



Stormwater Pollution Prevention Plan

The North 60 - Phase 1

*Hospital Road & Route 9A
Mount Pleasant (T)*

Prepared By:

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Project Information:

Project Title: The North 60 – Phase 1
Project Address: Hospital Road & Route 9A, Mount Pleasant, NY
Tax Map Number: Sheet 116.8, Block 1, Lot(s) 3, 4, 5, 6, 7, 8, 9
Sheet 111.20, Block 1, Lot 80
Project Area: 78.92 +/- Acres

Applicant/Owner Information:

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Short-Term Responsible Party for SWPPP Implementation:

Short-term responsible parties for SWPPP Implementation will be the General Contractor.

Long-Term Responsible Party for SWPPP Implementation:

Long-term responsible parties for SWPPP Implementation will be the Owners.

Potential Party Responsible for Inspections as Required Under SPDES Permit:

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1.0 Introduction:

The applicant is proposing to construct a new mixed-use community located on Hospital Road and Route 9A in the Town of Mount Pleasant. The project is entitled, “The North 60”. This report pertains to Phase 1 of the site development.

1.1 Project Description:

The Westchester Medical Village site contains 78.92 acres located on the north side of Hospital Road.

The applicant is proposing to construct a new mixed use community with biomedical research facilities. Phase 1 of the project will include the construction of 5 new buildings. The development will consist of a new hotel, retail space, medical office space, and biomedical space. Parking facilities and a new system of roadways will also be constructed as part of in Phase 1. A new “Main Street” boulevard connects the development to the existing Hospital Road and the proposed “West Street” will connect Hospital Road to Route 9A (Saw Mill River Road). The proposed area of disturbance for Phase 1 is 40.7 acres and the project is located within the Saw Mill River Watershed. Please note, the Project Site discharges to the Saw Mill River (Middle and tribs) which has been identified as a “303(d) Impaired Segment by Construction Related Pollutant(s)” in Appendix E of the NYSDEC SPDES General Permit GP-0-20-001. Uncontrolled and untreated release of stormwater runoff to the 303(d) segment could exacerbate the existing water quality concerns. Therefore, drainage systems designed in accordance with New York State Department of Environmental Conservation (NYSDEC) regulations are proposed to treat stormwater runoff generated by the proposed improvements. The project will be served by the existing public water system and will connect wastewater to the existing public sanitary sewer system in the vicinity of the project.

The project will affect a property listed on the State or National Register of Historic Places. A Phase I & Phase II Archaeological Study was performed on the project site by Hartgen Archeological Consultants, Inc. Two archeological sites



were identified on the Project Site during the study. A Saw Mill River Precontact Site and the J. Van Tassel Historic Site were both found in the southeast portion of the Project Site, adjacent to the proposed wet pond. It has been determined that avoidance of these areas during construction will not be feasible and therefore a Phase III Archeological Resources investigation will be performed prior to construction. Any historically significant artifacts identified during the Phase III study will be properly documented and recovered from the site before construction disturbance commences. The impacted historic sites have been identified on the project plans. A map showing historic places in the vicinity of the project can be found in Appendix "E". Please note, the historic map has been updated to display the two onsite areas identified by Hartgen Archeological Consultants, Inc.

Assuming a timely permitting process, construction is anticipated to begin in the fall of 2021. Ultimate build out of Phase 1 will take approximately 5 years to complete.

The following is a list permits that must be obtained:

- Town of Mount Pleasant Town Board Zoning Amendment Approval
- Town of Mount Pleasant Planning Board Site Plan and Subdivision Approval
- Army Corps of Engineers Wetlands Approval
- NYSDEC: Article 15, Title 5 Stream Disturbance Permit
- NYSDEC: Section 401 Water Quality Certification (Joint Permit Application with Army Corps of Engineers)
- NYSDEC Region 3 SWPPP Review (To be coordinated with other NYSDEC application submissions.)
- Westchester County Department of Health Public Water Supply and Wastewater Approvals
- NYSDOT Highway Work Permit Approval



- New York State Department of Environmental Conservation SPDES
#GP-0-20-001 Notice of Intent for Stormwater Discharges from
Construction Activities

1.2 Existing Site Conditions:

The existing 78.92 acre site currently has a parking area and a construction staging area on the south side of the site which is accessed from Hospital Road. There are also several residences and an existing landscape business located on the west side of the site which is accessed from an existing paved driveway connected to Old Saw Mill River Road. A majority of the site is undeveloped woodlands and meadows. Two streams flow through the site to the north where they discharge to the Saw Mill River adjacent to Route 9A. The streams originate from the existing Westchester Medical Center drainage system outfalls.

Slopes vary greatly onsite. The existing parking area and existing construction staging area are located on the mildly sloped ridgeline which extends through the center of the site. The north side of the site contains steep slopes which descend towards Route 9A. Very steep ravines are located along the banks of the two existing streams which separate the site into three distinct areas. NRCS soil boundaries identified onsite and within the boundaries of the analysis consist of Paxton Fine Sandy Loam, Woodbridge Loam, Ridgebury Loam, and Urban Land. Paxton Fine Sandy Loam belongs to hydrologic group "C", Woodbridge Loam belongs to hydrologic group "C", and Ridgebury Loam belongs to hydrologic group "D". The Urban Land areas are treated as hydrologic group "C" for the purposes of this drainage analysis. A soil map for the site area can be found in Appendix "D" of this report.

1.3 Proposed Site Conditions:

The construction of the buildings, roadways, walkways, and parking areas within the limits of Phase 1 will result in the creation of approximately 14.4 acres of additional impervious surfaces. Runoff from the proposed improvements is to be collected by a system of catch basins and piping, then captured and treated in



stormwater management practices. The existing structures and driveways located onsite are to be removed.

As per the New York State Stormwater Management Design Manual (Stormwater Design Manual) the site planning for the project is required to employ techniques (listed on Table 3.1 of the Manual) which will achieve the preservation of natural resources.

The reduction of clearing and grading on site was a key aspect of the design. Although total disturbance for Phase 1 of the site development is approximately 40.7 acres, a large portion of the property is proposed to remain as natural wooded areas.

The natural areas of the property were also preserved by locating proposed disturbance associated with the construction in areas which had been previously developed. The proposed “Main Street” area of the project is located where the existing paved parking lot and existing construction staging area are currently located. The proposed “West Street” is located over a portion of the existing paved common driveway which connects the existing onsite residences to Route 9A. This effectively limits the amount of new impervious required for the construction of the roadways.

The table provided on the following page shows a comparison of pre-development impervious cover with post-development impervious cover for each of the sub-watersheds.

Impervious Area Comparison

	A	B	Total
Pre-development Impervious Area (SF)	181,472	0	181,472
Post-development Impervious Area (SF)	700,122	108,792	808,914
Change in Impervious (SF)	+518,650	+108,792	+627,442

2.0 Stormwater Management:

The stormwater systems for the project are proposed for the qualitative and quantitative management of stormwater runoff from the site. As the site falls under the requirements of the State SPDES program, all stormwater facilities employed for this site have been designed to meet NYSDEC requirements for water quality volume, stream channel protection volume, overbank flood control, and extreme flood control. The Stormwater Pollution Prevention Plan (SWPPP) for the Project Site has also been designed in accordance with the requirements set forth in the Mount Pleasant Town Code Chapter 183, Stormwater Management and Erosion and Sediment Control.

The stormwater management planning process included several design decisions and techniques to help minimize the impacts of development. Roadway pavement and sidewalk widths were designed with the minimum width practicable while meeting the requirements of the Mount Pleasant Town Code. Preservation of natural buffers and undisturbed areas was also a key element of the design. A large portion of the north side of the Project Site is proposed to remain undisturbed woodlands as part of the Master Development Plan. Although a portion of the onsite wetland are proposed to be disturbed, the wetland areas were already previously impacted by surrounding development and their health would be improved by the proposed stormwater management plan.

The natural areas of the Project Site were also preserved by locating proposed construction disturbance in areas which had been previously developed. The proposed Main Street area of the Project Site is located where the existing paved parking lot and construction staging area are currently located. The proposed West Street is located over a portion of the existing paved common driveway which connects the existing onsite residences to Route 9A. This effectively limits the amount of new impervious required for the construction of the roadways.

Parking reductions were also a factor in the stormwater planning for the Project Site. The Proposed Action includes realistic parking requirements for each proposed onsite use in order to eliminate any unnecessary parking areas which



may be in excess of the actual site needs. Dedicated bicycle paths and the proposed shuttle bus route would help promote less vehicular traffic as well, which helps manage the parking requirements for the Project Site. Multilevel parking structures have been proposed under several of the buildings to eliminate the need for large, surface level parking lots which greatly reduces the amount of impervious surfaces proposed for the site.

The hydrologic model for this project consists of two (2) design points. The two existing watercourses which flow through the site enter into two separate culvert pipes prior to crossing under Old Saw Mill River Road on the northern side of the project site. The entrances of these culverts have been selected as the design points for the project. As part of the stormwater analysis, the contributing offsite areas which are tributary to the design points have been included in hydrologic model for the project. The offsite areas mainly consist of the existing Westchester Medical Center facility located to the south of the project site. These areas flow to existing offsite stormwater ponds and the discharge pipes from the existing ponds outlet to the watercourses found on the project site. There are (4) subcatchments in pre-development analysis. Each of the predevelopment design points receive runoff from one offsite subcatchment area and each has one onsite subcatchment which is tributary to their respective design point. There is a total of (18) subcatchments in the post development analysis. Once again, the two offsite subcatchment areas located to the south of the project site have been included in the analysis. Each of the stormwater treatment practices proposed for the site have separate subcatchment areas in order to analyze and design each proposed practice. The remaining subcatchments represent all untreated runoff which flows to the existing onsite streams or directly to the design points.

HydroCAD v. 10.0, a computer-modeling program based upon TR-20, was used to generate peak flows from the subcatchments. In the program, the user inputs various characteristics for each subcatchment including a curve number and time of concentration. These two parameters relate runoff to the specific land characteristics of the subcatchment. Based upon the inputted data,



peak flows are generated for the 1, 2, 10, 25, 50, and 100-year storm events for the pre-development and post-development subcatchments.

The proposed stormwater management practices contained within Phase 1 of The North 60 Project are described below.

Infiltration Basin (Design I-2)

- o Two (2) infiltration basins will be constructed as part of the Phase 1 Plan. The infiltration basin consists of a flat bottom basin located in a highly permeable area of the site and effectively recharges runoff back into the onsite soil which reduces post development runoff volumes from the site. Infiltration Basin #1 is to be located on the north side of proposed Cross Street and to the west of the “North Parking Lot”. Infiltration Basin #1 treats runoff from the “West Parking Lot”, the segment of “Cross Street” to be constructed in Phase 1, and the paved loading area of Building B1. Infiltration Basin #2 located on the northern portion of the site where an existing residence and lawn area is currently located. The existing residence is to be removed from the area during the construction of the basin. The infiltration basin treats runoff from impervious surfaces located on the proposed main street portion of the site and the remaining portion of the “North Parking Lot”. The two proposed infiltration basins are both tributary to Design Point “A”. The infiltration basins have been designed with outlet structures which allow for storage of the entire 90% design storm and extended detention for the larger storm events. A rip-rap spillway is provided above the 100-year peak water elevation for emergency use only if the outlet structure fails to control the peak level of the basin.

Subsurface Infiltration Systems (Design I-4)

- o Five (5) subsurface infiltration systems are proposed for the Phase 1 development. The infiltration systems consist of Cultec Recharger infiltration chambers situated in gravel beds. Infiltration System #1 which treats the upper portion of the proposed “Western Street” shall use Cultec



Recharger 360HD chambers. Infiltration System #2 which treats the rooftop runoff from proposed buildings “B1” and “B4” located on the proposed “Main Street” shall use Cultec Recharger 360HD chambers. Infiltration System #3 treats the large surface parking lot located to the north of the proposed hotel. System #3 shall use Cultec Recharger 330XLHD chambers. Infiltration System #4 treats a portion of the “North Parking Lot” located at the end of the Phase 1 “Main Street”. System #4 shall use Cultec Recharger 330XLHD chambers. Infiltration System #9 treats the rooftop of the proposed hotel and a portion of the hotel entrance area. System #9 shall use Cultec Recharger 330XLHD chambers. The subsurface infiltration systems recharge stormwater runoff back into the onsite soil and each system is designed as an “off-line” practice which treats the 90% design storm and bypasses larger storm events via diversion structures.

Wet Pond (Design P-2)

- o One (1) wet pond is proposed for the project. The wet pond stormwater practice shall consist of a permanent pool of water with extended detention capacity above the permanent pool which is controlled by a weir outlet. A sediment forebay has been designed to provide pretreatment at the inlet side of the pond and the water quality volume associated with the 90% storm is provided partially in the permanent pool and partially in the extended detention area in accordance with the Stormwater Design Manual. The proposed pond is approximately 6 to 7 feet in depth with shallower areas along the side slopes. The wet pond treats the runoff generated from the proposed hotel rooftop and the hotel driveway area. The pond also receives stormwater from the outfall of the existing offsite stormwater basin located to the south of the proposed hotel. The proposed wet pond will be constructed to replace a portion of the existing watercourse which flows through the site to Design Pont “B”. The existing watercourse suffers from existing erosion problems and carries



sediment laden runoff through the project site. The proposed wet pond will detain the stormwater which will allow time for quality treatment of the runoff and ultimately reduced peak runoff rates which flow to the remaining portion of the existing stream.

Please note, the Stormwater Design Manual states that wet ponds shall not be constructed within existing wetlands. The proposed wet pond deviates from this requirement and will require authorization from the NYSDEC Region 3 Office. The wet pond design within the existing wetland area is further discussed below.

The onsite “Wetland #2” which is to be impacted by the proposed wet pond construction originates from the outfall of the existing drainage basin located at the corner of Hospital Road and Woods Road. Wetland #2 flows to Design Point B in the hydrologic model of the Project Site. The existing drainage basin discharges onto the Project Site via a 36-inch corrugated metal culvert pipe. The existing perennial watercourse which is created by the stormwater outfall is approximately five to 10 feet in width and the depth varies from three inches to 24 inches. Existing construction debris and roadside litter is observed throughout the existing wetland area. The plan proposes to create the wet pond in the vicinity of the existing wetland which would eliminate the first 1,000 feet of the watercourse and disturb approximately 14,000 square feet of wetlands. The portion of the existing watercourse to be eliminated has an approximate slope of 3%. The proposed wet pond would allow for stormwater quality treatment by creating a permanent pool with extended detention capacity above to attenuate the larger storm events. The pond level is controlled by a proposed outlet weir structure which discharges back to Wetland #2 on the north side of the proposed pond via a stabilized rip-rap channel to prevent erosion. Since the existing watercourse suffers from existing erosion issues and has been negatively impacted by the continuous construction staging located along the edge of the wetland, the creation of the proposed



stormwater pond would result in improved stormwater quality and reduced peak flows within the wetland. The remaining portion of Wetland #2 is to remain undisturbed and protected as part of the Master Plan of development. The proposed pond will ultimately create a new habitat for wildlife and plants, it will improve water quality to the design point, and help prevent future erosion of the downstream watercourse.

In order to construct the wet pond, the watercourse will be temporarily piped beyond the extent of the future wet pond and discharged into the watercourse immediately downstream of the wet pond location. The temporary pipe shall be 36" HDPE pipe and will connect to the existing drain manhole located at the Hospital Road & Woods Road intersection. The temporary pipe shall discharge to a typical ADS pipe end section shall remain in place until the wet pond area has permanent vegetative growth and all contributing drainage areas have been fully stabilized. The configuration of the temporary pipe has been shown on the Erosion Control Plan EC-1.

Pocket Wetland (Design W-4)

- o One (1) pocket wetland is proposed for the project. The pocket wetland consist of a forebay located at the inlet, a shallow marsh area, and a micropool at the outlet structure. The pocket wetland has been designed for extended detention and it provides twenty four hour center of mass detention time for the one year storm event (2.8 inches). The pocket wetland also provides extended detention storage above the permanent pool for the larger storm events. The pocket wetland treats the lower portion of "West Street" in the northwest corner of the project site. A high groundwater table was located in the area of the proposed pocket wetland and the wetland has been designed such that the bottom of the deep pools are into the existing groundwater table. This will help sustain wetland plantings within the basin. The design



and sizing calculations for the pocket wetland can be found in Appendix "I" of this report.

Required pretreatment for the stormwater runoff will be accomplished using subsurface Hydro-International First Defense High Capacity hydrodynamic separator chambers prior to each practice. The pretreatment practices are to be sized based on the peak flow generated by the 90% storm, 1.5" of rainfall in twenty-four hours. The hydrodynamic separator meets the requirements of propriety treatment systems set forth in the NYSDEC Stormwater Design Manual. See Appendix "C" for the New Jersey DEP certification for the First Defense chamber. Additional information about the capacity, installation, and maintenance for the pretreatment chamber can also be found in Appendix "C". All proposed stormwater conveyance piping shall be high density polyethylene pipe (HDPE). Additional pretreatment for the stormwater management systems will consist of 24" sumps in all preceding catch basins.

The stormwater infiltration practices meet the required 3' separation distance to groundwater or bedrock layer as verified by test pits witnessed by Bibbo Associates, LLP on January 16, 2018 and January 19, 2018. Preliminary infiltration rates have been applied to each practice based on field observations, NRCS soil types, and initial infiltration test runs. Final infiltration testing shall be performed for the practices prior to Site Plan Approval in order to confirm the preliminary results and the infiltration practices shall be revised accordingly. Please see Appendix "H" of this report for additional soil testing information.

The stormwater management plan for the project must also address the concerns regarding pollutants found in chemical applications such as fertilizers, pesticides, herbicides, and fungicides. Fertilizers and pesticides containing high levels of nutrients such as nitrates can be carried in stormwater runoff and discharged into existing surface waters where the pollutants can cause excess algae growth. Temporary erosion control practices will protect the existing surface waters during the construction process as vegetative cover is being established onsite. As per the Erosion Control Program for the Project Site, all



temporary erosion control measures shall remain in place until a firm stand of grass is established on all the disturbed areas not planned for impervious cover. After construction is complete it's anticipated that the use of fertilizers will be minimal and isolated to the landscaped areas immediately adjacent to the proposed buildings. Runoff reduction practices design in accordance with the Stormwater Design Manual will effectively reduce the impact of these pollutants over the long-term and therefore a separate application plan has not been proposed for the Project Site. Please note, in accordance with the Westchester County Department of Health Pesticide Reduction Law (Chapter 690 of the Laws of Westchester), no pesticides shall be applied to any County-owned property. It is not anticipated that any herbicides, pesticides or fungicides will be used on the project site and any potential future application plans shall be reviewed and approved by the Westchester County Department of Health.

2.1 NYSDEC Requirements:

2.1.1 Water Quality Volume:

The North 60 Project Property is governed by the New York State Stormwater Management Design Manual (Stormwater Design Manual). In order to improve water quality the best management practices employed have been sized using a 90% rainfall volume of 1.5 inches of rain.

The water quality volumes were calculated using formulation specified in Chapter 4 of the Stormwater Design Manual. A summary table illustrating the required water quality volume versus provided water quality volume for each best management practice is provided on the following page. Calculations for the required water quality volumes can be found in the Appendix "B" of this report.



Summary of Stormwater Practice Sizing

<i>SW Practice ID</i>	<i>Water Quality Volume Required (ft³)</i>	<i>Provided Volume in Practice (ft³)</i>
INF-SYS. 1	10,946	11,361
INF-SYS. 2	11,035	11,484
INF-SYS. 3	8,379	11,853
INF-SYS. 4	3,551	5,393
INF-SYS. 9	2,737	2,799
SWP-1	6,369	6,369
SWP-2	12,432	12,935
SWP-3	40,460	41,586
SWP-4	6,019	6,019

2.1.2 Runoff Reduction Volume:

The water quality volume (WQv) tributary to each practice also forms a target for the runoff reduction volume (RRv). The goal is to capture the runoff at the source and treat the stormwater runoff onsite with green infrastructure techniques, upstream of the end of line practice. The proposed infiltration practices are to be utilized as a volume reduction practices when calculating RRv.

Tables which provided a breakdown of the RRv credit taken in each subcatchment have been included in Appendix B of this report. The tables also includes a column for the Minimum RRv. When it can be shown that 100% of the WQv cannot be reduced in green infrastructure practices, it must be shown that at least the Minimum RRv is reduced by the green practices proposed. The Minimum RRv is based on the impervious area introduced by the project and a Hydrologic Soil Group Specific Reduction Factor which has been calculated based on the weighted average of hydrologic soil groups for each subcatchment. Calculations for RRv and the derivation of Minimum RRv are included in the drainage calculations found in the Appendix "B" of this report.

The goal of treating the entire WQv onsite in green practices was not fully achieved, but the Minimum RRv has been obtained for each subcatchment, apart



from the small section of roadway which flows towards NYS Route 9A. It is anticipated that this area of new impervious surfaces will be treated with a green infrastructure practice to be provided offsite in the NYSDOT right of way to be reviewed and approved. Please note, extensive tree plantings along the new West Street roadways will provide runoff area reductions onsite to the greatest extent allowable. The Minimum RRV represents the volume reduction required for the new impervious areas. There are several reasons why additional green infrastructure techniques were not used to further reduce the WQv.

The steep slopes found onsite limited the amount of green infrastructure practices which were feasible to use onsite. Another factor which limited the amount of green practices used on the project was the significant portion of the property which is either a wetland area or a wetland buffer area. Our goal was to preserve those areas to the furthest extent possible. Please note, the removal of the existing paved driveway and reconfiguration of Old Saw Mill River Road results in a proposed reduction of impervious surface within the Route 9A right-of-way on the north side of the site beyond Design Point "A".

Please note, the RRV target includes all subcatchments which contain new impervious surfaces. There is a small section of new roadway at the lower entrance of West Street in which onsite stormwater treatment is infeasible due to the very steep existing grades. This area of new impervious surface is tributary to Design Point "A" and the RRV target (Basin A WQv listed in the table on the previous page) has been adjusted to reflect this additional area. A vast majority of the new impervious surfaces are treated in proposed runoff reduction practices and a main goal of the design was to provide the maximum amount of runoff reduction that is feasible on the Project Site.

2.1.4 Stream Channel Protection Volume:

Stream channel protection volume is designed to protect downstream channels from erosion, and is obtained by providing 24-hour (1440 min) extended detention of the one-year, twenty-four hour storm event. The infiltration practices have been designed to capture and infiltrate a majority of the runoff generated by



the one year storm event. The pocket wetland and proposed pond have been sized to provide 24-hour extended detention of the one year storm event. The peak flow rates generated by the one year storm event have been reduced at both of the design points.

2.1.3 Overbank & Extreme Flood Control:

Overbank Flood Control is intended to mitigate the frequency and magnitude of out-of-bank flooding due to new development. Overbank Flood Control is achieved through the attenuation of the post-development 24-hour peak discharge from the 10-year storm to predevelopment rates. The post-development peak flows have been reduced to below predevelopment levels thus achieving Overbank Flood Control.

Extreme Flood Control is achieved through the attenuation of the post-development 24-hour peak discharge from the 100-year storm to predevelopment rates. The purpose of Extreme Flood Control is to prevent the risk of flood damage from large storm events, maintain the predevelopment 100-year flood plain boundary, and to physically protect the stormwater management practices at the site. Extreme Flood Control has been achieved for the site.

Summary tables for the 1, 2, 10, 25, 50, and 100-year pre-development and post-development peak flows for each design point can be found in the table provided on the following page. Additionally, the runoff volumes for each storm event have also been provided for comparison purposes. Please see Appendix “A” of this report for detailed HydroCAD Output Reports for each design storm.



Summary of Peak Runoff Rates & Runoff Volumes – Design Point A

1 year storm event	Pre	Post	% Change
Peak flow (cfs)	61.75	52.21	-18.3%
Runoff volume (cf)	277,125	198,956	-39.3%
2 year storm event	Pre	Post	% Change
Peak flow (cfs)	88.13	68.51	-28.6%
Runoff volume (cf)	413,194	303,537	-36.1%
10 year storm event	Pre	Post	% Change
Peak flow (cfs)	152.55	134.25	-13.6%
Runoff volume (cf)	818,458	644,474	-27.0%
25 year storm event	Pre	Post	% Change
Peak flow (cfs)	204.63	197.52	-3.6%
Runoff volume (cf)	1,160,846	953,621	-21.7%
50 year storm event	Pre	Post	% Change
Peak flow (cfs)	280.29	265.09	-5.7%
Runoff volume (cf)	1,488,097	1,253,670	-18.7%
100 year storm event	Pre	Post	% Change
Peak flow (cfs)	371.76	367.62	-1.1%
Runoff volume (cf)	1,887,228	1,623,976	-16.2%

Summary of Peak Runoff Rates & Runoff Volumes – Design Point B

1 year storm event	Pre	Post	% Change
Peak flow (cfs)	13.08	11.39	-14.8%
Runoff volume (cf)	228,292	226,981	-0.6%
2 year storm event	Pre	Post	% Change
Peak flow (cfs)	23.71	20.49	-15.7%
Runoff volume (cf)	331,486	326,922	-1.4%
10 year storm event	Pre	Post	% Change
Peak flow (cfs)	60.32	54.20	-11.3%
Runoff volume (cf)	643,599	631,668	-1.9%
25 year storm event	Pre	Post	% Change
Peak flow (cfs)	93.21	86.14	-8.2%
Runoff volume (cf)	910,215	894,546	-1.8%
50 year storm event	Pre	Post	% Change
Peak flow (cfs)	125.08	117.97	-6.0%
Runoff volume (cf)	1,166,444	1,146,610	-1.7%
100 year storm event	Pre	Post	% Change
Peak flow (cfs)	163.56	157.36	-3.9%
Runoff volume (cf)	1,480,165	1,454,811	-1.7%



3.0 Erosion & Sediment Control:

The plans provide for specific erosion and sediment controls to be employed during construction. It is the intent to provide effective erosion control by minimizing land disturbance at one given time, containing sediment from disturbed areas, treating runoff where possible, and stabilizing disturbed soils as soon as possible. It is anticipated that Phase 1 will be further broken down into approximately ten (10) sub-phases. The project plan set includes additional phasing information and a general construction sequence for the project. The directives specified on the plans and in this report serve as a minimum for erosion and sediment control. Further practices and measures may be required pursuant to onsite inspections in conformance with the requirements of the SPDES General Permit GP-0-20-001 permit. As per the SPDES permit onsite, inspections are to be performed by a “Qualified Inspector” on a weekly basis during construction. All erosion and sediment control practices specified for this site shall be in conformance with the New York Standards & Specifications for Erosion & Sediment Control.

3.1 Temporary Erosion & Sediment Control Practices:

Listed below are the Temporary Erosion & Sediment Control Practices specified on the Erosion Control Plan. All practices shall be installed and maintained in conformance with the New York Standards & Specifications for Erosion & Sediment Control:

- Silt Fence
- Soil Stockpile
- Construction Entrance
- Drop Inlet Protection
- Dust & Debris Control
- Temporary Sediment Trap
- Erosion blankets



- Construction Ditch
- Water Bar
- Dewatering Sump Pit

Silt fence for the site will consist of a geotextile fabric installed at the toe of all disturbed slopes, and parallel to the contours. The silt fence is intended to reduce runoff velocity, and intercept sediment-laden runoff. Construction details specifying the proposed installation and type of permissible silt fence can be found on the plans. The silt fencing will also control litter and construction debris from leaving the site and polluting stormwater discharge. There shall be no chemicals stored onsite.

A stabilized construction entrance should be installed where construction vehicles enter on to existing roadways from the site. The construction entrance is designed to prevent outgoing trucks from tracking soil onto the road. Construction details specifying installation requirements can be found on the plan.

Drop inlet protect for the site will consist of silt fencing surrounding the catch basins. The purpose of the staked silt fence is to prevent water with large amounts of sediment to enter the drainage system through the inlets.

A water truck shall be maintained on-site for dust control as required. Construction debris, such as sheet metal and wood scrap, paper and insulation products, styrofoam cups and paper wrappers which could become windblown litter over and off the site if neglected. Suitable and ample refuse containers shall be provided on the site and emptied when full. Any scattered debris shall be picked up and placed in containers on a continuous basis.

Temporary sediment traps are proposed to control sediment laden runoff and store the accumulated sediment for proper disposal. The sediment traps have been designed to meet the standards of the New York Standards & Specifications for Erosion & Sediment Control. Construction details specifying installation and sizing requirements can be found on the plan and sizing information can be found in Appendix “M” of this report.

Erosion control blankets (anchored stabilization matting) provide protective cover for newly graded steep slopes, protect against rainwater



splashing/overland flow, and help promote seed germination. Erosion blankets shall be installed on all embankments which are graded steeper than 3 horizontal to 1 vertical. Construction details specifying installation requirements can be found on the plan.

Construction ditches will be implemented downgrade from exposed soil disturbance to help control and convey sediment laden runoff to the proposed sediment traps. Construction details specifying the installation and sizing requirements can be found on the plan.

Temporary water bars will be provided during construction at various locations along the roughly graded Main Street and East Parking Lot. The water bars will help divert sediment laden runoff towards the runoff control practices which will prevent the accumulation of erosive runoff by dispersing the flows at set intervals. Details showing the temporary water bar construction can be found on the plan.

Dewatering sump pits will be utilized as needed during construction to remove sediment laden groundwater from excavated areas and convey the groundwater to sediment control practices. If groundwater is encountered during soil excavation and/or if large rainfall events create ponding inside open excavations, a sump pit shall be installed as shown in the details provided on the plan. The sump pump discharge line shall outlet to a construction ditch or directly to a sediment trap.

In addition to the temporary erosion and sediment control practices listed above, additional measures shall be implemented to mitigate potential pollution during the construction phase of the project. The general contractor supervising site construction shall be responsible for the implementing the follow measures to control and prevent non-sediment pollution during construction activities; prevent the generation of pollutants due to improper handling, storage, and spills; and prevent the movement of toxic substances from the site into surface waters:



Material Handling & Construction Staging Areas

- All construction waste materials shall be collected and removed from the site regularly by the general contractor. The general contractor shall supply waste barrels for proper disposal of waste materials. All personnel working on the site shall be instructed of the proper procedures for construction waste disposal.
- All construction equipment and maintenance materials shall be stored in a construction staging area. Silt fence shall be installed down gradient of the construction staging area. Shipping containers shall be utilized to store hand tools, small parts, and other construction materials, not taken off site daily. Construction waste barrels, recycling barrels and if necessary hazardous waste containers shall be located within the limits of the construction staging area.

Waste Management & Establishment of Washout Areas

- Although it is not anticipated any hazardous waste materials will be utilized during construction, any hazardous waste materials shall be disposed of in accordance with federal, state, and local regulations. No hazardous waste shall be disposed of onsite. Hazardous waste materials shall be stored in appropriate and clearly marked containers and segregated from the other non-waste materials. All hazardous waste shall be stored in a structurally sound and sealed shipping containers located in the staging areas. Material safety data sheets, material inventory, and emergency contact numbers will be maintained in the office trailer. All personnel working on the site shall be instructed of the proper procedures for hazardous waste disposal.
- Temporary sanitary facilities (portable toilets) shall be provided onsite during the entire length of construction. The sanitary facilities shall be located in the project staging area, or in an alternate area away from the construction activities on the site. The portable toilets shall be inspected weekly for evidence of leaking holding tanks.



- All recyclables, including wood pallets, cardboard boxes, and all other recyclable construction scraps shall be disposed of in a designated recycling barrel provided by the contractor and removed from the site regularly. All personnel working on the site shall be instructed of the proper procedures for construction waste recycling

Proper Equipment Fueling & Spill Prevention

- Throughout the construction of the project, several types of vehicles and equipment will be used onsite. Fueling of the equipment shall occur within the limits of the construction staging area. Fuel will be delivered to the site as needed, by the general contractor, or a party chosen by the general contractor. Only minor vehicle equipment maintenance shall occur on-site, all major maintenance shall be performed off-site. All equipment fluids generated from minor maintenance activities shall be disposed of into designated drums and stored in accordance with the hazardous waste storage as previously discussed.

3.2 Permanent Erosion & Sediment Control Practices:

The intent of the permanent erosion and sediment control practices is to permanently stabilize the ground surface via vegetative and structural practices, while controlling and reducing runoff velocities.

The following permanent erosion & sediment control practices are proposed for the site:

- Land Grading
- Vegetation
- Rock Outlet Protection

Land grading is the reshaping of the existing land surface in accordance with the grading plan. Proper land grading is an essential component of the erosion control plan, as well as the stormwater pollution prevention plan. Proper grading will ensure the intended drainage areas are directed to the stormwater management practices.

Vegetation will be provided on all disturbed soils not covered by the proposed building, driveway, or parking area. Permanent vegetation will reduce runoff velocities, filter stormwater runoff, and minimize soil erosion. Optimum times for planting are the early spring and fall; however, plantings can be started in the summer provided adequate mulch and moisture is supplied.

Rock outlet protection is proposed at the outfall of the outlet pipe from the bioretention basin. The intent of the rock outlet protection is to reduce the depth, velocity, and energy of water to prevent downstream erosion. The flows generated by the 10-year storm have been used to size the proposed rock outlet protection areas in association with the requirements provided in “Figure 5B.12” of the New York Standards & Specifications for Erosion & Sediment Control. Details specifying the dimensions of the rock outlet protection areas have been included on the project plans.

4.0 Maintenance & Inspection Requirements:

Maintenance and inspections are required in order to ensure the stormwater and erosion & sediment control practices are acting as designed. Site inspections shall be conducted by a “Qualified Inspector” at least two (2) times every seven (7) calendar days and the two (2) inspections shall be separated by a minimum of two (2) full calendar days for the duration of construction activities. The “Qualified Inspector” shall prepare an inspection report following every inspection to remain consistent with the NYSDEC General Permit GP-0-20-001. Upon completion of construction and the subsequent filing of the Notice of Termination, maintenance and inspections are expected to be minimal. Temporary and permanent maintenance and inspection requirements are further discussed below. Proper maintenance and inspections will ensure the longevity and effectiveness of the stormwater pollution prevention plan, and erosion and sediment control plan. The “Construction Site Log Book” from the New York Standards & Specifications for Erosion & Sediment Control provides guidelines for maintenance inspections during construction and has been provided in Appendix “F” of this report.

The Town of Mount Pleasant Stormwater Management Officer may require inspections as necessary to determine compliance with Chapter 183 of the Mount Pleasant Town Code and may either approve that portion of the work completed or notify the applicant wherein the work fails to comply with the requirements of Chapter 183 and the stormwater pollution prevention plan (SWPPP) as approved. To obtain inspections, the applicant shall notify the Town of Mount Pleasant enforcement official at least 48 hours before any of the following as required by the Stormwater Management Officer;

- 1) Start of Construction
- 2) Installation of sediment and erosion control measures
- 3) Completion of site clearing
- 4) Completion of rough grading
- 5) Completion of final grading
- 6) Close of construction season
- 7) Completion of final landscaping
- 8) Successful establishment of landscaping in public areas.

4.1 Short Term Maintenance and Inspection Requirements:

Inspections performed during construction should verify all practices are functioning properly, correctly maintained, and accumulated sediment is removed from all control structures. The inspector must also examine the site for any evidence of soil erosion, the potential for pollutants to enter the storm drain system, turbid discharge at all outfalls, and the potential for soil and mud to be transported on the public roadway at the site entrance. In addition to these general guidelines, the construction plan set will provide more specific erosion control guidelines, as well as a construction sequence to guide the contractor through the construction process. Discussed below are specific maintenance and inspection requirements for the temporary practices to be employed at the site.

During construction, the silt fence should be inspected to ensure correct installation. In addition, any accumulated sediment resulting in “bulges” in the silt fence should be removed and mixed with onsite soil. Any damaged or torn silt fence should be replaced.



The construction entrance should be checked to ensure no sediment is being deposited onto the public roadway. Should sediment be observed, it should be removed from the street, and the stone in the construction entrance replaced.

Once construction is completed and the site has been stabilized, a Notice of Termination shall be filed. At this point limited maintenance requirements are anticipated.

4.2 Long Term Maintenance and Inspection Requirements:

Once final stabilization is achieved, and construction complete maintenance and inspections will be limited to the infiltration systems, hydrodynamic separators, and stormwater basins. The owner, its successors and/or assigns shall completely familiarize themselves with the project plans, details and notes. A copy of the Maintenance & Inspection Checklist from the New York State Stormwater Management Design Manual has been included in Appendix "G" of this report to serve as a guide for maintaining and inspecting the infiltrator systems and stormwater basins.

Inspections of the following items should be performed at a minimum annually and following significant rainstorm events ($> \frac{1}{2}$ " within 24 hours):

Stormwater Basins and Ponds:

- Inspect basin for build up of trash or debris. Remove any trash to prevent clogging of outlet structure.
- Inspection of basin for accumulation of sediment. Accumulated sediment should be removed immediately.
- Inspect rock outlet protection pad. Replace any rocks that have been displaced by scour.
- Inspection of the outlet of the outflow pipe to ensure it is not plugged or clogged.

Infiltrator Systems:

- Inspection of the infiltrator units to ensure accumulated water is infiltrating into the soil, and debris has not entered the infiltration units. Any debris should be removed. Once debris is removed, if stormwater is still not infiltrating contact a professional engineer licensed in the State of New York to examine the system.
- Inspection of the outlet of the overflow pipe to ensure it is not plugged or clogged.



- Inspect rock outlet protection pad. Replace any rocks that have been displaced by scour.

Catch Basins and Drain Manholes:

- Inspect monthly and after heavy rainstorms for sediment accumulation in sumps. Accumulated sediment should be removed immediately.

Hydro-International First Defense Hydrodynamic Separator:

- Inspection of the treatment unit for sediment accumulation. Any debris and sediment should be removed.
- Refer to Appendix "C" of this report for additional inspection and maintenance information.

5.0 Outstanding Violations or Enforcement Actions:

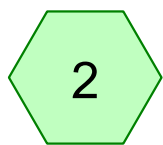
There are no known outstanding violations or enforcement actions against this property, the owner or the applicant. There has been no enforcement actions commenced against the applicant for any alleged violations of law related to the site or the activity for which approval is sought during the 5 years preceding the application.

6.0 Conclusion:

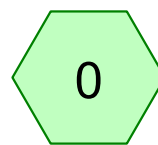
The applicant for the North 60 Project is proposing to construct a new biomedical mixed use community on the project site. The proposed area of disturbance is 40.7 acres. As part of the construction a stormwater management systems will be installed to treat the runoff from the proposed impervious surfaces. The stormwater management system was designed in accordance with the New York State Stormwater Management Design Manual, and shall result in improved stormwater quality as well as reduction in peak runoff flow rates.



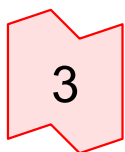
Appendix A-1:
Pre-Development
HydroCAD Output Reports



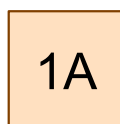
Pre A



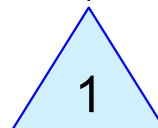
A0 (Offsite)



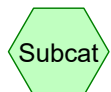
Design Point A



Existing Stream A



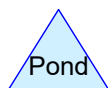
Offsite Pond A



Subcat



Reach



Pond



Link

Routing Diagram for N60 Phase-1 Pre-Dev A 2021

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N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 1-yr Rainfall=2.79"

Prepared by {enter your company name here}

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment0: A0 (Offsite)Runoff Area=1,115,060 sf 57.87% Impervious Runoff Depth=1.79"
Flow Length=1,018' Tc=12.5 min CN=90 Runoff=55.28 cfs 166,539 cf**Pond 1: Offsite Pond A**Peak Elev=360.61' Storage=63,532 cf Inflow=55.28 cfs 166,539 cf
Outflow=36.32 cfs 115,344 cf**Reach 1A: Existing Stream A**Avg. Flow Depth=0.86' Max Vel=6.81 fps Inflow=36.32 cfs 115,344 cf
n=0.040 L=2,194.0' S=0.0629 ' Capacity=272.52 cfs Outflow=33.36 cfs 115,344 cf**Subcatchment2: Pre A**Runoff Area=2,349,635 sf 8.44% Impervious Runoff Depth=0.83"
Flow Length=2,614' Tc=34.4 min CN=75 Runoff=30.46 cfs 161,781 cf**Link 3: Design Point A**Inflow=61.75 cfs 277,125 cf
Primary=61.75 cfs 277,125 cf**Total Runoff Area = 3,464,695 sf Runoff Volume = 328,320 cf Average Runoff Depth = 1.14"**
75.65% Pervious = 2,621,024 sf 24.35% Impervious = 843,671 sf

N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Subcatchment 0: A0 (Offsite)

Runoff = 55.28 cfs @ 12.20 hrs, Volume= 166,539 cf, Depth= 1.79"

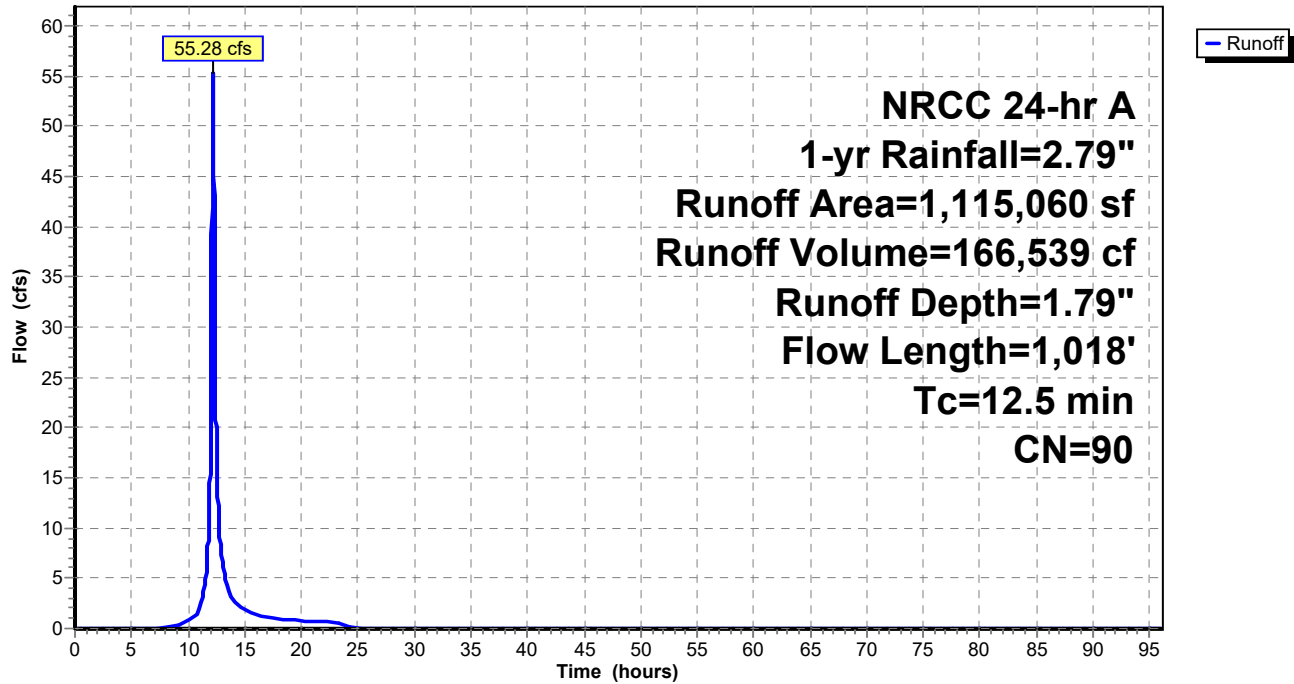
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 1-yr Rainfall=2.79"

Area (sf)	CN	Description
645,334	98	Paved parking, HSG C
443,611	80	>75% Grass cover, Good, HSG D
23,572	74	>75% Grass cover, Good, HSG C
2,543	61	>75% Grass cover, Good, HSG B
1,115,060	90	Weighted Average
469,726		42.13% Pervious Area
645,334		57.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0150	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.6	148	0.0574	3.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	30	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	740	0.0270	10.25	32.22	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Concrete sewer w/manholes & inlets
12.5	1,018	Total			

Subcatchment 0: A0 (Offsite)

Hydrograph



N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Pond 1: Offsite Pond A

Inflow Area = 1,115,060 sf, 57.87% Impervious, Inflow Depth = 1.79" for 1-yr event
 Inflow = 55.28 cfs @ 12.20 hrs, Volume= 166,539 cf
 Outflow = 36.32 cfs @ 12.33 hrs, Volume= 115,344 cf, Atten= 34%, Lag= 7.3 min
 Primary = 36.32 cfs @ 12.33 hrs, Volume= 115,344 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 360.61' @ 12.33 hrs Surf.Area= 20,903 sf Storage= 63,532 cf

Plug-Flow detention time= 143.7 min calculated for 115,332 cf (69% of inflow)
 Center-of-Mass det. time= 59.3 min (869.2 - 810.0)

Volume	Invert	Avail.Storage	Storage Description		
#1	357.00'	221,816 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
357.00	14,633	679.0	0	0	14,633
358.00	16,652	698.0	15,632	15,632	16,826
359.00	17,534	715.0	17,091	32,723	18,864
360.00	19,427	745.0	18,472	51,195	22,425
362.00	24,453	804.0	43,784	94,979	29,861
364.00	28,701	854.0	53,097	148,076	36,663
365.00	36,602	901.0	32,572	180,648	43,285
366.00	45,910	1,262.0	41,168	221,816	105,432

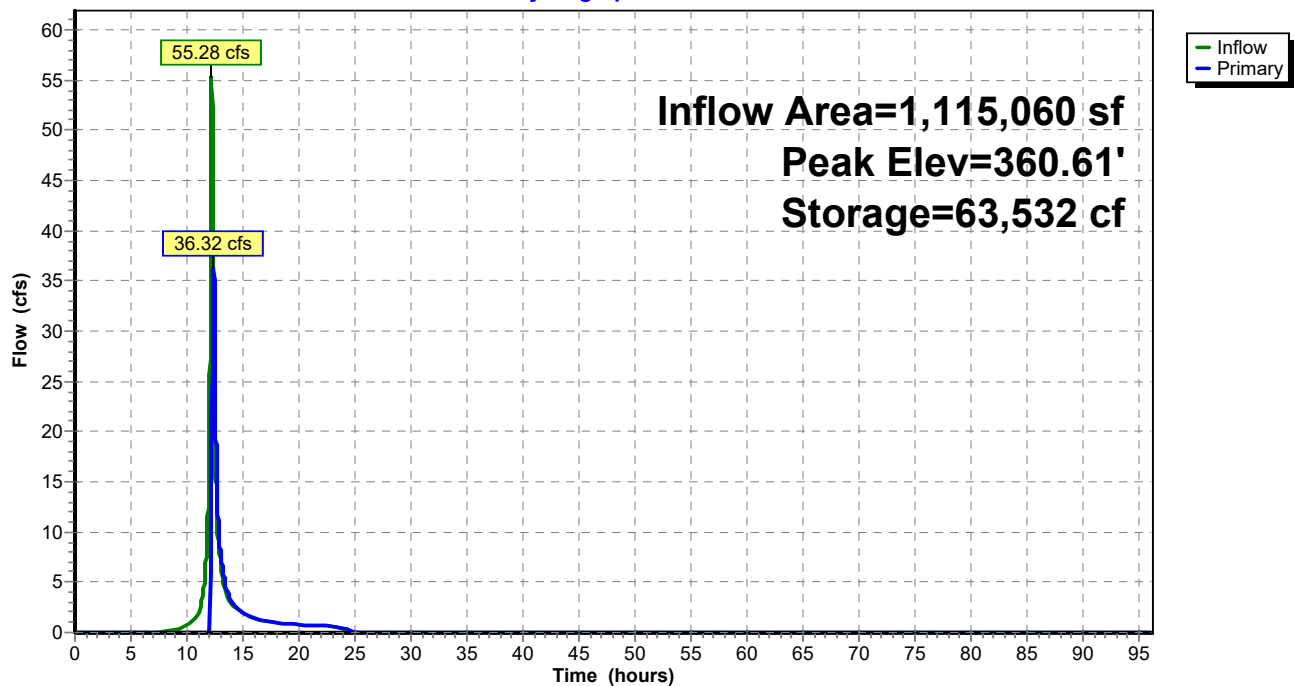
Device	Routing	Invert	Outlet Devices
#1	Primary	357.00'	30.0" Round Culvert L= 125.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 357.00' / 351.00' S= 0.0480 ' S= 0.0480 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf
#2	Device 1	360.00'	36.0" x 48.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Primary	364.75'	150.0' long x 36.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=36.32 cfs @ 12.33 hrs HW=360.61' TW=352.74' (Dynamic Tailwater)

- 1=Culvert (Inlet Controls 36.32 cfs @ 7.40 fps)
 2=Orifice/Grate (Passes 36.32 cfs of 43.79 cfs potential flow)
 3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 1: Offsite Pond A

Hydrograph



N60 Phase-1 Pre-Dev A 2021

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NRCC 24-hr A 1-yr Rainfall=2.79"

Printed 2/4/2021

Summary for Reach 1A: Existing Stream A

Inflow Area = 1,115,060 sf, 57.87% Impervious, Inflow Depth = 1.24" for 1-yr event
Inflow = 36.32 cfs @ 12.33 hrs, Volume= 115,344 cf
Outflow = 33.36 cfs @ 12.42 hrs, Volume= 115,344 cf, Atten= 8%, Lag= 5.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.81 fps, Min. Travel Time= 5.4 min
Avg. Velocity = 1.63 fps, Avg. Travel Time= 22.4 min

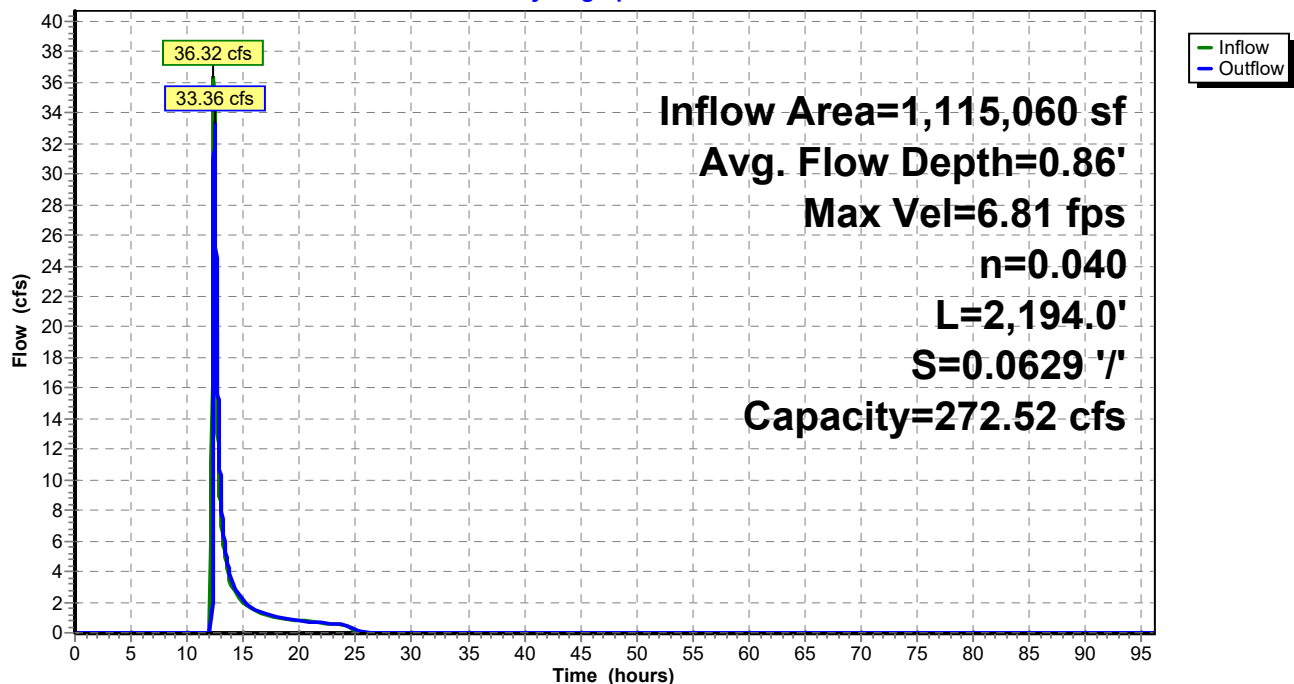
Peak Storage= 10,744 cf @ 12.42 hrs
Average Depth at Peak Storage= 0.86'
Bank-Full Depth= 2.50' Flow Area= 22.5 sf, Capacity= 272.52 cfs

4.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 2,194.0' Slope= 0.0629 '/'
Inlet Invert= 352.00', Outlet Invert= 214.00'



Reach 1A: Existing Stream A

Hydrograph



N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Subcatchment 2: Pre A

Runoff = 30.46 cfs @ 12.53 hrs, Volume= 161,781 cf, Depth= 0.83"

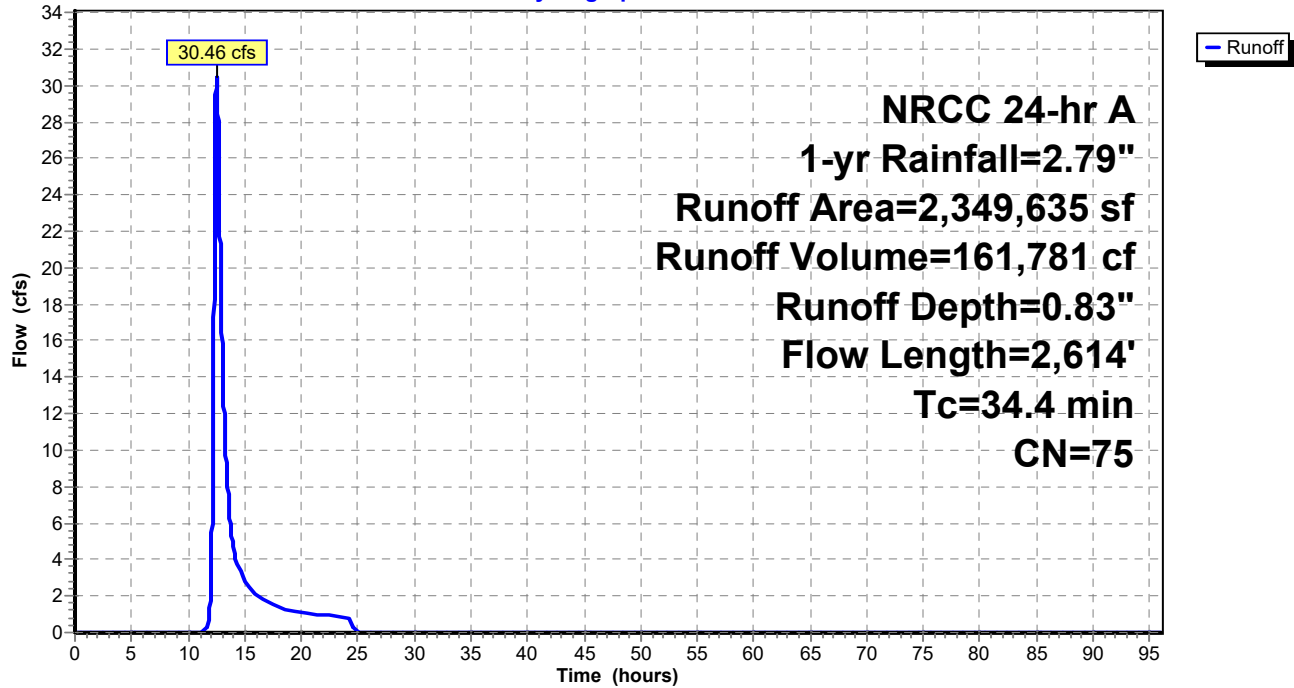
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 1-yr Rainfall=2.79"

	Area (sf)	CN	Description
*	181,472	98	Paved parking, roofs, HSG C
	159,966	91	Newly graded area, HSG C
	339,282	74	>75% Grass cover, Good, HSG C
	4,702	80	>75% Grass cover, Good, HSG D
	358,470	70	Brush, Fair, HSG C
	77,923	77	Brush, Fair, HSG D
	20,430	60	Woods, Fair, HSG B
	193,986	77	Woods, Good, HSG D
	996,539	70	Woods, Good, HSG C
	16,865	98	Water Surface, HSG D
	2,349,635	75	Weighted Average
	2,151,298		91.56% Pervious Area
	198,337		8.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0250	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
2.4	282	0.0142	1.92		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
13.2	2,232	0.0631	2.83	5.65	Channel Flow, Area= 2.0 sf Perim= 12.0' r= 0.17' n= 0.040 Winding stream, pools & shoals
34.4	2,614	Total			

Subcatchment 2: Pre A

Hydrograph



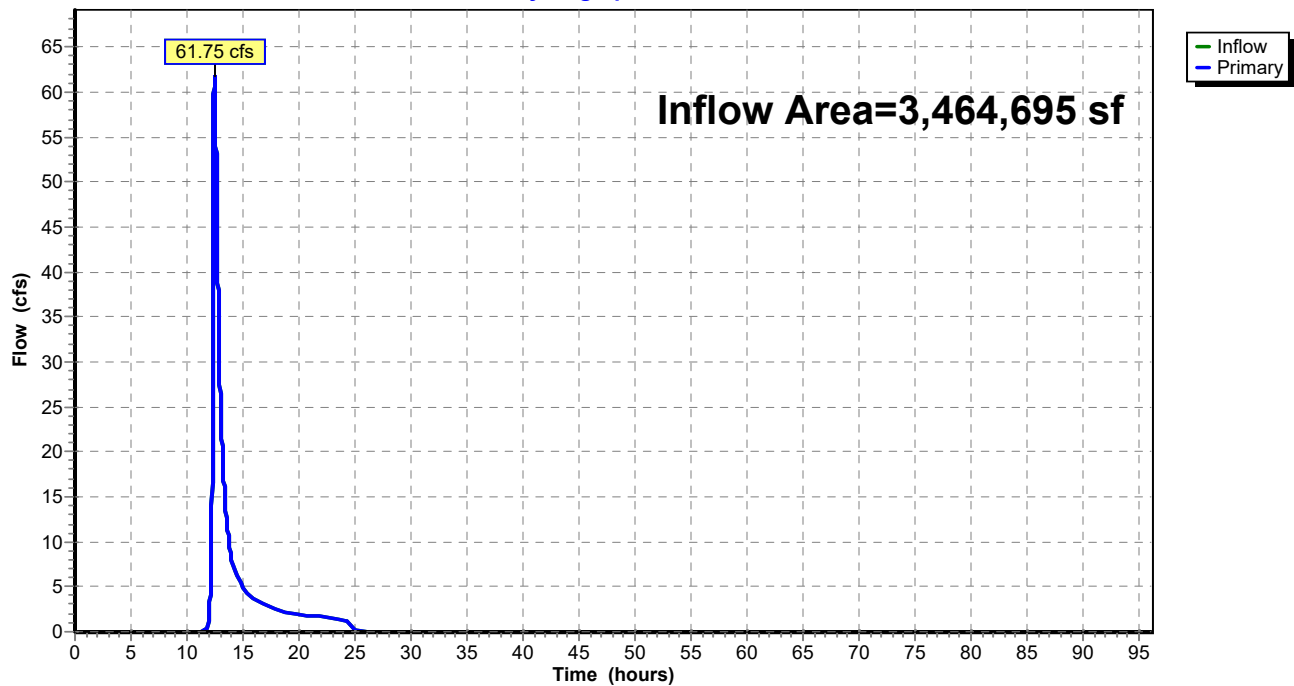
Summary for Link 3: Design Point A

Inflow Area = 3,464,695 sf, 24.35% Impervious, Inflow Depth = 0.96" for 1-yr event
 Inflow = 61.75 cfs @ 12.44 hrs, Volume= 277,125 cf
 Primary = 61.75 cfs @ 12.44 hrs, Volume= 277,125 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 3: Design Point A

Hydrograph



N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 2-yr Rainfall=3.42"

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment0: A0 (Offsite)Runoff Area=1,115,060 sf 57.87% Impervious Runoff Depth=2.37"
Flow Length=1,018' Tc=12.5 min CN=90 Runoff=72.43 cfs 220,520 cf**Pond 1: Offsite Pond A**Peak Elev=361.29' Storage=78,351 cf Inflow=72.43 cfs 220,520 cf
Outflow=41.23 cfs 169,325 cf**Reach 1A: Existing Stream A**Avg. Flow Depth=0.95' Max Vel=7.21 fps Inflow=41.23 cfs 169,325 cf
n=0.040 L=2,194.0' S=0.0629 ' Capacity=272.52 cfs Outflow=40.52 cfs 169,325 cf**Subcatchment2: Pre A**Runoff Area=2,349,635 sf 8.44% Impervious Runoff Depth=1.25"
Flow Length=2,614' Tc=34.4 min CN=75 Runoff=47.89 cfs 243,869 cf**Link 3: Design Point A**Inflow=88.13 cfs 413,194 cf
Primary=88.13 cfs 413,194 cf**Total Runoff Area = 3,464,695 sf Runoff Volume = 464,389 cf Average Runoff Depth = 1.61"**
75.65% Pervious = 2,621,024 sf 24.35% Impervious = 843,671 sf

N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 2-yr Rainfall=3.42"

Prepared by {enter your company name here}

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Summary for Subcatchment 0: A0 (Offsite)

Runoff = 72.43 cfs @ 12.20 hrs, Volume= 220,520 cf, Depth= 2.37"

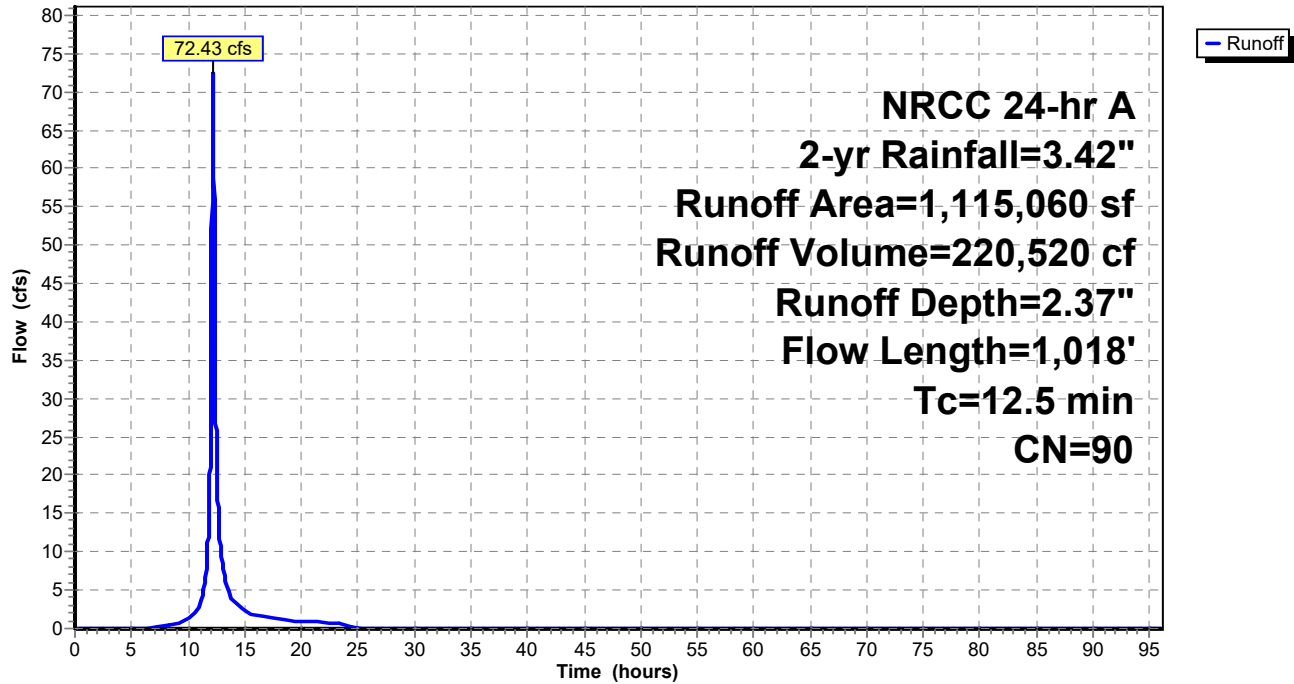
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 2-yr Rainfall=3.42"

Area (sf)	CN	Description
645,334	98	Paved parking, HSG C
443,611	80	>75% Grass cover, Good, HSG D
23,572	74	>75% Grass cover, Good, HSG C
2,543	61	>75% Grass cover, Good, HSG B
1,115,060	90	Weighted Average
469,726		42.13% Pervious Area
645,334		57.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0150	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.6	148	0.0574	3.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	30	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	740	0.0270	10.25	32.22	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Concrete sewer w/manholes & inlets
12.5	1,018	Total			

Subcatchment 0: A0 (Offsite)

Hydrograph



N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 2-yr Rainfall=3.42"

Prepared by {enter your company name here}

Printed 2/4/2021

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Summary for Pond 1: Offsite Pond A

Inflow Area = 1,115,060 sf, 57.87% Impervious, Inflow Depth = 2.37" for 2-yr event
 Inflow = 72.43 cfs @ 12.20 hrs, Volume= 220,520 cf
 Outflow = 41.23 cfs @ 12.35 hrs, Volume= 169,325 cf, Atten= 43%, Lag= 9.1 min
 Primary = 41.23 cfs @ 12.35 hrs, Volume= 169,325 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 361.29' @ 12.35 hrs Surf.Area= 22,611 sf Storage= 78,351 cf

Plug-Flow detention time= 123.4 min calculated for 169,325 cf (77% of inflow)
 Center-of-Mass det. time= 48.0 min (851.3 - 803.3)

Volume	Invert	Avail.Storage	Storage Description
#1	357.00'	221,816 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
357.00	14,633	679.0	0	0	14,633
358.00	16,652	698.0	15,632	15,632	16,826
359.00	17,534	715.0	17,091	32,723	18,864
360.00	19,427	745.0	18,472	51,195	22,425
362.00	24,453	804.0	43,784	94,979	29,861
364.00	28,701	854.0	53,097	148,076	36,663
365.00	36,602	901.0	32,572	180,648	43,285
366.00	45,910	1,262.0	41,168	221,816	105,432

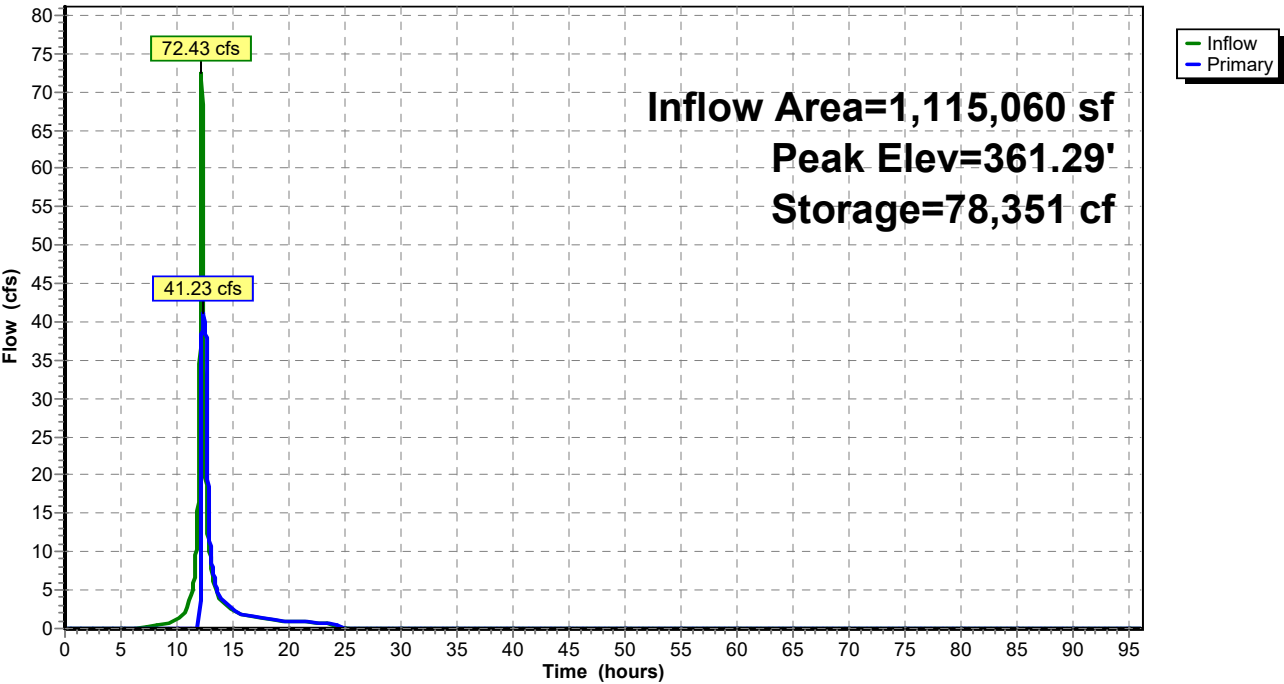
Device	Routing	Invert	Outlet Devices
#1	Primary	357.00'	30.0" Round Culvert L= 125.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 357.00' / 351.00' S= 0.0480 ' S= 0.0480 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf
#2	Device 1	360.00'	36.0" x 48.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Primary	364.75'	150.0' long x 36.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=41.23 cfs @ 12.35 hrs HW=361.29' TW=352.93' (Dynamic Tailwater)

1=Culvert (Inlet Controls 41.23 cfs @ 8.40 fps)
 2=Orifice/Grate (Passes 41.23 cfs of 131.40 cfs potential flow)
 3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 1: Offsite Pond A

Hydrograph



N60 Phase-1 Pre-Dev A 2021

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NRCC 24-hr A 2-yr Rainfall=3.42"

Printed 2/4/2021

Summary for Reach 1A: Existing Stream A

Inflow Area = 1,115,060 sf, 57.87% Impervious, Inflow Depth = 1.82" for 2-yr event
Inflow = 41.23 cfs @ 12.35 hrs, Volume= 169,325 cf
Outflow = 40.52 cfs @ 12.45 hrs, Volume= 169,325 cf, Atten= 2%, Lag= 5.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.21 fps, Min. Travel Time= 5.1 min
Avg. Velocity = 1.77 fps, Avg. Travel Time= 20.7 min

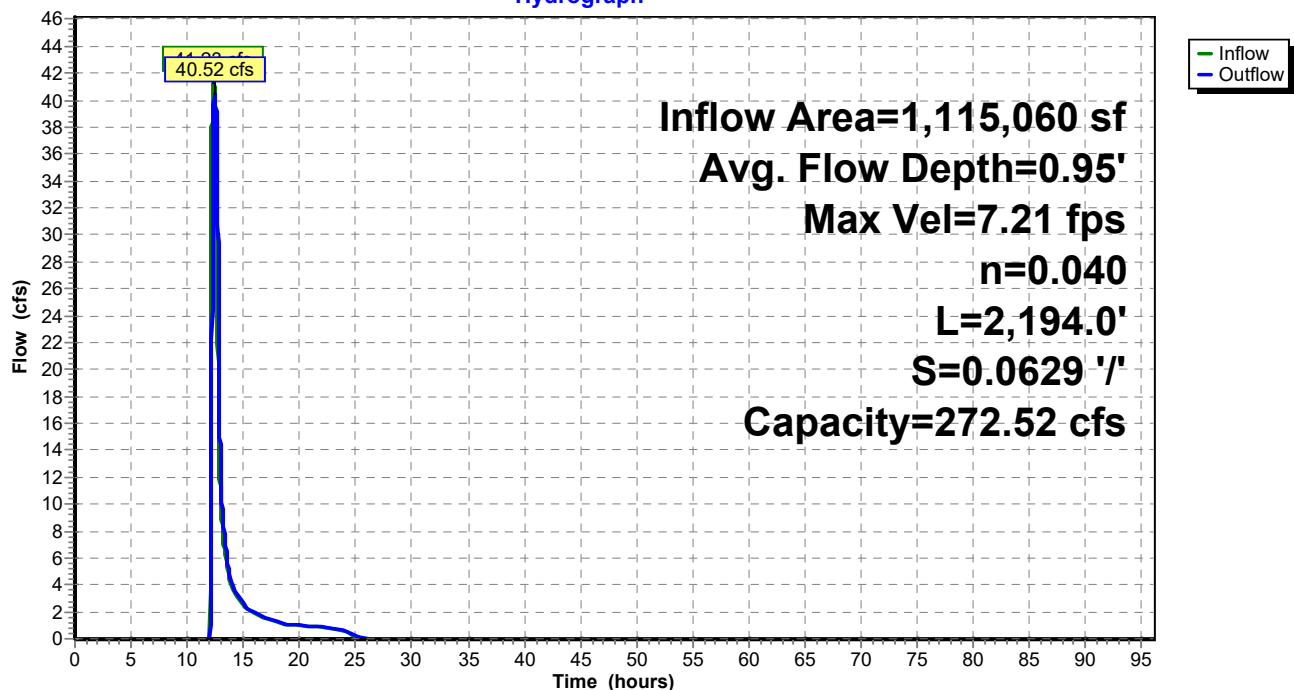
Peak Storage= 12,331 cf @ 12.45 hrs
Average Depth at Peak Storage= 0.95'
Bank-Full Depth= 2.50' Flow Area= 22.5 sf, Capacity= 272.52 cfs

4.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 ' ' Top Width= 14.00'
Length= 2,194.0' Slope= 0.0629 ' '
Inlet Invert= 352.00', Outlet Invert= 214.00'



Reach 1A: Existing Stream A

Hydrograph



N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Subcatchment 2: Pre A

Runoff = 47.89 cfs @ 12.50 hrs, Volume= 243,869 cf, Depth= 1.25"

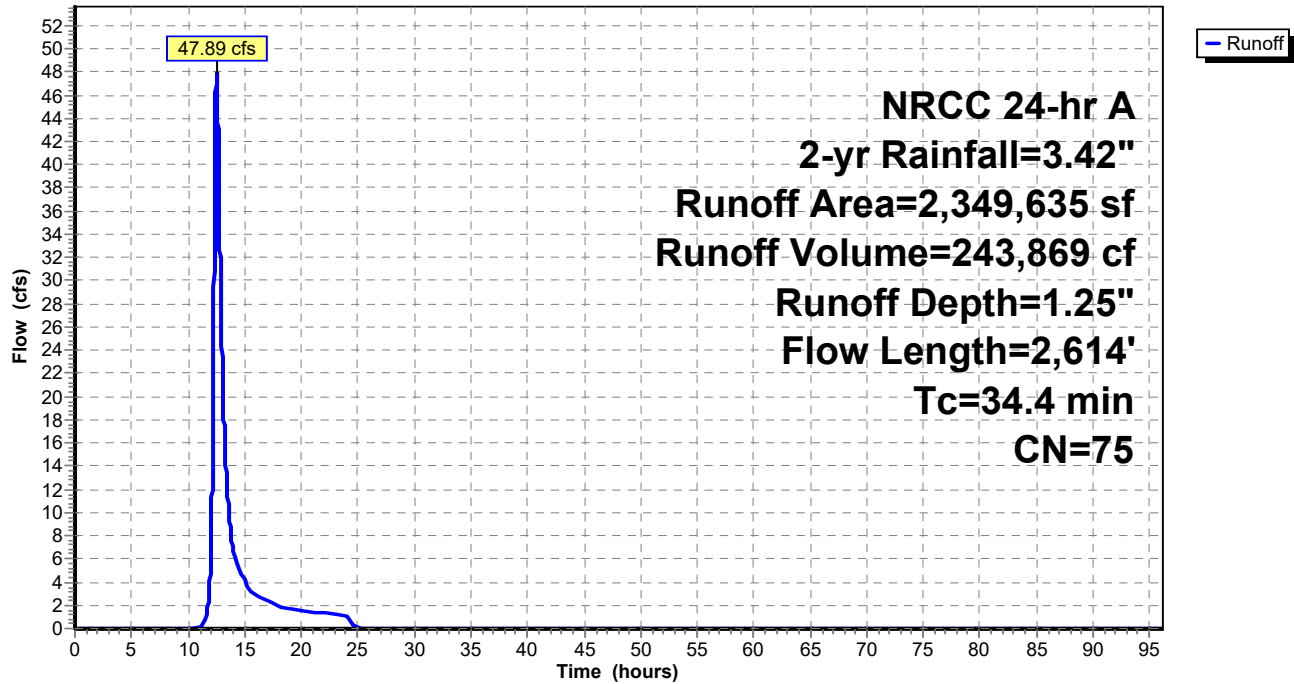
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 2-yr Rainfall=3.42"

	Area (sf)	CN	Description
*	181,472	98	Paved parking, roofs, HSG C
	159,966	91	Newly graded area, HSG C
	339,282	74	>75% Grass cover, Good, HSG C
	4,702	80	>75% Grass cover, Good, HSG D
	358,470	70	Brush, Fair, HSG C
	77,923	77	Brush, Fair, HSG D
	20,430	60	Woods, Fair, HSG B
	193,986	77	Woods, Good, HSG D
	996,539	70	Woods, Good, HSG C
	16,865	98	Water Surface, HSG D
	2,349,635	75	Weighted Average
	2,151,298		91.56% Pervious Area
	198,337		8.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0250	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
2.4	282	0.0142	1.92		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
13.2	2,232	0.0631	2.83	5.65	Channel Flow, Area= 2.0 sf Perim= 12.0' r= 0.17' n= 0.040 Winding stream, pools & shoals
34.4	2,614	Total			

Subcatchment 2: Pre A

Hydrograph



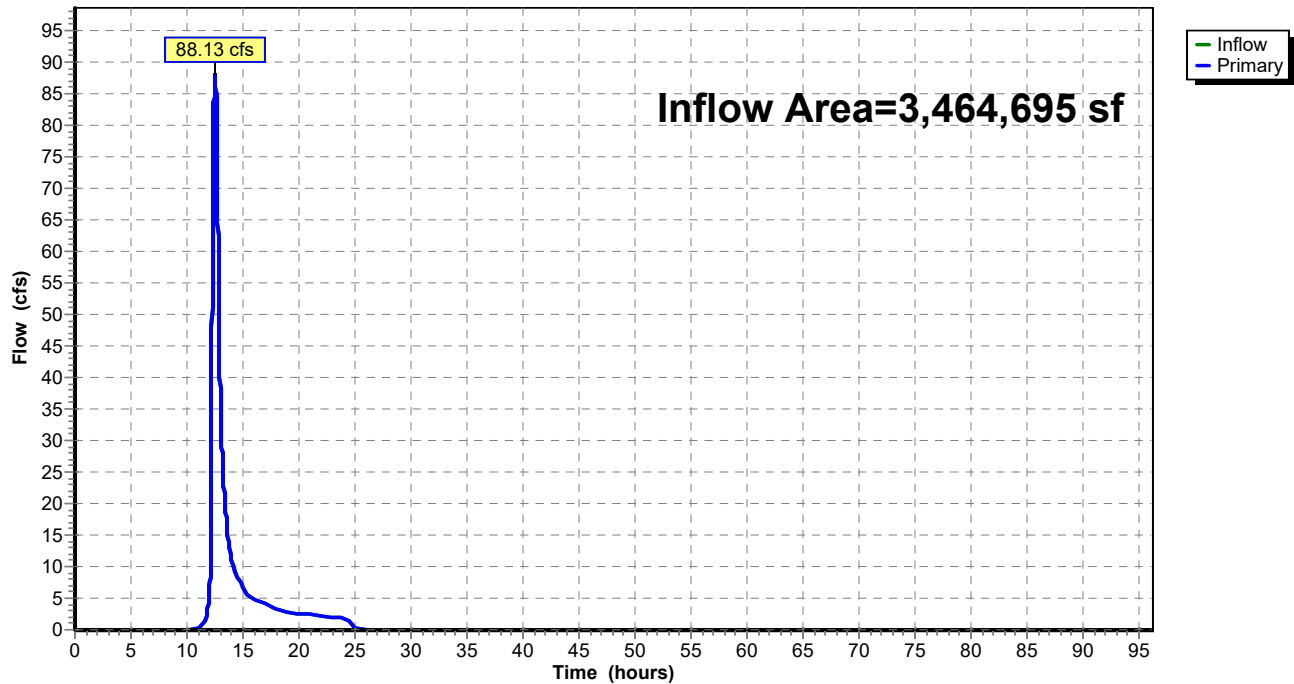
Summary for Link 3: Design Point A

Inflow Area = 3,464,695 sf, 24.35% Impervious, Inflow Depth = 1.43" for 2-yr event
 Inflow = 88.13 cfs @ 12.50 hrs, Volume= 413,194 cf
 Primary = 88.13 cfs @ 12.50 hrs, Volume= 413,194 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 3: Design Point A

Hydrograph



N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 10-yr Rainfall=5.12"

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment0: A0 (Offsite)Runoff Area=1,115,060 sf 57.87% Impervious Runoff Depth=3.99"
Flow Length=1,018' Tc=12.5 min CN=90 Runoff=118.73 cfs 370,955 cf**Pond 1: Offsite Pond A**Peak Elev=363.03' Storage=121,390 cf Inflow=118.73 cfs 370,955 cf
Outflow=51.70 cfs 319,760 cf**Reach 1A: Existing Stream A**Avg. Flow Depth=1.08' Max Vel=7.72 fps Inflow=51.70 cfs 319,760 cf
n=0.040 L=2,194.0' S=0.0629 ' Capacity=272.52 cfs Outflow=51.38 cfs 319,760 cf**Subcatchment2: Pre A**Runoff Area=2,349,635 sf 8.44% Impervious Runoff Depth=2.55"
Flow Length=2,614' Tc=34.4 min CN=75 Runoff=101.19 cfs 498,698 cf**Link 3: Design Point A**Inflow=152.55 cfs 818,458 cf
Primary=152.55 cfs 818,458 cf**Total Runoff Area = 3,464,695 sf Runoff Volume = 869,653 cf Average Runoff Depth = 3.01"**
75.65% Pervious = 2,621,024 sf 24.35% Impervious = 843,671 sf

N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Subcatchment 0: A0 (Offsite)

Runoff = 118.73 cfs @ 12.20 hrs, Volume= 370,955 cf, Depth= 3.99"

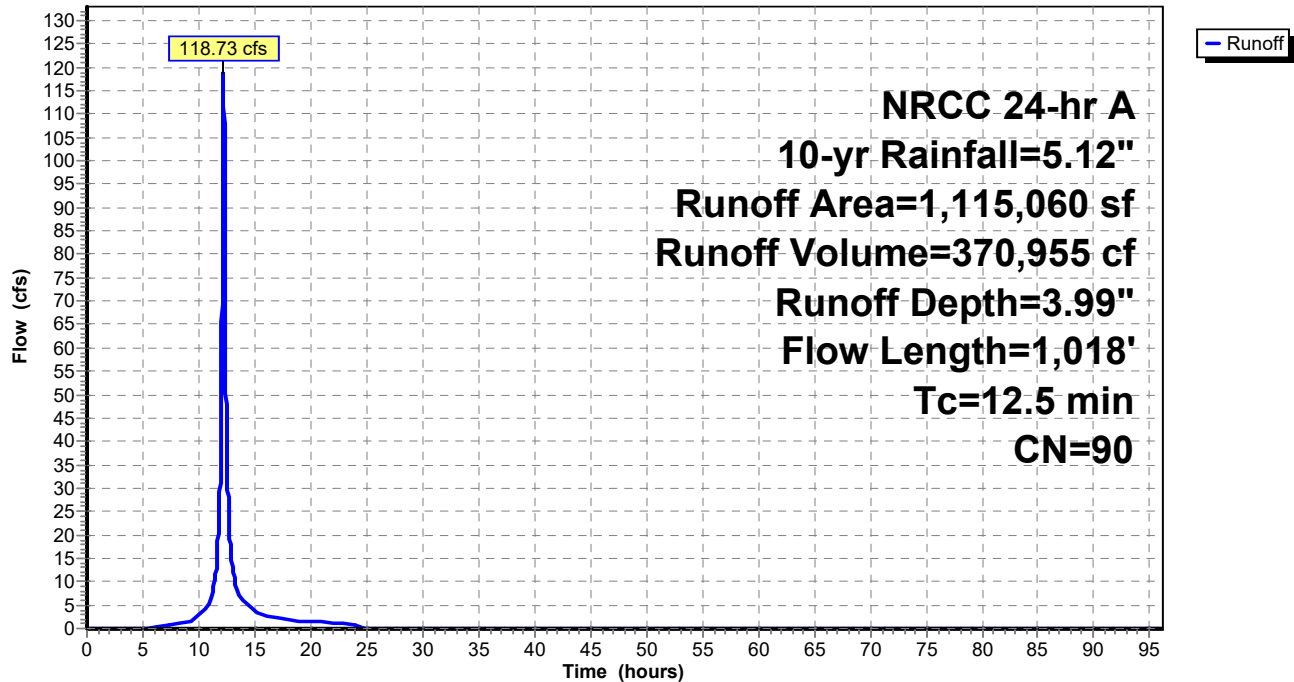
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 10-yr Rainfall=5.12"

Area (sf)	CN	Description
645,334	98	Paved parking, HSG C
443,611	80	>75% Grass cover, Good, HSG D
23,572	74	>75% Grass cover, Good, HSG C
2,543	61	>75% Grass cover, Good, HSG B
1,115,060	90	Weighted Average
469,726		42.13% Pervious Area
645,334		57.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0150	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.6	148	0.0574	3.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	30	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	740	0.0270	10.25	32.22	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Concrete sewer w/manholes & inlets
12.5	1,018	Total			

Subcatchment 0: A0 (Offsite)

Hydrograph



N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 10-yr Rainfall=5.12"

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Printed 2/4/2021

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Summary for Pond 1: Offsite Pond A

Inflow Area = 1,115,060 sf, 57.87% Impervious, Inflow Depth = 3.99" for 10-yr event
 Inflow = 118.73 cfs @ 12.20 hrs, Volume= 370,955 cf
 Outflow = 51.70 cfs @ 12.41 hrs, Volume= 319,760 cf, Atten= 56%, Lag= 12.7 min
 Primary = 51.70 cfs @ 12.41 hrs, Volume= 319,760 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 363.03' @ 12.41 hrs Surf.Area= 26,608 sf Storage= 121,390 cf

Plug-Flow detention time= 99.2 min calculated for 319,726 cf (86% of inflow)
 Center-of-Mass det. time= 41.8 min (832.7 - 790.9)

Volume	Invert	Avail.Storage	Storage Description		
#1	357.00'	221,816 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
357.00	14,633	679.0	0	0	14,633
358.00	16,652	698.0	15,632	15,632	16,826
359.00	17,534	715.0	17,091	32,723	18,864
360.00	19,427	745.0	18,472	51,195	22,425
362.00	24,453	804.0	43,784	94,979	29,861
364.00	28,701	854.0	53,097	148,076	36,663
365.00	36,602	901.0	32,572	180,648	43,285
366.00	45,910	1,262.0	41,168	221,816	105,432

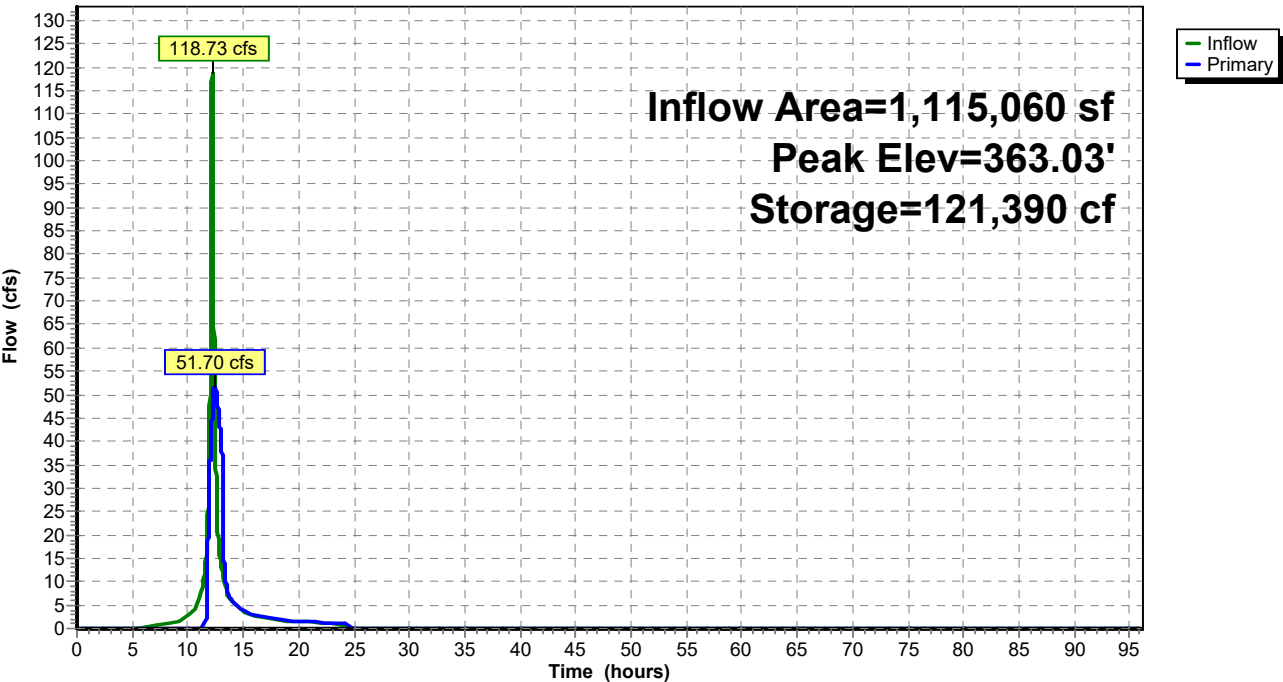
Device	Routing	Invert	Outlet Devices
#1	Primary	357.00'	30.0" Round Culvert L= 125.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 357.00' / 351.00' S= 0.0480 ' S= 0.0480 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf
#2	Device 1	360.00'	36.0" x 48.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Primary	364.75'	150.0' long x 36.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=51.70 cfs @ 12.41 hrs HW=363.03' TW=353.08' (Dynamic Tailwater)

- 1=Culvert (Inlet Controls 51.70 cfs @ 10.53 fps)
 2=Orifice/Grate (Passes 51.70 cfs of 201.30 cfs potential flow)
 3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 1: Offsite Pond A

Hydrograph



N60 Phase-1 Pre-Dev A 2021

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NRCC 24-hr A 10-yr Rainfall=5.12"

Printed 2/4/2021

Summary for Reach 1A: Existing Stream A

Inflow Area = 1,115,060 sf, 57.87% Impervious, Inflow Depth = 3.44" for 10-yr event
Inflow = 51.70 cfs @ 12.41 hrs, Volume= 319,760 cf
Outflow = 51.38 cfs @ 12.48 hrs, Volume= 319,760 cf, Atten= 1%, Lag= 4.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.72 fps, Min. Travel Time= 4.7 min
Avg. Velocity = 2.07 fps, Avg. Travel Time= 17.7 min

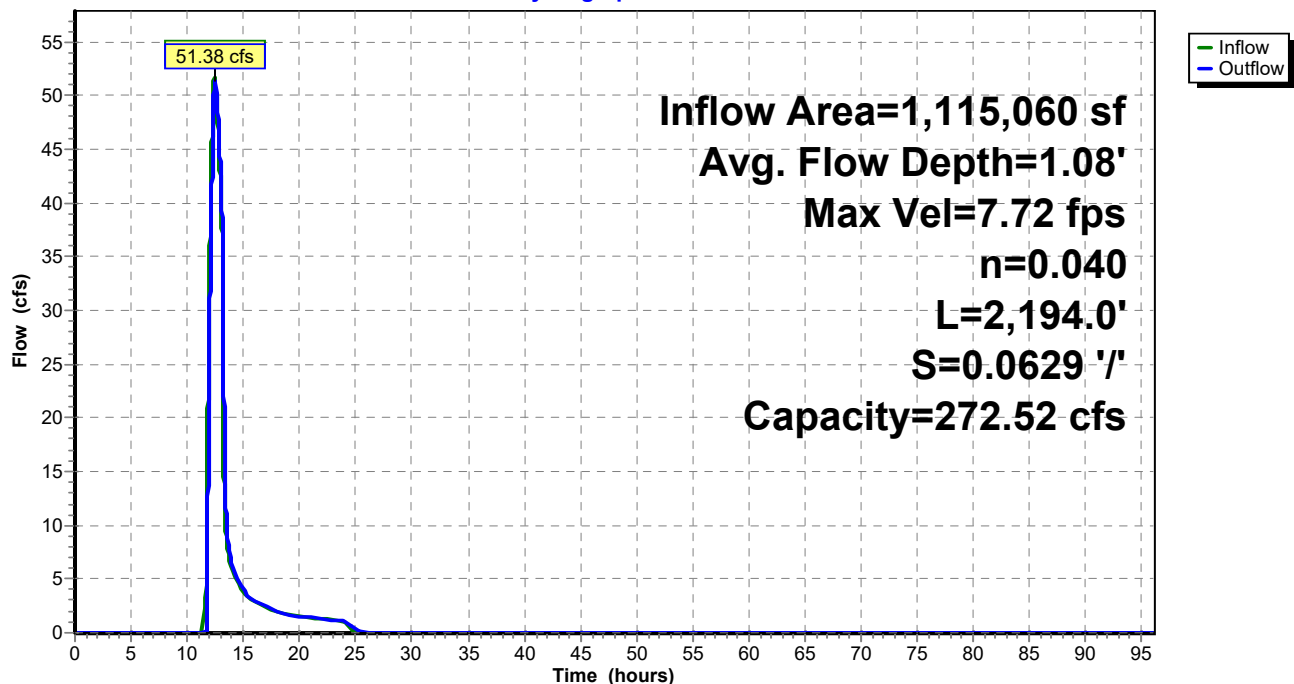
Peak Storage= 14,607 cf @ 12.48 hrs
Average Depth at Peak Storage= 1.08'
Bank-Full Depth= 2.50' Flow Area= 22.5 sf, Capacity= 272.52 cfs

4.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 ' ' Top Width= 14.00'
Length= 2,194.0' Slope= 0.0629 ' '
Inlet Invert= 352.00', Outlet Invert= 214.00'



Reach 1A: Existing Stream A

Hydrograph



N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Subcatchment 2: Pre A

Runoff = 101.19 cfs @ 12.50 hrs, Volume= 498,698 cf, Depth= 2.55"

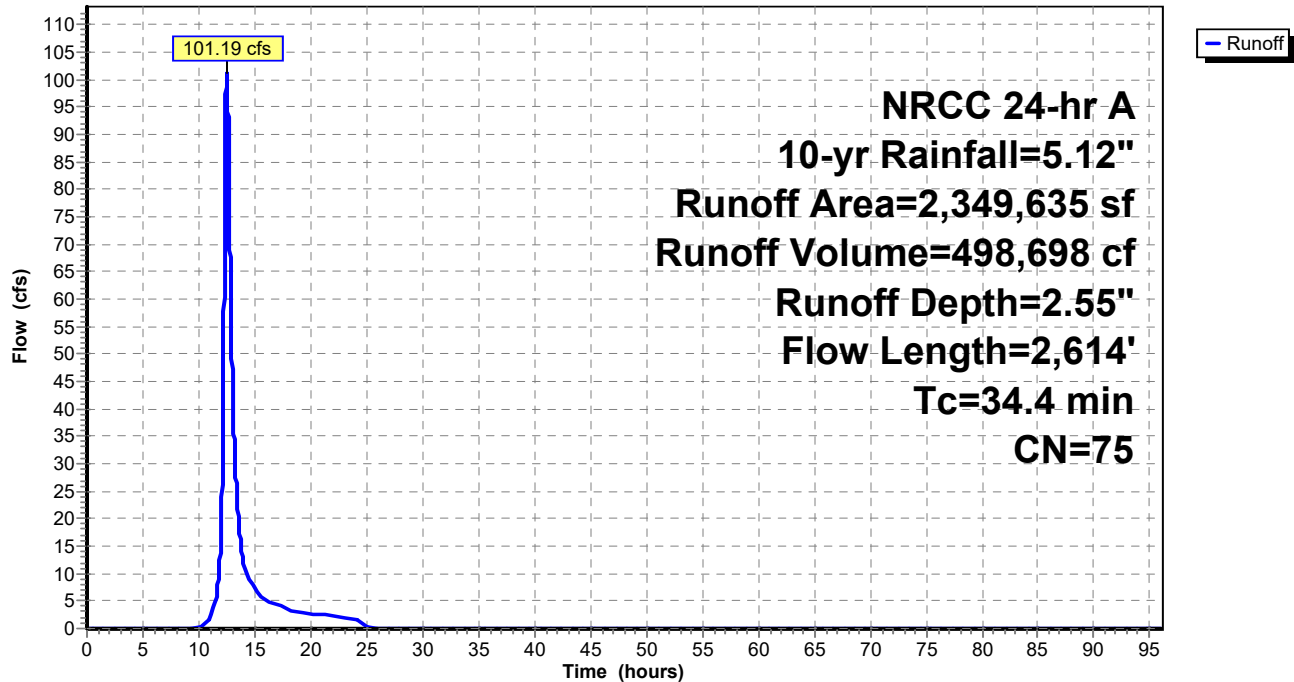
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 10-yr Rainfall=5.12"

	Area (sf)	CN	Description
*	181,472	98	Paved parking, roofs, HSG C
	159,966	91	Newly graded area, HSG C
	339,282	74	>75% Grass cover, Good, HSG C
	4,702	80	>75% Grass cover, Good, HSG D
	358,470	70	Brush, Fair, HSG C
	77,923	77	Brush, Fair, HSG D
	20,430	60	Woods, Fair, HSG B
	193,986	77	Woods, Good, HSG D
	996,539	70	Woods, Good, HSG C
	16,865	98	Water Surface, HSG D
	2,349,635	75	Weighted Average
	2,151,298		91.56% Pervious Area
	198,337		8.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0250	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
2.4	282	0.0142	1.92		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
13.2	2,232	0.0631	2.83	5.65	Channel Flow, Area= 2.0 sf Perim= 12.0' r= 0.17' n= 0.040 Winding stream, pools & shoals
34.4	2,614	Total			

Subcatchment 2: Pre A

Hydrograph

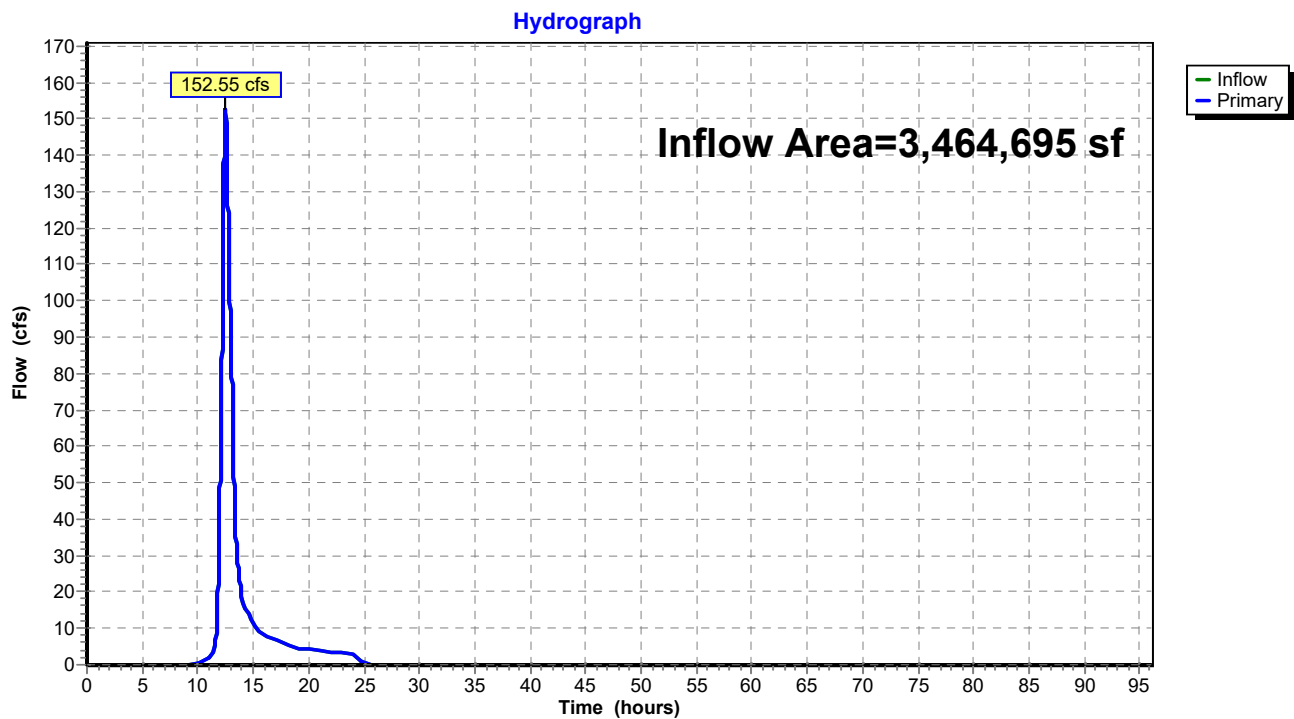


Summary for Link 3: Design Point A

Inflow Area = 3,464,695 sf, 24.35% Impervious, Inflow Depth = 2.83" for 10-yr event
 Inflow = 152.55 cfs @ 12.50 hrs, Volume= 818,458 cf
 Primary = 152.55 cfs @ 12.50 hrs, Volume= 818,458 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 3: Design Point A



N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 25-yr Rainfall=6.46"

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment0: A0 (Offsite)Runoff Area=1,115,060 sf 57.87% Impervious Runoff Depth=5.29"
Flow Length=1,018' Tc=12.5 min CN=90 Runoff=154.93 cfs 491,989 cf**Pond 1: Offsite Pond A**Peak Elev=364.35' Storage=158,428 cf Inflow=154.93 cfs 491,989 cf
Outflow=58.35 cfs 440,794 cf**Reach 1A: Existing Stream A**Avg. Flow Depth=1.15' Max Vel=7.99 fps Inflow=58.35 cfs 440,794 cf
n=0.040 L=2,194.0' S=0.0629 ' Capacity=272.52 cfs Outflow=58.10 cfs 440,794 cf**Subcatchment2: Pre A**Runoff Area=2,349,635 sf 8.44% Impervious Runoff Depth=3.68"
Flow Length=2,614' Tc=34.4 min CN=75 Runoff=146.55 cfs 720,052 cf**Link 3: Design Point A**Inflow=204.63 cfs 1,160,846 cf
Primary=204.63 cfs 1,160,846 cf**Total Runoff Area = 3,464,695 sf Runoff Volume = 1,212,041 cf Average Runoff Depth = 4.20"**
75.65% Pervious = 2,621,024 sf 24.35% Impervious = 843,671 sf

N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 25-yr Rainfall=6.46"

Prepared by {enter your company name here}

Printed 2/4/2021

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Summary for Subcatchment 0: A0 (Offsite)

Runoff = 154.93 cfs @ 12.20 hrs, Volume= 491,989 cf, Depth= 5.29"

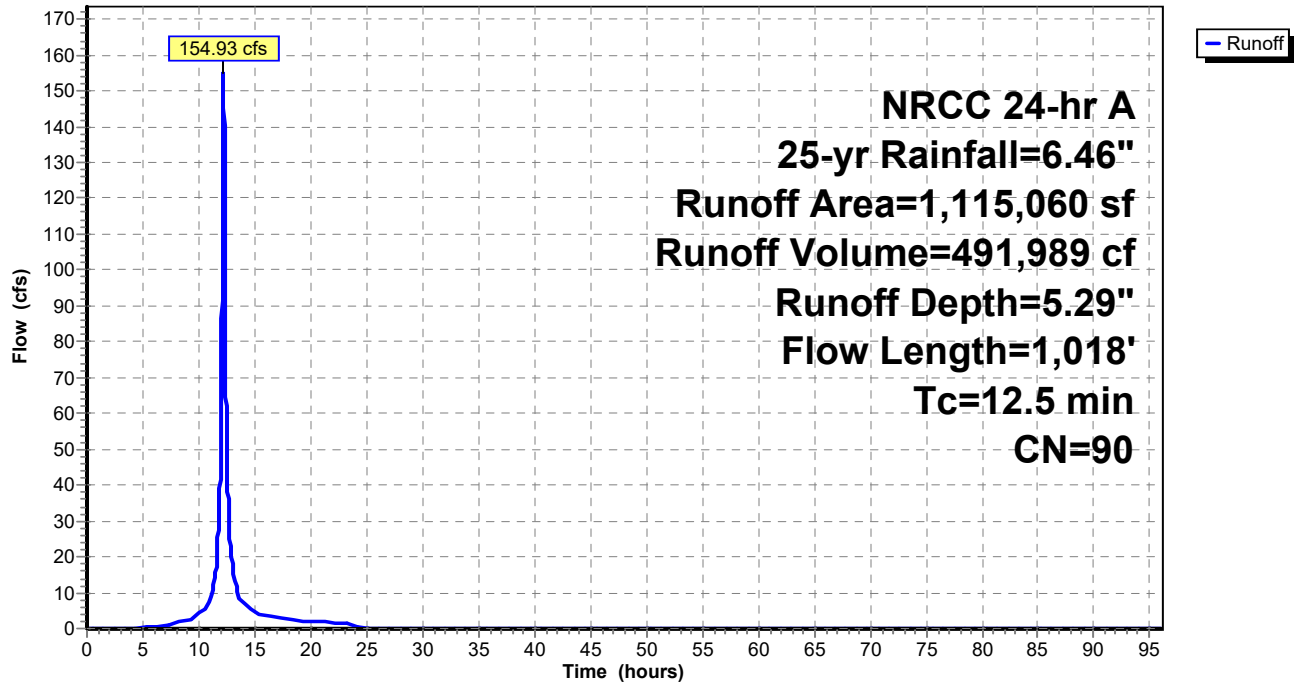
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 25-yr Rainfall=6.46"

Area (sf)	CN	Description
645,334	98	Paved parking, HSG C
443,611	80	>75% Grass cover, Good, HSG D
23,572	74	>75% Grass cover, Good, HSG C
2,543	61	>75% Grass cover, Good, HSG B
1,115,060	90	Weighted Average
469,726		42.13% Pervious Area
645,334		57.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0150	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.6	148	0.0574	3.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	30	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	740	0.0270	10.25	32.22	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Concrete sewer w/manholes & inlets
12.5	1,018	Total			

Subcatchment 0: A0 (Offsite)

Hydrograph



N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 25-yr Rainfall=6.46"

Prepared by {enter your company name here}

Printed 2/4/2021

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Summary for Pond 1: Offsite Pond A

Inflow Area = 1,115,060 sf, 57.87% Impervious, Inflow Depth = 5.29" for 25-yr event
 Inflow = 154.93 cfs @ 12.20 hrs, Volume= 491,989 cf
 Outflow = 58.35 cfs @ 12.45 hrs, Volume= 440,794 cf, Atten= 62%, Lag= 14.8 min
 Primary = 58.35 cfs @ 12.45 hrs, Volume= 440,794 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 364.35' @ 12.45 hrs Surf.Area= 31,319 sf Storage= 158,428 cf

Plug-Flow detention time= 90.4 min calculated for 440,794 cf (90% of inflow)
 Center-of-Mass det. time= 42.1 min (826.5 - 784.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	357.00'	221,816 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
357.00	14,633	679.0	0	0	14,633
358.00	16,652	698.0	15,632	15,632	16,826
359.00	17,534	715.0	17,091	32,723	18,864
360.00	19,427	745.0	18,472	51,195	22,425
362.00	24,453	804.0	43,784	94,979	29,861
364.00	28,701	854.0	53,097	148,076	36,663
365.00	36,602	901.0	32,572	180,648	43,285
366.00	45,910	1,262.0	41,168	221,816	105,432

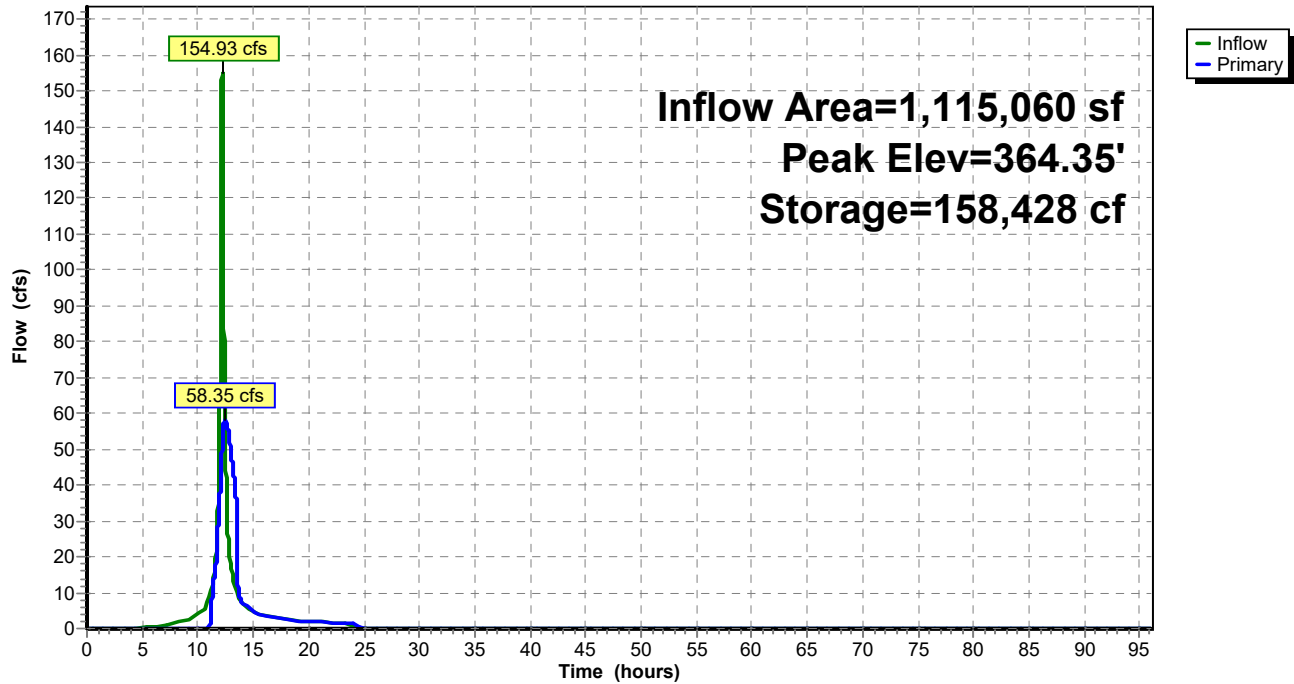
Device	Routing	Invert	Outlet Devices
#1	Primary	357.00'	30.0" Round Culvert L= 125.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 357.00' / 351.00' S= 0.0480 ' S= 0.0480 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf
#2	Device 1	360.00'	36.0" x 48.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Primary	364.75'	150.0' long x 36.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=58.35 cfs @ 12.45 hrs HW=364.34' TW=353.15' (Dynamic Tailwater)

- 1=Culvert (Inlet Controls 58.35 cfs @ 11.89 fps)
 2=Orifice/Grate (Passes 58.35 cfs of 240.87 cfs potential flow)
 3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 1: Offsite Pond A

Hydrograph



N60 Phase-1 Pre-Dev A 2021

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NRCC 24-hr A 25-yr Rainfall=6.46"

Printed 2/4/2021

Summary for Reach 1A: Existing Stream A

Inflow Area = 1,115,060 sf, 57.87% Impervious, Inflow Depth = 4.74" for 25-yr event
Inflow = 58.35 cfs @ 12.45 hrs, Volume= 440,794 cf
Outflow = 58.10 cfs @ 12.52 hrs, Volume= 440,794 cf, Atten= 0%, Lag= 4.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.99 fps, Min. Travel Time= 4.6 min
Avg. Velocity = 2.28 fps, Avg. Travel Time= 16.0 min

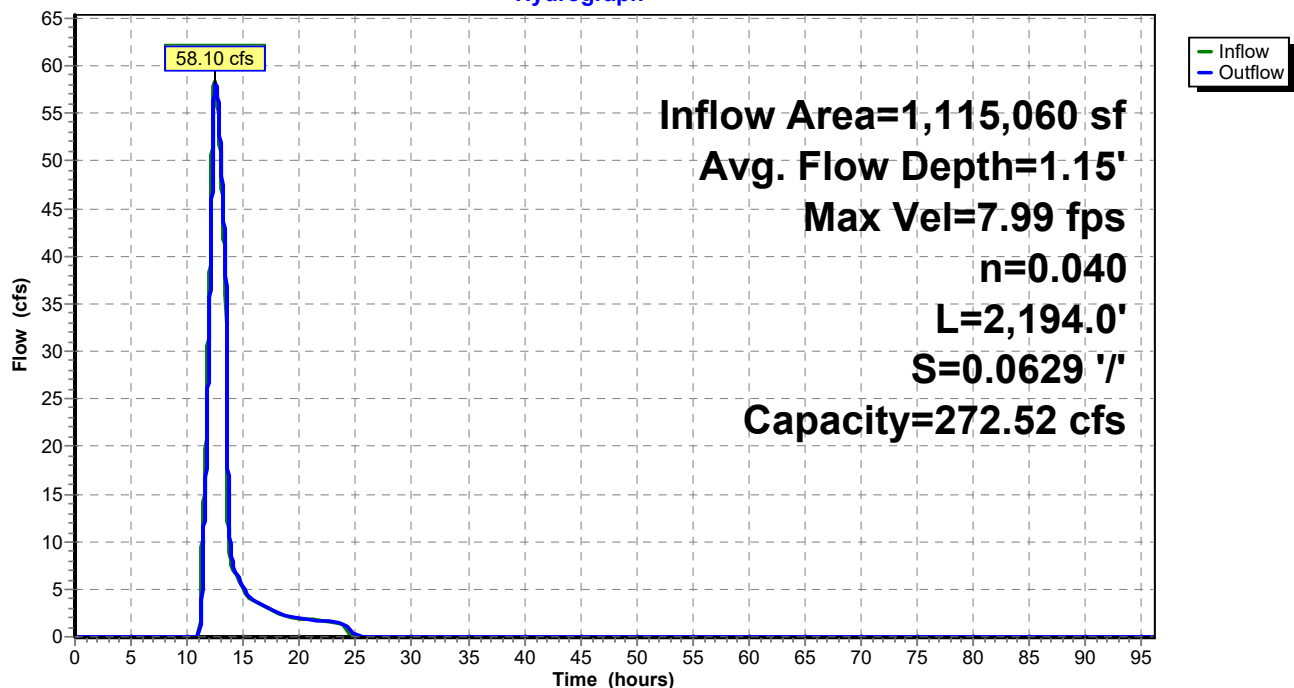
Peak Storage= 15,954 cf @ 12.52 hrs
Average Depth at Peak Storage= 1.15'
Bank-Full Depth= 2.50' Flow Area= 22.5 sf, Capacity= 272.52 cfs

4.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 2,194.0' Slope= 0.0629 '/'
Inlet Invert= 352.00', Outlet Invert= 214.00'



Reach 1A: Existing Stream A

Hydrograph



N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Subcatchment 2: Pre A

Runoff = 146.55 cfs @ 12.50 hrs, Volume= 720,052 cf, Depth= 3.68"

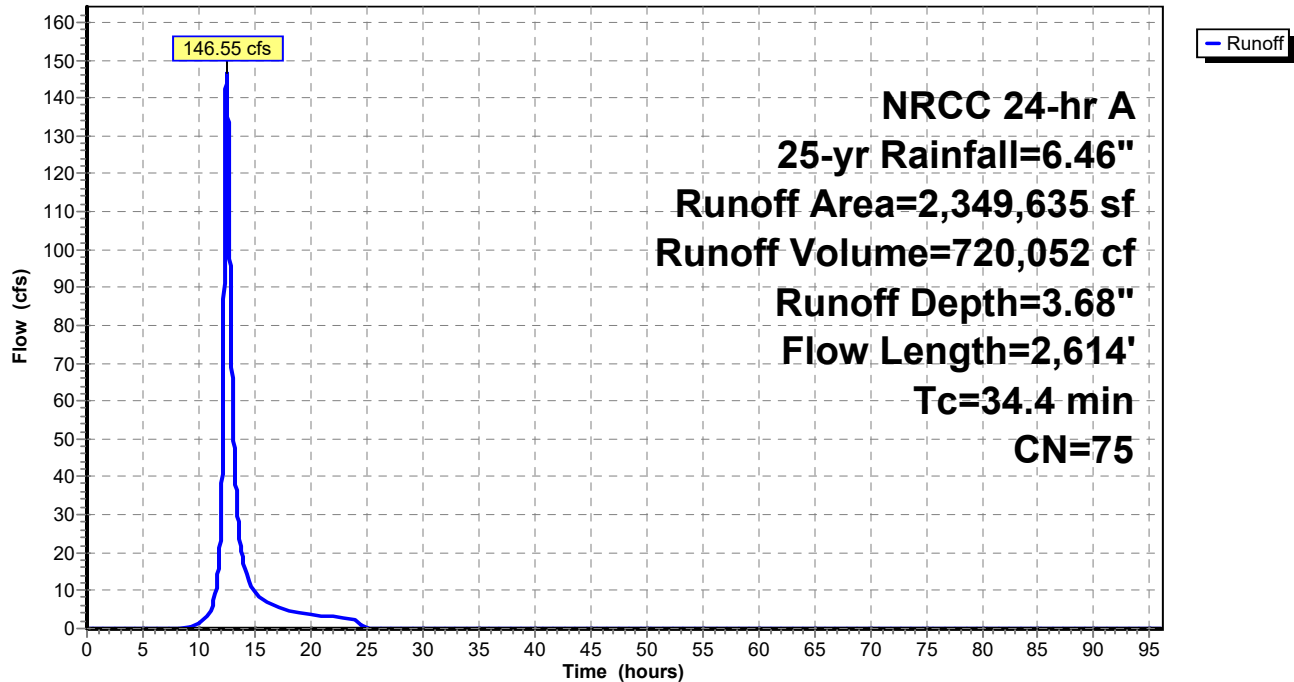
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 25-yr Rainfall=6.46"

	Area (sf)	CN	Description
*	181,472	98	Paved parking, roofs, HSG C
	159,966	91	Newly graded area, HSG C
	339,282	74	>75% Grass cover, Good, HSG C
	4,702	80	>75% Grass cover, Good, HSG D
	358,470	70	Brush, Fair, HSG C
	77,923	77	Brush, Fair, HSG D
	20,430	60	Woods, Fair, HSG B
	193,986	77	Woods, Good, HSG D
	996,539	70	Woods, Good, HSG C
	16,865	98	Water Surface, HSG D
	2,349,635	75	Weighted Average
	2,151,298		91.56% Pervious Area
	198,337		8.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0250	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
2.4	282	0.0142	1.92		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
13.2	2,232	0.0631	2.83	5.65	Channel Flow, Area= 2.0 sf Perim= 12.0' r= 0.17' n= 0.040 Winding stream, pools & shoals
34.4	2,614	Total			

Subcatchment 2: Pre A

Hydrograph



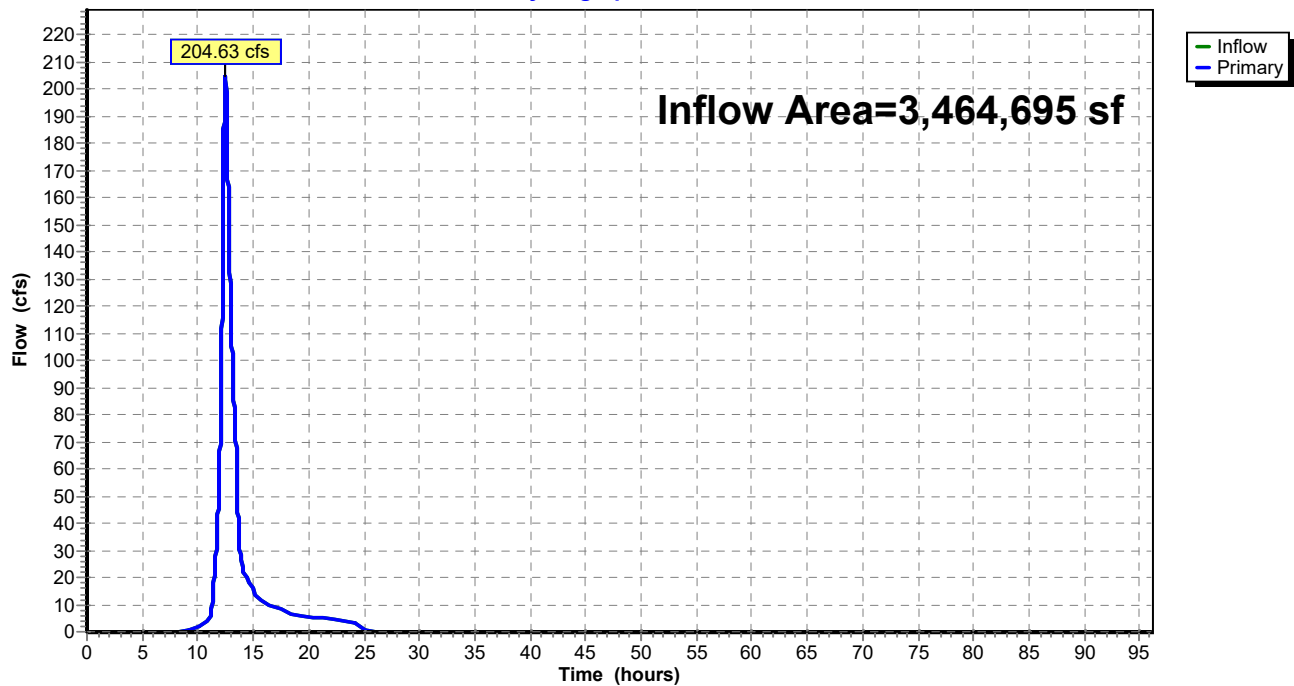
Summary for Link 3: Design Point A

Inflow Area = 3,464,695 sf, 24.35% Impervious, Inflow Depth = 4.02" for 25-yr event
 Inflow = 204.63 cfs @ 12.50 hrs, Volume= 1,160,846 cf
 Primary = 204.63 cfs @ 12.50 hrs, Volume= 1,160,846 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 3: Design Point A

Hydrograph



N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 50-yr Rainfall=7.70"

Prepared by {enter your company name here}

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment0: A0 (Offsite)Runoff Area=1,115,060 sf 57.87% Impervious Runoff Depth=6.51"
Flow Length=1,018' Tc=12.5 min CN=90 Runoff=188.18 cfs 604,958 cf**Pond 1: Offsite Pond A**Peak Elev=364.99' Storage=180,130 cf Inflow=188.18 cfs 604,958 cf
Outflow=107.44 cfs 553,763 cf**Reach 1A: Existing Stream A**Avg. Flow Depth=1.50' Max Vel=9.18 fps Inflow=107.44 cfs 553,763 cf
n=0.040 L=2,194.0' S=0.0629 ' Capacity=272.52 cfs Outflow=96.14 cfs 553,763 cf**Subcatchment2: Pre A**Runoff Area=2,349,635 sf 8.44% Impervious Runoff Depth=4.77"
Flow Length=2,614' Tc=34.4 min CN=75 Runoff=189.66 cfs 934,335 cf**Link 3: Design Point A**Inflow=280.29 cfs 1,488,097 cf
Primary=280.29 cfs 1,488,097 cf**Total Runoff Area = 3,464,695 sf Runoff Volume = 1,539,292 cf Average Runoff Depth = 5.33"**
75.65% Pervious = 2,621,024 sf 24.35% Impervious = 843,671 sf

N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Subcatchment 0: A0 (Offsite)

Runoff = 188.18 cfs @ 12.20 hrs, Volume= 604,958 cf, Depth= 6.51"

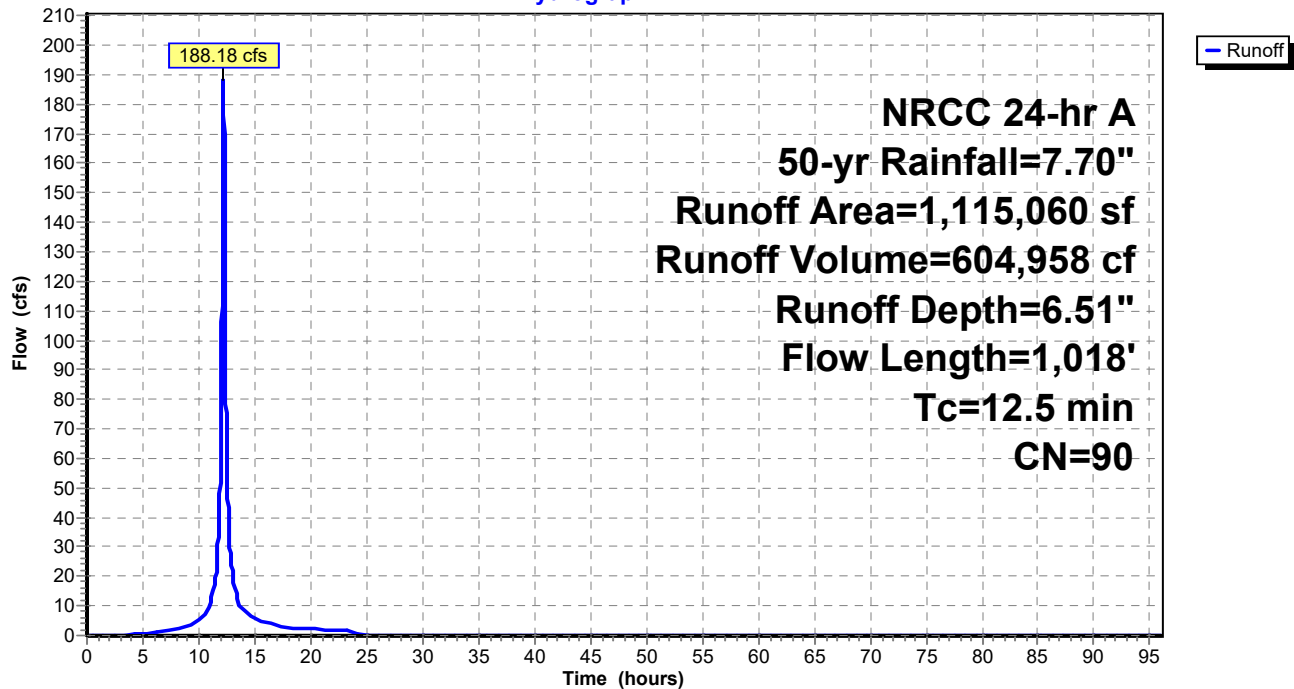
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 50-yr Rainfall=7.70"

Area (sf)	CN	Description
645,334	98	Paved parking, HSG C
443,611	80	>75% Grass cover, Good, HSG D
23,572	74	>75% Grass cover, Good, HSG C
2,543	61	>75% Grass cover, Good, HSG B
1,115,060	90	Weighted Average
469,726		42.13% Pervious Area
645,334		57.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0150	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.6	148	0.0574	3.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	30	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	740	0.0270	10.25	32.22	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Concrete sewer w/manholes & inlets
12.5	1,018	Total			

Subcatchment 0: A0 (Offsite)

Hydrograph



N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 50-yr Rainfall=7.70"

Prepared by {enter your company name here}

Printed 2/4/2021

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Summary for Pond 1: Offsite Pond A

Inflow Area = 1,115,060 sf, 57.87% Impervious, Inflow Depth = 6.51" for 50-yr event
 Inflow = 188.18 cfs @ 12.20 hrs, Volume= 604,958 cf
 Outflow = 107.44 cfs @ 12.35 hrs, Volume= 553,763 cf, Atten= 43%, Lag= 8.9 min
 Primary = 107.44 cfs @ 12.35 hrs, Volume= 553,763 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 364.99' @ 12.35 hrs Surf.Area= 36,483 sf Storage= 180,130 cf

Plug-Flow detention time= 83.1 min calculated for 553,763 cf (92% of inflow)
 Center-of-Mass det. time= 41.1 min (820.8 - 779.7)

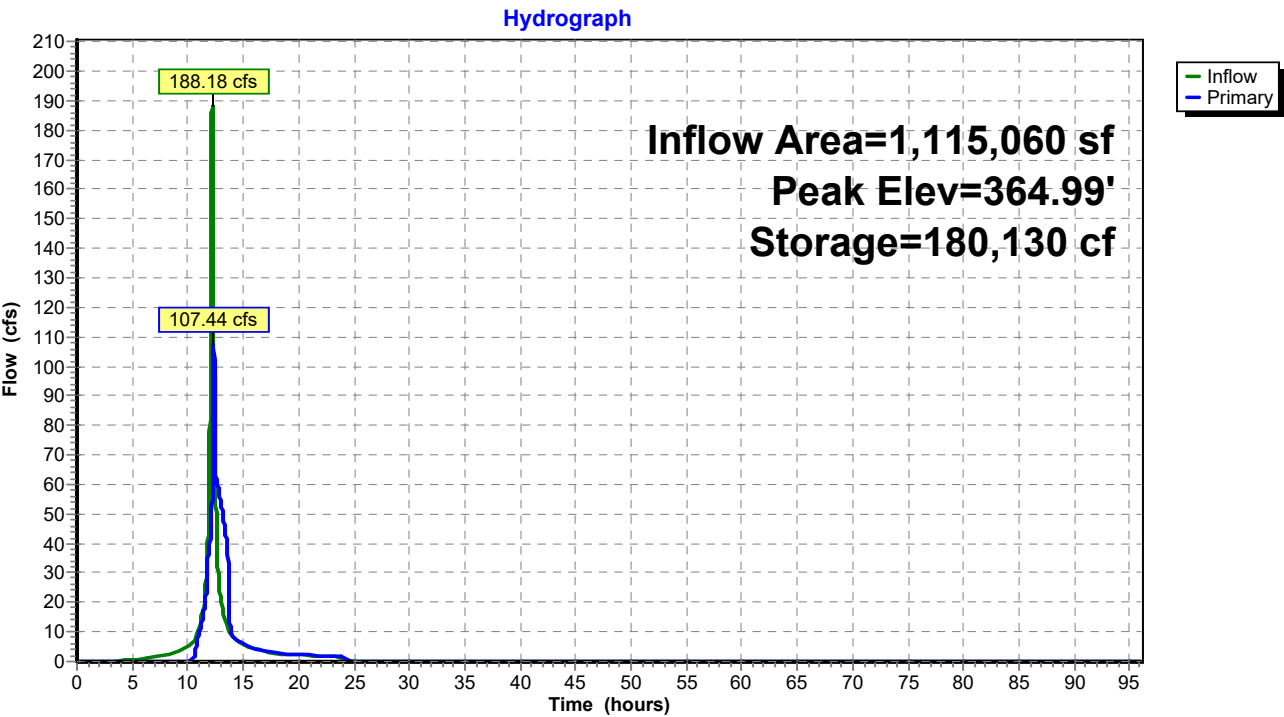
Volume	Invert	Avail.Storage	Storage Description		
#1	357.00'	221,816 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
357.00	14,633	679.0	0	0	14,633
358.00	16,652	698.0	15,632	15,632	16,826
359.00	17,534	715.0	17,091	32,723	18,864
360.00	19,427	745.0	18,472	51,195	22,425
362.00	24,453	804.0	43,784	94,979	29,861
364.00	28,701	854.0	53,097	148,076	36,663
365.00	36,602	901.0	32,572	180,648	43,285
366.00	45,910	1,262.0	41,168	221,816	105,432

Device	Routing	Invert	Outlet Devices
#1	Primary	357.00'	30.0" Round Culvert L= 125.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 357.00' / 351.00' S= 0.0480 ' S= 0.0480 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf
#2	Device 1	360.00'	36.0" x 48.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Primary	364.75'	150.0' long x 36.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=107.34 cfs @ 12.35 hrs HW=364.99' TW=353.40' (Dynamic Tailwater)

- 1=Culvert (Inlet Controls 61.34 cfs @ 12.50 fps)
 2=Orifice/Grate (Passes 61.34 cfs of 258.02 cfs potential flow)
 3=Broad-Crested Rectangular Weir (Weir Controls 46.00 cfs @ 1.30 fps)

Pond 1: Offsite Pond A



N60 Phase-1 Pre-Dev A 2021

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NRCC 24-hr A 50-yr Rainfall=7.70"

Printed 2/4/2021

Summary for Reach 1A: Existing Stream A

Inflow Area = 1,115,060 sf, 57.87% Impervious, Inflow Depth = 5.96" for 50-yr event
Inflow = 107.44 cfs @ 12.35 hrs, Volume= 553,763 cf
Outflow = 96.14 cfs @ 12.40 hrs, Volume= 553,763 cf, Atten= 11%, Lag= 3.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.18 fps, Min. Travel Time= 4.0 min
Avg. Velocity = 2.45 fps, Avg. Travel Time= 15.0 min

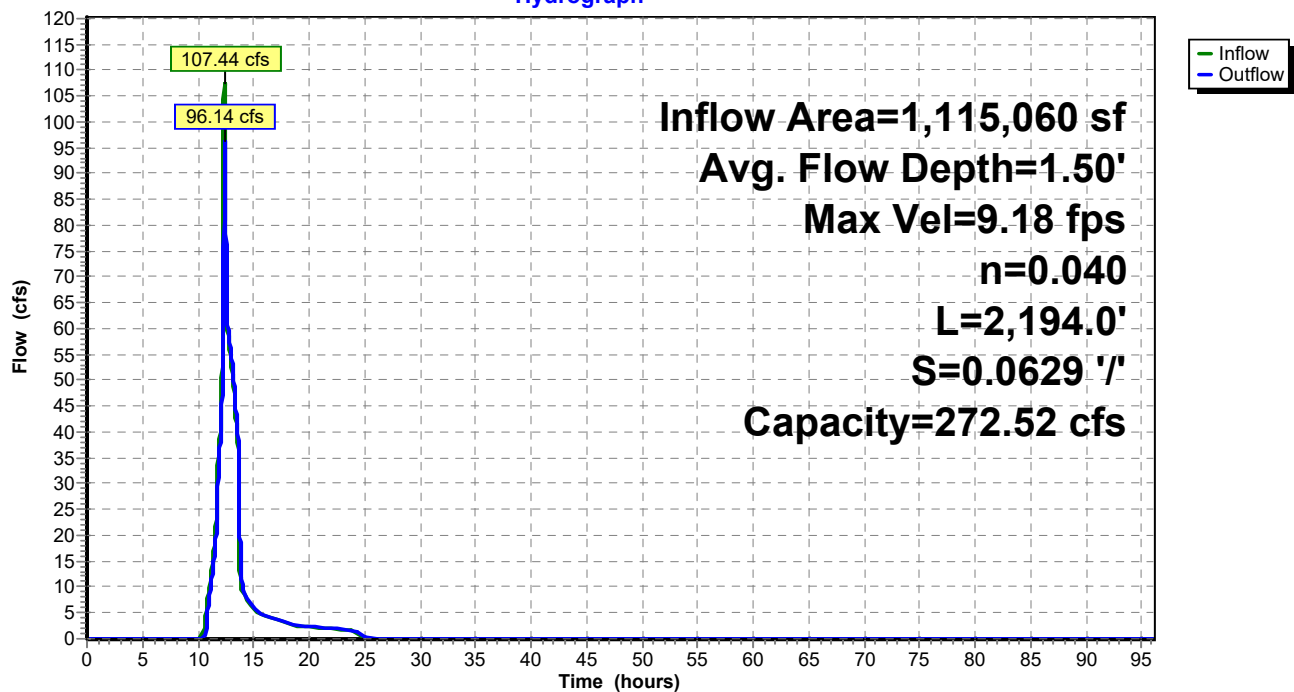
Peak Storage= 22,964 cf @ 12.40 hrs
Average Depth at Peak Storage= 1.50'
Bank-Full Depth= 2.50' Flow Area= 22.5 sf, Capacity= 272.52 cfs

4.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 2,194.0' Slope= 0.0629 '/'
Inlet Invert= 352.00', Outlet Invert= 214.00'



Reach 1A: Existing Stream A

Hydrograph



N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Subcatchment 2: Pre A

Runoff = 189.66 cfs @ 12.49 hrs, Volume= 934,335 cf, Depth= 4.77"

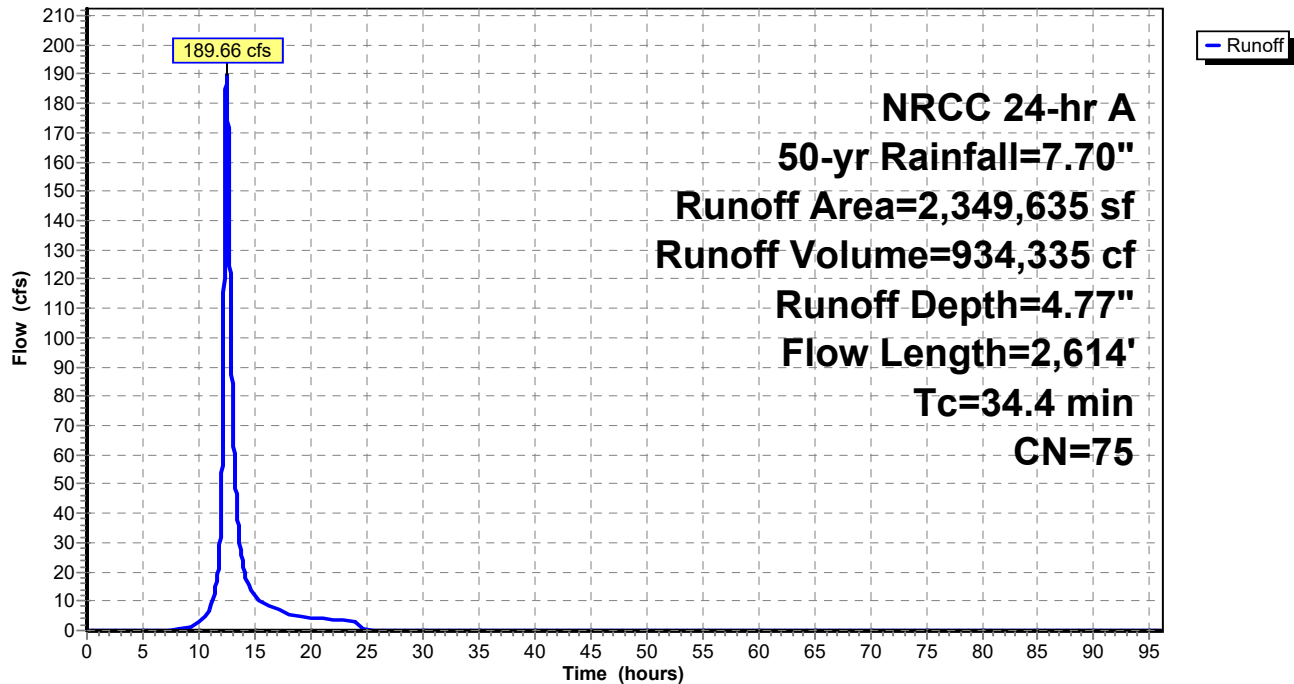
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 50-yr Rainfall=7.70"

	Area (sf)	CN	Description
*	181,472	98	Paved parking, roofs, HSG C
	159,966	91	Newly graded area, HSG C
	339,282	74	>75% Grass cover, Good, HSG C
	4,702	80	>75% Grass cover, Good, HSG D
	358,470	70	Brush, Fair, HSG C
	77,923	77	Brush, Fair, HSG D
	20,430	60	Woods, Fair, HSG B
	193,986	77	Woods, Good, HSG D
	996,539	70	Woods, Good, HSG C
	16,865	98	Water Surface, HSG D
	2,349,635	75	Weighted Average
	2,151,298		91.56% Pervious Area
	198,337		8.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0250	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
2.4	282	0.0142	1.92		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
13.2	2,232	0.0631	2.83	5.65	Channel Flow, Area= 2.0 sf Perim= 12.0' r= 0.17' n= 0.040 Winding stream, pools & shoals
34.4	2,614	Total			

Subcatchment 2: Pre A

Hydrograph



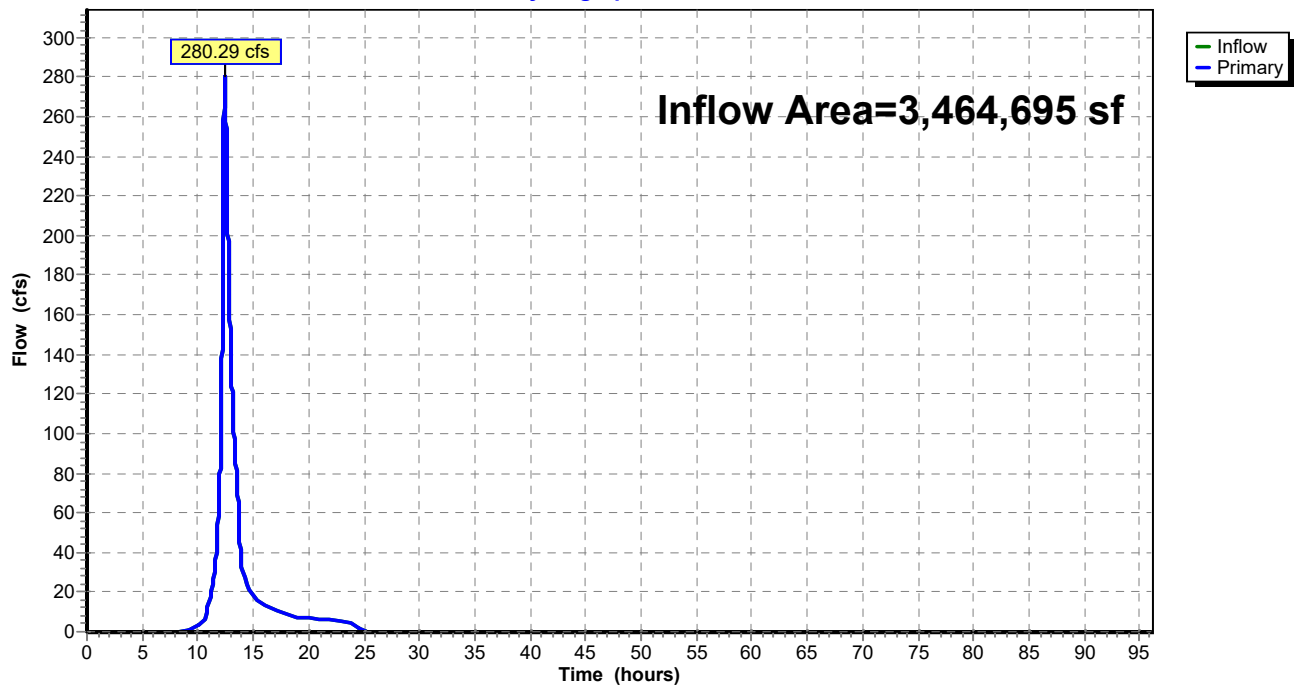
Summary for Link 3: Design Point A

Inflow Area = 3,464,695 sf, 24.35% Impervious, Inflow Depth = 5.15" for 50-yr event
 Inflow = 280.29 cfs @ 12.43 hrs, Volume= 1,488,097 cf
 Primary = 280.29 cfs @ 12.43 hrs, Volume= 1,488,097 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 3: Design Point A

Hydrograph



N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 100-yr Rainfall=9.18"

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment0: A0 (Offsite)Runoff Area=1,115,060 sf 57.87% Impervious Runoff Depth=7.97"
Flow Length=1,018' Tc=12.5 min CN=90 Runoff=227.61 cfs 740,519 cf**Pond 1: Offsite Pond A**Peak Elev=365.20' Storage=188,028 cf Inflow=227.61 cfs 740,519 cf
Outflow=183.31 cfs 689,324 cf**Reach 1A: Existing Stream A**Avg. Flow Depth=1.93' Max Vel=10.52 fps Inflow=183.31 cfs 689,324 cf
n=0.040 L=2,194.0' S=0.0629 ' Capacity=272.52 cfs Outflow=159.11 cfs 689,324 cf**Subcatchment2: Pre A**Runoff Area=2,349,635 sf 8.44% Impervious Runoff Depth=6.12"
Flow Length=2,614' Tc=34.4 min CN=75 Runoff=241.96 cfs 1,197,905 cf**Link 3: Design Point A**Inflow=371.76 cfs 1,887,228 cf
Primary=371.76 cfs 1,887,228 cf**Total Runoff Area = 3,464,695 sf Runoff Volume = 1,938,423 cf Average Runoff Depth = 6.71"**
75.65% Pervious = 2,621,024 sf 24.35% Impervious = 843,671 sf

N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Subcatchment 0: A0 (Offsite)

Runoff = 227.61 cfs @ 12.20 hrs, Volume= 740,519 cf, Depth= 7.97"

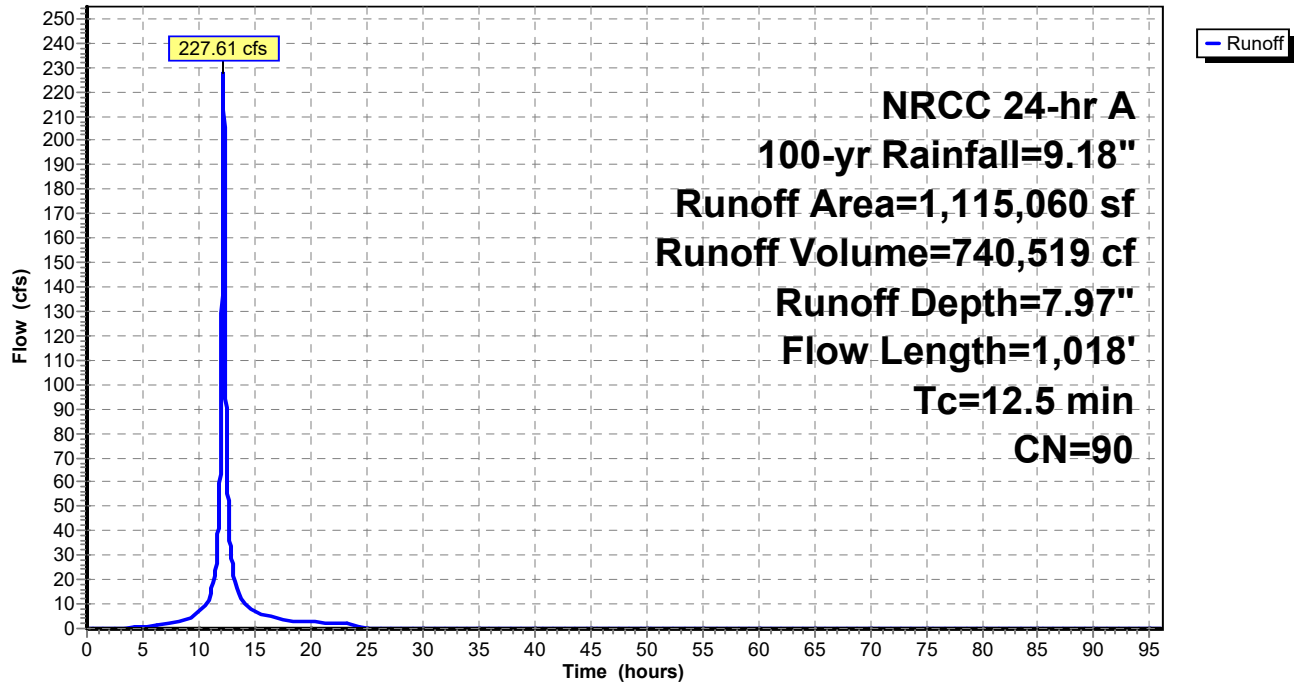
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 100-yr Rainfall=9.18"

Area (sf)	CN	Description
645,334	98	Paved parking, HSG C
443,611	80	>75% Grass cover, Good, HSG D
23,572	74	>75% Grass cover, Good, HSG C
2,543	61	>75% Grass cover, Good, HSG B
1,115,060	90	Weighted Average
469,726		42.13% Pervious Area
645,334		57.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0150	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.6	148	0.0574	3.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	30	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	740	0.0270	10.25	32.22	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Concrete sewer w/manholes & inlets
12.5	1,018	Total			

Subcatchment 0: A0 (Offsite)

Hydrograph



N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 100-yr Rainfall=9.18"

Prepared by {enter your company name here}

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Summary for Pond 1: Offsite Pond A

Inflow Area = 1,115,060 sf, 57.87% Impervious, Inflow Depth = 7.97" for 100-yr event
 Inflow = 227.61 cfs @ 12.20 hrs, Volume= 740,519 cf
 Outflow = 183.31 cfs @ 12.28 hrs, Volume= 689,324 cf, Atten= 19%, Lag= 4.8 min
 Primary = 183.31 cfs @ 12.28 hrs, Volume= 689,324 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 365.20' @ 12.28 hrs Surf.Area= 38,352 sf Storage= 188,028 cf

Plug-Flow detention time= 74.7 min calculated for 689,324 cf (93% of inflow)
 Center-of-Mass det. time= 38.3 min (813.6 - 775.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	357.00'	221,816 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
357.00	14,633	679.0	0	0	14,633
358.00	16,652	698.0	15,632	15,632	16,826
359.00	17,534	715.0	17,091	32,723	18,864
360.00	19,427	745.0	18,472	51,195	22,425
362.00	24,453	804.0	43,784	94,979	29,861
364.00	28,701	854.0	53,097	148,076	36,663
365.00	36,602	901.0	32,572	180,648	43,285
366.00	45,910	1,262.0	41,168	221,816	105,432

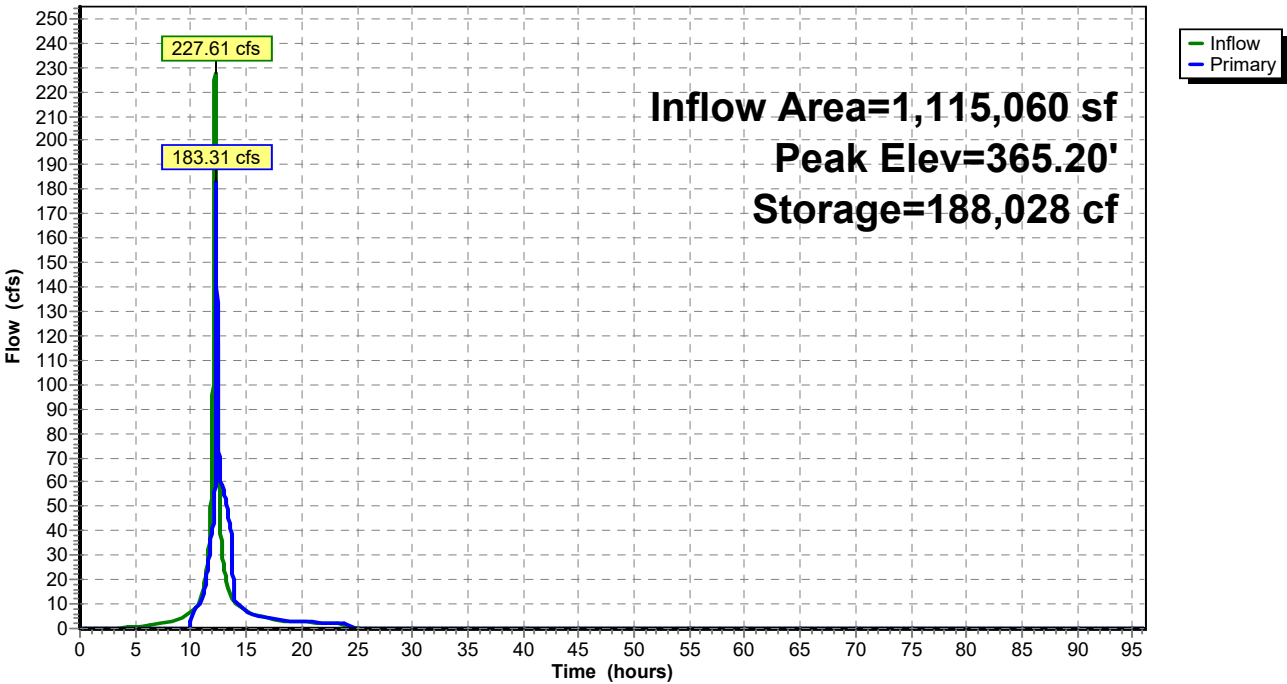
Device	Routing	Invert	Outlet Devices
#1	Primary	357.00'	30.0" Round Culvert L= 125.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 357.00' / 351.00' S= 0.0480 ' S= 0.0480 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf
#2	Device 1	360.00'	36.0" x 48.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Primary	364.75'	150.0' long x 36.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=183.09 cfs @ 12.28 hrs HW=365.20' TW=353.75' (Dynamic Tailwater)

- 1=Culvert (Inlet Controls 62.29 cfs @ 12.69 fps)
 2=Orifice/Grate (Passes 62.29 cfs of 263.43 cfs potential flow)
 3=Broad-Crested Rectangular Weir (Weir Controls 120.80 cfs @ 1.80 fps)

Pond 1: Offsite Pond A

Hydrograph



Summary for Reach 1A: Existing Stream A

Inflow Area = 1,115,060 sf, 57.87% Impervious, Inflow Depth = 7.42" for 100-yr event
Inflow = 183.31 cfs @ 12.28 hrs, Volume= 689,324 cf
Outflow = 159.11 cfs @ 12.33 hrs, Volume= 689,324 cf, Atten= 13%, Lag= 3.1 min

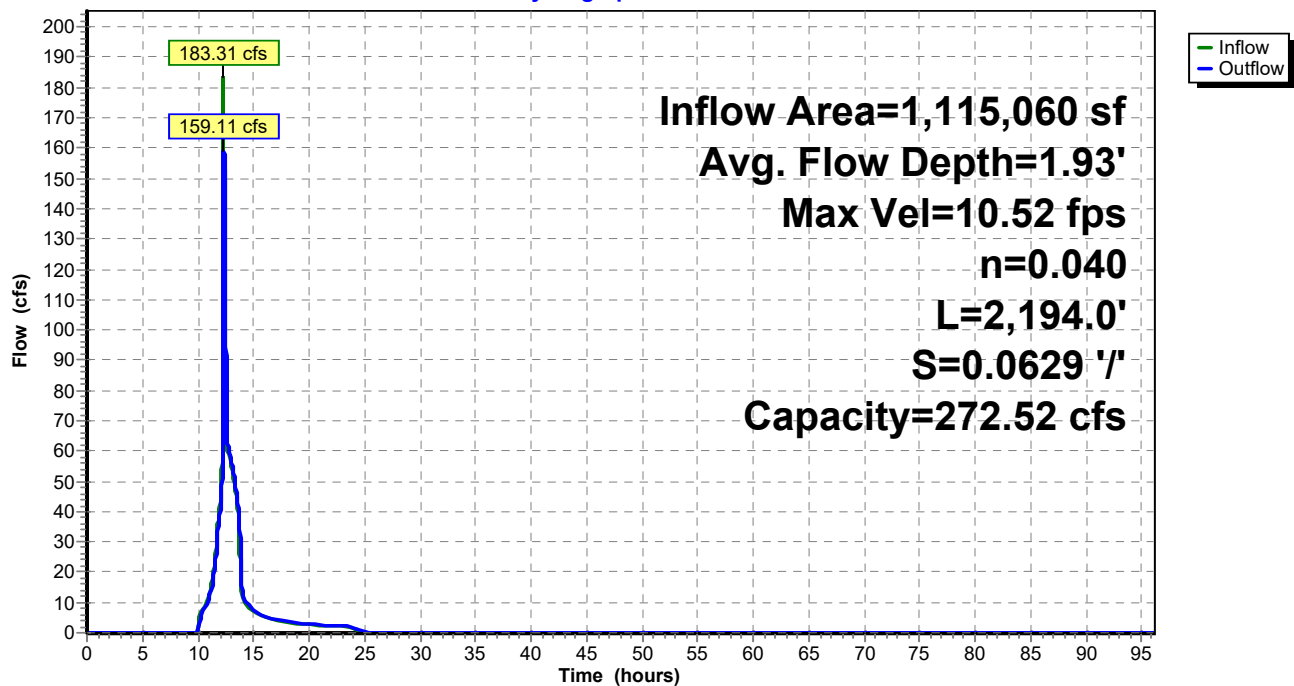
Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.52 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 2.61 fps, Avg. Travel Time= 14.0 min

Peak Storage= 33,194 cf @ 12.33 hrs
Average Depth at Peak Storage= 1.93'
Bank-Full Depth= 2.50' Flow Area= 22.5 sf, Capacity= 272.52 cfs

4.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 ' ' Top Width= 14.00'
Length= 2,194.0' Slope= 0.0629 ' '
Inlet Invert= 352.00', Outlet Invert= 214.00'

**Reach 1A: Existing Stream A**

Hydrograph



N60 Phase-1 Pre-Dev A 2021

NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Subcatchment 2: Pre A

Runoff = 241.96 cfs @ 12.49 hrs, Volume= 1,197,905 cf, Depth= 6.12"

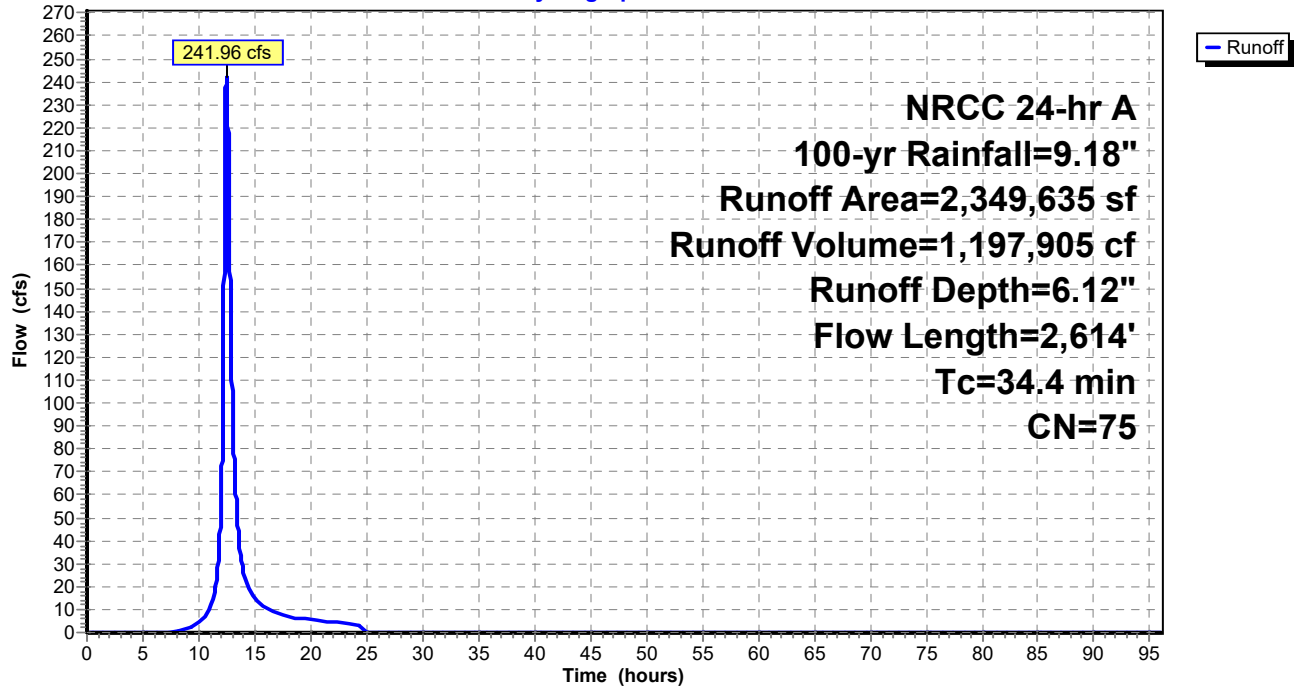
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 100-yr Rainfall=9.18"

	Area (sf)	CN	Description
*	181,472	98	Paved parking, roofs, HSG C
	159,966	91	Newly graded area, HSG C
	339,282	74	>75% Grass cover, Good, HSG C
	4,702	80	>75% Grass cover, Good, HSG D
	358,470	70	Brush, Fair, HSG C
	77,923	77	Brush, Fair, HSG D
	20,430	60	Woods, Fair, HSG B
	193,986	77	Woods, Good, HSG D
	996,539	70	Woods, Good, HSG C
	16,865	98	Water Surface, HSG D
	2,349,635	75	Weighted Average
	2,151,298		91.56% Pervious Area
	198,337		8.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0250	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
2.4	282	0.0142	1.92		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
13.2	2,232	0.0631	2.83	5.65	Channel Flow, Area= 2.0 sf Perim= 12.0' r= 0.17' n= 0.040 Winding stream, pools & shoals
34.4	2,614	Total			

Subcatchment 2: Pre A

Hydrograph



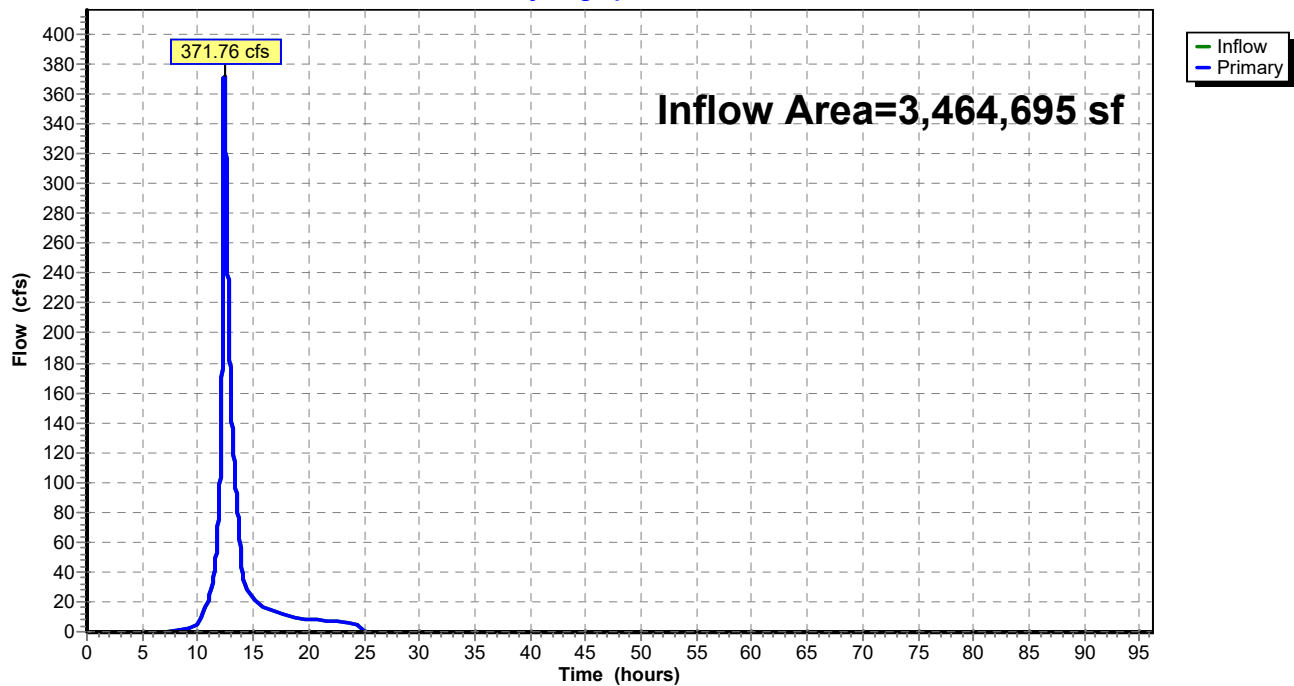
Summary for Link 3: Design Point A

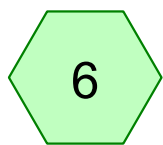
Inflow Area = 3,464,695 sf, 24.35% Impervious, Inflow Depth = 6.54" for 100-yr event
 Inflow = 371.76 cfs @ 12.38 hrs, Volume= 1,887,228 cf
 Primary = 371.76 cfs @ 12.38 hrs, Volume= 1,887,228 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

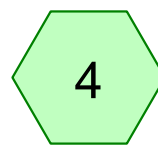
Link 3: Design Point A

Hydrograph

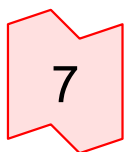




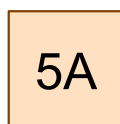
Pre B



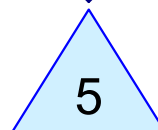
B0 (Offsite)



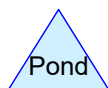
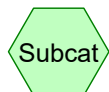
Design Point B



Existing Stream B



Offsite Pond B



Routing Diagram for N60 Phase-1 Pre-Dev B 2021

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N60 Phase-1 Pre-Dev B 2021

NRCC 24-hr A 1-yr Rainfall=2.79"

Prepared by {enter your company name here}

Printed 2/4/2021

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment4: B0 (Offsite)Runoff Area=1,510,771 sf 32.24% Impervious Runoff Depth=1.35"
Flow Length=1,871' Tc=32.3 min CN=84 Runoff=35.54 cfs 169,374 cf**Pond 5: Offsite Pond B**Peak Elev=383.57' Storage=82,924 cf Inflow=35.54 cfs 169,374 cf
36.0" Round Culvert n=0.025 L=158.0' S=0.0127 '/' Outflow=8.57 cfs 165,621 cf**Reach 5A: Existing Stream B**Avg. Flow Depth=0.41' Max Vel=4.29 fps Inflow=8.57 cfs 165,621 cf
n=0.040 L=2,704.0' S=0.0562 '/' Capacity=257.63 cfs Outflow=8.50 cfs 165,586 cf**Subcatchment6: Pre B**Runoff Area=1,252,502 sf 0.00% Impervious Runoff Depth=0.60"
Flow Length=2,216' Tc=27.6 min CN=70 Runoff=12.14 cfs 62,706 cf**Link 7: Design Point B**Inflow=13.08 cfs 228,292 cf
Primary=13.08 cfs 228,292 cf**Total Runoff Area = 2,763,273 sf Runoff Volume = 232,080 cf Average Runoff Depth = 1.01"**
82.37% Pervious = 2,276,217 sf 17.63% Impervious = 487,056 sf

N60 Phase-1 Pre-Dev B 2021

NRCC 24-hr A 1-yr Rainfall=2.79"

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Printed 2/4/2021

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Summary for Subcatchment 4: B0 (Offsite)

Runoff = 35.54 cfs @ 12.46 hrs, Volume= 169,374 cf, Depth= 1.35"

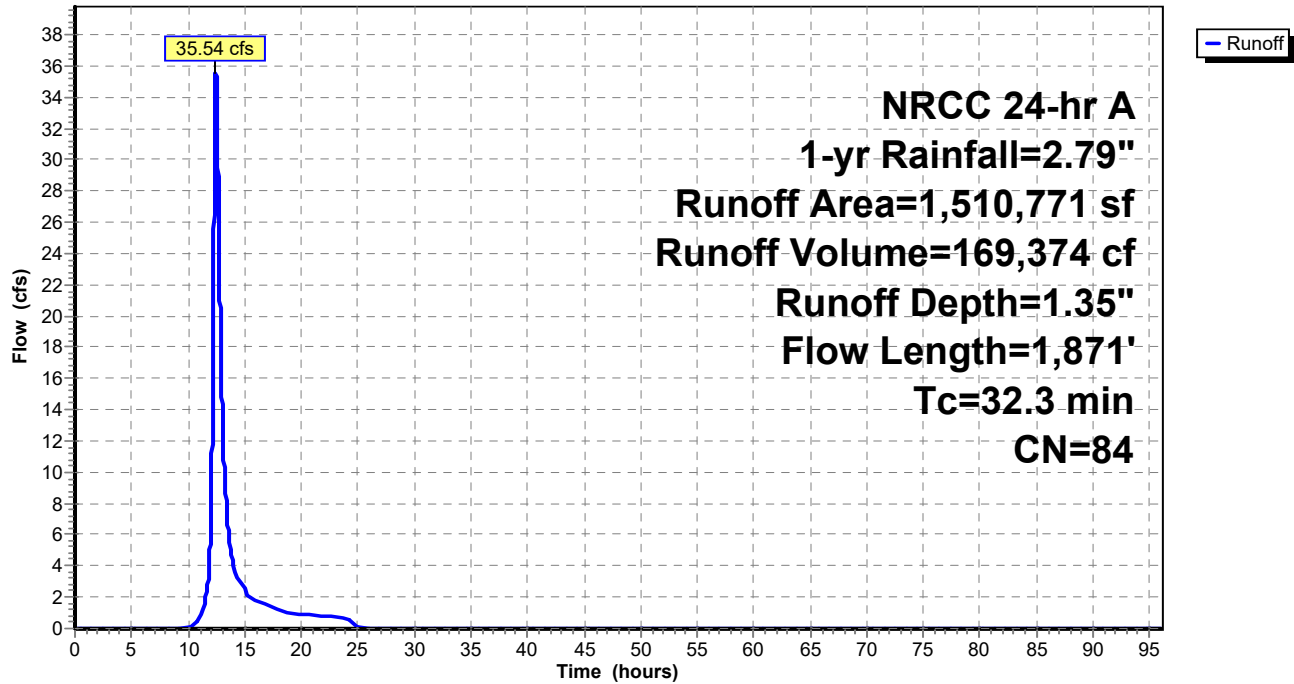
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 1-yr Rainfall=2.79"

Area (sf)	CN	Description
487,056	98	Paved parking, HSG C
497,987	77	Woods, Good, HSG D
134,328	70	Woods, Good, HSG C
375,457	80	>75% Grass cover, Good, HSG D
15,943	74	>75% Grass cover, Good, HSG C
1,510,771	84	Weighted Average
1,023,715		67.76% Pervious Area
487,056		32.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0300	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
9.5	848	0.0085	1.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.1	856	0.0093	2.78	3.06	Trap/Vee/Rect Channel Flow, Bot.W=3.00' D=0.33' Z= 1.0 '/' Top.W=3.66' n= 0.022 Earth, clean & straight
0.2	67	0.0150	6.66	64.08	Pipe Channel, 42.0" Round Area= 9.6 sf Perim= 11.0' r= 0.88' n= 0.025 Corrugated metal
32.3	1,871	Total			

Subcatchment 4: B0 (Offsite)

Hydrograph



N60 Phase-1 Pre-Dev B 2021

NRCC 24-hr A 1-yr Rainfall=2.79"

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Printed 2/4/2021

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Summary for Pond 5: Offsite Pond B

Inflow Area = 1,510,771 sf, 32.24% Impervious, Inflow Depth = 1.35" for 1-yr event
 Inflow = 35.54 cfs @ 12.46 hrs, Volume= 169,374 cf
 Outflow = 8.57 cfs @ 13.31 hrs, Volume= 165,621 cf, Atten= 76%, Lag= 50.9 min
 Primary = 8.57 cfs @ 13.31 hrs, Volume= 165,621 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 383.57' @ 13.32 hrs Surf.Area= 70,763 sf Storage= 82,924 cf

Plug-Flow detention time= 303.3 min calculated for 165,604 cf (98% of inflow)
 Center-of-Mass det. time= 290.7 min (1,138.9 - 848.2)

Volume	Invert	Avail.Storage	Storage Description
#1	382.00'	610,998 cf	Custom Stage Data (Irregular) Listed below (Recalc)

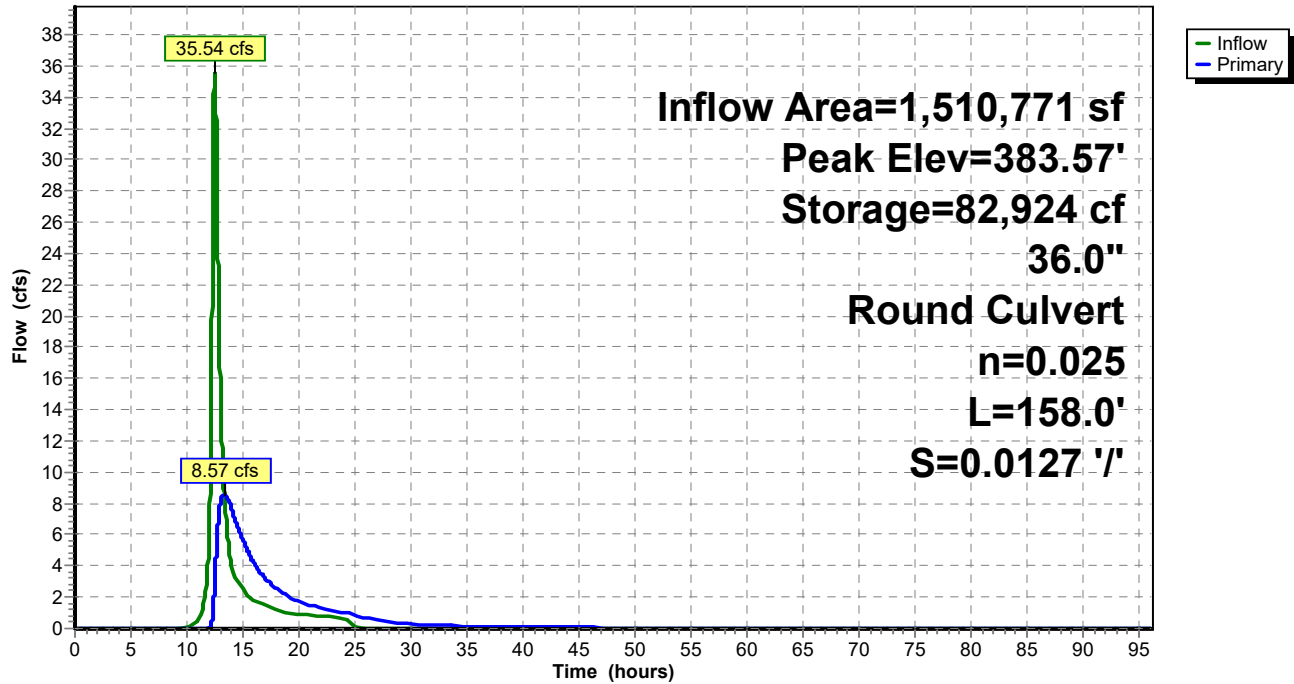
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
382.00	36,540	1,177.0	0	0	36,540
384.00	81,987	1,579.0	115,507	115,507	124,748
386.00	96,790	1,622.0	178,572	294,080	136,159
388.00	108,795	1,657.0	205,468	499,548	145,863
389.00	114,127	1,679.0	111,450	610,998	151,937

Device	Routing	Invert	Outlet Devices
#1	Primary	382.00'	36.0" Round Culvert L= 158.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 382.00' / 380.00' S= 0.0127 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 7.07 sf

Primary OutFlow Max=8.57 cfs @ 13.31 hrs HW=383.57' TW=382.41' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 8.57 cfs @ 3.32 fps)

Pond 5: Offsite Pond B

Hydrograph



N60 Phase-1 Pre-Dev B 2021

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NRCC 24-hr A 1-yr Rainfall=2.79"

Printed 2/4/2021

Summary for Reach 5A: Existing Stream B

Inflow Area = 1,510,771 sf, 32.24% Impervious, Inflow Depth > 1.32" for 1-yr event
Inflow = 8.57 cfs @ 13.31 hrs, Volume= 165,621 cf
Outflow = 8.50 cfs @ 13.45 hrs, Volume= 165,586 cf, Atten= 1%, Lag= 8.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.29 fps, Min. Travel Time= 10.5 min
Avg. Velocity = 1.15 fps, Avg. Travel Time= 39.1 min

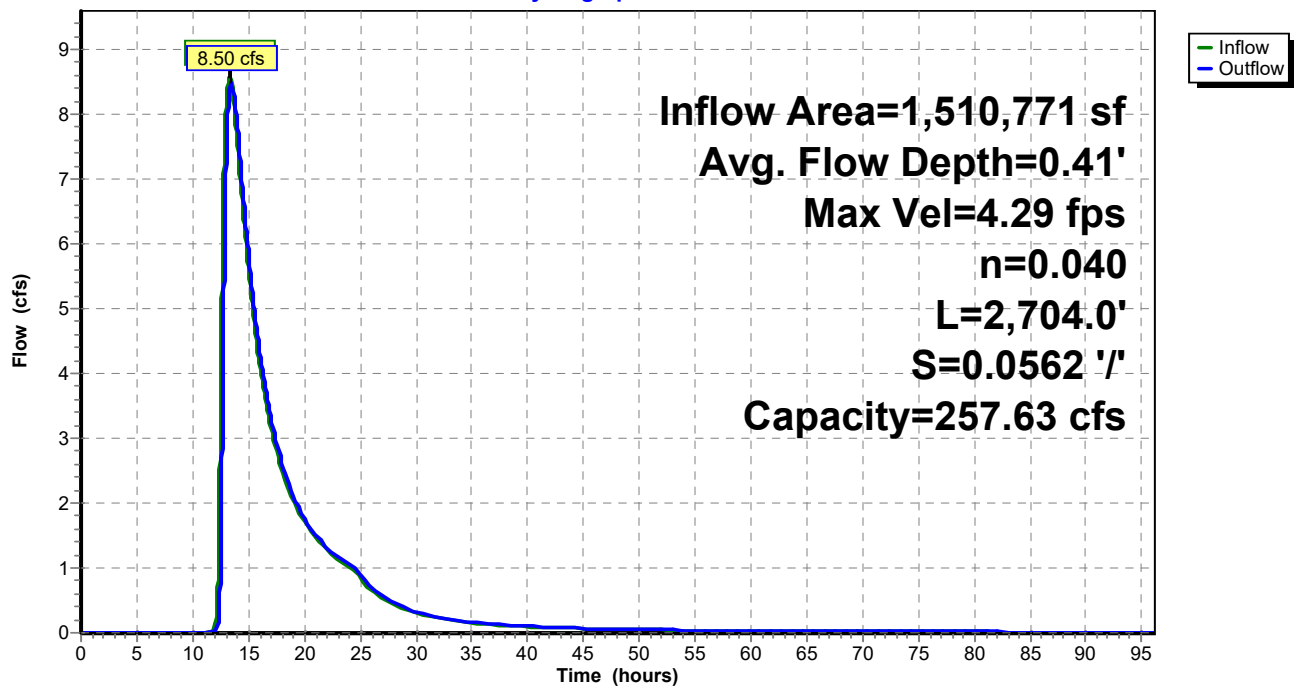
Peak Storage= 5,361 cf @ 13.45 hrs
Average Depth at Peak Storage= 0.41'
Bank-Full Depth= 2.50' Flow Area= 22.5 sf, Capacity= 257.63 cfs

4.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 2,704.0' Slope= 0.0562 '/'
Inlet Invert= 382.00', Outlet Invert= 230.00'



Reach 5A: Existing Stream B

Hydrograph



N60 Phase-1 Pre-Dev B 2021

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NRCC 24-hr A 1-yr Rainfall=2.79"

Printed 2/4/2021

Summary for Subcatchment 6: Pre B

Runoff = 12.14 cfs @ 12.45 hrs, Volume= 62,706 cf, Depth= 0.60"

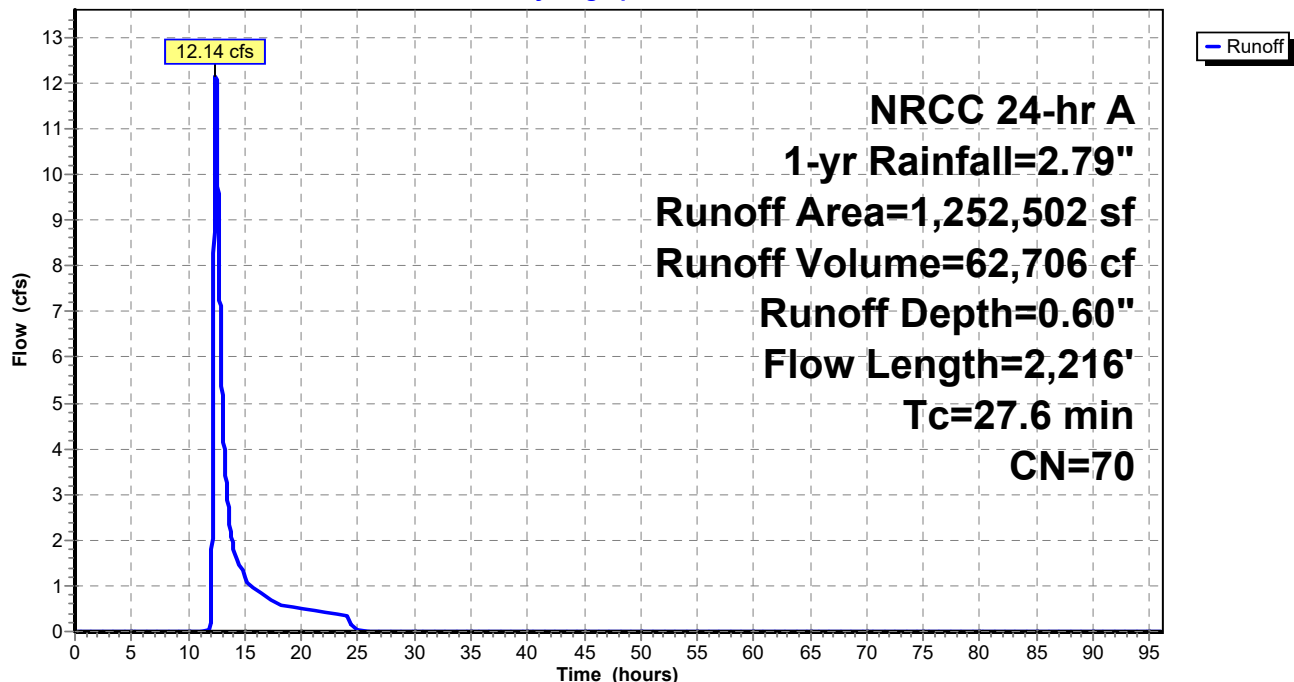
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 1-yr Rainfall=2.79"

Area (sf)	CN	Description
31,823	61	>75% Grass cover, Good, HSG B
32,077	55	Woods, Good, HSG B
38,670	91	Newly graded area, HSG C
18,832	91	Newly graded area, HSG C
1,131,100	70	Woods, Good, HSG C
1,252,502	70	Weighted Average
1,252,502		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0400	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
0.2	64	0.1875	6.97		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
11.8	2,052	0.0663	2.90	5.79	Channel Flow, Area= 2.0 sf Perim= 12.0' r= 0.17' n= 0.040 Winding stream, pools & shoals
27.6	2,216	Total			

Subcatchment 6: Pre B

Hydrograph



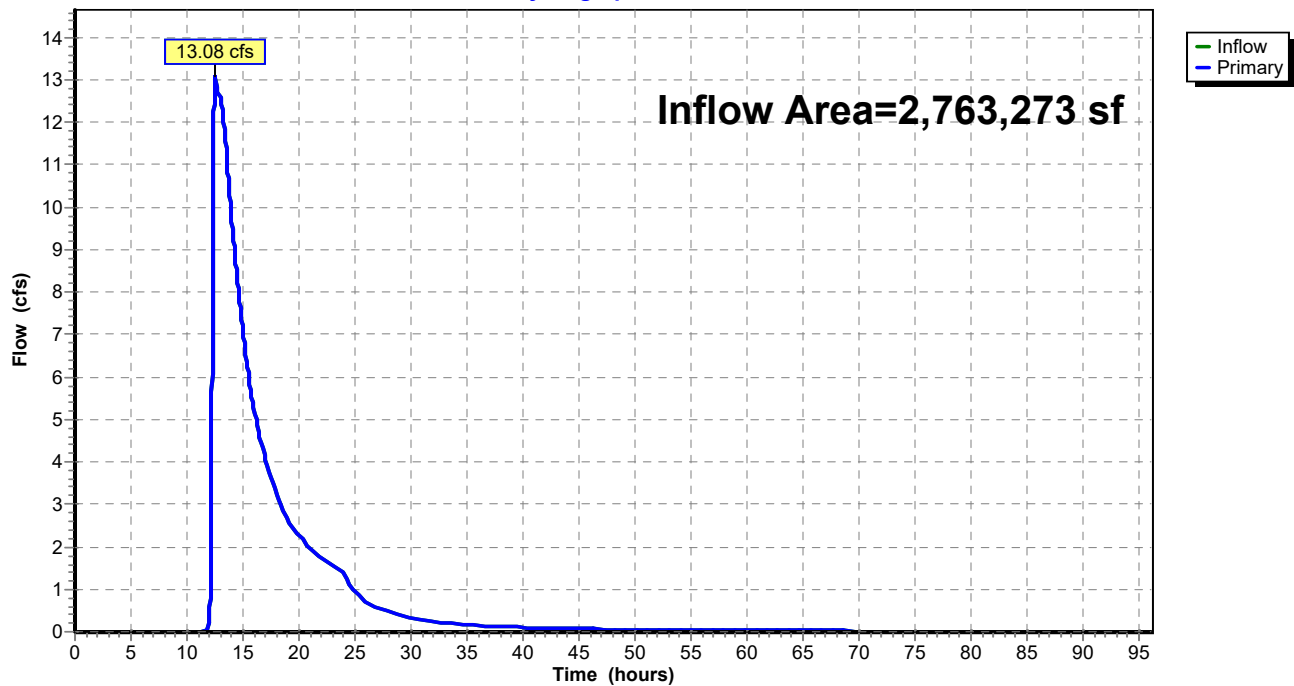
Summary for Link 7: Design Point B

Inflow Area = 2,763,273 sf, 17.63% Impervious, Inflow Depth > 0.99" for 1-yr event
 Inflow = 13.08 cfs @ 12.51 hrs, Volume= 228,292 cf
 Primary = 13.08 cfs @ 12.51 hrs, Volume= 228,292 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 7: Design Point B

Hydrograph



N60 Phase-1 Pre-Dev B 2021

NRCC 24-hr A 2-yr Rainfall=3.42"

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Printed 2/4/2021

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment4: B0 (Offsite)Runoff Area=1,510,771 sf 32.24% Impervious Runoff Depth=1.87"
Flow Length=1,871' Tc=32.3 min CN=84 Runoff=49.64 cfs 235,196 cf**Pond 5: Offsite Pond B**Peak Elev=383.96' Storage=112,227 cf Inflow=49.64 cfs 235,196 cf
36.0" Round Culvert n=0.025 L=158.0' S=0.0127 ' Outflow=13.68 cfs 231,419 cf**Reach 5A: Existing Stream B**Avg. Flow Depth=0.54' Max Vel=4.99 fps Inflow=13.68 cfs 231,419 cf
n=0.040 L=2,704.0' S=0.0562 ' Capacity=257.63 cfs Outflow=13.59 cfs 231,383 cf**Subcatchment6: Pre B**Runoff Area=1,252,502 sf 0.00% Impervious Runoff Depth=0.96"
Flow Length=2,216' Tc=27.6 min CN=70 Runoff=21.10 cfs 100,103 cf**Link 7: Design Point B**Inflow=23.71 cfs 331,486 cf
Primary=23.71 cfs 331,486 cf**Total Runoff Area = 2,763,273 sf Runoff Volume = 335,299 cf Average Runoff Depth = 1.46"**
82.37% Pervious = 2,276,217 sf 17.63% Impervious = 487,056 sf

N60 Phase-1 Pre-Dev B 2021

NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Subcatchment 4: B0 (Offsite)

Runoff = 49.64 cfs @ 12.45 hrs, Volume= 235,196 cf, Depth= 1.87"

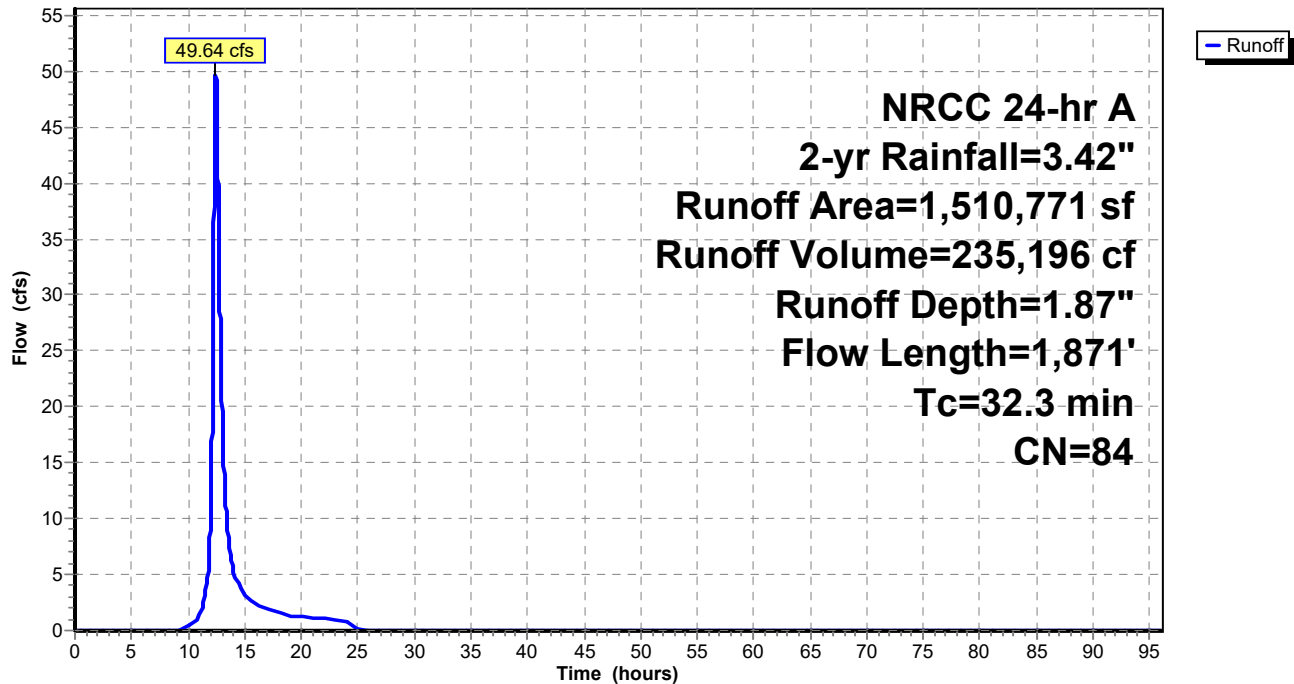
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 2-yr Rainfall=3.42"

Area (sf)	CN	Description
487,056	98	Paved parking, HSG C
497,987	77	Woods, Good, HSG D
134,328	70	Woods, Good, HSG C
375,457	80	>75% Grass cover, Good, HSG D
15,943	74	>75% Grass cover, Good, HSG C
1,510,771	84	Weighted Average
1,023,715		67.76% Pervious Area
487,056		32.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0300	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
9.5	848	0.0085	1.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.1	856	0.0093	2.78	3.06	Trap/Vee/Rect Channel Flow, Bot.W=3.00' D=0.33' Z= 1.0 '/' Top.W=3.66' n= 0.022 Earth, clean & straight
0.2	67	0.0150	6.66	64.08	Pipe Channel, 42.0" Round Area= 9.6 sf Perim= 11.0' r= 0.88' n= 0.025 Corrugated metal
32.3	1,871	Total			

Subcatchment 4: B0 (Offsite)

Hydrograph



N60 Phase-1 Pre-Dev B 2021

NRCC 24-hr A 2-yr Rainfall=3.42"

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Printed 2/4/2021

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Summary for Pond 5: Offsite Pond B

Inflow Area = 1,510,771 sf, 32.24% Impervious, Inflow Depth = 1.87" for 2-yr event
 Inflow = 49.64 cfs @ 12.45 hrs, Volume= 235,196 cf
 Outflow = 13.68 cfs @ 13.19 hrs, Volume= 231,419 cf, Atten= 72%, Lag= 44.0 min
 Primary = 13.68 cfs @ 13.19 hrs, Volume= 231,419 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 383.96' @ 13.20 hrs Surf.Area= 80,893 sf Storage= 112,227 cf

Plug-Flow detention time= 253.9 min calculated for 231,394 cf (98% of inflow)
 Center-of-Mass det. time= 244.6 min (1,084.9 - 840.3)

Volume	Invert	Avail.Storage	Storage Description
#1	382.00'	610,998 cf	Custom Stage Data (Irregular) Listed below (Recalc)

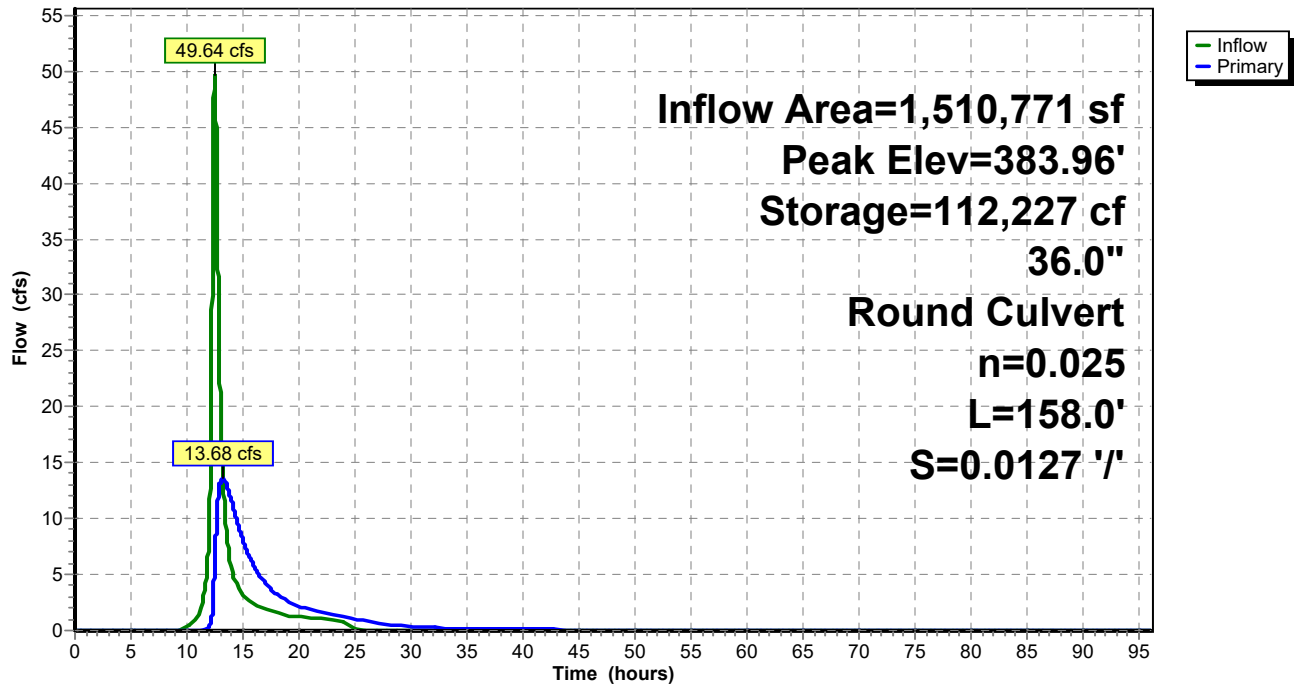
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
382.00	36,540	1,177.0	0	0	36,540
384.00	81,987	1,579.0	115,507	115,507	124,748
386.00	96,790	1,622.0	178,572	294,080	136,159
388.00	108,795	1,657.0	205,468	499,548	145,863
389.00	114,127	1,679.0	111,450	610,998	151,937

Device	Routing	Invert	Outlet Devices
#1	Primary	382.00'	36.0" Round Culvert L= 158.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 382.00' / 380.00' S= 0.0127 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 7.07 sf

Primary OutFlow Max=13.68 cfs @ 13.19 hrs HW=383.96' TW=382.53' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 13.68 cfs @ 3.97 fps)

Pond 5: Offsite Pond B

Hydrograph



N60 Phase-1 Pre-Dev B 2021

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NRCC 24-hr A 2-yr Rainfall=3.42"

Printed 2/4/2021

Summary for Reach 5A: Existing Stream B

Inflow Area = 1,510,771 sf, 32.24% Impervious, Inflow Depth > 1.84" for 2-yr event
Inflow = 13.68 cfs @ 13.19 hrs, Volume= 231,419 cf
Outflow = 13.59 cfs @ 13.31 hrs, Volume= 231,383 cf, Atten= 1%, Lag= 7.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 4.99 fps, Min. Travel Time= 9.0 min
Avg. Velocity = 1.21 fps, Avg. Travel Time= 37.2 min

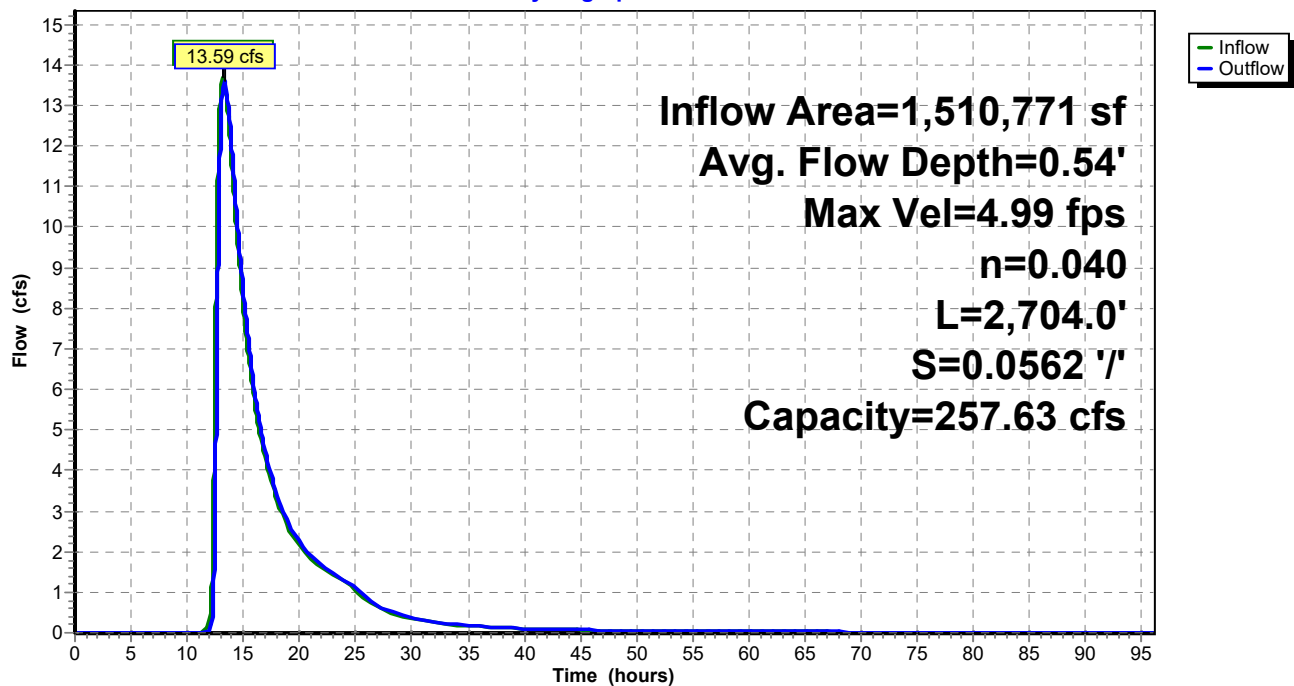
Peak Storage= 7,369 cf @ 13.31 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 2.50' Flow Area= 22.5 sf, Capacity= 257.63 cfs

4.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 2,704.0' Slope= 0.0562 '/'
Inlet Invert= 382.00', Outlet Invert= 230.00'



Reach 5A: Existing Stream B

Hydrograph



N60 Phase-1 Pre-Dev B 2021

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NRCC 24-hr A 2-yr Rainfall=3.42"

Printed 2/4/2021

Summary for Subcatchment 6: Pre B

Runoff = 21.10 cfs @ 12.42 hrs, Volume= 100,103 cf, Depth= 0.96"

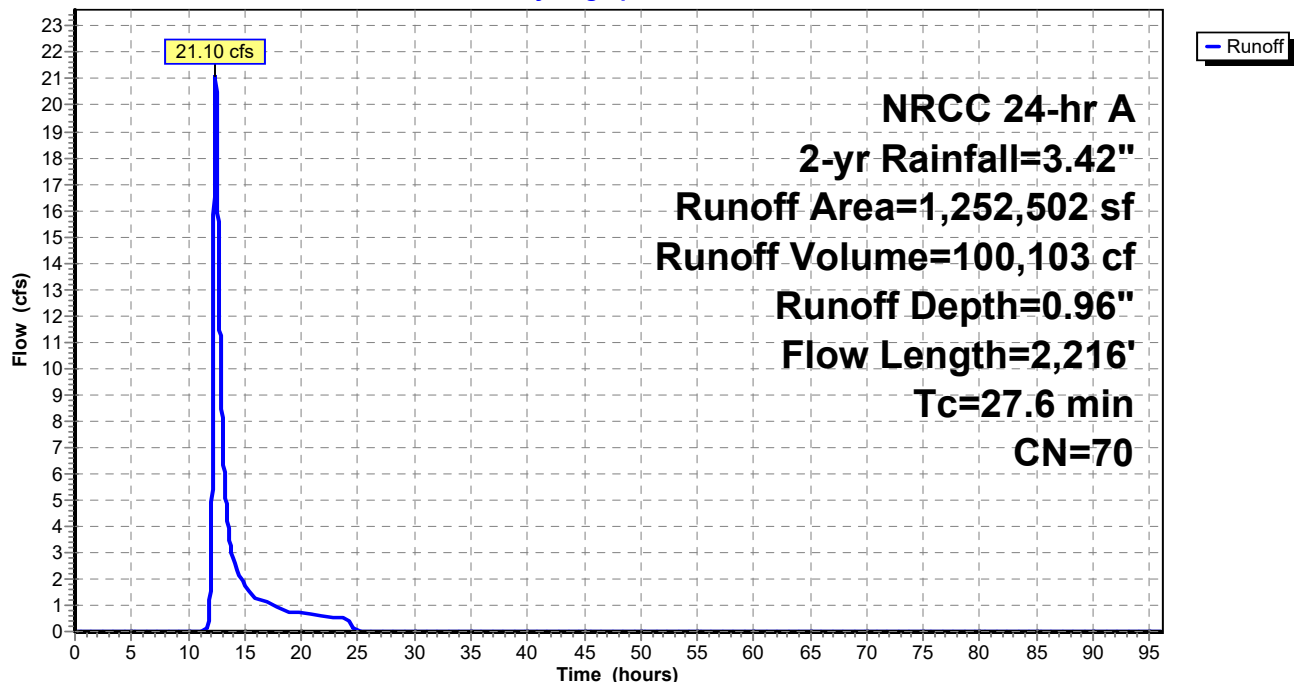
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 2-yr Rainfall=3.42"

Area (sf)	CN	Description
31,823	61	>75% Grass cover, Good, HSG B
32,077	55	Woods, Good, HSG B
38,670	91	Newly graded area, HSG C
18,832	91	Newly graded area, HSG C
1,131,100	70	Woods, Good, HSG C
1,252,502	70	Weighted Average
1,252,502		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0400	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
0.2	64	0.1875	6.97		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
11.8	2,052	0.0663	2.90	5.79	Channel Flow, Area= 2.0 sf Perim= 12.0' r= 0.17' n= 0.040 Winding stream, pools & shoals
27.6	2,216	Total			

Subcatchment 6: Pre B

Hydrograph



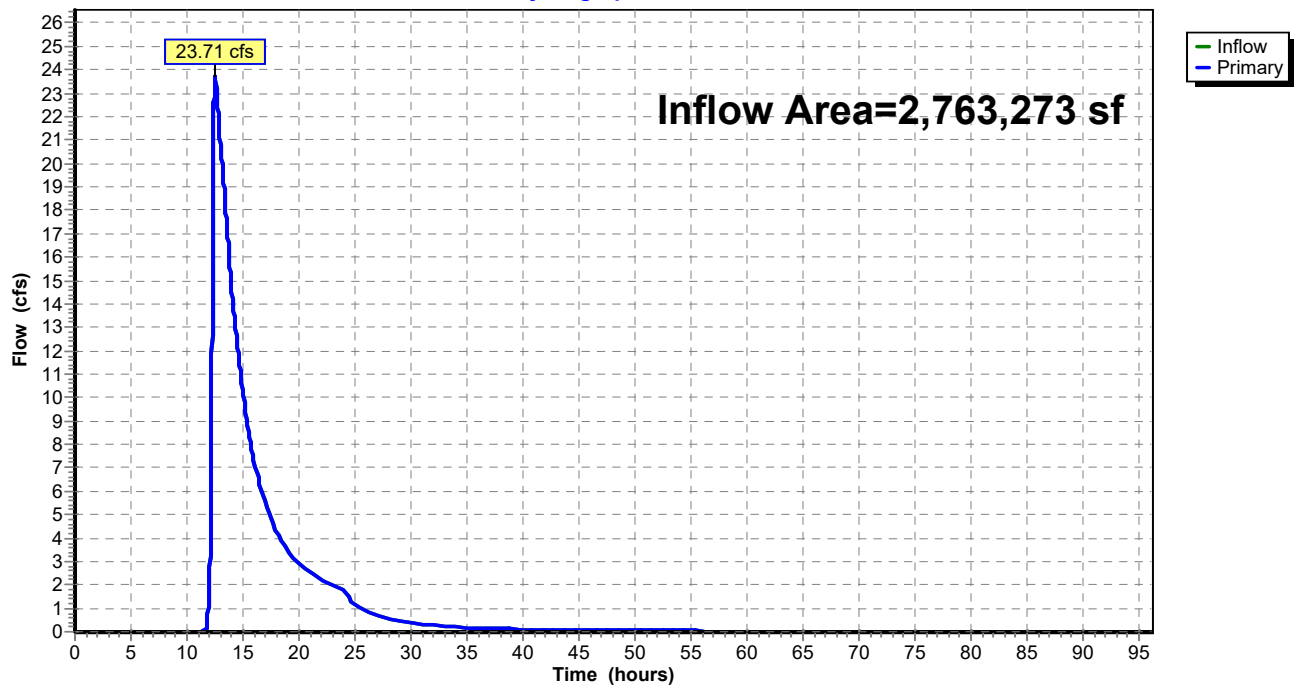
Summary for Link 7: Design Point B

Inflow Area = 2,763,273 sf, 17.63% Impervious, Inflow Depth > 1.44" for 2-yr event
 Inflow = 23.71 cfs @ 12.49 hrs, Volume= 331,486 cf
 Primary = 23.71 cfs @ 12.49 hrs, Volume= 331,486 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 7: Design Point B

Hydrograph



N60 Phase-1 Pre-Dev B 2021

NRCC 24-hr A 10-yr Rainfall=5.12"

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment4: B0 (Offsite)Runoff Area=1,510,771 sf 32.24% Impervious Runoff Depth=3.38"
Flow Length=1,871' Tc=32.3 min CN=84 Runoff=89.40 cfs 425,581 cf**Pond 5: Offsite Pond B**Peak Elev=384.92' Storage=194,403 cf Inflow=89.40 cfs 425,581 cf
36.0" Round Culvert n=0.025 L=158.0' S=0.0127 ' Outflow=29.36 cfs 421,762 cf**Reach 5A: Existing Stream B**Avg. Flow Depth=0.82' Max Vel=6.30 fps Inflow=29.36 cfs 421,762 cf
n=0.040 L=2,704.0' S=0.0562 ' Capacity=257.63 cfs Outflow=29.19 cfs 421,726 cf**Subcatchment6: Pre B**Runoff Area=1,252,502 sf 0.00% Impervious Runoff Depth=2.13"
Flow Length=2,216' Tc=27.6 min CN=70 Runoff=50.08 cfs 221,873 cf**Link 7: Design Point B**Inflow=60.32 cfs 643,599 cf
Primary=60.32 cfs 643,599 cf**Total Runoff Area = 2,763,273 sf Runoff Volume = 647,455 cf Average Runoff Depth = 2.81"**
82.37% Pervious = 2,276,217 sf 17.63% Impervious = 487,056 sf

N60 Phase-1 Pre-Dev B 2021

NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Subcatchment 4: B0 (Offsite)

Runoff = 89.40 cfs @ 12.45 hrs, Volume= 425,581 cf, Depth= 3.38"

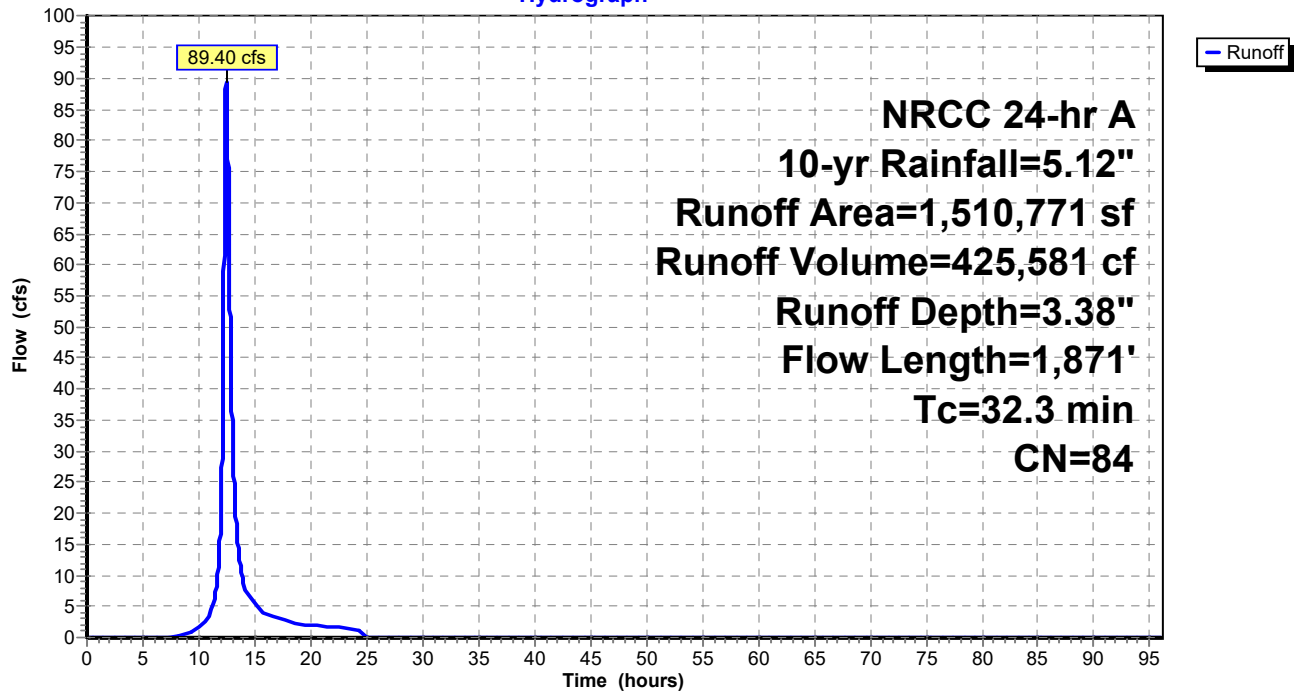
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 10-yr Rainfall=5.12"

Area (sf)	CN	Description
487,056	98	Paved parking, HSG C
497,987	77	Woods, Good, HSG D
134,328	70	Woods, Good, HSG C
375,457	80	>75% Grass cover, Good, HSG D
15,943	74	>75% Grass cover, Good, HSG C
1,510,771	84	Weighted Average
1,023,715		67.76% Pervious Area
487,056		32.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0300	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
9.5	848	0.0085	1.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.1	856	0.0093	2.78	3.06	Trap/Vee/Rect Channel Flow, Bot.W=3.00' D=0.33' Z= 1.0 '/' Top.W=3.66' n= 0.022 Earth, clean & straight
0.2	67	0.0150	6.66	64.08	Pipe Channel, 42.0" Round Area= 9.6 sf Perim= 11.0' r= 0.88' n= 0.025 Corrugated metal
32.3	1,871	Total			

Subcatchment 4: B0 (Offsite)

Hydrograph



N60 Phase-1 Pre-Dev B 2021

NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Pond 5: Offsite Pond B

Inflow Area = 1,510,771 sf, 32.24% Impervious, Inflow Depth = 3.38" for 10-yr event
 Inflow = 89.40 cfs @ 12.45 hrs, Volume= 425,581 cf
 Outflow = 29.36 cfs @ 13.05 hrs, Volume= 421,762 cf, Atten= 67%, Lag= 36.1 min
 Primary = 29.36 cfs @ 13.05 hrs, Volume= 421,762 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 384.92' @ 13.07 hrs Surf.Area= 88,679 sf Storage= 194,403 cf

Plug-Flow detention time= 191.3 min calculated for 421,718 cf (99% of inflow)
 Center-of-Mass det. time= 186.1 min (1,012.2 - 826.0)

Volume	Invert	Avail.Storage	Storage Description
#1	382.00'	610,998 cf	Custom Stage Data (Irregular) Listed below (Recalc)

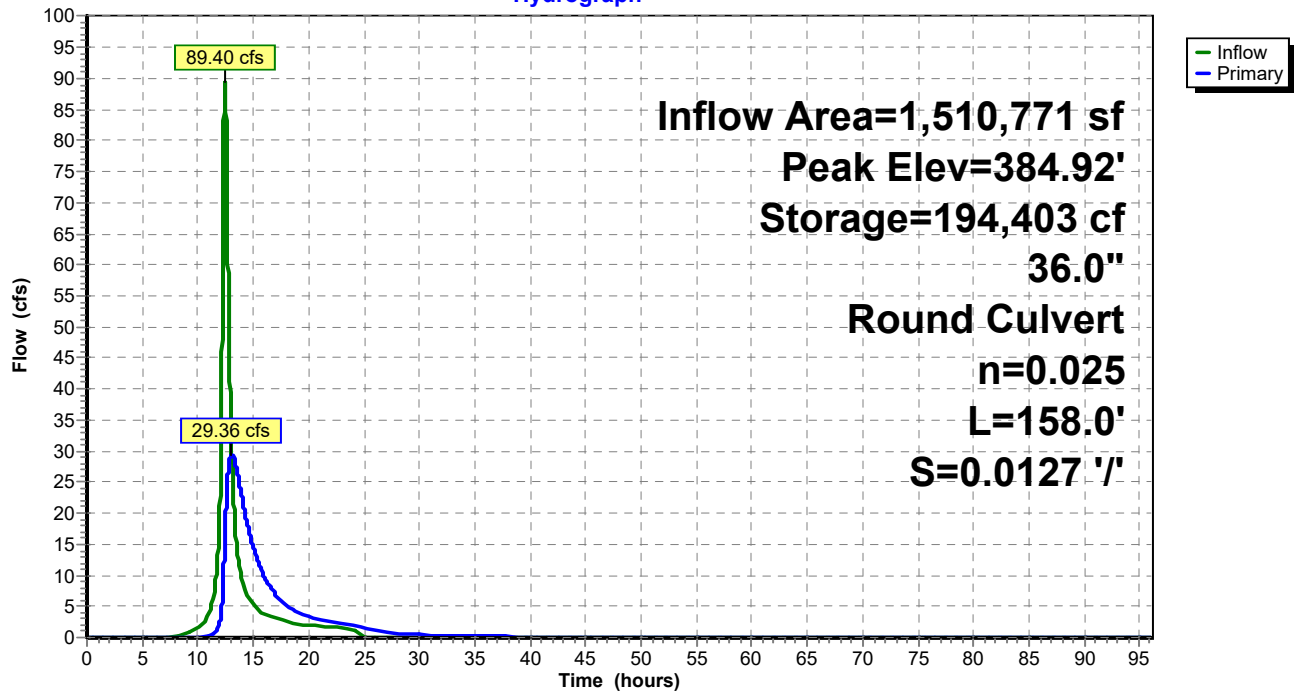
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
382.00	36,540	1,177.0	0	0	36,540
384.00	81,987	1,579.0	115,507	115,507	124,748
386.00	96,790	1,622.0	178,572	294,080	136,159
388.00	108,795	1,657.0	205,468	499,548	145,863
389.00	114,127	1,679.0	111,450	610,998	151,937

Device	Routing	Invert	Outlet Devices
#1	Primary	382.00'	36.0" Round Culvert L= 158.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 382.00' / 380.00' S= 0.0127 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 7.07 sf

Primary OutFlow Max=29.36 cfs @ 13.05 hrs HW=384.92' TW=382.82' (Dynamic Tailwater)
 1=Culvert (Outlet Controls 29.36 cfs @ 5.30 fps)

Pond 5: Offsite Pond B

Hydrograph



N60 Phase-1 Pre-Dev B 2021

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NRCC 24-hr A 10-yr Rainfall=5.12"

Printed 2/4/2021

Summary for Reach 5A: Existing Stream B

Inflow Area = 1,510,771 sf, 32.24% Impervious, Inflow Depth > 3.35" for 10-yr event
Inflow = 29.36 cfs @ 13.05 hrs, Volume= 421,762 cf
Outflow = 29.19 cfs @ 13.15 hrs, Volume= 421,726 cf, Atten= 1%, Lag= 6.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.30 fps, Min. Travel Time= 7.2 min
Avg. Velocity = 1.33 fps, Avg. Travel Time= 33.8 min

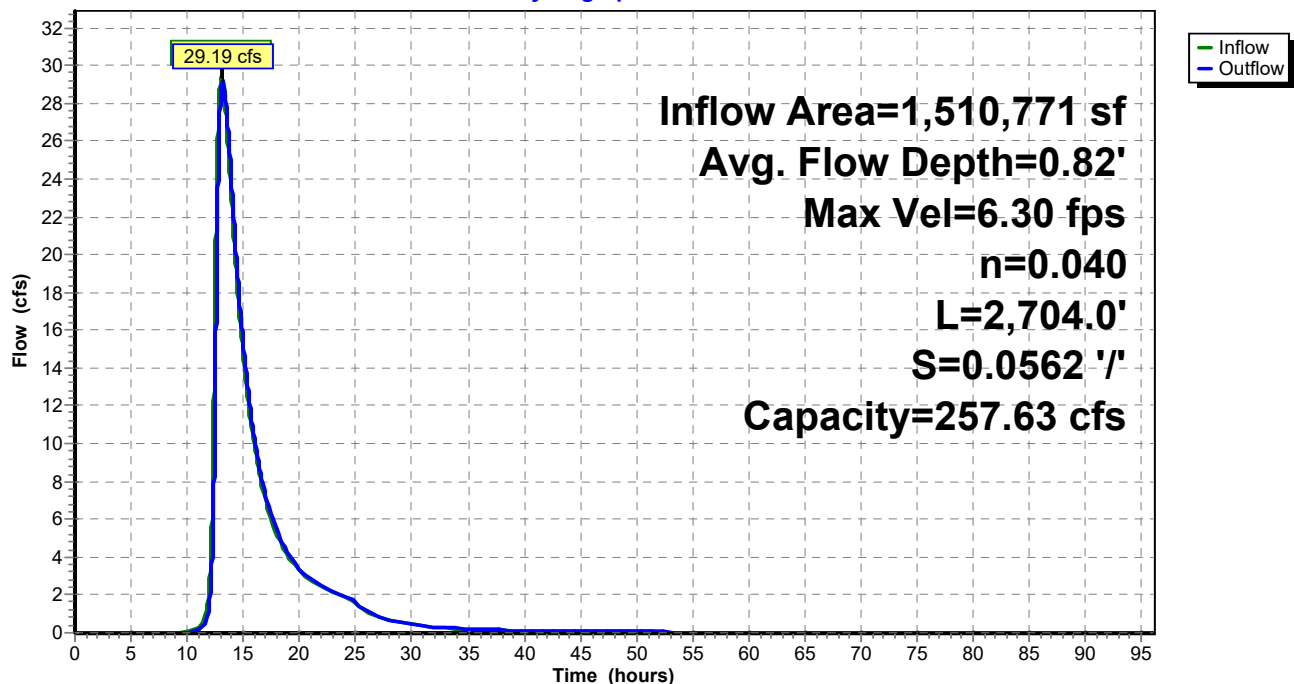
Peak Storage= 12,539 cf @ 13.15 hrs
Average Depth at Peak Storage= 0.82'
Bank-Full Depth= 2.50' Flow Area= 22.5 sf, Capacity= 257.63 cfs

4.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 2,704.0' Slope= 0.0562 '/'
Inlet Invert= 382.00', Outlet Invert= 230.00'



Reach 5A: Existing Stream B

Hydrograph



N60 Phase-1 Pre-Dev B 2021

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NRCC 24-hr A 10-yr Rainfall=5.12"

Printed 2/4/2021

Summary for Subcatchment 6: Pre B

Runoff = 50.08 cfs @ 12.42 hrs, Volume= 221,873 cf, Depth= 2.13"

