Preliminary Stormwater Pollution Prevention Plan:
for
23-28 Creek Drive

Prepared for:
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Beacon, NY 12508

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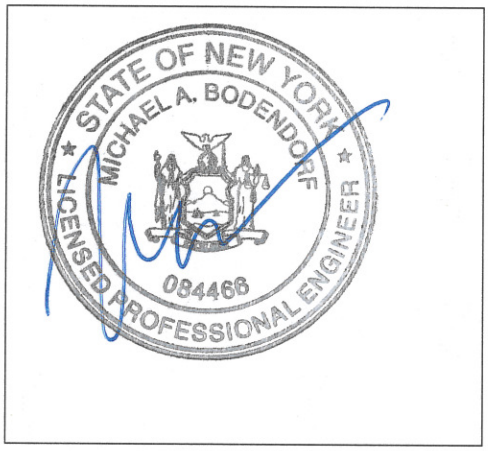

HUDSON
LAND DESIGN

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1.0 INTRODUCTION

1.1 Overview

This preliminary Stormwater Pollution Prevention Plan (SWPPP) has been developed in accordance with New York State Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity Permit No. GP-0-15-002, which authorizes stormwater discharges to surface waters of the State from the following construction activities identified within 40 CFR Parts 122.26(b)(14)(x), 122.26(b)(15)(i) and 122.26(b)(15)(ii), provided all of the eligibility provisions of this permit are met:

1. Construction activities involving soil disturbances of one (1) or more acres; including disturbances of less than one acre that are part of a larger common plan of development or sale that will ultimately disturb one or more acres of land; excluding routine maintenance activity that is performed to maintain the original line and grade, hydraulic capacity or original purpose of a facility;
2. Construction activities involving soil disturbances of less than one (1) acre where the Department has determined that a SPDES permit is required for stormwater discharges based on the potential for contribution to a violation of a water quality standard or for significant contribution of pollutants to surface waters of the State.
3. Construction activities located in the New York City, East of Hudson watershed, that involve soil disturbances between five thousand (5,000) square feet and one (1) acre of land.

This project qualifies for SPDES coverage under provision 1 as stated above.

The objectives of this SWPPP are as follows:

- To develop a sediment and erosion control plan in accordance with the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, which implements best management practices to stabilize disturbed areas, protect off site areas and sensitive areas and minimize the transport of sediment.
- To demonstrate that the resulting stormwater runoff from the development exiting the site will not adversely impact offsite properties, stormwater conveyance systems or receiving water bodies, and that temporary and permanent stormwater systems and facilities are designed in accordance with the latest revision to the New York State Stormwater Management Design Manual (SDM), January 2015.
- To demonstrate that runoff reduction measures have been implemented into the design of the site.
- To demonstrate that the required runoff from the development is captured and treated through approved water quality measures.

Construction activities are not permitted to begin until such time that authorization is obtained under the General Permit. This project is located within a Municipal Separate Storm Sewer System (MS4) area. Authorization to commence construction activities may commence five (5) days

following receipt of the Notice of Intent (NOI) accompanied by the MS4 SWPPP Acceptance Form.

A copy of the General Permit, SWPPP, NOI, NOI acknowledgment letter, MS4 SWPPP acceptance form, inspection reports and accompanying plans shall be maintained on-site from the date of initiation of construction activities until final stabilization of all disturbed areas has been achieved and the Notice of Termination (NOT) has been submitted.

1.2 Land Disturbance

Per the General Permit, no more than five (5) acres of land disturbance may occur at any one time without written approval from the NYSDEC. At a minimum, the owner or operator must comply with the following requirements in order to be authorized to disturb greater than five (5) acres of soil at any one time:

a. The owner or operator shall have a qualified inspector conduct at least two (2) site inspections every seven (7) calendar days, for as long as greater than five (5) acres of soil remain disturbed. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

b. In areas where soil disturbance activity has been temporarily or permanently ceased, temporary and/or permanent soil stabilization measures shall be installed and/or implemented within seven (7) days from the date the soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control.

c. The owner or operator shall prepare a phasing plan that defines maximum disturbed area per phase and shows required cuts and fills.

d. The owner or operator shall install any additional site specific practices needed to protect water quality.

Disturbance of more than five (5) acres at any one time is not anticipated for this project. Phasing of the construction activities is planned to limit the amount of disturbance at any one time.

2.0 PROJECT DESCRIPTION

2.1 Project Location

The project site is located along the south side of Creek Drive, in the City of Beacon, Dutchess County, New York. The Fishkill Creek marks the southeast border of the site. This project area is approximately 2.81 acres and consists of a former Department of Public Works facility with existing brick buildings, maintenance sheds and a large asphalt area.

2.2 Project Scope and Description

The project consists of the redevelopment of the existing Department of Public Works site on Creek Drive, Tax ID: 6054-37-037625. The existing buildings and large asphalt area will be demolished and replaced with a proposed 4-story building comprised of 9 apartments, and a 13,771 sqft shared workspace. Parking will be provided by the construction of underground parking beneath the main building and surface parking surrounding the proposed building.

A greenway trail will be constructed at the top of the bank along Fishkill Creek. The trail will continue from the newly constructed trail on 7-15 Creek Drive and continue to the south through the site where it will link with the pocket park located at Wollcott Avenue. A public park will be constructed in the south portion of the site, and a private park will be constructed in the mid-portion of the site.

A lot line realignment is proposed for the subject parcel, 0.44 acres of area will be added to the subject parcel from Parcel Tax ID: 6054-37-066670 to accommodate the northern parking area and entrance to underground parking. The subject parcel and Parcel 066670 will utilize the same ingress and egress off through the internal drive on parcel 066670.

The underlying soils and gravel areas have become compacted from continuous movement of vehicles and machinery throughout the site. The re-development of the site will entail soil restoration where impervious area is removed, specifically to the east of the proposed building. Restoration of the soil will result in a lower runoff curve number along with an overall reduction in impervious cover. The entire site will be landscaped appropriately for the use. In addition, the existing vegetated stream riparian area will remain undisturbed.

The proposed project at full build-out will disturb approximately 2.17 acres. The total drainage study area is 3.69 ac.

2.3 Surface Water Bodies

2.3.1 Wetlands

Federal wetlands are present along the Fishkill Creek according to the National Wetlands Inventory (NWI) mapper. The wetland is classified as R2UBH, typical of a lower perennial river. These areas appear to be restricted to the stream itself, which seems likely since the banks of the stream are generally steep. Typically, the United States Army Corps of Engineers (USACE) regulates Federal wetlands. No wetland permitting is sought, however, since there is no proposed disturbance to the wetlands.

The NYSDEC Environmental Resource Mapper does not indicate the presence of NYSDEC-regulated wetlands within or near the project location.

2.3.2 Streams

The Fishkill Creek runs in a north to south direction along the east property line, and is a fourth order stream. According to the NYSDEC Environmental Resource Mapper, the Stream Classification is C. Under New York State's Environmental Conservation Law (ECL), Title 5 of Article 15, certain waters of the State are protected on the basis of their classification. Streams and small water bodies located in the course of a stream that are designated as C(T) or higher (i.e., C (TS), B, or A) are collectively referred to as "protected streams". A Protection of Waters Permit is required to physically disturb the bed or banks of any stream with a classification standard of C(T) or higher. Therefore, the Fishkill Creek is not a protected stream as classified by the NYSDEC. However, the USACE regulates the Fishkill Creek to the mean water level. A permit will be required from the USACE for new stormwater outfalls and repair of existing outfalls adjacent to the creek.

2.3.3 Floodplains

Based upon a review of the National Flood Insurance Program Flood Insurance Rate Map panel 360227 0464 E and 36027 0577 E for the City of Beacon, New York, a small portion of the site is identified as area within the 100-year flood. An in-depth Flood Insurance Study (FIS) was prepared by the Federal Emergency Management Agency in 2012. The topographic survey datum is tied into the same datum used for the FIS. The determined floodplain line is shown on the plans. The proposed construction activities do not discharge fill into the floodplain or floodway of the stream; however, the existing building and proposed building on the south side are located in the floodplain. That said, there are no anticipated measurable impacts to the 100-year floodplain within this area.

3.0 NOTICE OF INTENT

Prior to commencement of construction activities, the Owner/Operator shall submit a Notice of Intent (NOI) to the NYSDEC for authorization. The NYSDEC authorization schedule is as follows:

For construction activities that are not subject to the requirements of a regulated, traditional land use control MS4:

- Five (5) business days from the date the NYSDEC receives a complete NOI for construction activities with a SWPPP that has been prepared in conformance with the technical standards, or
- Sixty (60) business days from the date the NYSDEC receives a complete NOI for construction activities with a SWPPP that has not been prepared in conformance with the technical standards.

For construction activities that are subject to the requirements of a regulated, traditional land use control MS4:

- Five (5) business days from the date the NYSDEC receives a complete NOI and signed "MS4 SWPPP Acceptance" form.

The project area is under the control of a regulated MS4, therefore the NOI shall be submitted directly to the NYSDEC along with a signed MS4 SWPPP Acceptance Form. A completed NOI is included in Appendix A of this SWPPP.

4.0 SOILS

The hydrologic soil characteristics of the watershed areas were obtained from Soil Survey Mapping of Dutchess County, New York, and available Geographical Information Systems (GIS) and are as follows:

Symbol	Description	Hydrologic Soil Group
Ud	Udorthents, smoothed	A

SOIL PROPERTIES

Symbol	Water Table	Restrictive Layer	Bedrock	Erosion Hazard (k)
Ud	54”	78”	78”	0.20 - Slight

Supporting soils information is provided in Appendix B of this SWPPP.

5.0 RAINFALL

5.1 Overview

The rainfall data utilized in the analysis of the watershed was obtained from Technical Release 55 (Urban Hydrology for Small Watersheds). Supporting information will be provided in future revisions to this SWPPP. The storm events are as follows:

Storm Event	24-Hour Rainfall (in)
1 - year	2.61
10 - year	4.71
100 - year	8.37

Rainfall data is provided in Appendix C of this SWPPP.

5.2 Rainfall Event Sizing Criteria

The stream channel protection volume (Cpv) criteria, intended to protect stream banks from erosion, will be demonstrated by providing 24 hour extended detention of the Type III 1-year, 24-hour storm event, or by infiltrating the entire volume. When providing extended detention, the channel protection volume criterion is not required where the resulting diameter of the stormwater management basin orifice is less than three (3) inches with a trash rack. Cpv can be met by use of green infrastructure treatment practices described in greater detail in section 6 of this report.

The overbank flood control (Qp) criteria, intended to prevent an increase in frequency and magnitude of out of bank flooding generated by new development, will be demonstrated by attenuating the Type III 10-year, 24-hour peak discharge rate to pre-development conditions. The overbank flood criteria can be waived if the project site discharges to a tidal water or fifth order stream.

The extreme flood control (Qf) criteria, intended to prevent the increased risk of flood damage from large storm events, maintain the boundaries of pre-development conditions, and protect the physical integrity of stormwater management practices, will be demonstrated by attenuating the Type III 100-year, 24 hour peak discharge rate to pre-development conditions. The extreme flood control criteria can be waived if the project site discharges to a tidal water or fifth order stream. The use of on-site green infrastructure stormwater treatment practices can mitigate post-developed Qp and Qf rates and volumes.

The pre and post-development runoff rates will be compared utilizing the Type III 1-year (channel protection), 10-year (overbank flood control), and 100-year (extreme flood control) year, 24-hour

storm events. Although not required, the pre versus post-development analysis will include the analysis of the Qp and Qf storm events.

The proposed drainage conveyance system will be designed utilizing the Type III, 25-year storm event.

6.0 STORMWATER ANALYSIS AND MANAGEMENT

6.1 Methodology

6.1.1 Hydrologic Analysis

The HydroCAD stormwater modeling system computer program by Applied Microcomputer Systems was used to analyze, design and document the complete drainage system. The program uses standard hydrograph generation and routing techniques based on the USDA-NRCS Technical Releases TR-20 and TR-55 to develop stormwater runoff rates and volumes.

The program determines the rate and volume of runoff based on inputs of the watershed area, and characteristics of the land including vegetative coverage, slope, soil type, and impervious area.

6.1.2 Stormwater Design Points

Design Points represent the location where the majority of runoff from an area exits the site. The same design points are identified in post-development conditions so that a comparison can be made between the pre-development and post-development conditions. One design point for the project was selected, as follows:

Stormwater Discharge Points	
SDP	**Description**
1	Fishkill Creek

6.2 Pre-Development Watershed Conditions

Subcatchment 1 is comprised of 2.07 acres of onsite area plus an additional 1.62 acres of offsite are that flows onto the site. Land cover consists primarily of impervious areas, meadow and wooded areas, a portion of Creek Drive and the unused train tracks. The subcatchment area contains predominantly soils in hydrologic soil group A. Runoff from the subcatchment travels via sheet flow and shallow concentrated flow to the SDP.

Detailed stormwater calculations and routing for the pre-development condition have been included in Appendix D.

The following table summarizes the pre-development watershed conditions:

Pre-Development Watershed Conditions					
Subcatchment	**Area (ac)**	**Cover**	**Average Curve #**	**Hydrologic Soil Group(s)**	**Time of Concentration**
1	3.69	Impervious, meadow, and wooded areas	51	A	6.0 minutes

6.3 Post-Development Watershed Conditions

The proposed development will result in a disturbance of approximately 2.60 total acres. The site is broken into three subcatchments, one of which does not require stormwater infrastructure for treatment, while the other two will be treated by surface infiltration basin or an underground infiltration chamber system. The following is a description of the three subcatchments:

Subcatchment 10 is comprised of approximately 0.613 acres of offsite area and 1.146 acres of onsite area totaling 1.759 acres located in the southern portion of the site. Land cover consists mainly of wooded and grass areas and some gravel area for the Greenway Trail. The entire subcatchment area contains soils in hydrologic soil group A. Runoff from the subcatchment travels overland via sheet flow, shallow concentrated flow and to SDP1.

Subcatchment 11 is comprised of approximately 0.343 acres of offsite area and 0.605 acres of onsite area totaling 0.949 acres located in the middle portion of the site. Land cover consists mainly of impervious paved surfaces, wooded offsite area and some grass areas. The entire subcatchment area contains soils in hydrologic soil group A. Runoff from the subcatchment travels overland via sheet flow, shallow concentrated flow and pipe flow to the proposed infiltration basin. Overflow from the nfiltration basin will travel via shallow concentrated flow to SDP1.

Subcatchment 12 is comprised of approximately 0.133 acres of offsite area and 0.589 acres of onsite area totaling 0.723 acres located in the northern portion of the site. Land cover consists mainly of impervious paved surfaces, wooded offsite area and some grass areas. The entire subcatchment area contains soils in hydrologic soil group A. Runoff from the subcatchment travels overland via sheet flow, shallow concentrated flow and pipe flow to the proposed underground infiltration basin. Overflow from the underground infiltration basin will travel via shallow concentrated flow to SDP1

Detailed stormwater calculations and routing for the post-development condition have been included in Appendix E.

The following table summarizes the post-development watershed conditions:

Post-Development Watershed Conditions					
Subcatchment	**Area (ac)**	**Cover**	**Average Curve #**	**Hydrologic Soil Group(s)**	**Time of Concentration**
10	1.759	Woods, grass, gravel, and a small amount of impervious areas	41	A	6.0 minutes
11	1.206	Impervious, woods, grass and small amount of gravel area	63	A	6.0 minutes
12	0.723	Impervious, woods, and grass	79	A	6.0 minutes

6.4 Hydrologic Review

The stormwater runoff rates at each discharge point under pre-development and post-development conditions are summarized below.

SDP	1 - Year		10 - Year		100 - Year	
	Pre	Post	Pre	Post	Pre	Post
1	0.02	0.00	1.57	0.80	10.35	11.97

As shown above, post-development peak flow rates for all storms area greater than the pre-development peak flow rates with the exception of the 100-year storm which is slightly higher than pre-conditions.

A downstream analysis has been conducted by using the 10% rule in accordance with §4.10 of the Stormwater Design Manual, where the stream watershed is analyzed at a point downstream from the site where the site represents 10% of the entire watershed area. The site watershed area of 3.688 acres is 0.006 square miles which is less than 0.1% of the entire creek watershed of 192 square miles. The peak flows associated with the creek at the site are 2,270 cfs, 6,560 cfs and 12,500 cfs for the 1-year, 10-year and 100-year storm respectively.

It is worth noting that the peak flows associated with the site will occur at a much earlier time than the peak flow associated with the creek, so the peak flow from the site will "beat the peak" of the stream; thus, creating no impact to the creek.

Supporting hydrologic analyses for pre-development and post-development conditions are included in Appendices D and E, respectively. A "Stream Stats" analysis report of Fishkill Creek is included within Appendix E.

6.5 Quantity and Quality Sizing Criteria for Re-development Projects

For re-development projects, sizing criteria shall be computed in accordance with §9.3.2 of the NYSDEC SWDM. The project at full build out will result in no increase in impervious or changes to hydrology that increases the discharge rate from the site when compared to pre-development conditions. The re-development of the project will reduce the overall site runoff curve number by restoring the soils beneath the compacted gravel areas that are proposed to be landscaped to their natural state. Based upon the reduction in impervious surface, the re-development project meets the criteria for A. I (Qp and Qf) and A. II (Cpv) of §9.3.2, where Qp, Qf and Cpv are waived. The soil restoration techniques are described in further detail within section 6.10 of this report.

Stormwater management areas (infiltration) shall be sized to provide runoff reduction for 25% minimum of the site's impervious area; however, have been sized to provide 100% runoff reduction of the site's impervious area.

6.6 Stormwater Management System

The stormwater management system will consist of a series of catch basins and associated piping that will collect site runoff from impervious and pervious surfaces and convey it to infiltration practices prior to discharge to the Fishkill Creek. The proposed catch basins will be equipped with deep sumps to provide for capture of sediment from parking areas.

6.7 Green Infrastructure for Stormwater Management

The SDM encourages the use of green infrastructure (GI) practices for stormwater management. Green infrastructure approach for stormwater management reduces a site's impact on an aquatic ecosystem through the use of site planning techniques, runoff reduction techniques, and certain standard stormwater management practices. The objective is to replicate the pre-development hydrology by maintaining pre-construction infiltration, peak runoff flow, discharge volume, and minimizing concentrated runoff by use of runoff control techniques. When implemented, green infrastructure can reduce volume, peak flow, and flow duration, promote infiltration and evapotranspiration, improve groundwater recharge, reduce downstream flooding, and protect downstream water and wetlands.

6.7.1 Green Infrastructure Practices

Green infrastructure consists of implementing several techniques during the site planning process which are:

- Preservation of Natural Resources – Preservation of undisturbed areas; preservation of buffers; reduction of clearing and grading; locating development in less sensitive areas; open space (park) design; soil restoration.
- Reduction of Impervious Cover – Roadway reduction; sidewalk reduction; driveway reduction; building footprint reduction; parking reduction.
- Runoff Reduction Techniques – Conservation of natural areas; sheet flow to riparian buffers or filter strips; vegetated open swale; tree planting/tree box; disconnection of roof runoff; stream daylighting for redevelopment projects; bioretention areas; rain gardens; green roofs; stormwater planters; rain tank/cistern; pervious pavement.

During the planning process, the above techniques are implemented to the greatest extent possible to reduce runoff developed by the site. The following summarizes the GI techniques implemented on the site:

- Most of the site has been disturbed from previous development. Maintaining the stream riparian zone will help prevent stream bank erosion.
- Impervious cover has been reduced wherever possible and when the project is complete the total amount of impervious area will be just 0.02 acres less than pre-development conditions.

6.7.2 Five Step Process for Stormwater Site Planning and Selection Design

Stormwater management using GI is summarized in the five step process described below.

Step 1: Site Planning

The site design will incorporate the preservation of natural resources including protection of natural areas, avoidance of sensitive areas, minimizing grading and soil disturbance, minimizing impervious areas on roads, driveways and parking lots. The site layout will avoid wetlands, waterways, buffers, areas of highly erodible soils and critical areas. The site design will also maintain natural drainage design points.

Step 2: Determine Water Quality Volume (WQv)
The WQv will be calculated for the site prior to implementation of GI practices. The calculated WQv must be reduced by implementation of GI & SMP's.

Step 3: Runoff Reduction by Applying Green Infrastructure Techniques
Green infrastructure practices will be implemented wherever possible to reduce runoff from the site. GI for this site will consist of reduction of roadway widths, providing parking beneath buildings and the use of infiltration practices.

Step 4: Apply Standard SMP's to Address Remaining Wqv
Standard SMP's such as ponds, filtering practices or stormwater wetlands to meet additional water quality volume requirements. It is not anticipated that additional standard SMP's will be required for this project based upon the reduction of impervious surfaces.

Step 5: Apply Volume and Peak Rate Control Practices (if needed)
Cpv, Qp and Qf must also be met, either by standard practices, or other accepted techniques such as meeting criteria set forth in the NYS SWDM §9.3.2, where Cpv, Qp and Qf are not required when impervious surfaces are reduced by more than 25% resulting in lower discharge rates to the SDP. Since post-developed impervious surface areas are slightly less than pre-developed conditions but not reduced by 25%, Cpv, Qp, and Qf shall be met by the implementation of SMP's.

6.8 Qualitative Practices

Qualitative practices are required since the re-development project meets the criteria set forth in the NYS SWDM §9.3.3. Two infiltration areas are proposed to manage and treat the runoff generated from the sites impervious areas.

Small sized, frequently occurring storms account for the majority of runoff events that generate stormwater runoff. As a result, the runoff from these storms is recognized as a major contributor of pollutants. Therefore, treating these frequently occurring smaller rainfall events and a portion of the larger events offers an opportunity to minimize the water quality impacts associated with developed areas.

The water quality volume, denoted as WQ_v , specifies a treatment volume required to be captured and treated by intercepting 90% of the average annual stormwater runoff volume. This criterion strives to achieve an 80% Total Suspended Solids (TSS) removal and 40% Total Phosphorous (TP) removal on an annual basis.

In numerical terms, it is calculated using the formula below which was obtained from Section 4.2 of the New York State Stormwater Management Design Manual, January 2015:

$$WQ_v = (P \times R_v \times A) / 12$$

Where:

WQ_v = Water Quality Volume (acre-feet)

P = 90% Rainfall Event Number

$R_v = 0.05+0.009 \times I$, where I is percent impervious (minimum $R_v = 0.2$)

A = Site area in acres (contributing area)

The following table has been developed summarizing the pre-treatment volume, water quality volume and treatment practices for the main project area.

Watershed	Total Required WQv (cf)	Required Pre-Treatment Volume (cf)	Pre-Treatment Practice	Treatment Practice	WQv Provided (cf)
11	2,713	2,713	Hydrodynamic	Infiltration	2,875
12	2,489	2,489	Hydrodynamic	Infiltration	2,526

*A large portion of Area 10 will remain undisturbed. All asphalt will be removed and the ground restored to landscaped areas; therefore, this area is not subject to water quality requirements. The watersheds will achieve water quality volume goals by sheet flow through landscaped and wooded areas.

All water quality volumes are calculated using the total contributing area. Offsite contributing areas that do not require treatment are diverted as much as possible. Infiltration rates are expected to be greater than 5 inches per hour, thus requiring 100% pre-treatment at both infiltration areas. The above volumes are total for the entire watershed. The infiltration practices have been sized to capture and infiltrate 100% of the WQv, even though per NYS SWDM §9.3.2, only treatment of 25% of the site's impervious area is required.

A major concern with runoff into waterbodies is phosphorus loading. Phosphorus, like nitrogen, is an essential nutrient for aquatic life in waterbodies. However, increased amounts of phosphorus entering surface waters promotes excessive algae growth, which decreases water clarity, causes variations in dissolved oxygen, disagreeable odors, habitat loss and fish kills. The protection of waterbodies from the harmful effects of phosphorus can be accomplished from reducing the runoff volume entering surface waters. Reduction of runoff volume reduces the concentrations of pollutants entering the surface water and thus decreases harmful effects. The removal of enhanced phosphorus can be accomplished using stormwater management practices. Whether in particulate or dissolved speciation, phosphorus can be removed using unit operations. Particulate phosphorus in particular can be removed using infiltration basins and through sedimentation of runoff before entering surface water. Primarily, reducing the WQv entering a surface water body will lower phosphorus pollutant loading. All of the onsite bioretention areas and the infiltration basin have been sized to infiltrate the entire WQv and 1-year storm.

6.8.2 Pre-Treatment Practices

The following pre-treatment practices have been incorporated into the design of this project. Preventative and corrective maintenance measures to provide long-term effectiveness of stormwater attenuation practices if properly implemented will be included in Appendix F.

6.8.2.1 Overland Flow

A significant portion of the runoff will flow overland to receiving water bodies. Much of the site's existing natural vegetation is proposed to remain, and the post developed land cover will be restored to meadow and landscaped areas. The meadow and landscaped areas will capture more

sediment and floatables than the pre-conditions impervious surfaces, construction material and vehicle storage.

6.8.2.2 Hydrodynamic Devices

Hydrodynamic devices are designed to intercept and store pollutants such as sediment and floatables for later removal and safe disposal.

Two hydrodynamic devices have been included in the design of this project.

6.8.3 Treatment Practices

The following treatment practices have not been incorporated into the design of this project, but are discussed should they are found to be required. Preventative and corrective maintenance measures to provide long-term effectiveness of stormwater attenuation practices if properly implemented will be included in Appendix F.

6.8.3.1 Infiltration Basins

Stormwater infiltration practices capture and temporarily store the water quality volume before allowing it to infiltrate through the floor of each practice into the soil over a two-day period. In areas where the subsurface soils exhibit high infiltration rates, the channel protection volume may also be infiltrated. Infiltration facilities are not typically capable of infiltrating the overbank flood or extreme flood volumes. Adequate outflows are required for these larger storm events. Soil testing to obtain infiltration rates are required as part of the design of infiltration facilities. Varying degrees of pre-treatment of the water quality are required based on the field determined infiltration rate of the subsurface soils. 100% of the water quality volume is required where the infiltration rate exceeds 5 inches per hour, 50% for infiltration rates between 2 and 5 inches per hour, and 25% for infiltration rates less than 2 inches per hour. Pre-treatment is typically accomplished through installation of plunge pools and other filtering methods. Infiltration practices must be isolated and protected from stormwater run-off during construction. The contributory drainage area shall be completely constructed and stabilized before connection of the stormwater conveyance system to the infiltration practice. Infiltration basins are typically landscaped by providing a hardy, drought tolerant grass species that is capable of tolerating periodic inundation. The established grass requires mowing twice annually (or as needed). Proper maintenance of the contributing conveyance system and pre-treatment practice are important in maintaining infiltration rates.

6.9 Runoff Reduction Volume (RRv)

RRv is met with the use of individual treatment practices since the re-development project meets the criteria set forth in the NYS SWDM §9.3.3. Two infiltration areas are proposed to manage and treat the runoff generated from the sites impervious areas.

RRv (measured in acre-feet) is reduction of the total WQv by application of GI techniques and SMP's to replicate the pre-development hydrology. The minimum required RRv is defined as the specified Reduction Factor (S), provided objective technical justification is documented.

RRv must be achieved by infiltration, groundwater recharge, reuse, recycle, evaporation/evapotranspiration of 100% of the post-developed WQv's to replicate pre-development hydrology by maintaining pre-construction infiltration, peak runoff flow, discharge volume, as well as minimizing concentrated flow by using runoff control techniques to provide treatment in a distributed manner before runoff reaches the collection system.

RRv is calculated based upon three methods:

1. Reduction of the practice contributing area in WQv computation.
2. Reduction of runoff volume by storage capacity of the practice.
3. Reduction using standard SMP's with runoff reduction capacity.

Projects that cannot meet 100% of the runoff reduction requirement must provide a justification that evaluates each of the GI planning and reduction techniques, and identify the specific limitations of the site according to which application of this criterion is technically infeasible. Projects that do not achieve runoff reduction to pre-construction must, at a minimum, reduce a percentage of the runoff from impervious areas to be constructed on the site. The percent reduction is based on the Hydrologic Soil Group(s) (HSG) of the site and is defined as Specific Reduction Factor (S).

The following lists the specific reduction factors for the HSG's.

HSG A = 0.55

HSG B = 0.40

HSG C = 0.30

HSG D = 0.20

The specific reduction factor (S) is based on the HSG's present at the site. The values are defined based on a hydrology analysis of low, medium, and high imperviousness. The reduction is achieved when runoff from a percentage of the impervious area on a site is captured, routed through GI or an SMP, infiltrated to the ground, reused, reduced by evapotranspiration, and eventually removed from the stormwater discharge from the site.

The following equation is used to determine the minimum RRv:

RRv (in acre-feet of storage) = [(P)(Rv*)(Ai)]/12

Ai = (S)(Aic)

Ai = impervious cover targeted for runoff reduction

(Aic) = total area of new impervious cover

Rv * = 0.05+0.009(I) where I is 100% impervious

S = Hydrologic Soil Group (HSG) Specific Reduction Factor (S)

The goal of the SWPPP is to utilize as many runoff reduction methods as possible on a site. All GI practices will be quantified and compared to the overall WQv for the site. If the RRv is greater than or equal to the WQv, then standard SMP's can be implemented to control peak rate leaving the site if applicable.

The following table summarizes required 100% RRv, minimum RRv, RRv reduced by use of runoff reduction techniques, RRv provided by standard SMP's with RRv and provided RRv for the main project area.

