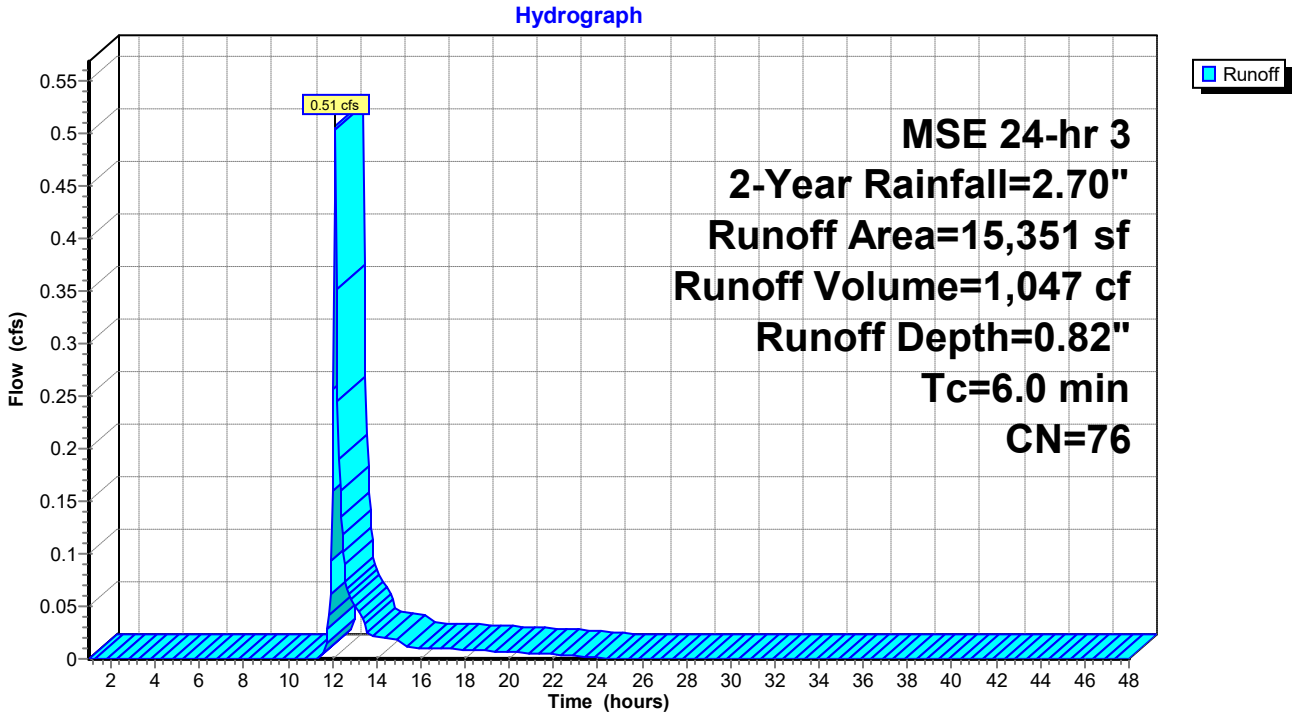
Runoff = 0.51 cfs @ 12.14 hrs, Volume= 1,047 cf, Depth= 0.82"
Routed to Link 66L : Total Offsite

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	1,360	98	walks
*	13,991	74	landscape
	15,351	76	Weighted Average
	13,991		91.14% Pervious Area
	1,360		8.86% Impervious Area

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

Subcatchment 147S: J



Summary for Subcatchment 148S: A3

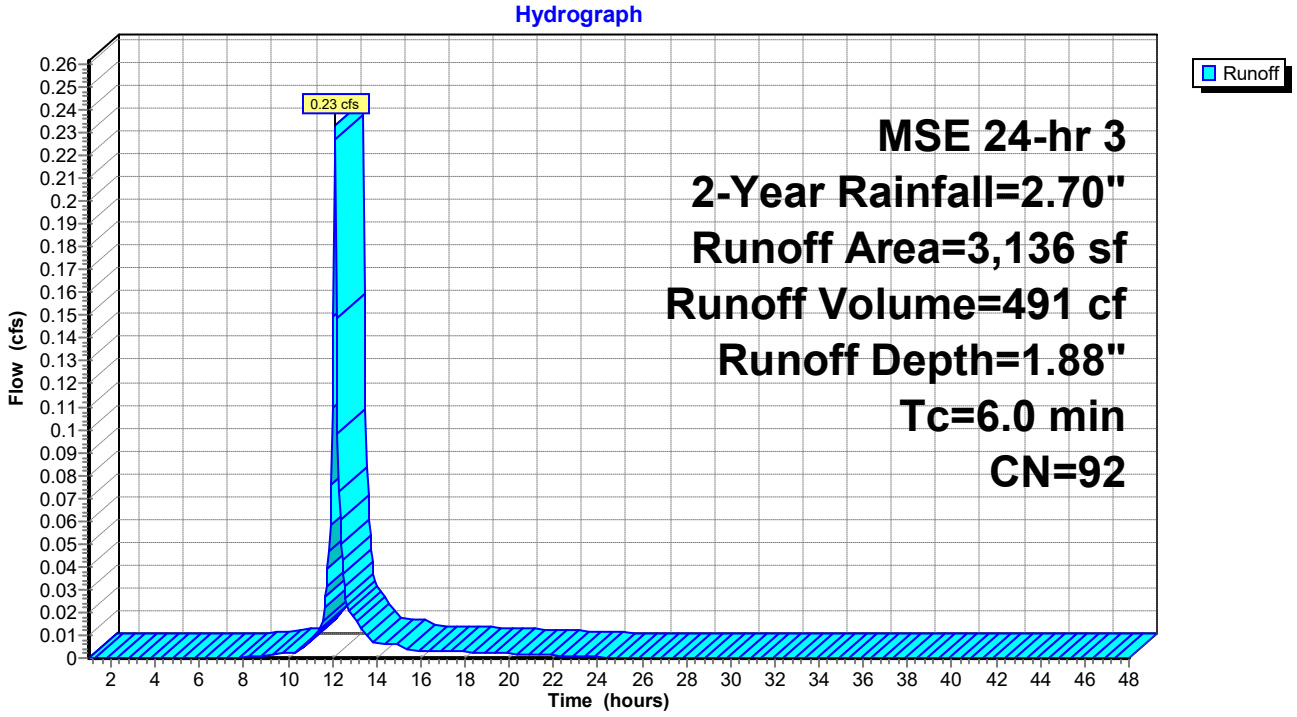
Runoff = 0.23 cfs @ 12.13 hrs, Volume= 491 cf, Depth= 1.88"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	452	98	WALKS
*	994	98	ROADS
*	924	98	ROOF
*	766	74	LANDSCAPING
	3,136	92	Weighted Average
	766		24.43% Pervious Area
	2,370		75.57% Impervious Area

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

Subcatchment 148S: A3



Summary for Subcatchment 149S: A4

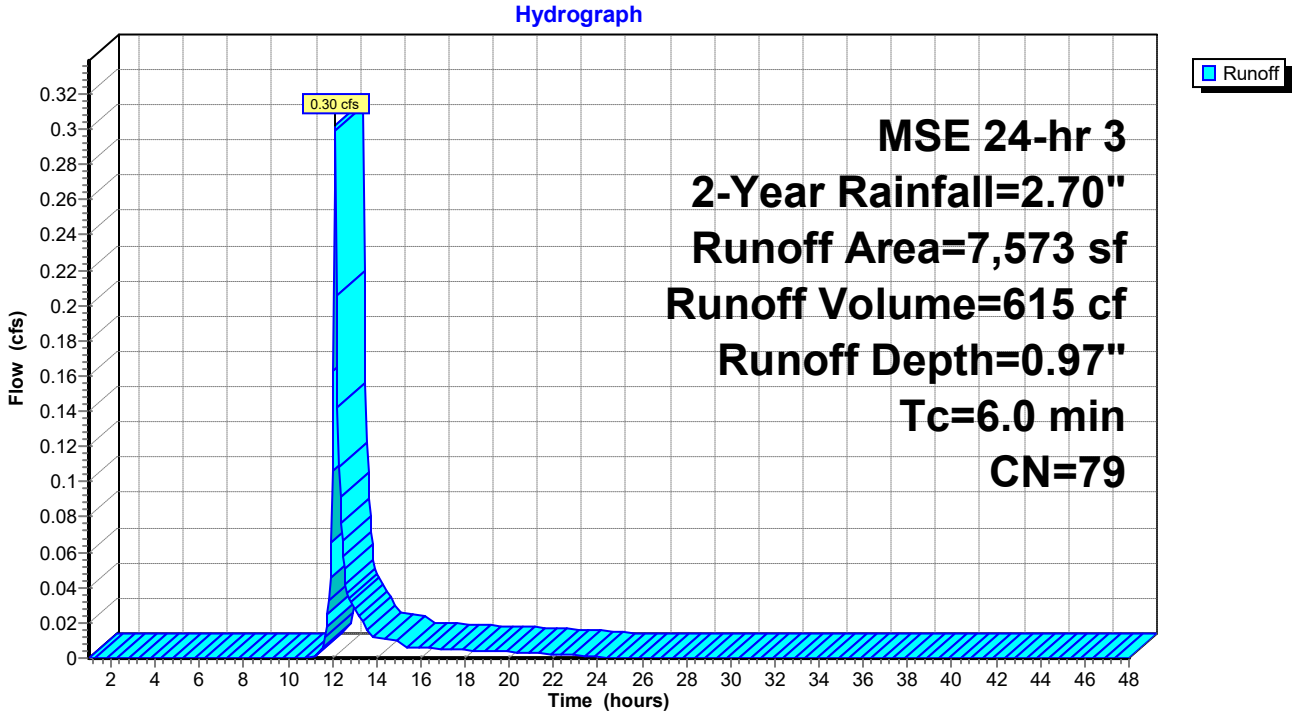
Runoff = 0.30 cfs @ 12.14 hrs, Volume= 615 cf, Depth= 0.97"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	401	98	WALKS
*	1,086	98	ROADS
*	0	98	ROOF
*	6,086	74	LANDSCAPING
	7,573	79	Weighted Average
	6,086		80.36% Pervious Area
	1,487		19.64% Impervious Area

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

Subcatchment 149S: A4



Summary for Subcatchment 150S: A6

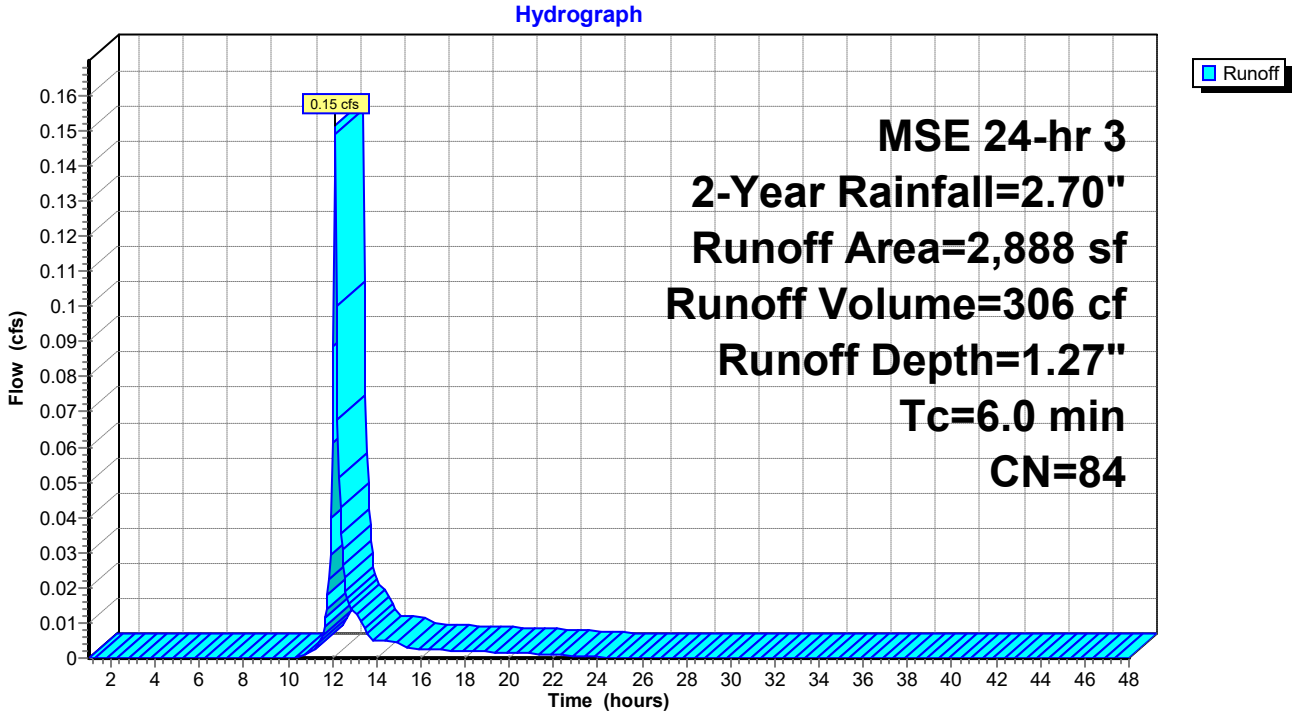
Runoff = 0.15 cfs @ 12.14 hrs, Volume= 306 cf, Depth= 1.27"
Routed to Link 127L : total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	316	98	WALKS
*	875	98	ROADS
*	0	98	ROOF
*	1,697	74	LANDSCAPING
	2,888	84	Weighted Average
	1,697		58.76% Pervious Area
	1,191		41.24% Impervious Area

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

Subcatchment 150S: A6



Summary for Subcatchment 151S: A8

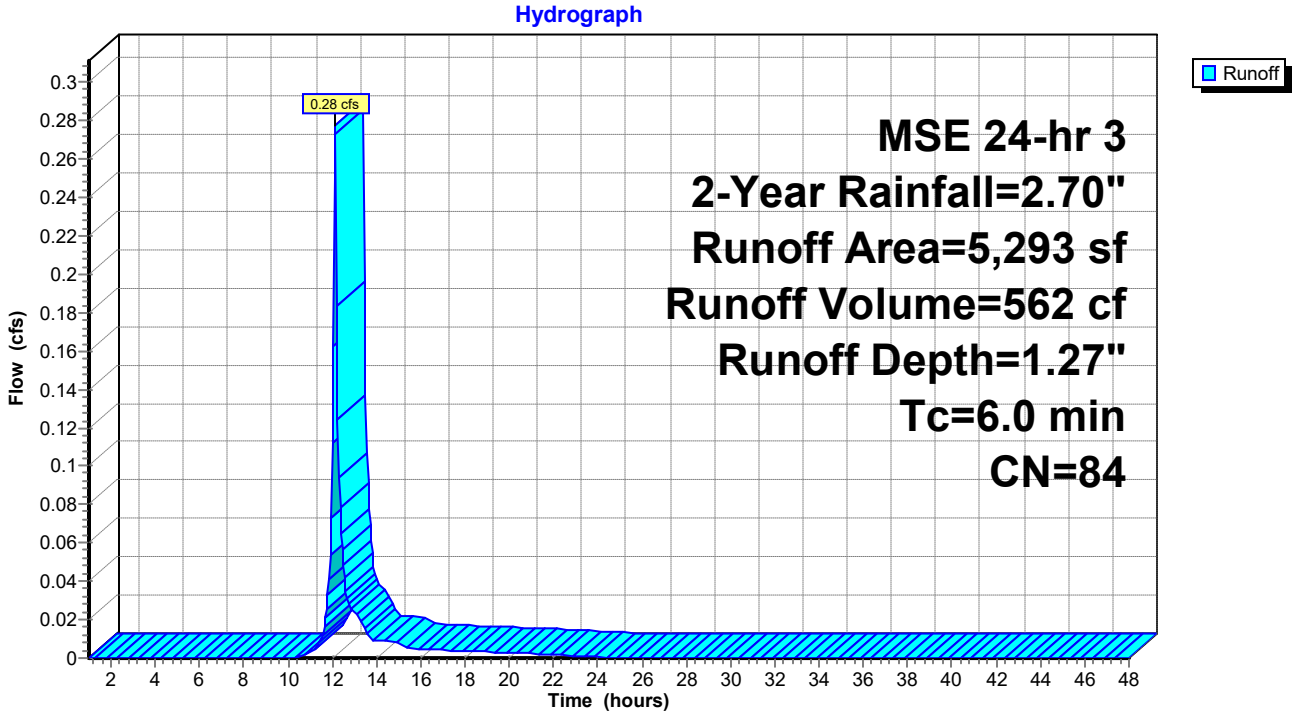
Runoff = 0.28 cfs @ 12.14 hrs, Volume= 562 cf, Depth= 1.27"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	688	98	WALKS
*	1,478	98	ROADS
*	0	98	ROOF
*	3,127	74	LANDSCAPING
	5,293	84	Weighted Average
	3,127		59.08% Pervious Area
	2,166		40.92% Impervious Area

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

Subcatchment 151S: A8



Summary for Subcatchment 152S: A10

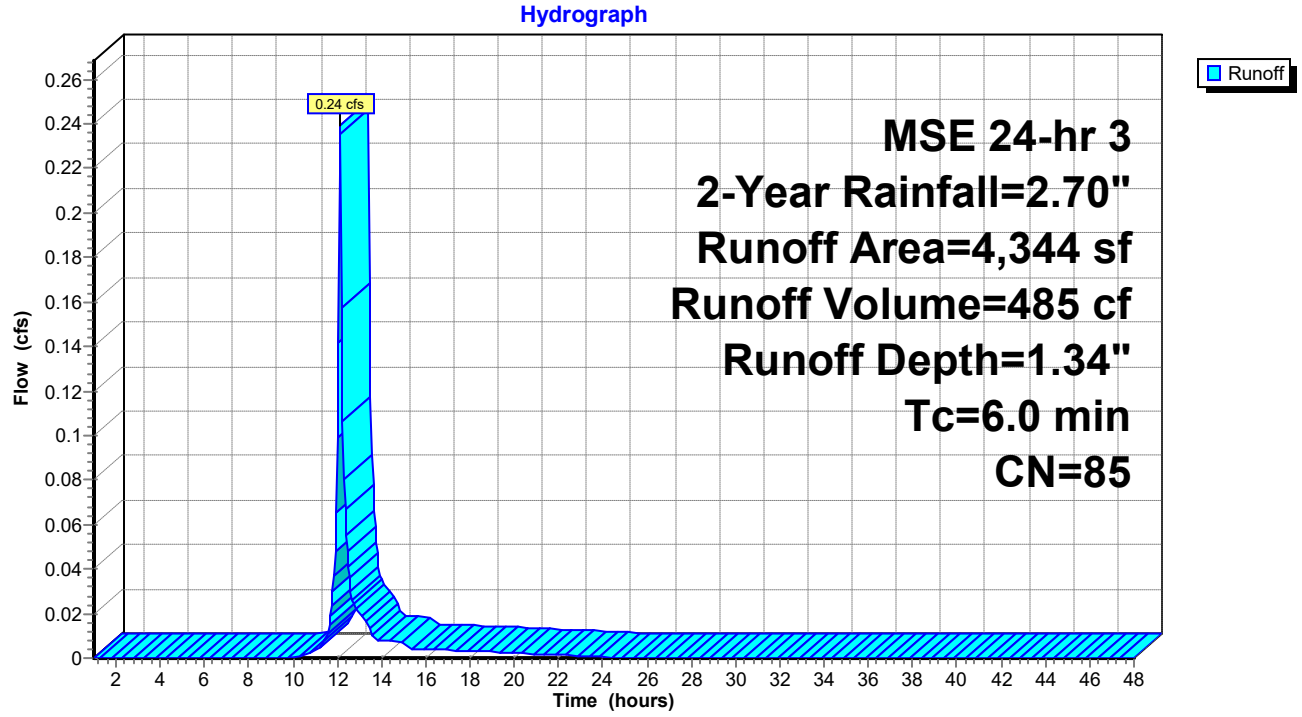
Runoff = 0.24 cfs @ 12.13 hrs, Volume= 485 cf, Depth= 1.34"
Routed to Pond 133P : WEST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	665	98	WALKS
*	1,415	98	ROADS
*	0	98	ROOF
*	2,264	74	LANDSCAPING
	4,344	85	Weighted Average
	2,264		52.12% Pervious Area
	2,080		47.88% Impervious Area

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

Subcatchment 152S: A10



Summary for Subcatchment 153S: A16

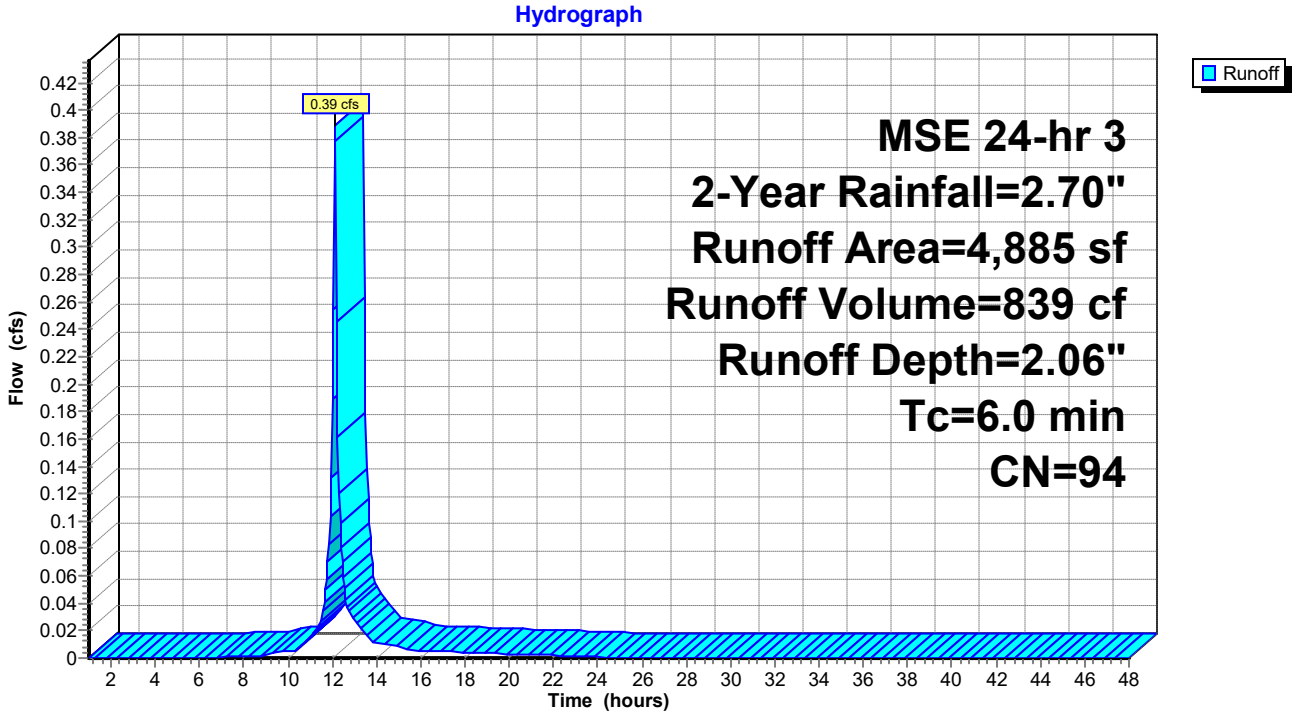
Runoff = 0.39 cfs @ 12.13 hrs, Volume= 839 cf, Depth= 2.06"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	1,314	98	WALKS
*	2,788	98	ROADS
*	0	98	ROOF
*	783	74	LANDSCAPING
	4,885	94	Weighted Average
	783		16.03% Pervious Area
	4,102		83.97% Impervious Area

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

Subcatchment 153S: A16



Summary for Subcatchment 154S: A17

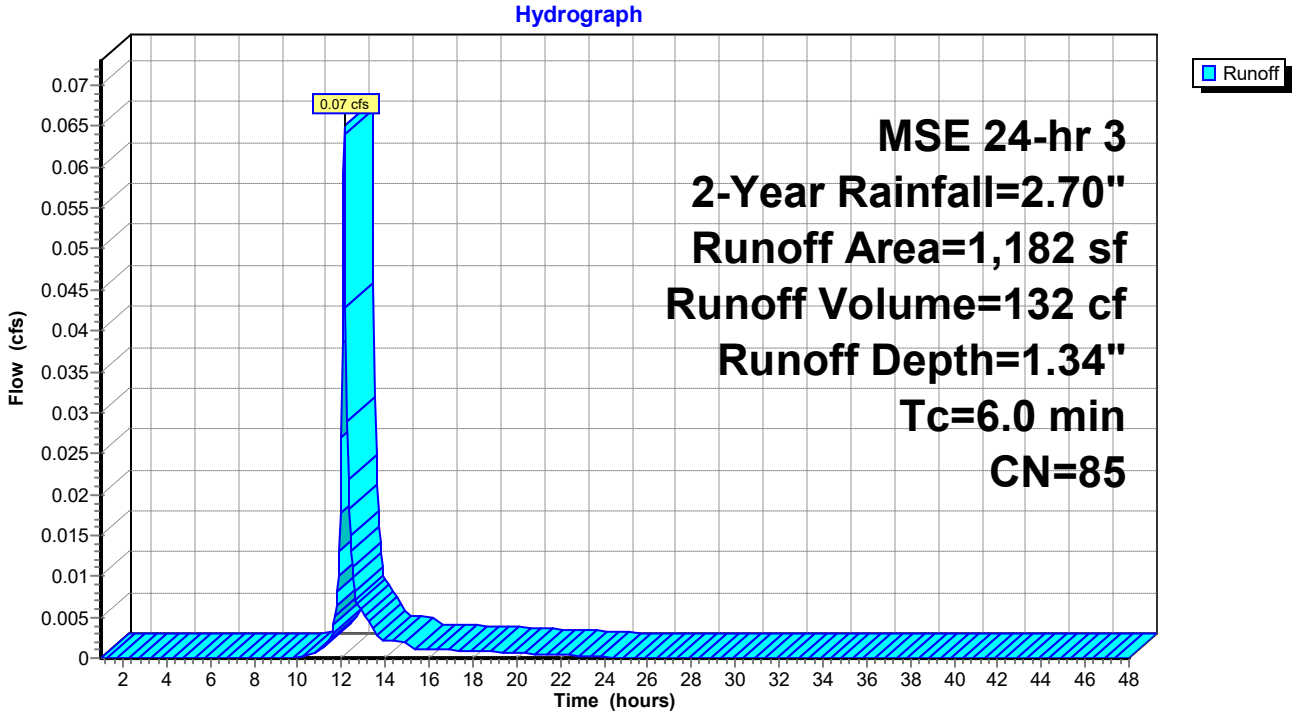
Runoff = 0.07 cfs @ 12.13 hrs, Volume= 132 cf, Depth= 1.34"
Routed to Link 176L : UPSTREAM OF OVERSIZED PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	70	98	WALKS
*	461	98	ROADS
*	0	98	ROOF
*	651	74	LANDSCAPING
	1,182	85	Weighted Average
	651		55.08% Pervious Area
	531		44.92% Impervious Area

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

Subcatchment 154S: A17



Summary for Subcatchment 155S: A18

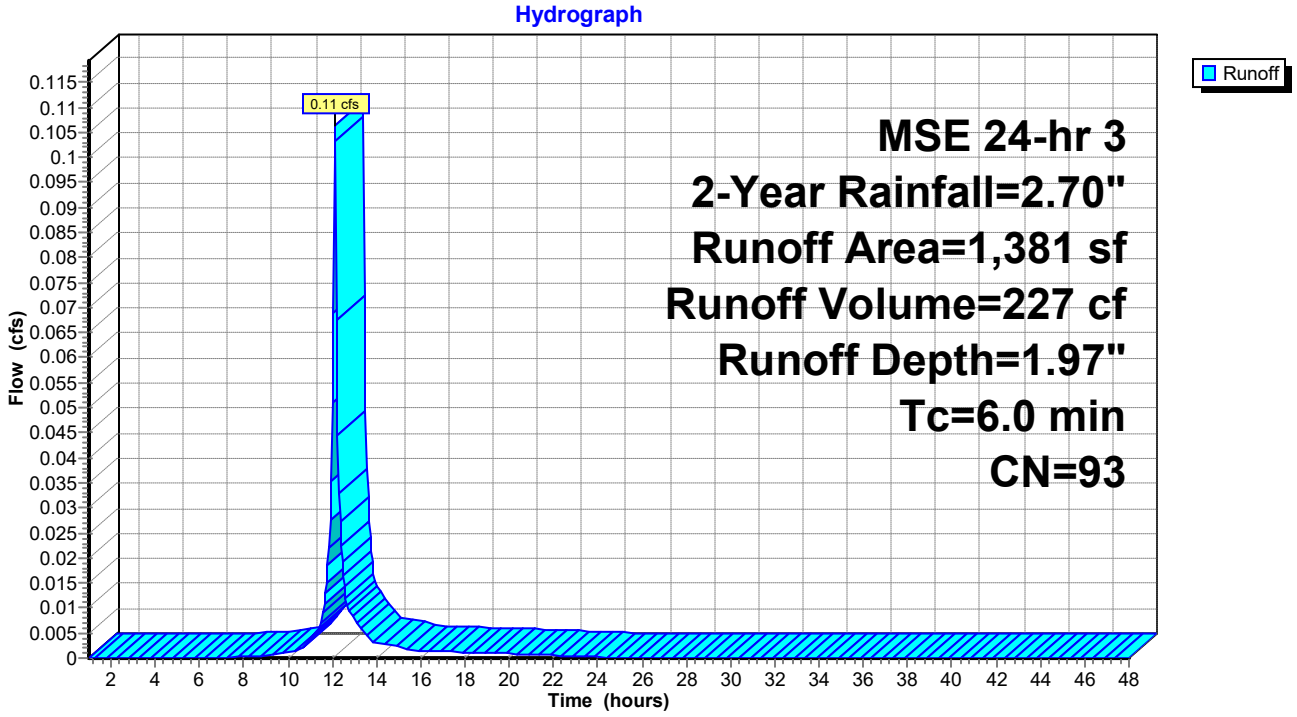
Runoff = 0.11 cfs @ 12.13 hrs, Volume= 227 cf, Depth= 1.97"
Routed to Link 176L : UPSTREAM OF OVERSIZED PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	353	98	WALKS
*	747	98	ROADS
*	0	98	ROOF
*	281	74	LANDSCAPING
	1,381	93	Weighted Average
	281		20.35% Pervious Area
	1,100		79.65% Impervious Area

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

Subcatchment 155S: A18



Summary for Subcatchment 156S: A19

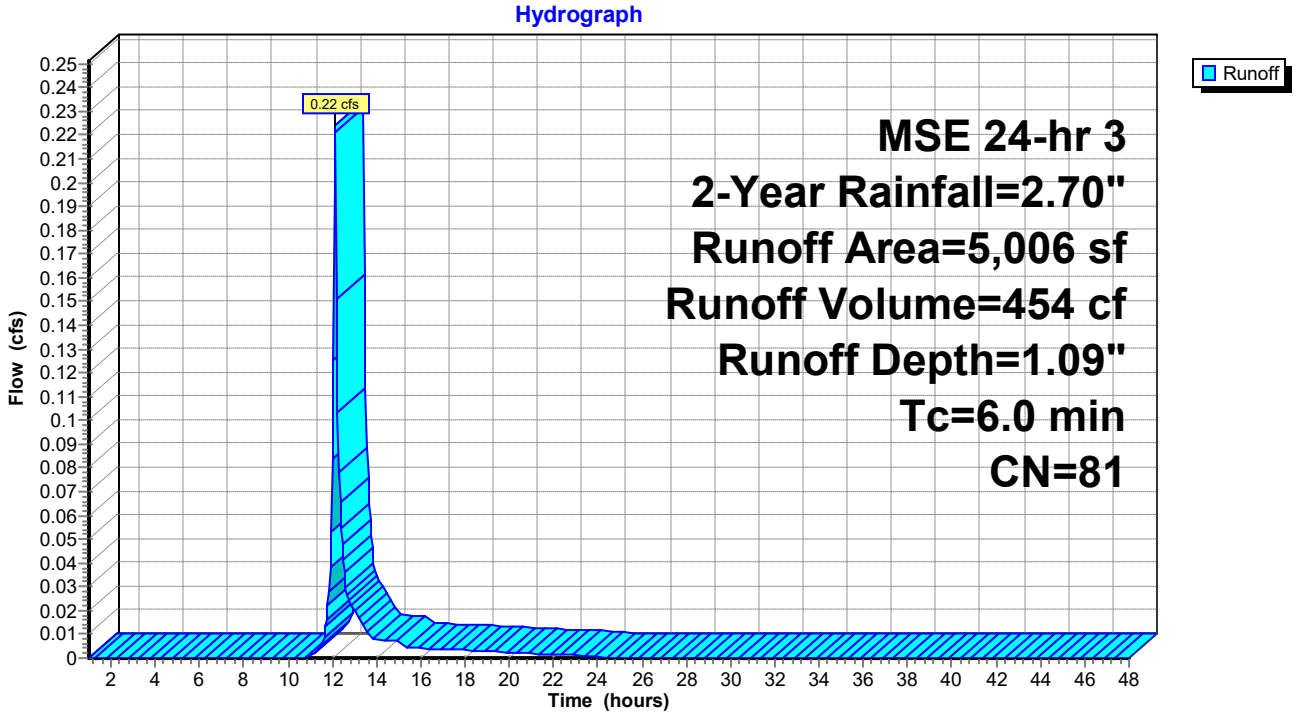
Runoff = 0.22 cfs @ 12.14 hrs, Volume= 454 cf, Depth= 1.09"
Routed to Link 176L : UPSTREAM OF OVERSIZED PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	390	98	WALKS
*	0	98	ROADS
*	1,063	98	ROOF
*	3,553	74	LANDSCAPING
	5,006	81	Weighted Average
	3,553		70.97% Pervious Area
	1,453		29.03% Impervious Area

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

Subcatchment 156S: A19



Summary for Subcatchment 157S: A20

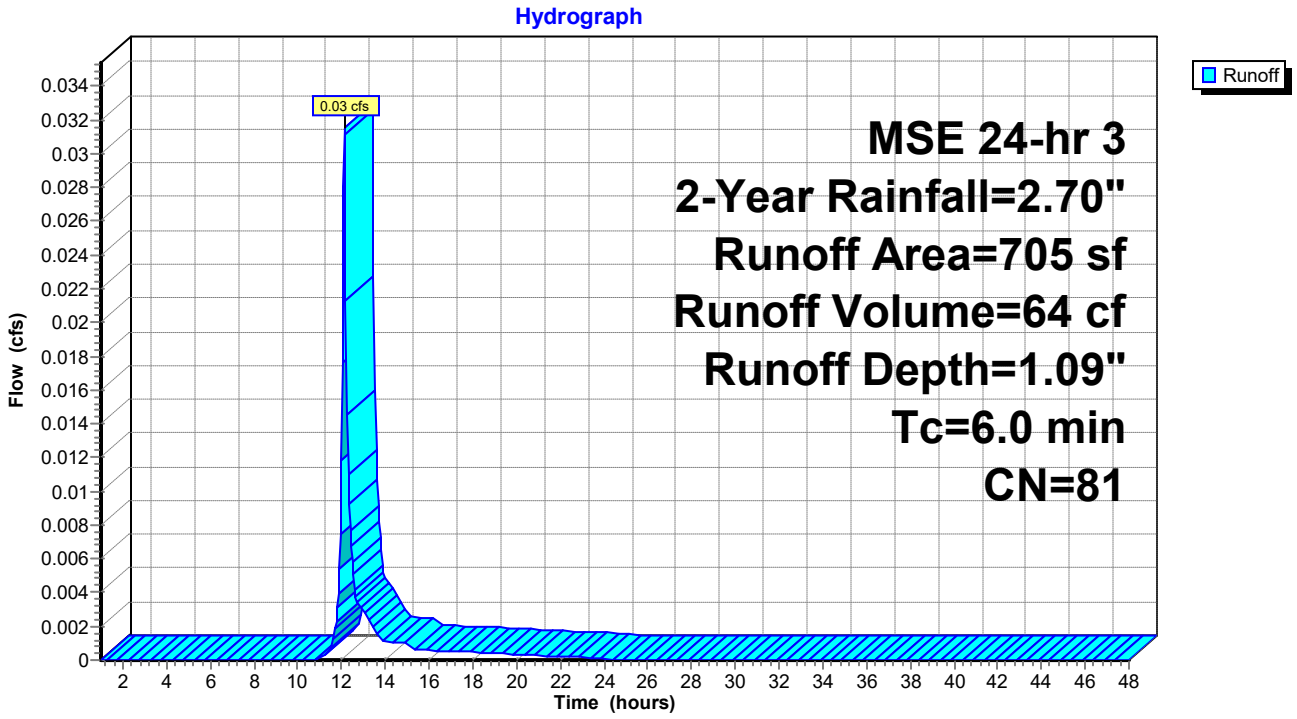
Runoff = 0.03 cfs @ 12.14 hrs, Volume= 64 cf, Depth= 1.09"
Routed to Link 176L : UPSTREAM OF OVERSIZED PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	204	98	WALKS
*	0	98	ROADS
*	0	98	ROOF
*	501	74	LANDSCAPING
	705	81	Weighted Average
	501		71.06% Pervious Area
	204		28.94% Impervious Area

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

Subcatchment 157S: A20



Summary for Subcatchment 158S: A21

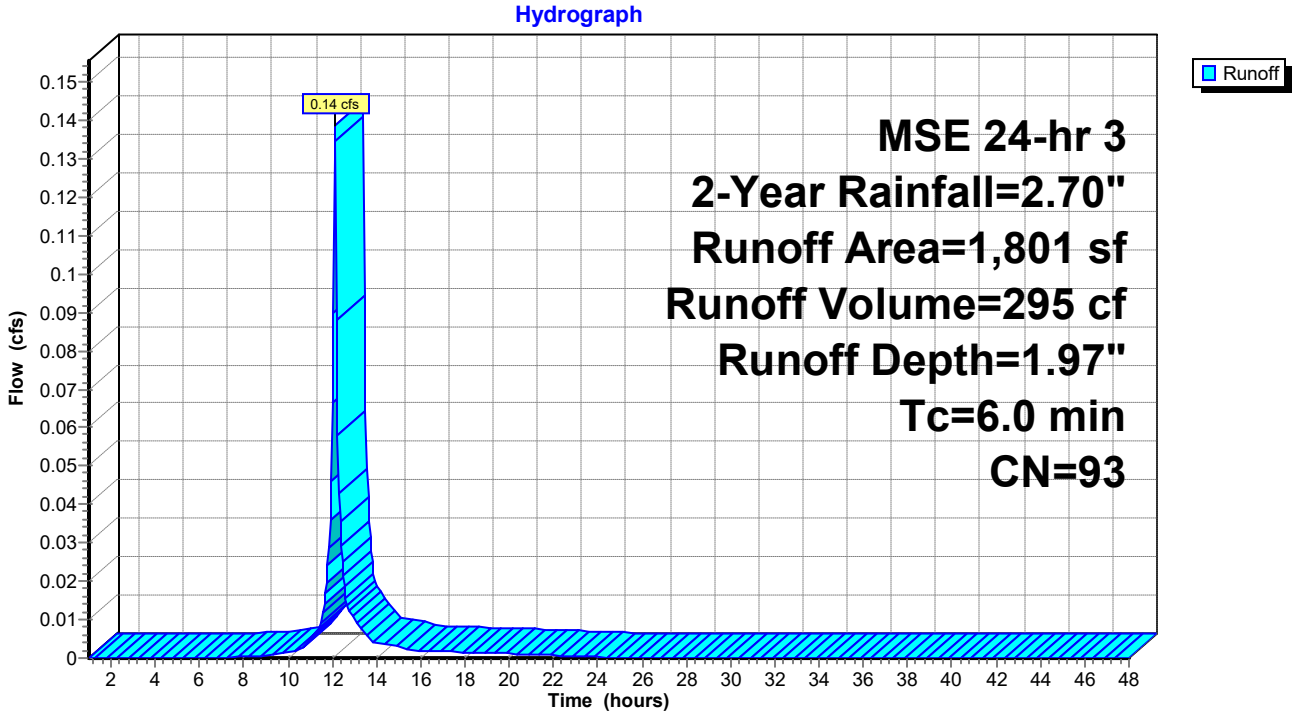
Runoff = 0.14 cfs @ 12.13 hrs, Volume= 295 cf, Depth= 1.97"
Routed to Link 176L : UPSTREAM OF OVERSIZED PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	338	98	WALKS
*	35	98	ROADS
*	1,063	98	ROOF
*	365	74	LANDSCAPING
	1,801	93	Weighted Average
	365		20.27% Pervious Area
	1,436		79.73% Impervious Area

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

Subcatchment 158S: A21



Summary for Subcatchment 159S: A22

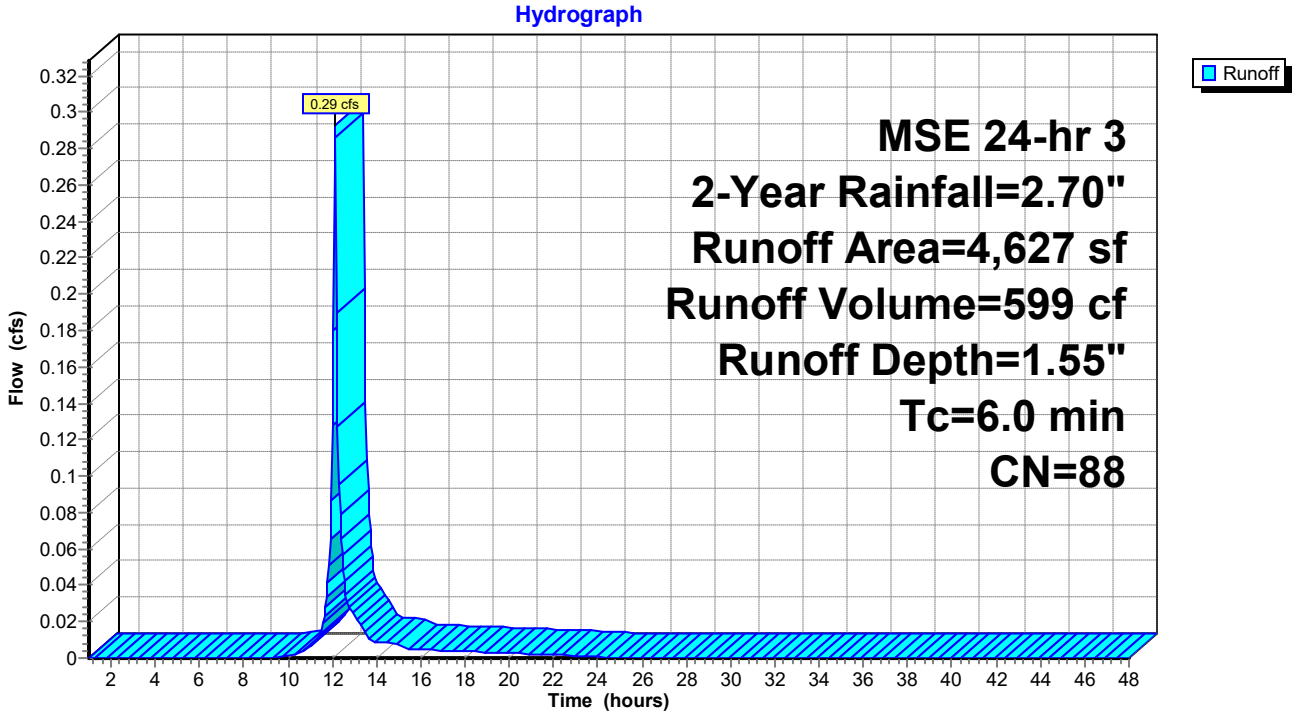
Runoff = 0.29 cfs @ 12.13 hrs, Volume= 599 cf, Depth= 1.55"
Routed to Pond 174P : EAST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	891	98	WALKS
*	1,814	98	ROADS
*	0	98	ROOF
*	1,922	74	LANDSCAPING
	4,627	88	Weighted Average
	1,922		41.54% Pervious Area
	2,705		58.46% Impervious Area

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

Subcatchment 159S: A22



Summary for Subcatchment 160S: A23

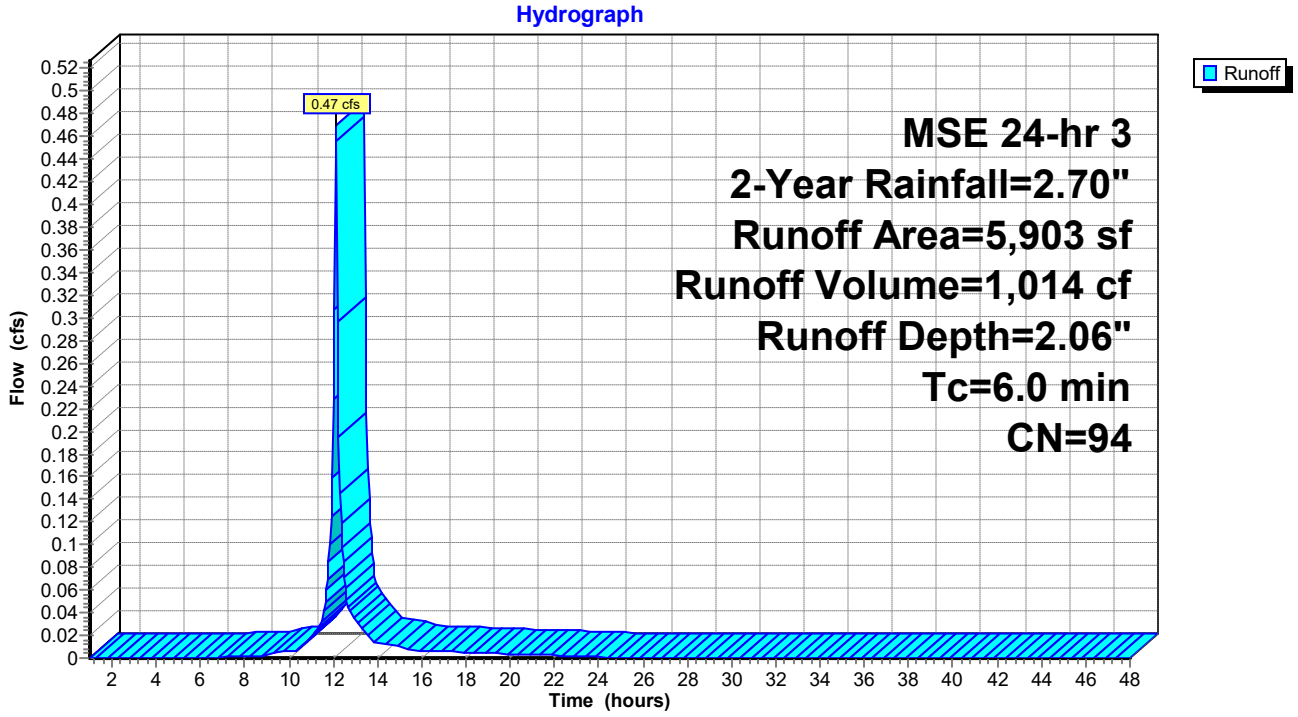
Runoff = 0.47 cfs @ 12.13 hrs, Volume= 1,014 cf, Depth= 2.06"
Routed to Pond 174P : EAST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	995	98	WALKS
*	1,695	98	ROADS
*	2,125	98	ROOF
*	1,088	74	LANDSCAPING
	5,903	94	Weighted Average
	1,088		18.43% Pervious Area
	4,815		81.57% Impervious Area

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

Subcatchment 160S: A23



Summary for Subcatchment 161S: A24

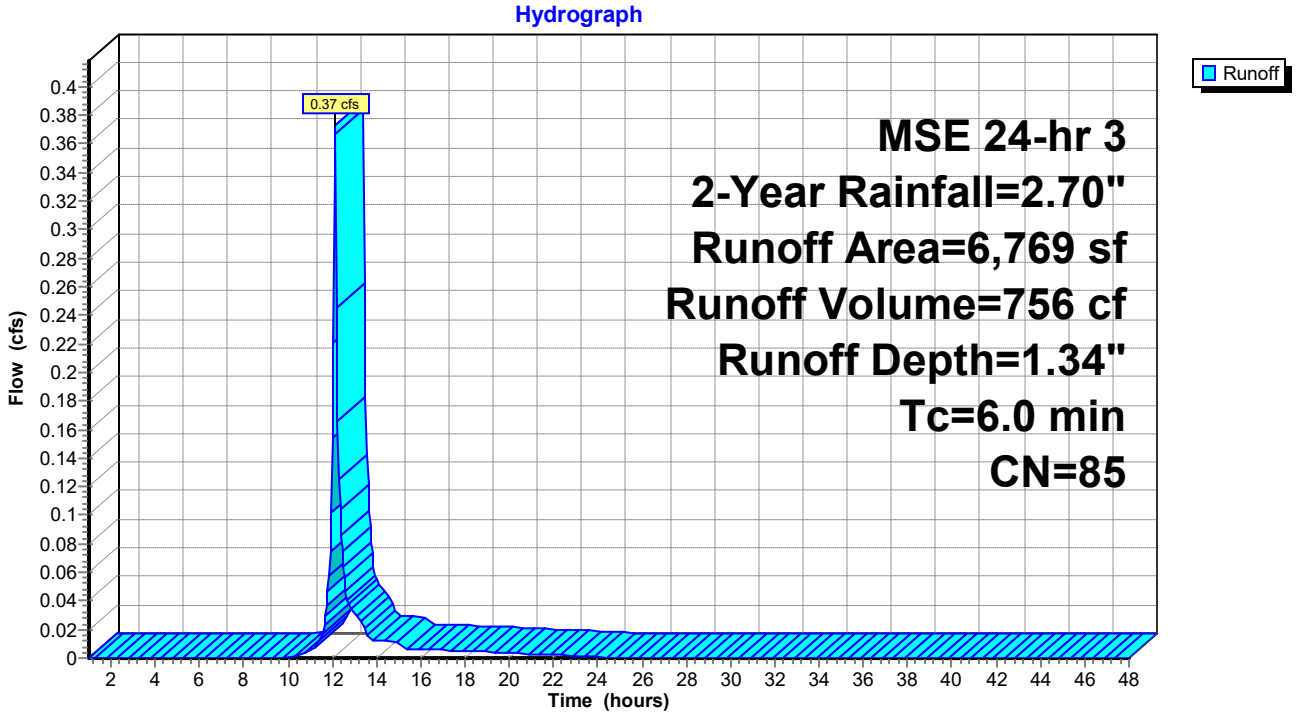
Runoff = 0.37 cfs @ 12.13 hrs, Volume= 756 cf, Depth= 1.34"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	1,331	98	WALKS
*	1,714	98	ROADS
*	0	98	ROOF
*	3,724	74	LANDSCAPING
	6,769	85	Weighted Average
	3,724		55.02% Pervious Area
	3,045		44.98% Impervious Area

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

Subcatchment 161S: A24



Summary for Subcatchment 162S: A25

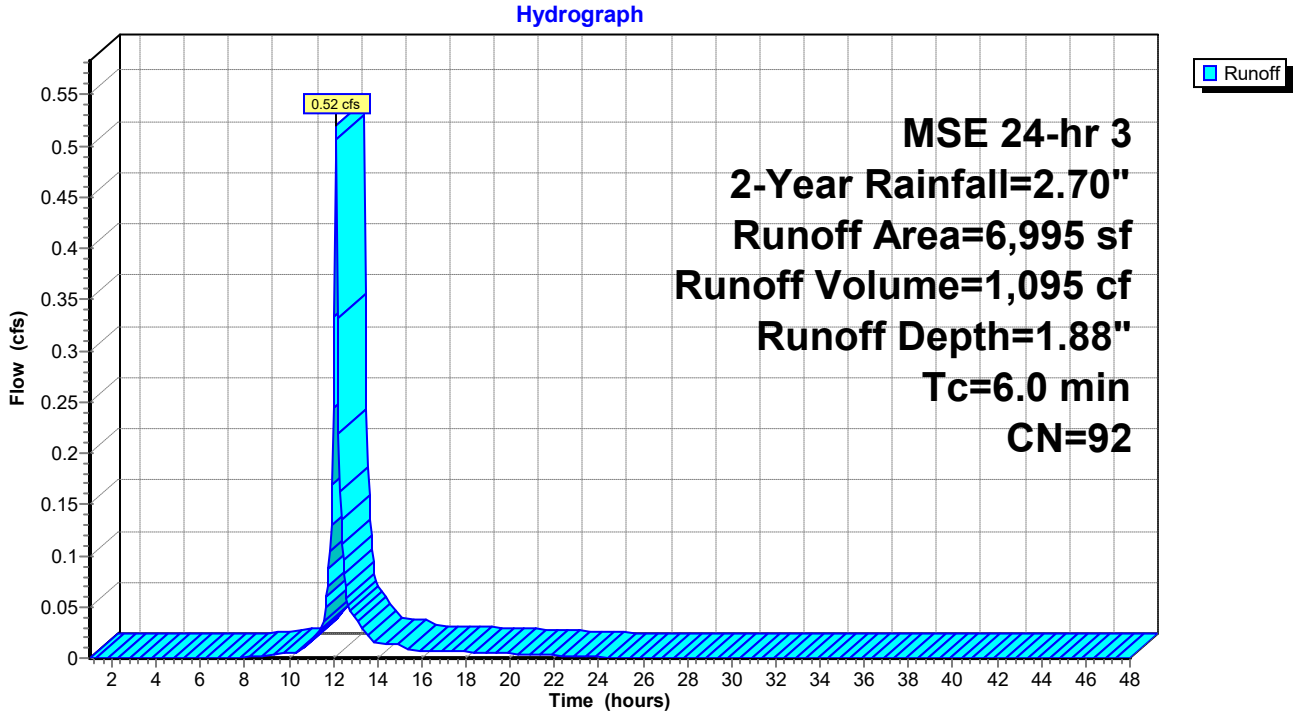
Runoff = 0.52 cfs @ 12.13 hrs, Volume= 1,095 cf, Depth= 1.88"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	1,096	98	WALKS
*	2,036	98	ROADS
*	2,125	98	ROOF
*	1,738	74	LANDSCAPING
	6,995	92	Weighted Average
	1,738		24.85% Pervious Area
	5,257		75.15% Impervious Area

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

Subcatchment 162S: A25



Summary for Subcatchment 163S: A26

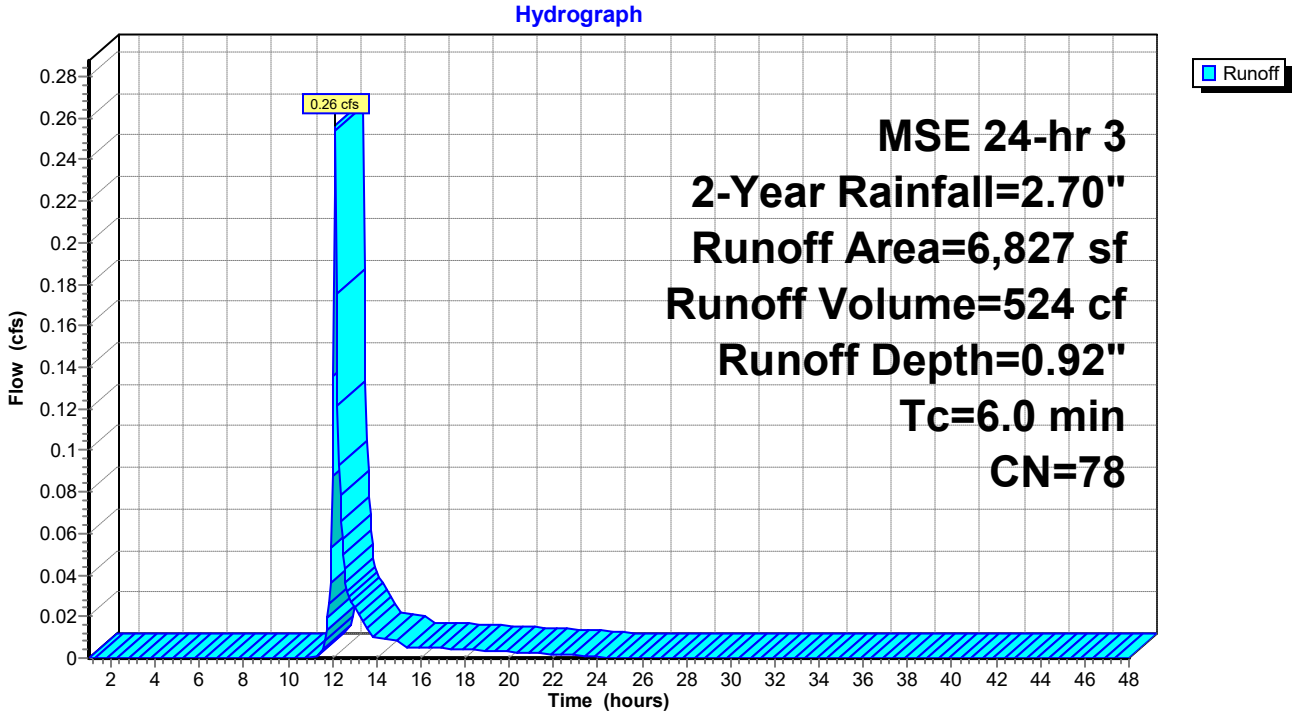
Runoff = 0.26 cfs @ 12.14 hrs, Volume= 524 cf, Depth= 0.92"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	314	98	WALKS
*	860	98	ROADS
*	0	98	ROOF
*	5,653	74	LANDSCAPING
	6,827	78	Weighted Average
	5,653		82.80% Pervious Area
	1,174		17.20% Impervious Area

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

Subcatchment 163S: A26



Summary for Subcatchment 164S: A27

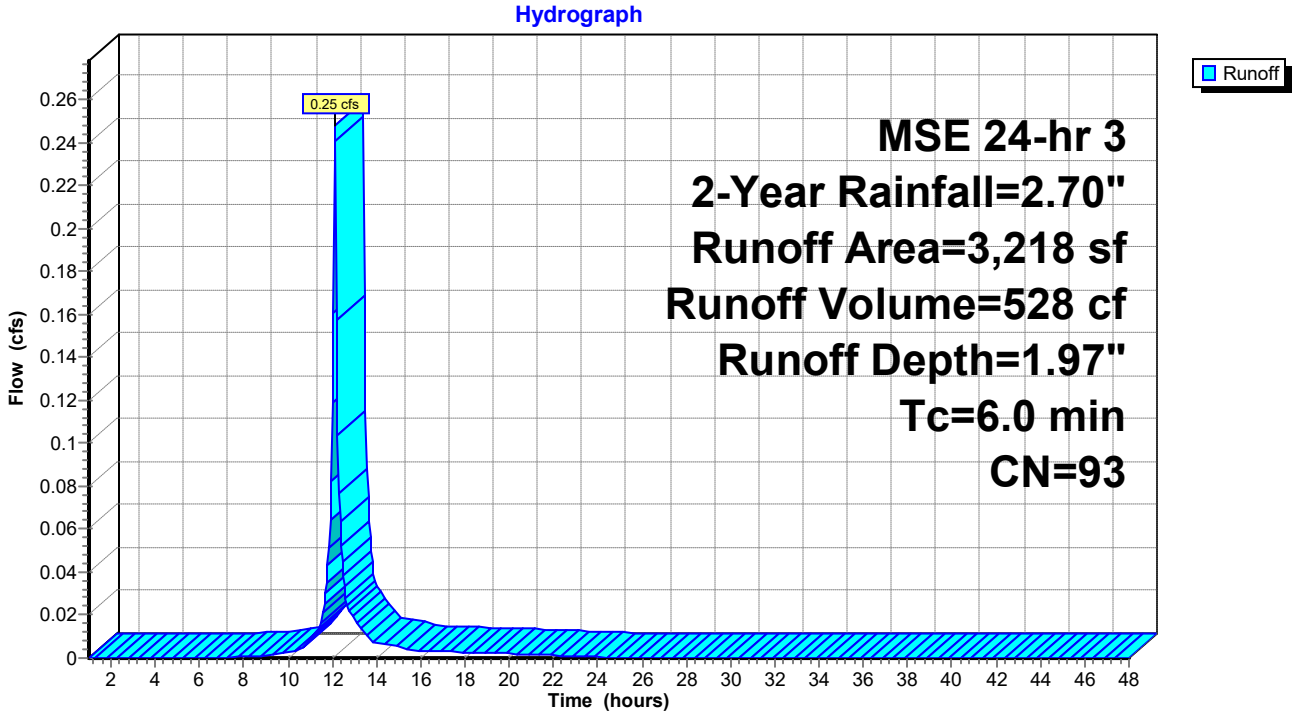
Runoff = 0.25 cfs @ 12.13 hrs, Volume= 528 cf, Depth= 1.97"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	532	98	WALKS
*	927	98	ROADS
*	1,063	98	ROOF
*	696	74	LANDSCAPING
	3,218	93	Weighted Average
	696		21.63% Pervious Area
	2,522		78.37% Impervious Area

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

Subcatchment 164S: A27



Summary for Subcatchment 165S: A28

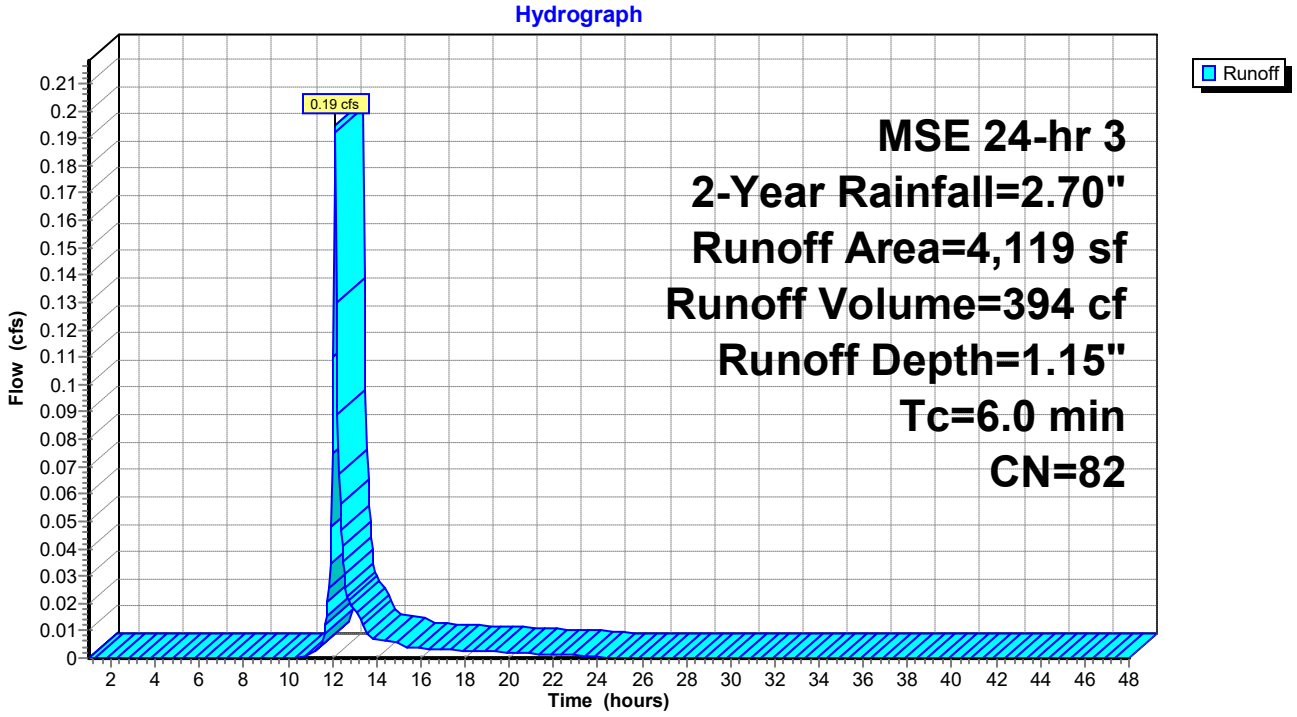
Runoff = 0.19 cfs @ 12.14 hrs, Volume= 394 cf, Depth= 1.15"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	364	98	WALKS
*	968	98	ROADS
*	0	98	ROOF
*	2,787	74	LANDSCAPING
	4,119	82	Weighted Average
	2,787		67.66% Pervious Area
	1,332		32.34% Impervious Area

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

Subcatchment 165S: A28



Summary for Subcatchment 166S: A29

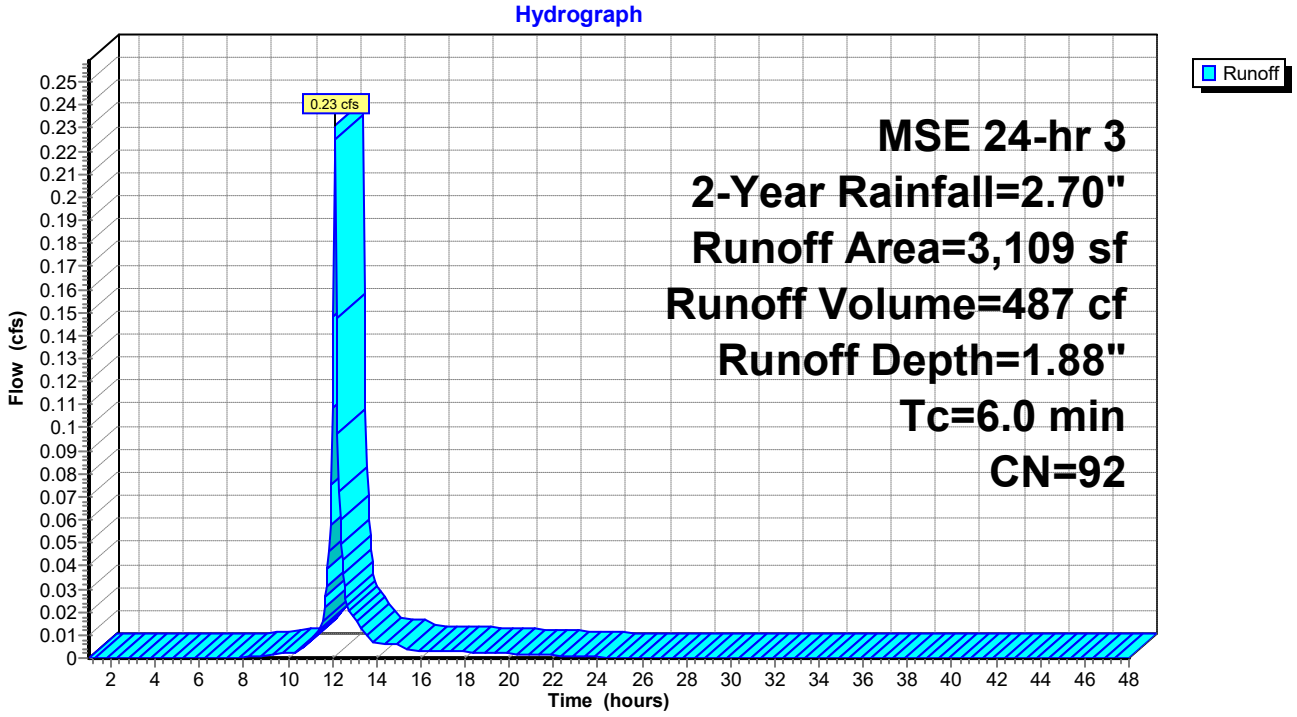
Runoff = 0.23 cfs @ 12.13 hrs, Volume= 487 cf, Depth= 1.88"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	367	98	WALKS
*	921	98	ROADS
*	1,063	98	ROOF
*	758	74	LANDSCAPING
	3,109	92	Weighted Average
	758		24.38% Pervious Area
	2,351		75.62% Impervious Area

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

Subcatchment 166S: A29



Summary for Subcatchment 167S: A31

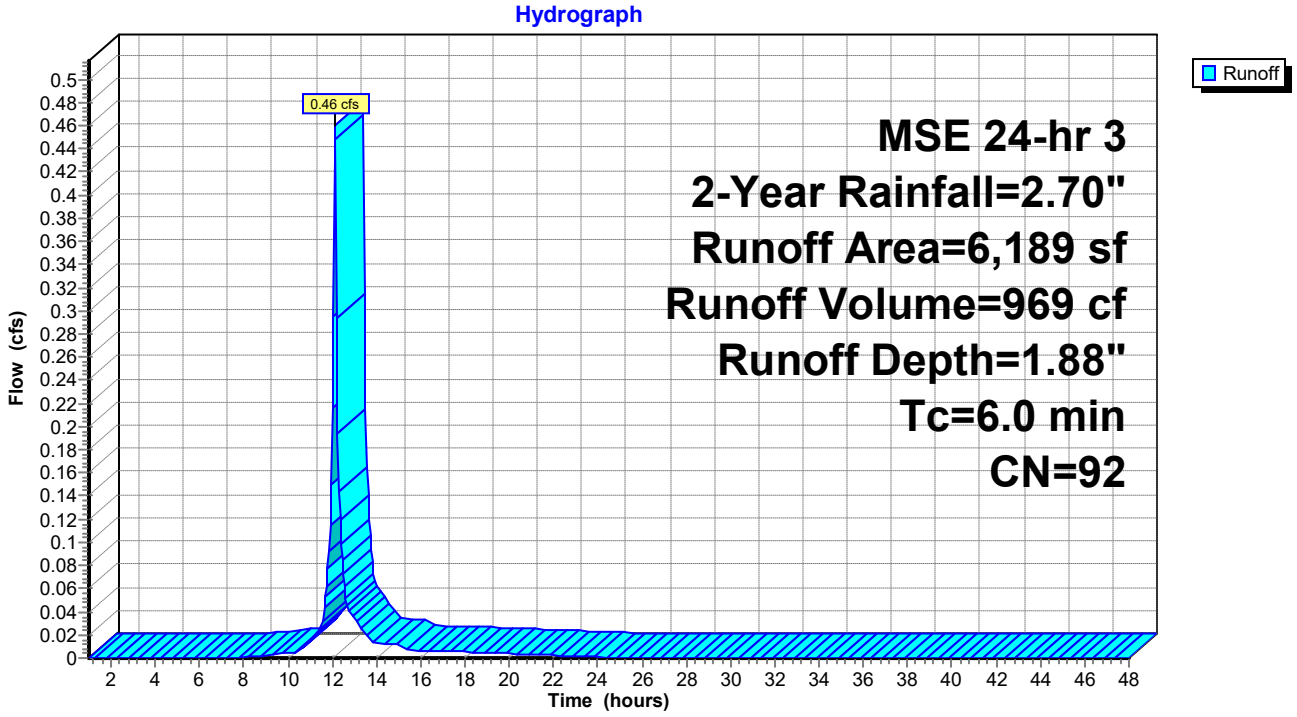
Runoff = 0.46 cfs @ 12.13 hrs, Volume= 969 cf, Depth= 1.88"
Routed to Link 126L : OVERSIZED PIPE RUN BY B3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	1,844	98	WALKS
*	2,869	98	ROADS
*	0	98	ROOF
*	1,476	74	LANDSCAPING
	6,189	92	Weighted Average
	1,476		23.85% Pervious Area
	4,713		76.15% Impervious Area

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

Subcatchment 167S: A31



Summary for Subcatchment 168S: A34

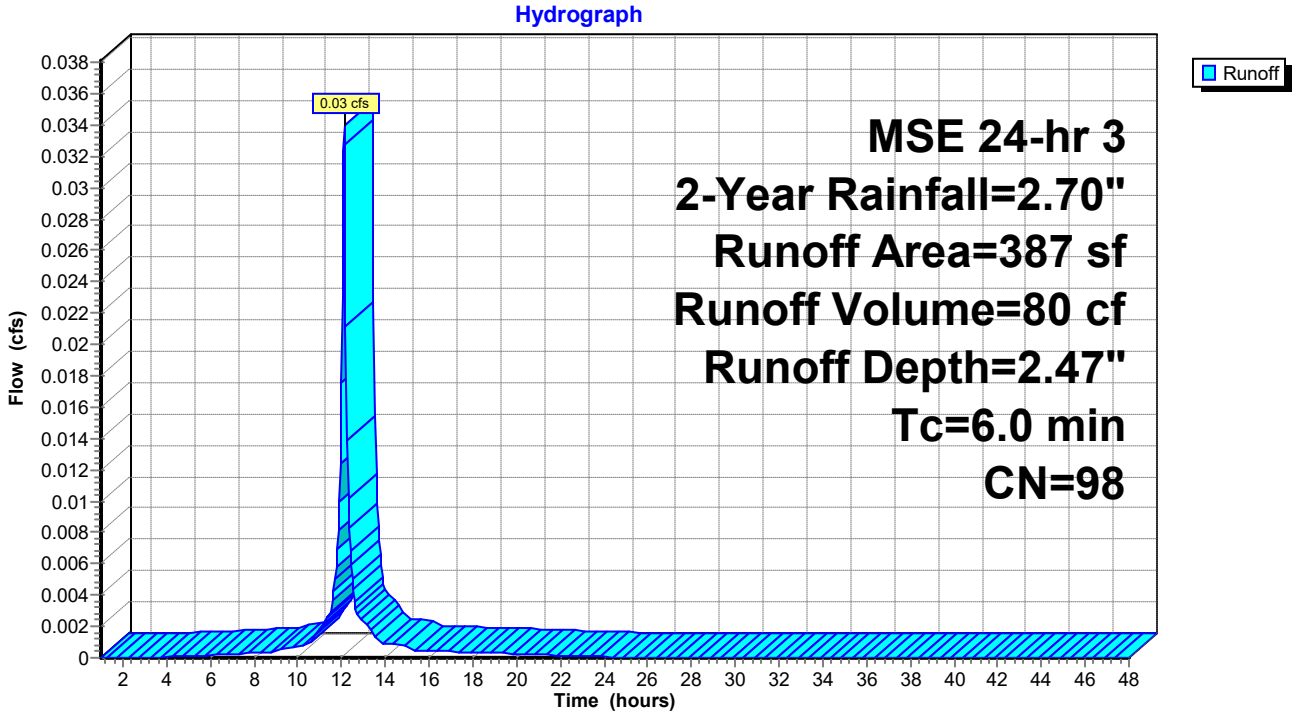
Runoff = 0.03 cfs @ 12.13 hrs, Volume= 80 cf, Depth= 2.47"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	0	98	WALKS
*	387	98	ROADS
*	0	98	ROOF
*	0	74	LANDSCAPING
	387	98	Weighted Average
	387		100.00% Impervious Area

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

Subcatchment 168S: A34



Summary for Subcatchment 169S: A36

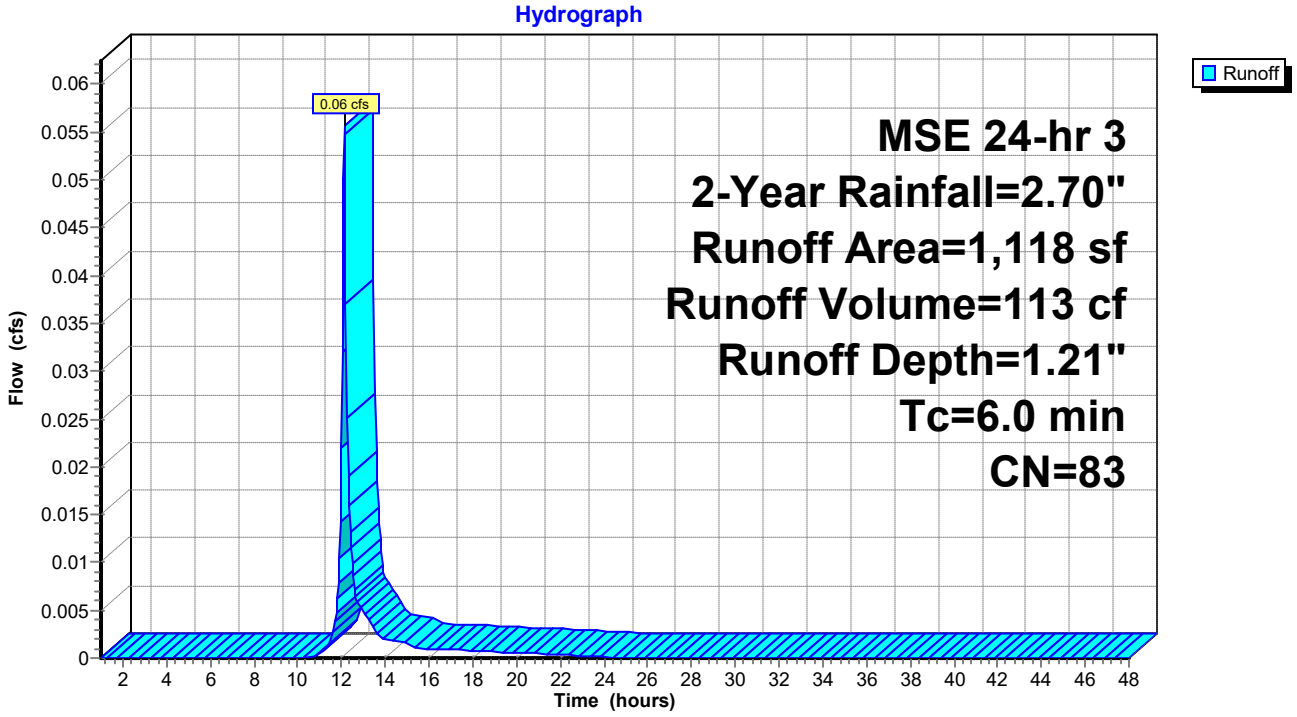
Runoff = 0.06 cfs @ 12.14 hrs, Volume= 113 cf, Depth= 1.21"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	401	98	WALKS
*	0	98	ROADS
*	0	98	ROOF
*	717	74	LANDSCAPING
	1,118	83	Weighted Average
	717		64.13% Pervious Area
	401		35.87% Impervious Area

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

Subcatchment 169S: A36



Summary for Subcatchment 170S: C (INTERIOR)

Subset C - C1
3/3/21
Southern portion of East Building Roof, Southern Building (Middle one) roof, pond area
pipe from roofs not sized yet

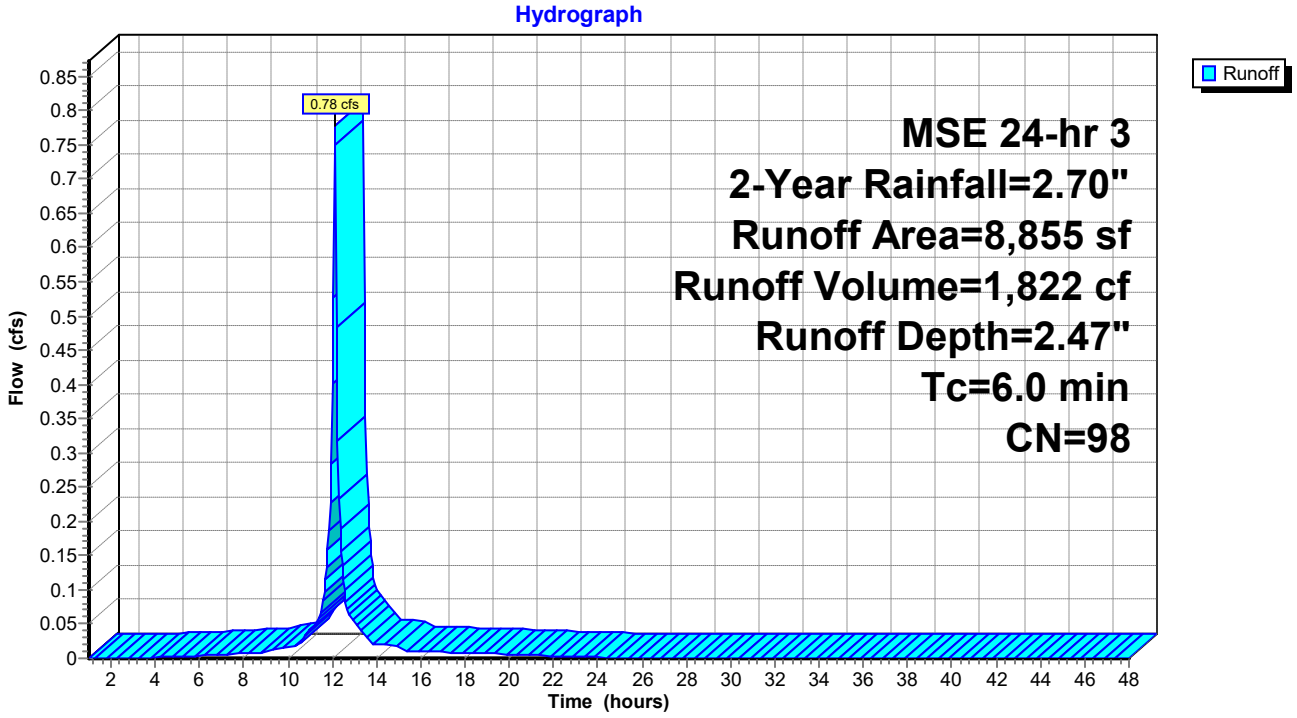
Runoff = 0.78 cfs @ 12.13 hrs, Volume= 1,822 cf, Depth= 2.47"
Routed to Link 171L : 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	8,855	98	roofs
	8,855		100.00% Impervious Area

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

Subcatchment 170S: C (INTERIOR)



Summary for Subcatchment 171S: A (MARIA ROOF) /2

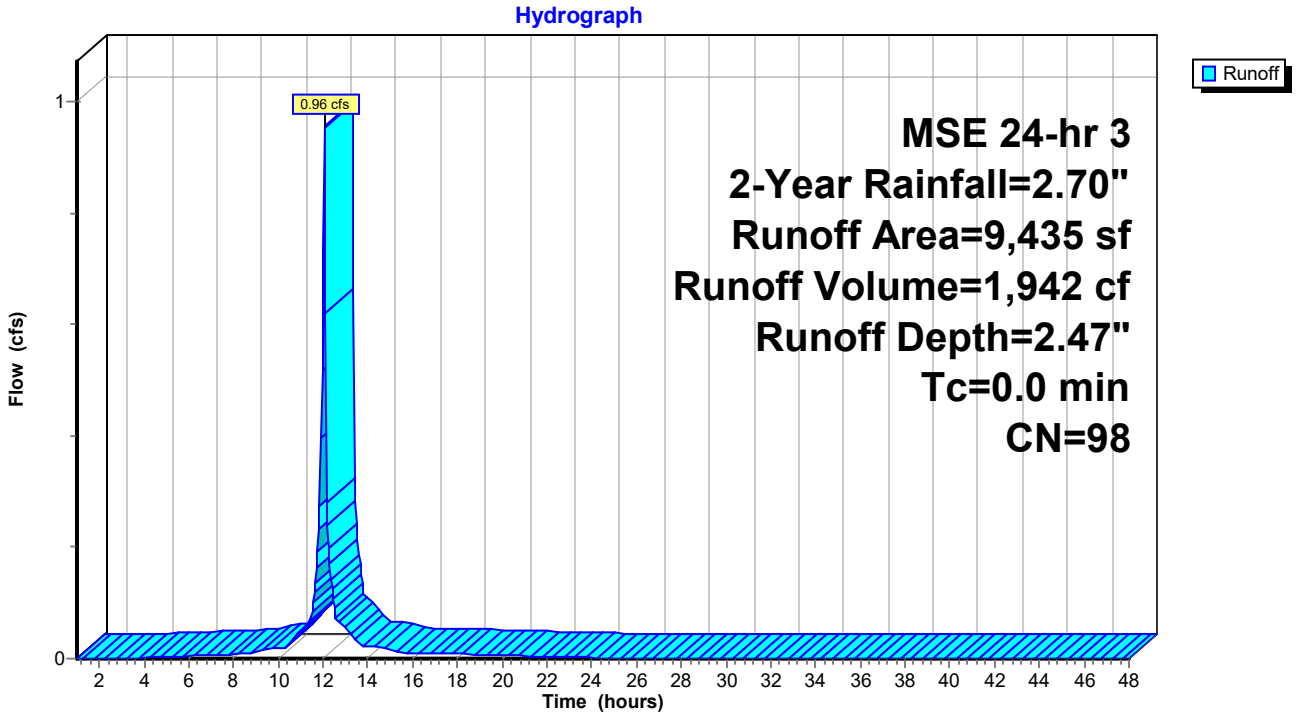
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.96 cfs @ 12.04 hrs, Volume= 1,942 cf, Depth= 2.47"
Routed to Link 134L : TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	9,435	98	Roofs
	9,435		100.00% Impervious Area

Subcatchment 171S: A (MARIA ROOF) /2



Summary for Subcatchment 172S: B1 (EXTERIOR)

3/3/21
Northern portion of W building roof

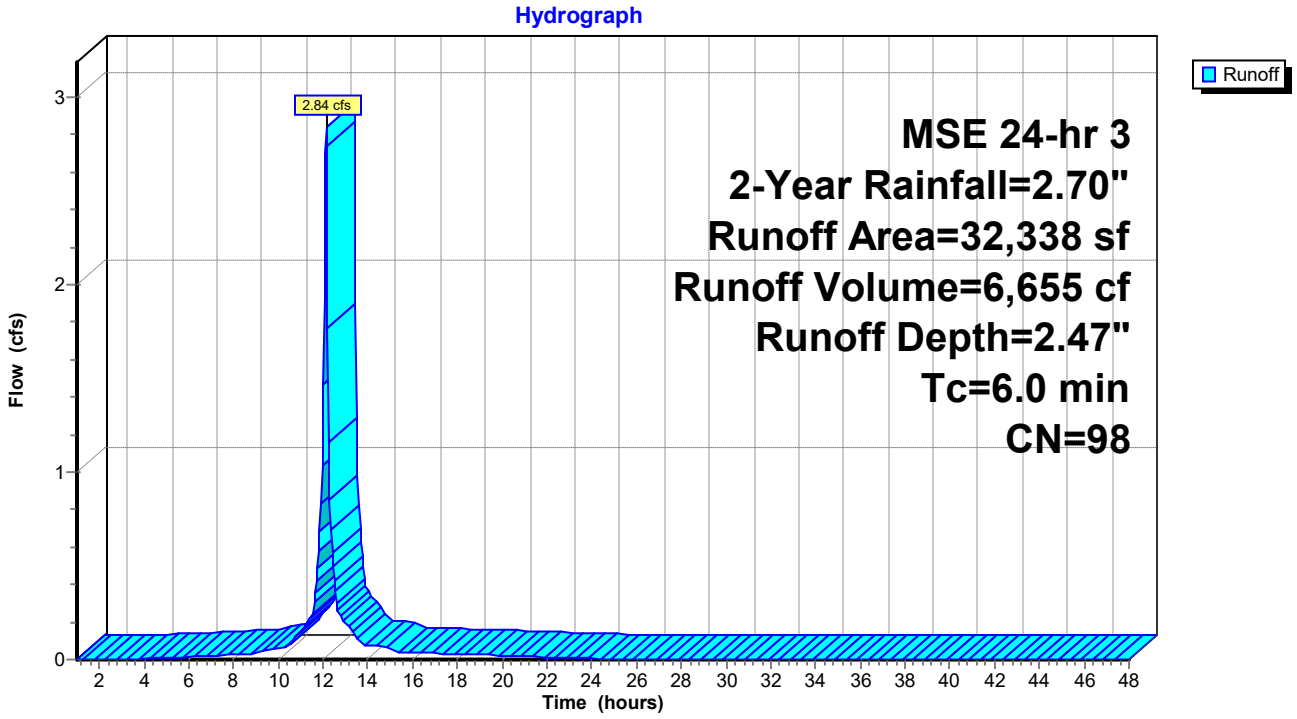
Runoff = 2.84 cfs @ 12.13 hrs, Volume= 6,655 cf, Depth= 2.47"
Routed to Reach 111R : Western PL North Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	32,338	98	roof
	32,338		100.00% Impervious Area

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

Subcatchment 172S: B1 (EXTERIOR)



Summary for Subcatchment 173S: A (MARIA ROOF) /2

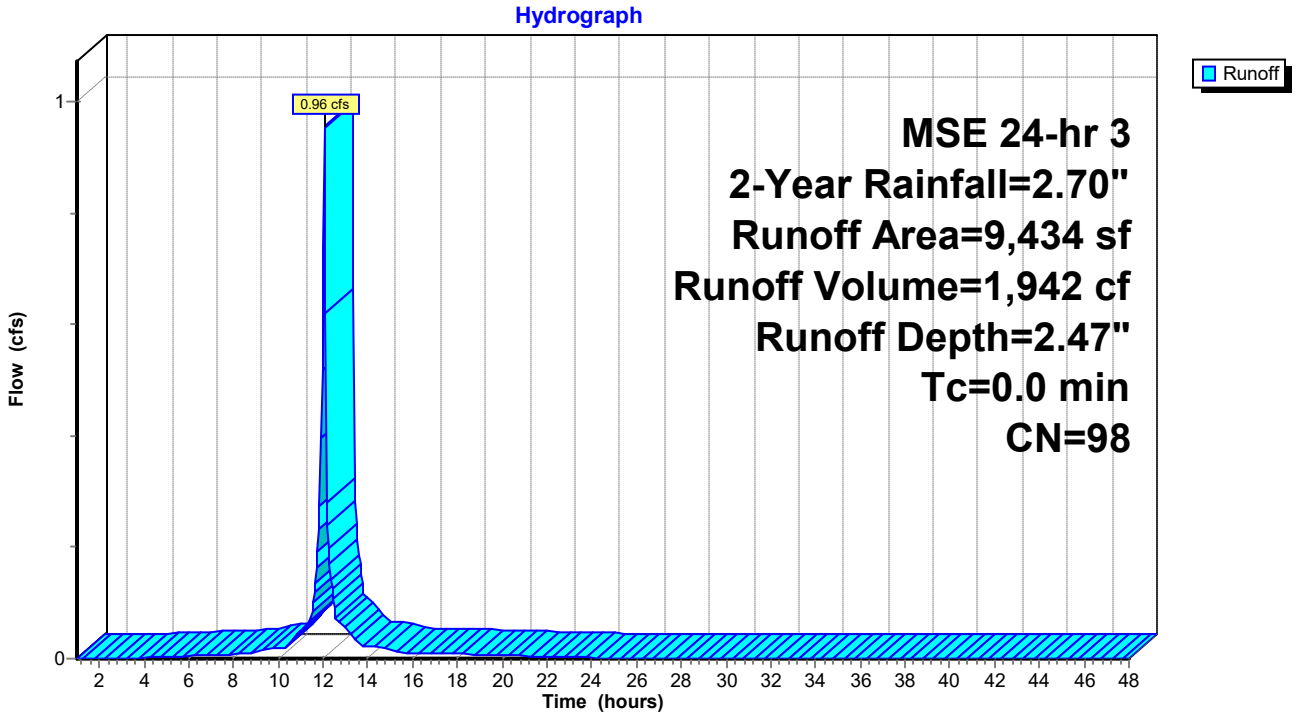
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.96 cfs @ 12.04 hrs, Volume= 1,942 cf, Depth= 2.47"
Routed to Link 175L : TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	9,434	98	Roofs
	9,434		100.00% Impervious Area

Subcatchment 173S: A (MARIA ROOF) /2



Summary for Subcatchment 175S: H6-b

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

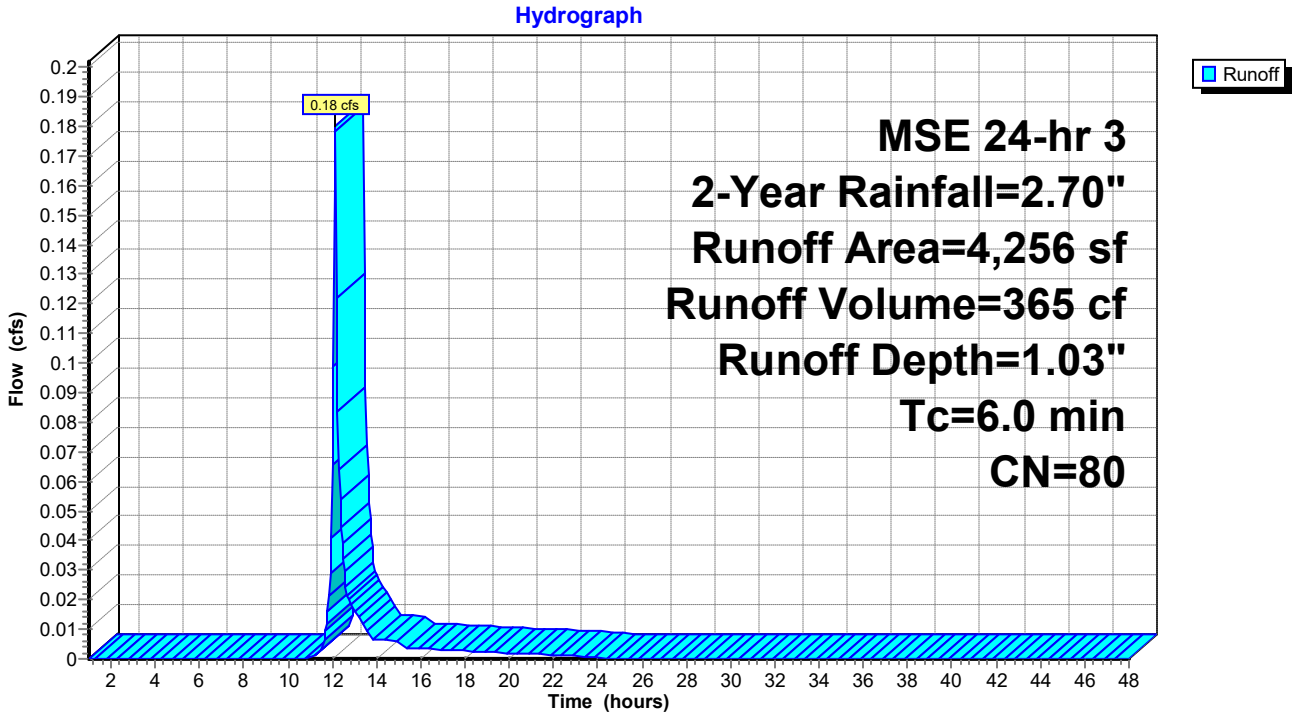
Runoff = 0.18 cfs @ 12.14 hrs, Volume= 365 cf, Depth= 1.03"
Routed to Link 115L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	3,243	74	landscape
*	1,013	98	road
	4,256	80	Weighted Average
	3,243		76.20% Pervious Area
	1,013		23.80% Impervious Area

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

Subcatchment 175S: H6-b



Summary for Subcatchment 176S: X (EX. RBL Area to RBL West Swale)

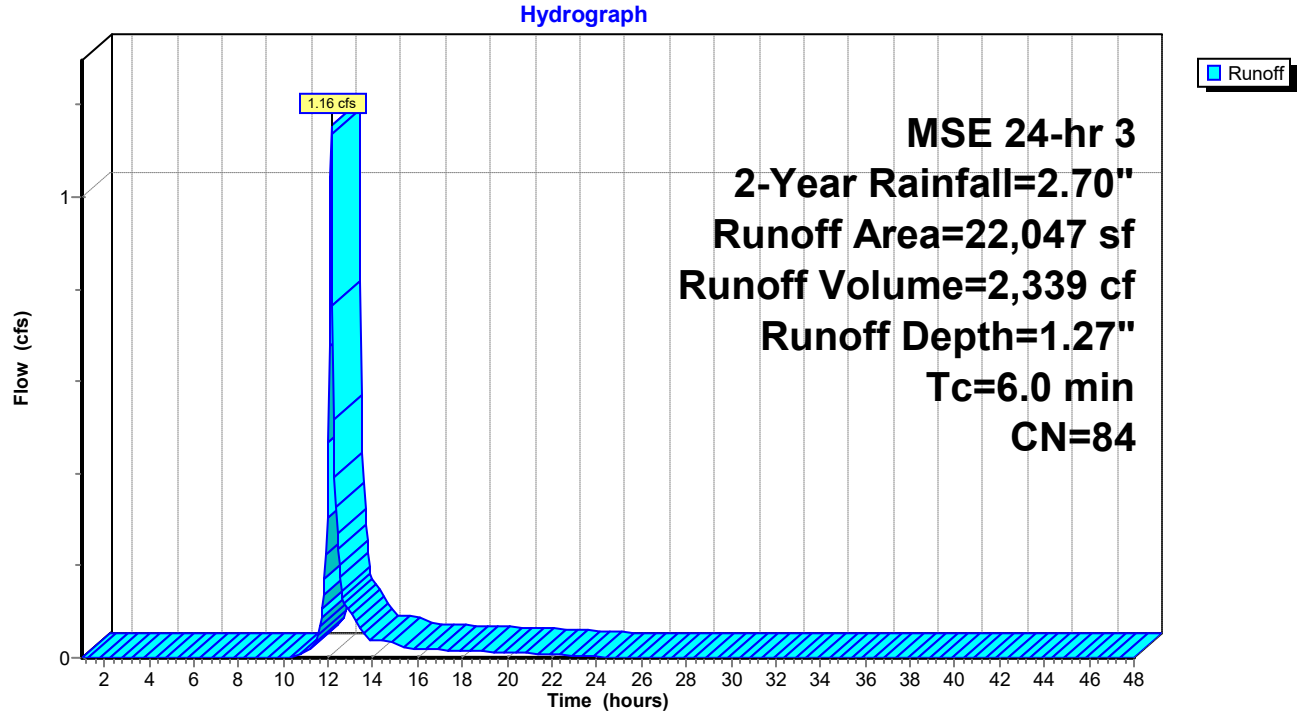
Runoff = 1.16 cfs @ 12.14 hrs, Volume= 2,339 cf, Depth= 1.27"
Routed to Reach 132R : EX. Red Barn Lane West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	12,014	74	landscape
*	9,160	98	road
*	873	74	landscape
	22,047	84	Weighted Average
	12,887		58.45% Pervious Area
	9,160		41.55% Impervious Area

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

Subcatchment 176S: X (EX. RBL Area to RBL West Swale)



Summary for Subcatchment 179S: H6-c

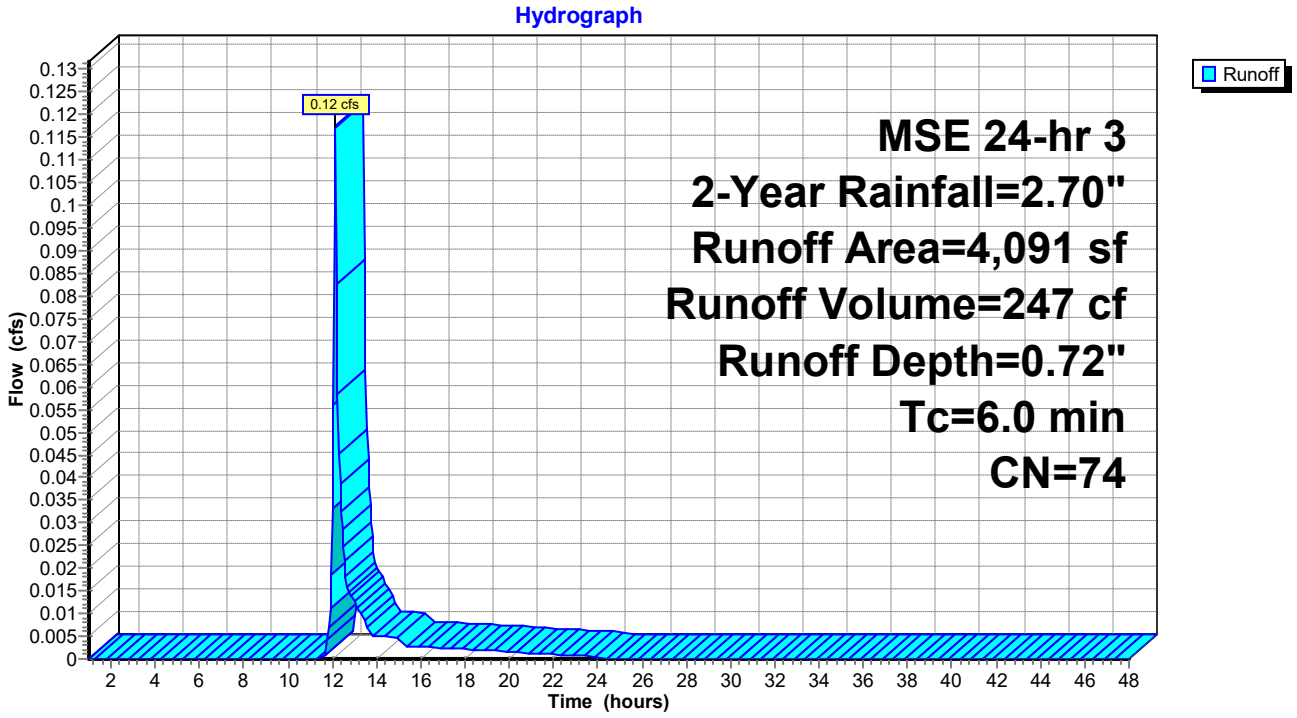
Runoff = 0.12 cfs @ 12.14 hrs, Volume= 247 cf, Depth= 0.72"
Routed to Link 115L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	4,091	74	per
	4,091		100.00% Pervious Area

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

Subcatchment 179S: H6-c



Summary for Subcatchment 182S: A35

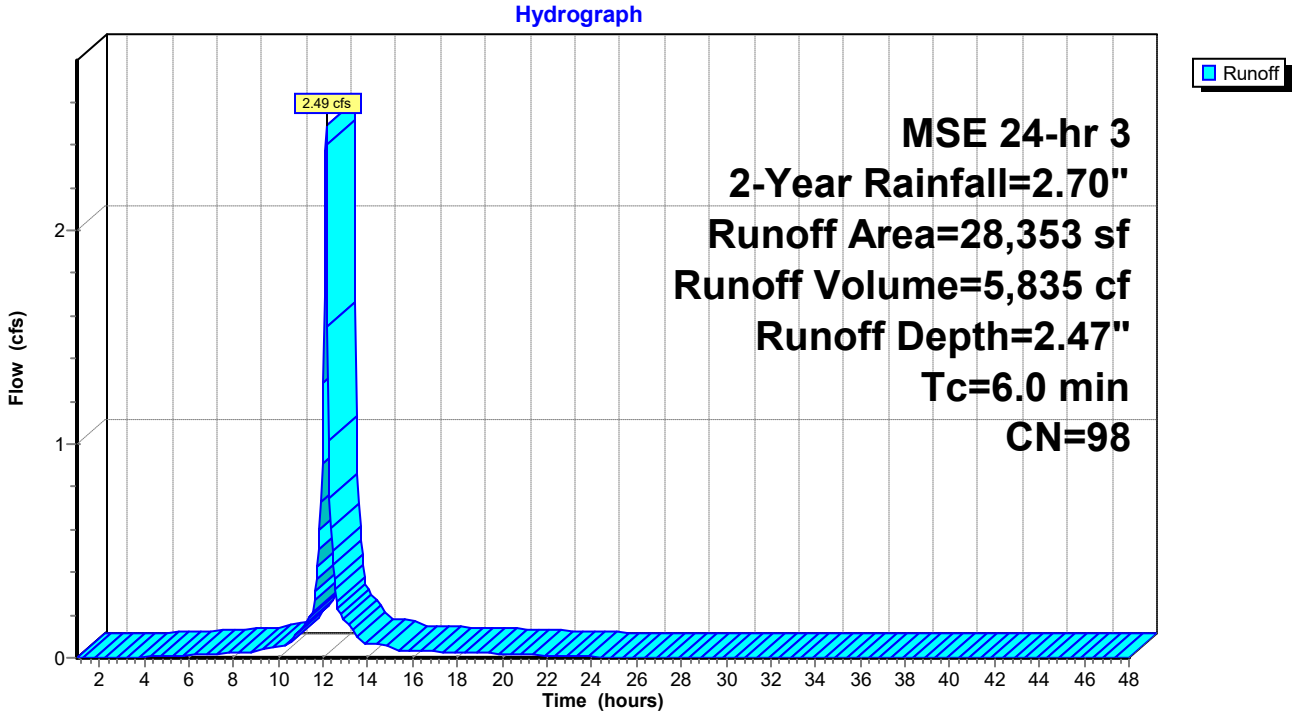
Runoff = 2.49 cfs @ 12.13 hrs, Volume= 5,835 cf, Depth= 2.47"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	28,353	98	WALKS
*	0	98	ROADS
*	0	98	ROOF
*	0	74	LANDSCAPING
	28,353	98	Weighted Average
	28,353		100.00% Impervious Area

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

Subcatchment 182S: A35



Summary for Subcatchment 183S: Y (RBL Area to RBL East Swale)

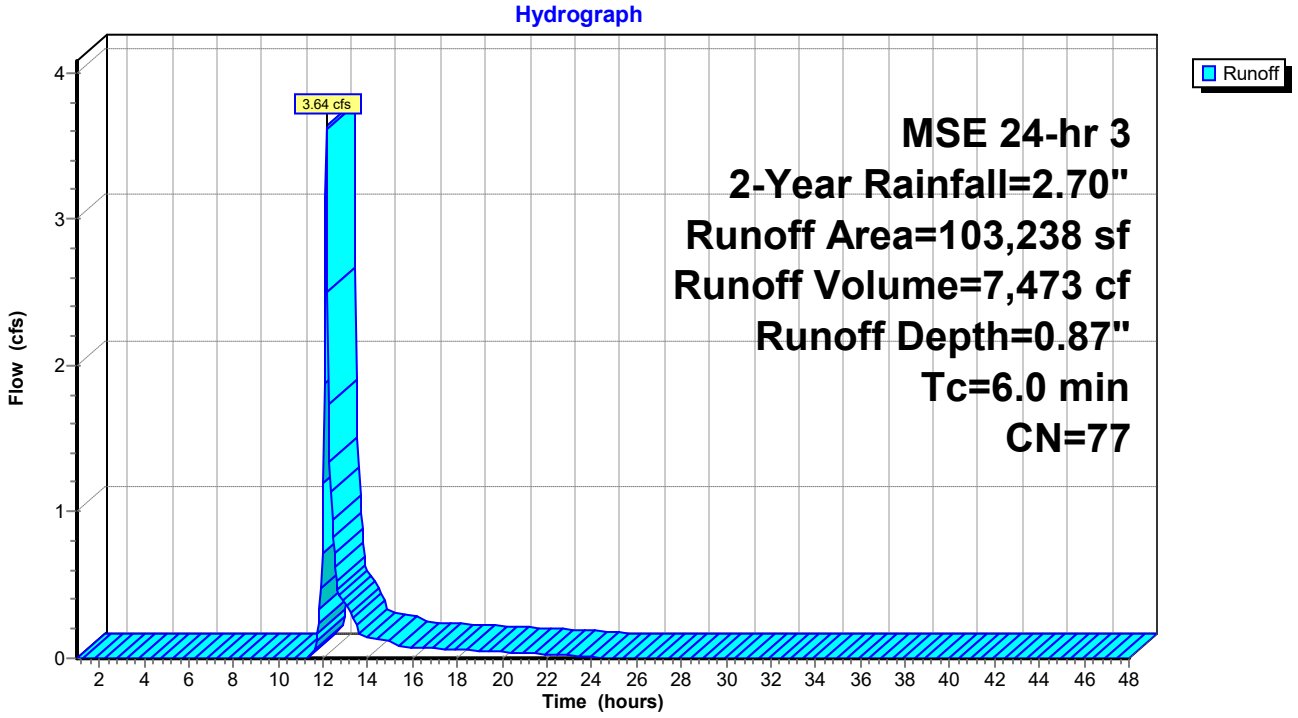
Runoff = 3.64 cfs @ 12.14 hrs, Volume= 7,473 cf, Depth= 0.87"
Routed to Reach 184R : Red Barn Lane East Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	92,001	74	landscape
*	11,237	98	road
	103,238	77	Weighted Average
	92,001		89.12% Pervious Area
	11,237		10.88% Impervious Area

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

Subcatchment 183S: Y (RBL Area to RBL East Swale)



Summary for Subcatchment 185S: H4

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

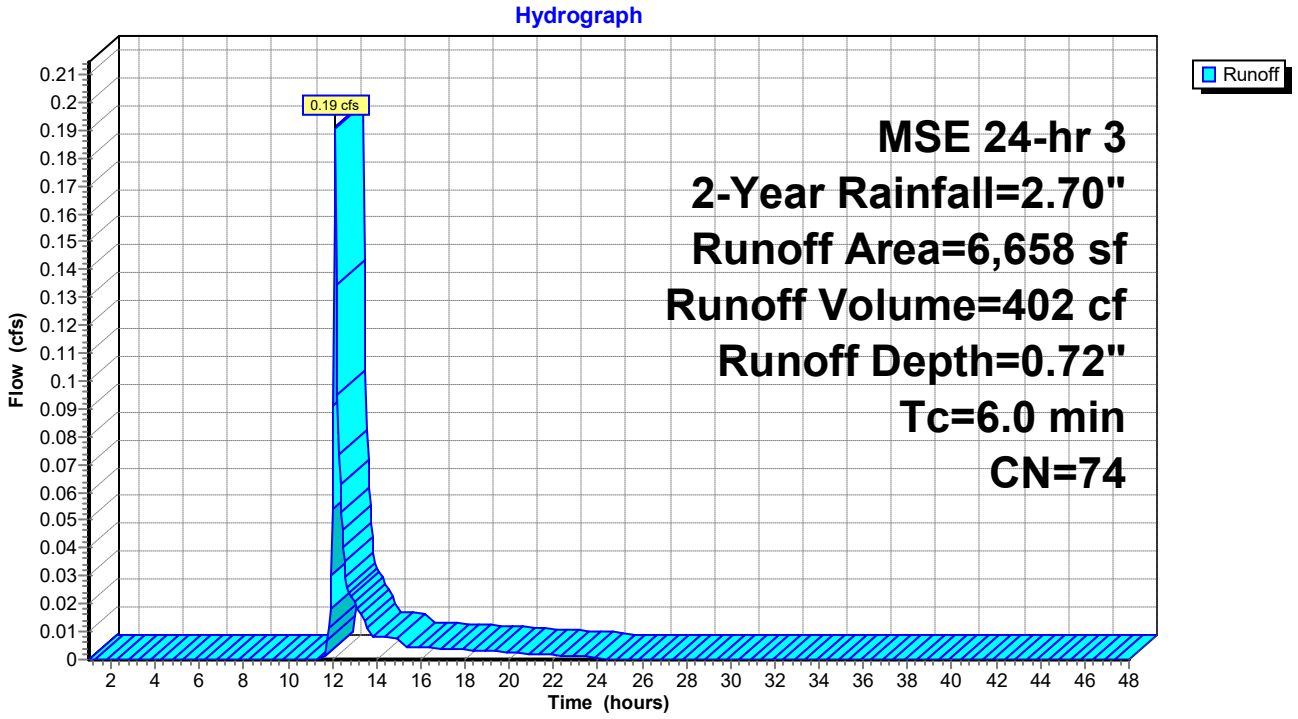
Runoff = 0.19 cfs @ 12.14 hrs, Volume= 402 cf, Depth= 0.72"
Routed to Link 66L : Total Offsite

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 2-Year Rainfall=2.70"

	Area (sf)	CN	Description
*	6,658	74	landscape
	6,658		100.00% Pervious Area

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

Subcatchment 185S: H4



Summary for Reach 99R: East Swale (SE End)

[62] Hint: Exceeded Reach 106R OUTLET depth by 0.31' @ 12.15 hrs

Inflow Area = 227,272 sf, 34.15% Impervious, Inflow Depth = 1.16" for 2-Year event
Inflow = 10.86 cfs @ 12.14 hrs, Volume= 21,971 cf
Outflow = 9.94 cfs @ 12.16 hrs, Volume= 21,971 cf, Atten= 8%, Lag= 1.6 min
Routed to Pond 58P : Dry Pond 1

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.50 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 0.79 fps, Avg. Travel Time= 12.0 min

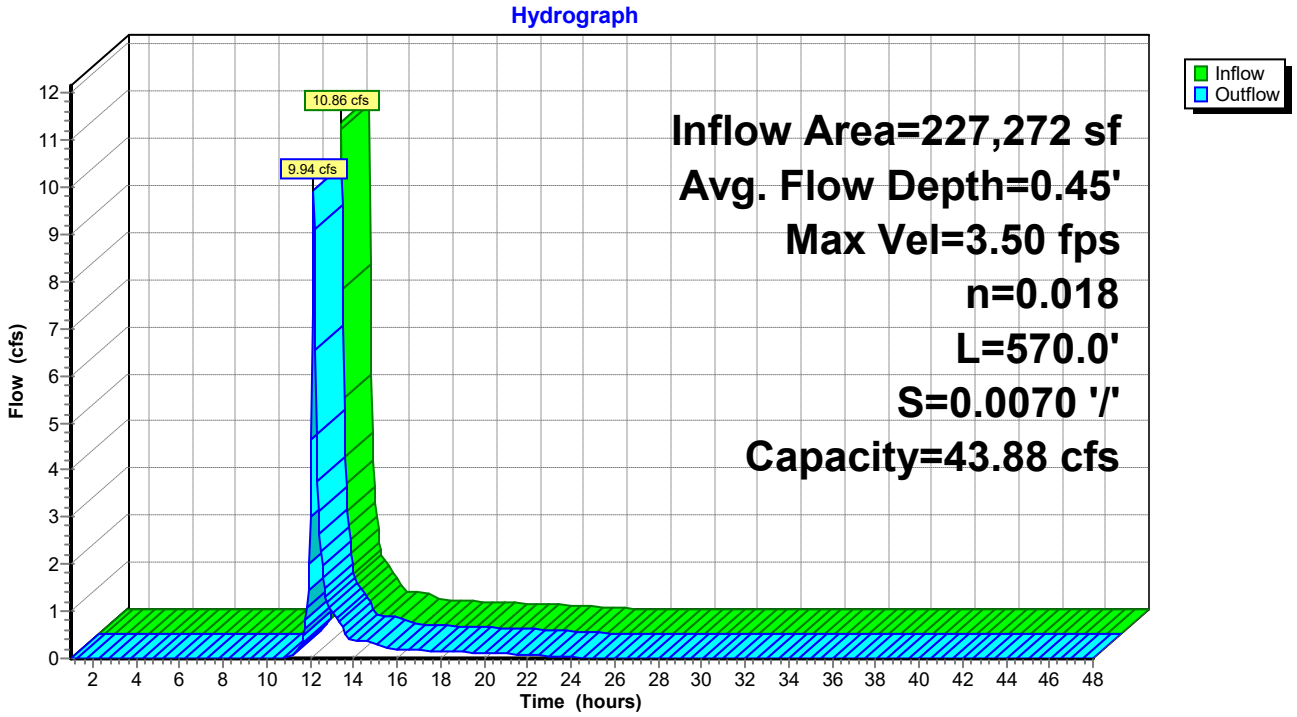
Peak Storage= 1,615 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.45' , Surface Width= 7.68'
Bank-Full Depth= 1.00' Flow Area= 8.0 sf, Capacity= 43.88 cfs

5.00' x 1.00' deep channel, n= 0.018
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 570.0' Slope= 0.0070 '/'
Inlet Invert= 757.00', Outlet Invert= 753.00'



‡

Reach 99R: East Swale (SE End)



Summary for Reach 106R: East Swale (North End)

3/2/21
Slope Calc - (140' x 4.64%)

Inflow Area = 19,337 sf, 26.10% Impervious, Inflow Depth = 1.03" for 2-Year event
Inflow = 0.82 cfs @ 12.14 hrs, Volume= 1,659 cf
Outflow = 0.81 cfs @ 12.15 hrs, Volume= 1,659 cf, Atten= 1%, Lag= 0.6 min
Routed to Reach 99R : East Swale (SE End)

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.56 fps, Min. Travel Time= 0.9 min
Avg. Velocity = 0.68 fps, Avg. Travel Time= 3.4 min

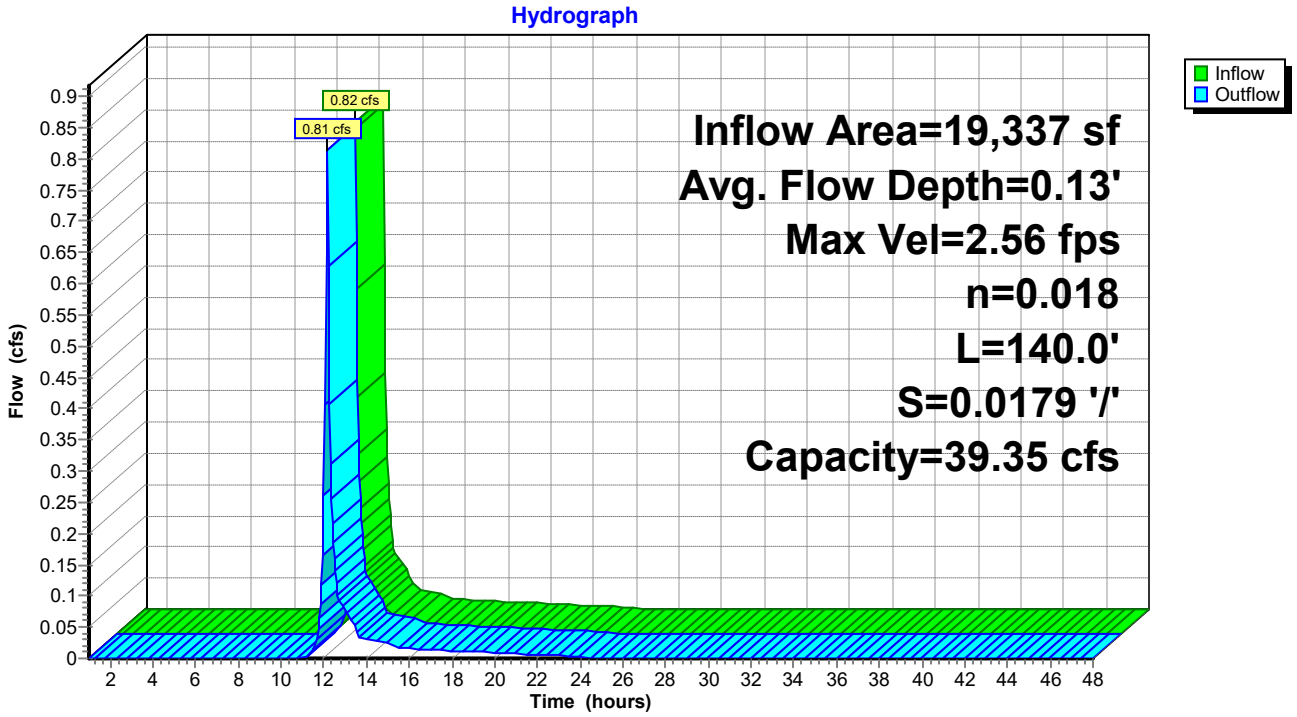
Peak Storage= 44 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.13' , Surface Width= 2.79'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 39.35 cfs

2.00' x 1.00' deep channel, n= 0.018 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 8.00'
Length= 140.0' Slope= 0.0179 '/'
Inlet Invert= 759.51', Outlet Invert= 757.00'



‡

Reach 106R: East Swale (North End)



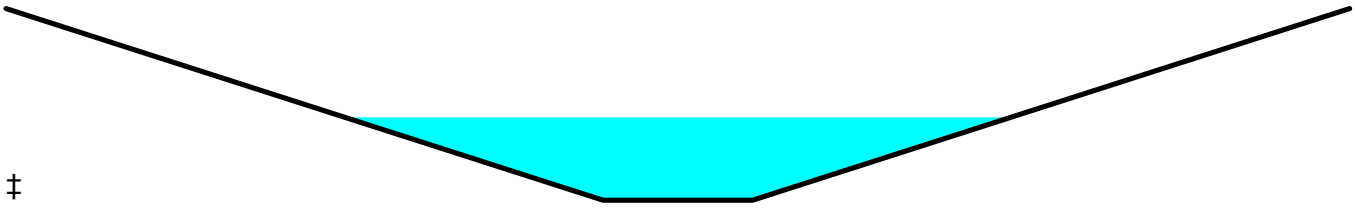
Summary for Reach 108R: South Berm Swale

Inflow Area = 124,665 sf, 12.91% Impervious, Inflow Depth = 0.88" for 2-Year event
Inflow = 2.99 cfs @ 12.14 hrs, Volume= 9,157 cf
Outflow = 2.84 cfs @ 12.16 hrs, Volume= 9,157 cf, Atten= 5%, Lag= 1.3 min
Routed to Pond 57P : Dry Pond 2

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.40 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 0.86 fps, Avg. Travel Time= 5.2 min

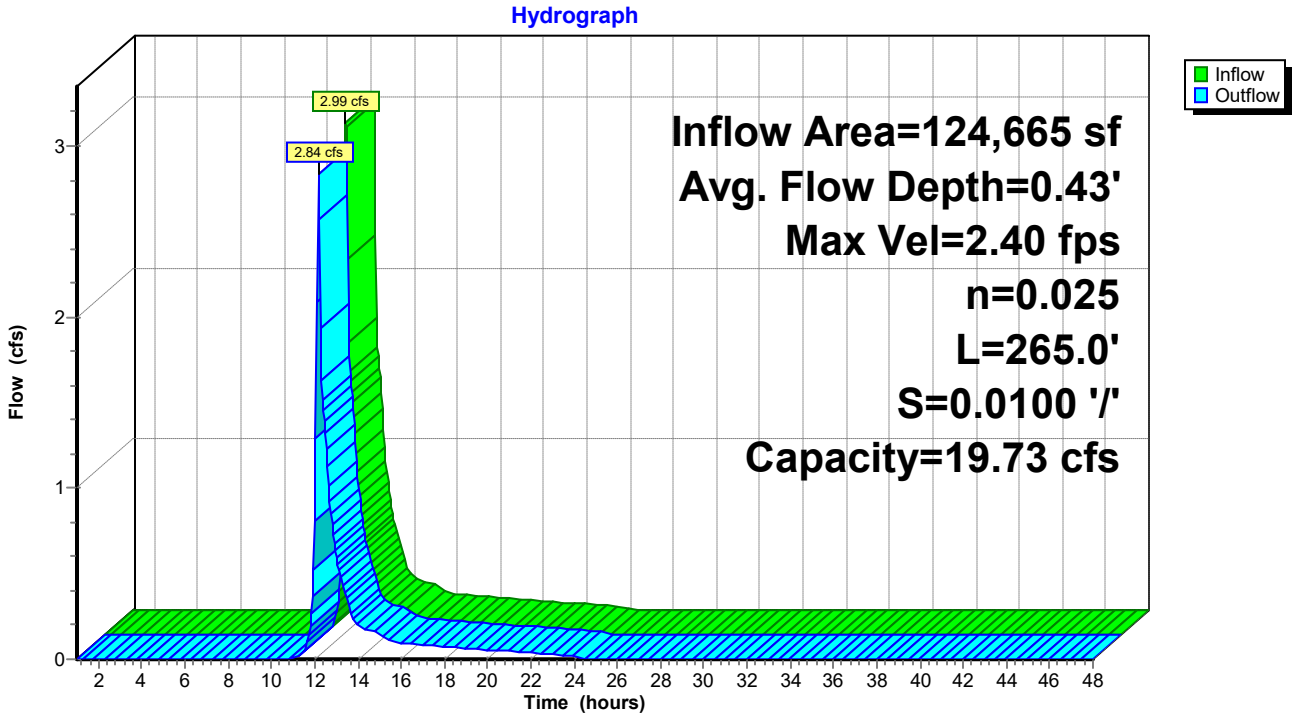
Peak Storage= 312 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.43' , Surface Width= 4.46'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 19.73 cfs

1.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 4.0 '/' Top Width= 9.00'
Length= 265.0' Slope= 0.0100 '/'
Inlet Invert= 754.00', Outlet Invert= 751.35'



‡

Reach 108R: South Berm Swale



Summary for Reach 109R: SC Road East Ditch

3/3/21
Ditch on north and west side of cul-de-sac road

Inflow Area = 41,695 sf, 60.00% Impervious, Inflow Depth = 1.55" for 2-Year event
Inflow = 2.64 cfs @ 12.13 hrs, Volume= 5,400 cf
Outflow = 2.30 cfs @ 12.17 hrs, Volume= 5,400 cf, Atten= 13%, Lag= 2.1 min
Routed to Pond 95P : Dry Pond 3

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.77 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 0.43 fps, Avg. Travel Time= 16.3 min

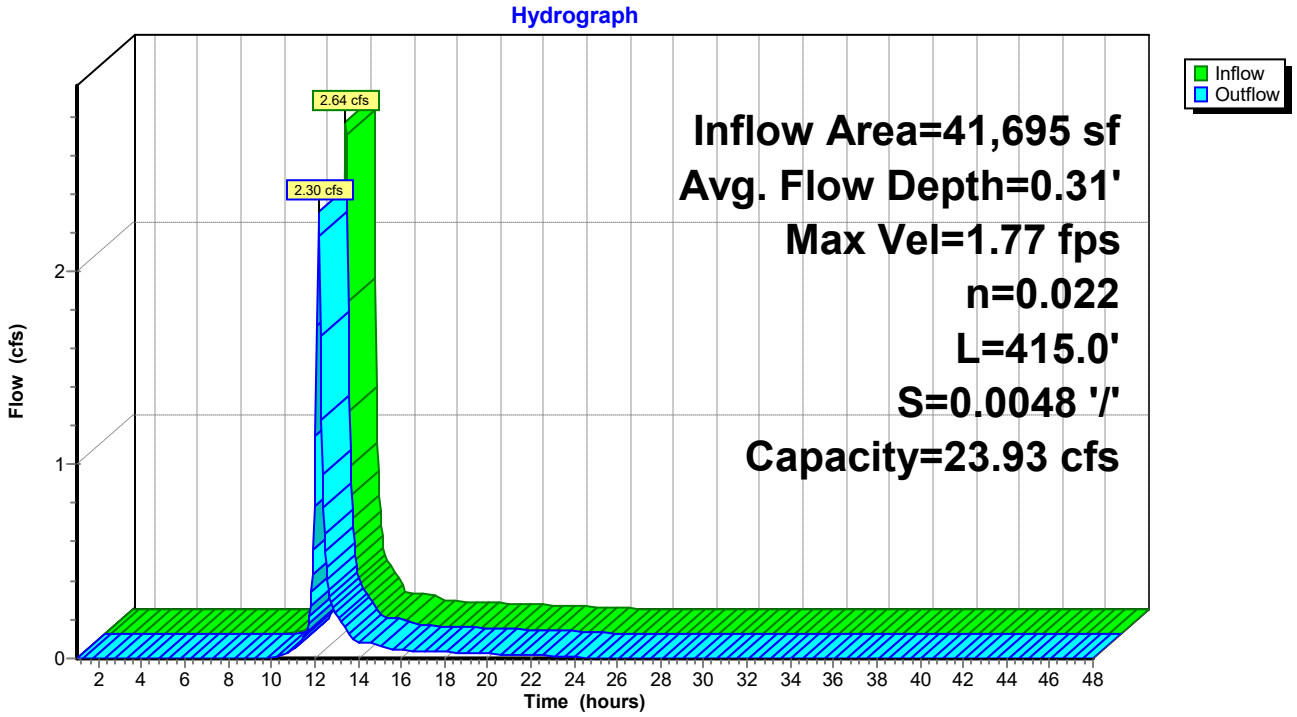
Peak Storage= 537 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.31' , Surface Width= 5.45'
Bank-Full Depth= 1.00' Flow Area= 7.0 sf, Capacity= 23.93 cfs

3.00' x 1.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 '/' Top Width= 11.00'
Length= 415.0' Slope= 0.0048 '/'
Inlet Invert= 747.00', Outlet Invert= 745.00'



‡

Reach 109R: SC Road East Ditch



Summary for Reach 111R: Western PL North Ditch

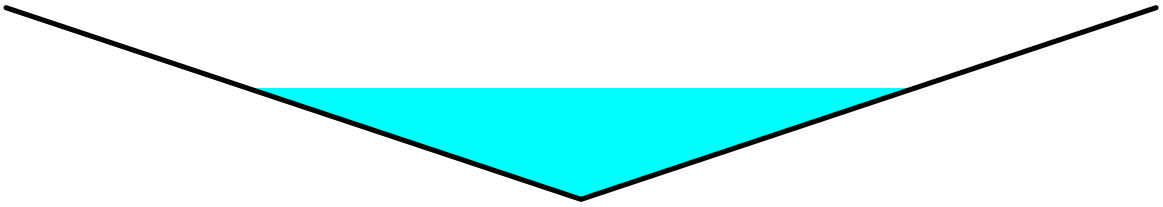
3/3/21
This is the western property line ditch that takes offsite flow and western building courtyard flow to IB
update length we shortened in screen share

Inflow Area = 158,356 sf, 28.25% Impervious, Inflow Depth = 1.17" for 2-Year event
Inflow = 6.79 cfs @ 12.14 hrs, Volume= 15,453 cf
Outflow = 6.30 cfs @ 12.16 hrs, Volume= 15,453 cf, Atten= 7%, Lag= 1.5 min
Routed to Pond 110R : Western Pipe Run

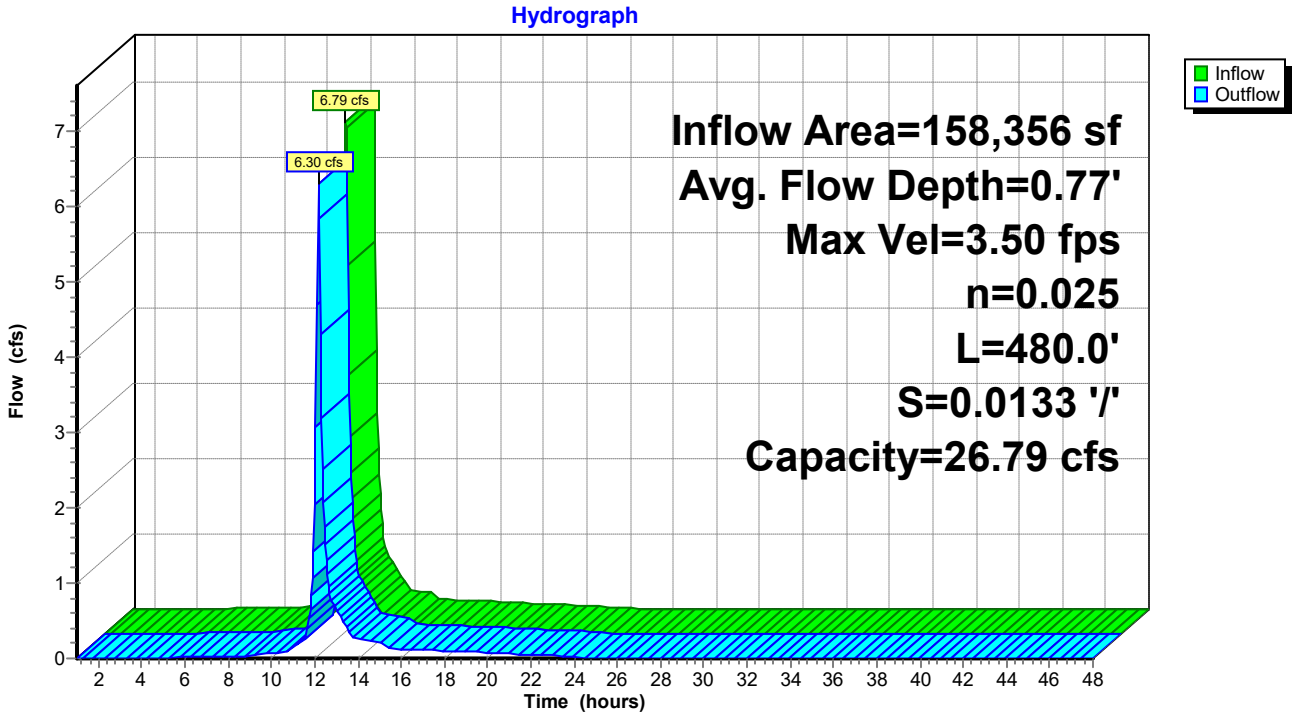
Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.50 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 1.10 fps, Avg. Travel Time= 7.3 min

Peak Storage= 861 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.77' , Surface Width= 4.64'
Bank-Full Depth= 1.33' Flow Area= 5.3 sf, Capacity= 26.79 cfs

0.00' x 1.33' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 7.98'
Length= 480.0' Slope= 0.0133 '/'
Inlet Invert= 755.50', Outlet Invert= 749.10'



Reach 111R: Western PL North Ditch



Summary for Reach 117R: SC Road West Ditch

3/3/21
Ditch on north and west side of cul-de-sac road

Inflow Area = 50,859 sf, 57.49% Impervious, Inflow Depth = 1.55" for 2-Year event
Inflow = 3.22 cfs @ 12.13 hrs, Volume= 6,587 cf
Outflow = 2.74 cfs @ 12.17 hrs, Volume= 6,587 cf, Atten= 15%, Lag= 2.4 min
Routed to Pond 95P : Dry Pond 3

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.77 fps, Min. Travel Time= 4.5 min
Avg. Velocity = 0.42 fps, Avg. Travel Time= 18.6 min

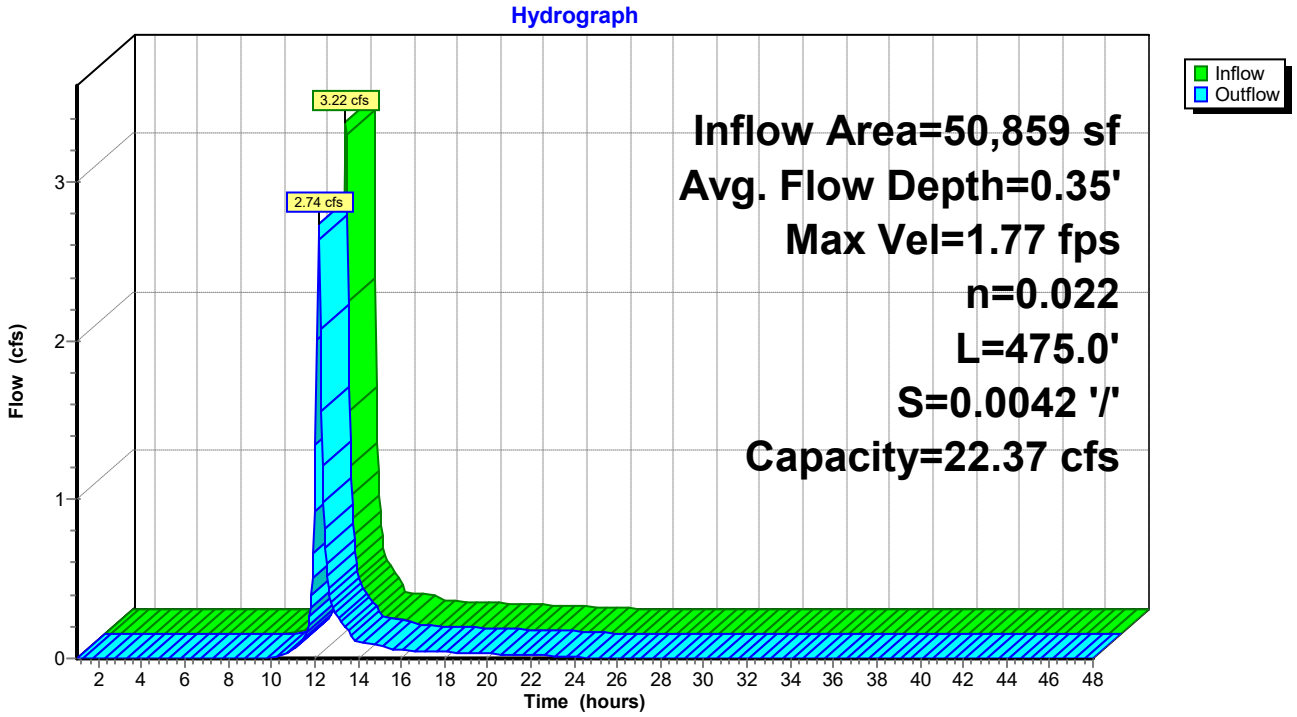
Peak Storage= 728 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.35' , Surface Width= 5.79'
Bank-Full Depth= 1.00' Flow Area= 7.0 sf, Capacity= 22.37 cfs

3.00' x 1.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 '/' Top Width= 11.00'
Length= 475.0' Slope= 0.0042 '/'
Inlet Invert= 747.00', Outlet Invert= 745.00'



‡

Reach 117R: SC Road West Ditch



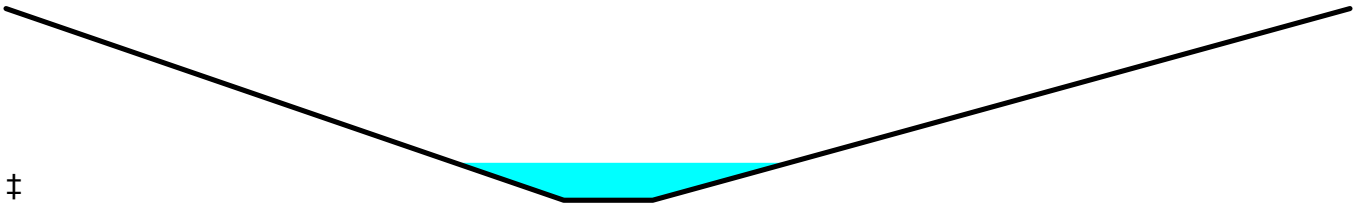
Summary for Reach 132R: EX. Red Barn Lane West Swale

Inflow Area = 51,883 sf, 28.33% Impervious, Inflow Depth = 1.07" for 2-Year event
Inflow = 2.28 cfs @ 12.14 hrs, Volume= 4,628 cf
Outflow = 1.93 cfs @ 12.18 hrs, Volume= 4,628 cf, Atten= 15%, Lag= 2.4 min
Routed to Pond 183P : 24" HDPE PIPE

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.62 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 0.83 fps, Avg. Travel Time= 12.2 min

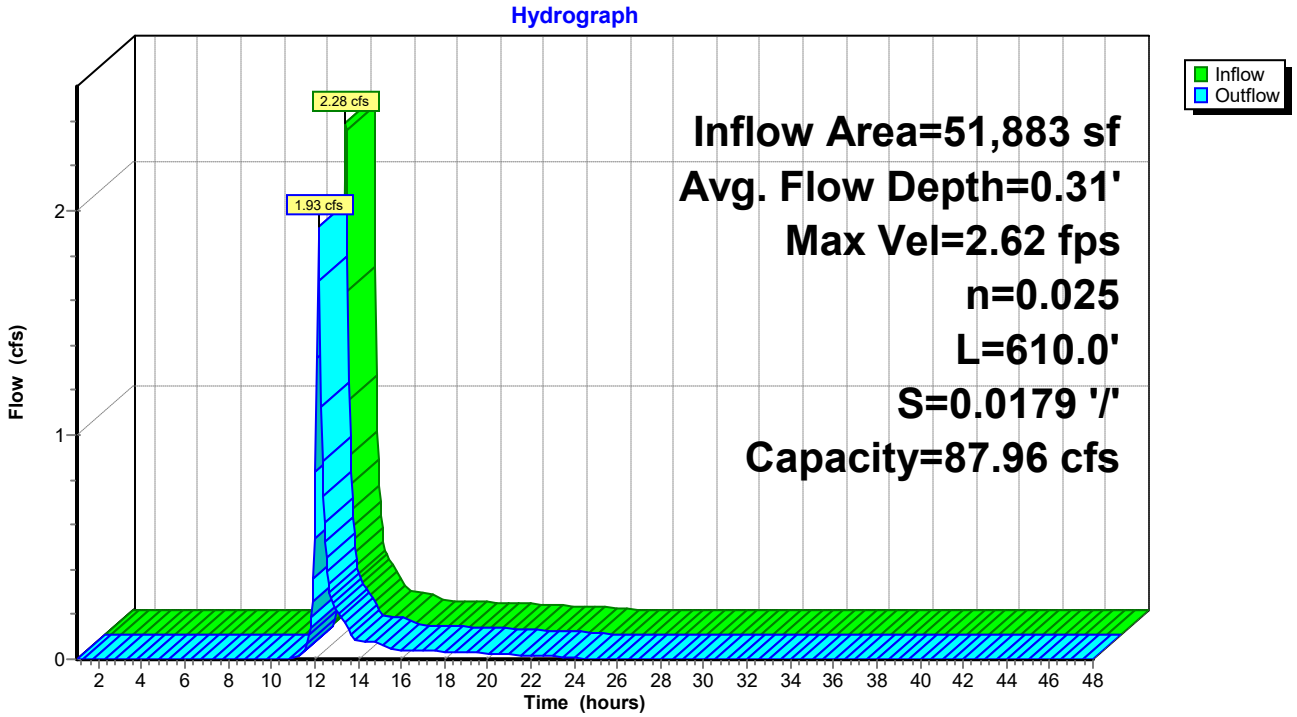
Peak Storage= 447 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.31' , Surface Width= 3.77'
Bank-Full Depth= 1.57' Flow Area= 12.7 sf, Capacity= 87.96 cfs

1.00' x 1.57' deep channel, n= 0.025
Side Slope Z-value= 4.0 5.0 '/' Top Width= 15.13'
Length= 610.0' Slope= 0.0179 '/'
Inlet Invert= 760.89', Outlet Invert= 750.00'



‡

Reach 132R: EX. Red Barn Lane West Swale



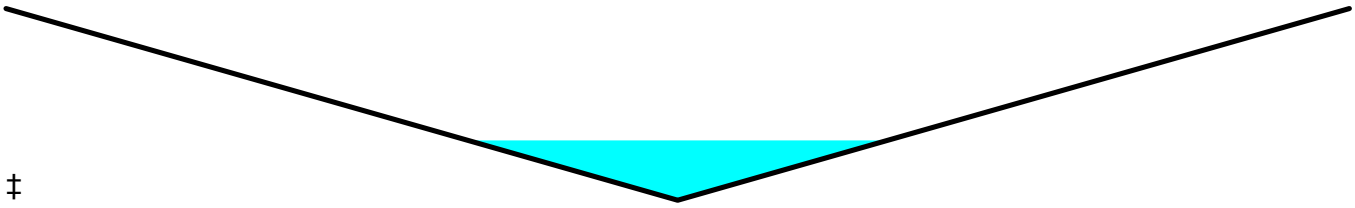
Summary for Reach 136R: SC West Ditch

Inflow Area = 20,215 sf, 20.28% Impervious, Inflow Depth = 0.97" for 2-Year event
Inflow = 0.81 cfs @ 12.14 hrs, Volume= 1,641 cf
Outflow = 0.74 cfs @ 12.16 hrs, Volume= 1,641 cf, Atten= 8%, Lag= 1.6 min
Routed to Pond 95P : Dry Pond 3

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.52 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 0.56 fps, Avg. Travel Time= 6.5 min

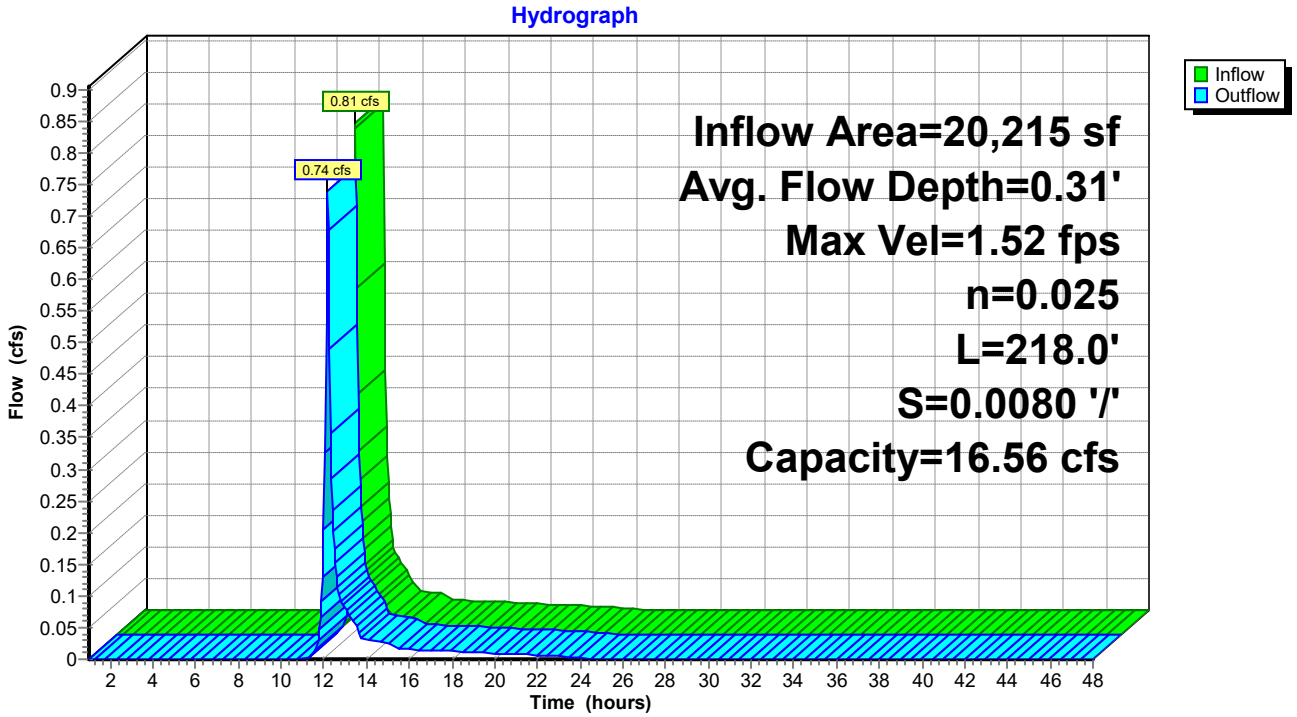
Peak Storage= 106 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.31' , Surface Width= 3.12'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 16.56 cfs

0.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 5.0 '/' Top Width= 10.00'
Length= 218.0' Slope= 0.0080 '/'
Inlet Invert= 743.75', Outlet Invert= 742.00'



‡

Reach 136R: SC West Ditch



Summary for Reach 151R: Western PL North Ditch

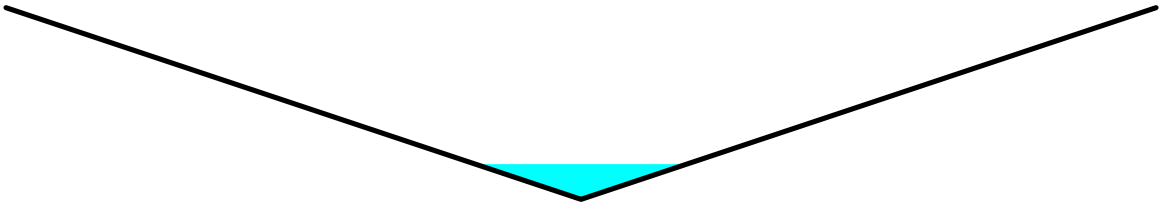
3/3/21
This is the western property line ditch that takes offsite flow and western building courtyard flow to IB
update length we shortened in screen share

Inflow Area = 8,222 sf, 12.92% Impervious, Inflow Depth = 0.87" for 2-Year event
Inflow = 0.29 cfs @ 12.14 hrs, Volume= 595 cf
Outflow = 0.26 cfs @ 12.17 hrs, Volume= 595 cf, Atten= 10%, Lag= 1.7 min
Routed to Pond 110R : Western Pipe Run

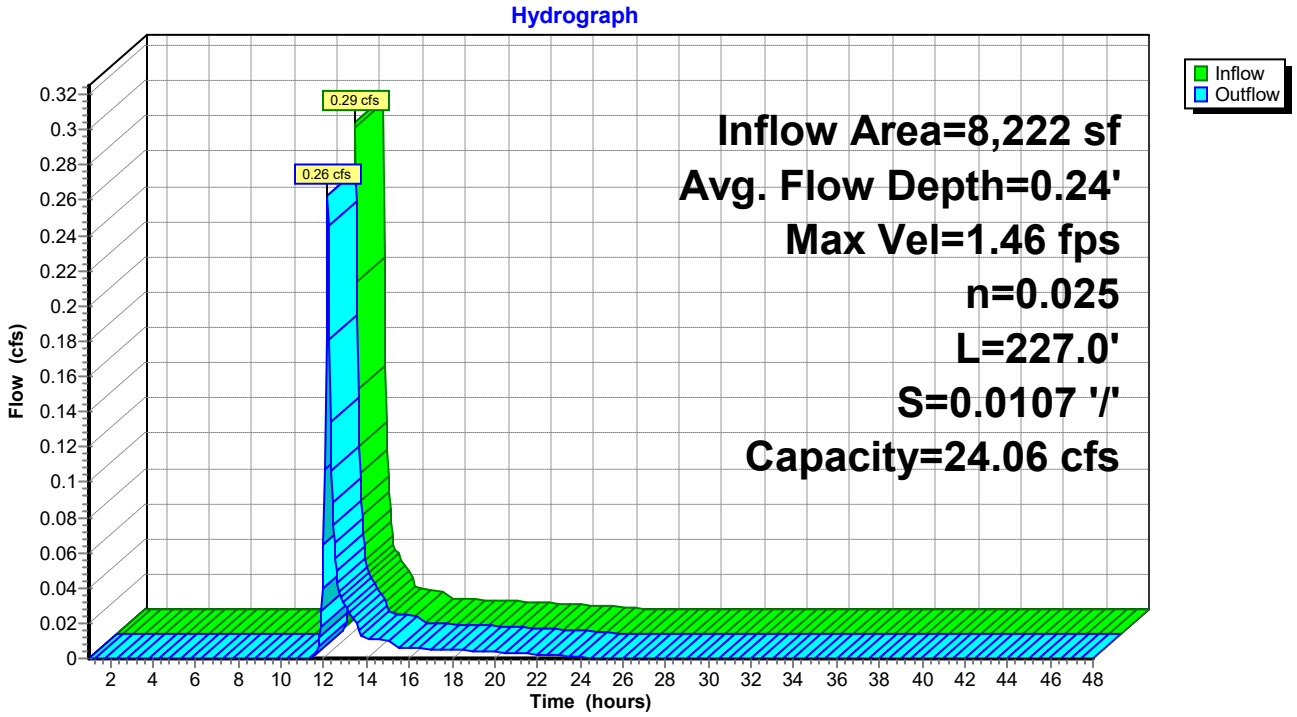
Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.46 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 0.56 fps, Avg. Travel Time= 6.7 min

Peak Storage= 41 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.24' , Surface Width= 1.47'
Bank-Full Depth= 1.33' Flow Area= 5.3 sf, Capacity= 24.06 cfs

0.00' x 1.33' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 7.98'
Length= 227.0' Slope= 0.0107 '/'
Inlet Invert= 751.54', Outlet Invert= 749.10'



Reach 151R: Western PL North Ditch



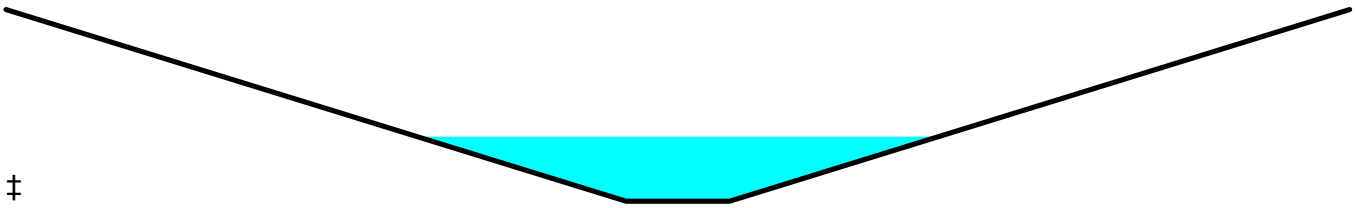
Summary for Reach 184R: Red Barn Lane East Swale

Inflow Area = 103,238 sf, 10.88% Impervious, Inflow Depth = 0.87" for 2-Year event
Inflow = 3.64 cfs @ 12.14 hrs, Volume= 7,473 cf
Outflow = 2.79 cfs @ 12.20 hrs, Volume= 7,473 cf, Atten= 24%, Lag= 3.5 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.73 fps, Min. Travel Time= 5.8 min
Avg. Velocity = 0.87 fps, Avg. Travel Time= 18.1 min

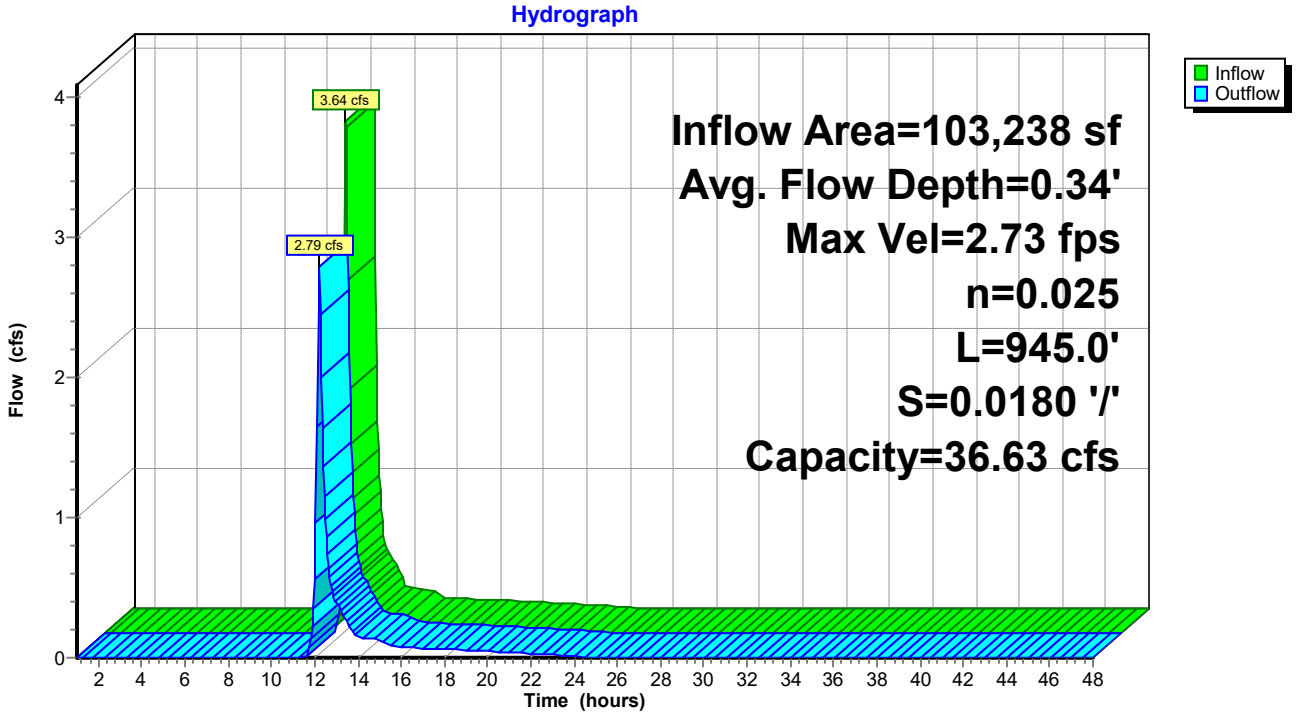
Peak Storage= 966 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.34' , Surface Width= 5.05'
Bank-Full Depth= 1.00' Flow Area= 7.0 sf, Capacity= 36.63 cfs

1.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 6.0 '/' Top Width= 13.00'
Length= 945.0' Slope= 0.0180 '/'
Inlet Invert= 763.00', Outlet Invert= 746.00'



‡

Reach 184R: Red Barn Lane East Swale



Summary for Pond 41P: Reach Pipe

Inflow Area = 806,202 sf, 39.20% Impervious, Inflow Depth = 0.02" for 2-Year event
Inflow = 0.65 cfs @ 12.18 hrs, Volume= 1,561 cf
Outflow = 0.65 cfs @ 12.18 hrs, Volume= 1,561 cf, Atten= 0%, Lag= 0.3 min
Primary = 0.65 cfs @ 12.18 hrs, Volume= 1,561 cf
Routed to Pond 154P : Southeast Basin

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 738.44' @ 12.18 hrs Surf.Area= 34 sf Storage= 6 cf

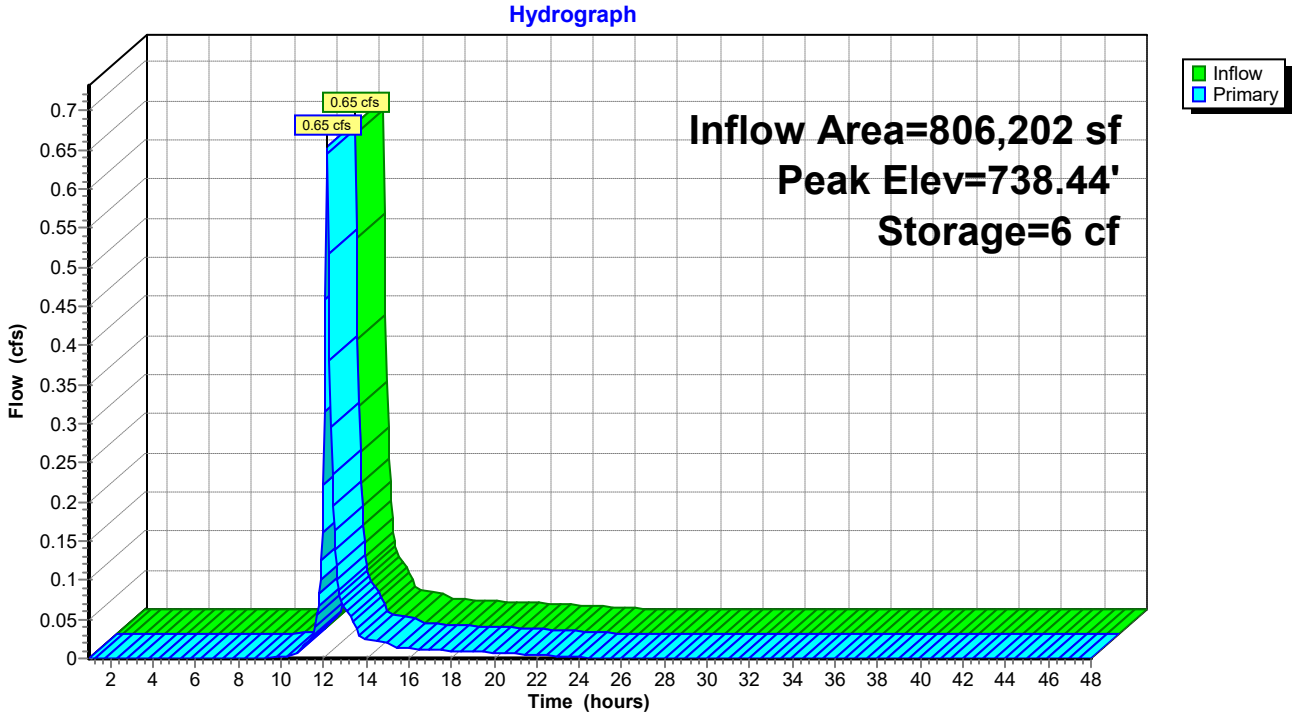
Plug-Flow detention time= 0.1 min calculated for 1,560 cf (100% of inflow)
Center-of-Mass det. time= 0.1 min (806.4 - 806.3)

Volume	Invert	Avail.Storage	Storage Description
#1	738.00'	1,587 cf	**24.0" Round Pipe Storage** L= 505.0' S= 0.0150 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	738.00'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.64 cfs @ 12.18 hrs HW=738.43' TW=730.27' (Dynamic Tailwater)
↑—**1=Orifice/Grate** (Orifice Controls 0.64 cfs @ 2.24 fps)

Pond 41P: Reach Pipe



Summary for Pond 57P: Dry Pond 2

Inflow Area = 214,039 sf, 18.55% Impervious, Inflow Depth = 0.96" for 2-Year event
Inflow = 5.75 cfs @ 12.17 hrs, Volume= 17,093 cf
Outflow = 1.68 cfs @ 12.65 hrs, Volume= 17,093 cf, Atten= 71%, Lag= 28.6 min
Discarded = 1.68 cfs @ 12.65 hrs, Volume= 17,093 cf
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 41P : Reach Pipe
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Reach 117R : SC Road West Ditch

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 747.51' @ 12.65 hrs Surf.Area= 8,054 sf Storage= 3,888 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 16.6 min (848.9 - 832.3)

Volume	Invert	Avail.Storage	Storage Description
#1	747.00'	55,955 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
747.00	7,300	0	0
748.00	8,788	8,044	8,044
749.00	10,334	9,561	17,605
750.00	11,935	11,135	28,740
751.00	13,594	12,765	41,504
752.00	15,308	14,451	55,955

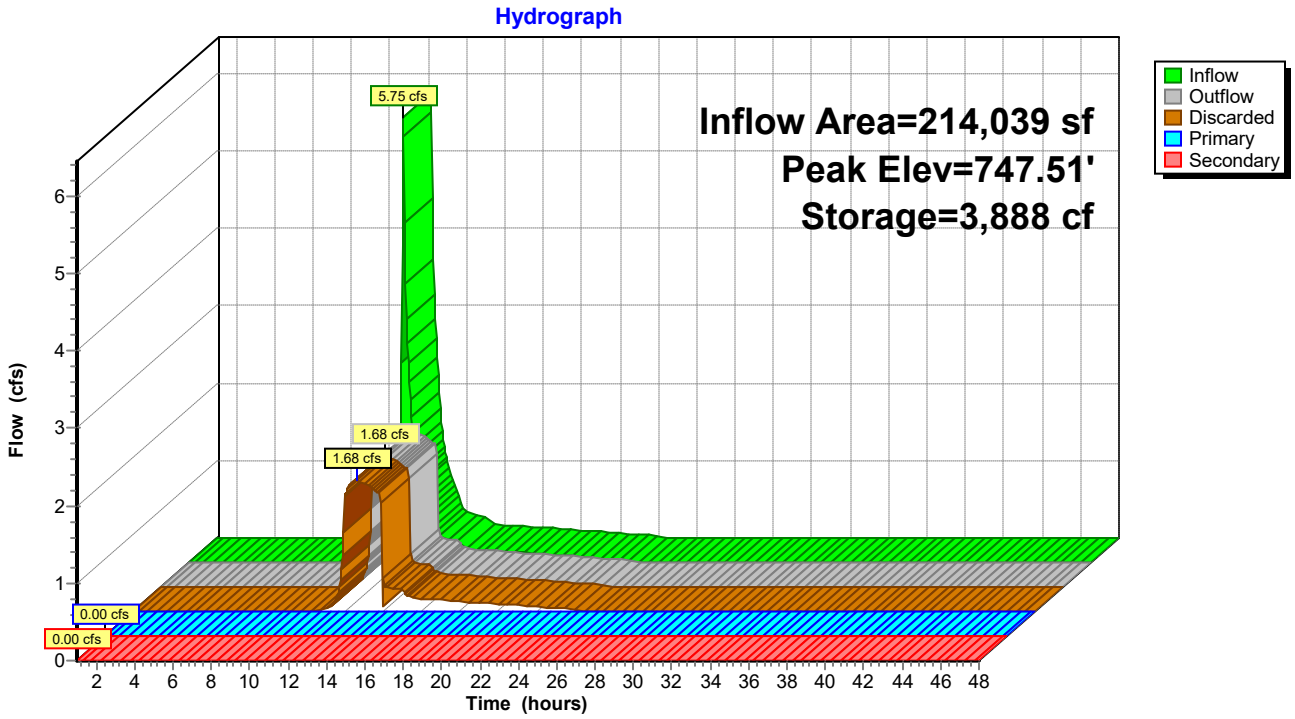
Device	Routing	Invert	Outlet Devices
#1	Primary	750.00'	**12.0" Round Culvert** L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 750.00' / 749.50' S= 0.0200 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#2	Device 1	750.33'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	751.66'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	750.44'	**12.0" Round Culvert** L= 214.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 750.44' / 750.01' S= 0.0020 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#5	Device 4	750.44'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Device 4	751.93'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#7	Discarded	747.00'	**8.880 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 720.00' Phase-In= 0.01'

Discarded OutFlow Max=1.68 cfs @ 12.65 hrs HW=747.51' (Free Discharge)
└**7=Exfiltration** (Controls 1.68 cfs)

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=747.00' TW=738.00' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)
  └**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=747.00' TW=747.00' (Dynamic Tailwater)
└**4=Culvert** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Pond 57P: Dry Pond 2



Summary for Pond 58P: Dry Pond 1

Inflow Area = 579,504 sf, 46.53% Impervious, Inflow Depth = 1.40" for 2-Year event
Inflow = 18.58 cfs @ 12.15 hrs, Volume= 67,403 cf
Outflow = 1.66 cfs @ 15.07 hrs, Volume= 67,403 cf, Atten= 91%, Lag= 175.3 min
Discarded = 1.66 cfs @ 15.07 hrs, Volume= 67,403 cf
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 101R : Reach Pipe DP1 TO MH
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 57P : Dry Pond 2

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 748.28' @ 15.07 hrs Surf.Area= 21,618 sf Storage= 25,415 cf

Plug-Flow detention time= 169.5 min calculated for 67,403 cf (100% of inflow)
Center-of-Mass det. time= 169.5 min (1,034.2 - 864.6)

Volume	Invert	Avail.Storage	Storage Description
#1	747.00'	197,389 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
747.00	17,995	0	0
748.00	20,805	19,400	19,400
749.00	23,672	22,239	41,639
750.00	26,595	25,134	66,772
751.00	29,575	28,085	94,857
752.00	32,612	31,094	125,951
753.00	35,705	34,159	160,109
754.00	38,855	37,280	197,389

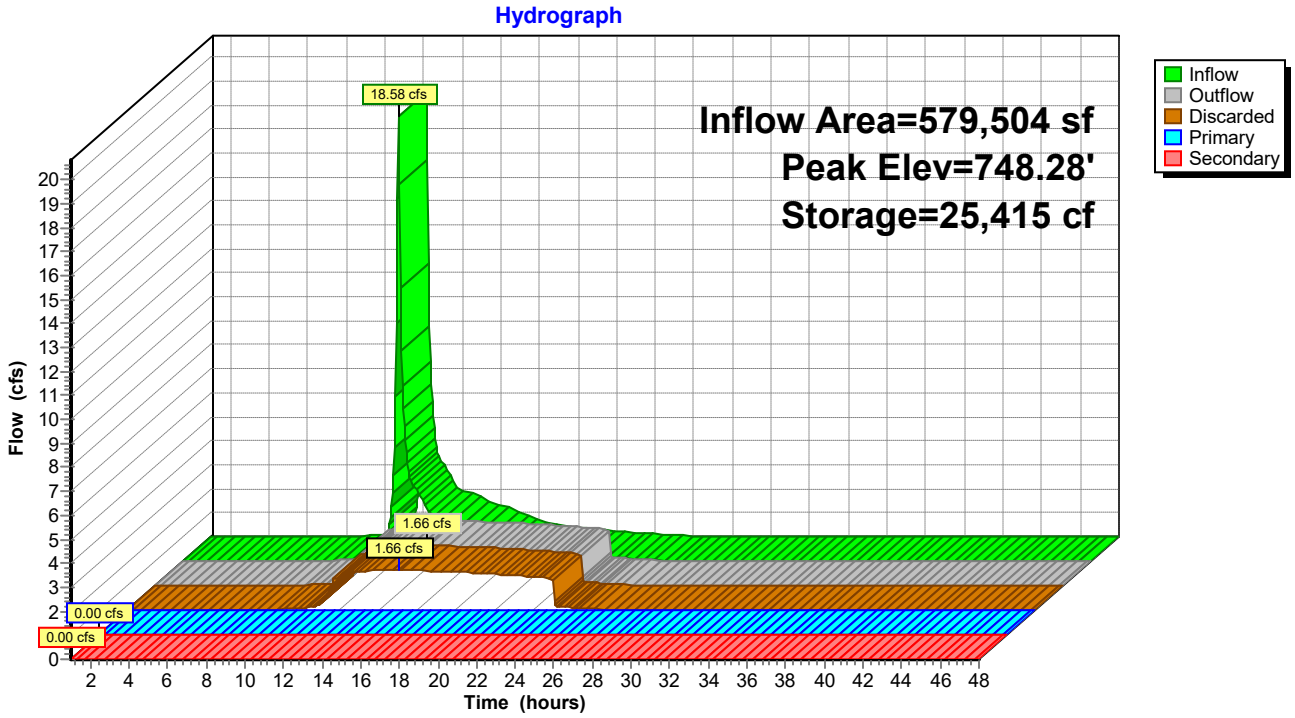
Device	Routing	Invert	Outlet Devices
#1	Primary	750.50'	**15.0" Round Culvert** L= 373.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 750.50' / 747.00' S= 0.0094 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf
#2	Device 1	752.91'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	752.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#4	Discarded	747.00'	**3.180 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 720.00' Phase-In= 0.01'

Discarded OutFlow Max=1.66 cfs @ 15.07 hrs HW=748.28' (Free Discharge)
└**4=Exfiltration** (Controls 1.66 cfs)

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=747.00' TW=750.50' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=747.00' TW=747.00' (Dynamic Tailwater)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 58P: Dry Pond 1



Summary for Pond 60P: Infiltration Basin #1

Inflow Area = 294,617 sf, 23.08% Impervious, Inflow Depth = 1.05" for 2-Year event
Inflow = 9.09 cfs @ 12.19 hrs, Volume= 25,851 cf
Outflow = 1.64 cfs @ 12.74 hrs, Volume= 25,851 cf, Atten= 82%, Lag= 33.1 min
Discarded = 1.64 cfs @ 12.74 hrs, Volume= 25,851 cf
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 95P : Dry Pond 3
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Reach 136R : SC West Ditch

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 741.18' @ 12.74 hrs Surf.Area= 13,585 sf Storage= 8,868 cf

Plug-Flow detention time= 43.9 min calculated for 25,823 cf (100% of inflow)
Center-of-Mass det. time= 43.8 min (859.3 - 815.5)

Volume	Invert	Avail.Storage	Storage Description
#1	740.50'	73,217 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
740.50	12,516	0	0
741.00	13,294	6,453	6,453
742.00	14,915	14,105	20,557
743.00	16,625	15,770	36,327
744.00	18,423	17,524	53,851
745.00	20,309	19,366	73,217

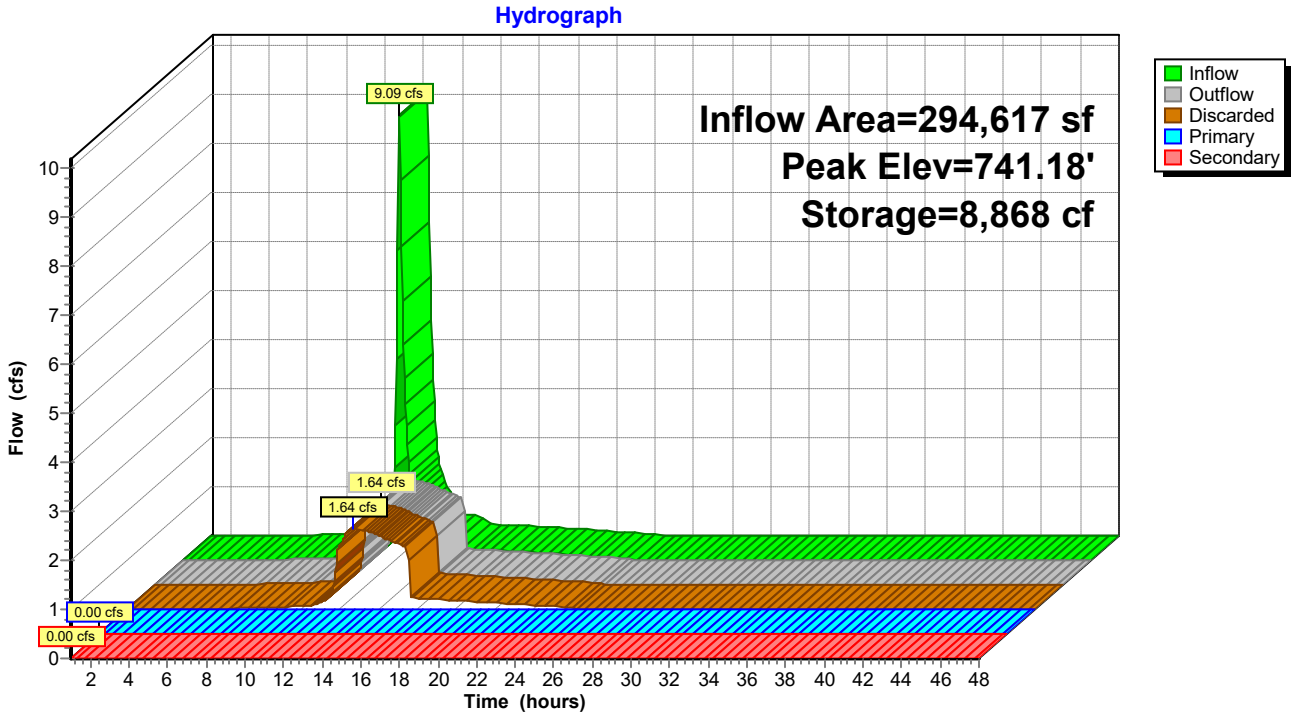
Device	Routing	Invert	Outlet Devices
#1	Primary	742.00'	**12.0" Round Culvert** L= 205.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 742.00' / 741.00' S= 0.0049 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	744.75'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#3	Discarded	740.50'	**4.320 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 737.40' Phase-In= 0.01'

Discarded OutFlow Max=1.64 cfs @ 12.74 hrs HW=741.18' (Free Discharge)
3=Exfiltration (Controls 1.64 cfs)

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=740.50' TW=739.00' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=740.50' TW=743.75' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 60P: Infiltration Basin #1



Summary for Pond 95P: Dry Pond 3

Inflow Area = 432,925 sf, 29.66% Impervious, Inflow Depth = 0.43" for 2-Year event
Inflow = 6.57 cfs @ 12.16 hrs, Volume= 15,370 cf
Outflow = 3.63 cfs @ 12.30 hrs, Volume= 15,370 cf, Atten= 45%, Lag= 8.0 min
Discarded = 3.63 cfs @ 12.30 hrs, Volume= 15,370 cf
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 154P : Southeast Basin
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 154P : Southeast Basin

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 739.16' @ 12.30 hrs Surf.Area= 0.226 ac Storage= 0.035 af

Plug-Flow detention time= 2.1 min calculated for 15,354 cf (100% of inflow)
Center-of-Mass det. time= 2.1 min (815.7 - 813.6)

Volume	Invert	Avail.Storage	Storage Description
#1	739.00'	1.214 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
739.00	0.220	0.000	0.000
740.00	0.260	0.240	0.240
741.00	0.302	0.281	0.521
742.00	0.346	0.324	0.845
743.00	0.392	0.369	1.214

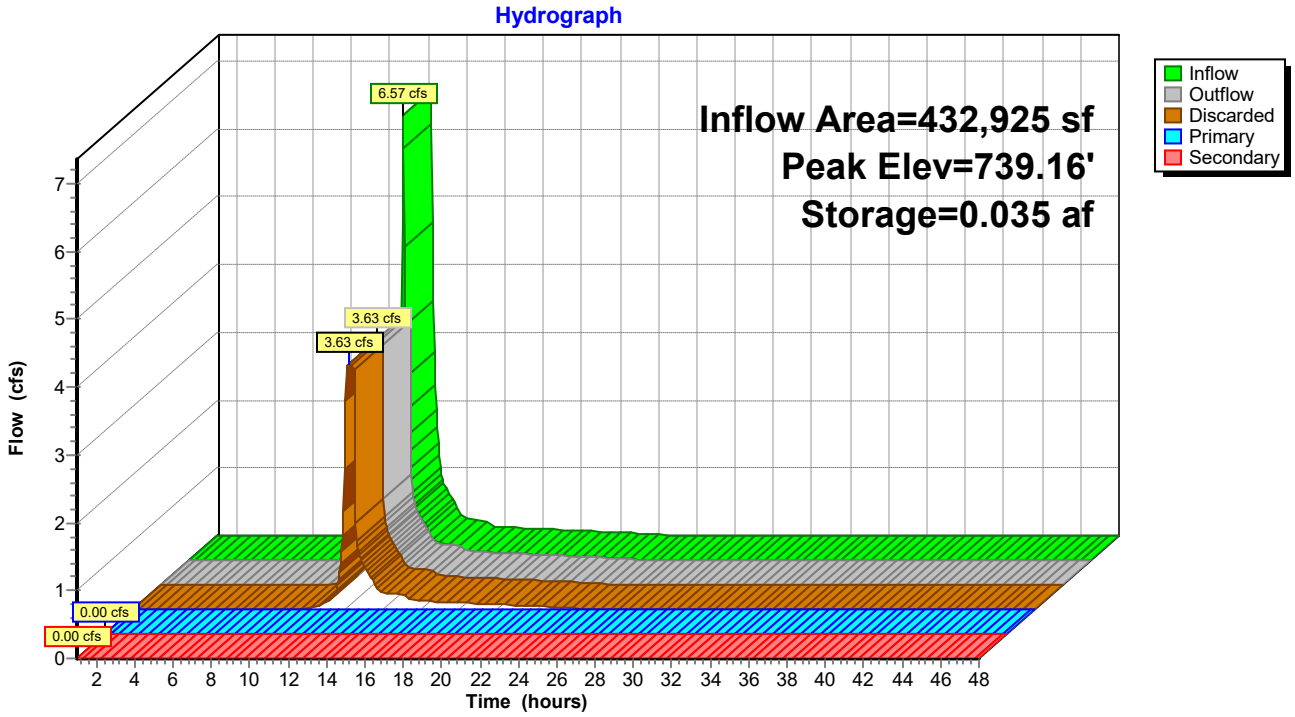
Device	Routing	Invert	Outlet Devices
#1	Primary	741.00'	**6.0" Round Culvert** L= 84.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 741.00' / 738.00' S= 0.0357 '/' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#2	Secondary	742.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Discarded	739.00'	**15.720 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 726.55' Phase-In= 0.01'

Discarded OutFlow Max=3.63 cfs @ 12.30 hrs HW=739.16' (Free Discharge)
↑—**3=Exfiltration** (Controls 3.63 cfs)

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=739.00' TW=730.00' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=739.00' TW=730.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 95P: Dry Pond 3



Summary for Pond 101R: Reach Pipe DP1 TO MH

3/2/21
Reach Pipe 4

[57] Hint: Peaked at 750.50' (Flood elevation advised)

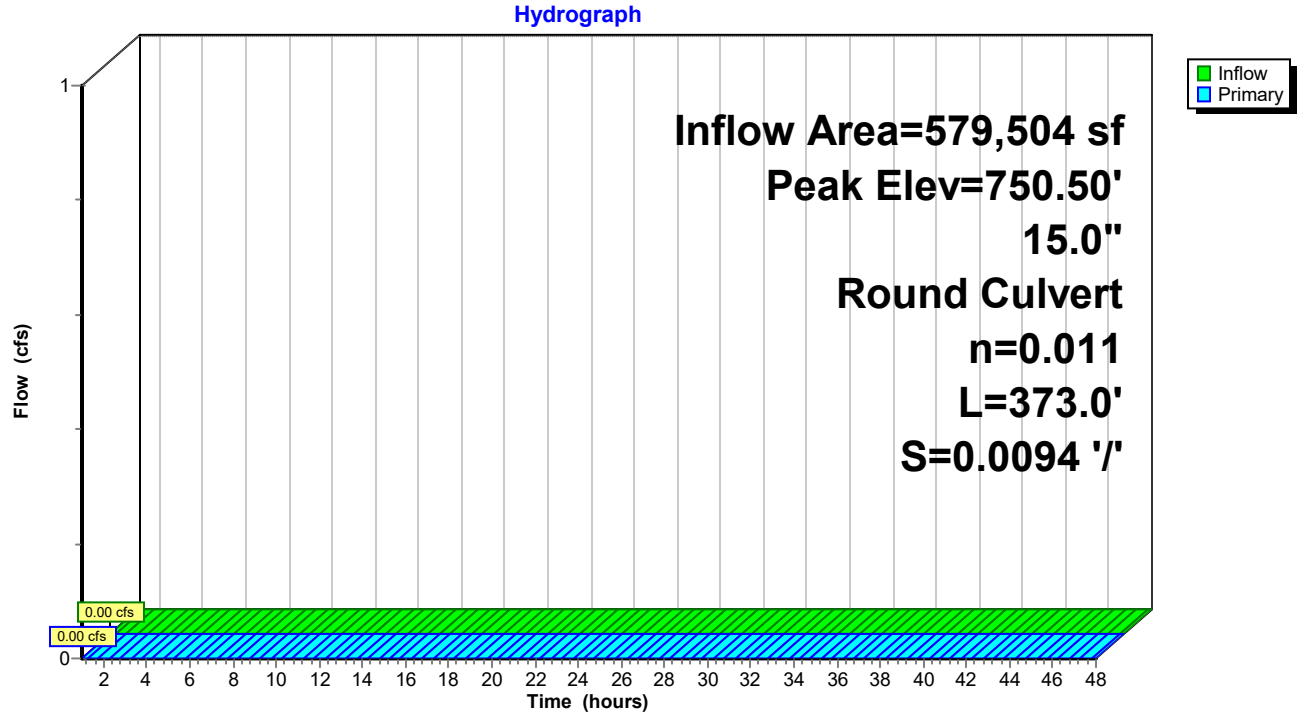
Inflow Area = 579,504 sf, 46.53% Impervious, Inflow Depth = 0.00" for 2-Year event
Inflow = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 1.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 41P : Reach Pipe

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 750.50' @ 1.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	750.50'	**15.0" Round Culvert** L= 373.0' Ke= 0.500 Inlet / Outlet Invert= 750.50' / 747.00' S= 0.0094 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=750.50' TW=738.00' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.00 cfs)

Pond 101R: Reach Pipe DP1 TO MH



Summary for Pond 110R: Western Pipe Run

3/3/21
Pipe that cuts through western exterior courtyard to collect ditch north of west building and northern portion of west building roof and conveys to DP1

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[57] Hint: Peaked at 746.26' (Flood elevation advised)