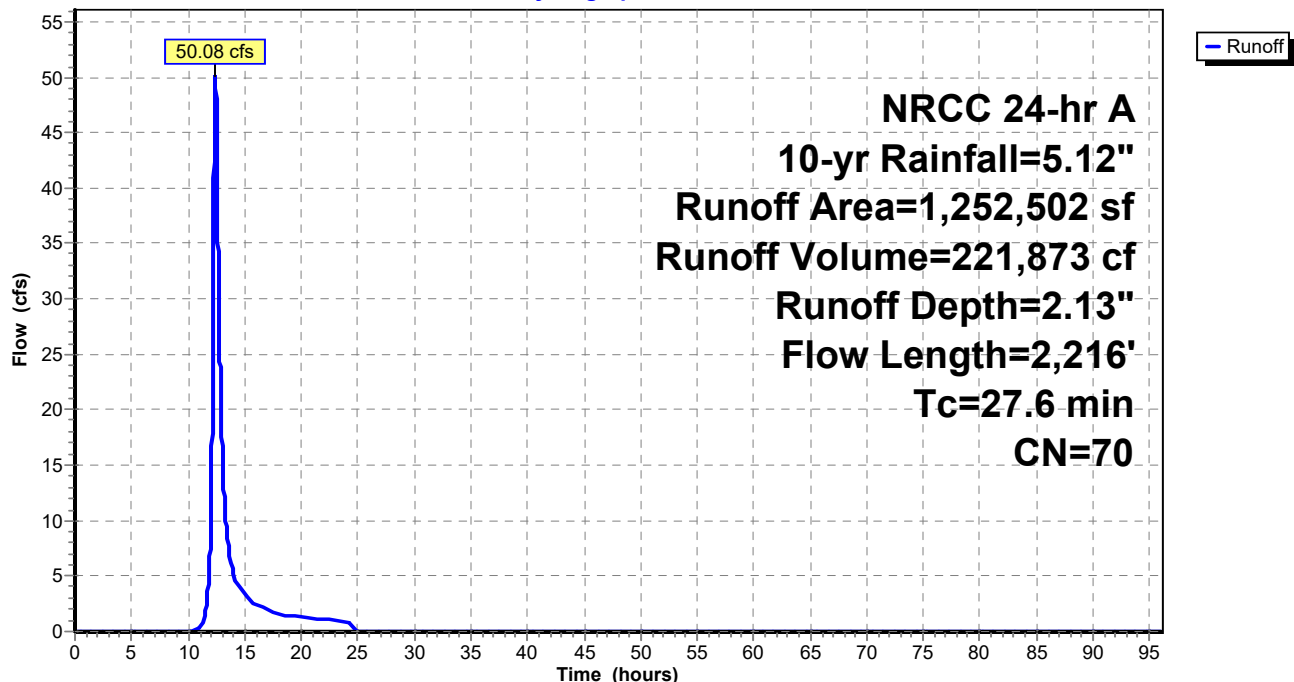
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 10-yr Rainfall=5.12"

Area (sf)	CN	Description
31,823	61	>75% Grass cover, Good, HSG B
32,077	55	Woods, Good, HSG B
38,670	91	Newly graded area, HSG C
18,832	91	Newly graded area, HSG C
1,131,100	70	Woods, Good, HSG C
1,252,502	70	Weighted Average
1,252,502		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0400	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
0.2	64	0.1875	6.97		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
11.8	2,052	0.0663	2.90	5.79	Channel Flow, Area= 2.0 sf Perim= 12.0' r= 0.17' n= 0.040 Winding stream, pools & shoals
27.6	2,216	Total			

Subcatchment 6: Pre B

Hydrograph



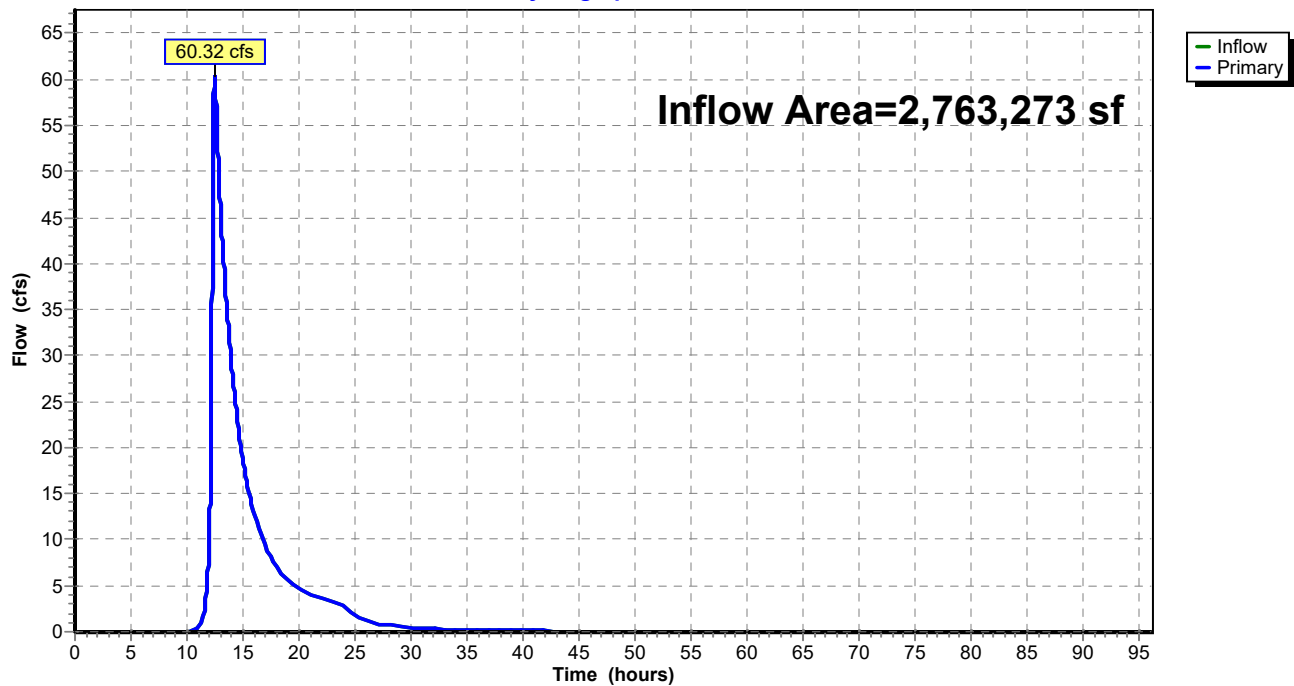
Summary for Link 7: Design Point B

Inflow Area = 2,763,273 sf, 17.63% Impervious, Inflow Depth > 2.79" for 10-yr event
 Inflow = 60.32 cfs @ 12.47 hrs, Volume= 643,599 cf
 Primary = 60.32 cfs @ 12.47 hrs, Volume= 643,599 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 7: Design Point B

Hydrograph



N60 Phase-1 Pre-Dev B 2021

NRCC 24-hr A 25-yr Rainfall=6.46"

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment4: B0 (Offsite)Runoff Area=1,510,771 sf 32.24% Impervious Runoff Depth=4.63"
Flow Length=1,871' Tc=32.3 min CN=84 Runoff=121.32 cfs 582,745 cf**Pond 5: Offsite Pond B**Peak Elev=385.66' Storage=261,986 cf Inflow=121.32 cfs 582,745 cf
36.0" Round Culvert n=0.025 L=158.0' S=0.0127 ' Outflow=40.33 cfs 578,905 cf**Reach 5A: Existing Stream B**Avg. Flow Depth=0.98' Max Vel=6.91 fps Inflow=40.33 cfs 578,905 cf
n=0.040 L=2,704.0' S=0.0562 ' Capacity=257.63 cfs Outflow=40.21 cfs 578,868 cf**Subcatchment6: Pre B**Runoff Area=1,252,502 sf 0.00% Impervious Runoff Depth=3.17"
Flow Length=2,216' Tc=27.6 min CN=70 Runoff=75.66 cfs 331,347 cf**Link 7: Design Point B**Inflow=93.21 cfs 910,215 cf
Primary=93.21 cfs 910,215 cf**Total Runoff Area = 2,763,273 sf Runoff Volume = 914,091 cf Average Runoff Depth = 3.97"**
82.37% Pervious = 2,276,217 sf 17.63% Impervious = 487,056 sf

N60 Phase-1 Pre-Dev B 2021

NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Subcatchment 4: B0 (Offsite)

Runoff = 121.32 cfs @ 12.45 hrs, Volume= 582,745 cf, Depth= 4.63"

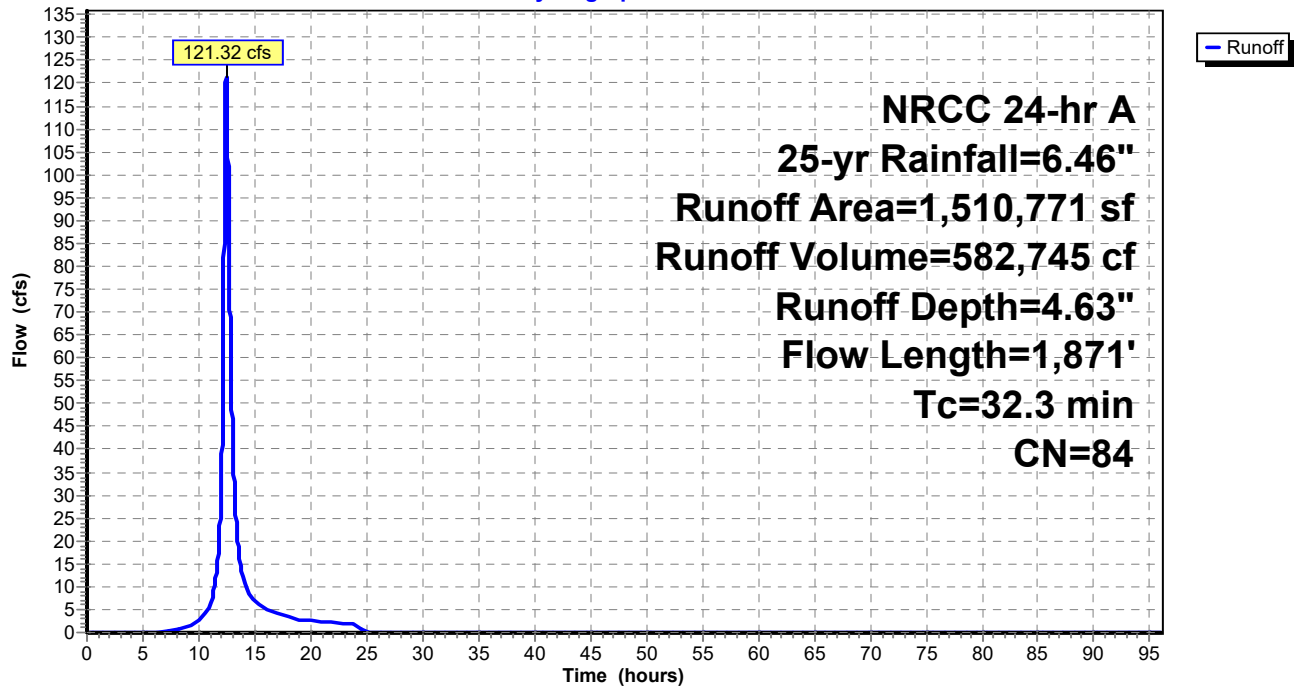
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 25-yr Rainfall=6.46"

Area (sf)	CN	Description
487,056	98	Paved parking, HSG C
497,987	77	Woods, Good, HSG D
134,328	70	Woods, Good, HSG C
375,457	80	>75% Grass cover, Good, HSG D
15,943	74	>75% Grass cover, Good, HSG C
1,510,771	84	Weighted Average
1,023,715		67.76% Pervious Area
487,056		32.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0300	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
9.5	848	0.0085	1.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.1	856	0.0093	2.78	3.06	Trap/Vee/Rect Channel Flow, Bot.W=3.00' D=0.33' Z= 1.0 '/' Top.W=3.66' n= 0.022 Earth, clean & straight
0.2	67	0.0150	6.66	64.08	Pipe Channel, 42.0" Round Area= 9.6 sf Perim= 11.0' r= 0.88' n= 0.025 Corrugated metal
32.3	1,871	Total			

Subcatchment 4: B0 (Offsite)

Hydrograph



N60 Phase-1 Pre-Dev B 2021

NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Pond 5: Offsite Pond B

Inflow Area = 1,510,771 sf, 32.24% Impervious, Inflow Depth = 4.63" for 25-yr event
 Inflow = 121.32 cfs @ 12.45 hrs, Volume= 582,745 cf
 Outflow = 40.33 cfs @ 13.04 hrs, Volume= 578,905 cf, Atten= 67%, Lag= 35.1 min
 Primary = 40.33 cfs @ 13.04 hrs, Volume= 578,905 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 385.66' @ 13.05 hrs Surf.Area= 94,217 sf Storage= 261,986 cf

Plug-Flow detention time= 169.8 min calculated for 578,905 cf (99% of inflow)
 Center-of-Mass det. time= 165.6 min (984.1 - 818.5)

Volume	Invert	Avail.Storage	Storage Description
#1	382.00'	610,998 cf	Custom Stage Data (Irregular) Listed below (Recalc)

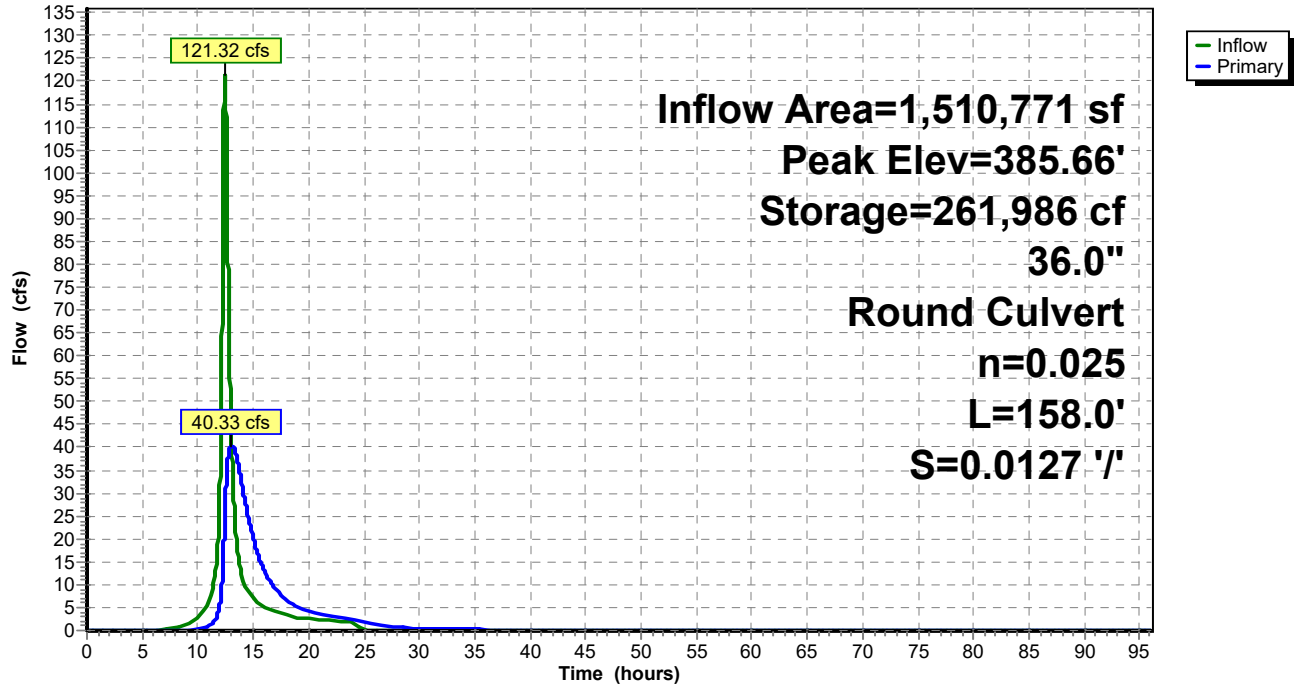
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
382.00	36,540	1,177.0	0	0	36,540
384.00	81,987	1,579.0	115,507	115,507	124,748
386.00	96,790	1,622.0	178,572	294,080	136,159
388.00	108,795	1,657.0	205,468	499,548	145,863
389.00	114,127	1,679.0	111,450	610,998	151,937

Device	Routing	Invert	Outlet Devices
#1	Primary	382.00'	36.0" Round Culvert L= 158.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 382.00' / 380.00' S= 0.0127 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 7.07 sf

Primary OutFlow Max=40.33 cfs @ 13.04 hrs HW=385.66' TW=382.97' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 40.33 cfs @ 5.95 fps)

Pond 5: Offsite Pond B

Hydrograph



N60 Phase-1 Pre-Dev B 2021

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NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Reach 5A: Existing Stream B

Inflow Area = 1,510,771 sf, 32.24% Impervious, Inflow Depth > 4.60" for 25-yr event
Inflow = 40.33 cfs @ 13.04 hrs, Volume= 578,905 cf
Outflow = 40.21 cfs @ 13.13 hrs, Volume= 578,868 cf, Atten= 0%, Lag= 5.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.91 fps, Min. Travel Time= 6.5 min
Avg. Velocity = 1.41 fps, Avg. Travel Time= 32.0 min

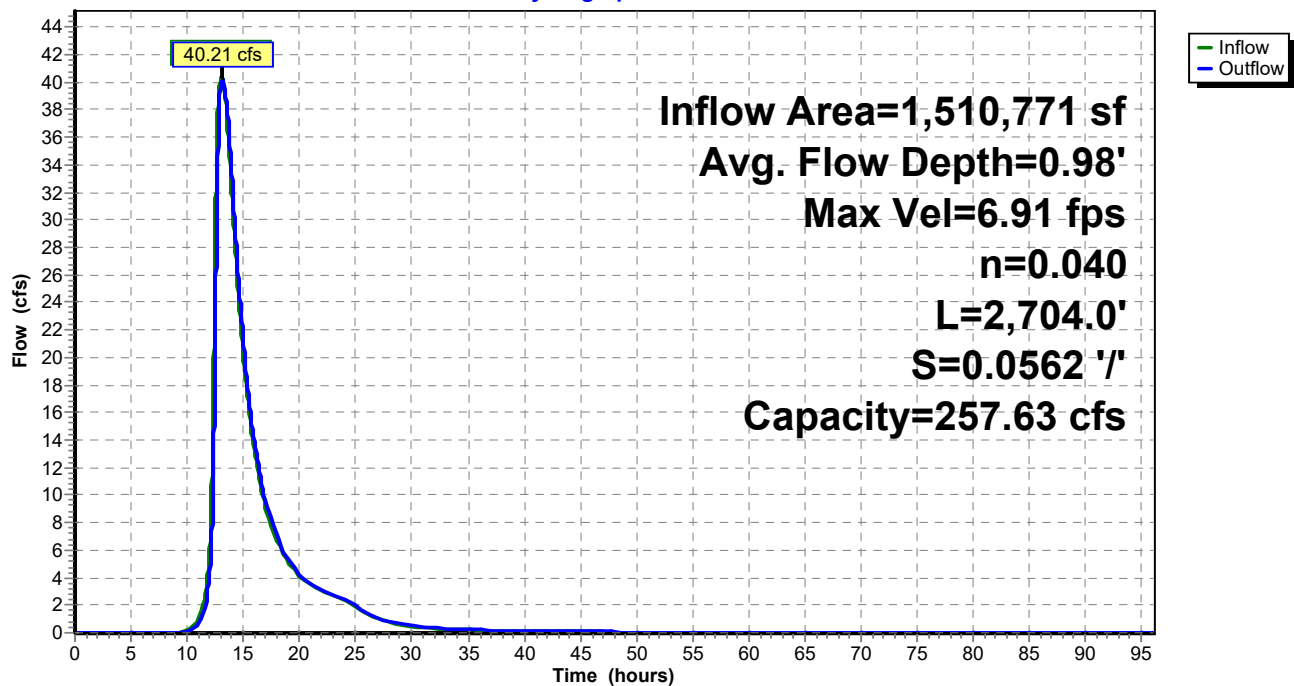
Peak Storage= 15,731 cf @ 13.13 hrs
Average Depth at Peak Storage= 0.98'
Bank-Full Depth= 2.50' Flow Area= 22.5 sf, Capacity= 257.63 cfs

4.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 ' ' Top Width= 14.00'
Length= 2,704.0' Slope= 0.0562 ' '
Inlet Invert= 382.00', Outlet Invert= 230.00'



Reach 5A: Existing Stream B

Hydrograph



N60 Phase-1 Pre-Dev B 2021

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NRCC 24-hr A 25-yr Rainfall=6.46"

Printed 2/4/2021

Summary for Subcatchment 6: Pre B

Runoff = 75.66 cfs @ 12.41 hrs, Volume= 331,347 cf, Depth= 3.17"

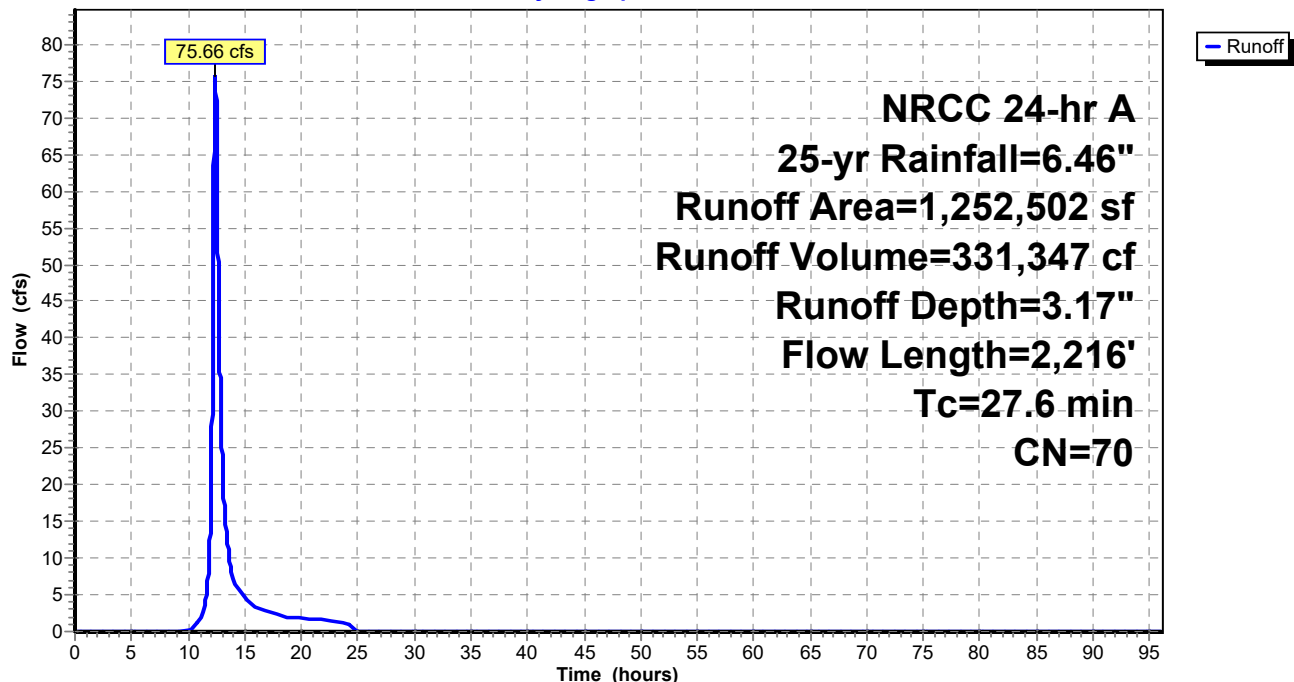
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 25-yr Rainfall=6.46"

Area (sf)	CN	Description
31,823	61	>75% Grass cover, Good, HSG B
32,077	55	Woods, Good, HSG B
38,670	91	Newly graded area, HSG C
18,832	91	Newly graded area, HSG C
1,131,100	70	Woods, Good, HSG C
1,252,502	70	Weighted Average
1,252,502		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0400	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
0.2	64	0.1875	6.97		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
11.8	2,052	0.0663	2.90	5.79	Channel Flow, Area= 2.0 sf Perim= 12.0' r= 0.17' n= 0.040 Winding stream, pools & shoals
27.6	2,216	Total			

Subcatchment 6: Pre B

Hydrograph



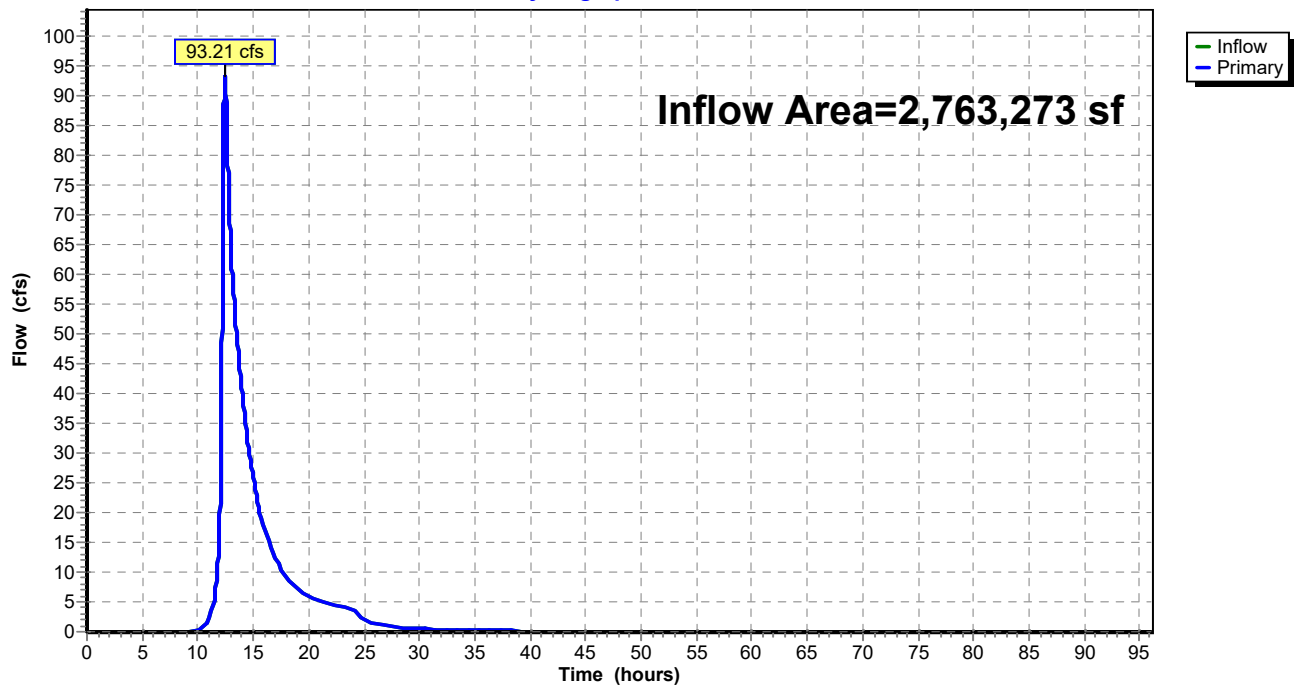
Summary for Link 7: Design Point B

Inflow Area = 2,763,273 sf, 17.63% Impervious, Inflow Depth > 3.95" for 25-yr event
 Inflow = 93.21 cfs @ 12.45 hrs, Volume= 910,215 cf
 Primary = 93.21 cfs @ 12.45 hrs, Volume= 910,215 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 7: Design Point B

Hydrograph



N60 Phase-1 Pre-Dev B 2021

NRCC 24-hr A 50-yr Rainfall=7.70"

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment4: B0 (Offsite)Runoff Area=1,510,771 sf 32.24% Impervious Runoff Depth=5.81"
Flow Length=1,871' Tc=32.3 min CN=84 Runoff=150.90 cfs 731,166 cf**Pond 5: Offsite Pond B**Peak Elev=386.42' Storage=335,602 cf Inflow=150.90 cfs 731,166 cf
36.0" Round Culvert n=0.025 L=158.0' S=0.0127 ' Outflow=43.68 cfs 727,311 cf**Reach 5A: Existing Stream B**Avg. Flow Depth=1.02' Max Vel=7.08 fps Inflow=43.68 cfs 727,311 cf
n=0.040 L=2,704.0' S=0.0562 ' Capacity=257.63 cfs Outflow=43.62 cfs 727,274 cf**Subcatchment6: Pre B**Runoff Area=1,252,502 sf 0.00% Impervious Runoff Depth=4.21"
Flow Length=2,216' Tc=27.6 min CN=70 Runoff=100.65 cfs 439,170 cf**Link 7: Design Point B**Inflow=125.08 cfs 1,166,444 cf
Primary=125.08 cfs 1,166,444 cf**Total Runoff Area = 2,763,273 sf Runoff Volume = 1,170,336 cf Average Runoff Depth = 5.08"**
82.37% Pervious = 2,276,217 sf 17.63% Impervious = 487,056 sf

N60 Phase-1 Pre-Dev B 2021

NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Subcatchment 4: B0 (Offsite)

Runoff = 150.90 cfs @ 12.45 hrs, Volume= 731,166 cf, Depth= 5.81"

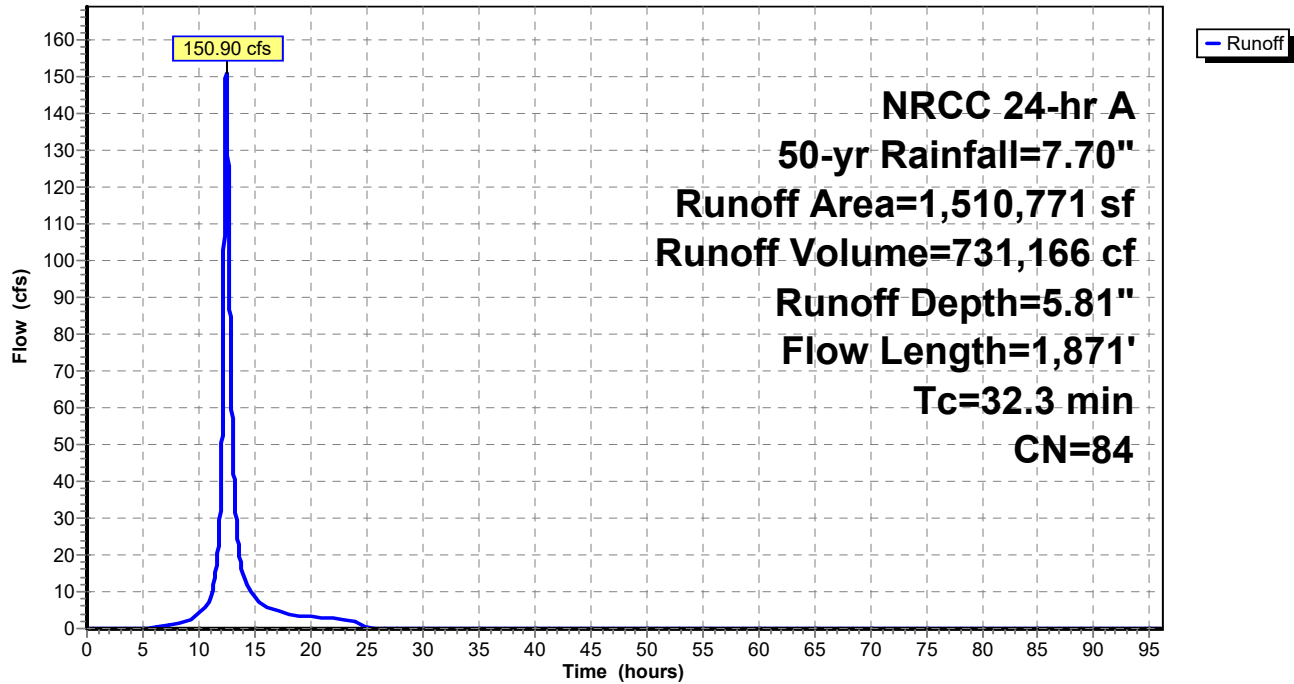
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 50-yr Rainfall=7.70"

Area (sf)	CN	Description
487,056	98	Paved parking, HSG C
497,987	77	Woods, Good, HSG D
134,328	70	Woods, Good, HSG C
375,457	80	>75% Grass cover, Good, HSG D
15,943	74	>75% Grass cover, Good, HSG C
1,510,771	84	Weighted Average
1,023,715		67.76% Pervious Area
487,056		32.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0300	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
9.5	848	0.0085	1.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.1	856	0.0093	2.78	3.06	Trap/Vee/Rect Channel Flow, Bot.W=3.00' D=0.33' Z= 1.0 '/' Top.W=3.66' n= 0.022 Earth, clean & straight
0.2	67	0.0150	6.66	64.08	Pipe Channel, 42.0" Round Area= 9.6 sf Perim= 11.0' r= 0.88' n= 0.025 Corrugated metal
32.3	1,871	Total			

Subcatchment 4: B0 (Offsite)

Hydrograph



N60 Phase-1 Pre-Dev B 2021

NRCC 24-hr A 50-yr Rainfall=7.70"

Prepared by {enter your company name here}

Printed 2/4/2021

HydroCAD® 10.00-24 s/n 02226 © 2018 HydroCAD Software Solutions LLC

Summary for Pond 5: Offsite Pond B

Inflow Area = 1,510,771 sf, 32.24% Impervious, Inflow Depth = 5.81" for 50-yr event
 Inflow = 150.90 cfs @ 12.45 hrs, Volume= 731,166 cf
 Outflow = 43.68 cfs @ 13.11 hrs, Volume= 727,311 cf, Atten= 71%, Lag= 39.4 min
 Primary = 43.68 cfs @ 13.11 hrs, Volume= 727,311 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 386.42' @ 13.11 hrs Surf.Area= 99,274 sf Storage= 335,602 cf

Plug-Flow detention time= 161.9 min calculated for 727,236 cf (99% of inflow)
 Center-of-Mass det. time= 158.9 min (972.1 - 813.2)

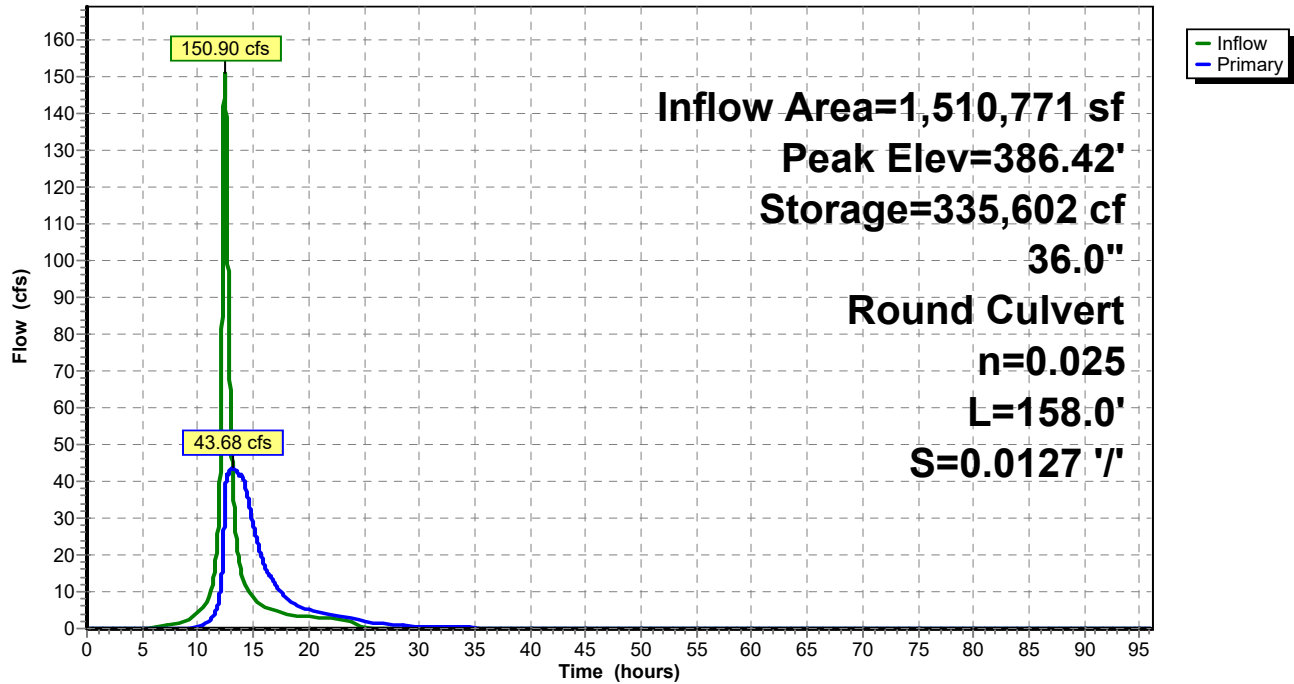
Volume	Invert	Avail.Storage	Storage Description		
#1	382.00'	610,998 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
382.00	36,540	1,177.0	0	0	36,540
384.00	81,987	1,579.0	115,507	115,507	124,748
386.00	96,790	1,622.0	178,572	294,080	136,159
388.00	108,795	1,657.0	205,468	499,548	145,863
389.00	114,127	1,679.0	111,450	610,998	151,937

Device	Routing	Invert	Outlet Devices
#1	Primary	382.00'	36.0" Round Culvert L= 158.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 382.00' / 380.00' S= 0.0127 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 7.07 sf

Primary OutFlow Max=43.68 cfs @ 13.11 hrs HW=386.42' TW=383.02' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 43.68 cfs @ 6.18 fps)

Pond 5: Offsite Pond B

Hydrograph



N60 Phase-1 Pre-Dev B 2021

Prepared by {enter your company name here}

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NRCC 24-hr A 50-yr Rainfall=7.70"

Printed 2/4/2021

Summary for Reach 5A: Existing Stream B

Inflow Area = 1,510,771 sf, 32.24% Impervious, Inflow Depth > 5.78" for 50-yr event
Inflow = 43.68 cfs @ 13.11 hrs, Volume= 727,311 cf
Outflow = 43.62 cfs @ 13.19 hrs, Volume= 727,274 cf, Atten= 0%, Lag= 5.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.08 fps, Min. Travel Time= 6.4 min
Avg. Velocity = 1.48 fps, Avg. Travel Time= 30.5 min

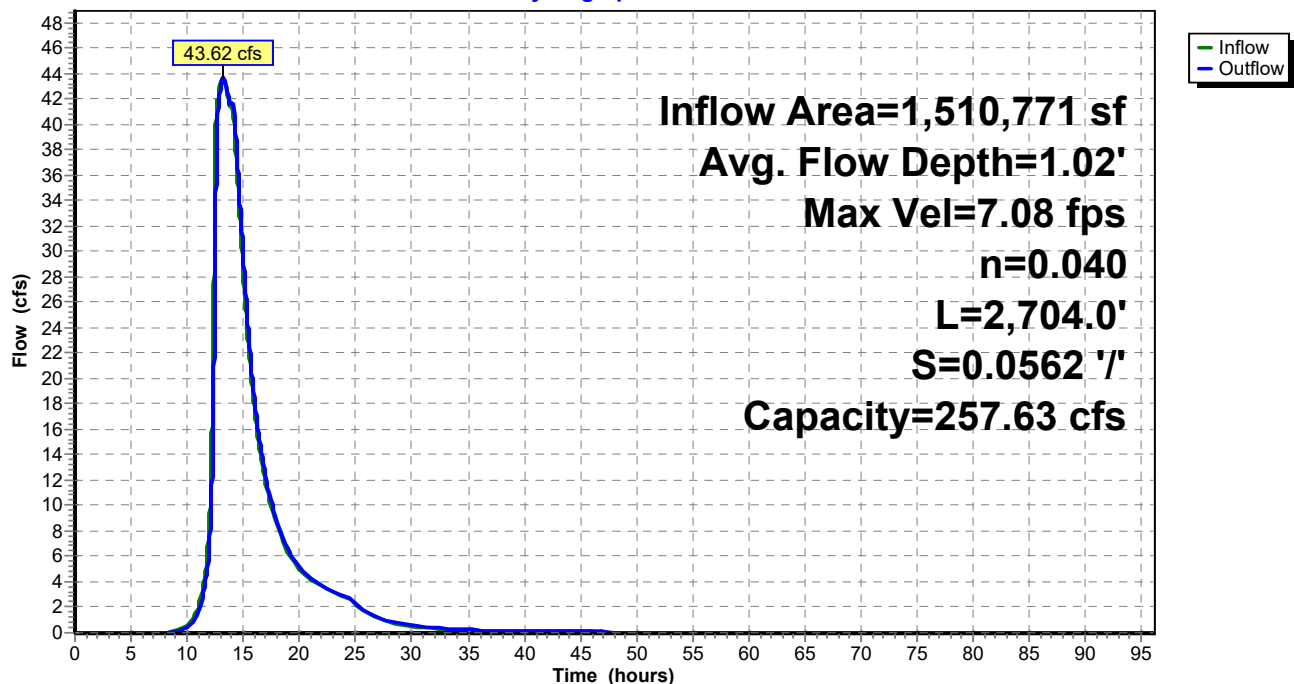
Peak Storage= 16,670 cf @ 13.19 hrs
Average Depth at Peak Storage= 1.02'
Bank-Full Depth= 2.50' Flow Area= 22.5 sf, Capacity= 257.63 cfs

4.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 2,704.0' Slope= 0.0562 '/'
Inlet Invert= 382.00', Outlet Invert= 230.00'



Reach 5A: Existing Stream B

Hydrograph



N60 Phase-1 Pre-Dev B 2021

Prepared by {enter your company name here}

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NRCC 24-hr A 50-yr Rainfall=7.70"

Printed 2/4/2021

Summary for Subcatchment 6: Pre B

Runoff = 100.65 cfs @ 12.39 hrs, Volume= 439,170 cf, Depth= 4.21"

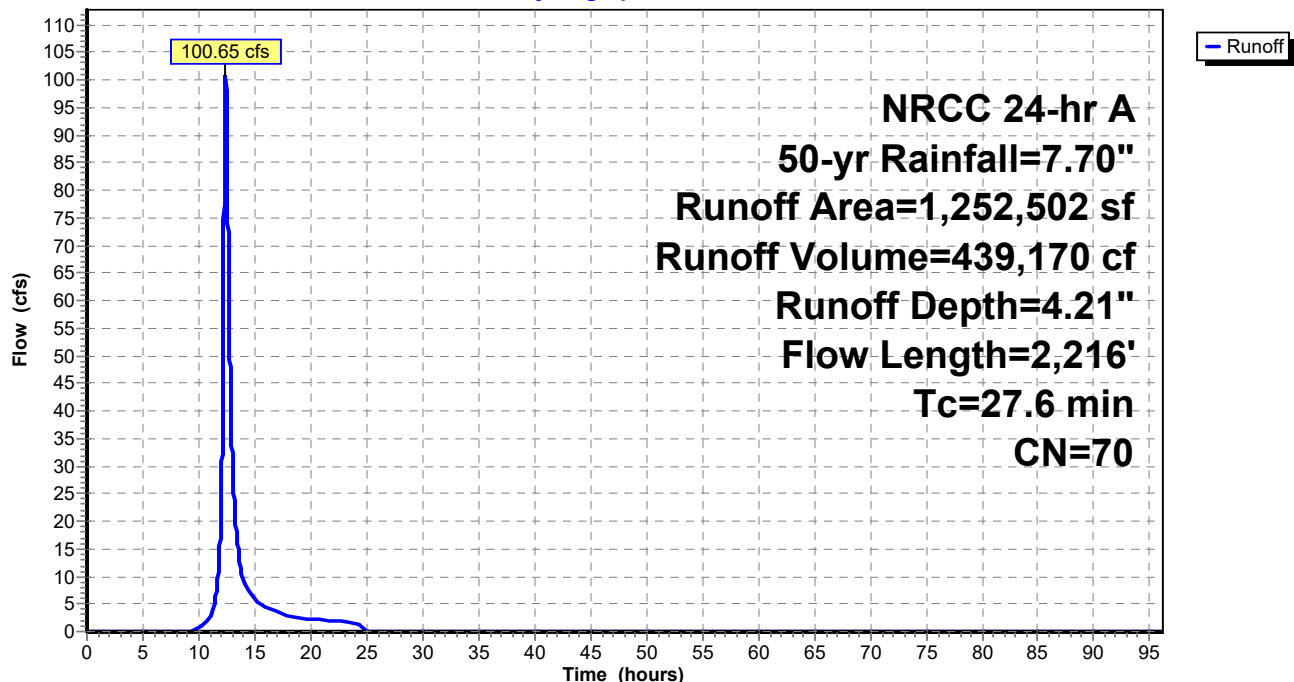
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 50-yr Rainfall=7.70"

Area (sf)	CN	Description
31,823	61	>75% Grass cover, Good, HSG B
32,077	55	Woods, Good, HSG B
38,670	91	Newly graded area, HSG C
18,832	91	Newly graded area, HSG C
1,131,100	70	Woods, Good, HSG C
1,252,502	70	Weighted Average
1,252,502		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0400	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
0.2	64	0.1875	6.97		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
11.8	2,052	0.0663	2.90	5.79	Channel Flow, Area= 2.0 sf Perim= 12.0' r= 0.17' n= 0.040 Winding stream, pools & shoals
27.6	2,216	Total			

Subcatchment 6: Pre B

Hydrograph

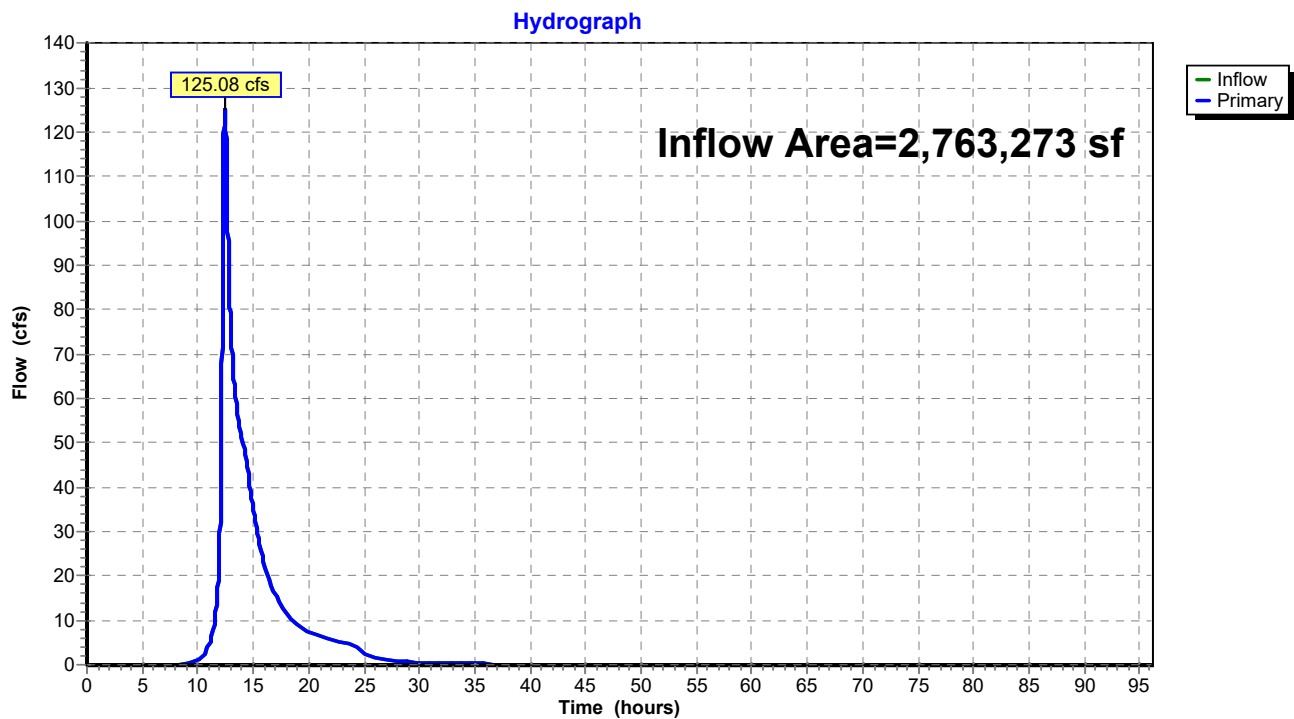


Summary for Link 7: Design Point B

Inflow Area = 2,763,273 sf, 17.63% Impervious, Inflow Depth = 5.07" for 50-yr event
 Inflow = 125.08 cfs @ 12.43 hrs, Volume= 1,166,444 cf
 Primary = 125.08 cfs @ 12.43 hrs, Volume= 1,166,444 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 7: Design Point B



N60 Phase-1 Pre-Dev B 2021

NRCC 24-hr A 100-yr Rainfall=9.18"

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment4: B0 (Offsite)Runoff Area=1,510,771 sf 32.24% Impervious Runoff Depth=7.23"
Flow Length=1,871' Tc=32.3 min CN=84 Runoff=186.10 cfs 910,648 cf**Pond 5: Offsite Pond B**Peak Elev=387.32' Storage=427,294 cf Inflow=186.10 cfs 910,648 cf
36.0" Round Culvert n=0.025 L=158.0' S=0.0127 ' Outflow=48.76 cfs 906,778 cf**Reach 5A: Existing Stream B**Avg. Flow Depth=1.08' Max Vel=7.30 fps Inflow=48.76 cfs 906,778 cf
n=0.040 L=2,704.0' S=0.0562 ' Capacity=257.63 cfs Outflow=48.71 cfs 906,741 cf**Subcatchment6: Pre B**Runoff Area=1,252,502 sf 0.00% Impervious Runoff Depth=5.49"
Flow Length=2,216' Tc=27.6 min CN=70 Runoff=131.36 cfs 573,424 cf**Link 7: Design Point B**Inflow=163.56 cfs 1,480,165 cf
Primary=163.56 cfs 1,480,165 cf**Total Runoff Area = 2,763,273 sf Runoff Volume = 1,484,072 cf Average Runoff Depth = 6.44"**
82.37% Pervious = 2,276,217 sf 17.63% Impervious = 487,056 sf

N60 Phase-1 Pre-Dev B 2021

NRCC 24-hr A 100-yr Rainfall=9.18"

Prepared by {enter your company name here}

Printed 2/4/2021

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Summary for Subcatchment 4: B0 (Offsite)

Runoff = 186.10 cfs @ 12.45 hrs, Volume= 910,648 cf, Depth= 7.23"

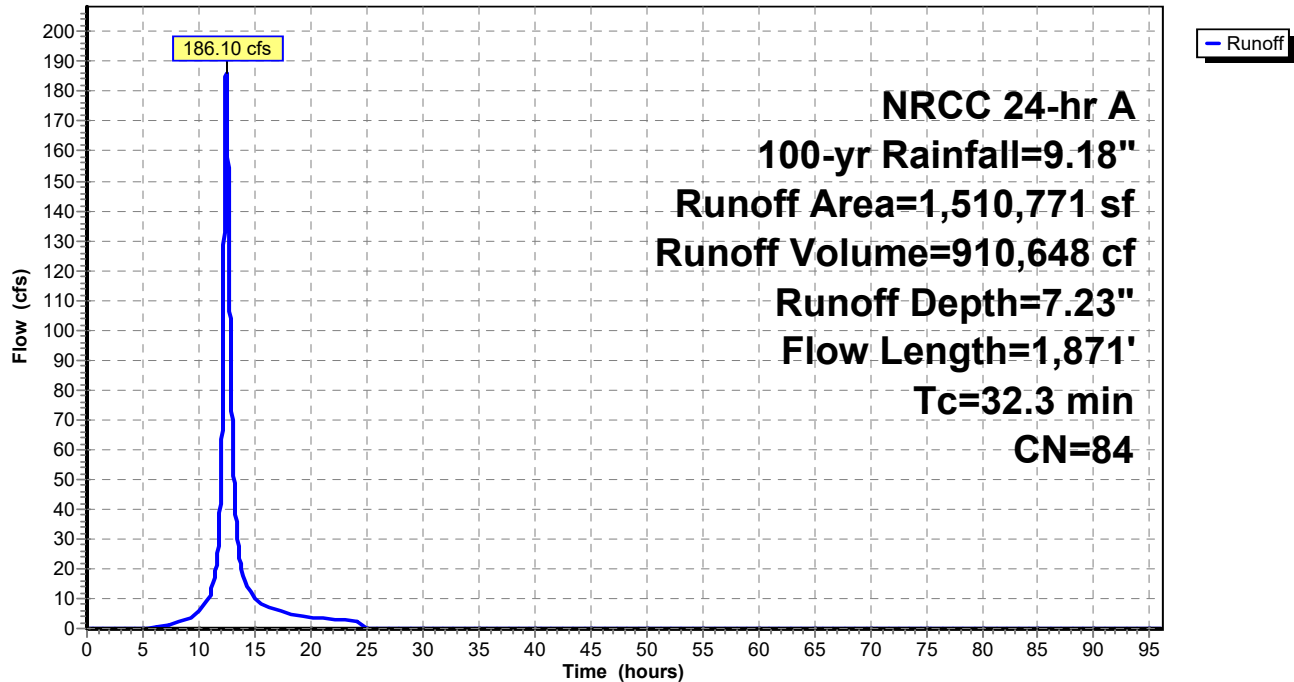
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 100-yr Rainfall=9.18"

Area (sf)	CN	Description
487,056	98	Paved parking, HSG C
497,987	77	Woods, Good, HSG D
134,328	70	Woods, Good, HSG C
375,457	80	>75% Grass cover, Good, HSG D
15,943	74	>75% Grass cover, Good, HSG C
1,510,771	84	Weighted Average
1,023,715		67.76% Pervious Area
487,056		32.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0300	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
9.5	848	0.0085	1.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.1	856	0.0093	2.78	3.06	Trap/Vee/Rect Channel Flow, Bot.W=3.00' D=0.33' Z= 1.0 '/' Top.W=3.66' n= 0.022 Earth, clean & straight
0.2	67	0.0150	6.66	64.08	Pipe Channel, 42.0" Round Area= 9.6 sf Perim= 11.0' r= 0.88' n= 0.025 Corrugated metal
32.3	1,871	Total			

Subcatchment 4: B0 (Offsite)

Hydrograph



N60 Phase-1 Pre-Dev B 2021

NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Pond 5: Offsite Pond B

Inflow Area = 1,510,771 sf, 32.24% Impervious, Inflow Depth = 7.23" for 100-yr event
 Inflow = 186.10 cfs @ 12.45 hrs, Volume= 910,648 cf
 Outflow = 48.76 cfs @ 13.16 hrs, Volume= 906,778 cf, Atten= 74%, Lag= 42.5 min
 Primary = 48.76 cfs @ 13.16 hrs, Volume= 906,778 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 387.32' @ 13.16 hrs Surf.Area= 104,652 sf Storage= 427,294 cf

Plug-Flow detention time= 159.7 min calculated for 906,684 cf (100% of inflow)
 Center-of-Mass det. time= 157.4 min (965.4 - 808.0)

Volume	Invert	Avail.Storage	Storage Description
#1	382.00'	610,998 cf	Custom Stage Data (Irregular) Listed below (Recalc)

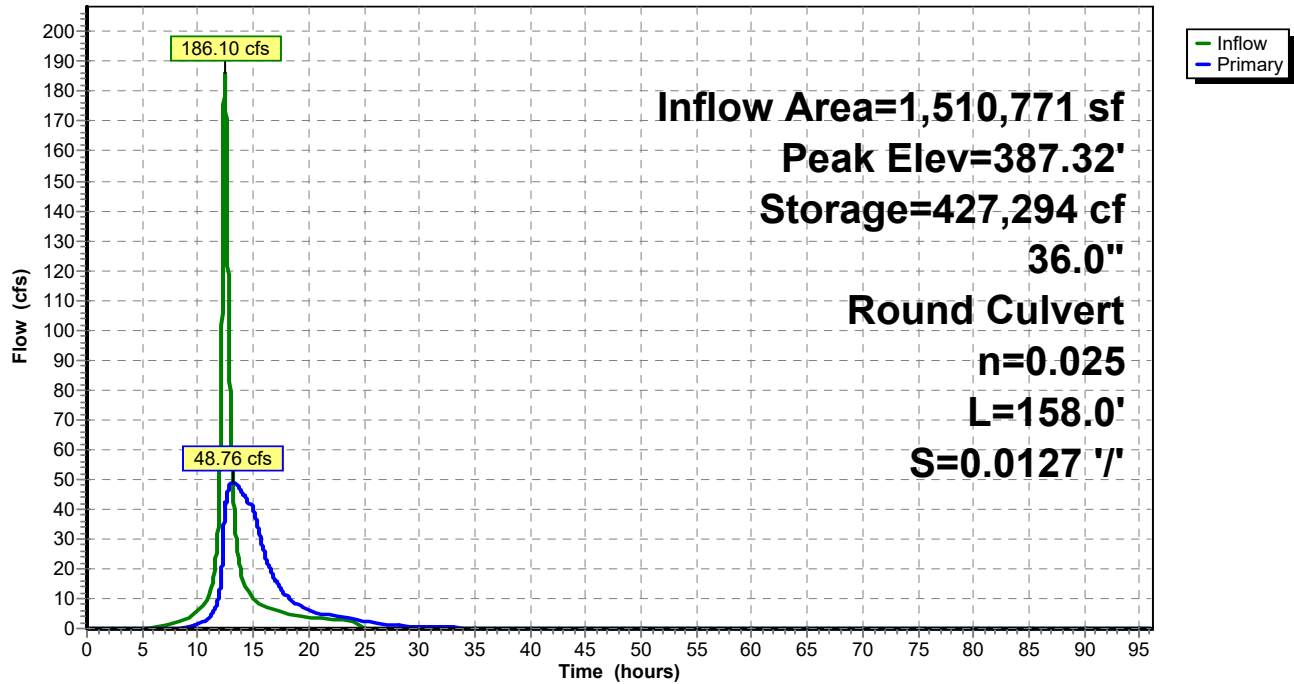
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
382.00	36,540	1,177.0	0	0	36,540
384.00	81,987	1,579.0	115,507	115,507	124,748
386.00	96,790	1,622.0	178,572	294,080	136,159
388.00	108,795	1,657.0	205,468	499,548	145,863
389.00	114,127	1,679.0	111,450	610,998	151,937

Device	Routing	Invert	Outlet Devices
#1	Primary	382.00'	36.0" Round Culvert L= 158.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 382.00' / 380.00' S= 0.0127 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 7.07 sf

Primary OutFlow Max=48.75 cfs @ 13.16 hrs HW=387.32' TW=383.08' (Dynamic Tailwater)
 ↑**1=Culvert** (Outlet Controls 48.75 cfs @ 6.90 fps)

Pond 5: Offsite Pond B

Hydrograph



N60 Phase-1 Pre-Dev B 2021

Prepared by {enter your company name here}

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NRCC 24-hr A 100-yr Rainfall=9.18"

Printed 2/4/2021

Summary for Reach 5A: Existing Stream B

Inflow Area = 1,510,771 sf, 32.24% Impervious, Inflow Depth > 7.20" for 100-yr event
Inflow = 48.76 cfs @ 13.16 hrs, Volume= 906,778 cf
Outflow = 48.71 cfs @ 13.24 hrs, Volume= 906,741 cf, Atten= 0%, Lag= 5.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 7.30 fps, Min. Travel Time= 6.2 min
Avg. Velocity = 1.55 fps, Avg. Travel Time= 29.0 min

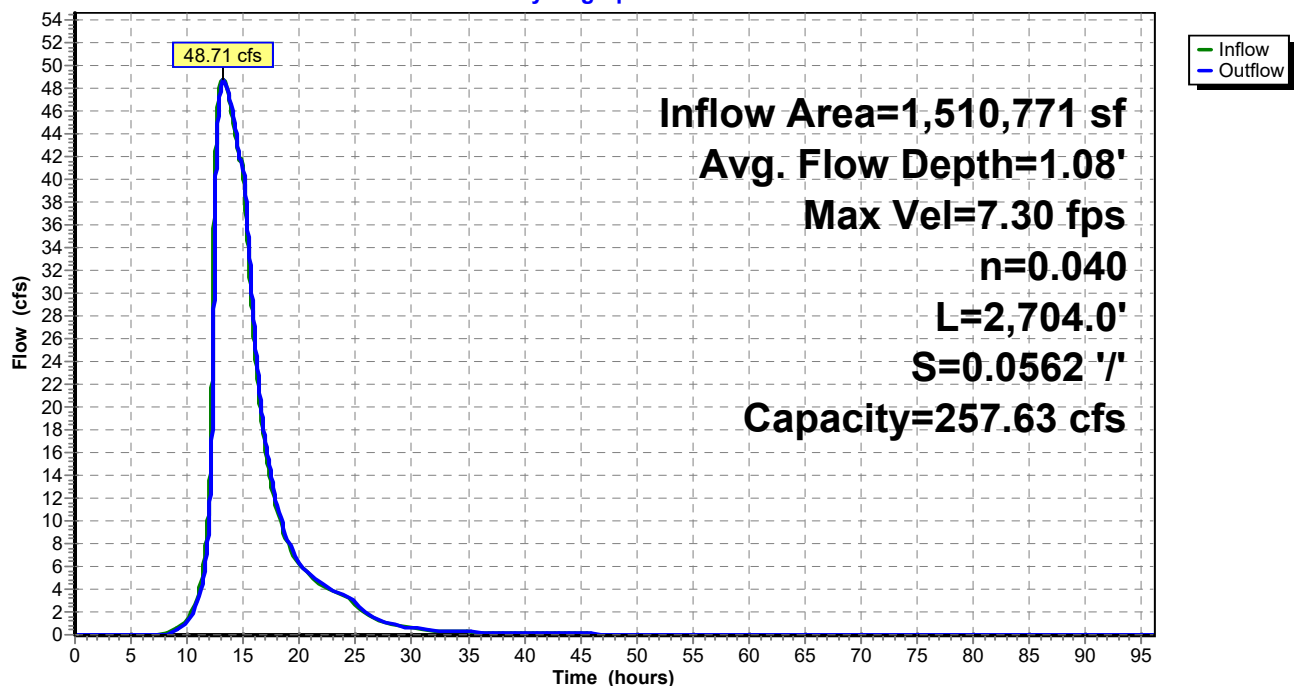
Peak Storage= 18,038 cf @ 13.24 hrs
Average Depth at Peak Storage= 1.08'
Bank-Full Depth= 2.50' Flow Area= 22.5 sf, Capacity= 257.63 cfs

4.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 2,704.0' Slope= 0.0562 '/'
Inlet Invert= 382.00', Outlet Invert= 230.00'



Reach 5A: Existing Stream B

Hydrograph



N60 Phase-1 Pre-Dev B 2021

Prepared by {enter your company name here}

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NRCC 24-hr A 100-yr Rainfall=9.18"

Printed 2/4/2021

Summary for Subcatchment 6: Pre B

Runoff = 131.36 cfs @ 12.39 hrs, Volume= 573,424 cf, Depth= 5.49"

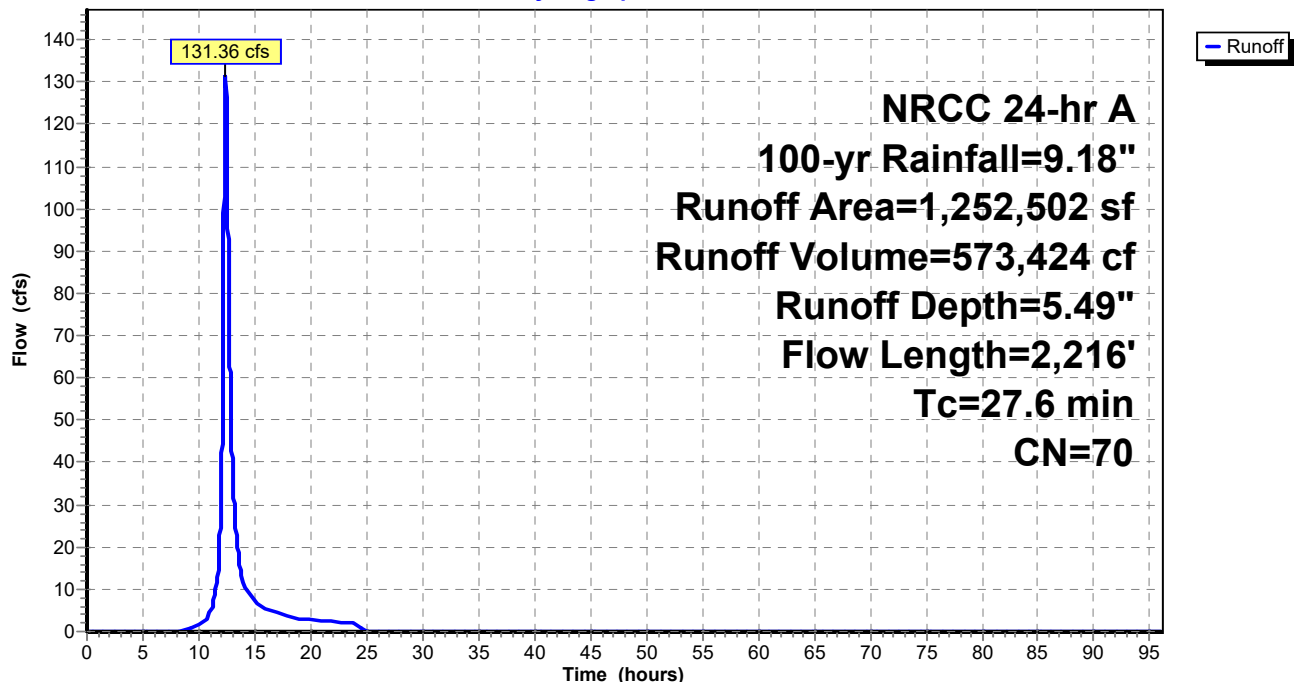
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 100-yr Rainfall=9.18"

Area (sf)	CN	Description
31,823	61	>75% Grass cover, Good, HSG B
32,077	55	Woods, Good, HSG B
38,670	91	Newly graded area, HSG C
18,832	91	Newly graded area, HSG C
1,131,100	70	Woods, Good, HSG C
1,252,502	70	Weighted Average
1,252,502		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0400	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
0.2	64	0.1875	6.97		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
11.8	2,052	0.0663	2.90	5.79	Channel Flow, Area= 2.0 sf Perim= 12.0' r= 0.17' n= 0.040 Winding stream, pools & shoals
27.6	2,216	Total			

Subcatchment 6: Pre B

Hydrograph



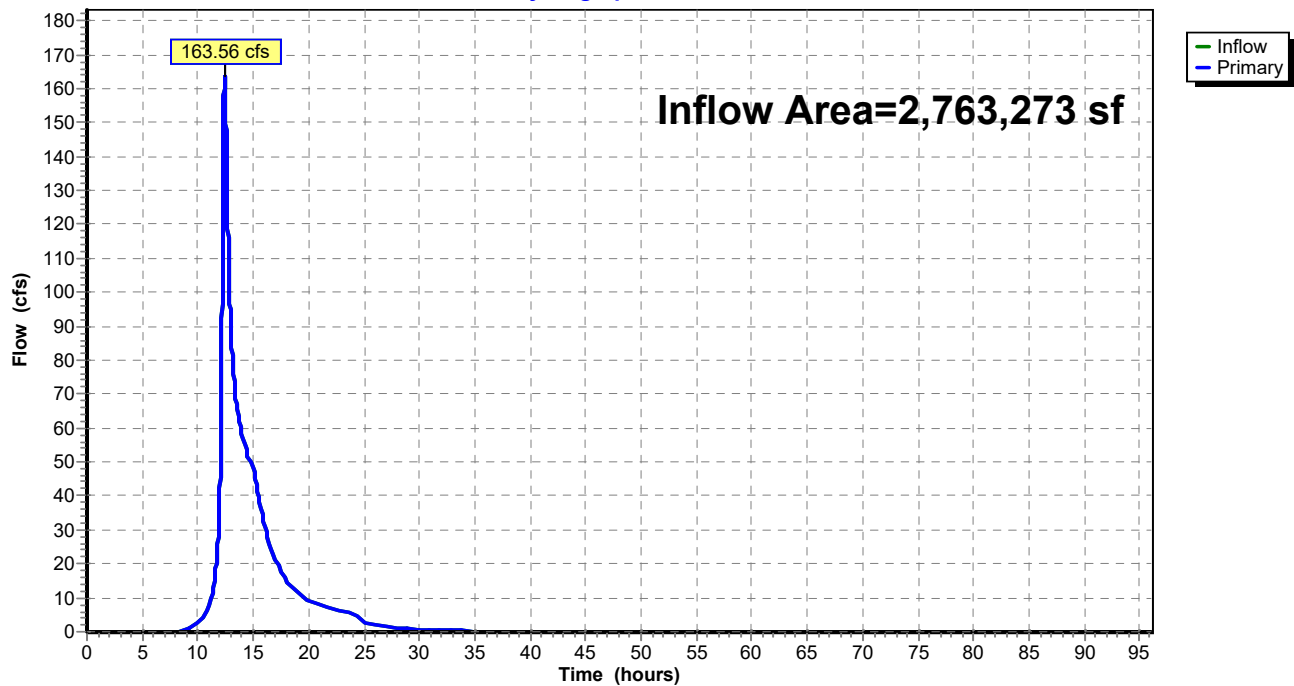
Summary for Link 7: Design Point B

Inflow Area = 2,763,273 sf, 17.63% Impervious, Inflow Depth = 6.43" for 100-yr event
 Inflow = 163.56 cfs @ 12.42 hrs, Volume= 1,480,165 cf
 Primary = 163.56 cfs @ 12.42 hrs, Volume= 1,480,165 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

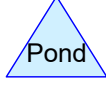
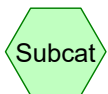
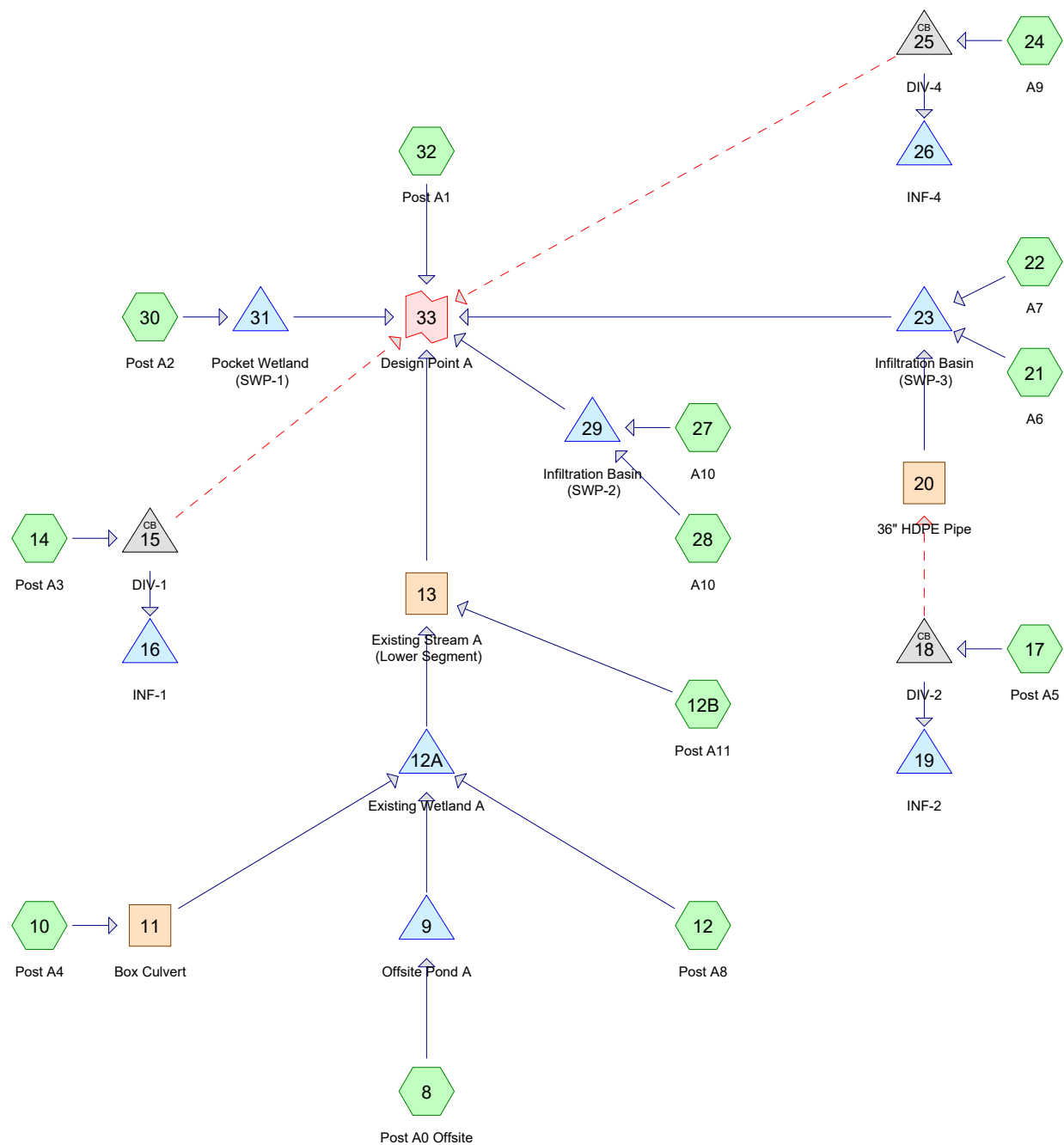
Link 7: Design Point B

Hydrograph





Appendix A-2:
Post-Development
HydroCAD Output Reports



Routing Diagram for N60 P1 Post-A 2021
 Prepared by {enter your company name here}, Printed 5/12/2021
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N60 P1 Post-A 2021

NRCC 24-hr A 1-yr Rainfall=2.79"

Prepared by {enter your company name here}

Printed 5/12/2021

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 8: Post A0 Offsite

Runoff Area=1,115,060 sf 57.87% Impervious Runoff Depth=1.79"
 Flow Length=1,018' Tc=12.5 min CN=90 Runoff=55.28 cfs 166,539 cf

Pond 9: Offsite Pond A

Peak Elev=360.61' Storage=63,532 cf Inflow=55.28 cfs 166,539 cf
 Outflow=36.32 cfs 115,344 cf

Subcatchment 10: Post A4

Runoff Area=164,583 sf 10.25% Impervious Runoff Depth=0.88"
 Flow Length=340' Tc=20.5 min CN=76 Runoff=3.04 cfs 12,019 cf

Reach 11: Box Culvert

Avg. Flow Depth=0.21' Max Vel=1.78 fps Inflow=3.04 cfs 12,019 cf
 n=0.041 L=98.0' S=0.0204 ' Capacity=177.99 cfs Outflow=3.03 cfs 12,019 cf

Subcatchment 12: Post A8

Runoff Area=392,732 sf 0.00% Impervious Runoff Depth=0.69"
 Flow Length=320' Tc=21.4 min CN=72 Runoff=5.22 cfs 22,456 cf

Pond 12A: Existing Wetland A

Peak Elev=322.57' Storage=1,360 cf Inflow=44.55 cfs 149,819 cf
 96.0" x 36.0" Box Culvert n=0.040 L=116.0' S=0.0776 ' Outflow=44.51 cfs 149,819 cf

Subcatchment 12B: Post A11

Runoff Area=722,164 sf 1.29% Impervious Runoff Depth=0.60"
 Flow Length=475' Tc=19.8 min CN=70 Runoff=8.37 cfs 36,155 cf

Reach 13: Existing Stream A (Lower

Avg. Flow Depth=1.05' Max Vel=8.13 fps Inflow=52.86 cfs 185,973 cf
 n=0.040 L=1,360.0' S=0.0721 ' Capacity=601.12 cfs Outflow=51.94 cfs 185,973 cf

Subcatchment 14: Post A3

Runoff Area=106,378 sf 85.91% Impervious Runoff Depth=2.24"
 Tc=6.0 min CN=95 Runoff=7.98 cfs 19,899 cf

Pond 15: DIV-1

Peak Elev=325.73' Inflow=7.98 cfs 19,899 cf
 Primary=5.63 cfs 19,145 cf Secondary=2.41 cfs 754 cf Outflow=7.98 cfs 19,899 cf

Pond 16: INF-1

Peak Elev=324.31' Storage=5,325 cf Inflow=5.63 cfs 19,145 cf
 Outflow=1.18 cfs 19,145 cf

Subcatchment 17: Post A5

Runoff Area=92,926 sf 100.00% Impervious Runoff Depth=2.56"
 Tc=6.0 min CN=98 Runoff=7.44 cfs 19,818 cf

Pond 18: DIV-2

Peak Elev=363.66' Inflow=7.44 cfs 19,818 cf
 Primary=6.11 cfs 19,478 cf Secondary=1.45 cfs 340 cf Outflow=7.44 cfs 19,818 cf

Pond 19: INF-2

Peak Elev=361.95' Storage=5,846 cf Inflow=6.11 cfs 19,478 cf
 Outflow=0.99 cfs 19,478 cf

Reach 20: 36" HDPE Pipe

Avg. Flow Depth=0.16' Max Vel=8.73 fps Inflow=1.45 cfs 340 cf
 36.0" Round Pipe n=0.013 L=805.0' S=0.1205 ' Capacity=231.53 cfs Outflow=1.24 cfs 340 cf

Subcatchment 21: A6

Runoff Area=384,686 sf 86.44% Impervious Runoff Depth=2.35"
 Tc=6.0 min CN=96 Runoff=29.63 cfs 75,193 cf

N60 P1 Post-A 2021

NRCC 24-hr A 1-yr Rainfall=2.79"

Prepared by {enter your company name here}

Printed 5/12/2021

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Subcatchment22: A7 Runoff Area=103,728 sf 0.00% Impervious Runoff Depth=0.52"
Tc=6.0 min CN=68 Runoff=1.69 cfs 4,508 cf

Pond 23: Infiltration Basin (SWP-3) Peak Elev=258.38' Storage=27,059 cf Inflow=32.30 cfs 80,040 cf
Discarded=4.64 cfs 80,040 cf Primary=0.00 cfs 0 cf Outflow=4.64 cfs 80,040 cf

Subcatchment24: A9 Runoff Area=33,825 sf 87.77% Impervious Runoff Depth=2.24"
Tc=6.0 min CN=95 Runoff=2.54 cfs 6,327 cf

Pond 25: DIV-4 Peak Elev=347.73' Inflow=2.54 cfs 6,327 cf
Primary=2.54 cfs 6,327 cf Secondary=0.00 cfs 0 cf Outflow=2.54 cfs 6,327 cf

Pond 26: INF-4 Peak Elev=347.07' Storage=1,537 cf Inflow=2.54 cfs 6,327 cf
Outflow=0.52 cfs 6,327 cf

Subcatchment27: A10 Runoff Area=147,528 sf 61.97% Impervious Runoff Depth=1.71"
Tc=6.0 min CN=89 Runoff=8.98 cfs 21,036 cf

Subcatchment28: A10 Runoff Area=10,748 sf 95.65% Impervious Runoff Depth=2.45"
Tc=6.0 min CN=97 Runoff=0.85 cfs 2,195 cf

Pond 29: Infiltration Basin (SWP-2) Peak Elev=315.48' Storage=6,948 cf Inflow=9.83 cfs 23,231 cf
Discarded=1.87 cfs 23,231 cf Primary=0.00 cfs 0 cf Outflow=1.87 cfs 23,231 cf

Subcatchment30: Post A2 Runoff Area=231,706 sf 20.73% Impervious Runoff Depth=0.93"
Flow Length=817' Tc=17.7 min CN=77 Runoff=4.93 cfs 17,922 cf

Pond 31: Pocket Wetland (SWP-1) Peak Elev=236.00' Storage=24,178 cf Inflow=4.93 cfs 17,922 cf
Outflow=0.05 cfs 10,042 cf

Subcatchment32: Post A1 Runoff Area=21,588 sf 37.76% Impervious Runoff Depth=1.22"
Tc=6.0 min CN=82 Runoff=0.95 cfs 2,187 cf

Link 33: Design Point A Inflow=52.21 cfs 198,956 cf
Primary=52.21 cfs 198,956 cf

Total Runoff Area = 3,527,652 sf Runoff Volume = 406,253 cf Average Runoff Depth = 1.38"
61.00% Pervious = 2,151,703 sf 39.00% Impervious = 1,375,949 sf

N60 P1 Post-A 2021

NRCC 24-hr A 1-yr Rainfall=2.79"

Prepared by {enter your company name here}

Printed 5/12/2021

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Summary for Subcatchment 8: Post A0 Offsite

Runoff = 55.28 cfs @ 12.20 hrs, Volume= 166,539 cf, Depth= 1.79"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 1-yr Rainfall=2.79"

Area (sf)	CN	Description
645,334	98	Paved parking, HSG C
443,611	80	>75% Grass cover, Good, HSG D
23,572	74	>75% Grass cover, Good, HSG C
2,543	61	>75% Grass cover, Good, HSG B
1,115,060	90	Weighted Average
469,726		42.13% Pervious Area
645,334		57.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0150	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.6	148	0.0574	3.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	30	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	740	0.0270	10.25	32.22	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Concrete sewer w/manholes & inlets
12.5	1,018	Total			

N60 P1 Post-A 2021

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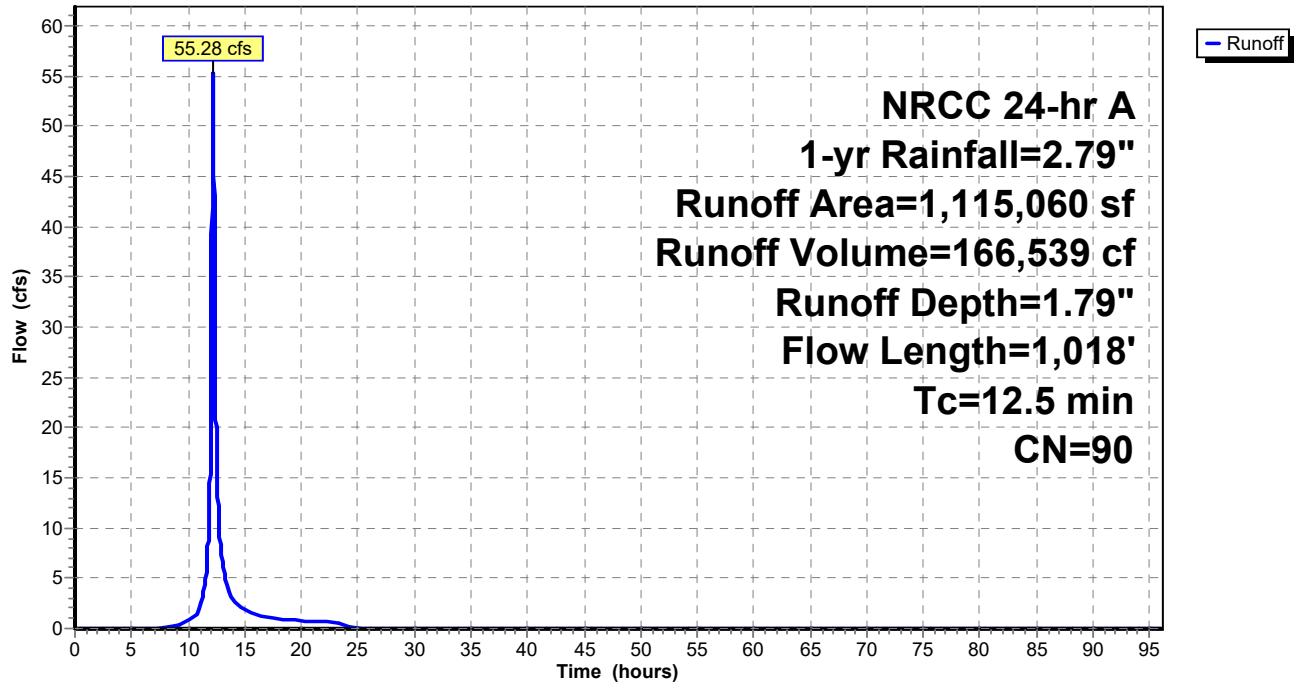
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NRCC 24-hr A 1-yr Rainfall=2.79"

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Subcatchment 8: Post A0 Offsite

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Pond 9: Offsite Pond A

Inflow Area = 1,115,060 sf, 57.87% Impervious, Inflow Depth = 1.79" for 1-yr event
 Inflow = 55.28 cfs @ 12.20 hrs, Volume= 166,539 cf
 Outflow = 36.32 cfs @ 12.33 hrs, Volume= 115,344 cf, Atten= 34%, Lag= 7.3 min
 Primary = 36.32 cfs @ 12.33 hrs, Volume= 115,344 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 360.61' @ 12.33 hrs Surf.Area= 20,903 sf Storage= 63,532 cf

Plug-Flow detention time= 143.7 min calculated for 115,332 cf (69% of inflow)
 Center-of-Mass det. time= 59.3 min (869.2 - 810.0)

Volume	Invert	Avail.Storage	Storage Description		
#1	357.00'	221,816 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
357.00	14,633	679.0	0	0	14,633
358.00	16,652	698.0	15,632	15,632	16,826
359.00	17,534	715.0	17,091	32,723	18,864
360.00	19,427	745.0	18,472	51,195	22,425
362.00	24,453	804.0	43,784	94,979	29,861
364.00	28,701	854.0	53,097	148,076	36,663
365.00	36,602	901.0	32,572	180,648	43,285
366.00	45,910	1,262.0	41,168	221,816	105,432

Device	Routing	Invert	Outlet Devices
#1	Primary	357.00'	30.0" Round Culvert L= 125.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 357.00' / 351.00' S= 0.0480 ' S= 0.0480 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf
#2	Device 1	360.00'	36.0" x 48.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Primary	364.75'	150.0' long x 36.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=36.32 cfs @ 12.33 hrs HW=360.61' TW=322.57' (Dynamic Tailwater)

- 1=Culvert (Inlet Controls 36.32 cfs @ 7.40 fps)
 2=Orifice/Grate (Passes 36.32 cfs of 43.79 cfs potential flow)
 3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

N60 P1 Post-A 2021

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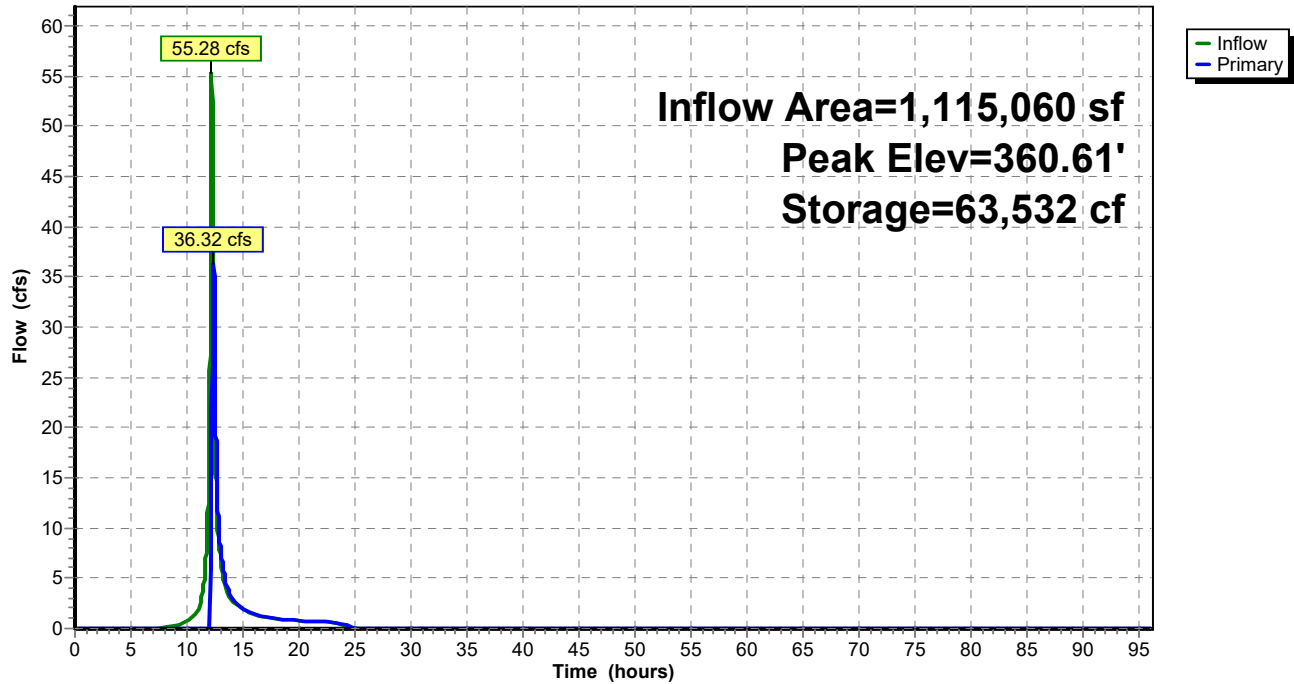
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Pond 9: Offsite Pond A

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Summary for Subcatchment 10: Post A4

Runoff = 3.04 cfs @ 12.32 hrs, Volume= 12,019 cf, Depth= 0.88"

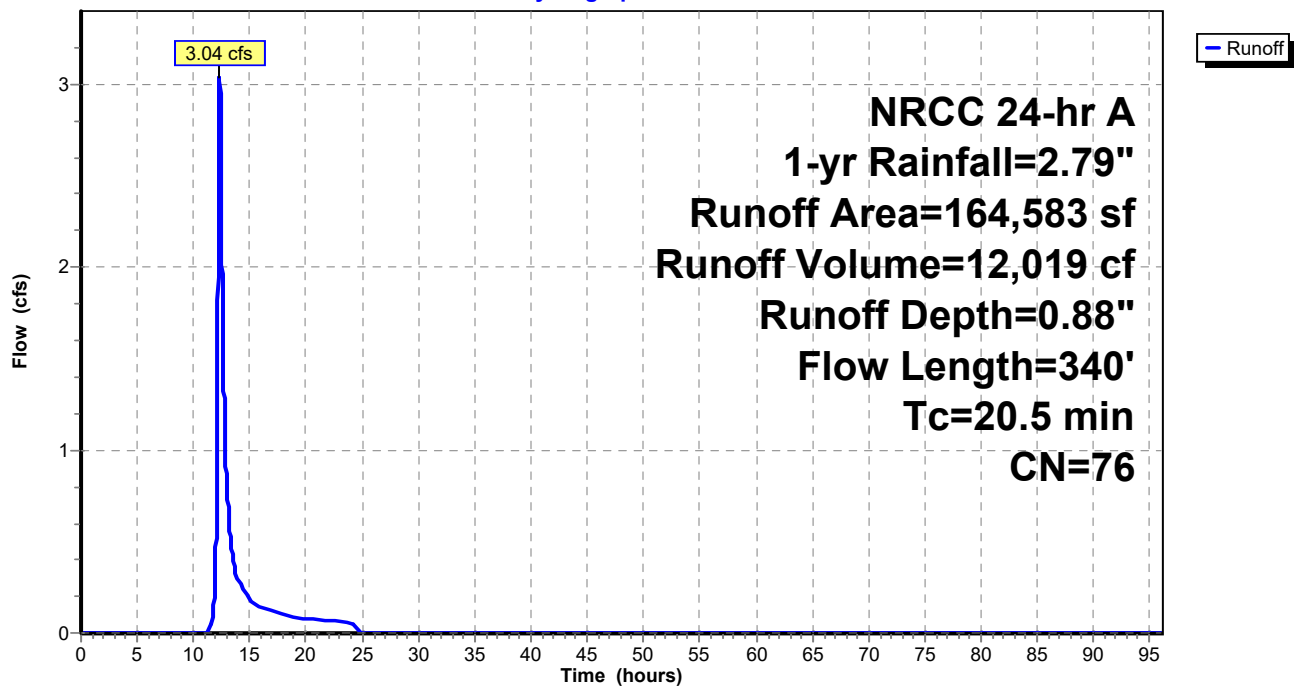
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 1-yr Rainfall=2.79"

Area (sf)	CN	Description
15,990	74	>75% Grass cover, Good, HSG C
65,271	70	Woods, Good, HSG C
66,457	77	Woods, Good, HSG D
16,865	98	Water Surface, HSG D
164,583	76	Weighted Average
147,718		89.75% Pervious Area
16,865		10.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0250	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.7	240	0.0208	2.32		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
20.5	340	Total			

Subcatchment 10: Post A4

Hydrograph



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NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Reach 11: Box Culvert

Inflow Area = 164,583 sf, 10.25% Impervious, Inflow Depth = 0.88" for 1-yr event
Inflow = 3.04 cfs @ 12.32 hrs, Volume= 12,019 cf
Outflow = 3.03 cfs @ 12.33 hrs, Volume= 12,019 cf, Atten= 0%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 1.78 fps, Min. Travel Time= 0.9 min
Avg. Velocity= 0.61 fps, Avg. Travel Time= 2.7 min

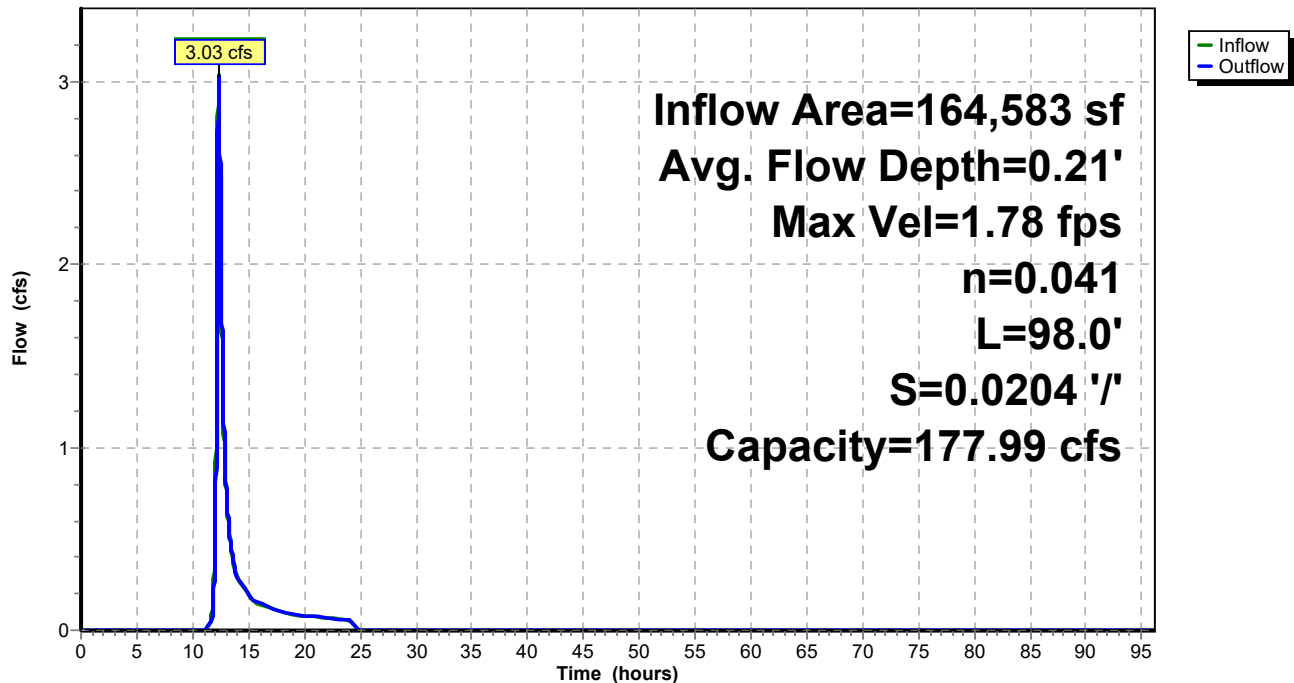
Peak Storage= 167 cf @ 12.33 hrs
Average Depth at Peak Storage= 0.21'
Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 177.99 cfs

8.00' x 3.00' deep channel, n= 0.041 Riprap, 2-inch
Length= 98.0' Slope= 0.0204 '/
Inlet Invert= 349.00', Outlet Invert= 347.00'



Reach 11: Box Culvert

Hydrograph



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NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Subcatchment 12: Post A8

Runoff = 5.22 cfs @ 12.34 hrs, Volume= 22,456 cf, Depth= 0.69"

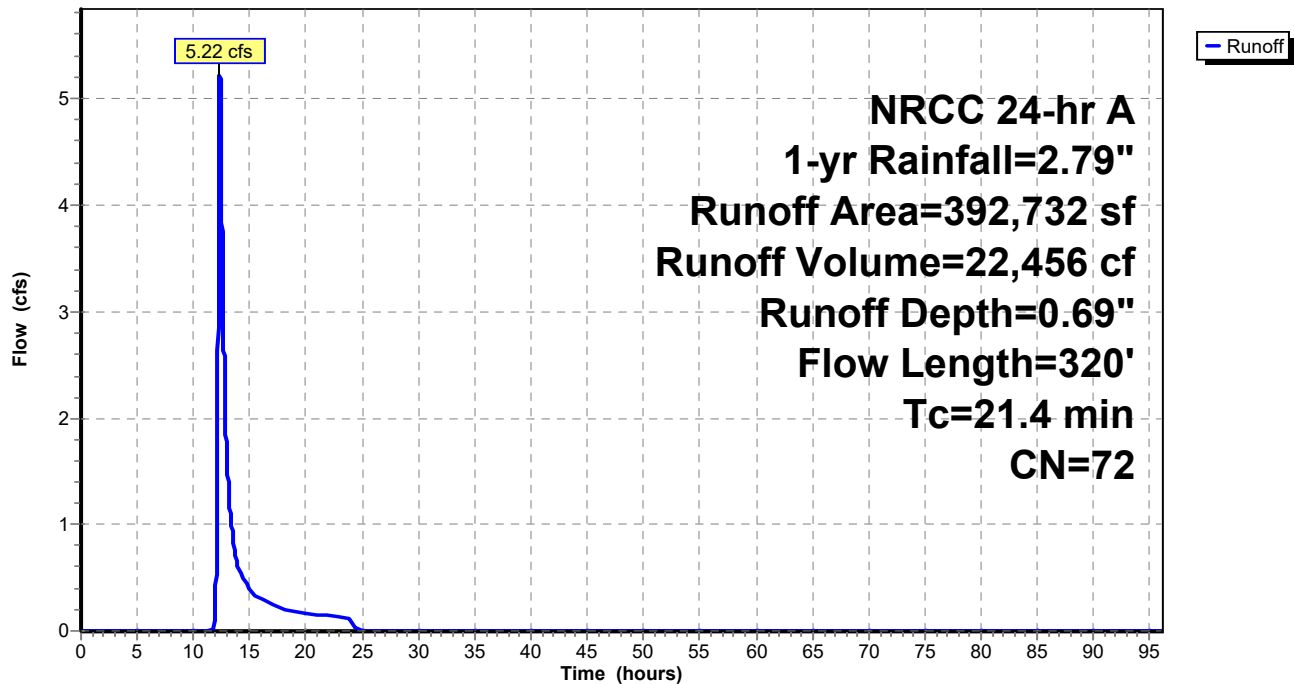
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 1-yr Rainfall=2.79"

Area (sf)	CN	Description
278,057	70	Woods, Good, HSG C
108,143	77	Woods, Good, HSG D
6,532	74	>75% Grass cover, Good, HSG C
392,732	72	Weighted Average
392,732		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
0.9	220	0.0636	4.06		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
21.4	320	Total			

Subcatchment 12: Post A8

Hydrograph



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NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Pond 12A: Existing Wetland A

Inflow Area = 1,672,375 sf, 39.60% Impervious, Inflow Depth = 1.08" for 1-yr event
 Inflow = 44.55 cfs @ 12.34 hrs, Volume= 149,819 cf
 Outflow = 44.51 cfs @ 12.35 hrs, Volume= 149,819 cf, Atten= 0%, Lag= 0.7 min
 Primary = 44.51 cfs @ 12.35 hrs, Volume= 149,819 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 322.57' @ 12.35 hrs Surf.Area= 1,891 sf Storage= 1,360 cf

Plug-Flow detention time= 0.4 min calculated for 149,803 cf (100% of inflow)
 Center-of-Mass det. time= 0.4 min (870.0 - 869.6)

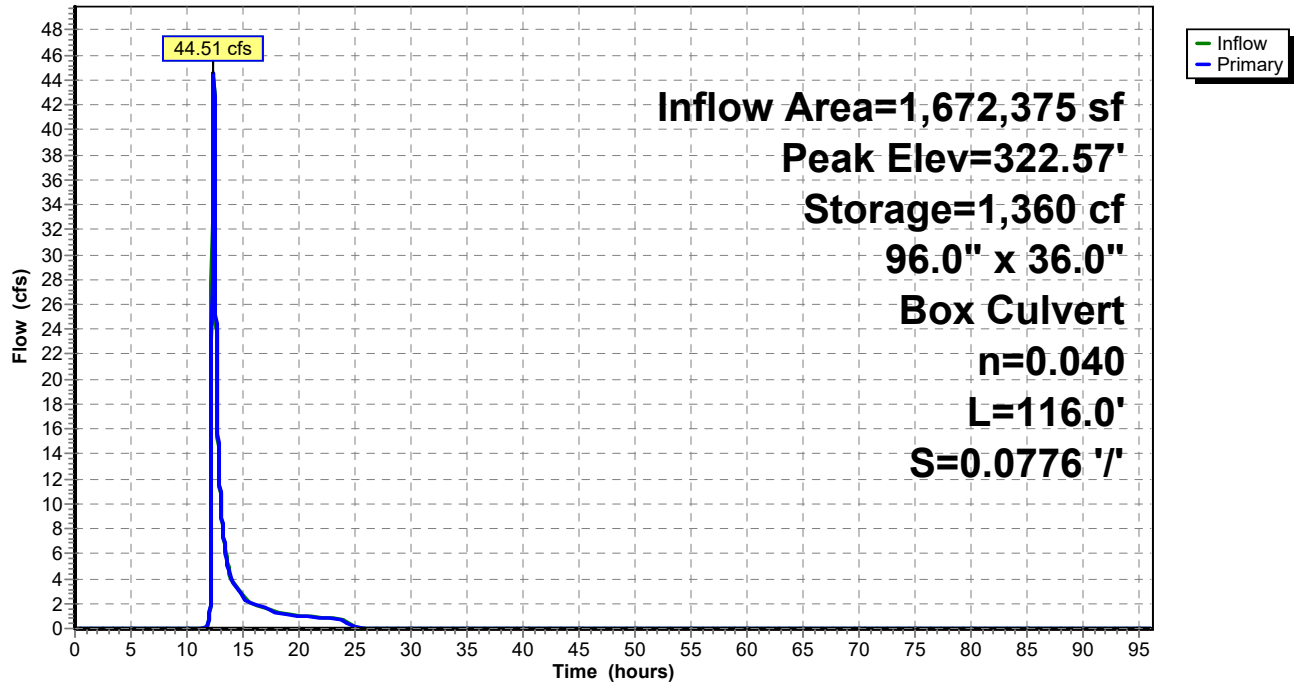
Volume	Invert	Avail.Storage	Storage Description		
#1	321.00'	190,307 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
321.00	124	53.2	0	0	124
322.00	1,084	175.8	525	525	2,361
324.00	4,913	341.5	5,536	6,061	9,202
326.00	11,332	638.2	15,804	21,866	32,354
328.00	20,583	804.3	31,458	53,324	51,475
330.00	34,086	1,075.5	54,104	107,428	92,087
332.00	49,257	1,268.5	82,879	190,307	128,164

Device	Routing	Invert	Outlet Devices
#1	Primary	321.00'	96.0" W x 36.0" H Box Culvert L= 116.0' Box, 0° wingwalls, square crown edge, Ke= 0.700 Inlet / Outlet Invert= 321.00' / 312.00' S= 0.0776 '/' Cc= 0.900 n= 0.040 Earth, cobble bottom, clean sides, Flow Area= 24.00 sf

Primary OutFlow Max=44.50 cfs @ 12.35 hrs HW=322.57' TW=313.03' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 44.50 cfs @ 3.55 fps)

Pond 12A: Existing Wetland A

Hydrograph



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Summary for Subcatchment 12B: Post A11

Runoff = 8.37 cfs @ 12.34 hrs, Volume= 36,155 cf, Depth= 0.60"

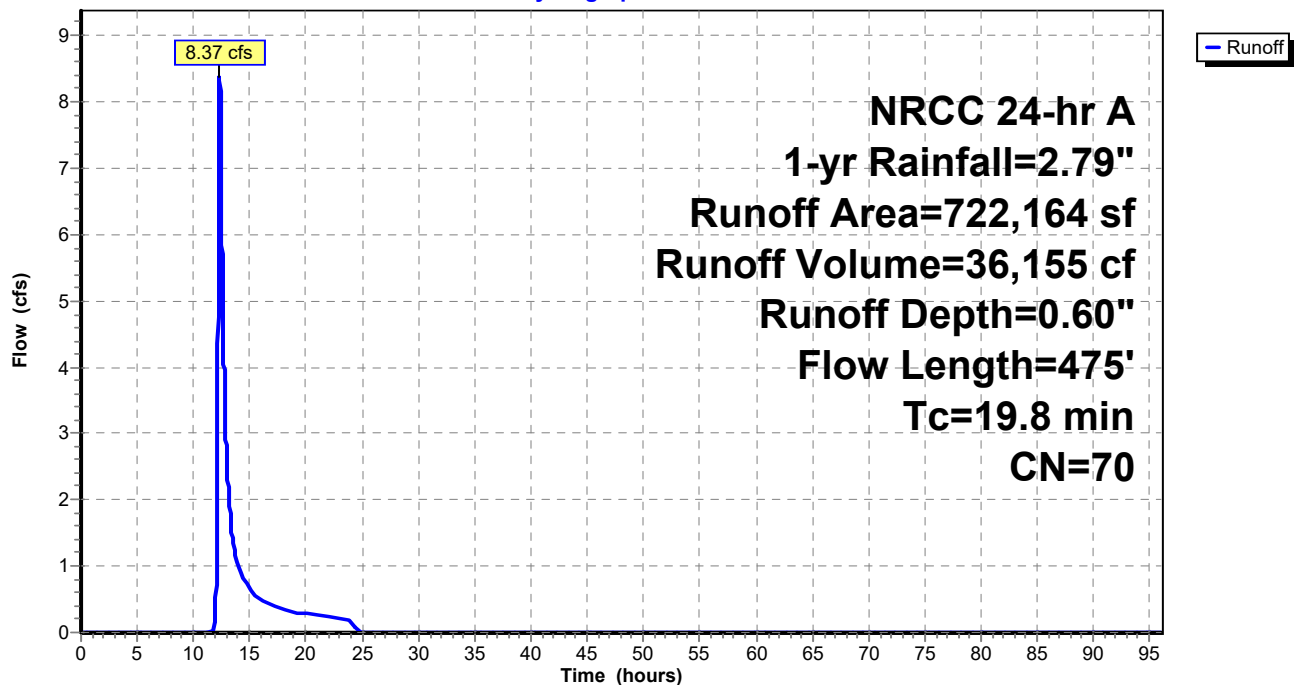
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 1-yr Rainfall=2.79"

Area (sf)	CN	Description
17,361	55	Woods, Good, HSG B
681,082	70	Woods, Good, HSG C
11,683	77	Woods, Good, HSG D
9,345	98	Paved parking, HSG C
2,693	74	>75% Grass cover, Good, HSG C
722,164	70	Weighted Average
712,819		98.71% Pervious Area
9,345		1.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0250	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.0	375	0.1400	6.02		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
19.8	475	Total			

Subcatchment 12B: Post A11

Hydrograph



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Summary for Reach 13: Existing Stream A (Lower Segment)

Inflow Area = 2,394,539 sf, 28.04% Impervious, Inflow Depth = 0.93" for 1-yr event
Inflow = 52.86 cfs @ 12.34 hrs, Volume= 185,973 cf
Outflow = 51.94 cfs @ 12.39 hrs, Volume= 185,973 cf, Atten= 2%, Lag= 3.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.13 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 2.10 fps, Avg. Travel Time= 10.8 min

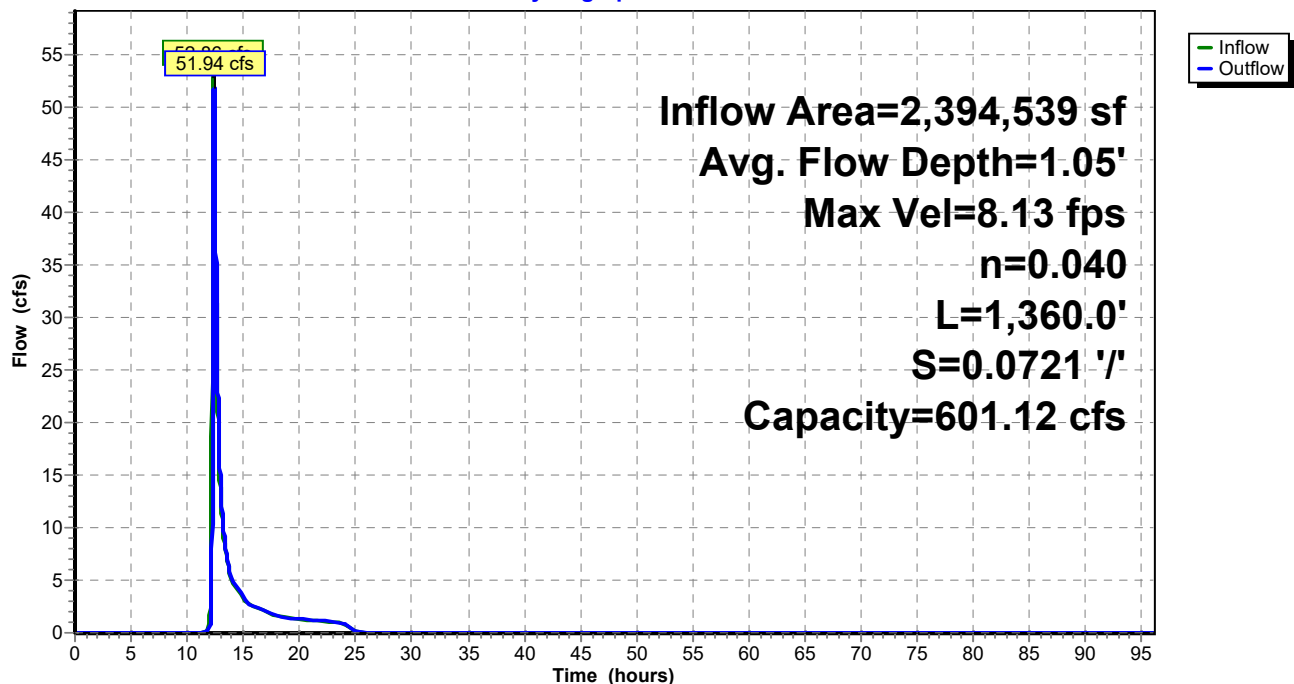
Peak Storage= 8,692 cf @ 12.39 hrs
Average Depth at Peak Storage= 1.05'
Bank-Full Depth= 3.50' Flow Area= 38.5 sf, Capacity= 601.12 cfs

4.00' x 3.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 ' ' Top Width= 18.00'
Length= 1,360.0' Slope= 0.0721 ' '
Inlet Invert= 312.00', Outlet Invert= 214.00'



Reach 13: Existing Stream A (Lower Segment)

Hydrograph



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NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Subcatchment 14: Post A3

Runoff = 7.98 cfs @ 12.13 hrs, Volume= 19,899 cf, Depth= 2.24"

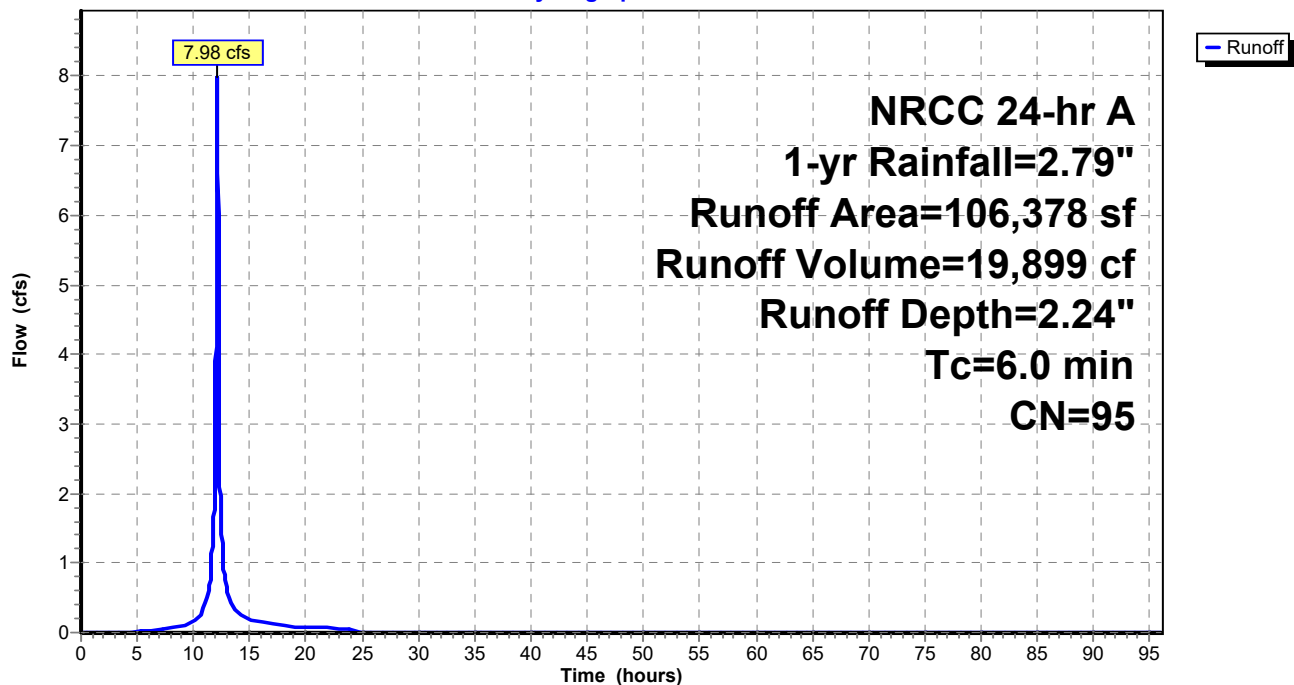
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 1-yr Rainfall=2.79"

Area (sf)	CN	Description
91,392	98	Paved parking, HSG C
14,986	74	>75% Grass cover, Good, HSG C
106,378	95	Weighted Average
14,986		14.09% Pervious Area
91,392		85.91% Impervious Area

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

Subcatchment 14: Post A3

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Pond 15: DIV-1

Inflow Area = 106,378 sf, 85.91% Impervious, Inflow Depth = 2.24" for 1-yr event
 Inflow = 7.98 cfs @ 12.13 hrs, Volume= 19,899 cf
 Outflow = 7.98 cfs @ 12.13 hrs, Volume= 19,899 cf, Atten= 0%, Lag= 0.0 min
 Primary = 5.63 cfs @ 12.12 hrs, Volume= 19,145 cf
 Secondary = 2.41 cfs @ 12.13 hrs, Volume= 754 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 325.73' @ 12.13 hrs

Flood Elev= 328.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	323.00'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 323.00' / 323.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	323.00'	24.0" Round Culvert L= 51.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 323.00' / 320.00' S= 0.0588 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	325.50'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=5.58 cfs @ 12.12 hrs HW=325.71' TW=323.54' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 5.58 cfs @ 7.11 fps)**Secondary OutFlow** Max=2.40 cfs @ 12.13 hrs HW=325.72' TW=0.00' (Dynamic Tailwater)↑**2=Culvert** (Passes 2.40 cfs of 19.86 cfs potential flow)↑**3=Broad-Crested Rectangular Weir** (Weir Controls 2.40 cfs @ 1.33 fps)

N60 P1 Post-A 2021

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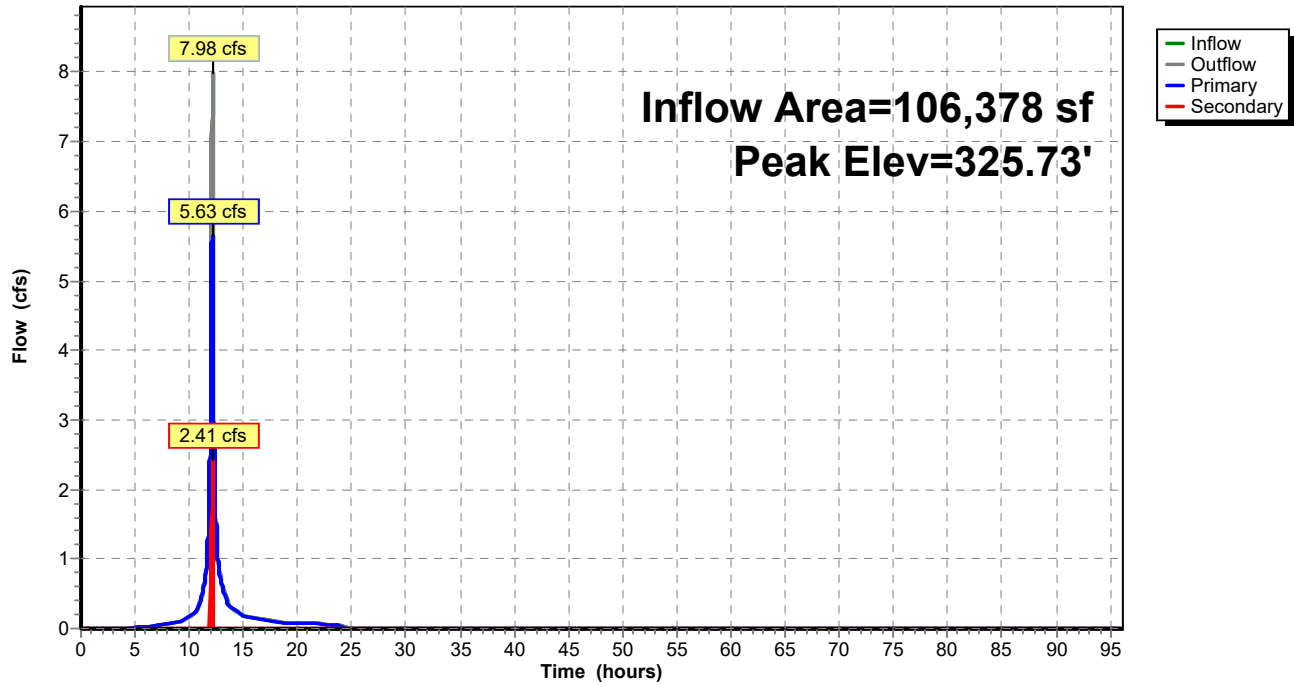
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NRCC 24-hr A 1-yr Rainfall=2.79"

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Pond 15: DIV-1

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Pond 16: INF-1

Inflow Area = 106,378 sf, 85.91% Impervious, Inflow Depth = 2.16" for 1-yr event
 Inflow = 5.63 cfs @ 12.12 hrs, Volume= 19,145 cf
 Outflow = 1.18 cfs @ 11.79 hrs, Volume= 19,145 cf, Atten= 79%, Lag= 0.0 min
 Discarded = 1.18 cfs @ 11.79 hrs, Volume= 19,145 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 324.31' @ 12.58 hrs Surf.Area= 4,245 sf Storage= 5,325 cf

Plug-Flow detention time= 27.3 min calculated for 19,143 cf (100% of inflow)
 Center-of-Mass det. time= 27.3 min (810.3 - 783.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	322.50'	4,688 cf	36.75'W x 115.50'L x 4.33'H Field A 18,393 cf Overall - 6,674 cf Embedded = 11,720 cf x 40.0% Voids
#2A	323.00'	6,674 cf	Cultec R-360HD x 180 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 180 Chambers in 6 Rows Cap Storage= +6.5 cf x 2 x 6 rows = 77.5 cf
		11,361 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	322.50'	12.000 in/hr Exfiltration over Horizontal area Phase-In= 0.01'

Discarded OutFlow Max=1.18 cfs @ 11.79 hrs HW=322.55' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 1.18 cfs)

N60 P1 Post-A 2021

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NRCC 24-hr A 1-yr Rainfall=2.79"

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Pond 16: INF-1 - Chamber Wizard Field A

Chamber Model = Cultec R-360HD (Cultec Recharger® 360HD)

Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf

Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap

Cap Storage= +6.5 cf x 2 x 6 rows = 77.5 cf

60.0" Wide + 9.0" Spacing = 69.0" C-C Row Spacing

30 Chambers/Row x 3.67' Long +1.25' Cap Length x 2 = 112.50' Row Length +18.0" End Stone x 2 = 115.50' Base Length

6 Rows x 60.0" Wide + 9.0" Spacing x 5 + 18.0" Side Stone x 2 = 36.75' Base Width

6.0" Base + 36.0" Chamber Height + 10.0" Cover = 4.33' Field Height

180 Chambers x 36.6 cf + 6.5 cf Cap Volume x 2 x 6 Rows = 6,673.6 cf Chamber Storage

18,393.4 cf Field - 6,673.6 cf Chambers = 11,719.8 cf Stone x 40.0% Voids = 4,687.9 cf Stone Storage

Chamber Storage + Stone Storage = 11,361.5 cf = 0.261 af

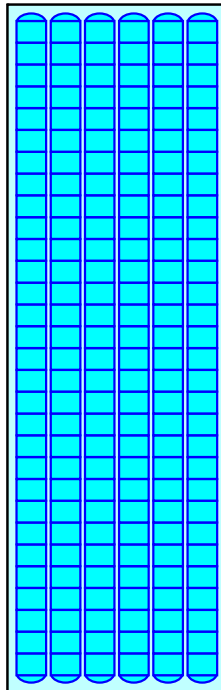
Overall Storage Efficiency = 61.8%

Overall System Size = 115.50' x 36.75' x 4.33'

180 Chambers

681.2 cy Field

434.1 cy Stone



N60 P1 Post-A 2021

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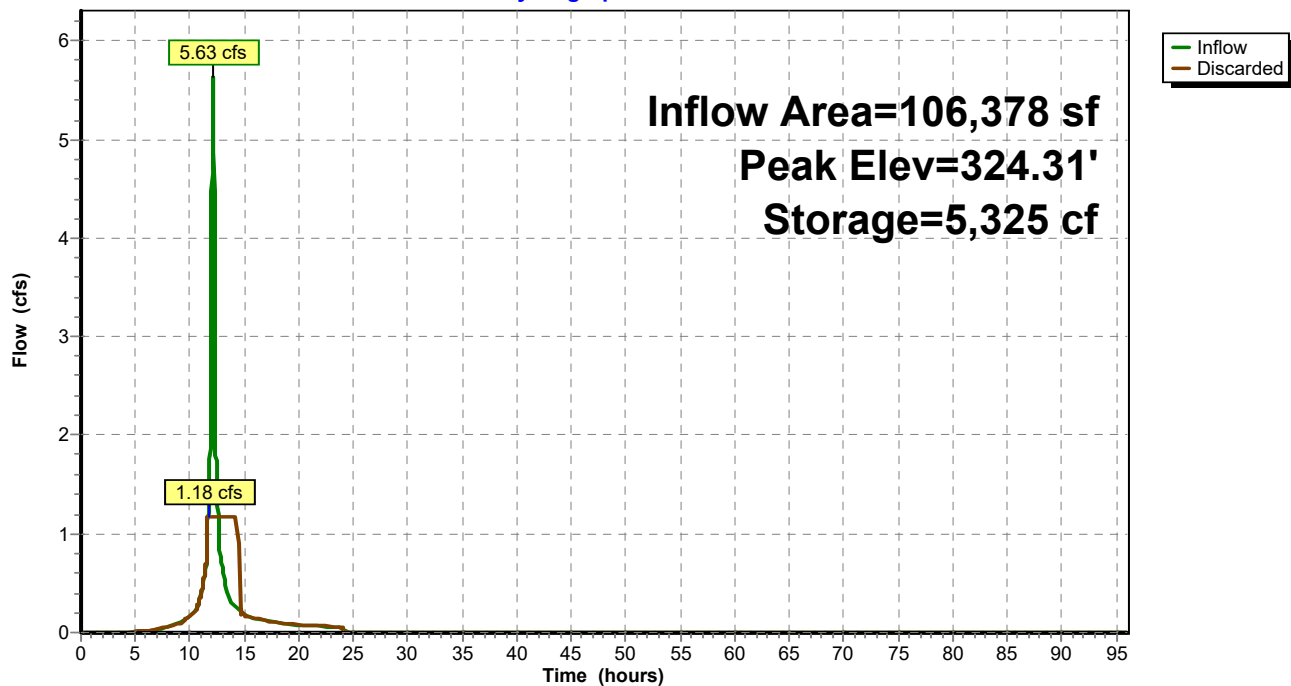
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NRCC 24-hr A 1-yr Rainfall=2.79"

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Pond 16: INF-1

Hydrograph



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NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Subcatchment 17: Post A5

Runoff = 7.44 cfs @ 12.13 hrs, Volume= 19,818 cf, Depth= 2.56"

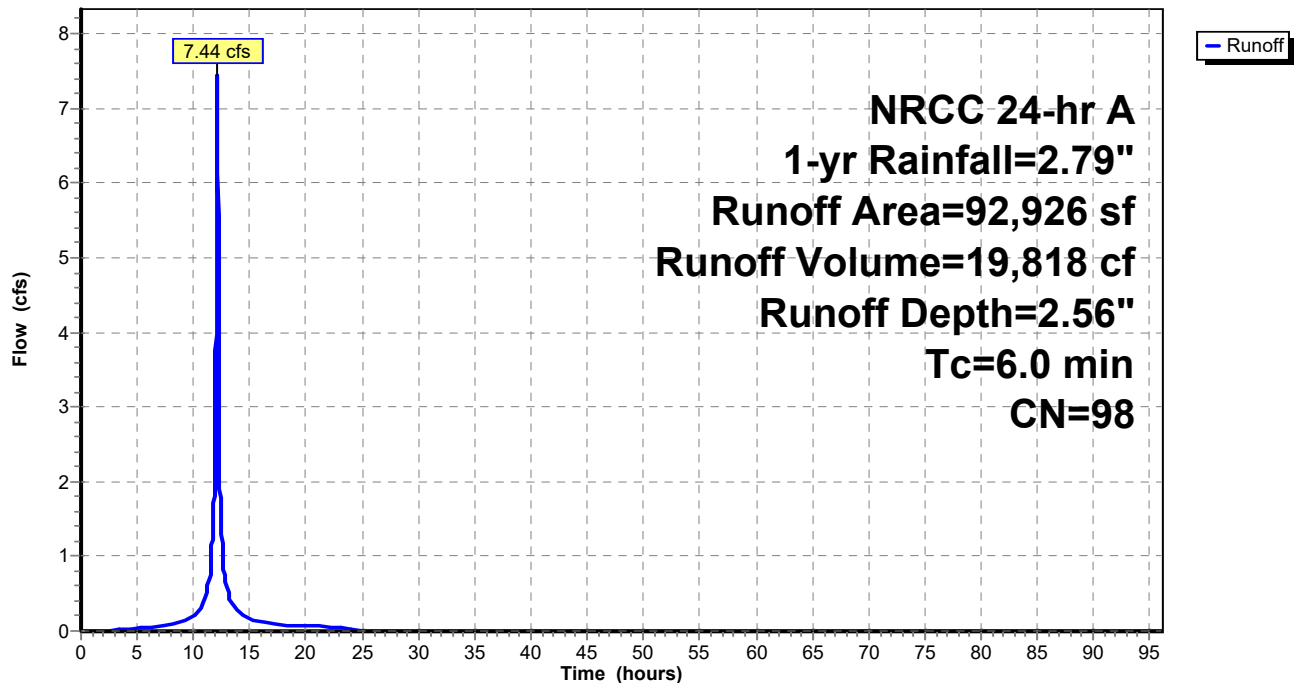
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 1-yr Rainfall=2.79"

Area (sf)	CN	Description
92,926	98	Roofs, HSG C
92,926		100.00% Impervious Area

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

Subcatchment 17: Post A5

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Pond 18: DIV-2

Inflow Area = 92,926 sf, 100.00% Impervious, Inflow Depth = 2.56" for 1-yr event
 Inflow = 7.44 cfs @ 12.13 hrs, Volume= 19,818 cf
 Outflow = 7.44 cfs @ 12.13 hrs, Volume= 19,818 cf, Atten= 0%, Lag= 0.0 min
 Primary = 6.11 cfs @ 12.10 hrs, Volume= 19,478 cf
 Secondary = 1.45 cfs @ 12.13 hrs, Volume= 340 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 363.66' @ 12.13 hrs

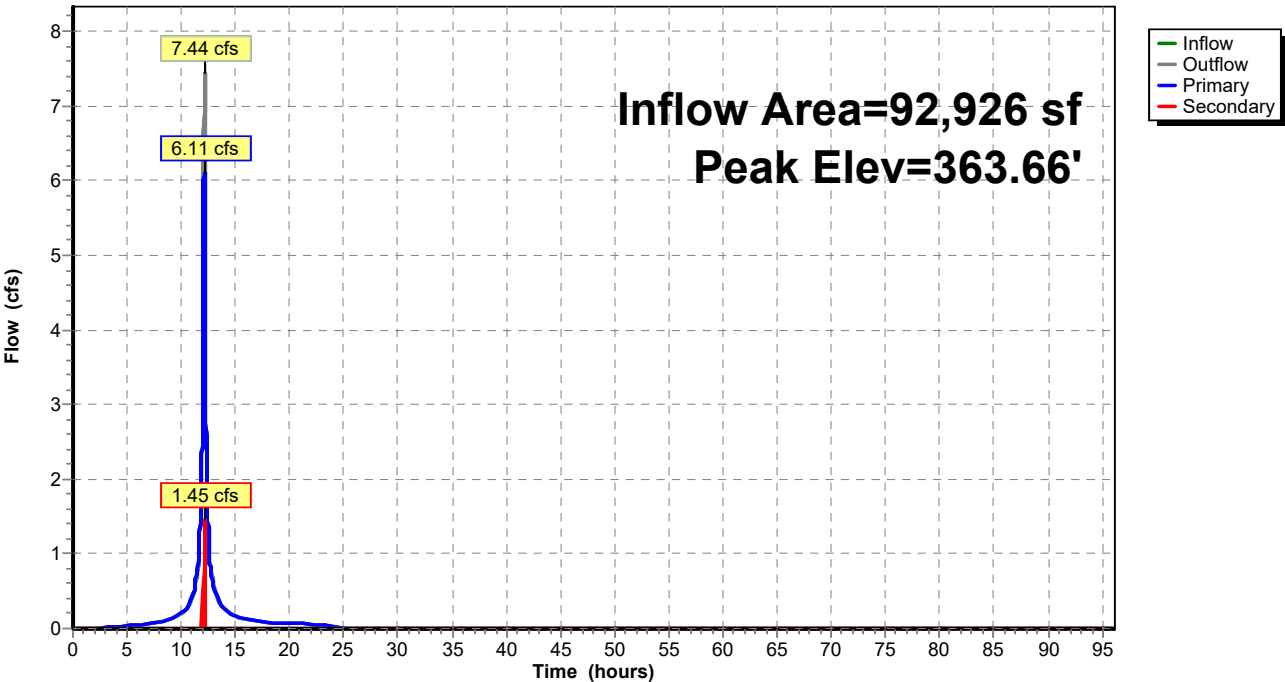
Flood Elev= 371.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	360.50'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 360.50' / 360.50' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	363.00'	24.0" Round Culvert L= 550.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 363.00' / 355.00' S= 0.0145 ' S= 0.0145 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	363.50'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=6.05 cfs @ 12.10 hrs HW=363.61' TW=361.05' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 6.05 cfs @ 7.71 fps)**Secondary OutFlow** Max=1.44 cfs @ 12.13 hrs HW=363.66' TW=355.14' (Dynamic Tailwater)↑ **2=Culvert** (Passes 1.44 cfs of 2.50 cfs potential flow)↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 1.44 cfs @ 1.12 fps)

Pond 18: DIV-2

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Pond 19: INF-2

Inflow Area = 92,926 sf, 100.00% Impervious, Inflow Depth = 2.52" for 1-yr event
 Inflow = 6.11 cfs @ 12.10 hrs, Volume= 19,478 cf
 Outflow = 0.99 cfs @ 11.68 hrs, Volume= 19,478 cf, Atten= 84%, Lag= 0.0 min
 Discarded = 0.99 cfs @ 11.68 hrs, Volume= 19,478 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 361.95' @ 12.60 hrs Surf.Area= 4,285 sf Storage= 5,846 cf

Plug-Flow detention time= 35.3 min calculated for 19,476 cf (100% of inflow)
 Center-of-Mass det. time= 35.3 min (793.7 - 758.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	360.00'	4,724 cf	42.50'W x 100.83'L x 4.33'H Field A 18,570 cf Overall - 6,760 cf Embedded = 11,810 cf x 40.0% Voids
#2A	360.50'	6,760 cf	Cultec R-360HD x 182 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 182 Chambers in 7 Rows Cap Storage= +6.5 cf x 2 x 7 rows = 90.4 cf
		11,484 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	360.00'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.01'

Discarded OutFlow Max=0.99 cfs @ 11.68 hrs HW=360.04' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.99 cfs)

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NRCC 24-hr A 1-yr Rainfall=2.79"

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Pond 19: INF-2 - Chamber Wizard Field A

Chamber Model = Cultec R-360HD (Cultec Recharger® 360HD)

Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf

Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap

Cap Storage= +6.5 cf x 2 x 7 rows = 90.4 cf

60.0" Wide + 9.0" Spacing = 69.0" C-C Row Spacing

26 Chambers/Row x 3.67' Long +1.25' Cap Length x 2 = 97.83' Row Length +18.0" End Stone x 2 = 100.83' Base Length

7 Rows x 60.0" Wide + 9.0" Spacing x 6 + 18.0" Side Stone x 2 = 42.50' Base Width

6.0" Base + 36.0" Chamber Height + 10.0" Cover = 4.33' Field Height

182 Chambers x 36.6 cf + 6.5 cf Cap Volume x 2 x 7 Rows = 6,759.8 cf Chamber Storage

18,570.1 cf Field - 6,759.8 cf Chambers = 11,810.4 cf Stone x 40.0% Voids = 4,724.1 cf Stone Storage

Chamber Storage + Stone Storage = 11,483.9 cf = 0.264 af

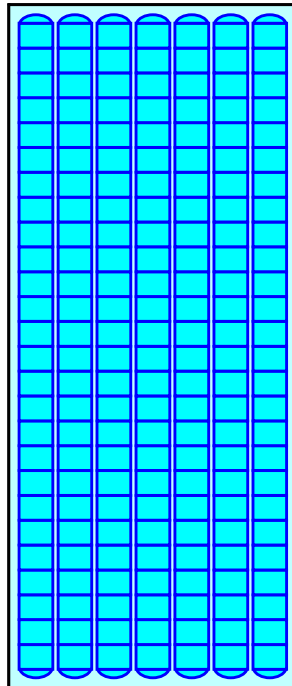
Overall Storage Efficiency = 61.8%

Overall System Size = 100.83' x 42.50' x 4.33'

182 Chambers

687.8 cy Field

437.4 cy Stone



N60 P1 Post-A 2021

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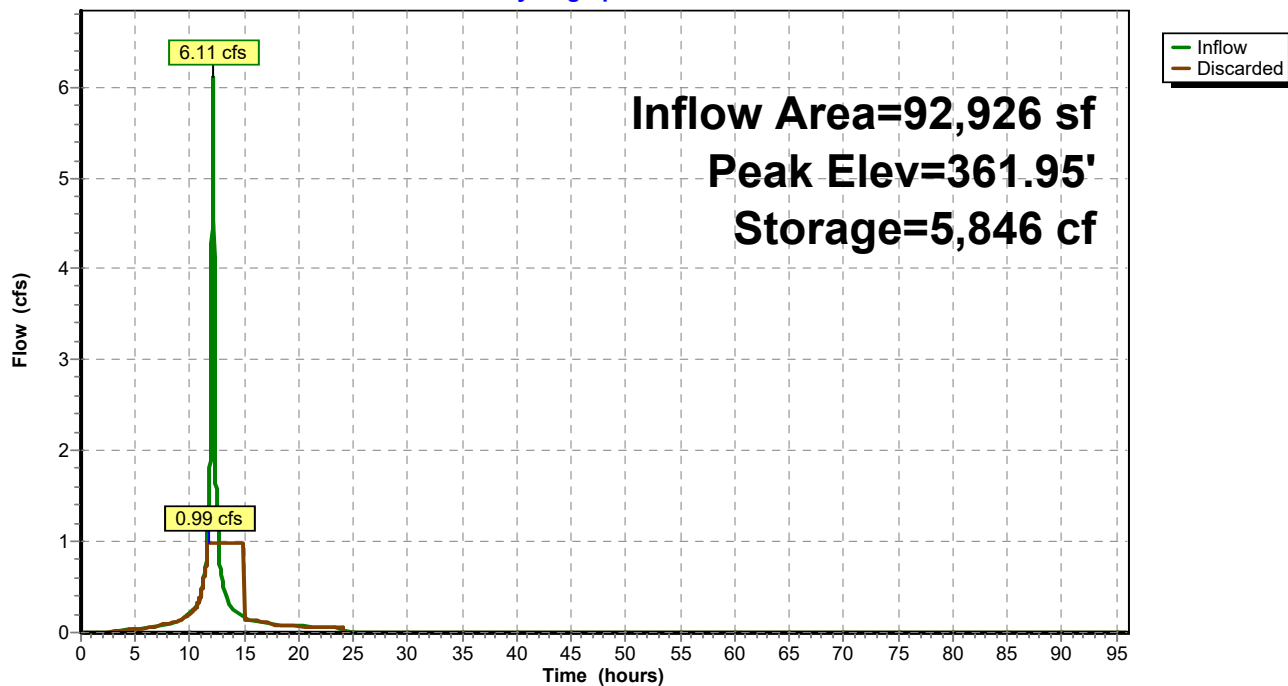
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Pond 19: INF-2

Hydrograph



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NRCC 24-hr A 1-yr Rainfall=2.79"

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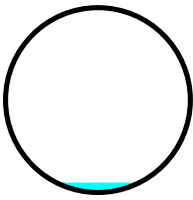
Summary for Reach 20: 36" HDPE Pipe

Inflow = 1.45 cfs @ 12.13 hrs, Volume= 340 cf
Outflow = 1.24 cfs @ 12.15 hrs, Volume= 340 cf, Atten= 15%, Lag= 1.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.73 fps, Min. Travel Time= 1.5 min
Avg. Velocity= 3.93 fps, Avg. Travel Time= 3.4 min

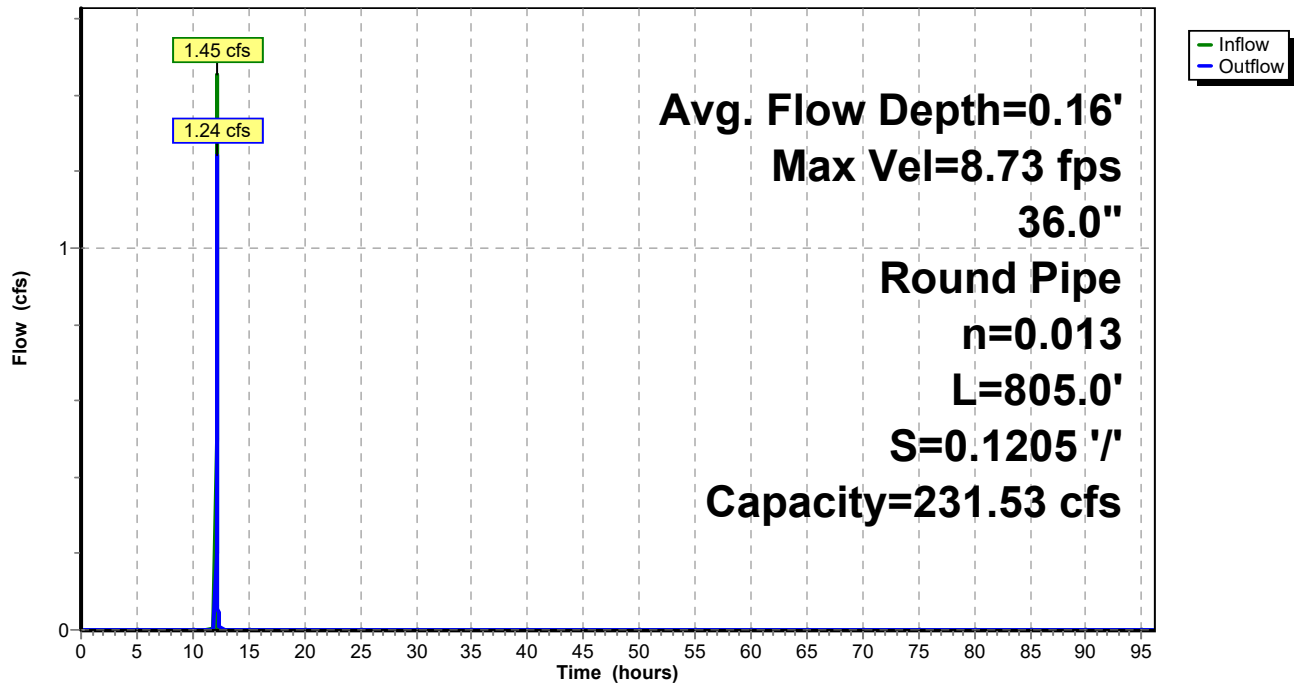
Peak Storage= 114 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.16'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 231.53 cfs

36.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 805.0' Slope= 0.1205 '/'
Inlet Invert= 355.00', Outlet Invert= 258.00'



Reach 20: 36" HDPE Pipe

Hydrograph



N60 P1 Post-A 2021

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NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Subcatchment 21: A6

Runoff = 29.63 cfs @ 12.13 hrs, Volume= 75,193 cf, Depth= 2.35"

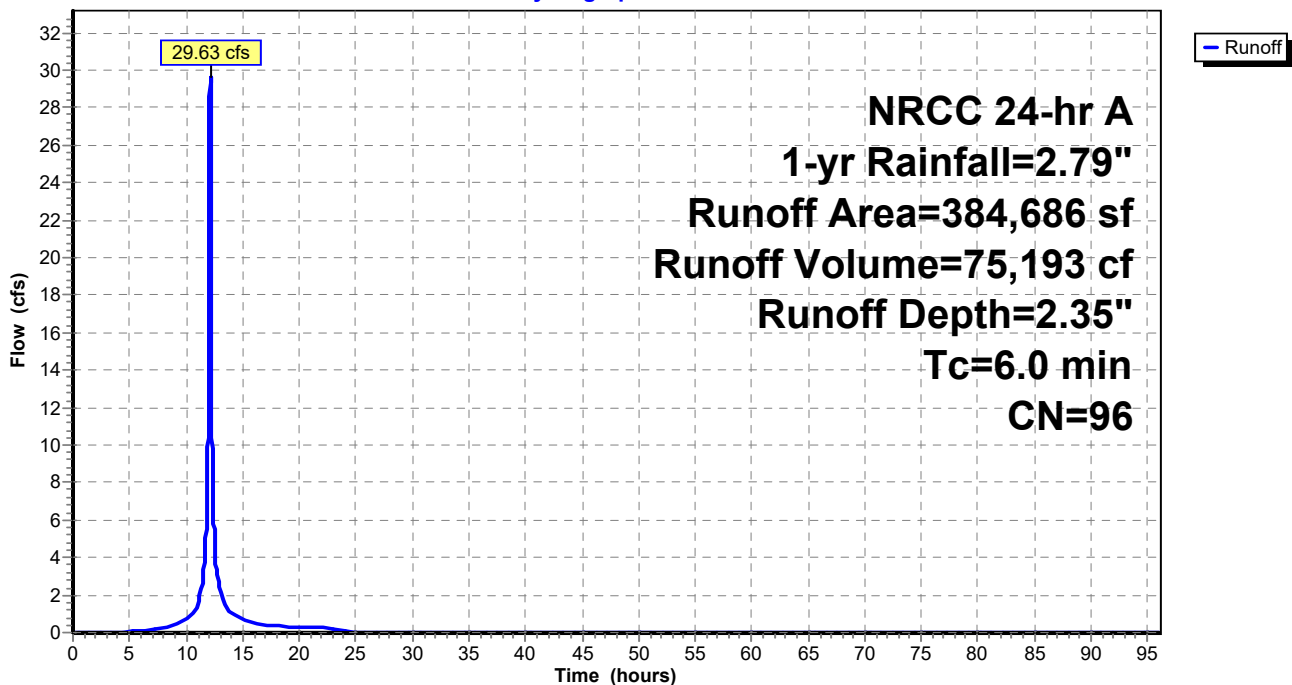
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 1-yr Rainfall=2.79"

Area (sf)	CN	Description
332,512	98	Paved parking, HSG C
52,174	86	<50% Grass cover, Poor, HSG C
384,686	96	Weighted Average
52,174		13.56% Pervious Area
332,512		86.44% Impervious Area

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

Subcatchment 21: A6

Hydrograph



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NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Subcatchment 22: A7

Runoff = 1.69 cfs @ 12.14 hrs, Volume= 4,508 cf, Depth= 0.52"

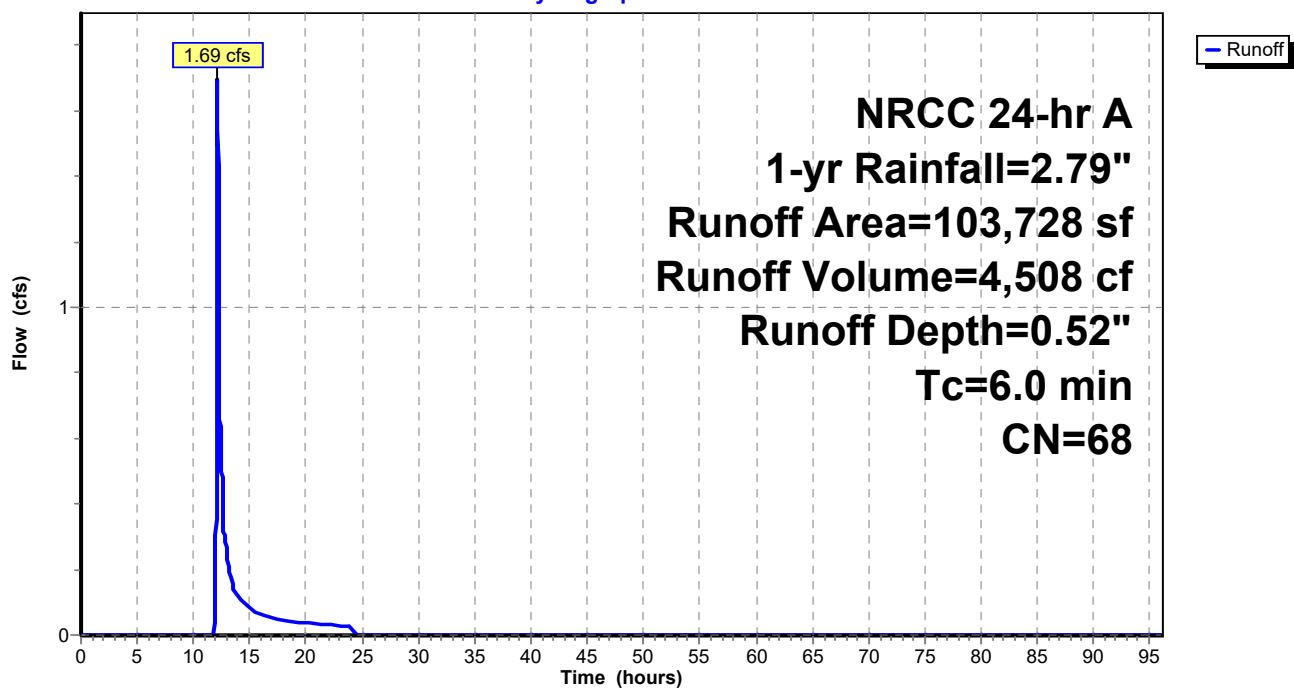
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 1-yr Rainfall=2.79"

Area (sf)	CN	Description
35,128	65	Brush, Good, HSG C
68,600	70	Woods, Good, HSG C
103,728	68	Weighted Average
103,728		100.00% Pervious Area

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

Subcatchment 22: A7

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Pond 23: Infiltration Basin (SWP-3)

Inflow Area = 488,414 sf, 68.08% Impervious, Inflow Depth = 1.97" for 1-yr event
 Inflow = 32.30 cfs @ 12.13 hrs, Volume= 80,040 cf
 Outflow = 4.64 cfs @ 12.59 hrs, Volume= 80,040 cf, Atten= 86%, Lag= 27.2 min
 Discarded = 4.64 cfs @ 12.59 hrs, Volume= 80,040 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 258.38' @ 12.59 hrs Surf.Area= 13,365 sf Storage= 27,059 cf

Plug-Flow detention time= 43.5 min calculated for 80,032 cf (100% of inflow)
 Center-of-Mass det. time= 43.5 min (823.6 - 780.1)

Volume	Invert	Avail.Storage	Storage Description		
#1	256.00'	103,740 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
256.00	9,450	527.9	0	0	9,450
258.00	12,731	565.7	22,100	22,100	12,917
260.00	16,238	603.5	28,898	50,998	16,623
262.00	19,973	641.3	36,147	87,144	20,569
262.80	21,527	656.4	16,596	103,740	22,212

Device	Routing	Invert	Outlet Devices
#1	Primary	254.00'	36.0" Round Culvert X 2.00 L= 95.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 254.00' / 244.00' S= 0.1053 ' S= 0.1053 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	260.00'	2.0' long x 0.5' breadth Broad-Crested Rectangular Weir X 2.00 Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	260.00'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir X 2.00 Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	259.40'	6.0" Vert. Orifice/Grate C= 0.600
#5	Device 1	261.00'	36.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Discarded	256.00'	15.000 in/hr Exfiltration over Surface area Phase-In= 0.10'

Discarded OutFlow Max=4.64 cfs @ 12.59 hrs HW=258.38' (Free Discharge)

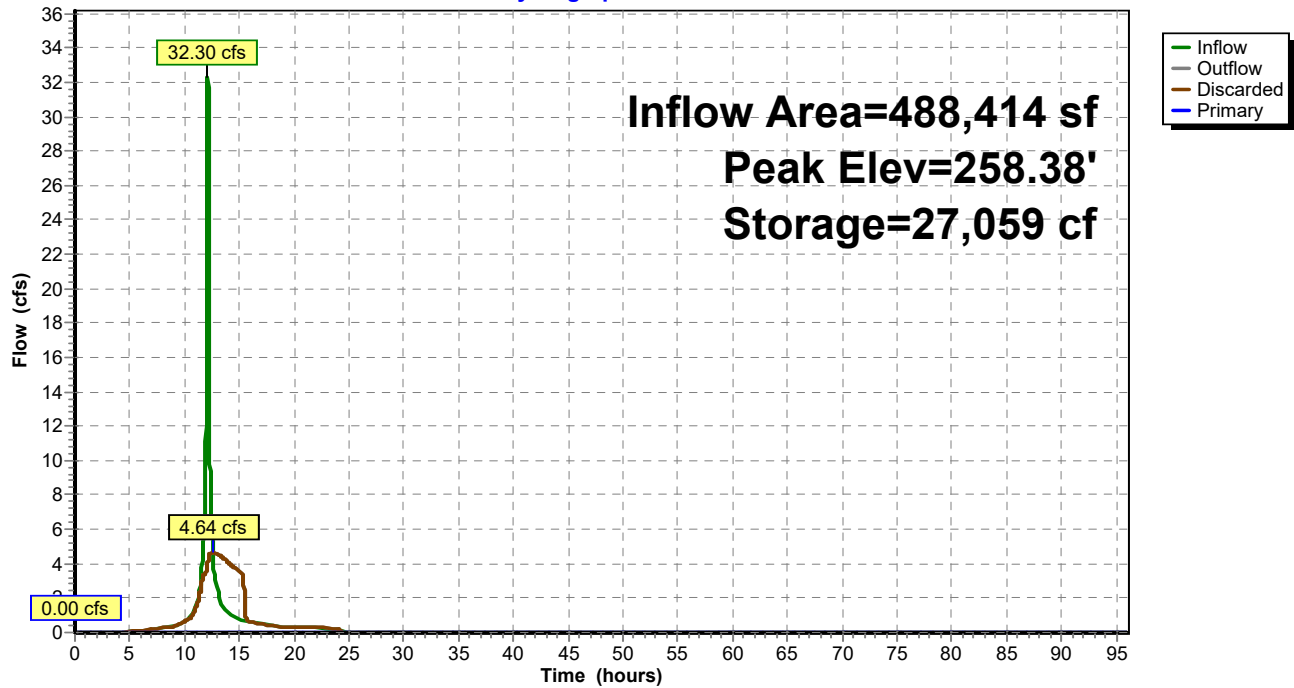
↑ **6=Exfiltration** (Exfiltration Controls 4.64 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=256.00' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 0.00 cfs of 48.21 cfs potential flow)
 ↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
 ↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
 ↑ **4=Orifice/Grate** (Controls 0.00 cfs)
 ↑ **5=Orifice/Grate** (Controls 0.00 cfs)

Pond 23: Infiltration Basin (SWP-3)

Hydrograph



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NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Subcatchment 24: A9

Runoff = 2.54 cfs @ 12.13 hrs, Volume= 6,327 cf, Depth= 2.24"

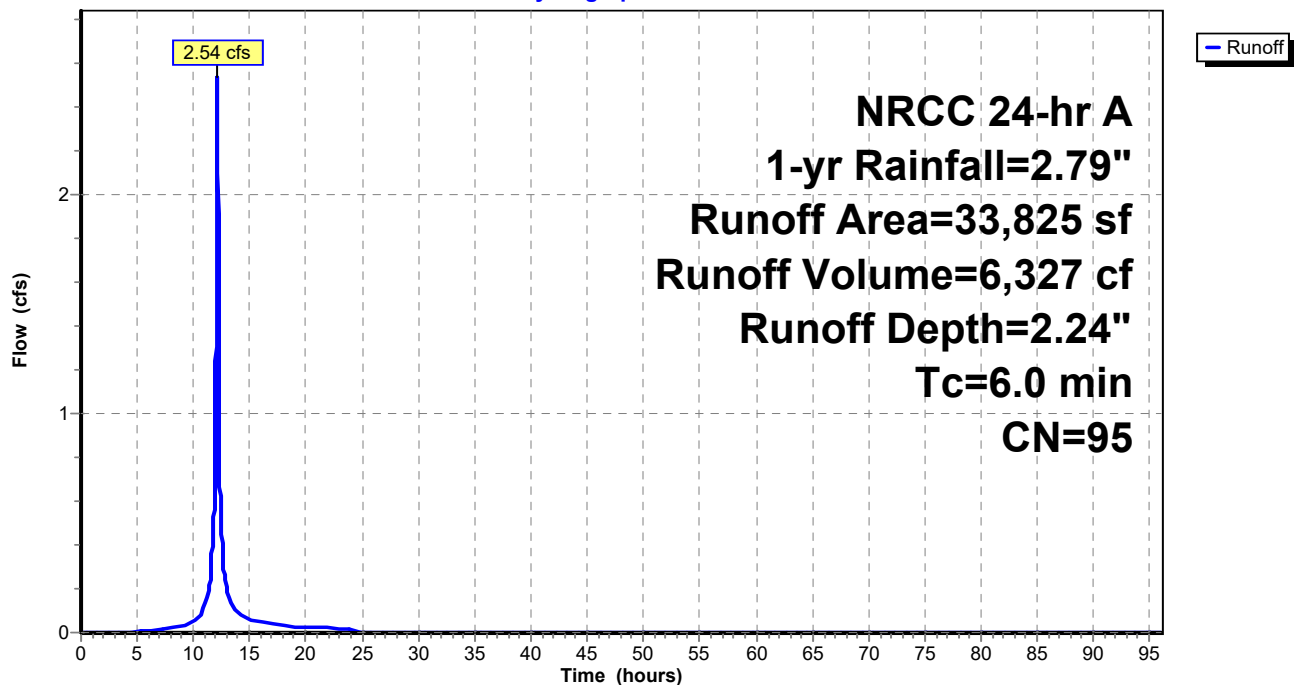
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 1-yr Rainfall=2.79"

Area (sf)	CN	Description
29,687	98	Paved parking, HSG C
4,138	74	>75% Grass cover, Good, HSG C
33,825	95	Weighted Average
4,138		12.23% Pervious Area
29,687		87.77% Impervious Area

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

Subcatchment 24: A9

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Pond 25: DIV-4

Inflow Area = 33,825 sf, 87.77% Impervious, Inflow Depth = 2.24" for 1-yr event
 Inflow = 2.54 cfs @ 12.13 hrs, Volume= 6,327 cf
 Outflow = 2.54 cfs @ 12.13 hrs, Volume= 6,327 cf, Atten= 0%, Lag= 0.0 min
 Primary = 2.54 cfs @ 12.13 hrs, Volume= 6,327 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 347.73' @ 12.13 hrs

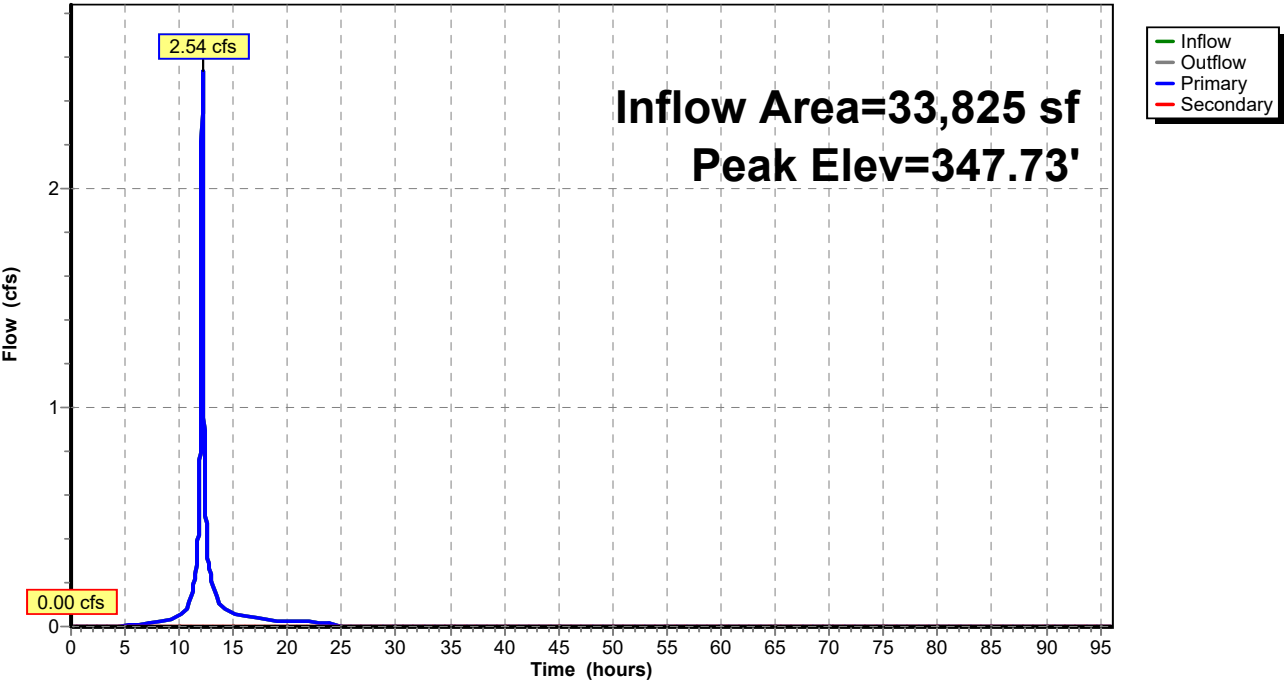
Flood Elev= 356.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	346.50'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 346.50' / 346.50' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	347.50'	18.0" Round Culvert L= 128.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 347.50' / 344.00' S= 0.0273 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	349.33'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=2.54 cfs @ 12.13 hrs HW=347.73' TW=346.71' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 2.54 cfs @ 3.36 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=346.50' TW=0.00' (Dynamic Tailwater)↑ **2=Culvert** (Controls 0.00 cfs)↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 25: DIV-4

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Pond 26: INF-4

Inflow Area = 33,825 sf, 87.77% Impervious, Inflow Depth = 2.24" for 1-yr event
 Inflow = 2.54 cfs @ 12.13 hrs, Volume= 6,327 cf
 Outflow = 0.52 cfs @ 11.89 hrs, Volume= 6,327 cf, Atten= 80%, Lag= 0.0 min
 Discarded = 0.52 cfs @ 11.89 hrs, Volume= 6,327 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 347.07' @ 12.42 hrs Surf.Area= 2,242 sf Storage= 1,537 cf

Plug-Flow detention time= 16.7 min calculated for 6,327 cf (100% of inflow)
 Center-of-Mass det. time= 16.7 min (797.6 - 780.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	346.00'	2,196 cf	30.50'W x 73.50'L x 3.88'H Field A 8,687 cf Overall - 3,196 cf Embedded = 5,490 cf x 40.0% Voids
#2A	346.50'	3,196 cf	Cultec R-330XLHD x 60 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 6 rows
		5,393 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	346.00'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.01'

Discarded OutFlow Max=0.52 cfs @ 11.89 hrs HW=346.04' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.52 cfs)

N60 P1 Post-A 2021

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NRCC 24-hr A 1-yr Rainfall=2.79"

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Pond 26: INF-4 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 6 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

10 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 71.50' Row Length +12.0" End Stone x 2 = 73.50' Base Length

6 Rows x 52.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.50' Base Width

6.0" Base + 30.5" Chamber Height + 10.0" Cover = 3.88' Field Height

60 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 6 Rows = 3,196.5 cf Chamber Storage

8,686.8 cf Field - 3,196.5 cf Chambers = 5,490.3 cf Stone x 40.0% Voids = 2,196.1 cf Stone Storage

Chamber Storage + Stone Storage = 5,392.6 cf = 0.124 af

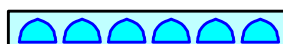
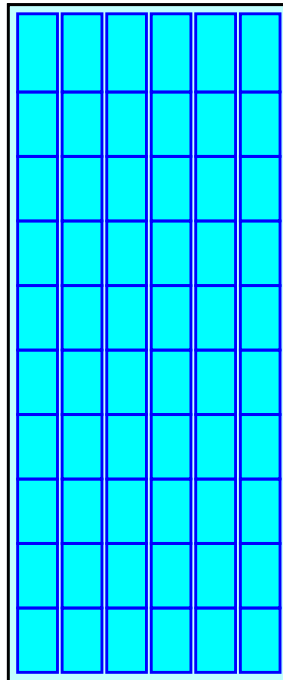
Overall Storage Efficiency = 62.1%

Overall System Size = 73.50' x 30.50' x 3.88'

60 Chambers

321.7 cy Field

203.3 cy Stone



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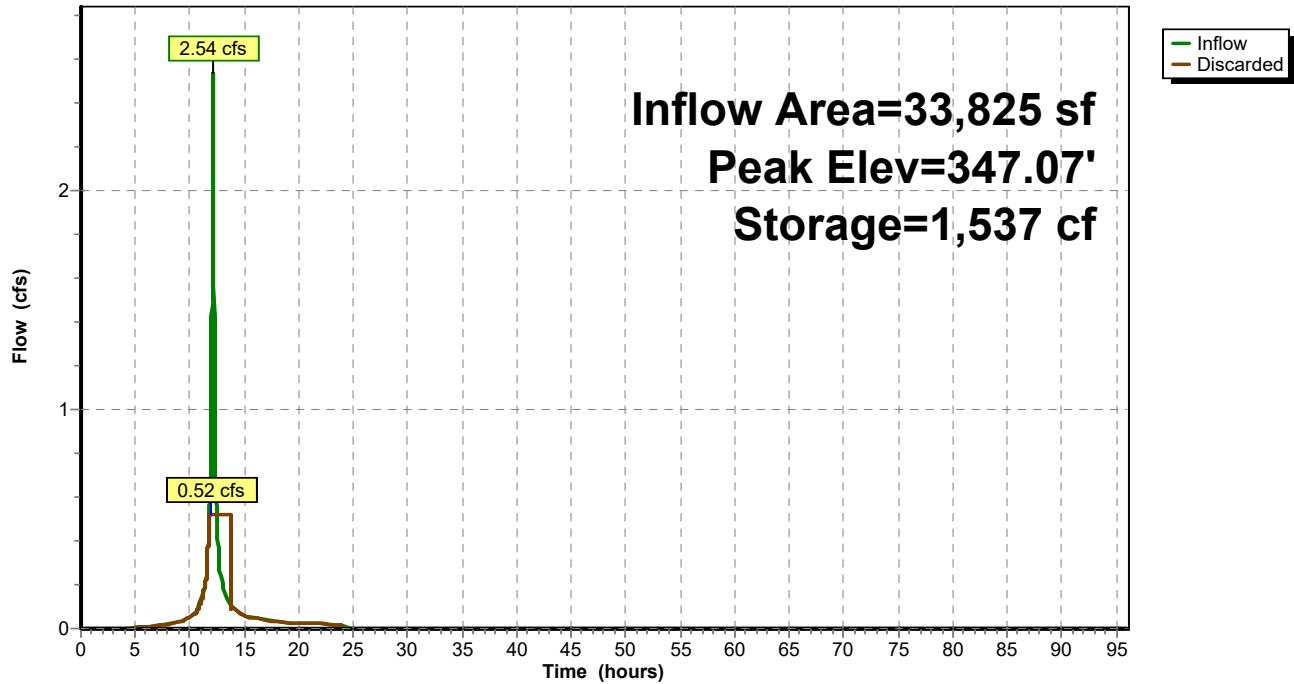
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Pond 26: INF-4

Hydrograph



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NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Subcatchment 27: A10

Runoff = 8.98 cfs @ 12.13 hrs, Volume= 21,036 cf, Depth= 1.71"

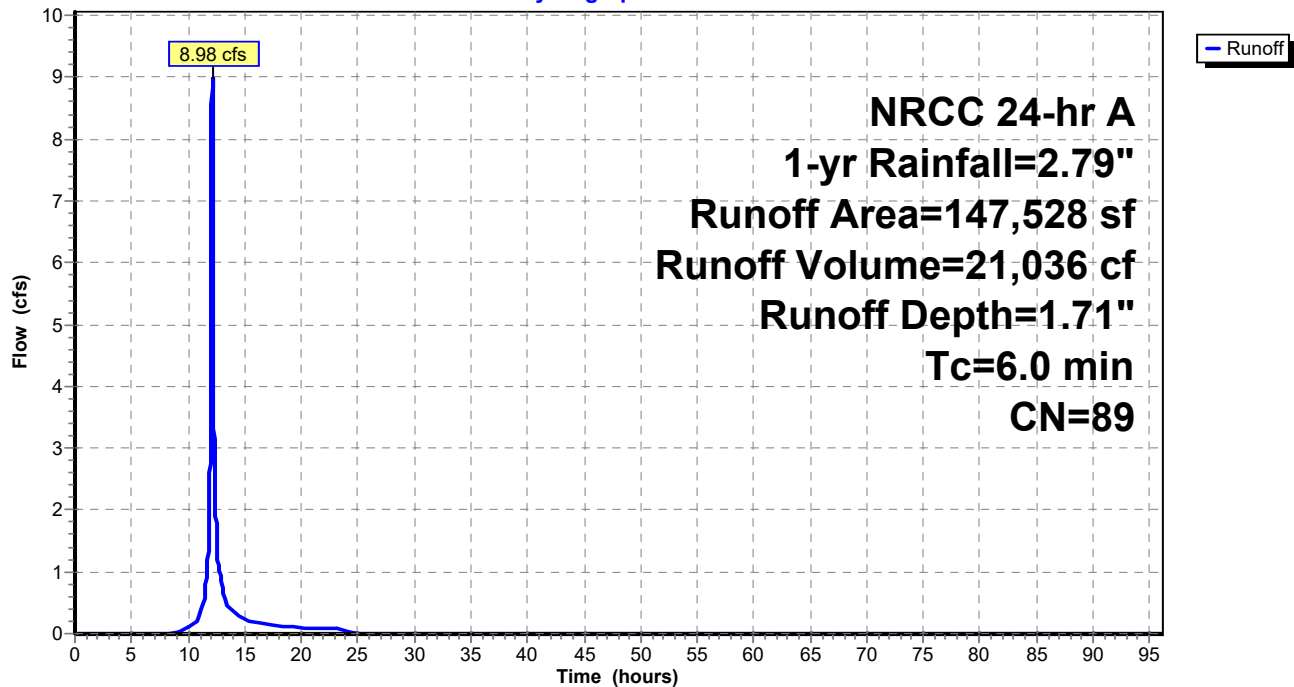
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 1-yr Rainfall=2.79"

Area (sf)	CN	Description
91,430	98	Paved parking, HSG C
5,603	80	>75% Grass cover, Good, HSG D
7,435	74	>75% Grass cover, Good, HSG C
16,120	73	Brush, Good, HSG D
19,715	77	Brush, Poor, HSG C
7,225	70	Woods, Good, HSG C
147,528	89	Weighted Average
56,098		38.03% Pervious Area
91,430		61.97% Impervious Area

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

Subcatchment 27: A10

Hydrograph



N60 P1 Post-A 2021

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NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Subcatchment 28: A10

Runoff = 0.85 cfs @ 12.13 hrs, Volume= 2,195 cf, Depth= 2.45"

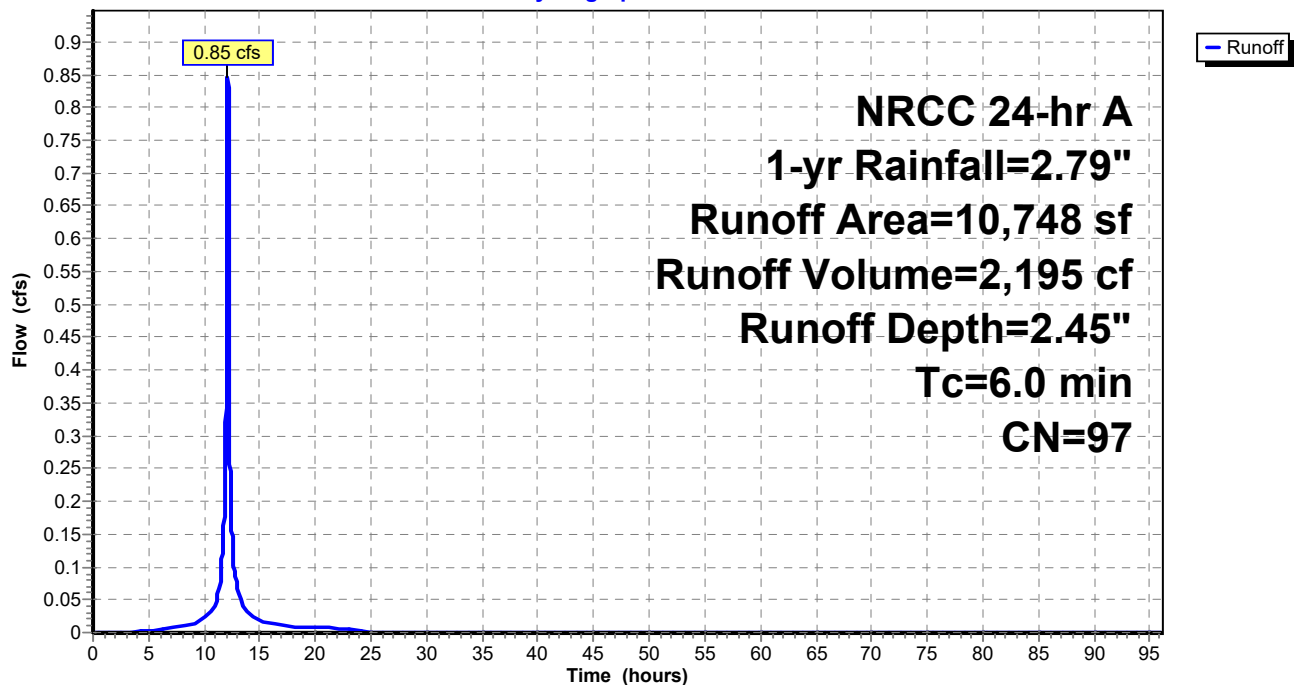
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 1-yr Rainfall=2.79"

Area (sf)	CN	Description
10,280	98	Paved parking, HSG D
468	80	>75% Grass cover, Good, HSG D
10,748	97	Weighted Average
468		4.35% Pervious Area
10,280		95.65% Impervious Area

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

Subcatchment 28: A10

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Pond 29: Infiltration Basin (SWP-2)

Inflow Area = 158,276 sf, 64.26% Impervious, Inflow Depth = 1.76" for 1-yr event
 Inflow = 9.83 cfs @ 12.13 hrs, Volume= 23,231 cf
 Outflow = 1.87 cfs @ 12.53 hrs, Volume= 23,231 cf, Atten= 81%, Lag= 23.9 min
 Discarded = 1.87 cfs @ 12.53 hrs, Volume= 23,231 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 315.48' @ 12.53 hrs Surf.Area= 5,379 sf Storage= 6,948 cf

Plug-Flow detention time= 28.0 min calculated for 23,229 cf (100% of inflow)
 Center-of-Mass det. time= 28.0 min (831.7 - 803.8)

Volume	Invert	Avail.Storage	Storage Description		
#1	314.00'	47,274 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
314.00	4,026	293.0	0	0	4,026
316.00	5,897	330.7	9,864	9,864	5,998
318.00	7,994	368.3	13,838	23,702	8,204
320.00	10,316	406.0	18,261	41,962	10,652
320.50	10,932	415.4	5,311	47,274	11,300

Device	Routing	Invert	Outlet Devices
#1	Primary	308.00'	15.0" Round Culvert L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 308.00' / 304.00' S= 0.0667 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	316.50'	6.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	318.50'	2.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	319.00'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Discarded	314.00'	15.000 in/hr Exfiltration over Surface area Phase-In= 0.10'

Discarded OutFlow Max=1.87 cfs @ 12.53 hrs HW=315.48' (Free Discharge)

↑**5=Exfiltration** (Exfiltration Controls 1.87 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=314.00' TW=0.00' (Dynamic Tailwater)

↑**1=Culvert** (Passes 0.00 cfs of 13.70 cfs potential flow)

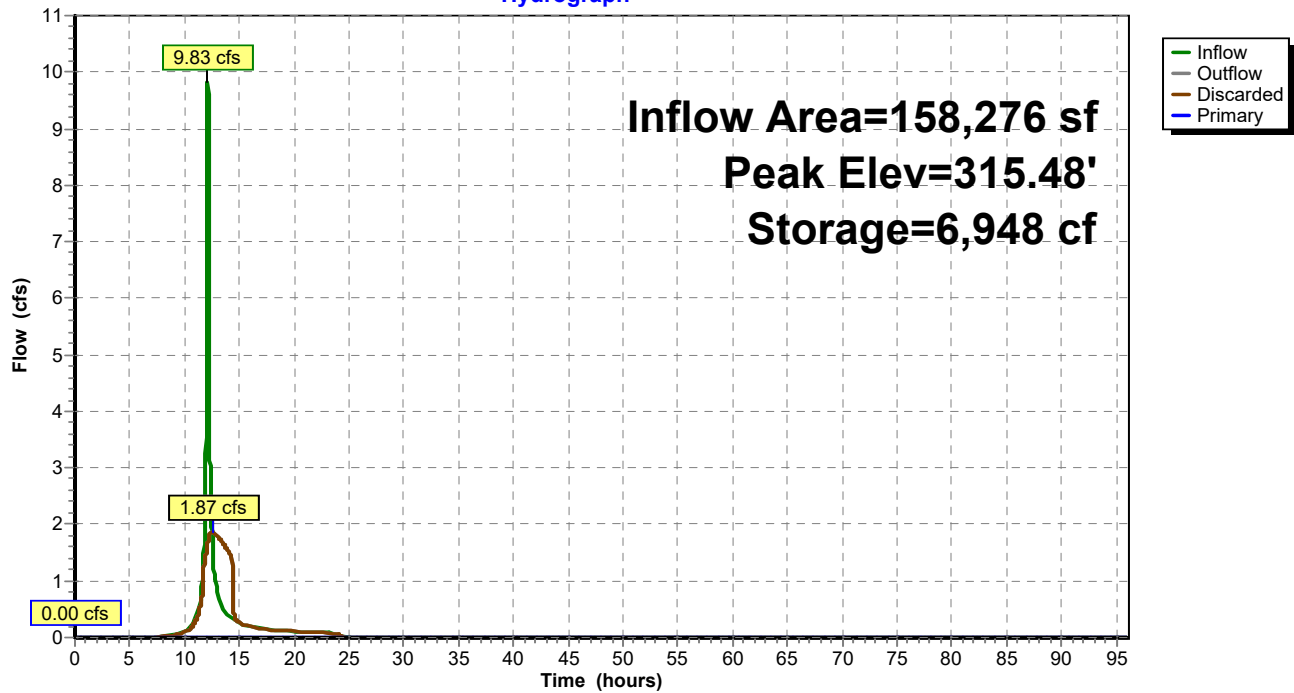
↑**2=Orifice/Grate** (Controls 0.00 cfs)

↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

↑**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 29: Infiltration Basin (SWP-2)

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Subcatchment 30: Post A2

Runoff = 4.93 cfs @ 12.29 hrs, Volume= 17,922 cf, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 1-yr Rainfall=2.79"

Area (sf)	CN	Description
43,743	98	Paved parking, HSG C
107,245	74	>75% Grass cover, Good, HSG C
2,876	61	>75% Grass cover, Good, HSG B
39,583	70	Woods, Good, HSG C
4,283	98	Water Surface, HSG C
33,976	65	Brush, Good, HSG C
231,706	77	Weighted Average
183,680		79.27% Pervious Area
48,026		20.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0400	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.4	215	0.0260	2.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	125	0.1000	6.42		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.4	377	0.0750	14.42	17.69	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
17.7	817	Total			

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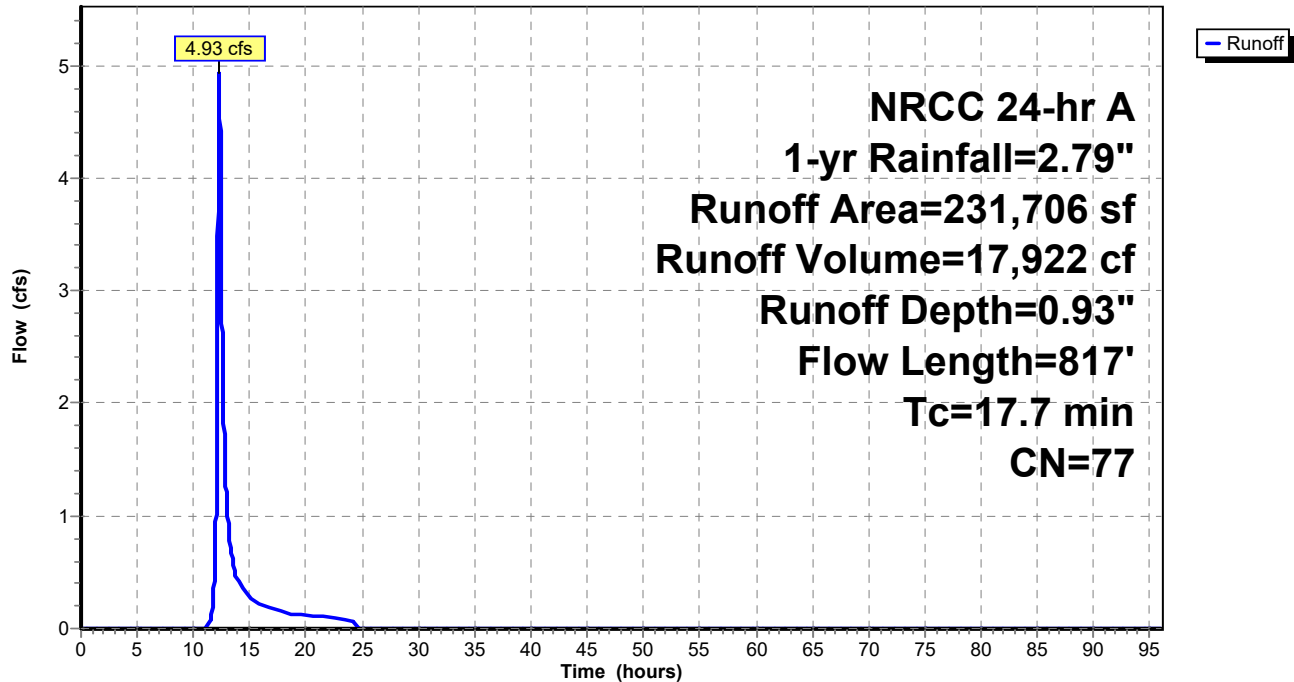
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NRCC 24-hr A 1-yr Rainfall=2.79"

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Subcatchment 30: Post A2

Hydrograph



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NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Pond 31: Pocket Wetland (SWP-1)

Inflow Area = 231,706 sf, 20.73% Impervious, Inflow Depth = 0.93" for 1-yr event
 Inflow = 4.93 cfs @ 12.29 hrs, Volume= 17,922 cf
 Outflow = 0.05 cfs @ 24.24 hrs, Volume= 10,042 cf, Atten= 99%, Lag= 717.0 min
 Primary = 0.05 cfs @ 24.24 hrs, Volume= 10,042 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Starting Elev= 234.50' Surf.Area= 12,504 sf Storage= 7,835 cf
 Peak Elev= 236.00' @ 24.24 hrs Surf.Area= 15,030 sf Storage= 24,178 cf (16,342 cf above start)

Plug-Flow detention time= 4,386.3 min calculated for 2,206 cf (12% of inflow)
 Center-of-Mass det. time= 2,257.4 min (3,113.0 - 855.6)

Volume	Invert	Avail.Storage	Storage Description
#1	230.00'	1,811 cf	Forebay (Irregular) Listed below (Recalc)
#2	230.00'	1,976 cf	Micropool (Irregular) Listed below (Recalc)
#3	233.90'	65,123 cf	Marsh & Storage (Irregular) Listed below (Recalc)
		68,911 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
230.00	86	34.2	0	0	86
231.00	217	53.2	147	147	225
232.00	406	72.3	307	453	426
233.00	651	91.4	524	977	688
233.90	1,233	129.1	834	1,811	1,357

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
230.00	86	34.2	0	0	86
231.00	217	53.2	147	147	225
232.00	406	72.3	307	453	426
233.00	651	91.4	524	977	688
233.90	1,646	155.1	1,000	1,976	1,942

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
233.90	4,232	530.5	0	0	4,232
234.50	9,625	400.9	4,048	4,048	13,842
235.00	10,440	413.5	5,015	9,063	14,683
236.00	12,144	438.8	11,281	20,344	16,451
237.00	13,950	464.0	13,037	33,381	18,317
238.00	15,856	489.2	14,893	48,273	20,287
239.00	17,864	514.5	16,850	65,123	22,369

Device	Routing	Invert	Outlet Devices
#1	Primary	232.00'	15.0" Round Culvert L= 117.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 232.00' / 216.50' S= 0.1325 ' / ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

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#2	Device 1	234.50'	1.1" Vert. Orifice/Grate	C= 0.600
#3	Device 1	236.00'	36.0" x 48.0" Horiz. Orifice/Grate	C= 0.600

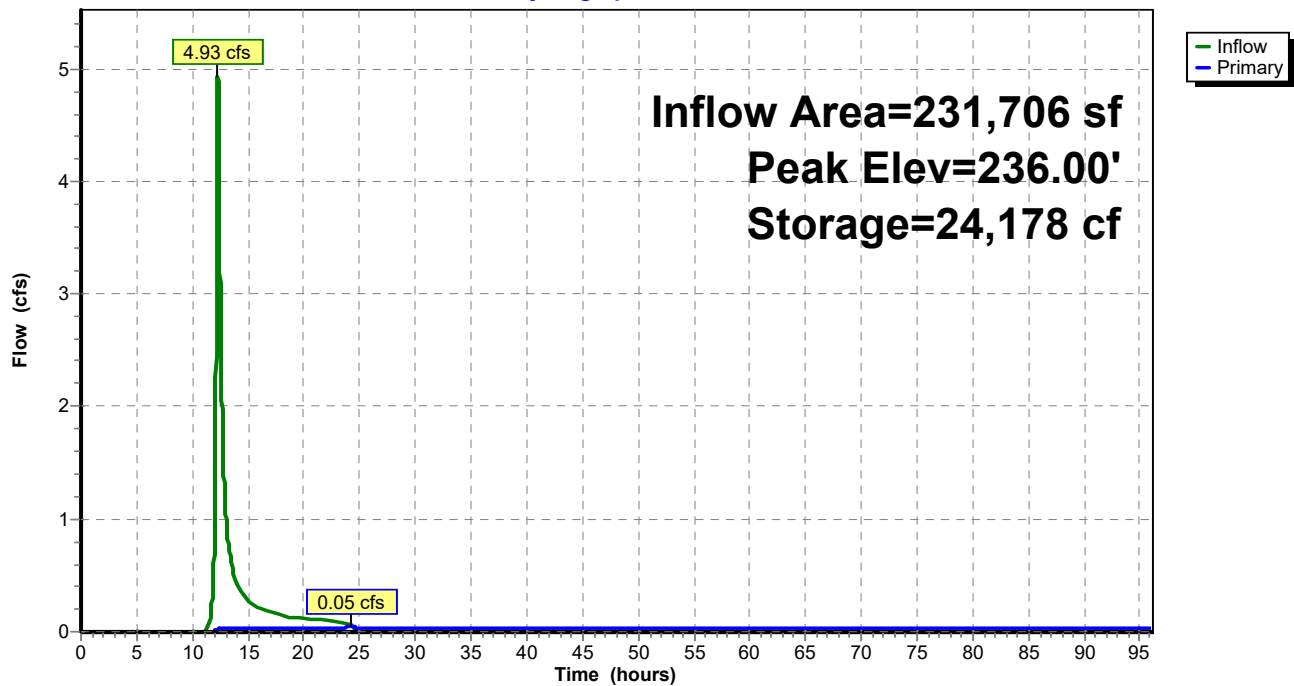
Limited to weir flow at low heads

Primary OutFlow Max=0.05 cfs @ 24.24 hrs HW=236.00' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 0.05 cfs of 10.86 cfs potential flow)
2=Orifice/Grate (Orifice Controls 0.04 cfs @ 5.81 fps)
3=Orifice/Grate (Weir Controls 0.01 cfs @ 0.20 fps)

Pond 31: Pocket Wetland (SWP-1)

Hydrograph



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NRCC 24-hr A 1-yr Rainfall=2.79"

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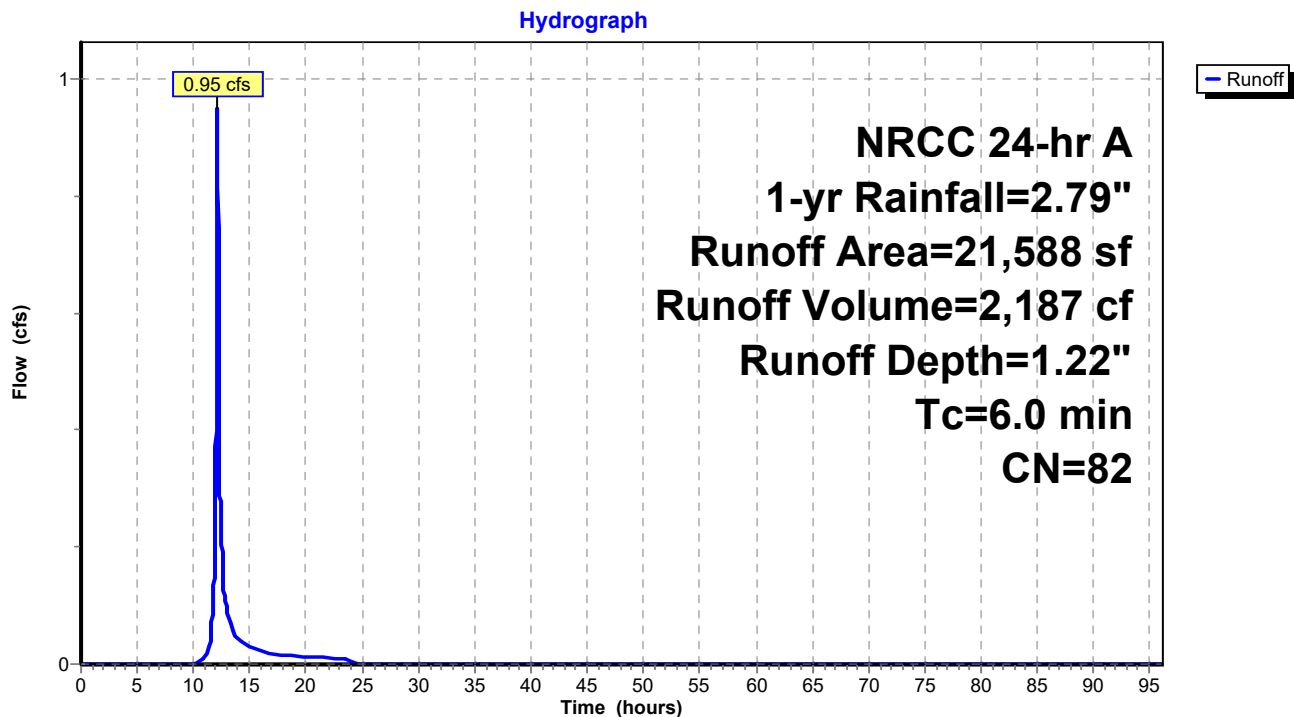
Summary for Subcatchment 32: Post A1

Runoff = 0.95 cfs @ 12.14 hrs, Volume= 2,187 cf, Depth= 1.22"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 1-yr Rainfall=2.79"

Area (sf)	CN	Description
8,152	98	Paved parking, HSG C
10,356	74	>75% Grass cover, Good, HSG C
3,080	70	Woods, Good, HSG C
21,588	82	Weighted Average
13,436		62.24% Pervious Area
8,152		37.76% Impervious Area

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

Subcatchment 32: Post A1

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NRCC 24-hr A 1-yr Rainfall=2.79"

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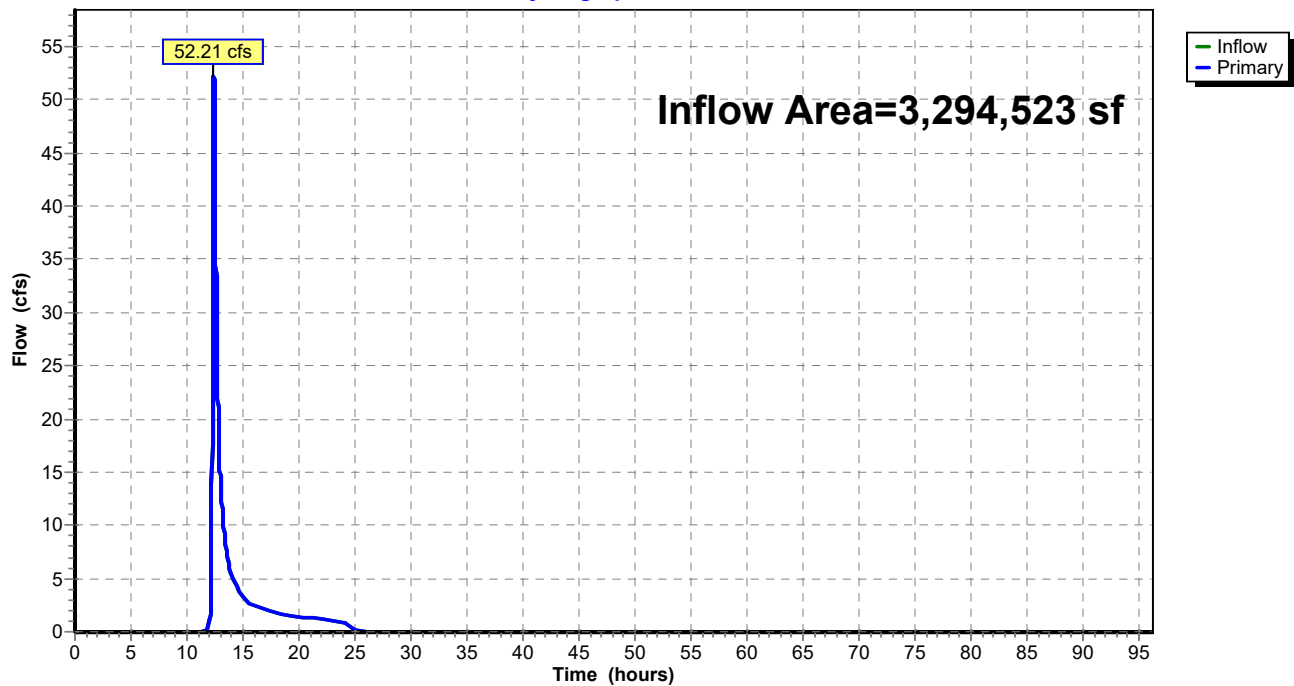
Summary for Link 33: Design Point A

Inflow Area = 3,294,523 sf, 35.27% Impervious, Inflow Depth > 0.72" for 1-yr event
Inflow = 52.21 cfs @ 12.39 hrs, Volume= 198,956 cf
Primary = 52.21 cfs @ 12.39 hrs, Volume= 198,956 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 33: Design Point A

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 2-yr Rainfall=3.42"

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment8: Post A0 OffsiteRunoff Area=1,115,060 sf 57.87% Impervious Runoff Depth=2.37"
Flow Length=1,018' Tc=12.5 min CN=90 Runoff=72.43 cfs 220,520 cf**Pond 9: Offsite Pond A**Peak Elev=361.29' Storage=78,351 cf Inflow=72.43 cfs 220,520 cf
Outflow=41.23 cfs 169,325 cf**Subcatchment10: Post A4**Runoff Area=164,583 sf 10.25% Impervious Runoff Depth=1.31"
Flow Length=340' Tc=20.5 min CN=76 Runoff=4.68 cfs 17,934 cf**Reach 11: Box Culvert**Avg. Flow Depth=0.28' Max Vel=2.11 fps Inflow=4.68 cfs 17,934 cf
n=0.041 L=98.0' S=0.0204 ' Capacity=177.99 cfs Outflow=4.67 cfs 17,934 cf**Subcatchment12: Post A8**Runoff Area=392,732 sf 0.00% Impervious Runoff Depth=1.07"
Flow Length=320' Tc=21.4 min CN=72 Runoff=8.64 cfs 34,984 cf**Pond 12A: Existing Wetland A**Peak Elev=322.79' Storage=1,828 cf Inflow=54.50 cfs 222,243 cf
96.0" x 36.0" Box Culvert n=0.040 L=116.0' S=0.0776 ' Outflow=54.42 cfs 222,243 cf**Subcatchment12B: Post A11**Runoff Area=722,164 sf 1.29% Impervious Runoff Depth=0.96"
Flow Length=475' Tc=19.8 min CN=70 Runoff=14.49 cfs 57,717 cf**Reach 13: Existing Stream A (Lower**Avg. Flow Depth=1.21' Max Vel=8.77 fps Inflow=68.74 cfs 279,960 cf
n=0.040 L=1,360.0' S=0.0721 ' Capacity=601.12 cfs Outflow=68.12 cfs 279,960 cf**Subcatchment14: Post A3**Runoff Area=106,378 sf 85.91% Impervious Runoff Depth=2.86"
Tc=6.0 min CN=95 Runoff=10.01 cfs 25,358 cf**Pond 15: DIV-1**Peak Elev=325.84' Inflow=10.01 cfs 25,358 cf
Primary=5.57 cfs 23,430 cf Secondary=4.64 cfs 1,929 cf Outflow=10.01 cfs 25,358 cf**Pond 16: INF-1**Peak Elev=324.79' Storage=6,835 cf Inflow=5.57 cfs 23,430 cf
Outflow=1.18 cfs 23,430 cf**Subcatchment17: Post A5**Runoff Area=92,926 sf 100.00% Impervious Runoff Depth=3.19"
Tc=6.0 min CN=98 Runoff=9.17 cfs 24,677 cf**Pond 18: DIV-2**Peak Elev=363.78' Inflow=9.17 cfs 24,677 cf
Primary=6.03 cfs 23,539 cf Secondary=3.35 cfs 1,139 cf Outflow=9.17 cfs 24,677 cf**Pond 19: INF-2**Peak Elev=362.44' Storage=7,384 cf Inflow=6.03 cfs 23,539 cf
Outflow=0.99 cfs 23,539 cf**Reach 20: 36" HDPE Pipe**Avg. Flow Depth=0.25' Max Vel=11.58 fps Inflow=3.35 cfs 1,139 cf
36.0" Round Pipe n=0.013 L=805.0' S=0.1205 ' Capacity=231.53 cfs Outflow=3.19 cfs 1,139 cf**Subcatchment21: A6**Runoff Area=384,686 sf 86.44% Impervious Runoff Depth=2.97"
Tc=6.0 min CN=96 Runoff=36.90 cfs 95,090 cf

N60 P1 Post-A 2021

NRCC 24-hr A 2-yr Rainfall=3.42"

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Subcatchment22: A7 Runoff Area=103,728 sf 0.00% Impervious Runoff Depth=0.86"
Tc=6.0 min CN=68 Runoff=3.02 cfs 7,393 cf

Pond 23: Infiltration Basin (SWP-3) Peak Elev=259.19' Storage=38,403 cf Inflow=42.90 cfs 103,621 cf
Discarded=5.13 cfs 103,621 cf Primary=0.00 cfs 0 cf Outflow=5.13 cfs 103,621 cf

Subcatchment24: A9 Runoff Area=33,825 sf 87.77% Impervious Runoff Depth=2.86"
Tc=6.0 min CN=95 Runoff=3.18 cfs 8,063 cf

Pond 25: DIV-4 Peak Elev=347.96' Inflow=3.18 cfs 8,063 cf
Primary=3.18 cfs 8,063 cf Secondary=0.00 cfs 0 cf Outflow=3.18 cfs 8,063 cf

Pond 26: INF-4 Peak Elev=347.48' Storage=2,285 cf Inflow=3.18 cfs 8,063 cf
Outflow=0.52 cfs 8,063 cf

Subcatchment27: A10 Runoff Area=147,528 sf 61.97% Impervious Runoff Depth=2.28"
Tc=6.0 min CN=89 Runoff=11.84 cfs 28,071 cf

Subcatchment28: A10 Runoff Area=10,748 sf 95.65% Impervious Runoff Depth=3.07"
Tc=6.0 min CN=97 Runoff=1.05 cfs 2,754 cf

Pond 29: Infiltration Basin (SWP-2) Peak Elev=316.08' Storage=10,365 cf Inflow=12.88 cfs 30,826 cf
Discarded=2.08 cfs 30,826 cf Primary=0.00 cfs 0 cf Outflow=2.08 cfs 30,826 cf

Subcatchment30: Post A2 Runoff Area=231,706 sf 20.73% Impervious Runoff Depth=1.37"
Flow Length=817' Tc=17.7 min CN=77 Runoff=7.46 cfs 26,479 cf

Pond 31: Pocket Wetland (SWP-1) Peak Elev=236.06' Storage=24,849 cf Inflow=7.46 cfs 26,479 cf
Outflow=0.69 cfs 18,561 cf

Subcatchment32: Post A1 Runoff Area=21,588 sf 37.76% Impervious Runoff Depth=1.72"
Tc=6.0 min CN=82 Runoff=1.34 cfs 3,088 cf

Link 33: Design Point A Inflow=68.51 cfs 303,537 cf
Primary=68.51 cfs 303,537 cf

Total Runoff Area = 3,527,652 sf Runoff Volume = 552,129 cf Average Runoff Depth = 1.88"
61.00% Pervious = 2,151,703 sf 39.00% Impervious = 1,375,949 sf

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NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Subcatchment 8: Post A0 Offsite

Runoff = 72.43 cfs @ 12.20 hrs, Volume= 220,520 cf, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 2-yr Rainfall=3.42"

Area (sf)	CN	Description
645,334	98	Paved parking, HSG C
443,611	80	>75% Grass cover, Good, HSG D
23,572	74	>75% Grass cover, Good, HSG C
2,543	61	>75% Grass cover, Good, HSG B
1,115,060	90	Weighted Average
469,726		42.13% Pervious Area
645,334		57.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0150	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.6	148	0.0574	3.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	30	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	740	0.0270	10.25	32.22	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Concrete sewer w/manholes & inlets
12.5	1,018	Total			

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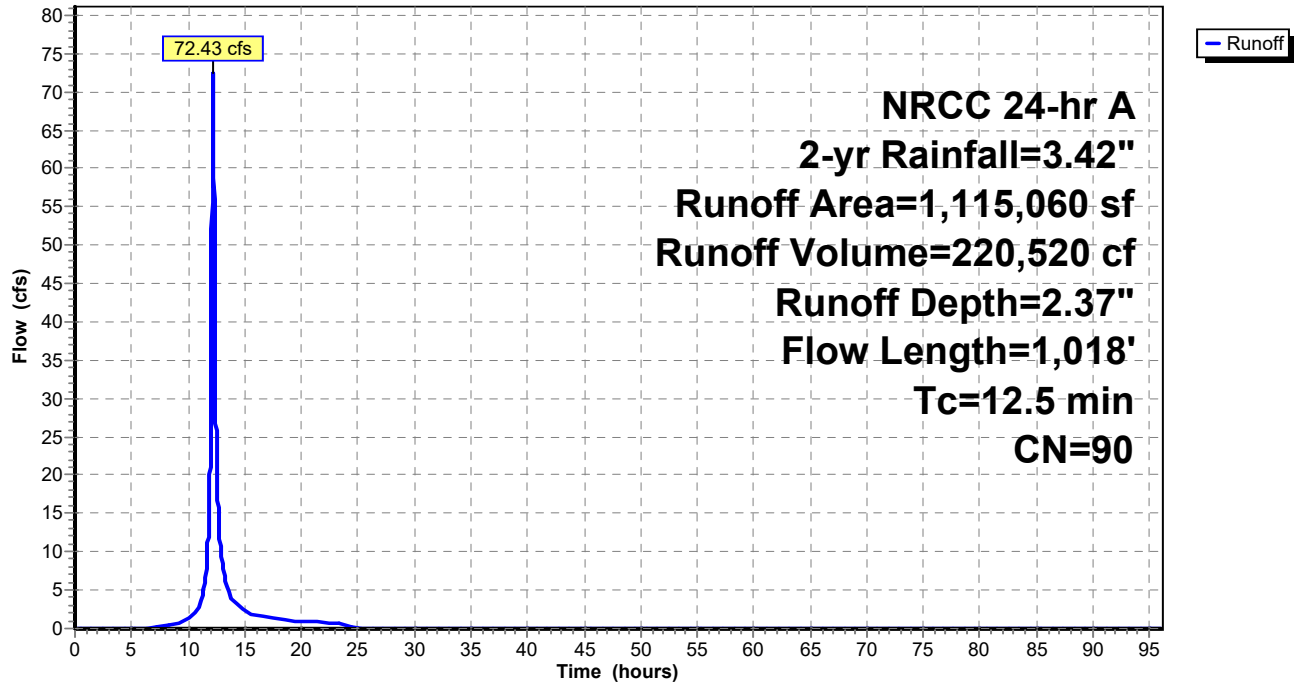
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Subcatchment 8: Post A0 Offsite

Hydrograph



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NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Pond 9: Offsite Pond A

Inflow Area = 1,115,060 sf, 57.87% Impervious, Inflow Depth = 2.37" for 2-yr event
 Inflow = 72.43 cfs @ 12.20 hrs, Volume= 220,520 cf
 Outflow = 41.23 cfs @ 12.35 hrs, Volume= 169,325 cf, Atten= 43%, Lag= 9.1 min
 Primary = 41.23 cfs @ 12.35 hrs, Volume= 169,325 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 361.29' @ 12.35 hrs Surf.Area= 22,611 sf Storage= 78,351 cf

Plug-Flow detention time= 123.4 min calculated for 169,325 cf (77% of inflow)
 Center-of-Mass det. time= 48.0 min (851.3 - 803.3)

Volume	Invert	Avail.Storage	Storage Description
#1	357.00'	221,816 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
357.00	14,633	679.0	0	0	14,633
358.00	16,652	698.0	15,632	15,632	16,826
359.00	17,534	715.0	17,091	32,723	18,864
360.00	19,427	745.0	18,472	51,195	22,425
362.00	24,453	804.0	43,784	94,979	29,861
364.00	28,701	854.0	53,097	148,076	36,663
365.00	36,602	901.0	32,572	180,648	43,285
366.00	45,910	1,262.0	41,168	221,816	105,432

Device	Routing	Invert	Outlet Devices
#1	Primary	357.00'	30.0" Round Culvert L= 125.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 357.00' / 351.00' S= 0.0480 ' S= 0.0480 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf
#2	Device 1	360.00'	36.0" x 48.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Primary	364.75'	150.0' long x 36.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=41.23 cfs @ 12.35 hrs HW=361.29' TW=322.79' (Dynamic Tailwater)

1=Culvert (Inlet Controls 41.23 cfs @ 8.40 fps)
 2=Orifice/Grate (Passes 41.23 cfs of 131.40 cfs potential flow)
 3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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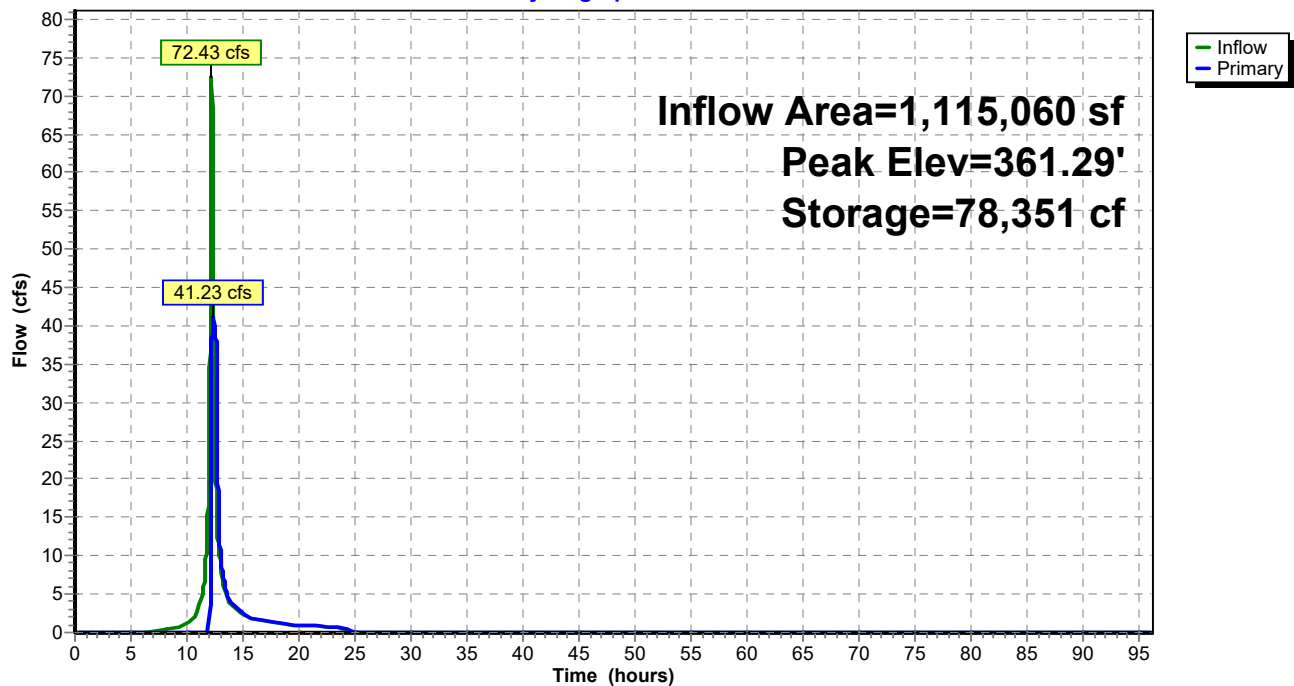
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NRCC 24-hr A 2-yr Rainfall=3.42"

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Pond 9: Offsite Pond A

Hydrograph



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Summary for Subcatchment 10: Post A4

Runoff = 4.68 cfs @ 12.32 hrs, Volume= 17,934 cf, Depth= 1.31"

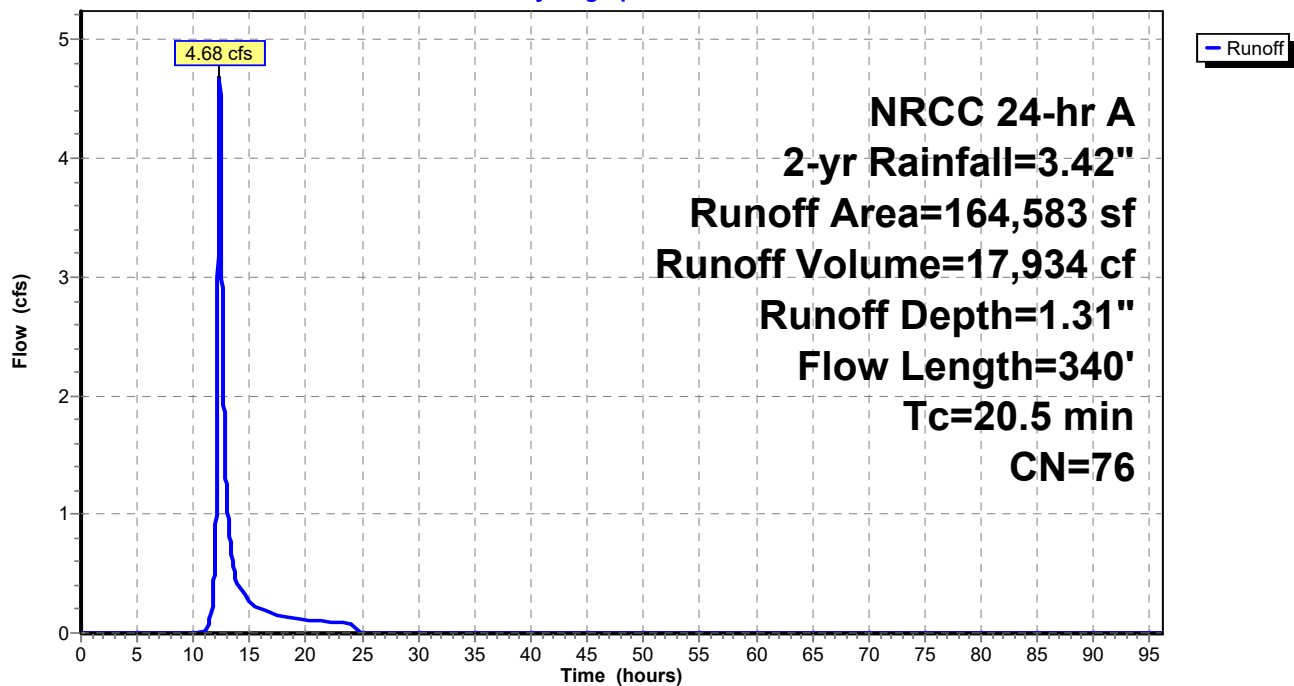
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 2-yr Rainfall=3.42"

Area (sf)	CN	Description
15,990	74	>75% Grass cover, Good, HSG C
65,271	70	Woods, Good, HSG C
66,457	77	Woods, Good, HSG D
16,865	98	Water Surface, HSG D
164,583	76	Weighted Average
147,718		89.75% Pervious Area
16,865		10.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0250	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.7	240	0.0208	2.32		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
20.5	340	Total			

Subcatchment 10: Post A4

Hydrograph



N60 P1 Post-A 2021

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NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Reach 11: Box Culvert

Inflow Area = 164,583 sf, 10.25% Impervious, Inflow Depth = 1.31" for 2-yr event
Inflow = 4.68 cfs @ 12.32 hrs, Volume= 17,934 cf
Outflow = 4.67 cfs @ 12.33 hrs, Volume= 17,934 cf, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.11 fps, Min. Travel Time= 0.8 min
Avg. Velocity= 0.66 fps, Avg. Travel Time= 2.5 min

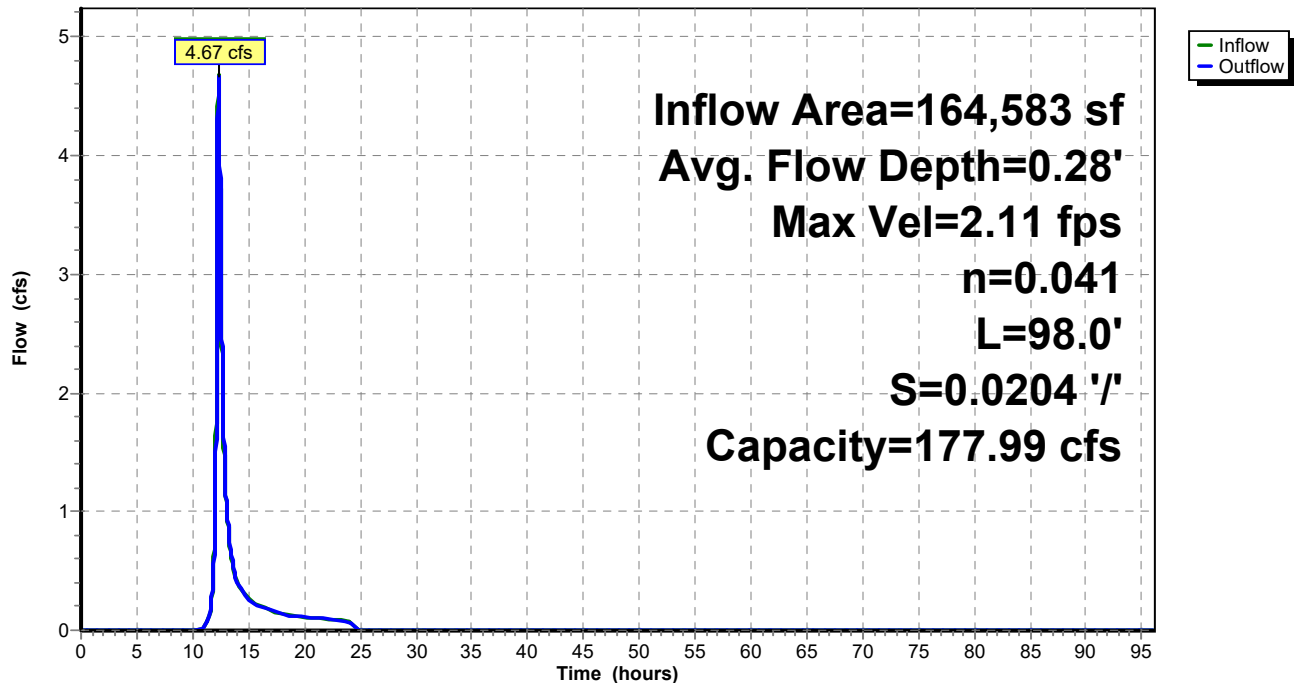
Peak Storage= 217 cf @ 12.33 hrs
Average Depth at Peak Storage= 0.28'
Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 177.99 cfs

8.00' x 3.00' deep channel, n= 0.041 Riprap, 2-inch
Length= 98.0' Slope= 0.0204 '/'
Inlet Invert= 349.00', Outlet Invert= 347.00'



Reach 11: Box Culvert

Hydrograph



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NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Subcatchment 12: Post A8

Runoff = 8.64 cfs @ 12.34 hrs, Volume= 34,984 cf, Depth= 1.07"

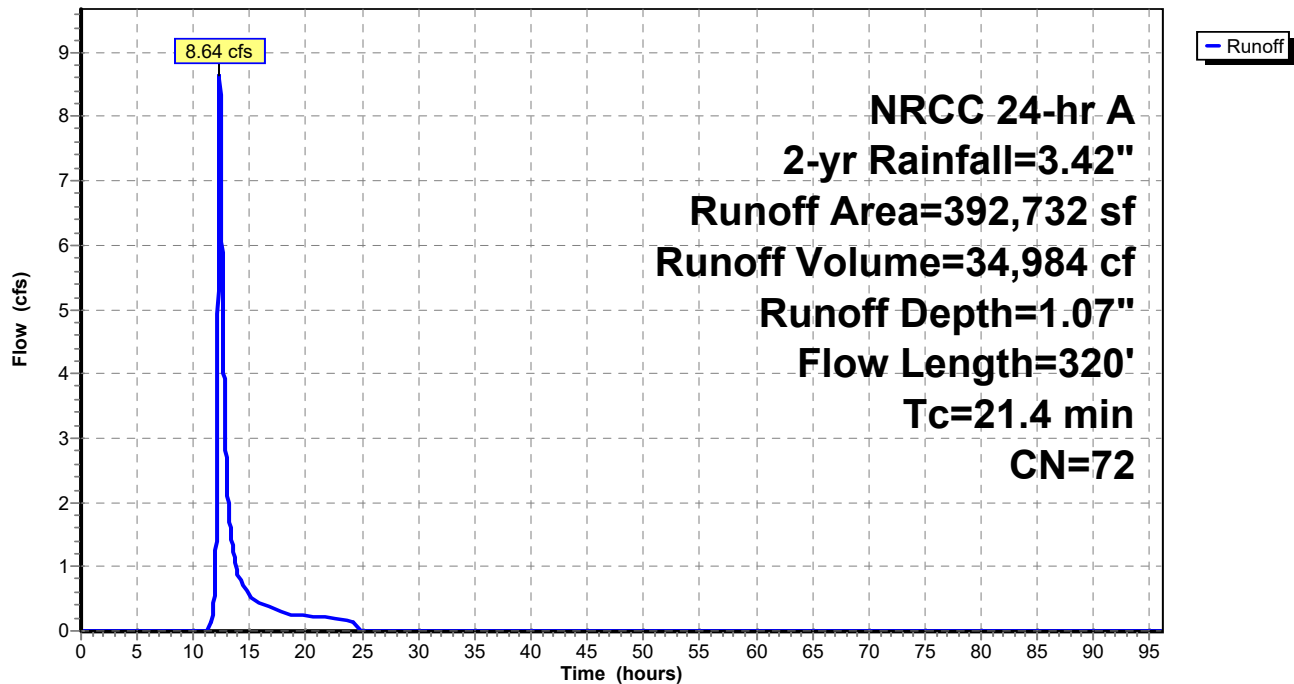
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 2-yr Rainfall=3.42"

Area (sf)	CN	Description
278,057	70	Woods, Good, HSG C
108,143	77	Woods, Good, HSG D
6,532	74	>75% Grass cover, Good, HSG C
392,732	72	Weighted Average
392,732		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
0.9	220	0.0636	4.06		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
21.4	320	Total			

Subcatchment 12: Post A8

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Pond 12A: Existing Wetland A

Inflow Area = 1,672,375 sf, 39.60% Impervious, Inflow Depth = 1.59" for 2-yr event
 Inflow = 54.50 cfs @ 12.34 hrs, Volume= 222,243 cf
 Outflow = 54.42 cfs @ 12.35 hrs, Volume= 222,243 cf, Atten= 0%, Lag= 0.8 min
 Primary = 54.42 cfs @ 12.35 hrs, Volume= 222,243 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 322.79' @ 12.35 hrs Surf.Area= 2,272 sf Storage= 1,828 cf

Plug-Flow detention time= 0.4 min calculated for 222,219 cf (100% of inflow)
 Center-of-Mass det. time= 0.4 min (853.5 - 853.1)

Volume	Invert	Avail.Storage	Storage Description		
#1	321.00'	190,307 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
321.00	124	53.2	0	0	124
322.00	1,084	175.8	525	525	2,361
324.00	4,913	341.5	5,536	6,061	9,202
326.00	11,332	638.2	15,804	21,866	32,354
328.00	20,583	804.3	31,458	53,324	51,475
330.00	34,086	1,075.5	54,104	107,428	92,087
332.00	49,257	1,268.5	82,879	190,307	128,164

Device	Routing	Invert	Outlet Devices
#1	Primary	321.00'	96.0" W x 36.0" H Box Culvert L= 116.0' Box, 0° wingwalls, square crown edge, Ke= 0.700 Inlet / Outlet Invert= 321.00' / 312.00' S= 0.0776 '/' Cc= 0.900 n= 0.040 Earth, cobble bottom, clean sides, Flow Area= 24.00 sf

Primary OutFlow Max=54.42 cfs @ 12.35 hrs HW=322.79' TW=313.21' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 54.42 cfs @ 3.79 fps)