Watershed	Required Total RRv (cf)	Required Minimum RRv (cf)	RRv reduced by use of runoff reduction techniques (cf)	RRv provided by standard SMP with RRv (cf)*	RRv (cf) Provided
11	2,713	1,397	0	2,875	2,713*
12	2,489	1,338	0	2,526	2,489

* Treatment practices can be oversized to provide additional runoff reduction (RRv); however, they can only be oversized to provide up to 100% of the RRv. No additional credit can be taken for RRv for practices that provide greater than 100% RRv. The infiltration practices have been sized to infiltrate the 1-year storm.

6.10 Soil Restoration

Soils within disturbed areas tend to over compact as a result of heavy construction traffic; thus limiting their infiltrative capacity. The existing soils and gravel areas around the site have been compacted by DPW vehicle storage and periodic movement of vehicles and machinery throughout the site. Under the GP 0-015-002 permit, soil restoration is required in disturbed areas that will be vegetated in order to recover the original properties and porosity of the soil, especially in areas that receive high construction traffic, or areas that have soils that are poorly drained.

Many runoff reduction practices need Soil Restoration measures applied over and adjacent to the practice to achieve runoff reduction performance. Some key benefits of soil restoration are less runoff, better water quality; healthier, aesthetically pleasing landscapes; increased porosity on redevelopment sites where impervious cover is converted to converted to pervious; decreases runoff volume generated and lowers the demand on runoff control structures; enhances direct groundwater recharge; promotes successful long-term re-vegetation by restoring soil organic matter, permeability, drainage and water holding capacity for healthy root system development of trees, shrubs and deep-rooted ground covers, minimizing lawn chemical requirements, plant drowning during wet periods, and burnout during dry periods.

Soil restoration is required on redevelopment projects in areas where existing impervious area will be converted to pervious area.

6.10.1 Soil Restoration Methods

- Topsoil Application – Applying 6" of topsoil in soils with an HSG of A & B and have only been stripped, cut or filled. Soils with HSG of C or D that have only been stripped require aeration in addition to topsoil.
- Aeration - Aeration includes the use of machines such as tractor-drawn implements with coulters making a narrow slit in the soil, a roller with many spikes making indentations in the soil, or prongs which function like a mini-subsoiler.

- Tilling – Tilling includes the use of a cat-mounted ripper, tractor mounted disc, or tiller in order to expose the compacted soil devoid of oxygen to air an recreates temporary air space which allows for infiltration.
- Full Soil Restoration - Consists of Deep Ripping and De-Compaction, Compost Enhancement, and/or Deep Subsoiling. Deep Ripping includes the use of a cat mounted ripper, and is typically done at 12" to 24" depths. Compost Enhancement is done by using a deep subsoiler after topsoil has been applied. The goal is to alleviate the compaction that may have occurred during the placement of topsoil. This method mixes the topsoil and compost with subsoils.

Restoration techniques shall not be done until construction is complete and traffic will not travel through green areas. It is expected that deep ripping will be required in areas that the compacted gravel existed proposed to landscaped. These areas will be shown on the erosion and sediment control plan.

7.0 EROSION AND SEDIMENT CONTROL

7.1 Overview

The most sensitive stage of the development cycle is the period when vegetation is cleared and a site is graded. The potential impacts to on-site and off-site receiving waters and adjoining properties are particularly high at this stage. For example, trees and topsoil are removed, soils are exposed to erosion, and natural topography and drainage patterns are altered. Control of erosion and sediment during these periods is an essential function of this SWPPP and accompanying plans.

Effective and practical measures employed to minimize the erosion potential and prevent sediment from leaving the construction site and reaching streams or other water bodies have been recommended in accordance with:

- New York State Standards and Specifications for Erosion and Sediment Control, November, 2016

In order to ensure the effectiveness of the measures recommended herein, routine inspections and documentation, along with procedures for monitoring the findings, maintenance, and corrective actions resulting from each inspection are outlined within this section of the SWPPP.

7.2 Temporary Erosion and Sediment Control Measures

The following temporary measures have been incorporated into the erosion and sediment control plans for the site construction activities. These measures are also detailed on the site plans.

7.2.1 Silt Fence

A silt fence is a temporary sediment barrier consisting of a filter fabric stretched across and attached to supporting posts, entrenched, and supported with woven wire fence. Silt fences are installed on the contours across a slope and used to trap sediment by intercepting and detaining sediment laden runoff from disturbed areas in order to promote sedimentation on the uphill side of the fence.

Silt fences are suitable for perimeter and interior control, placed below areas where runoff may occur in the form of sheet flow. It should not be placed in channels or areas where flow is concentrated. In addition to interior and perimeter control a silt fence can be applied in the following applications:

- Below the toe or down slope of exposed and erodible slopes.
- Along streams and channels banks.
- Around temporary spoil area and stockpiles.

7.2.2 Stabilized Construction Entrance

A stabilized construction entrance consists of a pad of aggregate overlaying a geotextile fabric located at a point where construction vehicles enter or exit a site to reduce or eliminate the tracking of sediment onto public right of ways, street, alleys or parking areas, thereby preventing the transportation of sediment into local stormwater collection systems. Efficiency is greatly increased when a washing area is included as part of a stabilized construction entrance.

Stabilized construction entrances shall be a minimum of fifty (50) feet long and twelve (12) feet wide, but not less than the full width of points where vehicles enter and exit the site. Where there is only one access point to the site, the stabilized construction entrance shall be a minimum of twenty-four (24) feet wide. Stabilized construction entrances shall be a minimum of six (6) inches in depth consisting of one (1) to four (4) inch stone, or reclaimed or recycled equivalent.

7.2.3 Check Dams

Check dams shall be placed in channels to reduce scour and erosion by reducing flow velocity and promoting sediment settlement. Check dams shall be spaced in the channel so that the crest of the downstream dam is at the elevation of the toe of the upstream dam. Check dams, consisting of a well-graded stone two (2) – nine (9) inches in size (NYSDOT – Light Stone) shall maintain a height of two (2) feet with side slopes of 2:1 extending beyond the bank of the channel by a minimum of one and a half (1.5) feet. Check dams shall be anchored in the channel by a cutoff trench of one and a half (1.5) feet in width by a half (0.5) foot in depth.

7.2.4 Inlet Protection

Inlet protection consists of a filtering measure placed around or upstream of a storm drain used to trap sediment by temporary ponding runoff before it enters the storm drain. Inlet protection is not considered to be a primary means of sediment control and should be used with an overall integrated sediment control program. There are four types of storm drain inlet protection consisting of: excavated drop inlet protection, fabric drop inlet protection, stone and block drop inlet protection and curb drop inlet protection.

Inlet protection shall be implemented for all inlets that could potentially be impacted by sediment laden runoff.

7.2.5 Temporary Channels

Temporary channels in the form of diversion swales or berms may be used to intercept and direct runoff under the following applications:

- Above disturbed areas in order to direct and prevent clean runoff from flowing over disturbed areas until the area is permanently stabilized.
- Below disturbed areas to convey sediment laden runoff to sediment traps.
- Across disturbed slopes to reduce slope lengths.

Where used to convey sediment laden runoff, temporary channels shall be equipped with check dams.

7.2.6 Water Bars

Water bars are temporary earth barriers constructed across construction roads used to intercept and divert roadway runoff toward temporary sediment traps or channels, prevent runoff from concentrating, and minimize the potential of gullies from forming. Spacing of water bars is dependent upon the road slope, and shall be installed in accordance with the schedule depicted on the Erosion and Sediment Control detail sheet.

7.2.7 Straw Bale Barriers

Straw bale barriers are used to intercept and contain sediment from disturbed areas of limited size in order to prevent sediment from exiting the site. Bales should be placed in a single row lengthwise along the contour, with ends abutting one another. Straw bales shall be bound and installed so that the bindings are oriented around the sides. Straw bales shall be entrenched a minimum of four (4) inches, backfilled, and anchored using either two stakes or rebar driven through the straw bales to a depth of one and a half (1.5) to two (2) feet below grade.

Straw bales shall be used where no other measure is feasible. They shall not be used where there is a concentration of flow within a channel or other area.

The useful life of a straw bale barrier is three (3) months.

7.2.8 Temporary Soil Stockpiles

Stockpiling of soil is a method of preserving soil and topsoil for regrading and vegetating disturbed areas. Stockpiles shall be located away from environmentally sensitive areas (i.e. wetlands and associated buffers, streams, water bodies) and shall be protected with a peripheral silt fence. Slopes of stockpiles shall not exceed 2:1. Temporary stabilization measures shall be completed within fourteen (14) days of stockpile formation.

7.2.9 Dust Control

Dust control measures reduce the surface and air transport of dust, thereby preventing pollutants from mixing into stormwater. Dust control measures for the construction activities associated within this project consist of windbreaks, minimization of soil disturbance (preserving buffer areas of vegetation where practical), mulching, temporary and permanent vegetation cover, barriers (i.e. geotextile on driving surfaces) and water spraying.

Construction activities shall be scheduled to minimize the amount of area disturbed at any one time.

7.2.10 Temporary Soil Stabilization Practices

Stabilization practices reduce the potential for soil detachment by shielding the soil surface from the impact of rainfall and reducing overland flow velocity.

The Contractor shall initiate stabilization measures as soon as possible in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. This requirement does not apply where the initiation of stabilization measures by the 14th day after construction activity temporarily or permanently ceased is precluded by snow cover or frozen ground conditions.

Temporary stabilization practices may include:

7.2.10.1 Mulching

Mulching is a temporary soil stabilization practice. Mulching prevents erosion by protecting soil from raindrop impact and by reducing the velocity of overland flow. Mulching also retains moisture within the soil surface and prevents germination. Where mulching consists of wood chips or shavings, it shall be applied at a rate of 500-900 lbs per 1000 s.f. Where mulching consists of straw, it shall be applied at a rate of 90-100 lbs. per 1000 s.f. All temporary grass areas shall receive a standard application of mulch consisting of straw, unless the area is hydro-seeded.

7.2.10.2 Temporary Seeding

Temporary seeding provides additional benefits over other stabilization practices by creating a vegetation system holding soil particles in place with root systems and maintaining the soils capacity to absorb runoff. Temporary vegetation shall be placed in accordance with project plans. Irrigation shall be used when the soil is dry or when summer plantings are done.

7.2.10.3 Temporary Erosion Control Blanket

A temporary erosion control blanket is a degradable erosion control blanket used to hold seed and soil in place until vegetation is established in disturbed areas. Temporary erosion control blankets insulate and conserve seed moisture thus reducing evaporation and increasing germination rates, and protect seeds from birds. Temporary erosion control blankets may consist of straw blankets, excelsior blankets (curled wood excelsior), coconut fiber blankets, or wood fiber blankets (reprocessed wood fibers which do not possess or contain any growth or germination inhibiting factors).

7.3 Permanent Erosion and Sediment Control Measures

The following permanent measures have been incorporated into the erosion and sediment control plans for the site construction activities.

7.3.1 Outlet Protection

Outlet protection is used to reduce stormwater velocity and dissipate the energy of flow exiting a culvert before discharging into receiving channels. Rip-rap treatment extends between the point where flows exit the culvert and where the velocity and/or energy from runoff is dissipated to a degree where there is minimal erosion downstream of the discharge point.

A geotextile fabric shall be placed beneath the rip-rap to prevent soil movement into and through the rip-rap.

7.3.2 Permanent Soil Stabilization Practices

Stabilization practices reduce the potential for soil detachment by shielding the soil surface from the impact of rainfall and reducing overland flow velocity.

The Contractor shall initiate stabilization measures as soon as possible in portions of the site where construction activities have permanently ceased, but in no case more than 14 days after the construction activity in that portion of the site has permanently ceased.

Permanent stabilization practices may include:

7.3.2.1 Sod

Where exposed soils have the potential to generate off-site sediment loading, sod can provide a immediate form of stabilization and extra protection to a disturbed area. Where applied, sod shall be blue grass or a bluegrass/red fescue mixture or a perennial ryegrass and machine cut with a uniform soil thickness of ¾ inch, plus or minus ¼ inch. Sod shall be used at the discretion of the Owner, unless specifically required by the plans.

7.3.2.2 Permanent Vegetation

Permanent vegetation shall be used to provide a protective cover for exposed areas that have received final grading. Permanent stabilization shall be applied where topsoil has been placed or returned and incorporated into the soil surface. When used, this process shall be followed with the application of straw mulch to protect soil from erosion and seed from drying out. Irrigation shall be used when the soil is dry or when summer plantings are done. Permanent vegetation shall be placed in accordance with project plans.

7.3.2.3 Hydroseeding

Hydroseeding is the hydraulic application of seed and fertilizer onto prepared seed beds. When used, this process shall be followed with the application of straw mulch to protect soil from erosion and seed from drying out. Irrigation shall be used when the soil is dry or when summer plantings are done. Hydroseeding shall be used at the discretion of the Contractor, unless specifically required by the plans.

7.3.2.4 Permanent Erosion Control Blankets

Permanent erosion control blankets are comprised of synthetic materials that form a high strength mat that helps prevent soil erosion in channels and on steep slopes. Stems and roots become intertwined within the matrix, thus reinforcing the vegetation and anchoring the mat. Permanent erosion control blankets insulate and conserve seed moisture thus reducing evaporation and increasing germination rates, and protect seeds from birds. When used within channels, permanent erosion control blankets can aid in the establishment of vegetation and increase the maximum permissible velocity of the given channel by reinforcing the soil and vegetation to resist the forces of erosion during runoff events.

7.4 Erosion and Sediment Control Sequencing Schedule

Implementation schedules for the installation of erosion and sediment control measures prior to and during the course of construction will depend greatly on the actual construction schedule and the varying field conditions that may warrant temporary construction stops and/or work commencing in other locations. The plans include an anticipated construction sequence schedule, of which temporary and permanent erosion and sediment control practices will be required and inspected.

The construction sequencing schedule is as follows:

1. Schedule a pre-construction meeting which shall include the city engineer, owner or owner's representative, project engineer, contractor and subcontractors (if necessary) who are to perform the construction.
2. Establish the limit of disturbance for proposed clearing and grading associated with the proposed parking areas and stormwater management area.
3. Install stabilized construction entrance as depicted on the plan.
4. Clear locations for installation of proposed erosion and sediment control measures.
5. Install silt fence as shown on this plan and in other areas that become apparent following clearing activities.
6. Prior to further construction activities, contractor shall contact the project engineer to conduct a pre-construction site assessment to verify that the appropriate erosion and sediment controls shown on this plan have been adequately installed ensuring overall preparedness of this site for the commencement of construction.
7. Commence mass grading activities on project area.
8. Install underground detention system. Install silt fence surrounding underground detention footprint. Use orange construction fence in addition to the silt fence if necessary.
9. Construct storm sewer system.
10. Construct curbing and parking areas to binder course.
11. Till soil in all landscaped areas that have previously been disturbed.
12. Install all proposed landscaping.
13. Pave top course on parking areas.
14. Install infiltration basin.
15. Remove erosion and sediment controls when contributing drainage areas have become stabilized.

Erosion control measures shall be inspected and repaired as needed during construction activities and based on the maintenance schedule. Additional erosion control measures based on site conditions shall be provided as necessary in order to protect adjacent parcels and waters.

7.5 Maintenance Schedules

Maintenance of the erosion and sediment controls incorporated into this project shall be performed on a regular basis to assure continued effectiveness. This includes repairs and replacement to all erosion and sediment control practices, including cleanout of all sediment retaining measures. Those measures found to be ineffective during routine inspections shall be repaired or replaced and cleaned out (where applicable) before the next anticipated storm event or within 24-hours of being notified, whichever comes first. A more detailed description of the maintenance procedures for the site specific erosion and sediment control practices has been provided on the plan set.

7.6 Construction Staging Areas

Construction staging areas are areas designated within construction sites where most equipment and materials are stored. The locations of the construction staging areas for this project have been shown on the plan set.

7.7 Site Assessments, Inspections and Reporting

Regular inspections of the construction site shall be performed by a qualified professional who is familiar with all aspects of the SWPPP and the implemented control practices. Inspections are intended to identify areas where the pollutant control measures at the site are ineffective and have the potential to allow pollutants to enter water bodies or adjoining properties.

7.7.1 Prior to Construction

Prior to the commencement of construction, a qualified professional shall conduct an inspection of the site and certify in an inspection report that the appropriate erosion and sediment control measures have been installed as indicated by the project plan set and SWPPP. This certification shall be forwarded to the Owner's Representative and Contractor for filing in the construction log book.

A copy of the "Pre-Construction Site Assessment Checklist" has been provided in Appendix G.

7.7.2 During Construction

Following the commencement of construction, a qualified professional shall perform inspections of site construction activities in accordance with the SPDES General Permit. Inspections shall occur every seven (7) calendar days. Refer to Section 1.2 of this SWPPP for additional inspection requirements associated with disturbance of greater than five (5) acres at any time.

For project areas where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the qualified inspector shall conduct a site inspection at least once every thirty (30) calendar days. The owner or operator shall notify the Regional Office stormwater contact person in writing prior to reducing the frequency of inspections.

For project areas where soil disturbance activities have been shut down with partial project completion, the qualified inspector can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved final stabilization and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational. The owner or operator shall notify the Regional Office stormwater contact person in writing prior to the shutdown.

The inspections shall include observation of installed and maintained erosion and sediment control measures for consistency with project specifications and documentation of items to be corrected and recommendations for mitigating concerns. The following information, at minimum, shall be recorded during each inspection:

- Date and time of inspection;
- Name and title of person(s) performing inspection;
- A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection;
- A description of the condition of the runoff at all points of discharge from the construction site. This shall include identification of any discharges of sediment from the construction site. Include discharges from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow;
- A description of the condition of all natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the construction site which receive runoff from disturbed areas. This shall include identification of any discharges of sediment to the surface waterbody;
- Identification of all erosion and sediment control practices that need repair or maintenance;
- Identification of all erosion and sediment control practices that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;
- Description and sketch of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection;
- Current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards;
- 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 (where applicable);
- Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of the sediment storage volume;

- Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s);

- Digital photographs, with date stamp, that clearly show the condition of all practices that have been identified as needing corrective actions. The qualified inspector shall attach paper color copies of the digital photographs to the inspection report being maintained on site within seven (7) calendar days of the date of the inspection. The qualified inspector shall also take digital photographs, with date stamp, that clearly show the condition of the practice(s) after the corrective action has been completed. The qualified inspector shall attach paper color copies of the digital photographs to the inspection report that documents the completion of the corrective action work within seven (7) calendar days of that inspection

- A brief description of any erosion and sediment control practice repairs, maintenance or installations made as a result of previous inspection; and

- All deficiencies that are identified with the implementation of the SWPPP.

Summary reports shall be forwarded to the Owner's Representative and Contractor. Reports shall be incorporated into the construction log book. Within one business day of the completion of an inspection, the qualified inspector shall notify the owner or operator and appropriate contractor or subcontractor of any corrective actions that need to be taken. The contractor or subcontractor shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

A copy of the "Construction" inspection report has been provided in Appendix M.

7.7.3 Quarterly Report

The Owner shall prepare a written summary of its status with respect to compliance with the SPDES General Permit at a minimum frequency of every three months during which coverage under the permit exists. The summary should address the status of achieving each component of the SWPPP. The report shall include the overall performance of the stormwater facilities, average, minimum and maximum depths of sediment within the stormwater facilities, the physical condition of all drainage structures, maintenance reports from the previous year, and any recommendations for any repairs, modifications or adjustments to the stormwater facilities.

7.7.4 End of Term

Termination of coverage under SPDES General Permit is accomplished by filing a Notice of Termination with the NYSDEC. Prior to the filing of the Notice of Termination (NOT), the Owner shall have a qualified professional perform a final site inspection. The qualified professional shall certify that the site has undergone final stabilization using either vegetative or structural stabilization methods, that all temporary erosion and sediment control structures have been removed, and that all permanent erosion control and stormwater facilities have been installed and are operational in conformance with the SWPPP by signing the "Final Stabilization" and "Post-Construction Stormwater Management Practice" certification statements on the NOT. The owner

or operator shall then submit the completed NOT form to the NYSDEC. "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 geotextile) have been employed on all unpaved areas and area not covered by permanent structures.

A NOT is provided in Appendix N.

7.8 Construction Log Book

The construction log book shall be maintained on-site from the date of initiation of construction activities to the date of final stabilization and shall be made available to the permitting authority upon request. The construction log book shall contain a record of all inspections; preparer's, qualified professional's, owner's/operator's, contractor's, and sub-contractor's (if applicable) certifications; and weekly and quarterly reports.

7.9 Long Term Operation and Maintenance Plan of Stormwater System and Landscape Areas

A separate Long Term Operation and Maintenance (O&M) Plan will be provided within Appendix O in the final SWPPP.

7.9.1 Deep Sump Catch Basins and Piping

All catch basins shall be inspected after each storm event for sediment accumulation, and debris, and remove as necessary. When sediment accumulation within the catch basin sump reaches 1/2 of the sump depth, it shall be removed. Associated piping shall be inspected annually, and accumulated sediment shall be removed as needed.

7.9.2 Infiltration Basins

Infiltration basins shall be inspected monthly for sediment and debris accumulation. Inflow pipes, outlet structures and spillways should also be inspected for sediment and debris monthly. Any accumulated sediment or debris should be removed as necessary. After storm events, the infiltration basin's dewatering duration should also be monitored. The basin floor shall be mowed when the grass reaches a height of 18". Sediment shall be cleaned out of the basin annually.

7.9.3 Underground Infiltration System

The underground infiltration system shall be inspected monthly for sediment and debris accumulation. Inflow pipes, outlet structures and spillways should also be inspected for sediment and debris monthly. Any accumulated sediment or debris should be removed as necessary. After storm events, the underground infiltration system dewatering duration should also be monitored. Sediment shall be cleaned out of the system annually.

7.9.4 Hydrodynamic Pretreatment Devices

The hydrodynamic pretreatment devices (HPD) require regular inspection and maintenance to ensure optimal performance. Maintenance frequency will be driven by upstream conditions (contributing drainage area stabilization) and proper maintenance of upstream structures and culvert pipes. The manufacturer recommends that the HPD units be inspected quarterly (at each change of season). The structure shall be visually inspected for blockages or obstructions in the inlet or separation screen. The inspection should also quantify accumulation of hydrocarbons, sediment and trash within the system. Inspections and maintenance shall be performed by qualified personnel with adequate training in these types of units. The units shall be cleaned by vacuum truck once a year (except for the first year where more frequent cleanings may be required).

8.0 GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES

The following good housekeeping and material management practices shall be followed to reduce the risk of spills or exposure of materials to stormwater runoff.

8.1 Waste Materials

All waste material, including but not limited to trash and construction debris, generated during construction shall be collected and stored in a proper receptacle in accordance with Federal, State, County and Local regulations. No waste material shall be buried on-site. All collected waste material shall be hauled to an approved waste disposal facility.

8.2 Chemical

Chemicals used on-site shall be kept in small quantities and stored in closed water tight containers undercover in a neat and orderly manner and kept out of direct contact with stormwater. Chemical products shall not be mixed with one another unless recommended by manufacturer.

All on-site personnel shall have access to material safety data sheets (MSDS) and National Institute for Occupational Safety and Health (NIOSH) Guide to Chemical Hazards (latest edition) for all chemicals stored and used on-site.

Manufacturer's and/or Federal, State, County and Local guidelines for proper use and disposal shall be followed. Any spills or contamination of runoff with chemicals shall be contained, collected, cleaned up immediately and disposed of in accordance with Federal, State, County and Local regulations.

8.3 Fuels and Oil

All on-site vehicles, tools, and construction equipment shall be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. On-site vehicle and equipment refueling shall be conducted at a location away from access to surface waters and runoff. Any on-site storage tanks shall have a means of secondary containment. Oil products shall be kept in their original containers with original manufacturer's label. In the event of a spill, it shall be contained,

cleaned up immediately and the material, including any contaminated soil, shall be disposed of in accordance with Federal, State, County and Local regulations.

Fuel and oil spills in excess of reportable quantities shall be reported to the NYSDEC as soon as the discharge is discovered.

8.4 Fertilizers

Fertilizers used on-site shall be stored in closed water tight containers undercover in a neat orderly manner and kept out of direct contact with stormwater. Manufacturer's and/or Federal, State, County and Local guidelines for proper use and disposal shall be followed. Any spills or contamination of runoff with fertilizers shall be contained, collected, cleaned up immediately, and disposed of in accordance with Federal, State, County and Local regulations.

8.5 Paint

Paints used on-site shall be stored in closed, water tight containers undercover in a neat and orderly manner and kept out of direct contact with stormwater. Manufacturer's and/or Federal, State, County and Local guidelines for proper use and disposal shall be followed. Any spills or contamination of runoff with paint shall be contained, collected, cleaned up immediately, and disposed of in accordance with Federal, State, County and Local regulations.

8.6 Sanitary Waste Facilities

Should portable units be located on-site, they shall placed in upland areas away from direct contact with surface waters. They shall be serviced and cleaned on a weekly basis by a licensed portable toilet and septic disposal service. Any spills occurring during service shall be cleaned up immediately and disposed of in accordance with Federal, State, County, and Local regulations.

8.7 Container Disposal

All of a product shall be used up before disposal of the container. Empty containers that may contain chemical residue shall be disposed of in accordance with Federal, State, County and Local regulations.

8.8 Concrete and Asphalt Trucks

Concrete and asphalt trucks shall not be allowed to wash out or discharge surplus material on-site.

8.9 Site Supervisor

It shall be the responsibility of the Contractor's Site Supervisor to inspect daily and ensure the proper use, storage and disposal of all on-site materials.

9.0 SWPPP AMENDMENT

The SWPPP shall be updated by a licensed professional engineer whenever any of the following apply:

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.

2) The SWPPP proves to be ineffective in:
    - Eliminating or significantly minimizing pollutants from sources identified in the SWPPP required by the SPDES Permit; or
    - Achieving the general objective of controlling pollutants in stormwater discharges from permitted construction activity.
3) Identify any new contractor or subcontractor that will implement any measure of the SWPPP.
4) NYSDEC notifies the Permittee that the SWPPP does not meet one or more of the minimum requirements of the SPDES Permit. Within seven (7) days of such notification or as provided for by the NYSDEC, the Permittee shall make amendments to the SWPPP and submit to the NYSDEC a written certification that the requested changes have been made.

Since this project is subject to the requirements of a regulated, traditional land use control MS4, the owner or operator shall notify the MS4 in writing of any planned amendments or modifications to the post-construction stormwater management practice component of the SWPPP. Unless otherwise notified by the MS4, the owner or operator shall have the SWPPP amendments or modifications reviewed and accepted by the MS4 prior to commencing construction of the post-construction stormwater management practice.

10.0 CONTRACTOR CERTIFICATIONS

All contractors and subcontractors that have any responsibility to install, inspect or maintain erosion or sediment control measures shall sign a copy of the certification statement included in Appendix I before undertaking any construction activity at the site identified in the SWPPP.

11.0 OWNER/OPERATOR CERTIFICATION

The Owner/Operator must review and sign the owner/operator certification statement included in Appendix K.

12.0 CONCLUSIONS

This SWPPP demonstrates that the proposed project generally meets the requirements of SPDES GP-0-015-002, as follows:

- An erosion and sediment control plan in accordance with the latest revision to the New York State Standards and Specifications for Erosion and Sediment Control, November 2016, has been developed for the project and is included in the site plan set.
- Hydrologic and Hydraulic calculations for all storm events modeled will demonstrate that the resulting stormwater runoff from the development, exiting the site will not adversely impact offsite properties, stormwater conveyance systems or receiving water bodies. Temporary and permanent stormwater systems and facilities are designed in accordance with the latest revision to the New York State Stormwater Management Design Manual, January 2015.

- The project has been designed to capture and treat 90% of the average annual stormwater runoff from the development through approved water quality measures in all available areas.
- The green infrastructure practices capture a minimum of 25% of the required runoff reduction volume (RRv).

APPENDIX A

NOTICE OF INTENT AND MS4 ACCEPTANCE

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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-0-10-001

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)

Owner/Operator Contact Person Last Name (NOT CONSULTANT)

Owner/Operator Contact Person First Name

Owner/Operator Mailing Address

City

State ☐☐ Zip ☐☐☐☐☐ - ☐☐☐☐

Phone (Owner/Operator) ☐☐☐ - ☐☐☐ - ☐☐☐☐

Fax (Owner/Operator) ☐☐☐ - ☐☐☐ - ☐☐☐☐

Email (Owner/Operator)

FED TAX ID ☐☐ - ☐☐☐☐☐☐☐ (not required for individuals)

Project Site Information

Project/Site Name

Street Address (NOT P.O. BOX)

Side of Street
○ **North** ○ **South** ○ **East** ○ **West**

City/Town/Village (THAT ISSUES BUILDING PERMIT)

State N Y Zip - County DEC Region

Name of Nearest Cross Street

Distance to Nearest Cross Street (Feet)

Project In Relation to Cross Street
○ **North** ○ **South** ○ **East** ○ **West**

Tax Map Numbers
Section-Block-Parcel

Tax Map Numbers

1. Provide the Geographic Coordinates for the project site in NYTM Units. To do this you **must** go to the NYSDEC Stormwater Interactive Map on the DEC website at:

www.dec.ny.gov/imsmaps/stormwater/viewer.htm

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located your project site, go to the tool boxes on the top and choose "i"(identify). Then click on the center of your site and a new window containing the X, Y coordinates in UTM will pop up. Transcribe these coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting)

Y Coordinates (Northing) 4

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 — Number of Lots
- ○ 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

***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**
.	.	.	.

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**
%	%	%	%

7. Is this a phased project? ○ **Yes** ○ **No**

8. Enter the planned start and end dates of the disturbance activities.

Start Date / / - **End Date** / /

9. Identify the nearest surface waterbody(ies) to which construction site runoff will discharge.

Name

9a. Type of waterbody identified in Question 9?