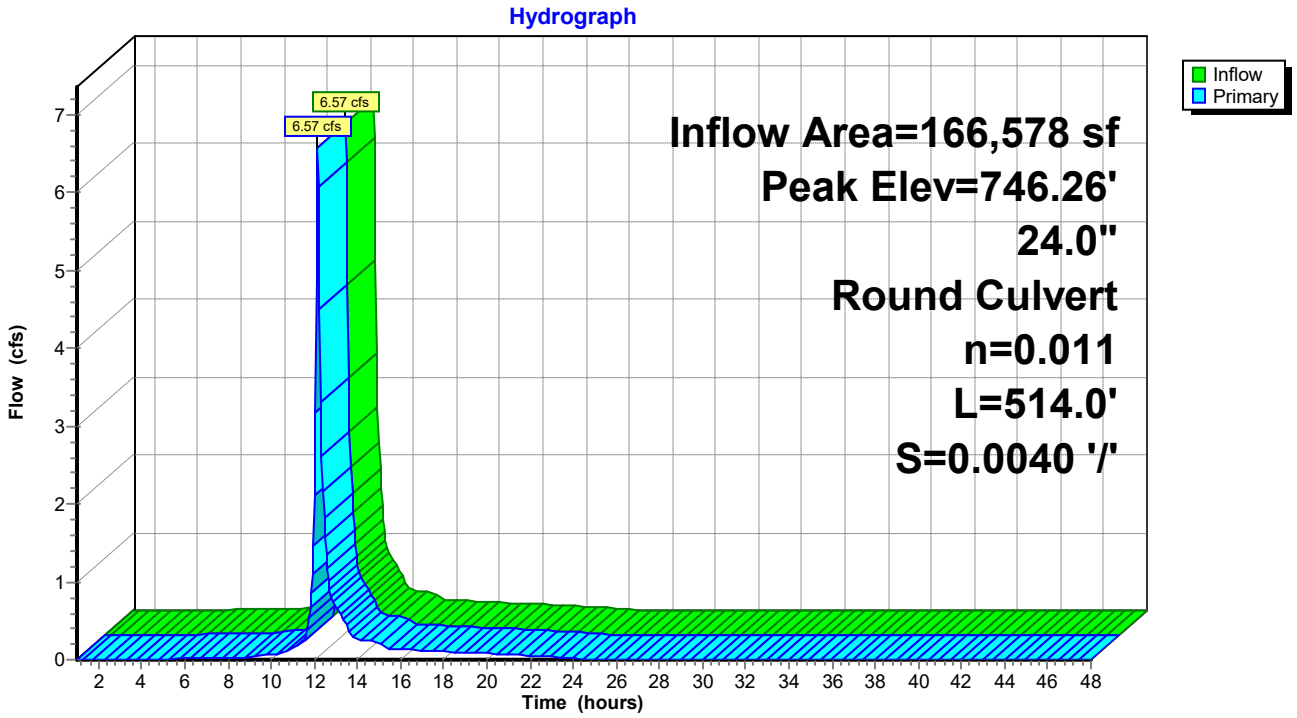
Inflow Area = 166,578 sf, 27.50% Impervious, Inflow Depth = 1.16" for 2-Year event
Inflow = 6.57 cfs @ 12.17 hrs, Volume= 16,048 cf
Outflow = 6.57 cfs @ 12.17 hrs, Volume= 16,048 cf, Atten= 0%, Lag= 0.0 min
Primary = 6.57 cfs @ 12.17 hrs, Volume= 16,048 cf
Routed to Pond 60P : Infiltration Basin #1

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 746.26' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	745.06'	**24.0" Round Culvert** L= 514.0' Ke= 0.500 Inlet / Outlet Invert= 745.06' / 743.00' S= 0.0040 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf

Primary OutFlow Max=6.36 cfs @ 12.17 hrs HW=746.23' TW=740.74' (Dynamic Tailwater)
1=Culvert (Barrel Controls 6.36 cfs @ 4.78 fps)

Pond 110R: Western Pipe Run



Summary for Pond 127P: B3 OVERSIZED PIPE RUN (24" W/15" ORIFICE)

3/3/21
Pipe that cuts through western exterior courtyard to collect ditch north of west building and northern portion of west building roof and conveys to DP1

Inflow Area = 40,670 sf, 35.10% Impervious, Inflow Depth = 1.21" for 2-Year event
Inflow = 1.99 cfs @ 12.14 hrs, Volume= 4,109 cf
Outflow = 1.95 cfs @ 12.15 hrs, Volume= 4,109 cf, Atten= 2%, Lag= 0.8 min
Primary = 1.95 cfs @ 12.15 hrs, Volume= 4,109 cf
Routed to Link 128L : FROM OVERSIZED PIPE RUN

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 751.81' @ 12.15 hrs Surf.Area= 238 sf Storage= 93 cf

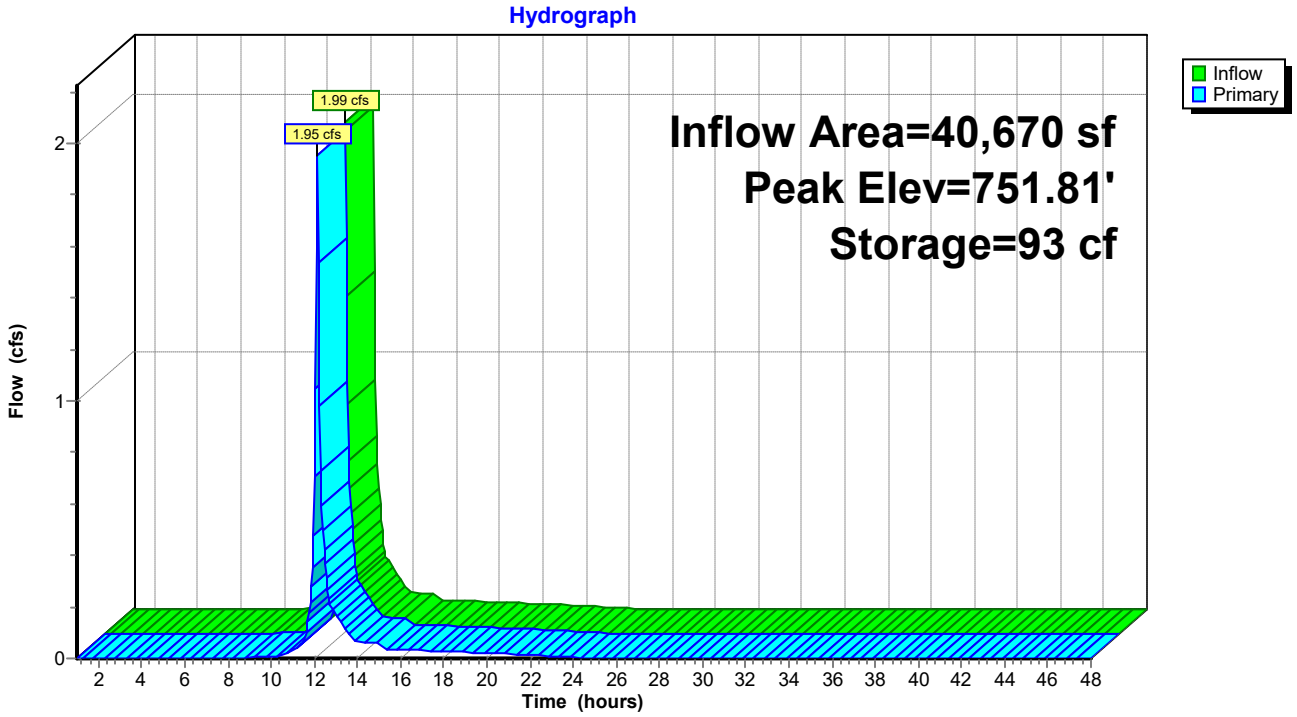
Plug-Flow detention time= 0.6 min calculated for 4,104 cf (100% of inflow)
Center-of-Mass det. time= 0.6 min (808.7 - 808.1)

Volume	Invert	Avail.Storage	Storage Description
#1	751.12'	424 cf	**24.0" Round Pipe Storage** L= 135.0' S= 0.0022 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	751.12'	**15.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.94 cfs @ 12.15 hrs HW=751.80' TW=0.00' (Dynamic Tailwater)
↑└**1=Orifice/Grate** (Orifice Controls 1.94 cfs @ 2.82 fps)

Pond 127P: B3 OVERSIZED PIPE RUN (24" W/15" ORIFICE)



Summary for Pond 129P: STORMTECH FROM ADS

Inflow Area = 194,230 sf, 70.09% Impervious, Inflow Depth = 1.85" for 2-Year event
Inflow = 12.57 cfs @ 12.13 hrs, Volume= 29,928 cf
Outflow = 1.38 cfs @ 12.65 hrs, Volume= 29,781 cf, Atten= 89%, Lag= 31.4 min
Primary = 1.38 cfs @ 12.65 hrs, Volume= 29,781 cf
Routed to Pond 58P : Dry Pond 1

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 752.55' @ 12.65 hrs Surf.Area= 19,777 sf Storage= 15,440 cf

Plug-Flow detention time= 148.4 min calculated for 29,749 cf (99% of inflow)
Center-of-Mass det. time= 146.6 min (923.6 - 777.0)

Volume	Invert	Avail.Storage	Storage Description
#1B	751.25'	27,133 cf	**115.92'W x 170.61'L x 5.50'H Field B** 108,771 cf Overall - 40,939 cf Embedded = 67,832 cf x 40.0% Voids
#2B	752.00'	40,939 cf	**ADS_StormTech MC-3500 d +Cap** x 368 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 368 Chambers in 16 Rows Cap Storage= 14.9 cf x 2 x 16 rows = 476.8 cf
		68,072 cf	Total Available Storage

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	751.25'	**10.0" Round Culvert X 2.00** L= 200.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 751.25' / 750.65' S= 0.0030 '/' Cc= 0.900 n= 0.011, Flow Area= 0.55 sf
#2	Device 1	751.25'	**5.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.38 cfs @ 12.65 hrs HW=752.55' TW=748.03' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 1.38 cfs of 3.28 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 1.38 cfs @ 5.04 fps)

Pond 129P: STORMTECH FROM ADS - Chamber Wizard Field B

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= 14.9 cf x 2 x 16 rows = 476.8 cf

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

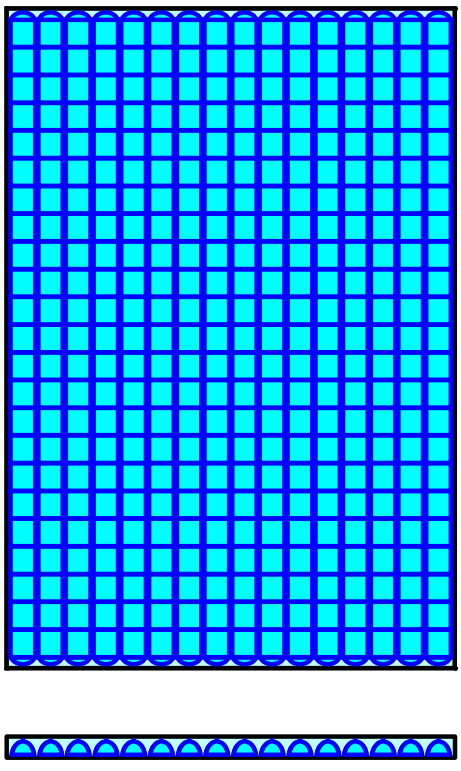
23 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 168.61' Row Length +12.0" End Stone x 2 = 170.61' Base Length
16 Rows x 77.0" Wide + 9.0" Spacing x 15 + 12.0" Side Stone x 2 = 115.92' Base Width
9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

368 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 16 Rows = 40,939.1 cf Chamber Storage

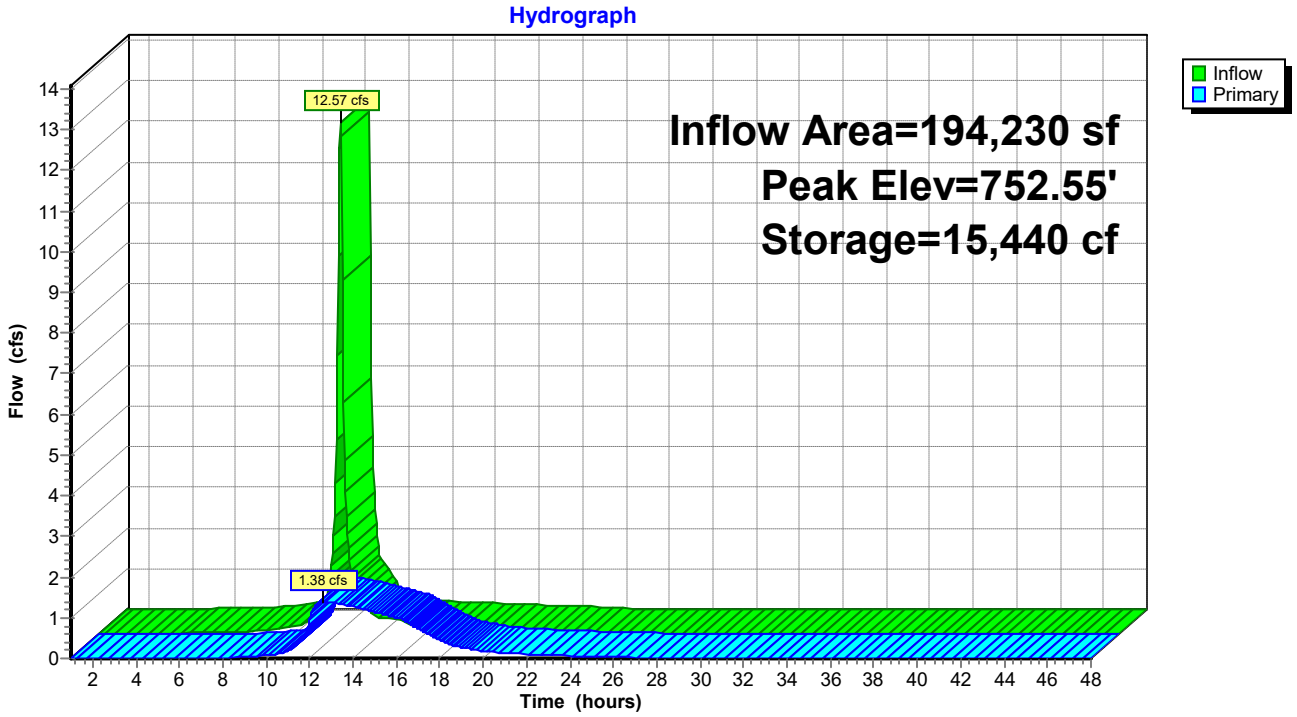
108,771.0 cf Field - 40,939.1 cf Chambers = 67,831.9 cf Stone x 40.0% Voids = 27,132.7 cf Stone Storage

Chamber Storage + Stone Storage = 68,071.9 cf = 1.563 af
Overall Storage Efficiency = 62.6%
Overall System Size = 170.61' x 115.92' x 5.50'

368 Chambers
4,028.6 cy Field
2,512.3 cy Stone



Pond 129P: STORMTECH FROM ADS



Summary for Pond 133P: WEST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

3/3/21
Pipe that cuts through western exterior courtyard to collect ditch north of west building and northern portion of west building roof and conveys to DP1

Inflow Area = 48,160 sf, 58.41% Impervious, Inflow Depth = 1.58" for 2-Year event
Inflow = 3.04 cfs @ 12.13 hrs, Volume= 6,343 cf
Outflow = 2.98 cfs @ 12.15 hrs, Volume= 6,343 cf, Atten= 2%, Lag= 0.9 min
Primary = 2.98 cfs @ 12.15 hrs, Volume= 6,343 cf
Routed to Link 134L : TO UG

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 755.79' @ 12.15 hrs Surf.Area= 301 sf Storage= 153 cf

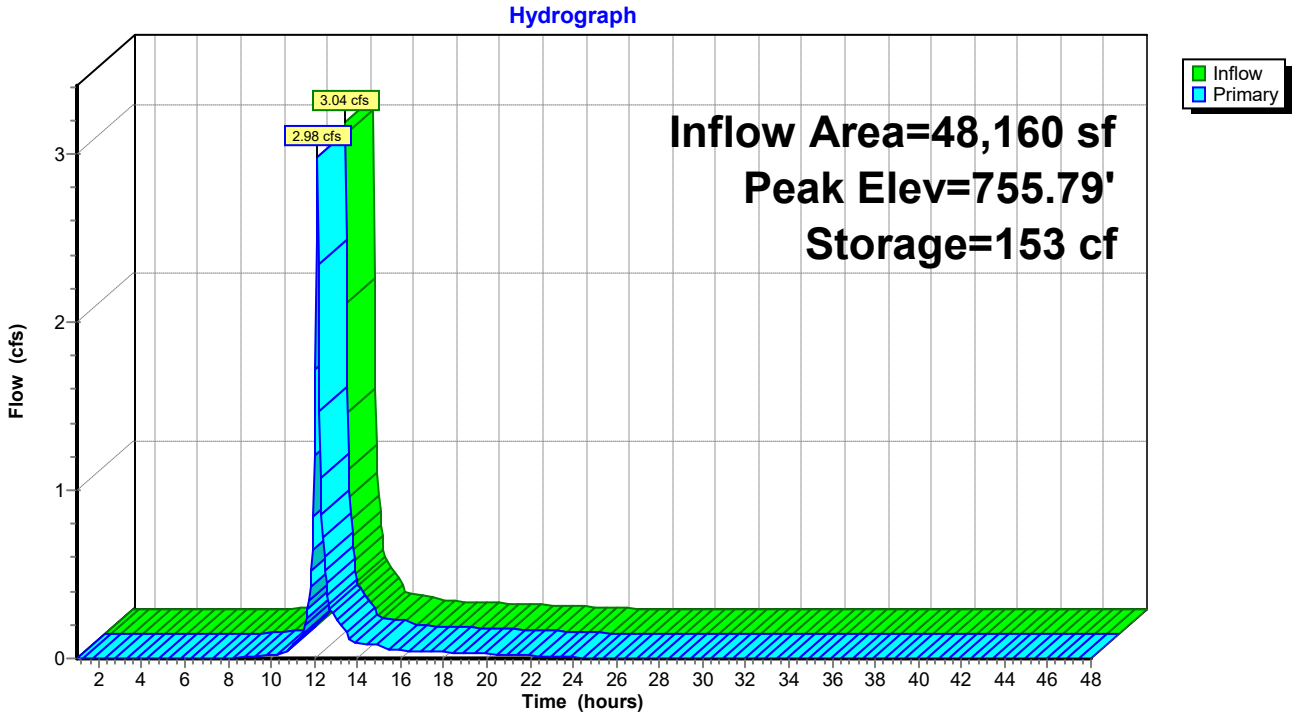
Plug-Flow detention time= 0.6 min calculated for 6,336 cf (100% of inflow)
Center-of-Mass det. time= 0.6 min (795.6 - 795.0)

Volume	Invert	Avail.Storage	Storage Description
#1	754.90'	503 cf	**24.0" Round Pipe Storage** L= 160.0' S= 0.0025 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	754.90'	**15.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.95 cfs @ 12.15 hrs HW=755.78' TW=0.00' (Dynamic Tailwater)
1=Orifice/Grate (Orifice Controls 2.95 cfs @ 3.19 fps)

Pond 133P: WEST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)



Summary for Pond 154P: Southeast Basin

Inflow Area = 1,278,750 sf, 34.76% Impervious, Inflow Depth = 0.04" for 2-Year event
Inflow = 1.75 cfs @ 12.15 hrs, Volume= 3,952 cf
Outflow = 0.11 cfs @ 13.55 hrs, Volume= 3,953 cf, Atten= 94%, Lag= 83.9 min
Discarded = 0.11 cfs @ 13.55 hrs, Volume= 3,953 cf

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 730.50' @ 13.55 hrs Surf.Area= 5,437 sf Storage= 2,064 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 209.3 min (1,034.3 - 824.9)

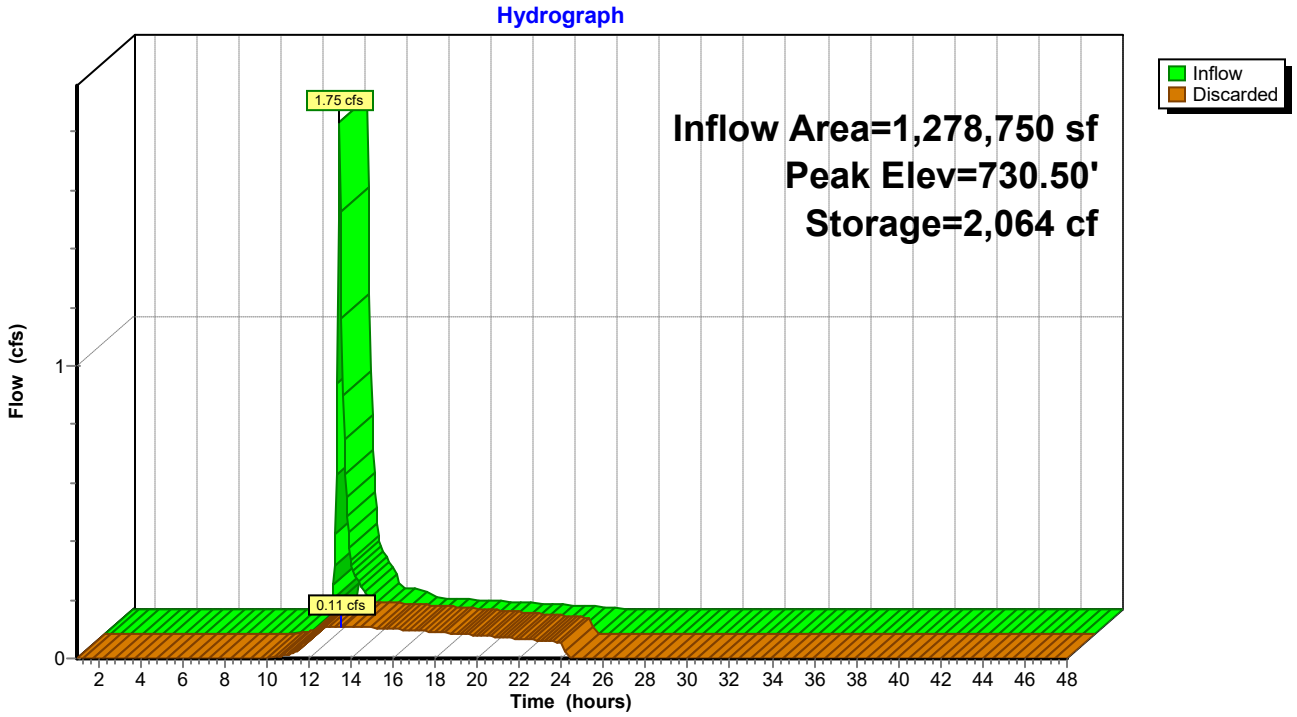
Volume	Invert	Avail.Storage	Storage Description
#1	730.00'	273,743 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
730.00	2,768	0	0
731.00	8,073	5,421	5,421
732.00	12,399	10,236	15,657
733.00	17,056	14,728	30,384
734.00	21,328	19,192	49,576
735.00	25,607	23,468	73,044
736.00	29,845	27,726	100,770
737.00	35,145	32,495	133,265
738.00	42,680	38,913	172,177
739.00	51,064	46,872	219,049
740.00	58,323	54,694	273,743

Device	Routing	Invert	Outlet Devices
#1	Discarded	730.00'	**0.840 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 720.00'

Discarded OutFlow Max=0.11 cfs @ 13.55 hrs HW=730.50' (Free Discharge)
↑**1=Exfiltration** (Controls 0.11 cfs)

Pond 154P: Southeast Basin



Summary for Pond 174P: EAST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

3/3/21
Pipe that cuts through western exterior courtyard to collect ditch north of west building and northern portion of west building roof and conveys to DP1

Inflow Area = 20,605 sf, 59.42% Impervious, Inflow Depth = 1.62" for 2-Year event
Inflow = 1.33 cfs @ 12.13 hrs, Volume= 2,785 cf
Outflow = 1.30 cfs @ 12.15 hrs, Volume= 2,785 cf, Atten= 2%, Lag= 0.9 min
Primary = 1.30 cfs @ 12.15 hrs, Volume= 2,785 cf
Routed to Link 175L : TO UG

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 755.45' @ 12.15 hrs Surf.Area= 237 sf Storage= 60 cf

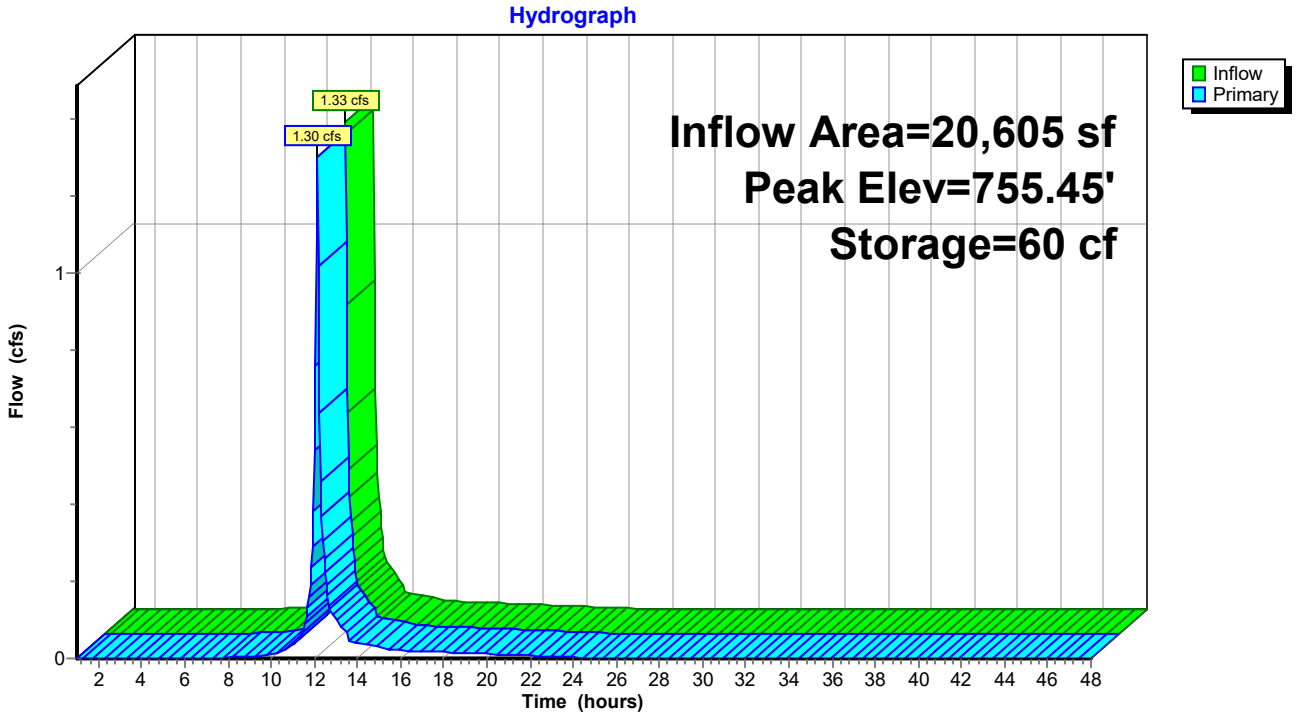
Plug-Flow detention time= 0.5 min calculated for 2,782 cf (100% of inflow)
Center-of-Mass det. time= 0.5 min (793.5 - 793.0)

Volume	Invert	Avail.Storage	Storage Description
#1	754.90'	503 cf	**24.0" Round Pipe Storage** L= 160.0' S= 0.0025 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	754.90'	**15.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.29 cfs @ 12.15 hrs HW=755.44' TW=0.00' (Dynamic Tailwater)
↑—**1=Orifice/Grate** (Orifice Controls 1.29 cfs @ 2.51 fps)

Pond 174P: EAST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)



Summary for Pond 183P: 24" HDPE PIPE

[57] Hint: Peaked at 749.65' (Flood elevation advised)

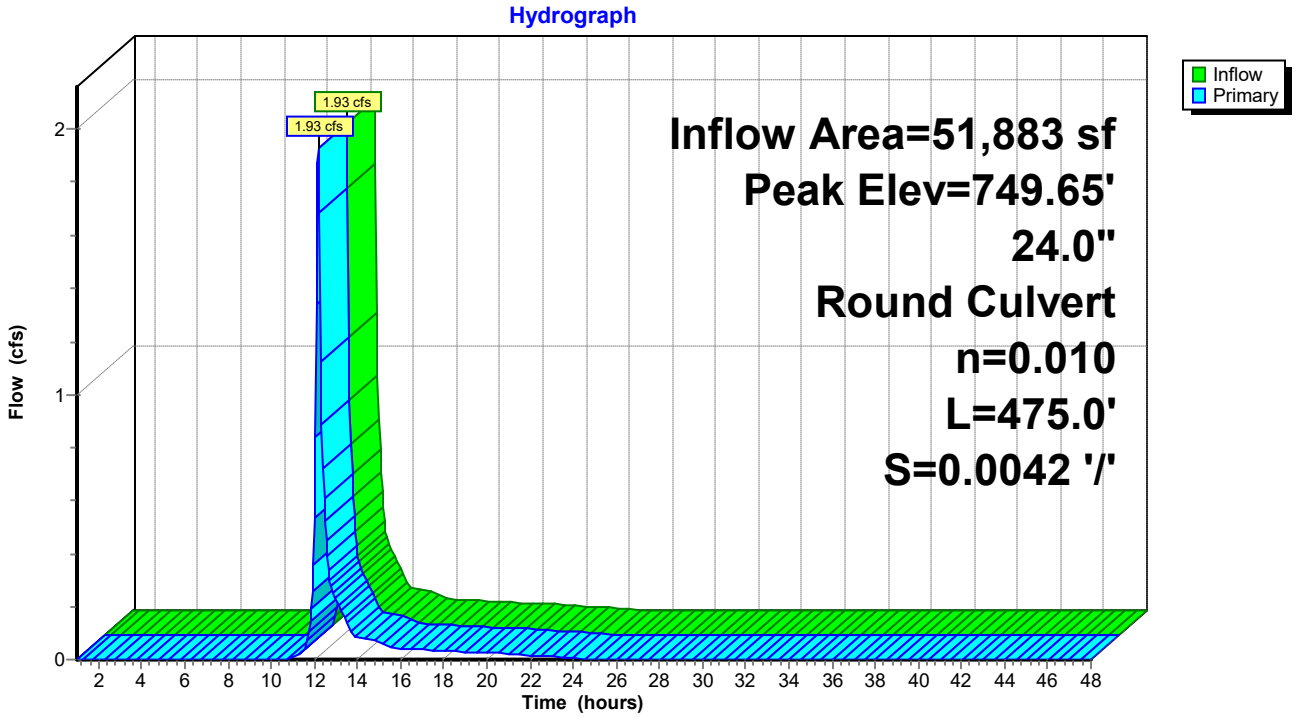
Inflow Area = 51,883 sf, 28.33% Impervious, Inflow Depth = 1.07" for 2-Year event
Inflow = 1.93 cfs @ 12.18 hrs, Volume= 4,628 cf
Outflow = 1.93 cfs @ 12.18 hrs, Volume= 4,628 cf, Atten= 0%, Lag= 0.0 min
Primary = 1.93 cfs @ 12.18 hrs, Volume= 4,628 cf
Routed to Pond 57P : Dry Pond 2

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 749.65' @ 12.18 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	749.00'	**24.0" Round Culvert** L= 475.0' Ke= 0.900 Inlet / Outlet Invert= 749.00' / 747.00' S= 0.0042 '/' Cc= 0.900 n= 0.010, Flow Area= 3.14 sf

Primary OutFlow Max=1.88 cfs @ 12.18 hrs HW=749.64' TW=747.20' (Dynamic Tailwater)
1=Culvert (Inlet Controls 1.88 cfs @ 2.15 fps)

Pond 183P: 24" HDPE PIPE

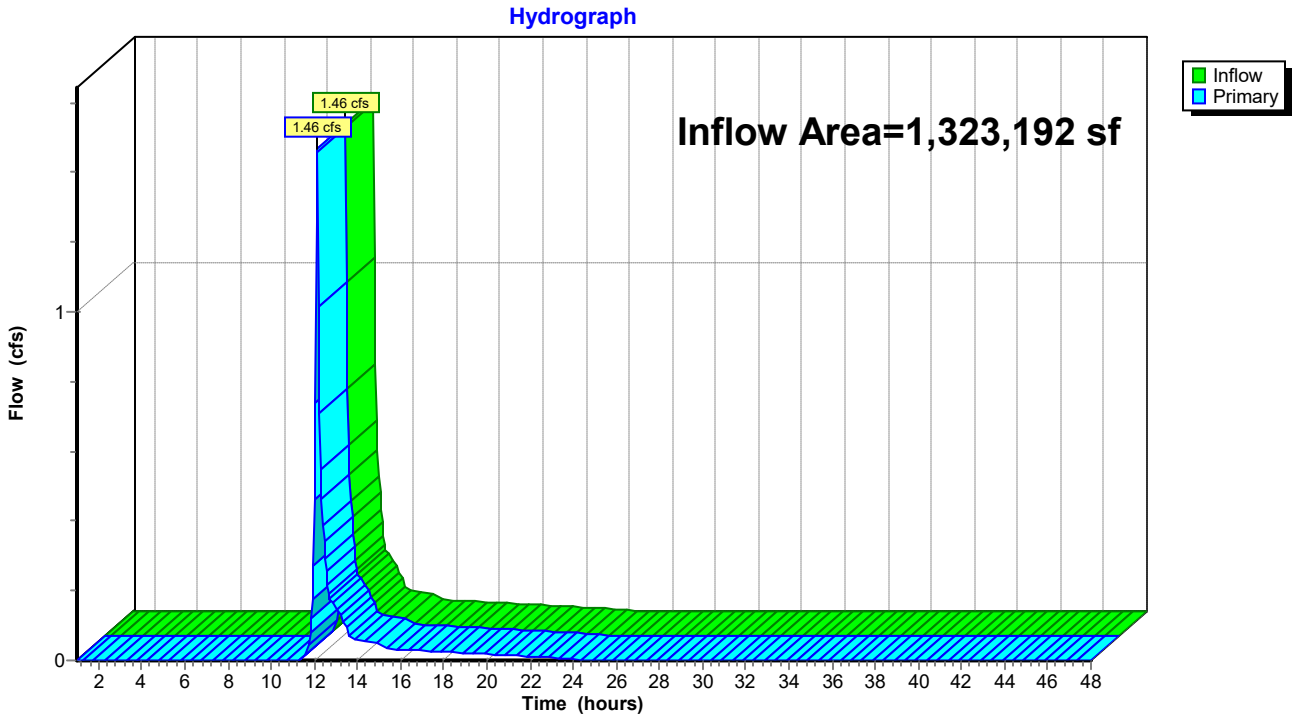


Summary for Link 48L: TOTAL OUTFALL

Inflow Area = 1,323,192 sf, 33.86% Impervious, Inflow Depth = 0.03" for 2-Year event
Inflow = 1.46 cfs @ 12.14 hrs, Volume= 3,026 cf
Primary = 1.46 cfs @ 12.14 hrs, Volume= 3,026 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 48L: TOTAL OUTFALL

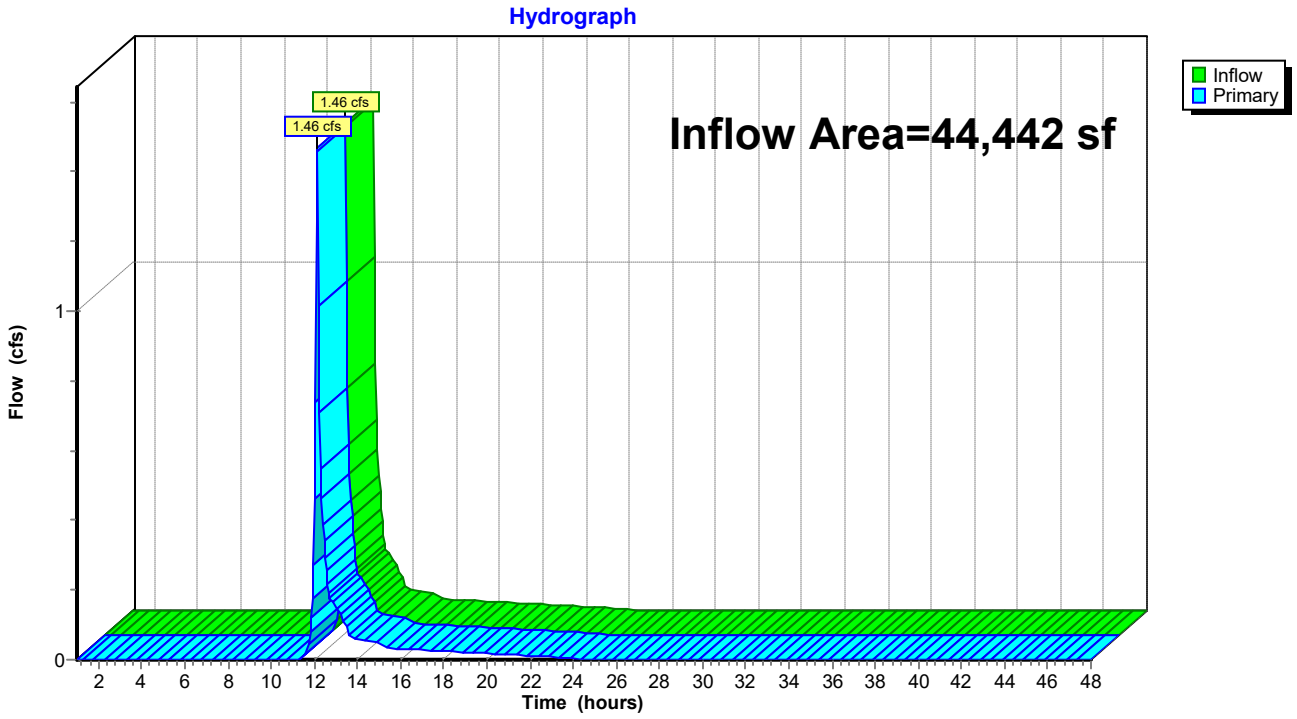


Summary for Link 66L: Total Offsite

Inflow Area = 44,442 sf, 7.89% Impervious, Inflow Depth = 0.82" for 2-Year event
Inflow = 1.46 cfs @ 12.14 hrs, Volume= 3,026 cf
Primary = 1.46 cfs @ 12.14 hrs, Volume= 3,026 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 48L : TOTAL OUTFALL

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 66L: Total Offsite

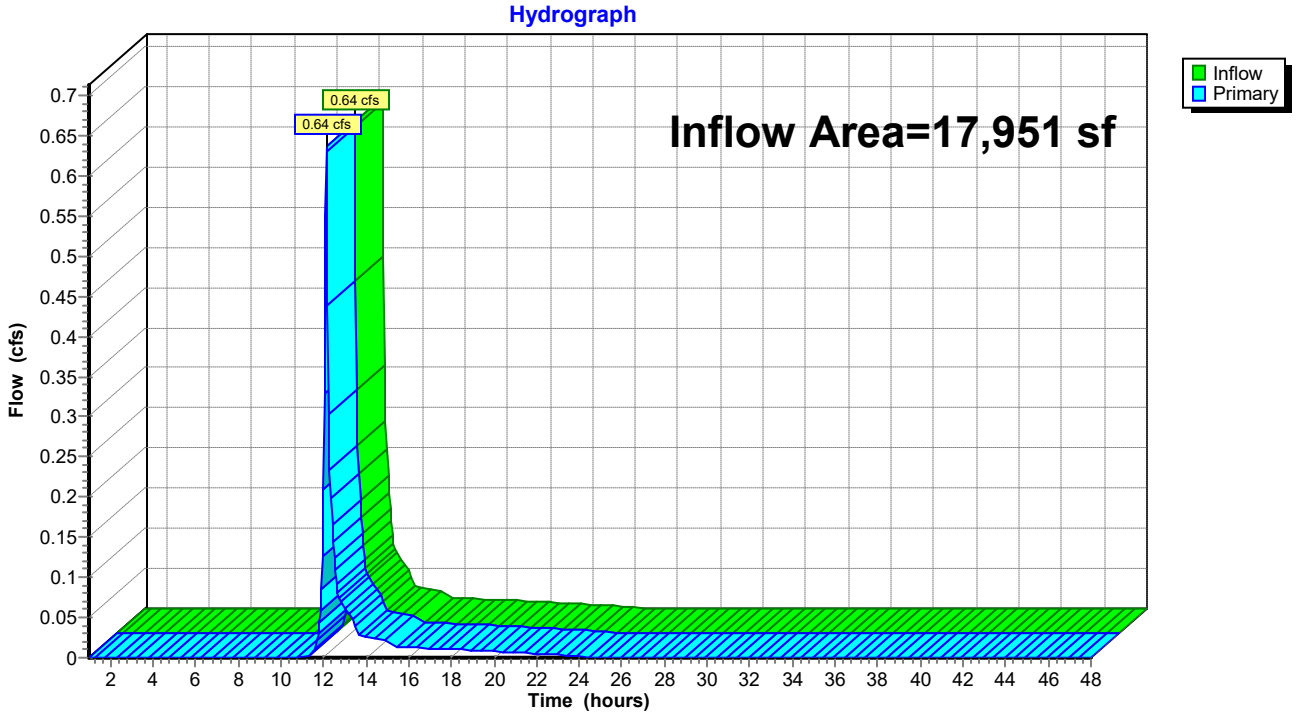


Summary for Link 115L: EX. Cul-de-sac On Green Meadow Place

Inflow Area = 17,951 sf, 11.95% Impervious, Inflow Depth = 0.87" for 2-Year event
Inflow = 0.64 cfs @ 12.14 hrs, Volume= 1,307 cf
Primary = 0.64 cfs @ 12.14 hrs, Volume= 1,307 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 66L : Total Offsite

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 115L: EX. Cul-de-sac On Green Meadow Place

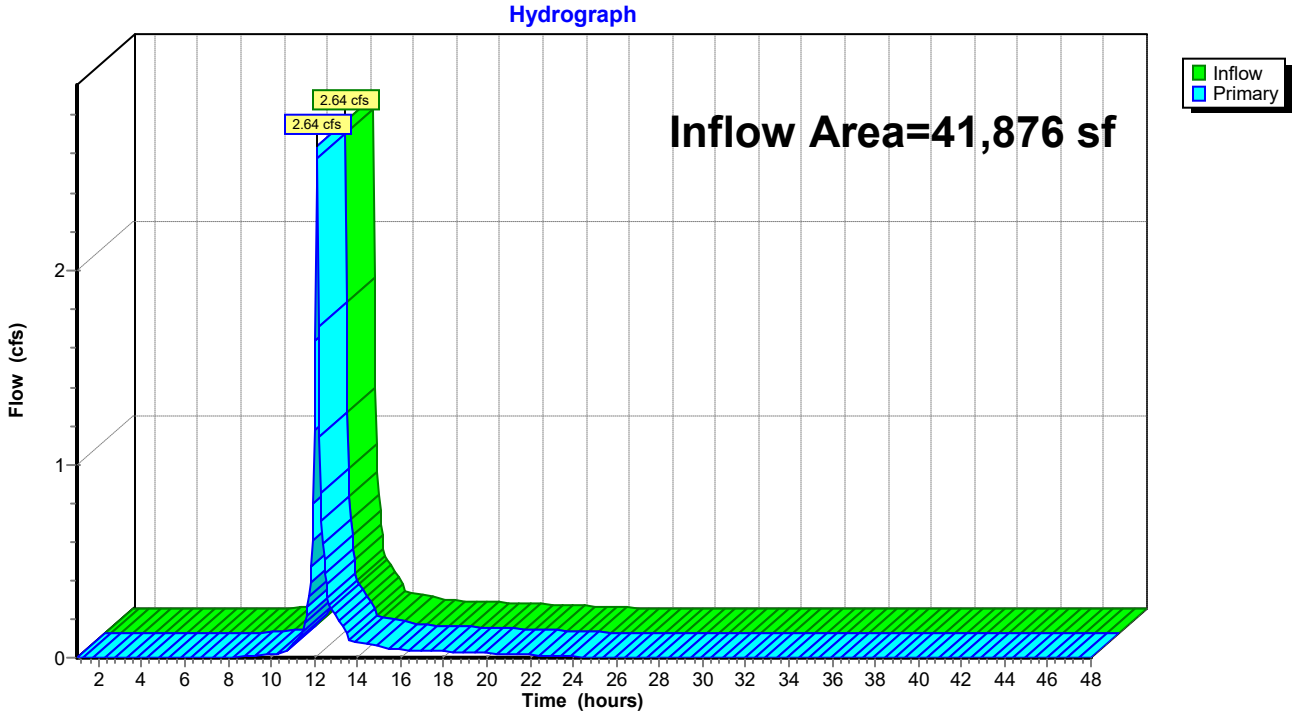


Summary for Link 124L: TO 12" PRIOR TO 24" (WEST)

Inflow Area = 41,876 sf, 58.23% Impervious, Inflow Depth = 1.58" for 2-Year event
Inflow = 2.64 cfs @ 12.13 hrs, Volume= 5,509 cf
Primary = 2.64 cfs @ 12.13 hrs, Volume= 5,509 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 133P : WEST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 124L: TO 12" PRIOR TO 24" (WEST)

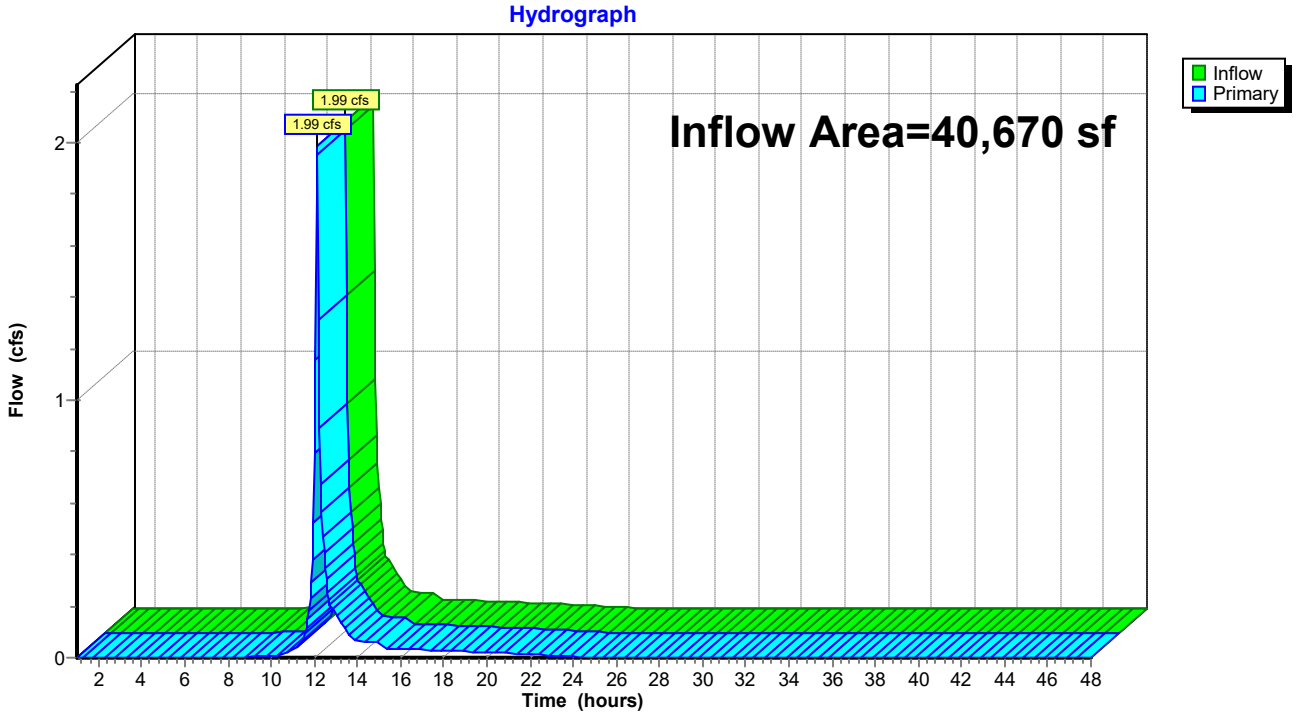


Summary for Link 126L: OVERSIZED PIPE RUN BY B3

Inflow Area = 40,670 sf, 35.10% Impervious, Inflow Depth = 1.21" for 2-Year event
Inflow = 1.99 cfs @ 12.14 hrs, Volume= 4,109 cf
Primary = 1.99 cfs @ 12.14 hrs, Volume= 4,109 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 127P : B3 OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 126L: OVERSIZED PIPE RUN BY B3

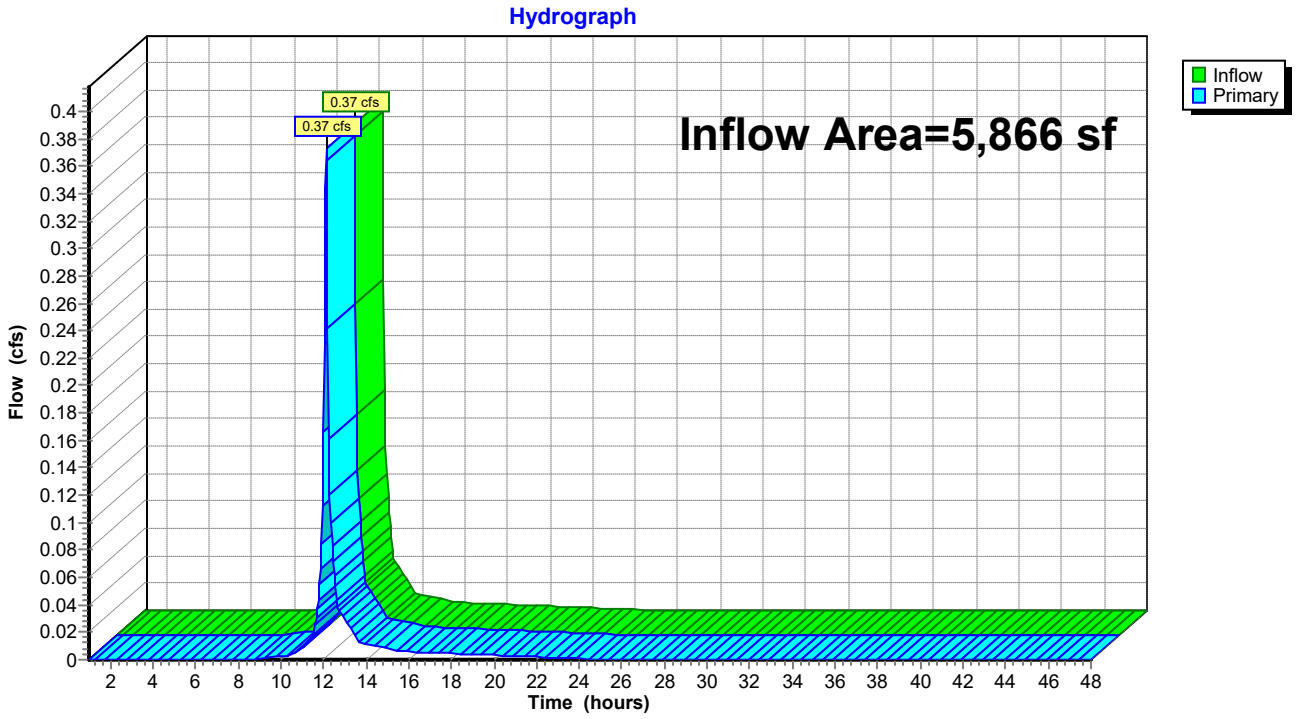


Summary for Link 127L: total

Inflow Area = 5,866 sf, 59.31% Impervious, Inflow Depth = 1.58" for 2-Year event
Inflow = 0.37 cfs @ 12.13 hrs, Volume= 773 cf
Primary = 0.37 cfs @ 12.13 hrs, Volume= 773 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 177L : SUM OF As TO UG

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 127L: total

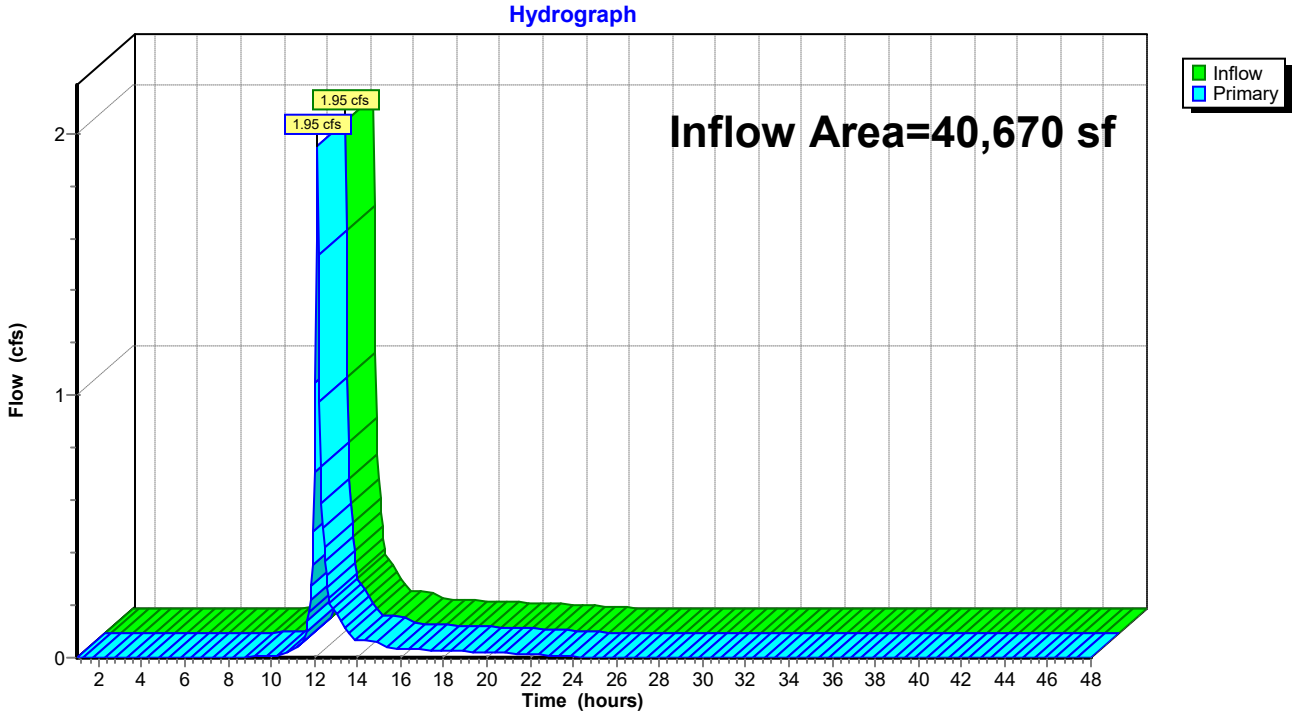


Summary for Link 128L: FROM OVERSIZED PIPE RUN

Inflow Area = 40,670 sf, 35.10% Impervious, Inflow Depth = 1.21" for 2-Year event
Inflow = 1.95 cfs @ 12.15 hrs, Volume= 4,109 cf
Primary = 1.95 cfs @ 12.15 hrs, Volume= 4,109 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 58P : Dry Pond 1

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 128L: FROM OVERSIZED PIPE RUN

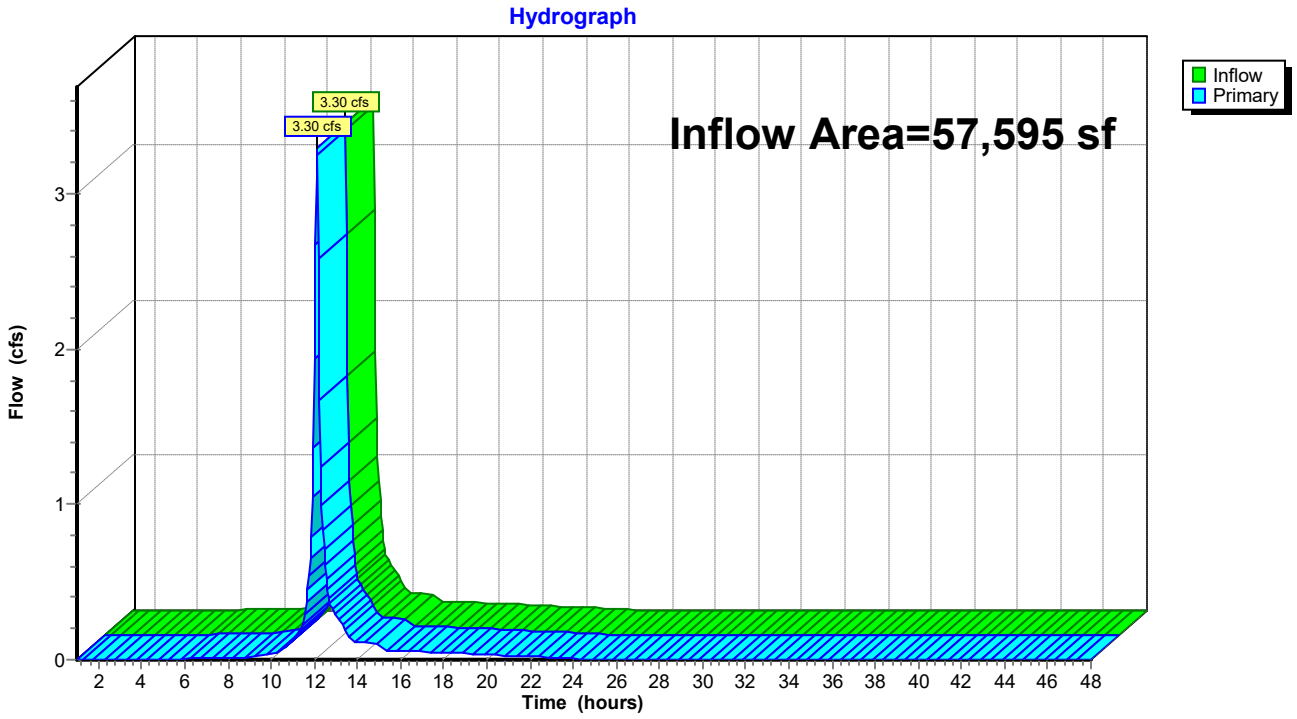


Summary for Link 134L: TO UG

Inflow Area = 57,595 sf, 65.23% Impervious, Inflow Depth = 1.73" for 2-Year event
Inflow = 3.30 cfs @ 12.13 hrs, Volume= 8,284 cf
Primary = 3.30 cfs @ 12.13 hrs, Volume= 8,284 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 178L : As

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 134L: TO UG

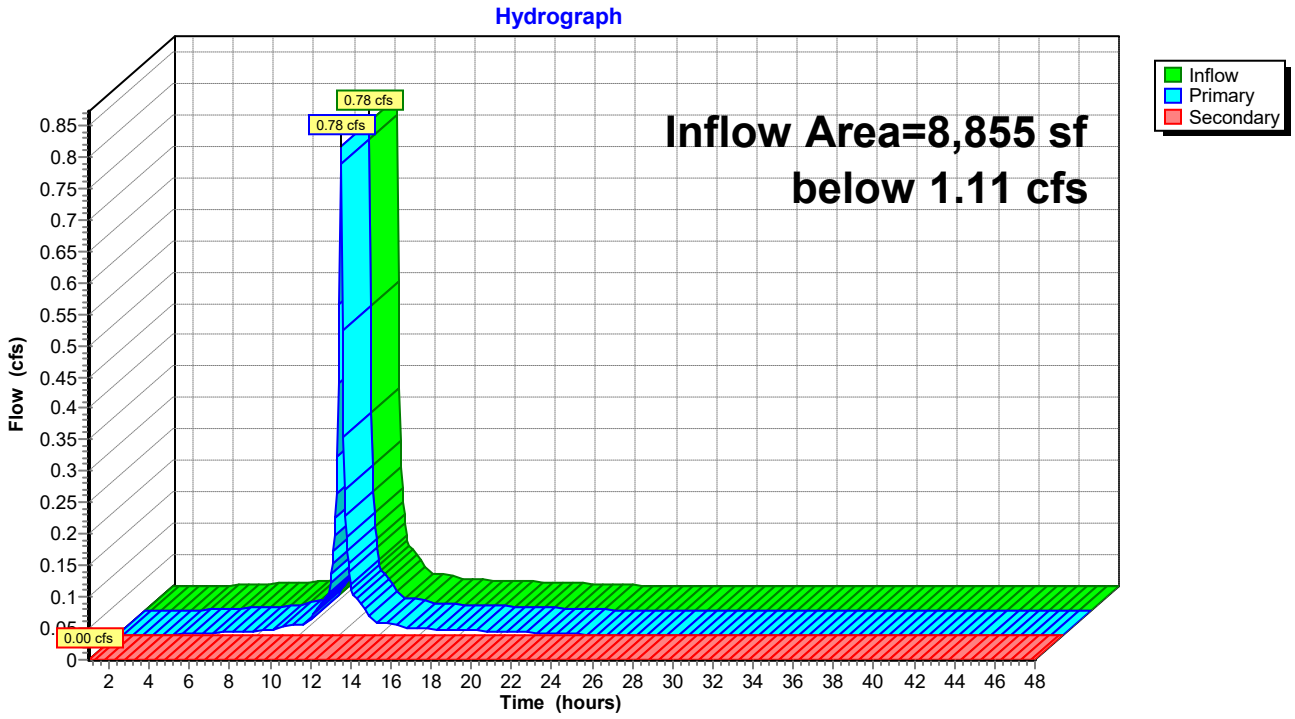


Summary for Link 171L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

Inflow Area = 8,855 sf,100.00% Impervious, Inflow Depth = 2.47" for 2-Year event
Inflow = 0.78 cfs @ 12.13 hrs, Volume= 1,822 cf
Primary = 0.78 cfs @ 12.13 hrs, Volume= 1,822 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 129P : STORMTECH FROM ADS
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Reach 99R : East Swale (SE End)

Primary outflow = Inflow below 1.11 cfs, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 171L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

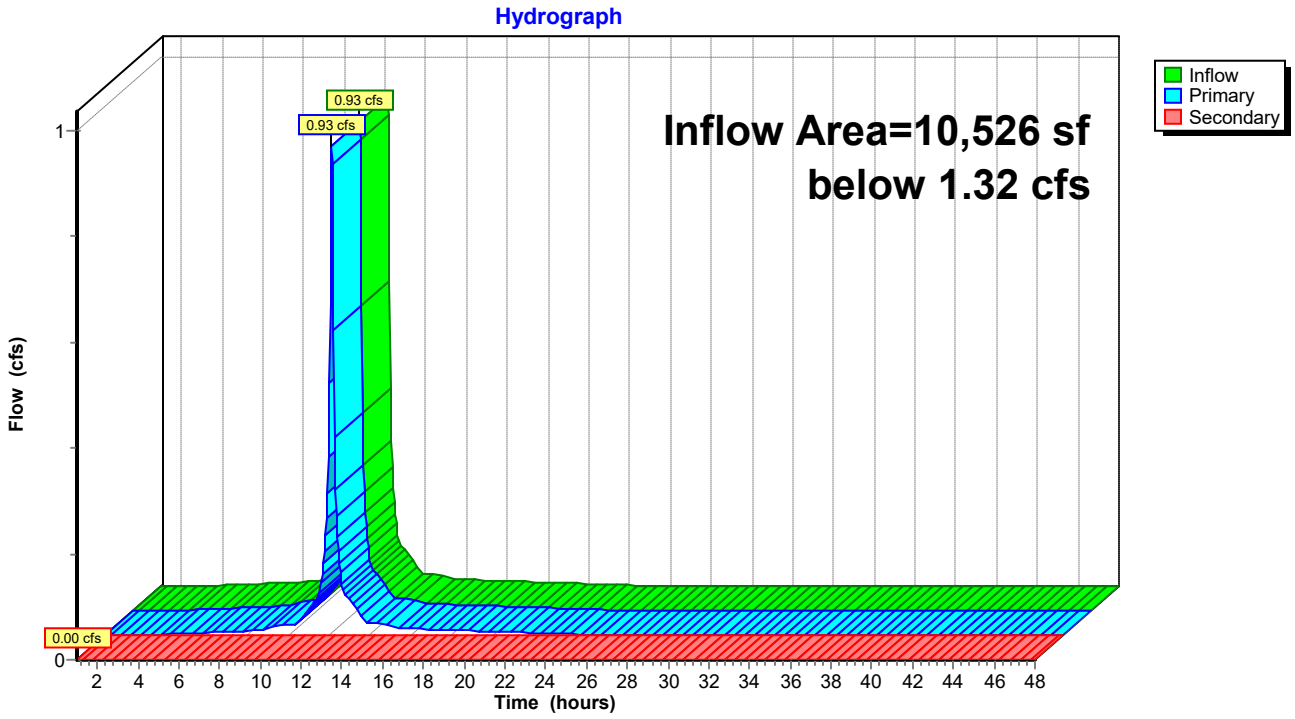


Summary for Link 174L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

Inflow Area = 10,526 sf,100.00% Impervious, Inflow Depth = 2.47" for 2-Year event
Inflow = 0.93 cfs @ 12.13 hrs, Volume= 2,166 cf
Primary = 0.93 cfs @ 12.13 hrs, Volume= 2,166 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 129P : STORMTECH FROM ADS
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Reach 111R : Western PL North Ditch

Primary outflow = Inflow below 1.32 cfs, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 174L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

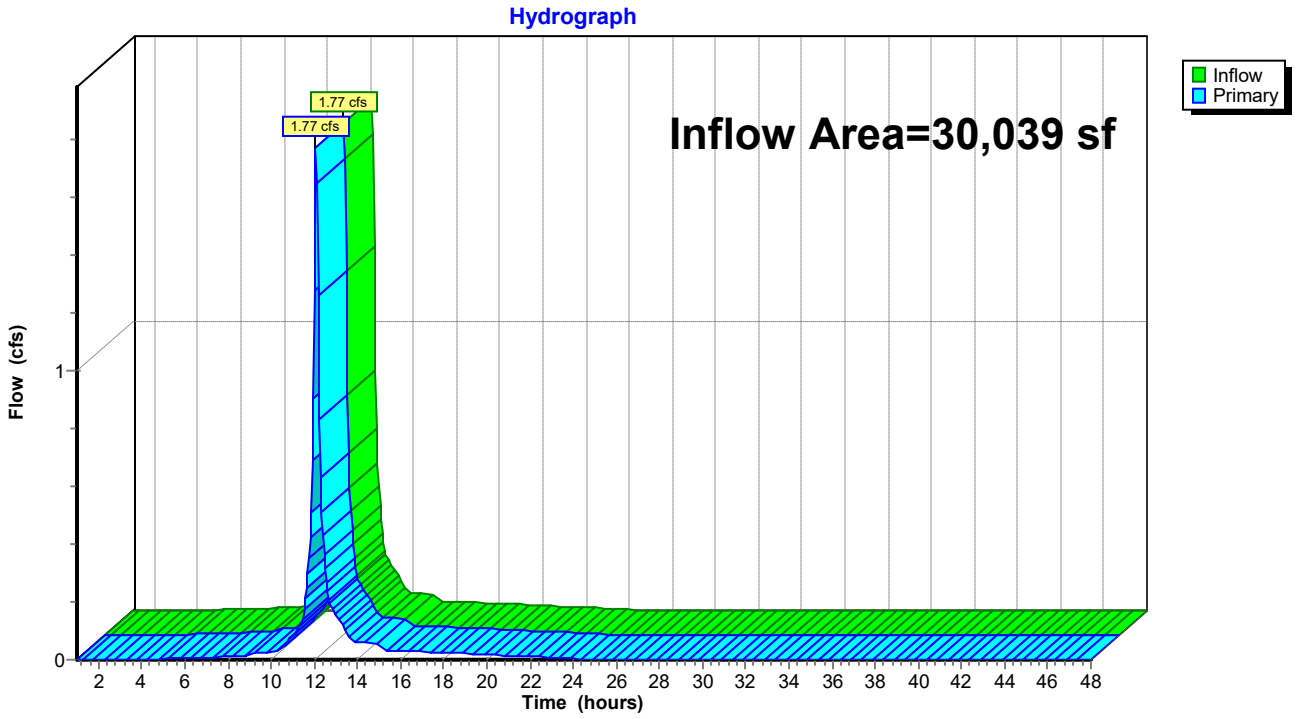


Summary for Link 175L: TO UG

Inflow Area = 30,039 sf, 72.17% Impervious, Inflow Depth = 1.89" for 2-Year event
Inflow = 1.77 cfs @ 12.07 hrs, Volume= 4,726 cf
Primary = 1.77 cfs @ 12.07 hrs, Volume= 4,726 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 178L : As

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 175L: TO UG

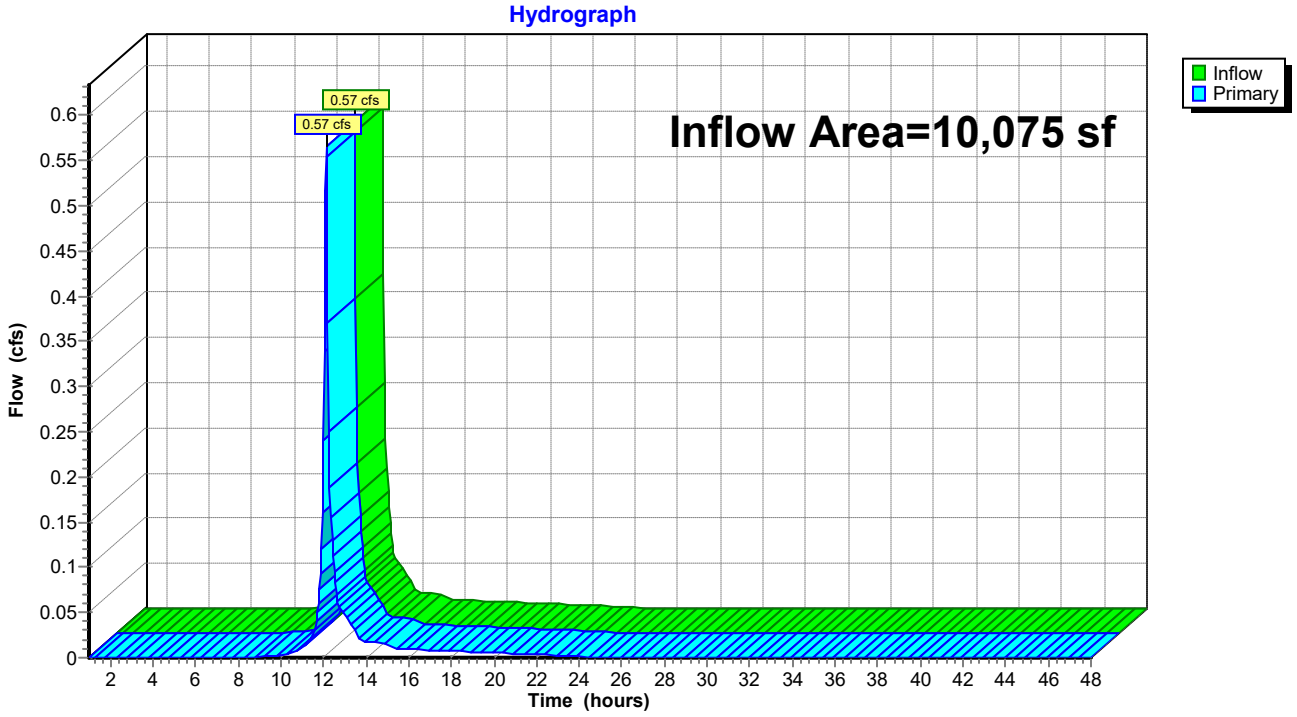


Summary for Link 176L: UPSTREAM OF OVERSIZED PIPE

Inflow Area = 10,075 sf, 46.89% Impervious, Inflow Depth = 1.40" for 2-Year event
Inflow = 0.57 cfs @ 12.13 hrs, Volume= 1,171 cf
Primary = 0.57 cfs @ 12.13 hrs, Volume= 1,171 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 174P : EAST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 176L: UPSTREAM OF OVERSIZED PIPE

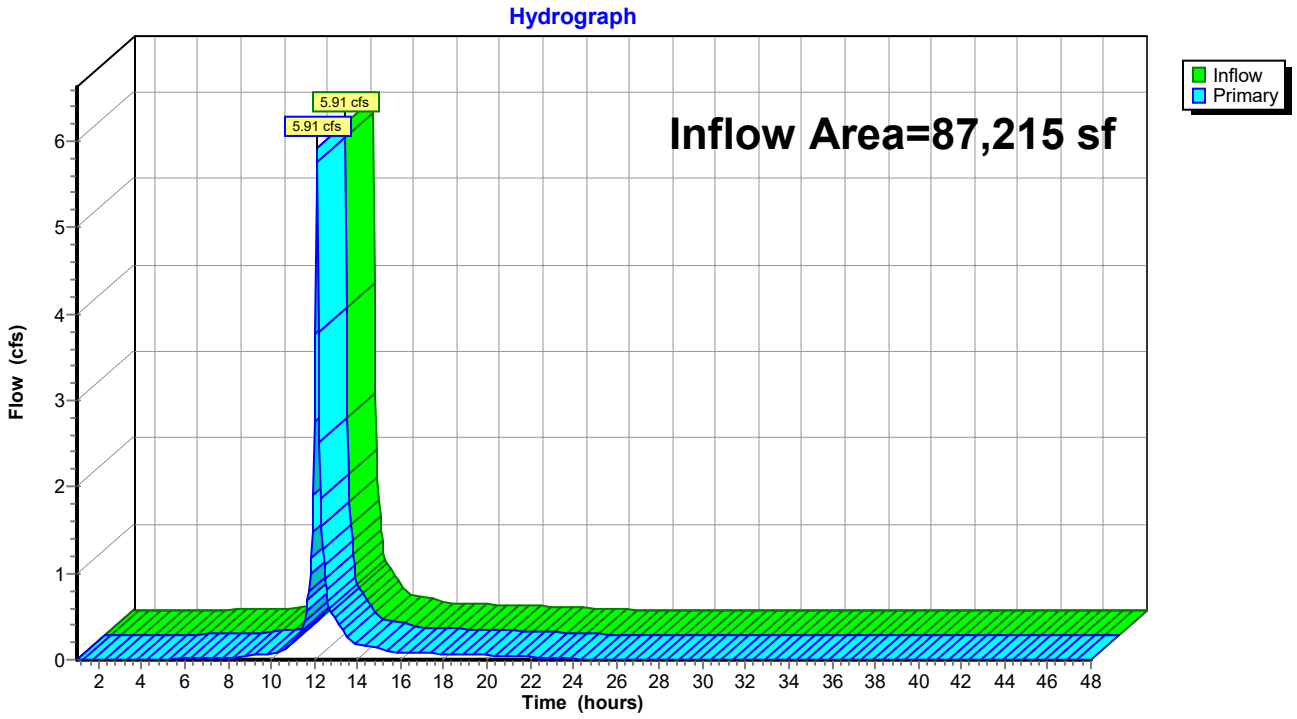


Summary for Link 177L: SUM OF As TO UG

Inflow Area = 87,215 sf, 65.94% Impervious, Inflow Depth = 1.78" for 2-Year event
Inflow = 5.91 cfs @ 12.13 hrs, Volume= 12,929 cf
Primary = 5.91 cfs @ 12.13 hrs, Volume= 12,929 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 129P : STORMTECH FROM ADS

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 177L: SUM OF As TO UG

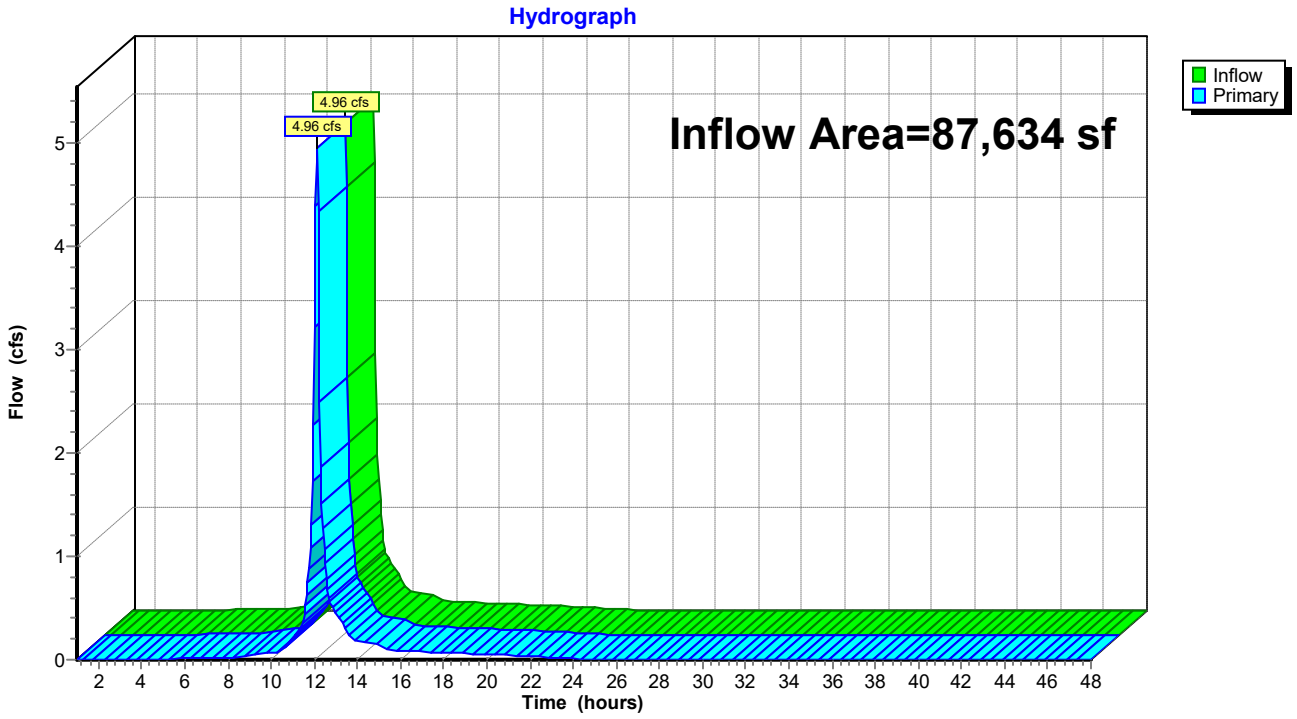


Summary for Link 178L: As

Inflow Area = 87,634 sf, 67.61% Impervious, Inflow Depth = 1.78" for 2-Year event
Inflow = 4.96 cfs @ 12.13 hrs, Volume= 13,010 cf
Primary = 4.96 cfs @ 12.13 hrs, Volume= 13,010 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 129P : STORMTECH FROM ADS

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 178L: As



Time span=1.00-48.00 hrs, dt=0.05 hrs, 941 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 35S: F6 Runoff Area=3,950 sf 0.00% Impervious Runoff Depth=1.46"
Tc=6.0 min CN=74 Runoff=0.24 cfs 480 cf

Subcatchment 37S: F6 Runoff Area=4,391 sf 0.00% Impervious Runoff Depth=1.46"
Tc=6.0 min CN=74 Runoff=0.26 cfs 534 cf

Subcatchment 40S: F5 (Direct to Basin) Runoff Area=31,282 sf 0.00% Impervious Runoff Depth=1.46"
Tc=6.0 min CN=74 Runoff=1.88 cfs 3,802 cf

Subcatchment 49S: D2 Runoff Area=16,605 sf 53.61% Impervious Runoff Depth=2.46"
Flow Length=393' Slope=0.0076 '/' Tc=10.7 min CN=87 Runoff=1.38 cfs 3,408 cf

Subcatchment 52S: E1 Runoff Area=39,552 sf 5.46% Impervious Runoff Depth=1.53"
Flow Length=100' Slope=0.0300 '/' Tc=9.6 min CN=75 Runoff=2.12 cfs 5,028 cf

Subcatchment 55S: G Runoff Area=4,482 sf 0.00% Impervious Runoff Depth=1.46"
Tc=6.0 min CN=74 Runoff=0.27 cfs 545 cf

Subcatchment 81S: O1 Runoff Area=11,697 sf 0.00% Impervious Runoff Depth=1.46"
Tc=6.0 min CN=74 Runoff=0.70 cfs 1,422 cf

Subcatchment 82S: D1 Runoff Area=20,886 sf 0.00% Impervious Runoff Depth=1.46"
Flow Length=400' Slope=0.0100 '/' Tc=22.0 min CN=74 Runoff=0.72 cfs 2,538 cf

Subcatchment 87S: I Runoff Area=56,129 sf 0.00% Impervious Runoff Depth=1.46"
Flow Length=750' Slope=0.0100 '/' Tc=30.4 min CN=74 Runoff=1.62 cfs 6,821 cf

Subcatchment 95S: C1 Runoff Area=19,337 sf 26.10% Impervious Runoff Depth=1.89"
Tc=6.0 min CN=80 Runoff=1.50 cfs 3,039 cf

Subcatchment 96S: E2 Runoff Area=18,820 sf 39.11% Impervious Runoff Depth=2.12"
Flow Length=400' Slope=0.0300 '/' Tc=13.7 min CN=83 Runoff=1.23 cfs 3,328 cf

Subcatchment 97S: C2 Runoff Area=99,572 sf 33.61% Impervious Runoff Depth=2.04"
Tc=6.0 min CN=82 Runoff=8.34 cfs 16,940 cf

Subcatchment 98S: E3 Runoff Area=109,219 sf 13.58% Impervious Runoff Depth=1.66"
Flow Length=200' Tc=16.3 min CN=77 Runoff=5.14 cfs 15,152 cf

Subcatchment 105S: C (EXTERIOR) Runoff Area=83,930 sf 38.97% Impervious Runoff Depth=2.12"
Tc=6.0 min CN=83 Runoff=7.28 cfs 14,842 cf

Subcatchment 106S: B Runoff Area=86,466 sf 11.84% Impervious Runoff Depth=1.66"
Tc=6.0 min CN=77 Runoff=5.94 cfs 11,995 cf

Subcatchment 107S: F Runoff Area=41,695 sf 60.00% Impervious Runoff Depth=2.55"
Tc=6.0 min CN=88 Runoff=4.25 cfs 8,871 cf

Subcatchment 108S: B1 (INTERIOR) Runoff Area=10,526 sf 100.00% Impervious Runoff Depth=3.58"
Tc=6.0 min CN=98 Runoff=1.32 cfs 3,136 cf

Subcatchment 112S: D3 Runoff Area=8,222 sf 12.92% Impervious Runoff Depth=1.66"
Tc=6.0 min CN=77 Runoff=0.56 cfs 1,141 cf

Subcatchment 118S: A14 Runoff Area=16,514 sf 54.25% Impervious Runoff Depth=2.46"
Tc=6.0 min CN=87 Runoff=1.63 cfs 3,389 cf

Subcatchment 120S: A30 Runoff Area=14,121 sf 18.33% Impervious Runoff Depth=1.74"
Tc=6.0 min CN=78 Runoff=1.01 cfs 2,044 cf

Subcatchment 121S: A32 Runoff Area=13,562 sf 14.98% Impervious Runoff Depth=1.74"
Tc=6.0 min CN=78 Runoff=0.97 cfs 1,963 cf

Subcatchment 122S: F1 Runoff Area=50,859 sf 57.49% Impervious Runoff Depth=2.55"
Tc=6.0 min CN=88 Runoff=5.18 cfs 10,820 cf

Subcatchment 125S: F3 Runoff Area=20,215 sf 20.28% Impervious Runoff Depth=1.81"
Tc=6.0 min CN=79 Runoff=1.51 cfs 3,050 cf

Subcatchment 126S: F4 Runoff Area=25,539 sf 8.13% Impervious Runoff Depth=1.59"
Tc=6.0 min CN=76 Runoff=1.68 cfs 3,393 cf

Subcatchment 127S: A13 Runoff Area=1,947 sf 62.25% Impervious Runoff Depth=2.65"
Tc=6.0 min CN=89 Runoff=0.20 cfs 429 cf

Subcatchment 128S: A15 Runoff Area=8,786 sf 25.73% Impervious Runoff Depth=1.89"
Tc=6.0 min CN=80 Runoff=0.68 cfs 1,381 cf

Subcatchment 130S: A12 Runoff Area=3,208 sf 80.89% Impervious Runoff Depth=3.04"
Tc=6.0 min CN=93 Runoff=0.37 cfs 811 cf

Subcatchment 131S: A11 Runoff Area=6,149 sf 79.15% Impervious Runoff Depth=3.04"
Tc=6.0 min CN=93 Runoff=0.71 cfs 1,555 cf

Subcatchment 132S: A9 Runoff Area=1,940 sf 86.03% Impervious Runoff Depth=3.24"
Tc=6.0 min CN=95 Runoff=0.23 cfs 524 cf

Subcatchment 133S: A7 Runoff Area=4,839 sf 73.84% Impervious Runoff Depth=2.93"
Tc=6.0 min CN=92 Runoff=0.55 cfs 1,183 cf

Subcatchment 134S: A5 Runoff Area=2,978 sf 76.83% Impervious Runoff Depth=2.93"
Tc=6.0 min CN=92 Runoff=0.34 cfs 728 cf

Subcatchment 136S: A33 Runoff Area=6,798 sf 72.68% Impervious Runoff Depth=2.84"
Tc=6.0 min CN=91 Runoff=0.75 cfs 1,606 cf

Subcatchment 137S: A1 Runoff Area=11,792 sf 39.91% Impervious Runoff Depth=2.20"
Tc=6.0 min CN=84 Runoff=1.06 cfs 2,166 cf

Subcatchment 138S: F2 Runoff Area=12,659 sf 52.90% Impervious Runoff Depth=2.46"
Tc=10.0 min CN=87 Runoff=1.07 cfs 2,598 cf

Subcatchment 139S: A2 Runoff Area=5,968 sf 57.66% Impervious Runoff Depth=2.55"
Tc=6.0 min CN=88 Runoff=0.61 cfs 1,270 cf

Subcatchment 140S: H1 Runoff Area=124,005 sf 32.15% Impervious Runoff Depth=2.04"
Tc=6.0 min CN=82 Runoff=10.38 cfs 21,097 cf

Subcatchment 141S: H2 Runoff Area=54,034 sf 29.78% Impervious Runoff Depth=1.96"
Tc=6.0 min CN=81 Runoff=4.36 cfs 8,838 cf

Subcatchment 142S: H3 Runoff Area=29,836 sf 18.57% Impervious Runoff Depth=1.74"
Tc=6.0 min CN=78 Runoff=2.14 cfs 4,318 cf

Subcatchment 144S: H5 Runoff Area=14,502 sf 0.00% Impervious Runoff Depth=1.46"
Tc=6.0 min CN=74 Runoff=0.87 cfs 1,762 cf

Subcatchment 145S: H6-a Runoff Area=9,604 sf 11.80% Impervious Runoff Depth=1.66"
Tc=6.0 min CN=77 Runoff=0.66 cfs 1,332 cf

Subcatchment 146S: O2 Runoff Area=132,678 sf 2.29% Impervious Runoff Depth=1.53"
Flow Length=377' Tc=12.2 min CN=75 Runoff=6.50 cfs 16,867 cf

Subcatchment 147S: J Runoff Area=15,351 sf 8.86% Impervious Runoff Depth=1.59"
Tc=6.0 min CN=76 Runoff=1.01 cfs 2,040 cf

Subcatchment 148S: A3 Runoff Area=3,136 sf 75.57% Impervious Runoff Depth=2.93"
Tc=6.0 min CN=92 Runoff=0.35 cfs 767 cf

Subcatchment 149S: A4 Runoff Area=7,573 sf 19.64% Impervious Runoff Depth=1.81"
Tc=6.0 min CN=79 Runoff=0.57 cfs 1,143 cf

Subcatchment 150S: A6 Runoff Area=2,888 sf 41.24% Impervious Runoff Depth=2.20"
Tc=6.0 min CN=84 Runoff=0.26 cfs 531 cf

Subcatchment 151S: A8 Runoff Area=5,293 sf 40.92% Impervious Runoff Depth=2.20"
Tc=6.0 min CN=84 Runoff=0.48 cfs 972 cf

Subcatchment 152S: A10 Runoff Area=4,344 sf 47.88% Impervious Runoff Depth=2.29"
Tc=6.0 min CN=85 Runoff=0.40 cfs 829 cf

Subcatchment 153S: A16 Runoff Area=4,885 sf 83.97% Impervious Runoff Depth=3.14"
Tc=6.0 min CN=94 Runoff=0.58 cfs 1,278 cf

Subcatchment 154S: A17 Runoff Area=1,182 sf 44.92% Impervious Runoff Depth=2.29"
Tc=6.0 min CN=85 Runoff=0.11 cfs 225 cf

Subcatchment 155S: A18 Runoff Area=1,381 sf 79.65% Impervious Runoff Depth=3.04"
Tc=6.0 min CN=93 Runoff=0.16 cfs 349 cf

Subcatchment 156S: A19 Runoff Area=5,006 sf 29.03% Impervious Runoff Depth=1.96"
Tc=6.0 min CN=81 Runoff=0.40 cfs 819 cf

Subcatchment 157S: A20 Runoff Area=705 sf 28.94% Impervious Runoff Depth=1.96"
Tc=6.0 min CN=81 Runoff=0.06 cfs 115 cf

Subcatchment 158S: A21 Runoff Area=1,801 sf 79.73% Impervious Runoff Depth=3.04"
Tc=6.0 min CN=93 Runoff=0.21 cfs 456 cf

Subcatchment 159S: A22 Runoff Area=4,627 sf 58.46% Impervious Runoff Depth=2.55"
Tc=6.0 min CN=88 Runoff=0.47 cfs 984 cf

Subcatchment 160S: A23 Runoff Area=5,903 sf 81.57% Impervious Runoff Depth=3.14"
Tc=6.0 min CN=94 Runoff=0.70 cfs 1,544 cf

Subcatchment 161S: A24 Runoff Area=6,769 sf 44.98% Impervious Runoff Depth=2.29"
Tc=6.0 min CN=85 Runoff=0.63 cfs 1,291 cf

Subcatchment 162S: A25 Runoff Area=6,995 sf 75.15% Impervious Runoff Depth=2.93"
Tc=6.0 min CN=92 Runoff=0.79 cfs 1,710 cf

Subcatchment 163S: A26 Runoff Area=6,827 sf 17.20% Impervious Runoff Depth=1.74"
Tc=6.0 min CN=78 Runoff=0.49 cfs 988 cf

Subcatchment 164S: A27 Runoff Area=3,218 sf 78.37% Impervious Runoff Depth=3.04"
Tc=6.0 min CN=93 Runoff=0.37 cfs 814 cf

Subcatchment 165S: A28 Runoff Area=4,119 sf 32.34% Impervious Runoff Depth=2.04"
Tc=6.0 min CN=82 Runoff=0.34 cfs 701 cf

Subcatchment 166S: A29 Runoff Area=3,109 sf 75.62% Impervious Runoff Depth=2.93"
Tc=6.0 min CN=92 Runoff=0.35 cfs 760 cf

Subcatchment 167S: A31 Runoff Area=6,189 sf 76.15% Impervious Runoff Depth=2.93"
Tc=6.0 min CN=92 Runoff=0.70 cfs 1,513 cf

Subcatchment 168S: A34 Runoff Area=387 sf 100.00% Impervious Runoff Depth=3.58"
Tc=6.0 min CN=98 Runoff=0.05 cfs 115 cf

Subcatchment 169S: A36 Runoff Area=1,118 sf 35.87% Impervious Runoff Depth=2.12"
Tc=6.0 min CN=83 Runoff=0.10 cfs 198 cf

Subcatchment 170S: C (INTERIOR) Runoff Area=8,855 sf 100.00% Impervious Runoff Depth=3.58"
Tc=6.0 min CN=98 Runoff=1.11 cfs 2,638 cf

Subcatchment 171S: A (MARIA ROOF) /2 Runoff Area=9,435 sf 100.00% Impervious Runoff Depth=3.58"
Tc=0.0 min CN=98 Runoff=1.36 cfs 2,811 cf

Subcatchment 172S: B1 (EXTERIOR) Runoff Area=32,338 sf 100.00% Impervious Runoff Depth=3.58"
Tc=6.0 min CN=98 Runoff=4.04 cfs 9,636 cf

Subcatchment 173S: A (MARIA ROOF) /2 Runoff Area=9,434 sf 100.00% Impervious Runoff Depth=3.58"
Tc=0.0 min CN=98 Runoff=1.36 cfs 2,811 cf

Subcatchment 175S: H6-b Runoff Area=4,256 sf 23.80% Impervious Runoff Depth=1.89"
Tc=6.0 min CN=80 Runoff=0.33 cfs 669 cf

Subcatchment 176S: X (EX. RBL Area to Runoff Area=22,047 sf 41.55% Impervious Runoff Depth=2.20"
Tc=6.0 min CN=84 Runoff=1.98 cfs 4,050 cf

Subcatchment 179S: H6-c Runoff Area=4,091 sf 0.00% Impervious Runoff Depth=1.46"
Tc=6.0 min CN=74 Runoff=0.25 cfs 497 cf

Subcatchment 182S: A35 Runoff Area=28,353 sf 100.00% Impervious Runoff Depth=3.58"
Tc=6.0 min CN=98 Runoff=3.55 cfs 8,448 cf

Subcatchment 183S: Y (RBL Area to RBL Runoff Area=103,238 sf 10.88% Impervious Runoff Depth=1.66"
Tc=6.0 min CN=77 Runoff=7.09 cfs 14,322 cf

Subcatchment 185S: H4 Runoff Area=6,658 sf 0.00% Impervious Runoff Depth=1.46"
Tc=6.0 min CN=74 Runoff=0.40 cfs 809 cf

Reach 99R: East Swale (SE End) Avg. Flow Depth=0.62' Max Vel=4.22 fps Inflow=19.15 cfs 38,978 cf
n=0.018 L=570.0' S=0.0070 '/' Capacity=43.88 cfs Outflow=17.99 cfs 38,978 cf

Reach 106R: East Swale (North End) Avg. Flow Depth=0.19' Max Vel=3.13 fps Inflow=1.50 cfs 3,039 cf
n=0.018 L=140.0' S=0.0179 '/' Capacity=39.35 cfs Outflow=1.50 cfs 3,039 cf

Reach 108R: South Berm Swale Avg. Flow Depth=0.58' Max Vel=2.86 fps Inflow=5.71 cfs 17,422 cf
n=0.025 L=265.0' S=0.0100 '/' Capacity=19.73 cfs Outflow=5.52 cfs 17,422 cf

Reach 109R: SC Road East Ditch Avg. Flow Depth=0.40' Max Vel=2.06 fps Inflow=4.25 cfs 8,871 cf
n=0.022 L=415.0' S=0.0048 '/' Capacity=23.93 cfs Outflow=3.81 cfs 8,871 cf

Reach 111R: Western PL North Ditch Avg. Flow Depth=0.96' Max Vel=4.06 fps Inflow=11.90 cfs 26,659 cf
n=0.025 L=480.0' S=0.0133 '/' Capacity=26.79 cfs Outflow=11.26 cfs 26,659 cf

Reach 117R: SC Road West Ditch Avg. Flow Depth=0.46' Max Vel=2.06 fps Inflow=5.18 cfs 10,820 cf
n=0.022 L=475.0' S=0.0042 '/' Capacity=22.37 cfs Outflow=4.55 cfs 10,820 cf

Reach 132R: EX. Red Barn Lane West Avg. Flow Depth=0.41' Max Vel=3.09 fps Inflow=4.12 cfs 8,368 cf
n=0.025 L=610.0' S=0.0179 '/' Capacity=87.96 cfs Outflow=3.65 cfs 8,368 cf

Reach 136R: SC West Ditch Avg. Flow Depth=0.40' Max Vel=1.79 fps Inflow=1.51 cfs 3,050 cf
n=0.025 L=218.0' S=0.0080 '/' Capacity=16.56 cfs Outflow=1.42 cfs 3,050 cf

Reach 151R: Western PL North Ditch Avg. Flow Depth=0.32' Max Vel=1.74 fps Inflow=0.56 cfs 1,141 cf
n=0.025 L=227.0' S=0.0107 '/' Capacity=24.06 cfs Outflow=0.53 cfs 1,141 cf

Reach 184R: Red Barn Lane East Swale Avg. Flow Depth=0.46' Max Vel=3.27 fps Inflow=7.09 cfs 14,322 cf
n=0.025 L=945.0' S=0.0180 '/' Capacity=36.63 cfs Outflow=5.76 cfs 14,322 cf

Pond 41P: Reach Pipe Peak Elev=738.59' Storage=12 cf Inflow=1.07 cfs 2,598 cf
Outflow=1.07 cfs 2,598 cf

Pond 57P: Dry Pond 2 Peak Elev=748.34' Storage=11,113 cf Inflow=10.89 cfs 31,736 cf
Discarded=2.00 cfs 31,736 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=2.00 cfs 31,736 cf

Pond 58P: Dry Pond 1 Peak Elev=749.34' Storage=49,958 cf Inflow=32.52 cfs 112,765 cf
Discarded=1.95 cfs 112,765 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=1.95 cfs 112,765 cf

Pond 60P: Infiltration Basin #1 Peak Elev=741.96' Storage=19,944 cf Inflow=16.73 cfs 46,280 cf
Discarded=2.12 cfs 46,280 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=2.12 cfs 46,280 cf

Pond 95P: Dry Pond 3 Peak Elev=739.51' Storage=0.118 af Inflow=11.37 cfs 26,134 cf
Discarded=3.96 cfs 26,134 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=3.96 cfs 26,134 cf

Pond 101R: Reach Pipe DP1 TO MH Peak Elev=750.50' Inflow=0.00 cfs 0 cf
15.0" Round Culvert n=0.011 L=373.0' S=0.0094 '/' Outflow=0.00 cfs 0 cf

Pond 110R: Western Pipe Run Peak Elev=746.78' Inflow=11.78 cfs 27,800 cf
24.0" Round Culvert n=0.011 L=514.0' S=0.0040 '/' Outflow=11.78 cfs 27,800 cf

Pond 127P: B3 OVERSIZED PIPE RUN (24" Peak Elev=752.08' Storage=162 cf Inflow=3.43 cfs 7,126 cf
Outflow=3.38 cfs 7,126 cf

Pond 129P: STORMTECH FROM ADS Peak Elev=753.13' Storage=25,019 cf Inflow=19.27 cfs 46,436 cf
Outflow=1.70 cfs 46,285 cf

Pond 133P: WEST COURTYARD OVERSIZED Peak Elev=756.15' Storage=266 cf Inflow=4.86 cfs 10,312 cf
Outflow=4.67 cfs 10,312 cf

Pond 154P: Southeast Basin Peak Elev=730.87' Storage=4,401 cf Inflow=3.37 cfs 7,414 cf
Outflow=0.15 cfs 7,416 cf

Pond 174P: EAST COURTYARD OVERSIZED Peak Elev=755.61' Storage=102 cf Inflow=2.11 cfs 4,493 cf
Outflow=2.07 cfs 4,493 cf

Pond 183P: 24" HDPE PIPE Peak Elev=749.92' Inflow=3.65 cfs 8,368 cf
24.0" Round Culvert n=0.010 L=475.0' S=0.0042 '/' Outflow=3.65 cfs 8,368 cf

Link 48L: TOTAL OUTFALL Inflow=2.91 cfs 5,892 cf
Primary=2.91 cfs 5,892 cf

Link 66L: Total Offsite Inflow=2.91 cfs 5,892 cf
Primary=2.91 cfs 5,892 cf

Link 115L: EX. Cul-de-sac On Green Meadow Place Inflow=1.24 cfs 2,498 cf
Primary=1.24 cfs 2,498 cf

Link 124L: TO 12" PRIOR TO 24" (WEST) Inflow=4.23 cfs 8,959 cf
Primary=4.23 cfs 8,959 cf

Link 126L: OVERSIZED PIPE RUN BY B3 Inflow=3.43 cfs 7,126 cf
Primary=3.43 cfs 7,126 cf

Link 127L: total Inflow=0.60 cfs 1,259 cf
Primary=0.60 cfs 1,259 cf

Link 128L: FROM OVERSIZED PIPE RUN Inflow=3.38 cfs 7,126 cf
Primary=3.38 cfs 7,126 cf

Link 134L: TO UG Inflow=5.12 cfs 13,123 cf
Primary=5.12 cfs 13,123 cf

Link 171L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW below 1.11 cfs Inflow=1.11 cfs 2,638 cf
Primary=1.11 cfs 2,638 cf Secondary=0.00 cfs 0 cf

Link 174L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW below 1.32 cfs Inflow=1.32 cfs 3,136 cf
Primary=1.32 cfs 3,136 cf Secondary=0.00 cfs 0 cf

Link 175L: TO UG Inflow=2.65 cfs 7,304 cf
Primary=2.65 cfs 7,304 cf

Link 176L: UPSTREAM OF OVERSIZED PIPE Inflow=0.94 cfs 1,964 cf
Primary=0.94 cfs 1,964 cf

Link 177L: SUM OF As TO UG Inflow=9.15 cfs 20,234 cf
Primary=9.15 cfs 20,234 cf

Link 178L: As Inflow=7.61 cfs 20,427 cf
Primary=7.61 cfs 20,427 cf

Total Runoff Area = 1,570,805 sf Runoff Volume = 262,983 cf Average Runoff Depth = 2.01"
70.57% Pervious = 1,108,561 sf 29.43% Impervious = 462,244 sf

Summary for Subcatchment 35S: F6

3/3/21
Undetained portion of SE corner of SC that goes direct to SE low area (back yards of 3 home lots SE corner)

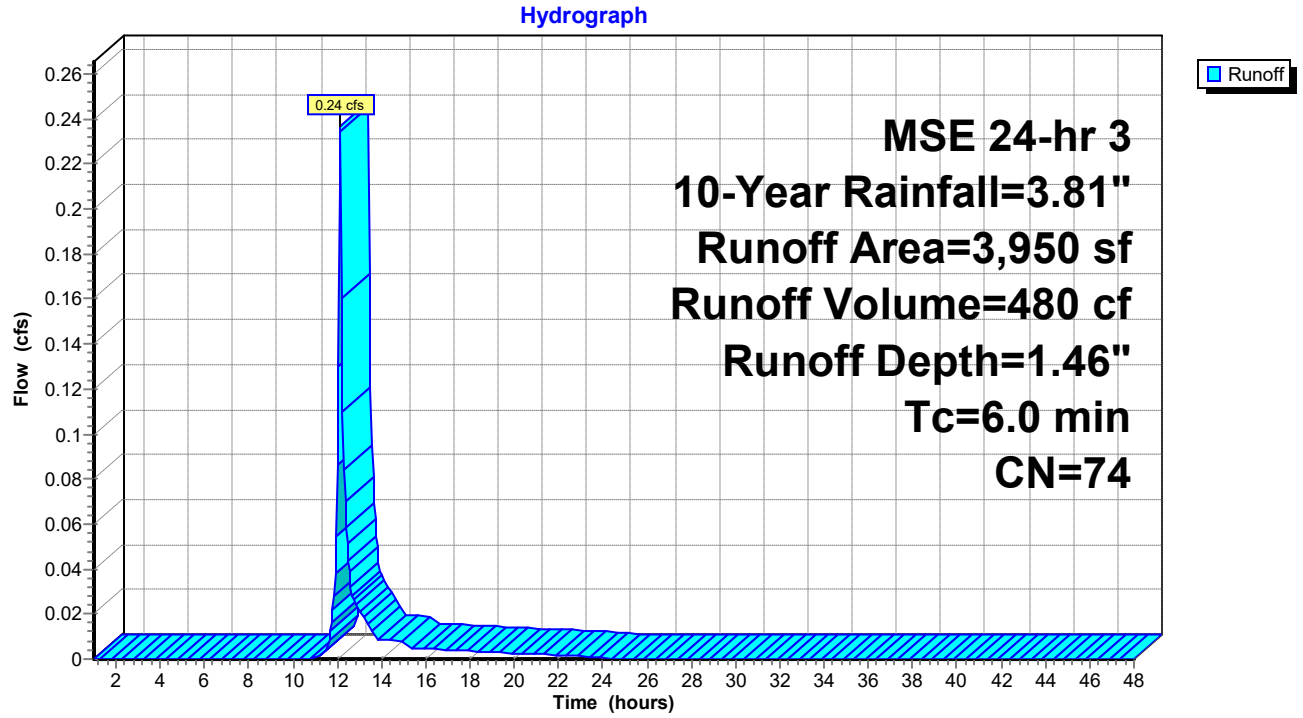
Runoff = 0.24 cfs @ 12.14 hrs, Volume= 480 cf, Depth= 1.46"
Routed to Pond 154P : Southeast Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	3,950	74	landscape
	3,950		100.00% Pervious Area

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

Subcatchment 35S: F6



Summary for Subcatchment 37S: F6

3/3/21
Undetained portion of SE corner of SC that goes direct to SE low area (back yards of 3 home lots SE corner)

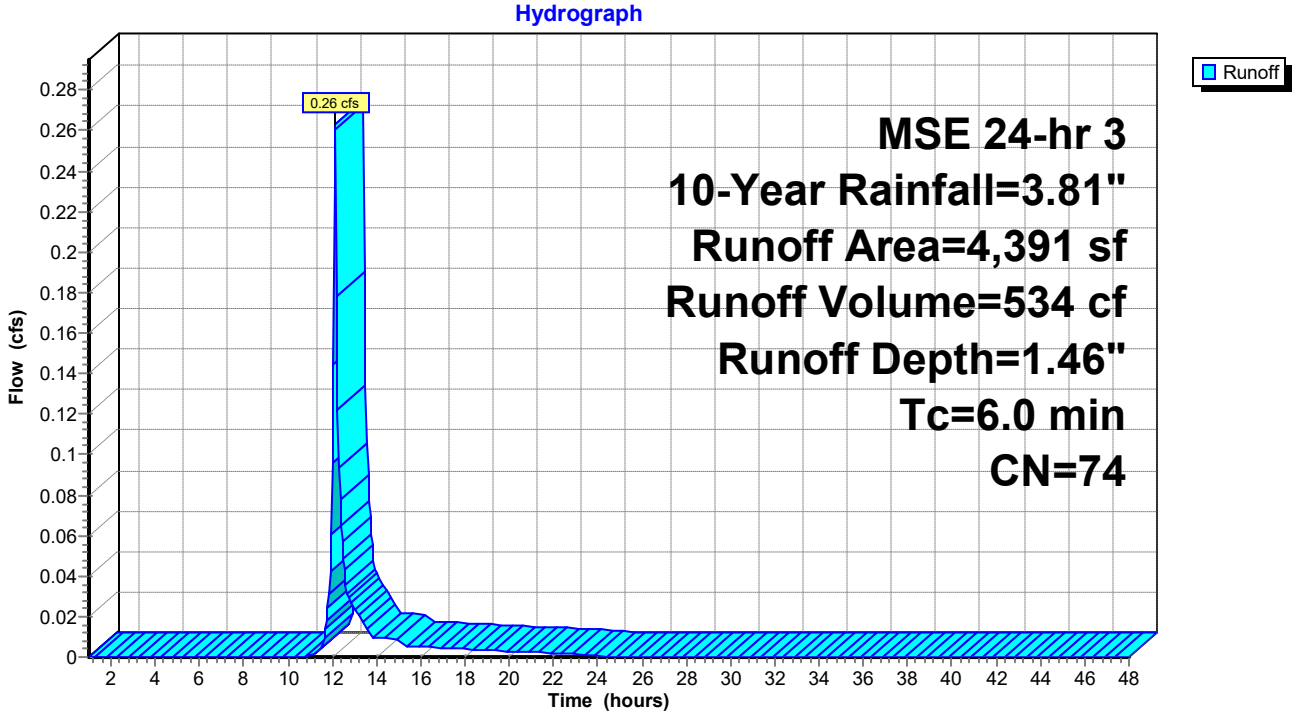
Runoff = 0.26 cfs @ 12.14 hrs, Volume= 534 cf, Depth= 1.46"
Routed to Pond 154P : Southeast Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	4,391	74	landscape
	4,391		100.00% Pervious Area

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

Subcatchment 37S: F6



Summary for Subcatchment 40S: F5 (Direct to Basin)

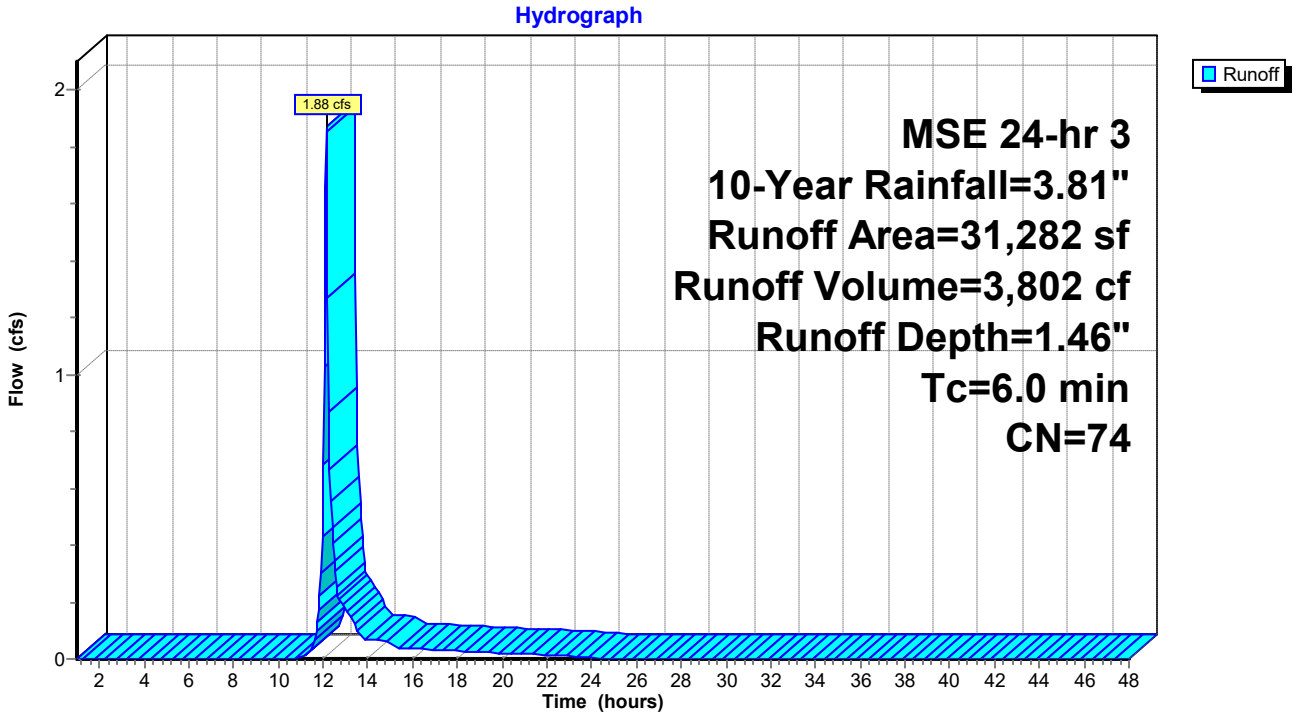
Runoff = 1.88 cfs @ 12.14 hrs, Volume= 3,802 cf, Depth= 1.46"
Routed to Pond 154P : Southeast Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	31,282	74	landscape
	31,282		100.00% Pervious Area

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

Subcatchment 40S: F5 (Direct to Basin)



Summary for Subcatchment 49S: D2

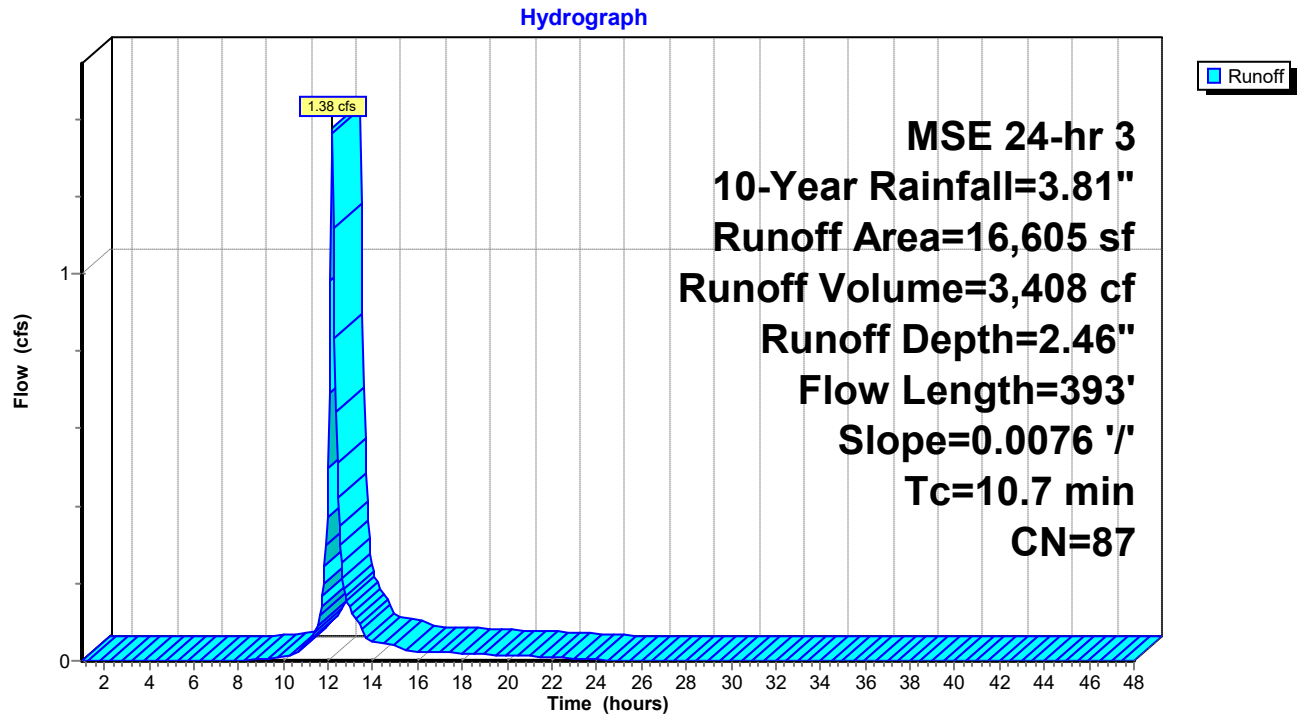
Runoff = 1.38 cfs @ 12.18 hrs, Volume= 3,408 cf, Depth= 2.46"
Routed to Pond 57P : Dry Pond 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	8,902	98	roof
*	7,703	74	landscape
	16,605	87	Weighted Average
	7,703		46.39% Pervious Area
	8,902		53.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	393	0.0076	0.61		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps

Subcatchment 49S: D2



Summary for Subcatchment 52S: E1

3/3/21
Delineation NOT updated based on Justin's waterdrops, needs finalization, it routes to western property ditch that goes ultimately to IB. We are using Joe's SWMP2 Figure from December 2020.

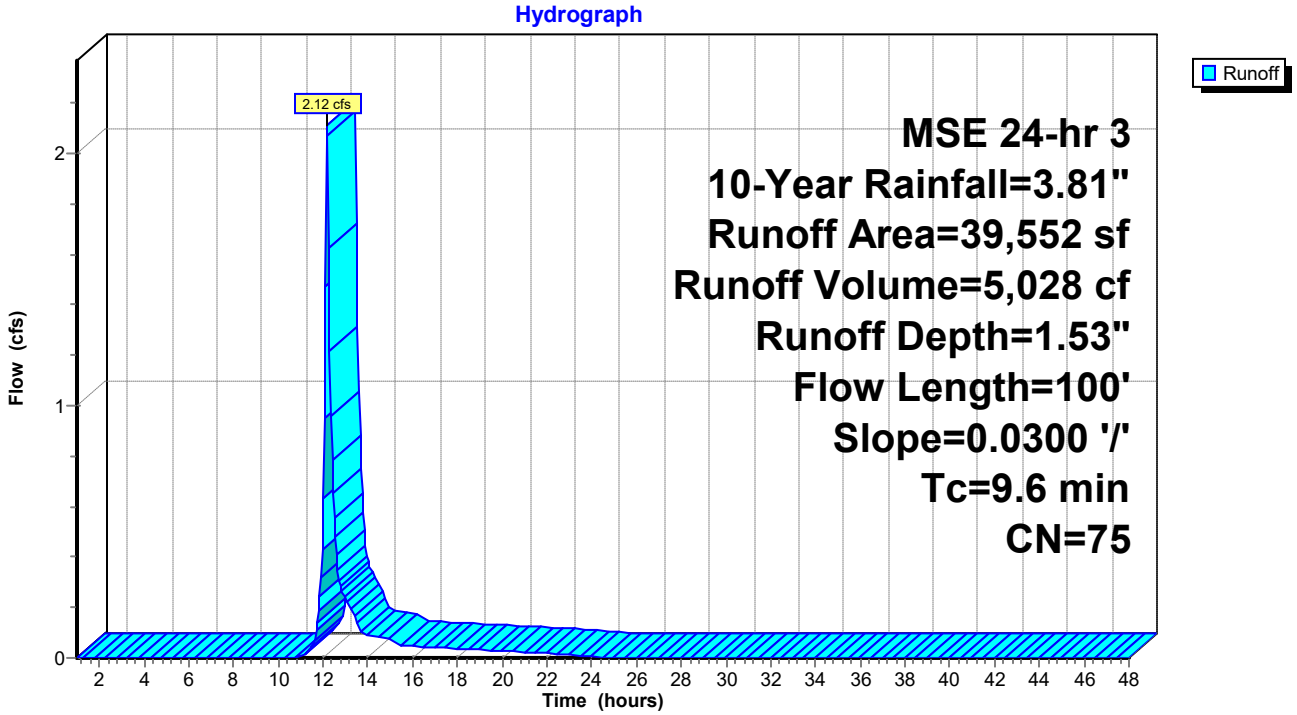
Runoff = 2.12 cfs @ 12.18 hrs, Volume= 5,028 cf, Depth= 1.53"
Routed to Reach 111R : Western PL North Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	2,161	98	Walks
	37,391	74	>75% Grass cover, Good, HSG C
	39,552	75	Weighted Average
	37,391		94.54% Pervious Area
	2,161		5.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0300	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 52S: E1



Summary for Subcatchment 55S: G

3/3/21
Needs to be delineated, this is from Joe's SWMP2

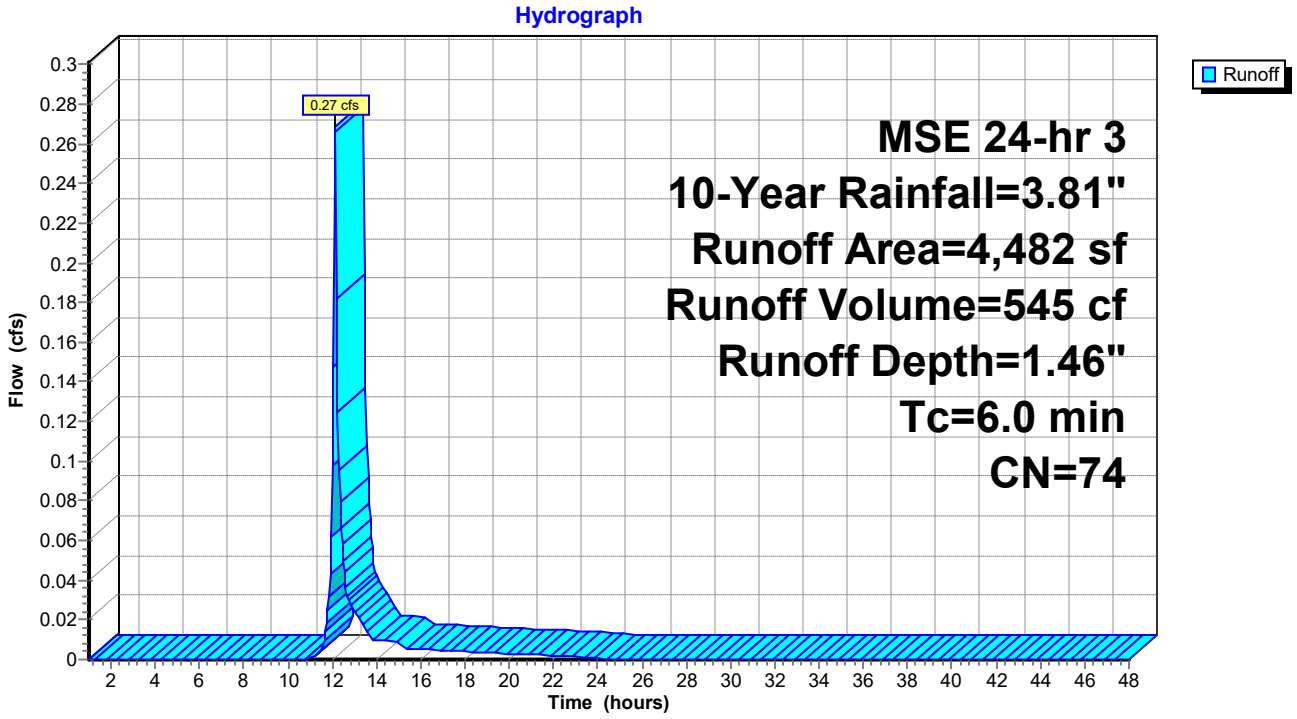
Runoff = 0.27 cfs @ 12.14 hrs, Volume= 545 cf, Depth= 1.46"
Routed to Link 66L : Total Offsite

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	4,482	74	landscape
	4,482		100.00% Pervious Area

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

Subcatchment 55S: G



Summary for Subcatchment 81S: O1

3/3/21
SW portion off-site flowing into IB

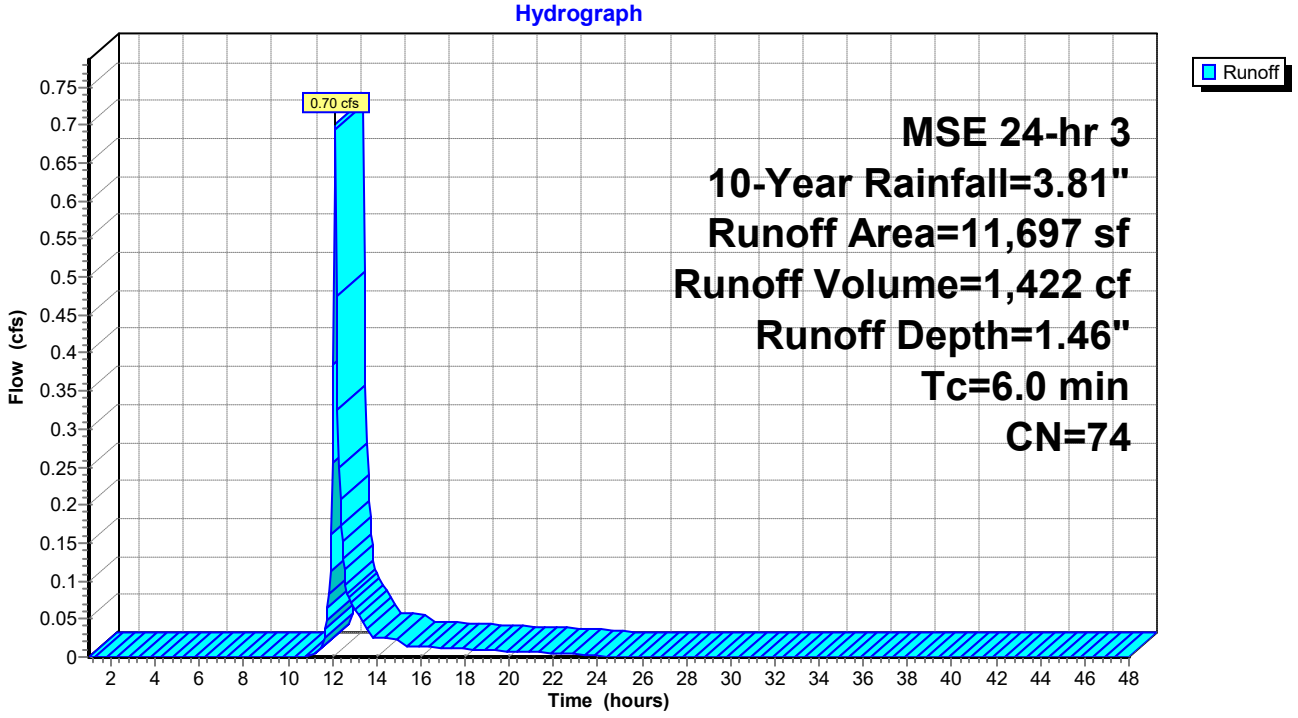
Runoff = 0.70 cfs @ 12.14 hrs, Volume= 1,422 cf, Depth= 1.46"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	11,697	74	PERV
	11,697		100.00% Pervious Area

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

Subcatchment 81S: O1



Summary for Subcatchment 82S: D1

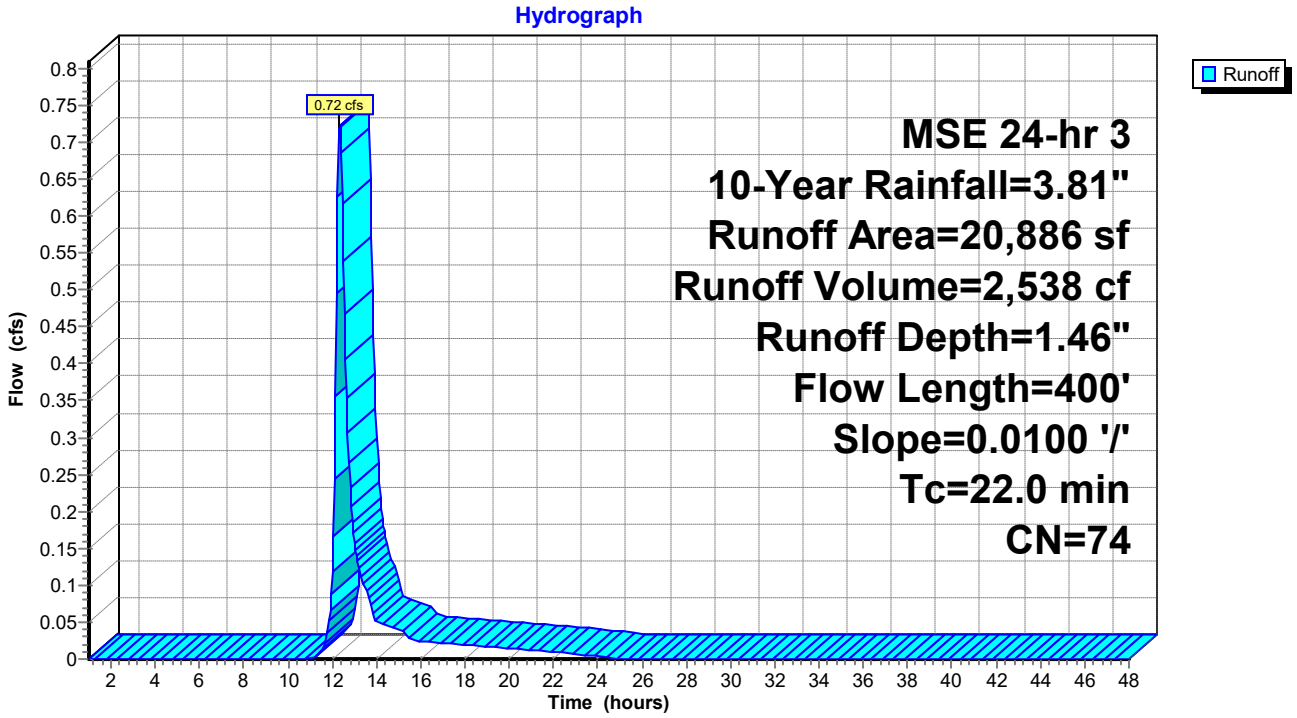
Runoff = 0.72 cfs @ 12.34 hrs, Volume= 2,538 cf, Depth= 1.46"
Routed to Pond 57P : Dry Pond 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	20,886	74	landscape
	20,886		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	100	0.0100	0.11		**Sheet Flow, BUILDING TO SWALE** Grass: Short n= 0.150 P2= 2.42"
7.1	300	0.0100	0.70		**Shallow Concentrated Flow, SWALE ALONG BACK** Short Grass Pasture Kv= 7.0 fps
22.0	400	Total			

Subcatchment 82S: D1



Summary for Subcatchment 87S: I

3/3/21
Wooded area

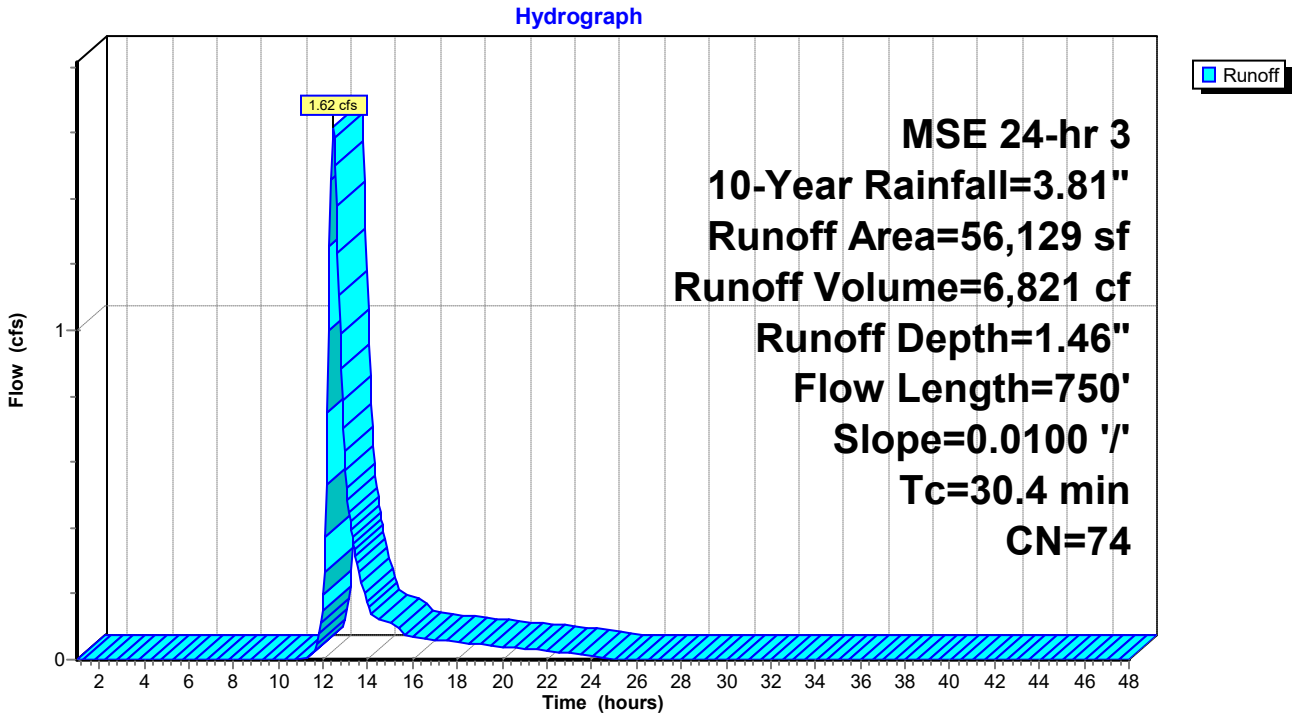
Runoff = 1.62 cfs @ 12.45 hrs, Volume= 6,821 cf, Depth= 1.46"
Routed to Reach 108R : South Berm Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	56,129	74	landscape
	56,129		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	100	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.42"
15.5	650	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
30.4	750	Total			

Subcatchment 87S: I



Summary for Subcatchment 95S: C1

Area actually draining to east swale
3/3/21
Northern portion of East Roof, exterior east courtyard, 7 home lots

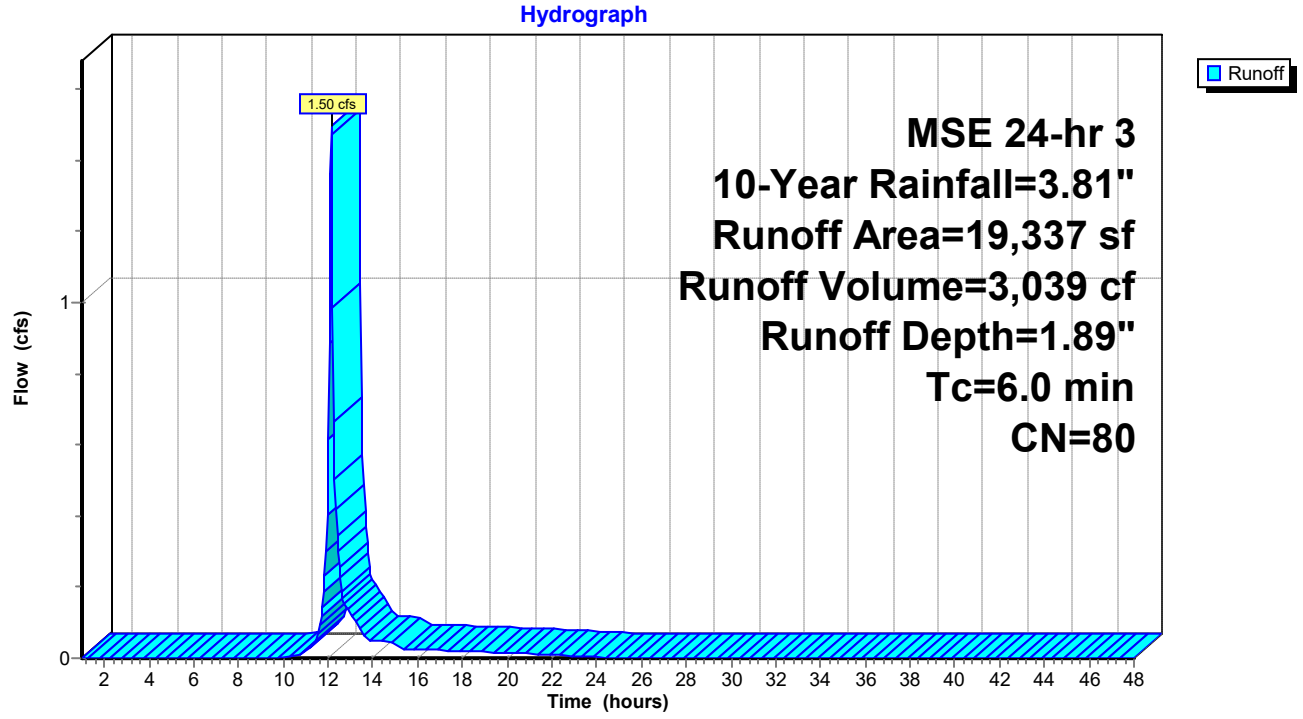
Runoff = 1.50 cfs @ 12.13 hrs, Volume= 3,039 cf, Depth= 1.89"
Routed to Reach 106R : East Swale (North End)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	2,210	98	walks
*	1,774	98	roads
*	14,290	74	landscape
*	1,063	98	roof
	19,337	80	Weighted Average
	14,290		73.90% Pervious Area
	5,047		26.10% Impervious Area

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

Subcatchment 95S: C1



Summary for Subcatchment 96S: E2

3/3/21
Delineation needs updating, but it does route to IB
Portion of cemetary site that flows from north to south into IB

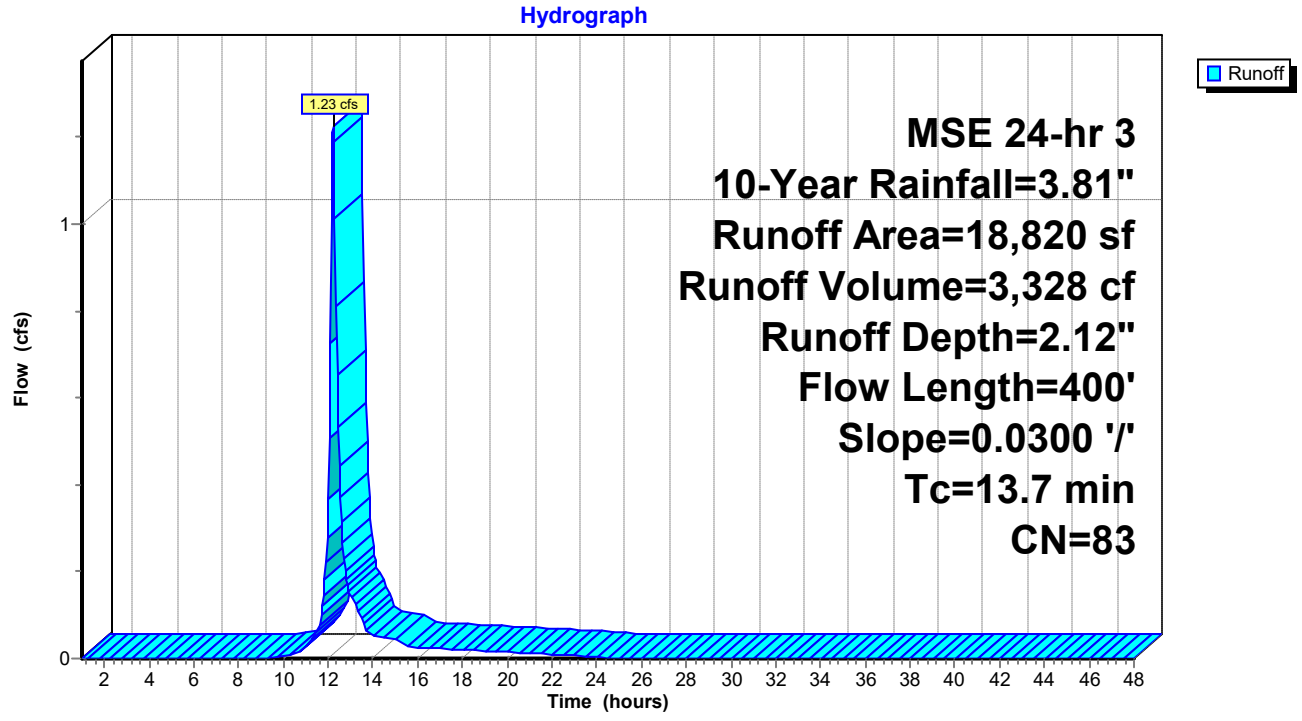
Runoff = 1.23 cfs @ 12.22 hrs, Volume= 3,328 cf, Depth= 2.12"
Routed to Pond 60P : Infiltration Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	11,460	74	landscape
*	7,360	98	roofs
	18,820	83	Weighted Average
	11,460		60.89% Pervious Area
	7,360		39.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0300	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.42"
4.1	300	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.7	400	Total			

Subcatchment 96S: E2



Summary for Subcatchment 97S: C2

Subset C - C1
3/3/21
Southern portion of East Building Roof, Southern Building (Middle one) roof, pond area
pipe from roofs not sized yet

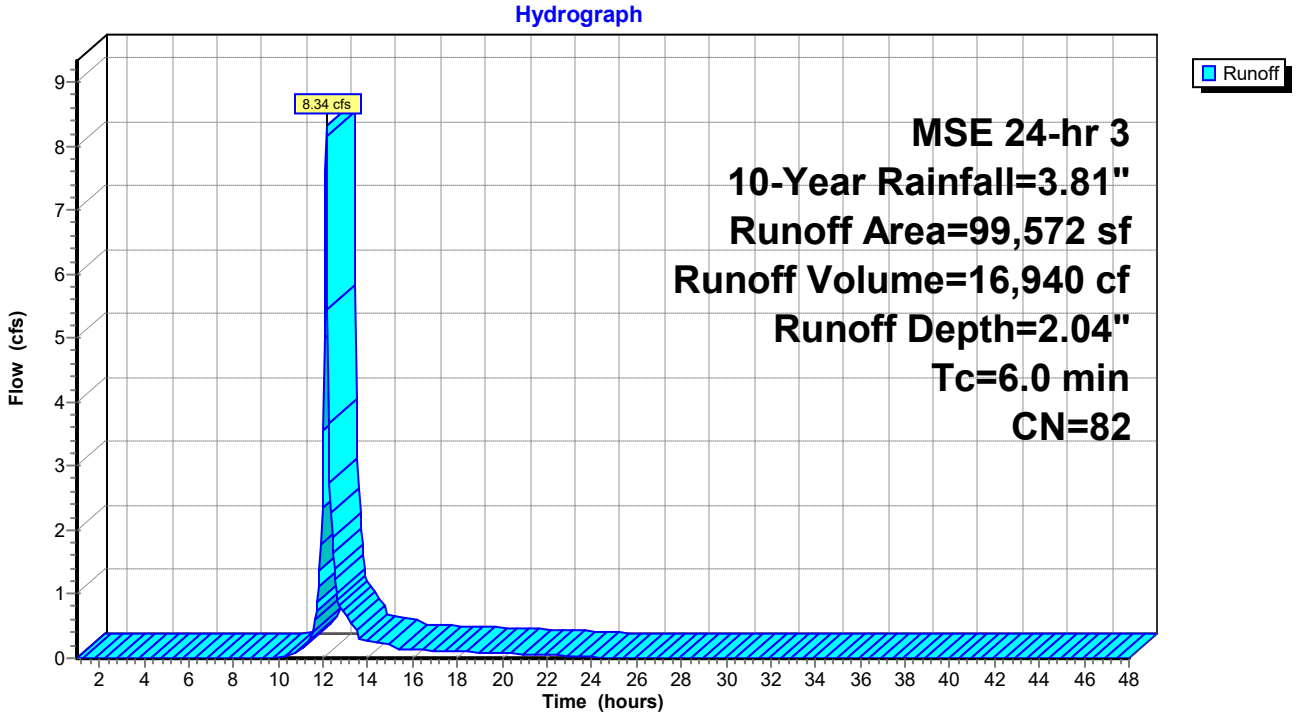
Runoff = 8.34 cfs @ 12.13 hrs, Volume= 16,940 cf, Depth= 2.04"
Routed to Pond 58P : Dry Pond 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	9,728	98	walks and patios
*	23,739	98	roofs
*	66,105	74	landscape
	99,572	82	Weighted Average
	66,105		66.39% Pervious Area
	33,467		33.61% Impervious Area

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

Subcatchment 97S: C2



Summary for Subcatchment 98S: E3

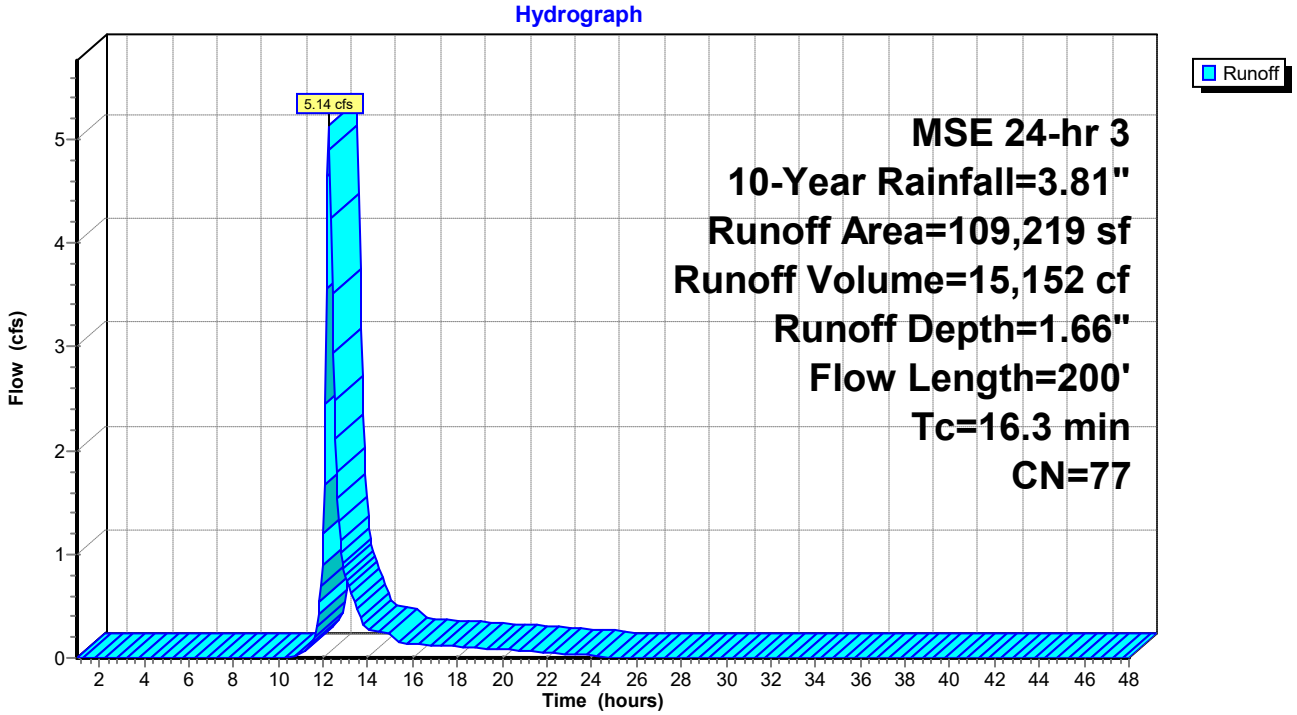
Runoff = 5.14 cfs @ 12.26 hrs, Volume= 15,152 cf, Depth= 1.66"
Routed to Pond 60P : Infiltration Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	6,532	98	walks
*	8,300	98	Roads
*	94,387	74	landscape
	109,219	77	Weighted Average
	94,387		86.42% Pervious Area
	14,832		13.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	100	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.42"
1.4	100	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
16.3	200	Total			

Subcatchment 98S: E3



Summary for Subcatchment 105S: C (EXTERIOR)

Subset C - C1
3/3/21
Southern portion of East Building Roof, Southern Building (Middle one) roof, pond area
pipe from roofs not sized yet

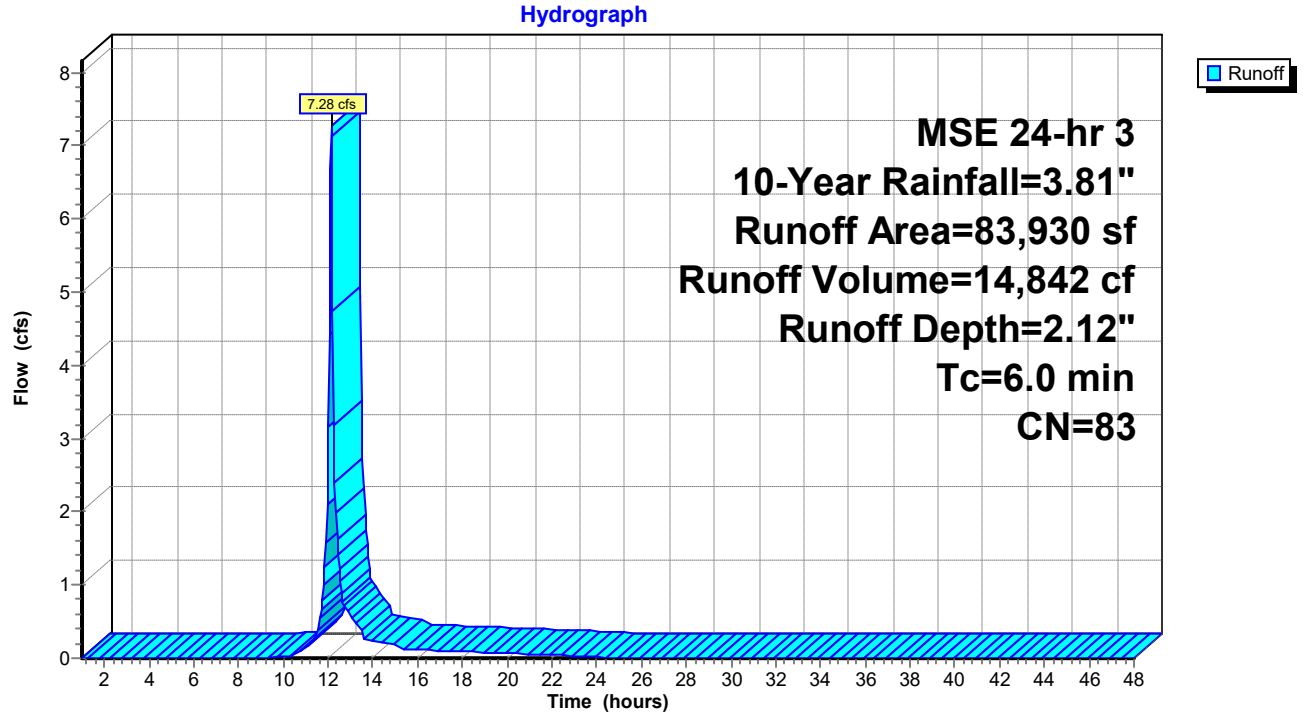
Runoff = 7.28 cfs @ 12.13 hrs, Volume= 14,842 cf, Depth= 2.12"
Routed to Reach 99R : East Swale (SE End)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	8,648	98	walks and patios
*	24,058	98	roofs
*	51,224	74	landscape
	83,930	83	Weighted Average
	51,224		61.03% Pervious Area
	32,706		38.97% Impervious Area

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

Subcatchment 105S: C (EXTERIOR)



Summary for Subcatchment 106S: B

3/3/21
North face of West Building, Lawn Area south of WTP, Patios

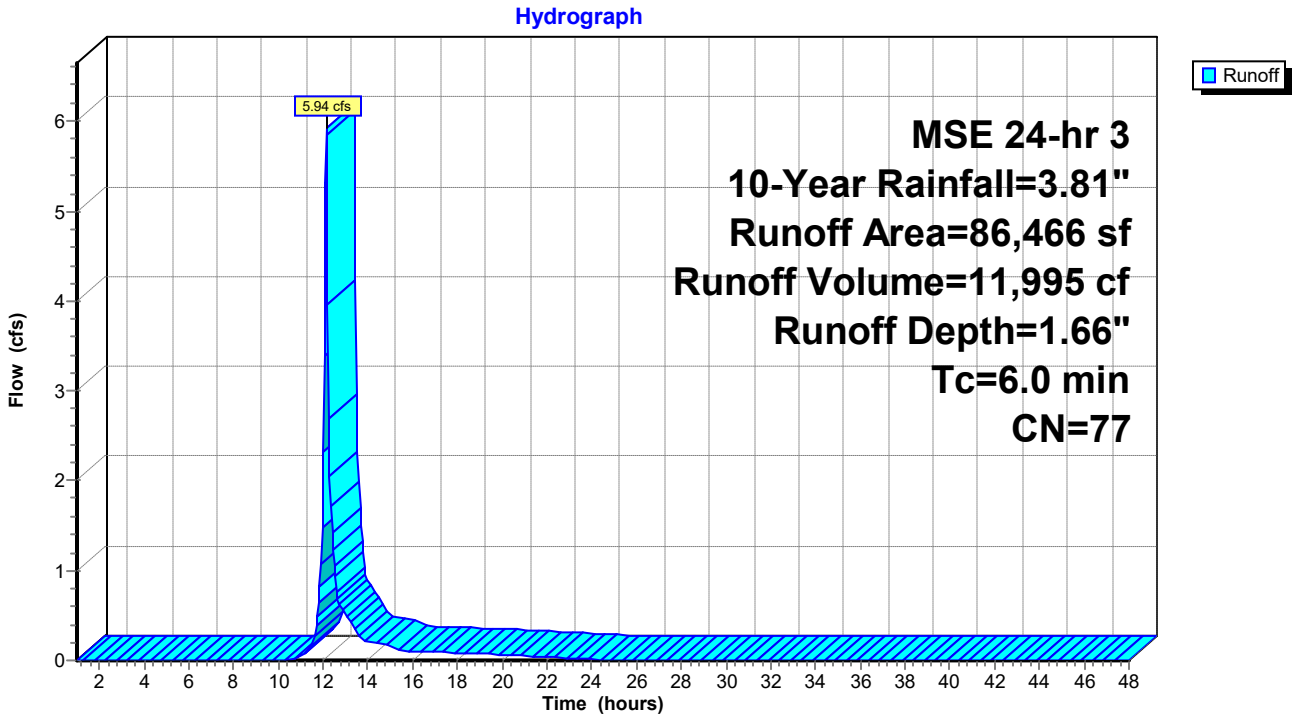
Runoff = 5.94 cfs @ 12.14 hrs, Volume= 11,995 cf, Depth= 1.66"
Routed to Reach 111R : Western PL North Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	76,225	74	landscape
*	9,317	98	walks
*	924	98	roof
	86,466	77	Weighted Average
	76,225		88.16% Pervious Area
	10,241		11.84% Impervious Area

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

Subcatchment 106S: B



Summary for Subcatchment 107S: F

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

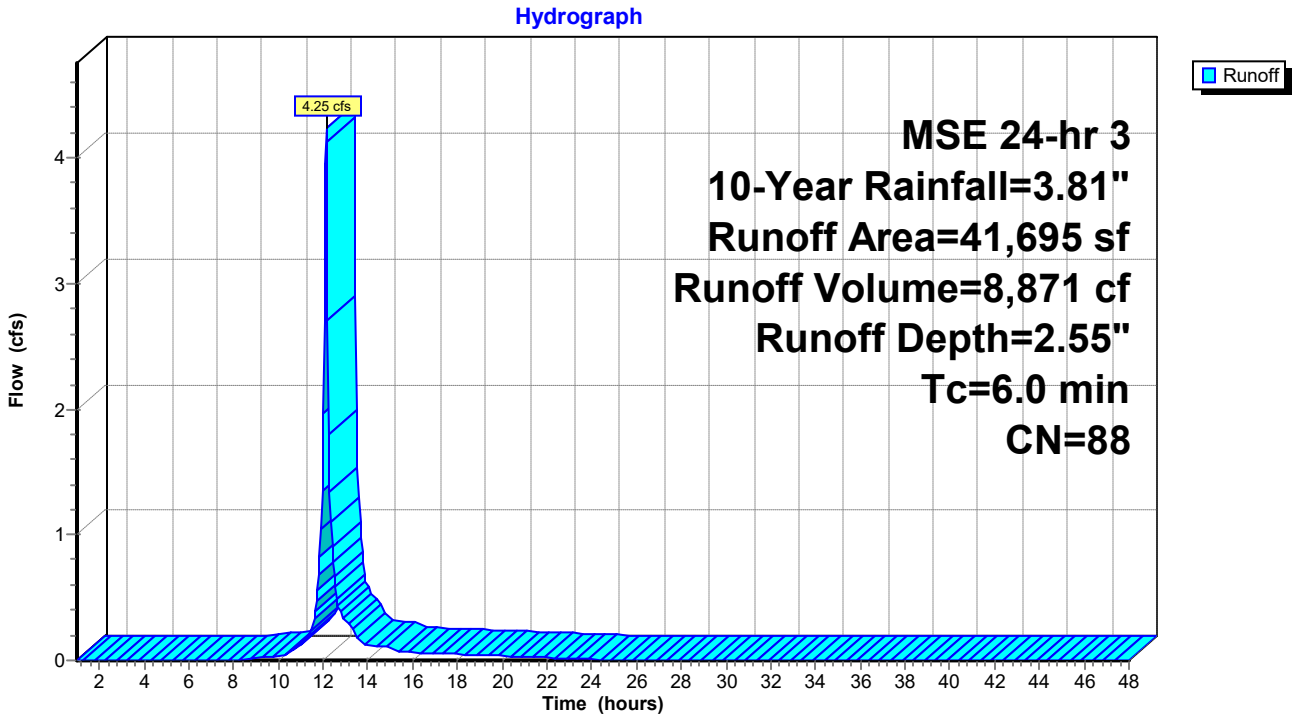
Runoff = 4.25 cfs @ 12.13 hrs, Volume= 8,871 cf, Depth= 2.55"
Routed to Reach 109R : SC Road East Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	7,467	98	roads
*	17,550	98	roof
*	16,678	74	landscape
	41,695	88	Weighted Average
	16,678		40.00% Pervious Area
	25,017		60.00% Impervious Area

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

Subcatchment 107S: F



Summary for Subcatchment 108S: B1 (INTERIOR)

3/3/21
Northern portion of W building roof

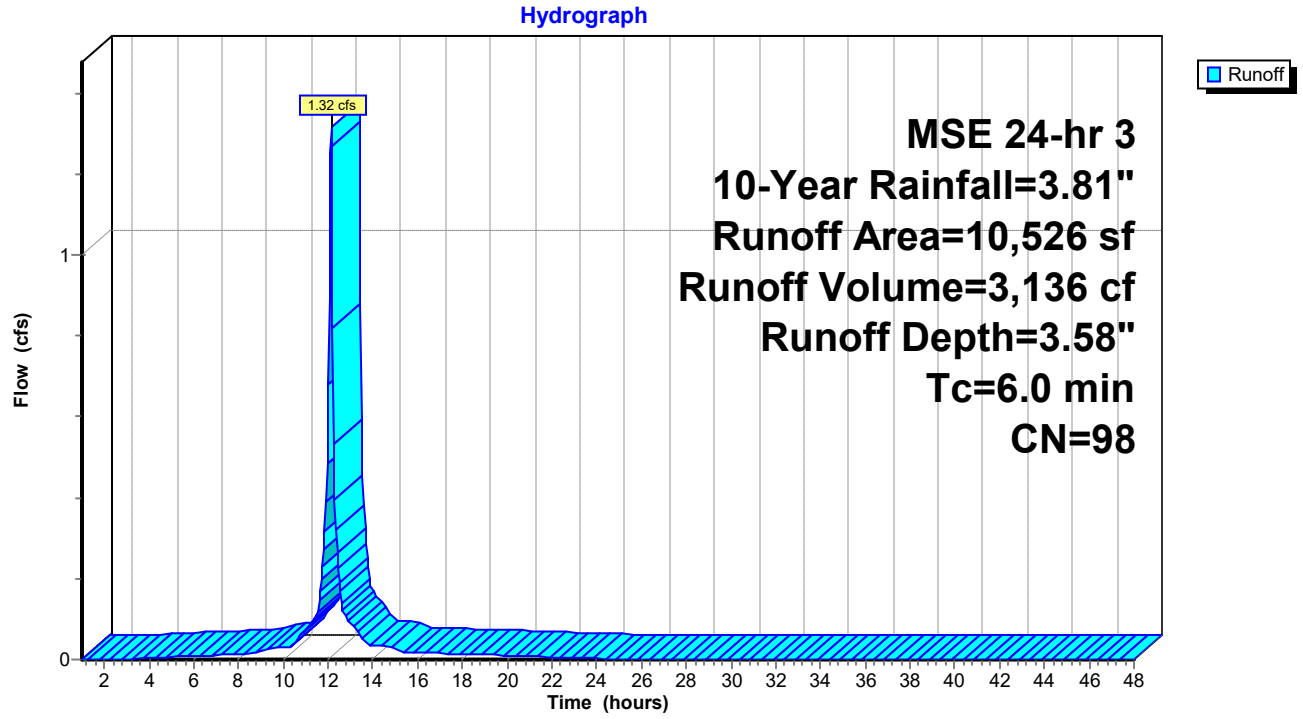
Runoff = 1.32 cfs @ 12.13 hrs, Volume= 3,136 cf, Depth= 3.58"
Routed to Link 174L : 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	10,526	98	roof
	10,526		100.00% Impervious Area

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

Subcatchment 108S: B1 (INTERIOR)



Summary for Subcatchment 112S: D3

3/3/21
Western Building Courtyard (need to check that Joe's overall B works with B1-B4 in our update

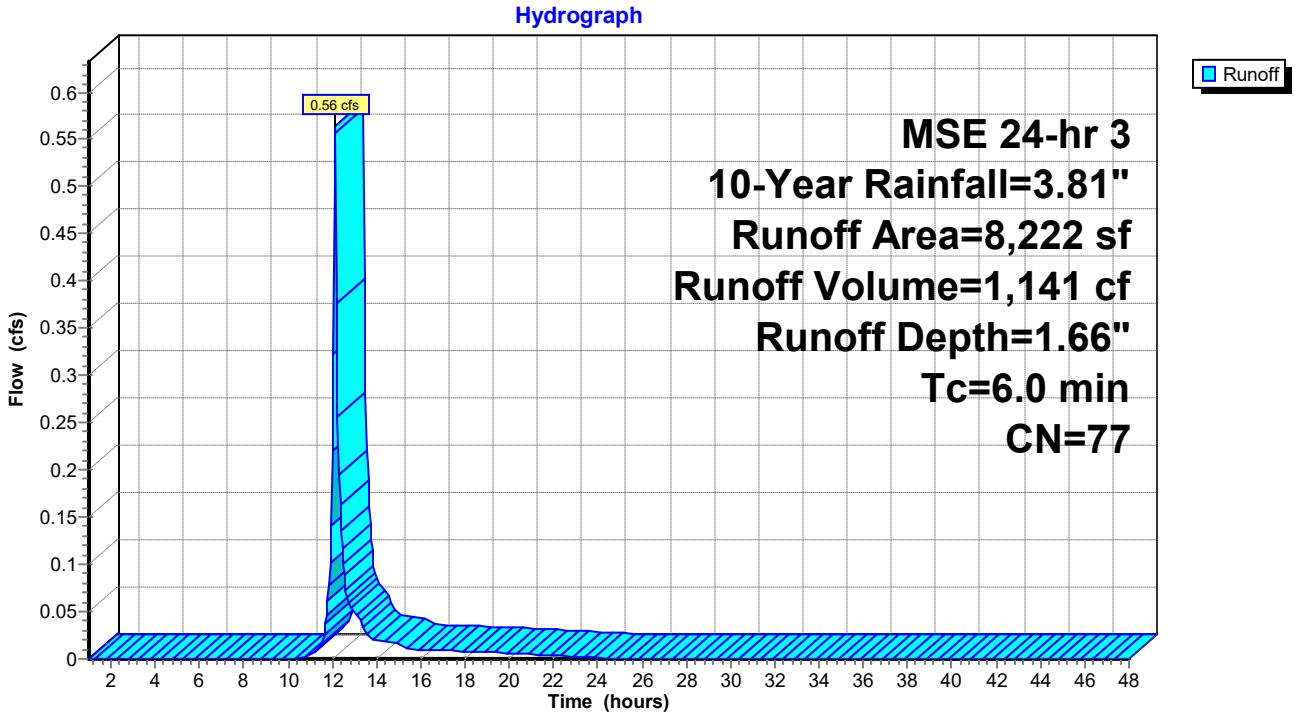
Runoff = 0.56 cfs @ 12.14 hrs, Volume= 1,141 cf, Depth= 1.66"
Routed to Reach 151R : Western PL North Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	1,062	98	walks
*	7,160	74	landscape
	8,222	77	Weighted Average
	7,160		87.08% Pervious Area
	1,062		12.92% Impervious Area

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

Subcatchment 112S: D3



Summary for Subcatchment 118S: A14

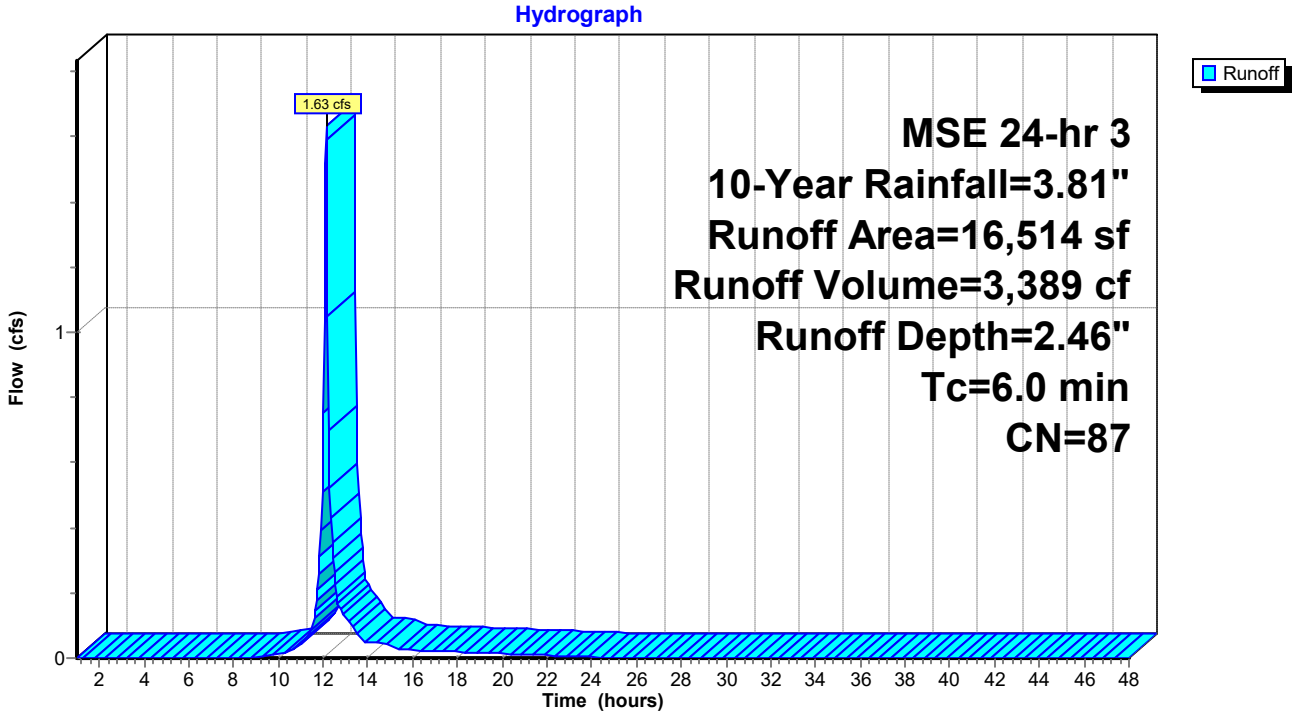
Runoff = 1.63 cfs @ 12.13 hrs, Volume= 3,389 cf, Depth= 2.46"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	3,919	98	WALKS
*	5,040	98	ROADS
*	0	98	ROOF
*	7,555	74	LANDSCAPING
	16,514	87	Weighted Average
	7,555		45.75% Pervious Area
	8,959		54.25% Impervious Area

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

Subcatchment 118S: A14



Summary for Subcatchment 120S: A30

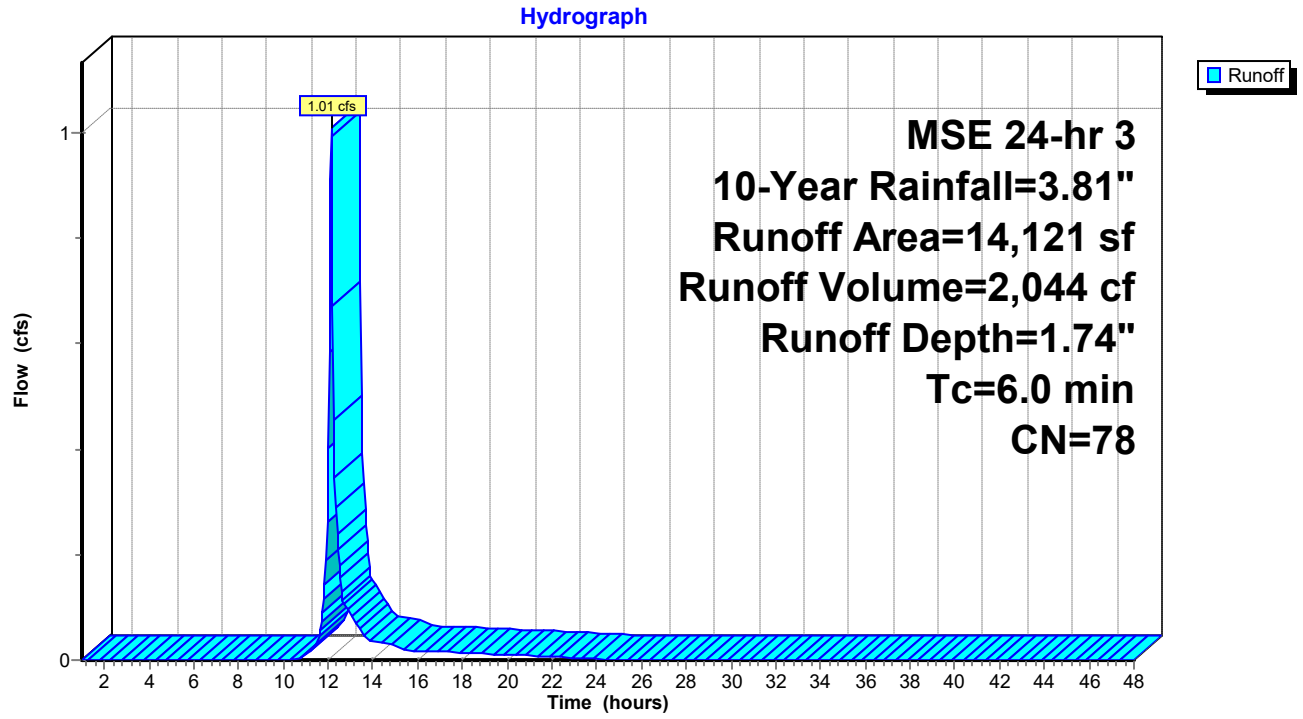
Runoff = 1.01 cfs @ 12.14 hrs, Volume= 2,044 cf, Depth= 1.74"
Routed to Link 126L : OVERSIZED PIPE RUN BY B3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	1,025	98	WALKS
*	1,563	98	ROADS
*	0	98	ROOF
*	11,533	74	LANDSCAPING
	14,121	78	Weighted Average
	11,533		81.67% Pervious Area
	2,588		18.33% Impervious Area

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

Subcatchment 120S: A30



Summary for Subcatchment 121S: A32

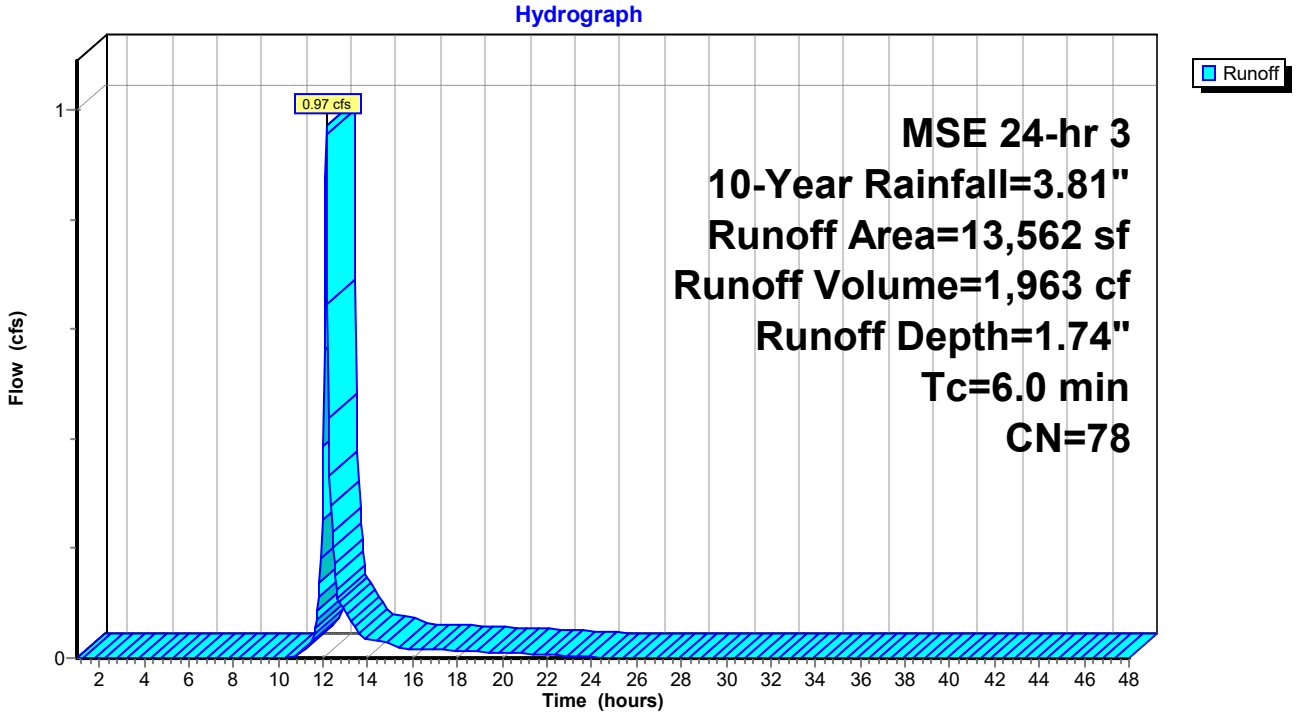
Runoff = 0.97 cfs @ 12.14 hrs, Volume= 1,963 cf, Depth= 1.74"
Routed to Link 126L : OVERSIZED PIPE RUN BY B3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	808	98	WALKS
*	1,224	98	ROADS
*	0	98	ROOF
*	11,530	74	LANDSCAPING
	13,562	78	Weighted Average
	11,530		85.02% Pervious Area
	2,032		14.98% Impervious Area

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

Subcatchment 121S: A32



Summary for Subcatchment 122S: F1

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

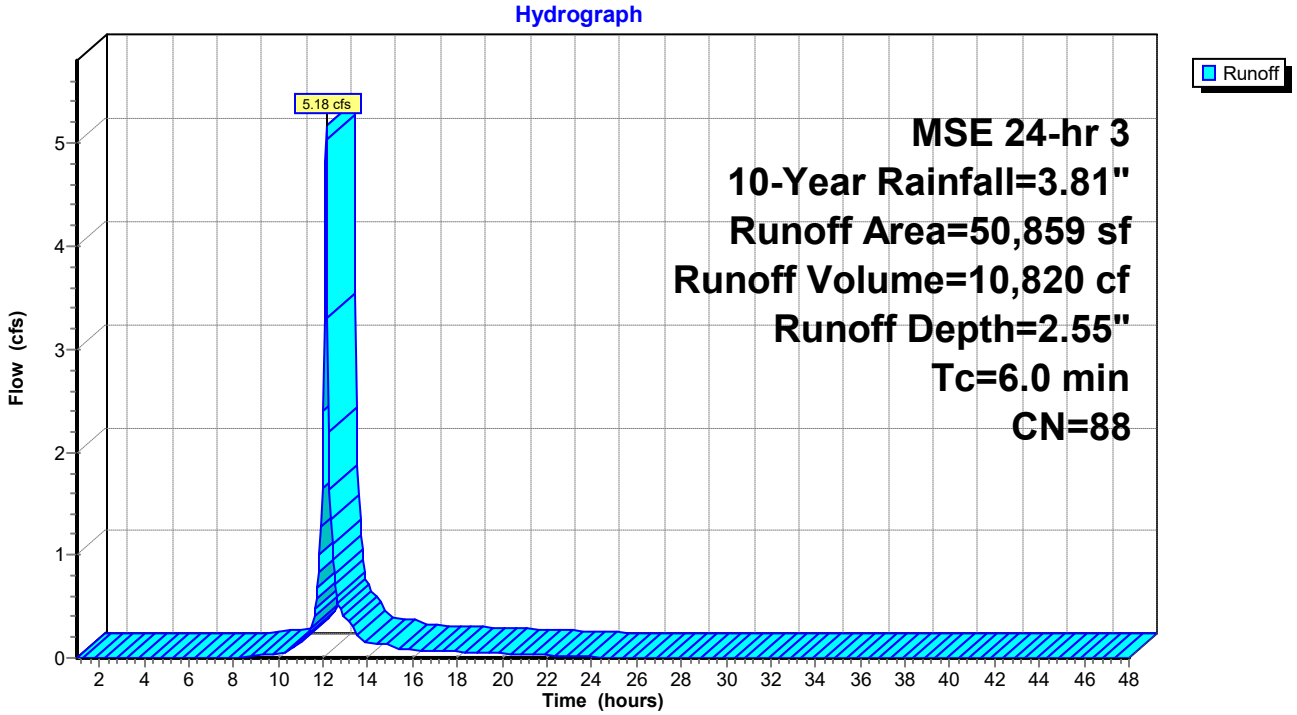
Runoff = 5.18 cfs @ 12.13 hrs, Volume= 10,820 cf, Depth= 2.55"
Routed to Reach 117R : SC Road West Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	244	98	walks
*	10,158	98	roads
*	18,836	98	roof
*	21,621	74	landscape
	50,859	88	Weighted Average
	21,621		42.51% Pervious Area
	29,238		57.49% Impervious Area

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

Subcatchment 122S: F1



Summary for Subcatchment 125S: F3

3/3/21
SW Lot that drains direct to SC Pond

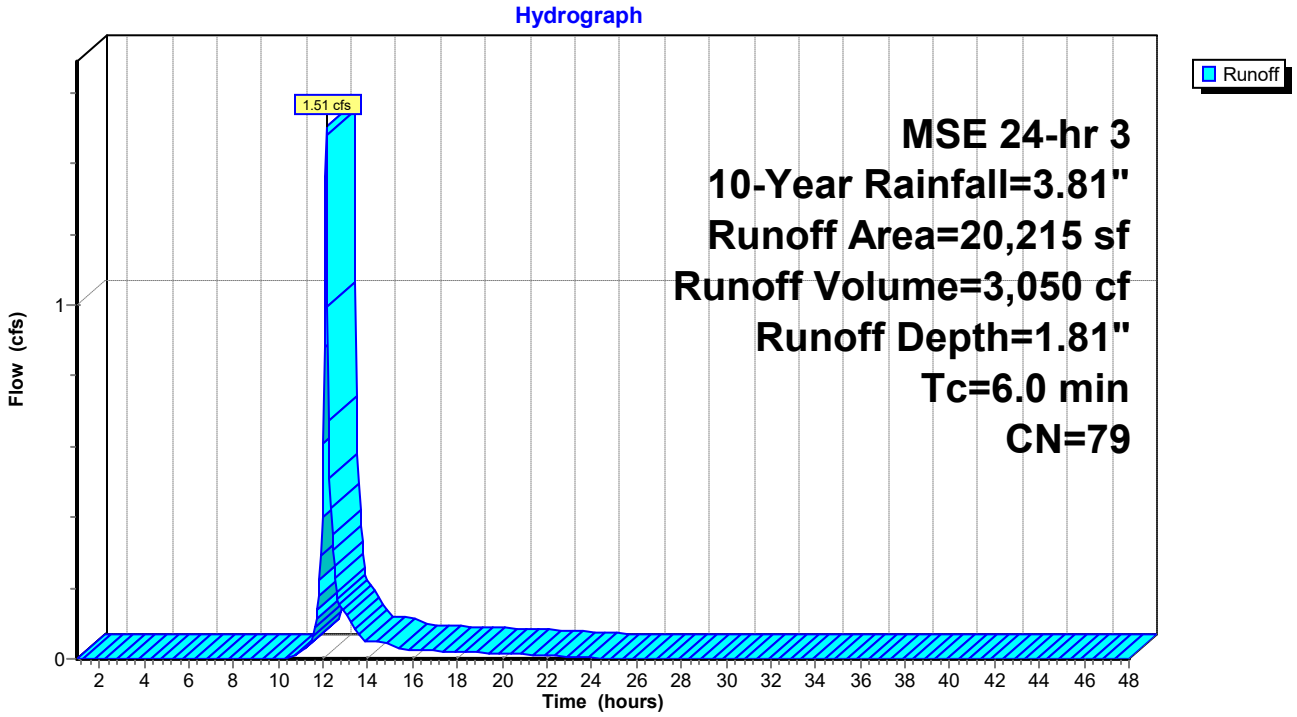
Runoff = 1.51 cfs @ 12.13 hrs, Volume= 3,050 cf, Depth= 1.81"
Routed to Reach 136R : SC West Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	4,099	98	roof
*	16,116	74	landscape
	20,215	79	Weighted Average
	16,116		79.72% Pervious Area
	4,099		20.28% Impervious Area

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

Subcatchment 125S: F3



Summary for Subcatchment 126S: F4

3/3/21
SC Pond itself

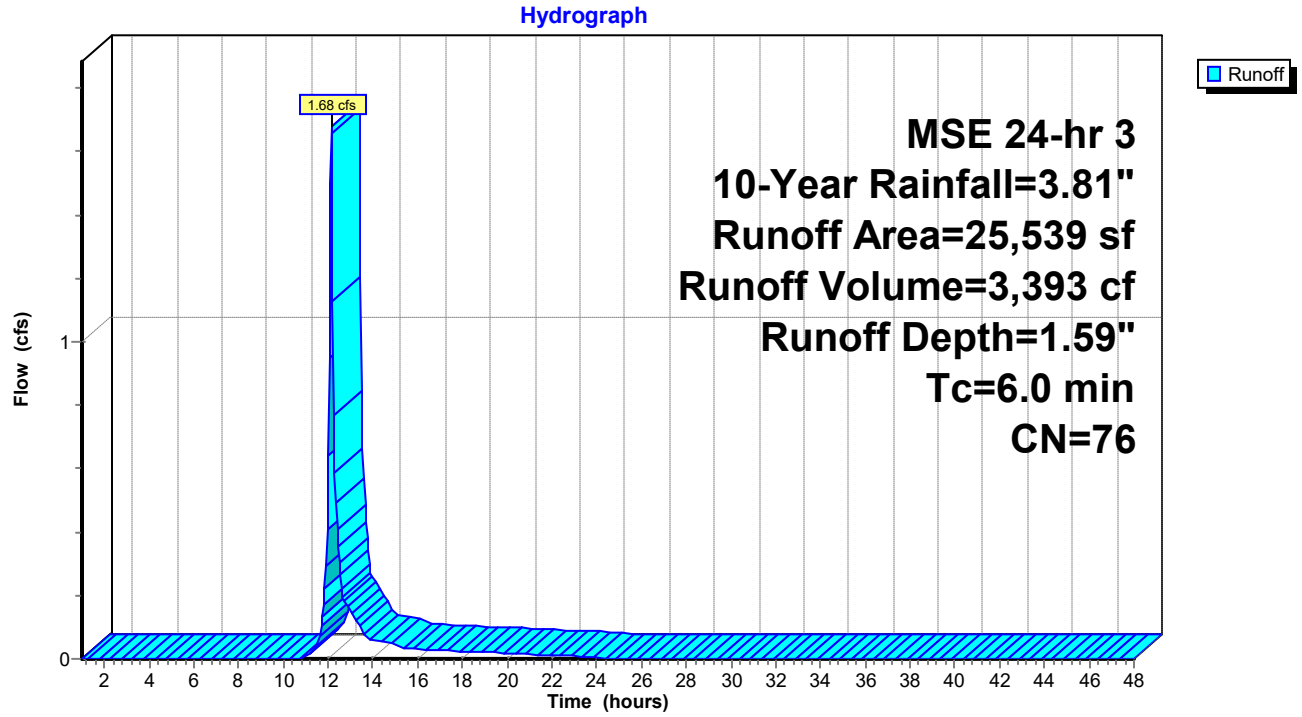
Runoff = 1.68 cfs @ 12.14 hrs, Volume= 3,393 cf, Depth= 1.59"
Routed to Pond 95P : Dry Pond 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	23,462	74	landscape
*	2,077	98	roof
	25,539	76	Weighted Average
	23,462		91.87% Pervious Area
	2,077		8.13% Impervious Area