N60 P1 Post-A 2021

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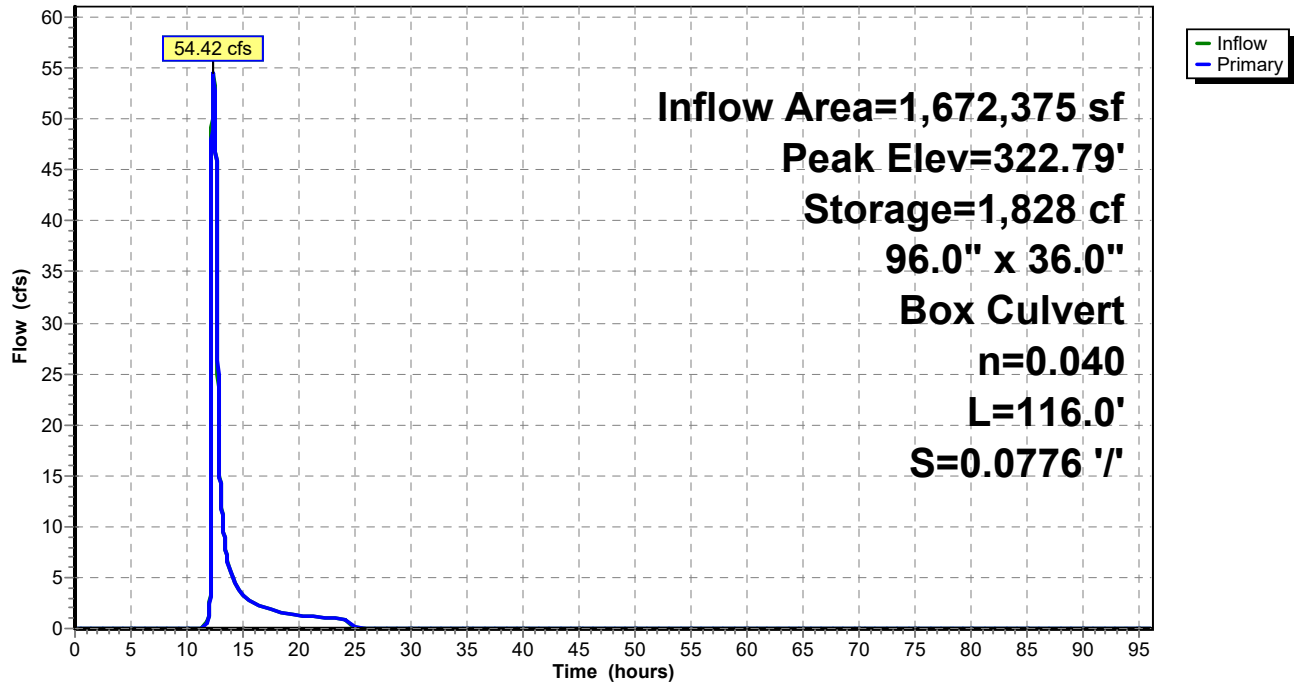
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Pond 12A: Existing Wetland A

Hydrograph



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NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Subcatchment 12B: Post A11

Runoff = 14.49 cfs @ 12.32 hrs, Volume= 57,717 cf, Depth= 0.96"

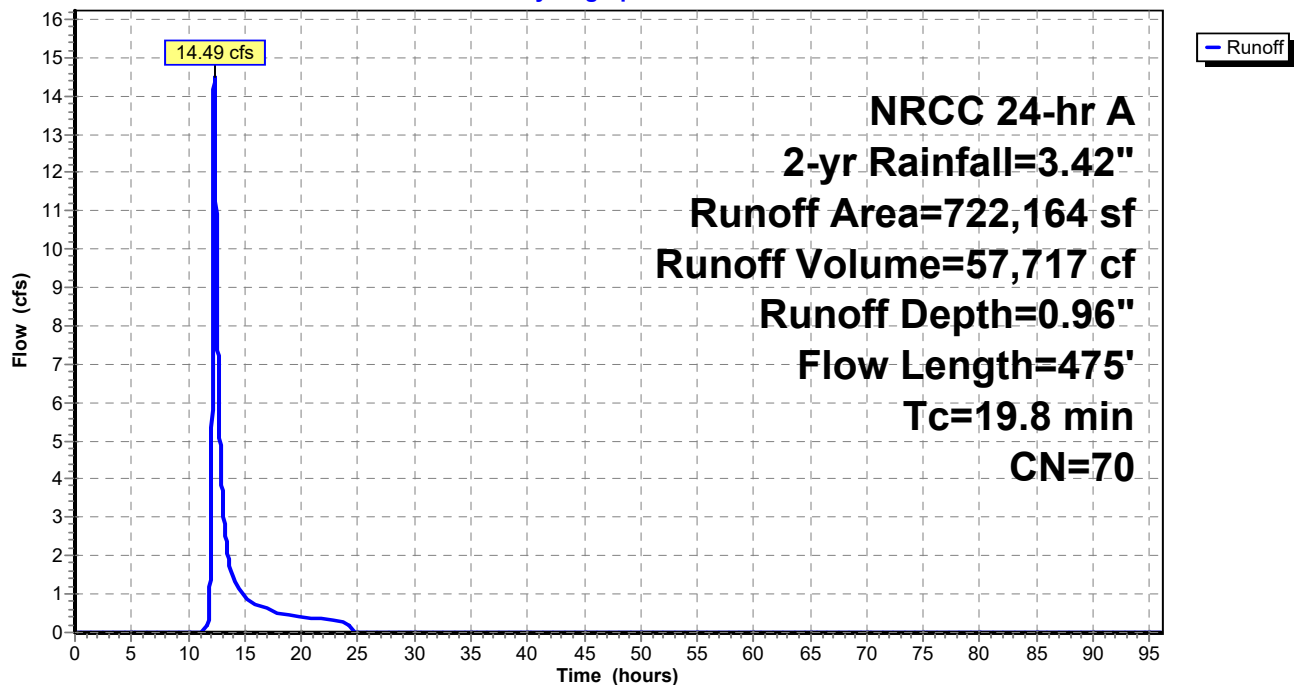
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 2-yr Rainfall=3.42"

Area (sf)	CN	Description
17,361	55	Woods, Good, HSG B
681,082	70	Woods, Good, HSG C
11,683	77	Woods, Good, HSG D
9,345	98	Paved parking, HSG C
2,693	74	>75% Grass cover, Good, HSG C
722,164	70	Weighted Average
712,819		98.71% Pervious Area
9,345		1.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0250	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.0	375	0.1400	6.02		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
19.8	475	Total			

Subcatchment 12B: Post A11

Hydrograph



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NRCC 24-hr A 2-yr Rainfall=3.42"

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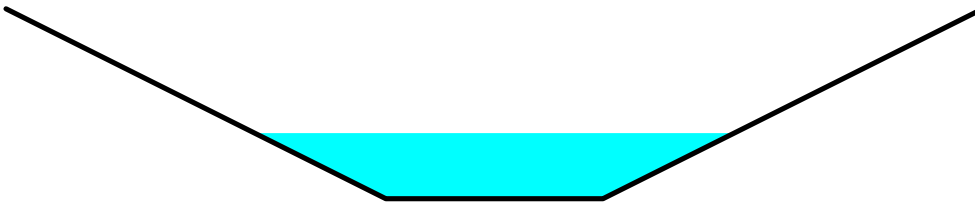
Summary for Reach 13: Existing Stream A (Lower Segment)

Inflow Area = 2,394,539 sf, 28.04% Impervious, Inflow Depth = 1.40" for 2-yr event
Inflow = 68.74 cfs @ 12.34 hrs, Volume= 279,960 cf
Outflow = 68.12 cfs @ 12.37 hrs, Volume= 279,960 cf, Atten= 1%, Lag= 2.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.77 fps, Min. Travel Time= 2.6 min
Avg. Velocity = 2.28 fps, Avg. Travel Time= 9.9 min

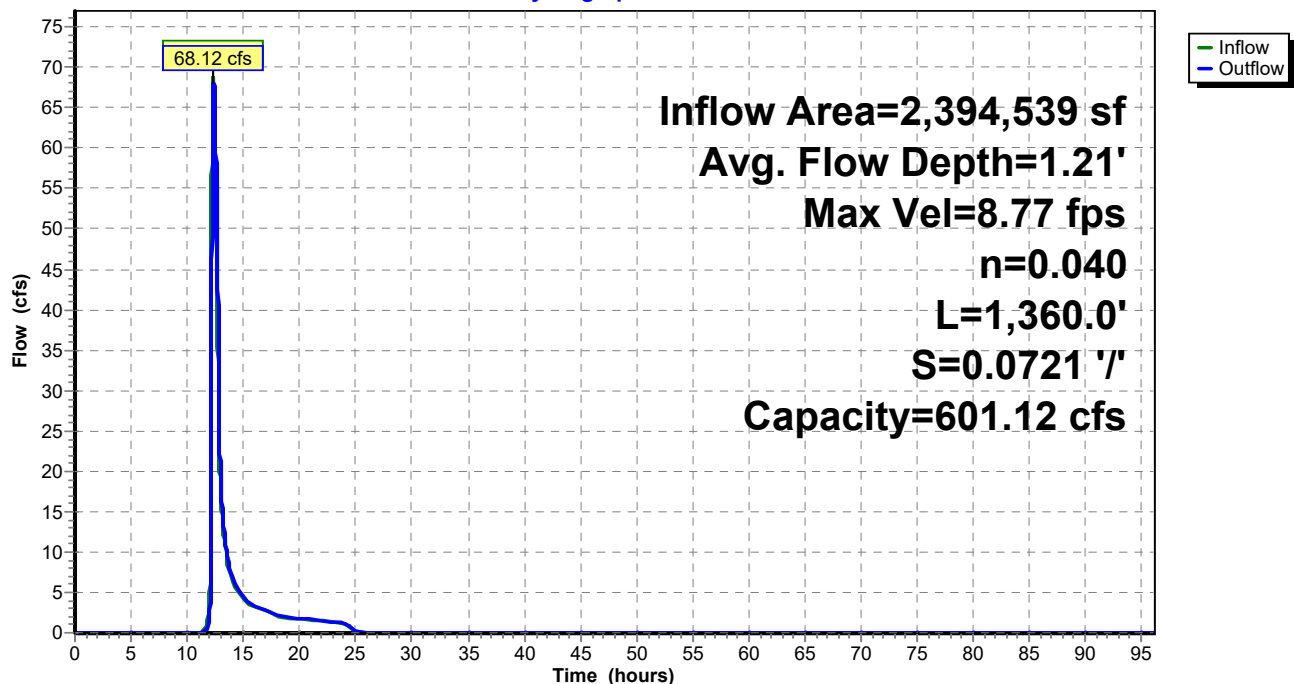
Peak Storage= 10,558 cf @ 12.37 hrs
Average Depth at Peak Storage= 1.21'
Bank-Full Depth= 3.50' Flow Area= 38.5 sf, Capacity= 601.12 cfs

4.00' x 3.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 1,360.0' Slope= 0.0721 '/'
Inlet Invert= 312.00', Outlet Invert= 214.00'



Reach 13: Existing Stream A (Lower Segment)

Hydrograph



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NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Subcatchment 14: Post A3

Runoff = 10.01 cfs @ 12.13 hrs, Volume= 25,358 cf, Depth= 2.86"

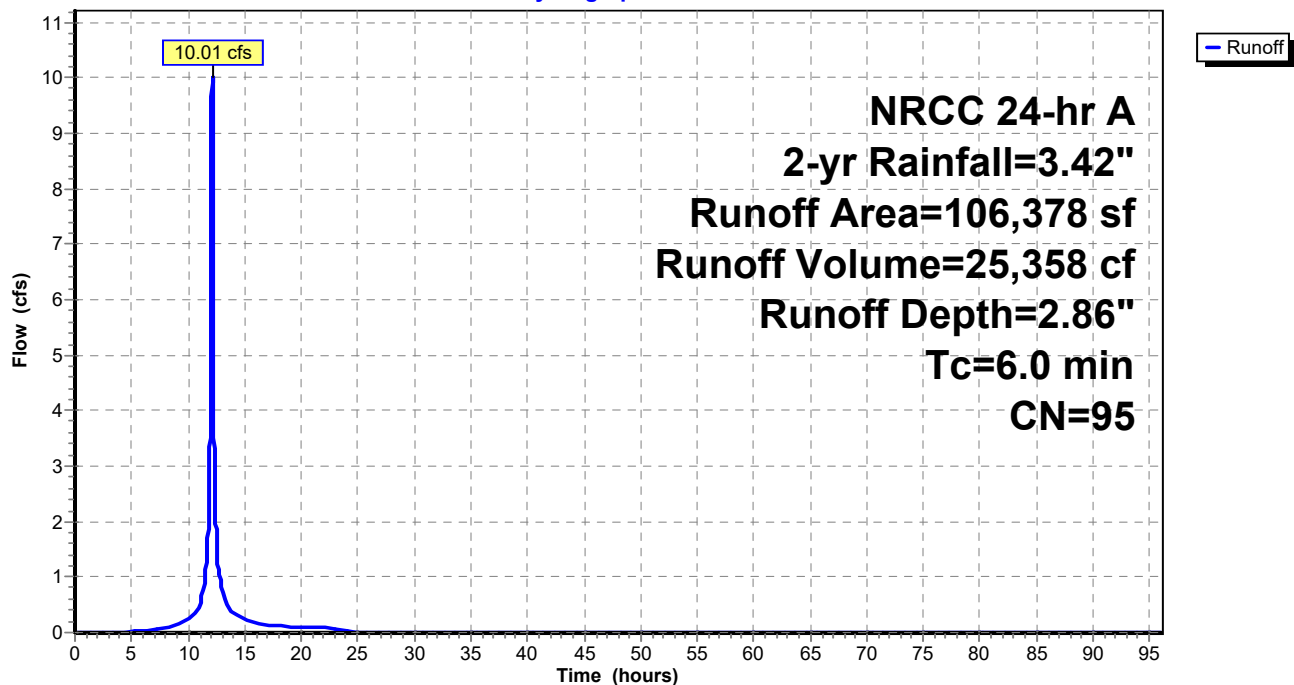
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 2-yr Rainfall=3.42"

Area (sf)	CN	Description
91,392	98	Paved parking, HSG C
14,986	74	>75% Grass cover, Good, HSG C
106,378	95	Weighted Average
14,986		14.09% Pervious Area
91,392		85.91% Impervious Area

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

Subcatchment 14: Post A3

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Pond 15: DIV-1

Inflow Area = 106,378 sf, 85.91% Impervious, Inflow Depth = 2.86" for 2-yr event
 Inflow = 10.01 cfs @ 12.13 hrs, Volume= 25,358 cf
 Outflow = 10.01 cfs @ 12.13 hrs, Volume= 25,358 cf, Atten= 0%, Lag= 0.0 min
 Primary = 5.57 cfs @ 12.06 hrs, Volume= 23,430 cf
 Secondary = 4.64 cfs @ 12.13 hrs, Volume= 1,929 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 325.84' @ 12.13 hrs

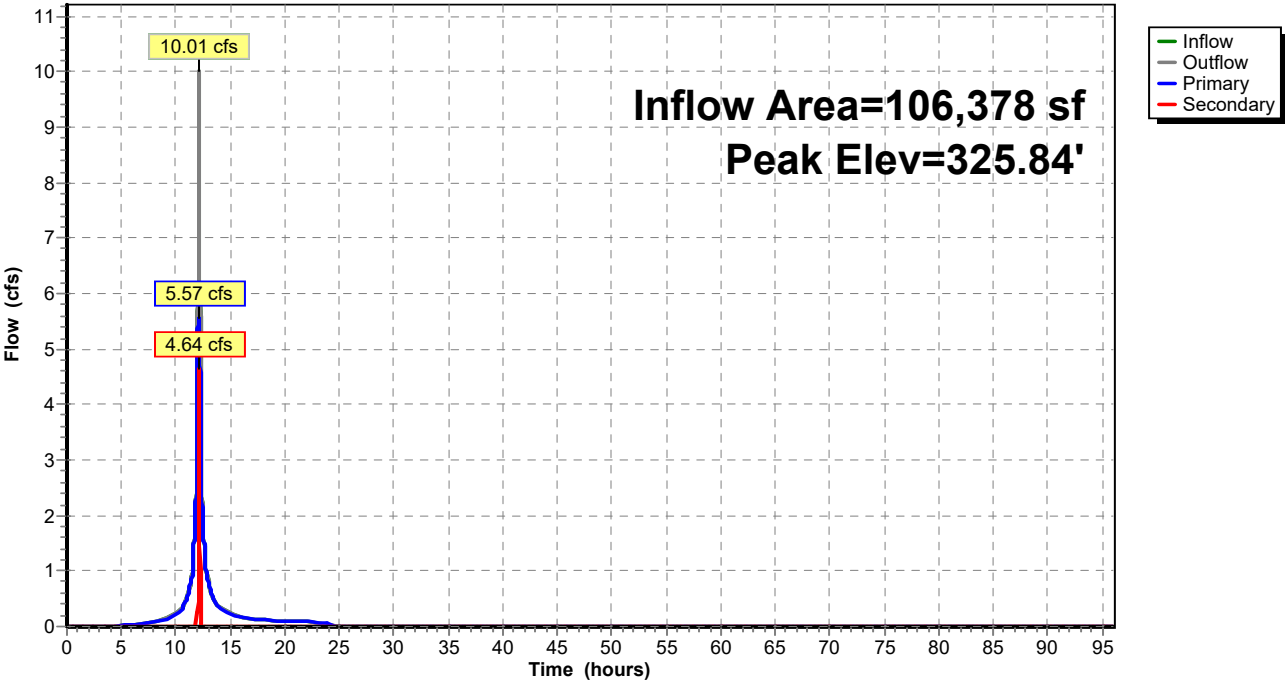
Flood Elev= 328.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	323.00'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 323.00' / 323.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	323.00'	24.0" Round Culvert L= 51.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 323.00' / 320.00' S= 0.0588 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	325.50'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=5.51 cfs @ 12.06 hrs HW=325.68' TW=323.56' (Dynamic Tailwater)↑**1=Culvert** (Inlet Controls 5.51 cfs @ 7.02 fps)**Secondary OutFlow** Max=4.62 cfs @ 12.13 hrs HW=325.84' TW=0.00' (Dynamic Tailwater)↑**2=Culvert** (Passes 4.62 cfs of 20.53 cfs potential flow)↑**3=Broad-Crested Rectangular Weir** (Weir Controls 4.62 cfs @ 1.69 fps)

Pond 15: DIV-1

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Pond 16: INF-1

Inflow Area = 106,378 sf, 85.91% Impervious, Inflow Depth = 2.64" for 2-yr event
 Inflow = 5.57 cfs @ 12.06 hrs, Volume= 23,430 cf
 Outflow = 1.18 cfs @ 11.65 hrs, Volume= 23,430 cf, Atten= 79%, Lag= 0.0 min
 Discarded = 1.18 cfs @ 11.65 hrs, Volume= 23,430 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 324.79' @ 12.65 hrs Surf.Area= 4,245 sf Storage= 6,835 cf

Plug-Flow detention time= 36.3 min calculated for 23,427 cf (100% of inflow)
 Center-of-Mass det. time= 36.3 min (815.6 - 779.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	322.50'	4,688 cf	36.75'W x 115.50'L x 4.33'H Field A 18,393 cf Overall - 6,674 cf Embedded = 11,720 cf x 40.0% Voids
#2A	323.00'	6,674 cf	Cultec R-360HD x 180 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 180 Chambers in 6 Rows Cap Storage= +6.5 cf x 2 x 6 rows = 77.5 cf
		11,361 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	322.50'	12.000 in/hr Exfiltration over Horizontal area Phase-In= 0.01'

Discarded OutFlow Max=1.18 cfs @ 11.65 hrs HW=322.54' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 1.18 cfs)

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NRCC 24-hr A 2-yr Rainfall=3.42"

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Pond 16: INF-1 - Chamber Wizard Field A

Chamber Model = Cultec R-360HD (Cultec Recharger® 360HD)

Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf

Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap

Cap Storage= +6.5 cf x 2 x 6 rows = 77.5 cf

60.0" Wide + 9.0" Spacing = 69.0" C-C Row Spacing

30 Chambers/Row x 3.67' Long +1.25' Cap Length x 2 = 112.50' Row Length +18.0" End Stone x 2 = 115.50' Base Length

6 Rows x 60.0" Wide + 9.0" Spacing x 5 + 18.0" Side Stone x 2 = 36.75' Base Width

6.0" Base + 36.0" Chamber Height + 10.0" Cover = 4.33' Field Height

180 Chambers x 36.6 cf + 6.5 cf Cap Volume x 2 x 6 Rows = 6,673.6 cf Chamber Storage

18,393.4 cf Field - 6,673.6 cf Chambers = 11,719.8 cf Stone x 40.0% Voids = 4,687.9 cf Stone Storage

Chamber Storage + Stone Storage = 11,361.5 cf = 0.261 af

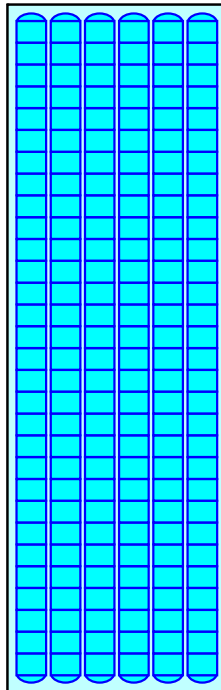
Overall Storage Efficiency = 61.8%

Overall System Size = 115.50' x 36.75' x 4.33'

180 Chambers

681.2 cy Field

434.1 cy Stone



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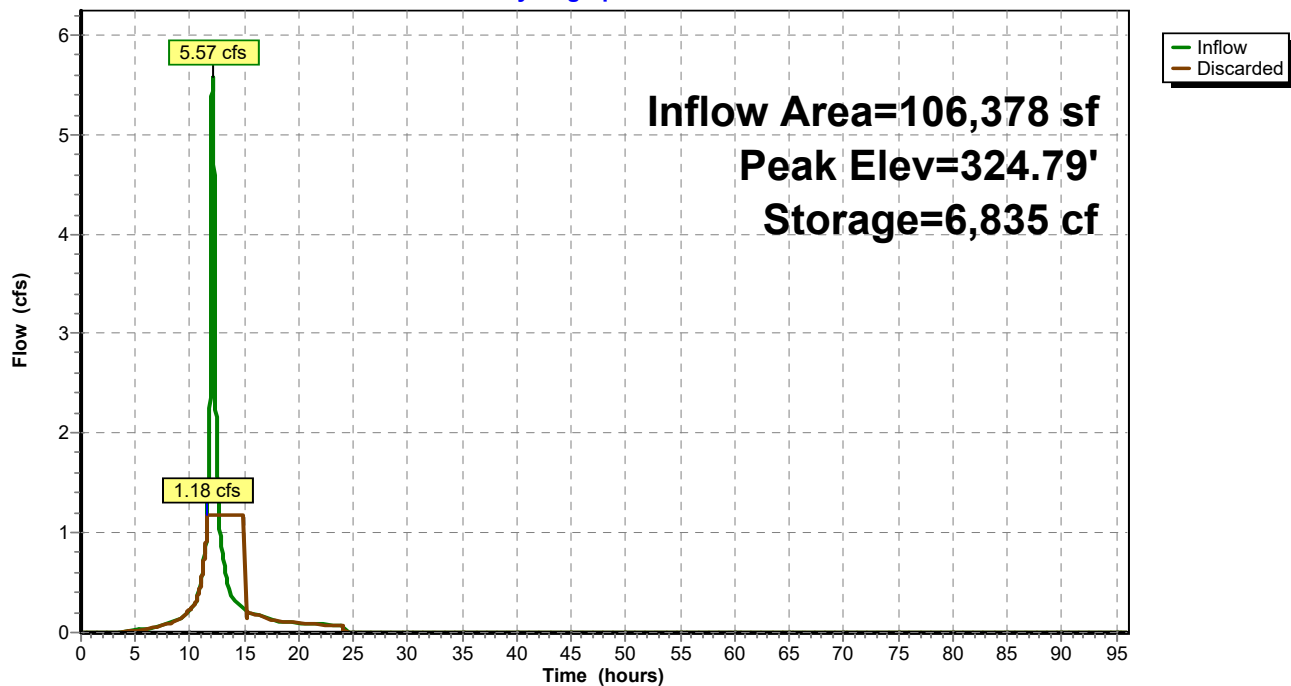
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Pond 16: INF-1

Hydrograph



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NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Subcatchment 17: Post A5

Runoff = 9.17 cfs @ 12.13 hrs, Volume= 24,677 cf, Depth= 3.19"

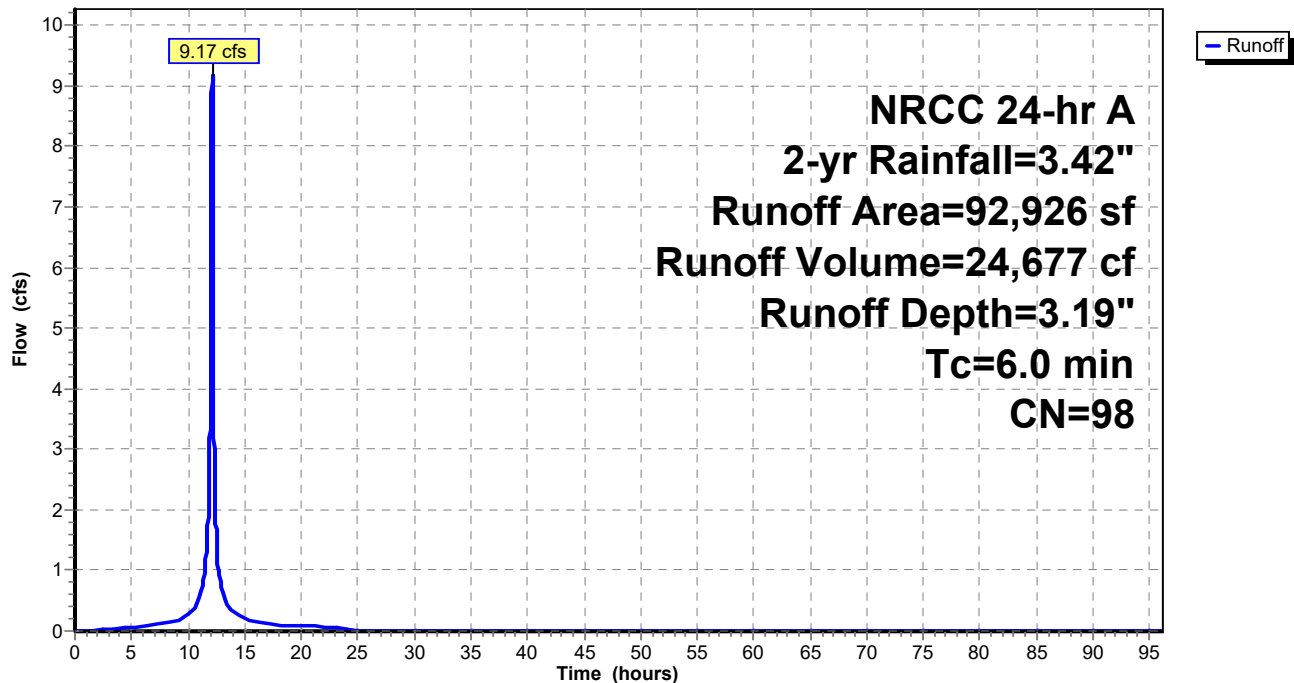
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 2-yr Rainfall=3.42"

Area (sf)	CN	Description
92,926	98	Roofs, HSG C
92,926		100.00% Impervious Area

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

Subcatchment 17: Post A5

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Pond 18: DIV-2

Inflow Area = 92,926 sf, 100.00% Impervious, Inflow Depth = 3.19" for 2-yr event
 Inflow = 9.17 cfs @ 12.13 hrs, Volume= 24,677 cf
 Outflow = 9.17 cfs @ 12.13 hrs, Volume= 24,677 cf, Atten= 0%, Lag= 0.0 min
 Primary = 6.03 cfs @ 12.06 hrs, Volume= 23,539 cf
 Secondary = 3.35 cfs @ 12.13 hrs, Volume= 1,139 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 363.78' @ 12.13 hrs

Flood Elev= 371.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	360.50'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 360.50' / 360.50' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	363.00'	24.0" Round Culvert L= 550.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 363.00' / 355.00' S= 0.0145 ' S= 0.0145 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	363.50'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=5.97 cfs @ 12.06 hrs HW=363.59' TW=361.11' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 5.97 cfs @ 7.60 fps)**Secondary OutFlow** Max=3.34 cfs @ 12.13 hrs HW=363.78' TW=355.24' (Dynamic Tailwater)↑ **2=Culvert** (Passes 3.34 cfs of 3.39 cfs potential flow)↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 3.34 cfs @ 1.50 fps)

N60 P1 Post-A 2021

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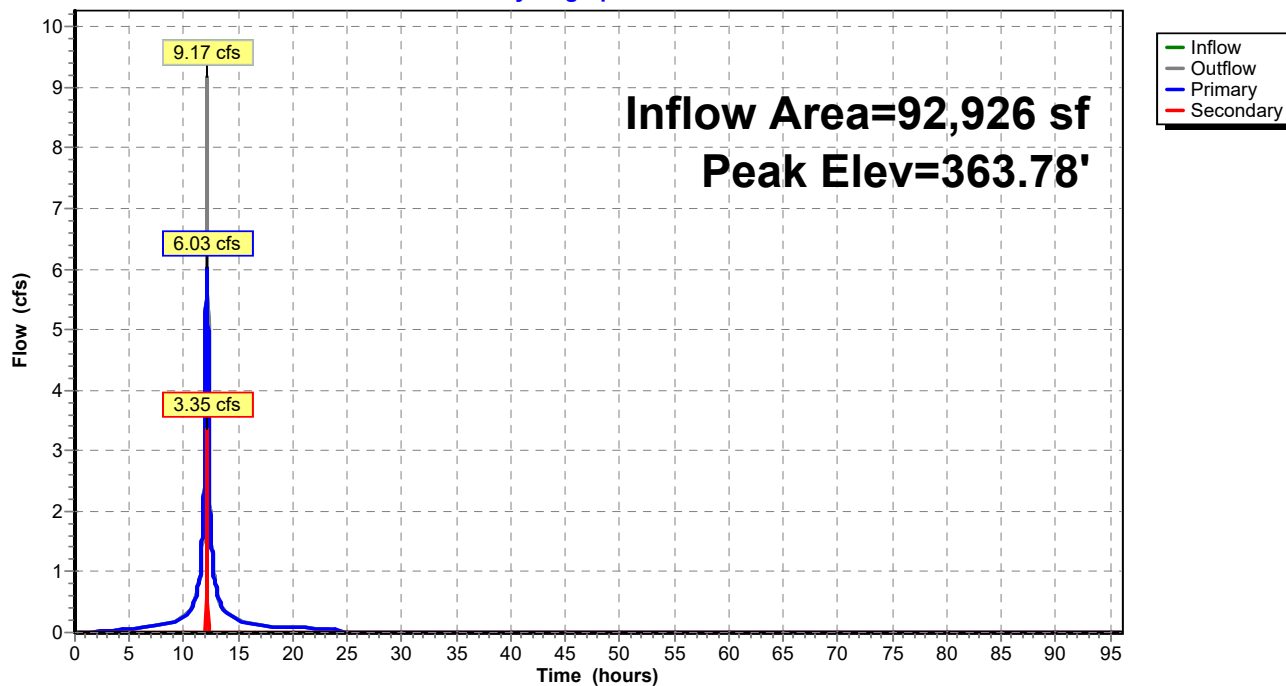
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NRCC 24-hr A 2-yr Rainfall=3.42"

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Pond 18: DIV-2

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Pond 19: INF-2

Inflow Area = 92,926 sf, 100.00% Impervious, Inflow Depth = 3.04" for 2-yr event
 Inflow = 6.03 cfs @ 12.06 hrs, Volume= 23,539 cf
 Outflow = 0.99 cfs @ 11.62 hrs, Volume= 23,539 cf, Atten= 84%, Lag= 0.0 min
 Discarded = 0.99 cfs @ 11.62 hrs, Volume= 23,539 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 362.44' @ 12.69 hrs Surf.Area= 4,285 sf Storage= 7,384 cf

Plug-Flow detention time= 46.1 min calculated for 23,536 cf (100% of inflow)
 Center-of-Mass det. time= 46.1 min (801.3 - 755.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	360.00'	4,724 cf	42.50'W x 100.83'L x 4.33'H Field A 18,570 cf Overall - 6,760 cf Embedded = 11,810 cf x 40.0% Voids
#2A	360.50'	6,760 cf	Cultec R-360HD x 182 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 182 Chambers in 7 Rows Cap Storage= +6.5 cf x 2 x 7 rows = 90.4 cf
		11,484 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	360.00'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.01'

Discarded OutFlow Max=0.99 cfs @ 11.62 hrs HW=360.05' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.99 cfs)

N60 P1 Post-A 2021

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NRCC 24-hr A 2-yr Rainfall=3.42"

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Pond 19: INF-2 - Chamber Wizard Field A

Chamber Model = Cultec R-360HD (Cultec Recharger® 360HD)

Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf

Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap

Cap Storage= +6.5 cf x 2 x 7 rows = 90.4 cf

60.0" Wide + 9.0" Spacing = 69.0" C-C Row Spacing

26 Chambers/Row x 3.67' Long +1.25' Cap Length x 2 = 97.83' Row Length +18.0" End Stone x 2 = 100.83' Base Length

7 Rows x 60.0" Wide + 9.0" Spacing x 6 + 18.0" Side Stone x 2 = 42.50' Base Width

6.0" Base + 36.0" Chamber Height + 10.0" Cover = 4.33' Field Height

182 Chambers x 36.6 cf + 6.5 cf Cap Volume x 2 x 7 Rows = 6,759.8 cf Chamber Storage

18,570.1 cf Field - 6,759.8 cf Chambers = 11,810.4 cf Stone x 40.0% Voids = 4,724.1 cf Stone Storage

Chamber Storage + Stone Storage = 11,483.9 cf = 0.264 af

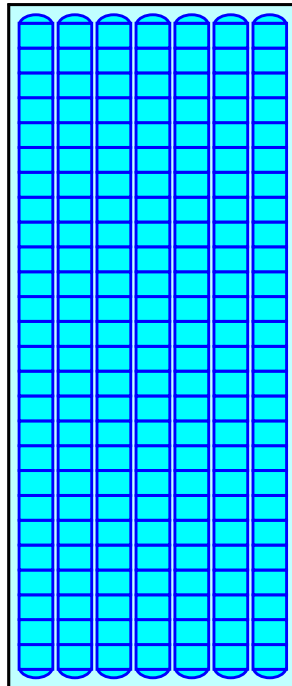
Overall Storage Efficiency = 61.8%

Overall System Size = 100.83' x 42.50' x 4.33'

182 Chambers

687.8 cy Field

437.4 cy Stone



N60 P1 Post-A 2021

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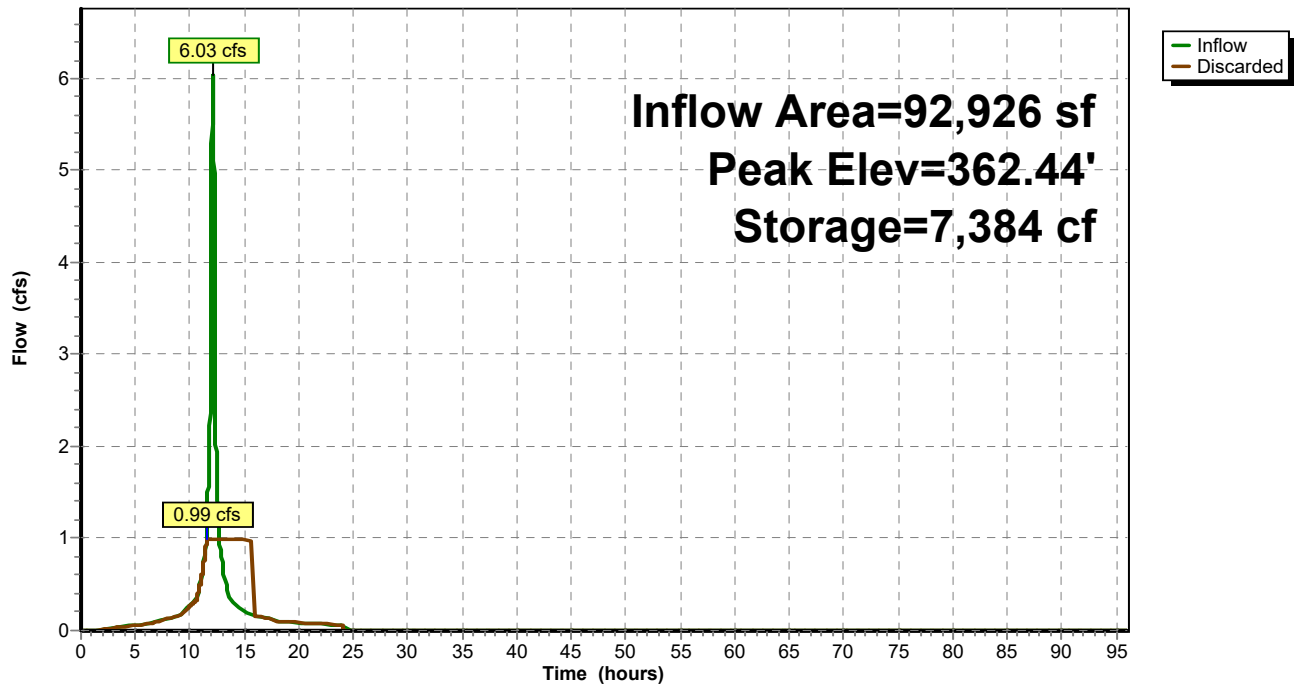
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NRCC 24-hr A 2-yr Rainfall=3.42"

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Pond 19: INF-2

Hydrograph



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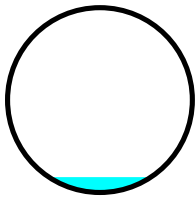
Summary for Reach 20: 36" HDPE Pipe

Inflow = 3.35 cfs @ 12.13 hrs, Volume= 1,139 cf
Outflow = 3.19 cfs @ 12.15 hrs, Volume= 1,139 cf, Atten= 5%, Lag= 0.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 11.58 fps, Min. Travel Time= 1.2 min
Avg. Velocity= 4.78 fps, Avg. Travel Time= 2.8 min

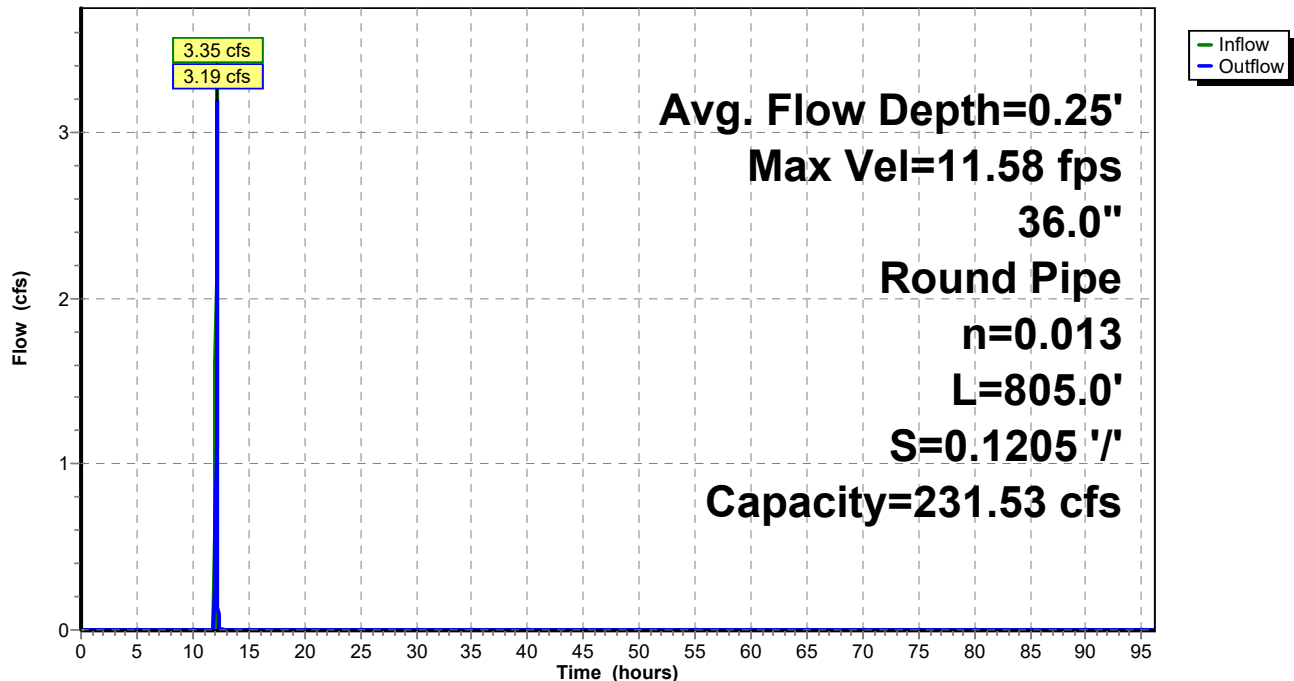
Peak Storage= 221 cf @ 12.15 hrs
Average Depth at Peak Storage= 0.25'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 231.53 cfs

36.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 805.0' Slope= 0.1205 '/
Inlet Invert= 355.00', Outlet Invert= 258.00'



Reach 20: 36" HDPE Pipe

Hydrograph



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NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Subcatchment 21: A6

Runoff = 36.90 cfs @ 12.13 hrs, Volume= 95,090 cf, Depth= 2.97"

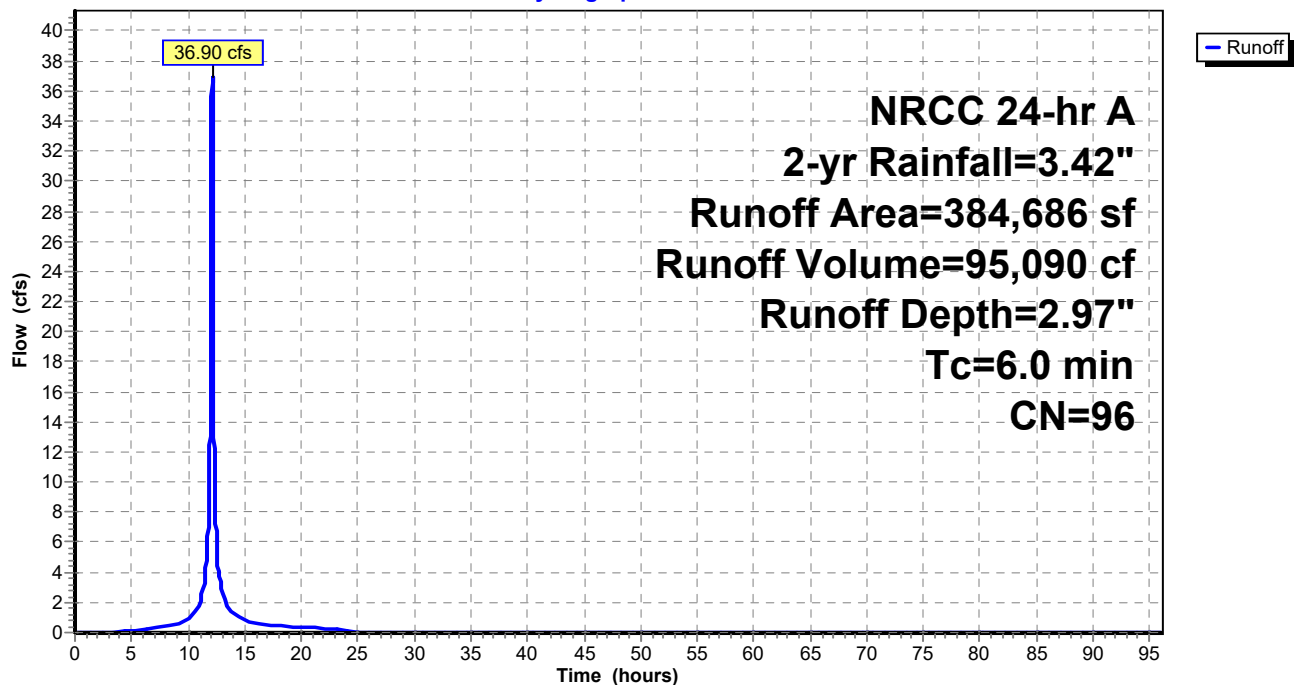
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 2-yr Rainfall=3.42"

Area (sf)	CN	Description
332,512	98	Paved parking, HSG C
52,174	86	<50% Grass cover, Poor, HSG C
384,686	96	Weighted Average
52,174		13.56% Pervious Area
332,512		86.44% Impervious Area

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

Subcatchment 21: A6

Hydrograph



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NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Subcatchment 22: A7

Runoff = 3.02 cfs @ 12.14 hrs, Volume= 7,393 cf, Depth= 0.86"

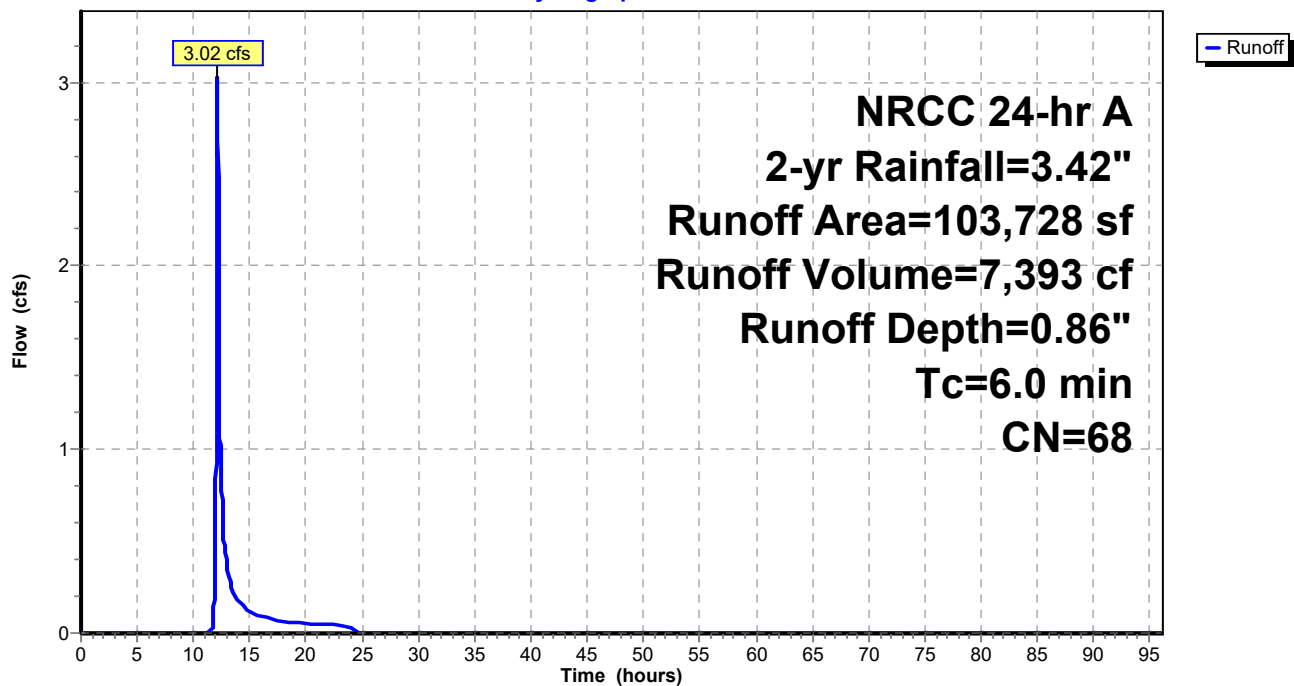
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 2-yr Rainfall=3.42"

Area (sf)	CN	Description
35,128	65	Brush, Good, HSG C
68,600	70	Woods, Good, HSG C
103,728	68	Weighted Average
103,728		100.00% Pervious Area

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

Subcatchment 22: A7

Hydrograph



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NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Pond 23: Infiltration Basin (SWP-3)

Inflow Area = 488,414 sf, 68.08% Impervious, Inflow Depth = 2.55" for 2-yr event
 Inflow = 42.90 cfs @ 12.13 hrs, Volume= 103,621 cf
 Outflow = 5.13 cfs @ 12.62 hrs, Volume= 103,621 cf, Atten= 88%, Lag= 29.4 min
 Discarded = 5.13 cfs @ 12.62 hrs, Volume= 103,621 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 259.19' @ 12.62 hrs Surf.Area= 14,761 sf Storage= 38,403 cf

Plug-Flow detention time= 58.7 min calculated for 103,621 cf (100% of inflow)
 Center-of-Mass det. time= 58.7 min (834.1 - 775.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	256.00'	103,740 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
256.00	9,450	527.9	0	0	9,450
258.00	12,731	565.7	22,100	22,100	12,917
260.00	16,238	603.5	28,898	50,998	16,623
262.00	19,973	641.3	36,147	87,144	20,569
262.80	21,527	656.4	16,596	103,740	22,212

Device	Routing	Invert	Outlet Devices
#1	Primary	254.00'	36.0" Round Culvert X 2.00 L= 95.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 254.00' / 244.00' S= 0.1053 ' S= 0.1053 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	260.00'	2.0' long x 0.5' breadth Broad-Crested Rectangular Weir X 2.00 Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	260.00'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir X 2.00 Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	259.40'	6.0" Vert. Orifice/Grate C= 0.600
#5	Device 1	261.00'	36.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Discarded	256.00'	15.000 in/hr Exfiltration over Surface area Phase-In= 0.10'

Discarded OutFlow Max=5.13 cfs @ 12.62 hrs HW=259.19' (Free Discharge)

↑ **6=Exfiltration** (Exfiltration Controls 5.13 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=256.00' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 0.00 cfs of 48.21 cfs potential flow)
 ↑ **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
 ↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
 ↑ **4=Orifice/Grate** (Controls 0.00 cfs)
 ↑ **5=Orifice/Grate** (Controls 0.00 cfs)

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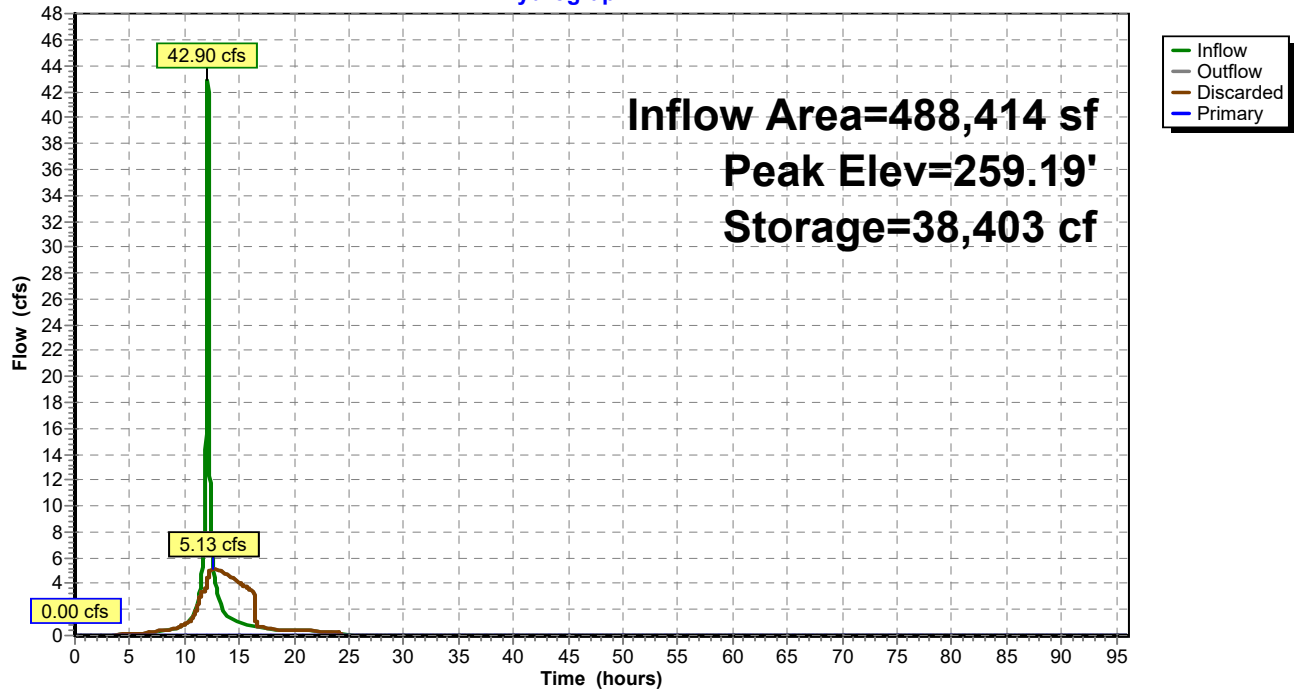
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Pond 23: Infiltration Basin (SWP-3)

Hydrograph



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Summary for Subcatchment 24: A9

Runoff = 3.18 cfs @ 12.13 hrs, Volume= 8,063 cf, Depth= 2.86"

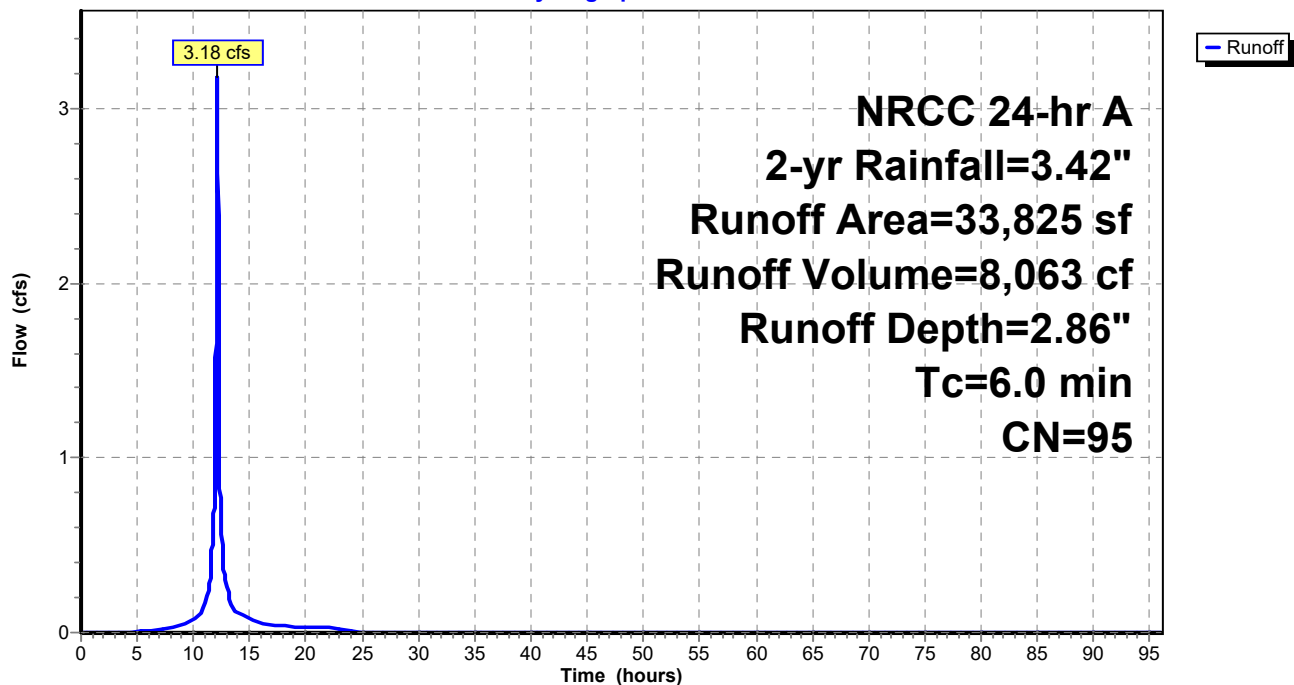
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 2-yr Rainfall=3.42"

Area (sf)	CN	Description
29,687	98	Paved parking, HSG C
4,138	74	>75% Grass cover, Good, HSG C
33,825	95	Weighted Average
4,138		12.23% Pervious Area
29,687		87.77% Impervious Area

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

Subcatchment 24: A9

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Pond 25: DIV-4

Inflow Area = 33,825 sf, 87.77% Impervious, Inflow Depth = 2.86" for 2-yr event
 Inflow = 3.18 cfs @ 12.13 hrs, Volume= 8,063 cf
 Outflow = 3.18 cfs @ 12.13 hrs, Volume= 8,063 cf, Atten= 0%, Lag= 0.0 min
 Primary = 3.18 cfs @ 12.13 hrs, Volume= 8,063 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 347.96' @ 12.13 hrs

Flood Elev= 356.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	346.50'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 346.50' / 346.50' S= 0.0000 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	347.50'	18.0" Round Culvert L= 128.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 347.50' / 344.00' S= 0.0273 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	349.33'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=3.18 cfs @ 12.13 hrs HW=347.96' TW=346.93' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 3.18 cfs @ 4.05 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=346.50' TW=0.00' (Dynamic Tailwater)↑ **2=Culvert** (Controls 0.00 cfs)↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

N60 P1 Post-A 2021

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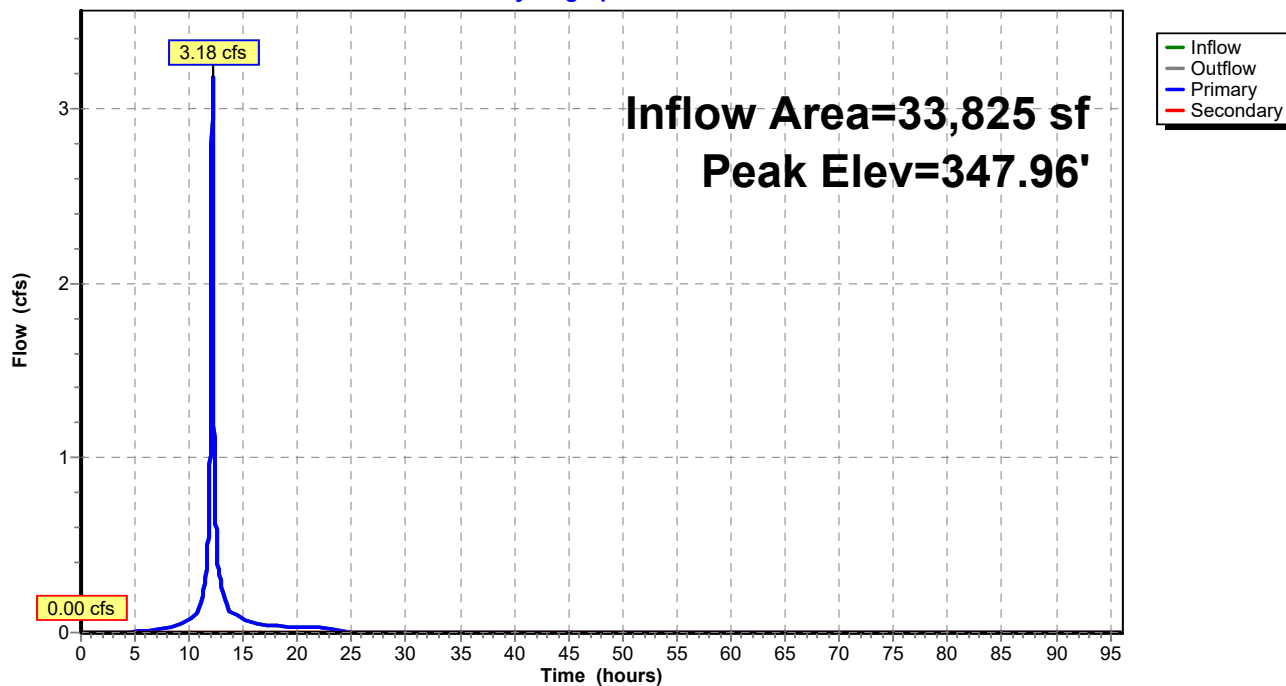
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NRCC 24-hr A 2-yr Rainfall=3.42"

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Pond 25: DIV-4

Hydrograph



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NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Pond 26: INF-4

Inflow Area = 33,825 sf, 87.77% Impervious, Inflow Depth = 2.86" for 2-yr event
 Inflow = 3.18 cfs @ 12.13 hrs, Volume= 8,063 cf
 Outflow = 0.52 cfs @ 11.82 hrs, Volume= 8,063 cf, Atten= 84%, Lag= 0.0 min
 Discarded = 0.52 cfs @ 11.82 hrs, Volume= 8,063 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 347.48' @ 12.56 hrs Surf.Area= 2,242 sf Storage= 2,285 cf

Plug-Flow detention time= 26.2 min calculated for 8,062 cf (100% of inflow)
 Center-of-Mass det. time= 26.2 min (801.6 - 775.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	346.00'	2,196 cf	30.50'W x 73.50'L x 3.88'H Field A 8,687 cf Overall - 3,196 cf Embedded = 5,490 cf x 40.0% Voids
#2A	346.50'	3,196 cf	Cultec R-330XLHD x 60 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 6 rows
		5,393 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	346.00'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.01'

Discarded OutFlow Max=0.52 cfs @ 11.82 hrs HW=346.05' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.52 cfs)

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Pond 26: INF-4 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 6 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

10 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 71.50' Row Length +12.0" End Stone x 2 = 73.50' Base Length

6 Rows x 52.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.50' Base Width

6.0" Base + 30.5" Chamber Height + 10.0" Cover = 3.88' Field Height

60 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 6 Rows = 3,196.5 cf Chamber Storage

8,686.8 cf Field - 3,196.5 cf Chambers = 5,490.3 cf Stone x 40.0% Voids = 2,196.1 cf Stone Storage

Chamber Storage + Stone Storage = 5,392.6 cf = 0.124 af

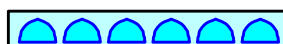
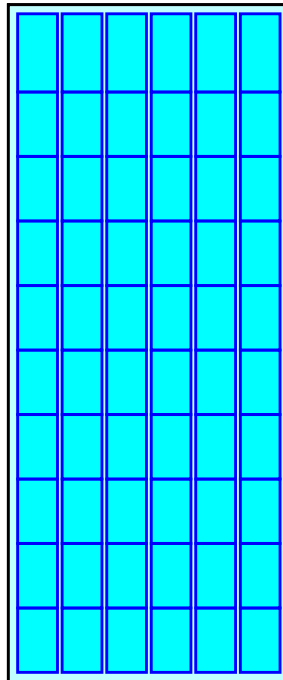
Overall Storage Efficiency = 62.1%

Overall System Size = 73.50' x 30.50' x 3.88'

60 Chambers

321.7 cy Field

203.3 cy Stone



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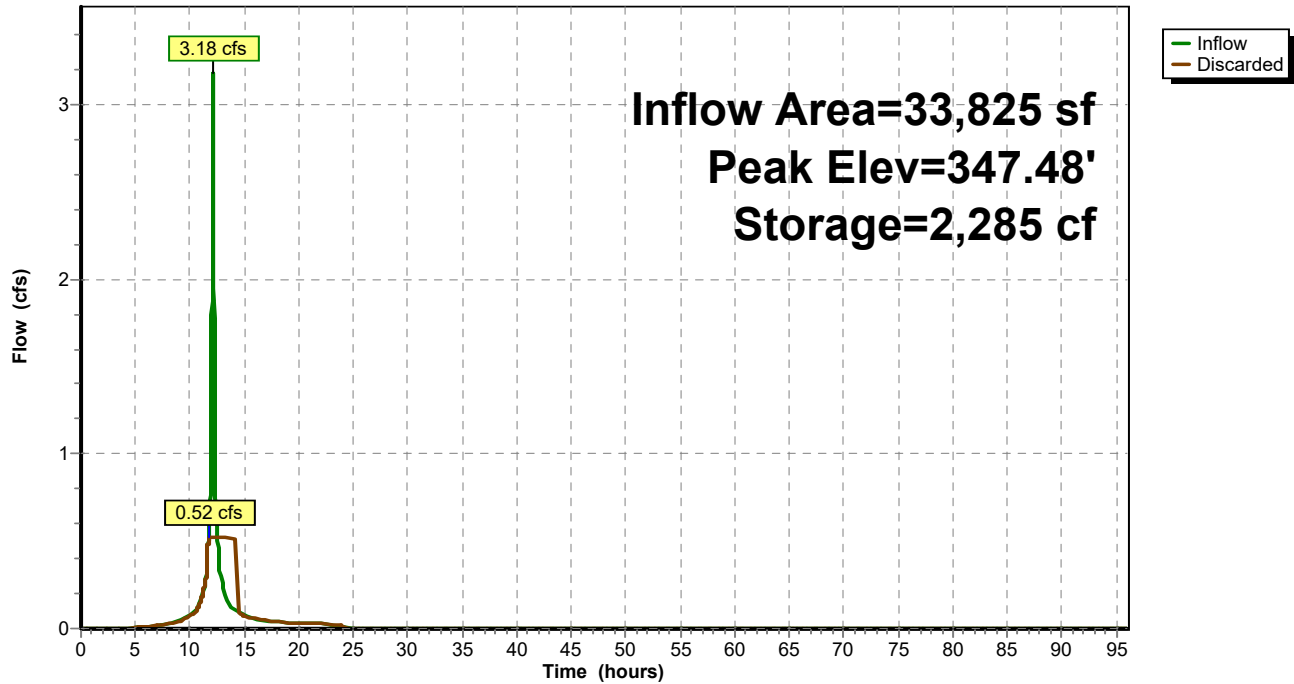
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Pond 26: INF-4

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Summary for Subcatchment 27: A10

Runoff = 11.84 cfs @ 12.13 hrs, Volume= 28,071 cf, Depth= 2.28"

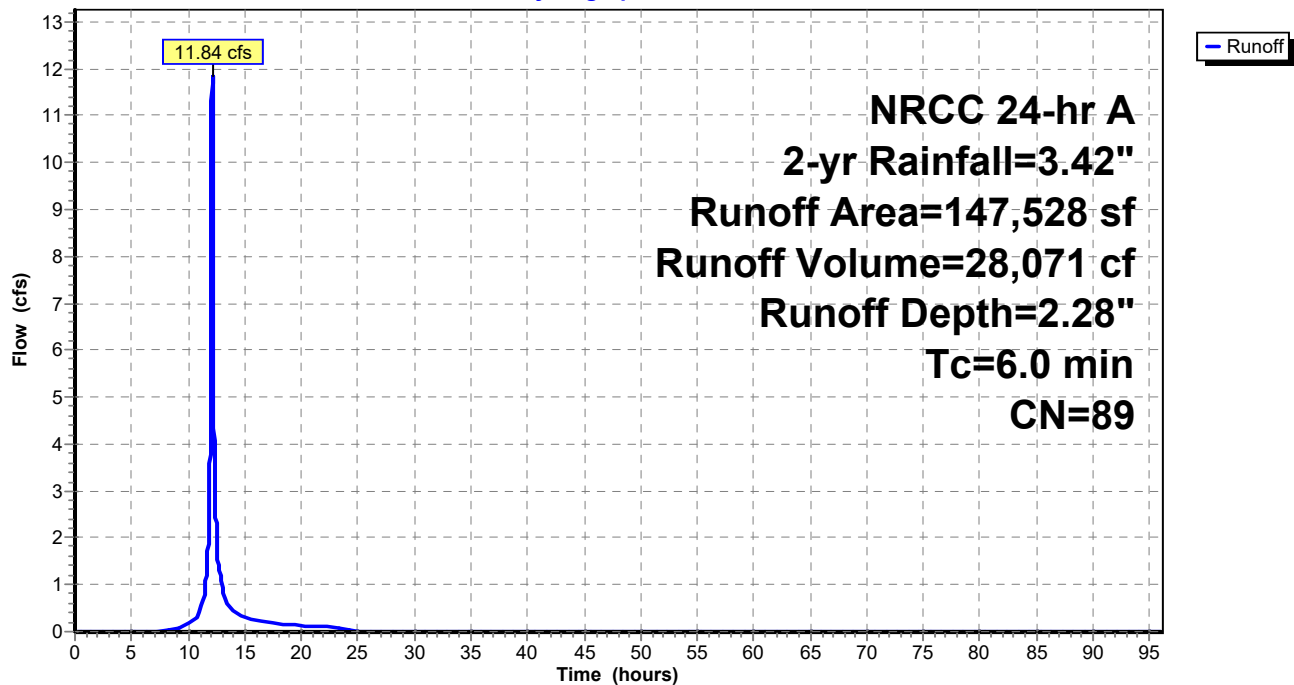
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 2-yr Rainfall=3.42"

Area (sf)	CN	Description
91,430	98	Paved parking, HSG C
5,603	80	>75% Grass cover, Good, HSG D
7,435	74	>75% Grass cover, Good, HSG C
16,120	73	Brush, Good, HSG D
19,715	77	Brush, Poor, HSG C
7,225	70	Woods, Good, HSG C
147,528	89	Weighted Average
56,098		38.03% Pervious Area
91,430		61.97% Impervious Area

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

Subcatchment 27: A10

Hydrograph



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NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Subcatchment 28: A10

Runoff = 1.05 cfs @ 12.13 hrs, Volume= 2,754 cf, Depth= 3.07"

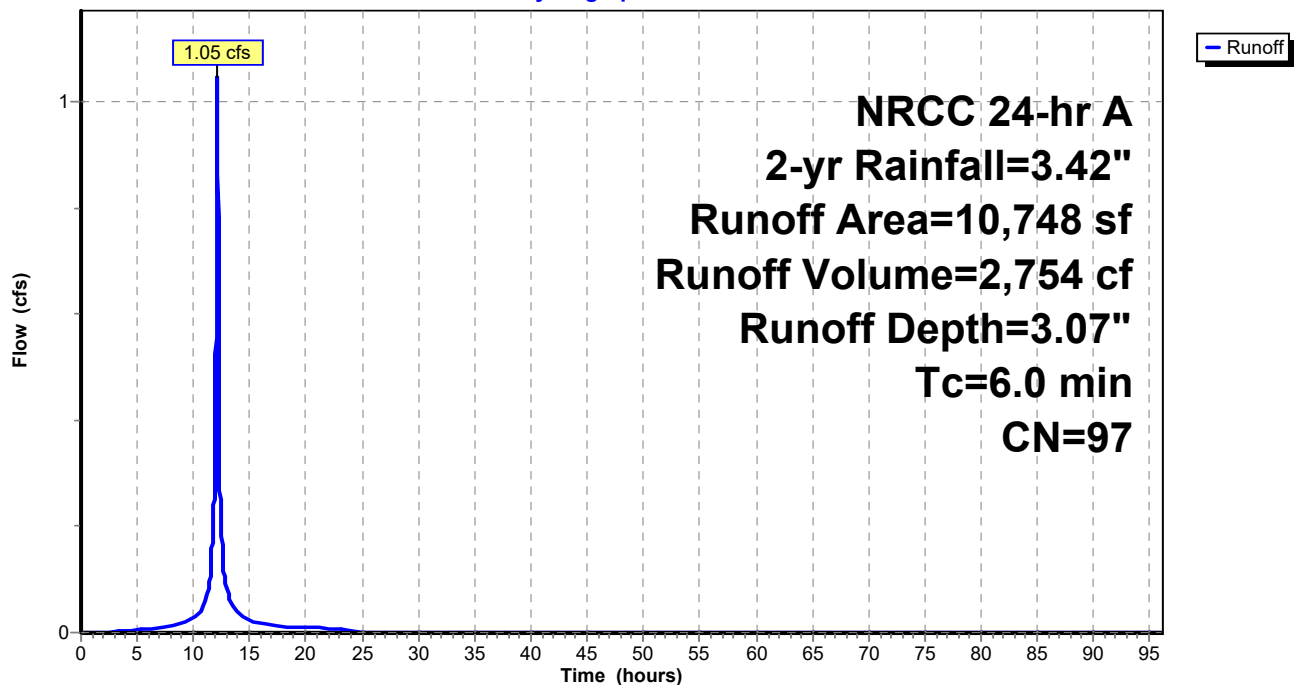
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 2-yr Rainfall=3.42"

Area (sf)	CN	Description
10,280	98	Paved parking, HSG D
468	80	>75% Grass cover, Good, HSG D
10,748	97	Weighted Average
468		4.35% Pervious Area
10,280		95.65% Impervious Area

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

Subcatchment 28: A10

Hydrograph



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NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Pond 29: Infiltration Basin (SWP-2)

Inflow Area = 158,276 sf, 64.26% Impervious, Inflow Depth = 2.34" for 2-yr event
 Inflow = 12.88 cfs @ 12.13 hrs, Volume= 30,826 cf
 Outflow = 2.08 cfs @ 12.57 hrs, Volume= 30,826 cf, Atten= 84%, Lag= 26.6 min
 Discarded = 2.08 cfs @ 12.57 hrs, Volume= 30,826 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 316.08' @ 12.57 hrs Surf.Area= 5,979 sf Storage= 10,365 cf

Plug-Flow detention time= 39.1 min calculated for 30,822 cf (100% of inflow)
 Center-of-Mass det. time= 39.0 min (836.3 - 797.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	314.00'	47,274 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
314.00	4,026	293.0	0	0	4,026
316.00	5,897	330.7	9,864	9,864	5,998
318.00	7,994	368.3	13,838	23,702	8,204
320.00	10,316	406.0	18,261	41,962	10,652
320.50	10,932	415.4	5,311	47,274	11,300

Device	Routing	Invert	Outlet Devices
#1	Primary	308.00'	15.0" Round Culvert L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 308.00' / 304.00' S= 0.0667 ' S= 0.0667 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	316.50'	6.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	318.50'	2.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	319.00'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Discarded	314.00'	15.000 in/hr Exfiltration over Surface area Phase-In= 0.10'

Discarded OutFlow Max=2.08 cfs @ 12.57 hrs HW=316.08' (Free Discharge)

↑ **5=Exfiltration** (Exfiltration Controls 2.08 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=314.00' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 0.00 cfs of 13.70 cfs potential flow)

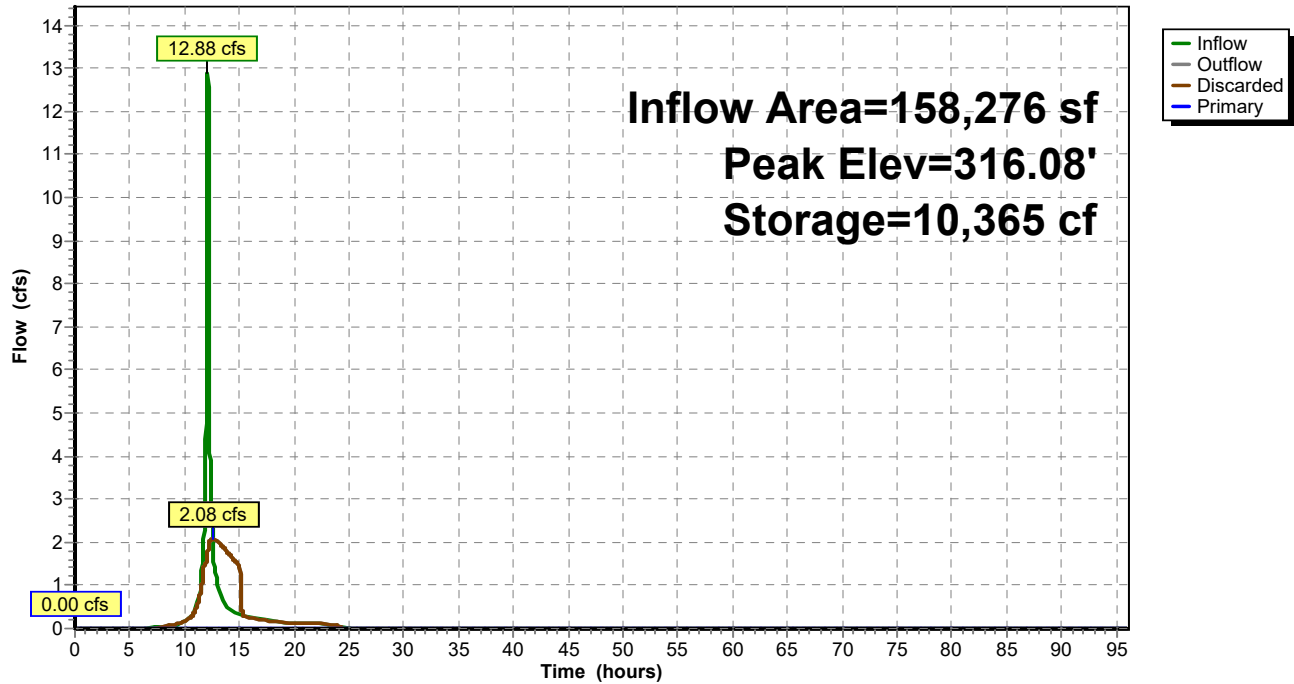
↑ **2=Orifice/Grate** (Controls 0.00 cfs)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 29: Infiltration Basin (SWP-2)

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Subcatchment 30: Post A2

Runoff = 7.46 cfs @ 12.28 hrs, Volume= 26,479 cf, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 2-yr Rainfall=3.42"

Area (sf)	CN	Description
43,743	98	Paved parking, HSG C
107,245	74	>75% Grass cover, Good, HSG C
2,876	61	>75% Grass cover, Good, HSG B
39,583	70	Woods, Good, HSG C
4,283	98	Water Surface, HSG C
33,976	65	Brush, Good, HSG C
231,706	77	Weighted Average
183,680		79.27% Pervious Area
48,026		20.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0400	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.4	215	0.0260	2.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	125	0.1000	6.42		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.4	377	0.0750	14.42	17.69	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
17.7	817	Total			

N60 P1 Post-A 2021

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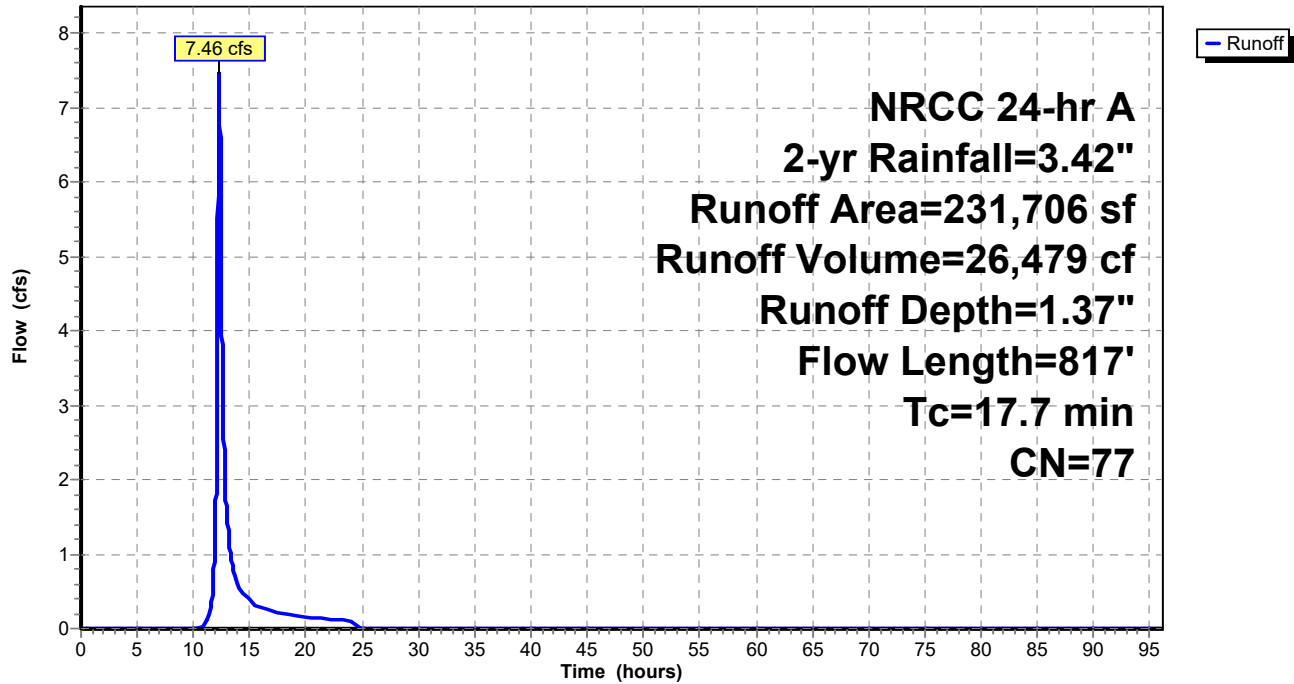
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NRCC 24-hr A 2-yr Rainfall=3.42"

Printed 5/12/2021

Subcatchment 30: Post A2

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Pond 31: Pocket Wetland (SWP-1)

Inflow Area = 231,706 sf, 20.73% Impervious, Inflow Depth = 1.37" for 2-yr event
 Inflow = 7.46 cfs @ 12.28 hrs, Volume= 26,479 cf
 Outflow = 0.69 cfs @ 13.69 hrs, Volume= 18,561 cf, Atten= 91%, Lag= 84.5 min
 Primary = 0.69 cfs @ 13.69 hrs, Volume= 18,561 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Starting Elev= 234.50' Surf.Area= 12,504 sf Storage= 7,835 cf
 Peak Elev= 236.06' @ 13.69 hrs Surf.Area= 15,126 sf Storage= 24,849 cf (17,013 cf above start)

Plug-Flow detention time= 2,301.0 min calculated for 10,724 cf (41% of inflow)

Center-of-Mass det. time= 1,304.4 min (2,149.8 - 845.4)

Volume	Invert	Avail.Storage	Storage Description
#1	230.00'	1,811 cf	Forebay (Irregular) Listed below (Recalc)
#2	230.00'	1,976 cf	Micropool (Irregular) Listed below (Recalc)
#3	233.90'	65,123 cf	Marsh & Storage (Irregular) Listed below (Recalc)
		68,911 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
230.00	86	34.2	0	0	86
231.00	217	53.2	147	147	225
232.00	406	72.3	307	453	426
233.00	651	91.4	524	977	688
233.90	1,233	129.1	834	1,811	1,357

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
230.00	86	34.2	0	0	86
231.00	217	53.2	147	147	225
232.00	406	72.3	307	453	426
233.00	651	91.4	524	977	688
233.90	1,646	155.1	1,000	1,976	1,942

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
233.90	4,232	530.5	0	0	4,232
234.50	9,625	400.9	4,048	4,048	13,842
235.00	10,440	413.5	5,015	9,063	14,683
236.00	12,144	438.8	11,281	20,344	16,451
237.00	13,950	464.0	13,037	33,381	18,317
238.00	15,856	489.2	14,893	48,273	20,287
239.00	17,864	514.5	16,850	65,123	22,369

Device	Routing	Invert	Outlet Devices
#1	Primary	232.00'	15.0" Round Culvert L= 117.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 232.00' / 216.50' S= 0.1325 ' / ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

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#2	Device 1	234.50'	1.1" Vert. Orifice/Grate	C= 0.600
#3	Device 1	236.00'	36.0" x 48.0" Horiz. Orifice/Grate	C= 0.600

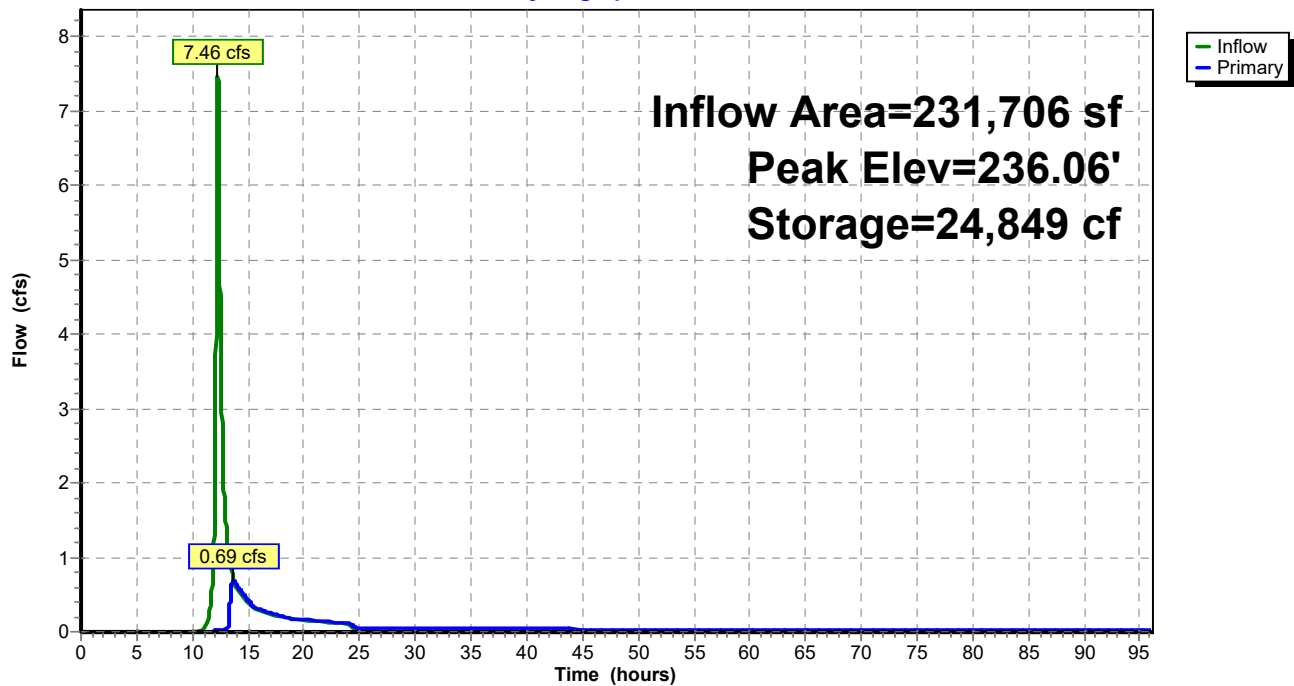
Limited to weir flow at low heads

Primary OutFlow Max=0.69 cfs @ 13.69 hrs HW=236.06' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 0.69 cfs of 10.95 cfs potential flow)
2=Orifice/Grate (Orifice Controls 0.04 cfs @ 5.92 fps)
3=Orifice/Grate (Weir Controls 0.65 cfs @ 0.79 fps)

Pond 31: Pocket Wetland (SWP-1)

Hydrograph



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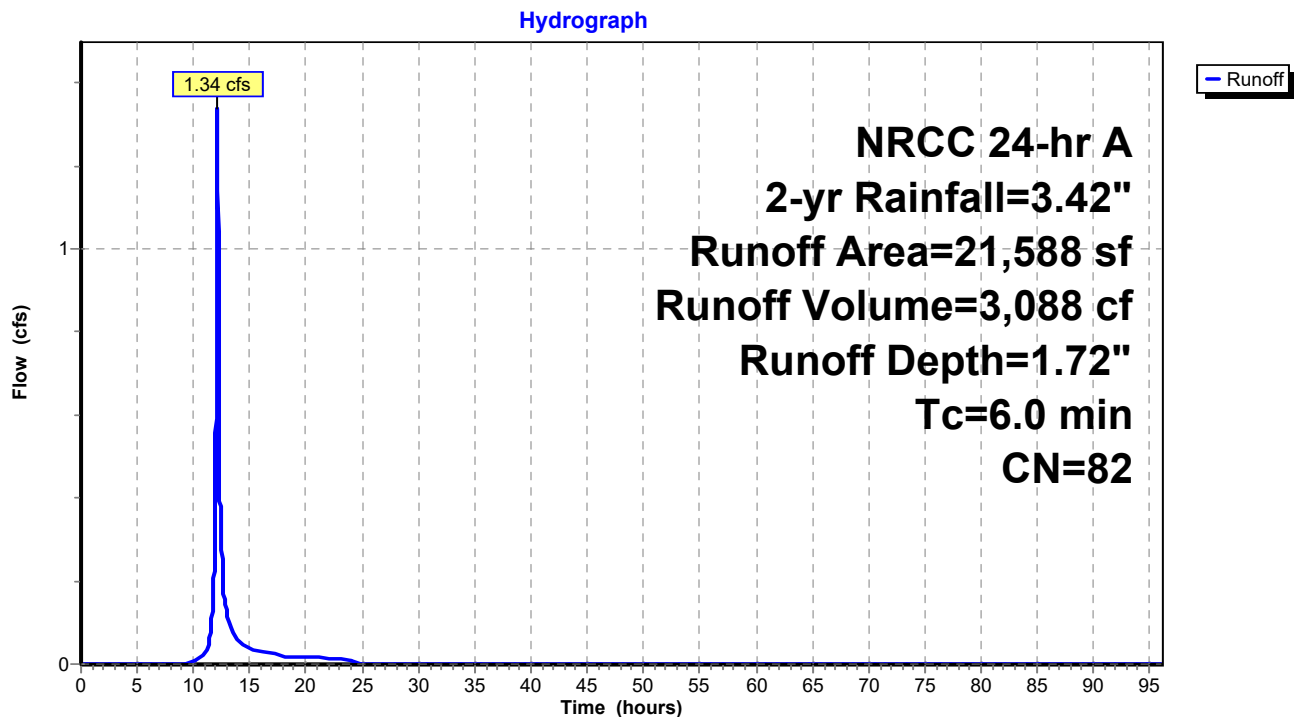
Summary for Subcatchment 32: Post A1

Runoff = 1.34 cfs @ 12.13 hrs, Volume= 3,088 cf, Depth= 1.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 2-yr Rainfall=3.42"

Area (sf)	CN	Description
8,152	98	Paved parking, HSG C
10,356	74	>75% Grass cover, Good, HSG C
3,080	70	Woods, Good, HSG C
21,588	82	Weighted Average
13,436		62.24% Pervious Area
8,152		37.76% Impervious Area

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

Subcatchment 32: Post A1

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NRCC 24-hr A 2-yr Rainfall=3.42"

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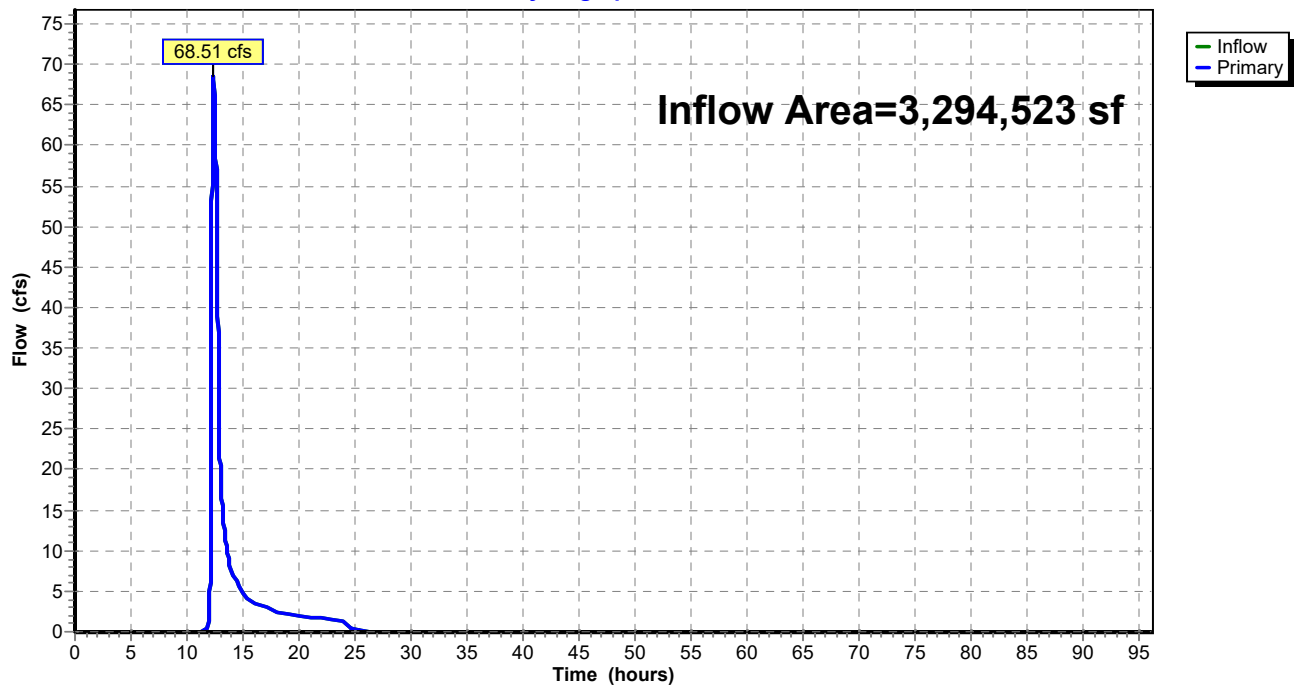
Summary for Link 33: Design Point A

Inflow Area = 3,294,523 sf, 35.27% Impervious, Inflow Depth > 1.11" for 2-yr event
Inflow = 68.51 cfs @ 12.37 hrs, Volume= 303,537 cf
Primary = 68.51 cfs @ 12.37 hrs, Volume= 303,537 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 33: Design Point A

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 10-yr Rainfall=5.12"

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment8: Post A0 Offsite Runoff Area=1,115,060 sf 57.87% Impervious Runoff Depth=3.99"
 Flow Length=1,018' Tc=12.5 min CN=90 Runoff=118.73 cfs 370,955 cf

Pond 9: Offsite Pond A Peak Elev=363.03' Storage=121,390 cf Inflow=118.73 cfs 370,955 cf
 Outflow=51.70 cfs 319,760 cf

Subcatchment10: Post A4 Runoff Area=164,583 sf 10.25% Impervious Runoff Depth=2.63"
 Flow Length=340' Tc=20.5 min CN=76 Runoff=9.63 cfs 36,136 cf

Reach 11: Box Culvert Avg. Flow Depth=0.43' Max Vel=2.77 fps Inflow=9.63 cfs 36,136 cf
 n=0.041 L=98.0' S=0.0204 ' Capacity=177.99 cfs Outflow=9.62 cfs 36,136 cf

Subcatchment12: Post A8 Runoff Area=392,732 sf 0.00% Impervious Runoff Depth=2.29"
 Flow Length=320' Tc=21.4 min CN=72 Runoff=19.39 cfs 74,969 cf

Pond 12A: Existing Wetland A Peak Elev=323.32' Storage=3,273 cf Inflow=80.07 cfs 430,864 cf
 96.0" x 36.0" Box Culvert n=0.040 L=116.0' S=0.0776 ' Outflow=79.86 cfs 430,864 cf

Subcatchment12B: Post A11 Runoff Area=722,164 sf 1.29% Impervious Runoff Depth=2.13"
 Flow Length=475' Tc=19.8 min CN=70 Runoff=34.41 cfs 127,927 cf

Reach 13: Existing Stream A Avg. Flow Depth=1.57' Max Vel=10.07 fps Inflow=113.31 cfs 558,791 cf
 n=0.040 L=1,360.0' S=0.0721 ' Capacity=601.12 cfs Outflow=112.44 cfs 558,791 cf

Subcatchment14: Post A3 Runoff Area=106,378 sf 85.91% Impervious Runoff Depth=4.54"
 Tc=6.0 min CN=95 Runoff=15.43 cfs 40,232 cf

Pond 15: DIV-1 Peak Elev=326.07' Inflow=15.43 cfs 40,232 cf
 Primary=5.30 cfs 32,199 cf Secondary=10.53 cfs 8,033 cf Outflow=15.43 cfs 40,232 cf

Pond 16: INF-1 Peak Elev=325.46' Storage=8,756 cf Inflow=5.30 cfs 32,199 cf
 Outflow=1.18 cfs 32,199 cf

Subcatchment17: Post A5 Runoff Area=92,926 sf 100.00% Impervious Runoff Depth=4.88"
 Tc=6.0 min CN=98 Runoff=13.81 cfs 37,813 cf

Pond 18: DIV-2 Peak Elev=364.28' Inflow=13.81 cfs 37,813 cf
 Primary=5.79 cfs 32,199 cf Secondary=8.14 cfs 5,614 cf Outflow=13.81 cfs 37,813 cf

Pond 19: INF-2 Peak Elev=363.49' Storage=10,039 cf Inflow=5.79 cfs 32,199 cf
 Outflow=0.99 cfs 32,199 cf

Reach 20: 36" HDPE Pipe Avg. Flow Depth=0.38' Max Vel=15.30 fps Inflow=8.14 cfs 5,614 cf
 36.0" Round Pipe n=0.013 L=805.0' S=0.1205 ' Capacity=231.53 cfs Outflow=8.01 cfs 5,614 cf

Subcatchment21: A6 Runoff Area=384,686 sf 86.44% Impervious Runoff Depth=4.65"
 Tc=6.0 min CN=96 Runoff=56.35 cfs 149,125 cf

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NRCC 24-hr A 10-yr Rainfall=5.12"

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Subcatchment22: A7Runoff Area=103,728 sf 0.00% Impervious Runoff Depth=1.97"
Tc=6.0 min CN=68 Runoff=7.34 cfs 16,989 cf**Pond 23: Infiltration Basin (SWP-3)**Peak Elev=260.58' Storage=60,785 cf Inflow=71.54 cfs 171,728 cf
Discarded=6.00 cfs 147,572 cf Primary=14.60 cfs 24,156 cf Outflow=20.60 cfs 171,728 cf**Subcatchment24: A9**Runoff Area=33,825 sf 87.77% Impervious Runoff Depth=4.54"
Tc=6.0 min CN=95 Runoff=4.91 cfs 12,793 cf**Pond 25: DIV-4**Peak Elev=349.26' Inflow=4.91 cfs 12,793 cf
Primary=4.91 cfs 12,793 cf Secondary=0.00 cfs 0 cf Outflow=4.91 cfs 12,793 cf**Pond 26: INF-4**Peak Elev=348.97' Storage=4,576 cf Inflow=4.91 cfs 12,793 cf
Outflow=0.52 cfs 12,793 cf**Subcatchment27: A10**Runoff Area=147,528 sf 61.97% Impervious Runoff Depth=3.89"
Tc=6.0 min CN=89 Runoff=19.55 cfs 47,786 cf**Subcatchment28: A10**Runoff Area=10,748 sf 95.65% Impervious Runoff Depth=4.77"
Tc=6.0 min CN=97 Runoff=1.59 cfs 4,269 cf**Pond 29: Infiltration Basin (SWP-2)**Peak Elev=317.45' Storage=19,455 cf Inflow=21.14 cfs 52,055 cf
Discarded=2.56 cfs 48,947 cf Primary=0.79 cfs 3,108 cf Outflow=3.35 cfs 52,055 cf**Subcatchment30: Post A2**Runoff Area=231,706 sf 20.73% Impervious Runoff Depth=2.72"
Flow Length=817' Tc=17.7 min CN=77 Runoff=15.07 cfs 52,591 cf**Pond 31: Pocket Wetland (SWP-1)**Peak Elev=236.33' Storage=28,267 cf Inflow=15.07 cfs 52,591 cf
Outflow=8.82 cfs 44,653 cf**Subcatchment32: Post A1**Runoff Area=21,588 sf 37.76% Impervious Runoff Depth=3.19"
Tc=6.0 min CN=82 Runoff=2.44 cfs 5,733 cf**Link 33: Design Point A**Inflow=134.25 cfs 644,474 cf
Primary=134.25 cfs 644,474 cf**Total Runoff Area = 3,527,652 sf Runoff Volume = 977,318 cf Average Runoff Depth = 3.32"**
61.00% Pervious = 2,151,703 sf 39.00% Impervious = 1,375,949 sf

N60 P1 Post-A 2021

NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Subcatchment 8: Post A0 Offsite

Runoff = 118.73 cfs @ 12.20 hrs, Volume= 370,955 cf, Depth= 3.99"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 10-yr Rainfall=5.12"

Area (sf)	CN	Description
645,334	98	Paved parking, HSG C
443,611	80	>75% Grass cover, Good, HSG D
23,572	74	>75% Grass cover, Good, HSG C
2,543	61	>75% Grass cover, Good, HSG B
1,115,060	90	Weighted Average
469,726		42.13% Pervious Area
645,334		57.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0150	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.6	148	0.0574	3.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	30	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	740	0.0270	10.25	32.22	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Concrete sewer w/manholes & inlets
12.5	1,018	Total			

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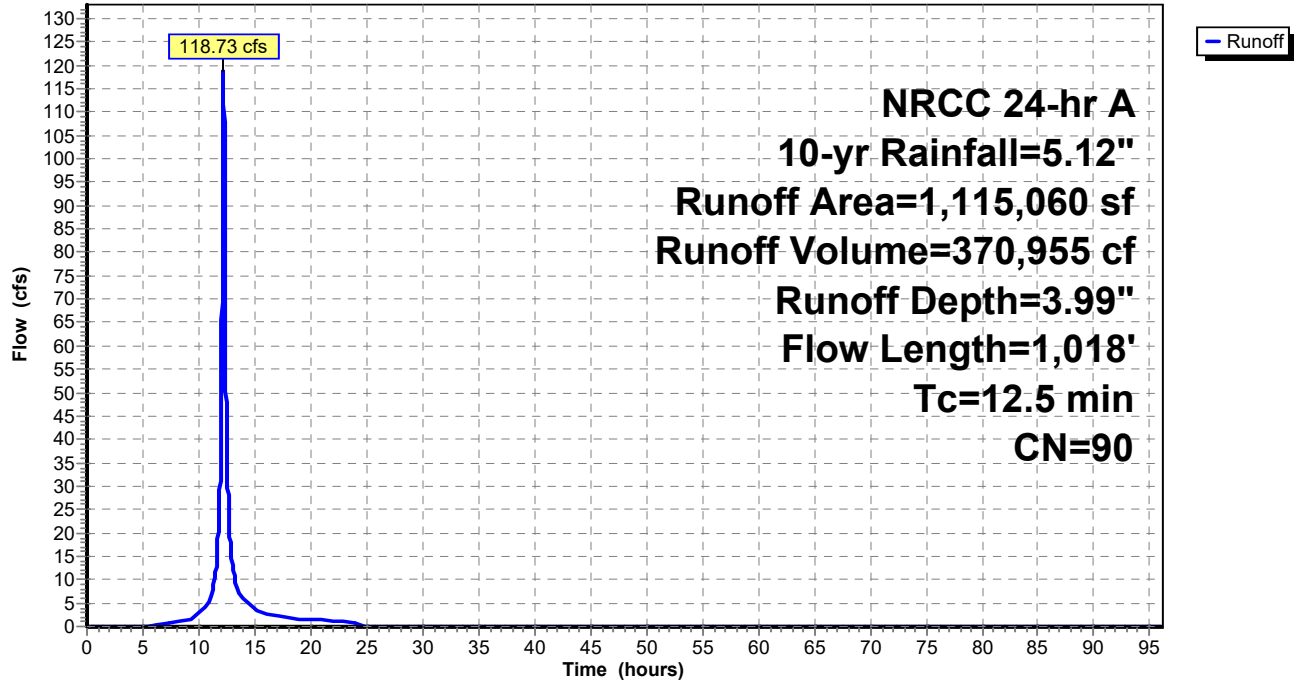
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Subcatchment 8: Post A0 Offsite

Hydrograph



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Summary for Pond 9: Offsite Pond A

Inflow Area = 1,115,060 sf, 57.87% Impervious, Inflow Depth = 3.99" for 10-yr event
 Inflow = 118.73 cfs @ 12.20 hrs, Volume= 370,955 cf
 Outflow = 51.70 cfs @ 12.41 hrs, Volume= 319,760 cf, Atten= 56%, Lag= 12.7 min
 Primary = 51.70 cfs @ 12.41 hrs, Volume= 319,760 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 363.03' @ 12.41 hrs Surf.Area= 26,608 sf Storage= 121,390 cf

Plug-Flow detention time= 99.2 min calculated for 319,726 cf (86% of inflow)
 Center-of-Mass det. time= 41.8 min (832.7 - 790.9)

Volume	Invert	Avail.Storage	Storage Description		
#1	357.00'	221,816 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
357.00	14,633	679.0	0	0	14,633
358.00	16,652	698.0	15,632	15,632	16,826
359.00	17,534	715.0	17,091	32,723	18,864
360.00	19,427	745.0	18,472	51,195	22,425
362.00	24,453	804.0	43,784	94,979	29,861
364.00	28,701	854.0	53,097	148,076	36,663
365.00	36,602	901.0	32,572	180,648	43,285
366.00	45,910	1,262.0	41,168	221,816	105,432

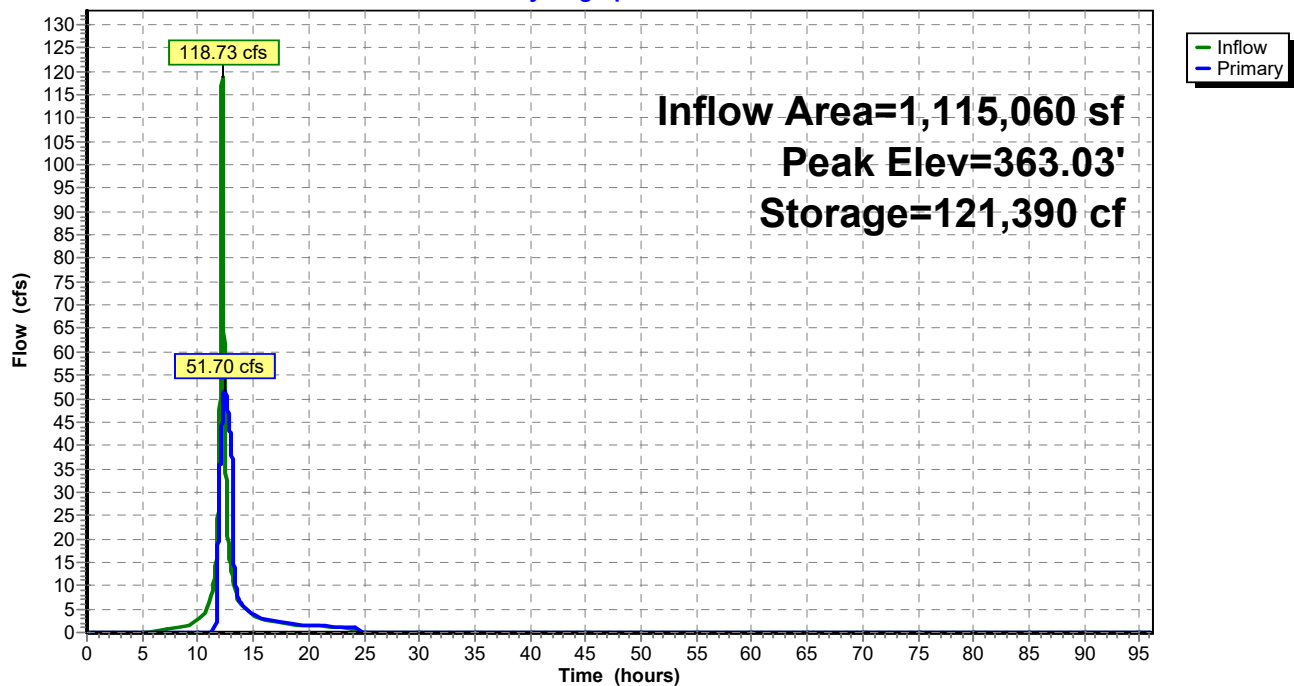
Device	Routing	Invert	Outlet Devices
#1	Primary	357.00'	30.0" Round Culvert L= 125.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 357.00' / 351.00' S= 0.0480 ' S= 0.0480 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf
#2	Device 1	360.00'	36.0" x 48.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Primary	364.75'	150.0' long x 36.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=51.70 cfs @ 12.41 hrs HW=363.03' TW=323.29' (Dynamic Tailwater)

- 1=Culvert (Inlet Controls 51.70 cfs @ 10.53 fps)
 2=Orifice/Grate (Passes 51.70 cfs of 201.30 cfs potential flow)
 3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 9: Offsite Pond A

Hydrograph



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NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Subcatchment 10: Post A4

Runoff = 9.63 cfs @ 12.30 hrs, Volume= 36,136 cf, Depth= 2.63"

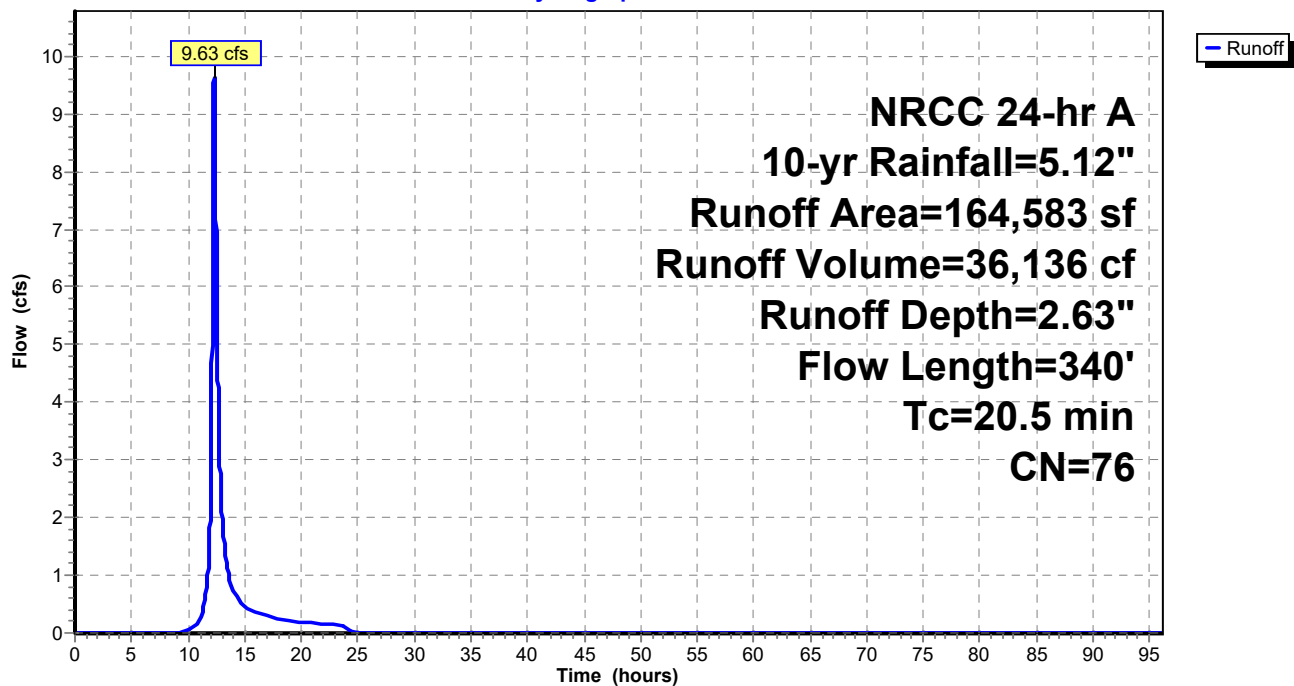
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 10-yr Rainfall=5.12"

Area (sf)	CN	Description
15,990	74	>75% Grass cover, Good, HSG C
65,271	70	Woods, Good, HSG C
66,457	77	Woods, Good, HSG D
16,865	98	Water Surface, HSG D
164,583	76	Weighted Average
147,718		89.75% Pervious Area
16,865		10.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0250	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.7	240	0.0208	2.32		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
20.5	340	Total			

Subcatchment 10: Post A4

Hydrograph



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Summary for Reach 11: Box Culvert

Inflow Area = 164,583 sf, 10.25% Impervious, Inflow Depth = 2.63" for 10-yr event
Inflow = 9.63 cfs @ 12.30 hrs, Volume= 36,136 cf
Outflow = 9.62 cfs @ 12.31 hrs, Volume= 36,136 cf, Atten= 0%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.77 fps, Min. Travel Time= 0.6 min
Avg. Velocity = 0.79 fps, Avg. Travel Time= 2.1 min

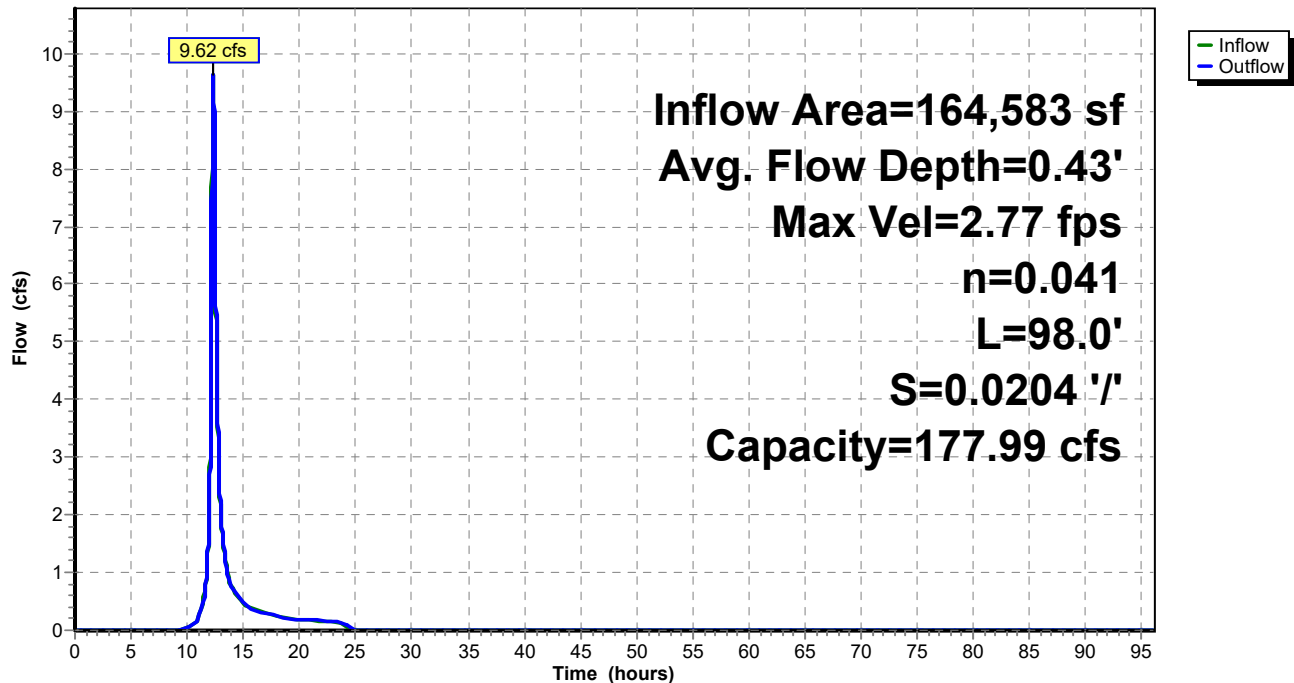
Peak Storage= 340 cf @ 12.31 hrs
Average Depth at Peak Storage= 0.43'
Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 177.99 cfs

8.00' x 3.00' deep channel, n= 0.041 Riprap, 2-inch
Length= 98.0' Slope= 0.0204 '/'
Inlet Invert= 349.00', Outlet Invert= 347.00'



Reach 11: Box Culvert

Hydrograph



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NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Subcatchment 12: Post A8

Runoff = 19.39 cfs @ 12.32 hrs, Volume= 74,969 cf, Depth= 2.29"

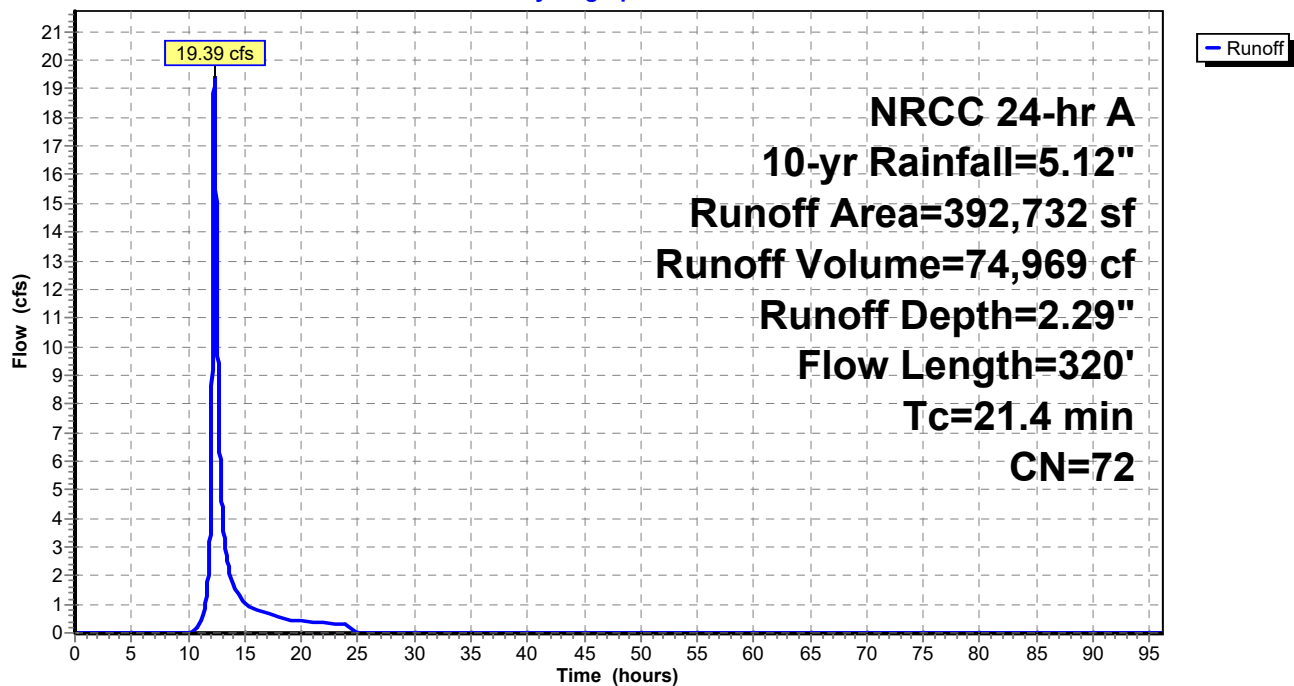
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 10-yr Rainfall=5.12"

Area (sf)	CN	Description
278,057	70	Woods, Good, HSG C
108,143	77	Woods, Good, HSG D
6,532	74	>75% Grass cover, Good, HSG C
392,732	72	Weighted Average
392,732		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
0.9	220	0.0636	4.06		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
21.4	320	Total			

Subcatchment 12: Post A8

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Pond 12A: Existing Wetland A

Inflow Area = 1,672,375 sf, 39.60% Impervious, Inflow Depth = 3.09" for 10-yr event
 Inflow = 80.07 cfs @ 12.34 hrs, Volume= 430,864 cf
 Outflow = 79.86 cfs @ 12.35 hrs, Volume= 430,864 cf, Atten= 0%, Lag= 1.0 min
 Primary = 79.86 cfs @ 12.35 hrs, Volume= 430,864 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 323.32' @ 12.35 hrs Surf.Area= 3,293 sf Storage= 3,273 cf

Plug-Flow detention time= 0.5 min calculated for 430,819 cf (100% of inflow)
 Center-of-Mass det. time= 0.5 min (835.1 - 834.6)

Volume	Invert	Avail.Storage	Storage Description		
#1	321.00'	190,307 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
321.00	124	53.2	0	0	124
322.00	1,084	175.8	525	525	2,361
324.00	4,913	341.5	5,536	6,061	9,202
326.00	11,332	638.2	15,804	21,866	32,354
328.00	20,583	804.3	31,458	53,324	51,475
330.00	34,086	1,075.5	54,104	107,428	92,087
332.00	49,257	1,268.5	82,879	190,307	128,164

Device	Routing	Invert	Outlet Devices
#1	Primary	321.00'	96.0" W x 36.0" H Box Culvert L= 116.0' Box, 0° wingwalls, square crown edge, Ke= 0.700 Inlet / Outlet Invert= 321.00' / 312.00' S= 0.0776 '/' Cc= 0.900 n= 0.040 Earth, cobble bottom, clean sides, Flow Area= 24.00 sf

Primary OutFlow Max=79.85 cfs @ 12.35 hrs HW=323.32' TW=313.57' (Dynamic Tailwater)
 ↑1=Culvert (Inlet Controls 79.85 cfs @ 4.31 fps)

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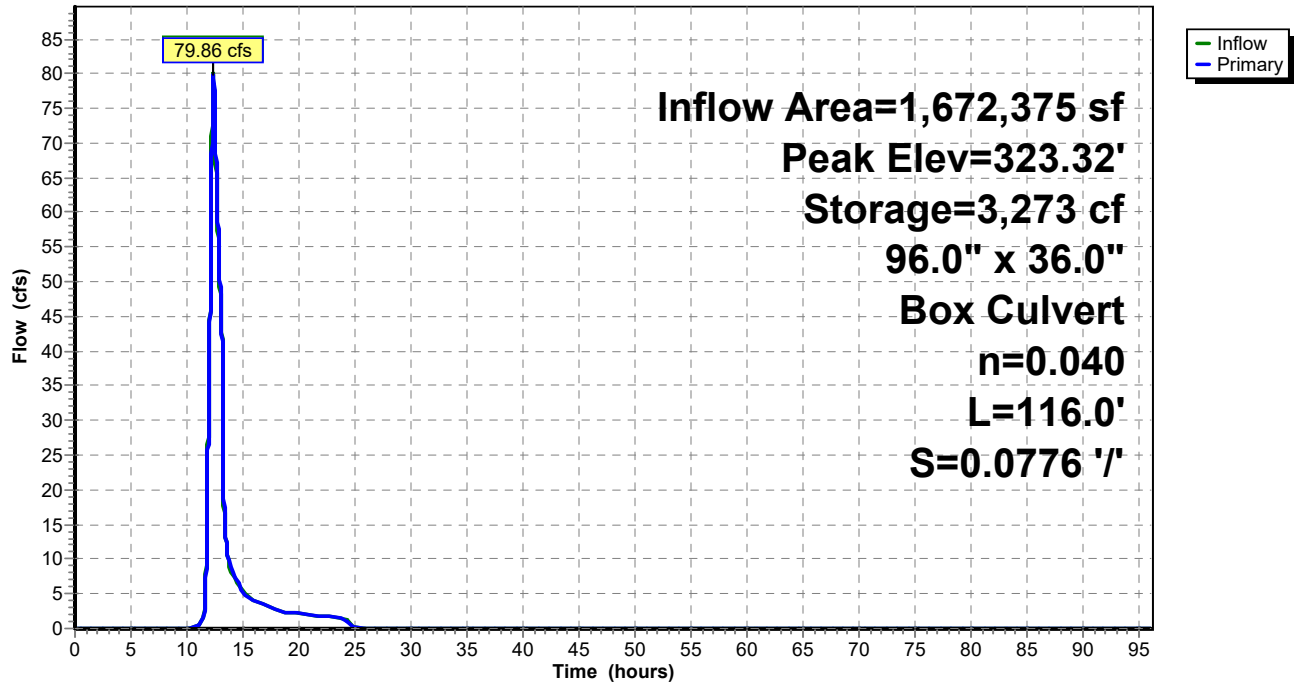
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NRCC 24-hr A 10-yr Rainfall=5.12"

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Pond 12A: Existing Wetland A

Hydrograph



N60 P1 Post-A 2021

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NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Subcatchment 12B: Post A11

Runoff = 34.41 cfs @ 12.30 hrs, Volume= 127,927 cf, Depth= 2.13"

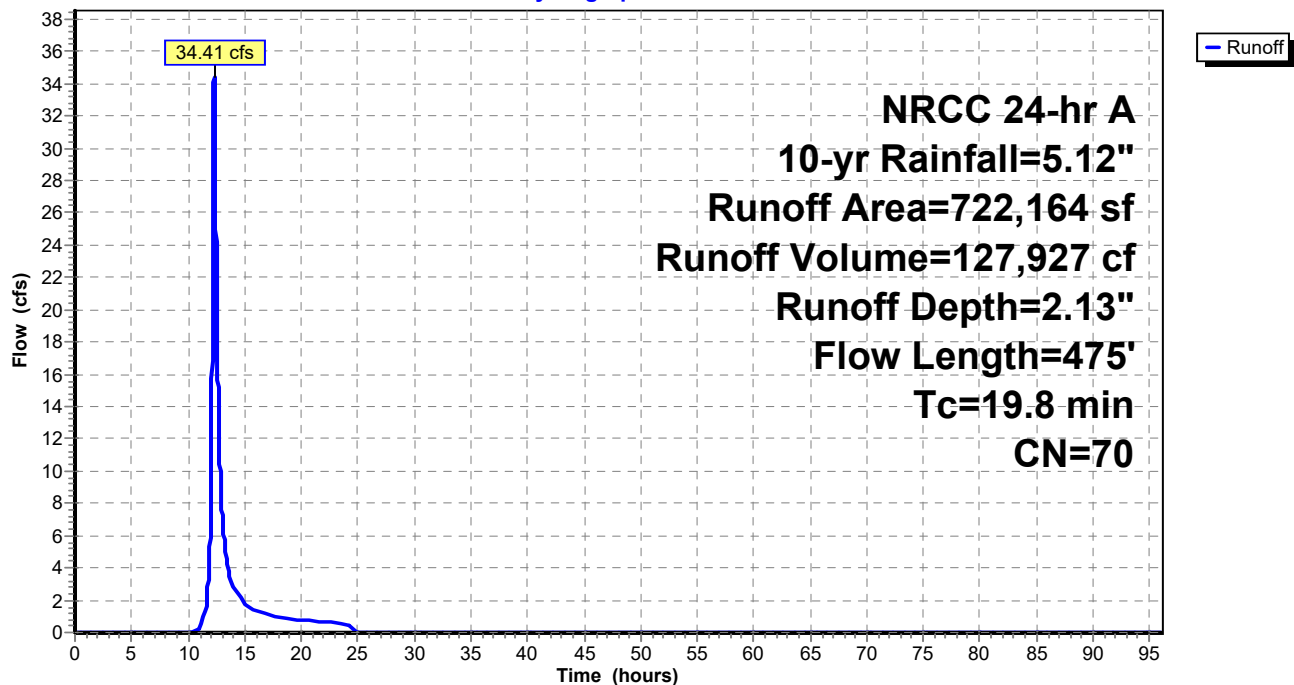
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 10-yr Rainfall=5.12"

Area (sf)	CN	Description
17,361	55	Woods, Good, HSG B
681,082	70	Woods, Good, HSG C
11,683	77	Woods, Good, HSG D
9,345	98	Paved parking, HSG C
2,693	74	>75% Grass cover, Good, HSG C
722,164	70	Weighted Average
712,819		98.71% Pervious Area
9,345		1.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0250	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.0	375	0.1400	6.02		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
19.8	475	Total			

Subcatchment 12B: Post A11

Hydrograph



N60 P1 Post-A 2021

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NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Reach 13: Existing Stream A (Lower Segment)

Inflow Area = 2,394,539 sf, 28.04% Impervious, Inflow Depth = 2.80" for 10-yr event
Inflow = 113.31 cfs @ 12.33 hrs, Volume= 558,791 cf
Outflow = 112.44 cfs @ 12.36 hrs, Volume= 558,791 cf, Atten= 1%, Lag= 1.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.07 fps, Min. Travel Time= 2.3 min
Avg. Velocity = 2.66 fps, Avg. Travel Time= 8.5 min

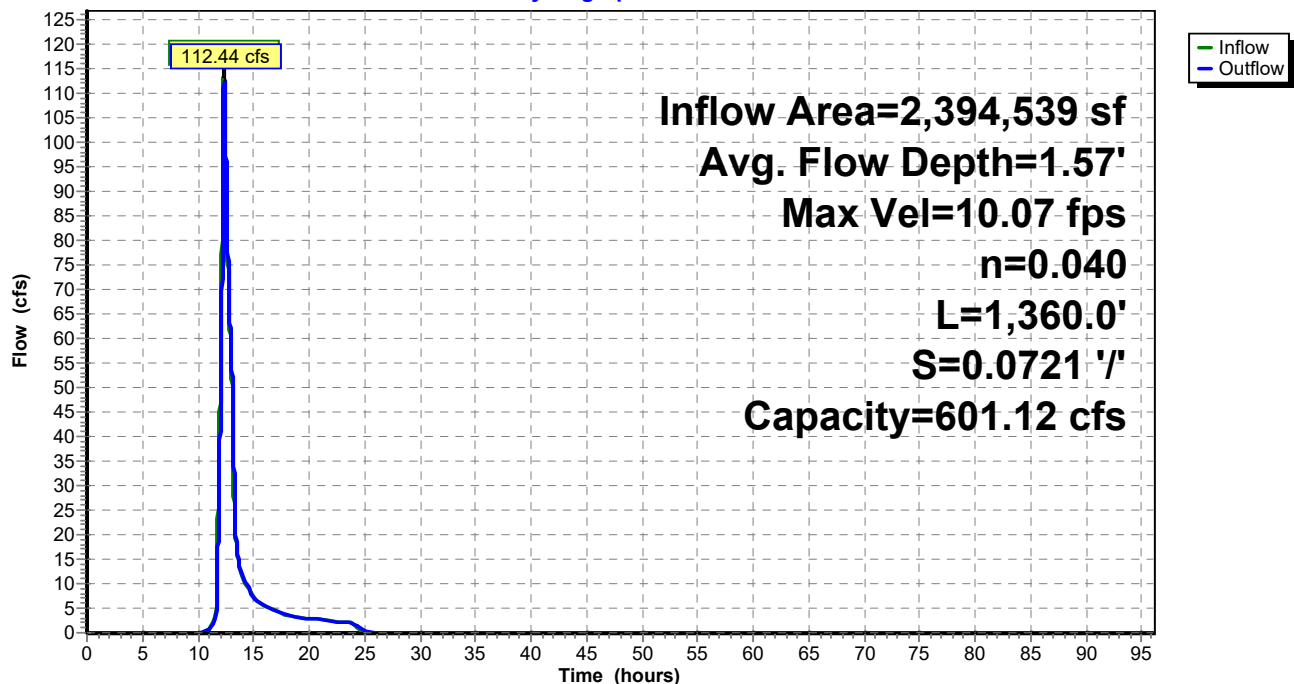
Peak Storage= 15,184 cf @ 12.36 hrs
Average Depth at Peak Storage= 1.57'
Bank-Full Depth= 3.50' Flow Area= 38.5 sf, Capacity= 601.12 cfs

4.00' x 3.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 ' ' Top Width= 18.00'
Length= 1,360.0' Slope= 0.0721 ' '
Inlet Invert= 312.00', Outlet Invert= 214.00'



Reach 13: Existing Stream A (Lower Segment)

Hydrograph



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NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Subcatchment 14: Post A3

Runoff = 15.43 cfs @ 12.13 hrs, Volume= 40,232 cf, Depth= 4.54"

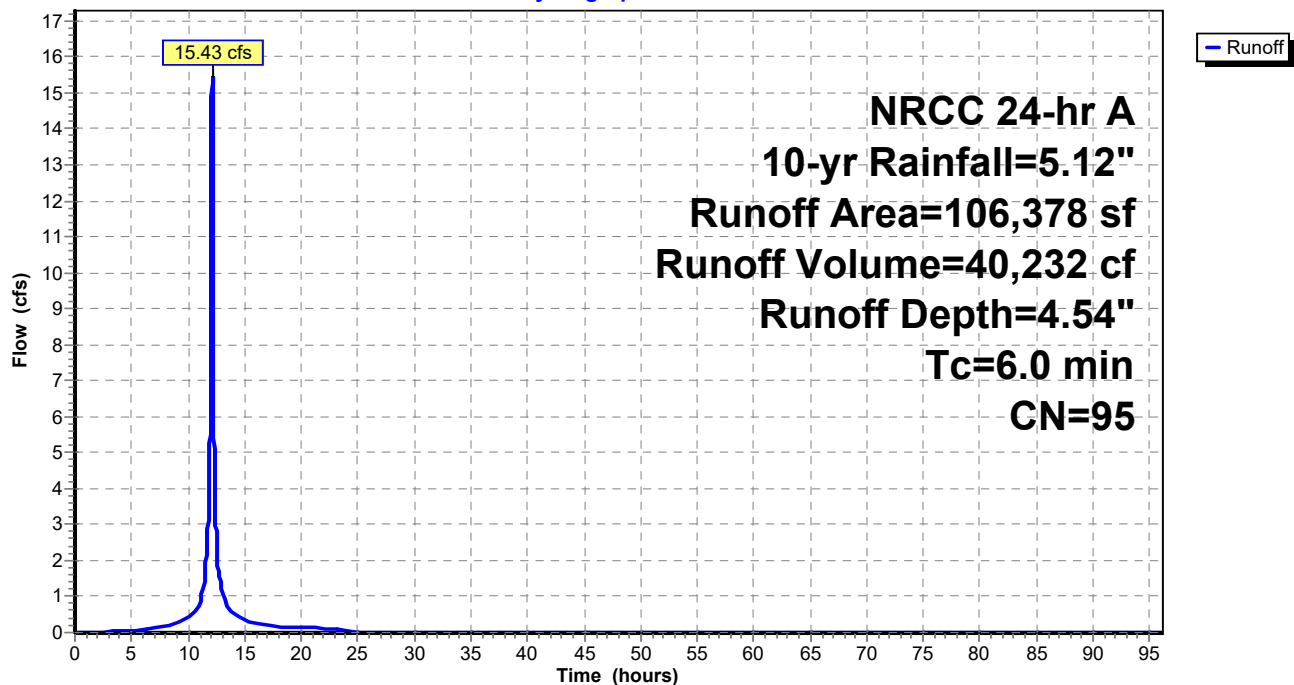
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 10-yr Rainfall=5.12"

Area (sf)	CN	Description
91,392	98	Paved parking, HSG C
14,986	74	>75% Grass cover, Good, HSG C
106,378	95	Weighted Average
14,986		14.09% Pervious Area
91,392		85.91% Impervious Area

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

Subcatchment 14: Post A3

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Pond 15: DIV-1

Inflow Area = 106,378 sf, 85.91% Impervious, Inflow Depth = 4.54" for 10-yr event
 Inflow = 15.43 cfs @ 12.13 hrs, Volume= 40,232 cf
 Outflow = 15.43 cfs @ 12.13 hrs, Volume= 40,232 cf, Atten= 0%, Lag= 0.0 min
 Primary = 5.30 cfs @ 11.94 hrs, Volume= 32,199 cf
 Secondary = 10.53 cfs @ 12.13 hrs, Volume= 8,033 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 326.07' @ 12.13 hrs

Flood Elev= 328.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	323.00'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 323.00' / 323.00' S= 0.0000 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	323.00'	24.0" Round Culvert L= 51.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 323.00' / 320.00' S= 0.0588 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	325.50'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=5.24 cfs @ 11.94 hrs HW=325.54' TW=323.62' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 5.24 cfs @ 6.68 fps)**Secondary OutFlow** Max=10.52 cfs @ 12.13 hrs HW=326.07' TW=0.00' (Dynamic Tailwater)↑ **2=Culvert** (Passes 10.52 cfs of 21.76 cfs potential flow)↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 10.52 cfs @ 2.31 fps)

N60 P1 Post-A 2021

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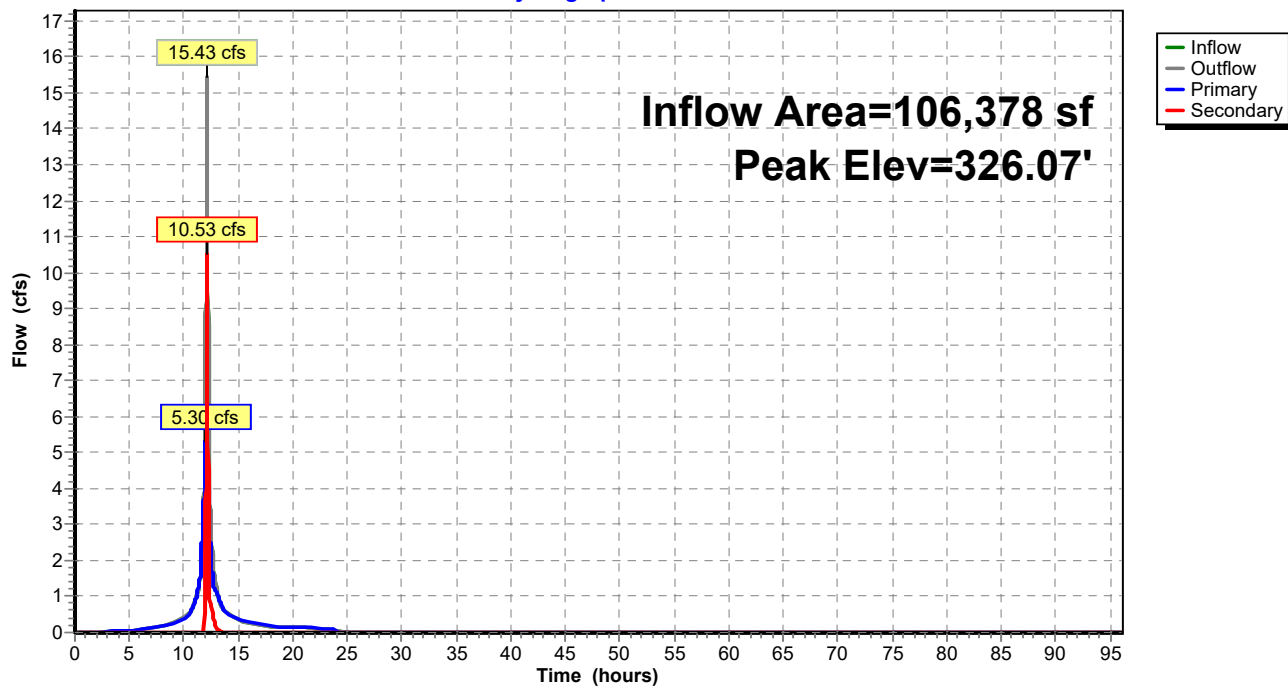
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NRCC 24-hr A 10-yr Rainfall=5.12"

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Pond 15: DIV-1

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Pond 16: INF-1

Inflow Area = 106,378 sf, 85.91% Impervious, Inflow Depth = 3.63" for 10-yr event
 Inflow = 5.30 cfs @ 11.94 hrs, Volume= 32,199 cf
 Outflow = 1.18 cfs @ 11.41 hrs, Volume= 32,199 cf, Atten= 78%, Lag= 0.0 min
 Discarded = 1.18 cfs @ 11.41 hrs, Volume= 32,199 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 325.46' @ 12.83 hrs Surf.Area= 4,245 sf Storage= 8,756 cf

Plug-Flow detention time= 47.8 min calculated for 32,196 cf (100% of inflow)
 Center-of-Mass det. time= 47.8 min (821.4 - 773.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	322.50'	4,688 cf	36.75'W x 115.50'L x 4.33'H Field A 18,393 cf Overall - 6,674 cf Embedded = 11,720 cf x 40.0% Voids
#2A	323.00'	6,674 cf	Cultec R-360HD x 180 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 180 Chambers in 6 Rows Cap Storage= +6.5 cf x 2 x 6 rows = 77.5 cf
		11,361 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	322.50'	12.000 in/hr Exfiltration over Horizontal area Phase-In= 0.01'

Discarded OutFlow Max=1.18 cfs @ 11.41 hrs HW=322.55' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 1.18 cfs)

N60 P1 Post-A 2021

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NRCC 24-hr A 10-yr Rainfall=5.12"

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Pond 16: INF-1 - Chamber Wizard Field A

Chamber Model = Cultec R-360HD (Cultec Recharger® 360HD)

Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf

Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap

Cap Storage= +6.5 cf x 2 x 6 rows = 77.5 cf

60.0" Wide + 9.0" Spacing = 69.0" C-C Row Spacing

30 Chambers/Row x 3.67' Long +1.25' Cap Length x 2 = 112.50' Row Length +18.0" End Stone x 2 = 115.50' Base Length

6 Rows x 60.0" Wide + 9.0" Spacing x 5 + 18.0" Side Stone x 2 = 36.75' Base Width

6.0" Base + 36.0" Chamber Height + 10.0" Cover = 4.33' Field Height

180 Chambers x 36.6 cf + 6.5 cf Cap Volume x 2 x 6 Rows = 6,673.6 cf Chamber Storage

18,393.4 cf Field - 6,673.6 cf Chambers = 11,719.8 cf Stone x 40.0% Voids = 4,687.9 cf Stone Storage

Chamber Storage + Stone Storage = 11,361.5 cf = 0.261 af

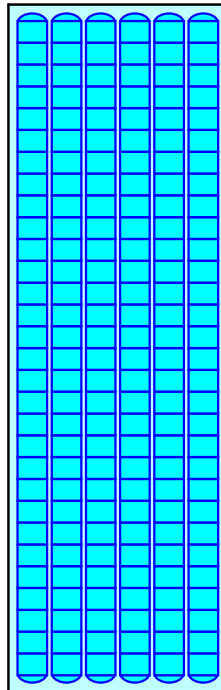
Overall Storage Efficiency = 61.8%

Overall System Size = 115.50' x 36.75' x 4.33'

180 Chambers

681.2 cy Field

434.1 cy Stone



N60 P1 Post-A 2021

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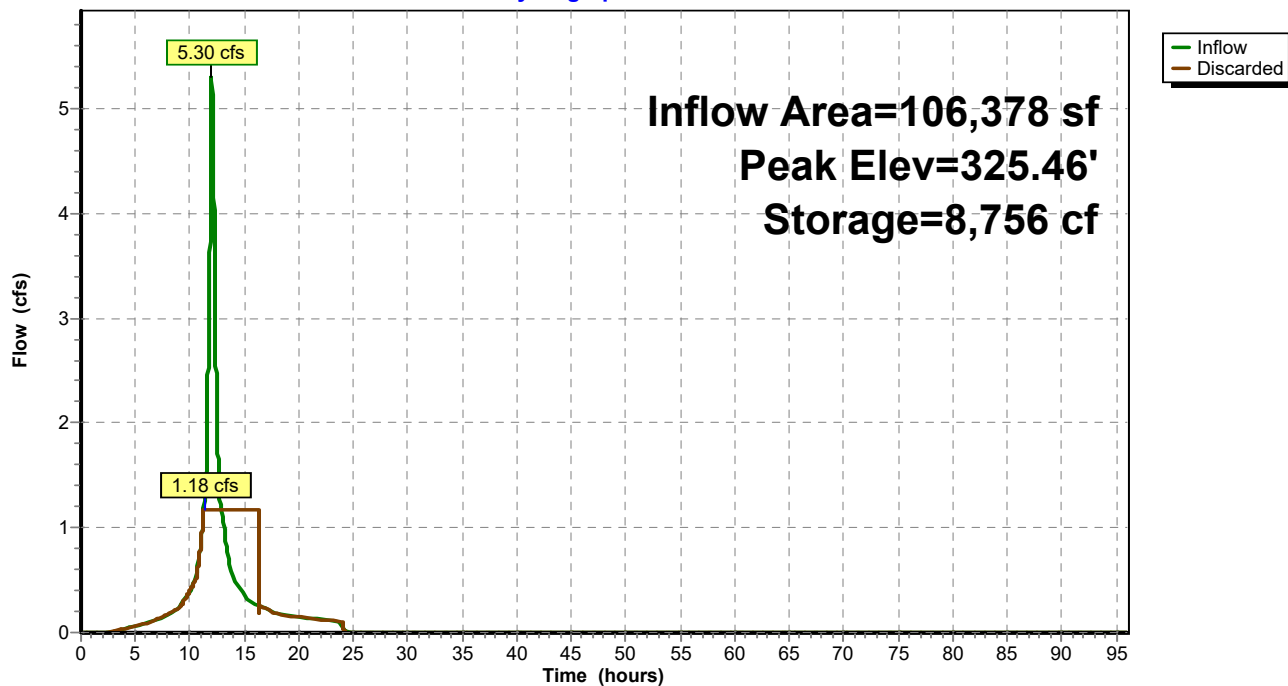
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Pond 16: INF-1

Hydrograph



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Summary for Subcatchment 17: Post A5

Runoff = 13.81 cfs @ 12.13 hrs, Volume= 37,813 cf, Depth= 4.88"

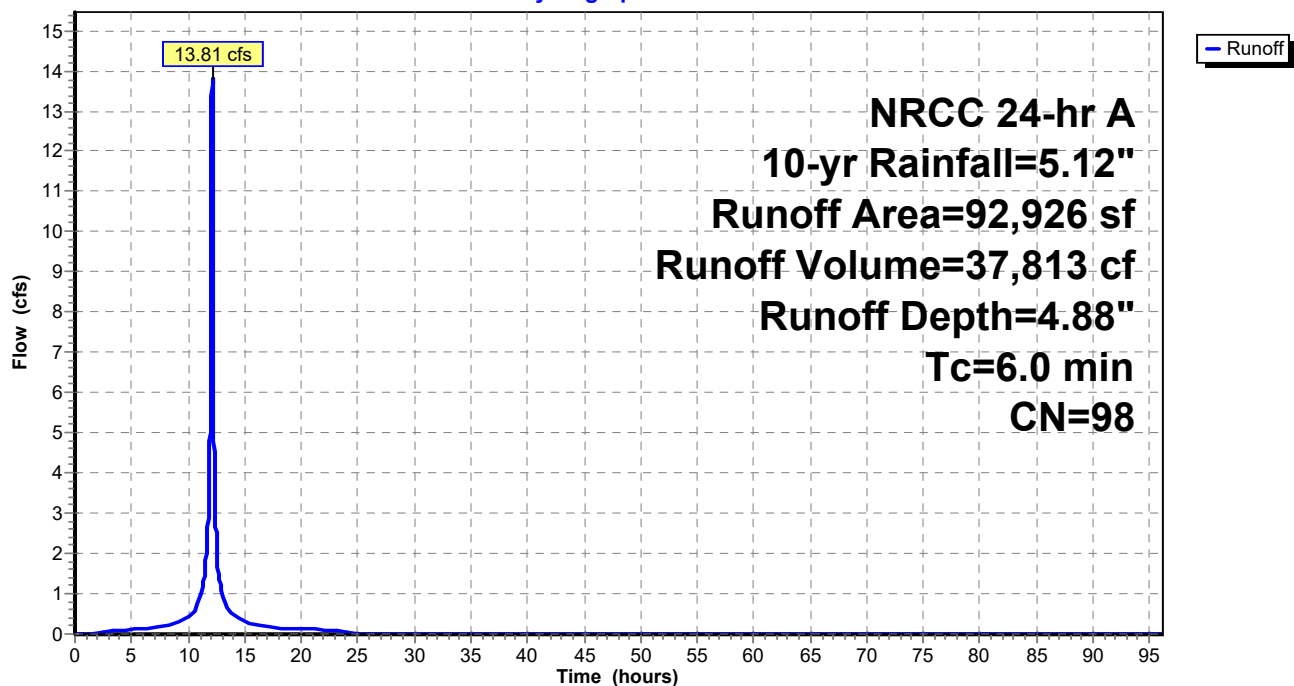
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 10-yr Rainfall=5.12"

Area (sf)	CN	Description
92,926	98	Roofs, HSG C
92,926		100.00% Impervious Area

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

Subcatchment 17: Post A5

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Pond 18: DIV-2

Inflow Area = 92,926 sf, 100.00% Impervious, Inflow Depth = 4.88" for 10-yr event
 Inflow = 13.81 cfs @ 12.13 hrs, Volume= 37,813 cf
 Outflow = 13.81 cfs @ 12.13 hrs, Volume= 37,813 cf, Atten= 0%, Lag= 0.0 min
 Primary = 5.79 cfs @ 11.97 hrs, Volume= 32,199 cf
 Secondary = 8.14 cfs @ 12.13 hrs, Volume= 5,614 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 364.28' @ 12.13 hrs

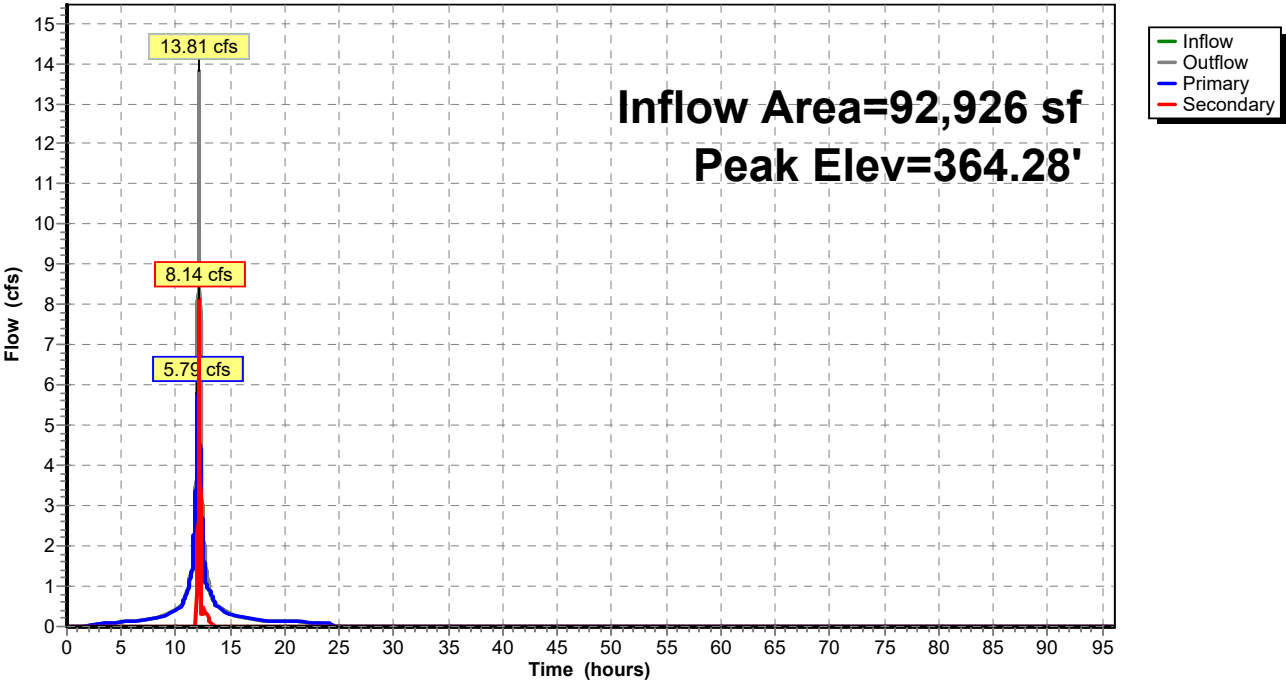
Flood Elev= 371.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	360.50'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 360.50' / 360.50' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	363.00'	24.0" Round Culvert L= 550.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 363.00' / 355.00' S= 0.0145 ' S= 0.0145 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	363.50'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=5.73 cfs @ 11.97 hrs HW=363.56' TW=361.27' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 5.73 cfs @ 7.29 fps)**Secondary OutFlow** Max=8.13 cfs @ 12.13 hrs HW=364.28' TW=355.38' (Dynamic Tailwater)↑ **2=Culvert** (Inlet Controls 8.13 cfs @ 3.84 fps)↑ **3=Broad-Crested Rectangular Weir** (Passes 8.13 cfs of 17.87 cfs potential flow)

Pond 18: DIV-2

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Pond 19: INF-2

Inflow Area = 92,926 sf, 100.00% Impervious, Inflow Depth = 4.16" for 10-yr event
 Inflow = 5.79 cfs @ 11.97 hrs, Volume= 32,199 cf
 Outflow = 0.99 cfs @ 11.32 hrs, Volume= 32,199 cf, Atten= 83%, Lag= 0.0 min
 Discarded = 0.99 cfs @ 11.32 hrs, Volume= 32,199 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 363.49' @ 12.80 hrs Surf.Area= 4,285 sf Storage= 10,039 cf

Plug-Flow detention time= 65.3 min calculated for 32,196 cf (100% of inflow)
 Center-of-Mass det. time= 65.3 min (814.8 - 749.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	360.00'	4,724 cf	42.50'W x 100.83'L x 4.33'H Field A 18,570 cf Overall - 6,760 cf Embedded = 11,810 cf x 40.0% Voids
#2A	360.50'	6,760 cf	Cultec R-360HD x 182 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 182 Chambers in 7 Rows Cap Storage= +6.5 cf x 2 x 7 rows = 90.4 cf
		11,484 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	360.00'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.01'

Discarded OutFlow Max=0.99 cfs @ 11.32 hrs HW=360.05' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.99 cfs)

N60 P1 Post-A 2021

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NRCC 24-hr A 10-yr Rainfall=5.12"

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Pond 19: INF-2 - Chamber Wizard Field A

Chamber Model = Cultec R-360HD (Cultec Recharger® 360HD)

Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf

Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap

Cap Storage= +6.5 cf x 2 x 7 rows = 90.4 cf

60.0" Wide + 9.0" Spacing = 69.0" C-C Row Spacing

26 Chambers/Row x 3.67' Long +1.25' Cap Length x 2 = 97.83' Row Length +18.0" End Stone x 2 = 100.83' Base Length

7 Rows x 60.0" Wide + 9.0" Spacing x 6 + 18.0" Side Stone x 2 = 42.50' Base Width

6.0" Base + 36.0" Chamber Height + 10.0" Cover = 4.33' Field Height

182 Chambers x 36.6 cf + 6.5 cf Cap Volume x 2 x 7 Rows = 6,759.8 cf Chamber Storage

18,570.1 cf Field - 6,759.8 cf Chambers = 11,810.4 cf Stone x 40.0% Voids = 4,724.1 cf Stone Storage

Chamber Storage + Stone Storage = 11,483.9 cf = 0.264 af

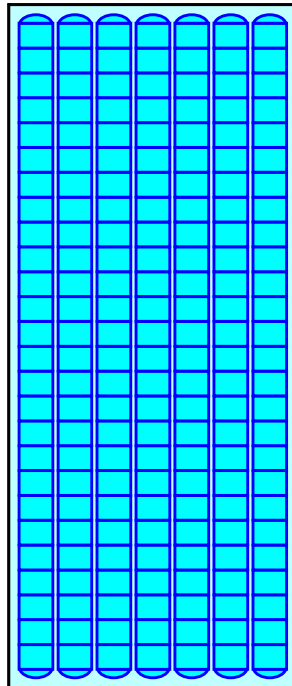
Overall Storage Efficiency = 61.8%

Overall System Size = 100.83' x 42.50' x 4.33'

182 Chambers

687.8 cy Field

437.4 cy Stone



N60 P1 Post-A 2021

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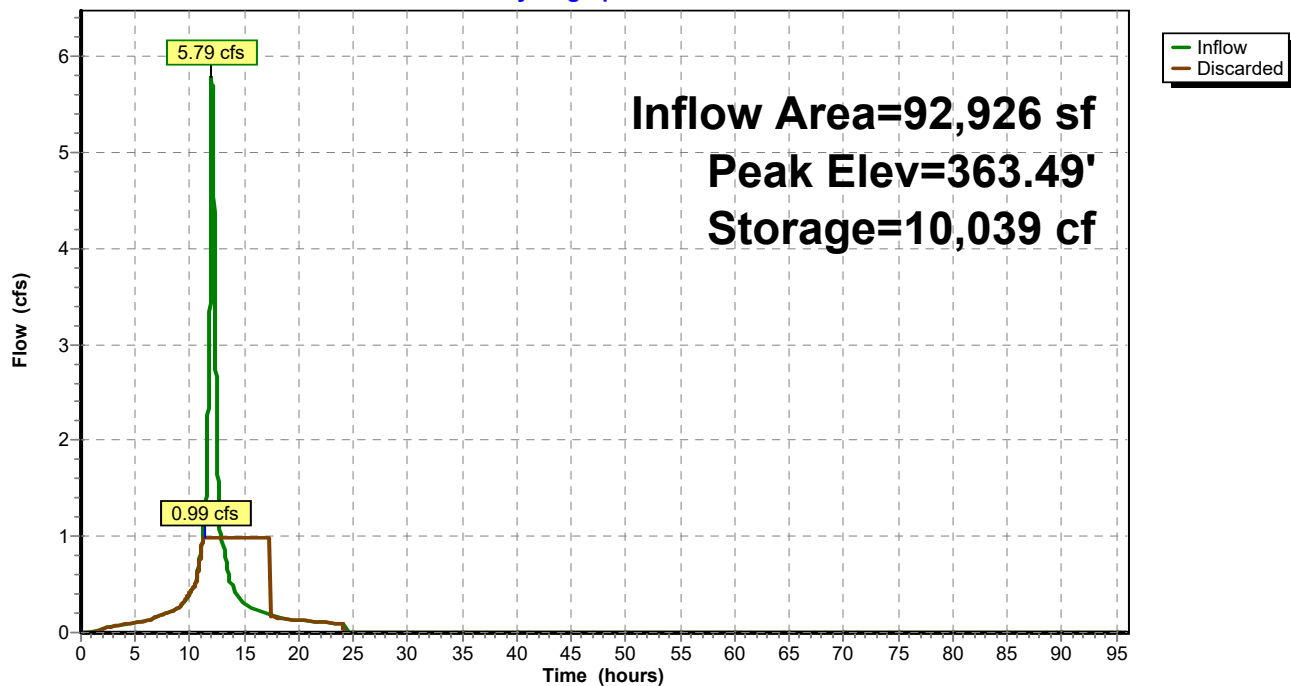
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Pond 19: INF-2

Hydrograph



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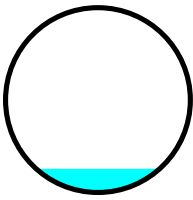
Summary for Reach 20: 36" HDPE Pipe

Inflow = 8.14 cfs @ 12.13 hrs, Volume= 5,614 cf
Outflow = 8.01 cfs @ 12.14 hrs, Volume= 5,614 cf, Atten= 2%, Lag= 0.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 15.30 fps, Min. Travel Time= 0.9 min
Avg. Velocity= 6.29 fps, Avg. Travel Time= 2.1 min

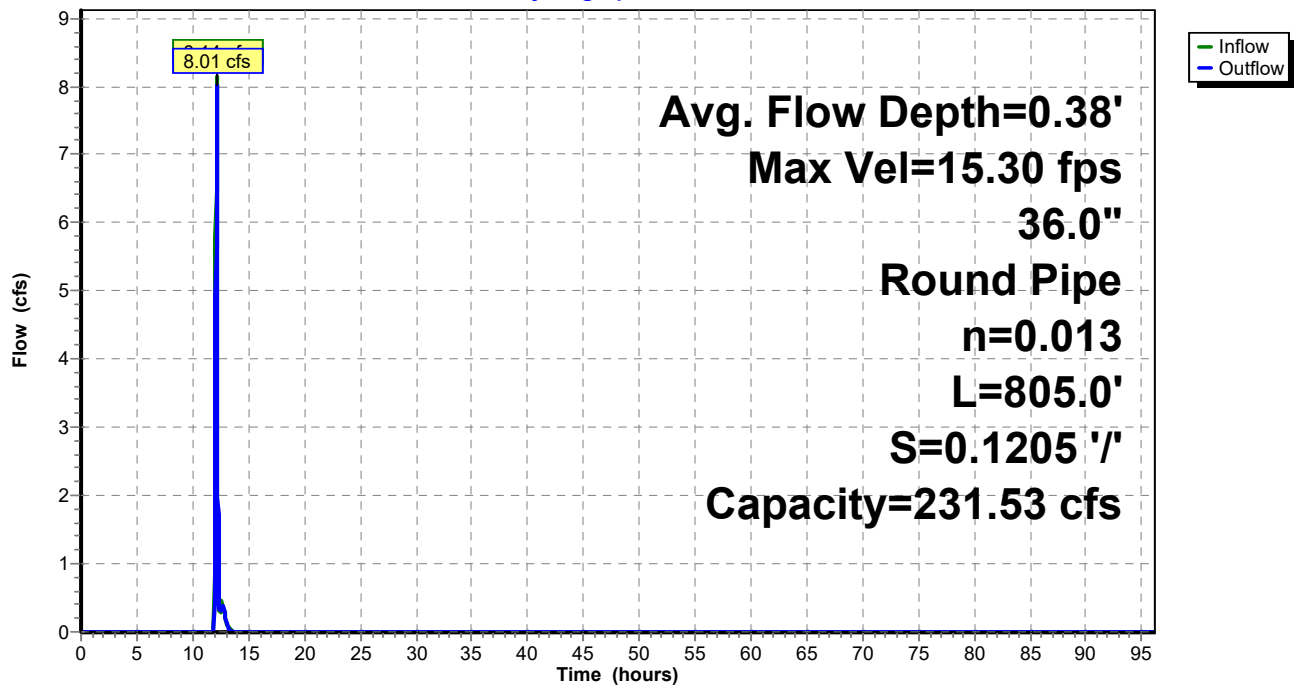
Peak Storage= 422 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.38'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 231.53 cfs

36.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 805.0' Slope= 0.1205 '/
Inlet Invert= 355.00', Outlet Invert= 258.00'



Reach 20: 36" HDPE Pipe

Hydrograph



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NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Subcatchment 21: A6

Runoff = 56.35 cfs @ 12.13 hrs, Volume= 149,125 cf, Depth= 4.65"

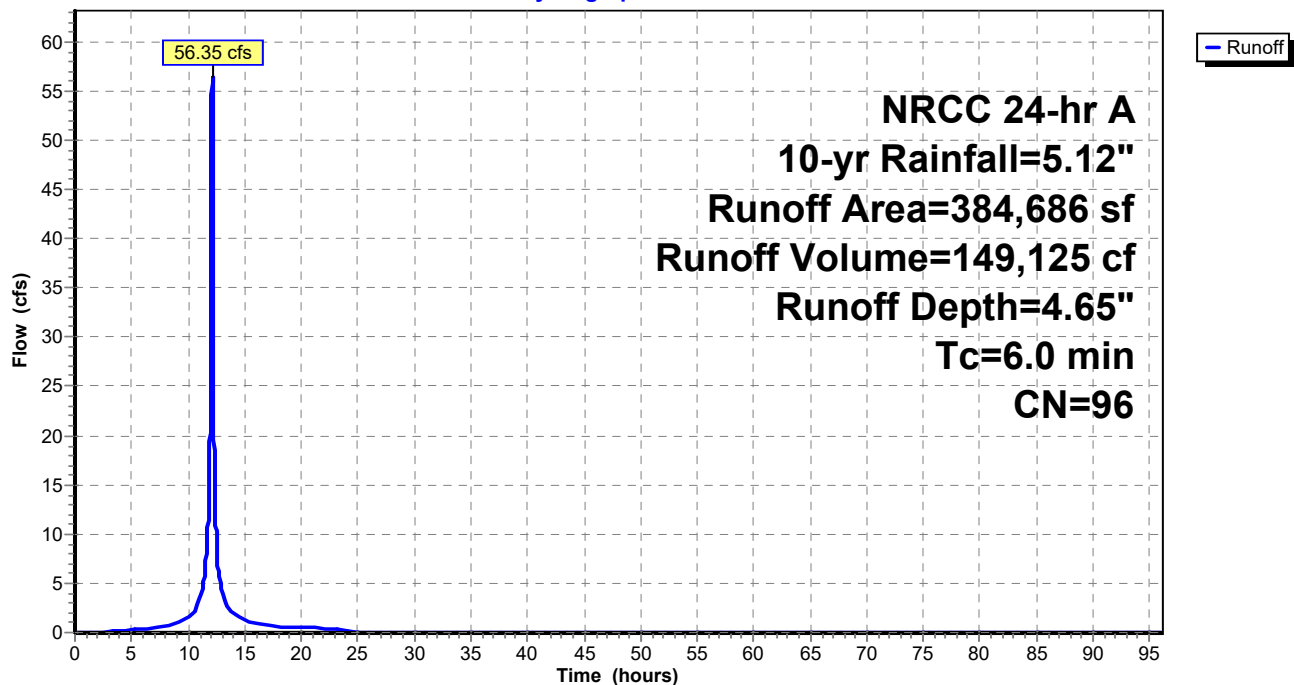
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 10-yr Rainfall=5.12"

Area (sf)	CN	Description
332,512	98	Paved parking, HSG C
52,174	86	<50% Grass cover, Poor, HSG C
384,686	96	Weighted Average
52,174		13.56% Pervious Area
332,512		86.44% Impervious Area

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

Subcatchment 21: A6

Hydrograph



N60 P1 Post-A 2021

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NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Subcatchment 22: A7

Runoff = 7.34 cfs @ 12.14 hrs, Volume= 16,989 cf, Depth= 1.97"

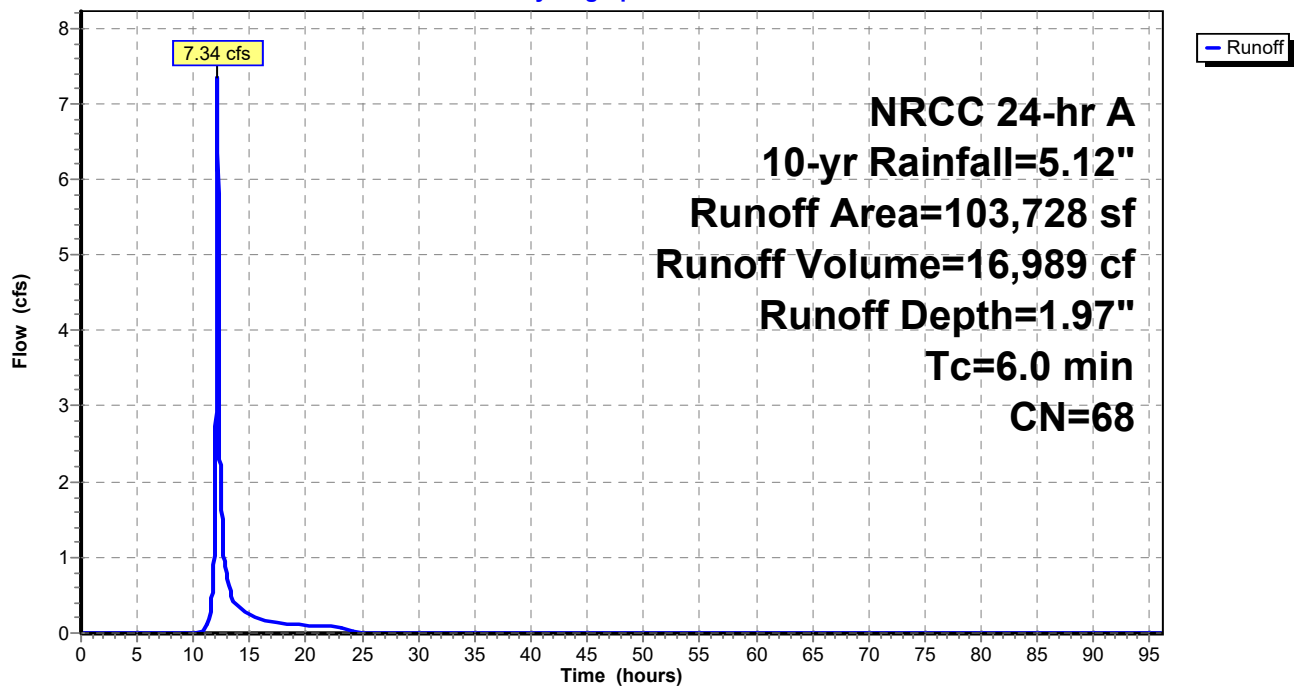
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 10-yr Rainfall=5.12"

Area (sf)	CN	Description
35,128	65	Brush, Good, HSG C
68,600	70	Woods, Good, HSG C
103,728	68	Weighted Average
103,728		100.00% Pervious Area

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

Subcatchment 22: A7

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Pond 23: Infiltration Basin (SWP-3)

Inflow Area = 488,414 sf, 68.08% Impervious, Inflow Depth = 4.22" for 10-yr event
 Inflow = 71.54 cfs @ 12.13 hrs, Volume= 171,728 cf
 Outflow = 20.60 cfs @ 12.31 hrs, Volume= 171,728 cf, Atten= 71%, Lag= 10.7 min
 Discarded = 6.00 cfs @ 12.31 hrs, Volume= 147,572 cf
 Primary = 14.60 cfs @ 12.31 hrs, Volume= 24,156 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 260.58' @ 12.31 hrs Surf.Area= 17,289 sf Storage= 60,785 cf

Plug-Flow detention time= 66.3 min calculated for 171,710 cf (100% of inflow)
 Center-of-Mass det. time= 66.3 min (833.1 - 766.9)

Volume	Invert	Avail.Storage	Storage Description		
#1	256.00'	103,740 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
256.00	9,450	527.9	0	0	9,450
258.00	12,731	565.7	22,100	22,100	12,917
260.00	16,238	603.5	28,898	50,998	16,623
262.00	19,973	641.3	36,147	87,144	20,569
262.80	21,527	656.4	16,596	103,740	22,212

Device	Routing	Invert	Outlet Devices
#1	Primary	254.00'	36.0" Round Culvert X 2.00 L= 95.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 254.00' / 244.00' S= 0.1053 ' S= 0.1053 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	260.00'	2.0' long x 0.5' breadth Broad-Crested Rectangular Weir X 2.00 Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	260.00'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir X 2.00 Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	259.40'	6.0" Vert. Orifice/Grate C= 0.600
#5	Device 1	261.00'	36.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Discarded	256.00'	15.000 in/hr Exfiltration over Surface area Phase-In= 0.10'

Discarded OutFlow Max=6.00 cfs @ 12.31 hrs HW=260.58' (Free Discharge)

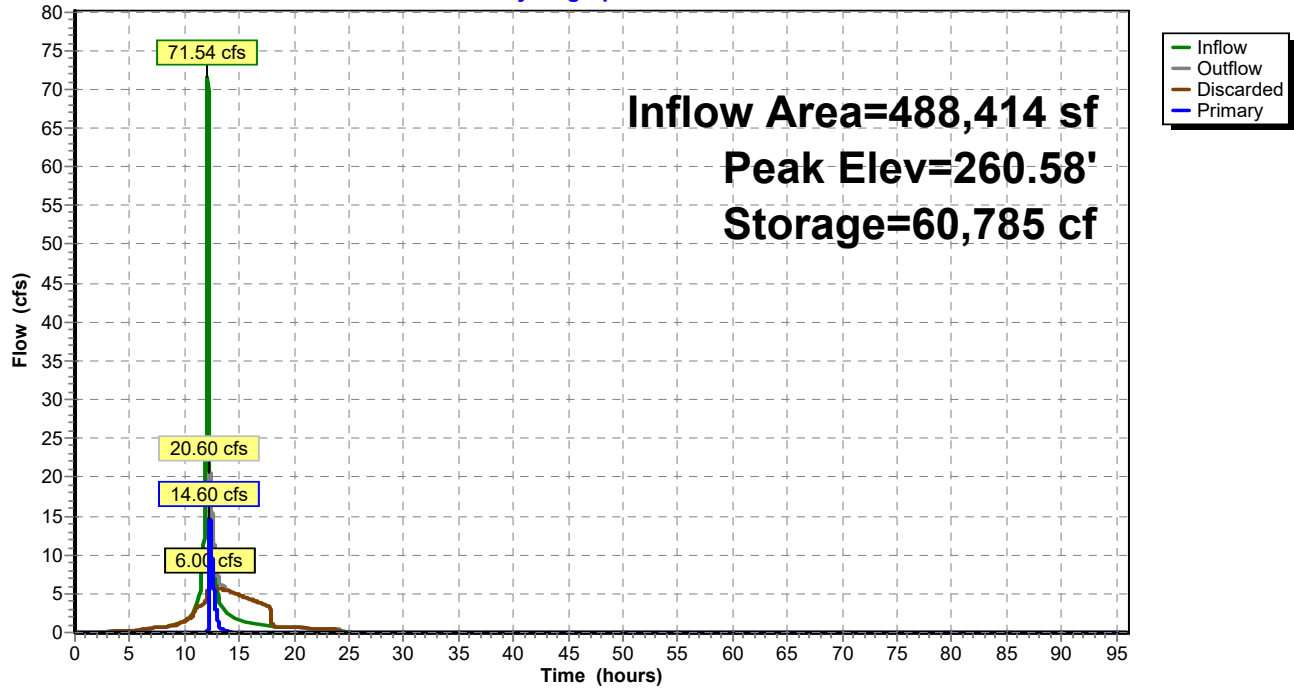
↳ **6=Exfiltration** (Exfiltration Controls 6.00 cfs)

Primary OutFlow Max=14.60 cfs @ 12.31 hrs HW=260.58' TW=0.00' (Dynamic Tailwater)

↳ **1=Culvert** (Passes 14.60 cfs of 153.48 cfs potential flow)
 ↳ **2=Broad-Crested Rectangular Weir** (Weir Controls 5.47 cfs @ 2.34 fps)
 ↳ **3=Broad-Crested Rectangular Weir** (Weir Controls 8.21 cfs @ 2.34 fps)
 ↳ **4=Orifice/Grate** (Orifice Controls 0.91 cfs @ 4.65 fps)
 ↳ **5=Orifice/Grate** (Controls 0.00 cfs)

Pond 23: Infiltration Basin (SWP-3)

Hydrograph



N60 P1 Post-A 2021

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NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Subcatchment 24: A9

Runoff = 4.91 cfs @ 12.13 hrs, Volume= 12,793 cf, Depth= 4.54"

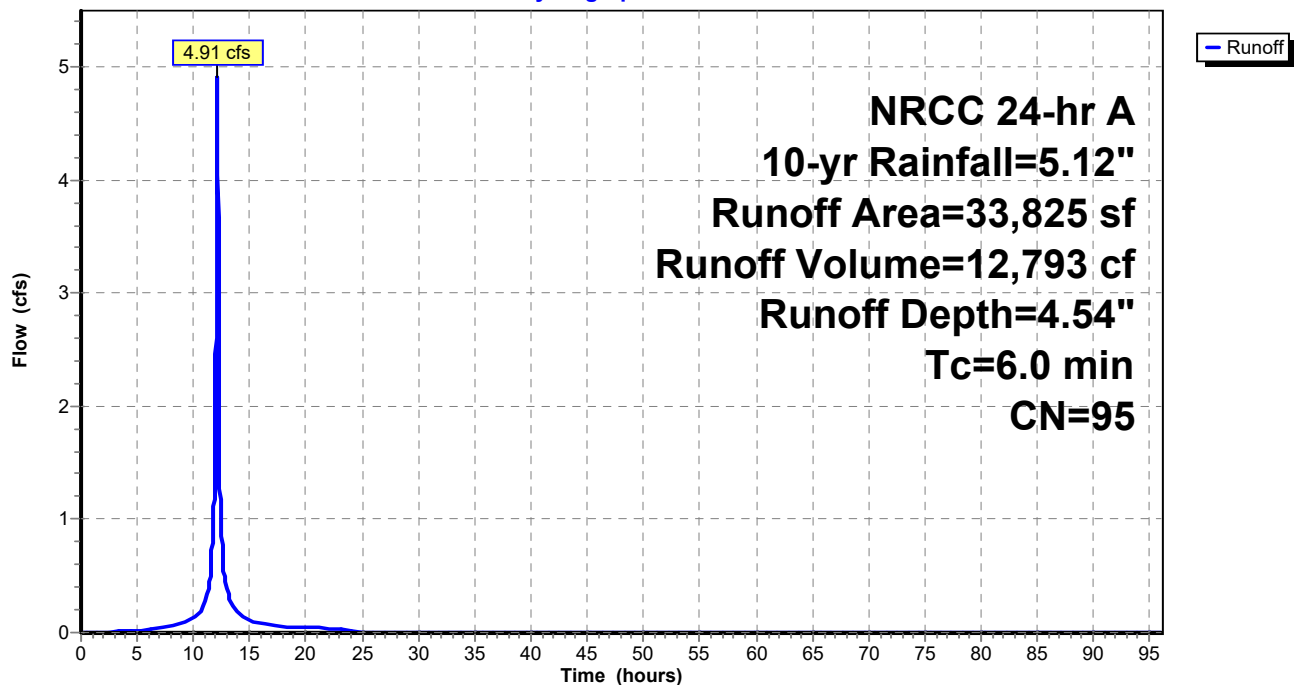
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 10-yr Rainfall=5.12"

Area (sf)	CN	Description
29,687	98	Paved parking, HSG C
4,138	74	>75% Grass cover, Good, HSG C
33,825	95	Weighted Average
4,138		12.23% Pervious Area
29,687		87.77% Impervious Area

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

Subcatchment 24: A9

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 10-yr Rainfall=5.12"

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Printed 5/12/2021

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Summary for Pond 25: DIV-4

Inflow Area = 33,825 sf, 87.77% Impervious, Inflow Depth = 4.54" for 10-yr event
 Inflow = 4.91 cfs @ 12.13 hrs, Volume= 12,793 cf
 Outflow = 4.91 cfs @ 12.13 hrs, Volume= 12,793 cf, Atten= 0%, Lag= 0.0 min
 Primary = 4.91 cfs @ 12.13 hrs, Volume= 12,793 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 349.26' @ 12.14 hrs

Flood Elev= 356.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	346.50'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 346.50' / 346.50' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	347.50'	18.0" Round Culvert L= 128.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 347.50' / 344.00' S= 0.0273 ' S= 0.0273 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	349.33'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.77 cfs @ 12.13 hrs HW=349.20' TW=347.61' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 4.77 cfs @ 6.08 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=346.50' TW=0.00' (Dynamic Tailwater)↑ **2=Culvert** (Controls 0.00 cfs)↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

N60 P1 Post-A 2021

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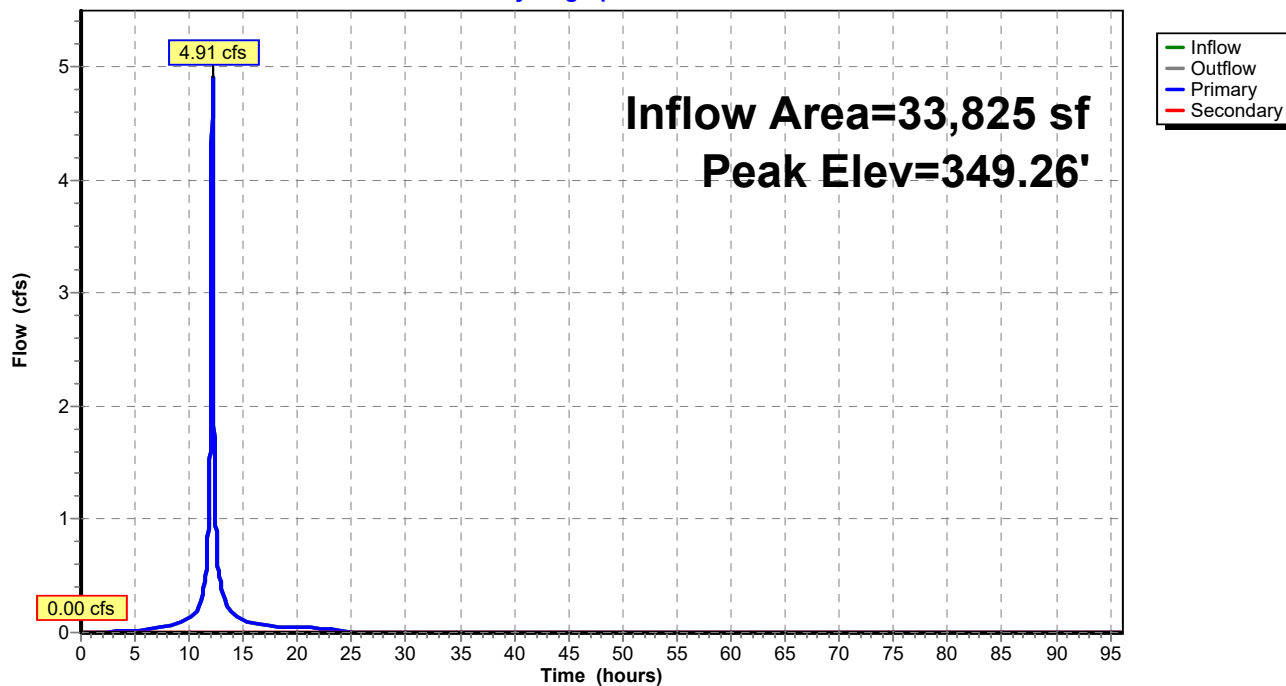
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NRCC 24-hr A 10-yr Rainfall=5.12"

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Pond 25: DIV-4

Hydrograph



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NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Pond 26: INF-4

Inflow Area = 33,825 sf, 87.77% Impervious, Inflow Depth = 4.54" for 10-yr event
 Inflow = 4.91 cfs @ 12.13 hrs, Volume= 12,793 cf
 Outflow = 0.52 cfs @ 11.62 hrs, Volume= 12,793 cf, Atten= 89%, Lag= 0.0 min
 Discarded = 0.52 cfs @ 11.62 hrs, Volume= 12,793 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 348.97' @ 12.71 hrs Surf.Area= 2,242 sf Storage= 4,576 cf

Plug-Flow detention time= 58.4 min calculated for 12,791 cf (100% of inflow)
 Center-of-Mass det. time= 58.4 min (823.7 - 765.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	346.00'	2,196 cf	30.50'W x 73.50'L x 3.88'H Field A 8,687 cf Overall - 3,196 cf Embedded = 5,490 cf x 40.0% Voids
#2A	346.50'	3,196 cf	Cultec R-330XLHD x 60 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 6 rows
		5,393 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	346.00'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.01'

Discarded OutFlow Max=0.52 cfs @ 11.62 hrs HW=346.05' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.52 cfs)

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NRCC 24-hr A 10-yr Rainfall=5.12"

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Pond 26: INF-4 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 6 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

10 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 71.50' Row Length +12.0" End Stone x 2 = 73.50' Base Length

6 Rows x 52.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.50' Base Width

6.0" Base + 30.5" Chamber Height + 10.0" Cover = 3.88' Field Height

60 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 6 Rows = 3,196.5 cf Chamber Storage

8,686.8 cf Field - 3,196.5 cf Chambers = 5,490.3 cf Stone x 40.0% Voids = 2,196.1 cf Stone Storage

Chamber Storage + Stone Storage = 5,392.6 cf = 0.124 af

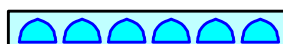
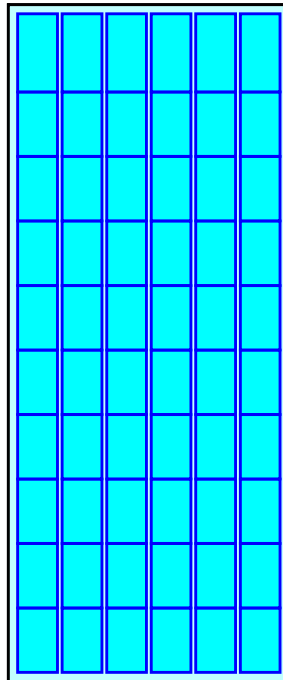
Overall Storage Efficiency = 62.1%

Overall System Size = 73.50' x 30.50' x 3.88'

60 Chambers

321.7 cy Field

203.3 cy Stone



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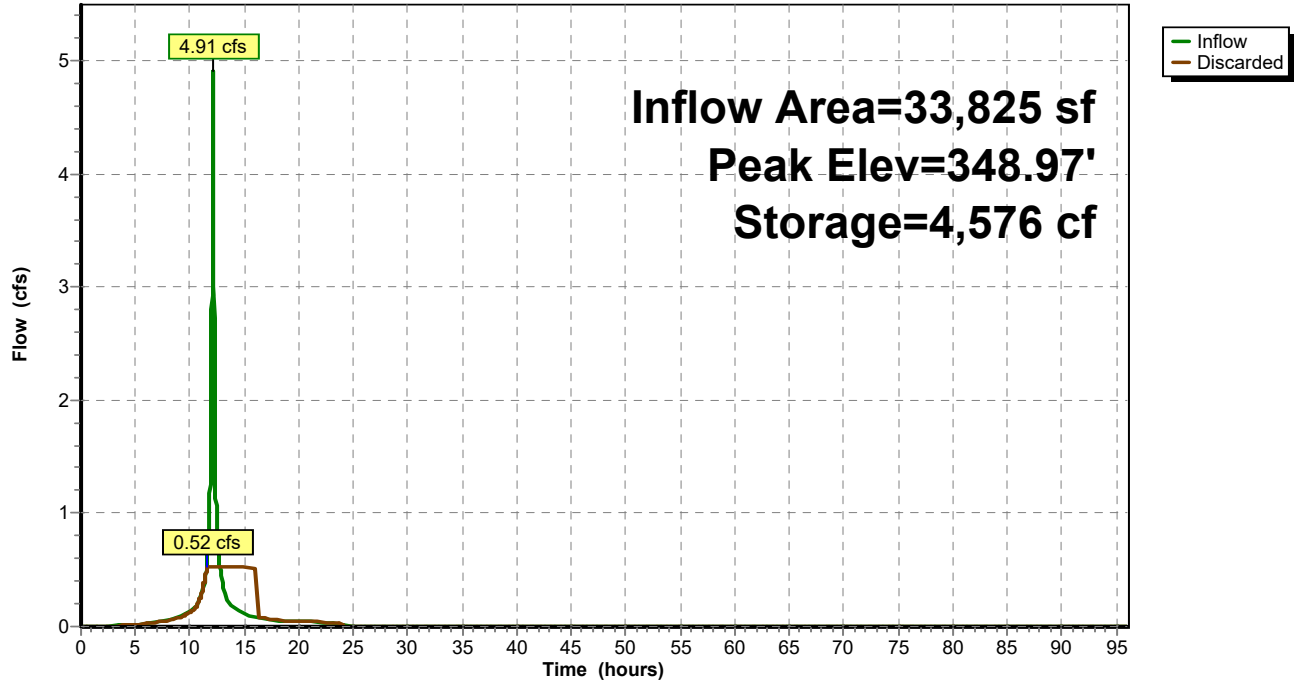
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NRCC 24-hr A 10-yr Rainfall=5.12"

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Pond 26: INF-4

Hydrograph



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NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Subcatchment 27: A10

Runoff = 19.55 cfs @ 12.13 hrs, Volume= 47,786 cf, Depth= 3.89"

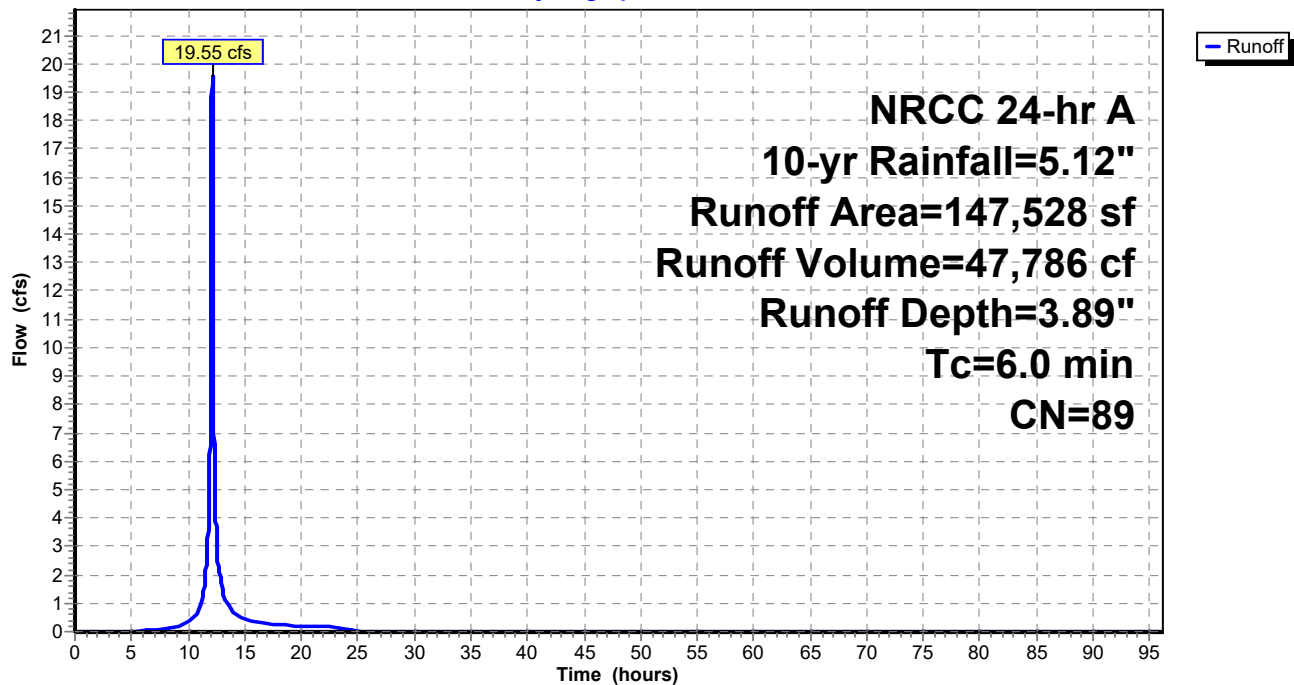
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 10-yr Rainfall=5.12"

Area (sf)	CN	Description
91,430	98	Paved parking, HSG C
5,603	80	>75% Grass cover, Good, HSG D
7,435	74	>75% Grass cover, Good, HSG C
16,120	73	Brush, Good, HSG D
19,715	77	Brush, Poor, HSG C
7,225	70	Woods, Good, HSG C
147,528	89	Weighted Average
56,098		38.03% Pervious Area
91,430		61.97% Impervious Area

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

Subcatchment 27: A10

Hydrograph



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NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Subcatchment 28: A10

Runoff = 1.59 cfs @ 12.13 hrs, Volume= 4,269 cf, Depth= 4.77"

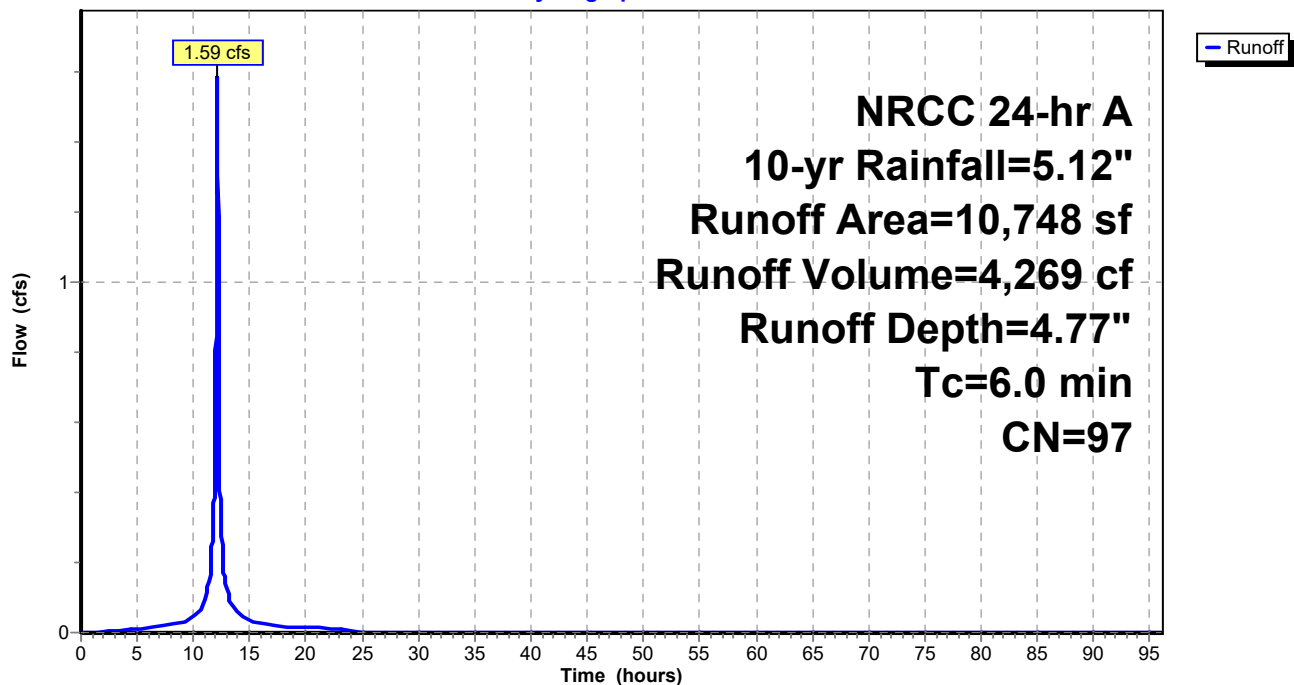
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 10-yr Rainfall=5.12"

Area (sf)	CN	Description
10,280	98	Paved parking, HSG D
468	80	>75% Grass cover, Good, HSG D
10,748	97	Weighted Average
468		4.35% Pervious Area
10,280		95.65% Impervious Area

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

Subcatchment 28: A10

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Pond 29: Infiltration Basin (SWP-2)

Inflow Area = 158,276 sf, 64.26% Impervious, Inflow Depth = 3.95" for 10-yr event
 Inflow = 21.14 cfs @ 12.13 hrs, Volume= 52,055 cf
 Outflow = 3.35 cfs @ 12.57 hrs, Volume= 52,055 cf, Atten= 84%, Lag= 26.4 min
 Discarded = 2.56 cfs @ 12.57 hrs, Volume= 48,947 cf
 Primary = 0.79 cfs @ 12.57 hrs, Volume= 3,108 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 317.45' @ 12.57 hrs Surf.Area= 7,383 sf Storage= 19,455 cf

Plug-Flow detention time= 56.9 min calculated for 52,055 cf (100% of inflow)
 Center-of-Mass det. time= 56.9 min (842.2 - 785.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	314.00'	47,274 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
314.00	4,026	293.0	0	0	4,026
316.00	5,897	330.7	9,864	9,864	5,998
318.00	7,994	368.3	13,838	23,702	8,204
320.00	10,316	406.0	18,261	41,962	10,652
320.50	10,932	415.4	5,311	47,274	11,300

Device	Routing	Invert	Outlet Devices
#1	Primary	308.00'	15.0" Round Culvert L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 308.00' / 304.00' S= 0.0667 ' S= 0.0667 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	316.50'	6.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	318.50'	2.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	319.00'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Discarded	314.00'	15.000 in/hr Exfiltration over Surface area Phase-In= 0.10'

Discarded OutFlow Max=2.56 cfs @ 12.57 hrs HW=317.45' (Free Discharge)

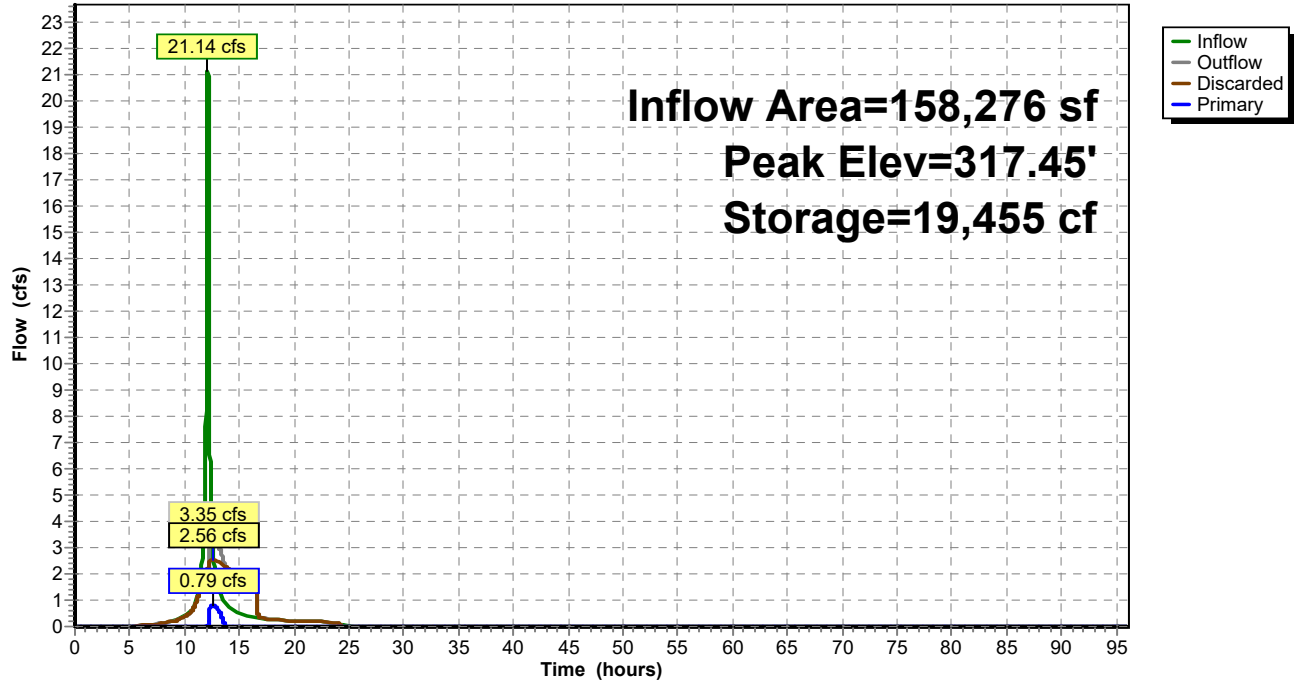
↑ **5=Exfiltration** (Exfiltration Controls 2.56 cfs)

Primary OutFlow Max=0.79 cfs @ 12.57 hrs HW=317.45' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 0.79 cfs of 17.55 cfs potential flow)
 ↑ **2=Orifice/Grate** (Orifice Controls 0.79 cfs @ 4.02 fps)
 ↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
 ↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 29: Infiltration Basin (SWP-2)

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Subcatchment 30: Post A2

Runoff = 15.07 cfs @ 12.27 hrs, Volume= 52,591 cf, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 10-yr Rainfall=5.12"

Area (sf)	CN	Description
43,743	98	Paved parking, HSG C
107,245	74	>75% Grass cover, Good, HSG C
2,876	61	>75% Grass cover, Good, HSG B
39,583	70	Woods, Good, HSG C
4,283	98	Water Surface, HSG C
33,976	65	Brush, Good, HSG C
231,706	77	Weighted Average
183,680		79.27% Pervious Area
48,026		20.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0400	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.4	215	0.0260	2.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	125	0.1000	6.42		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.4	377	0.0750	14.42	17.69	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
17.7	817	Total			

N60 P1 Post-A 2021

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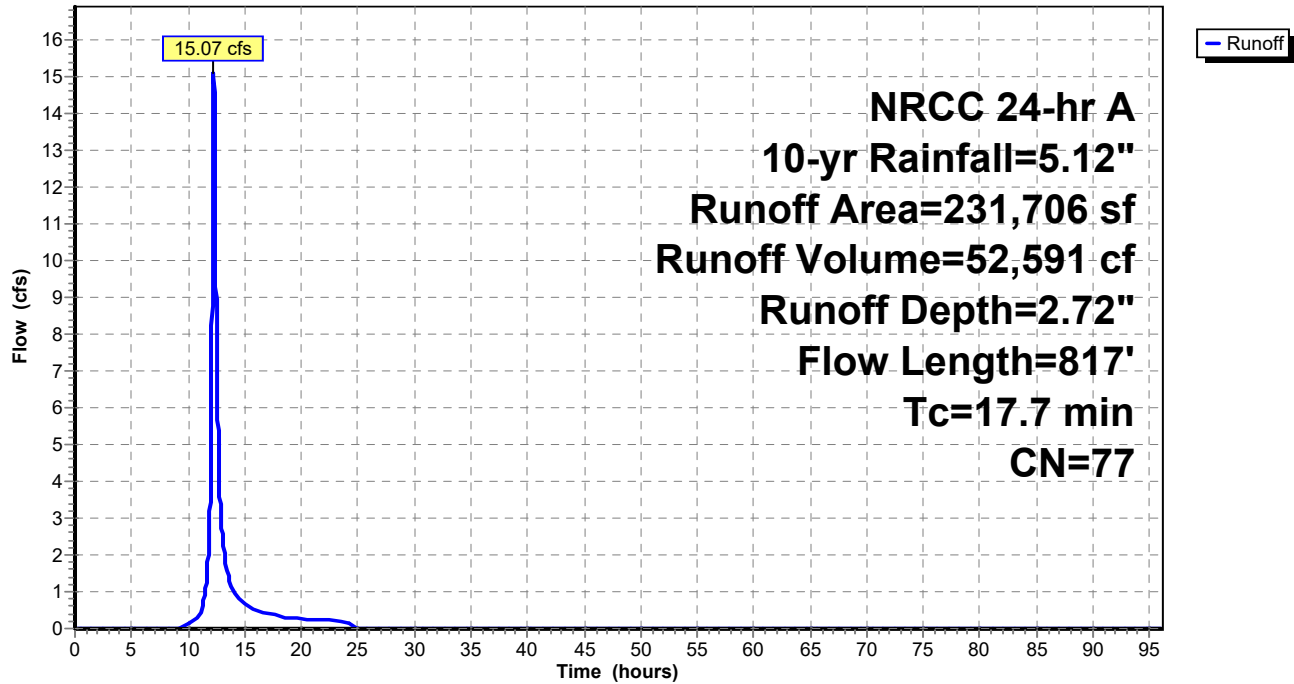
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NRCC 24-hr A 10-yr Rainfall=5.12"

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Subcatchment 30: Post A2

Hydrograph



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NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Pond 31: Pocket Wetland (SWP-1)

Inflow Area = 231,706 sf, 20.73% Impervious, Inflow Depth = 2.72" for 10-yr event
 Inflow = 15.07 cfs @ 12.27 hrs, Volume= 52,591 cf
 Outflow = 8.82 cfs @ 12.48 hrs, Volume= 44,653 cf, Atten= 41%, Lag= 12.5 min
 Primary = 8.82 cfs @ 12.48 hrs, Volume= 44,653 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Starting Elev= 234.50' Surf.Area= 12,504 sf Storage= 7,835 cf
 Peak Elev= 236.33' @ 12.48 hrs Surf.Area= 15,610 sf Storage= 28,267 cf (20,432 cf above start)

Plug-Flow detention time= 778.7 min calculated for 36,818 cf (70% of inflow)
 Center-of-Mass det. time= 555.3 min (1,383.8 - 828.5)

Volume	Invert	Avail.Storage	Storage Description
#1	230.00'	1,811 cf	Forebay (Irregular) Listed below (Recalc)
#2	230.00'	1,976 cf	Micropool (Irregular) Listed below (Recalc)
#3	233.90'	65,123 cf	Marsh & Storage (Irregular) Listed below (Recalc)
		68,911 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
230.00	86	34.2	0	0	86
231.00	217	53.2	147	147	225
232.00	406	72.3	307	453	426
233.00	651	91.4	524	977	688
233.90	1,233	129.1	834	1,811	1,357

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
230.00	86	34.2	0	0	86
231.00	217	53.2	147	147	225
232.00	406	72.3	307	453	426
233.00	651	91.4	524	977	688
233.90	1,646	155.1	1,000	1,976	1,942

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
233.90	4,232	530.5	0	0	4,232
234.50	9,625	400.9	4,048	4,048	13,842
235.00	10,440	413.5	5,015	9,063	14,683
236.00	12,144	438.8	11,281	20,344	16,451
237.00	13,950	464.0	13,037	33,381	18,317
238.00	15,856	489.2	14,893	48,273	20,287
239.00	17,864	514.5	16,850	65,123	22,369

Device	Routing	Invert	Outlet Devices
#1	Primary	232.00'	15.0" Round Culvert L= 117.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 232.00' / 216.50' S= 0.1325 ' / ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

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NRCC 24-hr A 10-yr Rainfall=5.12"

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#2	Device 1	234.50'	1.1" Vert. Orifice/Grate	C= 0.600
#3	Device 1	236.00'	36.0" x 48.0" Horiz. Orifice/Grate	C= 0.600

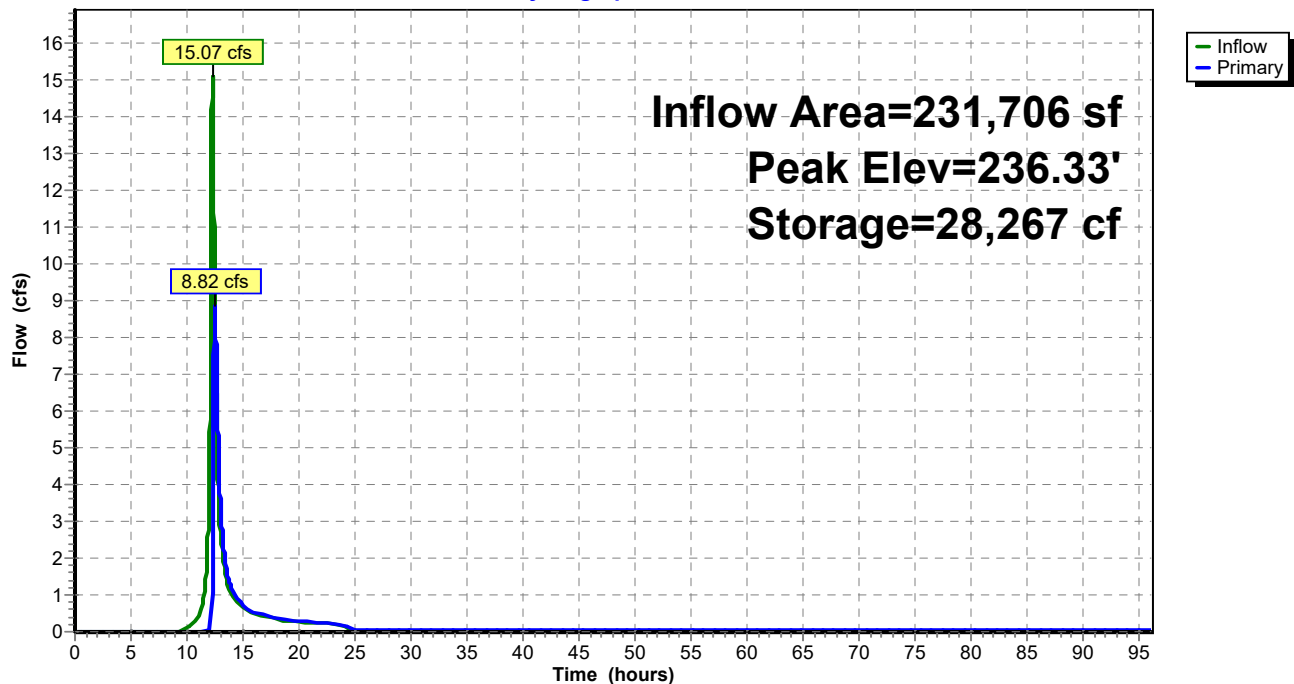
Limited to weir flow at low heads

Primary OutFlow Max=8.82 cfs @ 12.48 hrs HW=236.33' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 8.82 cfs of 11.38 cfs potential flow)
2=Orifice/Grate (Orifice Controls 0.04 cfs @ 6.44 fps)
3=Orifice/Grate (Weir Controls 8.78 cfs @ 1.89 fps)

Pond 31: Pocket Wetland (SWP-1)

Hydrograph



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NRCC 24-hr A 10-yr Rainfall=5.12"

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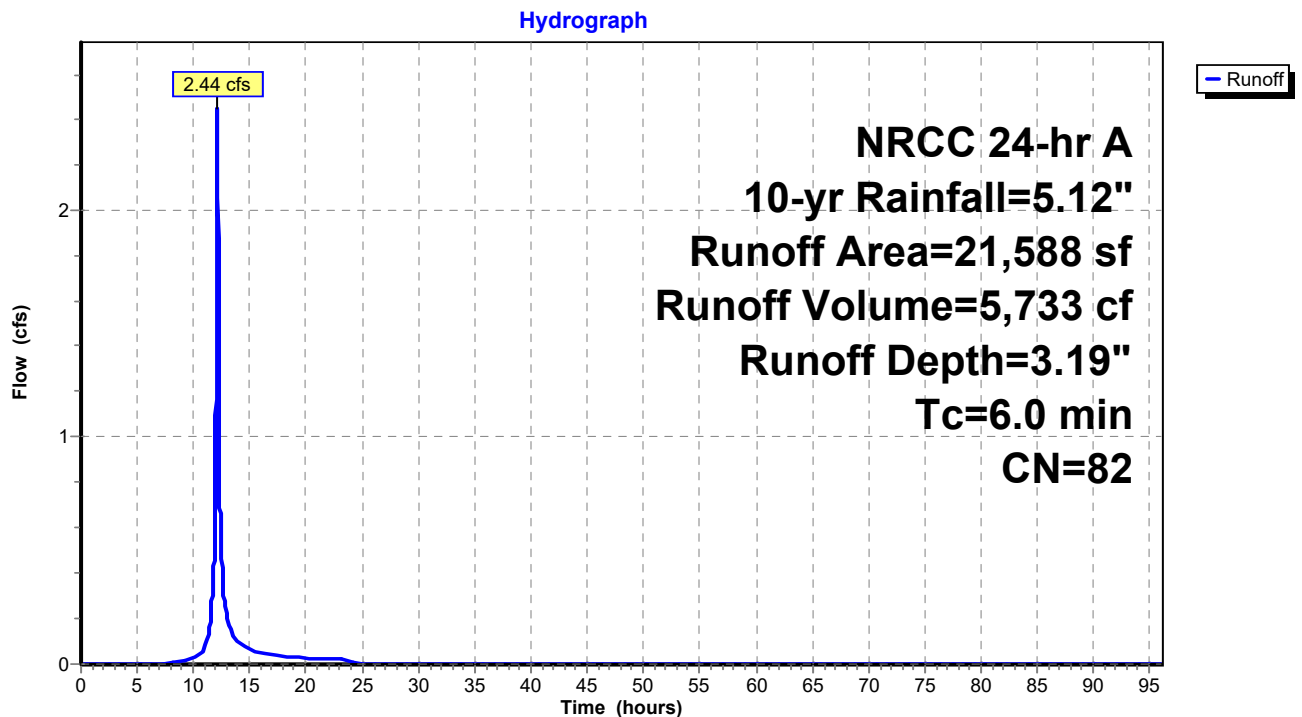
Summary for Subcatchment 32: Post A1

Runoff = 2.44 cfs @ 12.13 hrs, Volume= 5,733 cf, Depth= 3.19"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 10-yr Rainfall=5.12"

Area (sf)	CN	Description
8,152	98	Paved parking, HSG C
10,356	74	>75% Grass cover, Good, HSG C
3,080	70	Woods, Good, HSG C
21,588	82	Weighted Average
13,436		62.24% Pervious Area
8,152		37.76% Impervious Area

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

Subcatchment 32: Post A1

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NRCC 24-hr A 10-yr Rainfall=5.12"

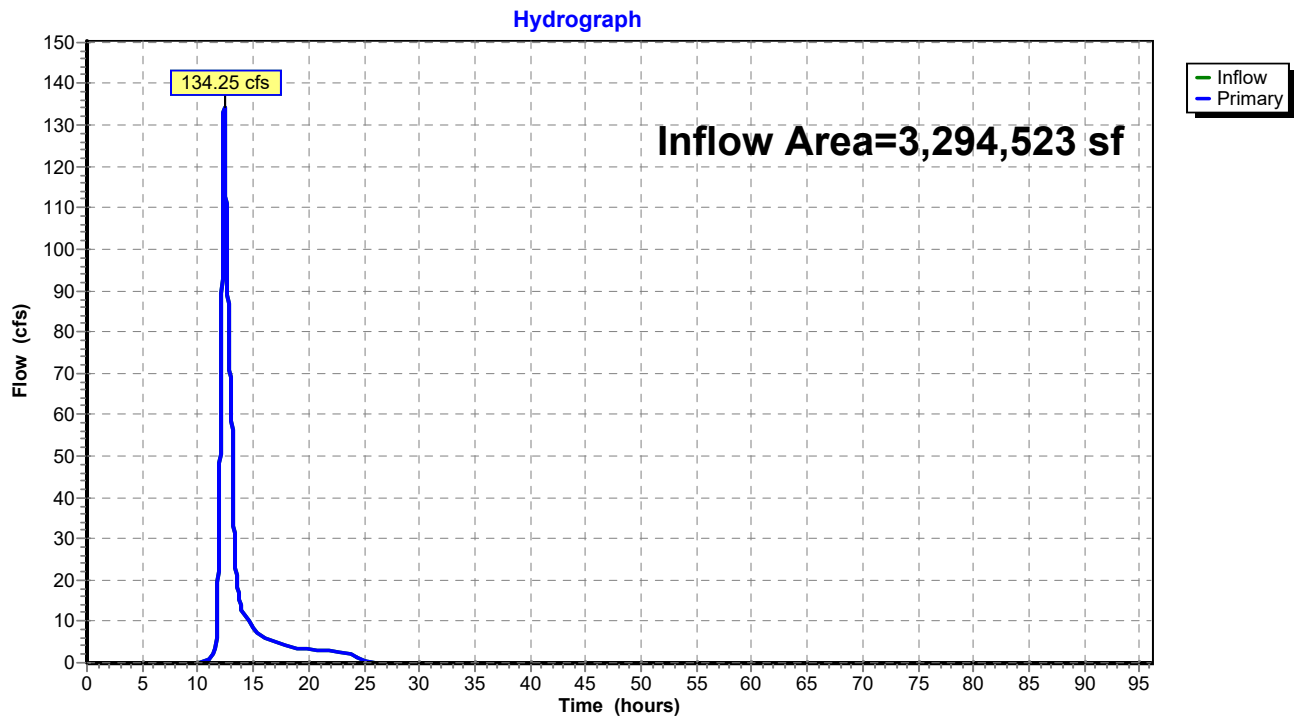
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Summary for Link 33: Design Point A

Inflow Area = 3,294,523 sf, 35.27% Impervious, Inflow Depth > 2.35" for 10-yr event
Inflow = 134.25 cfs @ 12.37 hrs, Volume= 644,474 cf
Primary = 134.25 cfs @ 12.37 hrs, Volume= 644,474 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 33: Design Point A



N60 P1 Post-A 2021

NRCC 24-hr A 25-yr Rainfall=6.46"

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment8: Post A0 Offsite Runoff Area=1,115,060 sf 57.87% Impervious Runoff Depth=5.29"
Flow Length=1,018' Tc=12.5 min CN=90 Runoff=154.93 cfs 491,989 cf

Pond 9: Offsite Pond A Peak Elev=364.35' Storage=158,428 cf Inflow=154.93 cfs 491,989 cf
Outflow=58.35 cfs 440,794 cf

Subcatchment10: Post A4 Runoff Area=164,583 sf 10.25% Impervious Runoff Depth=3.78"
Flow Length=340' Tc=20.5 min CN=76 Runoff=13.82 cfs 51,847 cf

Reach 11: Box Culvert Avg. Flow Depth=0.54' Max Vel=3.17 fps Inflow=13.82 cfs 51,847 cf
n=0.041 L=98.0' S=0.0204 ' Capacity=177.99 cfs Outflow=13.81 cfs 51,847 cf

Subcatchment12: Post A8 Runoff Area=392,732 sf 0.00% Impervious Runoff Depth=3.37"
Flow Length=320' Tc=21.4 min CN=72 Runoff=28.78 cfs 110,405 cf

Pond 12A: Existing Wetland A Peak Elev=323.68' Storage=4,610 cf Inflow=99.63 cfs 603,046 cf
96.0" x 36.0" Box Culvert n=0.040 L=116.0' S=0.0776 ' Outflow=99.29 cfs 603,046 cf

Subcatchment12B: Post A11 Runoff Area=722,164 sf 1.29% Impervious Runoff Depth=3.17"
Flow Length=475' Tc=19.8 min CN=70 Runoff=52.00 cfs 191,047 cf

Reach 13: Existing Stream A Avg. Flow Depth=1.80' Max Vel=10.86 fps Inflow=149.75 cfs 794,093 cf
n=0.040 L=1,360.0' S=0.0721 ' Capacity=601.12 cfs Outflow=148.67 cfs 794,093 cf

Subcatchment14: Post A3 Runoff Area=106,378 sf 85.91% Impervious Runoff Depth=5.87"
Tc=6.0 min CN=95 Runoff=19.66 cfs 52,025 cf

Pond 15: DIV-1 Peak Elev=326.21' Inflow=19.66 cfs 52,025 cf
Primary=5.12 cfs 37,059 cf Secondary=15.16 cfs 14,966 cf Outflow=19.66 cfs 52,025 cf

Pond 16: INF-1 Peak Elev=325.57' Storage=9,045 cf Inflow=5.12 cfs 37,059 cf
Outflow=1.18 cfs 37,059 cf

Subcatchment17: Post A5 Runoff Area=92,926 sf 100.00% Impervious Runoff Depth=6.22"
Tc=6.0 min CN=98 Runoff=17.45 cfs 48,177 cf

Pond 18: DIV-2 Peak Elev=364.63' Inflow=17.45 cfs 48,177 cf
Primary=5.59 cfs 36,468 cf Secondary=11.93 cfs 11,710 cf Outflow=17.45 cfs 48,177 cf

Pond 19: INF-2 Peak Elev=363.61' Storage=10,242 cf Inflow=5.59 cfs 36,468 cf
Outflow=0.99 cfs 36,468 cf

Reach 20: 36" HDPE Pipe Avg. Flow Depth=0.46' Max Vel=17.18 fps Inflow=11.93 cfs 11,710 cf
36.0" Round Pipe n=0.013 L=805.0' S=0.1205 ' Capacity=231.53 cfs Outflow=11.80 cfs 11,710 cf

Subcatchment21: A6 Runoff Area=384,686 sf 86.44% Impervious Runoff Depth=5.99"
Tc=6.0 min CN=96 Runoff=71.57 cfs 191,880 cf

N60 P1 Post-A 2021

NRCC 24-hr A 25-yr Rainfall=6.46"

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Subcatchment22: A7Runoff Area=103,728 sf 0.00% Impervious Runoff Depth=2.98"
Tc=6.0 min CN=68 Runoff=11.18 cfs 25,749 cf**Pond 23: Infiltration Basin (SWP-3)**Peak Elev=261.16' Storage=71,002 cf Inflow=94.39 cfs 229,338 cf
Discarded=6.37 cfs 168,985 cf Primary=45.36 cfs 60,353 cf Outflow=51.73 cfs 229,338 cf**Subcatchment24: A9**Runoff Area=33,825 sf 87.77% Impervious Runoff Depth=5.87"
Tc=6.0 min CN=95 Runoff=6.25 cfs 16,542 cf**Pond 25: DIV-4**Peak Elev=349.51' Inflow=6.25 cfs 16,542 cf
Primary=5.04 cfs 14,873 cf Secondary=1.74 cfs 1,669 cf Outflow=6.25 cfs 16,542 cf**Pond 26: INF-4**Peak Elev=349.44' Storage=5,001 cf Inflow=5.04 cfs 14,873 cf
Outflow=0.52 cfs 14,873 cf**Subcatchment27: A10**Runoff Area=147,528 sf 61.97% Impervious Runoff Depth=5.18"
Tc=6.0 min CN=89 Runoff=25.59 cfs 63,707 cf**Subcatchment28: A10**Runoff Area=10,748 sf 95.65% Impervious Runoff Depth=6.10"
Tc=6.0 min CN=97 Runoff=2.01 cfs 5,466 cf**Pond 29: Infiltration Basin (SWP-2)**Peak Elev=318.42' Storage=27,123 cf Inflow=27.60 cfs 69,173 cf
Discarded=2.93 cfs 61,615 cf Primary=1.22 cfs 7,558 cf Outflow=4.16 cfs 69,173 cf**Subcatchment30: Post A2**Runoff Area=231,706 sf 20.73% Impervious Runoff Depth=3.88"
Flow Length=817' Tc=17.7 min CN=77 Runoff=21.45 cfs 74,991 cf**Pond 31: Pocket Wetland (SWP-1)**Peak Elev=236.73' Storage=33,529 cf Inflow=21.45 cfs 74,991 cf
Outflow=11.98 cfs 67,044 cf**Subcatchment32: Post A1**Runoff Area=21,588 sf 37.76% Impervious Runoff Depth=4.41"
Tc=6.0 min CN=82 Runoff=3.33 cfs 7,938 cf**Link 33: Design Point A**Inflow=197.52 cfs 953,621 cf
Primary=197.52 cfs 953,621 cf**Total Runoff Area = 3,527,652 sf Runoff Volume = 1,331,763 cf Average Runoff Depth = 4.53"**
61.00% Pervious = 2,151,703 sf 39.00% Impervious = 1,375,949 sf

N60 P1 Post-A 2021

NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Subcatchment 8: Post A0 Offsite

Runoff = 154.93 cfs @ 12.20 hrs, Volume= 491,989 cf, Depth= 5.29"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 25-yr Rainfall=6.46"

Area (sf)	CN	Description
645,334	98	Paved parking, HSG C
443,611	80	>75% Grass cover, Good, HSG D
23,572	74	>75% Grass cover, Good, HSG C
2,543	61	>75% Grass cover, Good, HSG B
1,115,060	90	Weighted Average
469,726		42.13% Pervious Area
645,334		57.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0150	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.6	148	0.0574	3.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	30	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	740	0.0270	10.25	32.22	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Concrete sewer w/manholes & inlets
12.5	1,018	Total			