- ○ Wetland / State Jurisdiction On Site (Answer 9b)
- ○ Wetland / State Jurisdiction Off Site
- ○ Wetland / Federal Jurisdiction On Site (Answer 9b)
- ○ Wetland / Federal Jurisdiction Off Site
- ○ Stream / Creek On Site
- ○ Stream / Creek Off Site
- ○ River On Site
- ○ River Off Site
- ○ Lake On Site
- ○ Lake Off Site
- ○ Other Type On Site
- ○ Other Type Off Site

9b. How was the wetland identified?

- ○ Regulatory Map
- ○ Delineated by Consultant
- ○ Delineated by Army Corps of Engineers
- ○ Other (identify)

10. Has the surface waterbody(ies) in question 9 been identified as a 303(d) segment in Appendix E of GP-0-10-001? ○ **Yes** ○ **No**

11. Is this project located in one of the Watersheds identified in Appendix C of GP-0-10-001? ○ **Yes** ○ **No**

12. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? ○ **Yes** ○ **No**
If no, skip question 13.

13. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey? ○ **Yes** ○ **No**
If Yes, what is the acreage to be disturbed?

.

14. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area? ○ **Yes** ○ **No**

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?

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**

SWPPP Preparer

Contact Name (Last, Space, First)

Mailing Address

City

State Zip -

Phone - -

Fax - -

Email

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-0-10-001. 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 **MI**

Last Name

Signature

Date / /

25. Has a construction sequence schedule for the planned management practices been prepared? ○ 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

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

Other

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)

	Total Contributing Area (acres)		Total Contributing Impervious Area(acres)
RR Techniques (Area Reduction)			
○ 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)			___.___
○ Dry Well (I-3)			___.___
○ Underground Infiltration System (I-4)			___.___
○ Bioretention (F-5)			___.___
○ Dry Swale (O-1)			___.___
Standard SMPs			
○ Micropool Extended Detention (P-1)			___.___
○ Wet Pond (P-2)			___.___
○ 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)			___.___
○ 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.

Name

Manufacturer

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

_____ **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

_____ **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

☐☐☐.☐☐☐ **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). ☐☐☐.☐☐☐

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

☐☐☐.☐☐☐ **acre-feet**

CPv Provided

☐☐☐.☐☐☐ **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

☐☐☐.☐☐☐ **CFS**

Post-development

☐☐☐.☐☐☐ **CFS**

Total Extreme Flood Control Criteria (Qf)

Pre-Development

☐☐☐.☐☐☐ **CFS**

Post-development

☐☐☐.☐☐☐ **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

38. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed? ○ **Yes** ○ **No**

If Yes, Identify the entity responsible for the long term Operation and Maintenance

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 [N][Y][R][ ][ ][ ][ ][ ][ ]
- ○ Other [ ]
- ○ None

41. Does this project require a US Army Corps of Engineers Wetland Permit? ○ **Yes** ○ **No**
If Yes, Indicate Size of Impact. [ ][ ][ ][ ][ ].[ ]

42. Is this project subject to the requirements of a regulated, traditional land use control MS4? ○ **Yes** ○ **No**
(If No, skip question 43)

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][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

MI

Print Last Name

Owner/Operator Signature

Date

/ /

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:	Weber Projects III, LLC
2. Contact Person:	Rodney Weber
3. Street Address:	1 Churchill Street
4. City/State/Zip:	Beacon, NY 12508
II. Project Site Information	
5. Project/Site Name:	23-28 Creek Drive
6. Street Address:	23-28 Creek Drive
7. City/State/Zip:	Beacon, NY 12508
III. Stormwater Pollution Prevention Plan (SWPPP) Review and Acceptance Information	
8. SWPPP Reviewed by:	Michael A. Bodendorf, P.E.
9. Title/Position:	Professional Engineer
10. Date Final SWPPP Reviewed and Accepted:	
IV. Regulated MS4 Information	
11. Name of MS4:	City of Beacon
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:

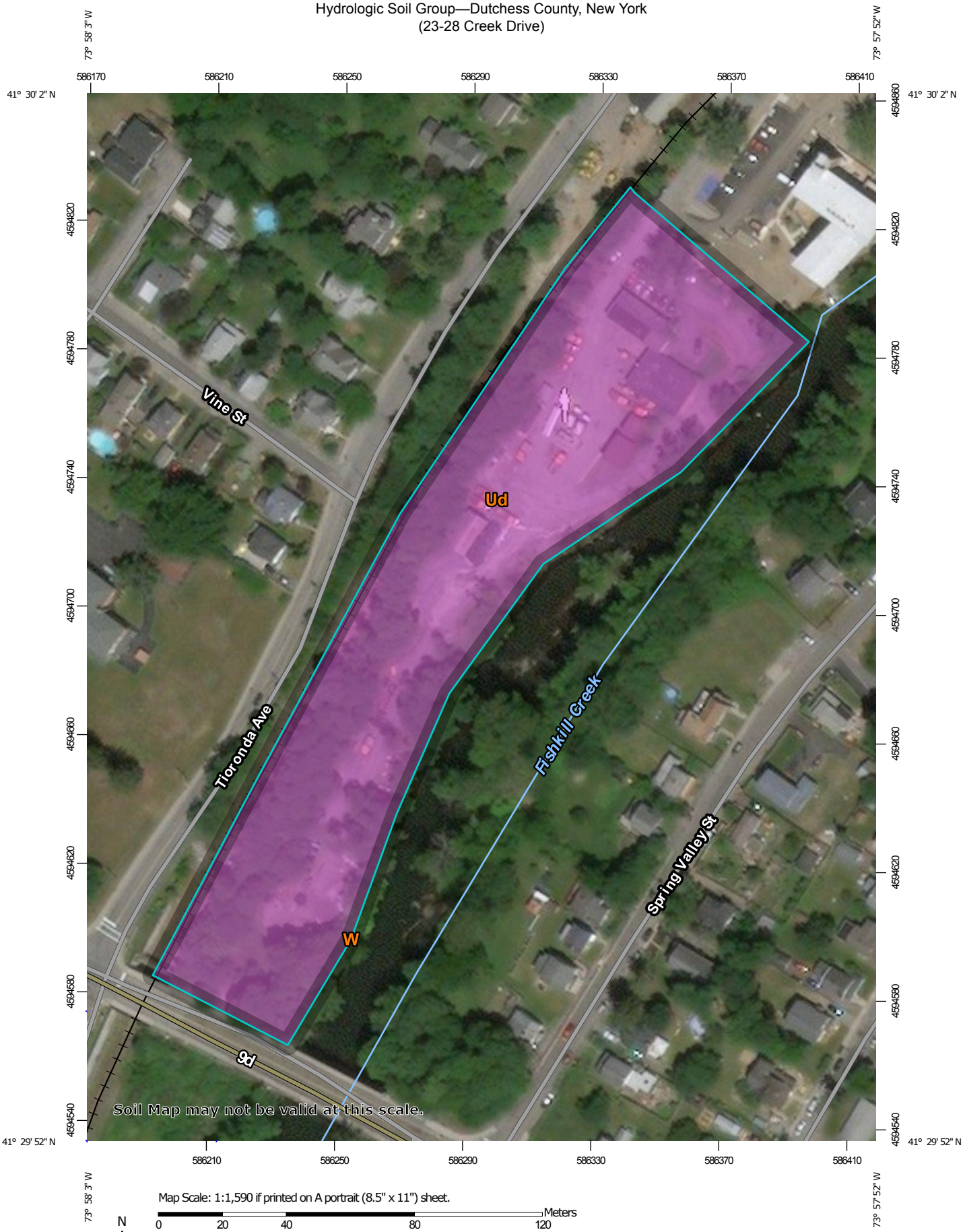
VI. Additional Information

(NYS DEC - MS4 SWPPP Acceptance Form - January 2015)

APPENDIX B

SOILS DATA

Hydrologic Soil Group—Dutchess County, New York
(23-28 Creek Drive)



Map Scale: 1:1,590 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 20 40 80 120

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

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 1:24,000.

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

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

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

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

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

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

Soil Survey Area: Dutchess County, New York
Survey Area Data: Version 15, Sep 2, 2018

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

Date(s) aerial images were photographed: Oct 7, 2013—Feb 26, 2017

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
Ud	Udorthents, smoothed	A	3.6	100.0%
W	Water		0.0	0.0%
Totals for Area of Interest			**3.6**	**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

APPENDIX C

RAINFALL DATA, NYSDEC ERM, FLOOD MAP AND WETLAND MAP

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New York
Location	
Longitude	73.966 degrees West
Latitude	41.500 degrees North
Elevation	0 feet
Date/Time	Mon, 22 Oct 2018 17:12:12 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.33	0.50	0.62	0.82	1.02	1.27	**1yr**	0.88	1.20	1.45	1.77	2.15	2.61	2.96	**1yr**	2.31	2.85	3.29	3.96	4.59	**1yr**
2yr	0.39	0.60	0.74	0.98	1.23	1.53	**2yr**	1.06	1.43	1.75	2.15	2.61	3.17	3.57	**2yr**	2.80	3.44	3.94	4.64	5.29	**2yr**
5yr	0.46	0.71	0.89	1.19	1.52	1.92	**5yr**	1.32	1.76	2.20	2.70	3.29	3.97	4.53	**5yr**	3.51	4.35	5.01	5.79	6.54	**5yr**
10yr	0.51	0.80	1.02	1.38	1.79	2.27	**10yr**	1.55	2.07	2.62	3.22	3.91	4.71	5.42	**10yr**	4.17	5.21	6.01	6.84	7.69	**10yr**
25yr	0.60	0.95	1.21	1.67	2.23	2.85	**25yr**	1.92	2.56	3.30	4.06	4.94	5.92	6.87	**25yr**	5.24	6.61	7.65	8.53	9.53	**25yr**
50yr	0.68	1.09	1.39	1.95	2.62	3.38	**50yr**	2.26	3.00	3.93	4.84	5.87	7.04	8.23	**50yr**	6.23	7.91	9.19	10.09	11.21	**50yr**
100yr	0.77	1.24	1.60	2.27	3.10	4.03	**100yr**	2.68	3.53	4.68	5.78	7.00	8.37	9.86	**100yr**	7.41	9.48	11.04	11.94	13.20	**100yr**
200yr	0.87	1.43	1.85	2.65	3.67	4.79	**200yr**	3.16	4.15	5.58	6.90	8.35	9.96	11.82	**200yr**	8.81	11.37	13.28	14.13	15.55	**200yr**
500yr	1.05	1.73	2.25	3.27	4.59	6.03	**500yr**	3.96	5.15	7.04	8.71	10.54	12.55	15.03	**500yr**	11.10	14.46	16.96	17.67	19.33	**500yr**

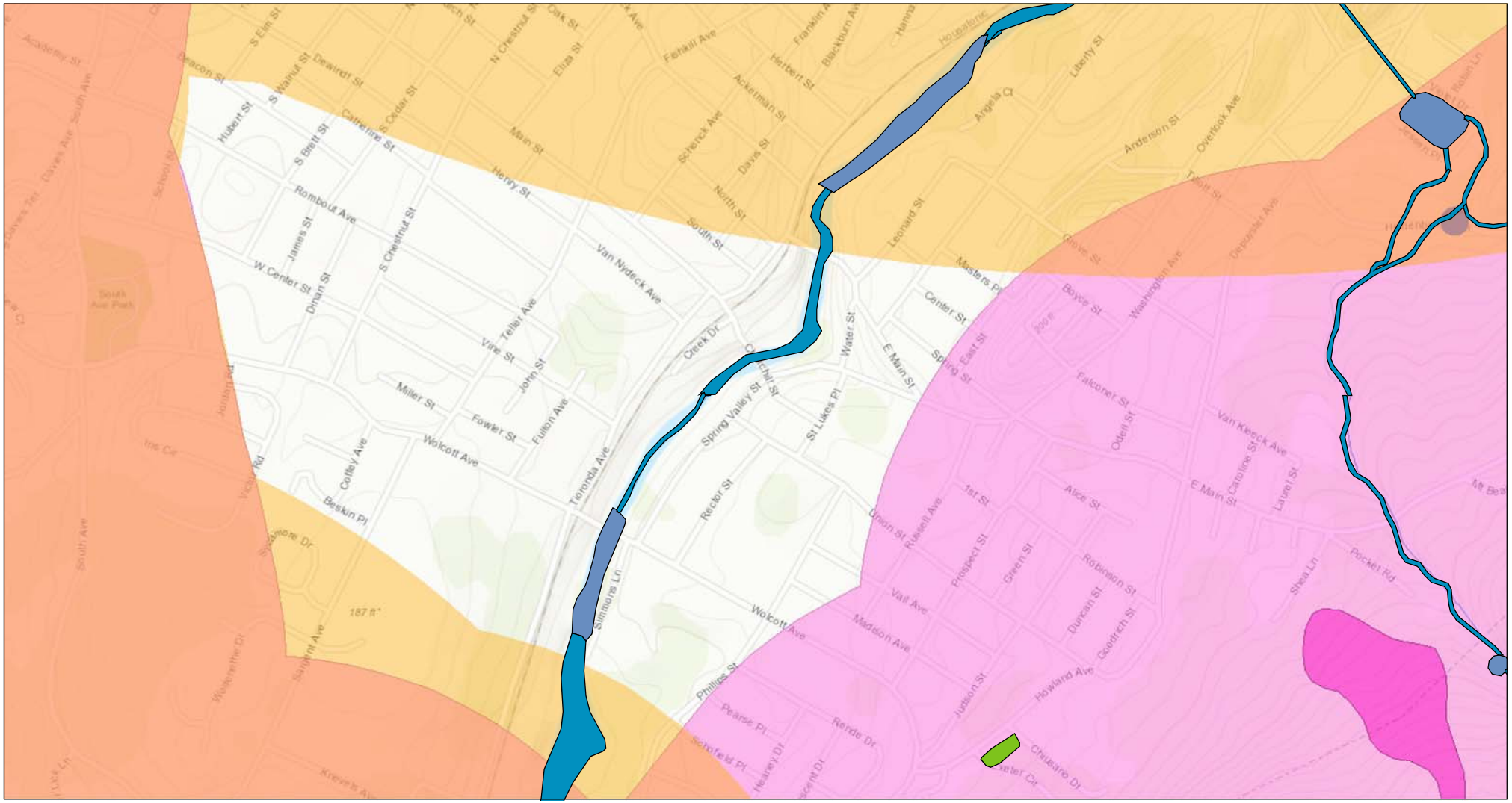
Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.28	0.44	0.53	0.72	0.88	1.09	**1yr**	0.76	1.06	1.25	1.60	2.01	2.08	2.36	**1yr**	1.84	2.27	2.59	3.32	4.16	**1yr**
2yr	0.37	0.58	0.71	0.96	1.19	1.42	**2yr**	1.03	1.39	1.61	2.06	2.59	3.08	3.46	**2yr**	2.72	3.33	3.79	4.49	5.14	**2yr**
5yr	0.42	0.65	0.81	1.11	1.41	1.66	**5yr**	1.22	1.62	1.88	2.42	3.01	3.67	4.18	**5yr**	3.25	4.02	4.59	5.31	6.09	**5yr**
10yr	0.47	0.72	0.90	1.25	1.62	1.85	**10yr**	1.40	1.81	2.12	2.72	3.38	4.16	4.83	**10yr**	3.69	4.65	5.28	6.02	6.92	**10yr**
25yr	0.54	0.82	1.03	1.46	1.93	2.14	**25yr**	1.66	2.09	2.46	3.06	3.94	4.89	5.85	**25yr**	4.33	5.63	6.36	7.10	8.19	**25yr**
50yr	0.60	0.92	1.15	1.65	2.22	2.38	**50yr**	1.91	2.33	2.77	3.42	4.44	5.54	6.77	**50yr**	4.91	6.51	7.32	8.05	9.33	**50yr**
100yr	0.68	1.03	1.29	1.87	2.56	2.68	**100yr**	2.21	2.62	3.13	3.81	5.02	6.24	7.85	**100yr**	5.53	7.55	8.43	9.11	10.63	**100yr**
200yr	0.77	1.16	1.47	2.13	2.98	2.99	**200yr**	2.57	2.93	3.54	4.28	5.67	6.99	9.12	**200yr**	6.19	8.77	9.72	10.30	12.13	**200yr**
500yr	0.92	1.37	1.76	2.56	3.65	3.49	**500yr**	3.15	3.41	4.19	4.99	6.70	8.13	11.14	**500yr**	7.20	10.72	11.73	12.10	14.45	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.36	0.56	0.68	0.92	1.13	1.36	**1yr**	0.97	1.33	1.53	1.97	2.43	2.82	3.20	**1yr**	2.49	3.08	3.57	4.25	4.93	**1yr**
2yr	0.40	0.62	0.77	1.04	1.28	1.54	**2yr**	1.10	1.51	1.74	2.25	2.80	3.34	3.71	**2yr**	2.95	3.56	4.10	4.82	5.47	**2yr**
5yr	0.49	0.76	0.94	1.29	1.64	1.96	**5yr**	1.42	1.91	2.26	2.89	3.66	4.26	4.88	**5yr**	3.77	4.70	5.41	6.28	7.01	**5yr**
10yr	0.58	0.89	1.11	1.55	2.00	2.37	**10yr**	1.72	2.31	2.74	3.53	4.49	5.21	6.01	**10yr**	4.61	5.78	6.70	7.69	8.48	**10yr**
25yr	0.72	1.10	1.37	1.95	2.57	3.05	**25yr**	2.22	2.98	3.57	4.73	5.88	6.79	7.92	**25yr**	6.01	7.62	8.92	10.04	10.93	**25yr**
50yr	0.85	1.29	1.61	2.32	3.12	3.70	**50yr**	2.69	3.62	4.35	5.83	7.21	8.32	9.76	**50yr**	7.37	9.39	11.09	12.30	13.24	**50yr**
100yr	1.01	1.52	1.91	2.75	3.78	4.50	**100yr**	3.26	4.40	5.30	7.20	8.83	10.20	12.02	**100yr**	9.03	11.56	13.78	15.10	16.05	**100yr**
200yr	1.19	1.79	2.26	3.28	4.57	5.45	**200yr**	3.94	5.33	6.47	8.86	10.82	12.52	14.82	**200yr**	11.08	14.25	17.15	18.53	19.46	**200yr**
500yr	1.49	2.22	2.85	4.14	5.89	7.05	**500yr**	5.08	6.89	8.41	11.70	14.17	16.44	19.52	**500yr**	14.55	18.77	22.91	24.33	25.10	**500yr**

23-28 Creek Drive



October 23, 2018

1:9,028

0 0.1 0.2 0.4 mi

0 0.175 0.35 0.7 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Author: HLD
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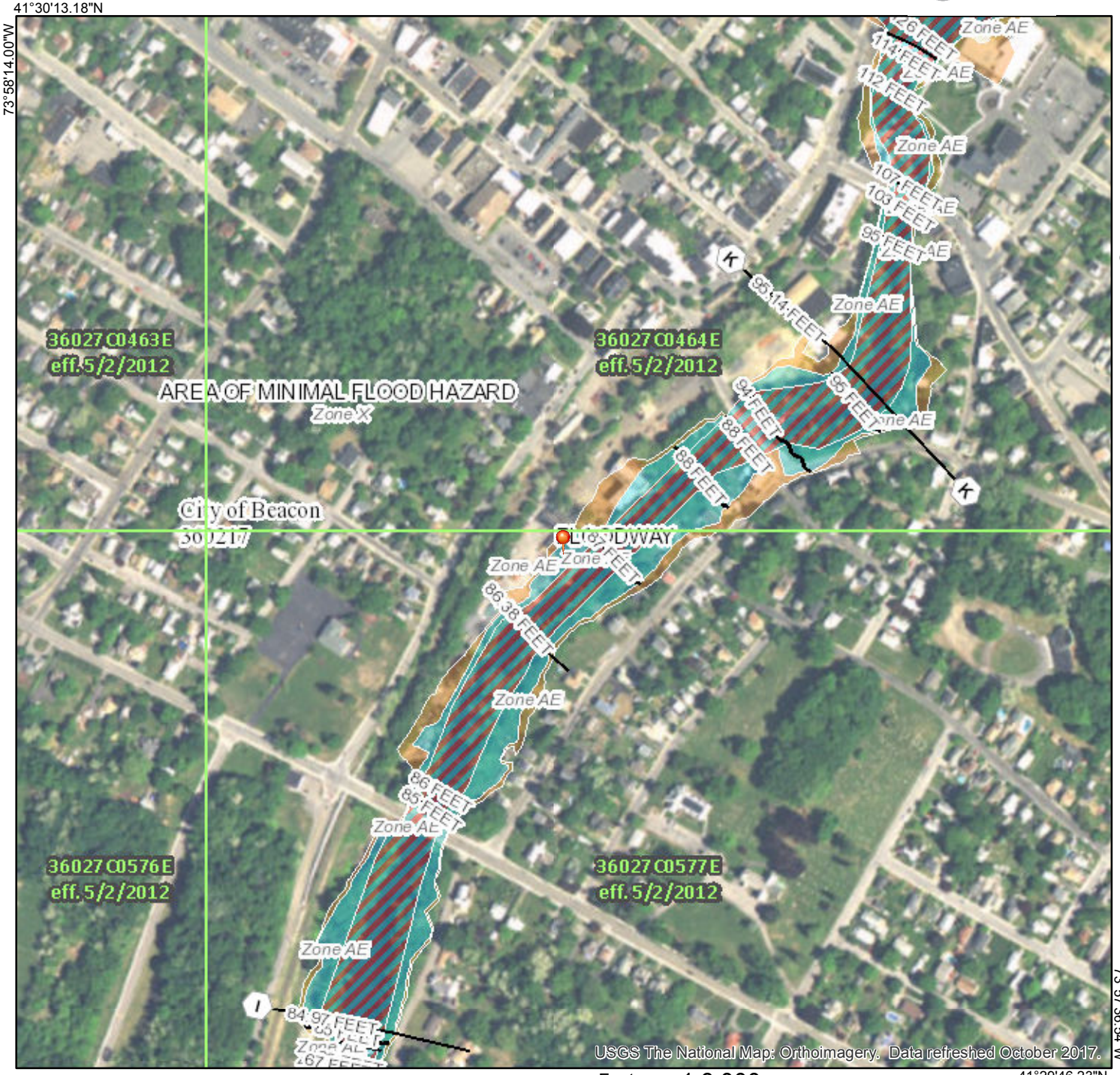
National Flood Hazard Layer FIRMette

FEMA



0 250 500 1,000 1,500 2,000 Feet

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- **SPECIAL FLOOD HAZARD AREAS**
  - Without Base Flood Elevation (BFE) *Zone A, V, A99*
  - With BFE or Depth *Zone AE, AO, AH, VE, AR*
  - Regulatory Floodway
- **OTHER AREAS OF FLOOD HAZARD**
  - 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
  - Future Conditions 1% Annual Chance Flood Hazard *Zone X*
  - Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
  - Area with Flood Risk due to Levee *Zone D*
- **OTHER AREAS**
  - NO SCREEN Area of Minimal Flood Hazard *Zone X*
  - Effective LOMRs
  - Area of Undetermined Flood Hazard *Zone D*
- **GENERAL STRUCTURES**
  - Channel, Culvert, or Storm Sewer
  - Levee, Dike, or Floodwall
- **OTHER FEATURES**
  - 20.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation
  - Coastal Transect
  - 513 Base Flood Elevation Line (BFE)
  - Limit of Study
  - Jurisdiction Boundary
  - Coastal Transect Baseline
  - Profile Baseline
  - Hydrographic Feature
- **MAP PANELS**
  - Digital Data Available
  - No Digital Data Available
  - Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 10/23/2018 at 9:53:29 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

U.S. Fish and Wildlife Service
National Wetlands Inventory

23-28 CREEK ROAD

October 22, 2018

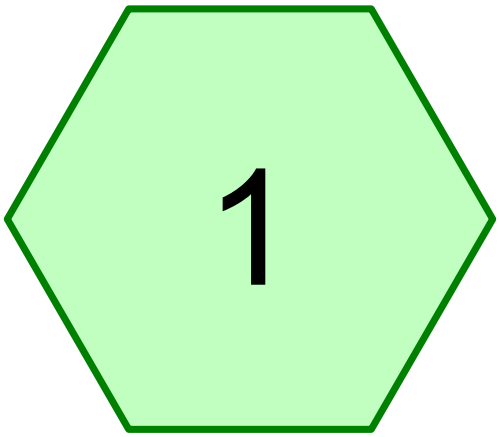
Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

APPENDIX D

PRE-DEVELOPMENT HYDROCAD MODEL



SUBCATCHMENT 1

Subcat Reach Pond Link

Routing Diagram for PRE
Prepared by Hudson Land Design

Summary for Subcatchment 1: SUBCATCHMENT 1

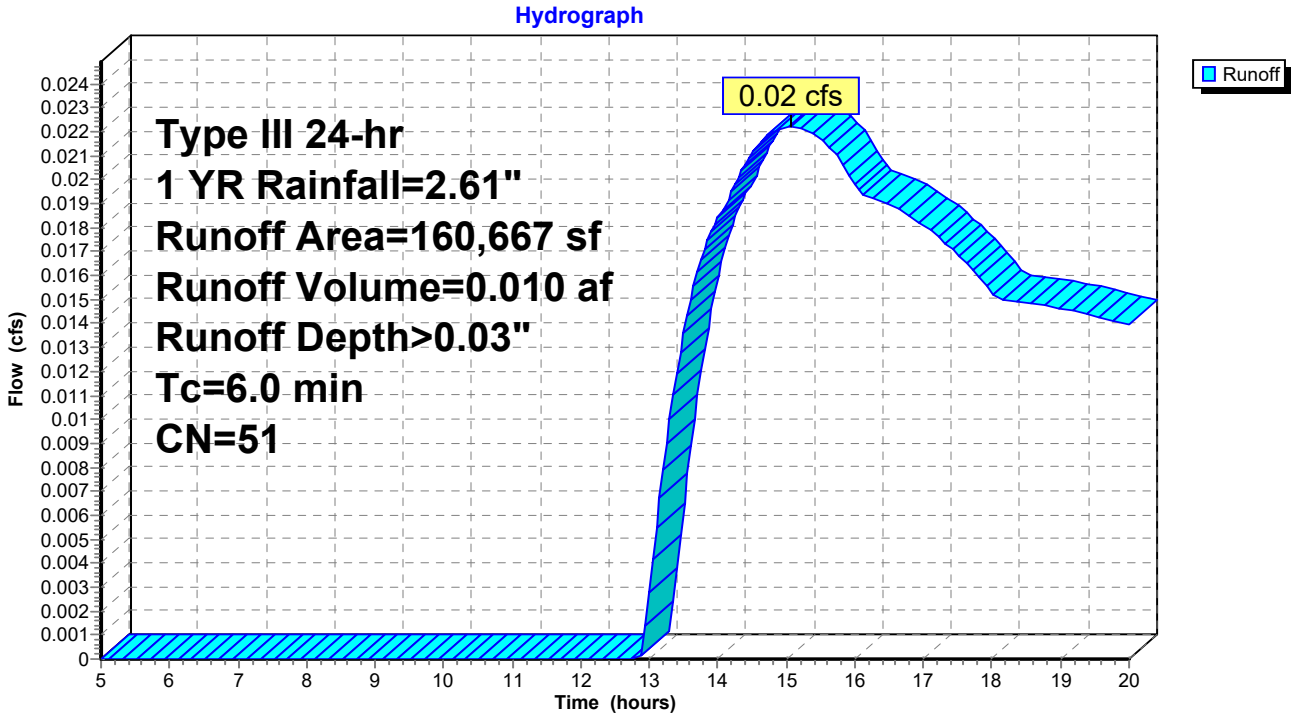
Runoff = 0.02 cfs @ 15.08 hrs, Volume= 0.010 af, Depth> 0.03"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YR Rainfall=2.61"

Area (sf)	CN	Description
48,660	98	Paved parking, HSG A
58,238	30	Woods, Good, HSG A
53,769	30	Meadow, non-grazed, HSG A
160,667	51	Weighted Average
112,007		69.71% Pervious Area
48,660		30.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, S1**