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

Subcatchment 126S: F4



Summary for Subcatchment 127S: A13

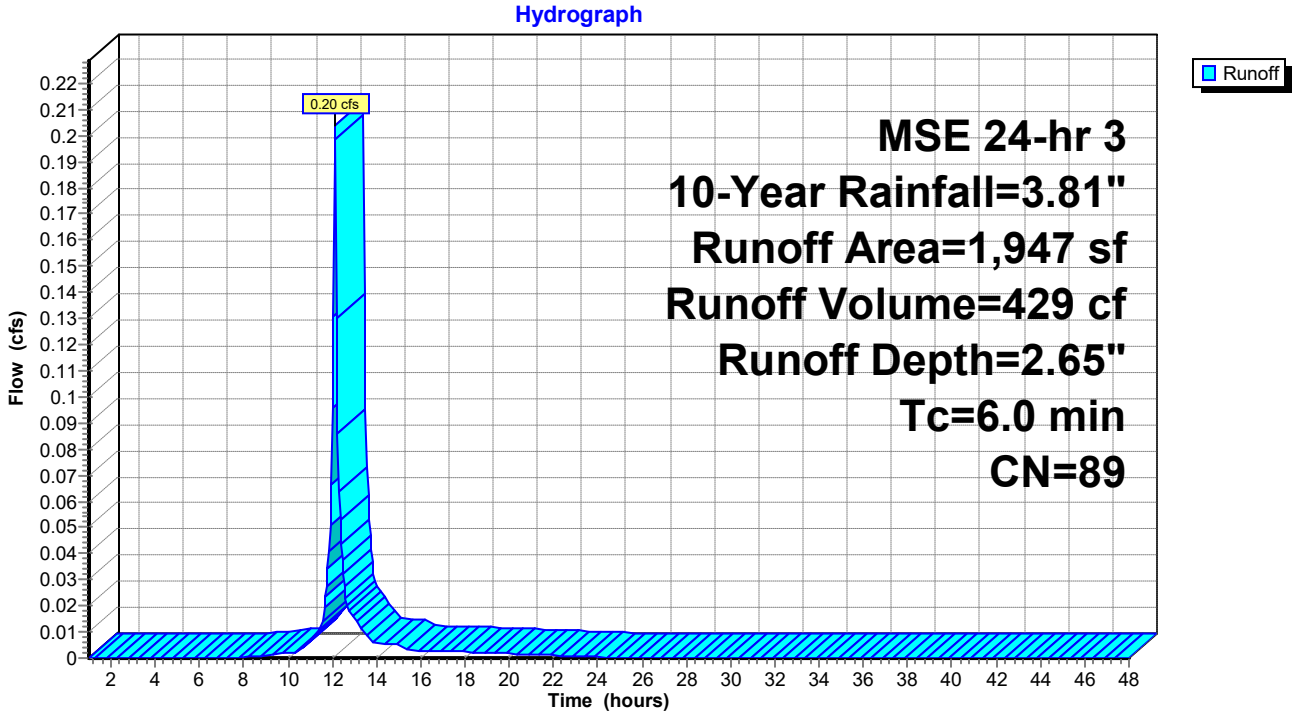
Runoff = 0.20 cfs @ 12.13 hrs, Volume= 429 cf, Depth= 2.65"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	288	98	WALKS
*	0	98	ROADS
*	924	98	ROOF
*	735	74	LANDSCAPING
	1,947	89	Weighted Average
	735		37.75% Pervious Area
	1,212		62.25% Impervious Area

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

Subcatchment 127S: A13



Summary for Subcatchment 128S: A15

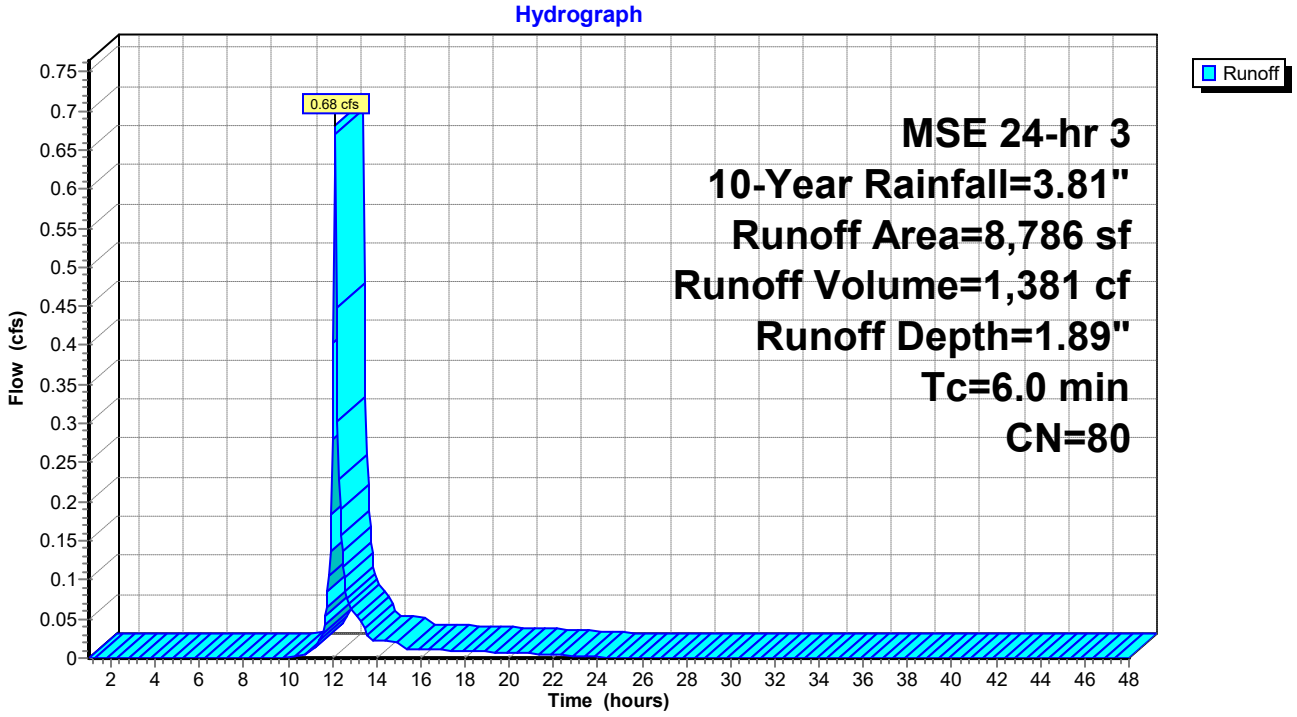
Runoff = 0.68 cfs @ 12.13 hrs, Volume= 1,381 cf, Depth= 1.89"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	2,261	98	WALKS
*	0	98	ROADS
*	0	98	ROOF
*	6,525	74	LANDSCAPING
	8,786	80	Weighted Average
	6,525		74.27% Pervious Area
	2,261		25.73% Impervious Area

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

Subcatchment 128S: A15



Summary for Subcatchment 130S: A12

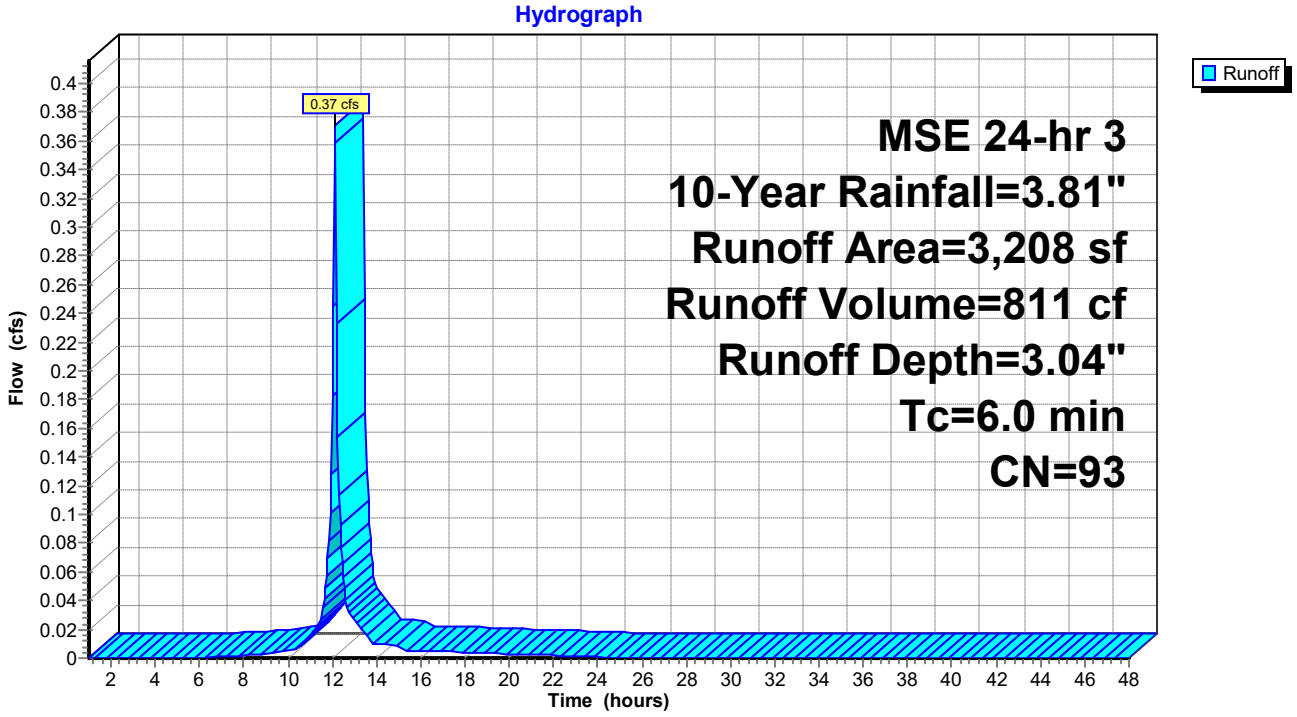
Runoff = 0.37 cfs @ 12.13 hrs, Volume= 811 cf, Depth= 3.04"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	216	98	WALKS
*	1,455	98	ROADS
*	924	98	ROOF
*	613	74	LANDSCAPING
	3,208	93	Weighted Average
	613		19.11% Pervious Area
	2,595		80.89% Impervious Area

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

Subcatchment 130S: A12



Summary for Subcatchment 131S: A11

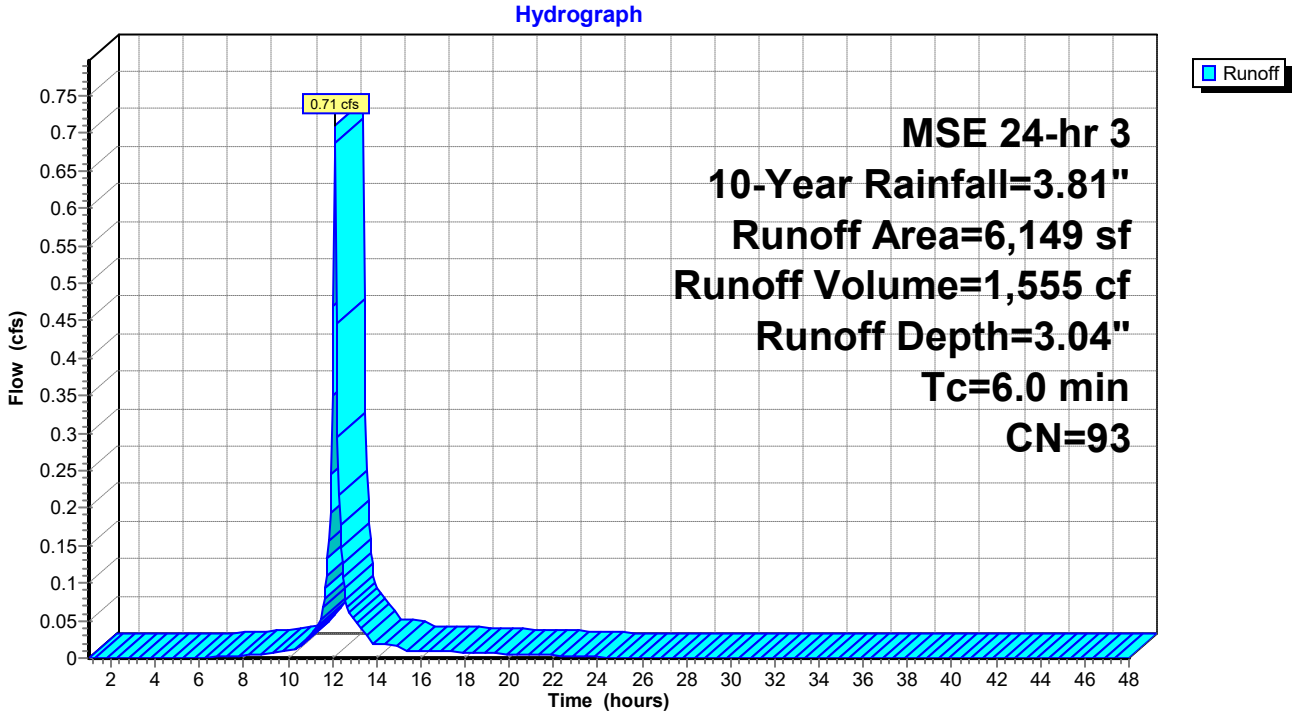
Runoff = 0.71 cfs @ 12.13 hrs, Volume= 1,555 cf, Depth= 3.04"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	1,109	98	WALKS
*	1,910	98	ROADS
*	1,848	98	ROOF
*	1,282	74	LANDSCAPING
	6,149	93	Weighted Average
	1,282		20.85% Pervious Area
	4,867		79.15% Impervious Area

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

Subcatchment 131S: A11



Summary for Subcatchment 132S: A9

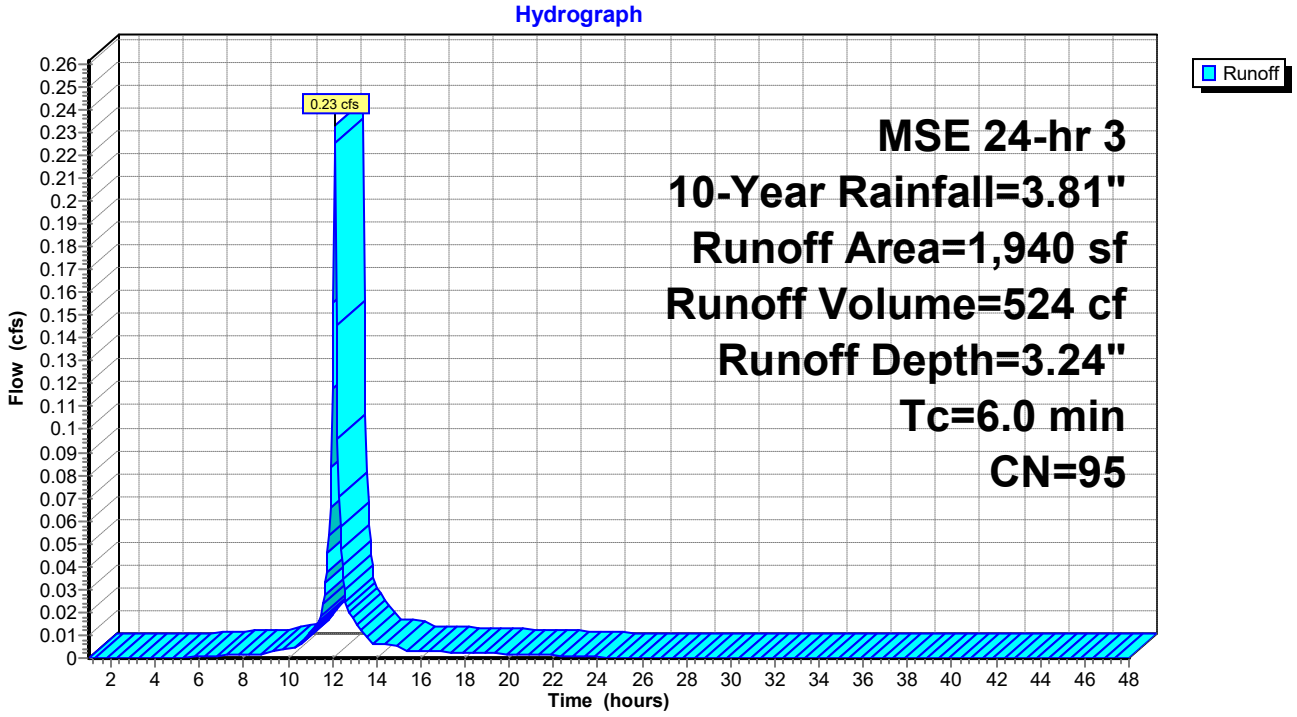
Runoff = 0.23 cfs @ 12.13 hrs, Volume= 524 cf, Depth= 3.24"
Routed to Pond 133P : WEST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	424	98	WALKS
*	321	98	ROADS
*	924	98	ROOF
*	271	74	LANDSCAPING
	1,940	95	Weighted Average
	271		13.97% Pervious Area
	1,669		86.03% Impervious Area

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

Subcatchment 132S: A9



Summary for Subcatchment 133S: A7

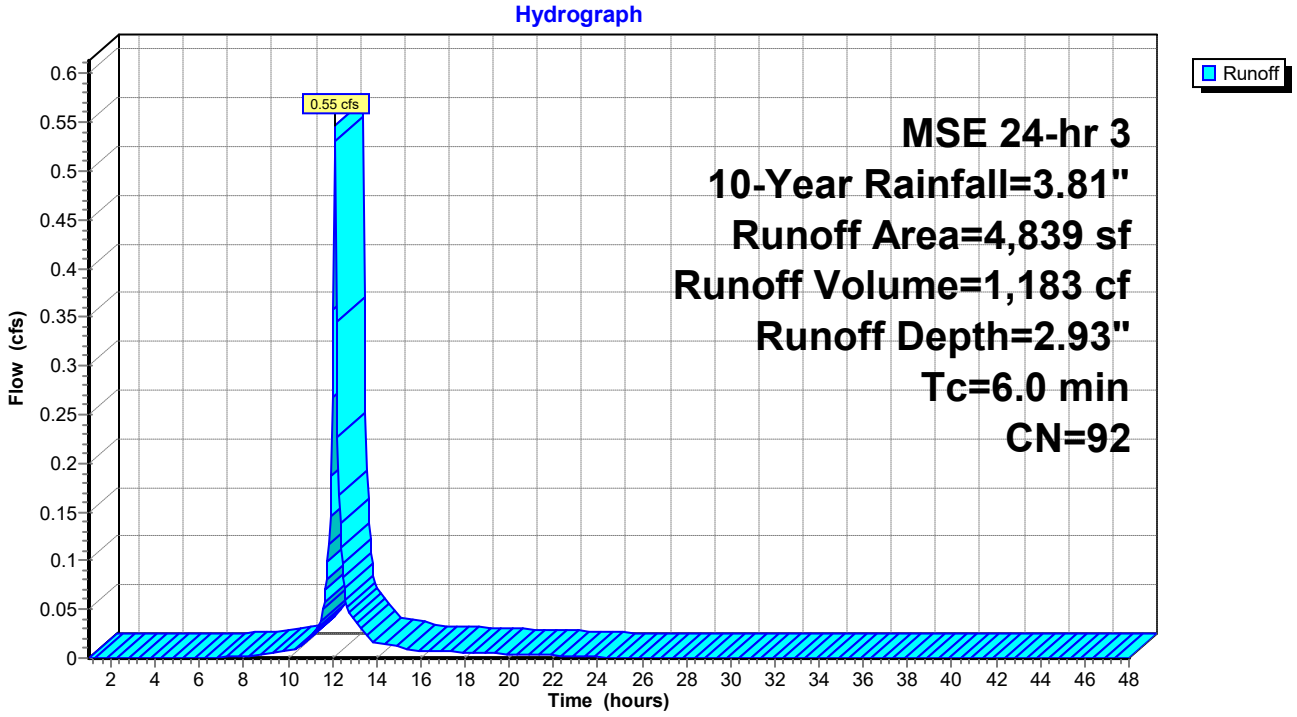
Runoff = 0.55 cfs @ 12.13 hrs, Volume= 1,183 cf, Depth= 2.93"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	939	98	WALKS
*	1,710	98	ROADS
*	924	98	ROOF
*	1,266	74	LANDSCAPING
	4,839	92	Weighted Average
	1,266		26.16% Pervious Area
	3,573		73.84% Impervious Area

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

Subcatchment 133S: A7



Summary for Subcatchment 134S: A5

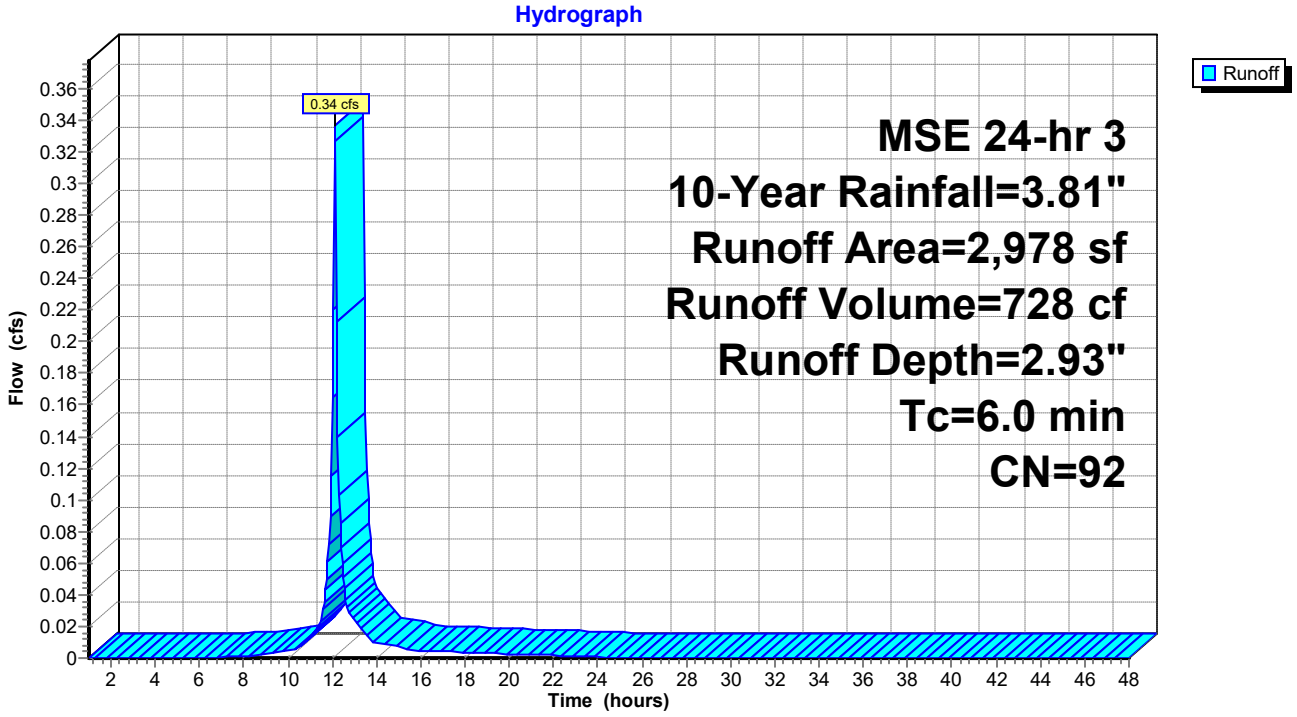
Runoff = 0.34 cfs @ 12.13 hrs, Volume= 728 cf, Depth= 2.93"
Routed to Link 127L : total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	489	98	WALKS
*	875	98	ROADS
*	924	98	ROOF
*	690	74	LANDSCAPING
	2,978	92	Weighted Average
	690		23.17% Pervious Area
	2,288		76.83% Impervious Area

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

Subcatchment 134S: A5



Summary for Subcatchment 136S: A33

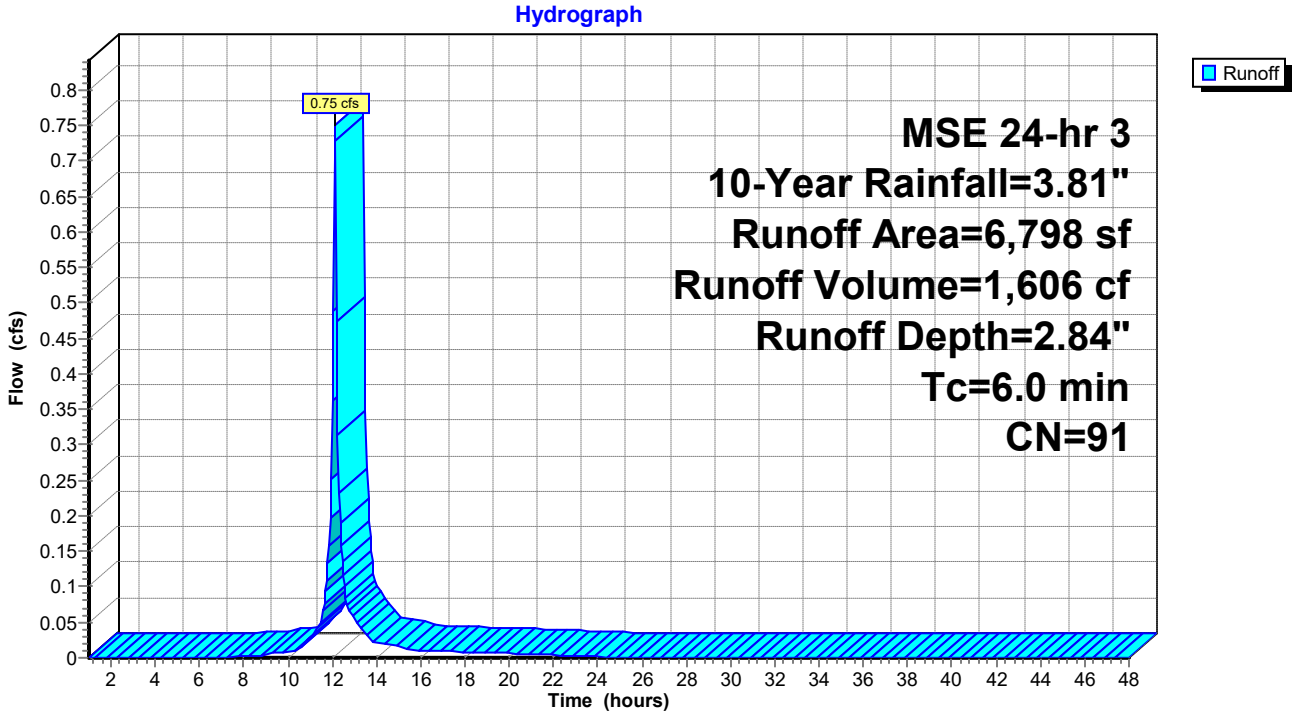
Runoff = 0.75 cfs @ 12.13 hrs, Volume= 1,606 cf, Depth= 2.84"
Routed to Link 126L : OVERSIZED PIPE RUN BY B3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	2,246	98	WALKS
*	2,695	98	ROADS
*	1,857	74	LANDSCAPING
	6,798	91	Weighted Average
	1,857		27.32% Pervious Area
	4,941		72.68% Impervious Area

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

Subcatchment 136S: A33



Summary for Subcatchment 137S: A1

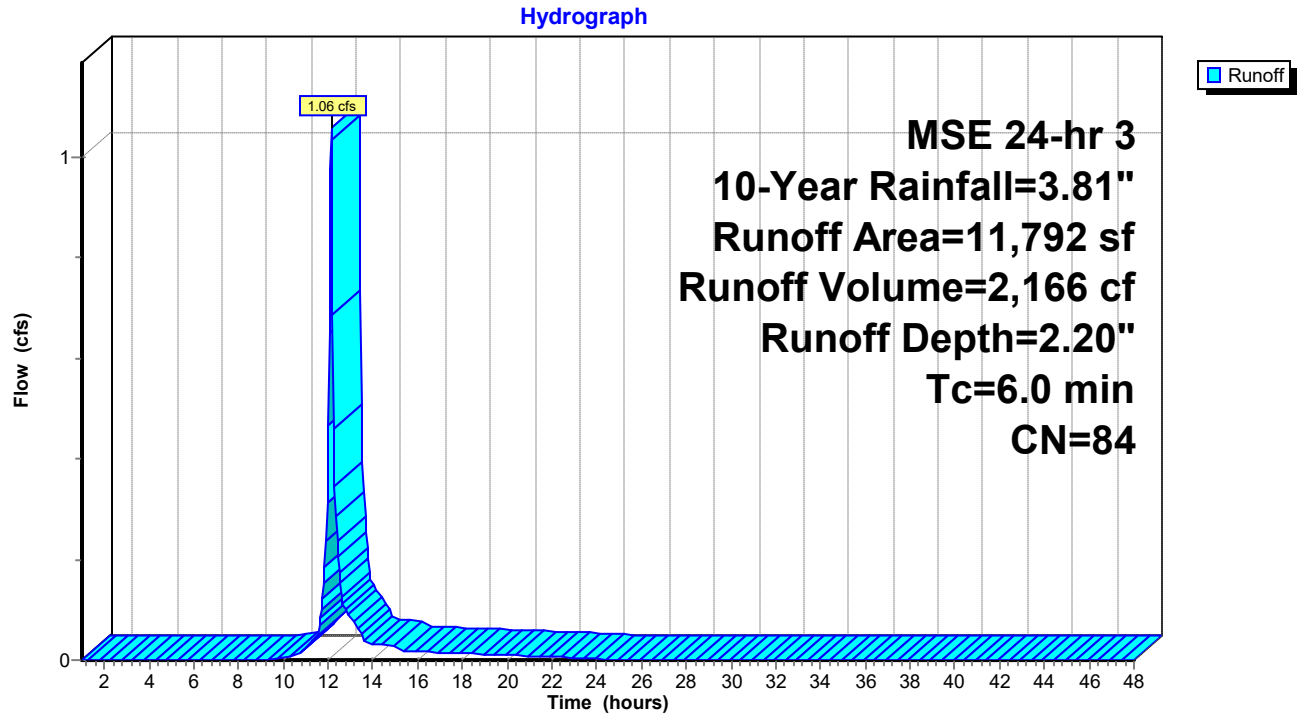
Runoff = 1.06 cfs @ 12.13 hrs, Volume= 2,166 cf, Depth= 2.20"
Routed to Pond 58P : Dry Pond 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	295	98	WALKS
*	3,348	98	ROADS
*	1,063	98	ROOF
*	7,086	74	LANDSCAPING
	11,792	84	Weighted Average
	7,086		60.09% Pervious Area
	4,706		39.91% Impervious Area

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

Subcatchment 137S: A1



Summary for Subcatchment 138S: F2

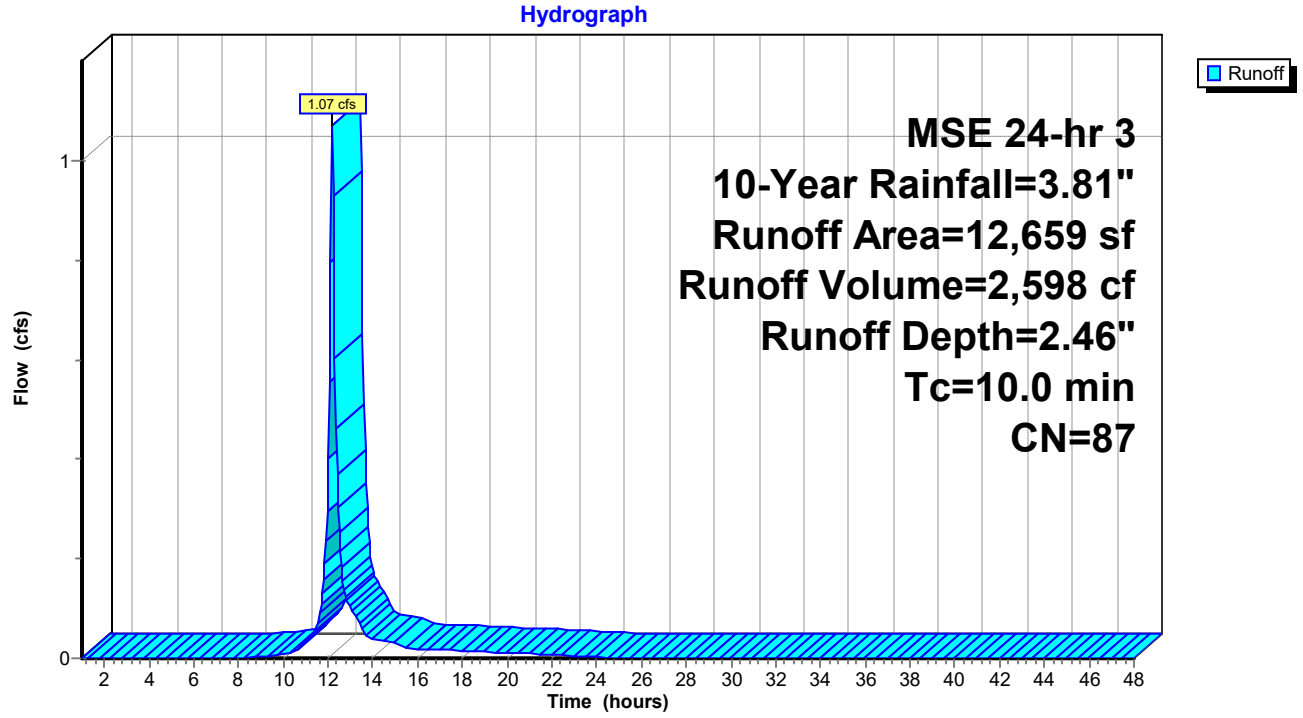
Runoff = 1.07 cfs @ 12.17 hrs, Volume= 2,598 cf, Depth= 2.46"
Routed to Pond 41P : Reach Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	5,962	74	Landscape
*	6,697	98	roof
	12,659	87	Weighted Average
	5,962		47.10% Pervious Area
	6,697		52.90% Impervious Area

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

Subcatchment 138S: F2



Summary for Subcatchment 139S: A2

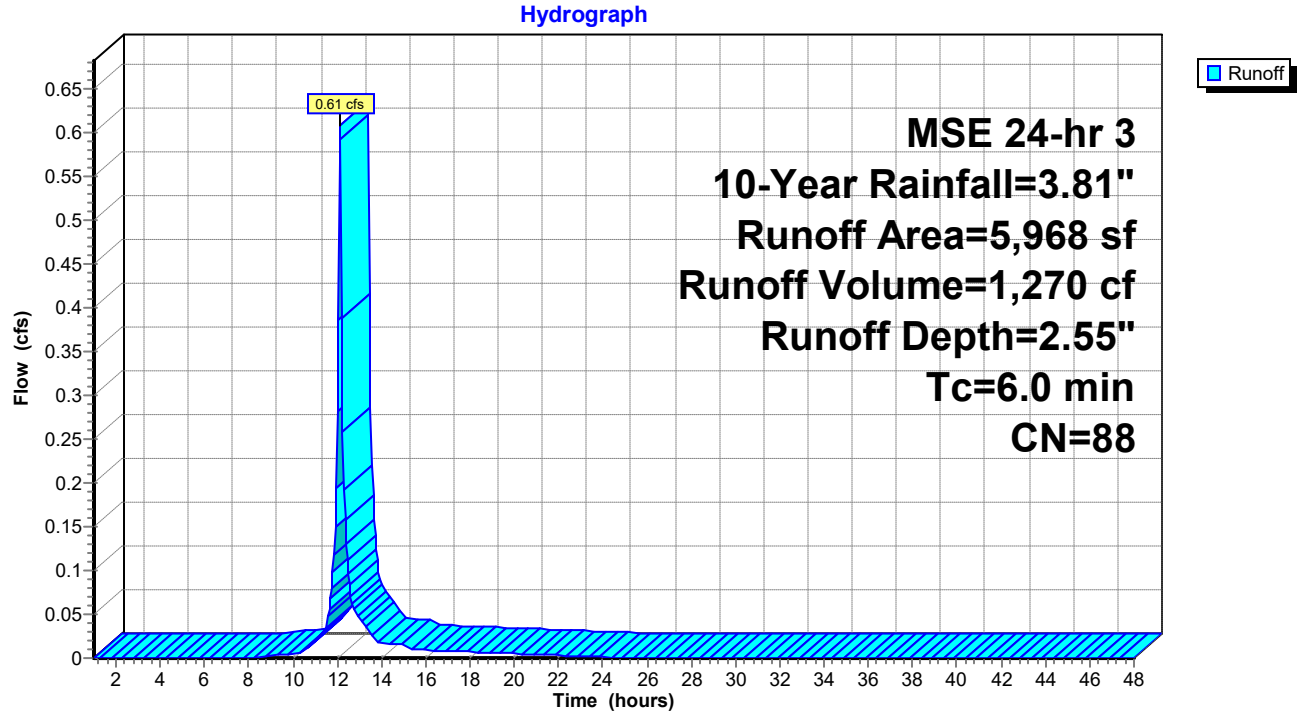
Runoff = 0.61 cfs @ 12.13 hrs, Volume= 1,270 cf, Depth= 2.55"
Routed to Pond 58P : Dry Pond 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	388	98	WALKS
*	2,129	98	ROADS
*	924	98	ROOF
*	2,527	74	LANDSCAPING
	5,968	88	Weighted Average
	2,527		42.34% Pervious Area
	3,441		57.66% Impervious Area

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

Subcatchment 139S: A2



Summary for Subcatchment 140S: H1

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

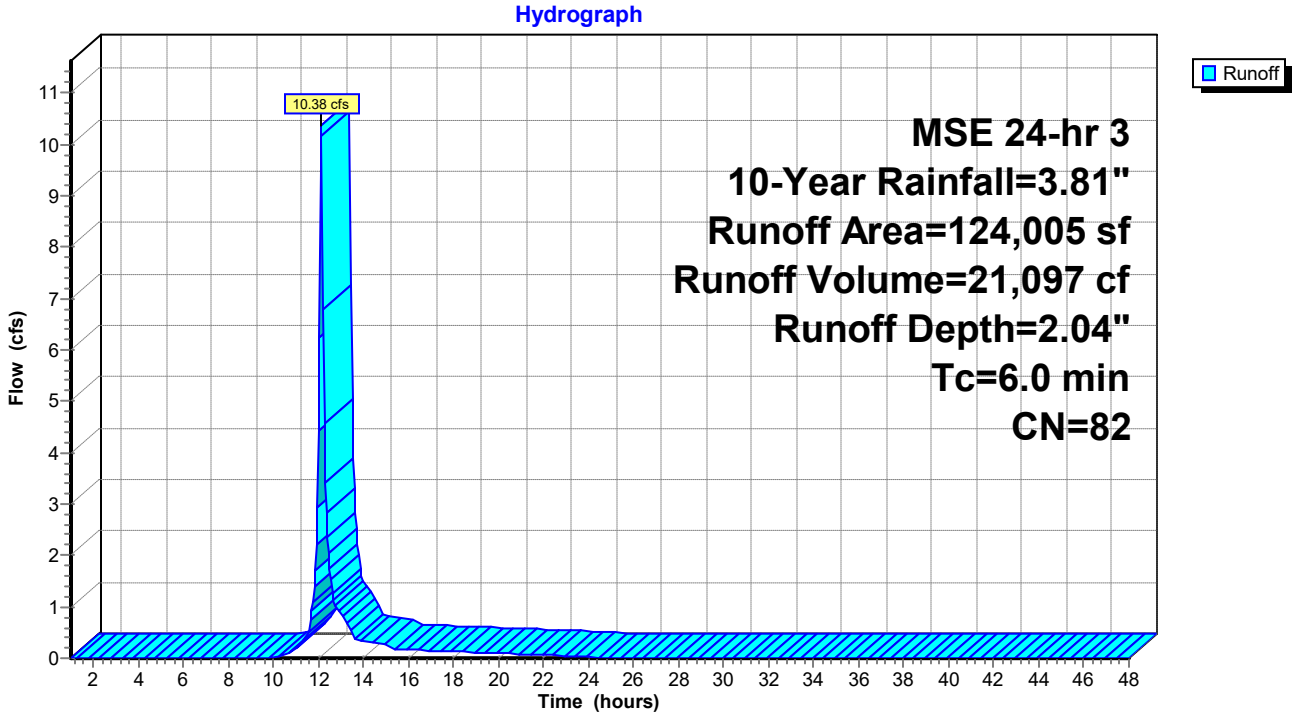
Runoff = 10.38 cfs @ 12.13 hrs, Volume= 21,097 cf, Depth= 2.04"
Routed to Reach 99R : East Swale (SE End)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	9,481	98	roads
*	24,942	98	roof
*	80,320	74	landscape
*	5,445	98	driveways and road NEW RBL
*	3,817	74	landscape NEW RBL
	124,005	82	Weighted Average
	84,137		67.85% Pervious Area
	39,868		32.15% Impervious Area

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

Subcatchment 140S: H1



Summary for Subcatchment 141S: H2

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

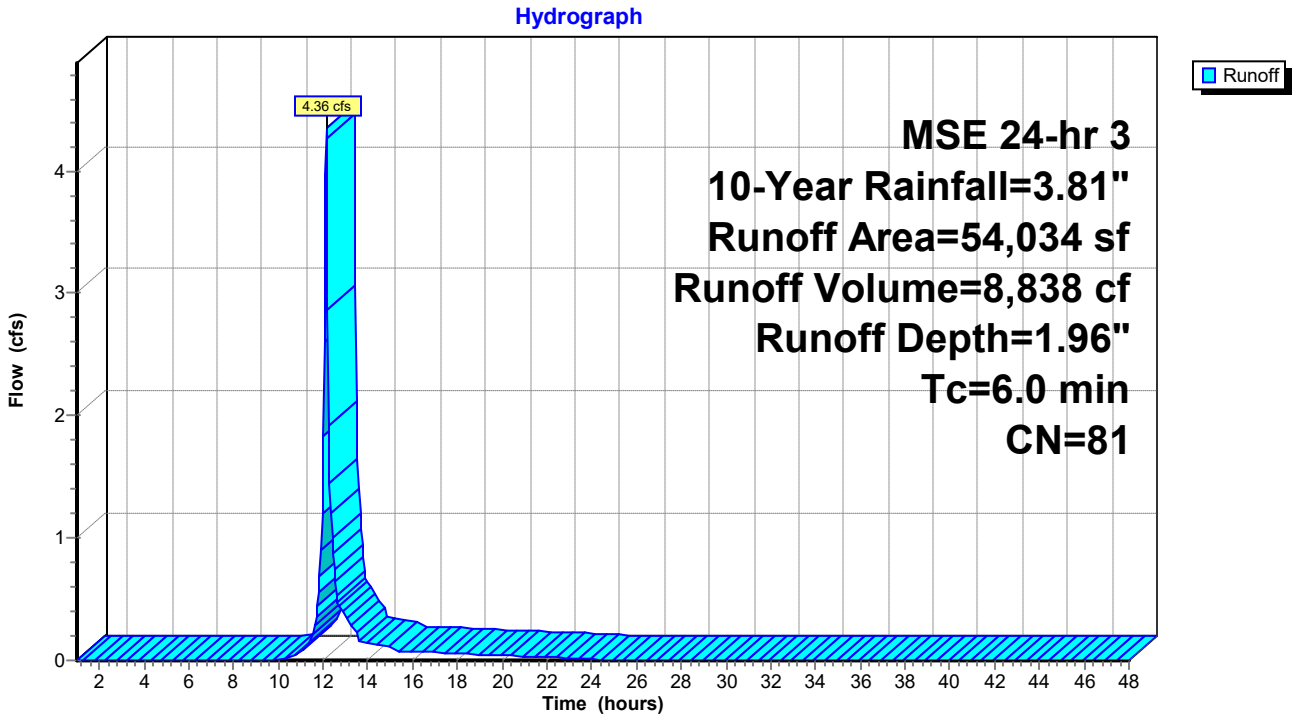
Runoff = 4.36 cfs @ 12.13 hrs, Volume= 8,838 cf, Depth= 1.96"
Routed to Reach 108R : South Berm Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	1,333	98	roads minus NEW RBL
*	14,758	98	roof
*	37,943	74	landscape minus NEW RBL
	54,034	81	Weighted Average
	37,943		70.22% Pervious Area
	16,091		29.78% Impervious Area

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

Subcatchment 141S: H2



Summary for Subcatchment 142S: H3

3/3/21
Needs to be delineated, this is from Joe's SWMP2

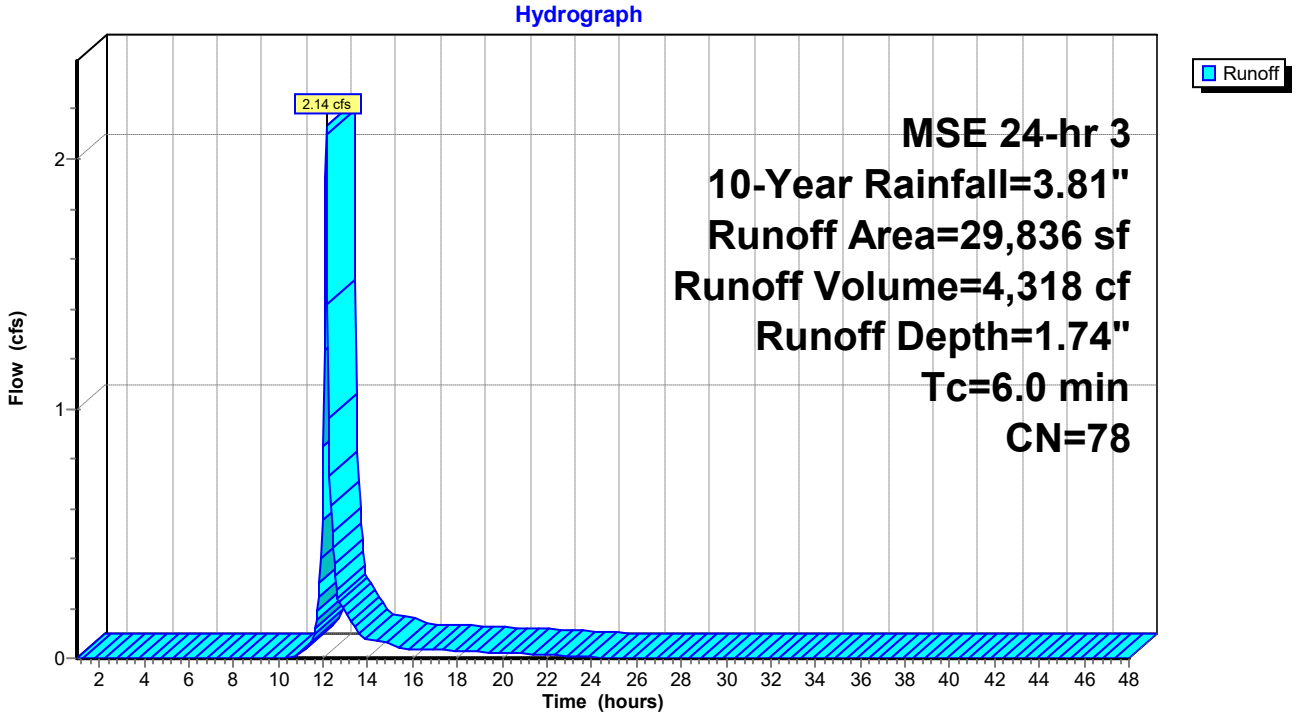
Runoff = 2.14 cfs @ 12.14 hrs, Volume= 4,318 cf, Depth= 1.74"
Routed to Reach 132R : EX. Red Barn Lane West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	1,041	98	roads
*	6,383	74	landscape
*	4,500	98	roads + roof NEW RBL
*	10,852	74	landscape NEW RBL
*	7,060	74	from H4
	29,836	78	Weighted Average
	24,295		81.43% Pervious Area
	5,541		18.57% Impervious Area

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

Subcatchment 142S: H3



Summary for Subcatchment 144S: H5

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

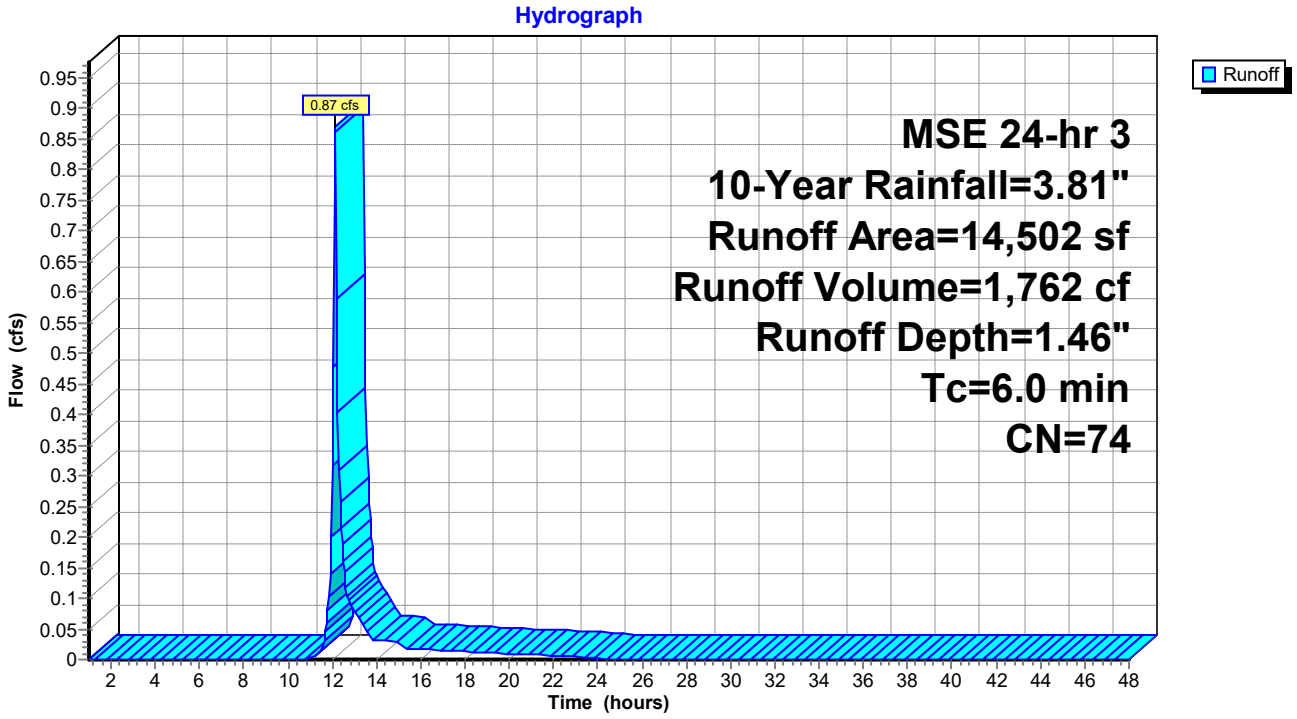
Runoff = 0.87 cfs @ 12.14 hrs, Volume= 1,762 cf, Depth= 1.46"
Routed to Reach 108R : South Berm Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	14,502	74	landscape
	14,502		100.00% Pervious Area

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

Subcatchment 144S: H5



Summary for Subcatchment 145S: H6-a

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

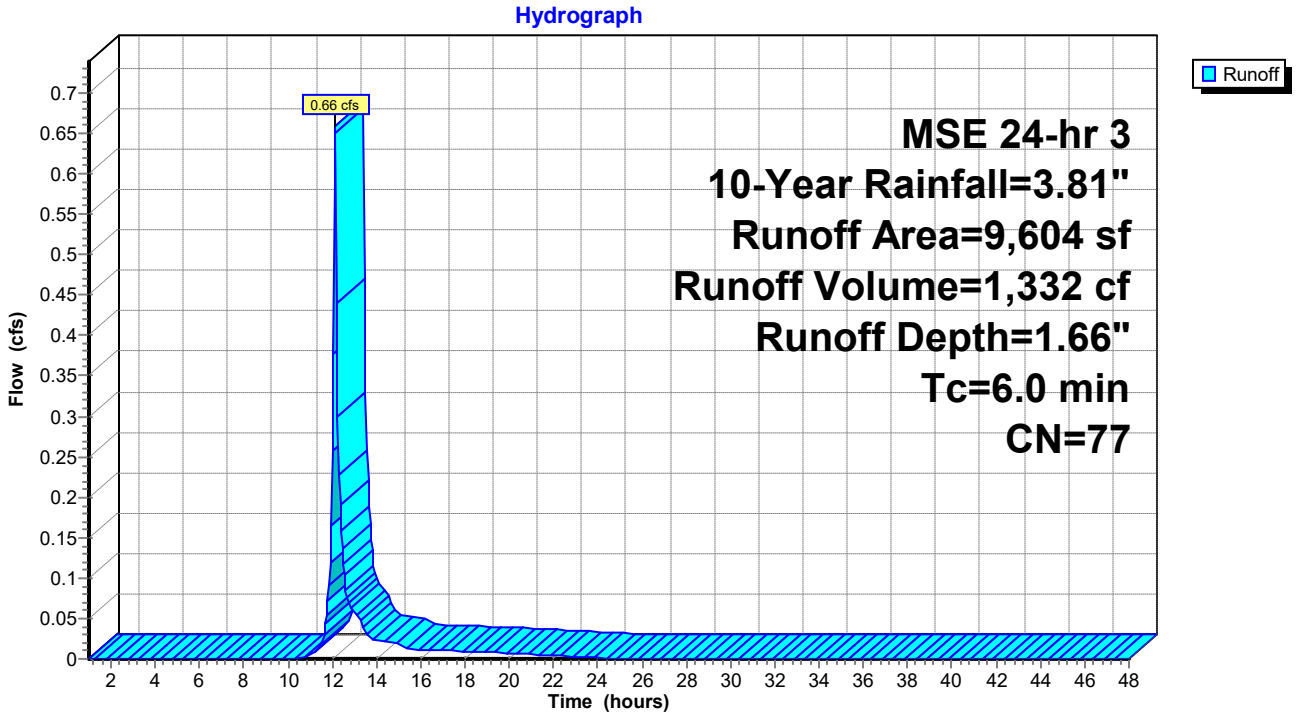
Runoff = 0.66 cfs @ 12.14 hrs, Volume= 1,332 cf, Depth= 1.66"
Routed to Link 115L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	8,471	74	landscape
*	1,133	98	road
	9,604	77	Weighted Average
	8,471		88.20% Pervious Area
	1,133		11.80% Impervious Area

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

Subcatchment 145S: H6-a



Summary for Subcatchment 146S: O2

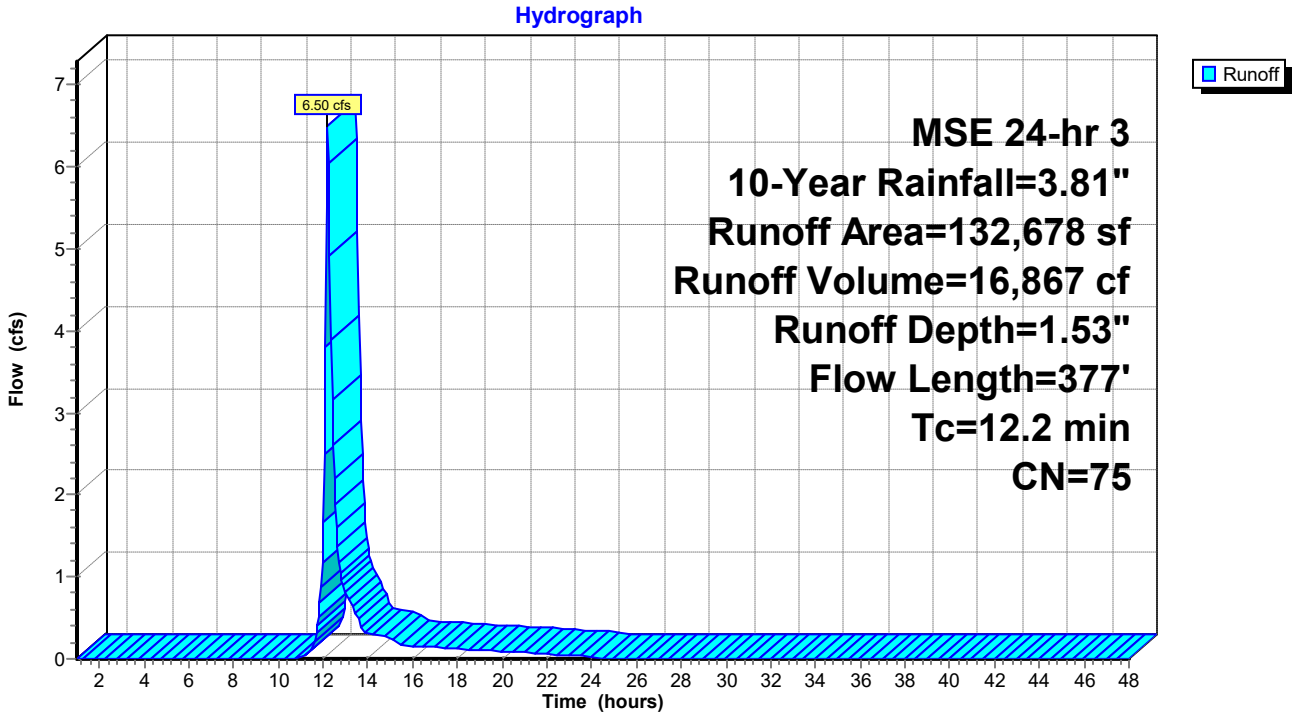
Runoff = 6.50 cfs @ 12.21 hrs, Volume= 16,867 cf, Depth= 1.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	129,638	74	PERV
*	3,040	98	IMPERV
	132,678	75	Weighted Average
	129,638		97.71% Pervious Area
	3,040		2.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	77	0.0288	0.16		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
4.3	300	0.0135	1.16		**Shallow Concentrated Flow, SHALLOW CONC** Nearly Bare & Untilled Kv= 10.0 fps
12.2	377	Total			

Subcatchment 146S: O2



Summary for Subcatchment 147S: J

3/3/21
Needs to be delineated, this is from Joe's SWMP2

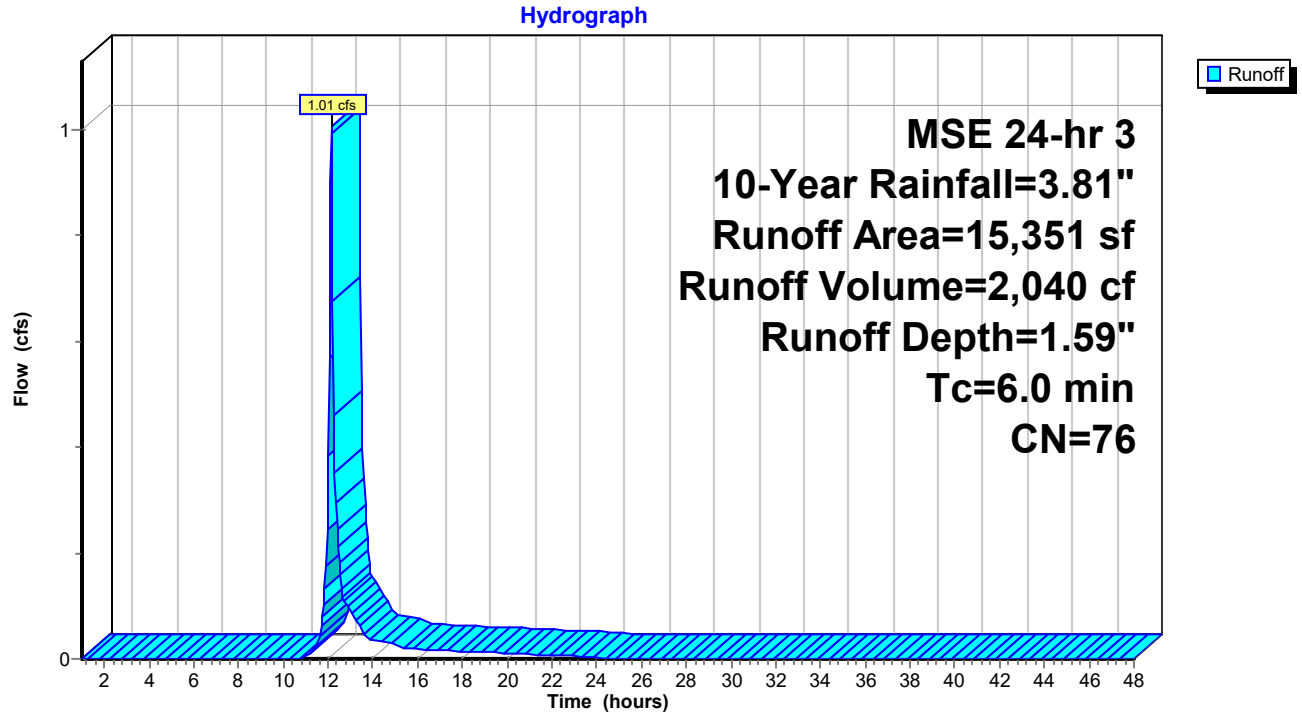
Runoff = 1.01 cfs @ 12.14 hrs, Volume= 2,040 cf, Depth= 1.59"
Routed to Link 66L : Total Offsite

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	1,360	98	walks
*	13,991	74	landscape
	15,351	76	Weighted Average
	13,991		91.14% Pervious Area
	1,360		8.86% Impervious Area

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

Subcatchment 147S: J



Summary for Subcatchment 148S: A3

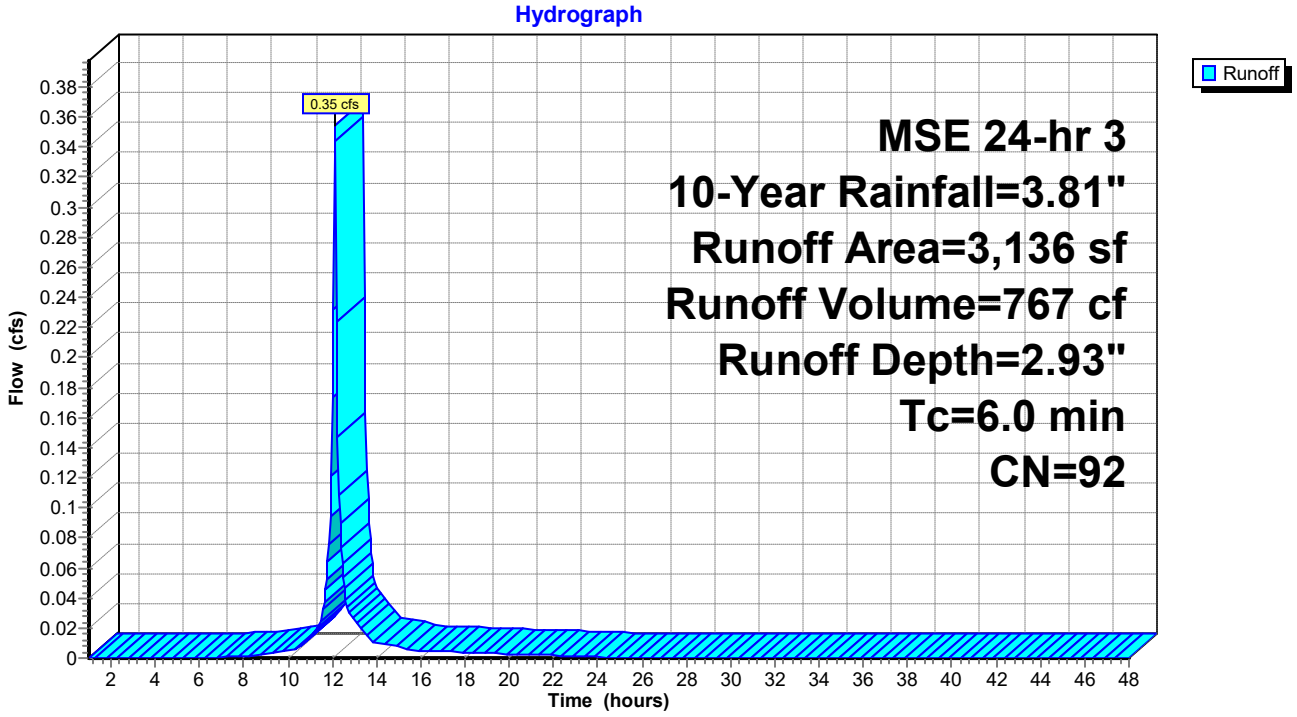
Runoff = 0.35 cfs @ 12.13 hrs, Volume= 767 cf, Depth= 2.93"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	452	98	WALKS
*	994	98	ROADS
*	924	98	ROOF
*	766	74	LANDSCAPING
	3,136	92	Weighted Average
	766		24.43% Pervious Area
	2,370		75.57% Impervious Area

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

Subcatchment 148S: A3



Summary for Subcatchment 149S: A4

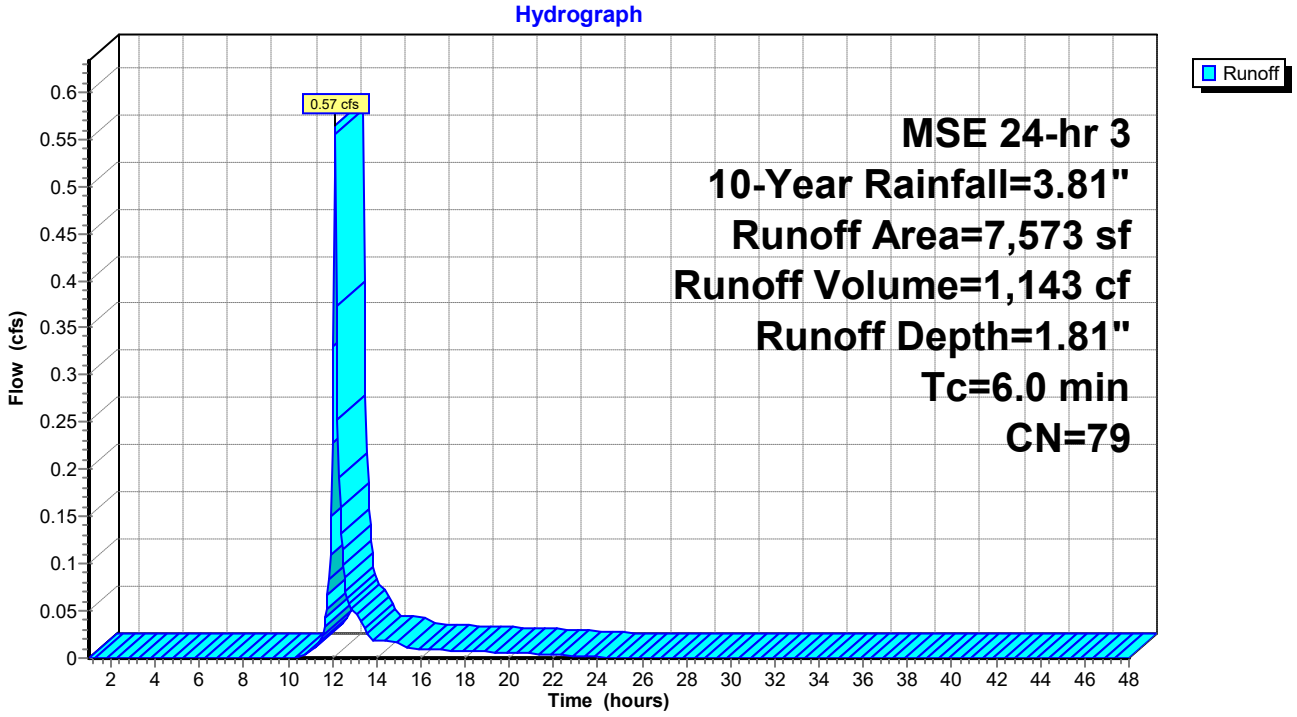
Runoff = 0.57 cfs @ 12.13 hrs, Volume= 1,143 cf, Depth= 1.81"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	401	98	WALKS
*	1,086	98	ROADS
*	0	98	ROOF
*	6,086	74	LANDSCAPING
	7,573	79	Weighted Average
	6,086		80.36% Pervious Area
	1,487		19.64% Impervious Area

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

Subcatchment 149S: A4



Summary for Subcatchment 150S: A6

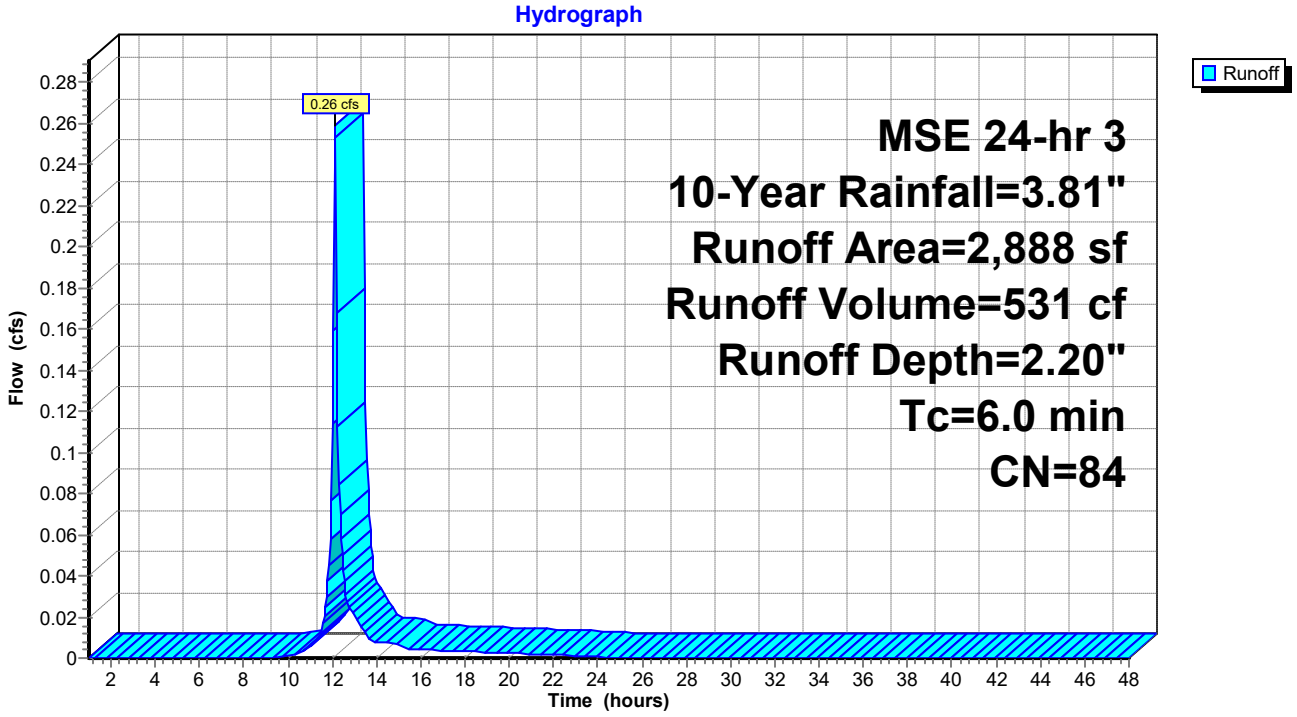
Runoff = 0.26 cfs @ 12.13 hrs, Volume= 531 cf, Depth= 2.20"
Routed to Link 127L : total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	316	98	WALKS
*	875	98	ROADS
*	0	98	ROOF
*	1,697	74	LANDSCAPING
	2,888	84	Weighted Average
	1,697		58.76% Pervious Area
	1,191		41.24% Impervious Area

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

Subcatchment 150S: A6



Summary for Subcatchment 151S: A8

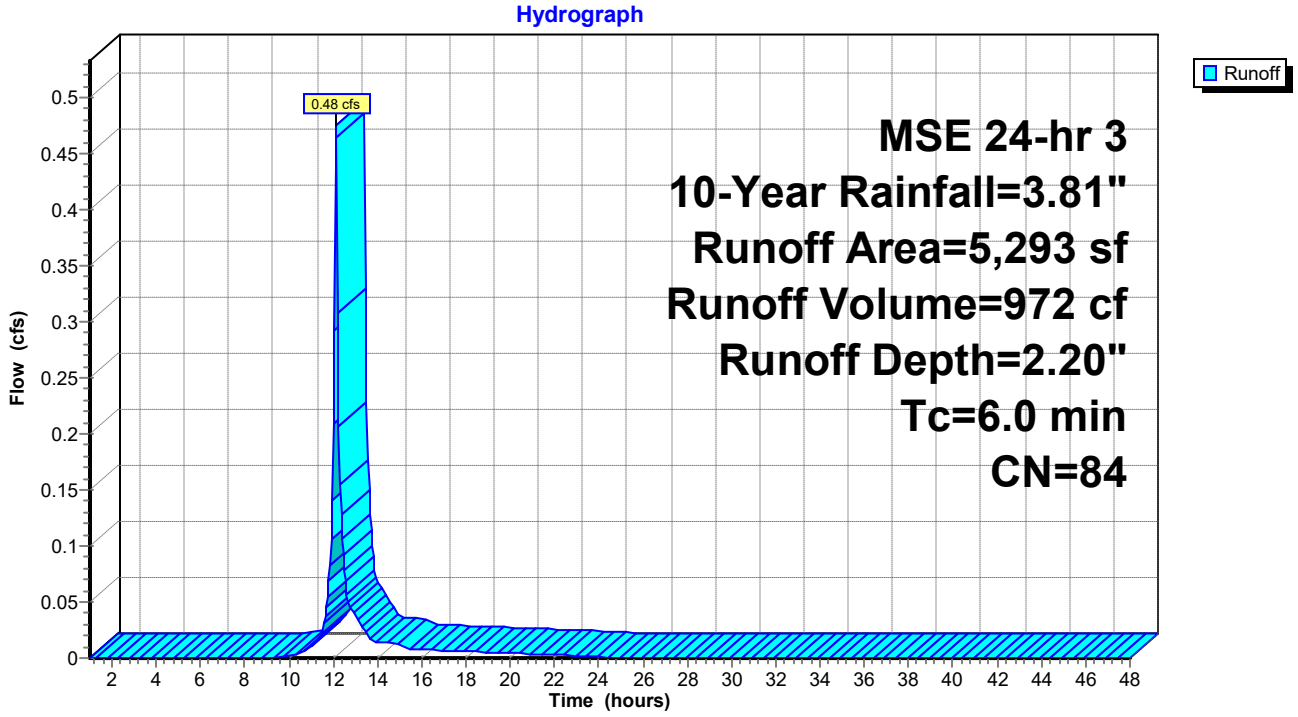
Runoff = 0.48 cfs @ 12.13 hrs, Volume= 972 cf, Depth= 2.20"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	688	98	WALKS
*	1,478	98	ROADS
*	0	98	ROOF
*	3,127	74	LANDSCAPING
	5,293	84	Weighted Average
	3,127		59.08% Pervious Area
	2,166		40.92% Impervious Area

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

Subcatchment 151S: A8



Summary for Subcatchment 152S: A10

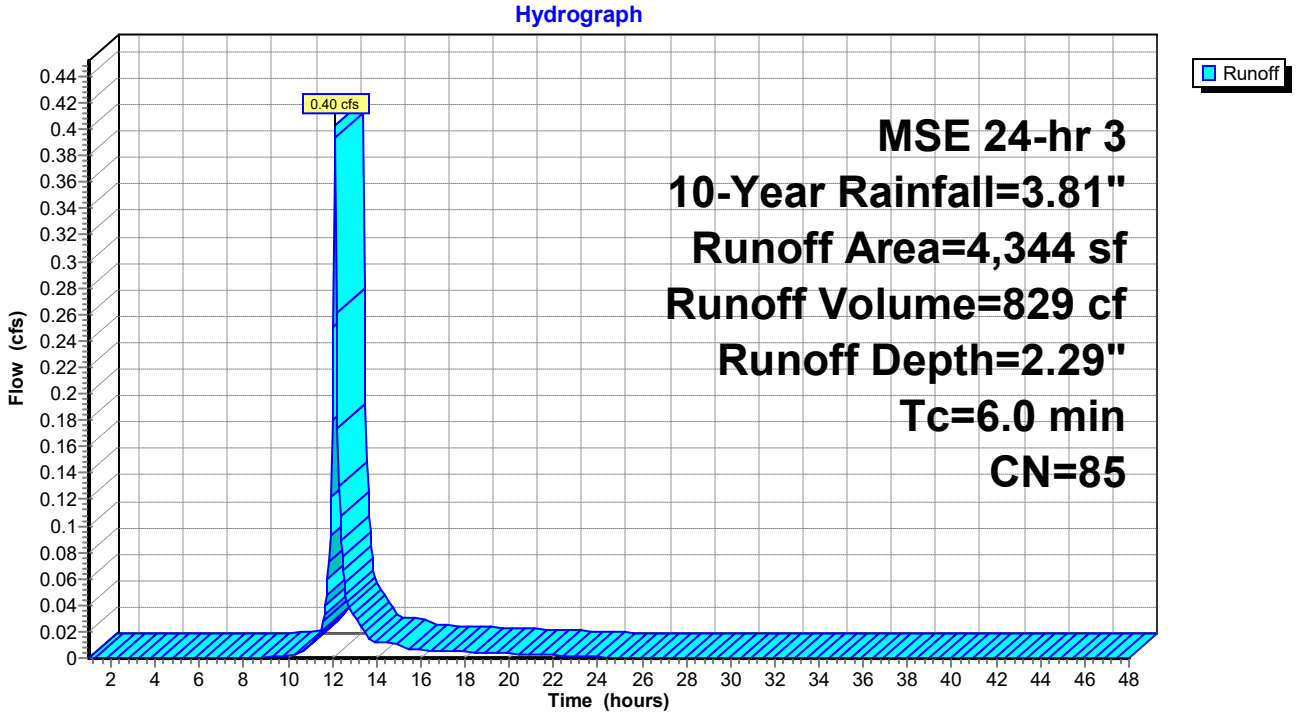
Runoff = 0.40 cfs @ 12.13 hrs, Volume= 829 cf, Depth= 2.29"
Routed to Pond 133P : WEST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	665	98	WALKS
*	1,415	98	ROADS
*	0	98	ROOF
*	2,264	74	LANDSCAPING
	4,344	85	Weighted Average
	2,264		52.12% Pervious Area
	2,080		47.88% Impervious Area

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

Subcatchment 152S: A10



Summary for Subcatchment 153S: A16

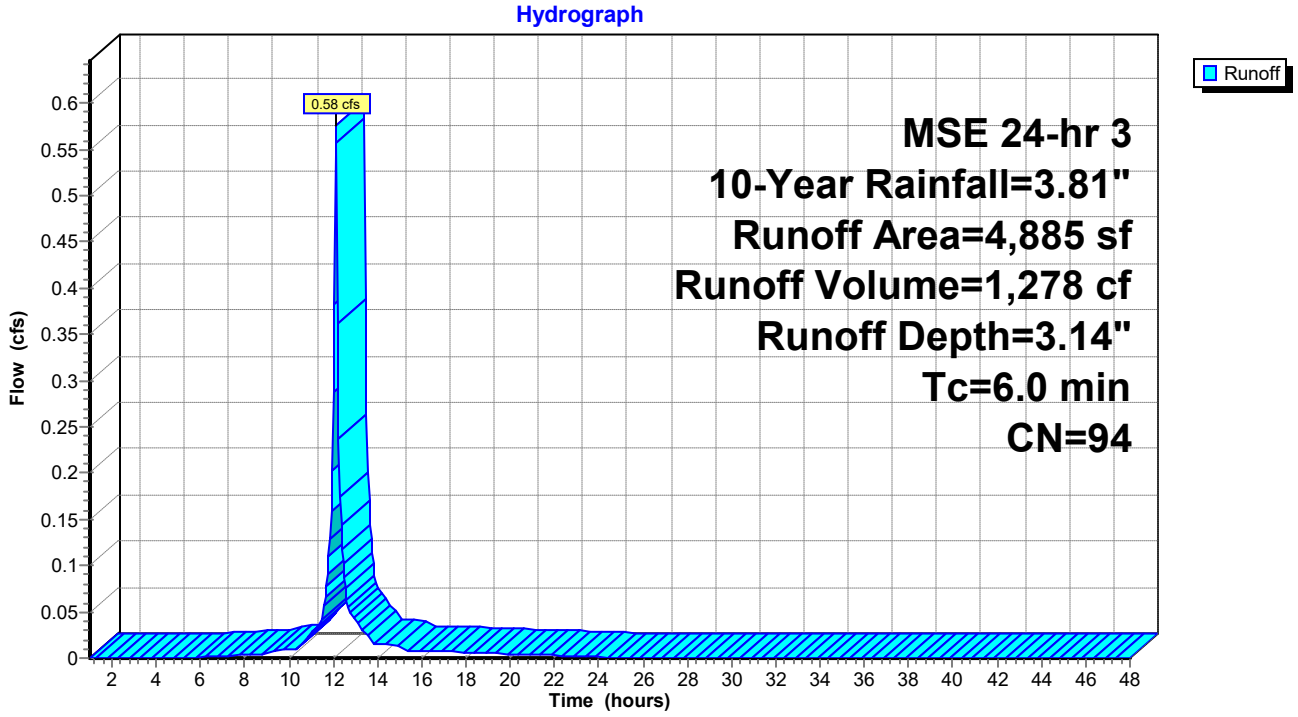
Runoff = 0.58 cfs @ 12.13 hrs, Volume= 1,278 cf, Depth= 3.14"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	1,314	98	WALKS
*	2,788	98	ROADS
*	0	98	ROOF
*	783	74	LANDSCAPING
	4,885	94	Weighted Average
	783		16.03% Pervious Area
	4,102		83.97% Impervious Area

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

Subcatchment 153S: A16



Summary for Subcatchment 154S: A17

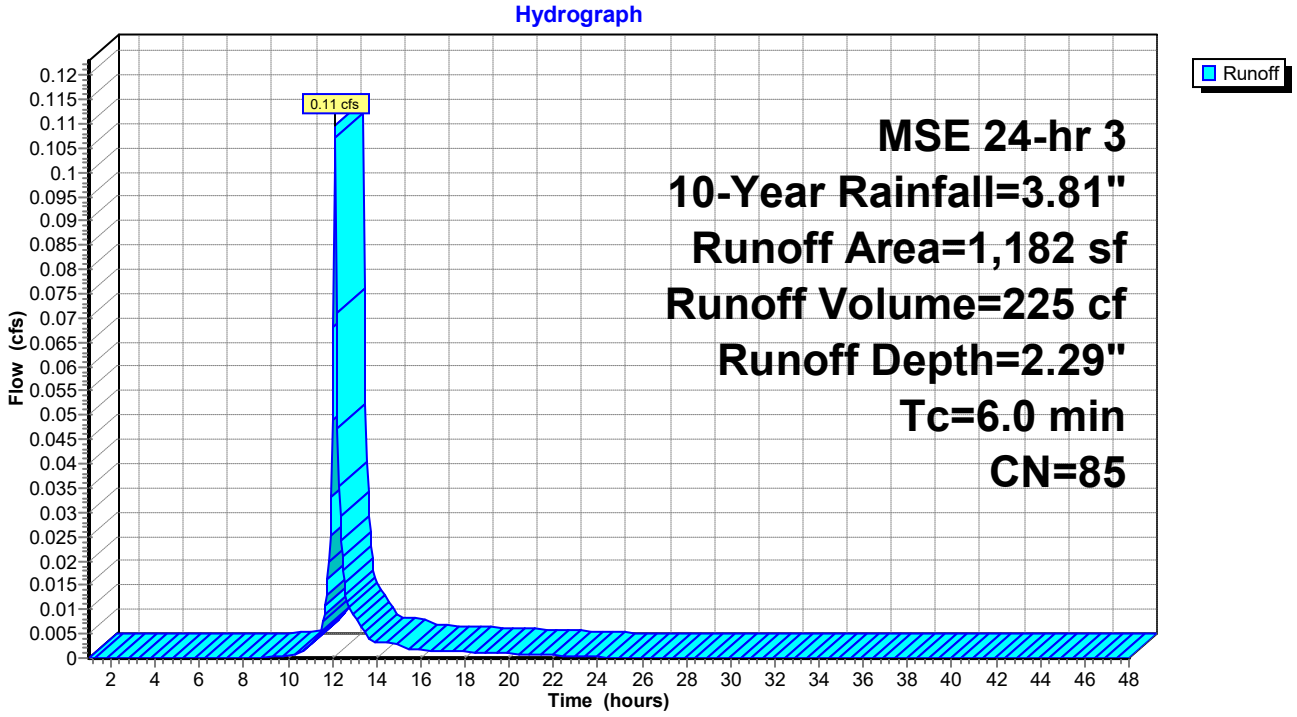
Runoff = 0.11 cfs @ 12.13 hrs, Volume= 225 cf, Depth= 2.29"
Routed to Link 176L : UPSTREAM OF OVERSIZED PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	70	98	WALKS
*	461	98	ROADS
*	0	98	ROOF
*	651	74	LANDSCAPING
	1,182	85	Weighted Average
	651		55.08% Pervious Area
	531		44.92% Impervious Area

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

Subcatchment 154S: A17



Summary for Subcatchment 155S: A18

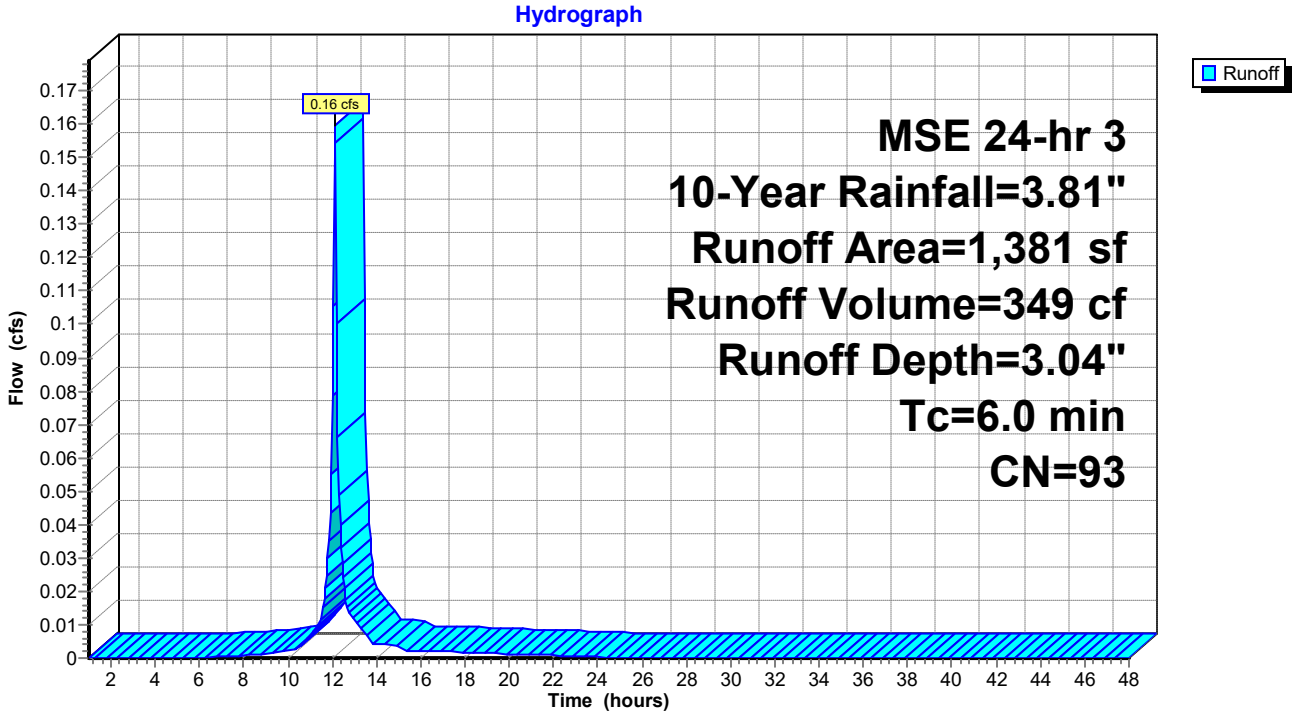
Runoff = 0.16 cfs @ 12.13 hrs, Volume= 349 cf, Depth= 3.04"
Routed to Link 176L : UPSTREAM OF OVERSIZED PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	353	98	WALKS
*	747	98	ROADS
*	0	98	ROOF
*	281	74	LANDSCAPING
	1,381	93	Weighted Average
	281		20.35% Pervious Area
	1,100		79.65% Impervious Area

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

Subcatchment 155S: A18



Summary for Subcatchment 156S: A19

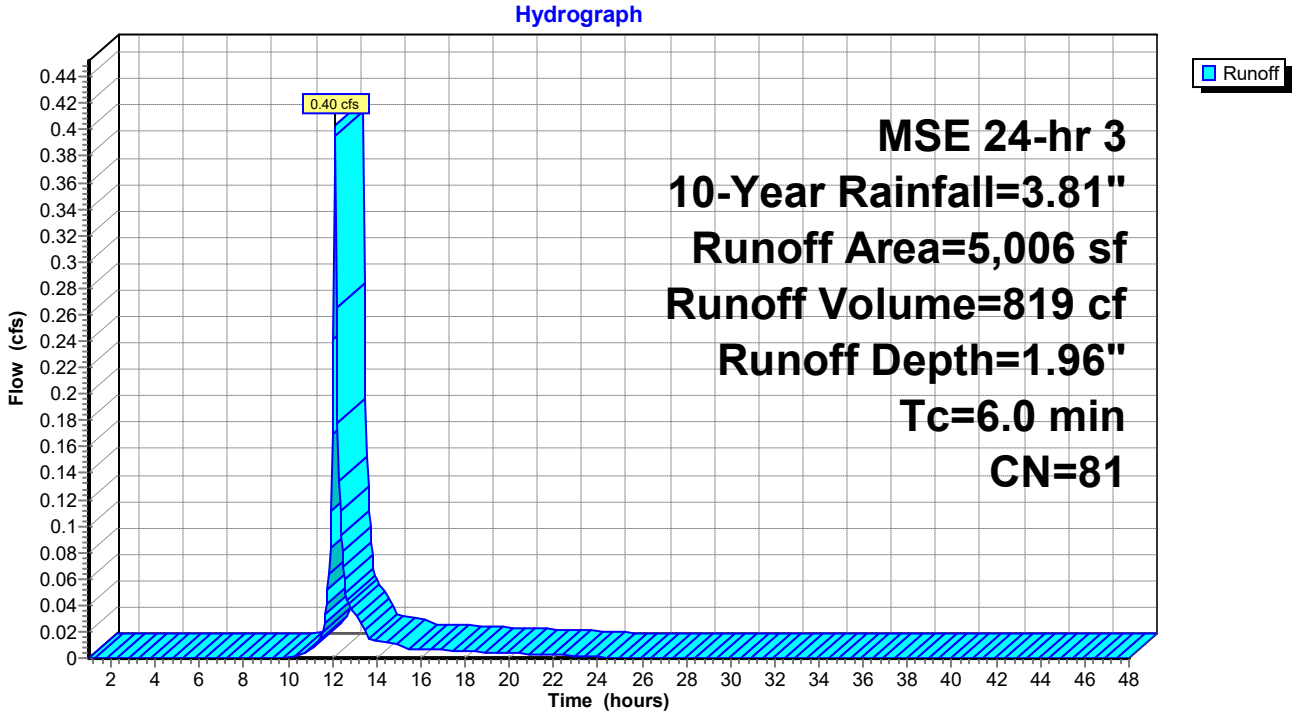
Runoff = 0.40 cfs @ 12.13 hrs, Volume= 819 cf, Depth= 1.96"
Routed to Link 176L : UPSTREAM OF OVERSIZED PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	390	98	WALKS
*	0	98	ROADS
*	1,063	98	ROOF
*	3,553	74	LANDSCAPING
	5,006	81	Weighted Average
	3,553		70.97% Pervious Area
	1,453		29.03% Impervious Area

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

Subcatchment 156S: A19



Summary for Subcatchment 157S: A20

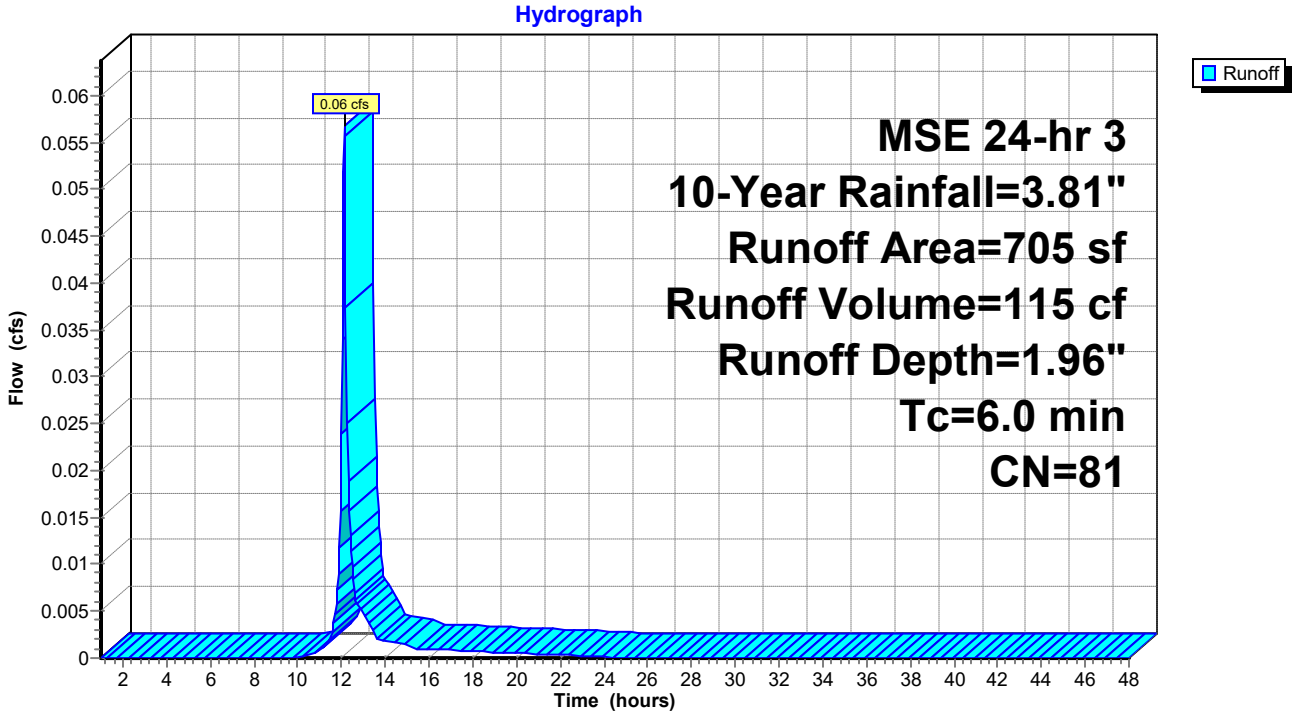
Runoff = 0.06 cfs @ 12.13 hrs, Volume= 115 cf, Depth= 1.96"
Routed to Link 176L : UPSTREAM OF OVERSIZED PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	204	98	WALKS
*	0	98	ROADS
*	0	98	ROOF
*	501	74	LANDSCAPING
	705	81	Weighted Average
	501		71.06% Pervious Area
	204		28.94% Impervious Area

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

Subcatchment 157S: A20



Summary for Subcatchment 158S: A21

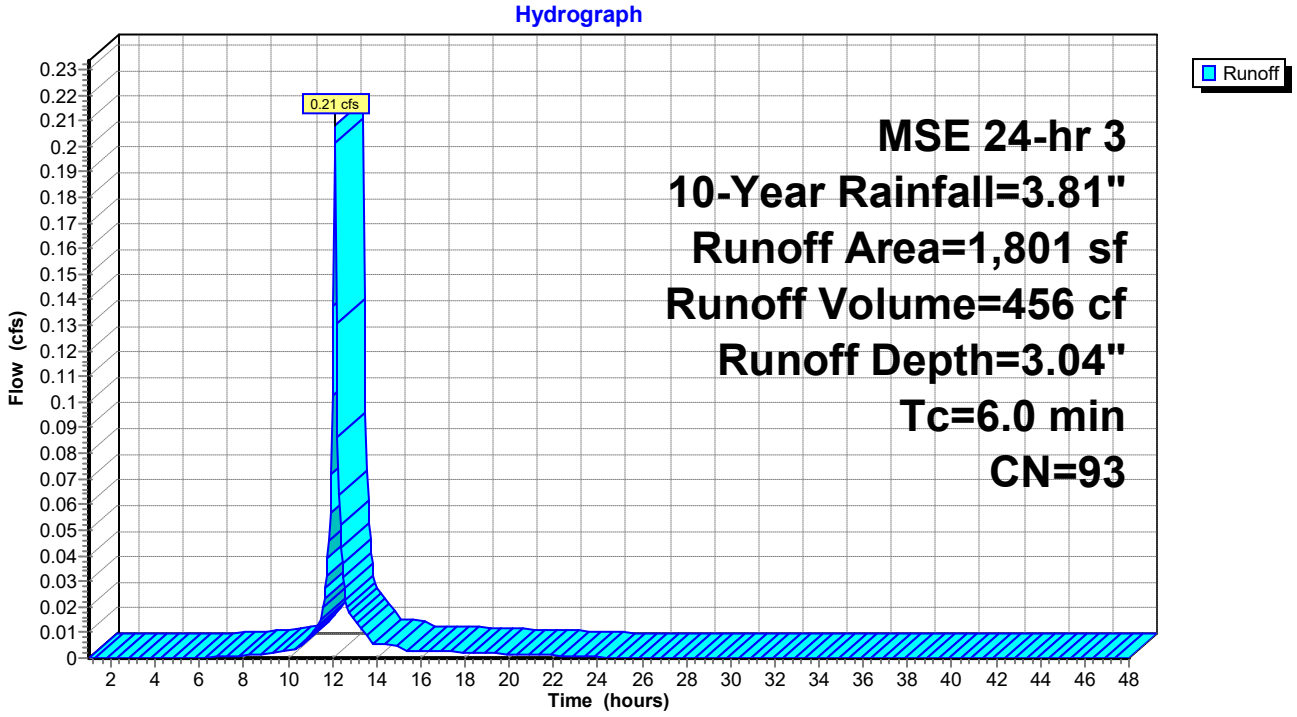
Runoff = 0.21 cfs @ 12.13 hrs, Volume= 456 cf, Depth= 3.04"
Routed to Link 176L : UPSTREAM OF OVERSIZED PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	338	98	WALKS
*	35	98	ROADS
*	1,063	98	ROOF
*	365	74	LANDSCAPING
	1,801	93	Weighted Average
	365		20.27% Pervious Area
	1,436		79.73% Impervious Area

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

Subcatchment 158S: A21



Summary for Subcatchment 159S: A22

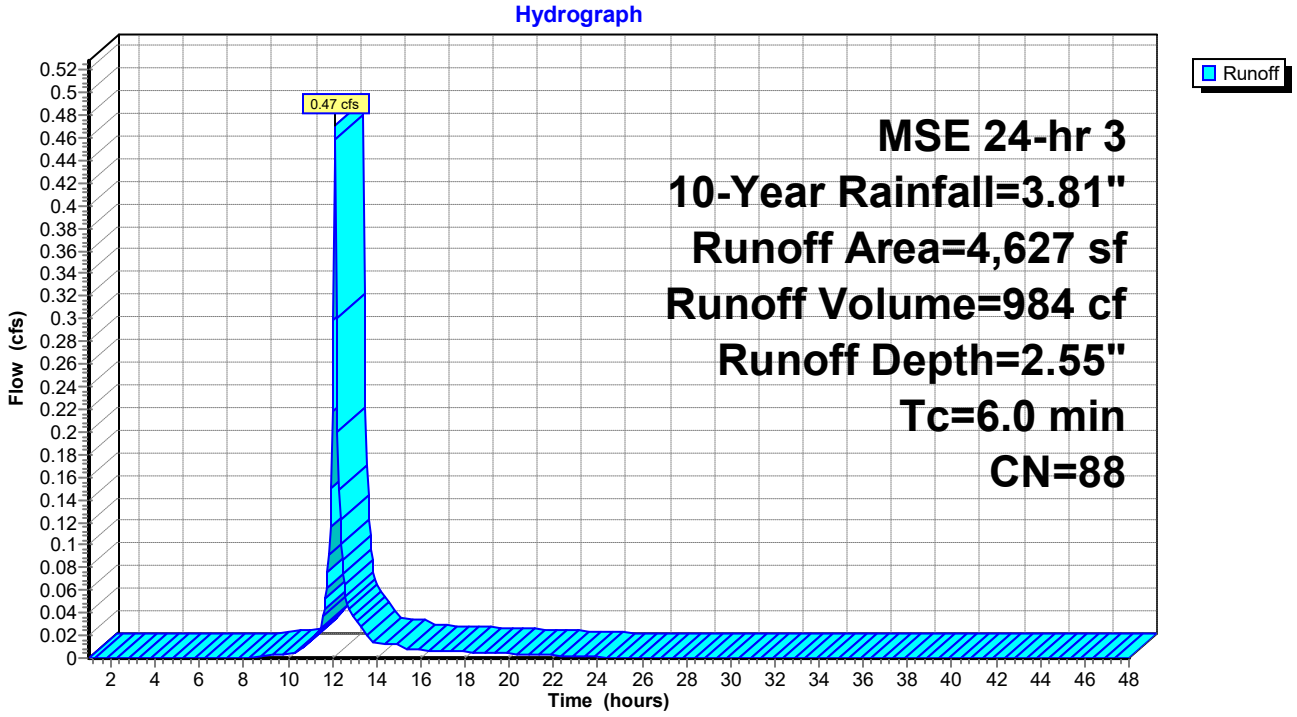
Runoff = 0.47 cfs @ 12.13 hrs, Volume= 984 cf, Depth= 2.55"
Routed to Pond 174P : EAST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	891	98	WALKS
*	1,814	98	ROADS
*	0	98	ROOF
*	1,922	74	LANDSCAPING
	4,627	88	Weighted Average
	1,922		41.54% Pervious Area
	2,705		58.46% Impervious Area

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

Subcatchment 159S: A22



Summary for Subcatchment 160S: A23

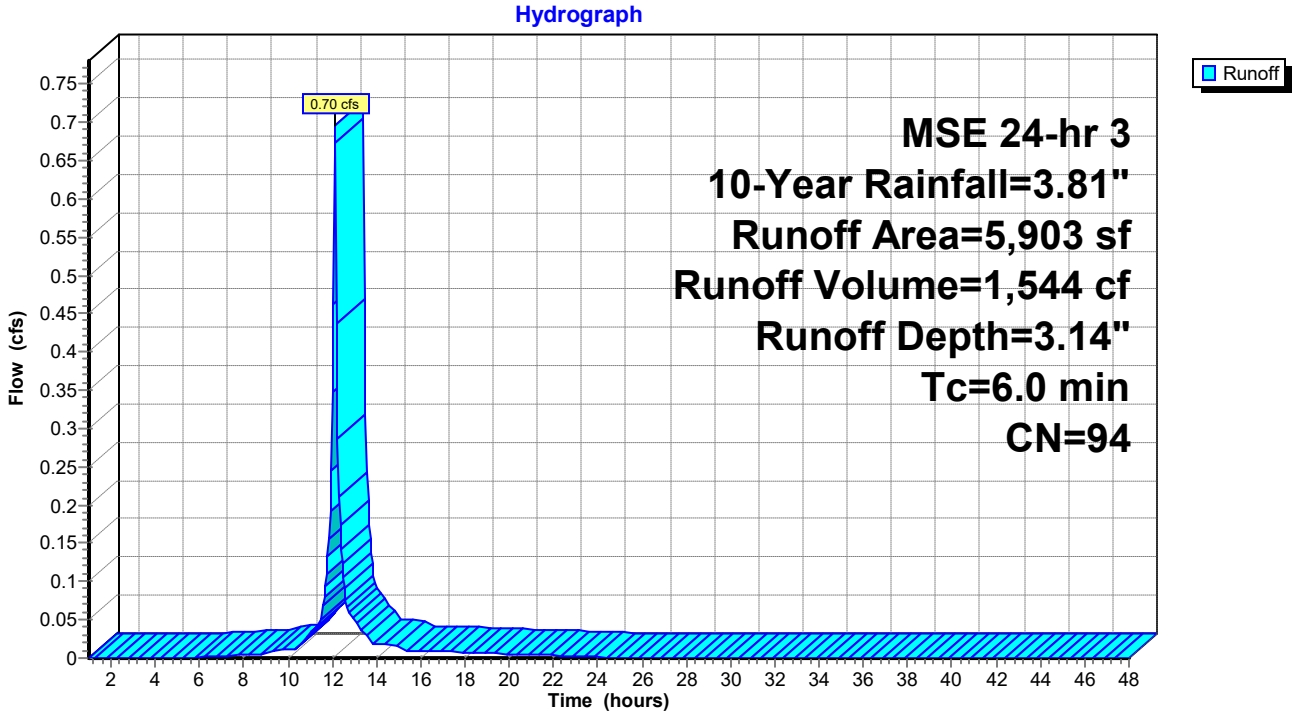
Runoff = 0.70 cfs @ 12.13 hrs, Volume= 1,544 cf, Depth= 3.14"
Routed to Pond 174P : EAST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	995	98	WALKS
*	1,695	98	ROADS
*	2,125	98	ROOF
*	1,088	74	LANDSCAPING
	5,903	94	Weighted Average
	1,088		18.43% Pervious Area
	4,815		81.57% Impervious Area

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

Subcatchment 160S: A23



Summary for Subcatchment 161S: A24

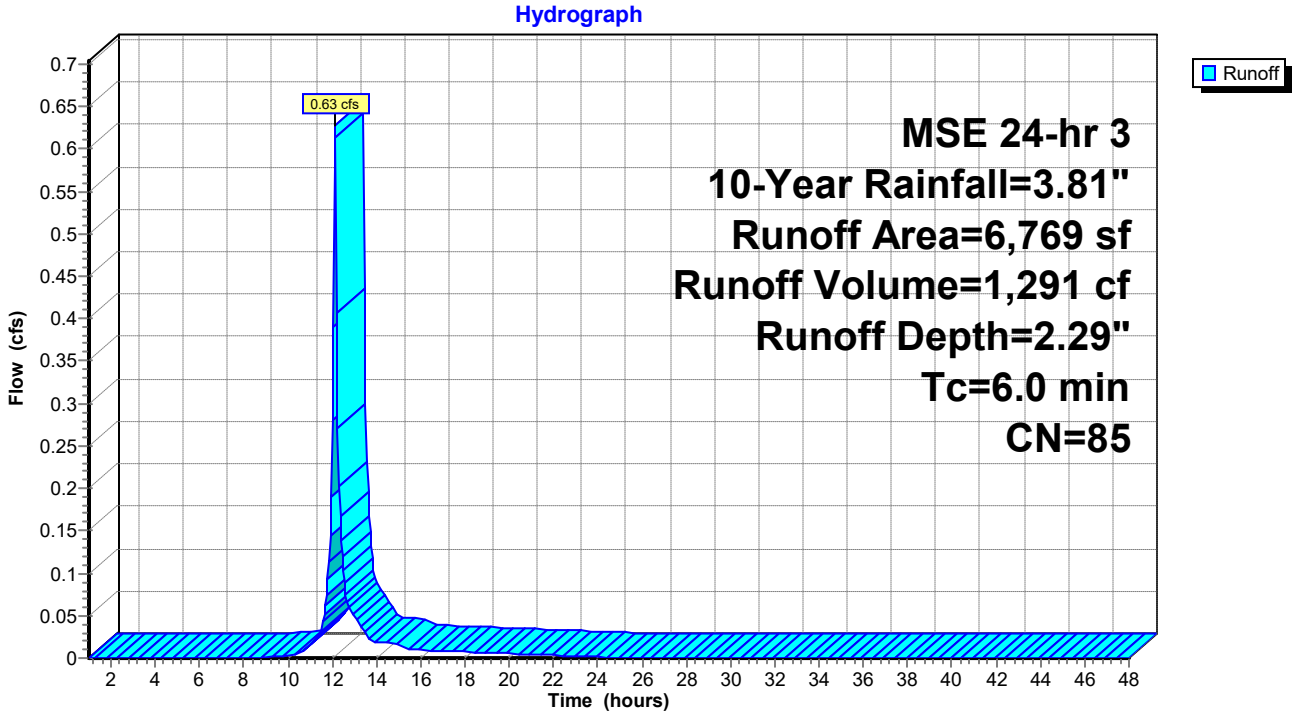
Runoff = 0.63 cfs @ 12.13 hrs, Volume= 1,291 cf, Depth= 2.29"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	1,331	98	WALKS
*	1,714	98	ROADS
*	0	98	ROOF
*	3,724	74	LANDSCAPING
	6,769	85	Weighted Average
	3,724		55.02% Pervious Area
	3,045		44.98% Impervious Area

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

Subcatchment 161S: A24



Summary for Subcatchment 162S: A25

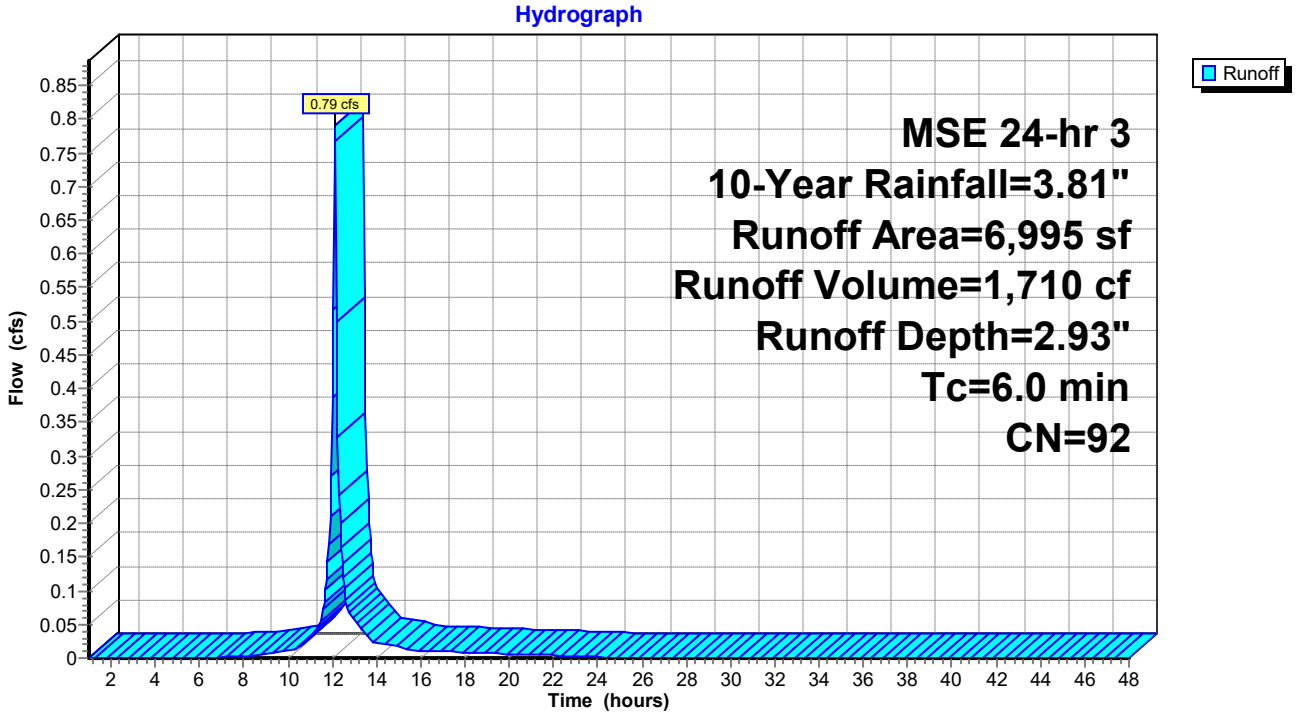
Runoff = 0.79 cfs @ 12.13 hrs, Volume= 1,710 cf, Depth= 2.93"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	1,096	98	WALKS
*	2,036	98	ROADS
*	2,125	98	ROOF
*	1,738	74	LANDSCAPING
	6,995	92	Weighted Average
	1,738		24.85% Pervious Area
	5,257		75.15% Impervious Area

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

Subcatchment 162S: A25



Summary for Subcatchment 163S: A26

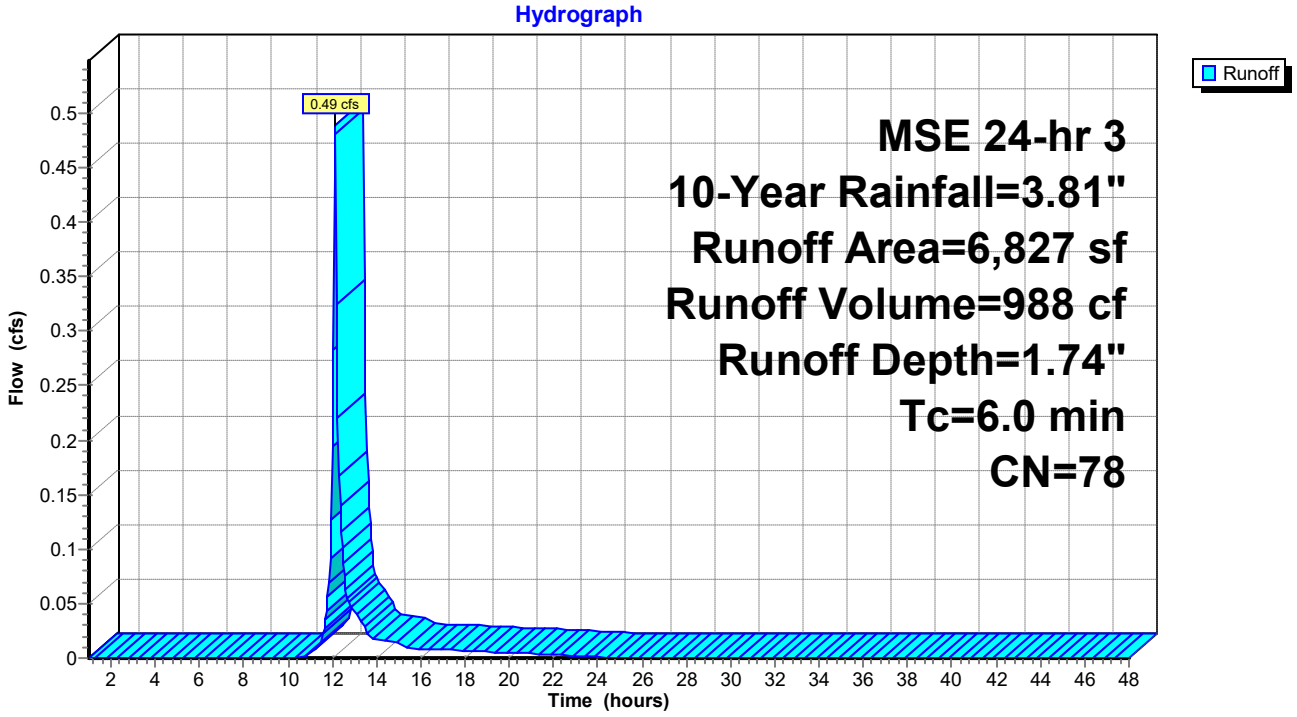
Runoff = 0.49 cfs @ 12.14 hrs, Volume= 988 cf, Depth= 1.74"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	314	98	WALKS
*	860	98	ROADS
*	0	98	ROOF
*	5,653	74	LANDSCAPING
	6,827	78	Weighted Average
	5,653		82.80% Pervious Area
	1,174		17.20% Impervious Area

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

Subcatchment 163S: A26



Summary for Subcatchment 164S: A27

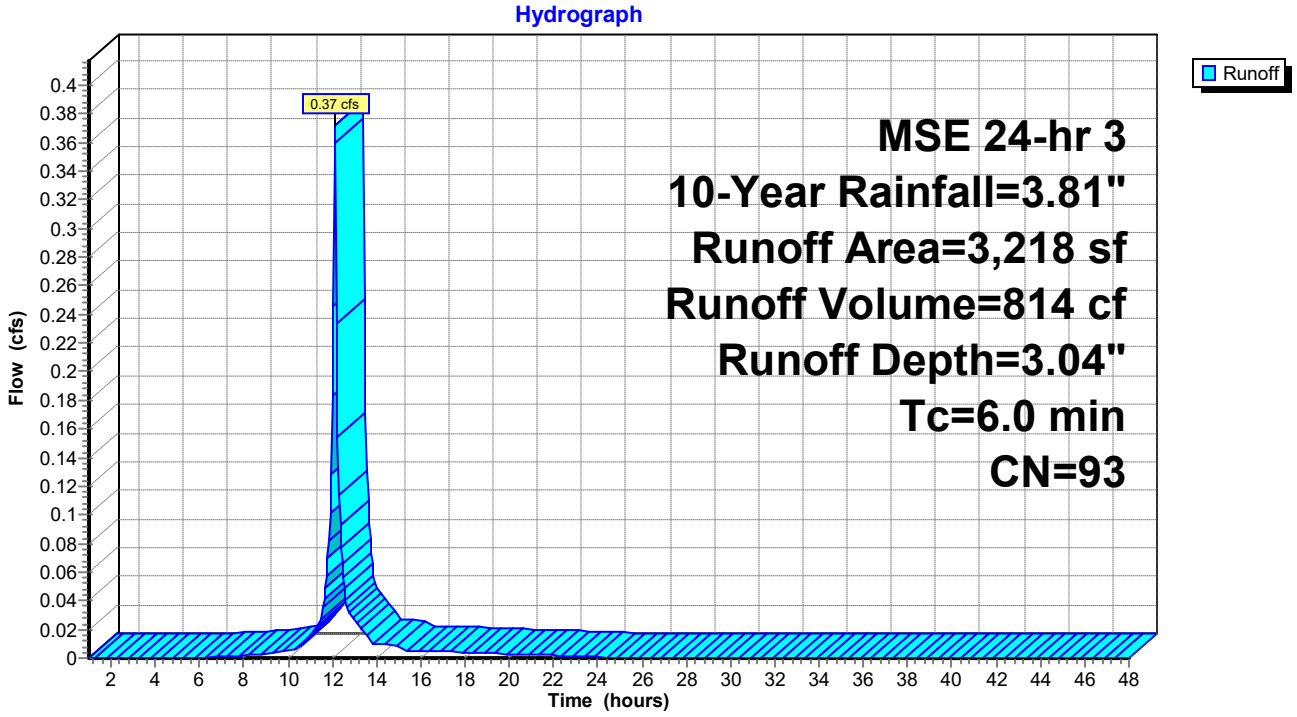
Runoff = 0.37 cfs @ 12.13 hrs, Volume= 814 cf, Depth= 3.04"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	532	98	WALKS
*	927	98	ROADS
*	1,063	98	ROOF
*	696	74	LANDSCAPING
	3,218	93	Weighted Average
	696		21.63% Pervious Area
	2,522		78.37% Impervious Area

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

Subcatchment 164S: A27



Summary for Subcatchment 165S: A28

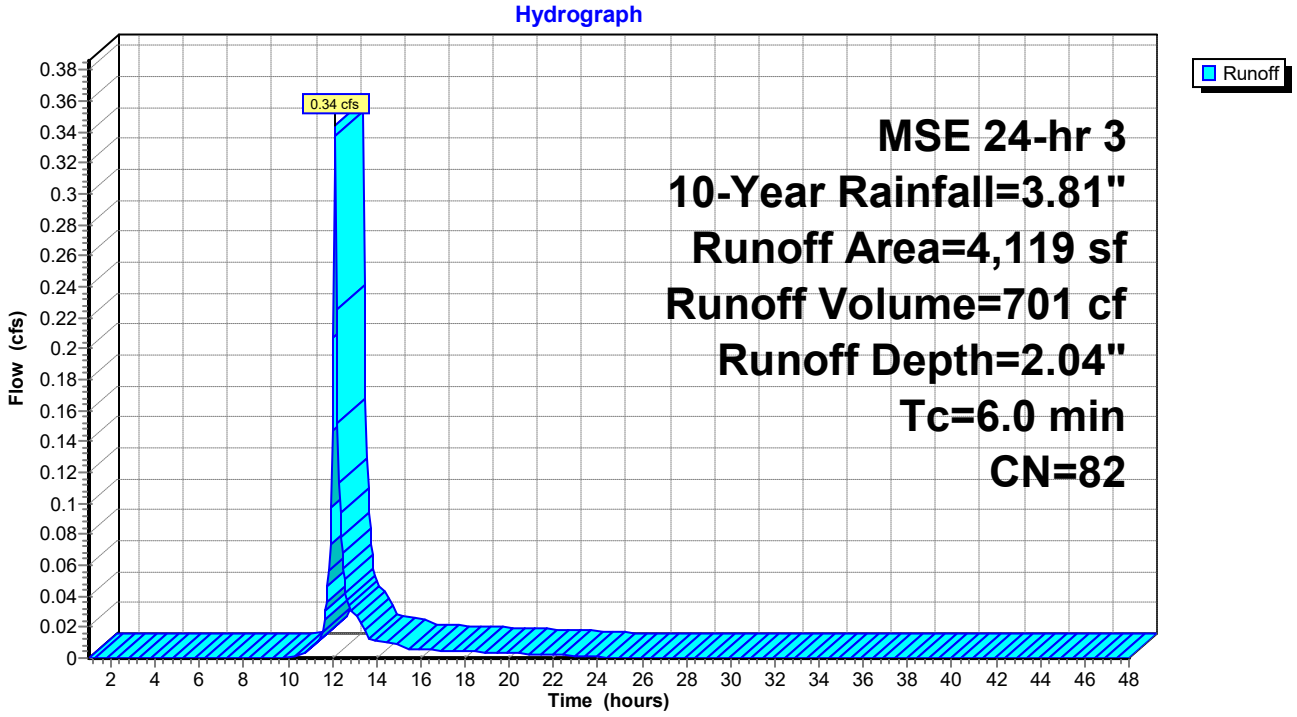
Runoff = 0.34 cfs @ 12.13 hrs, Volume= 701 cf, Depth= 2.04"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	364	98	WALKS
*	968	98	ROADS
*	0	98	ROOF
*	2,787	74	LANDSCAPING
	4,119	82	Weighted Average
	2,787		67.66% Pervious Area
	1,332		32.34% Impervious Area

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

Subcatchment 165S: A28



Summary for Subcatchment 166S: A29

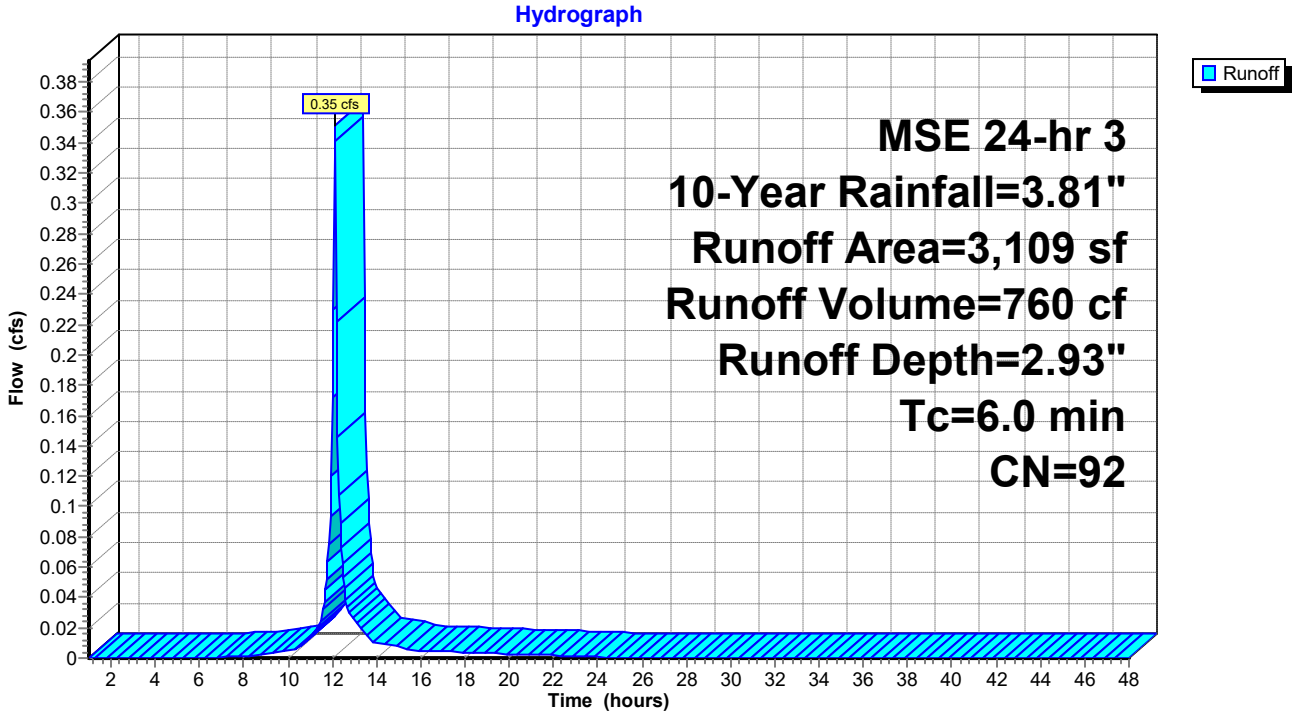
Runoff = 0.35 cfs @ 12.13 hrs, Volume= 760 cf, Depth= 2.93"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	367	98	WALKS
*	921	98	ROADS
*	1,063	98	ROOF
*	758	74	LANDSCAPING
	3,109	92	Weighted Average
	758		24.38% Pervious Area
	2,351		75.62% Impervious Area

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

Subcatchment 166S: A29



Summary for Subcatchment 167S: A31

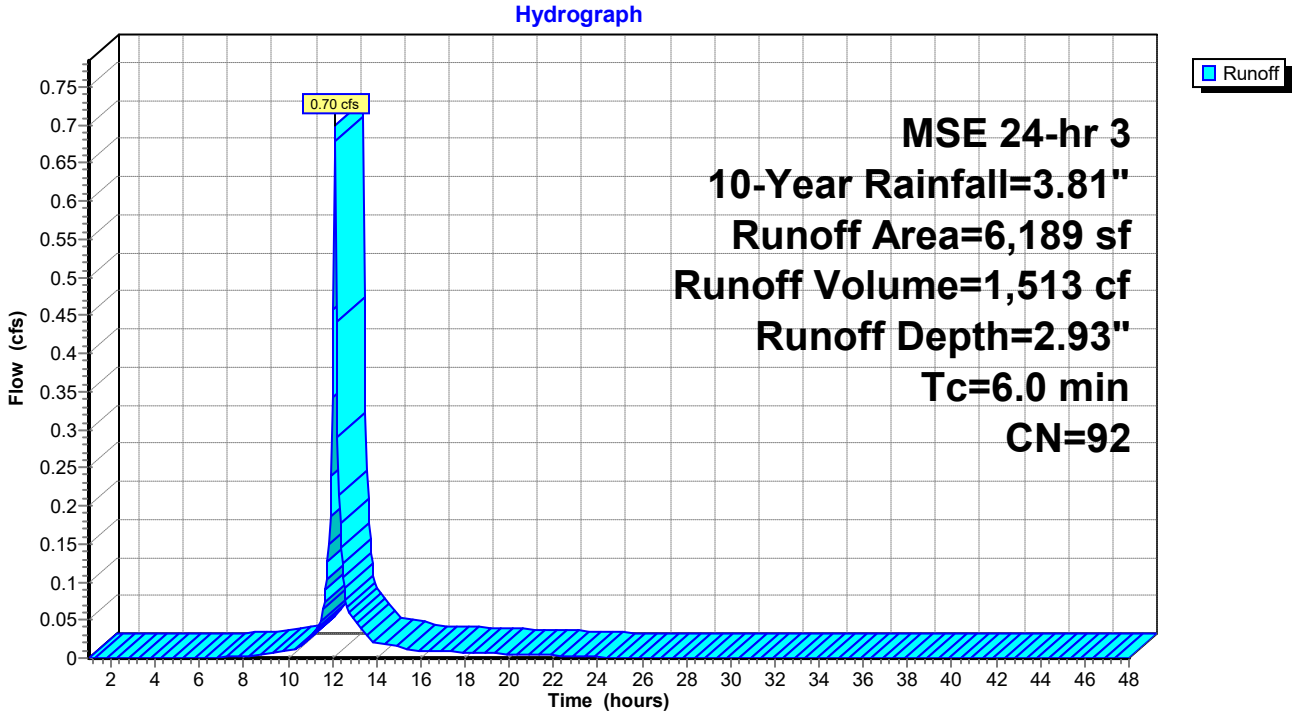
Runoff = 0.70 cfs @ 12.13 hrs, Volume= 1,513 cf, Depth= 2.93"
Routed to Link 126L : OVERSIZED PIPE RUN BY B3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	1,844	98	WALKS
*	2,869	98	ROADS
*	0	98	ROOF
*	1,476	74	LANDSCAPING
	6,189	92	Weighted Average
	1,476		23.85% Pervious Area
	4,713		76.15% Impervious Area

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

Subcatchment 167S: A31



Summary for Subcatchment 168S: A34

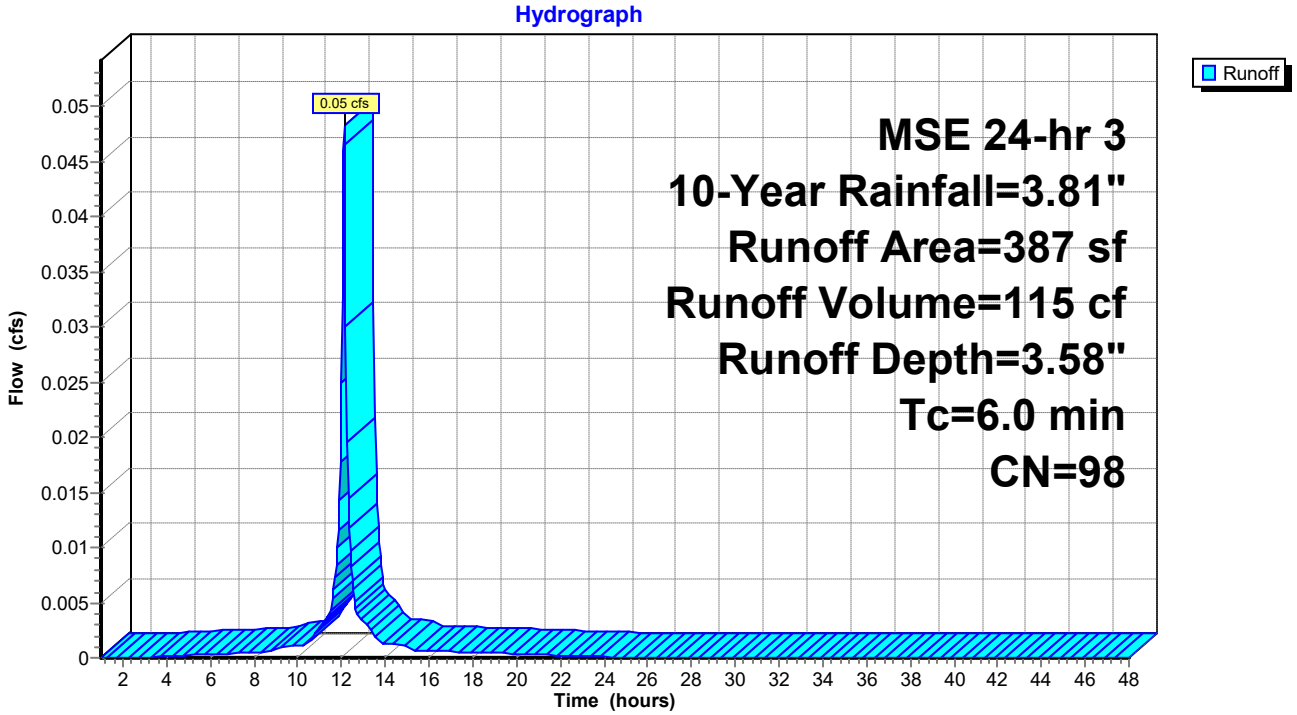
Runoff = 0.05 cfs @ 12.13 hrs, Volume= 115 cf, Depth= 3.58"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	0	98	WALKS
*	387	98	ROADS
*	0	98	ROOF
*	0	74	LANDSCAPING
	387	98	Weighted Average
	387		100.00% Impervious Area

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

Subcatchment 168S: A34



Summary for Subcatchment 169S: A36

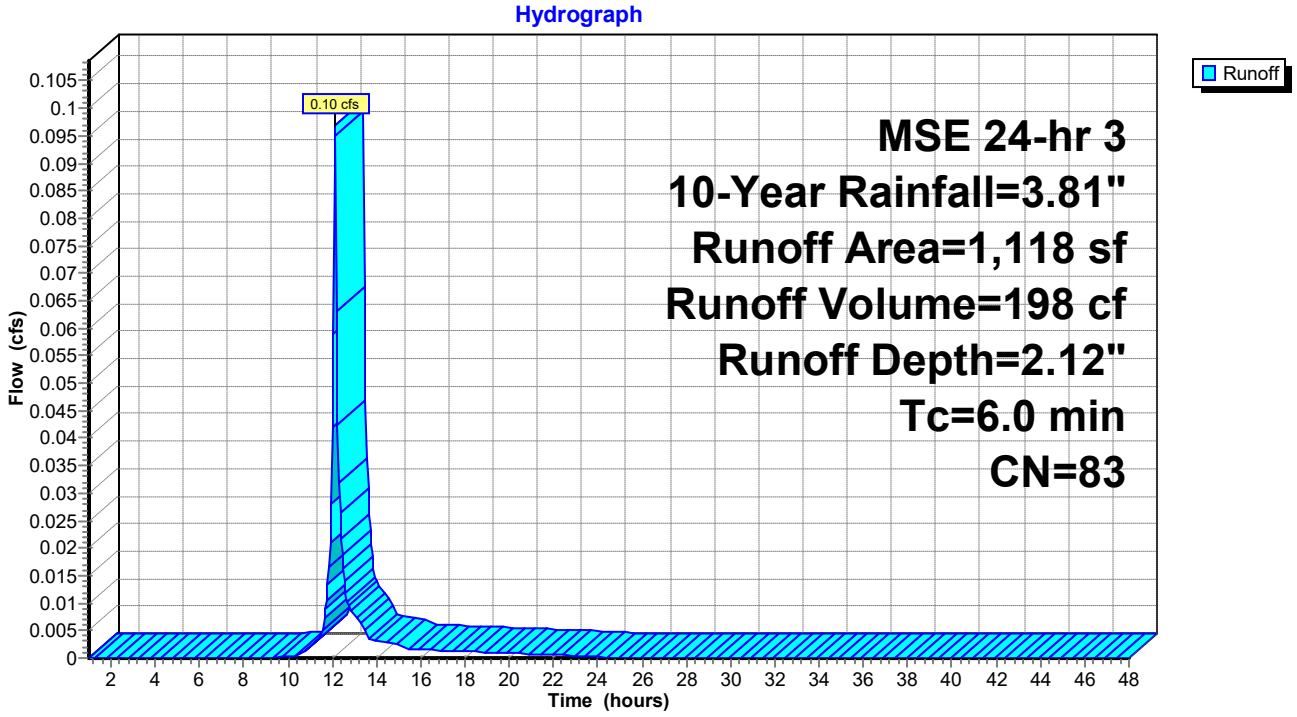
Runoff = 0.10 cfs @ 12.13 hrs, Volume= 198 cf, Depth= 2.12"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	401	98	WALKS
*	0	98	ROADS
*	0	98	ROOF
*	717	74	LANDSCAPING
	1,118	83	Weighted Average
	717		64.13% Pervious Area
	401		35.87% Impervious Area

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

Subcatchment 169S: A36



Summary for Subcatchment 170S: C (INTERIOR)

Subset C - C1
3/3/21
Southern portion of East Building Roof, Southern Building (Middle one) roof, pond area
pipe from roofs not sized yet

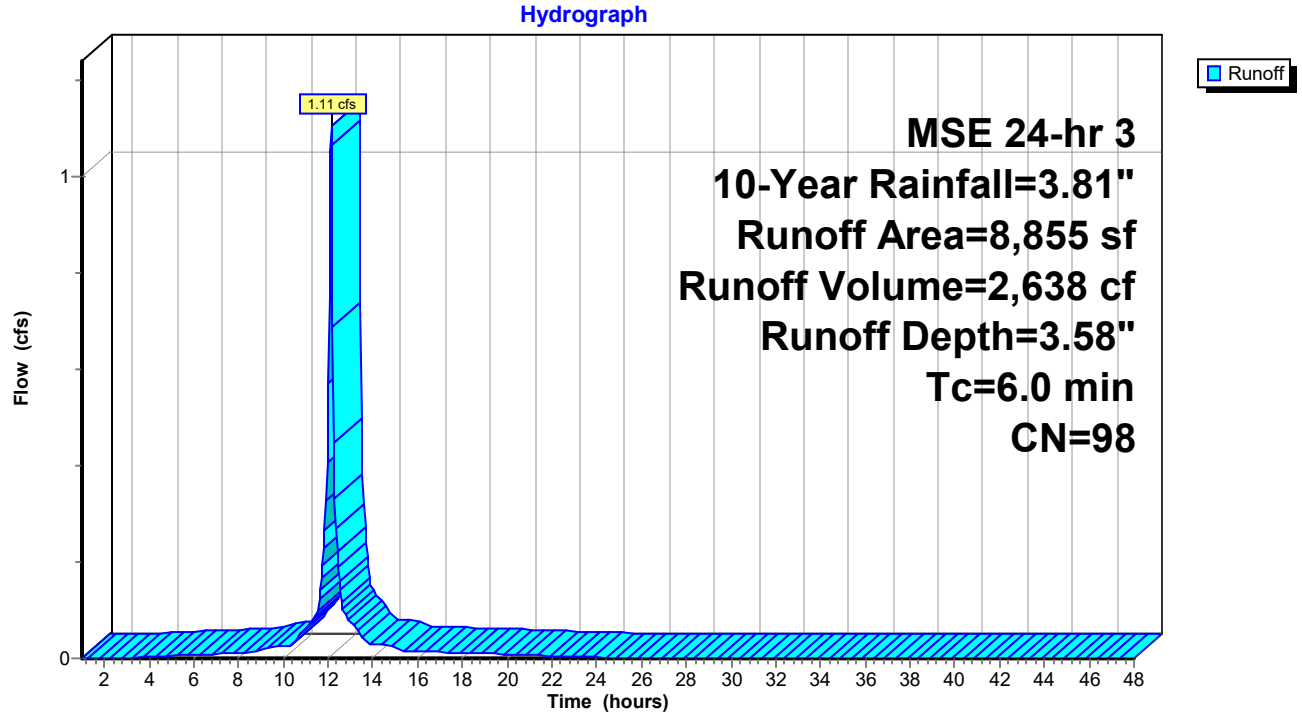
Runoff = 1.11 cfs @ 12.13 hrs, Volume= 2,638 cf, Depth= 3.58"
Routed to Link 171L : 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	8,855	98	roofs
	8,855		100.00% Impervious Area

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

Subcatchment 170S: C (INTERIOR)



Summary for Subcatchment 171S: A (MARIA ROOF) /2

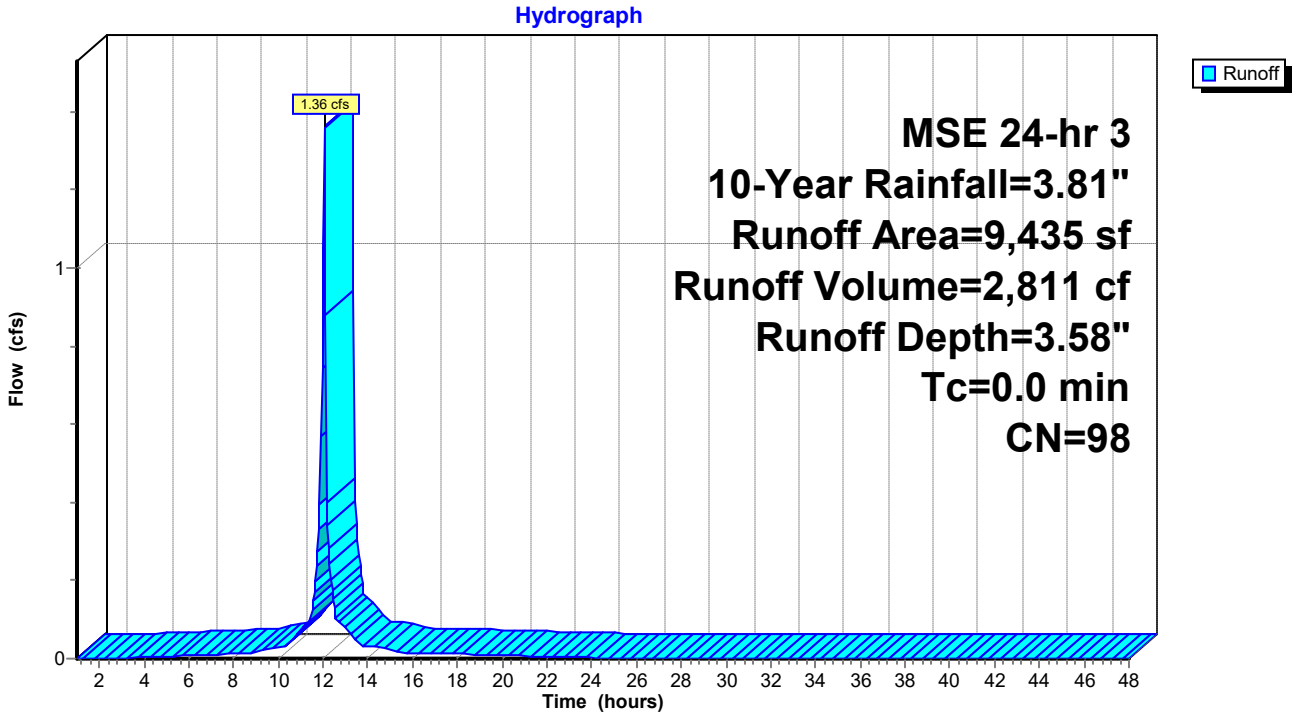
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 1.36 cfs @ 12.04 hrs, Volume= 2,811 cf, Depth= 3.58"
Routed to Link 134L : TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	9,435	98	Roofs
	9,435		100.00% Impervious Area

Subcatchment 171S: A (MARIA ROOF) /2



Summary for Subcatchment 172S: B1 (EXTERIOR)

3/3/21
Northern portion of W building roof

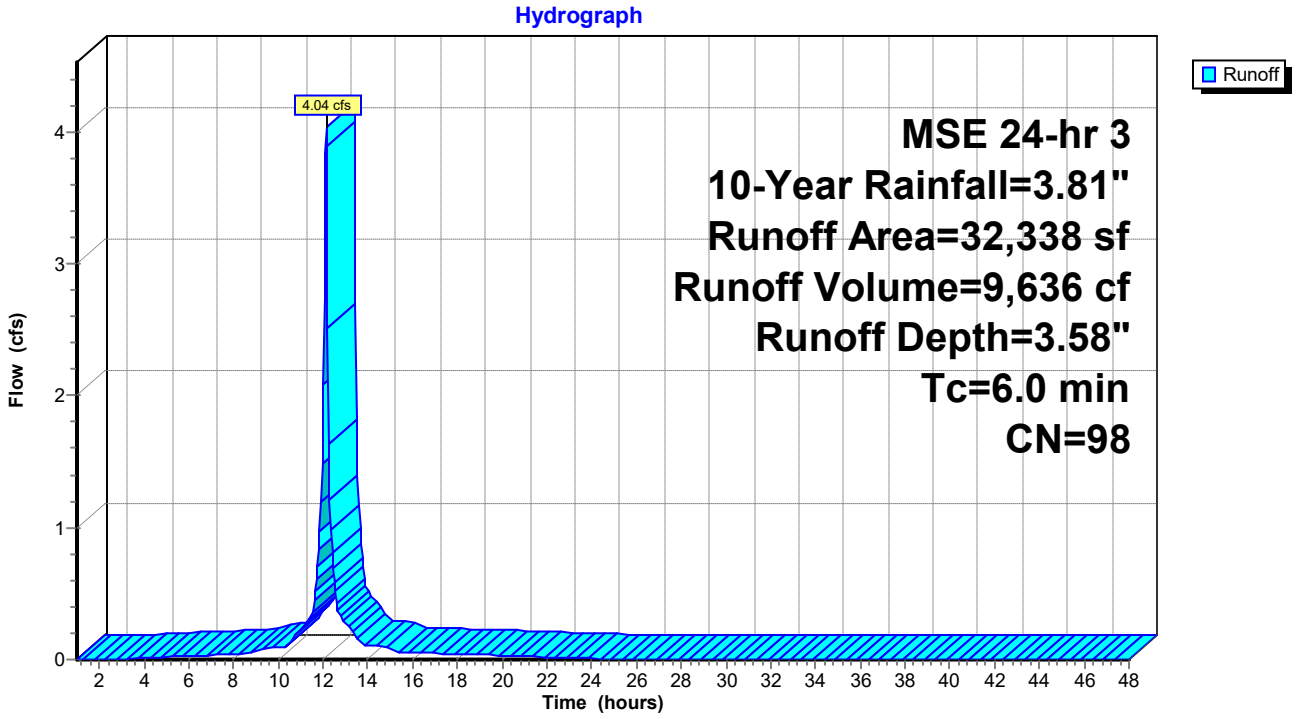
Runoff = 4.04 cfs @ 12.13 hrs, Volume= 9,636 cf, Depth= 3.58"
Routed to Reach 111R : Western PL North Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	32,338	98	roof
	32,338		100.00% Impervious Area

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

Subcatchment 172S: B1 (EXTERIOR)



Summary for Subcatchment 173S: A (MARIA ROOF) /2

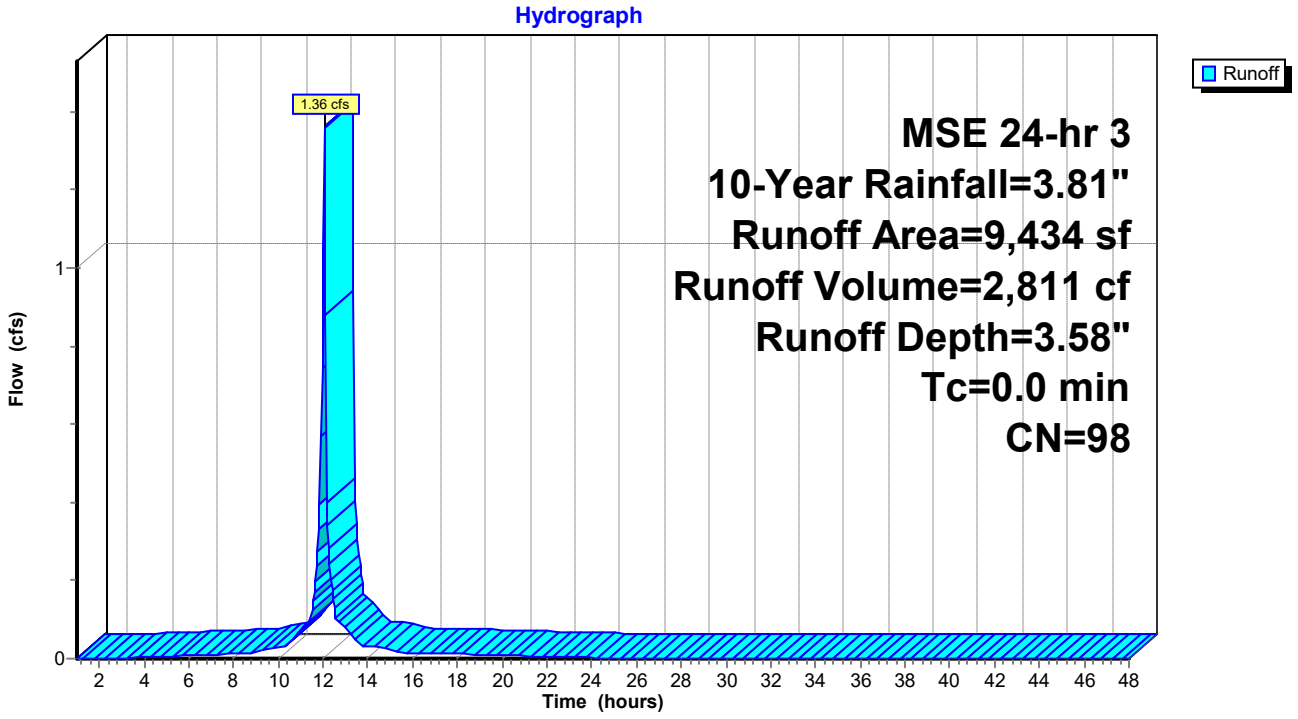
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 1.36 cfs @ 12.04 hrs, Volume= 2,811 cf, Depth= 3.58"
Routed to Link 175L : TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	9,434	98	Roofs
	9,434		100.00% Impervious Area

Subcatchment 173S: A (MARIA ROOF) /2



Summary for Subcatchment 175S: H6-b

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

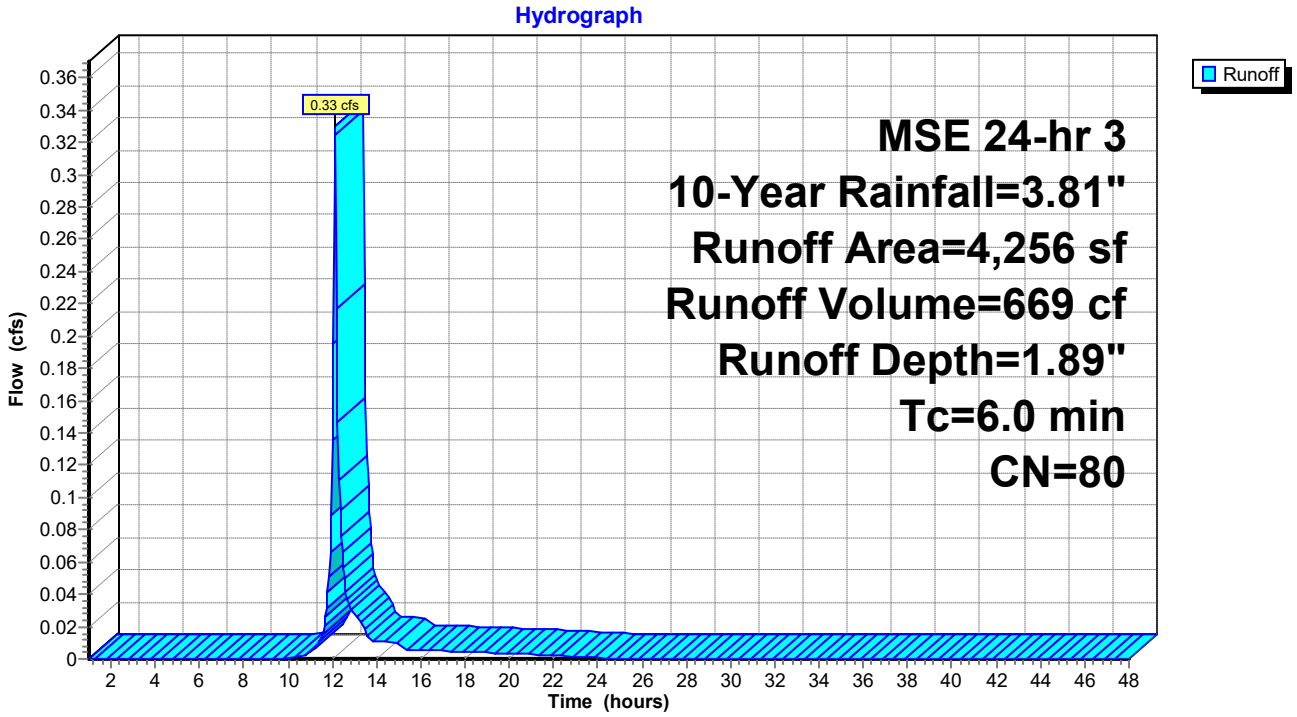
Runoff = 0.33 cfs @ 12.13 hrs, Volume= 669 cf, Depth= 1.89"
Routed to Link 115L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	3,243	74	landscape
*	1,013	98	road
	4,256	80	Weighted Average
	3,243		76.20% Pervious Area
	1,013		23.80% Impervious Area

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

Subcatchment 175S: H6-b



Summary for Subcatchment 176S: X (EX. RBL Area to RBL West Swale)

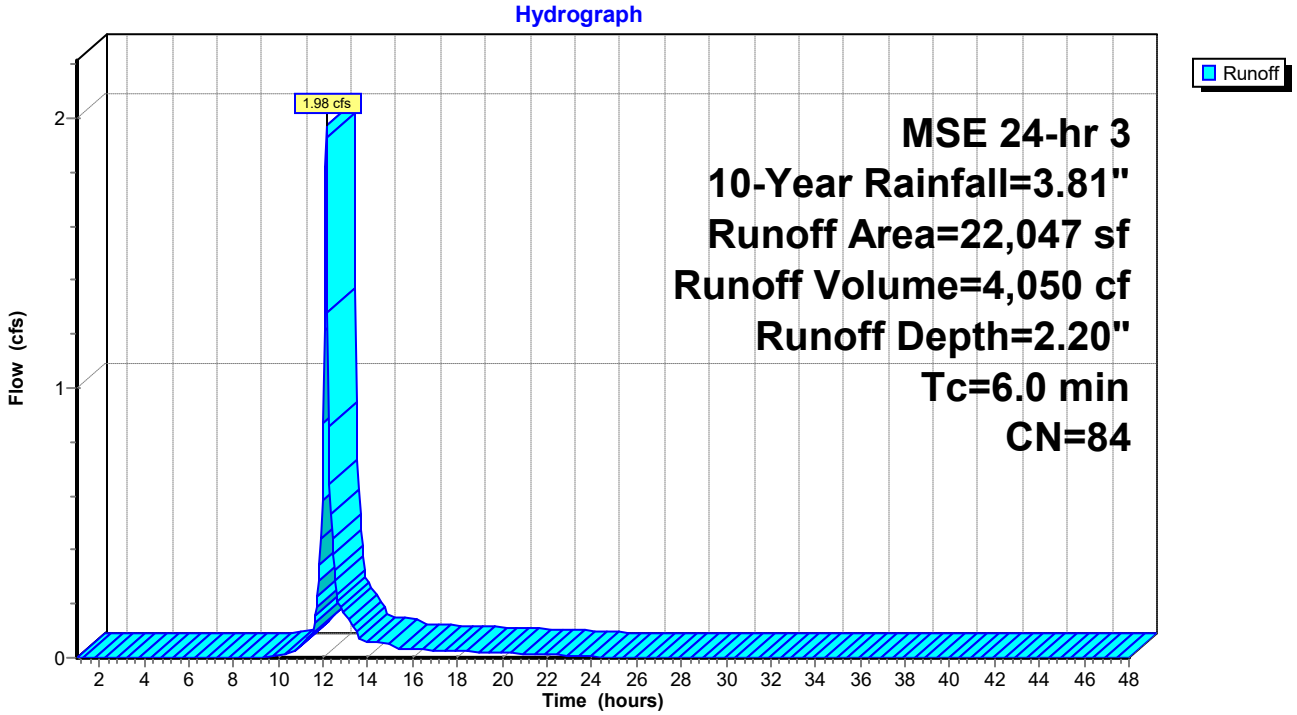
Runoff = 1.98 cfs @ 12.13 hrs, Volume= 4,050 cf, Depth= 2.20"
Routed to Reach 132R : EX. Red Barn Lane West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	12,014	74	landscape
*	9,160	98	road
*	873	74	landscape
	22,047	84	Weighted Average
	12,887		58.45% Pervious Area
	9,160		41.55% Impervious Area

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

Subcatchment 176S: X (EX. RBL Area to RBL West Swale)



Summary for Subcatchment 179S: H6-c

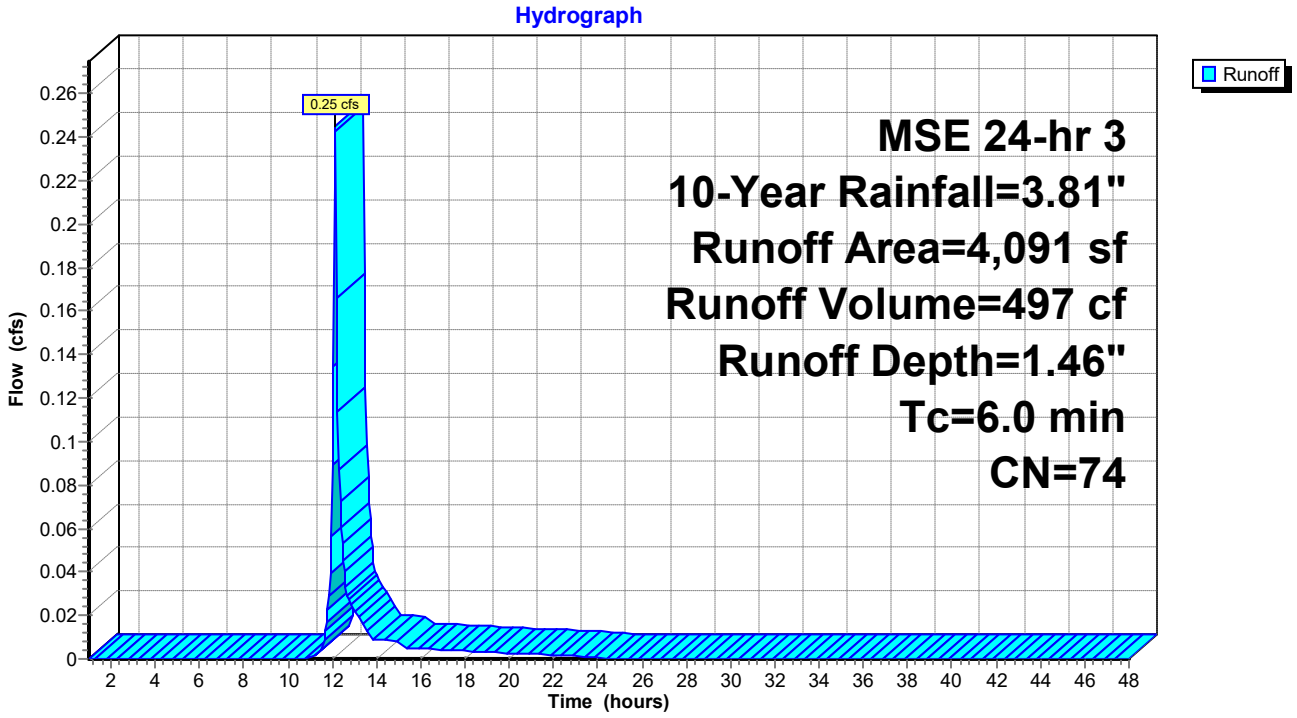
Runoff = 0.25 cfs @ 12.14 hrs, Volume= 497 cf, Depth= 1.46"
Routed to Link 115L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	4,091	74	per
	4,091		100.00% Pervious Area

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

Subcatchment 179S: H6-c



Summary for Subcatchment 182S: A35

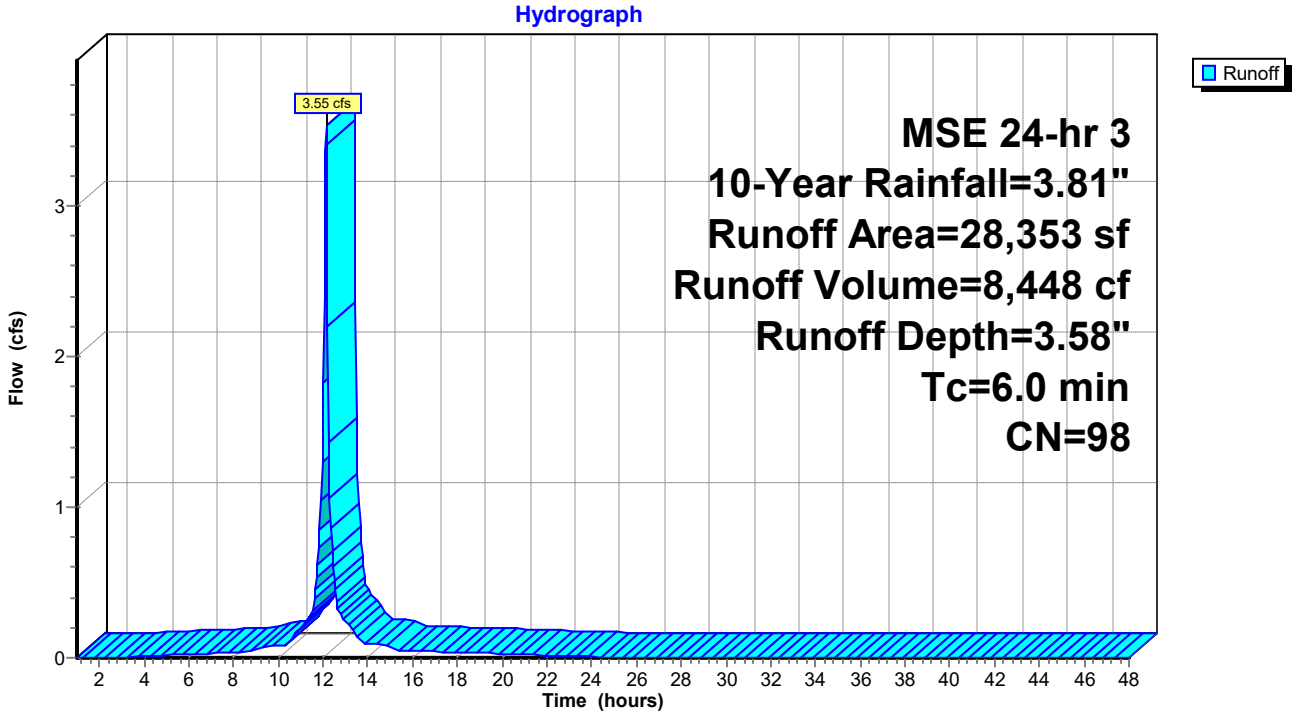
Runoff = 3.55 cfs @ 12.13 hrs, Volume= 8,448 cf, Depth= 3.58"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	28,353	98	WALKS
*	0	98	ROADS
*	0	98	ROOF
*	0	74	LANDSCAPING
	28,353	98	Weighted Average
	28,353		100.00% Impervious Area

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

Subcatchment 182S: A35



Summary for Subcatchment 183S: Y (RBL Area to RBL East Swale)

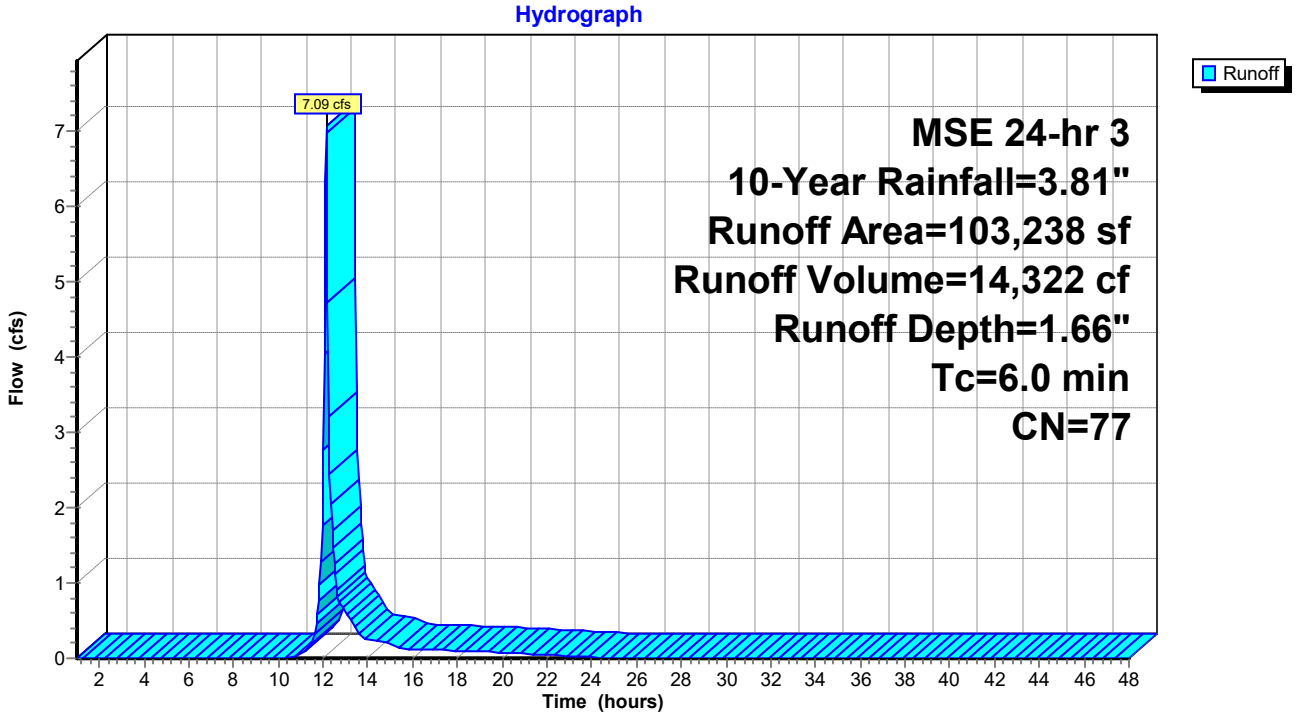
Runoff = 7.09 cfs @ 12.14 hrs, Volume= 14,322 cf, Depth= 1.66"
Routed to Reach 184R : Red Barn Lane East Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	92,001	74	landscape
*	11,237	98	road
	103,238	77	Weighted Average
	92,001		89.12% Pervious Area
	11,237		10.88% Impervious Area

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

Subcatchment 183S: Y (RBL Area to RBL East Swale)



Summary for Subcatchment 185S: H4

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

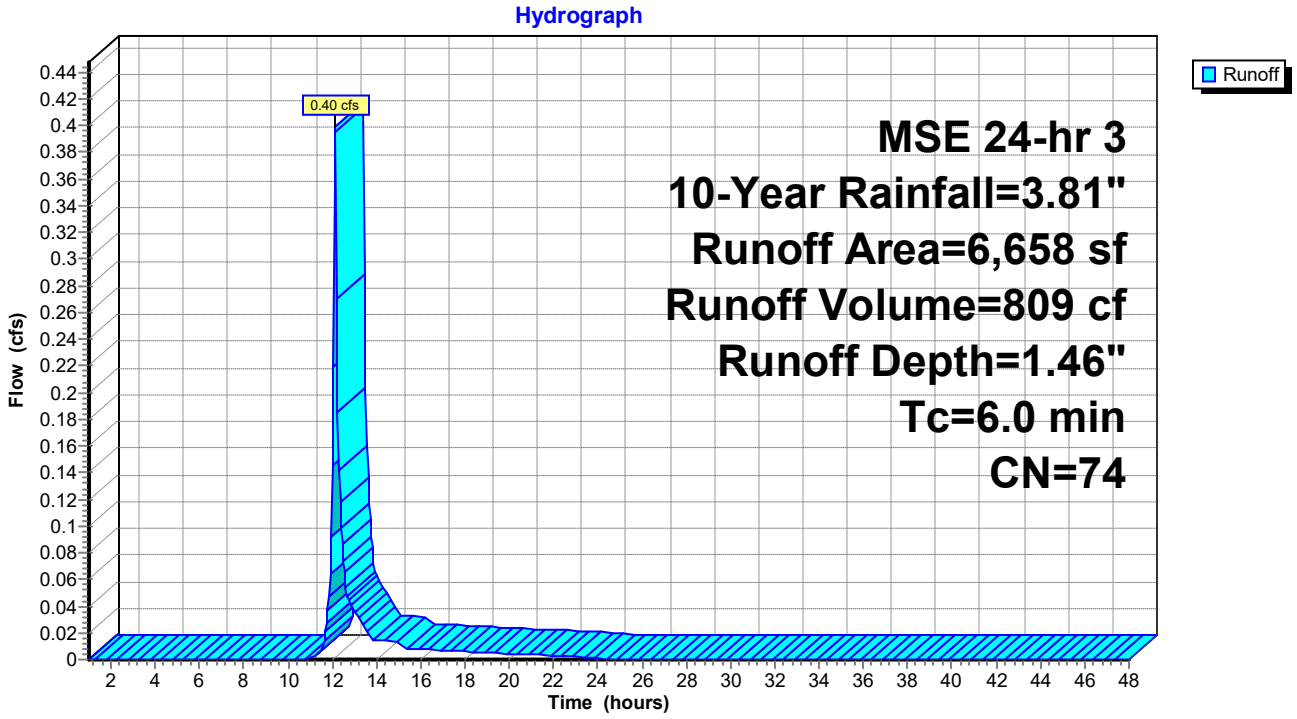
Runoff = 0.40 cfs @ 12.14 hrs, Volume= 809 cf, Depth= 1.46"
Routed to Link 66L : Total Offsite

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-Year Rainfall=3.81"

	Area (sf)	CN	Description
*	6,658	74	landscape
	6,658		100.00% Pervious Area

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

Subcatchment 185S: H4



Summary for Reach 99R: East Swale (SE End)

[62] Hint: Exceeded Reach 106R OUTLET depth by 0.43' @ 12.15 hrs

Inflow Area = 227,272 sf, 34.15% Impervious, Inflow Depth = 2.06" for 10-Year event
Inflow = 19.15 cfs @ 12.13 hrs, Volume= 38,978 cf
Outflow = 17.99 cfs @ 12.16 hrs, Volume= 38,978 cf, Atten= 6%, Lag= 1.4 min
Routed to Pond 58P : Dry Pond 1

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 4.22 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 0.93 fps, Avg. Travel Time= 10.3 min

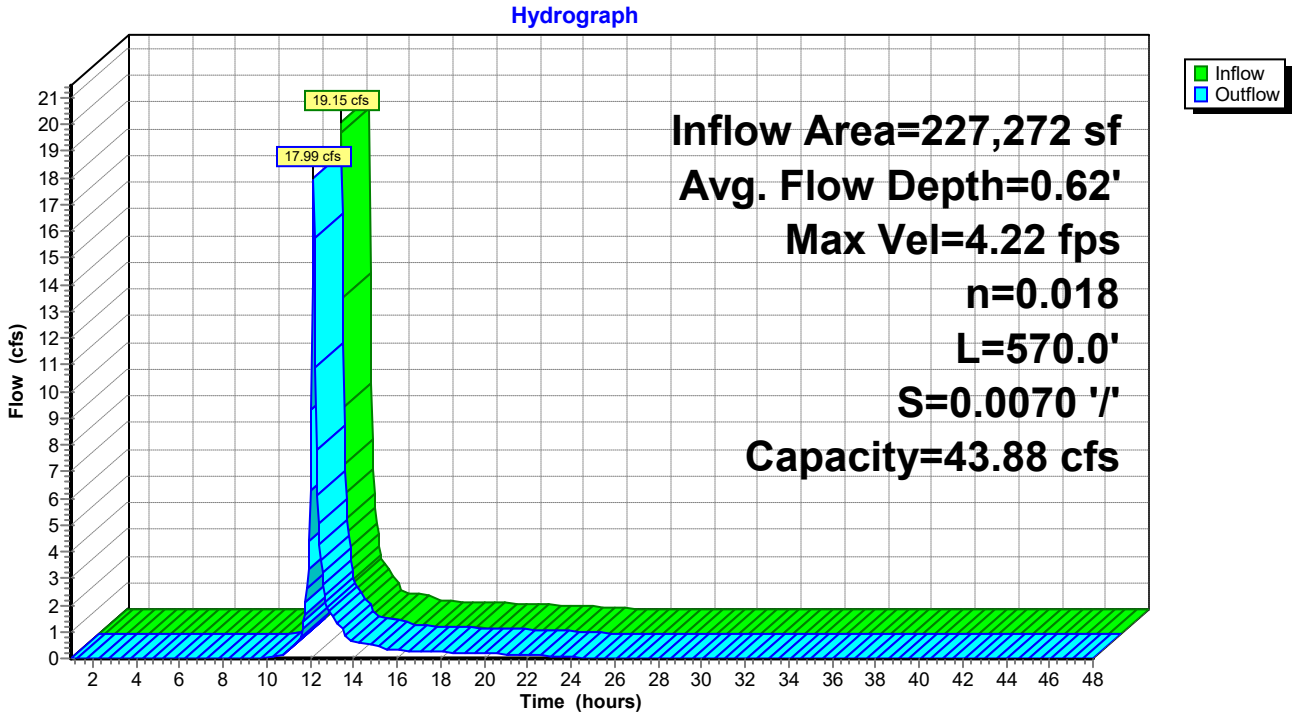
Peak Storage= 2,428 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.62' , Surface Width= 8.73'
Bank-Full Depth= 1.00' Flow Area= 8.0 sf, Capacity= 43.88 cfs

5.00' x 1.00' deep channel, n= 0.018
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 570.0' Slope= 0.0070 '/'
Inlet Invert= 757.00', Outlet Invert= 753.00'



‡

Reach 99R: East Swale (SE End)



Summary for Reach 106R: East Swale (North End)

3/2/21
Slope Calc - (140' x 4.64%)

Inflow Area = 19,337 sf, 26.10% Impervious, Inflow Depth = 1.89" for 10-Year event
Inflow = 1.50 cfs @ 12.13 hrs, Volume= 3,039 cf
Outflow = 1.50 cfs @ 12.14 hrs, Volume= 3,039 cf, Atten= 0%, Lag= 0.6 min
Routed to Reach 99R : East Swale (SE End)

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.13 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 0.79 fps, Avg. Travel Time= 2.9 min

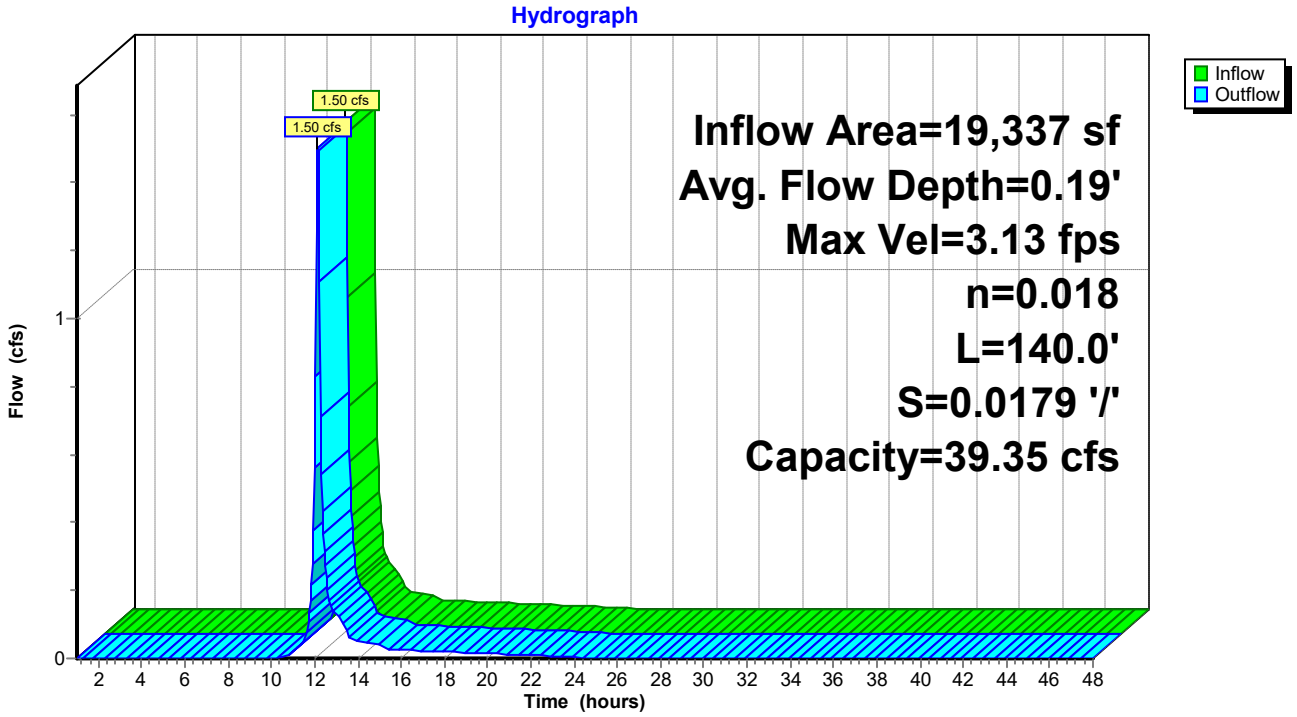
Peak Storage= 67 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.19' , Surface Width= 3.12'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 39.35 cfs

2.00' x 1.00' deep channel, n= 0.018 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 8.00'
Length= 140.0' Slope= 0.0179 '/'
Inlet Invert= 759.51', Outlet Invert= 757.00'



‡

Reach 106R: East Swale (North End)



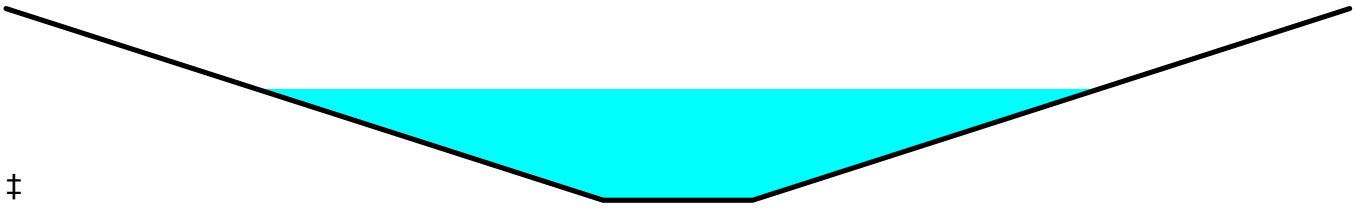
Summary for Reach 108R: South Berm Swale

Inflow Area = 124,665 sf, 12.91% Impervious, Inflow Depth = 1.68" for 10-Year event
Inflow = 5.71 cfs @ 12.14 hrs, Volume= 17,422 cf
Outflow = 5.52 cfs @ 12.16 hrs, Volume= 17,422 cf, Atten= 3%, Lag= 1.1 min
Routed to Pond 57P : Dry Pond 2

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.86 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 0.98 fps, Avg. Travel Time= 4.5 min

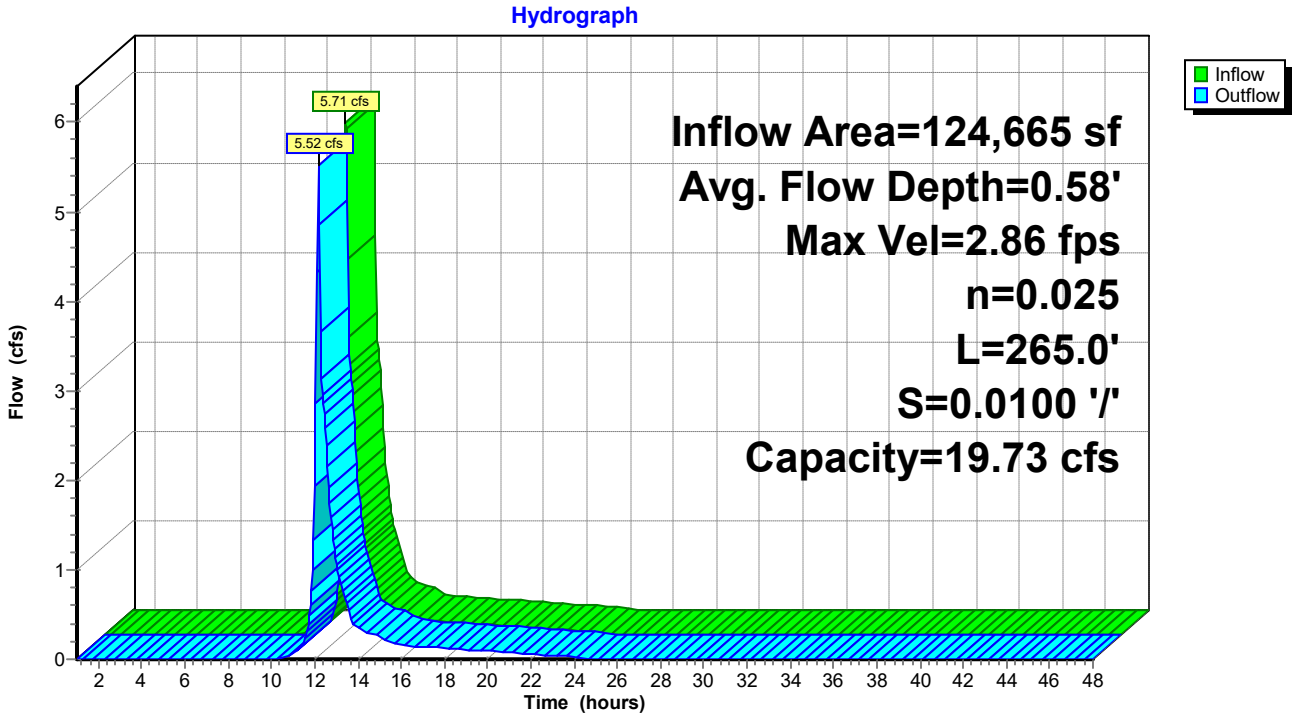
Peak Storage= 512 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.58' , Surface Width= 5.65'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 19.73 cfs

1.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 4.0 '/' Top Width= 9.00'
Length= 265.0' Slope= 0.0100 '/'
Inlet Invert= 754.00', Outlet Invert= 751.35'



‡

Reach 108R: South Berm Swale



Summary for Reach 109R: SC Road East Ditch

3/3/21
Ditch on north and west side of cul-de-sac road

Inflow Area = 41,695 sf, 60.00% Impervious, Inflow Depth = 2.55" for 10-Year event
Inflow = 4.25 cfs @ 12.13 hrs, Volume= 8,871 cf
Outflow = 3.81 cfs @ 12.16 hrs, Volume= 8,871 cf, Atten= 10%, Lag= 1.9 min
Routed to Pond 95P : Dry Pond 3

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.06 fps, Min. Travel Time= 3.4 min
Avg. Velocity = 0.48 fps, Avg. Travel Time= 14.4 min