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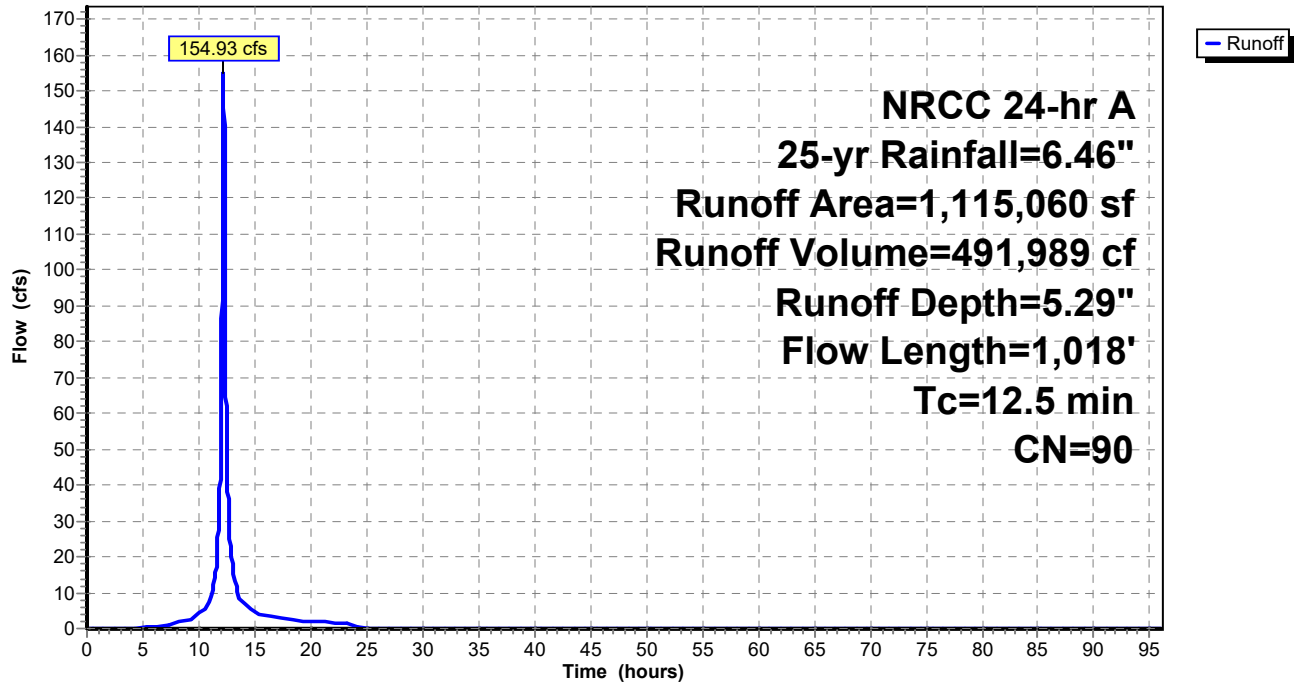
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Subcatchment 8: Post A0 Offsite

Hydrograph



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NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Pond 9: Offsite Pond A

Inflow Area = 1,115,060 sf, 57.87% Impervious, Inflow Depth = 5.29" for 25-yr event
 Inflow = 154.93 cfs @ 12.20 hrs, Volume= 491,989 cf
 Outflow = 58.35 cfs @ 12.45 hrs, Volume= 440,794 cf, Atten= 62%, Lag= 14.8 min
 Primary = 58.35 cfs @ 12.45 hrs, Volume= 440,794 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 364.35' @ 12.45 hrs Surf.Area= 31,319 sf Storage= 158,428 cf

Plug-Flow detention time= 90.4 min calculated for 440,794 cf (90% of inflow)
 Center-of-Mass det. time= 42.1 min (826.5 - 784.4)

Volume	Invert	Avail.Storage	Storage Description
#1	357.00'	221,816 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
357.00	14,633	679.0	0	0	14,633
358.00	16,652	698.0	15,632	15,632	16,826
359.00	17,534	715.0	17,091	32,723	18,864
360.00	19,427	745.0	18,472	51,195	22,425
362.00	24,453	804.0	43,784	94,979	29,861
364.00	28,701	854.0	53,097	148,076	36,663
365.00	36,602	901.0	32,572	180,648	43,285
366.00	45,910	1,262.0	41,168	221,816	105,432

Device	Routing	Invert	Outlet Devices
#1	Primary	357.00'	30.0" Round Culvert L= 125.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 357.00' / 351.00' S= 0.0480 ' S= 0.0480 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf
#2	Device 1	360.00'	36.0" x 48.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Primary	364.75'	150.0' long x 36.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=58.35 cfs @ 12.45 hrs HW=364.34' TW=323.59' (Dynamic Tailwater)

1=Culvert (Inlet Controls 58.35 cfs @ 11.89 fps)
 2=Orifice/Grate (Passes 58.35 cfs of 240.87 cfs potential flow)
 3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

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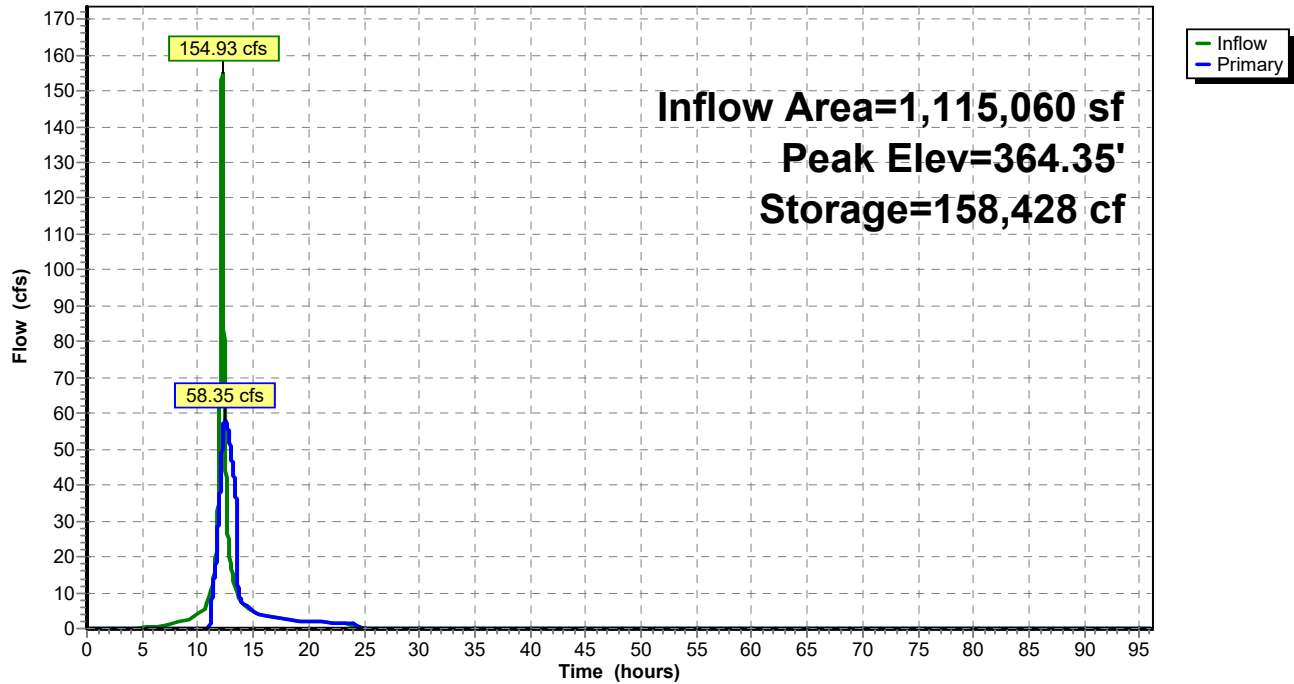
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NRCC 24-hr A 25-yr Rainfall=6.46"

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Pond 9: Offsite Pond A

Hydrograph



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Summary for Subcatchment 10: Post A4

Runoff = 13.82 cfs @ 12.30 hrs, Volume= 51,847 cf, Depth= 3.78"

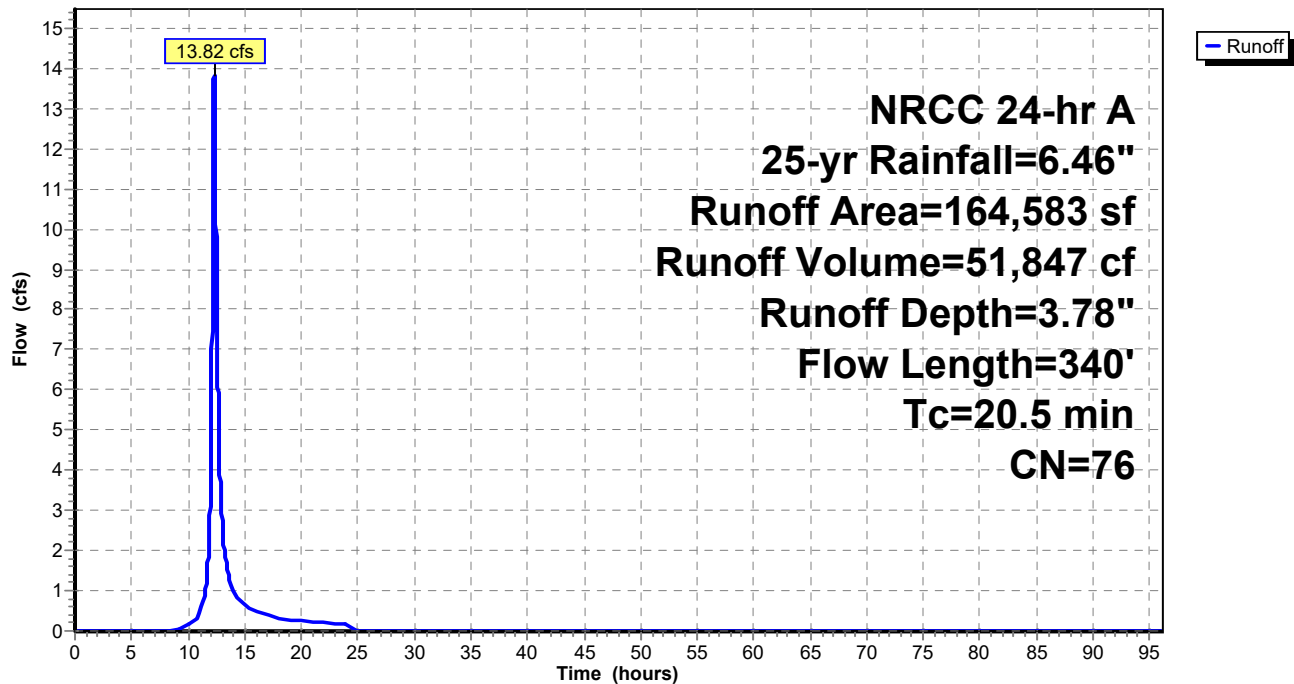
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 25-yr Rainfall=6.46"

Area (sf)	CN	Description
15,990	74	>75% Grass cover, Good, HSG C
65,271	70	Woods, Good, HSG C
66,457	77	Woods, Good, HSG D
16,865	98	Water Surface, HSG D
164,583	76	Weighted Average
147,718		89.75% Pervious Area
16,865		10.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0250	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.7	240	0.0208	2.32		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
20.5	340	Total			

Subcatchment 10: Post A4

Hydrograph



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Summary for Reach 11: Box Culvert

Inflow Area = 164,583 sf, 10.25% Impervious, Inflow Depth = 3.78" for 25-yr event
Inflow = 13.82 cfs @ 12.30 hrs, Volume= 51,847 cf
Outflow = 13.81 cfs @ 12.31 hrs, Volume= 51,847 cf, Atten= 0%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.17 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.87 fps, Avg. Travel Time= 1.9 min

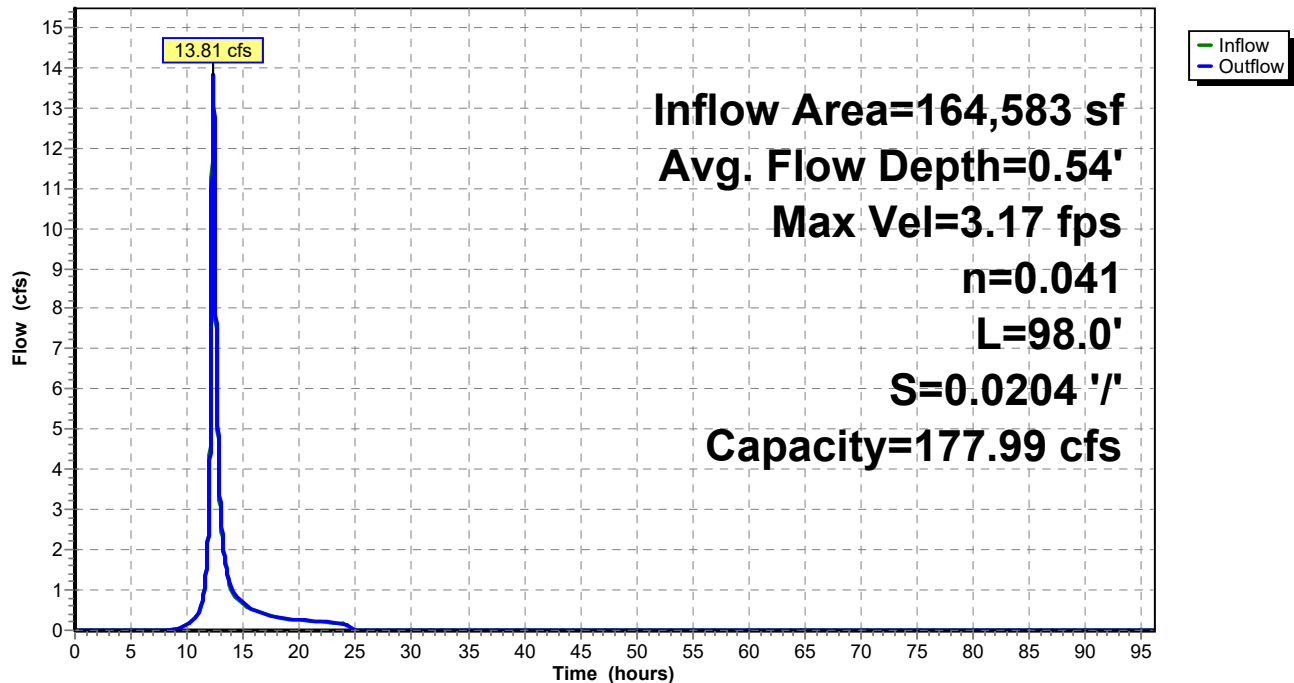
Peak Storage= 427 cf @ 12.31 hrs
Average Depth at Peak Storage= 0.54'
Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 177.99 cfs

8.00' x 3.00' deep channel, n= 0.041 Riprap, 2-inch
Length= 98.0' Slope= 0.0204 '/'
Inlet Invert= 349.00', Outlet Invert= 347.00'



Reach 11: Box Culvert

Hydrograph



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NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Subcatchment 12: Post A8

Runoff = 28.78 cfs @ 12.32 hrs, Volume= 110,405 cf, Depth= 3.37"

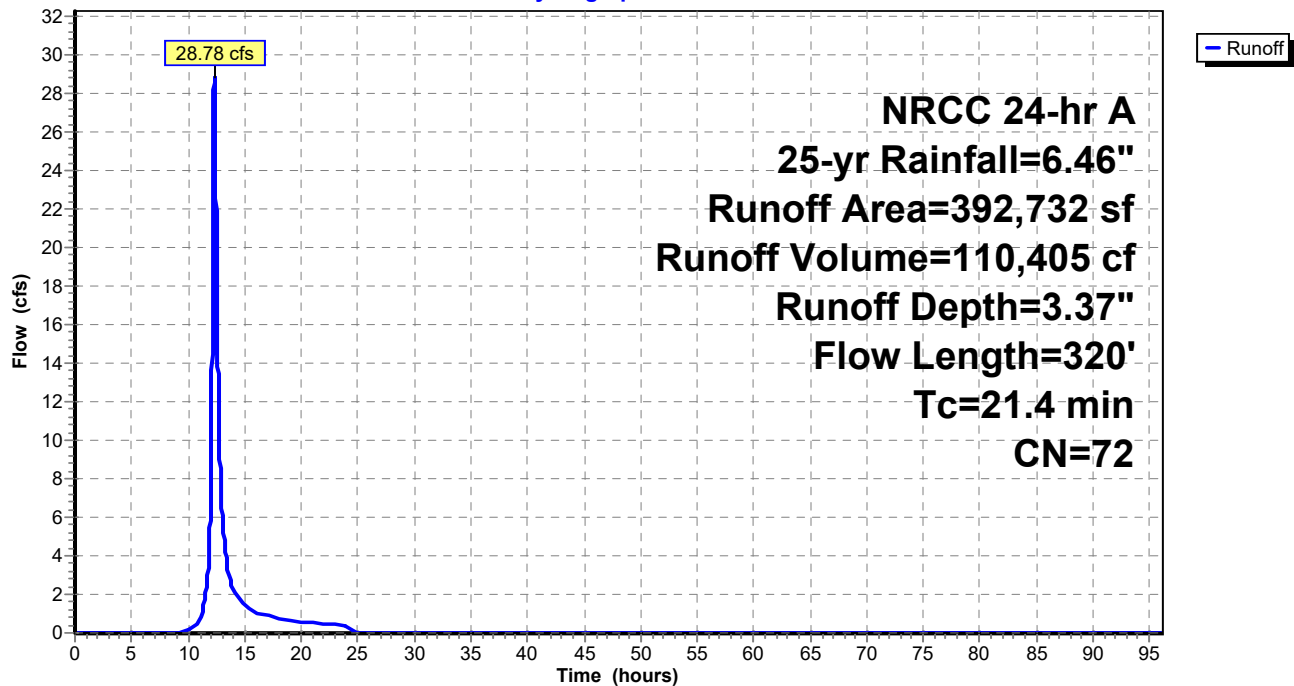
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 25-yr Rainfall=6.46"

Area (sf)	CN	Description
278,057	70	Woods, Good, HSG C
108,143	77	Woods, Good, HSG D
6,532	74	>75% Grass cover, Good, HSG C
392,732	72	Weighted Average
392,732		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
0.9	220	0.0636	4.06		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
21.4	320	Total			

Subcatchment 12: Post A8

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Pond 12A: Existing Wetland A

Inflow Area = 1,672,375 sf, 39.60% Impervious, Inflow Depth = 4.33" for 25-yr event
 Inflow = 99.63 cfs @ 12.33 hrs, Volume= 603,046 cf
 Outflow = 99.29 cfs @ 12.35 hrs, Volume= 603,046 cf, Atten= 0%, Lag= 1.1 min
 Primary = 99.29 cfs @ 12.35 hrs, Volume= 603,046 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 323.68' @ 12.35 hrs Surf.Area= 4,109 sf Storage= 4,610 cf

Plug-Flow detention time= 0.5 min calculated for 602,983 cf (100% of inflow)
 Center-of-Mass det. time= 0.5 min (828.2 - 827.6)

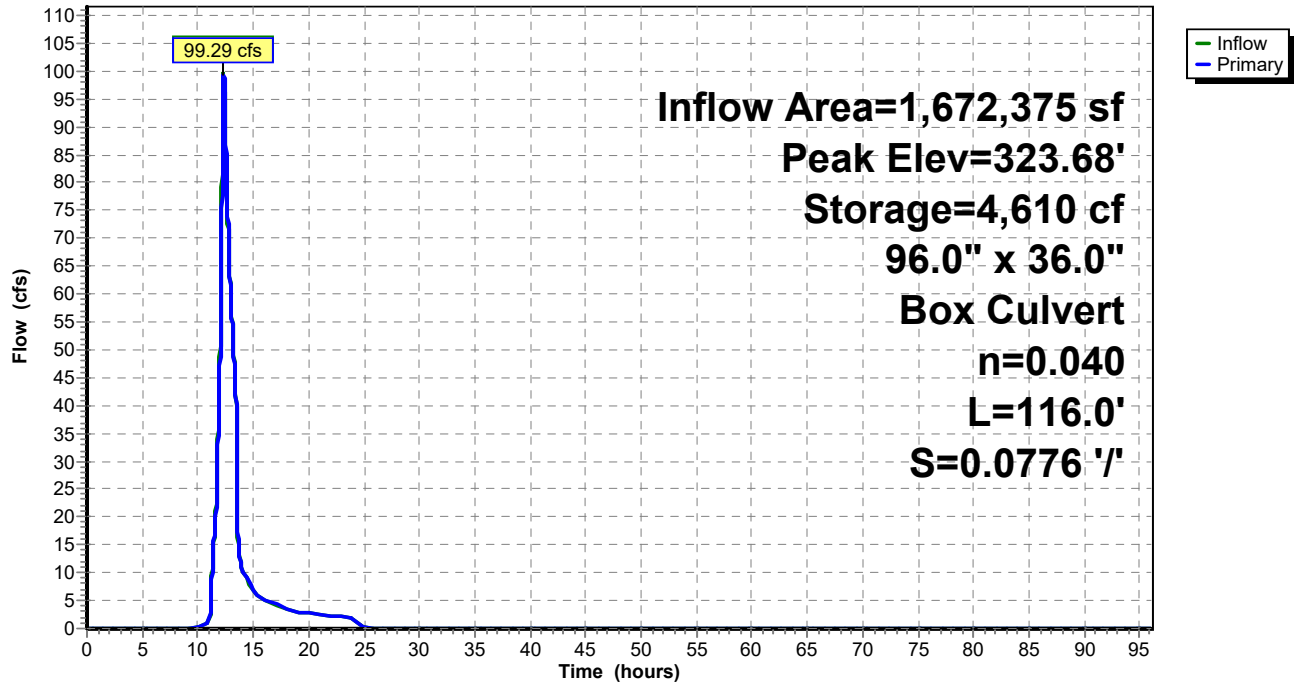
Volume	Invert	Avail.Storage	Storage Description		
#1	321.00'	190,307 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
321.00	124	53.2	0	0	124
322.00	1,084	175.8	525	525	2,361
324.00	4,913	341.5	5,536	6,061	9,202
326.00	11,332	638.2	15,804	21,866	32,354
328.00	20,583	804.3	31,458	53,324	51,475
330.00	34,086	1,075.5	54,104	107,428	92,087
332.00	49,257	1,268.5	82,879	190,307	128,164

Device	Routing	Invert	Outlet Devices
#1	Primary	321.00'	96.0" W x 36.0" H Box Culvert L= 116.0' Box, 0° wingwalls, square crown edge, Ke= 0.700 Inlet / Outlet Invert= 321.00' / 312.00' S= 0.0776 '/' Cc= 0.900 n= 0.040 Earth, cobble bottom, clean sides, Flow Area= 24.00 sf

Primary OutFlow Max=99.28 cfs @ 12.35 hrs HW=323.68' TW=313.80' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 99.28 cfs @ 4.63 fps)

Pond 12A: Existing Wetland A

Hydrograph



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Summary for Subcatchment 12B: Post A11

Runoff = 52.00 cfs @ 12.30 hrs, Volume= 191,047 cf, Depth= 3.17"

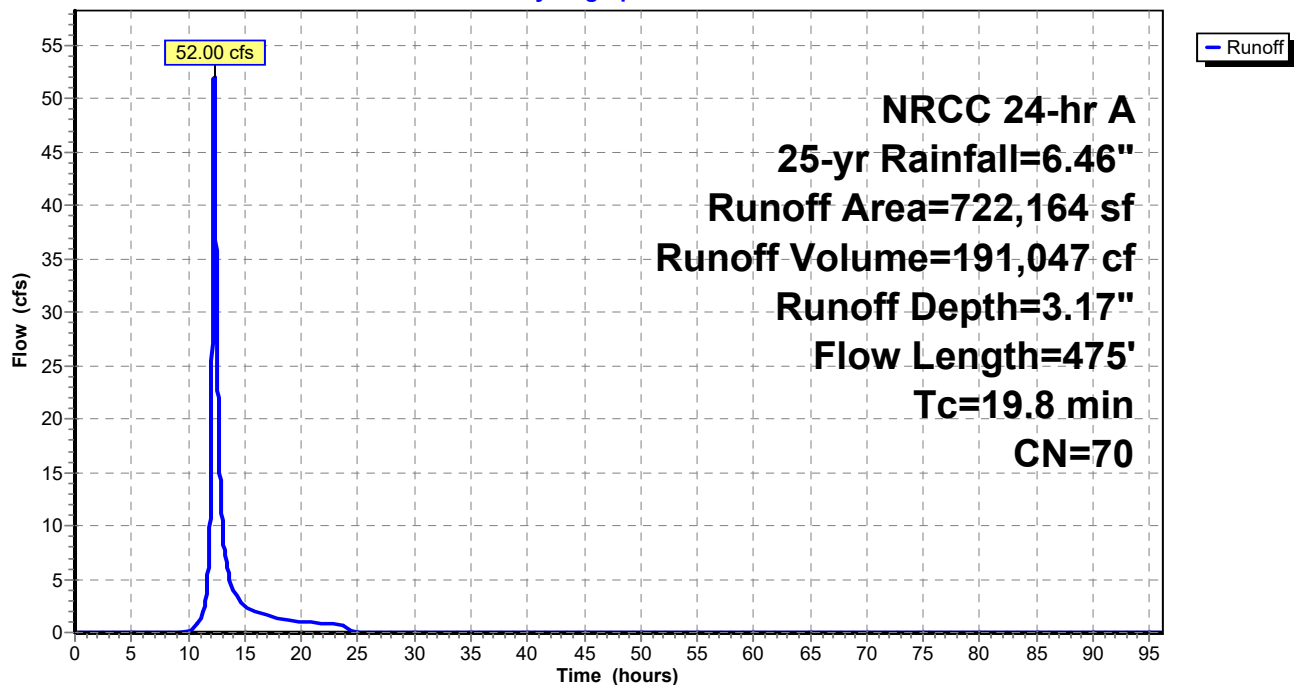
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 25-yr Rainfall=6.46"

Area (sf)	CN	Description
17,361	55	Woods, Good, HSG B
681,082	70	Woods, Good, HSG C
11,683	77	Woods, Good, HSG D
9,345	98	Paved parking, HSG C
2,693	74	>75% Grass cover, Good, HSG C
722,164	70	Weighted Average
712,819		98.71% Pervious Area
9,345		1.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0250	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.0	375	0.1400	6.02		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
19.8	475	Total			

Subcatchment 12B: Post A11

Hydrograph



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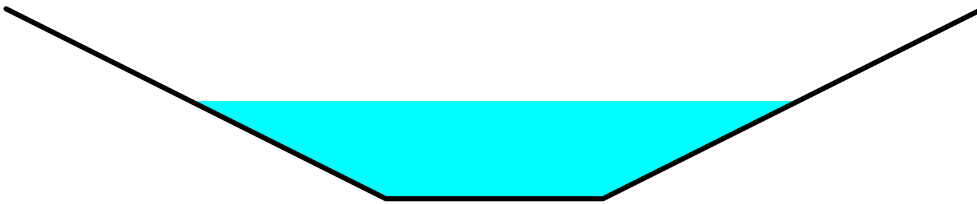
Summary for Reach 13: Existing Stream A (Lower Segment)

Inflow Area = 2,394,539 sf, 28.04% Impervious, Inflow Depth = 3.98" for 25-yr event
Inflow = 149.75 cfs @ 12.32 hrs, Volume= 794,093 cf
Outflow = 148.67 cfs @ 12.35 hrs, Volume= 794,093 cf, Atten= 1%, Lag= 1.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.86 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 2.89 fps, Avg. Travel Time= 7.8 min

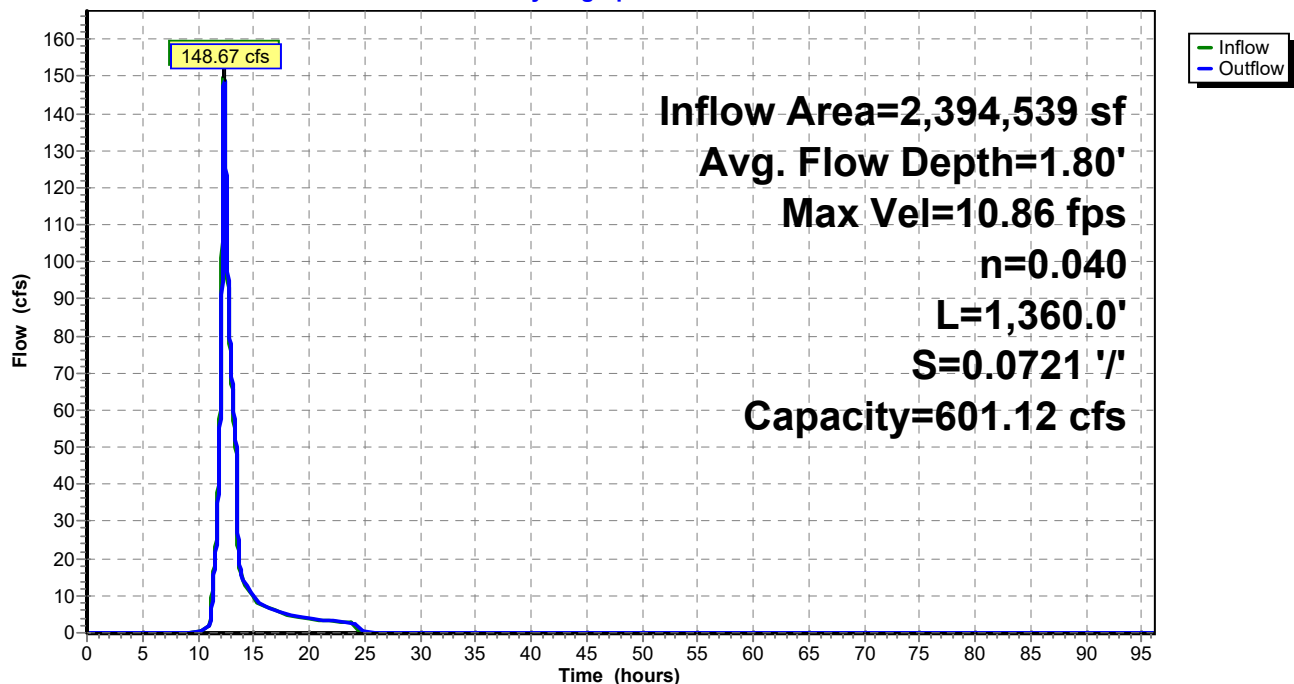
Peak Storage= 18,623 cf @ 12.35 hrs
Average Depth at Peak Storage= 1.80'
Bank-Full Depth= 3.50' Flow Area= 38.5 sf, Capacity= 601.12 cfs

4.00' x 3.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 1,360.0' Slope= 0.0721 '/'
Inlet Invert= 312.00', Outlet Invert= 214.00'



Reach 13: Existing Stream A (Lower Segment)

Hydrograph



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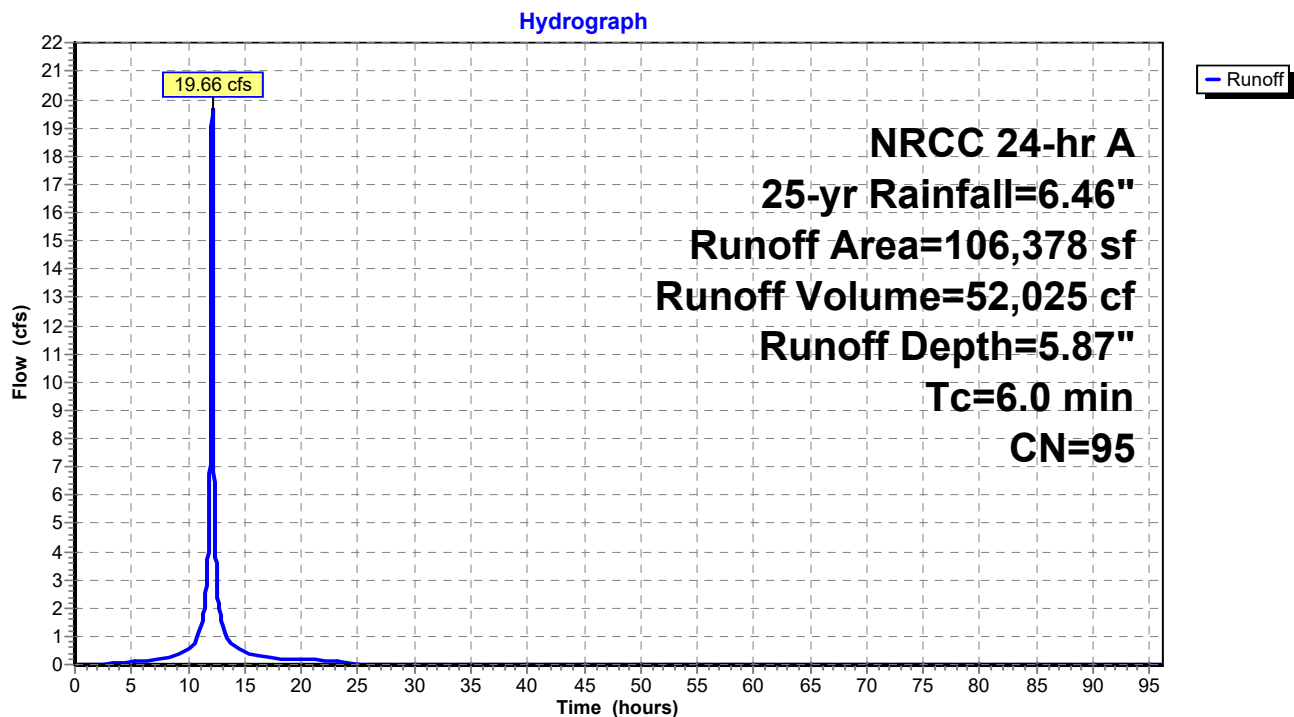
Summary for Subcatchment 14: Post A3

Runoff = 19.66 cfs @ 12.13 hrs, Volume= 52,025 cf, Depth= 5.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 25-yr Rainfall=6.46"

Area (sf)	CN	Description
91,392	98	Paved parking, HSG C
14,986	74	>75% Grass cover, Good, HSG C
106,378	95	Weighted Average
14,986		14.09% Pervious Area
91,392		85.91% Impervious Area

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

Subcatchment 14: Post A3

N60 P1 Post-A 2021

NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Pond 15: DIV-1

Inflow Area = 106,378 sf, 85.91% Impervious, Inflow Depth = 5.87" for 25-yr event
 Inflow = 19.66 cfs @ 12.13 hrs, Volume= 52,025 cf
 Outflow = 19.66 cfs @ 12.13 hrs, Volume= 52,025 cf, Atten= 0%, Lag= 0.0 min
 Primary = 5.12 cfs @ 11.86 hrs, Volume= 37,059 cf
 Secondary = 15.16 cfs @ 12.13 hrs, Volume= 14,966 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

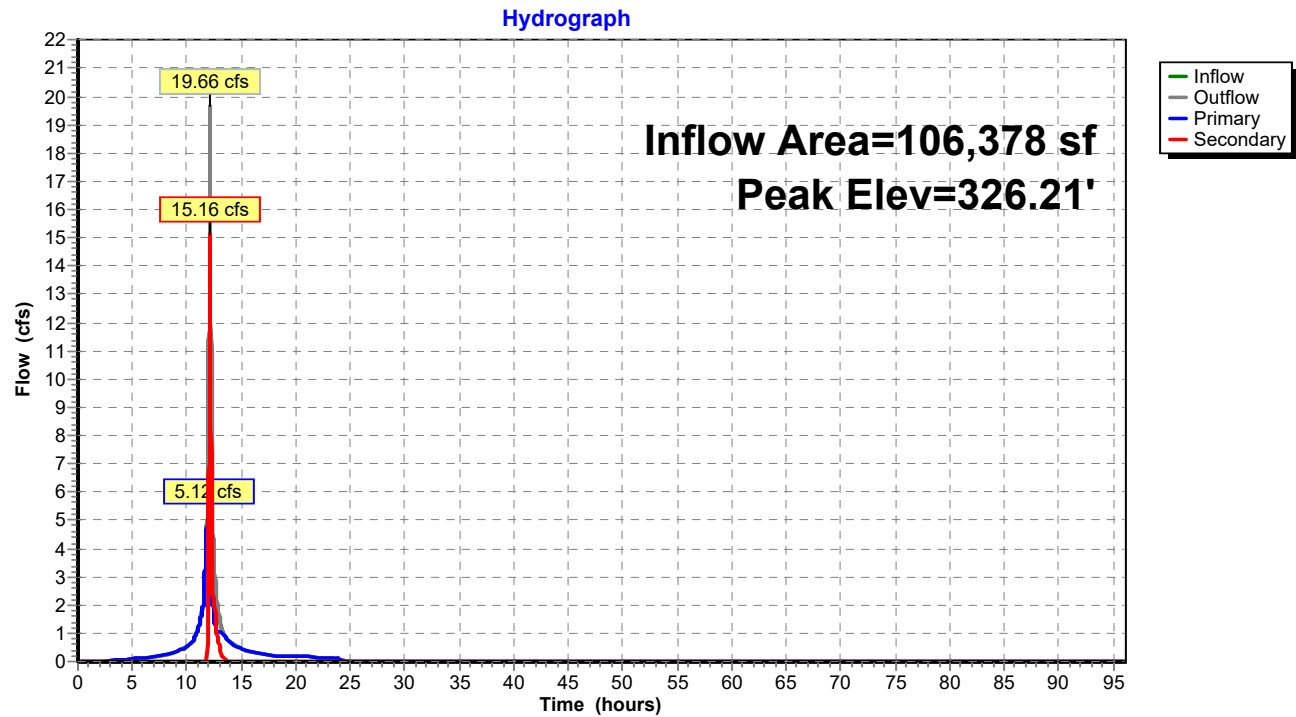
Peak Elev= 326.21' @ 12.13 hrs

Flood Elev= 328.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	323.00'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 323.00' / 323.00' S= 0.0000 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	323.00'	24.0" Round Culvert L= 51.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 323.00' / 320.00' S= 0.0588 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	325.50'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=5.05 cfs @ 11.86 hrs HW=325.55' TW=323.76' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 5.05 cfs @ 6.43 fps)**Secondary OutFlow** Max=15.15 cfs @ 12.13 hrs HW=326.21' TW=0.00' (Dynamic Tailwater)↑ **2=Culvert** (Passes 15.15 cfs of 22.46 cfs potential flow)↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 15.15 cfs @ 2.68 fps)

Pond 15: DIV-1



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NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Pond 16: INF-1

Inflow Area = 106,378 sf, 85.91% Impervious, Inflow Depth = 4.18" for 25-yr event
 Inflow = 5.12 cfs @ 11.86 hrs, Volume= 37,059 cf
 Outflow = 1.18 cfs @ 11.20 hrs, Volume= 37,059 cf, Atten= 77%, Lag= 0.0 min
 Discarded = 1.18 cfs @ 11.20 hrs, Volume= 37,059 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 325.57' @ 12.59 hrs Surf.Area= 4,245 sf Storage= 9,045 cf

Plug-Flow detention time= 48.8 min calculated for 37,055 cf (100% of inflow)
 Center-of-Mass det. time= 48.8 min (819.4 - 770.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	322.50'	4,688 cf	36.75'W x 115.50'L x 4.33'H Field A 18,393 cf Overall - 6,674 cf Embedded = 11,720 cf x 40.0% Voids
#2A	323.00'	6,674 cf	Cultec R-360HD x 180 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 180 Chambers in 6 Rows Cap Storage= +6.5 cf x 2 x 6 rows = 77.5 cf
		11,361 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	322.50'	12.000 in/hr Exfiltration over Horizontal area Phase-In= 0.01'

Discarded OutFlow Max=1.18 cfs @ 11.20 hrs HW=322.55' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 1.18 cfs)

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Pond 16: INF-1 - Chamber Wizard Field A

Chamber Model = Cultec R-360HD (Cultec Recharger® 360HD)

Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf

Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap

Cap Storage= +6.5 cf x 2 x 6 rows = 77.5 cf

60.0" Wide + 9.0" Spacing = 69.0" C-C Row Spacing

30 Chambers/Row x 3.67' Long + 1.25' Cap Length x 2 = 112.50' Row Length + 18.0" End Stone x 2 = 115.50' Base Length

6 Rows x 60.0" Wide + 9.0" Spacing x 5 + 18.0" Side Stone x 2 = 36.75' Base Width

6.0" Base + 36.0" Chamber Height + 10.0" Cover = 4.33' Field Height

180 Chambers x 36.6 cf + 6.5 cf Cap Volume x 2 x 6 Rows = 6,673.6 cf Chamber Storage

18,393.4 cf Field - 6,673.6 cf Chambers = 11,719.8 cf Stone x 40.0% Voids = 4,687.9 cf Stone Storage

Chamber Storage + Stone Storage = 11,361.5 cf = 0.261 af

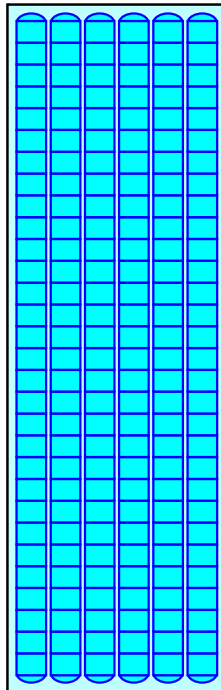
Overall Storage Efficiency = 61.8%

Overall System Size = 115.50' x 36.75' x 4.33'

180 Chambers

681.2 cy Field

434.1 cy Stone



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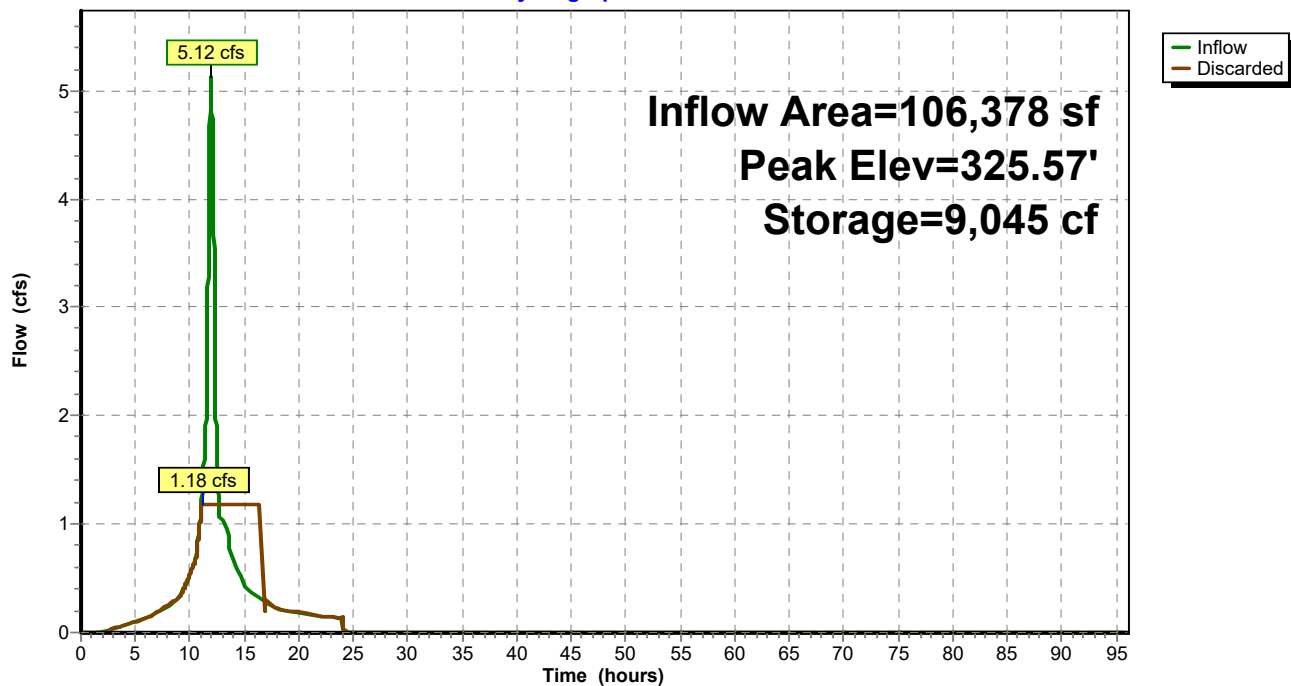
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Pond 16: INF-1

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Summary for Subcatchment 17: Post A5

Runoff = 17.45 cfs @ 12.13 hrs, Volume= 48,177 cf, Depth= 6.22"

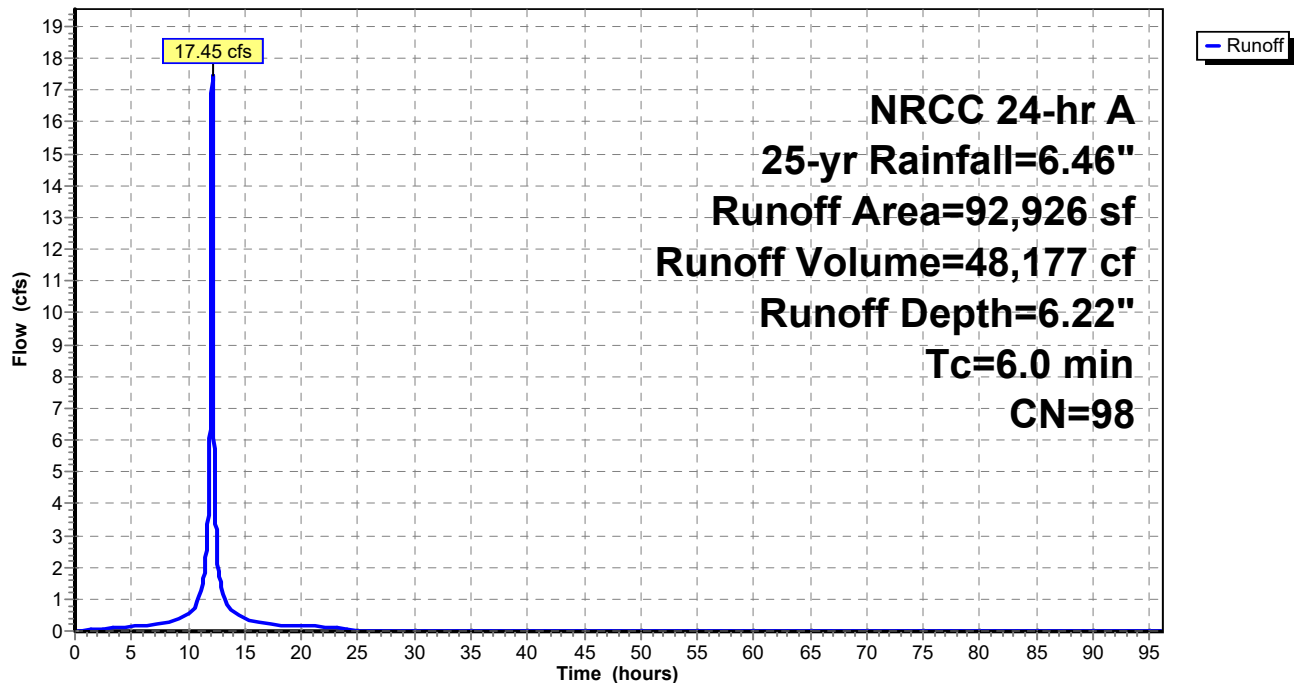
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 25-yr Rainfall=6.46"

Area (sf)	CN	Description
92,926	98	Roofs, HSG C
92,926		100.00% Impervious Area

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

Subcatchment 17: Post A5

Hydrograph



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NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Pond 18: DIV-2

Inflow Area = 92,926 sf, 100.00% Impervious, Inflow Depth = 6.22" for 25-yr event
 Inflow = 17.45 cfs @ 12.13 hrs, Volume= 48,177 cf
 Outflow = 17.45 cfs @ 12.13 hrs, Volume= 48,177 cf, Atten= 0%, Lag= 0.0 min
 Primary = 5.59 cfs @ 12.11 hrs, Volume= 36,468 cf
 Secondary = 11.93 cfs @ 12.13 hrs, Volume= 11,710 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 364.63' @ 12.13 hrs

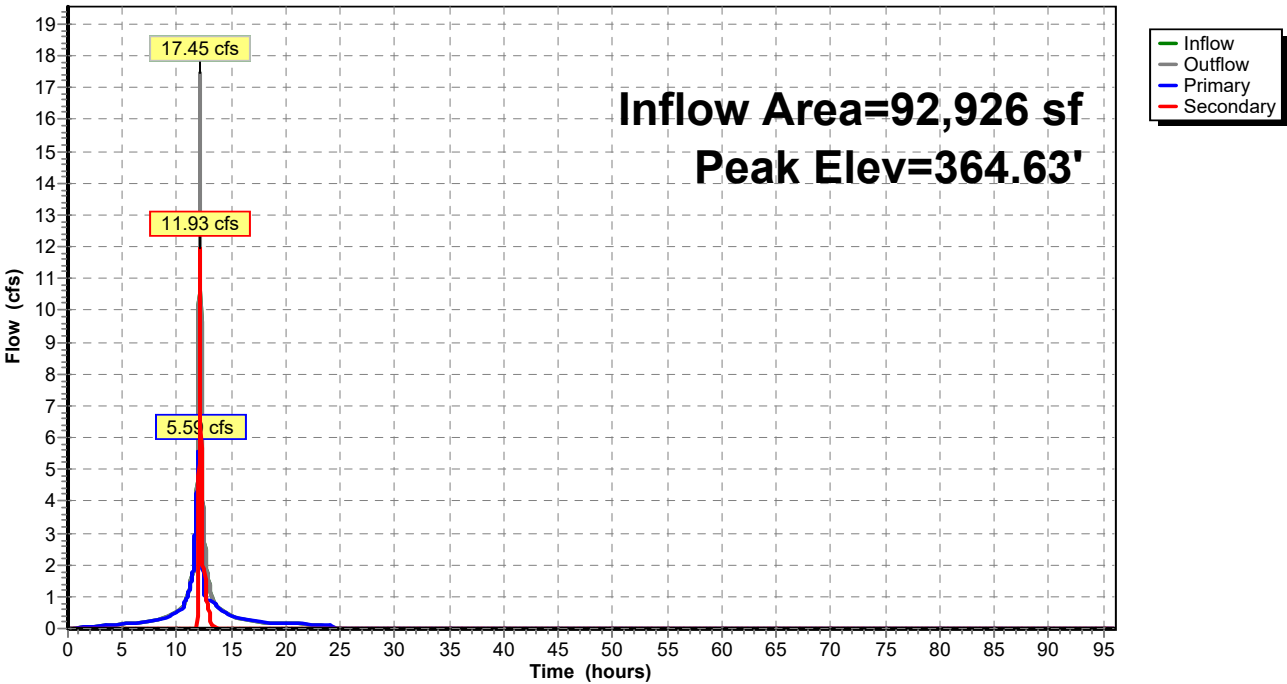
Flood Elev= 371.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	360.50'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 360.50' / 360.50' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	363.00'	24.0" Round Culvert L= 550.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 363.00' / 355.00' S= 0.0145 ' S= 0.0145 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	363.50'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=5.51 cfs @ 12.11 hrs HW=364.56' TW=362.44' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 5.51 cfs @ 7.02 fps)**Secondary OutFlow** Max=11.92 cfs @ 12.13 hrs HW=364.63' TW=355.46' (Dynamic Tailwater)↑ **2=Culvert** (Inlet Controls 11.92 cfs @ 4.35 fps)↑ **3=Broad-Crested Rectangular Weir** (Passes 11.92 cfs of 31.91 cfs potential flow)

Pond 18: DIV-2

Hydrograph



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NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Pond 19: INF-2

Inflow Area = 92,926 sf, 100.00% Impervious, Inflow Depth = 4.71" for 25-yr event
 Inflow = 5.59 cfs @ 12.11 hrs, Volume= 36,468 cf
 Outflow = 0.99 cfs @ 11.13 hrs, Volume= 36,468 cf, Atten= 82%, Lag= 0.0 min
 Discarded = 0.99 cfs @ 11.13 hrs, Volume= 36,468 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 363.61' @ 12.57 hrs Surf.Area= 4,285 sf Storage= 10,242 cf

Plug-Flow detention time= 66.4 min calculated for 36,464 cf (100% of inflow)
 Center-of-Mass det. time= 66.4 min (812.6 - 746.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	360.00'	4,724 cf	42.50'W x 100.83'L x 4.33'H Field A 18,570 cf Overall - 6,760 cf Embedded = 11,810 cf x 40.0% Voids
#2A	360.50'	6,760 cf	Cultec R-360HD x 182 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 182 Chambers in 7 Rows Cap Storage= +6.5 cf x 2 x 7 rows = 90.4 cf
		11,484 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	360.00'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.01'

Discarded OutFlow Max=0.99 cfs @ 11.13 hrs HW=360.05' (Free Discharge)
 ↑ **1=Exfiltration** (Exfiltration Controls 0.99 cfs)

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Pond 19: INF-2 - Chamber Wizard Field A

Chamber Model = Cultec R-360HD (Cultec Recharger® 360HD)

Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf

Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap

Cap Storage= +6.5 cf x 2 x 7 rows = 90.4 cf

60.0" Wide + 9.0" Spacing = 69.0" C-C Row Spacing

26 Chambers/Row x 3.67' Long +1.25' Cap Length x 2 = 97.83' Row Length +18.0" End Stone x 2 = 100.83' Base Length

7 Rows x 60.0" Wide + 9.0" Spacing x 6 + 18.0" Side Stone x 2 = 42.50' Base Width

6.0" Base + 36.0" Chamber Height + 10.0" Cover = 4.33' Field Height

182 Chambers x 36.6 cf + 6.5 cf Cap Volume x 2 x 7 Rows = 6,759.8 cf Chamber Storage

18,570.1 cf Field - 6,759.8 cf Chambers = 11,810.4 cf Stone x 40.0% Voids = 4,724.1 cf Stone Storage

Chamber Storage + Stone Storage = 11,483.9 cf = 0.264 af

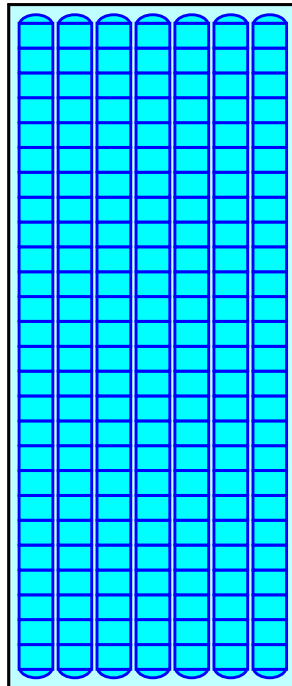
Overall Storage Efficiency = 61.8%

Overall System Size = 100.83' x 42.50' x 4.33'

182 Chambers

687.8 cy Field

437.4 cy Stone



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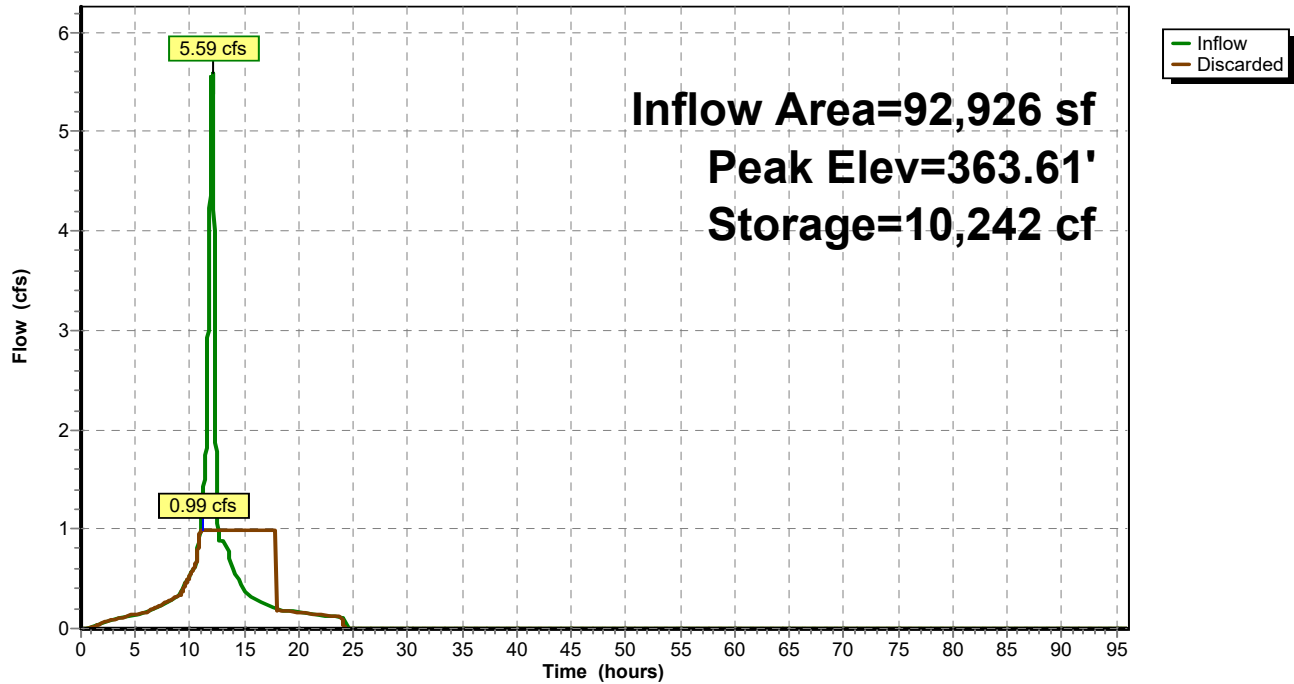
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Pond 19: INF-2

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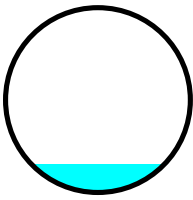
Summary for Reach 20: 36" HDPE Pipe

Inflow = 11.93 cfs @ 12.13 hrs, Volume= 11,710 cf
Outflow = 11.80 cfs @ 12.14 hrs, Volume= 11,710 cf, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 17.18 fps, Min. Travel Time= 0.8 min
Avg. Velocity = 7.65 fps, Avg. Travel Time= 1.8 min

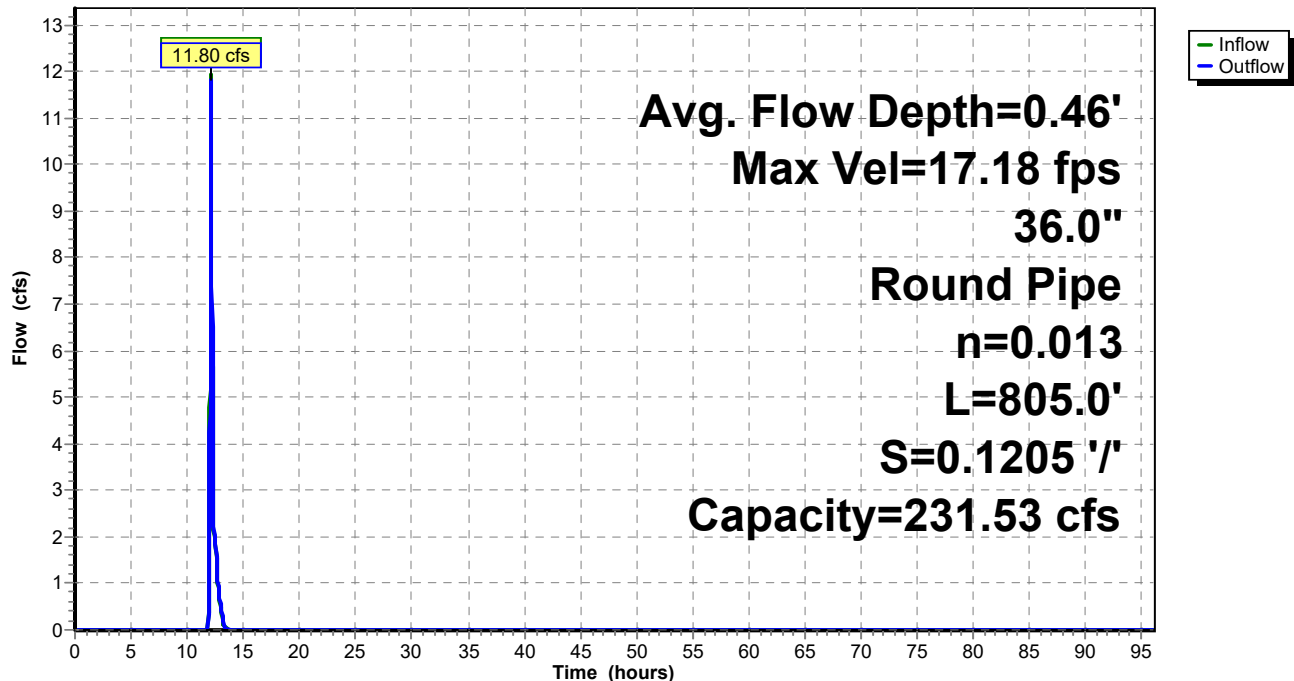
Peak Storage= 553 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.46'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 231.53 cfs

36.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 805.0' Slope= 0.1205 '/
Inlet Invert= 355.00', Outlet Invert= 258.00'



Reach 20: 36" HDPE Pipe

Hydrograph



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NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Subcatchment 21: A6

Runoff = 71.57 cfs @ 12.13 hrs, Volume= 191,880 cf, Depth= 5.99"

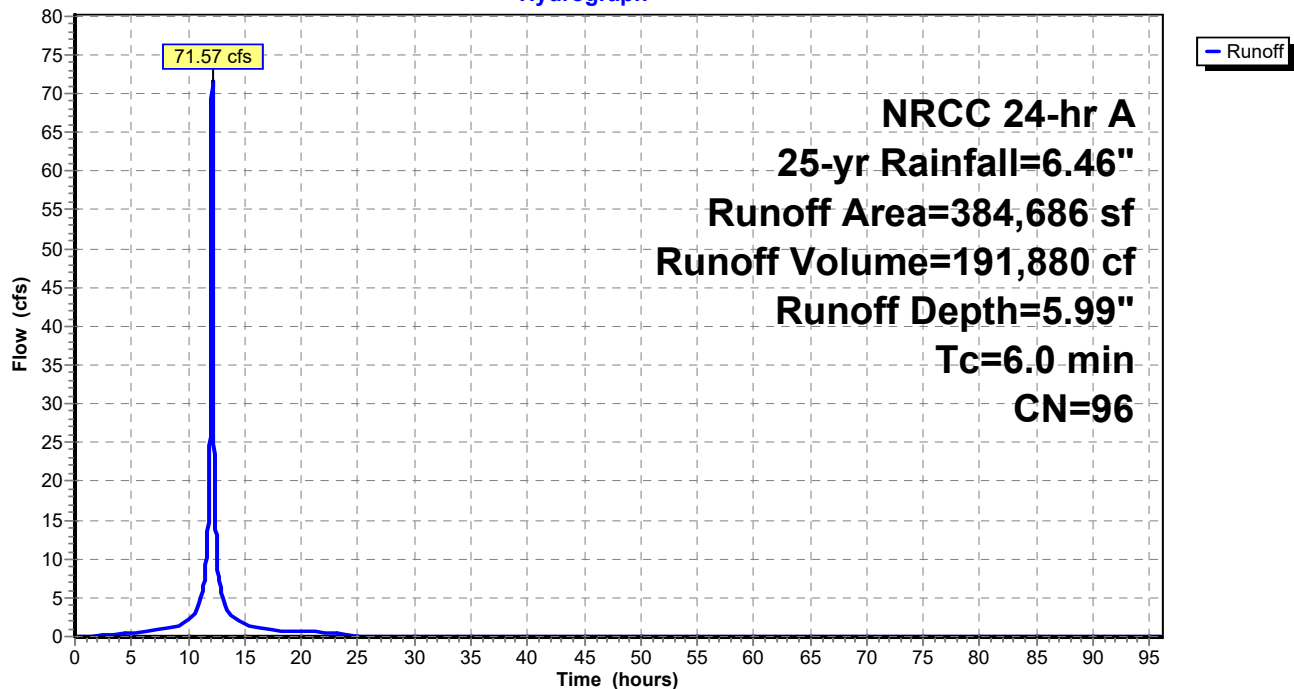
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 25-yr Rainfall=6.46"

Area (sf)	CN	Description
332,512	98	Paved parking, HSG C
52,174	86	<50% Grass cover, Poor, HSG C
384,686	96	Weighted Average
52,174		13.56% Pervious Area
332,512		86.44% Impervious Area

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

Subcatchment 21: A6

Hydrograph



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NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Subcatchment 22: A7

Runoff = 11.18 cfs @ 12.13 hrs, Volume= 25,749 cf, Depth= 2.98"

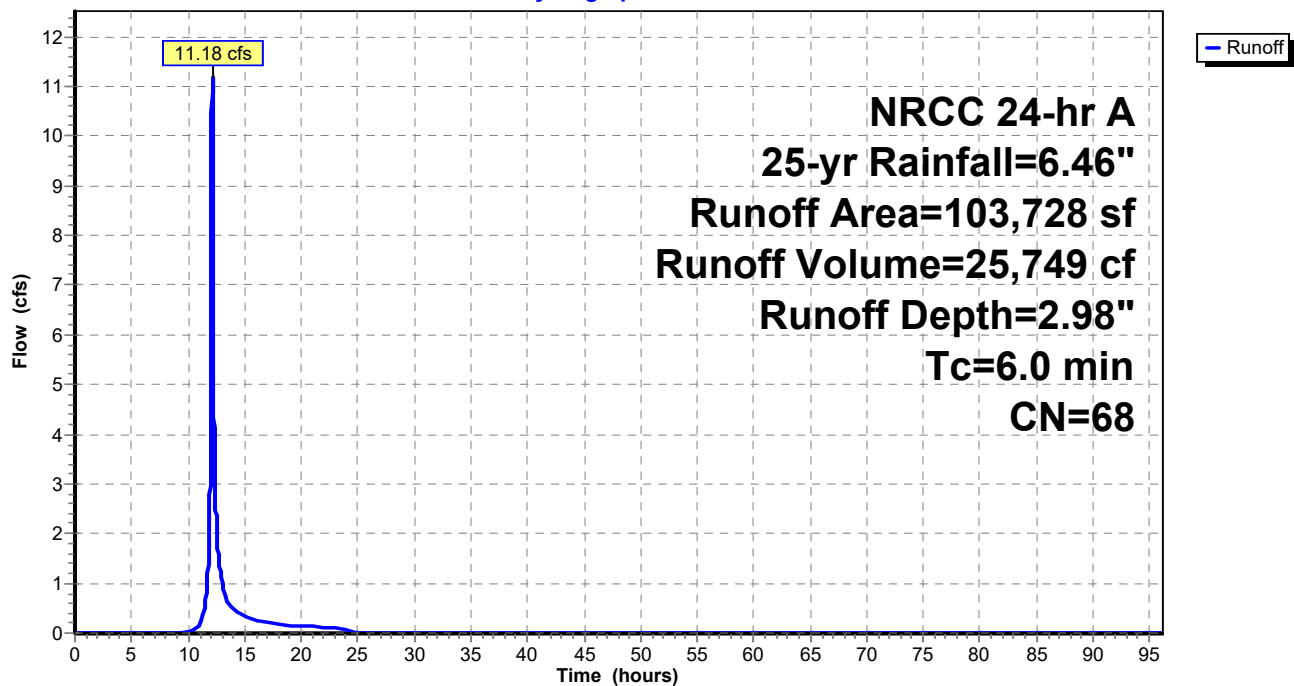
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 25-yr Rainfall=6.46"

Area (sf)	CN	Description
35,128	65	Brush, Good, HSG C
68,600	70	Woods, Good, HSG C
103,728	68	Weighted Average
103,728		100.00% Pervious Area

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

Subcatchment 22: A7

Hydrograph



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NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Pond 23: Infiltration Basin (SWP-3)

Inflow Area = 488,414 sf, 68.08% Impervious, Inflow Depth = 5.63" for 25-yr event
 Inflow = 94.39 cfs @ 12.13 hrs, Volume= 229,338 cf
 Outflow = 51.73 cfs @ 12.21 hrs, Volume= 229,338 cf, Atten= 45%, Lag= 4.9 min
 Discarded = 6.37 cfs @ 12.21 hrs, Volume= 168,985 cf
 Primary = 45.36 cfs @ 12.21 hrs, Volume= 60,353 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 261.16' @ 12.21 hrs Surf.Area= 18,352 sf Storage= 71,002 cf

Plug-Flow detention time= 58.0 min calculated for 229,315 cf (100% of inflow)
 Center-of-Mass det. time= 57.9 min (820.4 - 762.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	256.00'	103,740 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
256.00	9,450	527.9	0	0	9,450
258.00	12,731	565.7	22,100	22,100	12,917
260.00	16,238	603.5	28,898	50,998	16,623
262.00	19,973	641.3	36,147	87,144	20,569
262.80	21,527	656.4	16,596	103,740	22,212

Device	Routing	Invert	Outlet Devices
#1	Primary	254.00'	36.0" Round Culvert X 2.00 L= 95.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 254.00' / 244.00' S= 0.1053 ' S= 0.1053 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	260.00'	2.0' long x 0.5' breadth Broad-Crested Rectangular Weir X 2.00 Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	260.00'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir X 2.00 Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	259.40'	6.0" Vert. Orifice/Grate C= 0.600
#5	Device 1	261.00'	36.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Discarded	256.00'	15.000 in/hr Exfiltration over Surface area Phase-In= 0.10'

Discarded OutFlow Max=6.37 cfs @ 12.21 hrs HW=261.16' (Free Discharge)

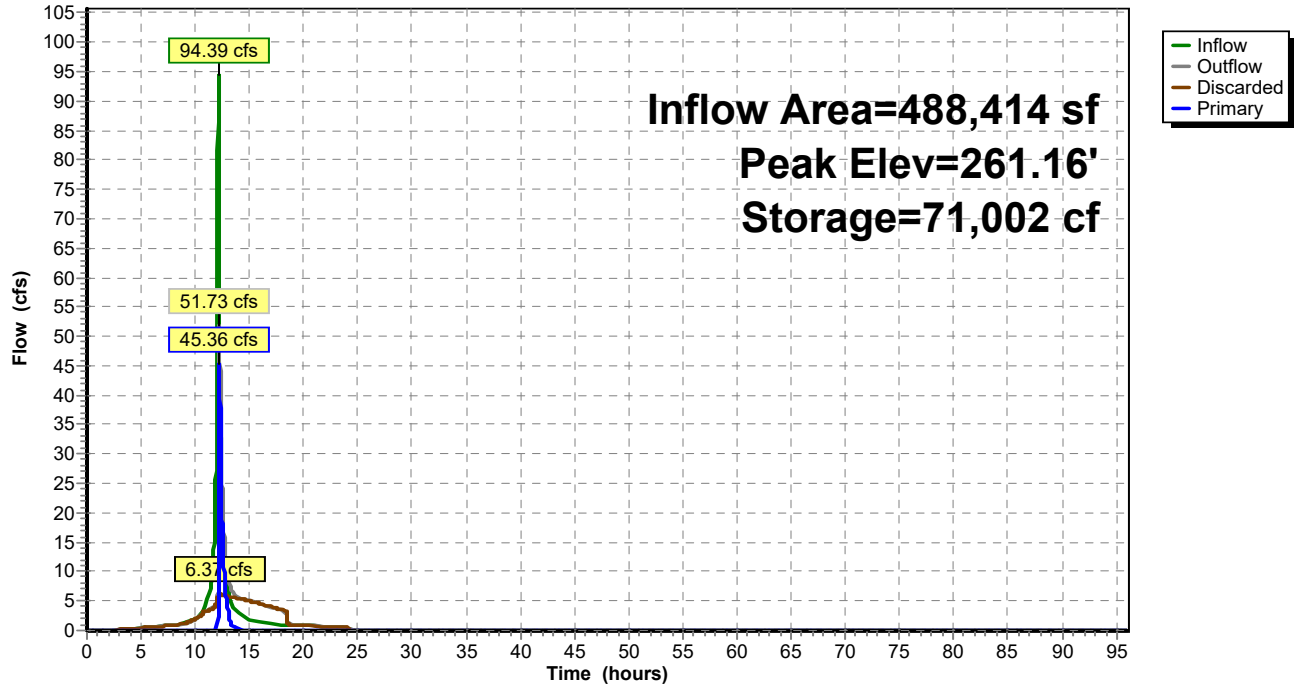
↑ **6=Exfiltration** (Exfiltration Controls 6.37 cfs)

Primary OutFlow Max=45.27 cfs @ 12.21 hrs HW=261.16' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 45.27 cfs of 161.89 cfs potential flow)
 ↑ **2=Broad-Crested Rectangular Weir** (Weir Controls 16.51 cfs @ 3.57 fps)
 ↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 24.77 cfs @ 3.57 fps)
 ↑ **4=Orifice/Grate** (Orifice Controls 1.16 cfs @ 5.91 fps)
 ↑ **5=Orifice/Grate** (Weir Controls 2.83 cfs @ 1.29 fps)

Pond 23: Infiltration Basin (SWP-3)

Hydrograph



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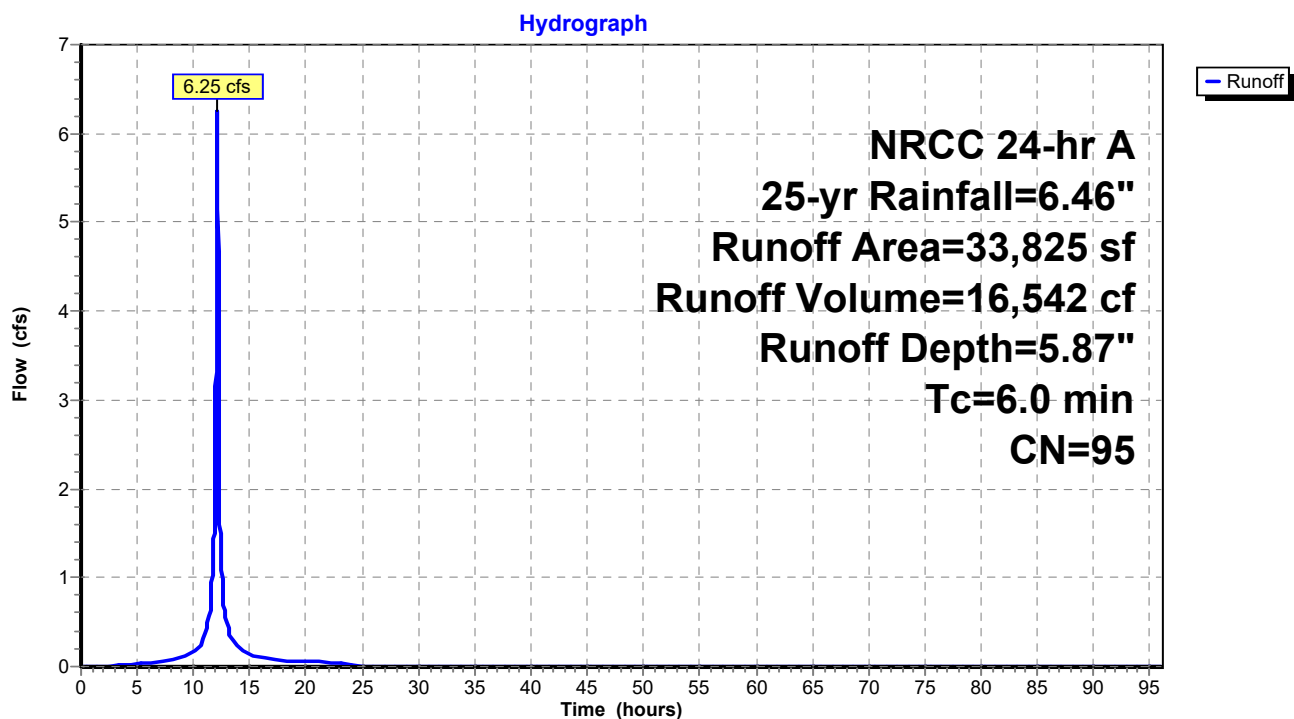
Summary for Subcatchment 24: A9

Runoff = 6.25 cfs @ 12.13 hrs, Volume= 16,542 cf, Depth= 5.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 25-yr Rainfall=6.46"

Area (sf)	CN	Description
29,687	98	Paved parking, HSG C
4,138	74	>75% Grass cover, Good, HSG C
33,825	95	Weighted Average
4,138		12.23% Pervious Area
29,687		87.77% Impervious Area

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

Subcatchment 24: A9

N60 P1 Post-A 2021

NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Pond 25: DIV-4

Inflow Area = 33,825 sf, 87.77% Impervious, Inflow Depth = 5.87" for 25-yr event
 Inflow = 6.25 cfs @ 12.13 hrs, Volume= 16,542 cf
 Outflow = 6.25 cfs @ 12.13 hrs, Volume= 16,542 cf, Atten= 0%, Lag= 0.0 min
 Primary = 5.04 cfs @ 12.08 hrs, Volume= 14,873 cf
 Secondary = 1.74 cfs @ 12.14 hrs, Volume= 1,669 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 349.51' @ 12.14 hrs

Flood Elev= 356.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	346.50'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 346.50' / 346.50' S= 0.0000 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	347.50'	18.0" Round Culvert L= 128.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 347.50' / 344.00' S= 0.0273 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	349.33'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.89 cfs @ 12.08 hrs HW=349.38' TW=347.71' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 4.89 cfs @ 6.22 fps)**Secondary OutFlow** Max=1.73 cfs @ 12.14 hrs HW=349.51' TW=0.00' (Dynamic Tailwater)↑ **2=Culvert** (Passes 1.73 cfs of 9.56 cfs potential flow)↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 1.73 cfs @ 1.19 fps)

N60 P1 Post-A 2021

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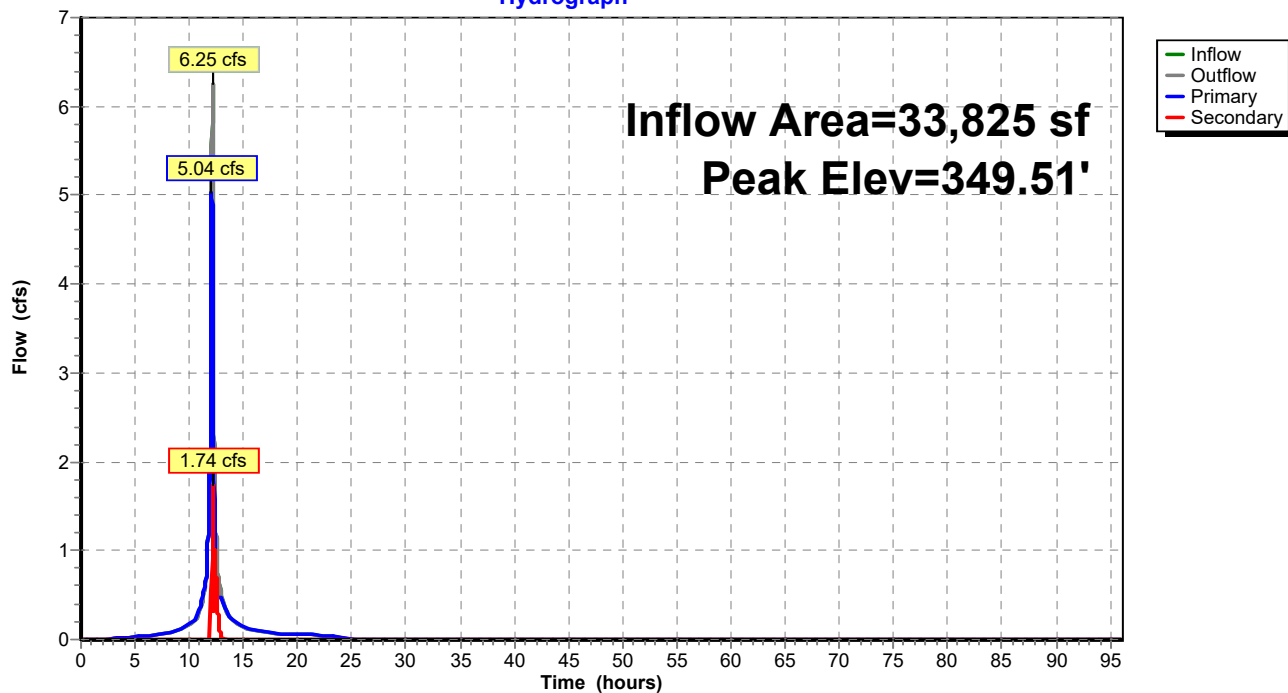
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Pond 25: DIV-4

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Pond 26: INF-4

Inflow Area = 33,825 sf, 87.77% Impervious, Inflow Depth = 5.28" for 25-yr event
 Inflow = 5.04 cfs @ 12.08 hrs, Volume= 14,873 cf
 Outflow = 0.52 cfs @ 11.47 hrs, Volume= 14,873 cf, Atten= 90%, Lag= 0.0 min
 Discarded = 0.52 cfs @ 11.47 hrs, Volume= 14,873 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 349.44' @ 12.37 hrs Surf.Area= 2,242 sf Storage= 5,001 cf

Plug-Flow detention time= 63.5 min calculated for 14,872 cf (100% of inflow)
 Center-of-Mass det. time= 63.5 min (825.8 - 762.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	346.00'	2,196 cf	30.50'W x 73.50'L x 3.88'H Field A 8,687 cf Overall - 3,196 cf Embedded = 5,490 cf x 40.0% Voids
#2A	346.50'	3,196 cf	Cultec R-330XLHD x 60 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 6 rows
		5,393 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	346.00'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.01'

Discarded OutFlow Max=0.52 cfs @ 11.47 hrs HW=346.04' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.52 cfs)

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Pond 26: INF-4 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 6 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

10 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 71.50' Row Length +12.0" End Stone x 2 = 73.50' Base Length

6 Rows x 52.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.50' Base Width

6.0" Base + 30.5" Chamber Height + 10.0" Cover = 3.88' Field Height

60 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 6 Rows = 3,196.5 cf Chamber Storage

8,686.8 cf Field - 3,196.5 cf Chambers = 5,490.3 cf Stone x 40.0% Voids = 2,196.1 cf Stone Storage

Chamber Storage + Stone Storage = 5,392.6 cf = 0.124 af

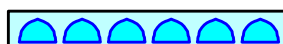
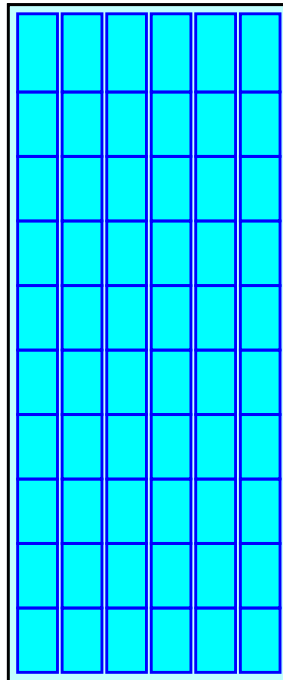
Overall Storage Efficiency = 62.1%

Overall System Size = 73.50' x 30.50' x 3.88'

60 Chambers

321.7 cy Field

203.3 cy Stone



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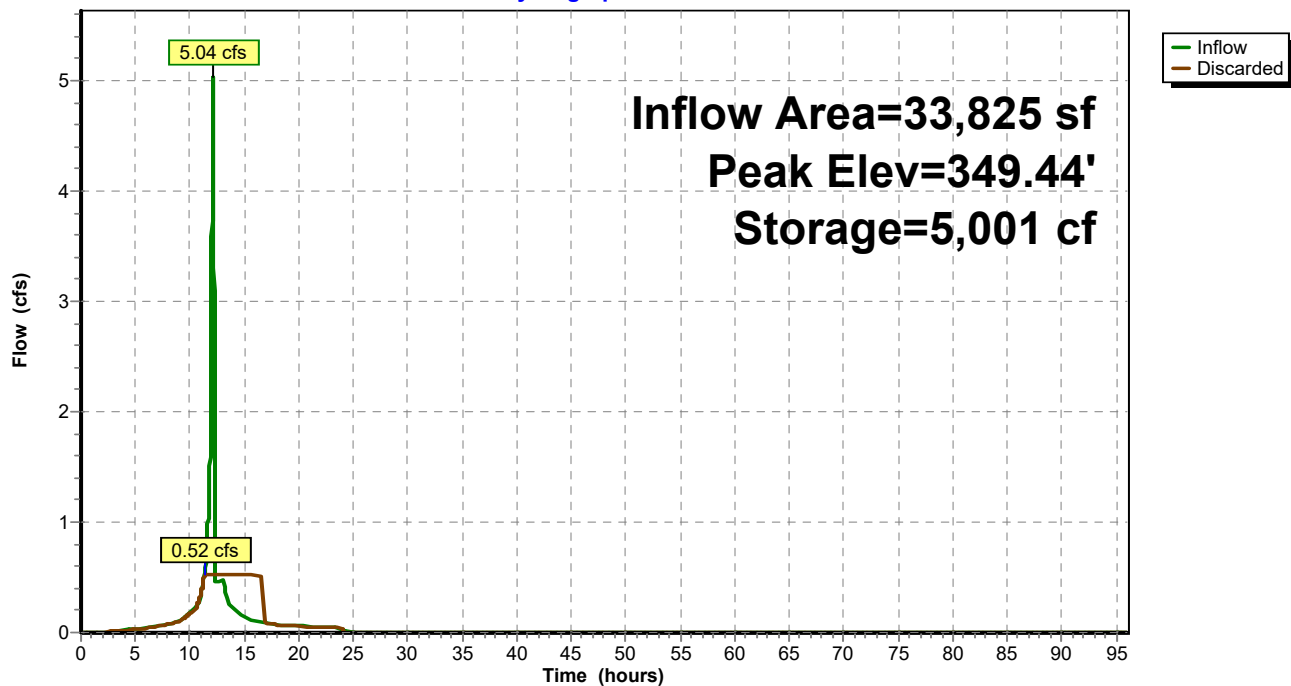
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Pond 26: INF-4

Hydrograph



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Summary for Subcatchment 27: A10

Runoff = 25.59 cfs @ 12.13 hrs, Volume= 63,707 cf, Depth= 5.18"

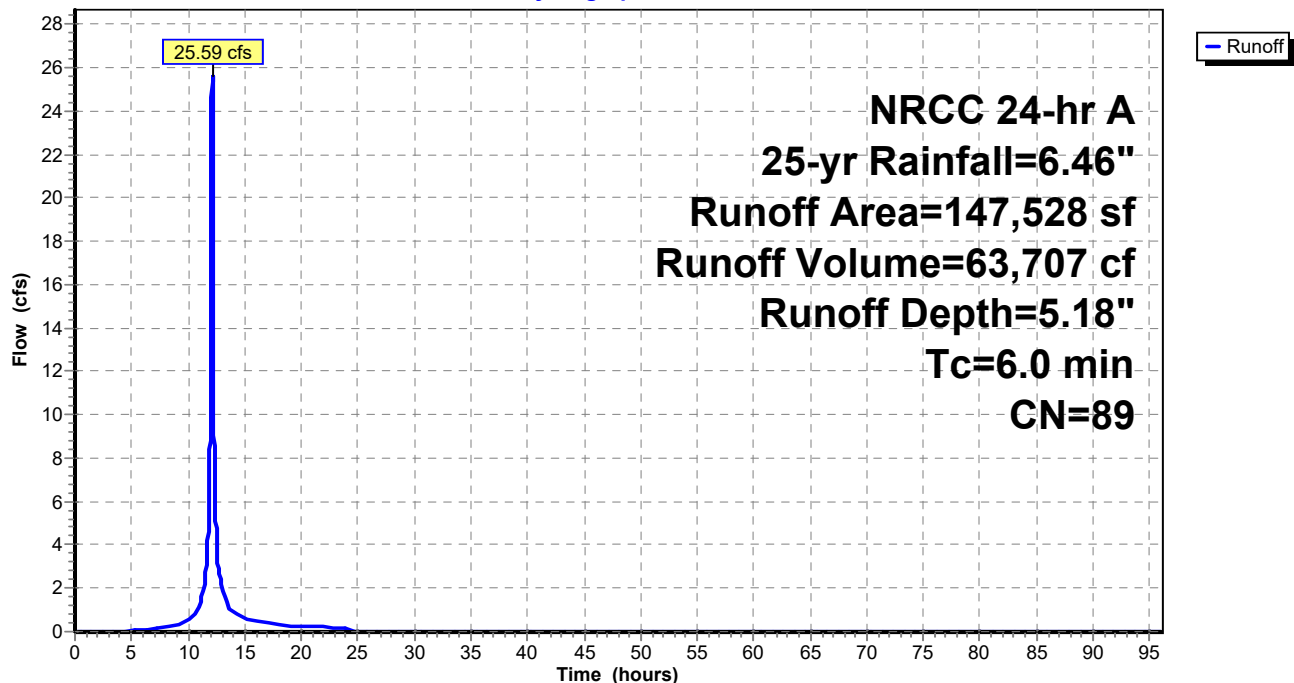
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 25-yr Rainfall=6.46"

Area (sf)	CN	Description
91,430	98	Paved parking, HSG C
5,603	80	>75% Grass cover, Good, HSG D
7,435	74	>75% Grass cover, Good, HSG C
16,120	73	Brush, Good, HSG D
19,715	77	Brush, Poor, HSG C
7,225	70	Woods, Good, HSG C
147,528	89	Weighted Average
56,098		38.03% Pervious Area
91,430		61.97% Impervious Area

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

Subcatchment 27: A10

Hydrograph



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NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Subcatchment 28: A10

Runoff = 2.01 cfs @ 12.13 hrs, Volume= 5,466 cf, Depth= 6.10"

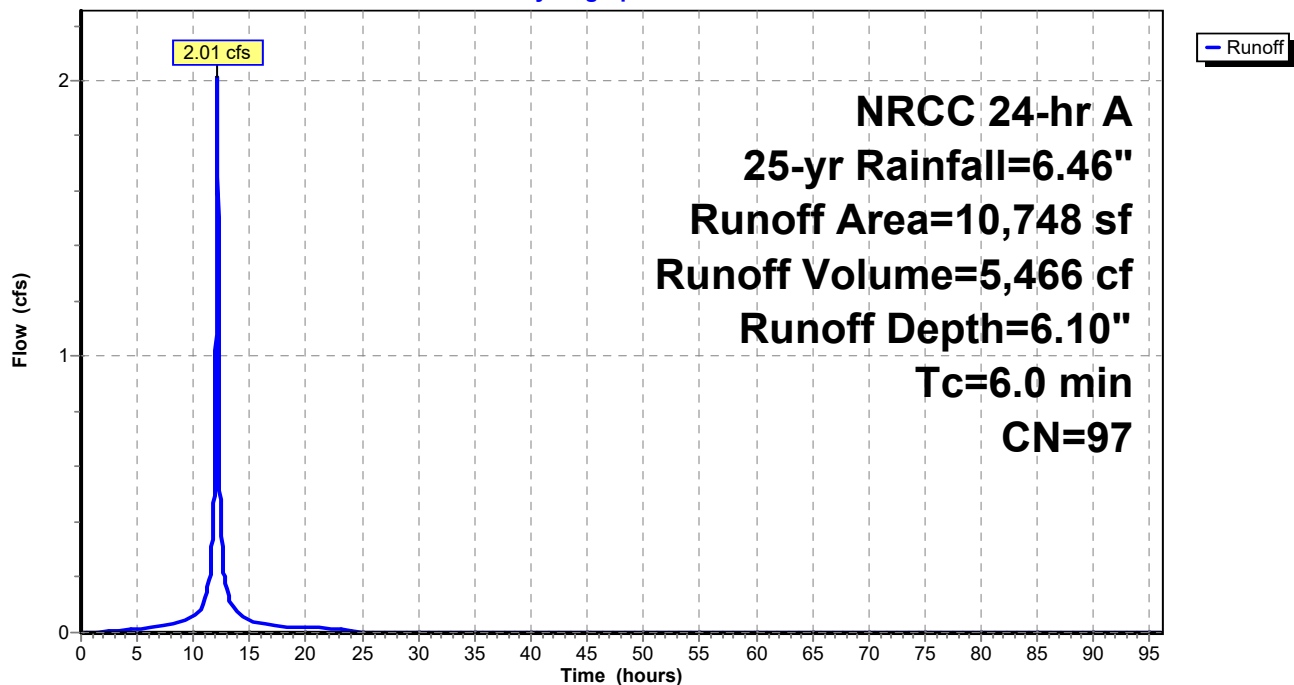
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 25-yr Rainfall=6.46"

Area (sf)	CN	Description
10,280	98	Paved parking, HSG D
468	80	>75% Grass cover, Good, HSG D
10,748	97	Weighted Average
468		4.35% Pervious Area
10,280		95.65% Impervious Area

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

Subcatchment 28: A10

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Pond 29: Infiltration Basin (SWP-2)

Inflow Area = 158,276 sf, 64.26% Impervious, Inflow Depth = 5.24" for 25-yr event
 Inflow = 27.60 cfs @ 12.13 hrs, Volume= 69,173 cf
 Outflow = 4.16 cfs @ 12.58 hrs, Volume= 69,173 cf, Atten= 85%, Lag= 26.9 min
 Discarded = 2.93 cfs @ 12.58 hrs, Volume= 61,615 cf
 Primary = 1.22 cfs @ 12.58 hrs, Volume= 7,558 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 318.42' @ 12.58 hrs Surf.Area= 8,453 sf Storage= 27,123 cf

Plug-Flow detention time= 65.6 min calculated for 69,166 cf (100% of inflow)
 Center-of-Mass det. time= 65.6 min (844.4 - 778.8)

Volume	Invert	Avail.Storage	Storage Description		
#1	314.00'	47,274 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
314.00	4,026	293.0	0	0	4,026
316.00	5,897	330.7	9,864	9,864	5,998
318.00	7,994	368.3	13,838	23,702	8,204
320.00	10,316	406.0	18,261	41,962	10,652
320.50	10,932	415.4	5,311	47,274	11,300

Device	Routing	Invert	Outlet Devices
#1	Primary	308.00'	15.0" Round Culvert L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 308.00' / 304.00' S= 0.0667 ' S= 0.0667 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	316.50'	6.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	318.50'	2.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	319.00'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Discarded	314.00'	15.000 in/hr Exfiltration over Surface area Phase-In= 0.10'

Discarded OutFlow Max=2.93 cfs @ 12.58 hrs HW=318.42' (Free Discharge)

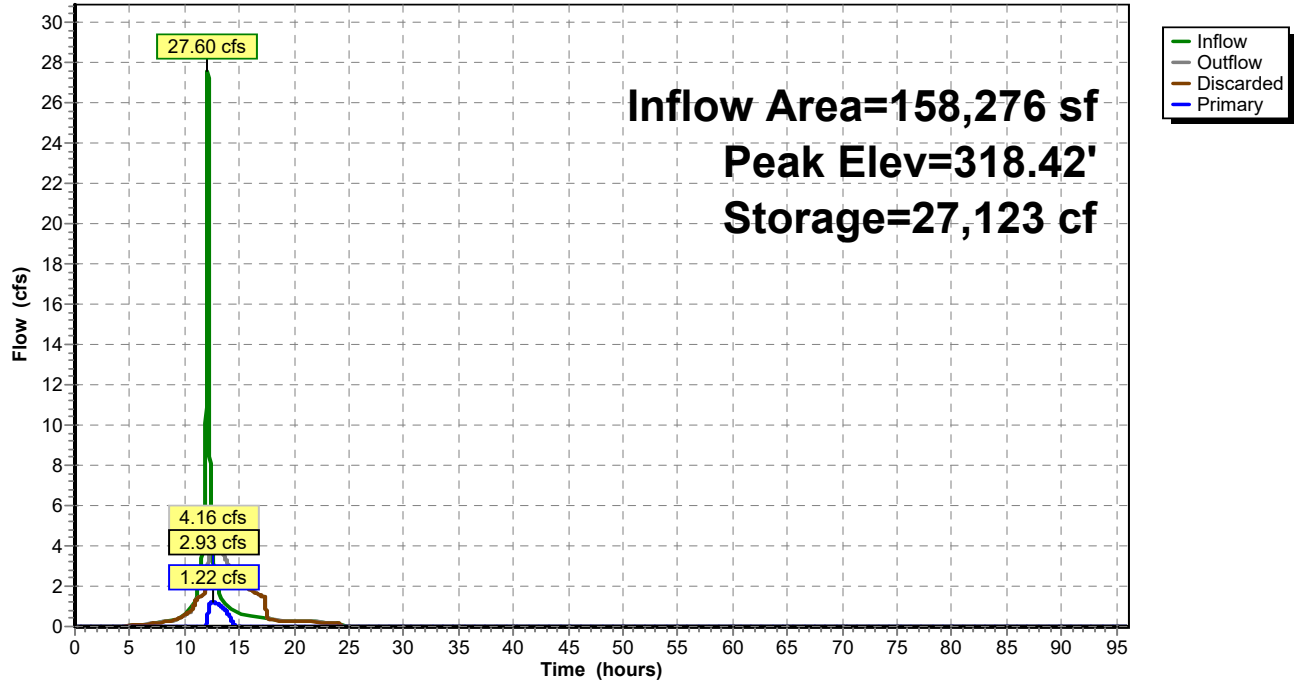
↑ **5=Exfiltration** (Exfiltration Controls 2.93 cfs)

Primary OutFlow Max=1.22 cfs @ 12.58 hrs HW=318.42' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 1.22 cfs of 18.49 cfs potential flow)
 ↑ **2=Orifice/Grate** (Orifice Controls 1.22 cfs @ 6.21 fps)
 ↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
 ↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 29: Infiltration Basin (SWP-2)

Hydrograph



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NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Subcatchment 30: Post A2

Runoff = 21.45 cfs @ 12.26 hrs, Volume= 74,991 cf, Depth= 3.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 25-yr Rainfall=6.46"

Area (sf)	CN	Description
43,743	98	Paved parking, HSG C
107,245	74	>75% Grass cover, Good, HSG C
2,876	61	>75% Grass cover, Good, HSG B
39,583	70	Woods, Good, HSG C
4,283	98	Water Surface, HSG C
33,976	65	Brush, Good, HSG C
231,706	77	Weighted Average
183,680		79.27% Pervious Area
48,026		20.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0400	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.4	215	0.0260	2.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	125	0.1000	6.42		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.4	377	0.0750	14.42	17.69	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
17.7	817	Total			

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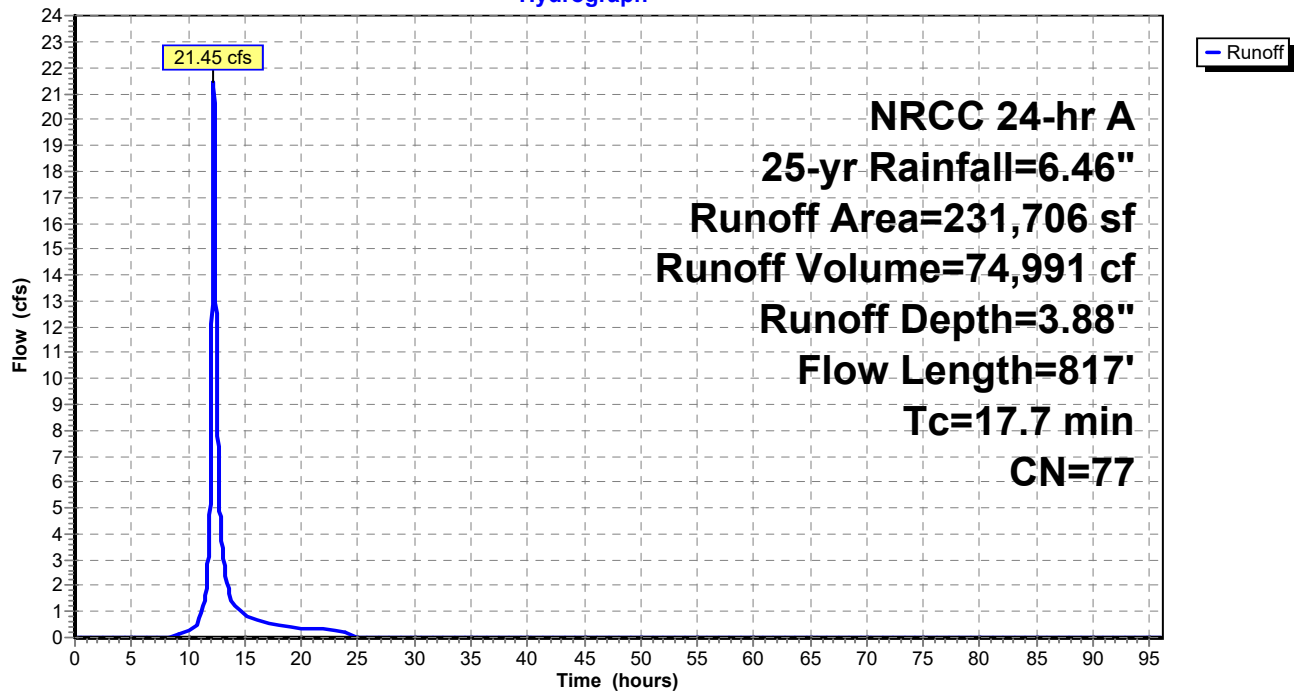
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NRCC 24-hr A 25-yr Rainfall=6.46"

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Subcatchment 30: Post A2

Hydrograph



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NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Pond 31: Pocket Wetland (SWP-1)

Inflow Area = 231,706 sf, 20.73% Impervious, Inflow Depth = 3.88" for 25-yr event
 Inflow = 21.45 cfs @ 12.26 hrs, Volume= 74,991 cf
 Outflow = 11.98 cfs @ 12.48 hrs, Volume= 67,044 cf, Atten= 44%, Lag= 13.1 min
 Primary = 11.98 cfs @ 12.48 hrs, Volume= 67,044 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Starting Elev= 234.50' Surf.Area= 12,504 sf Storage= 7,835 cf
 Peak Elev= 236.73' @ 12.48 hrs Surf.Area= 16,337 sf Storage= 33,529 cf (25,694 cf above start)

Plug-Flow detention time= 512.5 min calculated for 59,209 cf (79% of inflow)
 Center-of-Mass det. time= 377.3 min (1,197.2 - 819.9)

Volume	Invert	Avail.Storage	Storage Description
#1	230.00'	1,811 cf	Forebay (Irregular) Listed below (Recalc)
#2	230.00'	1,976 cf	Micropool (Irregular) Listed below (Recalc)
#3	233.90'	65,123 cf	Marsh & Storage (Irregular) Listed below (Recalc)
		68,911 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
230.00	86	34.2	0	0	86
231.00	217	53.2	147	147	225
232.00	406	72.3	307	453	426
233.00	651	91.4	524	977	688
233.90	1,233	129.1	834	1,811	1,357

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
230.00	86	34.2	0	0	86
231.00	217	53.2	147	147	225
232.00	406	72.3	307	453	426
233.00	651	91.4	524	977	688
233.90	1,646	155.1	1,000	1,976	1,942

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
233.90	4,232	530.5	0	0	4,232
234.50	9,625	400.9	4,048	4,048	13,842
235.00	10,440	413.5	5,015	9,063	14,683
236.00	12,144	438.8	11,281	20,344	16,451
237.00	13,950	464.0	13,037	33,381	18,317
238.00	15,856	489.2	14,893	48,273	20,287
239.00	17,864	514.5	16,850	65,123	22,369

Device	Routing	Invert	Outlet Devices
#1	Primary	232.00'	15.0" Round Culvert L= 117.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 232.00' / 216.50' S= 0.1325 ' / ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

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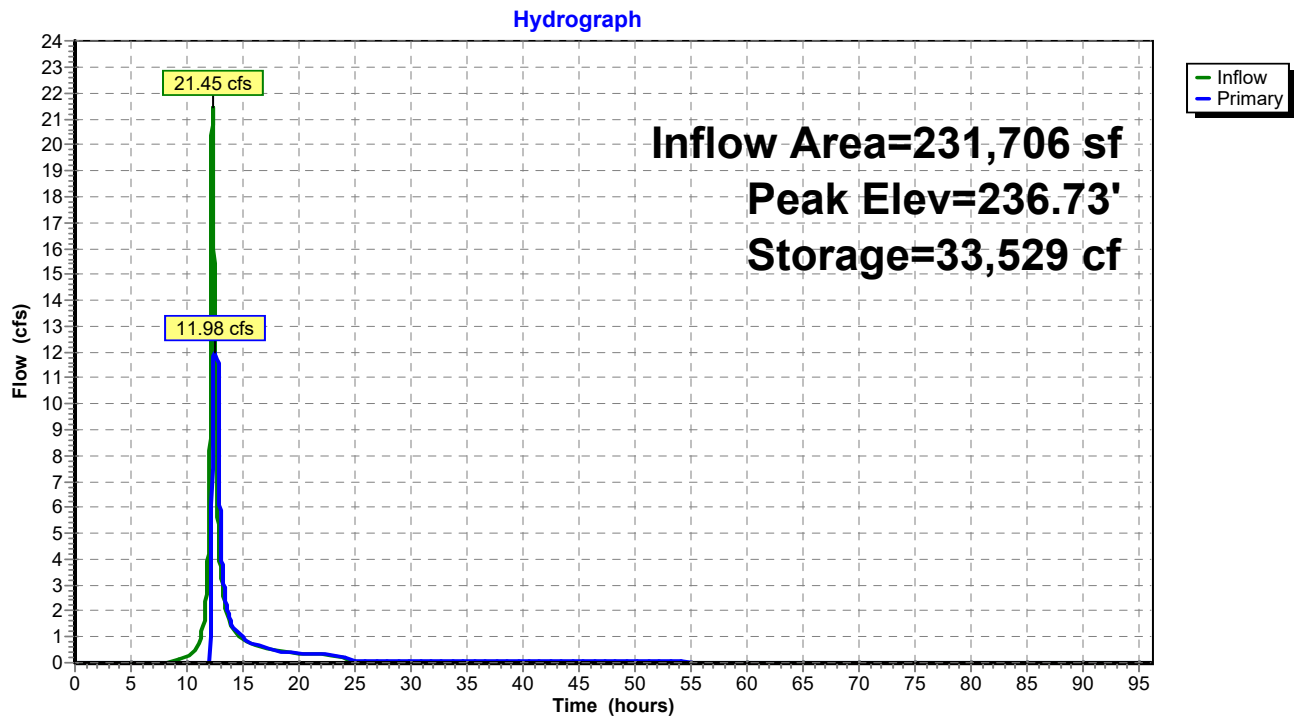
#2	Device 1	234.50'	1.1" Vert. Orifice/Grate	C= 0.600
#3	Device 1	236.00'	36.0" x 48.0" Horiz. Orifice/Grate	C= 0.600

Limited to weir flow at low heads

Primary OutFlow Max=11.98 cfs @ 12.48 hrs HW=236.73' TW=0.00' (Dynamic Tailwater)

1=Culvert (Inlet Controls 11.98 cfs @ 9.76 fps)
2=Orifice/Grate (Passes < 0.05 cfs potential flow)
3=Orifice/Grate (Passes < 28.81 cfs potential flow)

Pond 31: Pocket Wetland (SWP-1)



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Summary for Subcatchment 32: Post A1

Runoff = 3.33 cfs @ 12.13 hrs, Volume= 7,938 cf, Depth= 4.41"

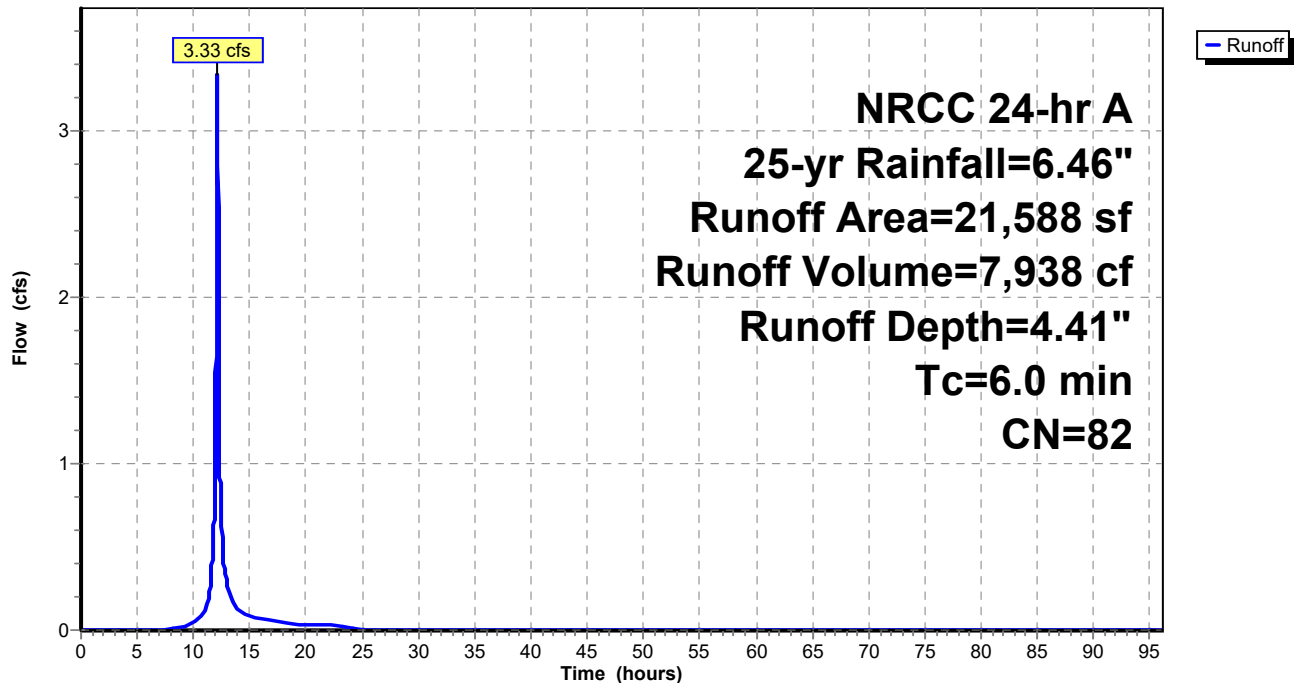
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 25-yr Rainfall=6.46"

Area (sf)	CN	Description
8,152	98	Paved parking, HSG C
10,356	74	>75% Grass cover, Good, HSG C
3,080	70	Woods, Good, HSG C
21,588	82	Weighted Average
13,436		62.24% Pervious Area
8,152		37.76% Impervious Area

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

Subcatchment 32: Post A1

Hydrograph



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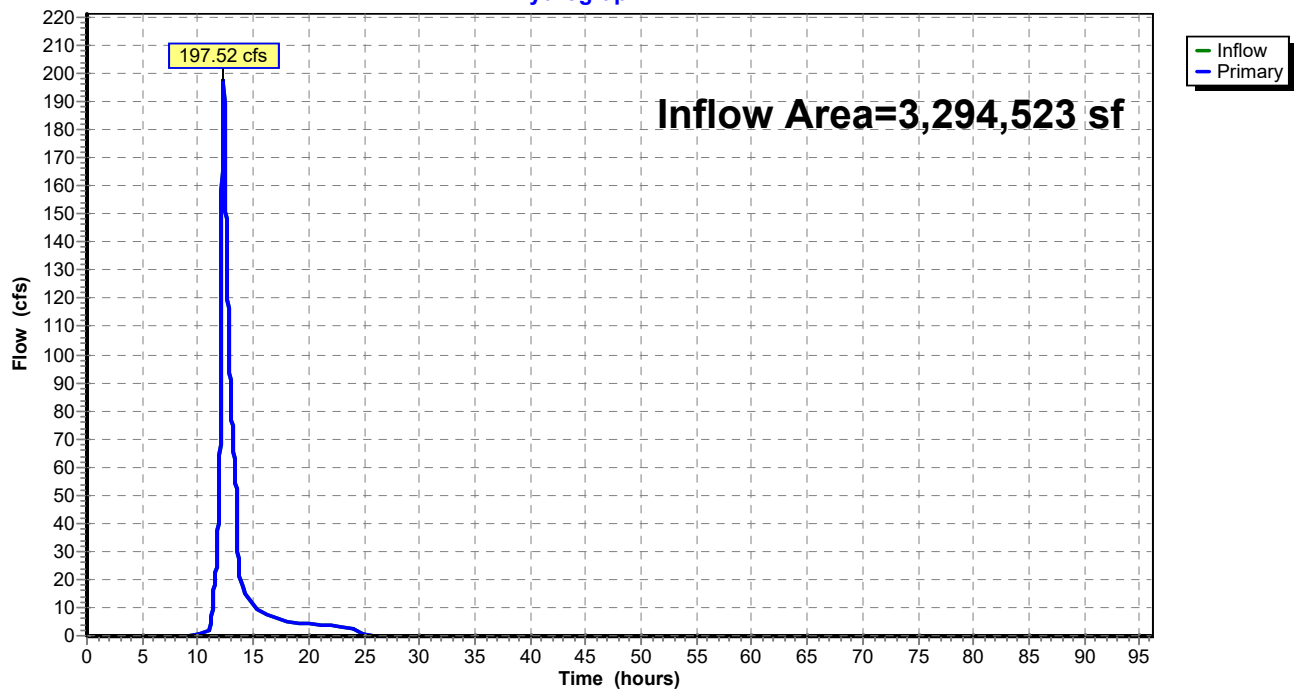
Summary for Link 33: Design Point A

Inflow Area = 3,294,523 sf, 35.27% Impervious, Inflow Depth > 3.47" for 25-yr event
Inflow = 197.52 cfs @ 12.31 hrs, Volume= 953,621 cf
Primary = 197.52 cfs @ 12.31 hrs, Volume= 953,621 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 33: Design Point A

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 50-yr Rainfall=7.70"

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment8: Post A0 Offsite Runoff Area=1,115,060 sf 57.87% Impervious Runoff Depth=6.51"
Flow Length=1,018' Tc=12.5 min CN=90 Runoff=188.18 cfs 604,958 cf

Pond 9: Offsite Pond A Peak Elev=364.99' Storage=180,130 cf Inflow=188.18 cfs 604,958 cf
Outflow=107.44 cfs 553,763 cf

Subcatchment10: Post A4 Runoff Area=164,583 sf 10.25% Impervious Runoff Depth=4.89"
Flow Length=340' Tc=20.5 min CN=76 Runoff=17.79 cfs 67,008 cf

Reach 11: Box Culvert Avg. Flow Depth=0.64' Max Vel=3.48 fps Inflow=17.79 cfs 67,008 cf
n=0.041 L=98.0' S=0.0204 '/' Capacity=177.99 cfs Outflow=17.78 cfs 67,008 cf

Subcatchment12: Post A8 Runoff Area=392,732 sf 0.00% Impervious Runoff Depth=4.43"
Flow Length=320' Tc=21.4 min CN=72 Runoff=37.81 cfs 145,056 cf

Pond 12A: Existing Wetland A Peak Elev=324.80' Storage=10,846 cf Inflow=162.10 cfs 765,827 cf
96.0" x 36.0" Box Culvert n=0.040 L=116.0' S=0.0776 '/' Outflow=151.54 cfs 765,827 cf

Subcatchment12B: Post A11 Runoff Area=722,164 sf 1.29% Impervious Runoff Depth=4.21"
Flow Length=475' Tc=19.8 min CN=70 Runoff=69.08 cfs 253,215 cf

Reach 13: Existing Stream A Avg. Flow Depth=2.14' Max Vel=11.91 fps Inflow=213.19 cfs 1,019,043 cf
n=0.040 L=1,360.0' S=0.0721 '/' Capacity=601.12 cfs Outflow=210.67 cfs 1,019,043 cf

Subcatchment14: Post A3 Runoff Area=106,378 sf 85.91% Impervious Runoff Depth=7.10"
Tc=6.0 min CN=95 Runoff=23.56 cfs 62,963 cf

Pond 15: DIV-1 Peak Elev=326.31' Inflow=23.56 cfs 62,963 cf
Primary=4.95 cfs 41,243 cf Secondary=19.41 cfs 21,720 cf Outflow=23.56 cfs 62,963 cf

Pond 16: INF-1 Peak Elev=325.67' Storage=9,292 cf Inflow=4.95 cfs 41,243 cf
Outflow=1.18 cfs 41,243 cf

Subcatchment17: Post A5 Runoff Area=92,926 sf 100.00% Impervious Runoff Depth=7.46"
Tc=6.0 min CN=98 Runoff=20.82 cfs 57,772 cf

Pond 18: DIV-2 Peak Elev=365.03' Inflow=20.82 cfs 57,772 cf
Primary=5.54 cfs 40,133 cf Secondary=15.32 cfs 17,639 cf Outflow=20.82 cfs 57,772 cf

Pond 19: INF-2 Peak Elev=363.79' Storage=10,553 cf Inflow=5.54 cfs 40,133 cf
Outflow=0.99 cfs 40,133 cf

Reach 20: 36" HDPE Pipe Avg. Flow Depth=0.52' Max Vel=18.51 fps Inflow=15.32 cfs 17,639 cf
36.0" Round Pipe n=0.013 L=805.0' S=0.1205 '/' Capacity=231.53 cfs Outflow=15.20 cfs 17,639 cf

Subcatchment21: A6 Runoff Area=384,686 sf 86.44% Impervious Runoff Depth=7.22"
Tc=6.0 min CN=96 Runoff=85.61 cfs 231,504 cf

N60 P1 Post-A 2021

NRCC 24-hr A 50-yr Rainfall=7.70"

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Subcatchment22: A7Runoff Area=103,728 sf 0.00% Impervious Runoff Depth=3.98"
Tc=6.0 min CN=68 Runoff=14.91 cfs 34,442 cf**Pond 23: Infiltration Basin (SWP-3)**Peak Elev=261.52' Storage=77,750 cf Inflow=115.56 cfs 283,586 cf
Discarded=6.61 cfs 187,449 cf Primary=80.49 cfs 96,136 cf Outflow=87.10 cfs 283,586 cf**Subcatchment24: A9**Runoff Area=33,825 sf 87.77% Impervious Runoff Depth=7.10"
Tc=6.0 min CN=95 Runoff=7.49 cfs 20,020 cf**Pond 25: DIV-4**Peak Elev=349.62' Inflow=7.49 cfs 20,020 cf
Primary=4.78 cfs 16,371 cf Secondary=3.54 cfs 3,649 cf Outflow=7.49 cfs 20,020 cf**Pond 26: INF-4**Peak Elev=349.51' Storage=5,067 cf Inflow=4.78 cfs 16,371 cf
Outflow=0.52 cfs 16,371 cf**Subcatchment27: A10**Runoff Area=147,528 sf 61.97% Impervious Runoff Depth=6.39"
Tc=6.0 min CN=89 Runoff=31.14 cfs 78,591 cf**Subcatchment28: A10**Runoff Area=10,748 sf 95.65% Impervious Runoff Depth=7.34"
Tc=6.0 min CN=97 Runoff=2.40 cfs 6,575 cf**Pond 29: Infiltration Basin (SWP-2)**Peak Elev=319.03' Storage=32,565 cf Inflow=33.54 cfs 85,166 cf
Discarded=3.18 cfs 70,663 cf Primary=3.85 cfs 14,504 cf Outflow=7.03 cfs 85,166 cf**Subcatchment30: Post A2**Runoff Area=231,706 sf 20.73% Impervious Runoff Depth=5.00"
Flow Length=817' Tc=17.7 min CN=77 Runoff=27.47 cfs 96,542 cf**Pond 31: Pocket Wetland (SWP-1)**Peak Elev=237.30' Storage=41,468 cf Inflow=27.47 cfs 96,542 cf
Outflow=12.78 cfs 88,588 cf**Subcatchment32: Post A1**Runoff Area=21,588 sf 37.76% Impervious Runoff Depth=5.58"
Tc=6.0 min CN=82 Runoff=4.16 cfs 10,030 cf**Link 33: Design Point A**Inflow=265.09 cfs 1,253,670 cf
Primary=265.09 cfs 1,253,670 cf**Total Runoff Area = 3,527,652 sf Runoff Volume = 1,668,678 cf Average Runoff Depth = 5.68"**
61.00% Pervious = 2,151,703 sf 39.00% Impervious = 1,375,949 sf

N60 P1 Post-A 2021

NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Subcatchment 8: Post A0 Offsite

Runoff = 188.18 cfs @ 12.20 hrs, Volume= 604,958 cf, Depth= 6.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 50-yr Rainfall=7.70"

Area (sf)	CN	Description
645,334	98	Paved parking, HSG C
443,611	80	>75% Grass cover, Good, HSG D
23,572	74	>75% Grass cover, Good, HSG C
2,543	61	>75% Grass cover, Good, HSG B
1,115,060	90	Weighted Average
469,726		42.13% Pervious Area
645,334		57.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0150	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.6	148	0.0574	3.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	30	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	740	0.0270	10.25	32.22	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Concrete sewer w/manholes & inlets
12.5	1,018	Total			

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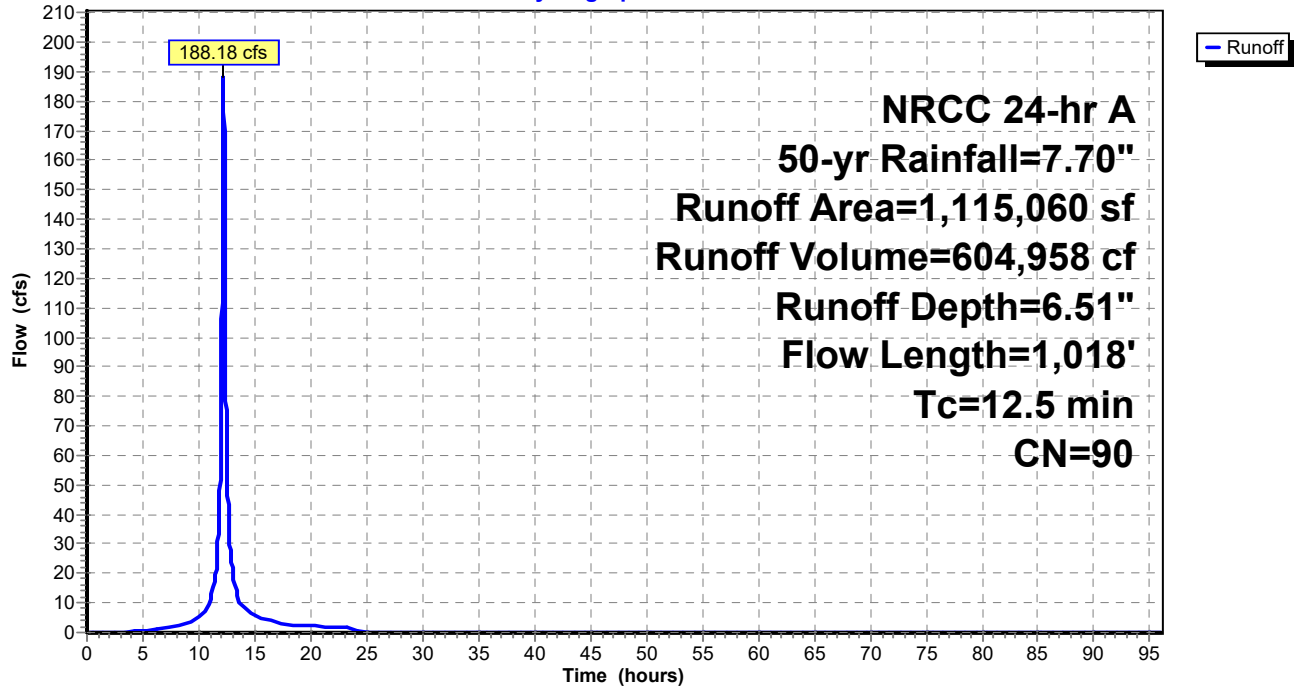
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Subcatchment 8: Post A0 Offsite

Hydrograph



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NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Pond 9: Offsite Pond A

Inflow Area = 1,115,060 sf, 57.87% Impervious, Inflow Depth = 6.51" for 50-yr event
 Inflow = 188.18 cfs @ 12.20 hrs, Volume= 604,958 cf
 Outflow = 107.44 cfs @ 12.35 hrs, Volume= 553,763 cf, Atten= 43%, Lag= 8.9 min
 Primary = 107.44 cfs @ 12.35 hrs, Volume= 553,763 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 364.99' @ 12.35 hrs Surf.Area= 36,483 sf Storage= 180,130 cf

Plug-Flow detention time= 83.1 min calculated for 553,763 cf (92% of inflow)
 Center-of-Mass det. time= 41.1 min (820.8 - 779.7)

Volume	Invert	Avail.Storage	Storage Description		
#1	357.00'	221,816 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
357.00	14,633	679.0	0	0	14,633
358.00	16,652	698.0	15,632	15,632	16,826
359.00	17,534	715.0	17,091	32,723	18,864
360.00	19,427	745.0	18,472	51,195	22,425
362.00	24,453	804.0	43,784	94,979	29,861
364.00	28,701	854.0	53,097	148,076	36,663
365.00	36,602	901.0	32,572	180,648	43,285
366.00	45,910	1,262.0	41,168	221,816	105,432

Device	Routing	Invert	Outlet Devices
#1	Primary	357.00'	30.0" Round Culvert L= 125.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 357.00' / 351.00' S= 0.0480 ' S= 0.0480 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf
#2	Device 1	360.00'	36.0" x 48.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Primary	364.75'	150.0' long x 36.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=107.34 cfs @ 12.35 hrs HW=364.99' TW=324.63' (Dynamic Tailwater)

- 1=Culvert (Inlet Controls 61.34 cfs @ 12.50 fps)
 2=Orifice/Grate (Passes 61.34 cfs of 258.02 cfs potential flow)
 3=Broad-Crested Rectangular Weir (Weir Controls 46.00 cfs @ 1.30 fps)

N60 P1 Post-A 2021

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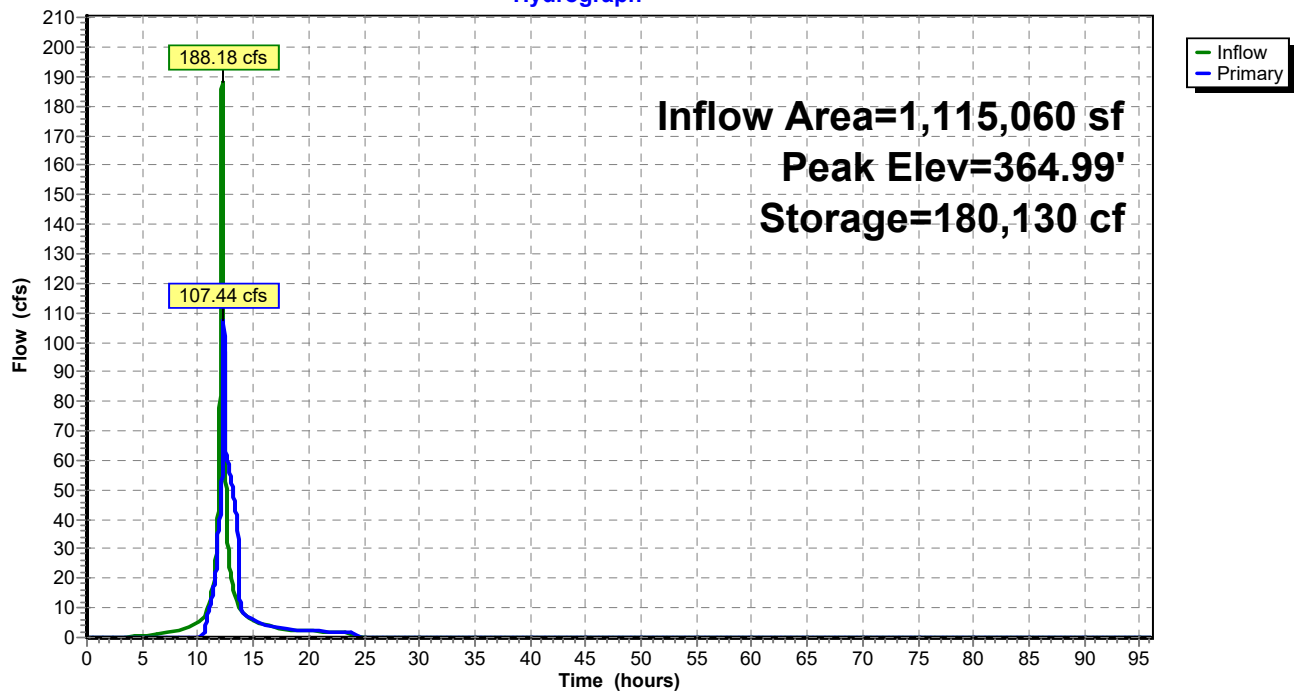
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Pond 9: Offsite Pond A

Hydrograph



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Summary for Subcatchment 10: Post A4

Runoff = 17.79 cfs @ 12.30 hrs, Volume= 67,008 cf, Depth= 4.89"

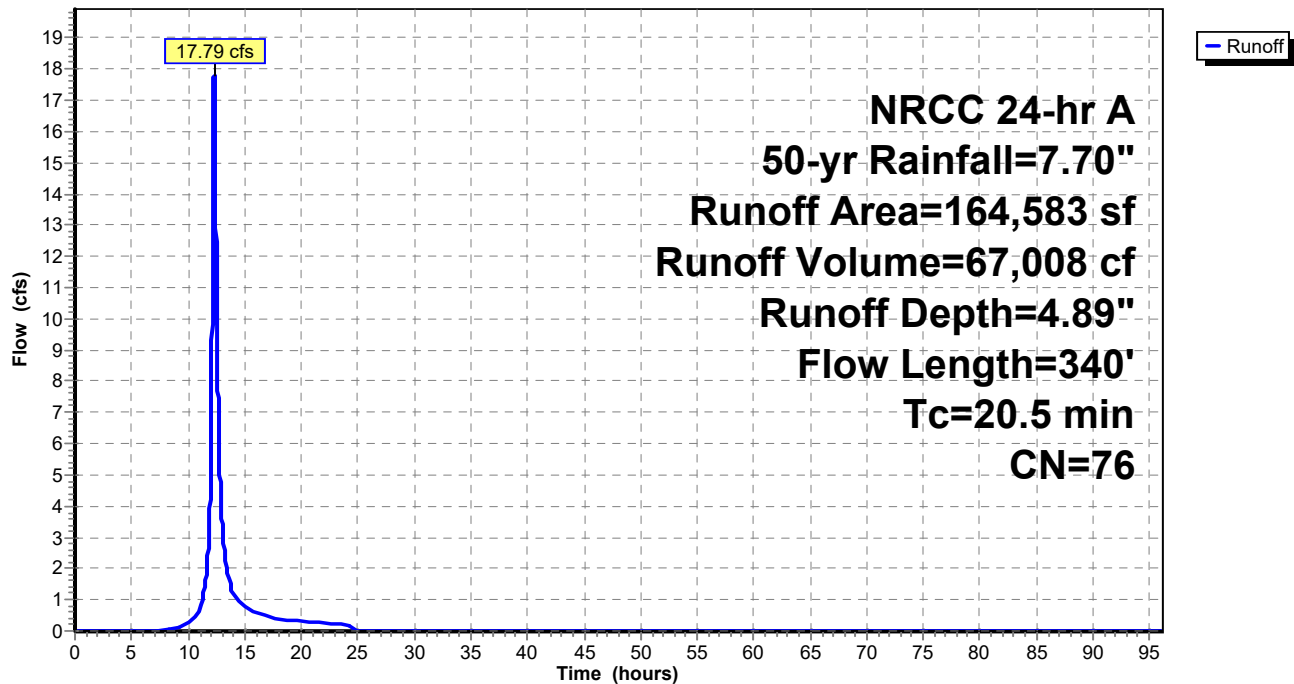
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 50-yr Rainfall=7.70"

Area (sf)	CN	Description
15,990	74	>75% Grass cover, Good, HSG C
65,271	70	Woods, Good, HSG C
66,457	77	Woods, Good, HSG D
16,865	98	Water Surface, HSG D
164,583	76	Weighted Average
147,718		89.75% Pervious Area
16,865		10.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0250	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.7	240	0.0208	2.32		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
20.5	340	Total			

Subcatchment 10: Post A4

Hydrograph



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Summary for Reach 11: Box Culvert

Inflow Area = 164,583 sf, 10.25% Impervious, Inflow Depth = 4.89" for 50-yr event
Inflow = 17.79 cfs @ 12.30 hrs, Volume= 67,008 cf
Outflow = 17.78 cfs @ 12.30 hrs, Volume= 67,008 cf, Atten= 0%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.48 fps, Min. Travel Time= 0.5 min
Avg. Velocity= 0.93 fps, Avg. Travel Time= 1.7 min

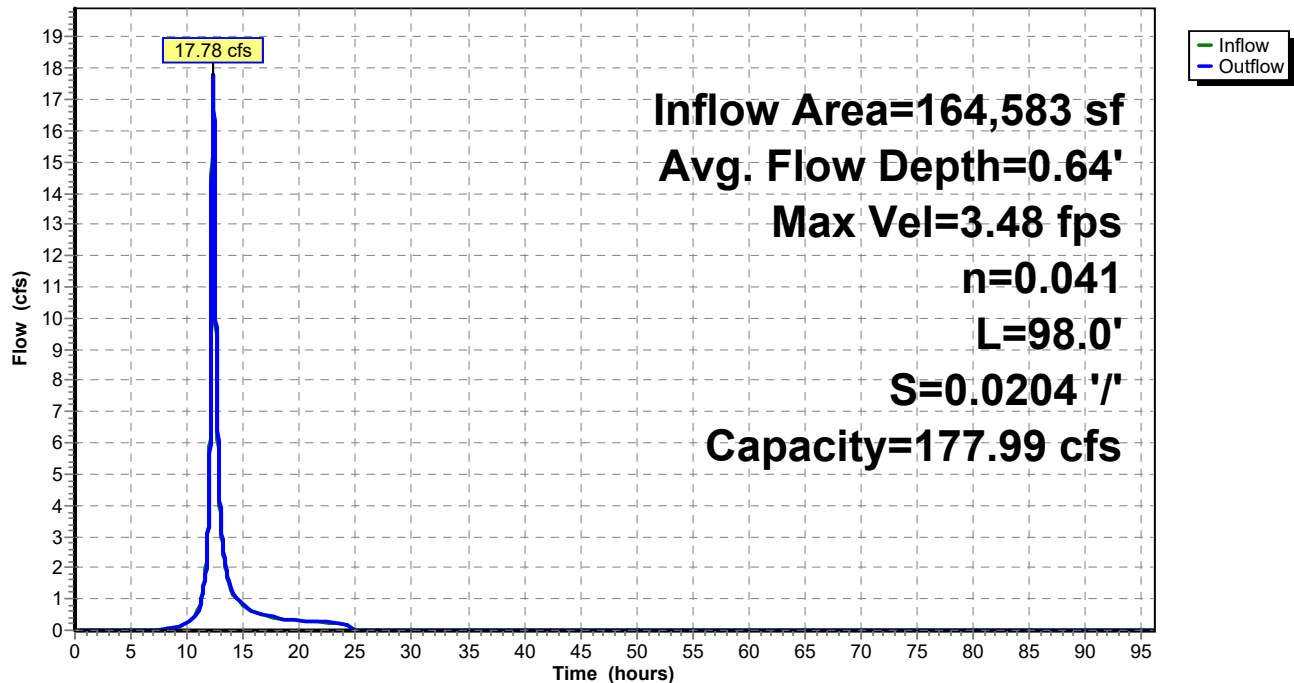
Peak Storage= 501 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.64'
Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 177.99 cfs

8.00' x 3.00' deep channel, n= 0.041 Riprap, 2-inch
Length= 98.0' Slope= 0.0204 '/'
Inlet Invert= 349.00', Outlet Invert= 347.00'



Reach 11: Box Culvert

Hydrograph



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NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Subcatchment 12: Post A8

Runoff = 37.81 cfs @ 12.31 hrs, Volume= 145,056 cf, Depth= 4.43"

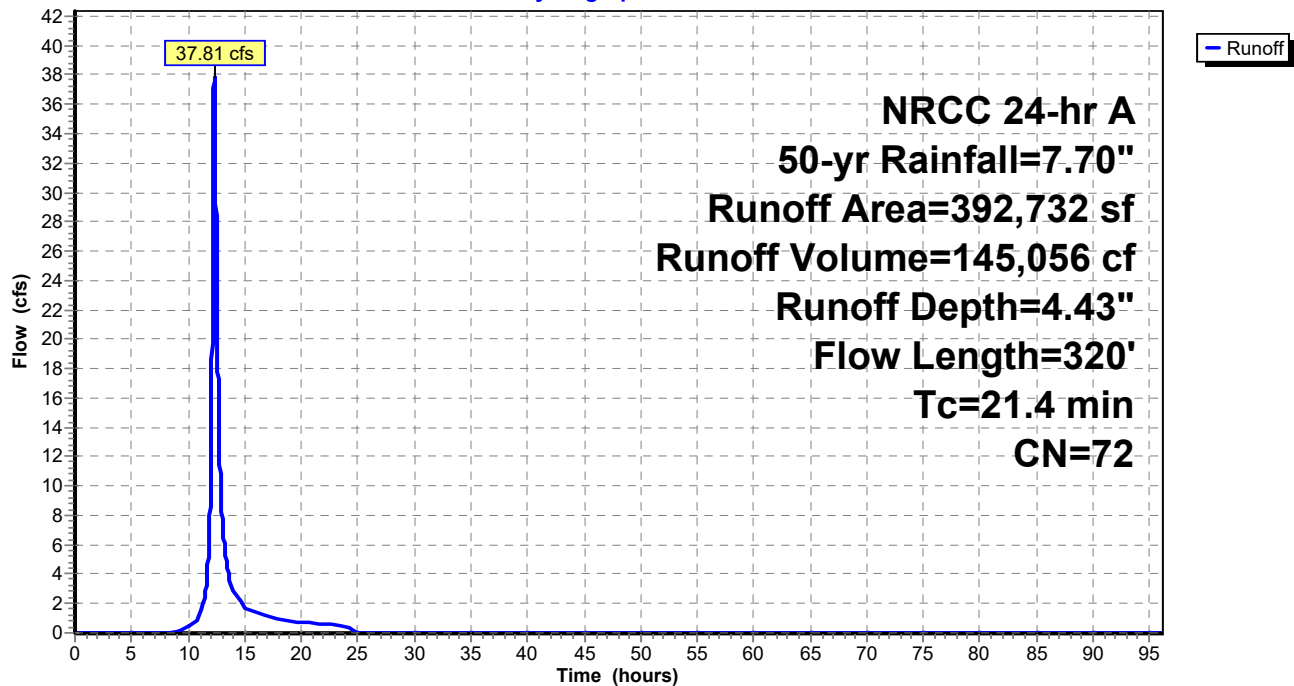
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 50-yr Rainfall=7.70"

Area (sf)	CN	Description
278,057	70	Woods, Good, HSG C
108,143	77	Woods, Good, HSG D
6,532	74	>75% Grass cover, Good, HSG C
392,732	72	Weighted Average
392,732		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
0.9	220	0.0636	4.06		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
21.4	320	Total			

Subcatchment 12: Post A8

Hydrograph



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NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Pond 12A: Existing Wetland A

Inflow Area = 1,672,375 sf, 39.60% Impervious, Inflow Depth = 5.50" for 50-yr event
 Inflow = 162.10 cfs @ 12.34 hrs, Volume= 765,827 cf
 Outflow = 151.54 cfs @ 12.39 hrs, Volume= 765,827 cf, Atten= 7%, Lag= 2.6 min
 Primary = 151.54 cfs @ 12.39 hrs, Volume= 765,827 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 324.80' @ 12.39 hrs Surf.Area= 7,156 sf Storage= 10,846 cf

Plug-Flow detention time= 0.7 min calculated for 765,827 cf (100% of inflow)
 Center-of-Mass det. time= 0.6 min (822.4 - 821.8)

Volume	Invert	Avail.Storage	Storage Description
#1	321.00'	190,307 cf	Custom Stage Data (Irregular) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
321.00	124	53.2	0	0	124
322.00	1,084	175.8	525	525	2,361
324.00	4,913	341.5	5,536	6,061	9,202
326.00	11,332	638.2	15,804	21,866	32,354
328.00	20,583	804.3	31,458	53,324	51,475
330.00	34,086	1,075.5	54,104	107,428	92,087
332.00	49,257	1,268.5	82,879	190,307	128,164

Device	Routing	Invert	Outlet Devices
#1	Primary	321.00'	96.0" W x 36.0" H Box Culvert L= 116.0' Box, 0° wingwalls, square crown edge, Ke= 0.700 Inlet / Outlet Invert= 321.00' / 312.00' S= 0.0776 '/' Cc= 0.900 n= 0.040 Earth, cobble bottom, clean sides, Flow Area= 24.00 sf

Primary OutFlow Max=151.47 cfs @ 12.39 hrs HW=324.80' TW=314.14' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 151.47 cfs @ 6.31 fps)

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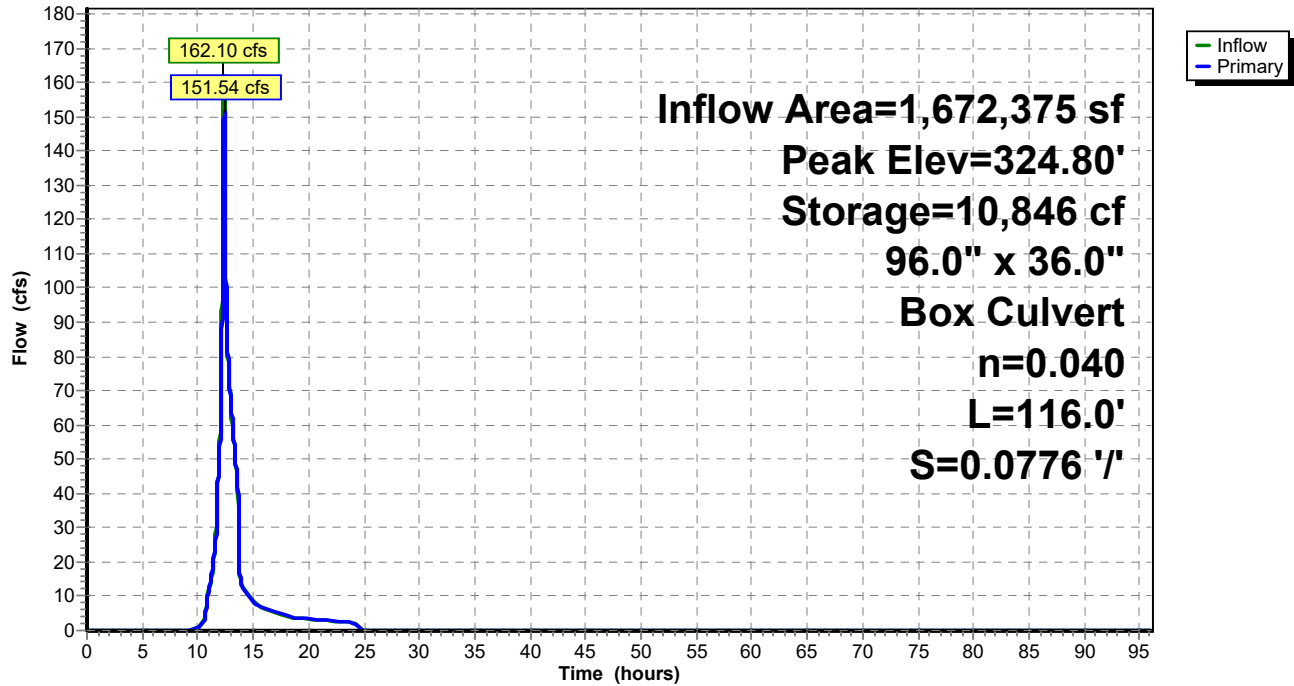
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Pond 12A: Existing Wetland A

Hydrograph



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Summary for Subcatchment 12B: Post A11

Runoff = 69.08 cfs @ 12.30 hrs, Volume= 253,215 cf, Depth= 4.21"

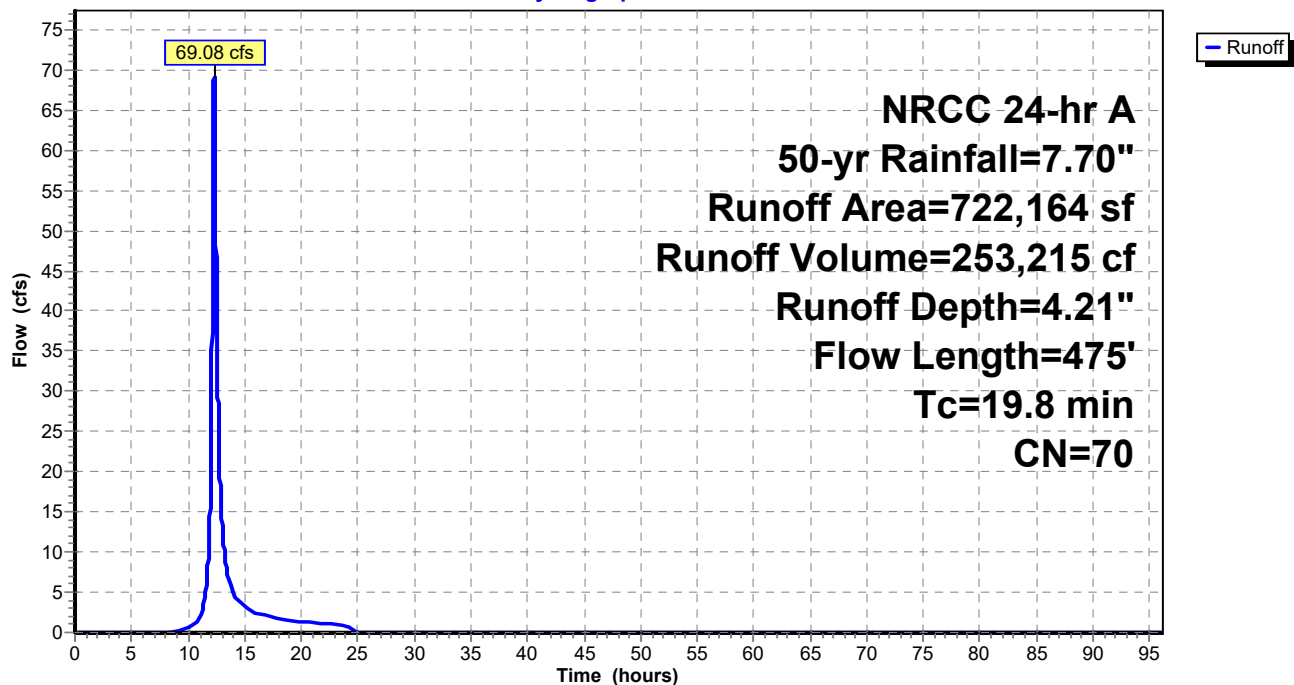
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 50-yr Rainfall=7.70"

Area (sf)	CN	Description
17,361	55	Woods, Good, HSG B
681,082	70	Woods, Good, HSG C
11,683	77	Woods, Good, HSG D
9,345	98	Paved parking, HSG C
2,693	74	>75% Grass cover, Good, HSG C
722,164	70	Weighted Average
712,819		98.71% Pervious Area
9,345		1.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0250	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.0	375	0.1400	6.02		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
19.8	475	Total			

Subcatchment 12B: Post A11

Hydrograph



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NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Reach 13: Existing Stream A (Lower Segment)

Inflow Area = 2,394,539 sf, 28.04% Impervious, Inflow Depth = 5.11" for 50-yr event
Inflow = 213.19 cfs @ 12.37 hrs, Volume= 1,019,043 cf
Outflow = 210.67 cfs @ 12.39 hrs, Volume= 1,019,043 cf, Atten= 1%, Lag= 1.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 11.91 fps, Min. Travel Time= 1.9 min
Avg. Velocity = 3.08 fps, Avg. Travel Time= 7.3 min

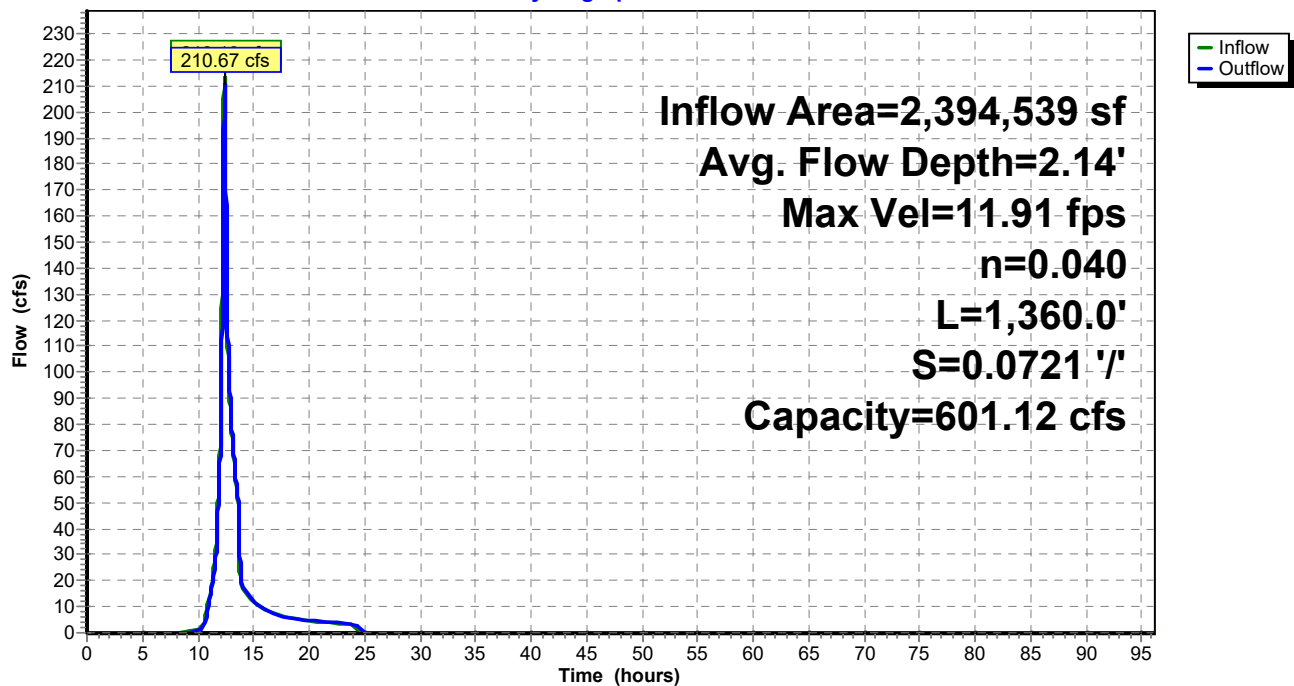
Peak Storage= 24,062 cf @ 12.39 hrs
Average Depth at Peak Storage= 2.14'
Bank-Full Depth= 3.50' Flow Area= 38.5 sf, Capacity= 601.12 cfs

4.00' x 3.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 1,360.0' Slope= 0.0721 '/'
Inlet Invert= 312.00', Outlet Invert= 214.00'



Reach 13: Existing Stream A (Lower Segment)

Hydrograph



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Summary for Subcatchment 14: Post A3

Runoff = 23.56 cfs @ 12.13 hrs, Volume= 62,963 cf, Depth= 7.10"

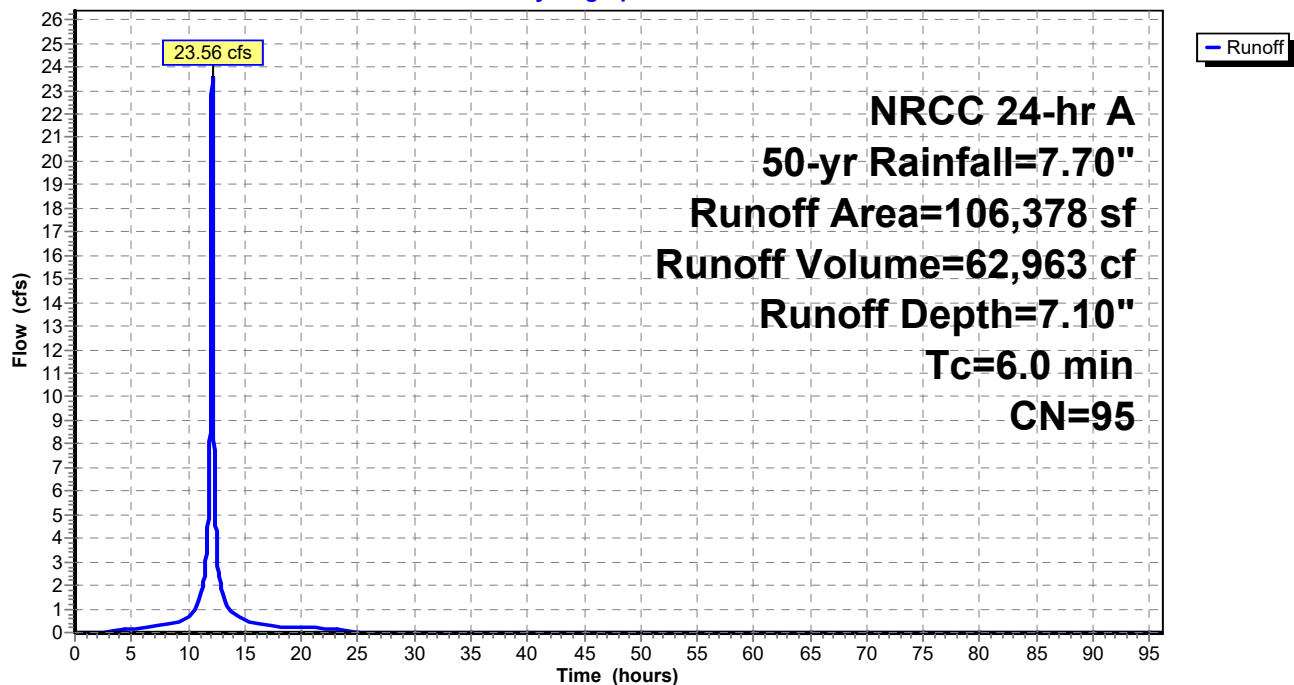
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 50-yr Rainfall=7.70"

Area (sf)	CN	Description
91,392	98	Paved parking, HSG C
14,986	74	>75% Grass cover, Good, HSG C
106,378	95	Weighted Average
14,986		14.09% Pervious Area
91,392		85.91% Impervious Area

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

Subcatchment 14: Post A3

Hydrograph



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NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Pond 15: DIV-1

Inflow Area = 106,378 sf, 85.91% Impervious, Inflow Depth = 7.10" for 50-yr event
 Inflow = 23.56 cfs @ 12.13 hrs, Volume= 62,963 cf
 Outflow = 23.56 cfs @ 12.13 hrs, Volume= 62,963 cf, Atten= 0%, Lag= 0.0 min
 Primary = 4.95 cfs @ 11.79 hrs, Volume= 41,243 cf
 Secondary = 19.41 cfs @ 12.13 hrs, Volume= 21,720 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 326.31' @ 12.13 hrs

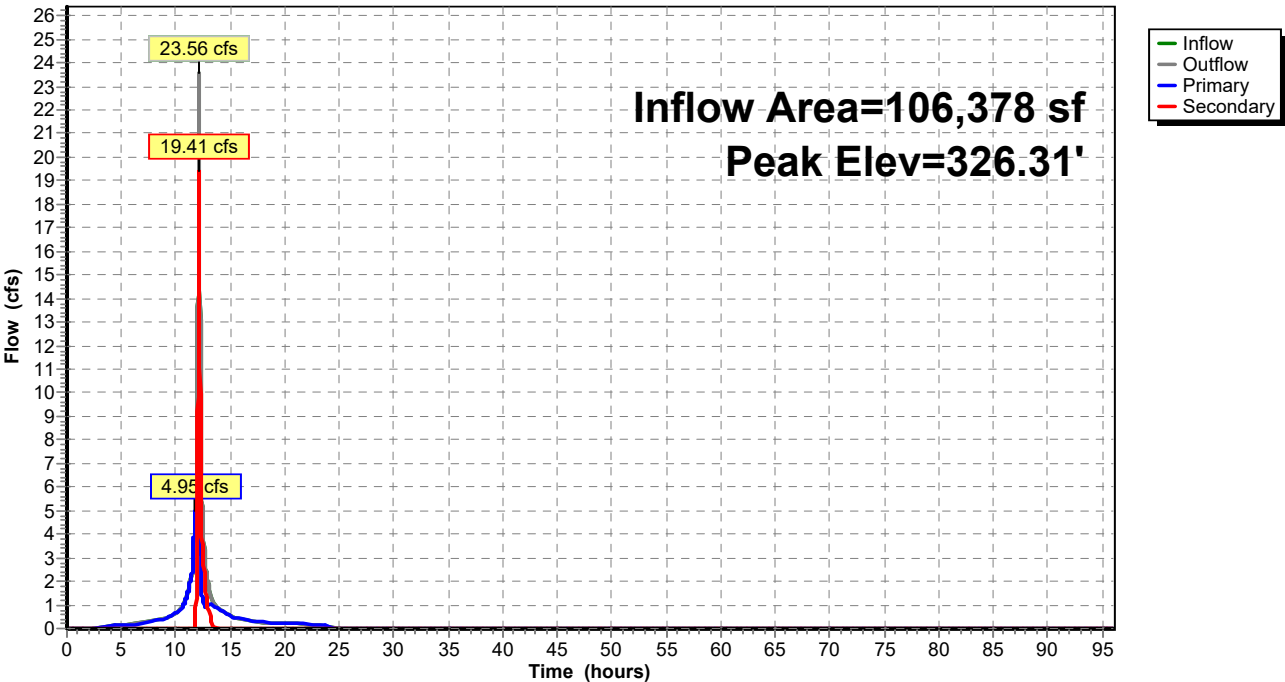
Flood Elev= 328.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	323.00'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 323.00' / 323.00' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	323.00'	24.0" Round Culvert L= 51.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 323.00' / 320.00' S= 0.0588 ' S= 0.0588 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	325.50'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.89 cfs @ 11.79 hrs HW=325.54' TW=323.87' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 4.89 cfs @ 6.22 fps)**Secondary OutFlow** Max=19.41 cfs @ 12.13 hrs HW=326.31' TW=0.00' (Dynamic Tailwater)↑ **2=Culvert** (Passes 19.41 cfs of 23.01 cfs potential flow)↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 19.41 cfs @ 2.98 fps)

Pond 15: DIV-1

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Pond 16: INF-1

Inflow Area = 106,378 sf, 85.91% Impervious, Inflow Depth = 4.65" for 50-yr event
 Inflow = 4.95 cfs @ 11.79 hrs, Volume= 41,243 cf
 Outflow = 1.18 cfs @ 11.03 hrs, Volume= 41,243 cf, Atten= 76%, Lag= 0.0 min
 Discarded = 1.18 cfs @ 11.03 hrs, Volume= 41,243 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 325.67' @ 12.47 hrs Surf.Area= 4,245 sf Storage= 9,292 cf

Plug-Flow detention time= 49.7 min calculated for 41,239 cf (100% of inflow)
 Center-of-Mass det. time= 49.7 min (817.6 - 767.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	322.50'	4,688 cf	36.75'W x 115.50'L x 4.33'H Field A 18,393 cf Overall - 6,674 cf Embedded = 11,720 cf x 40.0% Voids
#2A	323.00'	6,674 cf	Cultec R-360HD x 180 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 180 Chambers in 6 Rows Cap Storage= +6.5 cf x 2 x 6 rows = 77.5 cf
		11,361 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	322.50'	12.000 in/hr Exfiltration over Horizontal area Phase-In= 0.01'

Discarded OutFlow Max=1.18 cfs @ 11.03 hrs HW=322.55' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 1.18 cfs)

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Pond 16: INF-1 - Chamber Wizard Field A

Chamber Model = Cultec R-360HD (Cultec Recharger® 360HD)

Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf

Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap

Cap Storage= +6.5 cf x 2 x 6 rows = 77.5 cf

60.0" Wide + 9.0" Spacing = 69.0" C-C Row Spacing

30 Chambers/Row x 3.67' Long +1.25' Cap Length x 2 = 112.50' Row Length +18.0" End Stone x 2 = 115.50' Base Length

6 Rows x 60.0" Wide + 9.0" Spacing x 5 + 18.0" Side Stone x 2 = 36.75' Base Width

6.0" Base + 36.0" Chamber Height + 10.0" Cover = 4.33' Field Height

180 Chambers x 36.6 cf + 6.5 cf Cap Volume x 2 x 6 Rows = 6,673.6 cf Chamber Storage

18,393.4 cf Field - 6,673.6 cf Chambers = 11,719.8 cf Stone x 40.0% Voids = 4,687.9 cf Stone Storage

Chamber Storage + Stone Storage = 11,361.5 cf = 0.261 af

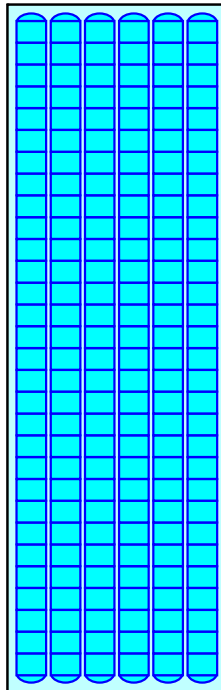
Overall Storage Efficiency = 61.8%

Overall System Size = 115.50' x 36.75' x 4.33'

180 Chambers

681.2 cy Field

434.1 cy Stone



N60 P1 Post-A 2021

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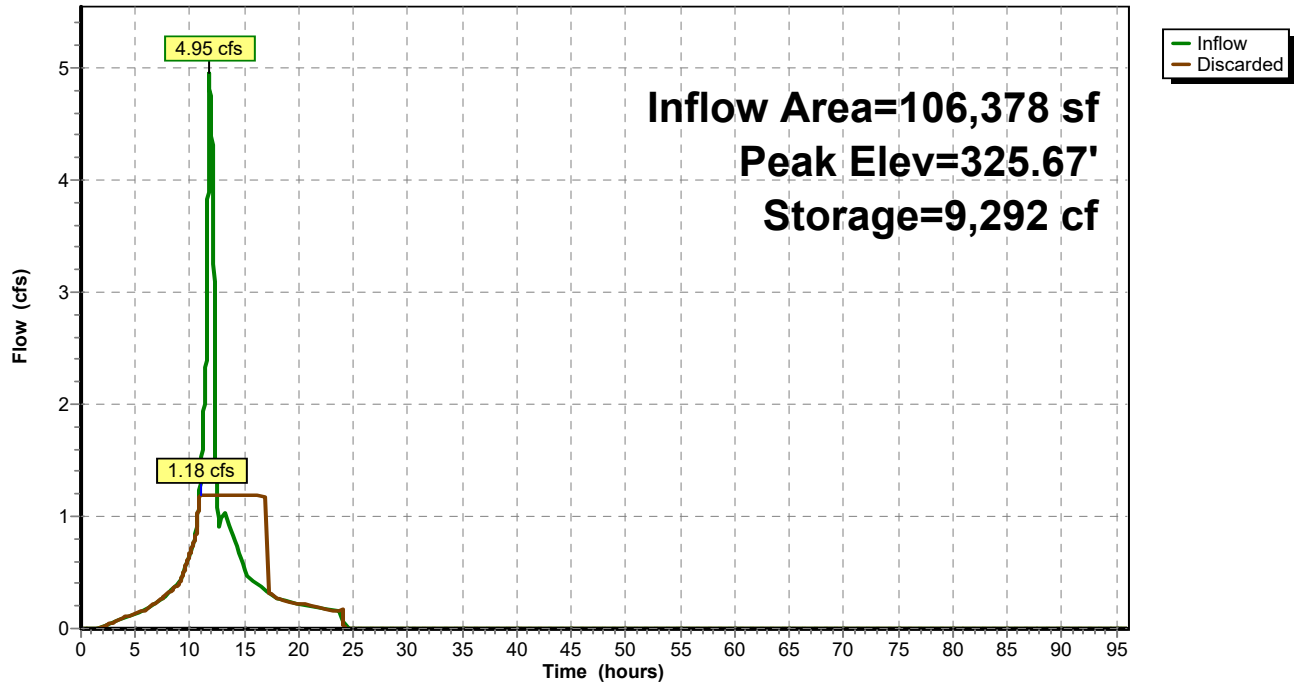
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Pond 16: INF-1

Hydrograph



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Summary for Subcatchment 17: Post A5

Runoff = 20.82 cfs @ 12.13 hrs, Volume= 57,772 cf, Depth= 7.46"

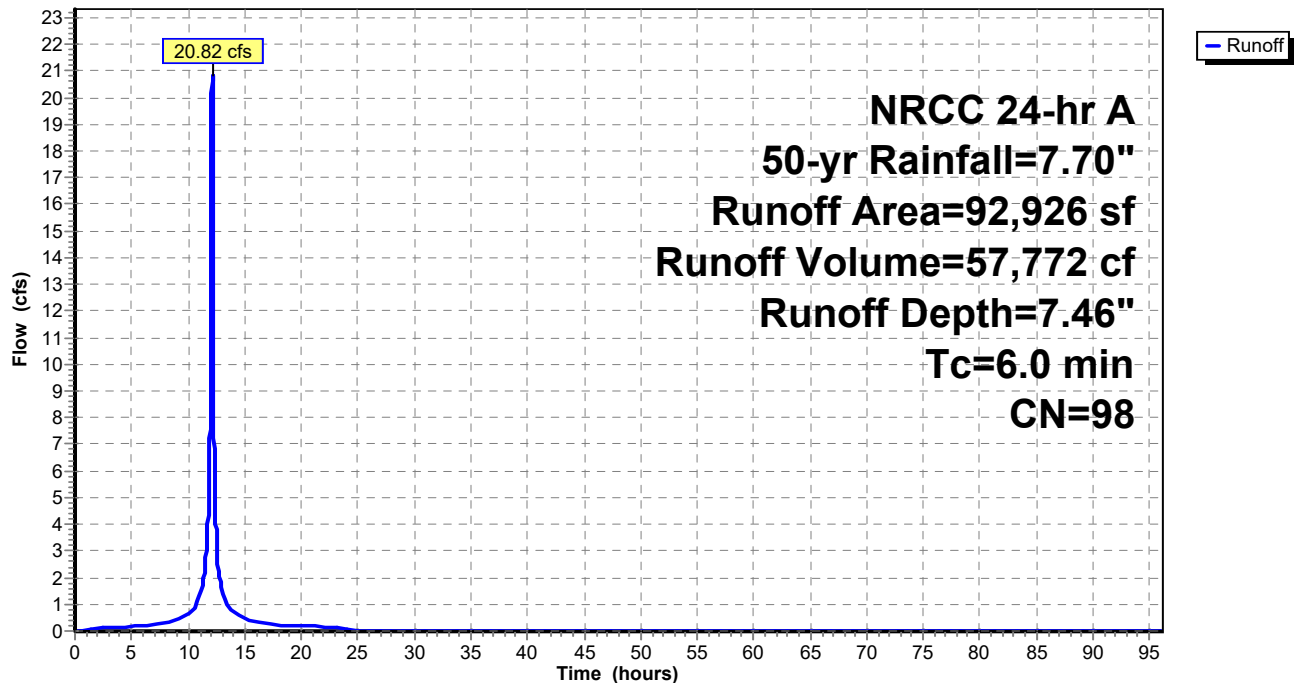
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 50-yr Rainfall=7.70"

Area (sf)	CN	Description
92,926	98	Roofs, HSG C
92,926		100.00% Impervious Area

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

Subcatchment 17: Post A5

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Pond 18: DIV-2

Inflow Area = 92,926 sf, 100.00% Impervious, Inflow Depth = 7.46" for 50-yr event
 Inflow = 20.82 cfs @ 12.13 hrs, Volume= 57,772 cf
 Outflow = 20.82 cfs @ 12.13 hrs, Volume= 57,772 cf, Atten= 0%, Lag= 0.0 min
 Primary = 5.54 cfs @ 12.12 hrs, Volume= 40,133 cf
 Secondary = 15.32 cfs @ 12.13 hrs, Volume= 17,639 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 365.03' @ 12.13 hrs

Flood Elev= 371.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	360.50'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 360.50' / 360.50' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	363.00'	24.0" Round Culvert L= 550.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 363.00' / 355.00' S= 0.0145 ' S= 0.0145 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	363.50'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=5.45 cfs @ 12.12 hrs HW=364.99' TW=362.91' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 5.45 cfs @ 6.94 fps)**Secondary OutFlow** Max=15.32 cfs @ 12.13 hrs HW=365.03' TW=355.52' (Dynamic Tailwater)↑ **2=Culvert** (Inlet Controls 15.32 cfs @ 4.87 fps)↑ **3=Broad-Crested Rectangular Weir** (Passes 15.32 cfs of 50.02 cfs potential flow)

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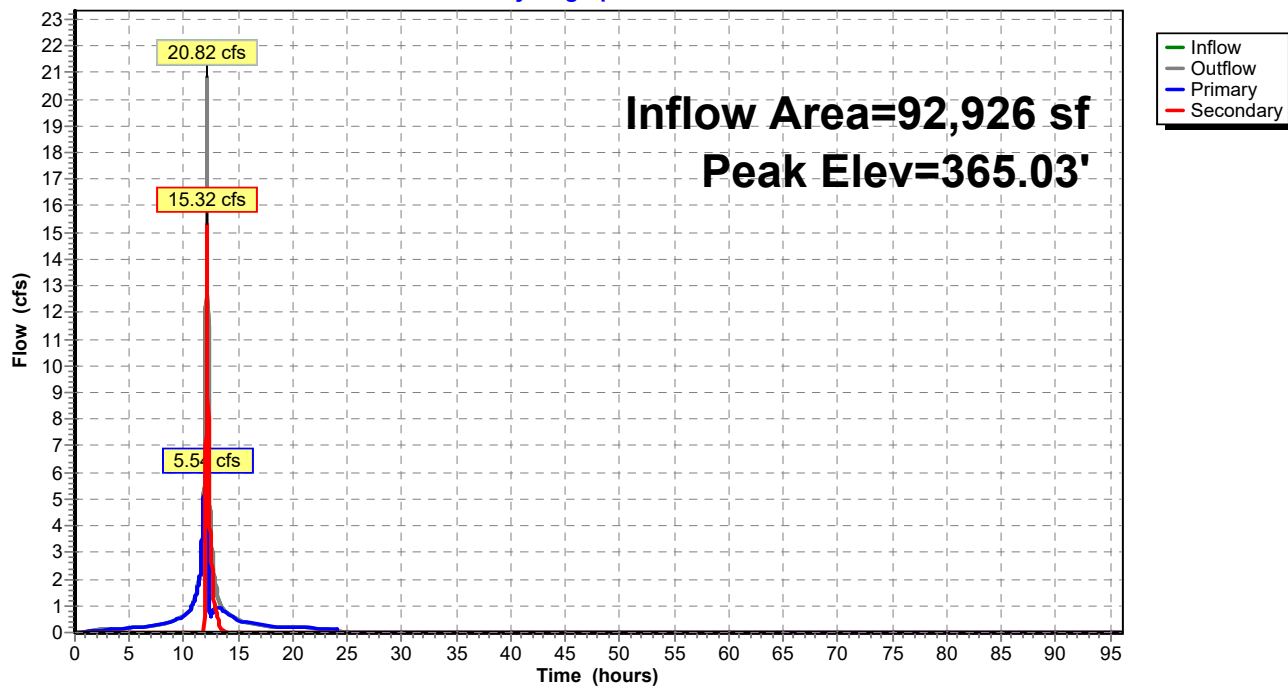
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NRCC 24-hr A 50-yr Rainfall=7.70"

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Pond 18: DIV-2

Hydrograph



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NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Pond 19: INF-2

Inflow Area = 92,926 sf, 100.00% Impervious, Inflow Depth = 5.18" for 50-yr event
 Inflow = 5.54 cfs @ 12.12 hrs, Volume= 40,133 cf
 Outflow = 0.99 cfs @ 10.94 hrs, Volume= 40,133 cf, Atten= 82%, Lag= 0.0 min
 Discarded = 0.99 cfs @ 10.94 hrs, Volume= 40,133 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 363.79' @ 12.37 hrs Surf.Area= 4,285 sf Storage= 10,553 cf

Plug-Flow detention time= 67.5 min calculated for 40,129 cf (100% of inflow)
 Center-of-Mass det. time= 67.5 min (811.2 - 743.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	360.00'	4,724 cf	42.50'W x 100.83'L x 4.33'H Field A 18,570 cf Overall - 6,760 cf Embedded = 11,810 cf x 40.0% Voids
#2A	360.50'	6,760 cf	Cultec R-360HD x 182 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 182 Chambers in 7 Rows Cap Storage= +6.5 cf x 2 x 7 rows = 90.4 cf
11,484 cf			Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	360.00'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.01'

Discarded OutFlow Max=0.99 cfs @ 10.94 hrs HW=360.05' (Free Discharge)

↑1=Exfiltration (Exfiltration Controls 0.99 cfs)

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Pond 19: INF-2 - Chamber Wizard Field A

Chamber Model = Cultec R-360HD (Cultec Recharger® 360HD)

Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf

Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap

Cap Storage= +6.5 cf x 2 x 7 rows = 90.4 cf

60.0" Wide + 9.0" Spacing = 69.0" C-C Row Spacing

26 Chambers/Row x 3.67' Long +1.25' Cap Length x 2 = 97.83' Row Length +18.0" End Stone x 2 = 100.83' Base Length

7 Rows x 60.0" Wide + 9.0" Spacing x 6 + 18.0" Side Stone x 2 = 42.50' Base Width

6.0" Base + 36.0" Chamber Height + 10.0" Cover = 4.33' Field Height

182 Chambers x 36.6 cf + 6.5 cf Cap Volume x 2 x 7 Rows = 6,759.8 cf Chamber Storage

18,570.1 cf Field - 6,759.8 cf Chambers = 11,810.4 cf Stone x 40.0% Voids = 4,724.1 cf Stone Storage

Chamber Storage + Stone Storage = 11,483.9 cf = 0.264 af

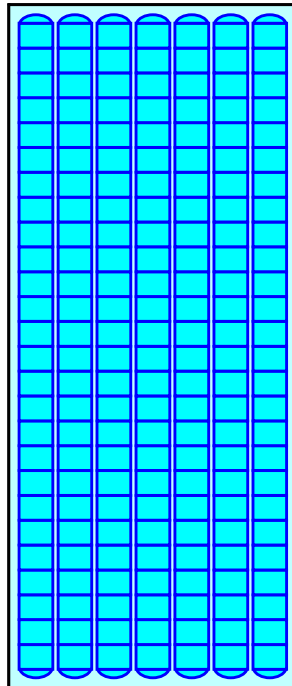
Overall Storage Efficiency = 61.8%

Overall System Size = 100.83' x 42.50' x 4.33'

182 Chambers

687.8 cy Field

437.4 cy Stone



N60 P1 Post-A 2021

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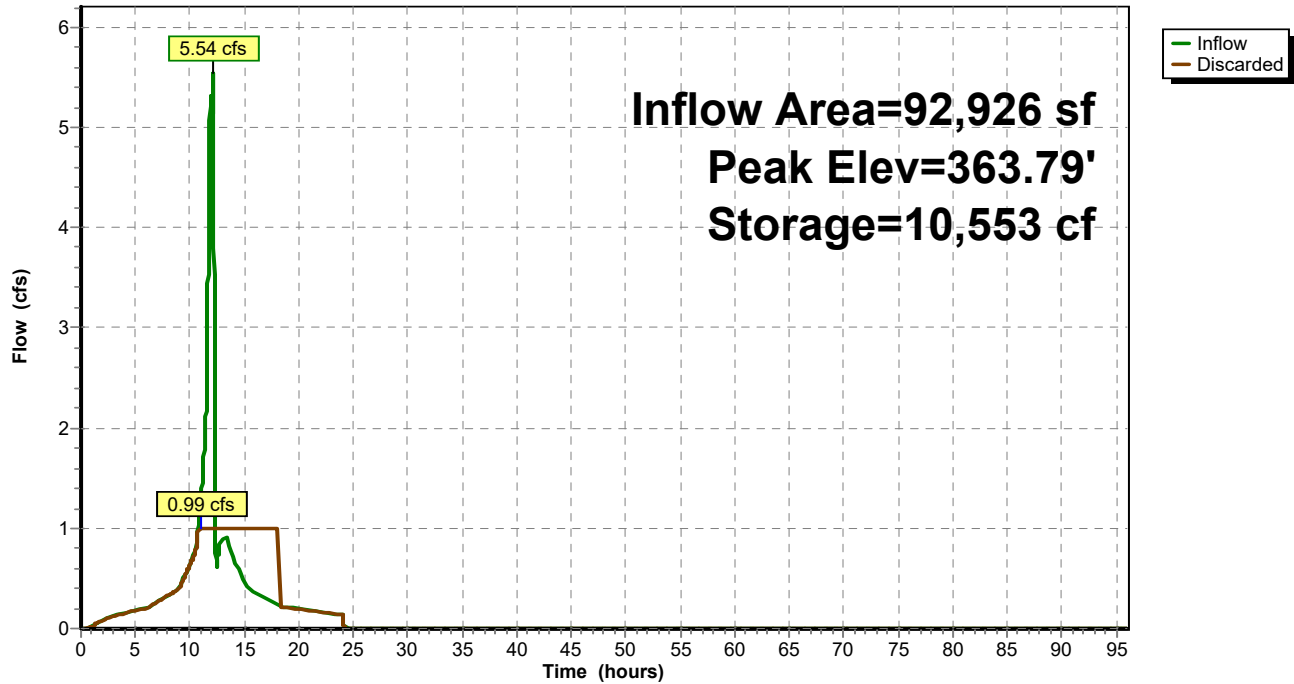
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NRCC 24-hr A 50-yr Rainfall=7.70"

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Pond 19: INF-2

Hydrograph



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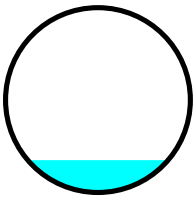
Summary for Reach 20: 36" HDPE Pipe

Inflow = 15.32 cfs @ 12.13 hrs, Volume= 17,639 cf
Outflow = 15.20 cfs @ 12.14 hrs, Volume= 17,639 cf, Atten= 1%, Lag= 0.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 18.51 fps, Min. Travel Time= 0.7 min
Avg. Velocity= 8.33 fps, Avg. Travel Time= 1.6 min

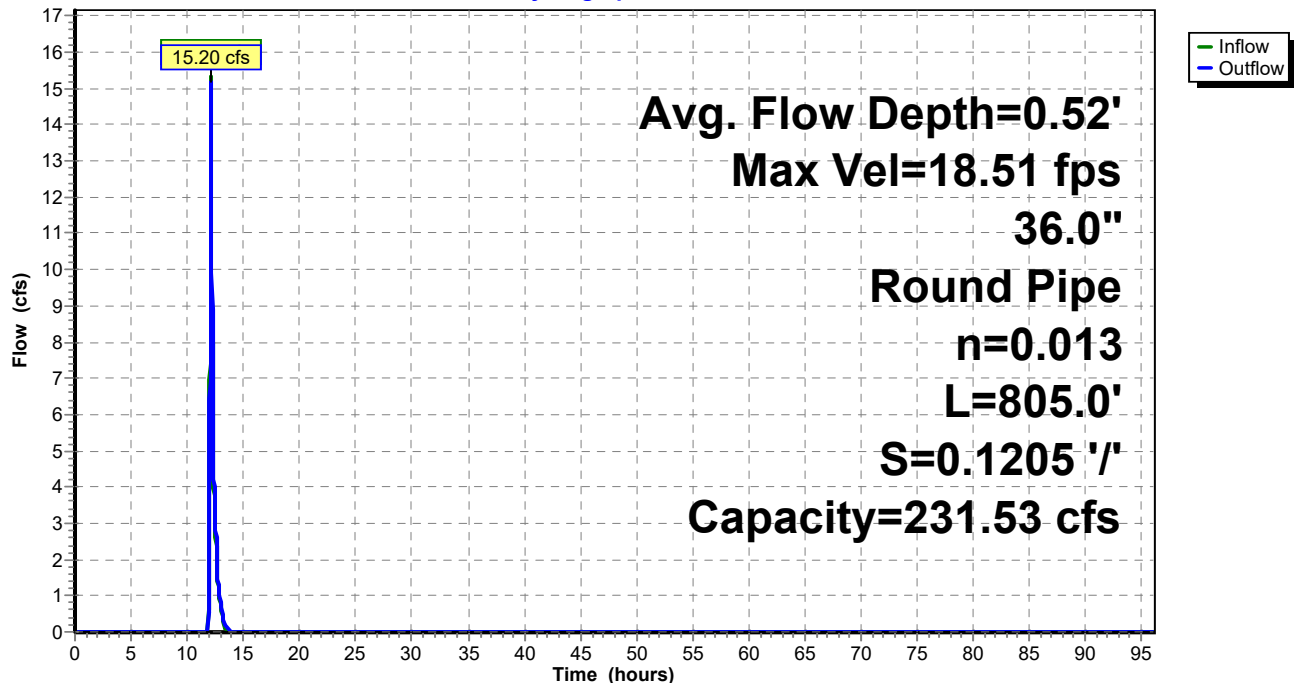
Peak Storage= 661 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.52'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 231.53 cfs

36.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 805.0' Slope= 0.1205 '/'
Inlet Invert= 355.00', Outlet Invert= 258.00'



Reach 20: 36" HDPE Pipe

Hydrograph



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NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Subcatchment 21: A6

Runoff = 85.61 cfs @ 12.13 hrs, Volume= 231,504 cf, Depth= 7.22"

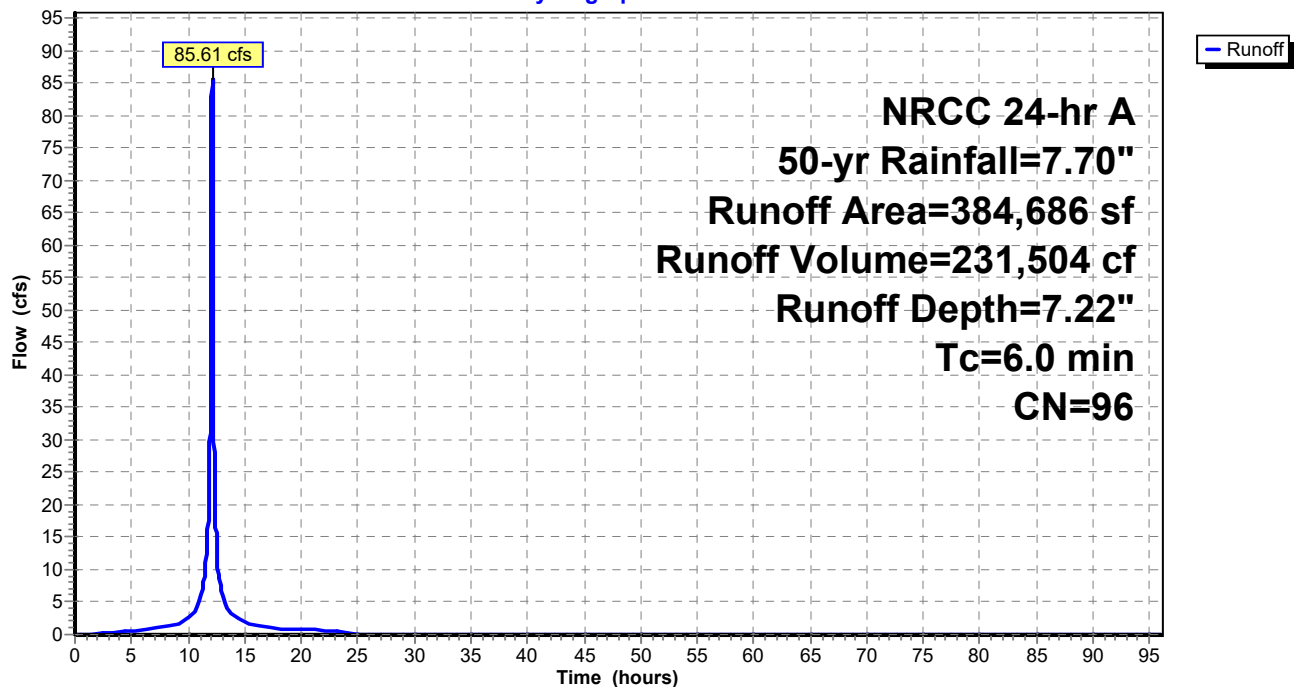
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 50-yr Rainfall=7.70"

Area (sf)	CN	Description
332,512	98	Paved parking, HSG C
52,174	86	<50% Grass cover, Poor, HSG C
384,686	96	Weighted Average
52,174		13.56% Pervious Area
332,512		86.44% Impervious Area

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

Subcatchment 21: A6

Hydrograph



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NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Subcatchment 22: A7

Runoff = 14.91 cfs @ 12.13 hrs, Volume= 34,442 cf, Depth= 3.98"

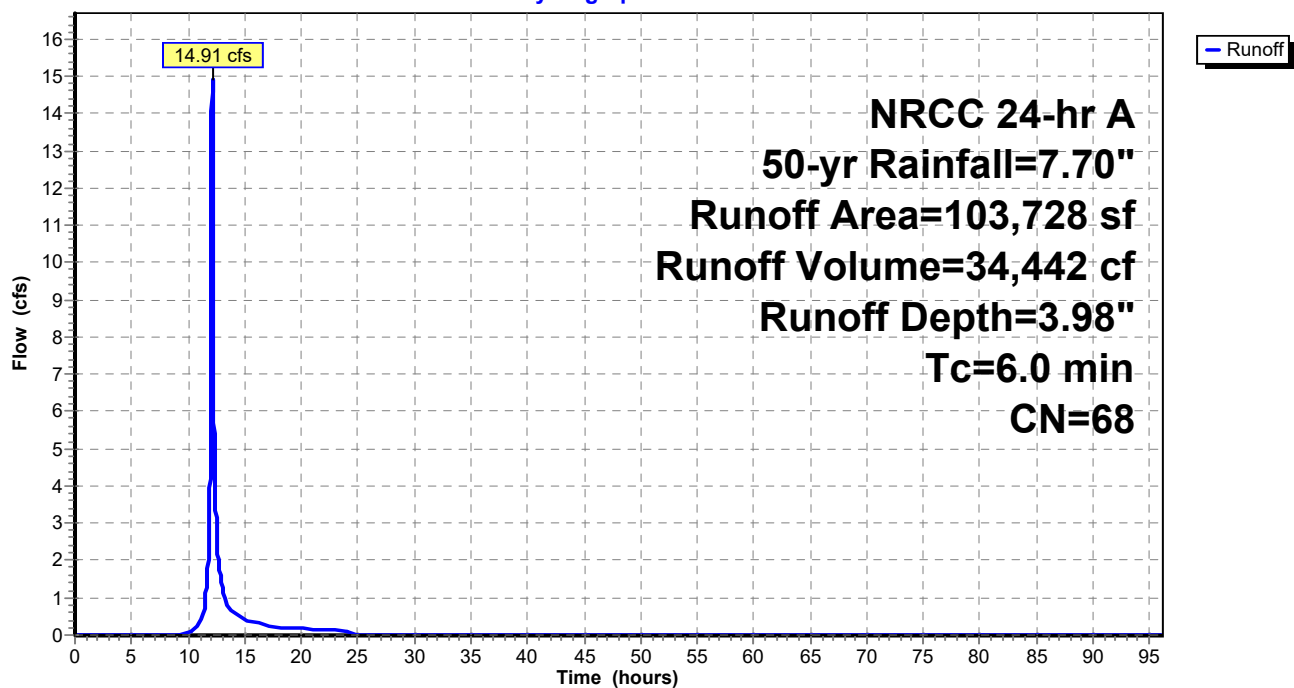
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 50-yr Rainfall=7.70"

Area (sf)	CN	Description
35,128	65	Brush, Good, HSG C
68,600	70	Woods, Good, HSG C
103,728	68	Weighted Average
103,728		100.00% Pervious Area

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

Subcatchment 22: A7

Hydrograph



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NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Pond 23: Infiltration Basin (SWP-3)

Inflow Area = 488,414 sf, 68.08% Impervious, Inflow Depth = 6.97" for 50-yr event
 Inflow = 115.56 cfs @ 12.13 hrs, Volume= 283,586 cf
 Outflow = 87.10 cfs @ 12.18 hrs, Volume= 283,586 cf, Atten= 25%, Lag= 3.0 min
 Discarded = 6.61 cfs @ 12.18 hrs, Volume= 187,449 cf
 Primary = 80.49 cfs @ 12.18 hrs, Volume= 96,136 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 261.52' @ 12.18 hrs Surf.Area= 19,038 sf Storage= 77,750 cf

Plug-Flow detention time= 52.8 min calculated for 283,556 cf (100% of inflow)
 Center-of-Mass det. time= 52.8 min (812.2 - 759.4)

Volume	Invert	Avail.Storage	Storage Description		
#1	256.00'	103,740 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
256.00	9,450	527.9	0	0	9,450
258.00	12,731	565.7	22,100	22,100	12,917
260.00	16,238	603.5	28,898	50,998	16,623
262.00	19,973	641.3	36,147	87,144	20,569
262.80	21,527	656.4	16,596	103,740	22,212

Device	Routing	Invert	Outlet Devices
#1	Primary	254.00'	36.0" Round Culvert X 2.00 L= 95.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 254.00' / 244.00' S= 0.1053 ' S= 0.1053 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	260.00'	2.0' long x 0.5' breadth Broad-Crested Rectangular Weir X 2.00 Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	260.00'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir X 2.00 Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	259.40'	6.0" Vert. Orifice/Grate C= 0.600
#5	Device 1	261.00'	36.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Discarded	256.00'	15.000 in/hr Exfiltration over Surface area Phase-In= 0.10'

Discarded OutFlow Max=6.61 cfs @ 12.18 hrs HW=261.52' (Free Discharge)

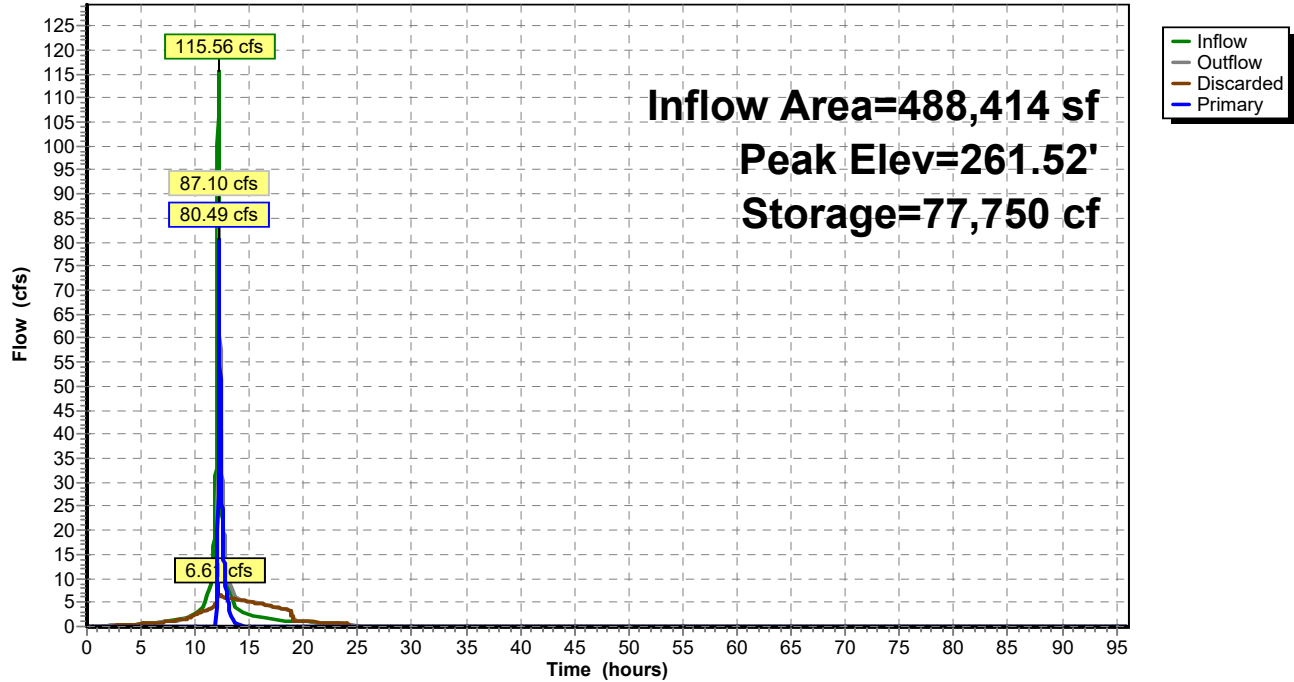
↳ **6=Exfiltration** (Exfiltration Controls 6.61 cfs)

Primary OutFlow Max=80.38 cfs @ 12.18 hrs HW=261.52' TW=0.00' (Dynamic Tailwater)

↳ **1=Culvert** (Passes 80.38 cfs of 166.98 cfs potential flow)
 ↳ **2=Broad-Crested Rectangular Weir** (Weir Controls 24.82 cfs @ 4.09 fps)
 ↳ **3=Broad-Crested Rectangular Weir** (Weir Controls 37.23 cfs @ 4.09 fps)
 ↳ **4=Orifice/Grate** (Orifice Controls 1.29 cfs @ 6.58 fps)
 ↳ **5=Orifice/Grate** (Weir Controls 17.04 cfs @ 2.35 fps)

Pond 23: Infiltration Basin (SWP-3)

Hydrograph



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NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Subcatchment 24: A9

Runoff = 7.49 cfs @ 12.13 hrs, Volume= 20,020 cf, Depth= 7.10"

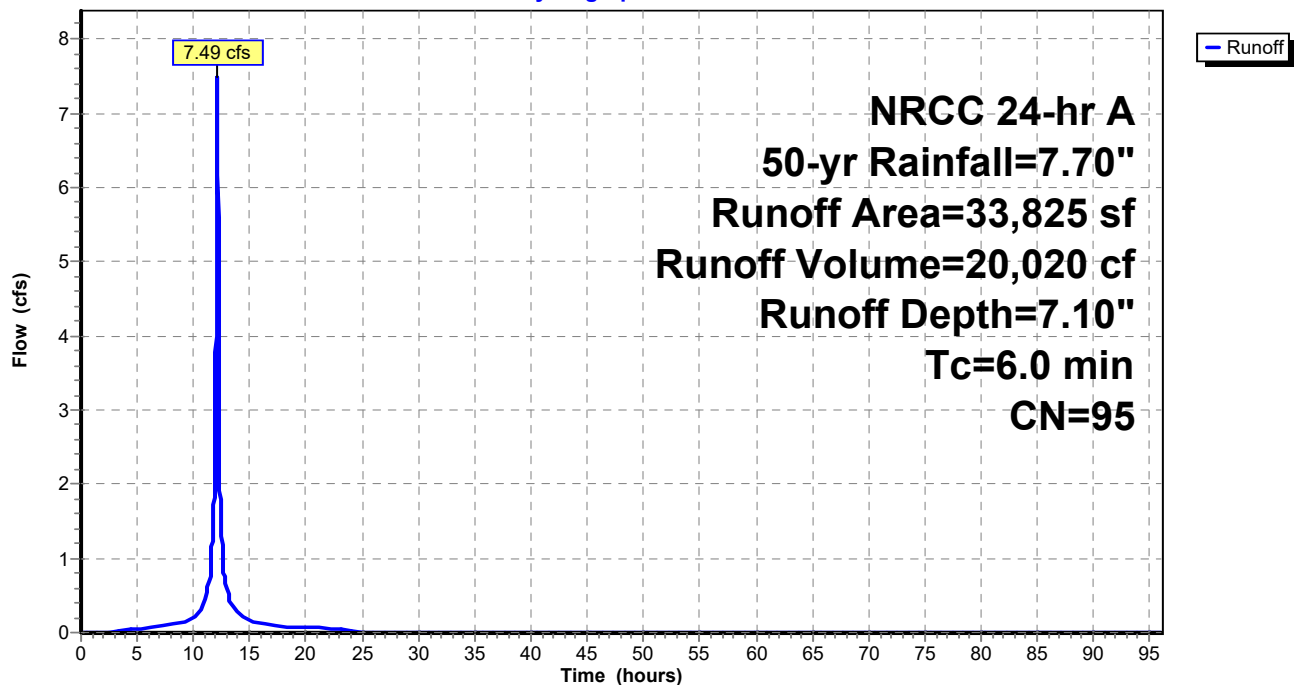
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 50-yr Rainfall=7.70"

Area (sf)	CN	Description
29,687	98	Paved parking, HSG C
4,138	74	>75% Grass cover, Good, HSG C
33,825	95	Weighted Average
4,138		12.23% Pervious Area
29,687		87.77% Impervious Area

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

Subcatchment 24: A9

Hydrograph



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NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Pond 25: DIV-4

Inflow Area = 33,825 sf, 87.77% Impervious, Inflow Depth = 7.10" for 50-yr event
 Inflow = 7.49 cfs @ 12.13 hrs, Volume= 20,020 cf
 Outflow = 7.49 cfs @ 12.13 hrs, Volume= 20,020 cf, Atten= 0%, Lag= 0.0 min
 Primary = 4.78 cfs @ 12.05 hrs, Volume= 16,371 cf
 Secondary = 3.54 cfs @ 12.14 hrs, Volume= 3,649 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 349.62' @ 12.14 hrs

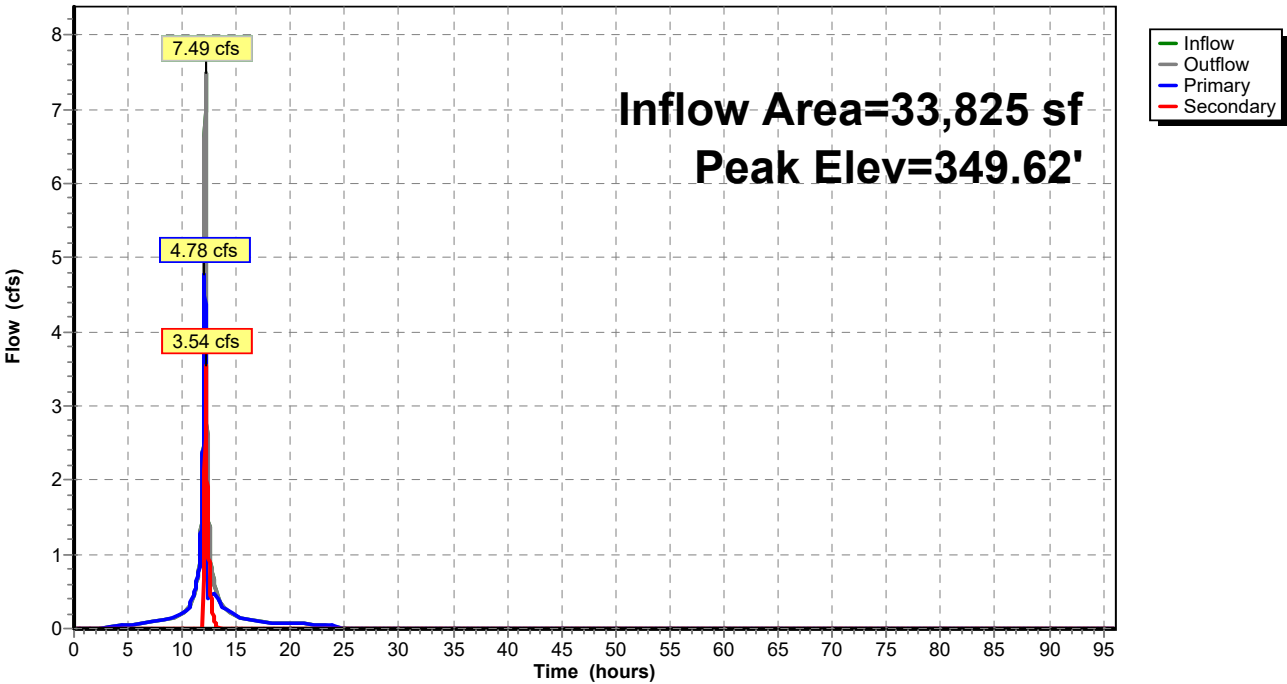
Flood Elev= 356.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	346.50'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 346.50' / 346.50' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	347.50'	18.0" Round Culvert L= 128.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 347.50' / 344.00' S= 0.0273 ' S= 0.0273 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	349.33'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.64 cfs @ 12.05 hrs HW=349.38' TW=347.87' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 4.64 cfs @ 5.91 fps)**Secondary OutFlow** Max=3.53 cfs @ 12.14 hrs HW=349.62' TW=0.00' (Dynamic Tailwater)↑ **2=Culvert** (Passes 3.53 cfs of 9.95 cfs potential flow)↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 3.53 cfs @ 1.53 fps)

Pond 25: DIV-4

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Pond 26: INF-4

Inflow Area = 33,825 sf, 87.77% Impervious, Inflow Depth = 5.81" for 50-yr event
 Inflow = 4.78 cfs @ 12.05 hrs, Volume= 16,371 cf
 Outflow = 0.52 cfs @ 11.30 hrs, Volume= 16,371 cf, Atten= 89%, Lag= 0.0 min
 Discarded = 0.52 cfs @ 11.30 hrs, Volume= 16,371 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 349.51' @ 12.29 hrs Surf.Area= 2,242 sf Storage= 5,067 cf

Plug-Flow detention time= 63.7 min calculated for 16,369 cf (100% of inflow)
 Center-of-Mass det. time= 63.7 min (824.1 - 760.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	346.00'	2,196 cf	30.50'W x 73.50'L x 3.88'H Field A 8,687 cf Overall - 3,196 cf Embedded = 5,490 cf x 40.0% Voids
#2A	346.50'	3,196 cf	Cultec R-330XLHD x 60 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 6 rows
		5,393 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	346.00'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.01'

Discarded OutFlow Max=0.52 cfs @ 11.30 hrs HW=346.04' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.52 cfs)

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NRCC 24-hr A 50-yr Rainfall=7.70"

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Pond 26: INF-4 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 6 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

10 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 71.50' Row Length +12.0" End Stone x 2 = 73.50' Base Length

6 Rows x 52.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.50' Base Width

6.0" Base + 30.5" Chamber Height + 10.0" Cover = 3.88' Field Height

60 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 6 Rows = 3,196.5 cf Chamber Storage

8,686.8 cf Field - 3,196.5 cf Chambers = 5,490.3 cf Stone x 40.0% Voids = 2,196.1 cf Stone Storage

Chamber Storage + Stone Storage = 5,392.6 cf = 0.124 af

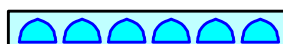
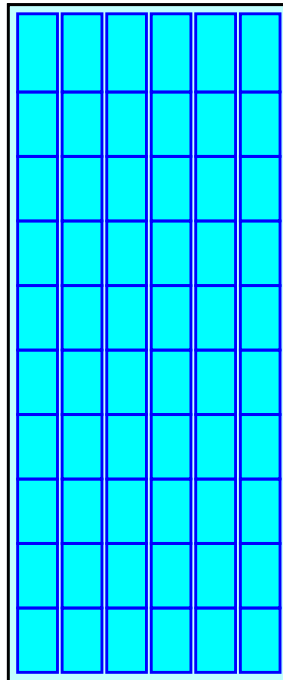
Overall Storage Efficiency = 62.1%

Overall System Size = 73.50' x 30.50' x 3.88'

60 Chambers

321.7 cy Field

203.3 cy Stone



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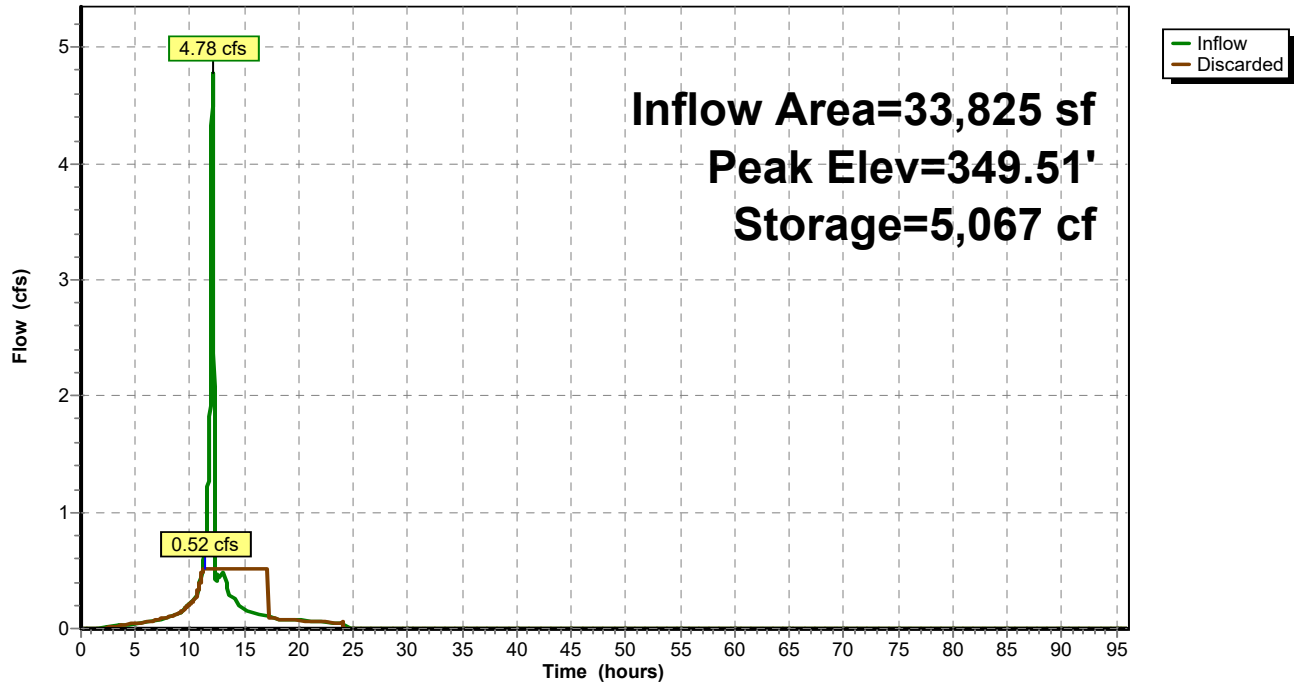
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NRCC 24-hr A 50-yr Rainfall=7.70"

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Pond 26: INF-4

Hydrograph



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NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Subcatchment 27: A10

Runoff = 31.14 cfs @ 12.13 hrs, Volume= 78,591 cf, Depth= 6.39"

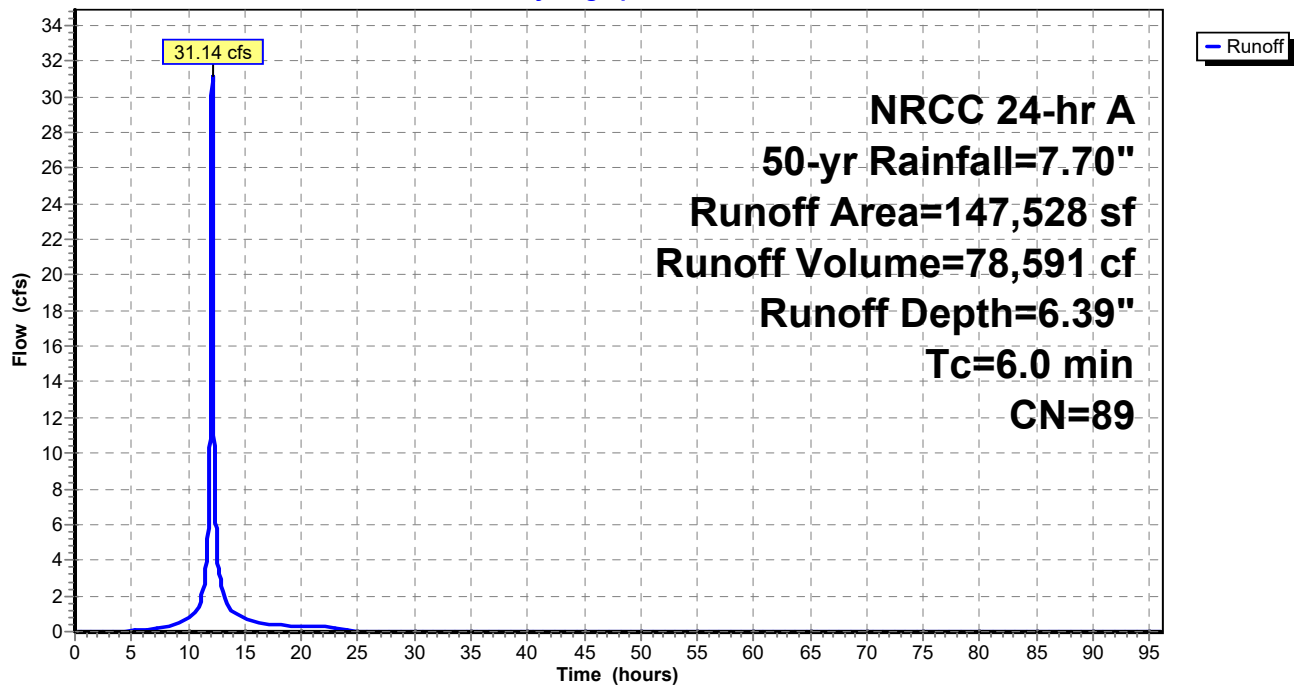
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 50-yr Rainfall=7.70"

Area (sf)	CN	Description
91,430	98	Paved parking, HSG C
5,603	80	>75% Grass cover, Good, HSG D
7,435	74	>75% Grass cover, Good, HSG C
16,120	73	Brush, Good, HSG D
19,715	77	Brush, Poor, HSG C
7,225	70	Woods, Good, HSG C
147,528	89	Weighted Average
56,098		38.03% Pervious Area
91,430		61.97% Impervious Area

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

Subcatchment 27: A10

Hydrograph



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NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Subcatchment 28: A10

Runoff = 2.40 cfs @ 12.13 hrs, Volume= 6,575 cf, Depth= 7.34"

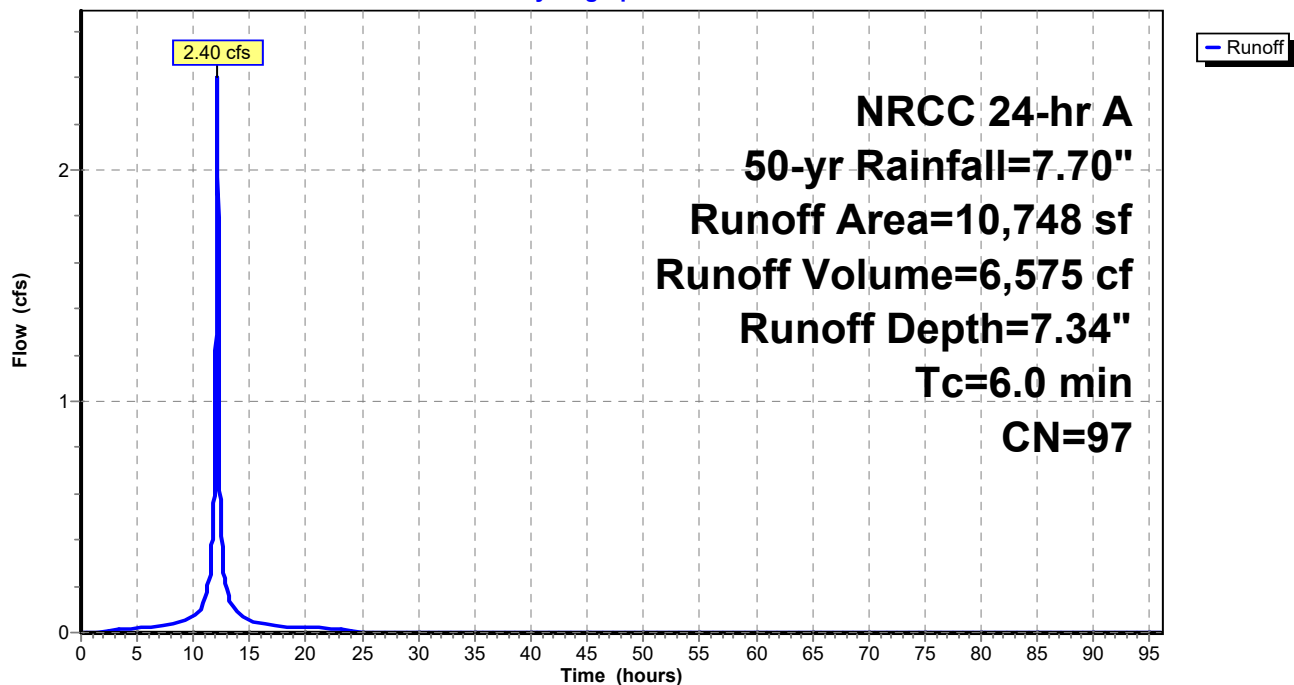
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 50-yr Rainfall=7.70"

Area (sf)	CN	Description
10,280	98	Paved parking, HSG D
468	80	>75% Grass cover, Good, HSG D
10,748	97	Weighted Average
468		4.35% Pervious Area
10,280		95.65% Impervious Area

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

Subcatchment 28: A10

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Pond 29: Infiltration Basin (SWP-2)

Inflow Area = 158,276 sf, 64.26% Impervious, Inflow Depth = 6.46" for 50-yr event
 Inflow = 33.54 cfs @ 12.13 hrs, Volume= 85,166 cf
 Outflow = 7.03 cfs @ 12.41 hrs, Volume= 85,166 cf, Atten= 79%, Lag= 16.8 min
 Discarded = 3.18 cfs @ 12.41 hrs, Volume= 70,663 cf
 Primary = 3.85 cfs @ 12.41 hrs, Volume= 14,504 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 319.03' @ 12.41 hrs Surf.Area= 9,158 sf Storage= 32,565 cf

Plug-Flow detention time= 66.2 min calculated for 85,158 cf (100% of inflow)
 Center-of-Mass det. time= 66.2 min (840.5 - 774.2)

Volume	Invert	Avail.Storage	Storage Description		
#1	314.00'	47,274 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
314.00	4,026	293.0	0	0	4,026
316.00	5,897	330.7	9,864	9,864	5,998
318.00	7,994	368.3	13,838	23,702	8,204
320.00	10,316	406.0	18,261	41,962	10,652
320.50	10,932	415.4	5,311	47,274	11,300

Device	Routing	Invert	Outlet Devices
#1	Primary	308.00'	15.0" Round Culvert L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 308.00' / 304.00' S= 0.0667 ' S= 0.0667 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	316.50'	6.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	318.50'	2.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	319.00'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Discarded	314.00'	15.000 in/hr Exfiltration over Surface area Phase-In= 0.10'

Discarded OutFlow Max=3.18 cfs @ 12.41 hrs HW=319.03' (Free Discharge)

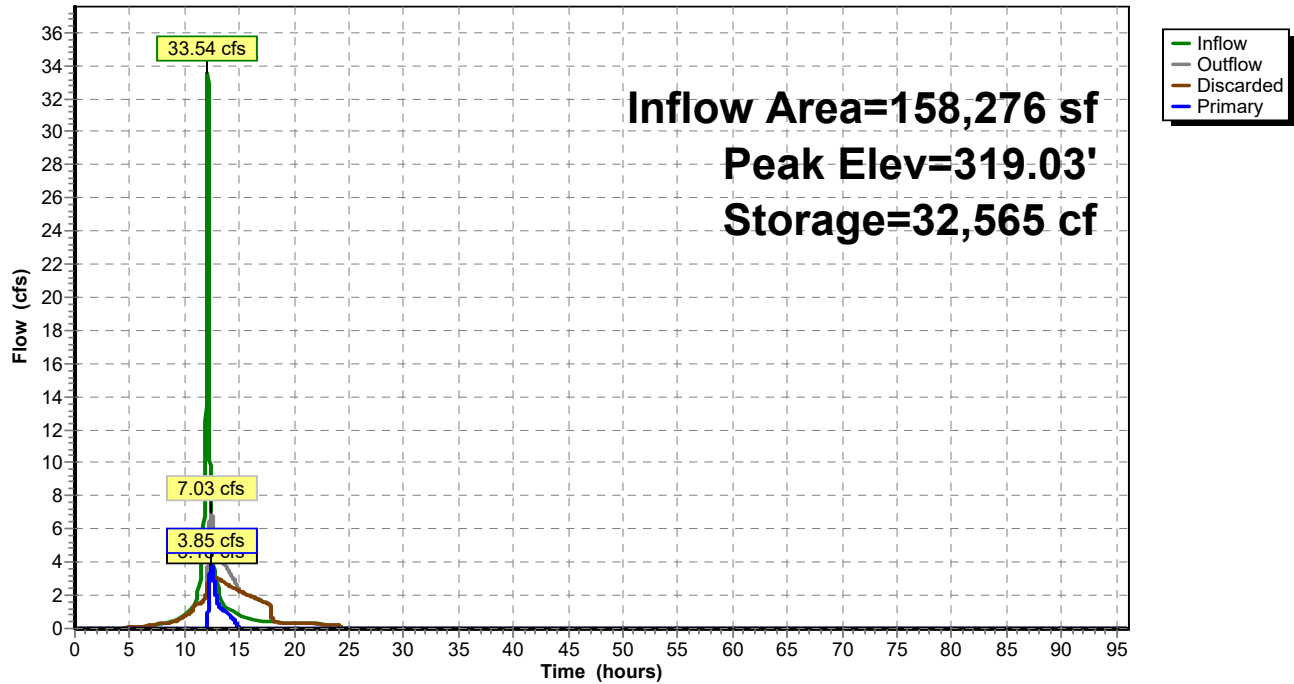
↳ **5=Exfiltration** (Exfiltration Controls 3.18 cfs)

Primary OutFlow Max=3.85 cfs @ 12.41 hrs HW=319.03' TW=0.00' (Dynamic Tailwater)

↳ **1=Culvert** (Passes 3.85 cfs of 19.06 cfs potential flow)
 ↳ **2=Orifice/Grate** (Orifice Controls 1.43 cfs @ 7.28 fps)
 ↳ **3=Broad-Crested Rectangular Weir** (Weir Controls 2.36 cfs @ 2.21 fps)
 ↳ **4=Broad-Crested Rectangular Weir** (Weir Controls 0.05 cfs @ 0.52 fps)

Pond 29: Infiltration Basin (SWP-2)

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Subcatchment 30: Post A2

Runoff = 27.47 cfs @ 12.26 hrs, Volume= 96,542 cf, Depth= 5.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 50-yr Rainfall=7.70"

Area (sf)	CN	Description
43,743	98	Paved parking, HSG C
107,245	74	>75% Grass cover, Good, HSG C
2,876	61	>75% Grass cover, Good, HSG B
39,583	70	Woods, Good, HSG C
4,283	98	Water Surface, HSG C
33,976	65	Brush, Good, HSG C
231,706	77	Weighted Average
183,680		79.27% Pervious Area
48,026		20.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0400	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.4	215	0.0260	2.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	125	0.1000	6.42		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.4	377	0.0750	14.42	17.69	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
17.7	817	Total			

N60 P1 Post-A 2021

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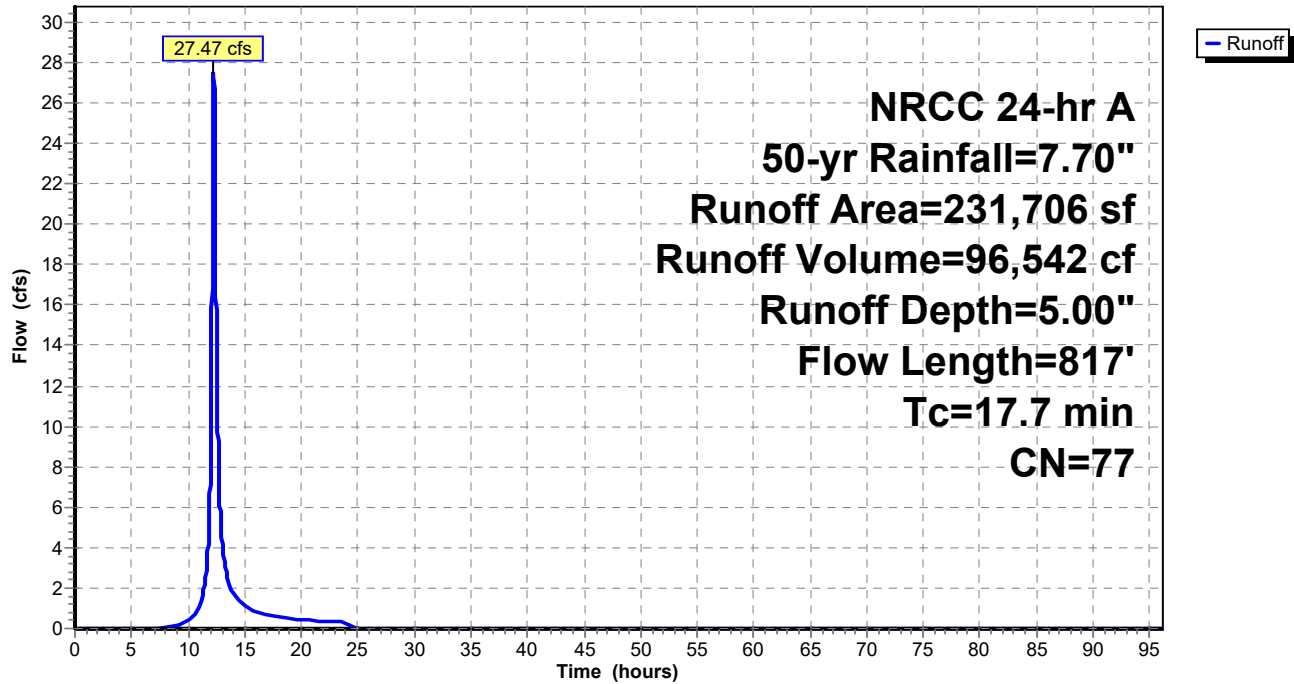
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NRCC 24-hr A 50-yr Rainfall=7.70"