Subcatchment 1: SUBCATCHMENT 1



Summary for Subcatchment 1: SUBCATCHMENT 1

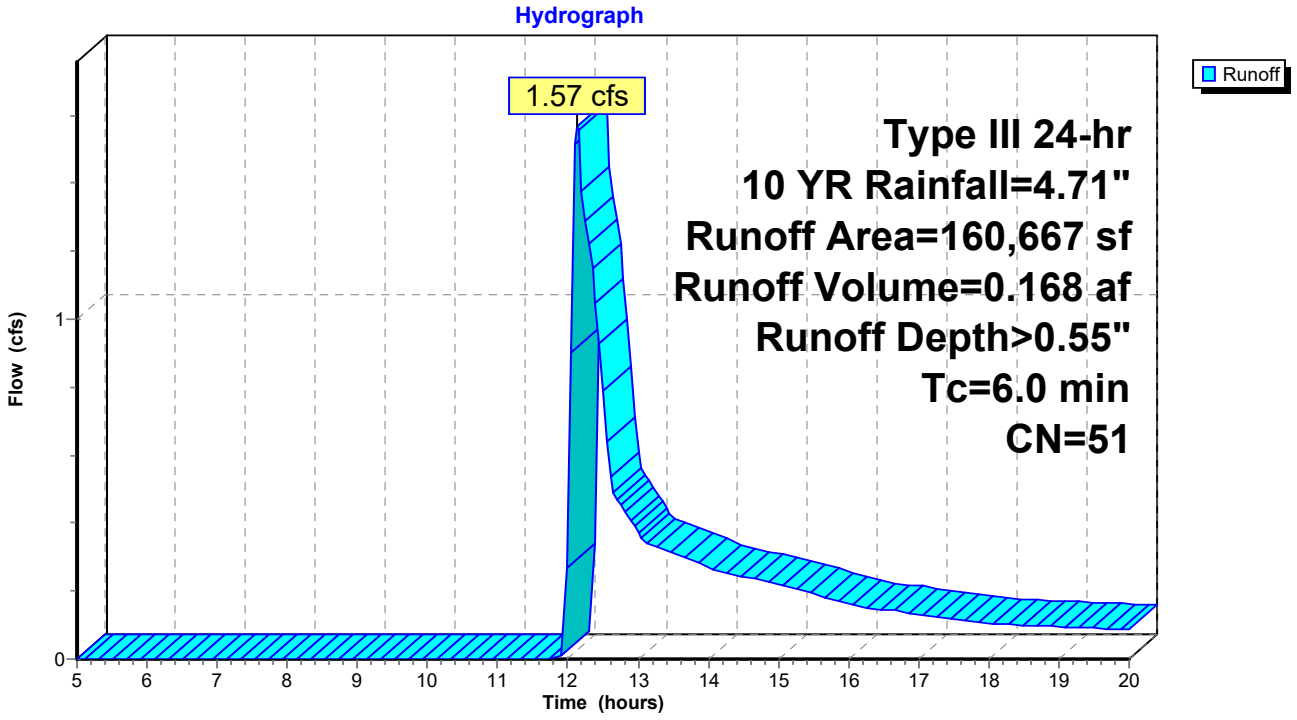
Runoff = 1.57 cfs @ 12.13 hrs, Volume= 0.168 af, Depth> 0.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.71"

Area (sf)	CN	Description
48,660	98	Paved parking, HSG A
58,238	30	Woods, Good, HSG A
53,769	30	Meadow, non-grazed, HSG A
160,667	51	Weighted Average
112,007		69.71% Pervious Area
48,660		30.29% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, S1**

Subcatchment 1: SUBCATCHMENT 1



Summary for Subcatchment 1: SUBCATCHMENT 1

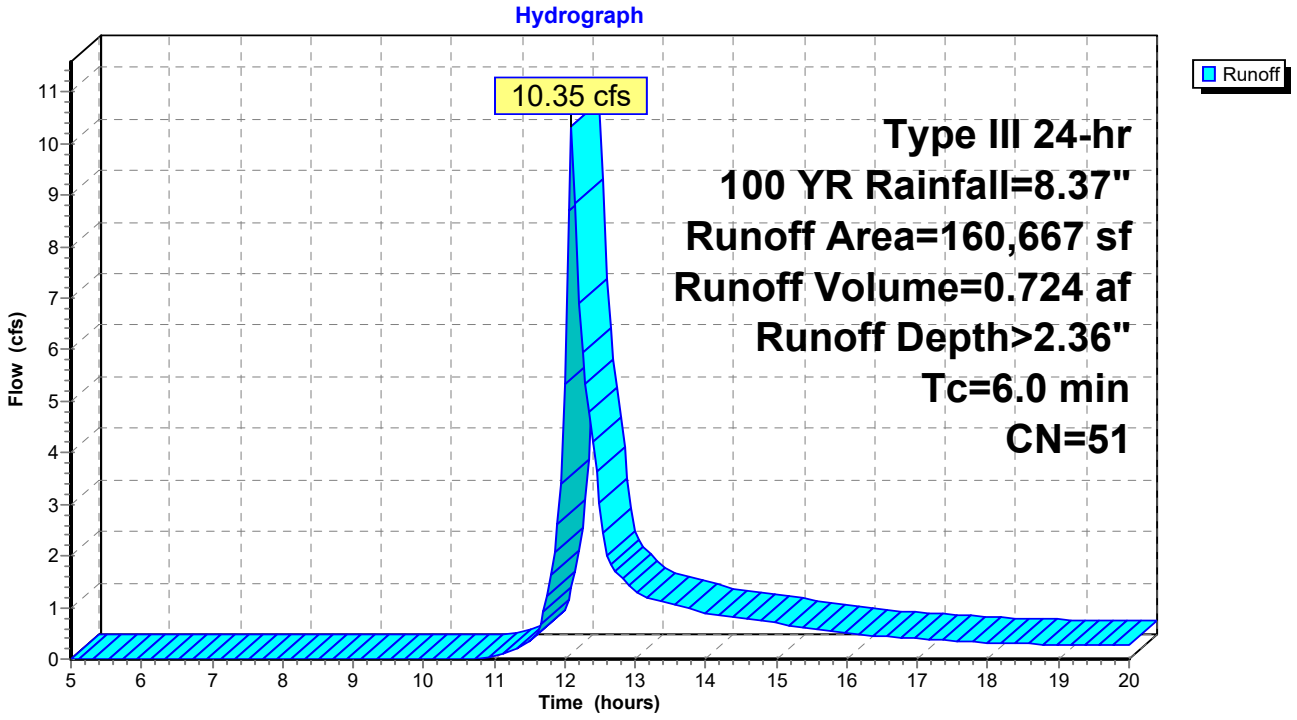
Runoff = 10.35 cfs @ 12.10 hrs, Volume= 0.724 af, Depth> 2.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.37"

Area (sf)	CN	Description
48,660	98	Paved parking, HSG A
58,238	30	Woods, Good, HSG A
53,769	30	Meadow, non-grazed, HSG A
160,667	51	Weighted Average
112,007		69.71% Pervious Area
48,660		30.29% Impervious Area

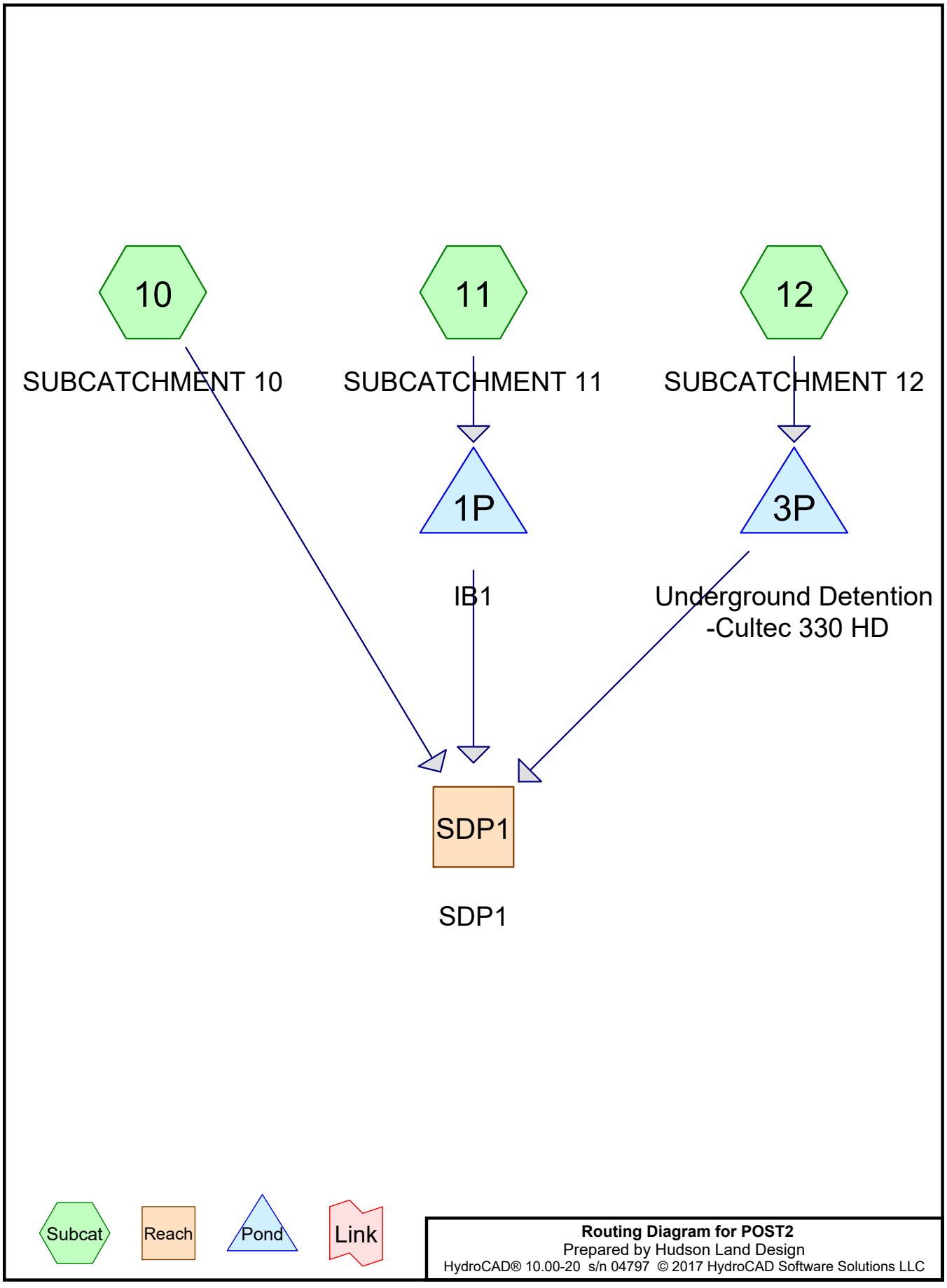
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, S1**

Subcatchment 1: SUBCATCHMENT 1



APPENDIX E

POST-DEVELOPMENT HYDROCAD MODEL



Routing Diagram for POST2
Prepared by Hudson Land Design

Summary for Subcatchment 10: SUBCATCHMENT 10

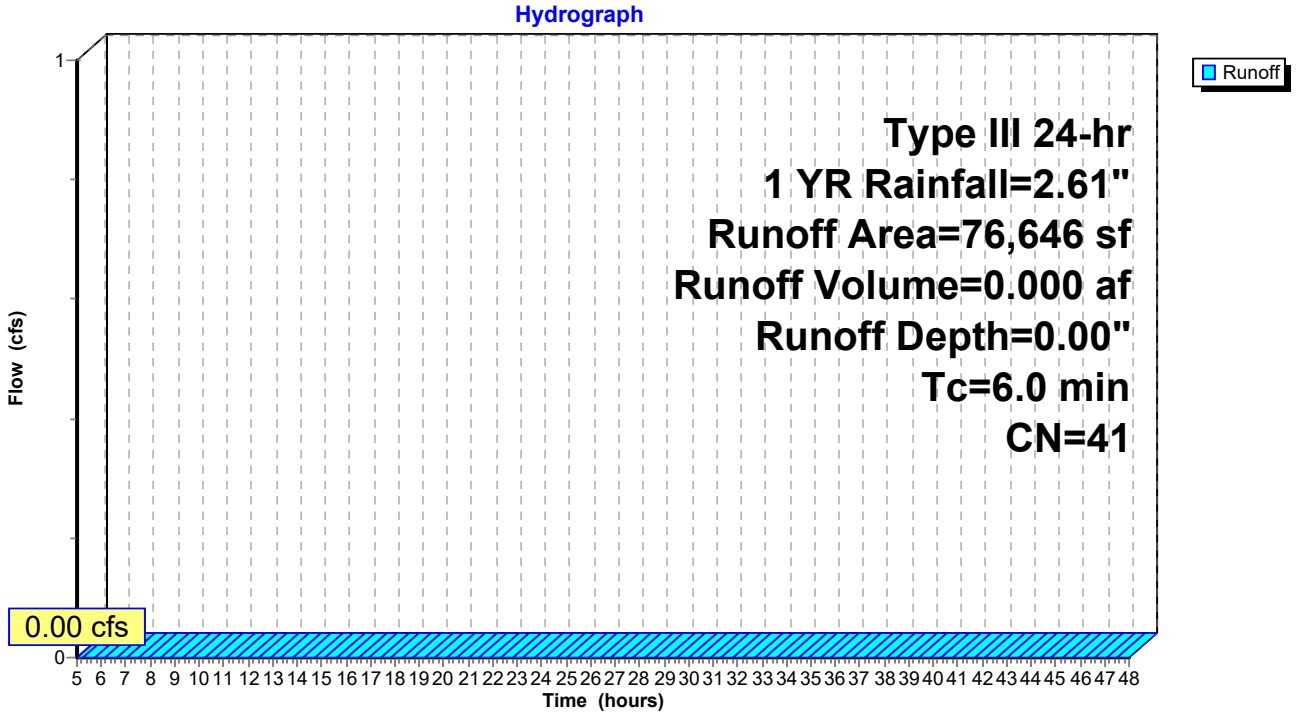
Runoff = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Depth= 0.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YR Rainfall=2.61"

Area (sf)	CN	Description
740	98	Paved parking, HSG A
37,514	30	Woods, Good, HSG A
30,748	39	>75% Grass cover, Good, HSG A
7,644	96	Gravel surface, HSG A
76,646	41	Weighted Average
75,906		99.03% Pervious Area
740		0.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, s1**

Subcatchment 10: SUBCATCHMENT 10



Summary for Subcatchment 11: SUBCATCHMENT 11

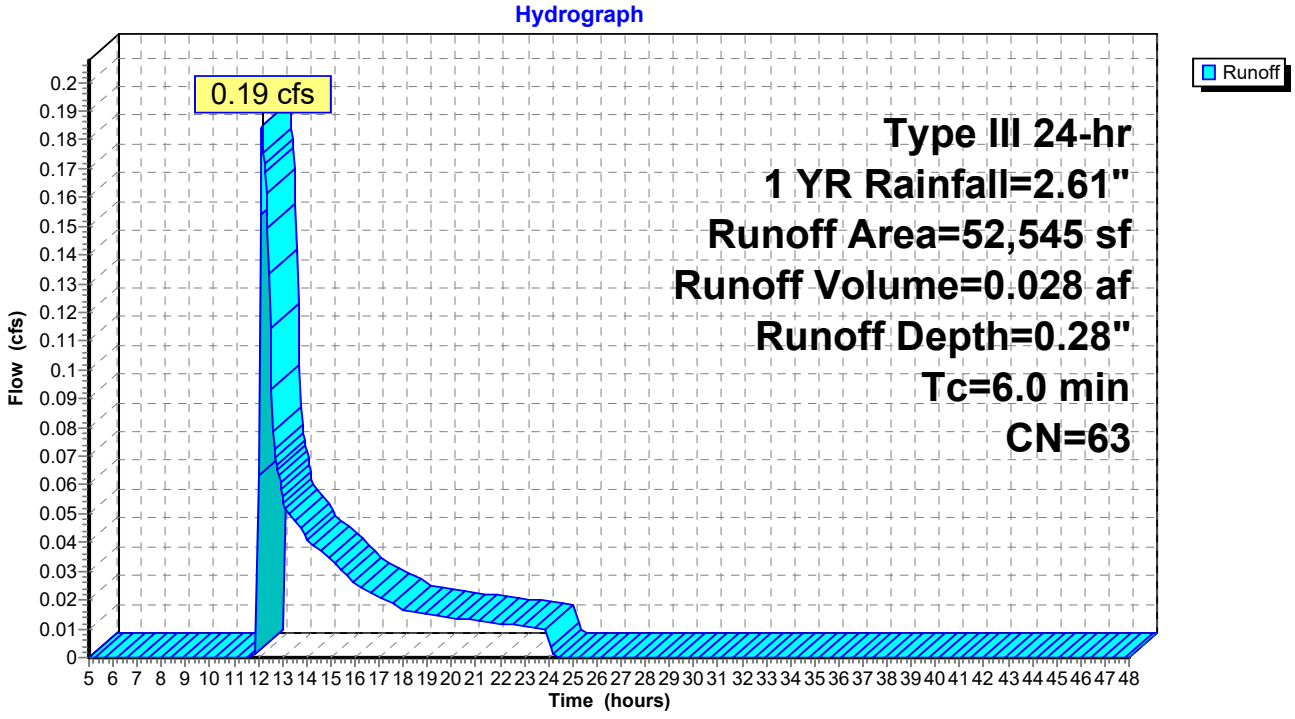
Runoff = 0.19 cfs @ 12.16 hrs, Volume= 0.028 af, Depth= 0.28"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YR Rainfall=2.61"

Area (sf)	CN	Description
22,913	98	Paved parking, HSG A
14,078	30	Woods, Good, HSG A
14,970	39	>75% Grass cover, Good, HSG A
584	96	Gravel surface, HSG A
52,545	63	Weighted Average
29,632		56.39% Pervious Area
22,913		43.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, S1**

Subcatchment 11: SUBCATCHMENT 11



Summary for Subcatchment 12: SUBCATCHMENT 12

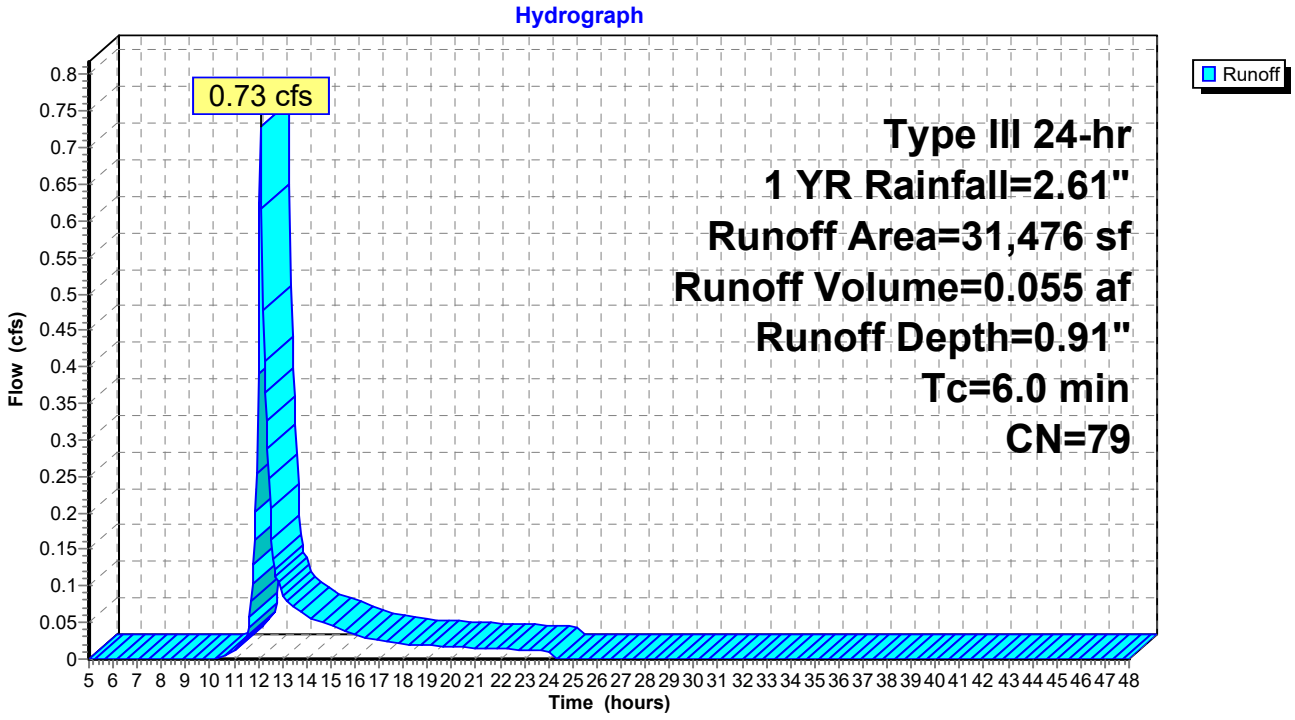
Runoff = 0.73 cfs @ 12.10 hrs, Volume= 0.055 af, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 1 YR Rainfall=2.61"

Area (sf)	CN	Description
21,963	98	Paved parking, HSG A
5,758	30	Woods, Good, HSG A
3,755	39	>75% Grass cover, Good, HSG A
31,476	79	Weighted Average
9,513		30.22% Pervious Area
21,963		69.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, S1**

Subcatchment 12: SUBCATCHMENT 12

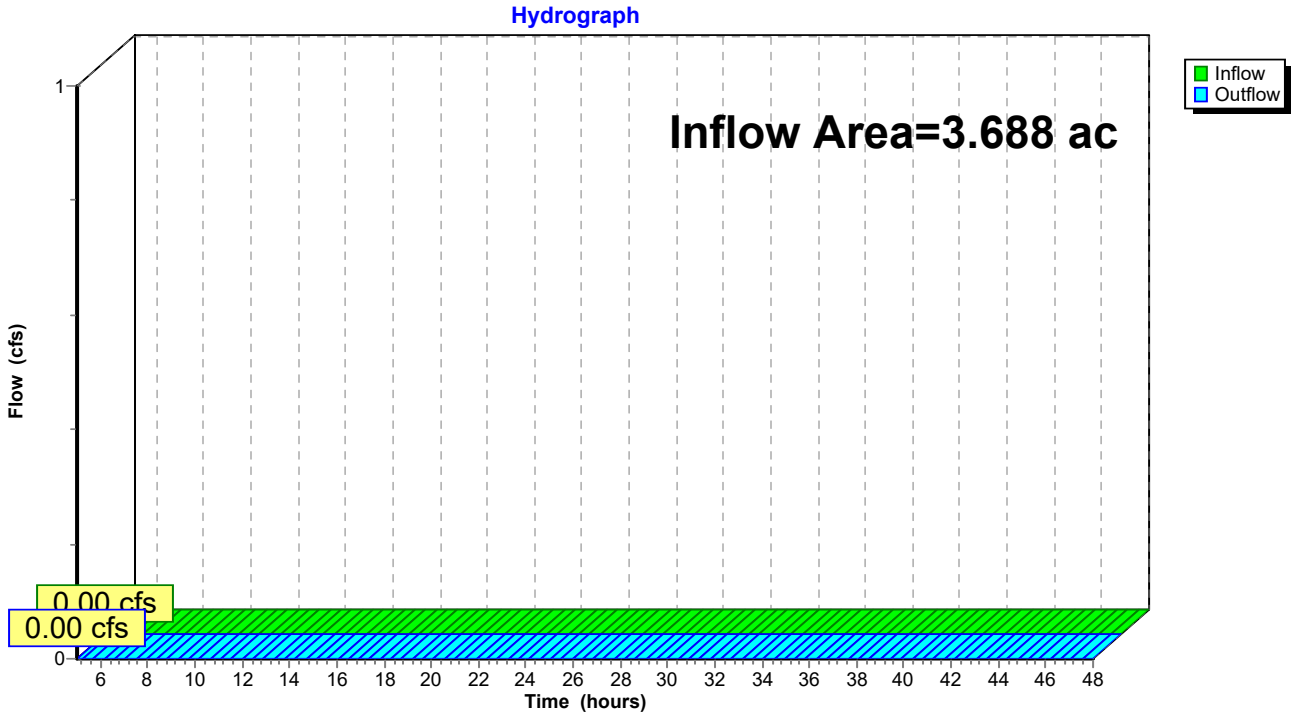


Summary for Reach SDP1: SDP1

Inflow Area = 3.688 ac, 28.39% Impervious, Inflow Depth = 0.00" for 1 YR event
Inflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs

Reach SDP1: SDP1



Summary for Pond 1P: IB1

Inflow Area = 1.206 ac, 43.61% Impervious, Inflow Depth = 0.28" for 1 YR event
Inflow = 0.19 cfs @ 12.16 hrs, Volume= 0.028 af
Outflow = 0.03 cfs @ 15.60 hrs, Volume= 0.028 af, Atten= 84%, Lag= 206.3 min
Discarded = 0.03 cfs @ 15.60 hrs, Volume= 0.028 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 88.61' @ 15.60 hrs Surf.Area= 867 sf Storage= 458 cf

Plug-Flow detention time= 251.0 min calculated for 0.028 af (100% of inflow)
Center-of-Mass det. time= 250.8 min (1,182.7 - 931.9)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	4,980 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

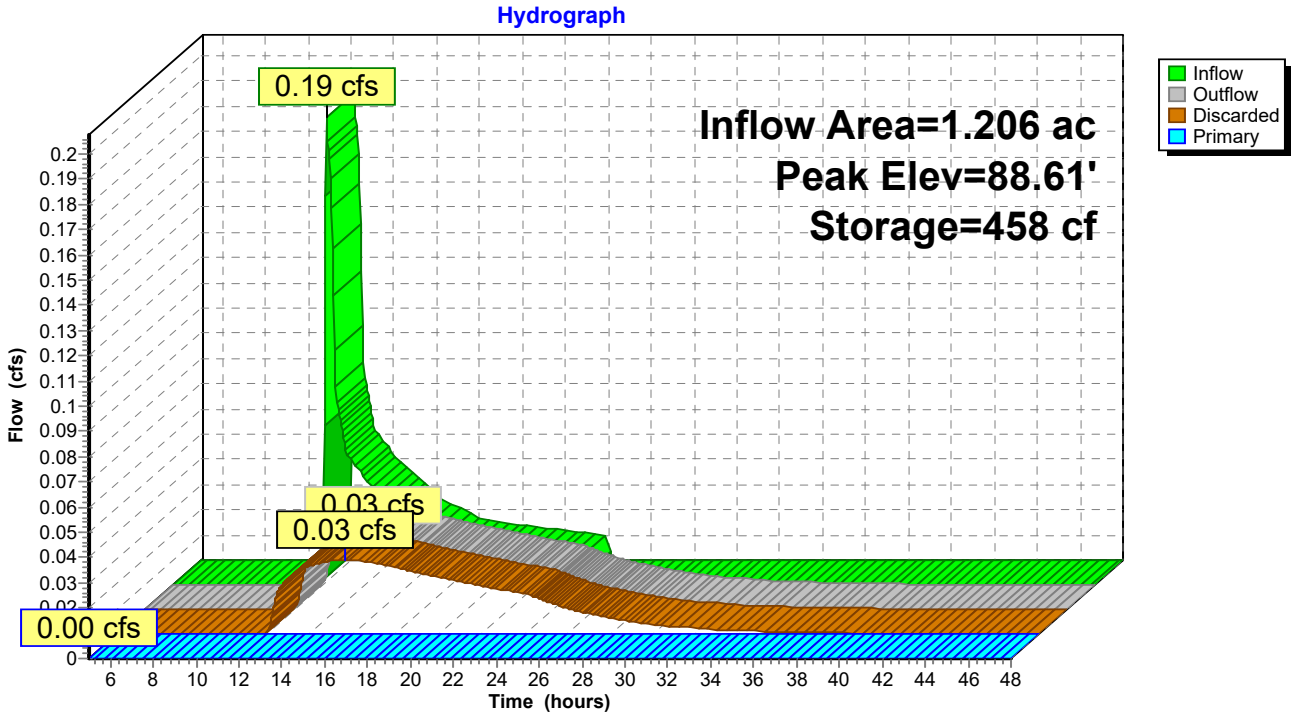
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.00	622	0	0
89.00	1,021	822	822
90.00	2,152	1,587	2,408
91.00	2,991	2,572	4,980

Device	Routing	Invert	Outlet Devices
#1	Primary	88.00'	**15.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 88.00' / 76.00' S= 0.3000 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	89.30'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	89.90'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	90.00'	**6.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#5	Discarded	88.00'	**5.000 in/hr Exfiltration over Surface area above 88.00'** Conductivity to Groundwater Elevation = 78.00' Excluded Surface area = 622 sf

Discarded OutFlow Max=0.03 cfs @ 15.60 hrs HW=88.61' (Free Discharge)
└**5=Exfiltration** (Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=88.00' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)
└**2=Orifice/Grate** (Controls 0.00 cfs)
└**3=Orifice/Grate** (Controls 0.00 cfs)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: IB1


Hydrograph
Inflow
Outflow
Discarded
Primary
0.19 cfs
0.03 cfs
0.03 cfs
0.00 cfs
Inflow Area=1.206 ac
Peak Elev=88.61'
Storage=458 cf
Flow (cfs)
Time (hours)

Summary for Pond 3P: Underground Detention -Cultec 330 HD

Inflow Area = 0.723 ac, 69.78% Impervious, Inflow Depth = 0.91" for 1 YR event
Inflow = 0.73 cfs @ 12.10 hrs, Volume= 0.055 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 83.35' @ 24.40 hrs Surf.Area= 1,599 sf Storage= 2,392 cf