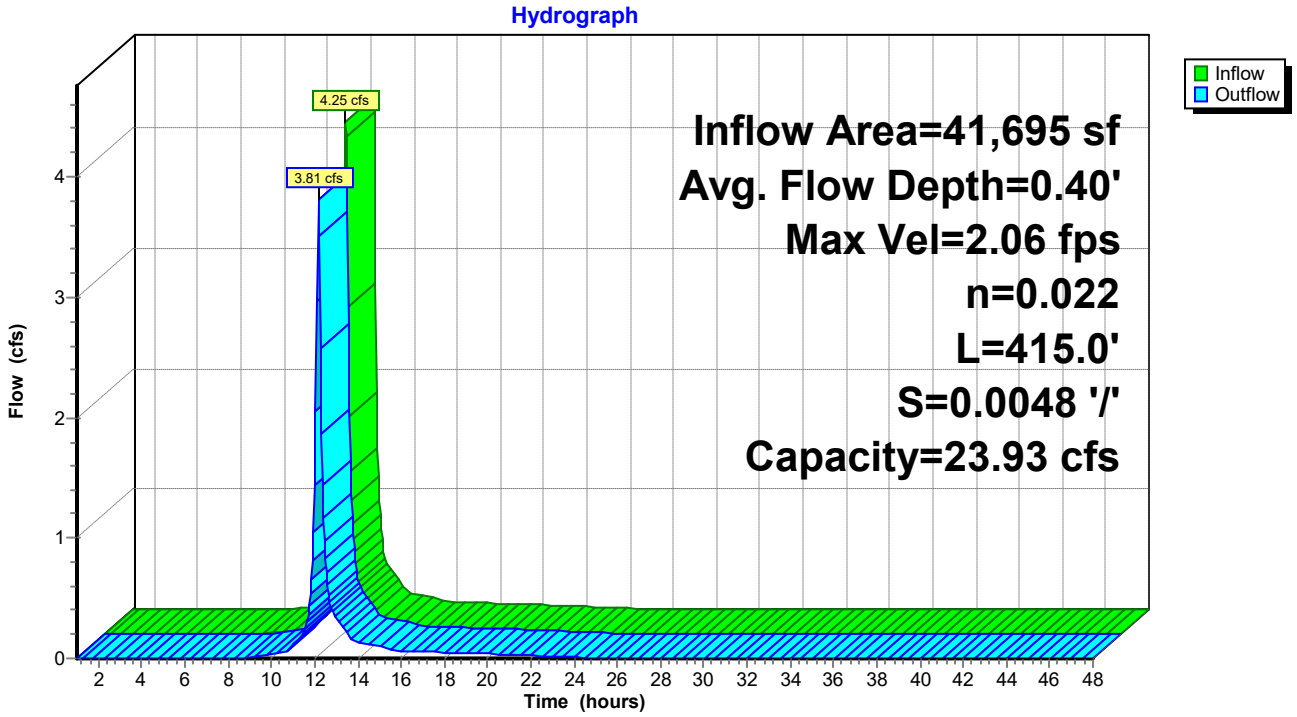
Peak Storage= 766 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.40' , Surface Width= 6.21'
Bank-Full Depth= 1.00' Flow Area= 7.0 sf, Capacity= 23.93 cfs

3.00' x 1.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 '/' Top Width= 11.00'
Length= 415.0' Slope= 0.0048 '/'
Inlet Invert= 747.00', Outlet Invert= 745.00'



‡

Reach 109R: SC Road East Ditch



Summary for Reach 111R: Western PL North Ditch

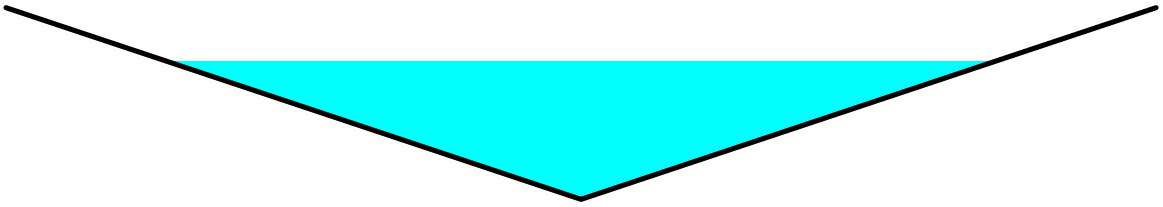
3/3/21
This is the western property line ditch that takes offsite flow and western building courtyard flow to IB
update length we shortened in screen share

Inflow Area = 158,356 sf, 28.25% Impervious, Inflow Depth = 2.02" for 10-Year event
Inflow = 11.90 cfs @ 12.14 hrs, Volume= 26,659 cf
Outflow = 11.26 cfs @ 12.16 hrs, Volume= 26,659 cf, Atten= 5%, Lag= 1.3 min
Routed to Pond 110R : Western Pipe Run

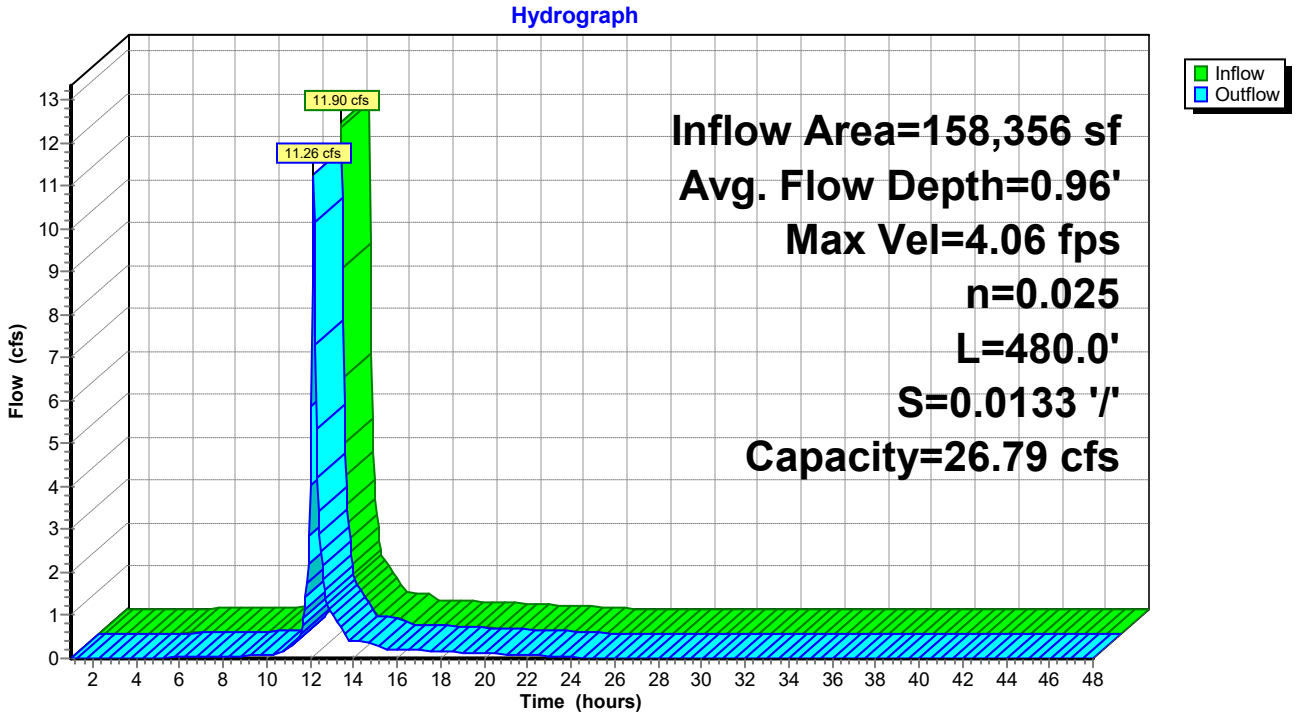
Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 4.06 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 1.23 fps, Avg. Travel Time= 6.5 min

Peak Storage= 1,330 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.96' , Surface Width= 5.77'
Bank-Full Depth= 1.33' Flow Area= 5.3 sf, Capacity= 26.79 cfs

0.00' x 1.33' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 7.98'
Length= 480.0' Slope= 0.0133 '/'
Inlet Invert= 755.50', Outlet Invert= 749.10'



Reach 111R: Western PL North Ditch



Summary for Reach 117R: SC Road West Ditch

3/3/21
Ditch on north and west side of cul-de-sac road

Inflow Area = 50,859 sf, 57.49% Impervious, Inflow Depth = 2.55" for 10-Year event
Inflow = 5.18 cfs @ 12.13 hrs, Volume= 10,820 cf
Outflow = 4.55 cfs @ 12.17 hrs, Volume= 10,820 cf, Atten= 12%, Lag= 2.1 min
Routed to Pond 95P : Dry Pond 3

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.06 fps, Min. Travel Time= 3.8 min
Avg. Velocity = 0.48 fps, Avg. Travel Time= 16.6 min

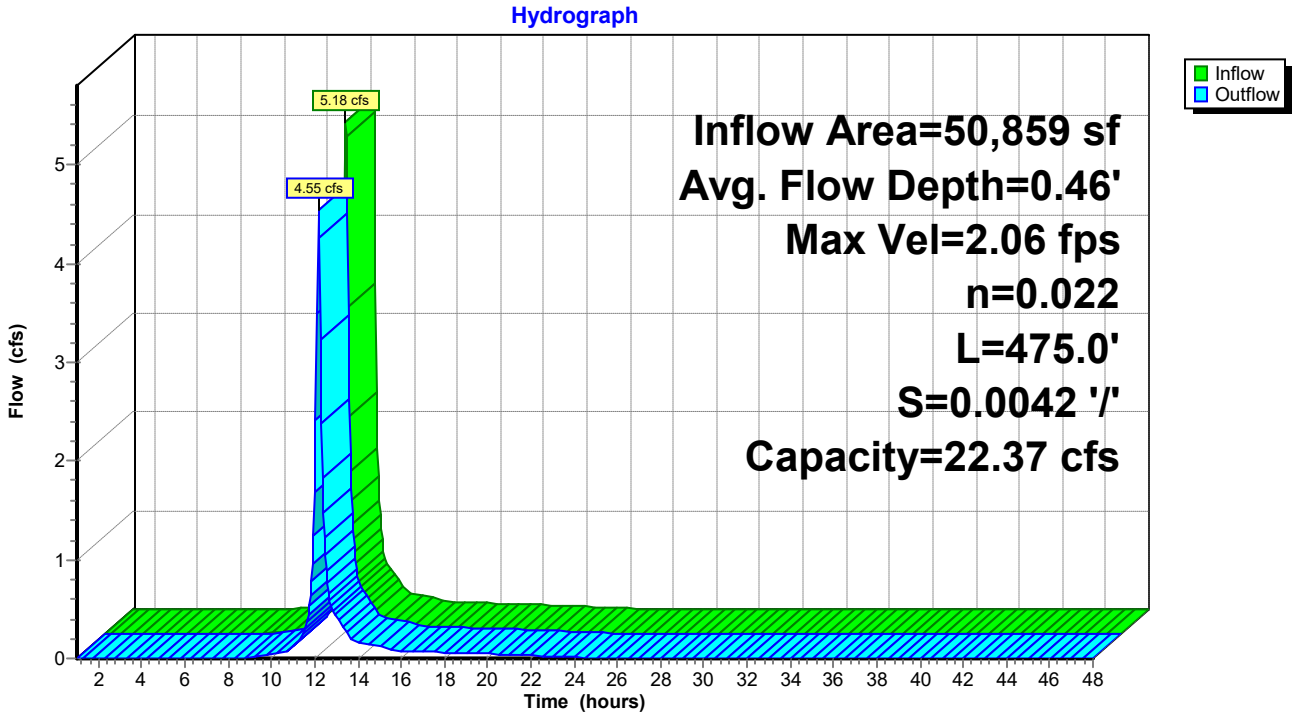
Peak Storage= 1,043 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.46' , Surface Width= 6.64'
Bank-Full Depth= 1.00' Flow Area= 7.0 sf, Capacity= 22.37 cfs

3.00' x 1.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 '/' Top Width= 11.00'
Length= 475.0' Slope= 0.0042 '/'
Inlet Invert= 747.00', Outlet Invert= 745.00'



‡

Reach 117R: SC Road West Ditch



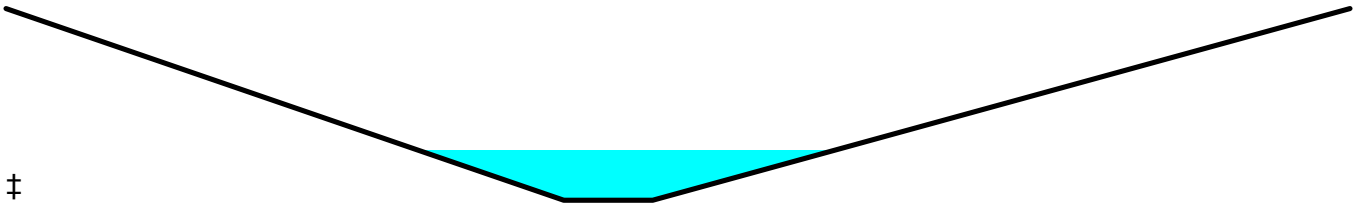
Summary for Reach 132R: EX. Red Barn Lane West Swale

Inflow Area = 51,883 sf, 28.33% Impervious, Inflow Depth = 1.94" for 10-Year event
Inflow = 4.12 cfs @ 12.13 hrs, Volume= 8,368 cf
Outflow = 3.65 cfs @ 12.17 hrs, Volume= 8,368 cf, Atten= 11%, Lag= 2.0 min
Routed to Pond 183P : 24" HDPE PIPE

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.09 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 0.95 fps, Avg. Travel Time= 10.7 min

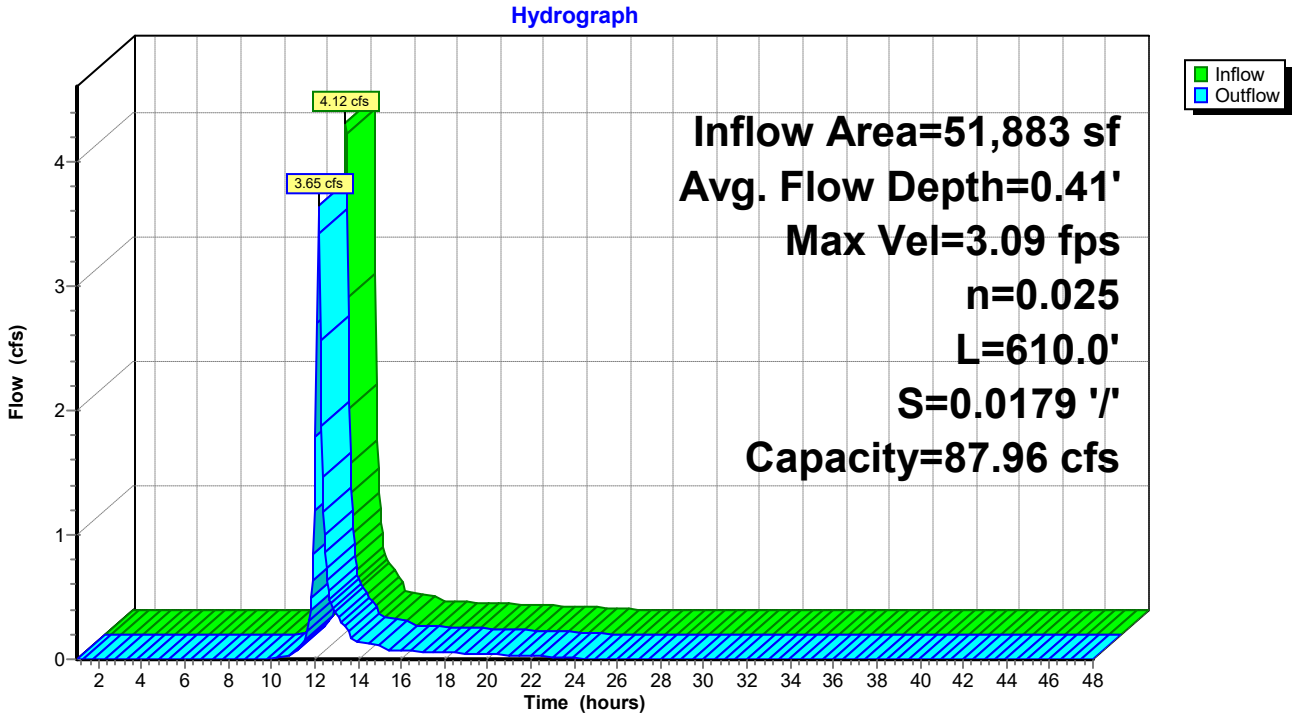
Peak Storage= 716 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.41' , Surface Width= 4.71'
Bank-Full Depth= 1.57' Flow Area= 12.7 sf, Capacity= 87.96 cfs

1.00' x 1.57' deep channel, n= 0.025
Side Slope Z-value= 4.0 5.0 '/' Top Width= 15.13'
Length= 610.0' Slope= 0.0179 '/'
Inlet Invert= 760.89', Outlet Invert= 750.00'



‡

Reach 132R: EX. Red Barn Lane West Swale



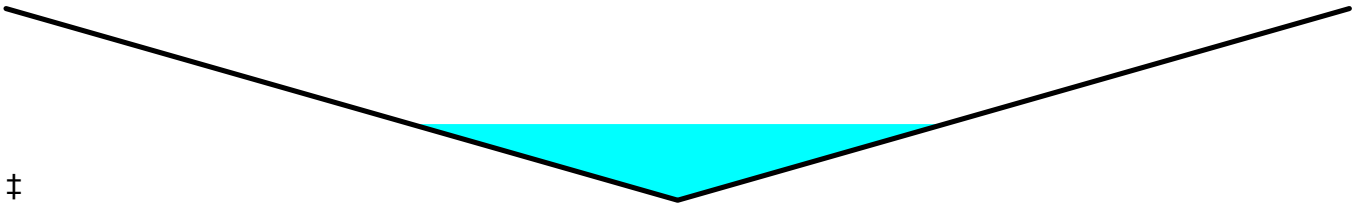
Summary for Reach 136R: SC West Ditch

Inflow Area = 20,215 sf, 20.28% Impervious, Inflow Depth = 1.81" for 10-Year event
Inflow = 1.51 cfs @ 12.13 hrs, Volume= 3,050 cf
Outflow = 1.42 cfs @ 12.16 hrs, Volume= 3,050 cf, Atten= 6%, Lag= 1.4 min
Routed to Pond 95P : Dry Pond 3

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.79 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 0.63 fps, Avg. Travel Time= 5.8 min

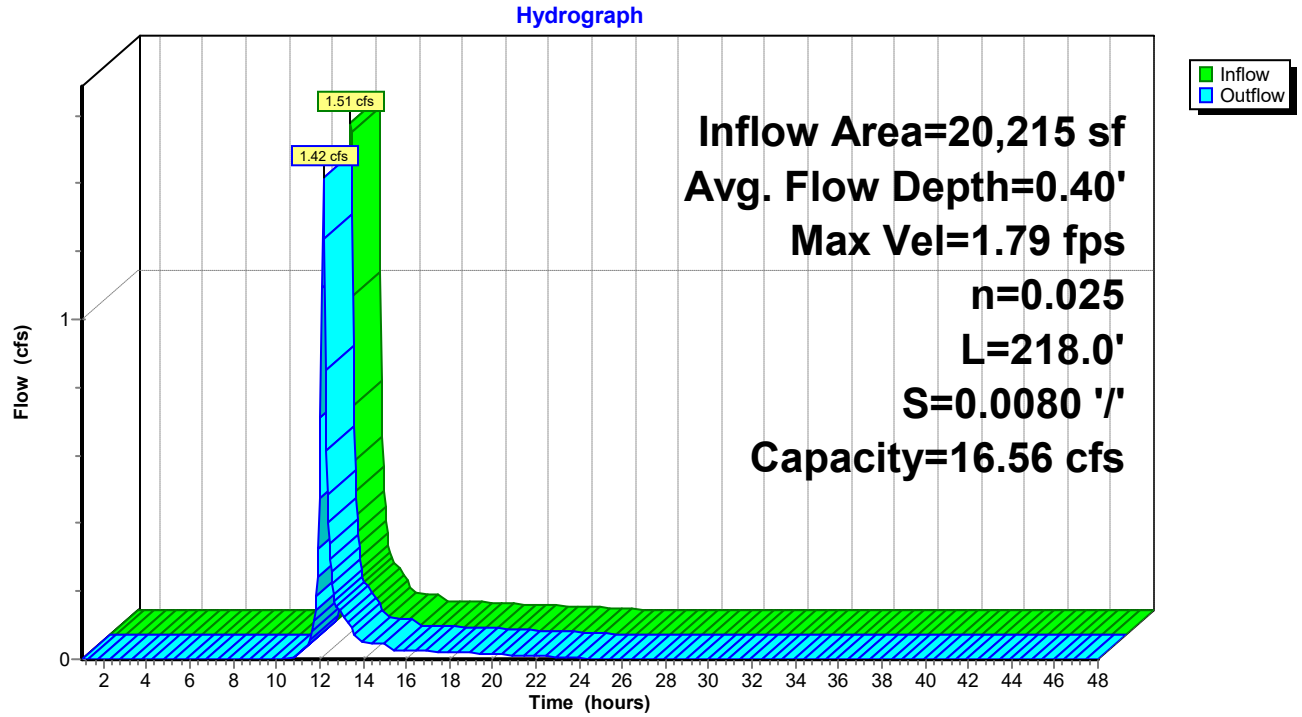
Peak Storage= 173 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.40' , Surface Width= 3.98'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 16.56 cfs

0.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 5.0 '/' Top Width= 10.00'
Length= 218.0' Slope= 0.0080 '/'
Inlet Invert= 743.75', Outlet Invert= 742.00'



‡

Reach 136R: SC West Ditch



Summary for Reach 151R: Western PL North Ditch

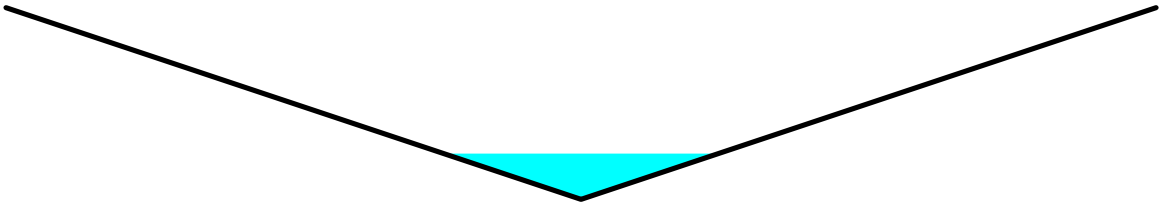
3/3/21
This is the western property line ditch that takes offsite flow and western building courtyard flow to IB
update length we shortened in screen share

Inflow Area = 8,222 sf, 12.92% Impervious, Inflow Depth = 1.66" for 10-Year event
Inflow = 0.56 cfs @ 12.14 hrs, Volume= 1,141 cf
Outflow = 0.53 cfs @ 12.16 hrs, Volume= 1,141 cf, Atten= 7%, Lag= 1.4 min
Routed to Pond 110R : Western Pipe Run

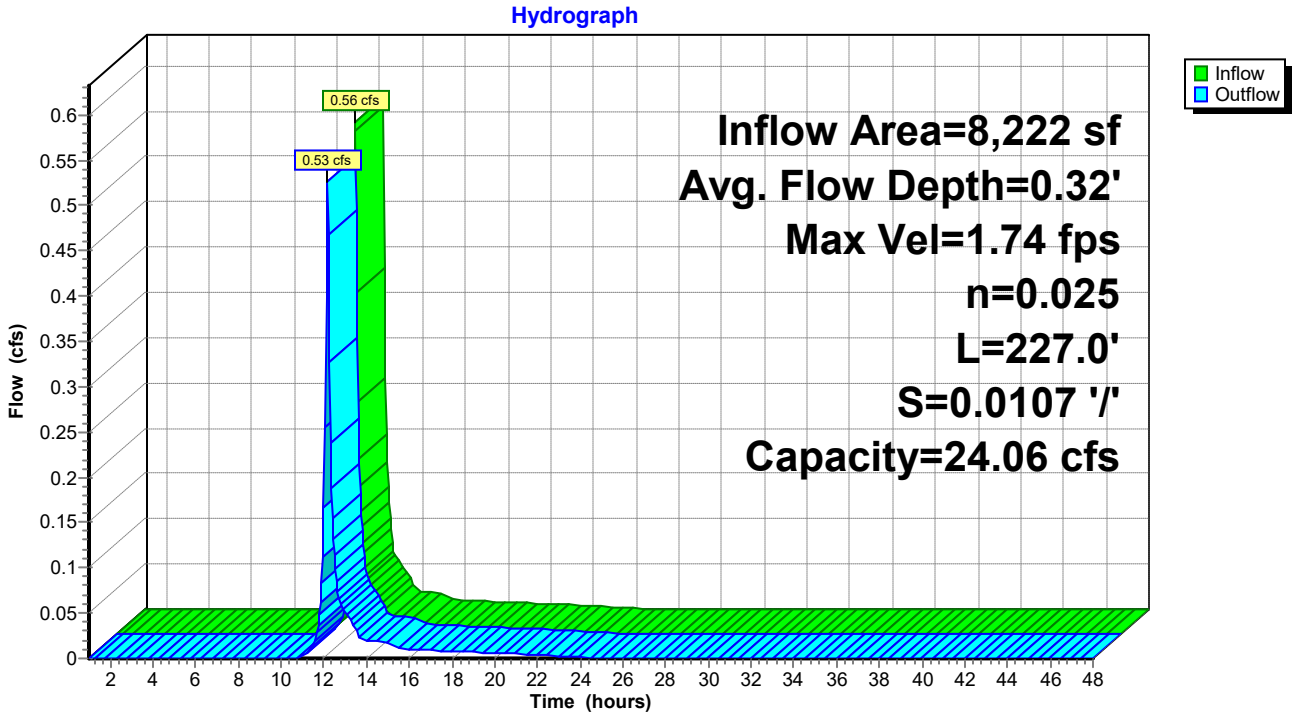
Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 1.74 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 0.64 fps, Avg. Travel Time= 5.9 min

Peak Storage= 69 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.32' , Surface Width= 1.90'
Bank-Full Depth= 1.33' Flow Area= 5.3 sf, Capacity= 24.06 cfs

0.00' x 1.33' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 7.98'
Length= 227.0' Slope= 0.0107 '/'
Inlet Invert= 751.54', Outlet Invert= 749.10'



Reach 151R: Western PL North Ditch



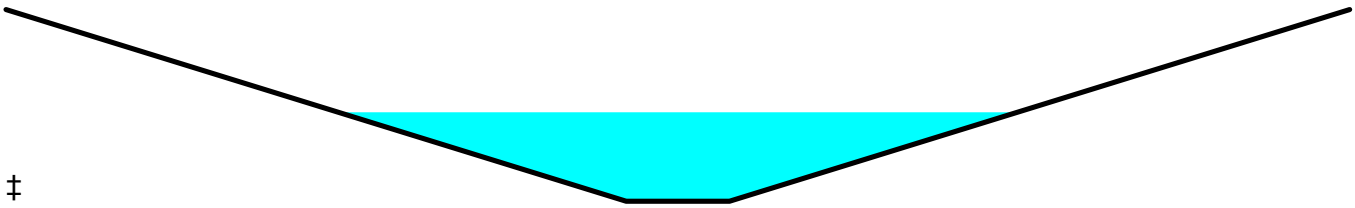
Summary for Reach 184R: Red Barn Lane East Swale

Inflow Area = 103,238 sf, 10.88% Impervious, Inflow Depth = 1.66" for 10-Year event
Inflow = 7.09 cfs @ 12.14 hrs, Volume= 14,322 cf
Outflow = 5.76 cfs @ 12.18 hrs, Volume= 14,322 cf, Atten= 19%, Lag= 2.9 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.27 fps, Min. Travel Time= 4.8 min
Avg. Velocity = 1.01 fps, Avg. Travel Time= 15.6 min

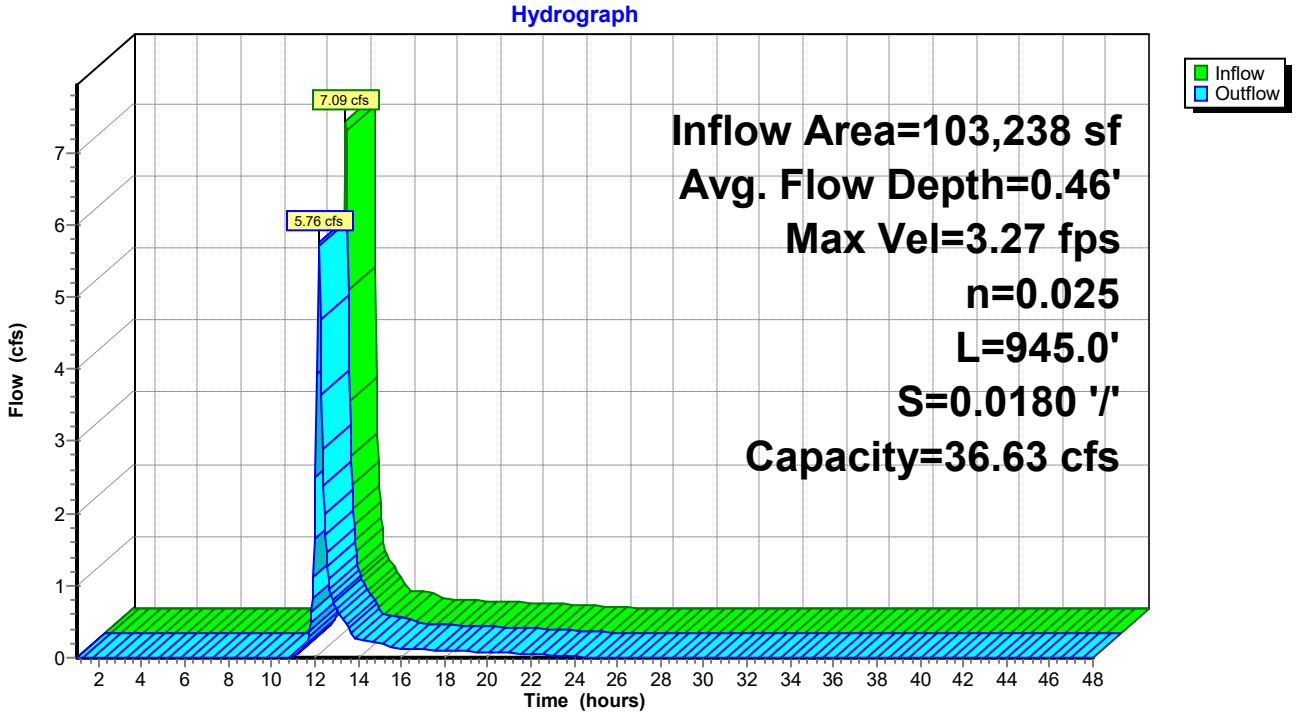
Peak Storage= 1,660 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.46' , Surface Width= 6.57'
Bank-Full Depth= 1.00' Flow Area= 7.0 sf, Capacity= 36.63 cfs

1.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 6.0 '/' Top Width= 13.00'
Length= 945.0' Slope= 0.0180 '/'
Inlet Invert= 763.00', Outlet Invert= 746.00'



‡

Reach 184R: Red Barn Lane East Swale



Summary for Pond 41P: Reach Pipe

Inflow Area = 806,202 sf, 39.20% Impervious, Inflow Depth = 0.04" for 10-Year event
Inflow = 1.07 cfs @ 12.17 hrs, Volume= 2,598 cf
Outflow = 1.07 cfs @ 12.18 hrs, Volume= 2,598 cf, Atten= 0%, Lag= 0.4 min
Primary = 1.07 cfs @ 12.18 hrs, Volume= 2,598 cf
Routed to Pond 154P : Southeast Basin

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 738.59' @ 12.18 hrs Surf.Area= 51 sf Storage= 12 cf

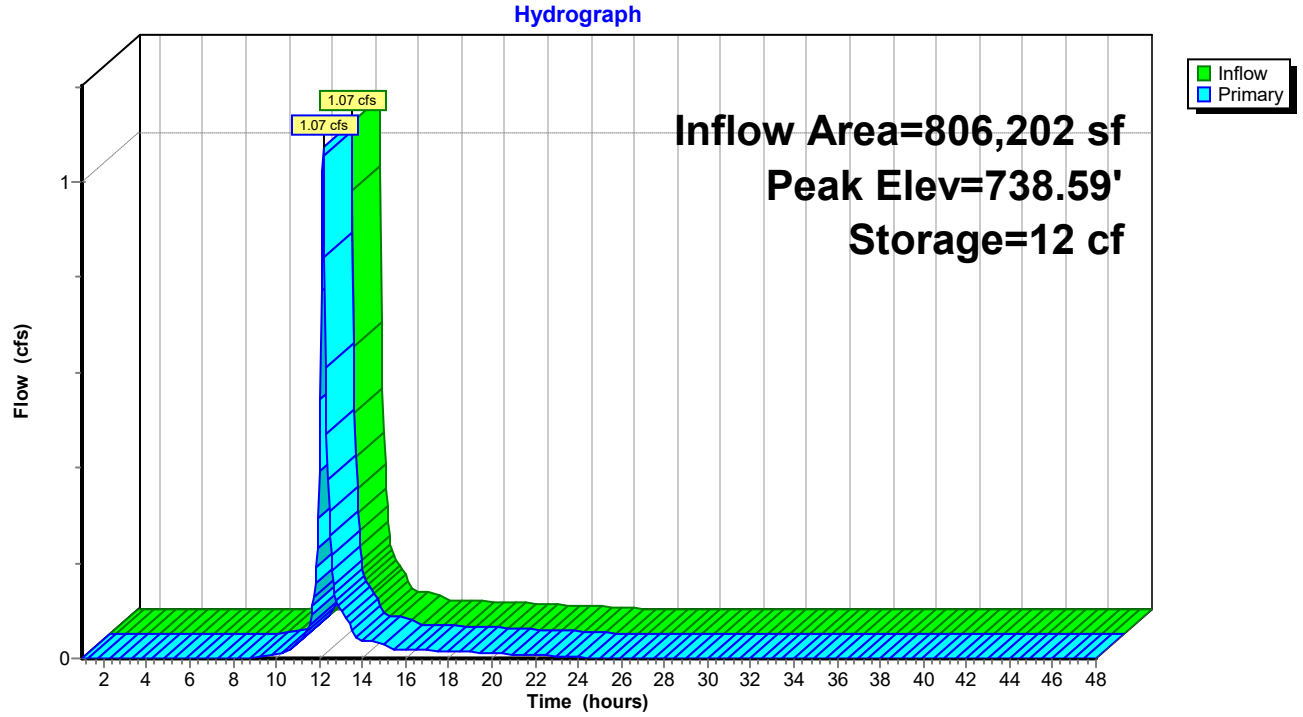
Plug-Flow detention time= 0.1 min calculated for 2,595 cf (100% of inflow)
Center-of-Mass det. time= 0.1 min (796.3 - 796.1)

Volume	Invert	Avail.Storage	Storage Description
#1	738.00'	1,587 cf	**24.0" Round Pipe Storage** L= 505.0' S= 0.0150 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	738.00'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.04 cfs @ 12.18 hrs HW=738.58' TW=730.52' (Dynamic Tailwater)
↳**1=Orifice/Grate** (Orifice Controls 1.04 cfs @ 2.59 fps)

Pond 41P: Reach Pipe



Summary for Pond 57P: Dry Pond 2

Inflow Area = 214,039 sf, 18.55% Impervious, Inflow Depth = 1.78" for 10-Year event
Inflow = 10.89 cfs @ 12.17 hrs, Volume= 31,736 cf
Outflow = 2.00 cfs @ 12.88 hrs, Volume= 31,736 cf, Atten= 82%, Lag= 43.2 min
Discarded = 2.00 cfs @ 12.88 hrs, Volume= 31,736 cf
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 41P : Reach Pipe
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Reach 117R : SC Road West Ditch

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 748.34' @ 12.88 hrs Surf.Area= 9,312 sf Storage= 11,113 cf

Plug-Flow detention time= 47.1 min calculated for 31,703 cf (100% of inflow)
Center-of-Mass det. time= 47.0 min (866.4 - 819.4)

Volume	Invert	Avail.Storage	Storage Description
#1	747.00'	55,955 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
747.00	7,300	0	0
748.00	8,788	8,044	8,044
749.00	10,334	9,561	17,605
750.00	11,935	11,135	28,740
751.00	13,594	12,765	41,504
752.00	15,308	14,451	55,955

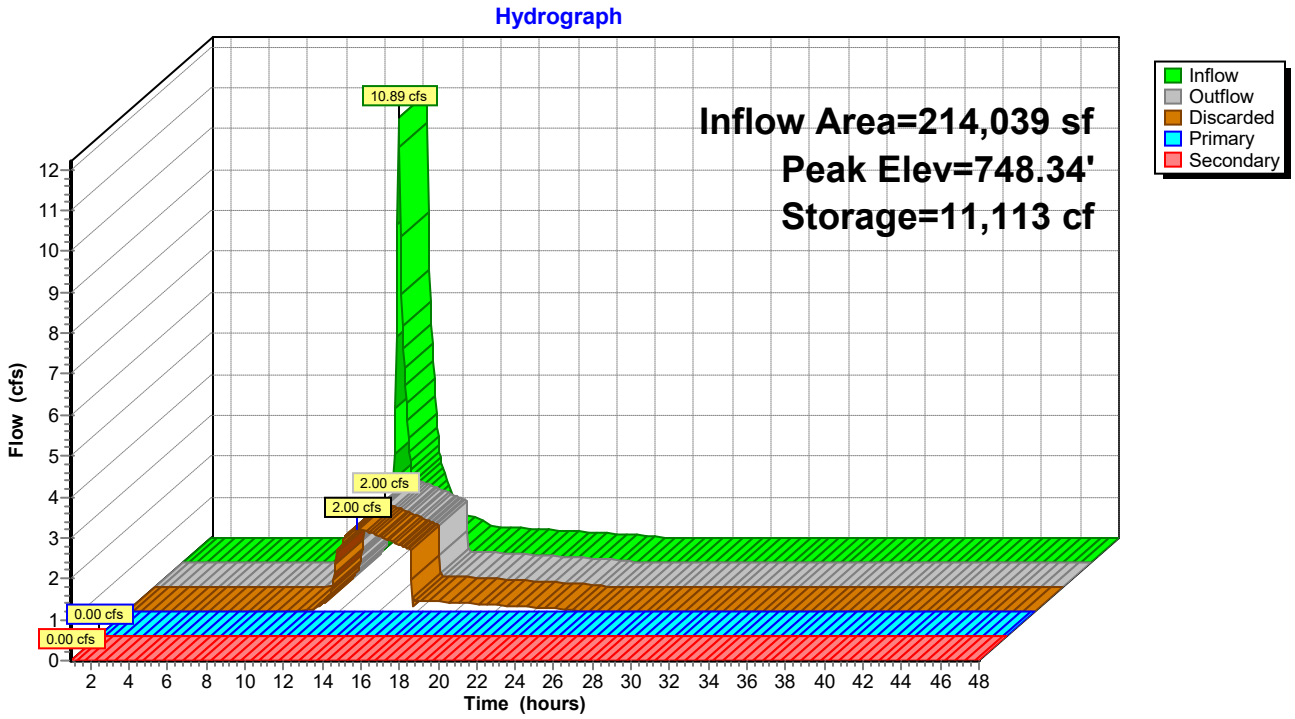
Device	Routing	Invert	Outlet Devices
#1	Primary	750.00'	**12.0" Round Culvert** L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 750.00' / 749.50' S= 0.0200 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#2	Device 1	750.33'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	751.66'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	750.44'	**12.0" Round Culvert** L= 214.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 750.44' / 750.01' S= 0.0020 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#5	Device 4	750.44'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Device 4	751.93'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#7	Discarded	747.00'	**8.880 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 720.00' Phase-In= 0.01'

Discarded OutFlow Max=2.00 cfs @ 12.88 hrs HW=748.34' (Free Discharge)
└**7=Exfiltration** (Controls 2.00 cfs)

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=747.00' TW=738.00' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)
  └**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=747.00' TW=747.00' (Dynamic Tailwater)
└**4=Culvert** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Pond 57P: Dry Pond 2



Summary for Pond 58P: Dry Pond 1

Inflow Area = 579,504 sf, 46.53% Impervious, Inflow Depth = 2.34" for 10-Year event
Inflow = 32.52 cfs @ 12.15 hrs, Volume= 112,765 cf
Outflow = 1.95 cfs @ 15.62 hrs, Volume= 112,765 cf, Atten= 94%, Lag= 208.5 min
Discarded = 1.95 cfs @ 15.62 hrs, Volume= 112,765 cf
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 101R : Reach Pipe DP1 TO MH
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 57P : Dry Pond 2

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 749.34' @ 15.62 hrs Surf.Area= 24,678 sf Storage= 49,958 cf

Plug-Flow detention time= 297.9 min calculated for 112,645 cf (100% of inflow)
Center-of-Mass det. time= 297.6 min (1,161.6 - 864.0)

Volume	Invert	Avail.Storage	Storage Description
#1	747.00'	197,389 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
747.00	17,995	0	0
748.00	20,805	19,400	19,400
749.00	23,672	22,239	41,639
750.00	26,595	25,134	66,772
751.00	29,575	28,085	94,857
752.00	32,612	31,094	125,951
753.00	35,705	34,159	160,109
754.00	38,855	37,280	197,389

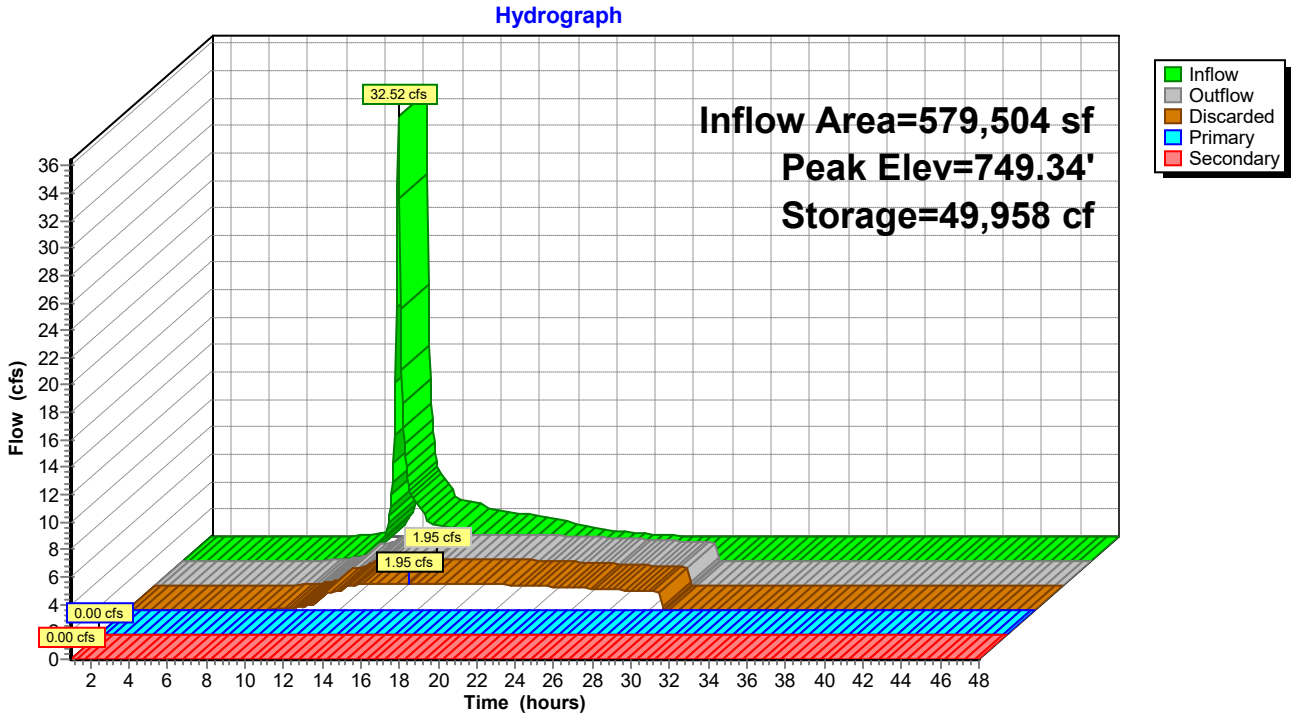
Device	Routing	Invert	Outlet Devices
#1	Primary	750.50'	**15.0" Round Culvert** L= 373.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 750.50' / 747.00' S= 0.0094 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf
#2	Device 1	752.91'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	752.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#4	Discarded	747.00'	**3.180 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 720.00' Phase-In= 0.01'

Discarded OutFlow Max=1.95 cfs @ 15.62 hrs HW=749.34' (Free Discharge)
└**4=Exfiltration** (Controls 1.95 cfs)

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=747.00' TW=750.50' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=747.00' TW=747.00' (Dynamic Tailwater)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 58P: Dry Pond 1



Summary for Pond 60P: Infiltration Basin #1

Inflow Area = 294,617 sf, 23.08% Impervious, Inflow Depth = 1.89" for 10-Year event
Inflow = 16.73 cfs @ 12.18 hrs, Volume= 46,280 cf
Outflow = 2.12 cfs @ 12.95 hrs, Volume= 46,280 cf, Atten= 87%, Lag= 46.3 min
Discarded = 2.12 cfs @ 12.95 hrs, Volume= 46,280 cf
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 95P : Dry Pond 3
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Reach 136R : SC West Ditch

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 741.96' @ 12.95 hrs Surf.Area= 14,848 sf Storage= 19,944 cf

Plug-Flow detention time= 88.5 min calculated for 46,231 cf (100% of inflow)
Center-of-Mass det. time= 88.4 min (894.9 - 806.5)

Volume	Invert	Avail.Storage	Storage Description
#1	740.50'	73,217 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
740.50	12,516	0	0
741.00	13,294	6,453	6,453
742.00	14,915	14,105	20,557
743.00	16,625	15,770	36,327
744.00	18,423	17,524	53,851
745.00	20,309	19,366	73,217

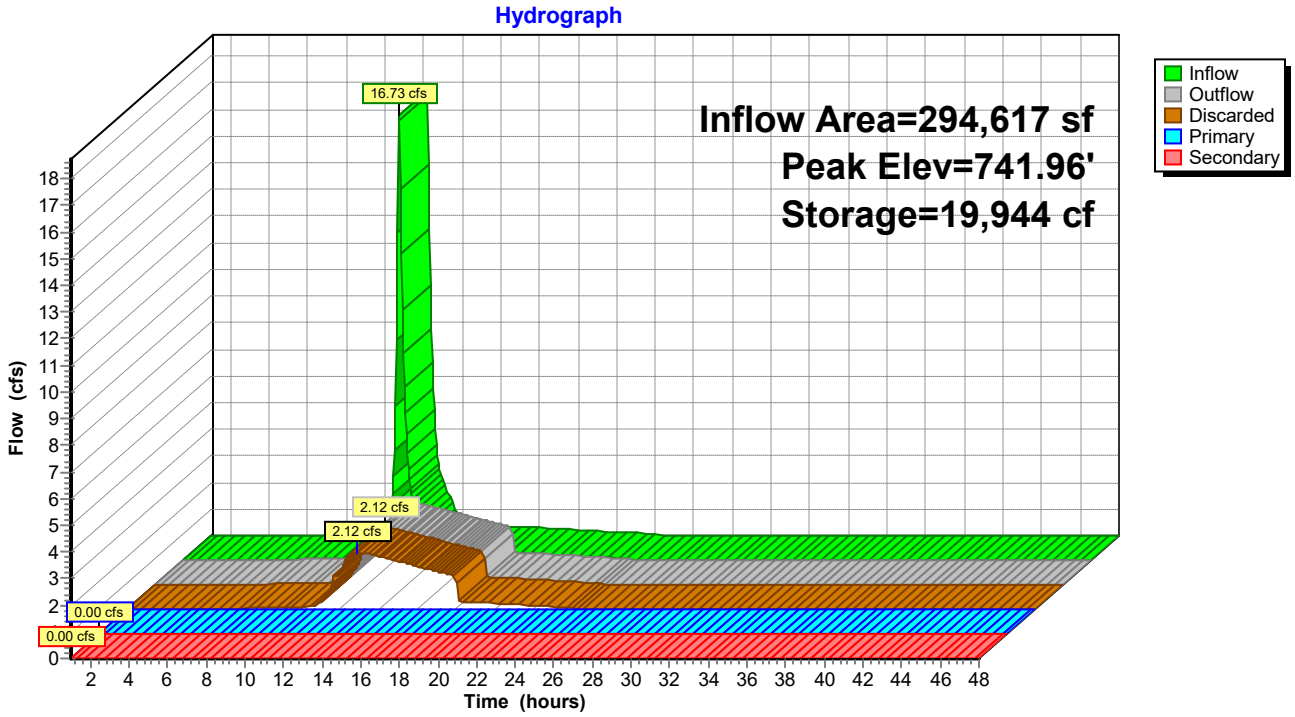
Device	Routing	Invert	Outlet Devices
#1	Primary	742.00'	**12.0" Round Culvert** L= 205.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 742.00' / 741.00' S= 0.0049 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	744.75'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#3	Discarded	740.50'	**4.320 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 737.40' Phase-In= 0.01'

Discarded OutFlow Max=2.12 cfs @ 12.95 hrs HW=741.96' (Free Discharge)
3=Exfiltration (Controls 2.12 cfs)

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=740.50' TW=739.00' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=740.50' TW=743.75' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 60P: Infiltration Basin #1



Summary for Pond 95P: Dry Pond 3

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 432,925 sf, 29.66% Impervious, Inflow Depth = 0.72" for 10-Year event
Inflow = 11.37 cfs @ 12.16 hrs, Volume= 26,134 cf
Outflow = 3.96 cfs @ 12.37 hrs, Volume= 26,134 cf, Atten= 65%, Lag= 12.7 min
Discarded = 3.96 cfs @ 12.37 hrs, Volume= 26,134 cf
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 154P : Southeast Basin
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 154P : Southeast Basin

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 739.51' @ 12.37 hrs Surf.Area= 0.240 ac Storage= 0.118 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 7.4 min (809.5 - 802.1)

Volume	Invert	Avail.Storage	Storage Description
#1	739.00'	1.214 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
739.00	0.220	0.000	0.000
740.00	0.260	0.240	0.240
741.00	0.302	0.281	0.521
742.00	0.346	0.324	0.845
743.00	0.392	0.369	1.214

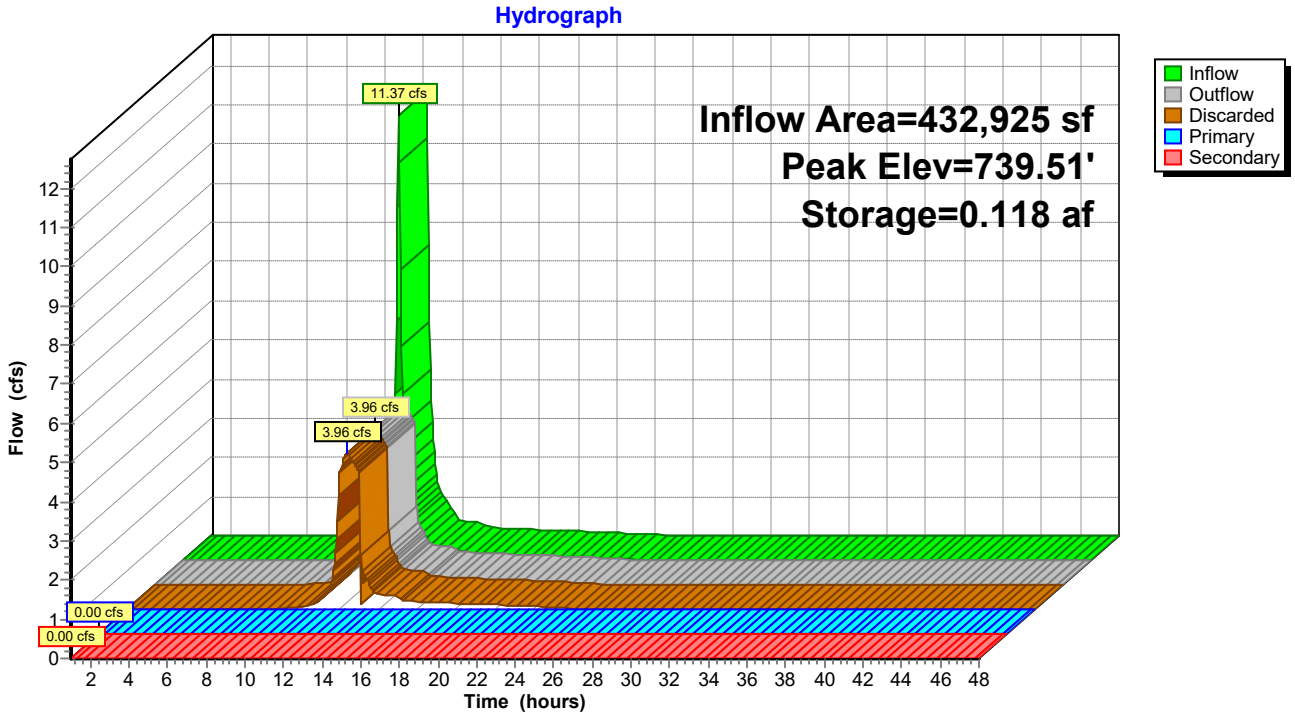
Device	Routing	Invert	Outlet Devices
#1	Primary	741.00'	**6.0" Round Culvert** L= 84.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 741.00' / 738.00' S= 0.0357 '/' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#2	Secondary	742.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Discarded	739.00'	**15.720 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 726.55' Phase-In= 0.01'

Discarded OutFlow Max=3.96 cfs @ 12.37 hrs HW=739.51' (Free Discharge)
└**3=Exfiltration** (Controls 3.96 cfs)

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=739.00' TW=730.00' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=739.00' TW=730.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 95P: Dry Pond 3



Summary for Pond 101R: Reach Pipe DP1 TO MH

3/2/21
Reach Pipe 4

[57] Hint: Peaked at 750.50' (Flood elevation advised)

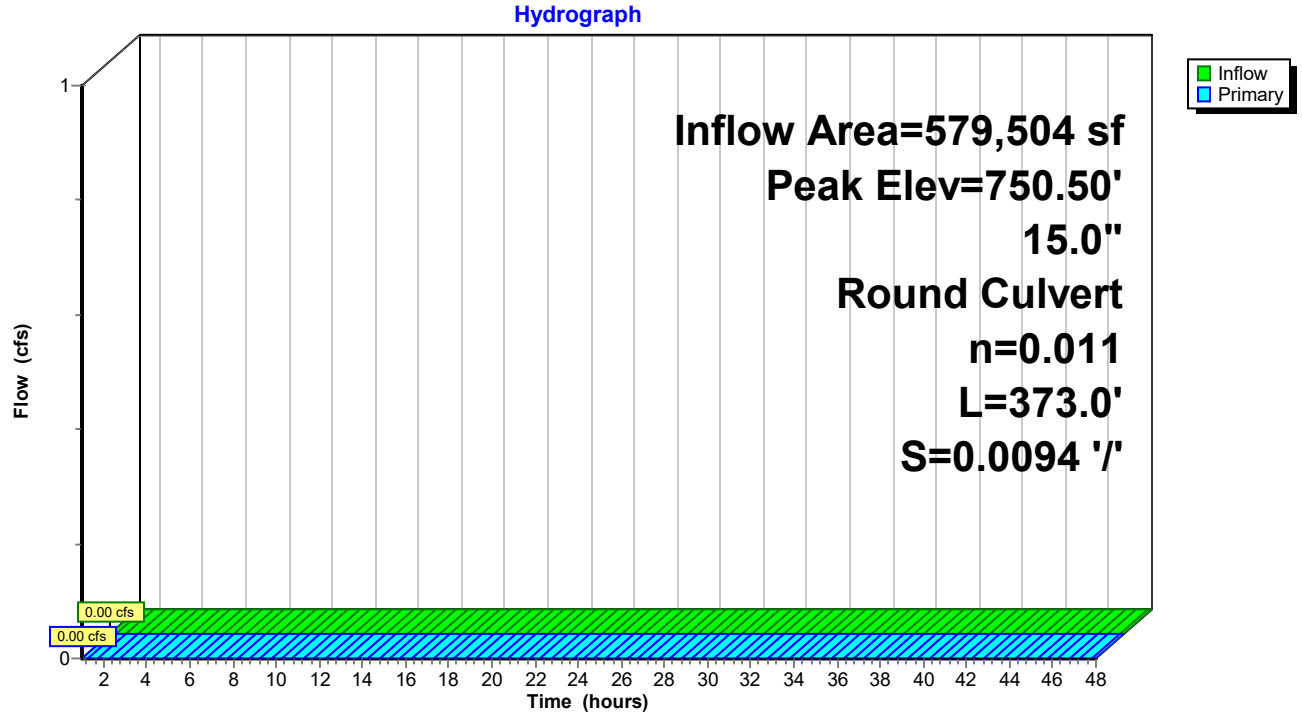
Inflow Area = 579,504 sf, 46.53% Impervious, Inflow Depth = 0.00" for 10-Year event
Inflow = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 1.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 41P : Reach Pipe

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 750.50' @ 1.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	750.50'	**15.0" Round Culvert** L= 373.0' Ke= 0.500 Inlet / Outlet Invert= 750.50' / 747.00' S= 0.0094 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=750.50' TW=738.00' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.00 cfs)

Pond 101R: Reach Pipe DP1 TO MH



Summary for Pond 110R: Western Pipe Run

3/3/21
Pipe that cuts through western exterior courtyard to collect ditch north of west building and northern portion of west building roof and conveys to DP1

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[57] Hint: Peaked at 746.78' (Flood elevation advised)

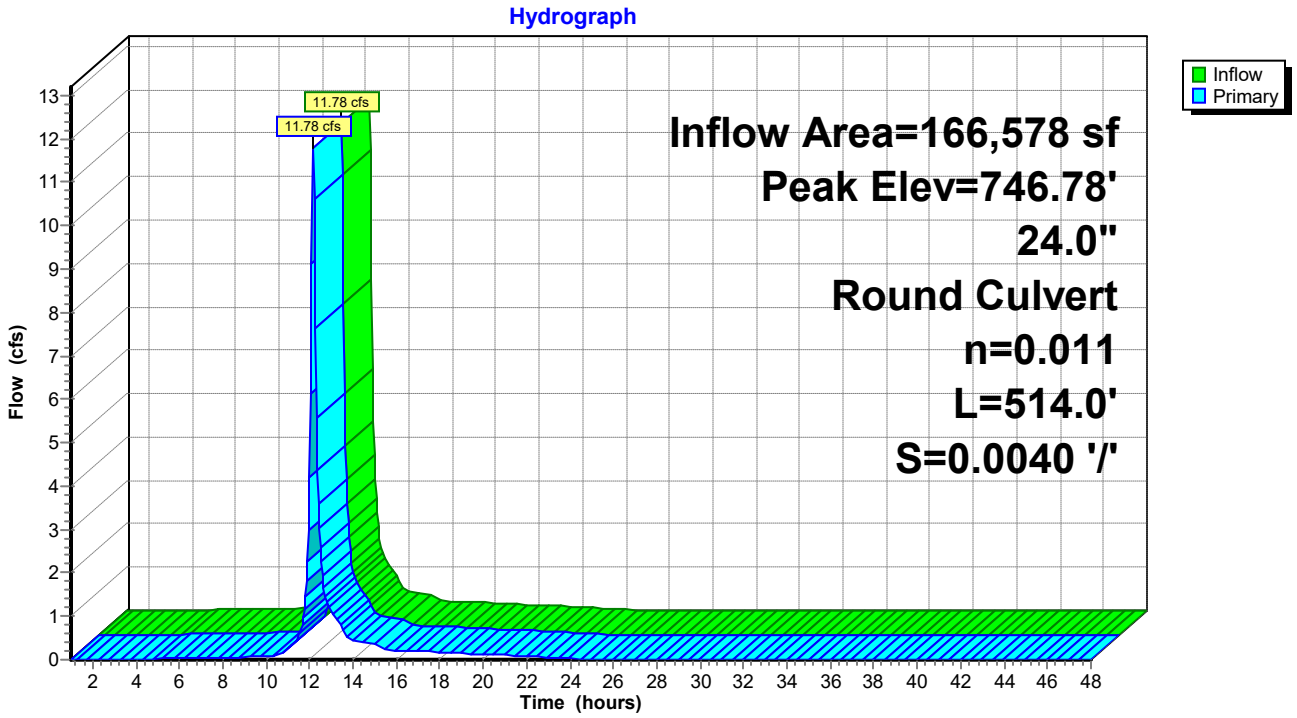
Inflow Area = 166,578 sf, 27.50% Impervious, Inflow Depth = 2.00" for 10-Year event
Inflow = 11.78 cfs @ 12.16 hrs, Volume= 27,800 cf
Outflow = 11.78 cfs @ 12.16 hrs, Volume= 27,800 cf, Atten= 0%, Lag= 0.0 min
Primary = 11.78 cfs @ 12.16 hrs, Volume= 27,800 cf
Routed to Pond 60P : Infiltration Basin #1

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 746.78' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	745.06'	**24.0" Round Culvert** L= 514.0' Ke= 0.500 Inlet / Outlet Invert= 745.06' / 743.00' S= 0.0040 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf

Primary OutFlow Max=11.49 cfs @ 12.16 hrs HW=746.75' TW=741.06' (Dynamic Tailwater)
↳**1=Culvert** (Barrel Controls 11.49 cfs @ 5.47 fps)

Pond 110R: Western Pipe Run



Summary for Pond 127P: B3 OVERSIZED PIPE RUN (24" W/15" ORIFICE)

3/3/21
Pipe that cuts through western exterior courtyard to collect ditch north of west building and northern portion of west building roof and conveys to DP1

Inflow Area = 40,670 sf, 35.10% Impervious, Inflow Depth = 2.10" for 10-Year event
Inflow = 3.43 cfs @ 12.13 hrs, Volume= 7,126 cf
Outflow = 3.38 cfs @ 12.15 hrs, Volume= 7,126 cf, Atten= 2%, Lag= 0.8 min
Primary = 3.38 cfs @ 12.15 hrs, Volume= 7,126 cf
Routed to Link 128L : FROM OVERSIZED PIPE RUN

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 752.08' @ 12.15 hrs Surf.Area= 264 sf Storage= 162 cf

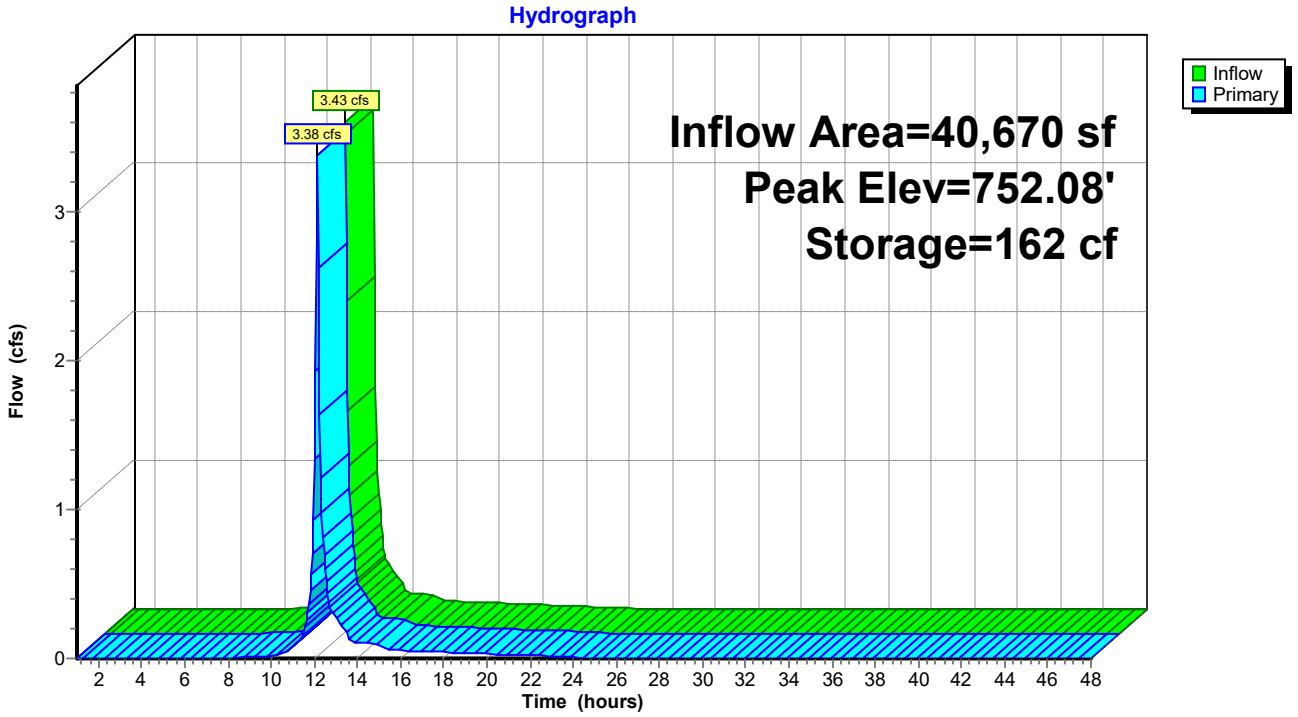
Plug-Flow detention time= 0.6 min calculated for 7,119 cf (100% of inflow)
Center-of-Mass det. time= 0.6 min (798.7 - 798.1)

Volume	Invert	Avail.Storage	Storage Description
#1	751.12'	424 cf	**24.0" Round Pipe Storage** L= 135.0' S= 0.0022 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	751.12'	**15.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.33 cfs @ 12.15 hrs HW=752.07' TW=0.00' (Dynamic Tailwater)
↑└**1=Orifice/Grate** (Orifice Controls 3.33 cfs @ 3.32 fps)

Pond 127P: B3 OVERSIZED PIPE RUN (24" W/15" ORIFICE)



Summary for Pond 129P: STORMTECH FROM ADS

Inflow Area = 194,230 sf, 70.09% Impervious, Inflow Depth = 2.87" for 10-Year event
Inflow = 19.27 cfs @ 12.13 hrs, Volume= 46,436 cf
Outflow = 1.70 cfs @ 12.86 hrs, Volume= 46,285 cf, Atten= 91%, Lag= 43.9 min
Primary = 1.70 cfs @ 12.86 hrs, Volume= 46,285 cf
Routed to Pond 58P : Dry Pond 1

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 753.13' @ 12.86 hrs Surf.Area= 19,777 sf Storage= 25,019 cf

Plug-Flow detention time= 177.8 min calculated for 46,236 cf (100% of inflow)
Center-of-Mass det. time= 176.8 min (947.6 - 770.8)

Volume	Invert	Avail.Storage	Storage Description
#1B	751.25'	27,133 cf	**115.92'W x 170.61'L x 5.50'H Field B** 108,771 cf Overall - 40,939 cf Embedded = 67,832 cf x 40.0% Voids
#2B	752.00'	40,939 cf	**ADS_StormTech MC-3500 d +Cap** x 368 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 368 Chambers in 16 Rows Cap Storage= 14.9 cf x 2 x 16 rows = 476.8 cf
		68,072 cf	Total Available Storage

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	751.25'	**10.0" Round Culvert X 2.00** L= 200.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 751.25' / 750.65' S= 0.0030 '/' Cc= 0.900 n= 0.011, Flow Area= 0.55 sf
#2	Device 1	751.25'	**5.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.70 cfs @ 12.86 hrs HW=753.13' TW=748.96' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 1.70 cfs of 4.06 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 1.70 cfs @ 6.22 fps)

Pond 129P: STORMTECH FROM ADS - Chamber Wizard Field B

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= 14.9 cf x 2 x 16 rows = 476.8 cf

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

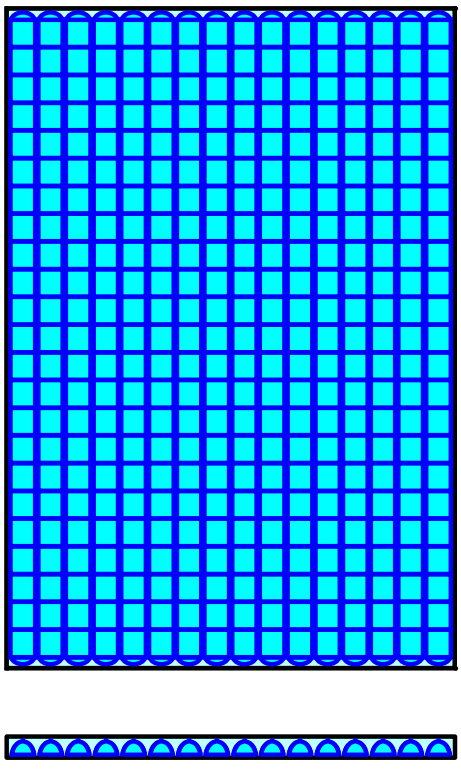
23 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 168.61' Row Length +12.0" End Stone x 2 = 170.61' Base Length
16 Rows x 77.0" Wide + 9.0" Spacing x 15 + 12.0" Side Stone x 2 = 115.92' Base Width
9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

368 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 16 Rows = 40,939.1 cf Chamber Storage

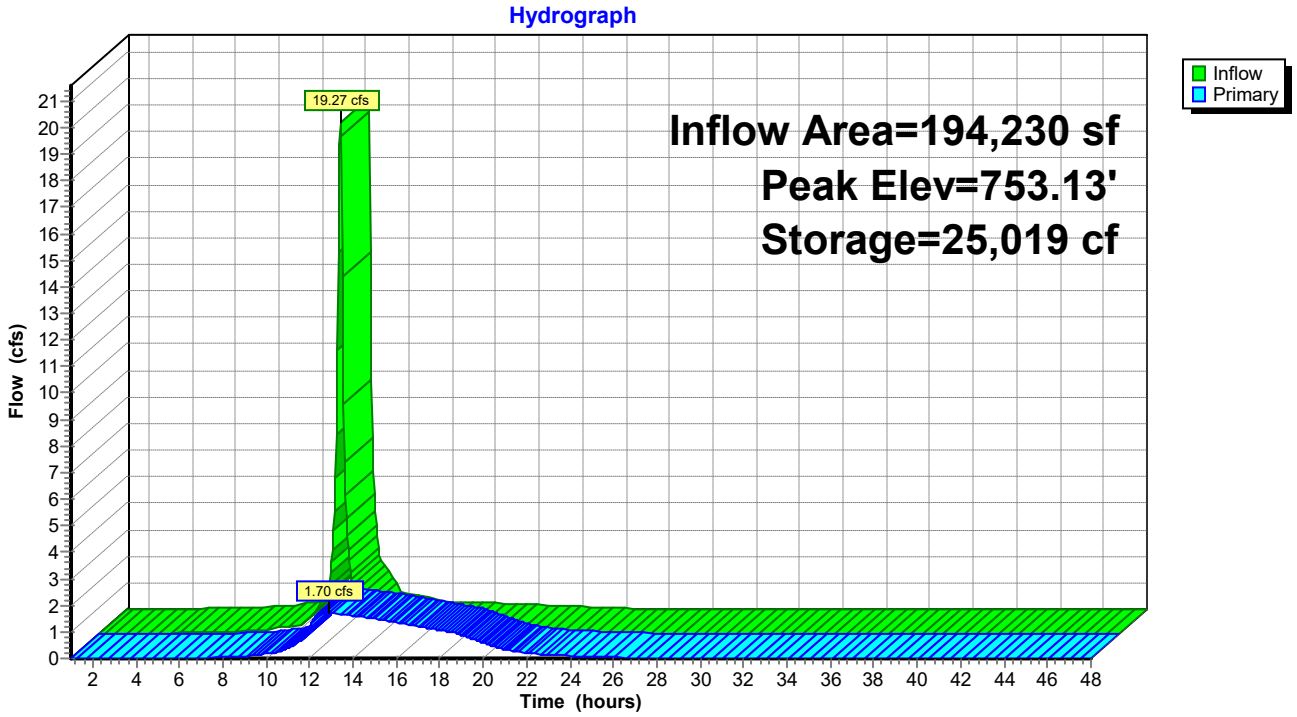
108,771.0 cf Field - 40,939.1 cf Chambers = 67,831.9 cf Stone x 40.0% Voids = 27,132.7 cf Stone Storage

Chamber Storage + Stone Storage = 68,071.9 cf = 1.563 af
Overall Storage Efficiency = 62.6%
Overall System Size = 170.61' x 115.92' x 5.50'

368 Chambers
4,028.6 cy Field
2,512.3 cy Stone



Pond 129P: STORMTECH FROM ADS



Summary for Pond 133P: WEST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

3/3/21
Pipe that cuts through western exterior courtyard to collect ditch north of west building and northern portion of west building roof and conveys to DP1

Inflow Area = 48,160 sf, 58.41% Impervious, Inflow Depth = 2.57" for 10-Year event
Inflow = 4.86 cfs @ 12.13 hrs, Volume= 10,312 cf
Outflow = 4.67 cfs @ 12.15 hrs, Volume= 10,312 cf, Atten= 4%, Lag= 1.0 min
Primary = 4.67 cfs @ 12.15 hrs, Volume= 10,312 cf
Routed to Link 134L : TO UG

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 756.15' @ 12.15 hrs Surf.Area= 317 sf Storage= 266 cf

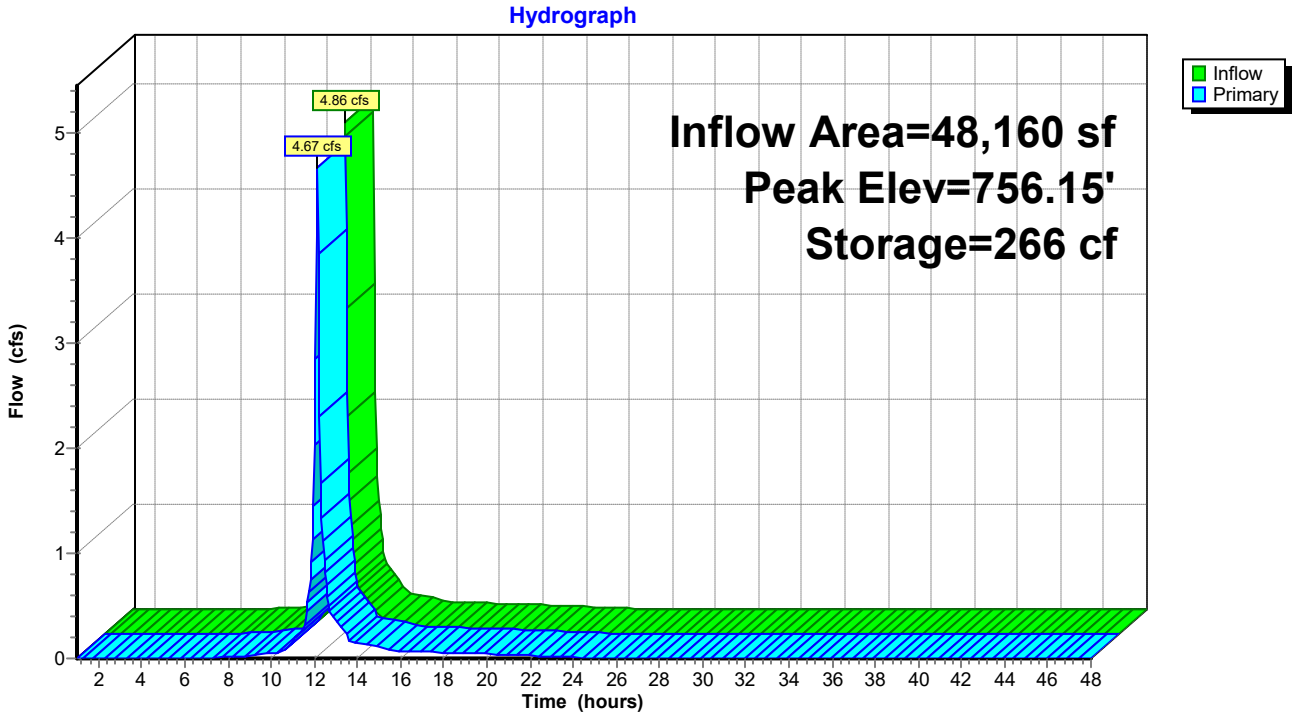
Plug-Flow detention time= 0.6 min calculated for 10,301 cf (100% of inflow)
Center-of-Mass det. time= 0.6 min (786.8 - 786.2)

Volume	Invert	Avail.Storage	Storage Description
#1	754.90'	503 cf	**24.0" Round Pipe Storage** L= 160.0' S= 0.0025 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	754.90'	**15.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.64 cfs @ 12.15 hrs HW=756.14' TW=0.00' (Dynamic Tailwater)
↑—**1=Orifice/Grate** (Orifice Controls 4.64 cfs @ 3.79 fps)

Pond 133P: WEST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)



Summary for Pond 154P: Southeast Basin

Inflow Area = 1,278,750 sf, 34.76% Impervious, Inflow Depth = 0.07" for 10-Year event
Inflow = 3.37 cfs @ 12.15 hrs, Volume= 7,414 cf
Outflow = 0.15 cfs @ 13.63 hrs, Volume= 7,416 cf, Atten= 96%, Lag= 88.8 min
Discarded = 0.15 cfs @ 13.63 hrs, Volume= 7,416 cf

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 730.87' @ 13.63 hrs Surf.Area= 7,373 sf Storage= 4,401 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 340.5 min (1,152.7 - 812.2)

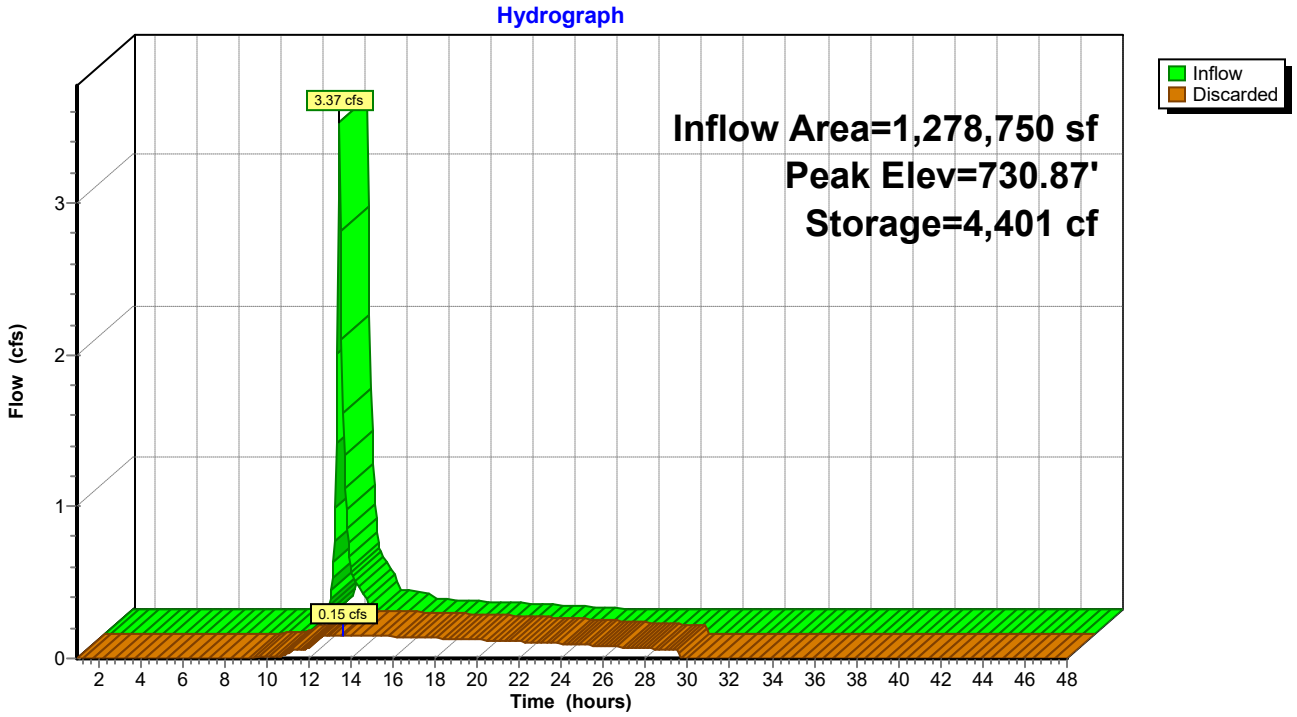
Volume	Invert	Avail.Storage	Storage Description
#1	730.00'	273,743 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
730.00	2,768	0	0
731.00	8,073	5,421	5,421
732.00	12,399	10,236	15,657
733.00	17,056	14,728	30,384
734.00	21,328	19,192	49,576
735.00	25,607	23,468	73,044
736.00	29,845	27,726	100,770
737.00	35,145	32,495	133,265
738.00	42,680	38,913	172,177
739.00	51,064	46,872	219,049
740.00	58,323	54,694	273,743

Device	Routing	Invert	Outlet Devices
#1	Discarded	730.00'	**0.840 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 720.00'

Discarded OutFlow Max=0.15 cfs @ 13.63 hrs HW=730.87' (Free Discharge)
↑**1=Exfiltration** (Controls 0.15 cfs)

Pond 154P: Southeast Basin



Summary for Pond 174P: EAST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

3/3/21
Pipe that cuts through western exterior courtyard to collect ditch north of west building and northern portion of west building roof and conveys to DP1

Inflow Area = 20,605 sf, 59.42% Impervious, Inflow Depth = 2.62" for 10-Year event
Inflow = 2.11 cfs @ 12.13 hrs, Volume= 4,493 cf
Outflow = 2.07 cfs @ 12.15 hrs, Volume= 4,493 cf, Atten= 2%, Lag= 0.9 min
Primary = 2.07 cfs @ 12.15 hrs, Volume= 4,493 cf
Routed to Link 175L : TO UG

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 755.61' @ 12.14 hrs Surf.Area= 276 sf Storage= 102 cf

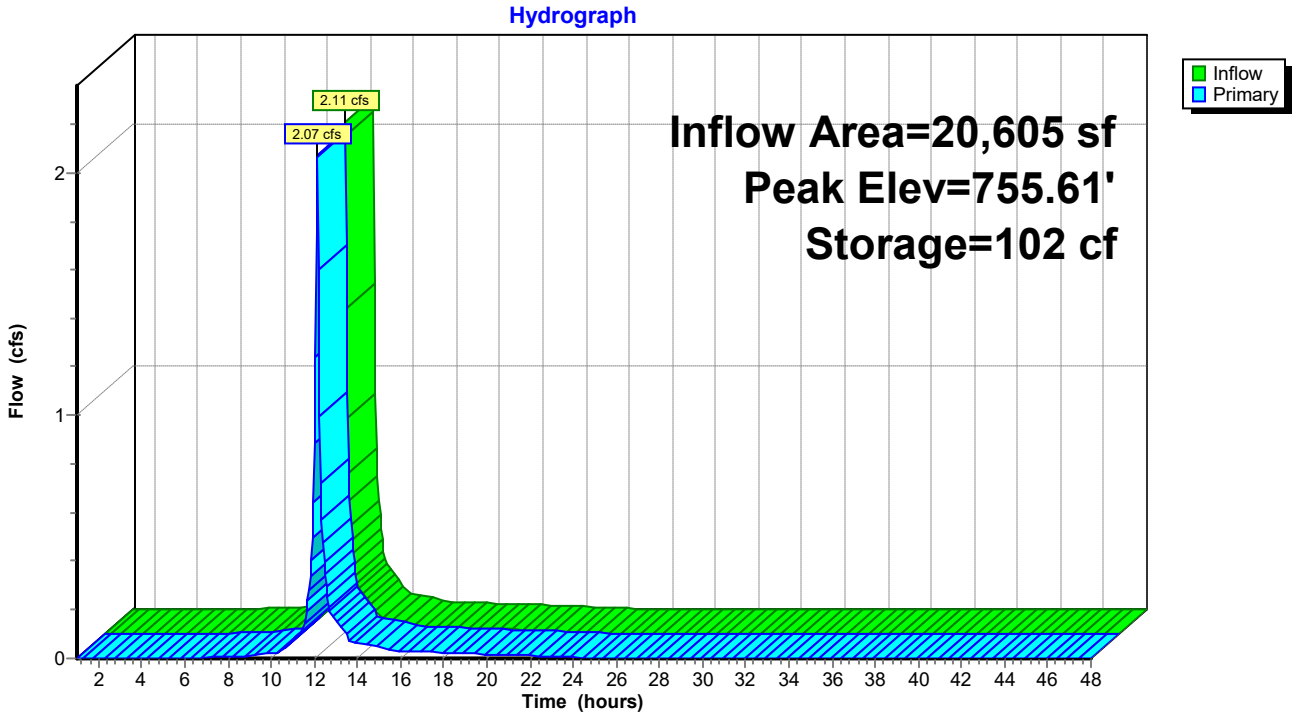
Plug-Flow detention time= 0.5 min calculated for 4,488 cf (100% of inflow)
Center-of-Mass det. time= 0.5 min (784.9 - 784.4)

Volume	Invert	Avail.Storage	Storage Description
#1	754.90'	503 cf	**24.0" Round Pipe Storage** L= 160.0' S= 0.0025 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	754.90'	**15.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.03 cfs @ 12.15 hrs HW=755.60' TW=0.00' (Dynamic Tailwater)
↑—**1=Orifice/Grate** (Orifice Controls 2.03 cfs @ 2.86 fps)

Pond 174P: EAST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)



Summary for Pond 183P: 24" HDPE PIPE

[57] Hint: Peaked at 749.92' (Flood elevation advised)

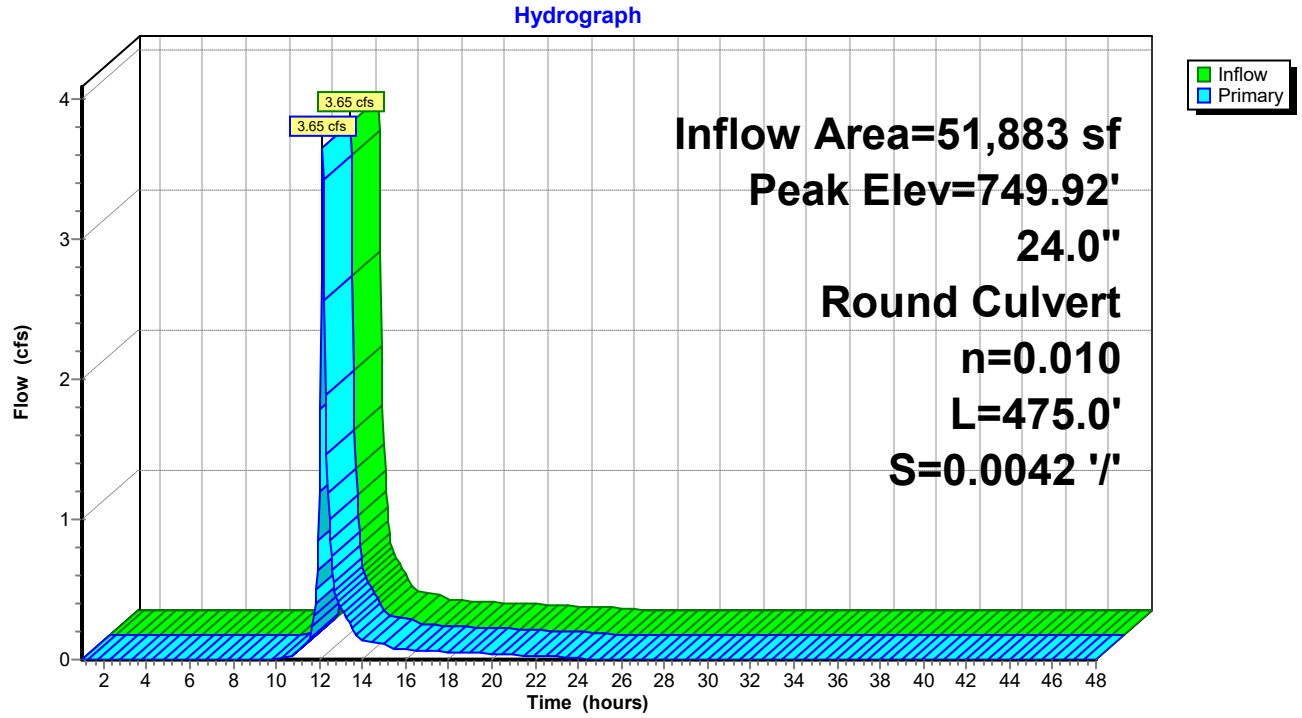
Inflow Area = 51,883 sf, 28.33% Impervious, Inflow Depth = 1.94" for 10-Year event
Inflow = 3.65 cfs @ 12.17 hrs, Volume= 8,368 cf
Outflow = 3.65 cfs @ 12.17 hrs, Volume= 8,368 cf, Atten= 0%, Lag= 0.0 min
Primary = 3.65 cfs @ 12.17 hrs, Volume= 8,368 cf
Routed to Pond 57P : Dry Pond 2

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 749.92' @ 12.17 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	749.00'	**24.0" Round Culvert** L= 475.0' Ke= 0.900 Inlet / Outlet Invert= 749.00' / 747.00' S= 0.0042 '/' Cc= 0.900 n= 0.010, Flow Area= 3.14 sf

Primary OutFlow Max=3.53 cfs @ 12.17 hrs HW=749.90' TW=747.52' (Dynamic Tailwater)
1=Culvert (Inlet Controls 3.53 cfs @ 2.56 fps)

Pond 183P: 24" HDPE PIPE

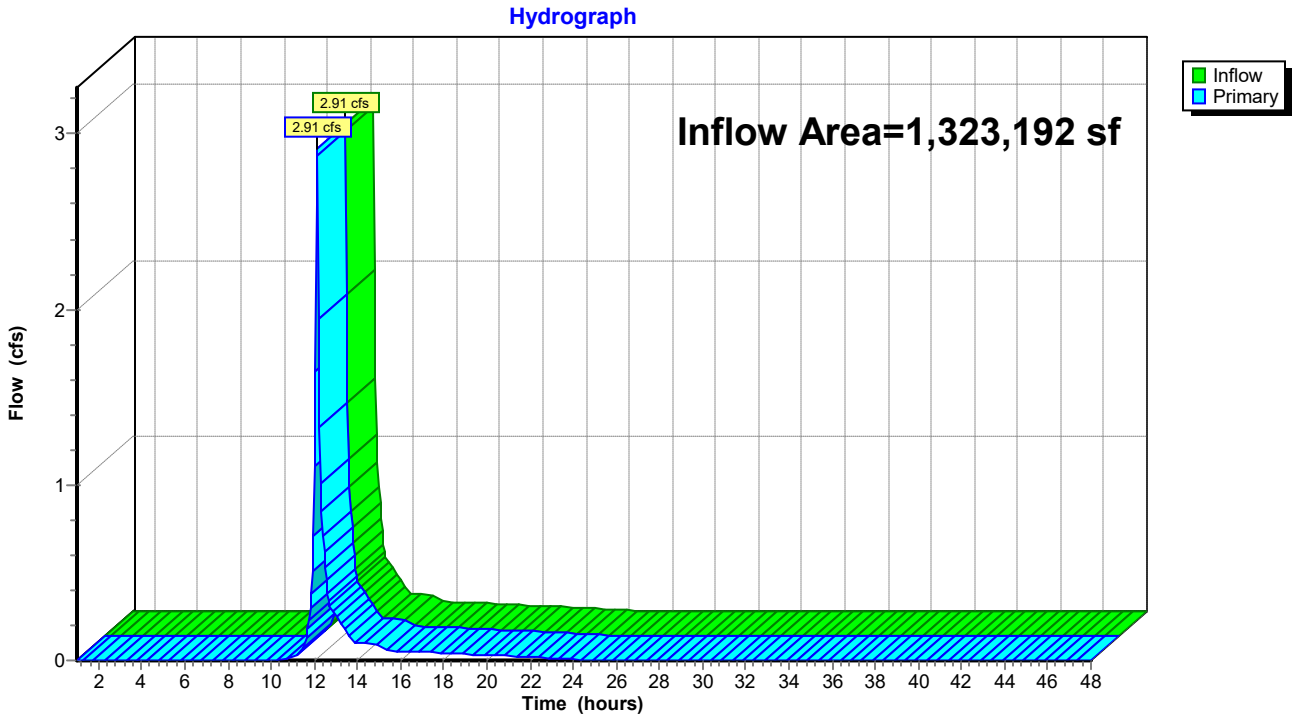


Summary for Link 48L: TOTAL OUTFALL

Inflow Area = 1,323,192 sf, 33.86% Impervious, Inflow Depth = 0.05" for 10-Year event
Inflow = 2.91 cfs @ 12.14 hrs, Volume= 5,892 cf
Primary = 2.91 cfs @ 12.14 hrs, Volume= 5,892 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 48L: TOTAL OUTFALL

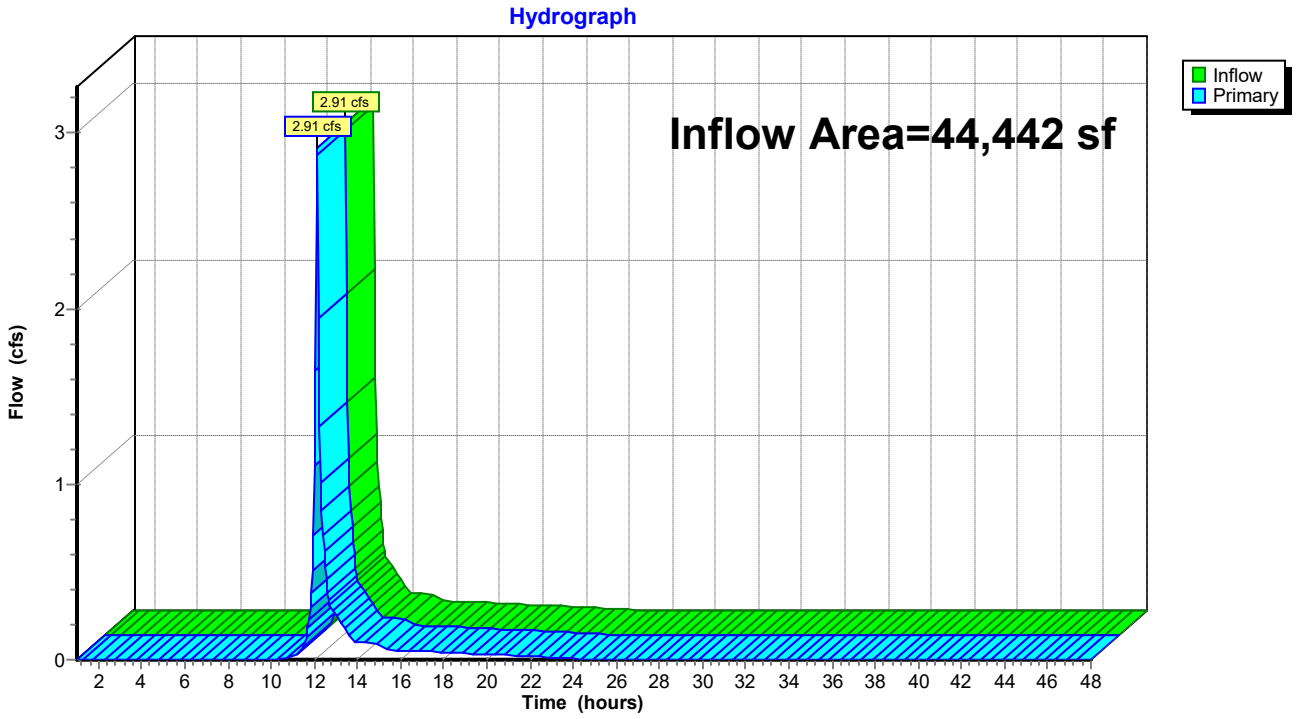


Summary for Link 66L: Total Offsite

Inflow Area = 44,442 sf, 7.89% Impervious, Inflow Depth = 1.59" for 10-Year event
Inflow = 2.91 cfs @ 12.14 hrs, Volume= 5,892 cf
Primary = 2.91 cfs @ 12.14 hrs, Volume= 5,892 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 48L : TOTAL OUTFALL

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 66L: Total Offsite

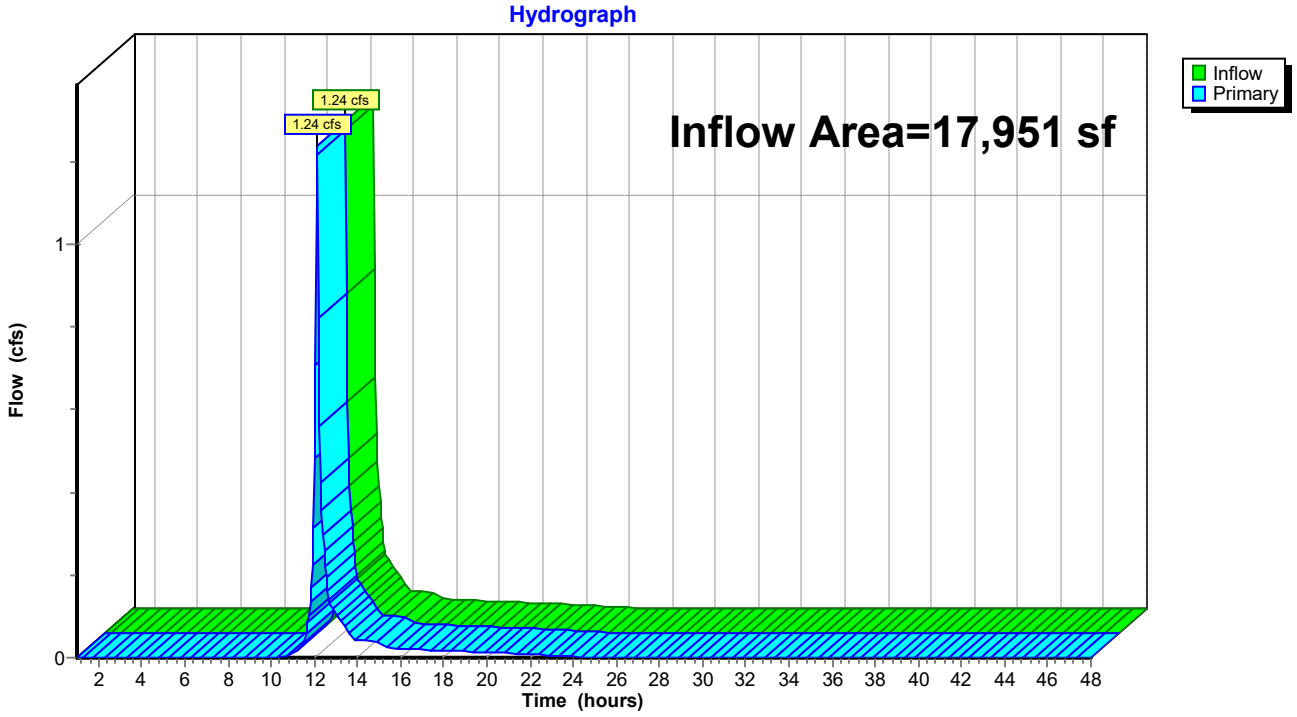


Summary for Link 115L: EX. Cul-de-sac On Green Meadow Place

Inflow Area = 17,951 sf, 11.95% Impervious, Inflow Depth = 1.67" for 10-Year event
Inflow = 1.24 cfs @ 12.14 hrs, Volume= 2,498 cf
Primary = 1.24 cfs @ 12.14 hrs, Volume= 2,498 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 66L : Total Offsite

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 115L: EX. Cul-de-sac On Green Meadow Place

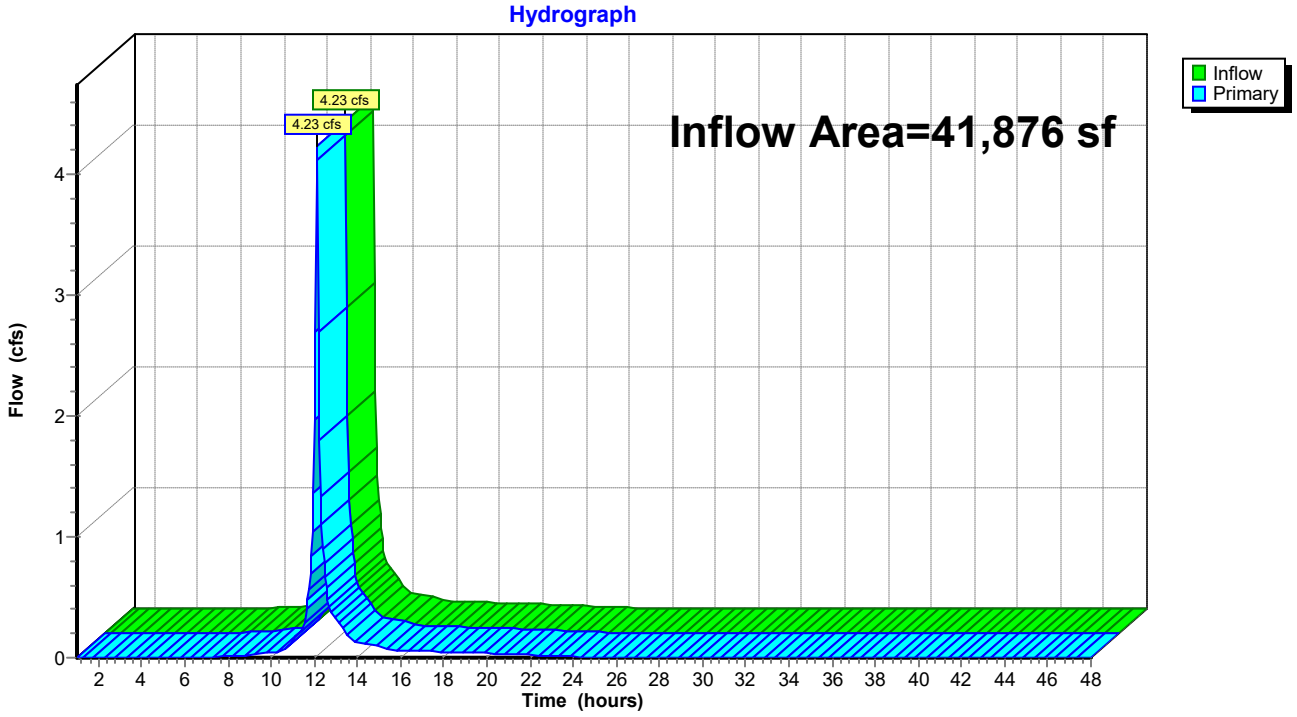


Summary for Link 124L: TO 12" PRIOR TO 24" (WEST)

Inflow Area = 41,876 sf, 58.23% Impervious, Inflow Depth = 2.57" for 10-Year event
Inflow = 4.23 cfs @ 12.13 hrs, Volume= 8,959 cf
Primary = 4.23 cfs @ 12.13 hrs, Volume= 8,959 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 133P : WEST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 124L: TO 12" PRIOR TO 24" (WEST)

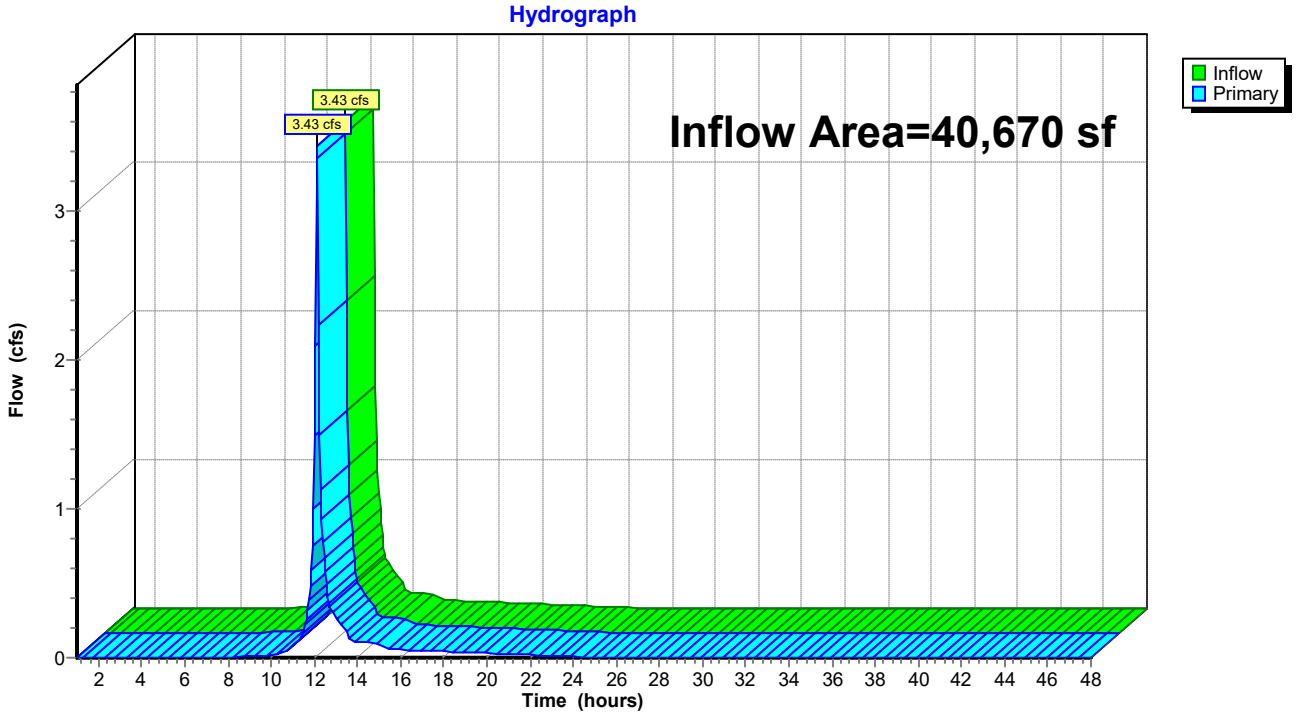


Summary for Link 126L: OVERSIZED PIPE RUN BY B3

Inflow Area = 40,670 sf, 35.10% Impervious, Inflow Depth = 2.10" for 10-Year event
Inflow = 3.43 cfs @ 12.13 hrs, Volume= 7,126 cf
Primary = 3.43 cfs @ 12.13 hrs, Volume= 7,126 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 127P : B3 OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 126L: OVERSIZED PIPE RUN BY B3

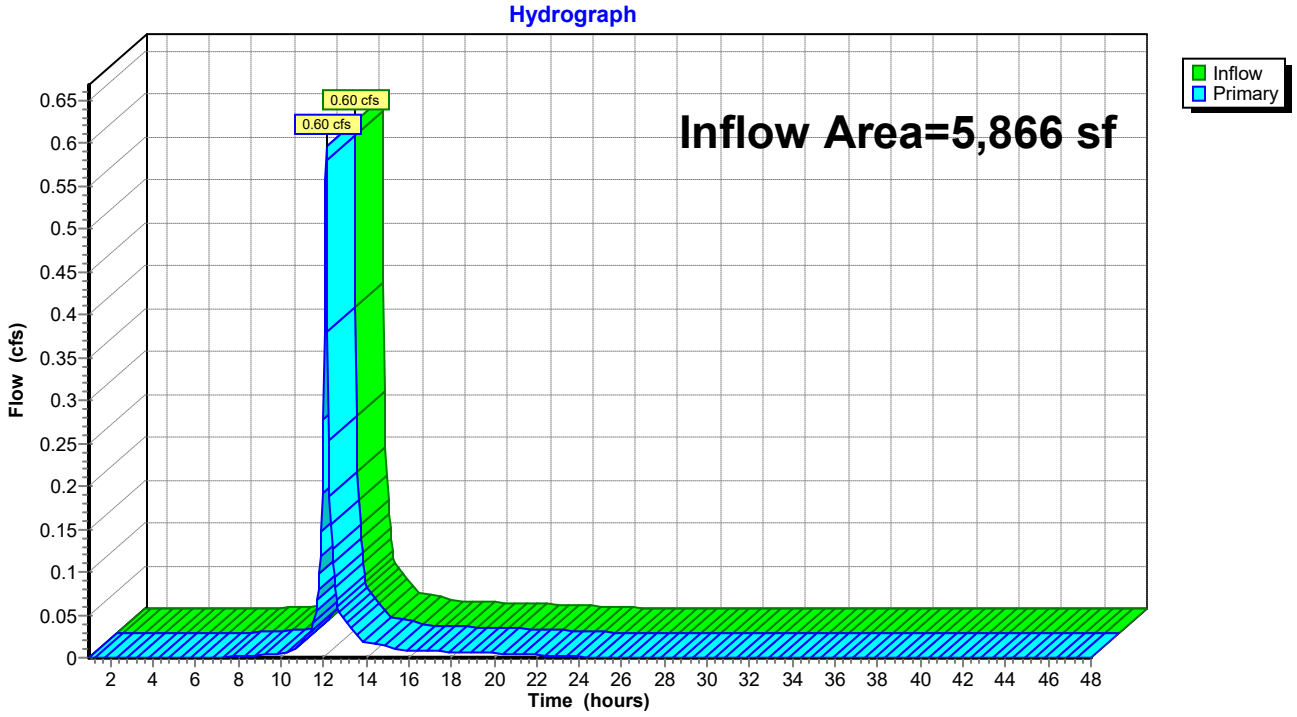


Summary for Link 127L: total

Inflow Area = 5,866 sf, 59.31% Impervious, Inflow Depth = 2.58" for 10-Year event
Inflow = 0.60 cfs @ 12.13 hrs, Volume= 1,259 cf
Primary = 0.60 cfs @ 12.13 hrs, Volume= 1,259 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 177L : SUM OF As TO UG

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 127L: total

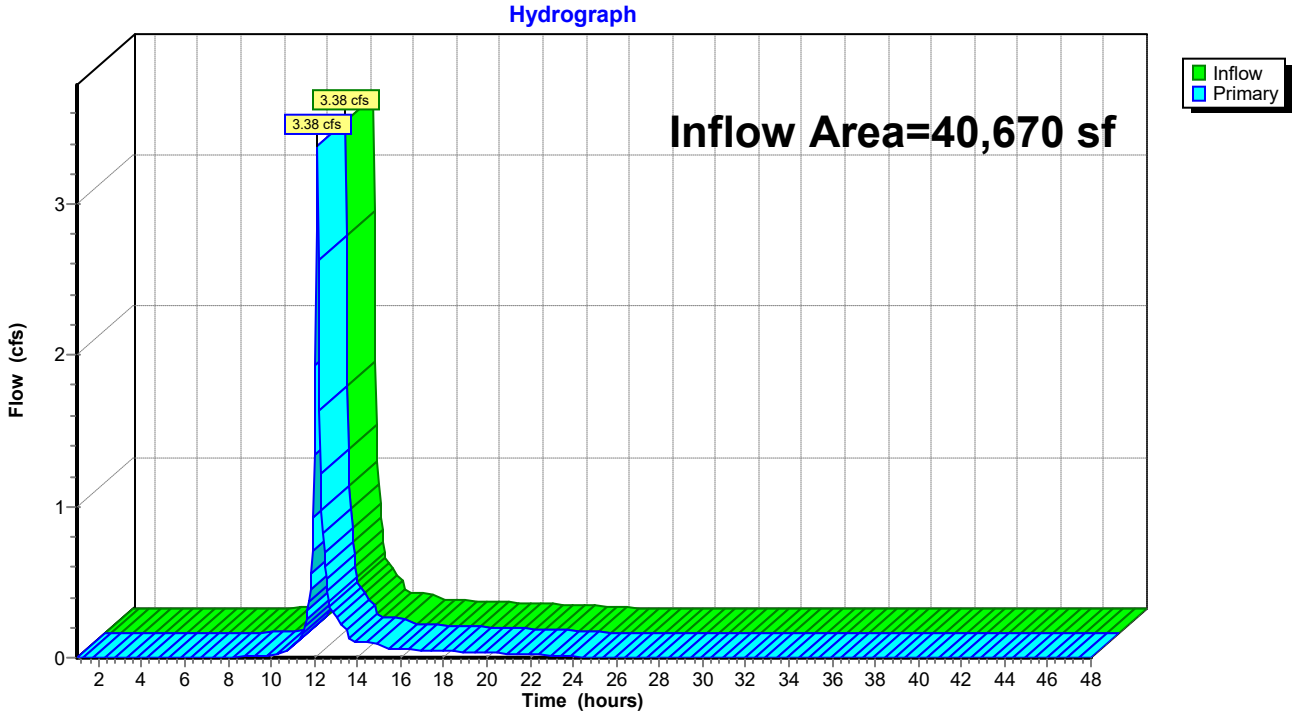


Summary for Link 128L: FROM OVERSIZED PIPE RUN

Inflow Area = 40,670 sf, 35.10% Impervious, Inflow Depth = 2.10" for 10-Year event
Inflow = 3.38 cfs @ 12.15 hrs, Volume= 7,126 cf
Primary = 3.38 cfs @ 12.15 hrs, Volume= 7,126 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 58P : Dry Pond 1

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 128L: FROM OVERSIZED PIPE RUN

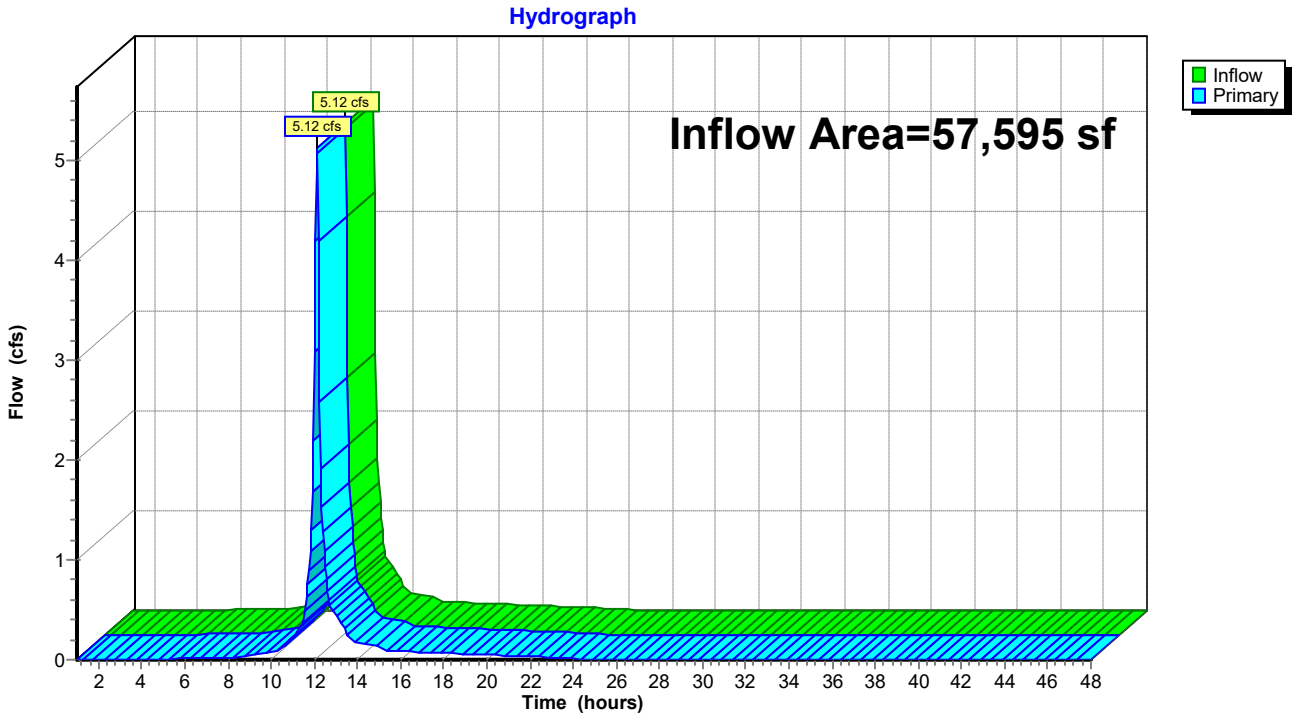


Summary for Link 134L: TO UG

Inflow Area = 57,595 sf, 65.23% Impervious, Inflow Depth = 2.73" for 10-Year event
Inflow = 5.12 cfs @ 12.13 hrs, Volume= 13,123 cf
Primary = 5.12 cfs @ 12.13 hrs, Volume= 13,123 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 178L : As

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 134L: TO UG

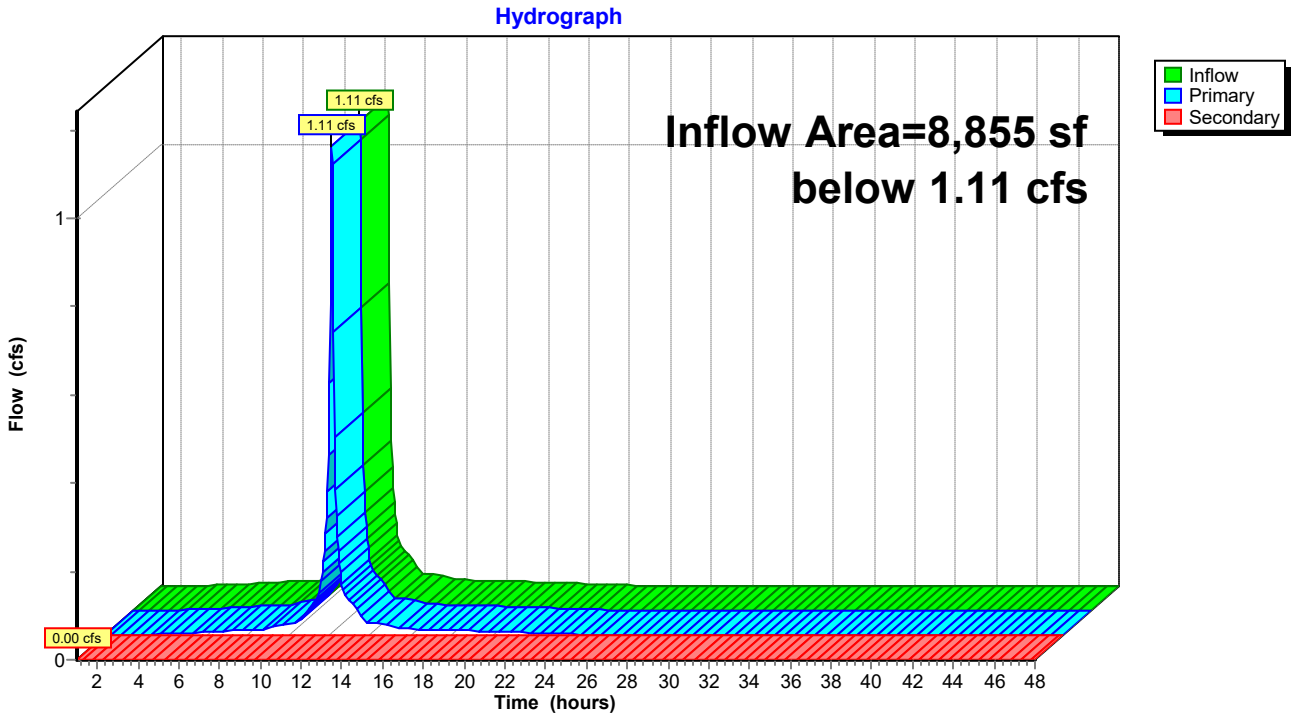


Summary for Link 171L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

Inflow Area = 8,855 sf,100.00% Impervious, Inflow Depth = 3.58" for 10-Year event
Inflow = 1.11 cfs @ 12.13 hrs, Volume= 2,638 cf
Primary = 1.11 cfs @ 12.13 hrs, Volume= 2,638 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 129P : STORMTECH FROM ADS
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Reach 99R : East Swale (SE End)

Primary outflow = Inflow below 1.11 cfs, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 171L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

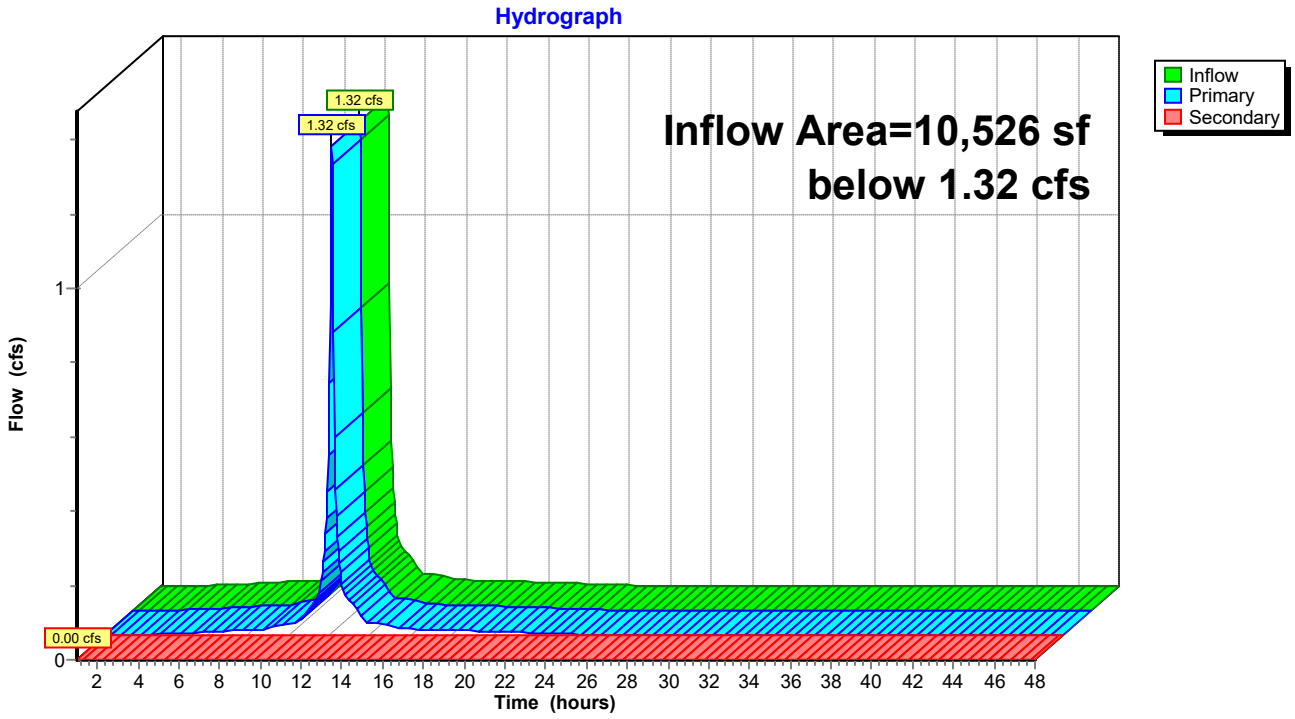


Summary for Link 174L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

Inflow Area = 10,526 sf,100.00% Impervious, Inflow Depth = 3.58" for 10-Year event
Inflow = 1.32 cfs @ 12.13 hrs, Volume= 3,136 cf
Primary = 1.32 cfs @ 12.13 hrs, Volume= 3,136 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 129P : STORMTECH FROM ADS
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Reach 111R : Western PL North Ditch

Primary outflow = Inflow below 1.32 cfs, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 174L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

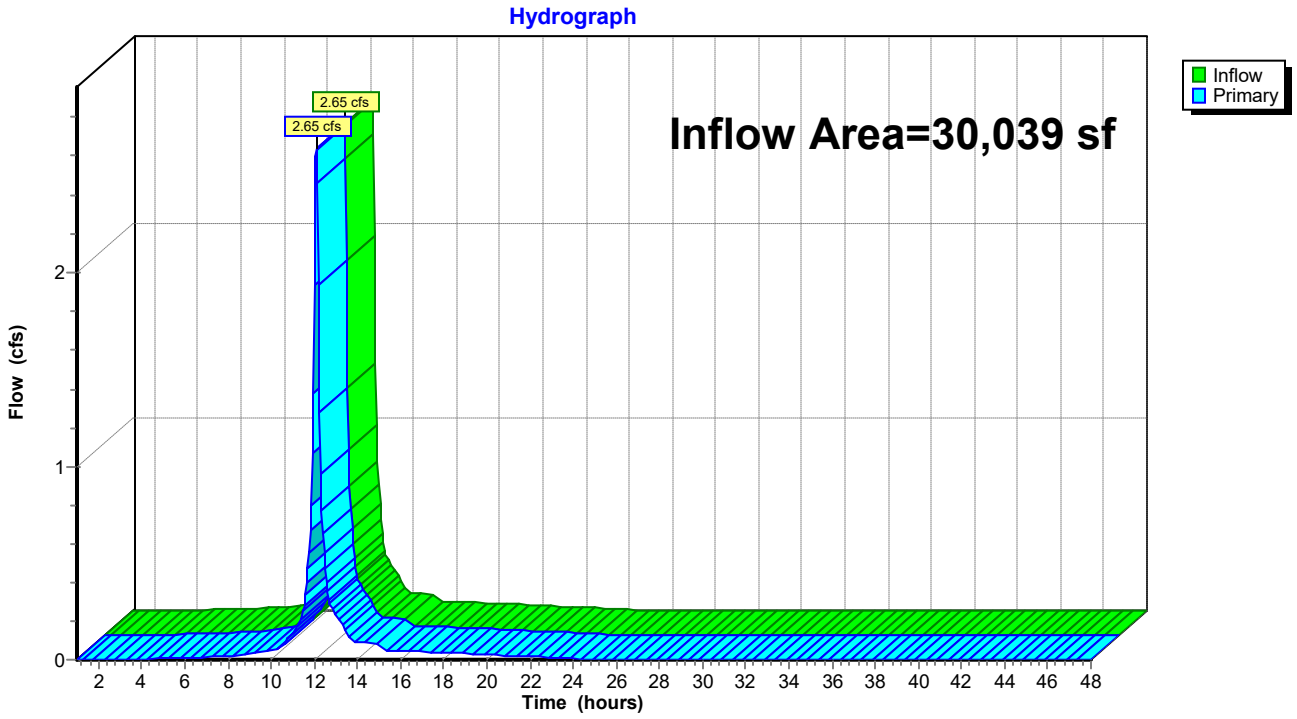


Summary for Link 175L: TO UG

Inflow Area = 30,039 sf, 72.17% Impervious, Inflow Depth = 2.92" for 10-Year event
Inflow = 2.65 cfs @ 12.08 hrs, Volume= 7,304 cf
Primary = 2.65 cfs @ 12.08 hrs, Volume= 7,304 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 178L : As

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 175L: TO UG

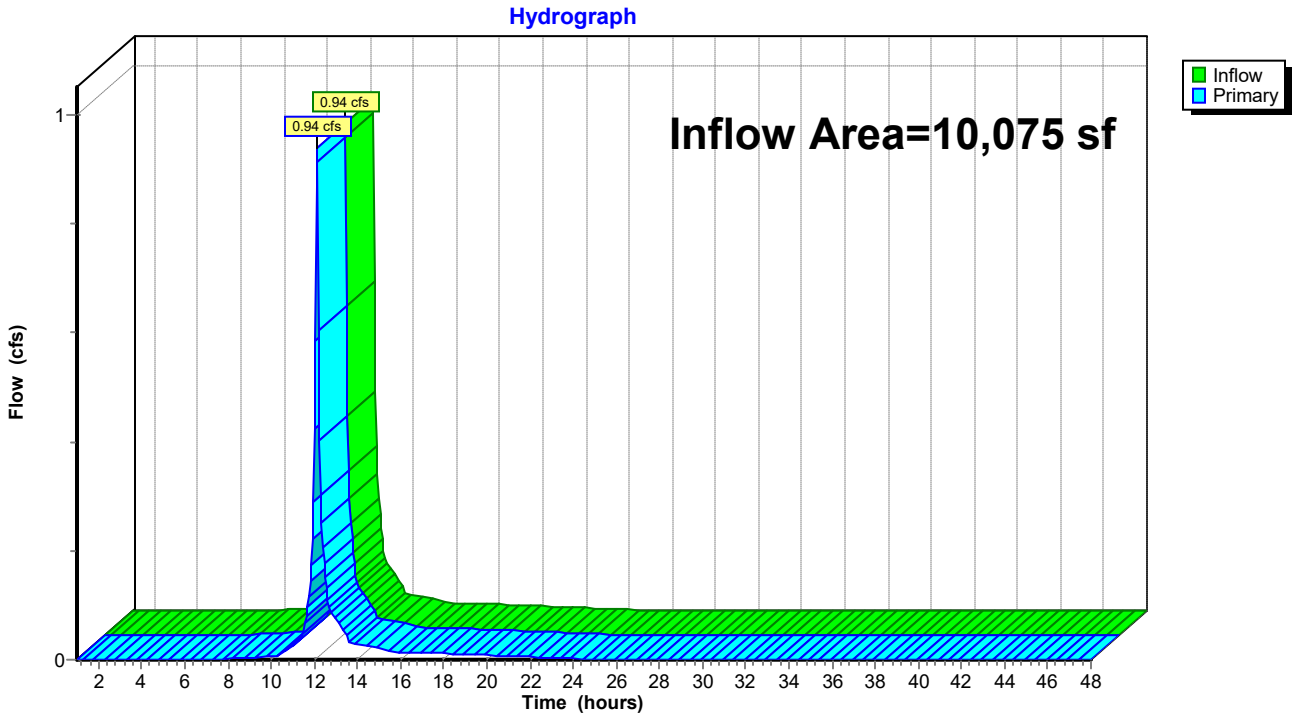


Summary for Link 176L: UPSTREAM OF OVERSIZED PIPE

Inflow Area = 10,075 sf, 46.89% Impervious, Inflow Depth = 2.34" for 10-Year event
Inflow = 0.94 cfs @ 12.13 hrs, Volume= 1,964 cf
Primary = 0.94 cfs @ 12.13 hrs, Volume= 1,964 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 174P : EAST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 176L: UPSTREAM OF OVERSIZED PIPE

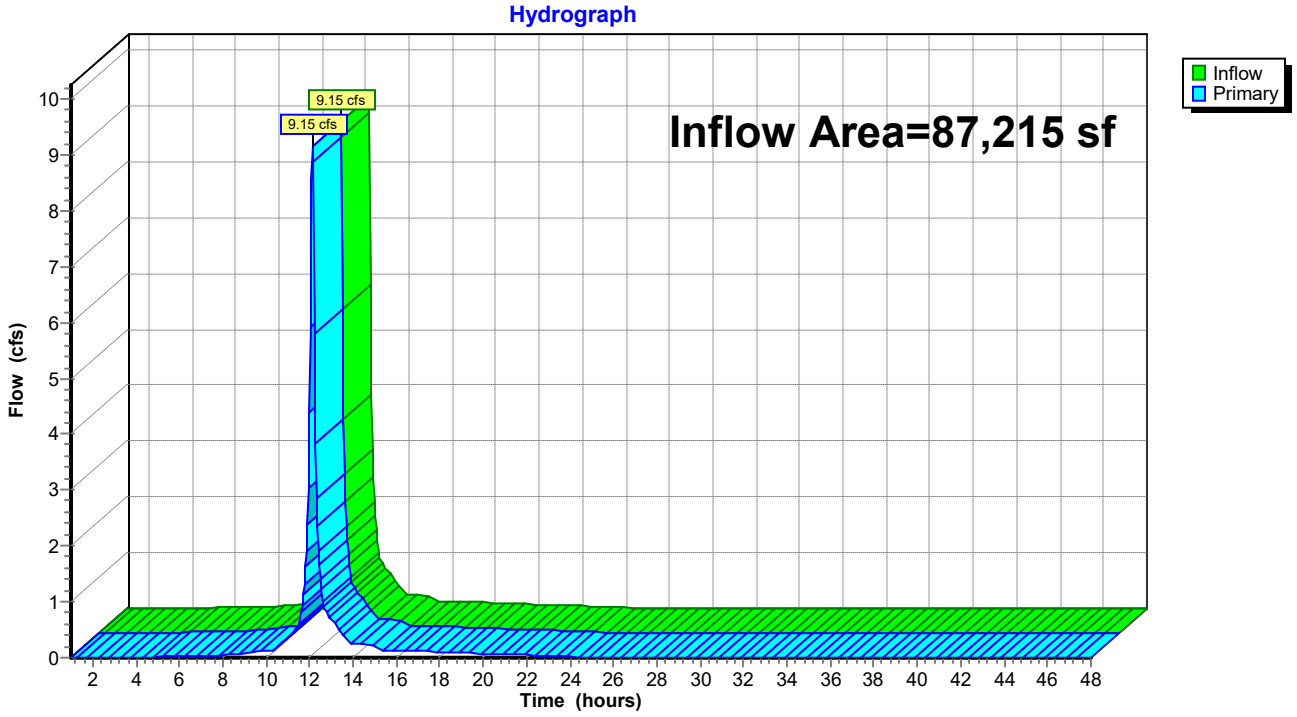


Summary for Link 177L: SUM OF As TO UG

Inflow Area = 87,215 sf, 65.94% Impervious, Inflow Depth = 2.78" for 10-Year event
Inflow = 9.15 cfs @ 12.13 hrs, Volume= 20,234 cf
Primary = 9.15 cfs @ 12.13 hrs, Volume= 20,234 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 129P : STORMTECH FROM ADS

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 177L: SUM OF As TO UG

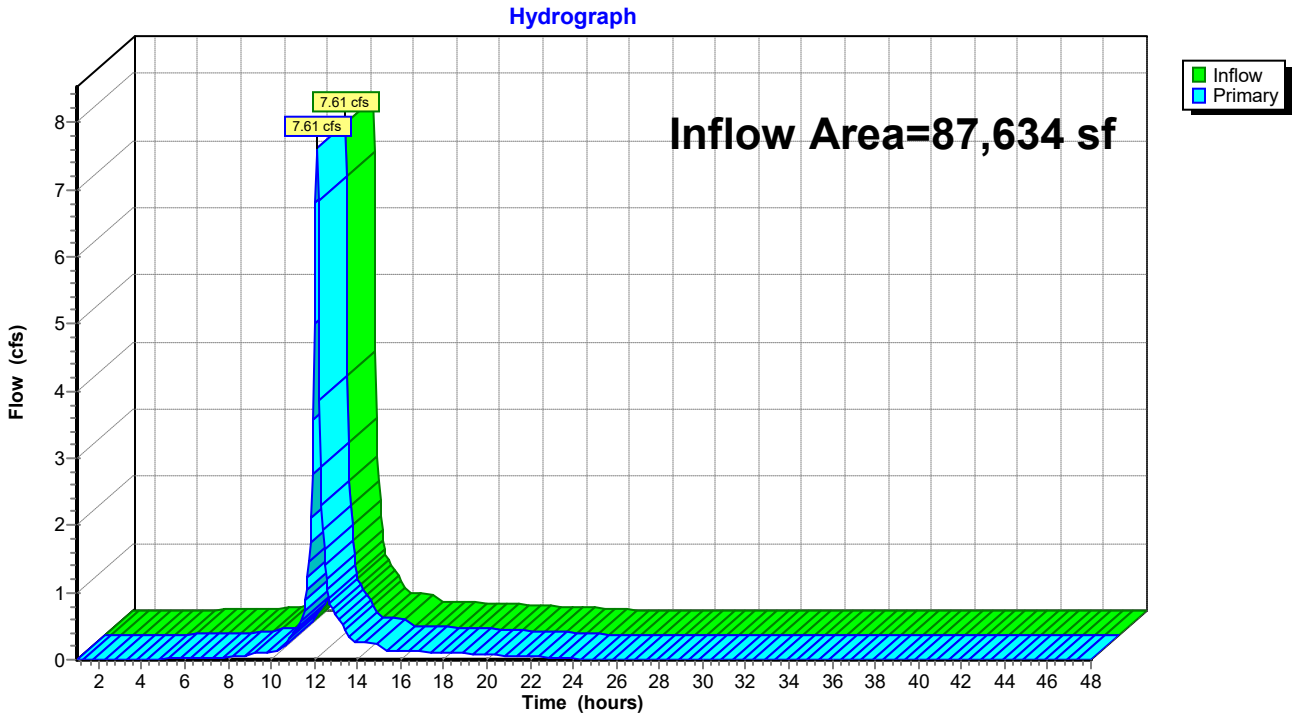


Summary for Link 178L: As

Inflow Area = 87,634 sf, 67.61% Impervious, Inflow Depth = 2.80" for 10-Year event
Inflow = 7.61 cfs @ 12.12 hrs, Volume= 20,427 cf
Primary = 7.61 cfs @ 12.12 hrs, Volume= 20,427 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 129P : STORMTECH FROM ADS

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 178L: As



Time span=1.00-48.00 hrs, dt=0.05 hrs, 941 points x 3
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 35S: F6 Runoff Area=3,950 sf 0.00% Impervious Runoff Depth=3.34"
Tc=6.0 min CN=74 Runoff=0.54 cfs 1,098 cf

Subcatchment 37S: F6 Runoff Area=4,391 sf 0.00% Impervious Runoff Depth=3.34"
Tc=6.0 min CN=74 Runoff=0.60 cfs 1,221 cf

Subcatchment 40S: F5 (Direct to Basin) Runoff Area=31,282 sf 0.00% Impervious Runoff Depth=3.34"
Tc=6.0 min CN=74 Runoff=4.28 cfs 8,699 cf

Subcatchment 49S: D2 Runoff Area=16,605 sf 53.61% Impervious Runoff Depth=4.69"
Flow Length=393' Slope=0.0076 '/' Tc=10.7 min CN=87 Runoff=2.54 cfs 6,489 cf

Subcatchment 52S: E1 Runoff Area=39,552 sf 5.46% Impervious Runoff Depth=3.44"
Flow Length=100' Slope=0.0300 '/' Tc=9.6 min CN=75 Runoff=4.81 cfs 11,325 cf

Subcatchment 55S: G Runoff Area=4,482 sf 0.00% Impervious Runoff Depth=3.34"
Tc=6.0 min CN=74 Runoff=0.61 cfs 1,246 cf

Subcatchment 81S: O1 Runoff Area=11,697 sf 0.00% Impervious Runoff Depth=3.34"
Tc=6.0 min CN=74 Runoff=1.60 cfs 3,253 cf

Subcatchment 82S: D1 Runoff Area=20,886 sf 0.00% Impervious Runoff Depth=3.34"
Flow Length=400' Slope=0.0100 '/' Tc=22.0 min CN=74 Runoff=1.69 cfs 5,808 cf

Subcatchment 87S: I Runoff Area=56,129 sf 0.00% Impervious Runoff Depth=3.34"
Flow Length=750' Slope=0.0100 '/' Tc=30.4 min CN=74 Runoff=3.81 cfs 15,608 cf

Subcatchment 95S: C1 Runoff Area=19,337 sf 26.10% Impervious Runoff Depth=3.94"
Tc=6.0 min CN=80 Runoff=3.07 cfs 6,356 cf

Subcatchment 96S: E2 Runoff Area=18,820 sf 39.11% Impervious Runoff Depth=4.26"
Flow Length=400' Slope=0.0300 '/' Tc=13.7 min CN=83 Runoff=2.42 cfs 6,679 cf

Subcatchment 97S: C2 Runoff Area=99,572 sf 33.61% Impervious Runoff Depth=4.15"
Tc=6.0 min CN=82 Runoff=16.50 cfs 34,460 cf

Subcatchment 98S: E3 Runoff Area=109,219 sf 13.58% Impervious Runoff Depth=3.64"
Flow Length=200' Tc=16.3 min CN=77 Runoff=11.28 cfs 33,100 cf

Subcatchment 105S: C (EXTERIOR) Runoff Area=83,930 sf 38.97% Impervious Runoff Depth=4.26"
Tc=6.0 min CN=83 Runoff=14.19 cfs 29,786 cf

Subcatchment 106S: B Runoff Area=86,466 sf 11.84% Impervious Runoff Depth=3.64"
Tc=6.0 min CN=77 Runoff=12.79 cfs 26,204 cf

Subcatchment 107S: F Runoff Area=41,695 sf 60.00% Impervious Runoff Depth=4.80"
Tc=6.0 min CN=88 Runoff=7.70 cfs 16,676 cf

Subcatchment 108S: B1 (INTERIOR) Runoff Area=10,526 sf 100.00% Impervious Runoff Depth=5.94"
Tc=6.0 min CN=98 Runoff=2.15 cfs 5,212 cf

Subcatchment 112S: D3 Runoff Area=8,222 sf 12.92% Impervious Runoff Depth=3.64"
Tc=6.0 min CN=77 Runoff=1.22 cfs 2,492 cf

Subcatchment 118S: A14 Runoff Area=16,514 sf 54.25% Impervious Runoff Depth=4.69"
Tc=6.0 min CN=87 Runoff=3.00 cfs 6,454 cf

Subcatchment 120S: A30 Runoff Area=14,121 sf 18.33% Impervious Runoff Depth=3.74"
Tc=6.0 min CN=78 Runoff=2.14 cfs 4,399 cf

Subcatchment 121S: A32 Runoff Area=13,562 sf 14.98% Impervious Runoff Depth=3.74"
Tc=6.0 min CN=78 Runoff=2.06 cfs 4,225 cf

Subcatchment 122S: F1 Runoff Area=50,859 sf 57.49% Impervious Runoff Depth=4.80"
Tc=6.0 min CN=88 Runoff=9.39 cfs 20,341 cf

Subcatchment 125S: F3 Runoff Area=20,215 sf 20.28% Impervious Runoff Depth=3.84"
Tc=6.0 min CN=79 Runoff=3.14 cfs 6,470 cf

Subcatchment 126S: F4 Runoff Area=25,539 sf 8.13% Impervious Runoff Depth=3.54"
Tc=6.0 min CN=76 Runoff=3.68 cfs 7,525 cf

Subcatchment 127S: A13 Runoff Area=1,947 sf 62.25% Impervious Runoff Depth=4.91"
Tc=6.0 min CN=89 Runoff=0.36 cfs 797 cf

Subcatchment 128S: A15 Runoff Area=8,786 sf 25.73% Impervious Runoff Depth=3.94"
Tc=6.0 min CN=80 Runoff=1.39 cfs 2,888 cf

Subcatchment 130S: A12 Runoff Area=3,208 sf 80.89% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=93 Runoff=0.63 cfs 1,433 cf

Subcatchment 131S: A11 Runoff Area=6,149 sf 79.15% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=93 Runoff=1.21 cfs 2,747 cf

Subcatchment 132S: A9 Runoff Area=1,940 sf 86.03% Impervious Runoff Depth=5.59"
Tc=6.0 min CN=95 Runoff=0.39 cfs 904 cf

Subcatchment 133S: A7 Runoff Area=4,839 sf 73.84% Impervious Runoff Depth=5.25"
Tc=6.0 min CN=92 Runoff=0.94 cfs 2,116 cf

Subcatchment 134S: A5 Runoff Area=2,978 sf 76.83% Impervious Runoff Depth=5.25"
Tc=6.0 min CN=92 Runoff=0.58 cfs 1,302 cf

Subcatchment 136S: A33 Runoff Area=6,798 sf 72.68% Impervious Runoff Depth=5.13"
Tc=6.0 min CN=91 Runoff=1.31 cfs 2,908 cf

Subcatchment 137S: A1 Runoff Area=11,792 sf 39.91% Impervious Runoff Depth=4.37"
Tc=6.0 min CN=84 Runoff=2.03 cfs 4,290 cf

Subcatchment 138S: F2 Runoff Area=12,659 sf 52.90% Impervious Runoff Depth=4.69"
Tc=10.0 min CN=87 Runoff=1.98 cfs 4,947 cf

Subcatchment 139S: A2 Runoff Area=5,968 sf 57.66% Impervious Runoff Depth=4.80"
Tc=6.0 min CN=88 Runoff=1.10 cfs 2,387 cf

Subcatchment 140S: H1 Runoff Area=124,005 sf 32.15% Impervious Runoff Depth=4.15"
Tc=6.0 min CN=82 Runoff=20.54 cfs 42,916 cf

Subcatchment 141S: H2 Runoff Area=54,034 sf 29.78% Impervious Runoff Depth=4.05"
Tc=6.0 min CN=81 Runoff=8.77 cfs 18,228 cf

Subcatchment 142S: H3 Runoff Area=29,836 sf 18.57% Impervious Runoff Depth=3.74"
Tc=6.0 min CN=78 Runoff=4.52 cfs 9,295 cf

Subcatchment 144S: H5 Runoff Area=14,502 sf 0.00% Impervious Runoff Depth=3.34"
Tc=6.0 min CN=74 Runoff=1.98 cfs 4,033 cf

Subcatchment 145S: H6-a Runoff Area=9,604 sf 11.80% Impervious Runoff Depth=3.64"
Tc=6.0 min CN=77 Runoff=1.42 cfs 2,911 cf

Subcatchment 146S: O2 Runoff Area=132,678 sf 2.29% Impervious Runoff Depth=3.44"
Flow Length=377' Tc=12.2 min CN=75 Runoff=14.77 cfs 37,990 cf

Subcatchment 147S: J Runoff Area=15,351 sf 8.86% Impervious Runoff Depth=3.54"
Tc=6.0 min CN=76 Runoff=2.21 cfs 4,523 cf

Subcatchment 148S: A3 Runoff Area=3,136 sf 75.57% Impervious Runoff Depth=5.25"
Tc=6.0 min CN=92 Runoff=0.61 cfs 1,371 cf

Subcatchment 149S: A4 Runoff Area=7,573 sf 19.64% Impervious Runoff Depth=3.84"
Tc=6.0 min CN=79 Runoff=1.18 cfs 2,424 cf

Subcatchment 150S: A6 Runoff Area=2,888 sf 41.24% Impervious Runoff Depth=4.37"
Tc=6.0 min CN=84 Runoff=0.50 cfs 1,051 cf

Subcatchment 151S: A8 Runoff Area=5,293 sf 40.92% Impervious Runoff Depth=4.37"
Tc=6.0 min CN=84 Runoff=0.91 cfs 1,925 cf

Subcatchment 152S: A10 Runoff Area=4,344 sf 47.88% Impervious Runoff Depth=4.47"
Tc=6.0 min CN=85 Runoff=0.76 cfs 1,619 cf

Subcatchment 153S: A16 Runoff Area=4,885 sf 83.97% Impervious Runoff Depth=5.47"
Tc=6.0 min CN=94 Runoff=0.97 cfs 2,229 cf

Subcatchment 154S: A17 Runoff Area=1,182 sf 44.92% Impervious Runoff Depth=4.47"
Tc=6.0 min CN=85 Runoff=0.21 cfs 441 cf

Subcatchment 155S: A18 Runoff Area=1,381 sf 79.65% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=93 Runoff=0.27 cfs 617 cf

Subcatchment 156S: A19 Runoff Area=5,006 sf 29.03% Impervious Runoff Depth=4.05"
Tc=6.0 min CN=81 Runoff=0.81 cfs 1,689 cf

Subcatchment 157S: A20 Runoff Area=705 sf 28.94% Impervious Runoff Depth=4.05"
Tc=6.0 min CN=81 Runoff=0.11 cfs 238 cf

Subcatchment 158S: A21 Runoff Area=1,801 sf 79.73% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=93 Runoff=0.35 cfs 804 cf

Subcatchment 159S: A22 Runoff Area=4,627 sf 58.46% Impervious Runoff Depth=4.80"
Tc=6.0 min CN=88 Runoff=0.85 cfs 1,851 cf

Subcatchment 160S: A23 Runoff Area=5,903 sf 81.57% Impervious Runoff Depth=5.47"
Tc=6.0 min CN=94 Runoff=1.17 cfs 2,693 cf

Subcatchment 161S: A24 Runoff Area=6,769 sf 44.98% Impervious Runoff Depth=4.47"
Tc=6.0 min CN=85 Runoff=1.19 cfs 2,523 cf

Subcatchment 162S: A25 Runoff Area=6,995 sf 75.15% Impervious Runoff Depth=5.25"
Tc=6.0 min CN=92 Runoff=1.36 cfs 3,058 cf

Subcatchment 163S: A26 Runoff Area=6,827 sf 17.20% Impervious Runoff Depth=3.74"
Tc=6.0 min CN=78 Runoff=1.03 cfs 2,127 cf

Subcatchment 164S: A27 Runoff Area=3,218 sf 78.37% Impervious Runoff Depth=5.36"
Tc=6.0 min CN=93 Runoff=0.63 cfs 1,437 cf

Subcatchment 165S: A28 Runoff Area=4,119 sf 32.34% Impervious Runoff Depth=4.15"
Tc=6.0 min CN=82 Runoff=0.68 cfs 1,426 cf

Subcatchment 166S: A29 Runoff Area=3,109 sf 75.62% Impervious Runoff Depth=5.25"
Tc=6.0 min CN=92 Runoff=0.61 cfs 1,359 cf

Subcatchment 167S: A31 Runoff Area=6,189 sf 76.15% Impervious Runoff Depth=5.25"
Tc=6.0 min CN=92 Runoff=1.21 cfs 2,706 cf

Subcatchment 168S: A34 Runoff Area=387 sf 100.00% Impervious Runoff Depth=5.94"
Tc=6.0 min CN=98 Runoff=0.08 cfs 192 cf

Subcatchment 169S: A36 Runoff Area=1,118 sf 35.87% Impervious Runoff Depth=4.26"
Tc=6.0 min CN=83 Runoff=0.19 cfs 397 cf

Subcatchment 170S: C (INTERIOR) Runoff Area=8,855 sf 100.00% Impervious Runoff Depth=5.94"
Tc=6.0 min CN=98 Runoff=1.81 cfs 4,384 cf

Subcatchment 171S: A (MARIA ROOF) /2 Runoff Area=9,435 sf 100.00% Impervious Runoff Depth=5.94"
Tc=0.0 min CN=98 Runoff=2.22 cfs 4,672 cf

Subcatchment 172S: B1 (EXTERIOR) Runoff Area=32,338 sf 100.00% Impervious Runoff Depth=5.94"
Tc=6.0 min CN=98 Runoff=6.60 cfs 16,012 cf

Subcatchment 173S: A (MARIA ROOF) /2 Runoff Area=9,434 sf 100.00% Impervious Runoff Depth=5.94"
Tc=0.0 min CN=98 Runoff=2.22 cfs 4,671 cf

Subcatchment 175S: H6-b Runoff Area=4,256 sf 23.80% Impervious Runoff Depth=3.94"
Tc=6.0 min CN=80 Runoff=0.68 cfs 1,399 cf

Subcatchment 176S: X (EX. RBL Area to Runoff Area=22,047 sf 41.55% Impervious Runoff Depth=4.37"
Tc=6.0 min CN=84 Runoff=3.80 cfs 8,020 cf

Subcatchment 179S: H6-c Runoff Area=4,091 sf 0.00% Impervious Runoff Depth=3.34"
Tc=6.0 min CN=74 Runoff=0.56 cfs 1,138 cf

Subcatchment 182S: A35 Runoff Area=28,353 sf 100.00% Impervious Runoff Depth=5.94"
Tc=6.0 min CN=98 Runoff=5.78 cfs 14,039 cf

Subcatchment 183S: Y (RBL Area to RBL Runoff Area=103,238 sf 10.88% Impervious Runoff Depth=3.64"
Tc=6.0 min CN=77 Runoff=15.27 cfs 31,287 cf

Subcatchment 185S: H4 Runoff Area=6,658 sf 0.00% Impervious Runoff Depth=3.34"
Tc=6.0 min CN=74 Runoff=0.91 cfs 1,851 cf

Reach 99R: East Swale (SE End) Avg. Flow Depth=0.91' Max Vel=5.22 fps Inflow=38.48 cfs 79,303 cf
n=0.018 L=570.0' S=0.0070 '/' Capacity=43.88 cfs Outflow=36.89 cfs 79,303 cf

Reach 106R: East Swale (North End) Avg. Flow Depth=0.28' Max Vel=3.89 fps Inflow=3.07 cfs 6,356 cf
n=0.018 L=140.0' S=0.0179 '/' Capacity=39.35 cfs Outflow=3.07 cfs 6,356 cf

Reach 108R: South Berm Swale Avg. Flow Depth=0.81' Max Vel=3.47 fps Inflow=12.15 cfs 37,868 cf
n=0.025 L=265.0' S=0.0100 '/' Capacity=19.73 cfs Outflow=11.92 cfs 37,868 cf

Reach 109R: SC Road East Ditch Avg. Flow Depth=0.55' Max Vel=2.46 fps Inflow=7.70 cfs 16,676 cf
n=0.022 L=415.0' S=0.0048 '/' Capacity=23.93 cfs Outflow=7.09 cfs 16,676 cf

Reach 111R: Western PL North Ditch Avg. Flow Depth=1.27' Max Vel=4.89 fps Inflow=24.65 cfs 53,831 cf
n=0.025 L=480.0' S=0.0133 '/' Capacity=26.79 cfs Outflow=23.70 cfs 53,831 cf

Reach 117R: SC Road West Ditch Avg. Flow Depth=0.63' Max Vel=2.46 fps Inflow=9.39 cfs 20,341 cf
n=0.022 L=475.0' S=0.0042 '/' Capacity=22.37 cfs Outflow=8.49 cfs 20,341 cf

Reach 132R: EX. Red Barn Lane West Avg. Flow Depth=0.57' Max Vel=3.75 fps Inflow=8.32 cfs 17,315 cf
n=0.025 L=610.0' S=0.0179 '/' Capacity=87.96 cfs Outflow=7.64 cfs 17,315 cf

Reach 136R: SC West Ditch Avg. Flow Depth=0.53' Max Vel=2.16 fps Inflow=3.14 cfs 6,470 cf
n=0.025 L=218.0' S=0.0080 '/' Capacity=16.56 cfs Outflow=3.02 cfs 6,470 cf

Reach 151R: Western PL North Ditch Avg. Flow Depth=0.43' Max Vel=2.13 fps Inflow=1.22 cfs 2,492 cf
n=0.025 L=227.0' S=0.0107 '/' Capacity=24.06 cfs Outflow=1.16 cfs 2,492 cf

Reach 184R: Red Barn Lane East Avg. Flow Depth=0.66' Max Vel=4.03 fps Inflow=15.27 cfs 31,287 cf
n=0.025 L=945.0' S=0.0180 '/' Capacity=36.63 cfs Outflow=13.18 cfs 31,287 cf

Pond 41P: Reach Pipe Peak Elev=738.97' Storage=42 cf Inflow=1.98 cfs 4,947 cf
Outflow=1.96 cfs 4,947 cf

Pond 57P: Dry Pond 2 Peak Elev=750.20' Storage=31,123 cf Inflow=23.01 cfs 67,480 cf
Discarded=2.75 cfs 67,480 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=2.75 cfs 67,480 cf

Pond 58P: Dry Pond 1 Peak Elev=751.50' Storage=110,025 cf Inflow=64.43 cfs 217,067 cf
Discarded=2.58 cfs 217,067 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=2.58 cfs 217,067 cf

Pond 60P: Infiltration Basin #1 Peak Elev=743.43' Storage=43,572 cf Inflow=35.85 cfs 96,102 cf
Discarded=3.09 cfs 77,358 cf Primary=2.77 cfs 18,744 cf Secondary=0.00 cfs 0 cf Outflow=5.81 cfs 96,102 cf

Pond 95P: Dry Pond 3 Peak Elev=740.64' Storage=0.414 af Inflow=22.15 cfs 69,757 cf
Discarded=5.07 cfs 69,757 cf Primary=0.00 cfs 0 cf Secondary=0.00 cfs 0 cf Outflow=5.07 cfs 69,757 cf

Pond 101R: Reach Pipe DP1 TO MH Peak Elev=750.50' Inflow=0.00 cfs 0 cf
15.0" Round Culvert n=0.011 L=373.0' S=0.0094 '/' Outflow=0.00 cfs 0 cf

Pond 110R: Western Pipe Run Peak Elev=750.91' Inflow=24.86 cfs 56,323 cf
24.0" Round Culvert n=0.011 L=514.0' S=0.0040 '/' Outflow=24.86 cfs 56,323 cf

Pond 127P: B3 OVERSIZED PIPE RUN (24" Peak Elev=752.93' Storage=377 cf Inflow=6.71 cfs 14,238 cf
Outflow=6.44 cfs 14,238 cf

Pond 129P: STORMTECH FROM ADS Peak Elev=754.57' Storage=47,052 cf Inflow=33.29 cfs 82,552 cf
Outflow=2.32 cfs 82,389 cf

Pond 133P: WEST COURTYARD OVERSIZED Peak Elev=758.12' Storage=503 cf Inflow=8.80 cfs 19,261 cf
Outflow=9.53 cfs 19,261 cf

Pond 154P: Southeast Basin Peak Elev=731.56' Storage=10,588 cf Inflow=7.18 cfs 15,965 cf
Outflow=0.22 cfs 15,965 cf

Pond 174P: EAST COURTYARD OVERSIZED Peak Elev=755.92' Storage=196 cf Inflow=3.79 cfs 8,332 cf
Outflow=3.71 cfs 8,332 cf

Pond 183P: 24" HDPE PIPE Peak Elev=750.42' Inflow=7.64 cfs 17,315 cf
24.0" Round Culvert n=0.010 L=475.0' S=0.0042 '/' Outflow=7.64 cfs 17,315 cf

Link 48L: TOTAL OUTFALL Inflow=6.39 cfs 13,068 cf
Primary=6.39 cfs 13,068 cf

Link 66L: Total Offsite Inflow=6.39 cfs 13,068 cf
Primary=6.39 cfs 13,068 cf

Link 115L: EX. Cul-de-sac On Green Meadow Place Inflow=2.66 cfs 5,447 cf
Primary=2.66 cfs 5,447 cf

Link 124L: TO 12" PRIOR TO 24" (WEST) Inflow=7.65 cfs 16,738 cf
Primary=7.65 cfs 16,738 cf

Link 126L: OVERSIZED PIPE RUN BY B3 Inflow=6.71 cfs 14,238 cf
Primary=6.71 cfs 14,238 cf

Link 127L: total Inflow=1.08 cfs 2,353 cf
Primary=1.08 cfs 2,353 cf

Link 128L: FROM OVERSIZED PIPE RUN Inflow=6.44 cfs 14,238 cf
Primary=6.44 cfs 14,238 cf

Link 134L: TO UG Inflow=10.25 cfs 23,933 cf
Primary=10.25 cfs 23,933 cf

Link 171L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW below 1.11 cfs Inflow=1.81 cfs 4,384 cf
Primary=1.11 cfs 4,140 cf Secondary=0.70 cfs 244 cf

Link 174L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW below 1.32 cfs Inflow=2.15 cfs 5,212 cf
Primary=1.32 cfs 4,922 cf Secondary=0.83 cfs 290 cf

Link 175L: TO UG Inflow=4.63 cfs 13,003 cf
Primary=4.63 cfs 13,003 cf

Link 176L: UPSTREAM OF OVERSIZED PIPE Inflow=1.76 cfs 3,788 cf
Primary=1.76 cfs 3,788 cf

Link 177L: SUM OF As TO UG Inflow=16.19 cfs 36,554 cf
Primary=16.19 cfs 36,554 cf

Link 178L: As Inflow=14.71 cfs 36,936 cf
Primary=14.71 cfs 36,936 cf

Total Runoff Area = 1,570,805 sf Runoff Volume = 533,387 cf Average Runoff Depth = 4.07"
70.57% Pervious = 1,108,561 sf 29.43% Impervious = 462,244 sf

Summary for Subcatchment 35S: F6

3/3/21
Undetained portion of SE corner of SC that goes direct to SE low area (back yards of 3 home lots SE corner)

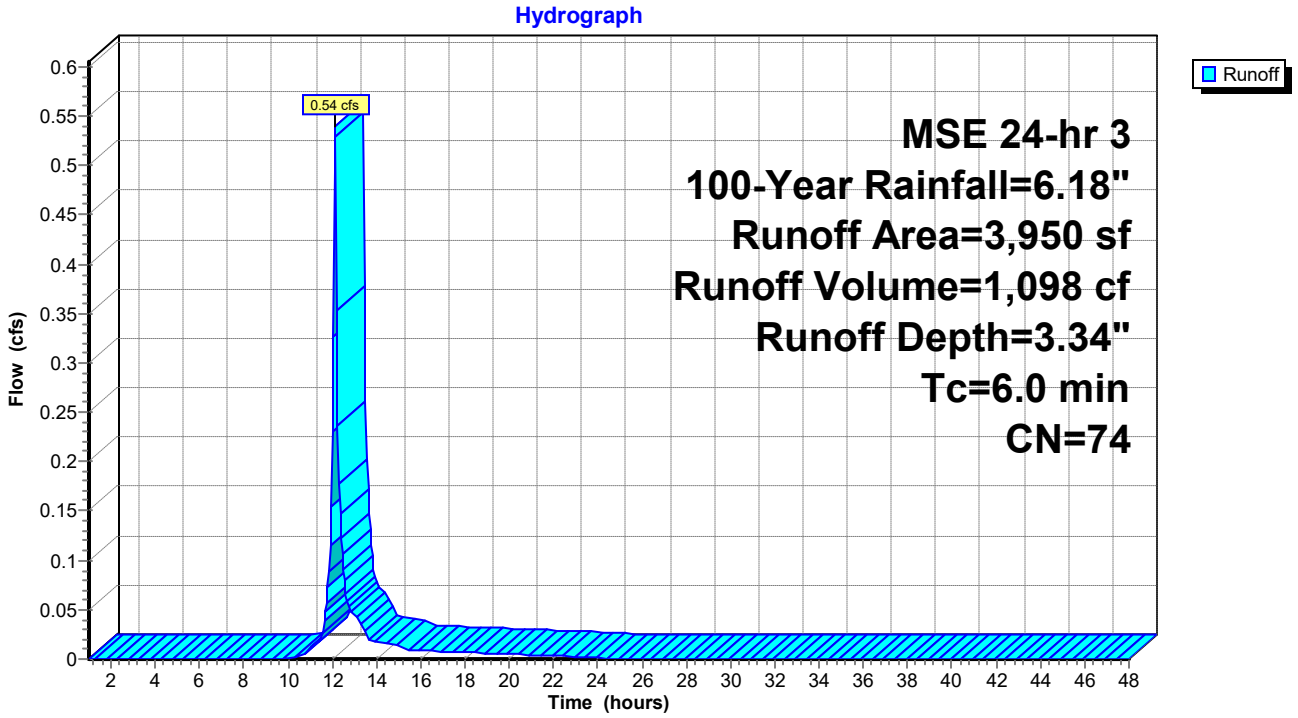
Runoff = 0.54 cfs @ 12.13 hrs, Volume= 1,098 cf, Depth= 3.34"
Routed to Pond 154P : Southeast Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	3,950	74	landscape
	3,950		100.00% Pervious Area

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

Subcatchment 35S: F6



Summary for Subcatchment 37S: F6

3/3/21
Undetained portion of SE corner of SC that goes direct to SE low area (back yards of 3 home lots SE corner)

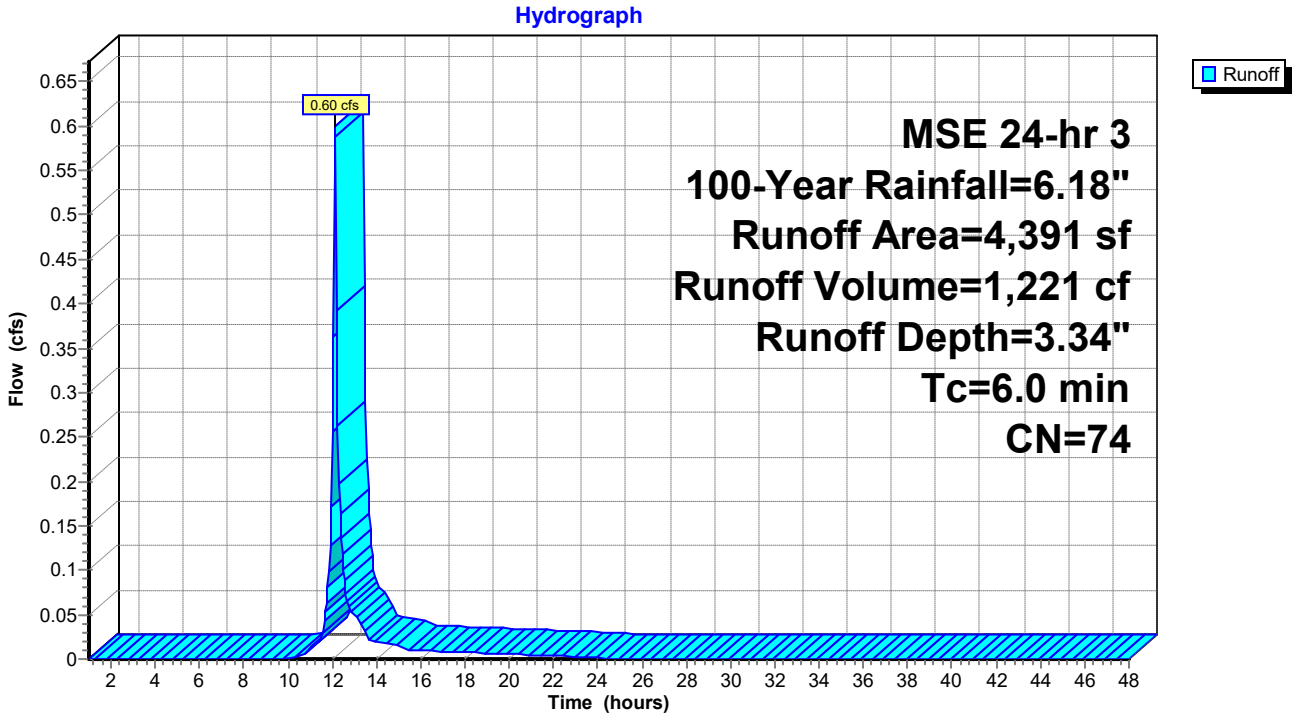
Runoff = 0.60 cfs @ 12.13 hrs, Volume= 1,221 cf, Depth= 3.34"
Routed to Pond 154P : Southeast Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	4,391	74	landscape
	4,391		100.00% Pervious Area

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

Subcatchment 37S: F6



Summary for Subcatchment 40S: F5 (Direct to Basin)

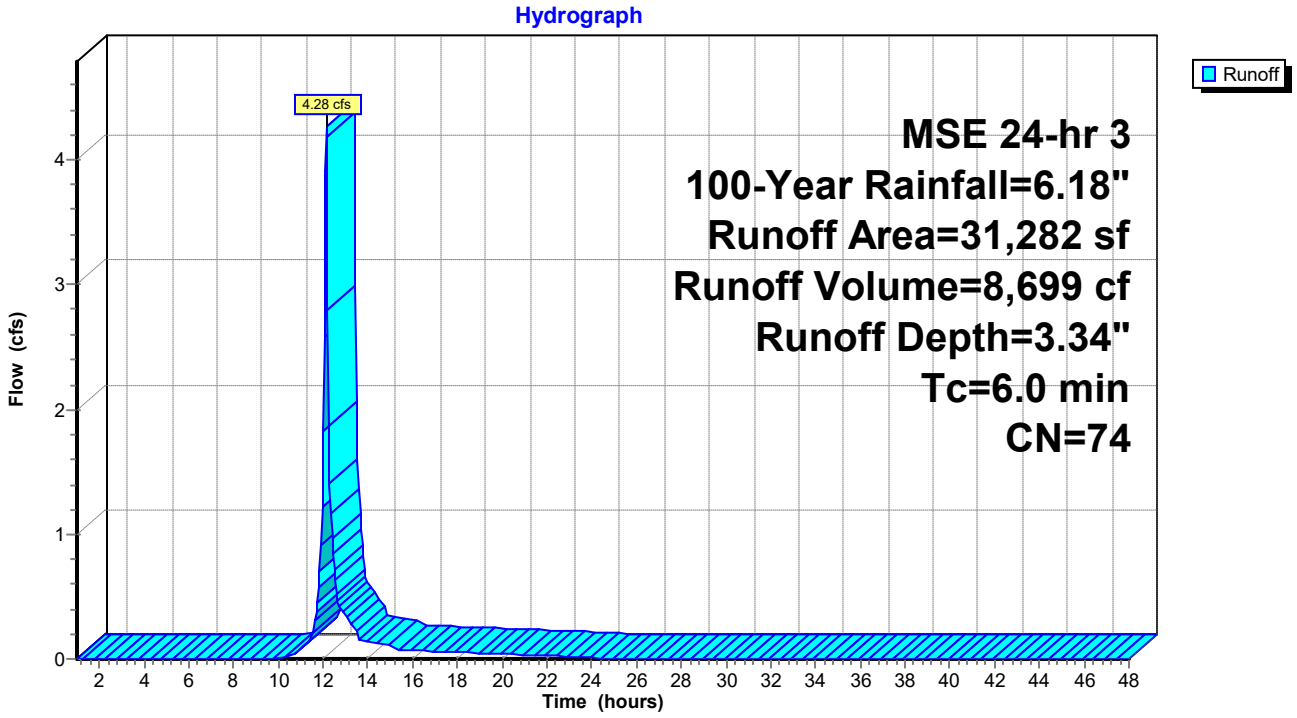
Runoff = 4.28 cfs @ 12.13 hrs, Volume= 8,699 cf, Depth= 3.34"
Routed to Pond 154P : Southeast Basin

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	31,282	74	landscape
	31,282		100.00% Pervious Area

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

Subcatchment 40S: F5 (Direct to Basin)



Summary for Subcatchment 49S: D2

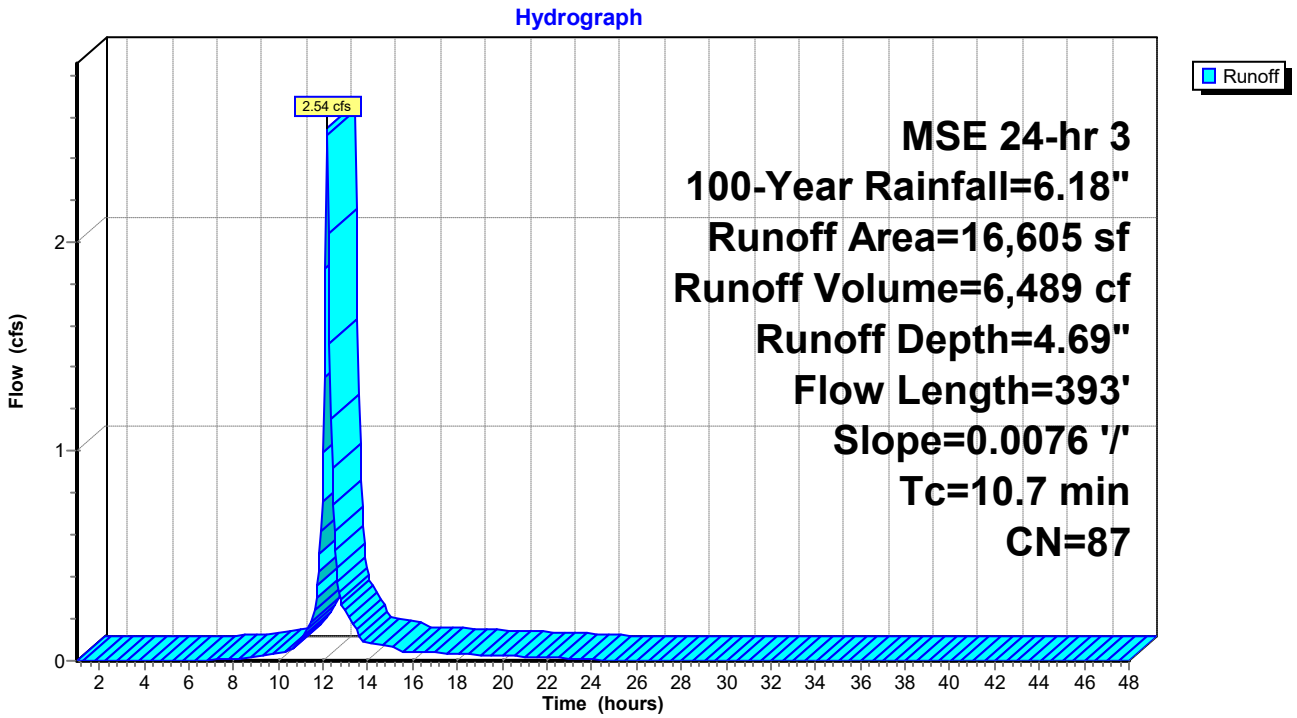
Runoff = 2.54 cfs @ 12.18 hrs, Volume= 6,489 cf, Depth= 4.69"
Routed to Pond 57P : Dry Pond 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	8,902	98	roof
*	7,703	74	landscape
	16,605	87	Weighted Average
	7,703		46.39% Pervious Area
	8,902		53.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	393	0.0076	0.61		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps

Subcatchment 49S: D2



Summary for Subcatchment 52S: E1

3/3/21
Delineation NOT updated based on Justin's waterdrops, needs finalization, it routes to western property ditch that goes ultimately to IB. We are using Joe's SWMP2 Figure from December 2020.