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Subcatchment 30: Post A2

Hydrograph



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NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Pond 31: Pocket Wetland (SWP-1)

Inflow Area = 231,706 sf, 20.73% Impervious, Inflow Depth = 5.00" for 50-yr event
 Inflow = 27.47 cfs @ 12.26 hrs, Volume= 96,542 cf
 Outflow = 12.78 cfs @ 12.54 hrs, Volume= 88,588 cf, Atten= 53%, Lag= 16.5 min
 Primary = 12.78 cfs @ 12.54 hrs, Volume= 88,588 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Starting Elev= 234.50' Surf.Area= 12,504 sf Storage= 7,835 cf
 Peak Elev= 237.30' @ 12.54 hrs Surf.Area= 17,392 sf Storage= 41,468 cf (33,633 cf above start)

Plug-Flow detention time= 395.6 min calculated for 80,753 cf (84% of inflow)
 Center-of-Mass det. time= 294.2 min (1,108.1 - 813.9)

Volume	Invert	Avail.Storage	Storage Description
#1	230.00'	1,811 cf	Forebay (Irregular) Listed below (Recalc)
#2	230.00'	1,976 cf	Micropool (Irregular) Listed below (Recalc)
#3	233.90'	65,123 cf	Marsh & Storage (Irregular) Listed below (Recalc)
		68,911 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
230.00	86	34.2	0	0	86
231.00	217	53.2	147	147	225
232.00	406	72.3	307	453	426
233.00	651	91.4	524	977	688
233.90	1,233	129.1	834	1,811	1,357

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
230.00	86	34.2	0	0	86
231.00	217	53.2	147	147	225
232.00	406	72.3	307	453	426
233.00	651	91.4	524	977	688
233.90	1,646	155.1	1,000	1,976	1,942

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
233.90	4,232	530.5	0	0	4,232
234.50	9,625	400.9	4,048	4,048	13,842
235.00	10,440	413.5	5,015	9,063	14,683
236.00	12,144	438.8	11,281	20,344	16,451
237.00	13,950	464.0	13,037	33,381	18,317
238.00	15,856	489.2	14,893	48,273	20,287
239.00	17,864	514.5	16,850	65,123	22,369

Device	Routing	Invert	Outlet Devices
#1	Primary	232.00'	15.0" Round Culvert L= 117.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 232.00' / 216.50' S= 0.1325 ' / ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

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NRCC 24-hr A 50-yr Rainfall=7.70"

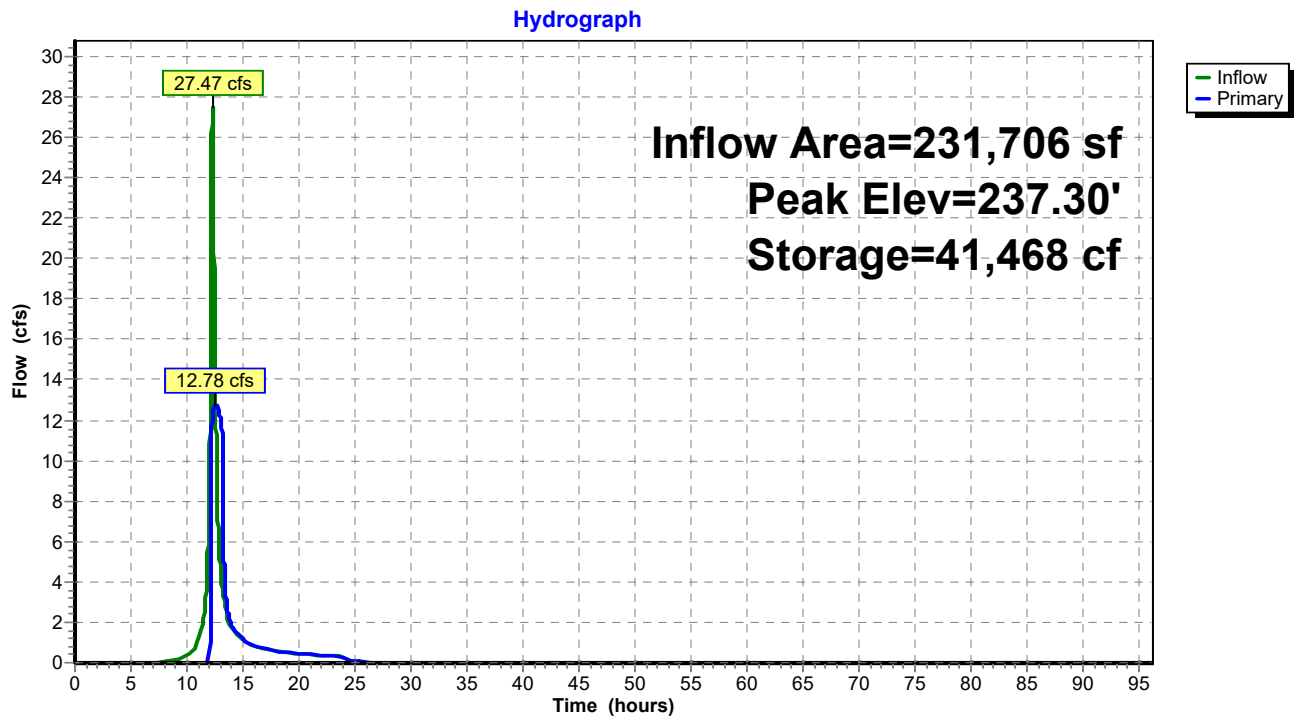
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#2	Device 1	234.50'	1.1" Vert. Orifice/Grate	C= 0.600
#3	Device 1	236.00'	36.0" x 48.0" Horiz. Orifice/Grate	C= 0.600
Limited to weir flow at low heads				

Primary OutFlow Max=12.78 cfs @ 12.54 hrs HW=237.30' TW=0.00' (Dynamic Tailwater)

1=Culvert (Inlet Controls 12.78 cfs @ 10.41 fps)
2=Orifice/Grate (Passes < 0.05 cfs potential flow)
3=Orifice/Grate (Passes < 65.93 cfs potential flow)

Pond 31: Pocket Wetland (SWP-1)



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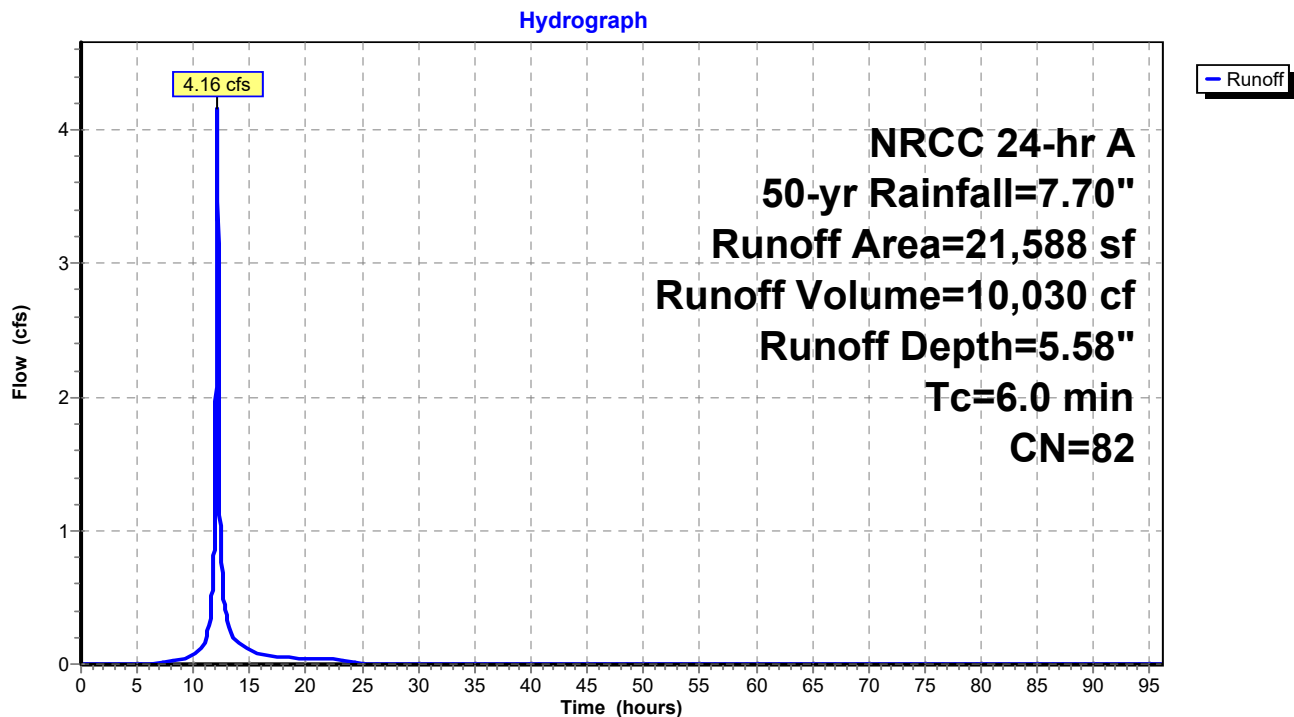
Summary for Subcatchment 32: Post A1

Runoff = 4.16 cfs @ 12.13 hrs, Volume= 10,030 cf, Depth= 5.58"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 50-yr Rainfall=7.70"

Area (sf)	CN	Description
8,152	98	Paved parking, HSG C
10,356	74	>75% Grass cover, Good, HSG C
3,080	70	Woods, Good, HSG C
21,588	82	Weighted Average
13,436		62.24% Pervious Area
8,152		37.76% Impervious Area

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

Subcatchment 32: Post A1

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NRCC 24-hr A 50-yr Rainfall=7.70"

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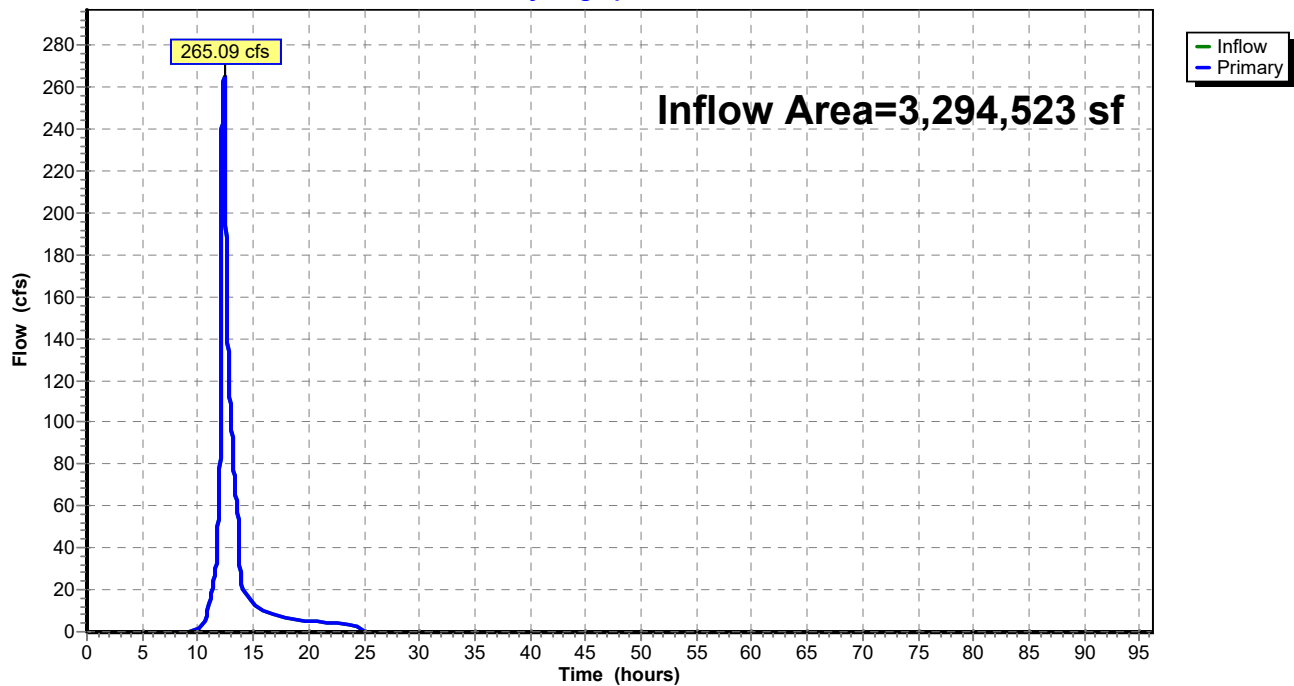
Summary for Link 33: Design Point A

Inflow Area = 3,294,523 sf, 35.27% Impervious, Inflow Depth > 4.57" for 50-yr event
Inflow = 265.09 cfs @ 12.38 hrs, Volume= 1,253,670 cf
Primary = 265.09 cfs @ 12.38 hrs, Volume= 1,253,670 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 33: Design Point A

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 8: Post A0 Offsite

Runoff Area=1,115,060 sf 57.87% Impervious Runoff Depth=0.68"
Flow Length=1,018' Tc=12.5 min CN=90 Runoff=21.26 cfs 63,508 cf

Pond 9: Offsite Pond A

Peak Elev=360.04' Storage=51,883 cf Inflow=21.26 cfs 63,508 cf
Outflow=0.61 cfs 12,313 cf

Subcatchment 10: Post A4

Runoff Area=164,583 sf 10.25% Impervious Runoff Depth=0.19"
Flow Length=340' Tc=20.5 min CN=76 Runoff=0.44 cfs 2,569 cf

Reach 11: Box Culvert

Avg. Flow Depth=0.06' Max Vel=0.84 fps Inflow=0.44 cfs 2,569 cf
n=0.041 L=98.0' S=0.0204 ' Capacity=177.99 cfs Outflow=0.43 cfs 2,569 cf

Subcatchment 12: Post A8

Runoff Area=392,732 sf 0.00% Impervious Runoff Depth=0.11"
Flow Length=320' Tc=21.4 min CN=72 Runoff=0.41 cfs 3,702 cf

Pond 12A: Existing Wetland A

Peak Elev=321.11' Storage=17 cf Inflow=0.82 cfs 18,584 cf
96.0" x 36.0" Box Culvert n=0.040 L=116.0' S=0.0776 ' Outflow=0.82 cfs 18,584 cf

Subcatchment 12B: Post A11

Runoff Area=722,164 sf 1.29% Impervious Runoff Depth=0.08"
Flow Length=475' Tc=19.8 min CN=70 Runoff=0.47 cfs 5,046 cf

Reach 13: Existing Stream A (Lower

Avg. Flow Depth=0.12' Max Vel=2.31 fps Inflow=1.24 cfs 23,631 cf
n=0.040 L=1,360.0' S=0.0721 ' Capacity=601.12 cfs Outflow=1.15 cfs 23,631 cf

Subcatchment 14: Post A3

Runoff Area=106,378 sf 85.91% Impervious Runoff Depth=1.01"
Tc=6.0 min CN=95 Runoff=3.78 cfs 8,977 cf

Pond 15: DIV-1

Peak Elev=324.67' Inflow=3.78 cfs 8,977 cf
Primary=3.78 cfs 8,977 cf Secondary=0.00 cfs 0 cf Outflow=3.78 cfs 8,977 cf

Pond 16: INF-1

Peak Elev=323.19' Storage=1,531 cf Inflow=3.78 cfs 8,977 cf
Outflow=1.18 cfs 8,977 cf

Subcatchment 17: Post A5

Runoff Area=92,926 sf 100.00% Impervious Runoff Depth=1.28"
Tc=6.0 min CN=98 Runoff=3.88 cfs 9,913 cf

Pond 18: DIV-2

Peak Elev=362.21' Inflow=3.88 cfs 9,913 cf
Primary=3.88 cfs 9,913 cf Secondary=0.00 cfs 0 cf Outflow=3.88 cfs 9,913 cf

Pond 19: INF-2

Peak Elev=360.81' Storage=1,973 cf Inflow=3.88 cfs 9,913 cf
Outflow=0.99 cfs 9,913 cf

Reach 20: 36" HDPE Pipe

Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0 cf
36.0" Round Pipe n=0.013 L=805.0' S=0.1205 ' Capacity=231.53 cfs Outflow=0.00 cfs 0 cf

Subcatchment 21: A6

Runoff Area=384,686 sf 86.44% Impervious Runoff Depth=1.09"
Tc=6.0 min CN=96 Runoff=14.52 cfs 35,093 cf

N60 P1 Post-A 2021

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Subcatchment22: A7 Runoff Area=103,728 sf 0.00% Impervious Runoff Depth=0.06"
Tc=6.0 min CN=68 Runoff=0.04 cfs 513 cf

Pond 23: Infiltration Basin (SWP-3) Peak Elev=256.83' Storage=8,337 cf Inflow=14.52 cfs 35,606 cf
Discarded=3.73 cfs 35,606 cf Primary=0.00 cfs 0 cf Outflow=3.73 cfs 35,606 cf

Subcatchment24: A9 Runoff Area=33,825 sf 87.77% Impervious Runoff Depth=1.01"
Tc=6.0 min CN=95 Runoff=1.20 cfs 2,854 cf

Pond 25: DIV-4 Peak Elev=347.26' Inflow=1.20 cfs 2,854 cf
Primary=1.20 cfs 2,854 cf Secondary=0.00 cfs 0 cf Outflow=1.20 cfs 2,854 cf

Pond 26: INF-4 Peak Elev=346.36' Storage=326 cf Inflow=1.20 cfs 2,854 cf
Outflow=0.52 cfs 2,854 cf

Subcatchment27: A10 Runoff Area=147,528 sf 61.97% Impervious Runoff Depth=0.63"
Tc=6.0 min CN=89 Runoff=3.36 cfs 7,753 cf

Subcatchment28: A10 Runoff Area=10,748 sf 95.65% Impervious Runoff Depth=1.18"
Tc=6.0 min CN=97 Runoff=0.43 cfs 1,060 cf

Pond 29: Infiltration Basin (SWP-2) Peak Elev=314.35' Storage=1,451 cf Inflow=3.79 cfs 8,813 cf
Discarded=1.50 cfs 8,813 cf Primary=0.00 cfs 0 cf Outflow=1.50 cfs 8,813 cf

Subcatchment30: Post A2 Runoff Area=231,706 sf 20.73% Impervious Runoff Depth=0.21"
Flow Length=817' Tc=17.7 min CN=77 Runoff=0.79 cfs 4,044 cf

Pond 31: Pocket Wetland (SWP-1) Peak Elev=234.84' Storage=11,214 cf Inflow=0.79 cfs 4,044 cf
Outflow=0.02 cfs 3,437 cf

Subcatchment32: Post A1 Runoff Area=21,588 sf 37.76% Impervious Runoff Depth=0.35"
Tc=6.0 min CN=82 Runoff=0.25 cfs 622 cf

Link 33: Design Point A Inflow=1.21 cfs 27,690 cf
Primary=1.21 cfs 27,690 cf

Total Runoff Area = 3,527,652 sf Runoff Volume = 145,655 cf Average Runoff Depth = 0.50"
61.00% Pervious = 2,151,703 sf 39.00% Impervious = 1,375,949 sf

N60 P1 Post-A 2021

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Subcatchment 8: Post A0 Offsite

Runoff = 21.26 cfs @ 12.21 hrs, Volume= 63,508 cf, Depth= 0.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 90% rainfall Rainfall=1.50"

Area (sf)	CN	Description
645,334	98	Paved parking, HSG C
443,611	80	>75% Grass cover, Good, HSG D
23,572	74	>75% Grass cover, Good, HSG C
2,543	61	>75% Grass cover, Good, HSG B
1,115,060	90	Weighted Average
469,726		42.13% Pervious Area
645,334		57.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0150	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.6	148	0.0574	3.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	30	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	740	0.0270	10.25	32.22	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Concrete sewer w/manholes & inlets
12.5	1,018	Total			

N60 P1 Post-A 2021

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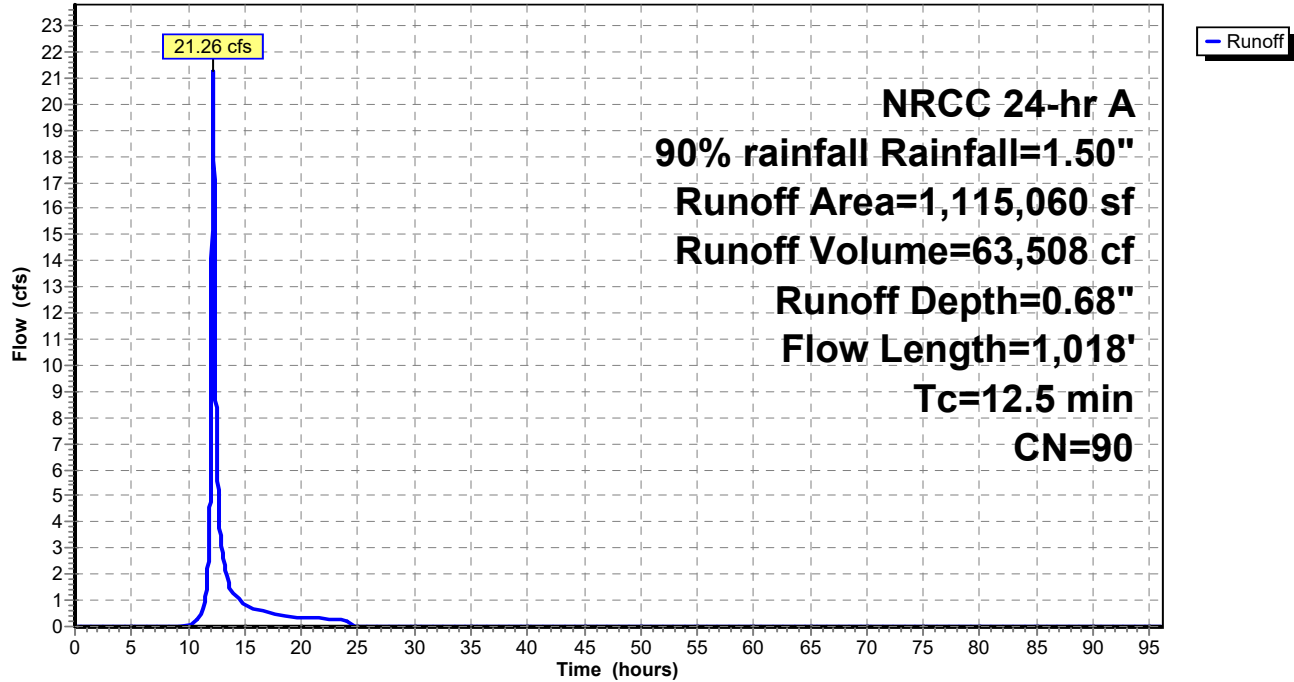
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Subcatchment 8: Post A0 Offsite

Hydrograph



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NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Pond 9: Offsite Pond A

Inflow Area = 1,115,060 sf, 57.87% Impervious, Inflow Depth = 0.68" for 90% rainfall event
 Inflow = 21.26 cfs @ 12.21 hrs, Volume= 63,508 cf
 Outflow = 0.61 cfs @ 16.33 hrs, Volume= 12,313 cf, Atten= 97%, Lag= 247.3 min
 Primary = 0.61 cfs @ 16.33 hrs, Volume= 12,313 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 360.04' @ 16.33 hrs Surf.Area= 19,511 sf Storage= 51,883 cf

Plug-Flow detention time= 456.3 min calculated for 12,313 cf (19% of inflow)
 Center-of-Mass det. time= 334.8 min (1,168.0 - 833.2)

Volume	Invert	Avail.Storage	Storage Description		
#1	357.00'	221,816 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
357.00	14,633	679.0	0	0	14,633
358.00	16,652	698.0	15,632	15,632	16,826
359.00	17,534	715.0	17,091	32,723	18,864
360.00	19,427	745.0	18,472	51,195	22,425
362.00	24,453	804.0	43,784	94,979	29,861
364.00	28,701	854.0	53,097	148,076	36,663
365.00	36,602	901.0	32,572	180,648	43,285
366.00	45,910	1,262.0	41,168	221,816	105,432

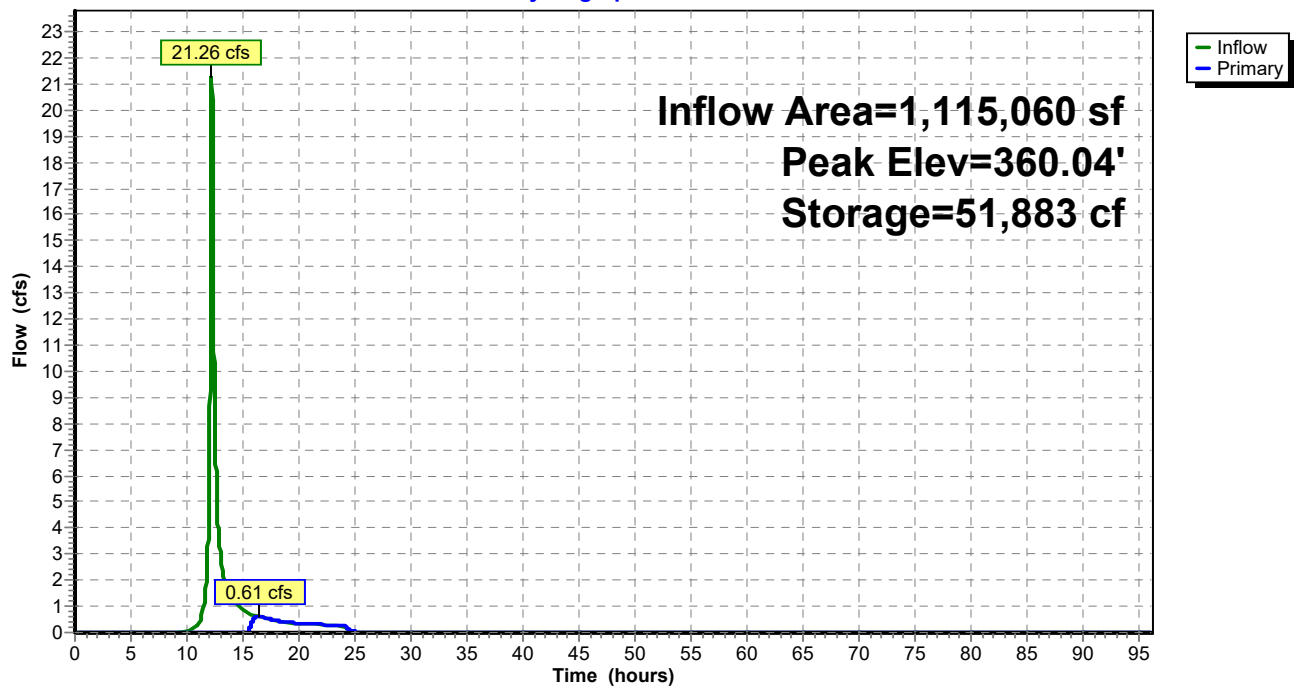
Device	Routing	Invert	Outlet Devices
#1	Primary	357.00'	30.0" Round Culvert L= 125.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 357.00' / 351.00' S= 0.0480 ' S= 0.0480 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf
#2	Device 1	360.00'	36.0" x 48.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Primary	364.75'	150.0' long x 36.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.61 cfs @ 16.33 hrs HW=360.04' TW=321.10' (Dynamic Tailwater)

- 1=Culvert (Passes 0.61 cfs of 31.58 cfs potential flow)
 2=Orifice/Grate (Weir Controls 0.61 cfs @ 0.61 fps)
 3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 9: Offsite Pond A

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Subcatchment 10: Post A4

Runoff = 0.44 cfs @ 12.39 hrs, Volume= 2,569 cf, Depth= 0.19"

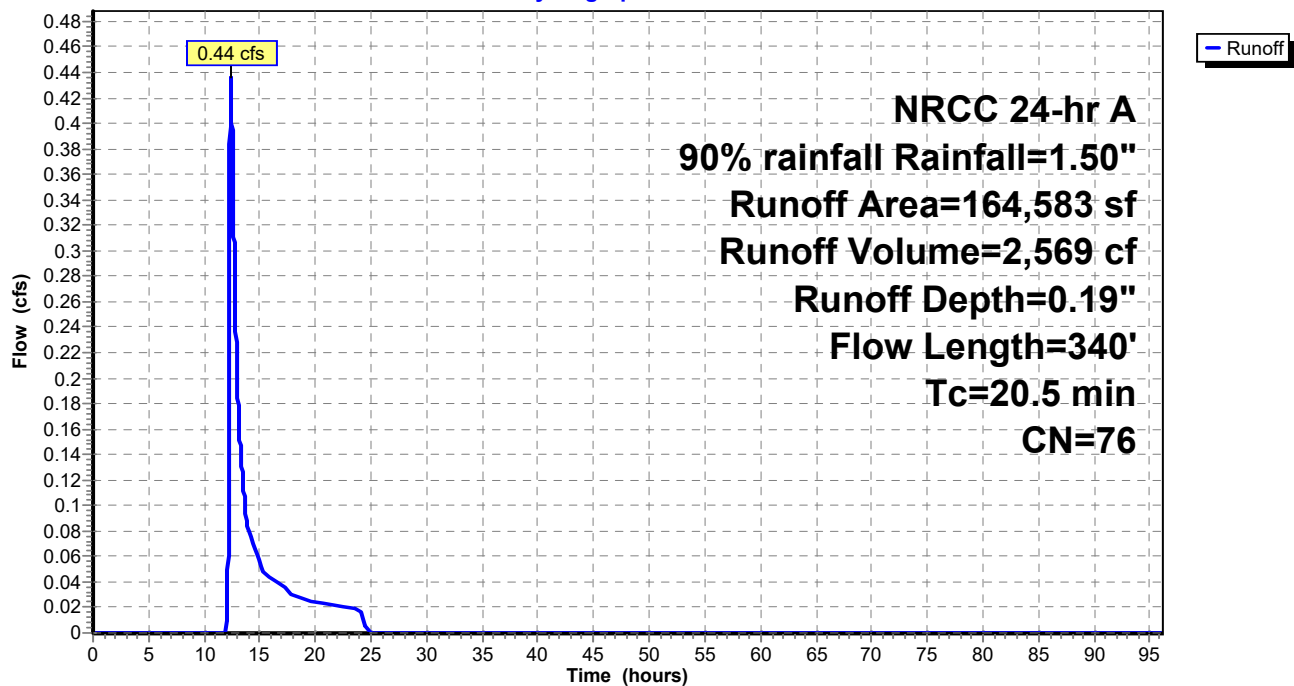
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 90% rainfall Rainfall=1.50"

Area (sf)	CN	Description
15,990	74	>75% Grass cover, Good, HSG C
65,271	70	Woods, Good, HSG C
66,457	77	Woods, Good, HSG D
16,865	98	Water Surface, HSG D
164,583	76	Weighted Average
147,718		89.75% Pervious Area
16,865		10.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0250	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.7	240	0.0208	2.32		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
20.5	340	Total			

Subcatchment 10: Post A4

Hydrograph



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NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Reach 11: Box Culvert

Inflow Area = 164,583 sf, 10.25% Impervious, Inflow Depth = 0.19" for 90% rainfall event
Inflow = 0.44 cfs @ 12.39 hrs, Volume= 2,569 cf
Outflow = 0.43 cfs @ 12.42 hrs, Volume= 2,569 cf, Atten= 0%, Lag= 1.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.84 fps, Min. Travel Time= 1.9 min
Avg. Velocity= 0.51 fps, Avg. Travel Time= 3.2 min

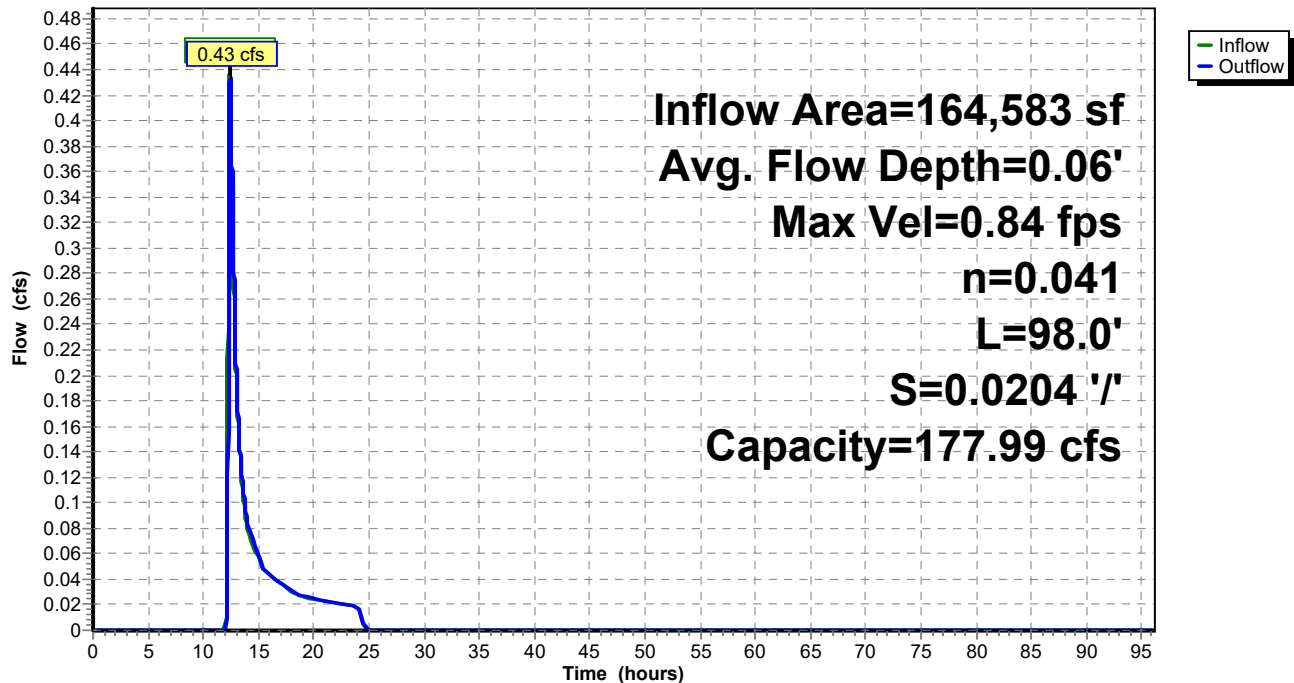
Peak Storage= 51 cf @ 12.42 hrs
Average Depth at Peak Storage= 0.06'
Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 177.99 cfs

8.00' x 3.00' deep channel, n= 0.041 Riprap, 2-inch
Length= 98.0' Slope= 0.0204 '/
Inlet Invert= 349.00', Outlet Invert= 347.00'



Reach 11: Box Culvert

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Subcatchment 12: Post A8

Runoff = 0.41 cfs @ 12.54 hrs, Volume= 3,702 cf, Depth= 0.11"

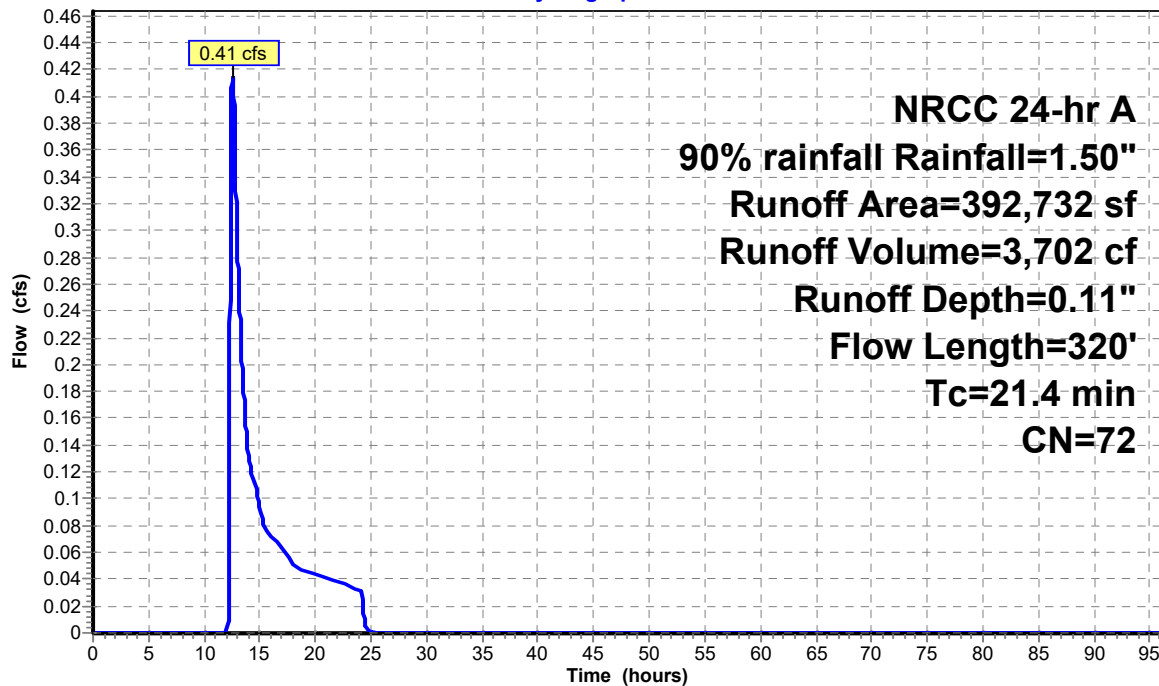
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 90% rainfall Rainfall=1.50"

Area (sf)	CN	Description
278,057	70	Woods, Good, HSG C
108,143	77	Woods, Good, HSG D
6,532	74	>75% Grass cover, Good, HSG C
392,732	72	Weighted Average
392,732		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
0.9	220	0.0636	4.06		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
21.4	320	Total			

Subcatchment 12: Post A8

Hydrograph



Runoff

N60 P1 Post-A 2021

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Pond 12A: Existing Wetland A

Inflow Area = 1,672,375 sf, 39.60% Impervious, Inflow Depth = 0.13" for 90% rainfall event
 Inflow = 0.82 cfs @ 12.46 hrs, Volume= 18,584 cf
 Outflow = 0.82 cfs @ 12.47 hrs, Volume= 18,584 cf, Atten= 0%, Lag= 0.3 min
 Primary = 0.82 cfs @ 12.47 hrs, Volume= 18,584 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 321.11' @ 12.47 hrs Surf.Area= 183 sf Storage= 17 cf

Plug-Flow detention time= 0.6 min calculated for 18,584 cf (100% of inflow)
 Center-of-Mass det. time= 0.4 min (1,089.7 - 1,089.3)

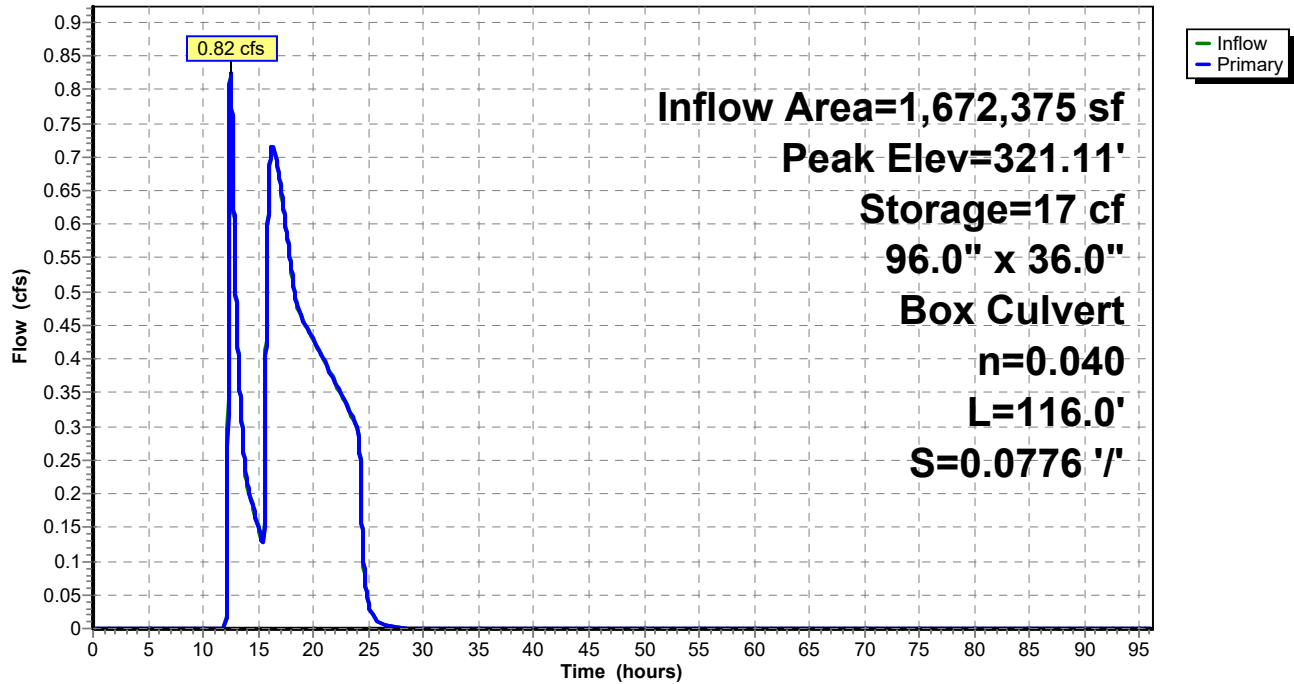
Volume	Invert	Avail.Storage	Storage Description		
#1	321.00'	190,307 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
321.00	124	53.2	0	0	124
322.00	1,084	175.8	525	525	2,361
324.00	4,913	341.5	5,536	6,061	9,202
326.00	11,332	638.2	15,804	21,866	32,354
328.00	20,583	804.3	31,458	53,324	51,475
330.00	34,086	1,075.5	54,104	107,428	92,087
332.00	49,257	1,268.5	82,879	190,307	128,164

Device	Routing	Invert	Outlet Devices
#1	Primary	321.00'	96.0" W x 36.0" H Box Culvert L= 116.0' Box, 0° wingwalls, square crown edge, Ke= 0.700 Inlet / Outlet Invert= 321.00' / 312.00' S= 0.0776 '/' Cc= 0.900 n= 0.040 Earth, cobble bottom, clean sides, Flow Area= 24.00 sf

Primary OutFlow Max=0.82 cfs @ 12.47 hrs HW=321.11' TW=312.09' (Dynamic Tailwater)
 1=Culvert (Inlet Controls 0.82 cfs @ 0.94 fps)

Pond 12A: Existing Wetland A

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Subcatchment 12B: Post A11

Runoff = 0.47 cfs @ 12.65 hrs, Volume= 5,046 cf, Depth= 0.08"

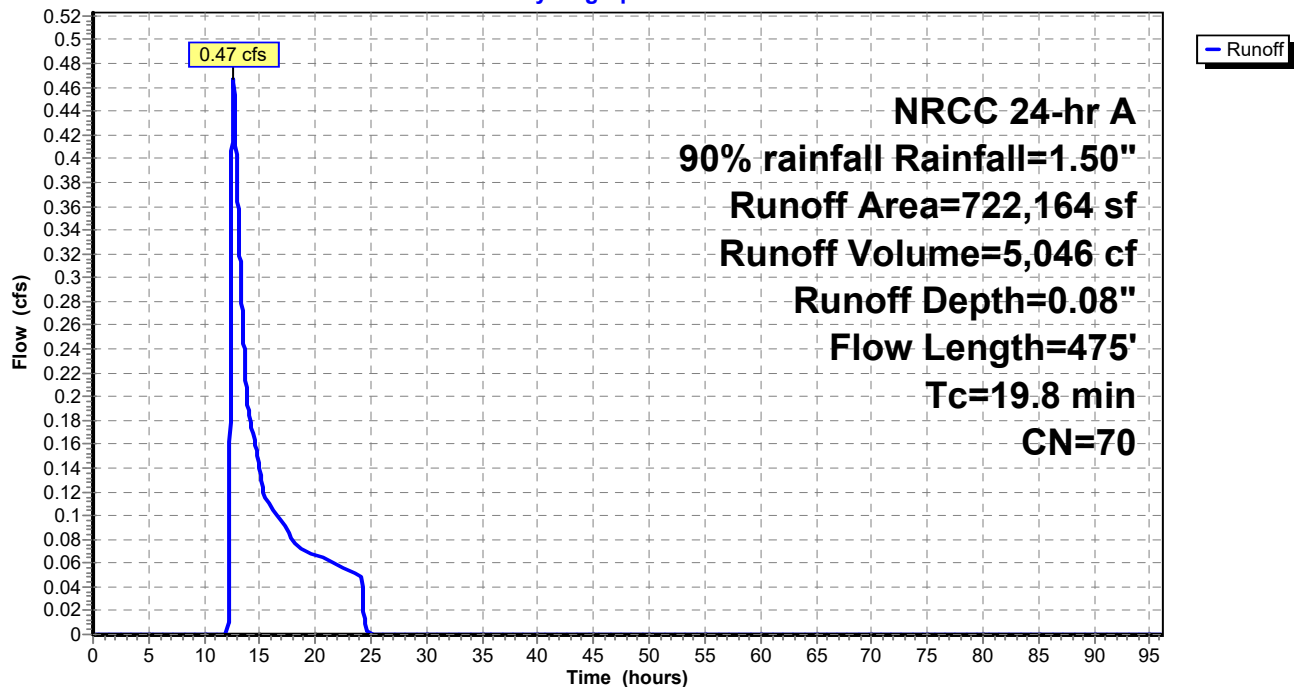
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 90% rainfall Rainfall=1.50"

Area (sf)	CN	Description
17,361	55	Woods, Good, HSG B
681,082	70	Woods, Good, HSG C
11,683	77	Woods, Good, HSG D
9,345	98	Paved parking, HSG C
2,693	74	>75% Grass cover, Good, HSG C
722,164	70	Weighted Average
712,819		98.71% Pervious Area
9,345		1.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0250	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.0	375	0.1400	6.02		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
19.8	475	Total			

Subcatchment 12B: Post A11

Hydrograph



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NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Reach 13: Existing Stream A (Lower Segment)

Inflow Area = 2,394,539 sf, 28.04% Impervious, Inflow Depth = 0.12" for 90% rainfall event
Inflow = 1.24 cfs @ 12.56 hrs, Volume= 23,631 cf
Outflow = 1.15 cfs @ 12.70 hrs, Volume= 23,631 cf, Atten= 7%, Lag= 8.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.31 fps, Min. Travel Time= 9.8 min
Avg. Velocity = 1.40 fps, Avg. Travel Time= 16.2 min

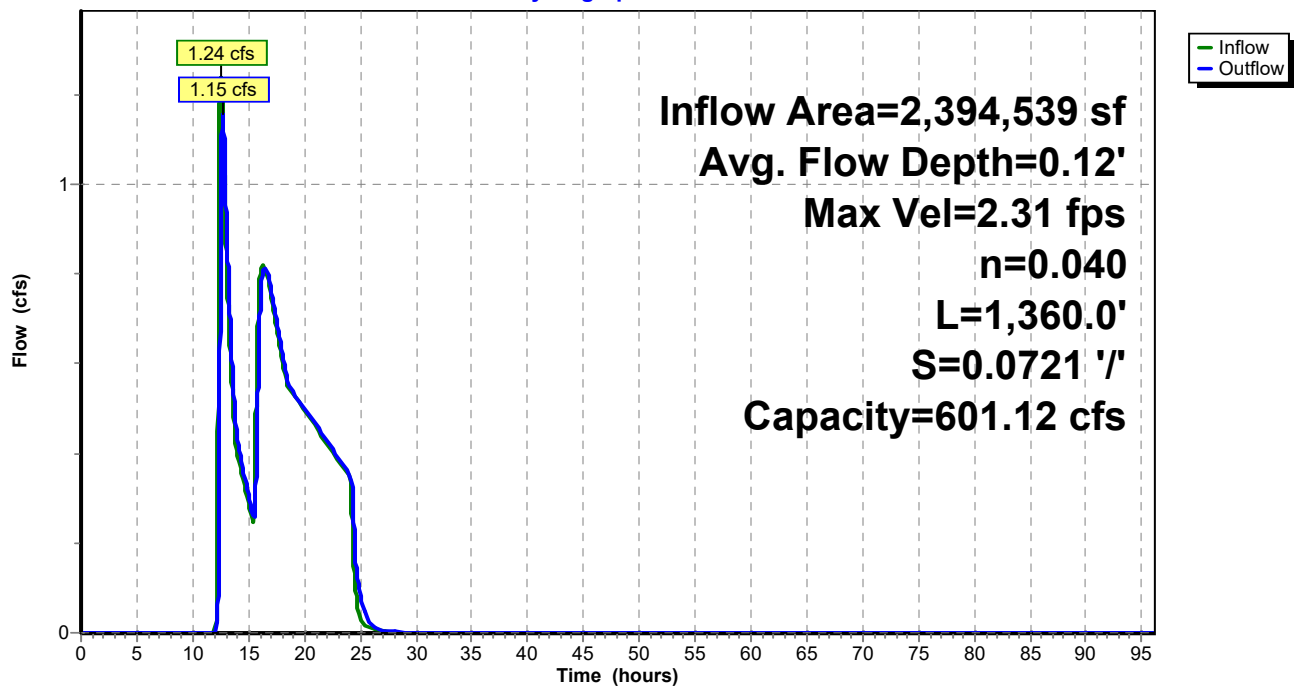
Peak Storage= 678 cf @ 12.70 hrs
Average Depth at Peak Storage= 0.12'
Bank-Full Depth= 3.50' Flow Area= 38.5 sf, Capacity= 601.12 cfs

4.00' x 3.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 ' ' Top Width= 18.00'
Length= 1,360.0' Slope= 0.0721 ' '
Inlet Invert= 312.00', Outlet Invert= 214.00'



Reach 13: Existing Stream A (Lower Segment)

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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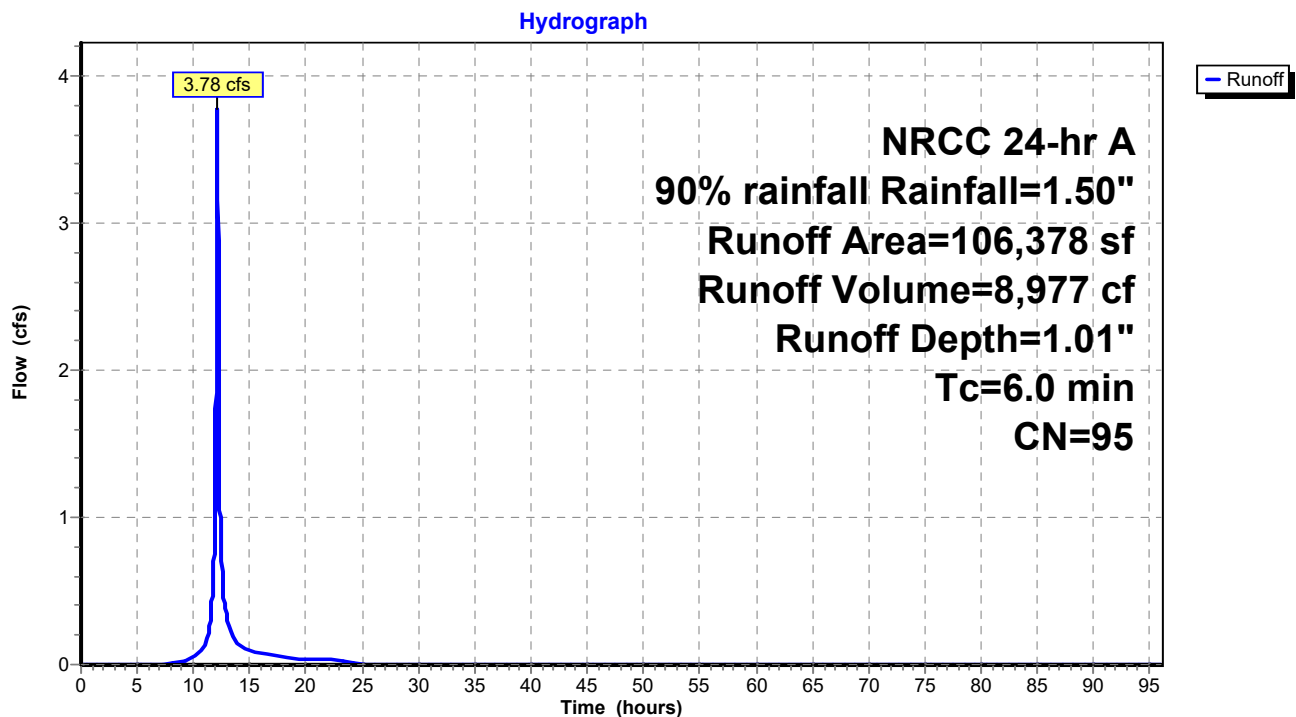
Summary for Subcatchment 14: Post A3

Runoff = 3.78 cfs @ 12.13 hrs, Volume= 8,977 cf, Depth= 1.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 90% rainfall Rainfall=1.50"

Area (sf)	CN	Description
91,392	98	Paved parking, HSG C
14,986	74	>75% Grass cover, Good, HSG C
106,378	95	Weighted Average
14,986		14.09% Pervious Area
91,392		85.91% Impervious Area

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

Subcatchment 14: Post A3

N60 P1 Post-A 2021

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Pond 15: DIV-1

Inflow Area = 106,378 sf, 85.91% Impervious, Inflow Depth = 1.01" for 90% rainfall event
 Inflow = 3.78 cfs @ 12.13 hrs, Volume= 8,977 cf
 Outflow = 3.78 cfs @ 12.13 hrs, Volume= 8,977 cf, Atten= 0%, Lag= 0.0 min
 Primary = 3.78 cfs @ 12.13 hrs, Volume= 8,977 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 324.67' @ 12.13 hrs

Flood Elev= 328.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	323.00'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 323.00' / 323.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	323.00'	24.0" Round Culvert L= 51.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 323.00' / 320.00' S= 0.0588 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	325.50'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=3.77 cfs @ 12.13 hrs HW=324.67' TW=322.99' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 3.77 cfs @ 4.80 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=323.00' TW=0.00' (Dynamic Tailwater)↑ **2=Culvert** (Controls 0.00 cfs)↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

N60 P1 Post-A 2021

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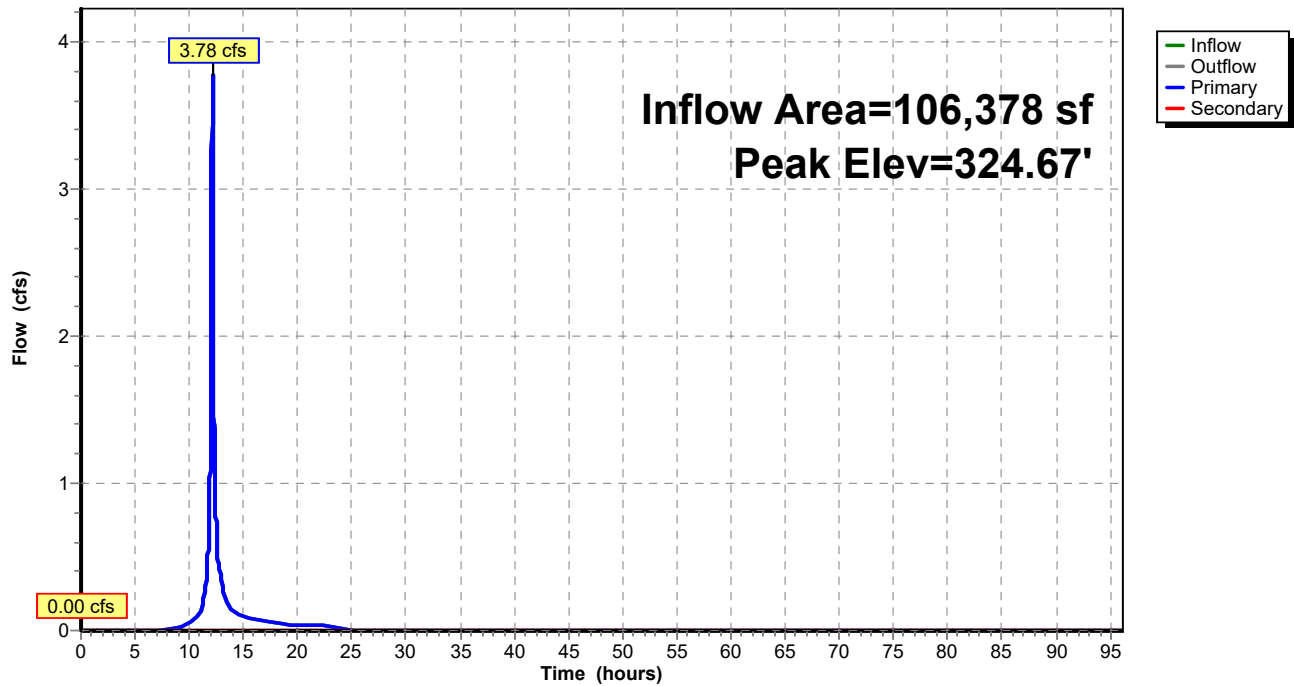
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NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Pond 15: DIV-1

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Pond 16: INF-1

Inflow Area = 106,378 sf, 85.91% Impervious, Inflow Depth = 1.01" for 90% rainfall event
 Inflow = 3.78 cfs @ 12.13 hrs, Volume= 8,977 cf
 Outflow = 1.18 cfs @ 12.00 hrs, Volume= 8,977 cf, Atten= 69%, Lag= 0.0 min
 Discarded = 1.18 cfs @ 12.00 hrs, Volume= 8,977 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 323.19' @ 12.31 hrs Surf.Area= 4,245 sf Storage= 1,531 cf

Plug-Flow detention time= 6.4 min calculated for 8,976 cf (100% of inflow)
 Center-of-Mass det. time= 6.4 min (806.1 - 799.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	322.50'	4,688 cf	36.75'W x 115.50'L x 4.33'H Field A 18,393 cf Overall - 6,674 cf Embedded = 11,720 cf x 40.0% Voids
#2A	323.00'	6,674 cf	Cultec R-360HD x 180 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 180 Chambers in 6 Rows Cap Storage= +6.5 cf x 2 x 6 rows = 77.5 cf
		11,361 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	322.50'	12.000 in/hr Exfiltration over Horizontal area Phase-In= 0.01'

Discarded OutFlow Max=1.18 cfs @ 12.00 hrs HW=322.55' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 1.18 cfs)

Pond 16: INF-1 - Chamber Wizard Field A**Chamber Model = Cultec R-360HD (Cultec Recharger® 360HD)**

Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf

Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap

Cap Storage= +6.5 cf x 2 x 6 rows = 77.5 cf

60.0" Wide + 9.0" Spacing = 69.0" C-C Row Spacing

30 Chambers/Row x 3.67' Long +1.25' Cap Length x 2 = 112.50' Row Length +18.0" End Stone x 2 = 115.50' Base Length

6 Rows x 60.0" Wide + 9.0" Spacing x 5 + 18.0" Side Stone x 2 = 36.75' Base Width

6.0" Base + 36.0" Chamber Height + 10.0" Cover = 4.33' Field Height

180 Chambers x 36.6 cf + 6.5 cf Cap Volume x 2 x 6 Rows = 6,673.6 cf Chamber Storage

18,393.4 cf Field - 6,673.6 cf Chambers = 11,719.8 cf Stone x 40.0% Voids = 4,687.9 cf Stone Storage

Chamber Storage + Stone Storage = 11,361.5 cf = 0.261 af

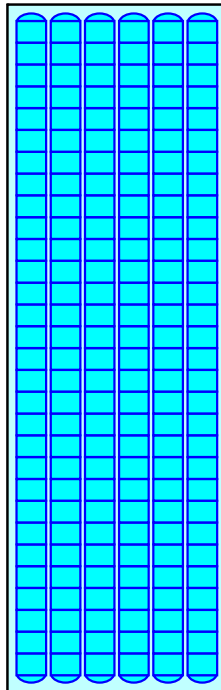
Overall Storage Efficiency = 61.8%

Overall System Size = 115.50' x 36.75' x 4.33'

180 Chambers

681.2 cy Field

434.1 cy Stone



N60 P1 Post-A 2021

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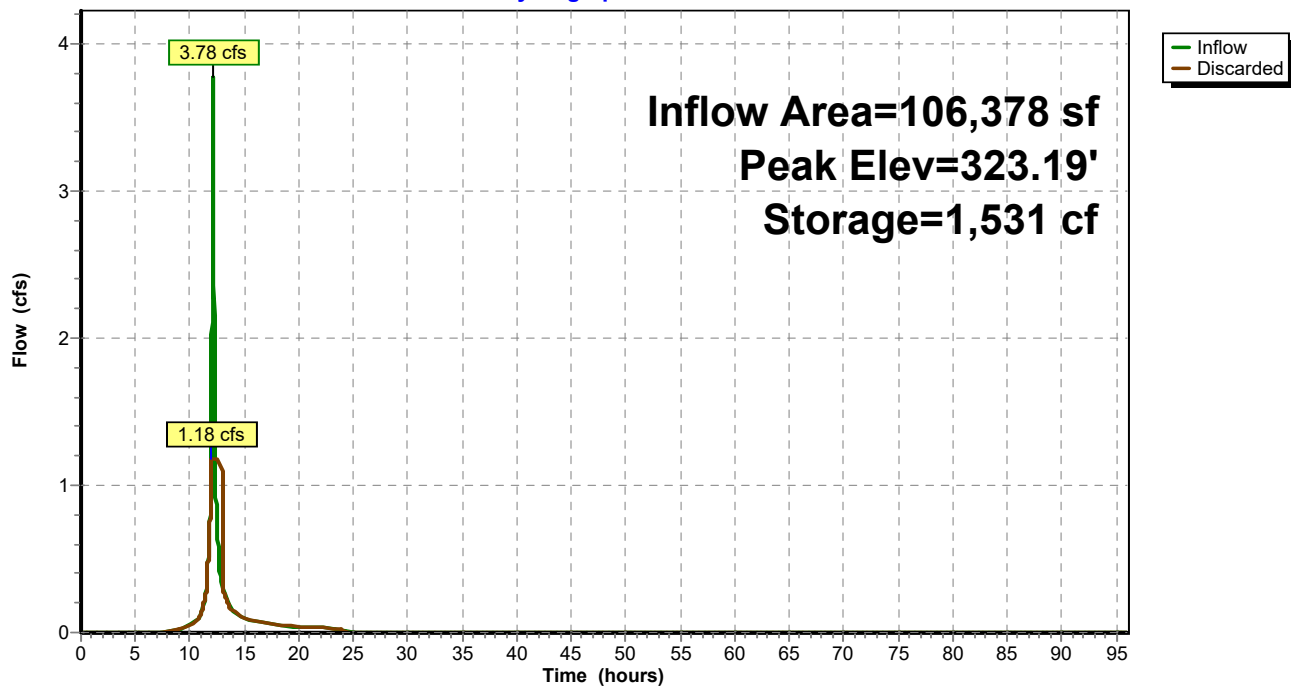
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Pond 16: INF-1

Hydrograph



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NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Subcatchment 17: Post A5

Runoff = 3.88 cfs @ 12.13 hrs, Volume= 9,913 cf, Depth= 1.28"

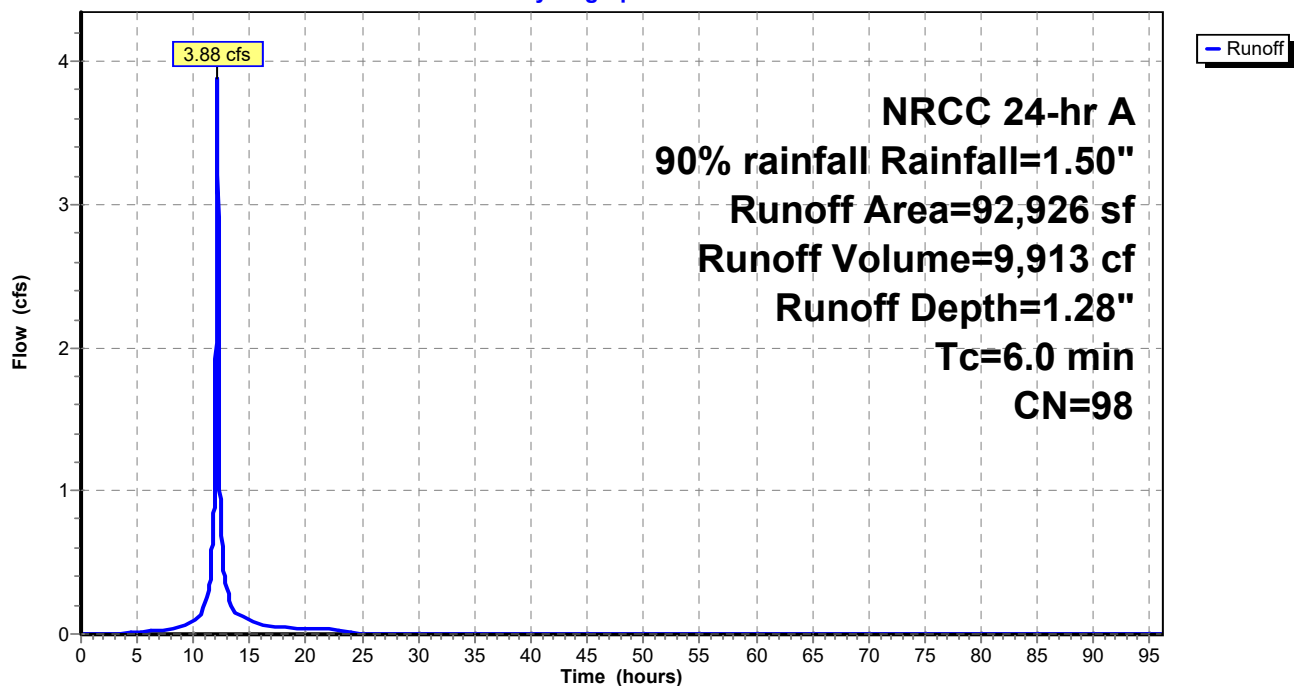
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 90% rainfall Rainfall=1.50"

Area (sf)	CN	Description
92,926	98	Roofs, HSG C
92,926		100.00% Impervious Area

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

Subcatchment 17: Post A5

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Pond 18: DIV-2

Inflow Area = 92,926 sf, 100.00% Impervious, Inflow Depth = 1.28" for 90% rainfall event
 Inflow = 3.88 cfs @ 12.13 hrs, Volume= 9,913 cf
 Outflow = 3.88 cfs @ 12.13 hrs, Volume= 9,913 cf, Atten= 0%, Lag= 0.0 min
 Primary = 3.88 cfs @ 12.13 hrs, Volume= 9,913 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 362.21' @ 12.13 hrs

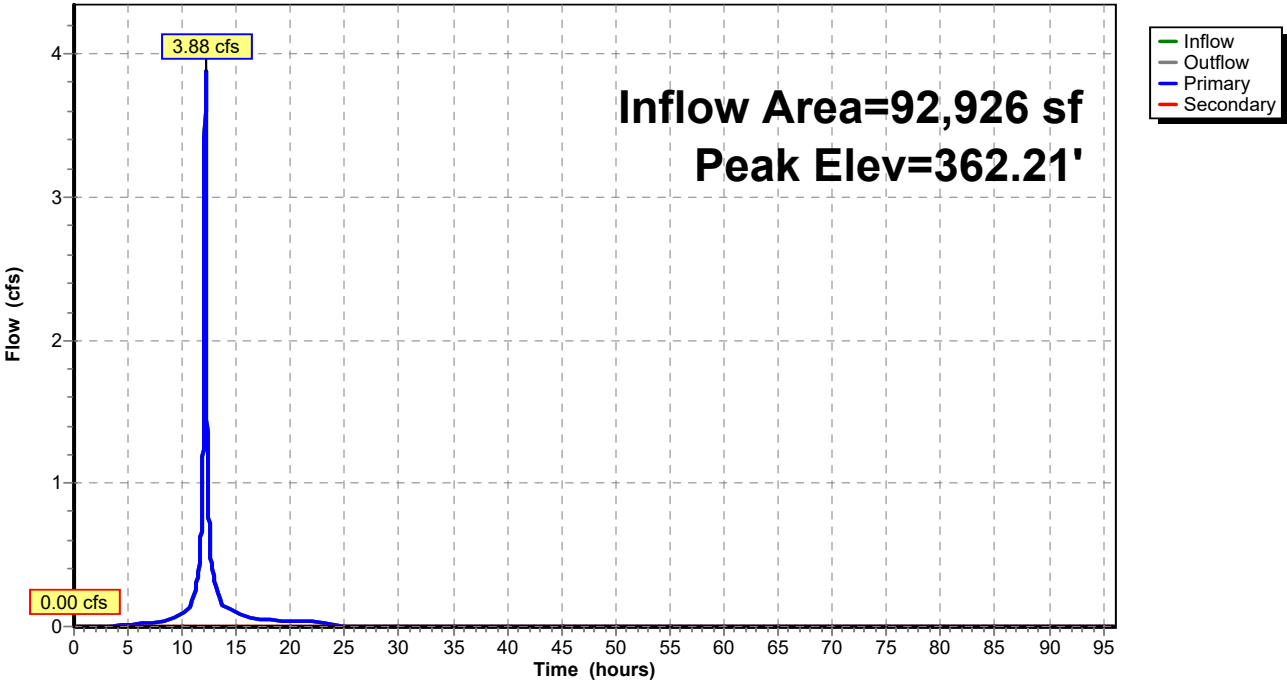
Flood Elev= 371.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	360.50'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 360.50' / 360.50' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	363.00'	24.0" Round Culvert L= 550.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 363.00' / 355.00' S= 0.0145 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	363.50'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=3.88 cfs @ 12.13 hrs HW=362.21' TW=360.57' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 3.88 cfs @ 4.93 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=360.50' TW=355.00' (Dynamic Tailwater)↑ **2=Culvert** (Controls 0.00 cfs)↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 18: DIV-2

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Pond 19: INF-2

Inflow Area = 92,926 sf, 100.00% Impervious, Inflow Depth = 1.28" for 90% rainfall event
 Inflow = 3.88 cfs @ 12.13 hrs, Volume= 9,913 cf
 Outflow = 0.99 cfs @ 11.95 hrs, Volume= 9,913 cf, Atten= 74%, Lag= 0.0 min
 Discarded = 0.99 cfs @ 11.95 hrs, Volume= 9,913 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 360.81' @ 12.36 hrs Surf.Area= 4,285 sf Storage= 1,973 cf

Plug-Flow detention time= 10.0 min calculated for 9,912 cf (100% of inflow)
 Center-of-Mass det. time= 10.0 min (782.1 - 772.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	360.00'	4,724 cf	42.50'W x 100.83'L x 4.33'H Field A 18,570 cf Overall - 6,760 cf Embedded = 11,810 cf x 40.0% Voids
#2A	360.50'	6,760 cf	Cultec R-360HD x 182 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 182 Chambers in 7 Rows Cap Storage= +6.5 cf x 2 x 7 rows = 90.4 cf
		11,484 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	360.00'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.01'

Discarded OutFlow Max=0.99 cfs @ 11.95 hrs HW=360.05' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.99 cfs)

Pond 19: INF-2 - Chamber Wizard Field A**Chamber Model = Cultec R-360HD (Cultec Recharger® 360HD)**

Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf

Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap

Cap Storage= +6.5 cf x 2 x 7 rows = 90.4 cf

60.0" Wide + 9.0" Spacing = 69.0" C-C Row Spacing

26 Chambers/Row x 3.67' Long +1.25' Cap Length x 2 = 97.83' Row Length +18.0" End Stone x 2 =
100.83' Base Length

7 Rows x 60.0" Wide + 9.0" Spacing x 6 + 18.0" Side Stone x 2 = 42.50' Base Width

6.0" Base + 36.0" Chamber Height + 10.0" Cover = 4.33' Field Height

182 Chambers x 36.6 cf + 6.5 cf Cap Volume x 2 x 7 Rows = 6,759.8 cf Chamber Storage

18,570.1 cf Field - 6,759.8 cf Chambers = 11,810.4 cf Stone x 40.0% Voids = 4,724.1 cf Stone Storage

Chamber Storage + Stone Storage = 11,483.9 cf = 0.264 af

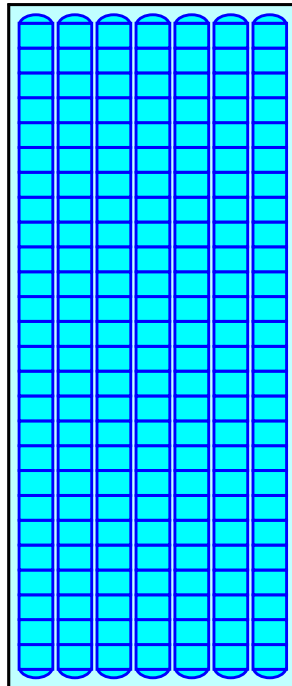
Overall Storage Efficiency = 61.8%

Overall System Size = 100.83' x 42.50' x 4.33'

182 Chambers

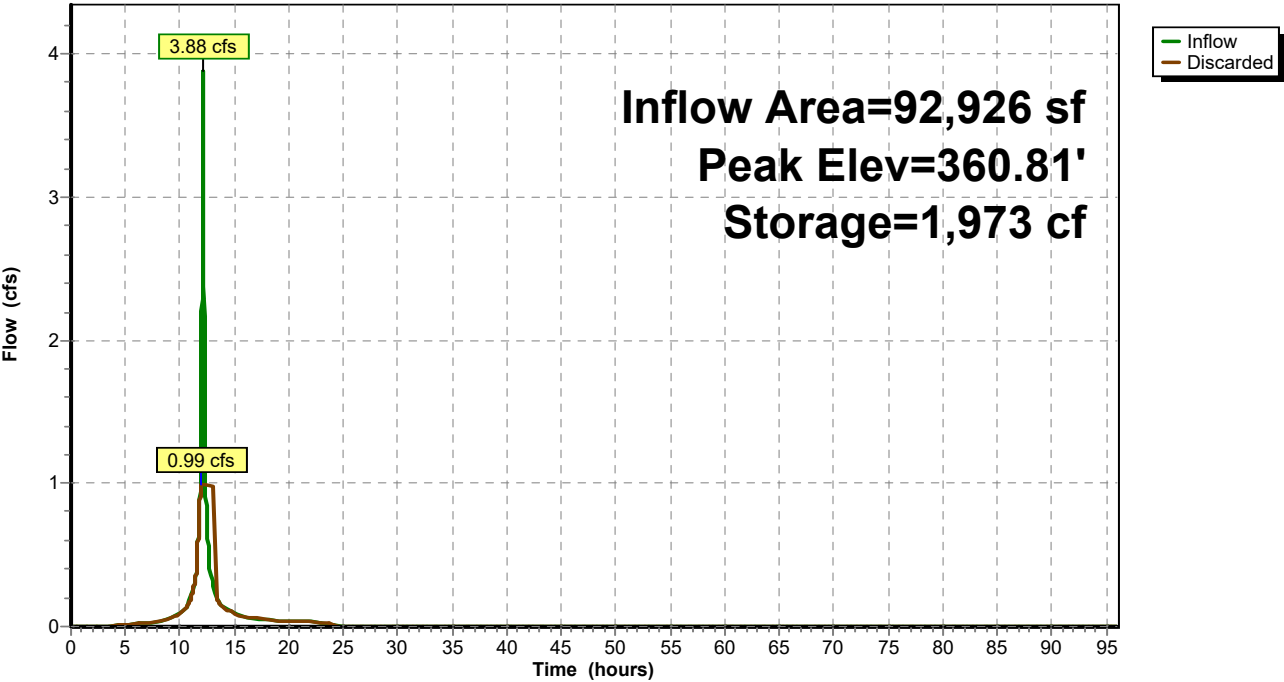
687.8 cy Field

437.4 cy Stone



Pond 19: INF-2

Hydrograph



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NRCC 24-hr A 90% rainfall Rainfall=1.50"

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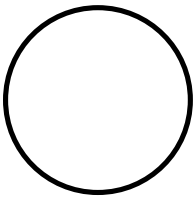
Summary for Reach 20: 36" HDPE Pipe

Inflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0 cf, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

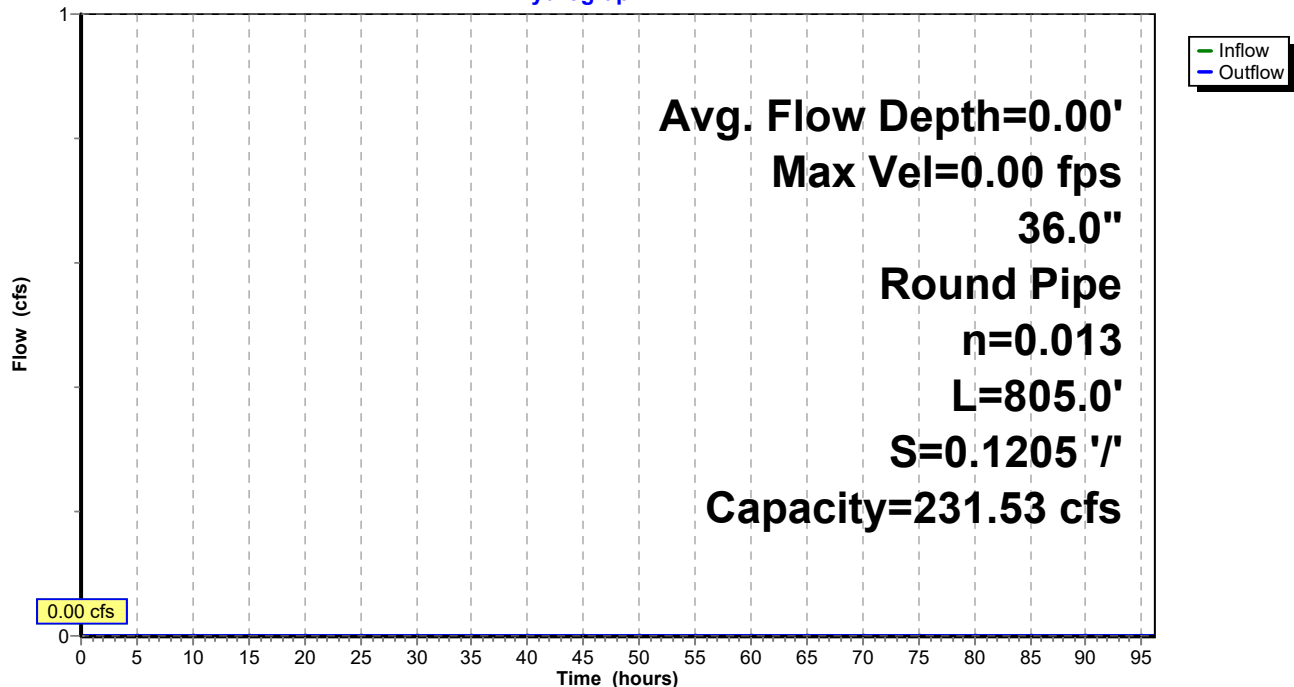
Peak Storage= 0 cf @ 0.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 231.53 cfs

36.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 805.0' Slope= 0.1205 '/
Inlet Invert= 355.00', Outlet Invert= 258.00'



Reach 20: 36" HDPE Pipe

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Subcatchment 21: A6

Runoff = 14.52 cfs @ 12.13 hrs, Volume= 35,093 cf, Depth= 1.09"

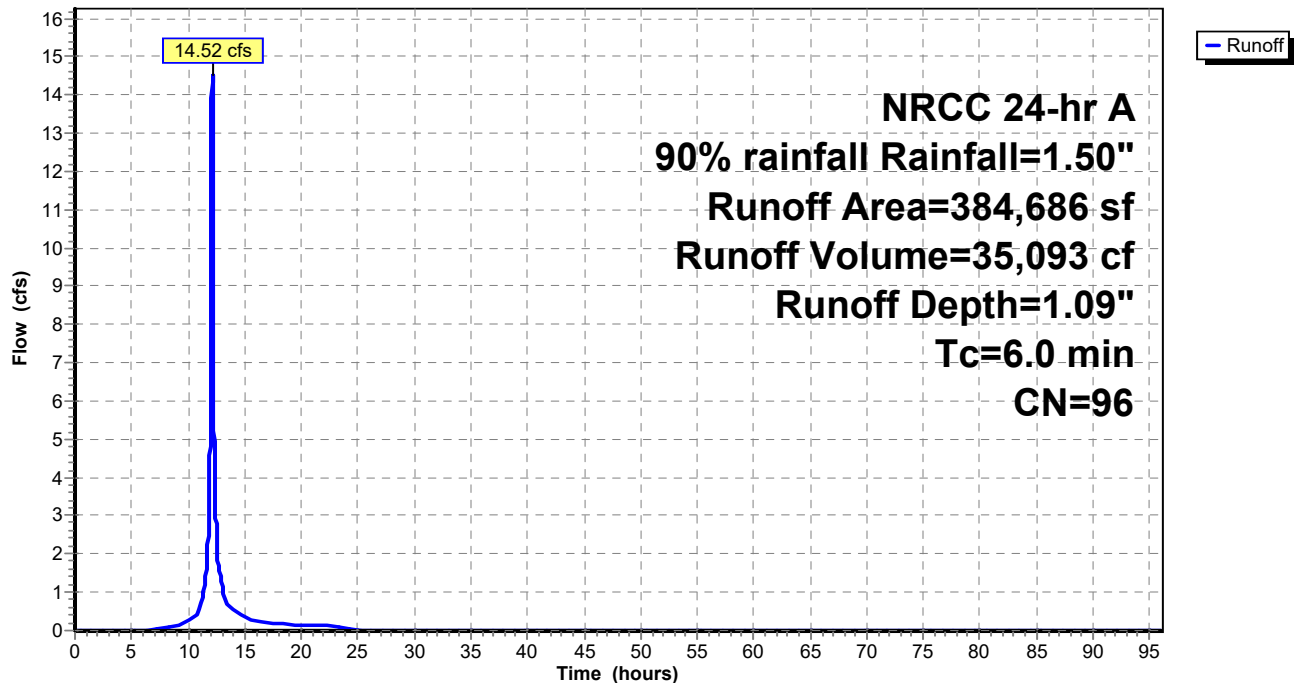
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 90% rainfall Rainfall=1.50"

Area (sf)	CN	Description
332,512	98	Paved parking, HSG C
52,174	86	<50% Grass cover, Poor, HSG C
384,686	96	Weighted Average
52,174		13.56% Pervious Area
332,512		86.44% Impervious Area

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

Subcatchment 21: A6

Hydrograph



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NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Subcatchment 22: A7

Runoff = 0.04 cfs @ 12.54 hrs, Volume= 513 cf, Depth= 0.06"

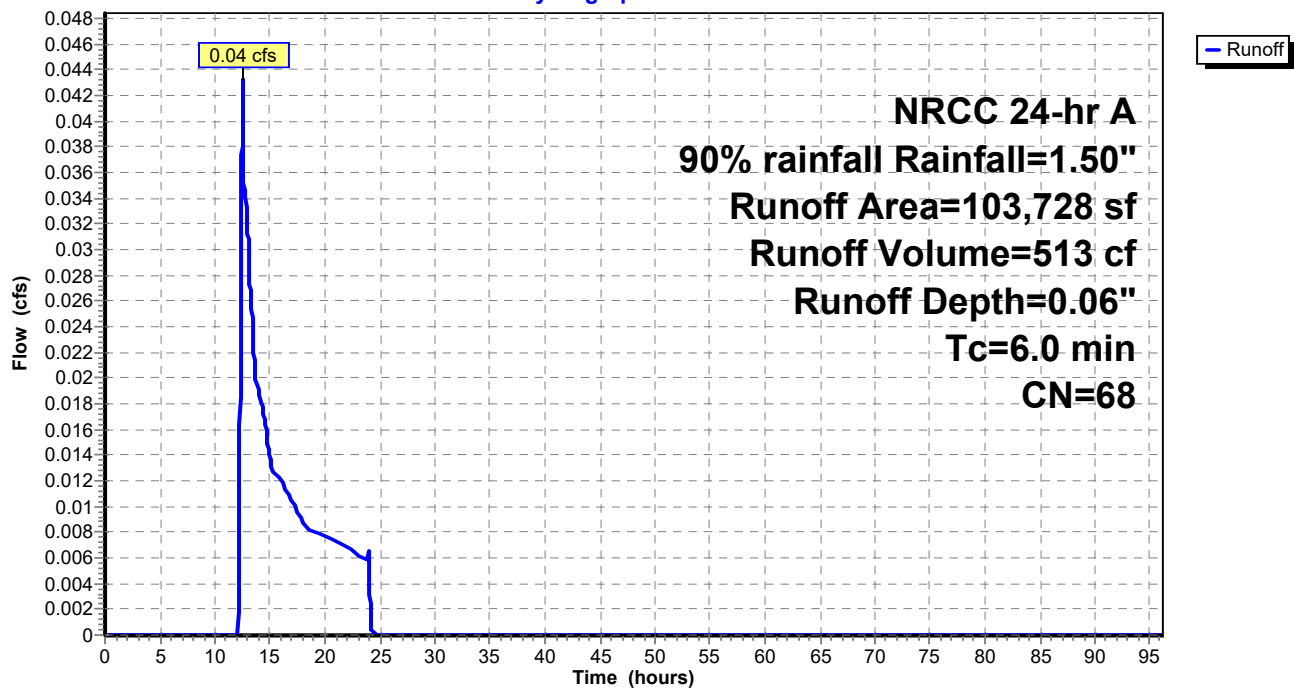
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 90% rainfall Rainfall=1.50"

Area (sf)	CN	Description
35,128	65	Brush, Good, HSG C
68,600	70	Woods, Good, HSG C
103,728	68	Weighted Average
103,728		100.00% Pervious Area

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

Subcatchment 22: A7

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Pond 23: Infiltration Basin (SWP-3)

Inflow Area = 488,414 sf, 68.08% Impervious, Inflow Depth = 0.87" for 90% rainfall event
 Inflow = 14.52 cfs @ 12.13 hrs, Volume= 35,606 cf
 Outflow = 3.73 cfs @ 12.37 hrs, Volume= 35,606 cf, Atten= 74%, Lag= 14.1 min
 Discarded = 3.73 cfs @ 12.37 hrs, Volume= 35,606 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 256.83' @ 12.37 hrs Surf.Area= 10,746 sf Storage= 8,337 cf

Plug-Flow detention time= 15.3 min calculated for 35,602 cf (100% of inflow)
 Center-of-Mass det. time= 15.3 min (810.3 - 795.0)

Volume	Invert	Avail.Storage	Storage Description		
#1	256.00'	103,740 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
256.00	9,450	527.9	0	0	9,450
258.00	12,731	565.7	22,100	22,100	12,917
260.00	16,238	603.5	28,898	50,998	16,623
262.00	19,973	641.3	36,147	87,144	20,569
262.80	21,527	656.4	16,596	103,740	22,212

Device	Routing	Invert	Outlet Devices
#1	Primary	254.00'	36.0" Round Culvert X 2.00 L= 95.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 254.00' / 244.00' S= 0.1053 ' S= 0.1053 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	260.00'	2.0' long x 0.5' breadth Broad-Crested Rectangular Weir X 2.00 Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	260.00'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir X 2.00 Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	259.40'	6.0" Vert. Orifice/Grate C= 0.600
#5	Device 1	261.00'	36.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Discarded	256.00'	15.000 in/hr Exfiltration over Surface area Phase-In= 0.10'

Discarded OutFlow Max=3.73 cfs @ 12.37 hrs HW=256.83' (Free Discharge)

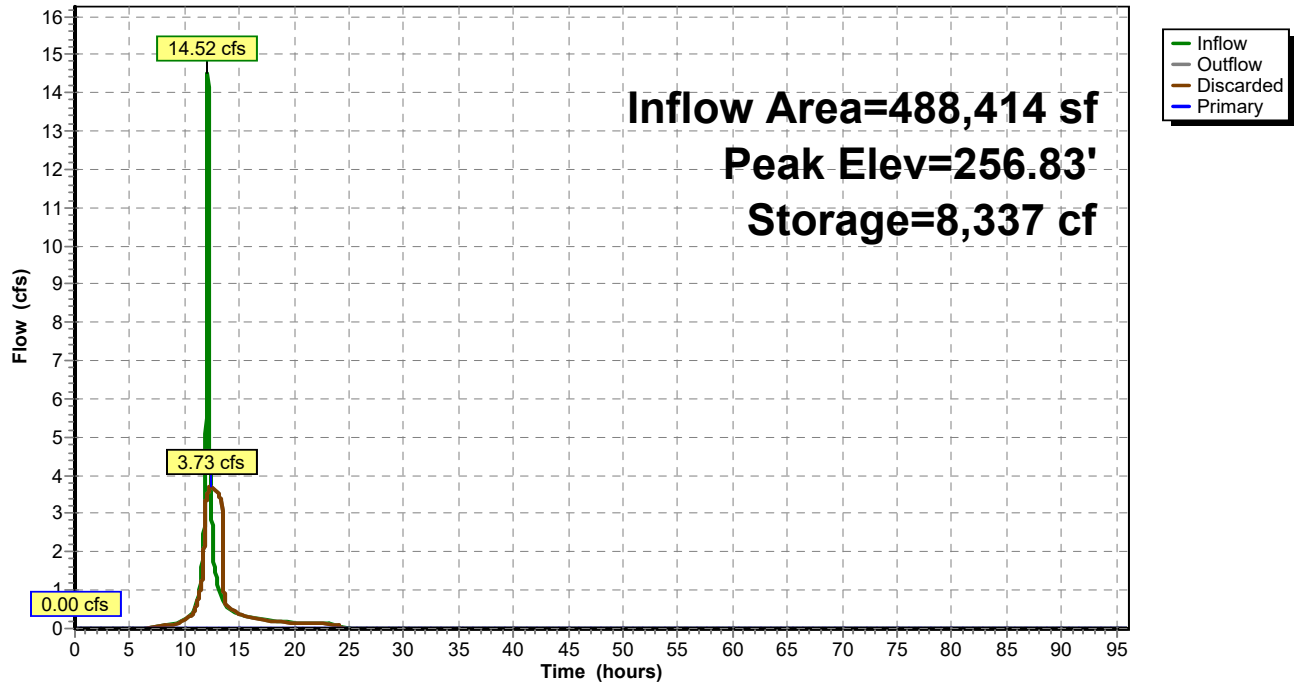
←**6=Exfiltration** (Exfiltration Controls 3.73 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=256.00' TW=0.00' (Dynamic Tailwater)

←**1=Culvert** (Passes 0.00 cfs of 48.21 cfs potential flow)
 ←**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
 ←**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
 ←**4=Orifice/Grate** (Controls 0.00 cfs)
 ←**5=Orifice/Grate** (Controls 0.00 cfs)

Pond 23: Infiltration Basin (SWP-3)

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Subcatchment 24: A9

Runoff = 1.20 cfs @ 12.13 hrs, Volume= 2,854 cf, Depth= 1.01"

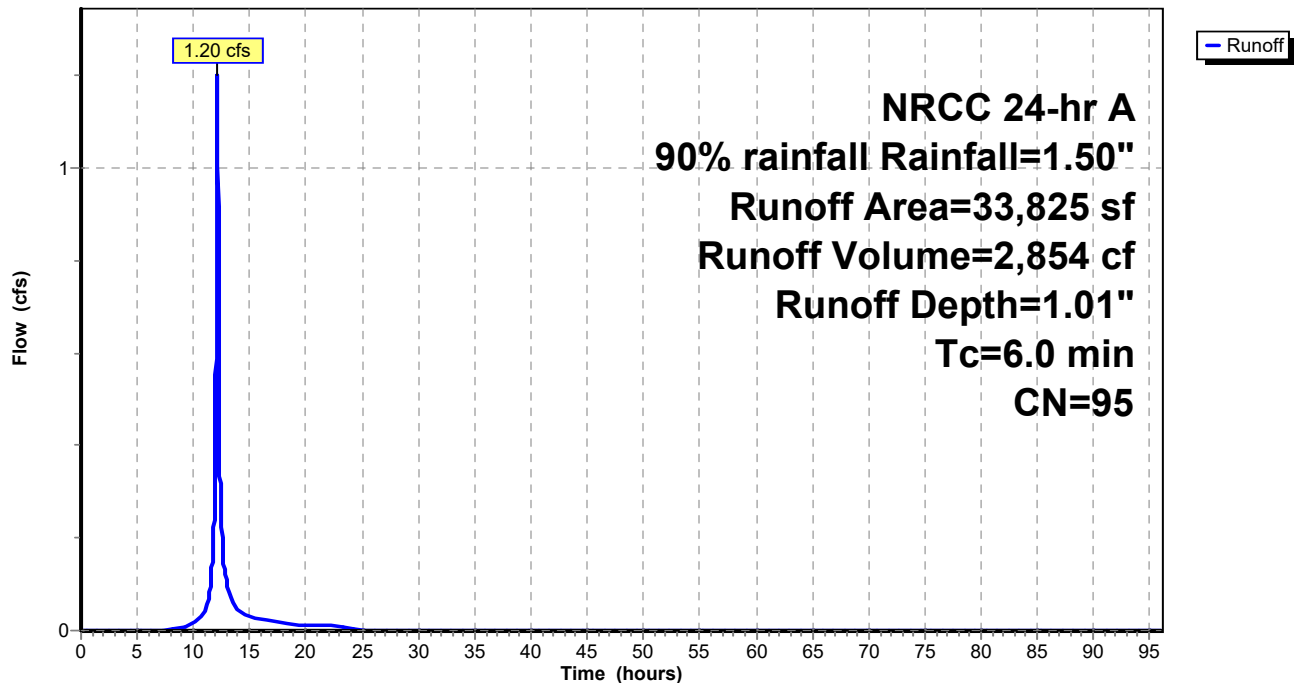
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 90% rainfall Rainfall=1.50"

Area (sf)	CN	Description
29,687	98	Paved parking, HSG C
4,138	74	>75% Grass cover, Good, HSG C
33,825	95	Weighted Average
4,138		12.23% Pervious Area
29,687		87.77% Impervious Area

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

Subcatchment 24: A9

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Pond 25: DIV-4

Inflow Area = 33,825 sf, 87.77% Impervious, Inflow Depth = 1.01" for 90% rainfall event
 Inflow = 1.20 cfs @ 12.13 hrs, Volume= 2,854 cf
 Outflow = 1.20 cfs @ 12.13 hrs, Volume= 2,854 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.20 cfs @ 12.13 hrs, Volume= 2,854 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 347.26' @ 12.13 hrs

Flood Elev= 356.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	346.50'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 346.50' / 346.50' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	347.50'	18.0" Round Culvert L= 128.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 347.50' / 344.00' S= 0.0273 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	349.33'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.20 cfs @ 12.13 hrs HW=347.26' TW=346.21' (Dynamic Tailwater)↑ **1=Culvert** (Barrel Controls 1.20 cfs @ 2.61 fps)**Secondary OutFlow** Max=0.00 cfs @ 0.00 hrs HW=346.50' TW=0.00' (Dynamic Tailwater)↑ **2=Culvert** (Controls 0.00 cfs)↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

N60 P1 Post-A 2021

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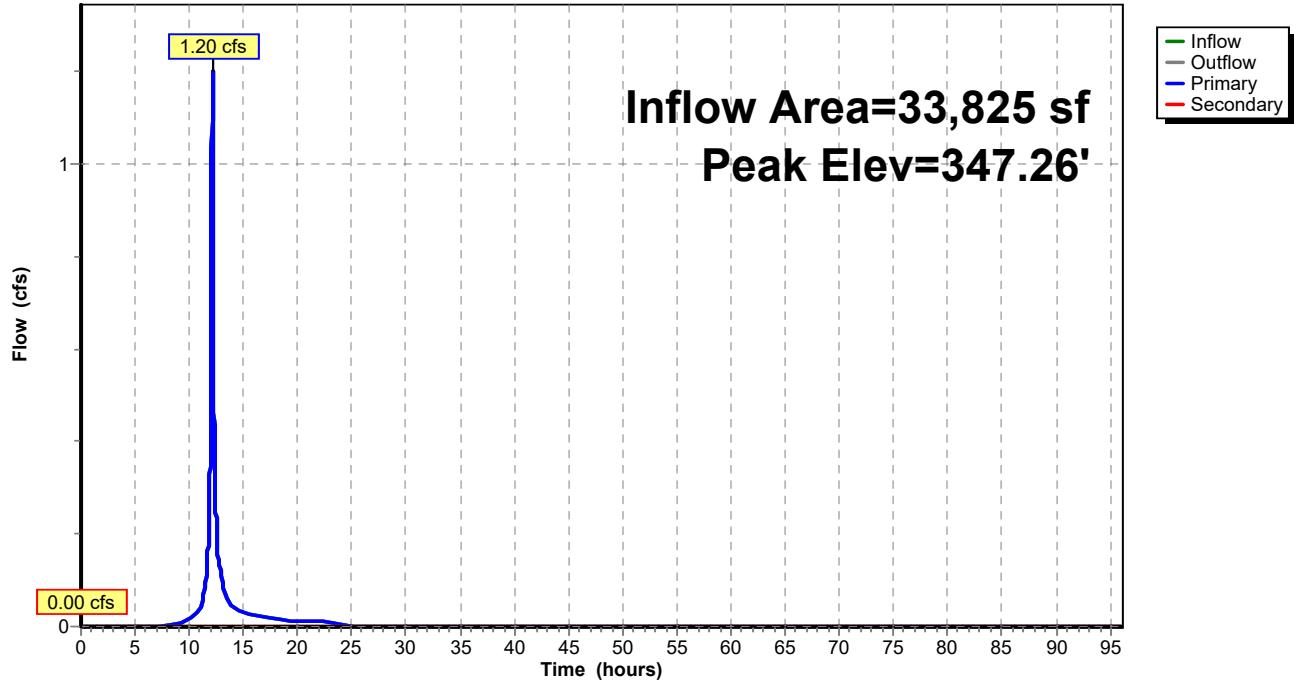
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NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Pond 25: DIV-4

Hydrograph



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NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Pond 26: INF-4

Inflow Area = 33,825 sf, 87.77% Impervious, Inflow Depth = 1.01" for 90% rainfall event
 Inflow = 1.20 cfs @ 12.13 hrs, Volume= 2,854 cf
 Outflow = 0.52 cfs @ 12.05 hrs, Volume= 2,854 cf, Atten= 57%, Lag= 0.0 min
 Discarded = 0.52 cfs @ 12.05 hrs, Volume= 2,854 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 346.36' @ 12.25 hrs Surf.Area= 2,242 sf Storage= 326 cf

Plug-Flow detention time= 2.6 min calculated for 2,854 cf (100% of inflow)
 Center-of-Mass det. time= 2.6 min (802.3 - 799.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	346.00'	2,196 cf	30.50'W x 73.50'L x 3.88'H Field A 8,687 cf Overall - 3,196 cf Embedded = 5,490 cf x 40.0% Voids
#2A	346.50'	3,196 cf	Cultec R-330XLHD x 60 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 6 rows
		5,393 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	346.00'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.01'

Discarded OutFlow Max=0.52 cfs @ 12.05 hrs HW=346.04' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.52 cfs)

N60 P1 Post-A 2021

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Pond 26: INF-4 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 6 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

10 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 71.50' Row Length +12.0" End Stone x 2 = 73.50' Base Length

6 Rows x 52.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.50' Base Width

6.0" Base + 30.5" Chamber Height + 10.0" Cover = 3.88' Field Height

60 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 6 Rows = 3,196.5 cf Chamber Storage

8,686.8 cf Field - 3,196.5 cf Chambers = 5,490.3 cf Stone x 40.0% Voids = 2,196.1 cf Stone Storage

Chamber Storage + Stone Storage = 5,392.6 cf = 0.124 af

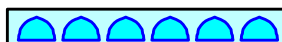
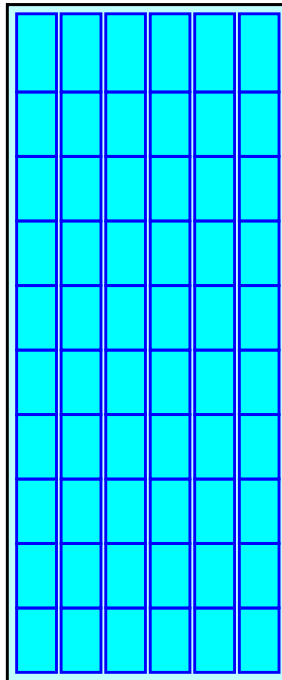
Overall Storage Efficiency = 62.1%

Overall System Size = 73.50' x 30.50' x 3.88'

60 Chambers

321.7 cy Field

203.3 cy Stone



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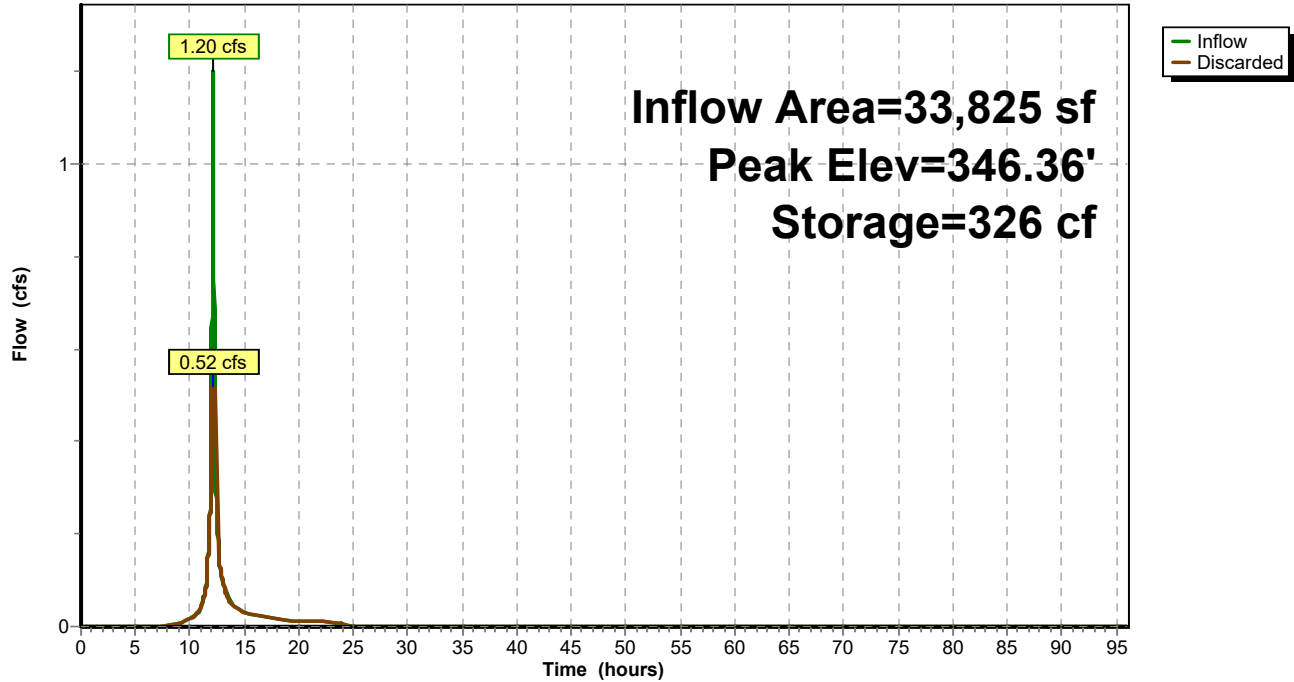
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NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Pond 26: INF-4

Hydrograph



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NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Subcatchment 27: A10

Runoff = 3.36 cfs @ 12.14 hrs, Volume= 7,753 cf, Depth= 0.63"

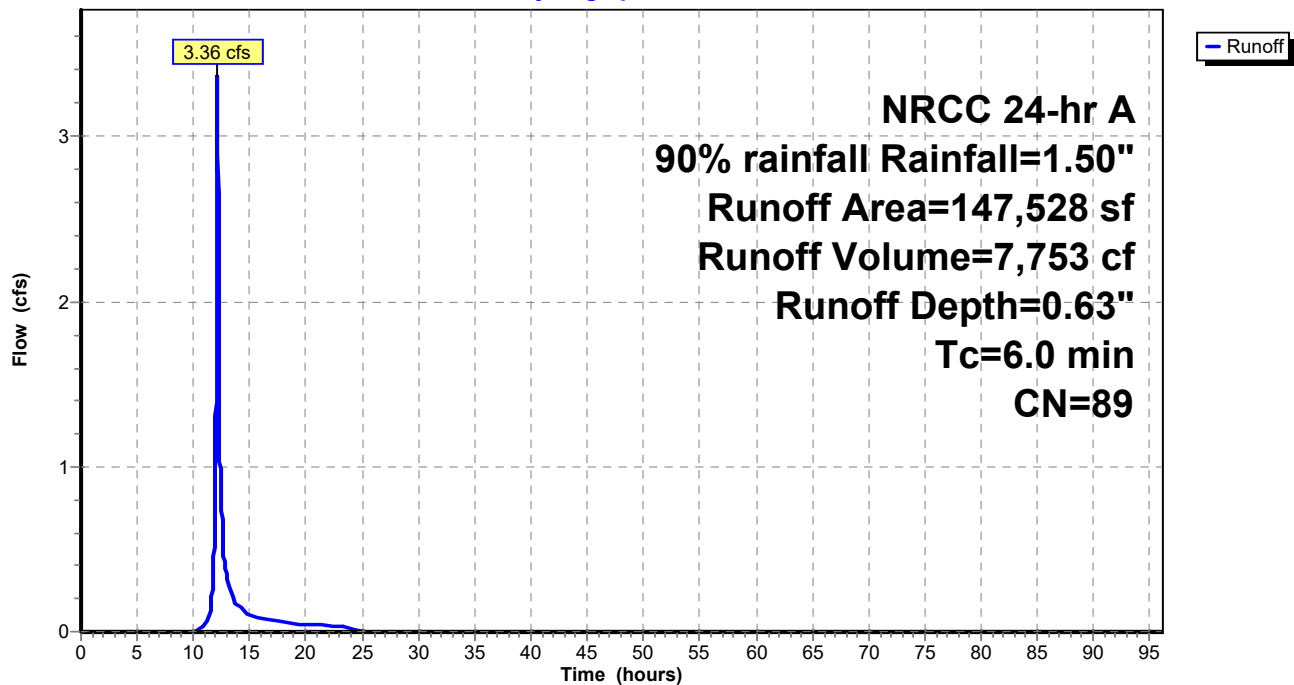
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 90% rainfall Rainfall=1.50"

Area (sf)	CN	Description
91,430	98	Paved parking, HSG C
5,603	80	>75% Grass cover, Good, HSG D
7,435	74	>75% Grass cover, Good, HSG C
16,120	73	Brush, Good, HSG D
19,715	77	Brush, Poor, HSG C
7,225	70	Woods, Good, HSG C
147,528	89	Weighted Average
56,098		38.03% Pervious Area
91,430		61.97% Impervious Area

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

Subcatchment 27: A10

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Subcatchment 28: A10

Runoff = 0.43 cfs @ 12.13 hrs, Volume= 1,060 cf, Depth= 1.18"

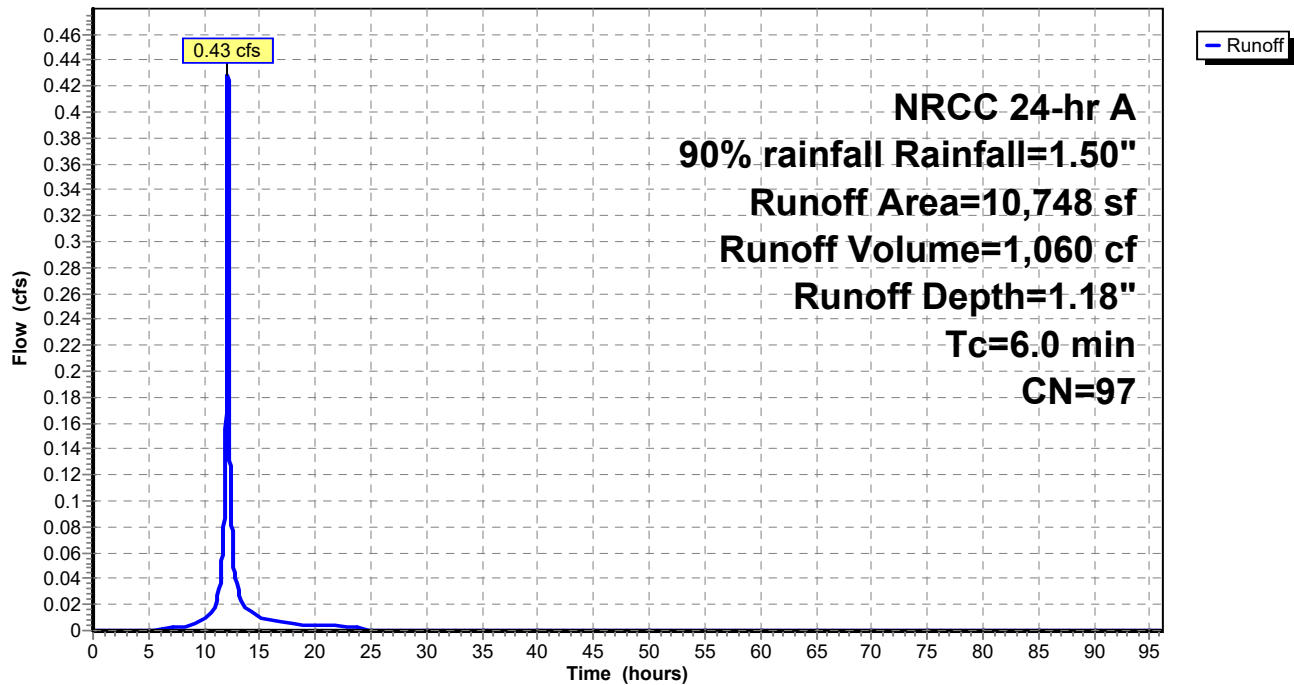
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 90% rainfall Rainfall=1.50"

Area (sf)	CN	Description
10,280	98	Paved parking, HSG D
468	80	>75% Grass cover, Good, HSG D
10,748	97	Weighted Average
468		4.35% Pervious Area
10,280		95.65% Impervious Area

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

Subcatchment 28: A10

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Pond 29: Infiltration Basin (SWP-2)

Inflow Area = 158,276 sf, 64.26% Impervious, Inflow Depth = 0.67" for 90% rainfall event
 Inflow = 3.79 cfs @ 12.13 hrs, Volume= 8,813 cf
 Outflow = 1.50 cfs @ 12.28 hrs, Volume= 8,813 cf, Atten= 60%, Lag= 8.6 min
 Discarded = 1.50 cfs @ 12.28 hrs, Volume= 8,813 cf
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 314.35' @ 12.28 hrs Surf.Area= 4,326 sf Storage= 1,451 cf

Plug-Flow detention time= 7.7 min calculated for 8,813 cf (100% of inflow)
 Center-of-Mass det. time= 7.6 min (833.7 - 826.0)

Volume	Invert	Avail.Storage	Storage Description		
#1	314.00'	47,274 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
314.00	4,026	293.0	0	0	4,026
316.00	5,897	330.7	9,864	9,864	5,998
318.00	7,994	368.3	13,838	23,702	8,204
320.00	10,316	406.0	18,261	41,962	10,652
320.50	10,932	415.4	5,311	47,274	11,300

Device	Routing	Invert	Outlet Devices
#1	Primary	308.00'	15.0" Round Culvert L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 308.00' / 304.00' S= 0.0667 ' S= 0.0667 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	316.50'	6.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	318.50'	2.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	319.00'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Discarded	314.00'	15.000 in/hr Exfiltration over Surface area Phase-In= 0.10'

Discarded OutFlow Max=1.50 cfs @ 12.28 hrs HW=314.35' (Free Discharge)

↑ **5=Exfiltration** (Exfiltration Controls 1.50 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=314.00' TW=0.00' (Dynamic Tailwater)

↑ **1=Culvert** (Passes 0.00 cfs of 13.70 cfs potential flow)

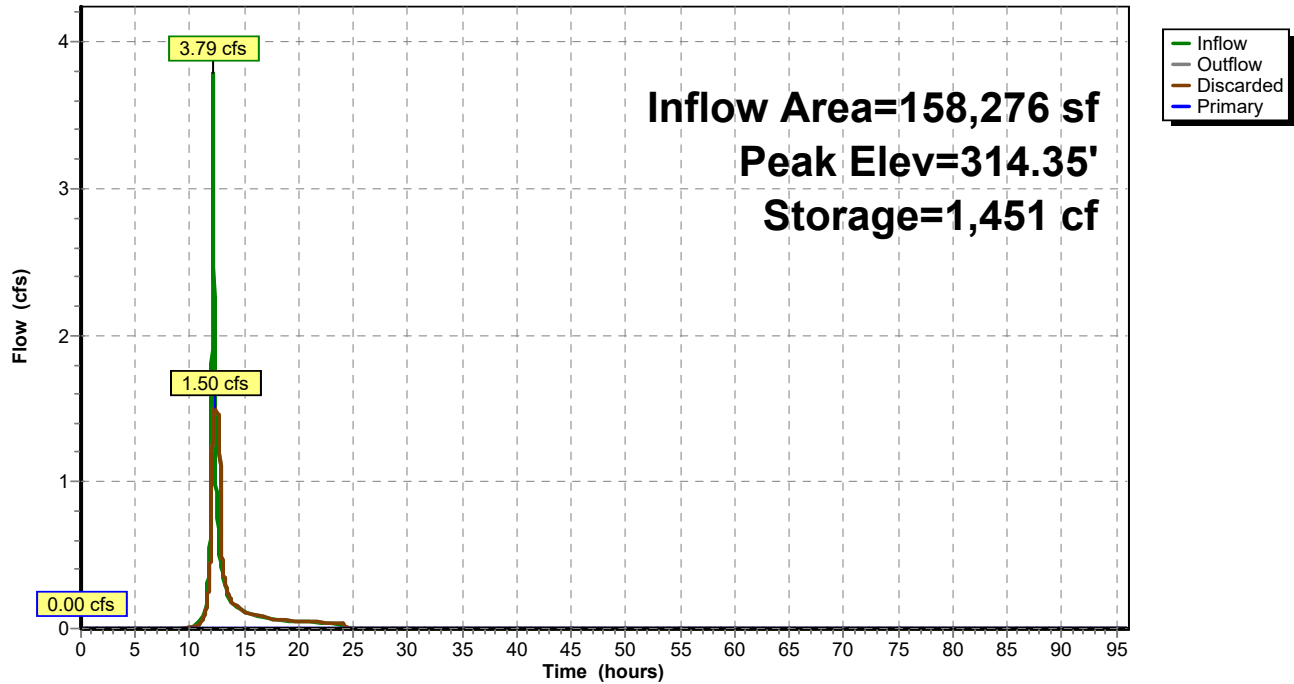
↑ **2=Orifice/Grate** (Controls 0.00 cfs)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

↑ **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 29: Infiltration Basin (SWP-2)

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Subcatchment 30: Post A2

Runoff = 0.79 cfs @ 12.33 hrs, Volume= 4,044 cf, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 90% rainfall Rainfall=1.50"

Area (sf)	CN	Description
43,743	98	Paved parking, HSG C
107,245	74	>75% Grass cover, Good, HSG C
2,876	61	>75% Grass cover, Good, HSG B
39,583	70	Woods, Good, HSG C
4,283	98	Water Surface, HSG C
33,976	65	Brush, Good, HSG C
231,706	77	Weighted Average
183,680		79.27% Pervious Area
48,026		20.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0400	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.4	215	0.0260	2.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	125	0.1000	6.42		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.4	377	0.0750	14.42	17.69	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
17.7	817	Total			

N60 P1 Post-A 2021

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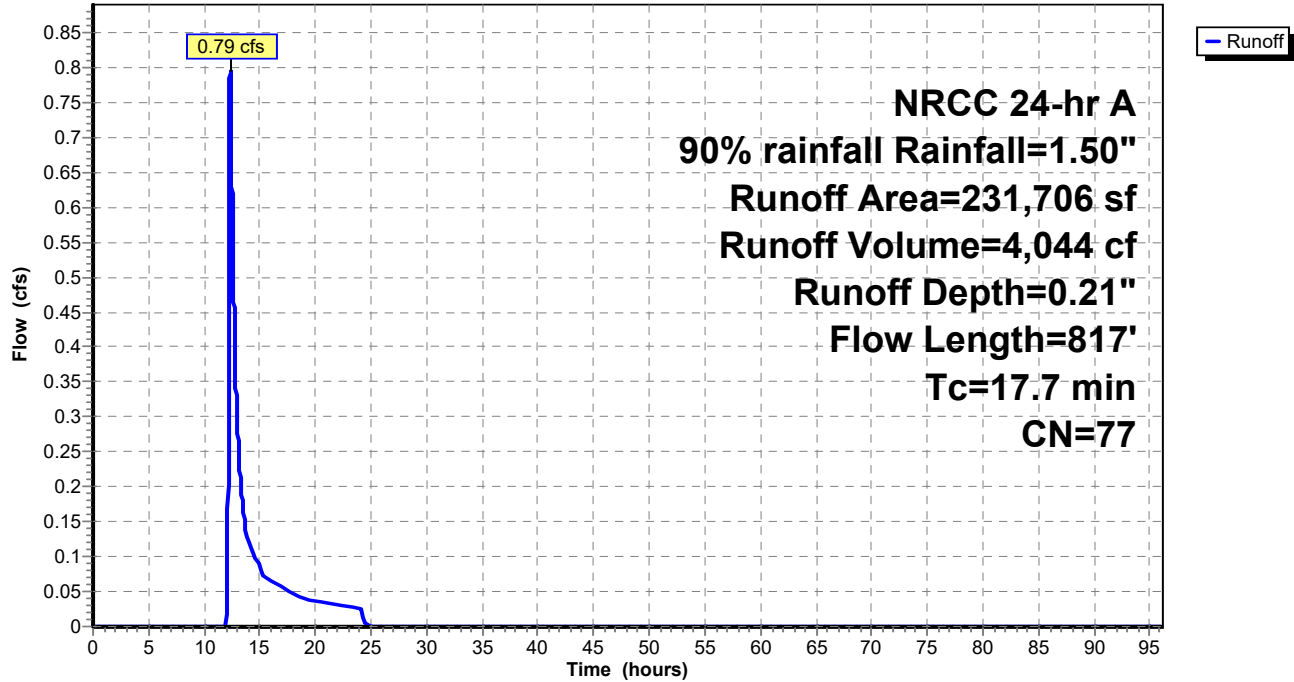
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NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Subcatchment 30: Post A2

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Pond 31: Pocket Wetland (SWP-1)

Inflow Area = 231,706 sf, 20.73% Impervious, Inflow Depth = 0.21" for 90% rainfall event
 Inflow = 0.79 cfs @ 12.33 hrs, Volume= 4,044 cf
 Outflow = 0.02 cfs @ 24.23 hrs, Volume= 3,437 cf, Atten= 98%, Lag= 713.7 min
 Primary = 0.02 cfs @ 24.23 hrs, Volume= 3,437 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Starting Elev= 234.50' Surf.Area= 12,504 sf Storage= 7,835 cf

Peak Elev= 234.84' @ 24.23 hrs Surf.Area= 13,057 sf Storage= 11,214 cf (3,379 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= 1,871.4 min (2,775.1 - 903.7)

Volume	Invert	Avail.Storage	Storage Description
#1	230.00'	1,811 cf	Forebay (Irregular) Listed below (Recalc)
#2	230.00'	1,976 cf	Micropool (Irregular) Listed below (Recalc)
#3	233.90'	65,123 cf	Marsh & Storage (Irregular) Listed below (Recalc)
		68,911 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
230.00	86	34.2	0	0	86
231.00	217	53.2	147	147	225
232.00	406	72.3	307	453	426
233.00	651	91.4	524	977	688
233.90	1,233	129.1	834	1,811	1,357

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
230.00	86	34.2	0	0	86
231.00	217	53.2	147	147	225
232.00	406	72.3	307	453	426
233.00	651	91.4	524	977	688
233.90	1,646	155.1	1,000	1,976	1,942

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
233.90	4,232	530.5	0	0	4,232
234.50	9,625	400.9	4,048	4,048	13,842
235.00	10,440	413.5	5,015	9,063	14,683
236.00	12,144	438.8	11,281	20,344	16,451
237.00	13,950	464.0	13,037	33,381	18,317
238.00	15,856	489.2	14,893	48,273	20,287
239.00	17,864	514.5	16,850	65,123	22,369

Device	Routing	Invert	Outlet Devices
#1	Primary	232.00'	15.0" Round Culvert L= 117.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 232.00' / 216.50' S= 0.1325 ' / ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

N60 P1 Post-A 2021

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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#2	Device 1	234.50'	1.1" Vert. Orifice/Grate	C= 0.600
#3	Device 1	236.00'	36.0" x 48.0" Horiz. Orifice/Grate	C= 0.600

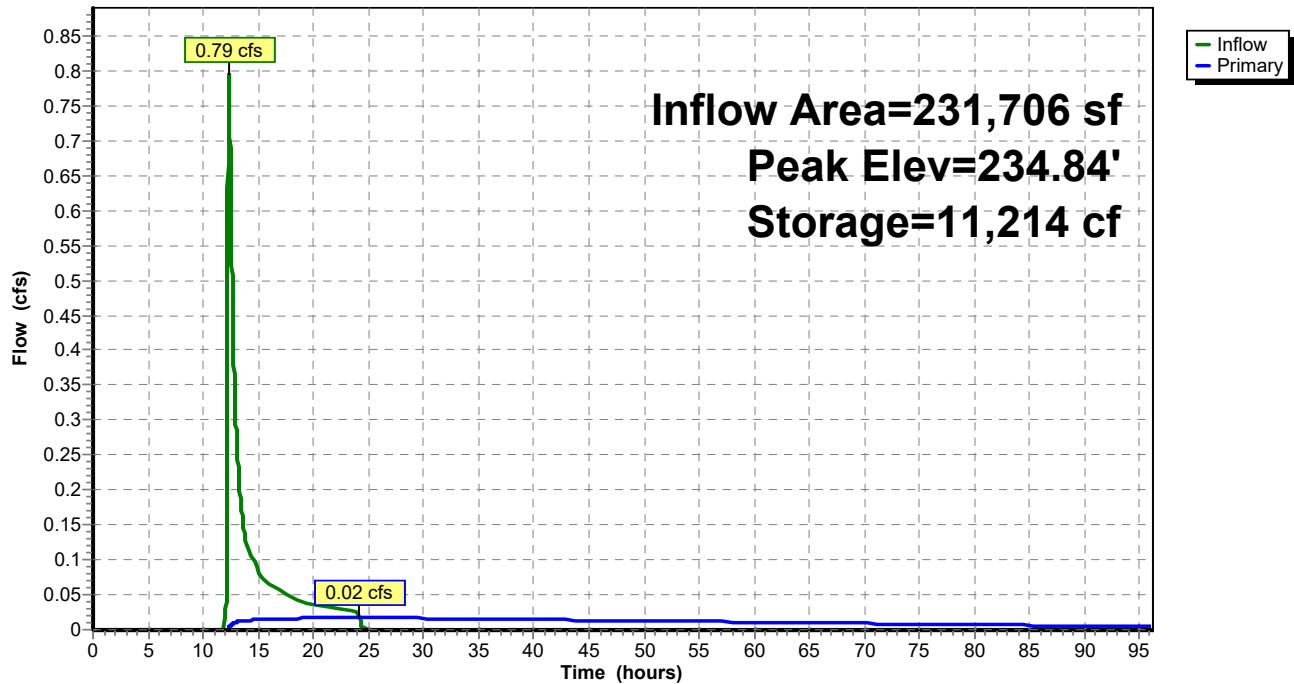
Limited to weir flow at low heads

Primary OutFlow Max=0.02 cfs @ 24.23 hrs HW=234.84' TW=0.00' (Dynamic Tailwater)

1=Culvert (Passes 0.02 cfs of 8.80 cfs potential flow)
2=Orifice/Grate (Orifice Controls 0.02 cfs @ 2.62 fps)
3=Orifice/Grate (Controls 0.00 cfs)

Pond 31: Pocket Wetland (SWP-1)

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Subcatchment 32: Post A1

Runoff = 0.25 cfs @ 12.14 hrs, Volume= 622 cf, Depth= 0.35"

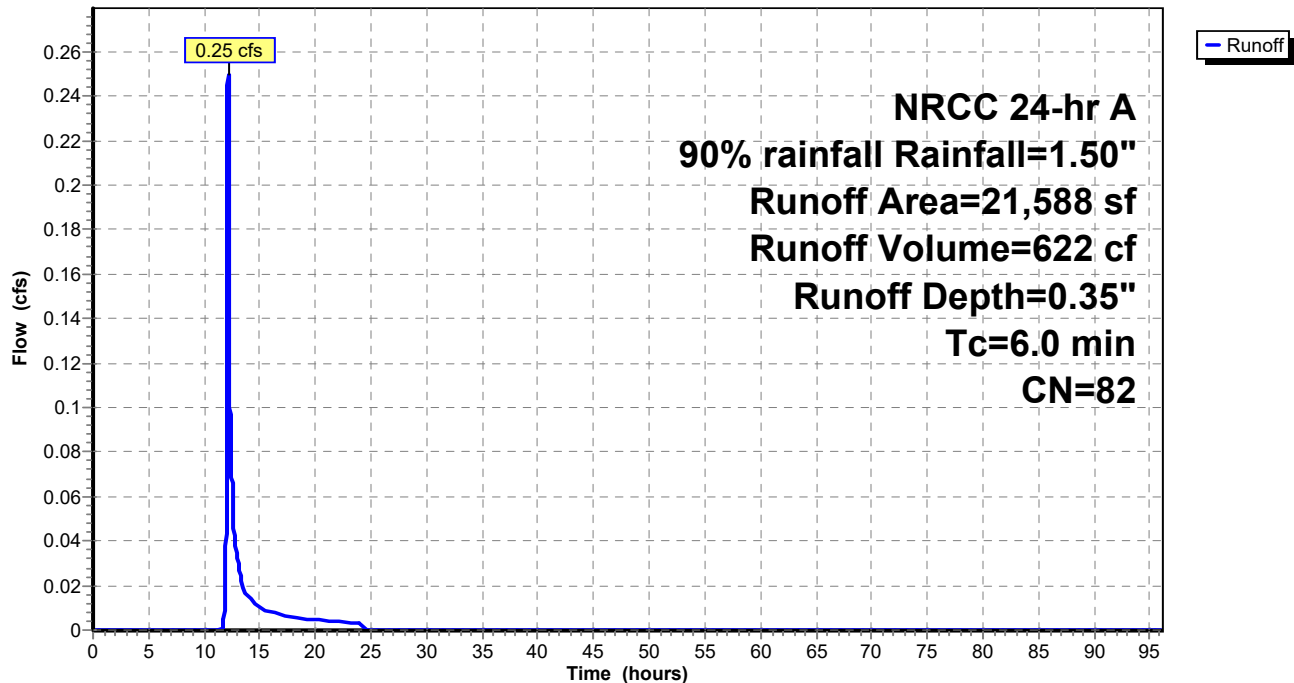
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 90% rainfall Rainfall=1.50"

Area (sf)	CN	Description
8,152	98	Paved parking, HSG C
10,356	74	>75% Grass cover, Good, HSG C
3,080	70	Woods, Good, HSG C
21,588	82	Weighted Average
13,436		62.24% Pervious Area
8,152		37.76% Impervious Area

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

Subcatchment 32: Post A1

Hydrograph



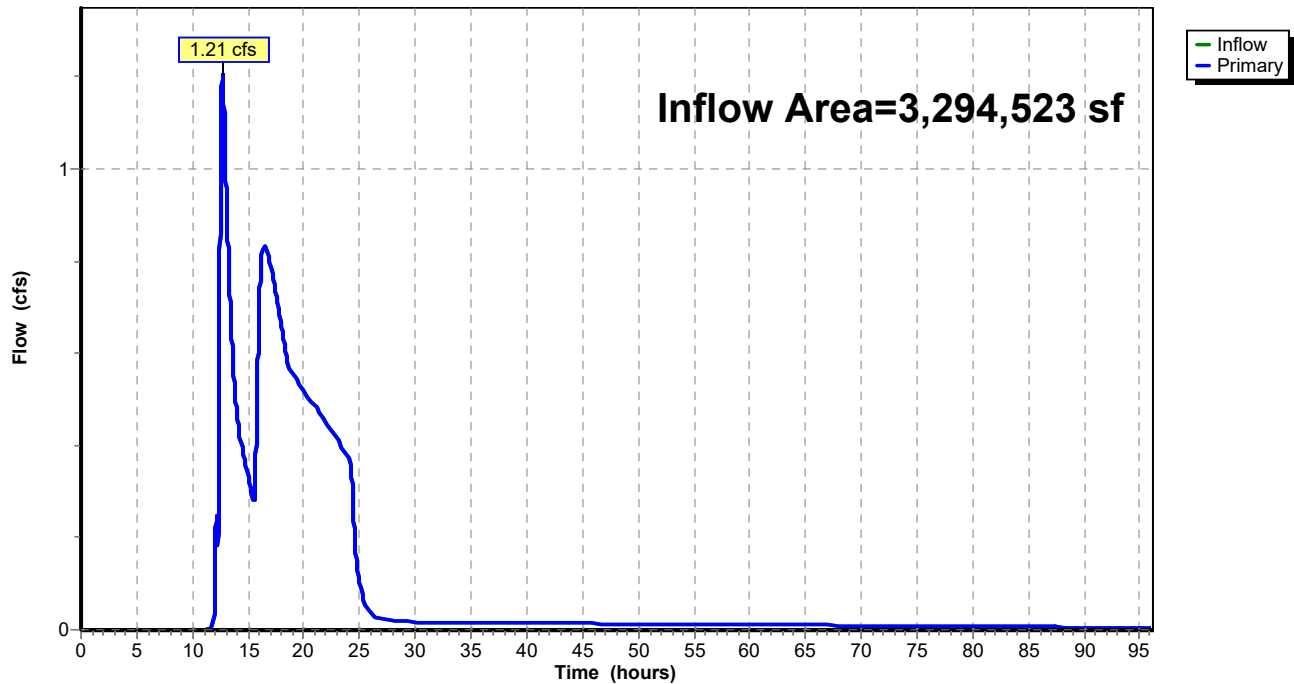
Summary for Link 33: Design Point A

Inflow Area = 3,294,523 sf, 35.27% Impervious, Inflow Depth > 0.10" for 90% rainfall event
 Inflow = 1.21 cfs @ 12.70 hrs, Volume= 27,690 cf
 Primary = 1.21 cfs @ 12.70 hrs, Volume= 27,690 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 33: Design Point A

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 100-yr Rainfall=9.18"

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 8: Post A0 Offsite

Runoff Area=1,115,060 sf 57.87% Impervious Runoff Depth=7.97"
Flow Length=1,018' Tc=12.5 min CN=90 Runoff=227.61 cfs 740,519 cf

Pond 9: Offsite Pond A

Peak Elev=365.20' Storage=188,028 cf Inflow=227.61 cfs 740,519 cf
Outflow=183.31 cfs 689,324 cf

Subcatchment 10: Post A4

Runoff Area=164,583 sf 10.25% Impervious Runoff Depth=6.24"
Flow Length=340' Tc=20.5 min CN=76 Runoff=22.58 cfs 85,616 cf

Reach 11: Box Culvert

Avg. Flow Depth=0.74' Max Vel=3.79 fps Inflow=22.58 cfs 85,616 cf
n=0.041 L=98.0' S=0.0204 ' S=0.0204 ' Capacity=177.99 cfs Outflow=22.57 cfs 85,616 cf

Subcatchment 12: Post A8

Runoff Area=392,732 sf 0.00% Impervious Runoff Depth=5.74"
Flow Length=320' Tc=21.4 min CN=72 Runoff=48.85 cfs 187,980 cf

Pond 12A: Existing Wetland A

Peak Elev=326.66' Storage=30,303 cf Inflow=253.80 cfs 962,920 cf
96.0" x 36.0" Box Culvert n=0.040 L=116.0' S=0.0776 ' S=0.0776 ' Outflow=206.93 cfs 962,920 cf

Subcatchment 12B: Post A11

Runoff Area=722,164 sf 1.29% Impervious Runoff Depth=5.49"
Flow Length=475' Tc=19.8 min CN=70 Runoff=89.96 cfs 330,623 cf

Reach 13: Existing Stream A

Avg. Flow Depth=2.49' Max Vel=12.94 fps Inflow=292.01 cfs 1,293,543 cf
n=0.040 L=1,360.0' S=0.0721 ' S=0.0721 ' Capacity=601.12 cfs Outflow=289.63 cfs 1,293,543 cf

Subcatchment 14: Post A3

Runoff Area=106,378 sf 85.91% Impervious Runoff Depth=8.58"
Tc=6.0 min CN=95 Runoff=28.19 cfs 76,036 cf

Pond 15: DIV-1

Peak Elev=326.56' Inflow=28.19 cfs 76,036 cf
Primary=4.81 cfs 45,953 cf Secondary=24.20 cfs 30,083 cf Outflow=28.19 cfs 76,036 cf

Pond 16: INF-1

Peak Elev=325.85' Storage=9,661 cf Inflow=4.81 cfs 45,953 cf
Outflow=1.18 cfs 45,953 cf

Subcatchment 17: Post A5

Runoff Area=92,926 sf 100.00% Impervious Runoff Depth=8.94"
Tc=6.0 min CN=98 Runoff=24.84 cfs 69,226 cf

Pond 18: DIV-2

Peak Elev=365.62' Inflow=24.84 cfs 69,226 cf
Primary=5.63 cfs 44,272 cf Secondary=19.27 cfs 24,954 cf Outflow=24.84 cfs 69,226 cf

Pond 19: INF-2

Peak Elev=364.20' Storage=11,261 cf Inflow=5.63 cfs 44,272 cf
Outflow=0.99 cfs 44,272 cf

Reach 20: 36" HDPE Pipe

Avg. Flow Depth=0.58' Max Vel=19.81 fps Inflow=19.27 cfs 24,954 cf
36.0" Round Pipe n=0.013 L=805.0' S=0.1205 ' S=0.1205 ' Capacity=231.53 cfs Outflow=19.15 cfs 24,954 cf

Subcatchment 21: A6

Runoff Area=384,686 sf 86.44% Impervious Runoff Depth=8.70"
Tc=6.0 min CN=96 Runoff=102.32 cfs 278,841 cf

N60 P1 Post-A 2021

NRCC 24-hr A 100-yr Rainfall=9.18"

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Subcatchment22: A7Runoff Area=103,728 sf 0.00% Impervious Runoff Depth=5.24"
Tc=6.0 min CN=68 Runoff=19.50 cfs 45,327 cf**Pond 23: Infiltration Basin (SWP-3)**Peak Elev=261.80' Storage=83,254 cf Inflow=140.79 cfs 349,122 cf
Discarded=6.80 cfs 208,184 cf Primary=114.75 cfs 140,938 cf Outflow=121.55 cfs 349,122 cf**Subcatchment24: A9**Runoff Area=33,825 sf 87.77% Impervious Runoff Depth=8.58"
Tc=6.0 min CN=95 Runoff=8.97 cfs 24,177 cf**Pond 25: DIV-4**Peak Elev=349.73' Inflow=8.97 cfs 24,177 cf
Primary=4.66 cfs 18,062 cf Secondary=5.95 cfs 6,115 cf Outflow=8.97 cfs 24,177 cf**Pond 26: INF-4**Peak Elev=349.63' Storage=5,173 cf Inflow=4.66 cfs 18,062 cf
Outflow=0.52 cfs 18,062 cf**Subcatchment27: A10**Runoff Area=147,528 sf 61.97% Impervious Runoff Depth=7.85"
Tc=6.0 min CN=89 Runoff=37.71 cfs 96,472 cf**Subcatchment28: A10**Runoff Area=10,748 sf 95.65% Impervious Runoff Depth=8.82"
Tc=6.0 min CN=97 Runoff=2.87 cfs 7,899 cf**Pond 29: Infiltration Basin (SWP-2)**Peak Elev=319.48' Storage=36,798 cf Inflow=40.58 cfs 104,371 cf
Discarded=3.36 cfs 78,618 cf Primary=11.05 cfs 25,752 cf Outflow=14.41 cfs 104,371 cf**Subcatchment30: Post A2**Runoff Area=231,706 sf 20.73% Impervious Runoff Depth=6.37"
Flow Length=817' Tc=17.7 min CN=77 Runoff=34.72 cfs 122,935 cf**Pond 31: Pocket Wetland (SWP-1)**Peak Elev=238.00' Storage=52,092 cf Inflow=34.72 cfs 122,935 cf
Outflow=13.02 cfs 114,976 cf**Subcatchment32: Post A1**Runoff Area=21,588 sf 37.76% Impervious Runoff Depth=6.99"
Tc=6.0 min CN=82 Runoff=5.14 cfs 12,569 cf**Link 33: Design Point A**Inflow=367.62 cfs 1,623,976 cf
Primary=367.62 cfs 1,623,976 cf**Total Runoff Area = 3,527,652 sf Runoff Volume = 2,078,220 cf Average Runoff Depth = 7.07"**
61.00% Pervious = 2,151,703 sf 39.00% Impervious = 1,375,949 sf

N60 P1 Post-A 2021

NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Subcatchment 8: Post A0 Offsite

Runoff = 227.61 cfs @ 12.20 hrs, Volume= 740,519 cf, Depth= 7.97"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 100-yr Rainfall=9.18"

Area (sf)	CN	Description
645,334	98	Paved parking, HSG C
443,611	80	>75% Grass cover, Good, HSG D
23,572	74	>75% Grass cover, Good, HSG C
2,543	61	>75% Grass cover, Good, HSG B
1,115,060	90	Weighted Average
469,726		42.13% Pervious Area
645,334		57.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.5	100	0.0150	0.16		Sheet Flow, Grass: Short n= 0.150 P2= 3.50"
0.6	148	0.0574	3.86		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.2	30	0.0200	2.87		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	740	0.0270	10.25	32.22	Pipe Channel, 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.015 Concrete sewer w/manholes & inlets
12.5	1,018	Total			

N60 P1 Post-A 2021

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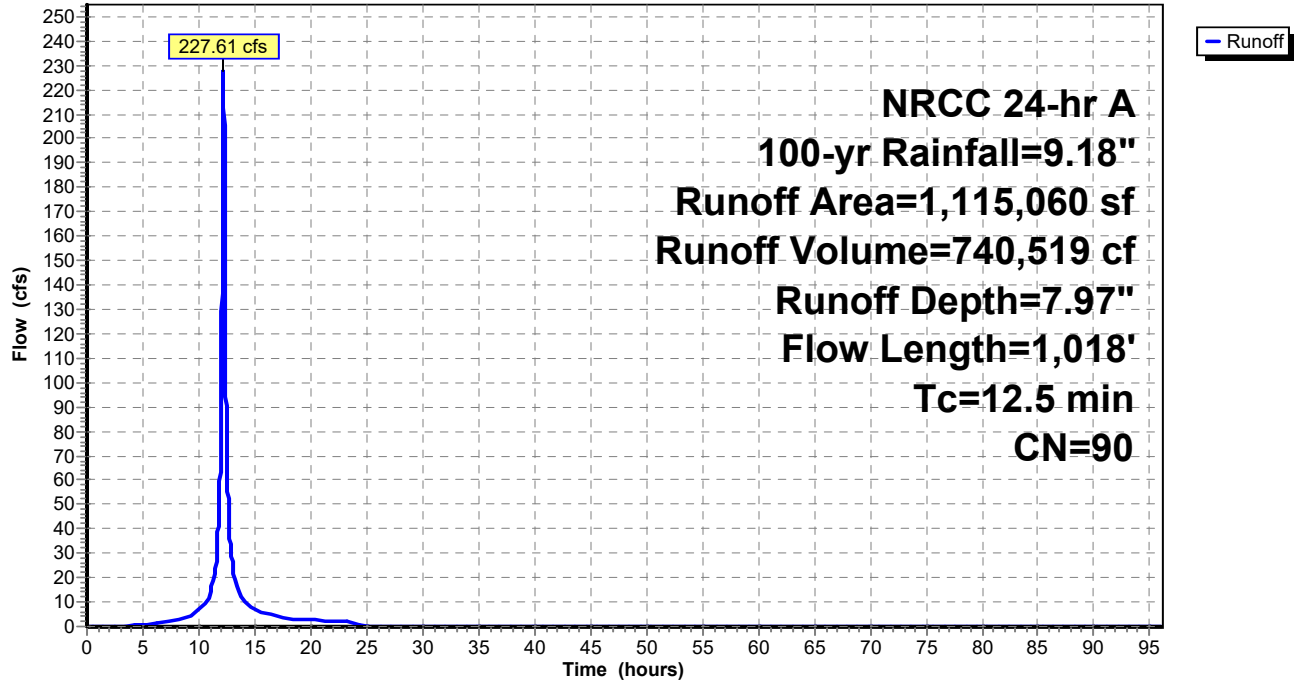
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NRCC 24-hr A 100-yr Rainfall=9.18"

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Subcatchment 8: Post A0 Offsite

Hydrograph



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NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Pond 9: Offsite Pond A

Inflow Area = 1,115,060 sf, 57.87% Impervious, Inflow Depth = 7.97" for 100-yr event
 Inflow = 227.61 cfs @ 12.20 hrs, Volume= 740,519 cf
 Outflow = 183.31 cfs @ 12.28 hrs, Volume= 689,324 cf, Atten= 19%, Lag= 4.8 min
 Primary = 183.31 cfs @ 12.28 hrs, Volume= 689,324 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 365.20' @ 12.28 hrs Surf.Area= 38,352 sf Storage= 188,028 cf

Plug-Flow detention time= 74.7 min calculated for 689,324 cf (93% of inflow)
 Center-of-Mass det. time= 38.3 min (813.6 - 775.3)

Volume	Invert	Avail.Storage	Storage Description		
#1	357.00'	221,816 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
357.00	14,633	679.0	0	0	14,633
358.00	16,652	698.0	15,632	15,632	16,826
359.00	17,534	715.0	17,091	32,723	18,864
360.00	19,427	745.0	18,472	51,195	22,425
362.00	24,453	804.0	43,784	94,979	29,861
364.00	28,701	854.0	53,097	148,076	36,663
365.00	36,602	901.0	32,572	180,648	43,285
366.00	45,910	1,262.0	41,168	221,816	105,432

Device	Routing	Invert	Outlet Devices
#1	Primary	357.00'	30.0" Round Culvert L= 125.0' RCP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 357.00' / 351.00' S= 0.0480 ' S= 0.0480 ' Cc= 0.900 n= 0.012 Concrete pipe, finished, Flow Area= 4.91 sf
#2	Device 1	360.00'	36.0" x 48.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#3	Primary	364.75'	150.0' long x 36.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=183.09 cfs @ 12.28 hrs HW=365.20' TW=325.81' (Dynamic Tailwater)

- 1=Culvert (Inlet Controls 62.29 cfs @ 12.69 fps)
 2=Orifice/Grate (Passes 62.29 cfs of 263.43 cfs potential flow)
 3=Broad-Crested Rectangular Weir (Weir Controls 120.80 cfs @ 1.80 fps)

N60 P1 Post-A 2021

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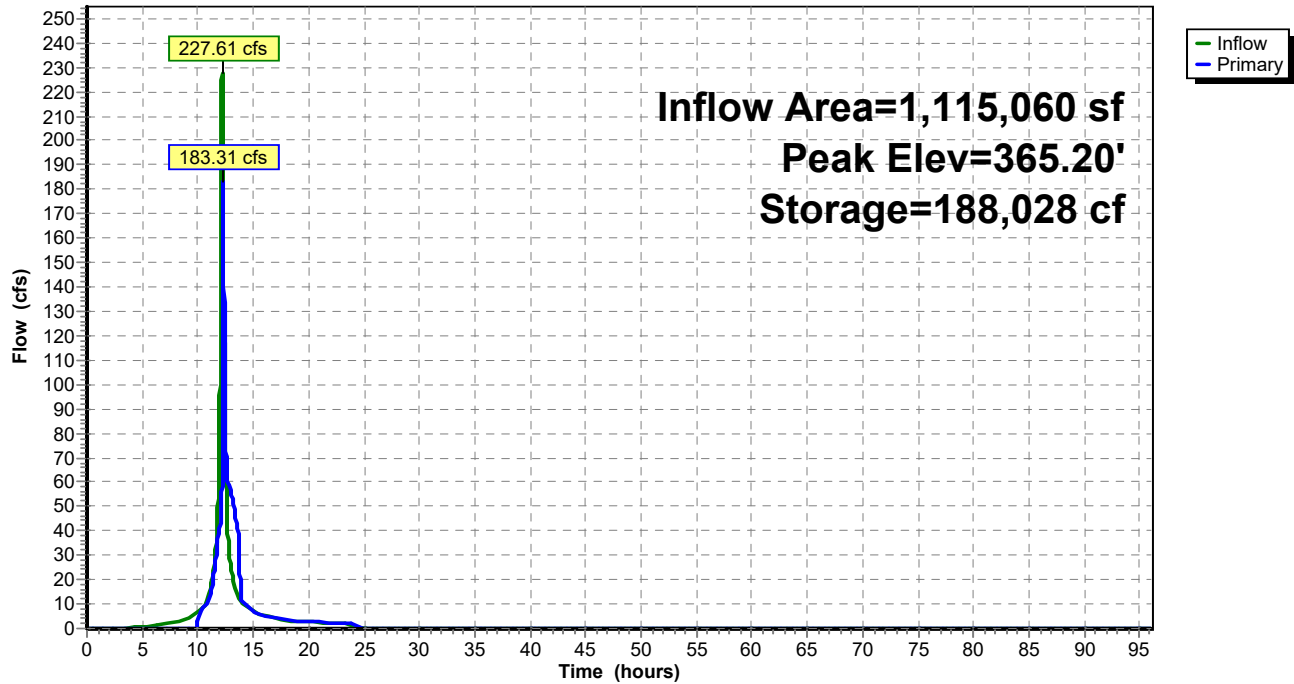
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NRCC 24-hr A 100-yr Rainfall=9.18"

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Pond 9: Offsite Pond A

Hydrograph



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NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Subcatchment 10: Post A4

Runoff = 22.58 cfs @ 12.30 hrs, Volume= 85,616 cf, Depth= 6.24"

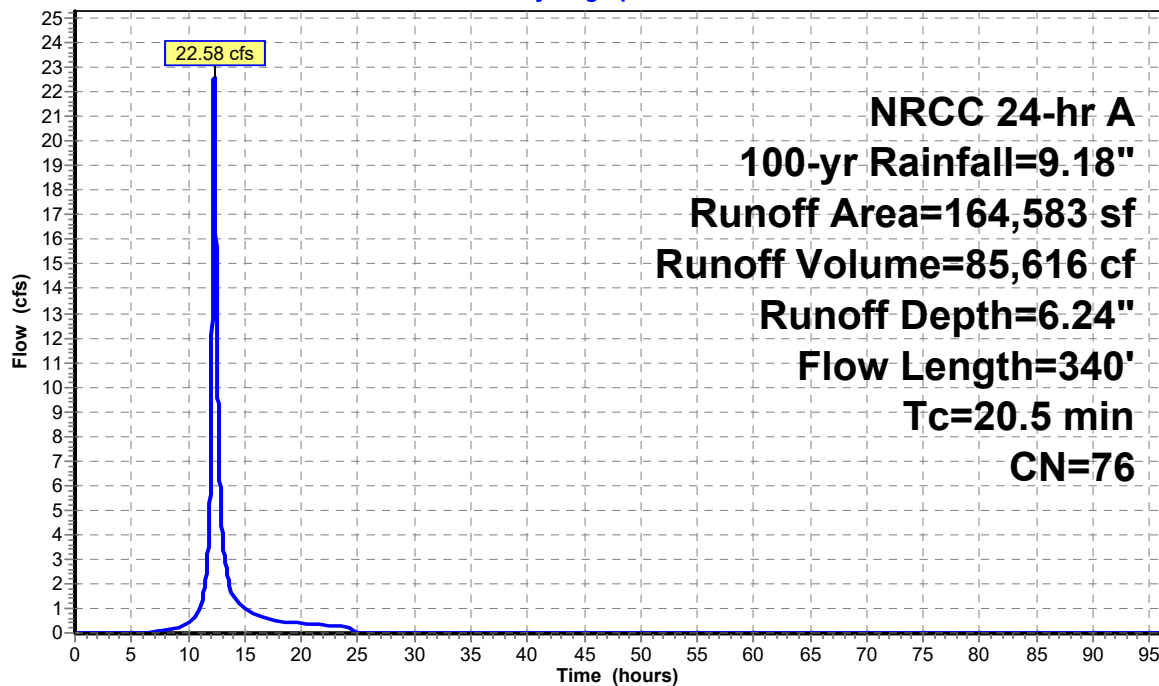
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 100-yr Rainfall=9.18"

Area (sf)	CN	Description
15,990	74	>75% Grass cover, Good, HSG C
65,271	70	Woods, Good, HSG C
66,457	77	Woods, Good, HSG D
16,865	98	Water Surface, HSG D
164,583	76	Weighted Average
147,718		89.75% Pervious Area
16,865		10.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0250	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.7	240	0.0208	2.32		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
20.5	340	Total			

Subcatchment 10: Post A4

Hydrograph



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NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Reach 11: Box Culvert

Inflow Area = 164,583 sf, 10.25% Impervious, Inflow Depth = 6.24" for 100-yr event
Inflow = 22.58 cfs @ 12.30 hrs, Volume= 85,616 cf
Outflow = 22.57 cfs @ 12.30 hrs, Volume= 85,616 cf, Atten= 0%, Lag= 0.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 3.79 fps, Min. Travel Time= 0.4 min
Avg. Velocity= 1.00 fps, Avg. Travel Time= 1.6 min

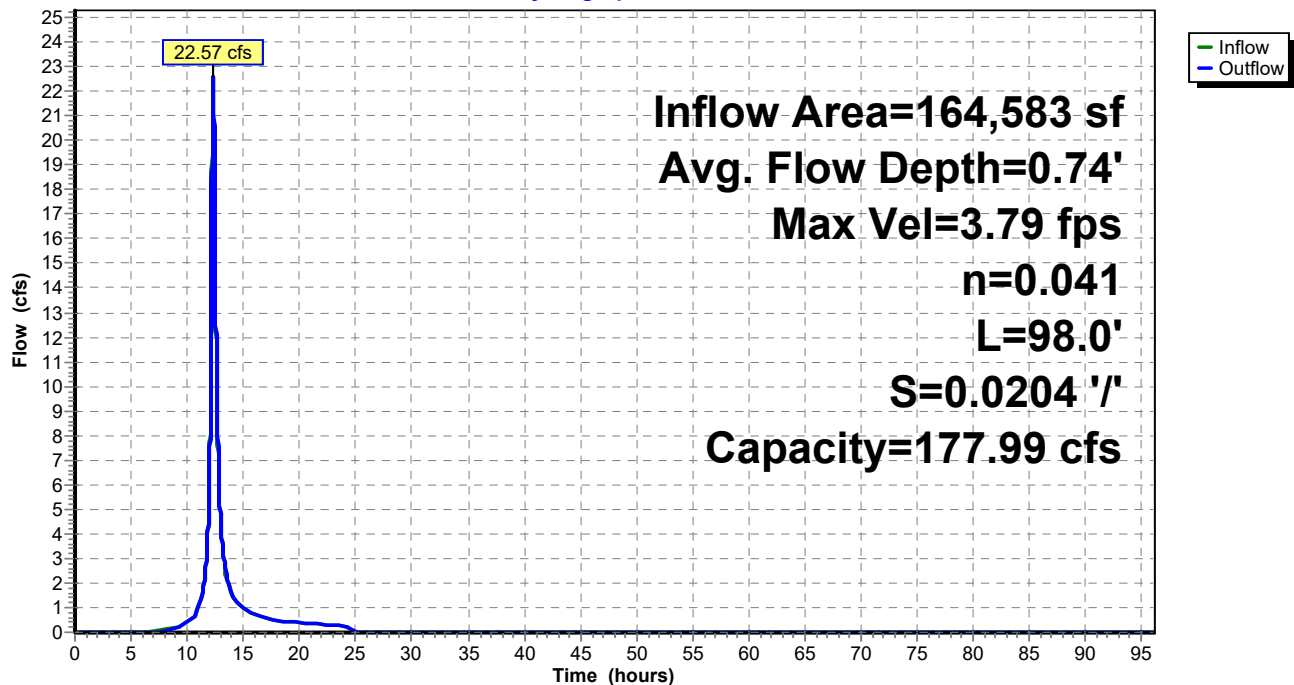
Peak Storage= 583 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.74'
Bank-Full Depth= 3.00' Flow Area= 24.0 sf, Capacity= 177.99 cfs

8.00' x 3.00' deep channel, n= 0.041 Riprap, 2-inch
Length= 98.0' Slope= 0.0204 '/'
Inlet Invert= 349.00', Outlet Invert= 347.00'



Reach 11: Box Culvert

Hydrograph



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NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Subcatchment 12: Post A8

Runoff = 48.85 cfs @ 12.31 hrs, Volume= 187,980 cf, Depth= 5.74"

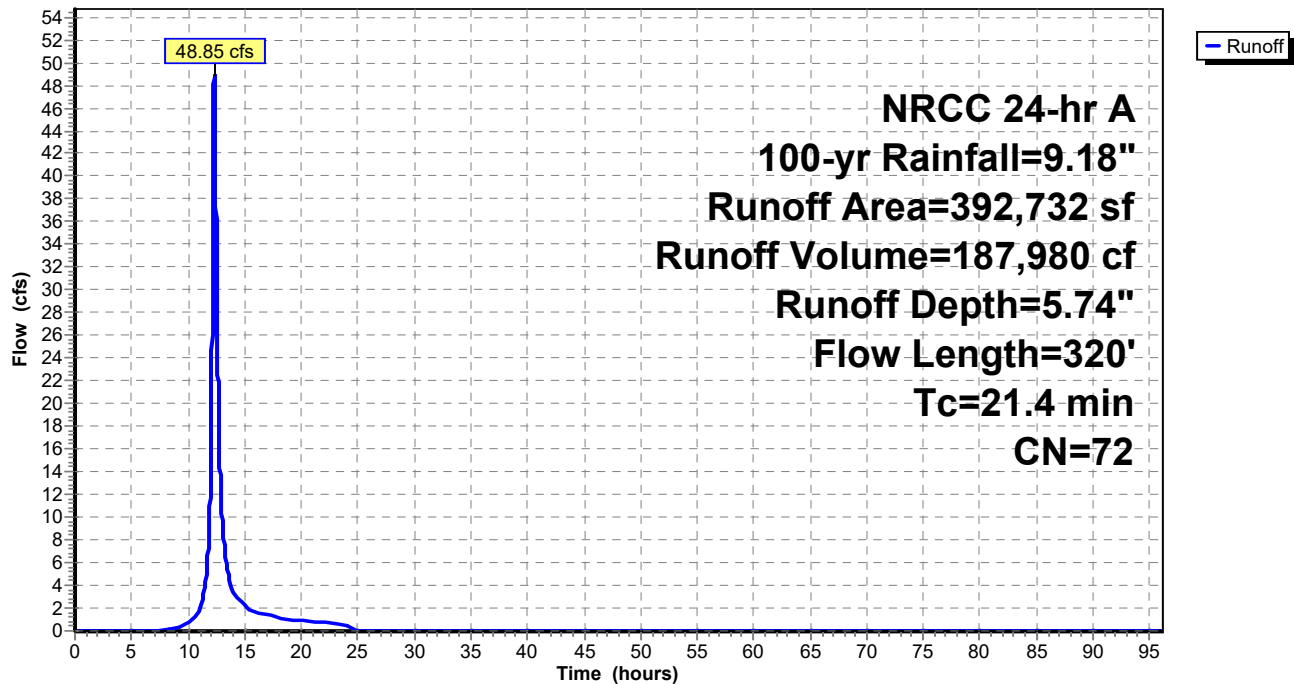
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 100-yr Rainfall=9.18"

Area (sf)	CN	Description
278,057	70	Woods, Good, HSG C
108,143	77	Woods, Good, HSG D
6,532	74	>75% Grass cover, Good, HSG C
392,732	72	Weighted Average
392,732		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.5	100	0.0200	0.08		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
0.9	220	0.0636	4.06		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
21.4	320	Total			

Subcatchment 12: Post A8

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Pond 12A: Existing Wetland A

Inflow Area = 1,672,375 sf, 39.60% Impervious, Inflow Depth = 6.91" for 100-yr event
 Inflow = 253.80 cfs @ 12.28 hrs, Volume= 962,920 cf
 Outflow = 206.93 cfs @ 12.36 hrs, Volume= 962,920 cf, Atten= 18%, Lag= 4.9 min
 Primary = 206.93 cfs @ 12.36 hrs, Volume= 962,920 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 326.66' @ 12.36 hrs Surf.Area= 14,103 sf Storage= 30,303 cf

Plug-Flow detention time= 1.0 min calculated for 962,920 cf (100% of inflow)
 Center-of-Mass det. time= 0.8 min (815.7 - 814.9)

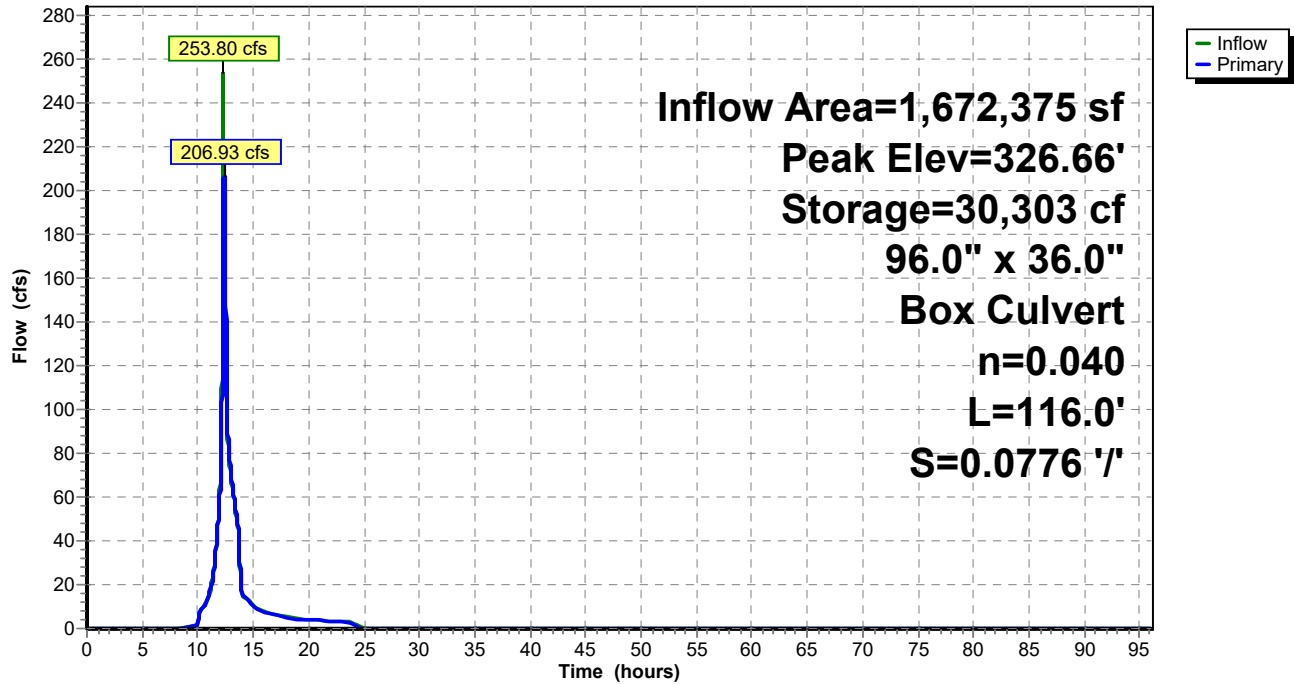
Volume	Invert	Avail.Storage	Storage Description		
#1	321.00'	190,307 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
321.00	124	53.2	0	0	124
322.00	1,084	175.8	525	525	2,361
324.00	4,913	341.5	5,536	6,061	9,202
326.00	11,332	638.2	15,804	21,866	32,354
328.00	20,583	804.3	31,458	53,324	51,475
330.00	34,086	1,075.5	54,104	107,428	92,087
332.00	49,257	1,268.5	82,879	190,307	128,164

Device	Routing	Invert	Outlet Devices
#1	Primary	321.00'	96.0" W x 36.0" H Box Culvert L= 116.0' Box, 0° wingwalls, square crown edge, Ke= 0.700 Inlet / Outlet Invert= 321.00' / 312.00' S= 0.0776 '/' Cc= 0.900 n= 0.040 Earth, cobble bottom, clean sides, Flow Area= 24.00 sf

Primary OutFlow Max=206.89 cfs @ 12.36 hrs HW=326.66' TW=314.49' (Dynamic Tailwater)
 ↑**1=Culvert** (Inlet Controls 206.89 cfs @ 8.62 fps)

Pond 12A: Existing Wetland A

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Subcatchment 12B: Post A11

Runoff = 89.96 cfs @ 12.29 hrs, Volume= 330,623 cf, Depth= 5.49"

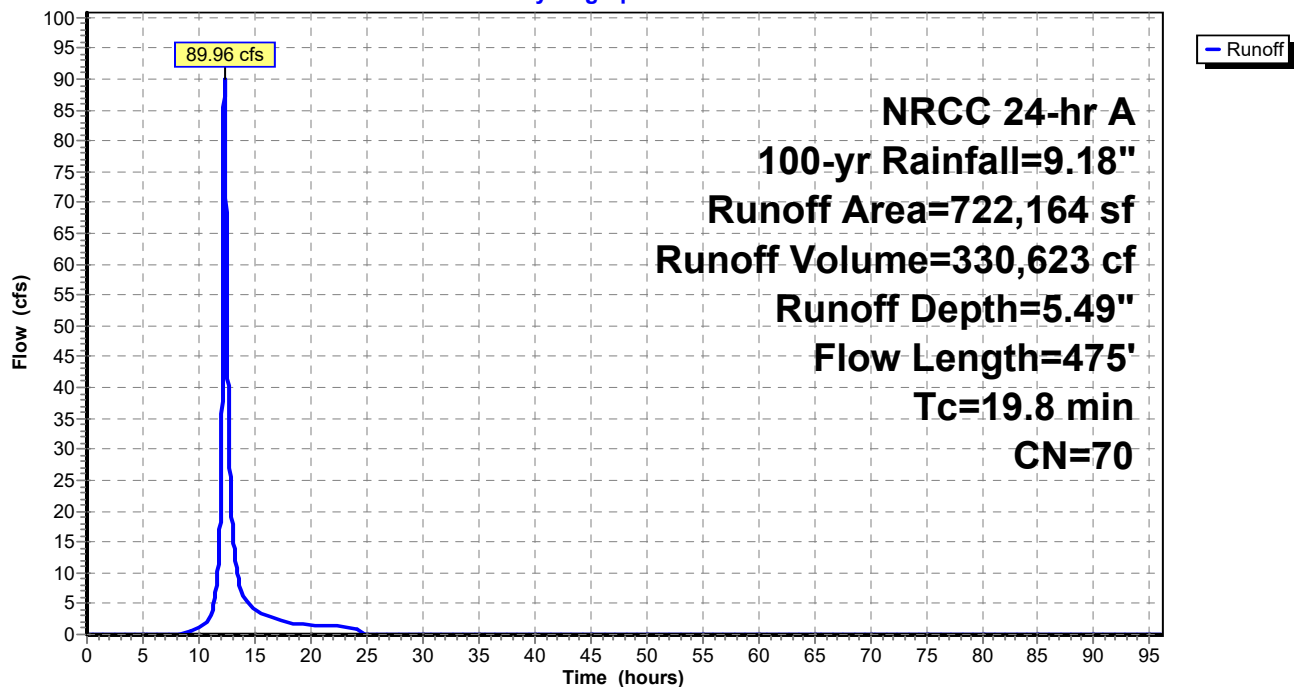
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 100-yr Rainfall=9.18"

Area (sf)	CN	Description
17,361	55	Woods, Good, HSG B
681,082	70	Woods, Good, HSG C
11,683	77	Woods, Good, HSG D
9,345	98	Paved parking, HSG C
2,693	74	>75% Grass cover, Good, HSG C
722,164	70	Weighted Average
712,819		98.71% Pervious Area
9,345		1.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.8	100	0.0250	0.09		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.0	375	0.1400	6.02		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
19.8	475	Total			

Subcatchment 12B: Post A11

Hydrograph



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NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Reach 13: Existing Stream A (Lower Segment)

Inflow Area = 2,394,539 sf, 28.04% Impervious, Inflow Depth = 6.48" for 100-yr event
Inflow = 292.01 cfs @ 12.34 hrs, Volume= 1,293,543 cf
Outflow = 289.63 cfs @ 12.36 hrs, Volume= 1,293,543 cf, Atten= 1%, Lag= 1.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 12.94 fps, Min. Travel Time= 1.8 min
Avg. Velocity = 3.28 fps, Avg. Travel Time= 6.9 min

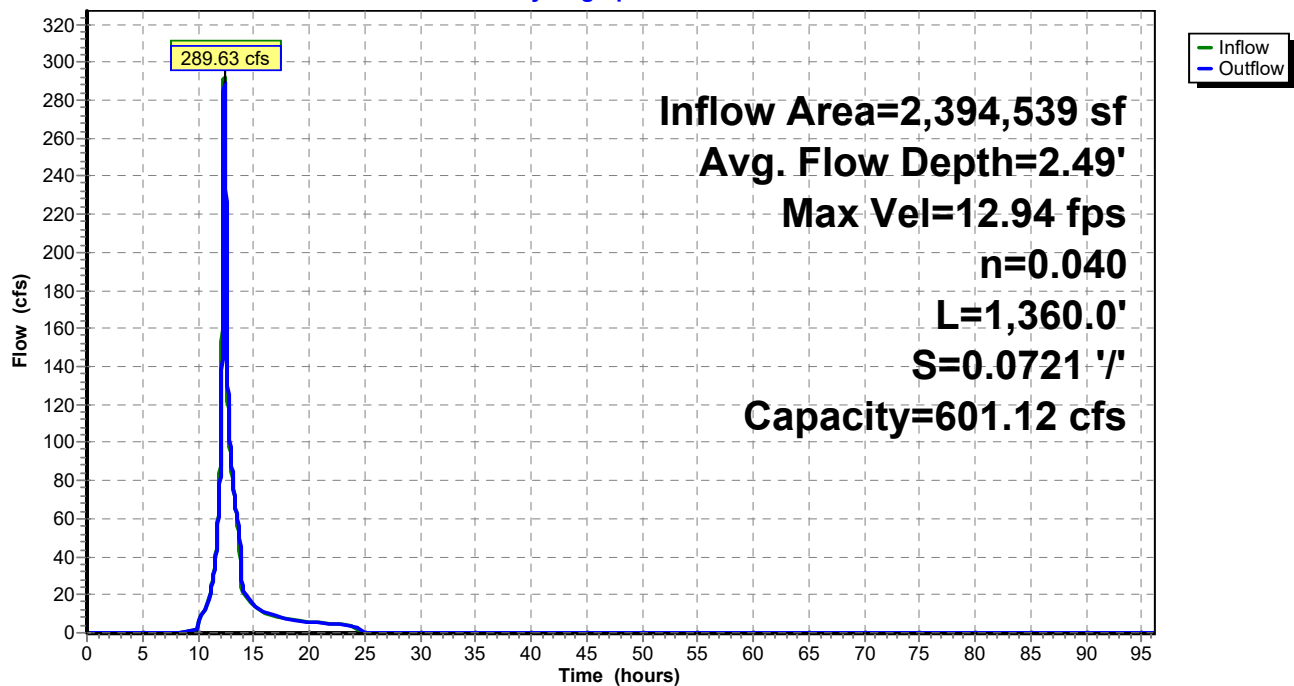
Peak Storage= 30,439 cf @ 12.36 hrs
Average Depth at Peak Storage= 2.49'
Bank-Full Depth= 3.50' Flow Area= 38.5 sf, Capacity= 601.12 cfs

4.00' x 3.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 '/' Top Width= 18.00'
Length= 1,360.0' Slope= 0.0721 '/'
Inlet Invert= 312.00', Outlet Invert= 214.00'



Reach 13: Existing Stream A (Lower Segment)

Hydrograph



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NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Subcatchment 14: Post A3

Runoff = 28.19 cfs @ 12.13 hrs, Volume= 76,036 cf, Depth= 8.58"

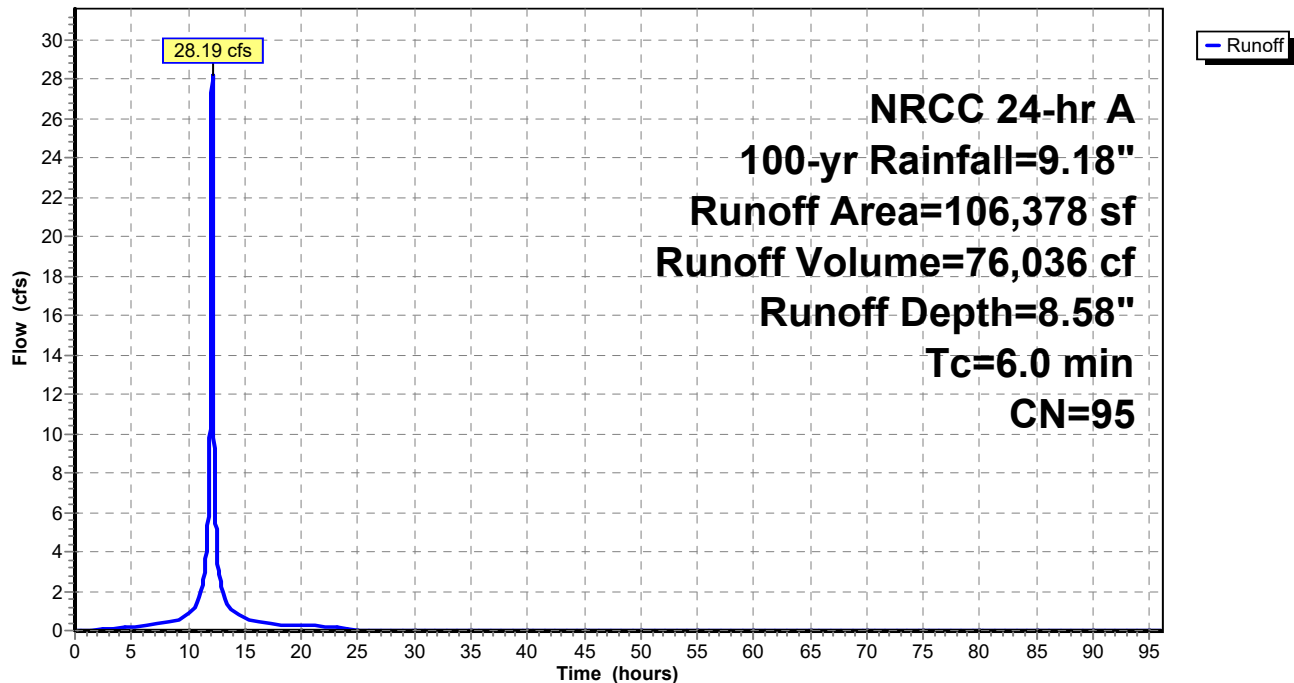
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 100-yr Rainfall=9.18"

Area (sf)	CN	Description
91,392	98	Paved parking, HSG C
14,986	74	>75% Grass cover, Good, HSG C
106,378	95	Weighted Average
14,986		14.09% Pervious Area
91,392		85.91% Impervious Area

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

Subcatchment 14: Post A3

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Pond 15: DIV-1

Inflow Area = 106,378 sf, 85.91% Impervious, Inflow Depth = 8.58" for 100-yr event
 Inflow = 28.19 cfs @ 12.13 hrs, Volume= 76,036 cf
 Outflow = 28.19 cfs @ 12.13 hrs, Volume= 76,036 cf, Atten= 0%, Lag= 0.0 min
 Primary = 4.81 cfs @ 11.69 hrs, Volume= 45,953 cf
 Secondary = 24.20 cfs @ 12.13 hrs, Volume= 30,083 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 326.56' @ 12.13 hrs

Flood Elev= 328.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	323.00'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 323.00' / 323.00' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	323.00'	24.0" Round Culvert L= 51.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 323.00' / 320.00' S= 0.0588 ' S= 0.0588 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	325.50'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.75 cfs @ 11.69 hrs HW=325.50' TW=323.93' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 4.75 cfs @ 6.05 fps)**Secondary OutFlow** Max=24.20 cfs @ 12.13 hrs HW=326.56' TW=0.00' (Dynamic Tailwater)↑ **2=Culvert** (Inlet Controls 24.20 cfs @ 7.70 fps)↑ **3=Broad-Crested Rectangular Weir** (Passes 24.20 cfs of 28.99 cfs potential flow)

N60 P1 Post-A 2021

Prepared by {enter your company name here}

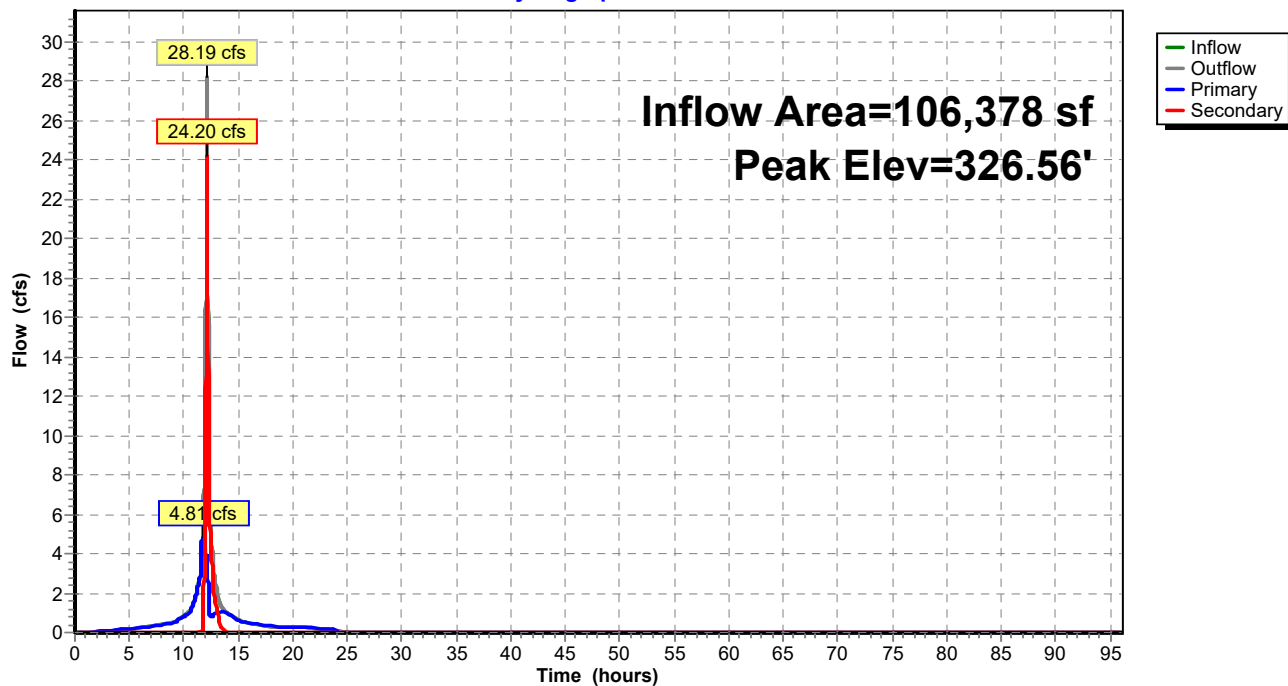
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NRCC 24-hr A 100-yr Rainfall=9.18"

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Pond 15: DIV-1

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Pond 16: INF-1

Inflow Area = 106,378 sf, 85.91% Impervious, Inflow Depth = 5.18" for 100-yr event
 Inflow = 4.81 cfs @ 11.69 hrs, Volume= 45,953 cf
 Outflow = 1.18 cfs @ 10.83 hrs, Volume= 45,953 cf, Atten= 76%, Lag= 0.0 min
 Discarded = 1.18 cfs @ 10.83 hrs, Volume= 45,953 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 325.85' @ 12.32 hrs Surf.Area= 4,245 sf Storage= 9,661 cf

Plug-Flow detention time= 51.0 min calculated for 45,948 cf (100% of inflow)
 Center-of-Mass det. time= 51.0 min (815.9 - 764.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	322.50'	4,688 cf	36.75'W x 115.50'L x 4.33'H Field A 18,393 cf Overall - 6,674 cf Embedded = 11,720 cf x 40.0% Voids
#2A	323.00'	6,674 cf	Cultec R-360HD x 180 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 180 Chambers in 6 Rows Cap Storage= +6.5 cf x 2 x 6 rows = 77.5 cf
		11,361 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	322.50'	12.000 in/hr Exfiltration over Horizontal area Phase-In= 0.01'

Discarded OutFlow Max=1.18 cfs @ 10.83 hrs HW=322.55' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 1.18 cfs)

Pond 16: INF-1 - Chamber Wizard Field A

Chamber Model = Cultec R-360HD (Cultec Recharger® 360HD)

Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf

Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap

Cap Storage= +6.5 cf x 2 x 6 rows = 77.5 cf

60.0" Wide + 9.0" Spacing = 69.0" C-C Row Spacing

30 Chambers/Row x 3.67' Long +1.25' Cap Length x 2 = 112.50' Row Length +18.0" End Stone x 2 = 115.50' Base Length

6 Rows x 60.0" Wide + 9.0" Spacing x 5 + 18.0" Side Stone x 2 = 36.75' Base Width

6.0" Base + 36.0" Chamber Height + 10.0" Cover = 4.33' Field Height

180 Chambers x 36.6 cf + 6.5 cf Cap Volume x 2 x 6 Rows = 6,673.6 cf Chamber Storage

18,393.4 cf Field - 6,673.6 cf Chambers = 11,719.8 cf Stone x 40.0% Voids = 4,687.9 cf Stone Storage

Chamber Storage + Stone Storage = 11,361.5 cf = 0.261 af

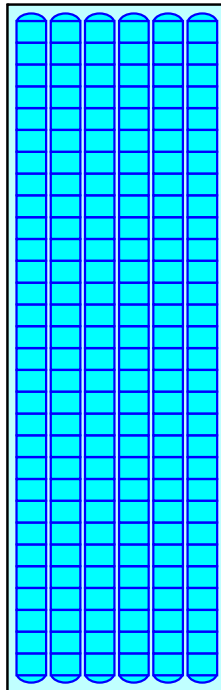
Overall Storage Efficiency = 61.8%

Overall System Size = 115.50' x 36.75' x 4.33'

180 Chambers

681.2 cy Field

434.1 cy Stone



N60 P1 Post-A 2021

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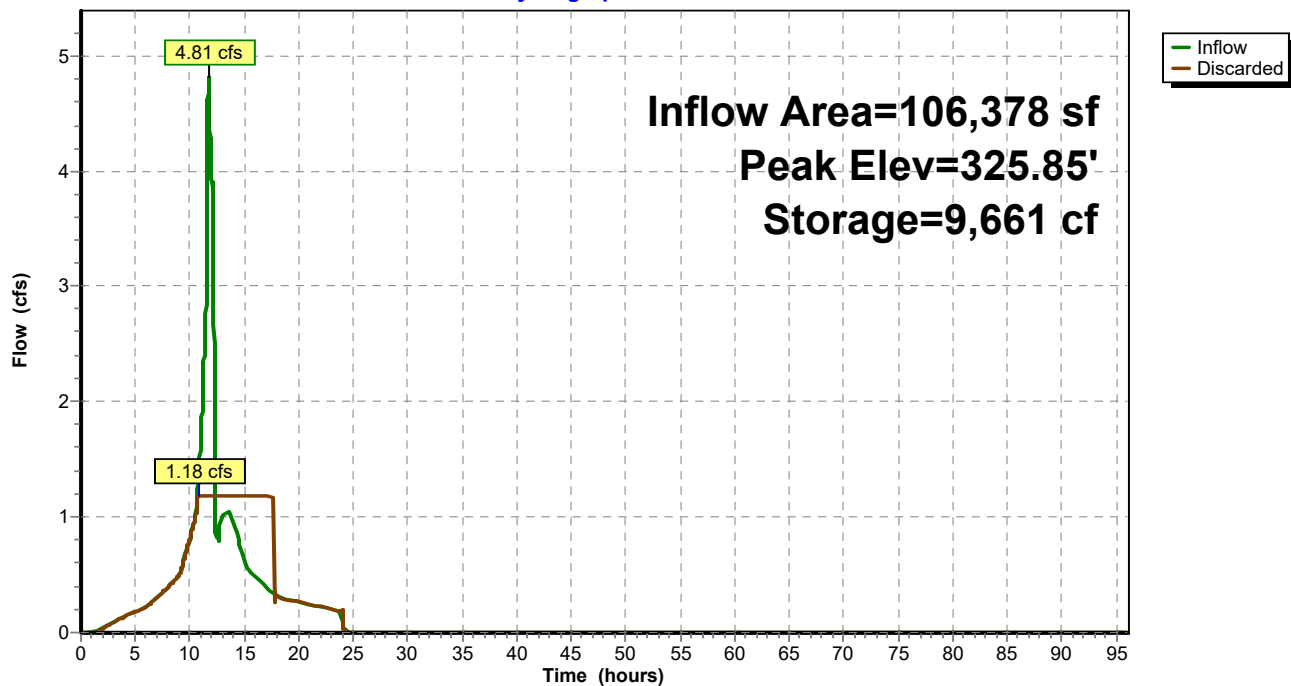
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NRCC 24-hr A 100-yr Rainfall=9.18"

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Pond 16: INF-1

Hydrograph



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Summary for Subcatchment 17: Post A5

Runoff = 24.84 cfs @ 12.13 hrs, Volume= 69,226 cf, Depth= 8.94"

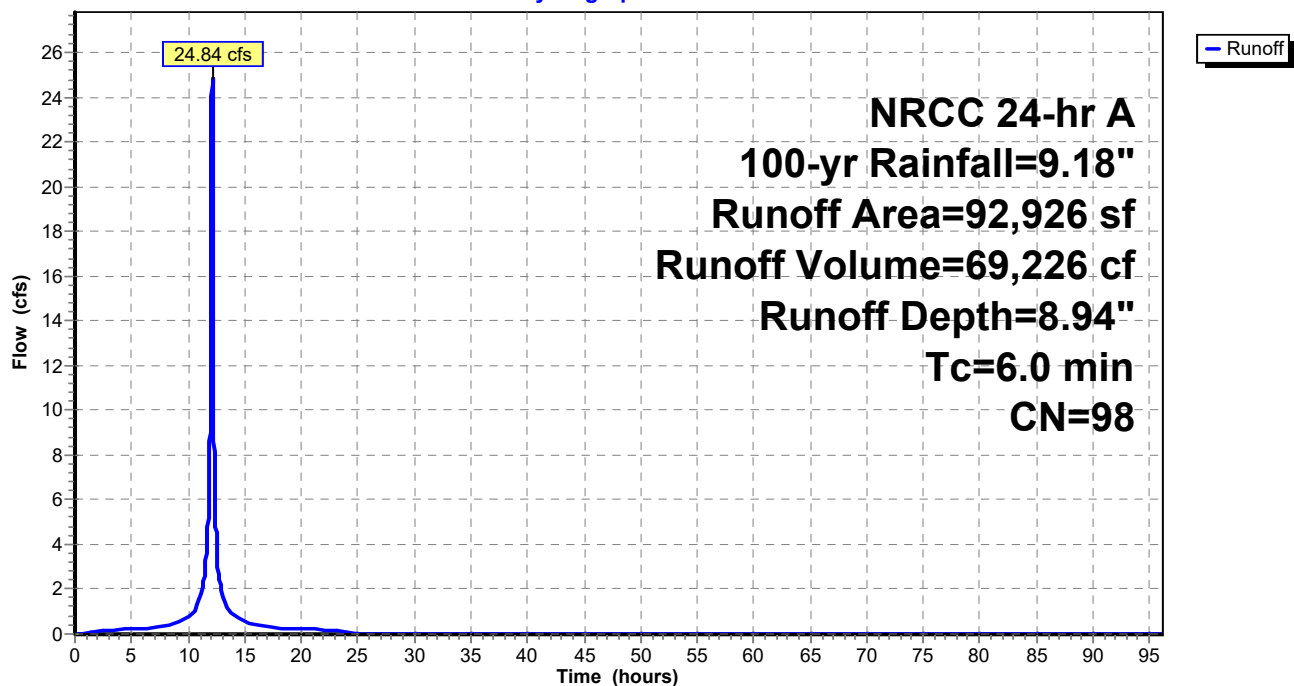
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 100-yr Rainfall=9.18"

Area (sf)	CN	Description
92,926	98	Roofs, HSG C
92,926		100.00% Impervious Area

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

Subcatchment 17: Post A5

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Pond 18: DIV-2

Inflow Area = 92,926 sf, 100.00% Impervious, Inflow Depth = 8.94" for 100-yr event
 Inflow = 24.84 cfs @ 12.13 hrs, Volume= 69,226 cf
 Outflow = 24.84 cfs @ 12.13 hrs, Volume= 69,226 cf, Atten= 0%, Lag= 0.0 min
 Primary = 5.63 cfs @ 12.12 hrs, Volume= 44,272 cf
 Secondary = 19.27 cfs @ 12.13 hrs, Volume= 24,954 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 365.62' @ 12.13 hrs

Flood Elev= 371.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	360.50'	12.0" Round Culvert L= 12.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 360.50' / 360.50' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	363.00'	24.0" Round Culvert L= 550.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 363.00' / 355.00' S= 0.0145 ' S= 0.0145 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	363.50'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=5.51 cfs @ 12.12 hrs HW=365.55' TW=363.43' (Dynamic Tailwater)↑ **1=Culvert** (Inlet Controls 5.51 cfs @ 7.01 fps)**Secondary OutFlow** Max=19.25 cfs @ 12.13 hrs HW=365.62' TW=355.58' (Dynamic Tailwater)↑ **2=Culvert** (Inlet Controls 19.25 cfs @ 6.13 fps)↑ **3=Broad-Crested Rectangular Weir** (Passes 19.25 cfs of 82.00 cfs potential flow)

N60 P1 Post-A 2021

Prepared by {enter your company name here}

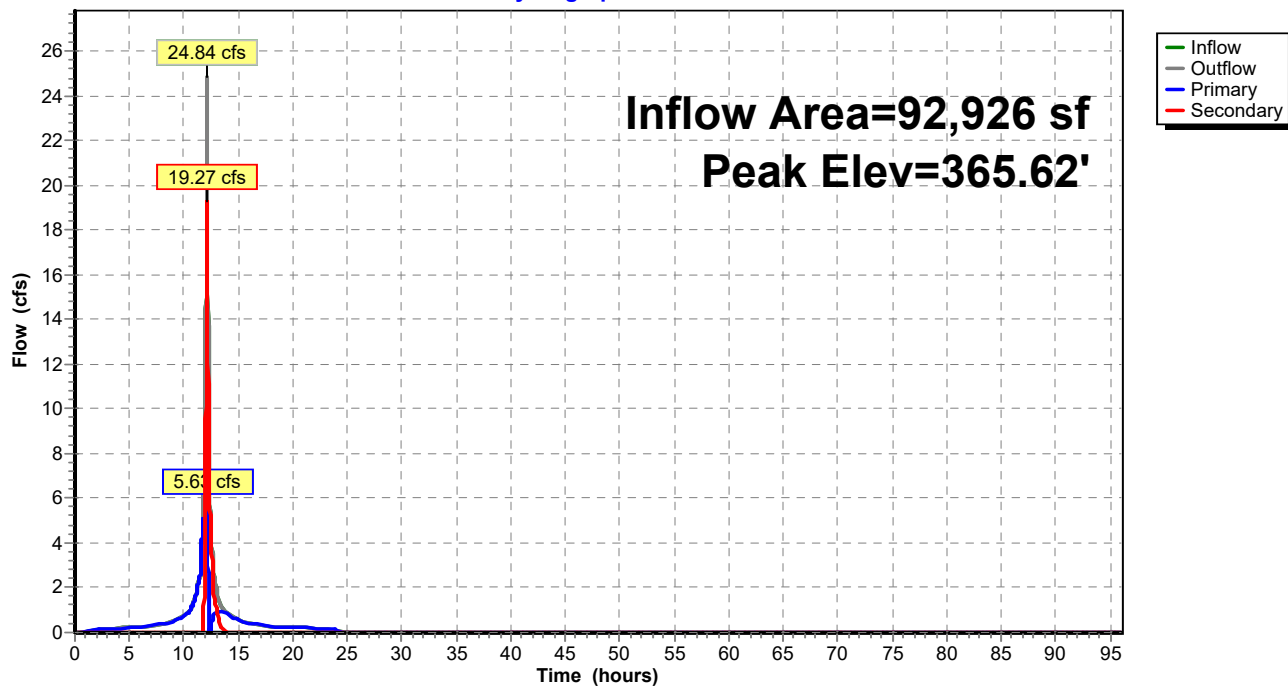
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Pond 18: DIV-2

Hydrograph



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NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Pond 19: INF-2

Inflow Area = 92,926 sf, 100.00% Impervious, Inflow Depth = 5.72" for 100-yr event
 Inflow = 5.63 cfs @ 12.12 hrs, Volume= 44,272 cf
 Outflow = 0.99 cfs @ 10.76 hrs, Volume= 44,272 cf, Atten= 82%, Lag= 0.0 min
 Discarded = 0.99 cfs @ 10.76 hrs, Volume= 44,272 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 364.20' @ 12.27 hrs Surf.Area= 4,285 sf Storage= 11,261 cf

Plug-Flow detention time= 69.2 min calculated for 44,268 cf (100% of inflow)
 Center-of-Mass det. time= 69.2 min (810.1 - 740.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	360.00'	4,724 cf	42.50'W x 100.83'L x 4.33'H Field A 18,570 cf Overall - 6,760 cf Embedded = 11,810 cf x 40.0% Voids
#2A	360.50'	6,760 cf	Cultec R-360HD x 182 Inside #1 Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap 182 Chambers in 7 Rows Cap Storage= +6.5 cf x 2 x 7 rows = 90.4 cf
		11,484 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	360.00'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.01'

Discarded OutFlow Max=0.99 cfs @ 10.76 hrs HW=360.05' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.99 cfs)

N60 P1 Post-A 2021

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NRCC 24-hr A 100-yr Rainfall=9.18"

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Pond 19: INF-2 - Chamber Wizard Field A

Chamber Model = Cultec R-360HD (Cultec Recharger® 360HD)

Effective Size= 54.9"W x 36.0"H => 9.99 sf x 3.67'L = 36.6 cf

Overall Size= 60.0"W x 36.0"H x 4.17'L with 0.50' Overlap

Cap Storage= +6.5 cf x 2 x 7 rows = 90.4 cf

60.0" Wide + 9.0" Spacing = 69.0" C-C Row Spacing

26 Chambers/Row x 3.67' Long +1.25' Cap Length x 2 = 97.83' Row Length +18.0" End Stone x 2 = 100.83' Base Length

7 Rows x 60.0" Wide + 9.0" Spacing x 6 + 18.0" Side Stone x 2 = 42.50' Base Width

6.0" Base + 36.0" Chamber Height + 10.0" Cover = 4.33' Field Height

182 Chambers x 36.6 cf + 6.5 cf Cap Volume x 2 x 7 Rows = 6,759.8 cf Chamber Storage

18,570.1 cf Field - 6,759.8 cf Chambers = 11,810.4 cf Stone x 40.0% Voids = 4,724.1 cf Stone Storage

Chamber Storage + Stone Storage = 11,483.9 cf = 0.264 af

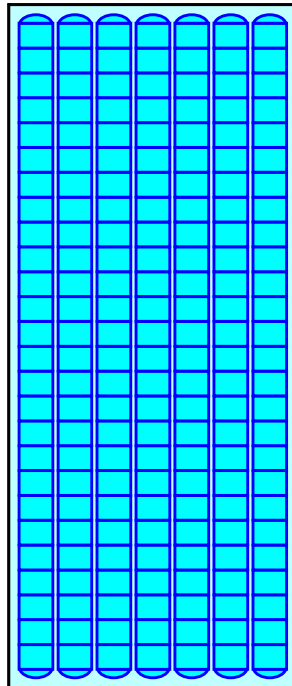
Overall Storage Efficiency = 61.8%

Overall System Size = 100.83' x 42.50' x 4.33'

182 Chambers

687.8 cy Field

437.4 cy Stone



N60 P1 Post-A 2021

Prepared by {enter your company name here}

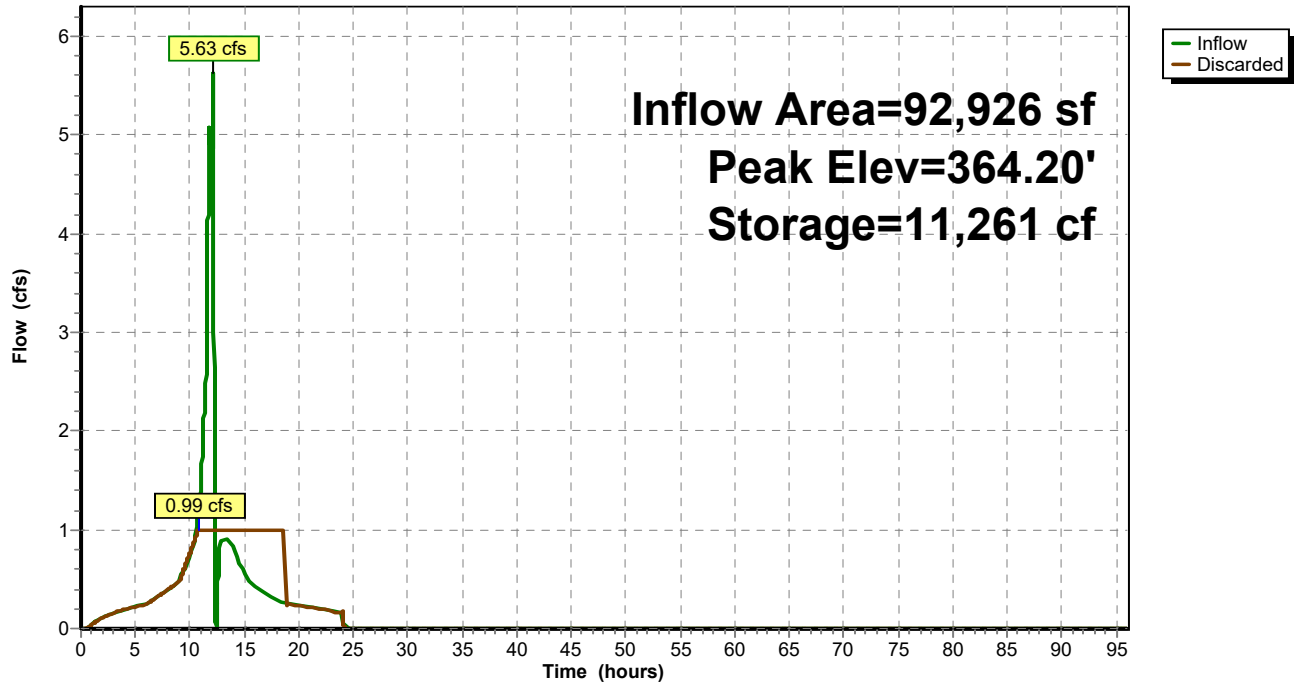
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Pond 19: INF-2

Hydrograph



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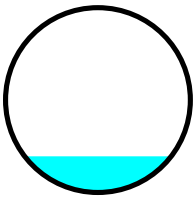
Summary for Reach 20: 36" HDPE Pipe

Inflow = 19.27 cfs @ 12.13 hrs, Volume= 24,954 cf
Outflow = 19.15 cfs @ 12.14 hrs, Volume= 24,954 cf, Atten= 1%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 19.81 fps, Min. Travel Time= 0.7 min
Avg. Velocity = 8.89 fps, Avg. Travel Time= 1.5 min

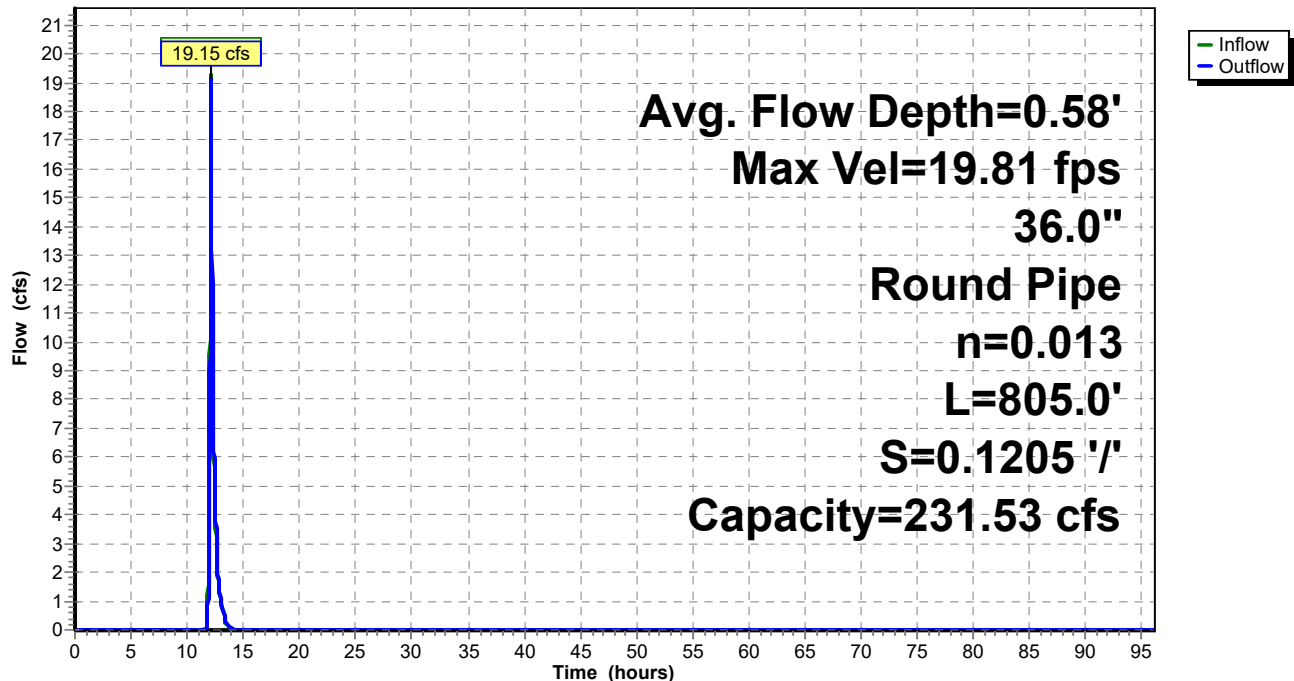
Peak Storage= 778 cf @ 12.14 hrs
Average Depth at Peak Storage= 0.58'
Bank-Full Depth= 3.00' Flow Area= 7.1 sf, Capacity= 231.53 cfs

36.0" Round Pipe
n= 0.013 Corrugated PE, smooth interior
Length= 805.0' Slope= 0.1205 '/
Inlet Invert= 355.00', Outlet Invert= 258.00'



Reach 20: 36" HDPE Pipe

Hydrograph



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NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Subcatchment 21: A6

Runoff = 102.32 cfs @ 12.13 hrs, Volume= 278,841 cf, Depth= 8.70"

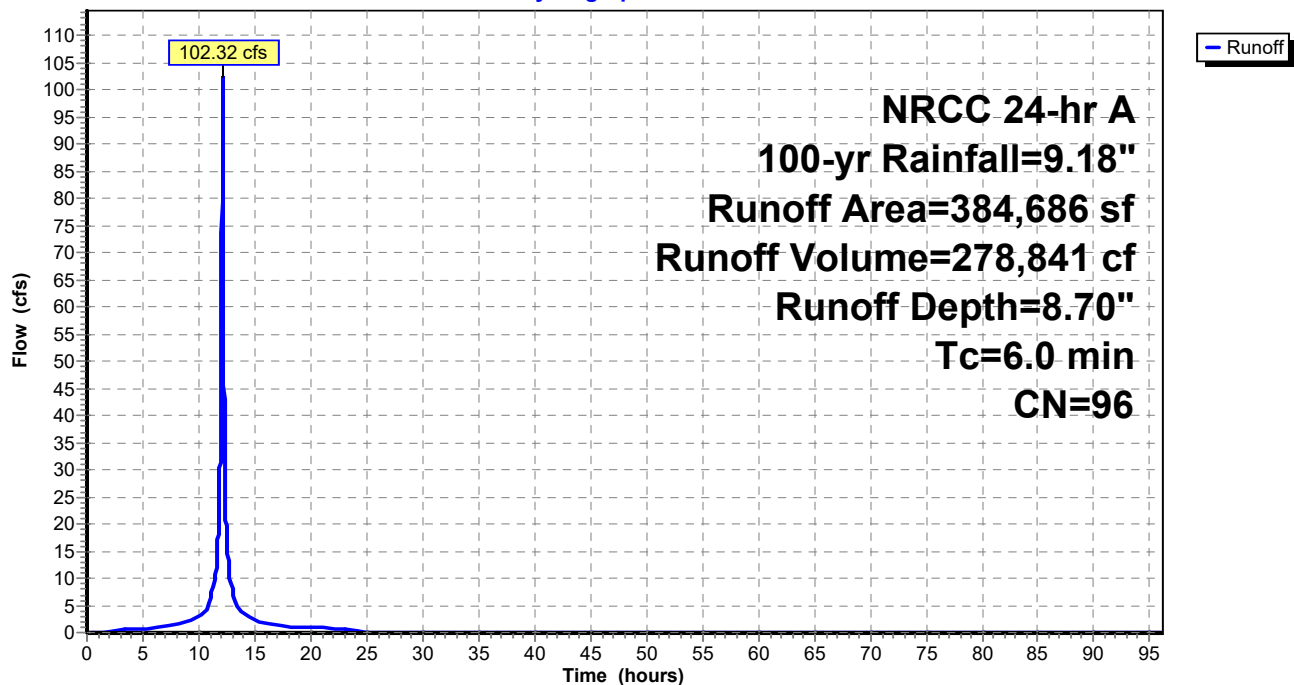
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 100-yr Rainfall=9.18"

Area (sf)	CN	Description
332,512	98	Paved parking, HSG C
52,174	86	<50% Grass cover, Poor, HSG C
384,686	96	Weighted Average
52,174		13.56% Pervious Area
332,512		86.44% Impervious Area

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

Subcatchment 21: A6

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Subcatchment 22: A7

Runoff = 19.50 cfs @ 12.13 hrs, Volume= 45,327 cf, Depth= 5.24"

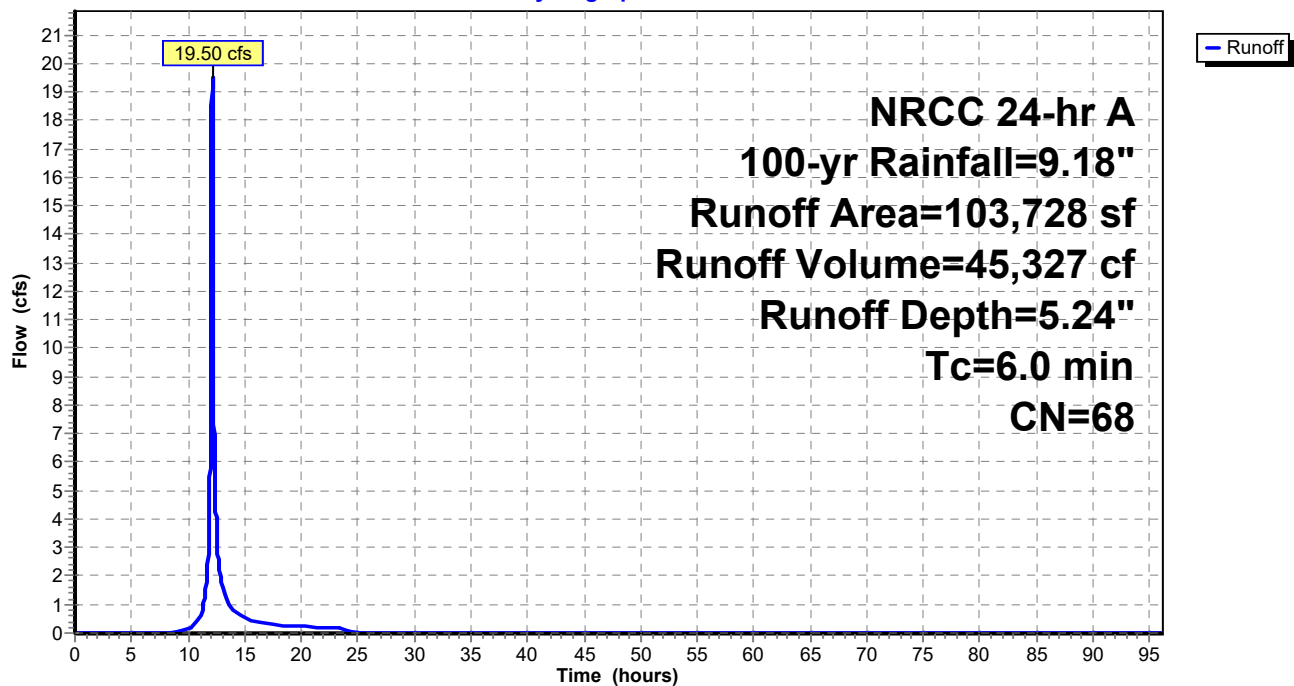
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 100-yr Rainfall=9.18"

Area (sf)	CN	Description
35,128	65	Brush, Good, HSG C
68,600	70	Woods, Good, HSG C
103,728	68	Weighted Average
103,728		100.00% Pervious Area

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

Subcatchment 22: A7

Hydrograph



N60 P1 Post-A 2021

NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Pond 23: Infiltration Basin (SWP-3)

Inflow Area = 488,414 sf, 68.08% Impervious, Inflow Depth = 8.58" for 100-yr event
 Inflow = 140.79 cfs @ 12.13 hrs, Volume= 349,122 cf
 Outflow = 121.55 cfs @ 12.17 hrs, Volume= 349,122 cf, Atten= 14%, Lag= 2.1 min
 Discarded = 6.80 cfs @ 12.17 hrs, Volume= 208,184 cf
 Primary = 114.75 cfs @ 12.17 hrs, Volume= 140,938 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 261.80' @ 12.17 hrs Surf.Area= 19,589 sf Storage= 83,254 cf

Plug-Flow detention time= 48.5 min calculated for 349,122 cf (100% of inflow)
 Center-of-Mass det. time= 48.5 min (805.1 - 756.6)

Volume	Invert	Avail.Storage	Storage Description		
#1	256.00'	103,740 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
256.00	9,450	527.9	0	0	9,450
258.00	12,731	565.7	22,100	22,100	12,917
260.00	16,238	603.5	28,898	50,998	16,623
262.00	19,973	641.3	36,147	87,144	20,569
262.80	21,527	656.4	16,596	103,740	22,212

Device	Routing	Invert	Outlet Devices
#1	Primary	254.00'	36.0" Round Culvert X 2.00 L= 95.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 254.00' / 244.00' S= 0.1053 ' S= 0.1053 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 7.07 sf
#2	Device 1	260.00'	2.0' long x 0.5' breadth Broad-Crested Rectangular Weir X 2.00 Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#3	Device 1	260.00'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir X 2.00 Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	259.40'	6.0" Vert. Orifice/Grate C= 0.600
#5	Device 1	261.00'	36.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads
#6	Discarded	256.00'	15.000 in/hr Exfiltration over Surface area Phase-In= 0.10'

Discarded OutFlow Max=6.80 cfs @ 12.17 hrs HW=261.80' (Free Discharge)

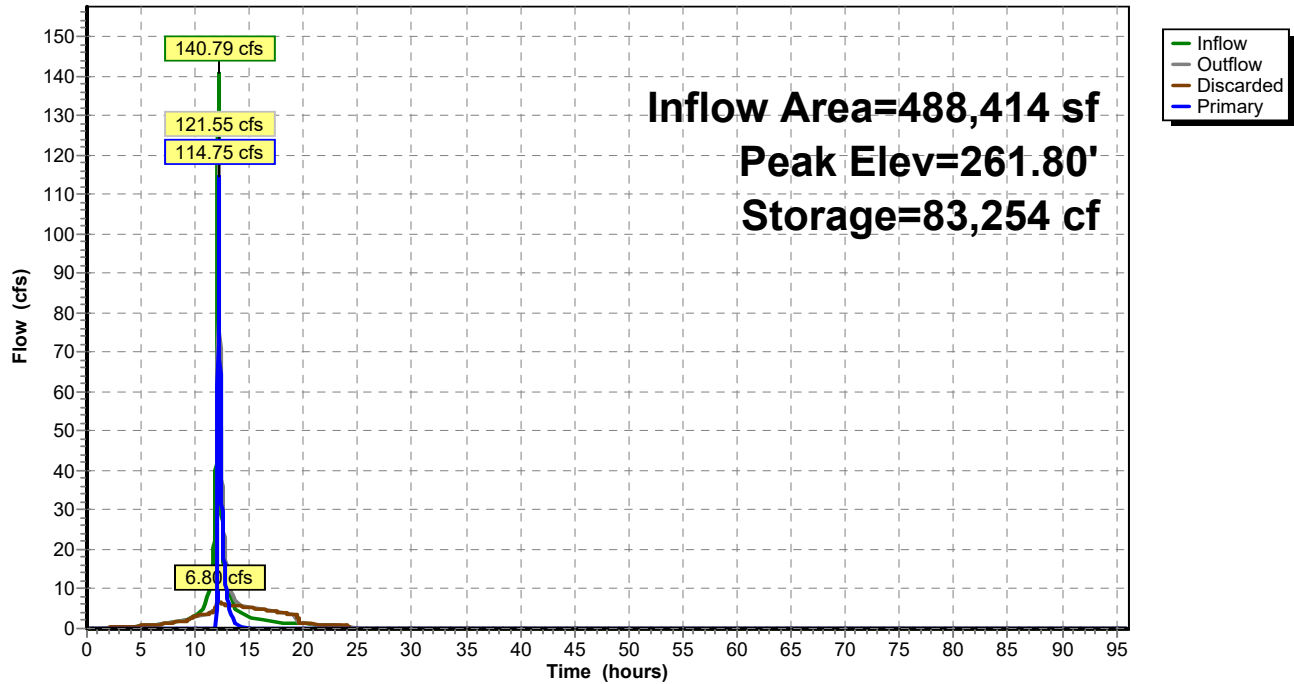
↳ **6=Exfiltration** (Exfiltration Controls 6.80 cfs)

Primary OutFlow Max=114.49 cfs @ 12.17 hrs HW=261.80' TW=0.00' (Dynamic Tailwater)

↳ **1=Culvert** (Passes 114.49 cfs of 170.87 cfs potential flow)
 ↳ **2=Broad-Crested Rectangular Weir** (Weir Controls 32.11 cfs @ 4.46 fps)
 ↳ **3=Broad-Crested Rectangular Weir** (Weir Controls 48.16 cfs @ 4.46 fps)
 ↳ **4=Orifice/Grate** (Orifice Controls 1.39 cfs @ 7.06 fps)
 ↳ **5=Orifice/Grate** (Weir Controls 32.84 cfs @ 2.93 fps)

Pond 23: Infiltration Basin (SWP-3)

Hydrograph



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NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Subcatchment 24: A9

Runoff = 8.97 cfs @ 12.13 hrs, Volume= 24,177 cf, Depth= 8.58"

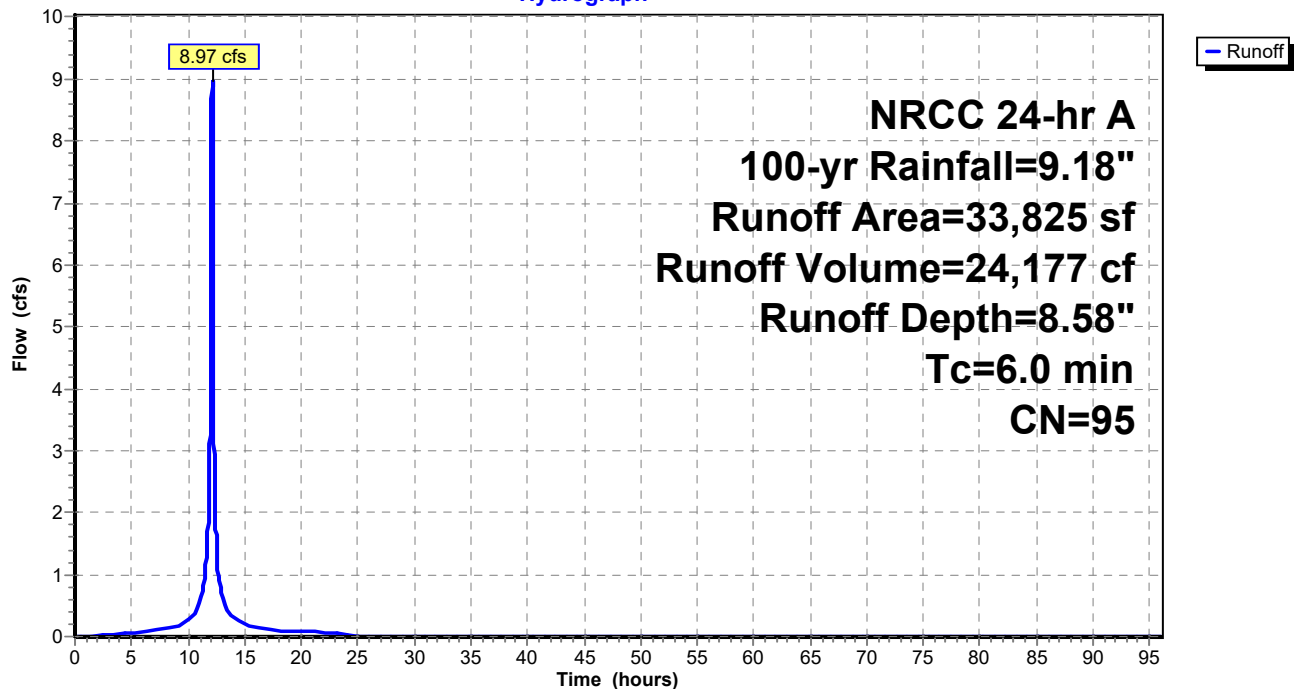
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 100-yr Rainfall=9.18"

Area (sf)	CN	Description
29,687	98	Paved parking, HSG C
4,138	74	>75% Grass cover, Good, HSG C
33,825	95	Weighted Average
4,138		12.23% Pervious Area
29,687		87.77% Impervious Area

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

Subcatchment 24: A9

Hydrograph



Summary for Pond 25: DIV-4

Inflow Area = 33,825 sf, 87.77% Impervious, Inflow Depth = 8.58" for 100-yr event
 Inflow = 8.97 cfs @ 12.13 hrs, Volume= 24,177 cf
 Outflow = 8.97 cfs @ 12.13 hrs, Volume= 24,177 cf, Atten= 0%, Lag= 0.0 min
 Primary = 4.66 cfs @ 12.00 hrs, Volume= 18,062 cf
 Secondary = 5.95 cfs @ 12.14 hrs, Volume= 6,115 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 349.73' @ 12.14 hrs

Flood Elev= 356.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	346.50'	12.0" Round Culvert L= 10.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 346.50' / 346.50' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	347.50'	18.0" Round Culvert L= 128.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 347.50' / 344.00' S= 0.0273 ' S= 0.0273 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.77 sf
#3	Device 2	349.33'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=4.52 cfs @ 12.00 hrs HW=349.37' TW=347.94' (Dynamic Tailwater)

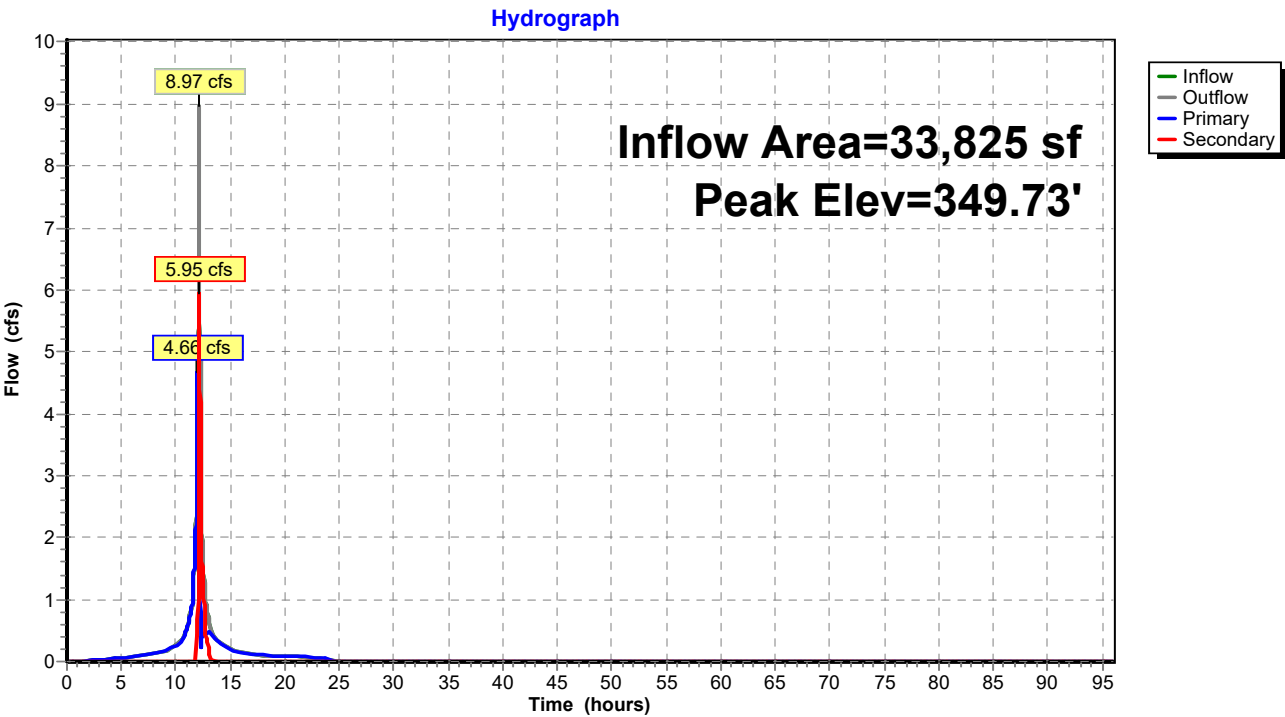
↑ **1=Culvert** (Inlet Controls 4.52 cfs @ 5.75 fps)

Secondary OutFlow Max=5.94 cfs @ 12.14 hrs HW=349.73' TW=0.00' (Dynamic Tailwater)

↑ **2=Culvert** (Passes 5.94 cfs of 10.36 cfs potential flow)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 5.94 cfs @ 1.85 fps)

Pond 25: DIV-4



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NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Pond 26: INF-4

Inflow Area = 33,825 sf, 87.77% Impervious, Inflow Depth = 6.41" for 100-yr event
 Inflow = 4.66 cfs @ 12.00 hrs, Volume= 18,062 cf
 Outflow = 0.52 cfs @ 11.15 hrs, Volume= 18,062 cf, Atten= 89%, Lag= 0.0 min
 Discarded = 0.52 cfs @ 11.15 hrs, Volume= 18,062 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 349.63' @ 12.22 hrs Surf.Area= 2,242 sf Storage= 5,173 cf

Plug-Flow detention time= 64.1 min calculated for 18,060 cf (100% of inflow)
 Center-of-Mass det. time= 64.1 min (822.4 - 758.3)