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

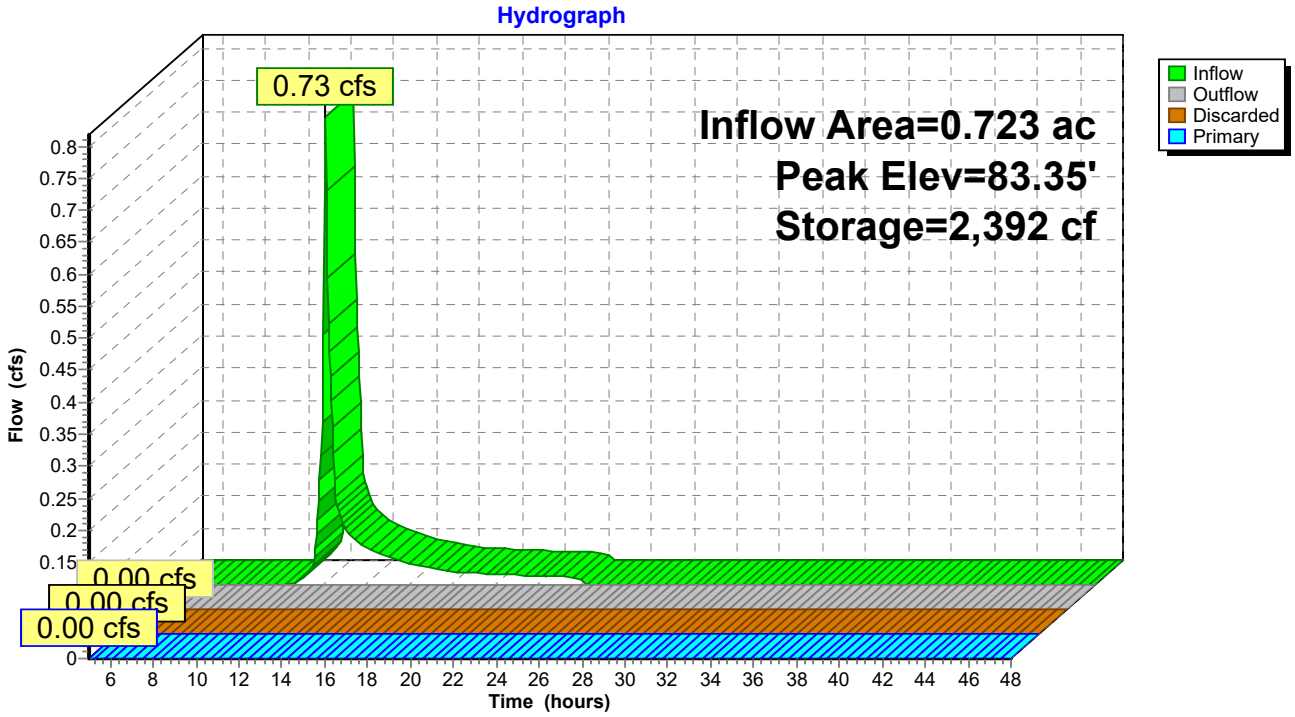
Volume	Invert	Avail.Storage	Storage Description
#1	81.00'	2,136 cf	**35.66'W x 44.84'L x 4.71'H Prismatoid** 7,531 cf Overall - 2,191 cf Embedded = 5,341 cf x 40.0% Voids
#2	82.00'	2,191 cf	**Cultec R-330XLHD** x 42 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap
		4,327 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	82.00'	**18.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 82.00' / 70.00' S= 0.3000 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	83.70'	**9.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	85.10'	**21.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Discarded	81.00'	**5.000 in/hr Exfiltration over Surface area above 81.00'** Conductivity to Groundwater Elevation = 70.00' Excluded Surface area = 1,599 sf

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=81.00' (Free Discharge)
└**4=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=81.00' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 3P: Underground Detention -Cultec 330 HD



Summary for Subcatchment 10: SUBCATCHMENT 10

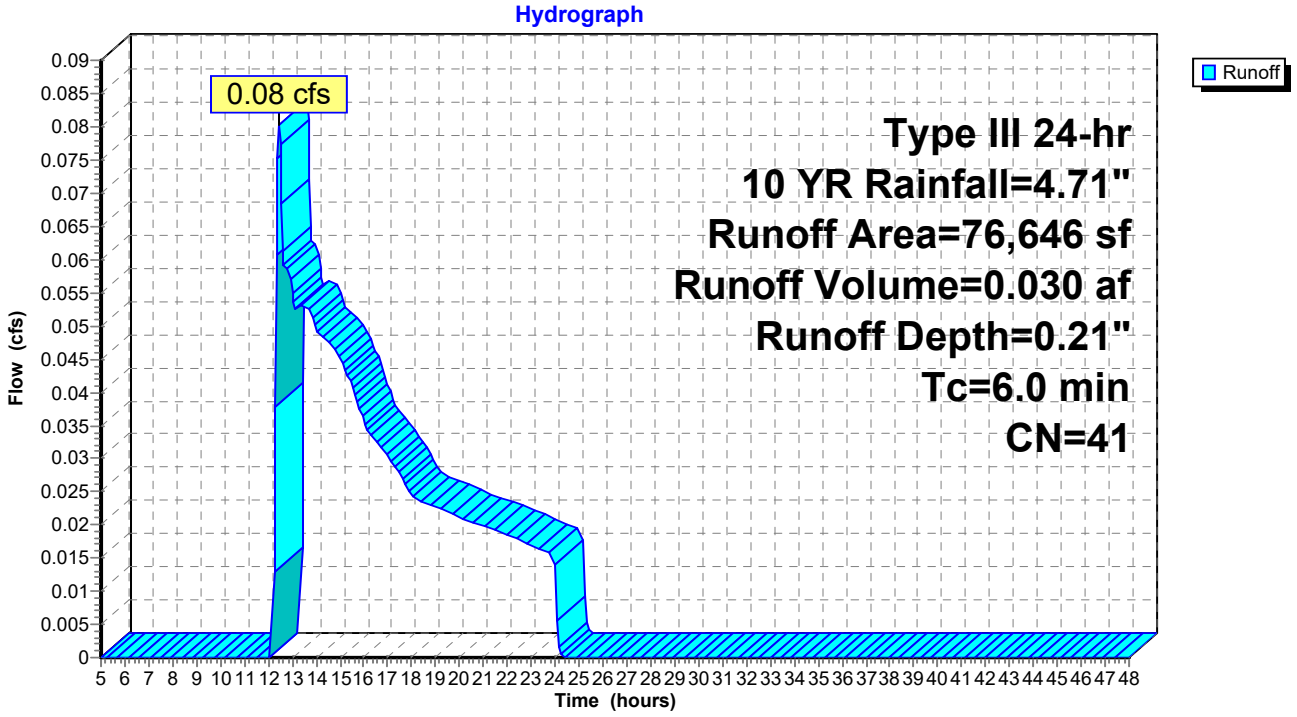
Runoff = 0.08 cfs @ 12.46 hrs, Volume= 0.030 af, Depth= 0.21"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.71"

Area (sf)	CN	Description
740	98	Paved parking, HSG A
37,514	30	Woods, Good, HSG A
30,748	39	>75% Grass cover, Good, HSG A
7,644	96	Gravel surface, HSG A
76,646	41	Weighted Average
75,906		99.03% Pervious Area
740		0.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, s1**

Subcatchment 10: SUBCATCHMENT 10



Summary for Subcatchment 11: SUBCATCHMENT 11

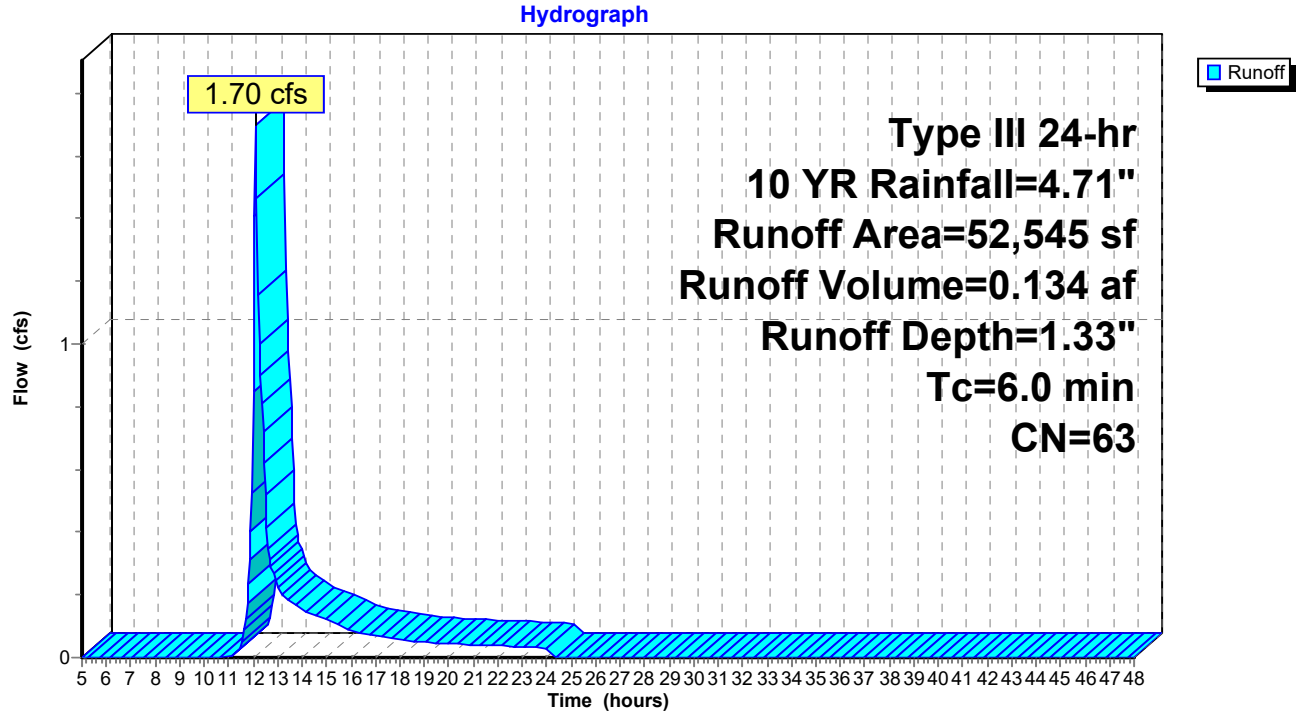
Runoff = 1.70 cfs @ 12.10 hrs, Volume= 0.134 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.71"

Area (sf)	CN	Description
22,913	98	Paved parking, HSG A
14,078	30	Woods, Good, HSG A
14,970	39	>75% Grass cover, Good, HSG A
584	96	Gravel surface, HSG A
52,545	63	Weighted Average
29,632		56.39% Pervious Area
22,913		43.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, S1**

Subcatchment 11: SUBCATCHMENT 11



Summary for Subcatchment 12: SUBCATCHMENT 12

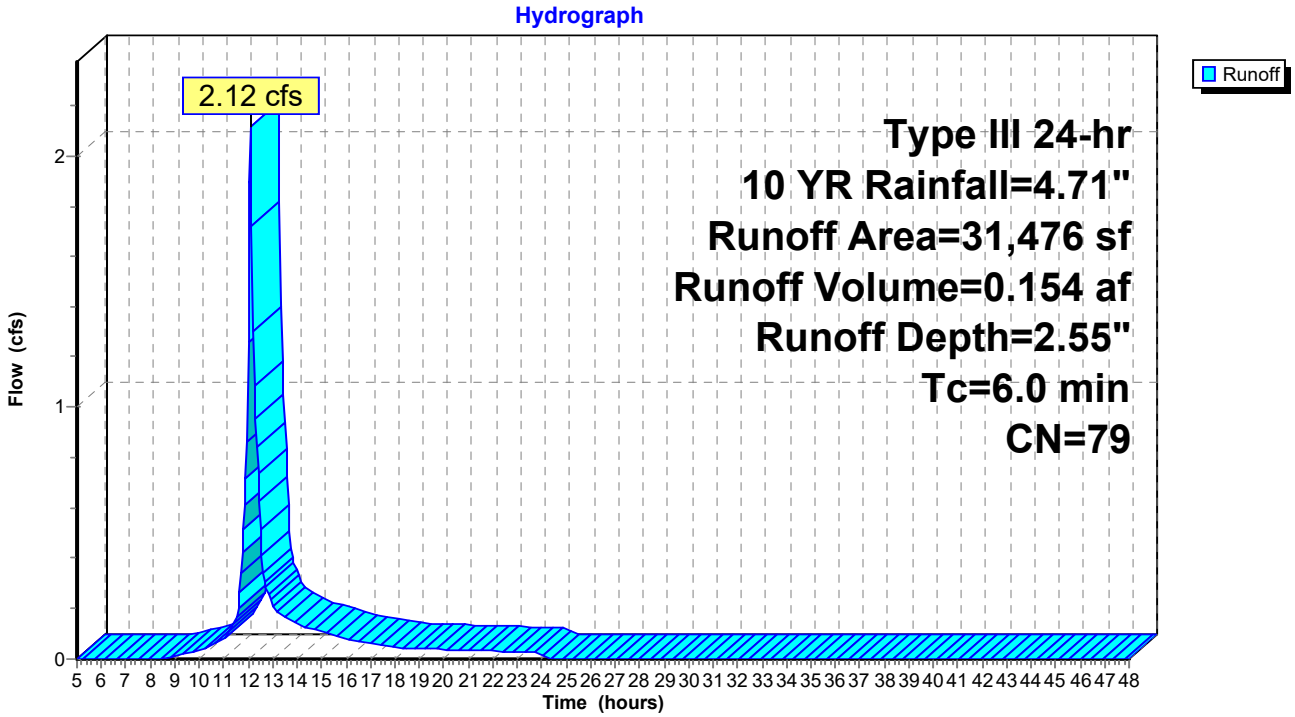
Runoff = 2.12 cfs @ 12.09 hrs, Volume= 0.154 af, Depth= 2.55"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 YR Rainfall=4.71"

Area (sf)	CN	Description
21,963	98	Paved parking, HSG A
5,758	30	Woods, Good, HSG A
3,755	39	>75% Grass cover, Good, HSG A
31,476	79	Weighted Average
9,513		30.22% Pervious Area
21,963		69.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, S1**

Subcatchment 12: SUBCATCHMENT 12

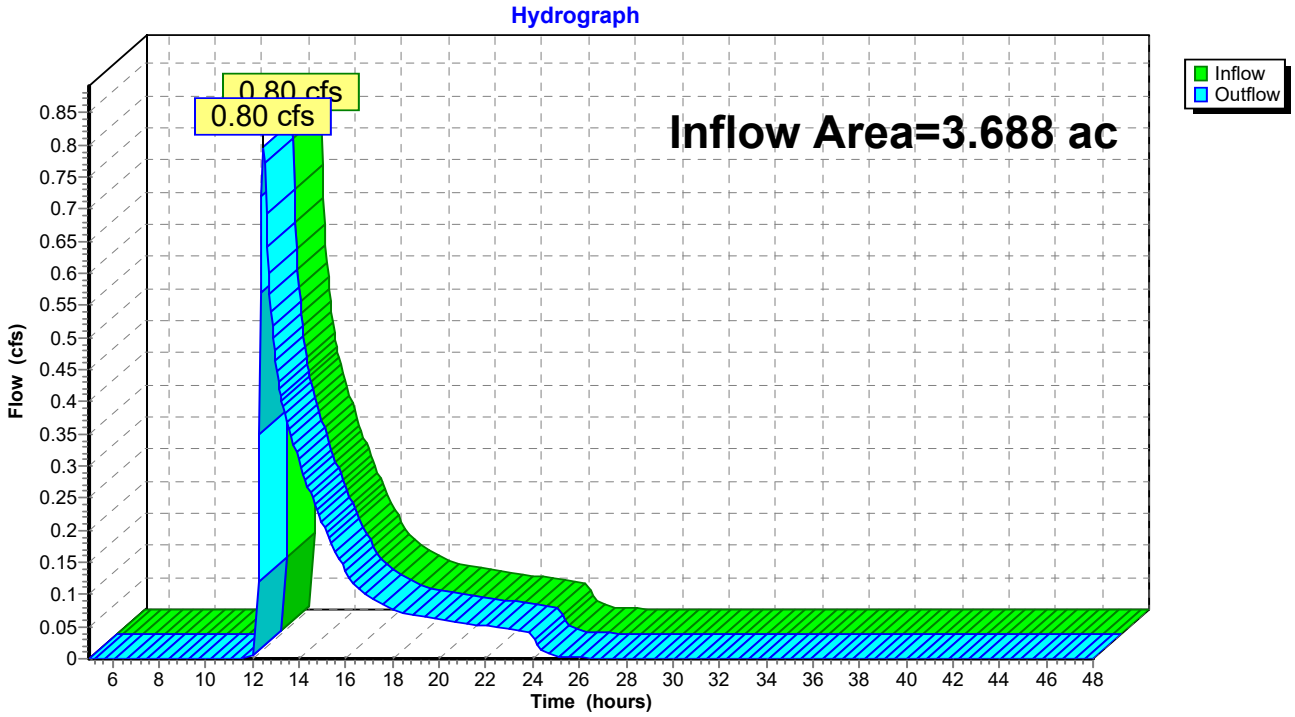


Summary for Reach SDP1: SDP1

Inflow Area = 3.688 ac, 28.39% Impervious, Inflow Depth = 0.48" for 10 YR event
Inflow = 0.80 cfs @ 12.48 hrs, Volume= 0.149 af
Outflow = 0.80 cfs @ 12.48 hrs, Volume= 0.149 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs

Reach SDP1: SDP1



Summary for Pond 1P: IB1

Inflow Area = 1.206 ac, 43.61% Impervious, Inflow Depth = 1.33" for 10 YR event
Inflow = 1.70 cfs @ 12.10 hrs, Volume= 0.134 af
Outflow = 0.31 cfs @ 12.66 hrs, Volume= 0.134 af, Atten= 82%, Lag= 33.4 min
Discarded = 0.16 cfs @ 12.66 hrs, Volume= 0.104 af
Primary = 0.15 cfs @ 12.66 hrs, Volume= 0.029 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 89.82' @ 12.66 hrs Surf.Area= 1,949 sf Storage= 2,040 cf

Plug-Flow detention time= 179.2 min calculated for 0.133 af (100% of inflow)
Center-of-Mass det. time= 180.2 min (1,050.8 - 870.5)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	4,980 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

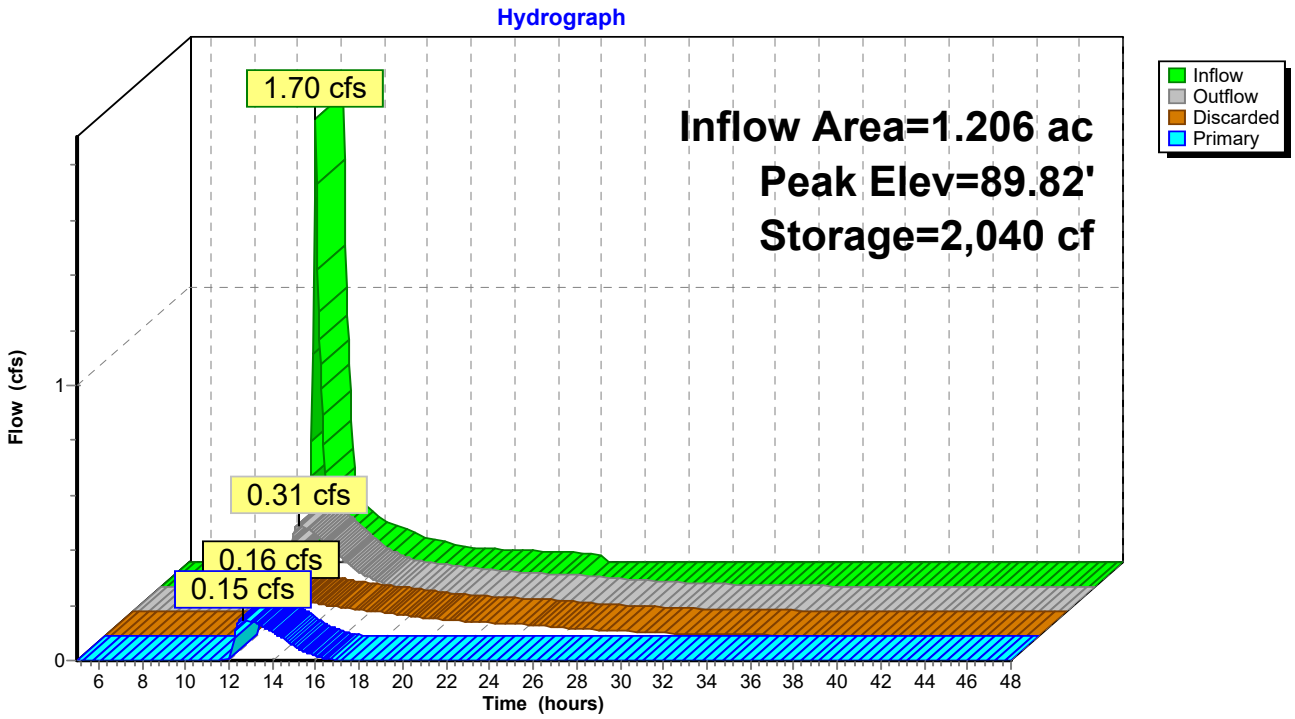
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.00	622	0	0
89.00	1,021	822	822
90.00	2,152	1,587	2,408
91.00	2,991	2,572	4,980

Device	Routing	Invert	Outlet Devices
#1	Primary	88.00'	**15.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 88.00' / 76.00' S= 0.3000 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	89.30'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	89.90'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	90.00'	**6.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#5	Discarded	88.00'	**5.000 in/hr Exfiltration over Surface area above 88.00'** Conductivity to Groundwater Elevation = 78.00' Excluded Surface area = 622 sf

Discarded OutFlow Max=0.16 cfs @ 12.66 hrs HW=89.82' (Free Discharge)
└**5=Exfiltration** (Controls 0.16 cfs)

Primary OutFlow Max=0.15 cfs @ 12.66 hrs HW=89.82' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.15 cfs of 6.46 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 0.15 cfs @ 3.03 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: IB1


Hydrograph
1.70 cfs
0.31 cfs
0.16 cfs
0.15 cfs
Inflow Area=1.206 ac
Peak Elev=89.82'
Storage=2,040 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
0
1
6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
Time (hours)

Summary for Pond 3P: Underground Detention -Cultec 330 HD

Inflow Area = 0.723 ac, 69.78% Impervious, Inflow Depth = 2.55" for 10 YR event
Inflow = 2.12 cfs @ 12.09 hrs, Volume= 0.154 af
Outflow = 0.57 cfs @ 12.48 hrs, Volume= 0.089 af, Atten= 73%, Lag= 23.0 min
Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.57 cfs @ 12.48 hrs, Volume= 0.089 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 84.08' @ 12.48 hrs Surf.Area= 1,599 sf Storage= 3,213 cf

Plug-Flow detention time= 218.7 min calculated for 0.089 af (58% of inflow)
Center-of-Mass det. time= 109.4 min (936.5 - 827.1)

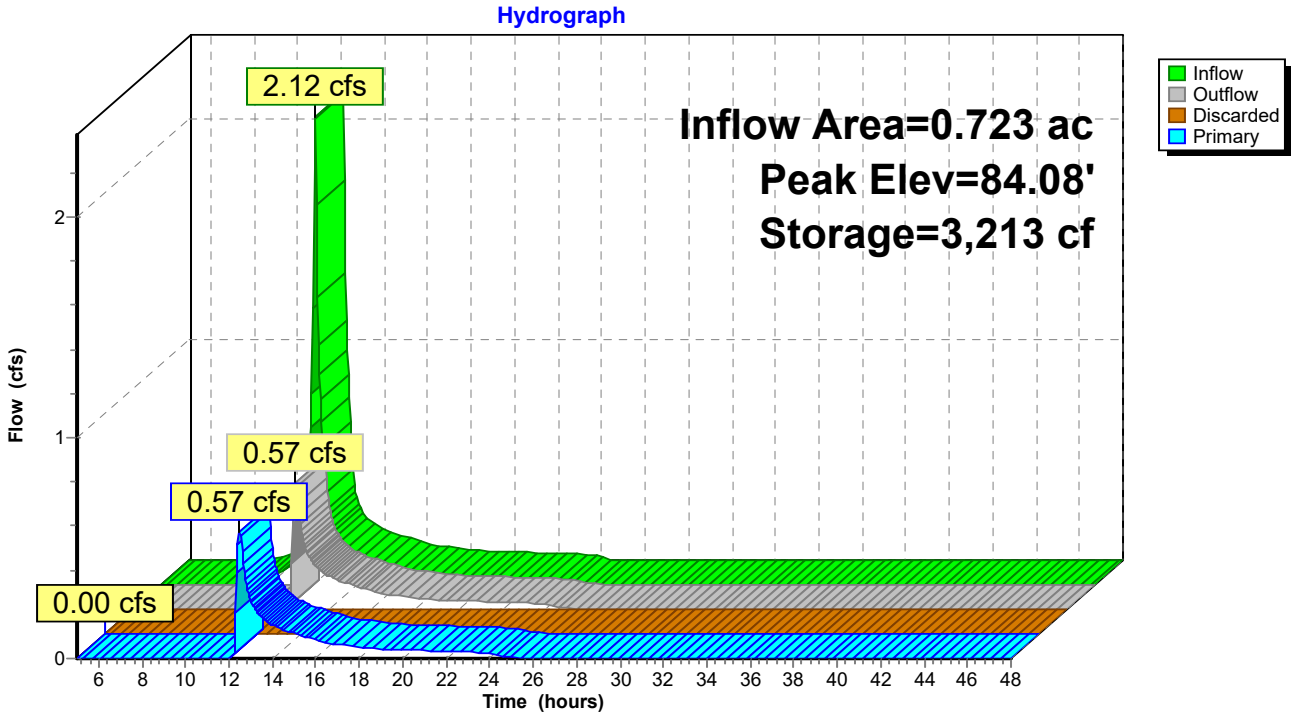
Volume	Invert	Avail.Storage	Storage Description
#1	81.00'	2,136 cf	**35.66'W x 44.84'L x 4.71'H Prismatoid** 7,531 cf Overall - 2,191 cf Embedded = 5,341 cf x 40.0% Voids
#2	82.00'	2,191 cf	**Cultec R-330XLHD** x 42 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap
		4,327 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	82.00'	**18.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 82.00' / 70.00' S= 0.3000 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	83.70'	**9.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	85.10'	**21.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Discarded	81.00'	**5.000 in/hr Exfiltration over Surface area above 81.00'** Conductivity to Groundwater Elevation = 70.00' Excluded Surface area = 1,599 sf

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=81.00' (Free Discharge)
└**4=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.57 cfs @ 12.48 hrs HW=84.08' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.57 cfs of 9.82 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.57 cfs @ 1.99 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 3P: Underground Detention -Cultec 330 HD



Summary for Subcatchment 10: SUBCATCHMENT 10

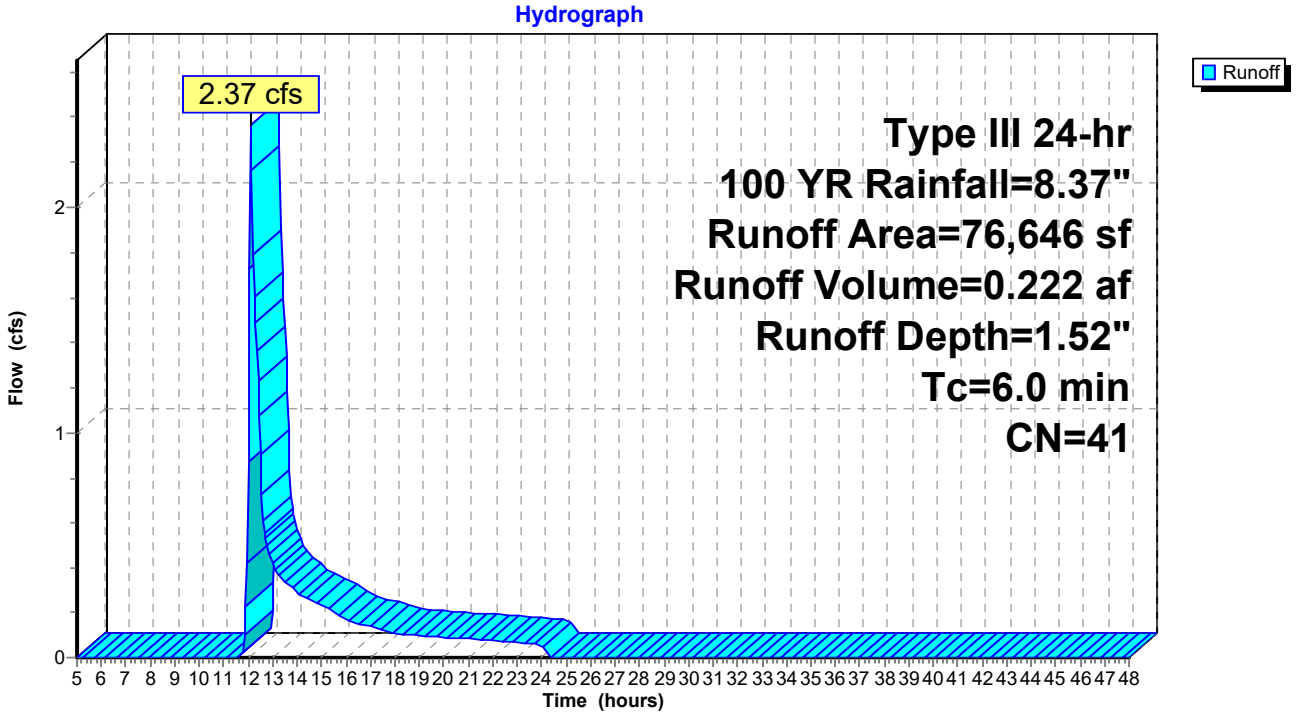
Runoff = 2.37 cfs @ 12.11 hrs, Volume= 0.222 af, Depth= 1.52"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.37"