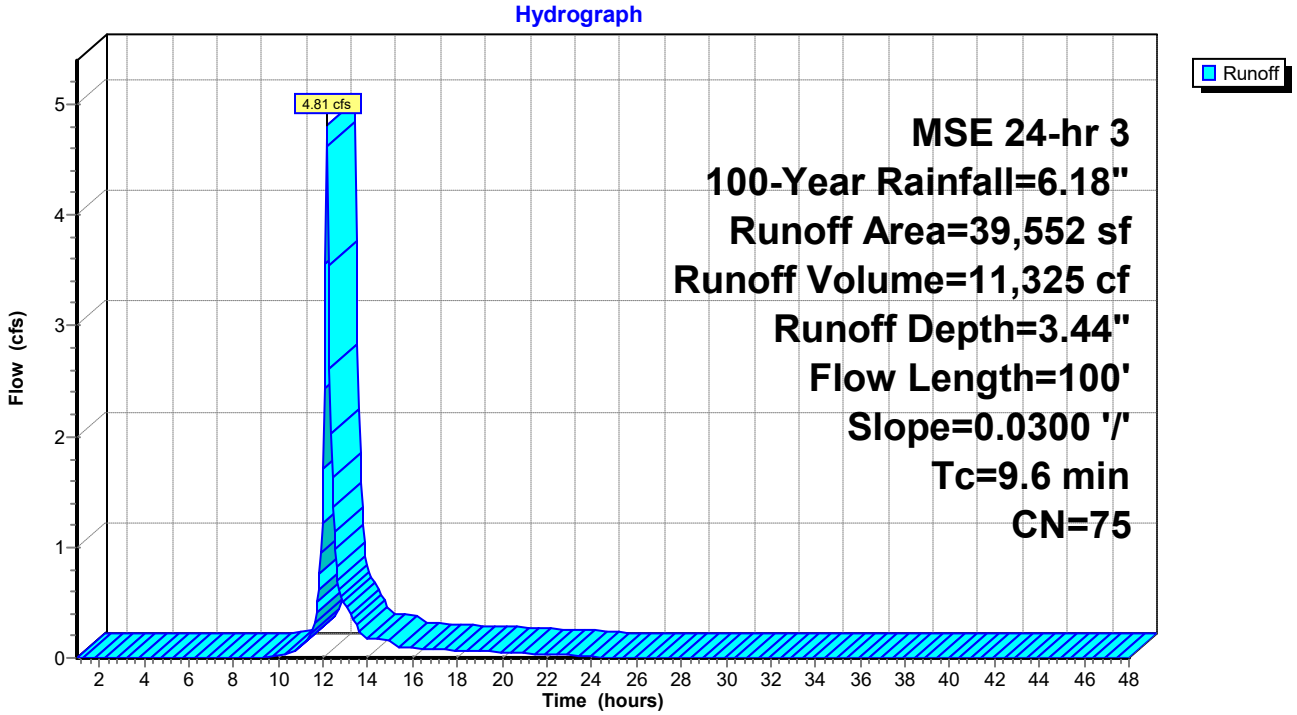
Runoff = 4.81 cfs @ 12.17 hrs, Volume= 11,325 cf, Depth= 3.44"
Routed to Reach 111R : Western PL North Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	2,161	98	Walks
	37,391	74	>75% Grass cover, Good, HSG C
	39,552	75	Weighted Average
	37,391		94.54% Pervious Area
	2,161		5.46% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0300	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.42"

Subcatchment 52S: E1



Summary for Subcatchment 55S: G

3/3/21
Needs to be delineated, this is from Joe's SWMP2

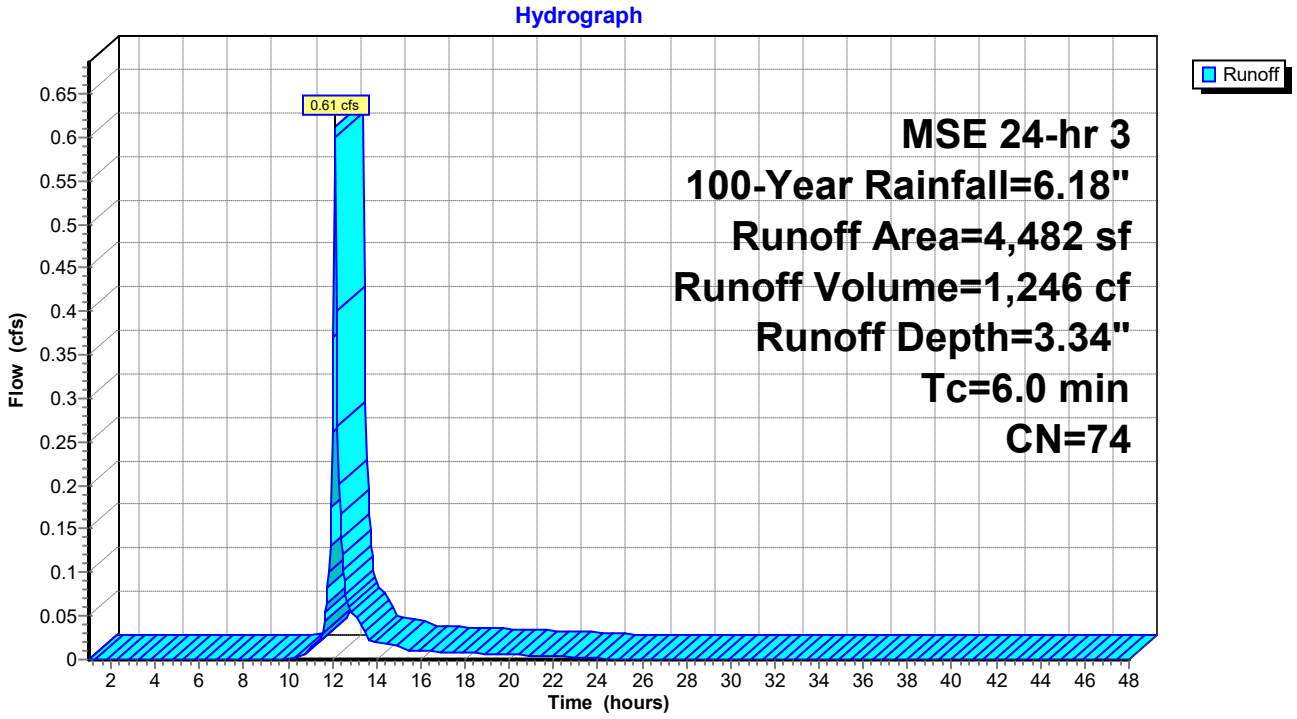
Runoff = 0.61 cfs @ 12.13 hrs, Volume= 1,246 cf, Depth= 3.34"
Routed to Link 66L : Total Offsite

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	4,482	74	landscape
	4,482		100.00% Pervious Area

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

Subcatchment 55S: G



Summary for Subcatchment 81S: O1

3/3/21
SW portion off-site flowing into IB

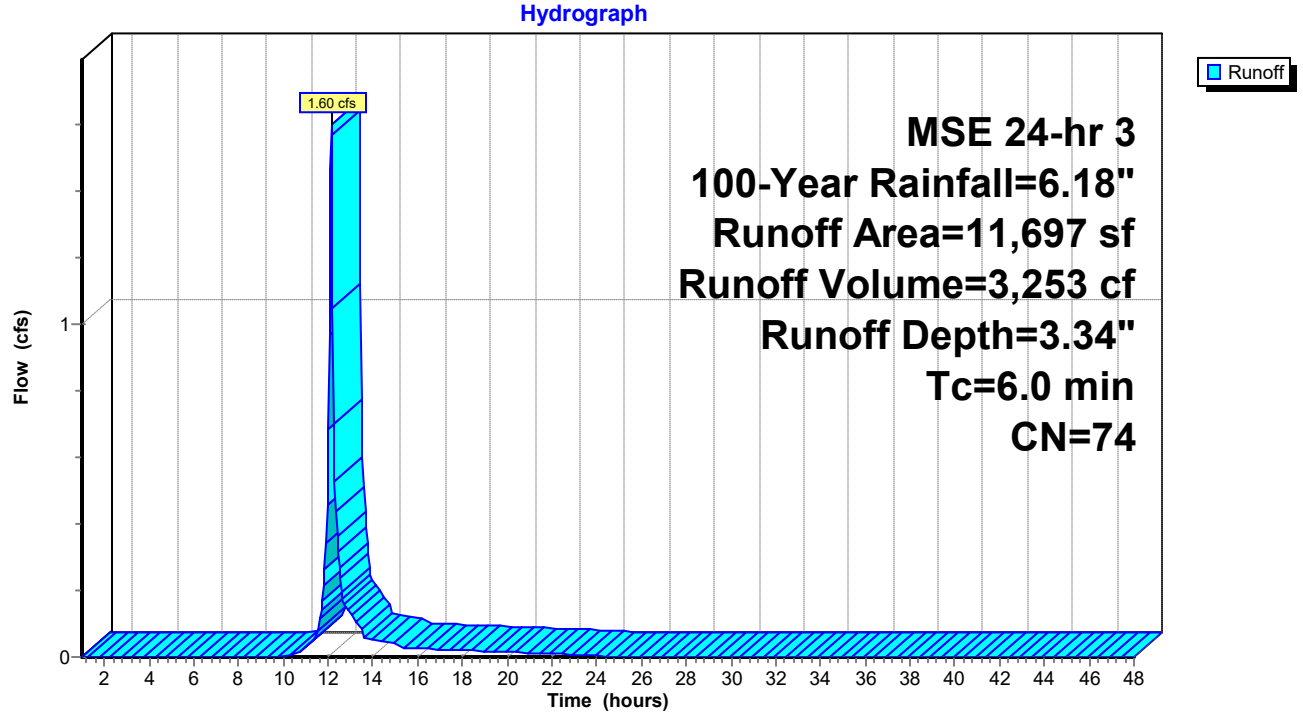
Runoff = 1.60 cfs @ 12.13 hrs, Volume= 3,253 cf, Depth= 3.34"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	11,697	74	PERV
	11,697		100.00% Pervious Area

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

Subcatchment 81S: O1



Summary for Subcatchment 82S: D1

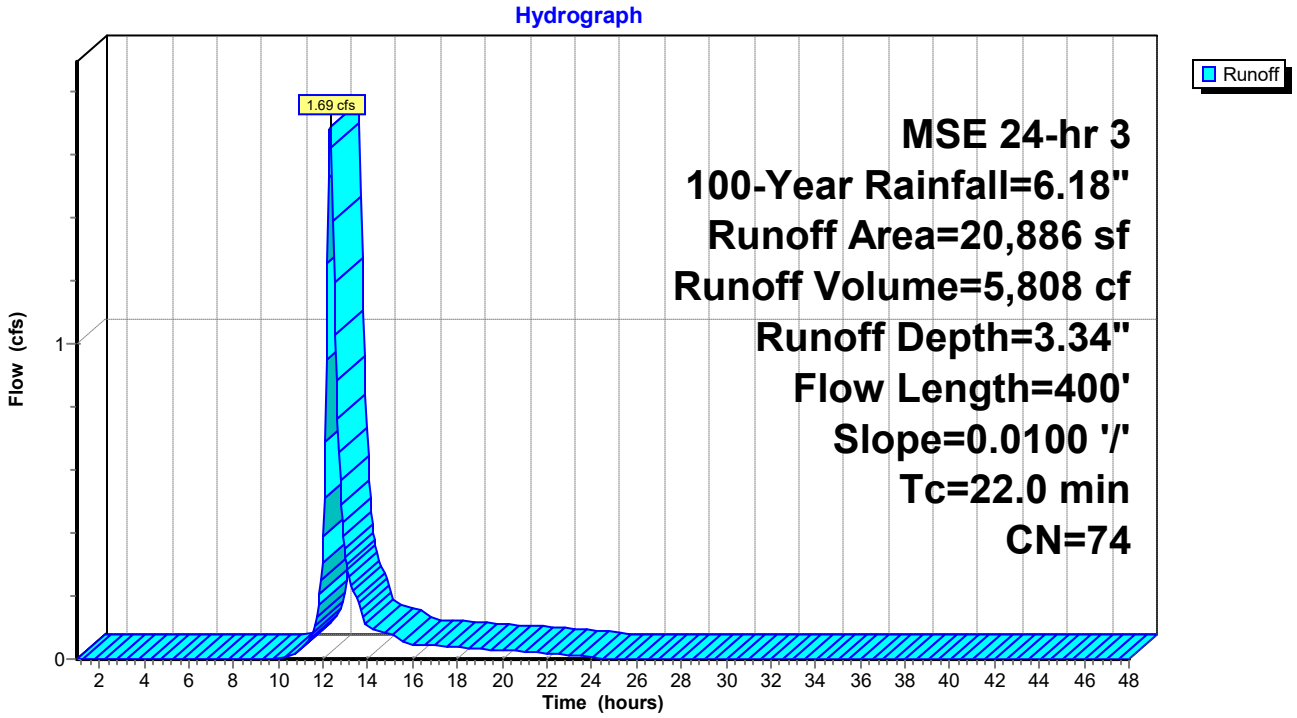
Runoff = 1.69 cfs @ 12.33 hrs, Volume= 5,808 cf, Depth= 3.34"
Routed to Pond 57P : Dry Pond 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	20,886	74	landscape
	20,886		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	100	0.0100	0.11		**Sheet Flow, BUILDING TO SWALE** Grass: Short n= 0.150 P2= 2.42"
7.1	300	0.0100	0.70		**Shallow Concentrated Flow, SWALE ALONG BACK** Short Grass Pasture Kv= 7.0 fps
22.0	400	Total			

Subcatchment 82S: D1



Summary for Subcatchment 87S: I

3/3/21
Wooded area

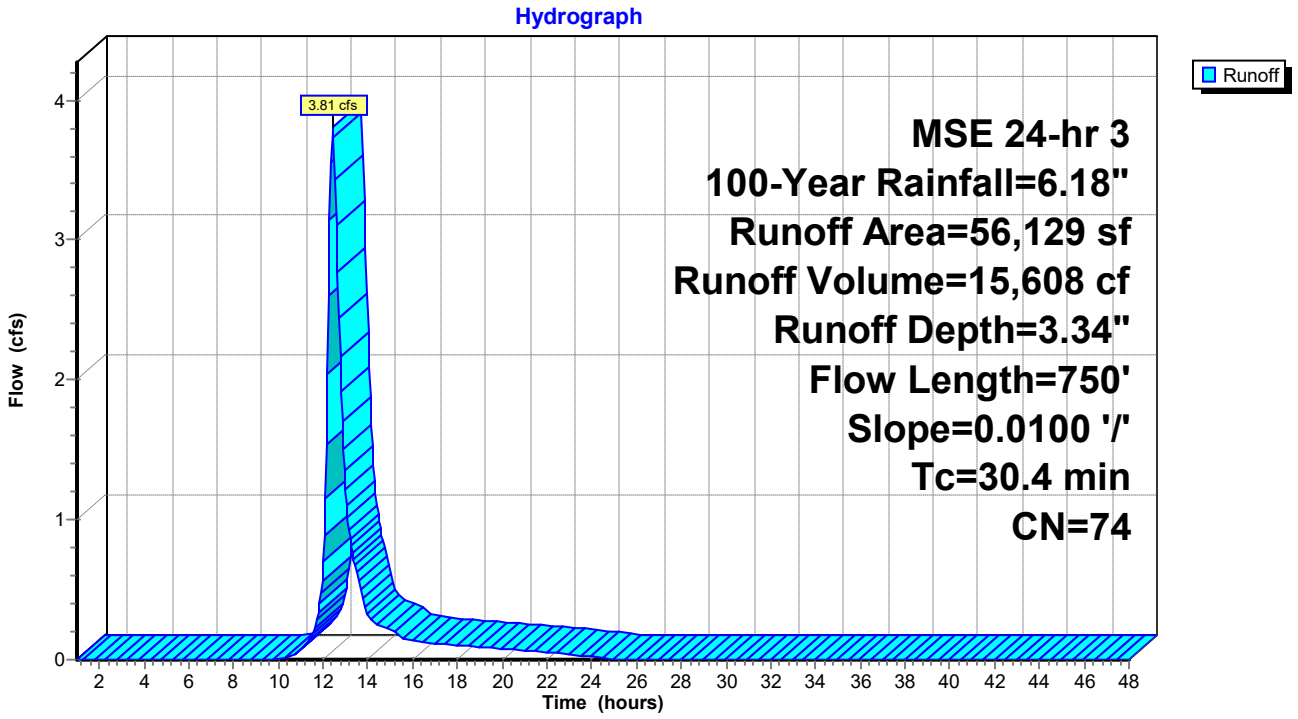
Runoff = 3.81 cfs @ 12.43 hrs, Volume= 15,608 cf, Depth= 3.34"
Routed to Reach 108R : South Berm Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	56,129	74	landscape
	56,129		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	100	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.42"
15.5	650	0.0100	0.70		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
30.4	750	Total			

Subcatchment 87S: I



Summary for Subcatchment 95S: C1

Area actually draining to east swale
3/3/21
Northern portion of East Roof, exterior east courtyard, 7 home lots

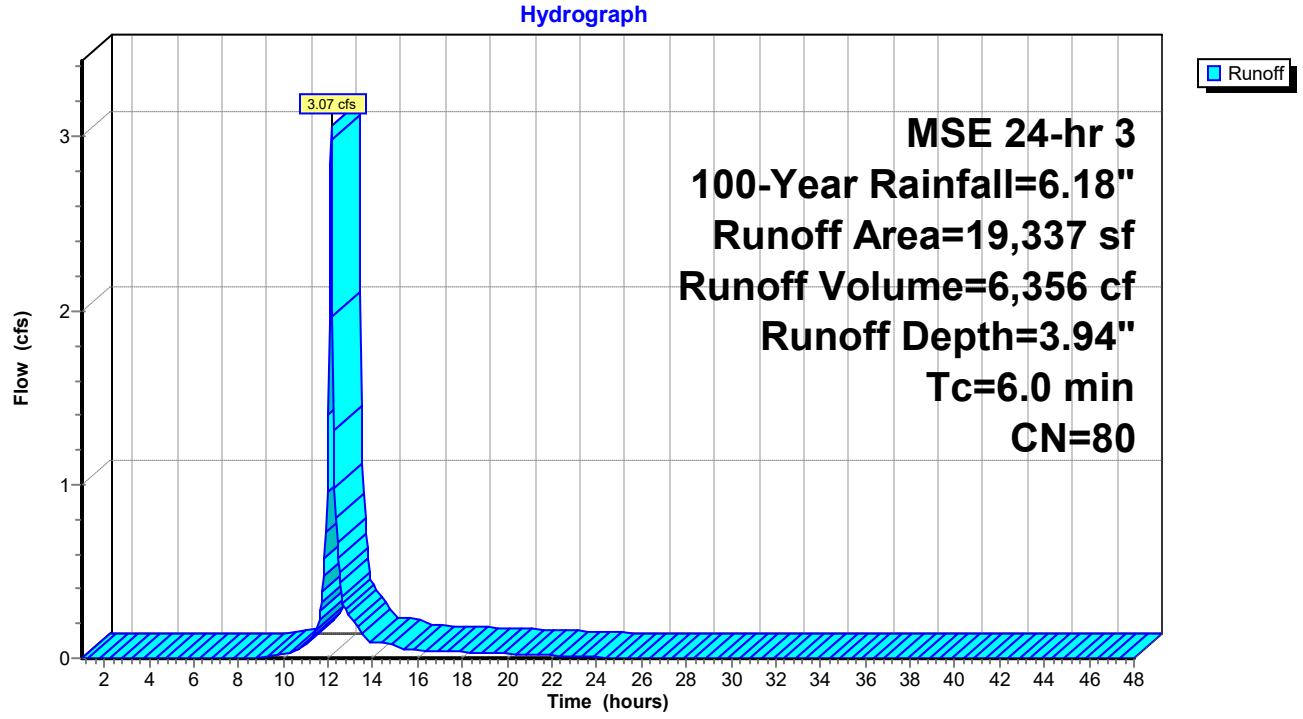
Runoff = 3.07 cfs @ 12.13 hrs, Volume= 6,356 cf, Depth= 3.94"
Routed to Reach 106R : East Swale (North End)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	2,210	98	walks
*	1,774	98	roads
*	14,290	74	landscape
*	1,063	98	roof
	19,337	80	Weighted Average
	14,290		73.90% Pervious Area
	5,047		26.10% Impervious Area

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

Subcatchment 95S: C1



Summary for Subcatchment 96S: E2

3/3/21
Delineation needs updating, but it does route to IB
Portion of cemetary site that flows from north to south into IB

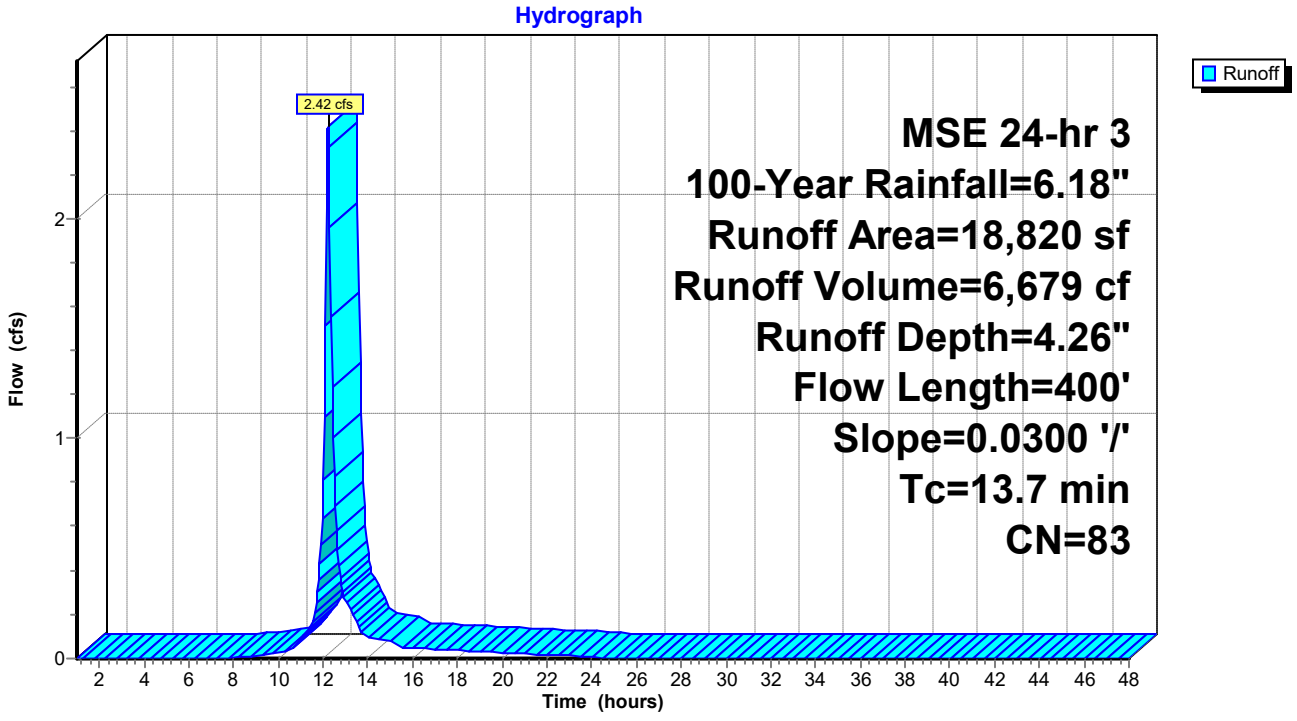
Runoff = 2.42 cfs @ 12.22 hrs, Volume= 6,679 cf, Depth= 4.26"
Routed to Pond 60P : Infiltration Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	11,460	74	landscape
*	7,360	98	roofs
	18,820	83	Weighted Average
	11,460		60.89% Pervious Area
	7,360		39.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.6	100	0.0300	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.42"
4.1	300	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
13.7	400	Total			

Subcatchment 96S: E2



Summary for Subcatchment 97S: C2

Subset C - C1
3/3/21
Southern portion of East Building Roof, Southern Building (Middle one) roof, pond area
pipe from roofs not sized yet

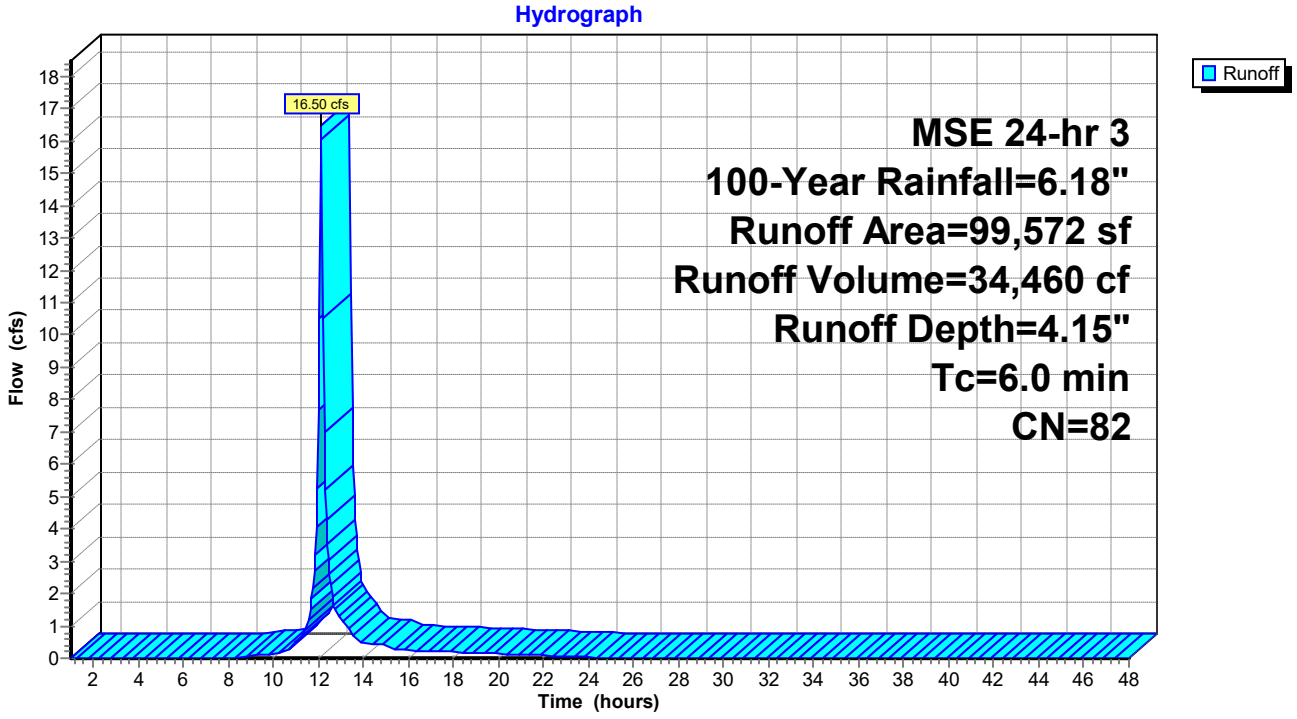
Runoff = 16.50 cfs @ 12.13 hrs, Volume= 34,460 cf, Depth= 4.15"
Routed to Pond 58P : Dry Pond 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	9,728	98	walks and patios
*	23,739	98	roofs
*	66,105	74	landscape
	99,572	82	Weighted Average
	66,105		66.39% Pervious Area
	33,467		33.61% Impervious Area

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

Subcatchment 97S: C2



Summary for Subcatchment 98S: E3

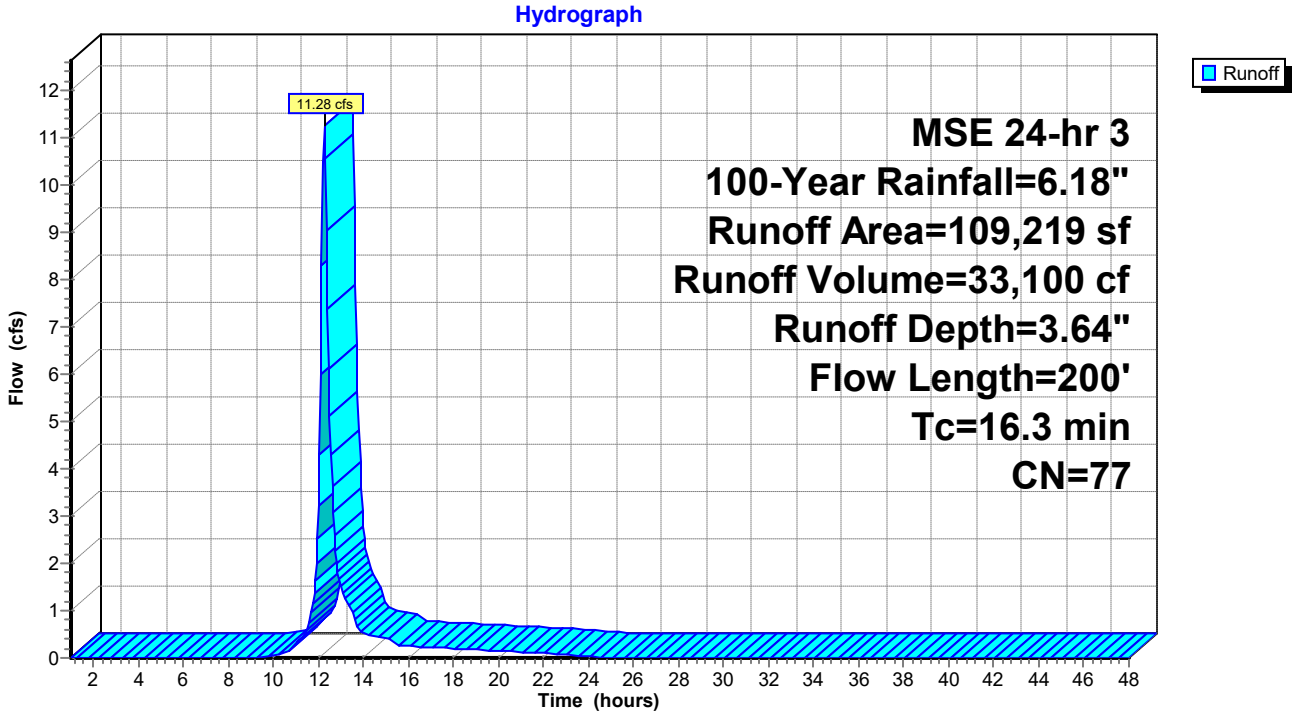
Runoff = 11.28 cfs @ 12.25 hrs, Volume= 33,100 cf, Depth= 3.64"
Routed to Pond 60P : Infiltration Basin #1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	6,532	98	walks
*	8,300	98	Roads
*	94,387	74	landscape
	109,219	77	Weighted Average
	94,387		86.42% Pervious Area
	14,832		13.58% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.9	100	0.0100	0.11		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.42"
1.4	100	0.0300	1.21		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
16.3	200	Total			

Subcatchment 98S: E3



Summary for Subcatchment 105S: C (EXTERIOR)

Subset C - C1
3/3/21
Southern portion of East Building Roof, Southern Building (Middle one) roof, pond area
pipe from roofs not sized yet

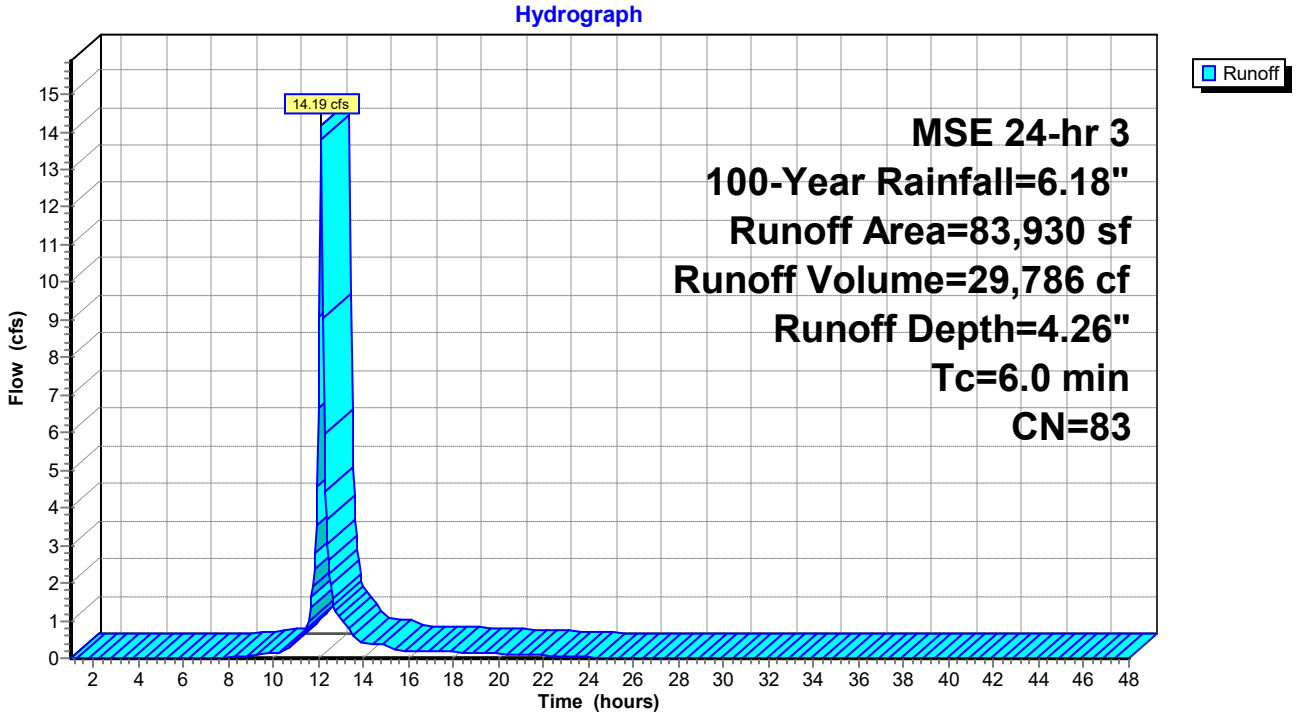
Runoff = 14.19 cfs @ 12.13 hrs, Volume= 29,786 cf, Depth= 4.26"
Routed to Reach 99R : East Swale (SE End)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	8,648	98	walks and patios
*	24,058	98	roofs
*	51,224	74	landscape
	83,930	83	Weighted Average
	51,224		61.03% Pervious Area
	32,706		38.97% Impervious Area

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

Subcatchment 105S: C (EXTERIOR)



Summary for Subcatchment 106S: B

3/3/21
North face of West Building, Lawn Area south of WTP, Patios

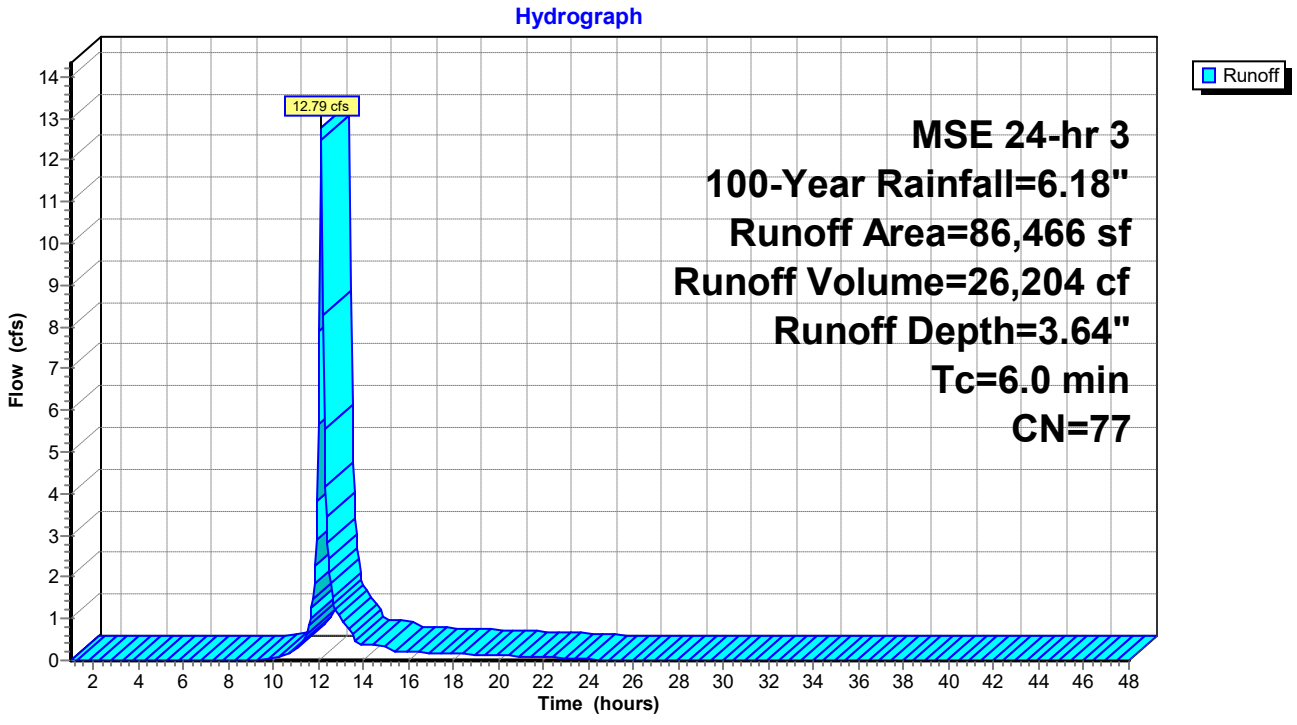
Runoff = 12.79 cfs @ 12.13 hrs, Volume= 26,204 cf, Depth= 3.64"
Routed to Reach 111R : Western PL North Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	76,225	74	landscape
*	9,317	98	walks
*	924	98	roof
	86,466	77	Weighted Average
	76,225		88.16% Pervious Area
	10,241		11.84% Impervious Area

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

Subcatchment 106S: B



Summary for Subcatchment 107S: F

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

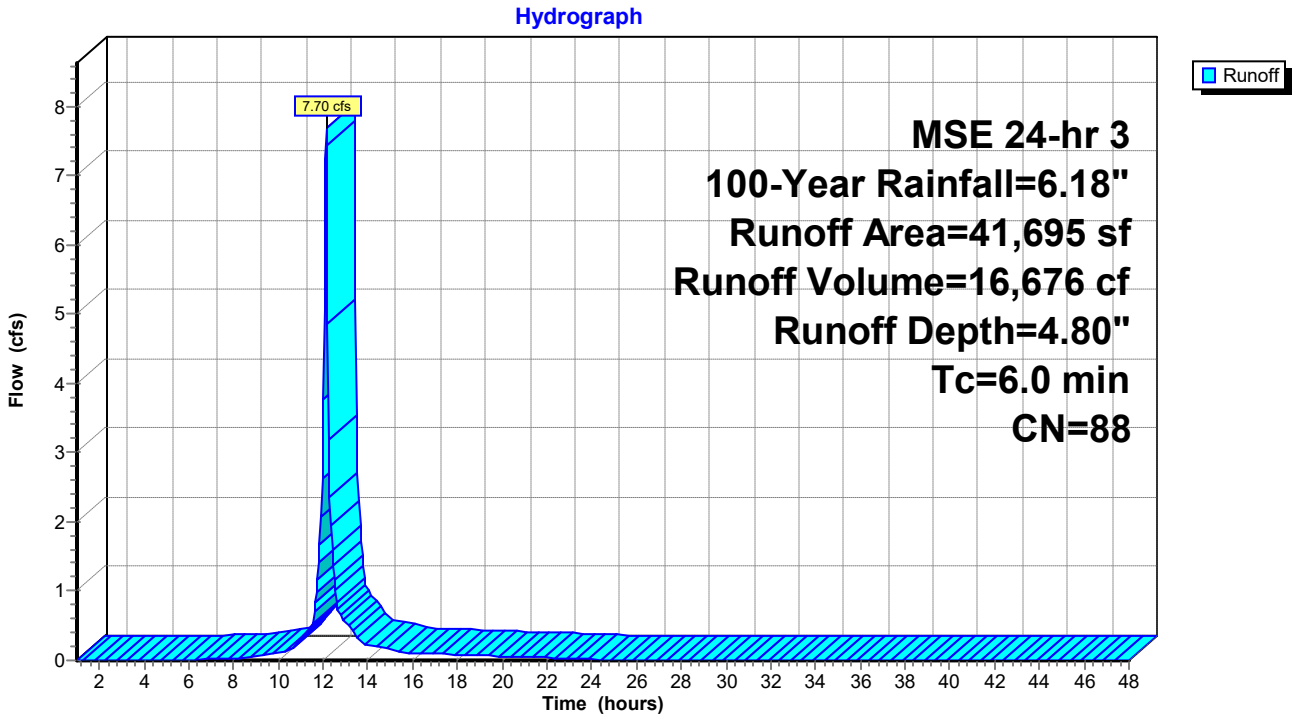
Runoff = 7.70 cfs @ 12.13 hrs, Volume= 16,676 cf, Depth= 4.80"
Routed to Reach 109R : SC Road East Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	7,467	98	roads
*	17,550	98	roof
*	16,678	74	landscape
	41,695	88	Weighted Average
	16,678		40.00% Pervious Area
	25,017		60.00% Impervious Area

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

Subcatchment 107S: F



Summary for Subcatchment 108S: B1 (INTERIOR)

3/3/21
Northern portion of W building roof

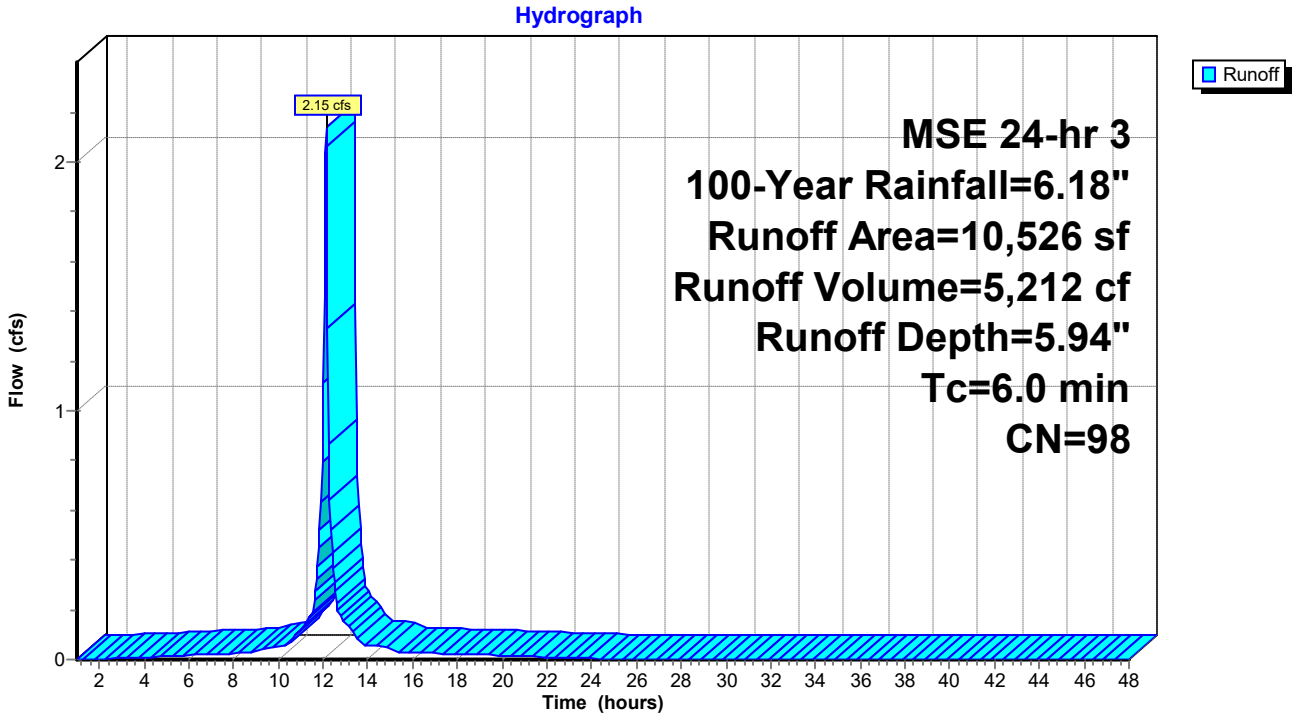
Runoff = 2.15 cfs @ 12.13 hrs, Volume= 5,212 cf, Depth= 5.94"
Routed to Link 174L : 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	10,526	98	roof
	10,526		100.00% Impervious Area

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

Subcatchment 108S: B1 (INTERIOR)



Summary for Subcatchment 112S: D3

3/3/21
Western Building Courtyard (need to check that Joe's overall B works with B1-B4 in our update

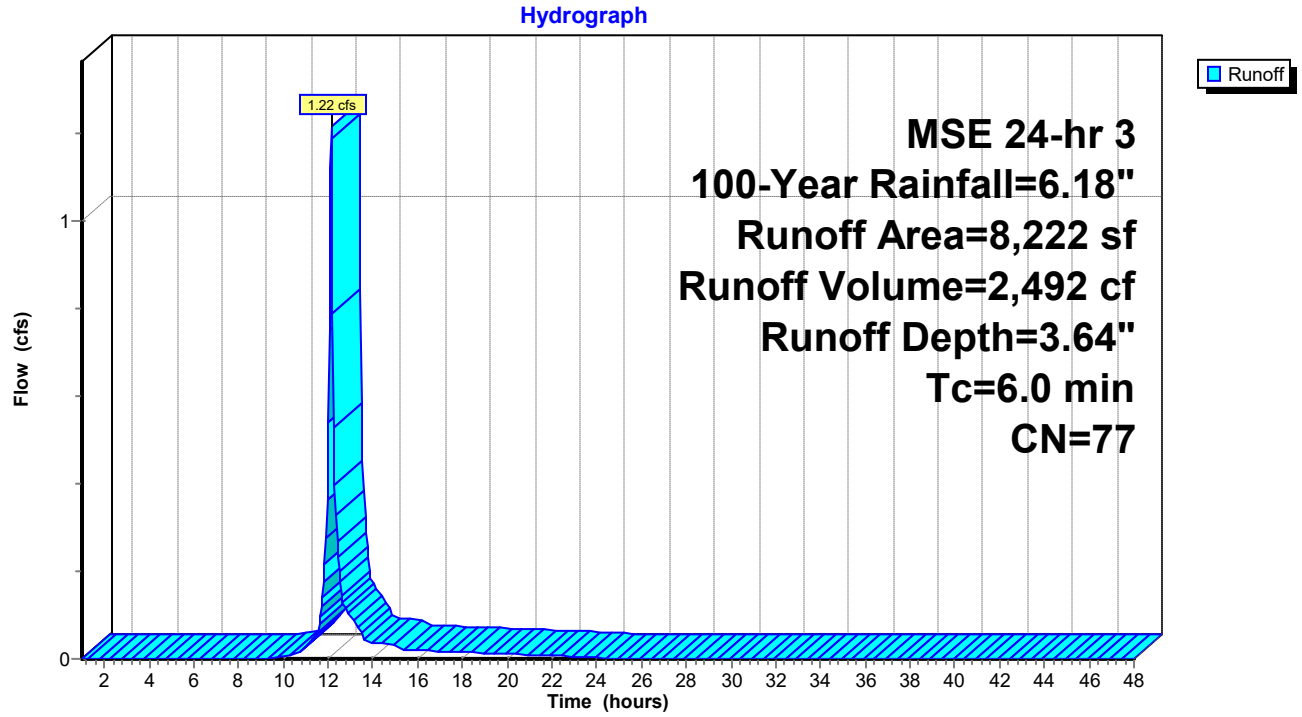
Runoff = 1.22 cfs @ 12.13 hrs, Volume= 2,492 cf, Depth= 3.64"
Routed to Reach 151R : Western PL North Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	1,062	98	walks
*	7,160	74	landscape
	8,222	77	Weighted Average
	7,160		87.08% Pervious Area
	1,062		12.92% Impervious Area

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

Subcatchment 112S: D3



Summary for Subcatchment 118S: A14

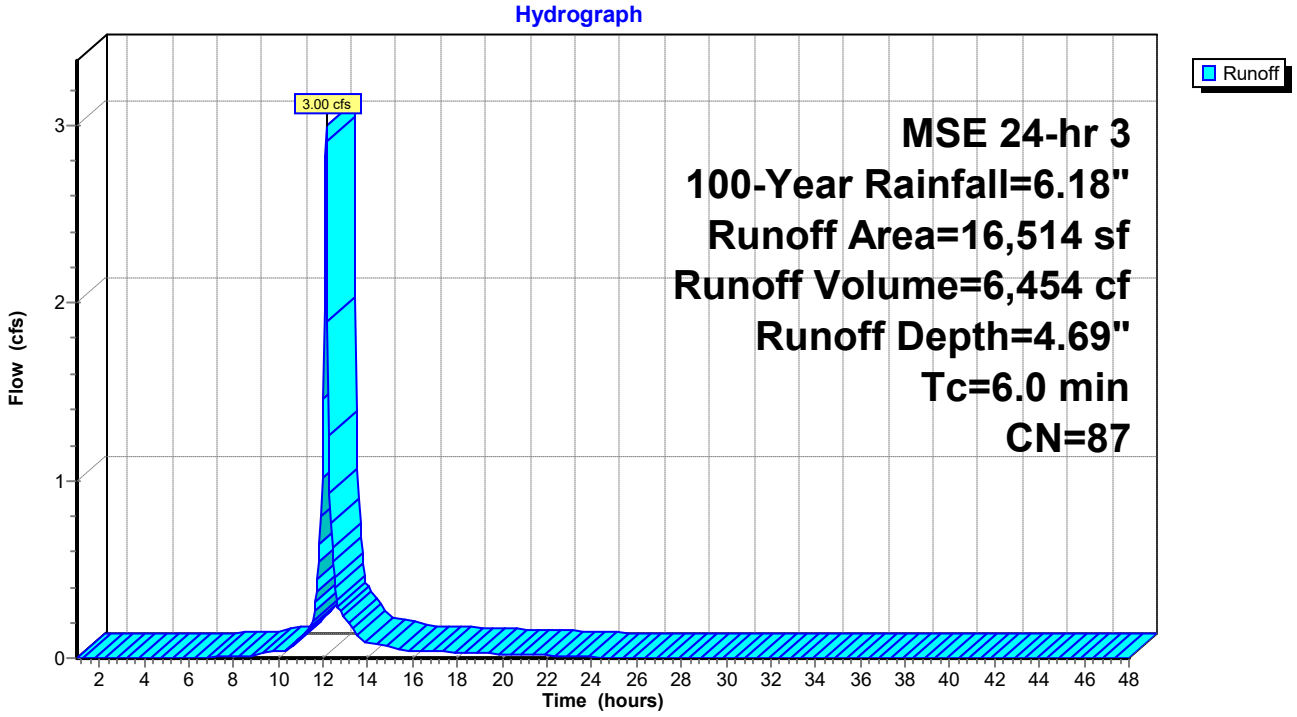
Runoff = 3.00 cfs @ 12.13 hrs, Volume= 6,454 cf, Depth= 4.69"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	3,919	98	WALKS
*	5,040	98	ROADS
*	0	98	ROOF
*	7,555	74	LANDSCAPING
	16,514	87	Weighted Average
	7,555		45.75% Pervious Area
	8,959		54.25% Impervious Area

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

Subcatchment 118S: A14



Summary for Subcatchment 120S: A30

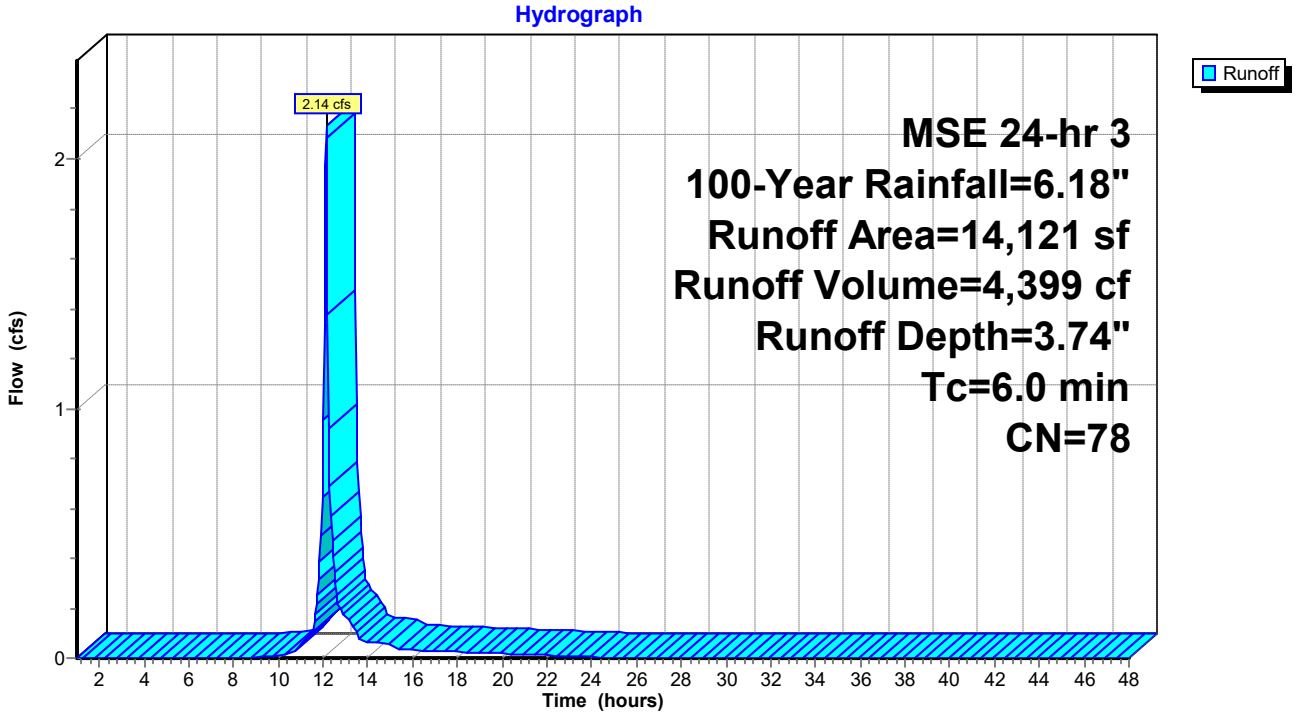
Runoff = 2.14 cfs @ 12.13 hrs, Volume= 4,399 cf, Depth= 3.74"
Routed to Link 126L : OVERSIZED PIPE RUN BY B3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	1,025	98	WALKS
*	1,563	98	ROADS
*	0	98	ROOF
*	11,533	74	LANDSCAPING
	14,121	78	Weighted Average
	11,533		81.67% Pervious Area
	2,588		18.33% Impervious Area

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

Subcatchment 120S: A30



Summary for Subcatchment 121S: A32

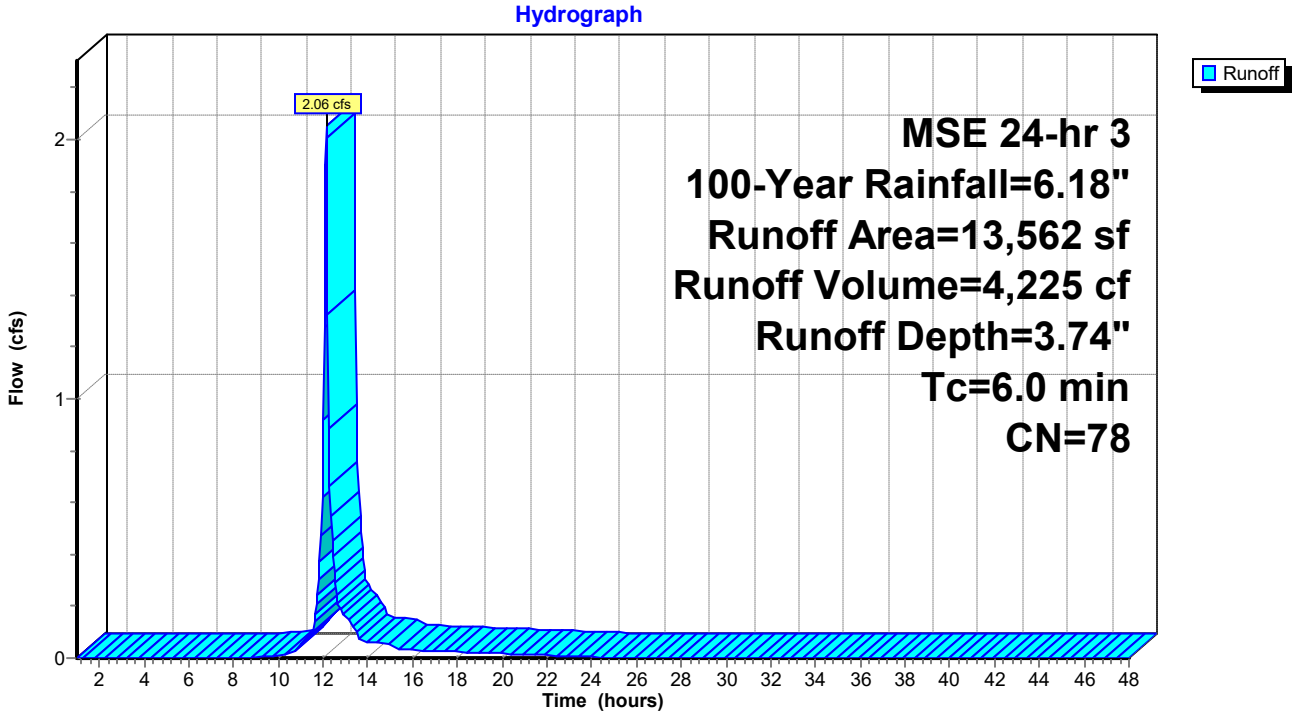
Runoff = 2.06 cfs @ 12.13 hrs, Volume= 4,225 cf, Depth= 3.74"
Routed to Link 126L : OVERSIZED PIPE RUN BY B3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	808	98	WALKS
*	1,224	98	ROADS
*	0	98	ROOF
*	11,530	74	LANDSCAPING
	13,562	78	Weighted Average
	11,530		85.02% Pervious Area
	2,032		14.98% Impervious Area

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

Subcatchment 121S: A32



Summary for Subcatchment 122S: F1

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

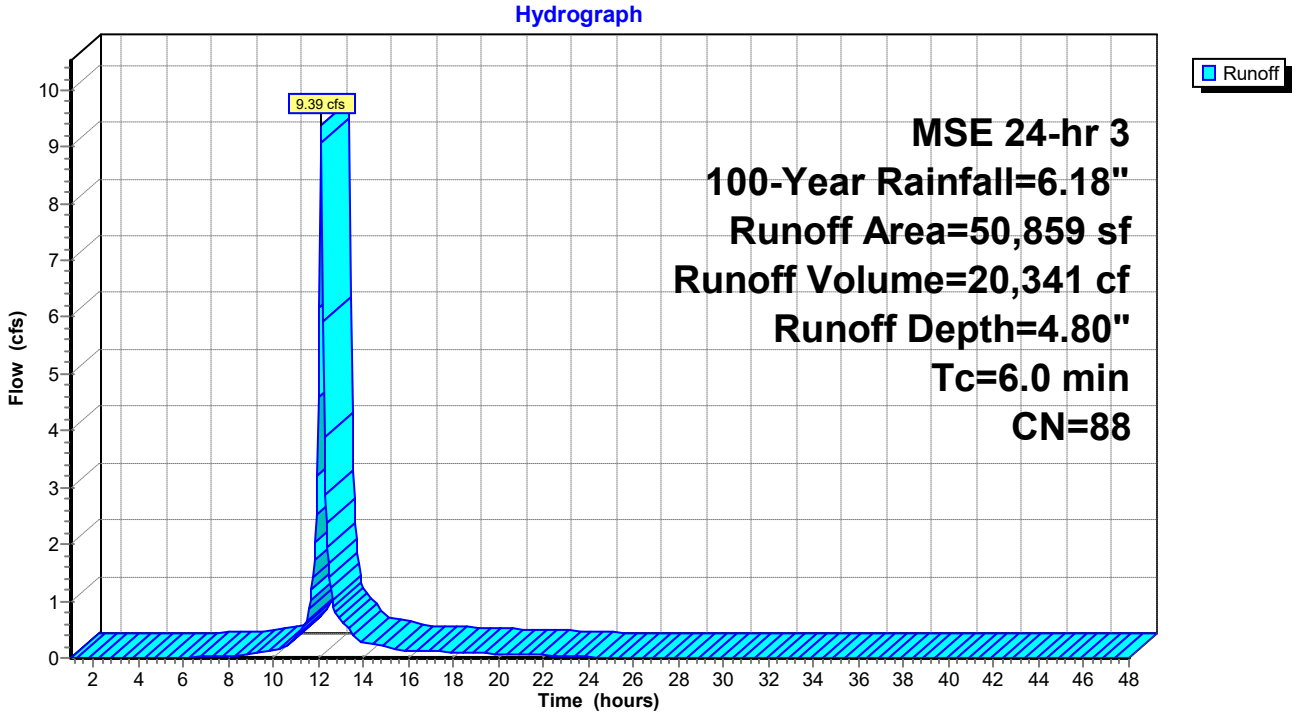
Runoff = 9.39 cfs @ 12.13 hrs, Volume= 20,341 cf, Depth= 4.80"
Routed to Reach 117R : SC Road West Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	244	98	walks
*	10,158	98	roads
*	18,836	98	roof
*	21,621	74	landscape
	50,859	88	Weighted Average
	21,621		42.51% Pervious Area
	29,238		57.49% Impervious Area

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

Subcatchment 122S: F1



Summary for Subcatchment 125S: F3

3/3/21
SW Lot that drains direct to SC Pond

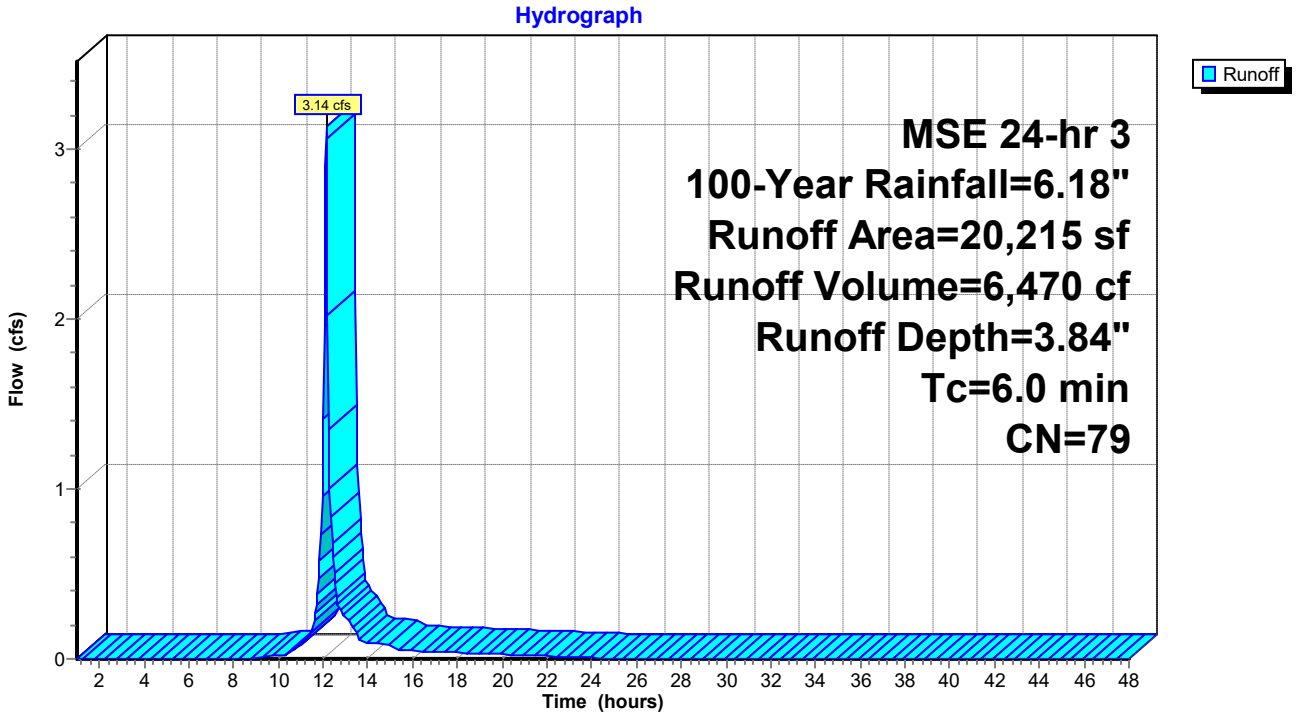
Runoff = 3.14 cfs @ 12.13 hrs, Volume= 6,470 cf, Depth= 3.84"
Routed to Reach 136R : SC West Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	4,099	98	roof
*	16,116	74	landscape
	20,215	79	Weighted Average
	16,116		79.72% Pervious Area
	4,099		20.28% Impervious Area

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

Subcatchment 125S: F3



Summary for Subcatchment 126S: F4

3/3/21
SC Pond itself

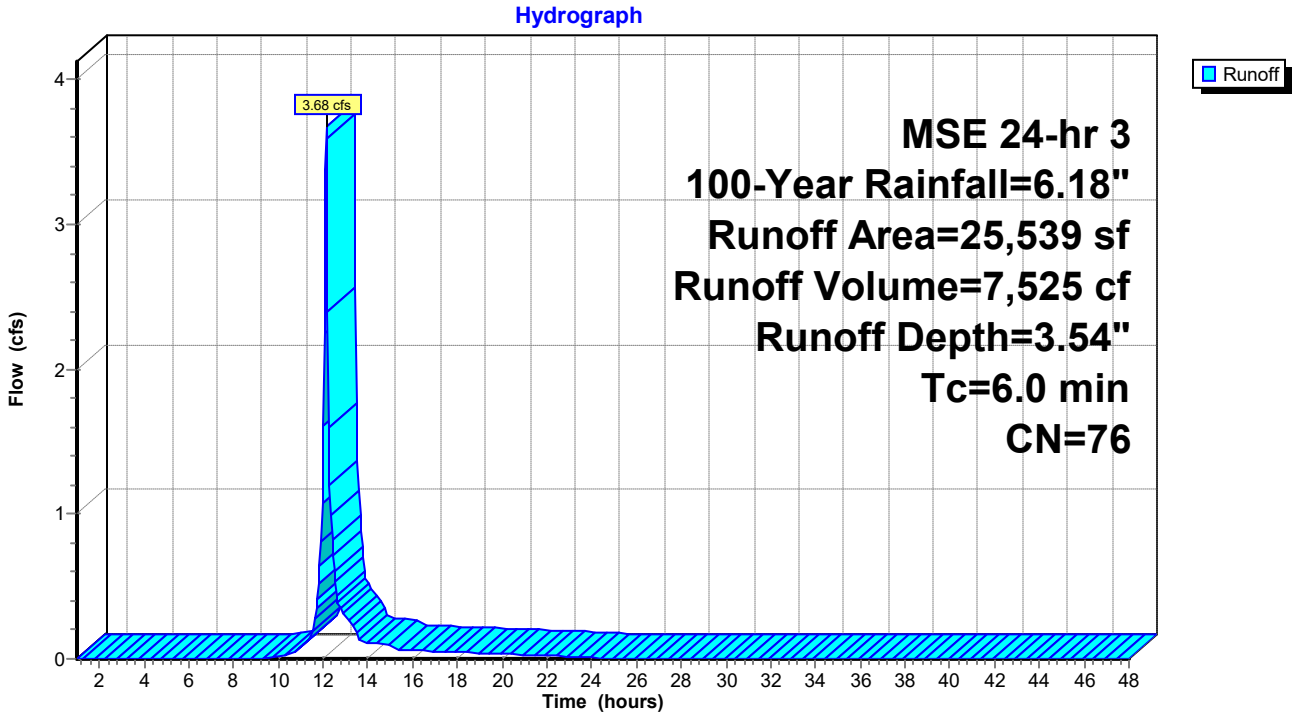
Runoff = 3.68 cfs @ 12.13 hrs, Volume= 7,525 cf, Depth= 3.54"
Routed to Pond 95P : Dry Pond 3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	23,462	74	landscape
*	2,077	98	roof
	25,539	76	Weighted Average
	23,462		91.87% Pervious Area
	2,077		8.13% Impervious Area

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

Subcatchment 126S: F4



Summary for Subcatchment 127S: A13

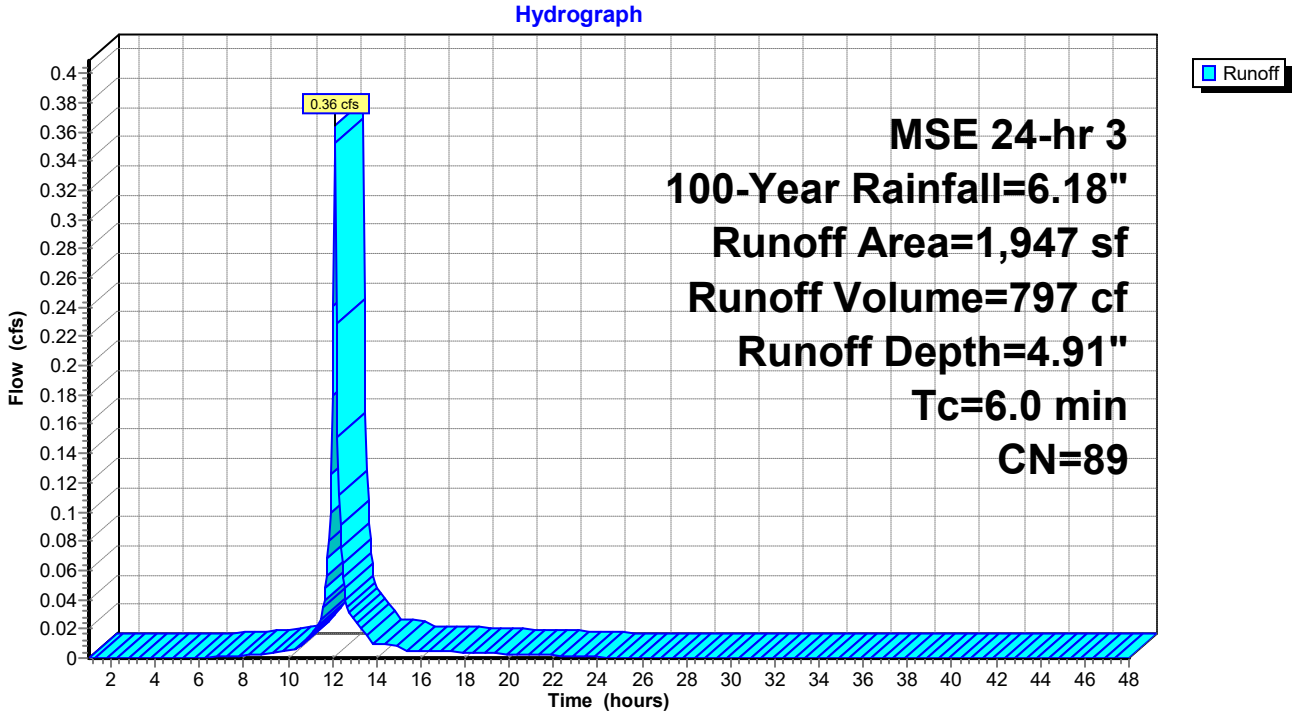
Runoff = 0.36 cfs @ 12.13 hrs, Volume= 797 cf, Depth= 4.91"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	288	98	WALKS
*	0	98	ROADS
*	924	98	ROOF
*	735	74	LANDSCAPING
	1,947	89	Weighted Average
	735		37.75% Pervious Area
	1,212		62.25% Impervious Area

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

Subcatchment 127S: A13



Summary for Subcatchment 128S: A15

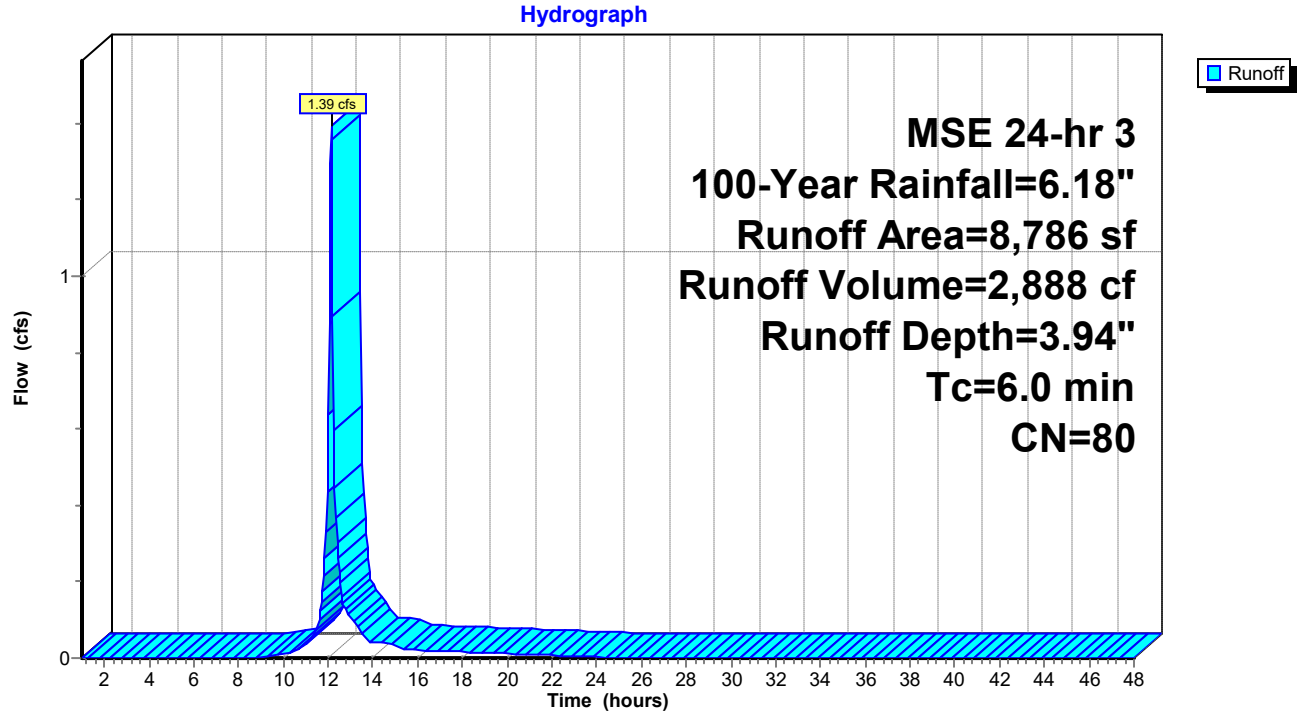
Runoff = 1.39 cfs @ 12.13 hrs, Volume= 2,888 cf, Depth= 3.94"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	2,261	98	WALKS
*	0	98	ROADS
*	0	98	ROOF
*	6,525	74	LANDSCAPING
	8,786	80	Weighted Average
	6,525		74.27% Pervious Area
	2,261		25.73% Impervious Area

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

Subcatchment 128S: A15



Summary for Subcatchment 130S: A12

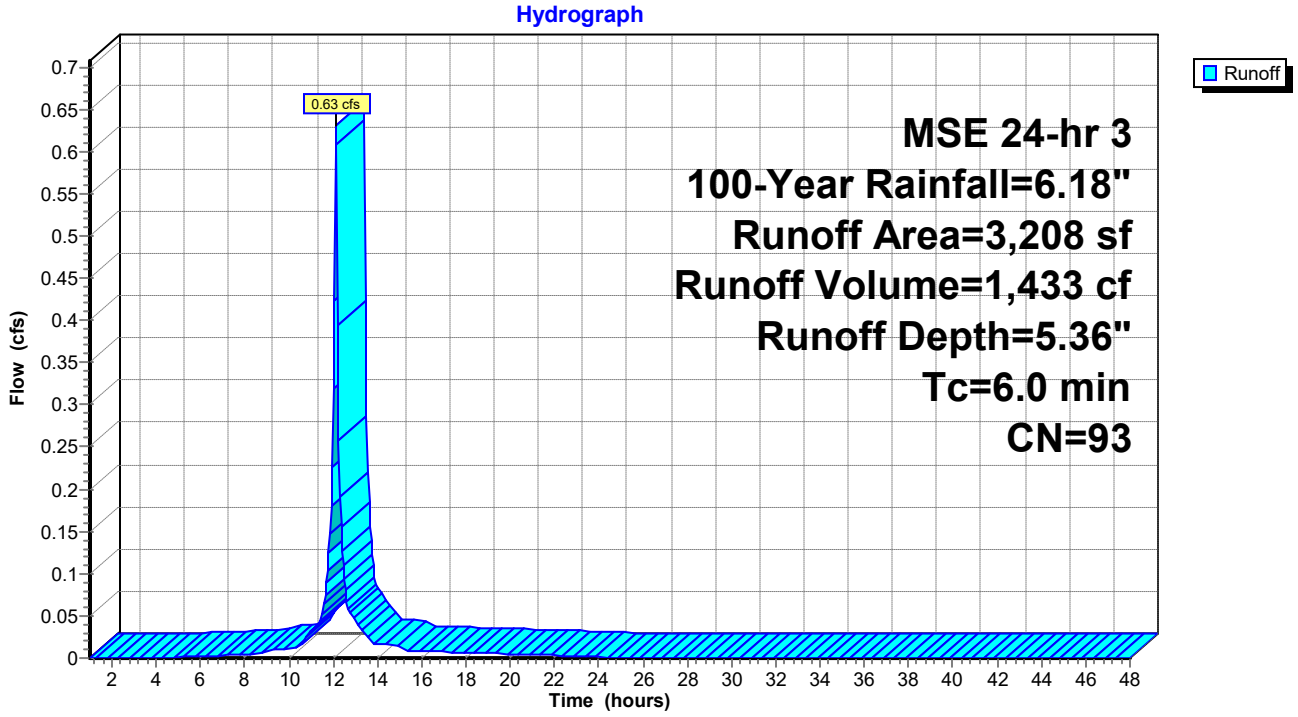
Runoff = 0.63 cfs @ 12.13 hrs, Volume= 1,433 cf, Depth= 5.36"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	216	98	WALKS
*	1,455	98	ROADS
*	924	98	ROOF
*	613	74	LANDSCAPING
	3,208	93	Weighted Average
	613		19.11% Pervious Area
	2,595		80.89% Impervious Area

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

Subcatchment 130S: A12



Summary for Subcatchment 131S: A11

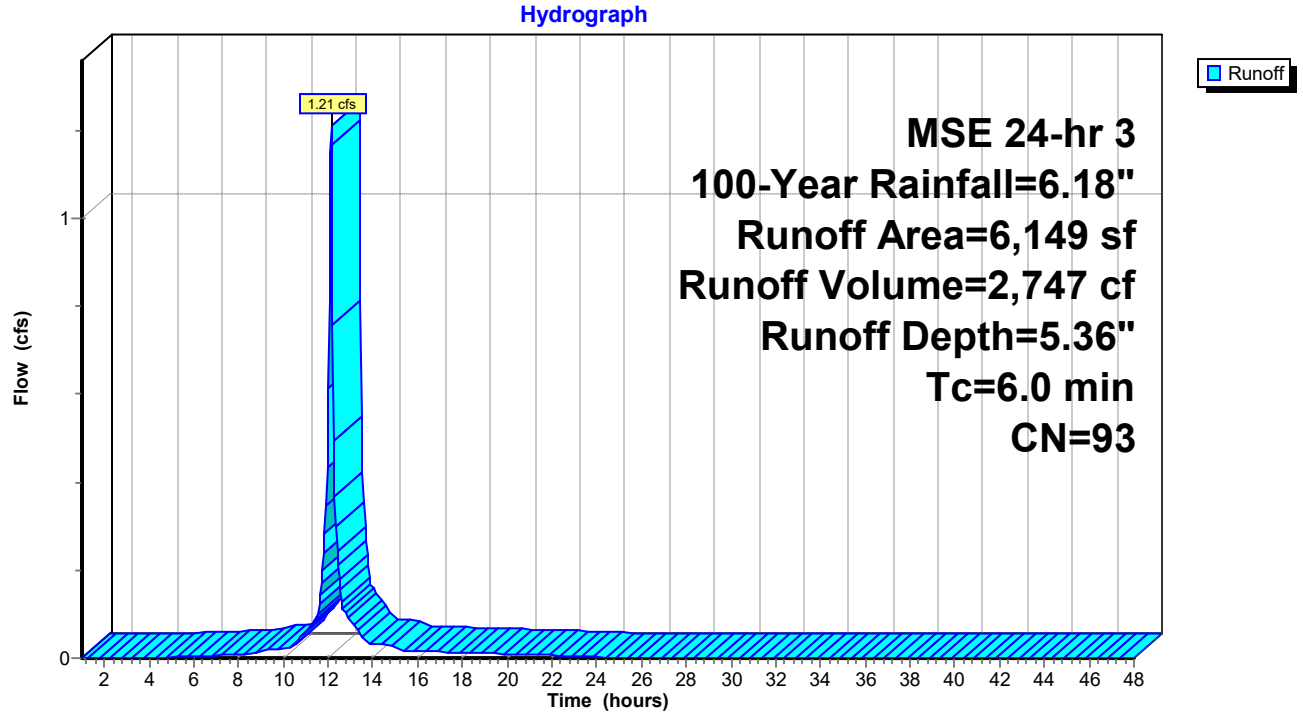
Runoff = 1.21 cfs @ 12.13 hrs, Volume= 2,747 cf, Depth= 5.36"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	1,109	98	WALKS
*	1,910	98	ROADS
*	1,848	98	ROOF
*	1,282	74	LANDSCAPING
	6,149	93	Weighted Average
	1,282		20.85% Pervious Area
	4,867		79.15% Impervious Area

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

Subcatchment 131S: A11



Summary for Subcatchment 132S: A9

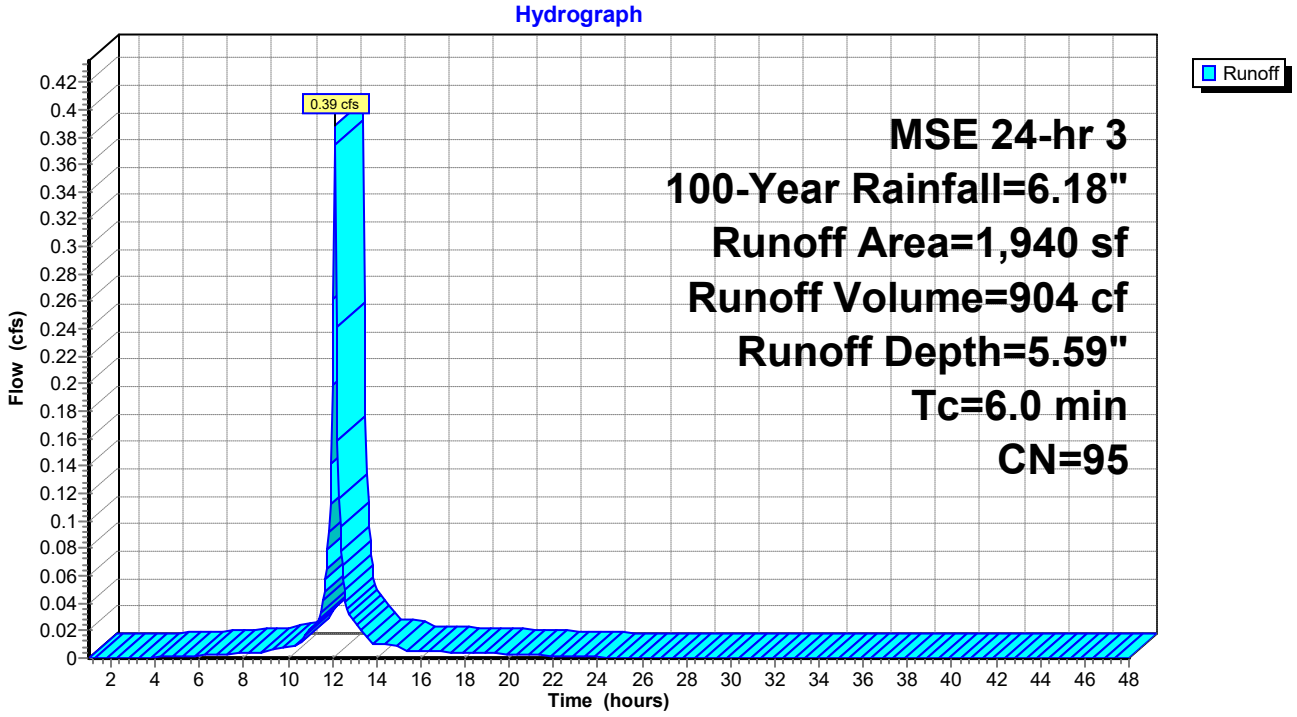
Runoff = 0.39 cfs @ 12.13 hrs, Volume= 904 cf, Depth= 5.59"
Routed to Pond 133P : WEST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	424	98	WALKS
*	321	98	ROADS
*	924	98	ROOF
*	271	74	LANDSCAPING
	1,940	95	Weighted Average
	271		13.97% Pervious Area
	1,669		86.03% Impervious Area

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

Subcatchment 132S: A9



Summary for Subcatchment 133S: A7

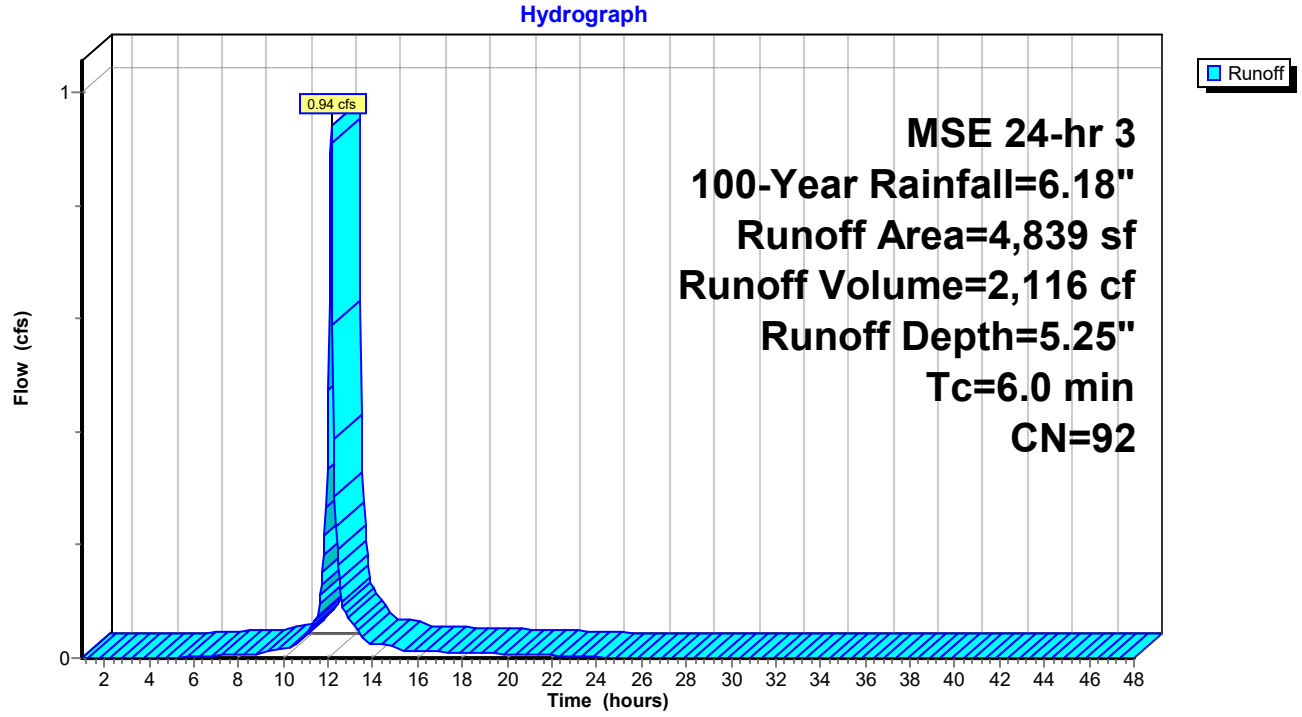
Runoff = 0.94 cfs @ 12.13 hrs, Volume= 2,116 cf, Depth= 5.25"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	939	98	WALKS
*	1,710	98	ROADS
*	924	98	ROOF
*	1,266	74	LANDSCAPING
	4,839	92	Weighted Average
	1,266		26.16% Pervious Area
	3,573		73.84% Impervious Area

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

Subcatchment 133S: A7



Summary for Subcatchment 134S: A5

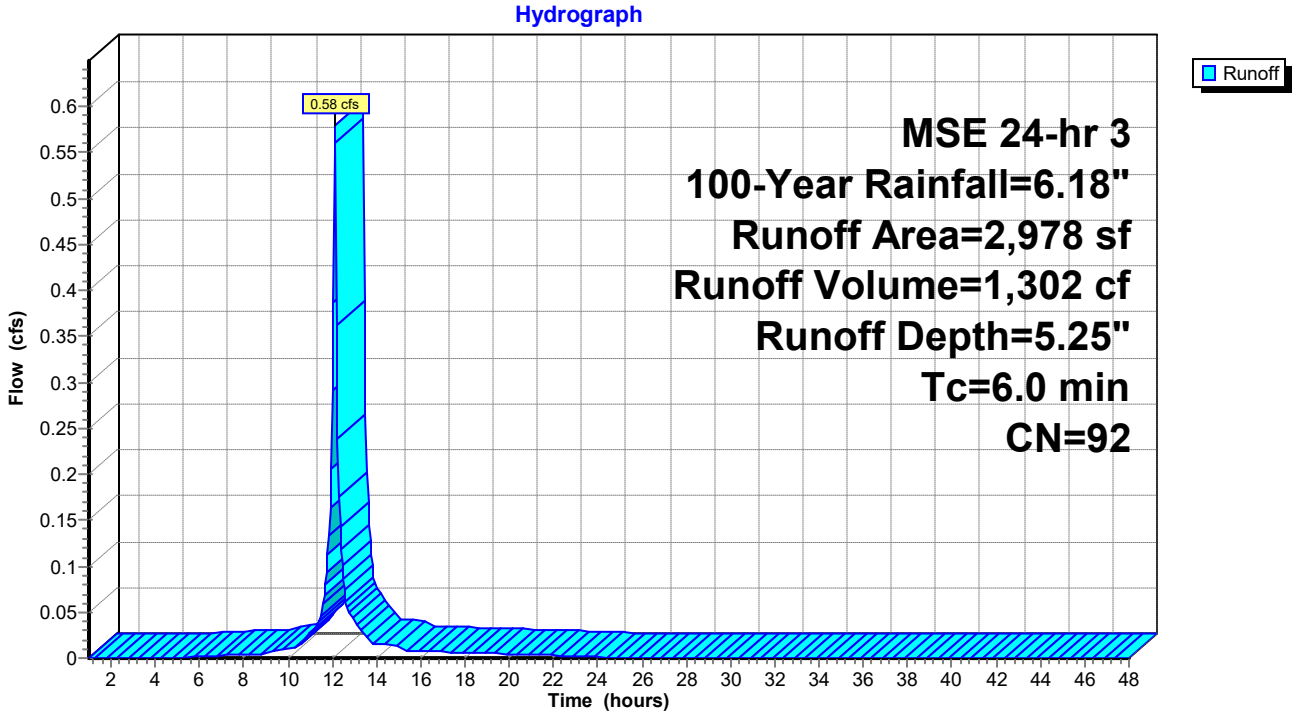
Runoff = 0.58 cfs @ 12.13 hrs, Volume= 1,302 cf, Depth= 5.25"
Routed to Link 127L : total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	489	98	WALKS
*	875	98	ROADS
*	924	98	ROOF
*	690	74	LANDSCAPING
	2,978	92	Weighted Average
	690		23.17% Pervious Area
	2,288		76.83% Impervious Area

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

Subcatchment 134S: A5



Summary for Subcatchment 136S: A33

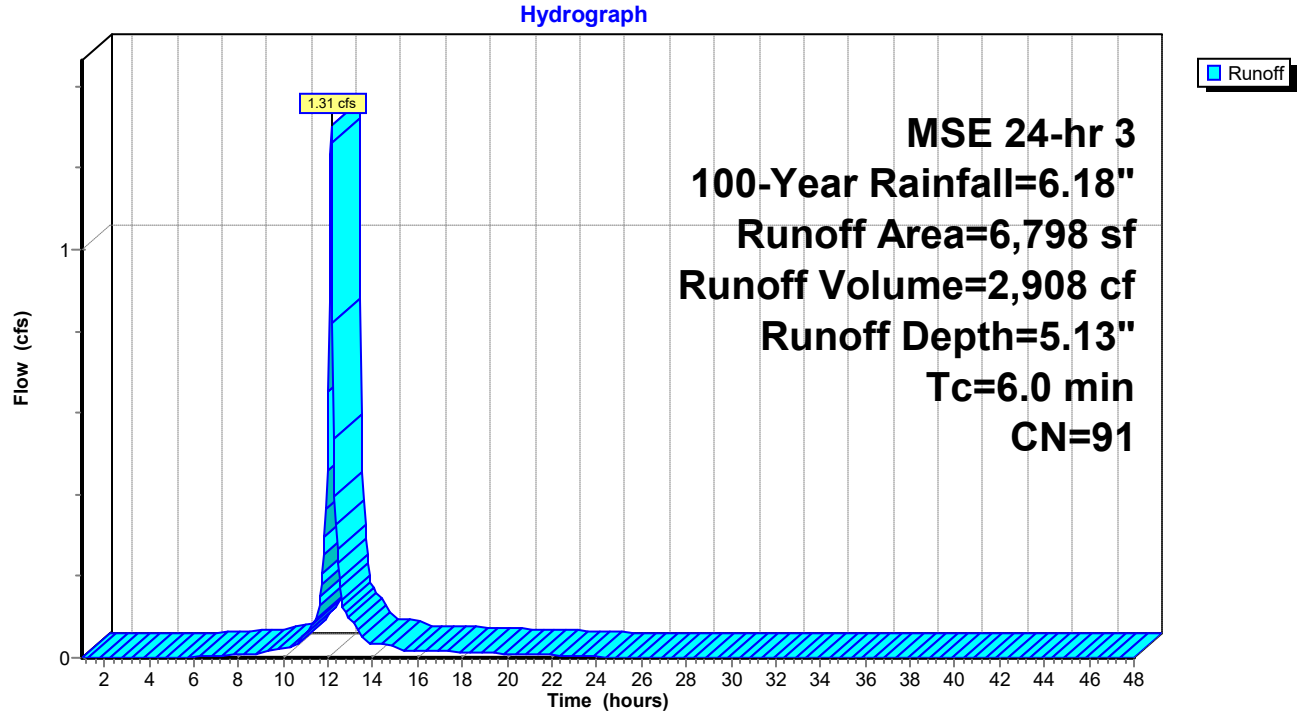
Runoff = 1.31 cfs @ 12.13 hrs, Volume= 2,908 cf, Depth= 5.13"
Routed to Link 126L : OVERSIZED PIPE RUN BY B3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	2,246	98	WALKS
*	2,695	98	ROADS
*	1,857	74	LANDSCAPING
	6,798	91	Weighted Average
	1,857		27.32% Pervious Area
	4,941		72.68% Impervious Area

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

Subcatchment 136S: A33



Summary for Subcatchment 137S: A1

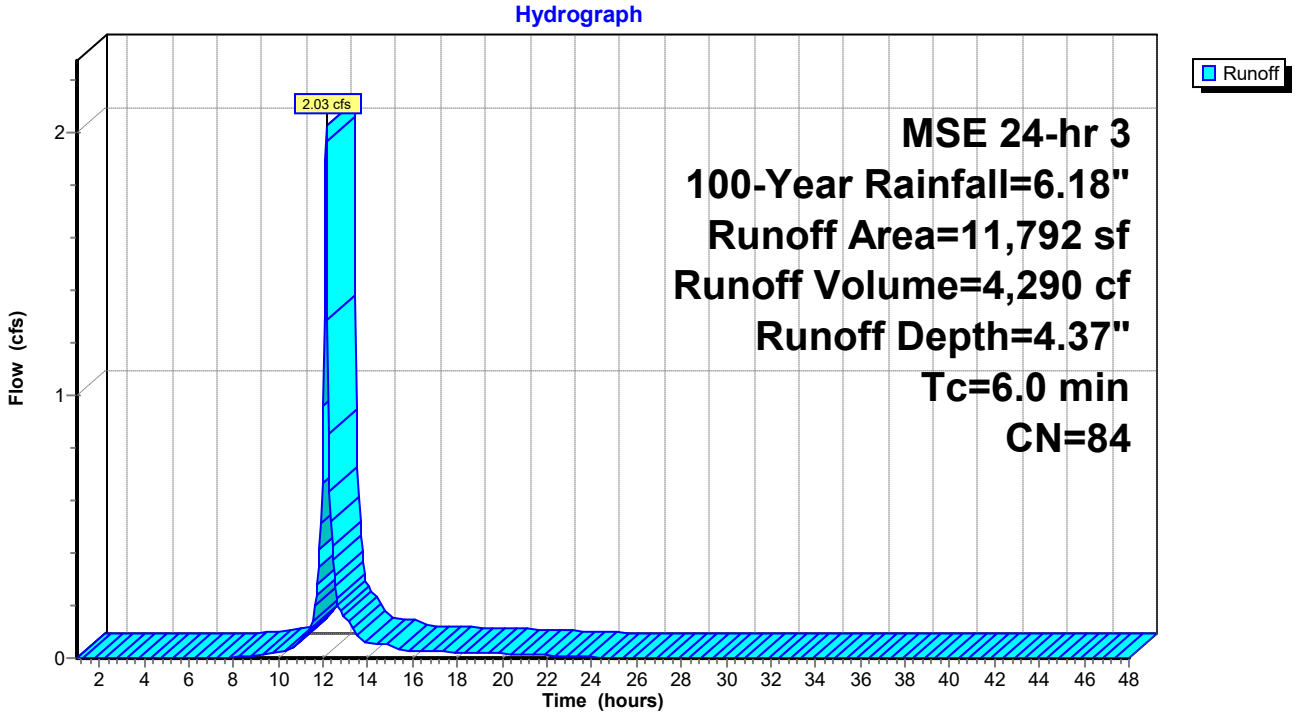
Runoff = 2.03 cfs @ 12.13 hrs, Volume= 4,290 cf, Depth= 4.37"
Routed to Pond 58P : Dry Pond 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	295	98	WALKS
*	3,348	98	ROADS
*	1,063	98	ROOF
*	7,086	74	LANDSCAPING
	11,792	84	Weighted Average
	7,086		60.09% Pervious Area
	4,706		39.91% Impervious Area

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

Subcatchment 137S: A1



Summary for Subcatchment 138S: F2

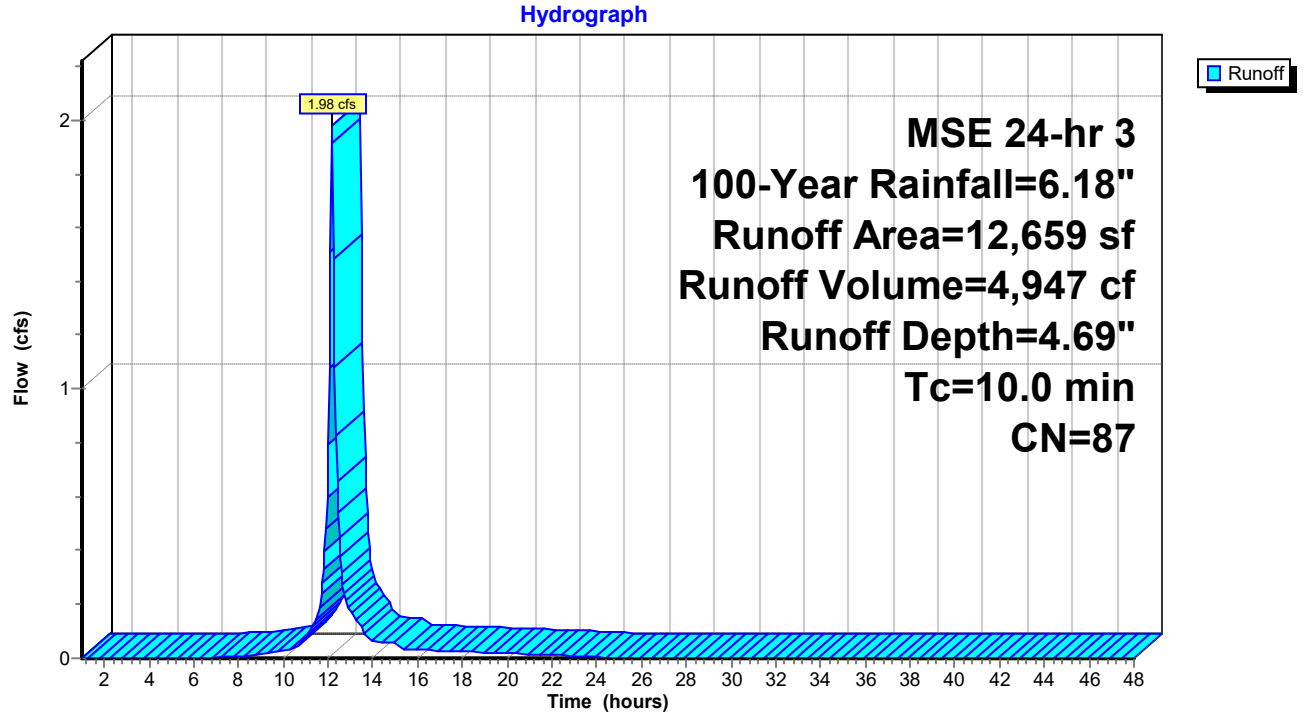
Runoff = 1.98 cfs @ 12.17 hrs, Volume= 4,947 cf, Depth= 4.69"
Routed to Pond 41P : Reach Pipe

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	5,962	74	Landscape
*	6,697	98	roof
	12,659	87	Weighted Average
	5,962		47.10% Pervious Area
	6,697		52.90% Impervious Area

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

Subcatchment 138S: F2



Summary for Subcatchment 139S: A2

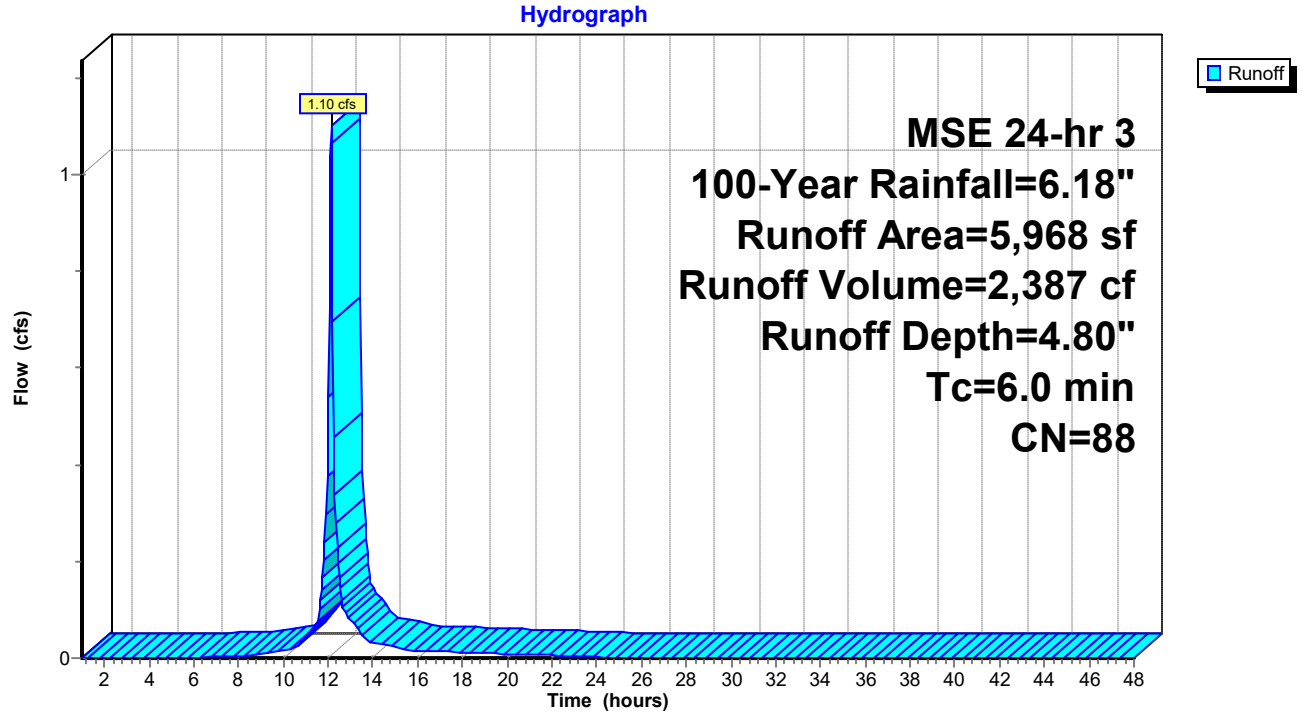
Runoff = 1.10 cfs @ 12.13 hrs, Volume= 2,387 cf, Depth= 4.80"
Routed to Pond 58P : Dry Pond 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	388	98	WALKS
*	2,129	98	ROADS
*	924	98	ROOF
*	2,527	74	LANDSCAPING
	5,968	88	Weighted Average
	2,527		42.34% Pervious Area
	3,441		57.66% Impervious Area

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

Subcatchment 139S: A2



Summary for Subcatchment 140S: H1

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

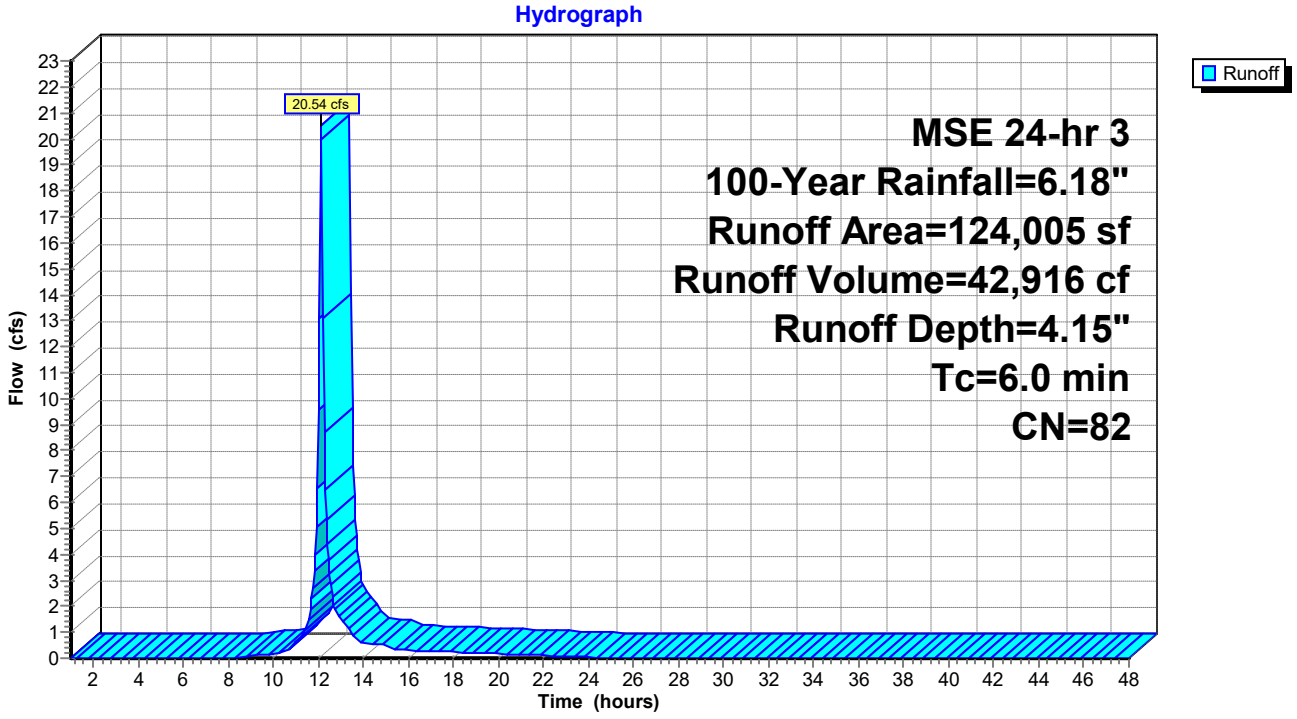
Runoff = 20.54 cfs @ 12.13 hrs, Volume= 42,916 cf, Depth= 4.15"
Routed to Reach 99R : East Swale (SE End)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	9,481	98	roads
*	24,942	98	roof
*	80,320	74	landscape
*	5,445	98	driveways and road NEW RBL
*	3,817	74	landscape NEW RBL
	124,005	82	Weighted Average
	84,137		67.85% Pervious Area
	39,868		32.15% Impervious Area

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

Subcatchment 140S: H1



Summary for Subcatchment 141S: H2

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

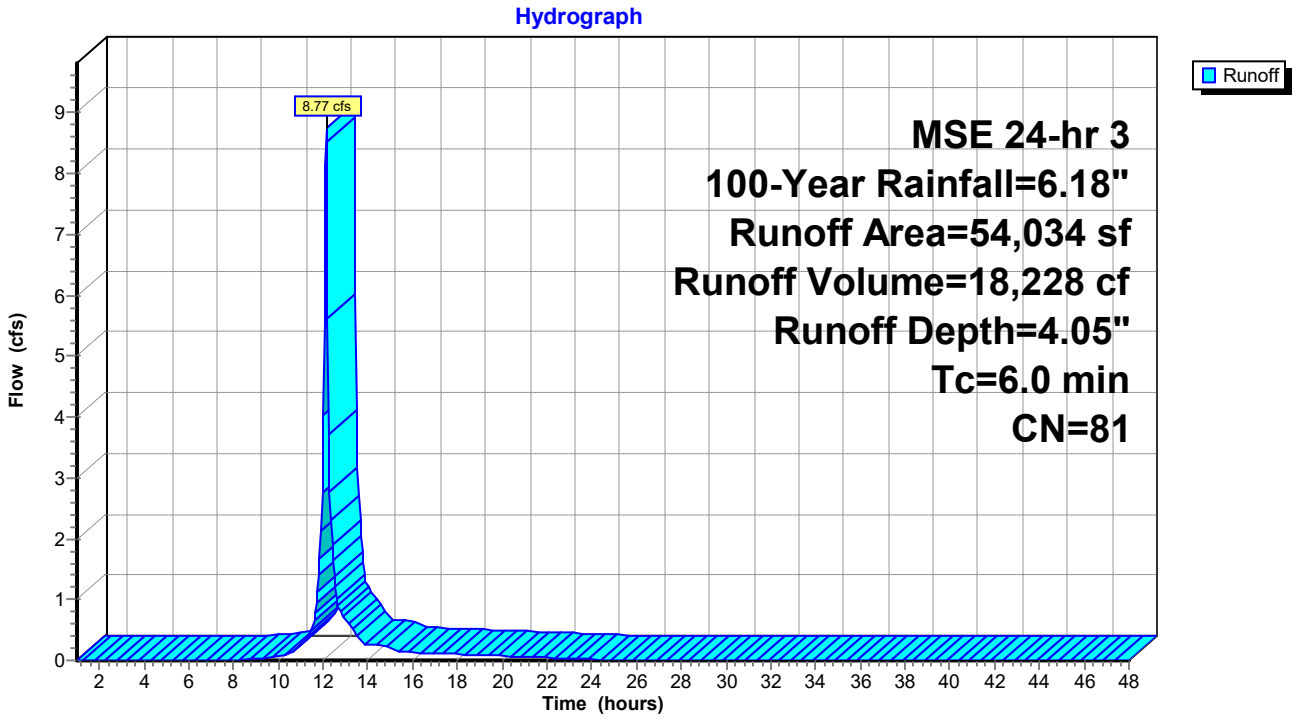
Runoff = 8.77 cfs @ 12.13 hrs, Volume= 18,228 cf, Depth= 4.05"
Routed to Reach 108R : South Berm Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	1,333	98	roads minus NEW RBL
*	14,758	98	roof
*	37,943	74	landscape minus NEW RBL
	54,034	81	Weighted Average
	37,943		70.22% Pervious Area
	16,091		29.78% Impervious Area

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

Subcatchment 141S: H2



Summary for Subcatchment 142S: H3

3/3/21
Needs to be delineated, this is from Joe's SWMP2

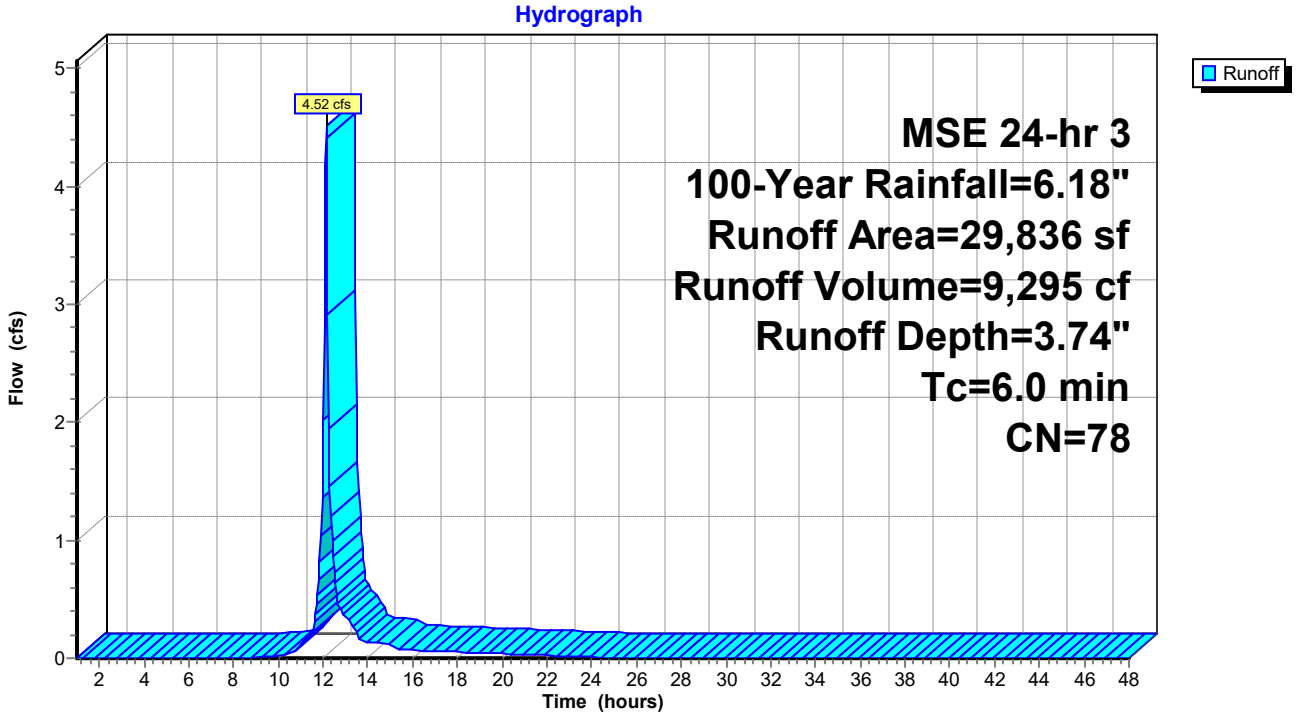
Runoff = 4.52 cfs @ 12.13 hrs, Volume= 9,295 cf, Depth= 3.74"
Routed to Reach 132R : EX. Red Barn Lane West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	1,041	98	roads
*	6,383	74	landscape
*	4,500	98	roads + roof NEW RBL
*	10,852	74	landscape NEW RBL
*	7,060	74	from H4
	29,836	78	Weighted Average
	24,295		81.43% Pervious Area
	5,541		18.57% Impervious Area

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

Subcatchment 142S: H3



Summary for Subcatchment 144S: H5

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

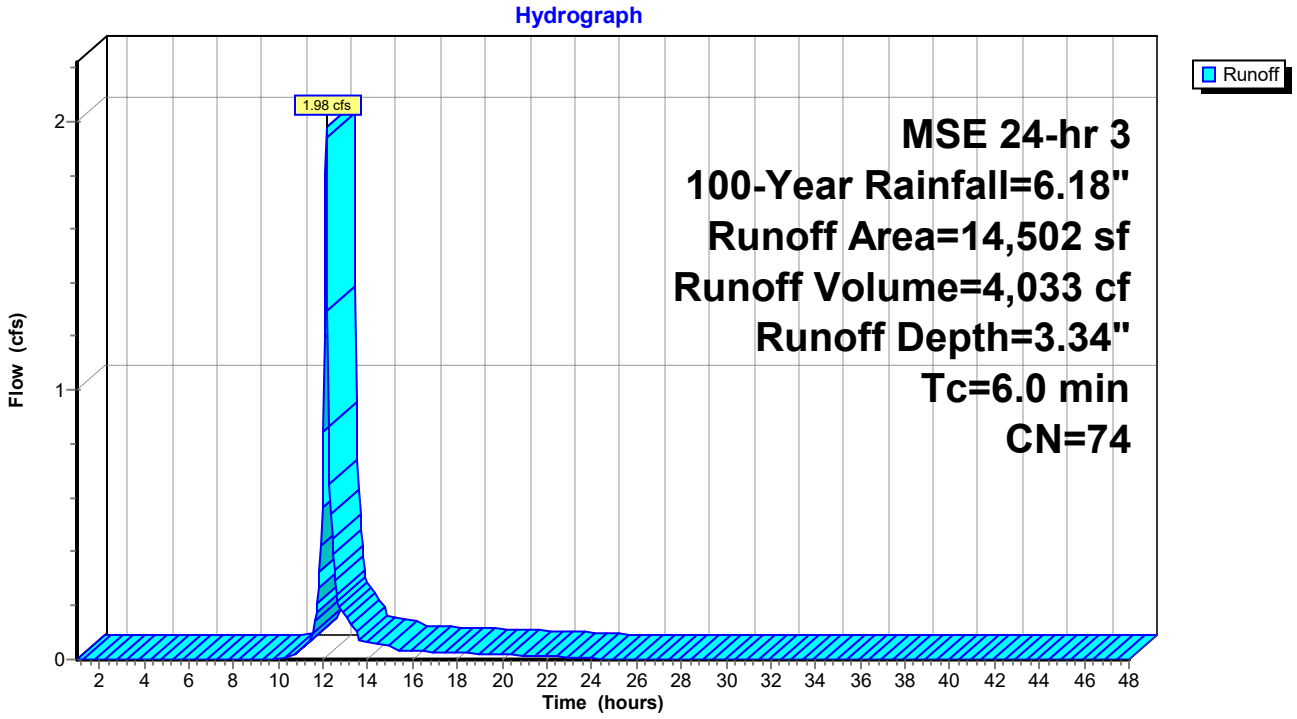
Runoff = 1.98 cfs @ 12.13 hrs, Volume= 4,033 cf, Depth= 3.34"
Routed to Reach 108R : South Berm Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	14,502	74	landscape
	14,502		100.00% Pervious Area

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

Subcatchment 144S: H5



Summary for Subcatchment 145S: H6-a

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

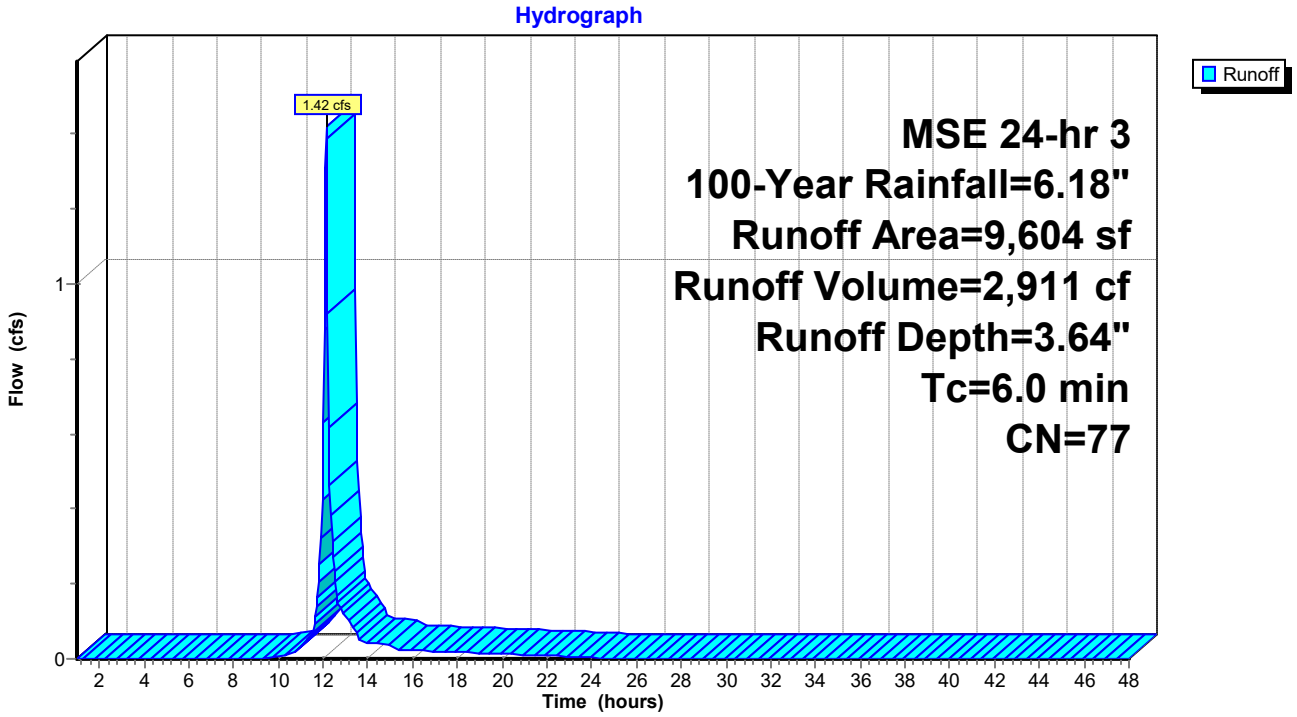
Runoff = 1.42 cfs @ 12.13 hrs, Volume= 2,911 cf, Depth= 3.64"
Routed to Link 115L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	8,471	74	landscape
*	1,133	98	road
	9,604	77	Weighted Average
	8,471		88.20% Pervious Area
	1,133		11.80% Impervious Area

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

Subcatchment 145S: H6-a



Summary for Subcatchment 146S: O2

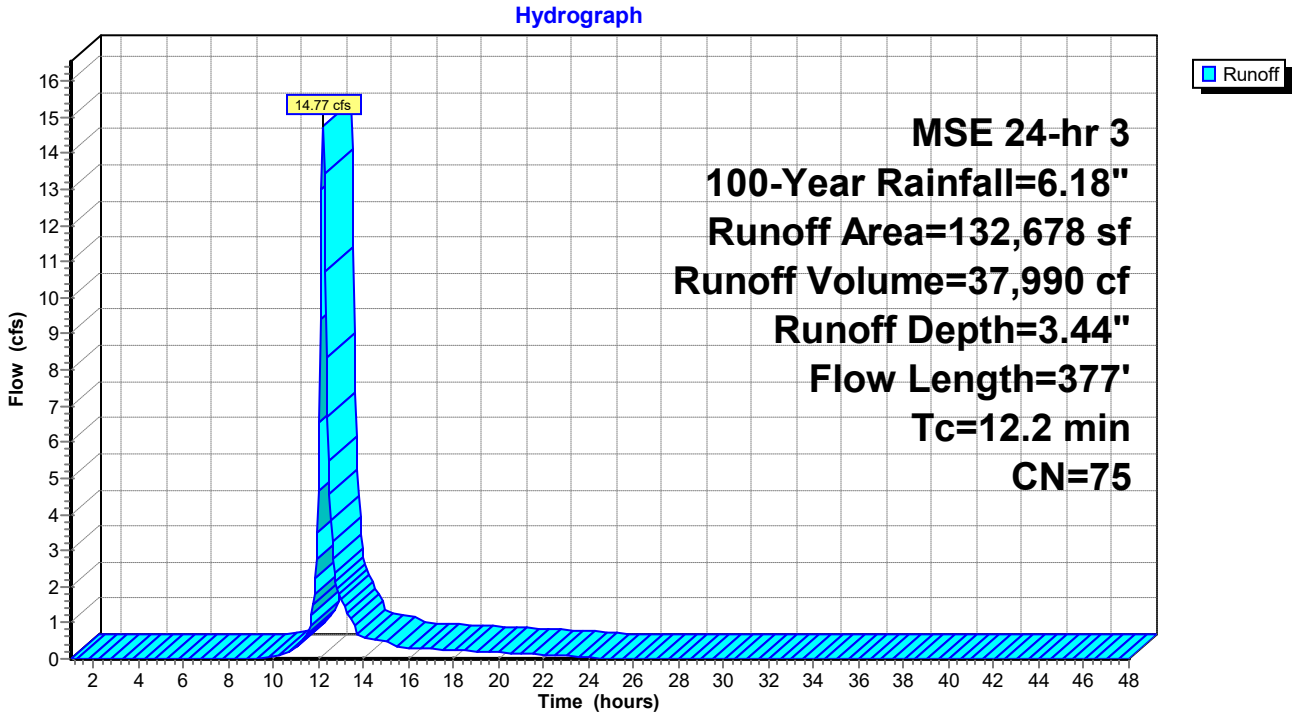
Runoff = 14.77 cfs @ 12.20 hrs, Volume= 37,990 cf, Depth= 3.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	129,638	74	PERV
*	3,040	98	IMPERV
	132,678	75	Weighted Average
	129,638		97.71% Pervious Area
	3,040		2.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9	77	0.0288	0.16		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 2.42"
4.3	300	0.0135	1.16		**Shallow Concentrated Flow, SHALLOW CONC** Nearly Bare & Untilled Kv= 10.0 fps
12.2	377	Total			

Subcatchment 146S: O2



Summary for Subcatchment 147S: J

3/3/21
Needs to be delineated, this is from Joe's SWMP2

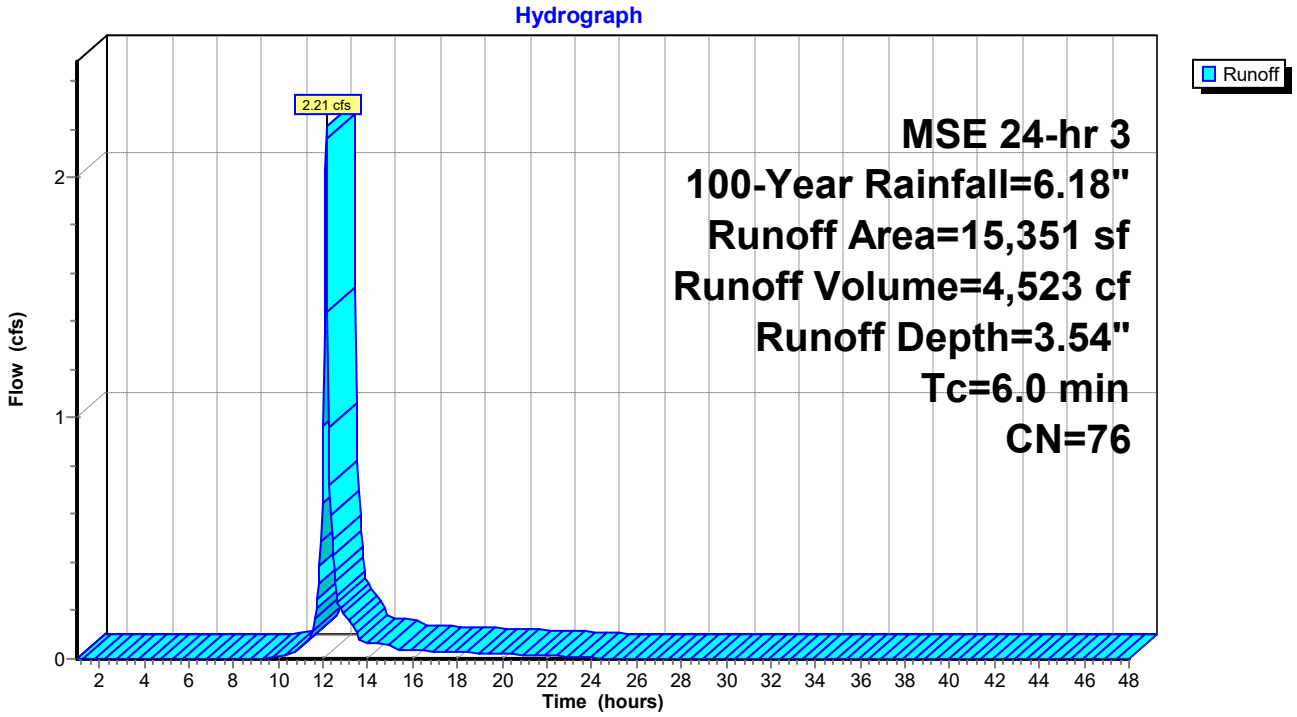
Runoff = 2.21 cfs @ 12.13 hrs, Volume= 4,523 cf, Depth= 3.54"
Routed to Link 66L : Total Offsite

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	1,360	98	walks
*	13,991	74	landscape
	15,351	76	Weighted Average
	13,991		91.14% Pervious Area
	1,360		8.86% Impervious Area

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

Subcatchment 147S: J



Summary for Subcatchment 148S: A3

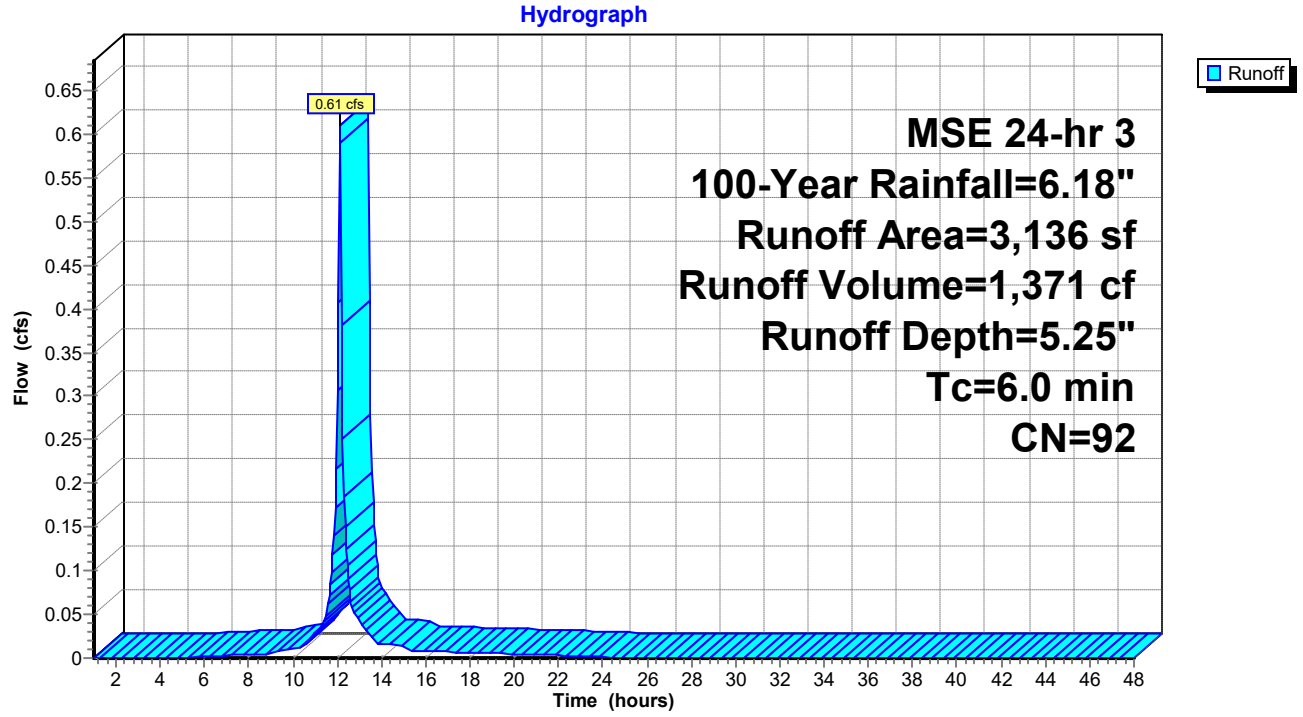
Runoff = 0.61 cfs @ 12.13 hrs, Volume= 1,371 cf, Depth= 5.25"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	452	98	WALKS
*	994	98	ROADS
*	924	98	ROOF
*	766	74	LANDSCAPING
	3,136	92	Weighted Average
	766		24.43% Pervious Area
	2,370		75.57% Impervious Area

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

Subcatchment 148S: A3



Summary for Subcatchment 149S: A4

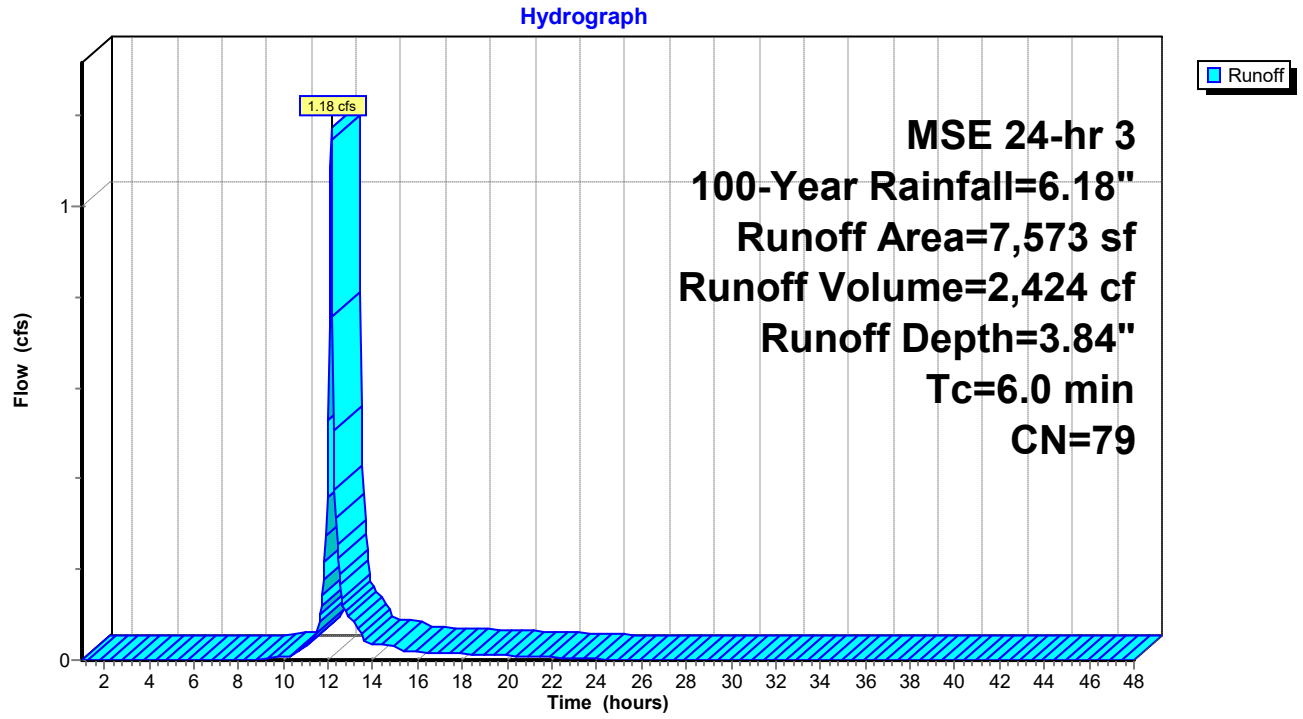
Runoff = 1.18 cfs @ 12.13 hrs, Volume= 2,424 cf, Depth= 3.84"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	401	98	WALKS
*	1,086	98	ROADS
*	0	98	ROOF
*	6,086	74	LANDSCAPING
	7,573	79	Weighted Average
	6,086		80.36% Pervious Area
	1,487		19.64% Impervious Area

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

Subcatchment 149S: A4



Summary for Subcatchment 150S: A6

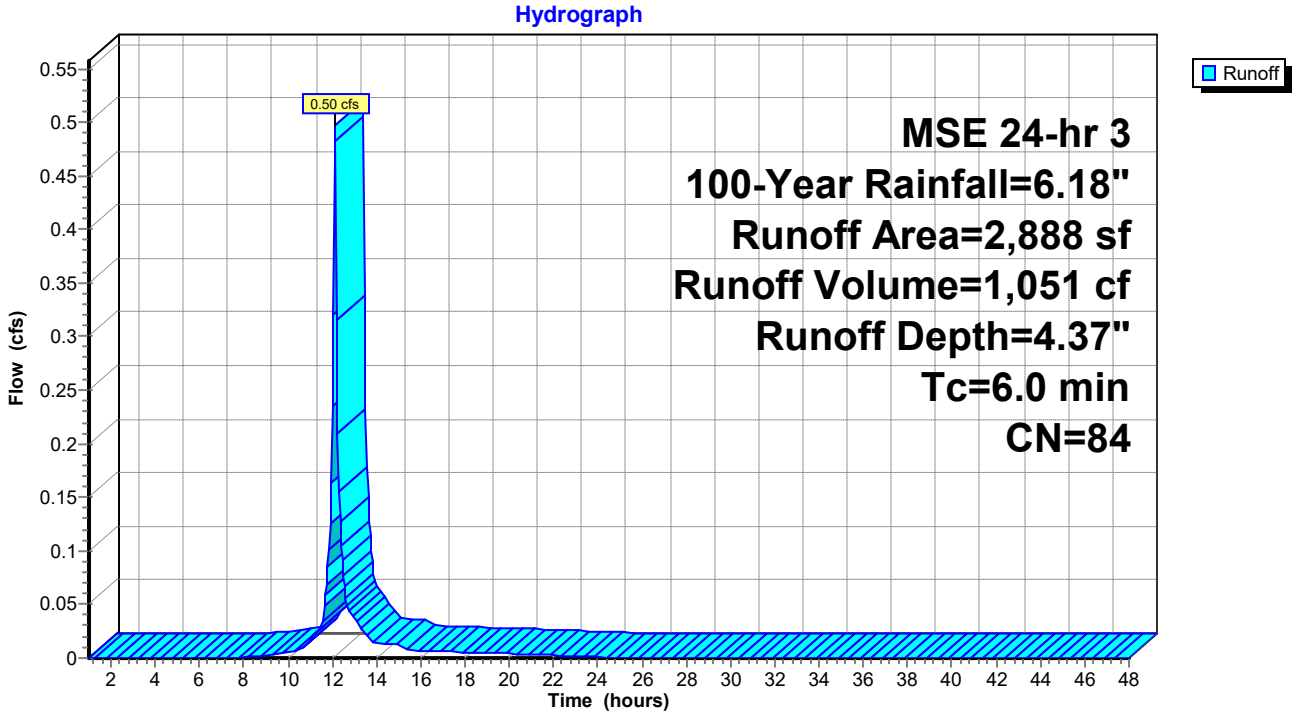
Runoff = 0.50 cfs @ 12.13 hrs, Volume= 1,051 cf, Depth= 4.37"
Routed to Link 127L : total

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	316	98	WALKS
*	875	98	ROADS
*	0	98	ROOF
*	1,697	74	LANDSCAPING
	2,888	84	Weighted Average
	1,697		58.76% Pervious Area
	1,191		41.24% Impervious Area

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

Subcatchment 150S: A6



Summary for Subcatchment 151S: A8

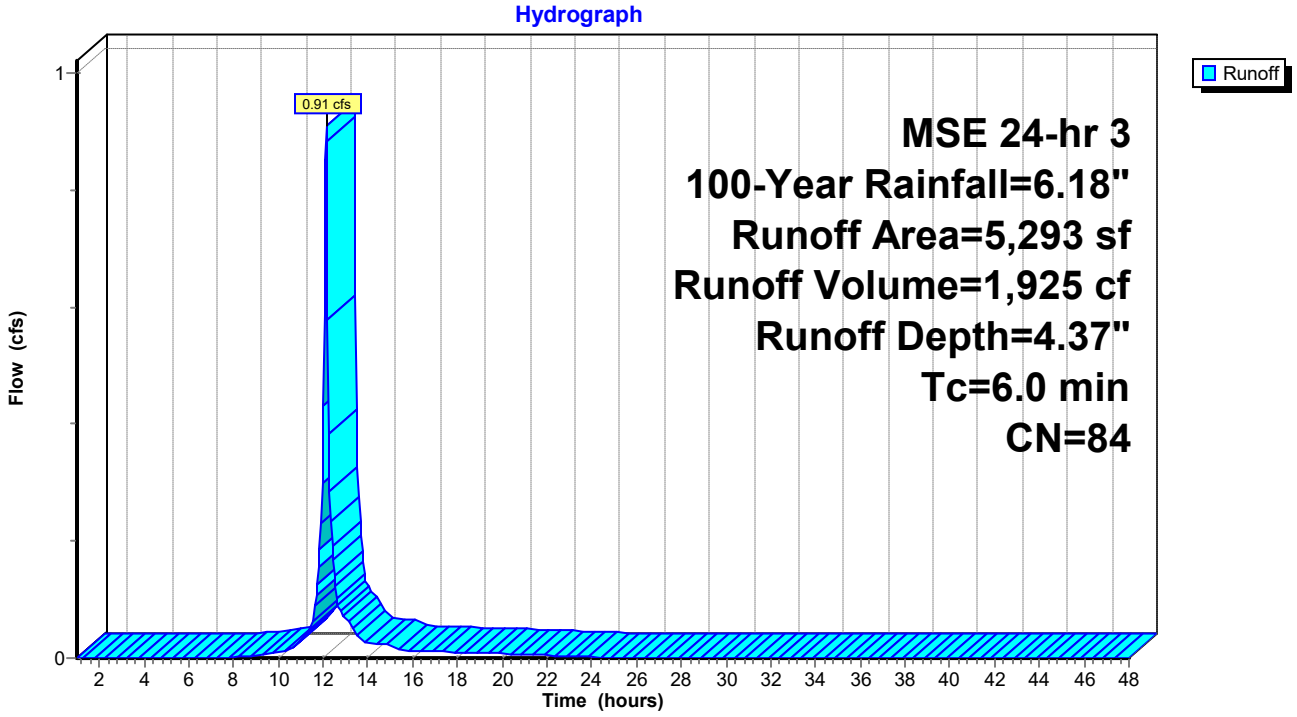
Runoff = 0.91 cfs @ 12.13 hrs, Volume= 1,925 cf, Depth= 4.37"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	688	98	WALKS
*	1,478	98	ROADS
*	0	98	ROOF
*	3,127	74	LANDSCAPING
	5,293	84	Weighted Average
	3,127		59.08% Pervious Area
	2,166		40.92% Impervious Area

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

Subcatchment 151S: A8



Summary for Subcatchment 152S: A10

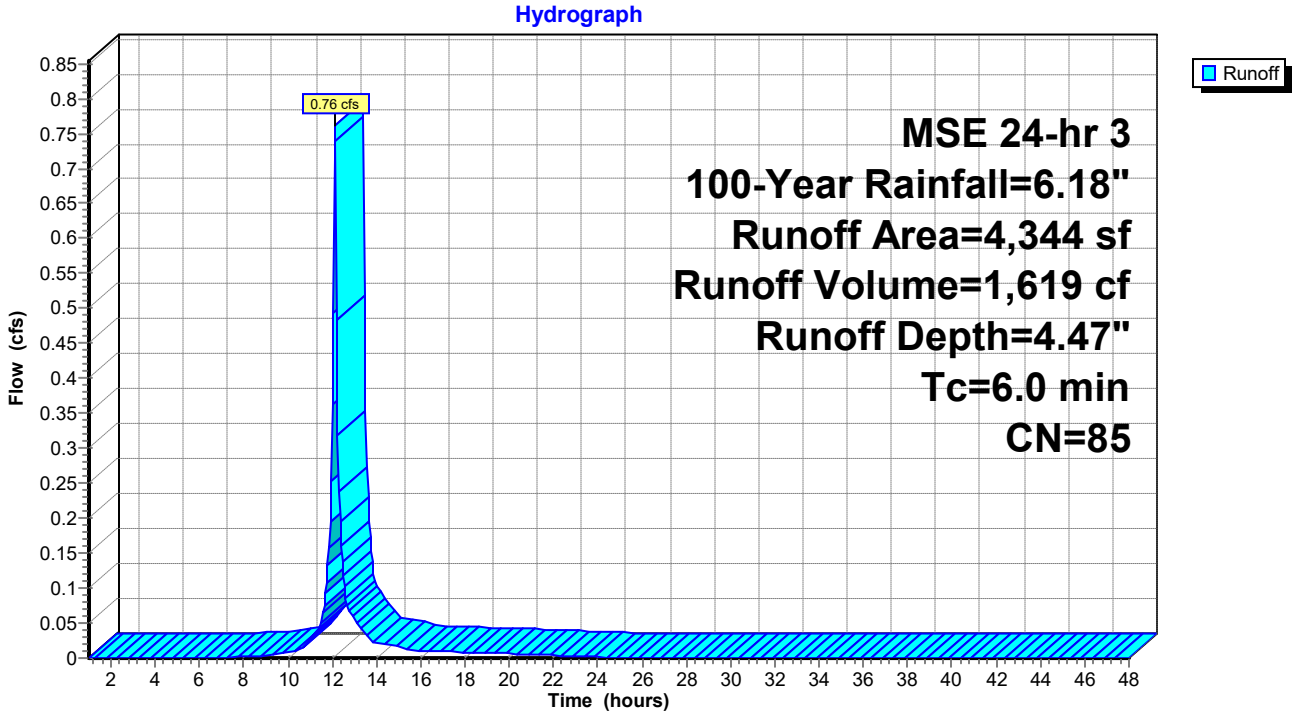
Runoff = 0.76 cfs @ 12.13 hrs, Volume= 1,619 cf, Depth= 4.47"
Routed to Pond 133P : WEST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	665	98	WALKS
*	1,415	98	ROADS
*	0	98	ROOF
*	2,264	74	LANDSCAPING
	4,344	85	Weighted Average
	2,264		52.12% Pervious Area
	2,080		47.88% Impervious Area

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

Subcatchment 152S: A10



Summary for Subcatchment 153S: A16

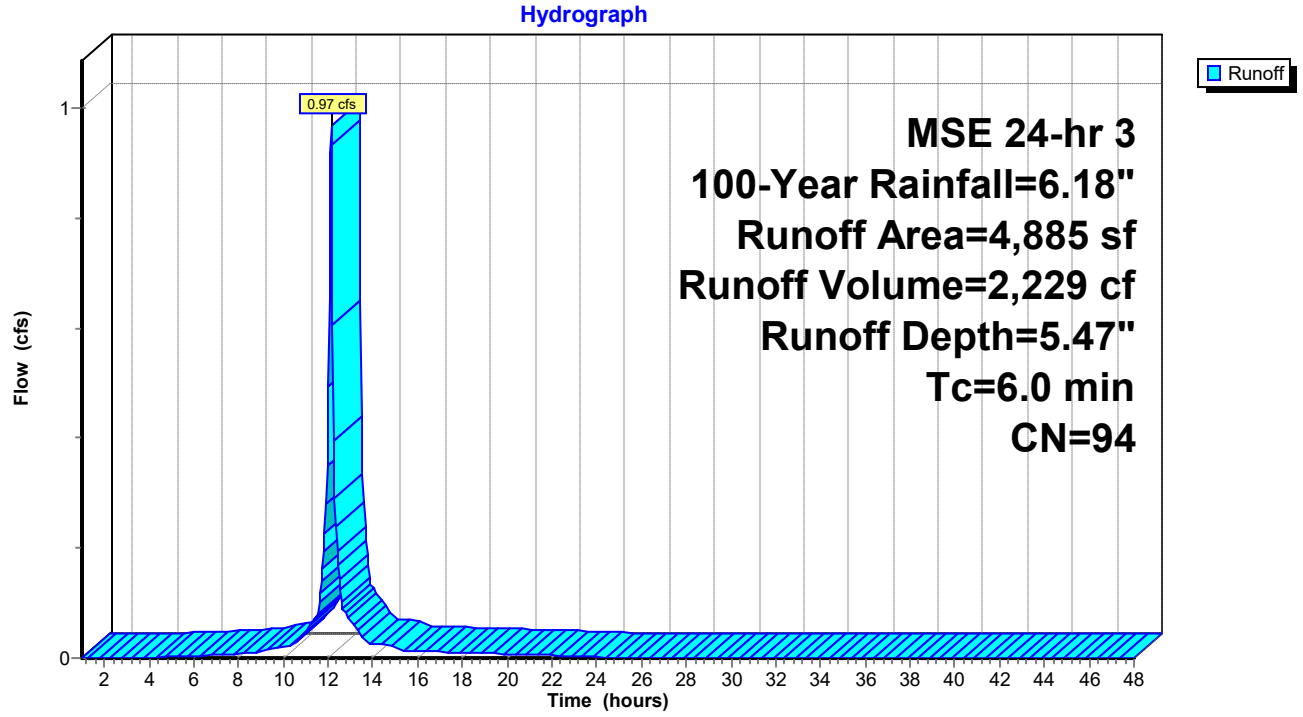
Runoff = 0.97 cfs @ 12.13 hrs, Volume= 2,229 cf, Depth= 5.47"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	1,314	98	WALKS
*	2,788	98	ROADS
*	0	98	ROOF
*	783	74	LANDSCAPING
	4,885	94	Weighted Average
	783		16.03% Pervious Area
	4,102		83.97% Impervious Area

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

Subcatchment 153S: A16



Summary for Subcatchment 154S: A17

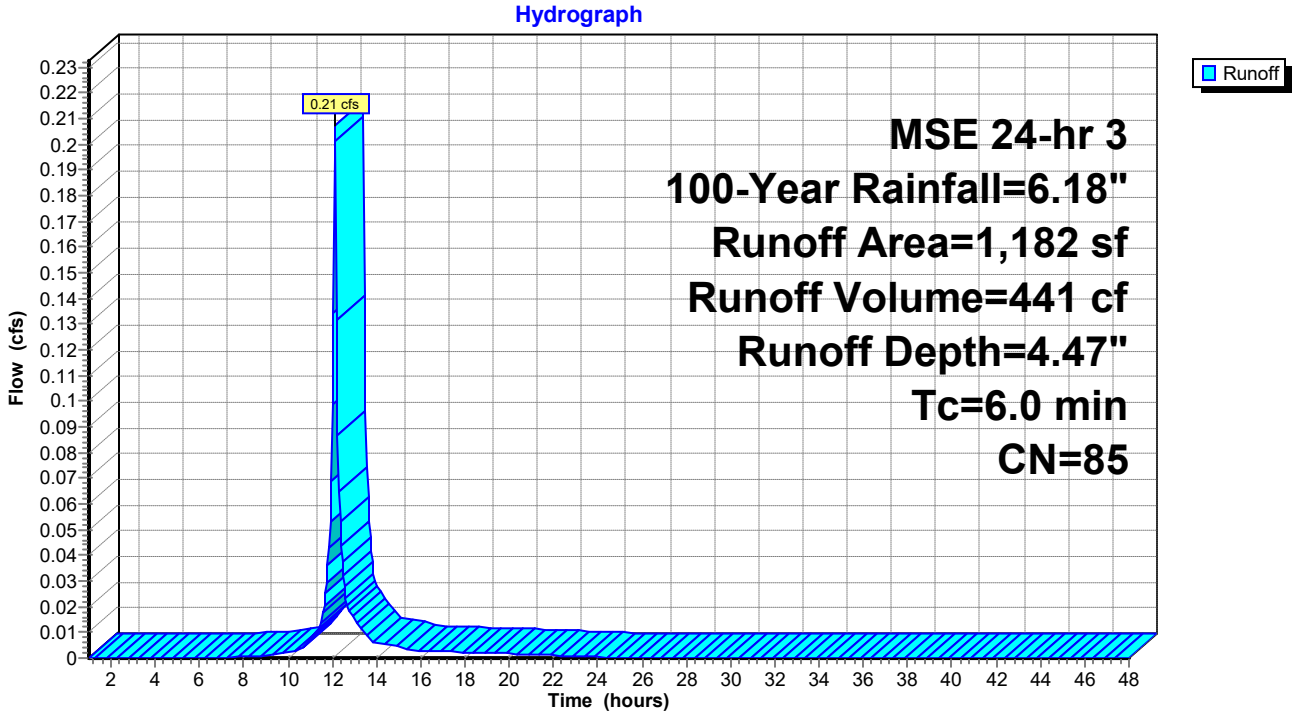
Runoff = 0.21 cfs @ 12.13 hrs, Volume= 441 cf, Depth= 4.47"
Routed to Link 176L : UPSTREAM OF OVERSIZED PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	70	98	WALKS
*	461	98	ROADS
*	0	98	ROOF
*	651	74	LANDSCAPING
	1,182	85	Weighted Average
	651		55.08% Pervious Area
	531		44.92% Impervious Area

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

Subcatchment 154S: A17



Summary for Subcatchment 155S: A18

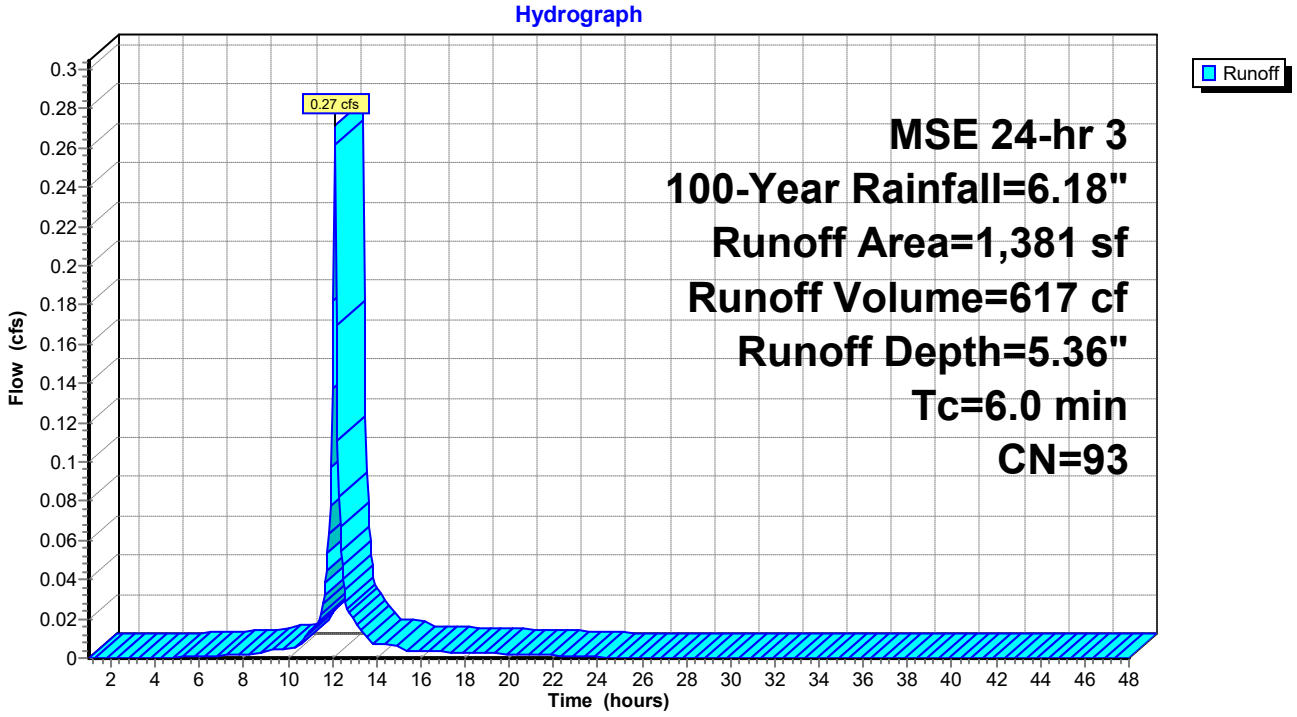
Runoff = 0.27 cfs @ 12.13 hrs, Volume= 617 cf, Depth= 5.36"
Routed to Link 176L : UPSTREAM OF OVERSIZED PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	353	98	WALKS
*	747	98	ROADS
*	0	98	ROOF
*	281	74	LANDSCAPING
	1,381	93	Weighted Average
	281		20.35% Pervious Area
	1,100		79.65% Impervious Area

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

Subcatchment 155S: A18



Summary for Subcatchment 156S: A19

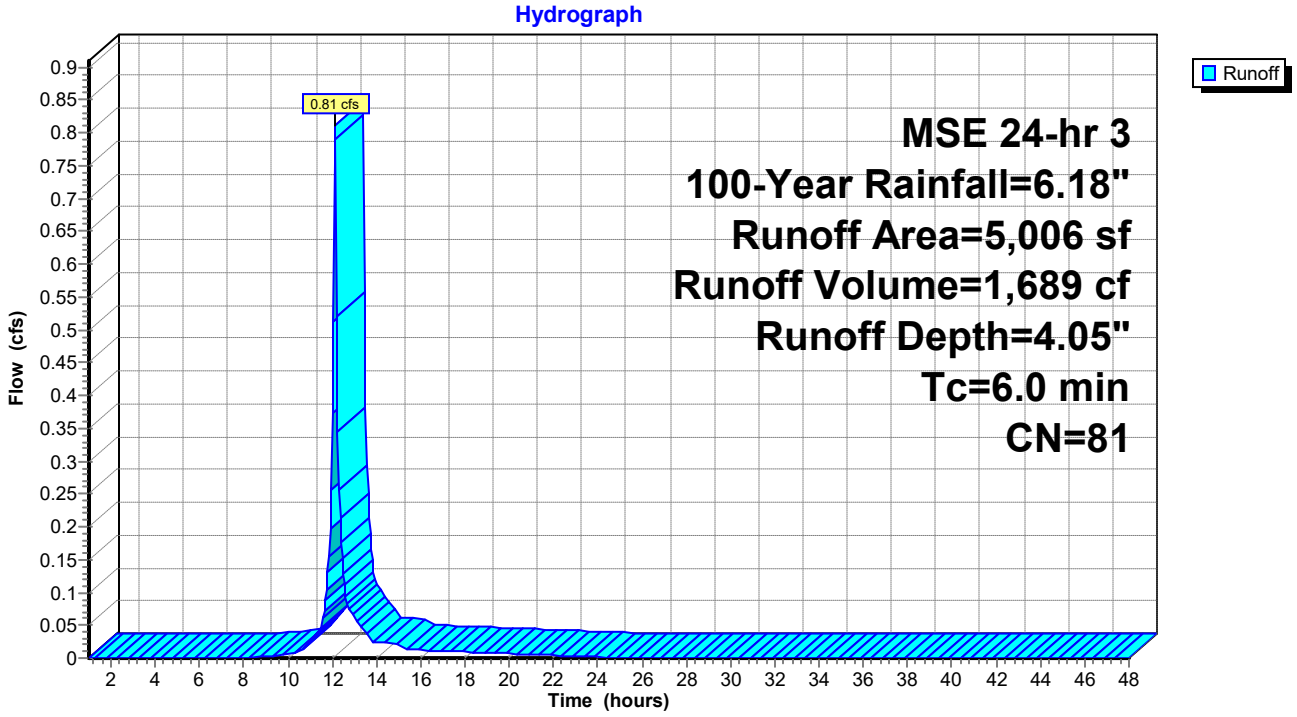
Runoff = 0.81 cfs @ 12.13 hrs, Volume= 1,689 cf, Depth= 4.05"
Routed to Link 176L : UPSTREAM OF OVERSIZED PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	390	98	WALKS
*	0	98	ROADS
*	1,063	98	ROOF
*	3,553	74	LANDSCAPING
	5,006	81	Weighted Average
	3,553		70.97% Pervious Area
	1,453		29.03% Impervious Area

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

Subcatchment 156S: A19



Summary for Subcatchment 157S: A20

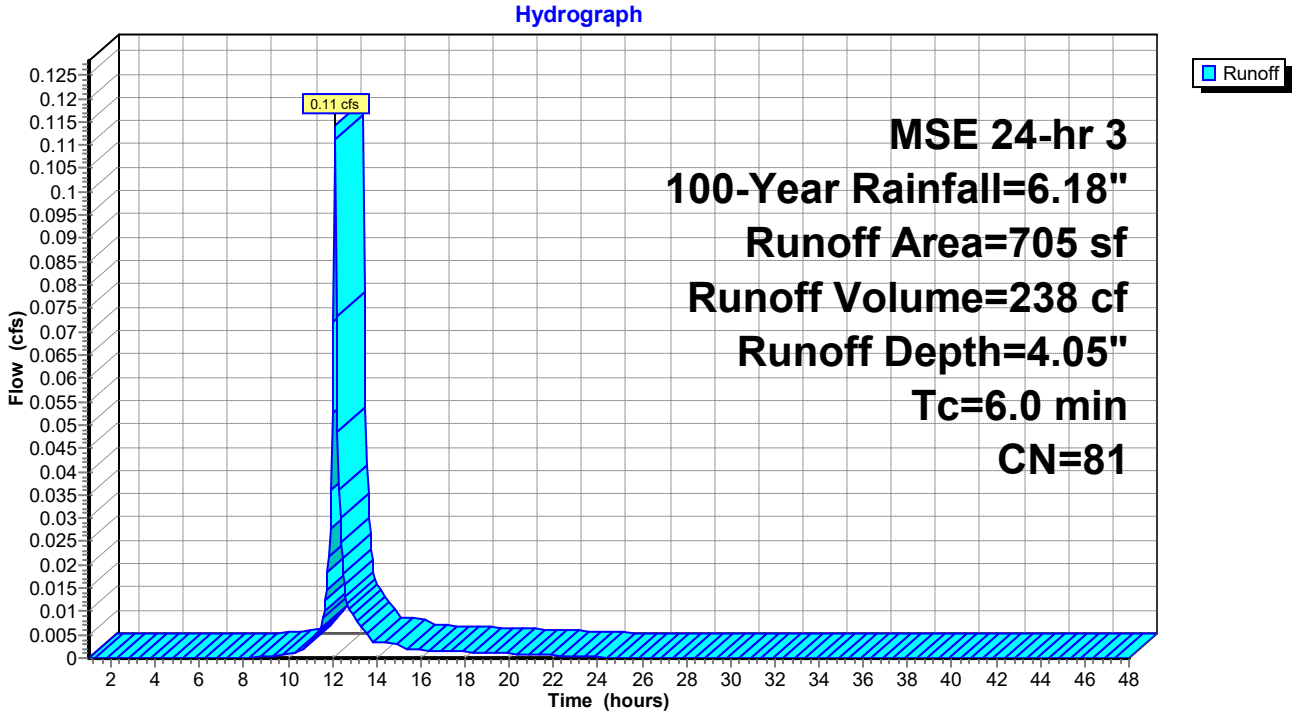
Runoff = 0.11 cfs @ 12.13 hrs, Volume= 238 cf, Depth= 4.05"
Routed to Link 176L : UPSTREAM OF OVERSIZED PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	204	98	WALKS
*	0	98	ROADS
*	0	98	ROOF
*	501	74	LANDSCAPING
	705	81	Weighted Average
	501		71.06% Pervious Area
	204		28.94% Impervious Area

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

Subcatchment 157S: A20



Summary for Subcatchment 158S: A21

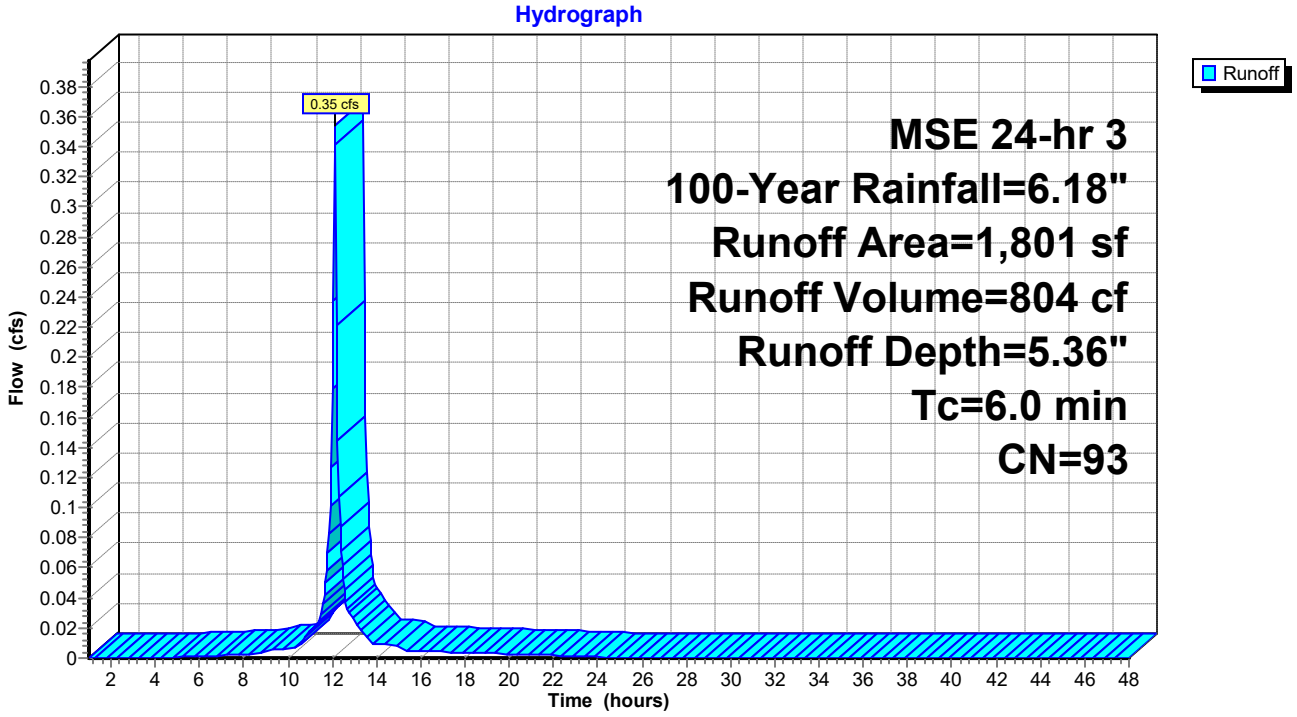
Runoff = 0.35 cfs @ 12.13 hrs, Volume= 804 cf, Depth= 5.36"
Routed to Link 176L : UPSTREAM OF OVERSIZED PIPE

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	338	98	WALKS
*	35	98	ROADS
*	1,063	98	ROOF
*	365	74	LANDSCAPING
	1,801	93	Weighted Average
	365		20.27% Pervious Area
	1,436		79.73% Impervious Area

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

Subcatchment 158S: A21



Summary for Subcatchment 159S: A22

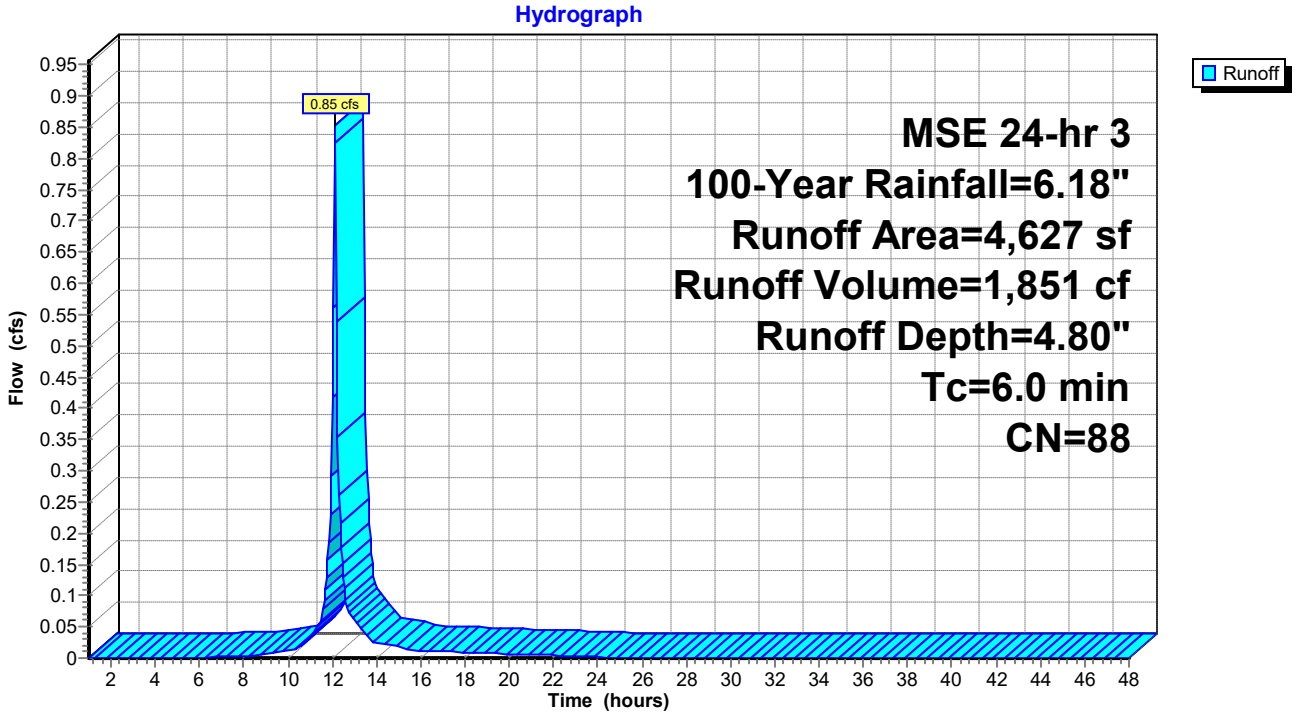
Runoff = 0.85 cfs @ 12.13 hrs, Volume= 1,851 cf, Depth= 4.80"
Routed to Pond 174P : EAST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	891	98	WALKS
*	1,814	98	ROADS
*	0	98	ROOF
*	1,922	74	LANDSCAPING
	4,627	88	Weighted Average
	1,922		41.54% Pervious Area
	2,705		58.46% Impervious Area

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

Subcatchment 159S: A22



Summary for Subcatchment 160S: A23

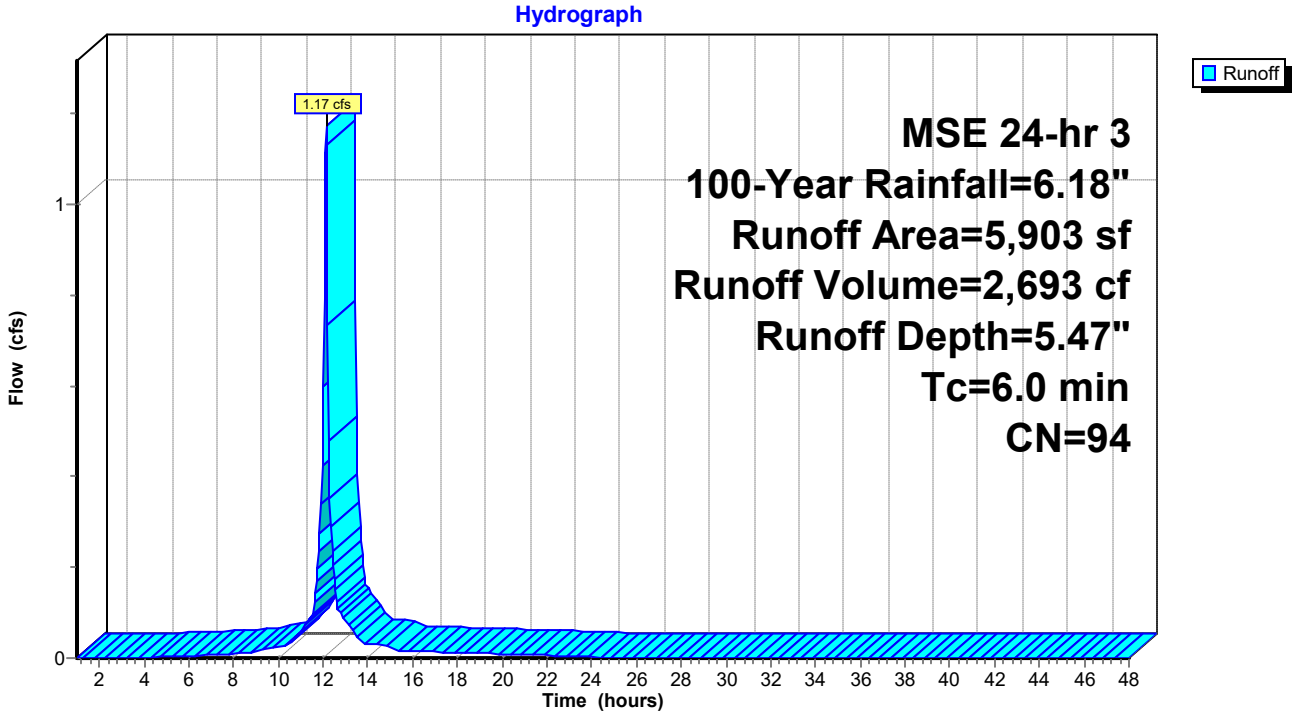
Runoff = 1.17 cfs @ 12.13 hrs, Volume= 2,693 cf, Depth= 5.47"
Routed to Pond 174P : EAST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	995	98	WALKS
*	1,695	98	ROADS
*	2,125	98	ROOF
*	1,088	74	LANDSCAPING
	5,903	94	Weighted Average
	1,088		18.43% Pervious Area
	4,815		81.57% Impervious Area

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

Subcatchment 160S: A23



Summary for Subcatchment 161S: A24

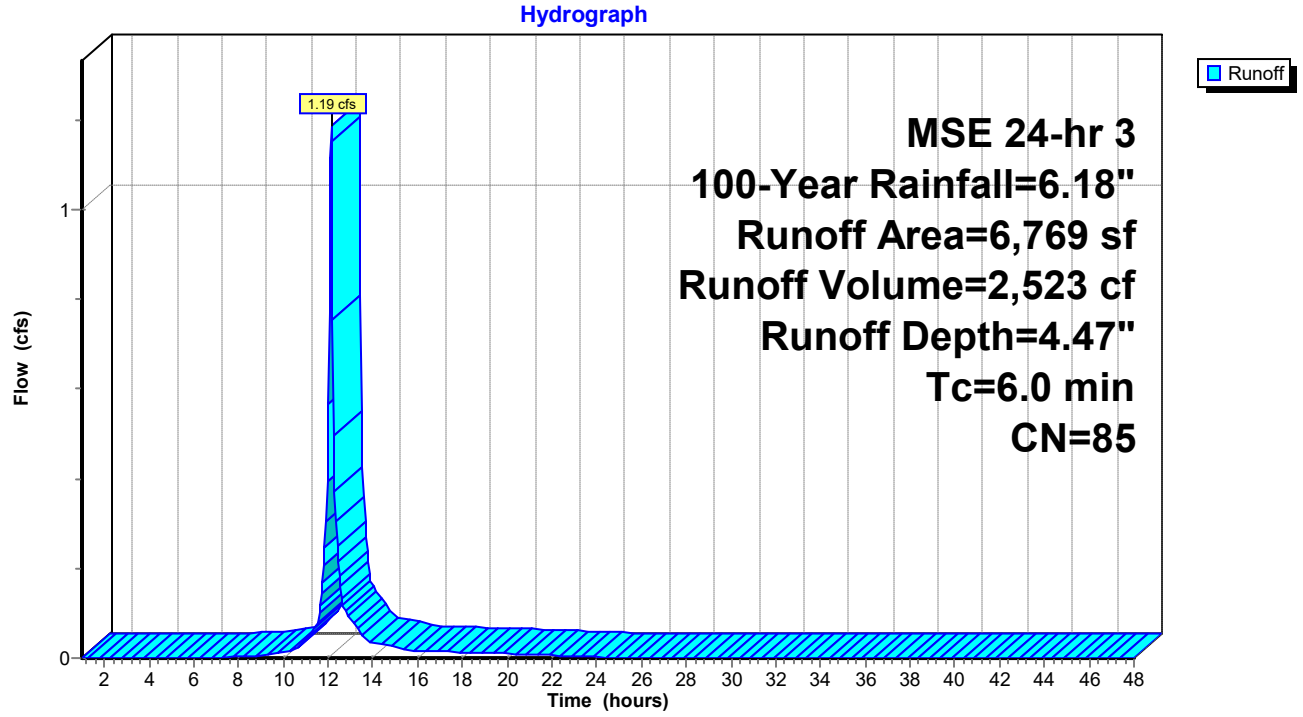
Runoff = 1.19 cfs @ 12.13 hrs, Volume= 2,523 cf, Depth= 4.47"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	1,331	98	WALKS
*	1,714	98	ROADS
*	0	98	ROOF
*	3,724	74	LANDSCAPING
	6,769	85	Weighted Average
	3,724		55.02% Pervious Area
	3,045		44.98% Impervious Area

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

Subcatchment 161S: A24



Summary for Subcatchment 162S: A25

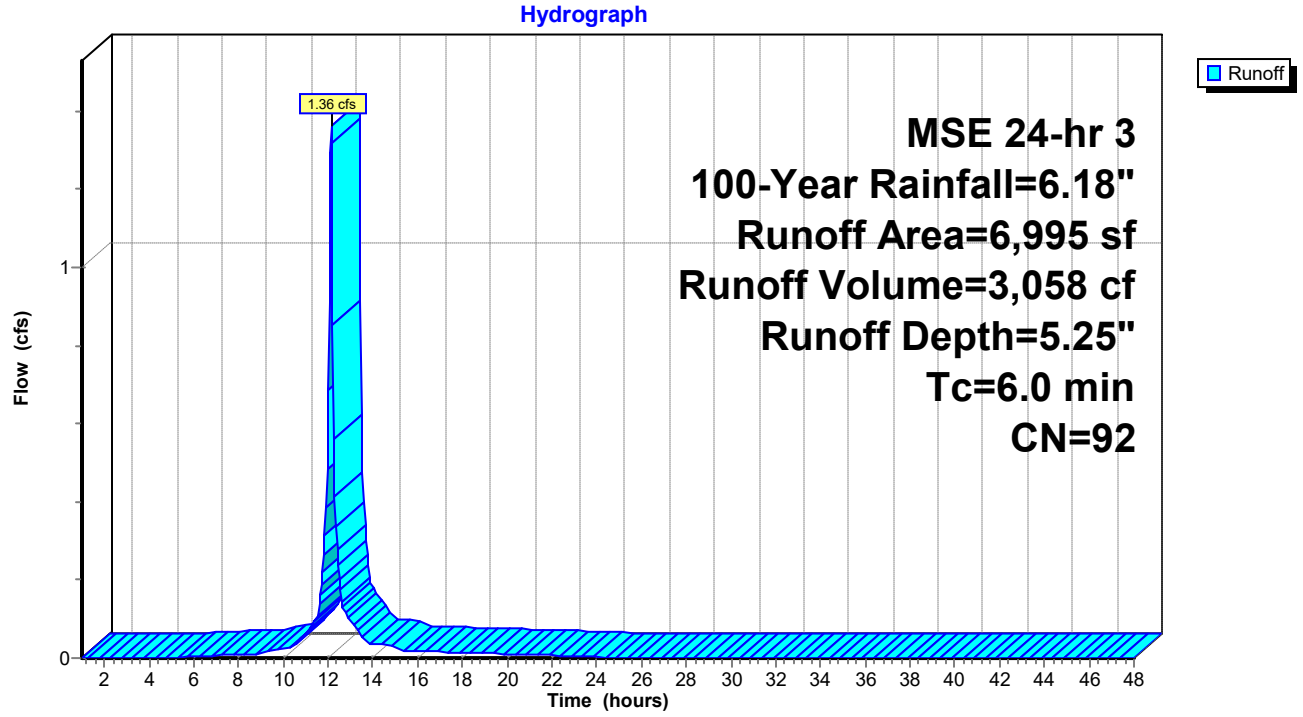
Runoff = 1.36 cfs @ 12.13 hrs, Volume= 3,058 cf, Depth= 5.25"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	1,096	98	WALKS
*	2,036	98	ROADS
*	2,125	98	ROOF
*	1,738	74	LANDSCAPING
	6,995	92	Weighted Average
	1,738		24.85% Pervious Area
	5,257		75.15% Impervious Area

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

Subcatchment 162S: A25



Summary for Subcatchment 163S: A26

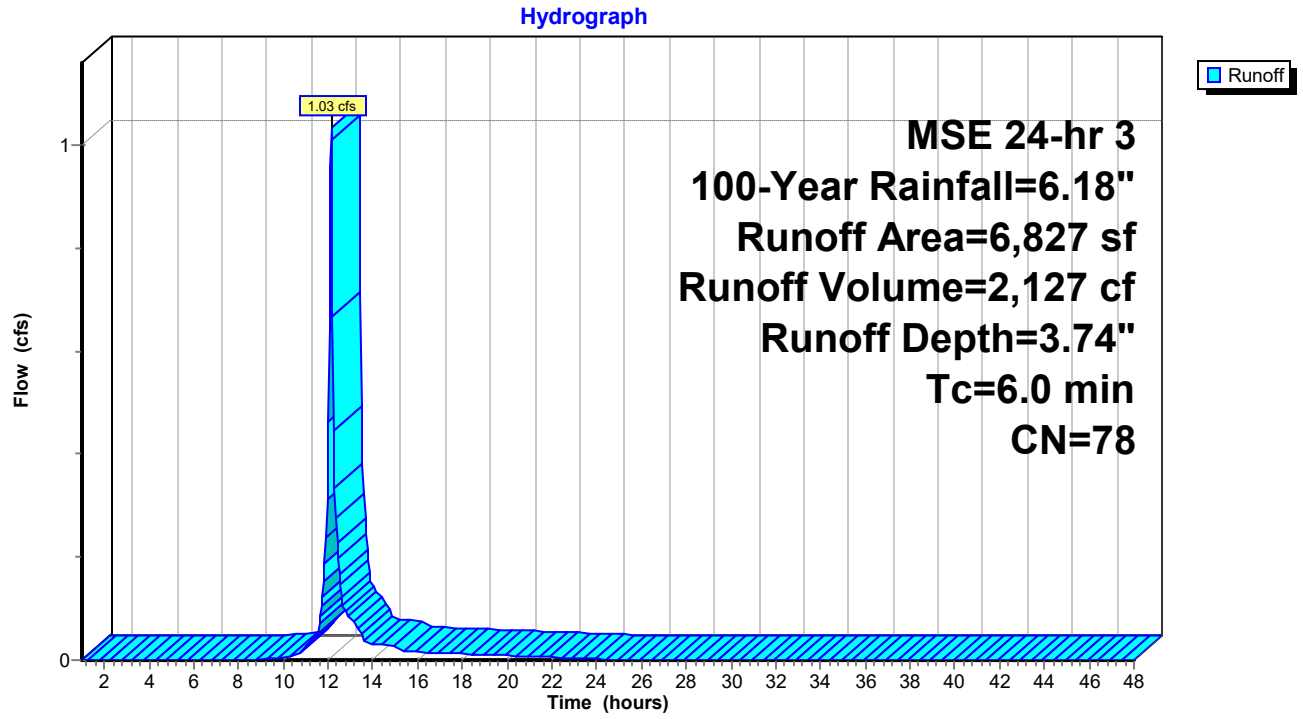
Runoff = 1.03 cfs @ 12.13 hrs, Volume= 2,127 cf, Depth= 3.74"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	314	98	WALKS
*	860	98	ROADS
*	0	98	ROOF
*	5,653	74	LANDSCAPING
	6,827	78	Weighted Average
	5,653		82.80% Pervious Area
	1,174		17.20% Impervious Area

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

Subcatchment 163S: A26



Summary for Subcatchment 164S: A27

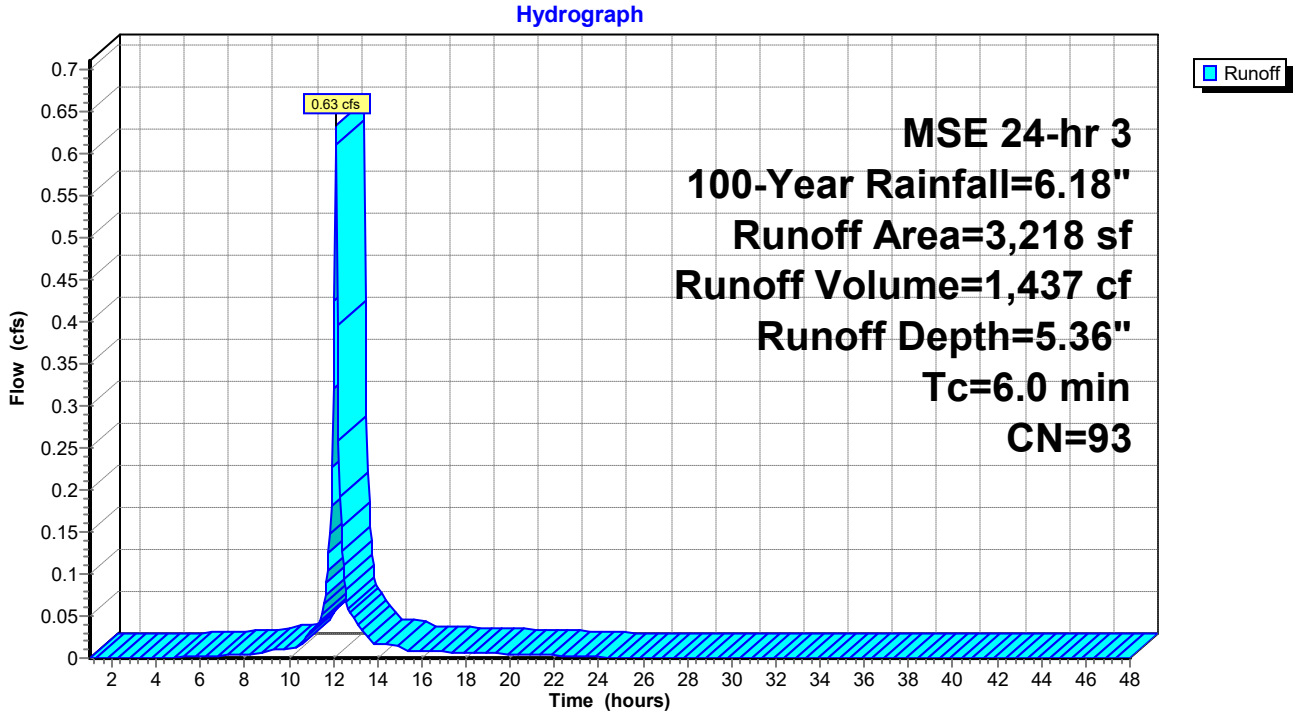
Runoff = 0.63 cfs @ 12.13 hrs, Volume= 1,437 cf, Depth= 5.36"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	532	98	WALKS
*	927	98	ROADS
*	1,063	98	ROOF
*	696	74	LANDSCAPING
	3,218	93	Weighted Average
	696		21.63% Pervious Area
	2,522		78.37% Impervious Area

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

Subcatchment 164S: A27



Summary for Subcatchment 165S: A28

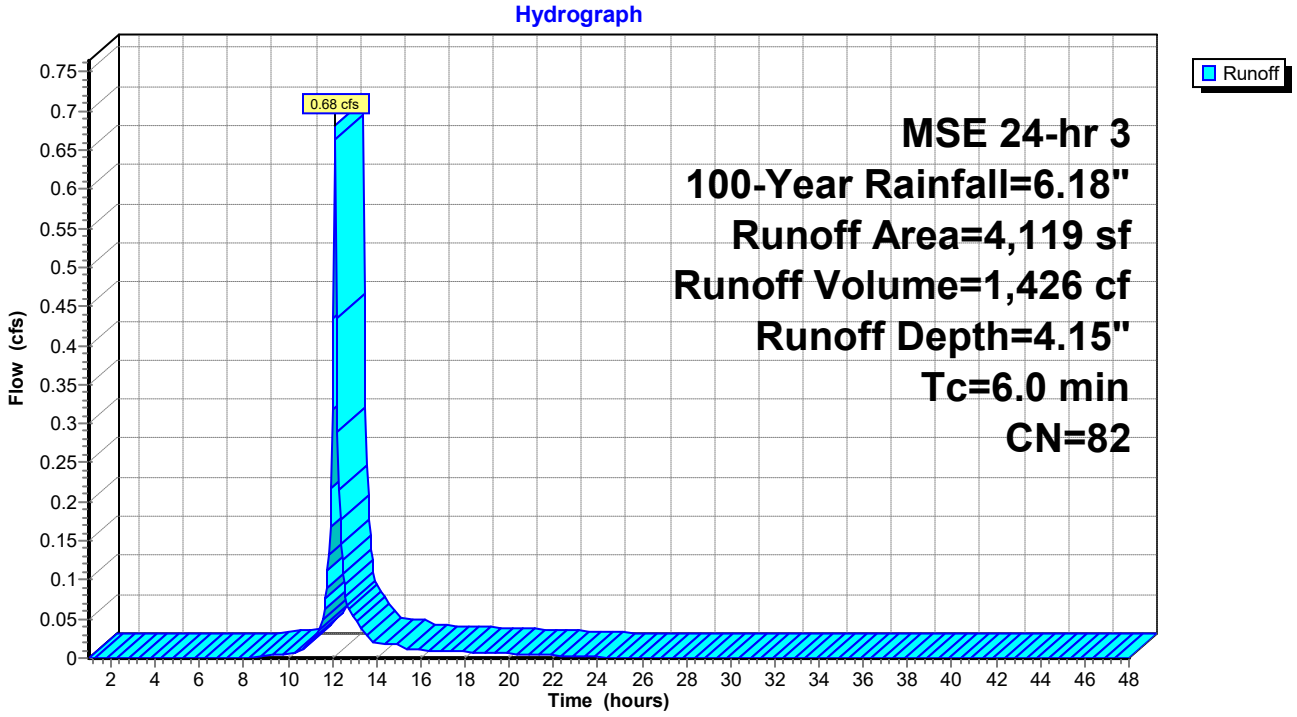
Runoff = 0.68 cfs @ 12.13 hrs, Volume= 1,426 cf, Depth= 4.15"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	364	98	WALKS
*	968	98	ROADS
*	0	98	ROOF
*	2,787	74	LANDSCAPING
	4,119	82	Weighted Average
	2,787		67.66% Pervious Area
	1,332		32.34% Impervious Area