Volume	Invert	Avail.Storage	Storage Description
#1A	346.00'	2,196 cf	30.50'W x 73.50'L x 3.88'H Field A 8,687 cf Overall - 3,196 cf Embedded = 5,490 cf x 40.0% Voids
#2A	346.50'	3,196 cf	Cultec R-330XLHD x 60 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 6 rows
		5,393 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	346.00'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.01'

Discarded OutFlow Max=0.52 cfs @ 11.15 hrs HW=346.04' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.52 cfs)

Pond 26: INF-4 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 6 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

10 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 71.50' Row Length +12.0" End Stone x 2 =
73.50' Base Length

6 Rows x 52.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.50' Base Width

6.0" Base + 30.5" Chamber Height + 10.0" Cover = 3.88' Field Height

60 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 6 Rows = 3,196.5 cf Chamber Storage

8,686.8 cf Field - 3,196.5 cf Chambers = 5,490.3 cf Stone x 40.0% Voids = 2,196.1 cf Stone Storage

Chamber Storage + Stone Storage = 5,392.6 cf = 0.124 af

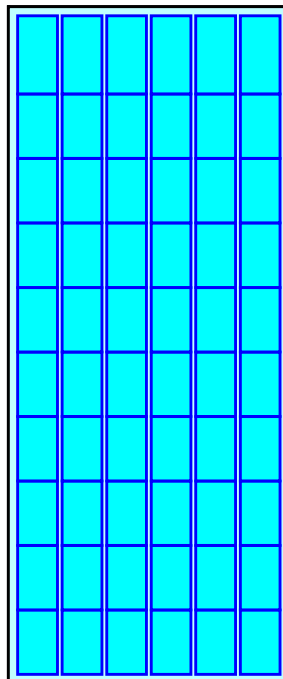
Overall Storage Efficiency = 62.1%

Overall System Size = 73.50' x 30.50' x 3.88'

60 Chambers

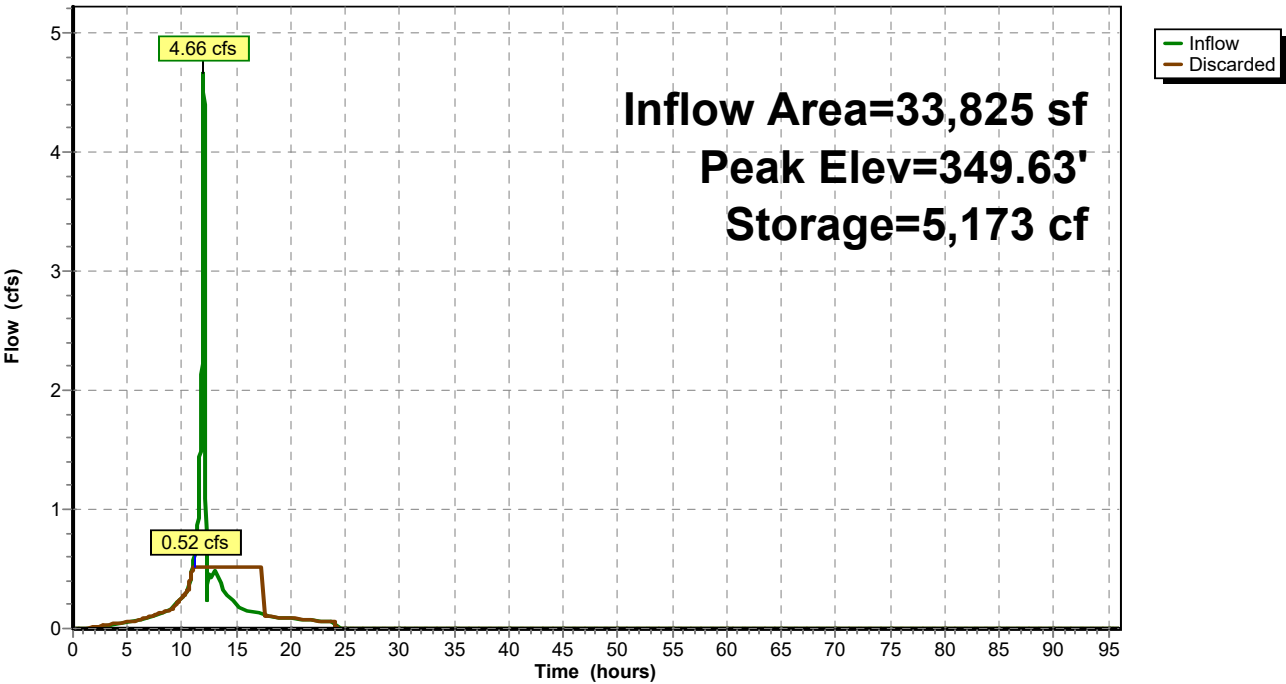
321.7 cy Field

203.3 cy Stone



Pond 26: INF-4

Hydrograph



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NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Subcatchment 27: A10

Runoff = 37.71 cfs @ 12.13 hrs, Volume= 96,472 cf, Depth= 7.85"

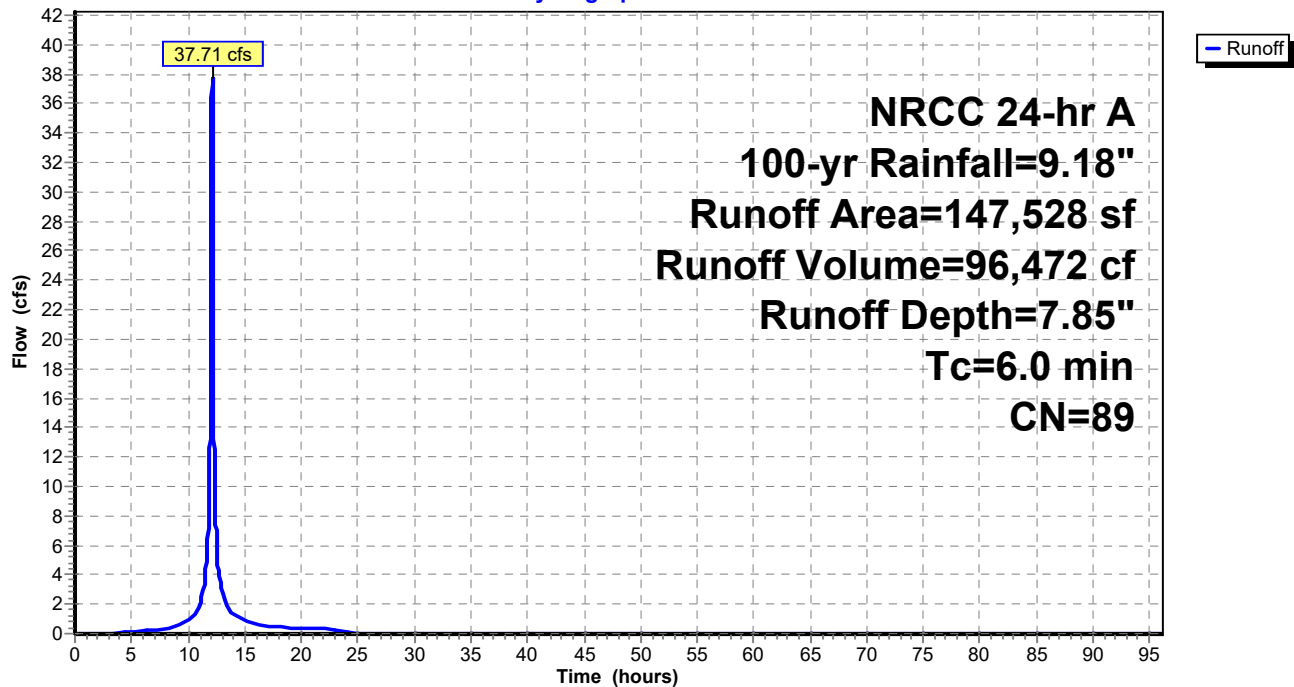
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 100-yr Rainfall=9.18"

Area (sf)	CN	Description
91,430	98	Paved parking, HSG C
5,603	80	>75% Grass cover, Good, HSG D
7,435	74	>75% Grass cover, Good, HSG C
16,120	73	Brush, Good, HSG D
19,715	77	Brush, Poor, HSG C
7,225	70	Woods, Good, HSG C
147,528	89	Weighted Average
56,098		38.03% Pervious Area
91,430		61.97% Impervious Area

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

Subcatchment 27: A10

Hydrograph



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NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Subcatchment 28: A10

Runoff = 2.87 cfs @ 12.13 hrs, Volume= 7,899 cf, Depth= 8.82"

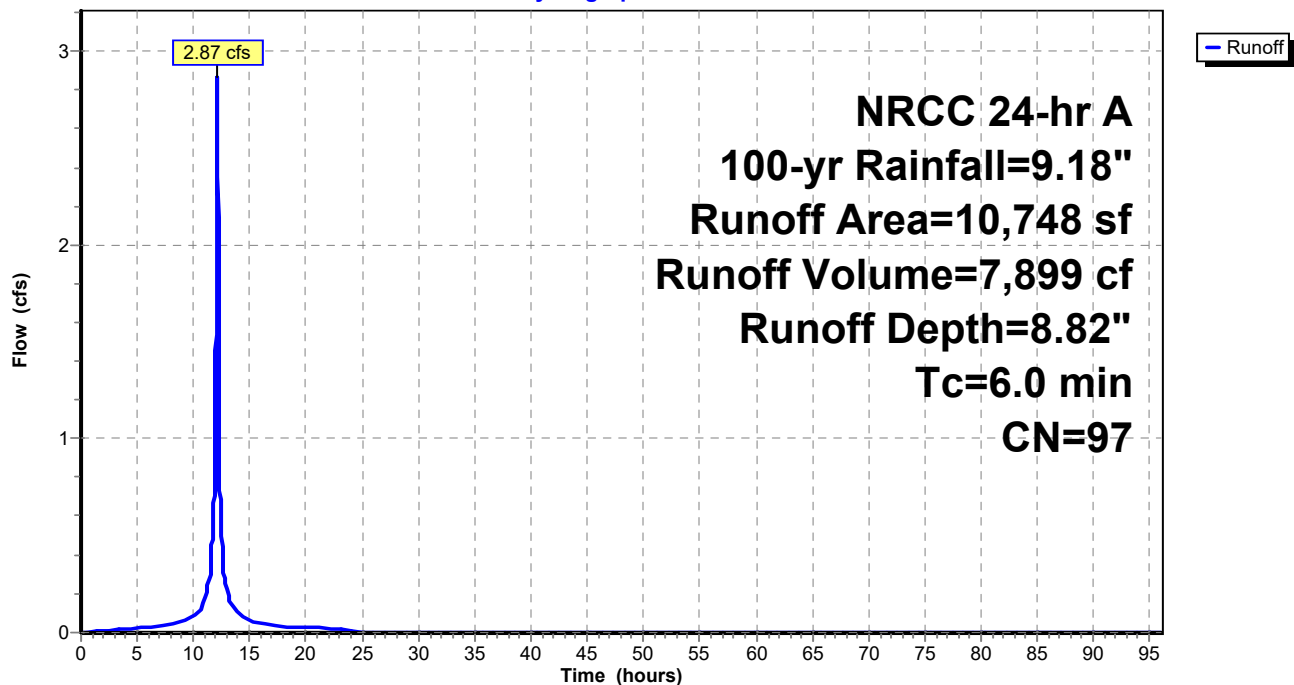
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 100-yr Rainfall=9.18"

Area (sf)	CN	Description
10,280	98	Paved parking, HSG D
468	80	>75% Grass cover, Good, HSG D
10,748	97	Weighted Average
468		4.35% Pervious Area
10,280		95.65% Impervious Area

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

Subcatchment 28: A10

Hydrograph



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NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Pond 29: Infiltration Basin (SWP-2)

Inflow Area = 158,276 sf, 64.26% Impervious, Inflow Depth = 7.91" for 100-yr event
 Inflow = 40.58 cfs @ 12.13 hrs, Volume= 104,371 cf
 Outflow = 14.41 cfs @ 12.28 hrs, Volume= 104,371 cf, Atten= 64%, Lag= 8.9 min
 Discarded = 3.36 cfs @ 12.28 hrs, Volume= 78,618 cf
 Primary = 11.05 cfs @ 12.28 hrs, Volume= 25,752 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 319.48' @ 12.28 hrs Surf.Area= 9,688 sf Storage= 36,798 cf

Plug-Flow detention time= 61.2 min calculated for 104,360 cf (100% of inflow)
 Center-of-Mass det. time= 61.2 min (831.1 - 769.8)

Volume	Invert	Avail.Storage	Storage Description		
#1	314.00'	47,274 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
314.00	4,026	293.0	0	0	4,026
316.00	5,897	330.7	9,864	9,864	5,998
318.00	7,994	368.3	13,838	23,702	8,204
320.00	10,316	406.0	18,261	41,962	10,652
320.50	10,932	415.4	5,311	47,274	11,300

Device	Routing	Invert	Outlet Devices
#1	Primary	308.00'	15.0" Round Culvert L= 60.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 308.00' / 304.00' S= 0.0667 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	316.50'	6.0" Vert. Orifice/Grate C= 0.600
#3	Device 1	318.50'	2.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#4	Device 1	319.00'	3.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32
#5	Discarded	314.00'	15.000 in/hr Exfiltration over Surface area Phase-In= 0.10'

Discarded OutFlow Max=3.36 cfs @ 12.28 hrs HW=319.48' (Free Discharge)

↳ **5=Exfiltration** (Exfiltration Controls 3.36 cfs)

Primary OutFlow Max=11.05 cfs @ 12.28 hrs HW=319.48' TW=0.00' (Dynamic Tailwater)

↳ **1=Culvert** (Passes 11.05 cfs of 19.47 cfs potential flow)

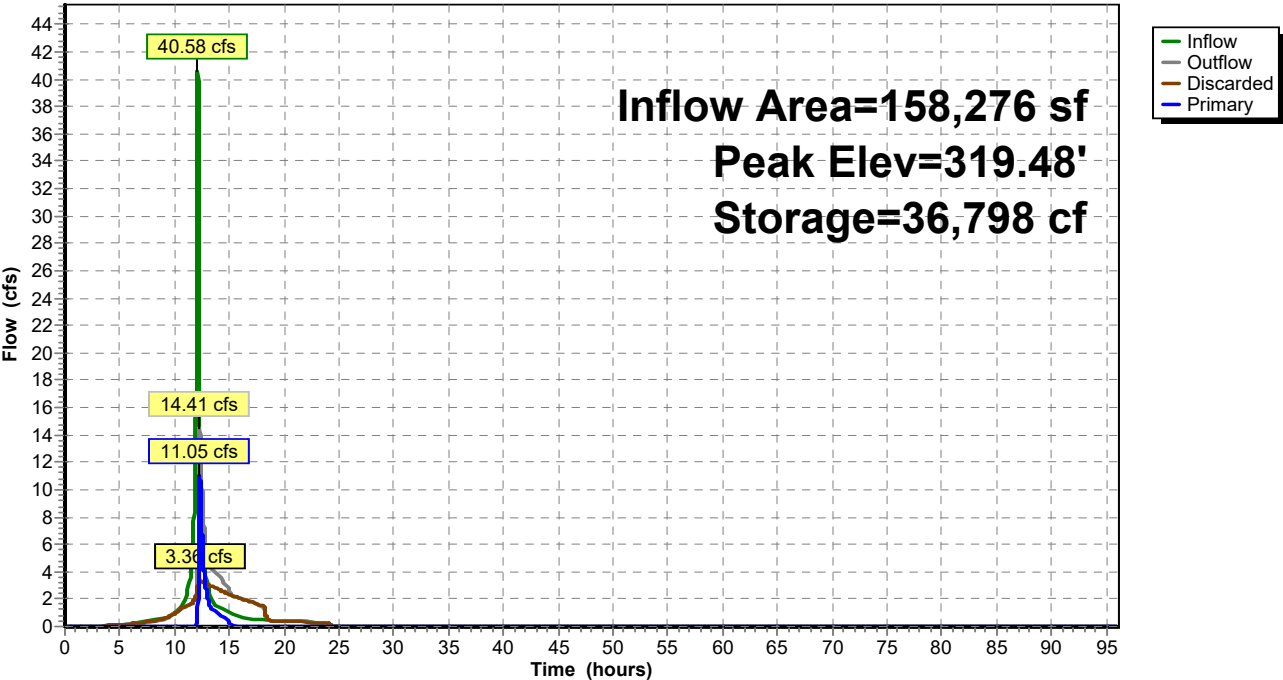
↳ **2=Orifice/Grate** (Orifice Controls 1.56 cfs @ 7.96 fps)

↳ **3=Broad-Crested Rectangular Weir** (Weir Controls 6.47 cfs @ 3.29 fps)

↳ **4=Broad-Crested Rectangular Weir** (Weir Controls 3.01 cfs @ 2.08 fps)

Pond 29: Infiltration Basin (SWP-2)

Hydrograph



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NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Subcatchment 30: Post A2

Runoff = 34.72 cfs @ 12.26 hrs, Volume= 122,935 cf, Depth= 6.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 100-yr Rainfall=9.18"

Area (sf)	CN	Description
43,743	98	Paved parking, HSG C
107,245	74	>75% Grass cover, Good, HSG C
2,876	61	>75% Grass cover, Good, HSG B
39,583	70	Woods, Good, HSG C
4,283	98	Water Surface, HSG C
33,976	65	Brush, Good, HSG C
231,706	77	Weighted Average
183,680		79.27% Pervious Area
48,026		20.73% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.6	100	0.0400	0.11		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.4	215	0.0260	2.60		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
0.3	125	0.1000	6.42		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.4	377	0.0750	14.42	17.69	Pipe Channel, 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013 Corrugated PE, smooth interior
17.7	817	Total			

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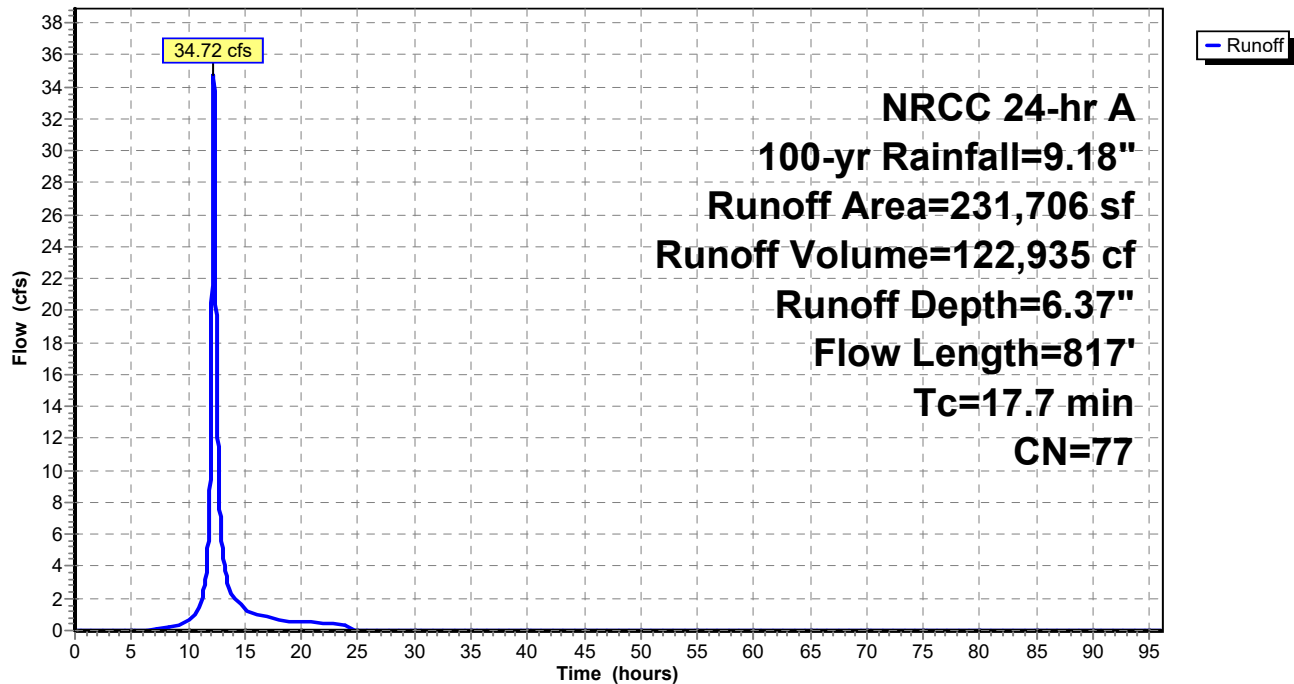
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NRCC 24-hr A 100-yr Rainfall=9.18"

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Subcatchment 30: Post A2

Hydrograph



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NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Pond 31: Pocket Wetland (SWP-1)

Inflow Area = 231,706 sf, 20.73% Impervious, Inflow Depth = 6.37" for 100-yr event
 Inflow = 34.72 cfs @ 12.26 hrs, Volume= 122,935 cf
 Outflow = 13.02 cfs @ 12.61 hrs, Volume= 114,976 cf, Atten= 63%, Lag= 20.9 min
 Primary = 13.02 cfs @ 12.61 hrs, Volume= 114,976 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Starting Elev= 234.50' Surf.Area= 12,504 sf Storage= 7,835 cf
 Peak Elev= 238.00' @ 12.61 hrs Surf.Area= 18,739 sf Storage= 52,092 cf (44,257 cf above start)

Plug-Flow detention time= 317.1 min calculated for 107,130 cf (87% of inflow)
 Center-of-Mass det. time= 238.0 min (1,046.1 - 808.1)

Volume	Invert	Avail.Storage	Storage Description
#1	230.00'	1,811 cf	Forebay (Irregular) Listed below (Recalc)
#2	230.00'	1,976 cf	Micropool (Irregular) Listed below (Recalc)
#3	233.90'	65,123 cf	Marsh & Storage (Irregular) Listed below (Recalc)
		68,911 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
230.00	86	34.2	0	0	86
231.00	217	53.2	147	147	225
232.00	406	72.3	307	453	426
233.00	651	91.4	524	977	688
233.90	1,233	129.1	834	1,811	1,357

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
230.00	86	34.2	0	0	86
231.00	217	53.2	147	147	225
232.00	406	72.3	307	453	426
233.00	651	91.4	524	977	688
233.90	1,646	155.1	1,000	1,976	1,942

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
233.90	4,232	530.5	0	0	4,232
234.50	9,625	400.9	4,048	4,048	13,842
235.00	10,440	413.5	5,015	9,063	14,683
236.00	12,144	438.8	11,281	20,344	16,451
237.00	13,950	464.0	13,037	33,381	18,317
238.00	15,856	489.2	14,893	48,273	20,287
239.00	17,864	514.5	16,850	65,123	22,369

Device	Routing	Invert	Outlet Devices
#1	Primary	232.00'	15.0" Round Culvert L= 117.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 232.00' / 216.50' S= 0.1325 ' / ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 1.23 sf

N60 P1 Post-A 2021

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NRCC 24-hr A 100-yr Rainfall=9.18"

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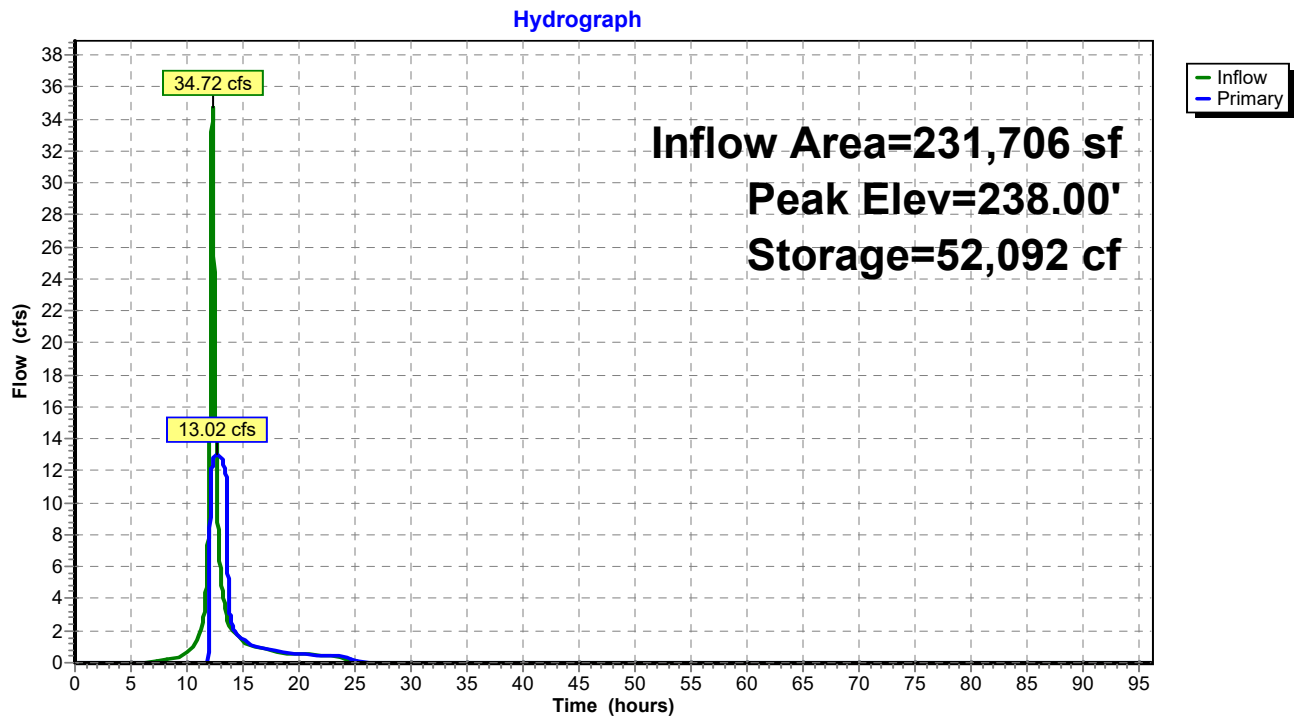
#2	Device 1	234.50'	1.1" Vert. Orifice/Grate	C= 0.600
#3	Device 1	236.00'	36.0" x 48.0" Horiz. Orifice/Grate	C= 0.600

Limited to weir flow at low heads

Primary OutFlow Max=13.02 cfs @ 12.61 hrs HW=238.00' TW=0.00' (Dynamic Tailwater)

1=Culvert (Barrel Controls 13.02 cfs @ 10.61 fps)
2=Orifice/Grate (Passes < 0.06 cfs potential flow)
3=Orifice/Grate (Passes < 81.75 cfs potential flow)

Pond 31: Pocket Wetland (SWP-1)



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NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Subcatchment 32: Post A1

Runoff = 5.14 cfs @ 12.13 hrs, Volume= 12,569 cf, Depth= 6.99"

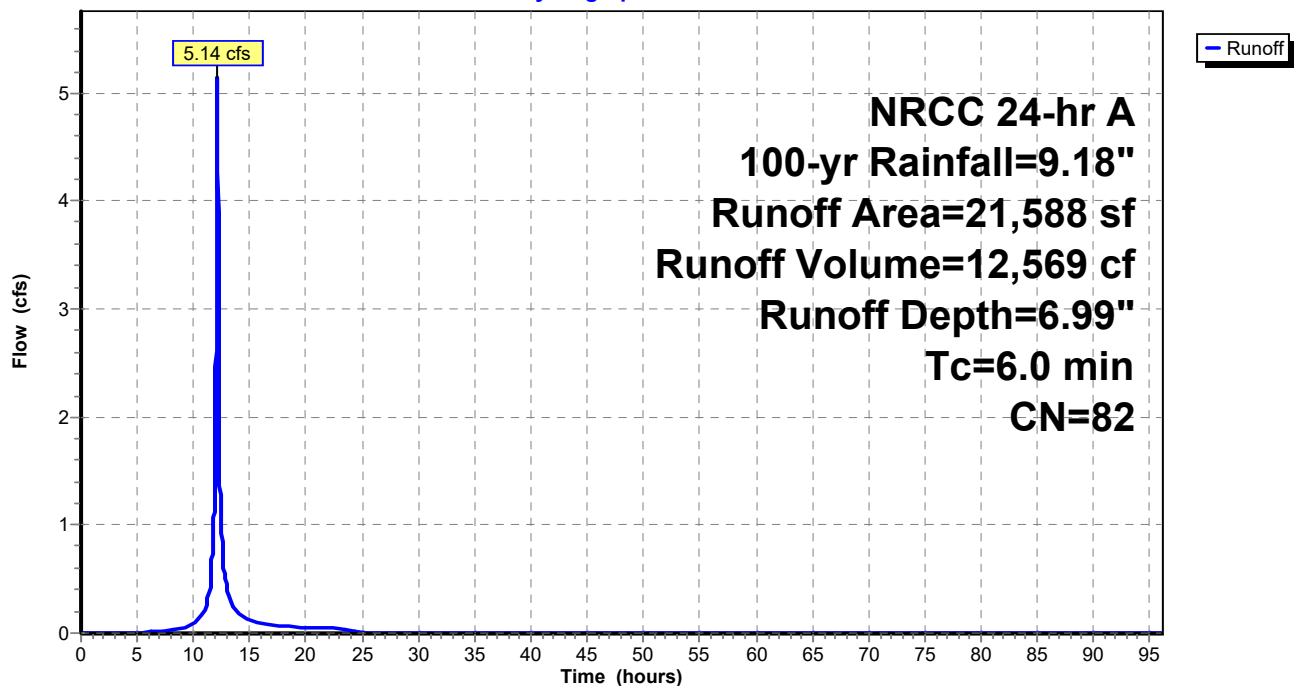
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 100-yr Rainfall=9.18"

Area (sf)	CN	Description
8,152	98	Paved parking, HSG C
10,356	74	>75% Grass cover, Good, HSG C
3,080	70	Woods, Good, HSG C
21,588	82	Weighted Average
13,436		62.24% Pervious Area
8,152		37.76% Impervious Area

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

Subcatchment 32: Post A1

Hydrograph



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NRCC 24-hr A 100-yr Rainfall=9.18"

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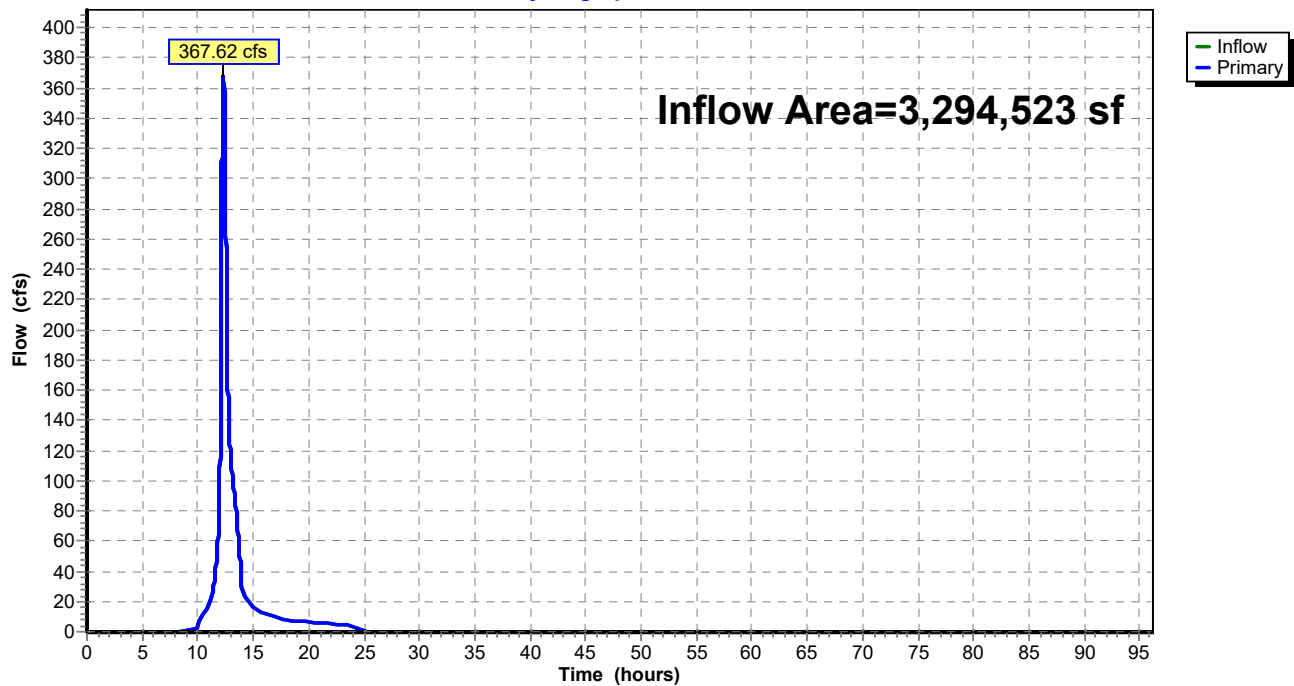
Summary for Link 33: Design Point A

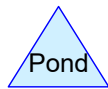
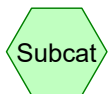
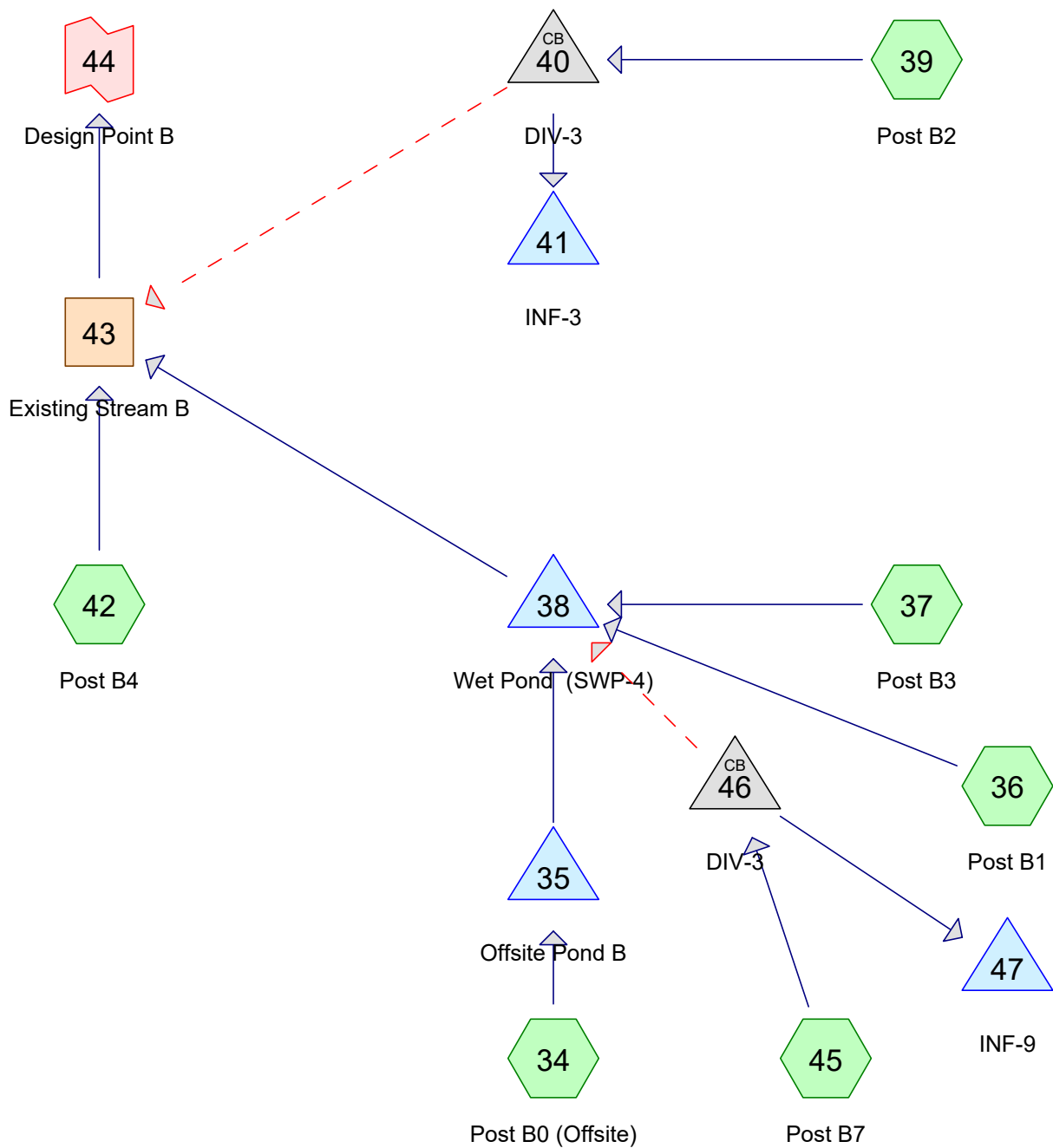
Inflow Area = 3,294,523 sf, 35.27% Impervious, Inflow Depth = 5.92" for 100-yr event
Inflow = 367.62 cfs @ 12.33 hrs, Volume= 1,623,976 cf
Primary = 367.62 cfs @ 12.33 hrs, Volume= 1,623,976 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 33: Design Point A

Hydrograph





Routing Diagram for N60 P1 Post-B 2021 - 5-4-12 AW
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N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 1-yr Rainfall=2.79"

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment34: Post B0 (Offsite) Runoff Area=1,510,771 sf 32.24% Impervious Runoff Depth=1.35"
Flow Length=1,871' Tc=32.3 min CN=84 Runoff=35.54 cfs 169,374 cf

Pond 35: Offsite Pond B Peak Elev=383.46' Storage=75,292 cf Inflow=35.54 cfs 169,374 cf
36.0" Round Culvert n=0.025 L=158.0' S=0.0127 ' Outflow=10.77 cfs 168,126 cf

Subcatchment36: Post B1 Runoff Area=58,920 sf 32.46% Impervious Runoff Depth=0.93"
Tc=6.0 min CN=77 Runoff=1.95 cfs 4,557 cf

Subcatchment37: Post B3 Runoff Area=127,555 sf 34.71% Impervious Runoff Depth=0.98"
Tc=6.0 min CN=78 Runoff=4.48 cfs 10,436 cf

Pond 38: Wet Pond (SWP-4) Peak Elev=376.83' Storage=173,147 cf Inflow=11.33 cfs 183,119 cf
Outflow=7.97 cfs 182,833 cf

Subcatchment39: Post B2 Runoff Area=133,020 sf 50.44% Impervious Runoff Depth=1.41"
Tc=6.0 min CN=85 Runoff=6.79 cfs 15,669 cf

Pond 40: DIV-3 Peak Elev=381.10' Inflow=6.79 cfs 15,669 cf
Primary=6.10 cfs 15,560 cf Secondary=0.69 cfs 108 cf Outflow=6.79 cfs 15,669 cf

Pond 41: INF-3 Peak Elev=378.87' Storage=4,606 cf Inflow=6.10 cfs 15,560 cf
Outflow=1.13 cfs 15,560 cf

Subcatchment42: Post B4 Runoff Area=879,847 sf 0.00% Impervious Runoff Depth=0.60"
Flow Length=675' Tc=15.1 min CN=70 Runoff=11.68 cfs 44,049 cf

Reach 43: Existing Stream B Avg. Flow Depth=0.45' Max Vel=5.13 fps Inflow=12.21 cfs 226,990 cf
n=0.040 L=1,360.0' S=0.0721 ' Capacity=291.69 cfs Outflow=11.39 cfs 226,981 cf

Link 44: Design Point B Inflow=11.39 cfs 226,981 cf
Primary=11.39 cfs 226,981 cf

Subcatchment45: Post B7 Runoff Area=26,280 sf 87.02% Impervious Runoff Depth=2.24"
Tc=6.0 min CN=95 Runoff=1.97 cfs 4,916 cf

Pond 46: DIV-3 Peak Elev=389.44' Inflow=1.97 cfs 4,916 cf
Primary=1.97 cfs 4,916 cf Secondary=0.00 cfs 0 cf Outflow=1.97 cfs 4,916 cf

Pond 47: INF-9 Peak Elev=389.44' Storage=1,608 cf Inflow=1.97 cfs 4,916 cf
Outflow=0.27 cfs 4,916 cf

Total Runoff Area = 2,736,393 sf Runoff Volume = 249,001 cf Average Runoff Depth = 1.09"
76.60% Pervious = 2,095,980 sf 23.40% Impervious = 640,413 sf

N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Subcatchment 34: Post B0 (Offsite)

Runoff = 35.54 cfs @ 12.46 hrs, Volume= 169,374 cf, Depth= 1.35"

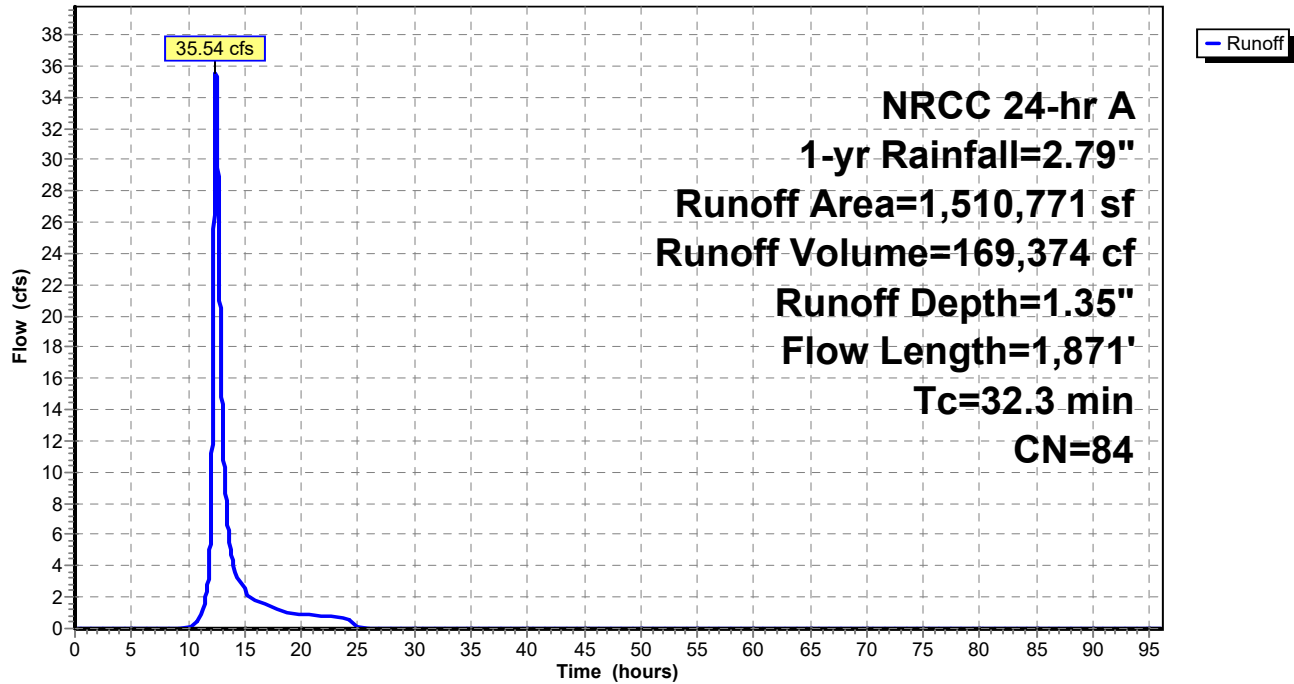
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 1-yr Rainfall=2.79"

Area (sf)	CN	Description
487,056	98	Paved parking, HSG C
497,987	77	Woods, Good, HSG D
134,328	70	Woods, Good, HSG C
375,457	80	>75% Grass cover, Good, HSG D
15,943	74	>75% Grass cover, Good, HSG C
1,510,771	84	Weighted Average
1,023,715		67.76% Pervious Area
487,056		32.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0300	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
9.5	848	0.0085	1.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.1	856	0.0093	2.78	3.06	Trap/Vee/Rect Channel Flow, Bot.W=3.00' D=0.33' Z= 1.0 '/' Top.W=3.66' n= 0.022 Earth, clean & straight
0.2	67	0.0150	6.66	64.08	Pipe Channel, 42.0" Round Area= 9.6 sf Perim= 11.0' r= 0.88' n= 0.025 Corrugated metal
32.3	1,871	Total			

Subcatchment 34: Post B0 (Offsite)

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Pond 35: Offsite Pond B

Inflow Area = 1,510,771 sf, 32.24% Impervious, Inflow Depth = 1.35" for 1-yr event
 Inflow = 35.54 cfs @ 12.46 hrs, Volume= 169,374 cf
 Outflow = 10.77 cfs @ 13.17 hrs, Volume= 168,126 cf, Atten= 70%, Lag= 42.8 min
 Primary = 10.77 cfs @ 13.17 hrs, Volume= 168,126 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 383.46' @ 13.17 hrs Surf.Area= 68,005 sf Storage= 75,292 cf

Plug-Flow detention time= 205.3 min calculated for 168,126 cf (99% of inflow)
 Center-of-Mass det. time= 200.8 min (1,049.1 - 848.2)

Volume	Invert	Avail.Storage	Storage Description
#1	382.00'	610,998 cf	Custom Stage Data (Irregular) Listed below (Recalc)

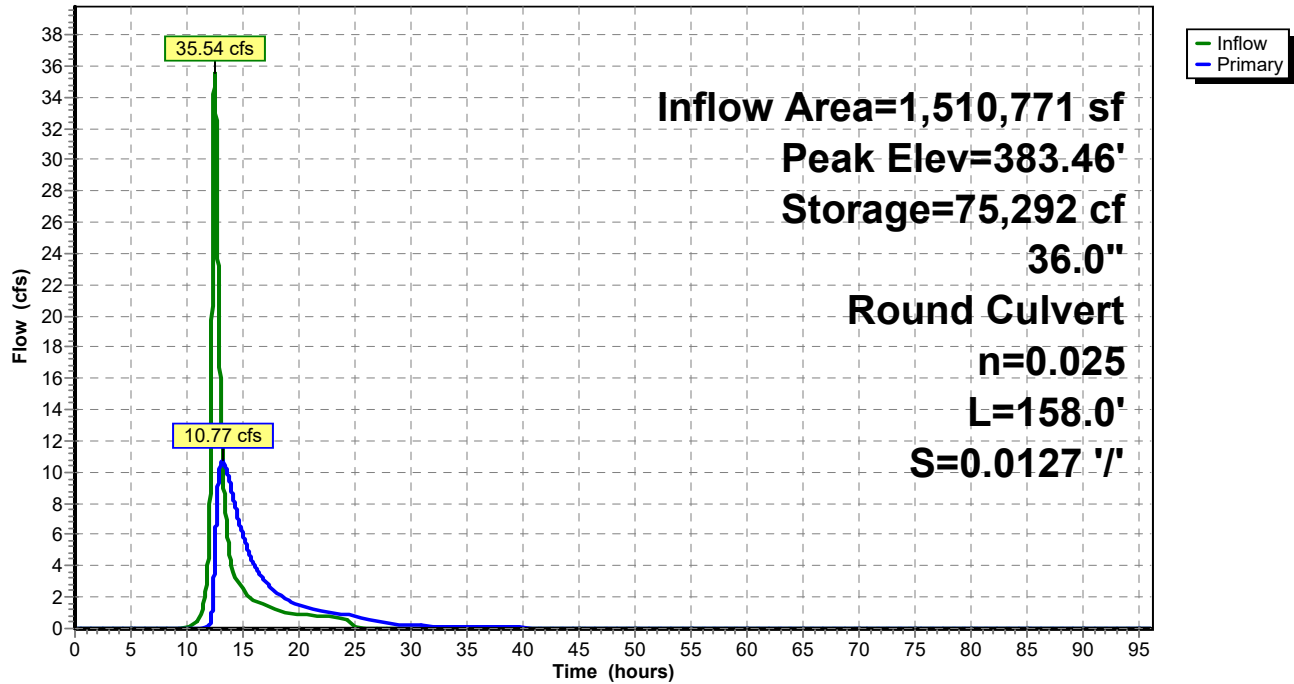
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
382.00	36,540	1,177.0	0	0	36,540
384.00	81,987	1,579.0	115,507	115,507	124,748
386.00	96,790	1,622.0	178,572	294,080	136,159
388.00	108,795	1,657.0	205,468	499,548	145,863
389.00	114,127	1,679.0	111,450	610,998	151,937

Device	Routing	Invert	Outlet Devices
#1	Primary	382.00'	36.0" Round Culvert L= 158.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 382.00' / 380.00' S= 0.0127 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 7.07 sf

Primary OutFlow Max=10.77 cfs @ 13.17 hrs HW=383.46' TW=376.59' (Dynamic Tailwater)
 ↑**1=Culvert** (Barrel Controls 10.77 cfs @ 4.60 fps)

Pond 35: Offsite Pond B

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

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NRCC 24-hr A 1-yr Rainfall=2.79"

Printed 5/12/2021

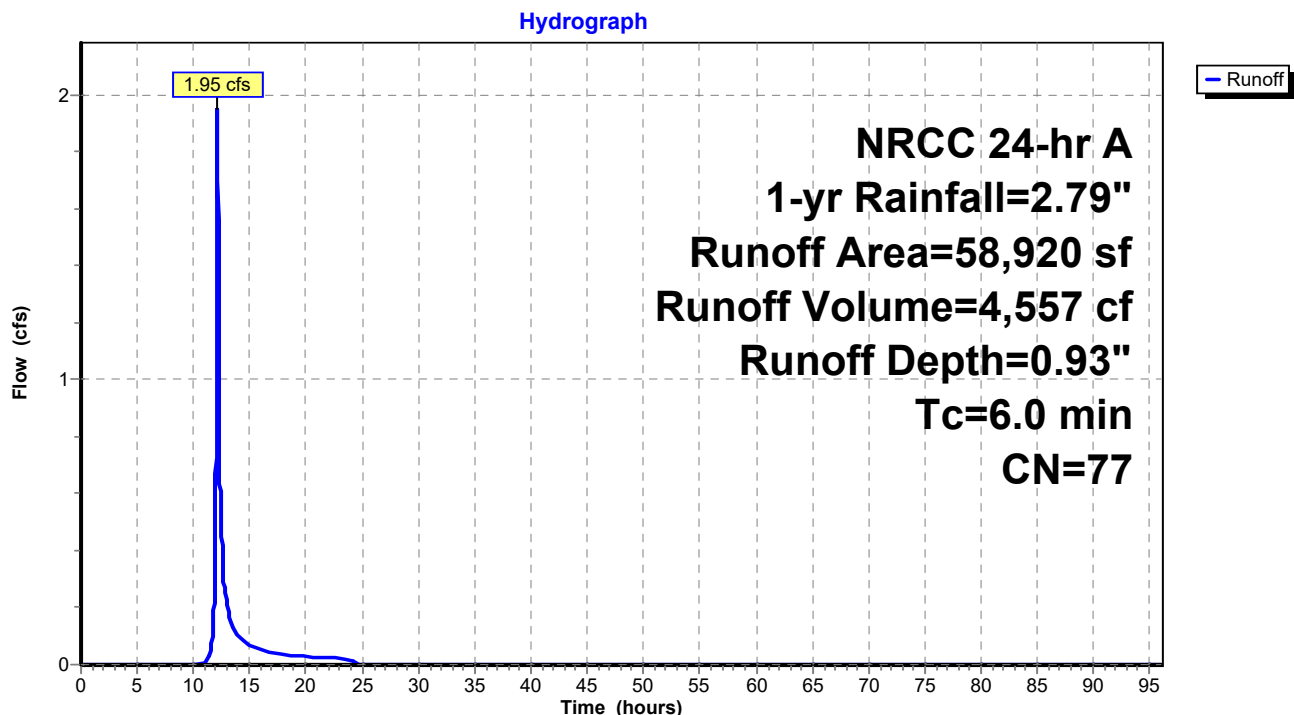
Summary for Subcatchment 36: Post B1

Runoff = 1.95 cfs @ 12.14 hrs, Volume= 4,557 cf, Depth= 0.93"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 1-yr Rainfall=2.79"

Area (sf)	CN	Description
19,123	98	Paved parking, HSG C
22,978	74	>75% Grass cover, Good, HSG C
4,537	61	>75% Grass cover, Good, HSG B
12,282	55	Woods, Good, HSG B
58,920	77	Weighted Average
39,797		67.54% Pervious Area
19,123		32.46% Impervious Area

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

Subcatchment 36: Post B1

N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 1-yr Rainfall=2.79"

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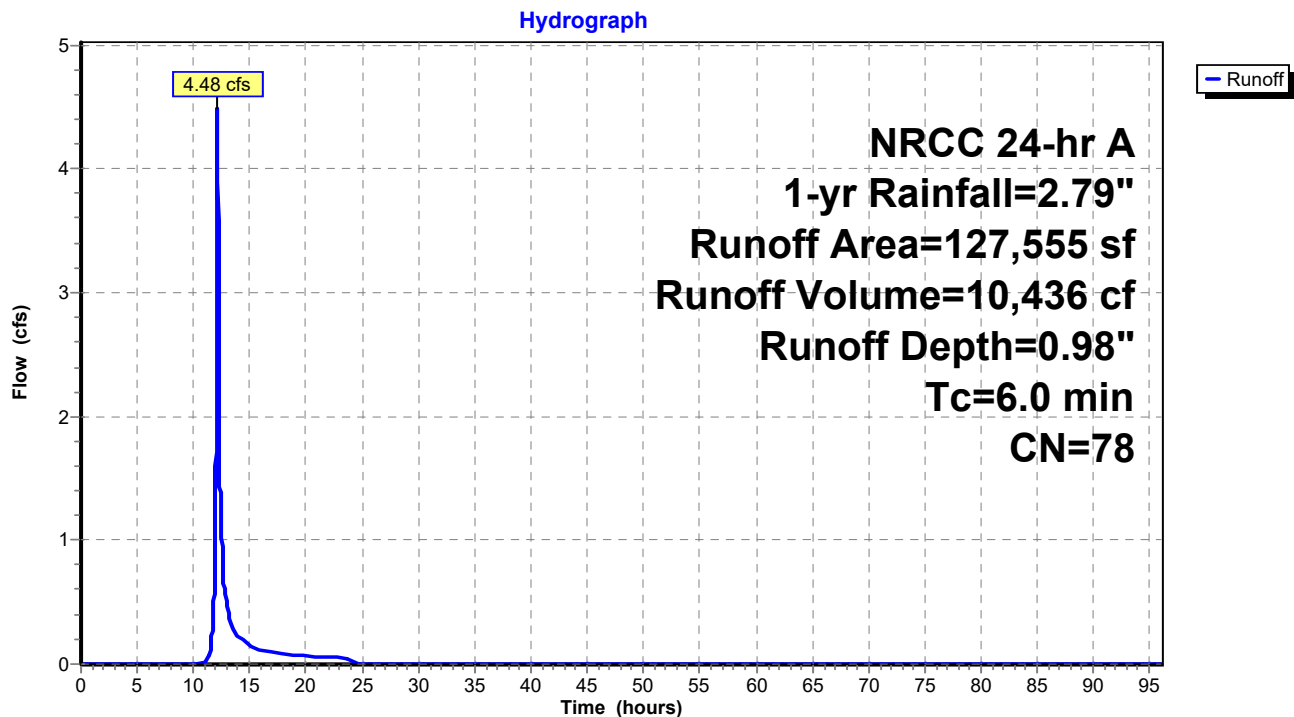
Summary for Subcatchment 37: Post B3

Runoff = 4.48 cfs @ 12.14 hrs, Volume= 10,436 cf, Depth= 0.98"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 1-yr Rainfall=2.79"

Area (sf)	CN	Description
44,276	98	Water Surface, HSG C
22,184	74	>75% Grass cover, Good, HSG C
61,095	65	Brush, Good, HSG C
127,555	78	Weighted Average
83,279		65.29% Pervious Area
44,276		34.71% Impervious Area

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

Subcatchment 37: Post B3

N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Pond 38: Wet Pond (SWP-4)

Inflow Area = 1,697,246 sf, 32.43% Impervious, Inflow Depth > 1.29" for 1-yr event
 Inflow = 11.33 cfs @ 13.13 hrs, Volume= 183,119 cf
 Outflow = 7.97 cfs @ 14.33 hrs, Volume= 182,833 cf, Atten= 30%, Lag= 71.5 min
 Primary = 7.97 cfs @ 14.33 hrs, Volume= 182,833 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Starting Elev= 376.00' Surf.Area= 88,186 sf Storage= 134,213 cf
 Peak Elev= 376.83' @ 14.33 hrs Surf.Area= 92,516 sf Storage= 173,147 cf (38,934 cf above start)

Plug-Flow detention time= 926.6 min calculated for 48,619 cf (27% of inflow)
 Center-of-Mass det. time= 113.9 min (1,146.0 - 1,032.2)

Volume	Invert	Avail.Storage	Storage Description
#1	372.00'	7,914 cf	Forebay (Irregular) Listed below (Recalc)
#2	372.00'	121,847 cf	Permanent Pool (Irregular) Listed below (Recalc)
#3	375.90'	259,334 cf	Additional Storage (Irregular) Listed below (Recalc)
		389,094 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
372.00	885	114.0	0	0	885
373.00	1,392	139.2	1,129	1,129	1,408
374.00	1,998	164.4	1,686	2,815	2,036
375.00	2,707	189.5	2,344	5,158	2,764
375.90	3,430	212.2	2,755	7,914	3,512

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
372.00	22,804	1,051.3	0	0	22,804
373.00	27,060	1,076.5	24,902	24,902	27,202
374.00	31,416	1,101.7	29,211	54,113	31,703
375.00	35,874	1,127.0	33,620	87,733	36,327
375.90	39,971	1,149.7	34,114	121,847	40,565

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
375.90	44,276	1,380.7	0	0	44,276
377.00	50,030	1,294.2	51,836	51,836	62,747
378.00	55,257	1,319.4	52,622	104,458	68,149
379.00	60,586	1,344.7	57,901	162,359	73,675
380.00	66,015	1,370.0	63,281	225,640	79,307
380.50	68,768	1,382.6	33,693	259,334	82,151

Device	Routing	Invert	Outlet Devices
#1	Primary	376.00'	4.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

N60 P1 Post-B 2021 - 5-4-12 AW

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NRCC 24-hr A 1-yr Rainfall=2.79"

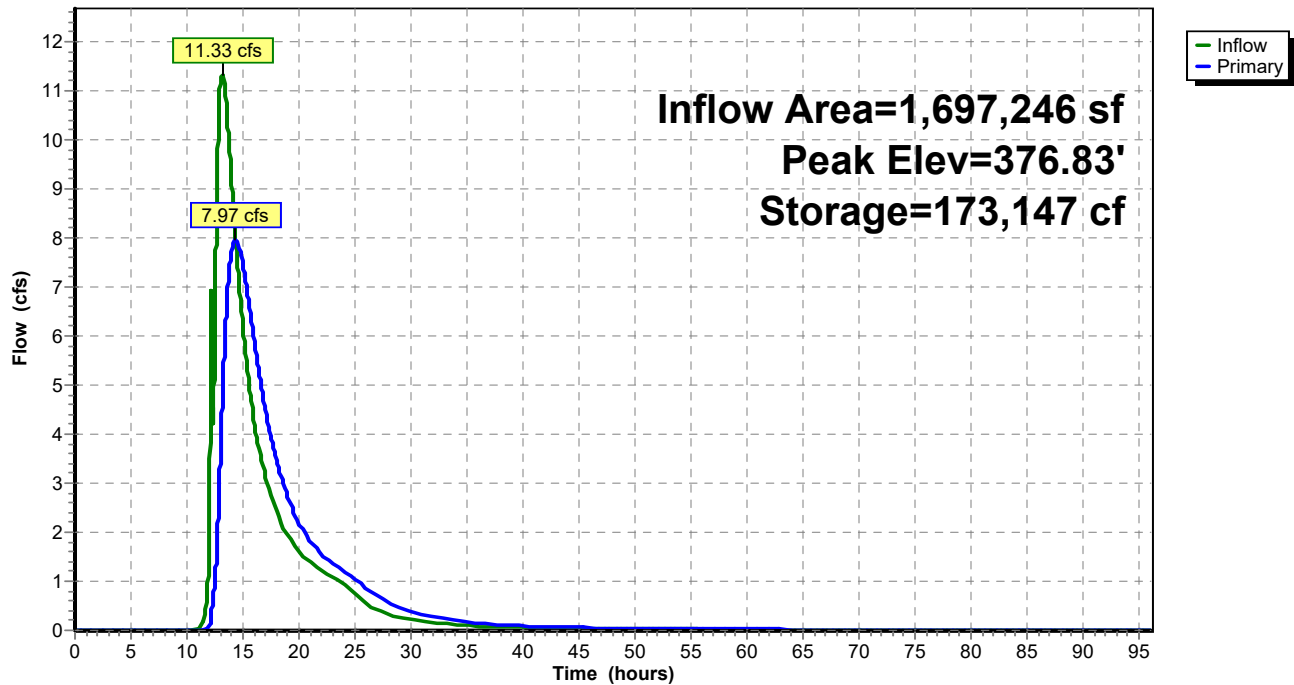
Printed 5/12/2021

Primary OutFlow Max=7.97 cfs @ 14.33 hrs HW=376.83' TW=312.40' (Dynamic Tailwater)

1=Broad-Crested Rectangular Weir (Weir Controls 7.97 cfs @ 2.40 fps)

Pond 38: Wet Pond (SWP-4)

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

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NRCC 24-hr A 1-yr Rainfall=2.79"

Printed 5/12/2021

Summary for Subcatchment 39: Post B2

Runoff = 6.79 cfs @ 12.13 hrs, Volume= 15,669 cf, Depth= 1.41"

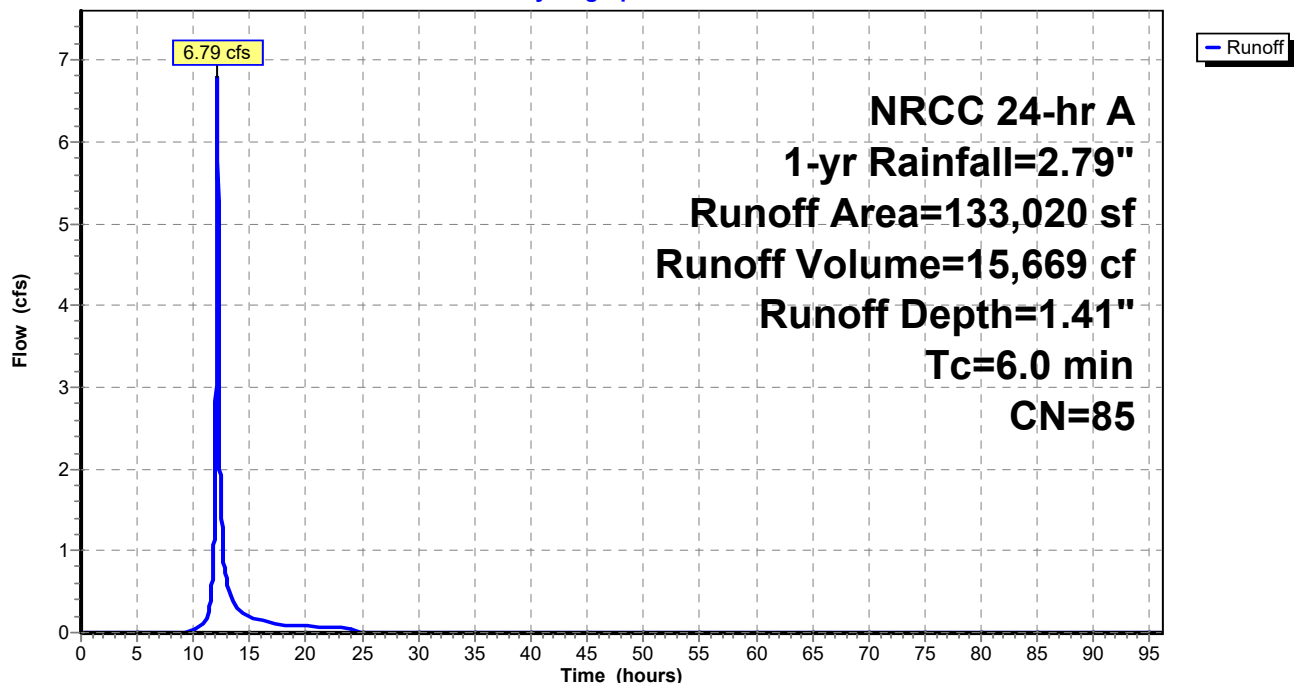
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 1-yr Rainfall=2.79"

Area (sf)	CN	Description
67,090	98	Paved parking, HSG C
40,460	74	>75% Grass cover, Good, HSG C
7,690	61	>75% Grass cover, Good, HSG B
17,780	70	Woods, Good, HSG C
133,020	85	Weighted Average
65,930		49.56% Pervious Area
67,090		50.44% Impervious Area

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

Subcatchment 39: Post B2

Hydrograph



Summary for Pond 40: DIV-3

Inflow Area = 133,020 sf, 50.44% Impervious, Inflow Depth = 1.41" for 1-yr event
 Inflow = 6.79 cfs @ 12.13 hrs, Volume= 15,669 cf
 Outflow = 6.79 cfs @ 12.13 hrs, Volume= 15,669 cf, Atten= 0%, Lag= 0.0 min
 Primary = 6.10 cfs @ 12.13 hrs, Volume= 15,560 cf
 Secondary = 0.69 cfs @ 12.13 hrs, Volume= 108 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 381.10' @ 12.13 hrs

Flood Elev= 386.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	378.00'	12.0" Round Culvert L= 9.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 378.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	378.00'	24.0" Round Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 377.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	381.00'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=6.09 cfs @ 12.13 hrs HW=381.10' TW=378.32' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 6.09 cfs @ 7.76 fps)

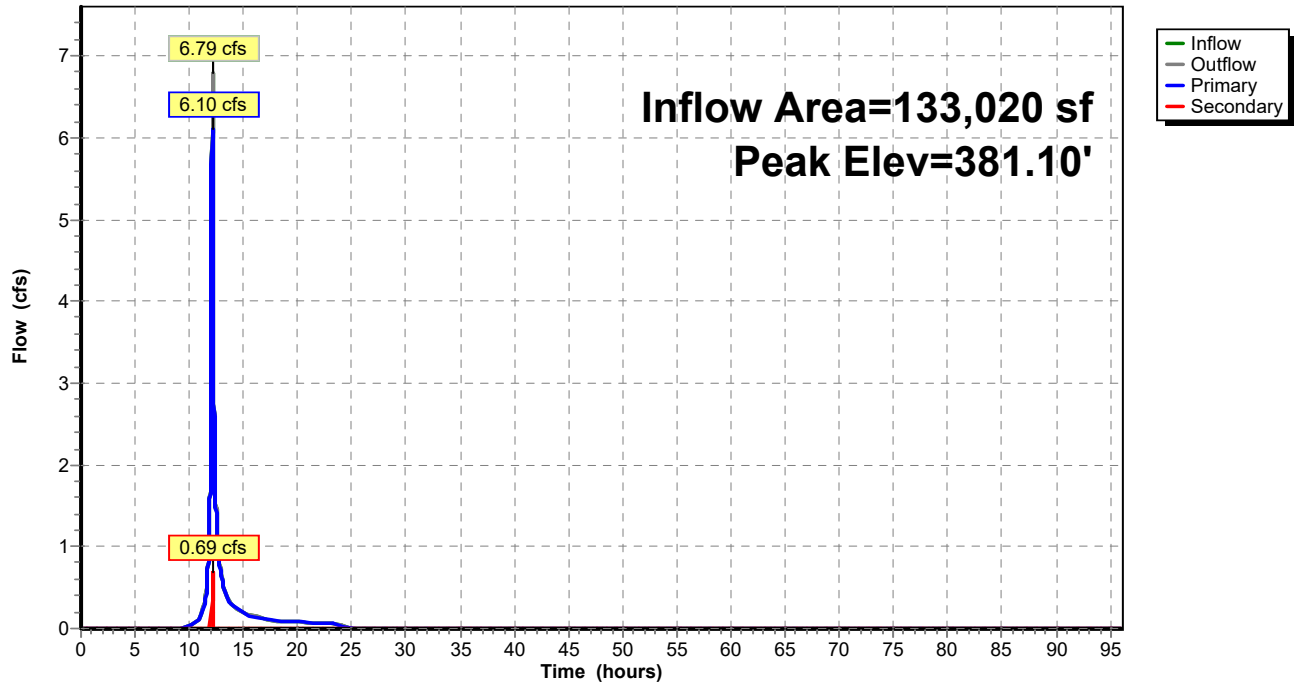
Secondary OutFlow Max=0.68 cfs @ 12.13 hrs HW=381.10' TW=312.22' (Dynamic Tailwater)

↑**2=Culvert** (Passes 0.68 cfs of 21.90 cfs potential flow)

↑**3=Broad-Crested Rectangular Weir** (Weir Controls 0.68 cfs @ 0.87 fps)

Pond 40: DIV-3

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Pond 41: INF-3

Inflow Area = 133,020 sf, 50.44% Impervious, Inflow Depth = 1.40" for 1-yr event
 Inflow = 6.10 cfs @ 12.13 hrs, Volume= 15,560 cf
 Outflow = 1.13 cfs @ 11.90 hrs, Volume= 15,560 cf, Atten= 81%, Lag= 0.0 min
 Discarded = 1.13 cfs @ 11.90 hrs, Volume= 15,560 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 378.87' @ 12.58 hrs Surf.Area= 4,883 sf Storage= 4,606 cf

Plug-Flow detention time= 28.4 min calculated for 15,559 cf (100% of inflow)
 Center-of-Mass det. time= 28.4 min (849.8 - 821.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	377.50'	4,711 cf	45.00'W x 108.50'L x 3.88'H Field A 18,920 cf Overall - 7,142 cf Embedded = 11,778 cf x 40.0% Voids
#2A	378.00'	7,142 cf	Cultec R-330XLHD x 135 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 9 rows
		11,853 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	377.50'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.10'

Discarded OutFlow Max=1.13 cfs @ 11.90 hrs HW=377.62' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 1.13 cfs)

Pond 41: INF-3 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 9 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

15 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 106.50' Row Length +12.0" End Stone x 2 = 108.50' Base Length

9 Rows x 52.0" Wide + 6.0" Spacing x 8 + 12.0" Side Stone x 2 = 45.00' Base Width

6.0" Base + 30.5" Chamber Height + 10.0" Cover = 3.88' Field Height

135 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 9 Rows = 7,141.8 cf Chamber Storage

18,919.7 cf Field - 7,141.8 cf Chambers = 11,777.9 cf Stone x 40.0% Voids = 4,711.2 cf Stone Storage

Chamber Storage + Stone Storage = 11,852.9 cf = 0.272 af

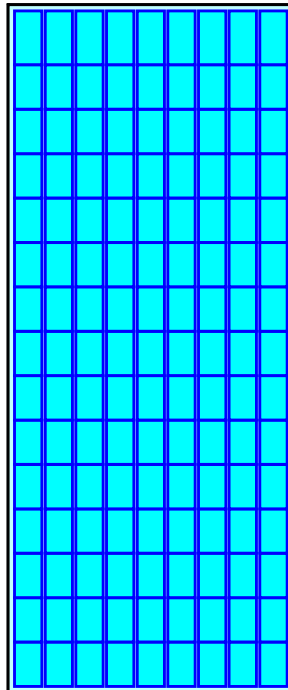
Overall Storage Efficiency = 62.6%

Overall System Size = 108.50' x 45.00' x 3.88'

135 Chambers

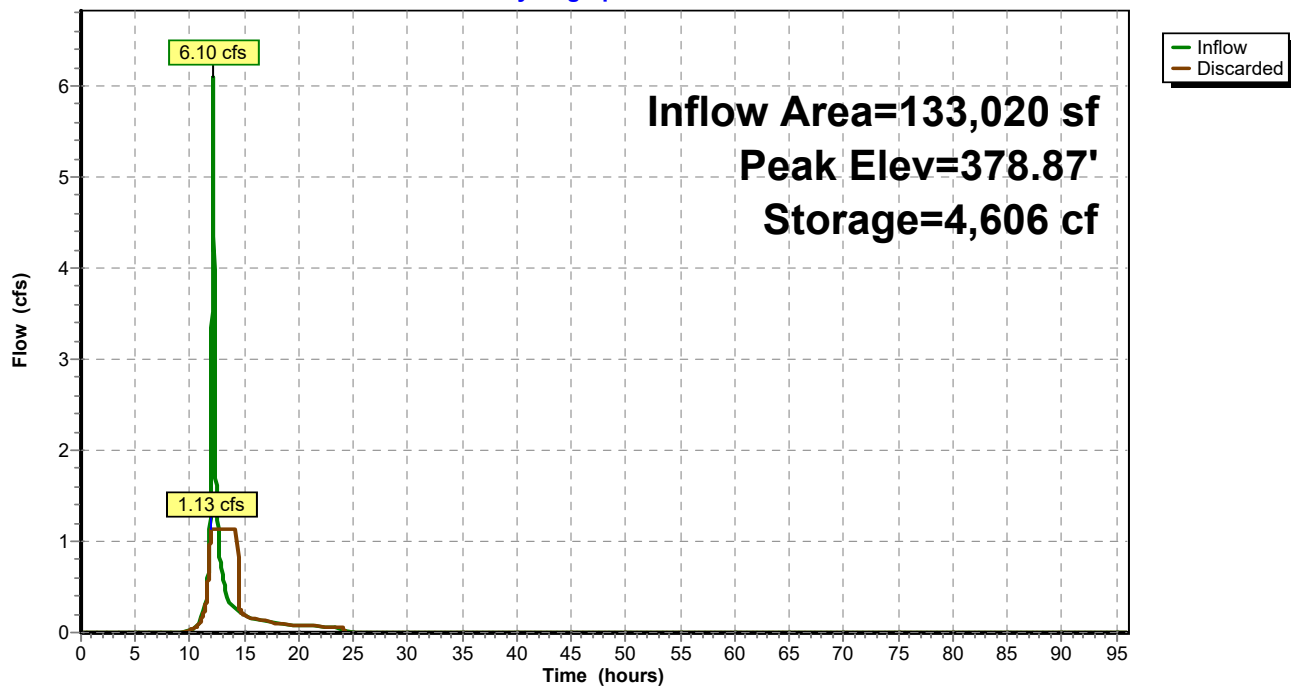
700.7 cy Field

436.2 cy Stone



Pond 41: INF-3

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

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NRCC 24-hr A 1-yr Rainfall=2.79"

Printed 5/12/2021

Summary for Subcatchment 42: Post B4

Runoff = 11.68 cfs @ 12.26 hrs, Volume= 44,049 cf, Depth= 0.60"

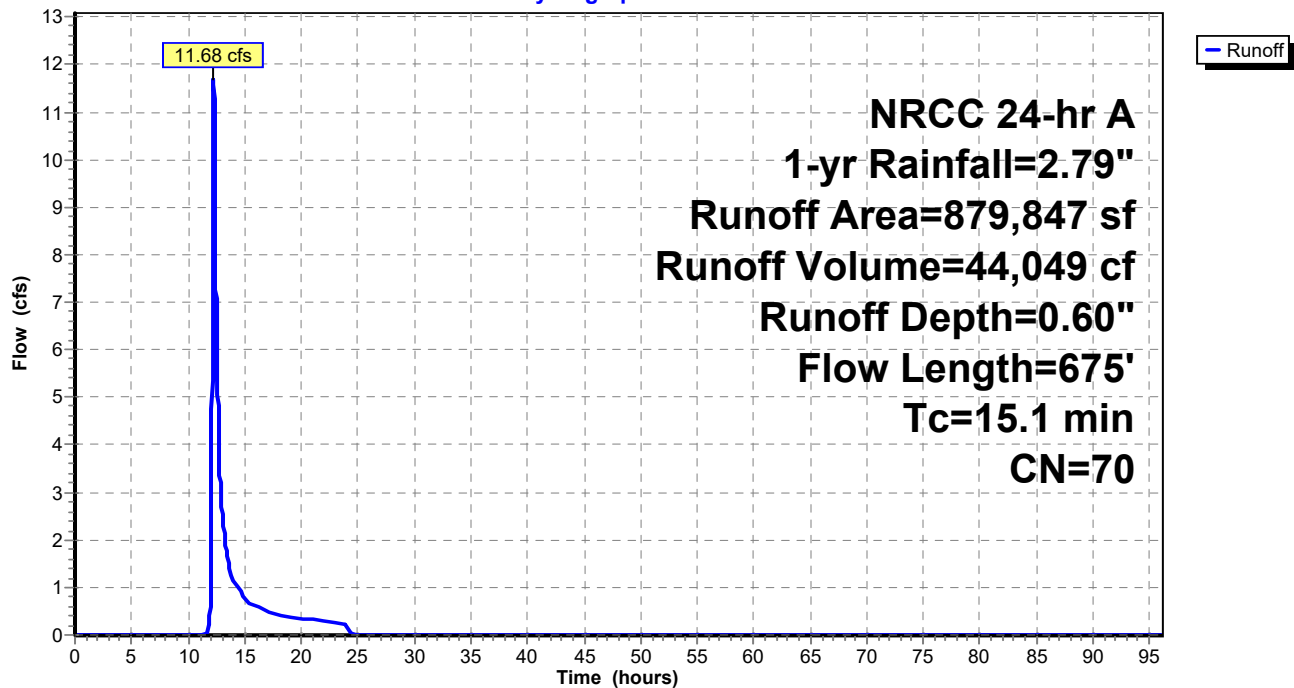
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 1-yr Rainfall=2.79"

Area (sf)	CN	Description
19,672	61	>75% Grass cover, Good, HSG B
13,245	74	>75% Grass cover, Good, HSG C
16,422	55	Woods, Good, HSG B
810,443	70	Woods, Good, HSG C
20,065	70	Woods, Good, HSG C
879,847	70	Weighted Average
879,847		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	100	0.0600	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.9	575	0.0950	4.96		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.1	675	Total			

Subcatchment 42: Post B4

Hydrograph



Summary for Reach 43: Existing Stream B

Inflow Area = 2,577,093 sf, 21.36% Impervious, Inflow Depth > 1.06" for 1-yr event
Inflow = 12.21 cfs @ 12.26 hrs, Volume= 226,990 cf
Outflow = 11.39 cfs @ 12.32 hrs, Volume= 226,981 cf, Atten= 7%, Lag= 3.5 min

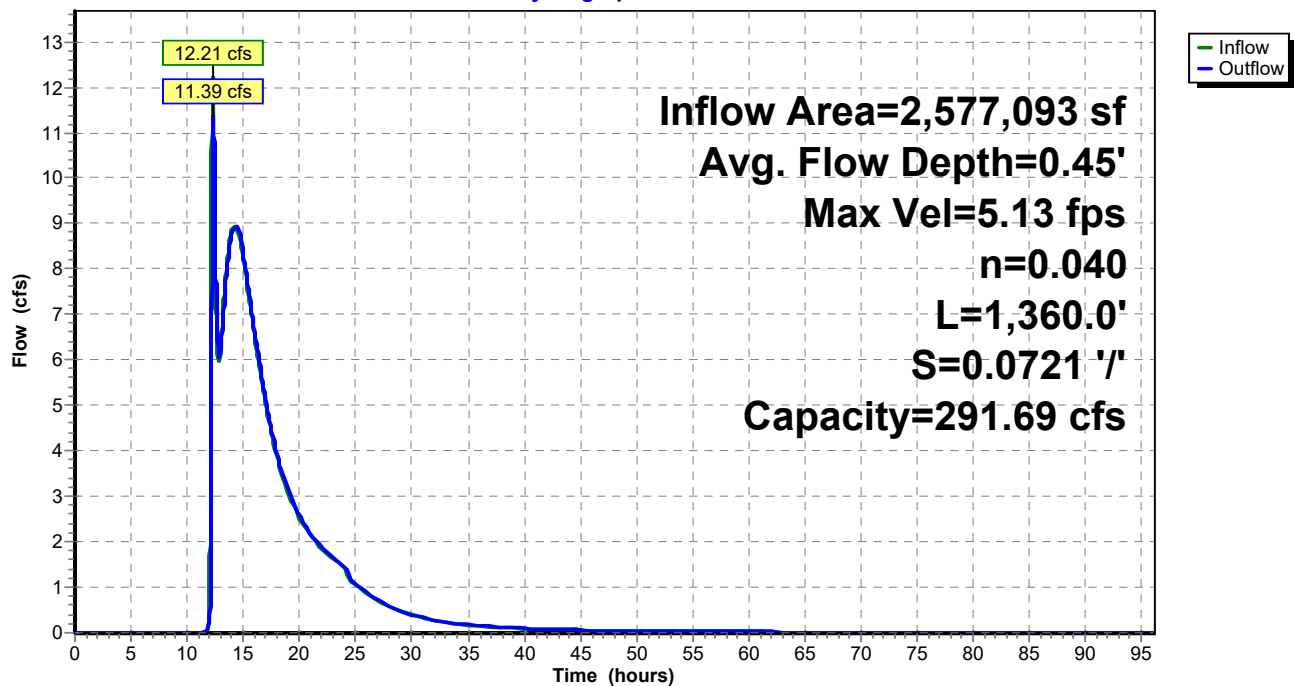
Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 5.13 fps, Min. Travel Time= 4.4 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 16.7 min

Peak Storage= 3,020 cf @ 12.32 hrs
Average Depth at Peak Storage= 0.45'
Bank-Full Depth= 2.50' Flow Area= 22.5 sf, Capacity= 291.69 cfs

4.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 1,360.0' Slope= 0.0721 '/'
Inlet Invert= 312.00', Outlet Invert= 214.00'

**Reach 43: Existing Stream B**

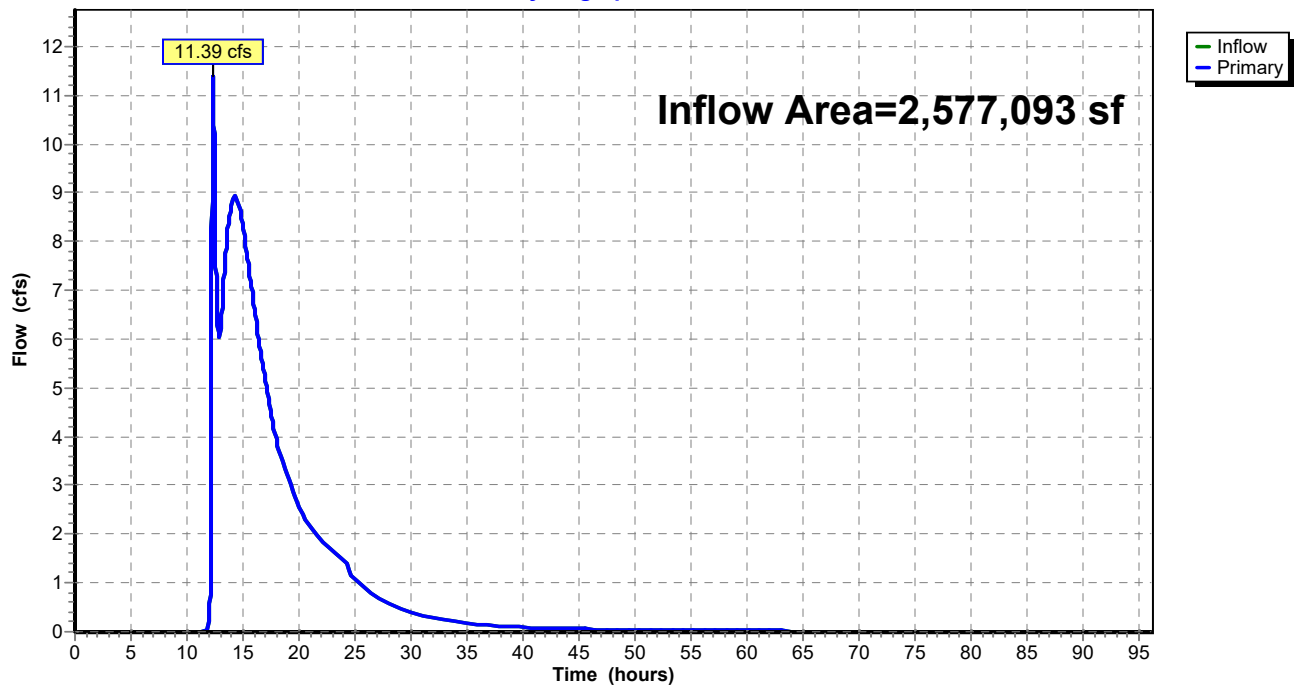
Hydrograph



Summary for Link 44: Design Point B

Inflow Area = 2,577,093 sf, 21.36% Impervious, Inflow Depth > 1.06" for 1-yr event
Inflow = 11.39 cfs @ 12.32 hrs, Volume= 226,981 cf
Primary = 11.39 cfs @ 12.32 hrs, Volume= 226,981 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 44: Design Point B**Hydrograph**

N60 P1 Post-B 2021 - 5-4-12 AW

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NRCC 24-hr A 1-yr Rainfall=2.79"

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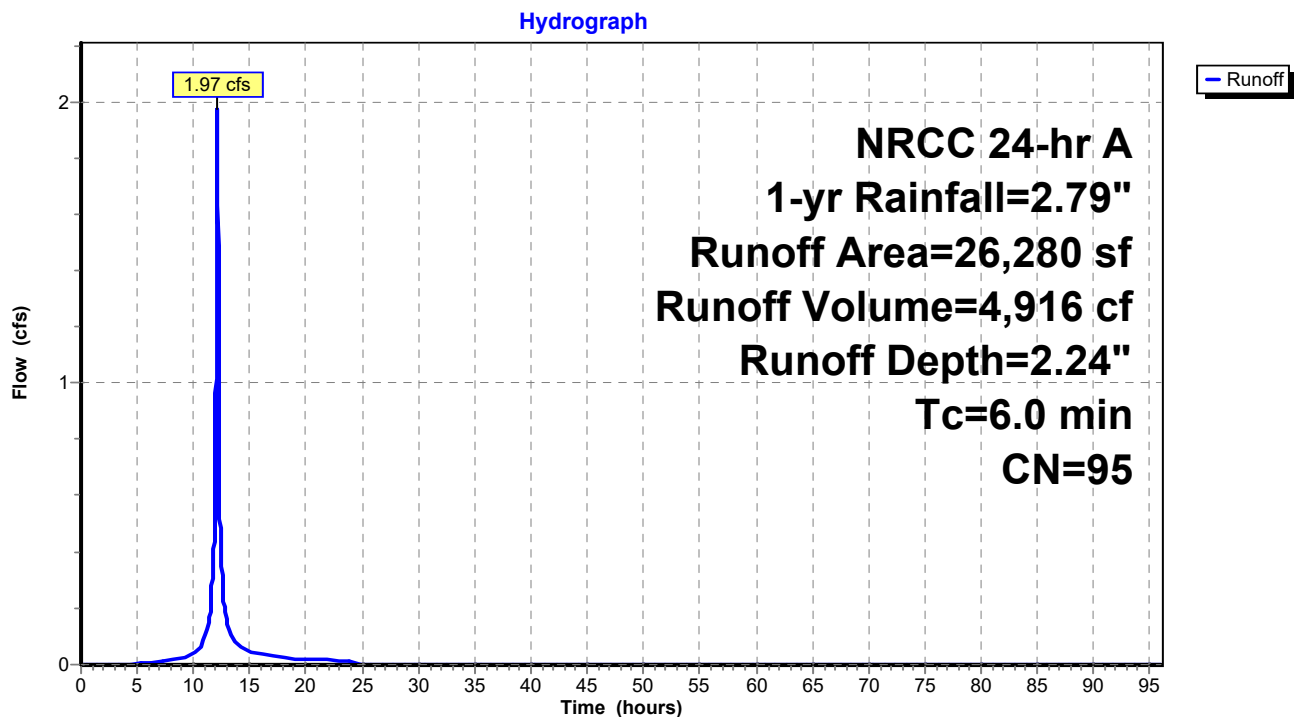
Summary for Subcatchment 45: Post B7

Runoff = 1.97 cfs @ 12.13 hrs, Volume= 4,916 cf, Depth= 2.24"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 1-yr Rainfall=2.79"

Area (sf)	CN	Description
14,320	98	Roofs, HSG C
4,847	98	Paved parking, HSG A
3,412	74	>75% Grass cover, Good, HSG C
* 3,701	98	Paved Walkway
26,280	95	Weighted Average
3,412		12.98% Pervious Area
22,868		87.02% Impervious Area

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

Subcatchment 45: Post B7

Summary for Pond 46: DIV-3

Inflow Area = 26,280 sf, 87.02% Impervious, Inflow Depth = 2.24" for 1-yr event
 Inflow = 1.97 cfs @ 12.13 hrs, Volume= 4,916 cf
 Outflow = 1.97 cfs @ 12.13 hrs, Volume= 4,916 cf, Atten= 0%, Lag= 0.0 min
 Primary = 1.97 cfs @ 12.13 hrs, Volume= 4,916 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 389.44' @ 12.60 hrs

Flood Elev= 392.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	388.00'	12.0" Round Culvert L= 17.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 388.00' / 388.00' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	388.00'	24.0" Round Culvert L= 113.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 388.00' / 386.00' S= 0.0177 ' S= 0.0177 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	390.50'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.97 cfs @ 12.13 hrs HW=389.05' TW=388.67' (Dynamic Tailwater)

↑ **1=Culvert** (Barrel Controls 1.97 cfs @ 2.97 fps)

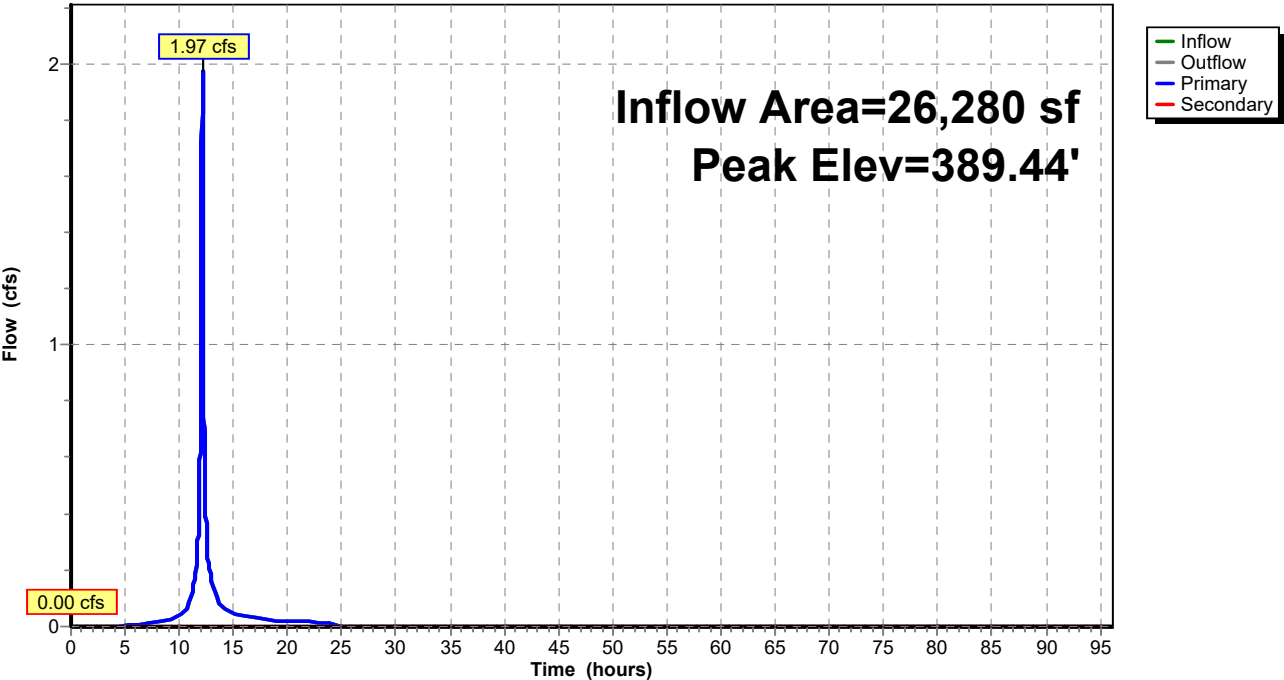
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=388.00' TW=376.00' (Dynamic Tailwater)

↑ **2=Culvert** (Controls 0.00 cfs)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 46: DIV-3

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 1-yr Rainfall=2.79"

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Summary for Pond 47: INF-9

Inflow Area = 26,280 sf, 87.02% Impervious, Inflow Depth = 2.24" for 1-yr event
 Inflow = 1.97 cfs @ 12.13 hrs, Volume= 4,916 cf
 Outflow = 0.27 cfs @ 11.74 hrs, Volume= 4,916 cf, Atten= 86%, Lag= 0.0 min
 Discarded = 0.27 cfs @ 11.74 hrs, Volume= 4,916 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 389.44' @ 12.60 hrs Surf.Area= 1,174 sf Storage= 1,608 cf

Plug-Flow detention time= 39.3 min calculated for 4,916 cf (100% of inflow)
 Center-of-Mass det. time= 39.3 min (820.2 - 780.9)

Volume	Invert	Avail.Storage	Storage Description
#1A	387.50'	1,167 cf	30.50'W x 38.50'L x 3.88'H Field A 4,550 cf Overall - 1,632 cf Embedded = 2,918 cf x 40.0% Voids
#2A	388.00'	1,632 cf	Cultec R-330XLHD x 30 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 6 rows
		2,799 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	387.50'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.10'

Discarded OutFlow Max=0.27 cfs @ 11.74 hrs HW=387.62' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.27 cfs)

Pond 47: INF-9 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 6 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

5 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 36.50' Row Length +12.0" End Stone x 2 = 38.50' Base Length

6 Rows x 52.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.50' Base Width

6.0" Base + 30.5" Chamber Height + 10.0" Cover = 3.88' Field Height

30 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 6 Rows = 1,631.8 cf Chamber Storage

4,550.2 cf Field - 1,631.8 cf Chambers = 2,918.4 cf Stone x 40.0% Voids = 1,167.4 cf Stone Storage

Chamber Storage + Stone Storage = 2,799.1 cf = 0.064 af

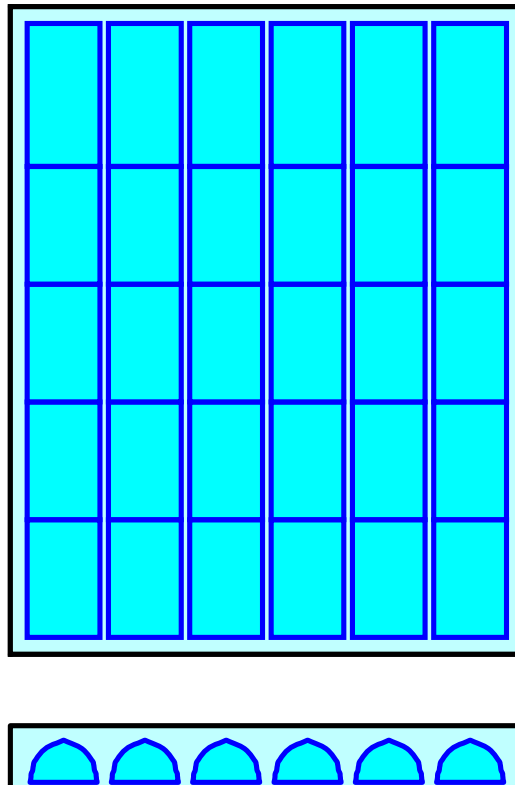
Overall Storage Efficiency = 61.5%

Overall System Size = 38.50' x 30.50' x 3.88'

30 Chambers

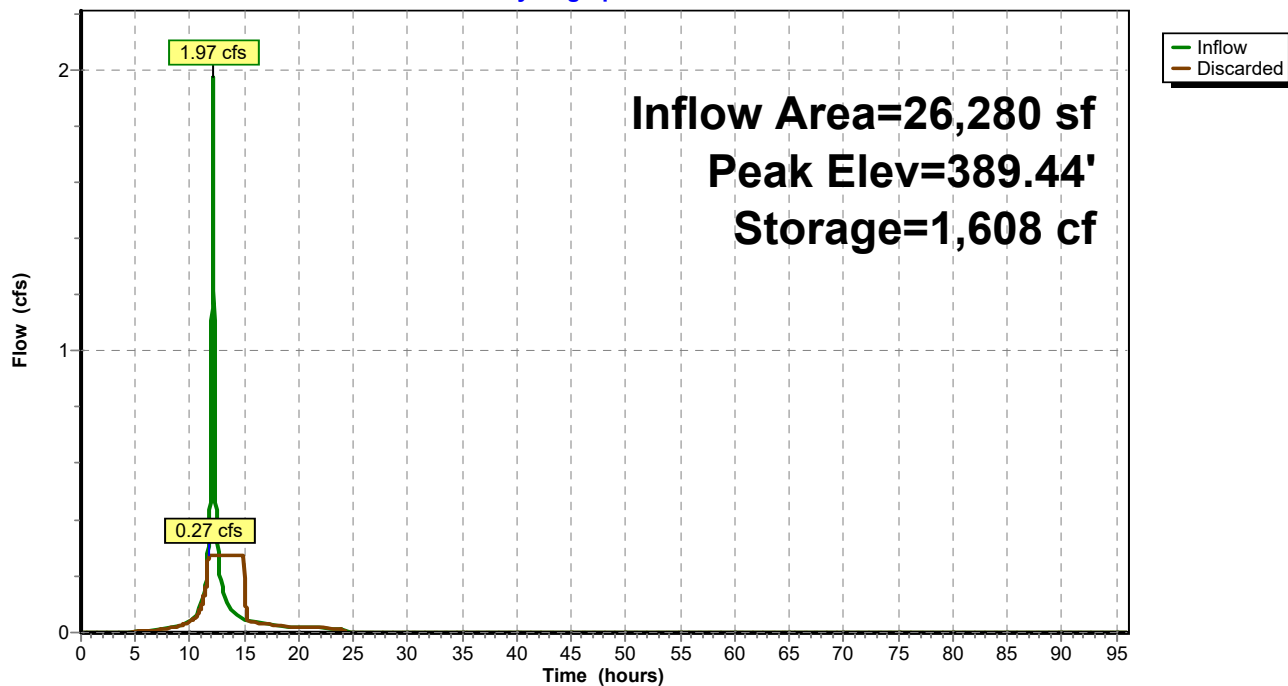
168.5 cy Field

108.1 cy Stone



Pond 47: INF-9

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 2-yr Rainfall=3.42"

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment34: Post B0 (Offsite) Runoff Area=1,510,771 sf 32.24% Impervious Runoff Depth=1.87"
 Flow Length=1,871' Tc=32.3 min CN=84 Runoff=49.64 cfs 235,196 cf

Pond 35: Offsite Pond B Peak Elev=383.84' Storage=102,972 cf Inflow=49.64 cfs 235,196 cf
 36.0" Round Culvert n=0.025 L=158.0' S=0.0127 ' Outflow=16.27 cfs 233,939 cf

Subcatchment36: Post B1 Runoff Area=58,920 sf 32.46% Impervious Runoff Depth=1.37"
 Tc=6.0 min CN=77 Runoff=2.92 cfs 6,733 cf

Subcatchment37: Post B3 Runoff Area=127,555 sf 34.71% Impervious Runoff Depth=1.44"
 Tc=6.0 min CN=78 Runoff=6.62 cfs 15,273 cf

Pond 38: Wet Pond (SWP-4) Peak Elev=377.12' Storage=187,758 cf Inflow=17.14 cfs 255,945 cf
 Outflow=12.54 cfs 255,655 cf

Subcatchment39: Post B2 Runoff Area=133,020 sf 50.44% Impervious Runoff Depth=1.95"
 Tc=6.0 min CN=85 Runoff=9.29 cfs 21,581 cf

Pond 40: DIV-3 Peak Elev=381.26' Inflow=9.29 cfs 21,581 cf
 Primary=6.27 cfs 20,624 cf Secondary=3.04 cfs 957 cf Outflow=9.29 cfs 21,581 cf

Pond 41: INF-3 Peak Elev=379.42' Storage=6,757 cf Inflow=6.27 cfs 20,624 cf
 Outflow=1.13 cfs 20,624 cf

Subcatchment42: Post B4 Runoff Area=879,847 sf 0.00% Impervious Runoff Depth=0.96"
 Flow Length=675' Tc=15.1 min CN=70 Runoff=20.16 cfs 70,319 cf

Reach 43: Existing Stream B Avg. Flow Depth=0.63' Max Vel=6.17 fps Inflow=21.36 cfs 326,932 cf
 n=0.040 L=1,360.0' S=0.0721 ' Capacity=291.69 cfs Outflow=20.49 cfs 326,922 cf

Link 44: Design Point B Inflow=20.49 cfs 326,922 cf
 Primary=20.49 cfs 326,922 cf

Subcatchment45: Post B7 Runoff Area=26,280 sf 87.02% Impervious Runoff Depth=2.86"
 Tc=6.0 min CN=95 Runoff=2.47 cfs 6,265 cf

Pond 46: DIV-3 Peak Elev=390.31' Inflow=2.47 cfs 6,265 cf
 Primary=2.47 cfs 6,265 cf Secondary=0.00 cfs 0 cf Outflow=2.47 cfs 6,265 cf

Pond 47: INF-9 Peak Elev=390.30' Storage=2,282 cf Inflow=2.47 cfs 6,265 cf
 Outflow=0.27 cfs 6,265 cf

Total Runoff Area = 2,736,393 sf Runoff Volume = 355,368 cf Average Runoff Depth = 1.56"
76.60% Pervious = 2,095,980 sf 23.40% Impervious = 640,413 sf

N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Subcatchment 34: Post B0 (Offsite)

Runoff = 49.64 cfs @ 12.45 hrs, Volume= 235,196 cf, Depth= 1.87"

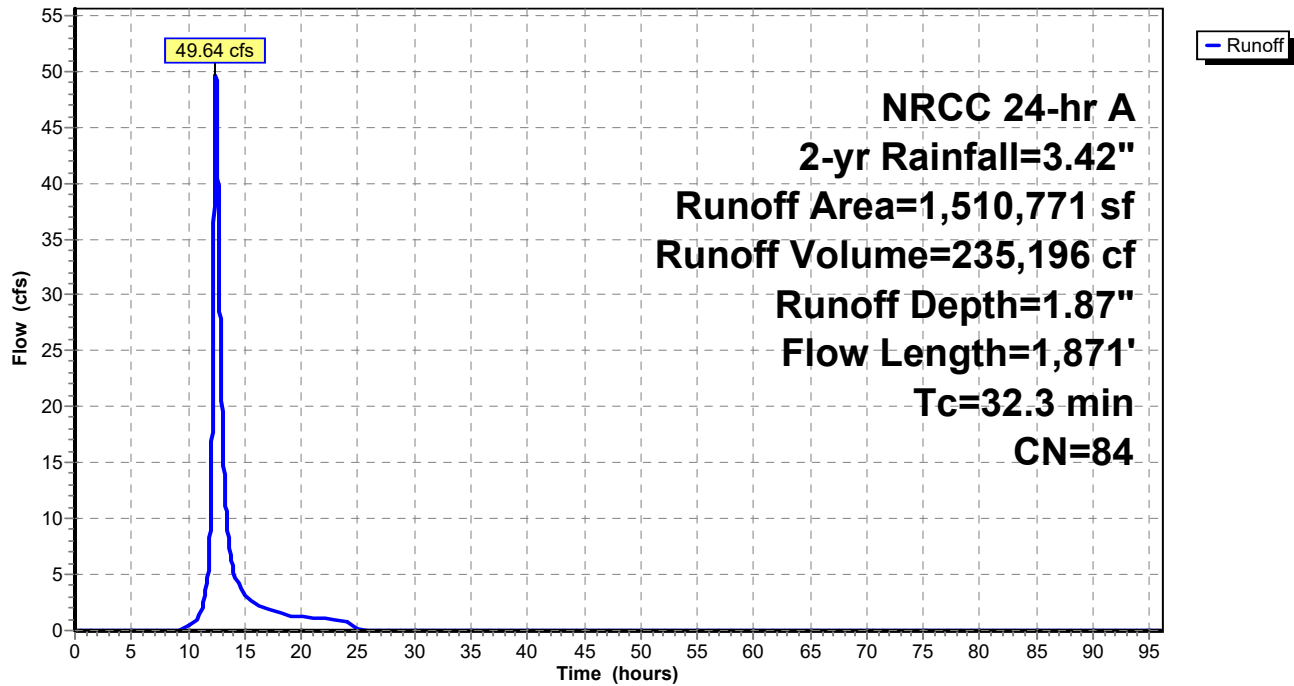
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 2-yr Rainfall=3.42"

Area (sf)	CN	Description
487,056	98	Paved parking, HSG C
497,987	77	Woods, Good, HSG D
134,328	70	Woods, Good, HSG C
375,457	80	>75% Grass cover, Good, HSG D
15,943	74	>75% Grass cover, Good, HSG C
1,510,771	84	Weighted Average
1,023,715		67.76% Pervious Area
487,056		32.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0300	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
9.5	848	0.0085	1.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.1	856	0.0093	2.78	3.06	Trap/Vee/Rect Channel Flow, Bot.W=3.00' D=0.33' Z= 1.0 '/' Top.W=3.66' n= 0.022 Earth, clean & straight
0.2	67	0.0150	6.66	64.08	Pipe Channel, 42.0" Round Area= 9.6 sf Perim= 11.0' r= 0.88' n= 0.025 Corrugated metal
32.3	1,871	Total			

Subcatchment 34: Post B0 (Offsite)

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Pond 35: Offsite Pond B

Inflow Area = 1,510,771 sf, 32.24% Impervious, Inflow Depth = 1.87" for 2-yr event
 Inflow = 49.64 cfs @ 12.45 hrs, Volume= 235,196 cf
 Outflow = 16.27 cfs @ 13.10 hrs, Volume= 233,939 cf, Atten= 67%, Lag= 38.7 min
 Primary = 16.27 cfs @ 13.10 hrs, Volume= 233,939 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 383.84' @ 13.10 hrs Surf.Area= 77,765 sf Storage= 102,972 cf

Plug-Flow detention time= 176.7 min calculated for 233,915 cf (99% of inflow)
 Center-of-Mass det. time= 173.8 min (1,014.1 - 840.3)

Volume	Invert	Avail.Storage	Storage Description
#1	382.00'	610,998 cf	Custom Stage Data (Irregular) Listed below (Recalc)

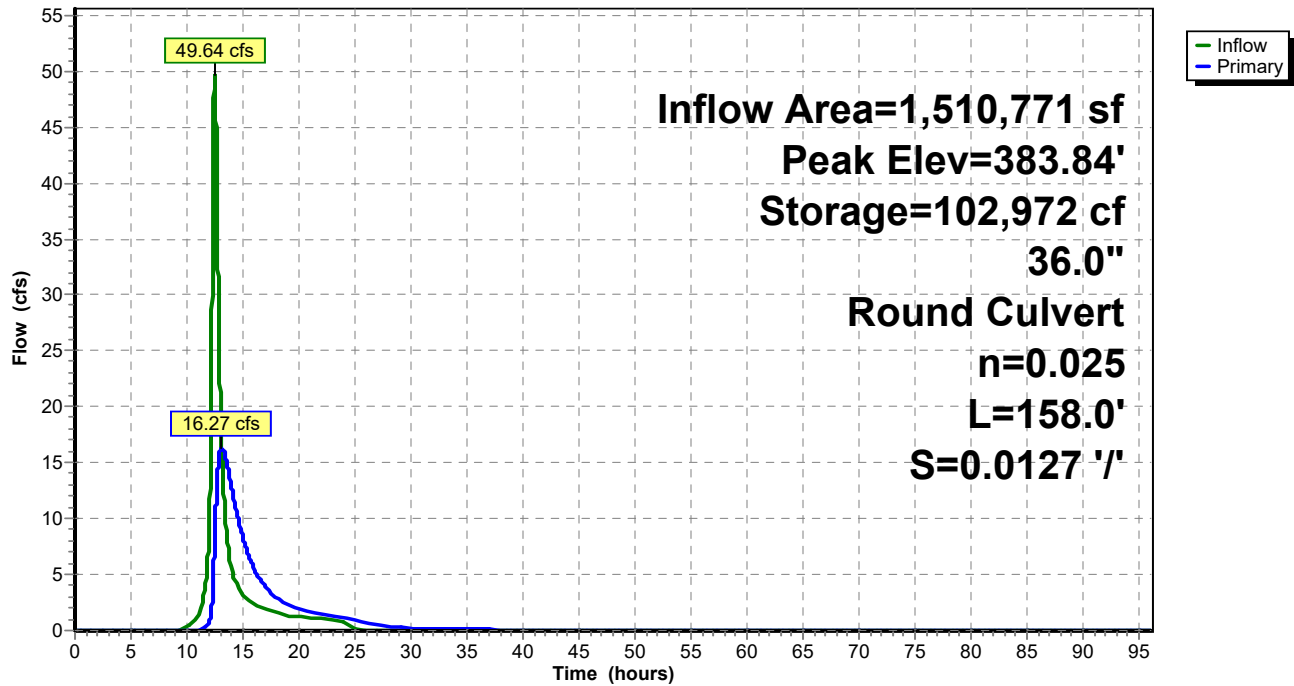
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
382.00	36,540	1,177.0	0	0	36,540
384.00	81,987	1,579.0	115,507	115,507	124,748
386.00	96,790	1,622.0	178,572	294,080	136,159
388.00	108,795	1,657.0	205,468	499,548	145,863
389.00	114,127	1,679.0	111,450	610,998	151,937

Device	Routing	Invert	Outlet Devices
#1	Primary	382.00'	36.0" Round Culvert L= 158.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 382.00' / 380.00' S= 0.0127 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 7.07 sf

Primary OutFlow Max=16.27 cfs @ 13.10 hrs HW=383.84' TW=376.83' (Dynamic Tailwater)
 ↑**1=Culvert** (Barrel Controls 16.27 cfs @ 5.11 fps)

Pond 35: Offsite Pond B

Hydrograph



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NRCC 24-hr A 2-yr Rainfall=3.42"

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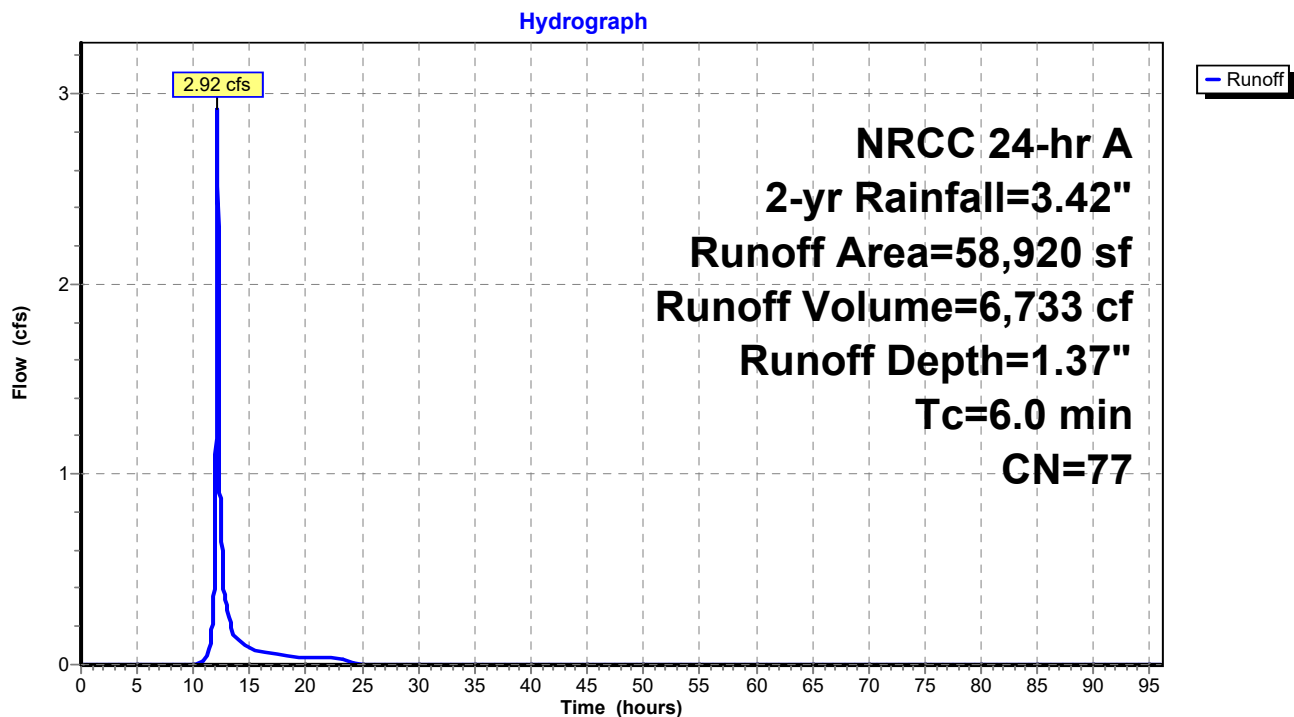
Summary for Subcatchment 36: Post B1

Runoff = 2.92 cfs @ 12.14 hrs, Volume= 6,733 cf, Depth= 1.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 2-yr Rainfall=3.42"

Area (sf)	CN	Description
19,123	98	Paved parking, HSG C
22,978	74	>75% Grass cover, Good, HSG C
4,537	61	>75% Grass cover, Good, HSG B
12,282	55	Woods, Good, HSG B
58,920	77	Weighted Average
39,797		67.54% Pervious Area
19,123		32.46% Impervious Area

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

Subcatchment 36: Post B1

N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 2-yr Rainfall=3.42"

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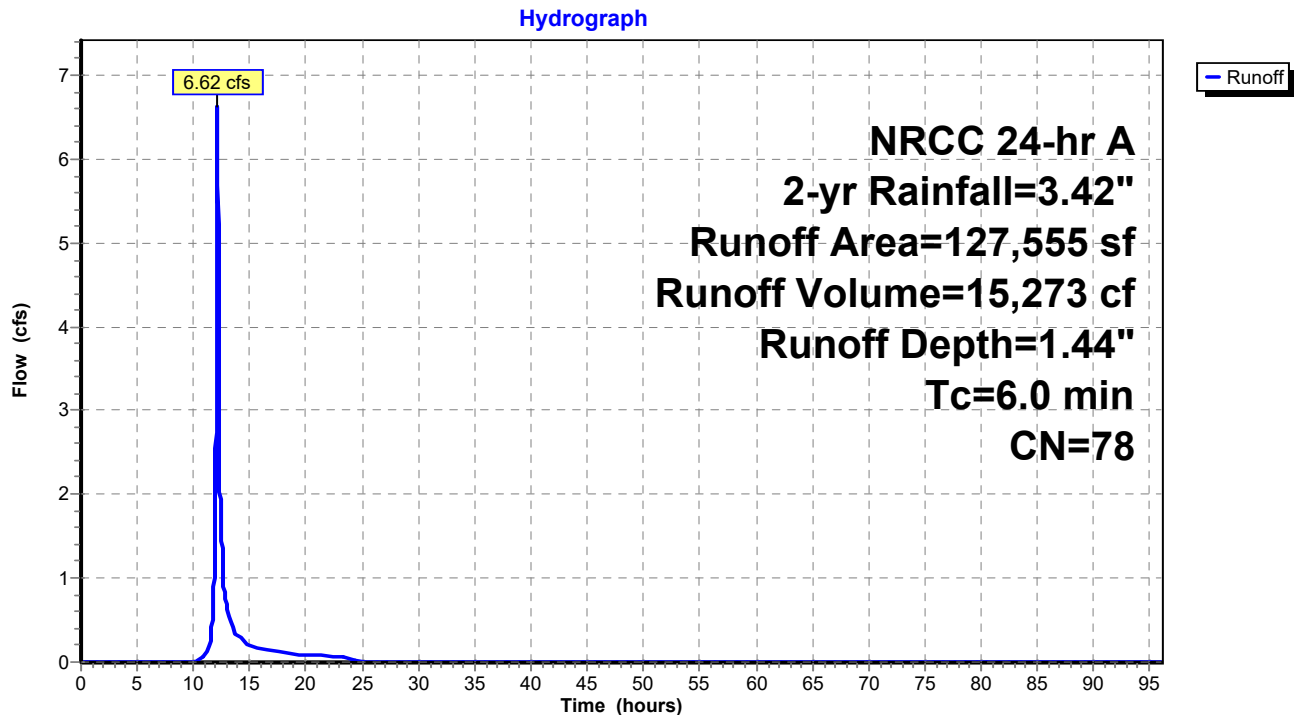
Summary for Subcatchment 37: Post B3

Runoff = 6.62 cfs @ 12.14 hrs, Volume= 15,273 cf, Depth= 1.44"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 2-yr Rainfall=3.42"

Area (sf)	CN	Description
44,276	98	Water Surface, HSG C
22,184	74	>75% Grass cover, Good, HSG C
61,095	65	Brush, Good, HSG C
127,555	78	Weighted Average
83,279		65.29% Pervious Area
44,276		34.71% Impervious Area

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

Subcatchment 37: Post B3

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NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Pond 38: Wet Pond (SWP-4)

Inflow Area = 1,697,246 sf, 32.43% Impervious, Inflow Depth > 1.81" for 2-yr event
 Inflow = 17.14 cfs @ 13.05 hrs, Volume= 255,945 cf
 Outflow = 12.54 cfs @ 14.10 hrs, Volume= 255,655 cf, Atten= 27%, Lag= 63.3 min
 Primary = 12.54 cfs @ 14.10 hrs, Volume= 255,655 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Starting Elev= 376.00' Surf.Area= 88,186 sf Storage= 134,213 cf
 Peak Elev= 377.12' @ 14.10 hrs Surf.Area= 94,057 sf Storage= 187,758 cf (53,545 cf above start)

Plug-Flow detention time= 562.5 min calculated for 121,430 cf (47% of inflow)
 Center-of-Mass det. time= 100.6 min (1,099.0 - 998.5)

Volume	Invert	Avail.Storage	Storage Description
#1	372.00'	7,914 cf	Forebay (Irregular) Listed below (Recalc)
#2	372.00'	121,847 cf	Permanent Pool (Irregular) Listed below (Recalc)
#3	375.90'	259,334 cf	Additional Storage (Irregular) Listed below (Recalc)
		389,094 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
372.00	885	114.0	0	0	885
373.00	1,392	139.2	1,129	1,129	1,408
374.00	1,998	164.4	1,686	2,815	2,036
375.00	2,707	189.5	2,344	5,158	2,764
375.90	3,430	212.2	2,755	7,914	3,512

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
372.00	22,804	1,051.3	0	0	22,804
373.00	27,060	1,076.5	24,902	24,902	27,202
374.00	31,416	1,101.7	29,211	54,113	31,703
375.00	35,874	1,127.0	33,620	87,733	36,327
375.90	39,971	1,149.7	34,114	121,847	40,565

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
375.90	44,276	1,380.7	0	0	44,276
377.00	50,030	1,294.2	51,836	51,836	62,747
378.00	55,257	1,319.4	52,622	104,458	68,149
379.00	60,586	1,344.7	57,901	162,359	73,675
380.00	66,015	1,370.0	63,281	225,640	79,307
380.50	68,768	1,382.6	33,693	259,334	82,151

Device	Routing	Invert	Outlet Devices
#1	Primary	376.00'	4.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

N60 P1 Post-B 2021 - 5-4-12 AW

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NRCC 24-hr A 2-yr Rainfall=3.42"

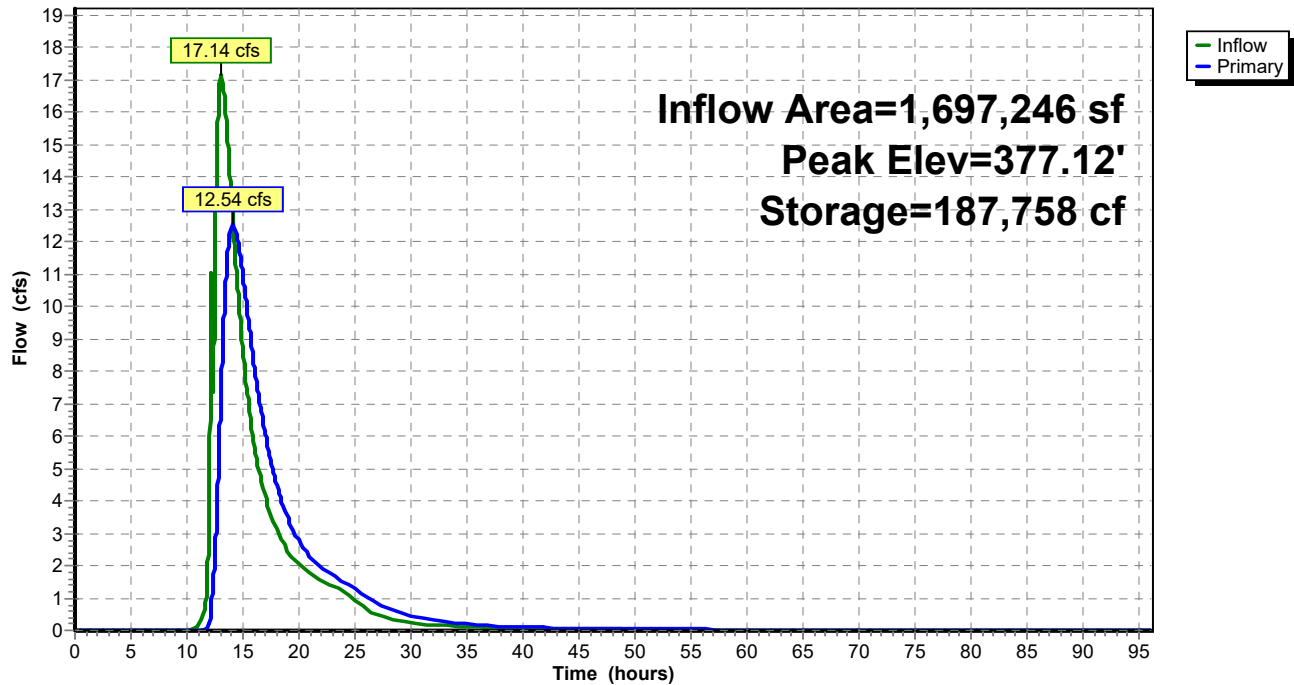
Printed 5/12/2021

Primary OutFlow Max=12.54 cfs @ 14.10 hrs HW=377.12' TW=312.51' (Dynamic Tailwater)

1=Broad-Crested Rectangular Weir (Weir Controls 12.54 cfs @ 2.79 fps)

Pond 38: Wet Pond (SWP-4)

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

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NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Subcatchment 39: Post B2

Runoff = 9.29 cfs @ 12.13 hrs, Volume= 21,581 cf, Depth= 1.95"

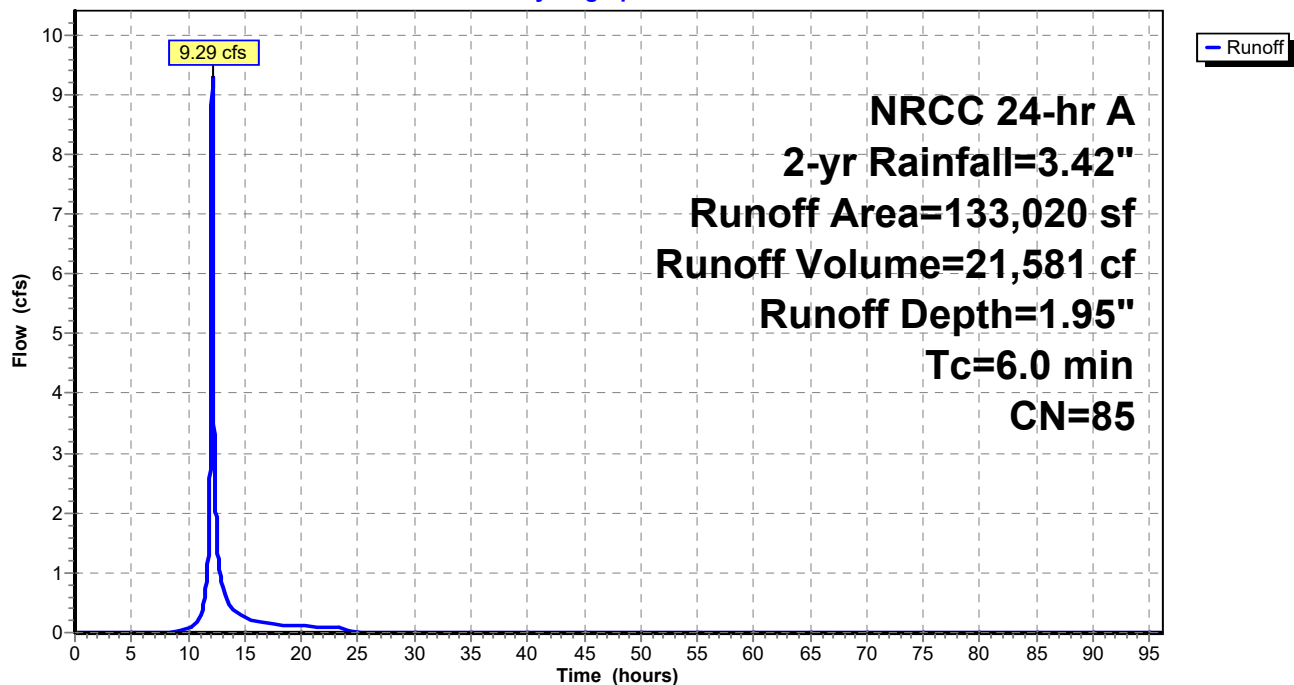
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 2-yr Rainfall=3.42"

Area (sf)	CN	Description
67,090	98	Paved parking, HSG C
40,460	74	>75% Grass cover, Good, HSG C
7,690	61	>75% Grass cover, Good, HSG B
17,780	70	Woods, Good, HSG C
133,020	85	Weighted Average
65,930		49.56% Pervious Area
67,090		50.44% Impervious Area

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

Subcatchment 39: Post B2

Hydrograph



Summary for Pond 40: DIV-3

Inflow Area = 133,020 sf, 50.44% Impervious, Inflow Depth = 1.95" for 2-yr event
 Inflow = 9.29 cfs @ 12.13 hrs, Volume= 21,581 cf
 Outflow = 9.29 cfs @ 12.13 hrs, Volume= 21,581 cf, Atten= 0%, Lag= 0.0 min
 Primary = 6.27 cfs @ 12.12 hrs, Volume= 20,624 cf
 Secondary = 3.04 cfs @ 12.14 hrs, Volume= 957 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 381.26' @ 12.14 hrs

Flood Elev= 386.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	378.00'	12.0" Round Culvert L= 9.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 378.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	378.00'	24.0" Round Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 377.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	381.00'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=6.25 cfs @ 12.12 hrs HW=381.25' TW=378.53' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 6.25 cfs @ 7.95 fps)

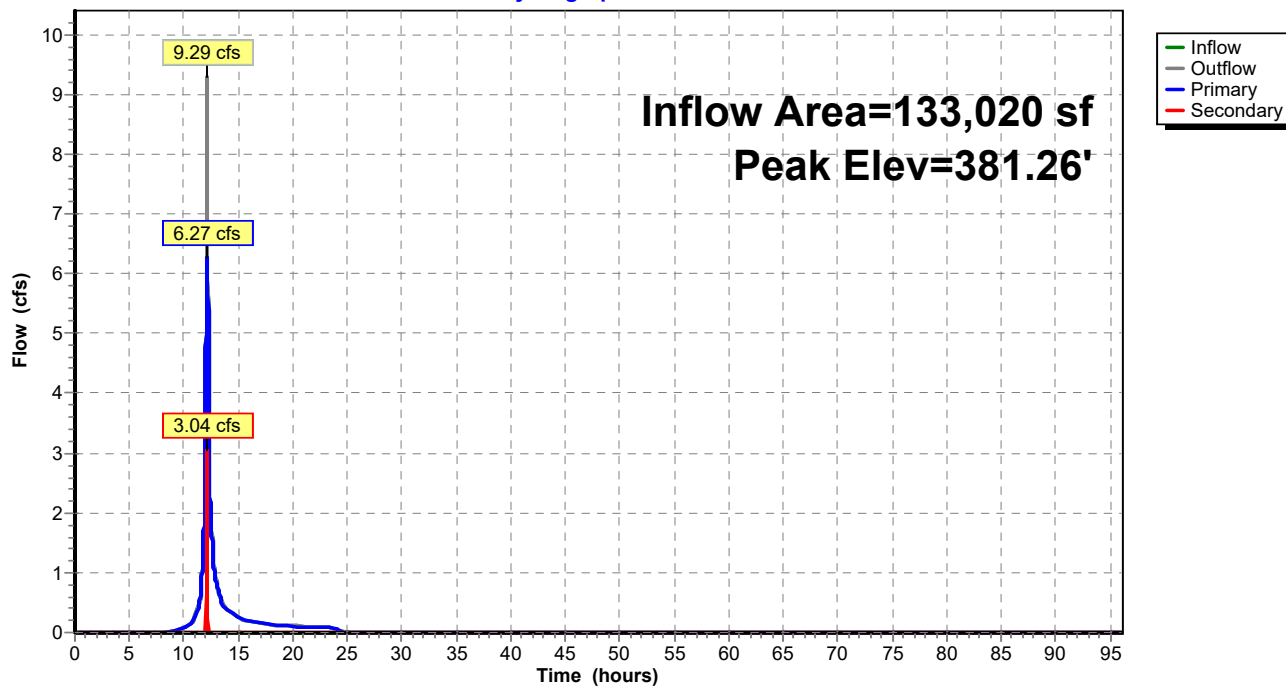
Secondary OutFlow Max=3.01 cfs @ 12.14 hrs HW=381.26' TW=312.43' (Dynamic Tailwater)

↑**2=Culvert** (Passes 3.01 cfs of 22.74 cfs potential flow)

↑**3=Broad-Crested Rectangular Weir** (Weir Controls 3.01 cfs @ 1.45 fps)

Pond 40: DIV-3

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 2-yr Rainfall=3.42"

Prepared by {enter your company name here}

Printed 5/12/2021

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Summary for Pond 41: INF-3

Inflow Area = 133,020 sf, 50.44% Impervious, Inflow Depth = 1.86" for 2-yr event
 Inflow = 6.27 cfs @ 12.12 hrs, Volume= 20,624 cf
 Outflow = 1.13 cfs @ 11.80 hrs, Volume= 20,624 cf, Atten= 82%, Lag= 0.0 min
 Discarded = 1.13 cfs @ 11.80 hrs, Volume= 20,624 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 379.42' @ 12.70 hrs Surf.Area= 4,883 sf Storage= 6,757 cf

Plug-Flow detention time= 43.5 min calculated for 20,622 cf (100% of inflow)
 Center-of-Mass det. time= 43.5 min (860.5 - 817.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	377.50'	4,711 cf	45.00'W x 108.50'L x 3.88'H Field A 18,920 cf Overall - 7,142 cf Embedded = 11,778 cf x 40.0% Voids
#2A	378.00'	7,142 cf	Cultec R-330XLHD x 135 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 9 rows
		11,853 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	377.50'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.10'

Discarded OutFlow Max=1.13 cfs @ 11.80 hrs HW=377.62' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 1.13 cfs)

Pond 41: INF-3 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 9 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

15 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 106.50' Row Length +12.0" End Stone x 2 =
108.50' Base Length

9 Rows x 52.0" Wide + 6.0" Spacing x 8 + 12.0" Side Stone x 2 = 45.00' Base Width

6.0" Base + 30.5" Chamber Height + 10.0" Cover = 3.88' Field Height

135 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 9 Rows = 7,141.8 cf Chamber Storage

18,919.7 cf Field - 7,141.8 cf Chambers = 11,777.9 cf Stone x 40.0% Voids = 4,711.2 cf Stone Storage

Chamber Storage + Stone Storage = 11,852.9 cf = 0.272 af

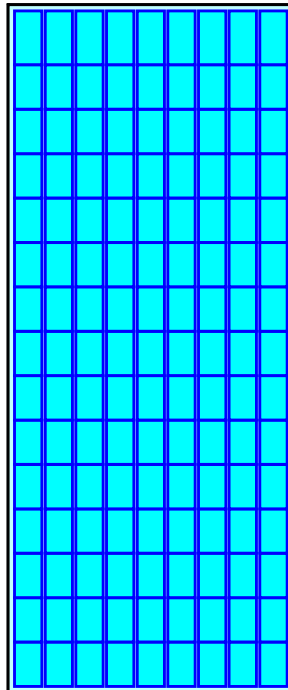
Overall Storage Efficiency = 62.6%

Overall System Size = 108.50' x 45.00' x 3.88'

135 Chambers

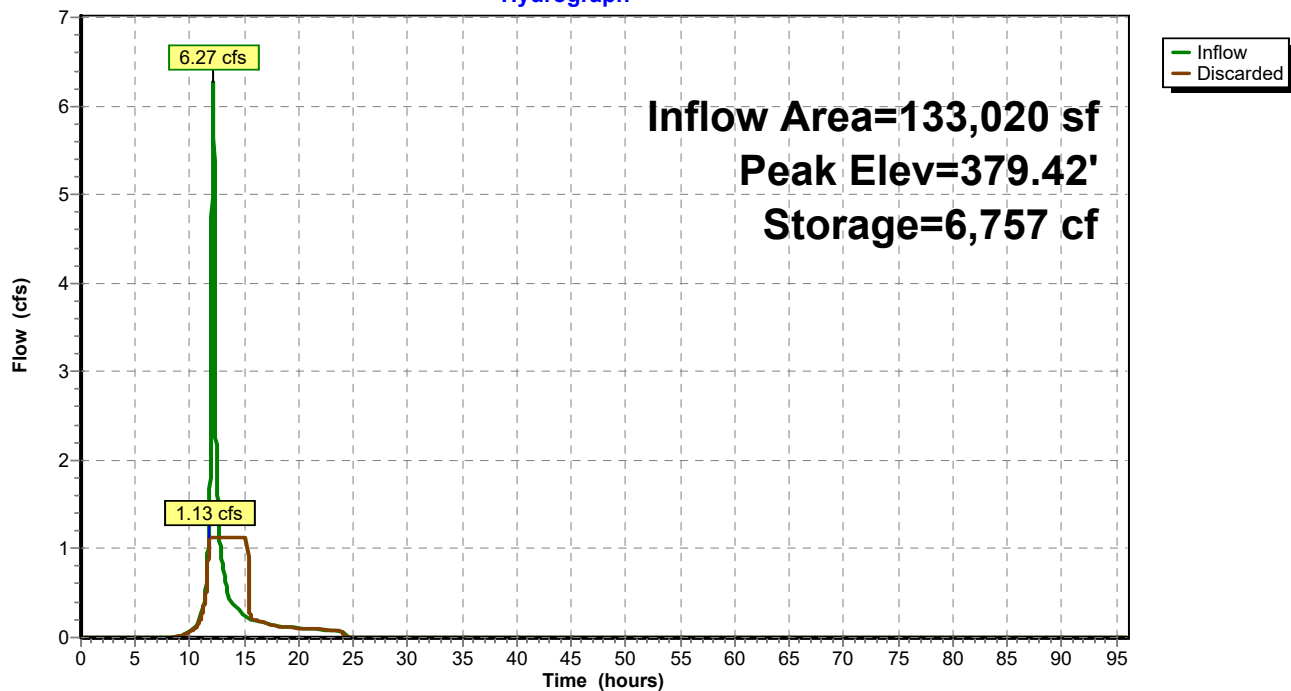
700.7 cy Field

436.2 cy Stone



Pond 41: INF-3

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

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NRCC 24-hr A 2-yr Rainfall=3.42"

Printed 5/12/2021

Summary for Subcatchment 42: Post B4

Runoff = 20.16 cfs @ 12.25 hrs, Volume= 70,319 cf, Depth= 0.96"

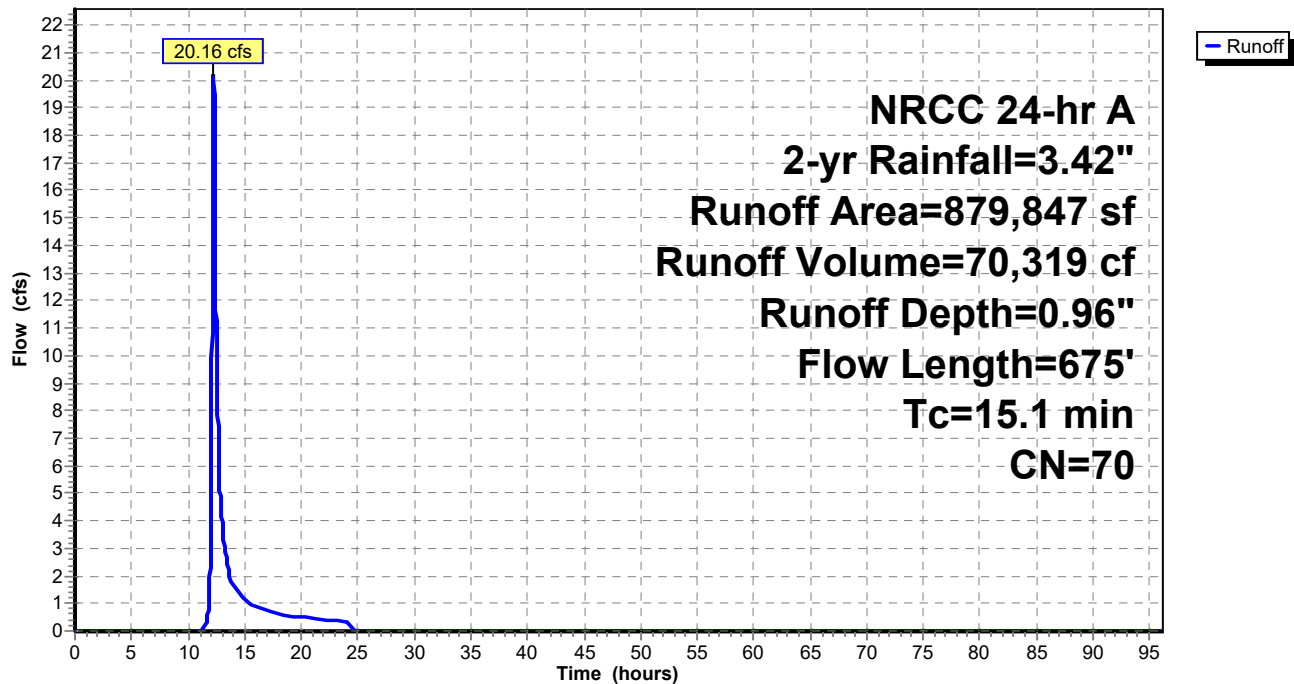
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 2-yr Rainfall=3.42"

Area (sf)	CN	Description
19,672	61	>75% Grass cover, Good, HSG B
13,245	74	>75% Grass cover, Good, HSG C
16,422	55	Woods, Good, HSG B
810,443	70	Woods, Good, HSG C
20,065	70	Woods, Good, HSG C
879,847	70	Weighted Average
879,847		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	100	0.0600	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.9	575	0.0950	4.96		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.1	675	Total			

Subcatchment 42: Post B4

Hydrograph



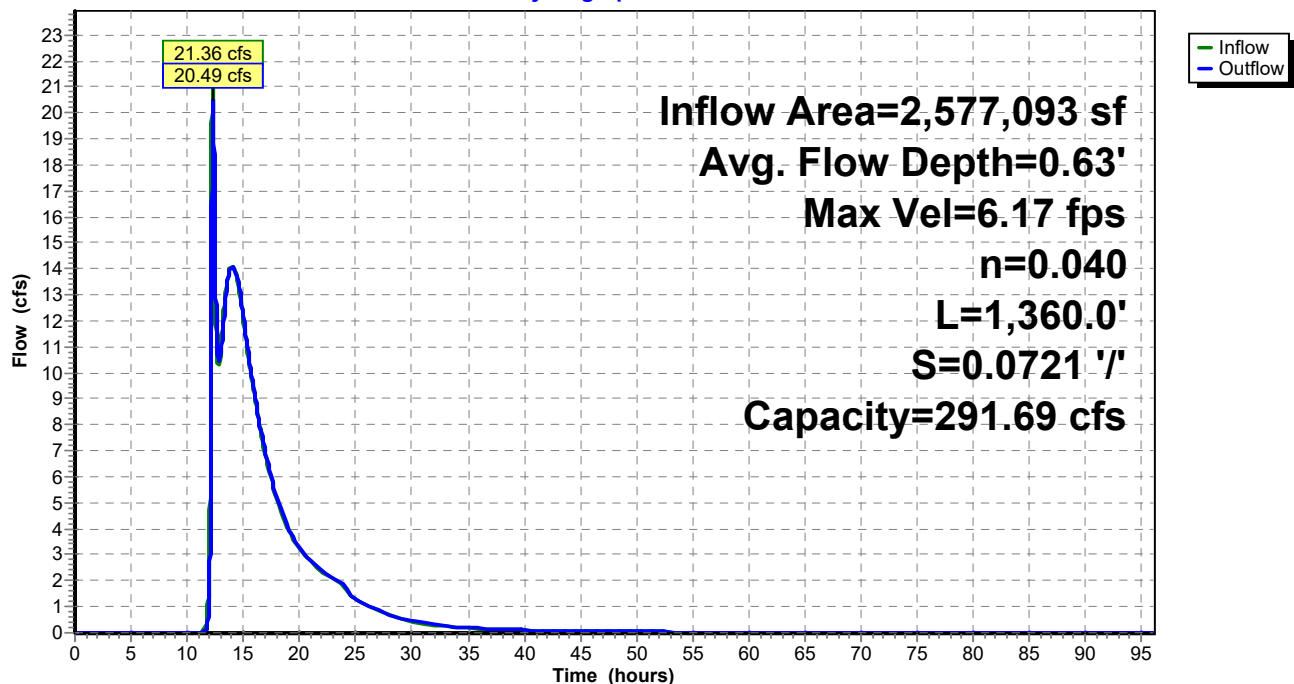
Summary for Reach 43: Existing Stream B

Inflow Area = 2,577,093 sf, 21.36% Impervious, Inflow Depth > 1.52" for 2-yr event
Inflow = 21.36 cfs @ 12.26 hrs, Volume= 326,932 cf
Outflow = 20.49 cfs @ 12.30 hrs, Volume= 326,922 cf, Atten= 4%, Lag= 2.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 6.17 fps, Min. Travel Time= 3.7 min
Avg. Velocity = 1.43 fps, Avg. Travel Time= 15.8 min

Peak Storage= 4,516 cf @ 12.30 hrs
Average Depth at Peak Storage= 0.63'
Bank-Full Depth= 2.50' Flow Area= 22.5 sf, Capacity= 291.69 cfs

4.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 1,360.0' Slope= 0.0721 '/'
Inlet Invert= 312.00', Outlet Invert= 214.00'

**Reach 43: Existing Stream B****Hydrograph**

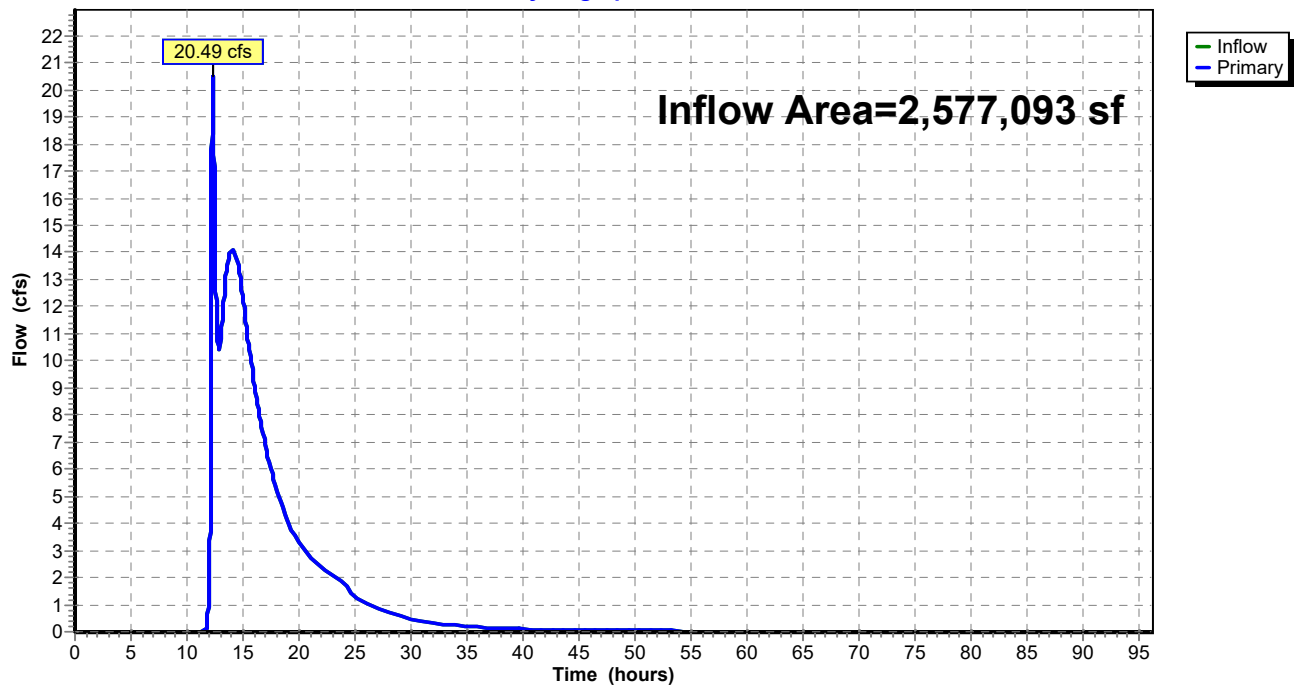
Summary for Link 44: Design Point B

Inflow Area = 2,577,093 sf, 21.36% Impervious, Inflow Depth > 1.52" for 2-yr event
 Inflow = 20.49 cfs @ 12.30 hrs, Volume= 326,922 cf
 Primary = 20.49 cfs @ 12.30 hrs, Volume= 326,922 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 44: Design Point B

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 2-yr Rainfall=3.42"

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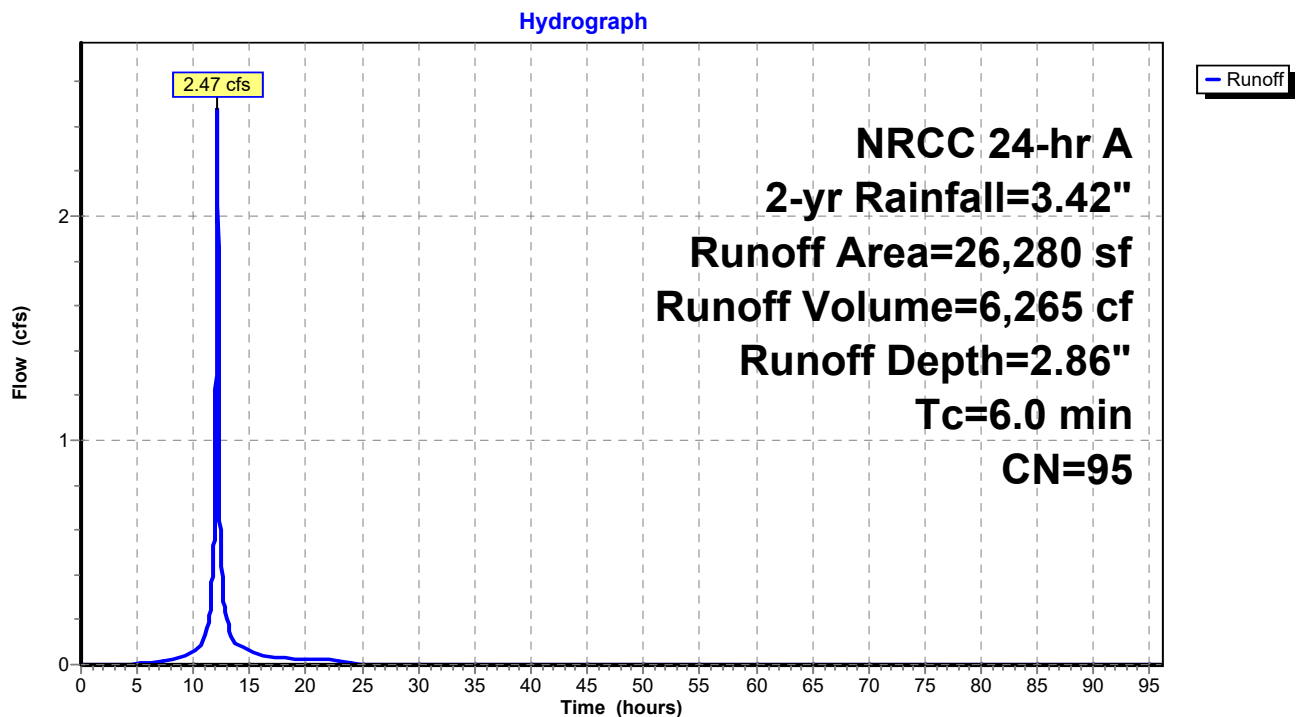
Summary for Subcatchment 45: Post B7

Runoff = 2.47 cfs @ 12.13 hrs, Volume= 6,265 cf, Depth= 2.86"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 2-yr Rainfall=3.42"

Area (sf)	CN	Description
14,320	98	Roofs, HSG C
4,847	98	Paved parking, HSG A
3,412	74	>75% Grass cover, Good, HSG C
* 3,701	98	Paved Walkway
26,280	95	Weighted Average
3,412		12.98% Pervious Area
22,868		87.02% Impervious Area

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

Subcatchment 45: Post B7

Summary for Pond 46: DIV-3

Inflow Area = 26,280 sf, 87.02% Impervious, Inflow Depth = 2.86" for 2-yr event
 Inflow = 2.47 cfs @ 12.13 hrs, Volume= 6,265 cf
 Outflow = 2.47 cfs @ 12.13 hrs, Volume= 6,265 cf, Atten= 0%, Lag= 0.0 min
 Primary = 2.47 cfs @ 12.13 hrs, Volume= 6,265 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 390.31' @ 12.69 hrs

Flood Elev= 392.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	388.00'	12.0" Round Culvert L= 17.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 388.00' / 388.00' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	388.00'	24.0" Round Culvert L= 113.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 388.00' / 386.00' S= 0.0177 ' S= 0.0177 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	390.50'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=2.22 cfs @ 12.13 hrs HW=389.41' TW=389.06' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 2.22 cfs @ 2.82 fps)

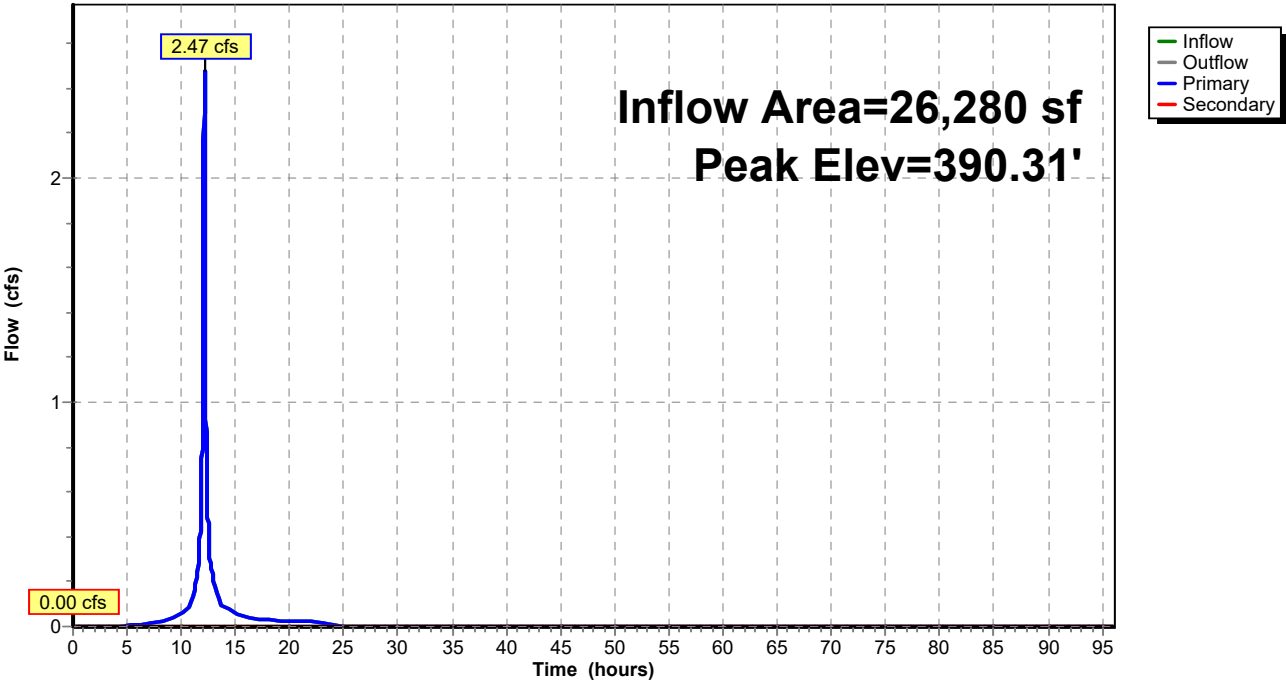
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=388.00' TW=376.00' (Dynamic Tailwater)

↑ **2=Culvert** (Controls 0.00 cfs)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 46: DIV-3

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 2-yr Rainfall=3.42"

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Summary for Pond 47: INF-9

Inflow Area = 26,280 sf, 87.02% Impervious, Inflow Depth = 2.86" for 2-yr event
 Inflow = 2.47 cfs @ 12.13 hrs, Volume= 6,265 cf
 Outflow = 0.27 cfs @ 11.63 hrs, Volume= 6,265 cf, Atten= 89%, Lag= 0.0 min
 Discarded = 0.27 cfs @ 11.63 hrs, Volume= 6,265 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 390.30' @ 12.69 hrs Surf.Area= 1,174 sf Storage= 2,282 cf

Plug-Flow detention time= 58.1 min calculated for 6,264 cf (100% of inflow)
 Center-of-Mass det. time= 58.0 min (833.4 - 775.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	387.50'	1,167 cf	30.50'W x 38.50'L x 3.88'H Field A 4,550 cf Overall - 1,632 cf Embedded = 2,918 cf x 40.0% Voids
#2A	388.00'	1,632 cf	Cultec R-330XLHD x 30 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 6 rows
		2,799 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	387.50'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.10'

Discarded OutFlow Max=0.27 cfs @ 11.63 hrs HW=387.62' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.27 cfs)

Pond 47: INF-9 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 6 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

5 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 36.50' Row Length +12.0" End Stone x 2 = 38.50' Base Length

6 Rows x 52.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.50' Base Width

6.0" Base + 30.5" Chamber Height + 10.0" Cover = 3.88' Field Height

30 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 6 Rows = 1,631.8 cf Chamber Storage

4,550.2 cf Field - 1,631.8 cf Chambers = 2,918.4 cf Stone x 40.0% Voids = 1,167.4 cf Stone Storage

Chamber Storage + Stone Storage = 2,799.1 cf = 0.064 af

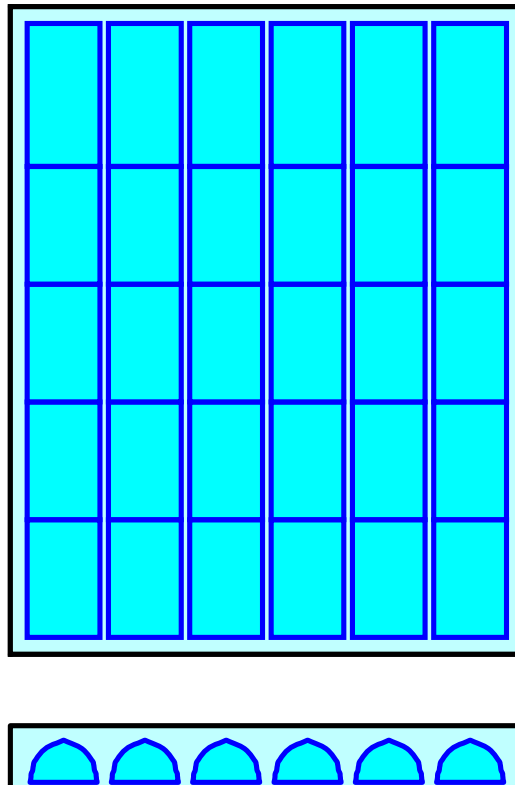
Overall Storage Efficiency = 61.5%

Overall System Size = 38.50' x 30.50' x 3.88'

30 Chambers

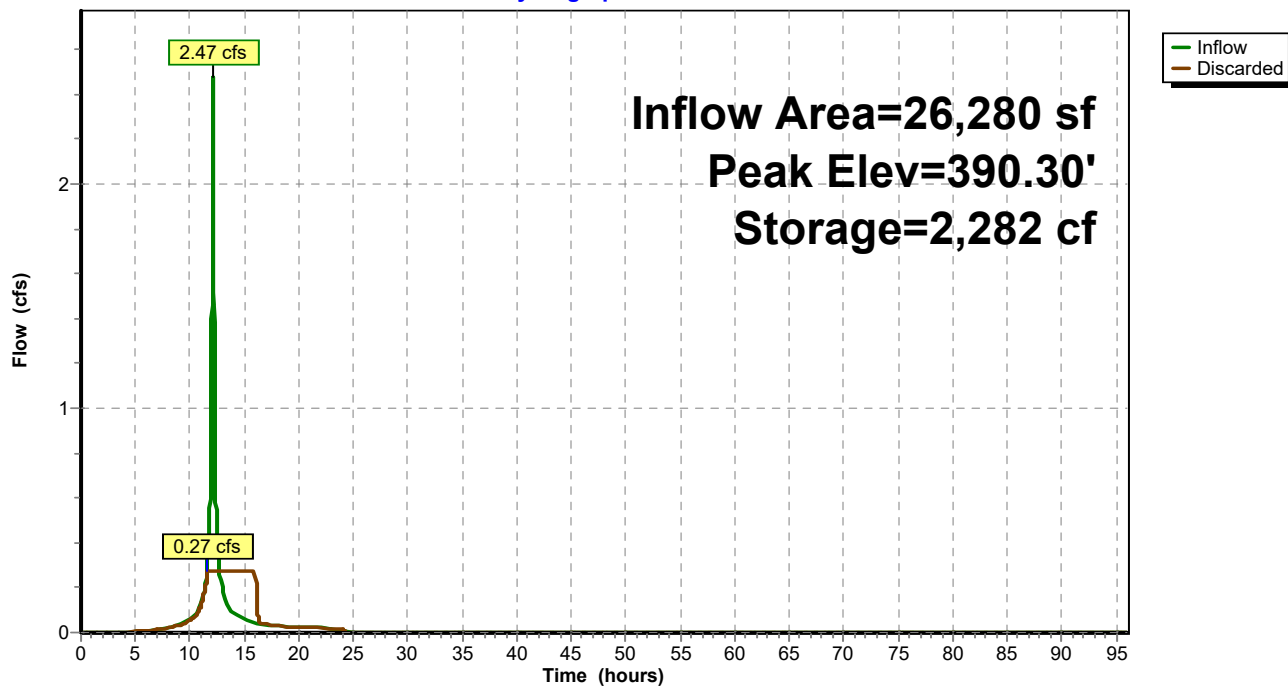
168.5 cy Field

108.1 cy Stone



Pond 47: INF-9

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 10-yr Rainfall=5.12"

Prepared by {enter your company name here}

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment34: Post B0 (Offsite) Runoff Area=1,510,771 sf 32.24% Impervious Runoff Depth=3.38"
Flow Length=1,871' Tc=32.3 min CN=84 Runoff=89.40 cfs 425,581 cf

Pond 35: Offsite Pond B Peak Elev=384.79' Storage=182,615 cf Inflow=89.40 cfs 425,581 cf
36.0" Round Culvert n=0.025 L=158.0' S=0.0127 ' Outflow=31.40 cfs 424,308 cf

Subcatchment36: Post B1 Runoff Area=58,920 sf 32.46% Impervious Runoff Depth=2.72"
Tc=6.0 min CN=77 Runoff=5.78 cfs 13,373 cf

Subcatchment37: Post B3 Runoff Area=127,555 sf 34.71% Impervious Runoff Depth=2.81"
Tc=6.0 min CN=78 Runoff=12.90 cfs 29,910 cf

Pond 38: Wet Pond (SWP-4) Peak Elev=377.84' Storage=225,319 cf Inflow=33.11 cfs 469,506 cf
Outflow=26.21 cfs 469,211 cf

Subcatchment39: Post B2 Runoff Area=133,020 sf 50.44% Impervious Runoff Depth=3.48"
Tc=6.0 min CN=85 Runoff=16.21 cfs 38,566 cf

Pond 40: DIV-3 Peak Elev=381.56' Inflow=16.21 cfs 38,566 cf
Primary=6.12 cfs 31,960 cf Secondary=10.33 cfs 6,606 cf Outflow=16.21 cfs 38,566 cf

Pond 41: INF-3 Peak Elev=380.96' Storage=11,051 cf Inflow=6.12 cfs 31,960 cf
Outflow=1.13 cfs 31,960 cf

Subcatchment42: Post B4 Runoff Area=879,847 sf 0.00% Impervious Runoff Depth=2.13"
Flow Length=675' Tc=15.1 min CN=70 Runoff=47.48 cfs 155,860 cf

Reach 43: Existing Stream B Avg. Flow Depth=1.07' Max Vel=8.23 fps Inflow=55.45 cfs 631,677 cf
n=0.040 L=1,360.0' S=0.0721 ' Capacity=291.69 cfs Outflow=54.20 cfs 631,668 cf

Link 44: Design Point B Inflow=54.20 cfs 631,668 cf
Primary=54.20 cfs 631,668 cf

Subcatchment45: Post B7 Runoff Area=26,280 sf 87.02% Impervious Runoff Depth=4.54"
Tc=6.0 min CN=95 Runoff=3.81 cfs 9,939 cf

Pond 46: DIV-3 Peak Elev=390.74' Inflow=3.81 cfs 9,939 cf
Primary=3.38 cfs 8,024 cf Secondary=2.72 cfs 1,915 cf Outflow=3.81 cfs 9,939 cf

Pond 47: INF-9 Peak Elev=390.76' Storage=2,508 cf Inflow=3.38 cfs 8,024 cf
Outflow=0.27 cfs 8,024 cf

Total Runoff Area = 2,736,393 sf Runoff Volume = 673,230 cf Average Runoff Depth = 2.95"
76.60% Pervious = 2,095,980 sf 23.40% Impervious = 640,413 sf

N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 10-yr Rainfall=5.12"

Prepared by {enter your company name here}

Printed 5/12/2021

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Summary for Subcatchment 34: Post B0 (Offsite)

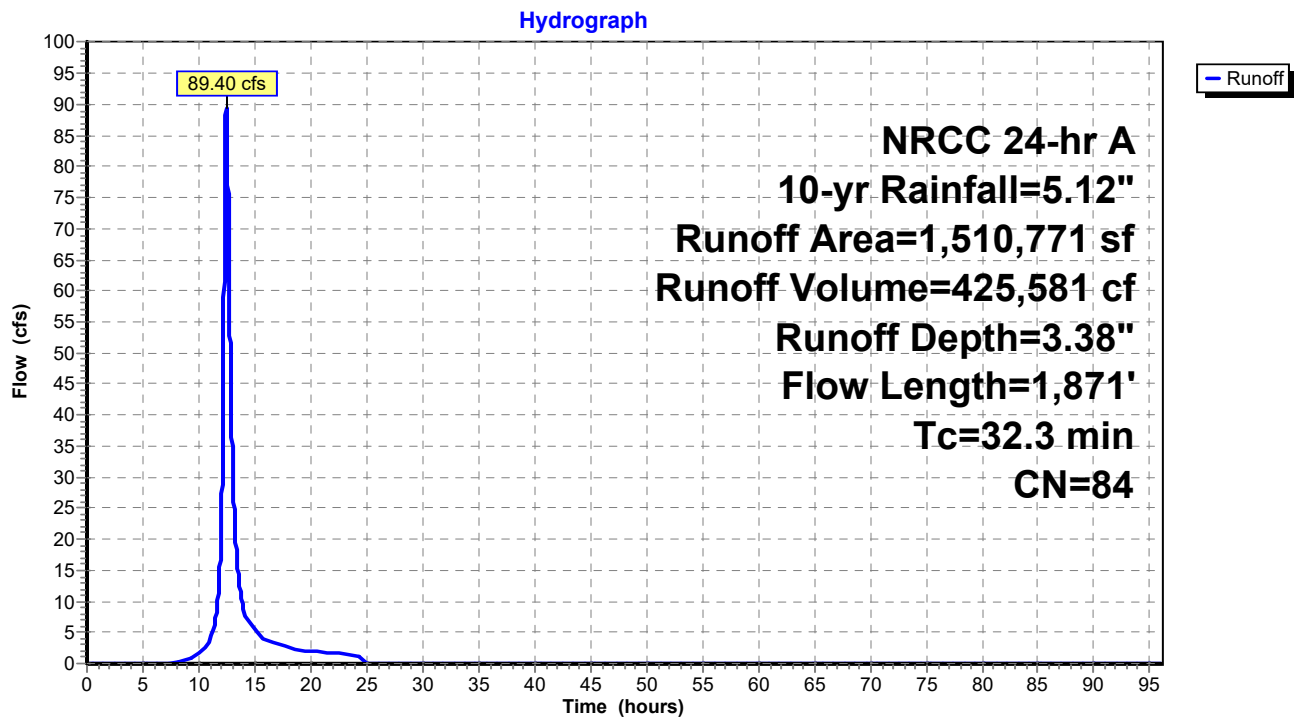
Runoff = 89.40 cfs @ 12.45 hrs, Volume= 425,581 cf, Depth= 3.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 10-yr Rainfall=5.12"

Area (sf)	CN	Description
487,056	98	Paved parking, HSG C
497,987	77	Woods, Good, HSG D
134,328	70	Woods, Good, HSG C
375,457	80	>75% Grass cover, Good, HSG D
15,943	74	>75% Grass cover, Good, HSG C
1,510,771	84	Weighted Average
1,023,715		67.76% Pervious Area
487,056		32.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0300	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
9.5	848	0.0085	1.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.1	856	0.0093	2.78	3.06	Trap/Vee/Rect Channel Flow, Bot.W=3.00' D=0.33' Z= 1.0 '/' Top.W=3.66' n= 0.022 Earth, clean & straight
0.2	67	0.0150	6.66	64.08	Pipe Channel, 42.0" Round Area= 9.6 sf Perim= 11.0' r= 0.88' n= 0.025 Corrugated metal
32.3	1,871	Total			

Subcatchment 34: Post B0 (Offsite)



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Pond 35: Offsite Pond B

Inflow Area = 1,510,771 sf, 32.24% Impervious, Inflow Depth = 3.38" for 10-yr event
 Inflow = 89.40 cfs @ 12.45 hrs, Volume= 425,581 cf
 Outflow = 31.40 cfs @ 13.03 hrs, Volume= 424,308 cf, Atten= 65%, Lag= 34.8 min
 Primary = 31.40 cfs @ 13.03 hrs, Volume= 424,308 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 384.79' @ 13.03 hrs Surf.Area= 87,696 sf Storage= 182,615 cf

Plug-Flow detention time= 142.8 min calculated for 424,308 cf (100% of inflow)
 Center-of-Mass det. time= 140.8 min (966.9 - 826.0)

Volume	Invert	Avail.Storage	Storage Description
#1	382.00'	610,998 cf	Custom Stage Data (Irregular) Listed below (Recalc)

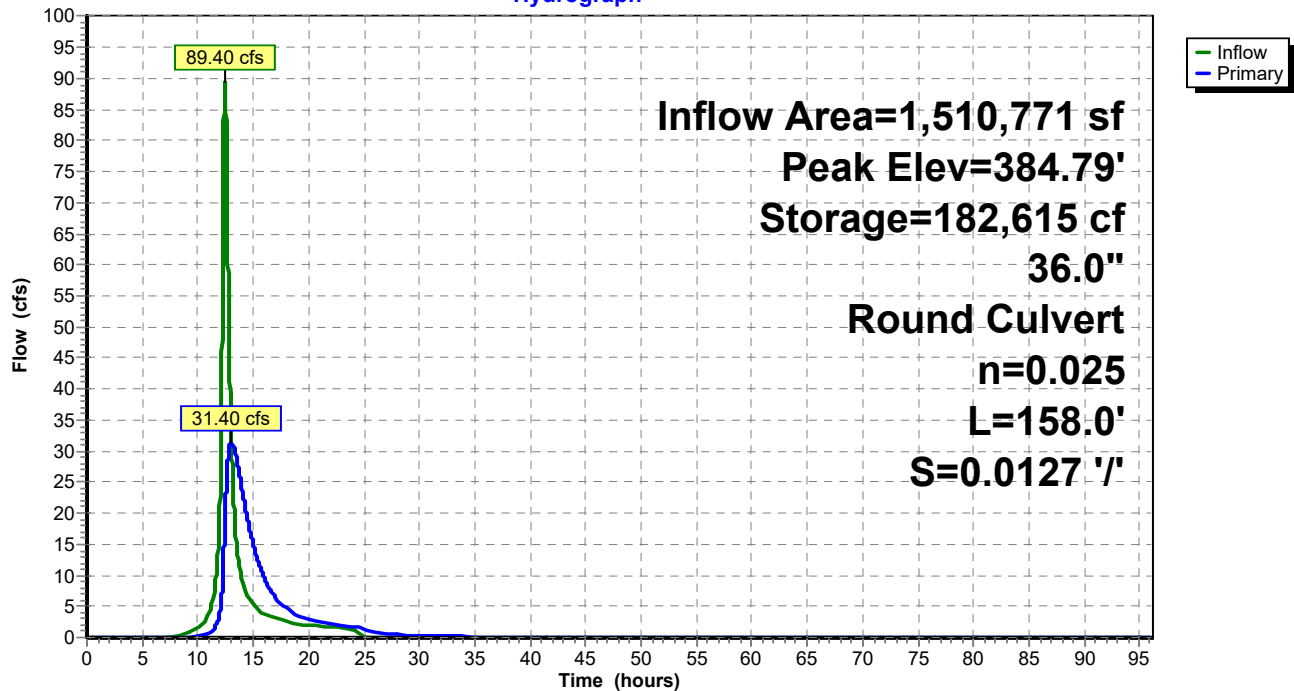
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
382.00	36,540	1,177.0	0	0	36,540
384.00	81,987	1,579.0	115,507	115,507	124,748
386.00	96,790	1,622.0	178,572	294,080	136,159
388.00	108,795	1,657.0	205,468	499,548	145,863
389.00	114,127	1,679.0	111,450	610,998	151,937

Device	Routing	Invert	Outlet Devices
#1	Primary	382.00'	36.0" Round Culvert L= 158.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 382.00' / 380.00' S= 0.0127 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 7.07 sf

Primary OutFlow Max=31.40 cfs @ 13.03 hrs HW=384.79' TW=377.51' (Dynamic Tailwater)
 ↑**1=Culvert** (Barrel Controls 31.40 cfs @ 5.96 fps)

Pond 35: Offsite Pond B

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

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NRCC 24-hr A 10-yr Rainfall=5.12"

Printed 5/12/2021

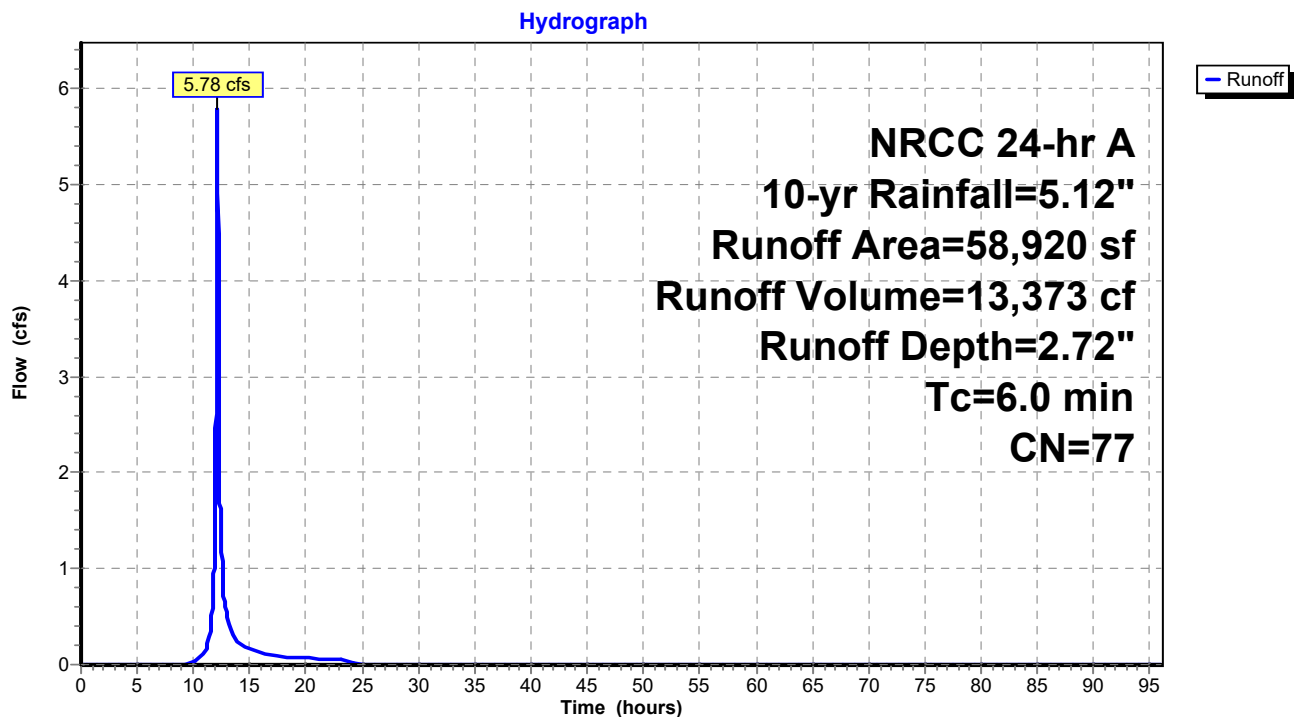
Summary for Subcatchment 36: Post B1

Runoff = 5.78 cfs @ 12.13 hrs, Volume= 13,373 cf, Depth= 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 10-yr Rainfall=5.12"

Area (sf)	CN	Description
19,123	98	Paved parking, HSG C
22,978	74	>75% Grass cover, Good, HSG C
4,537	61	>75% Grass cover, Good, HSG B
12,282	55	Woods, Good, HSG B
58,920	77	Weighted Average
39,797		67.54% Pervious Area
19,123		32.46% Impervious Area

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

Subcatchment 36: Post B1

N60 P1 Post-B 2021 - 5-4-12 AW

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NRCC 24-hr A 10-yr Rainfall=5.12"

Printed 5/12/2021

Summary for Subcatchment 37: Post B3

Runoff = 12.90 cfs @ 12.13 hrs, Volume= 29,910 cf, Depth= 2.81"

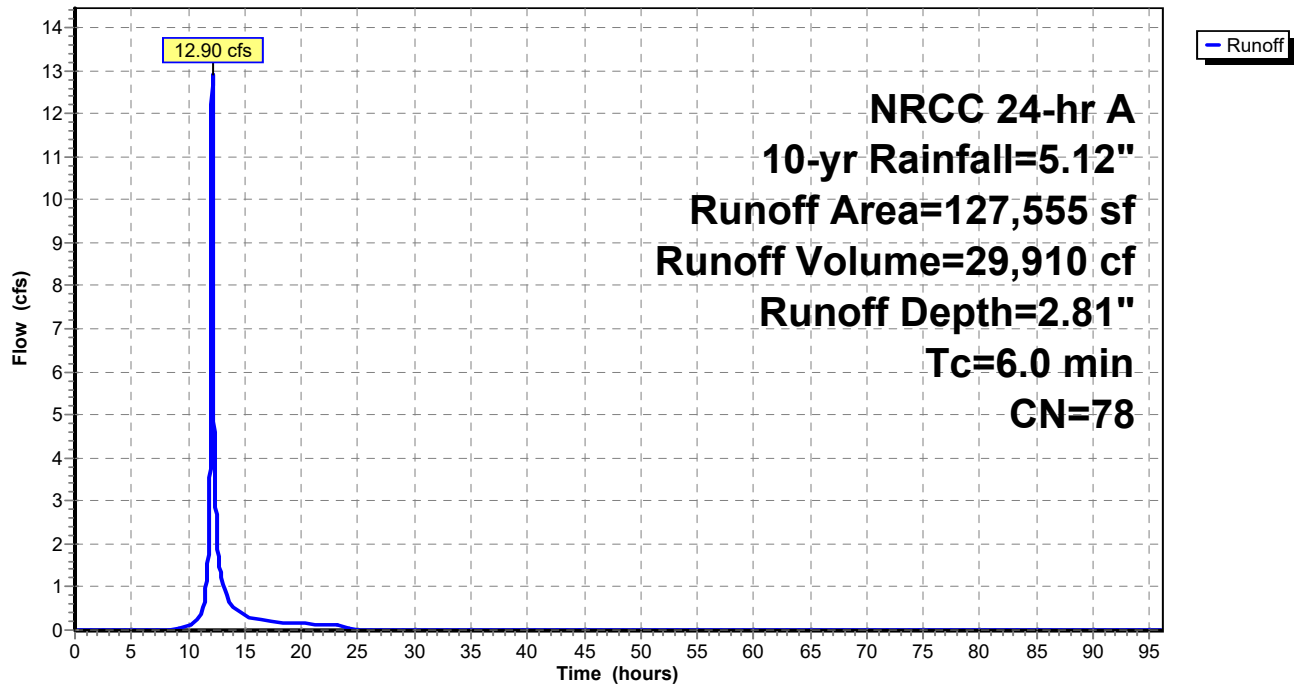
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 10-yr Rainfall=5.12"

Area (sf)	CN	Description
44,276	98	Water Surface, HSG C
22,184	74	>75% Grass cover, Good, HSG C
61,095	65	Brush, Good, HSG C
127,555	78	Weighted Average
83,279		65.29% Pervious Area
44,276		34.71% Impervious Area

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

Subcatchment 37: Post B3

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Pond 38: Wet Pond (SWP-4)

Inflow Area = 1,697,246 sf, 32.43% Impervious, Inflow Depth > 3.32" for 10-yr event
 Inflow = 33.11 cfs @ 12.96 hrs, Volume= 469,506 cf
 Outflow = 26.21 cfs @ 13.83 hrs, Volume= 469,211 cf, Atten= 21%, Lag= 52.3 min
 Primary = 26.21 cfs @ 13.83 hrs, Volume= 469,211 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Starting Elev= 376.00' Surf.Area= 88,186 sf Storage= 134,213 cf
 Peak Elev= 377.84' @ 13.83 hrs Surf.Area= 97,792 sf Storage= 225,319 cf (91,106 cf above start)

Plug-Flow detention time= 308.2 min calculated for 334,963 cf (71% of inflow)
 Center-of-Mass det. time= 81.2 min (1,033.3 - 952.1)

Volume	Invert	Avail.Storage	Storage Description
#1	372.00'	7,914 cf	Forebay (Irregular) Listed below (Recalc)
#2	372.00'	121,847 cf	Permanent Pool (Irregular) Listed below (Recalc)
#3	375.90'	259,334 cf	Additional Storage (Irregular) Listed below (Recalc)
		389,094 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
372.00	885	114.0	0	0	885
373.00	1,392	139.2	1,129	1,129	1,408
374.00	1,998	164.4	1,686	2,815	2,036
375.00	2,707	189.5	2,344	5,158	2,764
375.90	3,430	212.2	2,755	7,914	3,512

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
372.00	22,804	1,051.3	0	0	22,804
373.00	27,060	1,076.5	24,902	24,902	27,202
374.00	31,416	1,101.7	29,211	54,113	31,703
375.00	35,874	1,127.0	33,620	87,733	36,327
375.90	39,971	1,149.7	34,114	121,847	40,565

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
375.90	44,276	1,380.7	0	0	44,276
377.00	50,030	1,294.2	51,836	51,836	62,747
378.00	55,257	1,319.4	52,622	104,458	68,149
379.00	60,586	1,344.7	57,901	162,359	73,675
380.00	66,015	1,370.0	63,281	225,640	79,307
380.50	68,768	1,382.6	33,693	259,334	82,151

Device	Routing	Invert	Outlet Devices
#1	Primary	376.00'	4.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

N60 P1 Post-B 2021 - 5-4-12 AW

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NRCC 24-hr A 10-yr Rainfall=5.12"

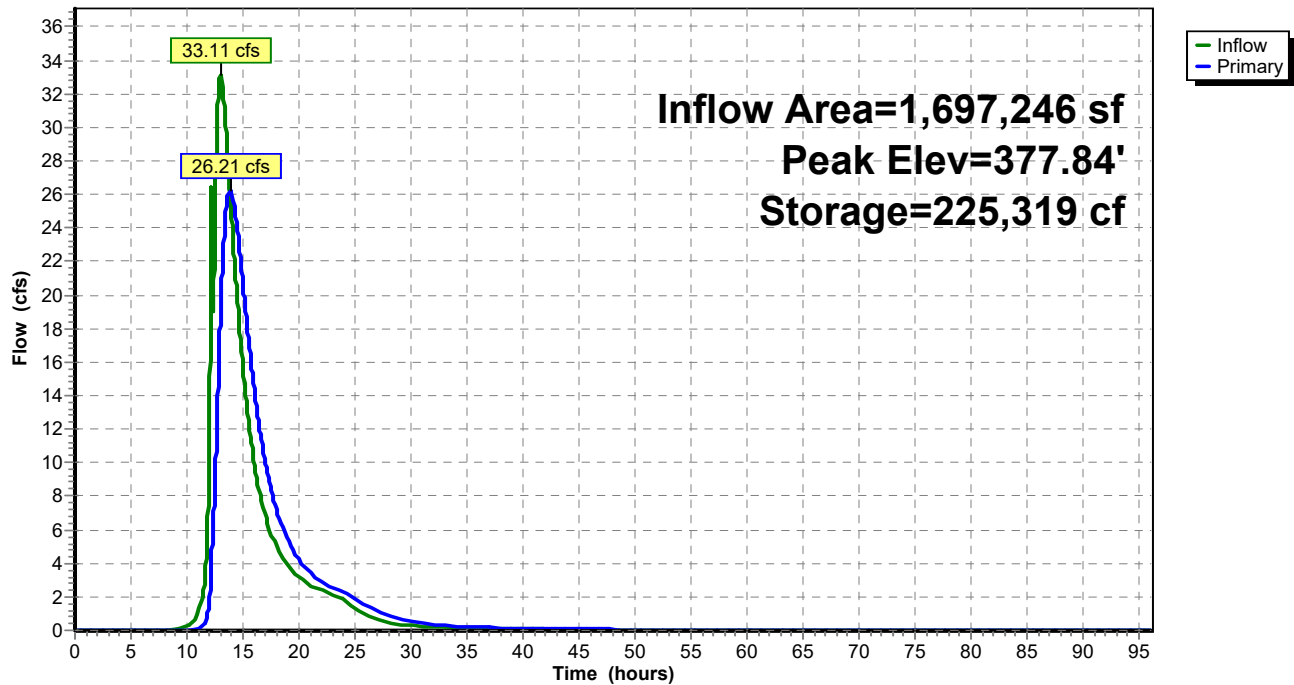
Printed 5/12/2021

Primary OutFlow Max=26.21 cfs @ 13.83 hrs HW=377.84' TW=312.78' (Dynamic Tailwater)

1=Broad-Crested Rectangular Weir (Weir Controls 26.21 cfs @ 3.57 fps)

Pond 38: Wet Pond (SWP-4)

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

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NRCC 24-hr A 10-yr Rainfall=5.12"

Printed 5/12/2021

Summary for Subcatchment 39: Post B2

Runoff = 16.21 cfs @ 12.13 hrs, Volume= 38,566 cf, Depth= 3.48"

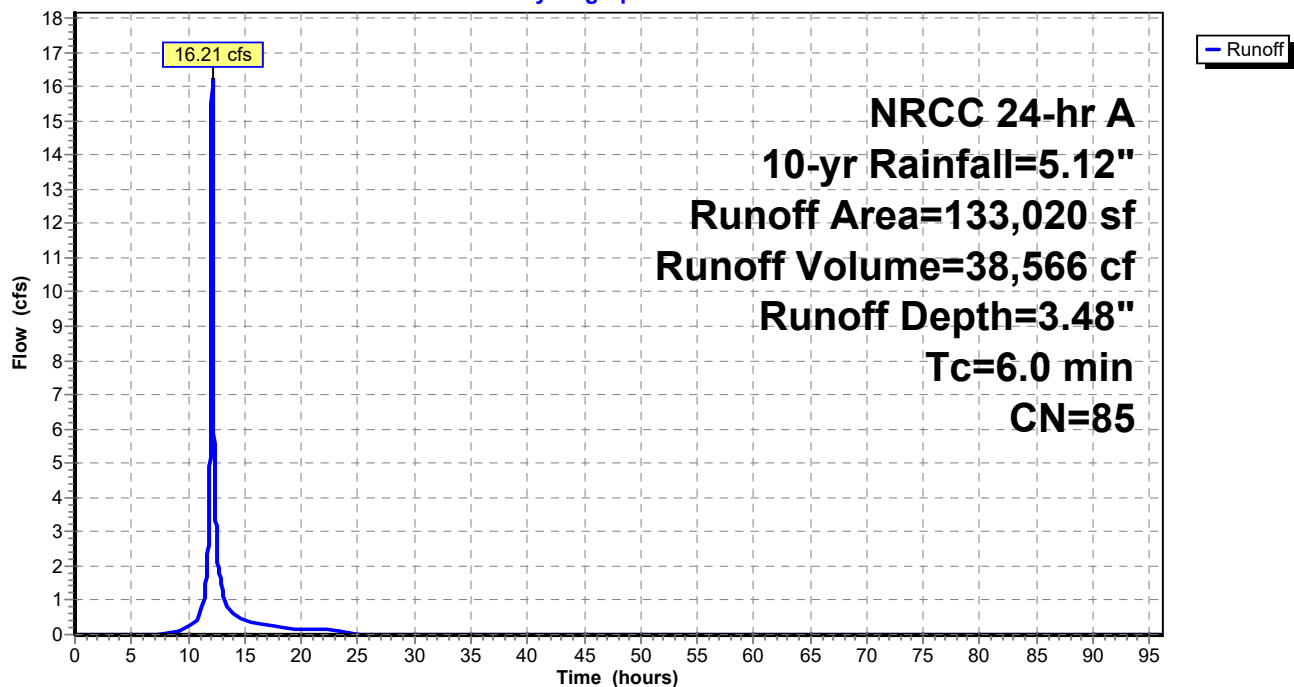
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 10-yr Rainfall=5.12"

Area (sf)	CN	Description
67,090	98	Paved parking, HSG C
40,460	74	>75% Grass cover, Good, HSG C
7,690	61	>75% Grass cover, Good, HSG B
17,780	70	Woods, Good, HSG C
133,020	85	Weighted Average
65,930		49.56% Pervious Area
67,090		50.44% Impervious Area

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

Subcatchment 39: Post B2

Hydrograph



Summary for Pond 40: DIV-3

Inflow Area = 133,020 sf, 50.44% Impervious, Inflow Depth = 3.48" for 10-yr event
 Inflow = 16.21 cfs @ 12.13 hrs, Volume= 38,566 cf
 Outflow = 16.21 cfs @ 12.13 hrs, Volume= 38,566 cf, Atten= 0%, Lag= 0.0 min
 Primary = 6.12 cfs @ 11.99 hrs, Volume= 31,960 cf
 Secondary = 10.33 cfs @ 12.13 hrs, Volume= 6,606 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 381.56' @ 12.13 hrs

Flood Elev= 386.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	378.00'	12.0" Round Culvert L= 9.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 378.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	378.00'	24.0" Round Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 377.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	381.00'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=6.07 cfs @ 11.99 hrs HW=381.15' TW=378.57' (Dynamic Tailwater)

↑**1=Culvert** (Inlet Controls 6.07 cfs @ 7.73 fps)

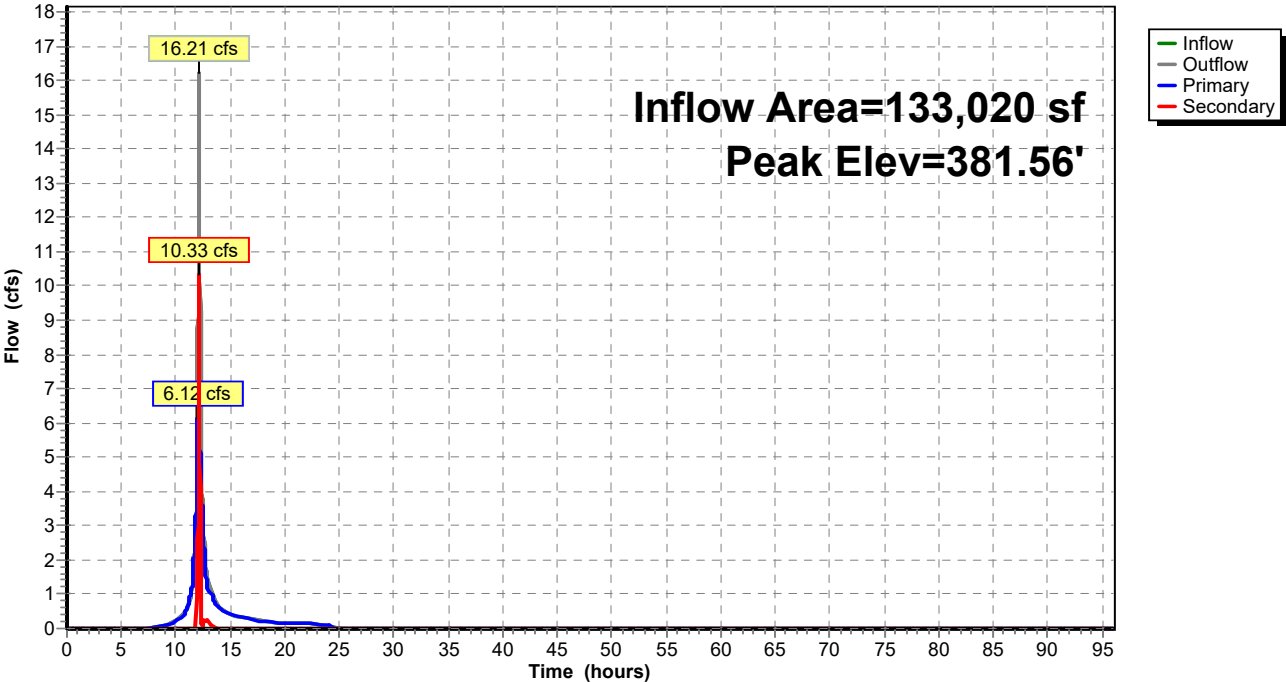
Secondary OutFlow Max=10.30 cfs @ 12.13 hrs HW=381.56' TW=312.86' (Dynamic Tailwater)

↑**2=Culvert** (Passes 10.30 cfs of 24.22 cfs potential flow)

↑**3=Broad-Crested Rectangular Weir** (Weir Controls 10.30 cfs @ 2.29 fps)

Pond 40: DIV-3

Hydrograph



Summary for Pond 41: INF-3

Inflow Area = 133,020 sf, 50.44% Impervious, Inflow Depth = 2.88" for 10-yr event
 Inflow = 6.12 cfs @ 11.99 hrs, Volume= 31,960 cf
 Outflow = 1.13 cfs @ 11.56 hrs, Volume= 31,960 cf, Atten= 82%, Lag= 0.0 min
 Discarded = 1.13 cfs @ 11.56 hrs, Volume= 31,960 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 380.96' @ 12.97 hrs Surf.Area= 4,883 sf Storage= 11,051 cf

Plug-Flow detention time= 74.6 min calculated for 31,957 cf (100% of inflow)
 Center-of-Mass det. time= 74.6 min (887.6 - 813.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	377.50'	4,711 cf	45.00'W x 108.50'L x 3.88'H Field A 18,920 cf Overall - 7,142 cf Embedded = 11,778 cf x 40.0% Voids
#2A	378.00'	7,142 cf	Cultec R-330XLHD x 135 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 9 rows
		11,853 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	377.50'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.10'

Discarded OutFlow Max=1.13 cfs @ 11.56 hrs HW=377.62' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 1.13 cfs)

Pond 41: INF-3 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 9 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

15 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 106.50' Row Length +12.0" End Stone x 2 =
108.50' Base Length

9 Rows x 52.0" Wide + 6.0" Spacing x 8 + 12.0" Side Stone x 2 = 45.00' Base Width

6.0" Base + 30.5" Chamber Height + 10.0" Cover = 3.88' Field Height

135 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 9 Rows = 7,141.8 cf Chamber Storage

18,919.7 cf Field - 7,141.8 cf Chambers = 11,777.9 cf Stone x 40.0% Voids = 4,711.2 cf Stone Storage

Chamber Storage + Stone Storage = 11,852.9 cf = 0.272 af

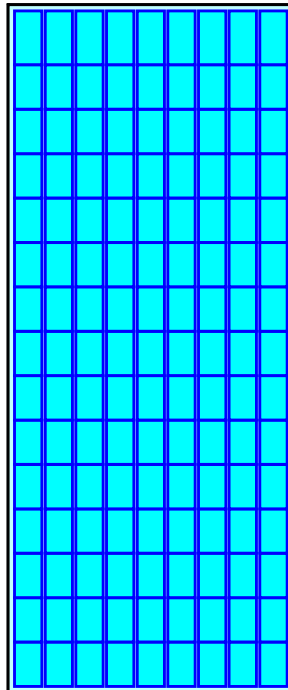
Overall Storage Efficiency = 62.6%

Overall System Size = 108.50' x 45.00' x 3.88'

135 Chambers

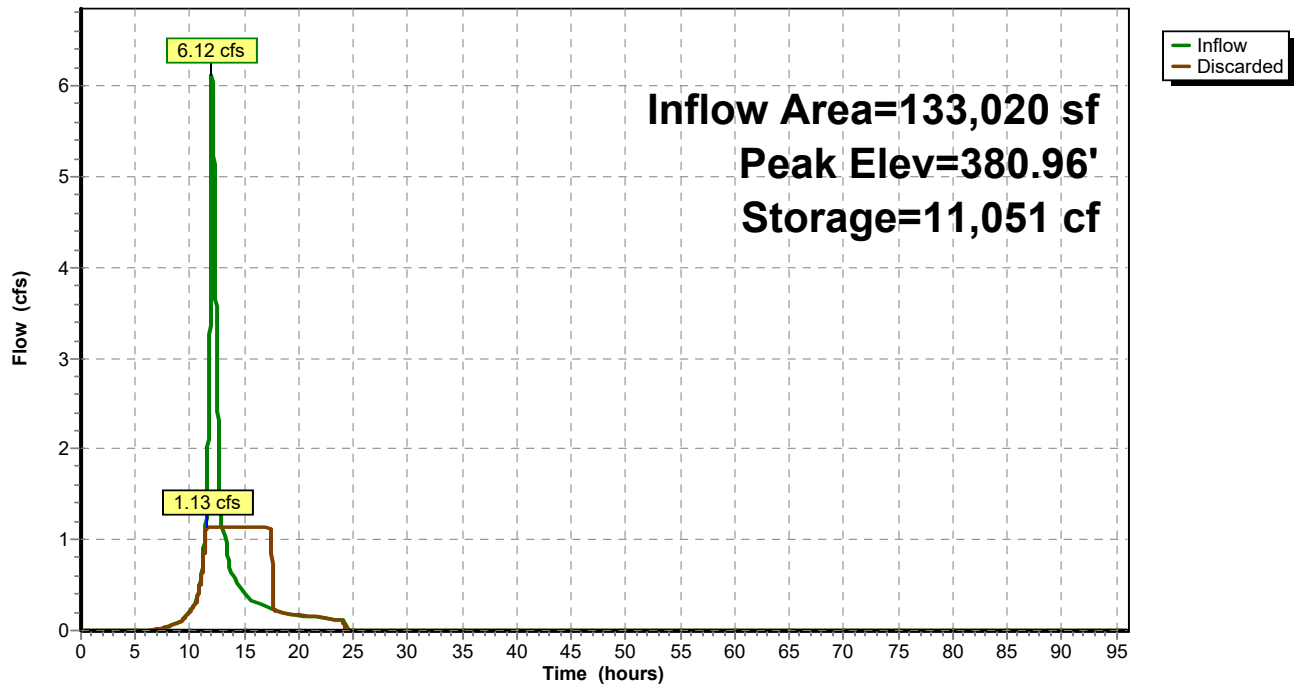
700.7 cy Field

436.2 cy Stone



Pond 41: INF-3

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

Prepared by {enter your company name here}

NRCC 24-hr A 10-yr Rainfall=5.12"

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Summary for Subcatchment 42: Post B4

Runoff = 47.48 cfs @ 12.24 hrs, Volume= 155,860 cf, Depth= 2.13"

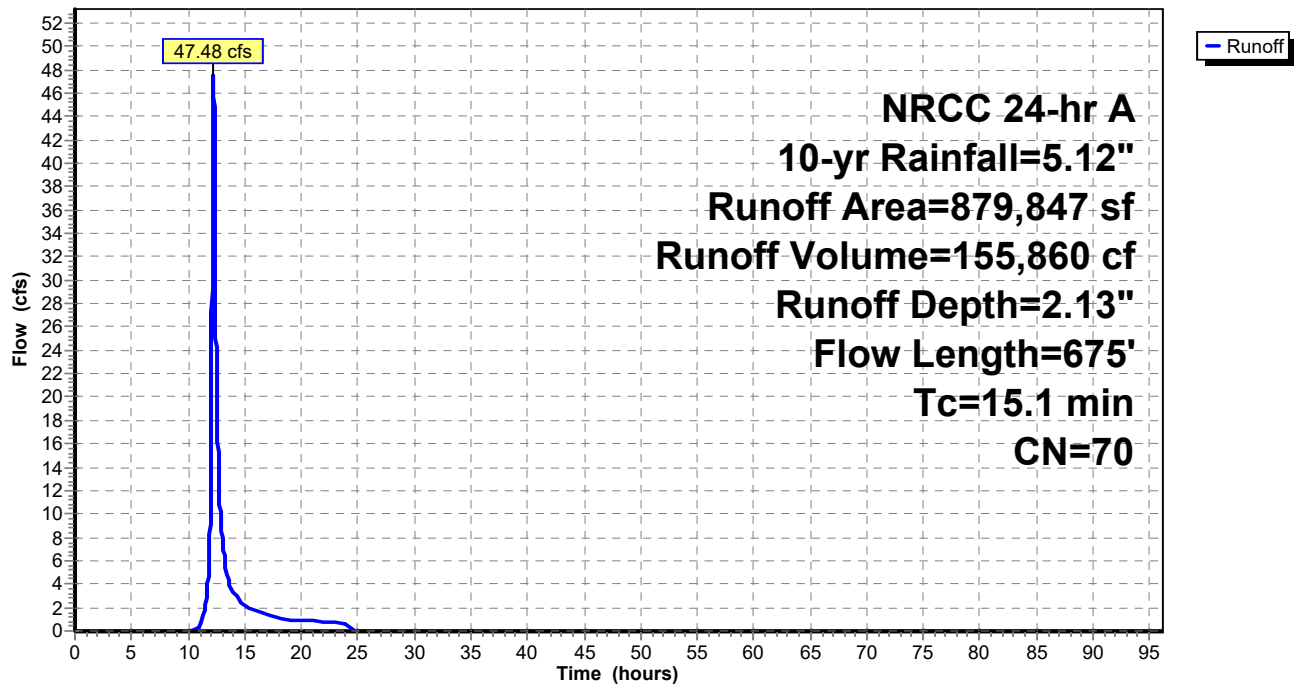
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 10-yr Rainfall=5.12"

Area (sf)	CN	Description
19,672	61	>75% Grass cover, Good, HSG B
13,245	74	>75% Grass cover, Good, HSG C
16,422	55	Woods, Good, HSG B
810,443	70	Woods, Good, HSG C
20,065	70	Woods, Good, HSG C
879,847	70	Weighted Average
879,847		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	100	0.0600	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.9	575	0.0950	4.96		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.1	675	Total			

Subcatchment 42: Post B4

Hydrograph



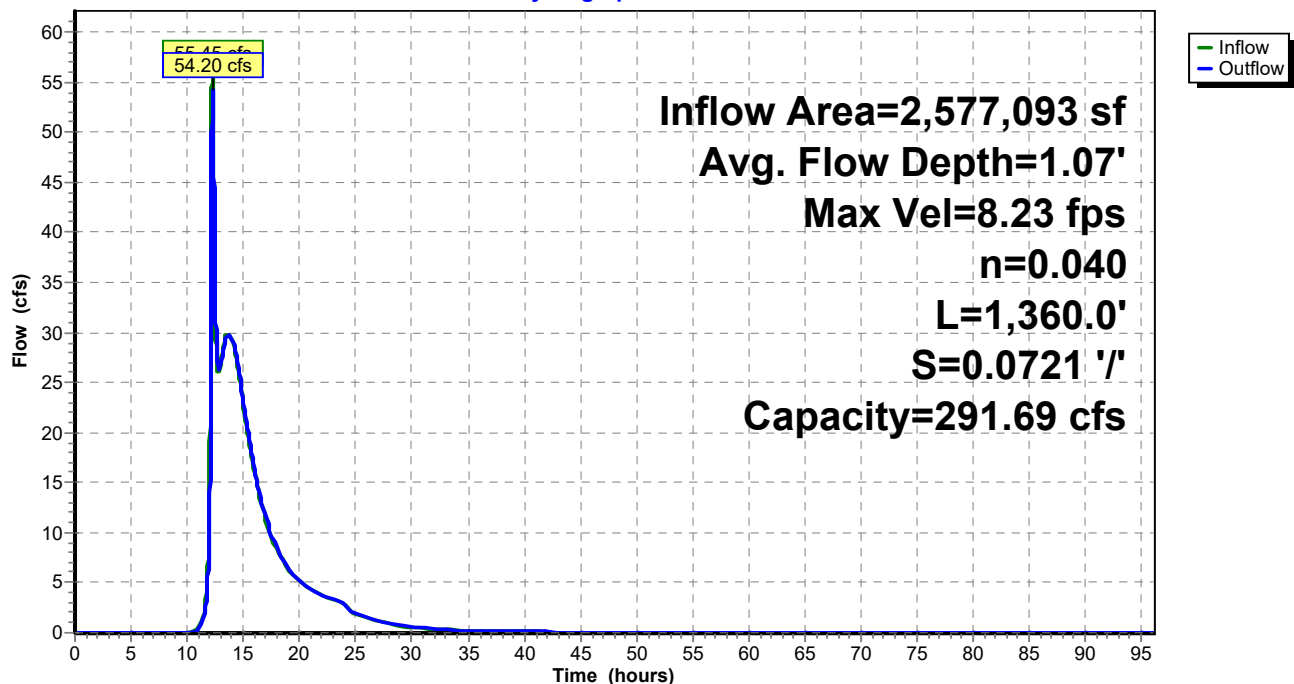
Summary for Reach 43: Existing Stream B

Inflow Area = 2,577,093 sf, 21.36% Impervious, Inflow Depth > 2.94" for 10-yr event
Inflow = 55.45 cfs @ 12.23 hrs, Volume= 631,677 cf
Outflow = 54.20 cfs @ 12.26 hrs, Volume= 631,668 cf, Atten= 2%, Lag= 1.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 8.23 fps, Min. Travel Time= 2.8 min
Avg. Velocity = 1.60 fps, Avg. Travel Time= 14.2 min

Peak Storage= 8,961 cf @ 12.26 hrs
Average Depth at Peak Storage= 1.07'
Bank-Full Depth= 2.50' Flow Area= 22.5 sf, Capacity= 291.69 cfs

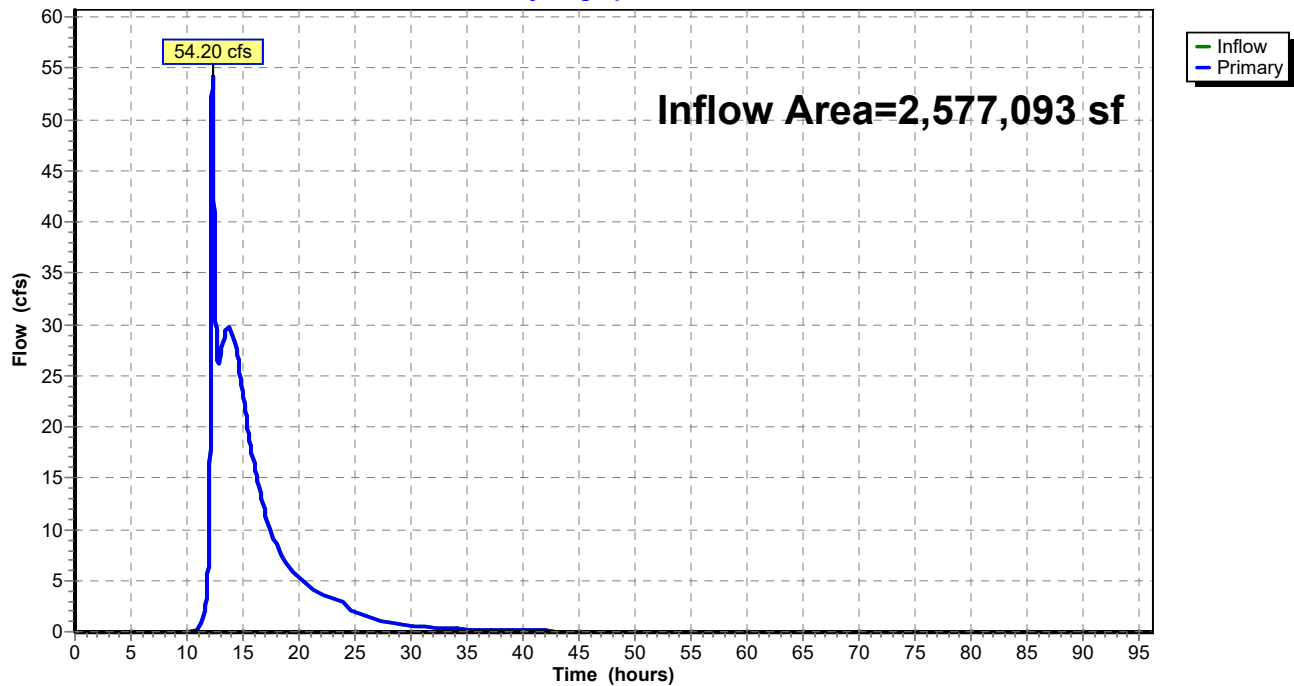
4.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 ' ' Top Width= 14.00'
Length= 1,360.0' Slope= 0.0721 ' '
Inlet Invert= 312.00', Outlet Invert= 214.00'

**Reach 43: Existing Stream B****Hydrograph**

Summary for Link 44: Design Point B

Inflow Area = 2,577,093 sf, 21.36% Impervious, Inflow Depth > 2.94" for 10-yr event
Inflow = 54.20 cfs @ 12.26 hrs, Volume= 631,668 cf
Primary = 54.20 cfs @ 12.26 hrs, Volume= 631,668 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 44: Design Point B**Hydrograph**

N60 P1 Post-B 2021 - 5-4-12 AW

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NRCC 24-hr A 10-yr Rainfall=5.12"

Printed 5/12/2021

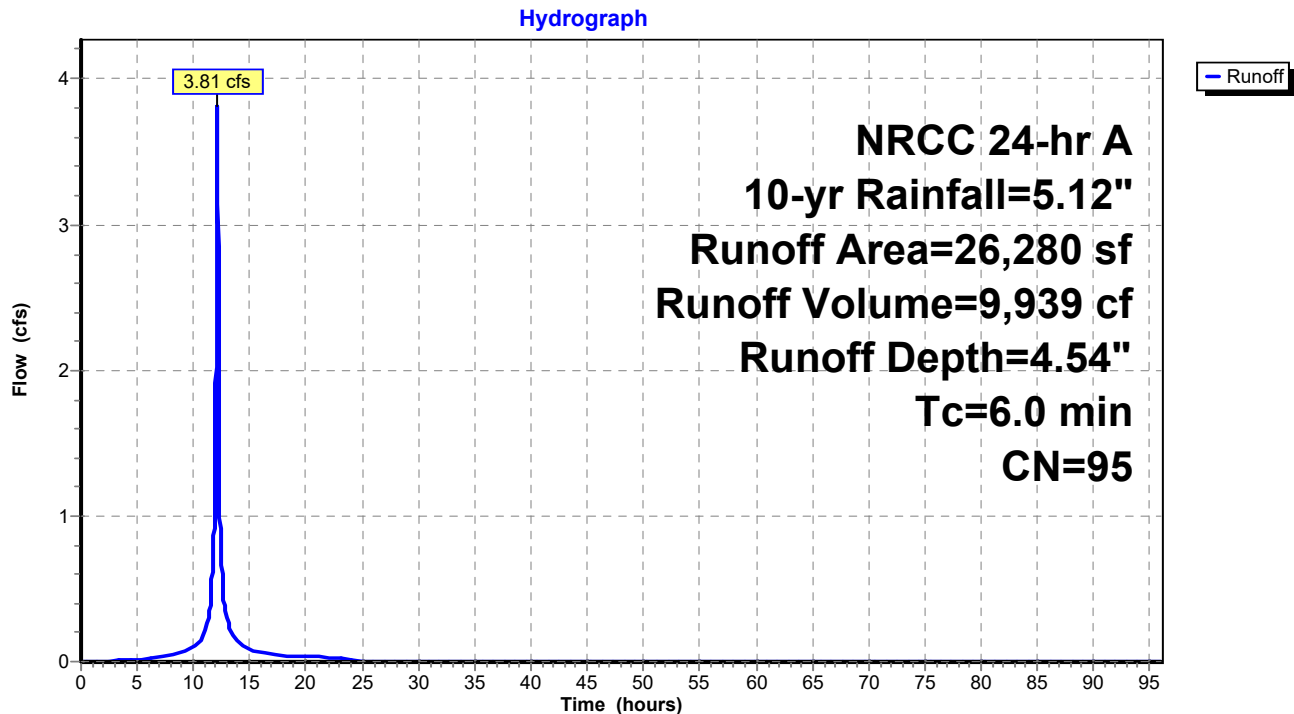
Summary for Subcatchment 45: Post B7

Runoff = 3.81 cfs @ 12.13 hrs, Volume= 9,939 cf, Depth= 4.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 10-yr Rainfall=5.12"

Area (sf)	CN	Description
14,320	98	Roofs, HSG C
4,847	98	Paved parking, HSG A
3,412	74	>75% Grass cover, Good, HSG C
* 3,701	98	Paved Walkway
26,280	95	Weighted Average
3,412		12.98% Pervious Area
22,868		87.02% Impervious Area

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

Subcatchment 45: Post B7

Summary for Pond 46: DIV-3

Inflow Area = 26,280 sf, 87.02% Impervious, Inflow Depth = 4.54" for 10-yr event
 Inflow = 3.81 cfs @ 12.13 hrs, Volume= 9,939 cf
 Outflow = 3.81 cfs @ 12.13 hrs, Volume= 9,939 cf, Atten= 0%, Lag= 0.0 min
 Primary = 3.38 cfs @ 12.09 hrs, Volume= 8,024 cf
 Secondary = 2.72 cfs @ 12.18 hrs, Volume= 1,915 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 390.74' @ 12.18 hrs

Flood Elev= 392.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	388.00'	12.0" Round Culvert L= 17.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 388.00' / 388.00' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	388.00'	24.0" Round Culvert L= 113.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 388.00' / 386.00' S= 0.0177 ' S= 0.0177 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	390.50'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=3.06 cfs @ 12.09 hrs HW=390.48' TW=389.82' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 3.06 cfs @ 3.90 fps)

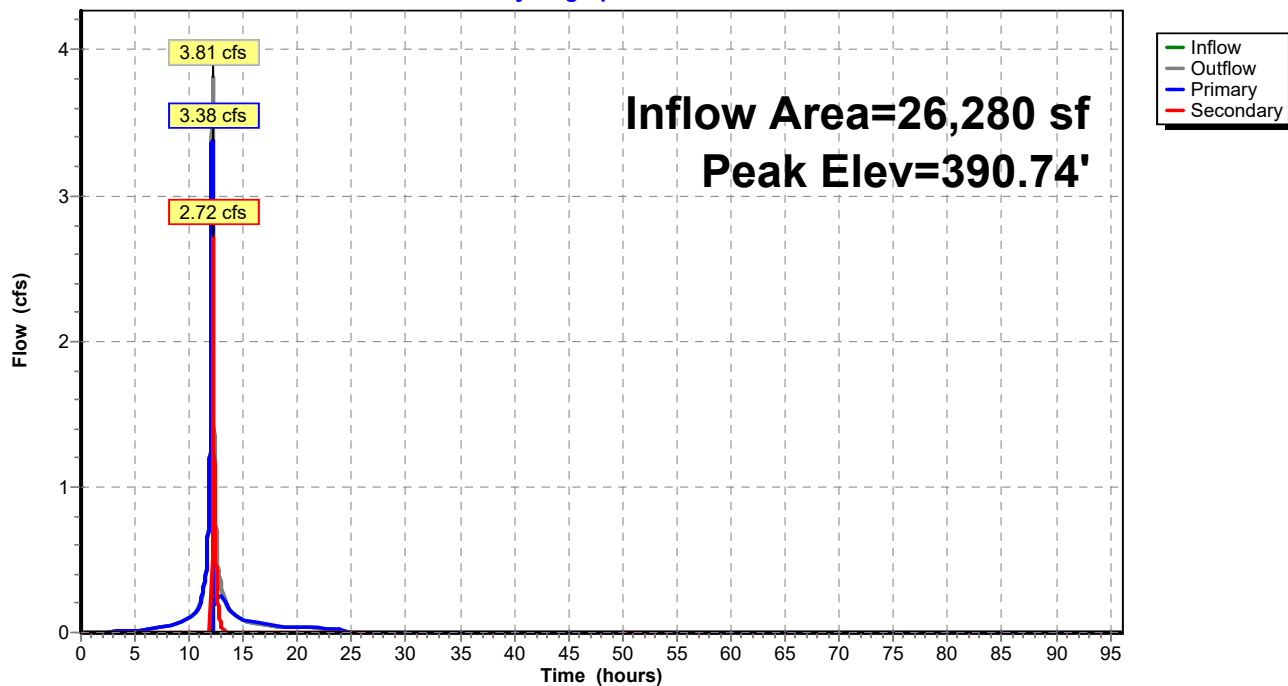
Secondary OutFlow Max=2.68 cfs @ 12.18 hrs HW=390.74' TW=376.54' (Dynamic Tailwater)

↑ **2=Culvert** (Passes 2.68 cfs of 19.96 cfs potential flow)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 2.68 cfs @ 1.39 fps)

Pond 46: DIV-3

Hydrograph



Summary for Pond 47: INF-9

Inflow Area = 26,280 sf, 87.02% Impervious, Inflow Depth = 3.66" for 10-yr event
 Inflow = 3.38 cfs @ 12.09 hrs, Volume= 8,024 cf
 Outflow = 0.27 cfs @ 11.33 hrs, Volume= 8,024 cf, Atten= 92%, Lag= 0.0 min
 Discarded = 0.27 cfs @ 11.33 hrs, Volume= 8,024 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 390.76' @ 12.18 hrs Surf.Area= 1,174 sf Storage= 2,508 cf

Plug-Flow detention time= 61.7 min calculated for 8,024 cf (100% of inflow)
 Center-of-Mass det. time= 61.7 min (833.3 - 771.6)

Volume	Invert	Avail.Storage	Storage Description
#1A	387.50'	1,167 cf	30.50'W x 38.50'L x 3.88'H Field A 4,550 cf Overall - 1,632 cf Embedded = 2,918 cf x 40.0% Voids
#2A	388.00'	1,632 cf	Cultec R-330XLHD x 30 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 6 rows
		2,799 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	387.50'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.10'

Discarded OutFlow Max=0.27 cfs @ 11.33 hrs HW=387.62' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.27 cfs)

Pond 47: INF-9 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 6 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

5 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 36.50' Row Length +12.0" End Stone x 2 = 38.50' Base Length

6 Rows x 52.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.50' Base Width

6.0" Base + 30.5" Chamber Height + 10.0" Cover = 3.88' Field Height

30 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 6 Rows = 1,631.8 cf Chamber Storage

4,550.2 cf Field - 1,631.8 cf Chambers = 2,918.4 cf Stone x 40.0% Voids = 1,167.4 cf Stone Storage

Chamber Storage + Stone Storage = 2,799.1 cf = 0.064 af

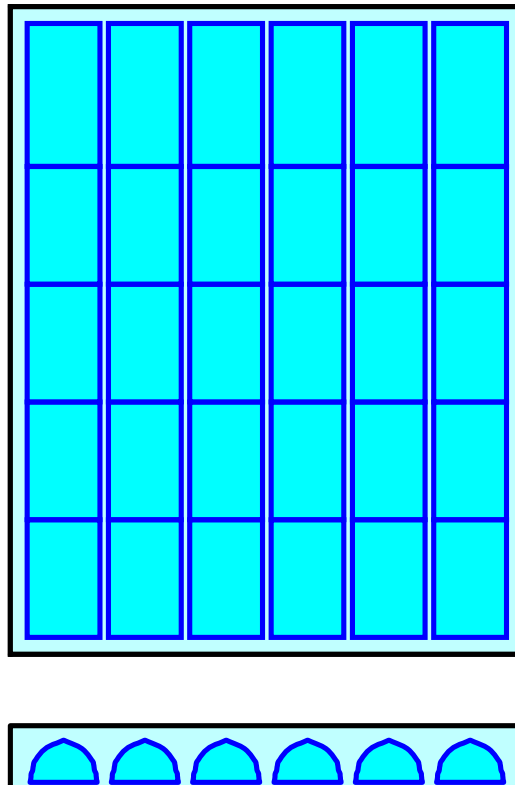
Overall Storage Efficiency = 61.5%

Overall System Size = 38.50' x 30.50' x 3.88'

30 Chambers

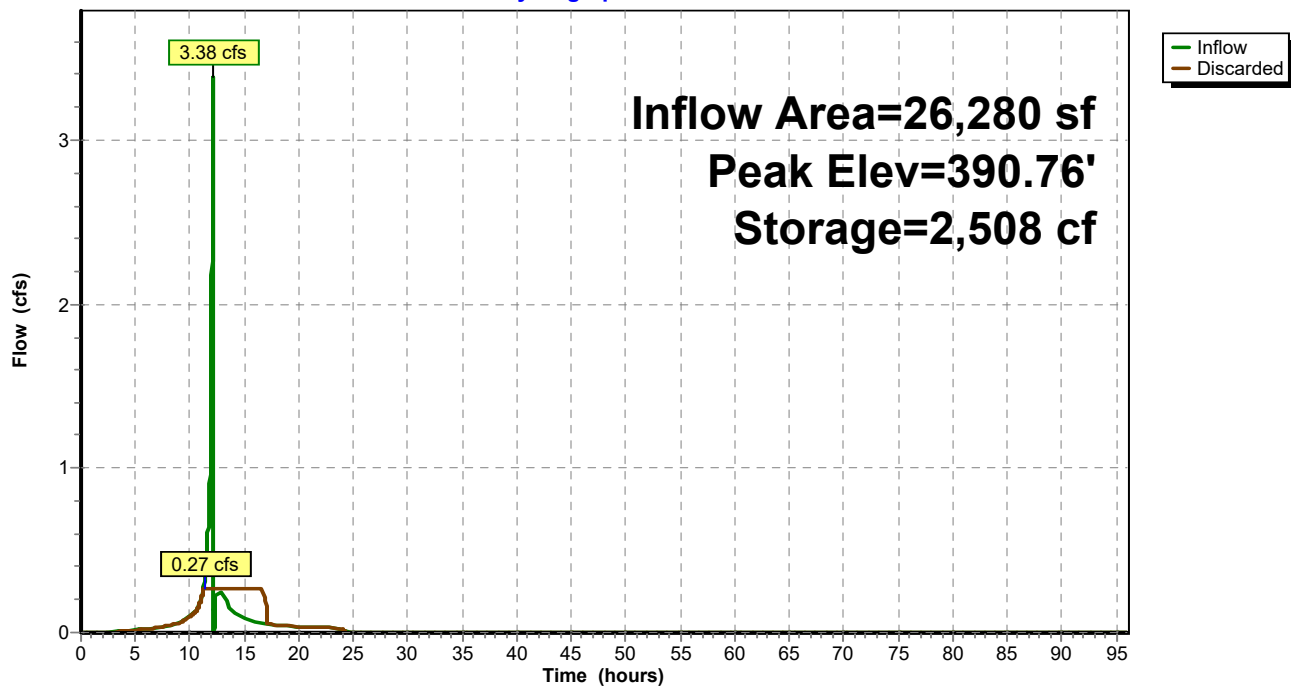
168.5 cy Field

108.1 cy Stone



Pond 47: INF-9

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 25-yr Rainfall=6.46"