Area (sf)	CN	Description
740	98	Paved parking, HSG A
37,514	30	Woods, Good, HSG A
30,748	39	>75% Grass cover, Good, HSG A
7,644	96	Gravel surface, HSG A
76,646	41	Weighted Average
75,906		99.03% Pervious Area
740		0.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, s1**

Subcatchment 10: SUBCATCHMENT 10



Summary for Subcatchment 11: SUBCATCHMENT 11

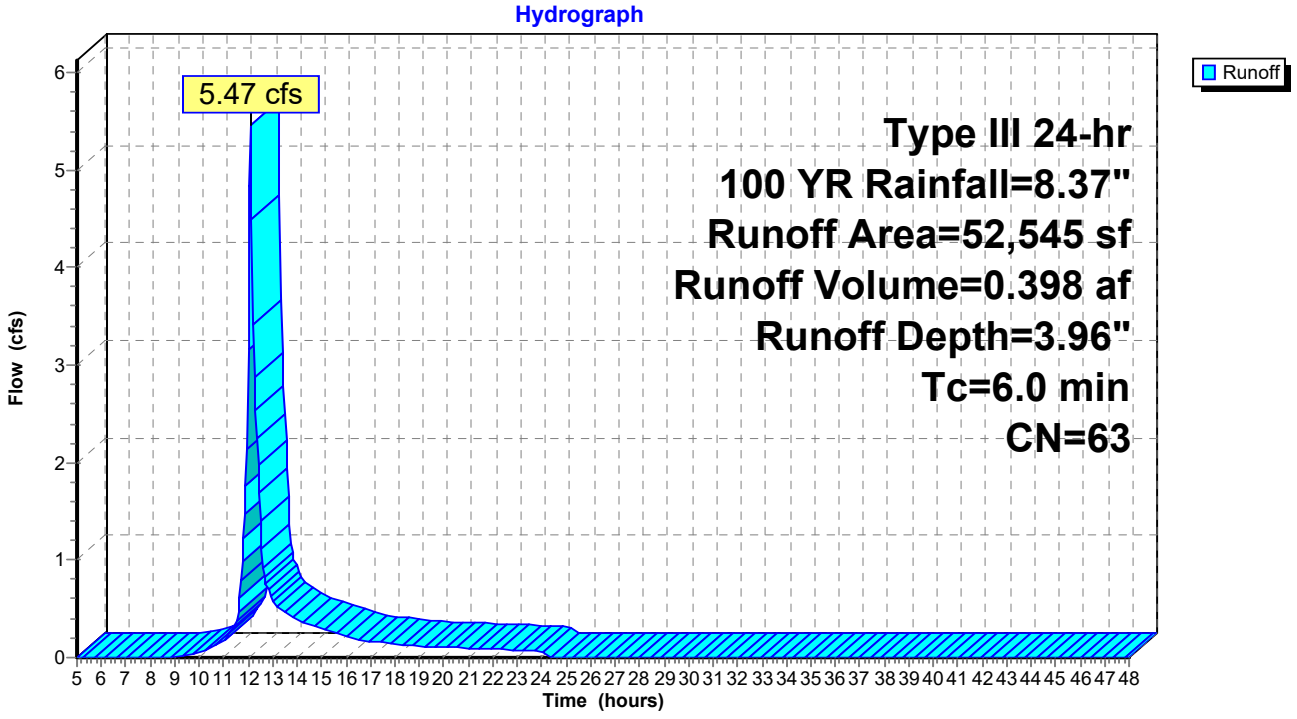
Runoff = 5.47 cfs @ 12.09 hrs, Volume= 0.398 af, Depth= 3.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.37"

Area (sf)	CN	Description
22,913	98	Paved parking, HSG A
14,078	30	Woods, Good, HSG A
14,970	39	>75% Grass cover, Good, HSG A
584	96	Gravel surface, HSG A
52,545	63	Weighted Average
29,632		56.39% Pervious Area
22,913		43.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, S1**

Subcatchment 11: SUBCATCHMENT 11



Summary for Subcatchment 12: SUBCATCHMENT 12

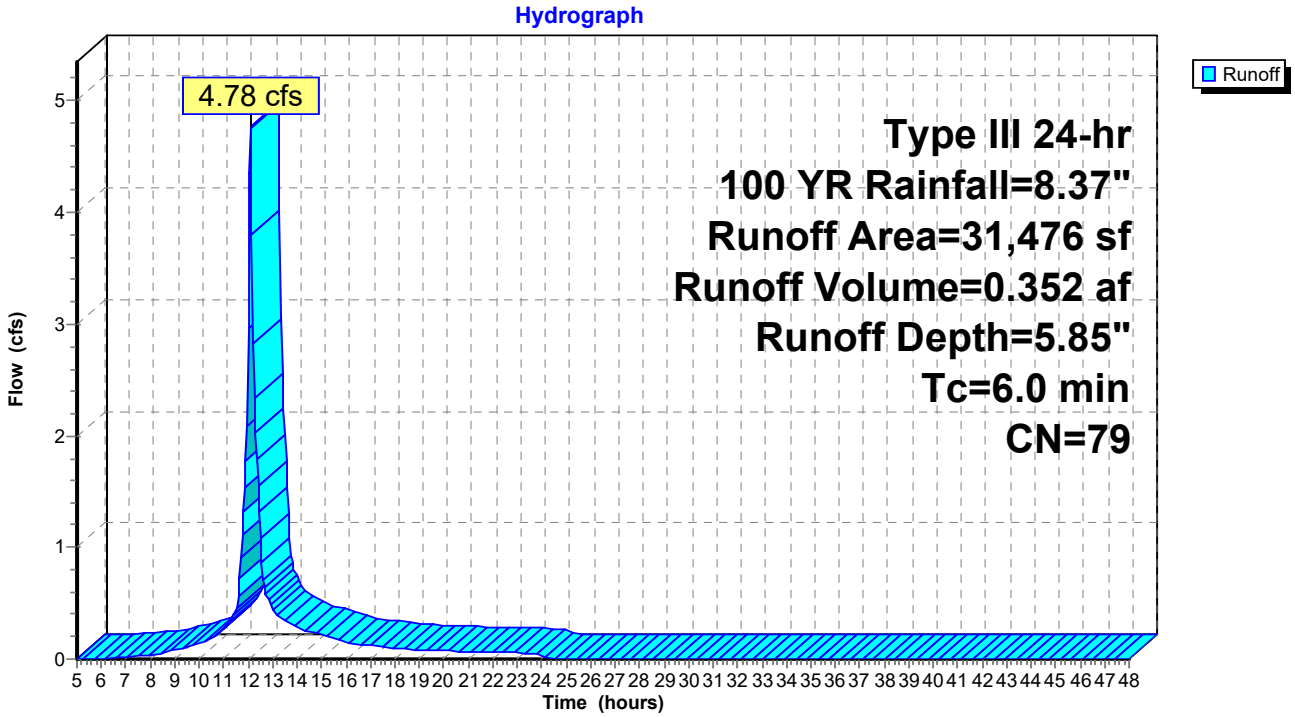
Runoff = 4.78 cfs @ 12.09 hrs, Volume= 0.352 af, Depth= 5.85"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=8.37"

Area (sf)	CN	Description
21,963	98	Paved parking, HSG A
5,758	30	Woods, Good, HSG A
3,755	39	>75% Grass cover, Good, HSG A
31,476	79	Weighted Average
9,513		30.22% Pervious Area
21,963		69.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, S1**

Subcatchment 12: SUBCATCHMENT 12

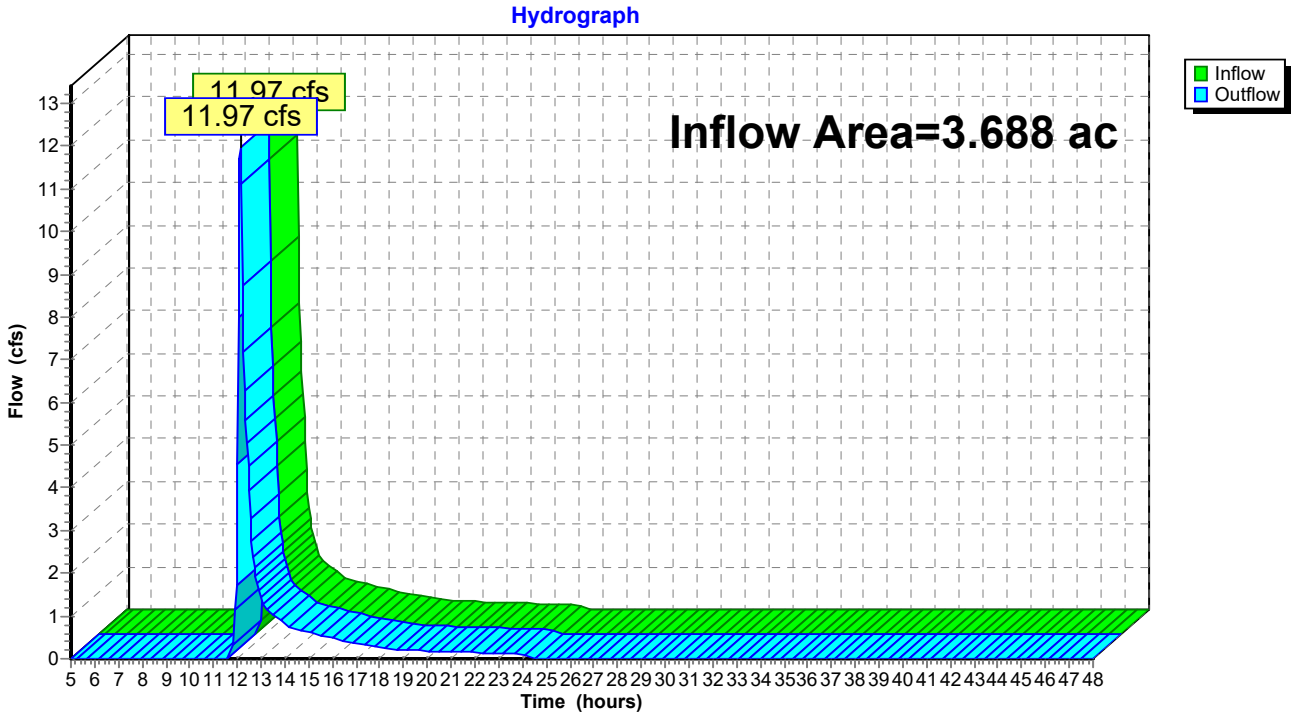


Summary for Reach SDP1: SDP1

Inflow Area = 3.688 ac, 28.39% Impervious, Inflow Depth = 2.43" for 100 YR event
Inflow = 11.97 cfs @ 12.12 hrs, Volume= 0.745 af
Outflow = 11.97 cfs @ 12.12 hrs, Volume= 0.745 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs

Reach SDP1: SDP1



Summary for Pond 1P: IB1

Inflow Area = 1.206 ac, 43.61% Impervious, Inflow Depth = 3.96" for 100 YR event
Inflow = 5.47 cfs @ 12.09 hrs, Volume= 0.398 af
Outflow = 5.39 cfs @ 12.11 hrs, Volume= 0.398 af, Atten= 2%, Lag= 0.9 min
Discarded = 0.20 cfs @ 12.11 hrs, Volume= 0.163 af
Primary = 5.19 cfs @ 12.11 hrs, Volume= 0.235 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 90.10' @ 12.11 hrs Surf.Area= 2,233 sf Storage= 2,620 cf

Plug-Flow detention time= 88.6 min calculated for 0.398 af (100% of inflow)
Center-of-Mass det. time= 89.7 min (927.0 - 837.4)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	4,980 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

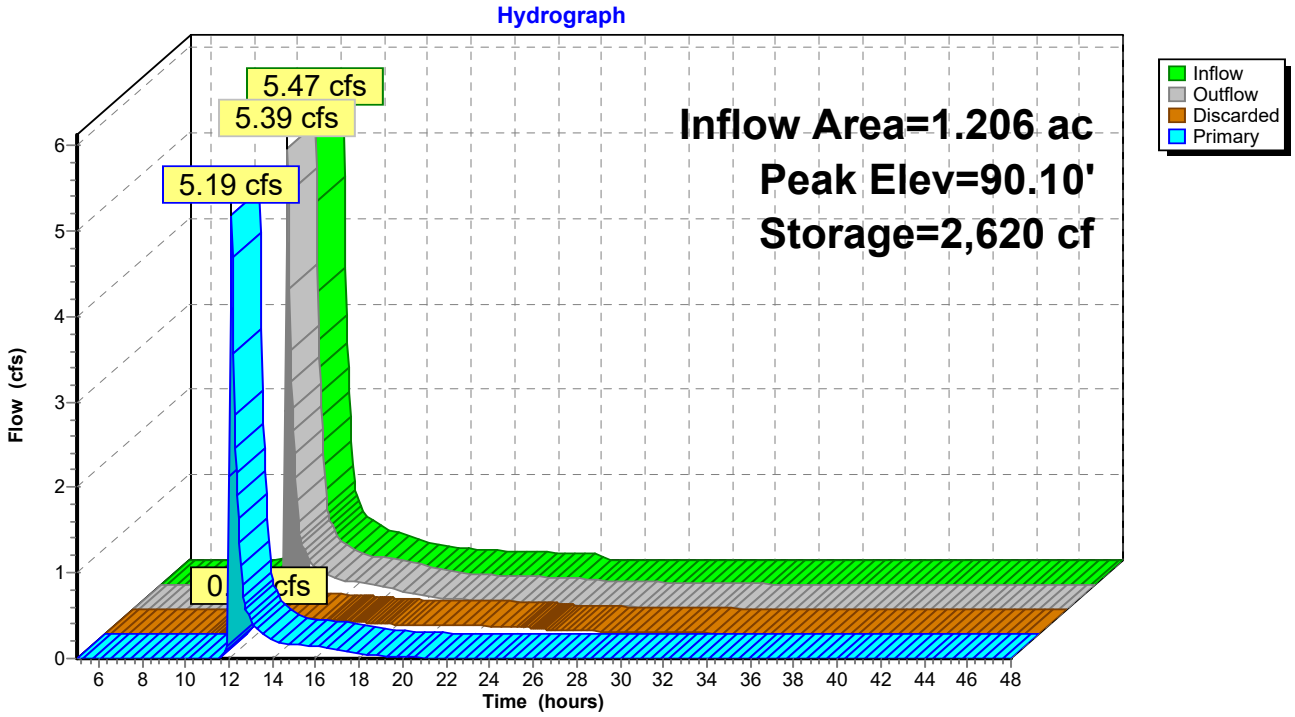
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.00	622	0	0
89.00	1,021	822	822
90.00	2,152	1,587	2,408
91.00	2,991	2,572	4,980

Device	Routing	Invert	Outlet Devices
#1	Primary	88.00'	**15.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 88.00' / 76.00' S= 0.3000 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	89.30'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	89.90'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	90.00'	**6.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#5	Discarded	88.00'	**5.000 in/hr Exfiltration over Surface area above 88.00'** Conductivity to Groundwater Elevation = 78.00' Excluded Surface area = 622 sf

Discarded OutFlow Max=0.20 cfs @ 12.11 hrs HW=90.09' (Free Discharge)
└**5=Exfiltration** (Controls 0.20 cfs)

Primary OutFlow Max=5.06 cfs @ 12.11 hrs HW=90.09' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 4.64 cfs of 7.16 cfs potential flow)
  └**2=Orifice/Grate** (Orifice Controls 0.19 cfs @ 3.94 fps)
  └**3=Orifice/Grate** (Weir Controls 4.45 cfs @ 1.44 fps)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 0.42 cfs @ 0.74 fps)

Pond 1P: IB1


Hydrograph
5.47 cfs
5.39 cfs
5.19 cfs
Inflow Area=1.206 ac
Peak Elev=90.10'
Storage=2,620 cf
Inflow
Outflow
Discarded
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
6
8
10
12
14
16
18
20
22
24
26
28
30
32
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40
42
44
46
48

Summary for Pond 3P: Underground Detention -Cultec 330 HD

Inflow Area = 0.723 ac, 69.78% Impervious, Inflow Depth = 5.85" for 100 YR event
Inflow = 4.78 cfs @ 12.09 hrs, Volume= 0.352 af
Outflow = 4.36 cfs @ 12.13 hrs, Volume= 0.288 af, Atten= 9%, Lag= 2.4 min
Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 4.36 cfs @ 12.13 hrs, Volume= 0.288 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 85.61' @ 12.13 hrs Surf.Area= 1,599 sf Storage= 4,262 cf

Plug-Flow detention time= 122.5 min calculated for 0.288 af (82% of inflow)
Center-of-Mass det. time= 51.2 min (854.7 - 803.5)

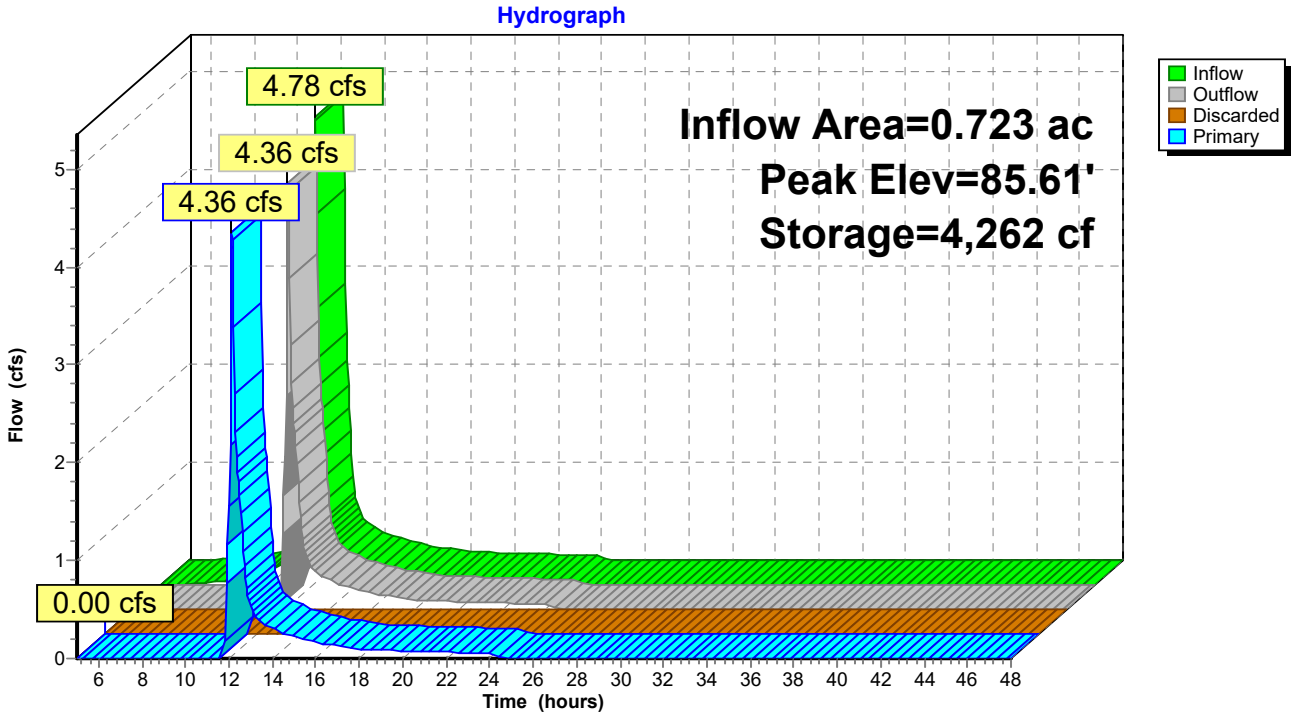
Volume	Invert	Avail.Storage	Storage Description
#1	81.00'	2,136 cf	**35.66'W x 44.84'L x 4.71'H Prismatoid** 7,531 cf Overall - 2,191 cf Embedded = 5,341 cf x 40.0% Voids
#2	82.00'	2,191 cf	**Cultec R-330XLHD** x 42 Inside #1 Effective Size= 47.8"W x 30.0"H => 7.45 sf x 7.00'L = 52.2 cf Overall Size= 52.0"W x 30.5"H x 8.50'L with 1.50' Overlap
		4,327 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	82.00'	**18.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 82.00' / 70.00' S= 0.3000 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	83.70'	**9.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	85.10'	**21.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Discarded	81.00'	**5.000 in/hr Exfiltration over Surface area above 81.00'** Conductivity to Groundwater Elevation = 70.00' Excluded Surface area = 1,599 sf

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=81.00' (Free Discharge)
└**4=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=4.24 cfs @ 12.13 hrs HW=85.59' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 4.24 cfs of 14.34 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 2.31 cfs @ 6.16 fps)
  └**3=Orifice/Grate** (Orifice Controls 1.93 cfs @ 2.25 fps)

Pond 3P: Underground Detention -Cultec 330 HD



APPENDIX F

STORMWATER MANAGEMENT PRACTICE DESIGN

Project: 21-28 Creek Drive (Former DPW Site)
Description: Stormwater Management Design
By/Date: AG 12/10/2018 Reviewed/Date: MAB 12/13/2018

STORMWATER MANAGEMENT PRACTICE:
Subcatchment 11

1) Determine Required Water Quality Volume & Stormwater Management Practice

Water quality volume to be treated will be calculated using the 90% rule from Section 4.2 of the New York State Storm Water Design Manual (January 2015), hereinafter referred to as NYSSDM.

WQv = 43,560 x [P x Rv x A] / 12

Where:
WQv = Water quality volume (cf)
P = 90 % Rainfall Event Number (in), per Figure 4.1
Rv = 0.05 + 0.009 x I , where I is % impervious area*
A = Watershed (ac)
* A minimum Rv of 0.2 will be applied to regulated sites.

Watershed	P (in)	Impervious Area (ac)	Impervious (Coverage %)	Rv	Total Area (ac)	WQv (cf)	Pre-Treatment Practice	Treatment Practice
Subcatchment 11	1.40	0.526	43.5	0.44	1.210	2,713	Hydrodynamic	Infiltration

Note: Pretreatment will be handeled via a hydrodynamic device.

2) Subsurface soil conditions

Design Infiltration Rate (f_c): 5.00 inches per hour

3) Determine Required Pre-Treatment Volume

Determine Pre-Treatment Volume

Design Infiltration Rate: 5.00 inches per hour
Required Minimum Pretreatment Volume: 100%

Watershed	Required WQv (cf)	Required Pre-Treatment Volume (cf)	Pre-Treatment Practice	Treatment Practice
Subcatchment 11	2,713	2,713	Hydrodynamic	Infiltration

Notes:
1) Pretreatment volumes per § 6.3.3 of the NYSSDM (January 2015).

4) Determine Runoff Reduction Volume (RR_V)

Goal: Provide 100% RR_V by implementing Green Infrastructure techniques and Stormwater Management Practices

RR_V = 43,560 x [P x Rv x A] / 12

Where:
RR_V = Runoff Reduction Volume (cf)
P = 90 % Rainfall Event Number (in), per Figure 4.1
Rv = 0.05 + 0.009 x I , where I is % impervious area
A = Watershed (ac)

R_V: 0.44

100% RR_V: 2,713 cf

* Minimum Rv of of 0.2 not applicable to RR_V calculations (use actual calculated Rv).

For projects that cannot meet 100% RR_V: Implement Specific Reduction Factor (S), which provides an absoulte minimum acceptable RR_V.

Drainage Area with Hydrologic Soil Group A:	1.210 acres	Corresponding S: 0.55
Drainage Area with Hydrologic Soil Group B:	0.000 acres	Corresponding S: 0.40
Drainage Area with Hydrologic Soil Group C:	0.000 acres	Corresponding S: 0.30
Drainage Area with Hydrologic Soil Group D:	0.000 acres	Corresponding S: 0.20
Total Area:	1.210 acres	
Total Area Matches		Calculated S: 0.55

Minimum RR_V (acre-feet) = [(P)(Rv*)(Ai)]/12

Calculated Ai: 0.289
Calculated Rv*: 0.95
Calculated Minimum RR_V: 1397 cf

Where:
P = 90 % Rainfall Event Number (in), per Figure 4.1
Rv* = 0.05 + 0.009 x I , where I is % impervious area (100%)
Ai = (S)(Aic)
Aic = Total area of new impervious cover

5) Stormwater Management Practice Design

Consider infiltating RRv

100% RRv =	2,713 cf	
RRv Infiltrated in Basin =	2,875 cf	From HydroCAD Model
Is RRV 100% infiltrated?	yes - acceptable	The WQv storm inflow volume is less than the calculated 100% RRv. Therefore a Test Storm for RRv with a depth of 3.5 inches was used to demonstrate that the infiltration basin will infiltrate 2,875cf of volume without flowing through any orifices.

Consider infiltrating CPv:
Determine Stream Channel Protection Volume (Cpv)

◆ 1-Year Storm Runoff Volume	0.001 acre-feet	From Cpv calculations below
Cpv Infiltrated in Basin =	0.066 acre-feet	From HydroCAD Model
Is Cpv 100% infiltrated?	yes - acceptable	The basin infiltrates the entire 1-year storm.