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

Subcatchment 165S: A28



Summary for Subcatchment 166S: A29

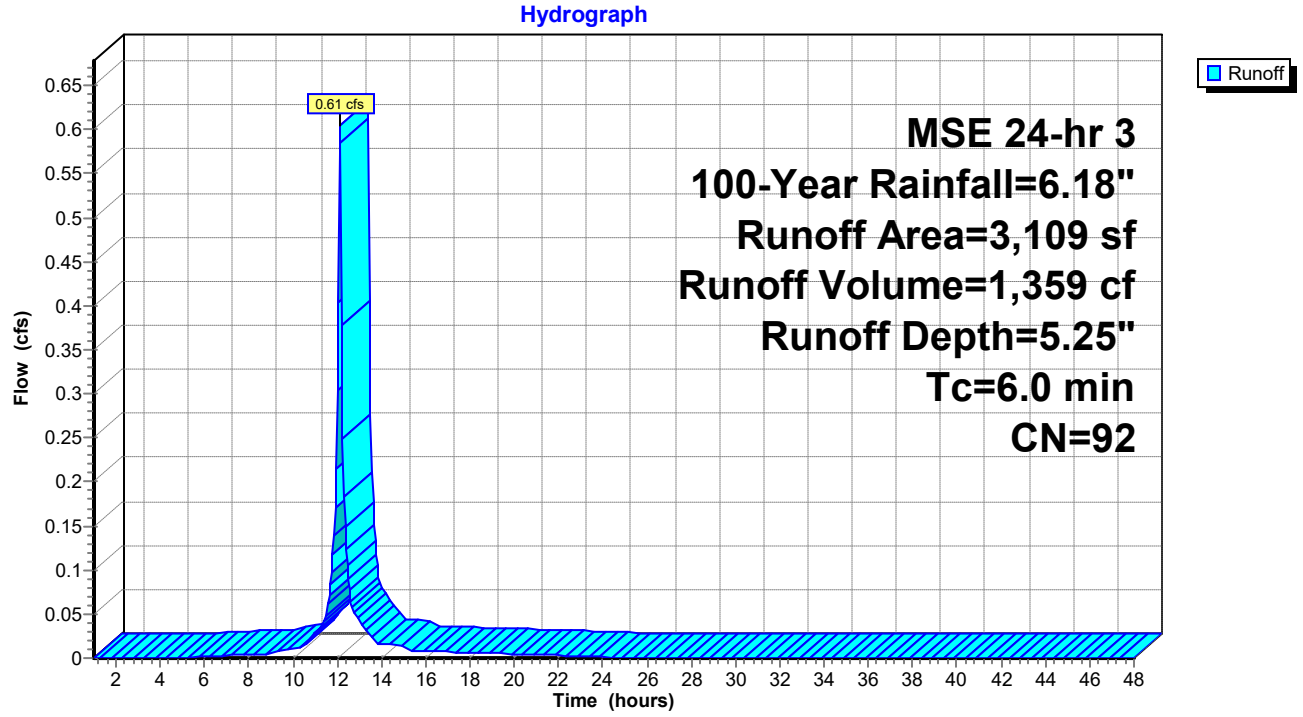
Runoff = 0.61 cfs @ 12.13 hrs, Volume= 1,359 cf, Depth= 5.25"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	367	98	WALKS
*	921	98	ROADS
*	1,063	98	ROOF
*	758	74	LANDSCAPING
	3,109	92	Weighted Average
	758		24.38% Pervious Area
	2,351		75.62% Impervious Area

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

Subcatchment 166S: A29



Summary for Subcatchment 167S: A31

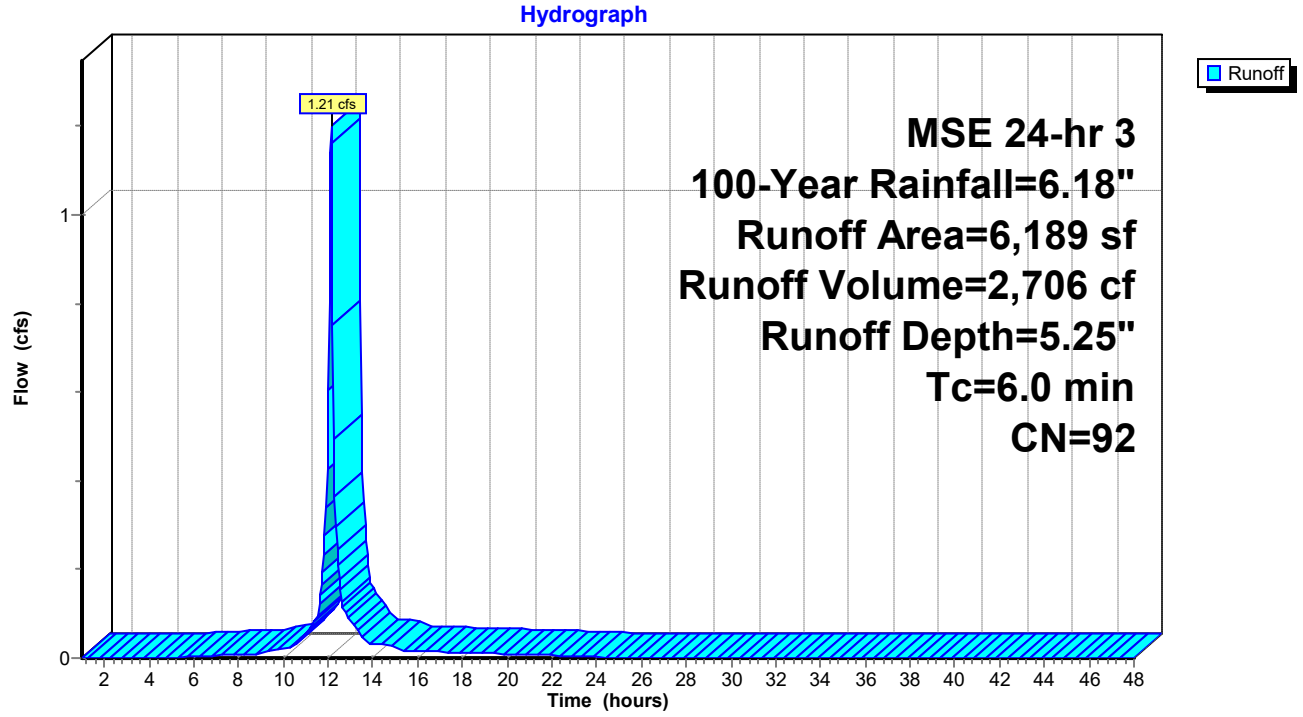
Runoff = 1.21 cfs @ 12.13 hrs, Volume= 2,706 cf, Depth= 5.25"
Routed to Link 126L : OVERSIZED PIPE RUN BY B3

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	1,844	98	WALKS
*	2,869	98	ROADS
*	0	98	ROOF
*	1,476	74	LANDSCAPING
	6,189	92	Weighted Average
	1,476		23.85% Pervious Area
	4,713		76.15% Impervious Area

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

Subcatchment 167S: A31



Summary for Subcatchment 168S: A34

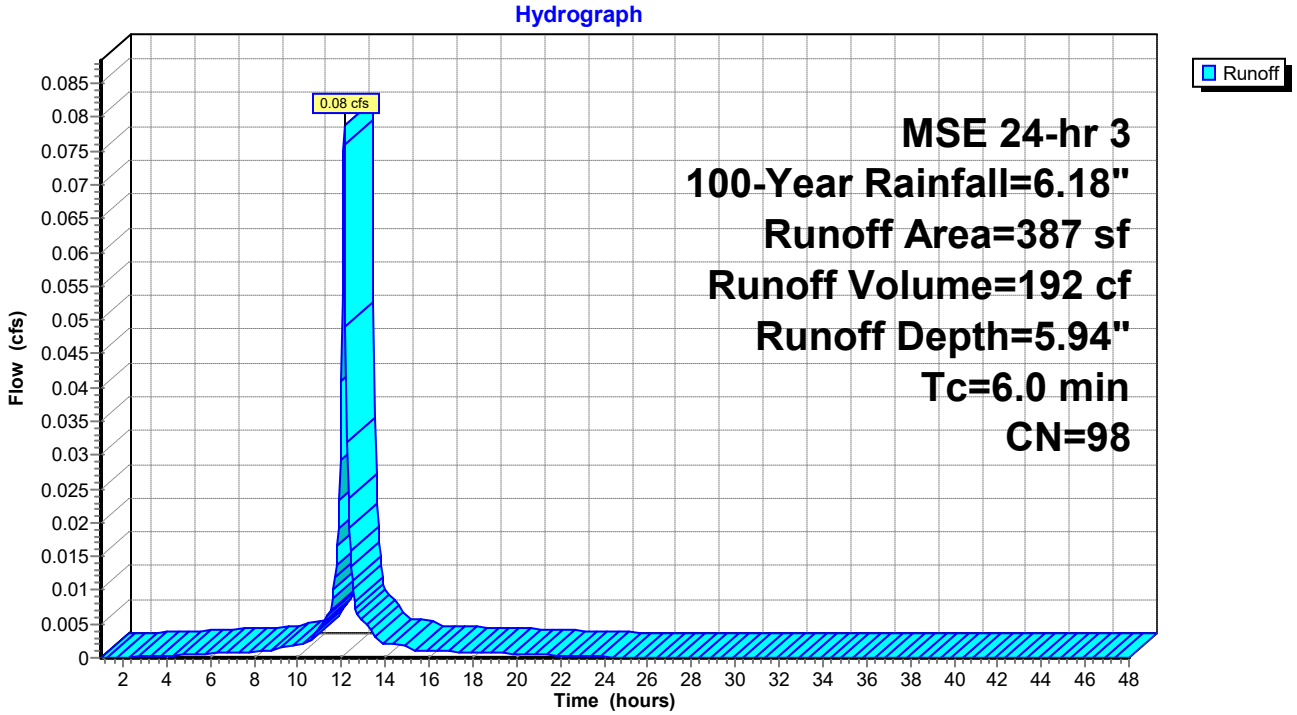
Runoff = 0.08 cfs @ 12.13 hrs, Volume= 192 cf, Depth= 5.94"
Routed to Link 124L : TO 12" PRIOR TO 24" (WEST)

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	0	98	WALKS
*	387	98	ROADS
*	0	98	ROOF
*	0	74	LANDSCAPING
	387	98	Weighted Average
	387		100.00% Impervious Area

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

Subcatchment 168S: A34



Summary for Subcatchment 169S: A36

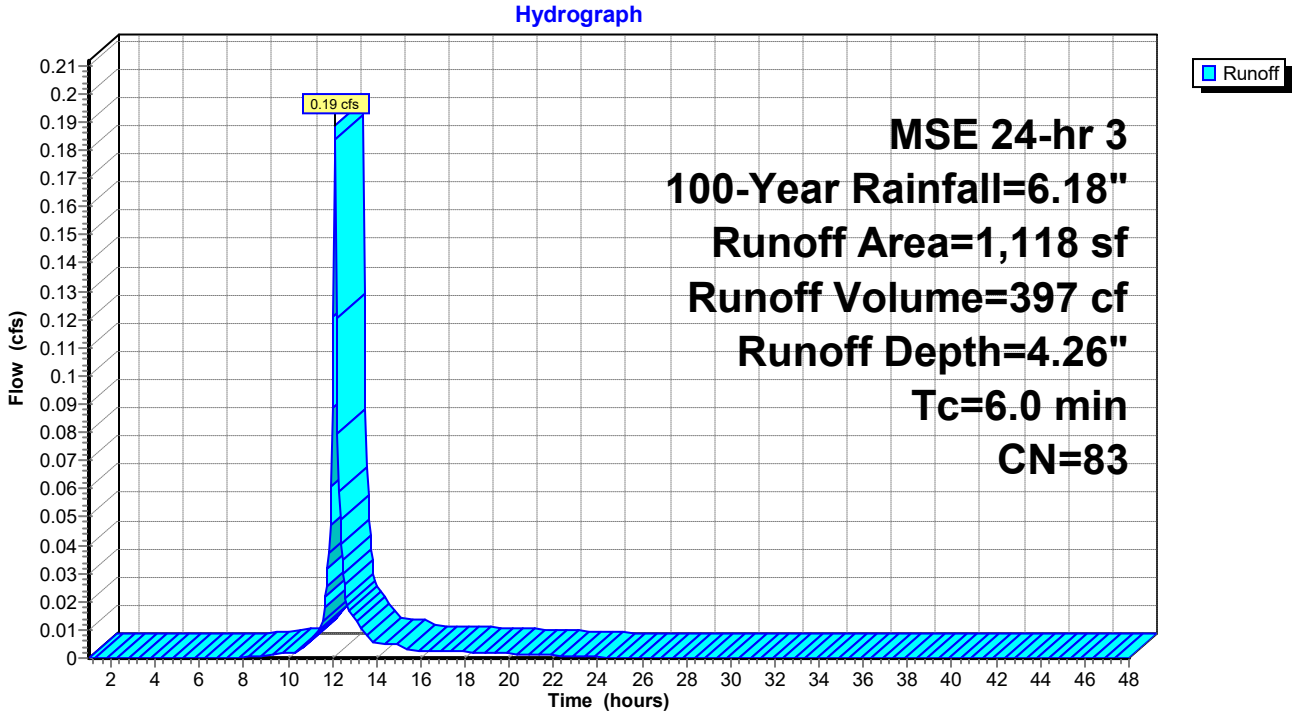
Runoff = 0.19 cfs @ 12.13 hrs, Volume= 397 cf, Depth= 4.26"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	401	98	WALKS
*	0	98	ROADS
*	0	98	ROOF
*	717	74	LANDSCAPING
	1,118	83	Weighted Average
	717		64.13% Pervious Area
	401		35.87% Impervious Area

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

Subcatchment 169S: A36



Summary for Subcatchment 170S: C (INTERIOR)

Subset C - C1
3/3/21
Southern portion of East Building Roof, Southern Building (Middle one) roof, pond area
pipe from roofs not sized yet

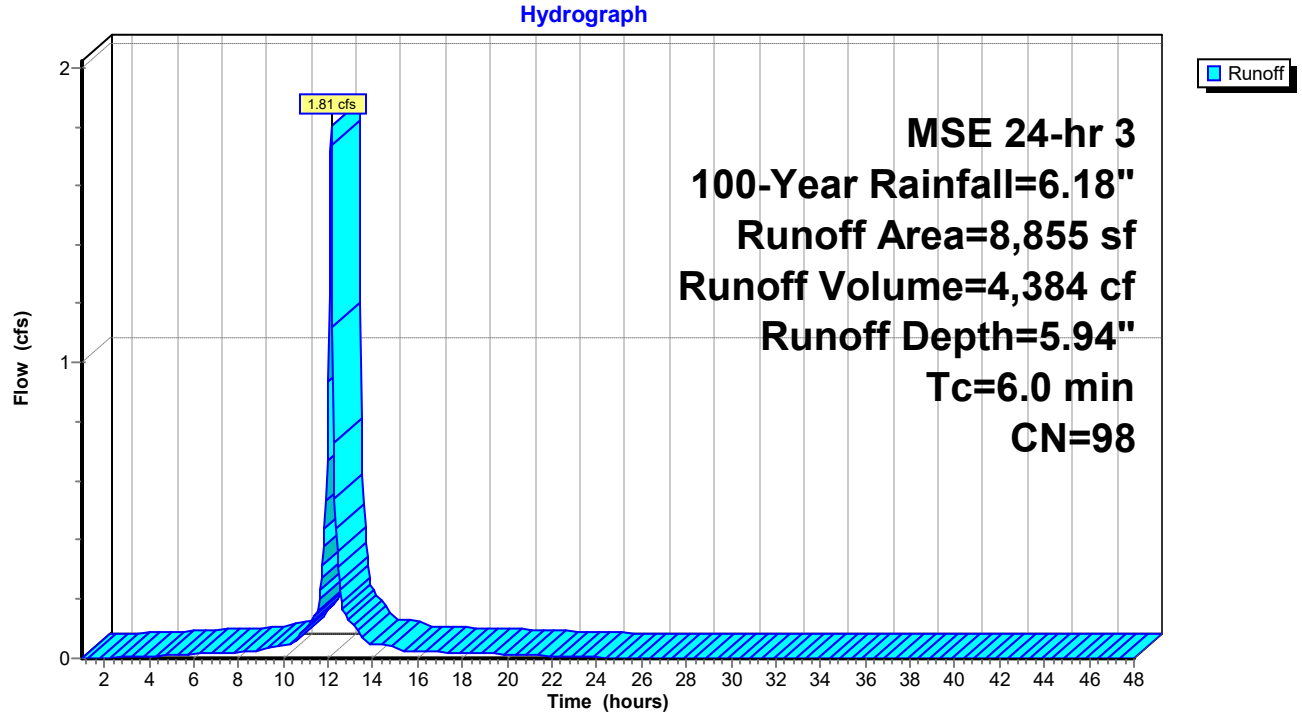
Runoff = 1.81 cfs @ 12.13 hrs, Volume= 4,384 cf, Depth= 5.94"
Routed to Link 171L : 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	8,855	98	roofs
	8,855		100.00% Impervious Area

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

Subcatchment 170S: C (INTERIOR)



Summary for Subcatchment 171S: A (MARIA ROOF) /2

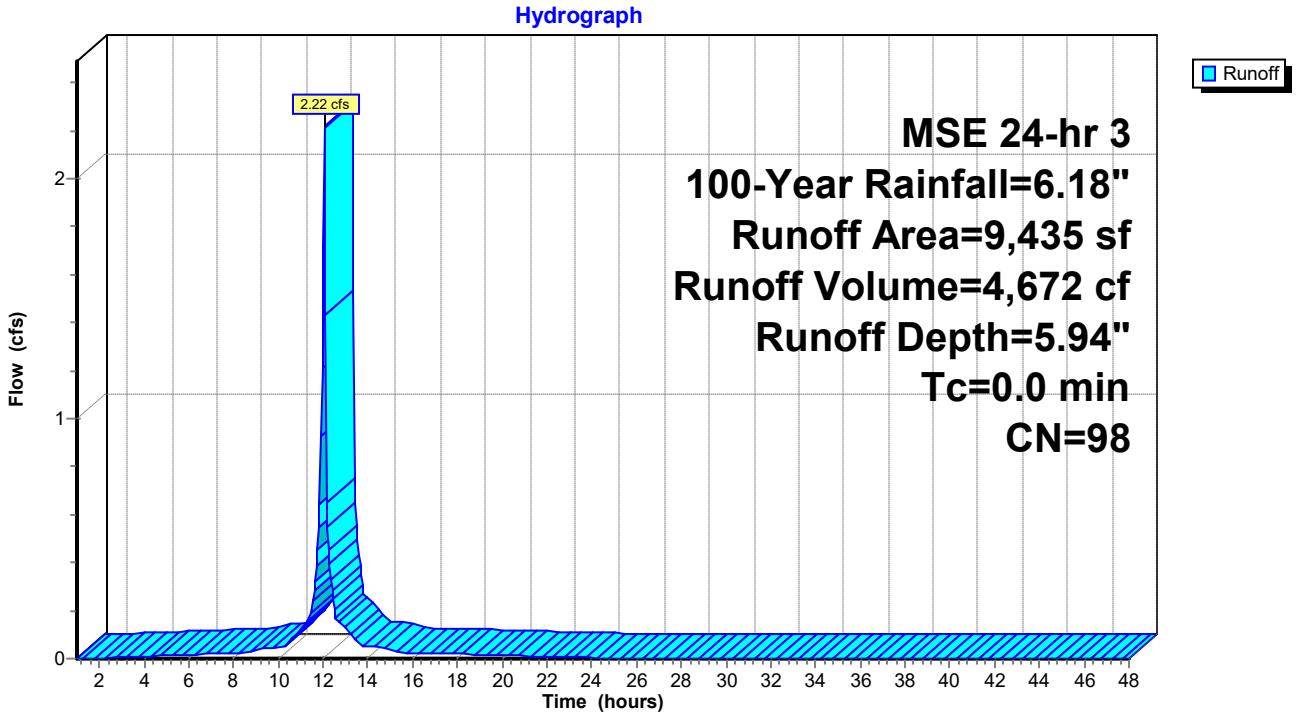
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 2.22 cfs @ 12.04 hrs, Volume= 4,672 cf, Depth= 5.94"
Routed to Link 134L : TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	9,435	98	Roofs
	9,435		100.00% Impervious Area

Subcatchment 171S: A (MARIA ROOF) /2



Summary for Subcatchment 172S: B1 (EXTERIOR)

3/3/21
Northern portion of W building roof

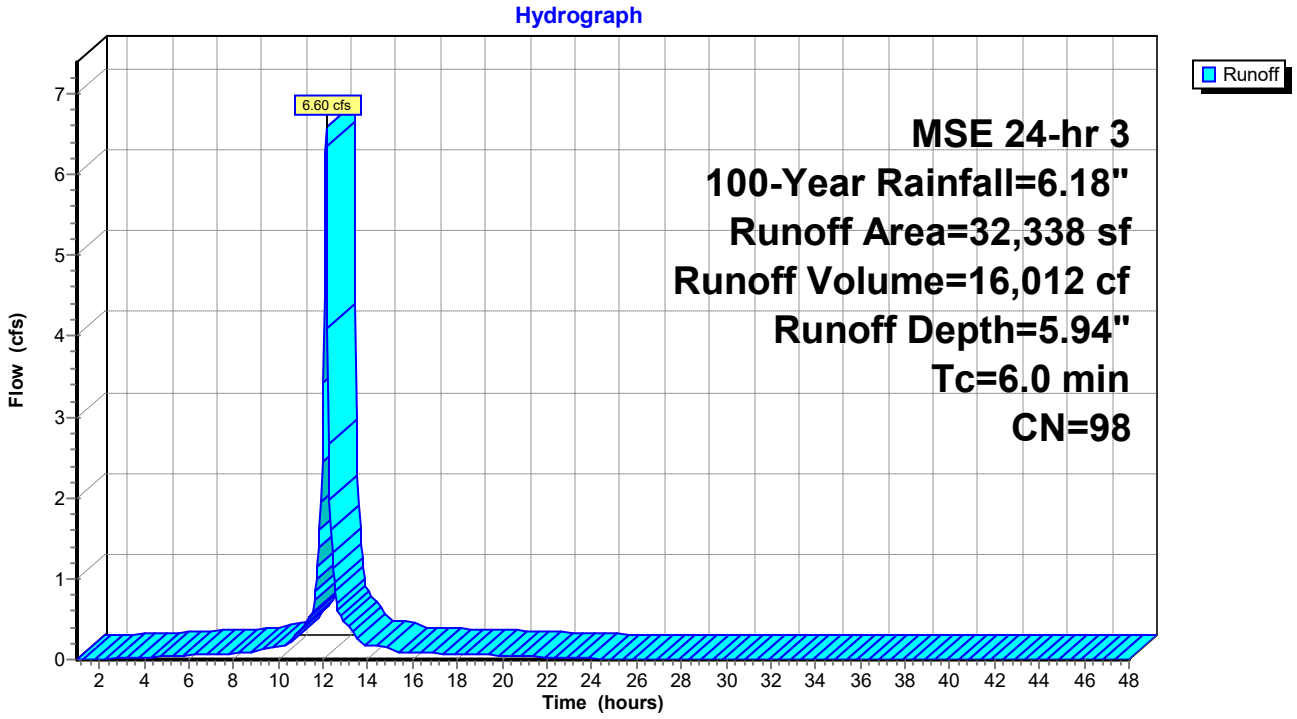
Runoff = 6.60 cfs @ 12.13 hrs, Volume= 16,012 cf, Depth= 5.94"
Routed to Reach 111R : Western PL North Ditch

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	32,338	98	roof
	32,338		100.00% Impervious Area

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

Subcatchment 172S: B1 (EXTERIOR)



Summary for Subcatchment 173S: A (MARIA ROOF) /2

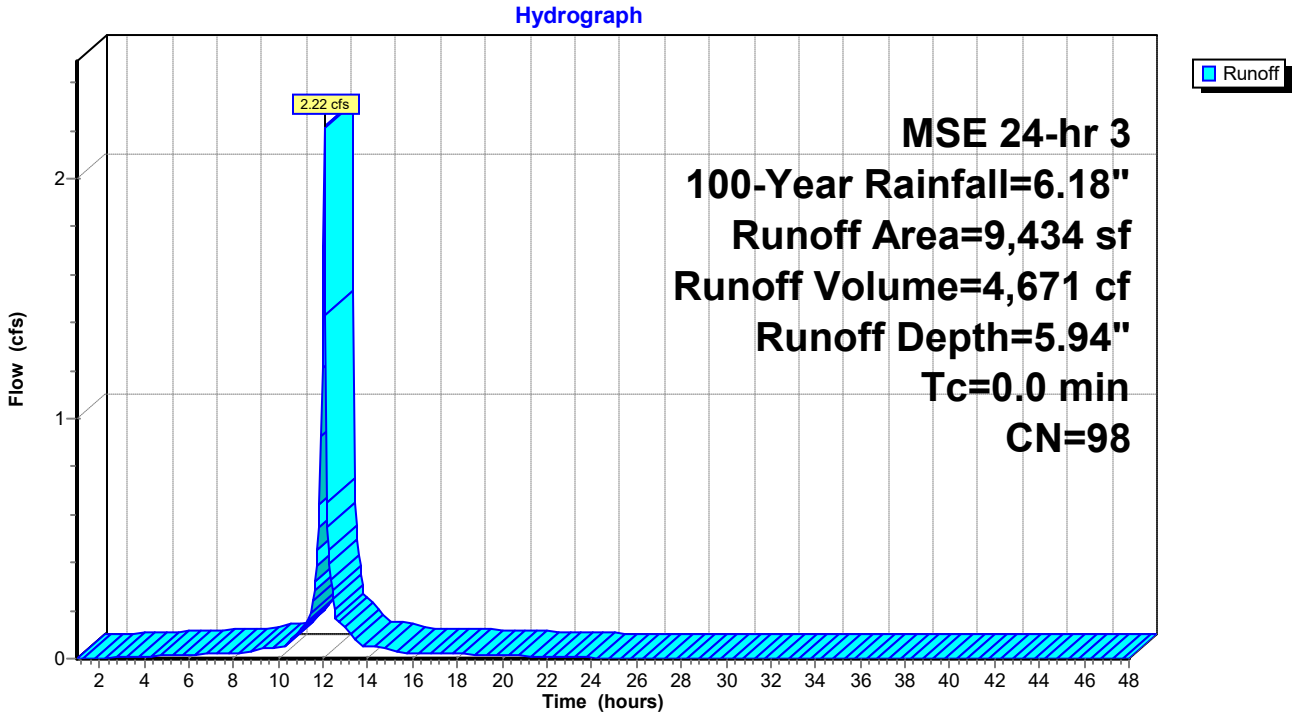
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 2.22 cfs @ 12.04 hrs, Volume= 4,671 cf, Depth= 5.94"
Routed to Link 175L : TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	9,434	98	Roofs
	9,434		100.00% Impervious Area

Subcatchment 173S: A (MARIA ROOF) /2



Summary for Subcatchment 175S: H6-b

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

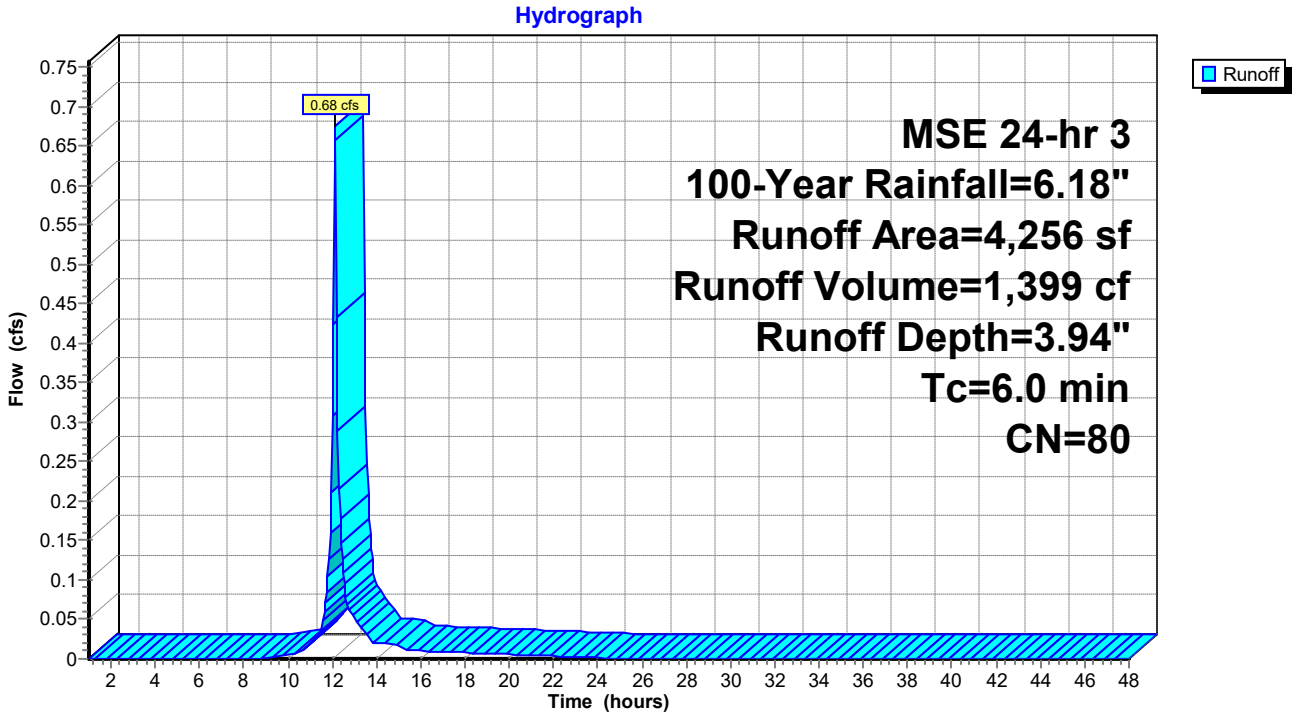
Runoff = 0.68 cfs @ 12.13 hrs, Volume= 1,399 cf, Depth= 3.94"
Routed to Link 115L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	3,243	74	landscape
*	1,013	98	road
	4,256	80	Weighted Average
	3,243		76.20% Pervious Area
	1,013		23.80% Impervious Area

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

Subcatchment 175S: H6-b



Summary for Subcatchment 176S: X (EX. RBL Area to RBL West Swale)

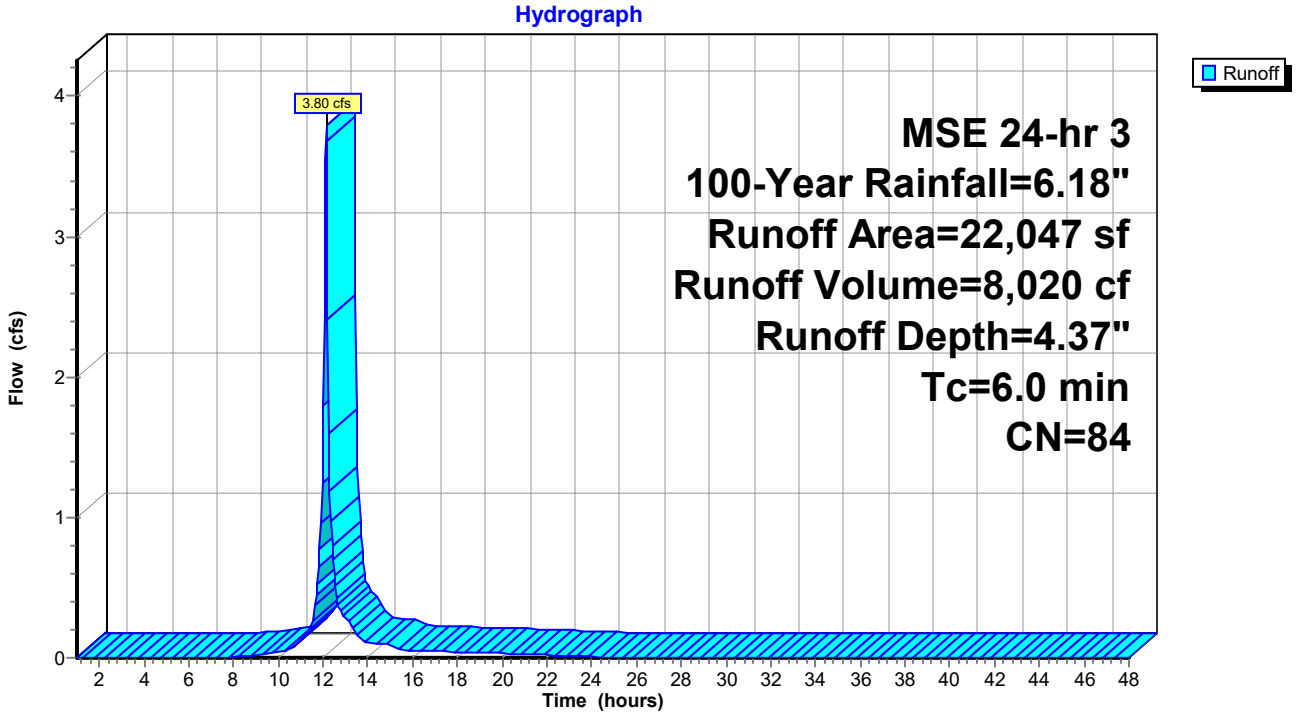
Runoff = 3.80 cfs @ 12.13 hrs, Volume= 8,020 cf, Depth= 4.37"
Routed to Reach 132R : EX. Red Barn Lane West Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	12,014	74	landscape
*	9,160	98	road
*	873	74	landscape
	22,047	84	Weighted Average
	12,887		58.45% Pervious Area
	9,160		41.55% Impervious Area

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

Subcatchment 176S: X (EX. RBL Area to RBL West Swale)



Summary for Subcatchment 179S: H6-c

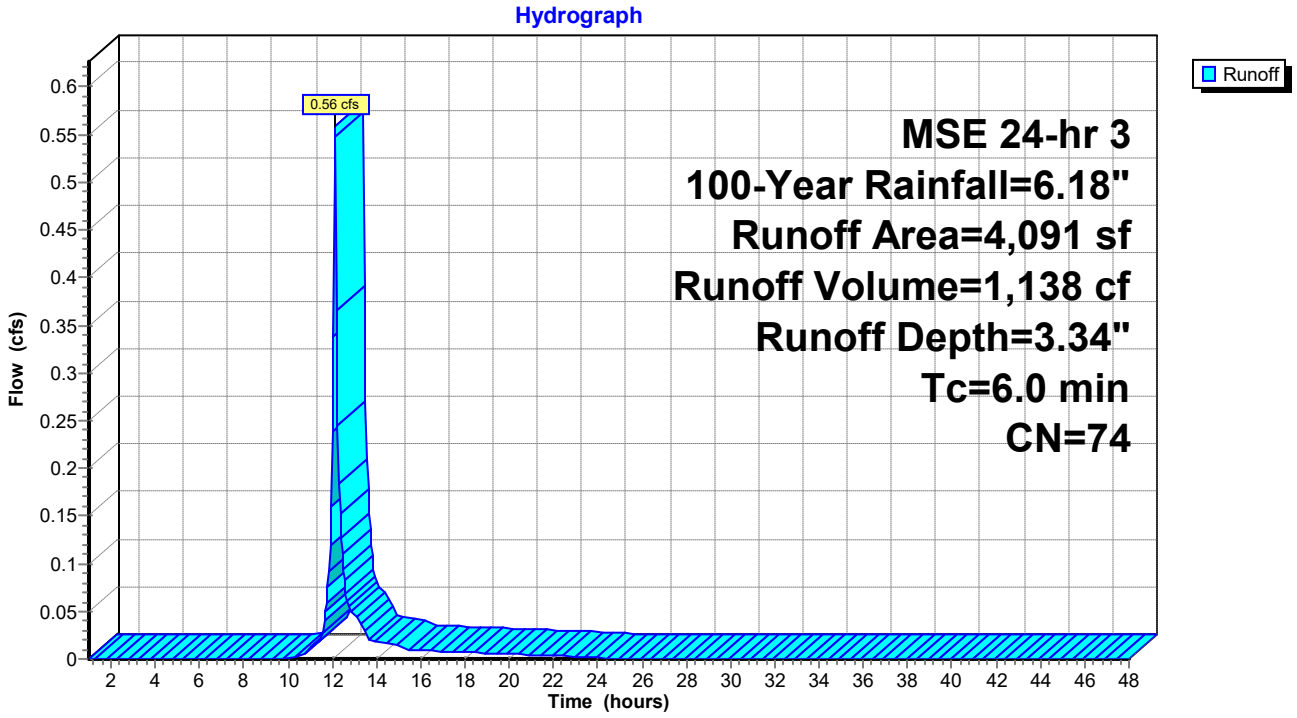
Runoff = 0.56 cfs @ 12.13 hrs, Volume= 1,138 cf, Depth= 3.34"
Routed to Link 115L : EX. Cul-de-sac On Green Meadow Place

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	4,091	74	per
	4,091		100.00% Pervious Area

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

Subcatchment 179S: H6-c



Summary for Subcatchment 182S: A35

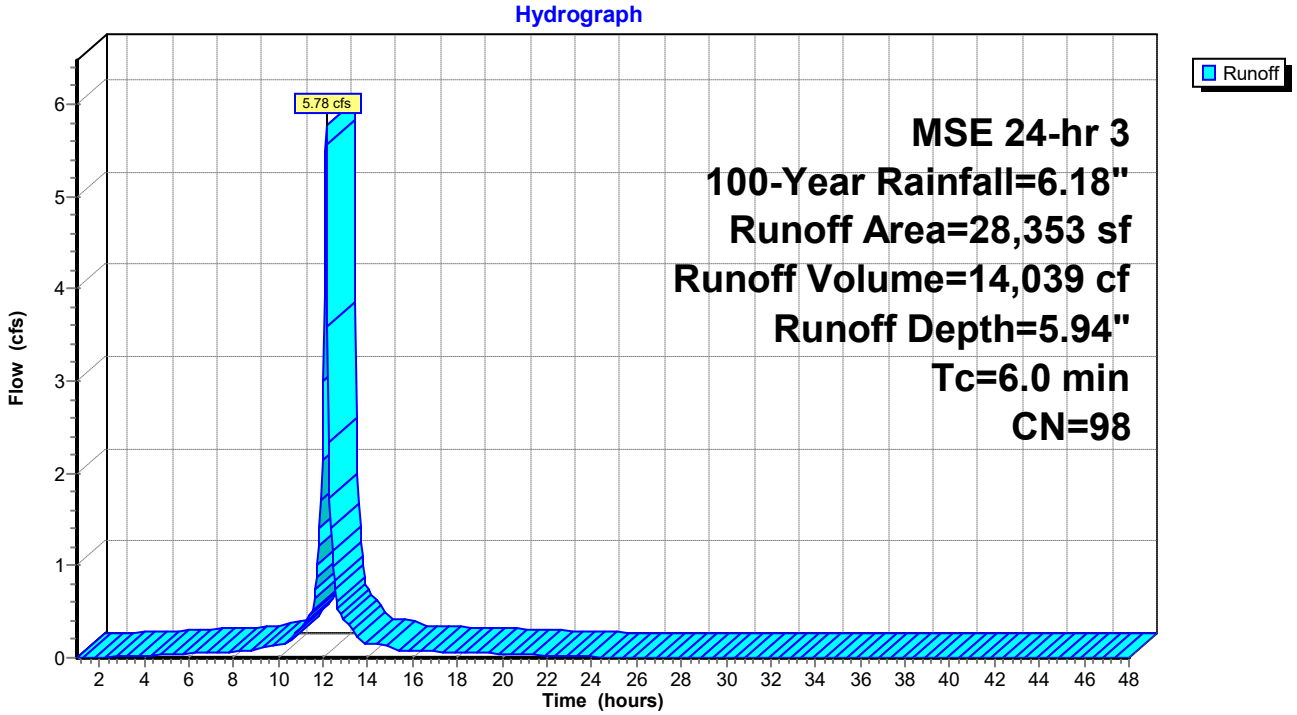
Runoff = 5.78 cfs @ 12.13 hrs, Volume= 14,039 cf, Depth= 5.94"
Routed to Link 177L : SUM OF As TO UG

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	28,353	98	WALKS
*	0	98	ROADS
*	0	98	ROOF
*	0	74	LANDSCAPING
	28,353	98	Weighted Average
	28,353		100.00% Impervious Area

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

Subcatchment 182S: A35



Summary for Subcatchment 183S: Y (RBL Area to RBL East Swale)

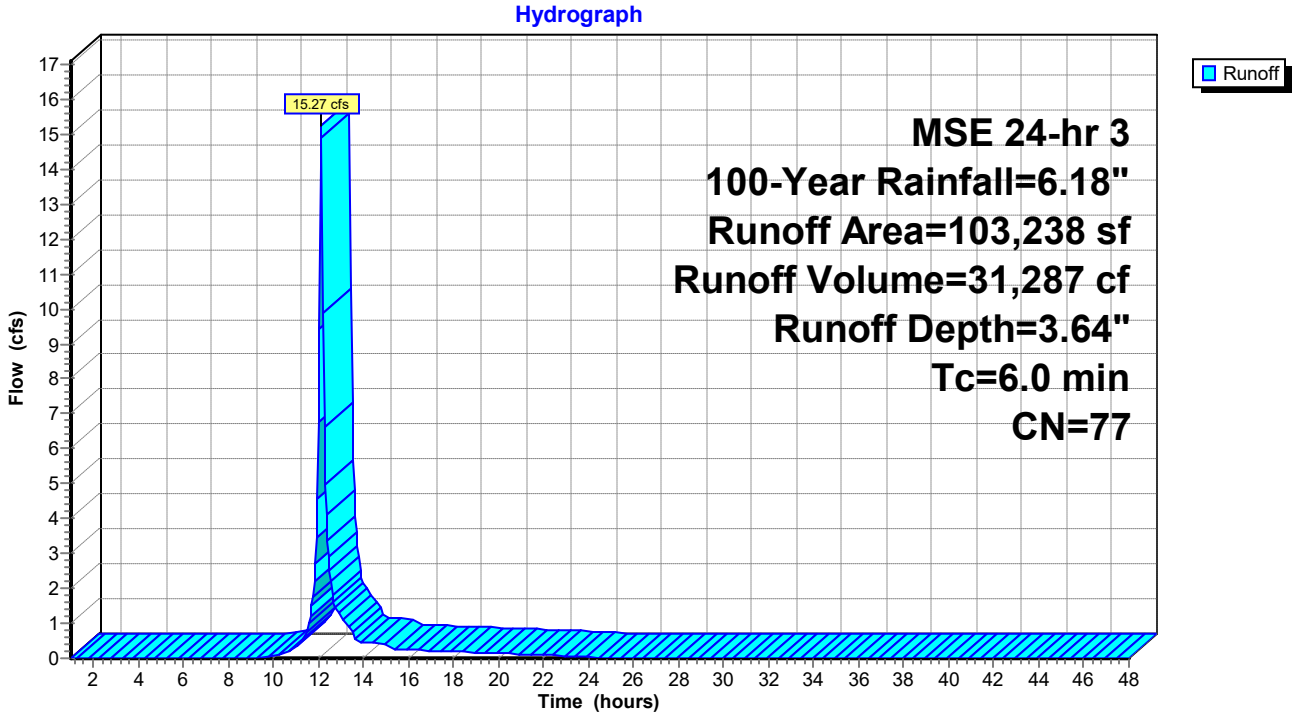
Runoff = 15.27 cfs @ 12.13 hrs, Volume= 31,287 cf, Depth= 3.64"
Routed to Reach 184R : Red Barn Lane East Swale

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	92,001	74	landscape
*	11,237	98	road
	103,238	77	Weighted Average
	92,001		89.12% Pervious Area
	11,237		10.88% Impervious Area

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

Subcatchment 183S: Y (RBL Area to RBL East Swale)



Summary for Subcatchment 185S: H4

3/3/21
Northern Berm north of cul-de-sac road, east side of SC

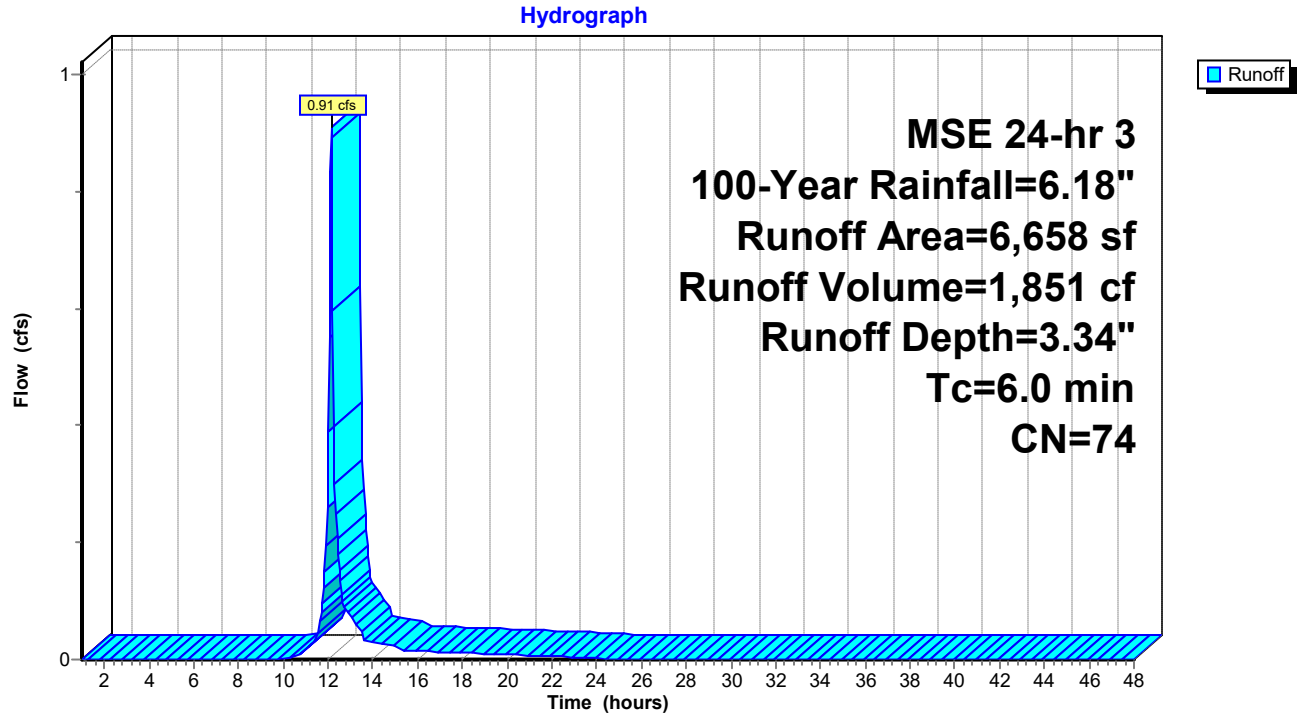
Runoff = 0.91 cfs @ 12.13 hrs, Volume= 1,851 cf, Depth= 3.34"
Routed to Link 66L : Total Offsite

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 100-Year Rainfall=6.18"

	Area (sf)	CN	Description
*	6,658	74	landscape
	6,658		100.00% Pervious Area

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

Subcatchment 185S: H4



Summary for Reach 99R: East Swale (SE End)

[62] Hint: Exceeded Reach 106R OUTLET depth by 0.64' @ 12.15 hrs

Inflow Area = 227,272 sf, 34.15% Impervious, Inflow Depth = 4.19" for 100-Year event
Inflow = 38.48 cfs @ 12.13 hrs, Volume= 79,303 cf
Outflow = 36.89 cfs @ 12.15 hrs, Volume= 79,303 cf, Atten= 4%, Lag= 1.2 min
Routed to Pond 58P : Dry Pond 1

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 5.22 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 1.12 fps, Avg. Travel Time= 8.5 min

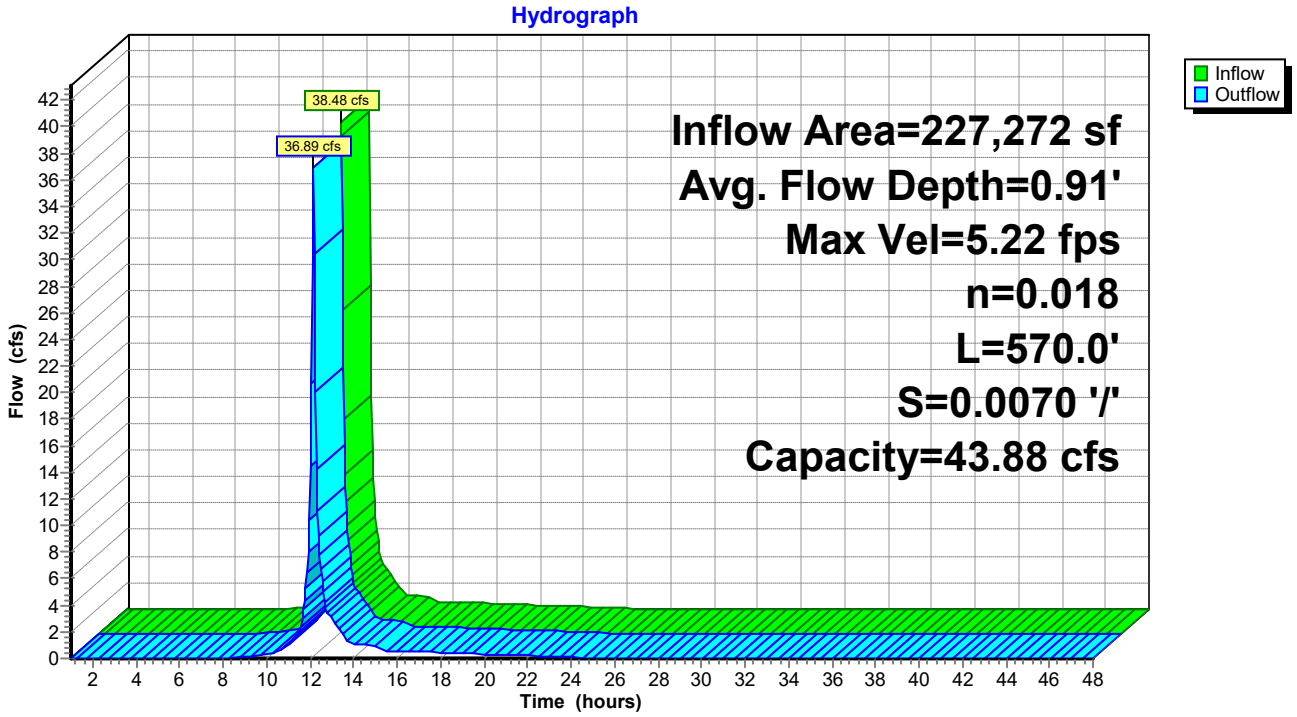
Peak Storage= 4,028 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.91' , Surface Width= 10.48'
Bank-Full Depth= 1.00' Flow Area= 8.0 sf, Capacity= 43.88 cfs

5.00' x 1.00' deep channel, n= 0.018
Side Slope Z-value= 3.0 '/' Top Width= 11.00'
Length= 570.0' Slope= 0.0070 '/'
Inlet Invert= 757.00', Outlet Invert= 753.00'



‡

Reach 99R: East Swale (SE End)



Summary for Reach 106R: East Swale (North End)

3/2/21
Slope Calc - (140' x 4.64%)

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[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 19,337 sf, 26.10% Impervious, Inflow Depth = 3.94" for 100-Year event
Inflow = 3.07 cfs @ 12.13 hrs, Volume= 6,356 cf
Outflow = 3.07 cfs @ 12.14 hrs, Volume= 6,356 cf, Atten= 0%, Lag= 0.5 min
Routed to Reach 99R : East Swale (SE End)

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.89 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.95 fps, Avg. Travel Time= 2.5 min

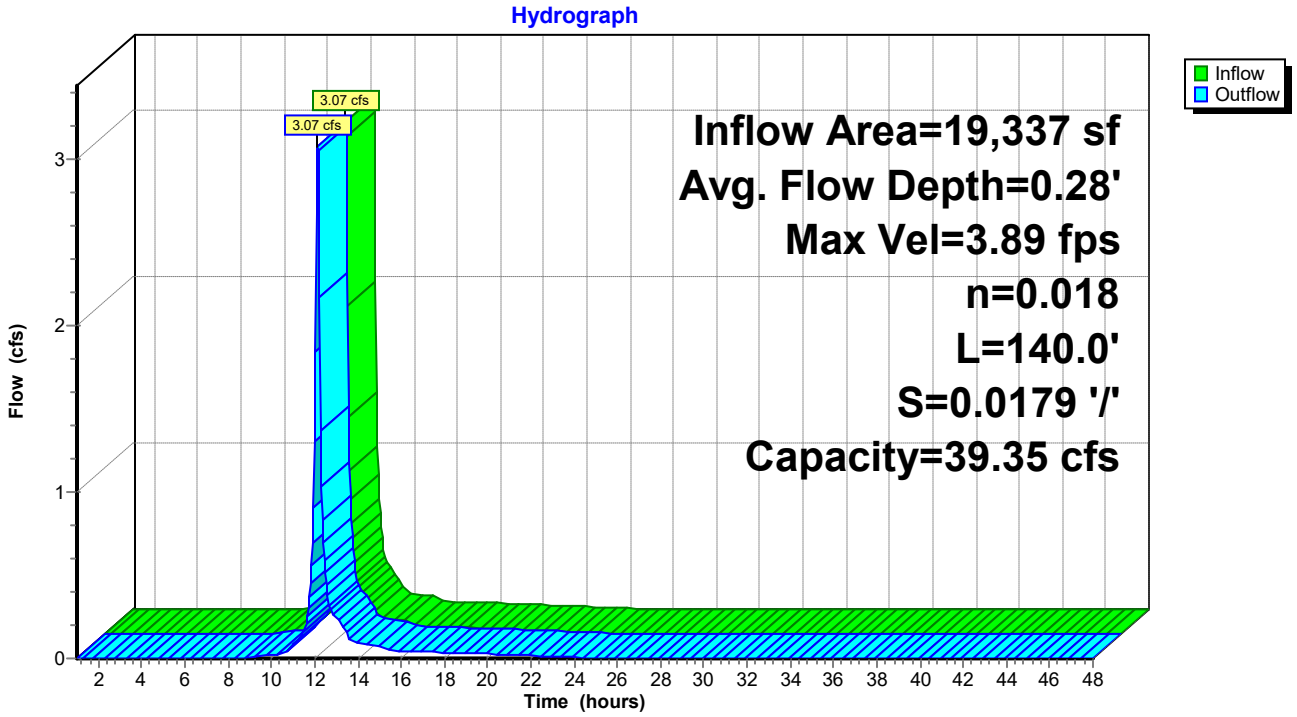
Peak Storage= 110 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.28' , Surface Width= 3.67'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 39.35 cfs

2.00' x 1.00' deep channel, n= 0.018 Earth, clean & straight
Side Slope Z-value= 3.0 '/' Top Width= 8.00'
Length= 140.0' Slope= 0.0179 '/'
Inlet Invert= 759.51', Outlet Invert= 757.00'



‡

Reach 106R: East Swale (North End)



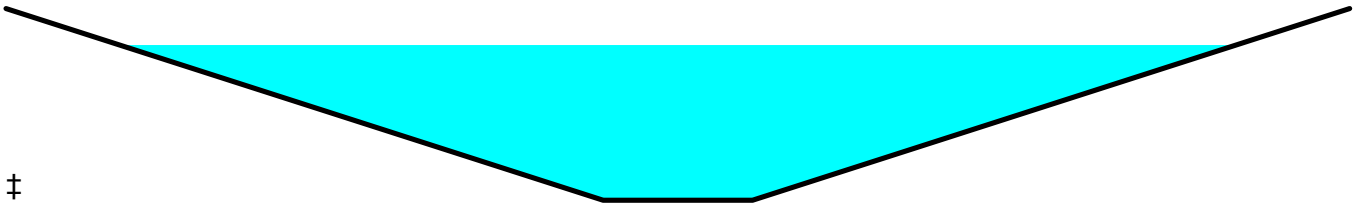
Summary for Reach 108R: South Berm Swale

Inflow Area = 124,665 sf, 12.91% Impervious, Inflow Depth = 3.65" for 100-Year event
Inflow = 12.15 cfs @ 12.14 hrs, Volume= 37,868 cf
Outflow = 11.92 cfs @ 12.15 hrs, Volume= 37,868 cf, Atten= 2%, Lag= 0.9 min
Routed to Pond 57P : Dry Pond 2

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.47 fps, Min. Travel Time= 1.3 min
Avg. Velocity = 1.15 fps, Avg. Travel Time= 3.9 min

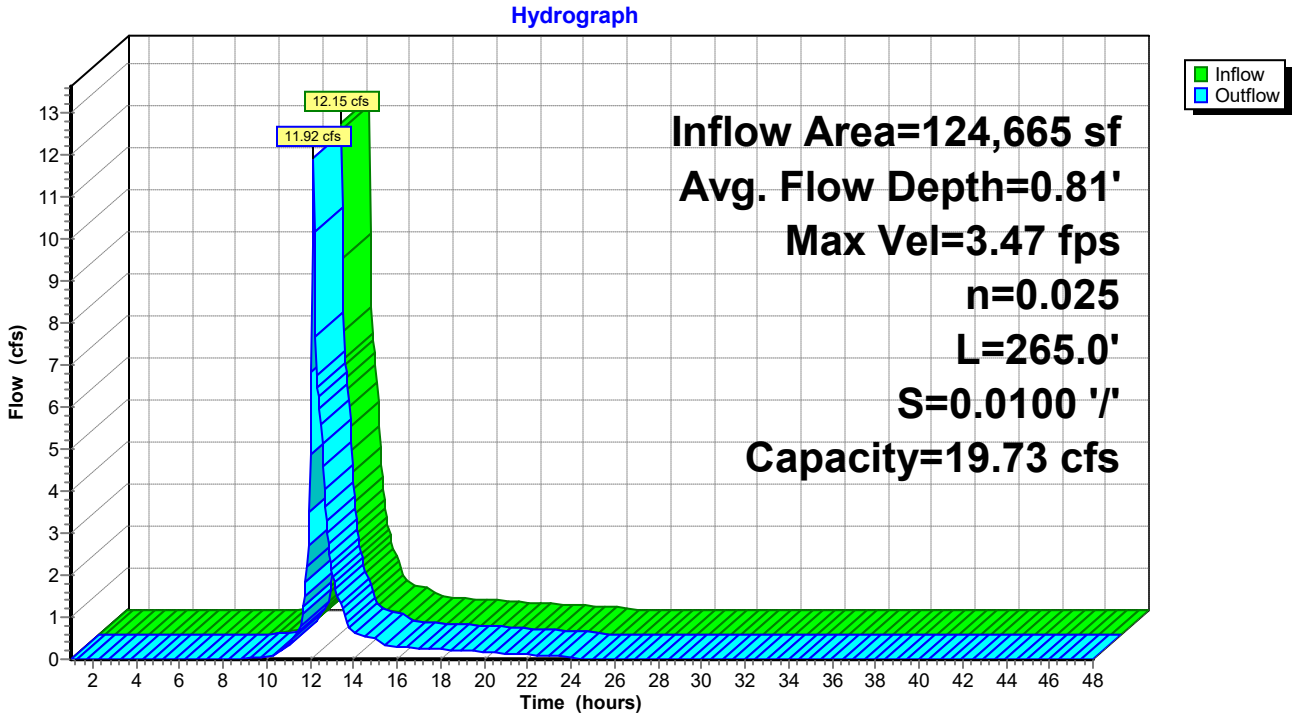
Peak Storage= 909 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.81' , Surface Width= 7.48'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 19.73 cfs

1.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 4.0 '/' Top Width= 9.00'
Length= 265.0' Slope= 0.0100 '/'
Inlet Invert= 754.00', Outlet Invert= 751.35'



‡

Reach 108R: South Berm Swale



Summary for Reach 109R: SC Road East Ditch

3/3/21
Ditch on north and west side of cul-de-sac road

Inflow Area = 41,695 sf, 60.00% Impervious, Inflow Depth = 4.80" for 100-Year event
Inflow = 7.70 cfs @ 12.13 hrs, Volume= 16,676 cf
Outflow = 7.09 cfs @ 12.16 hrs, Volume= 16,676 cf, Atten= 8%, Lag= 1.7 min
Routed to Pond 95P : Dry Pond 3

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.46 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 0.57 fps, Avg. Travel Time= 12.1 min

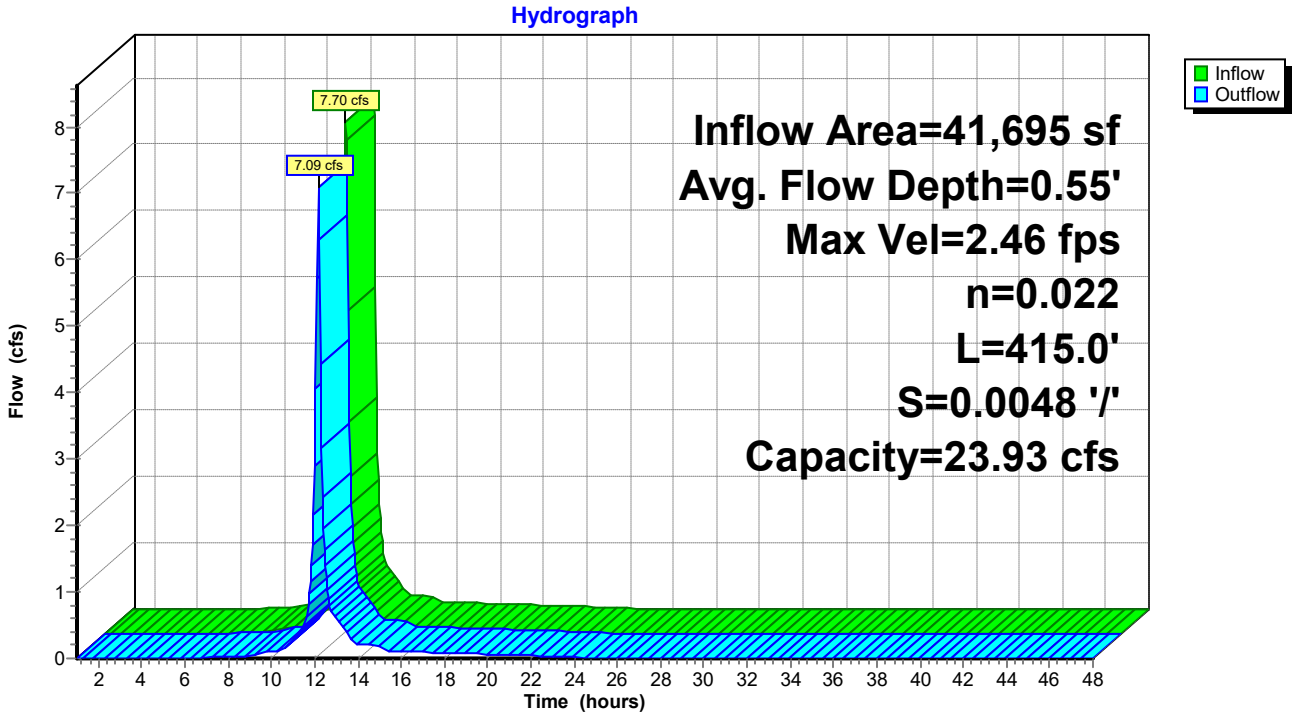
Peak Storage= 1,195 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.55' , Surface Width= 7.42'
Bank-Full Depth= 1.00' Flow Area= 7.0 sf, Capacity= 23.93 cfs

3.00' x 1.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 '/' Top Width= 11.00'
Length= 415.0' Slope= 0.0048 '/'
Inlet Invert= 747.00', Outlet Invert= 745.00'



‡

Reach 109R: SC Road East Ditch



Summary for Reach 111R: Western PL North Ditch

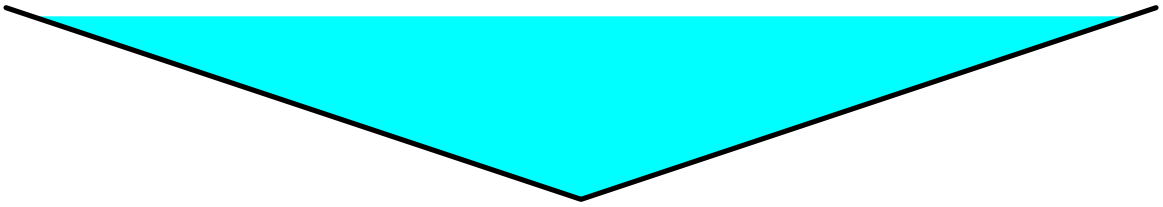
3/3/21
This is the western property line ditch that takes offsite flow and western building courtyard flow to IB
update length we shortened in screen share

Inflow Area = 158,356 sf, 28.25% Impervious, Inflow Depth = 4.08" for 100-Year event
Inflow = 24.65 cfs @ 12.14 hrs, Volume= 53,831 cf
Outflow = 23.70 cfs @ 12.15 hrs, Volume= 53,831 cf, Atten= 4%, Lag= 1.1 min
Routed to Pond 110R : Western Pipe Run

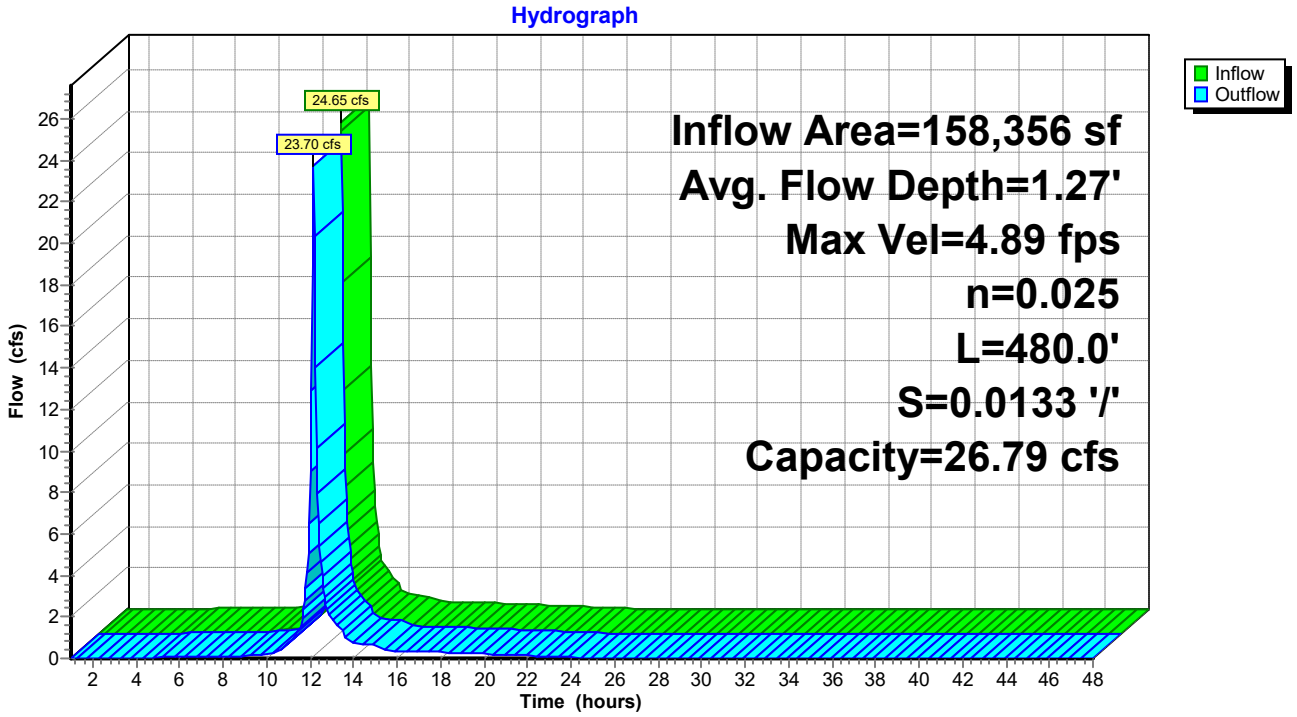
Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 4.89 fps, Min. Travel Time= 1.6 min
Avg. Velocity = 1.43 fps, Avg. Travel Time= 5.6 min

Peak Storage= 2,323 cf @ 12.15 hrs
Average Depth at Peak Storage= 1.27' , Surface Width= 7.62'
Bank-Full Depth= 1.33' Flow Area= 5.3 sf, Capacity= 26.79 cfs

0.00' x 1.33' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 7.98'
Length= 480.0' Slope= 0.0133 '/'
Inlet Invert= 755.50', Outlet Invert= 749.10'



Reach 111R: Western PL North Ditch



Summary for Reach 117R: SC Road West Ditch

3/3/21
Ditch on north and west side of cul-de-sac road

Inflow Area = 50,859 sf, 57.49% Impervious, Inflow Depth = 4.80" for 100-Year event
Inflow = 9.39 cfs @ 12.13 hrs, Volume= 20,341 cf
Outflow = 8.49 cfs @ 12.16 hrs, Volume= 20,341 cf, Atten= 10%, Lag= 1.8 min
Routed to Pond 95P : Dry Pond 3

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.46 fps, Min. Travel Time= 3.2 min
Avg. Velocity = 0.57 fps, Avg. Travel Time= 13.9 min

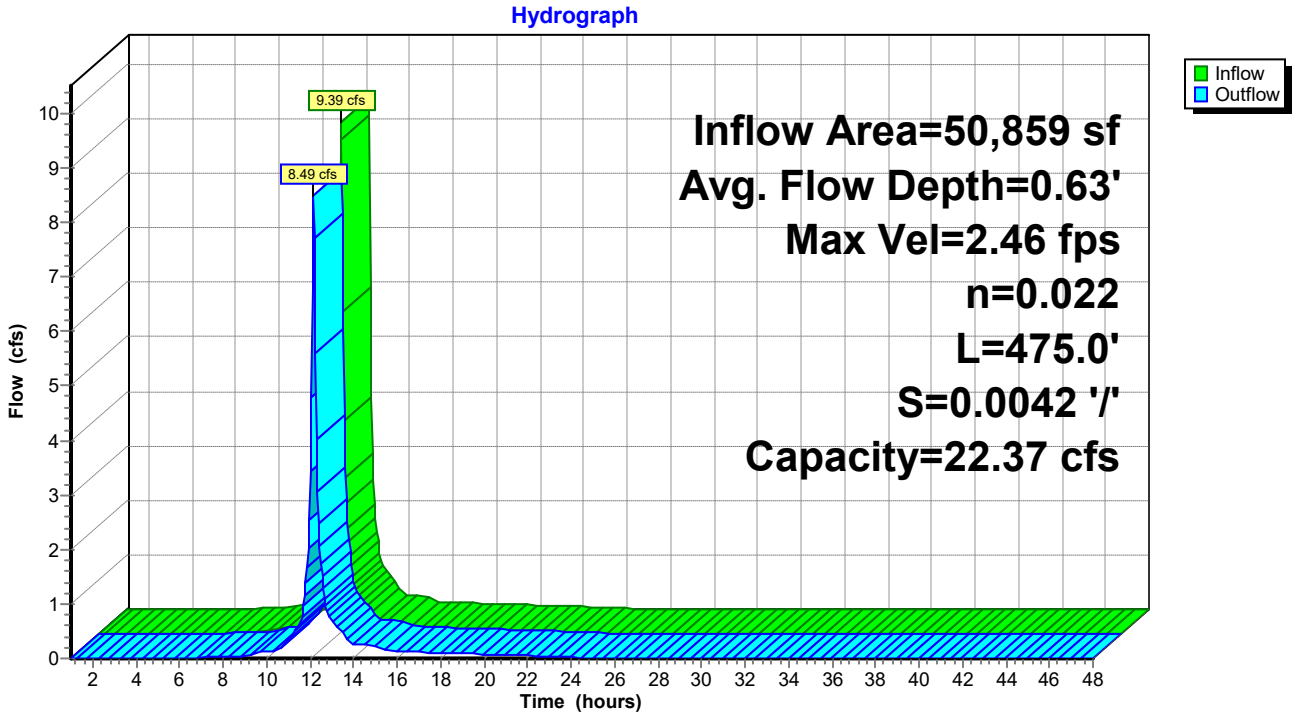
Peak Storage= 1,636 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.63' , Surface Width= 8.01'
Bank-Full Depth= 1.00' Flow Area= 7.0 sf, Capacity= 22.37 cfs

3.00' x 1.00' deep channel, n= 0.022
Side Slope Z-value= 4.0 '/' Top Width= 11.00'
Length= 475.0' Slope= 0.0042 '/'
Inlet Invert= 747.00', Outlet Invert= 745.00'



‡

Reach 117R: SC Road West Ditch



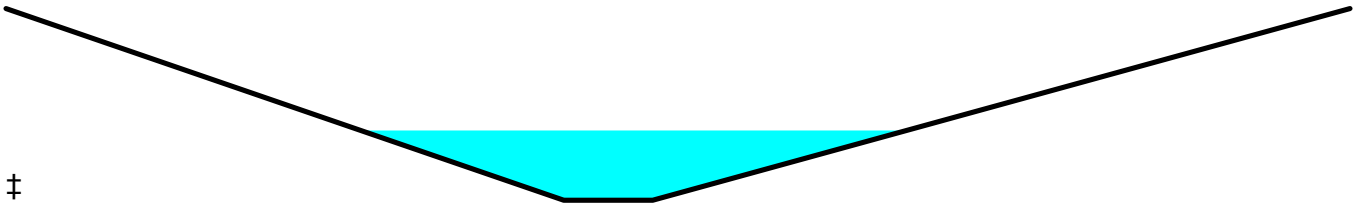
Summary for Reach 132R: EX. Red Barn Lane West Swale

Inflow Area = 51,883 sf, 28.33% Impervious, Inflow Depth = 4.00" for 100-Year event
Inflow = 8.32 cfs @ 12.13 hrs, Volume= 17,315 cf
Outflow = 7.64 cfs @ 12.16 hrs, Volume= 17,315 cf, Atten= 8%, Lag= 1.7 min
Routed to Pond 183P : 24" HDPE PIPE

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 3.75 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 1.10 fps, Avg. Travel Time= 9.2 min

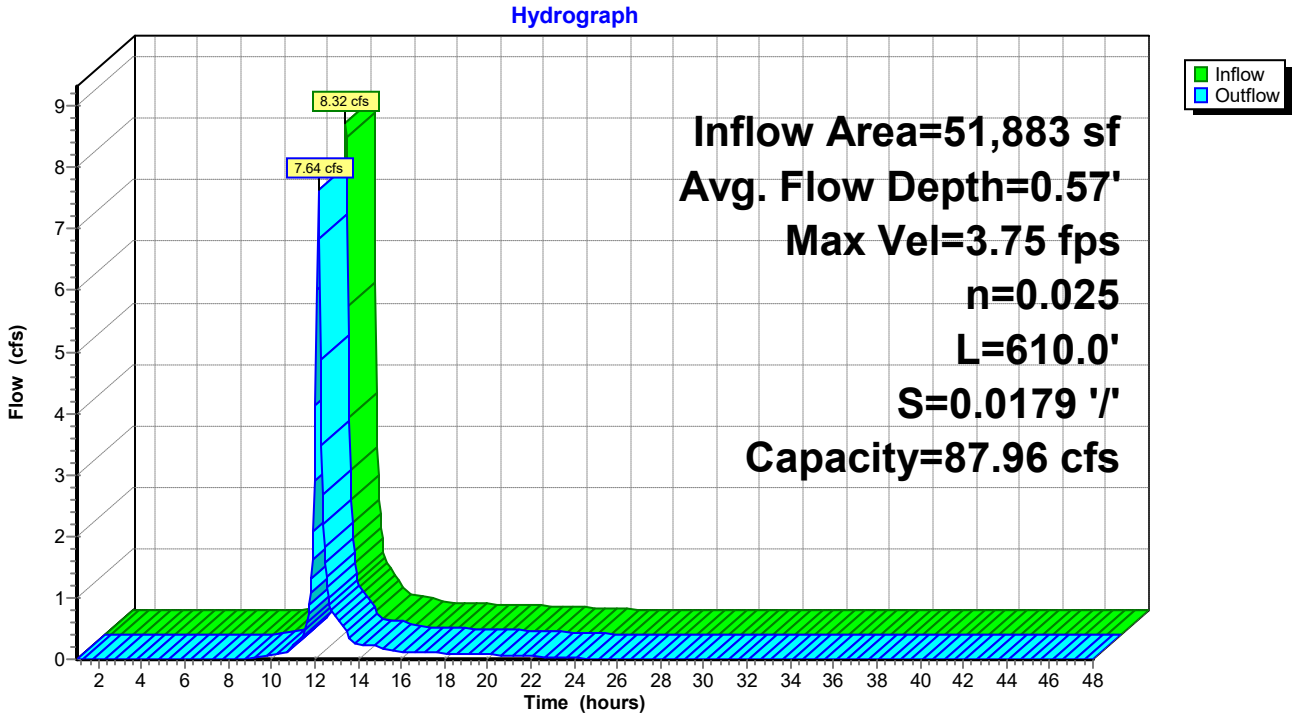
Peak Storage= 1,241 cf @ 12.16 hrs
Average Depth at Peak Storage= 0.57' , Surface Width= 6.13'
Bank-Full Depth= 1.57' Flow Area= 12.7 sf, Capacity= 87.96 cfs

1.00' x 1.57' deep channel, n= 0.025
Side Slope Z-value= 4.0 5.0 '/' Top Width= 15.13'
Length= 610.0' Slope= 0.0179 '/'
Inlet Invert= 760.89', Outlet Invert= 750.00'



‡

Reach 132R: EX. Red Barn Lane West Swale



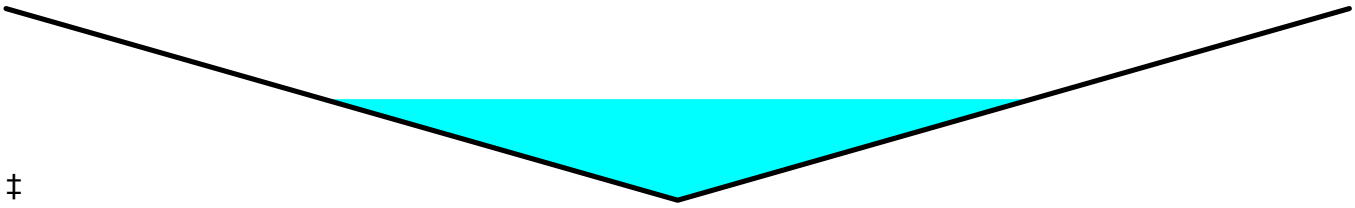
Summary for Reach 136R: SC West Ditch

Inflow Area = 20,215 sf, 20.28% Impervious, Inflow Depth = 3.84" for 100-Year event
Inflow = 3.14 cfs @ 12.13 hrs, Volume= 6,470 cf
Outflow = 3.02 cfs @ 12.15 hrs, Volume= 6,470 cf, Atten= 4%, Lag= 1.2 min
Routed to Pond 95P : Dry Pond 3

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.16 fps, Min. Travel Time= 1.7 min
Avg. Velocity = 0.72 fps, Avg. Travel Time= 5.1 min

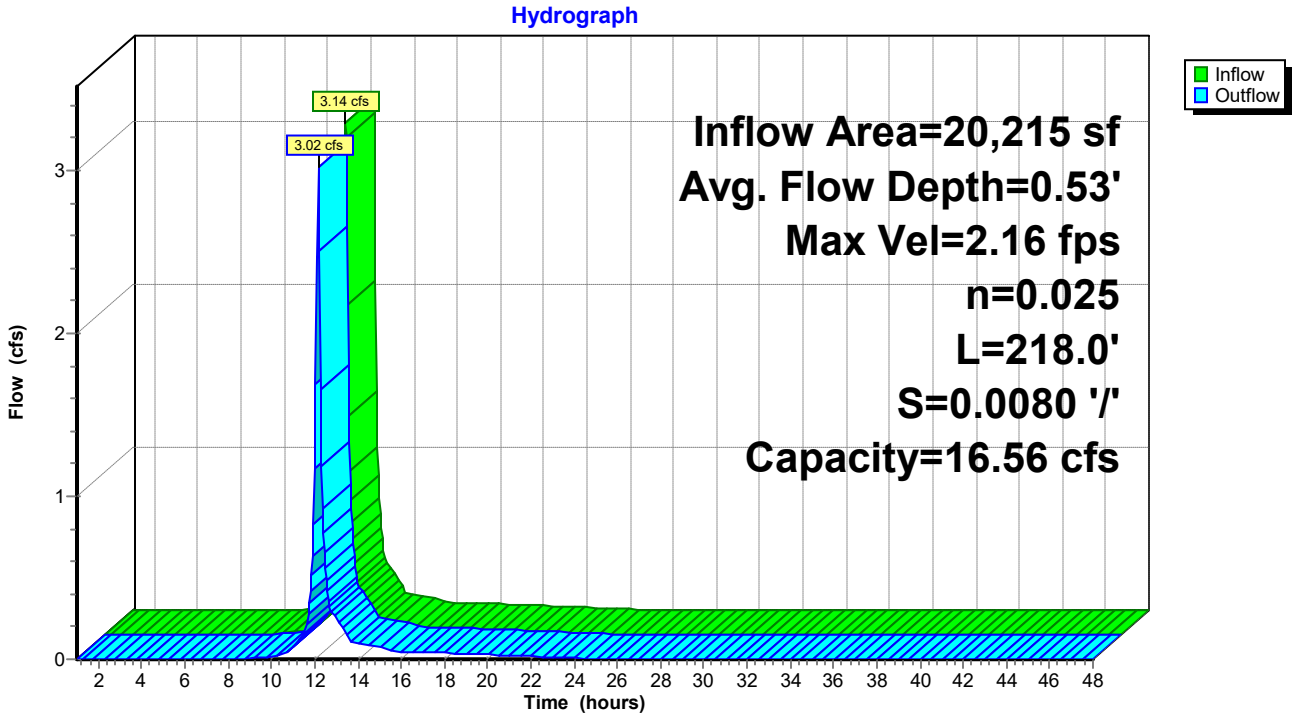
Peak Storage= 304 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.53' , Surface Width= 5.28'
Bank-Full Depth= 1.00' Flow Area= 5.0 sf, Capacity= 16.56 cfs

0.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 5.0 '/' Top Width= 10.00'
Length= 218.0' Slope= 0.0080 '/'
Inlet Invert= 743.75', Outlet Invert= 742.00'



‡

Reach 136R: SC West Ditch



Summary for Reach 151R: Western PL North Ditch

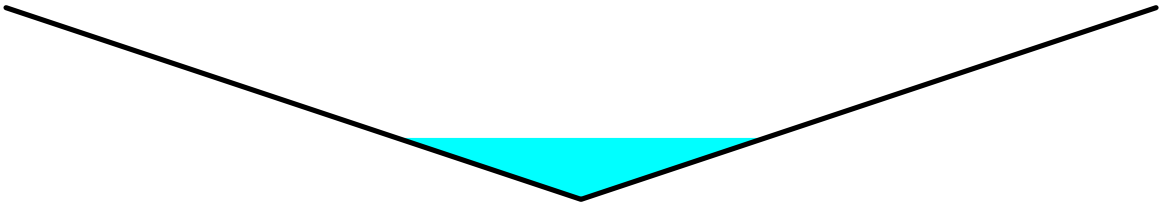
3/3/21
This is the western property line ditch that takes offsite flow and western building courtyard flow to IB
update length we shortened in screen share

Inflow Area = 8,222 sf, 12.92% Impervious, Inflow Depth = 3.64" for 100-Year event
Inflow = 1.22 cfs @ 12.13 hrs, Volume= 2,492 cf
Outflow = 1.16 cfs @ 12.15 hrs, Volume= 2,492 cf, Atten= 4%, Lag= 1.2 min
Routed to Pond 110R : Western Pipe Run

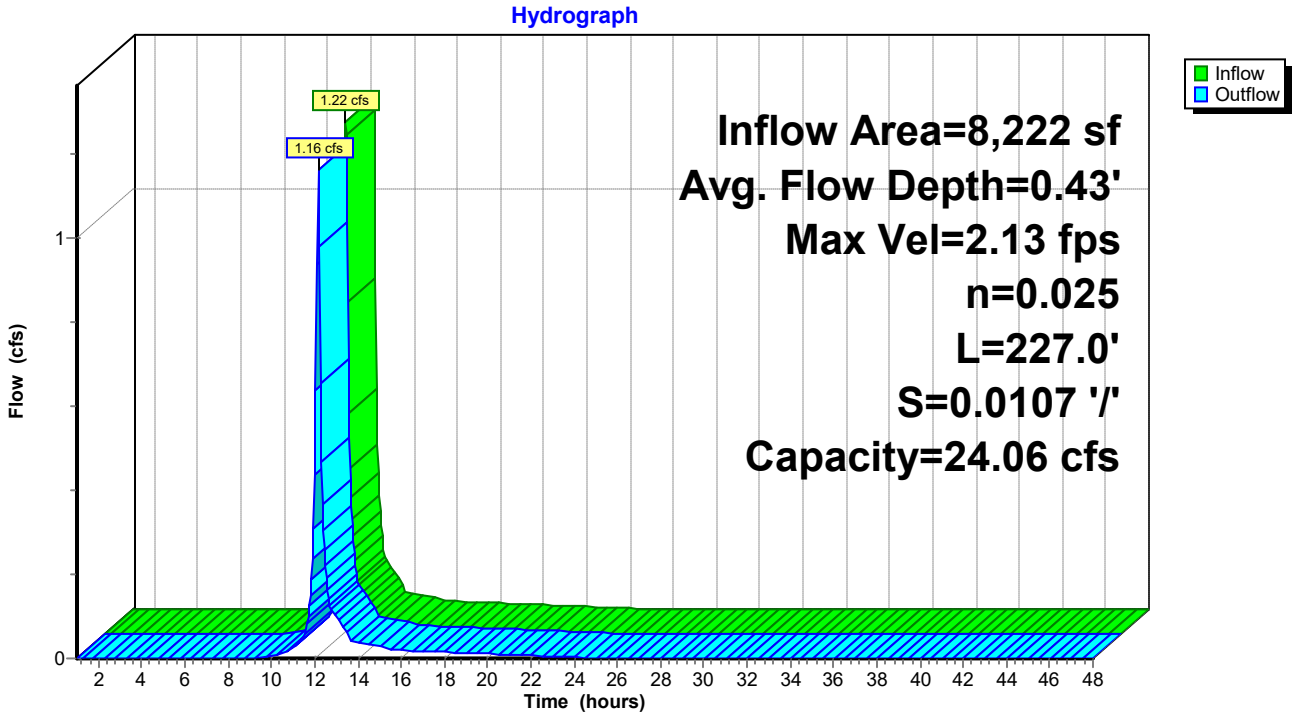
Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 2.13 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 0.73 fps, Avg. Travel Time= 5.2 min

Peak Storage= 124 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.43' , Surface Width= 2.56'
Bank-Full Depth= 1.33' Flow Area= 5.3 sf, Capacity= 24.06 cfs

0.00' x 1.33' deep channel, n= 0.025
Side Slope Z-value= 3.0 '/' Top Width= 7.98'
Length= 227.0' Slope= 0.0107 '/'
Inlet Invert= 751.54', Outlet Invert= 749.10'



Reach 151R: Western PL North Ditch



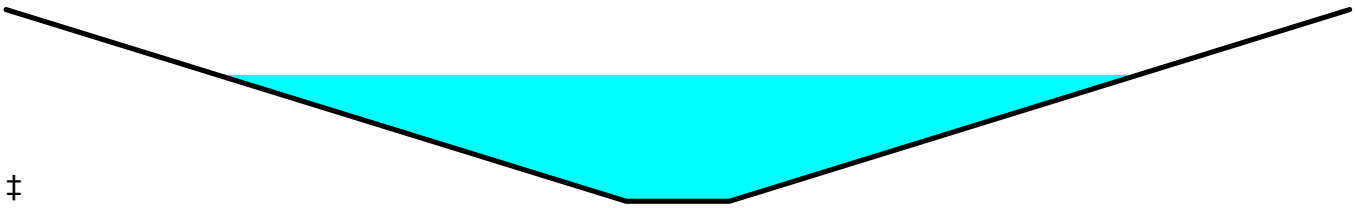
Summary for Reach 184R: Red Barn Lane East Swale

Inflow Area = 103,238 sf, 10.88% Impervious, Inflow Depth = 3.64" for 100-Year event
Inflow = 15.27 cfs @ 12.13 hrs, Volume= 31,287 cf
Outflow = 13.18 cfs @ 12.17 hrs, Volume= 31,287 cf, Atten= 14%, Lag= 2.3 min

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Max. Velocity= 4.03 fps, Min. Travel Time= 3.9 min
Avg. Velocity = 1.19 fps, Avg. Travel Time= 13.3 min

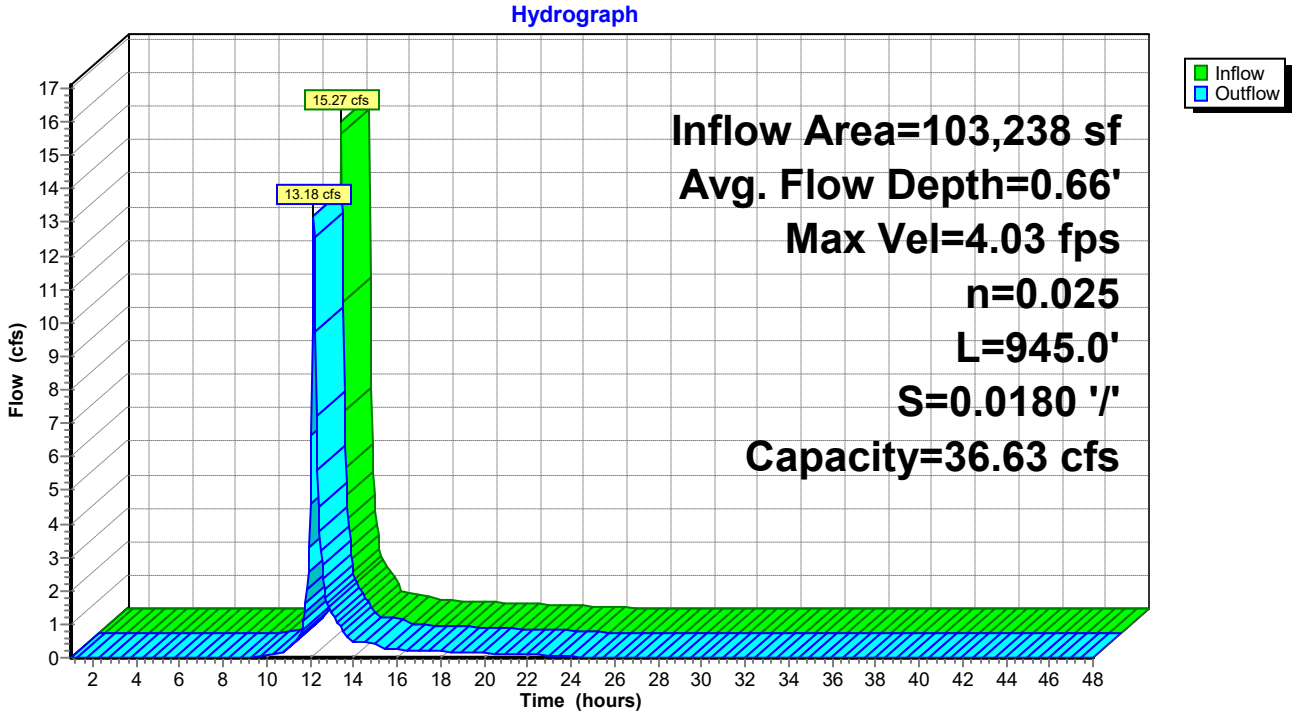
Peak Storage= 3,080 cf @ 12.17 hrs
Average Depth at Peak Storage= 0.66' , Surface Width= 8.91'
Bank-Full Depth= 1.00' Flow Area= 7.0 sf, Capacity= 36.63 cfs

1.00' x 1.00' deep channel, n= 0.025
Side Slope Z-value= 6.0 '/' Top Width= 13.00'
Length= 945.0' Slope= 0.0180 '/'
Inlet Invert= 763.00', Outlet Invert= 746.00'



‡

Reach 184R: Red Barn Lane East Swale



Summary for Pond 41P: Reach Pipe

Inflow Area = 806,202 sf, 39.20% Impervious, Inflow Depth = 0.07" for 100-Year event
Inflow = 1.98 cfs @ 12.17 hrs, Volume= 4,947 cf
Outflow = 1.96 cfs @ 12.19 hrs, Volume= 4,947 cf, Atten= 1%, Lag= 0.9 min
Primary = 1.96 cfs @ 12.19 hrs, Volume= 4,947 cf
Routed to Pond 154P : Southeast Basin

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 738.97' @ 12.19 hrs Surf.Area= 102 sf Storage= 42 cf

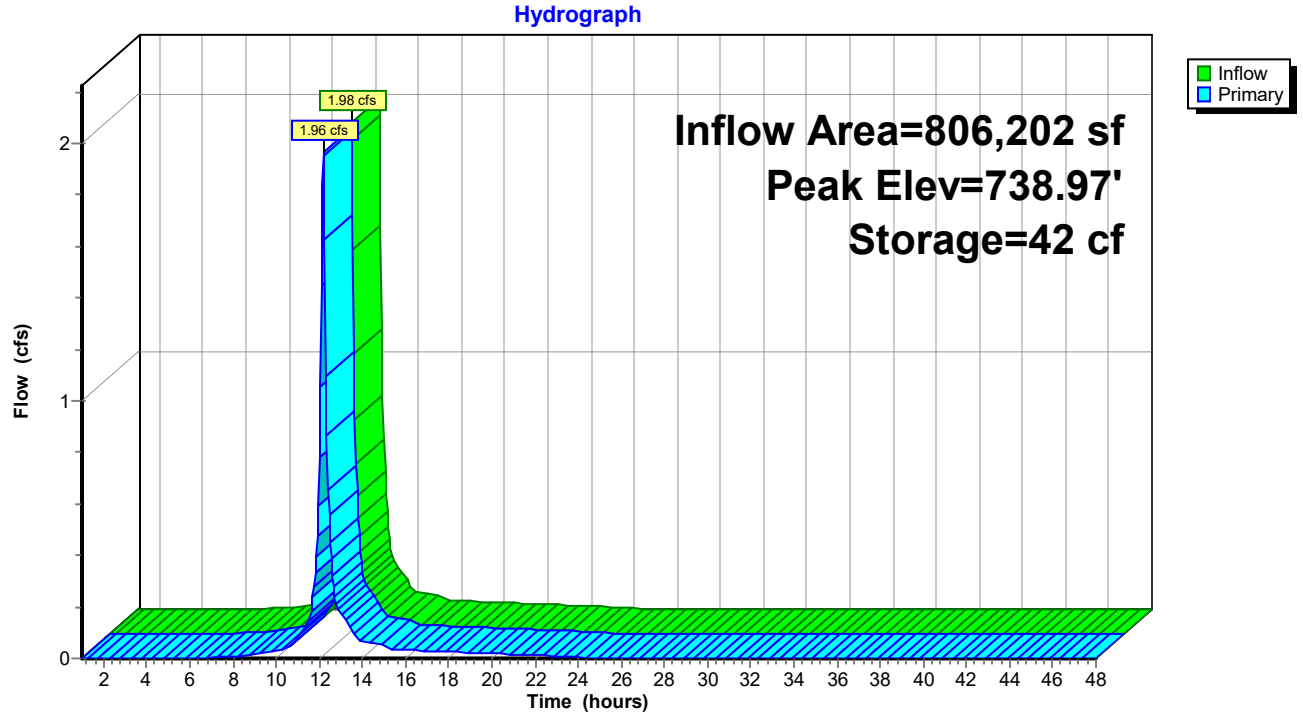
Plug-Flow detention time= 0.2 min calculated for 4,942 cf (100% of inflow)
Center-of-Mass det. time= 0.2 min (783.5 - 783.3)

Volume	Invert	Avail.Storage	Storage Description
#1	738.00'	1,587 cf	**24.0" Round Pipe Storage** L= 505.0' S= 0.0150 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	738.00'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.92 cfs @ 12.19 hrs HW=738.95' TW=731.06' (Dynamic Tailwater)
↳**1=Orifice/Grate** (Orifice Controls 1.92 cfs @ 3.52 fps)

Pond 41P: Reach Pipe



Summary for Pond 57P: Dry Pond 2

Inflow Area = 214,039 sf, 18.55% Impervious, Inflow Depth = 3.78" for 100-Year event
Inflow = 23.01 cfs @ 12.16 hrs, Volume= 67,480 cf
Outflow = 2.75 cfs @ 13.17 hrs, Volume= 67,480 cf, Atten= 88%, Lag= 60.5 min
Discarded = 2.75 cfs @ 13.17 hrs, Volume= 67,480 cf
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 41P : Reach Pipe
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Reach 117R : SC Road West Ditch

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 750.20' @ 13.17 hrs Surf.Area= 12,262 sf Storage= 31,123 cf

Plug-Flow detention time= 109.4 min calculated for 67,409 cf (100% of inflow)
Center-of-Mass det. time= 109.3 min (913.7 - 804.4)

Volume	Invert	Avail.Storage	Storage Description
#1	747.00'	55,955 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
747.00	7,300	0	0
748.00	8,788	8,044	8,044
749.00	10,334	9,561	17,605
750.00	11,935	11,135	28,740
751.00	13,594	12,765	41,504
752.00	15,308	14,451	55,955

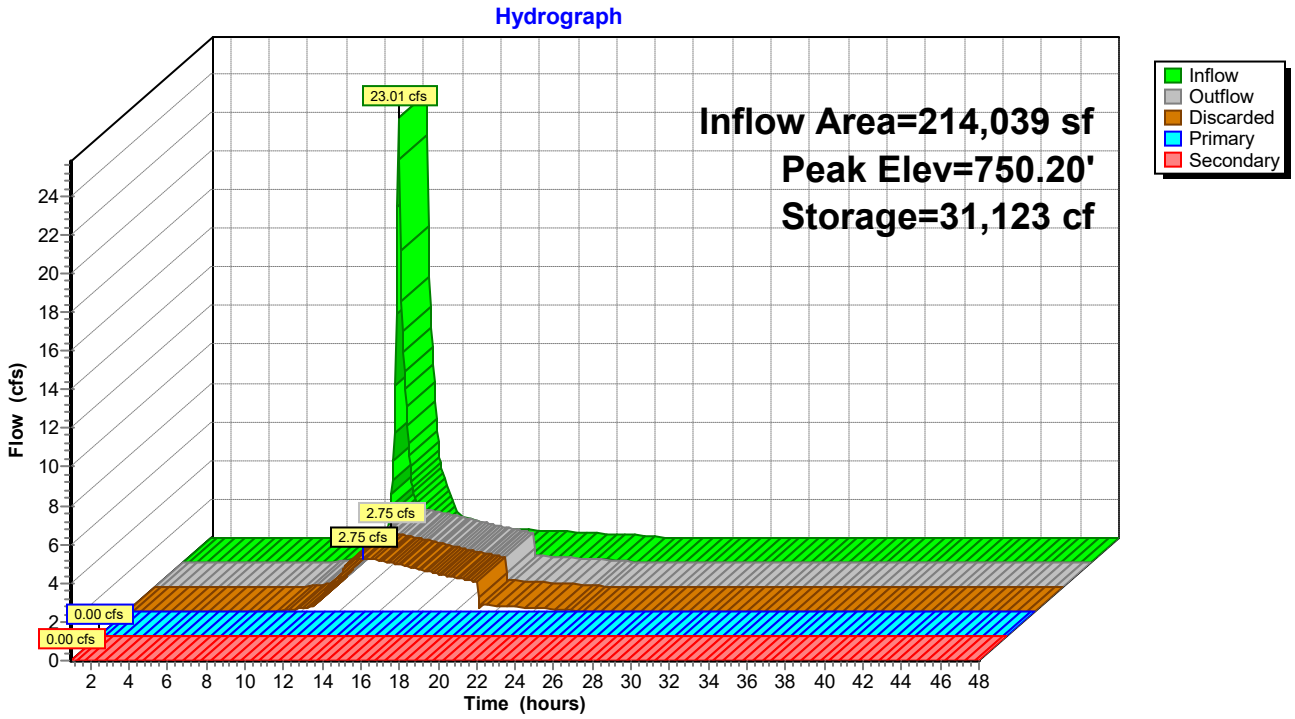
Device	Routing	Invert	Outlet Devices
#1	Primary	750.00'	**12.0" Round Culvert** L= 25.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 750.00' / 749.50' S= 0.0200 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#2	Device 1	750.33'	**12.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Device 1	751.66'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Secondary	750.44'	**12.0" Round Culvert** L= 214.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 750.44' / 750.01' S= 0.0020 '/' Cc= 0.900 n= 0.011, Flow Area= 0.79 sf
#5	Device 4	750.44'	**10.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#6	Device 4	751.93'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#7	Discarded	747.00'	**8.880 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 720.00' Phase-In= 0.01'

Discarded OutFlow Max=2.75 cfs @ 13.17 hrs HW=750.20' (Free Discharge)
└**7=Exfiltration** (Controls 2.75 cfs)

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=747.00' TW=738.00' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)
  └**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=747.00' TW=747.00' (Dynamic Tailwater)
└**4=Culvert** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Pond 57P: Dry Pond 2



Summary for Pond 58P: Dry Pond 1

Inflow Area = 579,504 sf, 46.53% Impervious, Inflow Depth = 4.49" for 100-Year event
Inflow = 64.43 cfs @ 12.14 hrs, Volume= 217,067 cf
Outflow = 2.58 cfs @ 17.29 hrs, Volume= 217,067 cf, Atten= 96%, Lag= 308.6 min
Discarded = 2.58 cfs @ 17.29 hrs, Volume= 217,067 cf
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 101R : Reach Pipe DP1 TO MH
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 57P : Dry Pond 2

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 751.50' @ 17.29 hrs Surf.Area= 31,094 sf Storage= 110,025 cf

Plug-Flow detention time= 506.4 min calculated for 217,067 cf (100% of inflow)
Center-of-Mass det. time= 506.4 min (1,377.0 - 870.6)

Volume	Invert	Avail.Storage	Storage Description
#1	747.00'	197,389 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
747.00	17,995	0	0
748.00	20,805	19,400	19,400
749.00	23,672	22,239	41,639
750.00	26,595	25,134	66,772
751.00	29,575	28,085	94,857
752.00	32,612	31,094	125,951
753.00	35,705	34,159	160,109
754.00	38,855	37,280	197,389

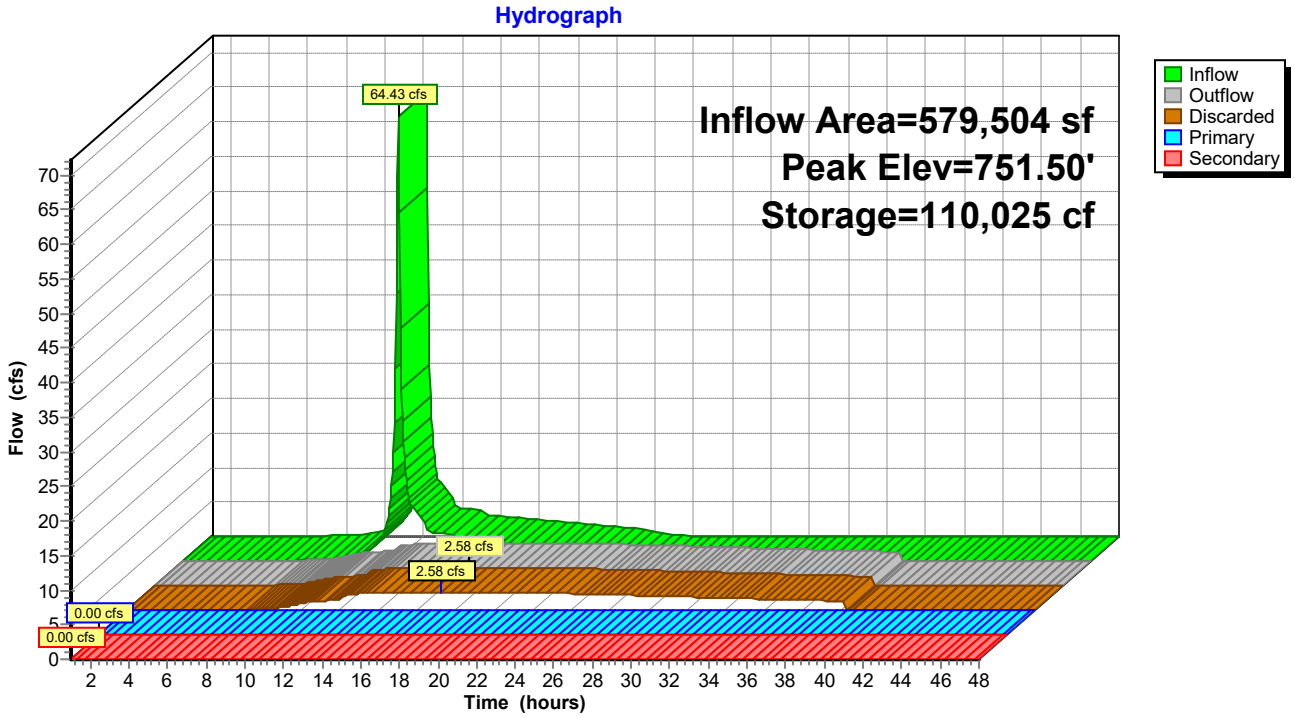
Device	Routing	Invert	Outlet Devices
#1	Primary	750.50'	**15.0" Round Culvert** L= 373.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 750.50' / 747.00' S= 0.0094 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf
#2	Device 1	752.91'	**24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	752.50'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#4	Discarded	747.00'	**3.180 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 720.00' Phase-In= 0.01'

Discarded OutFlow Max=2.58 cfs @ 17.29 hrs HW=751.50' (Free Discharge)
└**4=Exfiltration** (Controls 2.58 cfs)

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=747.00' TW=750.50' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=747.00' TW=747.00' (Dynamic Tailwater)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 58P: Dry Pond 1



Summary for Pond 60P: Infiltration Basin #1

Inflow Area = 294,617 sf, 23.08% Impervious, Inflow Depth = 3.91" for 100-Year event
Inflow = 35.85 cfs @ 12.17 hrs, Volume= 96,102 cf
Outflow = 5.81 cfs @ 12.70 hrs, Volume= 96,102 cf, Atten= 84%, Lag= 31.9 min
Discarded = 3.09 cfs @ 12.70 hrs, Volume= 77,358 cf
Primary = 2.77 cfs @ 12.44 hrs, Volume= 18,744 cf
Routed to Pond 95P : Dry Pond 3
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Reach 136R : SC West Ditch

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 743.43' @ 12.70 hrs Surf.Area= 17,391 sf Storage= 43,572 cf

Plug-Flow detention time= 106.4 min calculated for 96,000 cf (100% of inflow)
Center-of-Mass det. time= 106.3 min (900.8 - 794.5)

Volume	Invert	Avail.Storage	Storage Description
#1	740.50'	73,217 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
740.50	12,516	0	0
741.00	13,294	6,453	6,453
742.00	14,915	14,105	20,557
743.00	16,625	15,770	36,327
744.00	18,423	17,524	53,851
745.00	20,309	19,366	73,217

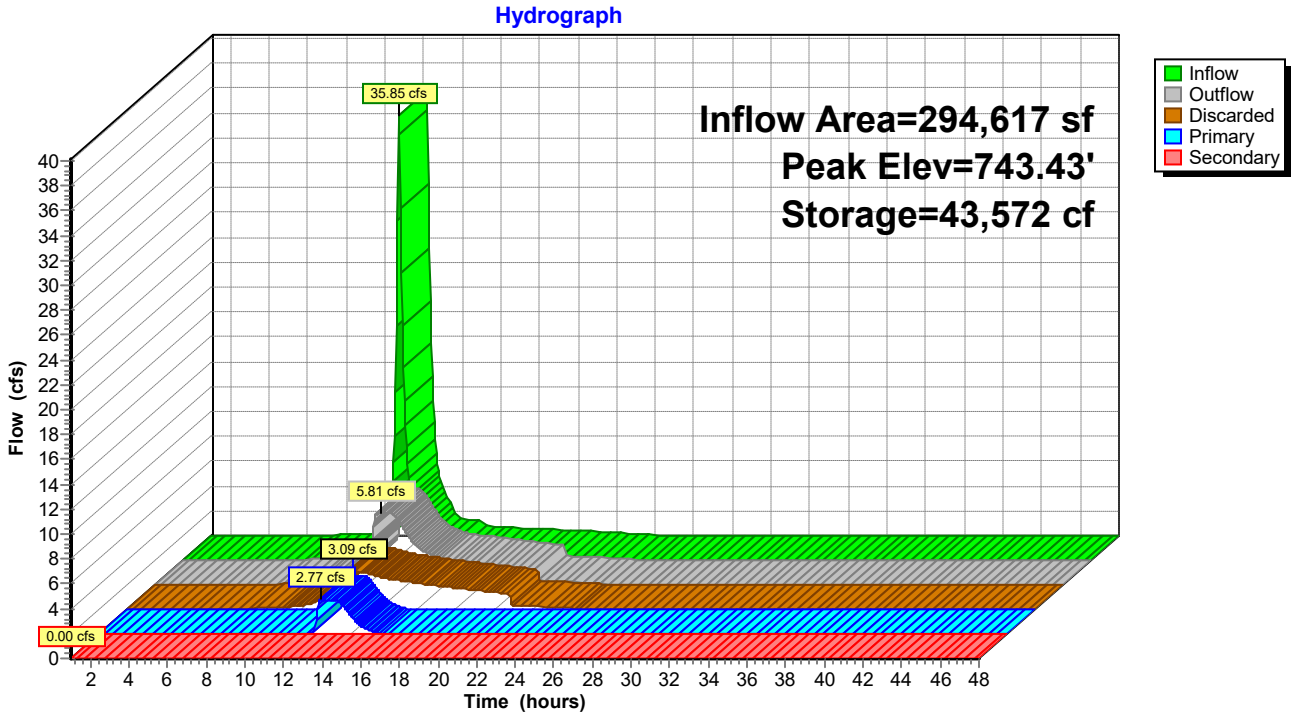
Device	Routing	Invert	Outlet Devices
#1	Primary	742.00'	**12.0" Round Culvert** L= 205.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 742.00' / 741.00' S= 0.0049 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	744.75'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#3	Discarded	740.50'	**4.320 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 737.40' Phase-In= 0.01'

Discarded OutFlow Max=3.09 cfs @ 12.70 hrs HW=743.43' (Free Discharge)
3=Exfiltration (Controls 3.09 cfs)

Primary OutFlow Max=2.77 cfs @ 12.44 hrs HW=743.26' TW=740.54' (Dynamic Tailwater)
1=Culvert (Barrel Controls 2.77 cfs @ 3.60 fps)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=740.50' TW=743.75' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 60P: Infiltration Basin #1



Summary for Pond 95P: Dry Pond 3

[87] Warning: Oscillations may require smaller dt or Finer Routing (severity=1)

Inflow Area = 432,925 sf, 29.66% Impervious, Inflow Depth = 1.93" for 100-Year event
Inflow = 22.15 cfs @ 12.15 hrs, Volume= 69,757 cf
Outflow = 5.07 cfs @ 12.73 hrs, Volume= 69,757 cf, Atten= 77%, Lag= 34.6 min
Discarded = 5.07 cfs @ 12.73 hrs, Volume= 69,757 cf
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 154P : Southeast Basin
Secondary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 154P : Southeast Basin

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 740.64' @ 12.73 hrs Surf.Area= 0.287 ac Storage= 0.414 af

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 33.6 min (824.6 - 790.9)

Volume	Invert	Avail.Storage	Storage Description
#1	739.00'	1.214 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
739.00	0.220	0.000	0.000
740.00	0.260	0.240	0.240
741.00	0.302	0.281	0.521
742.00	0.346	0.324	0.845
743.00	0.392	0.369	1.214

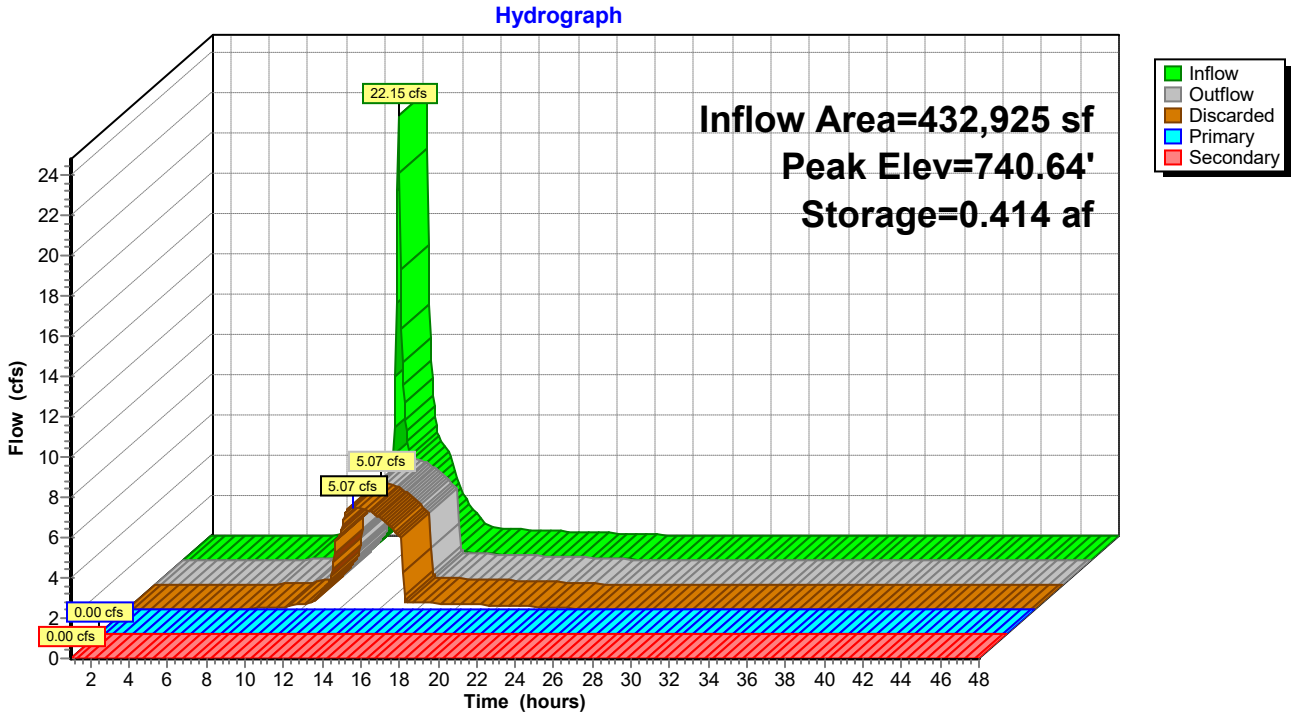
Device	Routing	Invert	Outlet Devices
#1	Primary	741.00'	**6.0" Round Culvert** L= 84.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 741.00' / 738.00' S= 0.0357 '/' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#2	Secondary	742.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88
#3	Discarded	739.00'	**15.720 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 726.55' Phase-In= 0.01'

Discarded OutFlow Max=5.07 cfs @ 12.73 hrs HW=740.64' (Free Discharge)
3=Exfiltration (Controls 5.07 cfs)

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=739.00' TW=730.00' (Dynamic Tailwater)
1=Culvert (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 1.00 hrs HW=739.00' TW=730.00' (Dynamic Tailwater)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 95P: Dry Pond 3



Summary for Pond 101R: Reach Pipe DP1 TO MH

3/2/21
Reach Pipe 4

[57] Hint: Peaked at 750.50' (Flood elevation advised)

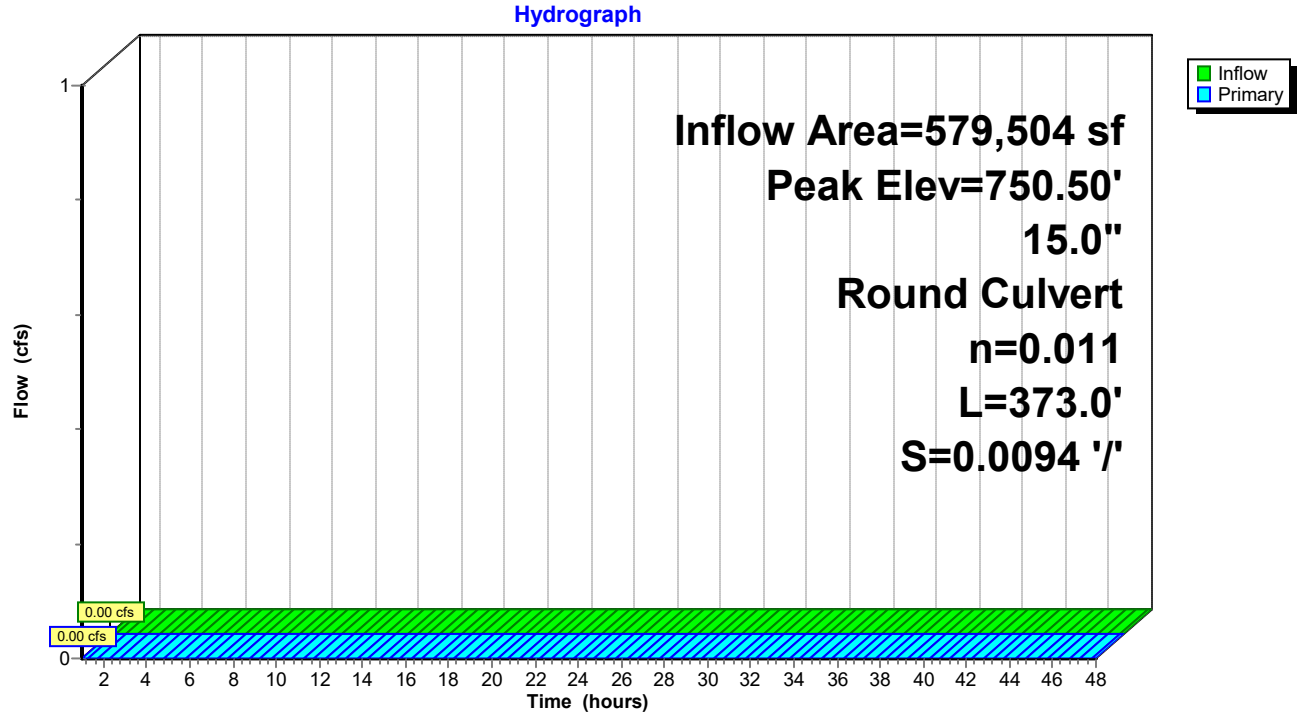
Inflow Area = 579,504 sf, 46.53% Impervious, Inflow Depth = 0.00" for 100-Year event
Inflow = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 1.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min
Primary = 0.00 cfs @ 1.00 hrs, Volume= 0 cf
Routed to Pond 41P : Reach Pipe

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 750.50' @ 1.00 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	750.50'	**15.0" Round Culvert** L= 373.0' Ke= 0.500 Inlet / Outlet Invert= 750.50' / 747.00' S= 0.0094 '/' Cc= 0.900 n= 0.011, Flow Area= 1.23 sf

Primary OutFlow Max=0.00 cfs @ 1.00 hrs HW=750.50' TW=738.00' (Dynamic Tailwater)
↑—**1=Culvert** (Controls 0.00 cfs)

Pond 101R: Reach Pipe DP1 TO MH



Summary for Pond 110R: Western Pipe Run

3/3/21
Pipe that cuts through western exterior courtyard to collect ditch north of west building and northern portion of west building roof and conveys to DP1

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[57] Hint: Peaked at 750.91' (Flood elevation advised)
[62] Hint: Exceeded Reach 111R OUTLET depth by 0.53' @ 12.15 hrs
[64] Warning: Exceeded Reach 111R outlet bank by 0.48' @ 12.15 hrs
[62] Hint: Exceeded Reach 151R OUTLET depth by 1.38' @ 12.15 hrs
[64] Warning: Exceeded Reach 151R outlet bank by 0.48' @ 12.15 hrs

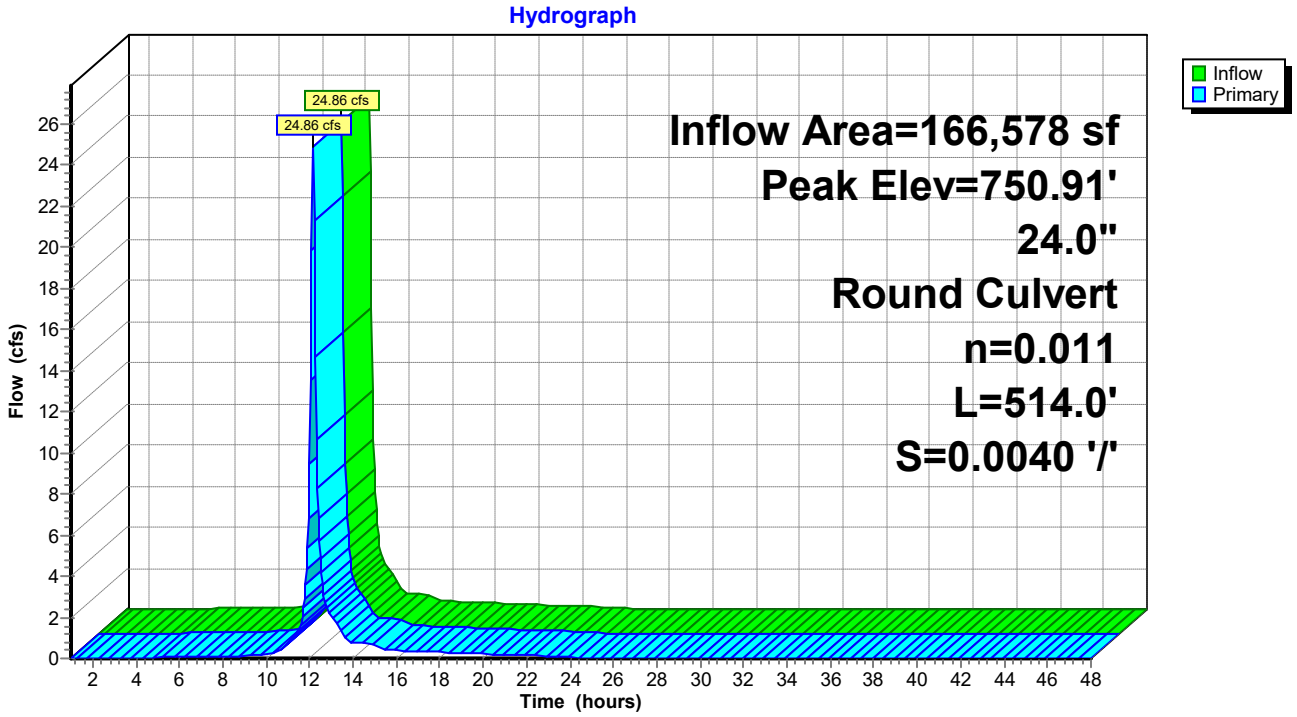
Inflow Area = 166,578 sf, 27.50% Impervious, Inflow Depth = 4.06" for 100-Year event
Inflow = 24.86 cfs @ 12.15 hrs, Volume= 56,323 cf
Outflow = 24.86 cfs @ 12.15 hrs, Volume= 56,323 cf, Atten= 0%, Lag= 0.0 min
Primary = 24.86 cfs @ 12.15 hrs, Volume= 56,323 cf
Routed to Pond 60P : Infiltration Basin #1

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 750.91' @ 12.15 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	745.06'	**24.0" Round Culvert** L= 514.0' Ke= 0.500 Inlet / Outlet Invert= 745.06' / 743.00' S= 0.0040 '/' Cc= 0.900 n= 0.011, Flow Area= 3.14 sf

Primary OutFlow Max=24.54 cfs @ 12.15 hrs HW=750.77' TW=741.97' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 24.54 cfs @ 7.81 fps)

Pond 110R: Western Pipe Run



Summary for Pond 127P: B3 OVERSIZED PIPE RUN (24" W/15" ORIFICE)

3/3/21
Pipe that cuts through western exterior courtyard to collect ditch north of west building and northern portion of west building roof and conveys to DP1

Inflow Area = 40,670 sf, 35.10% Impervious, Inflow Depth = 4.20" for 100-Year event
Inflow = 6.71 cfs @ 12.13 hrs, Volume= 14,238 cf
Outflow = 6.44 cfs @ 12.15 hrs, Volume= 14,238 cf, Atten= 4%, Lag= 1.1 min
Primary = 6.44 cfs @ 12.15 hrs, Volume= 14,238 cf
Routed to Link 128L : FROM OVERSIZED PIPE RUN

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 752.93' @ 12.15 hrs Surf.Area= 199 sf Storage= 377 cf

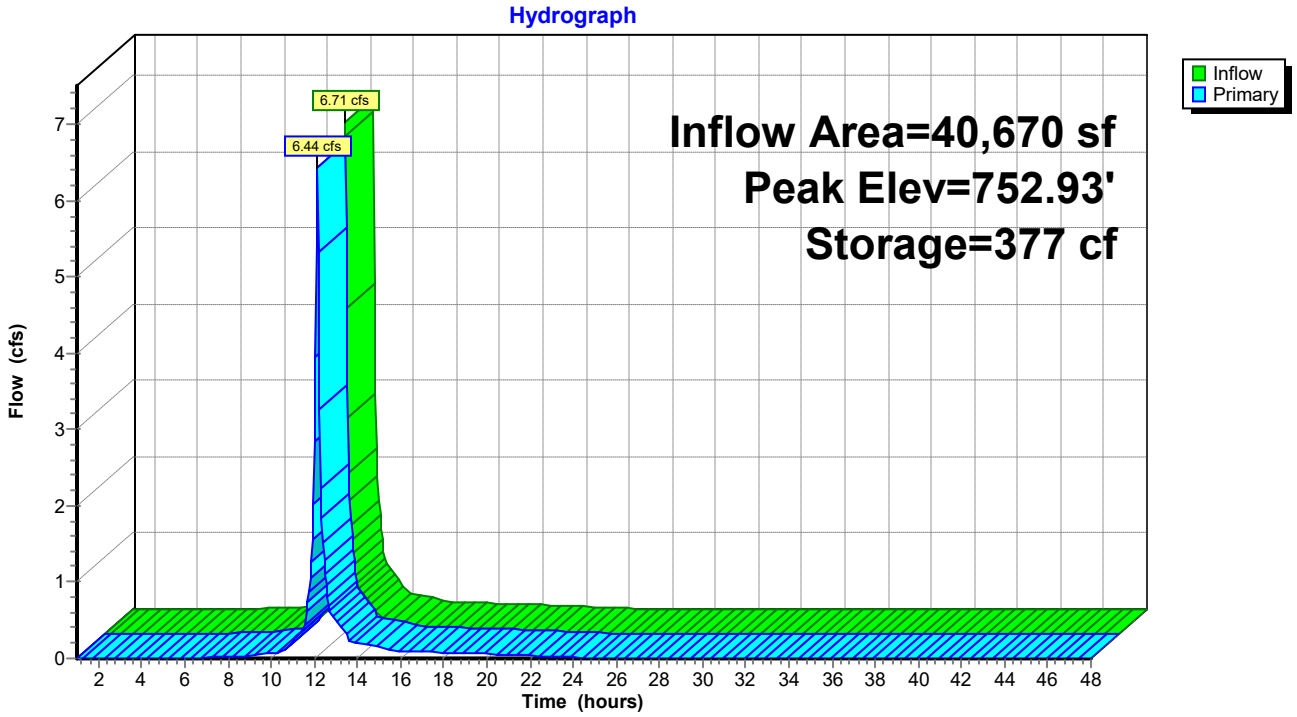
Plug-Flow detention time= 0.7 min calculated for 14,223 cf (100% of inflow)
Center-of-Mass det. time= 0.7 min (786.3 - 785.6)

Volume	Invert	Avail.Storage	Storage Description
#1	751.12'	424 cf	**24.0" Round Pipe Storage** L= 135.0' S= 0.0022 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	751.12'	**15.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=6.42 cfs @ 12.15 hrs HW=752.93' TW=0.00' (Dynamic Tailwater)
↑—**1=Orifice/Grate** (Orifice Controls 6.42 cfs @ 5.23 fps)

Pond 127P: B3 OVERSIZED PIPE RUN (24" W/15" ORIFICE)



Summary for Pond 129P: STORMTECH FROM ADS

Inflow Area = 194,230 sf, 70.09% Impervious, Inflow Depth = 5.10" for 100-Year event
Inflow = 33.29 cfs @ 12.13 hrs, Volume= 82,552 cf
Outflow = 2.32 cfs @ 13.15 hrs, Volume= 82,389 cf, Atten= 93%, Lag= 60.9 min
Primary = 2.32 cfs @ 13.15 hrs, Volume= 82,389 cf
Routed to Pond 58P : Dry Pond 1

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 754.57' @ 13.15 hrs Surf.Area= 19,777 sf Storage= 47,052 cf

Plug-Flow detention time= 239.1 min calculated for 82,389 cf (100% of inflow)
Center-of-Mass det. time= 237.8 min (1,000.6 - 762.7)

Volume	Invert	Avail.Storage	Storage Description
#1B	751.25'	27,133 cf	**115.92'W x 170.61'L x 5.50'H Field B** 108,771 cf Overall - 40,939 cf Embedded = 67,832 cf x 40.0% Voids
#2B	752.00'	40,939 cf	**ADS_StormTech MC-3500 d +Cap** x 368 Inside #1 Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap 368 Chambers in 16 Rows Cap Storage= 14.9 cf x 2 x 16 rows = 476.8 cf
		68,072 cf	Total Available Storage

Storage Group B created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	751.25'	**10.0" Round Culvert X 2.00** L= 200.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 751.25' / 750.65' S= 0.0030 '/' Cc= 0.900 n= 0.011, Flow Area= 0.55 sf
#2	Device 1	751.25'	**5.0" Vert. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.32 cfs @ 13.15 hrs HW=754.57' TW=750.97' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 2.32 cfs of 5.57 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 2.32 cfs @ 8.49 fps)

Pond 129P: STORMTECH FROM ADS - Chamber Wizard Field B

Chamber Model = ADS_StormTech MC-3500 d +Cap (ADS StormTech® MC-3500 d rev 03/14 with Cap volume)
Effective Size= 70.4"W x 45.0"H => 15.33 sf x 7.17'L = 110.0 cf
Overall Size= 77.0"W x 45.0"H x 7.50'L with 0.33' Overlap
Cap Storage= 14.9 cf x 2 x 16 rows = 476.8 cf

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

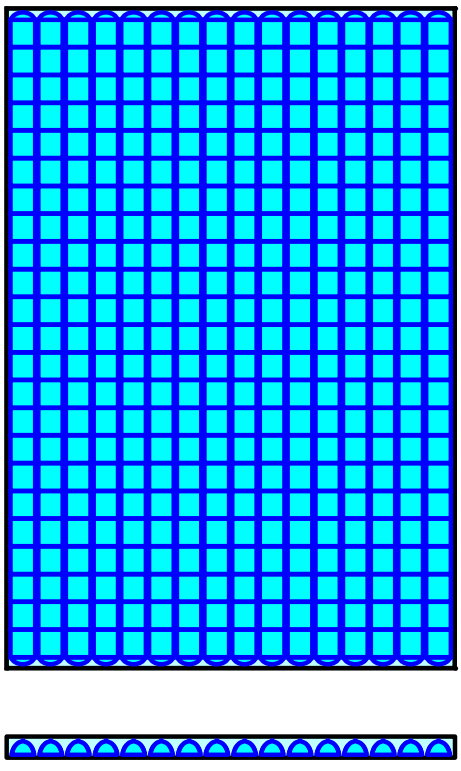
23 Chambers/Row x 7.17' Long +1.85' Cap Length x 2 = 168.61' Row Length +12.0" End Stone x 2 = 170.61' Base Length
16 Rows x 77.0" Wide + 9.0" Spacing x 15 + 12.0" Side Stone x 2 = 115.92' Base Width
9.0" Stone Base + 45.0" Chamber Height + 12.0" Stone Cover = 5.50' Field Height

368 Chambers x 110.0 cf + 14.9 cf Cap Volume x 2 x 16 Rows = 40,939.1 cf Chamber Storage

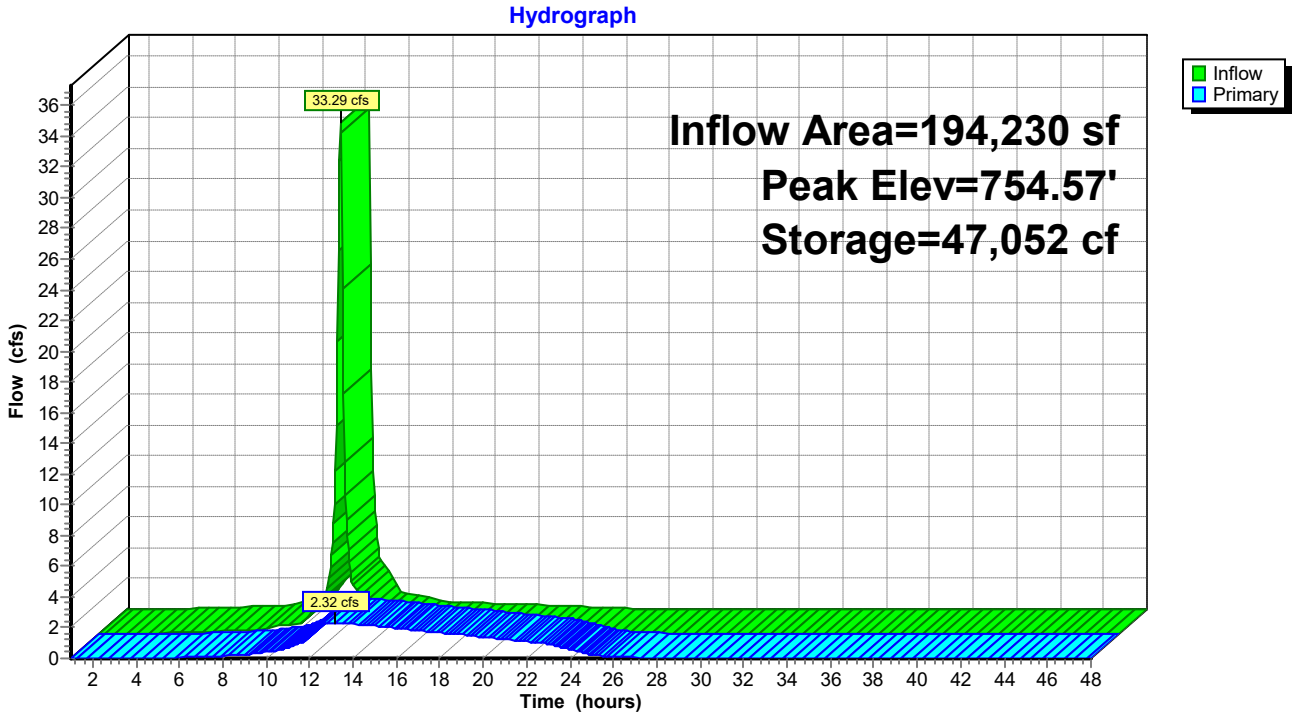
108,771.0 cf Field - 40,939.1 cf Chambers = 67,831.9 cf Stone x 40.0% Voids = 27,132.7 cf Stone Storage

Chamber Storage + Stone Storage = 68,071.9 cf = 1.563 af
Overall Storage Efficiency = 62.6%
Overall System Size = 170.61' x 115.92' x 5.50'

368 Chambers
4,028.6 cy Field
2,512.3 cy Stone



Pond 129P: STORMTECH FROM ADS



Summary for Pond 133P: WEST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

3/3/21
Pipe that cuts through western exterior courtyard to collect ditch north of west building and northern portion of west building roof and conveys to DP1

[93] Warning: Storage range exceeded by 0.82'
[90] Warning: Qout>Qin may require smaller dt or Finer Routing

Inflow Area = 48,160 sf, 58.41% Impervious, Inflow Depth = 4.80" for 100-Year event
Inflow = 8.80 cfs @ 12.13 hrs, Volume= 19,261 cf
Outflow = 9.53 cfs @ 12.15 hrs, Volume= 19,261 cf, Atten= 0%, Lag= 1.0 min
Primary = 9.53 cfs @ 12.15 hrs, Volume= 19,261 cf
Routed to Link 134L : TO UG

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 758.12' @ 12.15 hrs Storage= 503 cf

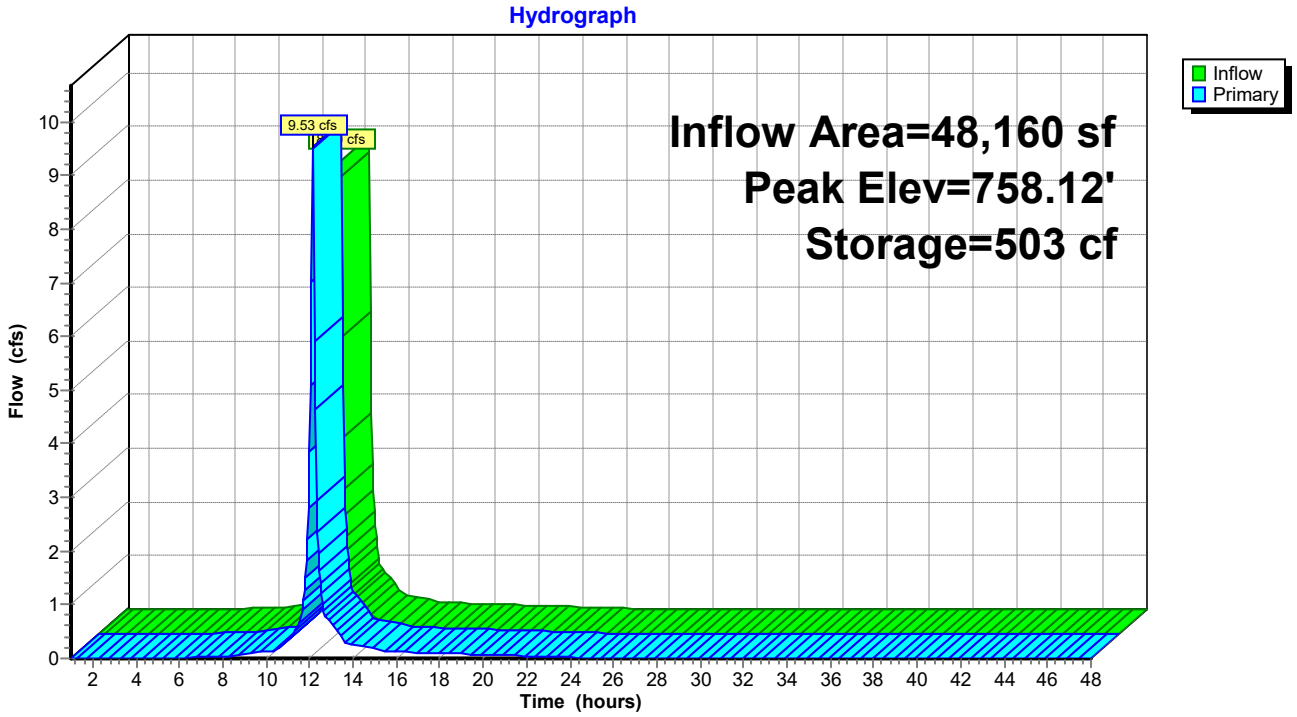
Plug-Flow detention time= 0.7 min calculated for 19,241 cf (100% of inflow)
Center-of-Mass det. time= 0.7 min (775.5 - 774.8)

Volume	Invert	Avail.Storage	Storage Description
#1	754.90'	503 cf	**24.0" Round Pipe Storage** L= 160.0' S= 0.0025 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	754.90'	**15.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=9.31 cfs @ 12.15 hrs HW=758.01' TW=0.00' (Dynamic Tailwater)
↑**1=Orifice/Grate** (Orifice Controls 9.31 cfs @ 7.59 fps)

Pond 133P: WEST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)



Summary for Pond 154P: Southeast Basin

Inflow Area = 1,278,750 sf, 34.76% Impervious, Inflow Depth = 0.15" for 100-Year event
Inflow = 7.18 cfs @ 12.14 hrs, Volume= 15,965 cf
Outflow = 0.22 cfs @ 14.44 hrs, Volume= 15,965 cf, Atten= 97%, Lag= 138.2 min
Discarded = 0.22 cfs @ 14.44 hrs, Volume= 15,965 cf

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 731.56' @ 14.44 hrs Surf.Area= 10,483 sf Storage= 10,588 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 559.4 min (1,356.7 - 797.3)

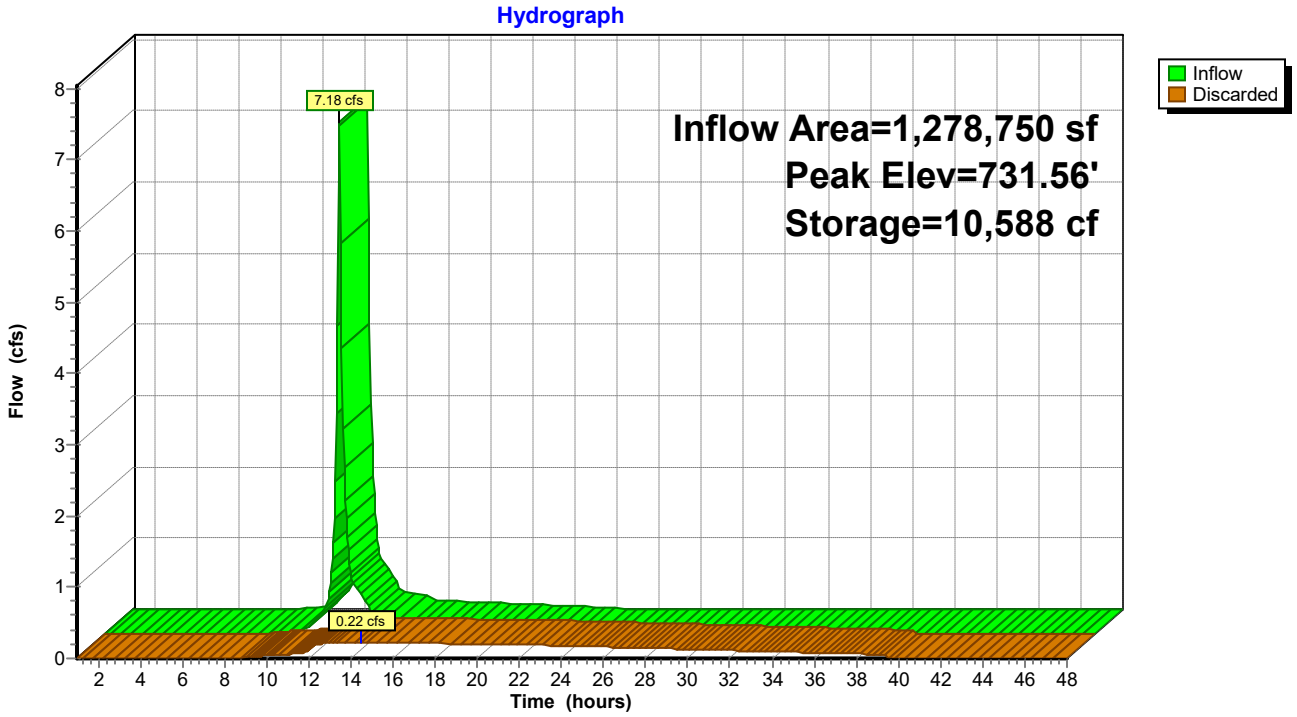
Volume	Invert	Avail.Storage	Storage Description
#1	730.00'	273,743 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
730.00	2,768	0	0
731.00	8,073	5,421	5,421
732.00	12,399	10,236	15,657
733.00	17,056	14,728	30,384
734.00	21,328	19,192	49,576
735.00	25,607	23,468	73,044
736.00	29,845	27,726	100,770
737.00	35,145	32,495	133,265
738.00	42,680	38,913	172,177
739.00	51,064	46,872	219,049
740.00	58,323	54,694	273,743

Device	Routing	Invert	Outlet Devices
#1	Discarded	730.00'	**0.840 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 720.00'

Discarded OutFlow Max=0.22 cfs @ 14.44 hrs HW=731.56' (Free Discharge)
1=Exfiltration (Controls 0.22 cfs)

Pond 154P: Southeast Basin



Summary for Pond 174P: EAST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

3/3/21
Pipe that cuts through western exterior courtyard to collect ditch north of west building and northern portion of west building roof and conveys to DP1

Inflow Area = 20,605 sf, 59.42% Impervious, Inflow Depth = 4.85" for 100-Year event
Inflow = 3.79 cfs @ 12.13 hrs, Volume= 8,332 cf
Outflow = 3.71 cfs @ 12.14 hrs, Volume= 8,332 cf, Atten= 2%, Lag= 0.9 min
Primary = 3.71 cfs @ 12.14 hrs, Volume= 8,332 cf
Routed to Link 175L : TO UG

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 755.92' @ 12.14 hrs Surf.Area= 313 sf Storage= 196 cf

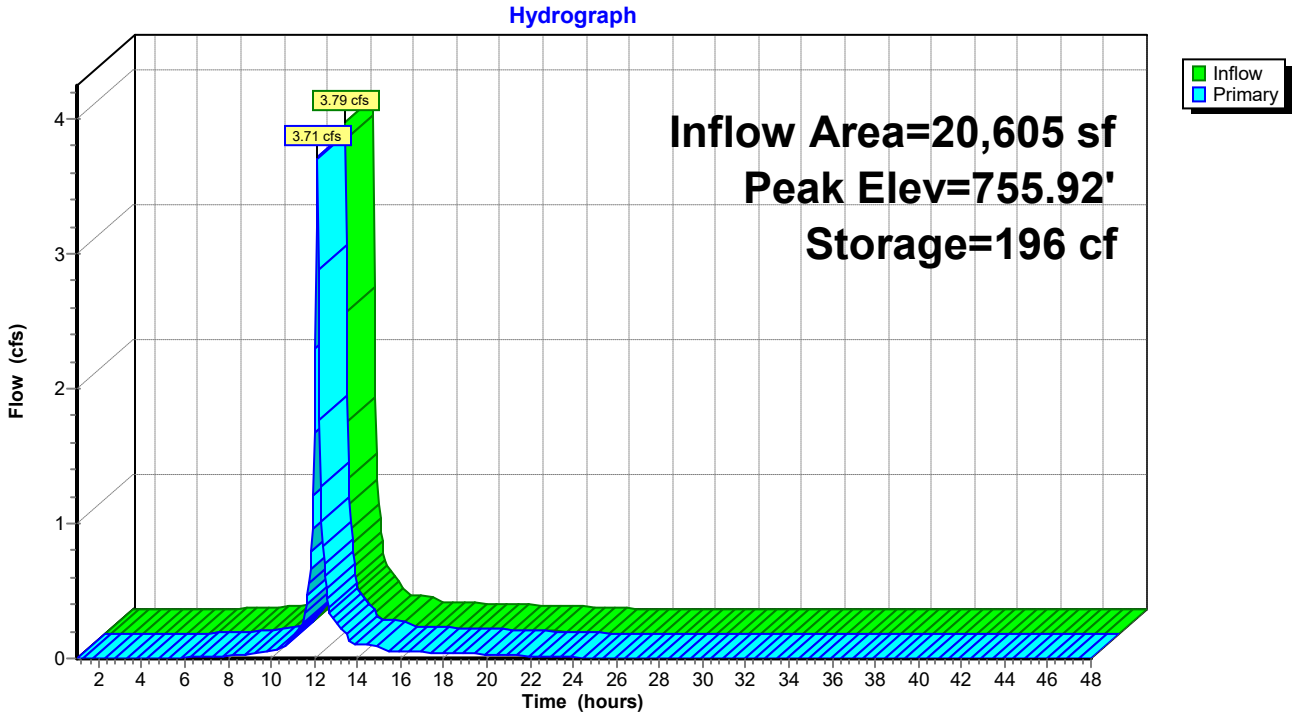
Plug-Flow detention time= 0.6 min calculated for 8,323 cf (100% of inflow)
Center-of-Mass det. time= 0.6 min (773.9 - 773.3)

Volume	Invert	Avail.Storage	Storage Description
#1	754.90'	503 cf	**24.0" Round Pipe Storage** L= 160.0' S= 0.0025 '/'

Device	Routing	Invert	Outlet Devices
#1	Primary	754.90'	**15.0" Vert. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.64 cfs @ 12.14 hrs HW=755.91' TW=0.00' (Dynamic Tailwater)
↑—**1=Orifice/Grate** (Orifice Controls 3.64 cfs @ 3.42 fps)

Pond 174P: EAST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)



Summary for Pond 183P: 24" HDPE PIPE

[57] Hint: Peaked at 750.42' (Flood elevation advised)
[62] Hint: Exceeded Reach 132R OUTLET depth by 0.04' @ 13.25 hrs

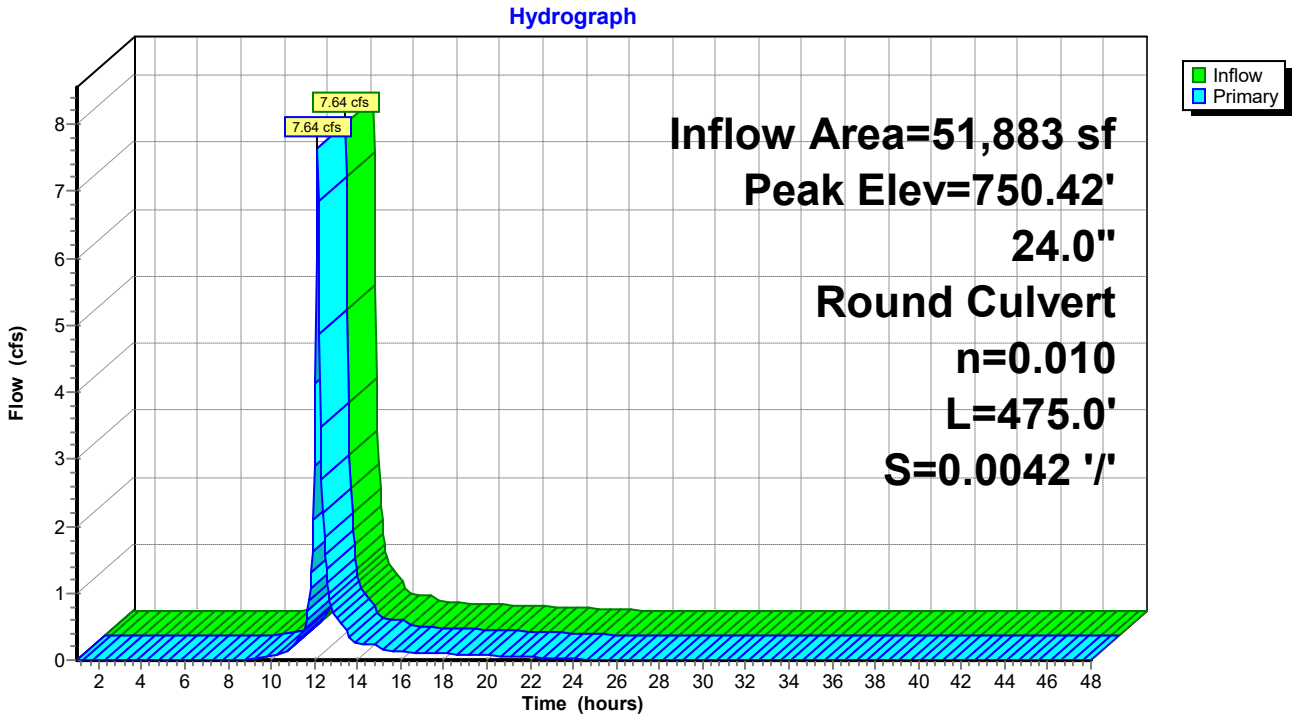
Inflow Area = 51,883 sf, 28.33% Impervious, Inflow Depth = 4.00" for 100-Year event
Inflow = 7.64 cfs @ 12.16 hrs, Volume= 17,315 cf
Outflow = 7.64 cfs @ 12.16 hrs, Volume= 17,315 cf, Atten= 0%, Lag= 0.0 min
Primary = 7.64 cfs @ 12.16 hrs, Volume= 17,315 cf
Routed to Pond 57P : Dry Pond 2

Routing by Dyn-Stor-Ind method, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs / 3
Peak Elev= 750.42' @ 12.16 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	749.00'	**24.0" Round Culvert** L= 475.0' Ke= 0.900 Inlet / Outlet Invert= 749.00' / 747.00' S= 0.0042 '/' Cc= 0.900 n= 0.010, Flow Area= 3.14 sf

Primary OutFlow Max=7.47 cfs @ 12.16 hrs HW=750.40' TW=748.42' (Dynamic Tailwater)
↳**1=Culvert** (Inlet Controls 7.47 cfs @ 3.18 fps)

Pond 183P: 24" HDPE PIPE

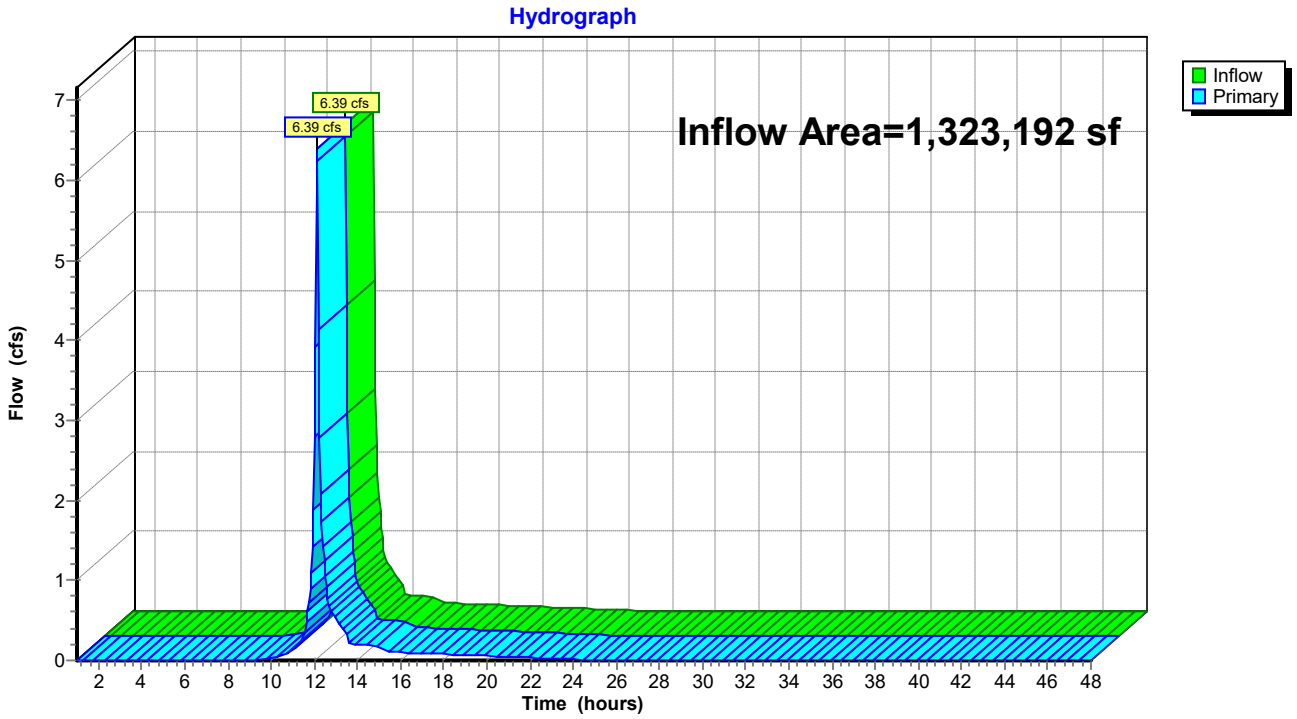


Summary for Link 48L: TOTAL OUTFALL

Inflow Area = 1,323,192 sf, 33.86% Impervious, Inflow Depth = 0.12" for 100-Year event
Inflow = 6.39 cfs @ 12.13 hrs, Volume= 13,068 cf
Primary = 6.39 cfs @ 12.13 hrs, Volume= 13,068 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 48L: TOTAL OUTFALL

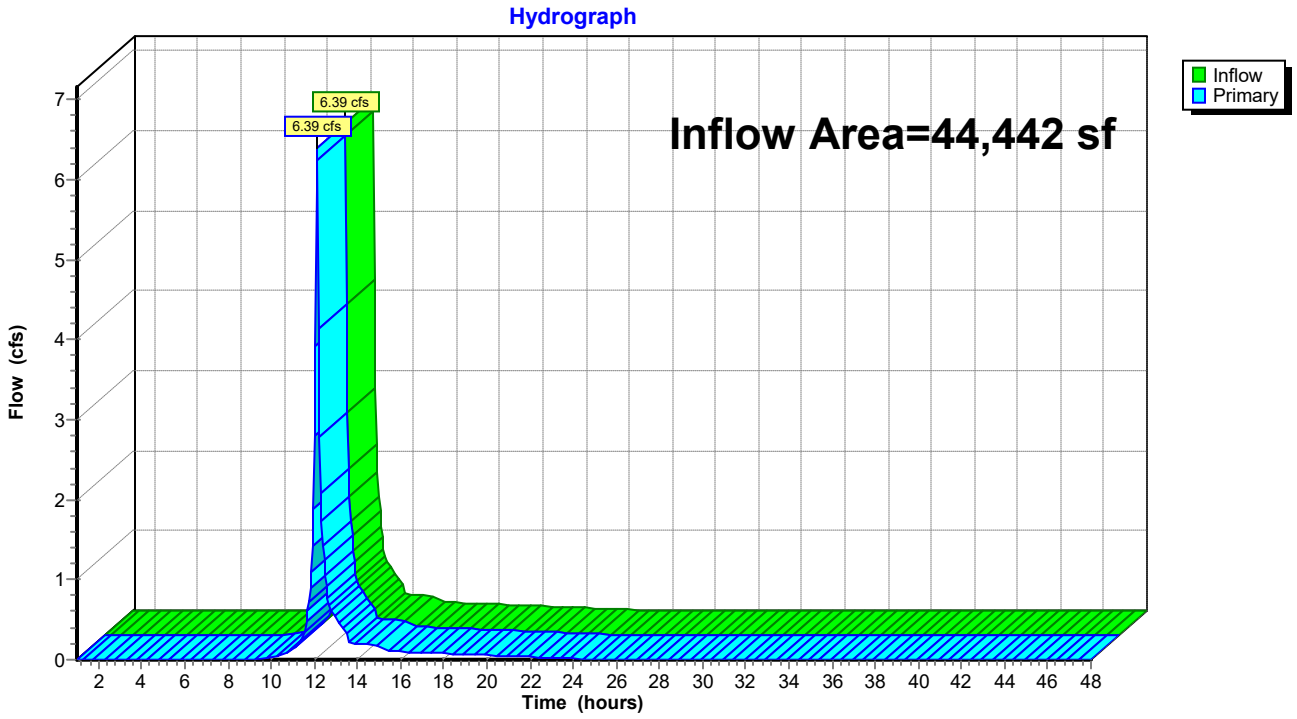


Summary for Link 66L: Total Offsite

Inflow Area = 44,442 sf, 7.89% Impervious, Inflow Depth = 3.53" for 100-Year event
Inflow = 6.39 cfs @ 12.13 hrs, Volume= 13,068 cf
Primary = 6.39 cfs @ 12.13 hrs, Volume= 13,068 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 48L : TOTAL OUTFALL

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 66L: Total Offsite

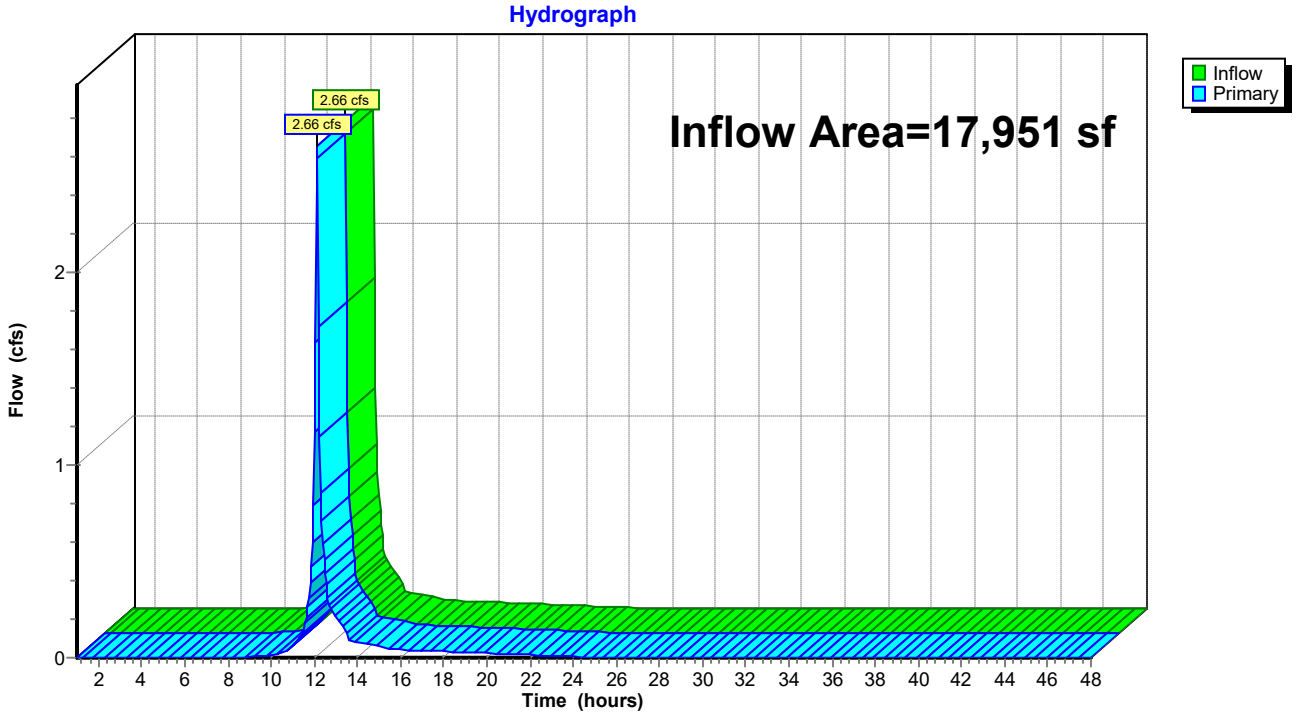


Summary for Link 115L: EX. Cul-de-sac On Green Meadow Place

Inflow Area = 17,951 sf, 11.95% Impervious, Inflow Depth = 3.64" for 100-Year event
Inflow = 2.66 cfs @ 12.13 hrs, Volume= 5,447 cf
Primary = 2.66 cfs @ 12.13 hrs, Volume= 5,447 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 66L : Total Offsite

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 115L: EX. Cul-de-sac On Green Meadow Place

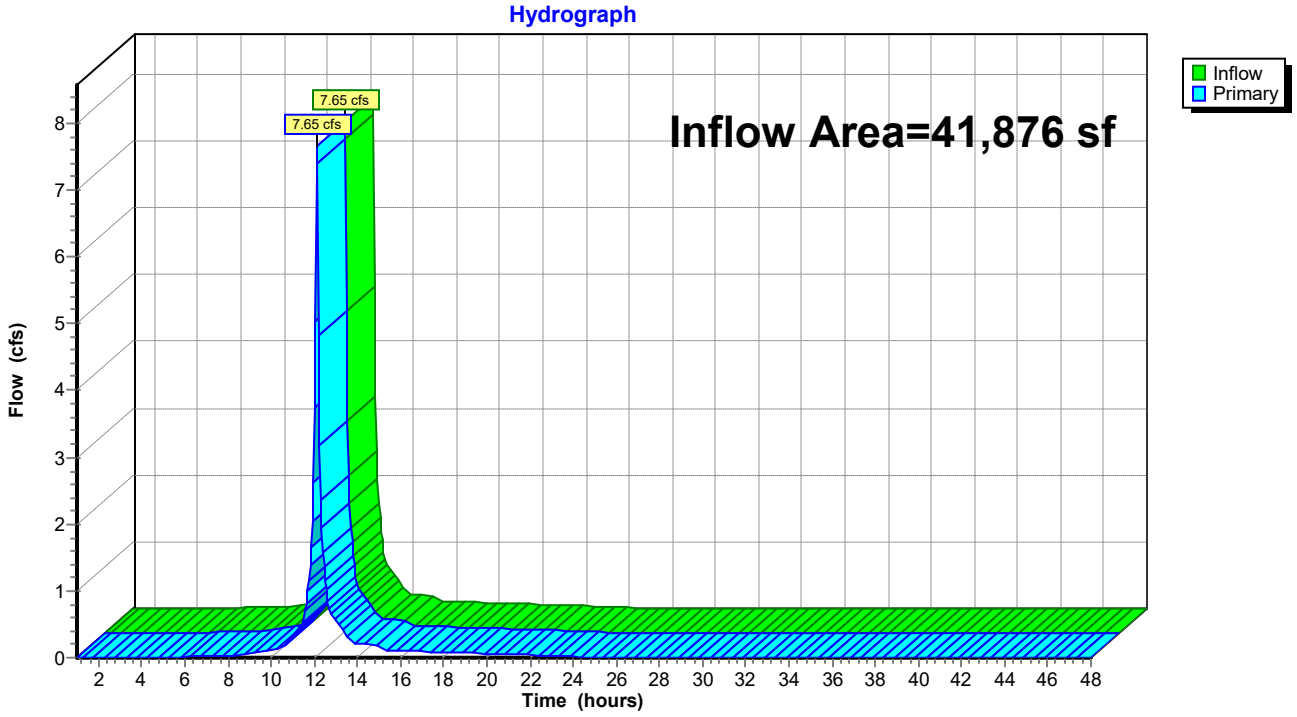


Summary for Link 124L: TO 12" PRIOR TO 24" (WEST)

Inflow Area = 41,876 sf, 58.23% Impervious, Inflow Depth = 4.80" for 100-Year event
Inflow = 7.65 cfs @ 12.13 hrs, Volume= 16,738 cf
Primary = 7.65 cfs @ 12.13 hrs, Volume= 16,738 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 133P : WEST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 124L: TO 12" PRIOR TO 24" (WEST)

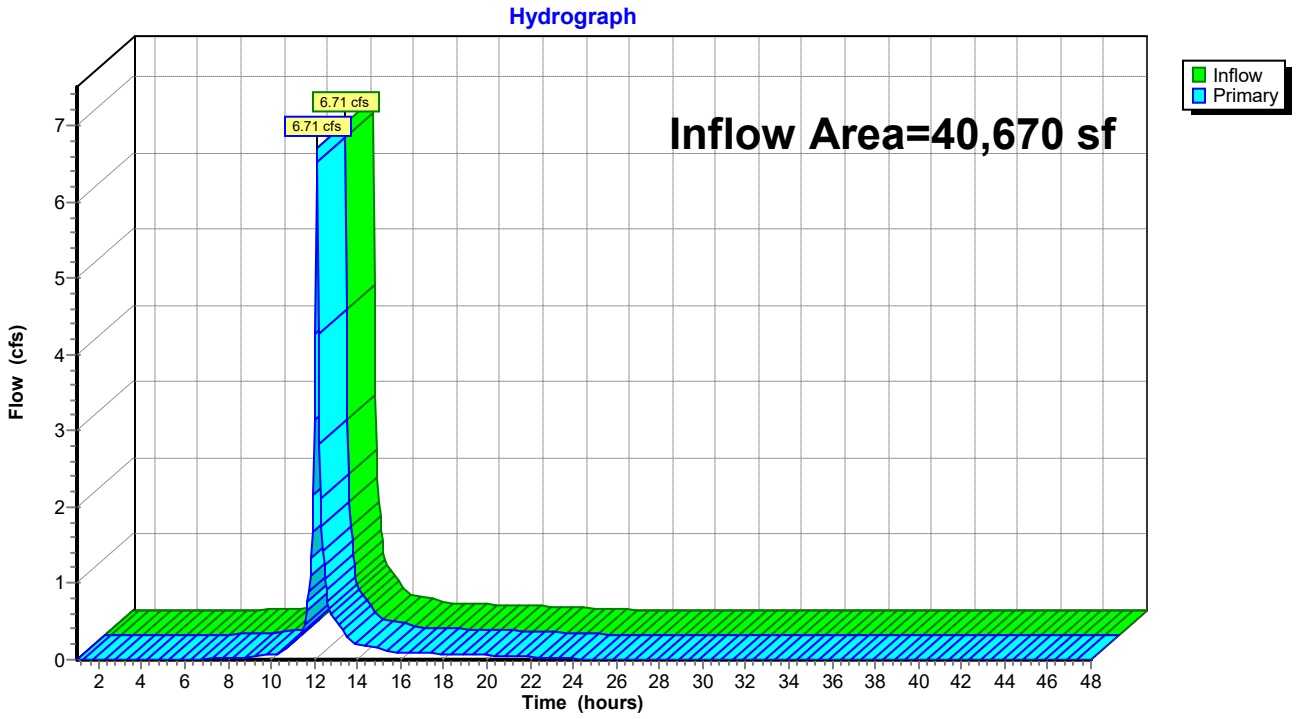


Summary for Link 126L: OVERSIZED PIPE RUN BY B3

Inflow Area = 40,670 sf, 35.10% Impervious, Inflow Depth = 4.20" for 100-Year event
Inflow = 6.71 cfs @ 12.13 hrs, Volume= 14,238 cf
Primary = 6.71 cfs @ 12.13 hrs, Volume= 14,238 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 127P : B3 OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 126L: OVERSIZED PIPE RUN BY B3

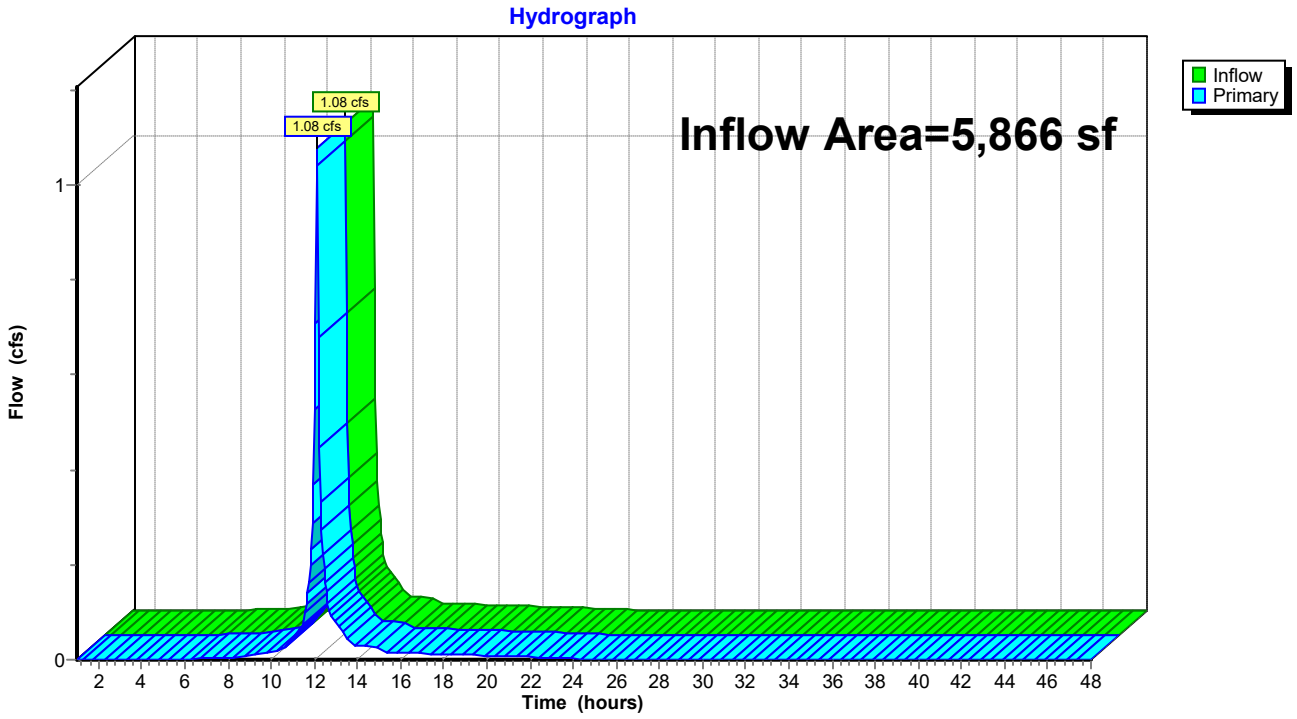


Summary for Link 127L: total

Inflow Area = 5,866 sf, 59.31% Impervious, Inflow Depth = 4.81" for 100-Year event
Inflow = 1.08 cfs @ 12.13 hrs, Volume= 2,353 cf
Primary = 1.08 cfs @ 12.13 hrs, Volume= 2,353 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 177L : SUM OF As TO UG

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 127L: total

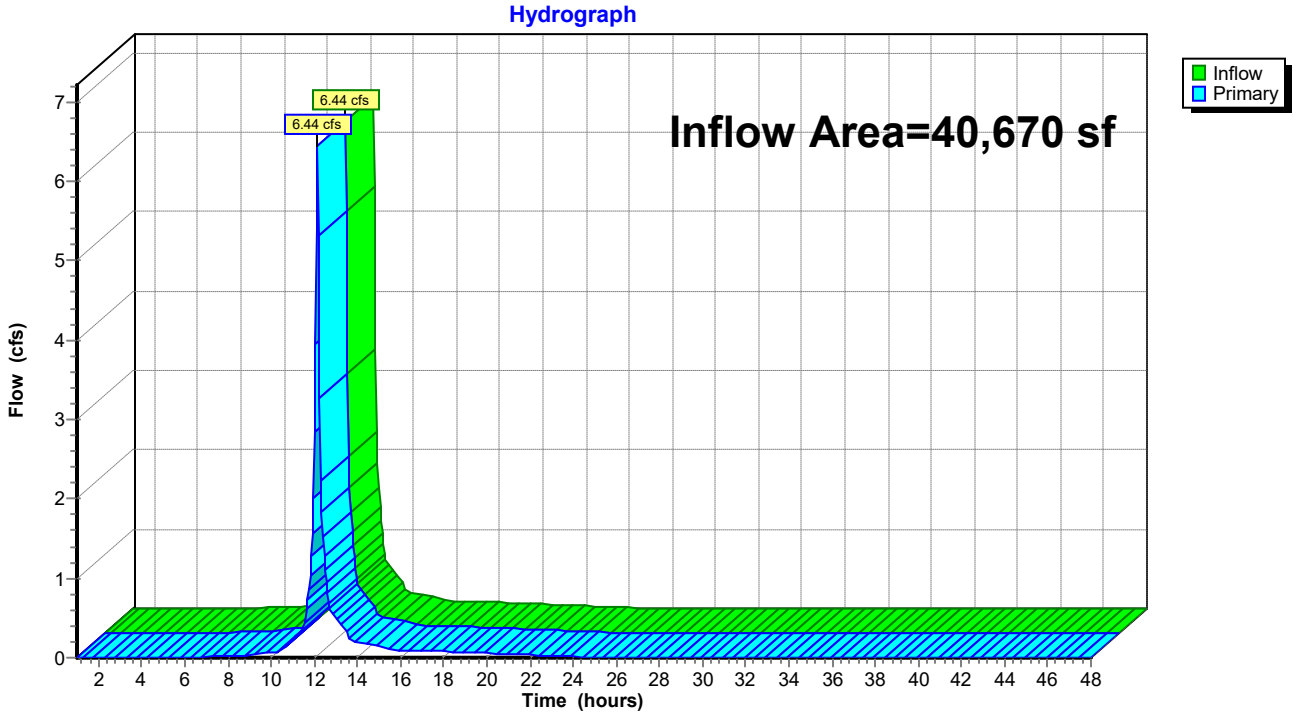


Summary for Link 128L: FROM OVERSIZED PIPE RUN

Inflow Area = 40,670 sf, 35.10% Impervious, Inflow Depth = 4.20" for 100-Year event
Inflow = 6.44 cfs @ 12.15 hrs, Volume= 14,238 cf
Primary = 6.44 cfs @ 12.15 hrs, Volume= 14,238 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 58P : Dry Pond 1

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 128L: FROM OVERSIZED PIPE RUN

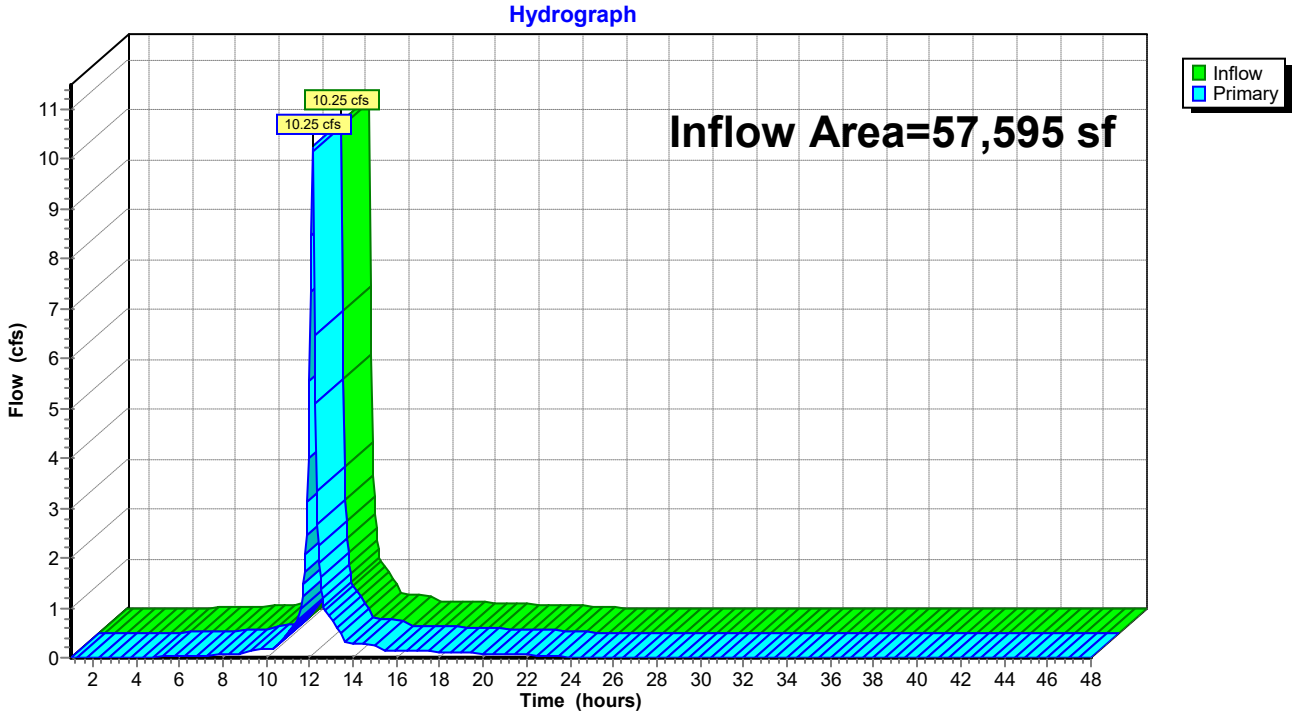


Summary for Link 134L: TO UG

Inflow Area = 57,595 sf, 65.23% Impervious, Inflow Depth = 4.99" for 100-Year event
Inflow = 10.25 cfs @ 12.14 hrs, Volume= 23,933 cf
Primary = 10.25 cfs @ 12.14 hrs, Volume= 23,933 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 178L : As

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 134L: TO UG

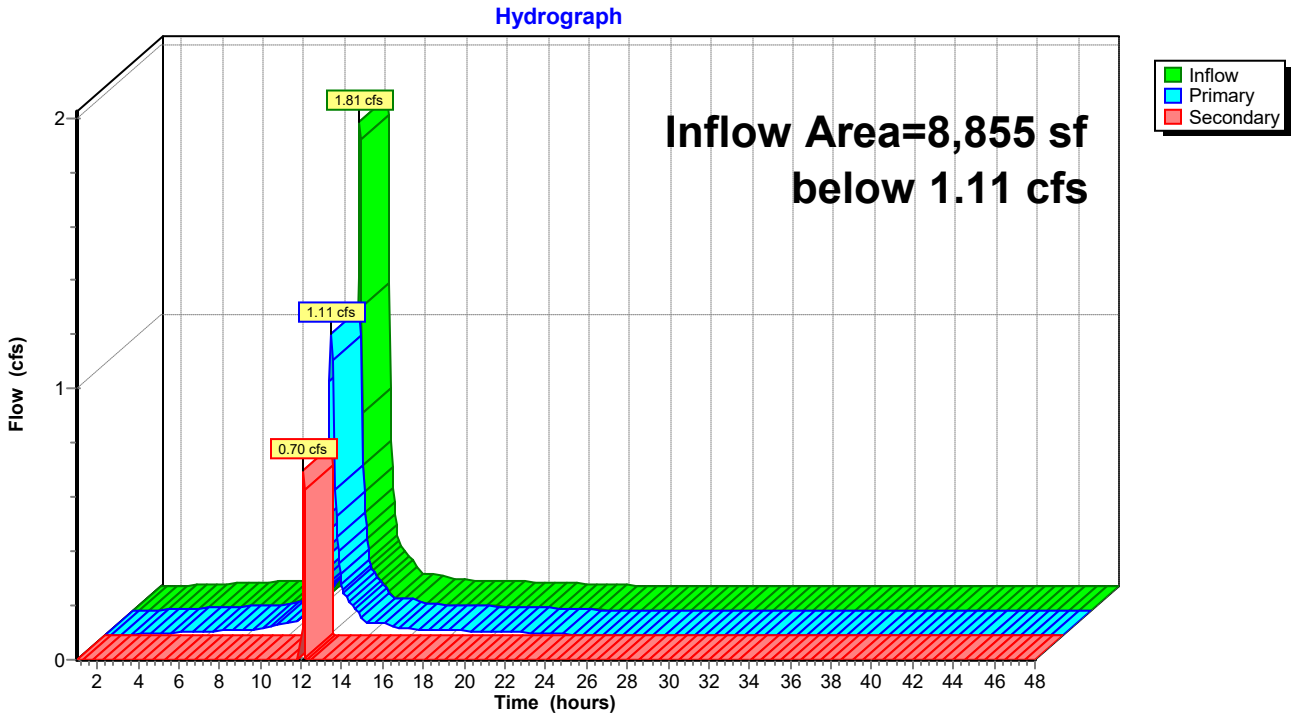


Summary for Link 171L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

Inflow Area = 8,855 sf,100.00% Impervious, Inflow Depth = 5.94" for 100-Year event
Inflow = 1.81 cfs @ 12.13 hrs, Volume= 4,384 cf
Primary = 1.11 cfs @ 12.05 hrs, Volume= 4,140 cf, Atten= 39%, Lag= 0.0 min
Routed to Pond 129P : STORMTECH FROM ADS
Secondary = 0.70 cfs @ 12.13 hrs, Volume= 244 cf
Routed to Reach 99R : East Swale (SE End)

Primary outflow = Inflow below 1.11 cfs, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 171L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