Prepared by {enter your company name here}

Printed 5/12/2021

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment34: Post B0 (Offsite) Runoff Area=1,510,771 sf 32.24% Impervious Runoff Depth=4.63"
Flow Length=1,871' Tc=32.3 min CN=84 Runoff=121.32 cfs 582,745 cf

Pond 35: Offsite Pond B Peak Elev=385.54' Storage=249,913 cf Inflow=121.32 cfs 582,745 cf
36.0" Round Culvert n=0.025 L=158.0' S=0.0127 ' Outflow=41.02 cfs 581,464 cf

Subcatchment36: Post B1 Runoff Area=58,920 sf 32.46% Impervious Runoff Depth=3.88"
Tc=6.0 min CN=77 Runoff=8.16 cfs 19,069 cf

Subcatchment37: Post B3 Runoff Area=127,555 sf 34.71% Impervious Runoff Depth=3.99"
Tc=6.0 min CN=78 Runoff=18.09 cfs 42,391 cf

Pond 38: Wet Pond (SWP-4) Peak Elev=378.30' Storage=250,813 cf Inflow=43.46 cfs 646,586 cf
Outflow=36.60 cfs 646,287 cf

Subcatchment39: Post B2 Runoff Area=133,020 sf 50.44% Impervious Runoff Depth=4.74"
Tc=6.0 min CN=85 Runoff=21.70 cfs 52,520 cf

Pond 40: DIV-3 Peak Elev=381.73' Inflow=21.70 cfs 52,520 cf
Primary=5.91 cfs 37,014 cf Secondary=16.19 cfs 15,507 cf Outflow=21.70 cfs 52,520 cf

Pond 41: INF-3 Peak Elev=381.06' Storage=11,239 cf Inflow=5.91 cfs 37,014 cf
Outflow=1.13 cfs 37,014 cf

Subcatchment42: Post B4 Runoff Area=879,847 sf 0.00% Impervious Runoff Depth=3.17"
Flow Length=675' Tc=15.1 min CN=70 Runoff=71.69 cfs 232,762 cf

Reach 43: Existing Stream B Avg. Flow Depth=1.37' Max Vel=9.36 fps Inflow=87.66 cfs 894,556 cf
n=0.040 L=1,360.0' S=0.0721 ' Capacity=291.69 cfs Outflow=86.14 cfs 894,546 cf

Link 44: Design Point B Inflow=86.14 cfs 894,546 cf
Primary=86.14 cfs 894,546 cf

Subcatchment45: Post B7 Runoff Area=26,280 sf 87.02% Impervious Runoff Depth=5.87"
Tc=6.0 min CN=95 Runoff=4.86 cfs 12,852 cf

Pond 46: DIV-3 Peak Elev=390.85' Inflow=4.86 cfs 12,852 cf
Primary=3.01 cfs 9,192 cf Secondary=4.74 cfs 3,661 cf Outflow=4.86 cfs 12,852 cf

Pond 47: INF-9 Peak Elev=390.85' Storage=2,551 cf Inflow=3.01 cfs 9,192 cf
Outflow=0.27 cfs 9,192 cf

Total Runoff Area = 2,736,393 sf Runoff Volume = 942,340 cf Average Runoff Depth = 4.13"
76.60% Pervious = 2,095,980 sf 23.40% Impervious = 640,413 sf

N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Subcatchment 34: Post B0 (Offsite)

Runoff = 121.32 cfs @ 12.45 hrs, Volume= 582,745 cf, Depth= 4.63"

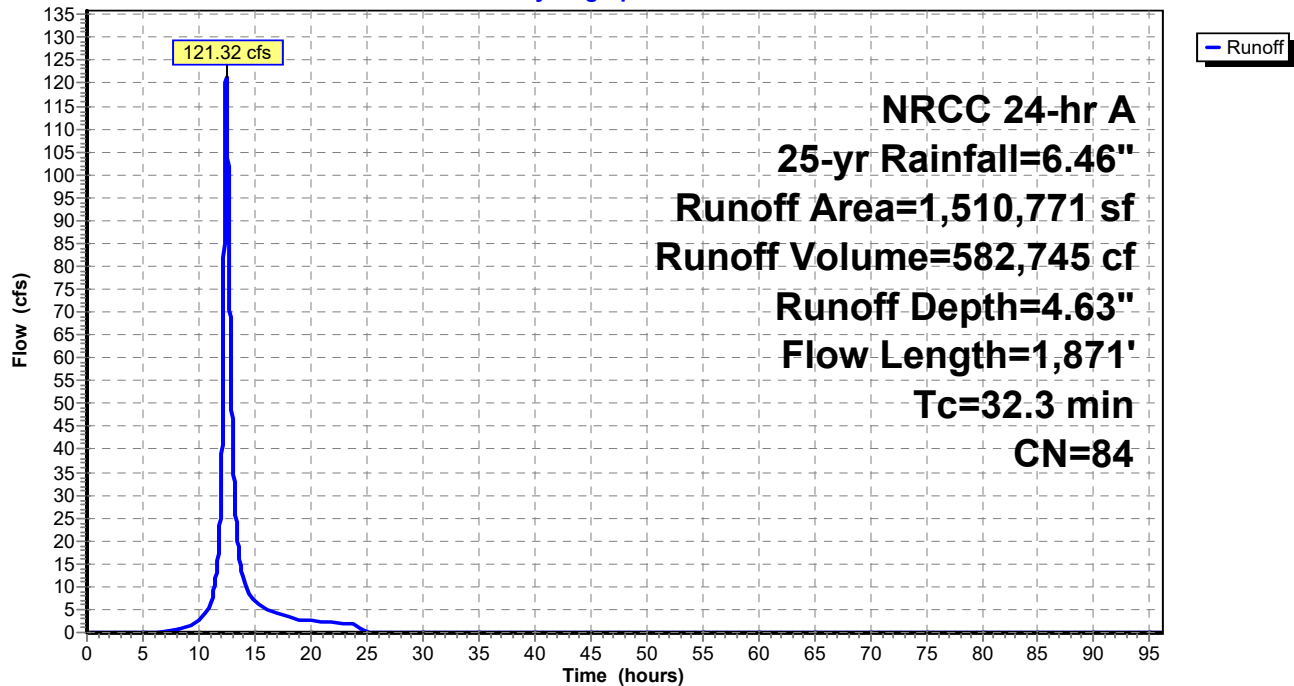
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 25-yr Rainfall=6.46"

Area (sf)	CN	Description
487,056	98	Paved parking, HSG C
497,987	77	Woods, Good, HSG D
134,328	70	Woods, Good, HSG C
375,457	80	>75% Grass cover, Good, HSG D
15,943	74	>75% Grass cover, Good, HSG C
1,510,771	84	Weighted Average
1,023,715		67.76% Pervious Area
487,056		32.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0300	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
9.5	848	0.0085	1.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.1	856	0.0093	2.78	3.06	Trap/Vee/Rect Channel Flow, Bot.W=3.00' D=0.33' Z= 1.0 '/' Top.W=3.66' n= 0.022 Earth, clean & straight
0.2	67	0.0150	6.66	64.08	Pipe Channel, 42.0" Round Area= 9.6 sf Perim= 11.0' r= 0.88' n= 0.025 Corrugated metal
32.3	1,871	Total			

Subcatchment 34: Post B0 (Offsite)

Hydrograph



Summary for Pond 35: Offsite Pond B

Inflow Area = 1,510,771 sf, 32.24% Impervious, Inflow Depth = 4.63" for 25-yr event
 Inflow = 121.32 cfs @ 12.45 hrs, Volume= 582,745 cf
 Outflow = 41.02 cfs @ 13.04 hrs, Volume= 581,464 cf, Atten= 66%, Lag= 35.3 min
 Primary = 41.02 cfs @ 13.04 hrs, Volume= 581,464 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 385.54' @ 13.04 hrs Surf.Area= 93,240 sf Storage= 249,913 cf

Plug-Flow detention time= 132.1 min calculated for 581,464 cf (100% of inflow)
 Center-of-Mass det. time= 130.6 min (949.2 - 818.5)

Volume	Invert	Avail.Storage	Storage Description
#1	382.00'	610,998 cf	Custom Stage Data (Irregular) Listed below (Recalc)

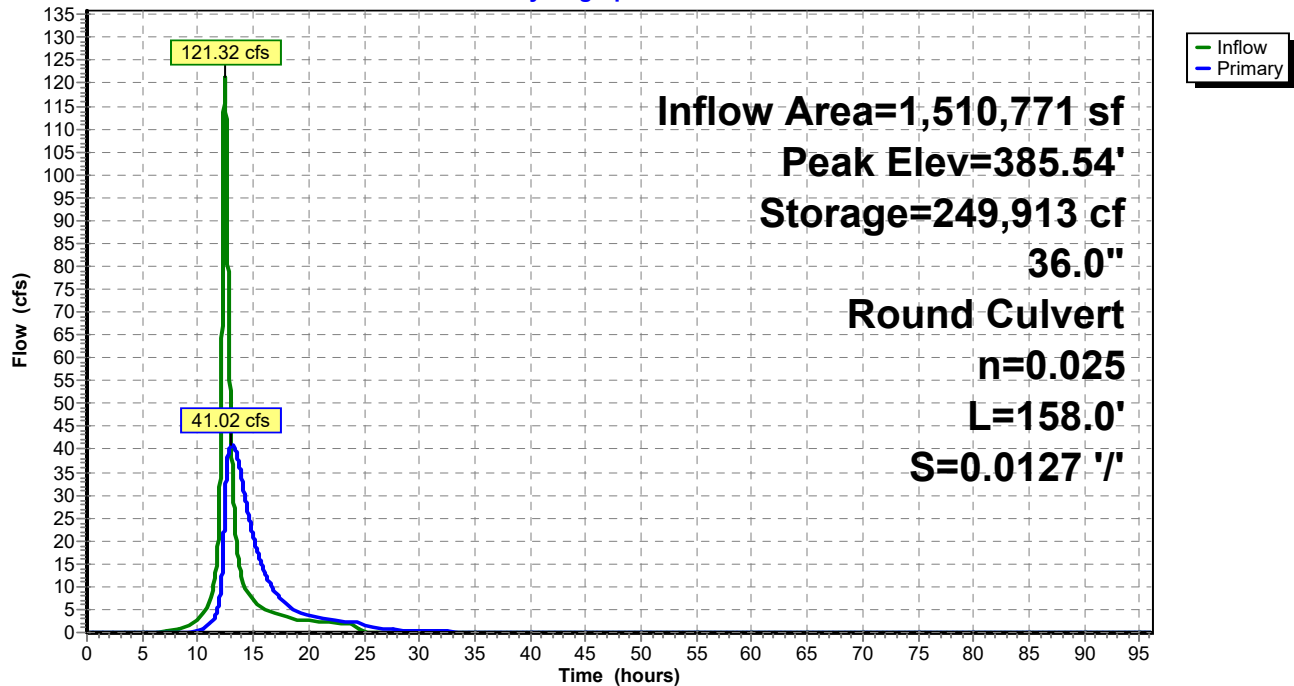
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
382.00	36,540	1,177.0	0	0	36,540
384.00	81,987	1,579.0	115,507	115,507	124,748
386.00	96,790	1,622.0	178,572	294,080	136,159
388.00	108,795	1,657.0	205,468	499,548	145,863
389.00	114,127	1,679.0	111,450	610,998	151,937

Device	Routing	Invert	Outlet Devices
#1	Primary	382.00'	36.0" Round Culvert L= 158.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 382.00' / 380.00' S= 0.0127 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 7.07 sf

Primary OutFlow Max=41.02 cfs @ 13.04 hrs HW=385.54' TW=377.99' (Dynamic Tailwater)
 1=Culvert (Barrel Controls 41.02 cfs @ 6.21 fps)

Pond 35: Offsite Pond B

Hydrograph



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NRCC 24-hr A 25-yr Rainfall=6.46"

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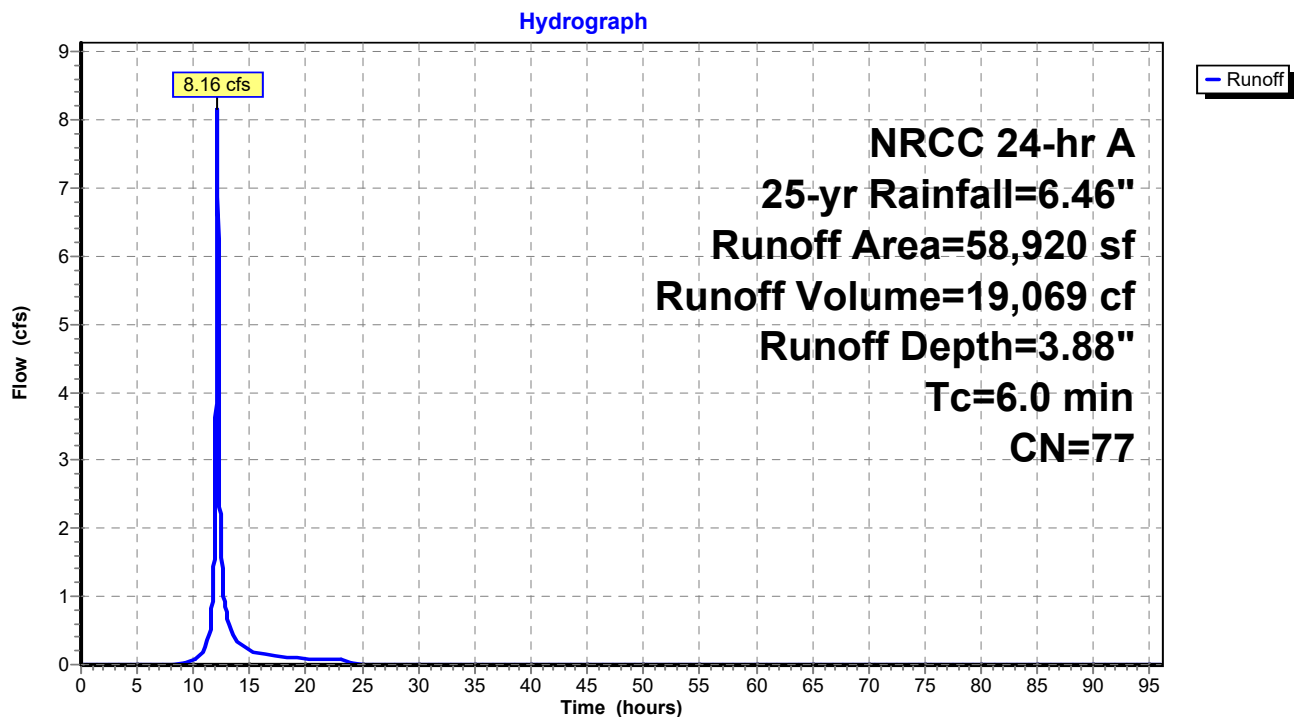
Summary for Subcatchment 36: Post B1

Runoff = 8.16 cfs @ 12.13 hrs, Volume= 19,069 cf, Depth= 3.88"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 25-yr Rainfall=6.46"

Area (sf)	CN	Description
19,123	98	Paved parking, HSG C
22,978	74	>75% Grass cover, Good, HSG C
4,537	61	>75% Grass cover, Good, HSG B
12,282	55	Woods, Good, HSG B
58,920	77	Weighted Average
39,797		67.54% Pervious Area
19,123		32.46% Impervious Area

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

Subcatchment 36: Post B1

N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Subcatchment 37: Post B3

Runoff = 18.09 cfs @ 12.13 hrs, Volume= 42,391 cf, Depth= 3.99"

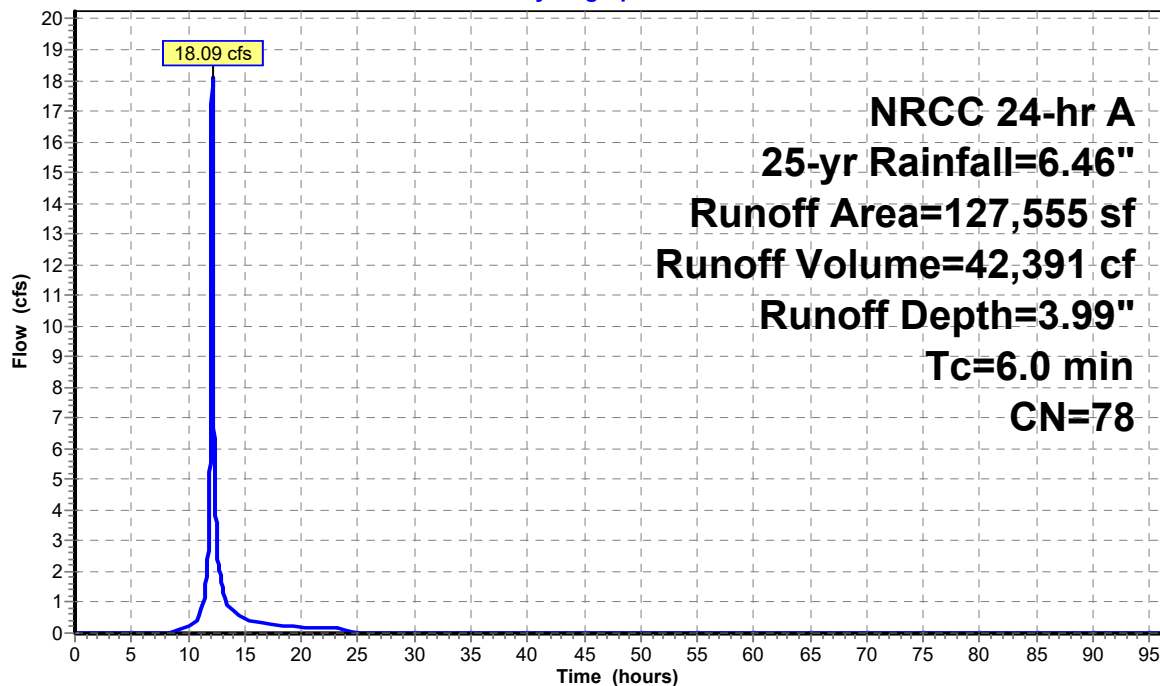
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 25-yr Rainfall=6.46"

Area (sf)	CN	Description
44,276	98	Water Surface, HSG C
22,184	74	>75% Grass cover, Good, HSG C
61,095	65	Brush, Good, HSG C
127,555	78	Weighted Average
83,279		65.29% Pervious Area
44,276		34.71% Impervious Area

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

Subcatchment 37: Post B3

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Pond 38: Wet Pond (SWP-4)

Inflow Area = 1,697,246 sf, 32.43% Impervious, Inflow Depth = 4.57" for 25-yr event
 Inflow = 43.46 cfs @ 12.94 hrs, Volume= 646,586 cf
 Outflow = 36.60 cfs @ 13.81 hrs, Volume= 646,287 cf, Atten= 16%, Lag= 51.9 min
 Primary = 36.60 cfs @ 13.81 hrs, Volume= 646,287 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Starting Elev= 376.00' Surf.Area= 88,186 sf Storage= 134,213 cf
 Peak Elev= 378.30' @ 13.81 hrs Surf.Area= 100,211 sf Storage= 250,813 cf (116,600 cf above start)

Plug-Flow detention time= 240.4 min calculated for 512,074 cf (79% of inflow)
 Center-of-Mass det. time= 73.3 min (1,007.9 - 934.5)

Volume	Invert	Avail.Storage	Storage Description
#1	372.00'	7,914 cf	Forebay (Irregular) Listed below (Recalc)
#2	372.00'	121,847 cf	Permanent Pool (Irregular) Listed below (Recalc)
#3	375.90'	259,334 cf	Additional Storage (Irregular) Listed below (Recalc)
		389,094 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
372.00	885	114.0	0	0	885
373.00	1,392	139.2	1,129	1,129	1,408
374.00	1,998	164.4	1,686	2,815	2,036
375.00	2,707	189.5	2,344	5,158	2,764
375.90	3,430	212.2	2,755	7,914	3,512

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
372.00	22,804	1,051.3	0	0	22,804
373.00	27,060	1,076.5	24,902	24,902	27,202
374.00	31,416	1,101.7	29,211	54,113	31,703
375.00	35,874	1,127.0	33,620	87,733	36,327
375.90	39,971	1,149.7	34,114	121,847	40,565

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
375.90	44,276	1,380.7	0	0	44,276
377.00	50,030	1,294.2	51,836	51,836	62,747
378.00	55,257	1,319.4	52,622	104,458	68,149
379.00	60,586	1,344.7	57,901	162,359	73,675
380.00	66,015	1,370.0	63,281	225,640	79,307
380.50	68,768	1,382.6	33,693	259,334	82,151

Device	Routing	Invert	Outlet Devices
#1	Primary	376.00'	4.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

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NRCC 24-hr A 25-yr Rainfall=6.46"

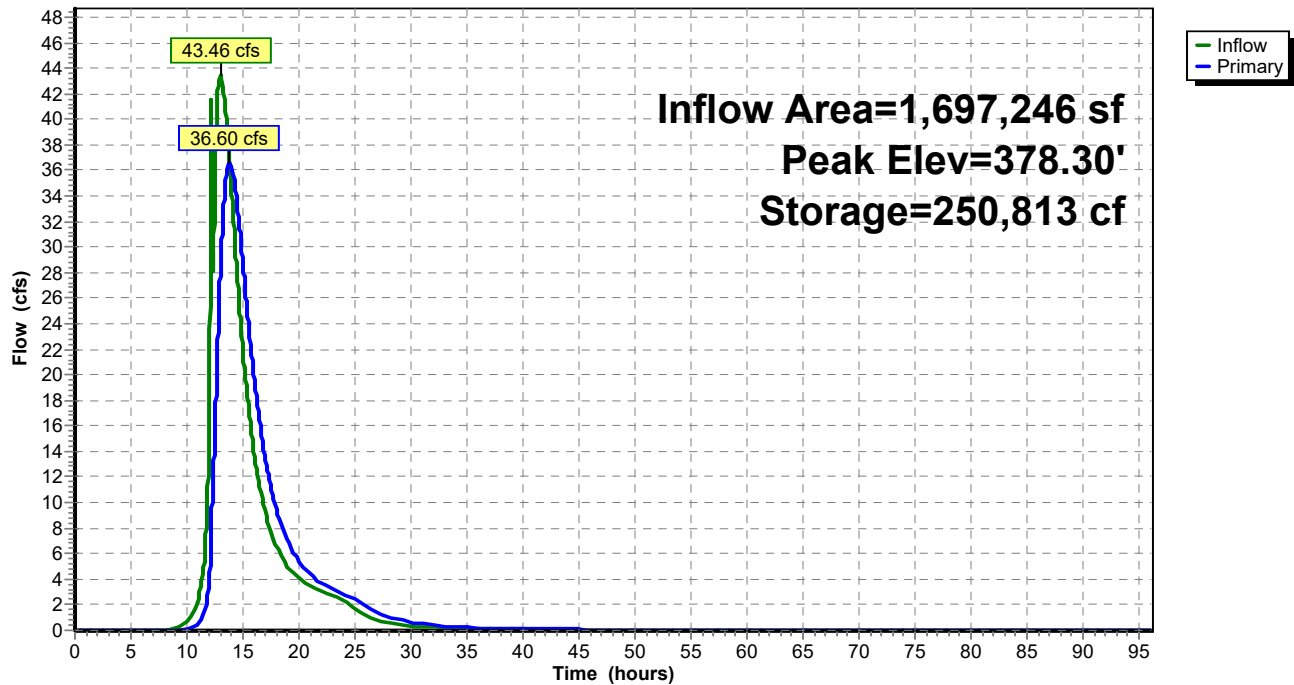
Printed 5/12/2021

Primary OutFlow Max=36.60 cfs @ 13.81 hrs HW=378.30' TW=312.93' (Dynamic Tailwater)

1=Broad-Crested Rectangular Weir (Weir Controls 36.60 cfs @ 3.99 fps)

Pond 38: Wet Pond (SWP-4)

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

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NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Subcatchment 39: Post B2

Runoff = 21.70 cfs @ 12.13 hrs, Volume= 52,520 cf, Depth= 4.74"

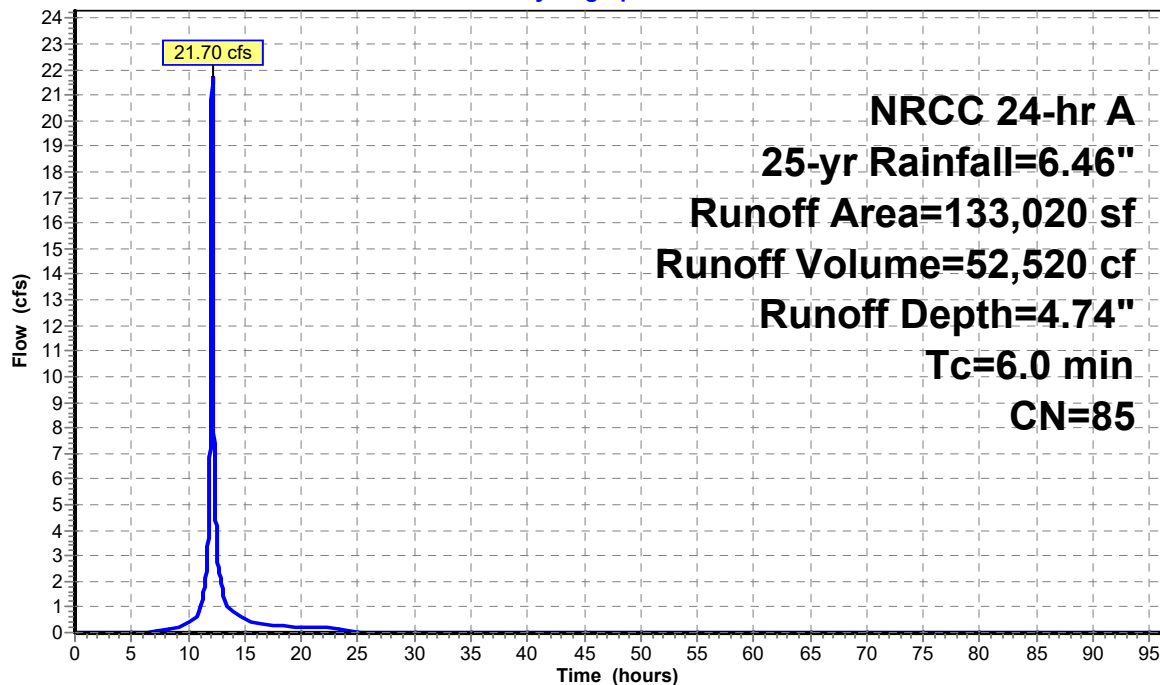
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 25-yr Rainfall=6.46"

Area (sf)	CN	Description
67,090	98	Paved parking, HSG C
40,460	74	>75% Grass cover, Good, HSG C
7,690	61	>75% Grass cover, Good, HSG B
17,780	70	Woods, Good, HSG C
133,020	85	Weighted Average
65,930		49.56% Pervious Area
67,090		50.44% Impervious Area

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

Subcatchment 39: Post B2

Hydrograph



Summary for Pond 40: DIV-3

Inflow Area = 133,020 sf, 50.44% Impervious, Inflow Depth = 4.74" for 25-yr event
 Inflow = 21.70 cfs @ 12.13 hrs, Volume= 52,520 cf
 Outflow = 21.70 cfs @ 12.13 hrs, Volume= 52,520 cf, Atten= 0%, Lag= 0.0 min
 Primary = 5.91 cfs @ 11.89 hrs, Volume= 37,014 cf
 Secondary = 16.19 cfs @ 12.13 hrs, Volume= 15,507 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 381.73' @ 12.13 hrs

Flood Elev= 386.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	378.00'	12.0" Round Culvert L= 9.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 378.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	378.00'	24.0" Round Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 377.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	381.00'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=5.83 cfs @ 11.89 hrs HW=381.04' TW=378.66' (Dynamic Tailwater)

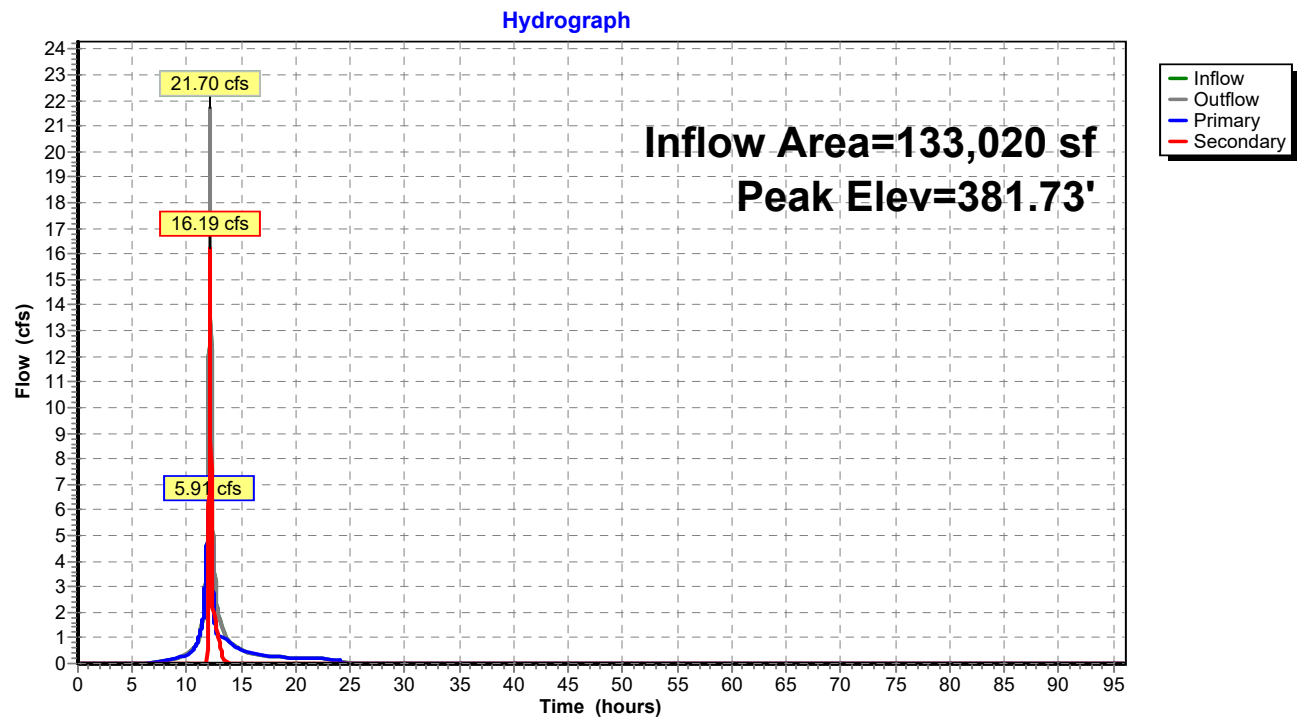
↑**1=Culvert** (Inlet Controls 5.83 cfs @ 7.42 fps)

Secondary OutFlow Max=16.16 cfs @ 12.13 hrs HW=381.73' TW=313.14' (Dynamic Tailwater)

↑**2=Culvert** (Passes 16.16 cfs of 25.00 cfs potential flow)

↑**3=Broad-Crested Rectangular Weir** (Weir Controls 16.16 cfs @ 2.76 fps)

Pond 40: DIV-3



Summary for Pond 41: INF-3

Inflow Area = 133,020 sf, 50.44% Impervious, Inflow Depth = 3.34" for 25-yr event
 Inflow = 5.91 cfs @ 11.89 hrs, Volume= 37,014 cf
 Outflow = 1.13 cfs @ 11.28 hrs, Volume= 37,014 cf, Atten= 81%, Lag= 0.0 min
 Discarded = 1.13 cfs @ 11.28 hrs, Volume= 37,014 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 381.06' @ 12.70 hrs Surf.Area= 4,883 sf Storage= 11,239 cf

Plug-Flow detention time= 76.4 min calculated for 37,010 cf (100% of inflow)
 Center-of-Mass det. time= 76.4 min (891.3 - 814.8)

Volume	Invert	Avail.Storage	Storage Description
#1A	377.50'	4,711 cf	45.00'W x 108.50'L x 3.88'H Field A 18,920 cf Overall - 7,142 cf Embedded = 11,778 cf x 40.0% Voids
#2A	378.00'	7,142 cf	Cultec R-330XLHD x 135 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 9 rows
		11,853 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	377.50'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.10'

Discarded OutFlow Max=1.13 cfs @ 11.28 hrs HW=377.62' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 1.13 cfs)

Pond 41: INF-3 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 9 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

15 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 106.50' Row Length +12.0" End Stone x 2 =
108.50' Base Length

9 Rows x 52.0" Wide + 6.0" Spacing x 8 + 12.0" Side Stone x 2 = 45.00' Base Width

6.0" Base + 30.5" Chamber Height + 10.0" Cover = 3.88' Field Height

135 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 9 Rows = 7,141.8 cf Chamber Storage

18,919.7 cf Field - 7,141.8 cf Chambers = 11,777.9 cf Stone x 40.0% Voids = 4,711.2 cf Stone Storage

Chamber Storage + Stone Storage = 11,852.9 cf = 0.272 af

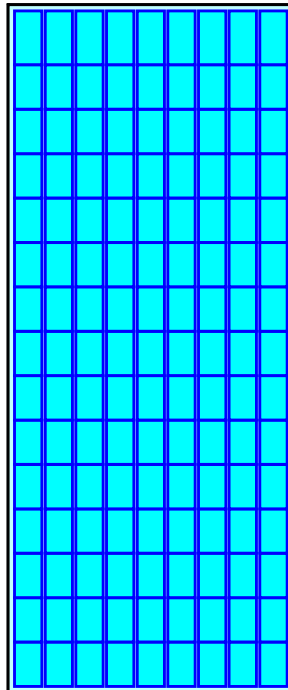
Overall Storage Efficiency = 62.6%

Overall System Size = 108.50' x 45.00' x 3.88'

135 Chambers

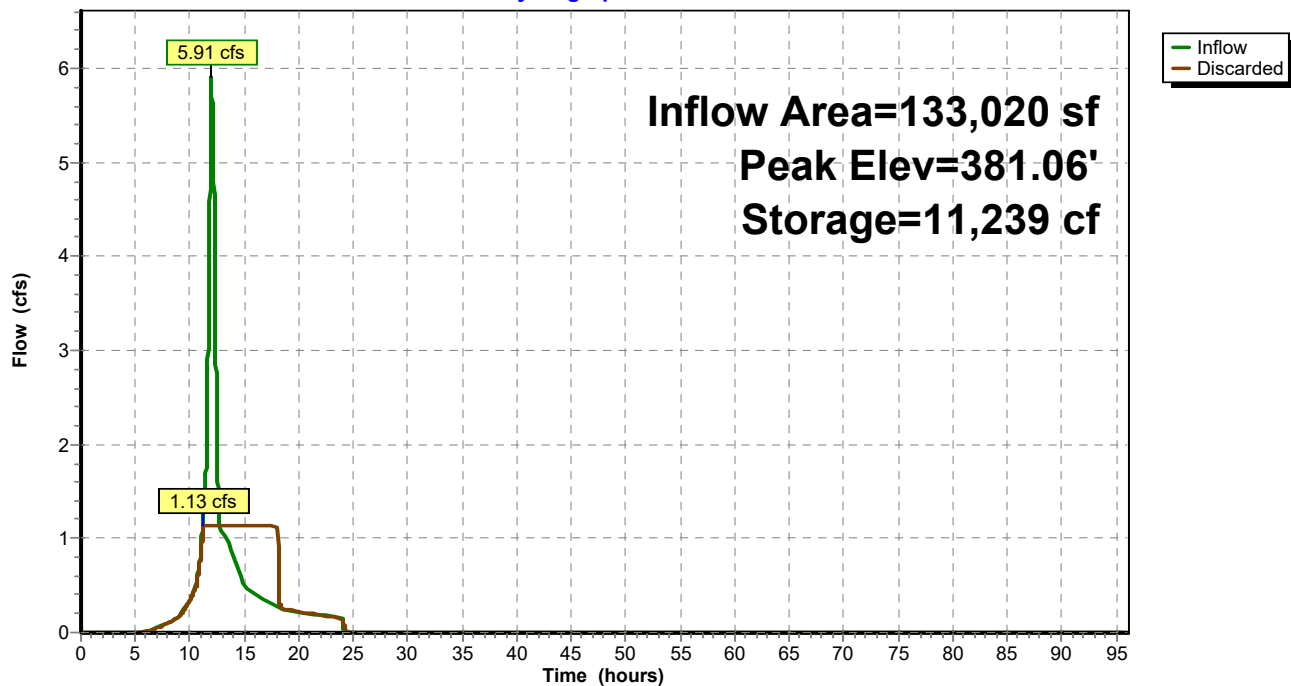
700.7 cy Field

436.2 cy Stone



Pond 41: INF-3

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

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NRCC 24-hr A 25-yr Rainfall=6.46"

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Summary for Subcatchment 42: Post B4

Runoff = 71.69 cfs @ 12.23 hrs, Volume= 232,762 cf, Depth= 3.17"

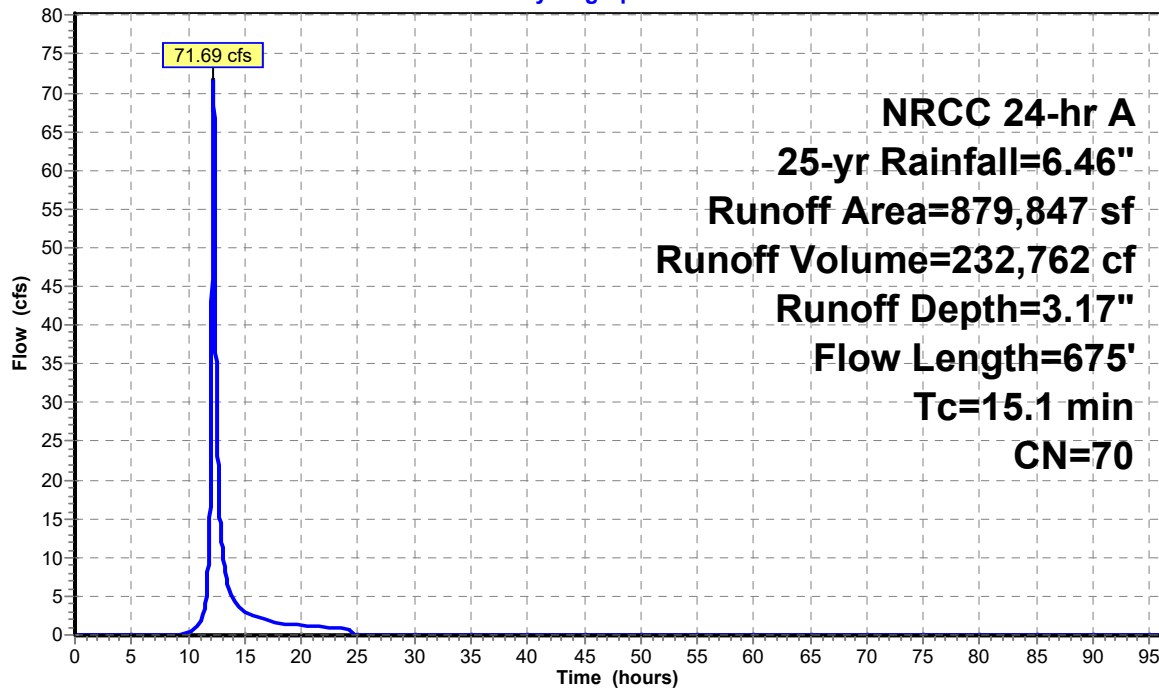
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 25-yr Rainfall=6.46"

Area (sf)	CN	Description
19,672	61	>75% Grass cover, Good, HSG B
13,245	74	>75% Grass cover, Good, HSG C
16,422	55	Woods, Good, HSG B
810,443	70	Woods, Good, HSG C
20,065	70	Woods, Good, HSG C
879,847	70	Weighted Average
879,847		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	100	0.0600	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.9	575	0.0950	4.96		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.1	675	Total			

Subcatchment 42: Post B4

Hydrograph



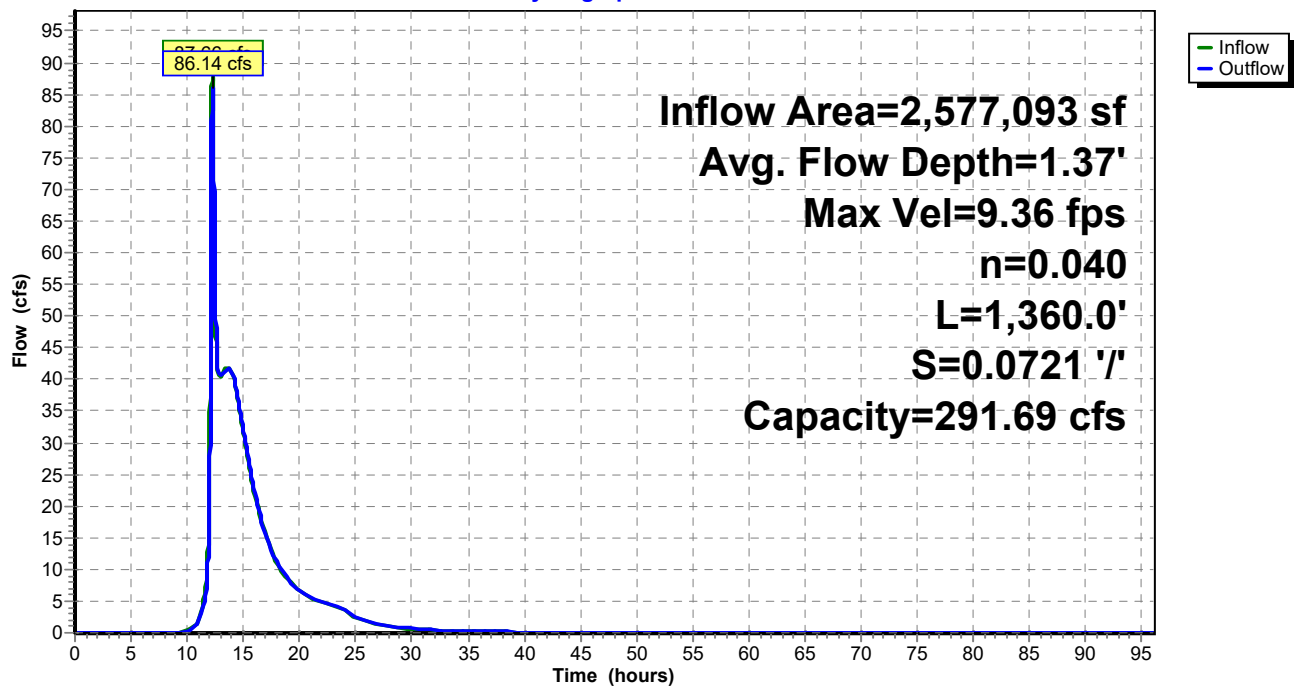
Summary for Reach 43: Existing Stream B

Inflow Area = 2,577,093 sf, 21.36% Impervious, Inflow Depth = 4.17" for 25-yr event
Inflow = 87.66 cfs @ 12.23 hrs, Volume= 894,556 cf
Outflow = 86.14 cfs @ 12.26 hrs, Volume= 894,546 cf, Atten= 2%, Lag= 1.7 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 9.36 fps, Min. Travel Time= 2.4 min
Avg. Velocity = 1.70 fps, Avg. Travel Time= 13.4 min

Peak Storage= 12,511 cf @ 12.26 hrs
Average Depth at Peak Storage= 1.37'
Bank-Full Depth= 2.50' Flow Area= 22.5 sf, Capacity= 291.69 cfs

4.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 1,360.0' Slope= 0.0721 '/'
Inlet Invert= 312.00', Outlet Invert= 214.00'

**Reach 43: Existing Stream B****Hydrograph**

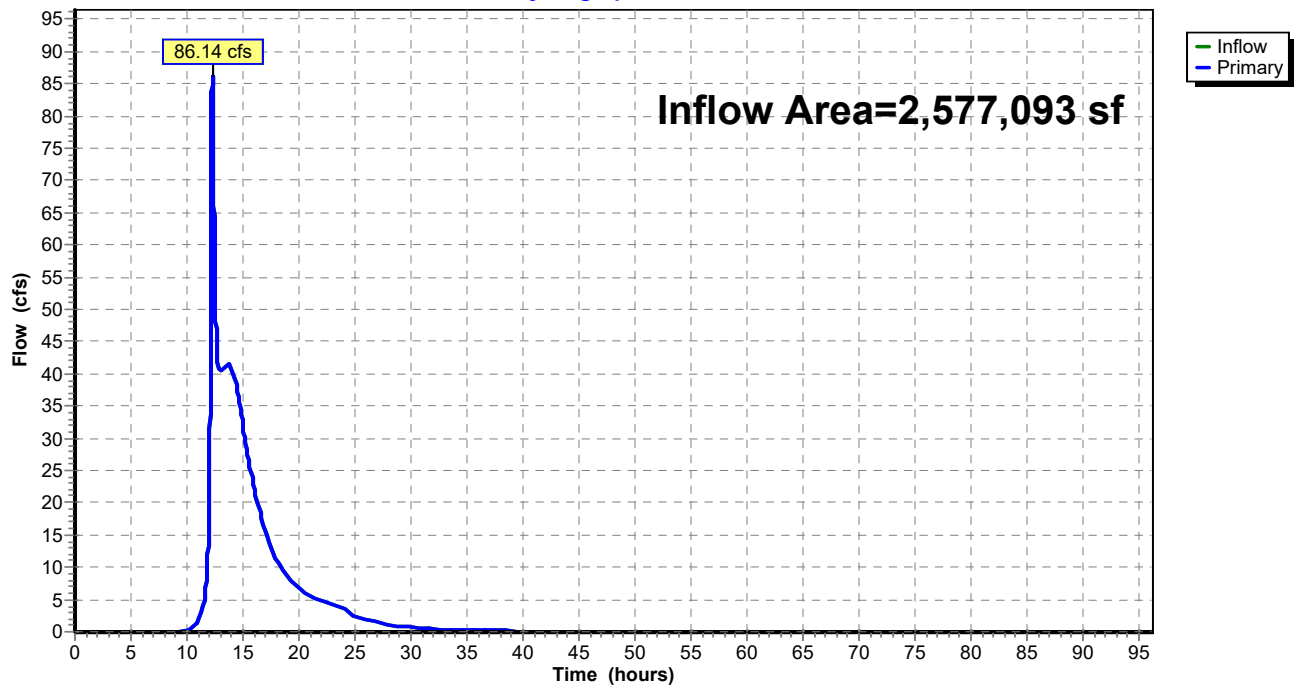
Summary for Link 44: Design Point B

Inflow Area = 2,577,093 sf, 21.36% Impervious, Inflow Depth = 4.17" for 25-yr event
 Inflow = 86.14 cfs @ 12.26 hrs, Volume= 894,546 cf
 Primary = 86.14 cfs @ 12.26 hrs, Volume= 894,546 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 44: Design Point B

Hydrograph



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NRCC 24-hr A 25-yr Rainfall=6.46"

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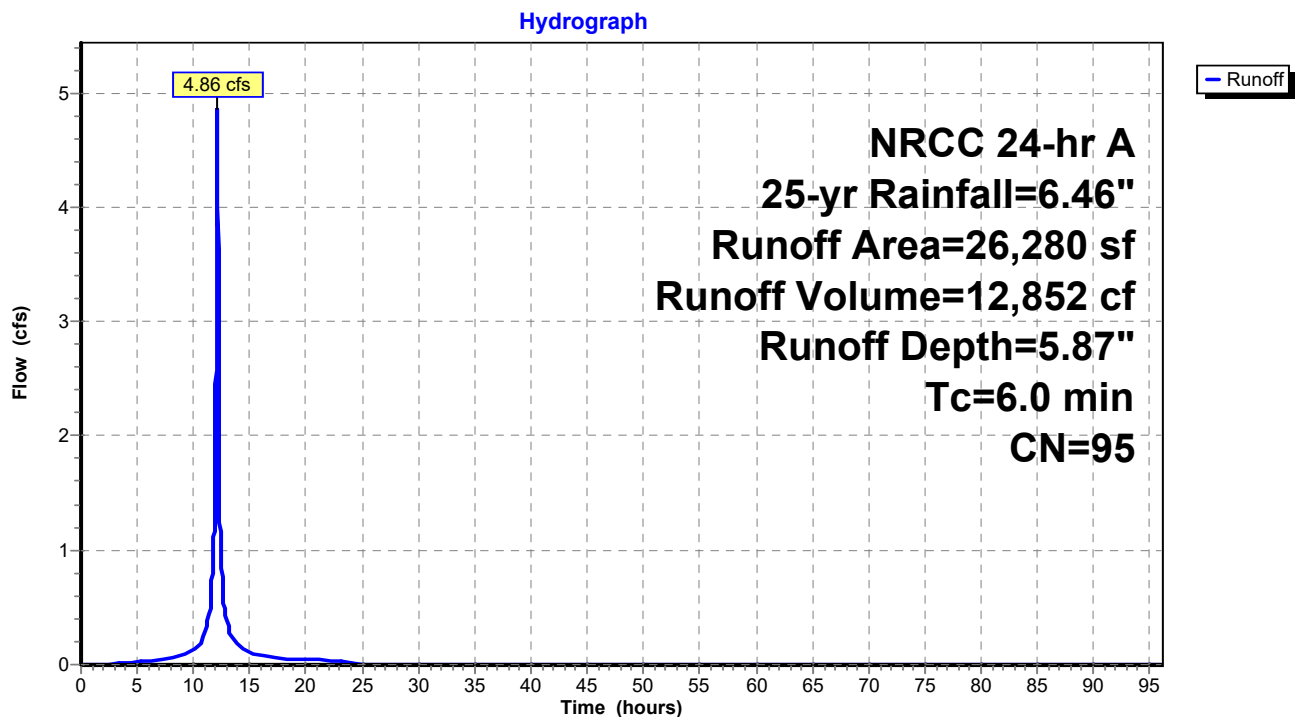
Summary for Subcatchment 45: Post B7

Runoff = 4.86 cfs @ 12.13 hrs, Volume= 12,852 cf, Depth= 5.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 25-yr Rainfall=6.46"

Area (sf)	CN	Description
14,320	98	Roofs, HSG C
4,847	98	Paved parking, HSG A
3,412	74	>75% Grass cover, Good, HSG C
* 3,701	98	Paved Walkway
26,280	95	Weighted Average
3,412		12.98% Pervious Area
22,868		87.02% Impervious Area

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

Subcatchment 45: Post B7

Summary for Pond 46: DIV-3

Inflow Area = 26,280 sf, 87.02% Impervious, Inflow Depth = 5.87" for 25-yr event
 Inflow = 4.86 cfs @ 12.13 hrs, Volume= 12,852 cf
 Outflow = 4.86 cfs @ 12.13 hrs, Volume= 12,852 cf, Atten= 0%, Lag= 0.0 min
 Primary = 3.01 cfs @ 12.04 hrs, Volume= 9,192 cf
 Secondary = 4.74 cfs @ 12.14 hrs, Volume= 3,661 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 390.85' @ 12.14 hrs

Flood Elev= 392.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	388.00'	12.0" Round Culvert L= 17.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 388.00' / 388.00' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	388.00'	24.0" Round Culvert L= 113.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 388.00' / 386.00' S= 0.0177 ' S= 0.0177 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	390.50'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=2.69 cfs @ 12.04 hrs HW=390.50' TW=389.99' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 2.69 cfs @ 3.43 fps)

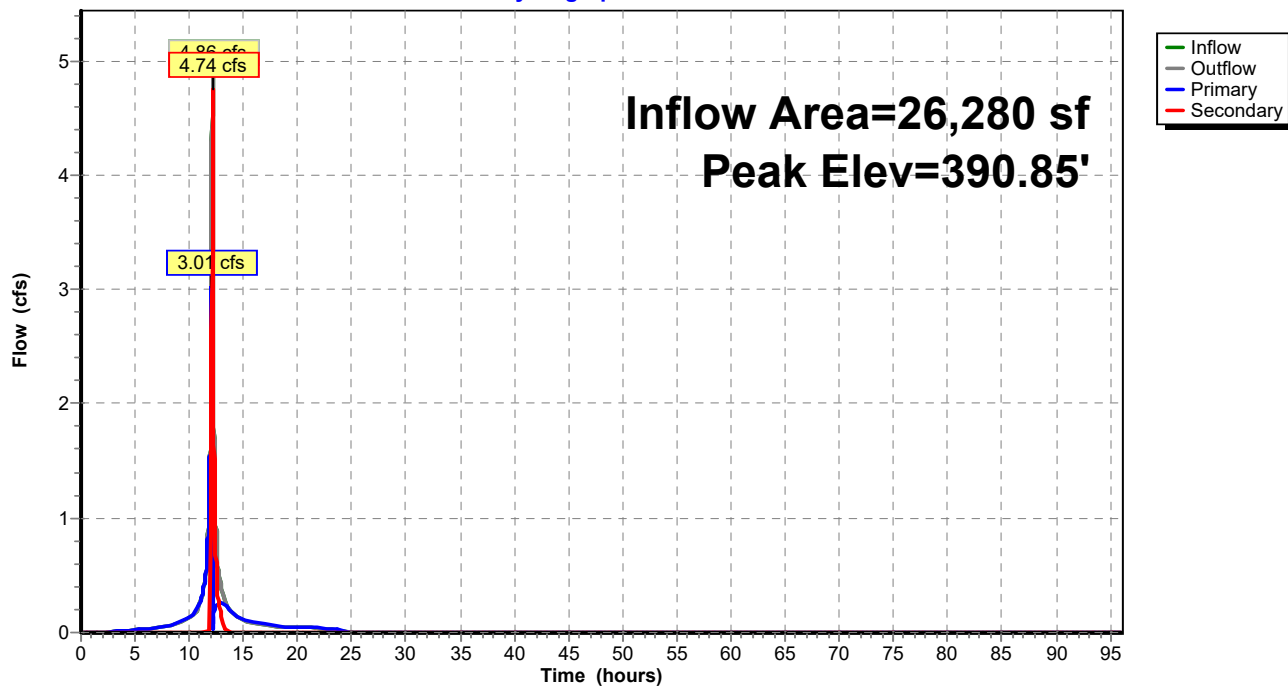
Secondary OutFlow Max=4.71 cfs @ 12.14 hrs HW=390.85' TW=376.78' (Dynamic Tailwater)

↑ **2=Culvert** (Passes 4.71 cfs of 20.56 cfs potential flow)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 4.71 cfs @ 1.70 fps)

Pond 46: DIV-3

Hydrograph



Summary for Pond 47: INF-9

Inflow Area = 26,280 sf, 87.02% Impervious, Inflow Depth = 4.20" for 25-yr event
 Inflow = 3.01 cfs @ 12.04 hrs, Volume= 9,192 cf
 Outflow = 0.27 cfs @ 11.12 hrs, Volume= 9,192 cf, Atten= 91%, Lag= 0.0 min
 Discarded = 0.27 cfs @ 11.12 hrs, Volume= 9,192 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 390.85' @ 12.13 hrs Surf.Area= 1,174 sf Storage= 2,551 cf

Plug-Flow detention time= 62.1 min calculated for 9,191 cf (100% of inflow)
 Center-of-Mass det. time= 62.1 min (831.3 - 769.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	387.50'	1,167 cf	30.50'W x 38.50'L x 3.88'H Field A 4,550 cf Overall - 1,632 cf Embedded = 2,918 cf x 40.0% Voids
#2A	388.00'	1,632 cf	Cultec R-330XLHD x 30 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 6 rows
		2,799 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	387.50'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.10'

Discarded OutFlow Max=0.27 cfs @ 11.12 hrs HW=387.62' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.27 cfs)

Pond 47: INF-9 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 6 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

5 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 36.50' Row Length +12.0" End Stone x 2 =
38.50' Base Length

6 Rows x 52.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.50' Base Width

6.0" Base + 30.5" Chamber Height + 10.0" Cover = 3.88' Field Height

30 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 6 Rows = 1,631.8 cf Chamber Storage

4,550.2 cf Field - 1,631.8 cf Chambers = 2,918.4 cf Stone x 40.0% Voids = 1,167.4 cf Stone Storage

Chamber Storage + Stone Storage = 2,799.1 cf = 0.064 af

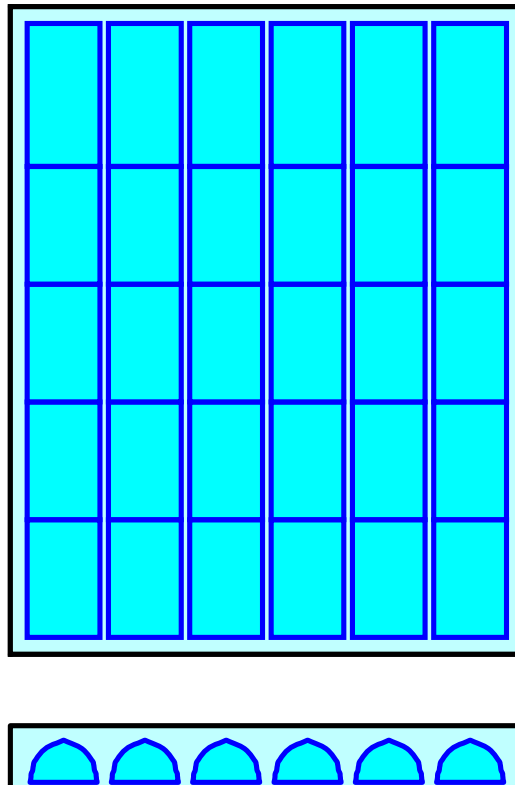
Overall Storage Efficiency = 61.5%

Overall System Size = 38.50' x 30.50' x 3.88'

30 Chambers

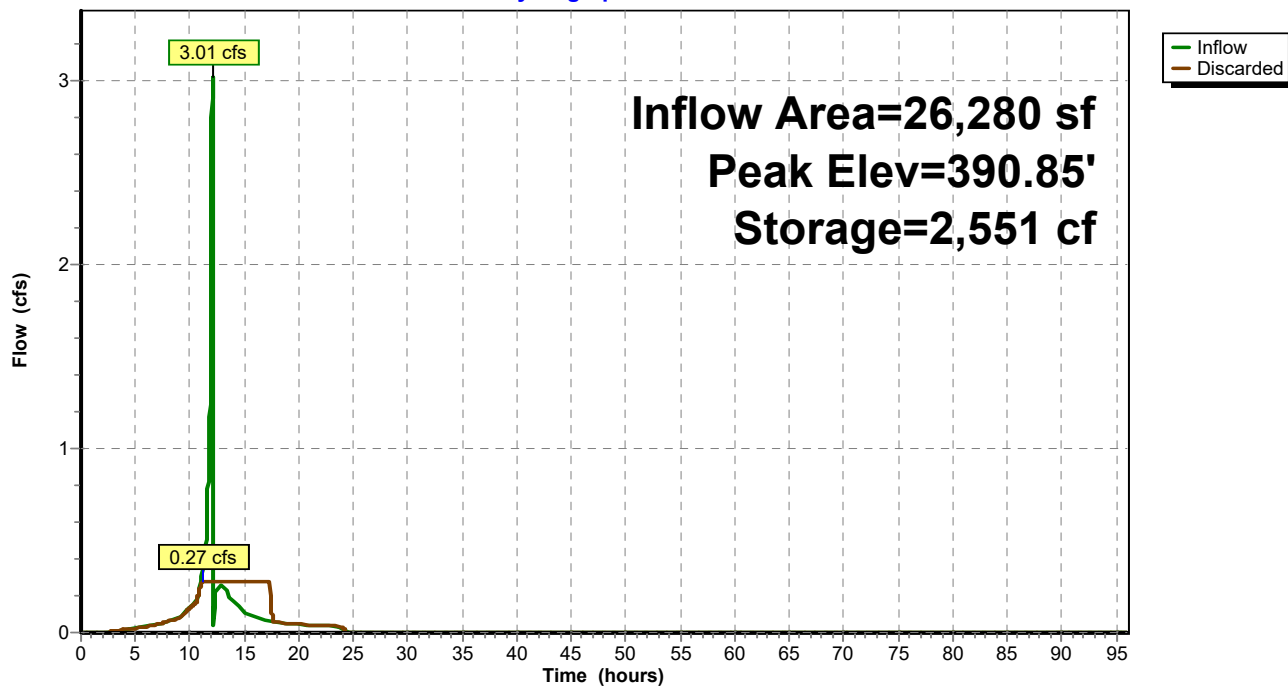
168.5 cy Field

108.1 cy Stone



Pond 47: INF-9

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 50-yr Rainfall=7.70"

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment34: Post B0 (Offsite) Runoff Area=1,510,771 sf 32.24% Impervious Runoff Depth=5.81"
Flow Length=1,871' Tc=32.3 min CN=84 Runoff=150.90 cfs 731,166 cf

Pond 35: Offsite Pond B Peak Elev=386.31' Storage=324,023 cf Inflow=150.90 cfs 731,166 cf
36.0" Round Culvert n=0.025 L=158.0' S=0.0127 '/' Outflow=43.05 cfs 729,880 cf

Subcatchment36: Post B1 Runoff Area=58,920 sf 32.46% Impervious Runoff Depth=5.00"
Tc=6.0 min CN=77 Runoff=10.40 cfs 24,549 cf

Subcatchment37: Post B3 Runoff Area=127,555 sf 34.71% Impervious Runoff Depth=5.11"
Tc=6.0 min CN=78 Runoff=22.94 cfs 54,364 cf

Pond 38: Wet Pond (SWP-4) Peak Elev=378.52' Storage=263,853 cf Inflow=53.88 cfs 814,150 cf
Outflow=42.17 cfs 813,850 cf

Subcatchment39: Post B2 Runoff Area=133,020 sf 50.44% Impervious Runoff Depth=5.92"
Tc=6.0 min CN=85 Runoff=26.76 cfs 65,669 cf

Pond 40: DIV-3 Peak Elev=381.87' Inflow=26.76 cfs 65,669 cf
Primary=5.68 cfs 41,403 cf Secondary=21.62 cfs 24,265 cf Outflow=26.76 cfs 65,669 cf

Pond 41: INF-3 Peak Elev=381.18' Storage=11,473 cf Inflow=5.68 cfs 41,403 cf
Outflow=1.13 cfs 41,403 cf

Subcatchment42: Post B4 Runoff Area=879,847 sf 0.00% Impervious Runoff Depth=4.21"
Flow Length=675' Tc=15.1 min CN=70 Runoff=95.15 cfs 308,504 cf

Reach 43: Existing Stream B Avg. Flow Depth=1.60' Max Vel=10.20 fps Inflow=119.70 cfs 1,146,620 cf
n=0.040 L=1,360.0' S=0.0721 '/' Capacity=291.69 cfs Outflow=117.97 cfs 1,146,610 cf

Link 44: Design Point B Inflow=117.97 cfs 1,146,610 cf
Primary=117.97 cfs 1,146,610 cf

Subcatchment45: Post B7 Runoff Area=26,280 sf 87.02% Impervious Runoff Depth=7.10"
Tc=6.0 min CN=95 Runoff=5.82 cfs 15,555 cf

Pond 46: DIV-3 Peak Elev=390.88' Inflow=5.82 cfs 15,555 cf
Primary=2.78 cfs 10,198 cf Secondary=5.56 cfs 5,356 cf Outflow=5.82 cfs 15,555 cf

Pond 47: INF-9 Peak Elev=390.88' Storage=2,568 cf Inflow=2.78 cfs 10,198 cf
Outflow=0.27 cfs 10,198 cf

Total Runoff Area = 2,736,393 sf Runoff Volume = 1,199,808 cf Average Runoff Depth = 5.26"
76.60% Pervious = 2,095,980 sf 23.40% Impervious = 640,413 sf

N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 50-yr Rainfall=7.70"

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Printed 5/12/2021

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Summary for Subcatchment 34: Post B0 (Offsite)

Runoff = 150.90 cfs @ 12.45 hrs, Volume= 731,166 cf, Depth= 5.81"

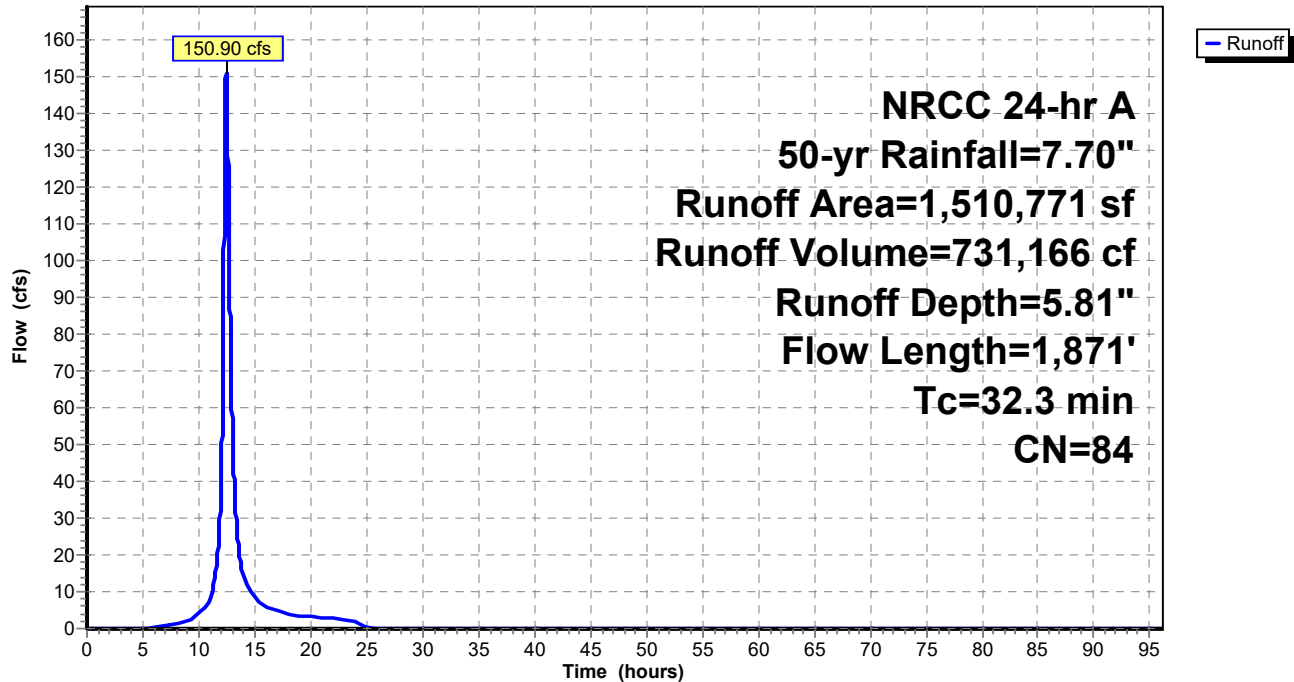
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 50-yr Rainfall=7.70"

Area (sf)	CN	Description
487,056	98	Paved parking, HSG C
497,987	77	Woods, Good, HSG D
134,328	70	Woods, Good, HSG C
375,457	80	>75% Grass cover, Good, HSG D
15,943	74	>75% Grass cover, Good, HSG C
1,510,771	84	Weighted Average
1,023,715		67.76% Pervious Area
487,056		32.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0300	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
9.5	848	0.0085	1.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.1	856	0.0093	2.78	3.06	Trap/Vee/Rect Channel Flow, Bot.W=3.00' D=0.33' Z= 1.0 '/' Top.W=3.66' n= 0.022 Earth, clean & straight
0.2	67	0.0150	6.66	64.08	Pipe Channel, 42.0" Round Area= 9.6 sf Perim= 11.0' r= 0.88' n= 0.025 Corrugated metal
32.3	1,871	Total			

Subcatchment 34: Post B0 (Offsite)

Hydrograph



Summary for Pond 35: Offsite Pond B

Inflow Area = 1,510,771 sf, 32.24% Impervious, Inflow Depth = 5.81" for 50-yr event
 Inflow = 150.90 cfs @ 12.45 hrs, Volume= 731,166 cf
 Outflow = 43.05 cfs @ 13.12 hrs, Volume= 729,880 cf, Atten= 71%, Lag= 40.3 min
 Primary = 43.05 cfs @ 13.12 hrs, Volume= 729,880 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 386.31' @ 13.12 hrs Surf.Area= 98,584 sf Storage= 324,023 cf

Plug-Flow detention time= 131.2 min calculated for 729,804 cf (100% of inflow)
 Center-of-Mass det. time= 130.5 min (943.6 - 813.2)

Volume	Invert	Avail.Storage	Storage Description
#1	382.00'	610,998 cf	Custom Stage Data (Irregular) Listed below (Recalc)

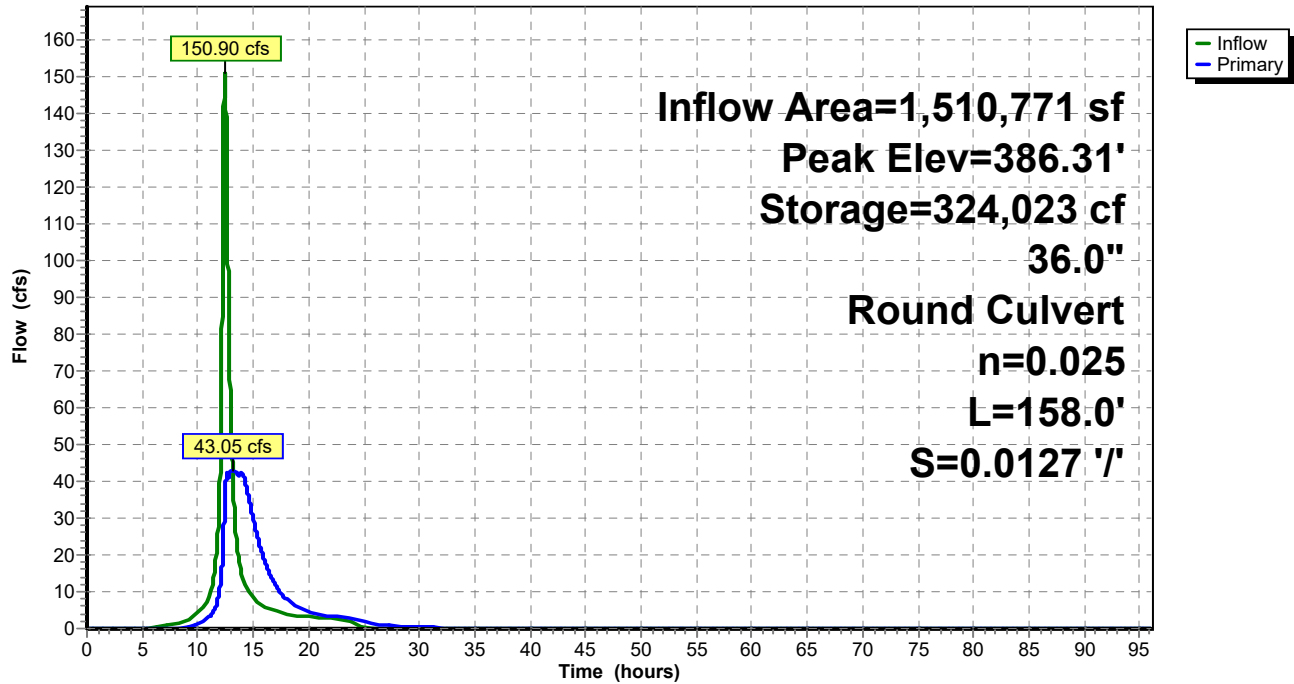
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
382.00	36,540	1,177.0	0	0	36,540
384.00	81,987	1,579.0	115,507	115,507	124,748
386.00	96,790	1,622.0	178,572	294,080	136,159
388.00	108,795	1,657.0	205,468	499,548	145,863
389.00	114,127	1,679.0	111,450	610,998	151,937

Device	Routing	Invert	Outlet Devices
#1	Primary	382.00'	36.0" Round Culvert L= 158.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 382.00' / 380.00' S= 0.0127 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 7.07 sf

Primary OutFlow Max=43.05 cfs @ 13.12 hrs HW=386.31' TW=378.29' (Dynamic Tailwater)
 ↑**1=Culvert** (Barrel Controls 43.05 cfs @ 6.09 fps)

Pond 35: Offsite Pond B

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

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NRCC 24-hr A 50-yr Rainfall=7.70"

Printed 5/12/2021

Summary for Subcatchment 36: Post B1

Runoff = 10.40 cfs @ 12.13 hrs, Volume= 24,549 cf, Depth= 5.00"

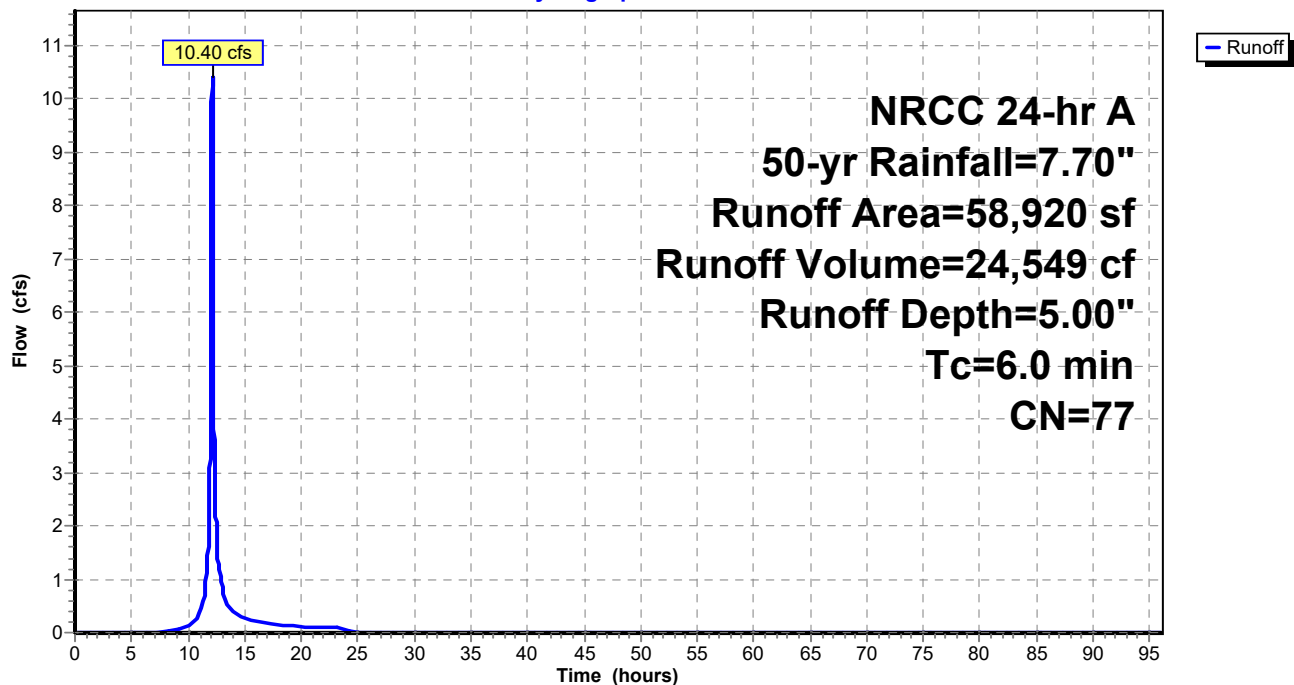
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 50-yr Rainfall=7.70"

Area (sf)	CN	Description
19,123	98	Paved parking, HSG C
22,978	74	>75% Grass cover, Good, HSG C
4,537	61	>75% Grass cover, Good, HSG B
12,282	55	Woods, Good, HSG B
58,920	77	Weighted Average
39,797		67.54% Pervious Area
19,123		32.46% Impervious Area

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

Subcatchment 36: Post B1

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

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NRCC 24-hr A 50-yr Rainfall=7.70"

Printed 5/12/2021

Summary for Subcatchment 37: Post B3

Runoff = 22.94 cfs @ 12.13 hrs, Volume= 54,364 cf, Depth= 5.11"

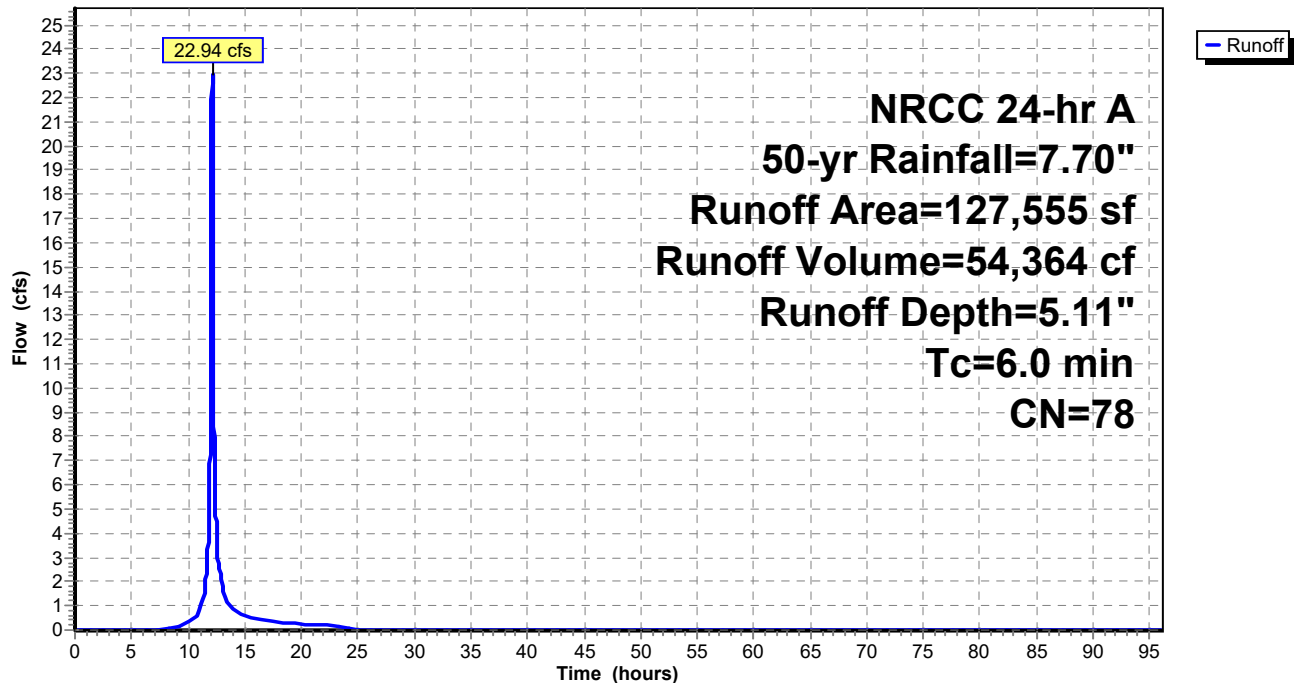
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 50-yr Rainfall=7.70"

Area (sf)	CN	Description
44,276	98	Water Surface, HSG C
22,184	74	>75% Grass cover, Good, HSG C
61,095	65	Brush, Good, HSG C
127,555	78	Weighted Average
83,279		65.29% Pervious Area
44,276		34.71% Impervious Area

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

Subcatchment 37: Post B3

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Pond 38: Wet Pond (SWP-4)

Inflow Area = 1,697,246 sf, 32.43% Impervious, Inflow Depth = 5.76" for 50-yr event
 Inflow = 53.88 cfs @ 12.14 hrs, Volume= 814,150 cf
 Outflow = 42.17 cfs @ 14.17 hrs, Volume= 813,850 cf, Atten= 22%, Lag= 121.9 min
 Primary = 42.17 cfs @ 14.17 hrs, Volume= 813,850 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Starting Elev= 376.00' Surf.Area= 88,186 sf Storage= 134,213 cf
 Peak Elev= 378.52' @ 14.17 hrs Surf.Area= 101,416 sf Storage= 263,853 cf (129,640 cf above start)

Plug-Flow detention time= 204.2 min calculated for 679,566 cf (83% of inflow)
 Center-of-Mass det. time= 68.7 min (997.2 - 928.5)

Volume	Invert	Avail.Storage	Storage Description
#1	372.00'	7,914 cf	Forebay (Irregular) Listed below (Recalc)
#2	372.00'	121,847 cf	Permanent Pool (Irregular) Listed below (Recalc)
#3	375.90'	259,334 cf	Additional Storage (Irregular) Listed below (Recalc)
		389,094 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
372.00	885	114.0	0	0	885
373.00	1,392	139.2	1,129	1,129	1,408
374.00	1,998	164.4	1,686	2,815	2,036
375.00	2,707	189.5	2,344	5,158	2,764
375.90	3,430	212.2	2,755	7,914	3,512

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
372.00	22,804	1,051.3	0	0	22,804
373.00	27,060	1,076.5	24,902	24,902	27,202
374.00	31,416	1,101.7	29,211	54,113	31,703
375.00	35,874	1,127.0	33,620	87,733	36,327
375.90	39,971	1,149.7	34,114	121,847	40,565

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
375.90	44,276	1,380.7	0	0	44,276
377.00	50,030	1,294.2	51,836	51,836	62,747
378.00	55,257	1,319.4	52,622	104,458	68,149
379.00	60,586	1,344.7	57,901	162,359	73,675
380.00	66,015	1,370.0	63,281	225,640	79,307
380.50	68,768	1,382.6	33,693	259,334	82,151

Device	Routing	Invert	Outlet Devices
#1	Primary	376.00'	4.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

N60 P1 Post-B 2021 - 5-4-12 AW

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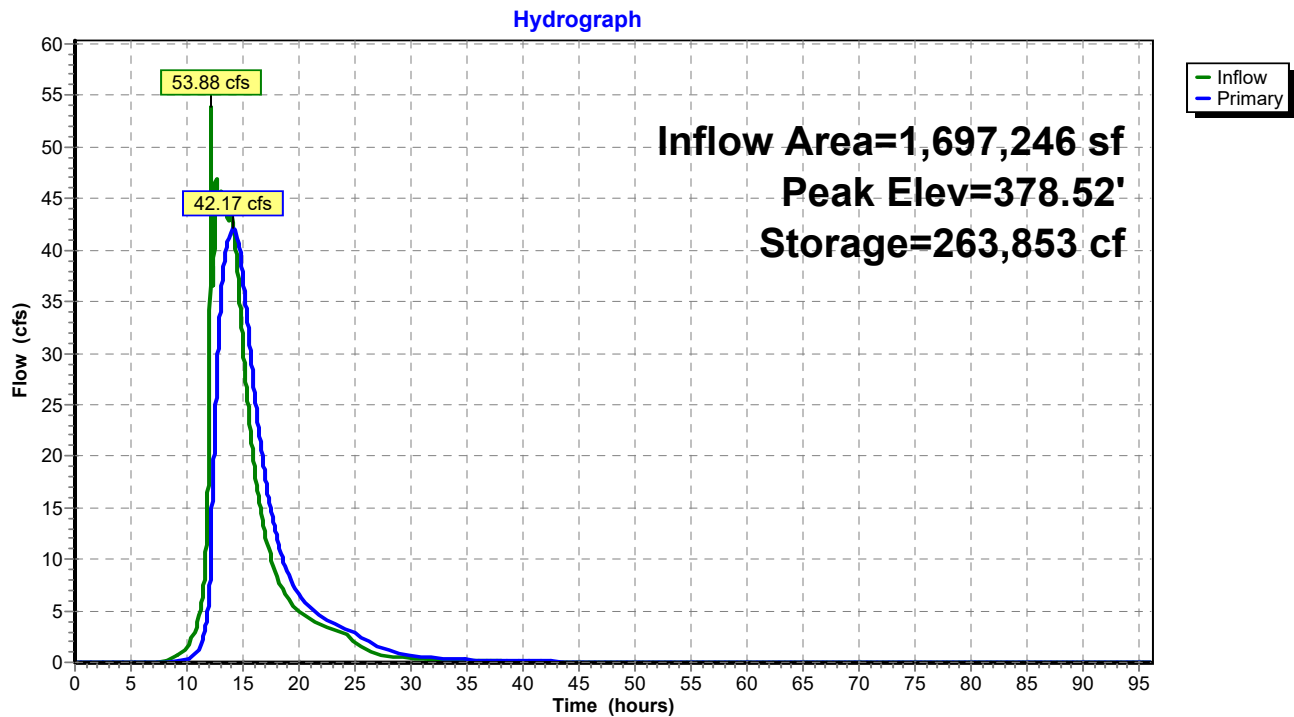
NRCC 24-hr A 50-yr Rainfall=7.70"

Printed 5/12/2021

Primary OutFlow Max=42.17 cfs @ 14.17 hrs HW=378.52' TW=313.00' (Dynamic Tailwater)

1=Broad-Crested Rectangular Weir (Weir Controls 42.17 cfs @ 4.18 fps)

Pond 38: Wet Pond (SWP-4)



N60 P1 Post-B 2021 - 5-4-12 AW

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NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Subcatchment 39: Post B2

Runoff = 26.76 cfs @ 12.13 hrs, Volume= 65,669 cf, Depth= 5.92"

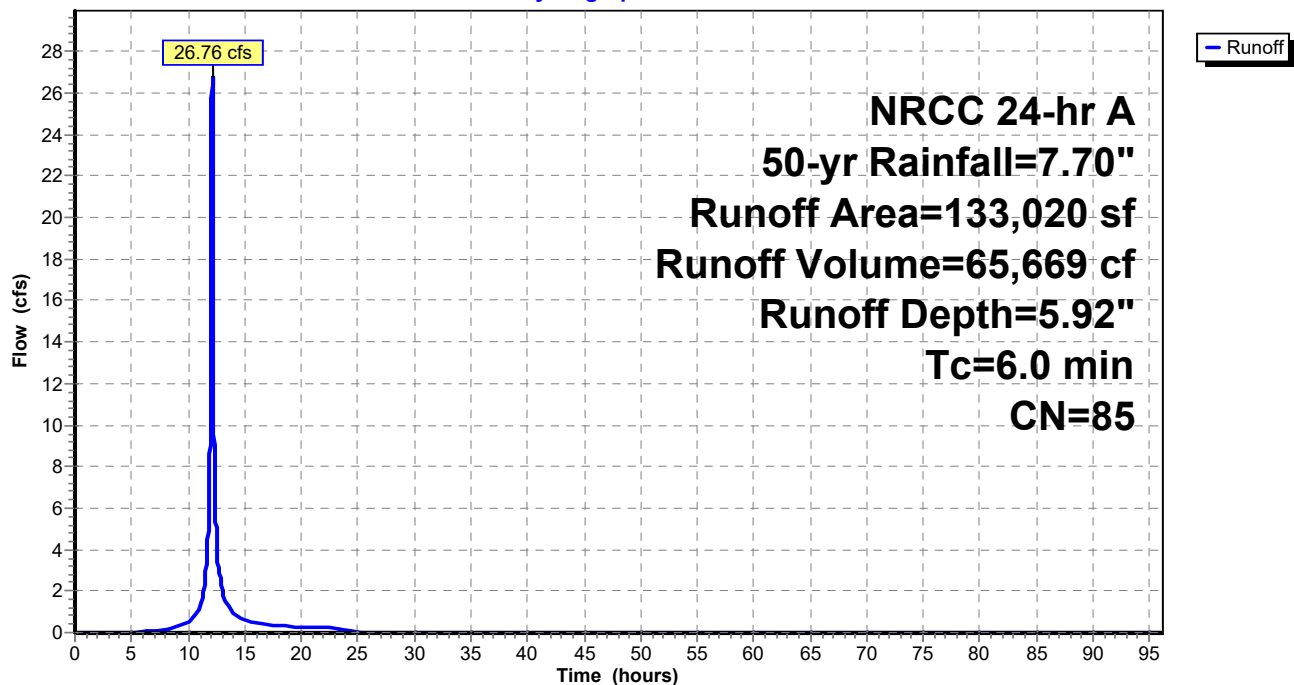
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 50-yr Rainfall=7.70"

Area (sf)	CN	Description
67,090	98	Paved parking, HSG C
40,460	74	>75% Grass cover, Good, HSG C
7,690	61	>75% Grass cover, Good, HSG B
17,780	70	Woods, Good, HSG C
133,020	85	Weighted Average
65,930		49.56% Pervious Area
67,090		50.44% Impervious Area

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

Subcatchment 39: Post B2

Hydrograph



Summary for Pond 40: DIV-3

Inflow Area = 133,020 sf, 50.44% Impervious, Inflow Depth = 5.92" for 50-yr event
 Inflow = 26.76 cfs @ 12.13 hrs, Volume= 65,669 cf
 Outflow = 26.76 cfs @ 12.13 hrs, Volume= 65,669 cf, Atten= 0%, Lag= 0.0 min
 Primary = 5.68 cfs @ 11.82 hrs, Volume= 41,403 cf
 Secondary = 21.62 cfs @ 12.13 hrs, Volume= 24,265 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 381.87' @ 12.13 hrs

Flood Elev= 386.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	378.00'	12.0" Round Culvert L= 9.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 378.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	378.00'	24.0" Round Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 377.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	381.00'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=5.61 cfs @ 11.82 hrs HW=381.02' TW=378.81' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 5.61 cfs @ 7.15 fps)

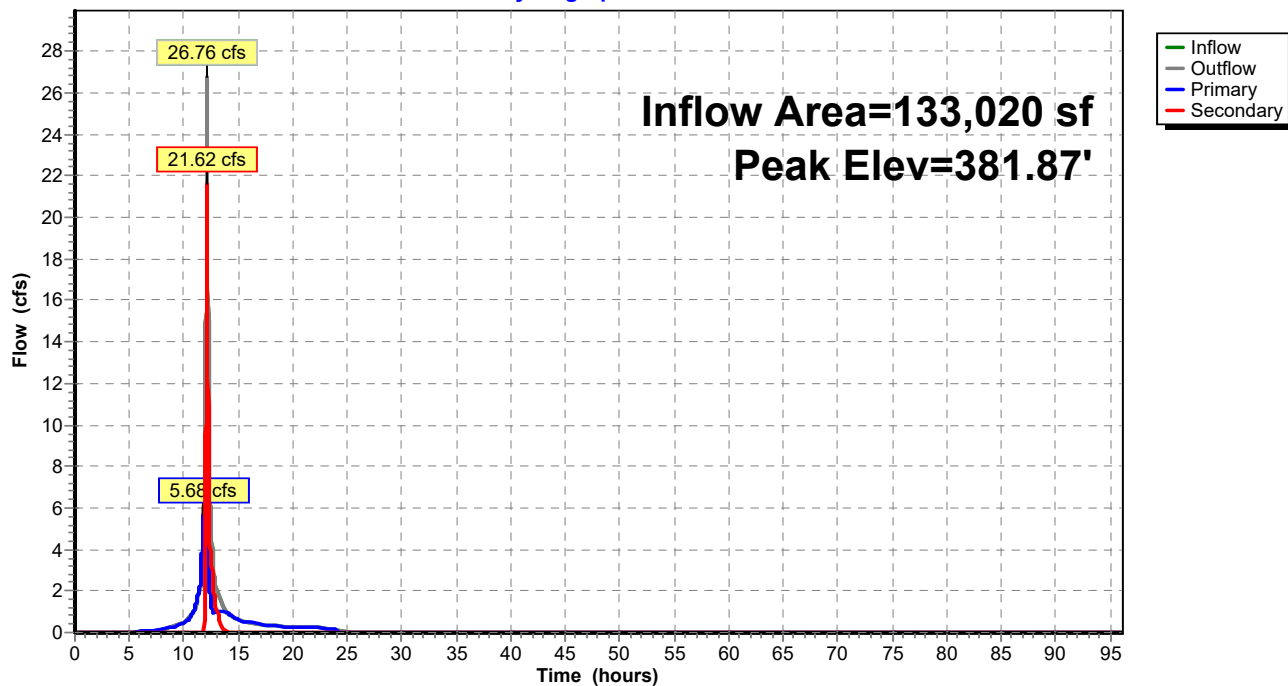
Secondary OutFlow Max=21.59 cfs @ 12.13 hrs HW=381.87' TW=313.36' (Dynamic Tailwater)

↑ **2=Culvert** (Passes 21.59 cfs of 25.64 cfs potential flow)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 21.59 cfs @ 3.09 fps)

Pond 40: DIV-3

Hydrograph



Summary for Pond 41: INF-3

Inflow Area = 133,020 sf, 50.44% Impervious, Inflow Depth = 3.74" for 50-yr event
 Inflow = 5.68 cfs @ 11.82 hrs, Volume= 41,403 cf
 Outflow = 1.13 cfs @ 11.09 hrs, Volume= 41,403 cf, Atten= 80%, Lag= 0.0 min
 Discarded = 1.13 cfs @ 11.09 hrs, Volume= 41,403 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 381.18' @ 12.57 hrs Surf.Area= 4,883 sf Storage= 11,473 cf

Plug-Flow detention time= 78.3 min calculated for 41,399 cf (100% of inflow)
 Center-of-Mass det. time= 78.3 min (893.4 - 815.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	377.50'	4,711 cf	45.00'W x 108.50'L x 3.88'H Field A 18,920 cf Overall - 7,142 cf Embedded = 11,778 cf x 40.0% Voids
#2A	378.00'	7,142 cf	Cultec R-330XLHD x 135 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 9 rows
		11,853 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	377.50'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.10'

Discarded OutFlow Max=1.13 cfs @ 11.09 hrs HW=377.62' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 1.13 cfs)

Pond 41: INF-3 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 9 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

15 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 106.50' Row Length +12.0" End Stone x 2 = 108.50' Base Length

9 Rows x 52.0" Wide + 6.0" Spacing x 8 + 12.0" Side Stone x 2 = 45.00' Base Width

6.0" Base + 30.5" Chamber Height + 10.0" Cover = 3.88' Field Height

135 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 9 Rows = 7,141.8 cf Chamber Storage

18,919.7 cf Field - 7,141.8 cf Chambers = 11,777.9 cf Stone x 40.0% Voids = 4,711.2 cf Stone Storage

Chamber Storage + Stone Storage = 11,852.9 cf = 0.272 af

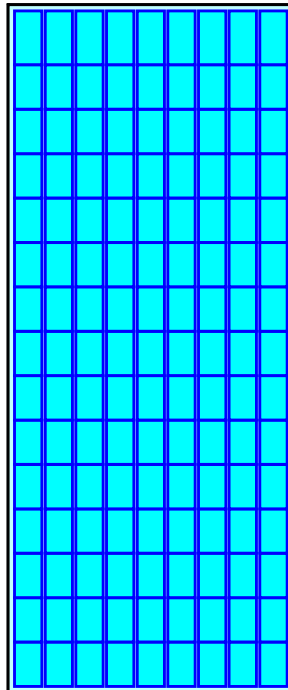
Overall Storage Efficiency = 62.6%

Overall System Size = 108.50' x 45.00' x 3.88'

135 Chambers

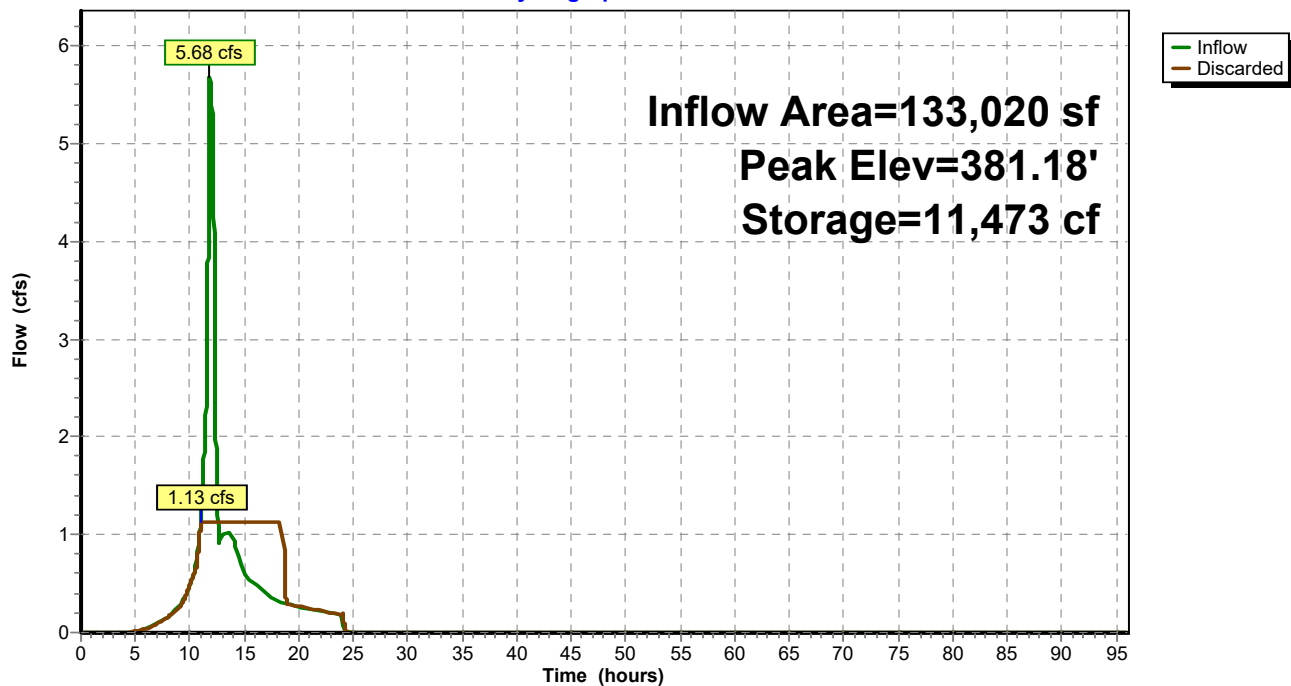
700.7 cy Field

436.2 cy Stone



Pond 41: INF-3

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

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NRCC 24-hr A 50-yr Rainfall=7.70"

Printed 5/12/2021

Summary for Subcatchment 42: Post B4

Runoff = 95.15 cfs @ 12.23 hrs, Volume= 308,504 cf, Depth= 4.21"

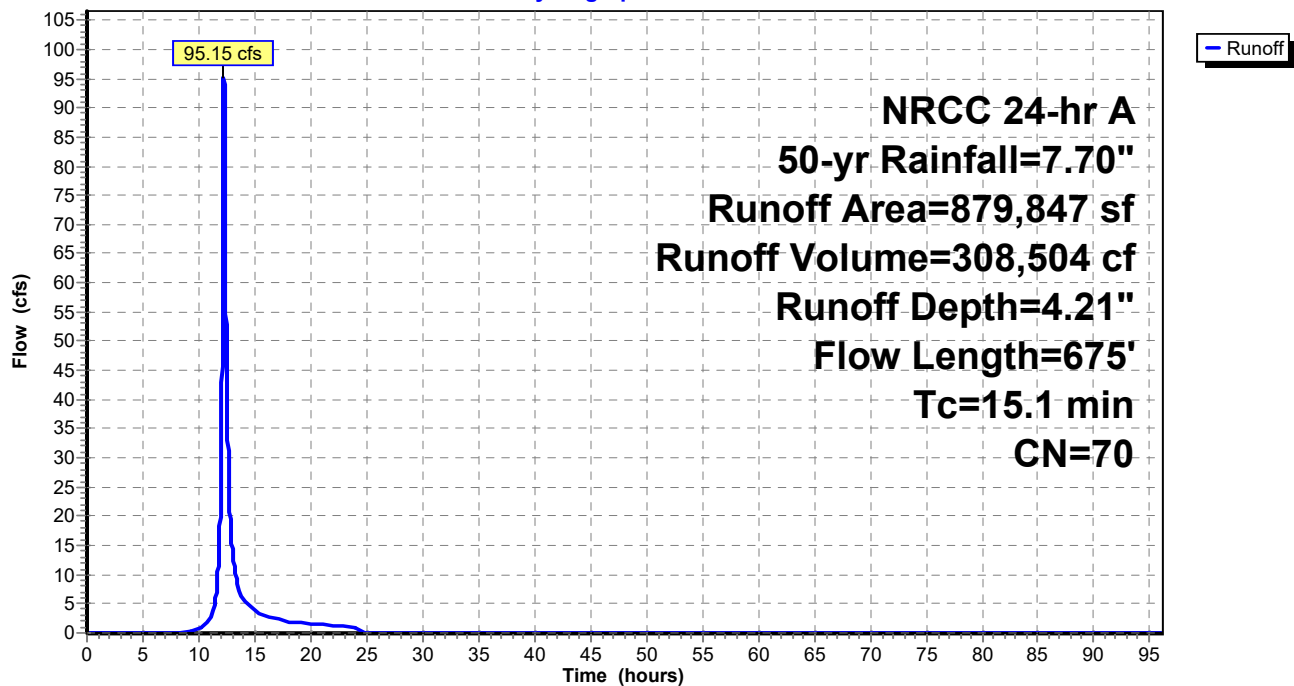
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 50-yr Rainfall=7.70"

Area (sf)	CN	Description
19,672	61	>75% Grass cover, Good, HSG B
13,245	74	>75% Grass cover, Good, HSG C
16,422	55	Woods, Good, HSG B
810,443	70	Woods, Good, HSG C
20,065	70	Woods, Good, HSG C
879,847	70	Weighted Average
879,847		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	100	0.0600	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.9	575	0.0950	4.96		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.1	675	Total			

Subcatchment 42: Post B4

Hydrograph



Summary for Reach 43: Existing Stream B

Inflow Area = 2,577,093 sf, 21.36% Impervious, Inflow Depth = 5.34" for 50-yr event
Inflow = 119.70 cfs @ 12.23 hrs, Volume= 1,146,620 cf
Outflow = 117.97 cfs @ 12.25 hrs, Volume= 1,146,610 cf, Atten= 1%, Lag= 1.5 min

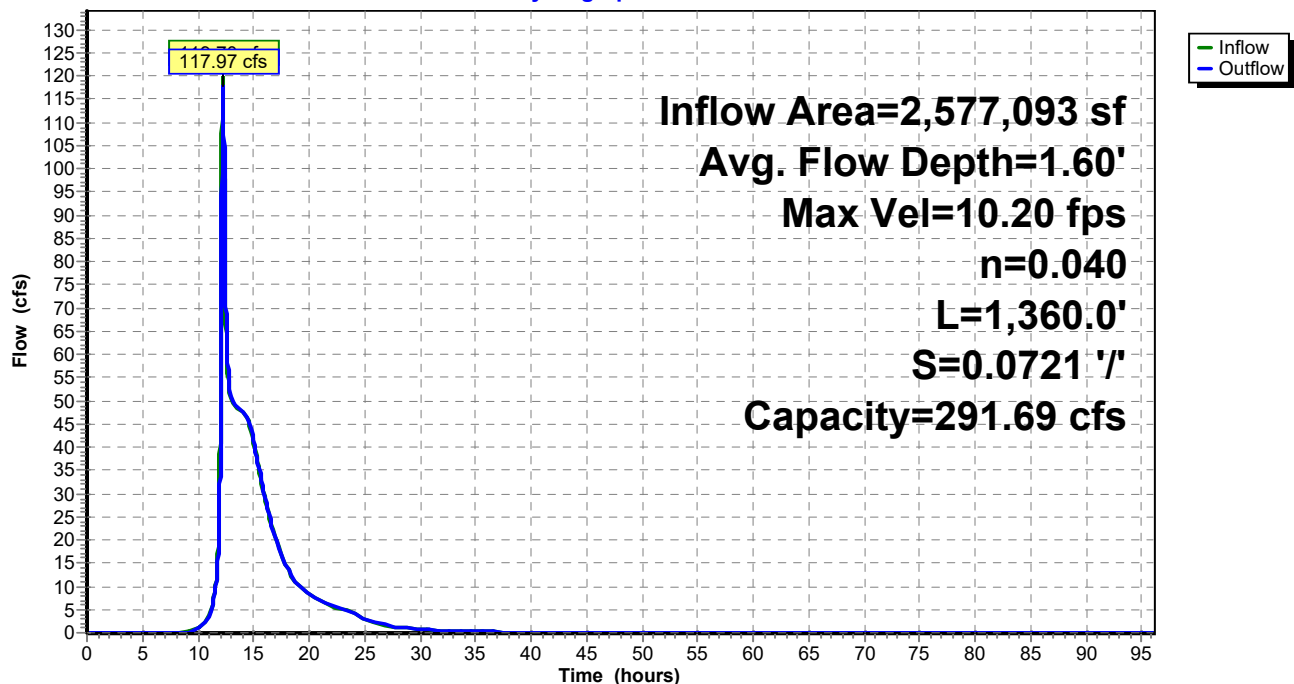
Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 10.20 fps, Min. Travel Time= 2.2 min
Avg. Velocity = 1.78 fps, Avg. Travel Time= 12.7 min

Peak Storage= 15,725 cf @ 12.25 hrs
Average Depth at Peak Storage= 1.60'
Bank-Full Depth= 2.50' Flow Area= 22.5 sf, Capacity= 291.69 cfs

4.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 1,360.0' Slope= 0.0721 '/'
Inlet Invert= 312.00', Outlet Invert= 214.00'

**Reach 43: Existing Stream B**

Hydrograph



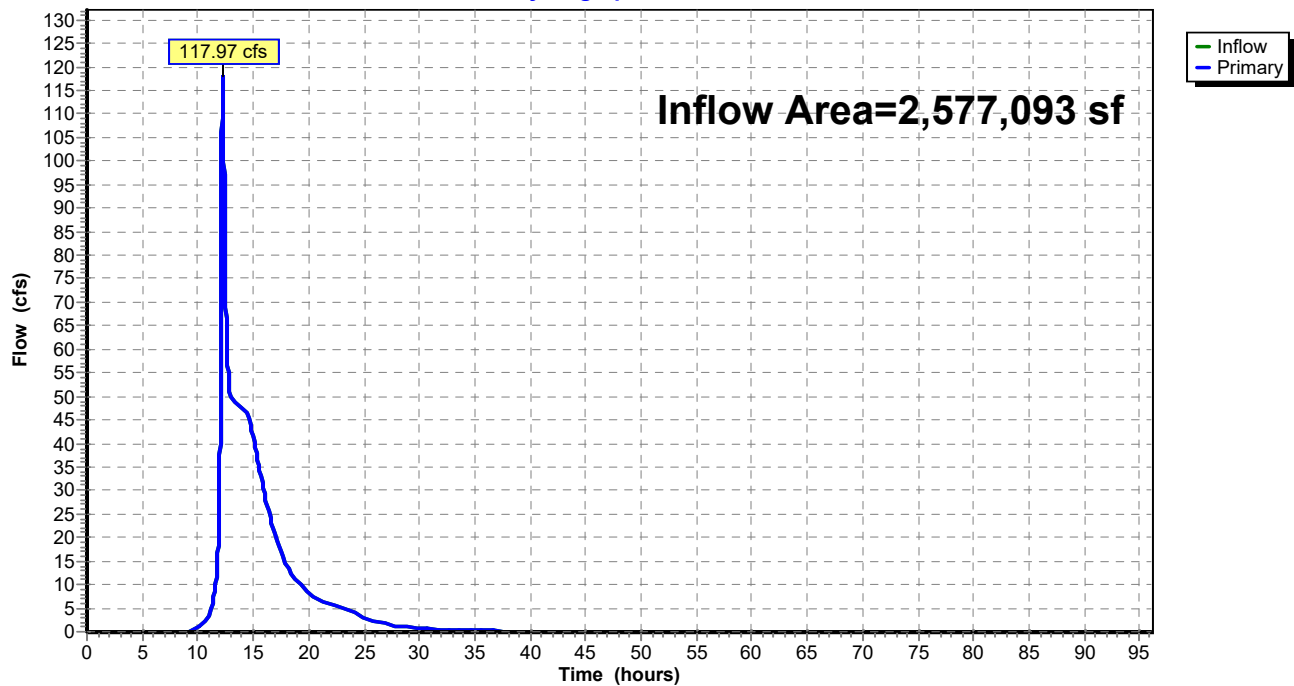
Summary for Link 44: Design Point B

Inflow Area = 2,577,093 sf, 21.36% Impervious, Inflow Depth = 5.34" for 50-yr event
 Inflow = 117.97 cfs @ 12.25 hrs, Volume= 1,146,610 cf
 Primary = 117.97 cfs @ 12.25 hrs, Volume= 1,146,610 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 44: Design Point B

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

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NRCC 24-hr A 50-yr Rainfall=7.70"

Printed 5/12/2021

Summary for Subcatchment 45: Post B7

Runoff = 5.82 cfs @ 12.13 hrs, Volume= 15,555 cf, Depth= 7.10"

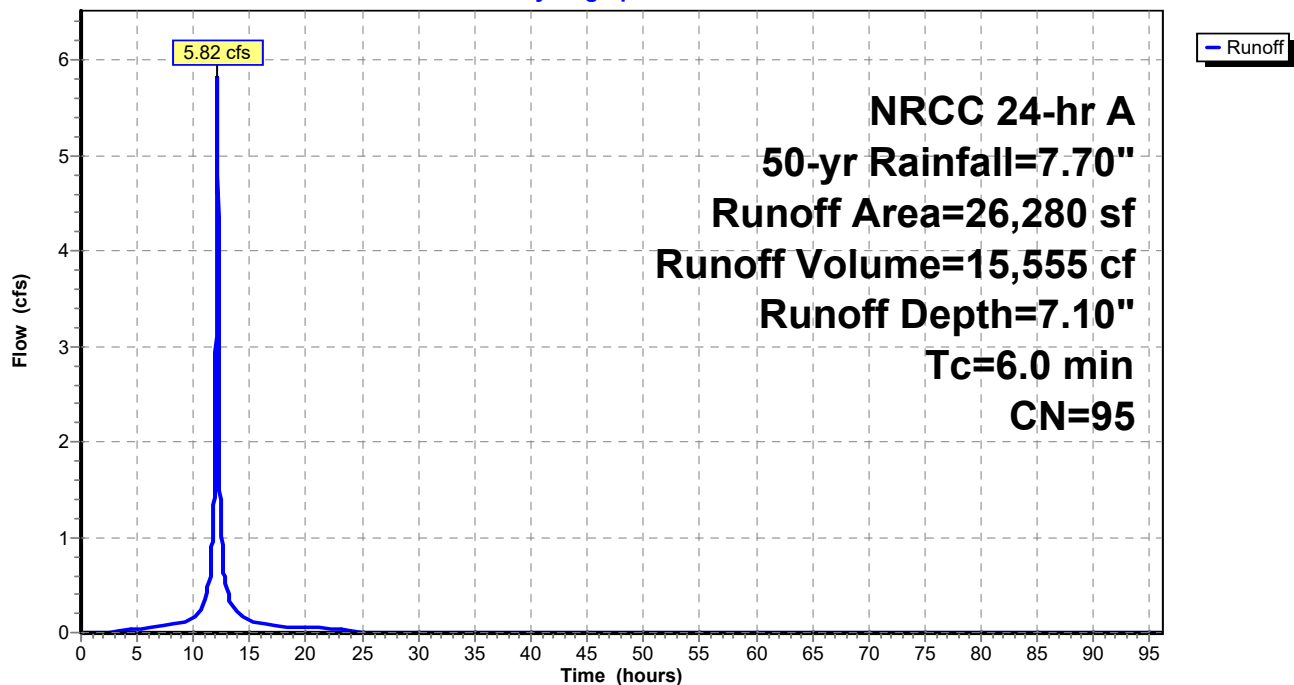
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 50-yr Rainfall=7.70"

Area (sf)	CN	Description
14,320	98	Roofs, HSG C
4,847	98	Paved parking, HSG A
3,412	74	>75% Grass cover, Good, HSG C
* 3,701	98	Paved Walkway
26,280	95	Weighted Average
3,412		12.98% Pervious Area
22,868		87.02% Impervious Area

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

Subcatchment 45: Post B7

Hydrograph



Summary for Pond 46: DIV-3

Inflow Area = 26,280 sf, 87.02% Impervious, Inflow Depth = 7.10" for 50-yr event
 Inflow = 5.82 cfs @ 12.13 hrs, Volume= 15,555 cf
 Outflow = 5.82 cfs @ 12.13 hrs, Volume= 15,555 cf, Atten= 0%, Lag= 0.0 min
 Primary = 2.78 cfs @ 11.98 hrs, Volume= 10,198 cf
 Secondary = 5.56 cfs @ 12.14 hrs, Volume= 5,356 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 390.88' @ 12.14 hrs

Flood Elev= 392.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	388.00'	12.0" Round Culvert L= 17.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 388.00' / 388.00' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	388.00'	24.0" Round Culvert L= 113.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 388.00' / 386.00' S= 0.0177 ' S= 0.0177 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	390.50'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=2.43 cfs @ 11.98 hrs HW=390.48' TW=390.07' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 2.43 cfs @ 3.10 fps)

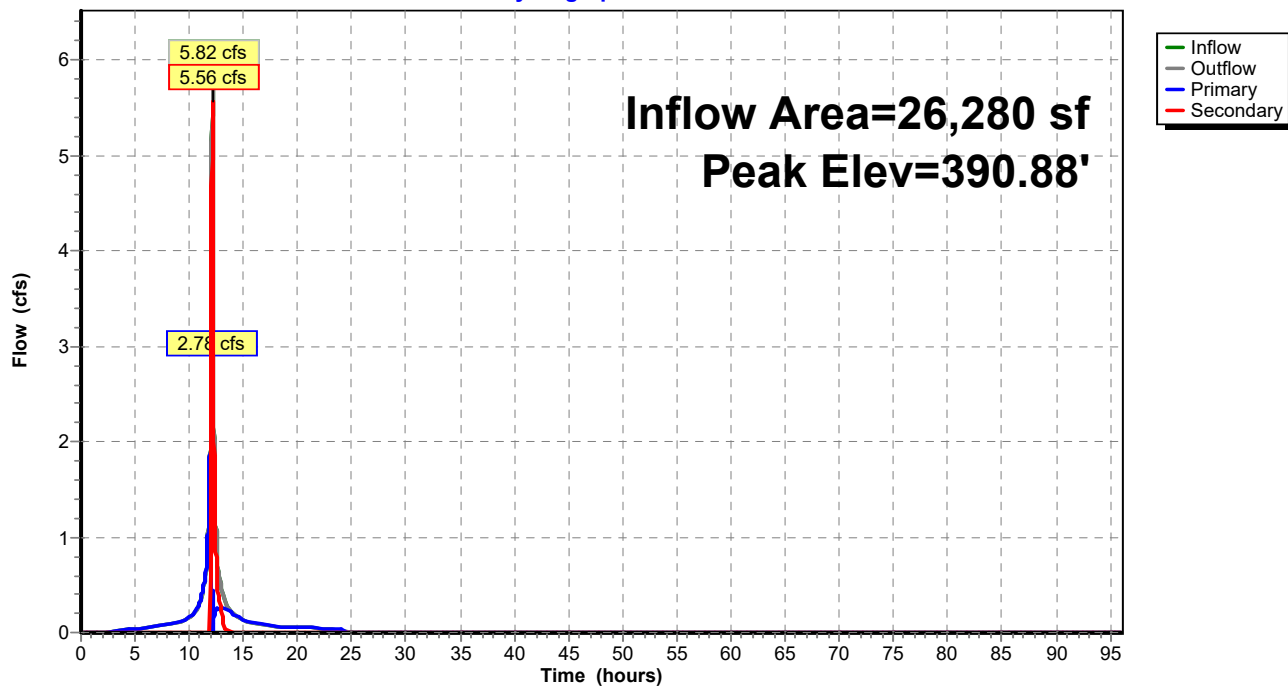
Secondary OutFlow Max=5.55 cfs @ 12.14 hrs HW=390.88' TW=377.07' (Dynamic Tailwater)

↑ **2=Culvert** (Passes 5.55 cfs of 20.76 cfs potential flow)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 5.55 cfs @ 1.80 fps)

Pond 46: DIV-3

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 50-yr Rainfall=7.70"

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Summary for Pond 47: INF-9

Inflow Area = 26,280 sf, 87.02% Impervious, Inflow Depth = 4.66" for 50-yr event
 Inflow = 2.78 cfs @ 11.98 hrs, Volume= 10,198 cf
 Outflow = 0.27 cfs @ 10.93 hrs, Volume= 10,198 cf, Atten= 90%, Lag= 0.0 min
 Discarded = 0.27 cfs @ 10.93 hrs, Volume= 10,198 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 390.88' @ 12.13 hrs Surf.Area= 1,174 sf Storage= 2,568 cf

Plug-Flow detention time= 62.7 min calculated for 10,197 cf (100% of inflow)
 Center-of-Mass det. time= 62.7 min (829.7 - 767.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	387.50'	1,167 cf	30.50'W x 38.50'L x 3.88'H Field A 4,550 cf Overall - 1,632 cf Embedded = 2,918 cf x 40.0% Voids
#2A	388.00'	1,632 cf	Cultec R-330XLHD x 30 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 6 rows
		2,799 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	387.50'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.10'

Discarded OutFlow Max=0.27 cfs @ 10.93 hrs HW=387.62' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.27 cfs)

Pond 47: INF-9 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 6 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

5 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 36.50' Row Length +12.0" End Stone x 2 = 38.50' Base Length

6 Rows x 52.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.50' Base Width

6.0" Base + 30.5" Chamber Height + 10.0" Cover = 3.88' Field Height

30 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 6 Rows = 1,631.8 cf Chamber Storage

4,550.2 cf Field - 1,631.8 cf Chambers = 2,918.4 cf Stone x 40.0% Voids = 1,167.4 cf Stone Storage

Chamber Storage + Stone Storage = 2,799.1 cf = 0.064 af

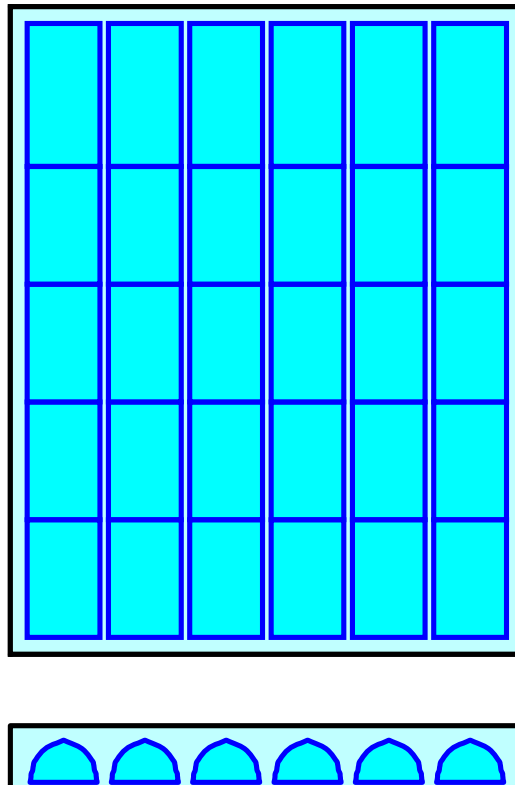
Overall Storage Efficiency = 61.5%

Overall System Size = 38.50' x 30.50' x 3.88'

30 Chambers

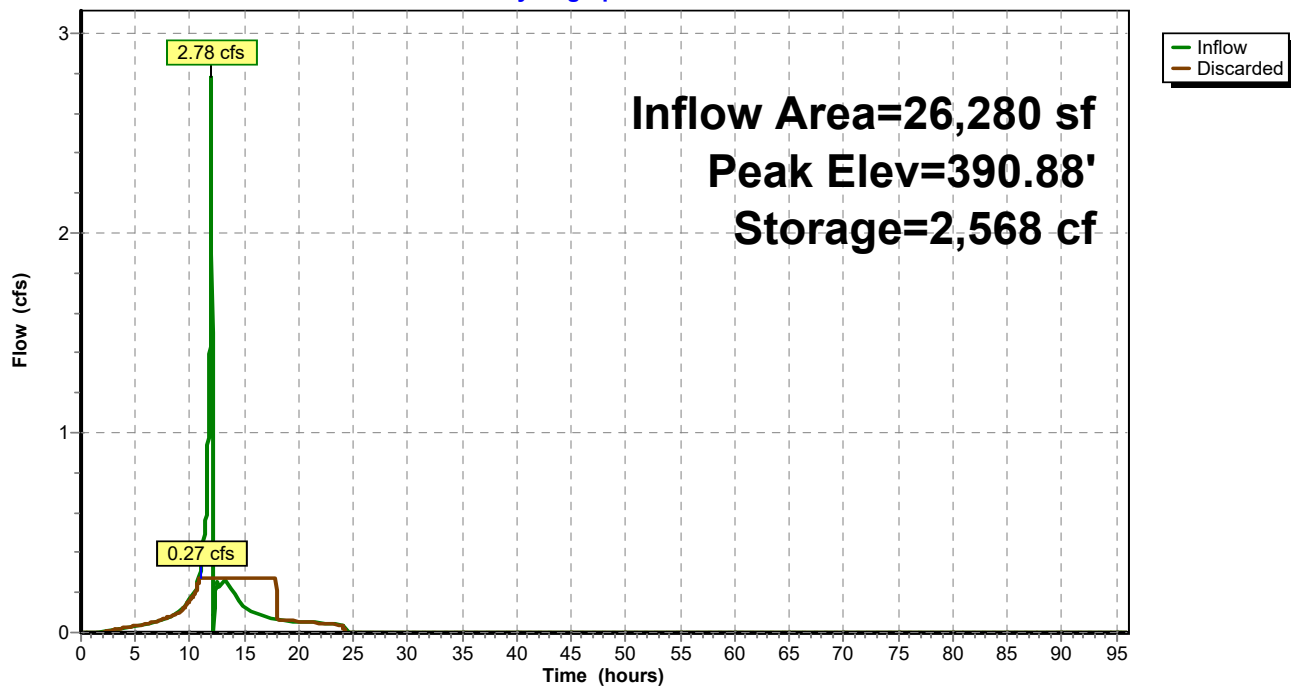
168.5 cy Field

108.1 cy Stone



Pond 47: INF-9

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN

Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment34: Post B0 (Offsite) Runoff Area=1,510,771 sf 32.24% Impervious Runoff Depth=0.41"
Flow Length=1,871' Tc=32.3 min CN=84 Runoff=10.00 cfs 52,139 cf

Pond 35: Offsite Pond B Peak Elev=382.60' Storage=25,141 cf Inflow=10.00 cfs 52,139 cf
36.0" Round Culvert n=0.025 L=158.0' S=0.0127 ' Outflow=1.85 cfs 50,927 cf

Subcatchment36: Post B1 Runoff Area=58,920 sf 32.46% Impervious Runoff Depth=0.21"
Tc=6.0 min CN=77 Runoff=0.33 cfs 1,028 cf

Subcatchment37: Post B3 Runoff Area=127,555 sf 34.71% Impervious Runoff Depth=0.23"
Tc=6.0 min CN=78 Runoff=0.85 cfs 2,479 cf

Pond 38: Wet Pond (SWP-4) Peak Elev=376.25' Storage=145,607 cf Inflow=1.95 cfs 54,434 cf
Outflow=1.35 cfs 54,161 cf

Subcatchment39: Post B2 Runoff Area=133,020 sf 50.44% Impervious Runoff Depth=0.45"
Tc=6.0 min CN=85 Runoff=2.12 cfs 5,009 cf

Pond 40: DIV-3 Peak Elev=379.06' Inflow=2.12 cfs 5,009 cf
Primary=2.12 cfs 5,009 cf Secondary=0.00 cfs 0 cf Outflow=2.12 cfs 5,009 cf

Pond 41: INF-3 Peak Elev=377.76' Storage=509 cf Inflow=2.12 cfs 5,009 cf
Outflow=1.13 cfs 5,009 cf

Subcatchment42: Post B4 Runoff Area=879,847 sf 0.00% Impervious Runoff Depth=0.08"
Flow Length=675' Tc=15.1 min CN=70 Runoff=0.59 cfs 6,148 cf

Reach 43: Existing Stream B Avg. Flow Depth=0.14' Max Vel=2.53 fps Inflow=1.48 cfs 60,309 cf
n=0.040 L=1,360.0' S=0.0721 ' Capacity=291.69 cfs Outflow=1.48 cfs 60,300 cf

Link 44: Design Point B Inflow=1.48 cfs 60,300 cf
Primary=1.48 cfs 60,300 cf

Subcatchment45: Post B7 Runoff Area=26,280 sf 87.02% Impervious Runoff Depth=1.01"
Tc=6.0 min CN=95 Runoff=0.93 cfs 2,218 cf

Pond 46: DIV-3 Peak Elev=388.68' Inflow=0.93 cfs 2,218 cf
Primary=0.93 cfs 2,218 cf Secondary=0.00 cfs 0 cf Outflow=0.93 cfs 2,218 cf

Pond 47: INF-9 Peak Elev=388.21' Storage=445 cf Inflow=0.93 cfs 2,218 cf
Outflow=0.27 cfs 2,218 cf

Total Runoff Area = 2,736,393 sf Runoff Volume = 69,020 cf Average Runoff Depth = 0.30"
76.60% Pervious = 2,095,980 sf 23.40% Impervious = 640,413 sf

N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Subcatchment 34: Post B0 (Offsite)

Runoff = 10.00 cfs @ 12.50 hrs, Volume= 52,139 cf, Depth= 0.41"

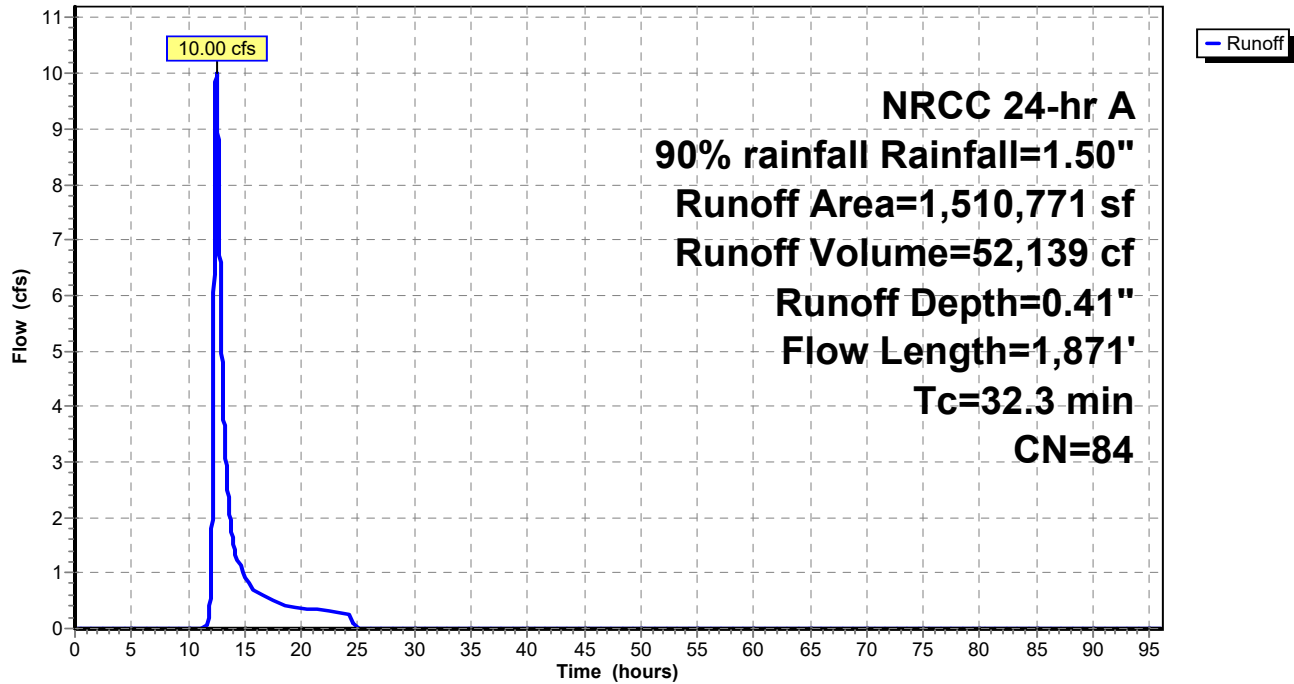
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 90% rainfall Rainfall=1.50"

Area (sf)	CN	Description
487,056	98	Paved parking, HSG C
497,987	77	Woods, Good, HSG D
134,328	70	Woods, Good, HSG C
375,457	80	>75% Grass cover, Good, HSG D
15,943	74	>75% Grass cover, Good, HSG C
1,510,771	84	Weighted Average
1,023,715		67.76% Pervious Area
487,056		32.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0300	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
9.5	848	0.0085	1.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.1	856	0.0093	2.78	3.06	Trap/Vee/Rect Channel Flow, Bot.W=3.00' D=0.33' Z= 1.0 '/' Top.W=3.66' n= 0.022 Earth, clean & straight
0.2	67	0.0150	6.66	64.08	Pipe Channel, 42.0" Round Area= 9.6 sf Perim= 11.0' r= 0.88' n= 0.025 Corrugated metal
32.3	1,871	Total			

Subcatchment 34: Post B0 (Offsite)

Hydrograph



Summary for Pond 35: Offsite Pond B

Inflow Area = 1,510,771 sf, 32.24% Impervious, Inflow Depth = 0.41" for 90% rainfall event
 Inflow = 10.00 cfs @ 12.50 hrs, Volume= 52,139 cf
 Outflow = 1.85 cfs @ 13.76 hrs, Volume= 50,927 cf, Atten= 82%, Lag= 75.9 min
 Primary = 1.85 cfs @ 13.76 hrs, Volume= 50,927 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 382.60' @ 13.76 hrs Surf.Area= 48,176 sf Storage= 25,141 cf

Plug-Flow detention time= 385.2 min calculated for 50,927 cf (98% of inflow)
 Center-of-Mass det. time= 372.0 min (1,251.1 - 879.1)

Volume	Invert	Avail.Storage	Storage Description
#1	382.00'	610,998 cf	Custom Stage Data (Irregular) Listed below (Recalc)

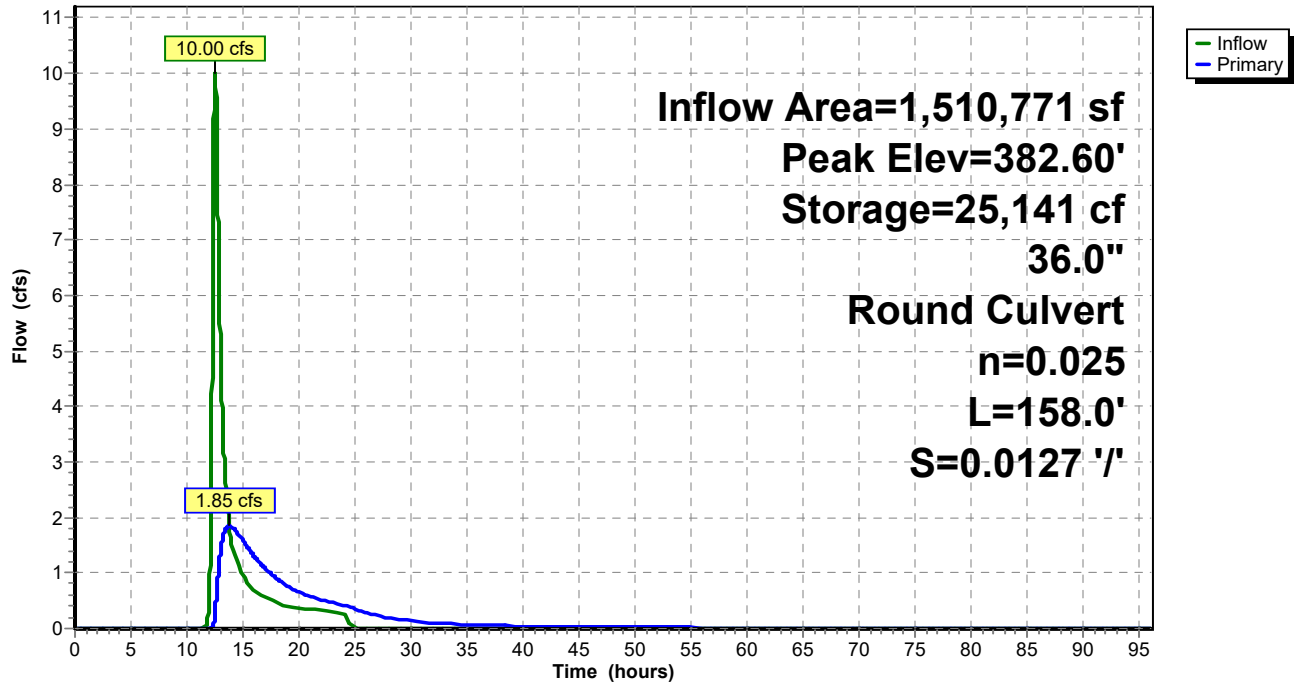
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
382.00	36,540	1,177.0	0	0	36,540
384.00	81,987	1,579.0	115,507	115,507	124,748
386.00	96,790	1,622.0	178,572	294,080	136,159
388.00	108,795	1,657.0	205,468	499,548	145,863
389.00	114,127	1,679.0	111,450	610,998	151,937

Device	Routing	Invert	Outlet Devices
#1	Primary	382.00'	36.0" Round Culvert L= 158.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 382.00' / 380.00' S= 0.0127 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 7.07 sf

Primary OutFlow Max=1.85 cfs @ 13.76 hrs HW=382.60' TW=376.16' (Dynamic Tailwater)
 ↑**1=Culvert** (Barrel Controls 1.85 cfs @ 2.81 fps)

Pond 35: Offsite Pond B

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Subcatchment 36: Post B1

Runoff = 0.33 cfs @ 12.15 hrs, Volume= 1,028 cf, Depth= 0.21"

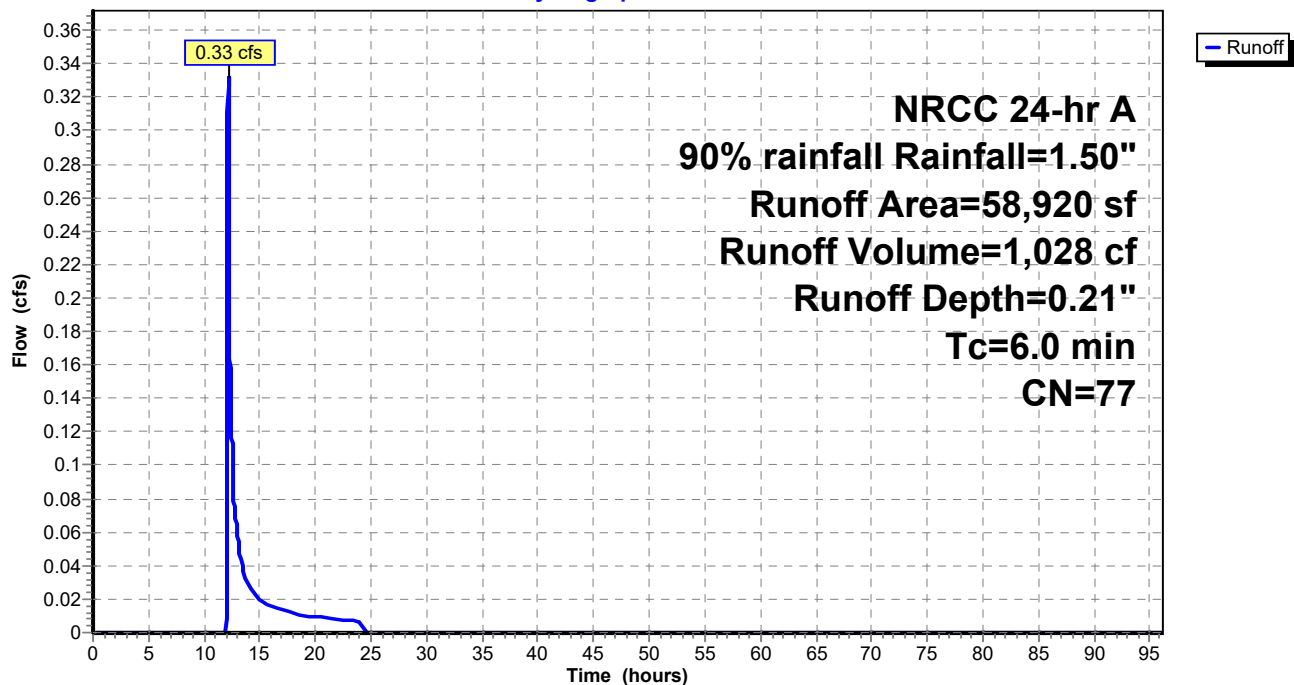
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 90% rainfall Rainfall=1.50"

Area (sf)	CN	Description
19,123	98	Paved parking, HSG C
22,978	74	>75% Grass cover, Good, HSG C
4,537	61	>75% Grass cover, Good, HSG B
12,282	55	Woods, Good, HSG B
58,920	77	Weighted Average
39,797		67.54% Pervious Area
19,123		32.46% Impervious Area

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

Subcatchment 36: Post B1

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Subcatchment 37: Post B3

Runoff = 0.85 cfs @ 12.15 hrs, Volume= 2,479 cf, Depth= 0.23"

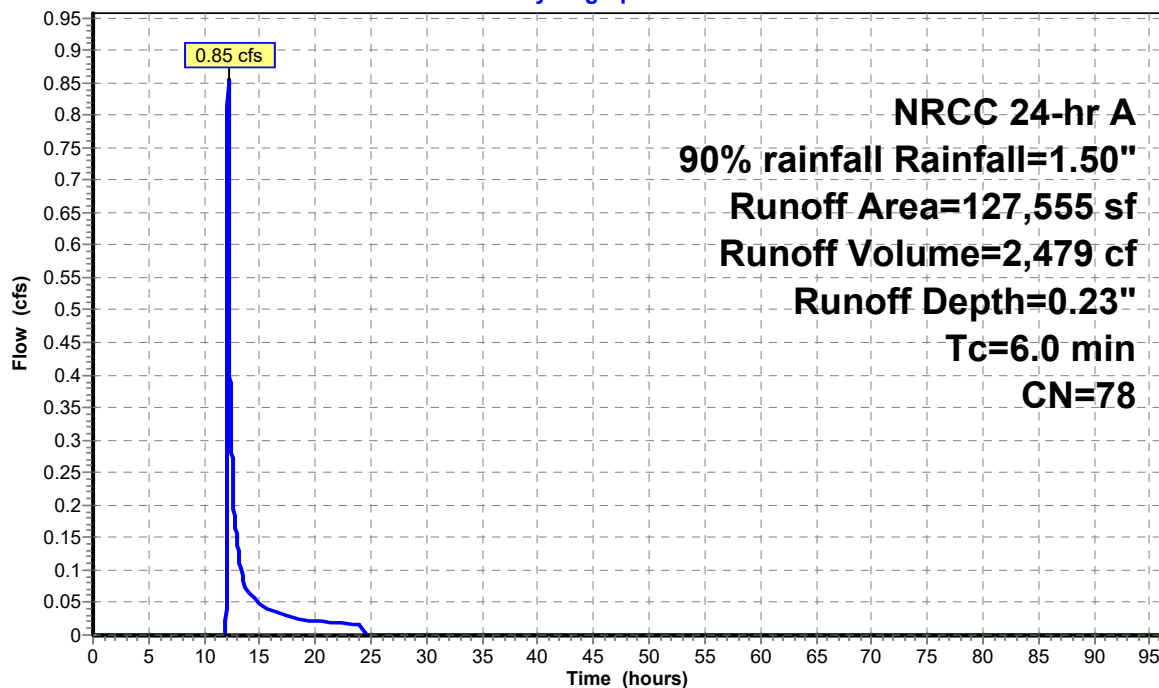
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 90% rainfall Rainfall=1.50"

Area (sf)	CN	Description
44,276	98	Water Surface, HSG C
22,184	74	>75% Grass cover, Good, HSG C
61,095	65	Brush, Good, HSG C
127,555	78	Weighted Average
83,279		65.29% Pervious Area
44,276		34.71% Impervious Area

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

Subcatchment 37: Post B3

Hydrograph



Runoff

N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Pond 38: Wet Pond (SWP-4)

Inflow Area = 1,697,246 sf, 32.43% Impervious, Inflow Depth > 0.38" for 90% rainfall event
 Inflow = 1.95 cfs @ 13.74 hrs, Volume= 54,434 cf
 Outflow = 1.35 cfs @ 16.00 hrs, Volume= 54,161 cf, Atten= 31%, Lag= 135.9 min
 Primary = 1.35 cfs @ 16.00 hrs, Volume= 54,161 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Starting Elev= 376.00' Surf.Area= 88,186 sf Storage= 134,213 cf

Peak Elev= 376.25' @ 16.00 hrs Surf.Area= 89,474 sf Storage= 145,607 cf (11,394 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)

Center-of-Mass det. time= 182.7 min (1,410.4 - 1,227.7)

Volume	Invert	Avail.Storage	Storage Description
#1	372.00'	7,914 cf	Forebay (Irregular) Listed below (Recalc)
#2	372.00'	121,847 cf	Permanent Pool (Irregular) Listed below (Recalc)
#3	375.90'	259,334 cf	Additional Storage (Irregular) Listed below (Recalc)
		389,094 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
372.00	885	114.0	0	0	885
373.00	1,392	139.2	1,129	1,129	1,408
374.00	1,998	164.4	1,686	2,815	2,036
375.00	2,707	189.5	2,344	5,158	2,764
375.90	3,430	212.2	2,755	7,914	3,512

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
372.00	22,804	1,051.3	0	0	22,804
373.00	27,060	1,076.5	24,902	24,902	27,202
374.00	31,416	1,101.7	29,211	54,113	31,703
375.00	35,874	1,127.0	33,620	87,733	36,327
375.90	39,971	1,149.7	34,114	121,847	40,565

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
375.90	44,276	1,380.7	0	0	44,276
377.00	50,030	1,294.2	51,836	51,836	62,747
378.00	55,257	1,319.4	52,622	104,458	68,149
379.00	60,586	1,344.7	57,901	162,359	73,675
380.00	66,015	1,370.0	63,281	225,640	79,307
380.50	68,768	1,382.6	33,693	259,334	82,151

Device	Routing	Invert	Outlet Devices
#1	Primary	376.00'	4.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 90% rainfall Rainfall=1.50"

Prepared by {enter your company name here}

Printed 5/12/2021

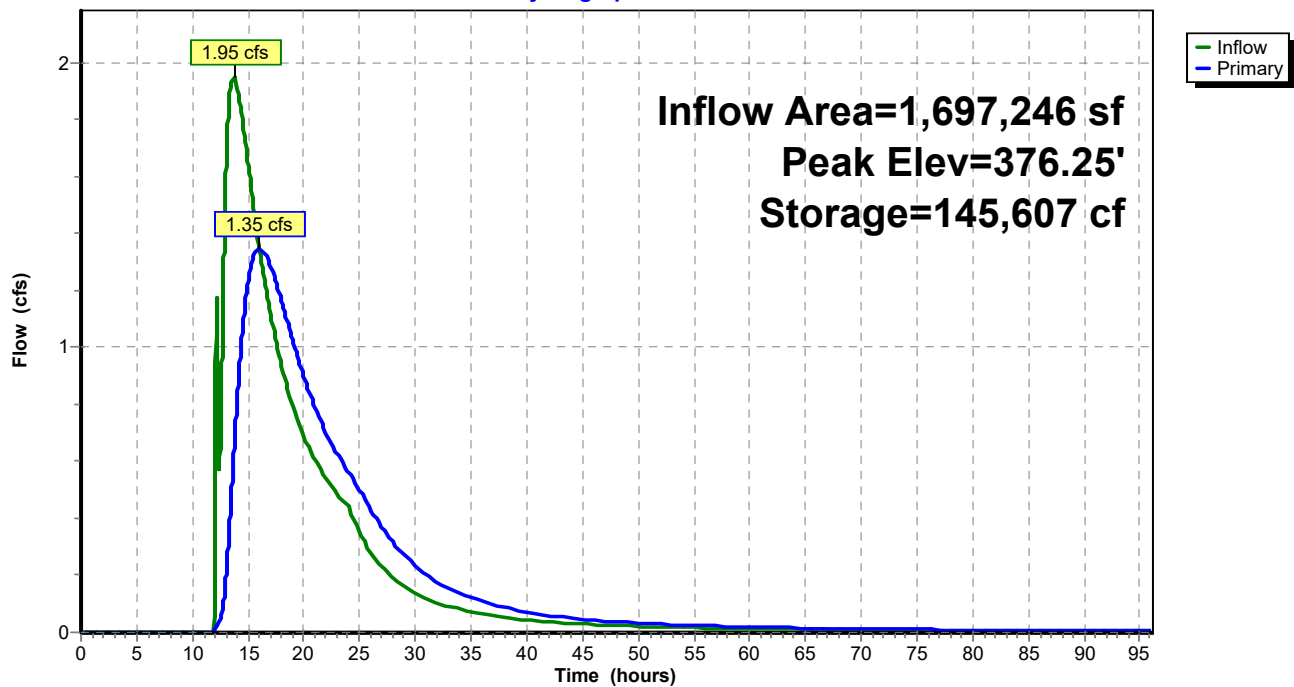
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Primary OutFlow Max=1.35 cfs @ 16.00 hrs HW=376.25' TW=312.14' (Dynamic Tailwater)

1=Broad-Crested Rectangular Weir (Weir Controls 1.35 cfs @ 1.34 fps)

Pond 38: Wet Pond (SWP-4)

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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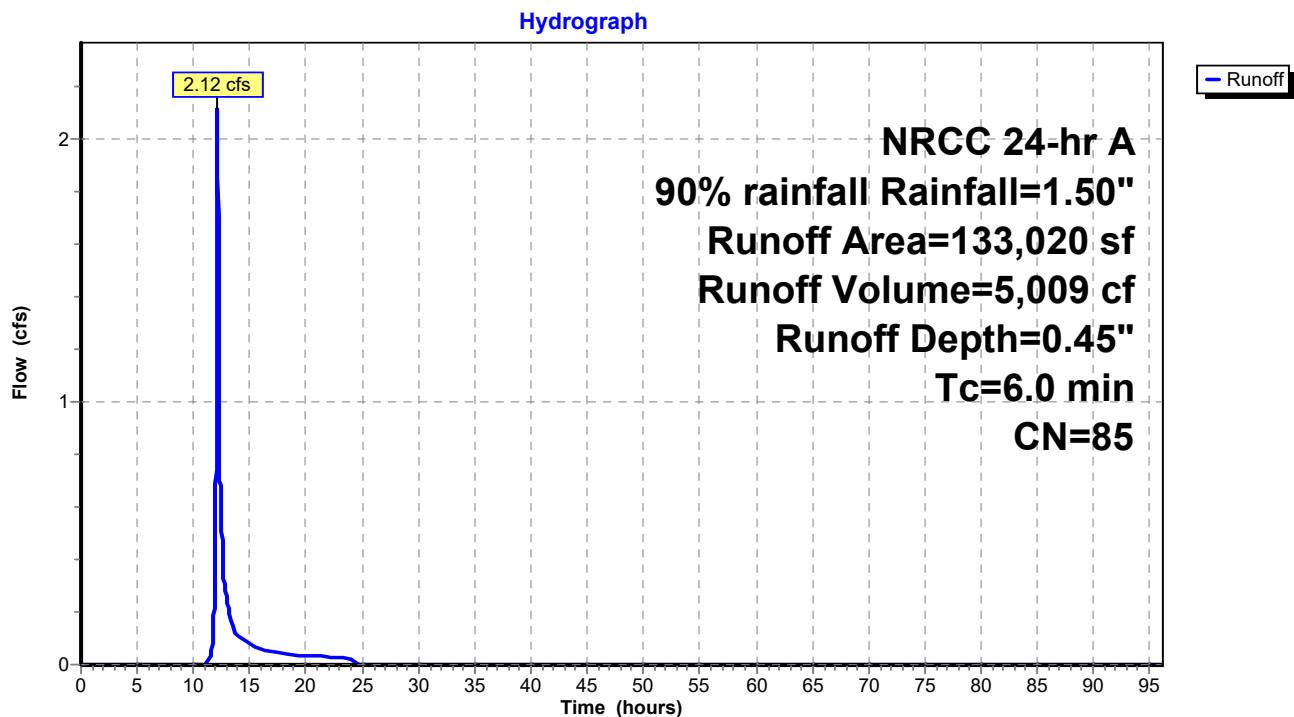
Summary for Subcatchment 39: Post B2

Runoff = 2.12 cfs @ 12.14 hrs, Volume= 5,009 cf, Depth= 0.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 90% rainfall Rainfall=1.50"

Area (sf)	CN	Description
67,090	98	Paved parking, HSG C
40,460	74	>75% Grass cover, Good, HSG C
7,690	61	>75% Grass cover, Good, HSG B
17,780	70	Woods, Good, HSG C
133,020	85	Weighted Average
65,930		49.56% Pervious Area
67,090		50.44% Impervious Area

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

Subcatchment 39: Post B2

Summary for Pond 40: DIV-3

Inflow Area = 133,020 sf, 50.44% Impervious, Inflow Depth = 0.45" for 90% rainfall event
 Inflow = 2.12 cfs @ 12.14 hrs, Volume= 5,009 cf
 Outflow = 2.12 cfs @ 12.14 hrs, Volume= 5,009 cf, Atten= 0%, Lag= 0.0 min
 Primary = 2.12 cfs @ 12.14 hrs, Volume= 5,009 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 379.06' @ 12.14 hrs

Flood Elev= 386.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	378.00'	12.0" Round Culvert L= 9.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 378.00' S= 0.0000 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	378.00'	24.0" Round Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 377.00' S= 0.0200 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	381.00'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=2.11 cfs @ 12.14 hrs HW=379.06' TW=377.67' (Dynamic Tailwater)

↑**1=Culvert** (Barrel Controls 2.11 cfs @ 3.15 fps)

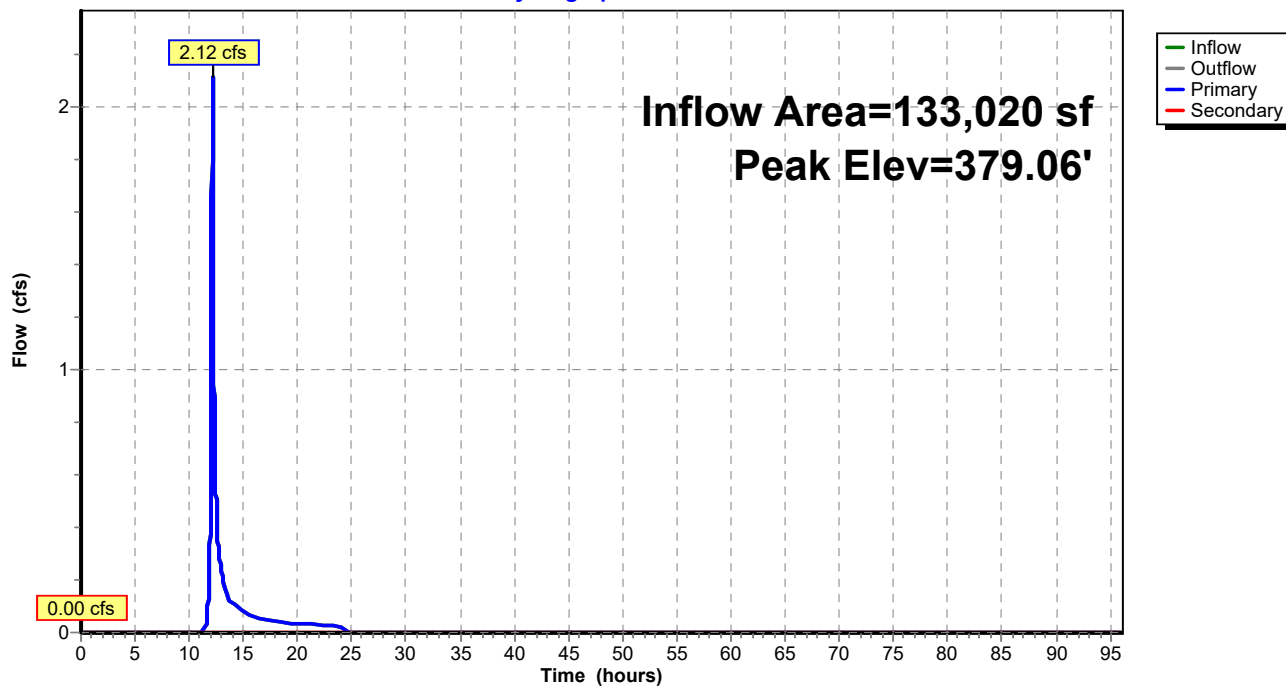
Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=378.00' TW=312.00' (Dynamic Tailwater)

↑**2=Culvert** (Controls 0.00 cfs)

↑**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 40: DIV-3

Hydrograph



Summary for Pond 41: INF-3

Inflow Area = 133,020 sf, 50.44% Impervious, Inflow Depth = 0.45" for 90% rainfall event
 Inflow = 2.12 cfs @ 12.14 hrs, Volume= 5,009 cf
 Outflow = 1.13 cfs @ 12.11 hrs, Volume= 5,009 cf, Atten= 47%, Lag= 0.0 min
 Discarded = 1.13 cfs @ 12.11 hrs, Volume= 5,009 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 377.76' @ 12.24 hrs Surf.Area= 4,883 sf Storage= 509 cf

Plug-Flow detention time= 3.7 min calculated for 5,008 cf (100% of inflow)
 Center-of-Mass det. time= 3.7 min (853.8 - 850.0)

Volume	Invert	Avail.Storage	Storage Description
#1A	377.50'	4,711 cf	45.00'W x 108.50'L x 3.88'H Field A 18,920 cf Overall - 7,142 cf Embedded = 11,778 cf x 40.0% Voids
#2A	378.00'	7,142 cf	Cultec R-330XLHD x 135 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 9 rows
		11,853 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	377.50'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.10'

Discarded OutFlow Max=1.13 cfs @ 12.11 hrs HW=377.62' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 1.13 cfs)

Pond 41: INF-3 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 9 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

15 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 106.50' Row Length +12.0" End Stone x 2 = 108.50' Base Length

9 Rows x 52.0" Wide + 6.0" Spacing x 8 + 12.0" Side Stone x 2 = 45.00' Base Width

6.0" Base + 30.5" Chamber Height + 10.0" Cover = 3.88' Field Height

135 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 9 Rows = 7,141.8 cf Chamber Storage

18,919.7 cf Field - 7,141.8 cf Chambers = 11,777.9 cf Stone x 40.0% Voids = 4,711.2 cf Stone Storage

Chamber Storage + Stone Storage = 11,852.9 cf = 0.272 af

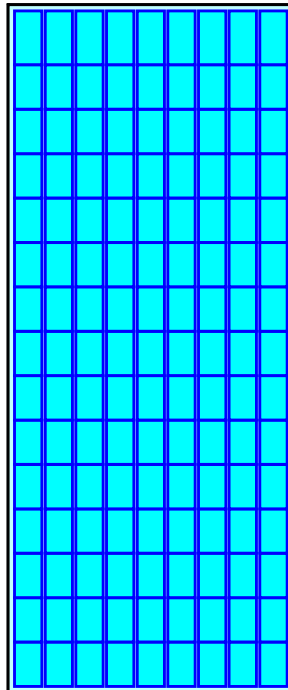
Overall Storage Efficiency = 62.6%

Overall System Size = 108.50' x 45.00' x 3.88'

135 Chambers

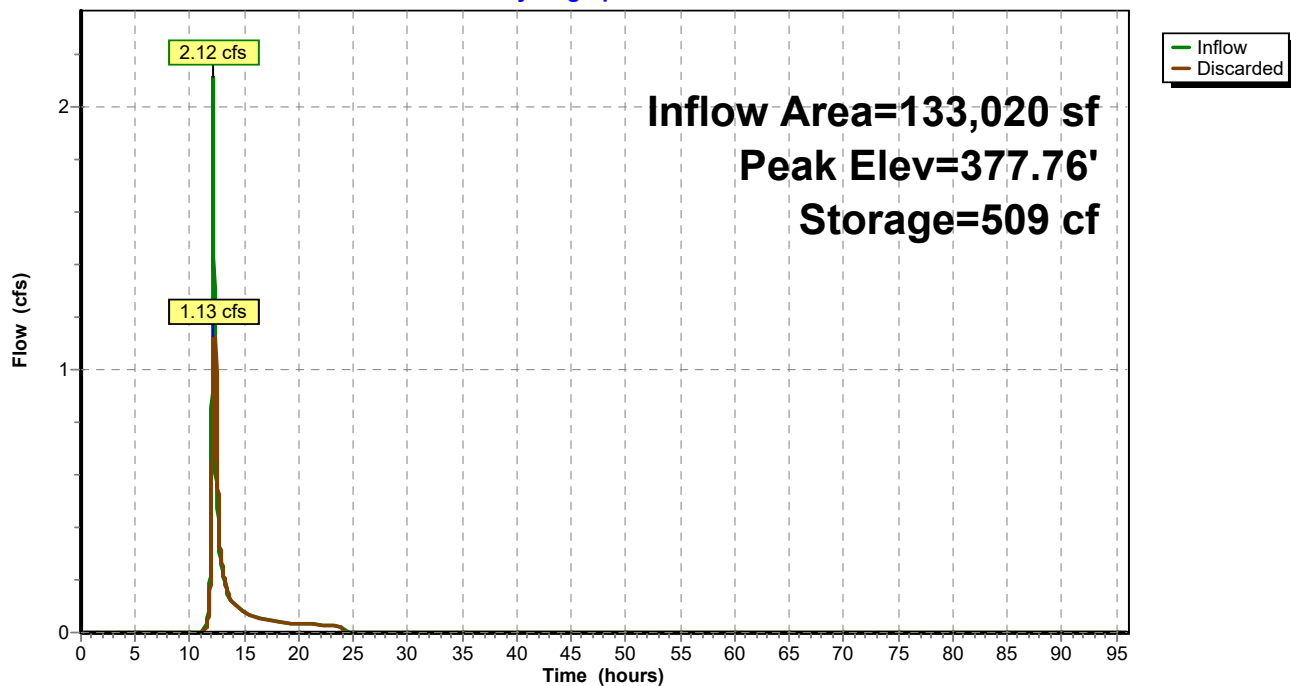
700.7 cy Field

436.2 cy Stone



Pond 41: INF-3

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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Summary for Subcatchment 42: Post B4

Runoff = 0.59 cfs @ 12.60 hrs, Volume= 6,148 cf, Depth= 0.08"

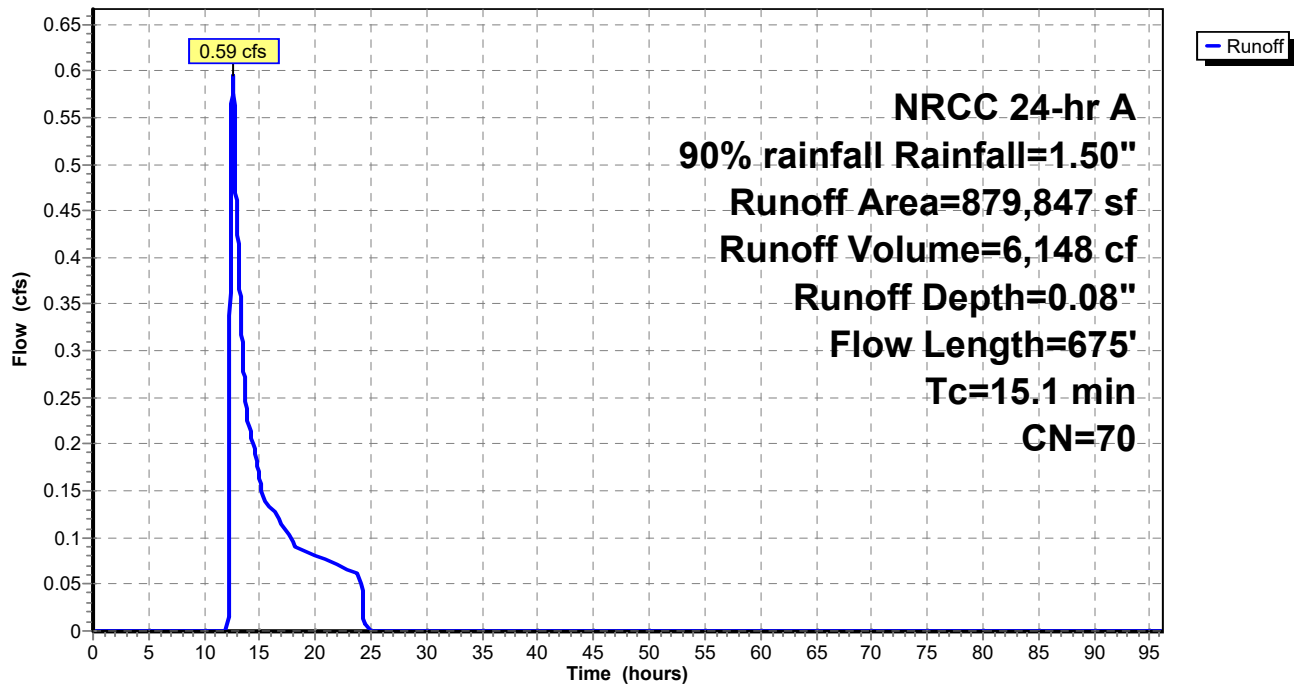
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 90% rainfall Rainfall=1.50"

Area (sf)	CN	Description
19,672	61	>75% Grass cover, Good, HSG B
13,245	74	>75% Grass cover, Good, HSG C
16,422	55	Woods, Good, HSG B
810,443	70	Woods, Good, HSG C
20,065	70	Woods, Good, HSG C
879,847	70	Weighted Average
879,847		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	100	0.0600	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.9	575	0.0950	4.96		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.1	675	Total			

Subcatchment 42: Post B4

Hydrograph



Summary for Reach 43: Existing Stream B

Inflow Area = 2,577,093 sf, 21.36% Impervious, Inflow Depth > 0.28" for 90% rainfall event
Inflow = 1.48 cfs @ 15.92 hrs, Volume= 60,309 cf
Outflow = 1.48 cfs @ 16.02 hrs, Volume= 60,300 cf, Atten= 0%, Lag= 6.0 min

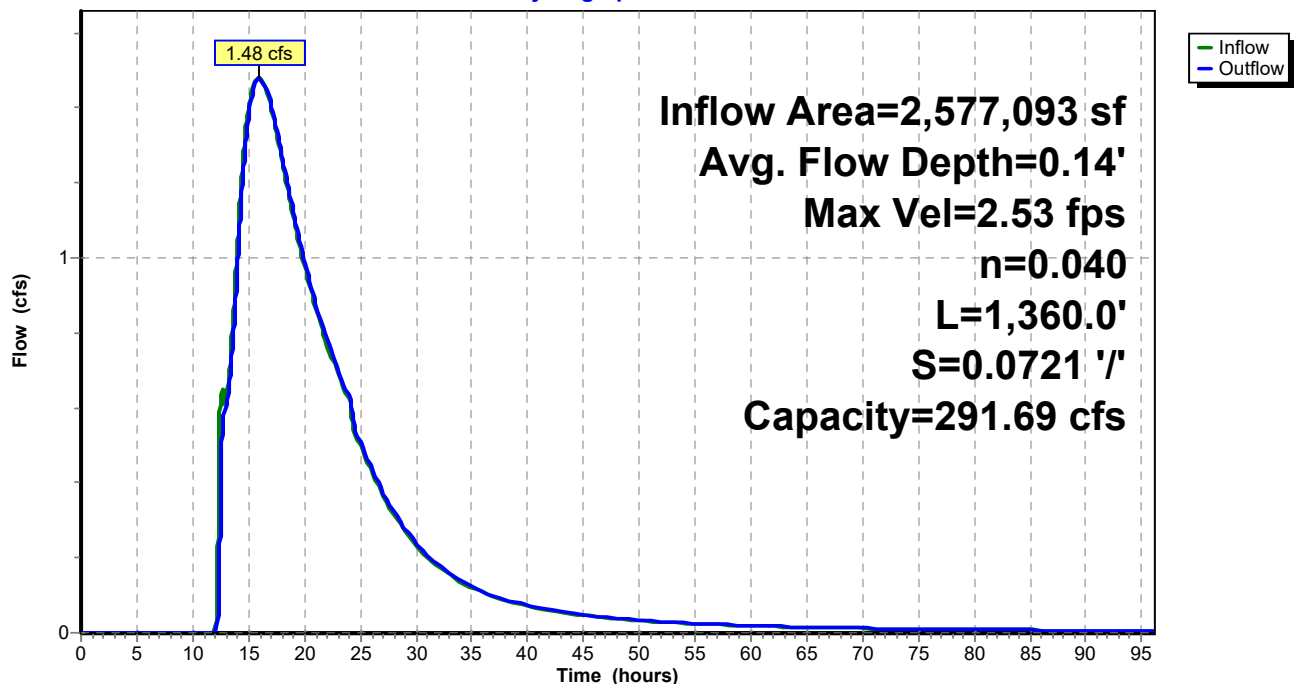
Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 2.53 fps, Min. Travel Time= 9.0 min
Avg. Velocity = 1.10 fps, Avg. Travel Time= 20.6 min

Peak Storage= 796 cf @ 16.02 hrs
Average Depth at Peak Storage= 0.14'
Bank-Full Depth= 2.50' Flow Area= 22.5 sf, Capacity= 291.69 cfs

4.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 ' ' Top Width= 14.00'
Length= 1,360.0' Slope= 0.0721 ' '
Inlet Invert= 312.00', Outlet Invert= 214.00'

**Reach 43: Existing Stream B**

Hydrograph



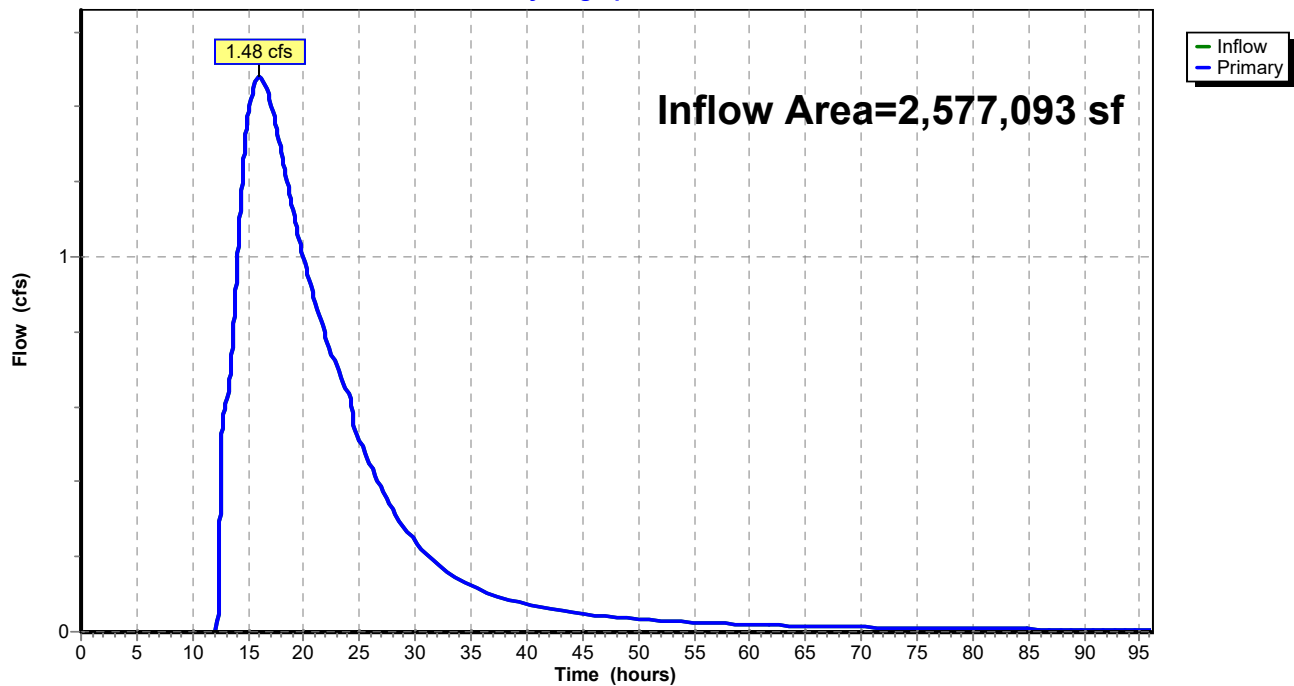
Summary for Link 44: Design Point B

Inflow Area = 2,577,093 sf, 21.36% Impervious, Inflow Depth > 0.28" for 90% rainfall event
 Inflow = 1.48 cfs @ 16.02 hrs, Volume= 60,300 cf
 Primary = 1.48 cfs @ 16.02 hrs, Volume= 60,300 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 44: Design Point B

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 90% rainfall Rainfall=1.50"

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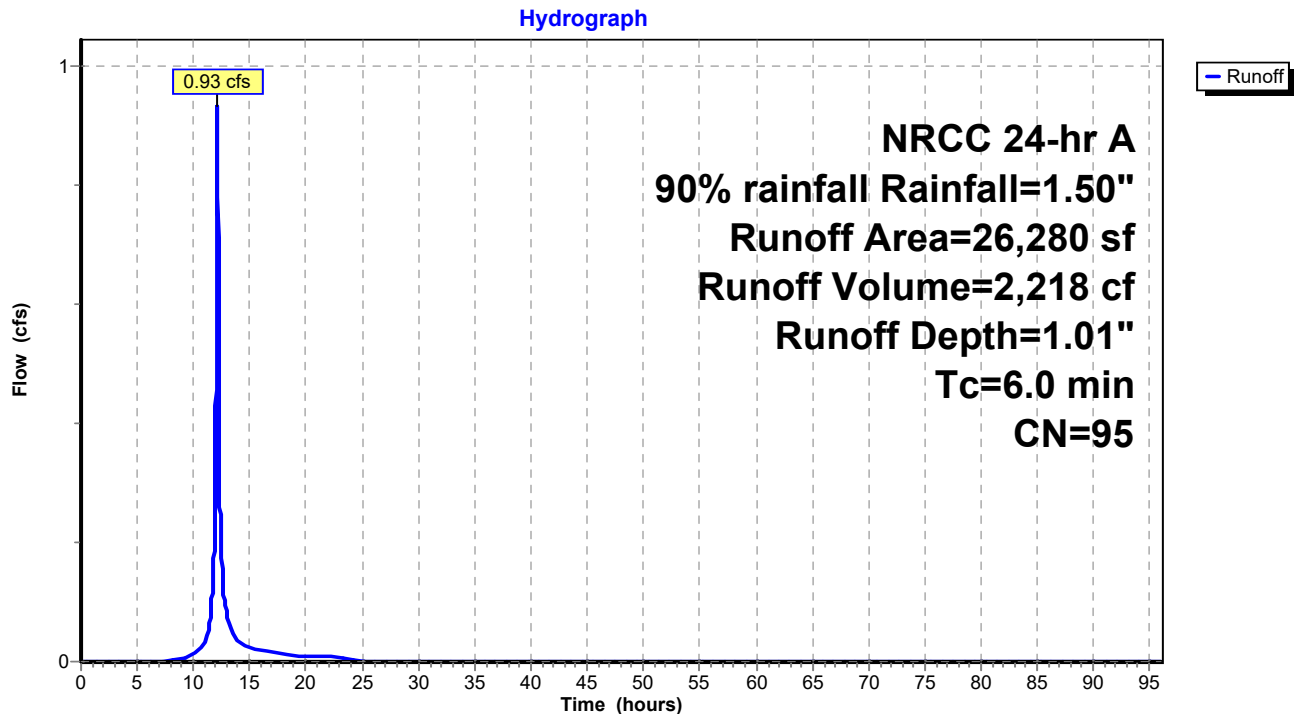
Summary for Subcatchment 45: Post B7

Runoff = 0.93 cfs @ 12.13 hrs, Volume= 2,218 cf, Depth= 1.01"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 90% rainfall Rainfall=1.50"

Area (sf)	CN	Description
14,320	98	Roofs, HSG C
4,847	98	Paved parking, HSG A
3,412	74	>75% Grass cover, Good, HSG C
* 3,701	98	Paved Walkway
26,280	95	Weighted Average
3,412		12.98% Pervious Area
22,868		87.02% Impervious Area

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

Subcatchment 45: Post B7

Summary for Pond 46: DIV-3

Inflow Area = 26,280 sf, 87.02% Impervious, Inflow Depth = 1.01" for 90% rainfall event
 Inflow = 0.93 cfs @ 12.13 hrs, Volume= 2,218 cf
 Outflow = 0.93 cfs @ 12.13 hrs, Volume= 2,218 cf, Atten= 0%, Lag= 0.0 min
 Primary = 0.93 cfs @ 12.13 hrs, Volume= 2,218 cf
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 388.68' @ 12.13 hrs

Flood Elev= 392.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	388.00'	12.0" Round Culvert L= 17.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 388.00' / 388.00' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	388.00'	24.0" Round Culvert L= 113.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 388.00' / 386.00' S= 0.0177 ' S= 0.0177 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	390.50'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=0.93 cfs @ 12.13 hrs HW=388.68' TW=388.03' (Dynamic Tailwater)

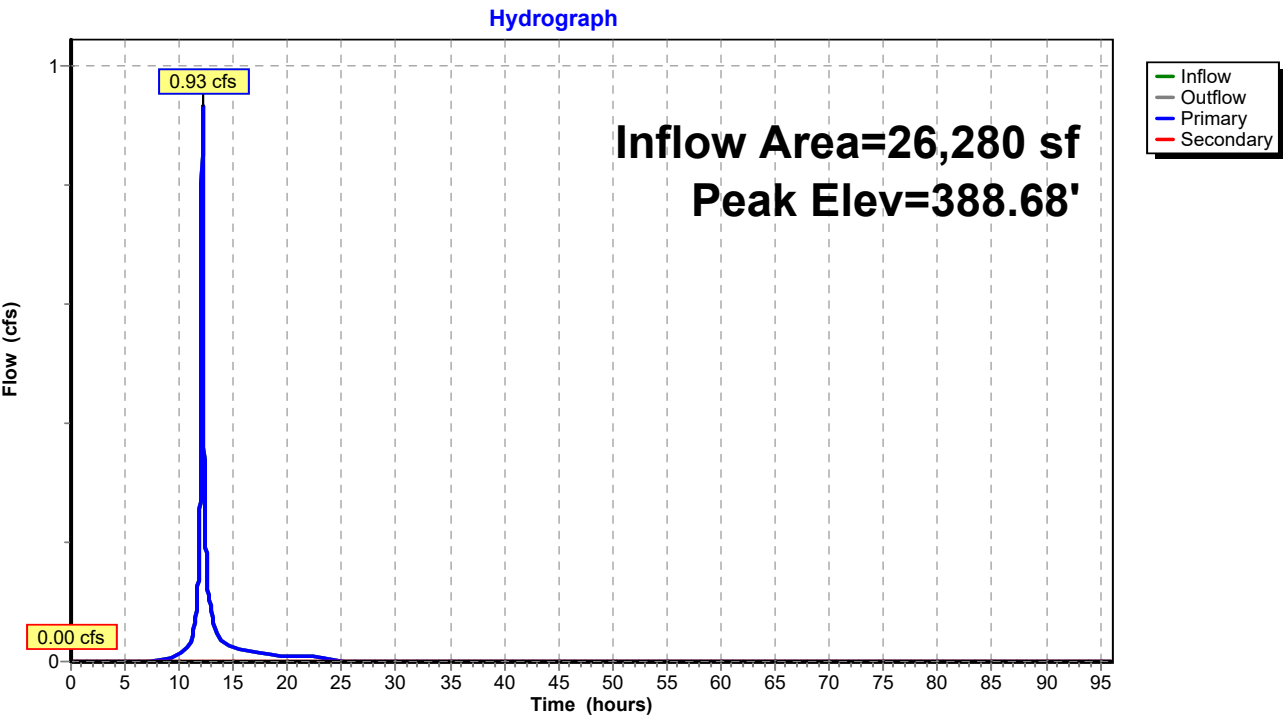
↑ **1=Culvert** (Barrel Controls 0.93 cfs @ 2.32 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=388.00' TW=376.00' (Dynamic Tailwater)

↑ **2=Culvert** (Controls 0.00 cfs)

↑ **3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 46: DIV-3



Summary for Pond 47: INF-9

Inflow Area = 26,280 sf, 87.02% Impervious, Inflow Depth = 1.01" for 90% rainfall event
 Inflow = 0.93 cfs @ 12.13 hrs, Volume= 2,218 cf
 Outflow = 0.27 cfs @ 11.99 hrs, Volume= 2,218 cf, Atten= 71%, Lag= 0.0 min
 Discarded = 0.27 cfs @ 11.99 hrs, Volume= 2,218 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 388.21' @ 12.33 hrs Surf.Area= 1,174 sf Storage= 445 cf

Plug-Flow detention time= 10.1 min calculated for 2,217 cf (100% of inflow)
 Center-of-Mass det. time= 10.1 min (809.8 - 799.7)

Volume	Invert	Avail.Storage	Storage Description
#1A	387.50'	1,167 cf	30.50'W x 38.50'L x 3.88'H Field A 4,550 cf Overall - 1,632 cf Embedded = 2,918 cf x 40.0% Voids
#2A	388.00'	1,632 cf	Cultec R-330XLHD x 30 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 6 rows
		2,799 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	387.50'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.10'

Discarded OutFlow Max=0.27 cfs @ 11.99 hrs HW=387.63' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 0.27 cfs)

Pond 47: INF-9 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 6 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

5 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 36.50' Row Length +12.0" End Stone x 2 = 38.50' Base Length

6 Rows x 52.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.50' Base Width

6.0" Base + 30.5" Chamber Height + 10.0" Cover = 3.88' Field Height

30 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 6 Rows = 1,631.8 cf Chamber Storage

4,550.2 cf Field - 1,631.8 cf Chambers = 2,918.4 cf Stone x 40.0% Voids = 1,167.4 cf Stone Storage

Chamber Storage + Stone Storage = 2,799.1 cf = 0.064 af

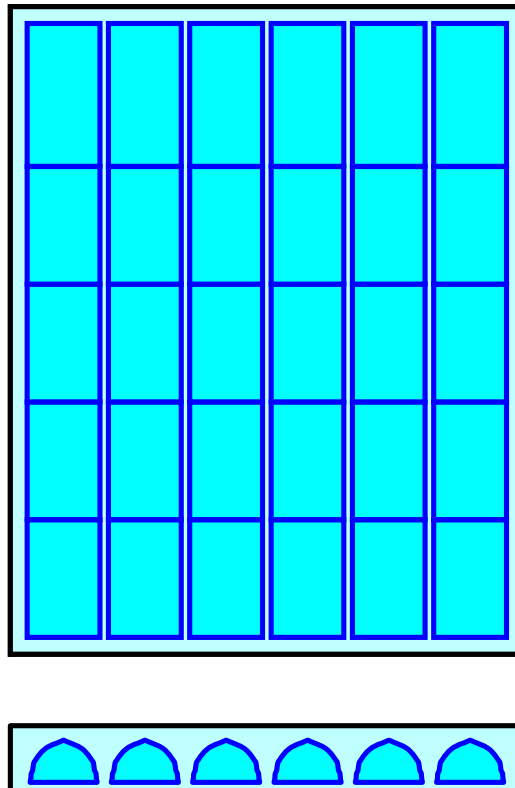
Overall Storage Efficiency = 61.5%

Overall System Size = 38.50' x 30.50' x 3.88'

30 Chambers

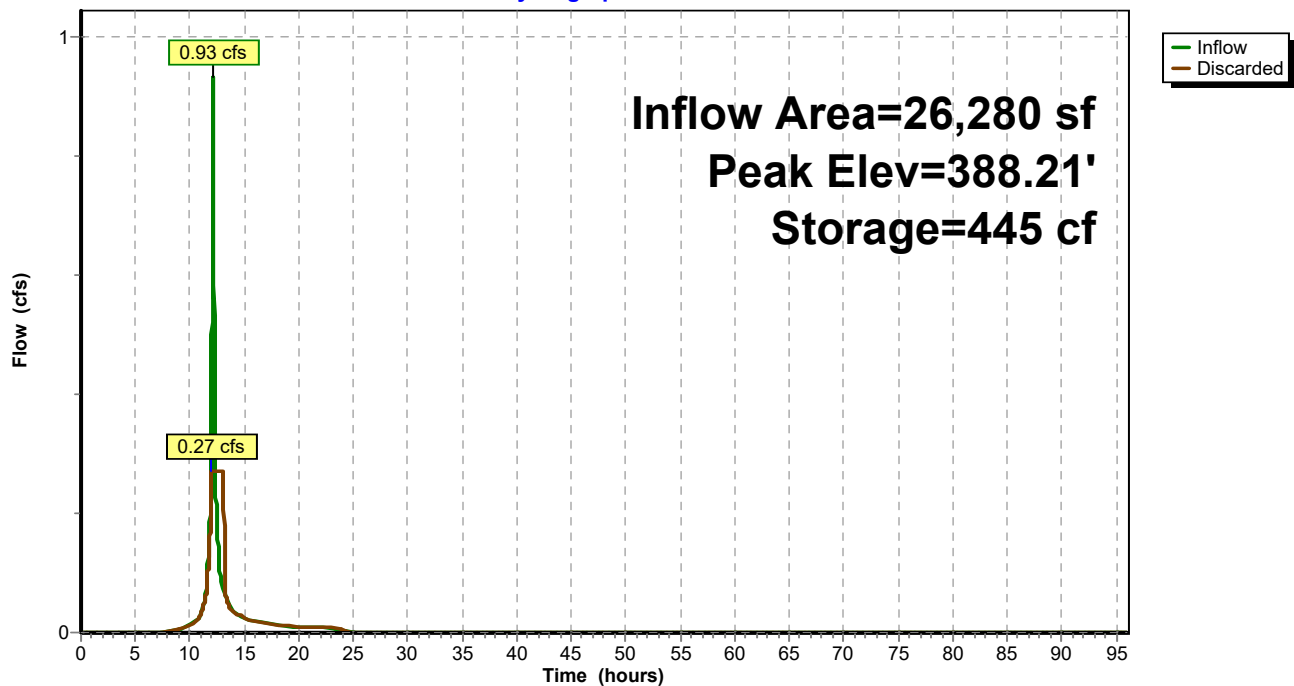
168.5 cy Field

108.1 cy Stone



Pond 47: INF-9

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 100-yr Rainfall=9.18"

Prepared by {enter your company name here}

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Time span=0.00-96.00 hrs, dt=0.01 hrs, 9601 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment34: Post B0 (Offsite) Runoff Area=1,510,771 sf 32.24% Impervious Runoff Depth=7.23"
Flow Length=1,871' Tc=32.3 min CN=84 Runoff=186.10 cfs 910,648 cf

Pond 35: Offsite Pond B Peak Elev=387.20' Storage=414,374 cf Inflow=186.10 cfs 910,648 cf
36.0" Round Culvert n=0.025 L=158.0' S=0.0127 '/' Outflow=48.51 cfs 909,356 cf

Subcatchment36: Post B1 Runoff Area=58,920 sf 32.46% Impervious Runoff Depth=6.37"
Tc=6.0 min CN=77 Runoff=13.08 cfs 31,261 cf

Subcatchment37: Post B3 Runoff Area=127,555 sf 34.71% Impervious Runoff Depth=6.49"
Tc=6.0 min CN=78 Runoff=28.76 cfs 68,997 cf

Pond 38: Wet Pond (SWP-4) Peak Elev=378.73' Storage=276,181 cf Inflow=68.39 cfs 1,017,061 cf
Outflow=47.55 cfs 1,016,759 cf

Subcatchment39: Post B2 Runoff Area=133,020 sf 50.44% Impervious Runoff Depth=7.36"
Tc=6.0 min CN=85 Runoff=32.77 cfs 81,545 cf

Pond 40: DIV-3 Peak Elev=382.37' Inflow=32.77 cfs 81,545 cf
Primary=5.43 cfs 46,297 cf Secondary=27.76 cfs 35,248 cf Outflow=32.77 cfs 81,545 cf

Pond 41: INF-3 Peak Elev=381.35' Storage=11,796 cf Inflow=5.43 cfs 46,297 cf
Outflow=1.13 cfs 46,297 cf

Subcatchment42: Post B4 Runoff Area=879,847 sf 0.00% Impervious Runoff Depth=5.49"
Flow Length=675' Tc=15.1 min CN=70 Runoff=123.91 cfs 402,814 cf

Reach 43: Existing Stream B Avg. Flow Depth=1.85' Max Vel=11.02 fps Inflow=159.35 cfs 1,454,821 cf
n=0.040 L=1,360.0' S=0.0721 '/' Capacity=291.69 cfs Outflow=157.36 cfs 1,454,811 cf

Link 44: Design Point B Inflow=157.36 cfs 1,454,811 cf
Primary=157.36 cfs 1,454,811 cf

Subcatchment45: Post B7 Runoff Area=26,280 sf 87.02% Impervious Runoff Depth=8.58"
Tc=6.0 min CN=95 Runoff=6.97 cfs 18,784 cf

Pond 46: DIV-3 Peak Elev=390.93' Inflow=6.97 cfs 18,784 cf
Primary=2.33 cfs 11,337 cf Secondary=6.71 cfs 7,447 cf Outflow=6.97 cfs 18,784 cf

Pond 47: INF-9 Peak Elev=390.93' Storage=2,590 cf Inflow=2.33 cfs 11,337 cf
Outflow=0.27 cfs 11,337 cf

Total Runoff Area = 2,736,393 sf Runoff Volume = 1,514,049 cf Average Runoff Depth = 6.64"
76.60% Pervious = 2,095,980 sf 23.40% Impervious = 640,413 sf

N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 100-yr Rainfall=9.18"

Prepared by {enter your company name here}

Printed 5/12/2021

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Summary for Subcatchment 34: Post B0 (Offsite)

Runoff = 186.10 cfs @ 12.45 hrs, Volume= 910,648 cf, Depth= 7.23"

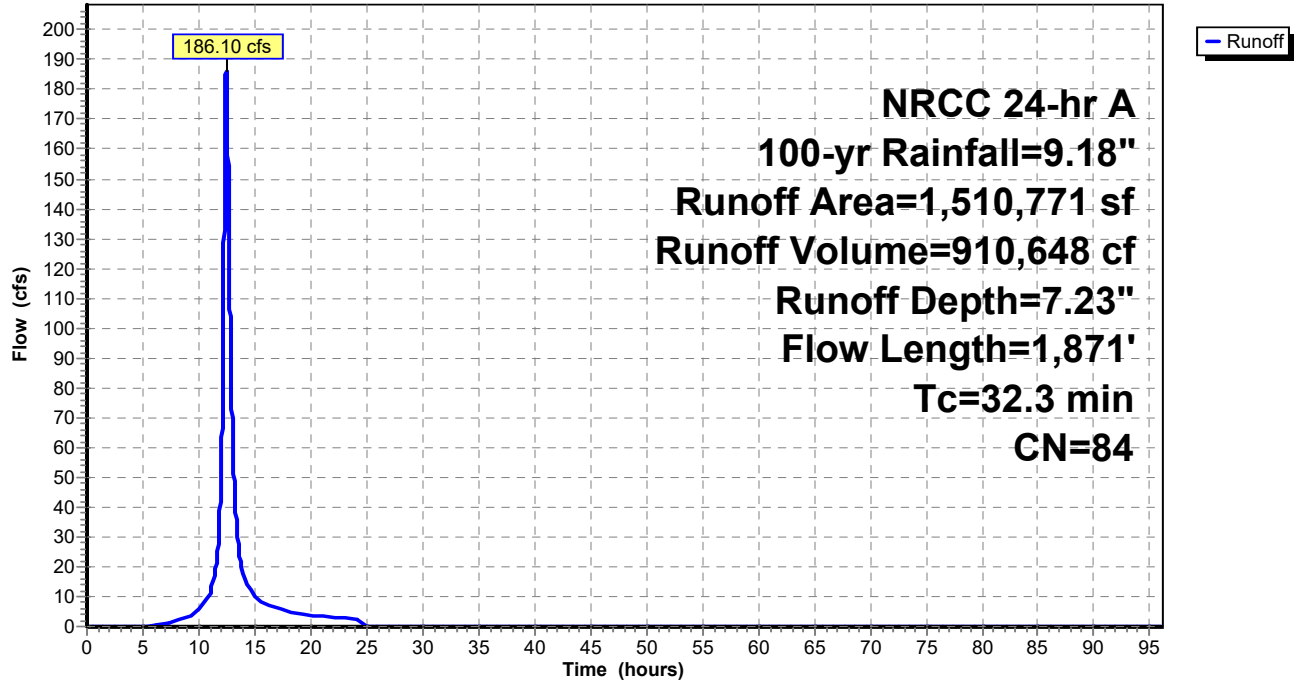
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 100-yr Rainfall=9.18"

Area (sf)	CN	Description
487,056	98	Paved parking, HSG C
497,987	77	Woods, Good, HSG D
134,328	70	Woods, Good, HSG C
375,457	80	>75% Grass cover, Good, HSG D
15,943	74	>75% Grass cover, Good, HSG C
1,510,771	84	Weighted Average
1,023,715		67.76% Pervious Area
487,056		32.24% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0300	0.10		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
9.5	848	0.0085	1.48		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
5.1	856	0.0093	2.78	3.06	Trap/Vee/Rect Channel Flow, Bot.W=3.00' D=0.33' Z= 1.0 '/' Top.W=3.66' n= 0.022 Earth, clean & straight
0.2	67	0.0150	6.66	64.08	Pipe Channel, 42.0" Round Area= 9.6 sf Perim= 11.0' r= 0.88' n= 0.025 Corrugated metal
32.3	1,871	Total			

Subcatchment 34: Post B0 (Offsite)

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Pond 35: Offsite Pond B

Inflow Area = 1,510,771 sf, 32.24% Impervious, Inflow Depth = 7.23" for 100-yr event
 Inflow = 186.10 cfs @ 12.45 hrs, Volume= 910,648 cf
 Outflow = 48.51 cfs @ 13.17 hrs, Volume= 909,356 cf, Atten= 74%, Lag= 43.1 min
 Primary = 48.51 cfs @ 13.17 hrs, Volume= 909,356 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 387.20' @ 13.17 hrs Surf.Area= 103,903 sf Storage= 414,374 cf

Plug-Flow detention time= 134.0 min calculated for 909,261 cf (100% of inflow)
 Center-of-Mass det. time= 133.5 min (941.5 - 808.0)

Volume	Invert	Avail.Storage	Storage Description
#1	382.00'	610,998 cf	Custom Stage Data (Irregular) Listed below (Recalc)

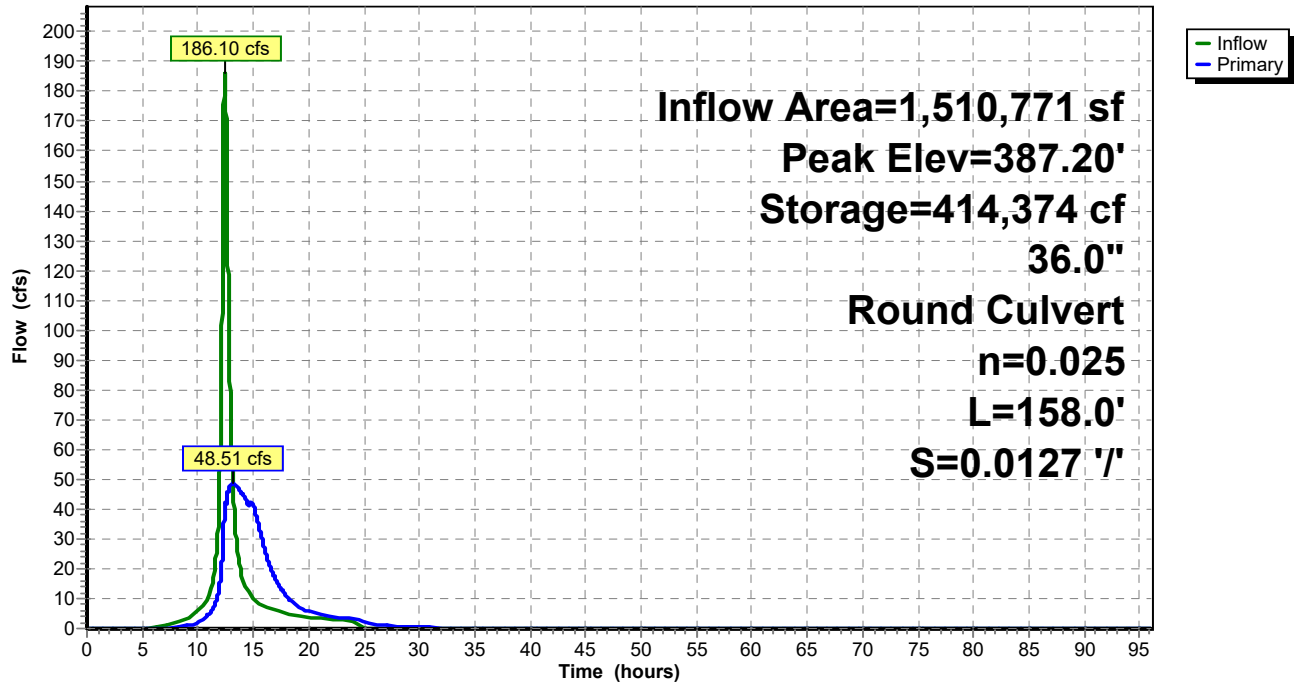
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
382.00	36,540	1,177.0	0	0	36,540
384.00	81,987	1,579.0	115,507	115,507	124,748
386.00	96,790	1,622.0	178,572	294,080	136,159
388.00	108,795	1,657.0	205,468	499,548	145,863
389.00	114,127	1,679.0	111,450	610,998	151,937

Device	Routing	Invert	Outlet Devices
#1	Primary	382.00'	36.0" Round Culvert L= 158.0' CPP, end-section conforming to fill, Ke= 0.500 Inlet / Outlet Invert= 382.00' / 380.00' S= 0.0127 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 7.07 sf

Primary OutFlow Max=48.51 cfs @ 13.17 hrs HW=387.20' TW=378.59' (Dynamic Tailwater)
 ↑**1=Culvert** (Barrel Controls 48.51 cfs @ 6.86 fps)

Pond 35: Offsite Pond B

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Subcatchment 36: Post B1

Runoff = 13.08 cfs @ 12.13 hrs, Volume= 31,261 cf, Depth= 6.37"

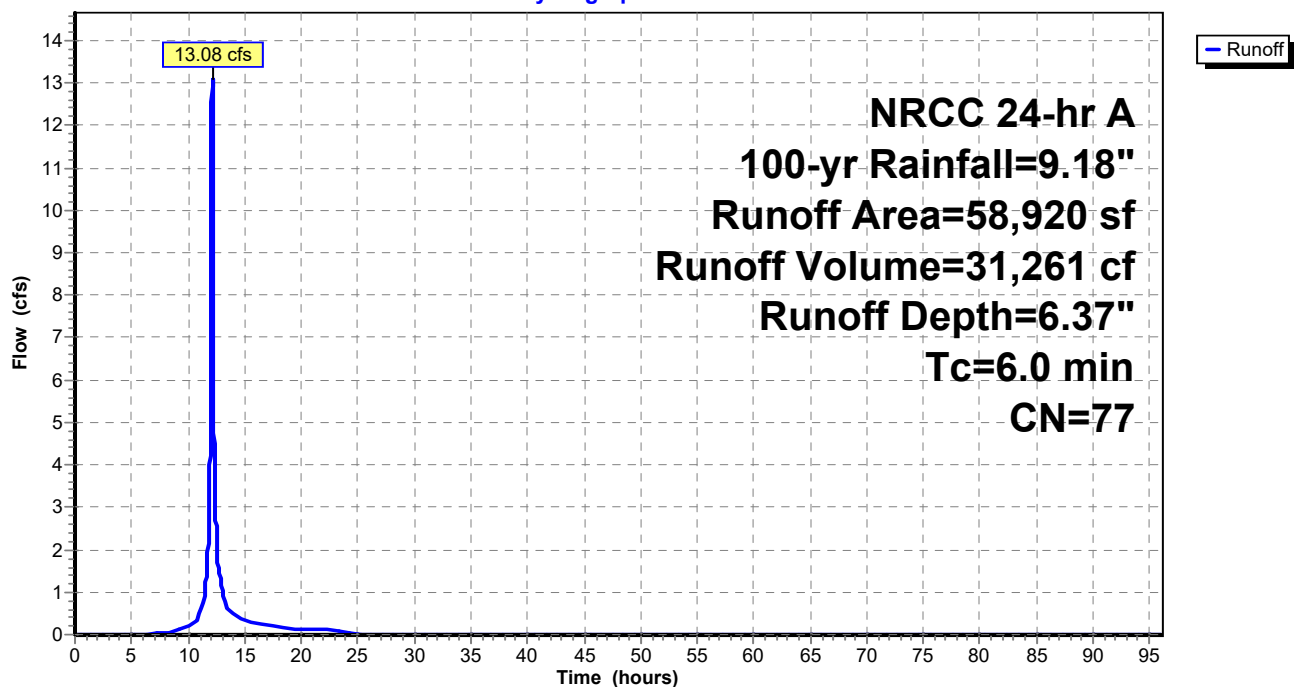
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 100-yr Rainfall=9.18"

Area (sf)	CN	Description
19,123	98	Paved parking, HSG C
22,978	74	>75% Grass cover, Good, HSG C
4,537	61	>75% Grass cover, Good, HSG B
12,282	55	Woods, Good, HSG B
58,920	77	Weighted Average
39,797		67.54% Pervious Area
19,123		32.46% Impervious Area

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

Subcatchment 36: Post B1

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 100-yr Rainfall=9.18"

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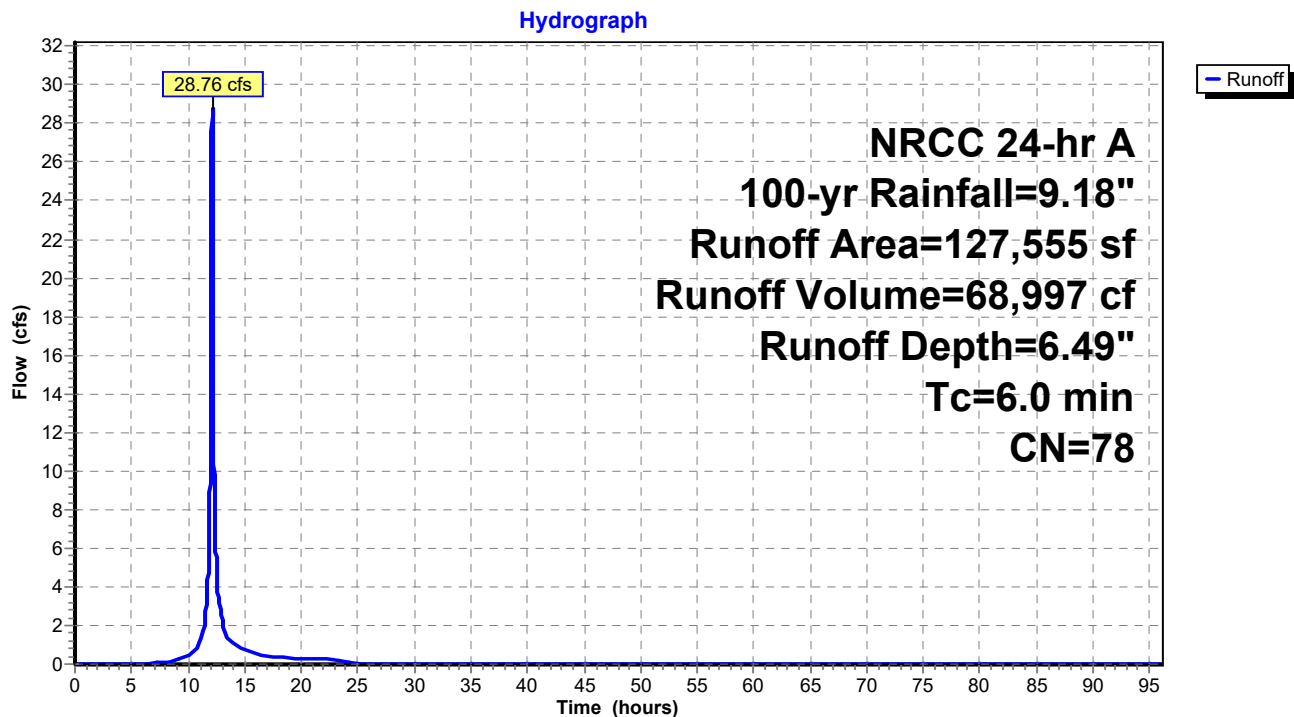
Summary for Subcatchment 37: Post B3

Runoff = 28.76 cfs @ 12.13 hrs, Volume= 68,997 cf, Depth= 6.49"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 100-yr Rainfall=9.18"

Area (sf)	CN	Description
44,276	98	Water Surface, HSG C
22,184	74	>75% Grass cover, Good, HSG C
61,095	65	Brush, Good, HSG C
127,555	78	Weighted Average
83,279		65.29% Pervious Area
44,276		34.71% Impervious Area

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

Subcatchment 37: Post B3

N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Pond 38: Wet Pond (SWP-4)

Inflow Area = 1,697,246 sf, 32.43% Impervious, Inflow Depth = 7.19" for 100-yr event
 Inflow = 68.39 cfs @ 12.14 hrs, Volume= 1,017,061 cf
 Outflow = 47.55 cfs @ 13.88 hrs, Volume= 1,016,759 cf, Atten= 30%, Lag= 104.4 min
 Primary = 47.55 cfs @ 13.88 hrs, Volume= 1,016,759 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Starting Elev= 376.00' Surf.Area= 88,186 sf Storage= 134,213 cf
 Peak Elev= 378.73' @ 13.88 hrs Surf.Area= 102,544 sf Storage= 276,181 cf (141,968 cf above start)

Plug-Flow detention time= 177.0 min calculated for 882,453 cf (87% of inflow)
 Center-of-Mass det. time= 64.8 min (990.4 - 925.6)

Volume	Invert	Avail.Storage	Storage Description
#1	372.00'	7,914 cf	Forebay (Irregular) Listed below (Recalc)
#2	372.00'	121,847 cf	Permanent Pool (Irregular) Listed below (Recalc)
#3	375.90'	259,334 cf	Additional Storage (Irregular) Listed below (Recalc)
		389,094 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
372.00	885	114.0	0	0	885
373.00	1,392	139.2	1,129	1,129	1,408
374.00	1,998	164.4	1,686	2,815	2,036
375.00	2,707	189.5	2,344	5,158	2,764
375.90	3,430	212.2	2,755	7,914	3,512

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
372.00	22,804	1,051.3	0	0	22,804
373.00	27,060	1,076.5	24,902	24,902	27,202
374.00	31,416	1,101.7	29,211	54,113	31,703
375.00	35,874	1,127.0	33,620	87,733	36,327
375.90	39,971	1,149.7	34,114	121,847	40,565

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
375.90	44,276	1,380.7	0	0	44,276
377.00	50,030	1,294.2	51,836	51,836	62,747
378.00	55,257	1,319.4	52,622	104,458	68,149
379.00	60,586	1,344.7	57,901	162,359	73,675
380.00	66,015	1,370.0	63,281	225,640	79,307
380.50	68,768	1,382.6	33,693	259,334	82,151

Device	Routing	Invert	Outlet Devices
#1	Primary	376.00'	4.0' long x 20.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

N60 P1 Post-B 2021 - 5-4-12 AW

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NRCC 24-hr A 100-yr Rainfall=9.18"

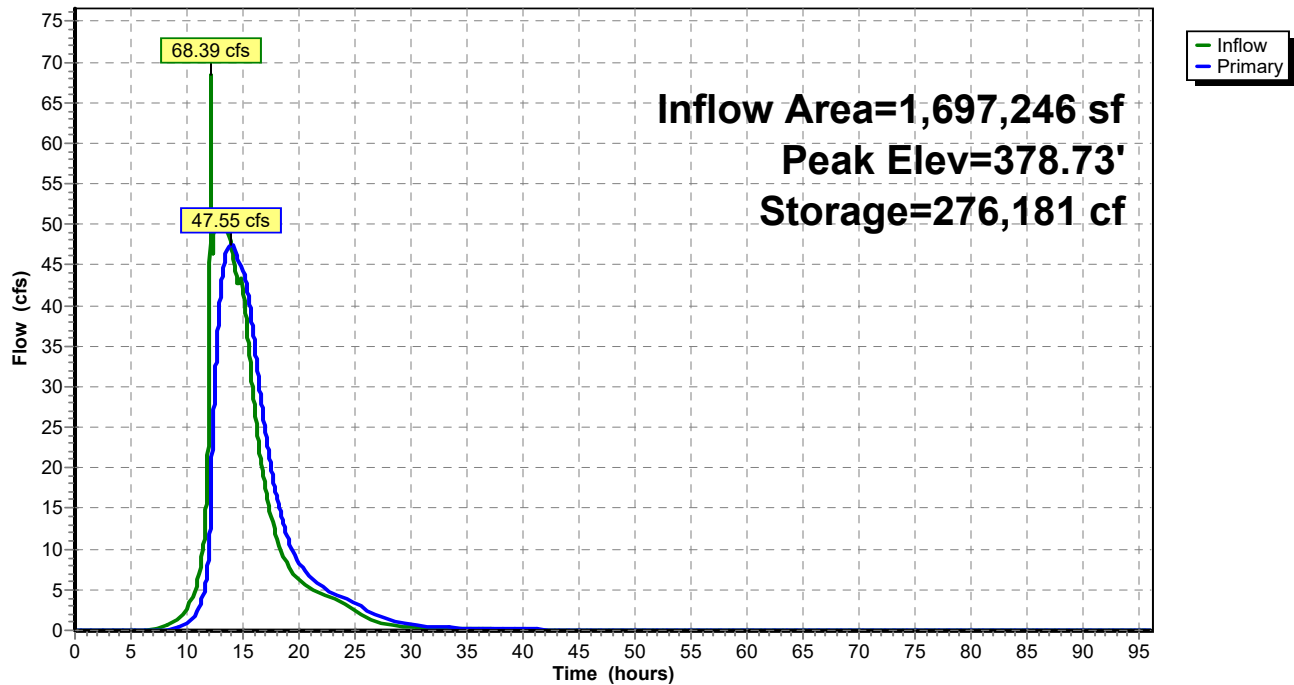
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Primary OutFlow Max=47.55 cfs @ 13.88 hrs HW=378.73' TW=313.08' (Dynamic Tailwater)

1=Broad-Crested Rectangular Weir (Weir Controls 47.55 cfs @ 4.35 fps)

Pond 38: Wet Pond (SWP-4)

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Subcatchment 39: Post B2

Runoff = 32.77 cfs @ 12.13 hrs, Volume= 81,545 cf, Depth= 7.36"

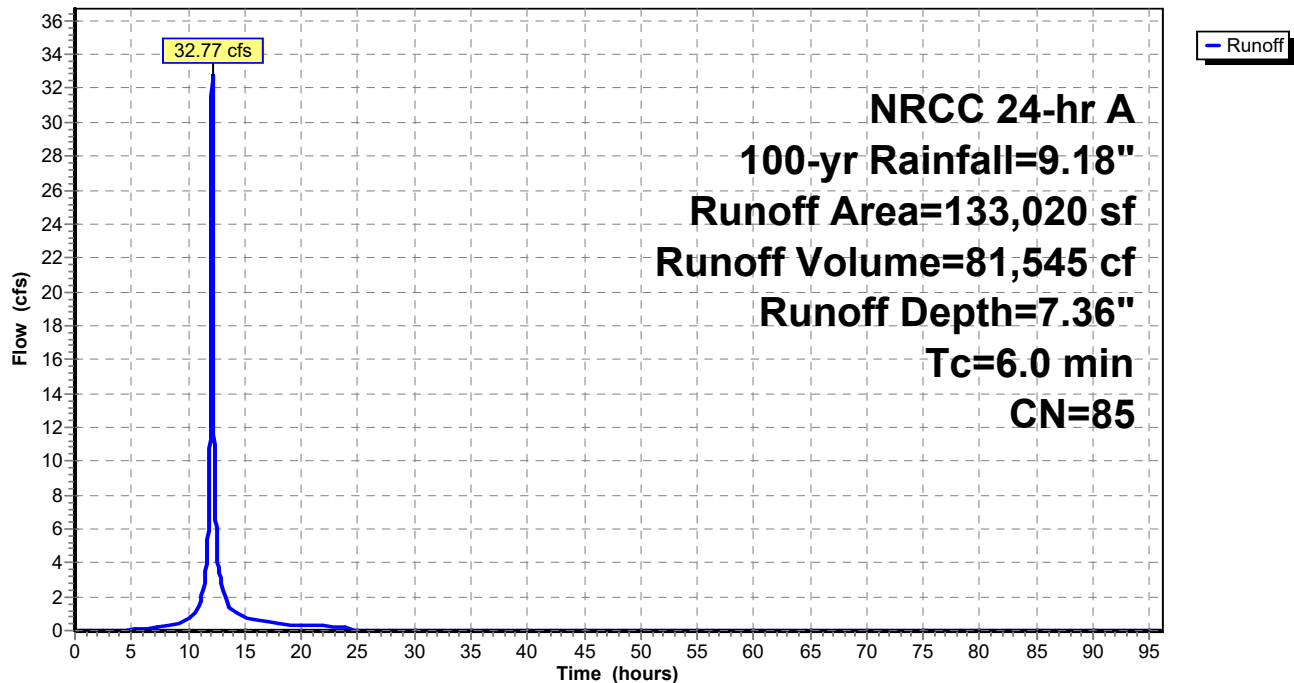
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 100-yr Rainfall=9.18"

Area (sf)	CN	Description
67,090	98	Paved parking, HSG C
40,460	74	>75% Grass cover, Good, HSG C
7,690	61	>75% Grass cover, Good, HSG B
17,780	70	Woods, Good, HSG C
133,020	85	Weighted Average
65,930		49.56% Pervious Area
67,090		50.44% Impervious Area

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

Subcatchment 39: Post B2

Hydrograph



Summary for Pond 40: DIV-3

Inflow Area = 133,020 sf, 50.44% Impervious, Inflow Depth = 7.36" for 100-yr event
 Inflow = 32.77 cfs @ 12.13 hrs, Volume= 81,545 cf
 Outflow = 32.77 cfs @ 12.13 hrs, Volume= 81,545 cf, Atten= 0%, Lag= 0.0 min
 Primary = 5.43 cfs @ 11.75 hrs, Volume= 46,297 cf
 Secondary = 27.76 cfs @ 12.13 hrs, Volume= 35,248 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 382.37' @ 12.13 hrs

Flood Elev= 386.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	378.00'	12.0" Round Culvert L= 9.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 378.00' S= 0.0000 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	378.00'	24.0" Round Culvert L= 50.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 378.00' / 377.00' S= 0.0200 ' / ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	381.00'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=5.37 cfs @ 11.75 hrs HW=381.04' TW=379.02' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 5.37 cfs @ 6.84 fps)

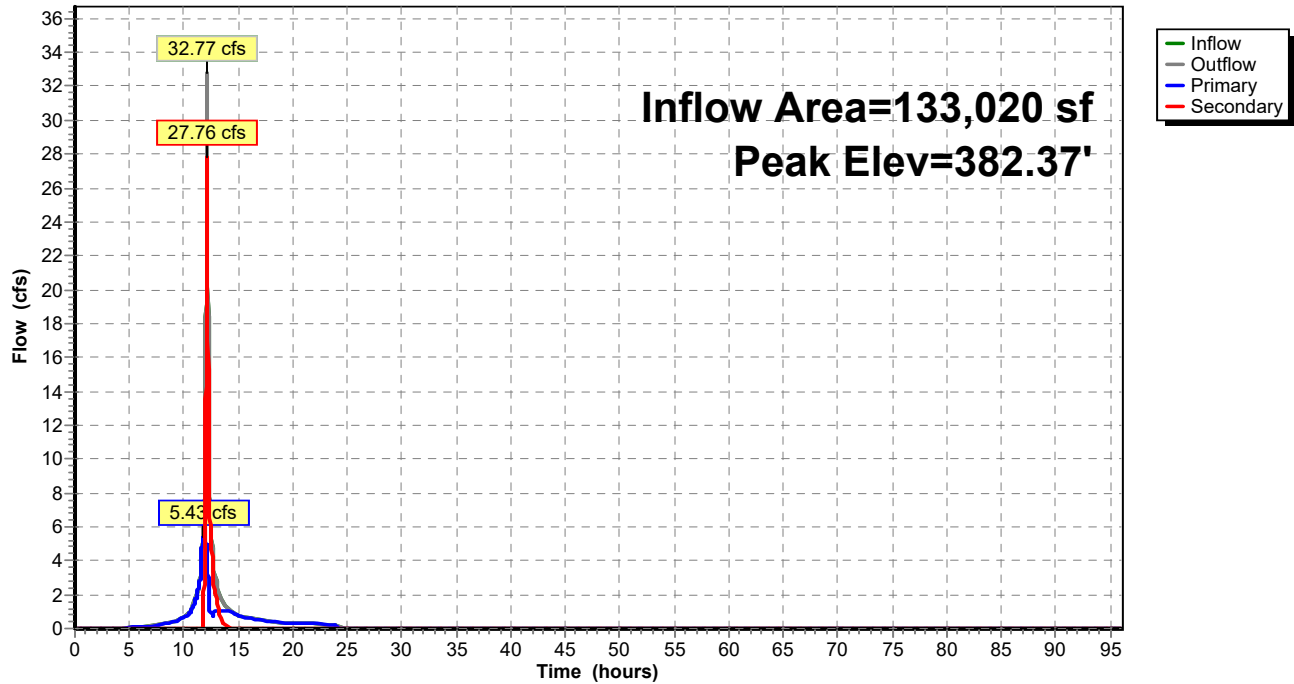
Secondary OutFlow Max=27.74 cfs @ 12.13 hrs HW=382.36' TW=313.60' (Dynamic Tailwater)

↑ **2=Culvert** (Inlet Controls 27.74 cfs @ 8.83 fps)

↑ **3=Broad-Crested Rectangular Weir** (Passes 27.74 cfs of 42.22 cfs potential flow)

Pond 40: DIV-3

Hydrograph



Summary for Pond 41: INF-3

Inflow Area = 133,020 sf, 50.44% Impervious, Inflow Depth = 4.18" for 100-yr event
 Inflow = 5.43 cfs @ 11.75 hrs, Volume= 46,297 cf
 Outflow = 1.13 cfs @ 10.85 hrs, Volume= 46,297 cf, Atten= 79%, Lag= 0.0 min
 Discarded = 1.13 cfs @ 10.85 hrs, Volume= 46,297 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 381.35' @ 12.37 hrs Surf.Area= 4,883 sf Storage= 11,796 cf

Plug-Flow detention time= 80.5 min calculated for 46,293 cf (100% of inflow)
 Center-of-Mass det. time= 80.4 min (894.9 - 814.5)

Volume	Invert	Avail.Storage	Storage Description
#1A	377.50'	4,711 cf	45.00'W x 108.50'L x 3.88'H Field A 18,920 cf Overall - 7,142 cf Embedded = 11,778 cf x 40.0% Voids
#2A	378.00'	7,142 cf	Cultec R-330XLHD x 135 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 9 rows
		11,853 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	377.50'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.10'

Discarded OutFlow Max=1.13 cfs @ 10.85 hrs HW=377.62' (Free Discharge)

↑**1=Exfiltration** (Exfiltration Controls 1.13 cfs)

Pond 41: INF-3 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 9 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

15 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 106.50' Row Length +12.0" End Stone x 2 = 108.50' Base Length

9 Rows x 52.0" Wide + 6.0" Spacing x 8 + 12.0" Side Stone x 2 = 45.00' Base Width

6.0" Base + 30.5" Chamber Height + 10.0" Cover = 3.88' Field Height

135 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 9 Rows = 7,141.8 cf Chamber Storage

18,919.7 cf Field - 7,141.8 cf Chambers = 11,777.9 cf Stone x 40.0% Voids = 4,711.2 cf Stone Storage

Chamber Storage + Stone Storage = 11,852.9 cf = 0.272 af

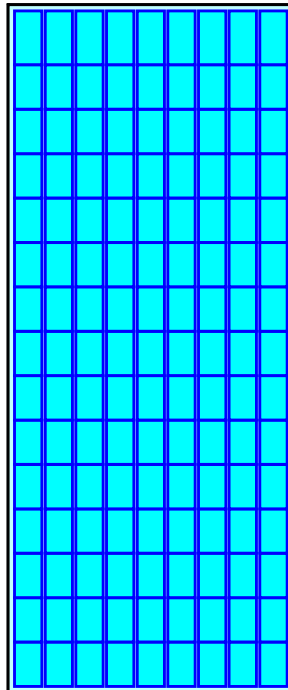
Overall Storage Efficiency = 62.6%

Overall System Size = 108.50' x 45.00' x 3.88'

135 Chambers

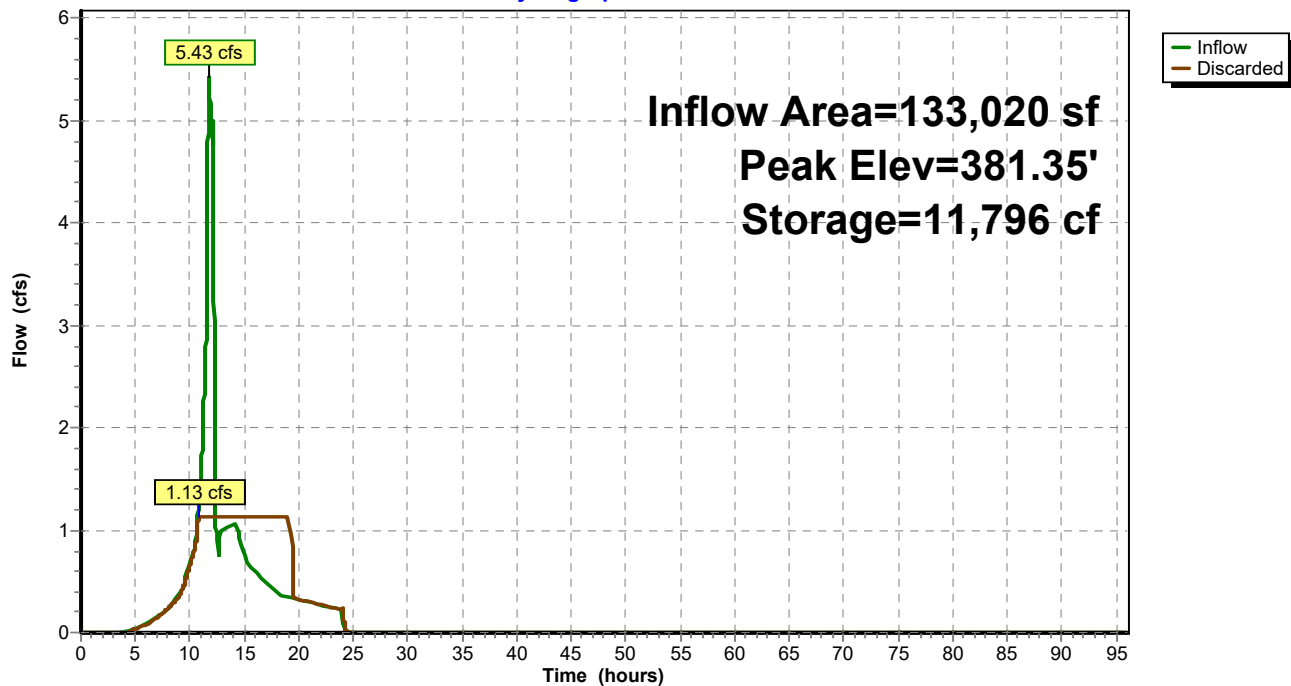
700.7 cy Field

436.2 cy Stone



Pond 41: INF-3

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

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NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Subcatchment 42: Post B4

Runoff = 123.91 cfs @ 12.23 hrs, Volume= 402,814 cf, Depth= 5.49"

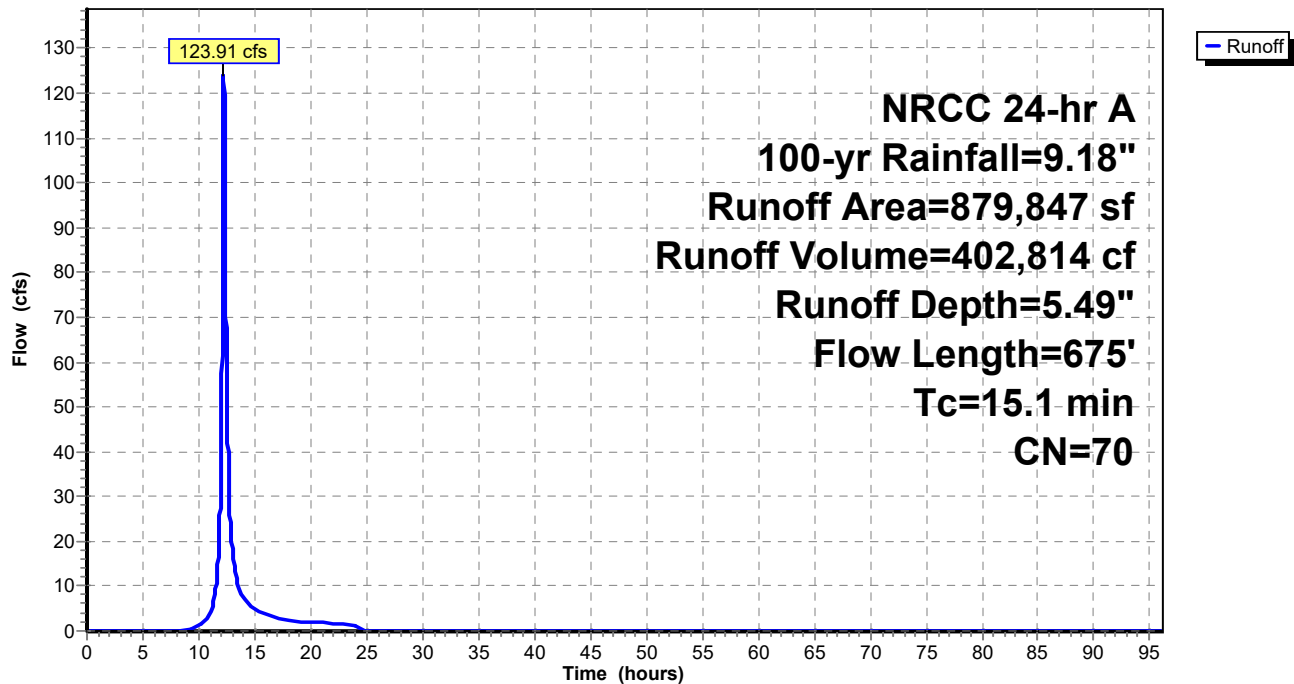
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 100-yr Rainfall=9.18"

Area (sf)	CN	Description
19,672	61	>75% Grass cover, Good, HSG B
13,245	74	>75% Grass cover, Good, HSG C
16,422	55	Woods, Good, HSG B
810,443	70	Woods, Good, HSG C
20,065	70	Woods, Good, HSG C
879,847	70	Weighted Average
879,847		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2	100	0.0600	0.13		Sheet Flow, Woods: Light underbrush n= 0.400 P2= 3.50"
1.9	575	0.0950	4.96		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
15.1	675	Total			

Subcatchment 42: Post B4

Hydrograph



Summary for Reach 43: Existing Stream B

Inflow Area = 2,577,093 sf, 21.36% Impervious, Inflow Depth = 6.77" for 100-yr event
Inflow = 159.35 cfs @ 12.23 hrs, Volume= 1,454,821 cf
Outflow = 157.36 cfs @ 12.25 hrs, Volume= 1,454,811 cf, Atten= 1%, Lag= 1.3 min

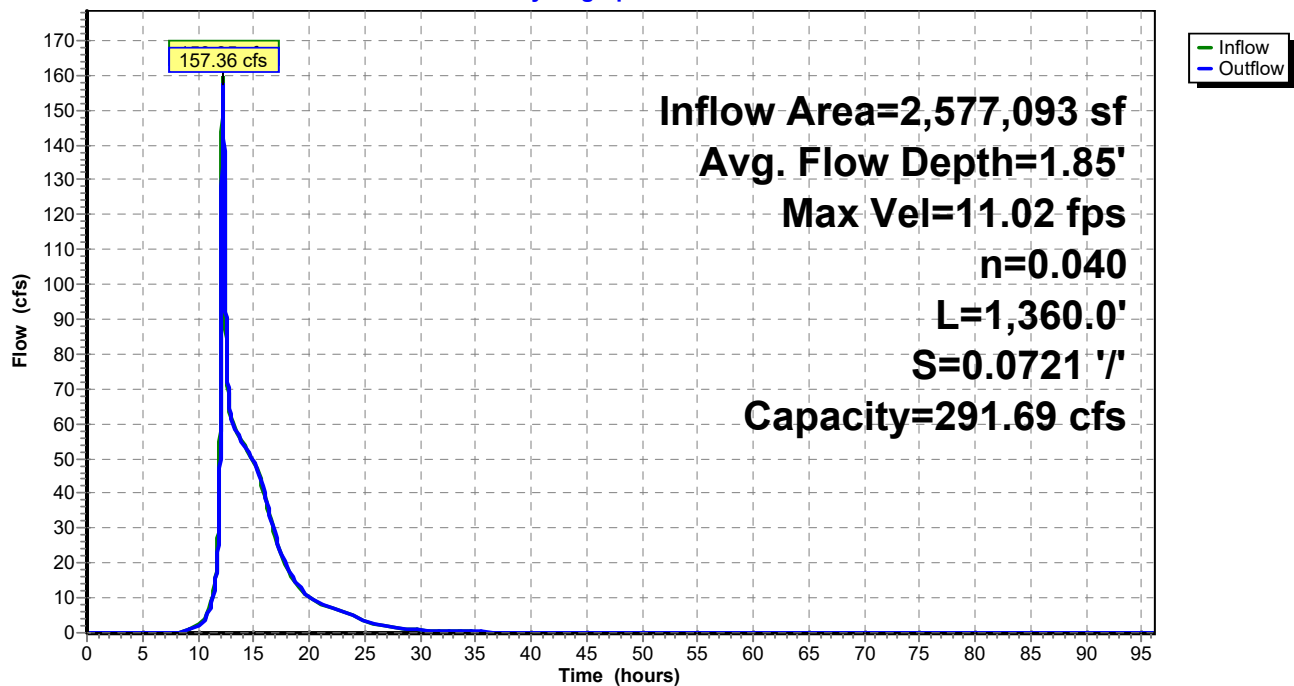
Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
Max. Velocity= 11.02 fps, Min. Travel Time= 2.1 min
Avg. Velocity = 1.88 fps, Avg. Travel Time= 12.1 min

Peak Storage= 19,416 cf @ 12.25 hrs
Average Depth at Peak Storage= 1.85'
Bank-Full Depth= 2.50' Flow Area= 22.5 sf, Capacity= 291.69 cfs

4.00' x 2.50' deep channel, n= 0.040 Winding stream, pools & shoals
Side Slope Z-value= 2.0 '/' Top Width= 14.00'
Length= 1,360.0' Slope= 0.0721 '/'
Inlet Invert= 312.00', Outlet Invert= 214.00'

**Reach 43: Existing Stream B**

Hydrograph



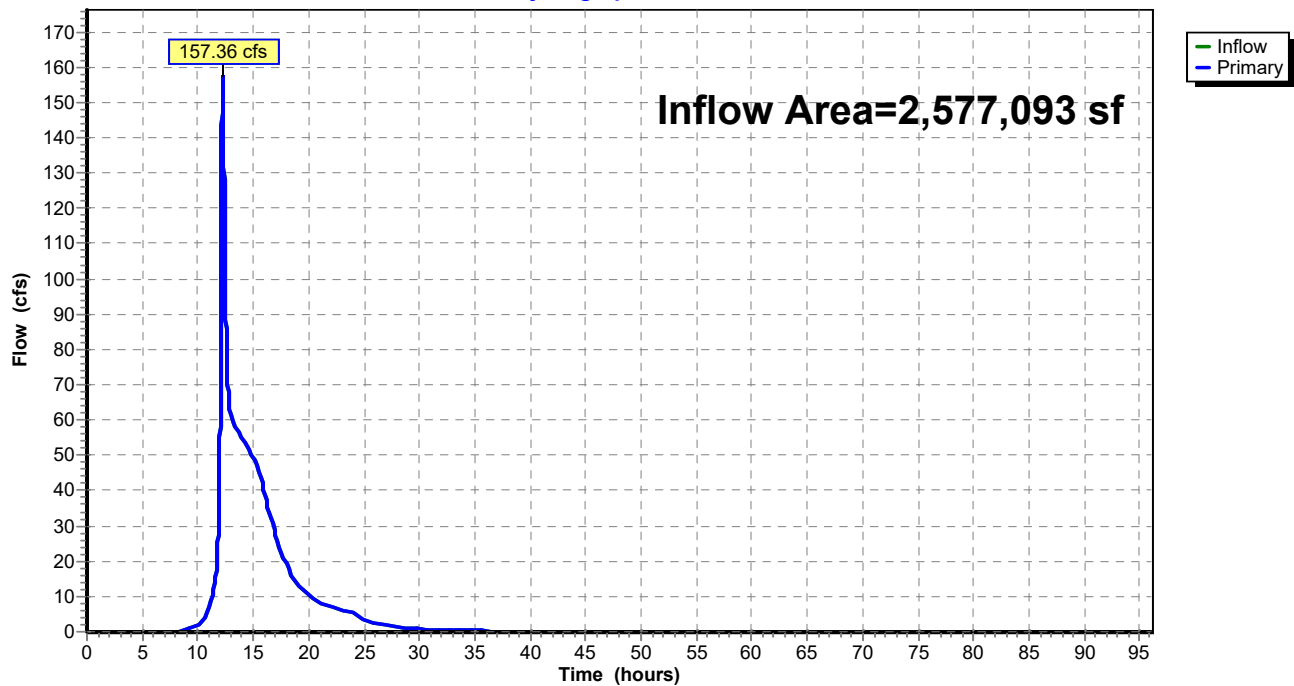
Summary for Link 44: Design Point B

Inflow Area = 2,577,093 sf, 21.36% Impervious, Inflow Depth = 6.77" for 100-yr event
 Inflow = 157.36 cfs @ 12.25 hrs, Volume= 1,454,811 cf
 Primary = 157.36 cfs @ 12.25 hrs, Volume= 1,454,811 cf, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Link 44: Design Point B

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Subcatchment 45: Post B7

Runoff = 6.97 cfs @ 12.13 hrs, Volume= 18,784 cf, Depth= 8.58"

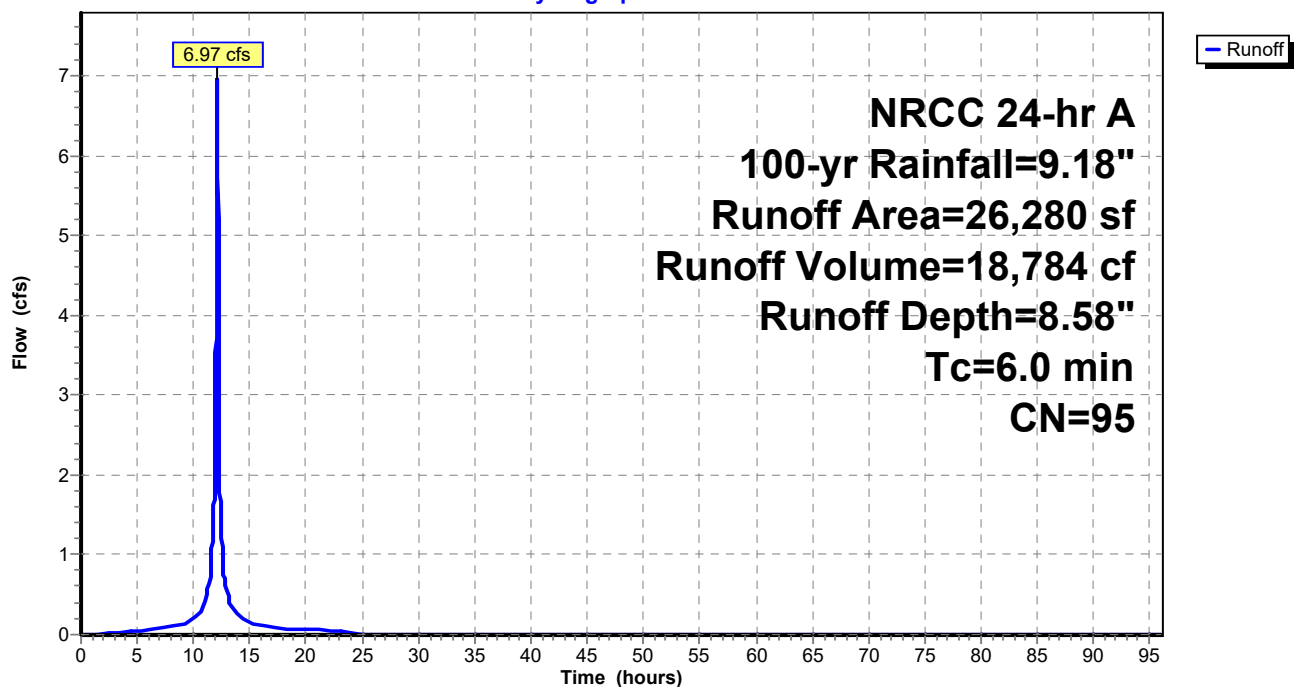
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
NRCC 24-hr A 100-yr Rainfall=9.18"

Area (sf)	CN	Description
14,320	98	Roofs, HSG C
4,847	98	Paved parking, HSG A
3,412	74	>75% Grass cover, Good, HSG C
* 3,701	98	Paved Walkway
26,280	95	Weighted Average
3,412		12.98% Pervious Area
22,868		87.02% Impervious Area

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

Subcatchment 45: Post B7

Hydrograph



Summary for Pond 46: DIV-3

Inflow Area = 26,280 sf, 87.02% Impervious, Inflow Depth = 8.58" for 100-yr event
 Inflow = 6.97 cfs @ 12.13 hrs, Volume= 18,784 cf
 Outflow = 6.97 cfs @ 12.13 hrs, Volume= 18,784 cf, Atten= 0%, Lag= 0.0 min
 Primary = 2.33 cfs @ 11.92 hrs, Volume= 11,337 cf
 Secondary = 6.71 cfs @ 12.14 hrs, Volume= 7,447 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Peak Elev= 390.93' @ 12.14 hrs

Flood Elev= 392.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	388.00'	12.0" Round Culvert L= 17.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 388.00' / 388.00' S= 0.0000 ' S= 0.0000 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Secondary	388.00'	24.0" Round Culvert L= 113.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 388.00' / 386.00' S= 0.0177 ' S= 0.0177 ' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 3.14 sf
#3	Device 2	390.50'	8.0' long x 0.5' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 Coef. (English) 2.80 2.92 3.08 3.30 3.32

Primary OutFlow Max=1.95 cfs @ 11.92 hrs HW=390.47' TW=390.21' (Dynamic Tailwater)

↑ **1=Culvert** (Inlet Controls 1.95 cfs @ 2.48 fps)

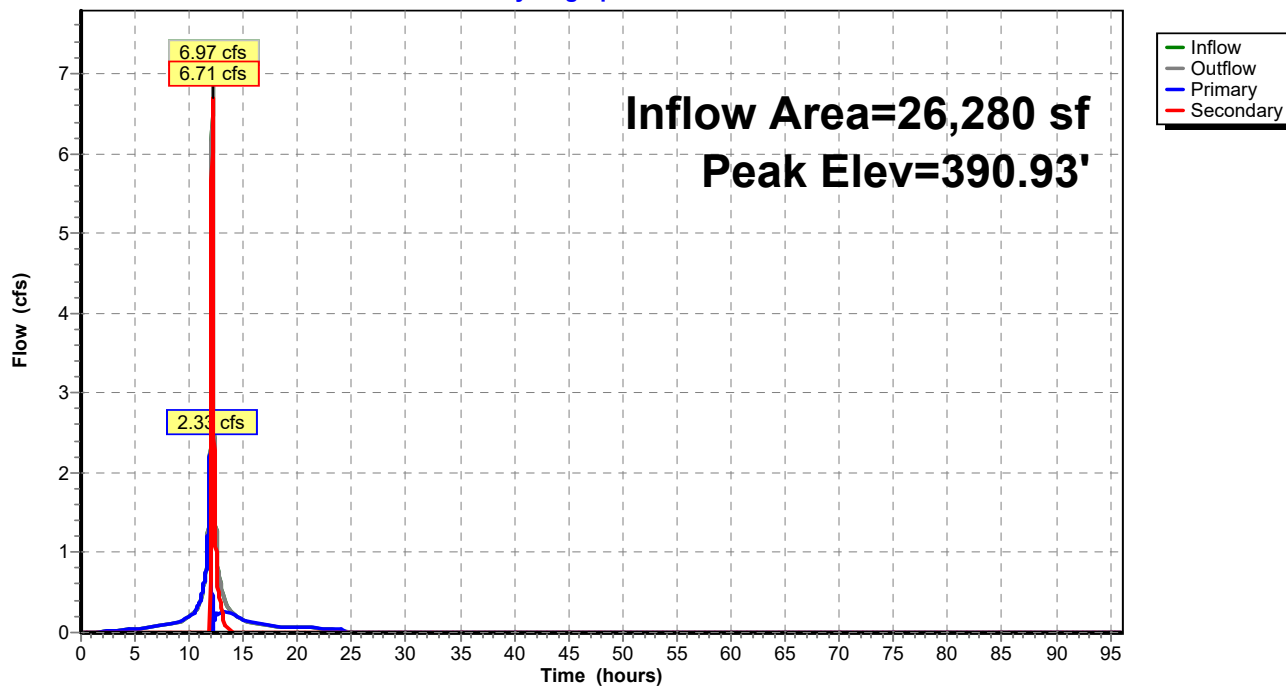
Secondary OutFlow Max=6.69 cfs @ 12.14 hrs HW=390.93' TW=377.40' (Dynamic Tailwater)

↑ **2=Culvert** (Passes 6.69 cfs of 21.03 cfs potential flow)

↑ **3=Broad-Crested Rectangular Weir** (Weir Controls 6.69 cfs @ 1.94 fps)

Pond 46: DIV-3

Hydrograph



N60 P1 Post-B 2021 - 5-4-12 AW

NRCC 24-hr A 100-yr Rainfall=9.18"

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Summary for Pond 47: INF-9

Inflow Area = 26,280 sf, 87.02% Impervious, Inflow Depth = 5.18" for 100-yr event
 Inflow = 2.33 cfs @ 11.92 hrs, Volume= 11,337 cf
 Outflow = 0.27 cfs @ 10.74 hrs, Volume= 11,337 cf, Atten= 88%, Lag= 0.0 min
 Discarded = 0.27 cfs @ 10.74 hrs, Volume= 11,337 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs
 Peak Elev= 390.93' @ 12.13 hrs Surf.Area= 1,174 sf Storage= 2,590 cf

Plug-Flow detention time= 63.9 min calculated for 11,336 cf (100% of inflow)
 Center-of-Mass det. time= 63.9 min (828.3 - 764.4)

Volume	Invert	Avail.Storage	Storage Description
#1A	387.50'	1,167 cf	30.50'W x 38.50'L x 3.88'H Field A 4,550 cf Overall - 1,632 cf Embedded = 2,918 cf x 40.0% Voids
#2A	388.00'	1,632 cf	Cultec R-330XLHD x 30 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap Row Length Adjustment= +1.50' x 7.45 sf x 6 rows
		2,799 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	387.50'	10.000 in/hr Exfiltration over Horizontal area Phase-In= 0.10'

Discarded OutFlow Max=0.27 cfs @ 10.74 hrs HW=387.62' (Free Discharge)↑**1=Exfiltration** (Exfiltration Controls 0.27 cfs)

Pond 47: INF-9 - Chamber Wizard Field A

Chamber Model = Cultec R-330XLHD (Cultec Recharger® 330XLHD)

Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf

Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap

Row Length Adjustment= +1.50' x 7.45 sf x 6 rows

52.0" Wide + 6.0" Spacing = 58.0" C-C Row Spacing

5 Chambers/Row x 7.00' Long +1.50' Row Adjustment = 36.50' Row Length +12.0" End Stone x 2 =
38.50' Base Length

6 Rows x 52.0" Wide + 6.0" Spacing x 5 + 12.0" Side Stone x 2 = 30.50' Base Width

6.0" Base + 30.5" Chamber Height + 10.0" Cover = 3.88' Field Height

30 Chambers x 52.2 cf +1.50' Row Adjustment x 7.45 sf x 6 Rows = 1,631.8 cf Chamber Storage

4,550.2 cf Field - 1,631.8 cf Chambers = 2,918.4 cf Stone x 40.0% Voids = 1,167.4 cf Stone Storage

Chamber Storage + Stone Storage = 2,799.1 cf = 0.064 af

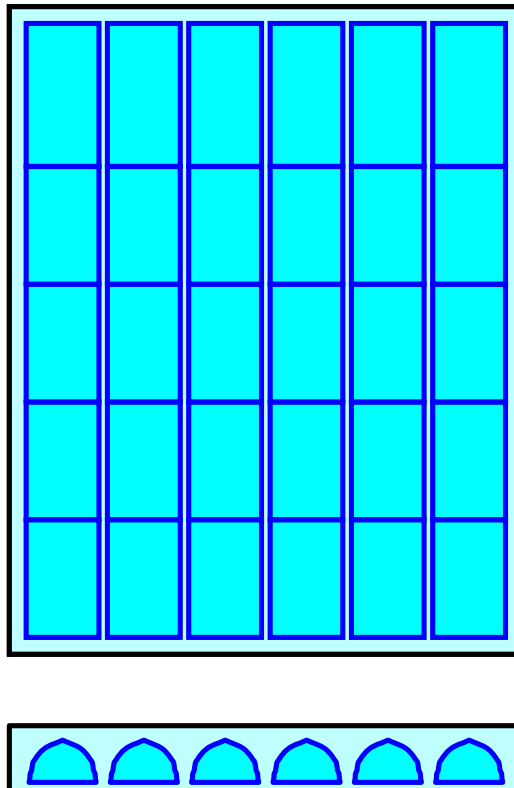
Overall Storage Efficiency = 61.5%

Overall System Size = 38.50' x 30.50' x 3.88'

30 Chambers

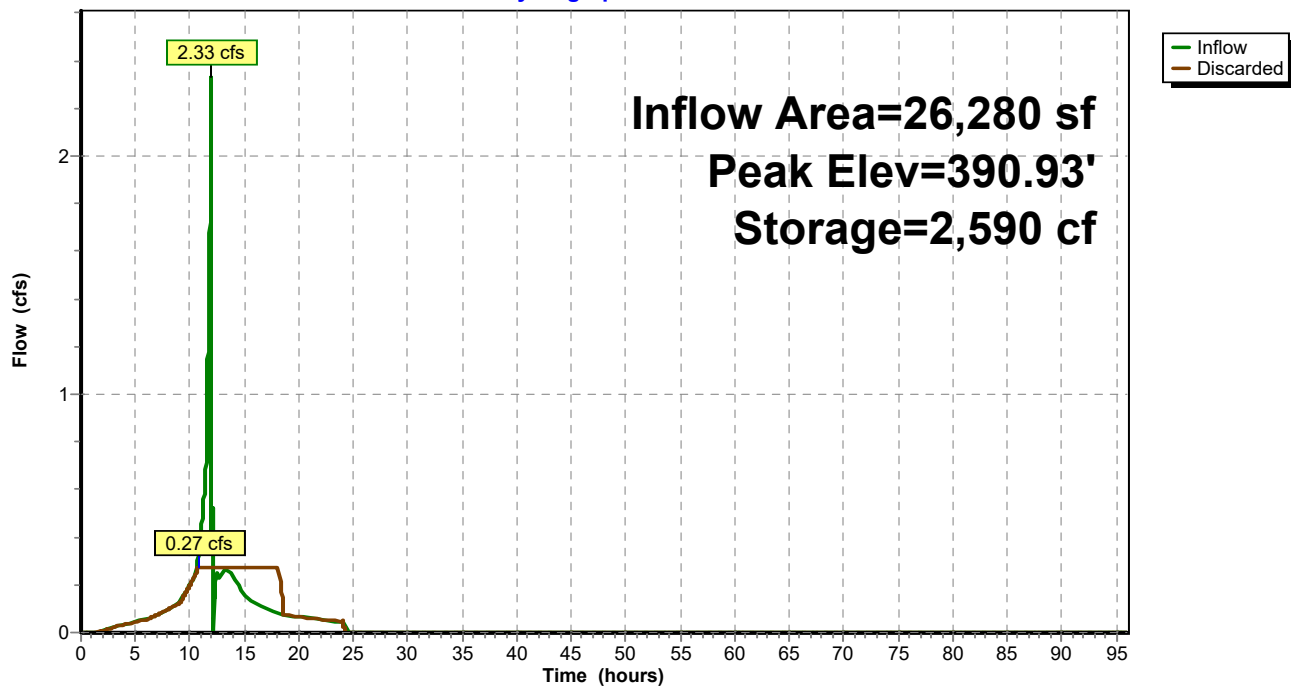
168.5 cy Field

108.1 cy Stone



Pond 47: INF-9

Hydrograph





Appendix B:
Water Quality Volume &
Runoff Reduction Calculations

RRv Analysis A

Subcatchment ID	Basin Description	Total Area (sq. ft)	Impervious area (sq. ft.)	RRv Required (cu.ft)	RRv Min (cu.ft)	Green Practice	Reduction credit	Total Reduction Provided (cu. ft)
A1	Northern Portion of West Street	21,588	8,152	823	307	Tree Plantings (Area Reduction)	25% of impervious area Max	229
A2	Northern Portion of West Street	231,706	48,026	5,793	1,928	Tree Plantings (Area Reduction)	25% of impervious area Max	1,058
A3	Southern Portion of West Street	106,378	91,392	10,946	27,418	INF-1 (Runoff Reduction)	100% Runoff Reduction Volume	10,946
A5	Grocery Store and Medical Office	92,926	92,926	11,035	3,002	INF-2 (Runoff Reduction)	100% Runoff Reduction Volume	11,035
A6	Central/North Parking Lot and Main Street	384,686	332,512	39,812	11,846	SWP-3 (Runoff Reduction)	100% Runoff Reduction Volume	40,460
A7	Overland Flow to SWP-3	103,728	0	2,593	0			
A9	Portion of North Parking Lot	33,825	29,687	3,551	1,058	INF-4 (Runoff Reduction)	100% Runoff Reduction Volume	3,551
A10	West Parking Lot and Overland Flow to SWP-2	158,276	101,710	12,432	3,164	SWP-2 (Runoff Reduction)	100% Runoff Reduction Volume	12,432
Basin A	All Subcatchments Listed Above	1,133,113	704,405	86,985	48,721			79,711

Project The North 60 - Phase 1**Water Quality Volume (WQv) Calculation**Basin ID: **Basin A1****90% WQv:**

Subcatchment Area (A): 21,588 sq.ft.
Rainfall (P): 1.5 in.
Impervious Area 8,152 sq.ft.*
Percent Imperviousness(I): 37.76 %
 $R_v = .05 + .009(I)$ 0.38986
 $R_v =$ 0.3898555 **
 $WQv = (P) (R_v) (A) / 12$ 1,052 cu.ft.
or
0.0242 ac.ft.