Project: 21-28 Creek Drive (Former DPW Site)
Description: Stormwater Management Design
By/Date: AG 12/10/2018 Reviewed/Date: MAB 12/13/2018

STORMWATER MANAGEMENT PRACTICE:
Subcatchment 11

5.1) Determine Stream Channel Protection Volume (Cpv)

- Post Developed Runoff Curve Number (CN) = 63 From HydroCAD model

- Computed Initial Abstraction (Ia)
  Ia = 200/CN-2 = 1.175

  1 Year Rainfall: P = 2.6 inches
  Ia /P = 0.45 (use minimum Ia/P=0.1, maximum Ia/P=0.5)
  Tc = 0.1 hours From HydroCAD model

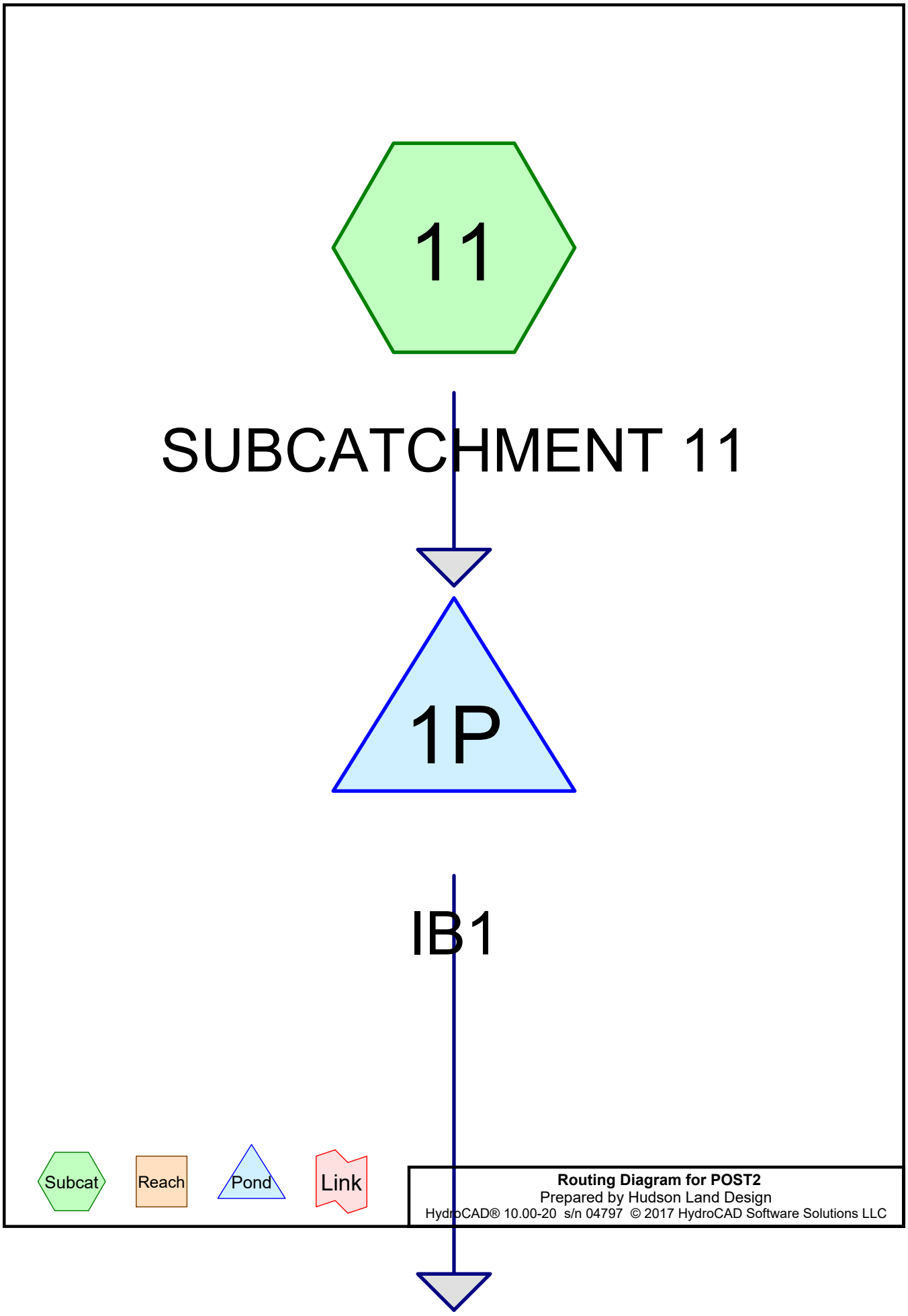
- Compute Unit Peak Discharge (qu) From Exhibit 4-III of TR-55, Second Edition June 1986
  qu = 350 csm/in

- Find qo/qi using Figure 8.5 from Chapter 8 of the New York State Stormwater Design Manual (August 2003)
  Peak outflow discharge/peak inflow discharge (qo/qi)
  = 0.050

- $Vs/Vr=0.682-1.43(qo/qi)+1.64(qo/qi)^2-0.804(qo/qi)^3$ 0.61 Where Vs equals the channel protection storage (Cpv) and Vr equals the volume of runoff in inches
- From HydroCAD find the runoff depth (Q) 0.02 inches

  Watershed Area (A) = 1.21 acres
- Solve for Vs; Vs=Cpv=(Vs/Vr)(Q)(1/12)(A) 0.001 acre feet
  or 54 cubic feet 0.001 acre-feet

6) See HydroCAD model for Overbank Flood Control (Qp) and Extreme Flood Control (Qf) computations


11
SUBCATCHMENT 11
1P
IB1
Subcat
Reach
Pond
Link
Routing Diagram for POST2
Prepared by Hudson Land Design
HydroCAD® 10.00-20 s/n 04797 © 2017 HydroCAD Software Solutions LLC

Summary for Subcatchment 11: SUBCATCHMENT 11

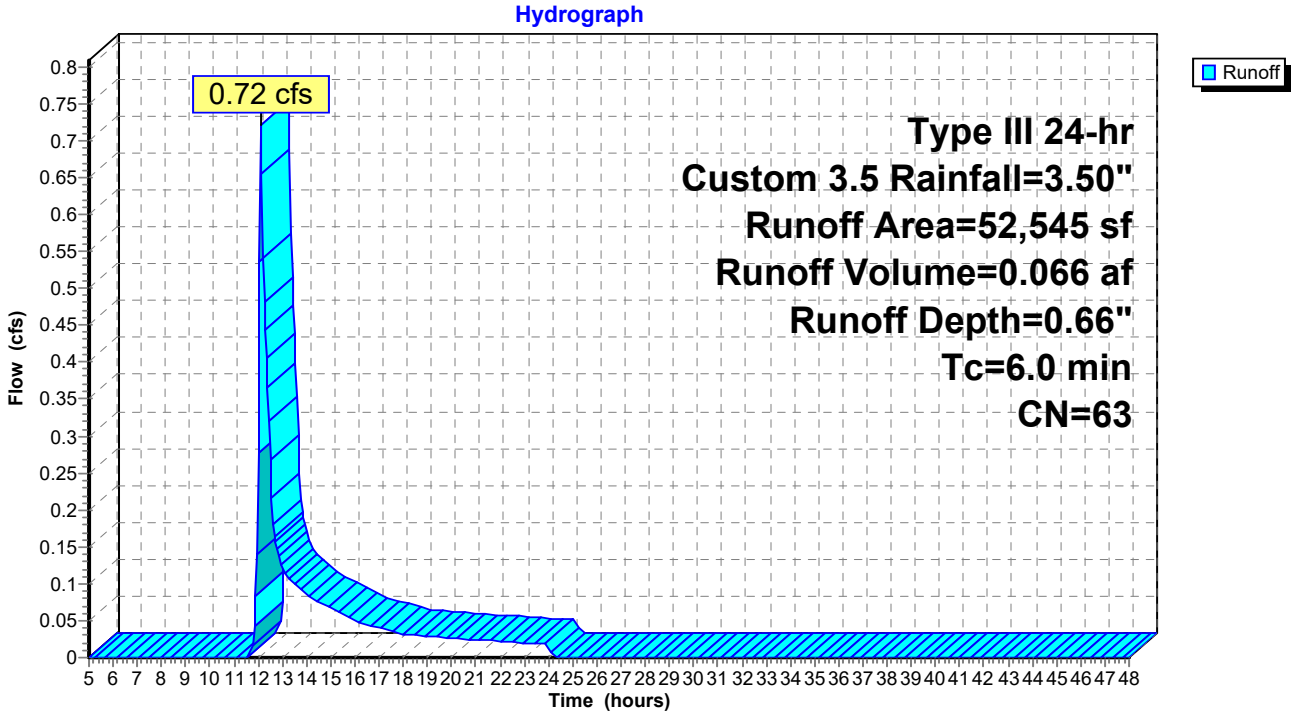
Runoff = 0.72 cfs @ 12.11 hrs, Volume= 0.066 af, Depth= 0.66"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr Custom 3.5 Rainfall=3.50"

Area (sf)	CN	Description
22,913	98	Paved parking, HSG A
14,078	30	Woods, Good, HSG A
14,970	39	>75% Grass cover, Good, HSG A
584	96	Gravel surface, HSG A
52,545	63	Weighted Average
29,632		56.39% Pervious Area
22,913		43.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, S1**

Subcatchment 11: SUBCATCHMENT 11



Summary for Pond 1P: IB1

Inflow Area = 1.206 ac, 43.61% Impervious, Inflow Depth = 0.66" for Custom 3.5 event
Inflow = 0.72 cfs @ 12.11 hrs, Volume= 0.066 af
Outflow = 0.08 cfs @ 14.08 hrs, Volume= 0.066 af, Atten= 89%, Lag= 118.2 min
Discarded = 0.08 cfs @ 14.08 hrs, Volume= 0.066 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 89.25' @ 14.08 hrs Surf.Area= 1,305 sf Storage= 1,113 cf

Plug-Flow detention time= 248.0 min calculated for 0.066 af (100% of inflow)
Center-of-Mass det. time= 249.0 min (1,144.0 - 895.1)

Volume	Invert	Avail.Storage	Storage Description
#1	88.00'	4,980 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

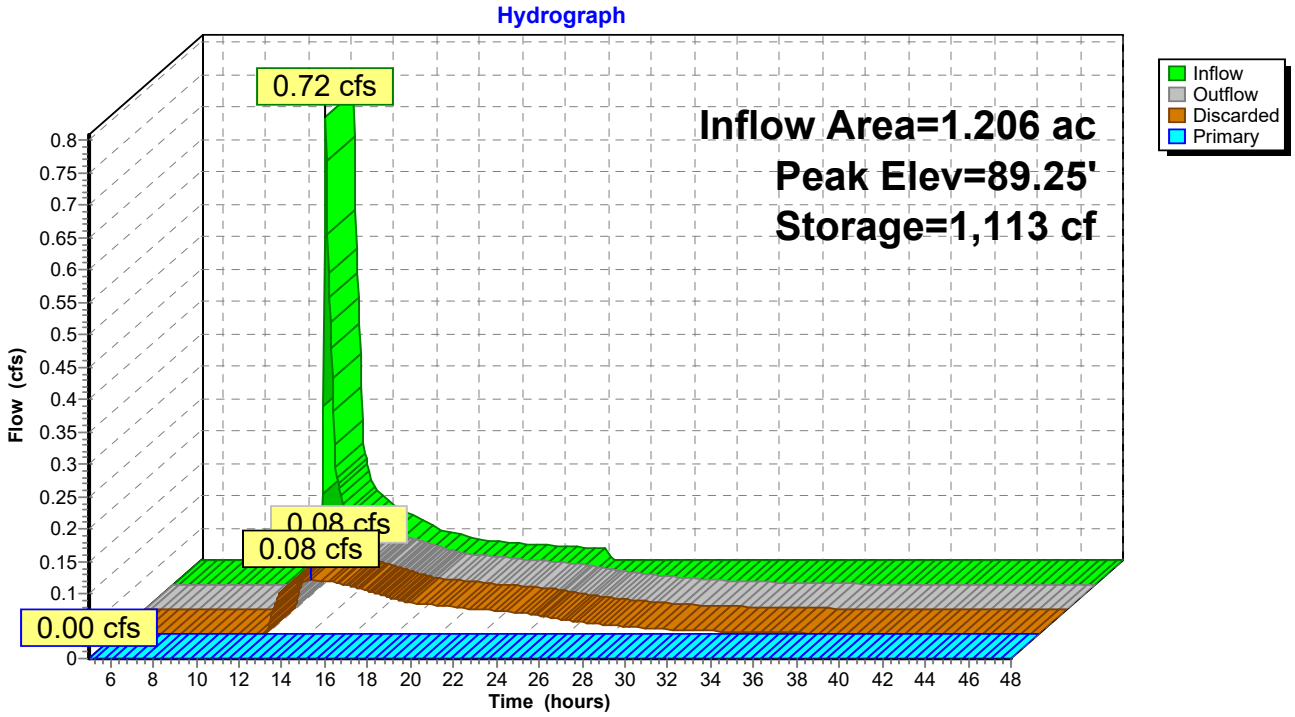
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
88.00	622	0	0
89.00	1,021	822	822
90.00	2,152	1,587	2,408
91.00	2,991	2,572	4,980

Device	Routing	Invert	Outlet Devices
#1	Primary	88.00'	**15.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 88.00' / 76.00' S= 0.3000 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	89.30'	**3.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	89.90'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	90.00'	**6.0' long x 8.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.43 2.54 2.70 2.69 2.68 2.68 2.66 2.64 2.64 2.64 2.65 2.65 2.66 2.66 2.68 2.70 2.74
#5	Discarded	88.00'	**5.000 in/hr Exfiltration over Surface area above 88.00'** Conductivity to Groundwater Elevation = 78.00' Excluded Surface area = 622 sf

Discarded OutFlow Max=0.08 cfs @ 14.08 hrs HW=89.25' (Free Discharge)
└**5=Exfiltration** (Controls 0.08 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=88.00' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)
  └**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: IB1


Hydrograph
Inflow
Outflow
Discarded
Primary
0.72 cfs
0.08 cfs
0.08 cfs
0.00 cfs
Inflow Area=1.206 ac
Peak Elev=89.25'
Storage=1,113 cf
Flow (cfs)
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
0.55
0.6
0.65
0.7
0.75
0.8
6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
Time (hours)

Project: 21-28 Creek Drive (Former DPW Site)
Description: Stormwater Management Design
By/Date: AG 12/10/2018 Reviewed/Date: MAB 12/13/2018

STORMWATER MANAGEMENT PRACTICE:
Subcatchment 12

1) Determine Required Water Quality Volume & Stormwater Management Practice

Water quality volume to be treated will be calculated using the 90% rule from Section 4.2 of the New York State Storm Water Design Manual (January 2015), hereinafter referred to as NYSSDM.

WQv = 43,560 x [P x Rv x A] / 12

Where:
WQv = Water quality volume (cf)
P = 90 % Rainfall Event Number (in), per Figure 4.1
Rv = 0.05 + 0.009 x I , where I is % impervious area*
A = Watershed (ac)
* A minimum Rv of 0.2 will be applied to regulated sites.

Watershed	P (in)	Impervious Area (ac)	Impervious (Coverage %)	Rv	Total Area (ac)	WQv (cf)	Pre-Treatment Practice	Treatment Practice
Subcatchment 12	1.40	0.504	69.7	0.68	0.723	2,489	Hydrodynamic	Underground Infiltration

Note: Pretreatment will be handeled via a hydrodynamic device.

2) Subsurface soil conditions

Design Infiltration Rate (f_c): 5.00 inches per hour

3) Determine Required Pre-Treatment Volume

Determine Pre-Treatment Volume

Design Infiltration Rate: 5.00 inches per hour
Required Minimum Pretreatment Volume: 100%

Watershed	Required WQv (cf)	Required Pre-Treatment Volume (cf)	Pre-Treatment Practice	Treatment Practice
Subcatchment 12	2,489	2,489	Hydrodynamic	Underground Infiltration

Notes:
1) Pretreatment volumes per § 6.3.3 of the NYSSDM (January 2015).

4) Determine Runoff Reduction Volume (RR_V)

Goal: Provide 100% RR_V by implementing Green Infrastructure techniques and Stormwater Management Practices

RR_V = 43,560 x [P x Rv x A] / 12

Where:
RR_V = Runoff Reduction Volume (cf)
P = 90 % Rainfall Event Number (in), per Figure 4.1
Rv = 0.05 + 0.009 x I , where I is % impervious area
A = Watershed (ac)

R_V: 0.68

100% RR_V: 2,489 cf

* Minimum Rv of of 0.2 not applicable to RR_V calculations (use actual calculated Rv).

For projects that cannot meet 100% RR_V: Implement Specific Reduction Factor (S), which provides an absoulte minimum acceptable RR_V.

Drainage Area with Hydrologic Soil Group A:	0.723 acres	Corresponding S: 0.55
Drainage Area with Hydrologic Soil Group B:	0.000 acres	Corresponding S: 0.40
Drainage Area with Hydrologic Soil Group C:	0.000 acres	Corresponding S: 0.30
Drainage Area with Hydrologic Soil Group D:	0.000 acres	Corresponding S: 0.20
Total Area:	0.723 acres	
Total Area Matches		Calculated S: 0.55

Minimum RR_V (acre-feet) = [(P)(Rv*)(Ai)]/12

Calculated Ai: 0.277
Calculated Rv*: 0.95
Calculated Minimum RR_V: 1338 cf

Where:
P = 90 % Rainfall Event Number (in), per Figure 4.1
Rv* = 0.05 + 0.009 x I , where I is % impervious area (100%)
Ai = (S)(Aic)
Aic = Total area of new impervious cover

5) Stormwater Management Practice Design

Consider infiltating RRv

100% RRv =	2,489 cf	
RRv Infiltrated in Basin =	2,526 cf	From HydroCAD Model
Is RRV 100% infiltrated?	yes - acceptable	The WQv storm inflow volume is less than the calculated 100% RRv. Therefore a Test Storm for RRv with a depth of 2.68 inches was used to demonstrate that the underground infiltration will infiltrate 2,489 cf of volume without flowing through any orifices.

Consider infiltrating CPv:
Determine Stream Channel Protection Volume (Cpv)

◆ 1-Year Storm Runoff Volume	0.008 acre-feet	From Cpv calculations below
Cpv Infiltrated in Basin =	0.049 acre-feet	From HydroCAD Model
Is Cpv 100% infiltrated?	yes - acceptable	The basin infiltrates the entire 1-year storm.

Project: 21-28 Creek Drive (Former DPW Site)
Description: Stormwater Management Design
By/Date: AG 12/10/2018 Reviewed/Date: MAB 12/13/2018

STORMWATER MANAGEMENT PRACTICE:
Subcatchment 12

5.1) Determine Stream Channel Protection Volume (Cpv)

- Post Developed Runoff Curve Number (CN) 79 From HydroCAD model

- Computed Initial Abstraction (Ia)

Ia = 200/CN-2 = 0.532

1 Year Rainfall: P = 2.6 inches
Ia /P = 0.20 (use minimum Ia/P=0.1, maximum Ia/P=0.5)
Tc = 0.1 hours From HydroCAD model

- Compute Unit Peak Discharge (qu) From Exhibit 4-III of TR-55, Second Edition June 1986

qu = 625 csm/in

- Find qo/qi using Figure 8.5 from Chapter 8 of the New York State Stormwater Design Manual (August 2003)

Peak outflow discharge/peak inflow discharge (qo/qi) = 0.030

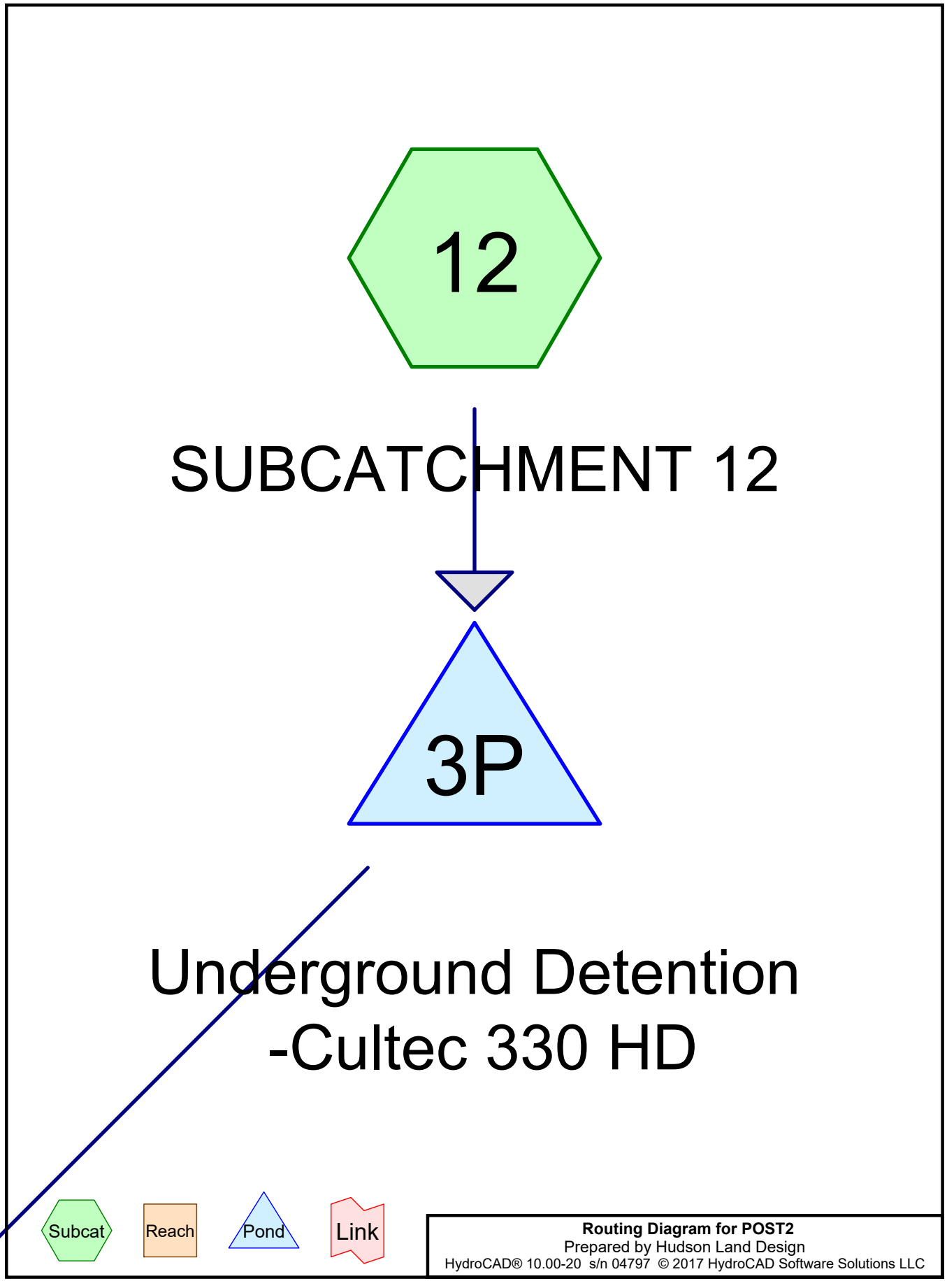
- $Vs/Vr=0.682-1.43(qo/qi)+1.64(qo/qi)^2-0.804(qo/qi)^3$ 0.64 Where Vs equals the channel protection storage (Cpv) and Vr equals the volume of runoff in inches
- From HydroCAD find the runoff depth (Q) 0.21 inches

Watershed Area (A) = 0.72 acres

- Solve for Vs; Vs=Cpv=(Vs/Vr)(Q)(1/12)(A) 0.008 acre feet

or 353 cubic feet 0.008 acre-feet

6) See HydroCAD model for Overbank Flood Control (Qp) and Extreme Flood Control (Qf) computations


12
SUBCATCHMENT 12
3P
Underground Detention
-Cultec 330 HD
Subcat
Reach
Pond
Link
Routing Diagram for POST2
Prepared by Hudson Land Design
HydroCAD® 10.00-20 s/n 04797 © 2017 HydroCAD Software Solutions LLC

Summary for Subcatchment 12: SUBCATCHMENT 12

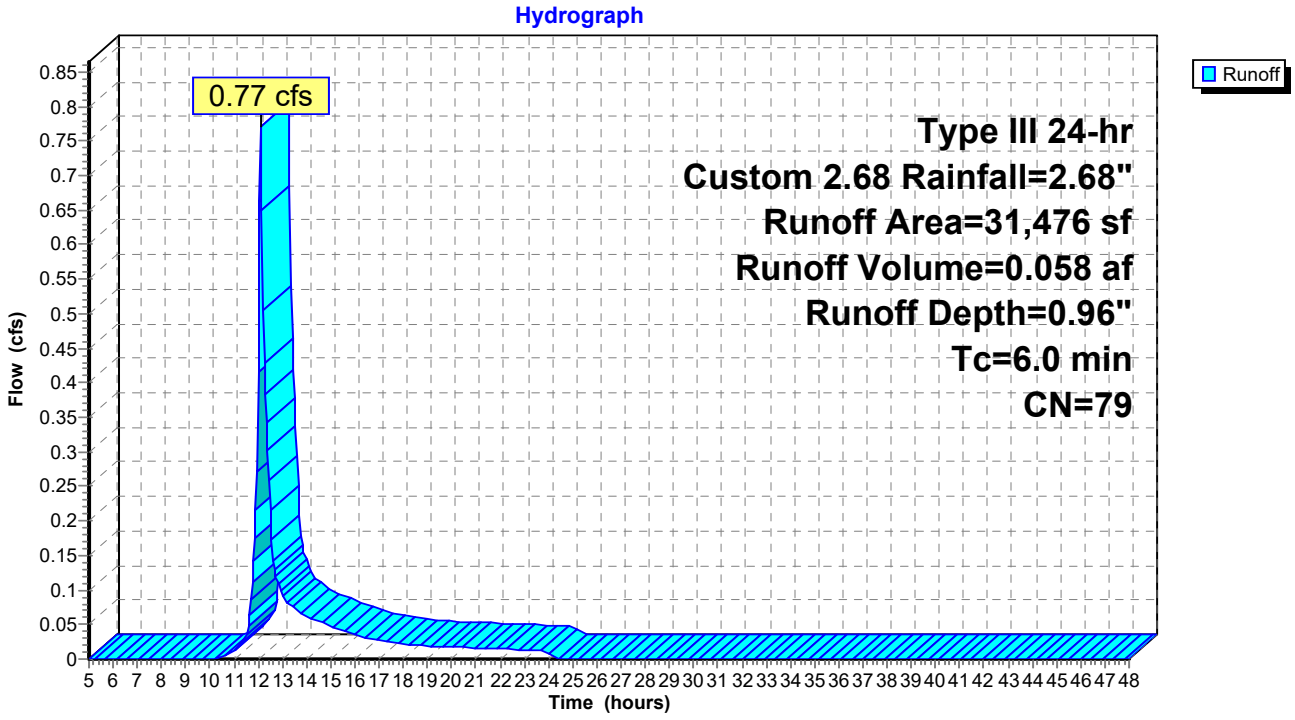
Runoff = 0.77 cfs @ 12.10 hrs, Volume= 0.058 af, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr Custom 2.68 Rainfall=2.68"

Area (sf)	CN	Description
21,963	98	Paved parking, HSG A
5,758	30	Woods, Good, HSG A
3,755	39	>75% Grass cover, Good, HSG A
31,476	79	Weighted Average
9,513		30.22% Pervious Area
21,963		69.78% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, S1**

Subcatchment 12: SUBCATCHMENT 12



Summary for Pond 3P: Underground Detention -Cultec 330 HD

Inflow Area = 0.723 ac, 69.78% Impervious, Inflow Depth = 0.96" for Custom 2.68 event
Inflow = 0.77 cfs @ 12.10 hrs, Volume= 0.058 af
Outflow = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Discarded = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af
Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 83.46' @ 24.40 hrs Surf.Area= 1,599 sf Storage= 2,519 cf

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

Volume	Invert	Avail.Storage	Storage Description
#1	81.00'	2,136 cf	**35.66'W x 44.84'L x 4.71'H Prismatoid** 7,531 cf Overall - 2,191 cf Embedded = 5,341 cf x 40.0% Voids
#2	82.00'	2,191 cf	**Cultec R-330XLHD** x 42 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
		4,327 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	82.00'	**18.0" Round Culvert** L= 40.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 82.00' / 70.00' S= 0.3000 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	83.70'	**9.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	85.10'	**21.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Discarded	81.00'	**5.000 in/hr Exfiltration over Surface area above 81.00'** Conductivity to Groundwater Elevation = 70.00' Excluded Surface area = 1,599 sf

Discarded OutFlow Max=0.00 cfs @ 5.00 hrs HW=81.00' (Free Discharge)
└**4=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=81.00' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)
  ├**2=Orifice/Grate** (Controls 0.00 cfs)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 3P: Underground Detention -Cultec 330 HD

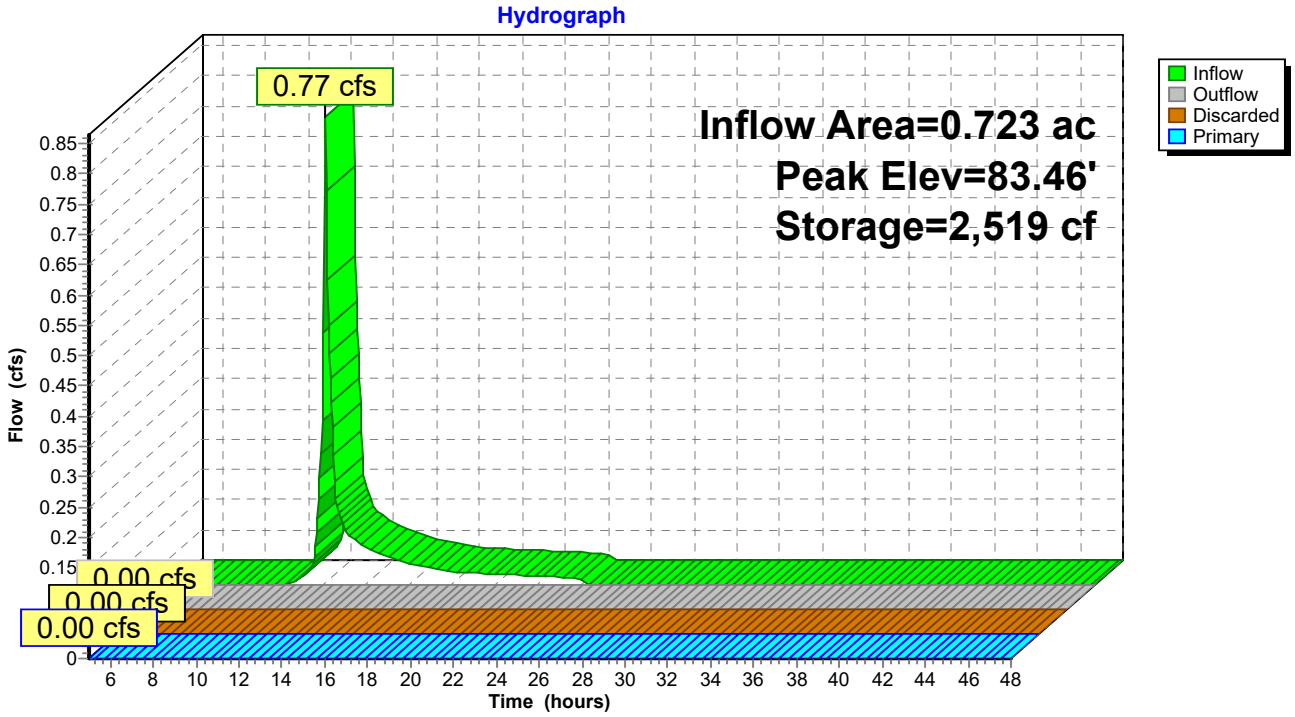
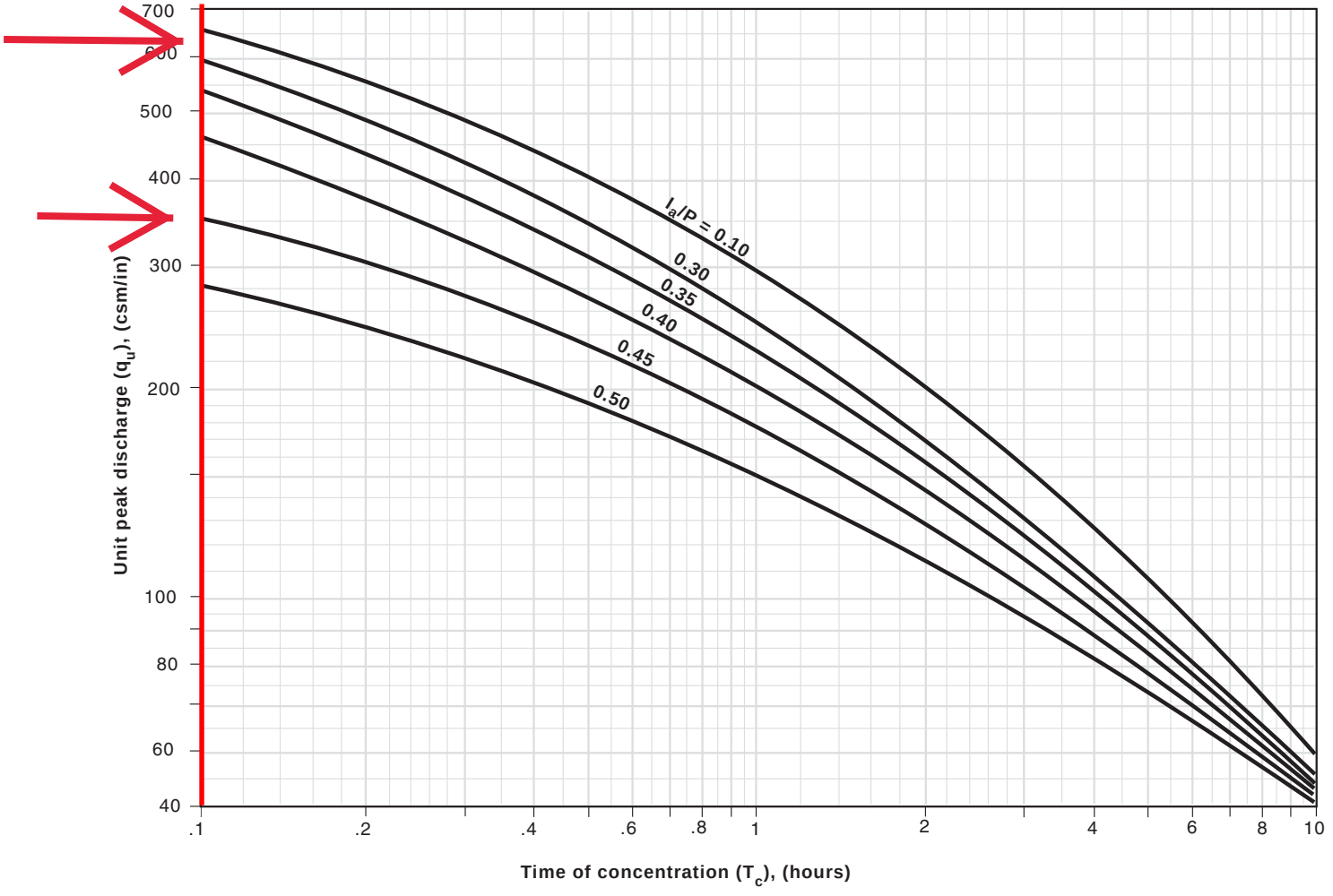