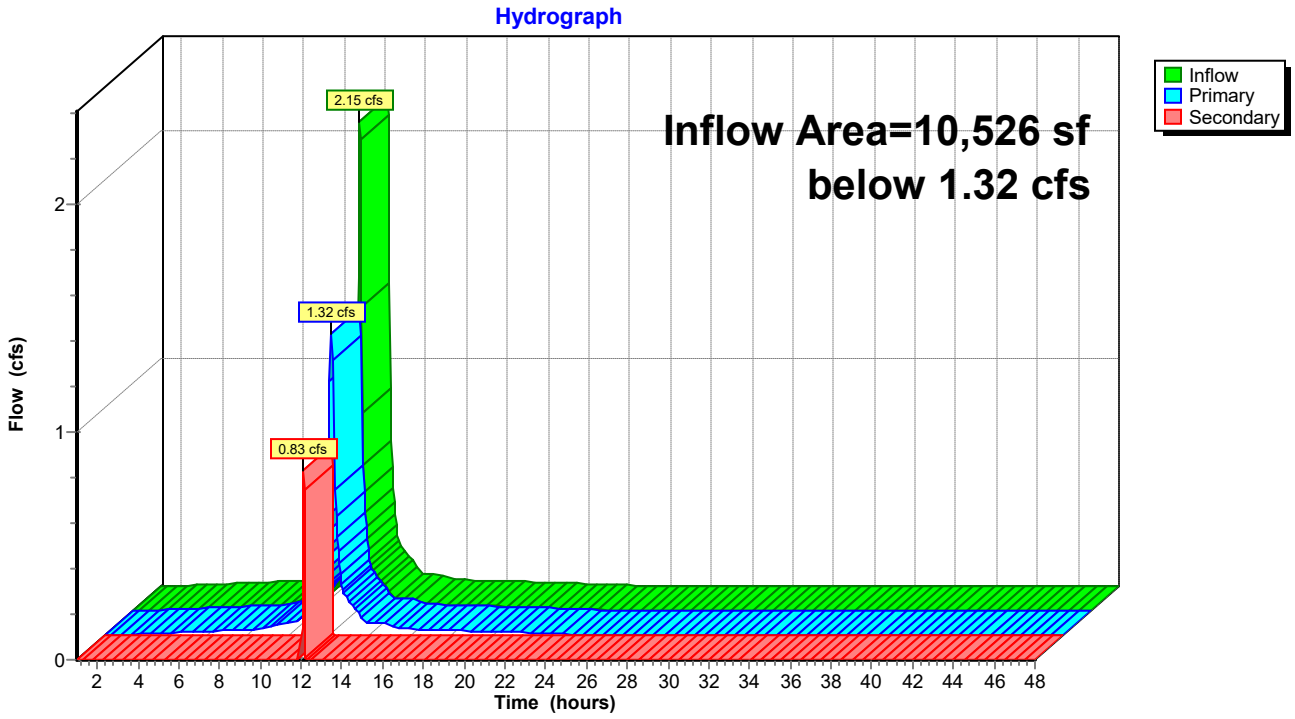


Summary for Link 174L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

Inflow Area = 10,526 sf,100.00% Impervious, Inflow Depth = 5.94" for 100-Year event
Inflow = 2.15 cfs @ 12.13 hrs, Volume= 5,212 cf
Primary = 1.32 cfs @ 12.05 hrs, Volume= 4,922 cf, Atten= 39%, Lag= 0.0 min
Routed to Pond 129P : STORMTECH FROM ADS
Secondary = 0.83 cfs @ 12.13 hrs, Volume= 290 cf
Routed to Reach 111R : Western PL North Ditch

Primary outflow = Inflow below 1.32 cfs, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 174L: 10-YEAR TO COURTYARD, ABOVE TO OVERFLOW DRAINS

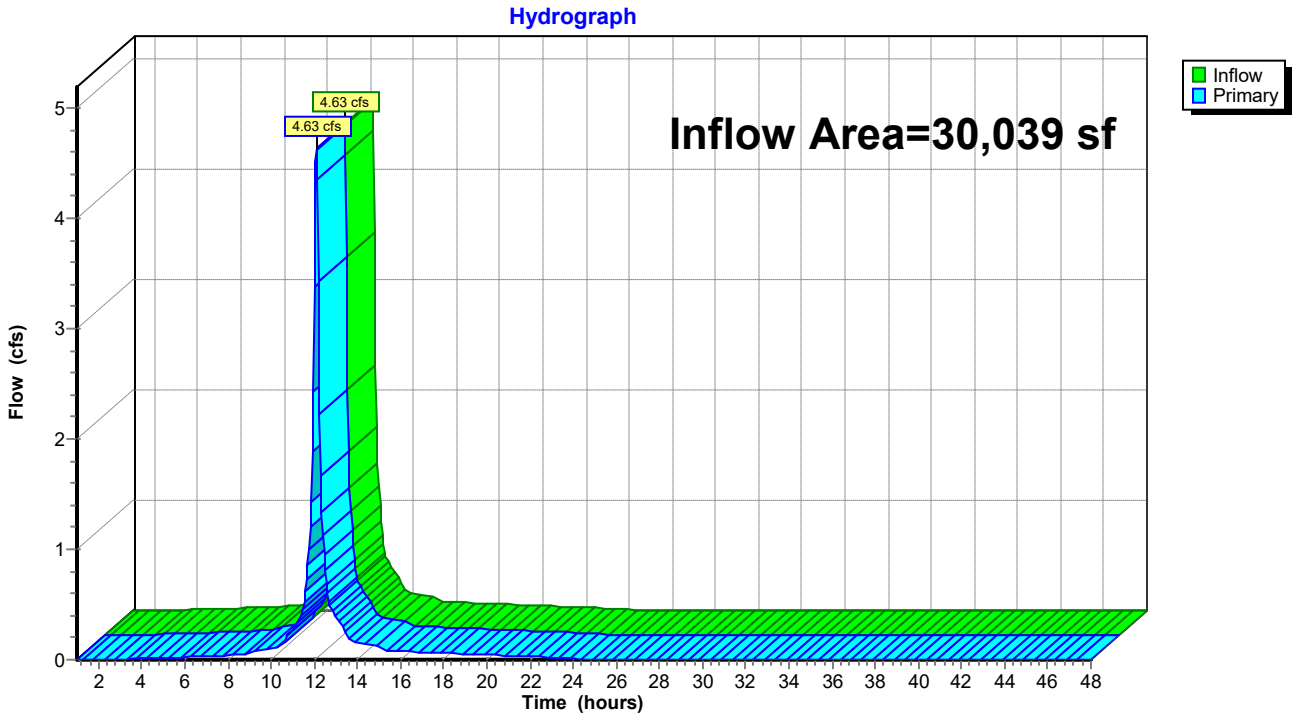


Summary for Link 175L: TO UG

Inflow Area = 30,039 sf, 72.17% Impervious, Inflow Depth = 5.19" for 100-Year event
Inflow = 4.63 cfs @ 12.09 hrs, Volume= 13,003 cf
Primary = 4.63 cfs @ 12.09 hrs, Volume= 13,003 cf, Atten= 0%, Lag= 0.0 min
Routed to Link 178L : As

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 175L: TO UG

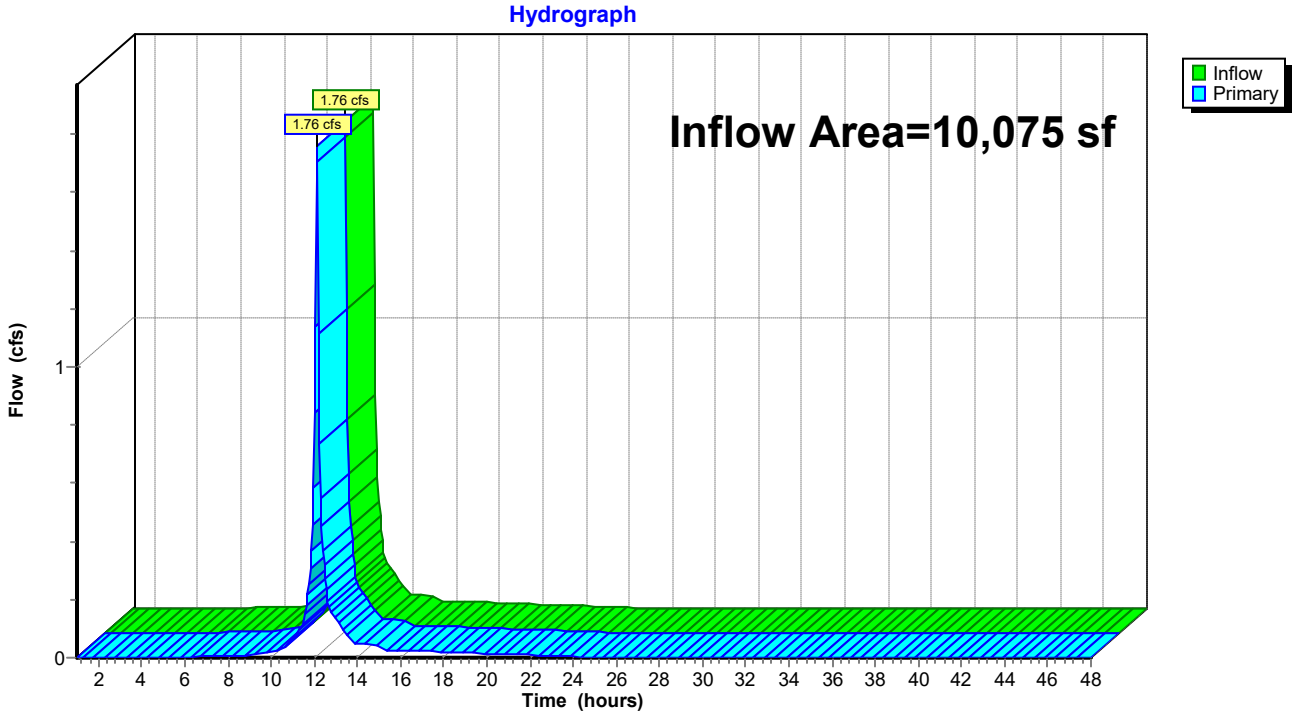


Summary for Link 176L: UPSTREAM OF OVERSIZED PIPE

Inflow Area = 10,075 sf, 46.89% Impervious, Inflow Depth = 4.51" for 100-Year event
Inflow = 1.76 cfs @ 12.13 hrs, Volume= 3,788 cf
Primary = 1.76 cfs @ 12.13 hrs, Volume= 3,788 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 174P : EAST COURTYARD OVERSIZED PIPE RUN (24" W/15" ORIFICE)

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 176L: UPSTREAM OF OVERSIZED PIPE

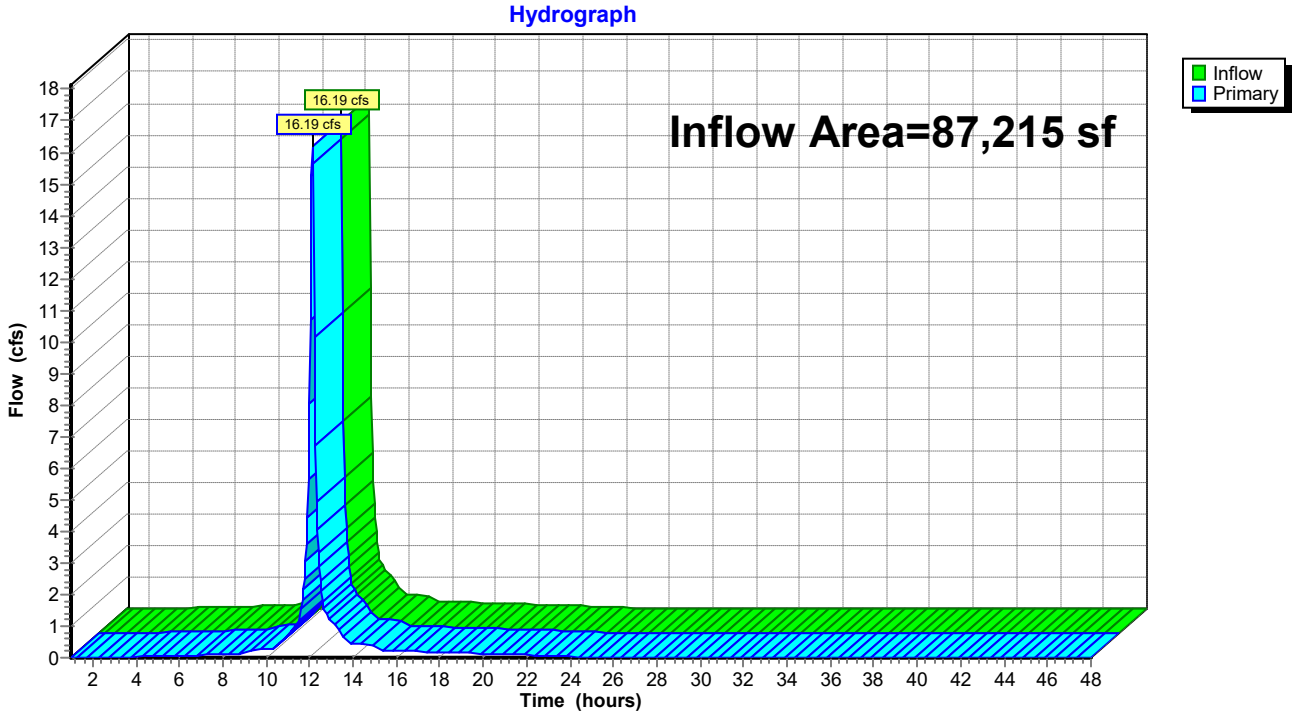


Summary for Link 177L: SUM OF As TO UG

Inflow Area = 87,215 sf, 65.94% Impervious, Inflow Depth = 5.03" for 100-Year event
Inflow = 16.19 cfs @ 12.13 hrs, Volume= 36,554 cf
Primary = 16.19 cfs @ 12.13 hrs, Volume= 36,554 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 129P : STORMTECH FROM ADS

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 177L: SUM OF As TO UG

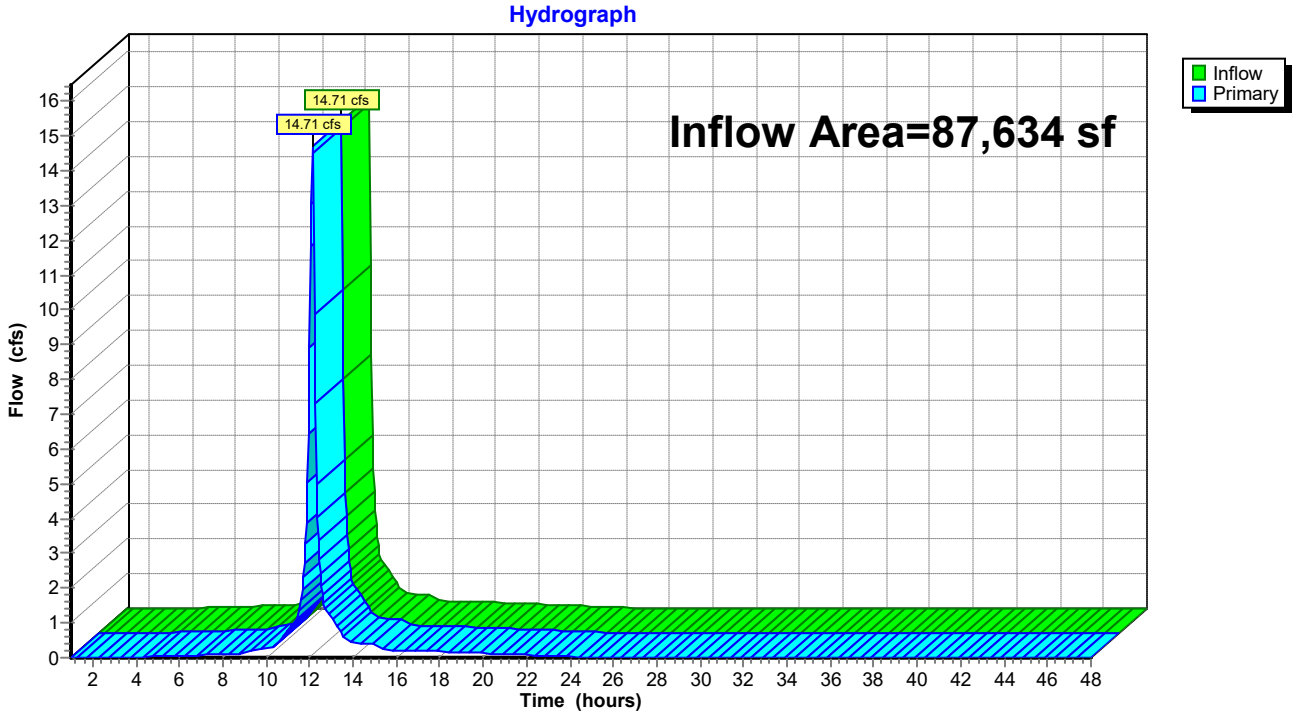


Summary for Link 178L: As

Inflow Area = 87,634 sf, 67.61% Impervious, Inflow Depth = 5.06" for 100-Year event
Inflow = 14.71 cfs @ 12.14 hrs, Volume= 36,936 cf
Primary = 14.71 cfs @ 12.14 hrs, Volume= 36,936 cf, Atten= 0%, Lag= 0.0 min
Routed to Pond 129P : STORMTECH FROM ADS

Primary outflow = Inflow, Time Span= 1.00-48.00 hrs, dt= 0.05 hrs

Link 178L: As



Hydrograph for Reach 184R: Red Barn Lane East Swale

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
1.00	0.00	0	763.00	0.00
2.00	0.00	0	763.00	0.00
3.00	0.00	0	763.00	0.00
4.00	0.00	0	763.00	0.00
5.00	0.00	0	763.00	0.00
6.00	0.00	0	763.00	0.00
7.00	0.00	0	763.00	0.00
8.00	0.00	0	763.00	0.00
9.00	0.01	2	763.00	0.00
10.00	0.07	60	763.05	0.06
11.00	0.36	182	763.11	0.29
12.00	**6.75**	**1,402**	**763.42**	**4.60**
13.00	**1.21**	**548**	**763.24**	**1.30**
14.00	0.47	264	763.15	0.48
15.00	0.41	239	763.14	0.42
16.00	0.24	160	763.10	0.24
17.00	0.21	148	763.10	0.22
18.00	0.19	136	763.09	0.19
19.00	0.16	123	763.09	0.17
20.00	0.14	110	763.08	0.14
21.00	0.11	96	763.07	0.12
22.00	0.09	81	763.06	0.09
23.00	0.06	65	763.05	0.07
24.00	0.04	47	763.04	0.04
25.00	0.00	8	763.01	0.00
26.00	0.00	2	763.00	0.00
27.00	0.00	1	763.00	0.00
28.00	0.00	0	763.00	0.00
29.00	0.00	0	763.00	0.00
30.00	0.00	0	763.00	0.00
31.00	0.00	0	763.00	0.00
32.00	0.00	0	763.00	0.00
33.00	0.00	0	763.00	0.00
34.00	0.00	0	763.00	0.00
35.00	0.00	0	763.00	0.00
36.00	0.00	0	763.00	0.00
37.00	0.00	0	763.00	0.00
38.00	0.00	0	763.00	0.00
39.00	0.00	0	763.00	0.00
40.00	0.00	0	763.00	0.00
41.00	0.00	0	763.00	0.00
42.00	0.00	0	763.00	0.00
43.00	0.00	0	763.00	0.00
44.00	0.00	0	763.00	0.00
45.00	0.00	0	763.00	0.00
46.00	0.00	0	763.00	0.00
47.00	0.00	0	763.00	0.00
48.00	0.00	0	763.00	0.00

Hydrograph for Reach 132R: EX. Red Barn Lane West Swale

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Outflow (cfs)
1.00	0.00	0	760.89	0.00
2.00	0.00	0	760.89	0.00
3.00	0.00	0	760.89	0.00
4.00	0.00	0	760.89	0.00
5.00	0.00	0	760.89	0.00
6.00	0.00	0	760.89	0.00
7.00	0.00	0	760.89	0.00
8.00	0.01	6	760.90	0.00
9.00	0.02	15	760.91	0.01
10.00	0.06	38	760.94	0.06
11.00	0.24	91	760.99	0.22
12.00	**3.82**	**604**	**761.26**	**2.90**
13.00	**0.64**	**206**	**761.07**	**0.67**
14.00	0.24	101	761.00	0.25
15.00	0.22	92	760.99	0.22
16.00	0.12	62	760.97	0.12
17.00	0.11	58	760.96	0.11
18.00	0.10	53	760.96	0.10
19.00	0.08	48	760.95	0.09
20.00	0.07	43	760.95	0.07
21.00	0.06	38	760.94	0.06
22.00	0.05	32	760.93	0.05
23.00	0.03	26	760.93	0.03
24.00	0.02	19	760.92	0.02
25.00	0.00	1	760.89	0.00
26.00	0.00	0	760.89	0.00
27.00	0.00	0	760.89	0.00
28.00	0.00	0	760.89	0.00
29.00	0.00	0	760.89	0.00
30.00	0.00	0	760.89	0.00
31.00	0.00	0	760.89	0.00
32.00	0.00	0	760.89	0.00
33.00	0.00	0	760.89	0.00
34.00	0.00	0	760.89	0.00
35.00	0.00	0	760.89	0.00
36.00	0.00	0	760.89	0.00
37.00	0.00	0	760.89	0.00
38.00	0.00	0	760.89	0.00
39.00	0.00	0	760.89	0.00
40.00	0.00	0	760.89	0.00
41.00	0.00	0	760.89	0.00
42.00	0.00	0	760.89	0.00
43.00	0.00	0	760.89	0.00
44.00	0.00	0	760.89	0.00
45.00	0.00	0	760.89	0.00
46.00	0.00	0	760.89	0.00
47.00	0.00	0	760.89	0.00
48.00	0.00	0	760.89	0.00

APPENDIX D

WINSLAMM INPUT & OUTPUT

Data file name: C:\Users\rtoy\OneDrive - K. Singh & Associates, Inc\Projects\40380 SSND Civil\CIV\Calcs\Stormwater\WinSLAMM\40380 WinSLAMM 2024.06.17_No P
WinSLAMM Version 10.4.1
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Milwaukee WI 1969.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:
Seed for random number generator: -42
Study period starting date: 01/05/69 Study period ending date: 12/31/69
Start of Winter Season: 12/02 End of Winter Season: 03/12
Date: 09-12-2024 Time: 16:51:24
Site information:

LU# 1 - Residential: SUM A-A35 (MINUS A1,A2,A30,A31,A32,A33) Total area (ac): 4.014
1 - Roofs 1: 0.798 ac. Flat Connected PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 0.746 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 1.136 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 1.334 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 2 - Residential: B Total area (ac): 1.985
1 - Roofs 1: 0.021 ac. Flat Connected PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.214 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 1.750 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 3 - Residential: C Total area (ac): 2.131
1 - Roofs 1: 0.756 ac. Flat Connected PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.199 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 1.176 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 4 - Residential: C1 Total area (ac): 0.444
1 - Roofs 1: 0.024 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 0.041 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.051 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.328 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 5 - Residential: C2 Total area (ac): 2.286
1 - Roofs 1: 0.545 ac. Flat Connected PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.223 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 1.518 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 6 - Residential: D1 Total area (ac): 0.479
45 - Large Landscaped Areas 1: 0.479 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 7 - Residential: D2 Total area (ac): 0.381
1 - Roofs 1: 0.204 ac. Flat Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.177 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 8 - Residential: D3 Total area (ac): 0.188
31 - Sidewalks 1: 0.024 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.164 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 9 - Residential: E1 Total area (ac): 0.908
31 - Sidewalks 1: 0.050 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.858 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 10 - Residential: E2 Total area (ac): 0.432
1 - Roofs 1: 0.169 ac. Flat Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.263 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 11 - Residential: E3 Total area (ac): 2.508
13 - Paved Parking 1: 0.191 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.150 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 2.167 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 12 - Residential: F Total area (ac): 0.957
1 - Roofs 1: 0.403 ac. Flat Connected PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 0.171 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.383 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 13 - Residential: F1 Total area (ac): 1.167
1 - Roofs 1: 0.432 ac. Flat Connected PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 0.233 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.006 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.496 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 14 - Residential: F2 Total area (ac): 0.291
1 - Roofs 1: 0.154 ac. Flat Connected PSD File: C:\WinSLAMM Files\NURP.cpz

45 - Large Landscaped Areas 1: 0.137 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 15 - Residential: F3 Total area (ac): 0.464
1 - Roofs 1: 0.094 ac. Flat Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.370 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 16 - Residential: F4 Total area (ac): 0.587
1 - Roofs 1: 0.048 ac. Flat Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.539 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 17 - Residential: F5 Total area (ac): 0.718
45 - Large Landscaped Areas 1: 0.718 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 18 - Residential: F6 Total area (ac): 0.191
45 - Large Landscaped Areas 1: 0.191 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 19 - Residential: G Total area (ac): 0.103
45 - Large Landscaped Areas 1: 0.103 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 20 - Residential: H1 Total area (ac): 2.848
1 - Roofs 1: 0.573 ac. Flat Connected PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 0.213 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
25 - Driveways 1: 0.130 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 1.844 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz
51 - Small Landscaped Areas 1: 0.088 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 21 - Residential: H2 Total area (ac): 1.239
1 - Roofs 1: 0.339 ac. Flat Connected PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 0.031 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.869 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 22 - Residential: H3 Total area (ac): 0.685
25 - Driveways 1: 0.107 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.020 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.558 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 23 - Residential: H5 Total area (ac): 0.333
45 - Large Landscaped Areas 1: 0.333 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 24 - Residential: I* Total area (ac): 1.289
45 - Large Landscaped Areas 1: 1.289 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 25 - Residential: J* Total area (ac): 0.352
31 - Sidewalks 1: 0.031 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.321 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 26 - Residential: A1,A2,A30,A31,A32,A33 Total area (ac): 1.342
1 - Roofs 1: 0.046 ac. Flat Connected PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 0.317 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.152 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.827 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 27 - Residential: B1 Total area (ac): 0.984
1 - Roofs 1: 0.984 ac. Flat Connected PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 28 - Residential: H4 Total area (ac): 0.153
45 - Large Landscaped Areas 1: 0.153 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 29 - Residential: H6-a, H6-b, H6-c Total area (ac): 0.412
25 - Driveways 1: 0.049 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.363 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

LU# 30 - Residential: X Total area (ac): 0.506
13 - Paved Parking 1: 0.210 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.296 ac. Normal Silty PSD File: C:\WinSLAMM Files\NURP.cpz

Control Practice 1: Wet Detention Pond CP# 1 (DS) - Dry Pond 1
Particle Size Distribution file name: Not needed - calculated by program
Initial stage elevation (ft): 0
Peak to Average Flow Ratio: 3.8
Maximum flow allowed into pond (cfs): No maximum value entered
Outlet Characteristics:
Outlet type: Broad Crested Weir
1. Weir crest length (ft): 3
2. Weir crest width (ft): 3
3. Height from datum to bottom of weir opening: 6
Outlet type: Vertical Stand Pipe
1. Stand pipe diameter (ft): 2
2. Stand pipe height above datum (ft): 5.91
Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.4130	3.46	0.00
2	1.00	0.4780	0.00	0.00
3	2.00	0.5430	0.00	0.00
4	3.00	0.6110	0.00	0.00
5	4.00	0.6790	0.00	0.00
6	5.00	0.7490	0.00	0.00
7	6.00	0.8200	0.00	0.00
8	7.00	0.8920	0.00	0.00

Control Practice 3: Grass Swale CP# 1 (DS) - South Berm Swale
Total drainage area (acres)= 2.861
Fraction of drainage area served by swales (ac) = 1.00
Swale density (ft/ac) = 88.11
Total swale length (ft) = 275
Average swale length to outlet (ft)= 138
Typical bottom width (ft) = 1.0
Typical swale side slope (_H:1V) = 4.0
Typical longitudinal slope (ft.H/ft.V) = 0.010
Swale retardance factor: D
Typical grass height (in) = 2.0
Swale dynamic infiltration rate (in/hr)= 1.500
Typical swale depth (ft) for cost analysis (optional) = 0.0
Particle size distribution file name: Not needed - calculated by program
Use total swale length instead of swale density for infiltration calculations: True
Control Practice 4: Grass Swale CP# 2 (DS) - West Swale
Total drainage area (acres)= 4.065
Fraction of drainage area served by swales (ac) = 1.00
Swale density (ft/ac) = 0.00
Total swale length (ft) = 480
Average swale length to outlet (ft)= 313
Typical bottom width (ft) = 0.0
Typical swale side slope (_H:1V) = 3.0
Typical longitudinal slope (ft.H/ft.V) = 0.013
Swale retardance factor: D
Typical grass height (in) = 2.0
Swale dynamic infiltration rate (in/hr)= 1.500
Typical swale depth (ft) for cost analysis (optional) = 0.0
Particle size distribution file name: Not needed - calculated by program
Use total swale length instead of swale density for infiltration calculations: True
Control Practice 5: Wet Detention Pond CP# 2 (DS) - Infiltration Basin 1
Particle Size Distribution file name: Not needed - calculated by program
Initial stage elevation (ft): 0
Peak to Average Flow Ratio: 3.8
Maximum flow allowed into pond (cfs): No maximum value entered
Outlet Characteristics:
Outlet type: Broad Crested Weir
1. Weir crest length (ft): 3
2. Weir crest width (ft): 0.1
3. Height from datum to bottom of weir opening: 7.75
Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.1770	4.32	0.00
2	1.00	0.2060	0.00	0.00
3	2.00	0.2370	0.00	0.00
4	3.00	0.2700	0.00	0.00
5	4.00	0.3050	0.00	0.00
6	5.00	0.3420	0.00	0.00
7	6.00	0.3820	0.00	0.00
8	7.00	0.4230	0.00	0.00
9	8.00	0.4660	0.00	0.00

Control Practice 6: Grass Swale CP# 3 (DS) - South Campus West Swale
Total drainage area (acres)= 7.469
Fraction of drainage area served by swales (ac) = 1.00
Swale density (ft/ac) = 0.00
Total swale length (ft) = 218
Average swale length to outlet (ft)= 213
Typical bottom width (ft) = 0.0
Typical swale side slope (_H:1V) = 5.0
Typical longitudinal slope (ft.H/ft.V) = 0.008
Swale retardance factor: D
Typical grass height (in) = 2.0
Swale dynamic infiltration rate (in/hr)= 0.500
Typical swale depth (ft) for cost analysis (optional) = 0.0
Particle size distribution file name: Not needed - calculated by program
Use total swale length instead of swale density for infiltration calculations: True
Control Practice 7: Wet Detention Pond CP# 3 (DS) - Dry Pond 3
Particle Size Distribution file name: Not needed - calculated by program
Initial stage elevation (ft): 0
Peak to Average Flow Ratio: 3.8
Maximum flow allowed into pond (cfs): No maximum value entered
Outlet Characteristics:
Outlet type: Orifice 1
1. Orifice diameter (ft): 0.5
2. Number of orifices: 1
3. Invert elevation above datum (ft): 2
Outlet type: Broad Crested Weir
1. Weir crest length (ft): 10
2. Weir crest width (ft): 5
3. Height from datum to bottom of weir opening: 3.75
Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.2200	1.63	0.00
2	1.00	0.2600	0.00	0.00
3	2.00	0.3020	0.00	0.00
4	3.00	0.3460	0.00	0.00
5	4.00	0.3920	0.00	0.00

Control Practice 8: Grass Swale CP# 4 (DS) - South Campus Road East Swale
Total drainage area (acres)= 0.957
Fraction of drainage area served by swales (ac) = 1.00
Swale density (ft/ac) = 0.00
Total swale length (ft) = 415
Average swale length to outlet (ft)= 313
Typical bottom width (ft) = 3.0
Typical swale side slope (_H:1V) = 4.0
Typical longitudinal slope (ft.H/ft.V) = 0.005
Swale retardance factor: D
Typical grass height (in) = 2.0
Swale dynamic infiltration rate (in/hr)= 0.500
Typical swale depth (ft) for cost analysis (optional) = 0.0
Particle size distribution file name: Not needed - calculated by program
Use total swale length instead of swale density for infiltration calculations: True
Control Practice 9: Grass Swale CP# 5 (DS) - South Campus Road West Swale
Total drainage area (acres)= 1.167
Fraction of drainage area served by swales (ac) = 1.00
Swale density (ft/ac) = 0.00
Total swale length (ft) = 475
Average swale length to outlet (ft)= 313
Typical bottom width (ft) = 3.0
Typical swale side slope (_H:1V) = 4.0
Typical longitudinal slope (ft.H/ft.V) = 0.004
Swale retardance factor: D
Typical grass height (in) = 2.0
Swale dynamic infiltration rate (in/hr)= 0.500
Typical swale depth (ft) for cost analysis (optional) = 0.0
Particle size distribution file name: Not needed - calculated by program
Use total swale length instead of swale density for infiltration calculations: True

Control Practice 10: Wet Detention Pond CP# 4 (DS) - Dry Pond 2
Particle Size Distribution file name: Not needed - calculated by program
Initial stage elevation (ft): 0
Peak to Average Flow Ratio: 3.8
Maximum flow allowed into pond (cfs): No maximum value entered
Outlet Characteristics:
Outlet type: Orifice 1
1. Orifice diameter (ft): 1
2. Number of orifices: 1
3. Invert elevation above datum (ft): 3
Outlet type: Broad Crested Weir
1. Weir crest length (ft): 10
2. Weir crest width (ft): 5
3. Height from datum to bottom of weir opening: 4.99
Outlet type: Vertical Stand Pipe
1. Stand pipe diameter (ft): 2
2. Stand pipe height above datum (ft): 4.66
Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.1680	0.02	0.00
2	1.00	0.2020	0.00	0.00
3	2.00	0.2370	0.00	0.00
4	3.00	0.2740	0.00	0.00
5	4.00	0.3120	0.00	0.00
6	5.00	0.3510	0.00	0.00

Control Practice 11: Grass Swale CP# 6 (DS) - East Swale
Total drainage area (acres)= 5.423
Fraction of drainage area served by swales (ac) = 1.00
Swale density (ft/ac) = 0.00
Total swale length (ft) = 706
Average swale length to outlet (ft)= 313
Typical bottom width (ft) = 5.0
Typical swale side slope (_H:1V) = 3.0
Typical longitudinal slope (ft.H/ft.V) = 0.010
Swale retardance factor: D
Typical grass height (in) = 2.0
Swale dynamic infiltration rate (in/hr)= 1.500
Typical swale depth (ft) for cost analysis (optional) = 0.0
Particle size distribution file name: Not needed - calculated by program
Use total swale length instead of swale density for infiltration calculations: True
Control Practice 12: Filter Strip CP# 1 (DS) - DS Filter Strips # 1
Total drainage area (acres)= 1.239
Fraction of drainage area served by filter strips (ac) = 1.00
Total filter strip width (ft) = 360.0
Effective flow length (ft) = 10
Infiltration rate (in/hr)= 2.500
Typical longitudinal slope (ft.H/ft.V) = 0.007
Typical grass height (in) = 2.5
Swale retardance factor = D
Use stochastic analysis to determine infiltration rate: False
Infiltration rate coeficient of variation (COV) = 0.00
Particle size distribution file name: Not needed - calculated by program
Surface Clogging Load (lbs/sf) = 3.50
Control Practice 14: Filter Strip CP# 2 (DS) - DS Filter Strips # 2
Total drainage area (acres)= 2.508
Fraction of drainage area served by filter strips (ac) = 1.00
Total filter strip width (ft) = 155.0
Effective flow length (ft) = 40
Infiltration rate (in/hr)= 2.500
Typical longitudinal slope (ft.H/ft.V) = 0.010
Typical grass height (in) = 2.5
Swale retardance factor = D
Use stochastic analysis to determine infiltration rate: False
Infiltration rate coeficient of variation (COV) = 0.00
Particle size distribution file name: Not needed - calculated by program
Surface Clogging Load (lbs/sf) = 3.50

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Data file name: C:\Users\rtoy\OneDrive - K. Singh & Associates, Inc\Projects\40380 SSND Civil\CIV\Calcs\Stormwater\WinSLAMM\40380 WinSLAMM 2024.06.17_No P
WinSLAMM Version 10.4.1
Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Milwaukee WI 1969.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppdx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:
Seed for random number generator: -42
Study period starting date: 01/05/69 Study period ending date: 12/31/69
Start of Winter Season: 12/02 End of Winter Season: 03/12
Model Run Start Date: 01/05/69 Model Run End Date: 12/31/69
Date of run: 09-12-2024 Time of run: 16:53:08
Total Area Modeled (acres): 30.377
Years in Model Run: 0.99

	Runoff Volume (cu ft)	Percent Runoff Volume Reduction	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of all Land Uses without Controls:	946271	-	85.13	5029	-
Outfall Total with Controls:	65552	93.07%	102.5	419.4	91.66%
Annualized Total After Outfall Controls:	66462			425.2	

Pollutant	Conc. No Controls	Conc. With Controls	Conc. Units	Pollutant Yield No Controls	Pollutant Yield With Controls	Pol. Yield Units	Percent Reduction
Particulate Solids	85.13	102.5	mg/L	5029	419.4	lbs	91.66 %
Particulate Phosphorus	0.2526	0.3138	mg/L	14.92	1.284	lbs	91.39 %

APPENDIX E

GEOTECHNICAL INVESTIGATION REPORT & INFILTRATION TEST MEMORANDA, DESIGN INFILTRATION CALCULATIONS



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GEOTECHNICAL ENGINEERING REPORT
School Sisters of Notre Dame Development
13105 Watertown Plank Road
Elm Grove, Wisconsin

June 3, 2019
File No. 20.0156624.00



PREPARED FOR:
Mandel Group Properties, LLC
c/o SSND Apartments, LLC
Milwaukee, Wisconsin

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June 3, 2020
File No. 20.0156624.00

Mr. Dan Romnek, Development Associate
Mandel Group Properties, LLC
c/o SSND Apartments, LLC
330 East Kilbourn Avenue
South Tower, Suite 600
Milwaukee, Wisconsin 53202

Re: Geotechnical Engineering Report
School Sisters of Notre Dame Development
13105 Watertown Plank Road
Elm Grove, Wisconsin

Dear Ms. Adler:

GZA GeoEnvironmental, Inc. (GZA) is pleased to present the attached Geotechnical Engineering Report ("Report") for the proposed School Sisters of Notre Dame Development in Elm Grove, Wisconsin. The Report provides findings, conclusions and recommendations that GZA derived from our geotechnical evaluation and are based on our current understanding of the project(s).

We appreciate the opportunity to provide services for this project. Please feel free to contact us with any questions.

Very truly yours,

GZA GeoEnvironmental, Inc.

Jesse D. Graham, P.E.
Geotechnical Engineer

Patrick J. Harrison, P.E.
Senior Geotechnical Consultant
Consultant/Reviewer

John M. Siwula, P.E., D. GE
Associate Principal

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Assistant Project Manager

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Attachments

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1.0 INTRODUCTION

GZA GeoEnvironmental, Inc. (GZA) conducted a geotechnical engineering evaluation and prepared this report for the residential development proposed at 13105 Watertown Plank Road in Elm Grove, Wisconsin ("Site"). A Site Location Map is provided as Figure 1. GZA's services were provided in general accordance with our Proposal for Geotechnical Engineering Services, GZA File No. 20.P000208.20, dated May 6, 2019. The findings, conclusions, and recommendations that GZA derived from the geotechnical evaluation are provided for Mandel Group Properties, LLC c/o SSND Apartments, LLC ("Client") in this Geotechnical Engineering Report ("Report") and are subject to the Limitations provided in Appendix A. Elevations, when provided, are based on the National Geodetic Vertical Datum of 1929 (NGVD 29). Elevations of the borings were surveyed by Chaput Land Surveys and are assumed to be accurate to the nearest 0.25 foot.

1.1 SUMMARY

Geotechnical findings and recommendations for the proposed development are summarized below. The summary is provided for the convenience of the non-technical reader and must be read in complete context with the remaining Report.

1. Twenty-one soil borings were drilled at the locations shown on Figure 2 to depths ranging from 15 to 30 feet below ground surface (bgs) (approximate Elevation 713 to 746) to evaluate subsurface conditions. Detailed soil boring logs are provided in Appendix B.
2. In general, the soils encountered in the borings consisted of approximately 8 to 36 inches of topsoil or asphalt pavement underlain by medium-dense, well- to poorly-graded sand with silt (SW-SM and SP-SM, respectively), with occasional layers of gravel, well-graded sands, and fine-grained soils. Occasional areas of deeper topsoil, up to 6 feet, were encountered at the Site. Groundwater was encountered in the borings at depths of approximately 17 to 18 feet bgs at the time of our exploration.
3. The sandy-silty, organic topsoil observed in surface and near-surface samples from the soil borings will need to be removed beneath proposed pavements and structures. Based on conditions observed in the soil borings, the depth of stripping could range from 2 to 6 feet across portions of the Site.
4. Historical information indicates that several buildings and tunnels previously occupied the Site and were removed in the past. Demolition of these structure(s) likely disturbed the underlying soils. Additionally, the possibility exists that foundations and other building components from the previous structures may be present at the Site requiring removal. Scarification, partial over-excavation and re-compaction of the disturbed soils will likely be required prior to slab-on-grade or pavement construction.
5. Based on the subsurface conditions and estimated structural loads, it is our opinion that shallow footing foundations consisting of strip and isolated spread footings are feasible for support of the proposed buildings. A 3,000 to 4,500 pound per square foot (psf) maximum, net, allowable bearing capacity is recommended for foundation design, depending on the location and foundation elevations of the structure on the Site. Bearing soils should consist of surface compacted, native, granular soils or compacted structural fill. The net allowable soil bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base. Strip footings should be at least 18 inches wide and isolated column footings should be at least 30 inches wide. Also, we recommend that perimeter footings and footings in unheated areas should extend at least 48 inches below the lowest adjacent exterior grade or to a depth required by the local building code, for frost protection. Interior footings beneath heated areas

of the buildings may bear on suitable bearing soils at a minimum of 18 inches below the surface of the overlying floor slab, provided the soil beneath the building will not freeze.

6. A vertical modulus of subgrade reaction (k_v) of 150 pounds per cubic inch (pci) is recommended for concrete slab-on-grade design where founded on native granular soil. If floor slabs are supported on fine-grained soil or soils with minor organic content, the design should use a vertical modulus of subgrade reaction (k_v) of 75 pci. A minimum 4-inch-thick concrete floor slab with at least wire mesh reinforcing is recommended for the proposed buildings. The use of a vapor retarder should be considered beneath concrete slabs-on-grade that will be covered with wood, tile, carpet, or other moisture-sensitive or impervious coverings, or when the slab will support equipment sensitive to moisture.
7. Subgrade soils exposed during the excavation will be sensitive to moisture changes and disturbance due to construction traffic. Disturbed soils may require re-compaction, additional over-excavation, and/or subgrade preparation. The subgrade should be protected from moisture changes and monitored for disturbance from construction equipment.

1.2 PURPOSE AND SCOPE OF SERVICES

GZA's objective for this project was to develop geotechnical engineering recommendations for design and construction of foundations, slabs-on-grade, fill placement, and construction considerations for the proposed development. To achieve our objective, GZA completed the following scope of work:

- Reviewed conceptual drawings provided by the Client;
- Coordinated a geotechnical subsurface exploration program that consisted of 21 soil borings;
- Visually classified soil samples recovered from the borings and prepared soil boring logs;
- Conducted field and laboratory tests on a select number of soil samples to aid in the evaluation of the engineering properties of the subsurface soils;
- Performed geotechnical engineering analyses and developed geotechnical engineering recommendations; and
- Prepared this Report, which summarizes GZA's findings from the geotechnical evaluation and provides geotechnical recommendations for the proposed project.

2.0 BACKGROUND

2.1 EXISTING CONDITIONS

The approximately 30-acre Site is located at 13015 Watertown Plank Road in Elm Grove, Wisconsin and is currently developed as the School Sisters of Notre Dame. The Site is located in the northeast quarter of Sections 25, Township 7 North, Range 20 East of the 4th Principle Meridian. The Site is bounded on the north and northwest by Watertown Plank Road, followed by predominantly commercial developments; on the south and southwest by railroad tracks, followed by commercial and light industrial developments; and on the east by homes and Red Barn Lane. Site surface elevations range from about Elevation 770 on the north side of the Site to about Elevation 730 on the southeast corner of the Site.

The Site has been developed since the mid- to late 1800s, with various buildings and burial grounds. Pedestrian tunnels exist between some of the existing buildings and are in various states of repair. Historical aerial photographs of the Site

indicate that several structures have been razed since the 1940s. Former buildings/structures were present in the 1940s, along Watertown Plank Road, Red Barn Lane, and in the middle areas of the Site. It is unknown if foundations, utilities, or other construction remnants remain in these areas . Some fill piles are present on the south side of the Site that appear to contain landscape waste materials. The contractor should expect to encounter areas of fill and deleterious subsurface conditions during development. The Site is located outside of the 100- and 500-year floodplains.

2.2 PROPOSED DEVELOPMENT

Preliminary details regarding the proposed structure quantity, size, and general loading conditions of the development were provided to GZA by the Client. It is our understanding that the development will consist of approximately 300 residential units spread through two existing buildings, eight multi-story apartment buildings, and 17 single-family homes. The multi-story buildings are expected to be two to four stories with a basement and of masonry and wood frame construction. The single-family homes are expected to be one story with a basement and of wood frame construction. Several private roads and driveways will also be included in the development. It is assumed that first-floor elevations of the various structures will be at or near existing Site grades. Based on our experience with similar projects, we anticipate that maximum column and wall loads to be approximately 300 kips and 8 kips per lineal foot, respectively.

3.0 SUBSURFACE EXPLORATION PROGRAM

GZA's subsurface exploration consisted of 21 soil borings, as described below. Detailed soil boring logs of current borings are provided in Appendix B.

3.1 SOIL BORINGS

GZA's subcontractor, GeoServe, Inc. (GeoServe) of McHenry, Illinois drilled 21 soil borings (AB-1 through AB-4; B-1 through B-16; and EB-1) within the Site boundaries. The locations of the borings are presented on Figure 2. The borings were drilled between April 21 and 24, 2020, to depths ranging between 15 and 30 feet bgs (approximate Elevation 713 to 746 [+/- 1 foot]). The actual termination depths are noted on the boring logs in Appendix B.

GeoServe utilized a Geoprobe® 7822 DT, track-mounted drill rig and 4.25-inch, inside diameter (ID), hollow-stem auger drilling techniques to advance the borings to the termination depths. Split-spoon soil samples were obtained in general accordance with American Society for Testing and Materials (ASTM) D1586, *Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils*. The SPT consists of driving a 1⅜-inch ID sampler for at least 18 inches with a 140-pound hammer falling 30 inches. The number of blows required for each 6 inches of penetration was recorded, and the number of blows required to drive the sampler from 6 to 18 inches of penetration is the SPT N-value, a commonly used indicator of soil density and consistency. The N-values are summarized on the boring logs in Appendix B. Observations of groundwater levels are discussed in Section 5.4 and are summarized on the soil boring logs.

Soil samples were collected in the split-spoon sampler and were stored in sealed, labeled, plastic jars. Samples were classified in general accordance with ASTM D2488, *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)*.

4.0 FIELD AND LABORATORY TESTING PROGRAM

Soil samples were visually classified in the field to determine approximate plasticity (for cohesive soils) and grain-size distribution (for granular soils). SPT N-values and/or pocket penetrometer testing results were utilized to evaluate relative density/consistency of the soils encountered and are recorded on the boring logs.

Laboratory tests were performed on select soil samples to aid in soil classification. The testing included natural moisture content and grain-size analysis testing. Three loss on ignition tests were conducted on select samples of the upper topsoil to estimate organic content. Organic content ranged from about 1.7% to 7.7%, by weight, in the upper tested soils. Complete results of the laboratory tests are summarized on the soil boring logs in Appendix B and laboratory summary reports in Appendix C.

5.0 GENERALIZED SUBSURFACE CONDITIONS

Subsurface conditions generally consisted of pavement or topsoil at the surface extending to various depths and thereafter underlain with granular soils with isolated areas of fine-grained, clayey soils. Because of the relatively large size of the Site and the differing soil and loading conditions, the Site has been divided into three subsets, the A-Group, the B-Group, and the C-Group, for discussion purposes as follows:

- A-Group includes borings AB-1 through AB-4, and EB-1, and is located in the southernmost section of the Site, extending from about Green Meadow Place to the railroad at the south end of the Site. Based on available information provided by the Client, this area will primarily be developed with two- to three-story, multi-unit, residential structures that are expected to consist of lightly- to moderately-loaded, masonry and wood-frame structures.
- B-Group includes borings B-1 through B-3, B-5 through B-7, B-9 through B-11, and B-13. These areas encompass the north-central and northwestern portions of the Site, which are currently developed with a majority of the existing campus infrastructure. These areas are expected to be developed with larger, multi-story, masonry structures with moderate loading.
- C-Group includes borings B-4, B-8, B-12, and B-14 through B-16 and is located primarily along the easternmost portion of the Site. Based on available information provided by the Client, this area will primarily be developed with one- to two-story homes that are expected to consist of lightly-loaded, wood-frame structures.

The general geologic setting and a generalized description of the subsurface conditions encountered at the soil boring locations are summarized below. Refer to the boring logs in Appendix B for more specific information. The table below provides a brief summary of the general surface conditions encountered within the areas of the A-, B-, and C-Groups.

Group Name	Pavement or Topsoil Thickness
A	0.5 to 4 feet (Topsoil)
B	2 to 3 inches (Paved Areas) 2 to 6 feet (Topsoil)
C	2 to 8.5 feet (Topsoil)

5.1 SURFACE CONDITIONS

The surface of the Site generally consisted of asphalt parking lots or grassy/topsoil conditions. Asphalt pavement thicknesses were measured in two borings and consisted of 2 to 3 inches of bituminous asphalt pavement underlain with 4 to 9 inches of aggregate base course material. The remaining borings were drilled in grassy areas and encountered varying thicknesses of topsoil, as described above and on the soil boring logs. Loss on ignition (LOI) testing was conducted on three samples in the upper 5 feet and indicated about 1.7% to 7.7% loss (by weight). Moisture contents in the upper soils ranged from about 11% to 32%, by weight and fines content (those materials passing the U.S. No. 200 sieve) ranging from about 27% to 74%, by weight. Topsoil with organic content greater than about 5% to 7% is generally considered compressible and not suitable as bearing soils.

5.2 GRANULAR SANDY AND GRAVELLY SOILS

The topsoil layer was generally underlain by granular soils predominantly consisting of well- to poorly-graded sand with silt (SW-SM and SP-SM, respectively) and layers of well-graded gravel with silt (GW-GM). Other various layers of granular soils were encountered, but appear to be isolated. SPT N-values of the granular outwash soils varied from 3 to 50+ blows per foot (bpf), generally increasing with depth to about 15 to 20 feet bgs and, thereafter, diminishing to about 10 bpf. The percentage by weight of soils finer than the U.S. No. 200 Sieve ranged from 4% to 39%, while moisture contents ranged from 5% to 29% moisture (by weight).

5.3 FINE-GRAINED SOILS

Clayey and silty soils (those soils with greater than 50% passing the U.S. No. 200 Sieve) were encountered at various depths in several borings. The layers appeared to generally be isolated, except for the southeast corner where the fine-grained soils appeared to be present below depths of about 9 feet consistently. Because of the gravel content in many clayey samples recovered, complete soil plasticity tests (Atterberg Limits) could not be performed . One liquid limit test was conducted on a clayey sample, which exhibited a liquid limit of 32. Additionally, five plastic limit tests were conducted with plastic limits ranging from 17 to 26, indicating low plasticity conditions. Several non-plastic, silty soils were also encountered during drilling. Moisture contents of the fine-grained soils ranged from about 16% to 40%, by weight. Pocket penetrometer tests were conducted in the field to estimate unconfined compressive strength of the clayey soils and ranged from about 0.5 to 4.5 tons per square foot (tsf), indicating soft to hard consistency.

5.4 GROUNDWATER

The soil borings were observed for the presence of groundwater during drilling. However, the hollow-stem the auger drilling techniques utilized to advance the soil borings produce a temporary casing as the drill stem is advanced and water conditions within the casing may not reflect actual groundwater levels at the Site. Based on measurements taken in borings AB-4 and EB-1, groundwater was estimated at approximately 17 to 18 feet bgs (Elevation 725 to 728 +/- 1 foot) at the time of drilling. Groundwater levels will fluctuate due to seasonal variations in the amount of precipitation, runoff, and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times over the life of the structure may be different than the levels indicated on the boring logs.

6.0 GEOTECHNICAL CONCLUSIONS AND RECOMMENDATIONS

Geotechnical design and related earthwork construction recommendations for the proposed development are provided in the following sections. The recommendations are based on subsurface conditions encountered at the boring locations and the results of GZA's geotechnical engineering analyses. As the project design continues to develop, these recommendations should be reviewed so that more specific geotechnical design criteria can be developed, if required.

6.1 GENERAL GEOTECHNICAL CONSIDERATIONS

Based on the subsurface conditions and estimated structural loads, it is our opinion that spread footing foundations are suitable to support the buildings. Fill soils and potential remnants of previous construction at the Site are expected. The contractor should review available historical photographs, as-builts, and other publicly available information to determine areas of potential deep, undocumented fill. Fill soils were likely side-cast at the time of previous structure demolition and not moisture conditioned and/or compacted to an engineering specification. Additionally, demolition of existing structures at the Site likely resulted in disturbance of upper soils. Loose, soft, or otherwise deleterious soils should be removed from the foundation bearing areas and replaced with engineered fill or flowable cementitious lean mix. If topsoil, peat, or other organic-rich soils are encountered at foundation grades, they should similarly be removed and replaced with approved fill.

Existing undocumented fill, if present should generally be considered unsuitable for support of footings, slabs, and pavements, and should be removed from the building areas. However, the existing fill could be evaluated for floor slab and pavement support, provided it is tested during construction to determine its suitability. It may also be possible to process the existing concrete and asphalt pavement materials for re-use if mixed with suitable portions of the fill and pavement base course as structural fill, providing that the moisture content is within 1% to 2% of the optimum water content for compaction. If deeper fills and or remnants of previous structures are encountered at or below the bottom of footing elevations, removal of additional fill and subsurface obstructions will also be required to facilitate foundation installation.

The floor slab subgrade should be thoroughly observed, density tested and/or proof rolled and tested by GZA prior to placing the layer of new controlled fill.

Groundwater is not expected to be a concern during construction and excavation for the proposed structures.

6.2 BUILDING FOUNDATIONS

It is our opinion that the buildings can be supported on conventional shallow-spread footing foundations bearing on the native undisturbed, granular (sand or gravel) soils, below the topsoil. Allowable bearing capacities are a function of the building location and anticipated depth of footings. It is not known if all structures will have basements or consist of slab-on-grade construction. As such, multiple allowable bearing capacities are provided for design purposes. The table below summarizes various options for net allowable bearing capacity based on a maximum anticipated settlement of 1 inch for strip footing and isolated column pad foundation design founded on native granular soils or stiff to hard, fine-grained soils.

Group	Allowable Bearing at 4 feet bgs	Allowable Bearing at 8 feet bgs
A-Group	3,000 psf	3,500 psf
B-Group	3,000 psf	4,500 psf
C-Group	2,500 psf	3,500 psf

The net allowable soil bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base. Strip footing foundations should be at least 18 inches wide and isolated column pads should be at least 30 inches wide to reduce the possibility of punching shear failure within foundation support material, regardless of calculated bearing pressure.

If undocumented fill materials are encountered during construction, use of a lean-mix cement slurry (1,500 pounds per square inch [psi] minimum compressive strength) can be used to backfill over-excavations or structural compacted fill can be used for backfill as an option. If lean-mix is utilized, the width of the excavation only needs to be as wide as the planned footing width, provided the excavation side walls are stable. Where granular, native soils are present, some caving may occur. To reduce the caving potential, sloping may be needed. If structural compacted fill is used to backfill over-excavations, the fill will need to be extended laterally at least 1 foot for every 2 vertical feet of soil removal.

We recommend that perimeter footings and foundations in unheated areas that will be subject to freezing conditions bear at least 48 inches below the lowest adjacent exterior grade or to a depth required by the local building code for frost protection. Interior footings may bear on suitable soils at a minimum depth of 18 inches below the surface of the overlying floor slab, provided the soil beneath the foundations will not freeze.

Roof drains and surface water should be directed away from the proposed buildings and paved areas, collected, and discharged from the Site by acceptable means.

Post-construction settlements of foundations will depend on the actual structural loads and the quality of the foundation preparation performed by the contractor. GZA has not been provided the final design loads for the proposed buildings. However, based on the subsurface conditions and estimated structural loads from our experience with similar buildings, we estimate that the post-construction total settlement will be 1 inch or less for foundations that are designed and constructed in accordance with the recommendations in this Report. We also estimate that the post-construction differential settlement will be approximately ½-inch or less over a distance of about 20 feet. These settlement estimates assume that footings will be supported on the compacted, native soils or a prepared subgrade.

6.3 FLOOR SLAB

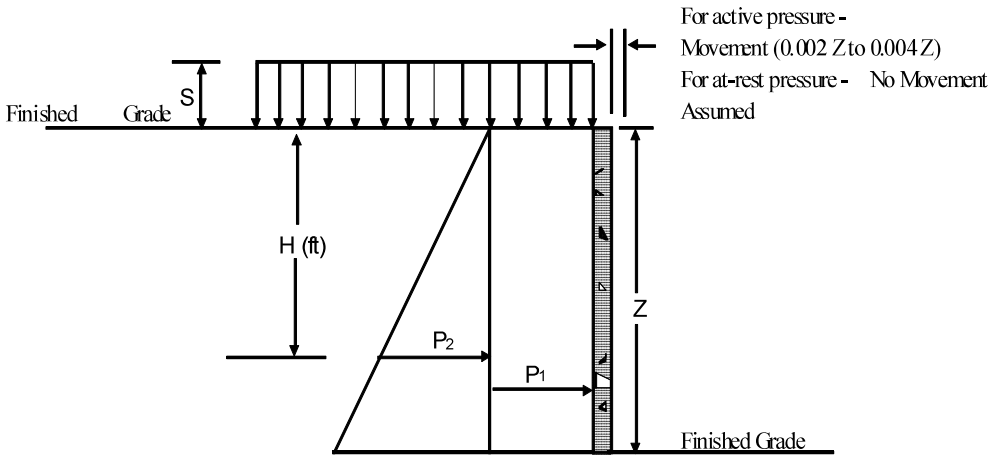
Based on the subsurface information, floor slabs placed over fine-grained soil or soils with minor organic content may be designed using a vertical modulus of subgrade reaction (k_v) of 75 pci, provided the slab subgrade, subbase, and base are prepared in accordance with this Report. Additionally, floor slabs placed on coarse-grained, sandy or gravelly soils may be designed using a K_v of 150 pci. The floor slab should be isolated from walls and columns to allow for independent movement. Joints should be constructed at regular intervals, as recommended by the American Concrete Institute (ACI). The structural engineer should specify actual details of the floor slab, including thickness, reinforcing, and joint details.

The need for and placement of the vapor retarder should be determined by the environmental engineer, architect, or structural engineer based on the proposed floor covering treatment, building function, concrete properties, placement techniques, and construction schedule. For further guidance concerning the use of vapor retarders, the designer should refer to ACI 302, *Construction of Concrete Floors,* and ACI 360, *Guide to Design of Slabs-on-Ground*.

Floor slabs should be a minimum of 4 inches thick and generally be underlain by a minimum 8-inch thick, coarse aggregate base course. The thickness of the aggregate base course may be reduced to 6 inches in areas of subgrade improvement if surficial compaction of the subgrade soils is undertaken and tested. The coarse aggregate base course should consist of material meeting the requirements for Wisconsin Department of Transportation (WisDOT) Standard Specifications for Highway and Structure Construction. Base course materials should be placed and compacted in accordance with Section 6.7.2. An experienced geotechnical engineer should test and approve base course material prior to placement.

6.4 LATERAL EARTH PRESSURES

Potential below grade walls, if any, and/or retaining walls with unbalanced backfill levels on opposite sides should be designed for earth pressures at least equal to those indicated in the following table. Earth pressures will be influenced by structural design of the walls, conditions of wall restraint, methods of construction and/or compaction, and the strength of the materials being restrained. Two wall restraint conditions are shown. Active earth pressure is commonly used for design of freestanding cantilever retaining walls that are unrestrained at the tops and free to move. The "at-rest" condition should be used for walls restrained from movement and rotation and would be appropriate for any below grade walls proposed. The recommended design lateral earth pressures are for cast-in-place concrete walls only and do not include a factor of safety or any provision for possible hydrostatic pressure on the walls.



Earth Pressure Coefficients

	Coefficient for Backfill Types	Equivalent Fluid Pressure (pcf)	Surcharge Pressure, P_1 (psf)	Earth Pressure, P_2 (psf)
Active (Ka)	Granular - 0.30	33	(0.33)S	(33)H
At-Rest (Ko)	Granular - 0.46	55	(0.46)S	(55)H
Passive (Kp)	Granular - 3.0	360	---	---

Conditions applicable to the above conditions include:

- For active earth pressure, the wall must rotate about base, with top lateral movements 0.002 Z to 0.004 Z, where Z is wall height;
- For passive earth pressure, the wall must move horizontally to mobilize resistance;
- Uniform surcharge, where S is the surcharge pressure;
- A maximum in-situ soil backfill weight of 115 pounds per cubic foot (pcf) should be used for granular backfill;

- Horizontal backfill, compacted to at least 90% of the ASTM D1557, *Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort,* maximum dry density;
- Loading from heavy compaction equipment is not included;
- No groundwater is acting on wall;
- No safety factor is included; and
- Ignore passive pressure in frost zone.

Backfill placed against walls can consist of on-Site granular soils. For the granular values to be valid, the granular backfill should extend out from the base of the wall at an angle of at least 45° and 60° from vertical for the active and passive cases, respectively. Additional design considerations are required where these conditions are not met. To calculate the resistance to sliding, a value of 0.35 could be used as the allowable coefficient of friction between the footing and the underlying soil.

6.5 UTILITIES

Existing utilities are present on the Site and old pedestrian tunnels are also reported to be on the Site. If below grade utilities will remain for use with the new development, those utilities should be protected by crane mats or other bridging devices during and after construction. Abandoned utility pipes and tunnels should be properly abandoned, removed, or plugged so they will not serve as conduits for water inflow and subsequent soil wetting and/or subsurface erosion, which could adversely affect new foundations, floor slabs, and pavements.

New underground pipes and utilities should be placed on bedding in accordance with manufacturer recommendations. Trench backfill should be placed in loose lifts not to exceed 6 inches thick and should be compacted in accordance with the specifications provided in this Report.

6.6 SEISMIC PARAMETERS

Based on the subsurface conditions encountered in the borings, the Site Class is considered to be "D" based on Table 1613.5.2 of the 2015 International Building Code. The following seismic design parameters presented below are calculated using the United State Geological Survey (USGS) *Seismic Hazard Curves and Uniform Hazard Response Spectra* calculator using Site Class "D" parameters.

Parameter	Value (unit)
S_s = Short Period Mapped Spectral Acceleration	0.087 (g)
S_1=1-second Period Mapped Spectral Acceleration	0.046 (g)
Fa = Short Period Site Coefficient	1.6 (unitless)
Fv = 1-sec. Period Site Coefficient	2.4 (unitless)
$SM_s = S_s \times Fa$	0.139 (g)
$SM_1 = S_1 \times Fv$	0.112 (g)
$SD_s = 0.667 \times SM_s$	0.093 (g)
$SD_1 = 0.667 \times SM_1$	0.074 (g)

6.7 SITE PREPARATION AND CONSTRUCTION

6.7.1 Subgrade Preparation

The topsoil at the boring locations was present to highly variable depths. Trees and landscaped areas are also on the property. These materials will need to be cleared and grubbed and removed prior to development. After stripping and cutting to the design subgrade elevation, the exposed subgrade should be proof rolled with a fully loaded, quad-axle dump truck with a 10-cubic yard capacity to detect unstable soil or other appropriate testing methods. A GZA geotechnical engineer should observe the exposed subgrade conditions and proof roll operations. Unsuitable bearing soil detected during proof rolling should be scarified and compacted in-place, replaced with fill material, or stabilized, as recommended by the geotechnical engineer. Once the subgrade is determined to be stable, Site grades may be raised, where needed, by placing and compacting General Fill material. Recommendations regarding fill placement and compaction of fill materials are provided in Section 6.7.2.

6.7.2 Placement and Compaction of Fill

Fill material should be placed on a properly prepared subgrade, as noted in Section 6.7.1. Also, the subgrade or fill soil should not be frozen. Fill soil should be placed and compacted in uniform, loose lifts that are between 6 and 12 inches thick. A GZA geotechnical engineer should determine the actual fill thickness based on characteristics of the fill materials and the type of compaction equipment that is used.

Fill, base course and backfill materials should be compacted to at least the minimum degree of compaction relative to the maximum dry density determined by the modified Proctor test (ASTM D1557), as noted in the following table. Vibratory compaction methods should be used with caution for fill placed on wet, native soils or near the water table. During placement, fill soil should have uniform water content within about 2% of the optimum water content determined by the modified Proctor compaction test.

Fill Area	**Percent of Maximum Dry Density Determined by ASTM D1557**
Below Foundations, Slabs-on-Grade and Slab-on-Grade Base Course	95
Pavement Base Course and Within 2 Feet of Surface Pavement Base Course	95
More Than 2 Feet Below Pavement Base Course	92
Below Landscape Areas	90

We recommend that a GZA geotechnical engineer test each layer of fill to measure in-place dry density and water content. Subsequent layers of fill should not be placed until the densities and water contents of the prior lift are in accordance with our recommendations. Improperly placed and compacted fill material should be scarified; moisture conditioned and re-compacted or replaced with suitable compacted fill. Also, in-place fill should be protected from moisture increases and construction traffic disturbance. Disturbed fill material may be scarified, moisture conditioned, and re-compacted, or it may be replaced with suitable fill material. Properly placed and compacted fill should be protected from freezing. General Fill, as defined in Appendix D, can be used to raise Site grades.

6.7.3 Foundations

We recommend that a GZA geotechnical engineer check foundation subgrades prior to concrete placement to confirm that the foundation soil resistance (blow counts) is consistent with the design parameters. The use of a dynamic cone penetrometer is recommended for verification of granular soil strength properties. If areas of weak or deleterious soils

are encountered, we recommend that the soils be over-excavated and re-placed and/or re-compacted with acceptable fill materials.

Foundations should be constructed immediately after subgrade preparation and soil testing to protect the soil bearing surface. In addition, foundation excavations should be backfilled as soon as possible after foundation construction. Excavations along foundation walls should be filled such that the fill at the interior and exterior sides of the walls are at about the same height for lateral pressure considerations. Backfill along foundation walls may consist of General Fill.

6.7.4 Excavation Slopes and Shoring

Excavations should be in accordance with current United States Department of Labor, Occupational Safety and Health Administration (OSHA) guidelines to protect workers and others during construction. Excavations must be shored, sloped, or benched, as required by OSHA. Per OSHA Standard 29 CFR 1926 Subpart P, the upper soils present at the Site should be classified as Type "C" soils. Excavations should also be in accordance with local, State, and Federal safety regulations. Due to the granular native soils, excavations are expected to slough or cave rapidly. The presence of old foundations and utility trenches within or near the excavation may also cause instability to occur. Exposed excavation slope faces should be protected. The geotechnical engineer should evaluate the stability of proposed slopes.

6.8 SHORT- AND LONG-TERM DEWATERING RECOMMENDATIONS

Based on the planned excavation depths, groundwater will likely not be encountered during construction. If deeper excavations are required that extend below the groundwater level, we anticipate that sump and pump methods should maintain levels within the excavation. The groundwater pumping rates required to maintain conditions suitable for construction will depend on the construction methods, soils encountered, and depth of excavation required.

Considering the length of time that the Sisters of Notre Dame have owned the property in its use, it is possible that field drain tiles may be present from past farming. If drain tiles are encountered, those should be connected to new storm sewers to allow for continued drainage unless re-grading does not require continued drain tile functionality.

It also appears that the groundwater level will be below the proposed basement depth and that long-term management of groundwater infiltration will be related to downward seepage from surface or perched groundwater in the backfill on the exterior of the basement walls. Assuming the groundwater levels remain at or below current elevations, long-term drainage can be accomplished through the design of a perimeter drainage system. The system should include exterior and interior perimeter drain lines consisting of slotted PVC pipe with a minimum diameter of 4 inches. The invert of drain lines should be at least 12 inches below the finished subgrade elevation of the interior slab or at least at footing base level and connected to a sump and pump system. The drain line should be sloped to provide positive gravity drainage and should be surrounded by free-draining (less than 3% fines), granular material graded to prevent the intrusion of fines, or an alternative open-graded, free-draining, granular material encapsulated with suitable filter fabric. At least a 2-foot wide section of free-draining, granular fill should be used for backfill above the drain line and adjacent to the wall. Backfill placed between the basement walls should be carefully placed to avoid overcompaction, which could result in excessive lateral earth pressures. The drainage section should extend to within 2 feet of final grade and be capped with low permeability, compacted, cohesive soils to minimize infiltration of surface water into the drain system. The exterior of the basement walls should be damp-proofed prior to backfill placement.

6.9 PAVEMENT RECOMMENDATIONS

We understand that areas of pavement outside of the proposed structures will include drive lanes and parking areas. Based on the soil conditions in the borings and our understanding of the proposed grades, we assume that the subgrade in these areas will generally consist of native sand and gravel surface compacted material. Topsoil and organic-rich material should be stripped from the paved areas and replaced with compacted granular fill as needed to establish grades. Based on our experience within these materials, a CBR value of about 5 was used by GZA to determine the recommended pavement thickness. Similarly, a modulus of subgrade reaction value equal to 150 pci could be used for design of rigid concrete pavement sections placed on compacted aggregate base course. Prior to placement of base course, subgrade soils should be prepared in accordance with this Report.

Typical pavement thickness recommendations are provided in the following table for asphalt and concrete pavements. The recommended pavement sections are based on an assumed moderate volume of passenger vehicle traffic and low volume of traffic from delivery or garbage trucks, and also should be considered minimum design thicknesses. Thickness recommendations for Passenger Vehicle Parking sections are based on light passenger vehicle traffic (gross weight less than 4 tons) and only occasional truck traffic such as fire trucks and snow removal trucks (2001 Wisconsin Asphalt Paving Association [WAPA] Traffic Class II). The Driveways sections are based on occasional garbage truck, buses and delivery truck traffic (WAPA Traffic Class III).

MINIMUM PAVEMENT SECTIONS		
	Passenger Vehicle Parking	**Roadways/Driveways**
Portland Cement Concrete (PCC)	4 inches	6 inches
Granular Base Course	6 inches	6 inches
Flexible Pavement Section:		
Asphalt Cement Concrete (ACC)	4 inches	5 inches
Granular Base Course	6 inches	8 inches

1. All materials should meet the current WisDOT Standard Specifications for Highway and Structure Construction.
2. In areas of anticipated heavy traffic, delivery trucks, or concentrated loads (e.g. dumpster pads), a minimum concrete thickness of 7 inches is recommended, but should be evaluated further when loading conditions are known.
3. A minimum 6-inch granular base should be used below PCC pavements.
4. A minimum 1.5-inch surface course should be used on ACC pavements.

The estimated pavement sections provided in this Report are minimums for the assumed design criteria and, as such, periodic maintenance should be expected. Areas for parking of heavy vehicles, concentrated turn areas, and start/stop maneuvers could require thicker pavement sections. Final design sections should consider details such as traffic loadings, traffic volumes, the desired design life and any applicable local or City requirements. If you wish, we would be pleased to perform a detailed pavement section design using traffic volumes and American Association of State Highway and Transportation Officials (AASHTO) or ACI procedures when this information is available.

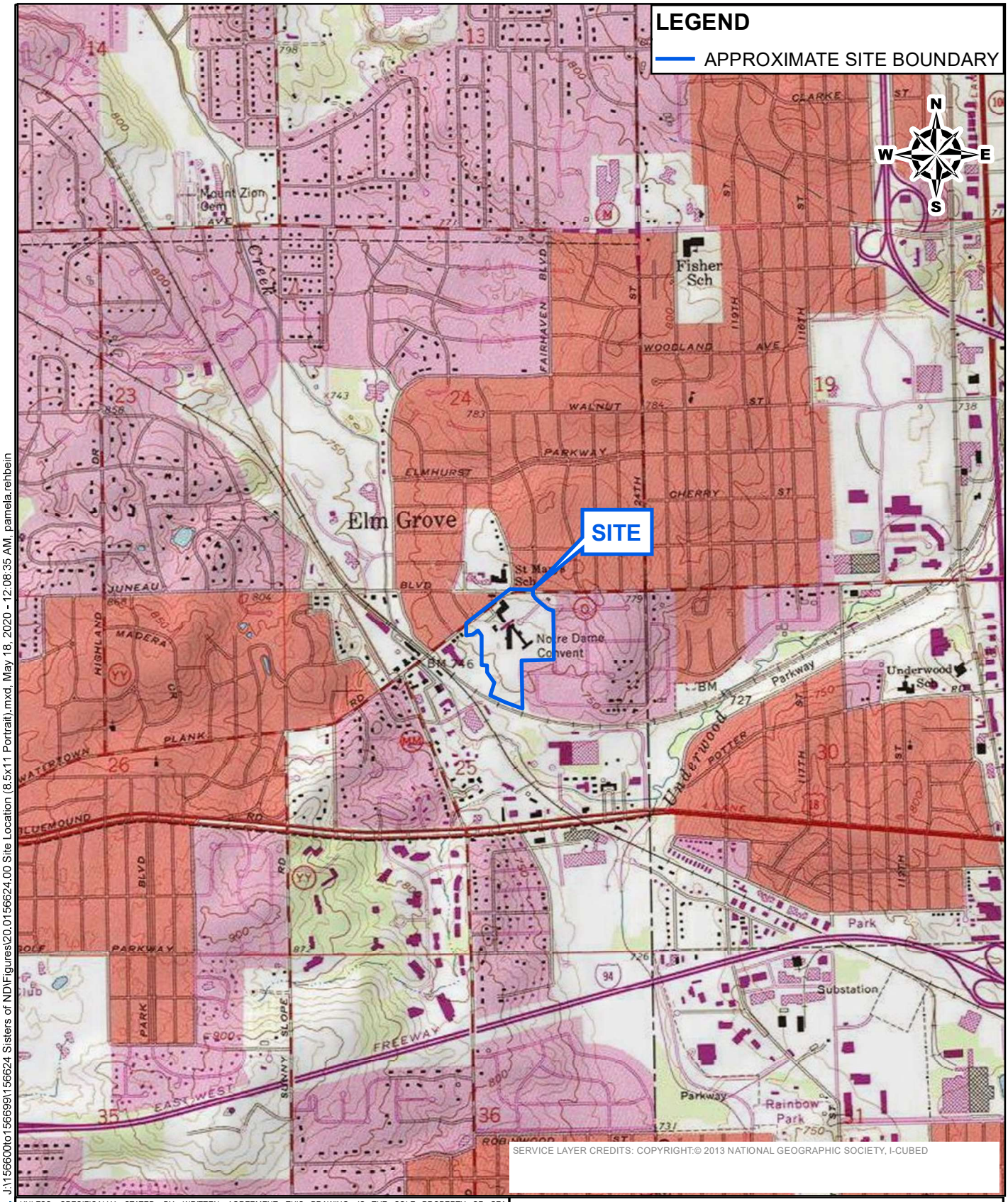
A maintenance program that includes surface sealing, joint cleaning and sealing, and timely repair of cracks and deteriorated areas will increase the pavement's service life. As an option, thicker sections could be constructed to decrease future maintenance.

The pavement base course is recommended to meet the gradation requirement of Structural Fill, as provided in Appendix D. We recommend that the pavement subgrade be sloped to discharge water to the perimeter edges of the pavement or to a catch basin/drain pipe system.

7.0 FINAL DESIGN AND CONSTRUCTION PHASE SERVICES

During construction, we recommend that GZA be retained to observe earthwork activities and geotechnical-related construction for compliance with our recommendations. These activities would include confirming that subsurface conditions encountered during construction are consistent with those anticipated, observation of general excavation work, subgrade preparation for foundations, for slab and pavement base course, foundation construction, slab and pavement base course placement and general fill placement.

FIGURES



© 2020 - GZA GeoEnvironmental, Inc. J:\156600to156699\156624 Sisters of NDFigures\20.0156624.00 Site Location (8.5x11 Portrait).mxd, May 18, 2020 - 12:08:35 AM, pamela.rehbein

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR THE USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

0 1,000 2,000 4,000
SCALE IN FEET

SCHOOL SISTERS OF NOTRE DAME DEVELOPMENT
13105 WATERTOWN PLANK ROAD
ELM GROVE, WISCONSIN

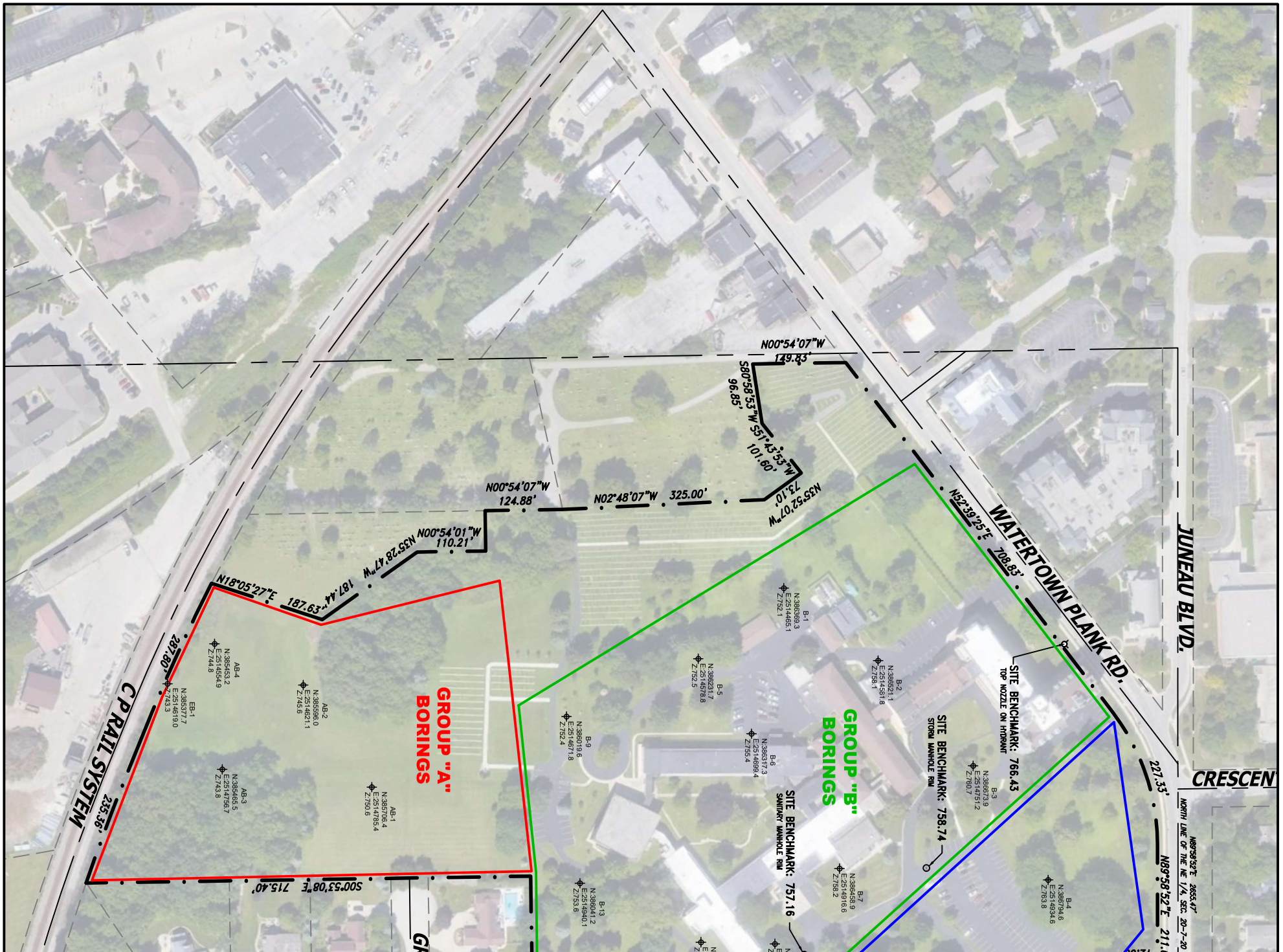
PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
MANDEL GROUP
330 EAST KILBOURN AVENUE
MILWAUKEE, WISCONSIN

SITE LOCATION MAP

PROJ MGR: JDG	REVIEWED BY: JDG	CHECKED BY: IJM	FIG 1
DESIGNED BY: IJM	DRAWN BY: PLT	SCALE: 1 in = 2,000 ft	
DATE: 05/18/2020	PROJECT NO: 20.0156624.00	REVISION NO:	SHEET NO: OF

©2016 – GZA GeoEnvironmental, Inc. GZA–J:\156600TO156699\156624 SISTERS OF ND\FIGURES\20.0156624.00 SITE PLAN.DWG FIG 2 – BORING LOCATION MAY 17, 2020 PAMELA REHBEIN



APPENDIX A

LIMITATIONS

GEOTECHNICAL LIMITATIONS

Use of Report

GZA GeoEnvironmental, Inc. (GZA) prepared this report on behalf of, and for the exclusive use of our Client for the stated purpose(s) and location(s) identified in the Proposal for Services and/or Report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not expressly identified in the contract documents, for any use, without our prior written permission, shall be at that party's sole risk, and without any liability to GZA.

Standard of Care

GZA's findings and conclusions are based on the work conducted as part of the Scope of Services set forth in Proposal for Services and/or Report, and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. If conditions other than those described in this report are found at the subject location(s), or the design has been altered in any way, GZA shall be so notified and afforded the opportunity to revise the report, as appropriate, to reflect the unanticipated changed conditions.

GZA's services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made.

In conducting our work, GZA relied upon certain information made available by public agencies, Client and/or others. GZA did not attempt to independently verify the accuracy or completeness of that information. Inconsistencies in this information which we have noted, if any, are discussed in the Report.

Subsurface Conditions

The generalized soil profile(s) provided in our Report are based on widely-spaced subsurface explorations and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized, and were based on our assessment of subsurface conditions. The composition of strata, and the transitions between strata, may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location refer to the exploration logs. The nature and extent of variations between these explorations may not become evident until further exploration or construction. If variations or other latent conditions then become evident, it will be necessary to reevaluate the conclusions and recommendations of this report.

In preparing this report, GZA relied on certain information provided by the Client, state and local officials, and other parties referenced therein which were made available to GZA at the time of our evaluation. GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this evaluation.

Water level readings have been made in test holes (as described in this Report) and monitoring wells at the specified times and under the stated conditions. These data have been reviewed and interpretations have been made in this Report. Fluctuations in the level of the groundwater however occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, the presence of subsurface utilities, and/or natural or artificially induced perturbations. The water table encountered in the course of the work may differ from that indicated in the Report.

GZA's services did not include an assessment of the presence of oil or hazardous materials at the property. Consequently, we did not consider the potential impacts (if any) that contaminants in soil or groundwater may have on construction activities, or the use of structures on the property.

Recommendations for foundation drainage, waterproofing, and moisture control address the conventional geotechnical engineering aspects of seepage control. These recommendations may not preclude an environment that allows the infestation of mold or other biological pollutants.

Compliance with Codes and Regulations

We used reasonable care in identifying and interpreting applicable codes and regulations. These codes and regulations are subject to various, and possibly contradictory, interpretations. Compliance with codes and regulations by other parties is beyond our control.

Additional Services

GZA recommends that we be retained to provide services during any future: site observations, design, implementation activities, construction and/or property development/redevelopment. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.

APPENDIX B

BORING LOGS

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

KEY TO SYMBOLS

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI

LITHOLOGIC SYMBOLS
(Unified Soil Classification System)


ASPHALT: Asphalt


CL: USCS Low Plasticity Clay


CL-ML: USCS Low Plasticity Silty Clay


CLS: USCS Low Plasticity Sandy Clay


FILL: Fill (made ground)


GC: USCS Clayey Gravel


GM: USCS Silty Gravel


GP-GM: USCS Poorly-graded Gravel with Silt


GW: USCS Well-graded Gravel


GW-GM: USCS Well-graded Gravel with Silt


ML: USCS Silt


PT: USCS Peat


SC: USCS Clayey Sand


SM: USCS Silty Sand


SP: USCS Poorly-graded Sand


SP-SM: USCS Poorly-graded Sand with Silt

RELATIVE DENSITY/ CONSISTENCY

Granular Soils (Sands, Gravels)

N-Value	Relative Density
0 - 4	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
> 50	Very Dense

Cohesive Soils (Clays, Some Silts)

PP-Value (tsf)	Consistency
< 0.25	Very Soft
0.25 - 0.5	Soft
0.5 - 1.0	Medium Stiff
1.0 - 2.0	Stiff
2.0 - 4.0	Very Stiff
> 4.0	Hard

MINOR COMPONENTS

Percentage	Descriptor
1 - 5	Trace
5 - 15	Little
15 - 30	Some
30 - 50	With

SOIL MOISTURE

DRY	No Free Moisture
MOIST	Wet to Touch, No Free Moisture
WET	Free Moisure

DRILLING STATISTICS

Number of Boreholes:	21
Total Length of Drilling:	500
Total Number of Samples:	163

TESTING:

Water Content:	40
Dry Density:	0
Atterberg Limits:	16
Sieve Analysis:	25
Unconfined:	0
Direct Shear:	0
Pocket Pen:	75

ABBREVIATIONS

LL	LIQUID LIMIT (%)
PI	PLASTIC INDEX (%)
W	MOISTURE CONTENT (%)
DD	DRY DENSITY (PCF)
NP	NON PLASTIC
P#200	PERCENT PASSING NO. 200 SIEVE (FINES)
PP	POCKET PENETROMETER (TSF)
TV	TORVANE
PID	PHOTOIONIZATION DETECTOR
UC	UNCONFINED COMPRESSION
ppm	PARTS PER MILLION

▽ Water Level at Time Drilling, or as Shown

▼ Water Level at End of Drilling, or as Shown

▼ Water Level After 24 Hours, or as Shown

GZA BOREHOLE LEGEND - GINT STD US LAB.GDT - 6/2/20 11:45 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.00 SCHOOL SISTERS OF NOTRE DAME (APRIL 2020).GPJ

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

BORING NUMBER AB-01

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/21/20 **COMPLETED** 4/21/20
GROUND ELEVATION 750.6 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0	750		Surface: Grassy											
			S-1: Upper 10": TOPSOIL: Stiff, Sandy, lean CLAY (CL), low plasticity; little Gravel, fine; trace Organics; brown, moist		S-1 (1-2.5)	18	2-4-3 (7)	1.0						
			Lower 8": Loose, well-graded SAND (SW), fine to coarse-grained; little to some Gravel, fine; little Silt; brown, moist (possible fill)											
			S-2: Upper 7": Stiff, Sandy, lean CLAY (CL), low plasticity; some Sand, fine to coarse; some Gravel, fine; brown, moist (possible fill)		S-2 (3.5-5)	14	3-4-10 (14)	2.0						
5	745		Lower 7": Medium dense, well-graded SAND (SW), fine to coarse-grained; little Gravel, fine; trace Silt; brown, dry											
			S-3: Medium dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; little Gravel, fine; brown, dry		S-3 (6-7.5)	18	10-9-7 (16)			5.4	NP	NP	NP	10
			S-4: Medium dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; little Gravel, fine; brown, dry		S-4 (8.5-10)	16	6-9-7 (16)							
10	740		S-5: Medium dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; some Gravel, fine; brown, dry		S-5 (11-12.5)	16	5-10-14 (24)							
			S-6: Medium dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; some Gravel, fine; trace Silt; brown, dry		S-6 (13.5-15)	14	2-8-10 (18)							
15	735													
			S-7: Upper 10": Dense, well-graded GRAVEL (GW), fine to coarse-grained; some Sand, fine to coarse; trace Silt; brown, dry; trace rock fragments	1	S-7 (18.5-20)	14	16-19-13 (32)	4.5						
20	730		Lower 4": Hard, lean CLAY (CL), low plasticity; little Sand, fine to coarse; little Gravel, fine to coarse; brown, dry											
			S-8: Medium dense, poorly-graded SAND (SP), fine to medium-grained; brown, wet		S-8 (23.5-25)	12	2-8-11 (19)							
25	725													
			S-9: Dense, poorly-graded SAND (SP), fine to coarse-grained; trace, Silt; brown, wet	2	S-9 (28.5-32)	14	10-16-18 (34)			25.2				4
30			Boring ended at 30' below ground surface and backfilled with auger cuttings and bentonite chips	3										

REMARKS

1. Rig chatter at 17' BGS
2. Approximately 8" of blowback in the hole
3. Cave in at 23.5' BGS - no water

GEOTECH WITH REMARKS AND ELEV - GINT STD US LAB.GDT - 6/3/20 14:27 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.00 SCHOOL SISTERS OF NOTRE DAME (APRIL 2020).GPJ

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

BORING NUMBER AB-02

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/21/20 **COMPLETED** 4/21/20
GROUND ELEVATION 745.6 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0	745		Surface: Grassy Upper 12": Silty SAND (SM) TOPSOIL, dark brown, with rootlets S-1: TOPSOIL: Loose, clayey SAND (SC), fine to medium-grained; trace Gravel, fine; trace Organics; brown, moist		S-1 (1-2.5)	12	2-3-5 (8)	1.0		26.0	NP	21	NP	34
			S-2: Medium dense, well-graded SAND with SILT (SW-SM), fine- to coarse-grained; some Gravel, fine to coarse; tanish brown, dry	1	S-2 (3.5-5)	13	8-13-15 (28)							
5	740		S-3: Medium dense, well-graded SAND with SILT (SW-SM), fine- to coarse-grained; some Gravel, fine to coarse; tanish brown, dry	2	S-3 (6-7.5)	15	7-12-10 (22)							
			S-4: Medium dense, well-graded SAND with SILT (SW-SM), fine- to coarse-grained; some Gravel, fine to coarse; tanish brown, dry		S-4 (8.5-10)	12	7-9-6 (15)							
10	735		S-5: Medium dense, well-graded SAND with SILT and GRAVEL (SW-SM), fine- to coarse-grained; tanish brown, dry		S-5 (11-12.5)	13	6-7-11 (18)							
			S-6: Medium dense, well-graded SAND with SILT and GRAVEL (SW-SM), fine- to coarse-grained; little Silt; tanish brown, dry		S-6 (13.5-15)	16	6-8-10 (18)			5.9	NP	NP	NP	10
15	730		S-7: Upper 2": Medium dense, well-graded SAND with SILT and GRAVEL (SW-SM), fine- to coarse-grained; little Silt; tanish brown, dry Lower 16": Hard, lean CLAY (CL), low plasticity; trace Sand, fine; brownish gray, moist		S-7 (18.5-20)	18	10-9-11 (20)	4.5		15.6				
20			Boring ended at 20' below ground surface and backfilled with auger cuttings and bentonite chips											

REMARKS

1. Rig chatter at approximately 3' bgs.
2. Rig chatter at approximately 6' bgs.

GEOTECH WITH REMARKS AND ELEV - GINT STD US LAB.GDT - 6/3/20 14:27 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.00 SCHOOL SISTERS OF NOTRE DAME (APRIL 2020).GPJ

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Brookfield, WI 53045
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BORING NUMBER AB-03

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/21/20 **COMPLETED** 4/21/20
GROUND ELEVATION 743.8 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: Grassy											
			S-1: TOPSOIL: Stiff, lean CLAY (CL), low plasticity; little Sand, fine to medium; trace Gravel, fine; trace Organics; brown, moist		S-1 (1-2.5)	12	1-2-2 (4)	1.5-2.0		19.6				
	740		S-2: Upper 4": TOPSOIL: Stiff, lean CLAY (CL), low plasticity; little Sand, fine to medium; trace Gravel, fine; trace Organics; brown, moist		S-2 (3.5-5)	16	6-8-10 (18)	1.0						
5			Lower 12": Medium dense, well-graded SAND with SILT and GRAVEL (SW-SM), fine- to coarse-grained; tanish brown, dry											
			S-3: Medium dense, well-graded GRAVEL with SILT and SAND (GW-GM), fine- to coarse-grained; tannish brown, dry		S-3 (6-7.5)	16	6-13-11 (24)			4.9	NP	NP	NP	8
	735		S-4: Medium dense, well-graded SAND with SILT (SW-SM), fine- to coarse-grained; some Gravel, fine to coarse; tannish brown, dry		S-4 (8.5-10)	15	4-7-8 (15)							
10			S-5: Medium dense, well-graded SAND with SILT (SW-SM), fine- to coarse-grained; some Gravel, fine to coarse; tannish brown, dry		S-5 (11-12.5)	16	9-11-10 (21)							
	730		S-6: Medium dense, well-graded SAND with SILT (SW-SM), fine- to coarse-grained; some Gravel, fine to coarse; tannish brown, dry		S-6 (13.5-15)	16	5-5-9 (14)							
15														
	725		S-7: Medium dense, well-graded SAND with SILT (SW-SM), fine- to coarse-grained; some Gravel, fine to coarse; tannish brown, wet	1	S-7 (18.5-20)	4	12-12-11 (23)							
20			Boring ended at 20' below ground surface and backfilled with auger cuttings and bentonite chips											

REMARKS

1. Rock fragment blocking tip of sampler.

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Brookfield, WI 53045
(262) 754-2560

BORING NUMBER AB-04

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/21/20 **COMPLETED** 4/21/20
GROUND ELEVATION 744.8 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB
4/21/20	AD	17		10 Minutes

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: Grassy											
			S-1: Upper 6": TOPSOIL: Stiff, lean CLAY (CL), low plasticity; little Sand, fine; trace Organics; brown, moist Lower 5": Loose, well-graded GRAVEL with SILT (GW-GM), fine- to coarse-grained; tan, dry		S-1 (1-2.5)	11	3-3-5 (8)	1.5						
5	740		S-2: Medium dense, well-graded SAND with SILT (SW-SM) fine- to coarse; some Gravel, fine to coarse; tan, dry		S-2 (3.5-5)	15	6-10-10 (20)	2						
			S-3: Medium dense, well-graded SAND with SILT and GRAVEL (SW-SM), fine- to coarse-grained; tan, dry		S-3 (6-7.5)	15	3-8-6 (14)							
10	735		S-4: Dense, well-graded SAND with SILT and GRAVEL (SW-SM), fine- to coarse-grained; tan, dry		S-4 (8.5-10)	18	17-18-18 (36)							
			S-5: Medium dense, poorly-graded GRAVEL with SILT and SAND (GP-GM), fine-grained; tan, dry	1	S-5 (11-12.5)	18	18-14-11 (25)			5.1	NP	NP	NP	12
15	730		S-6: Dense, poorly-graded GRAVEL with SILT and SAND (GP-GM), fine-grained; reddish tan, dry		S-6 (13.5-15)	18	6-18-18 (36)							
20	725		S-7: Upper 7": Medium dense, well-graded GRAVEL with SAND (GW),fine- to coarse-grained; trace Silt; reddish tan, dry Lower 7": Medium dense, well-graded GRAVEL (GW), fine- to coarse-grained; little Sand, fine to coarse; trace Silt; tanish brown, wet		S-7 (18.5-20)	14	7-9-10 (19)	1.5						
25	720		S-8: Upper 4": Medium dense, well-graded GRAVEL (GW), fine- to coarse-grained; little Sand, fine to coarse; trace Silt; tanish brown, wet Lower 8": Stiff, lean CLAY (CL), low plasticity; trace Sand, fine; brown/gray, wet		S-8 (23.5-25)	12	11-9-7 (16)	1.5-2.0						
30	715		S-9: Upper 6": Stiff, lean CLAY (CL), low plasticity; trace Sand, fine; brown/gray, wet Lower 10": Loose, poorly-graded SAND (SP), fine- to medium-grained; gray, wet Boring ended at 30' below ground surface and backfilled with auger cuttings and bentonite chips	2	S-9 (28.5-30)	16	5-3-4 (7)							

REMARKS

1. Rock chips present in sample. Possible cobbles.
2. Sample damaged by rock partially blocking tip of sampler.

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17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

BORING NUMBER B-01

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/22/20 **COMPLETED** 4/22/20
GROUND ELEVATION 752.1 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: Grassy											
	750		S-1: TOPSOIL: Stiff, lean CLAY (CL), low plasticity; trace Gravel, fine; trace Silt; trace Organics; brown, moist		S-1 (1-2.5)	16	1-2-3 (5)	1.0-2.0						
5			S-2: Stiff, lean CLAY (CL), low plasticity; little Gravel, fine; trace Silt; brown, moist		S-2 (3.5-5)	7	1-2-5 (7)	1.0-2.0		26.5				
	745		S-3: Upper 2": Stiff, lean CLAY (CL), low plasticity; little Gravel, fine; trace Silt; brown, moist Lower 9": Medium dense, well-graded GRAVEL (GW), fine to coarse-grained; with Sand, fine to coarse; little Silt; tan, moist		S-3 (6-7.5)	11	5-11-10 (21)	1.5						
10			S-4: Medium dense, Clayey SAND (SC), fine to coarse-grained; some Gravel, fine to coarse; trace Silt; tan, moist		S-4 (8.5-10)	10	9-11-10 (21)							
	740		S-5: Very loose, poorly-graded SAND with SILT (SP-SM), fine to medium-grained; tan, moist		S-5 (11-12.5)	10	1-2-1 (3)			8.5				9
15			S-6: Medium dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; some Gravel, fine to coarse; tan, dry		S-6 (13.5-15)	11	3-8-10 (18)							
	735													
20			S-7: Very dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; with Gravel, fine to coarse; tan, dry		S-7 (18.5-20)	11	11-25-26 (50+)			4.2				8
	730													
25			S-8: Medium dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; with Gravel, fine to coarse; tan, wet		S-8 (23.5-25)	12	5-11-11 (22)							
	725													
30			S-9: Medium dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; trace Gravel, fine; tan, wet	1	S-9 (28.5-30)	12	4-4-7 (11)							
			Boring ended at 30' below ground surface and backfilled with auger cuttings and bentonite chips	2										

REMARKS

1. Approximately 1-foot of blowback in the hole.
2. Cave in at 20' BGS - no water.

GEOTECH WITH REMARKS AND ELEV - GINT STD US LAB.GDT - 6/3/20 14:27 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.00 SCHOOL SISTERS OF NOTRE DAME (APRIL 2020).GPJ

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

BORING NUMBER B-02

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/22/20 **COMPLETED** 4/22/20
GROUND ELEVATION 758.1 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: 3-inches of Asphalt Concrete and approximately 9-inches of base course											
			S-1: Upper 10": FILL: Hard, lean CLAY (CL), low plasticity; little Gravel, fine; trace Sand, fine; gray, moist Lower 1": BURIED TOPSOIL: Very stiff, PEAT (PT); trace Sand, fine; black, moist	1	S-1 (1-2.5)	11	5-3-6 (9)	4.0-3.0						
	755													
			S-2: FILL: Very loose, Clayey SAND (SC), fine to coarse-grained; trace Gravel, fine to coarse; white, gray, moist	2	S-2 (3.5-5)	10	1-1-2 (3)			31.7				27
5														
			S-3: Loose, well-graded SAND (SW), fine to coarse-grained; little Gravel, fine; little Clay; brown to tan, dry to moist		S-3 (6-7.5)	15	1-3-5 (8)							
	750													
			S-4: Loose, poorly-graded SAND with SILT (SP-SM), fine to medium-grained; tan, dry		S-4 (8.5-10)	12	3-4-6 (10)							
10														
			S-5: Medium dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; little Gravel, fine to coarse; tan, dry		S-5 (11-12.5)	15	5-7-7 (14)							
	745													
			S-6: Dense, poorly-graded GRAVEL with SILT and SAND (GP-GM), fine to coarse-grained; tan, dry	2	S-6 (13.5-15)	18	8-21-21 (42)			4.8	NP	NP	NP	8
15														
	740													
			S-7: Dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; some Gravel, fine to coarse; trace Rock fragments; tan, dry		S-7 (18.5-20)	14	10-19-22 (41)							
20														
			Boring ended at 20' below ground surface and backfilled with auger cuttings and bentonite chips											

REMARKS

1. Boring offset 15' south due to close proximity to utilities
2. Supplementary boring blind drilled to 2' bgs approximately 1' south of original boring location. Shelby tube sample taken from 2 to 4' bgs. 15" of recovery.
2. Rig chatter at 13.5' BGS

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GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

BORING NUMBER B-03

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/23/20 **COMPLETED** 4/23/20
GROUND ELEVATION 760.7 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0	760		Surface: Grassy											
			S-1: TOPSOIL: Stiff, sandy, lean CLAY (CL), low plasticity; trace Organics; brown to dark brown, moist		S-1 (1-2.5)	13	4-2-2 (4)	2.0						
			S-2: TOPSOIL: Very stiff, sandy, lean CLAY (CL), low plasticity; trace Organics; trace Gravel, fine; brown to dark brown, moist		S-2 (3.5-5)	15	2-3-4 (7)	2.0-3.0		22.5	NP	26	NP	
5	755													
			S-3: Upper 4": Very stiff, sandy lean CLAY (CL), low plasticity; trace Organics; trace Gravel, fine; brown to dark brown, moist Lower 14": Loose, poorly-graded SAND (SP), fine to medium-grained; little to some Silt; tan, moist		S-3 (6-7.5)	18	5-4-6 (10)	3.0						
			S-4: Upper 14": Loose, well-graded SAND with SILT (SW-SM), fine to coarse-grained; trace Gravel, fine; tan, moist Lower 4": Medium stiff, SILT (ML); little Sand, fine; tan, moist to wet		S-4 (8.5-10)	18	6-6-4 (10)	2.5-1.0		19.0				
10	750													
			S-5: Upper 10": Medium dense, well-graded SAND (SW), fine to coarse-grained; little Silt; tan, moist Lower 6": Medium dense, clayey GRAVEL (GC), fine to coarse-grained; some Sand, fine to coarse; white and brown, moist		S-5 (11-12.5)	16	5-12-11 (23)							
			S-6: Medium dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; some Gravel, fine to coarse; tan, moist		S-6 (13.-15)	18	9-9-10 (19)							
15	745													
			S-7: Medium dense, well-graded GRAVEL with SILT and SAND (GW-GM), fine to coarse-grained; tan, moist		S-7 (18.5-20)	16	4-11-18 (19)			5.6	NP	NP	NP	11
20	740													
			S-8: Medium dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; some Gravel, fine to coarse; little Clayey seems; tan, moist		S-8 (23.5-25)	12	3-9-10 (19)							
25	735													
			S-9: Hard, lean CLAY (CL), low plasticity; trace Gravel, fine; grayish brown, moist, but spoon tip was wet		S-9 (28.5-30)	18	5-11-11 (22)	4.5+		15.3				
30			Boring ended at 30' below ground surface and backfilled with auger cuttings and bentonite chips	1										

REMARKS

1. Cave in at 25' BGS - no water

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GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

BORING NUMBER B-04

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/23/20 **COMPLETED** 4/23/20
GROUND ELEVATION 763.8 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: Grassy											
			S-1: TOPSOIL: Stiff, sandy lean CLAY (CL), low plasticity; trace Gravel, fine; trace Organics; brown, moist to wet	1	S-1 (1-2.5)	12	2-4-4 (8)	2.0						
	760		S-2: Upper 4": Medium dense, poorly-graded SAND (SP), fine to medium-grained; some Gravel, fine to coarse; trace Silt; light tan, moist		S-2 (3.5-5)	14	10-13-15 (28)	4.5+		11.0				60
5			Lower 10": Hard, SILT (ML), nonplastic; some Sand, fine; trace Gravel, fine; brown, moist											
			S-3: Dense, poorly-graded SAND with SILT (SP-SM), fine to medium-grained; tan, moist		S-3 (6-7.5)	18	14-18-18 (36)							
	755		S-4: Medium dense, poorly-graded SAND with SILT (SP-SM), fine to medium-grained; tan, moist		S-4 (8.5-10)	18	8-14-16 (30)			5.2				13
10			S-5: Medium dense, poorly-graded SAND with SILT (SP-SM), fine to coarse-grained; tan, moist		S-5 (11-12.5)	17	4-12-12 (24)							
	750		S-6: Medium dense, poorly-graded SAND with SILT (SP-SM), fine to medium-grained; tan, moist		S-6 (13.5-15)	18	5-10-11 (21)							
15														
	745		S-7: Medium dense, poorly-graded SAND with SILT (SP-SM), fine to medium-grained; tan, moist		S-7 (18.5-20)	15	4-9-13 (22)							
20			Boring ended at 20' below ground surface and backfilled with auger cuttings and bentonite chips	2										

REMARKS

1. Boring offset 10' north due to obstruction near surface
2. Cave in at 16' BGS - no water

GEOTECH WITH REMARKS AND ELEV - GINT STD US LAB.GDT - 6/3/20 14:27 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.00 SCHOOL SISTERS OF NOTRE DAME (APRIL 2020).GPJ

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
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(262) 754-2560

BORING NUMBER B-05

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/22/20 **COMPLETED** 4/22/20
GROUND ELEVATION 752.5 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: Grassy Upper 12: sandy lean CLAY (CL) TOPSOIL, dark brown (possible fill)											
	750		S-1: TOPSOIL: Stiff, lean CLAY (CL), low plasticity; little Sand, fine; trace Organics; brown, moist (possible fill)		S-1 (1-2.5)	13	1-2-3 (5)	1.5						
5			S-2: Upper 4": Stiff, lean CLAY (CL), low plasticity; little Sand, fine; brown, moist Lower 11": Medium dense, well-graded SAND (SW), fine to coarse-grained; some Gravel, fine to coarse; trace Cobbles; trace Clay; tan, dry (possible fill)		S-2 (3.5-5)	15	8-11-9 (20)	1.5						
	745		S-3: Upper 2": Medium dense, well-graded SAND (SW), fine to coarse-grained; some Gravel, fine to coarse; trace Cobbles; trace Clay; tan, dry (possible fill) Lower 16": Medium stiff, SILT (ML), nonplastic; trace Sand, fine; brown, moist		S-3 (6-7.5)	18	5-7-11 (18)			20.2				
10			S-4: Upper 6": Hard, lean CLAY (CL), low plasticity; brown, moist Lower 12": Hard, SILT (ML), nonplastic; brown, moist		S-4 (8.5-10)	18	4-12-14 (24)	4.5						
	740		S-5: Upper 3": Stiff, lean CLAY (CL), low plasticity; brown, moist Lower 11": Very dense, well-graded SAND (SW), fine to coarse-grained; some Gravel, fine to coarse; tan, dry		S-5 (11-12.5)	14	16-28-24 (50+)	2.0						
15			S-6: Dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; some Gravel, fine to coarse; tan, dry		S-6 (13.5-15)	14	13-18-18 (36)							
	735		S-7: Very dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; some Gravel, fine to coarse; trace Rock fragments; tan, dry		S-7 (18.5-20)	12	14-25-26 (50+)							
20			Boring ended at 20' below ground surface and backfilled with auger cuttings and bentonite chips	1										

REMARKS

1. Cave in at 11.5' below ground surface

GEOTECH WITH REMARKS AND ELEV - GINT STD US LAB.GDT - 6/3/20 14:27 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.00 SCHOOL SISTERS OF NOTRE DAME (APRIL 2020).GPJ

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

BORING NUMBER B-06

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/22/20 **COMPLETED** 4/22/20
GROUND ELEVATION 755.4 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0	755		Surface: 2-inches of Asphalt Concrete											
			S-1: Upper 4": Loose, well-graded SAND (SW), fine to coarse-grained; some Gravel, fine to coarse; little Silt; tan, dry (base course)		S-1 (1-2.5)	13	4-1-3 (4)	2.5						
			Lower 9": Very stiff, lean CLAY (CL), low plasticity; little Sand, fine; trace Organics; dark brown, moist (Possible Buried Topsoil)		S-2 (3.5-5)	12	1-1-2 (3)	1.5		21.7				33
5	750		S-2: Stiff, lean CLAY (CL), low plasticity; some Sand, fine to coarse; brown, moist (Possible Fill)											
			S-3: Upper 10": Medium dense, well-graded SAND (SW), fine to coarse-grained; some Gravel, fine to coarse; trace Silt; brown, dry		S-3 (6-7.5)	14	5-14-7 (21)	4.5						
			Lower 4": Hard, silty CLAY (CL-ML), low plasticity; trace Sand, fine; brown, moist											
			S-4: Interbedded Medium dense, silty SAND (SM), fine to medium-grained; brown, moist AND		S-4 (8.5-10)	16	3-7-10 (17)	2.0-3.0						
10	745		Very stiff, SILT (ML); little to trace Sand, fine to medium; brown, moist											
			S-5: Medium dense, poorly-graded SAND with SILT (SP-SM), fine to medium-grained; brown, dry		S-5 (11-12.5)	17	6-10-15 (25)							
			S-6: No recovery	1	S-6 (13.5-15)	0	10-15-17 (32)							
15	740													
			S-7: Dense, well-graded GRAVEL with SILT and SAND (GW-GM), fine to coarse-grained; tan, dry	2	S-7 (18.5-20)	10	6-21-17 (38)			3.7	NP	NP	NP	8
20	735													
			S-8: Dense, well-graded GRAVEL with SILT and SAND (GW-GM), fine to coarse-grained; tan, dry		S-8 (23.5-25)	13	10-21-23 (44)							
25	730													
			S-9: Medium dense, well-graded GRAVEL with SILT and SAND (GW-GM), fine to coarse-grained; wet, tannish brown		S-9 (28.5-30)	8	4-13-16 (29)			8.0	NP	NP	NP	5
30			Boring ended at 30' below ground surface and backfilled with auger cuttings and bentonite chips	3										

REMARKS

1. Rig chatter at 13'
2. Rig chatter at 17'
3. Cave in at 18.5' BGS - no water

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GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

BORING NUMBER B-07

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/23/20 **COMPLETED** 4/23/20
GROUND ELEVATION 758.2 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW/MBB **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: Grassy											
	755		S-1: TOPSOIL: Very stiff, lean CLAY (CL), low plasticity; little Gravel, fine; little Sand, fine to coarse; trace Organics; brown, moist	1	S-1 (1-2.5)	12	5-5-6 (11)	3.0-3.5						
5			S-2: Upper 12": Stiff, lean CLAY (CL), low plasticity; little Gravel, fine; little Sand, fine to coarse; brown, moist Lower 3": Very loose, poorly-graded SAND (SP), fine to medium-grained; trace Silt; tan, moist		S-2 (3.5-5)	15	3-1-1 (2)	1.5		17.7				
	750		S-3: Loose, poorly-graded SAND with SILT (SP-SM), fine to medium-grained; trace Gravel, fine; tan, moist		S-3 (6-7.5)	15	4-3-4 (7)							
10			S-4: Upper 3": Medium dense, poorly-graded SAND with SILT (SP-SM), fine to medium-grained; trace Gravel, fine; tan, moist Lower 11": Medium dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; some to with Gravel, fine; tannish brown, moist		S-4 (8.5-10)	14	3-6-6 (12)							
	745		S-5: Dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; some to with Gravel, fine; tannish brown, moist		S-5 (11-12.5)	18	6-12-19 (31)			7.3				7
15			S-6: Dense, well-graded GRAVEL with SILT and SAND (GW-GM), fine to coarse-grained; little Clayey intervals; white, brown, tan, moist		S-6 (13.5-15)	18	17-22-18 (40)							
	740		S-7: Medium dense, poorly-graded SAND with SILT (SP-SM), fine to medium-grained; brown, moist	2	S-7 (18.5-20)	16	6-6-7 (13)							
20	735		S-8: Upper 5": Stiff SILT (ML); little Sand, fine; brown, moist Lower 13": Medium dense, poorly-graded SAND with SILT (SP-SM), fine to medium-grained; brown, moist		S-8 (23.5-25)	18	9-12-13 (25)	2.0						
25														
	730		S-9: Medium dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; tan, wet		S-9 (28.5-30)	11	4-8-10 (18)							
30			Boring ended at 30' below ground surface and backfilled with auger cuttings and bentonite chips											

REMARKS

1. Boring offset 15' south due to a bush in the way
2. Rig chatter at 18.5-20' bgs

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17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

BORING NUMBER B-08

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/23/20 **COMPLETED** 4/23/20
GROUND ELEVATION 760.5 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0	760		Surface: Grassy											
			S-1: TOPSOIL: Stiff, lean CLAY (CL), low plasticity; little Sand, fine; trace Gravel, fine; trace organics; brown to dark brown, moist		S-1 (1-2.5)	16	1-1-2 (3)	1.5-2.0						
			S-2: FILL: Medium stiff, lean CLAY (CL), low plasticity; little Sand, fine to coarse (increasing sand with depth); little Gravel, fine; trace Organics; brown to dark brown, moist		S-2 (3.5-5)	8	2-2-2 (4)	0.5-1.0		17.1	NP	17	NP	
5	755		S-3: FILL: Stiff, lean CLAY (CL), low plasticity; little Sand, fine to coarse ; little Gravel, fine; trace Organics; brown to dark brown, moist; rock in shoe		S-3 (6-6.9)	10	4-50/4-(50+)	1.5-2.0						
			S-4: Upper 3": FILL: Stiff, lean CLAY (CL), low plasticity; little Sand, fine to coarse ; little Gravel, fine; trace Organics; brown to dark brown, moist Lower 13": Medium dense silty SAND (SM), fine-grained; tan, moist		S-4 (8.5-10)	16	5-5-6 (11)	2.0						
10	750		S-5: Medium dense silty SAND (SM), fine-grained; tan, moist		S-5 (11-12.5)	16	4-5-6 (11)			7.3				39
			S-6: Upper 7": Medium dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; trace Gravel, fine; tan, moist Lower 8": Medium dense, poorly-graded SAND with SILT (SP-SM), fine to medium-grained; tan, moist		S-6 (13.5-15)	15	4-9-7 (16)							
15			Boring ended at 15' below ground surface and backfilled with auger cuttings and bentonite chips	1										

REMARKS

1. Cave in at 11' BGS - no water

GEOTECH WITH REMARKS AND ELEV - GINT STD US LAB.GDT - 6/3/20 14:27 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.00 SCHOOL SISTERS OF NOTRE DAME (APRIL 2020).GPJ

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

BORING NUMBER B-09

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/21/20 **COMPLETED** 4/21/20
GROUND ELEVATION 752.4 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: Grassy											
	750		S-1: TOPSOIL: Stiff to very stiff, silty CLAY (CL-ML), low plasticity; little Sand, fine; trace Organics; brown, moist		S-1 (1-2.5)	11	2-3-3 (6)	1-2.5						
5			S-2: Medium dense, well-graded SAND (SW), fine to coarse-grained; with Gravel, fine to coarse; little Silt; tan and brown, moist (possible fill)		S-2 (3.5-5)	16	4-9-11 (20)	2.0						
	745		S-3: Dense, well-graded GRAVEL (GW), fine to coarse-grained; with Sand, fine to coarse; rock fragments; tan and brown, dry		S-3 (6-7.5)	16	13-16-26 (42)							
10			S-4: Upper 2": Medium dense, well-graded GRAVEL (GW), fine to coarse-grained; with Sand, fine to coarse; tan and brown, dry Lower 13": Medium stiff, SILT (ML), nonplastic; light brown, wet		S-4 (8.5-10)	15	10-10-12 (22)	0.5-1.0						
	740		S-5: Upper 3": Medium stiff, SILT (ML), nonplastic; light brown, wet Lower 15": Very stiff, lean CLAY (CL), low plasticity; silty seams; brownish gray, moist	1	S-5 (11-12.5)	18	3-5-9 (14)	0.5-3.0						
15			S-6: Very stiff, lean CLAY (CL), low plasticity; Silty seams; brownish gray, moist		S-6 (13.5-15)	18	2-2-2 (4)	1.5-3.0		39.8	32	19	13	
	735													
20			S-7: Upper 4": Very stiff, lean CLAY (CL), low plasticity; Silty seams; brownish gray, moist Lower 14": Medium dense, poorly-graded SAND with SILT (SP-SM), fine to medium-grained; tan, moist		S-7 (18.5-20)	18	5-11-13 (24)	3.0						
	730													
25			S-8: Upper 3": Medium dense, poorly-graded SAND with SILT (SP-SM), fine to medium-grained; tan, moist Middle 12": Medium stiff, SILT (ML), nonplastic; brown, wet Lower 3": Very stiff, lean CLAY (CL), low plasticity; little Sand, medium to coarse; brown, moist		S-8 (23.5-25)	18	6-11-11 (22)	0.5-2.0						
	725													
30			S-9: Upper 10": Dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; tan, wet Lower 4": Dense, well-graded GRAVEL with SILT and SAND (GW-GM), fine to coarse-grained; tan, wet Boring ended at 30' below ground surface and backfilled with auger cuttings and bentonite chips		S-9 (28.5-30)	14	3-13-18 (31)							

REMARKS

1. Supplementary boring blind drilled to 10.5' bgs approximately 1' east of original boring location. Shelby tube sample taken from 10.5 to 12.5' bgs. 23" of recovery. Tube was damaged at the bottom.

GEOTECH WITH REMARKS AND ELEV - GINT STD US LAB.GDT - 6/3/20 14:27 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.00 SCHOOL SISTERS OF NOTRE DAME (APRIL 2020).GPJ

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

BORING NUMBER B-10

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/22/20 **COMPLETED** 4/22/20
GROUND ELEVATION 757 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY MBB **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: Grassy											
	755		S-1: TOPSOIL: Soft to medium stiff, lean CLAY (CL), low plasticity; little Sand, medium to coarse; trace Organics; brown, moist		S-1 (1-2.5)	13	5-2-3 (5)	0.25-1.0						
			S-2: Upper 5": TOPSOIL: Very stiff, lean CLAY (CL), low plasticity; little Sand, medium to coarse; trace Organics; brown, moist		S-2 (3.5-5)	16	2-3-8 (11)	3.0						
5			Lower 11": Medium dense, well-graded SAND (SW), fine to coarse-grained; some Gravel, fine to coarse; tan, dry											
	750		S-3: Medium dense, silty GRAVEL with SAND (GM), fine to coarse-grained; tan, dry		S-3 (6-7.5)	10	6-12-11 (23)			4.9	NP	NP	NP	13
			S-4: Dense, silty GRAVEL with SAND (GM), fine to coarse-grained; tan, dry	1	S-4 (8.5-10)	18	10-18-14 (32)							
10														
	745		S-5: Interbedded Stiff, lean CLAY (CL), low plasticity; brown, moist AND stiff, SILT (ML); brown, moist	2	S-5 (11-12.5)	16	3-8-12 (20)	1.5		21.4				
			S-6: Interbedded Very stiff, lean CLAY (CL), low plasticity; brownish gray, moist AND stiff, SILT (ML), nonplastic; brownish gray, moist		S-6 (13.5-15)	16	3-6-11 (17)	3.0-1.5						
15														
	740		S-7: Upper 11": Interbedded Very stiff, lean CLAY (CL), low plasticity; brownish gray, moist AND stiff, SILT (ML); brownish gray, moist		S-7 (18.5-20)	15	3-10-10 (20)	3.0-1.5						
20			Lower 4": Medium dense, poorly-graded SAND (SP), fine to medium-grained; trace Silt; brown, dry	3										
			Boring ended at 20' below ground surface and backfilled with auger cuttings and bentonite chips											

REMARKS

1. Rig chatter at 8.5-10'
2. Rig chatter at 11-12.5'
3. Cave in at 17' BGS - water at 16.5' BGS

GEOTECH WITH REMARKS AND ELEV - GINT STD US LAB.GDT - 6/3/20 14:27 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.00 SCHOOL SISTERS OF NOTRE DAME (APRIL 2020).GPJ

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

BORING NUMBER B-11

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/23/20 **COMPLETED** 4/23/20
GROUND ELEVATION 756.6 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY MBB **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: Grassy											
	755		S-1: TOPSOIL: Soft to stiff, lean CLAY (CL), low plasticity; trace Sand, fine; trace Gravel, fine; trace Organics; brown, moist		S-1 (1-2.5)	15	1-2-3 (5)	0.5-2.0						
5			S-2: Upper 5": TOPSOIL: Stiff, lean CLAY (CL), low plasticity; trace Sand, fine; trace Gravel, fine; trace Organics; brown, moist Lower 8": Loose, Clayey SAND (SC), fine-grained; trace Silt; brown, moist		S-2 (3.5-5)	13	2-2-2 (4)							
	750		S-3: Loose, poorly-graded SAND with SILT (SP-SM), fine to medium-grained; brown, moist		S-3 (6-7.5)	16	1-3-3 (6)							
10			S-4: Upper 5": Medium dense, poorly-graded SAND with SILT (SP-SM), fine to medium-grained; brown, moist Lower 9": Medium dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; some Gravel, fine to coarse; tan, dry		S-4 (8.5-10)	14	3-11-7 (18)							
	745		S-5: Dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; with Gravel, fine to coarse; tan, dry; rock in shoe	1	S-5 (11-12.5)	14	10-20-15 (35)							
15			S-6: Medium dense, silty SAND (SM), fine to medium-grained; brown, moist; rock in shoe	2	S-6 (13.5-15)	1	7-10-11 (21)							
	740													
20			S-7: Upper 10": Stiff, Clayey SAND (SC), fine to coarse-grained; some Silt; brown, wet Lower 8": Very stiff, SILT (ML), nonplastic; brown, wet	3	S-7 (18.5-20)	18	6-6-9 (15)	1.0-2.5		21.1				
	735													
25			S-8: Medium dense, poorly-graded SAND with SILT (SP-SM), fine to medium-grained; little Gravel, fine to coarse; brown, moist		S-8 (23.5-25)	18	8-12-13 (25)							
	730													
30			S-9: Medium dense, silty SAND (SM), fine to medium-grained; brown, wet		S-9 (28.5-30)	15	6-10-12 (22)							
			Boring ended at 30' below ground surface and backfilled with auger cuttings and bentonite chips	5										

REMARKS

1. Rig chatter at 11-12.5'
2. Rig chatter at 13.5-15'
3. Rig chatter at 18.5-20'
5. Cave in at 18.5' BGS - water at 14' BGS

GEOTECH WITH REMARKS AND ELEV - GINT STD US LAB.GDT - 6/3/20 14:27 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.00 SCHOOL SISTERS OF NOTRE DAME (APRIL 2020).GPJ

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

BORING NUMBER B-12

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/24/20 **COMPLETED** 4/24/20
GROUND ELEVATION 761.1 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: Grassy											
	760		S-1: Very stiff, lean CLAY (CL), low plasticity; trace Gravel, fine; trace Sand, fine; brown, moist		S-1 (1-2.5)	14	2-2-2 (4)	2.5-3.0						
			S-2: Very stiff, lean CLAY (CL), low plasticity; little to trace Sand, fine, increasing towards bottom of sample; trace Gravel, fine brown, moist		S-2 (3.5-5)	11	3-2-4 (6)	3-3.5		20.3				74
5														
	755		S-3: Upper 2": Very stiff, sandy lean CLAY (CL), low plasticity; brown, moist Lower 3": Medium dense, well-graded GRAVEL (GW), fine to coarse-grained; some Sand, fine to coarse; rock fragments present; trace Silt; tan, dry		S-3 (6-7.5)	5	7-10-7 (17)	3.0						
			S-4: Medium dense, silty SAND (SM), fine to coarse-grained; with Gravel, fine to coarse; little clayey chunks; dark tan, moist to dry		S-4 (8.5-10)	14	4-6-6 (12)							
10														
	750		S-5: Loose, silty SAND (SM), fine to coarse-grained; some Gravel, fine to coarse; brownish tan, moist		S-5 (11-12.5)	18	6-5-5 (10)			7.0	NP	NP	NP	13
			S-6: Loose, well-graded SAND with SILT (SW-SM), fine to coarse-grained; some Gravel, fine to coarse; little Clayey pockets; trace Silt; brownish tan, moist		S-6 (13.5-15)	15	3-4-6 (10)							
15			Boring ended at 15' below ground surface and backfilled with auger cuttings and bentonite chips	1										

REMARKS

1. Cave in at 10.5' BGS - no water

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(262) 754-2560

BORING NUMBER B-13

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/22/20 **COMPLETED** 4/22/20
GROUND ELEVATION 753.6 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW/MBB **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: Grassy											
			S-1: Upper 11": TOPSOIL: Stiff to very stiff, lean CLAY (CL), low plasticity; trace Gravel, fine; trace Sand, fine; trace Organics; brown, moist		S-1 (1-2.5)	16	2-2-2 (4)	1.0-2.5						
	750		Lower 5": Loose, well-graded SAND (SW), fine to coarse-grained; little Gravel, fine; tan, moist		S-2 (3.5-5)	12	4-4-6 (10)							
5			S-2: Loose, silty SAND (SM), fine to coarse-grained; little Gravel, fine; tan, moist											
			S-3: Dense, silty SAND (SM), fine to coarse-grained; some Gravel, fine to coarse; tan, dry		S-3 (6-7.5)	16	8-16-16 (32)			6.4	NP	NP	NP	18
	745		S-4: Dense, silty SAND (SM), fine to coarse-grained; with Gravel, fine to coarse; gray, dry		S-4 (8.5-10)	14	11-26-20 (46)							
10			S-5: Very stiff to hard, SILT (ML), nonplastic; tan to red, moist (clayey seam in center)	1	S-5 (11-12.5)	16	4-6-11 (17)	3.0-4.5						
	740		S-6: Medium dense, Silty SAND (SM), fine-grained; tan, wet		S-6 (13.5-15)	18	4-13-15 (28)							
15														
	735		S-7: Upper 6": Medium dense, Silty SAND (SM), fine-grained; brown, wet transitioning to very stiff SILT (ML); brown, wet		S-7 (18.5-20)	17	6-5-8 (13)	2.0-3.5						
20			Lower 11": Very stiff, lean CLAY (CL), low plasticity; gray, wet											
	730		S-8: Upper 5": Soft, lean CLAY (CL), low plasticity; gray, wet		S-8 (23.5-25)	18	7-13-11 (24)	0.5		19.4				50
25			Lower 13": Soft, SILT (ML), nonplastic; little Sand, fine; gray, wet											
	725		S-9: Upper 3": Very stiff, lean CLAY (CL), low plasticity; trace Silt; gray, moist		S-9 (28.5-30)	15	5-8-8 (16)	3.0-0.25						
30			Lower 12": Very soft, SILT (ML), nonplastic; little Sand, fine; gray, wet	2										
			Boring ended at 30' below ground surface and backfilled with auger cuttings and bentonite chips											

REMARKS

1. Rig chatter at 11.5' BGS
2. Cave in at 15' below ground surface

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(262) 754-2560

BORING NUMBER B-14

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/23/20 **COMPLETED** 4/23/20
GROUND ELEVATION 754.0 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: Grassy											
			S-1: Upper 10": TOPSOIL: Very stiff, sandy, lean CLAY (CL), low plasticity; trace Organics; trace Gravel, fine; brown, moist Lower 2": Loose, well-graded SAND with SILT (SW-SM), fine to coarse-grained; some Gravel, fine to coarse; tan, moist		S-1 (1-2.5)	12	3-2-3 (5)	3.5						
	750		S-2: Medium dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; some to with Gravel, fine to coarse; tanish brown, moist		S-2 (3.5-5)	14	4-8-11 (19)							
5			S-3: Medium dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; with Gravel, fine to coarse; tanish brown, moist; clay in shoe		S-3 (6-7.5)	16	13-21-25 (46)							
	745		S-4: Dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; with Gravel, fine to coarse; tanish brown, moist		S-4 (8.5-10)	15	9-11-8 (19)							
10			S-5: Very stiff, sandy, lean CLAY (CL), low plasticity; brown, moist; sample was disturbed due to spoon pushing stone		S-5 (11-12.5)	10	7-11-16 (27)	3.0						
	740		S-6: Hard, lean CLAY (CL), low plasticity; little Sand, fine; brown transitioning to brownish gray, moist		S-6 (13.5-15)	16	4-7-9 (16)	4.5						
15			Boring ended at 15' below ground surface and backfilled with auger cuttings and bentonite chips	1										

REMARKS

1. Cave in at 11.5' BGS - no water

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17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

BORING NUMBER B-15

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/24/20 **COMPLETED** 4/24/20
GROUND ELEVATION 756.0 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: Grassy											
	755		S-1: Stiff to very stiff, sandy, lean CLAY (CL), low plasticity; trace Gravel, fine; trace Organics; brown, moist (Topsoil)		S-1 (1-2.5)	18	2-2-3 (5)	1.5-3.0						
			S-2: Stiff to very stiff, sandy, lean CLAY (CL), low plasticity; trace Gravel, fine; trace Organics; brown, moist (Topsoil)		S-2 (3.5-5)	14	1-2-2 (4)	2.0		17.0				
5														
	750		S-3: Loose, poorly-graded SAND with SILT (SP-SM), fine to medium-grained; tan, moist		S-3 (6-7.5)	16	1-3-3 (6)							
			S-4: Medium dense, poorly-graded SAND with SILT (SP-SM), fine to medium-grained; tan, moist		S-4 (8.5-10)	16	4-6-6 (12)			9.3				10
10														
	745		S-5: Poor recovery likely due to rock in spoon. Material in spoon was likely blowback, but is same material as above		S-5 (11-12.5)	3	7-11-14 (25)							
			S-6: Very stiff SILT (ML); trace Gravel, fine; brown, transitioning to gray, moist		S-6 (13.5-15)	16	4-19-21 (40)	2.5-3.0						
15			Boring ended at 15' below ground surface and backfilled with auger cuttings and bentonite chips	1										

REMARKS

1. Cave in at 11.5' BGS - no water

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(262) 754-2560

BORING NUMBER B-16

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/23/20 **COMPLETED** 4/23/20
GROUND ELEVATION 752.4 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: Grassy											
	750		S-1: Very stiff, sandy, lean CLAY (CL), low plasticity; trace Gravel, fine; trace Organics; brown, moist (topsoil)		S-1 (1-2.5)	10	1-2-2 (4)	2.5						
5			S-2: Upper 3": Stiff, sandy, lean CLAY (CL), low plasticity; trace Gravel, fine; trace Organics; brown, moist (topsoil) Lower 12": Medium dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; with Gravel, fine to coarse; tan, dry to moist		S-2 (3.5-5)	15	8-12-18 (30)	1.5						
	745		S-3: Very dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; with Gravel, fine to coarse; possible Cobbles, rock fragments in spoon; tan, dry to moist		S-3 (6-7.5)	8	9-40-17 (50+)							
10			S-4: Upper 4": Medium dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; with Gravel, fine to coarse; tan, dry to moist Lower 14": Very stiff, sandy, lean CLAY (CL), low plasticity; trace Gravel, fine; brown, moist; seam of Stiff SILT (ML); brown, moist		S-4 (8.5-10)	18	7-4-8 (12)	3.5 - 1.5						
	740		S-5: Very stiff, lean CLAY (CL), low plasticity; trace Sand, fine; trace Gravel, fine; seams of softer Silt (1.5 pocket pen); brown, moist		S-5 (11-12.5)	18	5-7-8 (15)	2.0 - 4.5		29.4				
15			S-6: Upper 15": Very stiff, lean CLAY (CL), low plasticity; gray, brown, moist Lower 3": Medium stiff SILT (ML); gray, brown, moist		S-6 (13.5-15)	18	3-4-9 (13)	3.5-2.5, 0.5						
	735		S-7: Very stiff, lean CLAY (CL), low plasticity; gray, brown, moist; seams of Silt		S-7 (18.5-20)	18	3-5-4 (9)	3.5		22.1				
20			Boring ended at 20' below ground surface and backfilled with auger cuttings and bentonite chips	1										

REMARKS

1. Cave in at 14.5' BGS - no water

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GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

BORING NUMBER EB-01

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/21/20 **COMPLETED** 4/21/20
GROUND ELEVATION 743.3 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB
4/21/20	AD	18		10 Minutes

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: Grassy											
			S-1: TOPSOIL: Medium stiff, sandy SILT (ML), low plasticity; little Clay; trace Gravel, fine; trace Organics; brown, moist		S-1 (1-2.5)	9	1-2-2 (4)	1.0						
	740													
5			S-2: Upper 6": Medium stiff, sandy SILT (ML), low plasticity; little Clay; trace Gravel, fine; trace Organics; brown, moist Lower 12": Medium dense, well-graded SAND (SW) fine- to coarse; some Gravel, fine to coarse; trace Silt; brown to tan, dry		S-2 (3.5-5)	14	10-11-12 (23)	2.0						
			S-3: Medium dense, well-graded SAND with SILT (SW-SM) fine- to coarse; some Gravel, fine to coarse; dark tan to brown, dry		S-3 (6-7.5)	14	5-11-10 (21)							
	735													
10			S-4: Medium dense, well-graded SAND with SILT (SW-SM) fine- to coarse; little Gravel, fine to coarse; brown to dark tan, dry		S-4 (8.5-10)	11	10-14-10 (24)							
			S-5: Medium dense, well-graded SAND with SILT and GRAVEL (SW-SM), fine- to coarse-grained; trace to little Silt; brown and tan, dry		S-5 (11-12.5)	12	14-11-10 (21)							
	730													
15			S-6: Medium dense, well-graded GRAVEL with SILT and SAND (GW-GM), fine- to coarse-grained; brown and tan, dry	1	S-6 (13.5-15)	15	12-14-15 (29)			4.6	NP	NP	NP	9
	725													
20			S-7: Medium dense, well-graded GRAVEL with SILT and SAND (GW-GM), fine- to coarse-grained; brown, wet		S-7 (18.5-20)	9	6-7-11 (18)							
	720													
25			S-8: Hard, silty CLAY (CL-ML), low plasticity; trace to little Sand, fine; grayish brown, wet -Multiple silty seams present in sample.		S-8 (23.5-25)	14	7-6-9 (15)	4.0						
	715													
30			S-9: Hard, silty CLAY (CL-ML), low plasticity; trace to little Sand, fine; grayish brown, wet	2	S-9 (28.5-30)	4	15-38-45 (50+)	4.0						
			Boring ended at 30' below ground surface and backfilled with auger cuttings and bentonite chips											

REMARKS

1. Rock chips present in sampler. Possible cobbles.
2. High blow counts likely due to rock blocking sampler.

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APPENDIX C

LABORATORY TESTING RESULTS

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

TABULATION OF LABORATORY DATA

CLIENT Mandel Group **PROJECT NAME** School Sisters

PROJECT NUMBER 20.0156624.00 **PROJECT LOCATION** 13105 W

Boring Number	Sample Number	Depth (ft)	Natural Moisture %	Dry Unit Weight (pcf)	Sieve Data: Percent Passing By Weight					Atterberg Limits		
					3/4"	No. 4	No. 10	*No. 40	No. 200	LL	PL	P
AB-01	S-3	6-7.5	5.4			88	75	37	10	NP	NP	N
AB-01	S-9	28.5-32	25.2						4			
AB-02	S-1	1-2.5	26.0						34	NP	21	N
AB-02	S-6	13.5-15	5.9		100	84	71	25	10	NP	NP	N
AB-02	S-7	18.5-20	15.6									
AB-03	S-1	1-2.5	19.6									
AB-03	S-3	6-7.5	4.9		81	46	34	16	8	NP	NP	N
AB-04	S-5	11-12.5	5.1		78	49	35	19	12	NP	NP	N
B-01	S-2	3.5-5	26.5									
B-01	S-5	11-12.5	8.5						9			
B-01	S-7	18.5-20	4.2						8			
B-02	S-2	3.5-5	31.7						27			
B-02	S-6	13.5-15	4.8		73	47	40	18	8	NP	NP	N
B-03	S-2	3.5-5	22.5							NP	26	N
B-03	S-4	8.5-10	19.0									
B-03	S-7	18.5-20	5.6		93	67	51	22	11	NP	NP	N
B-03	S-9	28.5-30	15.3									
B-04	S-2	3.5-5	11.0						60			
B-04	S-4	8.5-10	5.2						13			
B-05	S-3	6-7.5	20.2									
B-06	S-2	3.5-5	21.7						33			
B-06	S-7	18.5-20	3.7		78	50	37	19	8	NP	NP	N
B-06	S-9	28.5-30	8.0		89	48	30	19	5	NP	NP	N
B-07	S-2	3.5-5	17.7									
B-07	S-5	11-12.5	7.3						7			
B-08	S-2	3.5-5	17.1							NP	17	N

GZA LAB SUMMARY - GINT STD US LAB.GDT - 6/2/20 11:51 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.00 SCHOOL SISTERS OF NOTRE DAME (APRIL 2020).GPJ

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17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

TABULATION OF LABORATORY DATA

CLIENT Mandel Group **PROJECT NAME** School Sisters

PROJECT NUMBER 20.0156624.00 **PROJECT LOCATION** 13105 W

Boring Number	Sample Number	Depth (ft)	Natural Moisture %	Dry Unit Weight (pcf)	Sieve Data: Percent Passing By Weight					Atterberg Limits		
					3/4"	No. 4	No. 10	*No. 40	No. 200	LL	PL	P
B-08	S-5	11-12.5	7.3						39			
B-09	S-6	13.5-15	39.8							32	19	1
B-10	S-3	6-7.5	4.9		86	52	42	25	13	NP	NP	N
B-10	S-5	11-12.5	21.4									
B-11	S-7	18.5-20	21.1									
B-12	S-5	11-12.5	7.0		100	87	73	30	13	NP	NP	N
B-13	S-3	6-7.5	6.4		94	68	54	38	18	NP	NP	N
B-13		28.5-30										
B-15	S-2	3.5-5	17.0									
B-15	S-4	8.5-10	9.3						10			
B-16	S-5	11-12.5	29.4									
B-16	S-7	18.5-20	22.1									
EB-01	S-6	13.5-15	4.6		70	46	35	17	9	NP	NP	N
Maximum Values:			39.8		100	88	75	38	74	32	26	
Minimum Values:			3.7		70	46	30	16	4	0	0	
Average Value:			14.7		86	61	48	24	20	2	5	
Number of Tests Performed:			40	0	11	12	12	12	25	16	16	1

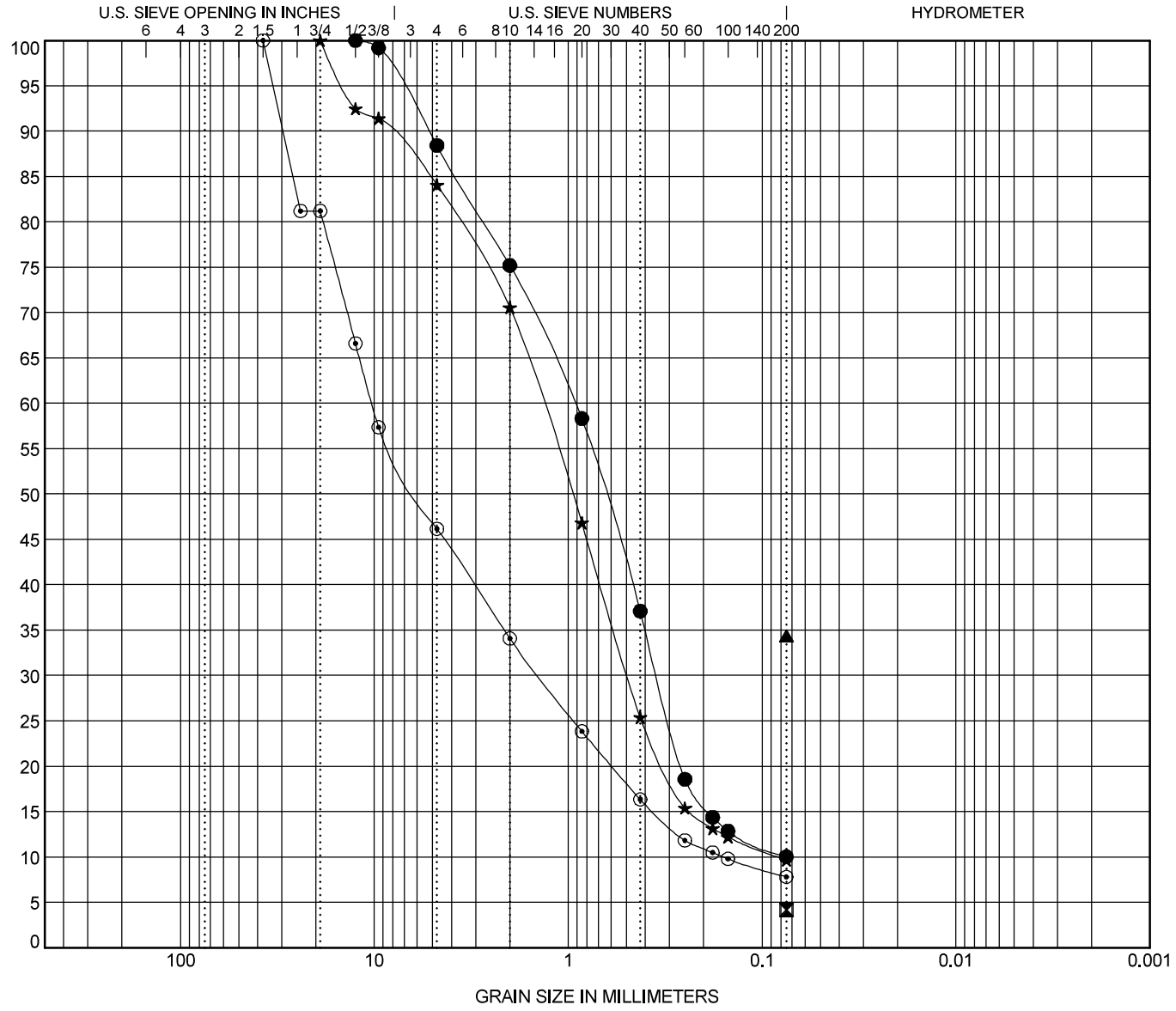
GZA LAB SUMMARY - GINT STD US LAB.GDT - 6/2/20 11:51 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.00 SCHOOL SISTERS OF NOTRE DAME (APRIL 2020).GPJ

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

GRAIN SIZE DISTRIBUTION

CLIENT Mandel Group **PROJECT NAME** School Sisters of Notre Dame

PROJECT NUMBER 20.0156624.00 **PROJECT LOCATION** 13105 Watertown Plank Rd., Elm Grove, WI



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	AB-01	6.0	WELL-GRADED SAND with SILT(SW-SM)	NP	NP	NP	1.74	12.39
⊠	AB-01	28.5						
▲	AB-02	1.0	SILTY SAND(SM)	NP	21	NP		
★	AB-02	13.5	WELL-GRADED SAND with SILT and GRAVEL(SW-SM)	NP	NP	NP	2.18	16.68
⊙	AB-03	6.0	WELL-GRADED GRAVEL with SILT and SAND(GW-GM)	NP	NP	NP	1.24	64.62

	BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AB-01	6.0	12.5	0.926	0.347		11.6	78.4	10.0	
⊠	AB-01	28.5	0.075						4.1	
▲	AB-02	1.0	0.075						34.4	
★	AB-02	13.5	19	1.366	0.493	0.082	15.9	74.4	9.7	
⊙	AB-03	6.0	37.5	10.276	1.423	0.159	53.8	38.4	7.8	

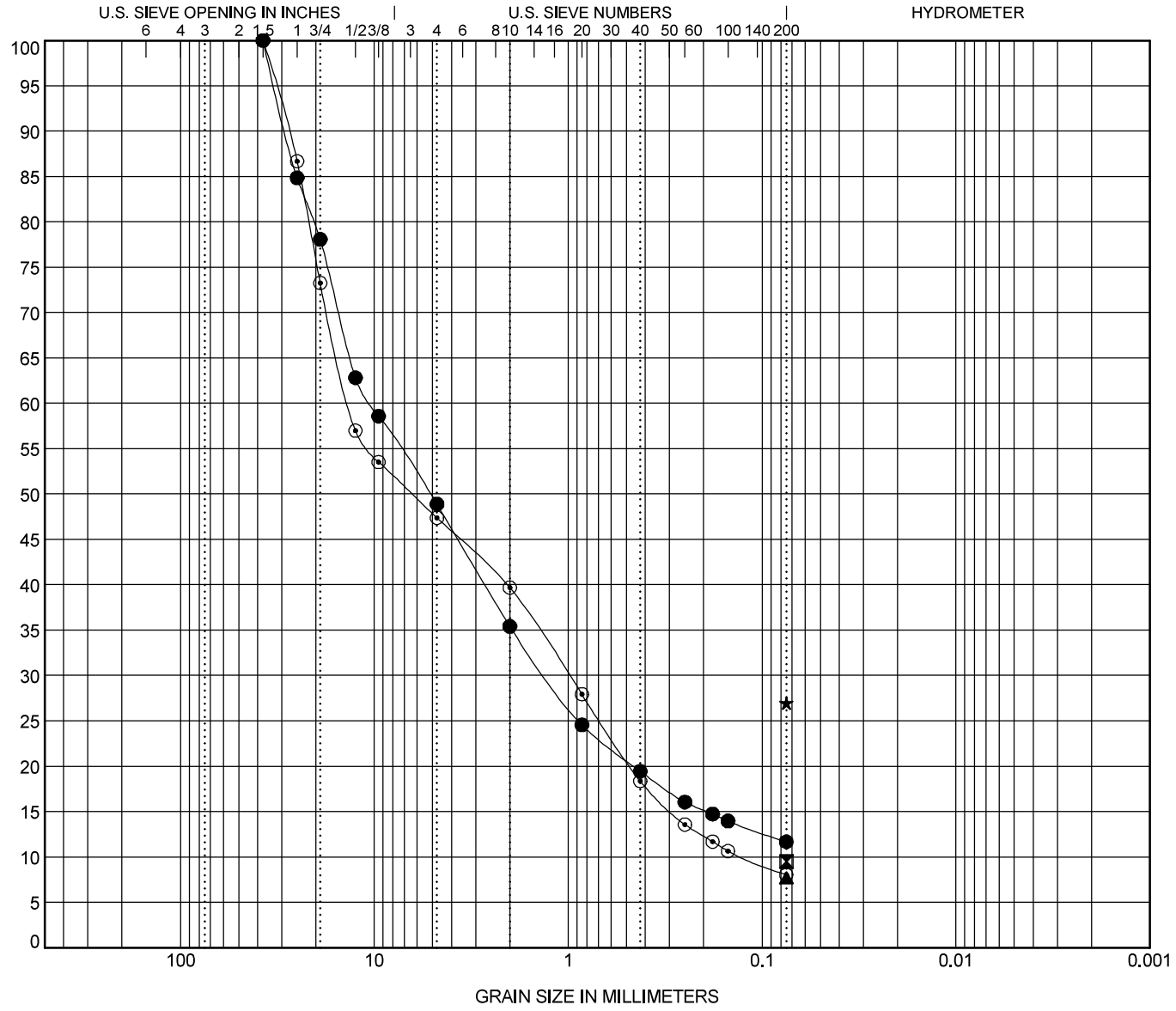
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	**AB-04**	**11.0**	**POORLY GRADED GRAVEL with SILT and SAND(GP-GM)**	**NP**	**NP**	**NP**	**3.61**	**229.46**
⊠	**B-01**	**11.0**						
▲	**B-01**	**18.5**						
★	**B-02**	**3.5**						
⊙	**B-02**	**13.5**	**POORLY GRADED GRAVEL with SILT and SAND(GP-GM)**	**NP**	**NP**	**NP**	**0.57**	**106.78**

	BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	**AB-04**	**11.0**	**37.5**	**10.413**	**1.306**		**51.1**	**37.2**	**11.7**	
⊠	**B-01**	**11.0**	**0.075**						**9.5**	
▲	**B-01**	**18.5**	**0.075**						**7.7**	
★	**B-02**	**3.5**	**0.075**						**26.9**	
⊙	**B-02**	**13.5**	**37.5**	**13.509**	**0.988**	**0.127**	**52.6**	**39.3**	**8.0**	

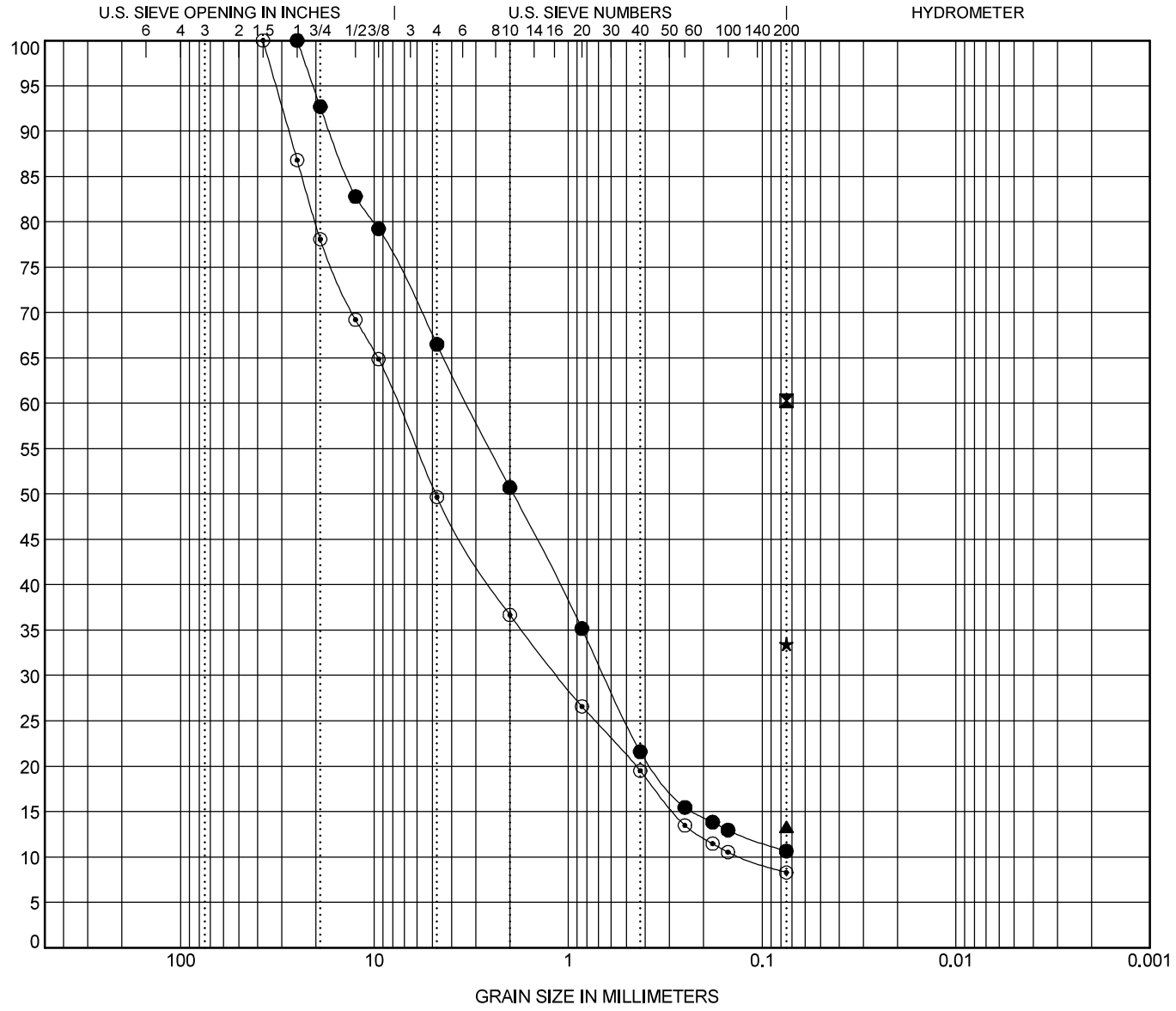
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	B-03	18.5	WELL-GRADED SAND with SILT and GRAVEL(SW-SM)	NP	NP	NP	2.07	53.84
⊠	B-04	3.5						
▲	B-04	8.5						
★	B-06	3.5						
⊙	B-06	18.5	WELL-GRADED GRAVEL with SILT and SAND(GW-GM)	NP	NP	NP	1.33	59.64

	BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-03	18.5	25	3.326	0.653		33.5	55.9	10.6	
⊠	B-04	3.5	0.075						60.3	
▲	B-04	8.5	0.075						13.3	
★	B-06	3.5	0.075						33.4	
⊙	B-06	18.5	37.5	7.609	1.136	0.128	50.3	41.4	8.3	

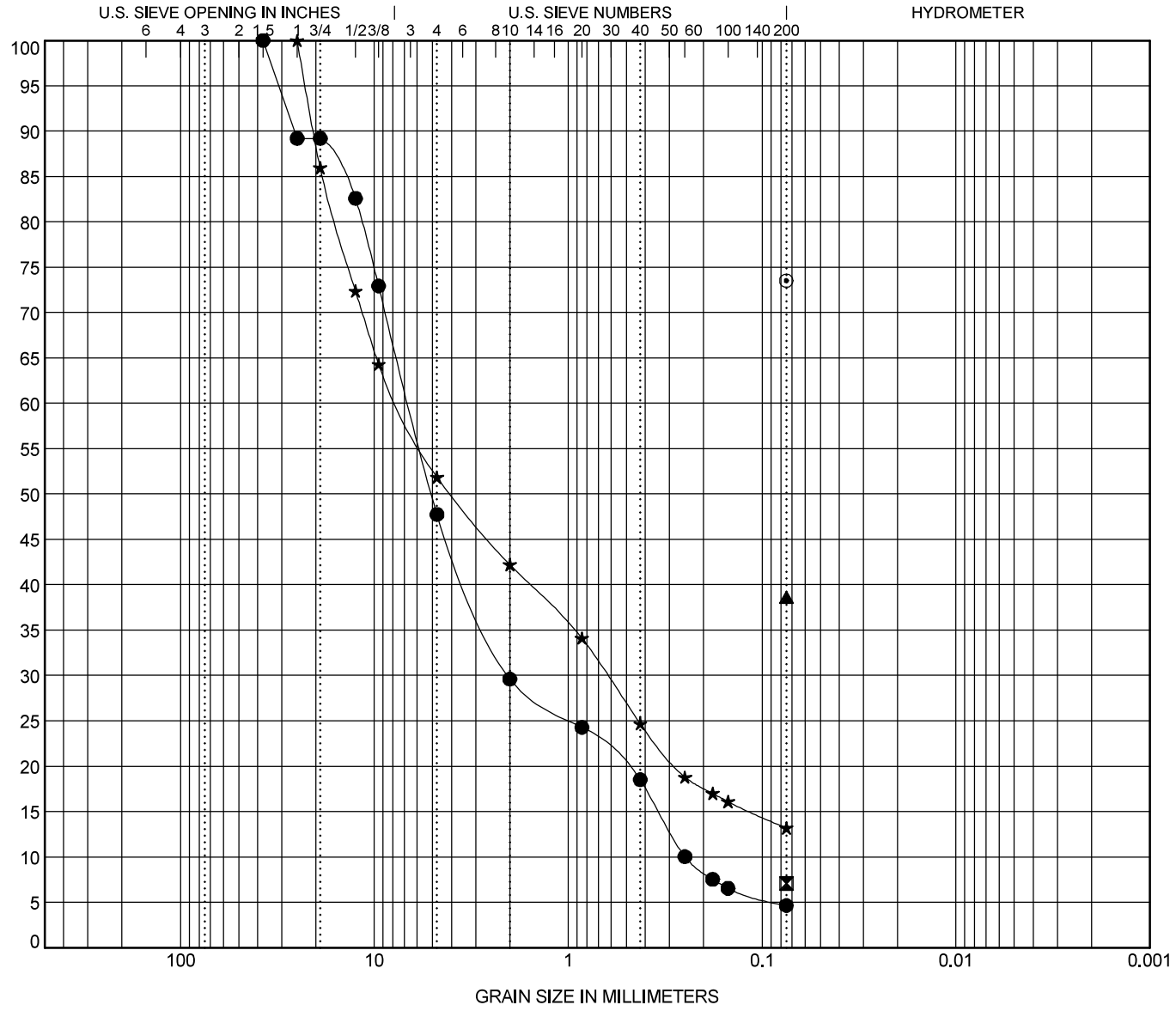
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COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	B-06	28.5	WELL-GRADED GRAVEL with SAND(GW)	NP	NP	NP	2.51	26.70
⊠	B-07	11.0						
▲	B-08	11.0						
★	B-10	6.0	SILTY GRAVEL with SAND(GM)	NP	NP	NP		
⊙	B-12	3.5						

	BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-06	28.5	37.5	6.655	2.039	0.249	52.3	43.1	4.6	
⊠	B-07	11.0	0.075						7.0	
▲	B-08	11.0	0.075						38.6	
★	B-10	6.0	25	7.475	0.628		48.1	38.7	13.2	
⊙	B-12	3.5	0.075						73.5	

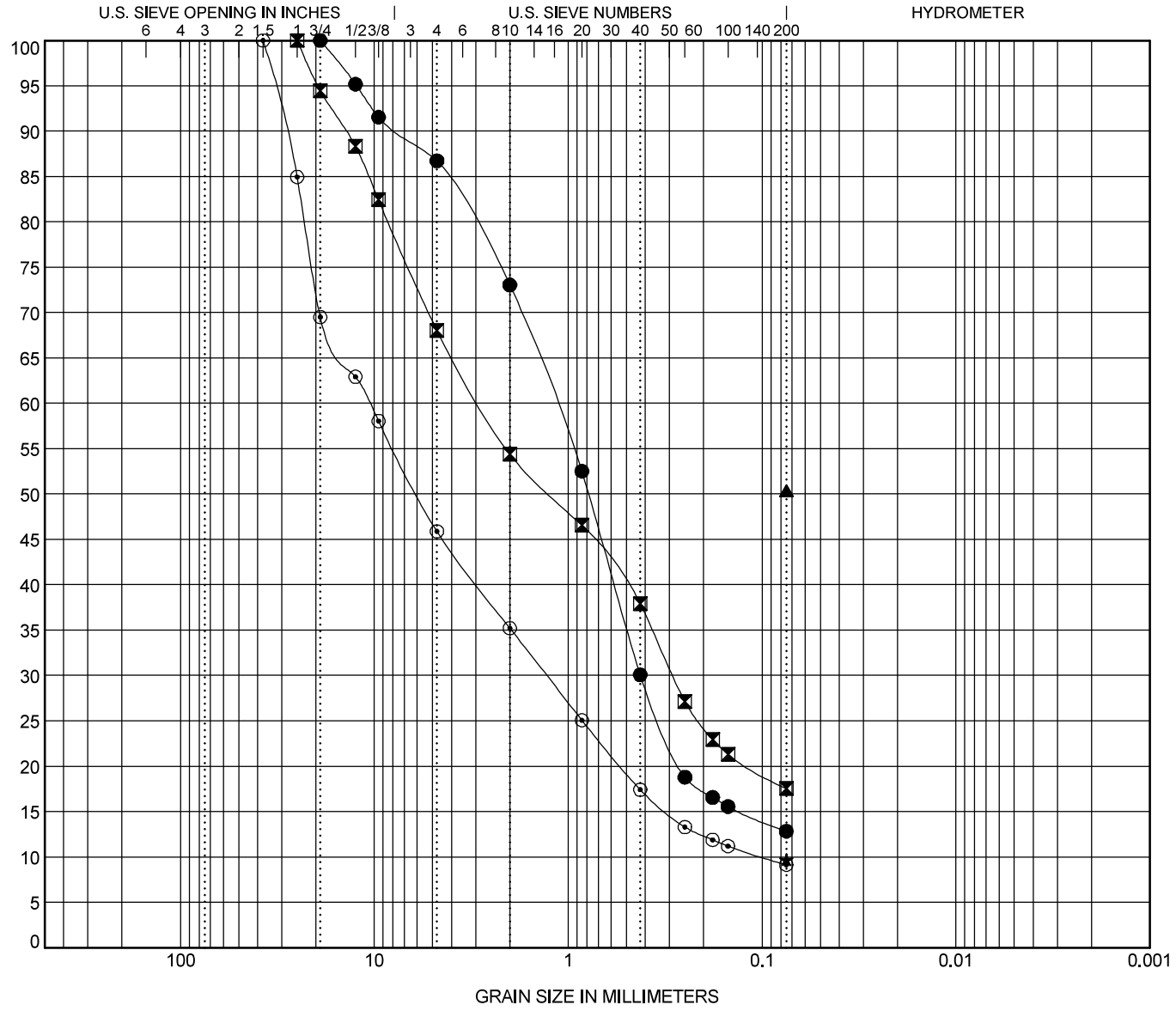
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PROJECT NUMBER 20.0156624.00 **PROJECT LOCATION** 13105 Watertown Plank Rd., Elm Grove, WI



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BOREHOLE	DEPTH	Classification	LL	PL	PI	Cc	Cu
●	B-12	11.0	SILTY SAND(SM)	NP	NP	NP		
⊠	B-13	6.0	SILTY SAND with GRAVEL(SM)	NP	NP	NP		
▲	B-13	23.5						
★	B-15	8.5						
⊙	EB-01	13.5	WELL-GRADED GRAVEL with SILT and SAND(GW-GM)	NP	NP	NP	1.56	105.20

	BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-12	11.0	19	1.161	0.424		13.3	73.9	12.8	
⊠	B-13	6.0	25	2.854	0.288		31.9	50.5	17.5	
▲	B-13	23.5	0.075						50.4	
★	B-15	8.5	0.075						9.7	
⊙	EB-01	13.5	37.5	10.603	1.29	0.101	54.1	36.8	9.1	

GRAIN SIZE - GINT STD US LAB.GDT - 6/2/20 11:53 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.00 SCHOOL SISTERS OF NOTRE DAME (APRIL 2020).GPJ

APPENDIX D

RECOMMENDED USE AND GRADATION REQUIREMENTS FOR FILL MATERIALS

APPENDIX D
RECOMMENDED USE AND GRADATION REQUIREMENTS
FOR FILL MATERIALS

School Sisters of Notre Dame Development
Elm Grove, Wisconsin

USE OF FILL MATERIALS

Structural Fill: As pavement base course, raising Site grades.

Coarse Aggregate: As floor slab base course.

General Fill: Used to raise Site grades.

GRADATION REQUIREMENTS

Structural Fill shall be free from ice and snow, roots, sod, rubbish and other deleterious or organic matter. It shall be a crushed stone aggregate conforming to the requirements of the WisDOT Standard Specifications for Highway and Structure Construction and the following gradation requirements:

Sieve Size	Percent Finer By Weight
1 inch	100
⅜-inch	40-75
No. 4	25-60
No. 10	15-45
No. 200	3-12

Coarse Aggregate shall be free from ice and snow, roots, sod, rubbish and other deleterious or organic matter. It shall conform to the requirements of the WisDOT Standard Specifications for Highway and Structure Construction, and the following gradation requirements:

Sieve Size	Percent Finer By Weight
1½ inches	100
1 inch	90-100
¾-inch	20-55
⅜-inch	0-15
No. 4	0-5

General Fill that are sufficient for use above the water table may be classified as GW, GP, GM, GC, SW, SP, SM, or CL in accordance with the Unified Soil Classification System (USCS) (ASTM D2487*, Standard Practice for Classification of Soils for Engineering Purposes [Unified Soil Classification System]*). Fill materials that are near the water table should consist of imported, well-graded, granular material that has minimal water sensitivity. Fill materials should be selected based on proximity to the water table and use. Fill materials are recommended to be natural soil free from ice and snow, roots, sod, rubbish and other deleterious or organic matter. The maximum particle size of fill is recommended to be $^{2}/_{3}$ of the loose lift thickness except in the top 12 inches of General Fill, which is recommended to have a maximum 3-inch particle size. An experienced geotechnical engineer should review and approve General Fill materials prior to use.



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ECOLOGICAL
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17975 West Sarah Lane
Suite 100
Brookfield, WI 53045
T: 262.754.2560
F: 262.923.7758
www.gza.com

February 4, 2021
File No. 20.0156624.01

Mr. Daniel T. Romnek, Development Associate
Mandel Development Inc.
330 East Kilbourn Avenue, Suite 600 South
Milwaukee, Wisconsin 53202

Re: Infiltration Test Results
School Sisters of Notre Dame Project
13105 Watertown Plank Road
Elm Grove, Wisconsin

Dear Mr. Romnek:

This letter provides GZA GeoEnvironmental, Inc.'s (GZA) infiltration test results obtained for the School Sisters of Notre Dame project in Elm Grove, Wisconsin ("Site"). We understand that stormwater infiltration is desired in the planned infiltration basin and ponds that are currently under design. Stormwater runoff from the structures and parking lots will be directed toward the stormwater dry ponds to treat the runoff for pollutants created from those surfaces before the water is conveyed to the infiltration basin and into the soil. We understand that the sizing, design, and configuration of the stormwater system will be conducted by K. Singh & Associates, Inc. (Singh). Preliminary pond information provided by Singh is as follows:

Pond Designation	Top of Pond Elevation (feet)	Bottom of Pond Elevation (feet)
Dry Pond #1	755.0	751.0
Dry Pond #2	753.0	751.0
Infiltration Basin #1	745.0	735.0

GZA conducted an assessment of the infiltration rate/potential in accordance with the Wisconsin Department of Natural Resources' (WDNR) Technical Standard 1002, "Site Evaluation for Stormwater Infiltration." The assessment was conducted to provide design criteria for the proposed infiltration design for the Site. The findings, conclusions, and recommendations that GZA derived from the assessment and geotechnical evaluation are provided in this letter. This letter is subject to the limitations provided in Attachment 1.

WORK SUMMARY

Three tests were conducted at the Site. Two test pits were excavated in the planned two northern dry ponds and the third test pit in the planned infiltration basin #1 by Western Contractors (an earthwork contractor). Double-ring infiltrometer tests were performed by GZA field geologists in the test pit locations. The three test locations (IT-1, IT-2, and IT-

3) are shown on Figure 1. The tests were performed on January 27, 2021. Excavation for the test pits extended below frost and was terminated at approximately 1.6 feet below grade for IT-1, 3.8 feet for IT-2, and 12 feet below grade for IT-3, which correspond to the approximate pond bottom elevations at or near elevation 750 feet North American Vertical Datum of 1988 (NAVD 88) for IT-1 and IT-2 and 732 feet for IT-3. The initially planned IT-3 location at planned Infiltration Basin #1 had to be relocated due to heavy tree cover and the presence of deep fill soil that contained rubble. The test was performed south of the tree area and at the south end of the planned basin location.

Previous soil borings were advanced on the Site for the geotechnical design aspects of the project. Soil borings B-9, B-10, and B-13 were drilled near the first two test pits and borings AB-1 and AB-2 near the third test pit relatively close to the planned ponds and infiltration basin locations. The approximate soil boring locations are also shown on Figure 2 and the boring logs are provided in Attachment 2. The borings were advanced through approximately 1¾ to 4 feet of topsoil with roots and organic matter. The underlying inorganic soils consisted of loose to dense, well-graded to poorly-graded sand with silt (SW, SW-SM, SP-SM) and poorly- to well-graded gravel (GM, GW). Lean clay (CL) soils and silt (ML) soils were present in distinct layers in the borings.

Bulk soil samples were obtained during the test pit excavations at the approximate pond and basin bottom elevations. Grain size tests were performed on the bulk samples and the grain size distribution for soil samples are presented in the table below. These results are based on sieve tests conducted following American Society for Testing and Materials (ASTM) D422, *Standard Test Method for Particle-Size Analysis of Soils*. The soil samples tested had moisture contents that ranged from 13.9% to 25.0% moisture. The soil tested had United States Department of Agriculture (USDA) classifications of loamy sand, sandy clay loam, and sandy loam for IT-1, IT-2, and IT-3 soil samples, respectively.

Test Sample Location	Approx. Ground Surface Elevation (feet)	Test Sample Depth (feet)	Approx. Test Elevation (feet)	Percent Gravel (%)	Percent Sand (%)	Percent Fines (Silt and Clay) (%)
IT-1	753.8	3.8	750.0	16.7	71.9	11.4
IT-2	752.3	1.6	750.7	4.3	46.5	49.2
IT-3	744.0	12.0	732.0	20.4	53.2	26.4

Wet soil was noted in boring B-13 at 13⅓ feet below ground surface (bgs) during drilling. This water depth corresponds to an approximate elevation of 740 feet NAVD 88.

DESIGN RECOMMENDATIONS

Infiltration rates at the test locations were variable. The initial infiltration rates were higher than the later, more stabilized rates. This phenomenon is common due to unsaturated infiltration rates being faster than more stabilized, saturated rates. The table below provides the test results.

Pond Designation	Test Designation	Range of Infiltration Rates (in/hr)	Stabilized Infiltration Rate (in/hr)
Dry Pond 1	Test Pit 1	12.8 to 21.2	12.9
Dry Pond 2	Test Pit 2	1.0 to 1.5	1.0
Infiltration Basin #1	Test Pit 3	10.8 to 19.0	10.8

Notes:

1) in/hr = inches per hour.

We appreciate the opportunity to provide service for this project. Please feel free to contact us with any questions.

Very truly yours,

GZA GeoEnvironmental, Inc.

John M. Siwula, P.E., D. GE
Associate Principal

Bernard G. Fenelon, P.G.
Senior Consultant/Hydrogeologist

J:\156600to156699\156624 Sisters of ND\01 Geotech CA1\Report\FINAL 20.0156624.01 Infiltration Test Results_Elm Grove WI 2-4-21.docx

Attachments: Figures 1 and 2
Limitations
Boring Logs

FIGURES



LEGEND

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE PARCEL BOUNDARY
- INFILTRATION TEST LOCATION
- STORM MANHOLE
- SANITARY MANHOLE
- HYDRANT

NOTES

1. BASE MAP DEVELOPED FROM A GOOGLE PROFESSIONAL ELECTRONIC IMAGE FILE. DIGITAL AERIAL ORTHOPHOTOGRAPHY WAS PUBLISHED BY THE U.S.G.S.
2. THE USE OF AERIAL PHOTOGRAPHY CAN OFTEN MAKE BUILDINGS AND OTHER SITE FEATURES APPEAR TO BE OVERLAPPING AND DISTORTED WHEN OVERLAID WITH ACTUAL SITE FEATURES.
3. THE INFORMATION ON THIS FIGURE WAS ADAPTED FROM TOPOGRAPHIC SURVEY BY CHAPUT LAND SURVEYS, DATED DECEMBER 15, 2020.
4. BEARINGS ARE REFERENCED TO THE WISCONSIN STATE PLANE COORDINATE SYSTEM (SOUTH ZONE) NAD27, IN WHICH THE NORTH LINE OF THE NE 1/4 BEARS N89 58'52"E.
5. VERTICAL DATUM IS BASED ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929.

N W E S

0 100' 200' 400'

SCALE IN FEET 1" = 200'

NO.	ISSUE/DESCRIPTION	BY	DATE

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SCHOOL SISTERS OF NOTRE DAME DEVELOPMENT
13105 WATERTOWN PLANK ROAD
ELM GROVE, WISCONSIN

INFILTRATION TEST LOCATIONS

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
MANDEL GROUP
330 EAST KILBOURN AVENUE
MILWAUKEE, WISCONSIN

PROJ MGR: JDG	REVIEWED BY: JDG	CHECKED BY: IJM	FIG 1
DESIGNED BY: IJM	DRAWN BY: PLR	SCALE: see above	
DATE: 6/3/2020	PROJECT NO. 20.0156624.01	REVISION NO.	SHEET NO.

©2016 – GZA GeoEnvironmental, Inc. GZA–\\GZAWAUKESHA\JOBS\156600T0156699\156624 SISTERS OF ND\FIGURES\20.0156624.00 SITE PLAN.DWG FIG 1 – INFILTRATION TEST LOCATIONS FEBRUARY 3, 2021 HUNTER PINK

©2016 – GZA GeoEnvironmental, Inc. GZA–\\GZAWAUKESHA\JOBS\156600T0156699\156624 SISTERS OF ND\FIGURES\20.0156624.00 SITE PLAN.DWG FIG 2 – BORING LOCATION FEBRUARY 3, 2021 HUNTER PINKERTON

JUNEAU BLVD.

WATERTOWN PLANK RD.

CRESCEN

WATERTOWN PLANK RD.

N89°58'52"E 2655.47'
NORTH LINE OF THE NE 1/4, SEC. 20-7-20

N89°58'52"E 211.08'

227.33'

S00°01'08"E 12.00'

101.83'

S00°01'08"E 237.78'

76.40'

STEPHEN PL.

SITE BENCHMARK: 764.46
SANITARY MANHOLE RIM

SITE BENCHMARK: 766.43
TOP NOZZLE ON HYDRANT

N52°39'25"E 708.83'

B-4
N:386794.6
E:2514934.6
Z:763.8

B-3
N:386673.9
E:2514751.2
Z:760.7

B-8
N:386663.9
E:2515071.0
Z:760.5

SITE BENCHMARK: 758.74
STORM MANHOLE RIM

GROUP "C" BORINGS

B-2
N:386521.1
E:2514581.8
Z:758.1

B-12
N:386501.4
E:2515229.6
Z:761.0

GROUP "B" BORINGS

B-7
N:386441.1
E:2514934.2
Z:758.2

B-1
N:386369.3
E:2514465.1
Z:752.1

SITE BENCHMARK: 757.16
SANITARY MANHOLE RIM

B-11
N:386354.9
E:2515037.6
Z:756.6

B-15
N:386325.1
E:2515245.9
Z:756.0

B-6
N:386317.3
E:2514699.4
Z:755.4

N00°54'07"W 129.63'

S80°58'53"W 96.85'

S51°43'53"W 101.60'

N35°52'07"W 73.10'

B-5
N:386231.7
E:2514578.8
Z:752.5

B-10
N:386291.0
E:2515011.8
Z:754+/-2

B-14
N:386178.3
E:2515157.3
Z:754.0

S00°53'08"E 731.70'

RED BARN LN.

N02°48'07"W 325.00'

TOP - 755'
BOTTOM - 751'

APPROX. DRY POND #1 AND #2 LOCATIONS

B-13
N:386041.2
E:2514940.1
Z:753.6

B-16
N:386025.9
E:2515235.2
Z:752.4

B-9
N:386019.6
E:2514677.[illegible]
Z:752.[illegible]

TOP - 753'
BOTTOM - 751'

S89°06'52"W 464.90'

N00°54'07"W 124.88'

N00°54'07"W 127.11'

N35°28'47"W 187.44'

187.63'

TOP - 745'
BOTTOM - 735'

GROUP "A" BORINGS

AB-1
N:385706.4
E:2514785.4
Z:750.6

AB-2
N:385596.0
E:2514621.1
Z:745.6

APPROX. INFILTRATION BASIN #1 LOCATION

S00°53'08"E 715.40'

GREEN MEADOW PL.

MEADOW DR.

N18°05'27"E

AB-4
N:385453.2
E:2514554.9
Z:744.8

AB-3
N:385465.5
E:2514756.7
Z:743.8

EB-1
N:385377.7
E:2514619.0
Z:743.3

287.80'

C P RAIL SYSTEM

235.36'

LEGEND

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE PARCEL BOUNDARY
- SOIL BORING
- STORM MANHOLE
- SANITARY MANHOLE
- HYDRANT

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1. BASE MAP DEVELOPED FROM A GOOGLE PROFESSIONAL ELECTRONIC IMAGE FILE. DIGITAL AERIAL ORTHOPHOTOGRAPHY WAS PUBLISHED BY THE U.S.G.S.
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3. THE INFORMATION ON THIS FIGURE WAS TAKEN FROM CHAPUT LAND SURVEYS, DRAWING NO. SB-EX3454-FAR, DATED MARCH 27, 2020.
4. BEARINGS ARE REFERENCED TO THE WISCONSIN STATE PLANE COORDINATE SYSTEM (SOUTH ZONE) NAD27, IN WHICH THE NORTH LINE OF THE NE 1/4 BEARS N89°58'52"E.
5. VERTICAL DATUM IS BASED ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929.
6. BORING B-10 WAS NOT SURVEYED BY CHAPUT. ELEVATION WAS ESTIMATED BASED ON SITE BENCHMARKS IN THE FIELD.

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0 100' 200' 400'
SCALE IN FEET 1" = 200'

NO.	ISSUE/DESCRIPTION	BY	DATE

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. (GZA). THE INFORMATION SHOWN ON THE DRAWING IS SOLELY FOR USE BY GZA'S CLIENT OR THE CLIENT'S DESIGNATED REPRESENTATIVE FOR THE SPECIFIC PROJECT AND LOCATION IDENTIFIED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED, REUSED, COPIED, OR ALTERED IN ANY MANNER FOR USE AT ANY OTHER LOCATION OR FOR ANY OTHER PURPOSE WITHOUT THE PRIOR WRITTEN CONSENT OF GZA. ANY TRANSFER, REUSE, OR MODIFICATION TO THE DRAWING BY THE CLIENT OR OTHERS, WITHOUT THE PRIOR WRITTEN EXPRESS CONSENT OF GZA, WILL BE AT THE USER'S SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.

SCHOOL SISTERS OF NOTRE DAME DEVELOPMENT
13105 WATERTOWN PLANK ROAD
ELM GROVE, WISCONSIN

BORING LOCATION MAP

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
MANDEL GROUP
330 EAST KILBOURN AVENUE
MILWAUKEE, WISCONSIN

PROJ MGR: JDG	REVIEWED BY: JDG	CHECKED BY: IJM	FIG
DESIGNED BY: IJM	DRAWN BY: PLR	SCALE: see above	2
DATE: 6/3/2020	PROJECT NO. 20.0156624.01	REVISION NO.	SHEET NO.

Attachment 1

Limitations

GEOTECHNICAL LIMITATIONS

USE OF REPORT

1. GZA GeoEnvironmental, Inc. (GZA) prepared this report on behalf of, and for the exclusive use of our Client for the stated purpose(s) and location(s) identified in the Proposal for Services and/or Report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not expressly identified in the contract documents, for any use, without our prior written permission, shall be at that party's sole risk, and without any liability to GZA.

STANDARD OF CARE

2. GZA's findings and conclusions are based on the work conducted as part of the Scope of Services set forth in Proposal for Services and/or Report and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. If conditions other than those described in this report are found at the subject location(s), or the design has been altered in any way, GZA shall be so notified and afforded the opportunity to revise the report, as appropriate, to reflect the unanticipated changed conditions.

3. GZA's services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made.

4. In conducting our work, GZA relied upon certain information made available by public agencies, Client and/or others. GZA did not attempt to independently verify the accuracy or completeness of that information. Inconsistencies in this information which we have noted, if any, are discussed in the Report.

SUBSURFACE CONDITIONS

5. The generalized soil profile(s) provided in our Report are based on widely-spaced subsurface explorations and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and were based on our assessment of subsurface conditions. The composition of strata, and the transitions between strata, may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location refer to the exploration logs. The nature and extent of variations between these explorations may not become evident until further exploration or construction. If variations or other latent conditions then become evident, it will be necessary to reevaluate the conclusions and recommendations of this report.

6. In preparing this report, GZA relied on certain information provided by the Client, state and local officials, and other parties referenced therein which were made available to GZA at the time of our evaluation. GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this evaluation.

7. Water level readings have been made in test holes (as described in this Report) and monitoring wells at the specified times and under the stated conditions. These data have been reviewed and interpretations have been made in this Report. Fluctuations in the level of the groundwater however occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, the presence of subsurface utilities, and/or natural or artificially induced perturbations. The water table encountered in the course of the work may differ from that indicated in the Report.

8. GZA's services did not include an assessment of the presence of oil or hazardous materials at the property. Consequently, we did not consider the potential impacts (if any) that contaminants in soil or groundwater may have on construction activities, or the use of structures on the property.

9. Recommendations for foundation drainage, waterproofing, and moisture control address the conventional geotechnical engineering aspects of seepage control. These recommendations may not preclude an environment that allows the infestation of mold or other biological pollutants.

COMPLIANCE WITH CODES AND REGULATIONS

10. We used reasonable care in identifying and interpreting applicable codes and regulations. These codes and regulations are subject to various, and possibly contradictory, interpretations. Compliance with codes and regulations by other parties is beyond our control.

ADDITIONAL SERVICES

11. GZA recommends that we be retained to provide services during any future: site observations, design, implementation activities, construction and/or property development/redevelopment. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.

Attachment 2

Boring Logs

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

BORING NUMBER B-09

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/21/20 **COMPLETED** 4/21/20
GROUND ELEVATION 752.4 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: Grassy											
	750		S-1: TOPSOIL: Stiff to very stiff, silty CLAY (CL-ML), low plasticity; little Sand, fine; trace Organics; brown, moist		S-1 (1-2.5)	11	2-3-3 (6)	1-2.5						
5			S-2: Medium dense, well-graded SAND (SW), fine to coarse-grained; with Gravel, fine to coarse; little Silt; tan and brown, moist (possible fill)		S-2 (3.5-5)	16	4-9-11 (20)	2.0						
	745		S-3: Dense, well-graded GRAVEL (GW), fine to coarse-grained; with Sand, fine to coarse; rock fragments; tan and brown, dry		S-3 (6-7.5)	16	13-16-26 (42)							
10			S-4: Upper 2": Medium dense, well-graded GRAVEL (GW), fine to coarse-grained; with Sand, fine to coarse; tan and brown, dry Lower 13": Medium stiff, SILT (ML), nonplastic; light brown, wet		S-4 (8.5-10)	15	10-10-12 (22)	0.5-1.0						
	740		S-5: Upper 3": Medium stiff, SILT (ML), nonplastic; light brown, wet Lower 15": Very stiff, lean CLAY (CL), low plasticity; silty seams; brownish gray, moist	1	S-5 (11-12.5)	18	3-5-9 (14)	0.5-3.0					
15			S-6: Very stiff, lean CLAY (CL), low plasticity; Silty seams; brownish gray, moist		S-6 (13.5-15)	18	2-2-2 (4)	1.5-3.0		39.8	32	19	13	
	735													
20			S-7: Upper 4": Very stiff, lean CLAY (CL), low plasticity; Silty seams; brownish gray, moist Lower 14": Medium dense, poorly-graded SAND with SILT (SP-SM), fine to medium-grained; tan, moist		S-7 (18.5-20)	18	5-11-13 (24)	3.0						
	730													
25			S-8: Upper 3": Medium dense, poorly-graded SAND with SILT (SP-SM), fine to medium-grained; tan, moist Middle 12": Medium stiff, SILT (ML), nonplastic; brown, wet Lower 3": Very stiff, lean CLAY (CL), low plasticity; little Sand, medium to coarse; brown, moist		S-8 (23.5-25)	18	6-11-11 (22)	0.5-2.0						
	725													
30			S-9: Upper 10": Dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; tan, wet Lower 4": Dense, well-graded GRAVEL with SILT and SAND (GW-GM), fine to coarse-grained; tan, wet		S-9 (28.5-30)	14	3-13-18 (31)							
			Boring ended at 30' below ground surface and backfilled with auger cuttings and bentonite chips											

REMARKS

1. Supplementary boring blind drilled to 10.5' bgs approximately 1' east of original boring location. Shelby tube sample taken from 10.5 to 12.5' bgs. 23" of recovery. Tube was damaged at the bottom.