** Minimum $R_v = 0.2$ **Area Reduced WQv:**

Subcatchment Area (A): 21,588 sq.ft.
Rainfall (P): 1.5 in.
Impervious Area 6,114 sq.ft.
Percent Imperviousness(I): 28.32 %
 $R_v = .05 + .009(I)$ 0.30489
 $R_v =$ 0.3048916 **
 $WQv = (P) (R_v) (A) / 12$ 823 cu.ft.
or
0.0189 ac.ft.

** Minimum $R_v = 0.2$



Project The North 60 - Phase 1

Specified Runoff Reduction Volume (S-RRv)

$$\text{RRv (in acre-feet of storage)} = [(P)(Rv)(Ai)] / 12$$

Basin ID: **Basin A1**

HSG: **B/C**

P = Rainfall (inches)

1.5 in

Rv = 0.05+0.009(I) where I is 100% impervious

0.95

Aic = Total area of new impervious cover

8,152 ft²

S = Hydrologic Soil Group (HSG) Specific Reduction Factor (S)

0.32 *

HSG A = 0.55

HSG C = 0.30

HSG B = 0.40

HSG D = 0.20

Ai = (S)(Aic)

2,584 ft²

Ai = impervious cover targeted for runoff reduction

therefore:

RRv =

$$\begin{array}{ccccccc} [(P) & (Rv) & (Ai)] & & / & 12 \\ 1.5 & 0.95 & 2,584 & & / & 12 = \end{array}$$

307 cu-ft
0.0070 ac-ft

*Weighted average based on contributing areas.

Project The North 60 - Phase 1**Area Reduction Practices**Basin ID: **Basin A1**

	<u>Total Area</u>	<u>Area of Impervious (AI)</u>
<i>Original Drainage Area (DA):</i>	21,588 sq.ft.	8,152 sq.ft.
Conservation of Natural Areas:	- 0 sq.ft.	- 0 sq.ft.
Riparian Buffers / Filter Strips:	- 0 sq.ft.	- 0 sq.ft.
Tree Planting / Tree Preservation:	- <u>0 sq.ft.</u>	- <u>2,038 sq.ft.</u>
Total Area Reduction:	= 0 sq.ft.	
Total AI Reduction:	=	2,038 sq.ft.
<i>Remaining DA:</i>	21,588 sq.ft.	-
<i>Remaining AI:</i>	-	6,114 sq.ft.
or	0.4956 Acres	0.1404 Acres

Project The North 60 - Phase 1**Water Quality Volume (WQv) Calculation**Basin ID: **Basin A2****90% WQv:**

Subcatchment Area (A): 231,706 sq.ft.
Rainfall (P): 1.5 in.
Impervious Area 48,026 sq.ft.*
Percent Imperviousness(I): 20.73 %
 $R_v = .05 + .009(I)$ 0.23654
 $R_v =$ 0.2365442 **
 $WQv = (P) (R_v) (A) / 12$ 6,851 cu.ft.
or
0.1573 ac.ft.

** Minimum $R_v = 0.2$ **Area Reduced WQv:**

Subcatchment Area (A): 231,706 sq.ft.
Rainfall (P): 1.5 in.
Impervious Area 36,019 sq.ft.
Percent Imperviousness(I): 15.55 %
 $R_v = .05 + .009(I)$ 0.18991
 $R_v =$ 0.2 **
 $WQv = (P) (R_v) (A) / 12$ 5,793 cu.ft.
or
0.1330 ac.ft.

** Minimum $R_v = 0.2$



Project The North 60 - Phase 1

Specified Runoff Reduction Volume (S-RRv)

$$\text{RRv (in acre-feet of storage)} = [(P)(Rv)(Ai)] / 12$$

Basin ID: **Basin A2**

HSG: **B/C**

P = Rainfall (inches)

1.5 in

Rv = 0.05+0.009(I) where I is 100% impervious

0.95

Aic = Total area of new impervious cover

48,026 ft²

S = Hydrologic Soil Group (HSG) Specific Reduction Factor (S)

0.34 *

HSG A = 0.55

HSG C = 0.30

HSG B = 0.40

HSG D = 0.20

Ai = (S)(Aic)

16,233 ft²

Ai = impervious cover targeted for runoff reduction

therefore:

RRv =

$$\begin{array}{ccccccc} [(P) & (Rv) & (Ai)] & & / & 12 \\ 1.5 & 0.95 & 16,233 & & / & 12 = \end{array}$$

1,928 cu-ft
0.0443 ac-ft

*Weighted average based on contributing areas.



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Project The North 60 - Phase 1

Area Reduction Practices

Basin ID: **Basin A2**

	<u>Total Area</u>	<u>Area of Impervious (AI)</u>
Original Drainage Area (DA):	213,706 sq.ft.	48,026 sq.ft.
Conservation of Natural Areas:	- 0 sq.ft.	- 0 sq.ft.
Riparian Buffers / Filter Strips:	- 0 sq.ft.	- 0 sq.ft.
Tree Planting / Tree Preservation:	- 0 sq.ft.	- 12,007 sq.ft.
Total Area Reduction:	= 0 sq.ft.	
Total AI Reduction:	=	12,007 sq.ft.
Remaining DA:	213,706 sq.ft.	-
Remaining AI:	-	36,019 sq.ft.
or	4.9060 Acres	0.8269 Acres

Project The North 60 - Phase 1**Water Quality Volume (WQv) Calculation**Basin ID: **Basin A3****90% WQv:**

Subcatchment Area (A): 106,378 sq.ft.
Rainfall (P): 1.5 in.
Impervious Area 91,392 sq.ft.*
Percent Imperviousness(I): 85.91 %
 $R_v = .05 + .009(I)$ 0.82321
 $R_v =$ 0.8232125 **
 $WQv = (P) (R_v) (A) / 12$ 10,946 cu.ft.
or
0.2513 ac.ft.

** Minimum $R_v = 0.2$ **Area Reduced WQv:**

Subcatchment Area (A): 106,378 sq.ft.
Rainfall (P): 1.5 in.
Impervious Area 91,392 sq.ft.
Percent Imperviousness(I): 85.91 %
 $R_v = .05 + .009(I)$ 0.82321
 $R_v =$ 0.8232125 **
 $WQv = (P) (R_v) (A) / 12$ 10,946 cu.ft.
or
0.2513 ac.ft.

** Minimum $R_v = 0.2$



Project The North 60 - Phase 1

Specified Runoff Reduction Volume (S-RRv)

$$\text{RRv (in acre-feet of storage)} = [(P)(Rv)(Ai)] / 12$$

Basin ID: **Basin A3**

HSG: **C**

P = Rainfall (inches)

1.5 in

Rv = 0.05+0.009(I) where I is 100% impervious

0.95

Aic = Total area of new impervious cover

91,392 ft²

S = Hydrologic Soil Group (HSG) Specific Reduction Factor (S)

0.30

HSG A = 0.55

HSG C = 0.30

HSG B = 0.40

HSG D = 0.20

Ai = (S)(Aic)

27,418 ft²

Ai = impervious cover targeted for runoff reduction

therefore:

RRv =

$$\begin{array}{ccccccc} [(P) & (Rv) & (Ai)] & & / & 12 \\ 1.5 & 0.95 & 27,418 & & / & 12 = \end{array}$$

3,256 cu-ft

0.0747 ac-ft



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Project The North 60 - Phase 1

Source Control Practices

Basin ID: Infiltrator System 1

HSG: C

Practice Type: I = Infiltration

(I)=Infiltration, (B)=Bioretention, (D)=Dry Swale, (V)=Vegetated Swale, (G)=Green Roof, (R)=Rain Garden,
(S)=Stormwater Planters, (C)=Cisterns/Rain Barrels, (P)=Porous Pavement

DA Tributary to Practice(s):

AI to Practice(s):

Total Area:

106,378 sq.ft.

91,392 sq.ft.

Subcatchment Area (A): 106,378 sq.ft.

Rainfall (P): 1.5 in.

Impervious Area 91,392 sq.ft.

Percent Imperviousness(I): 85.91 %

WQv 10,946 cu.ft.

or

0.2513 ac.ft.

Allowable Runoff Reduction Volume (RRv)

Practice Type: I = Infiltration

HSG: C

Allowable runoff reduction volume for Infiltration in C soil = 100% of WQv

10,946 x 1.00 = 10,946 cu.ft.

or

0.2513 ac.ft.

Project The North 60 - Phase 1**Water Quality Volume (WQv) Calculation**Basin ID: **Basin A5**

90% WQv:

Subcatchment Area (A):	92,926 sq.ft.	
Rainfall (P):	1.5 in.	
Impervious Area	92,926 sq.ft.*	
Percent Imperviousness(I):	100.00 %	
$R_v = .05 + .009(I)$	0.95000	
$R_v =$	0.95 **	** Minimum $R_v = 0.2$
$WQv = (P) (R_v) (A) / 12$	11,035 cu.ft.	
	or	
	0.2533 ac.ft.	

Area Reduced WQv:

Subcatchment Area (A):	92,926 sq.ft.	
Rainfall (P):	1.5 in.	
Impervious Area	92,926 sq.ft.	
Percent Imperviousness(I):	100.00 %	
$R_v = .05 + .009(I)$	0.95000	
$R_v =$	0.95 **	** Minimum $R_v = 0.2$
$WQv = (P) (R_v) (A) / 12$	11,035 cu.ft.	
	or	
	0.2533 ac.ft.	

Project The North 60 - Phase 1**Specified Runoff Reduction Volume (S-RRv)**

$$\text{RRv (in acre-feet of storage)} = [(P)(Rv)(Ai)] / 12$$

Basin ID: **Basin A5**HSG: C/D

P = Rainfall (inches)

1.5 in

Rv = 0.05+0.009(I) where I is 100% impervious

0.95

Aic = Total area of new impervious cover

92,926 ft²S = Hydrologic Soil Group (HSG) Specific Reduction Factor (S)

0.27 *

HSG A = 0.55

HSG C = 0.30

HSG B = 0.40

HSG D = 0.20

Ai = (S)(Aic)

25,276 ft²

Ai = impervious cover targeted for runoff reduction

therefore:

RRv =

$$\begin{array}{ccccccc} [(P) & (Rv) & (Ai)] & / & 12 \\ 1.5 & 0.95 & 25,276 & / & 12 = \end{array}$$

3,002 cu-ft**0.0689 ac-ft**

*Weighted average based on contributing areas.



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Project The North 60 - Phase 1

Source Control Practices

Basin ID: Infiltrator System 2

HSG: C

Practice Type: I = Infiltration

(I)=Infiltration, (B)=Bioretention, (D)=Dry Swale, (V)=Vegetated Swale, (G)=Green Roof, (R)=Rain Garden,
(S)=Stormwater Planters, (C)=Cisterns/Rain Barrels, (P)=Porous Pavement

DA Tributary to Practice(s):

AI to Practice(s):

Total Area:

92,926 sq.ft.

92,926 sq.ft.

Subcatchment Area (A): 92,926 sq.ft.

Rainfall (P): 1.5 in.

Impervious Area 92,926 sq.ft.

Percent Imperviousness(I): 100.00 %

WQv 11,035 cu.ft.

or

0.2533 ac.ft.

Allowable Runoff Reduction Volume (RRv)

Practice Type: I = Infiltration

HSG: C

Allowable runoff reduction volume for Infiltration in C soil = 100% of WQv

11,035 x 1.00 = 11,035 cu.ft.

or

0.2533 ac.ft.

Project The North 60 - Phase 1**Water Quality Volume (WQv) Calculation**Basin ID: **Basin A6****90% WQv:**

Subcatchment Area (A): 384,686 sq.ft.
Rainfall (P): 1.5 in.
Impervious Area 332,512 sq.ft.*
Percent Imperviousness(I): 86.44 %
 $R_v = .05 + .009(I)$ 0.82794
 $R_v =$ 0.8279353 **
 $WQv = (P) (R_v) (A) / 12$ 39,812 cu.ft.
or
0.9140 ac.ft.

** Minimum $R_v = 0.2$ **Area Reduced WQv:**

Subcatchment Area (A): 384,686 sq.ft.
Rainfall (P): 1.5 in.
Impervious Area 332,512 sq.ft.
Percent Imperviousness(I): 86.44 %
 $R_v = .05 + .009(I)$ 0.82794
 $R_v =$ 0.8279353 **
 $WQv = (P) (R_v) (A) / 12$ 39,812 cu.ft.
or
0.9140 ac.ft.

** Minimum $R_v = 0.2$



Project The North 60 - Phase 1

Specified Runoff Reduction Volume (S-RRv)

$$\text{RRv (in acre-feet of storage)} = [(P)(Rv)(Ai)] / 12$$

Basin ID: **Basin A6**

HSG: **C**

P = Rainfall (inches)

1.5 in

Rv = $0.05 + 0.009(I)$ where I is 100% impervious

0.95

Aic = Total area of new impervious cover

332,512 ft²

S = Hydrologic Soil Group (HSG) Specific Reduction Factor (S)

0.30

HSG A = 0.55

HSG C = 0.30

HSG B = 0.40

HSG D = 0.20

Ai = (S)(Aic)

99,754 ft²

Ai = impervious cover targeted for runoff reduction

therefore:

RRv =

$$\begin{array}{ccccccc} [(P) & (Rv) & (Ai)] & & / & 12 \\ 1.5 & 0.95 & 99,754 & & / & 12 & = \end{array}$$

11,846 cu-ft

0.2719 ac-ft

Project The North 60 - Phase 1**Water Quality Volume (WQv) Calculation**Basin ID: **Basin A7**

90% WQv: Subcatchment Area (A): 103,728 sq.ft.
Rainfall (P): 1.5 in.
Impervious Area 0 sq.ft.*
Percent Imperviousness(I): 0.00 %
 $R_v = .05 + .009(I)$ 0.05000
 $R_v =$ 0.2 ** ** Minimum $R_v = 0.2$
 $WQv = (P) (R_v) (A) / 12$ 2,593 cu.ft.
or
0.0595 ac.ft.

Area Reduced WQv: Subcatchment Area (A): 103,728 sq.ft.
Rainfall (P): 1.5 in.
Impervious Area 0 sq.ft.
Percent Imperviousness(I): 0.00 %
 $R_v = .05 + .009(I)$ 0.05000
 $R_v =$ 0.2 ** ** Minimum $R_v = 0.2$
 $WQv = (P) (R_v) (A) / 12$ 2,593 cu.ft.
or
0.0595 ac.ft.



Project The North 60 - Phase 1

Specified Runoff Reduction Volume (S-RRv)

$$\text{RRv (in acre-feet of storage)} = [(P)(Rv)(Ai)] / 12$$

Basin ID: **Basin A7**

HSG: **C**

P = Rainfall (inches)

1.5 in

Rv = 0.05+0.009(I) where I is 100% impervious

0.95

Aic = Total area of new impervious cover

0 ft²

S = Hydrologic Soil Group (HSG) Specific Reduction Factor (S)

0.30

HSG A = 0.55

HSG C = 0.30

HSG B = 0.40

HSG D = 0.20

Ai = (S)(Aic)

0 ft²

Ai = impervious cover targeted for runoff reduction

therefore:

RRv =

$$\begin{array}{ccccccc} [(P) & (Rv) & (Ai)] & & / & 12 \\ 1.5 & 0.95 & 0 & & / & 12 = \end{array}$$

0 cu-ft
0.0000 ac-ft



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Project The North 60 - Phase 1

Source Control Practices

Basin ID: Infiltration Basin (SWP-3)

HSG: C

Practice Type: I = Infiltration

(I)=Infiltration, (B)=Bioretention, (D)=Dry Swale, (V)=Vegetated Swale, (G)=Green Roof, (R)=Rain Garden,
(S)=Stormwater Planters, (C)=Cisterns/Rain Barrels, (P)=Porous Pavement

DA Tributary to Practice(s):

AI to Practice(s):

Total Area:

488,414 sq.ft.

332,512 sq.ft.

Subcatchment Area (A): 488,414 sq.ft.

Rainfall (P): 1.5 in.

Impervious Area 332,512 sq.ft.

Percent Imperviousness(I): 68.08 %

WQv 40,460 cu.ft.

or

0.9288 ac.ft.

Allowable Runoff Reduction Volume (RRv)

Practice Type: I = Infiltration

HSG: C

Allowable runoff reduction volume for Infiltration in C soil = 100% of WQv

40,460 x 1.00 = **40,460 cu.ft.**
or
0.9288 ac.ft.

Project The North 60 - Phase 1**Water Quality Volume (WQv) Calculation**Basin ID: **Basin A9****90% WQv:**

Subcatchment Area (A): 33,825 sq.ft.
Rainfall (P): 1.5 in.
Impervious Area 29,687 sq.ft.*
Percent Imperviousness(I): 87.77 %
 $R_v = .05 + .009(I)$ 0.83990
 $R_v =$ 0.839898 **
 $WQv = (P) (R_v) (A) / 12$ 3,551 cu.ft.
or
0.0815 ac.ft.

** Minimum $R_v = 0.2$ **Area Reduced WQv:**

Subcatchment Area (A): 33,825 sq.ft.
Rainfall (P): 1.5 in.
Impervious Area 29,687 sq.ft.
Percent Imperviousness(I): 87.77 %
 $R_v = .05 + .009(I)$ 0.83990
 $R_v =$ 0.839898 **
 $WQv = (P) (R_v) (A) / 12$ 3,551 cu.ft.
or
0.0815 ac.ft.

** Minimum $R_v = 0.2$



Project The North 60 - Phase 1

Specified Runoff Reduction Volume (S-RRv)

$$\text{RRv (in acre-feet of storage)} = [(P)(Rv)(Ai)] / 12$$

Basin ID: **Basin A9**

HSG: **C**

P = Rainfall (inches)

1.5 in

Rv = 0.05+0.009(I) where I is 100% impervious

0.95

Aic = Total area of new impervious cover

29,687 ft²

S = Hydrologic Soil Group (HSG) Specific Reduction Factor (S)

0.30

HSG A = 0.55

HSG C = 0.30

HSG B = 0.40

HSG D = 0.20

Ai = (S)(Aic)

8,906 ft²

Ai = impervious cover targeted for runoff reduction

therefore:

RRv =

$$\begin{array}{ccccccc} [(P) & (Rv) & (Ai)] & & / & 12 \\ 1.5 & 0.95 & 8,906 & & / & 12 = \end{array}$$

1,058 cu-ft

0.0243 ac-ft



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Project The North 60 - Phase 1

Source Control Practices

Basin ID: Infiltration System 4

HSG: C

Practice Type: I = Infiltration

(I)=Infiltration, (B)=Bioretention, (D)=Dry Swale, (V)=Vegetated Swale, (G)=Green Roof, (R)=Rain Garden,
(S)=Stormwater Planters, (C)=Cisterns/Rain Barrels, (P)=Porous Pavement

DA Tributary to Practice(s):

AI to Practice(s):

Total Area:

33,825 sq.ft.

29,687 sq.ft.

Subcatchment Area (A): 33,825 sq.ft.

Rainfall (P): 1.5 in.

Impervious Area 29,687 sq.ft.

Percent Imperviousness(I): 87.77 %

WQv 3,551 cu.ft.

or

0.0815 ac.ft.

Allowable Runoff Reduction Volume (RRv)

Practice Type: I = Infiltration

HSG: C

Allowable runoff reduction volume for Infiltration in C soil = 100% of WQv

3,551 x 1.00 = **3,551 cu.ft.**
or
0.0815 ac.ft.

Project The North 60 - Phase 1**Water Quality Volume (WQv) Calculation**Basin ID: **Basin A10****90% WQv:**

Subcatchment Area (A): 158,276 sq.ft.
Rainfall (P): 1.5 in.
Impervious Area 101,710 sq.ft.*
Percent Imperviousness(I): 64.26 %
 $R_v = .05 + .009(I)$ 0.62835
 $R_v =$ 0.6283505 **
 $WQv = (P) (R_v) (A) / 12$ 12,432 cu.ft.
or
0.2854 ac.ft.

** Minimum $R_v = 0.2$ **Area Reduced WQv:**

Subcatchment Area (A): 158,276 sq.ft.
Rainfall (P): 1.5 in.
Impervious Area 101,710 sq.ft.
Percent Imperviousness(I): 64.26 %
 $R_v = .05 + .009(I)$ 0.62835
 $R_v =$ 0.6283505 **
 $WQv = (P) (R_v) (A) / 12$ 12,432 cu.ft.
or
0.2854 ac.ft.

** Minimum $R_v = 0.2$



Project The North 60 - Phase 1

Specified Runoff Reduction Volume (S-RRv)

$$\text{RRv (in acre-feet of storage)} = [(P)(Rv)(Ai)] / 12$$

Basin ID: **Basin A10**

HSG: C/D

P = Rainfall (inches)

1.5 in

Rv = 0.05+0.009(I) where I is 100% impervious

0.95

Aic = Total area of new impervious cover

101,710 ft²

S = Hydrologic Soil Group (HSG) Specific Reduction Factor (S)

0.26 *

HSG A = 0.55

HSG C = 0.30

HSG B = 0.40

HSG D = 0.20

Ai = (S)(Aic)

26,648 ft²

Ai = impervious cover targeted for runoff reduction

therefore:

RRv =

$$\begin{array}{ccccccc} [(P) & (Rv) & (Ai)] & & / & 12 \\ 1.5 & 0.95 & 26,648 & & / & 12 & = \end{array}$$

3,164 cu-ft
0.0726 ac-ft

*Weighted average based on contributing areas.



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Project The North 60 - Phase 1

Source Control Practices

Basin ID: Infiltration Basin (SWP-2)

HSG: C

Practice Type: I = Infiltration

(I)=Infiltration, (B)=Bioretention, (D)=Dry Swale, (V)=Vegetated Swale, (G)=Green Roof, (R)=Rain Garden,
(S)=Stormwater Planters, (C)=Cisterns/Rain Barrels, (P)=Porous Pavement

DA Tributary to Practice(s):

AI to Practice(s):

Total Area:

158,276 sq.ft.

101,710 sq.ft.

Subcatchment Area (A): 158,276 sq.ft.

Rainfall (P): 1.5 in.

Impervious Area 101,710 sq.ft.

Percent Imperviousness(I): 64.26 %

WQv 12,432 cu.ft.

or

0.2854 ac.ft.

Allowable Runoff Reduction Volume (RRv)

Practice Type: I = Infiltration

HSG: C

Allowable runoff reduction volume for Infiltration in C soil = 100% of WQv

12,432 x 1.00 = 12,432 cu.ft.
or
0.2854 ac.ft.



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Project The North 60 - Phase 1

Total Runoff Reduction Volume

Basin ID: Post A

Total RRv provided:

Original WQv - Area Reduced WQv:	86,328	-	84,747	=	<u>RRv</u> 1,580 cu.ft.
Roof Top Disconnection:				=	0 cu.ft.

Source Control WQv Treatment Practices:

Basin:

Infiltrator System 1	=	10,946 cu.ft.
Infiltrator System 2	=	11,035 cu.ft.
Infiltration System 4	=	3,551 cu.ft.
Infiltration Basin (SWP-3)	=	40,460 cu.ft.
Infiltration Basin (SWP-2)	=	12,432 cu.ft.

Total RRv provided:	<u>80,004 cu.ft.</u>
	or
	1.837 ac.ft.

Is RRv provided 1.837 ac. ft. $\geq$ Original WQv 1.982 ac. ft.

No

Is RRv provided 1.837 ac. ft. $\geq$ S-RRv (min. RRv) 0.557 ac. ft.

Yes

Total drainage area treated with runoff reduction / source control practices:

Area Reduction Practices:	0 sq.ft.	or	0.000 Acres
Source Control Practices:	233,129 sq.ft.	or	5.352 Acres
Total:			5.352 Acres

RRv Analysis B

Subcatchment ID	Basin Description	Total Area (sq. ft)	Impervious area (sq. ft.)	RRv Required (cu.ft)	RRv Min (cu.ft)	Green Practice	Reduction credit	Total Reduction Provided (cu. ft)
B1	Portion of Hotel Drive	58,920	19,123	1,982	695	Tree Plantings (Area	25% of impervious area Max	538
B2	East Parking Lot	133,020	67,090	8,379	2,438	INF-3 (Runoff Reduction)	100% Runoff Reduction Volume	8,379
B7	Hotel and Portion of Hotel Drive	26,280	22,868	2,737	815	INF-9 (Runoff Reduction)	100% Runoff Reduction Volume	2,737
Basin B	All Subcatchments Listed Above	218,220	109,081	13,098	3,947	SWP-2 (Runoff Reduction)	100% Runoff Reduction Volume	11,654

Project The North 60 - Phase 1**Water Quality Volume (WQv) Calculation**Basin ID: **Basin B1****90% WQv:**

Subcatchment Area (A): 58,920 sq.ft.
Rainfall (P): 1.5 in.
Impervious Area 19,123 sq.ft.*
Percent Imperviousness(I): 32.46 %
 $R_v = .05 + .009(I)$ 0.34210
 $R_v =$ 0.3421029 **
 $WQv = (P) (R_v) (A) / 12$ 2,520 cu.ft.
or
0.0578 ac.ft.

** Minimum $R_v = 0.2$ **Area Reduced WQv:**

Subcatchment Area (A): 58,920 sq.ft.
Rainfall (P): 1.5 in.
Impervious Area 14,342 sq.ft.
Percent Imperviousness(I): 24.34 %
 $R_v = .05 + .009(I)$ 0.26907
 $R_v =$ 0.2690733 **
 $WQv = (P) (R_v) (A) / 12$ 1,982 cu.ft.
or
0.0455 ac.ft.

** Minimum $R_v = 0.2$



Project The North 60 - Phase 1

Specified Runoff Reduction Volume (S-RRv)

$$\text{RRv (in acre-feet of storage)} = [(P)(Rv)(Ai)] / 12$$

Basin ID: **Basin B1**

HSG: **B/C**

P = Rainfall (inches)

1.5 in

Rv = 0.05+0.009(I) where I is 100% impervious

0.95

Aic = Total area of new impervious cover

19,123 ft²

S = Hydrologic Soil Group (HSG) Specific Reduction Factor (S)

0.31 *

HSG A = 0.55

HSG C = 0.30

HSG B = 0.40

HSG D = 0.20

Ai = (S)(Aic)

5,852 ft²

Ai = impervious cover targeted for runoff reduction

therefore:

RRv =

$$\begin{array}{ccccccc} [(P) & (Rv) & (Ai)] & & / & 12 \\ 1.5 & 0.95 & 5,852 & & / & 12 = \end{array}$$

695 cu-ft
0.0160 ac-ft

*Weighted average based on contributing areas.

Project The North 60 - Phase 1**Area Reduction Practices**Basin ID: **Basin B1**

	<u>Total Area</u>	<u>Area of Impervious (AI)</u>
<i>Original Drainage Area (DA):</i>	58,920 sq.ft.	19,123 sq.ft.
Conservation of Natural Areas:	- 0 sq.ft.	- 0 sq.ft.
Riparian Buffers / Filter Strips:	- 0 sq.ft.	- 0 sq.ft.
Tree Planting / Tree Preservation:	- <u>0 sq.ft.</u>	- <u>4,780 sq.ft.</u>
Total Area Reduction:	= 0 sq.ft.	
Total AI Reduction:	=	4,780 sq.ft.
<i>Remaining DA:</i>	58,920 sq.ft.	-
<i>Remaining AI:</i>	-	14,343 sq.ft.
or	1.3526 Acres	0.3293 Acres

Project The North 60 - Phase 1**Water Quality Volume (WQv) Calculation**Basin ID: **Basin B2****90% WQv:**

Subcatchment Area (A): 133,020 sq.ft.
Rainfall (P): 1.5 in.
Impervious Area 67,090 sq.ft.*
Percent Imperviousness(I): 50.44 %
 $R_v = .05 + .009(I)$ 0.50392
 $R_v =$ 0.5039242 **
 $WQv = (P) (R_v) (A) / 12$ 8,379 cu.ft.
or
0.1924 ac.ft.

** Minimum $R_v = 0.2$ **Area Reduced WQv:**

Subcatchment Area (A): 133,020 sq.ft.
Rainfall (P): 1.5 in.
Impervious Area 67,090 sq.ft.
Percent Imperviousness(I): 50.44 %
 $R_v = .05 + .009(I)$ 0.50392
 $R_v =$ 0.5039242 **
 $WQv = (P) (R_v) (A) / 12$ 8,379 cu.ft.
or
0.1924 ac.ft.

** Minimum $R_v = 0.2$



Project The North 60 - Phase 1

Specified Runoff Reduction Volume (S-RRv)

$$\text{RRv (in acre-feet of storage)} = [(P)(Rv)(Ai)] / 12$$

Basin ID: **Basin B2**

HSG: **B/C**

P = Rainfall (inches)

1.5 in

Rv = 0.05+0.009(I) where I is 100% impervious

0.95

Aic = Total area of new impervious cover

67,090 ft²

S = Hydrologic Soil Group (HSG) Specific Reduction Factor (S)

0.31 *

HSG A = 0.55

HSG C = 0.30

HSG B = 0.40

HSG D = 0.20

Ai = (S)(Aic)

20,530 ft²

Ai = impervious cover targeted for runoff reduction

therefore:

RRv =

$$\begin{array}{ccccccc} [(P) & (Rv) & (Ai)] & & / & 12 \\ 1.5 & 0.95 & 20,530 & & / & 12 = \end{array}$$

2,438 cu-ft

0.0560 ac-ft

*Weighted average based on contributing areas.



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Project The North 60 - Phase 1

Source Control Practices

Basin ID: **Infiltrator System 3**

HSG: C

Practice Type: I = Infiltration

(I)=Infiltration, (B)=Bioretention, (D)=Dry Swale, (V)=Vegetated Swale, (G)=Green Roof, (R)=Rain Garden,
(S)=Stormwater Planters, (C)=Cisterns/Rain Barrels, (P)=Porous Pavement

DA Tributary to Practice(s):

AI to Practice(s):

Total Area:

133,020 sq.ft.

67,090 sq.ft.

Subcatchment Area (A): 133,020 sq.ft.

Rainfall (P): 1.5 in.

Impervious Area 67,090 sq.ft.

Percent Imperviousness(I): 50.44 %

WQv 8,379 cu.ft.

or

0.1924 ac.ft.

Allowable Runoff Reduction Volume (RRv)

Practice Type: I = Infiltration HSG: C

Allowable runoff reduction volume for Infiltration in C soil = 100% of WQv

8,379 x 1.00 = **8,379 cu.ft.**
or
0.1924 ac.ft.

Project The North 60 - Phase 1**Water Quality Volume (WQv) Calculation**Basin ID: **Basin B7**

90% WQv:

Subcatchment Area (A):	26,280 sq.ft.	
Rainfall (P):	1.5 in.	
Impervious Area	22,868 sq.ft.*	
Percent Imperviousness(I):	87.02 %	
Rv = .05 + .009(I)	0.83315	
Rv =	0.8331507 **	** Minimum Rv = 0.2
WQv = (P) (Rv) (A) / 12	2,737 cu.ft.	
	or	
	0.0628 ac.ft.	

Area Reduced WQv:

Subcatchment Area (A):	26,280 sq.ft.	
Rainfall (P):	1.5 in.	
Impervious Area	22,868 sq.ft.	
Percent Imperviousness(I):	87.02 %	
Rv = .05 + .009(I)	0.83315	
Rv =	0.8331507 **	** Minimum Rv = 0.2
WQv = (P) (Rv) (A) / 12	2,737 cu.ft.	
	or	
	0.0628 ac.ft.	



Project The North 60 - Phase 1

Specified Runoff Reduction Volume (S-RRv)

$$\text{RRv (in acre-feet of storage)} = [(P)(Rv)(Ai)] / 12$$

Basin ID: **Basin B7**

HSG: **C**

P = Rainfall (inches)

1.5 in

Rv = 0.05+0.009(I) where I is 100% impervious

0.95

Aic = Total area of new impervious cover

22,868 ft²

S = Hydrologic Soil Group (HSG) Specific Reduction Factor (S)

0.30

HSG A = 0.55

HSG C = 0.30

HSG B = 0.40

HSG D = 0.20

Ai = (S)(Aic)

6,860 ft²

Ai = impervious cover targeted for runoff reduction

therefore:

RRv =

$$\begin{array}{ccccccc} [(P) & (Rv) & (Ai)] & / & 12 \\ 1.5 & 0.95 & 6,860 & / & 12 = \end{array}$$

815 cu-ft
0.0187 ac-ft



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Project The North 60 - Phase 1

Source Control Practices

Basin ID: **Infiltrator System 9**

HSG: C

Practice Type: I = Infiltration

(I)=Infiltration, (B)=Bioretention, (D)=Dry Swale, (V)=Vegetated Swale, (G)=Green Roof, (R)=Rain Garden,
(S)=Stormwater Planters, (C)=Cisterns/Rain Barrels, (P)=Porous Pavement

DA Tributary to Practice(s):

AI to Practice(s):

Total Area:

26,280 sq.ft.

22,868 sq.ft.

Subcatchment Area (A): 26,280 sq.ft.

Rainfall (P): 1.5 in.

Impervious Area 22,868 sq.ft.

Percent Imperviousness(I): 87.02 %

WQv 2,737 cu.ft.

or

0.0628 ac.ft.

Allowable Runoff Reduction Volume (RRv)

Practice Type: I = Infiltration HSG: C

Allowable runoff reduction volume for Infiltration in C soil = 100% of WQv

2,737 x 1.00 = **2,737 cu.ft.**
or
0.0628 ac.ft.



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Project The North 60 - Phase 1

Total Runoff Reduction Volume

Basin ID: **Basin B**

Total RRv provided:

				<u>RRv</u>
Original WQv - Area Reduced WQv:	14,398	-	13,861	= 538 cu.ft.
Roof Top Disconnection:				= 0 cu.ft.
Source Control WQv Treatment Practices:				
<u>Basin:</u>				
Infiltrator System 3				= 8,379 cu.ft.
Infiltrator System 9				= 2,737 cu.ft.
				= cu.ft.
				= cu.ft.

Total RRv provided: 11,654 cu.ft.
or
0.268 ac.ft.

Is RRv provided 0.268 ac. ft. $\geq$ Original WQv 0.331 ac. ft.

No

Is RRv provided 0.268 ac. ft. $\geq$ S-RRv (min. RRv) 0.092 ac. ft.

Yes

Total drainage area treated with runoff reduction / source control practices:

Area Reduction Practices:	0 sq.ft.	or	0.000 Acres
Source Control Practices:	133,020 sq.ft.	or	3.054 Acres
Total:			3.054 Acres



Appendix C:
First Defense Stormwater Treatment
Chamber Information



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THE NORTH 60

Hydrodynamic Separator Summary Chart

<i>Structure Number</i>	<i>Model No.</i>	<i>Treatment Capacity (cfs)</i>	<i>WQv Flow (Treatmeant) (cfs)</i>	<i>Peak Bypass Flow (cfs)</i>	<i>Peak Flow (cfs)</i>
HDS-INF 1	FD-6HC	4.23	3.78	32.00	4.81
HDS-INF 2	FD-6HC	4.23	3.88	32.00	5.63
HDS-INF 3	FD-5HC	2.94	2.12	20.00	5.43
HDS-INF 4	FD-4HC	1.88	1.20	18.00	4.66
HDS-INF-9	FD-5HC	2.94	1.97	20.00	6.97
HDS-SWP 1	FD-8HC	7.52	0.79	50.00	34.72
HDS-SWP 2	FD-8HC	7.52	3.79	50.00	40.58
HDS-SWP 3	TBD	-----	14.52	-----	102.32

First Defense® High Capacity

A Simple Solution for your Trickiest Sites

Product Profil

The First Defense® High Capacity is an enhanced vortex separator that combines an effective stormwater treatment chamber with an integral peak flow bypass. It efficiently removes sediment total suspended solids (TSS), trash and hydrocarbons from stormwater runoff without washing out previously captured pollutants. The First Defense® High Capacity is available in several model configurations to accommodate a wide range of pipe sizes, peak flows and depth constraints (**Table 1**, next page).

Applications

- Stormwater treatment at the point of entry into the drainage line
- Sites constrained by space, topography or drainage profiles with limited slope and depth of cover
- Retrofit installations where stormwater treatment is placed on or tied into an existing storm drain line
- Pretreatment for filters, infiltration and storage

Advantages

- Inlet options include surface grate or multiple inlet pipes
- Integral high capacity bypass conveys large peak flows without the need for “offline” arrangements using separate junction manholes
- Proven to prevent pollutant washout at up to 450% of its treatment flow
- Long flow path through the device ensures a long residence time within the treatment chamber, enhancing pollutant settling
- Delivered to site pre-assembled and ready for installation

How it Works

The First Defense® High Capacity has internal components designed to remove and retain gross debris, total suspended solids (TSS) and hydrocarbons (**Fig.1**).

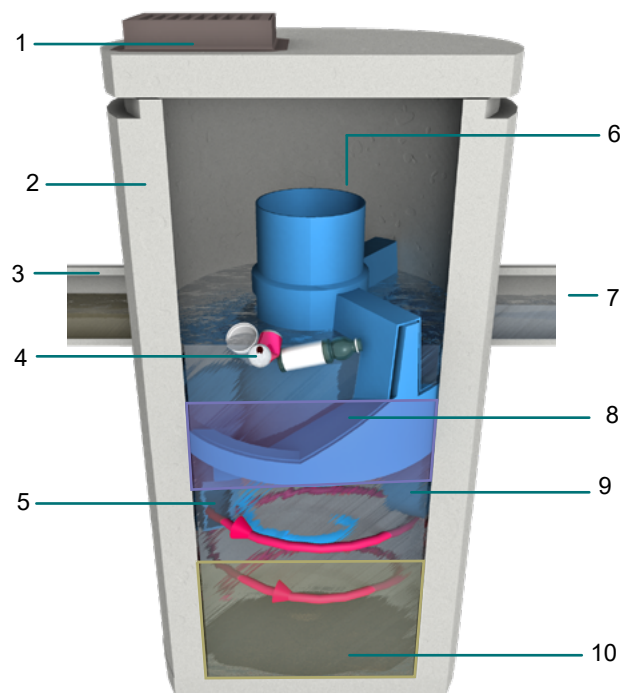
Contaminated stormwater runoff enters the inlet chute from a surface grate and/or inlet pipe. The inlet chute introduces flow into the chamber tangentially to create a low energy vortex flow regime (**magenta arrow**) that directs sediment into the sump while oils, floating trash and debris rise to the surface.

Treated stormwater exits through a submerged outlet chute located opposite to the direction of the rotating flow (**blue arrow**). Enhanced vortex separation is provided by forcing the rotating flow within the vessel to follow the longest path possible rather than directly from inlet to outlet.

Higher flows bypass the treatment chamber to prevent turbulence and washout of captured pollutants. An internal bypass conveys infrequent peak flows directly to the outlet eliminating the need for, and expense of, external bypass control structures. A floatables draw off slot functions to convey floatables into the treatment chamber prior to bypass.

Verified by NJCAT and NJDEP

Fig.1 The First Defense® High Capacity has internal components designed to efficiently capture pollutants and prevent washout a peak flows



Components

1. Inlet Grate (optional)	6. Internal Bypass
2. Precast chamber	7. Outlet pipe
3. Inlet Pipe (optional)	8. Oil and Floatables Storage
4. Floatables Draw Off Slot (not pictured)	9. Outlet chute
5. Inlet Chute	10. Sediment Storage Sump

First Defense® High Capacity

Sizing & Design

This adaptable online treatment system works easily with large pipes, multiple inlet pipes, inlet grates and now, contains a high capacity bypass for the conveyance of large peak flows. Designed with site flexibility in mind the First Defense® High Capacity allows engineers to maximize available site space without compromising treatment level.

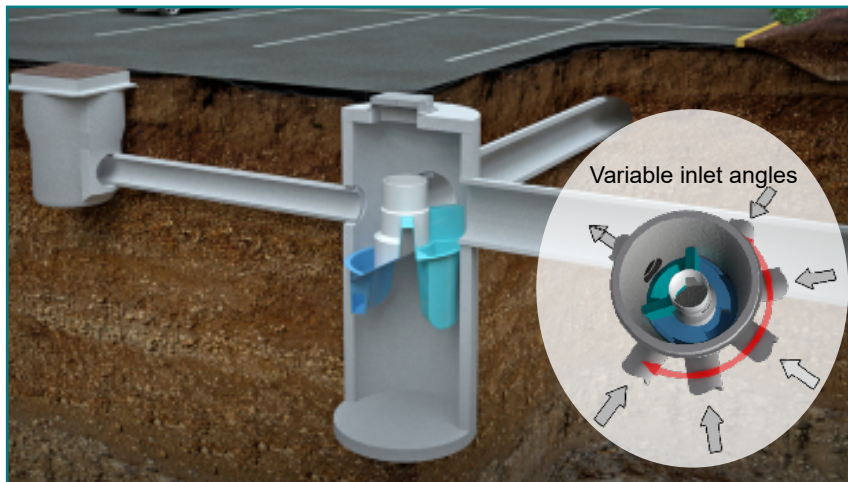


Fig 2. Works with multiple inlet pipes and grates

Inspection and Maintenance

Nobody maintains our systems better than we do. To ensure optimal, ongoing device performance, be sure to recommend Hydro International as a preferred service and maintenance provider to your clients.

Call **1 (800) 848-2706** to schedule an inspection and cleanout or learn more at hydro-int.com/service

Sizing Calculator for Engineers



This simple online tool will recommend the best separator, model size and online/offline arrangement based on site-specific data entered by the user.

Go to hydro-int.com/sizing to access the tool.



Fig 3. Maintenance is done with a vector truck

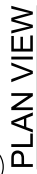
Table 1. First Defense® High Capacity Design Criteria.

First Defense® High Capacity Model Number	Diameter	Typical TSS Treatment Flow Rates		Peak Online Flow Rate	Maximum Pipe Diameter ¹	Oil Storage Capacity	Typical Sediment Storage Capacity ²	Minimum Distance from Outlet Invert to Top of Rim ³	Standard Distance from Outlet Invert to Sump Floor
		NJDEP Certified	110µm						
	(ft / m)	(cfs / L/s)	(cfs / L/s)	(cfs / L/s)	(in / mm)	(gal / L)	(yd³ / m³)	(ft / m)	(ft / m)
FD-3HC	3 / 0.9	0.84 / 23.7	1.06 / 30.0	15 / 424	18 / 457	125 / 473	0.4 / 0.3	2.0 - 3.5 / 0.6 - 1.0	3.71 / 1.13
FD-4HC	4 / 1.2	1.50 / 42.4	1.88 / 53.2	18 / 510	24 / 600	191 / 723	0.7 / 0.5	2.3 - 3.9 / 0.7 - 1.2	4.97 / 1.5
FD-5HC	5 / 1.5	2.35 / 66.2	2.94 / 83.2	20 / 566	24 / 600	300 / 1135	1.1 / .84	2.5 - 4.5 / 0.7 - 1.3	5.19 / 1.5
FD-6HC	6 / 1.8	3.38 / 95.7	4.23 / 119.8	32 / 906	30 / 750	496 / 1,878	1.6 / 1.2	3.0 - 5.1 / 0.9 - 1.6	5.97 / 1.8
FD-8HC	8 / 2.4	6.00 / 169.9	7.52 / 212.9	50 / 1,415	48 / 1219	1120 / 4239	2.8 / 2.1	3.0 - 6.0 / 0.9 - 1.8	7.40 / 2.2

¹Contact Hydro International when larger pipe sizes are required.

²Contact Hydro International when custom sediment storage capacity is required.

³Minimum distance for models depends on pipe diameter.



PRODUCT SPECIFICATION:

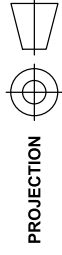
1. PEAK HYDRAULIC FLOW: 32.0 cfs (906 l/s)
2. MIN SEDIMENT STORAGE CAPACITY: 1.6 cu. yd. (1.2 cu. m.)
3. OIL STORAGE CAPACITY: 496 gal. (1878 liters)
4. MAXIMUM INLET/OUTLET PIPE DIAMETERS: 30 in. (750 mm)
5. THE TREATMENT SYSTEM SHALL USE AN INDUCED VORTEX TO SEPARATE POLLUTANTS FROM STORMWATER RUNOFF.
6. MORE PRODUCT INFORMATION INCLUDING REGULATORY ACCEPTANCES, PLEASE VISIT <https://hydro-int.com/en/products/first-defense>

1. General Arrangement drawings only. Contact Hydro International for site specific drawings.
2. The diameter of the inlet and outlet pipes may be no more than 30".
3. Multiple inlet pipes possible (refer to project plan).
4. Inlet/outlet pipe angle can vary to align with drainage network (refer to project plan.s)
5. Peak flow rate and minimum height limited by available cover and pipe diameter.
6. Larger sediment storage capacity may be provided with a deeper sump depth.

ANY WARRANTY GIVEN BY HYDRO INTERNATIONAL WILL APPLY ONLY TO THOSE ITEMS SUPPLIED BY IT. ACCORDINGLY HYDRO INTERNATIONAL CANNOT ACCEPT ANY RESPONSIBILITY FOR ANY STRUCTURE, PLANT, OR EQUIPMENT, OR THE PERFORMANCE THEREOF, DESIGNED, BUILT, MANUFACTURED, OR SUPPLIED BY ANY THIRD PARTY. HYDRO INTERNATIONAL DOES NOT WARRANT THAT THE INFORMATION CONTAINED IN THIS DRAWING IS COMPLETE, CORRECT, OR SUFFICIENT FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS SUPPLIED AND MUST NOT BE REPRODUCED, IN WHOLE OR IN PART, WITHOUT PRIOR PERMISSION IN WRITING FROM HYDRO INTERNATIONAL. THE COPYRIGHT OF THIS DRAWING, WHICH IS SUPPLIED IN CONFIDENCE, IT MUST NOT BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS SUPPLIED AND MUST NOT BE REPRODUCED, IN WHOLE OR IN PART, WITHOUT PRIOR PERMISSION IN WRITING FROM HYDRO INTERNATIONAL.

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IF IN DOUBT ASK

COMMENTS:

1. MANHOLE WALL AND SLAB THICKNESSES ARE NOT TO SCALE.
2. CONTACT HYDRO INTERNATIONAL FOR A BOTTOM OF STRUCTURE ELEVATION PRIOR TO SETTING FIRST DEFENSE MANHOLE.
3. CONTRACTOR TO CONFIRM RM, PIPE INVERTS, PIPE DIA. AND PIPE ORIENTATION PRIOR TO RELEASE OF UNIT TO FABRICATION.

DATE: 11/8/2019

DRAWN BY:

CHECKED BY:

Title
6-ft DIAMETER

FIRST DEFENSE HIGH CAPACITY

GENERAL ARRANGEMENT

Hydro
International
hydro-int.com

DO NOT SCALE DRAWING
STEEL FABRICATION TOLERANCES
UNLESS OTHERWISE SPECIFIED.

LINEAR		ANGULAR	
000 - 012in	= ±0.04in	000 - 120°	
012 - 024in	= ±0.06in	120 - 240°	
024 - 048in	= ±0.08in	240in >>>	

WEIGHT:	MATERIAL:

NAT LINGUAL

STOCK NUMBER:	

DRIVING NO.

DRAWING NO.:
6FDHC FDHC GA[illegible]

SHEET SIZE: 1 OF 1

5	



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Bureau of Nonpoint Pollution Control
Division of Water Quality
401-02B

Post Office Box 420
Trenton, New Jersey 08625-0420
609-633-7021 Fax: 609-777-0432
http://www.state.nj.us/dep/dwq/bnpc_home.htm

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

April 4, 2016

Lisa Lemont, CPSWQ
Business Development Manager
Hydro International
94 Hutchins Drive
Portland, ME 04102

Re: MTD Lab Certification
First Defense® HC (FDHC) Stormwater Treatment Device by Hydro International

TSS Removal Rate 50%

Dear Ms. Lemont:

The Stormwater Management rules under N.J.A.C. 7:8-5.5(b) and 5.7 (c) allow the use of manufactured treatment devices (MTDs) for compliance with the design and performance standards at N.J.A.C. 7:8-5 if the pollutant removal rates have been verified by the New Jersey Corporation for Advanced Technology (NJCAT) and have been certified by the New Jersey Department of Environmental Protection (NJDEP). Hydro International has requested an MTD Laboratory Certification for the First Defense® HC Stormwater Treatment Device.

The projects falls under the "Procedure for Obtaining Verification of a Stormwater Manufactured Treatment Device from New Jersey Corporation for Advance Technology" dated January 25, 2013. The applicable protocol is the "New Jersey Laboratory Testing Protocol to Assess Total Suspended Solids Removal by a Hydrodynamic Sedimentation Manufactured Treatment Device" dated January 25, 2013.

NJCAT verification documents submitted to the NJDEP indicate that the requirements of the aforementioned protocol have been met or exceeded. The NJCAT letter also included a recommended certification TSS removal rate and the required maintenance plan. The NJCAT Verification Report with the Verification Appendix (dated February 2016) for this device is published online at <http://www.njcat.org/verification-process/technology-verification-database.html>.

The NJDEP certifies the use of the First Defense® HC Stormwater Treatment Device by Hydro International at a TSS removal rate of 50% when designed, operated and maintained in accordance with the information provided in the Verification Appendix and the following conditions:

1. The maximum treatment flow rate (MTFR) for the manufactured treatment device (MTD) is calculated using the New Jersey Water Quality Design Storm (1.25 inches in 2 hrs) in N.J.A.C. 7:8-5.5.

2. The First Defense® HC Stormwater Treatment Device shall be installed using the same configuration reviewed by NJCAT and shall be sized in accordance with the criteria specified in item 6 below.
3. This First Defense® HC Stormwater Treatment Device cannot be used in series with another MTD or a media filter (such as a sand filter) to achieve an enhanced removal rate for total suspended solids (TSS) removal under N.J.A.C. 7:8-5.5.
4. Additional design criteria for MTDs can be found in Chapter 9.6 of the New Jersey Stormwater Best Management Practices (NJ Stormwater BMP) Manual which can be found on-line at www.njstormwater.org.
5. The maintenance plan for a site using the First Defense® HC Stormwater Treatment Device shall incorporate, at a minimum, the maintenance requirements noted in the attached document. However, it is recommended to review the maintenance website at http://www.hydro-int.com/UserFiles/downloads/FD_O%2BM_F1512.pdf for any changes to the maintenance requirements.
6. Sizing Requirements:

The example below demonstrates the sizing procedure for the First Defense® HC Stormwater Treatment Device:

Example: A 0.25 acre impervious site is to be treated to 50% TSS removal using a First Defense® HC Stormwater Treatment Device. The impervious site runoff (Q) based on the New Jersey Water Quality Design Storm was determined to be 0.79 cfs.

Maximum Treatment Flow Rate (MTFR) Evaluation:

The site runoff (Q) was based on the following:

time of concentration = 10 minutes

i=3.2 in/hr (page 5-8, Fig. 5-3 of the NJ Stormwater BMP Manual)

c=0.99 (curve number for impervious)

$Q=ciA=0.99 \times 3.2 \times 0.25 = 0.79$ cfs

Given the site runoff is 0.79 cfs and based on Table 1 below, the First Defense® HC Model 4-ft with a MTFR of 1.5 cfs would be the smallest model approved that could be used for this site that could remove 50% of the TSS from the impervious area without exceeding the MTFR.

The sizing table corresponding to the available system models is noted below. Additional specifications regarding each model can be found in the Verification Appendix under Table A-1 and Table A-2 of the NJCAT Verification Report.

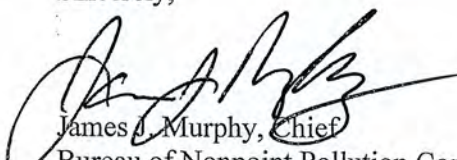
Table 1 First Defense® HC Models

First Defense® Model	Manhole Diameter (ft)	Maximum Treatment Flowrate, MTFR (cfs)
4-ft	4-ft	1.50
6-ft	6-ft	3.38
8-ft	8-ft	6.00

Be advised a detailed maintenance plan is mandatory for any project with a Stormwater BMP subject to the Stormwater Management Rules, N.J.A.C. 7:8. The plan must include all of the items identified in the Stormwater Management Rules, N.J.A.C. 7:8-5.8. Such items include, but are not limited to, the list of inspection and maintenance equipment and tools, specific corrective and preventative maintenance tasks, indication of problems in the system, and training of maintenance personnel. Additional information can be found in Chapter 8: Maintenance of the New Jersey Stormwater Best Management Practices Manual.

If you have any questions regarding the above information, please contact Mr. Titus Magnanao of my office at (609) 633-7021.

Sincerely,

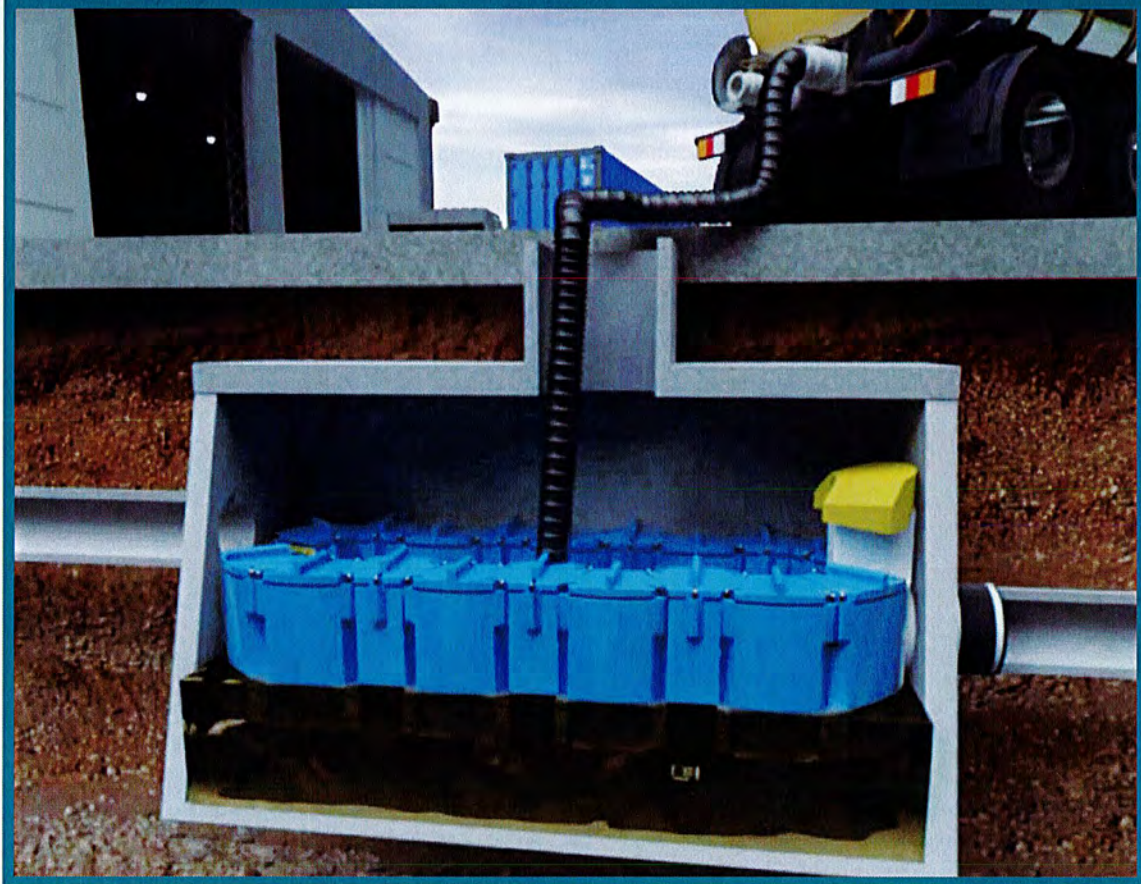

James L. Murphy, Chief
Bureau of Nonpoint Pollution Control

Attachment: Maintenance Plan

C: Chron File
Richard Magee, NJCAT
Vince Mazzei, DLUR
Ravi Patraju, NJDEP
Gabriel Mahon, BNPC
Titus Magnanao, BNPC

It's Your Site. Have it Done Right.

Regular Maintenance Ensures Optimal System Performance



Stormwater BMP Services

Inspection & Maintenance Services

Stormwater Maintenance Solutions

94 Hutchins Drive
Portland, ME 04102
1 (888) 382-7808
services@hydro-int.com

WHY IS STORMWATER BMP MAINTENANCE NECESSARY?

- Many stormwater permits require that stormwater **Best Management Practices (BMPs)** be maintained in order to be compliant
- Commercial properties contributing runoff to municipal drainage lines can be held liable for discharge exceedances
- BMPs that are not maintained will eventually reach treatment capacity and allow harmful pollution to discharge into local water bodies
- Going long periods in between cleanouts may cost you more money than doing more frequent maintenance
- Some commercial property lease agreements obligate renters to ensure their site is not polluting
- Industrial permit holders have to continually discharge within allowed benchmark pollutant concentrations

DON'T RISK DAMAGING YOUR BUSINESS REPUTATION: MAINTAIN YOUR STORMWATER BMP



IT'S YOUR COMMUNITY

You would never intentionally litter in your neighborhood or within the town or city that you work. A stormwater treatment BMP left uncleaned however will have the same effect as throwing garbage and other harmful pollutants into the lakes, rivers and oceans in your area. Other unintended consequences may include:

- Harming local ecosystems
- Negatively affecting regional fishing industry
- Creating visual eye sores that affect tourism and local economy
- Damaging your business reputation

DON'T DELAY!

Those who put off maintenance are at greater risk of receiving a **notice of violation** and often **PAY MORE** than those who consistently tend to system upkeep.

STORMWATER TREATMENT SYSTEMS

Stormwater BMPs are installed to prevent the trash, debris and pollutants captured in stormwater runoff from reaching receiving water bodies and causing harm to ecosystems.

Very much the way a dumpster needs to be emptied, so too does a stormwater treatment system need to be cleaned out to prevent pollutant overflow. If you have a system on your site, ensure that it is regularly inspected and cleaned.

TYPES OF STORMWATER TREATMENT BMP SYSTEMS SERVICED BY HYDRO

SAVE MONEY

AVOID SERVICE NEGLIGENCE
Sanitation services providers not intimately familiar with stormwater treatment systems are at risk of the following:

- Inadvertently breaking parts or failing to clean/replace system components appropriately.
- Charging you for more frequent maintenance because they lacked the tools to service your system properly in the first place.
- Billing you for replacement parts that might have been covered under your Hydro warranty plan
- Charging for maintenance that may not yet have been required.

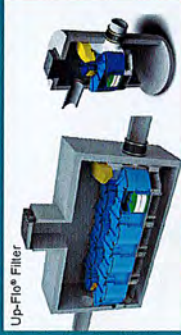
WHY HYDRO?

Hydro International has been engineering stormwater treatment systems for over 30 years. We understand the mechanics of removing pollutants from stormwater and how to keep systems running at an optimal level.

GET IT DONE RIGHT

Nobody knows our systems better than we do or understands what a system needs in order to function properly.

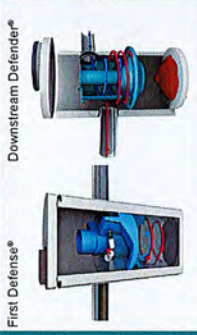
Hydro Filters



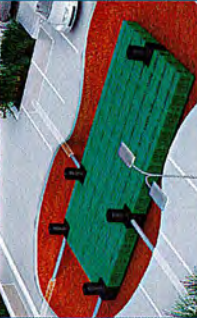
Catch Basins



Hydro Separators



Storage Structures



Hydro Baffle Boxes



Permeable Pavement



Biofilters & Bioretention Systems



Stormwater Ponds



VISIT HYDRO-INT.COM/SERVICE TO LEARN MORE

Services



1

Regular system inspections, including an initial warranty inspection of assembly, are recommended to ensure that your system is performing at an appropriate treatment level. A visual examination of your BMP from a Hydro treatment and maintenance specialist will allow us to establish:

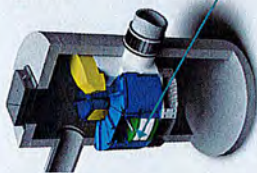
- **POLLUTANT ACCUMULATION:** The amount of debris and pollutants in your system will allow us to determine if your BMP is at capacity and calculate how frequently maintenance will be required
- **PROPER INSTALLATION:** A system that is not installed properly will not treat and function as intended
- **OPERATION EFFICIENCY:** Evaluation of device treatment performance
- **PRICING:** Your quote will be based on how much waste needs to be removed



2

Replacement Up-Flo® Filter Media Packs

Filter systems with media function very much the way domestic drinking water filters work. As water passes through them they capture pollutants and require periodic replacement in order to function properly.



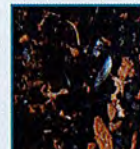
Up-Flo® Filter by Hydro International

MEDIA FILTRATION SYSTEMS

Compliance with your stormwater treatment permit requires using suitable Up-Flo® Filter replacement media bags from Hydro International to ensure the system is functioning as intended



Up-Flo® Filter media bag



Highly engineered Up-Flo® Filter media mix

Services

3

Cleanout Services

Trash, sediment and polluted water is stored inside treatment systems until they are removed by our team with a vactor truck (see Fig. 1). Sometimes teams must physically enter the system chambers in order to prepare the system for maintenance and install any replacement parts. Services include are not limited to:

- Solids removal
- Removal of liquid pollutants
- Replacement media installation (when applicable)



4

Service Warranty

Make sure you're not paying for service that is covered under your warranty plan. Only Hydro International's service teams can identify tune-ups that should be on us, not you.



WHY HYDRO?

Better Tools, Better Results

Not all vactor trucks are created equal. Appropriate tools and suction power are needed to service stormwater systems appropriately.



Companies who don't specialize in stormwater treatment won't have the tools to properly clean systems or install new parts.

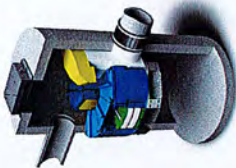
MEDIA FILTRATION SYSTEMS

Up-Flo® Filter

Hydro International offers a variety of stormwater treatment Best Management Practices (BMPs) designed to remove trash, sediment and pollutants from the stormwater running off of your site. In order to keep these systems performing at an optimal level, they require periodic cleanup and replacement parts (where necessary). This document will provide you with a brief overview of Hydro International's BMP types, how to identify them and what is involved in their maintenance and cleanup.



How do you know if you have an Up-Flo® Filter on your site?



WHAT TO LOOK FOR:

- Multi-colored gray or blue filter modules with yellow, blue or white internal components
- Comprised of individual module units that can be configured into a vault (Fig. 1) or a rounded manhole (Fig. 4).
- Your Hydro International manhole lid

MULTI-COLOR UNITS



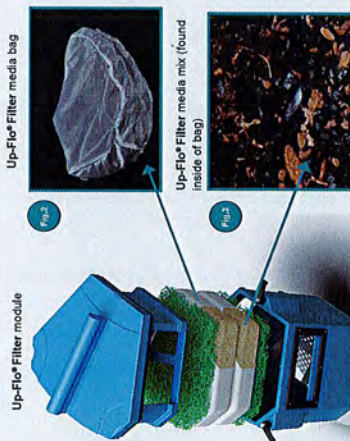
Filter systems with media (Fig. 3) function very much the way domestic drinking water filters work. As water passes through them they capture pollutants and require periodic replacement in order to function properly.

Looking down into a rounded manhole configuration



Compliance with your stormwater treatment permit requires using suitable Up-Flo® filter replacement media bags from Hydro International to ensure the system is functioning as intended (Fig. 2)

REPLACEMENT PARTS



SEDIMENT & TRASH SEPARATING SYSTEMS

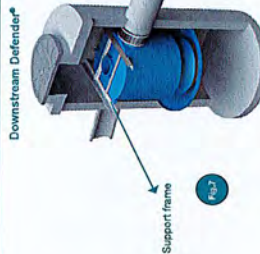
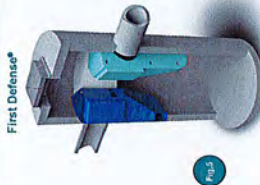
First Defense® & Downstream Defender® Stormwater Separators

The Downstream Defender and First Defense units are designed to remove trash and sediment from stormwater. They are cleaned out using a vacuum truck. No spare parts are required as part of typical maintenance.

How do you know if you have a First Defense or Downstream Defender on your site?

WHAT TO LOOK FOR:

First Defense® High Capacity



- Multi-colored blue/white units
- Open internal components (see Fig. 5 & Fig. 11)

MULTI-COLOR UNITS



- Solid colored units
- Closed top with a half wall separator (see Fig. 6)

SOLID COLOR UNITS



- Solid colored units
- Closed top with metal support frame (see Fig. 7 & Fig. 9 & 10)

SOLID COLOR UNITS



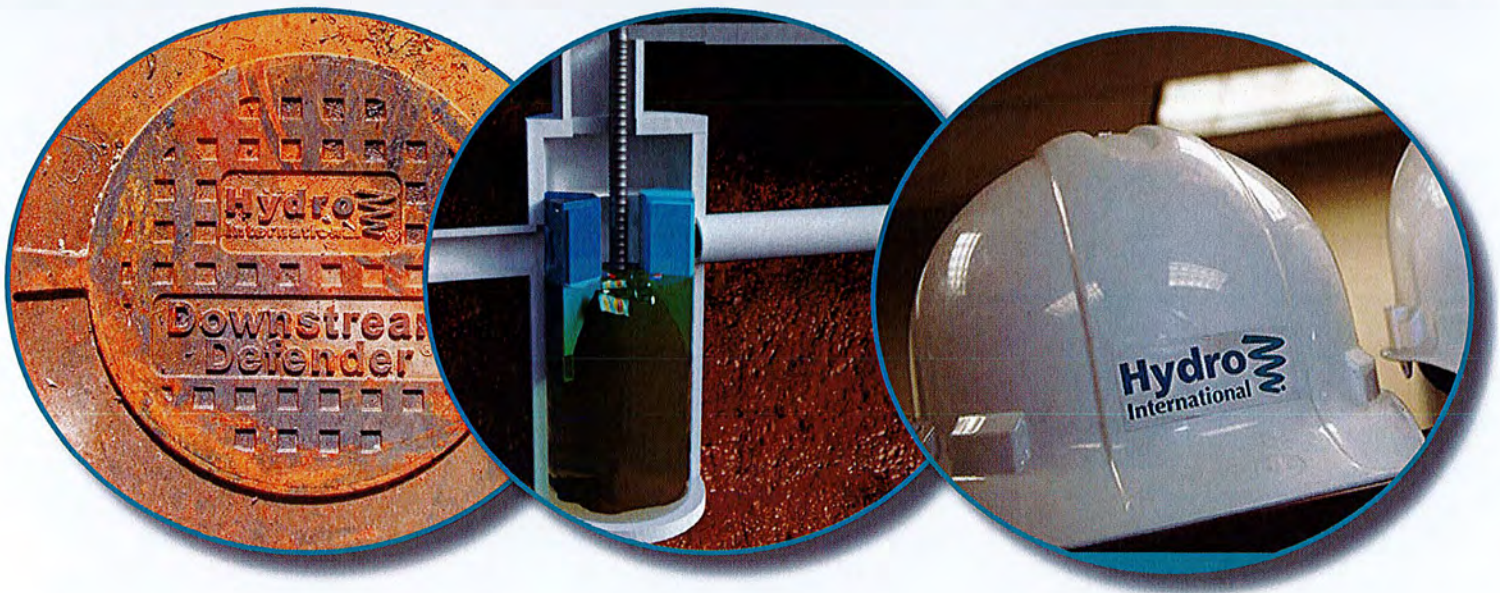
LOOK FOR A HYDRO INTERNATIONAL MANHOLE LID ON YOUR SITE



DOES YOUR SYSTEM NEED A CLEANOUT?
CALL FOR AN ESTIMATE AT 1-888-382-7808

Do it Right the First Time

LEARN MORE AT HYDRO-INT.COM/SERVICE



CALL 1 (888) 382-7808 TO SCHEDULE AN INSPECTION

Stormwater BMP System Services

Inspection & Maintenance Services

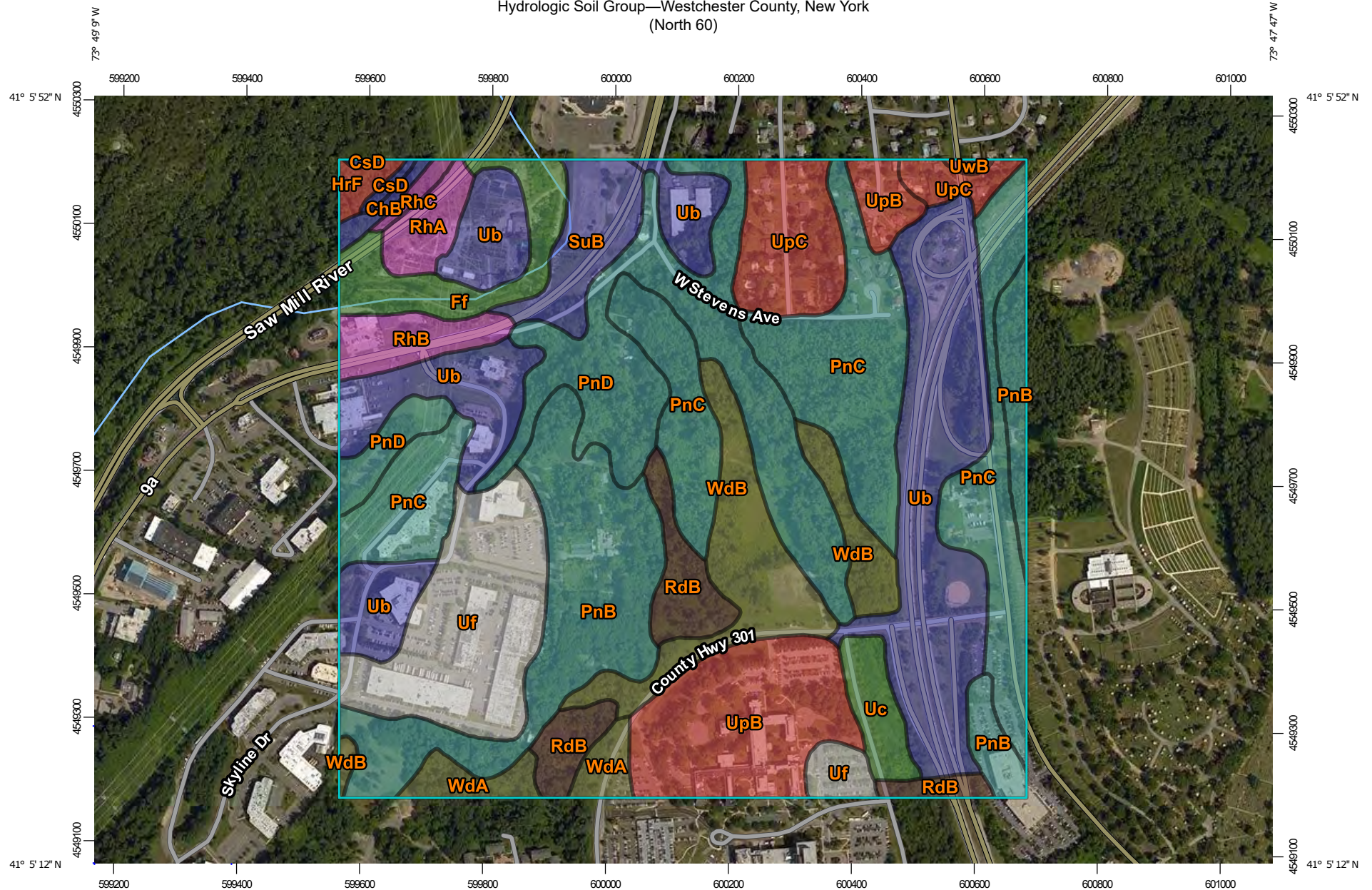
Stormwater Maintenance Solutions

94 Hutchins Drive
Portland, ME 04102
1 (888) 382-7808
services@hydro-int.com

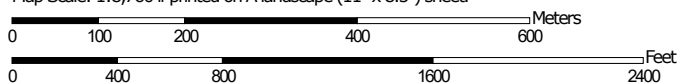


Appendix D:
NRCS Soil Map

Hydrologic Soil Group—Westchester County, New York (North 60)



Map Scale: 1:8,760 if printed on A landscape (11" x 8.5") sheet.



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



**Natural Resources
Conservation Service**

Web Soil Survey
National Cooperative Soil Survey

12/6/2017
Page 1 of 4

MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

Soil Rating Polygons

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Lines

 A
 A/D
 B
 B/D
 C
 C/D
 D
 Not rated or not available

Soil Rating Points

 A
 A/D
 B
 B/D

 C
 C/D
 D
 Not rated or not available

Water Features

 Streams and Canals

Transportation

 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

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: Westchester County, New York
 Survey Area Data: Version 13, Oct 8, 2017

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

Date(s) aerial images were photographed: Jul 21, 2014—Aug 27, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
ChB	Charlton fine sandy loam, 3 to 8 percent slopes	B	1.2	0.4%
CsD	Chatfield-Charlton complex, 15 to 35 percent slopes, very rocky	B	0.6	0.2%
Ff	Fluvaquents-Udifuvents complex, frequently flooded	A/D	8.6	3.0%
HrF	Hollis-Rock outcrop complex, 35 to 60 percent slopes	D	1.4	0.5%
PnB	Paxton fine sandy loam, 3 to 8 percent slopes	C	32.3	11.3%
PnC	Paxton fine sandy loam, 8 to 15 percent slopes	C	47.3	16.5%
PnD	Paxton fine sandy loam, 15 to 25 percent slopes	C	31.1	10.9%
RdB	Ridgebury loam, 3 to 8 percent slopes	B/D	9.5	3.3%
RhA	Riverhead loam, 0 to 3 percent slopes	A	3.8	1.3%
RhB	Riverhead loam, 3 to 8 percent slopes	A	5.1	1.8%
RhC	Riverhead loam, 8 to 15 percent slopes	A	0.9	0.3%
SuB	Sutton loam, 3 to 8 percent slopes	B	7.7	2.7%
Ub	Udorthents, smoothed	B	51.7	18.0%
Uc	Udorthents, wet substratum	A/D	4.3	1.5%
Uf	Urban land		23.4	8.2%
UpB	Urban land-Paxton complex, 3 to 8 percent slopes	D	21.8	7.6%
UpC	Urban land-Paxton complex, 8 to 15 percent slopes	D	12.4	4.3%
UwB	Urban land-Woodbridge complex, 3 to 8 percent slopes	D	0.3	0.1%
WdA	Woodbridge loam, 0 to 3 percent slopes	C/D	5.0	1.7%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
WdB	Woodbridge loam, 3 to 8 percent slopes	C/D	18.3	6.4%
Totals for Area of Interest			286.9	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



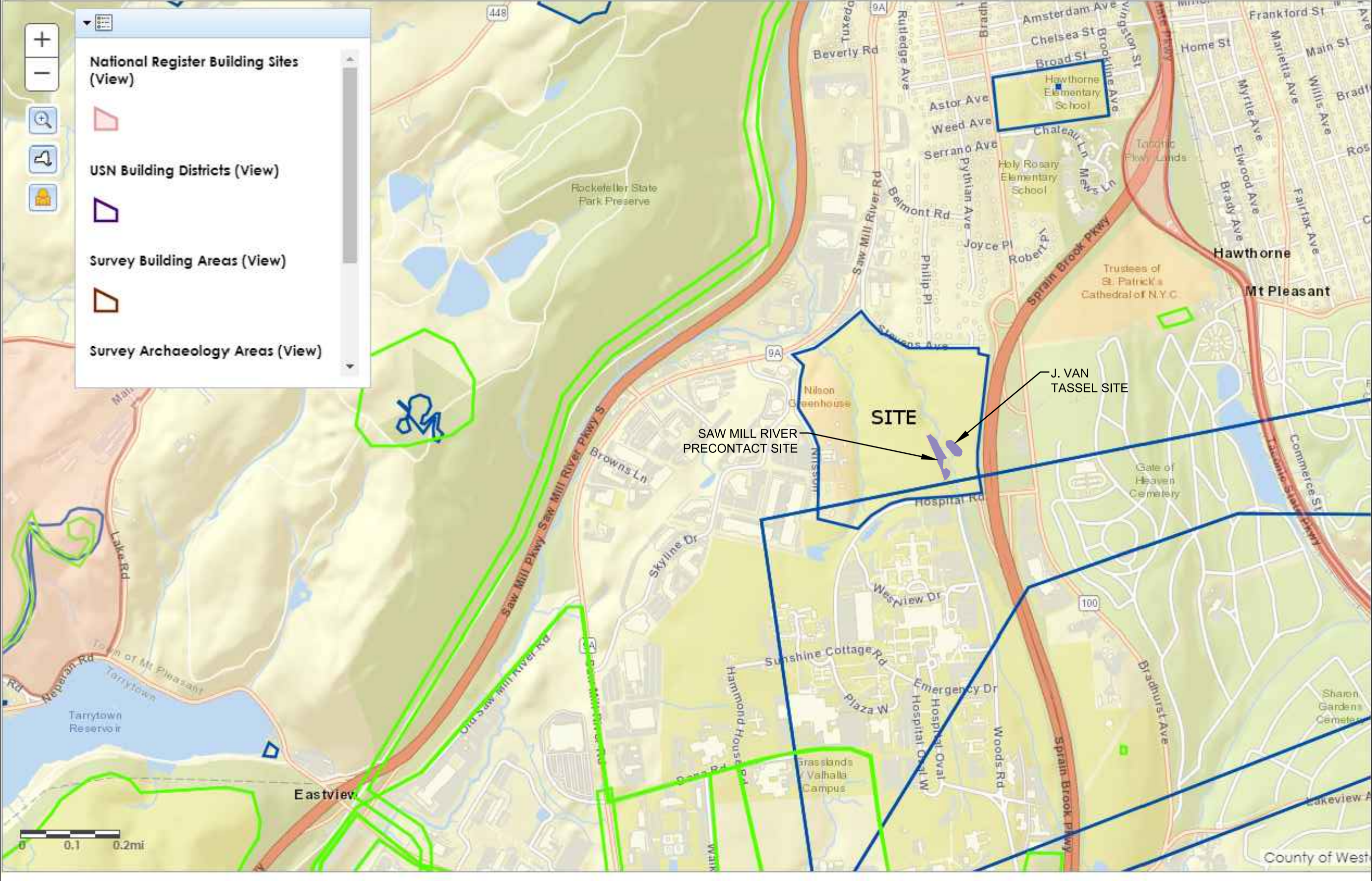
Appendix E:
Map of Historic Places
In Vicinity of Project

LEGEND



ONSITE ARCHEOLOGICAL SITES
(AS IDENTIFIED IN PHASE I STUDY)

MAP OF HISTORIC PLACES IN VICINITY OF PROJECT





Appendix F:
NYSDEC Construction Site Log Book

APPENDIX F CONSTRUCTION SITE INSPECTION AND MAINTENANCE LOG BOOK

STATE POLLUTANT DISCHARGE ELIMINATION SYSTEM FOR CONSTRUCTION
ACTIVITIES

SAMPLE CONSTRUCTION SITE LOG BOOK

Table of Contents

- I. Pre-Construction Meeting Documents
 - a. Preamble to Site Assessment and Inspections
 - b. Pre-Construction Site Assessment Checklist

- II. Construction Duration Inspections
 - a. Directions
 - b. Modification to the SWPPP

I. PRE-CONSTRUCTION MEETING DOCUMENTS

Project Name _____
Permit No. _____ **Date of Authorization** _____
Name of Operator _____
Prime Contractor _____

a. Preamble to Site Assessment and Inspections

The Following Information To Be Read By All Person's Involved in The Construction of Stormwater Related Activities:

The Operator agrees to have a qualified inspector¹ conduct an assessment of the site prior to the commencement of construction² and certify in this inspection report that the appropriate erosion and sediment controls described in the SWPPP have been adequately installed or implemented to ensure overall preparedness of the site for the commencement of construction.

Prior to the commencement of construction, the Operator shall certify in this site logbook that the SWPPP has been prepared in accordance with the State's standards and meets all Federal, State and local erosion and sediment control requirements. A preconstruction meeting should be held to review all of the SWPPP requirements with construction personnel.

When construction starts, site inspections shall be conducted by the qualified inspector at least every 7 calendar days. The Operator shall maintain a record of all inspection reports in this site logbook. The site logbook shall be maintained on site and be made available to the permitting authorities upon request.

Prior to filing the Notice of Termination or the end of permit term, the Operator shall have a qualified inspector perform a final site inspection. The qualified inspector shall certify that the site has undergone final stabilization³ using either vegetative or structural stabilization methods and that all temporary erosion and sediment controls (such as silt fencing) not needed for long-term erosion control have been removed. In addition, the Operator must identify and certify that all permanent structures described in the SWPPP have been constructed and provide the owner(s) with an operation and maintenance plan that ensures the structure(s) continuously functions as designed.

1 Refer to "Qualified Inspector" inspection requirements in the current SPDES General Permit for Stormwater Discharges from Construction Activity for complete list of inspection requirements.

2 "Commencement of construction" means the initial removal of vegetation and disturbance of soils associated with clearing, grading or excavating activities or other construction activities.

3 "Final stabilization" means that all soil-disturbing activities at the site have been completed and a uniform, perennial vegetative cover with a density of eighty (80) percent has been established or equivalent stabilization measures (such as the use of mulches or geotextiles) have been employed on all unpaved areas and areas not covered by permanent structures.

b. Pre-construction Site Assessment Checklist

(NOTE: Provide comments below as necessary)

1. Notice of Intent, SWPPP, and Contractors Certification:

Yes No NA

- ☐ ☐ ☐ Has a Notice of Intent been filed with the NYS Department of Conservation?
- ☐ ☐ ☐ Is the SWPPP on-site? Where? _____
- ☐ ☐ ☐ Is the Plan current? What is the latest revision date? _____
- ☐ ☐ ☐ Is a copy of the NOI (with brief description) onsite? Where? _____
- ☐ ☐ ☐ Have all contractors involved with stormwater related activities signed a contractor's certification?

2. Resource Protection

Yes No NA

- ☐ ☐ ☐ Are construction limits clearly flagged or fenced?
- ☐ ☐ ☐ Important trees and associated rooting zones, on-site septic system absorption fields, existing vegetated areas suitable for filter strips, especially in perimeter areas, have been flagged for protection.
- ☐ ☐ ☐ Creek crossings installed prior to land-disturbing activity, including clearing and blasting.

3. Surface Water Protection

Yes No NA

- ☐ ☐ ☐ Clean stormwater runoff has been diverted from areas to be disturbed.
- ☐ ☐ ☐ Bodies of water located either on site or in the vicinity of the site have been identified and protected.
- ☐ ☐ ☐ Appropriate practices to protect on-site or downstream surface water are installed.
- ☐ ☐ ☐ Are clearing and grading operations divided into areas <5 acres?

4. Stabilized Construction Access

Yes No NA

- ☐ ☐ ☐ A temporary construction entrance to capture mud and debris from construction vehicles before they enter the public highway has been installed.
- ☐ ☐ ☐ Other access areas (entrances, construction routes, equipment parking areas) are stabilized immediately as work takes place with gravel or other cover.
- ☐ ☐ ☐ Sediment tracked onto public streets is removed or cleaned on a regular basis.

5. Sediment Controls

Yes No NA

- ☐ ☐ ☐ Silt fence material and installation comply with the standard drawing and specifications.
- ☐ ☐ ☐ Silt fences are installed at appropriate spacing intervals
- ☐ ☐ ☐ Sediment/detention basin was installed as first land disturbing activity.
- ☐ ☐ ☐ Sediment traps and barriers are installed.

6. Pollution Prevention for Waste and Hazardous Materials

Yes No NA

- ☐ ☐ ☐ The Operator or designated representative has been assigned to implement the spill prevention avoidance and response plan.
- ☐ ☐ ☐ The plan is contained in the SWPPP on page _____
- ☐ ☐ ☐ Appropriate materials to control spills are onsite. Where? _____

II. CONSTRUCTION DURATION INSPECTIONS

a. Directions:

Inspection Forms will be filled out during the entire construction phase of the project.

Required Elements:

- 1) On a site map, indicate the extent of all disturbed site areas and drainage pathways. Indicate site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period;
- 2) Indicate on a site map all areas of the site that have undergone temporary or permanent stabilization;
- 3) Indicate all disturbed site areas that have not undergone active site work during the previous 14-day period;
- 4) Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of sediment storage volume (for example, 10 percent, 20 percent, 50 percent);
- 5) Inspect all erosion and sediment control practices and record all maintenance requirements such as verifying the integrity of barrier or diversion systems (earthen berms or silt fencing) and containment systems (sediment basins and sediment traps). Identify any evidence of rill or gully erosion occurring on slopes and any loss of stabilizing vegetation or seeding/mulching. Document any excessive deposition of sediment or ponding water along barrier or diversion systems. Record the depth of sediment within containment structures, any erosion near outlet and overflow structures, and verify the ability of rock filters around perforated riser pipes to pass water; and
- 6) Immediately report to the Operator any deficiencies that are identified with the implementation of the SWPPP.

SITE PLAN/SKETCH

Inspector (print name)

Date of Inspection

Qualified Inspector (print name)

Qualified Inspector Signature

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the forms is accurate and complete.

Maintaining Water Quality**Yes No NA**

- ☐ ☐ ☐ Is there an increase in turbidity causing a substantial visible contrast to natural conditions at the outfalls?
- ☐ ☐ ☐ Is there residue from oil and floating substances, visible oil film, or globules or grease at the outfalls?
- ☐ ☐ ☐ All disturbance is within the limits of the approved plans.
- ☐ ☐ ☐ Have receiving lake/bay, stream, and/or wetland been impacted by silt from project?

Housekeeping

1. General Site Conditions

Yes No NA

- ☐ ☐ ☐ Is construction site litter, debris and spoils appropriately managed?
- ☐ ☐ ☐ Are facilities and equipment necessary for implementation of erosion and sediment control in working order and/or properly maintained?
- ☐ ☐ ☐ Is construction impacting the adjacent property?
- ☐ ☐ ☐ Is dust adequately controlled?

2. Temporary Stream Crossing

Yes No NA

- ☐ ☐ ☐ Maximum diameter pipes necessary to span creek without dredging are installed.
- ☐ ☐ ☐ Installed non-woven geotextile fabric beneath approaches.
- ☐ ☐ ☐ Is fill composed of aggregate (no earth or soil)?
- ☐ ☐ ☐ Rock on approaches is clean enough to remove mud from vehicles & prevent sediment from entering stream during high flow.

3. Stabilized Construction Access

Yes No NA

- ☐ ☐ ☐ Stone is clean enough to effectively remove mud from vehicles.
- ☐ ☐ ☐ Installed per standards and specifications?
- ☐ ☐ ☐ Does all traffic use the stabilized entrance to enter and leave site?
- ☐ ☐ ☐ Is adequate drainage provided to prevent ponding at entrance?

Runoff Control Practices

1. Excavation Dewatering

Yes No NA

- ☐ ☐ ☐ Upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per plan.
- ☐ ☐ ☐ Clean water from upstream pool is being pumped to the downstream pool.
- ☐ ☐ ☐ Sediment laden water from work area is being discharged to a silt-trapping device.
- ☐ ☐ ☐ Constructed upstream berm with one-foot minimum freeboard.

Runoff Control Practices (continued)

2. Flow Spreader

Yes No NA

- ☐ ☐ ☐ Installed per plan.
- ☐ ☐ ☐ Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.
- ☐ ☐ ☐ Flow sheets out of level spreader without erosion on downstream edge.

3. Interceptor Dikes and Swales

Yes No NA

- ☐ ☐ ☐ Installed per plan with minimum side slopes 2H:1V or flatter.
- ☐ ☐ ☐ Stabilized by geotextile fabric, seed, or mulch with no erosion occurring.
- ☐ ☐ ☐ Sediment-laden runoff directed to sediment trapping structure

4. Stone Check Dam

Yes No NA

- ☐ ☐ ☐ Is channel stable? (flow is not eroding soil underneath or around the structure).
- ☐ ☐ ☐ Check is in good condition (rocks in place and no permanent pools behind the structure).
- ☐ ☐ ☐ Has accumulated sediment been removed?.

5. Rock Outlet Protection

Yes No NA

- ☐ ☐ ☐ Installed per plan.
- ☐ ☐ ☐ Installed concurrently with pipe installation.

Soil Stabilization

1. Topsoil and Spoil Stockpiles

Yes No NA

- ☐ ☐ ☐ Stockpiles are stabilized with vegetation and/or mulch.
- ☐ ☐ ☐ Sediment control is installed at the toe of the slope.

2. Revegetation

Yes No NA

- ☐ ☐ ☐ Temporary seedings and mulch have been applied to idle areas.
- ☐ ☐ ☐ 4 inches minimum of topsoil has been applied under permanent seedings

Sediment Control Practices

1. Silt Fence and Linear Barriers

Yes No NA

- ☐ ☐ ☐ Installed on Contour, 10 feet from toe of slope (not across conveyance channels).
- ☐ ☐ ☐ Joints constructed by wrapping the two ends together for continuous support.
- ☐ ☐ ☐ Fabric buried 6 inches minimum.
- ☐ ☐ ☐ Posts are stable, fabric is tight and without rips or frayed areas.
- Sediment accumulation is ____% of design capacity.

Sediment Control Practices (continued)

2. Storm Drain Inlet Protection (Use for Stone & Block; Filter Fabric; Curb; or, Excavated; Filter Sock or Manufactured practices)

Yes No NA

- ☐ ☐ ☐ Installed concrete blocks lengthwise so open ends face outward, not upward.
- ☐ ☐ ☐ Placed wire screen between No. 3 crushed stone and concrete blocks.
- ☐ ☐ ☐ Drainage area is 1acre or less.
- ☐ ☐ ☐ Excavated area is 900 cubic feet.
- ☐ ☐ ☐ Excavated side slopes should be 2:1.
- ☐ ☐ ☐ 2" x 4" frame is constructed and structurally sound.
- ☐ ☐ ☐ Posts 3-foot maximum spacing between posts.
- ☐ ☐ ☐ Fabric is embedded 1 to 1.5 feet below ground and secured to frame/posts with staples at max 8-inch spacing.
- ☐ ☐ ☐ Posts are stable, fabric is tight and without rips or frayed areas.
- ☐ ☐ ☐ Manufactured insert fabric is free of tears and punctures.
- ☐ ☐ ☐ Filter Sock is not torn or flattened and fill material is contained within the mesh sock.

Sediment accumulation ____% of design capacity.

3. Temporary Sediment Trap

Yes No NA

- ☐ ☐ ☐ Outlet structure is constructed per the approved plan or drawing.
- ☐ ☐ ☐ Geotextile fabric has been placed beneath rock fill.
- ☐ ☐ ☐ Sediment trap slopes and disturbed areas are stabilized.

Sediment accumulation is ____% of design capacity.

4. Temporary Sediment Basin

Yes No NA

- ☐ ☐ ☐ Basin and outlet structure constructed per the approved plan.
- ☐ ☐ ☐ Basin side slopes are stabilized with seed/mulch.
- ☐ ☐ ☐ Drainage structure flushed and basin surface restored upon removal of sediment basin facility.
- ☐ ☐ ☐ Sediment basin dewatering pool is dewatering at appropriate rate.

Sediment accumulation is ____% of design capacity.

Note: Not all erosion and sediment control practices are included in this listing. Add additional pages to this list as required by site specific design. All practices shall be maintained in accordance with their respective standards.

Construction inspection checklists for post-development stormwater management practices can be found in Appendix F of the New York Stormwater Management Design Manual.

CONSTRUCTION DURATION INSPECTIONS

b. Modifications to the SWPPP (To be completed as described below)

The Operator shall amend the SWPPP whenever:

1. There is a significant change in design, construction, operation, or maintenance which may have a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the SWPPP; or
2. The SWPPP proves to be ineffective in:
 - a. Eliminating or significantly minimizing pollutants from sources identified in the SWPPP and as required by this permit; or
 - b. Achieving the general objectives of controlling pollutants in stormwater discharges from permitted construction activity; and
3. Additionally, the SWPPP shall be amended to identify any new contractor or subcontractor that will implement any measure of the SWPPP.

Modification & Reason:This image shows a full page of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page, providing a template for handwriting practice or general writing. There are no margins, text, or other markings on the page.



Appendix G:
New York State Stormwater Management Design Manual
Maintenance & Inspection Checklist

MAINTENANCE AND INSPECTION REQUIREMENTS

Maintenance and inspections are required in order to ensure the stormwater and erosion & sediment control practices are acting as designed. Site inspections shall be conducted by a “Qualified Inspector” at least two (2) times every seven (7) calendar days and the two (2) inspections shall be separated by a minimum of two (2) full calendar days for the duration of construction activities. The “Qualified Inspector” shall prepare an inspection report following every inspection to remain consistent with the NYSDEC General Permit GP-0-20-001. Upon completion of construction and the subsequent filing of the Notice of Termination, maintenance and inspections are expected to be minimal. Temporary and permanent maintenance and inspection requirements are further discussed below. Proper maintenance and inspections will ensure the longevity and effectiveness of the stormwater pollution prevention plan, and erosion and sediment control plan. The “Construction Site Log Book” from the New York Standards & Specifications for Erosion & Sediment Control provides guidelines for maintenance inspections during construction and has been provided in Appendix “F” of the project SWPPP report.

Short Term Maintenance and Inspection Requirements:

Inspections performed during construction should verify all practices are functioning properly, correctly maintained, and accumulated sediment is removed from all control structures. The inspector must also examine the site for any evidence of soil erosion, the potential for pollutants to enter the storm drain system, turbid discharge at all outfalls, and the potential for soil and mud to be transported on the public roadway at the site entrance. In addition to these general guidelines, the construction plan set will provide more specific erosion control guidelines, as well as a construction sequence to guide the contractor through the construction process. Discussed below are specific maintenance and inspection requirements for the temporary practices to be employed at the site.

During construction, the silt fence should be inspected to ensure correct installation. In addition, any accumulated sediment resulting in “bulges” in the silt fence should be removed and mixed with onsite soil. Any damaged or torn silt fence should be replaced. The construction entrance should be checked to ensure no sediment is being deposited onto the public roadway. Should sediment be observed, it should be removed from the street, and the stone in the construction entrance replaced.

Long Term Maintenance and Inspection Requirements:

Once final stabilization is achieved, and construction complete maintenance and inspections will be limited to the infiltration systems, hydrodynamic separators, and stormwater basins. The owner, its successors and/or assigns shall completely familiarize themselves with the project plans, details, and notes. A copy of the Maintenance & Inspection Checklist from the New York State Stormwater Management Design Manual has been included at the end of this section to serve as a guide for maintaining and inspecting the infiltrator systems and stormwater basins.

Inspections of the following items should be performed at a minimum annually and following significant rainstorm events (> ½” within 24 hours):

Stormwater Basins and Ponds:

- Inspect basin for build up of trash or debris. Remove any trash to prevent clogging of outlet structure.
- Inspection of basin for accumulation of sediment. Accumulated sediment should be removed immediately.
- Inspect rock outlet protection pad. Replace any rocks that have been displaced by scour.
- Inspection of the outlet of the outflow pipe to ensure it is not plugged or clogged.

Infiltrator Systems:

- Inspection of the infiltrator units to ensure accumulated water is infiltrating into the soil, and debris has not entered the infiltration units. Any debris should be removed. Once debris is removed, if stormwater is still not infiltrating contact a professional engineer licensed in the State of New York to examine the system.
- Inspection of the outlet of the overflow pipe to ensure it is not plugged or clogged.
- Inspect rock outlet protection pad. Replace any rocks that have been displaced by scour.

Catch Basins and Drain Manholes:

- Inspect monthly and after heavy rainstorms for sediment accumulation in sumps. Accumulated sediment should be removed immediately.

Hydro-International First Defense Hydrodynamic Separator:

- Inspection of the treatment unit for sediment accumulation. Any debris and sediment should be removed.
- Refer to Appendix “C” of this report for additional inspection and maintenance information.

Note: Additional inspection requirements and frequencies are provided in the tables on the following pages.

MAINTENANCE & EROSION CONTROL INSPECTION REQUIREMENTS

SHORT TERM RESPONSIBLE PARTY: Trained Contractor

LONG TERM RESPONSIBLE PARTY: Owner of Record

PRACTICE: EROSION CONTROLS

Maintenance Item	Frequency of Inspection					
	Short Term				Long Term	
	Following Major Rainfall	Daily	Weekly	Monthly	Yearly	Following Major Rainfall
Silt Fence (not knocked down or bulging)	X	X				
Construction Entrance (silt accumulation)	X	X				
Soil Stockpile	X			X		
Seeding/Mulching	X			X		
Site Stabilization	X		X			
Catch Basin Inlet Protection	X		X			
General Site Appearance	X	X				
Debris/Litter Control	X	X				
Need to Clean Road Surface	X	X				

PRACTICE: INFILTRATION SYSTEMS

Maintenance Item	Frequency of Inspection						
	Short Term				Long Term		
	Following Major Rainfall	Daily	Weekly	Monthly	Monthly	Yearly	Following Major Rainfall
Inflow Pipes Clear	X					X	X
Outlet Structure	X					X	X
Diversion Manhole / Outlets	X		X	X	X	X	X
No Evidence of Downstream Erosion	X						X
Dewaters Between Storms	X						X

PRACTICE: CATCH BASINS, DRAIN MANHOLES & DIVERSION STRUCTURES

Maintenance Item	Frequency of Inspection						
	Short Term				Long Term		
	Following Major Rainfall	Daily	Weekly	Monthly	Monthly	Yearly	Following Major Rainfall
Inflow Pipes & Rims Clear	X			X		X	X
Sediment Accumulation in Sumps	X			X		X	X
Accumulation of larger trash	X			X	X	X	X
Outlets Unobstructed	X			X		C	X

PRACTICE: CDS PRETREATMENT UNITS

Maintenance Item	Frequency of Inspection							
	Short Term				Long Term			
	Following Major Rainfall	Daily	Weekly	Monthly	Monthly	Quarterly*	Yearly	Following Major Rainfall
Inflow Pipes & Rims Clear	X			X		X	X	X
Sediment Accumulation in Sumps	X			X		X	X	X
Accumulation of larger trash	X			X		X	X	X
Outlets Unobstructed	X			X		X	X	X

*During first year only.

PRACTICE: ROCK OUTLET PROTECTION

Maintenance Item	Frequency of Inspection						
	Short Term				Long Term		
	Following Major Rainfall	Daily	Weekly	Monthly	Monthly	Yearly	Following Major Rainfall
Debris Cleanout	X					X	X
Vegetation	X		X			X	X
Sediment Deposition	X		X			X	X
Dislodged Stone	X			X	X		X

PRACTICE: WET POND & POCKET WETLAND

Maintenance Item	Frequency of Inspection						
	Short Term				Long Term		
	Following Major Rainfall	Daily	Weekly	Monthly	Monthly	Yearly	Following Major Rainfall
Embankment & Emergency Spillway	X			X		X	X
Riser and Principal Spill	X			X		X	X
Permanent Pool	X			X	X		X
Sediment Forebays	X		X		X		X
Condition of Outfalls	X		X			X	X
Vegetation	X			X		X	X
Dry Pond Areas	X			X		X	X

Stormwater Pond/Wetland Operation, Maintenance and Management Inspection Checklist

Project _____
Location: _____
Site Status: _____

Date: _____
Time: _____

Inspector: _____

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
1. Embankment and emergency spillway (Annual, After Major Storms)		
1. Vegetation and ground cover adequate		
2. Embankment erosion		
3. Animal burrows		
4. Unauthorized planting		
5. Cracking, bulging, or sliding of dam		
a. Upstream face		
b. Downstream face		
c. At or beyond toe		
downstream		
upstream		
d. Emergency spillway		
6. Pond, toe & chimney drains clear and functioning		
7. Seeps/leaks on downstream face		
8. Slope protection or riprap failure		
9. Vertical/horizontal alignment of top of dam "As-Built"		

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
10. Emergency spillway clear of obstructions and debris		
11. Other (specify)		
2. Riser and principal spillway (Annual)		
Type: Reinforced concrete _____ Corrugated pipe _____ Masonry _____		
1. Low flow orifice obstructed		
2. Low flow trash rack. a. Debris removal necessary		
b. Corrosion control		
3. Weir trash rack maintenance a. Debris removal necessary		
b. corrosion control		
4. Excessive sediment accumulation insider riser		
5. Concrete/masonry condition riser and barrels a. cracks or displacement		
b. Minor spalling (<1")		
c. Major spalling (rebars exposed)		
d. Joint failures		
e. Water tightness		
6. Metal pipe condition		
7. Control valve a. Operational/exercised		
b. Chained and locked		
8. Pond drain valve a. Operational/exercised		
b. Chained and locked		
9. Outfall channels functioning		
10. Other (specify)		

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
3. Permanent Pool (Wet Ponds) (monthly)		
1. Undesirable vegetative growth		
2. Floating or floatable debris removal required		
3. Visible pollution		
4. Shoreline problem		
5. Other (specify)		
4. Sediment Forebays		
1. Sedimentation noted		
2. Sediment cleanout when depth < 50% design depth		
5. Dry Pond Areas		
1. Vegetation adequate		
2. Undesirable vegetative growth		
3. Undesirable woody vegetation		
4. Low flow channels clear of obstructions		
5. Standing water or wet spots		
6. Sediment and / or trash accumulation		
7. Other (specify)		
6. Condition of Outfalls (Annual , After Major Storms)		
1. Riprap failures		
2. Slope erosion		
3. Storm drain pipes		
4. Endwalls / Headwalls		
5. Other (specify)		
7. Other (Monthly)		
1. Encroachment on pond, wetland or easement area		

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
2. Complaints from residents		
3. Aesthetics		
a. Grass growing required		
b. Graffiti removal needed		
c. Other (specify)		
4. Conditions of maintenance access routes.		
5. Signs of hydrocarbon build-up		
6. Any public hazards (specify)		
8. Wetland Vegetation (Annual)		
1. Vegetation healthy and growing Wetland maintaining 50% surface area coverage of wetland plants after the second growing season. (If unsatisfactory, reinforcement plantings needed)		
2. Dominant wetland plants: Survival of desired wetland plant species Distribution according to landscaping plan?		
3. Evidence of invasive species		
4. Maintenance of adequate water depths for desired wetland plant species		
5. Harvesting of emergent plantings needed		
6. Have sediment accumulations reduced pool volume significantly or are plants "choked" with sediment		
7. Eutrophication level of the wetland.		
8. Other (specify)		

Comments:

Actions to be Taken:

Infiltration Trench Operation, Maintenance, and Management Inspection Checklist

Project:

Location:

Site Status:

Date:

Time:

Inspector:

MAINTENANCE ITEM	SATISFACTORY / UNSATISFACTORY	COMMENTS
1. Debris Cleanout (Monthly)		
Trench surface clear of debris		
Inflow pipes clear of debris		
Overflow spillway clear of debris		
Inlet area clear of debris		
2. Sediment Traps or Forebays (Annual)		
Obviously trapping sediment		
Greater than 50% of storage volume remaining		
3. Dewatering (Monthly)		
Trench dewaterers between storms		
4. Sediment Cleanout of Trench (Annual)		
No evidence of sedimentation in trench		
Sediment accumulation doesn't yet require cleanout		
5. Inlets (Annual)		

MAINTENANCE ITEM	SATISFACTORY / UNSATISFACTORY	COMMENTS
Good condition		
No evidence of erosion		
6. Outlet/Overflow Spillway (Annual)		
Good condition, no need for repair		
No evidence of erosion		
7. Aggregate Repairs (Annual)		
Surface of aggregate clean		
Top layer of stone does not need replacement		
Trench does not need rehabilitation		

Comments:

Actions to be Taken:



Appendix H:
Soil Testing Results

STORMWATER SOIL TESTING RESULTS				
TEST PIT I.D.	DESCRIPTION	FULL DEPTH	DEPTH TO LEDGEROCK	DEPTH TO GROUNDWATER
#1	6" TOP SOIL, 36" FINE SANDY LOAM, 102" MED/FINE SANDS W/ BLDRS, 12" FINE GREY SAND	13'	-	-
#2	6" TOP SOIL, 36" FINE SANDY LOAM, 96" MED/FINE SANDS MODERATE COMPACTION, 30" MED SAND/GRAVEL	14'	-	SEEPAGE @ 11'
#3	6" TOP SOIL, 36" FINE SANDY LOAM, 96" MED/FINE SANDS, 30" MED SAND/GRAVEL LIGHT COMPACTION	13.5'	-	-
#4	6" TOP SOIL, 30" FINE SANDY LOAM, 96" MED/FINE SANDS MODERATE COMPACTION	11'	11'	-
#5	6" TOP SOIL, 30" FINE SANDY LOAM, 102" MED/COARSE SANDY LOAM, DECAYED ROCK	8'	8'	-
#6	24" TOP SOIL, 96" MISC FILL/ORGANIC MATERIAL	10'	-	-
#7	24" TOP SOIL, 96" MISC FILL/ORGANIC MATERIAL	10'	-	-
#8	6" TOP SOIL, 36" FINE SANDY LOAM, 102" MED/FINE SANDS W/ SILT MODERATE COMPACTION	12'	-	-
#9	6" TOP SOIL, 36" FINE SANDY LOAM, 102" MED/FINE SANDS W/ BLDRS MODERATE COMPACTION	12'	-	-
#10	6" TOP SOIL, 24" FINE SANDY LOAM, 90" FINE GREY SANDS HEAVY COMPACTION	10'	-	MOTTILING @ 9'
#11	6" TOP SOIL, 30" FINE SANDY LOAM, 96" MED/FINE GREY SANDS WITH SILT	11'	-	-
#12	12" TOP SOIL, 24" FINE SANDY LOAM W/ SILT, 96" FINE GREY SANDS MODERATE COMPACTION	11'	-	-
#13	6" TOP SOIL, 36" FINE SANDY LOAM, 102" MED/FINE SANDS W/ SOME SILT MODERATE COMPACTION	12'	-	-
#14	6" TOP SOIL, 36" FINE SANDY LOAM, 102" MED/FINE SANDS W/ SOME SILT MODERATE COMPACTION	12'	-	-
#15	6" TOP SOIL, 36" FINE SANDY LOAM, 114" MED/FINE SANDS W/ SOME SILT MODERATE COMPACTION	13'	-	-
#16	LEDGEROCK ENCOUNTERED AT SURFACE	1'	1'	-
#17	6" TOP SOIL, 54" RED/ORANGE SILTY LOAM, 60" MED YELLOW SANDS MODERATE COMPACTION	10'	-	-
#18	6" TOP SOIL, 150" SANDY LOAM LIGHT COMPACTION	13'	-	-
#19	6" TOP SOIL, 42" FINE SANDY LOAM, 108" MED SANDS W/ BLDRS MODERATE COMPACTION	13'	-	-
#20	6" TOP SOIL, 60" FINE SANDY LOAM W/ SILT, 90" MED YELLOW SANDS LIGHT COMPACTION	-	-	MOTTILING @ 7'
#21	6" TOP SOIL, 36" FINE SANDY LOAM, 90" MED/FINE SANDS MODERATE COMPACTION	11'	-	-
#22	6" TOP SOIL, 36" FINE SANDY LOAM, 90" FINE SANDS W/ SILT MODERATE COMPACTION	12.5'	-	MOTTILING @ 10'
#23	6" TOP SOIL, 42" FINE SANDY LOAM, 48" FINE GREY SANDS W/ SILT MODERATE COMPACTION, 60" MED/FINE YELLOW/BROWN SANDS	13'	-	-
#24	24" TOP SOIL, 108" MISC FILL/ORGANIC MATERIAL	10'	-	WATER @ 8'
#25	12" TOP SOIL, 36" FINE SANDY LOAM, 108" MISC FILL/ORGANIC MATERIAL	10'	-	SEEPAGE @ 8'
#26	6" TOP SOIL, 138" YELLOW/WHITE MED/FINE SANDS LOOSE COMPACTION	12'	-	-
#27	6" TOP SOIL, 42" BROWN FINE SANDY LOAM W/ BOULDERS, 102" YELLOW/WHITE MED/FINE SANDS LOOSE COMPACTION	12.5'	-	-
DEEP TEST PITS BY: JP NILSEN WITNESSED BY: BIBBO ASSOCIATES DATE OF TESTING: 01/16/2018 & 01/19/2018				

(SEE FIGURE 3 LOCATED AT THE END OF THE REPORT FOR SOIL TESTING LOCATIONS)

PRELIMINARY STORMWATER SOIL INFILTRATION RATES	
SW PRACTICE I.D.	INFILTRATION RATE (INCHES PER HOUR)
INF-1	12.0 IN/HR
INF-2	10.0 IN/HR
INF-3	10.0 IN/HR
INF-4	12.0 IN/HR
INF-5	10.0 IN/HR
INF-6	15.0 IN/HR
INF-7	10.0 IN/HR
INF-8	10.0 IN/HR
SWP-2	15.0 IN/HR
SWP-3	15.0 IN/HR
INFILTRATION RATES BASED ON PRELIMINARY TEST RUNS AND DEEP TEST SOIL OBSERVATIONS. FINAL TESTING SHALL BE PERFORMED TO CONFIRM THESE RATES AND THE INFILTRATION PRACTICES SHALL BE REVISED ACCORDINGLY.	



Appendix I:
Pocket Wetland Sizing Calculations

Project The North 60 - Phase 1**Pocket Wetland Design***Required Elements*

Practice ID	SWP-1
Area of Contributory Watershed: ACW (s.f.)	231,706
WQv (90% Storm) (cu.ft.)	6,369
Permanent Pool Volume required = 50% WQv (cu.ft.)	3,185
Provided (cu.ft.)	7,835
Forebay Volume Required = 10% WQv (cu.ft.)	637
Provided (cu.ft.)	1,811
Wetland Surface Area (Perm. Pool Surface Area) Required = 1% ACW (s.f.)	2,317
Total Provided (s.f.)	9,625
< 6" depth permanent pool required area = 35% Total	3,369
Area Provided (s.f.)	5,393
provided %	56
< 18" depth permanent pool required area = 65% Total	6,256
Area Provided (s.f.)	8,323
provided %	86

Basin ID: **Post A2**

90% WQv: Subcatchment Area (A): 231,706 sq.ft.
 Rainfall (P): 1.5 in.
 Impervious Area 43,743 sq.ft.*
 Percent Imperviousness(I): 18.88 %
 $R_v = .05 + .009(I)$ 0.21991
 $R_v = 0.219908$ **
 $WQv = (P)(R_v)(A) / 12$ 6,369 cu.ft.
 or
 0.1462 ac.ft.

** Minimum $R_v = 0.2$

N60 Phase 1 Drainage A 6-11-19

Prepared by Bibbo Associates, LLP

HydroCAD® 10.00-24 s/n 02226 © 2018 HydroCAD Software Solutions LLC

Type III 24-hr 100-year storm Rainfall=9.00"

Printed 6/12/2019

Stage-Area-Storage for Pond 44P: Pocket Wetland

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
230.00	0	231.32	449	232.64	1,520	233.96	4,054
230.02	3	231.34	460	232.66	1,542	233.98	4,149
230.04	7	231.36	471	232.68	1,564	234.00	4,247
230.06	11	231.38	482	232.70	1,587	234.02	4,349
230.08	14	231.40	493	232.72	1,610	234.04	4,453
230.10	18	231.42	505	232.74	1,633	234.06	4,560
230.12	22	231.44	517	232.76	1,657	234.08	4,671
230.14	26	231.46	528	232.78	1,680	234.10	4,785
230.16	30	231.48	540	232.80	1,704	234.12	4,903
230.18	34	231.50	552	232.82	1,728	234.14	5,023
230.20	39	231.52	565	232.84	1,752	234.16	5,148
230.22	43	231.54	577	232.86	1,777	234.18	5,275
230.24	47	231.56	590	232.88	1,801	234.20	5,407
230.26	52	231.58	602	232.90	1,826	234.22	5,542
230.28	57	231.60	615	232.92	1,851	234.24	5,680
230.30	61	231.62	628	232.94	1,877	234.26	5,822
230.32	66	231.64	641	232.96	1,902	234.28	5,968
230.34	71	231.66	655	232.98	1,928	234.30	6,118
230.36	76	231.68	668	233.00	1,954	234.32	6,272
230.38	81	231.70	682	233.02	1,980	234.34	6,429
230.40	86	231.72	696	233.04	2,007	234.36	6,591
230.42	92	231.74	710	233.06	2,034	234.38	6,756
230.44	97	231.76	724	233.08	2,062	234.40	6,926
230.46	102	231.78	738	233.10	2,091	234.42	7,099
230.48	108	231.80	752	233.12	2,120	234.44	7,277
230.50	114	231.82	767	233.14	2,150	234.46	7,459
230.52	120	231.84	782	233.16	2,180	234.48	7,645
230.54	126	231.86	797	233.18	2,211	234.50	7,835
230.56	132	231.88	812	233.20	2,243	234.52	8,028
230.58	138	231.90	827	233.22	2,275	234.54	8,221
230.60	144	231.92	843	233.24	2,308	234.56	8,416
230.62	150	231.94	858	233.26	2,342	234.58	8,610
230.64	157	231.96	874	233.28	2,376	234.60	8,806
230.66	163	231.98	890	233.30	2,411	234.62	9,002
230.68	170	232.00	906	233.32	2,446	234.64	9,198
230.70	177	232.02	923	233.34	2,482	234.66	9,396
230.72	184	232.04	939	233.36	2,519	234.68	9,594
230.74	191	232.06	956	233.38	2,557	234.70	9,792
230.76	198	232.08	973	233.40	2,595	234.72	9,992
230.78	205	232.10	990	233.42	2,634	234.74	10,191
230.80	213	232.12	1,007	233.44	2,673	234.76	10,392
230.82	220	232.14	1,024	233.46	2,713	234.78	10,593
230.84	228	232.16	1,042	233.48	2,754	234.80	10,795
230.86	235	232.18	1,060	233.50	2,796	234.82	10,998
230.88	243	232.20	1,077	233.52	2,838	234.84	11,201
230.90	251	232.22	1,096	233.54	2,881	234.86	11,405
230.92	259	232.24	1,114	233.56	2,925	234.88	11,609
230.94	268	232.26	1,132	233.58	2,970	234.90	11,814
230.96	276	232.28	1,151	233.60	3,015	234.92	12,020
230.98	284	232.30	1,170	233.62	3,061	234.94	12,227
231.00	293	232.32	1,189	233.64	3,108	234.96	12,434
231.02	302	232.34	1,208	233.66	3,155	234.98	12,642
231.04	311	232.36	1,228	233.68	3,204	235.00	12,850
231.06	320	232.38	1,247	233.70	3,253	235.02	13,059
231.08	329	232.40	1,267	233.72	3,302	235.04	13,269
231.10	338	232.42	1,287	233.74	3,353	235.06	13,479
231.12	347	232.44	1,307	233.76	3,405	235.08	13,690
231.14	357	232.46	1,327	233.78	3,457	235.10	13,902
231.16	367	232.48	1,348	233.80	3,510	235.12	14,115
231.18	376	232.50	1,369	233.82	3,564	235.14	14,328
231.20	386	232.52	1,390	233.84	3,618	235.16	14,542
231.22	396	232.54	1,411	233.86	3,674	235.18	14,756
231.24	407	232.56	1,432	233.88	3,730	235.20	14,971
231.26	417	232.58	1,454	233.90	3,787	235.22	15,187
231.28	428	232.60	1,475	233.92	3,873	235.24	15,403
231.30	438	232.62	1,497	233.94	3,962	235.26	15,620

N60 Phase 1 Drainage A 6-11-19

Prepared by Bibbo Associates, LLP

HydroCAD® 10.00-24 s/n 02226 © 2018 HydroCAD Software Solutions LLC

Type III 24-hr 100-year storm Rainfall=9.00"

Printed 6/12/2019

Stage-Area-Storage for Pond 44P: Pocket Wetland (continued)

Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)	Elevation (feet)	Storage (cubic-feet)
235.28	15,838	236.60	31,736	237.92	50,799
235.30	16,056	236.62	32,001	237.94	51,113
235.32	16,275	236.64	32,266	237.96	51,428
235.34	16,495	236.66	32,532	237.98	51,744
235.36	16,716	236.68	32,799	238.00	52,061
235.38	16,937	236.70	33,066	238.02	52,378
235.40	17,159	236.72	33,335	238.04	52,697
235.42	17,381	236.74	33,604	238.06	53,016
235.44	17,604	236.76	33,873	238.08	53,335
235.46	17,828	236.78	34,144	238.10	53,656
235.48	18,052	236.80	34,415	238.12	53,977
235.50	18,278	236.82	34,687	238.14	54,300
235.52	18,504	236.84	34,960	238.16	54,623
235.54	18,730	236.86	35,233	238.18	54,946
235.56	18,957	236.88	35,507	238.20	55,271
235.58	19,185	236.90	35,782	238.22	55,596
235.60	19,414	236.92	36,058	238.24	55,923
235.62	19,643	236.94	36,334	238.26	56,249
235.64	19,873	236.96	36,611	238.28	56,577
235.66	20,104	236.98	36,889	238.30	56,906
235.68	20,335	237.00	37,168	238.32	57,235
235.70	20,567	237.02	37,447	238.34	57,565
235.72	20,800	237.04	37,727	238.36	57,896
235.74	21,033	237.06	38,008	238.38	58,228
235.76	21,267	237.08	38,290	238.40	58,560
235.78	21,502	237.10	38,572	238.42	58,894
235.80	21,738	237.12	38,855	238.44	59,228
235.82	21,974	237.14	39,139	238.46	59,563
235.84	22,211	237.16	39,424	238.48	59,898
235.86	22,448	237.18	39,709	238.50	60,235
235.88	22,687	237.20	39,995	238.52	60,572
235.90	22,926	237.22	40,282	238.54	60,910
235.92	23,165	237.24	40,569	238.56	61,249
235.94	23,406	237.26	40,858	238.58	61,589
235.96	23,647	237.28	41,147	238.60	61,929
235.98	23,889	237.30	41,436	238.62	62,271
236.00	24,131	237.32	41,727	238.64	62,613
236.02	24,375	237.34	42,018	238.66	62,956
236.04	24,618	237.36	42,310	238.68	63,299
236.06	24,863	237.38	42,603	238.70	63,644
236.08	25,108	237.40	42,897	238.72	63,989
236.10	25,354	237.42	43,191	238.74	64,336
236.12	25,601	237.44	43,486	238.76	64,683
236.14	25,849	237.46	43,782	238.78	65,030
236.16	26,097	237.48	44,079	238.80	65,379
236.18	26,346	237.50	44,376	238.82	65,729
236.20	26,595	237.52	44,674	238.84	66,079
236.22	26,845	237.54	44,973	238.86	66,430
236.24	27,096	237.56	45,273	238.88	66,782
236.26	27,348	237.58	45,573	238.90	67,135
236.28	27,600	237.60	45,874	238.92	67,488
236.30	27,854	237.62	46,176	238.94	67,843
236.32	28,107	237.64	46,479	238.96	68,198
236.34	28,362	237.66	46,783	238.98	68,554
236.36	28,617	237.68	47,087	239.00	68,911
236.38	28,873	237.70	47,392		
236.40	29,130	237.72	47,698		
236.42	29,387	237.74	48,004		
236.44	29,645	237.76	48,312		
236.46	29,904	237.78	48,620		
236.48	30,164	237.80	48,929		
236.50	30,424	237.82	49,238		
236.52	30,685	237.84	49,549		
236.54	30,947	237.86	49,860		
236.56	31,209	237.88	50,172		
236.58	31,472	237.90	50,485		

N60 Phase 1 Drainage A 6-11-19

Prepared by Bibbo Associates, LLP

HydroCAD® 10.00-24 s/n 02226 © 2018 HydroCAD Software Solutions LLC

Type III 24-hr 100-year storm Rainfall=9.00"

Printed 6/12/2019

Summary for Pond 44P: Pocket Wetland

Inflow Area = 231,706 sf, 20.73% Impervious, Inflow Depth = 6.20" for 100-year storm event
 Inflow = 27.13 cfs @ 12.24 hrs, Volume= 119,695 cf
 Outflow = 18.88 cfs @ 12.43 hrs, Volume= 95,883 cf, Atten= 30%, Lag= 11.3 min
 Primary = 18.88 cfs @ 12.43 hrs, Volume= 95,883 cf

Routing by Dyn-Stor-Ind method, Time Span= 0.00-96.00 hrs, dt= 0.01 hrs

Starting Elev= 234.50' Surf.Area= 12,504 sf Storage= 7,835 cf

Peak Elev= 238.08' @ 12.43 hrs Surf.Area= 18,895 sf Storage= 53,363 cf (45,528 cf above start)

Plug-Flow detention time= 563.9 min calculated for 88,048 cf (74% of inflow)

Center-of-Mass det. time= 430.2 min (1,246.2 - 816.0)

Volume	Invert	Avail.Storage	Storage Description
#1	230.00'	1,811 cf	Forebay (Irregular) Listed below (Recalc)
#2	230.00'	1,976 cf	Micropool (Irregular) Listed below (Recalc)
#3	233.90'	65,123 cf	Marsh & Storage (Irregular) Listed below (Recalc)
		68,911 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
230.00	86	34.2	0	0	86
231.00	217	53.2	147	147	225
232.00	406	72.3	307	453	426
233.00	651	91.4	524	977	688
233.90	1,233	129.1	834	1,811	1,357

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
230.00	86	34.2	0	0	86
231.00	217	53.2	147	147	225
232.00	406	72.3	307	453	426
233.00	651	91.4	524	977	688
233.90	1,646	155.1	1,000	1,976	1,942

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
233.90	4,232	530.5	0	0	4,232
234.50	9,625	400.9	4,048	4,048	13,842
235.00	10,440	413.5	5,015	9,063	14,683
236.00	12,144	438.8	11,281	20,344	16,451
237.00	13,950	464.0	13,037	33,381	18,317
238.00	15,856	489.2	14,893	48,273	20,287
239.00	17,864	514.5	16,850	65,123	22,369

Device	Routing	Invert	Outlet Devices
#1	Primary	232.00'	21.0" Round Culvert L= 74.0' CMP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 232.00' / 231.00' S= 0.0135 ' S= 0.0135 ' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 2.41 sf
#2	Device 1	234.50'	1.1" Vert. Orifice/Grate C= 0.600
#3	Device 1	237.50'	36.0" x 48.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=18.88 cfs @ 12.43 hrs HW=238.08' TW=0.00' (Dynamic Tailwater)

1=Culvert (Barrel Controls 18.88 cfs @ 7.85 fps)

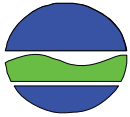
2=Orifice/Grate (Passes < 0.06 cfs potential flow)

3=Orifice/Grate (Passes < 20.31 cfs potential flow)



Appendix J:
Draft NYSDEC Notice of Intent &
MS-4 SWPPP Acceptance Form

NOTICE OF INTENT



New York State Department of Environmental Conservation

Division of Water

625 Broadway, 4th Floor

Albany, New York 12233-3505

NYR
(for DEC use only)

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

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

**-IMPORTANT-
RETURN THIS FORM TO THE ADDRESS ABOVE**

OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

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

F A R E R I A S S O C I A T E S / N O R T H 8 0 , L L C

Owner/Operator Contact Person Last Name (NOT CONSULTANT)

M O L N A R

Owner/Operator Contact Person First Name

K E V I N

Owner/Operator Mailing Address

2 D E A R F I E L D D R I V E , S U I T E 3

City

G R E E N W I C H

State

C T

Zip

0 6 8 3 1 -

Phone (Owner/Operator)

2 0 3 - 4 2 2 - 6 7 0 0

Fax (Owner/Operator)

- - -

Email (Owner/Operator)

k m o l n a r @ g a t e w a y d e v . c o m

FED TAX ID

- (not required for individuals)

Project Site Information

Project/Site Name

T H E N O R T H 6 0 - P H A S E I

Street Address (NOT P.O. BOX)

4 8 S A W M I L L R I V E R R O A D

Side of Street

☐ North ☒ South ☐ East ☐ West

City/Town/Village (THAT ISSUES BUILDING PERMIT)

M O U N T P L E A S A N T

State Zip

N Y 1 0 5 3 2 -

County

W E S T C H E S T E R

DEC Region

3

Name of Nearest Cross Street

O L D S A W M I L L R I V E R R O A D

Distance to Nearest Cross Street (Feet)

1 0 0

Project In Relation to Cross Street

☐ North ☒ South ☐ East ☐ WestTax Map Numbers
Section-Block-Parcel

1 1 6 . 8 - 1 - 9

Tax Map Numbers

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

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

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

X Coordinates (Easting)

-7 3 8 0 8

Ex. -73.749

Y Coordinates (Northing)

4 1 0 9 1

Ex. 42.652

2. What is the nature of this construction project?

☒ New Construction☐ Redevelopment with increase in impervious area☐ Redevelopment with no increase in impervious area

3. Select the predominant land use for both pre and post development conditions.

SELECT ONLY ONE CHOICE FOR EACH

**Pre-Development
Existing Land Use**

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

**Post-Development
Future Land Use**

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

Number of Lots

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

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

Total Site Area	Total Area To Be Disturbed	Existing Impervious Area To Be Disturbed	Future Impervious Area Within Disturbed Area																								
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		7	8	.	9																						
		4	0	.	7																						
			4	.	2																						
		1	8	.	5																						

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

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

A	B	C	D														
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		0															
		5															
		7	0														
		2	5														

7. Is this a phased project? ☒ Yes ☐ No

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

Start Date	End Date																
<table border="1"><tr><td>0</td><td>6</td></tr></table> / <table border="1"><tr><td>0</td><td>1</td></tr></table> / <table border="1"><tr><td>2</td><td>0</td><td>2</td><td>1</td></tr></table>	0	6	0	1	2	0	2	1	- <table border="1"><tr><td>0</td><td>9</td></tr></table> / <table border="1"><tr><td>0</td><td>1</td></tr></table> / <table border="1"><tr><td>2</td><td>0</td><td>2</td><td>5</td></tr></table>	0	9	0	1	2	0	2	5
0	6																
0	1																
2	0	2	1														
0	9																
0	1																
2	0	2	5														

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

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

[illegible]

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

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

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

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

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

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

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

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

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

[illegible]

SWPPP Preparer

[illegible]

Contact Name (Last, Space, First)

[illegible]

Mailing Address

[illegible]

City

[illegible]

State Zip

N	Y	1	0	5	8	9	-				

Phone

9	1	4	-	2	7	7	-	5	8	0	5

Fax

9	1	4

-

2	7	7

-

8	2	1	0

Email

t	a	l	l	e	n	@	b	i	b	b	o	a	s	s	o	c	i	a	t	e	s	.	c	o	m

[illegible]

SWPPP Preparer Certification

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

First Name

[illegible]

MI

S

Last Name

[illegible]

Signature

Date _____

 /

 /

☒ Yes ☐ No

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

Temporary Structural

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

Biotechnical

- **Brush Matting**
- **Wattling**

Other

[illegible]

Vegetative Measures

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

Permanent Structural

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

Post-construction Stormwater Management Practice (SMP) Requirements

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

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

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

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

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

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

Total WQv Required

. acre-feet

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

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

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

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

RR Techniques (Area Reduction)	Total Contributing Area (acres)	Total Contributing Impervious Area(acres)
☐ Conservation of Natural Areas (RR-1) ...	.	and/or .
☐ Sheetflow to Riparian Buffers/Filters Strips (RR-2)	.	and/or .
☐ Tree Planting/Tree Pit (RR-3)	.	and/or .
☐ Disconnection of Rooftop Runoff (RR-4) ..	.	and/or .
RR Techniques (Volume Reduction)		
☐ Vegetated Swale (RR-5)		
☐ Rain Garden (RR-6)		
☐ Stormwater Planter (RR-7)		
☐ Rain Barrel/Cistern (RR-8)		
☐ Porous Pavement (RR-9)		
☐ Green Roof (RR-10)		
Standard SMPs with RRv Capacity		
☐ Infiltration Trench (I-1)		
☒ Infiltration Basin (I-2)	9	7 3 2
☐ Dry Well (I-3)		
☒ Underground Infiltration System (I-4)	6	4 5 3
☐ Bioretention (F-5)		
☐ Dry Swale (O-1)		
Standard SMPs		
☐ Micropool Extended Detention (P-1)		
☒ Wet Pond (P-2)	0	6 7 9
☐ Wet Extended Detention (P-3)		
☐ Multiple Pond System (P-4)		
☐ Pocket Pond (P-5)		
☐ Surface Sand Filter (F-1)		
☐ Underground Sand Filter (F-2)		
☐ Perimeter Sand Filter (F-3)		
☐ Organic Filter (F-4)		
☐ Shallow Wetland (W-1)		
☐ Extended Detention Wetland (W-2)		
☐ Pond/Wetland System (W-3)		
☒ Pocket Wetland (W-4)	1	0 0 4
☐ Wet Swale (O-2)		

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

Alternative SMP												Total Contributing Impervious Area(acres)						
☐ Hydrodynamic															•			
☐ Wet Vault															•			
☐ Media Filter															•			
☐ Other															•			

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

[illegible][illegible]

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

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

Total RRv provided

		1

.

9	9	3

acre-feet

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

☐ Yes ☒ No

If Yes, go to question 36.

If No, go to question 32.

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

Minimum RRV Required

		0

.

6	4	5

acre-feet

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

☒ Yes ☐ No

If Yes, go to question 33.

Note: Use the space provided in question #39 to summarize the specific site limitations and justification for not reducing 100% of WQV required (#28). A detailed evaluation of the specific site limitations and justification for not reducing 100% of the WQV required (#28) must also be included in the SWPPP.

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

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

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

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

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

WQv Provided

0 . 3 0 8 acre-feet

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

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

2 . 3 0 1

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

If Yes, go to question 36.

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

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

CPv Required

9 . 8 7 1 acre-feet

CPv Provided

9 . 8 7 1 acre-feet

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

- ☐ Site discharges directly to tidal waters or a fifth order or larger stream.
- ☒ Reduction of the total CPv is achieved on site through runoff reduction techniques or infiltration systems.

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

Total Overbank Flood Control Criteria (Qp)

Pre-Development

2 1 2 . 8 7 CFS

Post-development

1 8 9 . 2 1 CFS

Total Extreme Flood Control Criteria (Qf)

Pre-Development

5 3 5 . 3 2 CFS

Post-development

5 2 5 . 8 9 CFS

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

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

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

☒ Yes ☐ No

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

[illegible]

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

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

- Air Pollution Control

- Coastal Erosion

☐ Hazardous Waste

○ Long Island Wells

○ Mined Land Reclamation

○ Solid Waste

○ Navigable Waters Protection / Article 15

○ Water Quality Certificate

- Dam Safety

○ Water Supply

○ Freshwater Wetlands/Article 24

- Tidal Wetlands

○ Wild, Scenic and Recreational Rivers

● Stream Bed or Bank Protection / Article 15

○ Endangered or Threatened Species(Incidental Take Permit)

- Individual SPDES

☐ SPDES Multi-Sector GP

☐ Other

☐ None

41. Does this project require a US Army Corps of Engineers Wetland Permit? ☐ ☐ ☐ ☐ ☐ ☐

☒ Yes ☐ No

If Yes, Indicate Size of Impact.	0	3

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

☒ Yes ☐ No

43. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI?

☒ Yes ☐ No

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

N	Y	P							

N	Y	R						

Owner/Operator Certification

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

Print First Name

K	E	V	I	N															

MI

Print Last Name

M	O	L	N	A	R														

Owner/Operator Signature

Date

				/				/				



**Department of
Environmental
Conservation**

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

**MS4 Stormwater Pollution Prevention Plan (SWPPP) Acceptance
Form**

for

Construction Activities Seeking Authorization Under SPDES General Permit

*(NOTE: Attach Completed Form to Notice Of Intent and Submit to Address Above)

I. Project Owner/Operator Information

1. Owner/Operator Name: Fareri Associates / North 80, LLC

2. Contact Person: Kevin Molnar, AIA

3. Street Address: 2 Dearfield Drive Suite 3

4. City/State/Zip: Greenwich, CT 06831

II. Project Site Information

5. Project/Site Name: The North 60

6. Street Address: Hospital Road, Route 9A, Old Saw Mill River Road

7. City/State/Zip: Hawthorne, NY 10532

III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information

8. SWPPP Reviewed by:

9. Title/Position:

10. Date Final SWPPP Reviewed and Accepted:

IV. Regulated MS4 Information

11. Name of MS4:

12. MS4 SPDES Permit Identification Number: NYR20A _____

13. Contact Person:

14. Street Address:

15. City/State/Zip:

16. Telephone Number:

MS4 SWPPP Acceptance Form - continued

V. Certification Statement - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative

I hereby certify that the final Stormwater Pollution Prevention Plan (SWPPP) for the construction project identified in question 5 has been reviewed and meets the substantive requirements in the SPDES General Permit For Stormwater Discharges from Municipal Separate Storm Sewer Systems (MS4s).
Note: The MS4, through the acceptance of the SWPPP, assumes no responsibility for the accuracy and adequacy of the design included in the SWPPP. In addition, review and acceptance of the SWPPP by the MS4 does not relieve the owner/operator or their SWPPP preparer of responsibility or liability for errors or omissions in the plan.

Printed Name:

Title/Position:

Signature:

Date:

VI. Additional Information



Appendix K:
Contractor Certification Document

**Contact Information and Certification:**

Prior to the commencement of construction activity, the owner or operator must identify the contractor(s) and subcontractor(s) that will be responsible for installing, constructing, repairing, replacing, inspecting and maintaining the erosion and sediment control practices included in the this Stormwater Pollution Prevention Plan (SWPPP); and the contractor(s) and subcontractor(s) that will be responsible for constructing the post-construction stormwater management practices as shown on the Construction Plans included in the SWPPP.

The owner or operator shall have each of the contractors and subcontractors identify at least one person from their company that will be responsible for implementation of the SWPPP. This person shall be known as the trained contractor. The owner or operator shall ensure that at least one trained contractor is on site on a daily basis when soil disturbance activities are being performed.

The owner or operator shall have each of the contractors and subcontractors identified above sign a copy of the certification statement on the next page before they commence any construction activity.

In addition to signing the certification statement, the certification page must also identify the specific elements of the SWPPP that each contractor and subcontractor will be responsible for and include the name and title of the person providing the signature; the name and title of the trained contractor responsible for SWPPP implementation; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification statement is signed. The owner or operator shall attach the certification statement(s) to the copy of the SWPPP that is maintained at the construction site. If new or additional contractors are hired to implement measures identified in the SWPPP after construction has commenced, they must also sign the certification statement and provide the information listed above.

CONTRACTOR'S CERTIFICATION

PROJECT NAME: THE NORTH 60

PROJECT ADDRESS: HOSPITAL ROAD & ROUTE 9A, MOUNT PLEASANT, NY

"I hereby certify under penalty of law that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I am aware that there are significant penalties for submitting false information that I do not believe to be true, including the possibility of fine and imprisonment for knowing violations"

Name: _____

Business Name: _____

Address: _____

Phone: _____

Trained Contractor Signature

Date



CONTRACTOR'S RESPONSIBILITY CERTIFICATION

PROJECT NAME: THE NORTH 60
PROJECT ADDRESS: HOSPITAL ROAD & ROUTE 9A, MOUNT PLEASANT, NY

Name: _____
Title: _____
Business Name: _____
Address: _____
Phone: _____

Specific element of the SWPPP Responsible for: _____
(i.e. silt fence, stabilized construction entrance, inlet protection, post-construction stormwater management practices installation, etc.)

Contractor Signature

Date

Trained Contractor responsible for SWPPP implementation:
(Individual listed on certification page above)

Name: _____
Business Name: _____
Address: _____
Phone: _____

(MAKE ADDITIONAL COPIES AS NEEDED)



Appendix L:
Rock Outlet Protection
Sizing Calculations



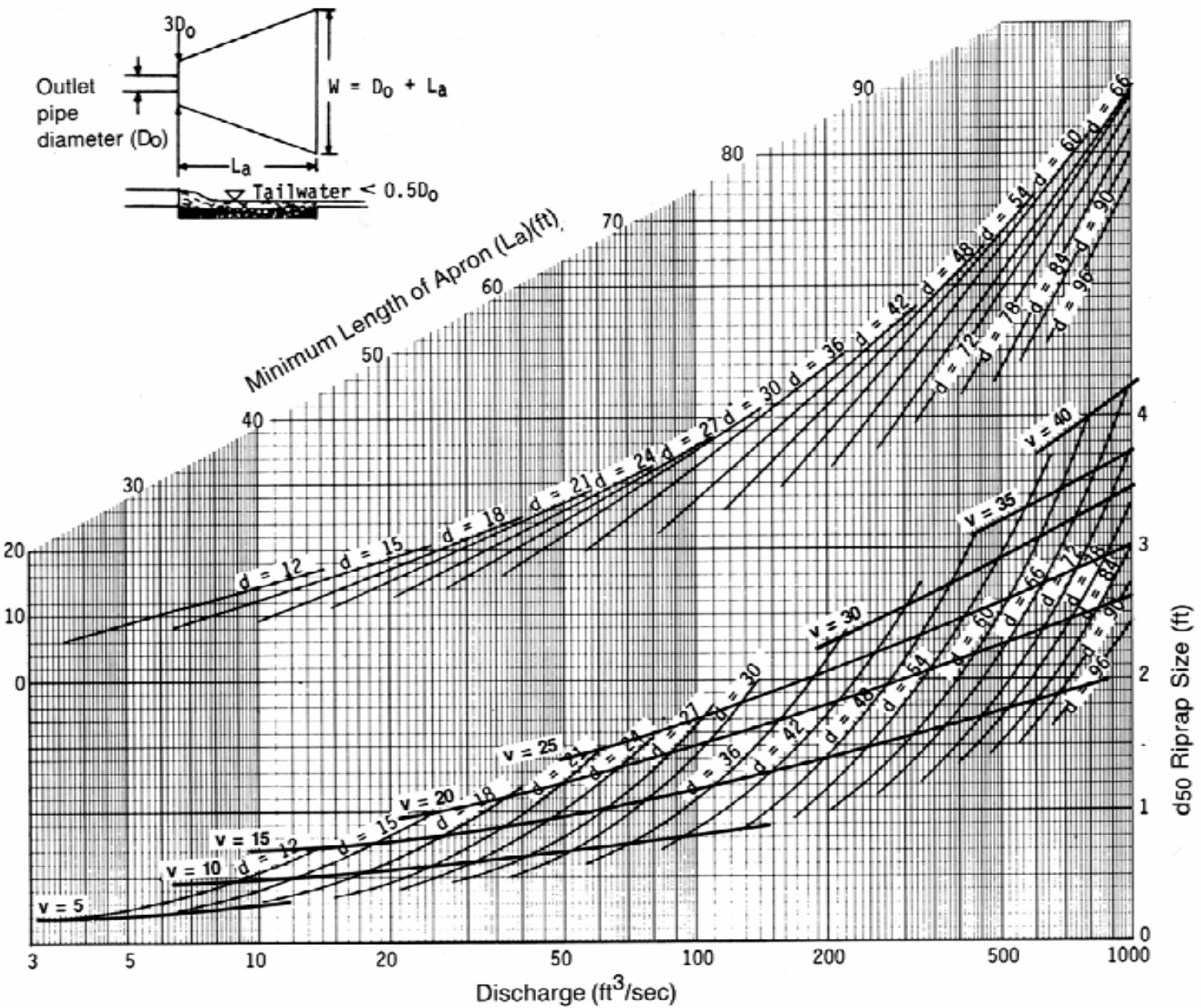
Rock Outlet Protection Sizing Calculations

Design Storm: 10 yr

Descp.	Q 10 (cfs)	d50 (in) (See Chart)	dmax (in) d50 x 1.5	La (See Chart)	Diameter of Pipe (Do) (ft)	3 x Diameter of Pipe	W = Do + La	Thickness (in) 1.5 x dmax		Stone Size (in)
								Calc.	Use	
SWP 1 - ES 1	15.07	6	9	6	1.5	4.5	7.5	13.5	14.0	6"-9"
SWP 2 - ES 1	21.14	10.8	16.2	20	1.33	3.99	21.33	24.3	24.0	10"-16"
SWP 2 - ES 2	3.35	3.3	4.95	6	1.33	3.99	7.33	7.4	8.0	3"-5"
SWP 3 - ES 1	71.54	9.6	14.4	24	3	9	27	21.6	22.0	9"-15"
SWP 3 - ES 2	20.6	3.3	4.95	6	4	12	10	7.4	8.0	3"-5"
SWP 4 - ES 1	12.78	4.8	7.2	6	1.33	3.99	7.33	10.8	11.0	4"-7"
SWP 4 - ES 2	31.4	3.6	5.4	6	3	9	9	8.1	8.0	3"-6"
INF 1 - ES 1	10.53	3.3	4.95	6	2	6	8	7.4	8.0	3"-5"
INF 3 - ES 1	10.33	3.3	4.95	6	2	6	8	7.4	8.0	3"-5"
INF 4 - ES 1	0	3.3	4.95	6	1.5	4.5	7.5	7.4	8.0	3"-5"
WS - ES 1	11.26	3.3	4.95	6	2	6	8	7.4	8.0	3"-5"

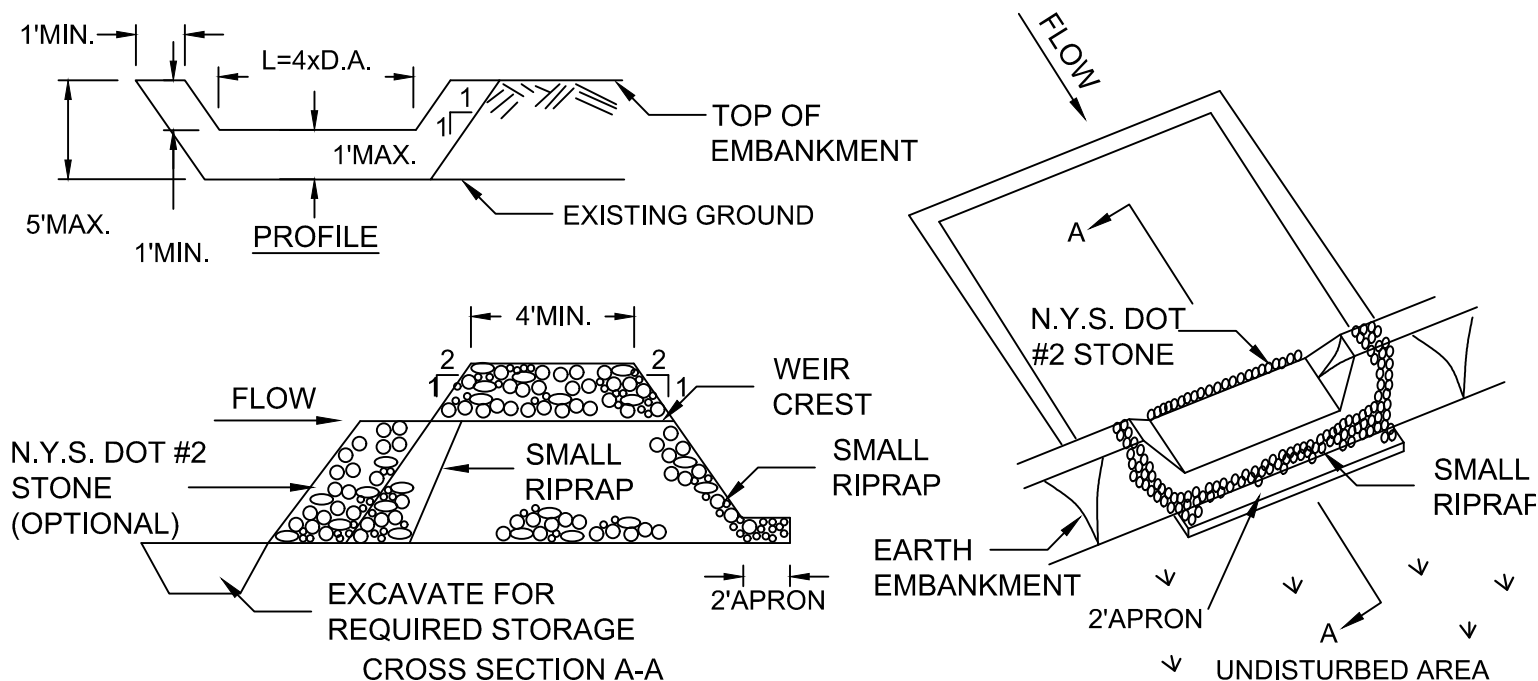
Figure 5B.12

Outlet Protection Design—Minimum Tailwater Condition
(Design of Outlet Protection from a Round Pipe Flowing Full,
Minimum Tailwater Condition: $T_w < 0.5D_o$) (USDA - NRCS)





Appendix M:
Temporary Sediment Trap
Detail & Sizing Calculations



OPTION: A ONE FOOT LAYER OF N.Y.S. DOT #2 STONE MAY BE PLACED ON THE UPSTREAM SIDE OF THE RIPRAP INPLACE OF THE EMBEDDED FILTER CLOTH.

NOTE: REQUIRED STORAGE SHALL BE 3,600 CU.FT. PER ACRE OF DRAINAGE AREA
MAXIMUM DRAINAGE AREA 5 ACRES

STONE OUTLET SEDIMENT TRAP ST-IV

N.T.S.

CONSTRUCTION SPECIFICATIONS

1. AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED AND STRIPPED OF ANY VEGETATION AND ROOT MAT. THE POOL AREA SHALL BE CLEARED.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS AND OTHER WOODY VEGETATION AS WELL AS OVER-SIZED STONES, ROCKS, ORGANIC MATERIAL OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
3. ALL CUT AND FILL SLOPES SHALL BE 2:1 OR FLATTER.
4. THE STONE USED IN THE OUTLET SHALL BE SMALL RIPRAP 4"-8" ALONG WITH A 1' THICKNESS OF 2" AGGREGATE PLACED ON THE UP-GRADE SIDE ON THE SMALL RIPRAP OR EMBEDDED FILTER CLOTH IN THE RIPRAP.
5. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP.
6. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED.
7. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND WATER POLLUTION IS MINIMIZED.
8. THE STRUCTURE SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

SEDIMENT TRAP SIZING									
	SEDIMENT TRAP #1		SEDIMENT TRAP #2		SEDIMENT TRAP #3		SEDIMENT TRAP #4		
DRAINAGE AREA	3.4 Ac		3.4 Ac		4.4 Ac		3.3 Ac		
REQUIRED STORAGE VOLUME	12,240 cu.ft.		12,240 cu.ft.		15,840 cu.ft.		11,880 cu.ft.		
CUMULATIVE STORAGE PROVIDED (cu.ft.)	ELEV	STORAGE	ELEV	STORAGE	ELEV	STORAGE	ELEV	STORAGE	
	380'	0	331'	0	338'	0	238'	0	
	381'	3,019	332'	3,019	339'	6,089	239'	2,485	
	382'	6,592	333'	6,592	340'	12,870	240'	5,359	
	383'	10,753	334'	10,753	341'	20,369	241'	8,649	
	384'	15,532	335'	15,532	342'	28,611	242'	12,379	
TOTAL STORAGE PROVIDED	14,720 cu.ft.		14,720 cu.ft.		26,157 cu.ft.		12,379 cu.ft.		
STONE OUTLET WIDTH	14'		14'		18'		14'		



Appendix N:
Phase 1 Construction Sequence



CONSTRUCTION SEQUENCING:

PRIOR TO THE COMMENCEMENT OF CONSTRUCTION THE APPLICANT, APPLICANT'S ENGINEER, CONTRACTOR, AND REPRESENTATIVES OF ALL INVOLVED REGULATORY AGENCIES SHALL REVIEW ALL ASPECTS OF THE PROPOSED CONSTRUCTION IN A PRE-CONSTRUCTION MEETING AT THE PROJECT SITE.

PHASE 1A:

1. INSTALL ALL EROSION AND SEDIMENT CONTROL MEASURES FOR PHASE 1A IN THE LOCATIONS SHOWN ON THE PROPOSED EROSION AND SEDIMENT CONTROL PLANS.

NOTE: INITIAL ACCESS FOR EQUIPMENT MOBILIZATION FOR PHASE 1A SHALL BE FROM THE EXISTING DRIVEWAY TO SAW MILL RIVER ROAD AT THE NORTHEAST CORNER OF THE

PROJECT SITE.

2. BEGIN DEMOLITION / REMOVAL OPERATIONS OF EXISTING DWELLINGS AND ANCILLARY SITE FEATURES WITHIN LIMITS OF PHASE 1A. ALL EXCESS MATERIAL AND CONSTRUCTION DEBRIS GENERATED BY REMOVAL OPERATIONS SHALL BE REMOVED FROM SITE AND PROPERLY DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL GUIDELINES.

3. ESTABLISH CONTRACTOR STAGING AREA FOR CONSTRUCTION TRAILERS, EQUIPMENT MOBILIZATION AND STOCKPILES FOR FUTURE WEST ST. EXCAVATION.

4. ALL AREAS WITHIN PHASE 1A WHICH ARE NOT TO BE UTILIZED FOR STAGING OR STOCKPILE AREA SHALL BE IMMEDIATELY STABILIZED WITH SEED AND MULCH IN ACCORDANCE WITH THE SEEDING NOTES SPECIFIED HEREIN ON SHEET D-4.

PHASE 1B:

1. INSTALL ALL EROSION AND SEDIMENT CONTROL MEASURES FOR PHASE 1B IN THE LOCATIONS SHOWN ON THE PROPOSED EROSION AND SEDIMENT CONTROL PLANS.

2. CLEAR AND GRUB PHASE 1B WORK AREA. ALL STUMPS GENERATED DURING CLEARING OPERATIONS SHALL BE REMOVED FROM SITE AND LEGALLY DISPOSED OF. NO ONSITE BURIAL OF THIS MATERIAL SHALL BE PERMITTED.

3. STRIP AND STOCKPILE TOPSOIL FROM PROPOSED WORK AREA. TOPSOIL SHALL BE TRANSPORTED VIA THE EXISTING DRIVEWAY TO THE STOCKPILE/ STAGING AREA ESTABLISHED DURING PHASE 1A. STOCKPILED MATERIAL TO REMAIN UNUSED FOR (7) SEVEN DAYS SHALL BE SEEDED AND STABILIZED IN ACCORDANCE WITH THE TEMPORARY SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.

4. BEGIN EARTHWORK OPERATIONS FOR FOR WEST ST. AND STORMWATER BASIN (SWP-1). BEGINNING AT OLD SAW MILL RIVER ROAD. AND CONSTRUCT RETAINING WALLS. EROSION CONTROL BLANKS SHALL BE INSTALLED IMMEDIATELY AFTER GRADING OF CREATED SLOPE IS COMPLETE. EXCESS MATERIAL RESULTING FROM WEST ST. EARTHWORK OPERATIONS SHALL BE TRANSPORTED VIA THE EXISTING DRIVEWAY TO THE STOCKPILE/STAGING AREA ESTABLISHED DURING PHASE 1A. STOCKPILE MATERIAL TO REMAIN UNUSED FOR (7) SEVEN DAYS SHALL BE SEEDED AND STABILIZED IN ACCORDANCE WITH TEMPORARY SEEDING SPECIFICATIONS. AS LONG-TERM



STOCKPILES ARE STABILIZED FOR FUTURE USE, ADDITIONAL EXCAVATED MATERIAL SHALL BE PLACED WITHIN THE LIMITS OF PHASE 1C AND/OR EXPORTED OFFSITE.

NOTE: STABILIZED CONSTRUCTION ENTRANCES FROM OLD SAW MILL RIVER ROAD AND EXISTING DRIVEWAY SHALL BE UTILIZED FOR CONSTRUCTION VEHICLE ACCESS DURING THIS PHASE.

CONNECTION TO SAW MILL RIVER ROAD (ROUTE 9A) SHALL NOT BE UTILIZED UNTIL SUCH TIME THAT ALL NECESSARY PERMANENT TRAFFIC CONTROL MEASURES HAVE BEEN INSTALLED.

5. INSTALL PROPOSED DRAINAGE STRUCTURES, ASSOCIATED INLET PROTECTION, CONNECTED PIPING, SUBSURFACE UTILITIES AND CURBS WITHIN LIMITS OF PHASE 1B.

6. INSTALL ITEM-4 SUB-BASE FOR PROPOSED ROAD, CONSTRUCT SIDEWALKS, AND ASPHALT PAVEMENT TO BINDER COURSE WITHIN LIMITS OF PHASE 1B.

7. STABILIZE ALL DISTURBED AREAS WITH TOPSOIL, SEED AND MULCH IN ACCORDANCE WITH THE SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.

8. REMOVE ANY ACCUMULATED SEDIMENT FROM STORMWATER BASIN (SWP-1) (TO BE UTILIZED AS TEMPORARY SEDIMENT BASIN DURING CONSTRUCTION), INSTALL PERMANENT BASIN PLANTINGS AND MAKE ANY MODIFICATIONS NECESSARY TO BASIN OUTLET STRUCTURE FOR CONVERSION FROM TEMPORARY SEDIMENT BASIN TO PERMANENT STORMWATER MANAGEMENT PRACTICE.

9. INSTALL REQUIRED TRAFFIC CONTROL MEASURES AT OLD SAW MILL RIVER ROAD AND SAW MILL RIVER ROAD (ROUTE 9A) IN ACCORDANCE WITH NYSDOT AND TOWN REQUIREMENTS.

10. ONCE FINAL STABILIZATION IS ACHIEVED ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES CAN BE REMOVED AND ALL DRAINAGE STRUCTURES SHALL BE INSPECTED AND ALL ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF.

PHASE 1C:

1. INSTALL ALL EROSION AND SEDIMENT CONTROL MEASURES FOR PHASE 1C IN THE LOCATIONS SHOWN ON THE PROPOSED EROSION AND SEDIMENT CONTROL PLANS.

2. CLEAR AND GRUB PHASE 1C WORK AREA. ALL STUMPS GENERATED DURING CLEARING OPERATIONS SHALL BE REMOVED FROM SITE AND LEGALLY DISPOSED OF. NO ONSITE BURIAL OF THIS MATERIAL SHALL BE PERMITTED.

3. STRIP AND STOCKPILE TOPSOIL FROM PROPOSED WORK AREA. TOPSOIL SHALL BE STOCKPILED IN THE STOCKPILE/ STAGING AREA ESTABLISHED DURING PHASE 1A. STOCKPILED MATERIAL TO REMAIN UNUSED FOR (7) SEVEN DAYS SHALL BE SEEDED AND STABILIZED IN ACCORDANCE WITH THE TEMPORARY SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.

4. BEGIN EARTHWORK OPERATIONS FOR REMAINDER WEST ST. WITHIN LIMITS OF PHASE 1C. ADDITIONAL FILL MATERIAL REQUIRED FOR PHASE 1C SHALL BE PROVIDED BY THE TEMPORARY STOCKPILES SITUATED IN PHASE 1A AND 1C. STOCKPILED MATERIAL TO REMAIN UNUSED FOR (7) SEVEN DAYS SHALL BE SEEDED AND STABILIZED IN ACCORDANCE WITH THE TEMPORARY SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.

5. INSTALL PROPOSED DRAINAGE STRUCTURES, ASSOCIATED INLET PROTECTION, CONNECTED PIPING, SUBSURFACE UTILITIES AND CURBS WITHIN LIMITS OF PHASE 1C.



6. INSTALL SUBSURFACE INFILTRATION SYSTEM #1. INFILTRATION SYSTEM SHALL REMAIN OFFLINE UNTIL FINAL STABILIZATION HAS BEEN ACHIEVED.
7. INSTALL ITEM 4 SUB-BASE FOR PROPOSED ROAD, CONSTRUCT SIDEWALKS AND ASPHALT PAVEMENT TO BINDER COURSE FOR REMAINDER OF WEST ST. WITHIN LIMITS OF PHASE 1C.
8. STABILIZE ALL DISTURBED AREAS WITH TOPSOIL, SEED AND MULCH IN ACCORDANCE WITH THE SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.
9. ONCE FINAL STABILIZATION IS ACHIEVED ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES CAN BE REMOVED AND ALL DRAINAGE STRUCTURES SHALL BE INSPECTED AND ALL ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF.

PHASE 1D:

1. INSTALL ALL EROSION AND SEDIMENT CONTROL MEASURES FOR PHASE 1D IN THE LOCATIONS SHOWN ON THE PROPOSED EROSION AND SEDIMENT CONTROL PLANS.
2. CLEAR AND GRUB PHASE 1D WORK AREA. ALL STUMPS GENERATED DURING CLEARING OPERATIONS SHALL BE REMOVED FROM SITE AND LEGALLY DISPOSED OF. NO ONSITE BURIAL OF THIS MATERIAL SHALL BE PERMITTED.
3. STRIP AND STOCKPILE TOPSOIL FROM PROPOSED WORK AREA. TOPSOIL SHALL BE STOCKPILED IN THE LOCATIONS SHOWN ON THE EROSION AND SEDIMENT CONTROL PLANS WITHIN THE LIMITS OF PHASE 1D. STOCKPILED MATERIAL TO REMAIN UNUSED FOR (7) SEVEN DAYS SHALL BE SEEDED AND STABILIZED IN ACCORDANCE WITH THE TEMPORARY SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.
4. IN ORDER TO CONSTRUCT THE PROPOSED WET POND, THE EXISTING WATERCOURSE SHALL BE TEMPORARILY PIPED BEYOND THE EXTENT OF THE FUTURE WET POND AND DISCHARGED INTO THE WATERCOURSE IMMEDIATELY DOWNSTREAM OF THE WET POND LOCATION. THE TEMPORARY PIPE SHALL BE 36" HDPE PIPE AND WILL CONNECT TO THE EXISTING DRAIN MANHOLE LOCATED AT THE HOSPITAL ROAD & WOODS ROAD INTERSECTION. THE TEMPORARY PIPE SHALL DISCHARGE TO A TYPICAL ADS PIPE END SECTION SHALL REMAIN IN PLACE UNTIL THE WET POND AREA HAS PERMANENT VEGETATIVE GROWTH AND ALL CONTRIBUTING DRAINAGE AREAS HAVE BEEN FULLY STABILIZED. THE CONFIGURATION OF THE TEMPORARY PIPE HAS BEEN SHOWN ON THE EROSION CONTROL PLAN EC-1.
5. BEGIN EARTHWORK OPERATIONS FOR HOTEL DRIVE, STORMWATER BASIN (SWP-4) AND CONSTRUCT RETAINING WALLS. EROSION CONTROL BLANKS SHALL BE INSTALLED IMMEDIATELY AFTER GRADING OF CREATED SLOPE IS COMPLETE. ADDITIONAL FILL MATERIAL REQUIRED FOR PHASE 1D SHALL BE PROVIDED BY THE TEMPORARY STOCKPILES SITUATED IN PHASE 1A AND 1C. STOCKPILED MATERIAL WHICH REMAINS UNUSED FOR (7) DAYS SHALL BE SEEDED AND STABILIZED IN ACCORDANCE WITH THE TEMPORARY SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.
6. BEGIN CONSTRUCTION OF HOTEL BUILDING.
7. INSTALL PROPOSED SUBSURFACE WATER AND SEWER MAINS FROM WEST ST. TO END OF HOTEL DRIVE.



8. INSTALL SUBSURFACE INFILTRATION SYSTEM #9. INSTALL PROPOSED DRAINAGE STRUCTURES, ASSOCIATED INLET PROTECTION, CONNECTED PIPING, SUBSURFACE UTILITIES AND CURBS WITHIN LIMITS OF PHASE 1D.
9. INSTALL ITEM 4-SUB BASE FOR HOTEL DRIVE, CONSTRUCT SIDEWALKS AND ASPHALT PAVEMENT TO BINDER COURSE.
10. STABILIZE ALL DISTURBED AREAS WITH TOPSOIL, SEED AND MULCH IN ACCORDANCE WITH THE SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.
11. INSTALL PERMANENT BASIN (SWP-4) PLANTINGS AND CONSTRUCT OUTLET STRUCTURE AND RIP-RAP CHANNEL AS PER DETAILS. ONCE ALL CONTRIBUTING AREAS ARE FULLY STABILIZED, REMOVE TEMPORARY BYPASS PIPE AND CONNECT PERMANENT DRAINAGE PIPING TO THE SEDIMENT FOREBAY OF THE NEWLY CREATED WET POND.
12. ONCE FINAL STABILIZATION IS ACHIEVED ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES CAN BE REMOVED AND ALL DRAINAGE STRUCTURES SHALL BE INSPECTED AND ALL ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF.

PHASE 1E:

1. INSTALL ALL EROSION AND SEDIMENT CONTROL MEASURES AND RUNOFF CONTROL MEASURES FOR PHASE 1E IN THE LOCATIONS SHOWN ON THE PROPOSED EROSION AND SEDIMENT CONTROL PLANS. ALL RUNOFF CONTROL MEASURES MUST BE INSTALLED BEFORE EARTHWORK/GRADING OPERATIONS.
2. CLEAR AND GRUB PHASE 1E WORK AREA. ALL STUMPS GENERATED DURING CLEARING OPERATIONS SHALL BE REMOVED FROM SITE AND LEGALLY DISPOSED OF. NO ONSITE BURIAL OF THIS MATERIAL SHALL BE PERMITTED.
3. STRIP AND STOCKPILE TOPSOIL FROM PROPOSED WORK AREA. TOPSOIL SHALL BE STOCKPILED IN THE LOCATIONS SHOWN ON THE EROSION AND SEDIMENT CONTROL PLANS WITHIN THE LIMITS OF PHASE 1E. STOCKPILED MATERIAL TO REMAIN UNUSED FOR (7) SEVEN DAYS SHALL BE SEEDED AND STABILIZED IN ACCORDANCE WITH THE TEMPORARY SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.
4. BEGIN EARTHWORK OPERATIONS FOR HOTEL PARKING AREA. EROSION CONTROL BLANKS SHALL BE INSTALLED IMMEDIATELY AFTER GRADING OF CREATED SLOPE IS COMPLETE. ALL EXCESS MATERIAL RESULTING FROM PHASE 1E EARTHWORK OPERATIONS SHALL BE STOCKPILED IN STOCKPILE/STAGING AREA ESTABLISHED DURING PHASE 1A. ANY STOCKPILED MATERIAL WHICH REMAINS UNUSED FOR (7) DAYS SHALL BE SEEDED AND STABILIZED IN ACCORDANCE WITH THE TEMPORARY SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.
5. INSTALL PROPOSED DRAINAGE STRUCTURES, ASSOCIATED INLET PROTECTION, CONNECTED PIPING, SUBSURFACE UTILITIES AND CURBS WITHIN LIMITS OF PHASE 1E.
6. INSTALL SUBSURFACE INFILTRATION SYSTEM # 3. INFILTRATION SYSTEM SHALL REMAIN OFFLINE UNTIL FINAL STABILIZATION HAS BEEN ACHIEVED.
7. INSTALL ITEM 4-SUB BASE FOR HOTEL PARKING AREA, CONSTRUCT SIDEWALKS AND ASPHALT PAVEMENT FOR PARKING AREA AND TOP COURSE OF HOTEL DRIVE.
8. STABILIZE ALL DISTURBED AREAS WITH TOPSOIL, SEED AND MULCH IN ACCORDANCE WITH THE SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.



9. ONCE FINAL STABILIZATION IS ACHIEVED ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES CAN BE REMOVED. ALL DRAINAGE STRUCTURES SHALL BE INSPECTED AND ALL ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF AND INFILTRATION SYSTEM CAN BE PLACED ONLINE.

PHASE 1F:

1. INSTALL ALL EROSION AND SEDIMENT CONTROL MEASURES FOR PHASE 1F IN THE LOCATIONS SHOWN ON THE PROPOSED EROSION AND SEDIMENT CONTROL PLANS.
2. CLEAR AND GRUB PHASE 1F WORK AREA. ALL STUMPS GENERATED DURING CLEARING OPERATIONS SHALL BE REMOVED FROM SITE AND LEGALLY DISPOSED OF. NO ONSITE BURIAL OF THIS MATERIAL SHALL BE PERMITTED.
3. STRIP AND STOCKPILE TOPSOIL FROM PROPOSED WORK AREA. TOPSOIL SHALL BE STOCKPILED IN THE LOCATIONS SHOWN ON THE EROSION AND SEDIMENT CONTROL PLANS WITHIN THE LIMITS OF PHASE 1F. STOCKPILED MATERIAL TO REMAIN UNUSED FOR (7) SEVEN DAYS SHALL BE SEEDED AND STABILIZED IN ACCORDANCE WITH THE TEMPORARY SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.
4. BEGIN EARTHWORK OPERATIONS FOR INFILTRATION BASIN (SWP-3). THE PROPOSED INFILTRATION BASIN SHALL NOT BE EXCAVATED TO THEIR RESPECTIVE FULL DEPTHS UNTIL THE OVERLAND AREAS TRIBUTARY TO THE BASINS HAVE BEEN STABILIZED. EROSION CONTROL BLANKS SHALL BE INSTALLED IMMEDIATELY AFTER GRADING OF CREATED SLOPE IS COMPLETE. ALL EXCESS MATERIAL RESULTING FROM PHASE 1E EARTHWORK OPERATIONS SHALL BE STOCKPILED IN STOCKPILE/STAGING AREA ESTABLISHED DURING PHASE 1A. ANY STOCKPILED MATERIAL WHICH REMAINS UNUSED FOR (7) DAYS SHALL BE SEEDED AND STABILIZED IN ACCORDANCE WITH THE TEMPORARY SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.
5. INSTALL PROPOSED DRAINAGE STRUCTURES, ASSOCIATED INLET PROTECTION AND CONNECTED PIPING WITHIN PHASE 1F.
6. STABILIZE ALL DISTURBED AREAS WITH TOPSOIL, SEED AND MULCH IN ACCORDANCE WITH THE SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.
7. ONCE FINAL STABILIZATION HAS BEEN ACHIEVED ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES CAN BE REMOVED. ALL DRAINAGE STRUCTURES SHALL BE INSPECTED AND ALL ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF.

PHASE 1G:

1. INSTALL ALL EROSION AND SEDIMENT CONTROL MEASURES AND RUNOFF CONTROL MEASURES FOR PHASE 1G IN THE LOCATIONS SHOWN ON THE PROPOSED EROSION AND SEDIMENT CONTROL PLANS. ALL RUNOFF CONTROL MEASURES MUST BE INSTALLED BEFORE EARTHWORK/GRADING OPERATIONS. WATER BARS AND CONSTRUCTION DITCHES SHALL REMAIN IN PLACE UNTIL PHASE 1G AND 1H ARE TO BE PAVED.
2. CLEAR AND GRUB PHASE 1G WORK AREA. ALL STUMPS GENERATED DURING CLEARING OPERATIONS SHALL BE REMOVED FROM SITE AND LEGALLY DISPOSED OF. NO ONSITE BURIAL OF THIS MATERIAL SHALL BE PERMITTED.



3. STRIP AND STOCKPILE TOPSOIL FROM PROPOSED WORK AREA. TOPSOIL SHALL BE STOCKPILED IN THE LOCATIONS SHOWN ON THE EROSION AND SEDIMENT CONTROL PLANS WITHIN THE LIMITS OF PHASE 1G. STOCKPILED MATERIAL TO REMAIN UNUSED FOR (7) SEVEN DAYS SHALL BE SEEDED AND STABILIZED IN ACCORDANCE WITH THE TEMPORARY SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.
4. BEGIN EARTHWORK OPERATIONS FOR MAIN ST. AND NORTH PARKING LOT. EROSION CONTROL BLANKS SHALL BE INSTALLED IMMEDIATELY AFTER GRADING OF CREATED SLOPE IS COMPLETE. EXCESS MATERIAL STOCKPILED FROM PREVIOUS PHASES IN STAGING AREA ESTABLISHED DURING PHASE 1A SHALL BE UTILIZED FOR FILL IN NORTH PARKING LOT. ANY STOCKPILED MATERIAL WHICH REMAINS UNUSED FOR (7) SEVEN DAYS SHALL BE SEEDED AND STABILIZED IN ACCORDANCE WITH THE TEMPORARY SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.
5. INSTALL PROPOSED DRAINAGE STRUCTURES, ASSOCIATED INLET PROTECTION, CONNECTED PIPING, SUBSURFACE UTILITIES AND CURBS WITHIN LIMITS OF PHASE 1G.
6. INSTALL SUBSURFACE INFILTRATION SYSTEM # 2. INFILTRATION SYSTEM SHALL REMAIN OFFLINE UNTIL FINAL STABILIZATION HAS BEEN ACHIEVED.
7. INSTALL ITEM 4-SUB BASE FOR MAIN ST. AND NORTH PARKING LOT, CONSTRUCT SIDEWALKS AND INSTALL ASPHALT PAVEMENT TO BINDER COURSE.
8. STABILIZE ALL DISTURBED AREAS WITH TOPSOIL, SEED AND MULCH IN ACCORDANCE WITH THE SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.
9. ONCE FINAL STABILIZATION HAS BEEN ACHIEVED ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES CAN BE REMOVED. ALL DRAINAGE STRUCTURES SHALL BE INSPECTED AND ALL ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF.

PHASE 1H:

1. INSTALL ALL EROSION AND SEDIMENT CONTROL MEASURES FOR PHASE 1H IN THE LOCATIONS SHOWN ON THE PROPOSED EROSION AND SEDIMENT CONTROL PLANS.
2. CLEAR AND GRUB PHASE 1H WORK AREA. ALL STUMPS GENERATED DURING CLEARING OPERATIONS SHALL BE REMOVED FROM SITE AND LEGALLY DISPOSED OF. NO ONSITE BURIAL OF THIS MATERIAL SHALL BE PERMITTED.
3. STRIP AND STOCKPILE TOPSOIL FROM PROPOSED WORK AREA. TOPSOIL SHALL BE STOCKPILED IN THE STOCKPILE/ STAGING AREA ESTABLISHED DURING PHASE 1A. STOCKPILED MATERIAL TO REMAIN UNUSED FOR (7) SEVEN DAYS SHALL BE SEEDED AND STABILIZED IN ACCORDANCE WITH THE TEMPORARY SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.
4. BEGIN EARTHWORK OPERATIONS FOR CENTRAL PARKING LOT. EXCESS MATERIAL RESULTING FROM PHASE 1H EARTHWORK OPERATIONS SHALL BE STOCKPILED WITHIN THE LIMITS OF PHASE 1H AND 1G. ANY STOCKPILED MATERIAL WHICH REMAINS UNUSED FOR (7) DAYS SHALL BE SEEDED AND STABILIZED IN ACCORDANCE WITH THE TEMPORARY SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.
4. AS LONG-TERM STOCKPILES ARE STABILIZED FOR FUTURE USE, ADDITIONAL EXCAVATED MATERIAL SHALL BE PLACED WITHIN THE LIMITS OF PHASE 1J AND 1I.
5. BEGIN CONSTRUCTION OF PHARMACY BUILDING.



6. INSTALL PROPOSED DRAINAGE STRUCTURES, ASSOCIATED INLET PROTECTION, CONNECTED PIPING, SUBSURFACE UTILITIES AND CURBS WITHIN LIMITS OF PHASE 1H.
7. INSTALL ITEM 4-SUB BASE FOR CENTRAL PARKING LOT, CONSTRUCT SIDEWALKS AND INSTALL ASPHALT PAVEMENT TO BINDER COURSE.
8. STABILIZE ALL DISTURBED AREAS WITH TOPSOIL, SEED AND MULCH IN ACCORDANCE WITH THE SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.
9. ONCE FINAL STABILIZATION HAS BEEN ACHIEVED ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES CAN BE REMOVED. ALL DRAINAGE STRUCTURES SHALL BE INSPECTED AND ALL ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF.

PHASE II:

1. INSTALL ALL EROSION AND SEDIMENT CONTROL MEASURES AND RUNOFF CONTROL MEASURES FOR PHASE II IN THE LOCATIONS SHOWN ON THE PROPOSED EROSION AND SEDIMENT CONTROL PLANS. ALL RUNOFF CONTROL MEASURES MUST BE INSTALLED BEFORE EARTHWORK/GRADING OPERATIONS.
2. CLEAR AND GRUB PHASE II WORK AREA. ALL STUMPS GENERATED DURING CLEARING OPERATIONS SHALL BE REMOVED FROM SITE AND LEGALLY DISPOSED OF. NO ONSITE BURIAL OF THIS MATERIAL SHALL BE PERMITTED.
3. STRIP AND STOCKPILE TOPSOIL FROM PROPOSED WORK AREA. TOPSOIL SHALL BE STOCKPILED IN THE STOCKPILE/ STAGING AREA ESTABLISHED DURING PHASE 1A. STOCKPILED MATERIAL TO REMAIN UNUSED FOR (7) SEVEN DAYS SHALL BE SEEDED AND STABILIZED IN ACCORDANCE WITH THE TEMPORARY SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.
4. BEGIN EARTHWORK OPERATIONS FOR INFILTRATION BASIN (SWP-2). THE PROPOSED INFILTRATION BASIN SHALL NOT BE EXCAVATED TO THEIR RESPECTIVE FULL DEPTHS UNTIL THE OVERLAND AREAS TRIBUTARY TO THE BASINS HAVE BEEN STABILIZED. EROSION CONTROL BLANKS SHALL BE INSTALLED IMMEDIATELY AFTER GRADING OF CREATED SLOPE IS COMPLETE. ADDITIONAL FILL MATERIAL REQUIRED FOR PHASE II SHALL BE PROVIDED BY THE TEMPORARY STOCKPILES SITUATED IN PHASE 1H AND 1G. ANY STOCKPILED MATERIAL WHICH REMAINS UNUSED FOR (7) DAYS SHALL BE SEEDED AND STABILIZED IN ACCORDANCE WITH THE TEMPORARY SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.
5. BEGIN EARTHWORK OPERATIONS FOR CROSS ST. AND WEST PARKING LOT.
6. INSTALL PROPOSED DRAINAGE STRUCTURES, ASSOCIATED INLET PROTECTION, CONNECTED PIPING, SUBSURFACE UTILITIES AND CURBS WITHIN LIMITS OF PHASE II.
7. INSTALL ITEM 4-SUB BASE FOR CROSS ST. AND WEST PARKING LOT, CONSTRUCT SIDEWALKS AND INSTALL ASPHALT PAVEMENT TO BINDER COURSE.
8. STABILIZE ALL DISTURBED AREAS WITH TOPSOIL, SEED AND MULCH IN ACCORDANCE WITH THE SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.
9. ONCE FINAL STABILIZATION HAS BEEN ACHIEVED ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES CAN BE REMOVED. ALL DRAINAGE STRUCTURES SHALL BE INSPECTED AND ALL ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF.

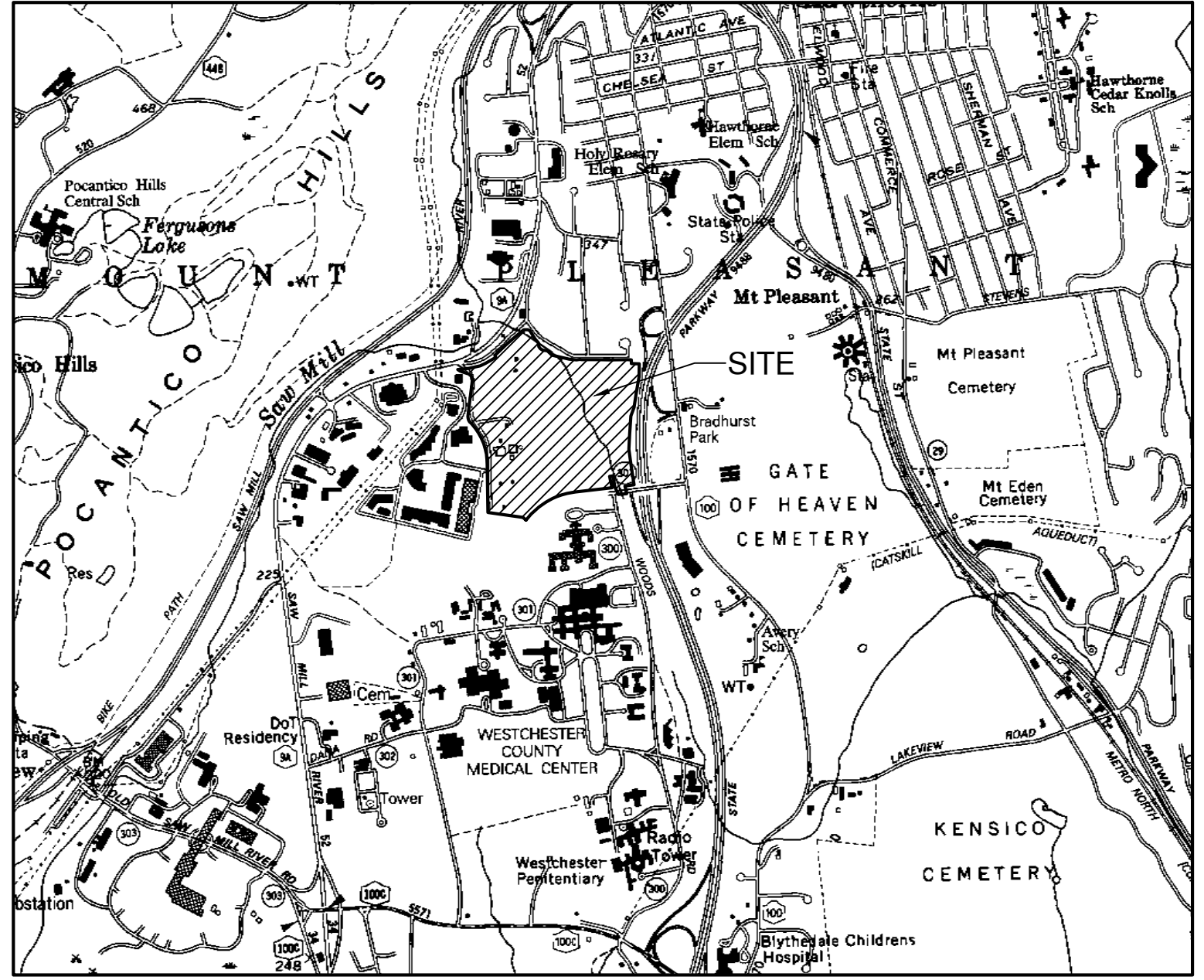
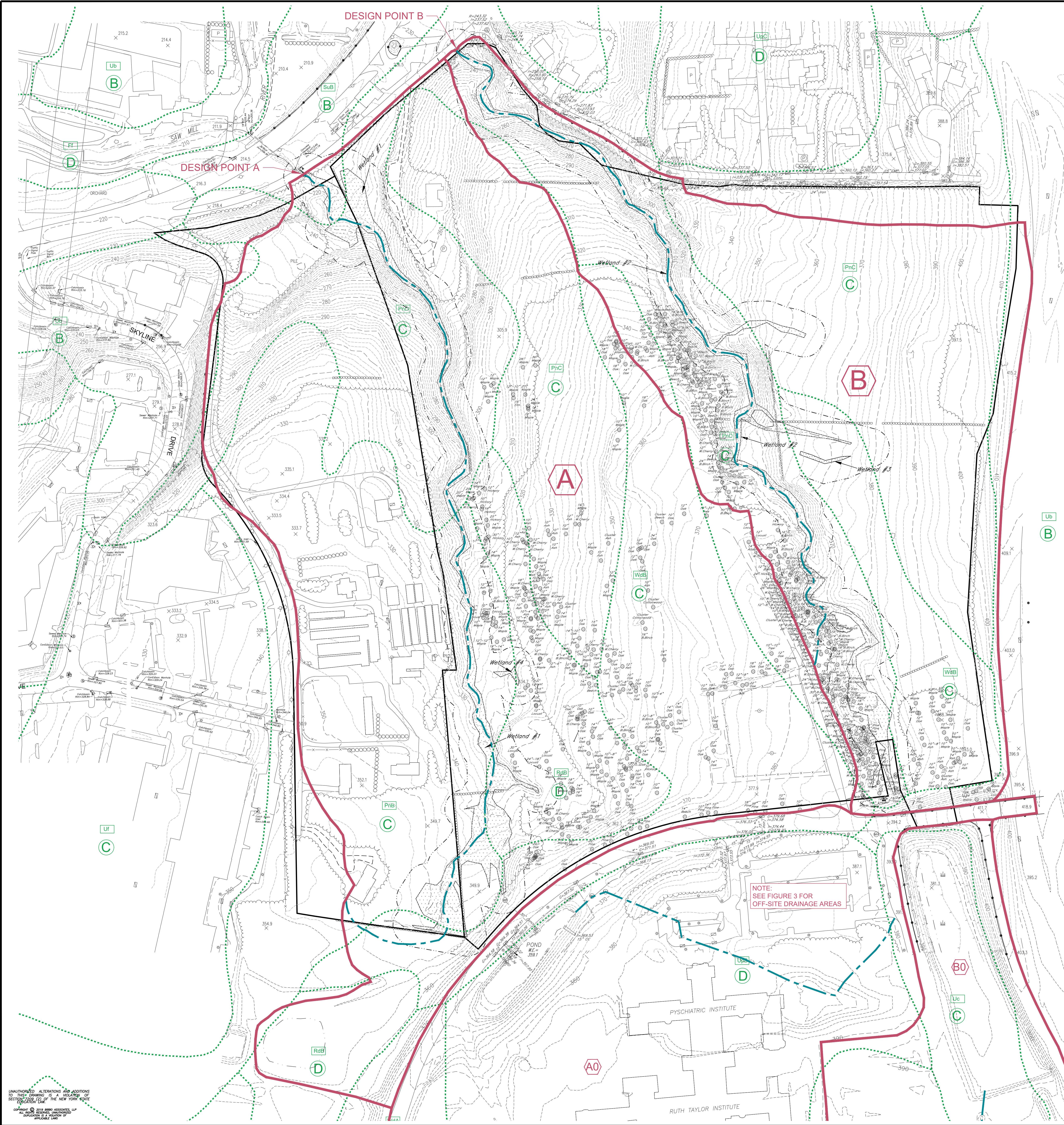


PHASE 1J:

1. INSTALL ALL EROSION AND SEDIMENT CONTROL MEASURES AND RUNOFF CONTROL MEASURES FOR PHASE 1J IN THE LOCATIONS SHOWN ON THE PROPOSED EROSION AND SEDIMENT CONTROL PLANS. ALL RUNOFF CONTROL MEASURES MUST BE INSTALLED BEFORE EARTHWORK/GRADING OPERATIONS.
2. CLEAR AND GRUB PHASE 1J WORK AREA. ALL STUMPS GENERATED DURING CLEARING OPERATIONS SHALL BE REMOVED FROM SITE AND LEGALLY DISPOSED OF. NO ONSITE BURIAL OF THIS MATERIAL SHALL BE PERMITTED.
3. STRIP AND STOCKPILE TOPSOIL FROM PROPOSED WORK AREA. TOPSOIL SHALL BE STOCKPILED IN THE STOCKPILE/ STAGING AREA ESTABLISHED DURING PHASE 1A. ADDITIONAL FILL MATERIAL REQUIRED FOR PHASE 1I SHALL BE PROVIDED BY THE TEMPORARY STOCKPILES SITUATED IN PHASE 1I AND 1J. STOCKPILED MATERIAL TO REMAIN UNUSED FOR (7) SEVEN DAYS SHALL BE SEEDED AND STABILIZED IN ACCORDANCE WITH THE TEMPORARY SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.
4. BEGIN CONSTRUCTION OF BIOTECH AND GROCERY BUILDINGS.
5. INSTALL PROPOSED DRAINAGE STRUCTURES, ASSOCIATED INLET PROTECTION, CONNECTED PIPING, SUBSURFACE UTILITIES AND CURBS WITHIN LIMITS OF PHASE 1J.
6. INSTALL ITEM 4-SUB BASE FOR PARKING AREAS, CONSTRUCT SIDEWALKS AND INSTALL ASPHALT PAVEMENT TO BINDER COURSE.
7. STABILIZE ALL DISTURBED AREAS WITH TOPSOIL, SEED AND MULCH IN ACCORDANCE WITH THE SEEDING SPECIFICATIONS PROVIDED ON SHEET D-4.
8. ONCE FINAL STABILIZATION HAS BEEN ACHIEVED ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES CAN BE REMOVED. ALL DRAINAGE STRUCTURES SHALL BE INSPECTED AND ALL ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF.

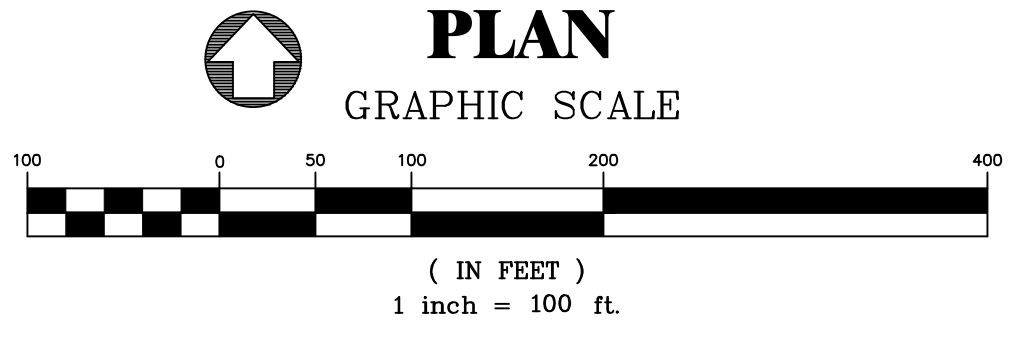


Figure 1:
Pre-Development Watershed Boundary Map



LOCATION MAP
N.T.S.

- LEGEND**
- EXISTING PROPERTY LINE
 - WETLAND AREA
 - WETLAND SETBACK LINE
 - EXISTING STONE WALL
 - EXISTING 2' CONTOUR
 - EXISTING 10' CONTOUR
 - SOIL BOUNDARY LINE
 - USGS SOIL CLASSIFICATION
 - HYDROLOGIC SOIL GROUP
 - WATERSHED BOUNDARY LINE
 - WATERSHED IDENTIFICATION
 - TIME OF CONCENTRATION (T_C PATH)



NOTE:
SEE FIGURE 3 FOR
OFF-SITE DRAINAGE AREAS

UNAUTHORIZED ALTERATIONS AND ADDITIONS
TO THIS DRAWING OR A PORTION OF
SECTION 200.1 (1) OF THE NEW YORK STATE
ELECTION LAW
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APPLICABLE LAW

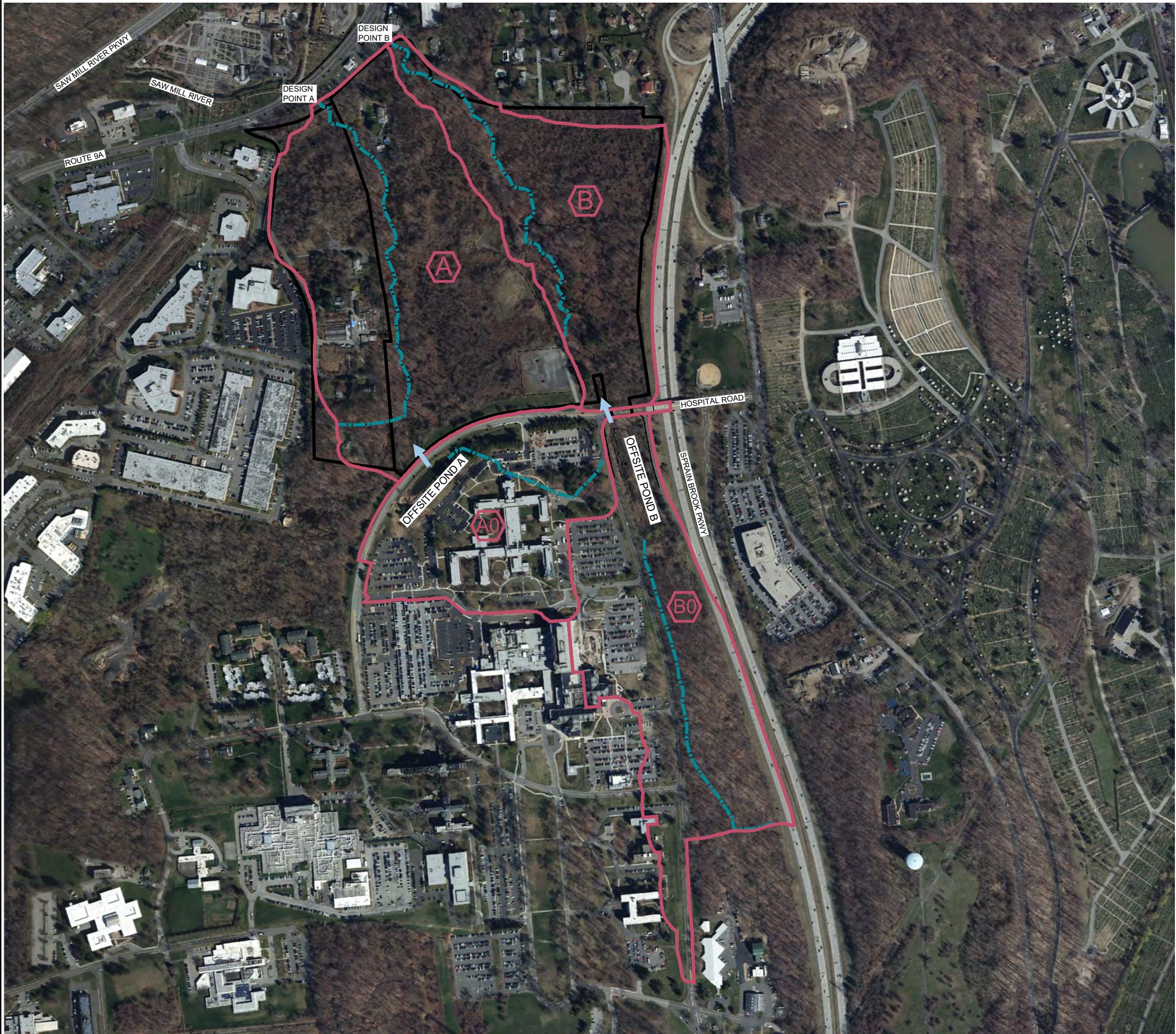
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	3-17-20	DEIS COMPLETENESS REVIEW	RH/NG				
DATE:	DESCRIPTION	BY/CK	DATE:	DESCRIPTION	BY/CK		
PRE-DEVELOPMENT WATERSHED BOUNDARY MAP							
THE NORTH 60							
HOSPITAL ROAD & ROUTE 9A TOWN OF MOUNT PLEASANT, WESTCHESTER COUNTY							
BIBBO ASSOCIATES, LLP 293 ROUTE 100 SUITE 203 SOMERS, NEW YORK 10589 TEL. 914.277.5805							
DATE:	JUNE 14, 2019	SCALE:	1" = 100'	FILE:	12-D	DSGN /	NG/TA
CHK:	NG/TA	DRN. BY:	NG	SHT NO.	FIGURE 1	DWG	NO.
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Figure 2:
Post-Development Watershed Boundary Map

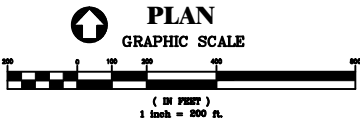


Figure 3:
Offsite Watershed Boundary Map



LEGEND

-  WATERSHED BOUNDARY LINE
-  WATERSHED IDENTIFICATION
-  TIME OF CONCENTRATION (T_c) PATH
-  LOCATION OF OFFSITE POND OUTLET ONTO PROJECT SITE



REPRODUCTION, ALTERATION AND EXTENSION
OF THIS MAP WITHOUT THE WRITTEN
CONSENT OF BIBBO ASSOCIATES, LLP
IS PROHIBITED.

NOTE: OFFSITE CONTRIBUTING WATERSHED AREAS HAVE BEEN DELINEATED BASED ON
INFORMATION PROVIDED FROM WESTCHESTER COUNTY DEPARTMENT OF PUBLIC WORKS,
TOPOGRAPHY SUPPLIED BY WESTCHESTER COUNTY GIS MAPPING, AND FIELD OBSERVATIONS.

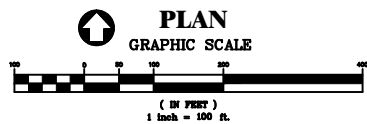
DESIGNER	DATE	DESCRIPTION	BY/CHK	DATE	DESCRIPTION	BY/CHK
OFFSITE WATERSHED BOUNDARY MAP						
WESTCHESTER MEDICAL VILLAGE			DATE:	JUNE 3, 2019	SCALE:	1" = 200'
STREET ADDRESS			FILE:	12-D	DSGN /	NG/TA
TOWN OF MOUNT PLEASANT, WESTCHESTER COUNTY			CHK:		DRN. BY:	NG
			SHT NO.	FIGURE 3	DWG NO.	OW
 BIBBO ASSOCIATES, LLP 293 ROUTE 100 SUITE 203 SOMERS, NEW YORK 10589 TEL: 914 277 5855						



Figure 4:
Soil Testing Map



- LEGEND**
- EXISTING PROPERTY LINE
 - WETLAND AREA
 - WETLAND SETBACK LINE
 - EXISTING STONE WALL
 - EXISTING 2' CONTOUR
 - EXISTING 10' CONTOUR
 - DEEP TEST PIT LOCATION
 - SOIL BOUNDARY LINE
 - USGS SOIL CLASSIFICATION
 - HYDROLOGIC SOIL GROUP



DATE:	DESCRIPTION:	BY/CHK:	DATE:	DESCRIPTION:	BY/CHK:
SOIL TESTING MAP					
THE NORTH 60					
TOWN OF MOUNT PLEASANT, WESTCHESTER COUNTY					
BIBBO ASSOCIATES, LLP			DATE:	JAN. 23, 2018	
293 ROUTE 100 SUITE 203			SCALE:	1" = 100'	
SOMERS, NEW YORK 10589			FILE:	12-D	
TEL. 914 277 5855			DSGN /	NGTA	
			CHK:		
			DRN. BY:	NG	
			SHT. NO.		
			DWG. NO.		ST-1