Exhibit 4-III Unit peal discharge (q_u) for NRCS (SCS) type III rainfall distribution



Compute Stream Channel Protection Volume, (Cp_v) (see Section 4.3 and Appendix B)

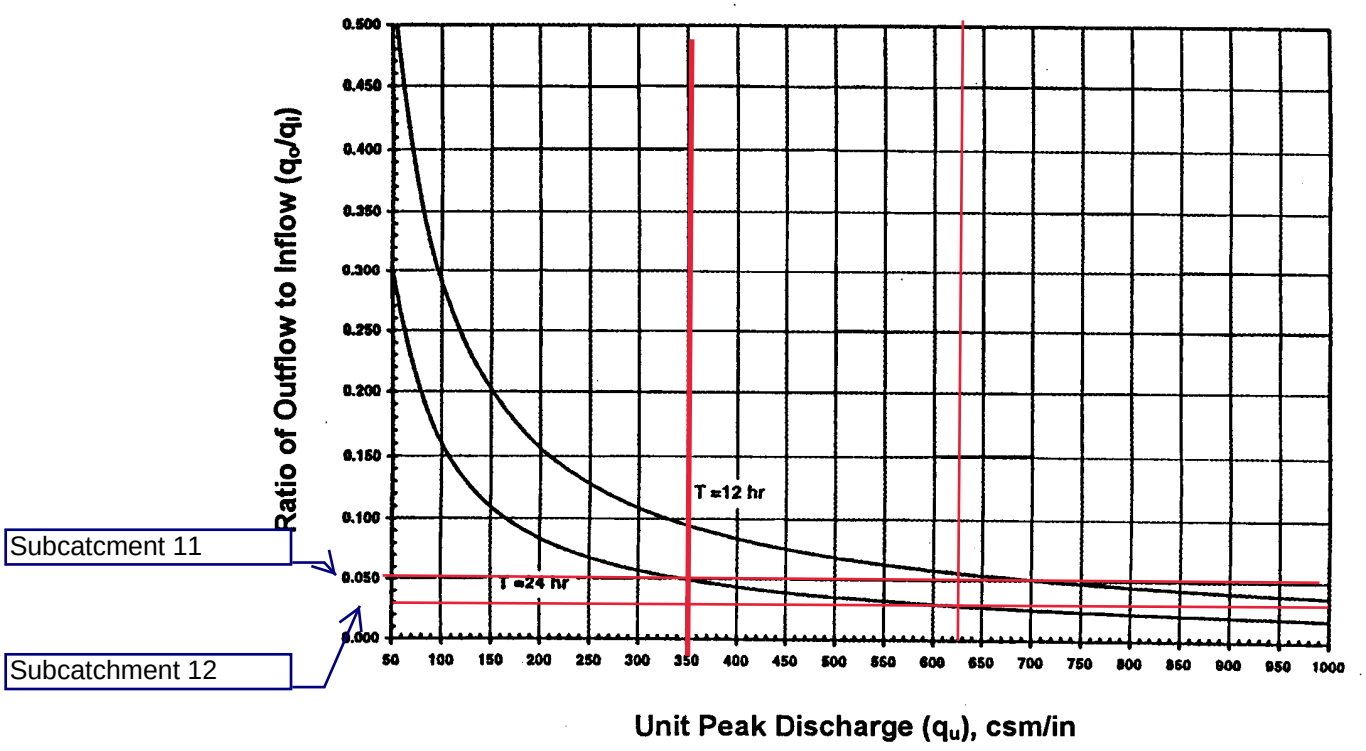
For stream channel protection, provide 24 hours of extended detention (T) for the one-year event.

Compute Channel Protection Storage Volume

First, determine the value of the unit peak discharge (q_u) using TR-55 and Type II Rainfall Distribution

- Initial abstraction (Ia) for CN of 78 is 0.564: [Ia = (200/CN - 2)]
- Ia/P = (0.564)/ 2.3 inches = 0.245
- T_c = 0.35 hours
- Using the above data and Exhibit 4-II from TR-55 (NRCS, 1986), q_u = 570 csm/in (cubic feet per second per square mile per year)
- Knowing q_u and T = 24 hours, find q_o/q_i using Figure 8.5 (also see methodology in Appendix B)
- Peak outflow discharge/peak inflow discharge (q_o/q_i) = 0.035
- $Vs/Vr = 0.683 - 1.43(q_o/q_i) + 1.64(q_o/q_i)^2 - 0.804(q_o/q_i)^3$ (from Appendix B)
  Where Vs equals channel protection storage (Cp_v) and Vr equals the volume of runoff in inches.

Figure 8.5 Detention Time vs. Discharge Ratios (Source: MDE, 2000)



APPENDIX G

PRE-CONSTRUCTION SITE ASSESSMENT CHECKLIST

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 professional[1] conduct an assessment of the site prior to the commencement of construction[2] 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.

When construction starts, site inspections shall be conducted by the qualified professional at least every 7 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater (Construction Duration Inspections). 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. The Operator shall post at the site, in a publicly accessible location, a summary of the site inspection activities on a monthly basis (Monthly Summary Report).

The operator shall also prepare a written summary of compliance with this general permit at a minimum frequency of every three months (Operator's Compliance Response Form), while coverage exists. The summary should address the status of achieving each component of the SWPPP.

Prior to filing the Notice of Termination or the end of permit term, the Operator shall have a qualified professional perform a final site inspection. The qualified professional shall certify that the site has undergone final stabilization[3] 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 "Qualified Professional means a person knowledgeable in the principles and practice of erosion and sediment controls, such as a Certified Professional in Erosion and Sediment Control (CPESC), soil scientist, licensed engineer or someone working under the direction and supervision of a licensed engineer (person must have experience in the principles and practices of erosion and sediment control).

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. Operators Certification

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. Further, I hereby certify that the SWPPP meets all Federal, State, and local erosion and sediment control requirements. I am aware that false statements made herein are punishable as a class A misdemeanor pursuant to Section 210.45 of the Penal Law.

Name (please print): _____

Title _____ **Date:** _____

Address: _____

Phone: _____ **Email:** _____

Signature: _____

c. Qualified Professional's Credentials & Certification

"I hereby certify that I meet the criteria set forth in the General Permit to conduct site inspections for this project and that the appropriate erosion and sediment controls described in the SWPPP and as described in the following Pre-construction Site Assessment Checklist have been adequately installed or implemented, ensuring the overall preparedness of this site for the commencement of construction."

Name (please print): _____

Title _____ **Date:** _____

Address: _____

Phone: _____ **Email:** _____

Signature: _____

d. 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 Entrance

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. Perimeter 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? _____

APPENDIX H

INFILTRATION BASIN INSPECTION CHECKLIST

Infiltration Basin Construction Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

CONSTRUCTION SEQUENCE	SATISFACTORY/ UNSATISFACTORY	COMMENTS
1. Pre-Construction		
Runoff diverted		
Soil permeability tested		
Groundwater / bedrock depth		
2. Excavation		
Size and location		
Side slopes stable		
Excavation does not compact subsoils		
3. Embankment		
Barrel		
Anti-seep collar or Filter diaphragm		
Fill material		

CONSTRUCTION SEQUENCE	SATISFACTORY/ UNSATISFACTORY	COMMENTS
4. Final Excavation		
Drainage area stabilized		
Sediment removed from facility		
Basin floor tilled		
Facility stabilized		
5. Final Inspection		
Pretreatment facility in place		
Inlets / outlets		
Contributing watershed stabilized before flow is routed to the factility		

Comments:

Actions to be Taken:

Open Channel System Construction Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

CONSTRUCTION SEQUENCE	SATISFACTORY / UNSATISFACTORY	COMMENTS
1. Pre-Construction		
Pre-construction meeting		
Runoff diverted		
Facility location staked out		
2. Excavation		
Size and location		
Side slope stable		
Soil permeability		
Groundwater / bedrock		
Lateral slopes completely level		
Longitudinal slopes within design range		
Excavation does not compact subsoils		
3. Check dams		
Dimensions		
Spacing		
Materials		

CONSTRUCTION SEQUENCE	SATISFACTORY / UNSATISFACTORY	COMMENTS
4. Structural Components		
Underdrain installed correctly		
Inflow installed correctly		
Pretreatment devices installed		
5. Vegetation		
Complies with planting specifications		
Topsoil adequate in composition and placement		
Adequate erosion control measures in place		
6. Final inspection		
Dimensions		
Check dams		
Proper outlet		
Effective stand of vegetation and stabilization		
Contributing watershed stabilized before flow is routed to the factility		

Comments:

Actions to be Taken:

APPENDIX I

CONTRACTOR AND SUBCONTRACTOR CERTIFICATIONS

CERTIFICATION STATEMENT

"I hereby certify 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 understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings."

Contractor:

Name:_____

Signature:_____

Title:_____

Company Name:_____

Company Address:_____

_____

_____

_____

Company Phone Number:_____

Site Address:_____

_____

_____

_____

Specific SWPPP Responsibilities:

_____

_____

_____

_____

_____

Date of Certification: _____

Name and Title of Trained Contractor for SWPPP Implementation:_____

_____

CERTIFICATION STATEMENT

"I hereby certify 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 understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings."

Sub-Contractor:

Name:_____

Signature:_____

Title:_____

Company Name:_____

Company Address:_____

_____

_____

_____

Company Phone Number:_____

Site Address:_____

_____

_____

_____

Specific SWPPP Responsibilities:

_____

_____

_____

_____

_____

Date of Certification: _____

Name and Title of Trained Contractor for SWPPP Implementation:_____

_____

APPENDIX J

QUALIFIED PROFESSIONAL'S CERTIFICATION

QUALIFIED PROFESSIONAL'S CERTIFICATION

" I hereby certify that I meet the criteria set forth in the General Permit to conduct site inspections for this project and that the appropriate erosion and sediment controls described in the SWPPP and as described in the Pre-Construction Site Assessment Checklist have been adequately installed or implemented, ensuring the overall preparedness of this site for the commencement of construction."

Name (Print):_____

Title:_____

Date:_____

Company Name:_____

Company Address:_____

_____

_____

_____

Company Phone Number:_____

Company Email:_____

Signature:_____

APPENDIX K

OWNER / OPERATOR CERTIFICATION

CERTIFICATION STATEMENT

" 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 also certify under penalty of law that that this document and the corresponding documents were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. Further, I am acknowledging that this SWPPP has been developed and will be implemented as the first element of construction and agree to comply with all the terms and conditions of the general permit for which the NOI is being submitted."

Name (Print):_____

Title:_____

Date:_____

Company Name:_____

Company Address:_____

_____

_____

_____

Company Phone Number:_____

Company Email:_____

Signature:_____

APPENDIX L

POST DEVELOPMENT MAINTENANCE AND INSPECTION CHECKLIST

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 dewaters 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:

Open Channel Operation, Maintenance, and Management Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

MAINTENANCE ITEM	SATISFACTORY/ UNSATISFACTORY	COMMENTS
1. Debris Cleanout (Monthly)		
Contributing areas clean of debris		
2. Check Dams or Energy Dissipators (Annual, After Major Storms)		
No evidence of flow going around structures		
No evidence of erosion at downstream toe		
Soil permeability		
Groundwater / bedrock		
3. Vegetation (Monthly)		
Mowing done when needed		
Minimum mowing depth not exceeded		
No evidence of erosion		
Fertilized per specification		
4. Dewatering (Monthly)		
Dewaters between storms		

MAINTENANCE ITEM	SATISFACTORY/ UNSATISFACTORY	COMMENTS
5. Sediment deposition (Annual)		
Clean of sediment		
6. Outlet/Overflow Spillway (Annual)		
Good condition, no need for repairs		
No evidence of erosion		

Comments:

Actions to be Taken:

APPENDIX M

CONSTRUCTION INSPECTION REPORT

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 Professional (print name)	**Qualified Professional 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?
[ ] [ ] [ ] Is there residue from oil and floating substances, visible oil film, or globules or grease?
[ ] [ ] [ ] 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 and debris 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.

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.

2. Level 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

Runoff Control Practices (continued)

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. Stabilized Construction Entrance
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?

2. Silt Fence
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)

3. Storm Drain Inlet Protection (Use for Stone & Block; Filter Fabric; Curb; or, Excavated 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.

Sediment accumulation ___% of design capacity.

4. 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 accumulation is ___% of design capacity.

5. 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 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.
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:

III. Monthly Summary of Site Inspection Activities

Name of Permitted Facility:	Today's Date:	Reporting Month:
Location:	Permit Identification #:	
Name and Telephone Number of Site Inspector:		

Date of Inspection	Regular / Rainfall based Inspection	Name of Inspector	Items of Concern

Owner/Operator Certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that false statements made herein are punishable as a class A misdemeanor pursuant to Section 210.45 of the Penal Law."

Signature of Permittee or Duly Authorized Representative

Name of Permittee or Duly Authorized Representative Date

Duly authorized representatives must have written authorization, submitted to DEC, to sign any permit documents.

APPENDIX N
NOTICE OF TERMINATION

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505
(NOTE: Submit completed form to address above)

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity

Please indicate your permit identification number: NYR ___ ___ ___ ___ ___ ___

I. Owner or Operator Information

1. Owner/Operator Name:

2. Street Address:

3. City/State/Zip:

4. Contact Person: | 4a.Telephone:

4b. Contact Person E-Mail:

II. Project Site Information

5. Project/Site Name:

6. Street Address:

7. City/Zip:

8. County:

III. Reason for Termination

9a. □ All disturbed areas have achieved final stabilization in accordance with the general permit and SWPPP. ***Date final stabilization completed** (month/year): _____

9b. □ Permit coverage has been transferred to new owner/operator. Indicate new owner/operator's permit identification number: NYR ___ ___ ___ ___ ___ ___
(Note: Permit coverage can not be terminated by owner identified in I.1. above until new owner/operator obtains coverage under the general permit)

9c. □ Other (Explain on Page 2)

IV. Final Site Information:

10a. Did this construction activity require the development of a SWPPP that includes post-construction stormwater management practices? □ yes □ no (If no, go to question 10f.)

10b. Have all post-construction stormwater management practices included in the final SWPPP been constructed? □ yes □ no (If no, explain on Page 2)

10c. Identify the entity responsible for long-term operation and maintenance of practice(s)?

_____

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

10d. Has the entity responsible for long-term operation and maintenance been given a copy of the operation and maintenance plan required by the general permit? □ yes □ no

10e. Indicate the method used to ensure long-term operation and maintenance of the post-construction stormwater management practice(s):

□ Post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain practice(s) have been deeded to the municipality.

□ Executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s).

□ For post-construction stormwater management practices that are privately owned, a mechanism is in place that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan, such as a deed covenant in the owner or operator's deed of record.

□ For post-construction stormwater management practices that are owned by a public or private institution (e.g. school, university or hospital), government agency or authority, or public utility; policy and procedures are in place that ensures operation and maintenance of the practice(s) in accordance with the operation and maintenance plan.

10f. Provide the total area of impervious surface (i.e. roof, pavement, concrete, gravel, etc.) constructed within the disturbance area? _____ (acres)

11. Is this project subject to the requirements of a regulated, traditional land use control MS4? □ yes □ no

(If Yes, complete section VI - "MS4 Acceptance" statement

V. Additional Information/Explanation:

(Use this section to answer questions 9c. and 10b., if applicable)

VI. MS4 Acceptance - MS4 Official (principal executive officer or ranking elected official) or Duly Authorized Representative (Note: Not required when 9b. is checked -transfer of coverage)

I have determined that it is acceptable for the owner or operator of the construction project identified in question 5 to submit the Notice of Termination at this time.

Printed Name:

Title/Position:

Signature:	Date:

NOTICE OF TERMINATION for Storm Water Discharges Authorized under the SPDES General Permit for Construction Activity - continued

VII. Qualified Inspector Certification - Final Stabilization:

I hereby certify that all disturbed areas have achieved final stabilization as defined in the current version of the general permit, and that all temporary, structural erosion and sediment control measures have been removed. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:	
Title/Position:	
Signature:	Date:

VIII. Qualified Inspector Certification - Post-construction Stormwater Management Practice(s):

I hereby certify that all post-construction stormwater management practices have been constructed in conformance with the SWPPP. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

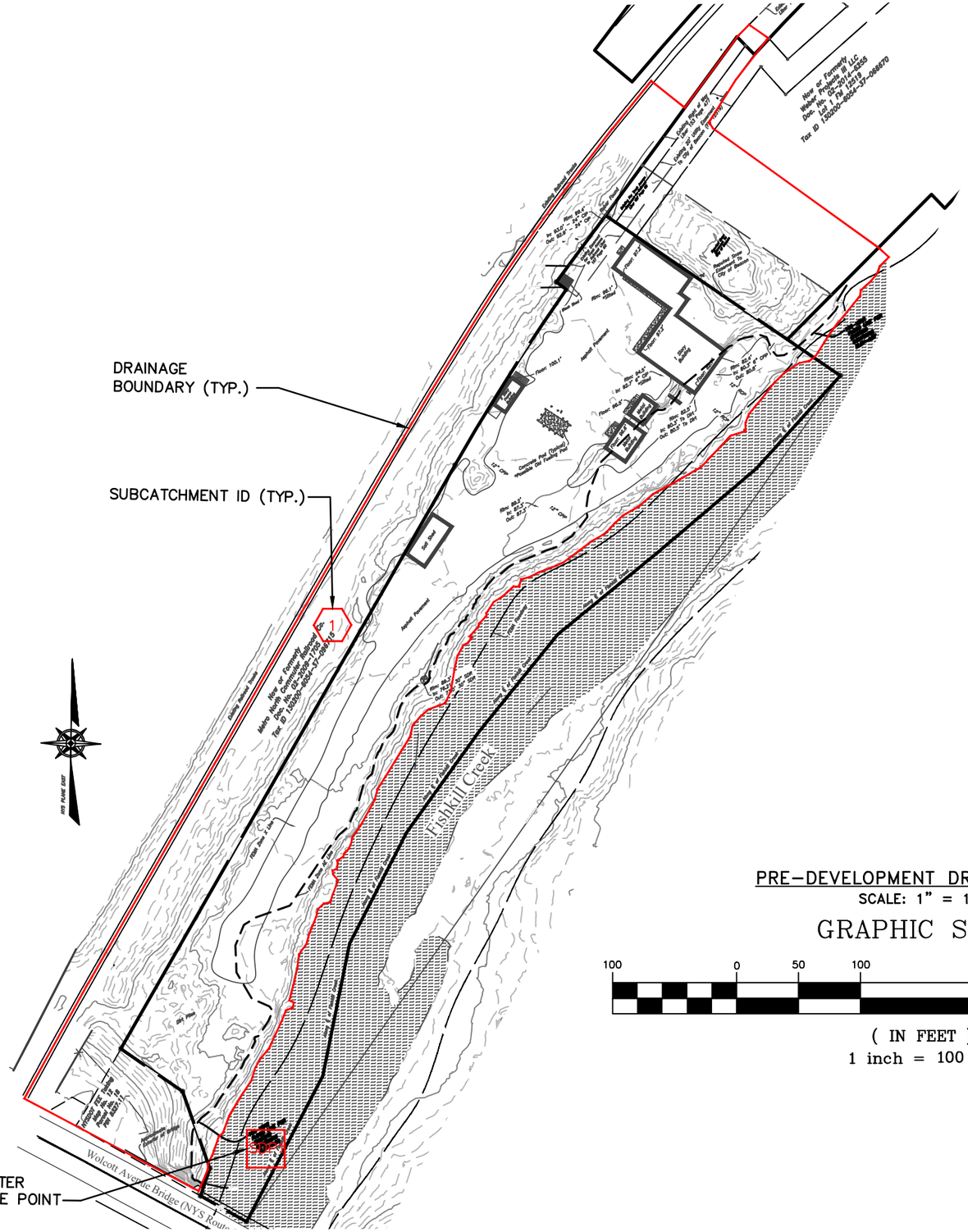
Printed Name:	
Title/Position:	
Signature:	Date:

IX. Owner or Operator Certification

I hereby certify that this document was prepared by me or under my direction or supervision. My determination, based upon my inquiry of the person(s) who managed the construction activity, or those persons directly responsible for gathering the information, is that the information provided in this document is true, accurate and complete. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

Printed Name:	
Title/Position:	
Signature:	Date:

(NYS DEC Notice of Termination - January 2015)



LEGEND:

DRAINAGE BOUNDARY

SUBCATCHMENT ID — 1

DESIGN POINT — SDP1

PRE-DRAINAGE
SUBCATCHMENT 1
TOTAL AREA = 160,667 SQFT

IMPERVIOUS = 48,660 SQFT
WOODS A = 58,238 SQFT
MEADOW A = 53,769 SQFT

TIME OF CONCENTRATION, Tc:
1. DIRECT ENTRY = 6 MINUTES

PRE-DEVELOPMENT DRAINAGE PLAN
SCALE: 1" = 100'

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

DRAWN BY: AG	CHECKED BY: DGK	JOB NO.: 2018:043	
REVISIONS:			
NO.	DATE	DESCRIPTION	BY

PRE-DEVELOPMENT DRAINAGE PLAN

23-28 CREEK DRIVE

CREEK DRIVE
CITY OF BEACON
DUTCHESS COUNTY, NEW YORK
TAX ID:
SCALE: 1" = 100'
OCTOBER 22, 2018

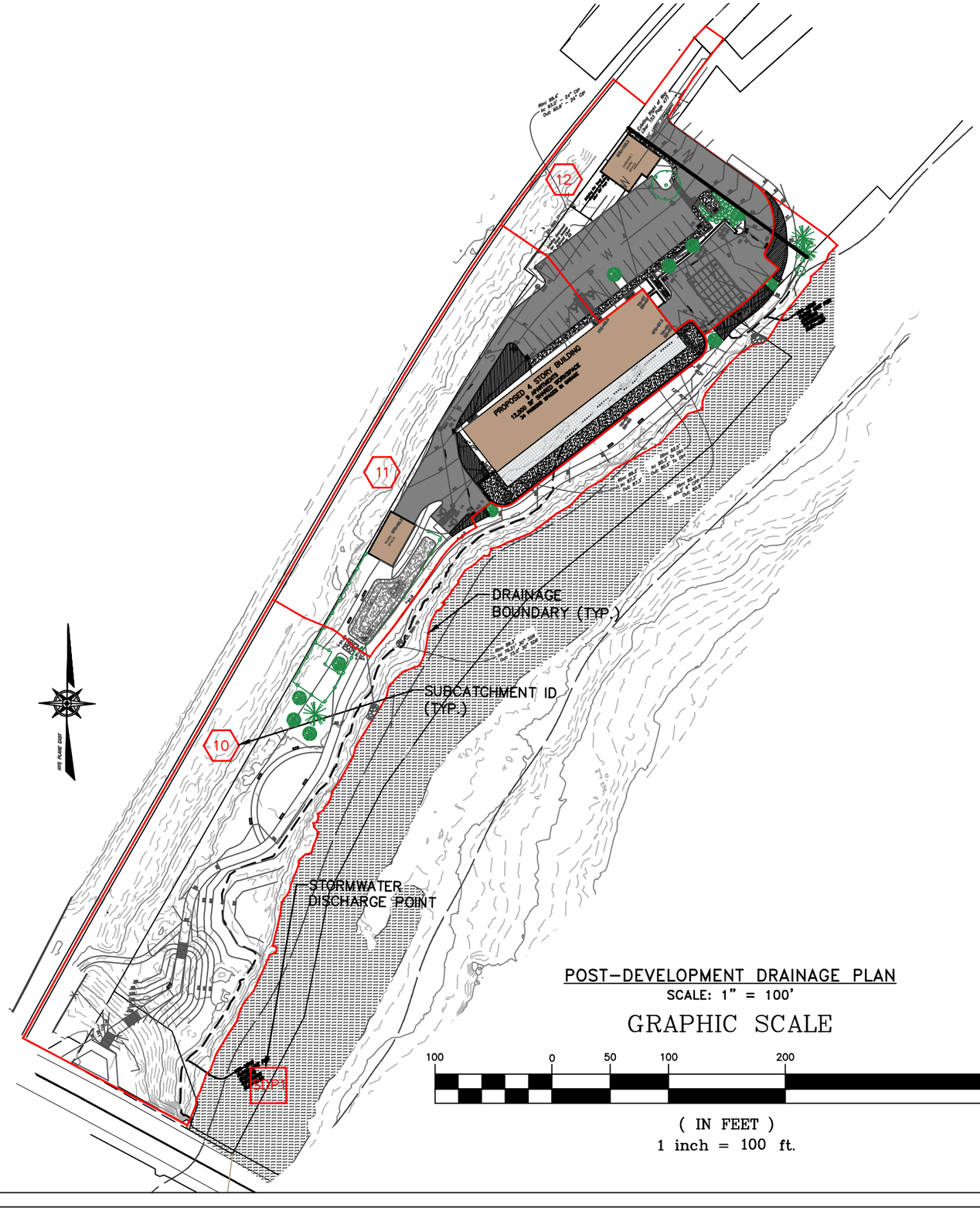
HUDSON LAND DESIGN

HUDSON LAND DESIGN
PROFESSIONAL ENGINEERING P.C.
174 MAIN STREET
BEACON, NEW YORK 12508
PH: 845-440-6926 F: 845-440-6637

SEAL

JON D. BODENDORF, P.E.
NYS LICENSE NO. 076245
DANIEL G. KOEHLER, P.E.
NYS LICENSE NO. 082716

SHEET: 1 OF 1



LEGEND:

DRAINAGE BOUNDARY

SUBCATCHMENT ID 1

DESIGN POINT SDP1

POST–DRAINAGE
SUBCATCHMENT 10
TOTAL AREA = 76,646 SQFT

IMPERVIOUS = 740 SQFT
WOODS A = 37,514 SQFT
GRASS A = 30,748 SQFT
GRAVEL A = 7,644 SQFT

TIME OF CONCENTRATION, Tc:
1. DIRECT ENTRY = 6 MINUTES

POST–DRAINAGE
SUBCATCHMENT 11
TOTAL AREA = 52,545 SQFT

IMPERVIOUS = 22,913 SQFT
WOODS A = 14,078 SQFT
GRASS A = 14,970 SQFT
GRAVEL A = 584 SQFT

TIME OF CONCENTRATION, Tc;
1. DIRECT ENTRY = 6 MINUTES

POST–DRAINAGE
SUBCATCHMENT 12
TOTAL AREA = 31,476 SQFT

IMPERVIOUS = 21,963 SQFT
WOODS A =5,758 SQFT
GRASS A = 3,755 SQFT

TIME OF CONCENTRATION, Tc;
1. DIRECT ENTRY = 6 MINUTES

POST–DEVELOPMENT DRAINAGE PLAN
SCALE: 1" = 100'

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

DRAWN BY: AG	CHECKED BY: DGK	JOB NO.: 2018:043	
REVISIONS:			
NO.	DATE	DESCRIPTION	BY

POST–DEVELOPMENT DRAINAGE PLAN
23–28 CREEK DRIVE

CREEK DRIVE
CITY OF BEACON
DUTCHESS COUNTY, NEW YORK
TAX ID:
SCALE: 1" = 100'
OCTOBER 22, 2018

HUDSON LAND DESIGN
PROFESSIONAL ENGINEERING P.C.
174 MAIN STREET
BEACON, NEW YORK 12508
PH: 845–440–6926 F: 845–440–6637

SEAL

JON D. BODENDORF, P.E.
NYS LICENSE NO. 076245
DANIEL G. KOEHLER, P.E.
NYS LICENSE NO. 082716

SHEET: 1 OF 1

APPENDIX O

OPERATION AND MAINTENANCE PLAN