GEOTECH WITH REMARKS AND ELEV - GINT STD US LAB.GDT - 6/3/20 14:27 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.00 SCHOOL SISTERS OF NOTRE DAME (APRIL 2020).GPJ

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

BORING NUMBER B-10

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/22/20 **COMPLETED** 4/22/20
GROUND ELEVATION 757 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY MBB **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: Grassy											
	755		S-1: TOPSOIL: Soft to medium stiff, lean CLAY (CL), low plasticity; little Sand, medium to coarse; trace Organics; brown, moist		S-1 (1-2.5)	13	5-2-3 (5)	0.25-1.0						
			S-2: Upper 5": TOPSOIL: Very stiff, lean CLAY (CL), low plasticity; little Sand, medium to coarse; trace Organics; brown, moist		S-2 (3.5-5)	16	2-3-8 (11)	3.0						
5			Lower 11": Medium dense, well-graded SAND (SW), fine to coarse-grained; some Gravel, fine to coarse; tan, dry											
	750		S-3: Medium dense, silty GRAVEL with SAND (GM), fine to coarse-grained; tan, dry		S-3 (6-7.5)	10	6-12-11 (23)			4.9	NP	NP	NP	13
			S-4: Dense, silty GRAVEL with SAND (GM), fine to coarse-grained; tan, dry	1	S-4 (8.5-10)	18	10-18-14 (32)							
10														
	745		S-5: Interbedded Stiff, lean CLAY (CL), low plasticity; brown, moist AND stiff, SILT (ML); brown, moist	2	S-5 (11-12.5)	16	3-8-12 (20)	1.5		21.4				
			S-6: Interbedded Very stiff, lean CLAY (CL), low plasticity; brownish gray, moist AND stiff, SILT (ML), nonplastic; brownish gray, moist		S-6 (13.5-15)	16	3-6-11 (17)	3.0-1.5						
15														
	740		S-7: Upper 11": Interbedded Very stiff, lean CLAY (CL), low plasticity; brownish gray, moist AND stiff, SILT (ML); brownish gray, moist		S-7 (18.5-20)	15	3-10-10 (20)	3.0-1.5						
20			Lower 4": Medium dense, poorly-graded SAND (SP), fine to medium-grained; trace Silt; brown, dry	3										
			Boring ended at 20' below ground surface and backfilled with auger cuttings and bentonite chips											

REMARKS

1. Rig chatter at 8.5-10'
2. Rig chatter at 11-12.5'
3. Cave in at 17' BGS - water at 16.5' BGS

GEOTECH WITH REMARKS AND ELEV - GINT STD US LAB.GDT - 6/3/20 14:27 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.00 SCHOOL SISTERS OF NOTRE DAME (APRIL 2020).GPJ

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

BORING NUMBER B-13

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/22/20 **COMPLETED** 4/22/20
GROUND ELEVATION 753.6 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW/MBB **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: Grassy											
			S-1: Upper 11": TOPSOIL: Stiff to very stiff, lean CLAY (CL), low plasticity; trace Gravel, fine; trace Sand, fine; trace Organics; brown, moist		S-1 (1-2.5)	16	2-2-2 (4)	1.0-2.5						
	750		Lower 5": Loose, well-graded SAND (SW), fine to coarse-grained; little Gravel, fine; tan, moist		S-2 (3.5-5)	12	4-4-6 (10)							
5			S-2: Loose, silty SAND (SM), fine to coarse-grained; little Gravel, fine; tan, moist											
			S-3: Dense, silty SAND (SM), fine to coarse-grained; some Gravel, fine to coarse; tan, dry		S-3 (6-7.5)	16	8-16-16 (32)			6.4	NP	NP	NP	18
	745		S-4: Dense, silty SAND (SM), fine to coarse-grained; with Gravel, fine to coarse; gray, dry		S-4 (8.5-10)	14	11-26-20 (46)							
10			S-5: Very stiff to hard, SILT (ML), nonplastic; tan to red, moist (clayey seam in center)	1	S-5 (11-12.5)	16	4-6-11 (17)	3.0-4.5						
	740		S-6: Medium dense, Silty SAND (SM), fine-grained; tan, wet		S-6 (13.5-15)	18	4-13-15 (28)							
15														
	735		S-7: Upper 6": Medium dense, Silty SAND (SM), fine-grained; brown, wet transitioning to very stiff SILT (ML); brown, wet		S-7 (18.5-20)	17	6-5-8 (13)	2.0-3.5						
20			Lower 11": Very stiff, lean CLAY (CL), low plasticity; gray, wet											
	730		S-8: Upper 5": Soft, lean CLAY (CL), low plasticity; gray, wet		S-8 (23.5-25)	18	7-13-11 (24)	0.5		19.4				50
25			Lower 13": Soft, SILT (ML), nonplastic; little Sand, fine; gray, wet											
	725		S-9: Upper 3": Very stiff, lean CLAY (CL), low plasticity; trace Silt; gray, moist		S-9 (28.5-30)	15	5-8-8 (16)	3.0-0.25						
30			Lower 12": Very soft, SILT (ML), nonplastic; little Sand, fine; gray, wet	2										
			Boring ended at 30' below ground surface and backfilled with auger cuttings and bentonite chips											

REMARKS

1. Rig chatter at 11.5' BGS
2. Cave in at 15' below ground surface

GEOTECH WITH REMARKS AND ELEV - GINT STD US LAB.GDT - 6/3/20 14:27 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.00 SCHOOL SISTERS OF NOTRE DAME (APRIL 2020).GPJ



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www.gza.com

April 7, 2023
File No. 20.0156624.03

Mr. Andrew Hellermann, VP of Construction Operations
Mandel Group Properties, LLC
330 East Kilbourn Avenue
South Tower, Suite 600
Milwaukee, Wisconsin 53202

Re: Infiltration Test Results
Caroline Heights Development
13105 Watertown Plank Road
Elm Grove, Wisconsin

Dear Mr. Hellermann:

This letter provides GZA GeoEnvironmental, Inc.'s (GZA) infiltration test results obtained in March 2023, for the Caroline Heights Development located at 13105 Watertown Plank Road in Elm Grove, Wisconsin ("Site"). We understand that storm water infiltration is desired in the storm water ponds and/or bio-swales that are currently under design. Storm water runoff from the structures and parking lots will be directed toward the storm water basins to allow infiltration into the soil. We understand that the sizing, design, and configuration of the storm water system will be conducted by K. Singh and Associates.

GZA conducted an assessment of the infiltration rate/potential in accordance with Wisconsin Department of Natural Resources (WDNR) Technical Standard 1002, "Site Evaluation for Stormwater Infiltration." The assessment was conducted to provide design criteria for the proposed infiltration design for the Site. The findings, conclusions, and recommendations that GZA derived from the assessment and the geotechnical evaluation are provided in this letter. This letter is subject to the limitations provided in **Attachment 1**.

WORK SUMMARY

Seven test pits were excavated (TP-1 through TP-7) in the planned infiltration test areas by C.W. Purpero, Inc. (an earthwork contractor). Locations of the test pits are provided on the attached **Figure 1**. A GZA field engineer logged and photographed the test pits during excavation and collected a representative sample for laboratory testing. Test pit logs are provided in **Attachment 2,** and a photographic log of the test pits is provided in **Attachment 3.**

Infiltrometer tests were performed by GZA field engineers in six of the seven test pits. Infiltration testing could not be performed in TP-5 due to the presence of groundwater encountered near the bottom of the test pit at approximate elevation 737.4 feet North American Vertical Datum of 1988 (NAVD 88). The tests were performed between February 28 and March 2, 2023.

Excavation for the test pits was terminated at approximately 2.6 and 8.6 feet below grade, which corresponds to the approximate pond bottom elevations, at or near elevations 737, 739, and 747 feet (NAVD 88). Although double-ring tests were attempted in the six test pits where groundwater was not present, due to high infiltration rates and the abundance of cobbles, single ring, falling head, infiltration tests were conducted in one of the six tests (TP-1), as noted on the testing results table below.

An Equal Opportunity Employer M/F/V/H

Generally, soils encountered at the bottom of pond design elevations consisted of granular sand and gravel (USDA: Sand) with varying amounts of cobbles (rocks greater than 3 inches in nominal diameter) and fines (those materials passing the U.S. No. 200 Sieve). TP-7 was the exception to the relatively uniform soil conditions, with low plasticity, lean clay (USDA: Clay Loam) present at the design elevation. The clayey soils generally retarded the infiltration rate, as reflected in the table below. A representative sample of the granular material present in the majority of the test pits was submitted for gradation analysis to determine the relative grain size distribution for soil grains greater than the No. 200 sieve (0.075 mm). The grain size distribution curve is provided in **Attachment 4**.

The test results showed approximately 46% soil retained on the No. 10 sieve (2 mm), the particle diameter demarcation between gravel and sand in the United States Department of Agriculture, Natural Resources Conservation Service (USDA) soil classification system. Although hydrometer testing was not conducted on the sample, the relatively small amount of soils passing the U.S. No. 200 sieve, resulted in a soil classification of "Sand" in accordance with the USDA classification system, regardless the relative amount of clay- or silt-sized particles present.

Previous soil borings were advanced in April 2020 on the Site for the geotechnical design aspects of the project. Soil borings B-9, B-13, AB-3, AB-4, and EB-1 were generally within the same area as the test pit locations (within about 500 feet). The approximate soil boring locations are also shown on **Figure 1** and the boring logs are provided in **Attachment 5**. Grain-size distribution testing, down to the U.S. No. 200 sieve, was conducted on samples from various depths on four of the five previously drilled borings, and can be referenced in our June 3, 2020 report.[1] Water was encountered in borings AB-4 and EB-1 at depths of about 17 to 18 feet below ground surface (bgs) at 20 to 45 minutes after completion of drilling. These water depths correspond to approximate elevations 728 and 725 feet NAVD 88.

MEASURED INFILTRATION RATES

Infiltration rates at the test locations were variable. Test locations were allowed to soak for a minimum of 20 minutes before measurements began. The initial infiltration rates were higher than the later, more stabilized rates. When calculating mean infiltration rates, the first two to three readings were generally ignored to account for initial surface and near surface disturbance and void filling. This phenomenon is common due to unsaturated infiltration rates being faster than more stabilized, saturated rates. The table below provides the test results.

Test Pit Designation	Approximate Base of TP Elev. (NAVD 88)	Range of Infiltration Rates (in/hr)[1]	Mean Infiltration Rate (in/hr)[1] (arithmetic mean)	Mean Infiltration Rate (in/hr)[1] (geometric mean)	Notes
TP-1	747	6.0 to 22.5	8.0	7.7	Single Ring Test
TP-2	747	6.9 to 9.9	7.9	7.9	Double Ring Test
TP-3	747	22.5 to 31.5	28.2	28.0	Double Ring Test
TP-4	747	13 to 31	16.2	15.7	Double Ring Test
TP-6	739	33 to 48	39.3	39.1	Double Ring Test
TP-7	739	1.5 to 4.0	2.1	2.1	Double Ring Test

Notes:
1) in/hr = inches per hour.

[1] *Geotechnical Engineering Report, School Sisters of Notre Dame Development, 13105 Watertown Plank Road, Elm Grove, Wisconsin*, dated June 3, 2020, GZA File No. 20.0156624.00.

An appropriate factor of safety, as provided by WDNR Technical Standard 1002, should be applied to the rates listed above, as appropriate.

We appreciate the opportunity to be of service on this project. Please feel free to contact us with any questions.

Very truly yours,

GZA GeoEnvironmental, Inc.

Ian J. Mosbrucker, P.E.
Project Manager

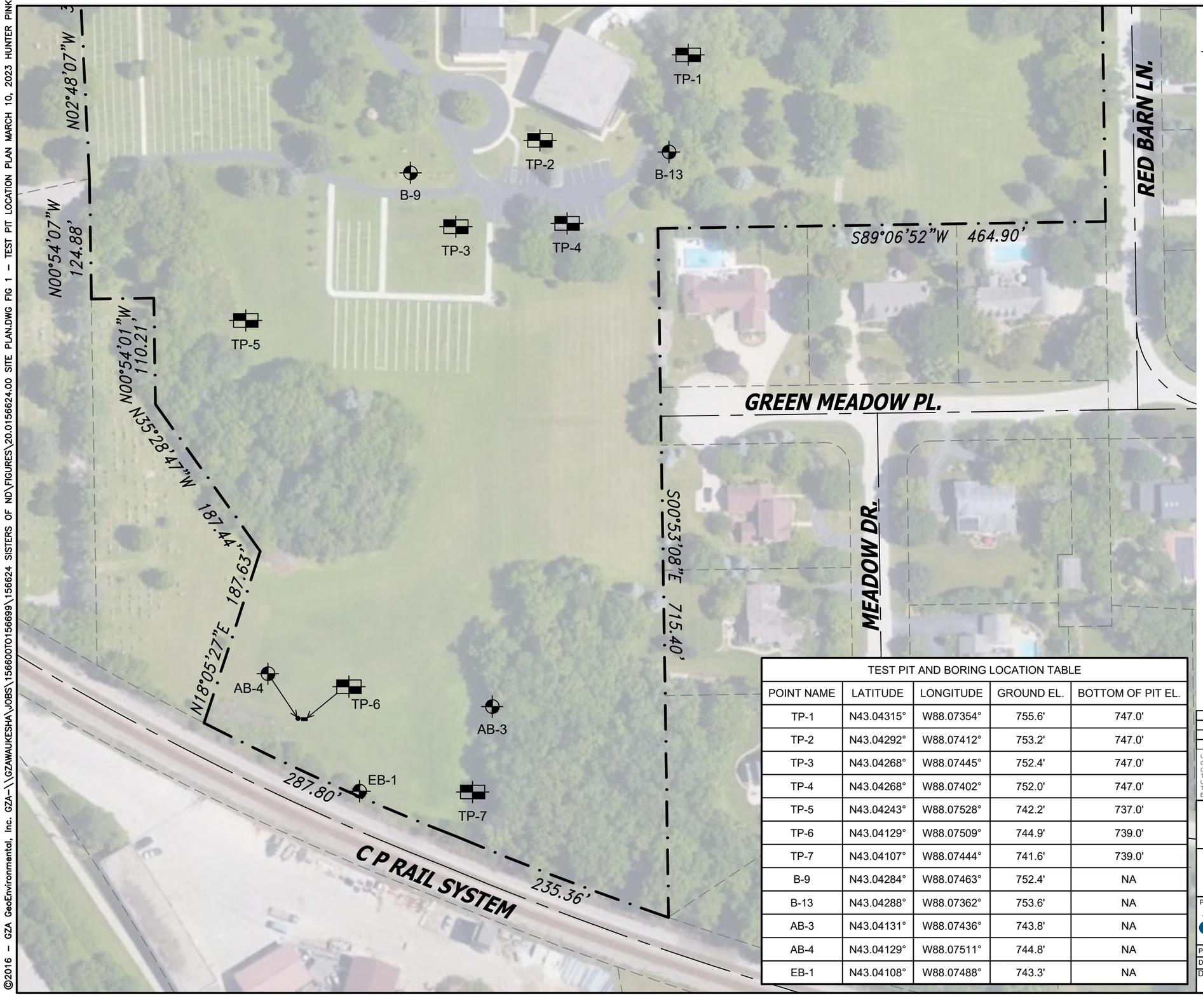
Jesse D. Graham, P.E.
Senior Project Manager

James F. Drought, P.G.
Principal/Hydrogeologist

J:\156600to156699\156624 Sisters of ND\03 Geotech CA2\Report\FINAL 20.0156624.03 Infiltration Test Results_Caroline Heights_Elm Grove WI 4.7.23.docx

Attachments: Figure 1 – Boring Location Plan
Limitations
Test Pit Logs
Photo Log
Grain Size Distribution Curve
Boring Logs

FIGURES



LEGEND

- APPROXIMATE SITE BOUNDARY
- APPROXIMATE PARCEL BOUNDARY
- GZA TEST PIT LOCATION (TP-1)
- BORINGS CONDUCTED IN 2020

NOTES

1. BASE MAP DEVELOPED FROM A GOOGLE PROFESSIONAL ELECTRONIC IMAGE FILE. DIGITAL AERIAL ORTHOPHOTOGRAPHY WAS PUBLISHED BY THE U.S.G.S.
2. THE USE OF AERIAL PHOTOGRAPHY CAN OFTEN MAKE BUILDINGS AND OTHER SITE FEATURES APPEAR TO BE OVERLAPPING AND DISTORTED WHEN OVERLAID WITH ACTUAL SITE FEATURES.
3. THE BASEMAP WAS REFERENCED FROM CHAPUT LAND SURVEYS, DRAWING NO. SB-EX3454-FAR, DATED MARCH 27, 2020.
4. BEARINGS ARE REFERENCED TO THE WISCONSIN STATE PLANE COORDINATE SYSTEM (SOUTH ZONE) NAD27, IN WHICH THE NORTH LINE OF THE NE 1/4 BEARS N89°58'52"E.
5. VERTICAL DATUM IS BASED ON THE NATIONAL GEODETIC VERTICAL DATUM OF 1929.

N W E S

0 100' 200' 400'

SCALE IN FEET

TEST PIT AND BORING LOCATION TABLE

POINT NAME	LATITUDE	LONGITUDE	GROUND EL.	BOTTOM OF PIT EL.
TP-1	N43.04315°	W88.07354°	755.6'	747.0'
TP-2	N43.04292°	W88.07412°	753.2'	747.0'
TP-3	N43.04268°	W88.07445°	752.4'	747.0'
TP-4	N43.04268°	W88.07402°	752.0'	747.0'
TP-5	N43.04243°	W88.07528°	742.2'	737.0'
TP-6	N43.04129°	W88.07509°	744.9'	739.0'
TP-7	N43.04107°	W88.07444°	741.6'	739.0'
B-9	N43.04284°	W88.07463°	752.4'	NA
B-13	N43.04288°	W88.07362°	753.6'	NA
AB-3	N43.04131°	W88.07436°	743.8'	NA
AB-4	N43.04129°	W88.07511°	744.8'	NA
EB-1	N43.04108°	W88.07488°	743.3'	NA

NO.	ISSUE/DESCRIPTION	BY	DATE

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SCHOOL SISTERS OF NOTRE DAME DEVELOPMENT
13105 WATERTOWN PLANK ROAD
ELM GROVE, WISCONSIN

TEST PIT AND BORING LOCATION PLAN

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
MANDEL GROUP
330 EAST KILBOURN AVENUE
MILWAUKEE, WISCONSIN

PROJ MGR: IJM	REVIEWED BY: JDG	CHECKED BY: ERH	FIG 1
DESIGNED BY: IJM	DRAWN BY: HKP	SCALE: SEE ABOVE	
DATE: APRIL, 2023	PROJECT NO. 20.0156624.03	REVISION NO.	SHEET NO.

©2016 – GZA GeoEnvironmental, Inc. GZA–\\GZAWAUKESHA\JOBS\156600T0156699\156624 SISTERS OF ND\FIGURES\20.0156624.00 SITE PLAN.DWG FIG 1 – TEST PIT LOCATION PLAN MARCH 10, 2023 HUNTER PINKERTON

Attachment 1

Limitations

GEOTECHNICAL LIMITATIONS

USE OF REPORT

1. GZA GeoEnvironmental, Inc. (GZA) prepared this report on behalf of, and for the exclusive use of our Client for the stated purpose(s) and location(s) identified in the Proposal for Services and/or Report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not expressly identified in the contract documents, for any use, without our prior written permission, shall be at that party's sole risk, and without any liability to GZA.

STANDARD OF CARE

2. GZA's findings and conclusions are based on the work conducted as part of the Scope of Services set forth in Proposal for Services and/or Report and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. If conditions other than those described in this report are found at the subject location(s), or the design has been altered in any way, GZA shall be so notified and afforded the opportunity to revise the report, as appropriate, to reflect the unanticipated changed conditions.

3. GZA's services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made.

4. In conducting our work, GZA relied upon certain information made available by public agencies, Client and/or others. GZA did not attempt to independently verify the accuracy or completeness of that information. Inconsistencies in this information which we have noted, if any, are discussed in the Report.

SUBSURFACE CONDITIONS

5. The generalized soil profile(s) provided in our Report are based on widely-spaced subsurface explorations and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and were based on our assessment of subsurface conditions. The composition of strata, and the transitions between strata, may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location refer to the exploration logs. The nature and extent of variations between these explorations may not become evident until further exploration or construction. If variations or other latent conditions then become evident, it will be necessary to reevaluate the conclusions and recommendations of this report.

6. In preparing this report, GZA relied on certain information provided by the Client, state and local officials, and other parties referenced therein which were made available to GZA at the time of our evaluation. GZA did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of this evaluation.

7. Water level readings have been made in test holes (as described in this Report) and monitoring wells at the specified times and under the stated conditions. These data have been reviewed and interpretations have been made in this Report. Fluctuations in the level of the groundwater however occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, the presence of subsurface utilities, and/or natural or artificially induced perturbations. The water table encountered in the course of the work may differ from that indicated in the Report.

8. GZA's services did not include an assessment of the presence of oil or hazardous materials at the property. Consequently, we did not consider the potential impacts (if any) that contaminants in soil or groundwater may have on construction activities, or the use of structures on the property.

9. Recommendations for foundation drainage, waterproofing, and moisture control address the conventional geotechnical engineering aspects of seepage control. These recommendations may not preclude an environment that allows the infestation of mold or other biological pollutants.

COMPLIANCE WITH CODES AND REGULATIONS

10. We used reasonable care in identifying and interpreting applicable codes and regulations. These codes and regulations are subject to various, and possibly contradictory, interpretations. Compliance with codes and regulations by other parties is beyond our control.

ADDITIONAL SERVICES

11. GZA recommends that we be retained to provide services during any future: site observations, design, implementation activities, construction and/or property development/redevelopment. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.

Attachment 2

Test Pit Logs

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

KEY TO SYMBOLS

CLIENT Mandel Group **PROJECT NAME** Caroline Heights Infiltration Testing

PROJECT NUMBER 20.0156624.03 **PROJECT LOCATION** 13105 Watertown Plank Road, Elm Grove, WI

LITHOLOGIC SYMBOLS (Unified Soil Classification System)


ASPHALT: Asphalt


CL: USCS Low Plasticity Clay


CL-ML: USCS Low Plasticity Silty Clay


CLS: USCS Low Plasticity Sandy Clay


COBBLES: Cobbles


FILL: Fill (made ground)


GC: USCS Clayey Gravel


GW: USCS Well-graded Gravel


GW-GM: USCS Well-graded Gravel with Silt


SC: USCS Clayey Sand


SM: USCS Silty Sand


SP: USCS Poorly-graded Sand


SW: USCS Well-graded Sand


SWG: USCS Well-graded Gravelly Sand


SW-SM: USCS Well-graded Sand with Silt


TOPSOIL: Topsoil

RELATIVE DENSITY/ CONSISTENCY

Cohesive Soils (Clays, Some Silts)

PP-Value (tsf)	Consistency
< 0.25	Very Soft
0.25 - 0.5	Soft
0.5 - 1.0	Medium Stiff
1.0 - 2.0	Stiff
2.0 - 4.0	Very Stiff
> 4.0	Hard

MINOR COMPONENTS

Percentage	Descriptor
1 - 5	Trace
5 - 15	Little
15 - 30	Some
30 - 50	With

SOIL MOISTURE

DRY	No Free Moisture
MOIST	Wet to Touch, No Free Moisture
WET	Free Moisure

DRILLING STATISTICS

Number of Test Pits:	7
Total Depth of Excavation:	38.7
Total Number of Samples:	0

TESTING:

Water Content:	0
Dry Density:	0
Atterberg Limits:	0
Sieve Analysis:	1
Unconfined:	0
Direct Shear:	0
Pocket Pen:	0

ABBREVIATIONS

LL	LIQUID LIMIT (%)
PI	PLASTIC INDEX (%)
W	MOISTURE CONTENT (%)
NP	NON PLASTIC
P#200	PERCENT PASSING NO. 200 SIEVE (FINES)
PP	POCKET PENETROMETER (TSF)
NE	NOT ENCOUNTERED
NM	NOT MEASURED
TV	TORVANE
PID	PHOTOIONIZATION DETECTOR
UC	UNCONFINED COMPRESSION
ppm	PARTS PER MILLION
ETR	ENERGY TRANSFER RATIO
N/O	NOT OBSERVED

GZA TESTPIT LEGEND - GINT STD US LAB.GDT - 4/7/23 09:18 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.03_CAROLINE HEIGHTS TP (MARCH 2023).GPJ

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

TEST PIT NUMBER TP-1

CLIENT Mandel Group
PROJECT NAME Caroline Heights Infiltration Testing
PROJECT NUMBER 20.0156624.03
PROJECT LOCATION 13105 Watertown Plank Road, Elm Grove, WI
DATE STARTED 2/28/23 **COMPLETED** 3/1/23
GROUND ELEVATION 755.6 ft NAVD 88
EXCAVATION CONTRACTOR C.W. Purpero, Inc.
LATITUDE 43.04315 **LONGITUDE** -88.07354
EXCAVATOR CAT 308
GROUND WATER DETAILS:
ENCOUNTERED (Y/N) NO
DEPTH BGS DRY
STAB. TIME N/A
APPEARANCE N/A
LOGGED BY IJM **CHECKED BY** JDG
ASSOCIATED PHOTOS 1, 2

DEPTH (ft)	Elevation (ft, NAVD 88)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	POCKET PEN. (tsf)	MOISTURE CONTENT (%)	EXCAVATION EFFORT	BOULDERS COUNT-CLASS
0.0	755.0		0-16": TOPSOIL - Lean CLAY (CL), low plasticity; little Sand, fine to coarse; little Roots/Organics; dark brown, moist [Loam]				E	
			16-25": Silty CLAY (CL-ML), low plasticity; little Sand, fine to coarse; trace Gravel, fine; trace Roots; reddish brown, moist [Clay Loam]				E	
2.5	752.5		25-47": Well-Graded SAND (SW), fine- to coarse-grained; trace grading to little Gravel, fine; trace Silt; yellowish brown to grayish brown, moist [Coarse Sand]	1			E	
			47-52": Well-Graded SAND with GRAVEL (SW), fine- to coarse-grained; trace Silt; yellowish gray, moist [Coarse Sand/Gravel]				E	
5.0	750.0		52 -103": Well-graded GRAVEL with SILT (GW-GM), fine- to coarse-grained; with Cobbles, 3 to 8" diameter; grayish brown, moist [Coarse Sand/Gravel]				M to D	>20-A
7.5	747.5		End of test pit at 8.6' bgs. Test pit backfilled with spoils.					

REMARKS

1. Seams of SW-SM present in layer.

LEGEND

E - Easy
M - Medium
D - Diffcult
A - 6-17"
B - 18-36"
C - 36"+

GEOTECH TP LAT-LONG - GINT STD US LAB.GDT - 4/7/23 09:28 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.03_CAROLINE HEIGHTS TP (MARCH 2023).GPJ

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

TEST PIT NUMBER TP-2

CLIENT Mandel Group
PROJECT NAME Caroline Heights Infiltration Testing
PROJECT NUMBER 20.0156624.03
PROJECT LOCATION 13105 Watertown Plank Road, Elm Grove, WI
DATE STARTED 2/28/23 **COMPLETED** 3/1/23
GROUND ELEVATION 753.2 ft NAVD 88
EXCAVATION CONTRACTOR C.W. Purpero, Inc.
LATITUDE 43.04292 **LONGITUDE** -88.07412
EXCAVATOR CAT 308
GROUND WATER DETAILS:
ENCOUNTERED (Y/N) NO
DEPTH BGS DRY
STAB. TIME N/A
APPEARANCE N/A
LOGGED BY JDG/RJD **CHECKED BY** JDG
ASSOCIATED PHOTOS 3, 4

DEPTH (ft)	Elevation (ft, NAVD 88)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	POCKET PEN. (tsf)	MOISTURE CONTENT (%)	EXCAVATION EFFORT	BOULDERS COUNT-CLASS
0.0	752.5		0-10": TOPSOIL - Sandy lean CLAY (CL), low plasticity; trace Gravel, fine to coarse; trace Rootlets and Organics; trace Glass Fragments; dark brown, moist [Loam]				E	
			10-30": Lean CLAY (CL), low plasticity; little Sand, fine to coarse; trace Gravel, fine to coarse; brown, moist [Clay Loam]				E	
2.5	750.0		30-42": Well-graded SAND with SILT (SW-SM), fine- to coarse-grained; trace grading to little Gravel, fine to coarse; light brown, moist [Coarse Sand]				E	
			42-52": Well-graded SAND with GRAVEL (SW), fine- to coarse-grained; trace Silt; light brown, moist [Coarse Sand/Gravel]	1			E	
5.0	747.5		52-75": Well-graded GRAVEL with SILT and SAND (GW-GM), fine- to coarse-grained; with Cobbles, 3-8" diameter; light brownish gray, dry to moist [Coarse Sand/Gravel]	2			M-D	10-A

End of test pit at 6.2' bgs. Test pit backfilled with spoils.

REMARKS

1. Sands collapsing as excavation is advanced.
2. Soil matrix roughly 50% subrounded cobbles. Most cobbles 3-6" nominal diameter. Trace cobbles >8" diameter.

LEGEND

E - Easy
M - Medium
D - Diffcult
A - 6-17"
B - 18-36"
C - 36"+

GEOTECH TP LAT-LONG - GINT STD US LAB.GDT - 4/7/23 09:28 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.03_CAROLINE HEIGHTS TP (MARCH 2023).GPJ

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

TEST PIT NUMBER TP-3

CLIENT Mandel Group
PROJECT NAME Caroline Heights Infiltration Testing
PROJECT NUMBER 20.0156624.03
PROJECT LOCATION 13105 Watertown Plank Road, Elm Grove, WI
DATE STARTED 2/28/23 **COMPLETED** 3/1/23
GROUND ELEVATION 752.4 ft NAVD 88
EXCAVATION CONTRACTOR C.W. Purpero, Inc.
LATITUDE 43.04268 **LONGITUDE** -88.07445
EXCAVATOR CAT 308
GROUND WATER DETAILS:
ENCOUNTERED (Y/N) NO
DEPTH BGS DRY
STAB. TIME N/A
APPEARANCE N/A
LOGGED BY IJM **CHECKED BY** JDG
ASSOCIATED PHOTOS 5, 6

DEPTH (ft)	Elevation (ft, NAVD 88)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	POCKET PEN. (tsf)	MOISTURE CONTENT (%)	EXCAVATION EFFORT	BOULDERS COUNT-CLASS
0.0			0-12": TOPSOIL - Lean CLAY (CL), low plasticity; little Sand, fine; little Organics and Rootlets; trace Gravel, fine; dark brown, moist [Loam]				E	
			12-24": Sandy lean CLAY (CL), low plasticity; trace Gravel, fine; trace Roots; brown, moist [Sandy Clay Loam]				E	
2.5	750.0		24-35": Clayey GRAVEL (GC), fine- to coarse-grained; some Sand, fine to coarse; brown, moist [Sandy Clay]				E	
			35-39": Well-graded SAND with SILT and GRAVEL (SW-SM), fine- to coarse-grained; light brown, moist [Coarse Sand]				E	
			39-62": Well-graded GRAVEL with SAND (GW), fine- to coarse-grained; some Cobbles, 3-6" diameter; trace Silt; light grayish brown, dry to moist [Coarse Sand]	1			M	5-A
5.0	747.5							

End of test pit at 5.2' bgs. Test pit backfilled with spoils.

REMARKS

1. Gravel collapsing as excavation is advanced. Soil matrix consists of approximately 20% cobbles 3-6" nominal diameter.

LEGEND

E - Easy
M - Medium
D - Diffcult
A - 6-17"
B - 18-36"
C - 36"+

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GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

TEST PIT NUMBER TP-4

CLIENT Mandel Group
PROJECT NAME Caroline Heights Infiltration Testing
PROJECT NUMBER 20.0156624.03
PROJECT LOCATION 13105 Watertown Plank Road, Elm Grove, WI
DATE STARTED 2/28/23 **COMPLETED** 3/1/23
GROUND ELEVATION 752.0 ft NAVD 88
EXCAVATION CONTRACTOR C.W. Purpero, Inc.
LATITUDE 43.04268 **LONGITUDE** -88.07402
EXCAVATOR CAT 308
GROUND WATER DETAILS:
ENCOUNTERED (Y/N) NO
DEPTH BGS DRY
STAB. TIME N/A
APPEARANCE N/A
LOGGED BY RJD **CHECKED BY** JDG
ASSOCIATED PHOTOS 7

DEPTH (ft)	Elevation (ft, NAVD 88)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	POCKET PEN. (tsf)	MOISTURE CONTENT (%)	EXCAVATION EFFORT	BOULDERS COUNT-CLASS
0.0			0-3.5": ASPHALT				M	
			3.5-7.5": 1-1/4" Traffic Bond Aggregate				M	
			7.5-10": FILL - Foundry Sand				E	
			10-17": Clayey SAND (SC), fine- to coarse-grained; little Gravel, fine to coarse; dark brown, moist [Sandy Clay Loam]				E	
			17-24": Sandy lean CLAY (CL), low plasticity; trace Gravel, fine; brown, moist [Clay Loam]				E	
	750.0							
2.5			24-60": Well-graded GRAVEL with SILT and SAND (GW-GM), fine- to coarse-grained; some Cobbles, 3-6" diameter; light grayish brown, dry to moist [Coarse Sand/Gravel]	1			M	10-A
	747.5							
5.0			End of test pit at 5' bgs. Test pit backfilled with spoils. Asphalt slabs piled at surface.					

REMARKS

1. Gravel collapsing as excavation is advanced. Soil matrix consists of approximately 25% cobbles 3-6" nominal diameter.

LEGEND

E - Easy
M - Medium
D - Diffcult
A - 6-17"
B - 18-36"
C - 36"+

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GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

TEST PIT NUMBER TP-5

CLIENT Mandel Group
PROJECT NAME Caroline Heights Infiltration Testing
PROJECT NUMBER 20.0156624.03
PROJECT LOCATION 13105 Watertown Plank Road, Elm Grove, WI
DATE STARTED 3/1/23 **COMPLETED** 3/2/23
GROUND ELEVATION 742.2 ft NAVD 88
EXCAVATION CONTRACTOR C.W. Purpero, Inc.
LATITUDE 43.04243 **LONGITUDE** -88.07528
EXCAVATOR CAT 308
GROUND WATER DETAILS:
ENCOUNTERED (Y/N) YES
DEPTH BGS 4.8
STAB. TIME 8 HRS
APPEARANCE MURKY
LOGGED BY IJM **CHECKED BY** JDG
ASSOCIATED PHOTOS 8

DEPTH (ft)	Elevation (ft, NAVD 88)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	POCKET PEN. (tsf)	MOISTURE CONTENT (%)	EXCAVATION EFFORT	BOULDERS COUNT-CLASS
0.0			0-17": Lean CLAY (CL), medium plasticity; little Sand, fine to coarse; little Gravel, fine, trace Roots; dark brown to black, moist to wet [Loam]				E	
			17-43": FILL - Mix of Gravelly CLAY and sandy lean CLAY (CL), low plasticity; brown to grayish brown, moist [Sandy Clay Loam]				E	
	740.0							
2.5			43-57": FILL - SLAG with gravel and sand; black-blue-orange-brown, moist to wet				E-M	
	737.5							
5.0			57-62": Silty SAND with GRAVEL (SM), fine-grained; some Cobbles, 3-10" diameter; orangish brown, wet [Sandy Loam]	1			M	15-A

End of test pit at 5.2' bgs. Test pit backfilled with spoils.

REMARKS

1. Cobbles highly disintegrated and pale white color. Soil matrix consists of approximately 30% cobbles 3-10".

LEGEND

E - Easy
M - Medium
D - Diffcult
A - 6-17"
B - 18-36"
C - 36"+

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GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

TEST PIT NUMBER TP-6

CLIENT Mandel Group
PROJECT NAME Caroline Heights Infiltration Testing
PROJECT NUMBER 20.0156624.03
PROJECT LOCATION 13105 Watertown Plank Road, Elm Grove, WI
DATE STARTED 2/28/23 **COMPLETED** 3/2/23
GROUND ELEVATION 744.9 ft NAVD 88
EXCAVATION CONTRACTOR C.W. Purpero, Inc.
LATITUDE 43.04129 **LONGITUDE** -88.07509
EXCAVATOR CAT 308
GROUND WATER DETAILS:
ENCOUNTERED (Y/N) NO
DEPTH BGS DRY
STAB. TIME N/A
APPEARANCE N/A
LOGGED BY IJM/RJD **CHECKED BY** JDG
ASSOCIATED PHOTOS 9, 10

DEPTH (ft)	Elevation (ft, NAVD 88)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	POCKET PEN. (tsf)	MOISTURE CONTENT (%)	EXCAVATION EFFORT	BOULDERS COUNT-CLASS
0.0			0- 9": TOPSOIL - Lean CLAY (CL), low plasticity; some Sand, fine to coarse; little Gravel, fine to coarse; trace Rootlets and Organics; dark grayish brown, moist [Loam]				E	
			9-19": Lean CLAY (CL), low plasticity; some Sand, fine to coarse; little Gravel, fine; brown, moist [Clay Loam]				E	
			19-30": Clayey SAND (SC), fine- to coarse-grained; some Gravel, fine to coarse; trace Silt; yellowish brown, moist [Sandy Clay Loam]				E	
2.5	742.5		30-71": Poorly-graded SAND with GRAVEL (SP), medium- to coarse-grained; trace Silt; light brown, moist [Coarse Sand/Gravel]	1			E	
5.0	740.0		End of test pit at 5.9' bgs. Test pit backfilled with spoils.					

REMARKS

1. Multiple, thin (2-4") layers of well-graded GRAVEL with SAND (GW) present from 30-71".

LEGEND

E - Easy
M - Medium
D - Diffcult
A - 6-17"
B - 18-36"
C - 36"+

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GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

TEST PIT NUMBER TP-7

CLIENT Mandel Group
PROJECT NAME Caroline Heights Infiltration Testing
PROJECT NUMBER 20.0156624.03
PROJECT LOCATION 13105 Watertown Plank Road, Elm Grove, WI
DATE STARTED 2/28/23 **COMPLETED** 3/2/23
GROUND ELEVATION 741.6 ft NAVD 88
EXCAVATION CONTRACTOR C.W. Purpero, Inc.
LATITUDE 43.042107 **LONGITUDE** -88.07444
EXCAVATOR CAT 308
GROUND WATER DETAILS:
ENCOUNTERED (Y/N) NO
DEPTH BGS DRY
STAB. TIME N/A
APPEARANCE N/A
LOGGED BY IJM **CHECKED BY** JDG
ASSOCIATED PHOTOS 11, 12

DEPTH (ft)	Elevation (ft, NAVD 88)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	POCKET PEN. (tsf)	MOISTURE CONTENT (%)	EXCAVATION EFFORT	BOULDERS COUNT-CLASS
0.0	740.0		0-10": TOPSOIL - Lean CLAY (CL), low plasticity; little Sand, fine to coarse; trace Organics and Rootlets; dark brown, moist [Loam]				E	
			10-37": Lean CLAY (CL), low plasticity; some Sand, fine to coarse; trace Gravel, fine; trace Silt; brown, moist [Clay Loam]				E	
2.5			End of test pit at 2.6' bgs. Test pit backfilled with spoils.					

REMARKS

LEGEND
E - Easy
M - Medium
D - Diffcult
A - 6-17"
B - 18-36"
C - 36"+

GEOTECH TP LAT-LONG - GINT STD US LAB.GDT - 4/7/23 09:28 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.03_CAROLINE HEIGHTS TP (MARCH 2023).GPJ

Attachment 3

Photo Log

Photographic Log

Client Name:	Site Location:	Project No.
Mandel Group, Inc	Caroline Heights, 13105 Watertown Plank Road Elm Grove, WI	20.0156624.03

Photo No.	Date:
1	2/28/23

Direction Photo Taken:
Northeast

Description:
Test Pit TP-1.



Photo No.	Date:
2	2/28/23

Direction Photo Taken:
North

Description:
Test Pit TP-1.



Photographic Log

Client Name:	Site Location:	Project No.
Mandel Group, Inc	Caroline Heights, 13105 Watertown Plank Road Elm Grove, WI	20.0156624.03

Photo No.	Date:
3	2/28/23

Direction Photo Taken:
North

Description:
Double-Ring infiltration test being conducted in Test Pit TP-2.



Photo No.	Date:
4	2/28/23

Direction Photo Taken:
Northwest

Description:
Test pit wall and excavated soils from Test Pit TP-2.



Photographic Log

Client Name:	Site Location:	Project No.
Mandel Group, Inc	Caroline Heights, 13105 Watertown Plank Road Elm Grove, WI	20.0156624.03

Photo No.	Date:
5	2/28/23

Direction Photo Taken:
West

Description:
Double-Ring test being conducted in Test Pit TP-3.



Photo No.	Date:
6	2/28/23

Direction Photo Taken:
Northwest

Description:
Topsoil and underlying granular soil excavated from Test Pit TP-3. .



Photographic Log

Client Name:	Site Location:	Project No.
Mandel Group, Inc	Caroline Heights, 13105 Watertown Plank Road Elm Grove, WI	20.0156624.03

Photo No.	Date:
7	2/28/23

Direction Photo Taken:
Southeast

Description:
Pre-soaking of the double-ring infiltration test in Test Pit TP-4.



Photo No.	Date:
8	3/1/23

Direction Photo Taken:
North

Description:
Soil and groundwater conditions at Test Pit TP-5. No test was conducted in this test pit due to shallow groundwater.



Photographic Log

Client Name:	Site Location:	Project No.
Mandel Group, Inc	Caroline Heights, 13105 Watertown Plank Road Elm Grove, WI	20.0156624.03

Photo No.	Date:
9	3/1/23

Direction Photo Taken:
East

Description:
Granular soils in Test Pit TP-6.



Photo No.	Date:
10	3/1/23

Direction Photo Taken:
Downward and Northeast

Description:
Setup of Double Ring test in Test Pit TP-6.



Photographic Log

Client Name:	Site Location:	Project No.
Mandel Group, Inc.	Caroline Heights, 13105 Watertown Plank Road Elm Grove, WI	20.0156624.03

Photo No.	Date:
11	3/1/23

Direction Photo Taken:
North

Description:
Test Pit TP-7 with double-ring test in progress.



Photo No.	Date:
12	3/1/23

Direction Photo Taken:
Northwest

Description:
Test Pit TP-7.



Photographic Log

Client Name: Mandel Group, Inc.	Site Location: Caroline Heights, 13105 Watertown Plank Road Elm Grove, WI	Project No. 20.0156624.03

to No.	Date:
1	2/28/22

Direction Photo Taken:
Northwest

Description:

Photo No.	Date:
2	2/28/22

Direction Photo Taken:
West

Description:
.

Attachment 4

Grain Size Distribution Curve

Sieve Analysis Report

ASTM C136/ASHTO T27

Report #: C136-000001-00

West Allis
2135 S. 116th Street
West Allis, WI 53227
Phone: 888-436-8378
Fax: 414-321-8359

Client:

GZA Geoenvironmental
17975 West Sarah Lane
Brookfield, WI 53045

Project:

7679
Caroline Heights
Caroline Heights
Elm Grove, WI

An aggregate sample was delivered to our laboratory for testing and reporting purposes. We received your sample and logged it into our Laboratory Information Management System (LIMS).

Sample Information

Sample Date:	03/02/2023	**Application:**	Not Specified
Sample No:	6828	**Sample From:**	On-site
Sampled By:	Client	**Visual Description:**	Brown sand with some gravel
Supplier:	Client	**Specification:**	Not Specified
Source:	Jobsite	**Field ID:**	1

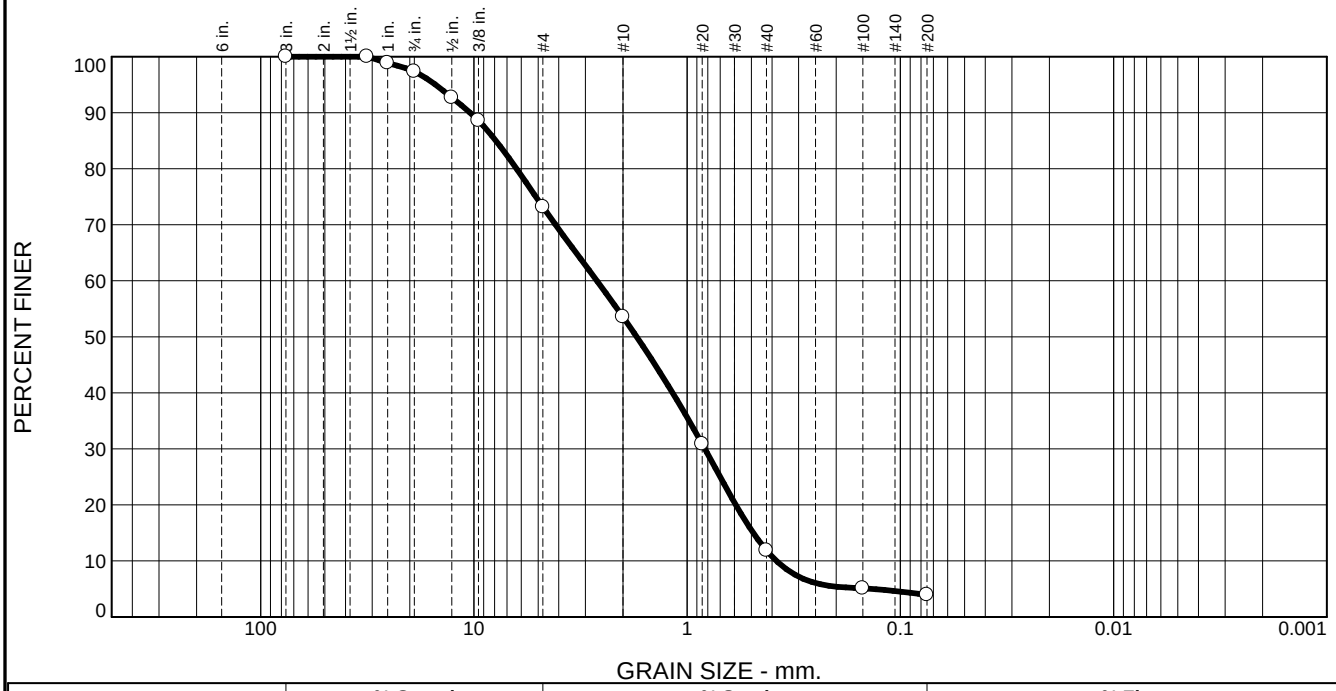
Per your request, the following test(s) have been performed:

ASTM C136/AASHTO T27, Sieve Analysis of Fine and Coarse Aggregates

Please contact your project manager with questions. Thank you.

Imtiaz Ahmed, Laboratory Manager
Mar 21, 2023

Sieve Analysis Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.6	24.2	19.6	41.7	8.0	3.9	

Test Results (ASTM C136 & ASTM C117)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3"	100.0		
1 1/4"	100.0		
1"	98.9		
3/4"	97.4		
1/2"	92.7		
3/8"	88.6		
#4	73.2		
#10	53.6		
#20	30.9		
#40	11.9		
#100	5.1		
#200	3.9		

* (no specification provided)

Material Description

Brown poorly graded sand with gravel

Atterberg Limits (ASTM D 4318)

PL= NP **LL=** NV **PI=** NP

Classification

USCS (D 2487)= SP **AASHTO (M 145)=** A-1-b

Coefficients

D_{90}= 10.4263 D_{85}= 7.8877 D_{60}= 2.6515
D_{50}= 1.7247 D_{30}= 0.8257 D_{15}= 0.4898
D_{10}= 0.3813 C_u= 6.95 C_c= 0.67

Remarks

F.M.=4.11

Date Received: 3-8-23 **Date Tested:** 3-14-23

Tested By: Abdel Deif

Checked By: Imtiaz Ahmed

Title: Lab Manager

Source of Sample: Onsite **Date Sampled:** 3-2-23
Sample Number: 1

GeoTest, Inc.

West Allis, WI

Client: GZA GeoEnvironmental Inc
Project: Caroline Heights

Project No: 7679 **Test No** 6828-6442

Attachment 5

Boring Logs

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

BORING NUMBER B-09

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/21/20 **COMPLETED** 4/21/20
GROUND ELEVATION 752.4 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: Grassy											
	750		S-1: TOPSOIL: Stiff to very stiff, silty CLAY (CL-ML), low plasticity; little Sand, fine; trace Organics; brown, moist		S-1 (1-2.5)	11	2-3-3 (6)	1-2.5						
5			S-2: Medium dense, well-graded SAND (SW), fine to coarse-grained; with Gravel, fine to coarse; little Silt; tan and brown, moist (possible fill)		S-2 (3.5-5)	16	4-9-11 (20)	2.0						
	745		S-3: Dense, well-graded GRAVEL (GW), fine to coarse-grained; with Sand, fine to coarse; rock fragments; tan and brown, dry		S-3 (6-7.5)	16	13-16-26 (42)							
10			S-4: Upper 2": Medium dense, well-graded GRAVEL (GW), fine to coarse-grained; with Sand, fine to coarse; tan and brown, dry Lower 13": Medium stiff, SILT (ML), nonplastic; light brown, wet		S-4 (8.5-10)	15	10-10-12 (22)	0.5-1.0						
	740		S-5: Upper 3": Medium stiff, SILT (ML), nonplastic; light brown, wet Lower 15": Very stiff, lean CLAY (CL), low plasticity; silty seams; brownish gray, moist	1	S-5 (11-12.5)	18	3-5-9 (14)	0.5-3.0					
15			S-6: Very stiff, lean CLAY (CL), low plasticity; Silty seams; brownish gray, moist		S-6 (13.5-15)	18	2-2-2 (4)	1.5-3.0		39.8	32	19	13	
	735													
20			S-7: Upper 4": Very stiff, lean CLAY (CL), low plasticity; Silty seams; brownish gray, moist Lower 14": Medium dense, poorly-graded SAND with SILT (SP-SM), fine to medium-grained; tan, moist		S-7 (18.5-20)	18	5-11-13 (24)	3.0						
	730													
25			S-8: Upper 3": Medium dense, poorly-graded SAND with SILT (SP-SM), fine to medium-grained; tan, moist Middle 12": Medium stiff, SILT (ML), nonplastic; brown, wet Lower 3": Very stiff, lean CLAY (CL), low plasticity; little Sand, medium to coarse; brown, moist		S-8 (23.5-25)	18	6-11-11 (22)	0.5-2.0						
	725													
30			S-9: Upper 10": Dense, well-graded SAND with SILT (SW-SM), fine to coarse-grained; tan, wet Lower 4": Dense, well-graded GRAVEL with SILT and SAND (GW-GM), fine to coarse-grained; tan, wet		S-9 (28.5-30)	14	3-13-18 (31)							
			Boring ended at 30' below ground surface and backfilled with auger cuttings and bentonite chips											

REMARKS

1. Supplementary boring blind drilled to 10.5' bgs approximately 1' east of original boring location. Shelby tube sample taken from 10.5 to 12.5' bgs. 23" of recovery. Tube was damaged at the bottom.

GEOTECH WITH REMARKS AND ELEV - GINT STD US LAB.GDT - 6/3/20 14:27 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.00 SCHOOL SISTERS OF NOTRE DAME (APRIL 2020).GPJ

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

BORING NUMBER B-13

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/22/20 **COMPLETED** 4/22/20
GROUND ELEVATION 753.6 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW/MBB **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: Grassy											
			S-1: Upper 11": TOPSOIL: Stiff to very stiff, lean CLAY (CL), low plasticity; trace Gravel, fine; trace Sand, fine; trace Organics; brown, moist		S-1 (1-2.5)	16	2-2-2 (4)	1.0-2.5						
	750		Lower 5": Loose, well-graded SAND (SW), fine to coarse-grained; little Gravel, fine; tan, moist		S-2 (3.5-5)	12	4-4-6 (10)							
5			S-2: Loose, silty SAND (SM), fine to coarse-grained; little Gravel, fine; tan, moist											
			S-3: Dense, silty SAND (SM), fine to coarse-grained; some Gravel, fine to coarse; tan, dry		S-3 (6-7.5)	16	8-16-16 (32)			6.4	NP	NP	NP	18
	745		S-4: Dense, silty SAND (SM), fine to coarse-grained; with Gravel, fine to coarse; gray, dry		S-4 (8.5-10)	14	11-26-20 (46)							
10			S-5: Very stiff to hard, SILT (ML), nonplastic; tan to red, moist (clayey seam in center)	1	S-5 (11-12.5)	16	4-6-11 (17)	3.0-4.5						
	740		S-6: Medium dense, Silty SAND (SM), fine-grained; tan, wet		S-6 (13.5-15)	18	4-13-15 (28)							
15														
	735		S-7: Upper 6": Medium dense, Silty SAND (SM), fine-grained; brown, wet transitioning to very stiff SILT (ML); brown, wet		S-7 (18.5-20)	17	6-5-8 (13)	2.0-3.5						
20			Lower 11": Very stiff, lean CLAY (CL), low plasticity; gray, wet											
	730		S-8: Upper 5": Soft, lean CLAY (CL), low plasticity; gray, wet		S-8 (23.5-25)	18	7-13-11 (24)	0.5		19.4				50
25			Lower 13": Soft, SILT (ML), nonplastic; little Sand, fine; gray, wet											
	725		S-9: Upper 3": Very stiff, lean CLAY (CL), low plasticity; trace Silt; gray, moist		S-9 (28.5-30)	15	5-8-8 (16)	3.0-0.25						
30			Lower 12": Very soft, SILT (ML), nonplastic; little Sand, fine; gray, wet	2										
			Boring ended at 30' below ground surface and backfilled with auger cuttings and bentonite chips											

REMARKS

1. Rig chatter at 11.5' BGS
2. Cave in at 15' below ground surface

GEOTECH WITH REMARKS AND ELEV - GINT STD US LAB.GDT - 6/3/20 14:27 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.00 SCHOOL SISTERS OF NOTRE DAME (APRIL 2020).GPJ

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

BORING NUMBER AB-03

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/21/20 **COMPLETED** 4/21/20
GROUND ELEVATION 743.8 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: Grassy											
			S-1: TOPSOIL: Stiff, lean CLAY (CL), low plasticity; little Sand, fine to medium; trace Gravel, fine; trace Organics; brown, moist		S-1 (1-2.5)	12	1-2-2 (4)	1.5-2.0		19.6				
	740		S-2: Upper 4": TOPSOIL: Stiff, lean CLAY (CL), low plasticity; little Sand, fine to medium; trace Gravel, fine; trace Organics; brown, moist		S-2 (3.5-5)	16	6-8-10 (18)	1.0						
5			Lower 12": Medium dense, well-graded SAND with SILT and GRAVEL (SW-SM), fine- to coarse-grained; tanish brown, dry											
			S-3: Medium dense, well-graded GRAVEL with SILT and SAND (GW-GM), fine- to coarse-grained; tannish brown, dry		S-3 (6-7.5)	16	6-13-11 (24)			4.9	NP	NP	NP	8
	735		S-4: Medium dense, well-graded SAND with SILT (SW-SM), fine- to coarse-grained; some Gravel, fine to coarse; tannish brown, dry		S-4 (8.5-10)	15	4-7-8 (15)							
10			S-5: Medium dense, well-graded SAND with SILT (SW-SM), fine- to coarse-grained; some Gravel, fine to coarse; tannish brown, dry		S-5 (11-12.5)	16	9-11-10 (21)							
	730		S-6: Medium dense, well-graded SAND with SILT (SW-SM), fine- to coarse-grained; some Gravel, fine to coarse; tannish brown, dry		S-6 (13.5-15)	16	5-5-9 (14)							
15														
	725		S-7: Medium dense, well-graded SAND with SILT (SW-SM), fine- to coarse-grained; some Gravel, fine to coarse; tannish brown, wet	1	S-7 (18.5-20)	4	12-12-11 (23)							
20			Boring ended at 20' below ground surface and backfilled with auger cuttings and bentonite chips											

REMARKS

1. Rock fragment blocking tip of sampler.

GEOTECH WITH REMARKS AND ELEV - GINT STD US LAB.GDT - 6/3/20 14:27 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.00 SCHOOL SISTERS OF NOTRE DAME (APRIL 2020).GPJ

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

BORING NUMBER AB-04

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/21/20 **COMPLETED** 4/21/20
GROUND ELEVATION 744.8 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB
4/21/20	AD	17		10 Minutes

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: Grassy											
			S-1: Upper 6": TOPSOIL: Stiff, lean CLAY (CL), low plasticity; little Sand, fine; trace Organics; brown, moist Lower 5": Loose, well-graded GRAVEL with SILT (GW-GM), fine- to coarse-grained; tan, dry		S-1 (1-2.5)	11	3-3-5 (8)	1.5						
5	740		S-2: Medium dense, well-graded SAND with SILT (SW-SM) fine- to coarse; some Gravel, fine to coarse; tan, dry		S-2 (3.5-5)	15	6-10-10 (20)	2						
			S-3: Medium dense, well-graded SAND with SILT and GRAVEL (SW-SM), fine- to coarse-grained; tan, dry		S-3 (6-7.5)	15	3-8-6 (14)							
10	735		S-4: Dense, well-graded SAND with SILT and GRAVEL (SW-SM), fine- to coarse-grained; tan, dry		S-4 (8.5-10)	18	17-18-18 (36)							
			S-5: Medium dense, poorly-graded GRAVEL with SILT and SAND (GP-GM), fine-grained; tan, dry	1	S-5 (11-12.5)	18	18-14-11 (25)			5.1	NP	NP	NP	12
15	730		S-6: Dense, poorly-graded GRAVEL with SILT and SAND (GP-GM), fine-grained; reddish tan, dry		S-6 (13.5-15)	18	6-18-18 (36)							
			S-7: Upper 7": Medium dense, well-graded GRAVEL with SAND (GW),fine- to coarse-grained; trace Silt; reddish tan, dry Lower 7": Medium dense, well-graded GRAVEL (GW), fine- to coarse-grained; little Sand, fine to coarse; trace Silt; tanish brown, wet		S-7 (18.5-20)	14	7-9-10 (19)	1.5						
20	725													
			S-8: Upper 4": Medium dense, well-graded GRAVEL (GW), fine- to coarse-grained; little Sand, fine to coarse; trace Silt; tanish brown, wet Lower 8": Stiff, lean CLAY (CL), low plasticity; trace Sand, fine; brown/gray, wet		S-8 (23.5-25)	12	11-9-7 (16)	1.5-2.0						
25	720													
			S-9: Upper 6": Stiff, lean CLAY (CL), low plasticity; trace Sand, fine; brown/gray, wet Lower 10": Loose, poorly-graded SAND (SP), fine- to medium-grained; gray, wet	2	S-9 (28.5-30)	16	5-3-4 (7)							
30	715		Boring ended at 30' below ground surface and backfilled with auger cuttings and bentonite chips											

REMARKS

1. Rock chips present in sample. Possible cobbles.
2. Sample damaged by rock partially blocking tip of sampler.

GEOTECH WITH REMARKS AND ELEV - GINT STD US LAB.GDT - 6/3/20 14:27 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.00 SCHOOL SISTERS OF NOTRE DAME (APRIL 2020).GPJ

GZA GeoEnvironmental, Inc.
17975 West Sarah Lane, #100
Brookfield, WI 53045
(262) 754-2560

BORING NUMBER EB-01

CLIENT Mandel Group
PROJECT NAME School Sisters of Notre Dame
PROJECT NUMBER 20.0156624.00
PROJECT LOCATION 13105 Watertown Plank Rd., Elm Grove, WI
DATE STARTED 4/21/20 **COMPLETED** 4/21/20
GROUND ELEVATION 743.3 ft, **HOLE SIZE** 4-1/4" inches
DRILLING CONTRACTOR GeoServe
DRILLING METHOD HSA
LOGGED BY AJW **CHECKED BY** JDG
DRILL RIG Geoprobe 7822DT

GROUND WATER LEVELS (ft, bgs):

DATE	TIME	DEPTH	CASING	STAB
4/21/20	AD	18		10 Minutes

DEPTH (ft)	Elevation (ft,)	GRAPHIC LOG	MATERIAL DESCRIPTION	REMARKS	SAMPLE TYPE NUMBER (Depth Interval)	RECOVERY (inches)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0			Surface: Grassy											
			S-1: TOPSOIL: Medium stiff, sandy SILT (ML), low plasticity; little Clay; trace Gravel, fine; trace Organics; brown, moist		S-1 (1-2.5)	9	1-2-2 (4)	1.0						
	740													
5			S-2: Upper 6": Medium stiff, sandy SILT (ML), low plasticity; little Clay; trace Gravel, fine; trace Organics; brown, moist Lower 12": Medium dense, well-graded SAND (SW) fine- to coarse; some Gravel, fine to coarse; trace Silt; brown to tan, dry		S-2 (3.5-5)	14	10-11-12 (23)	2.0						
			S-3: Medium dense, well-graded SAND with SILT (SW-SM) fine- to coarse; some Gravel, fine to coarse; dark tan to brown, dry		S-3 (6-7.5)	14	5-11-10 (21)							
	735													
10			S-4: Medium dense, well-graded SAND with SILT (SW-SM) fine- to coarse; little Gravel, fine to coarse; brown to dark tan, dry		S-4 (8.5-10)	11	10-14-10 (24)							
			S-5: Medium dense, well-graded SAND with SILT and GRAVEL (SW-SM), fine- to coarse-grained; trace to little Silt; brown and tan, dry		S-5 (11-12.5)	12	14-11-10 (21)							
	730													
15			S-6: Medium dense, well-graded GRAVEL with SILT and SAND (GW-GM), fine- to coarse-grained; brown and tan, dry	1	S-6 (13.5-15)	15	12-14-15 (29)			4.6	NP	NP	NP	9
	725													
20			S-7: Medium dense, well-graded GRAVEL with SILT and SAND (GW-GM), fine- to coarse-grained; brown, wet		S-7 (18.5-20)	9	6-7-11 (18)							
	720													
25			S-8: Hard, silty CLAY (CL-ML), low plasticity; trace to little Sand, fine; grayish brown, wet -Multiple silty seams present in sample.		S-8 (23.5-25)	14	7-6-9 (15)	4.0						
	715													
30			S-9: Hard, silty CLAY (CL-ML), low plasticity; trace to little Sand, fine; grayish brown, wet	2	S-9 (28.5-30)	4	15-38-45 (50+)	4.0						
			Boring ended at 30' below ground surface and backfilled with auger cuttings and bentonite chips											

REMARKS

1. Rock chips present in sampler. Possible cobbles.
2. High blow counts likely due to rock blocking sampler.

GEOTECH WITH REMARKS AND ELEV - GINT STD US LAB.GDT - 6/3/20 14:27 - J:\GEOTECH PROJECTS\GINT PROJECT DATABASES\20.0156624.00 SCHOOL SISTERS OF NOTRE DAME (APRIL 2020).GPJ

MEASURED INFILTRATION RATES

Infiltration rates at the test locations were variable. Test locations were allowed to soak for a minimum of 20 minutes before measurements began. The initial infiltration rates were higher than the later, more stabilized rates. When calculating mean infiltration rates, the first two to three readings were generally ignored to account for initial surface and near surface disturbance and void filling. This phenomenon is common due to unsaturated infiltration rates being faster than more stabilized, saturated rates. The table below provides the test results.

Test Pit Designation	Approximate Base of TP Elev. (NAVD 88)	Range of Infiltration Rates (in/hr)[1]	Mean Infiltration Rate (in/hr)[1] (arithmetic mean)	Mean Infiltration Rate (in/hr)[1] (geometric mean)	Notes
TP-1	747	6.0 to 22.5	8.0	7.7	Single Ring Test
TP-2	747	6.9 to 9.9	7.9	7.9	Double Ring Test
TP-3	747	22.5 to 31.5	28.2	28.0	Double Ring Test
TP-4	747	13 to 31	16.2	15.7	Double Ring Test
TP-6	739	33 to 48	39.3	39.1	Double Ring Test
TP-7	739	1.5 to 4.0	2.1	2.1	Double Ring Test

Notes:
1) in/hr = inches per hour.

Table 2. Design Static Infiltration Rates for Soil Textures Receiving Storm Water [Note 1]

Soil Texture	Design Static Infiltration Rate Without Measurement (Inches/Hour) [Note 2]
Coarse sand or coarser	3.60
Loamy coarse sand	3.60
Sand	3.60
Loamy sand	1.63
Sandy loam, fine sand, loamy sand, very fine sand, and loamy fine sand	0.50
Loam	0.24
Silt loam	0.13
Sandy clay loam	0.11
Clay loam	0.03
Silty Clay loam	0.04 [Note 3]
Sandy clay	0.04
Silty clay	0.07
Clay	0.07

Table 3. Correction Factors for Measured Infiltration Rates at Infiltration Devices [Note 1]

Ratio of Textural Infiltration Rates (*R*)	Correction Factor (*A*)
1	2.5
1.1 to 4.0	3.5
4.1 to 8.0	4.5
8.1 to 16.0	6.5
16.1 or greater	8.5

[Note 1] Washington State Department of Ecology, 2001.

AREAS WITH INFILTRATION TESTS

Dry Pond 1					
Grade	Soil Interface (A)	Depth B	Textural Infiltration Rate (Tn)	Textural Infiltration Rate (TL)	Test Infiltration Rate
Existing Grade Elevation	Soil Interface Elevation	Additional 5-ft Below Depth A	Textural Infiltration Rate at Depth A	Textural Infiltration Rate at Depth B	Stabilized (in/hr) Value C
755.6 - TP-1	747	742	3.6	3.6	7.95
753.2 - TP-2			COARSE SAND/GRAVEL	COARSE SAND/GRAVEL	
	Value D		TP-1/TP-2	TP-1/TP-2	
Tn/TL	Correction Factor (Table 3)				
1.00	2.5				
F(Static) or Design Infiltration					
C/D=	**3.18**				

GW = N/A

Dry Pond 2					
Grade	Soil Interface (A)	Depth B	Textural Infiltration Rate (Tn)	Textural Infiltration Rate (TL)	Test Infiltration Rate
Existing Grade Elevation	Soil Interface Elevation	Additional 5-ft Below Depth A	Textural Infiltration Rate at Depth A	Textural Infiltration Rate at Depth B	Stabilized (in/hr) Value C
752.4 - TP-3	747	742	3.6	3.6	22.20
752.0 - TP-4			COARSE SAND/GRAVEL	COARSE SAND/GRAVEL	
	Value D		TP-3/TP-4	TP-3/TP-4	
Tn/TL	Correction Factor (Table 3)				
1.00	2.5				
F(Static) or Design Infiltration					
C/D=	**8.88**				

GW = N/A

Dry Pond 3					
Grade	Soil Interface (A)	Depth B	Textural Infiltration Rate (Tn)	Textural Infiltration Rate (TL)	Test Infiltration Rate
Existing Grade Elevation	Soil Interface Elevation	Additional 5-ft Below Depth A	Textural Infiltration Rate at Depth A	Textural Infiltration Rate at Depth B	Stabilized (in/hr) Value C
744.9 - TP-6	739	734	3.6	3.6	39.30
			COARSE SAND/GRAVEL	COARSE SAND/GRAVEL	
	Value D		TP-6	TP-6	
Tn/TL	Correction Factor (Table 3)				
1.00	2.5				
F(Static) or Design Infiltration					
C/D=	**15.72**				

GW = -17 BORING AB-04
727.8
GW = -18 BORING EB-01
725.3
AVG GW = 726.55

Infiltration Basin					
Grade	Soil Interface (A)	Depth B	Textural Infiltration Rate (Tn)	Textural Infiltration Rate (TL)	Test Infiltration Rate
Existing Grade Elevation	Soil Interface Elevation	Additional 5-ft Below Depth A	Textural Infiltration Rate at Depth A	Textural Infiltration Rate at Depth B	Stabilized (in/hr) Value C
742.2 -TP-5	739	734	3.6	3.6	10.8*
			COARSE SAND/GRAVEL	COARSE SAND/GRAVEL	
	Value D		TP-5	TP-5	
Tn/TL	Correction Factor (Table 3)	BOTTOM NEED TO BE RAISED TO 741.00' (2'). CURRENT BOTTOM IS 737.00'... RAISED BOTTOM TO 739.00' FROM 737.00' 4/10/2023			
1.00	2.5				
F(Static) or Design Infiltration					
C/D=	**4.32**				

GW = -4.80 TEST PIT TP-5
737.40

*VALUE FROM PREVIOUS TESTING. PIT WAS SATURATED WITH WATER THIS TIME

Existing Southeast Basin					
Grade	Soil Interface (A)	Depth B	Textural Infiltration Rate (Tn)	Textural Infiltration Rate (TL)	Test Infiltration Rate
Existing Grade Elevation	Soil Interface Elevation	Additional 5-ft Below Depth A	Textural Infiltration Rate at Depth A	Textural Infiltration Rate at Depth B	Stabilized (in/hr) Value C
741.6 -TP-7	739	734	0.03	0.03	2.10
			CLAY LOAM	CLAY LOAM	
	Value D		TP-7	TP-7	
Tn/TL	Correction Factor (Table 3)				
1.00	2.5				
F(Static) or Design Infiltration					
C/D=	**0.84**				

GW = N/A

APPENDIX F

STORM PIPE CAPACITIES AND GRATE CAPACITIES CALCULATIONS & ADS PLAN

CAROLINE HEIGHTS DEVELOPMENT

Project ID 40380
Location Caroline Heights
Date 7/31/2023
Designer RJT
Reviewer APS

100-YEAR

Drainage Area		Size (acres)	C	I (in/hr)	Q (cfs)
B1	Roof Drain Pipe	0.034	0.90	9.930	0.3055
B2	Roof Drain Pipe	0.037	0.90	9.930	0.3309
B3	Roof Drain Pipe	0.104	0.90	9.930	0.9309

1. Intensity taken for 100-year storm from SEWRPC (Waukesha County)

$$I = \frac{a}{Tc^k + b}$$

9.930122693

a = 44.075
k = 0.631
b = 1.341

2. Runoff coefficients used 0.90 (hardscape & roof) and 0.35 (grass)

Area	Hardscape or Roof (SF)	Grass (SF)	Total (SF)
B1 Roof	1,489	-	1,489
B2 Roof	1,613	-	1,613
B3 Roof	4,537	-	4,537

	Roof Area (SF)	# Roof Drains	Average Area Per Drain (SF)
B1	52,114	35	1,489
B2	43,542	27	1,613
B3	22,686	5	4,537

CAROLINE HEIGHTS DEVELOPMENT

Project ID	40380
Location	Caroline Heights
Date	7/31/2023
Designer	RJT
Reviewer	APS

Pipe Inflow and Capacities (cfs)

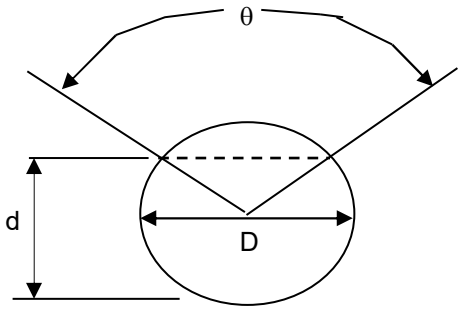
ROOF DRAIN PIPE B1	Area Inflow	Upstream Pipe Inflow	Total Flow	100-YEAR PASS/FAIL?
Inflow	0.305	0.000	0.305	PASS
Capacity	1.184			
GPM	531		137	
ROOF DRAIN PIPE B2	Area Inflow	Upstream Pipe Inflow	Total Flow	PASS/FAIL?
Inflow	0.331	0.000	0.331	PASS
Capacity	0.917			
GPM	412		149	
ROOF DRAIN PIPE B3	Area Inflow	Upstream Pipe Inflow	Total Flow	PASS/FAIL?
Inflow	0.931	0.000	0.931	PASS
Capacity	1.674			
GPM	751		418	

MANNING'S EQUATION FOR PIPE FLOW

Project:	40380	Location:	ROOF DRAIN PIPE B1
By:	RJT	Date:	7/31/2023
Chk. By:	APS	Date:	7/31/2023

mdo version 12.8.00

Clear Data Entry Cells



INPUT

D=	8	inches
d=	7.2	inches
n=	0.01	mannings coeff
θ=	73.7	degrees
S=	0.005	slope in/in

Mannings Formula

$Q=(1.486/n)AR_h^{2/3}S^{1/2}$

R=A/P

A=cross sectional area

P=wetted perimeter

S=slope of channel

n=Manning's roughness coefficient

$V=(1.49/n)R_h^{2/3}S^{1/2}$

Q=V x A

Solution to Mannings Equation				
Area,ft^2	Wetted Perimeter, ft	Hydraulic Radius, ft	velocity ft/s	flow, cfs
0.33	1.67	0.20	3.58	1.18

Manning's n-values	
PVC	0.01
PE (<9"dia)	0.015
PE (>12"dia)	0.02
PE(9-12"dia)	0.017
CMP	0.025
ADS N12	0.012
HCMP	0.023
Conc	0.013

Created by: Mike O'Shea

MANNING'S EQUATION FOR PIPE FLOW

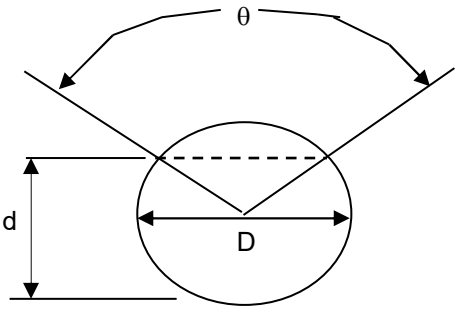
Project: 40380 Location: ROOF DRAIN PIPE B2

By: RJT Date: 7/31/2023

Chk. By: APS Date: 7/31/2023

mdo version 12.8.00

Clear Data Entry Cells



INPUT

D=	8	inches
d=	7.2	inches
n=	0.01	mannings coeff
θ=	73.7	degrees
S=	0.003	slope in/in

Mannings Formula

$Q=(1.486/n)AR_h^{2/3}S^{1/2}$

R=A/P

A=cross sectional area

P=wetted perimeter

S=slope of channel

n=Manning's roughness coefficient

$V=(1.49/n)R_h^{2/3}S^{1/2}$

Q=V x A

Solution to Mannings Equation				
Area,ft^2	Wetted Perimeter, ft	Hydraulic Radius, ft	velocity ft/s	flow, cfs
0.33	1.67	0.20	2.77	0.92

Manning's n-values	
PVC	0.01
PE (<9"dia)	0.015
PE (>12"dia)	0.02
PE(9-12"dia)	0.017
CMP	0.025
ADS N12	0.012
HCMP	0.023
Conc	0.013

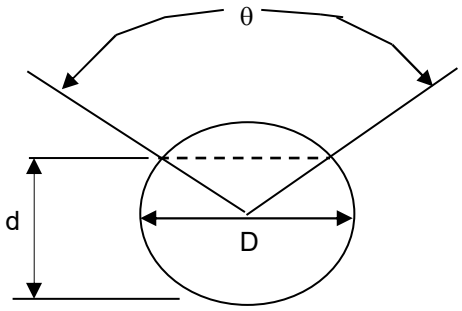
Created by: Mike O'Shea

MANNING'S EQUATION FOR PIPE FLOW

Project:	40380	Location:	ROOF DRAIN PIPE B3
By:	RJT	Date:	7/31/2023
Chk. By:	APS	Date:	7/31/2023

mdo version 12.8.00

Clear Data Entry Cells



INPUT

D=	8	inches
d=	7.2	inches
n=	0.01	mannings coeff
θ=	73.7	degrees
S=	0.01	slope in/in

Mannings Formula

$Q=(1.486/n)AR_h^{2/3}S^{1/2}$

R=A/P

A=cross sectional area

P=wetted perimeter

S=slope of channel

n=Manning's roughness coefficient

$V=(1.49/n)R_h^{2/3}S^{1/2}$

Q=V x A

Solution to Mannings Equation				
Area,ft^2	Wetted Perimeter, ft	Hydraulic Radius, ft	velocity ft/s	flow, cfs
0.33	1.67	0.20	5.06	1.67

Manning's n-values	
PVC	0.01
PE (<9"dia)	0.015
PE (>12"dia)	0.02
PE(9-12"dia)	0.017
CMP	0.025
ADS N12	0.012
HCMP	0.023
Conc	0.013

Created by: Mike O'Shea

CAROLINE HEIGHTS DEVELOPMENT

Project ID	40380
Location	Elm Grove
Date	9/4/2024
Designer	RJT
Reviewer	

Pipe Inflow and Capacities (cfs)

				Capacity of Pipe > Total Flow?	CAPACITY MINUS FLOW
1: 8" Min Capacity	Area Inflow	Upstream Pipe Inflow	Total Flow		
Inflow	1.630	0.000	1.630	PASS	0.044
Capacity	1.674				
GPM	751.441		731.598		
3: 12" Min Capacity					
Inflow		1.060	1.060	PASS	1.430
Capacity	2.490				
GPM	1117.553		475.763		
4: 15" Min Capacity					
Inflow		4.670	4.670	PASS	1.531
Capacity	6.201				
GPM	2783.094		2096.050		
5: 21" Min Capacity					
Inflow		5.130	5.130	PASS	6.894
Capacity	12.024				
GPM	5396.939		2302.513		
6: 24" Min Capacity					
Inflow		11.790	11.790	PASS	3.459
Capacity	15.249				
GPM	6844.167		5291.741		
7: UG OUT					
Inflow	1.700	0.000	1.700	PASS	0.858
Capacity	2.558				
GPM	1148.079		763.016		
8: DP1 OUT					
Inflow	0.000	0.000	0.000	PASS	6.422
Capacity	6.422				
GPM	2882.196		0.000		
9: DP2 OUT					
Inflow	0.000	0.000	0.000	PASS	5.370
Capacity	5.370				
GPM	2410.177		0.000		
10: DP3 OUT					
Inflow	0.000	0.000	0.000	PASS	1.130
Capacity	1.130				
GPM	507.121		0.000		
11: IB OUT					
Inflow	0.000	0.000	0.000	PASS	2.658
Capacity	2.658				
GPM	1192.977		0.000		
12: 15" Red Barn Lane					
Inflow	3.990	0.000	3.990	PASS	0.013
Capacity	4.003				
GPM	1796.479		1790.844		

NOTE: PIPE SLOPES ARE MINIMUM
SLOPE OF THAT SIZE

CAROLINE HEIGHTS DEVELOPMENT

Project ID	40380
Location	Elm Grove
Date	9/4/2024
Designer	RJT
Reviewer	

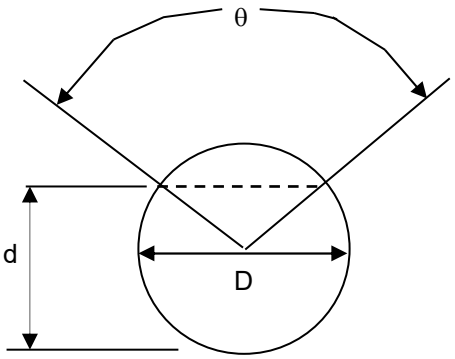
Drainage Area	Size (SF)	10-year Q (cfs)	100-year	NOTES
MAX OF ALL AREA A'S	227,399	1.63	3.00	MAX individual CFS of all Area A's (FOR 8")
A1	11,792	1.06	2.03	FOR 12" to DP1
A30, A31, A32, A33	40,670	3.43	6.71	FOR 21"
B	85,559	5.88	12.65	TO WEST SWALE THEN TO 24" PIPE
B1	42,864	5.36	8.74	TO WEST SWALE THEN TO 24" PIPE
C	122,933	10.29	20.37	TO EAST SWALE
C1	18,274	1.36	2.84	TO 24" PIPE
C2	77,290	6.94	13.32	DIRECT TO DP1
D1	20,886	0.72	1.69	DIRECT TO DP2
D2	16,636	1.07	2.21	DIRECT DP2
D3	8,234	0.57	1.22	WEST SWALE TO 24"
E1*	39,552	2.12	4.81	OFFSITE TO WEST SWALE TO 24"
E2	18,887	1.01	2.16	DIRECT TO INFILTRATION BASIN
E3	109,219	5.14	11.28	DIRECT TO INFILTRATION BASIN
F	43,646	4.45	8.06	GREEN MEADOW SWALE
F1	54,287	5.37	9.86	GREEN MEADOW SWALE
F2	18,888	0.95	2.19	TO 24" PIPE
F3	20,215	1.33	2.92	TO SOUTH CAMPUS WEST SWALE
F4	26,797	1.61	3.66	DIRECT TO DP3
F5	31,282	1.88	4.28	DIRECT TO SE BASIN
F6	6,642	0.40	0.91	TO RAIN GARDENS
H1	114,743	8.56	17.80	TO EAST SWALE
H2	65,303	4.87	10.13	TO SOUTH BERM SALE
H5	14,502	0.87	1.98	TO SOUTH BERM SWALE
I	56,129	1.62	3.81	TO SOUTH BERM SWALE
UNDERGROUND STORAGE	N/A	1.70	2.32	10" OUTLET (x2) to 21"
DP1	N/A	0.00	0.00	15" OUTLET
DP2	N/A	0.00	0.00	12" OUTLET
IB	N/A	0.00	2.77	12" OUTLET
DP3	N/A	0.00	0.00	6" OUTLET
TO WEST SWALE	177,116	11.79	24.86	FOR 24"
15" TO UG	43,275	4.67	9.53	FOR 15"
X	57,668	3.99	8.41	FOR 15" FROM RED BARN LANE WEST SWALE

1. Area Exhibit shown below for reference.
2. Flows based on MSE 3 (24-hr)



8" PVC @ MIN SLOPE

Clear Data Entry Cells



INPUT

D=	8	inches
d=	7.2	inches
n=	0.01	mannings coeff
θ=	73.7	degrees
S=	0.01	slope in/in

Mannings Formula

$Q=(1.486/n)AR_h^{2/3}S^{1/2}$

R=A/P

A=cross sectional area

P=wetted perimeter

S=slope of channel

n=Manning's roughness coefficient

$V=(1.49/n)R_h^{2/3}S^{1/2}$

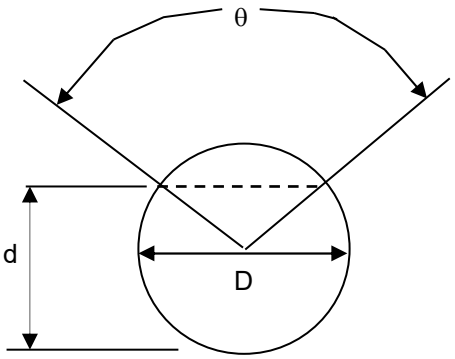
Q=V x A

Solution to Mannings Equation				
Area,ft^2	Wetted Perimeter, ft	Hydraulic Radius, ft	velocity ft/s	flow, cfs
0.33	1.67	0.20	5.06	1.67421

Manning's n-values	
PVC	0.01
PE (<9"dia)	0.015
PE (>12"dia)	0.02
PE(9-12"dia)	0.017
CMP	0.025
ADS N12	0.012
HCMP	0.023
Conc	0.013

12" @ MIN SLOPE

Clear Data Entry Cells



INPUT

D=	12	inches
d=	10.8	inches
n=	0.013	mannings coeff
θ=	73.7	degrees
S=	0.0043	slope in/in

Mannings Formula

$Q=(1.486/n)AR_h^{2/3}S^{1/2}$

R=A/P

A=cross sectional area

P=wetted perimeter

S=slope of channel

n=Manning's roughness coefficient

$V=(1.49/n)R_h^{2/3}S^{1/2}$

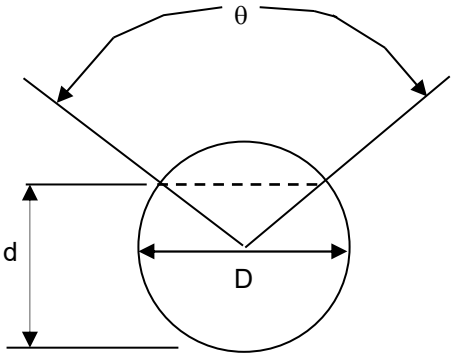
Q=V x A

Solution to Mannings Equation				
Area,ft^2	Wetted Perimeter, ft	Hydraulic Radius, ft	velocity ft/s	flow, cfs
0.74	2.50	0.30	3.34	2.48991

Manning's n-values	
PVC	0.01
PE (<9"dia)	0.015
PE (>12"dia)	0.02
PE(9-12"dia)	0.017
CMP	0.025
ADS N12	0.012
HCMP	0.023
Conc	0.013

15" PVC @ MIN SLOPE

Clear Data Entry Cells



INPUT

D=	15	inches
d=	13.5	inches
n=	0.01	mannings coeff
θ=	73.7	degrees
S=	0.0048	slope in/in

Mannings Formula

$Q=(1.486/n)AR_h^{2/3}S^{1/2}$

R=A/P

A=cross sectional area

P=wetted perimeter

S=slope of channel

n=Manning's roughness coefficient

$V=(1.49/n)R_h^{2/3}S^{1/2}$

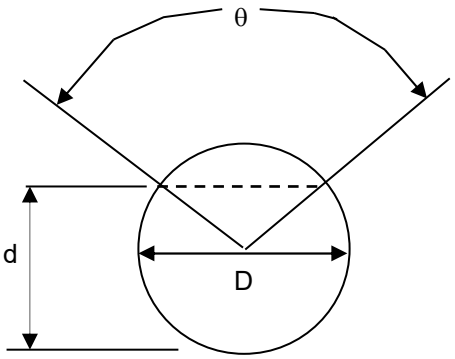
Q=V x A

Solution to Mannings Equation				
Area,ft^2	Wetted Perimeter, ft	Hydraulic Radius, ft	velocity ft/s	flow, cfs
1.16	3.12	0.37	5.33	6.20073

Manning's n-values	
PVC	0.01
PE (<9"dia)	0.015
PE (>12"dia)	0.02
PE(9-12"dia)	0.017
CMP	0.025
ADS N12	0.012
HCMP	0.023
Conc	0.013

21" @ MIN SLOPE

Clear Data Entry Cells



INPUT

D=	21	inches
d=	18.9	inches
n=	0.01	mannings coeff
θ=	73.7	degrees
S=	0.003	slope in/in

Mannings Formula

$Q=(1.486/n)AR_h^{2/3}S^{1/2}$

R=A/P

A=cross sectional area

P=wetted perimeter

S=slope of channel

n=Manning's roughness coefficient

$V=(1.49/n)R_h^{2/3}S^{1/2}$

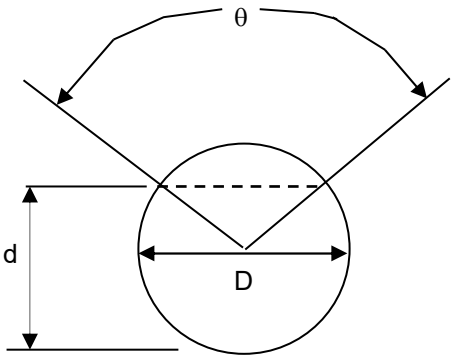
Q=V x A

Solution to Mannings Equation				
Area,ft^2	Wetted Perimeter, ft	Hydraulic Radius, ft	velocity ft/s	flow, cfs
2.28	4.37	0.52	5.27	12.02438

Manning's n-values	
PVC	0.01
PE (<9"dia)	0.015
PE (>12"dia)	0.02
PE(9-12"dia)	0.017
CMP	0.025
ADS N12	0.012
HCMP	0.023
Conc	0.013

24" @ MIN SLOPE

Clear Data Entry Cells



INPUT

D=	24	inches
d=	21.6	inches
n=	0.013	mannings coeff
θ=	73.7	degrees
S=	0.004	slope in/in

Mannings Formula

$Q=(1.486/n)AR_h^{2/3}S^{1/2}$

R=A/P

A=cross sectional area

P=wetted perimeter

S=slope of channel

n=Manning's roughness coefficient

$V=(1.49/n)R_h^{2/3}S^{1/2}$

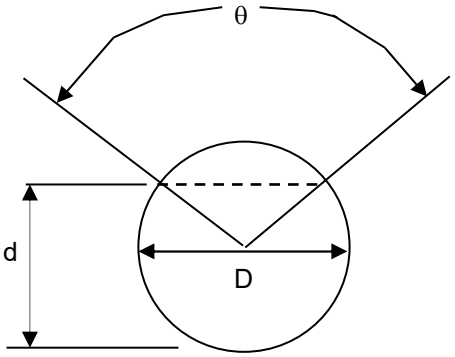
Q=V x A

Solution to Mannings Equation				
Area,ft^2	Wetted Perimeter, ft	Hydraulic Radius, ft	velocity ft/s	flow, cfs
2.98	5.00	0.60	5.12	15.24880

Manning's n-values	
PVC	0.01
PE (<9"dia)	0.015
PE (>12"dia)	0.02
PE(9-12"dia)	0.017
CMP	0.025
ADS N12	0.012
HCMP	0.023
Conc	0.013

10" UG OUTLET

Clear Data Entry Cells



INPUT

D=	10	inches
d=	9	inches
n=	0.013	mannings coeff
θ=	73.7	degrees
S=	0.003	slope in/in

Mannings Formula

$Q=(1.486/n)AR_h^{2/3}S^{1/2}$

R=A/P

A=cross sectional area

P=wetted perimeter

S=slope of channel

n=Manning's roughness coefficient

$V=(1.49/n)R_h^{2/3}S^{1/2}$

Q=V x A

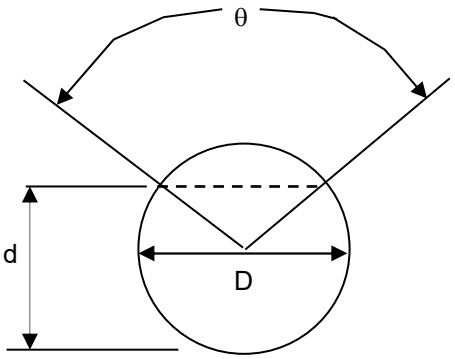
Solution to Mannings Equation				
Area,ft^2	Wetted Perimeter, ft	Hydraulic Radius, ft	velocity ft/s	flow, cfs
0.52	2.08	0.25	2.47	1.27896

Manning's n-values	
PVC	0.01
PE (<9"dia)	0.015
PE (>12"dia)	0.02
PE(9-12"dia)	0.017
CMP	0.025
ADS N12	0.012
HCMP	0.023
Conc	0.013

MULTIPLIED BY 2 IN SUMMARY TAB

15" DP1 OUTLET

Clear Data Entry Cells



INPUT

D=	15	inches
d=	13.5	inches
n=	0.013	mannings coeff
θ=	73.7	degrees
S=	0.0094	slope in/in

Mannings Formula

$Q=(1.486/n)AR_h^{2/3}S^{1/2}$

R=A/P

A=cross sectional area

P=wetted perimeter

S=slope of channel

n=Manning's roughness coefficient

$V=(1.49/n)R_h^{2/3}S^{1/2}$

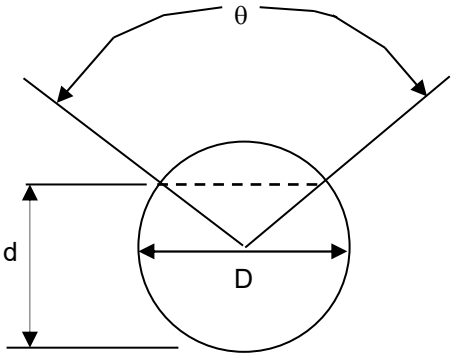
Q=V x A

Solution to Mannings Equation				
Area,ft^2	Wetted Perimeter, ft	Hydraulic Radius, ft	velocity ft/s	flow, cfs
1.16	3.12	0.37	5.74	6.67487

Manning's n-values	
PVC	0.01
PE (<9"dia)	0.015
PE (>12"dia)	0.02
PE(9-12"dia)	0.017
CMP	0.025
ADS N12	0.012
HCMP	0.023
Conc	0.013

12" DP2 OUTLET

Clear Data Entry Cells



INPUT

D=	12	inches
d=	10.8	inches
n=	0.013	mannings coeff
θ=	73.7	degrees
S=	0.02	slope in/in

Mannings Formula

$Q=(1.486/n)AR_h^{2/3}S^{1/2}$

R=A/P

A=cross sectional area

P=wetted perimeter

S=slope of channel

n=Manning's roughness coefficient

$V=(1.49/n)R_h^{2/3}S^{1/2}$

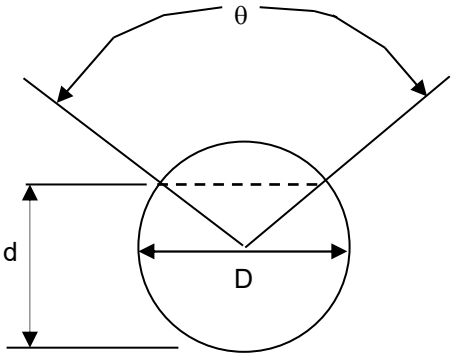
Q=V x A

Solution to Mannings Equation				
Area,ft^2	Wetted Perimeter, ft	Hydraulic Radius, ft	velocity ft/s	flow, cfs
0.74	2.50	0.30	7.21	5.36987

Manning's n-values	
PVC	0.01
PE (<9"dia)	0.015
PE (>12"dia)	0.02
PE(9-12"dia)	0.017
CMP	0.025
ADS N12	0.012
HCMP	0.023
Conc	0.013

6" DP3 OUTLET

Clear Data Entry Cells



INPUT

D=	6	inches
d=	5.4	inches
n=	0.013	mannings coeff
θ=	73.7	degrees
S=	0.0357	slope in/in

Mannings Formula

$Q=(1.486/n)AR_h^{2/3}S^{1/2}$

R=A/P

A=cross sectional area

P=wetted perimeter

S=slope of channel

n=Manning's roughness coefficient

$V=(1.49/n)R_h^{2/3}S^{1/2}$

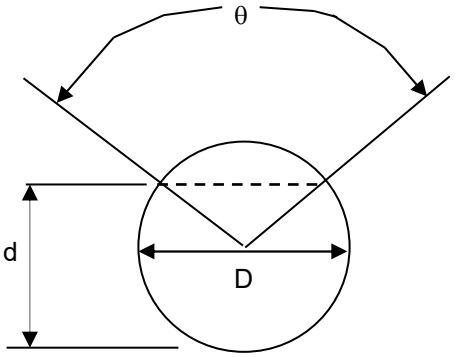
Q=V x A

Solution to Mannings Equation				
Area,ft^2	Wetted Perimeter, ft	Hydraulic Radius, ft	velocity ft/s	flow, cfs
0.19	1.25	0.15	6.07	1.12986

Manning's n-values	
PVC	0.01
PE (<9"dia)	0.015
PE (>12"dia)	0.02
PE(9-12"dia)	0.017
CMP	0.025
ADS N12	0.012
HCMP	0.023
Conc	0.013

12" IB OUTLET

Clear Data Entry Cells



INPUT

D=	12	inches
d=	10.8	inches
n=	0.013	mannings coeff
θ=	73.7	degrees
S=	0.0049	slope in/in

Mannings Formula

$Q=(1.486/n)AR_h^{2/3}S^{1/2}$

R=A/P

A=cross sectional area

P=wetted perimeter

S=slope of channel

n=Manning's roughness coefficient

$V=(1.49/n)R_h^{2/3}S^{1/2}$

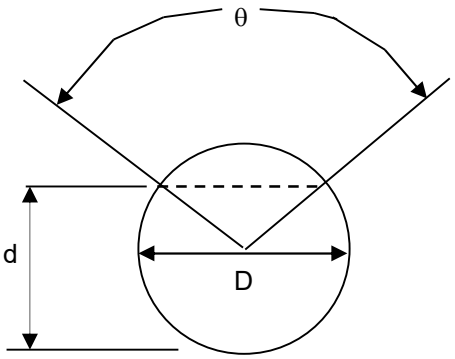
Q=V x A

Solution to Mannings Equation				
Area,ft^2	Wetted Perimeter, ft	Hydraulic Radius, ft	velocity ft/s	flow, cfs
0.74	2.50	0.30	3.57	2.65795

Manning's n-values	
PVC	0.01
PE (<9"dia)	0.015
PE (>12"dia)	0.02
PE(9-12"dia)	0.017
CMP	0.025
ADS N12	0.012
HCMP	0.023
Conc	0.013

15" RED BARN LANE WEST SWALE OUTLET

Clear Data Entry Cells



INPUT

D=	15	inches
d=	13.5	inches
n=	0.01	mannings coeff
θ=	73.7	degrees
S=	0.002	slope in/in

Mannings Formula

$Q=(1.486/n)AR_h^{2/3}S^{1/2}$

R=A/P

A=cross sectional area

P=wetted perimeter

S=slope of channel

n=Manning's roughness coefficient

$V=(1.49/n)R_h^{2/3}S^{1/2}$

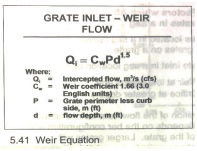
Q=V x A

Solution to Mannings Equation				
Area,ft^2	Wetted Perimeter, ft	Hydraulic Radius, ft	velocity ft/s	flow, cfs
1.16	3.12	0.37	3.44	4.00256

Manning's n-values	
PVC	0.01
PE (<9"dia)	0.015
PE (>12"dia)	0.02
PE(9-12"dia)	0.017
CMP	0.025
ADS N12	0.012
HCMP	0.023
Conc	0.013

GRATE CAPACITIES

TRENCH DRAIN (NEENAH 4525)		
d (ft)=	0.25	<1.4', so Grate is under Weir Flow**
Cw=	3	For US Costu. Units
Qi (cfs)=	Cw.P.d^1.5	For Weir flow
P (ft)=	6.33	Perimeter, CALCULATED*
Qi (cfs)=	2.37	Grate Capacity



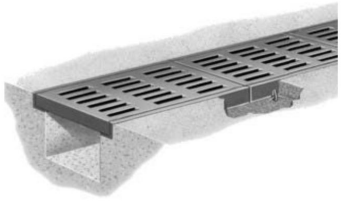
5.41 Weir Equation

PRODUCT DETAIL
4525

CUSTOMIZE YOUR QUOTE
REQUIRED TO SELECT ALL THE FILTERS TO ADD TO A QUOTE.

COMPONENT #1

PRODUCT TYPE: TRENCH GRATE
GRATE TYPE: A
GRATE WIDTH: 14
GRATE LENGTH: 23 7/8
SEAT DEPTH: 2
CLEAR OPENING: 12
MATERIAL: Gray Iron
MATERIAL TYPE: Non applicable
COMPONENTS: 49908141

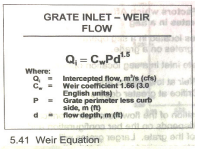


*NOTE
PERIMIETER IS 6.33' FOR ONE. WE WILL HAVE 10 IN SUCCESSION. PERIMETER FOR 10 IS 42.33

**NOTE
TRUE DEPTH OF FLOW IS 5.94". 3" WAS USED AS CONSERVATIVE VALUE

GRATE CAPACITIES

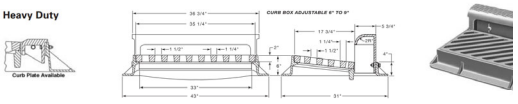
GRATE CURB INLET WEIR FLOW (R-3067-R)		
Lane (ft) =	18	Curb Inlets at 18' wide lanes
Slope =	2%	
d (ft)=	0.36	<1.4', so Grate is under Weir Flow
Cw=	3	For US Costu. Units
Qi (cfs)=	Cw.P.d^1.5	For Weir flow
P (ft)=	5.8	Perimeter, from Neenah catalog
Qi (cfs)=	3.76	Grate Capacity



5.41 Weir Equation

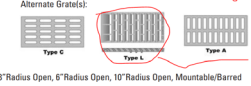
R-3067
Combination Inlet Frame, Grate, Curb Box

Heavy Duty



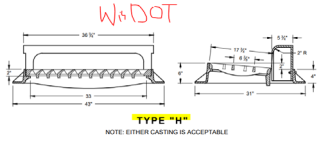
CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET
R-3067	R	2.0	5.8
R-3067	C	1.6	5.8
R-3067	L	2.1	5.8

Standard Grate (shown): Type R-diagonal
Alternate Grate(s):

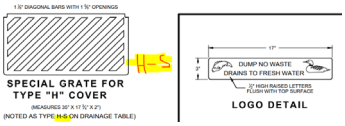


Available Curb Boxes: 2"Radius Open, 3"Radius Open, 6"Radius Open, 10"Radius Open, Mountable/Barred

W-DOT



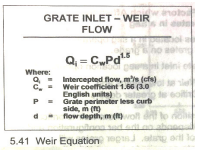
W-DOT Type - H-S



W-DOT Type - H

GRATE CAPACITIES

FIELD INLETS - BEEHIVE GRATE WEIR FLOW (R-2560 - E)		
d (ft)=	0.5	<1.4', so Grate is under Weir Flow
Cw=	3	For US Costu. Units
Qi (cfs)=	Cw.P.d^1.5	For Weir flow
P (ft)=	6	Perimeter, from Neenah catalog
Qi (cfs)=	6.36	Grate Capacity

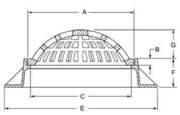


5.41 Weir Equation

Dimensions in inches

Catalog No.	A	B	C	E	F	G	Frame/Lid
R-2560-A	12	1	11	19	4	3 1/4	R-1791-A
R-2560-C	18 1/4	1 1/4	16 3/4	30	8	4	R-1900-A
R-2560-C1	22	1 1/2	20 15/32	27 9/16	3 15/16	4 1/2	R-1690
R-2560-C2	22	1 1/2	20 1/2	28 1/4	6	4 1/2	R-1761
R-2560-D	22	1 1/2	20	35	9	4 1/2	R-1710
R-2560-D1	22	1 1/2	20 15/32	27 9/16	3 15/16	7	R-1690
R-2560-D2	22	1 1/2	20 1/2	28 1/4	6	7	R-1761
R-2560-D3	22	1 1/2	20	35	9	7	R-1710
R-2560-D5	22 3/4	1 1/2	21 1/4	34	4	4 1/2	R-1647-A
R-2560-D6	22 3/4	1 1/2	21	34	9	4 1/2	R-1713
R-2560-D7	22 3/4	1 1/2	21 1/4	34	4	7	R-1647-A
R-2560-D8	22 3/4	1 1/2	21	34	9	7	R-1713
R-2560-E	23	1 1/2	21 1/16	35 7/16	8 7/8	7	R-1550-A
R-2560-E1	25 3/4	7/8	24	35 7/16	7	6	R-1733

Field Inlets for W-DOT Type - MH

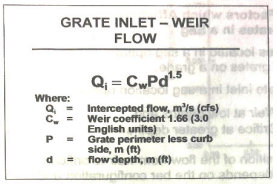



Illustrating R-2560-E

CATALOG NUMBER	GRATE TYPE	SQ. FT. OPEN	WEIR PERIMETER LINEAL FEET
R-2560-D8	Beehive	1.3	5.3
R-2560-E	Beehive	1.2	6.0

GRATE CAPACITIES

TRENCH DRAIN (NEENAH 4525)		
d (ft)=	0.25	<1.4', so Grate is under Weir Flow**
Cw=	3	For US Costu. Units
Qi (cfs)=	Cw.P.d^1.5	For Weir flow
P (ft)=	42.33	Perimeter, CALCULATED - SEE WORD DOC*
Qi (cfs)=	15.87	Grate Capacity



5.41 Weir Equation

PRODUCT DETAIL

4525

CUSTOMIZE YOUR QUOTE

REQUIRED TO SELECT ALL THE FILTERS TO ADD TO A QUOTE.

COMPONENT #1

PRODUCT TYPE: TRENCH GRATE

GRATE TYPE: A

GRATE WIDTH: 14

GRATE LENGTH: 23 7/8

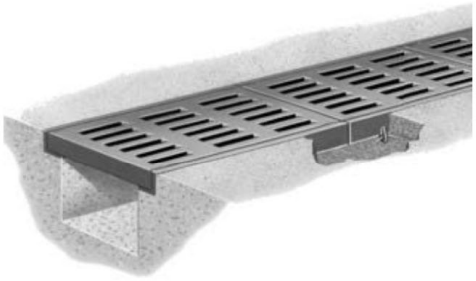
SEAT DEPTH: 2

CLEAR OPENING: 12

MATERIAL: Gray Iron

MATERIAL TYPE: Non applicable

COMPONENTS: 49908141



*NOTE
PERIMIETER IS 6.33' FOR ONE. WE WILL HAVE 10 IN SUCCESSION. PERIMETER FOR 10 IS 42.33

**NOTE
TRUE DEPTH OF FLOW IS 5.94". 3" WAS USED AS CONSERVATIVE VALUE

GRATES CAPACITIES TABLE

DRAINAGE AREA	DRAINAGE STRUCTURE	NEENAH GRATES	Q100 INFLOW (CFS)	1.25 X Q100 INFLOW (CFS)	MIN. GRATE CAP. (CFS) (Individual)	TOTAL GRATE CAP. (CFS)	CAP. TEST
WEST PARKING RAMP	TRENCH DRAIN WEST	4525 GRATE A	1.63	2.04	2.37	15.87	GOOD
EAST PARKING RAMP*	TRENCH DRAIN EAST (X3)	4525 GRATE A	0.65	0.81	2.37	15.87	GOOD
A13	FIELD INLET	R-2560-E	0.36	0.45	6.36	N/A	GOOD
A14	CURB INLET	R-3067-R	3.00	3.75	3.76	N/A	GOOD
A15	FIELD INLET	R-2560-E	1.39	1.74	6.36	N/A	GOOD
A30	CURB INLET	R-3067-R	2.14	2.68	3.76	N/A	GOOD
A32	CURB INLET	R-3067-R	2.06	2.58	3.76	N/A	GOOD

*NOTE: Q100 SPLIT BETWEEN 3 RAMP TRENCH DRAINS

CAP. = CAPACITY

HCAD

Design Procedure for Grate Inlets On-Grade

Eo =	0.5			
Rf =	1			
	Rs = ((1+((z*(v^1.8))/((Sx*(L^2.3))^(-1)			
	z =	0.15		
	Sx =	0.02	ft/ft	transverse slope
	v =	3.454995	ft/s	
	L =	2.75	ft	33 in
Rs =	1.286280525			
	v = Q/A			
	Q =	3.76	cfs	
	A =	1.088279	sqft	
v =	3.454994971			
	A =(Sx/2)*((T-W)^2)			
	Sx =	0.02	ft/ft	
	T =	10.93206	ft	ponded width
	W =	0.5	ft	gutter width
A =	1.088279442			
	y = z*((Q*n*Sx)/(S^(1/2)))^(3/8)			
	Q =	3.76	cfs	
	n =	0.013	mannings	
	S =	0.01	ft/ft	
	Sx =	0.02	ft/ft	
	z =	1.24		
y =	0.218641266			
	T = y/Sx			
	y =	0.218641		
	Sx =	0.02	ft/ft	
T =	10.93206328	ft	ponded width	
	Qi = Q*(Rf*Eo+Rs*(1-Eo))			
Qi =	4.30	cfs		
Q =	3.75	cfs	MAX CFS (125% Buffer) TO ANY GRATE	
Qi>Q	NO BYPASS FLOW			

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER:	JAKE BRUNOEHLER 262-794-2306 JAKE.BRUNOEHLER@ADSPIPE.COM
ADS SALES REP:	MATTHEW AYVAZZADEH 262-483-0606 MATTHEW.AYVAZZADEH@ADSPIPE.COM
PROJECT NO:	S213498

Advanced Drainage Systems, Inc.

SiteAssist™
FOR STORMTECH
INSTALLATION INSTRUCTIONS
VISIT OUR APP

CAROLINE HEIGHTS (SCHOOL SISTERS OF NOTRE DAME)

MILWAUKEE, WI

MC-3500 STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-3500.
2. CHAMBERS SHALL BE ARCH-SHAPED AND SHALL BE MANUFACTURED FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
4. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORTS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
5. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
6. CHAMBERS SHALL BE DESIGNED, TESTED AND ALLOWABLE LOAD CONFIGURATIONS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". LOAD CONFIGURATIONS SHALL INCLUDE: 1) INSTANTANEOUS (<1 MIN) AASHTO DESIGN TRUCK LIVE LOAD ON MINIMUM COVER 2) MAXIMUM PERMANENT (75-YR) COVER LOAD AND 3) ALLOWABLE COVER WITH PARKED (1-WEEK) AASHTO DESIGN TRUCK.
7. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT SHALL BE GREATER THAN OR EQUAL TO 450 LBS/FT/%. THE ASC IS DEFINED IN SECTION 6.2.8 OF ASTM F2418. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.
8. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. UPON REQUEST BY THE SITE DESIGN ENGINEER OR OWNER, THE CHAMBER MANUFACTURER SHALL SUBMIT A STRUCTURAL EVALUATION FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE AS FOLLOWS:
   - THE STRUCTURAL EVALUATION SHALL BE SEALED BY A REGISTERED PROFESSIONAL ENGINEER.
   - THE STRUCTURAL EVALUATION SHALL DEMONSTRATE THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY SECTIONS 3 AND 12.12 OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR THERMOPLASTIC PIPE.
   - THE TEST DERIVED CREEP MODULUS AS SPECIFIED IN ASTM F2418 SHALL BE USED FOR PERMANENT DEAD LOAD DESIGN EXCEPT THAT IT SHALL BE THE 75-YEAR MODULUS USED FOR DESIGN.
9. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-3500 CHAMBER SYSTEM

1. STORMTECH MC-3500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
9. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING.
10. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
11. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-3500 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

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PROPOSED LAYOUT

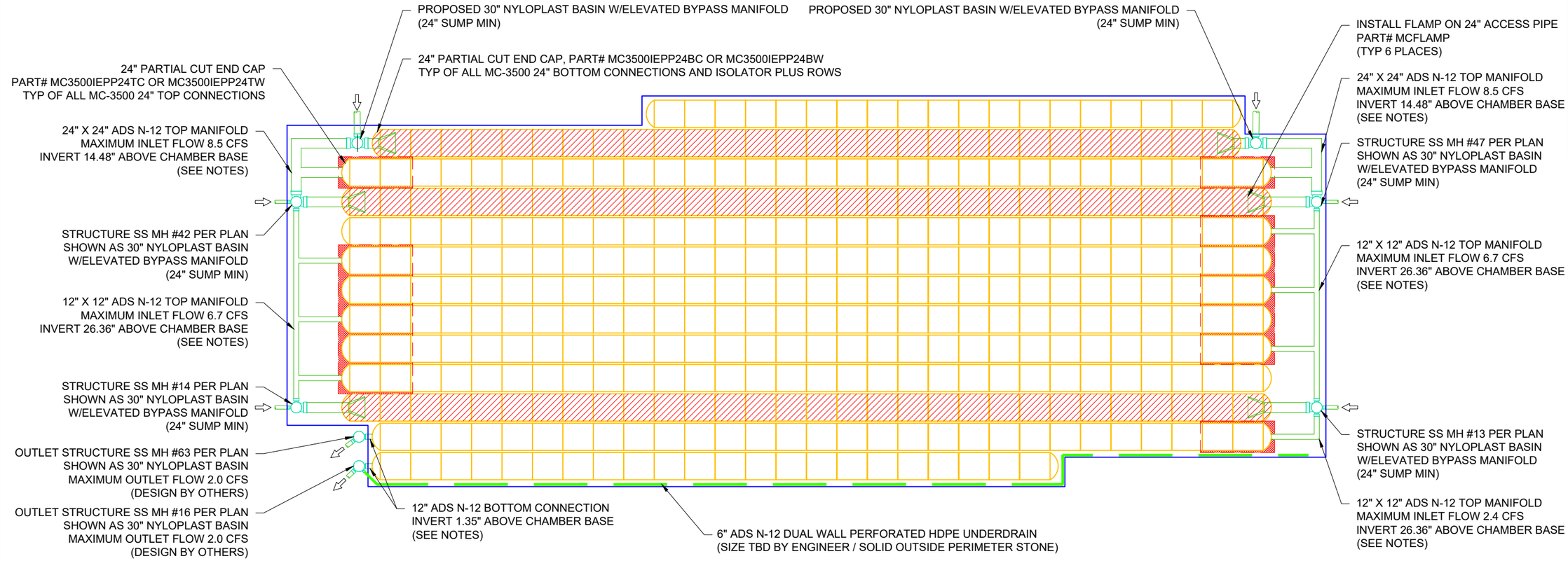
368	STORMTECH MC-3500 CHAMBERS
26	STORMTECH MC-3500 END CAPS
12	STONE ABOVE (in)
9	STONE BELOW (in)
40	% STONE VOID
70,823	**INSTALLED SYSTEM VOLUME (CF) (PERIMETER STONE INCLUDED)**
21051	SYSTEM AREA (ft²)
673	SYSTEM PERIMETER (ft)

PROPOSED ELEVATIONS

763.75	MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED)
757.75	MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC)
757.25	MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC)
757.25	MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT)
757.25	MINIMUM ALLOWABLE GRADE (TOP OF RIGID PAVEMENT)
756.75	TOP OF STONE
755.75	TOP OF MC-3500 CHAMBER
754.20	12" TOP MANIFOLD INVERT
753.21	24" TOP MANIFOLD INVERT
752.17	24" ISOLATOR ROW PLUS CONNECTION INVERT
752.11	12" BOTTOM CONNECTION INVERT
752.00	BOTTOM OF MC-3500 CHAMBER
751.25	UNDERDRAIN INVERT
751.25	BOTTOM OF STONE

NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECHNICAL NOTE 6.32 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.
- THE STORMTECH SYSTEM DEPICTED DOES NOT PROVIDE THE ABILITY TO BE MAINTAINED. NOT MAINTAINING THE SYSTEM MAY LEAD TO ACCUMULATION OF SEDIMENT AND DECREASE IN STORAGE VOLUME OVER TIME DEPENDENT ON UPSTREAM WATER QUALITY DEVICES.
- ADS DOES NOT DESIGN OR PROVIDE MEMBRANE LINER SYSTEMS. TO MINIMIZE THE LEAKAGE POTENTIAL OF LINER SYSTEMS, THE MEMBRANE LINER SYSTEM SHOULD BE DESIGNED BY A KNOWLEDGEABLE GEOTEXTILE PROFESSIONAL AND INSTALLED BY A QUALIFIED CONTRACTOR.



ISOLATOR ROW PLUS (SEE DETAIL)

PLACE MINIMUM 17.5' OF ADSPLUS125 WOVEN GEOTEXTILE OVER BEDDING STONE AND UNDERNEATH CHAMBER FEET FOR SCOUR PROTECTION AT ALL CHAMBER INLET ROWS

THERMOPLASTIC LINER (SEE TECHNICAL NOTE 6.50 / PROVIDED BY OTHERS / DESIGN BY OTHERS)

DATE	DRWN	CHKD	DESCRIPTION
05/20/24	CJM	HK	ADDED LINER & UNDERDRAIN/REMOVED NFC NOTE
03/01/24	CLB		REVISED INLETS TO NYLO REMOVED PIPES
07/18/23	MM	RWD	RELOCATED CHAMBERS UNDER SIDEWALK
05/03/23	CJM	CJM	REMOVED INSERTATEE CONNECTIONS
05/02/23	CJM	JKL	ADDED INSERTATEE CONNECTIONS
04/27/23	CJM	CJM	ADDITIONAL INLETS ADDED
04/25/2023	NAL		REVISE PER NOTES/ MARKUPS
04-19-2023	NSL	JPR	REDESIGN W/MC-3500 CHAMBERS AND COMMENTS
04-05-23	NAL	JPR	REVISE PER NOTES

CAROLINE HEIGHTS
(SCHOOL SISTERS OF NOTRE DAME)
MILWAUKEE, WI

DATE: 04/04/2023 | DRAWN: NAL
PROJECT #: S213498 | CHECKED: KLJ

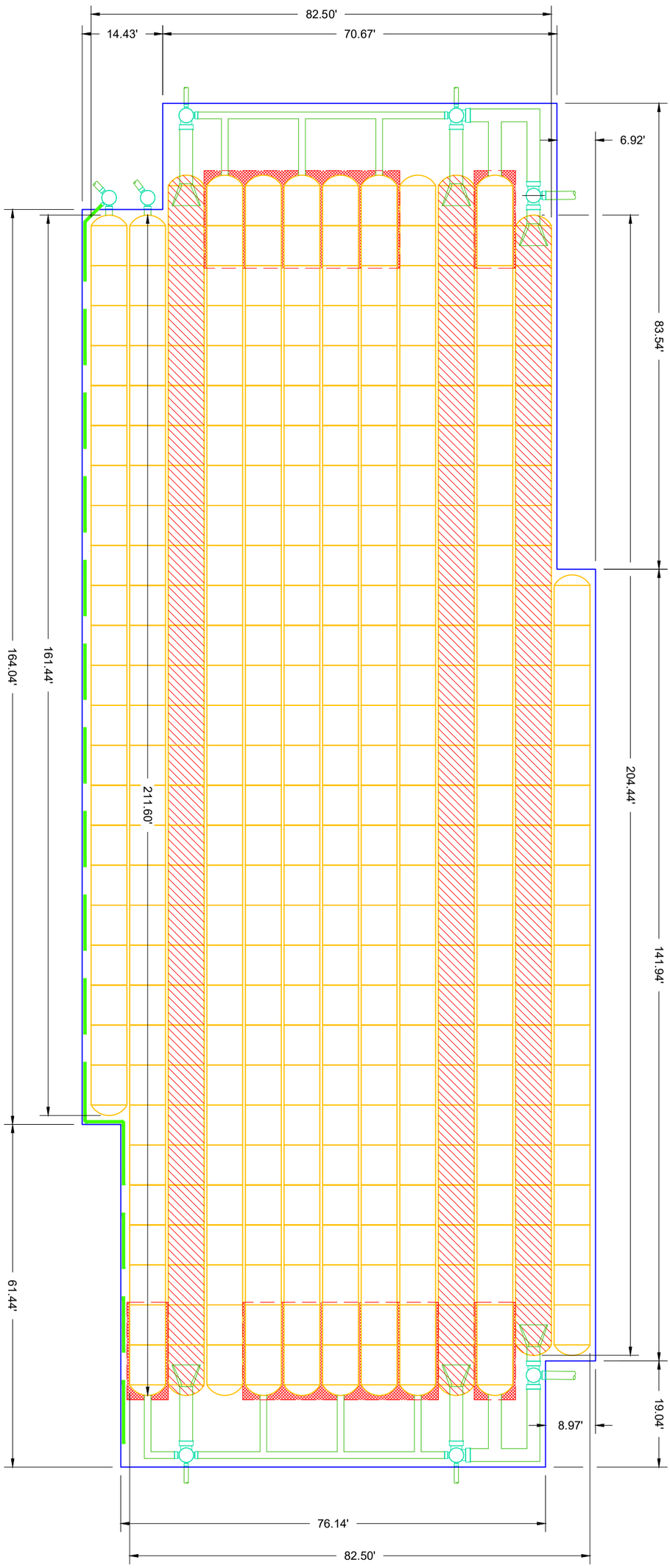
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4640 TRUEMAN BLVD
HILLIARD, OH 43026

ADS

50'
25'
0

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0 20' 40'

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CAROLINE HEIGHTS
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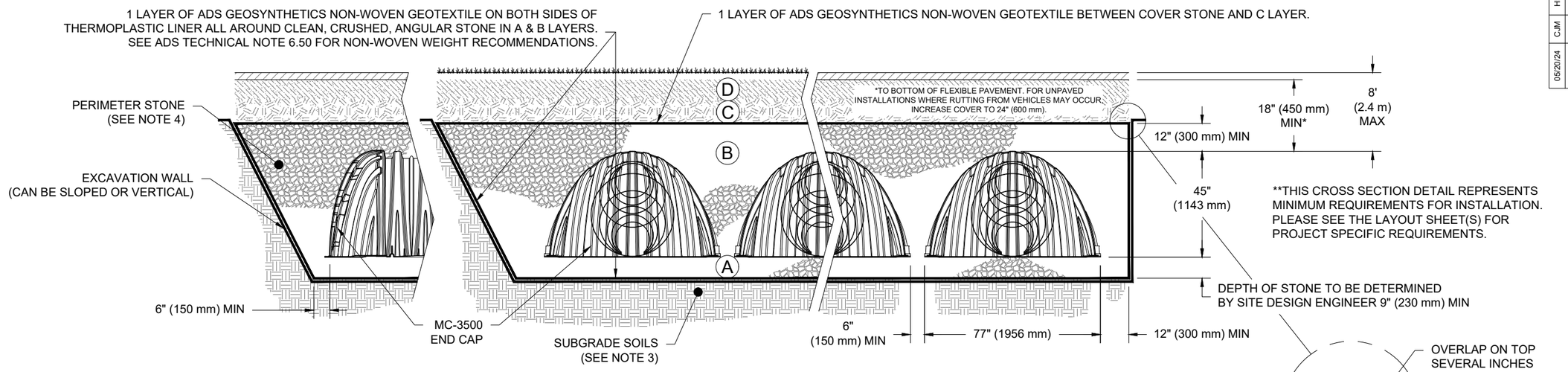
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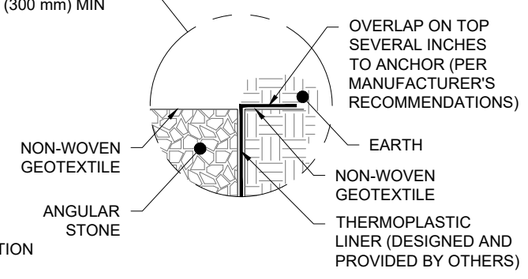
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ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2,3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.





THERMOPLASTIC LINER DETAIL

NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45x76 DESIGNATION SS.
2. MC-3500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 500 LBS/FT/%. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

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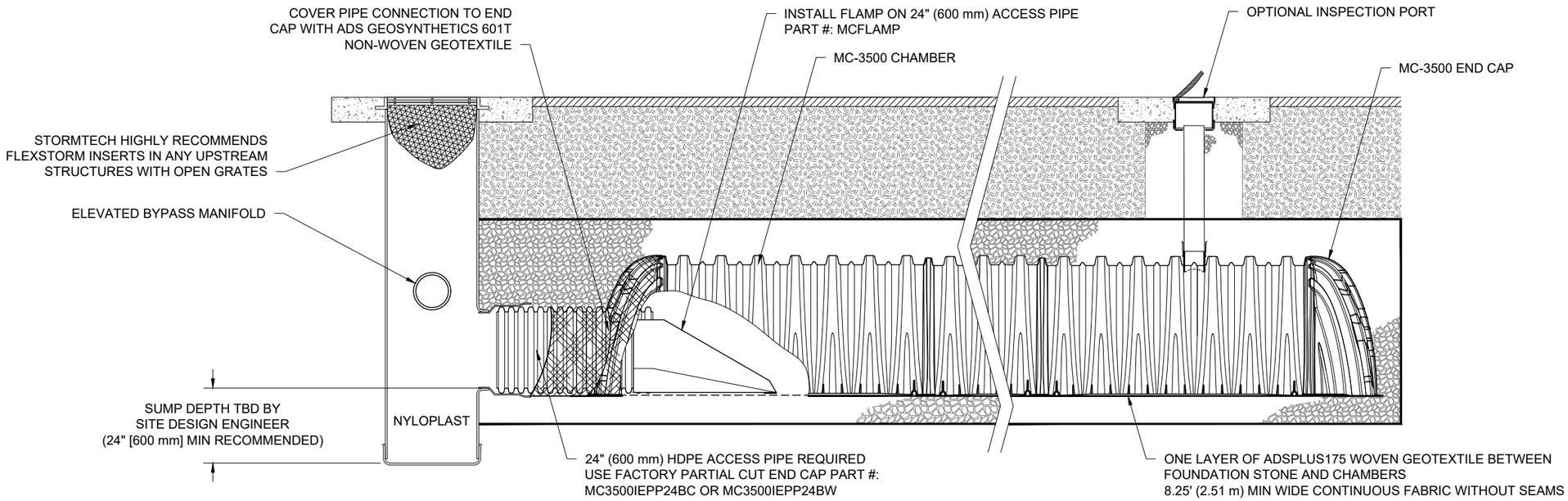
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MC-3500 ISOLATOR ROW PLUS DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR PLUS ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.

2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

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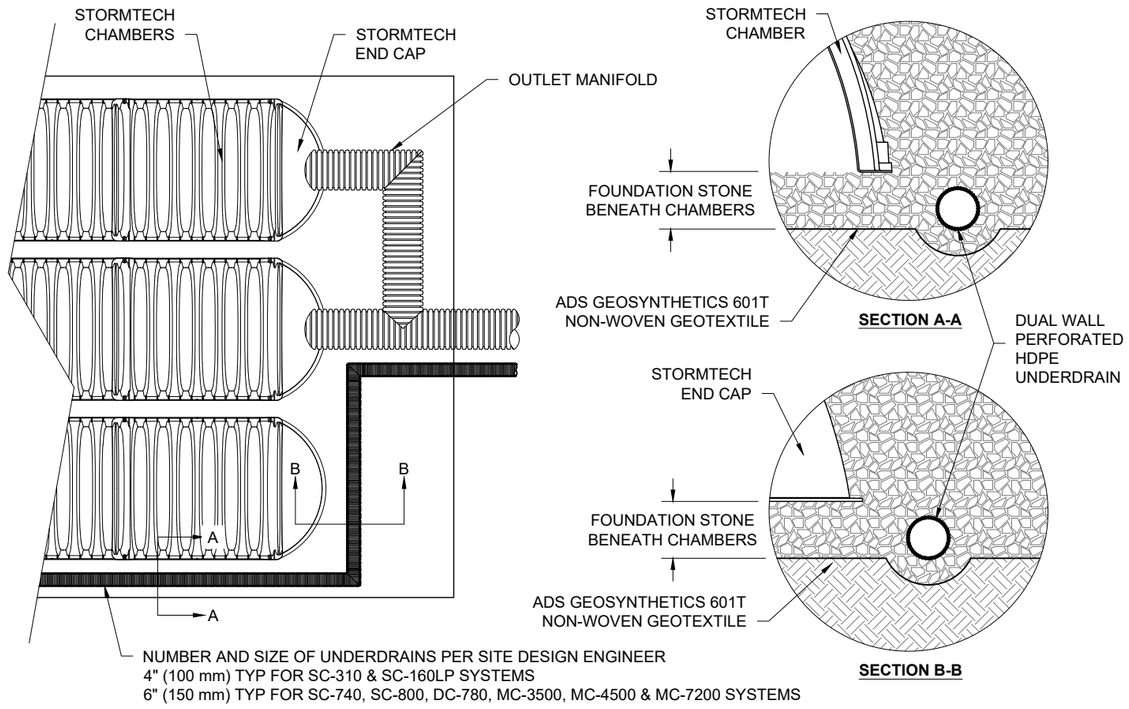
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THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE.

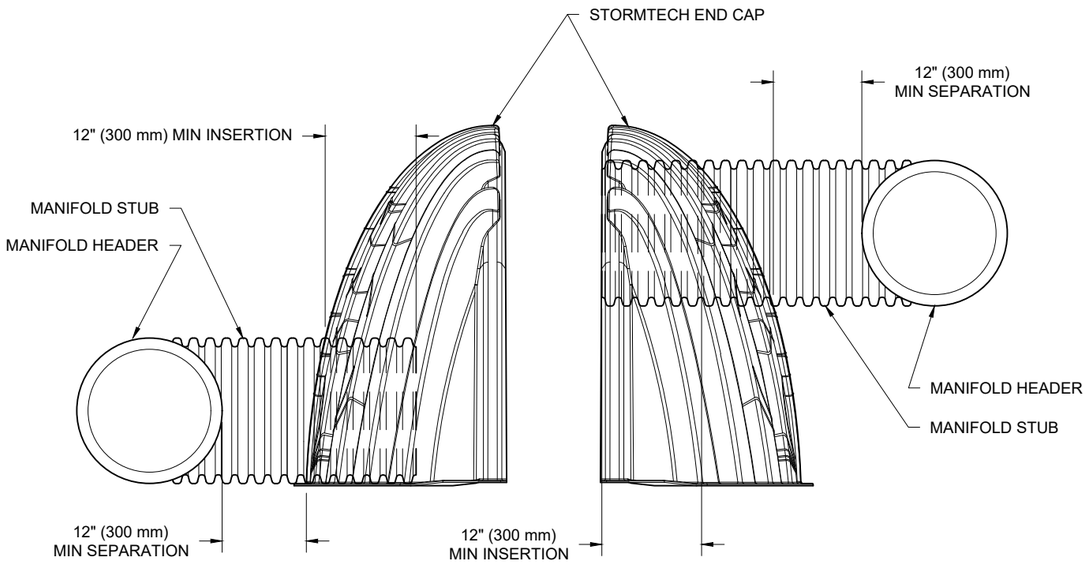
UNDERDRAIN DETAIL

NTS



MC-SERIES END CAP INSERTION DETAIL

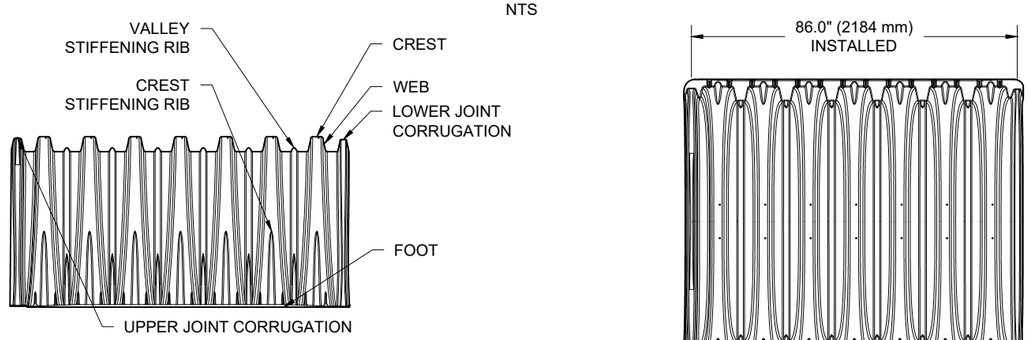
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NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.

MC-3500 TECHNICAL SPECIFICATION

NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	77.0" X 45.0" X 86.0"	(1956 mm X 1143 mm X 2184 mm)
CHAMBER STORAGE	109.9 CUBIC FEET	(3.11 m³)
MINIMUM INSTALLED STORAGE*	175.0 CUBIC FEET	(4.96 m³)
WEIGHT	134 lbs.	(60.8 kg)

NOMINAL END CAP SPECIFICATIONS

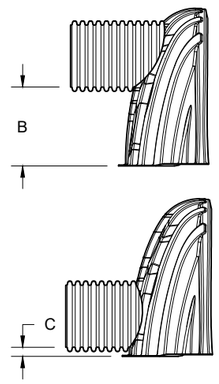
SIZE (W X H X INSTALLED LENGTH)	75.0" X 45.0" X 22.2"	(1905 mm X 1143 mm X 564 mm)
END CAP STORAGE	14.9 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	45.1 CUBIC FEET	(1.28 m³)
WEIGHT	49 lbs.	(22.2 kg)

*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION, 6" (152 mm) STONE BETWEEN CHAMBERS, 6" (152 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"
END CAPS WITH A WELDED CROWN PLATE END WITH "C"

PART #	STUB	B	C
MC3500IEPP06T	6" (150 mm)	33.21" (844 mm)	---
MC3500IEPP06B		---	0.66" (17 mm)
MC3500IEPP08T	8" (200 mm)	31.16" (791 mm)	---
MC3500IEPP08B		---	0.81" (21 mm)
MC3500IEPP10T	10" (250 mm)	29.04" (738 mm)	---
MC3500IEPP10B		---	0.93" (24 mm)
MC3500IEPP12T	12" (300 mm)	26.36" (670 mm)	---
MC3500IEPP12B		---	1.35" (34 mm)
MC3500IEPP15T	15" (375 mm)	23.39" (594 mm)	---
MC3500IEPP15B		---	1.50" (38 mm)
MC3500IEPP18TC	18" (450 mm)	20.03" (509 mm)	---
MC3500IEPP18TW			
MC3500IEPP18BC		---	1.77" (45 mm)
MC3500IEPP18BW			
MC3500IEPP24TC	24" (600 mm)	14.48" (368 mm)	---
MC3500IEPP24TW			
MC3500IEPP24BC		---	2.06" (52 mm)
MC3500IEPP24BW			
MC3500IEPP30BC	30" (750 mm)	---	2.75" (70 mm)

NOTE: ALL DIMENSIONS ARE NOMINAL



CUSTOM PARTIAL CUT INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS. CUSTOM INVERT LOCATIONS ON THE MC-3500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm). THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHEST POSSIBLE FOR THE PIPE SIZE.

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DATE: 04/04/2023 | DRAWN: NAL | CHECKED: KLJ | PROJECT #: S213498

THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

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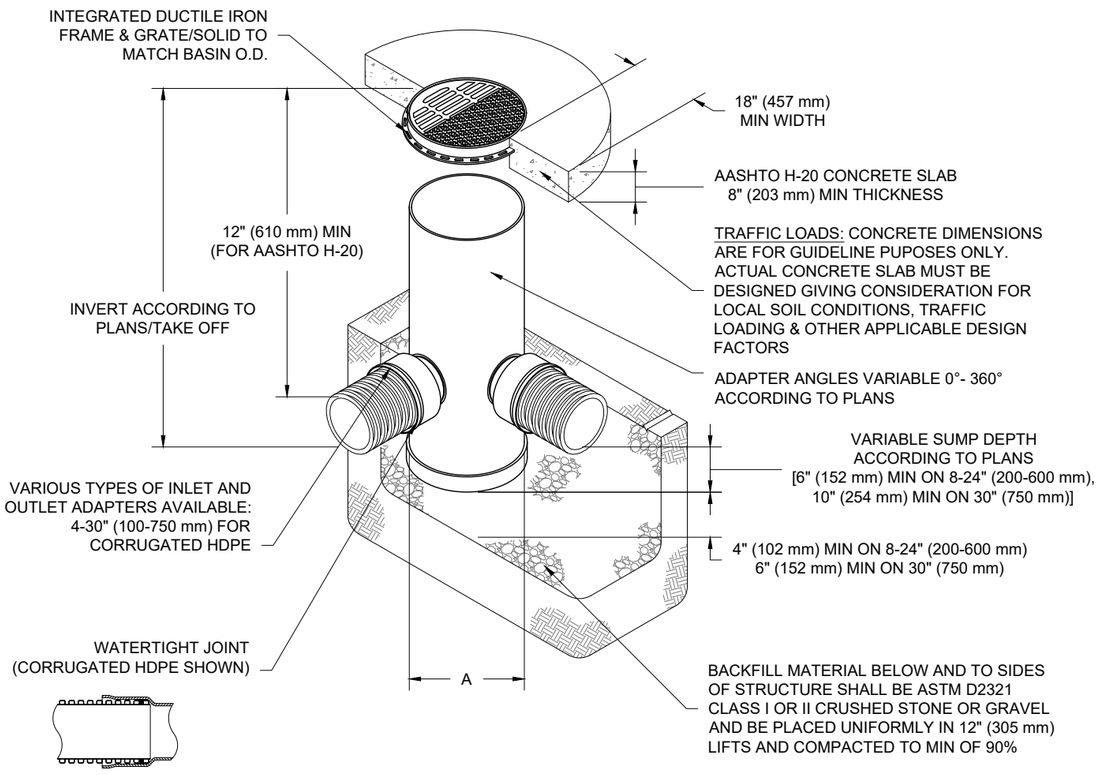
StormTech® Chamber System

888-892-2694 | WWW.STORMTECH.COM

4640 TRUEMAN BLVD
HILLIARD, OH 43026

NYLOPLAST DRAIN BASIN

NTS



NOTES

1. 8-30" (200-750 mm) GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
2. 12-30" (300-750 mm) FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
5. FOR COMPLETE DESIGN AND PRODUCT INFORMATION: **WWW.NYLOPLAST-US.COM**
6. TO ORDER CALL: **800-821-6710**

A	PART #	GRATE/SOLID COVER OPTIONS		
8" (200 mm)	2808AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" (250 mm)	2810AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" (300 mm)	2812AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
15" (375 mm)	2815AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
18" (450 mm)	2818AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
24" (600 mm)	2824AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
30" (750 mm)	2830AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20

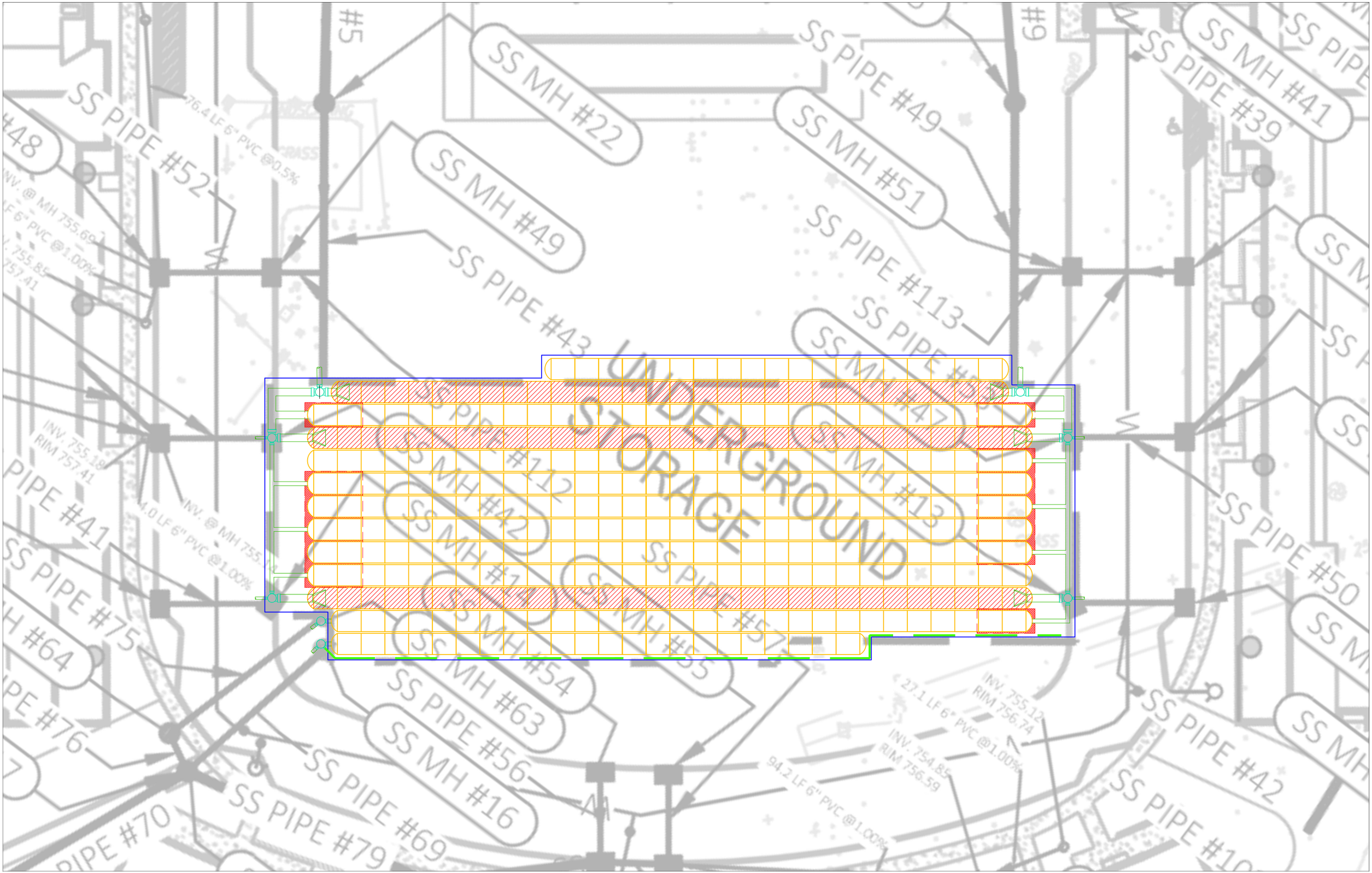
DATE	DRWN	CHKD	DESCRIPTION
05/20/24	CJM	HK	ADDED LINER & UNDERDRAIN/REMOVED NFC NOTE
03/01/24	CLB		REVISED INLETS TO NYLO REMOVED PIPES
07/18/23	MM	RWD	RELOCATED CHAMBERS UNDER SIDEWALK
05/03/23	CJM	CJM	REMOVED INSERTATEE CONNECTIONS
05/02/23	CJM	JKL	ADDED INSERTATEE CONNECTIONS
04/27/23	CJM	CJM	ADDITIONAL INLETS ADDED
04/25/2023	NAL		REVISE PER NOTES/ MARKUPS
04-19-2023	NSL	JPR	REDESIGN W/MC-3500 CHAMBERS AND COMMENTS
04-05-23	NAL	JPR	REVISE PER NOTES

CAROLINE HEIGHTS
(SCHOOL SISTERS OF NOTRE DAME)
MILWAUKEE, WI

DATE: 04/04/2023 DRAWN: NAL
PROJECT #: S213498 CHECKED: KLJ

Nyloplast®
770-932-2443 | WWW.NYLOPLAST-US.COM
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ADS

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UNDERGROUND STORAGE
SS MH #22
SS MH #49
SS MH #51
SS MH #41
SS PIPE #49
SS PIPE #52
SS PIPE #43
SS PIPE #113
SS PIPE #39
SS PIPE #41
SS PIPE #75
SS PIPE #76
SS PIPE #70
SS PIPE #69
SS PIPE #79
SS PIPE #56
SS MH #16
SS MH #63
SS MH #54
SS MH #42
SS MH #13
SS PIPE #12
SS PIPE #57
SS PIPE #50
SS PIPE #42
SS PIPE #10
76.4 LF 6" PVC @0.5%
INV. 755.19
RIM 757.41
INV. @ MH 755.69
INV. 755.85
INV. 755.12
RIM 756.74
27.1 LF 6" PVC @1.00%
INV. 754.85
RIM 756.59
94.2 LF 6" PVC @1.00%

AquaArmor BTL™-40

Double Scrim RPE

DESCRIPTION	BLACK 16 X 16 COUNT PER INCH	
FABRICATION & WAREHOUSE	PRINEVILLE, OREGON	
WEIGHT	18.5 OZ./SQ.YD. (+/-5%)	ASTM D751
THICKNESS	40 MIL (+/-10%)	ASTM D1777
COATING THICKNESS	2.5 MIL EACH (+/-5%)	
TENSILE STRENGTH (GRAB METHOD)	MD 680LBS. TD 680 LBS.	ASTM D5034
(STRIP METHOD)	MD 460 LBS. TD 460LBS	ASTM D5035
TEAR STRENGTH (TONGUE METHOD)	MD 140 LBS. TD 135 LBS.	ASTM D5884
BURSTING STRENGTH (MULLEN BURST)	1300 PSI	ASTM D3786
MVTR	0.31 g/m^2 – 24hr (0.04 perms)	ASTM E96
HYDROSTATIC RESISTANCE	685PSI	ASTM D751
PUNCTURE RESISTANCE	350 LBS	ASTM D4833
CBR STATIC RESISTANCE	2356 lb (10,461 N)	ASTM D6241
LOW TEMPERATURE COLD CRACK	-85º F	ASTM D2136
PERMEABILITY	<2.65 x 10^{-12} CM/SEC	ASTM D4491
CARBON BLACK CONTENT	3.1%	ASTM D4218
DIMENSIONAL STABILITY	MD -3.8% TD -1.8%	ASTM D1204
HP-OIT	3048 minutes	ASTM D5885
UV RESISTANCE	>90% STRENGTH RETAINED AFTER 2000 HRS.	ASTM G-154

ALL DATA IS DRAWN FROM U.S. TESTING AND PRECISION LABORATORIES.

Certified to NSF/ANSI 61-G & 372

3451 SW Empire Drive, Prineville, OR 97754 | 800.280.0712 | p 541.447.0712 | f 541.447.0759 | BTLLINERS.COM

Technical Note

TN 6.50 Thermoplastic Liners for Detention Systems

Overview

StormTech chambers offer the distinct advantage and versatility that allow them to be designed as an open bottom detention or retention system. In fact, the vast majority of StormTech installations and designs are open bottom detention systems. Using an open bottom system enables treatment of the storm water through the underlying soils and provides a volume safety factor based on the infiltrative capacity of the underlying soils.

In some applications, however, open bottom detention systems may not be allowed. This memo provides guidance for the design and installation of thermoplastic liners for detention systems using StormTech chambers. The major points of the memo are:

- Infiltration of stormwater is generally a desirable stormwater management practice, often required by regulations. Lined systems should only be specified where unique site conditions preclude significant infiltration.
- Thermoplastic liners provide cost effective and viable means to contain stormwater in StormTech subsurface systems where infiltration is undesirable.
- PVC and LLDPE are the most cost effective, installed membrane materials.
- Enhanced puncture resistance from angular aggregate on the water side and from protrusions on the soil side can be achieved by placing a non-woven geotextile on each side of the geomembrane. A sand underlayment in lieu of the geotextile on the soil side may be considered when cost effective.
- StormTech does not design, fabricate, sell or install thermoplastic liners. StormTech recommends consulting with liner professionals for final design and installation advice.

Membrane Materials

Polyvinyl chloride (PVC) is an effective liner material for StormTech systems. PVC offers good chemical resistance to contaminant concentrations typical of highway runoff and to chlorides from road salting applications. Non-reinforced 30 mil PVC liners are recommended for StormTech systems. PVC is flexible. It can be folded without damage and is typically prefabricated and shipped to the jobsite. Panels as large as 20,000 sq. ft. can be prefabricated into a 4000 lb panel (30 mil is 0.195 lbs/sq. ft., SG = 1.2). PVC has the versatility to be field solvent welded, taped or field heat welded. A very significant advantage of PVC is that an excavation contractor can install a PVC liner without specialty crews. Solvent welding of seams, patches and pipe boots can all be done by the excavation contractor making PVC the lowest cost liner alternative.

The PVC compound includes fillers and plasticizers to reduce cost and UV inhibitors to extend the service life under exposure to sunlight. Under prolonged sunlight exposures such as in a permanent surface pool, these additives can leach into the pool and reach concentrations harmful to aquatic life. PVC compounds referred to as “fish safe” are sometimes used for surface pond liners and may be considered for StormTech liners. However, since StormTech systems are subsurface, there is no opportunity for UV attack by sunlight. Also, since stormwater is detained for short durations, typically 48 hours or less, there is little opportunity for accumulation of leachates. Therefore, PVC is an excellent membrane material for thermoplastic liner detention systems.

Recommended Configuration: 30 mil PVC with 8-ounce non-woven geotextile underlayment and overlayment, open top with high flow bypass.

Recommended Restriction: Do not use for fuel spill containment.

Linear low density polyethylene (LLDPE) is a very inert material that offers excellent chemical resistance and is “fish safe”. LLDPE is an effective liner system for StormTech systems, particularly for small projects where the entire liner can be prefabricated in one piece or when using taped seams. LLDPE is flexible up to 30 mil but thicknesses greater than 30 mil should not be folded without potential damage. 30 mil LLDPE is recommended. Extra care should be taken to protect against puncture. A minimum 8-ounce non-woven fabric underlayment and 12-ounce overlayment should be specified. The underlayment should be increased to 12-ounce where water tightness is essential and increased puncture risk exists. Panels as large as 27,000 sq. ft. can be prefabricated into a 4000 lb roll (30 mil is 0.15 lbs/sq. ft.). LLDPE has a specific gravity less than 1.0. LLDPE seams can be taped or field heat welded. Installation costs may increase if field seaming by a specialty contractor is required.

Recommended Configuration: 30 mil LLDPE with 8-ounce non-woven geotextile underlayment and 12-ounce overlayment, open top with high flow bypass.

Recommended Restriction: Do not use for fuel spill containment.

Reinforced Polypropylene (RPP), EPDM *and* ***XR-5*** are excellent materials for lining systems due to their flexibility, durability and excellent chemical and UV resistance. Although excellent lining materials, they generally exceed the engineering requirements for typical applications and are higher in cost than PVC or LLDPE. For fuel and oil concentrations normally found in storm water from parking and roadways, PVC, LLDPE and PP are suitable. However, if containment of aggressive contaminants, fuels or fuel spills are anticipated, a liner professional should be consulted. XR-5 in thicknesses of 30 mil or more, with welded seams may be suitable.

Polyethylene (PE) materials are generally inert, offer excellent chemical resistance and are “fish safe”. Although ***medium density polyethylene (MDPE****)* liners are widely used for sanitary landfills and fish ponds, they are generally much higher in total cost and are not likely to be cost effective lining materials. ***High density polyethylene (HDPE)*** is not flexible enough to resist puncture and conform to the excavation. Cost aside, MDPE is an acceptable liner material for StormTech systems but should be limited to subgrades that are well prepared, without protrusions and must be field seamed.

Geotextile Materials

6-ounce	AASHTO M288 Class 2 non-woven separation geotextile over the top of stone (ADS 601 or equal)
8-ounce	AASHTO M288 Class 2 non-woven geotextile for use as protection layer for PVC, RPP and LLDPE (ADS 801 or equal)
12-ounce	AREMA Chapter 1 Part 10 Category “Regular” non-woven geotextile for use as protection layer for LLDPE and other PE membranes (ADS 1201 or equal)

Seaming Options

1. ***Prefabricated vs. Field*** Prefabricated seams are preferable to field seams for all liner materials whenever possible.
2. ***Solvent Welded*** PVC only, low cost
3. ***Heat Welded*** Costly, require trained seamer, for all liner materials
4. ***Taped*** Cost effective, M50-RC Gray distributed by Titus Industrial Group recommended, single sided, 4” width, for all liner materials. No water tightness data is available.
5. ***Overlapped*** Not water tight, no leakage rates available, suggest 4 ft overlap for all materials.

Pipe “boots” are used to seal pipe penetrations through the liner. Boots can either be prefabricated by the liner fabricator or field fabricated by the contractor. The boot is then solvent cemented, heat welded or taped to the liner. A pipe clamp is normally used to seal the boot around the pipe. Seaming and sealing pipe boots at low temperatures (32° F minimum) requires preheating of the material.

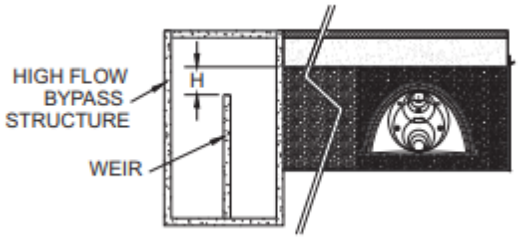
Design

General The design of a lined system must be performed by the consulting engineer and, at minimum, requires knowledge of design storage, peak flow rates and maximum seasonal high groundwater elevation. This information is used to design the peak flow control structure, maximum liner height and groundwater control (if necessary).

High Flow Bypass A high flow control is an important component for any lined system. The high flow control is designed to pass the peak flow while ensuring that the liner is not overtopped. The control structure can be an upstream high flow bypass or a downstream overflow structure. In both cases, a high flow weir, very similar to the high flow control in a pond outlet control structure, is normally used. The high flow weir should be sized such that the water surface elevation based on the maximum head on the weir is less than the top of the liner. Additional freeboard should be provided.

In a typical upstream bypass design, the calculated depth of flow over the weir (H) is subtracted from the maximum water surface elevation in the chamber system to establish the weir crest elevation. The storage in the chamber system associated with the weir crest elevation may be a design constraint. The designer may choose to increase the weir length and therefore decrease the flow depth to establish a higher weir crest.

The equation for a rectangular weir is:

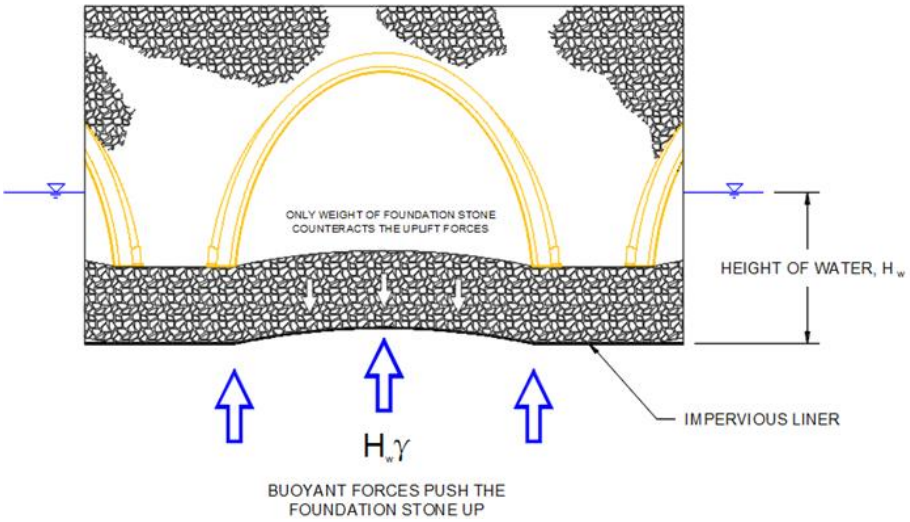


$$H = (Q / (C_d \times L))^{2/3}$$

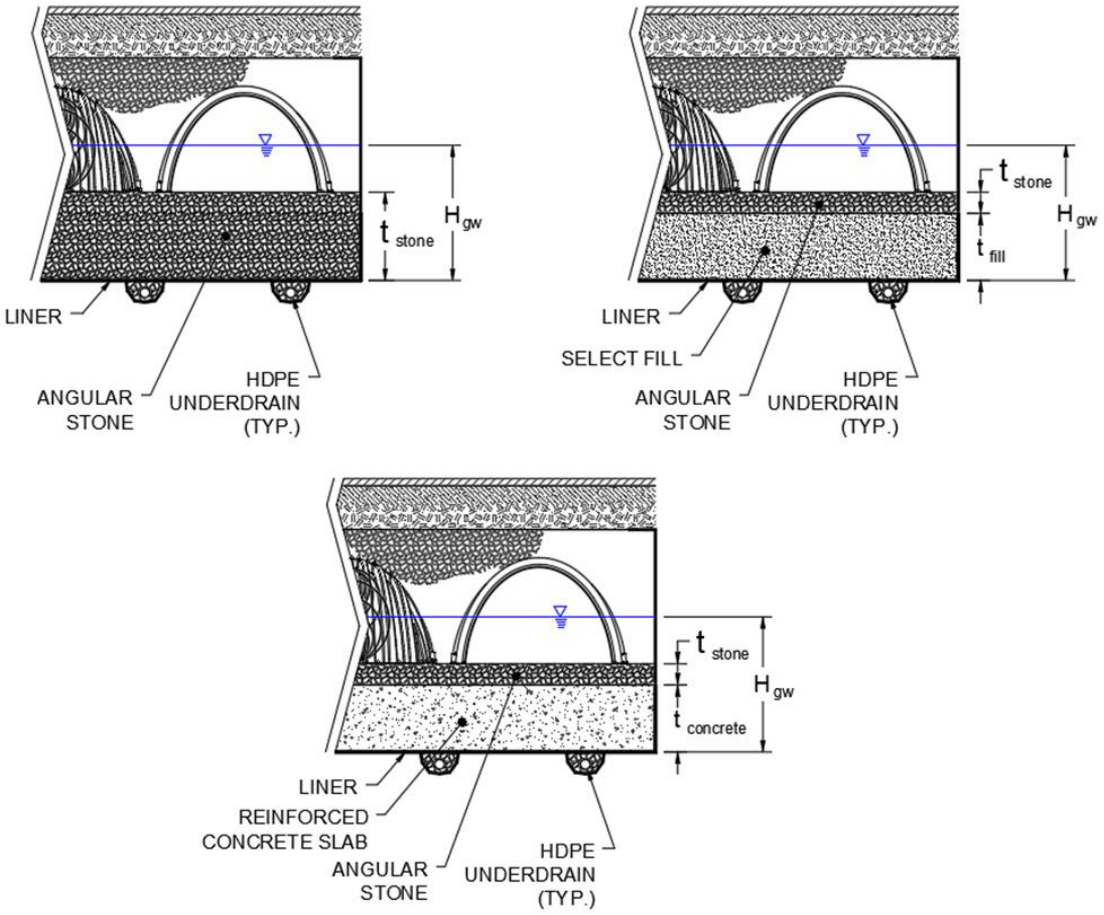
Where:
- Q = flow over the weir (cfs)
- C_d = discharge coefficient = 3.3
- H = Depth of flow over crest (ft)
- L = length of weir (ft)

In a typical downstream overflow design, the designer may incorporate one or more low flow orifices into the high flow weir wall. The weir crest is established as described above but hydraulic losses from the inlet to chamber to the outlet structure may need to be considered. Losses may be factored in by lowering the weir crest or increasing the liner freeboard.

Buoyancy ADS recommends against installing lined chamber systems below groundwater. Although the total weight of a chamber system generally exceeds the buoyant force, a limiting stability condition may result when the buoyant pressure exceeds the resistance pressure directly under the chamber. This could result in a heave of the bedding under the chamber leading to instability.



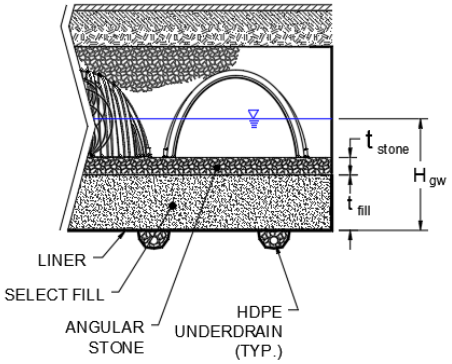
To prevent adverse impacts from ground water, where gravity discharge is possible, ADS recommends the installation of an underdrain system under the liner. Where there is a potential buoyant force, ADS recommends a sufficient bedding thickness, such that the weight of bedding exceeds the maximum buoyant force. The additional bedding thickness can be either increasing the foundation stone or adding a combination of foundation stone and select fill beneath the feet of the chamber and inside the liner to counteract these uplift forces.



The bedding thickness calculation is simplified by ignoring any structural contribution from the liner and reinforcing material and considering only the weight of the stone or stone/fill in the thinnest area of the bedding, which is located under the chamber.

The relationship between bedding thickness and maximum allowable groundwater elevation is:

<u>Select Fill and Foundation Stone Option</u>



$H_{gw} \times (62.4\ lb/ft^3) = [(Y_{stone} \times t) + [(Y_{fill} \times t)] / SF$

Where:

YH_{gw}= height of groundwater above liner bottom (in)

Y_{stone} = bulk density of bedding stone (lb/ft^3)

t_{fill} = thickness of fill bedding (in)

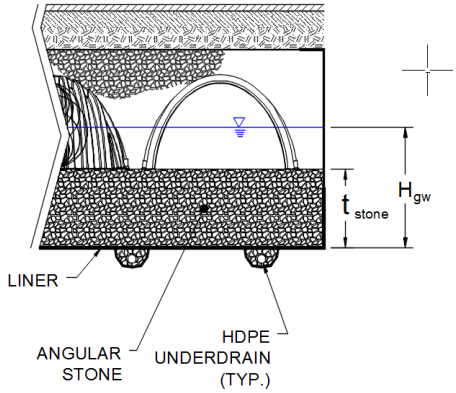
t_{stone} = thickness of stone bedding (in)

SF = safety factor (1.25 typical minimum)*

The bulk density of the open graded stone bedding materials varies from about 75 lbs/ft3 to over 100 lbs/ft^3. The bulk density of select fill materials varies from about 90 lbs/ft^3 to over 120 lbs/ft^3. Without specific bulk density information for the stone actually used, ADS recommends using not more than 75 lbs/ft^3.

* The consulting engineer may apply a lower or higher safety factor.

Increased Foundation Stone Option



H_{gw} x (62.4 lb/ft^3) = [(γ_{stone} x t) / SF

Where:

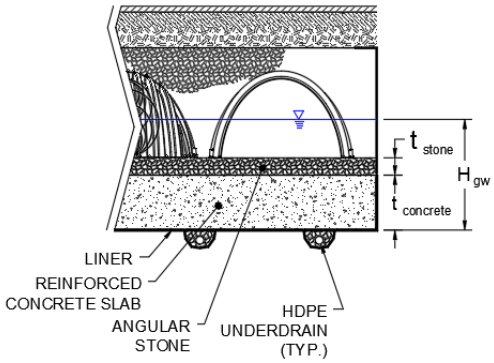
γH_{gw}= height of groundwater above liner bottom (in)

γ_{stone} = bulk density of bedding stone (lb/ft^3)

t = thickness of stone bedding (in)

SF = safety factor (1.25 typical minimum)*

Reinforced Concrete Slab



Alternatively, an engineer can design a reinforced concrete slab. The slab should be designed to handle the uplift forces from groundwater while transferring live & dead loads to the underlying material.

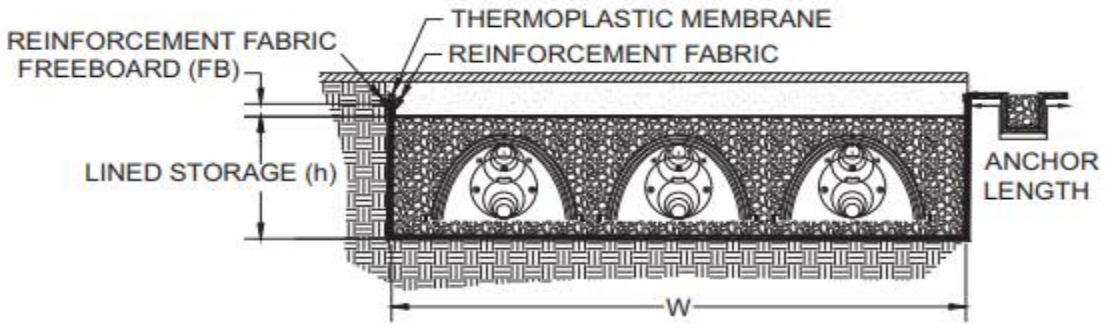
Installation

Installation should be in accordance with the liner manufacturer's instructions. Associations representing membrane materials have developed installation standards and other support documents for the respective lining materials. Visit their web sites for additional information.

- PVC Geomembrane Institute, University of Illinois, web: http://Pgi-tp.cee.uiuc.edu/forweb
- "HDPE Geomembrane Installation Specification" by the International Association of Geosynthetic Installers. Revised February 2000: http://www.iagi.org/specifications.htm

PVC and LLDPE liners should not be installed at temperatures less than 32° F or on windy days. Wind can catch the liner and be extremely dangerous to laborers. Stones and other protrusions should always be removed from the excavation. Rolling or compacting is recommended to knock down any remaining protrusions. The non-woven underlayment fabric is then placed in the excavation, the membrane placed, and a fabric reinforcement placed over the membrane. Liners are flapped by laborers to get air under the liner to enable easy drag across bed. Corners are generally formed by folding or "pleating" excess liner material.

An “anchor trench” about 12” deep by 12” wide may be dug around the top of the excavation to anchor the top of the reinforcement fabric and thermoplastic liner at the top of the excavation. Stone should be placed carefully to avoid puncture from long free falls. Similarly, additional care must be taken when spreading and compacting bedding stone to prevent stones from puncturing the liner during construction.



Estimating Liner Material

Liner fabricators require dimensional details to design panels and provide firm material quotations. The liner and reinforcing fabric quantities should include sidewalls and extra material for anchoring during installation. The excavation contractor should use care not to over excavate since a larger excavation would require additional liner materials.

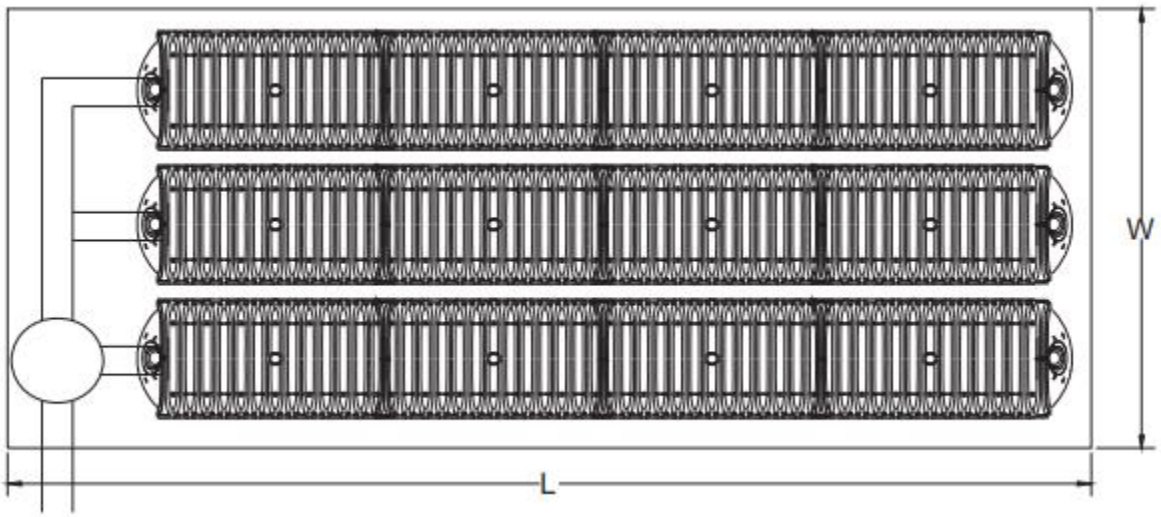
The fabricated sheet size for estimating purposes is calculated as follows:

Panel Size = [W + 2(h + FB + AL)] x [L + 2(h + FB + AL)]

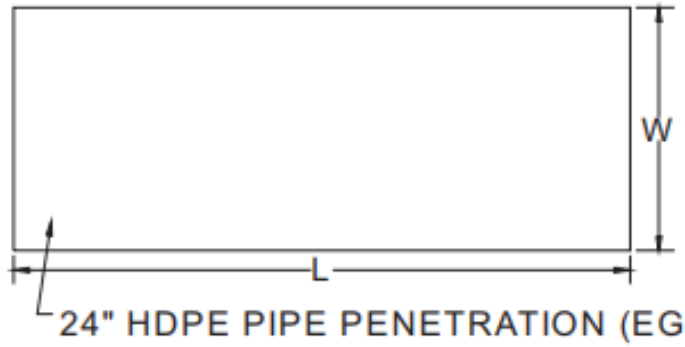
Where:

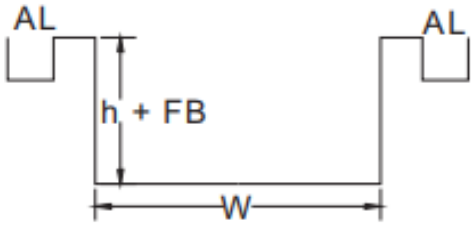
W = system width from StormTech layout drawing
L = system length from StormTech layout drawing
FB = freeboard based on engineer’s advice (0.5’ typical)
AL = anchor length of membrane and reinforcement to tie back sidewall material during installation and backfill of chambers (4’ typical)

The location and size of pipe penetrations should also be summarized for the fabricator.



Estimating Worksheet:





Panel Size = [W + 2(h + FB + AL)] x [L + 2(h + FB + AL)]

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APPENDIX G

STORMWATER MAINTENANCE AGREEMENT

Document Number

Stormwater Management Practice Agreement

Caroline Heights Apartments LLC, as "Owner" of the property described below, in accordance with Village of Elm Grove Municipal Code - Chapter 325-41, agrees to maintain stormwater management practice(s) on the subject property in accordance with approved plans. The owner further agrees to the terms stated in this document to ensure that the storm water management practice(s) continues serving the intended functions in perpetuity. This Agreement includes the following exhibits:

Exhibit A: Legal Description of the real estate for which this Agreement applies ("Property").
Exhibit B: Location Map(s) – shows an accurate location of each stormwater management practice affected by this Agreement.
Exhibit C: Maintenance Plan – prescribes those activities that must be carried out to maintain compliance with this Agreement.

Note: After construction verification has been accepted by the Village of Elm Grove, for all planned storm water management practices, an addendum(s) to this agreement shall be recorded by the Owner showing design and construction details. The addendum(s) may contain several additional exhibits.

Name and Return Address

Village of Elm Grove
c/o Village Clerk
13600 Juneau Blvd.
Elm Grove, WI 53122

Through this Agreement, the Owner hereby subjects the Property to the following covenants, conditions and restrictions:

1. The Owner shall be responsible for the routine and extraordinary maintenance and repair of the stormwater management practice(s) and drainage easements identified in **Exhibit B** and in accordance with the maintenance plan contained in **Exhibit C**.
2. Upon written notification by the Village, the Owner(s) shall, at their own cost and within a reasonable time period determined by the Village, have an inspection of the stormwater management practice conducted by a qualified professional, file a report with the Village and complete any maintenance or repair work recommended in the report. The Owner(s) shall be liable for the failure to undertake any maintenance or repairs.
3. In addition, and independent of the requirements under paragraph 2 above, the Village, or its designee, is authorized to access the property as necessary to conduct inspections of the storm water management practices or drainage easements to ascertain compliance with the intent of this Agreement and the activities prescribed in **Exhibit C**. The Village may require work to be done which differs from the report described in paragraph 2 above, if the Village reasonably concludes that such work is necessary and consistent with the intent of this agreement. Upon notification by the Village of required maintenance or repairs, the Owner(s) shall complete the specified maintenance or repairs within a reasonable period determined by the Village.
4. If the Owner(s) do not complete an inspection under 2. above or required maintenance or repairs under 3. above within the specified time period, the Village is authorized, but not required, to perform the specified inspections, maintenance or repairs. In the case of an emergency, as determined by the Village, no notice shall be required prior to the Village performing emergency maintenance or repairs. The Village may levy the costs and expenses of such inspections, maintenance or repair related actions as a special charge against the Property and collected as such in accordance with the procedures under s. 66.0627 Wis. Stats. or subch. VII of ch. 66 Wis. Stats.
5. This Agreement shall run with the Property and be binding upon all heirs, successors and assigns. After the Owner records this agreement, the Village shall have the sole authority to modify this agreement upon a 30-day notice to the current Owner(s).
6. Owner agrees to indemnify and hold harmless the Village, its officers, agents and employees against any and all actions, damages, judgments, costs, or fees of any kind whatsoever arising out of any act, error, or omission of the Owner, its agents, or employees relating to this agreement.
7. Copies of all inspection reports must be submitted to the Village of Elm Grove every other year, beginning on the first even year after the signing of the Agreement (e.g. Agreement signed in 2023, first report is due in 2024, then

2026, and so on). Inspection reports must be sent by January 31 to: ATTN: Stormwater Engineer, Village of Elm Grove – Engineering, 13600 Juneau Blvd, Elm Grove, WI 53122.

Dated this _____ day of _____, 202___.

Owner:

_____
Owner's Signature

_____
Owner's Typed/ Printed Name

Mailing Address:_____

_____

_____

_____

Phone Number: _____

Email Address: _____

Acknowledgements

State of Wisconsin:
County of Waukesha

Personally came before me this ____ day of_____, 202__, the above named _____ to me known to be the person who executed the foregoing instrument and acknowledged the same.

_____
Notary Public
My commission expires: _____

Approved for recording: _____
[Initials of Municipal staff]

This document was drafted by:
Village of Elm Grove
13600 Juneau Blvd
Elm Grove, WI 53122

The attached exhibits were drafted by:

K. Singh & Associates, Inc.
3636 N. 124th Street
Wauwatosa, WI 53222

Exhibit A – Legal Description

The following description and reduced copy map identifies the land parcel(s) affected by this Agreement. For a larger scale view of the referenced document, contact the Village of Elm Grove Clerk's Office.

Project Identifier: Caroline Heights Development **Acres:** 29.56 **Watershed:** N/A
Date of Recording: April 15th, 2020
Map Produced By: K. Singh & Associates, Inc., 3636 N. 124th Street, Wauwatosa, WI 53222

Legal Description: Part of the Northwest 1/4 and Southwest 1/4 of the Northeast 1/4 of Section 25, Town 7 North, Range 20 East, in the Village of Elm Grove, Waukesha County, Wisconsin.

(EXHIBIT ATTACHED AS SEPARATE DOCUMENT - 20221111-TOPO3454-UPDATE.pdf)

Exhibit B - Location Map
Storm Water Management Practices Covered by this Agreement

The stormwater management practices covered by this Agreement are depicted in the reduced copy of a portion of the construction plans, as shown below. The practices include 3 dry detention ponds, 1 infiltration basin, underground stormwater storage system, 4 grass swales and all associated pipes, earthen berms, rip rap and other components of these practices. All noted stormwater management practices are located within the site as noted in **Exhibit A**.

Project Name: Caroline Heights Development
Storm water Practices: 3 Dry Ponds, 1 Infiltration Basin, Underground Stormwater Storage System, Grass Swales (4), Up-FLO Filters (2)
Location of Practices: All areas of site
Owner: Caroline Heights Apartments LLC

Figure 1: Plan View of Stormwater BMP's

(FIGURE ATTACHED AS SEPARATE DOCUMENTS - C300 - Grading Plan Overview.pdf, C400 - Utility Plan Overview.pdf, Rev6 - Caroline Heights (School Sisters of Notre Dame) (S213498) 05-03-2023.pdf, revA_UFF-39_CPZ_Up Flo Drawing_22_12_3373.pdf, revB_UFF-62_CPZ_Up Flo Drawing_22_12_3373.pdf)

Figure 2: Profile View of BMP's

(FIGURE ATTACHED AS SEPARATE DOCUMENTS - C112 - Erosion Control Details.pdf, C340 - Grading Cross Sections DP1 and DP2.pdf, C341 - Grading Cross Sections DP3 and IB.pdf, C360 - West Swale P&P.pdf, C361 - East Swale P&P.pdf,)

Exhibit C
Stormwater Practice Maintenance Plan

This exhibit explains the basic function of each of the storm water practices listed in **Exhibit B** and prescribes the minimum maintenance requirements to remain compliant with this Agreement. The maintenance activities listed below are aimed to ensure these practices continue serving their intended functions in perpetuity. The list of activities is not all inclusive, but rather indicates the minimum type of maintenance that can be expected for this particular site. Access to the stormwater practices for maintenance vehicles is shown in **Exhibit B**. Any failure of a storm water practice that is caused by a lack of maintenance will subject the Owner(s) to enforcement of the provisions listed on page 1 of this Agreement by the Village.

Owner shall keep a record of all inspections performed and any work associated with the upkeep of the system. Copies of all inspection reports must be submitted to the Village of Elm Grove every other year, beginning on the first even year after the signing of the Agreement (e.g. Agreement signed in 2023, first report is due in 2024, then 2026, and so on). Inspection reports must be sent by January 31 to: **ATTN: Stormwater Engineer, Village of Elm Grove – Engineering, 13600 Junea Blvd., Elm Grove, WI 53122**.

System Description:

The dry detention ponds, infiltration basin and underground stormwater storage system are all designed to reduce pre-development peak-flows to the existing southeast basin, as well as remove total suspended solids and total suspended phosphorous. In addition to runoff conveyance, the grass swales also allow filtering of pollutants, especially from smaller storms. All detention basins and infiltration basin have apron endwalls with medium riprap for incoming pipes to mitigate erosion. All detention basins and infiltration basins also have emergency spillways that are not activated through any storm event.

"As-built" construction drawings of the basin, showing actual dimensions, elevations, outlet structures, etc. will be recorded as an addendum(s) to this agreement within 60 days after the Village accepts verification of construction from the project engineer.

Minimum Maintenance Requirements:

To ensure the proper long-term function of the storm water management practices described above, the following activities must be completed by the Facility Manager:

General Maintenance Requirements and Restrictions:

1. All outlet pipes must be checked monthly to ensure there is no blockage from floating debris or ice, especially the outlet control inlet grate and the trash rack at the apron end walls entering the dry ponds/infiltration basin. Any blockage must be removed immediately.
2. Grass swales shall be preserved to allow free flowing of surface runoff in accordance with approved grading plans. No buildings or other structures are allowed in these areas. No grading or filling is allowed that may interrupt flows in any way.
3. Grass swales, inlets and outlets must be checked after heavy rains (minimum of twice per year, May & October) for signs of erosion. Any eroding areas must be repaired immediately to prevent premature sediment build-up in the forebays or basin. Erosion matting is recommended for repairing grassed areas.
4. NO trees are to be planted or allowed to grow on the earthen berms. Tree root systems can reduce soil compaction and cause berm failure. The berms must be inspected annually and any woody vegetation removed.
5. If weed growth becomes a nuisance (decay odors, etc.), it must be removed from the dry ponds/infiltration basin and deposited where it cannot drain back into the basin.
6. When sediment in the dry ponds/infiltration basin is observed, it must be removed. All removed sediment must be placed in an appropriate upland disposal site and stabilized (grass cover) to prevent sediment from washing back into the basin.
7. No grading or filling of the basin or berm other than for sediment removal is allowed, unless otherwise approved by the Village.
8. Periodic mowing of the grass swales will encourage rigorous grass cover and allow better inspections for erosion. Waiting until after August 1 will avoid disturbing nesting wildlife. Mowing around the basin may attract nuisance populations of geese to the property and is not necessary or recommended.

9. Emergency spillways must have WisDOT turf reinforcement mat class III type B to prevent eroding. Emergency spillway shall be clear of debris at all times and repaired if damages are observed. At a minimum, spillway shall be inspected twice per year and after any rainfall event exceeding 6.31-inches during a 24-hour duration (100-Year Storm Event).
10. Up-flo filters must be inspected annually by a qualified inspector. Filter shall be replaced as necessary. Follow manufacturer's specifications for Up-flo filter maintenance.
11. Inspect underground stormwater storage facility every 6 months during the first year of operation. Adjust the inspection interval based on previous observations of sediment accumulation and high water elevations. Conduct jetting and vactoring annually or when inspection shows that maintenance is necessary. See manufacturer's specification for maintenance in Exhibit B, Figure 1 (Rev6 - Caroline Heights (School Sisters of Notre Dame) (S213498) 05-03-2023.pdf, page 6 of 7).
12. Any other repair or maintenance needed to ensure the continued function of the storm water practices or as ordered by the City under the provisions listed on page 1 of this Agreement.

Dry Ponds & Infiltration Basin Maintenance:

1. All dry ponds and infiltration basin should be inspected after each heavy rain, and periodically throughout the year, but at a minimum of once per year to ensure there is no outlet blockage from floating debris or ice. Any blockage must be removed immediately.
2. Nuisance (decay odors, etc.) floating algae or weed growth should be removed from the dry ponds and infiltration basin and deposited where it cannot drain back into the systems. Removal of the vegetation from the water reduces regrowth the following season (by harvesting the nutrients).
3. A minimum of 70% soil cover made up of native grasses must be maintained on the dry ponds and infiltration basin bottom to ensure infiltration rates. Periodic burning or mowing is recommended to enhance establishment of the prairie grasses (which may take 2-3 years) and maintain the minimum native cover. To reduce competition from cool season grasses (bluegrass, fescues, quack, etc.) and other weeds:
    a. For the first year, cut to a 6" height three times – once each in June, July and early August. To prevent damage to the native grasses, do not mow below a 6" height. Remove excessive accumulation of clippings to avoid smothering next year's seedlings.
    b. After the first year, mowing may only be needed in early June each year to help control the spread of cool season plants. The mowing should also be raised to 10-12" to avoid damage to the warm season plants.
    c. Burning may also be used to manage weeds in 2-5 years intervals. Late spring burns (mid-late May) provide maximum stimulus to warm season grasses and work well to control cool season grasses. Burn when the cool season grasses are growing, and the warm season plants are just barely starting to grow to get maximum control of cool season species.
    d. Any major bare areas or areas taken over by nonnative species must be reseeded. To clear area of weeds and cool season grasses, treat with an herbicide that contains glysophosphate in accordance with manufacturer's instructions. Ensure a firm seedbed is prepared to a depth of 3 inches (a roller is recommended). Seeding should occur in early-mid June. Seed with Big Bluestem, Indian Grass, Little Blue Stem or Switchgrass (preferably an equal mix of all four types). A companion crop of oats is recommended. Seed must be placed at a depth of 1/4 – 1/2" and a minimum rate of 1/4 pound per 100 square feet. If broadcast seeding by hand, drag leaf rake over soil surface after seeding. Then roll it again and cover with a light layer of mulch and staked erosion control netting to hold it in place until germination. For other planting details, see NRCS standard 342 (Critical Area Planting).
4. The dry ponds and infiltration basin and all components (grass swales, forebay, inlets, outlets, etc.) should be inspected after each heavy rain, but at a minimum of once per year. If the basin is not draining properly (within 72 hours), further inspection may be required by persons with expertise in storm water management and/or soils.
    a. If soil testing shows that the soil surface has become crusted, sealed, or compacted, some deep tillage should be performed. Deep tillage will cut through the underlying soils at a 2-3 foot depth, loosening the soil and improving infiltration rates, with minimal disturbance of the surface vegetation. Types of tillage equipment that can be used include a subsoiler or straight, narrow- shanked chisel plow.
    b. If sedimentation is determined to be causing the failure, the accumulated sediment must be removed and the area reseeded in accordance with the notes above.
    c. If the washed stone trench has become clogged, the stone – and possibly the soil immediately around the stone - must be replaced.

5. Any eroding areas must be repaired immediately to prevent premature sediment build-up in the system.
6. Heavy equipment and vehicles must be kept off the bottoms and side slopes of dry ponds and infiltration basin to prevent soil compaction. Soil compaction will reduce infiltration rates and may cause failure of the dry ponds and infiltration basin, resulting in ponding and possible growth of wetland plants.
7. No trees are to be planted or allowed to grow on the earthen berms or the bottom of the dry ponds or infiltration basin. On the berms, tree root systems can reduce soil compaction and cause berm failure. On the dry ponds and infiltration basin bottom, trees may shade out the native grasses. The dry ponds and infiltration basin must be inspected annually and any woody vegetation removed.